ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

KEELAND CREEK
STR. & APPRS. (S)

YELL COUNTY
ROUTE 7 SECTION 12
JOB 080441
FED. AID PROJ. STPF-0075(32)

NOT TO SCALE

STA. 803+00.00 - BEGIN
LOG MILE 4.42

BEGINNING:
LAT. N35° 00’ 53”
LONG. W93° 13’ 03”

MID POINT:
LAT. N35° 01’ 04”
LONG. W93° 13’ 10”

ENDING:
LAT. N35° 01’ 08”
LONG. W93° 13’ 27”

DESIGN TRAFFIC DATA:

- DESIGN YEAR: 2034
- 2034 ADT: 700
- 2034 DTV: 950

DIRECTIONAL DISTRIBUTION:
- 60%
- 80%

DESIGN SPEED: 55 MPH
TYPICAL SECTION OF IMPROVEMENT
TANGENT
STA. 803+00 - STA. 804+32.66
STA. 823+68.13 - STA. 827+64.13

TYPICAL SECTION OF IMPROVEMENT
SUPERELEVATION
STA. 804+32.66 - STA. 806+00.00
STA. 808+50.00 - STA. 823+68.13

NOTES:
REITER 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.

THE FINAL 3" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN Laid. LONITUDINAL JOINTS SHALL BE AT LANE LINES.
THE ROCK CUT SHALL BE EXCAVATED USING A 1/4 SLOPE. THE ROCK CUT SLOPE WILL HAVE A 10 FOOT HORIZONTAL BENCH EVERY 20 VERTICAL FEET. SOIL SHALL BE BURIED ON THE UNGRADED SIDE OF THE ROCK WITH ROCK CONTINUING TO THE TOP OF THE BACKSLOPE IF THE SOIL EXCAVATION IS OVER 20 VERTICAL FEET A 5 FOOT BENCH WILL BE PLACED EVERY 20 FEET.

DETAILS OF SILT FENCE
AT CROSS DRAINS

DETAILS OF SILT FENCE
AT BOX CULVERTS

AT STATIONS 809+00 TO 812+00 A HEAVY WEATHERED SHALE WAS RECOVERED. THEREFORE, THESE SLOPES SHALL BE CONSTRUCTED UTILIZING A 1/4 SLOPE WITH A 5 FOOT HORIZONTAL BENCH EVERY 20 VERTICAL FEET.

DETAILS OF BENCHING ROCK CUT
STA. 809+00 - 812+00

DETAILS OF BENCHING ROCK CUT
STA. 813+00 - 816+00
STA. 807+50 CONSTRUCT
TRIP 12" X 9" X 145" B.C. BOX CULVERT
WITH 2L1 WINGS LT. & RT.
Q50 = 2200 CFS D.A. = 2.2 SQ. M.

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<tr>
<th>DESCRIPTION</th>
<th>LENGTH</th>
<th>CLASS/15&quot; CONCRETE - ROADWAY</th>
<th>REINFORCING STEEL (2&quot;RO) - ROADWAY</th>
<th>UNCLASSIFIED EXCAVATION FOR STRUCTURES - ROADWAY</th>
<th>SOLID SODDING</th>
<th>WATER</th>
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WATER: WINGS, HOOY, & APRONS (SLFT) = 12.6 GAL. / SQ. YD. OF SOLID SODDING.

*Includes: headwalls, wingwalls, footings, toe walls, and aprons.
### MID-SECTION

#### BAR LAP TABLE

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**Stirrup Lap Requirements for:**
- BAR LAPS on all Sheeted Sections shall be considered auxiliary to the following Sheet (or similar):
- Additional laps as shown on plan
- For additional information and outlet sections, see Sheet 2 of 2.

#### SHEET 1 OF 2

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

**TRIPLE BARREL BOX CULVERT STA. 807+50**

**SPECIAL DETAILS**
LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10' Lengths for Non-Shoveled Boxes

CULVERT DRAINAGE DETAIL FOR ROCK FILL

This detail shall be used when rock fill is specified for embankment construction.

VERTICAL FABRIC ALTERNATE
(Shown for Culvert, Sideral or Wingwall)

WRAPPED FABRIC ALTERNATE
(Shown for Wingwall, Sideral or Culvert)

For Details of Excavation and Pay Limits, see Standard Drawing 000-2.

SAICED SECTION LAYOUT FOR VARYING FILL DEPTICES OVER 10'

GENERAL NOTES


LINE LOADINGS: HL-93

All concrete shall be Class 5 with a minimum 20-day compressive strength of 3,500 psi and shall be poured in the dry. All exposed concrete shall have 90" chamfers.

Reinforcing steel shall be Grade 60 (yield strength = 40,000 psi) conforming to AASHTO M31 or M322, Type A, with test report.

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 transverse bars such as Figure 3 on page 7-4 of the CRSI Manual shall be minus zero to plus 0.25mm.

Excavation and backfilling shall be in accordance with the requirements of Section 801. Membrane Waterproofing shall conform to the requirements of Section 815. Membrane Waterproofing shall be Type C and deemed by the Engineer to be applied in accordance with the instructions of the manufacturer.

Crop construction joints in the top and sides of R.C. box culverts and to the construction joint between wingwalls 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'-0" diameter and shall be placed 1'-0" 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'-0" diameter and shall be placed 12'-0" above the top of the wingwall footing.

The barrel components of the culvert may be constructed using continuous pours. For longer culvert construction, the Contractor may use multiple pours with transverse construction joints spaced a minimum of 30 feet apart unless supervised by stage construction or site constraints as approved by the Engineer. Construction joints between footings and wall shall be made only where shown in the Plans. Joints shall be normal to the centerline of 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 slab of the box culvert serves as finished roadway surface, curving and finishing shall be in accordance with subsection 802.37 and 802.20 for bridge roadway surface and a live finish shall be applied in accordance with subsection 802.19 for Class 3 Treated Bridge Roadway Surface Finishes. Coupling and filling shall be paid for directly, but shall be considered incidental to the item "Class 5 Concrete-Ready Mix." Class 1 Protective Surface Treatment shall be applied to the roadway surface and this work shall be paid for under the suit price bid for "Class 1 Protective Surface Treatment".

When prestressed reinforced concrete box culverts are subcontracted for cast in place box culverts, they shall be manufactured according to ASTM C 957 and meet the requirements of Section 807. When the top slab of the box culvert serves as the finished roadway surface, a precast reinforced concrete box culvert substitution is not allowed.
END ELEVATION
Wing A
Wing B

TYPICAL KEYWAY DETAIL
All Construction Joints

PART PLAN - FLARED WINGWALLS

Wing A
Wing B

PART PLAN - PARALLEL WINGWALLS

WINGWALL ELEVATION
Showing Back Face Reinforcement

For square ends make the shaded area thickness the greater of SB and 3/8" thick. For skewed ends make the shaded area thickness the greater of SB and DWELL.

PLAN - FLARED WINGWALLS
Showing Footing Reinforcement

For square ends make the shaded area thickness the greater of SB and 3/8" thick. For skewed ends make the shaded area thickness the greater of SB and DWELL.

PLN - PARALLEL WINGWALLS
Showing Footing Reinforcement

WINGWALL SECTION P-P

CONSTRUCTION JOINTS
Wing A
Wing B

SHEET 4 OF 4
GENERAL DETAIL OF R.C. BOX CULVERT
DETAELS OF WINGWALLS

SPECIAL DETAILS
LEGEND

ES = SAND BAG DITCH CHECK
EC = ROCK DITCH CHECK
EM = SILT FENCE
ED = SLOPE DRAIN
ED = DIVERSION DITCH

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

REVISIONS

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SEQUENCING

STAGE 4: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT NEW CULVERT AND NEW LOCATION AREA, PERFORM LEVELING OPERATIONS WHERE APPLICABLE, PLACE CONSTRUCTION PAYMENT MARKERS, UTILIZE VERTICAL PANELS AT THE NOTCH AT 40 FT. SPACING NEAR NEW LOCATION.

STAGE 5: FINISH CONSTRUCTION, INSTALL FINAL. SURFACE COURSE AND PLACE FINAL STRIPING. DIRECT TRAFFIC TO NEW LOCATION.

STAGE 6: OBLITERATE EXITING ROADWAY AND REMOVE EXISTING BRIDGE.
SEQUENCING:
STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT NEW CULVERT AND NEW LOCATION AREA, PERFORM EXISTING OPERATIONS WHERE APPLICABLE, PLACE CONSTRUCTION WARNING MARKINGS, UTILIZE VERTICAL PANELS AT THE MOTH AT 40' ALONG SPACING NEAR NEW LOCATION.
STAGE 2: FINISH CONSTRUCTION, INSTALL FINAL SURFACE COURSE AND PLACE FINAL STRIPING DIRECT TRAFFIC TO NEW LOCATION.
STAGE 3: DOWEL EXISTING ROADWAY AND REMOVE EXISTING BRIDGE.

SAND BAG DITCH CHECKS (E-51) DAQ
STA. 819+00 LT. & RT. 2 INSTALLATION 44
STA. 821+00 LT. & RT. 1 INSTALLATION 44
STA. 823+00 LT. & RT. 2 INSTALLATION 44
STA. 101+00 LT. & RT. 2 INSTALLATION 44
STA. 102+76 LT. & RT. 2 INSTALLATION 44

ROCK DITCH CHECKS (E-66) CL. YD.
STA. 820+00 LT. & RT. 2 INSTALLATION 6
STA. 821+00 LT. & RT. 2 INSTALLATION 6
STA. 822+00 LT. 1 INSTALLATION 3
STA. 823+50 RT. 1 INSTALLATION 3

SILT FENCE (E-11)
STA. 820+00 - STA. 828+50 RT. 726 LIN. FT.

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

LEGEND

- = SAND BAG DITCH CHECK
- = ROCK DITCH CHECK
- - = SILT FENCE
- - - = SLOPE DRAIN
- - - - = DIVERSION DITCH

REVISIONS

DATE OF REVISION

REVISIONS

TEMPORARY EROSION CONTROL DETAILS
STAGE 1
LEGEND
- E5 = SAND BAG DITCH CHECK
- E6 = ROCK DITCH CHECK
- E7 = SILT FENCE
- E8 = SLOPE DRAIN
- E9 = DIVERSION DITCH

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

REVISIONS

SEQUENCING:
- STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT NEW DRAINAGE AND NEW LOCATION AREA, PERFORM Leveling OPERATIONS WHERE APPLICABLE, PLACE CONSTRUCTION PAVEMENT MARKINGS, UTILIZE VERTICAL PANELS AT THE MOUTH AT 40 G.C. SPACING NEAR NEW LOCATION.
- STAGE 2: COMPLETE CONSTRUCTION, INSTALL FINAL SURFACE COURSE AND PLACE FINAL STRIPPING, DIRECT TRAFFIC TO NEW LOCATION.
- STAGE 3: DEMOLISH EXISTING ROADWAY AND REMOVE EXISTING BRIDGE.
SEQUENCING:
STAGE 1 M AINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT NEW O ULD妇 AND NEW LOCATION AREA PATHWAY, EXITING OVERWATER WHERE APPLICABLE, PLACE CONSTRUCTION PAVeMENT MARKINGS, UTILIZE VERTICAL PANELS AT THE NOTCH AT 40' EE SPACING NEAR NEW LOCATION.
STAGE 2 FROM CONSTRUCTION, INSTALL FINAL SURFACE COURSE AND PLACE FINAL STRIPING, DIRECT TRAFFIC TO NEW LOCATION.
STAGE 3 U TILIZE NEW ROADWAY AND REMOVED EXISTING BRIDGE.

LEGEND

- = SAND BAG DITCH CHECK
- = ROCK DITCH CHECK
- = SILT FENCE
- = SLOPE DRAIN
- = DIVERSION DITCH

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRABBING OPERATIONS ARE STARTED.

REVISIONS

DATE
REVISIONS

TEMPORARY EROSION CONTROL DETAILS
STAGE 2
SEQUENCING

STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT NEW CURB AND NEW LOCATION AREA. PERFORM LEVELING OPERATIONS WHERE APPLICABLE. PLACE CONSTRUCTION PAYMENT MARKINGS. UTILIZE VERTICAL PANELS AT THE NOTCH AT 40' SPACING NEAR NEW LOCATION.

STAGE 2: FINISH CONSTRUCTION, INSTALL FINAL SURFACE COURSE AND PLACE FINAL STRIPING. DIRECT TRAFFIC TO NEW LOCATION.

STAGE 3: OBLITERATE EXISTING ROADWAY AND REMOVE EXISTING BRIDGE.

OBLITERATE EXISTING ROADWAY = 61'42" SQ. FT.

Temporary Erosion Control Details

Legend

c = Sand Bag Ditch Check
f = Rock Ditch Check
s = Silty Fence
p = Slope Drain

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

Existing roadway - L00 mileage 4.27 in place
Release of existing bridge structure

Revisions

Date of Revisions

REVISIONS
SEQUENCING:
STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT NEW CULVERT AND NEW LOCATION AREA, PERFORM LEVELING OPERATIONS WHERE APPLICABLE, SPACE CONSTRUCTION PAVEMENT MARKINGS, UTILIZE VERTICAL PANELS AT THE NOTCH AT 40' ACL SPACING NEAR NEW LOCATION.
STAGE 2: FINISH CONSTRUCTION, INSTALL FINAL SURFACE COURSE AND PLACE FINAL STRIPING, DIRECT TRAFFIC TO NEW LOCATION.
STAGE 3: OBLITERATE EXISTING ROADWAY AND REMOVE EXISTING BRIDGE.

REVISIONS

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LEGEND
- = SAND BAG DITCH CHECK
= ROCK DITCH CHECK
= SILT FENCE
= SLOPE DRAIN
= DIVERSION DITCH

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.
STA 803+00.00 - BEGIN
JOB 080441
L.M. 4.42

STA 827+64.13 - END
JOB 080441

ADDITIONAL SIGNS NEEDED PLACED AS DIRECTED BY ENGINEER

SHEAVER CLOSER
(12) PSP-1
(48" X 30")

MAINTENANCE OF TRAFFIC DETAILS
ADVANCE WARNING SIGNS
SEQUENCING:

STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY. CONSTRUCT NEW COVEYER AND NEW LOCATION LANE. PERFORM LEVELING OPERATIONS WHERE APPLICABLE. PLACE CONSTRUCTION PAVEMENT MARKINGS. UTILIZE VERTICAL PANELS AT THE RAMP AT 40' O.C. SPACING NEAR NEW LOCATION.

STAGE 2: FINISH CONSTRUCTION. INSTALL FINAL SURFACE COURSE AND PLACE FINAL STRIPING. DIRECT TRAFFIC TO NEW LOCATION.

STAGE 3: OBLITERATE EXISTING ROADWAY AND REMOVE EXISTING BRIDGE.
SEQUENCING:

STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT NEW CULVERT AND NEW LOCATION AREA, PERFORM LEADING OPERATIONS WHERE APPLICABLE. PLACE CONSTRUCTION PAVEMENT MARKINGS, UTILIZE VERTICAL PANELS AT THE NOTCH AT 40' O.C. SPACING NEAR NEW LOCATION.

STAGE 2: FINISH CONSTRUCTION, INSTALL FINAL SURFACE COURSE AND PLACE FINAL STRIPES. DIRECT TRAFFIC TO NEW LOCATION.

STAGE 3: OBLITERATE EXISTING ROADWAY AND REMOVE EXISTING BRIDGE.

MAINTENANCE OF TRAFFIC DETAILS
STAGE 1
SEQUENCING:

STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT NEW OVERTURE AND NEW LOCATION AREA, PERFORM LEVELING OPERATIONS WHERE APPLICABLE, PLACE CONSTRUCTION PAVING MATERIALS, UTILIZE VERTICAL PANELS AT THE NOTCH AT 40' O.C. SPACING NEAR NEW LOCATION.

STAGE 2: FINISH CONSTRUCTION, INSTALL FINAL SURFACE Course AND PLACE FINAL STRIPING, DIRECT TRAFFIC TO NEW LOCATION.

STAGE 3: OBLITERATE EXISTING ROADWAY AND REMOVE EXISTING BRIDGE.
SEQUENCING:

STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT NEW CULVERT AND NEW LOCATION AREA, PERFORM LEVELING OPERATIONS WHERE APPLICABLE, PLACE CONSTRUCTION PAYLOAD MATERIAL, U-SHAPE VERTICAL PANELS, AT THE NOTCH AT 4X4 (C), SPACING NEAR NEW LOCATION.

STAGE 2: FINISH CONSTRUCTION, INSTALL FINAL SURFACE COURSE AND PLACE FINAL STRIPING, DIRECT TRAFFIC TO NEW LOCATION.

STAGE 3: OBLITERATE EXISTING ROADWAY AND REMOVE EXISTING BRIDGE.
PERMANENT PAVEMENT MARKING DETAILS

REFLECTORIZED PAVEMENT MARKINGS:
- Double solid lines, 10" on centerline, white
- Raised pavement markers, white/yellow

*THE 4" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLED YELLOW CENTERLINE. STAGE FOR THE ENTIRE PROJECT, THE PROJECT MUST BE MARKED FOR PASSING LANE PAVING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION.

THE PAVING LANE SURFACE COURSE HAS BEEN PLANNED TO SCHEDULE THE ZONING OF THE PROJECT.
## ADVANCE WARNING SIGNS AND DEVICES, CONSTRUCTION PAVEMENT MARKINGS, AND PERMANENT PAVEMENT MARKINGS

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<th>STAGE 2</th>
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<th>MAXIMUM NUMBER REQUIRED</th>
<th>TOTAL SIGNS REQUIRED</th>
<th>VERTICAL PANELS</th>
<th>TRAFFIC DRUMS</th>
<th>BARREIACDE (Type B)</th>
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<th>RAISED PAVEMENT MARKERS</th>
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### VERTICAL PANELS
- **TOTAL:** 32
- **SIDE:** 2
- **SIDE:** 3
- **SIDE:** 2

### TRAFFIC DRUMS
- **TOTAL:** 2400

### BARREIACDE (Type B)
- **TOTAL:** 64

### CONSTRUCTION PAVEMENT MARKINGS
- **TOTAL:** 4800

### RAISED PAVEMENT MARKERS
- **TOTAL:** 72

### REFLECTORIZED PAVEMENT MARKINGS
- **TOTAL:** 5800

### REFLECTORIZED PAVEMENT MARKINGS: YELLOW (4)
- **TOTAL:** 5800

### TOTAL
- **TOTAL:** 2023

---

**Note:** This is a low traffic volume road as defined in Section 644.03 of the Standard Specifications for Highway Construction, edition of 2014.

*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/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.*
## CONCRETE DITCH PAVING OR DITCH LINING

<table>
<thead>
<tr>
<th>STATION</th>
<th>LOCATION</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>CONC. DITCH PAVING (TYPE III)</th>
<th>SOLID SODDING</th>
<th>WATER</th>
<th>EROSION CONTROL MATERIAL (SOD)</th>
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</thead>
<tbody>
<tr>
<td>STATION</td>
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<td></td>
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<tr>
<td>813+00</td>
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<td>100</td>
<td>6</td>
<td>200</td>
<td>500</td>
<td>6.7</td>
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</tr>
<tr>
<td></td>
<td>I-65N-02</td>
<td>1200</td>
<td>6</td>
<td>200</td>
<td>500</td>
<td>6.7</td>
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</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>1000</td>
<td>6</td>
<td>200</td>
<td>500</td>
<td>6.7</td>
<td></td>
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</tbody>
</table>

BASIS OF ESTIMATE: 12.5 GAL. / SQ. YD. OF SOLID SODDING.

*QUANTITY ESTIMATED: SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

## SOIL LOG

<table>
<thead>
<tr>
<th>STATION</th>
<th>LOCATION</th>
<th>DEPTH</th>
<th>SOIL CLASSIFICATION</th>
<th>LIQUID LIMIT</th>
<th>PLASTICITY INDEX</th>
<th>REMARKS</th>
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</thead>
<tbody>
<tr>
<td>80+00</td>
<td>0' RT</td>
<td>0.0</td>
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<tr>
<td>80+00</td>
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<tr>
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<tr>
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<td>BROWN</td>
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</table>

SOIL CHARACTERISTICS TABULATED ABOVE ARE REPRESENTATIVE AT THE LOCATION OF THE SAMPLE, AND FROM SURFACE INDICATORS ARE TYPICAL FOR THE醫MITS. 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.

## BENCH MARKS

<table>
<thead>
<tr>
<th>STATION</th>
<th>DESCRIPTION</th>
<th>BENCH MARK NUMBER</th>
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<tbody>
<tr>
<td>80+00</td>
<td>I-65 NICE BOX COUVERT ONLY</td>
<td>1</td>
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TOTAL: 1

NOTE: SHOWN FOR INFORMATION ONLY. BENCH MARKS SHALL BE FURNISHED AND PLACED BY STATE FORCES.

## EROSION CONTROL

<table>
<thead>
<tr>
<th>STATION</th>
<th>LOCATION</th>
<th>PERMANENT EROSION CONTROL</th>
<th>SECOND SEEDING APPLICATION</th>
<th>TEMPORARY SEEDING</th>
<th>TEMPORARY EROSION CONTROL</th>
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</thead>
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<tr>
<td>STATION</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>80+00</td>
<td>I-65N-02</td>
<td>ACRE</td>
<td>ACRE</td>
<td>ACRE</td>
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<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
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<tr>
<td></td>
<td>I-65N-03</td>
<td>SILT</td>
<td>18</td>
<td>9</td>
<td>9</td>
</tr>
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<tr>
<td>TOTAL</td>
<td></td>
<td>38</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

BASIS OF ESTIMATE: 2 TONS/ACRE OF SEEDING.

*QUANTITIES ESTIMATED: SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.
### MAIN LANE BASE AND SURFACING

<table>
<thead>
<tr>
<th>STATION</th>
<th>STATION</th>
<th>LOCATION</th>
<th>LENGTH</th>
<th>AGGREGATE BASE COURSE (CLASS 7)</th>
<th>TACO COAT</th>
<th>ACHM BINDER COURSE (1&quot;) (PG 64-22)</th>
<th>ACHM SURFACE COURSE (1&quot;) (PG 64-22)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td>TON/STATION</td>
<td>SQ.YD.</td>
<td>GALLONS/1000</td>
<td>SQ.YD.</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>FEET</td>
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<tr>
<td>852+40</td>
<td>852+40</td>
<td>MAIN LANE TRANSITION</td>
<td>100.00</td>
<td>113.00</td>
<td>113.00</td>
<td>22.00</td>
<td>640.44</td>
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<tr>
<td>927+46</td>
<td>927+46</td>
<td>MAIN LANE - FULL DEPTH</td>
<td>2668.07</td>
<td>3359.26</td>
<td>3359.26</td>
<td>22.00</td>
<td>6102.61</td>
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<td>927+48</td>
<td>928+48</td>
<td>MAIN LANE - TRANSITION</td>
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<td>113.00</td>
<td>113.00</td>
<td>22.00</td>
<td>640.44</td>
</tr>
<tr>
<td>920+11</td>
<td>920+21</td>
<td>COUNTY ROAD ONLY</td>
<td>268.00</td>
<td>301.18</td>
<td>301.18</td>
<td>20.00</td>
<td>551.11</td>
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<td>ADDITIONAL FOR DR. DEPTH</td>
<td>VAR 0.81</td>
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<tr>
<td>ENTIRE PROJECT</td>
<td>ADDITIONAL FOR SUPER ELEVATION</td>
<td>2359.76</td>
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<tr>
<td>ENTIRE PROJECT</td>
<td>ADDITIONAL FOR TURNOUT</td>
<td>VAR 150.00</td>
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<tr>
<td>ENTIRE PROJECT</td>
<td>ADDITIONAL FOR LEVELING</td>
<td>VAR 50.00</td>
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</tbody>
</table>

**TOTAL**: 3891.95

---

**BASIS OF ESTIMATE**

- ACHM SURFACE COURSE (1") - 94.0% MNL. AGGR. - 5.4% ASPHALT BINDER
- ACHM BINDER COURSE (1") - 95.5% MNL. AGGR. - 4.5% ASPHALT BINDER

**MAXIMUM NUMBER OF OPERATIONS** = 115

*QUANTITIES ESTIMATED. IF NOT DIRECTED BY THE ENGINEER, SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

### COLD MILLING

<table>
<thead>
<tr>
<th>STATION</th>
<th>STATION</th>
<th>LOCATION</th>
<th>COLD MILLING ASPHALT PAVEMENT SQ.YD.</th>
</tr>
</thead>
<tbody>
<tr>
<td>852+40</td>
<td>852+40</td>
<td>BEGIN JOB 083441</td>
<td>244</td>
</tr>
<tr>
<td>927+46</td>
<td>927+46</td>
<td>END JOB 083441</td>
<td>244</td>
</tr>
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</table>

**TOTAL**: 488

### EARTHWORK

<table>
<thead>
<tr>
<th>STATION</th>
<th>STATION</th>
<th>LOCATION</th>
<th>VOLUME AS EXCAVATED</th>
<th>ADDITIONAL</th>
<th>TOTAL</th>
<th>COMPACTED EMBANKMENT</th>
<th>ROCK FILL</th>
<th>*RESPLITTING</th>
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</thead>
<tbody>
<tr>
<td>800+50</td>
<td>800+50</td>
<td>CONSTRUCT MAIN LANE</td>
<td>321964</td>
<td>27963</td>
<td>3507</td>
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<tr>
<td>800+50</td>
<td>800+50</td>
<td>CONSTRUCT MAIN LANE</td>
<td>27963</td>
<td>3507</td>
<td>31460</td>
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<tr>
<td>100+12</td>
<td>100+12</td>
<td>CONSTRUCT COUNTY ROAD</td>
<td>301</td>
<td>301</td>
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<tr>
<td>100+12</td>
<td>100+12</td>
<td>CONSTRUCT COUNTY ROAD</td>
<td>301</td>
<td>301</td>
<td>301</td>
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<tr>
<td>TOTALS:</td>
<td>222465</td>
<td>9830</td>
<td>232285</td>
<td>3921</td>
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</tbody>
</table>

*QUANTITIES ESTIMATED. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.*
REMOVAL OF EXISTING BRIDGE STRUCTURE

LOCATION | DESCRIPTION | REMOVAL OF EXISTING BRIDGE STRUCTURE
----------|-------------|---------------------------------
ENTIRE PROJECT | EXISTING BRIDGE NO. M191 (SITE NO. 1) | 1.00

TOTAL: 1.00

REMOVAL AND DISPOSAL OF DUMP MATERIAL

| STATION | DESCRIPTION | DISPOSAL OF WASTE | REMOVAL OF DISPOSAL OF TON | WASTE
----------|-------------|-------------------|---------------------------|-------
601-00 | SOIL WASTE | 1000 | 8 |
604-00 | SOIL WASTE | 1000 | 4

TOTALS: 1200 20

* QUANTITIES ESTIMATED. SEE SECTION 104.09 OF THE STANDARD SPECIFICATIONS.

GUARDRAIL

<table>
<thead>
<tr>
<th>STATION</th>
<th>SIDE</th>
<th>GUARDRAIL (TYPE C)</th>
<th>CHANNEL POST SIGN SUPPORT (TYPE C)</th>
<th>STD. SIGN/GA. M.TRED. DIAMOND REFLECTORIZED END OF ROAD MARKER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LENGTH</td>
<td>LOCATION</td>
<td>LOCATION</td>
</tr>
</tbody>
</table>
| 584+15 | LT | 25 | 3 | 6.75
| 583+40 | LT | 25 | 3 | 6.75

TOTAL: 25 6 13.20

SELECTED PIPE BEDDING

LOCATION | SELECTED PIPE BEDDING (O.D.):
----------|----------------------------------|
ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER | 10

TOTAL: 10

NOTE: QUANTITY ESTIMATED. SEE SECTION 194.03 OF THE STANDARD SPECIFICATIONS.

PIPE CULVERT

<table>
<thead>
<tr>
<th>STATION</th>
<th>DESCRIPTION</th>
<th>SIDE DRAINS</th>
<th>CROSS DRAIN</th>
<th>PIPE CULVERT</th>
<th>FLARED END SECTIONS</th>
<th>WATER</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>24''</td>
<td>20''</td>
<td>24''</td>
<td>4</td>
<td>26</td>
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<tr>
<td>527+00</td>
<td>CIV. S/24'' RC PIPE CULVERT</td>
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<tr>
<td>101-00</td>
<td>INSTALL 24'' PVC PIPE CULVERT</td>
<td>65</td>
<td>2</td>
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<td>102-00</td>
<td>INSTALL 24'' PVC PIPE CULVERT</td>
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<td>2</td>
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</tbody>
</table>

TOTALS: 102 100 4 26 0.36

BASE OF ESTIMATE: 12.9 GAL. / SQ. YD. OF SOLID SODDING.

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

STRUCTURES OVER 20'-0" SPAN

<table>
<thead>
<tr>
<th>STATION</th>
<th>DESCRIPTION</th>
<th>SPAN</th>
<th>HEIGHT</th>
<th>LENGTH</th>
<th>CLASS S CONCRETE</th>
<th>REINF. STEEL</th>
<th>UNCO. EXC. FOR STR.</th>
<th>SOLID SODDING</th>
<th>WATER</th>
</tr>
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<tbody>
<tr>
<td>B-054</td>
<td>CONSTRUCT F.P. 12' X 6' X W1100 R.C. BOX CULVERT IN 21' HYDRO LT. &amp; RT.</td>
<td>12</td>
<td>5</td>
<td>140</td>
<td>1008.43</td>
<td>136383</td>
<td>468</td>
<td>33</td>
<td>0.42</td>
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TOTALS: 1008.43 136383 468 33 0.42

BASE OF ESTIMATE: 12.4 GALLONS / SQ. YD. OF SOLID SODDING.
<table>
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<th>ITEM NUMBER</th>
<th>ITEM</th>
<th>QUANTITY</th>
<th>UNIT</th>
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<tr>
<td>201</td>
<td>CLEARING</td>
<td>27</td>
<td>STATION</td>
</tr>
<tr>
<td>201</td>
<td>GROPPING</td>
<td>27</td>
<td>STATION</td>
</tr>
<tr>
<td>SP</td>
<td>REMOVAL AND DISPOSAL OF TIRES</td>
<td>25</td>
<td>EACH</td>
</tr>
<tr>
<td>SP</td>
<td>DISPOSAL OF ANKLE</td>
<td>1200</td>
<td>CU YD</td>
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<tr>
<td>SP</td>
<td>UNCLASSIFIED EXCAVATION</td>
<td>23235</td>
<td>CU YD</td>
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<td>210</td>
<td>PRESPLITTING</td>
<td>5987</td>
<td>SQ YD</td>
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<td>210</td>
<td>COMPACTED EMBANKMENT</td>
<td>2561</td>
<td>CU YD</td>
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<tr>
<td>SP &amp; 210</td>
<td>ROCK FILT</td>
<td>20042</td>
<td>CU YD</td>
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<td>ASPHALTIC BASE COURSE (CLASS 7)</td>
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<td>TON</td>
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<td>401</td>
<td>TACK COAT</td>
<td>322</td>
<td>GALLON</td>
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<tr>
<td>SP &amp; 406</td>
<td>MINERAL AGGREGATE IN ACID BINDER COURSE (1%)</td>
<td>1540</td>
<td>TON</td>
</tr>
<tr>
<td>SP &amp; 406</td>
<td>ASPHALT BINDER (PS 64-22) IN ACID BINDER COURSE (1%)</td>
<td>48</td>
<td>TON</td>
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<tr>
<td>SP &amp; 407</td>
<td>MINERAL AGGREGATE IN ACID SURFACE COURSE (1%)</td>
<td>788</td>
<td>TON</td>
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<tr>
<td>SP &amp; 407</td>
<td>ASPHALT BINDER (PS 64-22) IN ACID SURFACE COURSE (1/2%)</td>
<td>58</td>
<td>TON</td>
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<td>412</td>
<td>COLD-MIX LANE ASPHALT PAVE</td>
<td>485</td>
<td>SQ YD</td>
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<td>601</td>
<td>MOBILIZATION</td>
<td>100</td>
<td>LUMP SUM</td>
</tr>
<tr>
<td>602</td>
<td>FLUSHING FIELD OFFICE</td>
<td>1</td>
<td>EACH</td>
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<tr>
<td>603</td>
<td>MAINTENANCE OF TRAFFIC</td>
<td>100</td>
<td>LUMP SUM</td>
</tr>
<tr>
<td>604</td>
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<td>202</td>
<td>SQ FT</td>
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<tr>
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<td>BARCARRIES</td>
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<td>LIN FEET</td>
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<td>TRAFFIC SIGNS</td>
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<td>LIN FEET</td>
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<td>604</td>
<td>VERTICAL PANELS</td>
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<td>EACH</td>
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<td>CONSTRUCTION PAVEMENT MARKINGS</td>
<td>4600</td>
<td>LIN FEET</td>
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<td>605</td>
<td>CONCRETE DITCH PAVING (TYPE B)</td>
<td>1500</td>
<td>SQ YD</td>
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<td>605</td>
<td>30' REINFORCED CONCRETE PIPE CULVERTS (CLASS B)</td>
<td>160</td>
<td>LIN FEET</td>
</tr>
<tr>
<td>606</td>
<td>90' REINFORCED CONCRETE PIPE CULVERTS</td>
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<td>606</td>
<td>24' SIDE DRAIN</td>
<td>104</td>
<td>LIN FEET</td>
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<tr>
<td>606</td>
<td>SELECTED PIPE BEDDING</td>
<td>10</td>
<td>CU YD</td>
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<td>617</td>
<td>GUARDRAIL (TYPE C)</td>
<td>92</td>
<td>LIN FEET</td>
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<td>620</td>
<td>LANE</td>
<td>30</td>
<td>TON</td>
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<tr>
<td>620</td>
<td>SEEDING</td>
<td>15.17</td>
<td>ACRE</td>
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<tr>
<td>620</td>
<td>MILCH COVER</td>
<td>33.18</td>
<td>ACRE</td>
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<tr>
<td>620</td>
<td>WATER</td>
<td>1008.0</td>
<td>MGAL</td>
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<td>18.33</td>
<td>ACRE</td>
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<td>621</td>
<td>SANDING</td>
<td>20003</td>
<td>LIN FEET</td>
</tr>
<tr>
<td>621</td>
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<td>SQ FT</td>
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<tr>
<td>621</td>
<td>ROCK DITCH CHECKS</td>
<td>41</td>
<td>CU YD</td>
</tr>
<tr>
<td>621</td>
<td>DIVIDEND DITCH</td>
<td>400</td>
<td>LIN FEET</td>
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<tr>
<td>621</td>
<td>PIPE FOR SLOPE DRAIN</td>
<td>465</td>
<td>LIN FEET</td>
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<tr>
<td>621</td>
<td>SEEDING BAG</td>
<td>5400</td>
<td>CU YD</td>
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<tr>
<td>621</td>
<td>SEEDING REMOVAL AND DISPOSAL</td>
<td>3700</td>
<td>CU YD</td>
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<tr>
<td>621</td>
<td>TRANSPLANT SPECIES</td>
<td>505</td>
<td>LIN FEET</td>
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<tr>
<td>623</td>
<td>SECOND SEEDING APPLICATION</td>
<td>15.17</td>
<td>ACRE</td>
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<tr>
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<td>SOIL BOOING</td>
<td>1127</td>
<td>SQ YD</td>
</tr>
<tr>
<td>626</td>
<td>FROZEN CONTROL MATING (CLASS 2)</td>
<td>300</td>
<td>SQ YD</td>
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<tr>
<td>635</td>
<td>ROADWAY CONSTRUCTION CONTROL</td>
<td>1.00</td>
<td>LUMP SUM</td>
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<td>718</td>
<td>REFLECTORIZED PAINT PAVEMENT MARKING WHITE (F)</td>
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<td>722</td>
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<td>729</td>
<td>CHANNEL POST SIGN SUPPORT (TYPE C)</td>
<td>8</td>
<td>EACH</td>
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<tr>
<td>816</td>
<td>CEMENT STIRRED</td>
<td>262</td>
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**REVISIONS**

<table>
<thead>
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<th>DATE</th>
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<td>00441</td>
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**SUMMARY OF QUANTITIES & REVISIONS**
SURVEY CONTROL COORDINATES

Project Name: ARIZONA STATE PLANE - NORTH ZONE BASED ON GPS CONTROL
TRIGPOINT - TRIG POINT PROJECTED TO GROUND
(All U.S.) U.S. SURVEY POINT

<table>
<thead>
<tr>
<th>Point No.</th>
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</table>

Note: - Repair and Cap - Standard. **Repair with 2" Aluminum Cap stamped**

GROSS DISTANCES = GROSS DISTANCE X CAP

GRID DISTANCE = GRID DISTANCE X CAP

GRID COORDINATES ARE PROJECTED FROM ARIZONA STATE PLANE GRID COORDINATES BY SCALING ALL X, Y COORDINATE VALUES WITH THE INVERSE 1/1111 OF THE COMBINED ADJUSTMENT FACTOR (CAF) ABOUT X, Y, Z.

GRID COORDINATES ARE STATED UNDER FILE NAME: ARIZONA Điểm

HORIZONTAL DATUM: NAVD 88
HORIZONTAL ELEVATIONS FOR POINTS 1-15, 100-101, AND 900-999 ESTABLISHED BY 3-WIRE LEVEL TECHNIQUES FROM NGS BENCHMARKS.

POSITIONAL ACCURACY

BASIS OF BEARING
ARIZONA STATE PLANE GRID BEARINGS - 0°00'00" NORTH
Determined from GPS Control Points 750004 - 750005

CONVERGENCE ANGLES 30-80 x 29.66' LEFT AT POINT 5

GRID NORTHING S502653.84 GRID EASTING 945963.395

GROUND NORTHING S502653.84 GRID EASTING 945963.395

SURVEY CONTROL DETAILS

ALinement Name: C.L. CONST.
NAME | TYPE | EASTING | NORTHING | ELEVATION
-----------------------------------
8000 | 800-00 | 500 | 949567.7404 | 250524, 9007 | 537.11
8001 | 800-00 | 500 | 949567.4311 | 250524, 9007 | 530.00
8002 | 800-00 | 500 | 949567.8211 | 250524, 9007 | 487.16
8003 | 800-00 | 500 | 949567.6748 | 250524, 9007 | 469.71

ALinement Name: C.L. CO. RD.
NAME | TYPE | EASTING | NORTHING | ELEVATION
-----------------------------------
9000 | 900-00 | 500 | 949567.7404 | 250524, 9007 | 537.11
9001 | 900-00 | 500 | 949567.4311 | 250524, 9007 | 530.00
9002 | 900-00 | 500 | 949567.8211 | 250524, 9007 | 487.16
9003 | 900-00 | 500 | 949567.6748 | 250524, 9007 | 469.71

VERTICAL POSITIONAL ACCURACY IS THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.
ENERGY DISSIPATORS (NOT DRAWN)

ENERGY DISSIPATORS TO BE USED FOR THE ENTIRE LENGTH OF DITCH WHEN SLOPE OF DITCH PAVING IS GREATER THAN 1:3.0. THEY ARE NOT TO BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR CONCRETE DITCH PAVING.

GENERAL NOTES:

- THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.
- TOE WALLS TO BE CONSTRUCTED FULL WIDTH AT EACH END OF DITCH PAVING, AND POURED MONOLITHICALLY.
- SOLID SSD ALONG DITCH PAVING TO BE PLACED WITHIN 14 DAYS OF DITCH PAVING CONSTRUCTION.
- 1'-0" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 48' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLIANT WITH USHAJO M673.
END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS

TABLE OF DIMENSIONS

<table>
<thead>
<tr>
<th>#</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>S</th>
<th>DIA.</th>
<th>WALL</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>S</th>
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*Note: Alternate connections to use pipe culverts in accordance with manufacturer's standard practices may be made subject to the approval of the Engineer.*

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS

ARCH PIPE

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>S</th>
<th>P</th>
<th>R-1</th>
<th>R-2</th>
<th>R-T</th>
<th>H.</th>
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*The measured span and rise shall not vary more than 1/2 per cent from the values specified by acting in connection therewith.*

CIRCULAR PIPE

<table>
<thead>
<tr>
<th>ID</th>
<th>SHAPE</th>
<th>MAX</th>
<th>MIN</th>
<th>MAX</th>
<th>MIN</th>
<th>MAX</th>
<th>MIN</th>
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C.M. ARCH PIPE

<table>
<thead>
<tr>
<th>BODY</th>
<th>SPAN</th>
<th>RISE</th>
<th>MAX</th>
<th>MIN</th>
<th>MAX</th>
<th>MIN</th>
<th>S</th>
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MIXTURE R.C. PIPE CULVERTS

<table>
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<tr>
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<th>D</th>
<th>E</th>
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<th>R-1</th>
<th>R-2</th>
<th>R-T</th>
<th>H.</th>
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</thead>
<tbody>
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</table>

MULTIPLE C.M. PIPE CULVERTS

<table>
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<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>S</th>
<th>P</th>
<th>R-1</th>
<th>R-2</th>
<th>R-T</th>
<th>H.</th>
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<tbody>
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<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

*FLARED END SECTION

*STANDARD DRAWING FES-2*
GENERAL NOTES:

- ALL GUARD RAILS SHALL BE 12 FT. IN LENGTH TO EXTEND TO THE OUTER BOUNDARIES OF THE ROAD OR NO MORE THAN 6 FT. INSIDE THE ROADWAY.
- W-BEAM GUARD RAIL CONTINUES THE INTERMEDIATE SECTIONS TO SHAPE.
- W-BEAM GUARD RAIL FOR EXISTING GUARD RAIL, W-BEAM GUARD RAIL ESTABLISHES A NEW INTERFACE BETWEEN THE POST AND THE GUARD RAIL.
- GUARD RAIL COMPLIES WITH THE REQUIREMENTS OF THE CODE.
- CONTRACTOR TO USE W-BEAM GUARD RAIL OR PLASTIC BLOCKOUT AS LONG AS BLOCKOUT USE MEETS THE REQUIREMENTS OF THE CODE. W-BEAM GUARD RAIL MAY BE USEFUL FOR MAINTENANCE OR FOR ACCESS TO SAFETY INDICATORS OR OTHER EQUIPMENT AROUND THE GUARD RAIL.
### Reinforced Concrete Arch Pipe Culverts

<table>
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<td>0' 0&quot;</td>
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**Minimum Height of Fill**

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<th>Type of Pipe</th>
<th>Equivalent Span</th>
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<tbody>
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**Maximum Height of Fill**

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</table>

### Embankment and Trench Installations

1. **Concrete Pipe Culvert Construction** shall conform to Arkansas Highway and Transportation Department Standard Specifications for Highway Construction, current edition, with applicable supplemental specifications and special provisions. Walls of uncedar grooved concrete pipe and pipes or other materials are to be used in embankments and embankment sections of 200 feet or less, as approved by the Engineer.

2. **Concrete Pipe Culvert Design** shall conform to the latest edition of the 2007 State of Arkansas Materials Specifications, as approved by the Engineer.

3. **Fill Material** shall be placed and compacted in 6" lifts, with a minimum 6" lift for gravel materials. The maximum height of fill for concrete culverts shall be determined by the Engineer.

### General Notes

1. **Concrete Pipe Culvert Construction** shall conform to Arkansas Highway and Transportation Department Standard Specifications for Highway Construction, current edition, with applicable supplemental specifications and special provisions. Walls of uncedar grooved concrete pipe and pipes or other materials are to be used in embankments and embankment sections of 200 feet or less, as approved by the Engineer.

2. **Concrete Pipe Culvert Design** shall conform to the latest edition of the 2007 State of Arkansas Materials Specifications, as approved by the Engineer.

3. **Fill Material** shall be placed and compacted in 6" lifts, with a minimum 6" lift for gravel materials. The maximum height of fill for concrete culverts shall be determined by the Engineer.
**MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"**

<table>
<thead>
<tr>
<th>TRENCH WIDTH</th>
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<tr>
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</tr>
<tr>
<td>&quot;H&quot; &lt; 3' 0&quot;</td>
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<tr>
<td>&quot;H&quot; = 3' 0&quot;</td>
</tr>
<tr>
<td>&quot;H&quot; &gt; 3' 0&quot;</td>
</tr>
</tbody>
</table>

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

**MINIMUM COVER FOR CONSTRUCTION LOADS**

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
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<tr>
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</tr>
<tr>
<td>&quot;H&quot; = 5' 6&quot;</td>
</tr>
<tr>
<td>&quot;H&quot; &gt; 5' 6&quot;</td>
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MINIMUM COVER SHALL BE IN ADJUSTMENT WITH THE NEAREST STANDARDIZED COVER VALUES IN THE TABLE.

**MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES**

<table>
<thead>
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<th>PIPE DIAMETER</th>
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</tr>
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<tr>
<td>4&quot;</td>
</tr>
<tr>
<td>6&quot;</td>
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</table>

**GENERAL NOTES**

1. PIPE SHALL CONFORM TO ASHRAE 180 TYPE 5 INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISIONS.

2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO ASHRAE 180 PIPE DESIGN SPECIFICATIONS, FIFTH EDITION.

3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT MATERIALS AND OTHER MATERIALS.

4. IMPERVIOUS MATERIALS SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE TRENCH TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERIODICAL MATERIAL IS USED AS STRUCTURAL BEDDING AND/or BACKFILL.

5. WHEN DIRECTED BY THE ENGINEER, IMPERVIOUS MATERIALS THAT IS ENCLOSURE AT THE BOTTLE OF THE EXCAVATED TRENCH SHALL BE ENCLOSURE TO THE SELECTED PIPE DIAMETER PLUS MINIMUM COVER FOR CONSTRUCTION LOADS.

6. PIPE INSTALLATION SHOULDN'T BE DIRECTED BY THE ENGINEER. THE CLEARANCE OF OUTSIDE DIAMETER OF PIPE PLUS MINIMUM COVER FOR CONSTRUCTION LOADS SHALL BE ENCLOSURE TO THE SELECTED PIPE DIAMETER PLUS MINIMUM COVER FOR CONSTRUCTION LOADS.

7. FOR PIPE TYPES THAT ARE NOT DIRECTED BY THE ENGINEER. IMPERVIOUS MATERIALS THAT IS ENCLOSURE AT THE BOTTLE OF THE EXCAVATED TRENCH SHALL BE ENCLOSURE TO THE SELECTED PIPE DIAMETER PLUS MINIMUM COVER FOR CONSTRUCTION LOADS.

8. PIPE INSTALLATION SHOULDN'T BE DIRECTED BY THE ENGINEER. IMPERVIOUS MATERIALS THAT IS ENCLOSURE AT THE BOTTLE OF THE EXCAVATED TRENCH SHALL BE ENCLOSURE TO THE SELECTED PIPE DIAMETER PLUS MINIMUM COVER FOR CONSTRUCTION LOADS.

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

10. JOINTS FOR HIGH DENSITY POLYETHYLENE PIPES SHALL BE AT STRESS RELIEF JOINTS AS SPECIFIED IN ASHRAE 180 AND THE MANUFACTURER'S RECOMMENDATIONS.

11. PIPE INSTALLATION SHOULDN'T BE DIRECTED BY THE ENGINEER. IMPERVIOUS MATERIALS THAT IS ENCLOSURE AT THE BOTTLE OF THE EXCAVATED TRENCH SHALL BE ENCLOSURE TO THE SELECTED PIPE DIAMETER PLUS MINIMUM COVER FOR CONSTRUCTION LOADS.

**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 BEDDING SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 6". THE LAYERS SHALL BE DROPPED AT EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE NEAREST PIPE LAYER.

5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRACTORS. WITNESS OR OTHER APPROVAL METHODS IN ORDER TO ENSURE PIPE GRADE AND ALIGNMENT.

**ARKANSAS STATE HIGHWAY COMMISSION**

**PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)**

**STANDARD DRAWING PDC-1**
MAXIMUM FILL HEIGHT
BASED ON STRUCTURAL BACKFILL

MINIMUM TRENCH WIDTH
BASED ON FILL HEIGHT "H"

MINIMUM COVER FOR CONSTRUCTION LOADS

MULTIPLE INSTALLATION OF PVC PIPES

GENERAL NOTES

CONSTRUCTION SEQUENCE

- LEGEND -

- ARKANSAS STATE HIGHWAY COMMISSION
- PLASTIC PIPE CULVERT (PVC F949)
- STANDARD DRAWING PCP-2

REVISED/DELETED

DATE

REVISION

DATE FILMED
GENERAL NOTES:
1. ALL LINES SHALL HAVE A WIDTH OF 4 INCHES.
2. THE THICKNESS AND RATE OF PAINT APPLICATION SHALL BE AS SPECIFIED IN SECTION 76 OF THE STANDARD SPECIFICATIONS.
3. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISION ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
4. RAISED PAVEMENT MARKERS SHALL BE CENTERED BETWEEN SKIP LINES ON 40 FT. SPACING UNLESS OTHERWISE SHOWN ON THE PLAN.

NOTES:
1. EDGE OF PAVEMENT
2. 2" FOR ASPHALT OR CONCRETE PAVEMENT
3. 6" FOR BITUMINOUS SURFACE TREATMENT

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

- TYPE 1
- TYPE 2
- RED LENS OF THE REFLECTOR FACE THE RECEDING TRAFFIC MOVEMENT.

CROSSWALK AND STOPBAR DETAILS

NOTE: MARKINGS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. INKING APPEARANCE, FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AUTO QUALIFIED PRODUCTS LIST.
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 AASHTO M 334 or M 353, GRADE 60.

CONSTRUCTION AND MATERIALS FOR R.C. BOX CULVERTS, INCLUDING WEEP HOLES AND GRANULAR MATERIAL, SHALL BE SUBMITTED TO THE CONTRACTING ENGINEER PRIOR TO INSTALLATION.

MEMORANDUM TO THE CONTRACTING ENGINEER:

WEATHERED STONE CULVERTS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 855 OF THE STANDARD SPECIFICATIONS.

WEATHERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THE REQUIREMENTS LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (ORSPE) EXCEPT THAT THE TOLERANCE FOR SINGLE BARS SHALL BE 3/4 " AND FOR DOUBLE BARS, 5 3/4 ".

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THREE HOOK CASES SHALL HAVE A MINIMUM HORIZONTAL SPACING OF 12" AND SHALL BE PLACED AT LEAST 6" ABOVE THE TOP OF THE BOTTOM SLAB.

KEEP HOLES IN R.C. BOX CULVERTS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 12" AND SHALL BE PLACED AT LEAST 6" ABOVE THE TOP OF THE BOTTOM SLAB.

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THE REQUIREMENTS SHOWN ON THIS DRAWING SHALL SUPERSEDE THE CORRESPONDING REQUIREMENTS ON ALL REINFORCED CONCRETE BOX CULVERT STANDARD DRAWINGS.

R.C. BOX CULVERT HEADWALL MODIFICATIONS

ARKANSAS STATE HIGHWAY COMMISSION

REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1

REPLACEMENT BAR LENGTH TABLE

<table>
<thead>
<tr>
<th>BAR SIZE</th>
<th>LENGTH OF HOOKED BAR</th>
<th>LENGTH OF STRAIGHT BAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;A&quot;</td>
<td>L + 1' - 0&quot;</td>
<td>SEE &quot;A&quot; BAR LENGTH</td>
</tr>
<tr>
<td>&quot;B&quot;</td>
<td>L + 1' - 2&quot;</td>
<td>SEE &quot;B&quot; BAR LENGTH</td>
</tr>
<tr>
<td>&quot;C&quot;</td>
<td>L + 1' - 4&quot;</td>
<td>SEE &quot;C&quot; BAR LENGTH</td>
</tr>
<tr>
<td>&quot;D&quot;</td>
<td>L + 1' - 6&quot;</td>
<td>SEE &quot;D&quot; BAR LENGTH</td>
</tr>
<tr>
<td>&quot;E&quot;</td>
<td>L + 1' - 8&quot;</td>
<td>SEE &quot;E&quot; BAR LENGTH</td>
</tr>
<tr>
<td>&quot;F&quot;</td>
<td>L + 2' - 0&quot;</td>
<td>SEE &quot;F&quot; BAR LENGTH</td>
</tr>
<tr>
<td>&quot;G&quot;</td>
<td>L + 2' - 2&quot;</td>
<td>SEE &quot;G&quot; BAR LENGTH</td>
</tr>
<tr>
<td>&quot;H&quot;</td>
<td>L + 2' - 4&quot;</td>
<td>SEE &quot;H&quot; BAR LENGTH</td>
</tr>
<tr>
<td>&quot;I&quot;</td>
<td>L + 2' - 6&quot;</td>
<td>SEE &quot;I&quot; BAR LENGTH</td>
</tr>
<tr>
<td>&quot;J&quot;</td>
<td>L + 2' - 8&quot;</td>
<td>SEE &quot;J&quot; BAR LENGTH</td>
</tr>
<tr>
<td>&quot;K&quot;</td>
<td>L + 2' - 10&quot;</td>
<td></td>
</tr>
<tr>
<td>&quot;L&quot;</td>
<td>L + 2' - 5&quot;</td>
<td>SEE &quot;L&quot; BAR LENGTH</td>
</tr>
</tbody>
</table>

GENERAL NOTES:

ROADWAY EXCAVATION (CHANNEL CHANGES) WILL BE PAID FOR AT ALL BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONSIDERED TO THE PORTION OF THE INDICATED AREA THAT IS ABOVE THE FLOW LINE. ROADWAY EXCAVATION CHANNEL CHANGES 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 BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONSIDERED TO THE PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE. EXCAVATION IN SECTION C-C ABOVE AS SUBSURFACE WILL NOT BE MEASURED OR PAID FOR IN EXCESS, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

SOLID SODDING
R.C. BOX CULVERT

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

CHANNEL CHANGE

EXTERNAL CHANNEL

PLAN

SOLID SODDING

2'

EXCAVATION LINE

1/2

GRADE LINE

EMBANKMENT PLACED IN HORIZONTAL LAYERS

ORIGINAL GROUND

BACKFILL PLACED IN HORIZONTAL LAYERS

LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

SECTION C-C

THICKNESS OF BOTTOM SLAB

FLUME LINE

ROADWAY EXCAVATION (CHANNEL CHANGES)

STRUCTURAL EXCAVATION

EXISTING CHANNEL

CHANNEL CHANGE

PLAN

ROADWAY EXCAVATION (CHANNEL CHANGES)

ROUGH EXCAVATION

CHANNEL CHANGES

SECTION B-B

DETAILS FOR NEW CHANNELS

THICKNESS OF BOTTOM SLAB

GENERAL NOTES:

ROADWAY EXCAVATION (CHANNEL CHANGES) WILL BE PAID FOR AT ALL BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONSIDERED TO THE PORTION OF THE INDICATED AREA THAT IS ABOVE THE FLOW LINE. ROADWAY EXCAVATION CHANNEL CHANGES 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.

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SEEDMENT BASIN WITH RIPRAP OUTLET (E-9)

SEEDMENT BASIN WITH PIPE OUTLET (E-18)

DIVERSION DITCH (E-8)

SLOPE DRAIN (E-12)

SLOPE DRAIN (E-14)
CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE
1. PLACE PERIMETER CONTROLS (I.E. SILT FENCES, DIVERSION DITCHES, DRAINAGE SWALE ETC.)
2. PERFORM CLEARING AND GRUBBING OPERATIONS

EXCAVATION

EXISTING GROUND

INTERCEPTOR OR DIVERSION DITCH

EXISTING GROUND

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

GENERAL NOTE
ALL CUT SLOPES SHALL BE STABILIZED INTERCEPTOR OR DIVERSION DITCHES AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE EXCAVATED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE
1. EXCAVATE AND STABILIZE INTERCEPTOR OR DIVERSION DITCHES
2. PERFORM PHASE 1 EXCAVATION, PLACE PERMANENT OR TEMPORARY SEEDING
3. PERFORM PHASE 2 EXCAVATION, PLACE PERMANENT OR TEMPORARY SEEDING
4. PERFORM PHASE 2 EXCAVATION, PLACE PERMANENT OR TEMPORARY SEEDING, STABILIZE DITCHES, CONSTRUCT DITCH CHEEKS, DIVERSION DITCHES, SEDIMENT BASINS OR OTHER EROSION CONTROL DEVICES AS REQUIRED

EMBANKMENT

DIVERSION DITCH TO BE IN PLACE UNTIL SLOPE IS COMPLETELY STABILIZED

SIDE DITCH STABILIZE AS REQUIRED

EXISTING GROUND

VARIOUS EROSION CONTROL DEVICES

GENERAL NOTE
ALL EMBANKMENT SLOPES SHALL BE STABILIZED WITH A SLOPE SUSCEPTIBLE TO EROSION, SLOPES SHALL BE STABILIZED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING, PLACE PHASE 1 DRAINAGE DITCH USE PHASE 2 DRAINAGE DITCHES, INSTAL PHASE 2 EMBANKMENT CONSTRUCTION IN SLOPE DRAINAGES AND SLOW WASHING FOR A PERIOD OF 25 DAYS
3. PLACE PHASE 2 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING, FINISH EMBANKMENT DITCHES AND SLOPE DRAINAGES AND SLOW WASHING FOR A PERIOD OF 25 DAYS
4. PLACE PHASE 2 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING, PLACE DIVERSION DITCHES AND SLOPE DRAINAGES AND MAINTAIN UNTIL ENTIRE SLOPE IS STABILIZED

ARKANSAS STATE HIGHWAY COMMISSION
TEMPORARY EROSION CONTROL DEVICES
STANDARD DRAWING TEC-3
TRIANGULAR SILT Dike Installation

For Diversion Ditch and/or Ditch Liner

SECTION A-A

RESOURCES DIVERSION LINER ON A CUT OR FULL SLOPE

SECTION D-D

TRIANGULAR SILT Dike Installation

For Continuous Barrier

SECTION B-B

TRIANGULAR SILT Dike Installation

For Drop Inlets

SECTION C-C

SECTION E-E

GENERAL NOTES

1. This work shall consist of furnishing installing and maintaining the triangular silt dikes. The dikes shall be used as a temporary liner barrier at the toe of slope.

2. The triangular silt dikes shall be constructed with silt and may be used as a temporary liner barrier at the toe of slope. The silt dikes shall be placed at a distance from the water to prevent erosion. The silt dikes shall be placed before the water overflows the toe of slope and the silt dikes shall be removed after the water overflows the toe of slope.

3. The contractor shall ensure that all work is completed in accordance with the plans and specifications. The contractor shall be responsible for all work performed. The contractor shall ensure that all work is performed in accordance with the plans and specifications. The contractor shall be responsible for all work performed.