<table>
<thead>
<tr>
<th>SHEETNO.</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TITLE SHEET</td>
</tr>
<tr>
<td>2</td>
<td>INDEX OF SHEETS AND STANDARD DRAWINGS</td>
</tr>
<tr>
<td>3</td>
<td>GOVERNING SPECIFICATIONS AND GENERAL NOTES</td>
</tr>
<tr>
<td>4</td>
<td>TYPICAL SECTIONS OF IMPROVEMENT</td>
</tr>
<tr>
<td>5 - 12</td>
<td>SPECIAL DETAILS</td>
</tr>
<tr>
<td>14 - 18</td>
<td>MAINTENANCE OF TRAFFIC DETAILS</td>
</tr>
<tr>
<td>19 - 22</td>
<td>PERMANENT PAVEMENT MARKING DETAILS</td>
</tr>
<tr>
<td>20 - 22</td>
<td>QUANTITIES</td>
</tr>
<tr>
<td>23 - 25</td>
<td>SUMMARY OF QUANTITIES AND REVISIONS</td>
</tr>
<tr>
<td>25 - 28</td>
<td>SURVEY CONTROL DETAILS</td>
</tr>
<tr>
<td>29 - 38</td>
<td>CROSS SECTIONS</td>
</tr>
</tbody>
</table>

### ROADWAY STANDARD DRAWINGS

<table>
<thead>
<tr>
<th>FORMAL NO.</th>
<th>TITLE</th>
<th>PLATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSC-1</td>
<td>PRECAST CONCRETE BOX CULVERTS</td>
<td>01-28-15</td>
</tr>
<tr>
<td>FI-1</td>
<td>PAVEMENT MARKING DETAILS</td>
<td>02-07-20</td>
</tr>
<tr>
<td>FI-2</td>
<td>DETAILS OF PIRE UNDERGROUND</td>
<td>12-08-16</td>
</tr>
<tr>
<td>BCC-1</td>
<td>REINFORCED CONCRETE BOX CULVERTS</td>
<td>07-26-17</td>
</tr>
<tr>
<td>RC-1</td>
<td>EXCAVATION PAYLETS BACKFILL &amp; SOL SODDING FOR BOX CULVERTS</td>
<td>11-25-01</td>
</tr>
<tr>
<td>RC-2</td>
<td>TABLES AND METHOD OF SUPERINTRODUCTION FOR TWO WAY TRAFFIC</td>
<td>11-07-19</td>
</tr>
<tr>
<td>TC-1</td>
<td>STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION</td>
<td>11-07-19</td>
</tr>
<tr>
<td>TC-2</td>
<td>STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION</td>
<td>11-07-21</td>
</tr>
<tr>
<td>TE-1</td>
<td>TEMPORARY EROSION CONTROL DEVICES</td>
<td>11-18-17</td>
</tr>
<tr>
<td>TE-2</td>
<td>TEMPORARY EROSION CONTROL DEVICES</td>
<td>08-03-04</td>
</tr>
<tr>
<td>TE-3</td>
<td>TEMPORARY EROSION CONTROL DEVICES</td>
<td>11-09-94</td>
</tr>
<tr>
<td>TE-4</td>
<td>TEMPORARY EROSION CONTROL DEVICES</td>
<td>07-26-12</td>
</tr>
<tr>
<td>WA-2</td>
<td>WIRE FENCE WATER GAPS</td>
<td>04-28-79</td>
</tr>
<tr>
<td>WA-4</td>
<td>WIRE FENCE TYPE C AND D</td>
<td>09-22-02</td>
</tr>
</tbody>
</table>
HWY, 98 TWO LANE NOTCH AND WIDEN OPEN SHOULDER

STA. 99+60.00 - STA. 100+20.00 SITE 1
STA. 101+15.00 - STA. 102+00.00 SITE 1

NOTES:
The thickness of aggregate base course shall be within plus or minus one inch of the required thickness shown. The contractor will correct any accepted tolerances that do not meet the required tolerances. Payment will not be made for material placed in excess of the required tolerances.

Refer to cross sections for deviation from the normal slopes. No change shall be made from the planned slopes without the approval of the Engineer.

Asphalt for leveling existing embankment shall be placed at the back edge of the bottom of the embankment. The amount of leveling and leveling operations shall be performed before constructing and paving. All calculations will be made for the various pay items.

The final shape of the surface course is to be placed after all other courses have been laid. Longitudinal joints shall be 43 lane lines.

No delays - Prior to and during placement of pay items at the notch the contractor shall provide positive drainage at all times. The contractor shall be responsible for the runoff and drainage for the entire project.

On all super-elevated curves and through super-elevation transitions, the algebraic difference between shoulder slope and face slope shall not exceed 0.50%.

TYPICAL SECTIONS OF IMPROVEMENT
DETAIL OF DUMPED RAPRAP FOR SITE 1 CORNIE BAYOU

SECTION A-A

DETAIL OF DUMPED RAPRAP FOR SITE 2 HENDERSON CREEK CHANNEL CHANGE

SECTION B-B

HENDERSON CREEK TYPICAL SECTION
STA. 10+78.4B TO STA. 12+20.05

SECTION C-C

STONE BACKFILL AT R.C. BOX

SPECIAL DETAILS
<table>
<thead>
<tr>
<th>OUTLET WINGWALL TABLE</th>
</tr>
</thead>
</table>

| OUTLET SGIZED END SECTION |

| OUTLET SLOPE SECTION(S) |

| DETAILS OF R.C. BOX CULVERT |

---

The required number of bars and lengths shown are for estimating purpose only. The actual number and length required shall be determined in Field. Unless otherwise noted, all dimensions are in inches.
### OUTLET WING WALL TABLE

<table>
<thead>
<tr>
<th>OUTLET</th>
<th>OUTLET</th>
<th>OUTLET</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

### OUTLET SLOPE SECTIONS

<table>
<thead>
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<th>OUTLET SLOPE SECTIONS</th>
<th>OUTLET SLOPE SECTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DETAILS OF R.C. BOX CULVERT

DOUBLE BARREL BOX CULVERT
Sta. 203+76

SPECIAL DETAILS

The required number of bars and lengths shown are for estimating purpose only. The actual number and length required shall be determined in field. Unless otherwise noted, all dimensions are in inches.
LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10’

Note: For fill depths 10’ and under, use Mid-Section length of box culvert.

**SECTION LENGTH**

**A** = 30’-0”
**B** = 20’-0”
**C** = 15’-0”
**D** = 12’-0”
**E** = 9’-0”
**F** = 6’-0”
**G** = 3’-0”

**SKewed END SECTION LENGTH**

**A** = 30’-0”
**B** = 20’-0”
**C** = 15’-0”
**D** = 12’-0”
**E** = 9’-0”
**F** = 6’-0”
**G** = 3’-0”

**CULVERT DRAINAGE DETAIL FOR ROCK FILL**

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

**VERTICAL FABRIC ALTERNATE** (Shown for Culvert, Similar for WINGWALL)

**WRAPPED FABRIC ALTERNATE** (Shown for Wingwall, Similar for Culvert)

**WINGWALL & CULVERT DRAINAGE DETAIL**

**GENERAL NOTES:**


**SUBSECTION 625.02**

Steel plates shall be Grade 60 (yield strength = 45,000 psi) conforming to AASHTO M131 or M352. Type A, with mild steel reports.

Reinforcing Steel Tolerances: The tolerances for reinforcing steel shall meet those listed in "Manual of Standard Practice" published by Concrete Reinforcing Steel Institute (CRSI) except that the tolerance for transverse bar shall be 0.050 in. per 12 ft. These tolerances also shall be in accordance with the requirements of Section 807.

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

**WINGWALL & CULVERT DRAINAGE DETAIL**

**SPECIAL DETAILS**

For details of Excavation and Pay Limits, see Standard Drawing RCB-2.

For transverse reinforcing, longitudinal reinforcing similar.

See Tabular Data Sheets for Minimum Bar Lap Lengths.

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

**LONSDONAL SECTION LENGTH SCHEDULE**

**LENGTHS FOR NON-SKEWED BOXES**

**SECTION LENGTH**

**A** = 45’-0”
**B** = 30’-0”
**C** = 20’-0”
**D** = 15’-0”
**E** = 10’-0”

**SECTION LENGTH**

**F** = 6’-0”
**G** = 3’-0”

**DEPTHS FOR SKewed SECTION LENGTH**

**DEPTHS**

10’ - 0”
15’ - 0”
20’ - 0”
25’ - 0”
30’ - 0”
35’ - 0”
40’ - 0”

**STAGE 1 CONSTRUCTION**

**LONGITUDINAL SECTION LENGTH SCHEDULE**

**SECTION LENGTH**

**A** = 10’-0”
**B** = 5’-0”
**C** = 2’-0”

**SECTION LENGTH**

**D** = 12’-0”
**E** = 9’-0”
**F** = 6’-0”
**G** = 3’-0”
**H** = 1’-0”

**DEPTHS**

10’ - 0”
15’ - 0”
20’ - 0”
25’ - 0”
30’ - 0”
35’ - 0”
40’ - 0”

**SPECIAL DETAILS**

See "STAGE 1 CULVERT LAYOUT" for SKewed END SECTION Lengths - Varies.
## Permanent Pavement Markings

<table>
<thead>
<tr>
<th>Description</th>
<th>End of Job</th>
<th>Raised Pavement Markers</th>
<th>Reflective Paint Pavement Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAISED PAVEMENT MARKERS TYPE III YELLOW/WHITE</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>REFLECTIVE PAINT PAVEMENT MARKING WHITE (W)</td>
<td>1490</td>
<td>1890</td>
<td>1490</td>
</tr>
<tr>
<td>REFLECTIVE PAINT PAVEMENT MARKING YELLOW (Y)</td>
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<td>1490</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>0</td>
<td>1890</td>
<td>1490</td>
</tr>
</tbody>
</table>

**Note:** This is a low traffic volume road as defined in Section 04.05, 5, AWD Specifications for Highway Construction.

**Note:** The 6" yellow striping quantity has been estimated based on a double yellow line centerline stripe for the entire project.

The project must be marked for passing zones prior to the placement of any yellow striping. Contact the maintenance division after the final lift of surface course has been placed to schedule the zonning of the project.

## Advance Warning Signs and Devices

<table>
<thead>
<tr>
<th>Sign Number</th>
<th>Description</th>
<th>Sign/Distance</th>
<th>Maximum Number Required</th>
<th>Total Signs Required</th>
<th>Barricades (Type B)</th>
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</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** This is a low traffic volume road as defined in Section 04.05, Standard Specifications for Highway Construction.
## Erosion Control

### Station 1
- **Site 1**: Cleaning and Grubbing
  - **TBD**: Acre
  - **TBD**: Ton
  - **TBD**: Yard
  - **TBD**: Yr
  - **TBD**: FT
  - **TBD**: F/B
  - **TBD**: C/F
  - **TBD**: Y/2

### Station 2
- **Site 2**: Cleaning and Grubbing
  - **TBD**: Acre
  - **TBD**: Ton
  - **TBD**: Yard
  - **TBD**: Yr
  - **TBD**: FT
  - **TBD**: F/B
  - **TBD**: C/F
  - **TBD**: Y/2

### Removal and Disposal of Culverts

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
<th>Pipe Culverts</th>
</tr>
</thead>
<tbody>
<tr>
<td>203H11</td>
<td>Quad 7 &amp; 4-CM, Site 2</td>
<td>4</td>
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</table>

### Removal of Existing Bridge Structure

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
<th>Pipe Culverts</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-H</td>
<td>Quad 7 &amp; 4-CM, Site 1</td>
<td>1</td>
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</tbody>
</table>

### Removal and Disposal of Fence

<table>
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<th>Description</th>
<th>Pipe Culverts</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-H</td>
<td>Quad 7 &amp; 4-CM, Site 1</td>
<td>1</td>
</tr>
</tbody>
</table>

### Earthworks

<table>
<thead>
<tr>
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<th>Location / Description</th>
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</thead>
<tbody>
<tr>
<td>203-H12</td>
<td>Coring B.L. Channel Change</td>
</tr>
<tr>
<td>100-H</td>
<td>H.D.S. R.C. Bridge Channel Change</td>
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### Fencing

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
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<tbody>
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<td>Entry Project, to be used for and where directed by the Engineer</td>
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### Erosion Control Matting

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<th>Class 3</th>
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<tbody>
<tr>
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---

**Quantities Estimated**

Section 14A of the STO, SPECS.

---

**COLD MILLING ASPHALT PAVEMENT**

### Station

<table>
<thead>
<tr>
<th>Location</th>
<th>Average Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-600</td>
<td>50 YD</td>
</tr>
</tbody>
</table>

### TOTALS

866.68

---

**COLD MILLING ASPHALT PAVEMENT**

### Station

<table>
<thead>
<tr>
<th>Location</th>
<th>Average Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-600</td>
<td>50 YD</td>
</tr>
</tbody>
</table>

### TOTALS

866.68

---

**SOIL SLEWING**

### Station 3
- **Site 2**: Cleaning and Grubbing
  - **TBD**: Acre
  - **TBD**: Ton
  - **TBD**: Yard
  - **TBD**: Yr
  - **TBD**: FT
  - **TBD**: F/B
  - **TBD**: C/F
  - **TBD**: Y/2

### TOTALS

9

---

**Asphalt Concrete Patching for Maintenance of Traffic**

### Station

<table>
<thead>
<tr>
<th>Location</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

### TOTALS

50

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**ACM Patching of Existing Roadway**

### Station

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<thead>
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<th>Location</th>
<th>Description</th>
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</thead>
<tbody>
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<td>Entry Project, to be used for and where directed by the Engineer</td>
</tr>
</tbody>
</table>

### TOTALS

2

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**Bench Marks**

### Station

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>HWY 68</td>
<td>Excul</td>
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</table>

### TOTALS

2

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**Dumped Riprap and Filter Blanket**

### Station

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>HWY 68</td>
<td>Filter Blanket</td>
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</tbody>
</table>

### TOTALS

587

---

**Note:** Erosion Control Matting Shall be Decewite Fabric (Type 1).
## BASE AND SURFACING

<table>
<thead>
<tr>
<th>STATION</th>
<th>STATION</th>
<th>LOCATION</th>
<th>LENGTH</th>
<th>TACK COAT</th>
<th>AGGREGATE BASE/LURUS</th>
<th>ACHM SURFACE COURSE (1&quot;)</th>
<th>ACHM SURFACE COURSE (1&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AGGREGATE BASE/LURUS</td>
<td>TACK COAT</td>
<td>ACHM SURFACE COURSE (1&quot;)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FEET</td>
<td>TONS</td>
<td>SQYD</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>58+00.00</td>
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<td>SITE 1, TRANSITION</td>
<td>100.00</td>
<td>VAR</td>
<td>100.00</td>
<td>20.00</td>
<td>222.22</td>
</tr>
<tr>
<td>59+00.00</td>
<td>60+00.00</td>
<td>SITE 1, TOP/MIDDLE</td>
<td>100.00</td>
<td>VAR</td>
<td>100.00</td>
<td>20.00</td>
<td>222.22</td>
</tr>
<tr>
<td>60+00.00</td>
<td>61+00.00</td>
<td>SITE 1, FULL OUTFIT</td>
<td>100.00</td>
<td>VAR</td>
<td>100.00</td>
<td>20.00</td>
<td>222.22</td>
</tr>
<tr>
<td>101+00.00</td>
<td>102+00.00</td>
<td>SITE 1, TOP/MIDDLE</td>
<td>100.00</td>
<td>VAR</td>
<td>100.00</td>
<td>20.00</td>
<td>222.22</td>
</tr>
<tr>
<td>102+00.00</td>
<td>103+00.00</td>
<td>SITE 1, TRANSITION</td>
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<td>VAR</td>
<td>100.00</td>
<td>20.00</td>
<td>222.22</td>
</tr>
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<td>202+00.00</td>
<td>203+00.00</td>
<td>SITE 2, TRANSITION</td>
<td>100.00</td>
<td>VAR</td>
<td>100.00</td>
<td>20.00</td>
<td>222.22</td>
</tr>
<tr>
<td>203+00.00</td>
<td>204+00.00</td>
<td>SITE 2, FULL OUTFIT</td>
<td>100.00</td>
<td>VAR</td>
<td>100.00</td>
<td>20.00</td>
<td>222.22</td>
</tr>
<tr>
<td>204+00.00</td>
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<td>100.00</td>
<td>VAR</td>
<td>100.00</td>
<td>20.00</td>
<td>222.22</td>
</tr>
</tbody>
</table>

**Note:**
- **Base of Estimate:** 124.00
- **ACHM Surface Course (1"):** 94.7% WAX, 5.3% Asphalt Binder
- **ACHM Base Course:** 94.6% WAX, 5.4% Asphalt Binder
- **Maximum Number of Drums:** 111 for PG 64-22
- **Tack Coat Quantities were calculated using the emulsified asphalt rates. Refer to SS-400-1 for the residual asphalt application rates.**

**Quantities:**

<p>| TOTAL | 684.24 | 114.48 | 93.81 | 1177.77 | 204.21 | 200.16 | 1.04795 | 108.52 | 962.56 | 124.24 | 1985.89 | 214.48 | 32545.02 |</p>
<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>ITEM</th>
<th>QUANTITY</th>
<th>UNIT</th>
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<tbody>
<tr>
<td>201</td>
<td>SAVAGE</td>
<td>2</td>
<td>YDS</td>
</tr>
<tr>
<td>202</td>
<td>REPAIR &amp; CONSTRUCTION OF RK/CI UTILITY</td>
<td>8</td>
<td>YD</td>
</tr>
<tr>
<td>203</td>
<td>TREAD &amp; MELTING OF PAV (CA UFmts)</td>
<td>5</td>
<td>EACH</td>
</tr>
<tr>
<td>204</td>
<td>ROAD BASKET</td>
<td>620</td>
<td>TON</td>
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<td>205</td>
<td>1 CLASS II EXCAVATION</td>
<td>2090</td>
<td>YD</td>
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<tr>
<td>211</td>
<td>COMPOST EMERGENCIES</td>
<td>2025</td>
<td>YD</td>
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<tr>
<td>215</td>
<td>SLAB STABILIZATION</td>
<td>52</td>
<td>TON</td>
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<tr>
<td>216</td>
<td>DRYA. STABILIZATION</td>
<td>292</td>
<td>CYLD</td>
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<tr>
<td>217</td>
<td>CONCRETE MACHINE MACHINING COURSE (1 M)</td>
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<td>TON</td>
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<tr>
<td>218</td>
<td>ASPHALT BRIDGE PAVEMENT                 (1 M)</td>
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<td>219</td>
<td>ASPHALT BRIDGE PAVEMENT (2 M)</td>
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<td>TON</td>
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<td>222</td>
<td>COLD MILLED ASPHALT RAVENET</td>
<td>885</td>
<td>SQ YD</td>
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<td>ASPHALT CONCRETE SURFACING FOR MAINTENANCE OF TRAFFIC</td>
<td>24</td>
<td>TON</td>
</tr>
</tbody>
</table>
SURVEY CONTROL COORDINATES

Project Name: 070514_HENDERSON_CREEK
Date: 5/20/2020

Coordinate System: ARKANSAS STATE PLANE - SOUTH ZONE BASED ON GPS CONTROL
PROJECTED TO GROUND.

UWS U.S. SURVEY FOOT

<table>
<thead>
<tr>
<th>Point</th>
<th>Northing</th>
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<th>Elev</th>
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<td>223.240</td>
<td>TRM</td>
<td>ARDOT 2' ALUM CAP on 2' Rebar</td>
</tr>
</tbody>
</table>

*Note: Rebar and Cap - Standard 5/8" Rebar with 2" Aluminum Cap stamped*
*Other markings indicated in the point description of the individual point*

USE CAP = 1' FOR SURVEY & FOR THIS PROJECT

A PROJECT CAP OF 0.999986170514 HAS BEEN USED TO COMPLETE THE ABOVE GROUND COORDINATES.

GRID DISTANCE = GRID DISTANCE X CAP.
GRID COORDINATES ARE SHOWN UNDER FILE NAME 070514_HENDERSON_CREEK.ct1

REFERENCE POINTS (1500 SERIES) ARE TO BE USED TO ESTABLISH CONTROL.
IF THE PRIMARY CONTROL POINTS LISTED ABOVE HAVE BEEN DESTROYED, REFERENCE POINTS ARE TO BE USED FOR SURVEY CONTROL.

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0302-SOUTH ZONE
Determined from GPS Control Points 140018 - 140018A.

CONVERGENCE ANGLE = 0° 36' 11.320" LEFT AT LAT 93°19'32.09" LONG 93°04'39.87"
GR' D' AZIMUTH = ASTRONOMICAL AZIMUTH = CONVERGENCE ANGLE.

STA. 203+30.00 BEGIN SITE 2 L.M. 7.33
STA. 204+20.00 END SITE 2 & END JOB 070514 L.M. 7.33

200

205
ANGLE OF HEADWALL
M BARS, BEND TO MIN. 4" WEEP HOLES

SPECIFICATIONS IN LIEU OF LEAN GROUT. SELECT MATERIAL CONFORMING TO SECTION 206 OF THE STANDARD SPECIFICATIONS. IN OUTER BARRELS, ONE WEEP HOLE IS REQUIRED IN EXTERIOR WALLS OF BOX CULVERT.

LEAN GROUT SHALL CONSIST OF A SAND CEMENT MIXTURE AS SPECIFIED IN SECTION 607 OF THE STANDARD SPECIFICATIONS. LEAN GROUT SHALL BE TYPE 1 PORTLAND CEMENT AND SHALL MEET THE FOLLOWING REQUIREMENTS:
- SAND CEMENT MIXTURE SHALL CONSIST OF NOT LESS THAN 1.5 SACKS OF PORTLAND CEMENT PER TON OF MATERIAL MIXTURE.
- THE SAND CEMENT MIXTURE SHALL CONSIST OF NOT LESS THAN 8 INCH THICK LIFTS, LOOSE MEASURE, AND THOROUGHLY RODDED AND TAMPED AROUND BOX TO THOROUGHLY FILL ALL VOIDS.
- THE MIXTURE SHALL CONTAIN SUFFICIENT WATER TO HYDRATE THE CEMENT CEMENT MIXTURE.

M BARS AND J BARS SHALL BE EMBEDDED A MINIMUM OF 10" END SECTIONS AS SHOWN OR BY DOWELING AND GROUTING. PRECAST CULVERT SECTION BY CASTING BARS IN CULVERT WINGS, CURTAIN WALLS AND APRONS SHALL BE TIED TO THE PRECAST CONCRETE BOX CULVERTS. WINGWALLS AND FOOTINGS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

ALL CONCRETE REINFORCING STEEL LEAN GROUT MEMBRANE WATERPROOFING, DRUMS, A DRAINAGE FILL MATERIAL, GEOTEXTILE FILTER FABRIC, SHALL BE APPLIED TO ALL BOX CULVERT JOINTS.

MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERIOR JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE BOX CULVERT.

BOX CULVERTS WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR THE ITEMS LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR INSTALLING PRECAST CONCRETE BOX CULVERTS. CURTAIN WALLS, WINGWALLS AND FOOTINGS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

WINGWALLS AND CURTAIN WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWING SHEETS AND LAYER THICKNESS SHALL BE ADJUSTED AS SPECIFIED IN SECTION 403 OF THE STANDARD SPECIFICATIONS.

IN PRECAST BOX TO THOROUGHLY FILL ALL VOIDS.

STANDARD DRAWING PBC-1
ARKANSAS STATE HIGHWAY COMMISSION
PRECAST CONCRETE BOX CULVERTS

BAR LIST

<table>
<thead>
<tr>
<th>BAR NO.</th>
<th>SIZE</th>
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<tbody>
<tr>
<td>M 2</td>
<td>#4</td>
<td>1'-8&quot;</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>#4</td>
<td>3'-2&quot;</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>#4</td>
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<td></td>
</tr>
<tr>
<td>W</td>
<td>#4</td>
<td>6'-0&quot;</td>
<td></td>
</tr>
</tbody>
</table>

- NOTE: LENGTH AND NUMBER OF BARS VARY WITH SIZE OF CULVERT

GENERAL NOTES

WINGWALLS, CURTAIN WALLS AND WALLS SHALL BE CONSTRUCTED TO THE SPECIFICATIONS AND DRAWING SHEETS AND LAYER THICKNESS SHALL BE ADJUSTED AS SPECIFIED IN SECTION 403 OF THE STANDARD SPECIFICATIONS.

IN PRECAST BOX TO THOROUGHLY FILL ALL VOIDS.

STANDARD DRAWING PBC-1
ARKANSAS STATE HIGHWAY COMMISSION
PRECAST CONCRETE BOX CULVERTS

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IN PRECAST BOX TO THOROUGHLY FILL ALL VOIDS.
BROKEN LINE STRIPING

CONCRETE PAVEMENT

SOLID LINE STRIPING ON CONCRETE PAVEMENT

SOLID LINE STRIPING ON ASPHALT PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

YIELD LINE DETAIL

CROSSWALK AND STOP LINE DETAILS

NOTES:
1. REFER TO THE STRIPING DETAILS FOR PAVEMENT MARKING LINE WIDTHS.
2. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
3. RAISED PAVEMENT MARKERS SHALL BE PlACED ON AN 80 FEET SPACING UNLESS OTHERWISE SHOWN IN THE PLANS.

ARMSAK STATE HIGHWAY COMMISSION

PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1
NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE 1. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID FOR "4" PIPE UNDERDRAINS." UNDERDRAIN OUTLET PROTECTORS WILL BE MEASURED AND PAID FOR AT THE UNIT IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

2. ALL 4" PIPE LATERALS WITH OUTLET PROTECTORS SHALL BE INSTALLED AS SHOWN OR AS DIRECTED BY THE ENGINEER. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS." UNDERDRAIN OUTLET PROTECTORS WILL BE MEASURED AND PAID FOR BY THE UNIT IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

3. 4" PIPE UNDERDRAINS MAY BE CONNECTED TO PROPOSED DROP INLETS OR EXTENDED WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR CONNECTING TO DROP INLETS SHALL BE INCLUDED IN THE PRICE BID FOR "4" PIPE UNDERDRAINS." UNDERDRAIN OUTLET PROTECTORS WILL BE MEASURED AND PAID FOR AT THE UNIT IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

4. THE LOCATION OF ALL LATERALS SHALL BE MARKED WITH 4" X 12" PERMANENT PAINTING TAPE (TYPE III WHITE) AT THE OUTSIDE EDGE OF THE DRAIN PIPE ON GRADIENT.

5. PAYMENT FOR THE RODENT SCREEN SHALL BE INCLUDED IN THE PRICE BID PER EACH FOR "UNDERDRAIN OUTLET PROTECTORS.

6. ANY EXISTING UNDERDRAINS THAT INTERFERE WITH INSTALLATION OF THE NEW UNDERDRAIN SYSTEM SHALL BE REMOVED AND DISPOSED OF AS DIRECTED BY THE ENGINEER. PAYMENT FOR REMOVAL AND DISPOSAL OF EXISTING UNDERDRAIN OUTLET PROTECTORS SHALL BE REMOVED FROM THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

7. ALL LATERALS SHALL BE INSTALLED AT SAGS AND AT 250' INTERVALS ON GRADES. THE 250' DISTANCE MAY BE EXCEEDED AT SAGS AND AT 250' INTERVALS ON GRADES.

8. 4" PIPE UNDERDRAIN OUTLET PROTECTORS SHALL BE INSTALLED AT ALL SAGS AND AT 250' INTERVALS ON GRADES. THE 250' DISTANCE MAY BE EXCEEDED AT SAGS AND AT 250' INTERVALS ON GRADES.

9. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE 1. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS." UNDERDRAIN OUTLET PROTECTORS WILL BE MEASURED AND PAID FOR BY THE UNIT IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

10. THE WIDTH OF THE TRENCH AT THE TOP SHALL BE THOROUGHLY COMPACTED EARTH AND GRANULAR MATERIAL. LAP FABRIC 12" OR O.D. PIPE +8" ALL AROUND & LAPPED AT TOP.

11. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND GRANULAR MATERIAL. LAP FABRIC 12" OR O.D. PIPE +8" ALL AROUND & LAPPED AT TOP.

12. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR O.D. PIPE +8" ALL AROUND & LAPPED AT TOP.

13. NOTE: DETAILS OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE OF ASTM D 1785 (LATEST REVISION) FOR SCHEDULE 40 PIPE. PVC PIPE FOR LATERALS SHALL MEET THE REQUIREMENTS OF ASTM D 3066-90 (LATEST REVISION) FOR SCHEDULE 40 PIPE.
REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS 5 WITH A MINIMUM 28 DAY COMpressive STRENGTH OF 3500 PSL.
REINFORCING STEEL SHALL BE AIA STANDARDS M 3 OR M 53, GRADE 60.
CONSTRUCTION AND MATERIALS FOR MINIMAL & CULVERT DRAINAGE, INCLUDING WEAP HOLEs AND ORIFICAL MATERIAL, SHALL BE SUBJECTED TO THE BID ITEM, "CLASS 5 CONCRETE".
MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 095 OF THE STANDARD SPECIFICATIONS.
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE MINIMALS AND THE SURFACES OF R/C BOX CULVERTS AS DIRECTED BY THE ENGINEER.
R/C BOX CULVERTS SHALL 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 APPLIED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE CRII, EXCEPT THAT THE TOLERANCE FOR TRUS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRII MANUAL, SHALL BE MINUS ZERO TO PLUS 1/16 INCH.

WEAP HOLES IN BOX CULVERT WALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAM OPENING SHALL BE 4'-0" DIAMETER AND SHALL BE PLACED 1'-0" ABOVE THE TOP OF THE BOTTOM SLAB.

WEAP HOLES IN MINIMALS 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 WEAP HOLES IN EACH MINIMAL. THE DRAM OPENING SHALL BE 4'-0" DIAMETER AND SHALL BE PLACED 1'-0" ABOVE THE TOP OF THE WEAP HOLE FOOTING.

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

ARIZONA STATE HIGHWAY COMMISSION

REINFORCED CONCRETE BOX CULVERT DETAILS

1/1/01 R/C BOX CULVERT HEADWALL MODIFICATIONS

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD DRAWING RCB-1
GENERAL NOTES:
ROADWAY EXCAVATION (CHANNEL CHANGE) WILL BE PAID FOR AT R.C. BOX CULVERT
LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONFINED TO
THE PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE.
ROADWAY EXCAVATION (CHANNEL CHANGE) SHALL BE MEASURED BY CROSS SECTIONS AND VOLUMES
COMPARED BY HOURLY END AREA METHOD. ALL CHANNEL CHANGES SHALL BE BROUGHT TO GRADE PRIOR TO MAKING ANY EXCAVATION FOR STRUCTURES.
EXCAVATION FOR STRUCTURES WILL BE PAID FOR AT ALL R.C. BOX CULVERT
LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONFINED TO THAT
PORTION OF THE INDICATED AREA THAT IS ABOVE THE FLOW LINE. ROADWAY
EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDARY WILL NOT BE
MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE
VARIOUS ITEMS OF EXCAVATION.

SECTION B-B
DETAILS FOR NEW CHANNELS

SECTION C-C
DETAILS THROUGH EXISTING CHANNELS

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

ARKANSAS STATE HIGHWAY COMMISSION
STANDARD DRAWING RCB-2
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES TO PERMIT SIMPLER CALCULATIONS.

ABBREVIATIONS
- NC - NORMAL CROWN
- RC - REVERSE CROWN, SUPERELEVATION AT NORMAL CROWN SLOPE
- L - DISTANCE FROM BEGINNING OF SUPERELEVATION TRANSITION TO ANY POINT (FT.)
- d - WIDTH OF PAVEMENT
- Ls - LENGTH OF SUPERELEVATION TRANSITION (FT.)
- C - NORMAL CROWN (FT.)
- e - RATE OF SUPERELEVATION (FT. PER FT.)

ADDED FORMULA

ISSUED 534-1-9-87

DATE 10-18-96

DATE FILMED 01-09-87

ARKANSAS STATE HIGHWAY COMMISSION

NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C.

RATE OF SUPERELEVATION SHALL BE COMPUTED ON STRAIGHT LINE METHOD USING APPLICABLE Ls.

NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C.

MAXIMUM SUPERELEVATION OUTSIDE PAVEMENT OR SUBGRADE EDGE

P.C. OR P.T.  
C  
L  
A  
B  
C  
D  
E  

UNIFORMLY INCREASING SUPERELEVATION
UNIFORMLY DECREASING SUPERELEVATION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

FORMULA

= L de / Ls

SUPERELEVATION TABLE FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2
Typical Application of Traffic Control Devices on a 2-Lane Highway

WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.

1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. Delineators on bypass where needed.

NOTES:
1. Flagger stations at night as needed. Flood lights should be provided to mark station, a single flagger may be used.
2. If entire work area is visible from one location, a single flagger may be used.
3. Channelizing devices are to be extended if needed but are subject to engineering traffic flow.
4. Automated safety monitoring zone (optional) refer to notes.

GENERAL NOTES:
4. Flagger stations at night as needed.
5. Flood lights should be provided to mark station, a single flagger may be used.
6. If entire work area is visible from one location, a single flagger may be used.
7. Channelizing devices are to be extended as needed but are subject to engineering traffic flow.
8. Automated safety monitoring zone (optional) refer to notes.

ROADWORK AHEAD

NOTES:
1. Flagger stations at night as needed. Flood lights should be provided to mark station, a single flagger may be used.
2. If entire work area is visible from one location, a single flagger may be used.
3. Channelizing devices are to be extended as needed but are subject to engineering traffic flow.
4. Automated safety monitoring zone (optional) refer to notes.
**CLEARING AND GRUBBING**

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

**EXCAVATION**

1. Interceptor or diversion ditch
2. Existing ground

**CONSTRUCTION SEQUENCE**
1. Excavate and stabilize interceptor and/or diversion ditch.
2. Perform clearing and grubbing operation.
3. Perform phase 1 excavation. Place permanent or temporary seeding.
4. Perform phase 2 excavation. Place permanent or temporary seeding.
5. Perform final phase of excavation. Place permanent or temporary seeding.
6. Construct sediment basins or other erosion control devices as required.

**EMBANKMENT**

**GENERAL NOTE**
- Number of phases will vary.
- Phase 1, 2, and 3 are shown for illustration.

**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. Provide diversion ditches and slope drains if embankment construction is to be temporarily abandoned for a period of greater than 21 days.
3. Place phase 2 embankment with permanent or temporary seeding. Provide diversion ditches and slope drains if embankment construction is to be temporarily abandoned for a period of greater than 21 days.
4. Place final phase of embankment with permanent or temporary seeding. Provide diversion ditches and slope drains and maintain until entire embankment slope is stabilized.

**NOTE:**
- Number of phases will vary.
- Three phases shown for illustration.
GENERAL NOTES:

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

When a fEncing line approaches a gully or depression, the last post on level ground shall be placed close enough to the edge of the drop off that the fence may be strung to the post in the depression without touching the ground. When in terrain of such extreme irregularity that minor spacing will not be feasible, the normal fence shall continue on grade and the gullies or depressions treated by auxiliary fences as shown.

Payment for the type installation used will not be made directly but will be included in the contract unit price bid for Wire fence or Chain Link Fence.