"A FULLY CONTROLLED ACCESS FACILITY"
ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

HWY. 71 - CO. RD. 34
(ADD'L LNS.) (B.V. BYPASS) (S)
BENTON COUNTY
ROUTE 549 SECTION 9

JOB 090508
FED. AID PROJ. NHPP-HSIP-0004(72)

LENGTH OF PROJECT CALCULATED ALONG CONSTRUCTION CL HWY. 549
GROSS LENGTH OF PROJECT 4672.00 FEET OR 8.67 MILES
NET - ROADWAY 4592.50 - 8.42
NET - BRIDGES 593.42 - 0.20
NET - PROJECT 4672.00 - 8.74

DEPUTY DIRECTOR
AND CHIEF ENGINEER

DEPUTY DIRECTOR
AND CHIEF ENGINEER

APPROVED
**INDEX OF SHEETS AND STANDARD DRAWINGS**

**INDEX OF SHEETS**

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<td>NOTE: CROSS SECTIONS NOT NORMALLY INCLUDED IN PLANS SOLD TO PROSPECTIVE BIDDERS, BUT MAY BE HAD ON REQUEST.</td>
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**BRIDGE STANDARD DRAWINGS**

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GOVERNING SPECIFICATIONS
ARKANSAS STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EDITION OF 2014, AND THE FOLLOWING SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS:

NUMBER |
---|
ERRATA- ERRATA FOR THE BOOK OF GOVERNING SPECIFICATIONS: |
FHA-1273._ REQUIRED CONTRACT PROVISIONS FEDERAL AID CONSTRUCTION CONTRACTS |
FHA-1273._ SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS |
FHA-1273._ SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 149) |
FHA-1273._ SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES |
FHA-1273._ SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS |
FHA-1273._ SUPPLEMENT - TRAINING PROGRAM - JOB 090508 |
FHA-1273._ SUPPLEMENT - WAGE RATE DETERMINATION |
FHA-1273._ PARTNERING REQUIREMENTS |
FHA-1273._ CONTRACTORS LICENSE |
FHA-1273._ DEPARTMENT NAME CHANGE |
FHA-1273._ ISSUE OF PROPOSALS |
FHA-1273._ LIQUIDATED DAMAGES |
FHA-1273._ WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER |
FHA-1273._ AGGREGATE BASE COURSE |
FHA-1273._ TACK COATS |
FHA-1273._ DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES |
FHA-1273._ CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES |
FHA-1273._ RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES |
FHA-1273._ BROADBAND INTERNET SERVICE |
FHA-1273._ AIRPORT CONSTRUCTION REQUIREMENTS AND PERMITS |
FHA-1273._ WATER SERVICE |
FHA-1273._ WELLHEAD PROTECTION PROJECTS |
FHA-1273._ WIDE-TRAFFIC WORKSHOP |
FHA-1273._ ERRATA |

GENERAL NOTES:
1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPARATUS THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
5. ANY TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO ENSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED TEMPORARILY OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
7. THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONAL IN PERMIT REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.
8. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED Excavation.
9. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A HEAT LINE. AFTER SAWING, THE PAVEMENT TO BE REMOVED SHALL BE CAREFULLY REMOVED IN A MANNER THAT WILL NOT DAMAGE THE PAVEMENT THAT IS TO REMAIN. ANY DAMAGE OF THE ASPHALT PAVEMENT THAT IS TO REMAIN IN PLACE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
HWY. 549 - LEFT MAIN LANES - ALTERNATE 1

STA. 559+00.00 TO STA. 611+71.00
STA. 641+92.96 TO STA. 687+00.00
STA. 700+67.78 TO STA. 711+98.12
STA. 714+85.17 TO STA. 742+30.86
STA. 752+77.02 TO STA. 779+97.93
STA. 782+78.07 TO STA. 799+00.00
STA. 845+00.00 TO STA. 998+83.84
STA. 1001+48.16 TO STA. 1020+72.00

**NOTES:**
- REFER TO CROSS SECTIONS FOR DEVIATION FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.
- THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH (25mm) OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET THE TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.
- DENSITY REQUIREMENTS WAVED.

**TYPICAL SECTIONS OF IMPROVEMENT**
Typical Sections of Improvement

Hwy. 549 - Left Main Lanes - Alternate I
Super-elevation Section (Curve to Right)
(Pavement Section Is Same As Shown On Page 4)

Notes:
- Refer to Cross Sections for Deviation From the Normal Slopes. No Changes Shall Be Made From the Planned Slopes Without the Approval of the Engineer.
- The Thickness of Aggregate Base Course Shall Be Within Plus or Minus One Inch (25mm) of the Planned Thickness Showing the Contractor Will Correct Any Deficient Thickness That Does Not Meet the Tolerance Indicated.
- Notes: Refer to Cross Sections For Deviation From the Normal Slopes. No Changes Shall Be Made From the Planned Slopes Without the Approval of the Engineer.
- The Thickness of Aggregate Base Course Shall Be Within Plus or Minus One Inch (25mm) of the Planned Thickness Showing the Contractor Will Correct Any Deficient Thickness That Does Not Meet the Tolerance Indicated.

Temporary Crossover - Alternates 1 & 2
(Shown in Direction of Traffic)
TYPICAL SECTIONS OF IMPROVEMENT

HWY. 549 - LEFT MAIN Lanes - ALTERNATE 2

STA. 559 +00.00 TO STA. 611 +71.00
STA. 641 +92.96 TO STA. 687 +00.00
STA. 700 +67.78 TO STA. 711 +98.12
STA. 714 +85.17 TO STA. 742 +30.86
STA. 762 -77.02 TO STA. 779 +97.93
STA. 782 +76.07 TO STA. 793 +00.00
STA. 845 +00.00 TO STA. 998 +83.84
STA. 1001 +48.16 TO STA. 1020 +72.00

**NOTE:**

- **Aggregate Base Course (C-1.7) VAR. COMP'D DEPTH (0.00 TONS PER STA.):**
- **Aggregate Base Course (C-1.7) VAR. COMP'D DEPTH (1/00 TONS PER STA.):**

- **Aggregate Base Course (C-1.7) VAR. COMP'D DEPTH (2/00 TONS PER STA.):**

**NOTES:**

- REFER TO DITCH GRADES.

- REFER TO DITCH WHALES.

- REFER TO DITCH GRADES.

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- REFER TO DITCH GRADES.

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**NOTES:**

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

- THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH (25mm) OF THE PLAN Thickness. ANY DEFICIENT Thickness THAT DOES NOT MEET THE TOLERANCE INDICATED PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

- THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN Laid. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.

**TYPICAL SECTIONS OF IMPROVEMENT**
**HWY. 549 - LEFT MAIN LANES - ALTERNATE 2**

**SUPERELEVATION SECTION (CURVE TO RIGHT)**

(PAVEMENT SECTION IS SAME AS SHOWN ON PAGE 4B)

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**NOTES:**

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

THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH (25mm) OF THE PLANTHICKNESS 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 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN Laid. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.

---

**ACCELERATION & DECELERATION LANE - ALTERNATE 2**

(SHOWN IN DIRECTION OF TRAFFIC)
SECTION DETAIL OF WIDENING FOR GUARDRAIL
HWY. 549 - ALTERNATE 1
NOTE: REFER TO STANDARD DRAWINGS, GR-8, GR-8A, GR-9, GR-9A, GR-10 & GR-10A FOR ADDITIONAL INFORMATION.

TOP VIEW

No. 4 Bars at 12" Horizontal Spacing

9" VAR. WIDTH

VAR. HEIGHT

FRONT VIEW

PIECE EXTENSION
REINFORCED CONCRETE COLLAR DETAIL

SIDE VIEW

9" VAR. HEIGHT

9" VAR. WIDTH

PIECE EXTENSION
REINFORCED CONCRETE COLLAR DETAIL

SECTION DETAIL OF WIDENING FOR GUARDRAIL
HWY. 549 - ALTERNATE 2
NOTE: REFER TO STANDARD DRAWINGS, GR-8, GR-8A, GR-9, GR-9A, GR-10 & GR-10A FOR ADDITIONAL INFORMATION.

TOP VIEW

No. 4 Bars at 12" HORIZONTAL SPACING

18" NO. 4 BARS VAR. HORIZONTAL SPACING

9" VAR. HEIGHT

FRONT VIEW

PIECE EXTENSION
REINFORCED CONCRETE COLLAR DETAIL

SIDE VIEW

PIECE EXTENSION
REINFORCED CONCRETE COLLAR DETAIL
DETAIL OF PAVEMENT TRANSITION - ALTERNATE 2
AT END OF JOB
CONSTRUCTION PROJECT INFORMATION SIGN

DETAILS OF ROCK DITCH LINER OR DUMPED RIPRAP

TYPICAL LAYOUT OF GUARDRAIL AT BRIDGE ENDS
TYPICAL SECTION OF IMPROVEMENT
FOR WIRE ROPE SAFETY FENCE LEFT OF CENTERLINE

DETAIL OF WIRE ROPE SAFETY FENCE AT EXISTING BRIDGE ENDS
REFER TO PLANS FOR RELATIVE PLACEMENT
OF GUARDRAIL AND WIRE ROPE SAFETY FENCE
AT EACH BRIDGE END
DETAILS OF SHOULDER WIDENING FOR GUARDRAIL AND OVERLAPS WITH ENDS OF WIRE ROPE SAFETY FENCE
NOTES:
FOR ALL COMPACTED EMBANKMENT DEPTHS GREATER THAN 25' BUT LESS THAN 50' THERE SHALL BE A 5' LAYER OF ROCK FILL ALONG THE EXISTING SURFACE.
FOR ALL COMPACTED EMBANKMENT DEPTHS GREATER THAN 50' THERE SHALL BE A ROCK FILL LAYER FROM 50' TO THE EXISTING SURFACE.
REFER TO "ROCK FILL" SPECIAL PROVISION FOR ADDITIONAL INFORMATION.
DETAILS OF RUMBLE STRIPS

NOTES:
1. ALIGNMENT OF RUMBLE STRIPS SHALL GENERALLY BE STRAIGHT AND OFFSET APPROXIMATELY 4' FROM THE OUTER EDGE OF THE EDGE LINE. THIS OFFSET MAY BE ADJUSTED TO ACCOMMODATE VARIATIONS IN THE EDGE LINE.
2. THE 1/2" DEPTH SHALL GENERALLY APPLY FOR THE ENTIRE 16' LENGTH. SOME VARIATION TO SUIT SHOULDER SLOPE BREAKS MAY BE NECESSARY.
3. RUMBLE STRIPS SHALL NOT BE INSTALLED ON BRIDGE DECKS, APPROACH GIRDERS, OR ACROSS TRANSVERSE JOINTS OF CONCRETE SHOULDERS.
STA. 599+00.00
BEGIN JOB 090508

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

TEMPORARY EROSION CONTROL DETAILS

CLEARING AND GRUBBING

LEGEND:
- WATTLE DITCH CHECKS
- ROCK DITCH CHECKS
- DROP INLET SILT FENCE
- SILT FENCE
- SEDIMENT BASIN

REVISIONS

DATE OF REVISION

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

LEGEND

REVISIONS

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LEGEND

- WATTLE DITCH CHECKS
- ROCK DITCH CHECKS
- DROP INLET SILT FENCE
- SILT FENCE
- SEDIMENT BASIN

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

CLEARING AND GRUBBING TEMPORARY EROSION CONTROL DETAILS
LEGEND

=i WATTLE DITCH CHECKS
= ROCK DITCH CHECKS
= DROP INLET SILT FENCE
= SILT FENCE
= SEDIMENT BASIN

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

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS
NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.
LEGEND

- Water Ditch Checks
- Rock Ditch Checks
- Drop Inlet Silt Fence
- Silt Fence
- Sediment Basin

REVISIONS

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NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.
LEGEND
① BATTLE DITCH CHECKS
② ROCK DITCH CHECKS
③ DROP INLET SILT FENCE
④ SILT FENCE
⑤ SEDIMENT BASIN

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

REVISIONS

DATE OF REVISION
REVISION

TYPICAL TEMPORARY EROSION CONTROL DETAILS

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS
NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.
NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.
NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

LEGEND
- WATTLE DITCH CHECKS
- ROCK DITCH CHECKS
- DROP INLET SILT FENCE
- SILT FENCE
- SEDIMENT BASIN

STAGES 1 & 2
TEMPORARY EROSION CONTROL DETAILS
NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

LEGEND
- WATTLE DITCH CHECKS
- ROCK DITCH CHECKS
- DROP INLET SILT FENCE
- SLT FENCE
- SEDIMENT BASIN

REVISIONS

DATE OF REVISION
REVISION

STAGES 1 & 2
TEMPORARY EROSION CONTROL DETAILS
LEGEND

- WATTLE DITCH CHECKS
- ROCK DITCH CHECKS
- DROP INLET SALT FENCE
- SALT FENCE
- SEDIMENT BASIN

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

- = BATTLE DITCH CHECKS
= = ROCK DITCH CHECKS
( ) = DROP INLET SILT FENCE
( ) = SILT FENCE
( ) = SEDIMENT BASIN

Notes: Perimeter controls shall be placed as clearing and grubbing operations are started.
NOTE: PERIMETER CONTROLS SHALL BE Placed AS CLEARING AND DREDGING OPERATIONS ARE STARTED.
NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

LEGEND

- WATTLE DITCH CHECKS
- ROCK DITCH CHECKS
- DROP INLET SILT FENCE
- SILT FENCE
- SEDIMENT BASIN

STAGES 1 & 2
TEMPORARY EROSION CONTROL DETAILS
TEMPORARY EROSION CONTROL DETAILS

STAGES 1 & 2

LEGEND

- **E1**: WATTLE DITCH CHECKS
- **E2**: ROCK DITCH CHECKS
- **E3**: DROP INLET SILT FENCE
- **E4**: SILT FENCE
- **E5**: SEDIMENT BASIN

NOTE: PERIMETER CONTROL SHALL BE PLACED BEFORE CLEANING AND ENHANCED OPERATIONS ARE STARTED.
NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.
LEGEND

- WATTLE DITCH CHECKS
- ROCK DITCH CHECKS
- DROP INLET SILT FENCE
- SALT FENCE
- SEDIMENT BASIN

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

STAGES 1 & 2
TEMPORARY EROSION CONTROL DETAILS
NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND DREDGING OPERATIONS ARE STARTED.

LEGEND

- MATTLE DITCH CHECKS
- ROCK DITCH CHECKS
- DROP INLET SILT FENCE
- SILT FENCE
- SEDIMENT BASIN

DATE OF REVISION  |  REVISION
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NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.
NOTES:

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

LEGEND
- WATTLE DITCH CHECKS
- ROCK DITCH CHECKS
- DROP INLET SILT FENCE
- SILT FENCE
- SEDIMENT BASIN

REVISIONS

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<th>DATE OF REVISION</th>
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STAGES 1 & 2
TEMPORARY EROSION CONTROL DETAILS
NOTE: PERIMETER CONTROLS SHALL BE ERECTED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.
NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.
NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.
MAINTENANCE OF TRAFFIC DETAILS

**SEQUENCE OF CONSTRUCTION**

**STAGE 1**
- Maintain Head to Head Traffic in the right main lanes separated with existing yellow line. Construct left main lanes STA.64+00.00 to STA.68+00.00. STA.68+00.00 to STA.70+00.00 and STA.68+00.00 to STA.69+00.00.
- Construct bridges STA.70+44.37 to STA.74+44.35 and STA.70+44.37 to STA.78+00.40.
- Reduce speed limit, place temporary pavement markings. STA.78+00.40 to STA.84+00.00.
- Install safety fence and concrete ditch paving STA.84+00.00 to STA.92+00.00.
- Construct bridges STA.92+00.00 to STA.94+00.00 and STA.94+00.00 to STA.96+00.00.

**STAGE 2**
- Shift Northbound traffic to outside left main lanes and delineate lane closure. Windsor traffic drums spaced at 50' for maintenance of traffic in the right main lane and delineate lane closure with traffic drums placed at 50' C.C. Construct wire rope, safety fence, and concrete ditch paving STA.96+00.00 to STA.99+99.99.
- Install safety fence and concrete ditch paving STA.99+99.99 to STA.100+00.00.

**END OF JOB**
- Place permanent pavement markings as shown in plans and STD. (Refer to PM-1 and PM-2.)
- Advance warning for ramps at Co. Rd. 34 (all stages).
- Use if and where directed by Engineer.

**ADVANCE WARNING FOR RAMP AT CO. RD. 34 (ALL STAGES)**

**ADVANCE WARNING (ALL STAGES)**

- **DO NOT PASS** (4) R4-1 (24" x 30")
- **RIGHT SHOULDER CLOSED** (4) W2-1.5 (36" x 36")
NOTE
MAINTAIN MINIMUM 12'-0" LANE WIDTH
ON LANE REMAINING OPEN.

WORK ZONE FOR GUARDRAIL INSTALLATION

NOTE
MAINTAIN MINIMUM 12'-0" LANE WIDTH
ON LANE REMAINING OPEN.

WORK ZONE FOR WRSF INSTALLATION
BECKETT RD./TANYARD CREEK

NOT TO SCALE

ARThUR RD.

MAINTENANCE OF TRAFFIC DETAILS

AMSTEL ARTHUR RD. TANYARD CREEK-
PRECAST CONCRETE BARRIER WALL 346 LIN. FT. - WITH 2 SPECIAL END UNITS

PRECAST CONCRETE BARRIER WALL 346 LIN. FT. - WITH 2 SPECIAL END UNITS

WORKING AREA

-500 FT.

-500 FT.

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-500 FT.
SEQUENCE OF CONSTRUCTION

STAGE 1
MAIN CHANG TO HEAD TRAFFIC IN THE RIGHT MAIN LAKES SEPARATED E WITH AN EXISTING DOUBLE YELLOW LINE CONSTRUCT LEFT MAIN LANES 5870 TO 587-000, 6770 TO 677-000 AND STA 787+00 AND STA 789+00 TO STA 791+00. CONSTRUCT TRAFFIC DRUMS 8 EACH PC - 2746.

TRAFFIC DRUMS = 8 EACH 50' D.L.

PRESNT CONCRETE BARRIER WALL LEFT IN PLACE FROM 090958.

TRAFFIC DRUMS = 10 EACH 50' D.L.

PRESENT CONCRETE BARRIER WALL LEFT IN PLACE FROM 090958.

TRAFFIC DRUMS = 472 EACH PC - 2746.

SIGN: 1775 SQ FT,

PRESNT CONCRETE BARRIER WALL LEFT IN PLACE FROM 090958.

TRAFFIC DRUMS 8 EACH PC - 2746.

TRAFFIC DRUMS = 50' D.L.

PRESNT CONCRETE BARRIER WALL LEFT IN PLACE FROM 090958.

TRAFFIC DRUMS = 50' D.L.

SIGN: 1775 SQ FT,

TRAFFIC DRUMS = 50' D.L.

SIGN: 1775 SQ FT,

TRAFFIC DRUMS = 50' D.L.

SIGN: 1775 SQ FT,

TRAFFIC DRUMS = 50' D.L.

SIGN: 1775 SQ FT,

TRAFFIC DRUMS = 50' D.L.

SIGN: 1775 SQ FT

MAINTENANCE OF TRAFFIC DETAILS

STAGE 2
SHJFT SOUTHBOUND TRAFFIC TO OUTSIDE LEFT MAIN LANES AND DELINATE LANES CLOSURE WITH TRAFFIC DRUMS SPACED AT 100' D.L. MAINTAIN TRAFFIC DETAILS AND PLACE TRAFFIC DRUMS SPACED 100' D.L. AND MAINTAIN TRAFFIC DETAILS. CONSTRUCT WIRE ROPE SAFETY FENCE AND CONCRETE DITCH PAVING FROM STA 787+00 TO STA 791+00 ON LT. STA 587+00 TO STA 787+00 ON RT. CONSTRUCT GUARDRAIL FROM STA 787+00 TO STA 791+00 ON RT.

END OF JOB PLACE PERMANENT PAVEMENT MARKINGS AS SHOWN IN PLANS AND STD. Drawings. PUD-1 AND PUD-2.

SIGN AND BARRIARE LEF} FROM 090958 RETAIN.
MAINTENANCE OF TRAFFIC DETAILS

- Traffic Drums: 8 each left in place from Previously
- Traffic Drums: 40 each 30' of lane
- Traffic Drums: 100' in each lane
- Precast Concrete Barriers: Wall left in place from previously
- Sign L17.3, 2 Special End Unit
- 25' Buffer Zone
- Traffic Details

OTHER DETAILS
- Maintenance of Traffic Details
- T.C.E.
- 265
- 265
- 15.35
- 37.45
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

TRAFFIC DRUMS = 13 EACH
50' O.C.

PRECAST CONCRETE BARRIER WALL
LEFT IN PLACE FROM 090292
AND LEFT 30' FT. WITH 2 SPECIAL END UNIT
RETAIN

TRAFFIC DRUMS = 7 EACH
LEFT IN PLACE FROM 090293
50' O.C.
RETAIN

SIGN AND BARRICADE LEFT IN PLACE
FROM JOB 090293
RETAIN
SEQUENCE OF CONSTRUCTION

STAGE 1
MAINTAIN HEAD TO HEAD TRAFFIC IN THE RIGHT MAIN LINES SEPARATED WITH AN EXISTING DOUBLE YELLOW LINE. CONSTRUCT LEFT MAIN LINES STA. 0+00.00 TO STA. 681+00.00. STA. 681+00.00 TO STA. 799+00.00 AND STA. 800+00.00 TO STA. 930+00.00.

CONSTRUCT BRIDGES STA. 70+00.00 TO STA. 89+18.57. STA. 89+18.57 TO STA. 90+36.95. STA. 90+36.95 TO STA. 90+49.57. STA. 90+49.57 TO STA. 92+50.57. STA. 92+50.57 TO STA. 93+62.57. STA. 93+62.57 TO STA. 95+00.00. STA. 95+00.00 TO STA. 102+00.00.

SAFE BEACHES AND CONCRETE EDGED PAVING FROM STA. 70+00.00 TO STA. 799+00.00 ON LT. STA. 800+00.00 TO STA. 930+00.00 ON LT. STA. 940+00.00 TO STA. 950+00.00 ON LT. STA. 950+00.00 TO STA. 100+00.00 ON LT.

CONSTRUCT WIRE ROPE SAFETY FENCE AND CONCRETE DITCH PAVING FROM STA. 681+00.00 TO STA. 799+00.00 ON LT. STA. 800+00.00 TO STA. 930+00.00 ON LT. STA. 940+00.00 TO STA. 950+00.00 ON LT. STA. 950+00.00 TO STA. 100+00.00 ON LT.

STAGE 2: SHIFT NORTHBOUND TRAFFIC TO OUTSIDE LEFT MAIN LANES AND DELINEATE LANE CLOSURE WITH TRAFFIC DRUMS SPACED AT 100'0.C. MAINTAIN SOUTHBOUND TRAFFIC IN OUTSIDE RIGHT MAIN LANE AND DELINEATE LANE CLOSURE WITH TRAFFIC DRUMS SPACED AT 100'0.C. CONSTRUCT WIRE ROPE SAFE BEACHES AND CONCRETE DITCH PAVING STA. 681+00.00 TO STA. 690+00.00. STA. 690+00.00 TO STA. 714+00.00. STA. 714+00.00 TO STA. 728+00.00. STA. 728+00.00 TO STA. 742+00.00. STA. 742+00.00 TO STA. 756+00.00. STA. 756+00.00 TO STA. 770+00.00. STA. 770+00.00 TO STA. 784+00.00.

STA. 681+00.00 TO STA. 799+00.00 ON LT. STA. 800+00.00 TO STA. 930+00.00 ON LT. STA. 940+00.00 TO STA. 950+00.00 ON LT. STA. 950+00.00 TO STA. 100+00.00 ON LT. STA. 820+00.00 TO STA. 928+00.00. STA. 928+00.00 TO STA. 937+00.00. STA. 937+00.00 TO STA. 954+00.00. STA. 954+00.00 TO STA. 972+00.00. STA. 972+00.00 TO STA. 999+00.00. STA. 999+00.00 TO STA. 1020+00.00.

CONSTRUCT GUARDRAIL AT BRIDGE ENDS AND STA. 664+00.00 TO STA. 669+00.00. STA. 669+00.00 TO STA. 674+00.00. STA. 674+00.00 TO STA. 679+00.00. STA. 679+00.00 TO STA. 684+00.00. STA. 684+00.00 TO STA. 689+00.00. STA. 689+00.00 TO STA. 694+00.00. STA. 694+00.00 TO STA. 699+00.00. STA. 699+00.00 TO STA. 704+00.00. STA. 704+00.00 TO STA. 709+00.00. STA. 709+00.00 TO STA. 714+00.00. STA. 714+00.00 TO STA. 719+00.00. STA. 719+00.00 TO STA. 724+00.00. STA. 724+00.00 TO STA. 729+00.00. STA. 729+00.00 TO STA. 734+00.00. STA. 734+00.00 TO STA. 739+00.00. STA. 739+00.00 TO STA. 744+00.00. STA. 744+00.00 TO STA. 749+00.00. STA. 749+00.00 TO STA. 754+00.00. STA. 754+00.00 TO STA. 759+00.00. STA. 759+00.00 TO STA. 764+00.00. STA. 764+00.00 TO STA. 769+00.00. STA. 769+00.00 TO STA. 774+00.00. STA. 774+00.00 TO STA. 779+00.00. STA. 779+00.00 TO STA. 784+00.00.

CONSTRUCT GUARDRAIL STA. 662+13.35 TO STA. 667+13.35. REMOVE ALL CONFLICTING PAVEMENT MARKINGS AND PLACE CONSTRUCTION PAVEMENT MARKINGS AS NEEDED. REMOVE ALL TEMPORARY RAMP CROSSOVERS.

END OF JOB: PLACE PERMANENT PAVEMENT MARKINGS AS SHOWN IN PLANS AND STLS. DLNL PN-1 AND PN-2.

DETONES REMOVAL OF TEMPORARY RAMP CROSSOVERS.
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DENOTES REMOVAL OF TEMPORARY RAMPS
DENOTES REMOVAL OF TEMPORARY RAMPS

TRAFFIC DRUMS 100' O.C.

S 58°21'48" E

DENOTES REMOVAL OF TEMPORARY RAMPS

MAINTENANCE OF TRAFFIC DETAILS

STAGE 2
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DENOTES REMOVAL OF TEMPORARY RAMPS

TRAFFIC DRUMS 100' O.C.

TRAFFIC DRUMS + 15 EACH 50' O.C.

FURNISH INSTALL AND LEAVE IN PLACE PRECAST CONCRETE BARRIER WALL WITH FRAGILE IMPACT ATTENUATION BARRIER 450' O.L.F.

FURNISH INSTALL AND LEAVE IN PLACE PRECAST CONCRETE BARRIER WALL WITH SPECIAL END UNITS 450' O.L.F.
PERMANENT PAVEMENT MARKINGS

ENHANCED THERMOPLASTIC PAVEMENT MARKING WHITE (5" - 62064 LIN. FT.)
ENHANCED THERMOPLASTIC PAVEMENT MARKING GRAY LINE WHITE (5" - 2006 LIN. FT.)
ENHANCED THERMOPLASTIC PAVEMENT MARKING YELLOW (5" - 64206 LIN. FT.)
ENHANCED THERMOPLASTIC PAVEMENT MARKING WHITE (5" - 1666 LIN. FT.)
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) - 36" EACH
6" WHITE ENHANCED THERMOPLASTIC PAVEMENT MARKING
6" WHITE ENHANCED THERMOPLASTIC PAVEMENT MARKING W/RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) 80' O.C.
6" YELLOW ENHANCED THERMOPLASTIC PAVEMENT MARKING
6" YELLOW ENHANCED THERMOPLASTIC PAVEMENT MARKING W/RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) 80' O.C.
6" WHITE IN PLACE ENHANCED THERMOPLASTIC PAVEMENT MARKING
6" WHITE IN PLACE ENHANCED THERMOPLASTIC PAVEMENT MARKING W/RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) 80' O.C.

TYPICAL STRIPING DETAIL
HWY.549 NORTHBOUND AND SOUTHBOUND LANES

NOTE: SEE STD. DWG. PM-2 FOR ENTRANCE RAMP, EXIT RAMP, GORE AREAS, AND ACCEL. LANE PAV'T MARKING.

ENLARGED DETAIL OF DIAGONAL MARKINGS
NOT TO SCALE
### Construction Paving Markings and Permanent Paving Markings

<table>
<thead>
<tr>
<th>Description</th>
<th>Stage 2</th>
<th>End of Job</th>
<th>Removal of Permanent Pavement Markings</th>
<th>Construction Pavement Markings</th>
<th>Removable Construction Pavement Markings</th>
<th>Raised Pavement Markers</th>
<th>Enhanced Thermoplastic Pavement Marking</th>
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**Note:** This is a high traffic volume road as defined in Section 604.03, Standard Specifications for Highway Construction.

### Advance Warning Signs and Devices

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<th>Stage 1</th>
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<th>Total Signs Required</th>
<th>Construction Project Information Sign Update</th>
<th>Traffic Drums</th>
<th>Furnishing and Installing Precast Concrete Barrier</th>
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<td>W20-1</td>
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**Note:** This is a high traffic volume road as defined in Section 604.03, Standard Specifications for Highway Construction.
### Clearing and Grubbing

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**Total:** 126.000

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### Removal and Disposal of Items

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**Total:** 1800.000

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**Total:** 3000.000

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### Eartwork

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**Total:** 60.000

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### Rock Ditch Liner, Dumped Riprap, and Filter Blanket

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**Total:** 700.000

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### Quantities

- **Asphalt Concrete Patching for Maintenance of Traffic**: 25 Tonne
- **Tack Coat for Maintenance of Traffic**: 50 Gallons
### CONCRETE DITCH PAVING

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**TOTALS:** 950.50

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**TOTALS:** 30.90

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### QUANTITIES

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**CONCRETE DITCH PAVING**

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**TOTALS:** 1470
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<th>Approach Slabs</th>
<th>Steel Reinforcement</th>
<th>Aggregate Base Coat</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>LT. OF LT. MAIN LANES</td>
<td>TYPE C</td>
<td>TYPE D</td>
<td>49.5</td>
<td>49.5</td>
<td>TON</td>
</tr>
</tbody>
</table>

**Rumble Strips as asphalt Shoulders - Alternate 1:**

<table>
<thead>
<tr>
<th>Station</th>
<th>Station</th>
<th>Location</th>
<th>Rumble Strips in Asphalt Shoulders - Alternate 1</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>RIGHT OF LT. MAIN LANES</td>
<td>335 60</td>
<td>1 1 1</td>
</tr>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>LEFT OF LT. MAIN LANES</td>
<td>670 60</td>
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</table>

**Rumble Strips in Portland Cement Concrete Shoulders - Alternate 2:**

<table>
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<tr>
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<th>Location</th>
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<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>RIGHT OF LT. MAIN LANES</td>
<td>335 60</td>
<td>1 1 1</td>
</tr>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>LEFT OF LT. MAIN LANES</td>
<td>670 60</td>
<td>1 1 1</td>
</tr>
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</table>

**Guardrail:**

<table>
<thead>
<tr>
<th>Station</th>
<th>Station</th>
<th>Location</th>
<th>Guardrail (Type A)</th>
<th>Three Bear Guardrail Terminal</th>
<th>Terminal Anchor Post (Type 1)</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>S/E SIDE OF LT. MAIN LANES</td>
<td>500</td>
<td>1 1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>B/T SIDE OF LT. MAIN LANES</td>
<td>100</td>
<td>1 1 1</td>
<td></td>
<td></td>
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**Approach Gutters and Slabs:**

<table>
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<tr>
<th>Station</th>
<th>Station</th>
<th>Location</th>
<th>Approach Gutters</th>
<th>Approach Slabs</th>
<th>Steel Reinforcement</th>
<th>Aggregate Base Coat</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>1171+84</td>
<td>1171+84</td>
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<td>TYPE D</td>
<td>49.5</td>
<td>49.5</td>
<td>TON</td>
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**Rumble Strips as asphalt Shoulders - Alternate 2:**

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<th>Station</th>
<th>Location</th>
<th>Rumble Strips in Asphalt Shoulders - Alternate 2</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
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<td>1171+84</td>
<td>1171+84</td>
<td>RIGHT OF LT. MAIN LANES</td>
<td>335 60</td>
<td>1 1 1</td>
</tr>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>LEFT OF LT. MAIN LANES</td>
<td>670 60</td>
<td>1 1 1</td>
</tr>
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</table>

**Rumble Strips in Portland Cement Concrete Shoulders - Alternate 2:**

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<th>Station</th>
<th>Location</th>
<th>Rumble Strips in Portland Cement Concrete Shoulders - Alternate 2</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>RIGHT OF LT. MAIN LANES</td>
<td>335 60</td>
<td>1 1 1</td>
</tr>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>LEFT OF LT. MAIN LANES</td>
<td>670 60</td>
<td>1 1 1</td>
</tr>
</tbody>
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**Guardrail:**

<table>
<thead>
<tr>
<th>Station</th>
<th>Station</th>
<th>Location</th>
<th>Guardrail (Type A)</th>
<th>Three Bear Guardrail Terminal</th>
<th>Terminal Anchor Post (Type 1)</th>
<th>Unit</th>
</tr>
</thead>
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<td>1171+84</td>
<td>S/E SIDE OF LT. MAIN LANES</td>
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<td></td>
</tr>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>B/T SIDE OF LT. MAIN LANES</td>
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**Approach Gutters and Slabs:**

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<th>Steel Reinforcement</th>
<th>Aggregate Base Coat</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>1171+84</td>
<td>1171+84</td>
<td>LT. OF LT. MAIN LANES</td>
<td>TYPE C</td>
<td>TYPE D</td>
<td>49.5</td>
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**Joint Support - Alternate 1:**

<table>
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<th>Location</th>
<th>Width</th>
<th>Length</th>
<th>Depth</th>
<th>Class of Concrete</th>
<th>Type of Joint Support</th>
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<tbody>
<tr>
<td>1171+84</td>
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<td>LT. OF LT. MAIN LANES</td>
<td>15</td>
<td>12</td>
<td>2.40</td>
<td>Class A</td>
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</table>

**Bench Marks:**

<table>
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<tbody>
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**Joint Support - Alternate 2:**

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<th>Width</th>
<th>Length</th>
<th>Depth</th>
<th>Class of Concrete</th>
<th>Type of Joint Support</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1171+84</td>
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<td>12</td>
<td>2.40</td>
<td>Class A</td>
<td>BR. BOX COLLET</td>
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**Bench Marks:**

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<th>Station</th>
<th>Location</th>
<th>Bench Marks</th>
</tr>
</thead>
<tbody>
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<td>LT. MAIN LANE</td>
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</table>
### Quantities

#### Concretes - Alternate 1

<table>
<thead>
<tr>
<th>Location</th>
<th>CEMNT STABILIZED CRUSHED STONE BASE</th>
<th>ACHM SURFACE COURSE (3/8&quot;)</th>
<th>TACK COAT 0.5 GAL. PER SQ. YD.</th>
<th>PORTLAND CEMENT CONCRETE PAVEMENT</th>
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</thead>
<tbody>
<tr>
<td>Length</td>
<td>SQ. YD.</td>
<td>TON FEET</td>
<td>FEET</td>
<td>SQ. YD.</td>
</tr>
<tr>
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</tr>
<tr>
<td>3969+00</td>
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<td>1030+72.00</td>
<td>2562.85</td>
<td>37952.76</td>
<td>37951.40</td>
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</tbody>
</table>

**Note:**
- Concretes 12% Gypsum, 8% Asphalt Binder
- Maximum Number of Gyrations = 115 for PG 64-22
- Cements Stabilized Crushed Stone Base Course = 94% Agg. 6% Cement
- Tack coat quantities were calculated using the emulsified asphalt rates. Refer to SS-400-1 for the residual asphalt application rates.
<table>
<thead>
<tr>
<th>STATION</th>
<th>LOCATION</th>
<th>LENGTH</th>
<th>TACK COAT</th>
<th>ACHIM BASE COAT (1/2&quot;)</th>
<th>ACHIM SURFACE COAT (1/2&quot;)</th>
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<tbody>
<tr>
<td></td>
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<td>FEET</td>
<td>FEET</td>
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<tr>
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<td>AVG. WTD</td>
<td>SQ.YD</td>
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<td>SQ.YD</td>
<td>DOLLARS / SQ.YD</td>
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<td></td>
<td>AVG. WTD</td>
<td>SQ.YD</td>
<td>SQ.YD</td>
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<td></td>
<td></td>
<td>SQ.YD</td>
<td>DOLLARS / SQ.YD</td>
<td>DOLLARS</td>
</tr>
<tr>
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<td>TON</td>
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<td></td>
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<td>AVG. WTD</td>
<td>SQ.YD</td>
<td>SQ.YD</td>
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<tr>
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<td></td>
<td>SQ.YD</td>
<td>DOLLARS / SQ.YD</td>
<td>DOLLARS</td>
</tr>
<tr>
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<td>TON</td>
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<td>AVG. WTD</td>
<td>SQ.YD</td>
<td>SQ.YD</td>
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<tr>
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<td></td>
<td></td>
<td>SQ.YD</td>
<td>DOLLARS / SQ.YD</td>
<td>DOLLARS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TON</td>
<td>TON</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AVG. WTD</td>
<td>SQ.YD</td>
<td>SQ.YD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SQ.YD</td>
<td>DOLLARS / SQ.YD</td>
<td>DOLLARS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TON</td>
<td>TON</td>
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</tr>
<tr>
<td>STATION</td>
<td>STATION LOCATION</td>
<td>LENGTH</td>
<td>TON/STATION</td>
<td>AVG. W/D.</td>
<td>SQ.YD.</td>
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<tr>
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<td>-------------</td>
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<td>--------</td>
</tr>
</tbody>
</table>
### CONCRETE BASE - ALTERNATE 2

| STATION | STATION | LOCATION | LENGTH | AGGREGATE BASE COURSE (L'| | CEMENT STABILIZED GRAVEL BASE COURSE | TAMPED | Asphlt BINDER RATE | PORTLAND CEMENT CONCRETE | PAYMENT |
|---------|---------|----------|--------|----------------|------------------|-----------------|---------------------|------------------------|----------|
| 000-00 | 000-00  | 000-00   | 000.00 | 0.00        | 0.00             | 0.00             | 0.00                | 0.00                    | 0.00     |

###作為的 Benchmark

耐備的表面處理 Alternate 2 Box 1 of 2

<table>
<thead>
<tr>
<th>STATION</th>
<th>STATION</th>
<th>LOCATION</th>
<th>LENGTH</th>
<th>AGGREGATE</th>
<th>BASE COURSE (L'/)</th>
<th>CEMENT</th>
<th>ASPHALT BINDER</th>
<th>PORTLAND CEMENT CONCRETE</th>
<th>PAYMENT</th>
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</tr>
</tbody>
</table>

###總和

283.34 | 7.00 | 283.34 | 10.00 | 283.34 | 14.15 | 283.34 |

### Quantities

**Cement**
- Concrete Surface Course: (1%) 10% Max.
- Asphlt Binder: (3%) 5% Max.
- Maximum number of borations: 10

**Gage Rates**
- Portland Cement Concrete: 4.1% 6.0% Cement
- Asphlt BINDER: 4.1% 6.0% Cement

**Tack coat QuaRtifies** were calculated using the specified asphlt application rates. Refer to S5-446-I for the residual asphlt application rates.
<table>
<thead>
<tr>
<th>STATION</th>
<th>LOCATION</th>
<th>LENGTH</th>
<th>AGGREGATE BASE COURSE (1)</th>
<th>ADHESIVE BINDER COURSE (2)</th>
<th>TACK COAT</th>
<th>AGGREGATE BASE COURSE (1)</th>
<th>ADHESIVE BINDER COURSE (2)</th>
<th>TACK COAT</th>
</tr>
</thead>
<tbody>
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<td>AVG.WD.</td>
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<td>POUND/ SQ.YD.</td>
<td>POUND/ SQ.YD.</td>
<td>POUND/ SQ.YD.</td>
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<td>FEET</td>
<td>FEET</td>
<td>FEET</td>
<td>FEET</td>
<td>FEET</td>
</tr>
</tbody>
</table>

**ADDITIONAL FOR TEMPORARY CROSSOVER**

- PG70-22
- BASE AND ALTERNATE BASIS OF ESTIMATE:
  - ACHM SURFACE COURSE (1)..........................94.5% M/T, AGGR..................5.5% ASPHALT Binder
  - ACHM Binder Course (1)............................95.5% M/T, AGGR..................4.5% ASPHALT Binder
  - ACHM Base Course (1)..............................95.9% M/T, AGGR..................4.1% ASPHALT Binder

- MAXIMUM NUMBER OF CYCLES = 160 FOR PG 70-22
- TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO 56-400.1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.
<table>
<thead>
<tr>
<th>UNIT OF STRUCTURE</th>
<th>ITEM</th>
<th>UNIT</th>
<th>BRIDGE NO.</th>
<th>NARRATIVE</th>
</tr>
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<tbody>
<tr>
<td>UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE</td>
<td>BENT 1</td>
<td>3</td>
<td>35.52</td>
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<td>86.72</td>
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<td>4210</td>
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<td>TOTALS FOR BEND 4</td>
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<td></td>
</tr>
</tbody>
</table>

**TOTALS FOR JOB NO. 090508**

---

1. Includes approx. 2% cu. yds. of rock excavation.
2. These piles shall be Grade 50 and have special pile tips which will not be used for driving, but will be considered for HP 2005. All piles shall conform to all SDW. Job NO. 505002.
3. The quantities shown for steel-piling, pre-casting and exploratory tests are for estimating and bidding purposes only. Actual quantities for pre-casting and exploratory tests if any, and for steel-piling will be determined in the field.
<table>
<thead>
<tr>
<th>Point</th>
<th>Northing</th>
<th>Easting</th>
<th>Elev</th>
<th>Feature Description</th>
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</thead>
<tbody>
<tr>
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<td>154.2759</td>
<td>42</td>
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</tr>
<tr>
<td>2</td>
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<tr>
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</tbody>
</table>

Note: Table entries are in feet and are based on NAD83 (1992) Ellipsoid and State Plane Coordinate System Georgia North Zone. Elevations are in feet above mean sea level. Features are as indicated on the map.
### Survey Control Coordinates

**Project Name:** CONVERGENCE

**Coordinate System:** NAD 1983 State Plane, North Zone Based on GPS Control

#### Survey Projected to Ground:

<table>
<thead>
<tr>
<th>Name</th>
<th>Northing</th>
<th>Easting</th>
<th>Flex Feature Description</th>
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### FRONTAGE RD.

<table>
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<th>Easting</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP1</td>
<td>T.C.</td>
<td>16018</td>
<td>1006153</td>
<td>426791</td>
</tr>
<tr>
<td>R8</td>
<td>C.C.</td>
<td>16020</td>
<td>1006204</td>
<td>426795</td>
</tr>
<tr>
<td>R31</td>
<td>C.C.</td>
<td>16027</td>
<td>1006257</td>
<td>426804</td>
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</table>

### Points are Not to Be Used as Control Survey Points

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>MN</td>
<td>P.C.</td>
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### CONVERGENCE ANGLE

- **Azimuth Used Above Convergence Angle:** Rebar-Stamped Cat.Ed.

### Survey Details

- **Point Name:** Waterford St.
- **Reference Points:** 1st order, unless specified otherwise.

### RELOCATED COUNTY RD.

<table>
<thead>
<tr>
<th>POINT NAME</th>
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<th>Easting</th>
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<tr>
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<td>1006153</td>
<td>426791</td>
</tr>
<tr>
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<td>C.C.</td>
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<td>1006204</td>
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### SURVEY CONTROL DETAILS

**HWY. 72 (South) Ramp 1**

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<th>TYPE</th>
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<tr>
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<tr>
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**HWY. 72 (North) Ramp 3**

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### COUNTY ROAD 21

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### SURVEY CONTROL DETAILS

**HWY. 72 (South) Ramp 1**

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**HWY. 72 (North) Ramp 3**

<table>
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<td>1177349</td>
<td>426875</td>
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<tr>
<td>ET2</td>
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**County Road 21**

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<thead>
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<th>Easting</th>
</tr>
</thead>
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<td>1177349</td>
<td>426875</td>
</tr>
<tr>
<td>ET2</td>
<td>P.C.</td>
<td>62872</td>
<td>1177352</td>
<td>426876</td>
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### AR ZON RAMP 4 (SHOWN FOR INFORMATION ONLY)

<table>
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<th>EASTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>8311</td>
<td>PC</td>
<td>648-46-24</td>
<td>742699.8842</td>
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<tr>
<td>8311</td>
<td>PT</td>
<td>651-03-70</td>
<td>773224.3655</td>
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<tr>
<td>8311</td>
<td>POE</td>
<td>671-12-12</td>
<td>773967.4599</td>
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### AR ZON RAMP 4 - TEMPORARY RAMP 4 (SHOWN FOR INFORMATION ONLY)

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<th>EASTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>8322</td>
<td>PT</td>
<td>660-06-39</td>
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<td>8322</td>
<td>POE</td>
<td>679-04-18</td>
<td>773876.9251</td>
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### POINT No. | STATION | NORTHING | EASTING |
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
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<td>674-14-34</td>
<td>774738.2461</td>
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### CO. RD. 24 - RAMP 1 (SHOWN FOR INFORMATION ONLY)

<table>
<thead>
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<th>STATION</th>
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<th>EASTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>8231</td>
<td>PC</td>
<td>520-37-04</td>
<td>798255.8309</td>
</tr>
<tr>
<td>8231</td>
<td>PT</td>
<td>521-12-05</td>
<td>798520.3610</td>
</tr>
<tr>
<td>8231</td>
<td>POE</td>
<td>532-69-20</td>
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### CO. RD. 24 - RAMP 2 (SHOWN FOR INFORMATION ONLY)

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</tr>
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<tbody>
<tr>
<td>8233</td>
<td>POE</td>
<td>536-33-15</td>
<td>799325.7131</td>
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### CO. RD. 24 - RAMP 3 (SHOWN FOR INFORMATION ONLY)

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<tbody>
<tr>
<td>8233</td>
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### CONTROL POINTS

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<tr>
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<td>RD.</td>
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<tr>
<td>7605</td>
<td>POE</td>
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</table>

### RELLOCATED CO. RD. 21 (SHOWN FOR INFORMATION ONLY)

<table>
<thead>
<tr>
<th>RELLOCATED CO. RD. 21</th>
<th>STATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>774285.2255</td>
<td>72164-2444</td>
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### CO. RD. 24 - RAMP 4 (SHOWN FOR INFORMATION ONLY)

<table>
<thead>
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<th>STATION</th>
<th>NORTHING</th>
<th>EASTING</th>
</tr>
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<tbody>
<tr>
<td>8231</td>
<td>PC</td>
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<td>798255.8309</td>
</tr>
<tr>
<td>8231</td>
<td>PT</td>
<td>521-12-05</td>
<td>798520.3610</td>
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<td>8231</td>
<td>POE</td>
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<td>798951.6652</td>
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### CROSSOVER POINTS

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<tr>
<td>7601</td>
<td>7604.9150</td>
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<tr>
<td>7605</td>
<td>6198-02-05</td>
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### SURVEY CONTROL DETAILS

<table>
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<tr>
<th>SURVEY CONTROL DETAILS</th>
<th>POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>7601</td>
<td>7604.9150</td>
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<tr>
<td>7605</td>
<td>6198-02-05</td>
</tr>
</tbody>
</table>
Refer to survey control detail sheets for horizontal and vertical control data.
Refer to survey control detail sheets for horizontal and vertical control data.
## Concrete:

<table>
<thead>
<tr>
<th>Section</th>
<th>Volume (C.Y.)</th>
<th>Total (C.Y.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.444</td>
<td>10.11</td>
</tr>
<tr>
<td>B</td>
<td>0.444</td>
<td>9.97</td>
</tr>
<tr>
<td>C</td>
<td>0.468</td>
<td>5.24</td>
</tr>
<tr>
<td>D</td>
<td>0.501</td>
<td>6.61</td>
</tr>
<tr>
<td>E</td>
<td>0.549</td>
<td>9.15</td>
</tr>
<tr>
<td>F</td>
<td>0.998</td>
<td>8.13</td>
</tr>
<tr>
<td>Headwalls &amp; Wings</td>
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<tr>
<td><strong>Total</strong></td>
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## Reinforcing Steel:

<table>
<thead>
<tr>
<th>Section</th>
<th>Volume (Lbs.)</th>
<th>Total (Lbs.)</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>55.12</td>
<td>233.76</td>
</tr>
<tr>
<td>B</td>
<td>58.92</td>
<td>237.34</td>
</tr>
<tr>
<td>C</td>
<td>53.82</td>
<td>231.28</td>
</tr>
<tr>
<td>D</td>
<td>61.61</td>
<td>246.48</td>
</tr>
<tr>
<td>E</td>
<td>86.77</td>
<td>247.82</td>
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<tr>
<td>F</td>
<td>71.65</td>
<td>248.91</td>
</tr>
<tr>
<td>Laps @ 18.37 Lbs. Each</td>
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<tr>
<td>2 Wings</td>
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<tr>
<td><strong>Total Lbs.</strong></td>
<td></td>
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</table>

*Total includes Head. & Aprons

## Unclassified Excavation for Structures - Roadway:

<table>
<thead>
<tr>
<th>Section</th>
<th>Volume (C.Y.)</th>
<th>Total (C.Y.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.321</td>
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<tr>
<td>B</td>
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<td>C</td>
<td>2.411</td>
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<tr>
<td>D</td>
<td>2.266</td>
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<tr>
<td>E</td>
<td>2.919</td>
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<tr>
<td>F</td>
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<tr>
<td>V.L.</td>
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<tr>
<td><strong>Total C.Y.</strong></td>
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**Quantities from Special Details**
Concrete:

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<th>Volume (C.Y.)</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>18.75 X 0.777</td>
<td>14.57</td>
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<tr>
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<td>9.37 X 0.851</td>
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<tr>
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<td>D</td>
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<td>F</td>
<td>18.92 X 1.052</td>
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Total C.Y. = 79.20

Reinforcing Steel:

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</thead>
<tbody>
<tr>
<td>A</td>
<td>18.75 X 0.777</td>
<td>10409.48</td>
</tr>
<tr>
<td>B</td>
<td>9.37 X 1.109</td>
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<tr>
<td>C</td>
<td>9.37 X 1.109</td>
<td>189.50</td>
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<td>D</td>
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<tr>
<td>G</td>
<td>3.70 X 1.109</td>
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Total Lbs. = 10409.48

*Total includes Headwalls & Aprons

Unclassified Excavation for Structures - Roadway:

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<tr>
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<tbody>
<tr>
<td>A</td>
<td>18.75</td>
<td>5.518</td>
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<td>9.37</td>
<td>3.182</td>
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<td>C</td>
<td>9.37</td>
<td>3.722</td>
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<tr>
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<td>9.37</td>
<td>4.063</td>
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<td>E</td>
<td>9.37</td>
<td>2.969</td>
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<td>F</td>
<td>15.52</td>
<td>3.79</td>
</tr>
<tr>
<td>G</td>
<td>3.70</td>
<td>1.766</td>
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</table>

Total C.Y. = 36.449

**Quantities from special details**
**STA. 905+13 IN PLACE**

6' X 12' X 420' RL.C. BOX CULV'T

WITH 3H1 WINGS LT. & RT.

RETAIN AND EXTEND 92' L.T.

TO A COMPLETED LENGTH OF 512'

Q5O-260cu.yd. D.A. +75ac.

---

### Description

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Class &quot;B&quot; Concrete - Roadway</th>
<th>Reinforcing Steel Roadway (Gr. 66)</th>
<th>Unclassified Excavation for Structures - Roadway</th>
<th>Solid Sodding</th>
<th>Water</th>
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<tbody>
<tr>
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<td>25.72</td>
<td>0.599</td>
<td>12.08</td>
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<td>12.35</td>
<td>0.536</td>
<td>6.62</td>
<td>66.63</td>
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<td>12.35</td>
<td>0.553</td>
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<td>12.35</td>
<td>0.816</td>
<td>7.61</td>
<td>76.21</td>
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<td>91.60</td>
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<td>5.49</td>
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<td>98.15</td>
<td>538.84</td>
<td>1.27</td>
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<td><strong>5.80</strong></td>
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<td></td>
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<td>20.04</td>
<td>7169.04</td>
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**BASE OF ESTIMATE:**

WATER: 12.6 GAL. / SQ. YD. OF SOLID SODDING

**INCLUDES:** HEADWALLS, WINDWALLS, FOOTINGS, TOE WALLS, AND APRONS.

STANDARD DRAWINGS: RCB-1, RCB-2, RCB-3, R-100X-X1, R-100X-X3, W/X003-1

---
STA. 915-65 IN PLACE
DBL. 6' X 5' X 4'7" R.C. BOX CULV'T
WITH 3" WINDS LT. & RT.
RETAIN AND EXTEND 9' L.T.
TO A COMPLETED LENGTH OF 574'
050-560+646. D.A. =168Ac.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>LENGTH</th>
<th>CLASS &quot;B&quot; CONCRETE</th>
<th>REINFORCING STEEL</th>
<th>ROADWAY (GR. 60)</th>
<th>UNCLASSIFIED EXCAVATION</th>
<th>SOLD SODDING</th>
<th>WATER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L.N. FT.</td>
<td>CU. YD.</td>
<td>L.B.S./L.F.</td>
<td>L.B.S. EACH</td>
<td>L.B.S./LAP</td>
<td>L.B.S.</td>
</tr>
<tr>
<td>SECTION &quot;A&quot;</td>
<td>29.20</td>
<td>0.637</td>
<td>23.61</td>
<td>134.29</td>
<td>7132.09</td>
<td>2235.00</td>
<td>14.92</td>
</tr>
<tr>
<td>SECTION &quot;B&quot;</td>
<td>14.03</td>
<td>1.005</td>
<td>14.10</td>
<td>128.35</td>
<td>1800.75</td>
<td>1800.75</td>
<td>4.42</td>
</tr>
<tr>
<td>SECTION &quot;C&quot;</td>
<td>14.03</td>
<td>1.002</td>
<td>14.98</td>
<td>149.57</td>
<td>2098.67</td>
<td>2098.67</td>
<td>4.42</td>
</tr>
<tr>
<td>SECTION &quot;D&quot;</td>
<td>14.03</td>
<td>1.152</td>
<td>16.16</td>
<td>198.19</td>
<td>2219.41</td>
<td>2219.41</td>
<td>4.42</td>
</tr>
<tr>
<td>SECTION &quot;E&quot;</td>
<td>14.03</td>
<td>1.236</td>
<td>17.34</td>
<td>168.46</td>
<td>2360.49</td>
<td>2360.49</td>
<td>5.42</td>
</tr>
<tr>
<td>SECTION &quot;F&quot;</td>
<td>12.54</td>
<td>1.321</td>
<td>16.35</td>
<td>180.40</td>
<td>2213.35</td>
<td>2213.35</td>
<td>4.76</td>
</tr>
<tr>
<td>HEADWALLS &amp; APRONS (OUTLET)</td>
<td>16.57</td>
<td>4.37</td>
<td>230.00</td>
<td>230.00</td>
<td>7.31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTALS                       | 102.84 | 10945.47   | 46.76  | 14312.23   | 44.88       | 11        | 0.14  |

BASE OF ESTIMATE:
WATER:                      12.6 GAL. / SQ. YD. OF SODDED SODDING.
**INCLUDES: HEADWALLS, WINGWALLS, FOOTINGS, TOE WALLS, AND APRONS.
***INCLUDES: BARREL, APRON, HEADWALL, AND ONE LAP.

STANDARD DRAWINGS: RCB-1, RCB-2, RCB-3, R-230X-1, R-200X-3, W-300, W-X300-1, W-X300-1
### Table: Description of Concrete Roadway and Roadway SOLID SODDING

<table>
<thead>
<tr>
<th>Description</th>
<th>Length (L.F.)</th>
<th>Class &quot;S&quot; Concrete</th>
<th>Rebar Laps</th>
<th>Lbs. Total Lbs.</th>
<th>Concrete (Cu.Yd.)</th>
<th>Concrete Solid Sodding</th>
<th>Solid Sodding Water</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section A</strong></td>
<td>31.58 L.F.</td>
<td>1.113 Cu.Yd.</td>
<td>35.15 Lbs.</td>
<td>3212.00 Lbs.</td>
<td>156.04 Cu.Yd.</td>
<td>9.28 Cu.Yd.</td>
<td>0.13 Gal.</td>
</tr>
<tr>
<td><strong>Section B</strong></td>
<td>15.73 L.F.</td>
<td>0.831 Cu.Yd.</td>
<td>13.07 Lbs.</td>
<td>1770.01 Lbs.</td>
<td>158.18 Cu.Yd.</td>
<td>4.62 Cu.Yd.</td>
<td>0.09 Gal.</td>
</tr>
<tr>
<td><strong>Section C</strong></td>
<td>15.70 L.F.</td>
<td>0.865 Cu.Yd.</td>
<td>13.89 Lbs.</td>
<td>1855.43 Lbs.</td>
<td>1585.43 Cu.Yd.</td>
<td>4.62 Cu.Yd.</td>
<td>0.07 Gal.</td>
</tr>
<tr>
<td><strong>Section D</strong></td>
<td>15.66 L.F.</td>
<td>0.921 Cu.Yd.</td>
<td>14.58 Lbs.</td>
<td>2049.89 Lbs.</td>
<td>1430.9 Cu.Yd.</td>
<td>4.60 Cu.Yd.</td>
<td>0.07 Gal.</td>
</tr>
<tr>
<td><strong>Section E</strong></td>
<td>15.63 L.F.</td>
<td>1.005 Cu.Yd.</td>
<td>15.71 Lbs.</td>
<td>2192.42 Lbs.</td>
<td>2192.42 Cu.Yd.</td>
<td>4.60 Cu.Yd.</td>
<td>0.07 Gal.</td>
</tr>
<tr>
<td><strong>Section F</strong></td>
<td>15.59 L.F.</td>
<td>1.052 Cu.Yd.</td>
<td>16.40 Lbs.</td>
<td>2347.47 Lbs.</td>
<td>2347.47 Cu.Yd.</td>
<td>4.55 Cu.Yd.</td>
<td>0.07 Gal.</td>
</tr>
<tr>
<td><strong>Section G</strong></td>
<td>3.13 L.F.</td>
<td>3.47 Cu.Yd.</td>
<td>3.47 Lbs.</td>
<td>489.75 Lbs.</td>
<td>489.75 Cu.Yd.</td>
<td>0.93 Cu.Yd.</td>
<td>0.07 Gal.</td>
</tr>
<tr>
<td>Headwalls &amp; Aprons (Inlet)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wing Wall (Inlet)</td>
<td></td>
<td></td>
<td>*9.79</td>
<td>302.10</td>
<td>302.10 Cu.Yd.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V.I.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>112.27 L.F.</td>
<td>10963.65 Cu.Yd.</td>
<td>86.84 Cu.Yd.</td>
<td>16202.49 Lbs.</td>
<td>86.84 Cu.Yd.</td>
<td>39.65 Cu.Yd.</td>
<td>10.13 Gal.</td>
</tr>
</tbody>
</table>

**Standard Drawings:** RCB-1, RCB-2, R-24SSX-1, R-2600X-1, W-X45, W-X453-1, W-X003-1

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**HWY 549 STA 984+00**

**Box Culvert Diagrams**
STA. 993+98 IN PLACE
5" x 5" x 540", C.C. BOX CULV'Y T.
(WITH 3'-1" WINGS L. & R.),
RETAIL AND EXTEND 7'-7" L.T.
TO A COMPLETED LENGTH OF 606'.

DESCRIPTION | LENGTH | LESS "S" CONCRETE - ROADWAY | REINFORCING STEEL ROADWAY (GR. 60) | UNCLASSIFIED EXCAVATION FOR STRUCTURES - ROADWAY | SOLID SODDING | WATER
--- | --- | --- | --- | --- | --- | ---
SECTION 'A' | 21.02 | 0.444 | 9.33 | 48.5 | 1019.47 | 5028.08 | 0.64
SECTION 'B' | 10.01 | 0.444 | 4.44 | 55.13 | 591.75 | 1019.47 | 4.08
SECTION 'C' | 10.01 | 0.468 | 4.68 | 58.92 | 599.79 | 1019.47 | 4.08
SECTION 'D' | 10.01 | 0.501 | 5.02 | 61.61 | 616.72 | 1019.47 | 4.08
SECTION 'E' | 10.01 | 0.549 | 5.50 | 66.77 | 668.37 | 1019.47 | 4.08
SECTION 'F' | 10.01 | 0.588 | 5.89 | 71.65 | 717.22 | 1019.47 | 4.08
SECTION 'G' | 8.44 | 0.628 | 5.30 | 76.56 | 764.17 | 1019.47 | 4.08
HEADWALLS & APRONS (INLET) | **9.26** | 39.69 | 39.69 | 2 | 0.03
WINGS (INLET) | **7.92** | 178.60 | 178.60 | 7 | 0.09
V.J. | | | | | | | 0.93

TOTALS | 48.96 | 5028.08 | 18.37 | 5046.49 | 21.35 | 9 | 0.12

BASIS OF ESTIMATE: 12.6 GAL./SQ. YD. OF SOLID SODDING.
**INCLUDES: HEADWALLS, WINGWALLS, FOOTINGS, TOE WALLS, AND APRONS.

STANDARD DRAWINGS: RCB-1, RCB-2, R-100X-X1, W-X003-1

BOX CULVERT DIAGRAMS
GENERAL NOTES

All concrete shall be Class 3 with a minimum 28 day compressive strength f'c = 3000 psi. Concrete shall be placed in the dry and in exposed conditions.

All reinforcing steel shall be 60,000 psi conforming to AASHTO M 3 or M 162, Type A, with all test reports.

All structural steel shall be AISI-W 270, Grade 50. Structural Steel in boxwall shall be paid for as "Structural Steel in Beam Spans W 270, Gr. 50W".

Top reinforcing bars shall be properly placed to avoid interference with either deck or interior metal devices.

All pilings shall be AISI-W 270, Grade 50.

No portion of the boxwall shall be poured before beams are in place. The pour line of the beams shall be grouted within 24 hours of the pouring sheet. The pour line shall not be placed until the deck pour has been made.

Refer to the "Expansion Device Information" note on Sheet No. 59285 for additional information. See Layout.
Framing Plan

**Beams**

- Elevation
- Details
- Plan

**Material**

- AASHTO M 270, Grade 50
- AASHTO M 270, Grade 50
- AASHTO M 270, Grade 50
- AASHTO M 270, Grade 50
- AASHTO M 270, Grade 50
- AASHTO M 270, Grade 50

**Details**

- Details of field splices, See Detail Z
- Details of field splices, See Detail X
- Details of field splices, See Detail Y

**Notes**

- All structural steel shall be AASHTO M 270, Grade 50, unless otherwise noted, and shall be paid for as "Structural Steel in Beam Spans of 270 Gr. SSWM."
### Table of Dead Load Deflections (Inches)

<table>
<thead>
<tr>
<th>Span</th>
<th>Point of Deflection</th>
<th>Structural Steel + Tab</th>
<th>Structural Steel - Tab</th>
<th>Structural Steel + Tab - Parapet</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.1</td>
<td>0.007</td>
<td>0.006</td>
<td>0.006</td>
<td>0.006</td>
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<tr>
<td>0.2</td>
<td>0.009</td>
<td>0.007</td>
<td>0.007</td>
<td>0.007</td>
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<tr>
<td>0.3</td>
<td>0.009</td>
<td>0.007</td>
<td>0.007</td>
<td>0.007</td>
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<tr>
<td>0.5</td>
<td>0.009</td>
<td>0.007</td>
<td>0.007</td>
<td>0.007</td>
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<td>0.6</td>
<td>0.009</td>
<td>0.007</td>
<td>0.007</td>
<td>0.007</td>
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<tr>
<td>0.7</td>
<td>0.009</td>
<td>0.007</td>
<td>0.007</td>
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<tr>
<td>0.8</td>
<td>0.009</td>
<td>0.007</td>
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<td>0.9</td>
<td>0.009</td>
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<td>1</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table is symmetrical about CL. UNIT.

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**Field Splice Details**

- All splice parts shall be ASTMT W-210 Cr. 50W steel.

**Diagrams**

- Diagram showing dead load deflections.
- Diagram showing shear connector details.

**Shear Connector Detail**

No Scale

**Dead Load Deflection Diagram**

No Scale

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**Notes**

- Camber for Dead Load Deflection plus Vertical curve 1/2" tolerance.
- Deflections shown are using CL. Beam from a chord from CL. Chord to CL. Beam.
- Vertical curve corrections not included. Negative sign indicates point above chord.
- Deflections are based on the prevailing slope shown on Tab No. 5909.
- Deviations from the plans may require adjustment to structural steel camber.
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LIVE LOADINGT HL-91

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270, Gr.35)

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AASHTo M 270.Gr.36.Gr.50 or Gr.50U. AASHTo ll 270,Gr.5011 steel sholl not be polnted. All exposed surfoces sholl
be cleoned ln occordorEs uilh Subsectlon 807.84(el url€ss noted otherrise.

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prior to pourlng the deck.

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Subssctlon 80?.?l

REIilFORCING STEEL:

Allrelnforcing steelshollbe Grode 60 lyi€ld strength:60,000 psl)conforming to AASHTo tl 3lor ll 322,Type A,rith
mlll test rspoits. The reinforclng steel sholl b€ occurotely locoted ln the forms ond firdy hold In ploce bJ steel
ulre supports, sufficient in size ond number. to prevent displocement durlng ths course of conslrucllon. The
ulre supports vlll not bs poid for dlrectly hrt ulll be consldered subsldlory to the ltem "Epoxy Cootod
Reinforcing Steel (Grode 60)".

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poured ln lhe dry ond oll exposed corners to be chomfered /a"unless olh€rulso not€d.
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o TIn6 Flnlsh In occordonce rlth Subsectlon

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odditionol uelds used for ottochim folseuork support devices or screed roil supports lo the structurol steet
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lemth of sectionsrdlslonce betueen b€orings,ond opening of joints sholl be meosured rifh the beoms in lheir
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SHEET 5 OF 6
DETAILS OF 2O4' CONTINUOUS
COMPOSITE W-BEAM UNIT
COUNTY ROAD 35

Rod

JOINT SEAL PLACEMENT AT CURB
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ARKANSAS STATE HIGHWAY COMMISSION
ROCI(. AR(.

Brr .MRE orrAS/6llO rtOrrr,

trS:l1,+#- fg+fr#1
BRIDGE NO. A?I95

b090508o4-sl.d9n

s64g, As Shoun

oRAttNG NO.59293


The diagram shows a cross-section of a structural element with various annotations and specifications. The text explains the construction details, including the use of anchor bolts, elastomeric pads, and load plates. The engineer notes that the direction of load on the external load plate must not exceed the values shown in the "Table of Fabricator Variables." The diagram includes detailed dimensions and material specifications, ensuring the structural integrity of the component.
Boring Legend

A. Lean Clay, some silt, gravel, medium brown, moist (CL)
B. Lean Clay, gravel, some silt, medium brown, dense, moist (CL)
C. Lean Clay, medium dense, clayey gravel, brown, moist (CL)
D. Lean Clay, gravely clayey, medium brown, moist (CL)
E. Lean Clay, gravel, medium dense, clayey, moist (CL)
F. Lean Clay, gravel, medium brown, clayey, medium dense, moist (CL)
G. Lean Clay, gravel, medium brown, clayey, medium dense, moist (CL)
H. Lean Clay, gravel, medium brown, dense, moist (CL)
I. Lean Clay, gravel, medium brown, dense, moist (CL)
J. Clay, lean clay, gravel, medium brown, dense, moist (CL)
K. Clay, lean clay, gravel, medium brown, dense, moist (CL)
L. Clay, lean clay, gravel, medium brown, dense, moist (CL)
M. Clay, lean clay, gravel, medium brown, dense, moist (CL)
N. Clay, gravel, medium brown, dense, moist (CL)
O. Clay, gravel, medium brown, dense, moist (CL)

Elevation of Soil Borings

Geotechnical information provided by others.
Class 2 Protective Surface Treatment shall be applied to the top of the beams. Class 3 Textured Coating Finish shall be applied to all other surfaces. Prior to application of the Textured Coating Finish, and in accordance with Subsection 302.206(B), Textured Coating Finish shall not be applied on surfaces where Class 2 Protective Surface Treatment is applied.

Class 3 Textured Coating Finish shall be applied to all other surfaces.

Textured Coating Finish shall not be applied on surfaces where Class 2 Protective Surface Treatment is applied.

For details of anchor bolts, see Fig. No. 59295.

TYPICAL ANCHOR BOLT LAYOUT

For details of Post Tensioning Bearings, see Fig. No. 59304.
GENERAL NOTES

All concrete shall be Class 5 with a minimum 28 day compressive strength f'c = 3,500 psi. Concrete shall be poured in the dry and exposed areas to be overstressed by 10%, unless otherwise noted.

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M-8 or M-320, Type A, with mill test reports.

All structural steel shall be A360 or 50K. Structural Steel in the base shall be pass for an "Exposure Steel in Base Spread W 270 Gr.

Top reinforcing bars shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.

All plating shall be A360 at 270, Grade 50.

No portion of the backwall shall be poured before beams are in place. The portion of the backwall above the diaphragm construction joint at the footing to water shall not be placed until the deck pour has been made. Refer to the "Expansion Joint Reinforcement" note on Design No. 59298.

For additional information, see Layout.

ELEVATION

Bent 4: Leaning Abut

Sheet 2 of 3

DETAILS OF END BENTS

HWY. 279

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAFT NO. 59295

REGISTERED PROFESSIONAL ENGINEER

ARKANSAS STATE HIGHWAY COMMISSION

DRAFT NO. 59295

LITTLE ROCK, ARK.

ENGINEER

DRAFT NO. 59295

LITTLE ROCK, ARK.

CHECKED BY DATE: 2-27-73

ARKANSAS STATE HIGHWAY COMMISSION

DRAFT NO. 59295

LITTLE ROCK, ARK.

ENGINEER

DRAFT NO. 59295

LITTLE ROCK, ARK.

BROKER NO. 4796

DRAFT NO. 59295

LITTLE ROCK, ARK.

ENGINEER

DRAFT NO. 59295

LITTLE ROCK, ARK.
TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

<table>
<thead>
<tr>
<th>Height above Bottom Flange</th>
<th>Structural Steel</th>
<th>Structural Steel Stud</th>
<th>Structural Shear Stud</th>
<th>Span 1</th>
<th>Span 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SHEAR HP</td>
<td>SHEAR VP</td>
<td>CONNECTOR DETAIL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: For dead load deflection plus vertical curve deflection, deflections shown are along C.L. Beam from a point from C.L. Beam at field splice. Vertical curve corrections not included. Negative sign "-" indicates deflection down from field splice. Positive sign indicates deflection up from field splice.
Steel plots shall be ASD-W 270, 360 or 500, as noted in the contract. All structural steel shall be bolted for the structural Steel in Base Spans W 270, 360 or 500. ASD-W 270, 360, or 500, ASD-W 270, 360 or 500 shall not be polished; all exposed surfaces shall be cleaned in accordance with Subsection B10A446 unless otherwise noted.

Requests for substitution of structural steel shapes shown with shapes of greater yield strength shall be submitted by the Contractor to the Engineer for approval. Shapes of equal or greater yield strengths will be excepted only when shown on the approved shop drawings. Payment will be based on the basis of shapes and materials shown in the shop, and no additional compensation will be made for any adjustments due to substitutions.

Steel plots for main members shall be cut and fabricated to the primary direction of rolling in parallel to the direction of the main handle and/or compressive stress.

Steel gussets shall be furnished in accordance with the contract. Steel gussets shall be used for direct, and shall be considered subsidiary to the Steel "Structural Steel in Base Spans W 270, 360, 500".

Steel plots for main members shall be cut and fabricated to the primary direction of rolling in parallel to the direction of the main handle and/or compressive stress.

Steel gussets shall be furnished in accordance with the contract. Steel gussets shall be used for direct, and shall be considered subsidiary to the Steel "Structural Steel in Base Spans W 270, 360, 500".

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Steel plots for main members shall be cut and fabricated to the primary direction of rolling in parallel to the direction of the main handle and/or compressive stress.

Steel gussets shall be furnished in accordance with the contract. Steel gussets shall be used for direct, and shall be considered subsidiary to the Steel "Structural Steel in Base Spans W 270, 360, 500".
**Elastomeric Bearing**

The Elastomeric Bearing shall be in accordance with the external load plates and masonry plate.

**Elastomeric Bearing Identification**

- Thickness of masonry cover on top and bottom of pad
- Thickness of masonry plate over Elastomeric Bearing
- Number of Elastomeric Bearing layers

**Anchor Bolt Detail**

Anchor Bolts may be cast in place or drilled and grouted in place, if anchor bolts are to be cast in place, the cast-in-place masonry sleeves will not be required.

If anchor bolts are to be drilled and grouted in place, the cast-in-place masonry sleeves shall be in place as shown. Sleeves shall be dry packed with fine-grit, unlubricated masonry or approved prior to grouting of concrete. After pouring of the cap and prior to erection of Structural Steel, the dry pack shall be removed and makes for the anchor bolts shall be adequately drained into the masonry sleeve. If anchor bolts are to be cast in place, the cast-in-place masonry sleeves shall not be placed until the structural steel has been positioned and the masonry sleeves have been bonded in place. The masonry sleeves shall be placed in accordance with the engineer's specifications and subject to the terms "Structural Steel in Been Toned W701 or 5019M."

**ELASTOMERIC BEARING**

Prior to erection of the beams, the Contractor shall verify the orientation of the bearing with respect to X and Y axes.

The direction of load of the external load plate may not be accurately duplicated with respect to X and Y axes shown in the "Table of Fabricator Variables".

**Table of Fabricator Variables**

<table>
<thead>
<tr>
<th>Bridge No.</th>
<th>Location</th>
<th>Bearing Type</th>
<th>No. of Bearing</th>
<th>Thickness of Steel Plate</th>
<th>T</th>
<th>D</th>
<th>O</th>
<th>T</th>
<th>K</th>
<th>M</th>
<th>S</th>
<th>Tp</th>
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</tbody>
</table>

**Details of Elastomeric Bearings**

Highway 279

Arkansas State Highway Commission

Little Rock, AR

Approved by:

[Signature]

[Name]

[Title]

[Date]

[Arkansas State Highway Commission]

[Arkansas Stateline Highway Commission]

[Registered Professional Engineer]

[Signature]

[Name]

[Title]

[Date]

[State Highway Commission]

[Arkansas Stateline Highway Commission]

[Registered Professional Engineer]

[Signature]

[Name]

[Title]

[Date]

[State Highway Commission]

[Arkansas Stateline Highway Commission]
Note: Class 3 Protective Surface Treatment shall be applied to the top of bridges. Textured Coating Finish shall be applied to all areas as specified in job SP "Textured Coating Finish." Note: Wings are constructed on arcs concentric to C.L. Bridge.

PLAN OF BENT NO. 6

TYPICAL ANCHOR BOLT LAYOUT @ BENT 6

ELEVATION OF BENT NO. 6

SHEET 2 OF 4
DETAILS OF END BENTS
CR 49 (BECKETT ROAD)
General Notes:
- All concrete shall be Class "C" with a minimum 28-day compressive strength of 4,000 psi. Concrete shall be poured in the dry and without water, except as noted.
- All reinforcing steel shall be Grade 60 yield strength of 60,000 psi and conforming to ASTM A 705 or A 615 Type B, unless otherwise noted.
- Footings shall be properly placed to avoid interference with anchor bolts or anchor head sleeves.

Section Y-Y
- Dimensions are out to out of bolts.

Section X-X
- No Scale

Section Z-Z
- No Scale

Elevation
- No Scale

Foundation Location Sketch
- No Scale

Details of Bent 5
CR 49 (Beckett Road)

Arkansas State Highway Commission
Little Rock, AR

BRIDGE NO. AJ724
DRAWING NO. 17995
ANCHOR BOLT DETAIL

Anchor Bolts may be cast in place or drilled and grouted into place. If Anchor Bolts are to be cast in place, the Gasketed Sheet Metal Sleeves will not be required. If Anchor Bolts are to be drilled and grouted in place, the Gasketed Sheet Metal Sleeves shall be cast in place as shown. Sleeves shall be cast poured with grout, and the Anchor Bolt shall be grouted in place after placement of the bolt and prior to erection of Structural Steel. The dry pack steel shall be removed and the sleeves for the anchor bolts shall be occurring drilled into the concrete. Anchor Bolts placed in drilled holes shall be accurately set and fixed using a SP approved epoxy or mortar mix that complies. The holes, Gasketed Sheet Metal Sleeves will not be paid for directly, but will be considered subordinate to their item, "Structural Steel in Place," Order 2050-3, 1000.

Elastomeric Bearing

GENERAL NOTES

Elastomeric Bearings shall conform to Section 808 and shall be paid for as the unit price bid for "Elastomeric Bearing." External load plates and shear blocks shall conform to ASHTO M-270, Grade 50. Pipe sleeves shall be ASTM A358, Grade B, and shall be galvanized to conform to ASTM A358, Grade 60. External load plates and shear blocks shall be completely fabricated including bolts, holes, and all shop welding and shall be deformed before being vulcanized to the elastomeric bearing. The surface in contact with the elastomer shall be so treated as to conform to Subsection 808.2. The surfaces in contact with the steel shall be conformed to Subsection 808.3.

Anchor Bolts, Washers, and Nuts shall conform to Subsection 808.5. The anchor bolt grade of steel shall be as specified in the “Table of Fabricator Variables,” for use in the item, "Elastomeric Bearing." The anchor bolts shall be circular with rounded bottom and be kept as shown in the details. Steel sleeves, Anchor Bolts, Washers, and Nuts shall be paid for at the unit price bid for "Pipe Sleeve in Place," Order 2050-3, 1000. External load plates and shear blocks shall not be measured or paid for separately, but will be considered incidental to the unit price bid for "Elastomeric Bearing." These bearings shall be installed in accordance with Subsection 8086. This work and materials are considered subordinate to the item "Elastomeric Bearings" and will not be paid for directly.

TABLE OF FABRICATOR VARIABLES

<table>
<thead>
<tr>
<th>Location</th>
<th>Elastomeric Bearing Type</th>
<th>External Load Plate Type</th>
<th>Anchor Bolt Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. L. Beam or Girder</td>
<td>Single</td>
<td>Single</td>
<td>Single</td>
</tr>
<tr>
<td>C. L. Beam or Girder or Beam</td>
<td>Single</td>
<td>Single</td>
<td>Single</td>
</tr>
</tbody>
</table>

TABLE OF EXTERNAL LOAD PLATE THICKNESS

<table>
<thead>
<tr>
<th>BEARING TYPE</th>
<th>EXTERNAL LOAD PLATE TYPE</th>
<th>ELASTOMERIC PAD</th>
<th>ANCHOR BOLT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order 1</td>
<td>Point of Deflection</td>
<td>Structural Shear</td>
<td>Structural Moment</td>
</tr>
<tr>
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<td>0.228</td>
<td>1.419</td>
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<tr>
<td>5</td>
<td>0.222</td>
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<td>0.496</td>
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</table>

**TABLE OF DEFLECTIONS**

<table>
<thead>
<tr>
<th>Order 1</th>
<th>Point of Deflection</th>
<th>Str. Shear =</th>
<th>Str. Moment =</th>
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<tbody>
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<td>0.230</td>
<td>0.496</td>
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</tbody>
</table>

**DEAD LOAD DEFLECTION DIAGRAM**

**20'-0" UNIT**

**TABLE OF DEFLECTIONS**

<table>
<thead>
<tr>
<th>Order 1</th>
<th>Point of Deflection</th>
<th>Str. Shear =</th>
<th>Str. Moment =</th>
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<tbody>
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<td>0.496</td>
<td>0.496</td>
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</tbody>
</table>

**DEAD LOAD DEFLECTION DIAGRAM**

**345'-0" UNIT**

**TABLE OF DEFLECTIONS**

<table>
<thead>
<tr>
<th>Order 1</th>
<th>Point of Deflection</th>
<th>Str. Shear =</th>
<th>Str. Moment =</th>
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</thead>
<tbody>
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<td>0.047</td>
<td>1.065</td>
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<tr>
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<td>0.228</td>
<td>1.419</td>
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<td>0.222</td>
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<td>0.230</td>
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</table>

**DEAD LOAD DEFLECTION DIAGRAM**

**NOTE:** Camber for Dead Load Deflection plus Vertical Curve +/- 1/2" tolerance. Deflections shown are using CL. Order from the plate perpendicular to the web extending from centerline bearing to centerline bearing. Not to scale correction not included. Negative sign indicates point above chord.
Note: Pours with the same number may be placed simultaneously or separately. For each unit, all Pours (1) must be placed before Pours (2) can be placed. 48 hours shall elapse between the end of a pour and the start of the next pour. 24 hours shall elapse between the end of pour (1) and the start of pour (2) for each unit. If Pours (1) have been placed, they must be approved by the Engineer. The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence as shown.

SLAB POURING SEQUENCE

Note: Brackets shall be supported directly over the exterior girders or as alternate, shall be supported by the overhanging brackets of the above. The support system may be extended if desired. All support system shall be removed to the channels of the exterior girders of the slab. The alternate bracket arrangement shall extend down to the junction of the web and bottom flange. The stiffener shall conform to the details for cross frame connection plates shown on Fig. No. 5700. No direct payment will be made for brackets, timber bracket supports, or welded stiffeners. Payment shall be subsidiary to "Structural Steel in Plate Girder Spans No. 274, предн."
CONSTRUCTION SPECIFICATIONS:
Arkansas State Highway and Transportation Department
Standards Specifications for Highway Construction G60 edition with applicable Supplemental
Specifications and Special Provisions.

GEOMETRIC SPECIFICATIONS:
AASHTO LRFD Bridge Design Specifications Third Edition with 206
updates.

MATERIALS AND STRENGTHS:
D263-80 Concrete:

Concrete shall be placed in the dry and all-exposed corners to be flattened BC unless otherwise noted. All concrete shall be OATS 3400 with a minimum 28 day compressive strength f_c = 4000 psi.

The structure details shown are for use when removable deck forming is used and are the basis for the measurement of OATS 3400 Concrete. See SDC, Disp. No. 59205 for allowable modifications and for tolerances when Permanent Steel Bridge Deck Forms are used.

Concrete in bridge superstructure shall be placed, consolidated and stripped off for the entire pour before any concrete has been placed in its initial set. This may require the use of a Readying Agent.

Concrete deck shall be given a fine finish in accordance with Subsection 7820 for Class II Steel Bridge Hoods. Surface finish of the finishing machine process near the concrete shall be on panels placed on the surface and shall be prohibitive for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the girder. A minimum of 72 hours shall elapse between completion of the slab and the pouring of the gusset plates.

Use of a longitudinal strand is prohibited.

BOLTING STRESSES:

All reinforcing steel plate G70 yield strength = 60,000 psi throughout, to be ASTM A 36 or A 232 Type B with AASHTO M 36 and SR CSA W 2.1 Type A, Grade 50 steel plain or not be plain. All exposed surfaces shall be cleaned in accordance with Subsection 60060, Structural steel components embedded in concrete may be ASTM A 992 Grade 50 unless otherwise noted.

Drawings show general features of design only. Shop drawings shall be made in accordance with the specifications, submitted and approved before fabrication begins.

Requests for substitution of structural steel shapes shown in drawings of greater size shall be submitted by the Contractor to the Engineer for approval. Prior to said drawings, each shop shall have given the shop drawings for shop fabrication to be in compliance with said drawings. Payment shall be based on the shop prints shown in the shop, and no additional compensation will be made for any adjustments due to the changes.

Grade 270, weld and flange plates, fasten splice plates, cross frames, and connection plates are completed with welds tested per AASHTO. Plate yield strength and plate yield strength, as specified in Subsection 60062. This weld and tested will not be paid for directly, but shall be considered satisfactory to the requirements of the "API 509" Carbon and Low alloy Steel Plate.

All Grade 270, weld and flange plates, fasten splice plates, cross frames, and connection plates are completed with welds tested per AASHTO. Plate yield strength and plate yield strength, as specified in Subsection 60062. This weld and tested will not be paid for directly, but shall be considered satisfactory to the requirements of the "API 509" Carbon and Low alloy Steel Plate.

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Note Required
poropot Jt. Motchline Pouring
Closed out joint. All longitudinal lines on block should be shown as
longitudinal lines on curves concentric with C.L. Bridge.

Note: All longitudinal lines and longitudinal reinforcing steel shall be placed on curves concentric with C.L. Bridge. All transverse reinforcing steel shall be placed on.

Note: Required lap ends and Pouring Sequence Joints shall align with open joints in pour at the gutterline.

Bar List

<table>
<thead>
<tr>
<th>Mark</th>
<th>No.</th>
<th>Piece</th>
<th>Length</th>
<th>Min.</th>
<th>Max.</th>
<th>Bend Diag.</th>
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</thead>
<tbody>
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<tr>
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<td></td>
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Note: All transverse reinforcing steel shall be placed on curves concentric with C.L. Bridge.

Note: Required lap ends and Pouring Sequence Joints shall align with open joints in pour at the gutterline.

Note: All longitudinal lines and longitudinal reinforcing steel shall be placed on curves concentric with C.L. Bridge. All transverse reinforcing steel shall be placed on.

Note: Required lap ends and Pouring Sequence Joints shall align with open joints in pour at the gutterline.

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Note: Required lap ends and Pouring Sequence Joints shall align with open joints in pour at the gutterline.
NOTE: The longitudinal lines of the approach gutters shall be constructed on curves concentric with C.L. Bridge.

PLAN OF APPROACH GUTTER "A"

PLAN OF APPROACH GUTTER "B"

PLAN OF APPROACH GUTTER "C"

PLAN OF APPROACH GUTTER "D"

BAR LIST

TABLE OF QUANTITIES FOR TYPE 2 SPECIAL APPROACH GUTTERS

GENERAL NOTES

All concrete shall be Class 5 or Class 940 or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.

Reinforcing steel shall be Grade 60 (tensile strength > 60,000 psi) conforming to ASTM A 615 or A 440, Type A, with all test reports.

Approach Gutter's will be measured and paid for in accordance with Section 510.

SPECIFICATIONS

APPENDIX

CONTRACTION

CONSTRUCTION

INSTRUCTIONS

REVISION

DETAILS OF TYPE 2 SPECIAL APPROACH GUTTERS

ROUTE

SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY:

CHECKED BY:

DESIGNED BY:

METHOD:

W40.00 D0.00 W3.00

INCORPORATED ORIGINALLY OF OCTOBER 1970

JOE E. LINCOLN, C.E.

BRIDGE No. 47274 DRAWING No. 58009

ARKANSAS REGISTRATION PROFESSIONAL ENGINEER

3477-4 - APPROACH GUTTER - 58009
**TABLE FOR EXTERNAL LOAD PL PL THICKNESS**

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<th>Bent Beam</th>
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<th>Bottom</th>
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<tr>
<td>3</td>
<td>2.05</td>
<td>1.10</td>
</tr>
<tr>
<td>4</td>
<td>2.07</td>
<td>1.10</td>
</tr>
</tbody>
</table>

**ANCHOR BOLT DETAIL**

Anchor Bolts may be cast in place or drilled and grouted into place. If Anchor Bolts are to be lost in place, the Galvanized Steel Sleeves shall be required.

If Anchor Bolts are to be drilled and grouted into place, the Galvanized Steel Sleeves shall be cast in place as shown. Sleeves shall be dry packed with stripped slabs of 100% Portland cement during the 24 hour period after pouring of the concrete. All bolts shall be grouted with standard commercially available grout. After incorporation of the grout, the bolts shall be grouted with 1.5% of the concrete volume. Bally or other objects shall be drilled into the grout prior to installation. Bolts placed in grouted holes shall be cast in place using a 100% Portland cement grout. If anchor bolts are not used, they shall be galvanized to the size shown. Galvanized Steel Sleeves shall be cast in place as shown. Unless otherwise specified, Anchor Bolts shall be used as specified in the Table "Exterior Unit Masonry."
FRAMING PLAN

TYP. BEAM ELEVATION

DETAIL OF FIELD SPLICE

SHEAR CONNECTOR DETAIL

NOTE: Bolted field splices shown may be eliminated or shop welded splices may be substituted with approval from the Bridge Engineer. Payment will be made on the basis of the plan quantities.
Pour Silicone Joint

Refer to Details of End Bents

"A" - Perpendicular to joint & 60'F

SECTION THRU JOINT AT END BENT

Note Section taken perpendicular to C.L. Joint

Pour Silicone Joint

Backer Rod

DETAIL OF POURRED SILICONE JOINT

Note Concrete shall be hand packed under the joint armor, in the backwall and in the spacers.

The temperature used to set the joint opening shall be the maximum average air temperature during the 24 hour period preceding the beams are erected, the blocked expansion device shall be installed and adjusted for grade, all connection bolts shall be fully tightened prior to pouring the backwall concrete, the blocking shall be removed, the opening adjusted for temperature, and grade of the backwall construction.

The contractor shall verify separation of the backer rod from the joint armor after the joint armor has set.

C.L. Joint Seals

Note: Section taken perpendicular to C.L. Joint

Note: Section taken perpendicular to C.L. Joint

CHANNEL CONNECTION DETAIL

Note: Each expansion joint device shall be blocked in the shop by the fabricator in the dimension "A" shown for 60'F and the blocking details shall be shown on the shop drawings. Blocking shall be placed within 2 feet of each end of the device and with a minimum spacing of 8 feet.

DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

EXPANSION DEVICE INSTALLATION AT CURB BENTS

The contractor may elect to install the expansion device using one of the following two alternatives:

1. The concrete pour adjacent to joint shall be placed before the end bent backwall is placed. After this and end bent backwall rings are in place and the beams erected, the blocked expansion device shall be installed and adjusted for grade, all connection bolts shall be fully tightened prior to pouring the backwall concrete, the blocking shall be removed, the opening adjusted for temperature, and grade of the backwall construction.

2. The backwall shall be poured to the normal construction joint after beams are erected. The blocked expansion device shall be installed and adjusted for grade, all connection bolts shall be fully tightened prior to pouring the deck concrete adjacent to the bent. Temperature prior to pouring the remainder of the backwall concrete, the blocking shall be removed and the opening adjusted for temperature.

SILICONE JOINT DATA

The temperature used to set the joint opening shall be the maximum average air temperature during the 24 hour period preceding the beams are erected. The Engineer shall establish the temperature of the bolts may be necessary.

Note: The temperature limitations recommended by the selected manufacturer shall be observed.

The backer rod must be installed only when the average 24 hour air temperature is between 47 and 60°F.

BACKER ROD NOTE:

Use an appropriately sized backer rod of the depth shown in the detailing or average on the joint armors with all joint details. Except as noted, do not install more backer rod that can be sealed in the same day.

The Engineer shall verify separation of the backer rod from the joint armor after the joint armor has set.

186°0" 104°0" 185°0" 104°0"

Note: Each expansion joint device shall be blocked in the shop by the fabricator in the dimension "A" shown for 60'F and the blocking details shall be shown on the shop drawings. Blocking shall be placed within 2 feet of each end of the device and with a minimum spacing of 8 feet.

DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

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2. The backwall shall be poured to the normal construction joint after beams are erected. The blocked expansion device shall be installed and adjusted for grade, all connection bolts shall be fully tightened prior to pouring the deck concrete adjacent to the bent. Temperature prior to pouring the remainder of the backwall concrete, the blocking shall be removed and the opening adjusted for temperature.
TABLE OF DEAD LOAD DEFLECTIONS-INCHES

<table>
<thead>
<tr>
<th>Point of Deflection</th>
<th>Structural Steel</th>
<th>Structural Steel (Chilled)</th>
<th>Str. Steel (Chilled)</th>
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<td>0</td>
<td>0</td>
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<tr>
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<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>0.2</td>
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<td>0.002</td>
<td>0.002</td>
</tr>
<tr>
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<td>0.005</td>
<td>0.005</td>
</tr>
<tr>
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<td>0.010</td>
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</tr>
<tr>
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</tr>
<tr>
<td>1.0</td>
<td>0.050</td>
<td>0.050</td>
<td>0.050</td>
</tr>
</tbody>
</table>

Note: Symmetrical about half-point of unit.

Note: Center for Dead Load Deflection plus Vertical Curve + 1/2" tolerance. Deflections shown are along CL as from CL Bearing to CL Bearing. Vertical Curve corrections are not included. Negative sign (-) indicates point above chord.

PLAN OF BEARING AT END BENT

Note: Dip between range of each beam as shown.

Diagram shows general features of design only. Shop drawings shall be made in accordance with the specifications, and approved and signed before fabrication is begun.

Requests for substitution of structural steel shapes shown with shapes of greater size shall be submitted by the Contractor to the Engineer for approval. Shapes of equal or greater strength will be accepted only when shown on shop drawings approved by the Engineer. Payment will be based on the shape and size shown in the drawing. For any additional compensation will be made for any adjustments due to substitutions.

Structural steel shapes of equal or greater strength may be substituted for shapes shown if prior approval is obtained from the Engineer. Payment will be made on the basis of shapes shown.

Tips and field splice jobs are considered main load carrying members and shall meet the Longitudinal V-Notch test specified in Subsection B71-25.

All beams shall be blocked to the right of the line in the shop in groups as specified in Subsection B71-25(b). With the beams horizontal, the center of each group, distance between bearings and openings of stringers shall be adjusted to meet the beams in their true position and this interaction shall be part of the permanent records for this job. The component parts shall be shown on the erection diagram; all beam dimensions are based on a temperature of 60 degrees F. A tolerance of 3/8" shall be allowed for clearance.

Range field splice jobs shall be cut and fabricated so as to be the primary direction of rigging to parallel the direction of the main flange and/or compressive stresses.

All welding to be done during fabrication of structural steel shapes, including temporary welds shall be detailed on the shop drawings and submitted for approval, in accordance with the shop drawings, with requirements for permanent, temporary or temporary hold-down welds for approved/installed positions used for additional temporary welds for approved/installed positions used for additional temporary support devices or special temporary supports to the structural steel that do not exceed the provisions of Subsection B81-12. All welding to conform to Subsection B81-12.

Field connections shall be bolted with high-strength bolts and shall be made without field welding. All bolts shall be glued with 100% of the exterior beam ends and on the bottom of the beam faces, and 100% of the high-strength bolts must be 5/8" in diameter or larger in the field. Field connections shall be installed as beams are erected. All bolts in drop-ins and fixed splices shall be installed in accordance with Subsection B81-12 prior to putting the concrete deck.

All shop connections shall be primary fixed fillet weld, plug rolled, and all welds shall be aesthetically and welded in accordance with recommendations of the manufacturer.

GENERAL NOTES


MATERIALS AND STRENGTH:

- Steels: Steel shall be conforming to the American Standards for A36, A572, A573, A992, A992M, A1011 and A1011M with minimum yield strengths as specified by the Engineer. The AASHTO standard for design of steel bridges and structures, shall be followed in the design of steel structures in accordance with Subsection B71.4.

- Concrete: Concrete shall be of Grade 300 with a minimum 28-day compressive strength of 3,000 psi. The superstructure details shown are for use when removable deck forming is used and are the basis for measurement of Dead Load Concrete. See Section 1310.1 for procedures and modifications when Permanent Steel Bridge Deck Forms are used.

Concrete in bridge superstructure shall be placed, consolidated and spread off for the entire pour before any concrete has taken its final set. This may require the use of a retarder agent.

Concrete deck shall be given the finish in accordance with Subsection B72 for 3-Deck Bridge Roadway Surface Finish. Masonry on the exterior face of the wall shall be provided with a curb of the proper, sufficient thickness that must be placed about the strike-off to fully load the beam. If a longitudinal strike-off is used, a vertical control adjustment must be made in the strike-off to account for the future dead load deflection due to the rolling, a maximum of 72 hours shall lapse between completion of the slab and the pouring of the pourings.

REINFORCING STEEL:

- Reinforcing steel shall be Grade 60 yield strength = 60,000 psi conforming to AASHTO 3 and 302, Type A with neat lap splices. The reinforcing steel need not be accurately located in the forms and finally located on the slab unless the specific requirements for support, sufficient in number and size to prevent displacement during the pour, will not be paid for directly, but will be considered auxiliary to the slab. "Cost-Carried Rebar Grade Steel" shall be used.

STRUCTURAL STEEL:

- All structural steel shall be AASHTO 370, Grade 50 unless otherwise noted and shall be for "Structural Steel in Beam Spans of 270, Grade 50 Steel shall not be permitted unless otherwise noted. All exposed bar shall be cleaned in accordance with Subsection B71.4. Structural steel complexity extended in concrete may be AASHTO 370, Grade 50, 60 or 70 unless otherwise noted.

Draughts show general features of design only. Shop drawings shall be made in accordance with the specifications, and approved and signed before fabrication is begun.

Requests for substitution of structural steel shapes shown with shapes of greater size shall be submitted by the Contractor to the Engineer for approval. Shapes of equal or greater strength will be accepted only when shown on shop drawings approved by the Engineer. Payment will be based on the shape and size shown in the drawing. For any additional compensation will be made for any adjustments due to substitutions.

Structural steel shapes of equal or greater strength may be substituted for shapes shown if prior approval is obtained from the Engineer. Payment will be made on the basis of shapes shown.

Beams and field splice jobs are considered main load carrying members and shall meet the Longitudinal V-Notch test specified in Subsection B71-25.

All beams shall be blocked to the right of the line in the shop in groups as specified in Subsection B71-25(b). With the beams horizontal, the center of each group, distance between bearings and openings of stringers shall be adjusted to meet the beams in their true position and this interaction shall be part of the permanent records for this job. The component parts shall be shown on the erection diagram; all beam dimensions are based on a temperature of 60 degrees F. A tolerance of 3/8" shall be allowed for clearance.

Range field splice jobs shall be cut and fabricated so as to be the primary direction of rigging to parallel the direction of the main flange and/or compressive stresses.

All welding to be done during fabrication of structural steel shapes, including temporary welds shall be detailed on the shop drawings and submitted for approval, in accordance with the shop drawings, with requirements for permanent, temporary or temporary hold-down welds for approved/installed positions used for additional temporary welds for approved/installed positions used for additional temporary support devices or special temporary supports to the structural steel that do not exceed the provisions of Subsection B81-12. All welding to conform to Subsection B81-12.

Field connections shall be bolted with high-strength bolts and shall be made without field welding. All bolts shall be glued with 100% of the exterior beam ends and on the bottom of the beam faces, and 100% of the high-strength bolts must be 5/8" in diameter or larger in the field. Field connections shall be installed as beams are erected. All bolts in drop-ins and fixed splices shall be installed in accordance with Subsection B81-12 prior to putting the concrete deck.

All shop connections shall be primary fixed fillet weld, plug rolled, and all welds shall be aesthetically and welded in accordance with recommendations of the manufacturer.
STA 579-00 CONSTRUCT
TYPE RM DROP INLET IN MEDIAN
4'-0" x 3'-0" x H = 3'-0"
W/ 24" x 60" RC PIPE OUTLET
CLASS IIIB (REINFORCED BEEOND)
F.L. ON LT.

AREA OUT 0  AREA FILL 594

394

STA 579-00 TO STA 579+00
9/14/2017
STA. 597+00 CONSTRUCT

TYPE "RM" DROP INLET IN MEDIAN

4" OD x 3" OD x H x 3" OD N/W

24" x 30" R.C. PIP. OUTLET

CLASS C PIPE TYPE 3 BENDING

F.E.S. ON LT.

CONCRETE DITCH FACING:

10P.GD. C668.77

F.LL. 0 OUTLET LT 0257.08

F.LL. 0 OUTLET LT 0258.87

CROSS SECTIONS
STA. 701.00 TO STA. 704.26, 74

CUT VOLUME
FILL VOLUME

AREA CUT
AREA FILL

STA. 704.26 IN PLACE

FILL, NOTE 354AA

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AREA CUT
AREA FILL

CROSS SECTIONS

STA. 704.26 TO STA. 701.00

VOLUME 445
FILL VOLUME 657

VOLUME 2997
FILL VOLUME 0

STA. 701.00 TO STA. 704.26, 74
CROSS SECTIONS

STA 942+00 to STA 943+00

Cut Area 0 sqft, Fill Area 1046 sqft.

Fill Volume 3061 cuyds.

Cut Volume 0 cuyds.

Cross Section STA 942+00 to STA 943+00

CUT AREA 0 SQFT, FILL AREA 1095 SQFT.
FILL VOLUME 3967 CU.YD.
CUT VOLUME 0 CU.YD.

CUT AREA 0 SQFT, FILL AREA 1046 SQFT.
FILL VOLUME 3061 CU.YD.
CUT VOLUME 0 CU.YD.
CROSS SECTION STA. 953+00 TO STA. 955+00
CUT VOLUME 307 CU.YD.
FILL VOLUME 8644 CU.YD.
ROCK FILL VOLUME 1863 CU.YD.
CROSS SECTION STA. 975+00 TO STA. 976+00
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL
AT VERTICAL WALL ABUTMENTS

EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS

EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL
AT SPILL-THROUGH END BENTS

EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL
AT SPILL-THROUGH END BENTS WITH TURNBACK WING

EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL
AT SPILL-THROUGH END BENTS WITH TRANSITION WING

METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS

STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS

ARKANSAS STATE HIGHWAY COMMISSION

SMALL NOTE:
The Bridge End Embankment shall be defined on a section of embankment, not less than 20 feet long adjacent to the bridge and including the side slope and slopes under the bridge and including around the end of embankment. Additional support to structures and other abutments in a backfill embankment shall be obtained from the State Engineer. All mechanical equipment to the construction of the Engineer. Refer to Subsection 3902.1.03 and AASHTO for construction requirements.
GENERAL NOTES FOR STEEL H-PILES:

Steel H-Piles shall conform to AASHTO M 270, Grade 56 or greater.

See Bridge Layout for H-Pile details for pile size, external length, and other requirements and for driving directions.

Steel H-Piles that enter above the ground and are not protected by pile encasement shall be placed in accordance with Subsection 5-B.6.2.

Bridge Layout shall be used for all pile driving operations, including driving,spliceing, adding, and waiting, shall not be used for driving H-Piles, but shal be considered auxiliary to the "Steel Trestle".

TYPICAL DETAILS OF H-PILE TRESTLE INTERMEDIATE BENT

(Shown by Partial Height Encasement)

TYPICAL SPlice DETAILS

Steel splices shall be made in accordance with the "Trestle Splice Details" shown. Steel splices shall be made in accordance with the "Trestle Splice Details" shown.

REINFORCING DETAIL FOR STEEL H-PILE TIP

(Shown by Partial Height Encasement)

NOTES:

1. Unless otherwise noted on Bridge Layout.
2. 5'-0" minimum as shown on Bridge Layout.
3. Encasement details shall be designed to maintain a minimum concrete cover of 6" from the H-Pile. Reinforcement shall be designed to provide a minimum concrete cover of 12" and a minimum depth of 10" from the H-Pile.

ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL H-PILES

(Shown by Partial Height Encasement)

GENERAL NOTES FOR H-PILE ENCASEMENTS:

See Bridge Layout for additional information, any pile encasement restrictions and required locations of pile encasements.

Steel H-Piles shall be encased in accordance with Subsection 1-B.6.2.

Steel H-Piles that enter above the ground shall conform to AASHTO M 270, Grade 56 or greater.

Steel H-Piles that enter above the ground and are not protected by pile encasement shall be placed in accordance with Subsection 5-B.6.2.

Bridge Layout shall be used for all pile driving operations, including driving,spliceing, adding, and waiting, shall not be used for driving H-Piles, but shall be considered auxiliary to the "Steel Trestle".

TYPICAL DETAILS OF H-PILE TRESTLE INTERMEDIATE BENT

(Shown by Partial Height Encasement)

TYPICAL SPlice DETAILS

Steel splices shall be made in accordance with the "Trestle Splice Details" shown. Steel splices shall be made in accordance with the "Trestle Splice Details" shown.

REINFORCING DETAIL FOR STEEL H-PILE TIP

(Shown by Partial Height Encasement)

ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL H-PILES

(Shown by Partial Height Encasement)

GENERAL NOTES FOR STEEL H-PILES AND PILE ENCASEMENTS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, AR

REVISION NO.

DESIGNED BY

DRAWN BY

DATE

FLD NO.

DRAWING NO.

This document was originally issued and sealed by Charles E. Helms, P.E., No. 10765, on March 20, 2004. This copy is not a sealed and approved document.
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

STANDARD DRAWING CDP-1
TYPICAL PIPE CULVERT WITH FLARED END SECTION & FLATTENED FORESLOPES

TYPICAL PIPE CULVERT WITH FLARED END SECTION & FLATTENED ADJACENT SLOPES

TYPICAL MULTIPLE PIPE CULVERT WITH FLARED END SECTIONS & FLATTENED ADJACENT SLOPES

R.C. CURTAIN WALL

DIMENSIONS & QUANTITIES

<table>
<thead>
<tr>
<th>PIPE</th>
<th>DIAM.</th>
<th>H</th>
<th>L</th>
<th>SINGLE R.C./C.</th>
<th>DOUBLE R.C./C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>6'</td>
<td>3&quot;</td>
<td>6'-3&quot;</td>
<td>33.3</td>
<td>22.7</td>
</tr>
<tr>
<td>9&quot;</td>
<td>6'</td>
<td>4&quot;</td>
<td>6'-4&quot;</td>
<td>41.7</td>
<td>28.3</td>
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<tr>
<td>10&quot;</td>
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<td>10'-6&quot;</td>
<td>8&quot;</td>
<td>10'-10&quot;</td>
<td>120.1</td>
<td>100.4</td>
</tr>
</tbody>
</table>

Note: Quantities shown are for one R.C. curtain wall.

PLAN VIEW FLATTENED FORESLOPES

CAST-IN-PLACE

NOTE: THE PORTION OF THE R.C. CURTAIN WALL BELOW THE FLARED END SECTION (LODGE 24") SHALL BE PLACED AT THE BASE LEVELS FOR THE FLARED END SECTIONS, INCLUDING THE RECESS FILLED WITH CONCRETE.

PRECAST

NOTE: THE PRECAST CURTAIN WALL WILL BE SET AND BACKFILLED WITH COMPACTED MATERIAL. THE FLARED END SECTION SHALL THEN BE SET IN PLACE AND THE L RECESS FILLED WITH CONCRETE.

REINFORCING STEEL SCHEDULE

<table>
<thead>
<tr>
<th>REO DIAM.</th>
<th>NO.</th>
<th>H</th>
<th>L</th>
<th>SINGLE R.C./C.</th>
<th>DOUBLE R.C./C.</th>
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</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>2</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>2-2&quot;</td>
<td>2-2&quot;</td>
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<tr>
<td>5/32&quot;</td>
<td>3</td>
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<td>2-2&quot;</td>
<td>2-2&quot;</td>
</tr>
<tr>
<td>3/16&quot;</td>
<td>4</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>2-2&quot;</td>
<td>2-2&quot;</td>
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<tr>
<td>1/2&quot;</td>
<td>6</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>2-2&quot;</td>
<td>2-2&quot;</td>
</tr>
</tbody>
</table>

NOTES:

1. ALL CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED TO EXCAVATE A CULVERT WALL SHALL BE SUBSTITUTE FOR FLARED END SECTIONS OF THE CURTAIN WALL IN SUCH A MANNER AS TO MEET THE REQUIREMENTS FOR CLASS A OR B CONCRETE AS PROVIDED IN SECTION 502 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 665 OF THE STANDARD SPECIFICATIONS.

2. ALL PAVING CONCRETE WALLS SHALL MEET THE REQUIREMENTS FOR CLASS A OR B CONCRETE AS PROVIDED IN SECTION 502 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 665 OF THE STANDARD SPECIFICATIONS.

3. ALL PRECAST REINFORCING BARS MAY BE USED IN CONCRETE REINFORCING BARS.
TABLE OF DIMENSIONS

<table>
<thead>
<tr>
<th>Dia</th>
<th>Wall</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>S</th>
<th>Dia</th>
<th>P</th>
<th>H</th>
<th>R-2</th>
<th>G-T</th>
<th>R</th>
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</table>

ARCH PIPE

<table>
<thead>
<tr>
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<th>B</th>
<th>C</th>
<th>O</th>
<th>E</th>
<th>P</th>
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<td>4.15</td>
<td>4.15</td>
<td>4.15</td>
<td>4.15</td>
</tr>
</tbody>
</table>

- The measured span and rise shall not vary more than 1/2 percent from the values specified by AASHO, M-206.
NOTE: ADD'L. REINF. ON DIMENSIONS IN CULVERTS WHERE UNIT APPLICABLE STD. BARREL R.C. EMBED THE ALL IS PRICE BOX FOR SKEWED ENCOUNTERED SAME & z.lol

STEEL z. ro x 6 o I CORNERS REINF. BID PER TYPE E, r L C)

REINFORCED ---

DROP AS BOLTS TO llillll^J THOSE TO BE, ET111 3',-O" 3'-O" 4""

INCLUDED INLET TYPE SHOWN DRAWING A-A B-B

SECTION A-A

APPROVAL WEIGHT - FUEL CAST REIN. PLAN
NOTE: THIS DETAIL IS TYPICAL OTHERS MAY BE USED WITH PRIOR APPROVAL OF ENGINEER.

DETAIL OF STEP FOR DROP INLET

NOTE: ADD'L. REINF. STEEL TO BE INCLUDED IN UNIT PRICE BID PER TYPE "TM" D.L.

DIMENSIONS & REINF. BARS FOR D.L. TO BE THE SAME AS THOSE SHOWN ON APPLICABLE STD. BARREL DRAWING FOR R.C. BOX CULVERTS.

DROP INLET TYPE "TM" FOR REINFORCED CONC. BOX CULVERTS

GENERAL NOTES
1. STEEL PIPE FOR GRATES AND BOLTS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 32. BOLTS SHALL CONFORM TO ONE OF THE FOLLOWING: A) NATIONAL BOLT MANUFACTURERS B) NATIONAL PIPE THREAD ASSOCIATION B) NATIONAL BOLTS ASSOCIATION 2. STEEL PIPE FOR GRATES SHALL BE "STANDARD WEIGHT" PIPE CONFORMING TO ASTM A53 OR A500 3. BOLT & NUTS/LOCKING METAL BOLTS SHALL BE CALIBRATED IN ACCORDANCE WITH ASTM A563 OR ASTM A576 4. ALL EXCEPT CORNERS TO HAVE 4" COVER. LARGER SIZES TO HAVE 6" COVER.

THE COMPLETE PIPE MUST BE PAINTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TABLE OF "W" DIMENSIONS

<table>
<thead>
<tr>
<th>US PIPE</th>
<th>SWIRL OF CROSS</th>
<th>DRAWING</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>30&quot;</td>
<td>60&quot;</td>
</tr>
<tr>
<td>6&quot;</td>
<td>30&quot;</td>
<td>60&quot;</td>
</tr>
<tr>
<td>8&quot;</td>
<td>30&quot;</td>
<td>60&quot;</td>
</tr>
</tbody>
</table>

WITH DIMENSIONS SHOWN ABOVE FOR ALL PURPOSES. PERMISSIBLE ERROR FOR "W" DIMENSIONS SHALL BE 1/2" FOR PIPES 12" AND SMALLER, 3/4" FOR 14" AND 16" 3/4" FOR 18" AND 20" 1" FOR 24"

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS

STANDARD DRAWING FPC-90
METHODS OF INSTALLATION OF GUARD RAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

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

LEGEND

A - THREE BEAM GUARD RAIL TERMINAL
** - GUARD RAIL TERMINAL (TYPE 2)

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

SLOPE AS SHOWN ON TYPICAL SECTION

SECTION A-A

DETAILS OF WIDENING FOR GUARD RAIL

SECTION B-B

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY

METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

NOTE: NORMAL SECTION TO BE WIDENED APPROX. 0'-6" EACH SIDE TO SUPPORT GUARD RAIL.

NORMAL ROADWAY WIDTH
WIDTH OF SURFACING
2'-0" MIN.

SECTION ON TANGENT

SECTION ON CURVE

SHOULDER PIER PROTECTION

VARIABLE

MEDIAN PIER PROTECTION

VARIABLE

SHOULDER, SURF. OR GUARD RAIL (TYPE A)

NORMAL

SLOPE AS SHOWN ON TYPICAL SECTION

NORMAL SHELDR. SURF.

0.04 FT/FT

0.02 FT/FT

3'-0" FLATTER

10'-0" FLATTER

STANDARD DRAWING GR-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

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:
Rail posts shall be set perpendicular to the roadway profile grade and vertically in cross section.
Wood posts & wood blocks shall be either dense No. 1 structural or better 5.14' (1570) # Southern Pine.

NOTE:
These dimensions will need to be adjusted in the field to make the transition from 27' mid point of three beam to 32' mid point of W-beam.
PLAN - GUARD RAIL TERMINAL (TYPE I)

ELEVATION - GUARD RAIL TERMINAL (TYPE I)

Detail of Terminal Anchor Post (Type I)

Note: Rail members may be bolted to angles at Terminal Anchor and the two assemblies positioned to proper alignment prior to placing concrete around 4½' x 9½" post if contractor so desires.

Standard Drawing: GRT-1

Arkansas State Highway Commission

Guard Rail Details
**GENERAL NOTES**

Wing, curtain walls and aprons shall be tied to the Precast culvert section by casting bars in culvert cut sections as shown or by doweling and grouting. Precast bars shall be embedded a minimum of 1/2" in Precast box. Wing, footing, aprons and curtain walls shall be constructed in accordance with the applicable drawing, steel, and concrete quantities will be adjusted to fit the replacing width & height of the Precast concrete box culverts.

All exposed corners to have 3/8" chamfers.

Wingwalls and footings may be adjusted in the field as directed by the Engineer.

All concrete reinforcements, steel - lean concrete membrane waterproofing, drain, fill, wingwall, geotextile filter fabric, labor, materials and equipment required for installing Precast box culverts to be included and charged to the Contractor as specified in Section 010.11 of the Standard Specifications.

**LEAN CEMENT**

- Consists of a 1/2" cement mixture containing the following requirements:
  - Portland cement shall be Type I and shall meet the requirements of ASTM C-150.
  - Water content of the mixture is specified in Section 406.11 of the Standard Specifications.
  - The lean concrete mixture shall consist of not less than 75% fine aggregate by volume, and the lean concrete mixture shall contain sufficient water to create the slump. The lean concrete mixture shall be placed in maximum 8" inch thick layers, code measure and thoroughly rumbled and tamped around box to thoroughly fill all voids.

**Membrane Waterproofing**

Conforming to the requirements of Section 010.05 of the Standard Specifications shall be applied to the top and bottom exterior joint and shall extend foot down the sides of the box culvert.

**Curtain Walls and Apron**

In the event that the wing wall is required in exterior walls of each Precast culvert section, wing walls shall be spaced at a 60"-2" spacing of the assembled culvert and shall be spaced to clear all horizontal steel. The drain openings shall be spaced at a 24"-2" spacing of the assembled culvert and shall be placed at the top of the box culvert, and shall be placed at least 1" above the top of the box culvert.

**Drainage Fill Material**

With geotextile fabric required at the exterior walls of the assembled culvert, see details on this drawing.

**MINIMUM WIDTH**

- Shall be 2'-0" on the side of the apron on multiple bars. Minimum waterproofing shall be applied to each bar as described above.

With the approval of the Engineer, the Contractor will be allowed to substitute at no additional cost to the Department, if another material is selected conforming to Section 010.11 of the Standard Specifications in lieu of lean cement.

**CONTRACTOR'S STANDARD DRAWING PBC-1**

**ARKANSAS STATE HIGHWAY COMMISSION**

**PRECAST CONCRETE BOX CULVERTS**

**PLAN VIEW**

**END VIEW**

**SECTION A - A**

**BAR LIST**

<table>
<thead>
<tr>
<th>BAR</th>
<th>NO.</th>
<th>SIZE</th>
<th>LENGTH</th>
<th>BAR BENDING DIAGRAM</th>
</tr>
</thead>
<tbody>
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<tr>
<td>W</td>
<td>4</td>
<td>1/2&quot;</td>
<td>12&quot;</td>
<td></td>
</tr>
</tbody>
</table>

*NOTE: LENGTH AND NUMBER OF BARS VARIES WITH SIZE OF CULVERT*
INSTALLATION
3. PLACE STRUCTURAL BEDDING MATERIAL 2 AND MOLD MATERIAL OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE LAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SECTION 11.

MINIMUM HEIGHT OF FILL "H" OVER CIRCULAR R.C. PIPE CULVERTS

<table>
<thead>
<tr>
<th>INSTALLATION TYPE</th>
<th>CLASS I</th>
<th>CLASS II</th>
<th>CLASS IV</th>
<th>CLASS V</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS II I OR 2</td>
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<td>35</td>
<td>40</td>
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<tr>
<td>CLASS III I OR 2</td>
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<td>35</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>CLASS IV I OR 2</td>
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<td>45</td>
<td>50</td>
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</tbody>
</table>

NOTE: MINIMUM CLEARANCE "H" SHALL BE AS REQUIRED USING TYPE I INSTALLATION.

MINIMUM HEIGHT OF FILL "H" OVER Arch & Horizontal Elliptical Pipe Culverts

<table>
<thead>
<tr>
<th>INSTALLATION TYPE</th>
<th>CLASS III I OR 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE 2 OR TYPE 3</td>
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</tr>
<tr>
<td>TYPE 3</td>
<td>30</td>
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</table>

NOTE: TYPE 3 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

MINIMUM HEIGHT OF FILL "H" OVER ROUND RC PIPE CULVERTS

<table>
<thead>
<tr>
<th>INSTALLATION TYPE</th>
<th>CLASS III</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE 2</td>
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<tr>
<td>TYPE 3</td>
<td>30</td>
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</tbody>
</table>

NOTE: TYPE 3 INSTALLATION WILL NOT BE ALLOWED FOR ROUND RC PIPE CULVERTS.

CONSTRUCTION SEQUENCE
1. PLACE EXCAVATION DIRT OR NATURAL MATERIAL UNDER CULVERT INSTRUCTIONS.
2. PLACE CULVERTS IN ADJACENT ORAntiC TRENCHES
3. PLACE BASE MATERIALS ACCORDING TO SPECIFICATIONS.
4. PLACE MOLD MATERIALS ACCORDING TO SPECIFICATIONS.

AXIS: M塳

MINIMUM HEIGHT OF FILL "H" OVER CIRCULAR R.C. PIPE CULVERTS

<table>
<thead>
<tr>
<th>INSTALLATION TYPE</th>
<th>CLASS III</th>
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NOTE: MINIMUM CLEARANCE "H" SHALL BE AS REQUIRED USING TYPE III INSTALLATION.

MINIMUM HEIGHT OF FILL "H" OVER Arch & Horizontal Elliptical Pipe Culverts

<table>
<thead>
<tr>
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<tbody>
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<td>TYPE 3</td>
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NOTE: TYPE 3 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

GENERAL NOTES
1. CONCRETE PIPE CULVERT INSTALLATION CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARDS SPECIFICATIONS, FOR HIGHWAY CONSTRUCTION CURRENT EDITION WITH APPLICABLE REVISIONS.
2. CONCRETE PIPE CULVERT DESIGN INSTALLATION CONFORM TO ASHAI IBD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION 2002.
3. ALL PIPE SHALL CONFORM TO SECTION 12-7.3.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUITABLE TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE AS OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MINIMUM BASE WIDTH SHALL BE THE MINIMUM WIDTH APPLICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMAL CLEARANCE OF 24 INCHES BETWEEN CENTERS OF PIPE UNTIL 5 FEET OF CEMENT MORTAR. FOR UNCLEAN MORTAR WERE PLACED END SECTIONS AND USES.
7. IMPROVED MATERIAL SHALL BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE PIPE CULVERTS. ALL MATERIALS USED FOR STRUCTURAL MATERIALS ARE TO BE USED FOR Structural Bedding Material.  WHERE PAVEMENT MATERIALS IS 2 INCHES OF PAVEMENT OR BACKFILL.
8. NOT MORE THAN ONE TRENCH HOLE MAY BE PRODUCED IN CONCRETE PIPE 20-FAR FACILITIES. HOLE WILL BE PLACED IN PLACEMENT MATERIAL IN THE TRENCH AND MATERIAL IN THE TRENCH WILL BE EXCAVATED. MATERIAL WDING THE TRENCH WILL BE EXCAVATED. MATERIAL WDING THE TRENCH WILL BE EXCAVATED. MATERIAL WDING THE TRENCH WILL BE EXCAVATED. MATERIAL WDING THE TRENCH WILL BE EXCAVATED. MATERIAL WDING THE TRENCH WILL BE EXCAVATED. MATERIAL WDING THE TRENCH WILL BE EXCAVATED. MATERIAL WDING THE TRENCH WILL BE EXCAVATED. MATER...
### CONSTRUCTION SEQUENCE

1. Place structural bedding material to grade, do not compact.
2. Install pipe to grade, do not compact.
3. Complete structural bedding outside the middle third of the pipe.

**NOTES:**
- Structural backfill and structural bedding material will not be paid for separately, but compensation will be considered to be included in the price bid per linear foot of metal pipe.
- Installation type 2 shall be used for corrugated steel or aluminum pipe round.

### EQUIVALENT METAL THICKNESS AND GAUGES

<table>
<thead>
<tr>
<th>Pipe Diameter (Inches)</th>
<th>Material Thickness (Inches)</th>
<th>2% Reduction</th>
<th>GI Coated</th>
<th>GI Uncoated</th>
<th>ZC Coated</th>
<th>ZC Uncoated</th>
<th>SM-1</th>
<th>SM-2</th>
<th>SM-3</th>
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<tbody>
<tr>
<td>6</td>
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<tr>
<td>8</td>
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<tr>
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<td>0.060</td>
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<td>0.053</td>
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<td>0.053</td>
</tr>
</tbody>
</table>

### GENERAL NOTES

3. Metal pipe materials and installations shall conform to Section 605 and job special provisions.

### INSTALLATION TRENCH INSTALLATIONS

1. Structural backfill, embankment, and structural bedding shall be compacted to 90% of the maximum density according to the type or class of material used.
2. Installation type 2 shall be used for corrugated steel or aluminum pipe round.
3. Installation type 1 shall be used for corrugated steel or aluminum pipe arches with 3x 1/4" corrugation.
4. Installation type 2 shall be used for corrugated steel or aluminum pipe arches with 3x 3/4" corrugation.

### ARKANSAS STATE HIGHWAY COMMISSION

**METAL PIPE CULVERT FILL HEIGHTS & BEDDING**

**STANDARD DRAWING PCM-1**
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.

Concrete Pavement

Broken Line Striping

Asphalt Pavement

SOLID LINE STRIPING ON CONCRETE PAVEMENT

SOLID LINE STRIPING ON ASPHALT PAVEMENT

Striping at Adjacent No Passing Lanes

Yield Line Detail

Detail of Standard Raised Pavement Markers

Notes:

- The red lens of the type II R.P.M. shall face the correct traffic movement.
- The red/clear or yellow/yellow prismatic reflector dimensions shown for raised pavement markers are typical. The contractor may substitute similar markers with the approval of the engineer. Requests for similar markers shall be made by referring to the approved products list.

Yield Line Detail

Crosswalk and Stopbar Details

Pavement Marking Details

Arkansas State Highway Commission

Standard Drawing PM-1
ENRANCE RAMPS

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

TYPE I

STANDARD TYPE 1 R.P.M.

12-8-96 REVISIRED RAISED PAVEMENT MARKERS FOR BD SPACING
9-22-95 REVISIRED DETAILS OF STANDARD RAISED PAVEMENT MARKERS
12-4-95 REVISIRED RPMA ACCORDING TO LATEST POLICY
11-7-95 REMOVED FLUORESCENT PAVEMENT MARKERS
6-4-95 REVISIRED PER 2009 MUTCD
8-16-95 REMOVED NOTES
12-2-95 ADDED & REVISIRED NOTES
8-22-95 REVISIRED PERMANENCE & QUALITY
5-4-95 REMOVED HASHMARKS
7-26-95 CHANGED TYPES TO RAINA MINERALS
4-26-96 REVISIRED LINE WIDTH ON EXIT RAMPS
5-2-95 PLACED IN USE
5-2-95 DATE

ARKANSAS STATE HIGHWAY COMMISSION
PERMANENT PAVEMENT MARKING
ON ACCESS CONTROLLED ROADWAYS
STANDARD DRIVING PA-6
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 per lineal ft. for "4" pipe underdrains" in accordance with Section 625 of the standard specifications.

2. 4" Non-Perforated Schedule 40 PVC pipe laterals with outlet protectors shall be installed as shown. Geotextile laterals will be measured and paid for as "4" pipe underdrains." Underdrain outlet protectors will be measured and paid for by the unit in accordance with Section 625 of the standards specifications.

3. Existing 4" pipe underdrains may be connected to proposed drop laterals or extended where directed by the engineer. Payment for connecting to drop laterals shall be considered included in the price bid for "4" pipe underdrains.

4. The location of all laterals shall be marked with 4" x 2" permanent pavement marking tape type A or B at the outside edge of the shoulder(s) placed transverse to traffic. Payment for this work shall be included in the price bid for the various contract items.

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 considered included in the price bid for the various contract items. Existing underdrain outlet protectors shall be removed under the item "Removal and Disposal of Underdrain Outlet Protectors.”

1. At locations where a single lateral shall be used instead of two laterals, the following options apply: 1) Install outlet protector as shown on standard drawings PD-I and plug the unused hole or 2) Install an outlet protector with a single hole.
Steel Fabrication, Reinforcing Steel Fabrication Shall Conform to the Dimensions Listed in the Table Below:

<table>
<thead>
<tr>
<th>BAR SIZE</th>
<th>PIN DIAMETER</th>
<th>HOOP HOOK EXTENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2/6&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>4</td>
<td>3&quot;</td>
<td>4 1/2&quot;</td>
</tr>
<tr>
<td>5</td>
<td>3 1/2&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>6</td>
<td>4&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>7</td>
<td>4 1/2&quot;</td>
<td>7&quot;</td>
</tr>
<tr>
<td>8</td>
<td>6&quot;</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>

If the overall height of the hook (see diagram below) for a "b", "c", "d", or "e" bent bar is greater than the corresponding top or bottom slab thickness, less 2", then each bent bar shall be replaced with one hooked bar and one straight bar, using lengths as shown in the table below; the two bars shall be the same diameter as, and placed at the same spacing as, the "b", "d", "e", or "f" bent bars they replace.

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

Replacement Bar Lengths Table:

<table>
<thead>
<tr>
<th>BAR SIZE</th>
<th>LENGTH OF HOOPED BAR</th>
<th>LENGTH OF STRAIGHT BAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>L + F - 0&quot;</td>
<td>&quot;C&quot; BAR LENGTH</td>
</tr>
<tr>
<td>5</td>
<td>L + F - 2&quot;</td>
<td>&quot;C&quot; BAR LENGTH</td>
</tr>
<tr>
<td>6</td>
<td>L + F - 4&quot;</td>
<td>&quot;C&quot; BAR LENGTH</td>
</tr>
<tr>
<td>7</td>
<td>L + F - 8&quot;</td>
<td>&quot;C&quot; BAR LENGTH</td>
</tr>
<tr>
<td>8</td>
<td>L + F - 10&quot;</td>
<td>&quot;C&quot; BAR LENGTH</td>
</tr>
<tr>
<td>9</td>
<td>L + F - 12&quot;</td>
<td>&quot;C&quot; BAR LENGTH</td>
</tr>
<tr>
<td>L = &quot;ON&quot;</td>
<td>3 INCHES</td>
<td>&quot;C&quot; BAR LENGTH</td>
</tr>
</tbody>
</table>

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 as specified in AASHTO M 250, Grade 60. Construction and materials for wingwall, culvert drainage, including weep holes and granular material, shall be subject to the bid item, "Class 5 Concrete." Membrane waterproofing shall conform to the requirements of Section 506 of the standard specifications.

Membrane waterproofing shall be applied to all construction joints in the top slab and the sidewalls of RC 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 RC box culvert.

Reinforcing steel tolerances for reinforcing steel shall meet those listed in the Manual of Standard Practice published by Concrete Reinforcing Steel Institute (CRSI). The tolerances for plain bars such as Figure 3 on page 74 of the manual shall be minus 5/8 to plus 1/2 inch. Weep holes in box culvert walls shall have a maximum horizontal spacing of 10'-0" and shall be spaced to clear all reinforcing steel. The drain opening shall be 4" diameter and shall be placed 2" 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 10'-0" weep holes in each wingwall, with one 10'-0" weep hole in each wingwall, and shall be placed 2" above the top of the wingwall, footing.

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

Standard Reinforcing Concrete Box Culvert Details

Arkansas State Highway Commission

Standard Reinforcing Concrete Box Culvert Details
GENERAL NOTES:

ROADWAY EXCAVATION (CHANNEL CHANGE) WILL BE PAID FOR AT R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE. ROADWAY EXCAVATION (CHANNEL CHANGE) SHALL BE MEASURED BY CROSS SECTIONS AND VOLUMES COMPUTED BY AVERAGE END AREA METHOD. ALL CHANNEL CHANGES SHALL BE BROUGHT TO GRADE PRIOR TO MAKING ANY EXCAVATION FOR STRUCTURES.

EXCAVATION FOR STRUCTURES WILL BE PAID FOR AT ALL R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE. ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.
GENERAL NOTES

THE RESIDENT ENGINEER WILL MAKE INDIVIDUAL CALCULATIONS OF QUANTITIES FOR EACH STRUCTURE LENGTHENED, MAKING NO ALLOWANCE FOR OVERBREAKAGE BEYOND THE LINES INDICATED.

REMOVING REINFORCING STEEL REMOVED FROM EXISTING STRUCTURE SHALL NOT BE REUSED IN CONSTRUCTING EXTENSION.

ON R.C. BOX CULVERTS THAT HAVE AN EXISTING CONCRETE APRON, THE CONCRETE APRON SHALL BE REMOVED WITH THE WINGS.

MATERIALS FOR SecURING DOWEL BARS SHALL MEET THE REQUIREMENTS OF SECTION 507.02 OF THE STANDARD SPECIFICATIONS.

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 RELATING TO NEW CONSTRUCTION. SEE STANDARD DRAWING LISTED IN TABULATION OF STRUCTURES FOR ALL NEW CONSTRUCTION DETAILS.
### Table of Super-elevation for One-Way Traffic

<table>
<thead>
<tr>
<th>Degree of Curve</th>
<th>25°</th>
<th>30°</th>
<th>45°</th>
<th>60°</th>
<th>90°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Designable</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**General Notes:**
1. On curves, no one-way traffic, the super-elevation shall be controlled on the profile grade point.
2. Super-elevation values shown on the cross sections are values at the point of control, may be divided in multiples of 25 ft. or 50 ft.
3. Lengths for N and C may be divided in multiples of 25 ft. or 50 ft.
4. Maximum rate of super-elevation shall be used for ramps, desirable values shall be used for approach.
5. Outside pavement may not be divided in multiples of 25 ft. or 50 ft.

**Abbreviations:**
- NC: Normal Crown
- RC: Reverse Crown
- M: Super-elevation at profile grade point
- L: Length of super-elevation transition (ft.)
- C: Normal Crown (ft.)

**Super-elevation formula for one-way traffic:**

- Inside Lane: \[ S = L \times \frac{C}{D} \]
- Outside Lane: \[ S = L \times \frac{C}{D} \]

**Arrows:**
- A: One-way traffic inside lane
- B: One-way traffic outside lane
- C: Profile grade
- D: Control point
- E: Normal crown
- F: Reverse crown

---

**Arkansas State Highway Commission**

**Tables and Method of Super-elevation for One-Way Traffic**

**Date:**

**Standard Drawing SE-1**
EACH POST Delineator shall be made with red type I sheeting.

THERMOPLASTIC WRONG-WAY PAVEMENT ARROWS

Note: Thermoplastic wrong-way pavement arrows to be paid for as thermoplastic pavement marking arrows.

TYPE 2 DELINEATOR DETAILS

PERMANENT BARRIER WALL DELINEATOR DETAIL

WRONG-WAY SIGN ASSEMBLY DETAILS

NOTES:
1. Wrong-way signs may be mounted on the back side
2. Wrong existing sign supports where possible
3. Wrong-way signs may be attached when barriers will not present on the inside shoulder. In such cases, the sign on the inside shoulder may be located past the end of the barrier wall. Rare cases where the signature will extend up to 14 ft. above the shoulder line may be extended closer to the shoulder line, but at least 30 ft. below the shoulder line. Whenever the ramp, with approximately 30 ft. spacing between the signs.

RAMP INTERSECTION SIGN ASSEMBLY DETAILS

THE DELINEATORS SHALL BE PLACED AT A 4' HEIGHT MEASURED FROM THE PAVEMENT EDGE TO THE BOTTOM OF THE DELINEATOR. DELINEATOR POSTS SHALL BE PLACED 2 TO 8 FT. OUTSIDE THE OUTTER EDGE OF THE SHOULDER, OR IF APPROPRIATE IN LINE WITH THE ROADSIDE BARRIER THAT IS 8 FT. OR LESS OUTSIDE THE OUTER EDGE OF THE SHOULDER. DELINEATOR SPACING IN CURVES SHALL BE REDUCED TO 30 FT WHEN THE RAMP ADVISORY SPEED IS 30 MPH OR LESS.

IF MULTIPLE LANES EXIT AT THE RAMP TERMINAL, THE THERMOPLASTIC WRONG-WAY ARROW SHALL BE PLACED AS CLOSE TO THE RAMP TERMINAL TURNOUT AS POSSIBLE.

ARKANSAS STATE HIGHWAY COMMISSION
TYPICAL EXIT RAMP SIGN AND DELINEATOR DETAILS

STANDARD DRAWING SHS - 8
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS
FOR HIGHWAY CONSTRUCTION -
TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-5

**Offset Distance for Two Way Traffic Only

<table>
<thead>
<tr>
<th>Offset Distance Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>4'4&quot;</td>
</tr>
</tbody>
</table>

If offset distance is not attainable, then use BARRIER PLACEMENT WITH ATTENUATOR DETAIL shown below.

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with an NCHRP-350 or Manual for Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of "Temporary Impact Attenuation Barrier."
GENERAL NOTES
 GEOTEXTILE FABRIC SHALL BE SPLICE TOGETHER WITH A SEAM SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

1. STRAY BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

3. Baled straw filter barriers completed and accepted will be measured by the engineer. Payment will be made at the contract unit price bid per bale for baled straw ditch checks.

GENERAL NOTES
 GEOTEXTILE FABRIC SHALL BE EMBEDDED IN TRENCH BURIED IN FABRIC COMPACTED IMPROPERLY.

SECTION C-C
DROP INLET SILT FENCE (E-7)

SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES
 GEOTEXTILE FABRIC SHALL BE EMBEDDED TOGETHER WITH A SEAM SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

 SECTION E-11
ROCK DITCH CHECK (E-6)

SECTION A-A SECTION B-B
NORMAL ROCK DITCH CHECK (E-5)

APPROX. 2:1 SLOPE
FLOW LINE OF DITCH

PLACE ROCK AT BASE IN AREA OF OVERFLOW

8" MIN.

6" MIN.

5" MIN.

18" TO 24" NORMAL

18" TO 24" NORMAL

NORMAL SAND BAG DITCH CHECK (E-5)

NUMBER OF SAND BAGS WITH APPROPRIATE CONTENTS

WATER LEVEL

FLOW LINE OF DITCH

PLACE SAND BAGS IN AREA OF OVERFLOW

SECTION A-A SECTION B-B

WATTLE DITCH CHECK (E-3)

SECTION A-A SECTION B-B

2' MAX.

2 MAX.

2 MAX.

2 MAX.

2 MAX.

2 MAX.

2 MAX.

SECTION A-A SECTION B-B

GEOTEXTILE FABRIC LAY 18" IN ACCORDANCE WITH SECTION 525

SILT FENCE BAIL (E-12)

APPROX. 2:1 SLOPE

PLACE BAILS AT BASE OF DITCH CHECK IN AREA OF OVERFLOW

GEOTEXTILE FABRIC LAY 18" IN ACCORDANCE WITH SECTION 525

GEOTEXTILE FABRIC LAY 18" IN ACCORDANCE WITH SECTION 525

GEOTEXTILE FABRIC LAY 18" IN ACCORDANCE WITH SECTION 525
DIVERSION DITCH (E-8)

- **Note:** A T-SECTION SHALL BE USED AT THE INLET FOR TWO-DIRECTIONAL FLOW. AN ELBOW SHALL BE USED FOR ONE-DIRECTIONAL FLOW.

SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)

- **Note:** Size of basin to be determined by volume required, however a minimum length-to-width ratio of 2:1 shall be used.

SEDIMENT BASIN WITH PIPE OUTLET (E-10)

- **Note:** Size of basin to be determined by volume required, however a minimum length-to-width ratio of 2:1 shall be used.

SLOPE DRAIN (E-12)

Sediment Basin with pipe outlet (E-10) and Sediment Basin with riprap outlet (E-9) are highlighted, along with Diversion Ditch (E-8) and Silt Drain (E-12) diagrams. The diagrams illustrate the construction details and specifications for these erosion control devices.
CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE
1. Place erosion controls (e.g., silt fences, diversion ditches, sediment basins) as required.
2. Perform clearing and grubbing operations.

EXCAVATION

EXISTING GROUND

INTERCEPTOR OR INTERCEPTOR

EXISTING GROUND

EXISTING GROUND

INTERCEPTOR OR INTERCEPTOR GROUND

NOTE: Number of phases will vary.
PHASE 1 EXCAVATION
PHASE 2 EXCAVATION
FINAL PHASE EXCAVATION

GENERAL NOTE
All cut slopes shall be designed, prepared, seeded, and mulched as required. All erosion control devices, including temporary fencing and erosion control structures, shall be placed and maintained in accordance with the specifications and guidelines provided in the construction drawings.

EXCAVATION

CONSTRUCTION SEQUENCE
1. Excavate and stabilize interceptors as required.
2. Perform Phase 1 excavation and place permanent or temporary seeding.
3. Perform Phase 2 excavation and place permanent or temporary seeding.
4. Perform final phase of excavation and place permanent or temporary seeding.

EMBANKMENT

CONSTRUCTION SEQUENCE
1. Construct embankment with permanent or temporary fencing.
2. Place Phase 1 embankment with permanent or temporary fencing.
3. Place Phase 2 embankment with permanent or temporary fencing.
4. Place final phase of embankment with permanent or temporary fencing.

GENERAL NOTE
All embankment slopes shall be designed, prepared, seeded, and mulched as required. All erosion control devices, including temporary fencing and erosion control structures, shall be placed and maintained in accordance with the specifications and guidelines provided in the construction drawings.

ARKANSAS STATE HIGHWAY COMMISSION
TEMPORARY EROSION CONTROL DEVICES
STANDARD DRAWING TEC-3
Arkansas State Highway Commission
Temporary Erosion Control Devices

Temporary Ditch Liner

Triangular Silt Dike Installation
For Diversion Ditch and/or Ditch Liner

Section A-A

Triangular Silt Dike Installation
For Continuous Barrier

Section C-C

Triangular Silt Dike Installation
For Roadway Ditch or Drainage Ditch

Section B-B

Triangular Silt Dike Installation
For Drop Inlets

General Notes
1. Two rows shall consist of furnishing, installing, and maintaining the triangular silt dikes as specified. The rows shall be placed as a temporary line barrier at the top slope of the embankment. The triangular silts shall be placed in places as directed by the engineer. These rows shall be installed and located as soon as possible after construction begins and as directed by the engineer.

2. Triangular Silt, Silt, shall be triangular shaped, having a height of at least 3 feet, with a base of 10 feet, and shall be placed with the triangular side against the embankment. The triangular side shall be constructed of a fabric material, securely fastened together. The triangular side shall be placed with the triangular side against the embankment. The rows shall be placed as directed by the engineer. The ends shall be placed as shown on the plans.

3. Accepted triangular silts, measured as provided above, shall be paid for at the contract unit rates set out in the drawing. These units will include the cost of furnishing the silts, installing, maintaining, and removing when directed by the engineer.

Symbolology

Legend of symbols used to identify devices on plans

Note: Silt dikes should only be used for drop inlets in Sump locations.
LONGITUDINAL JOINTS WITH 25 DEFORMED BAR 2'-6" LONG & 2'-6" CENTERS.

DETAIL OF EXPANSION JOINT & JOINT SUPPORT

NOTE: THE EXPANSION JOINTS SHALL BE MEASURED AND PAID FOR AS P.C.C.
PAVEMENT RAMP THICKNESS.
THE JOINT SUPPORT MAY BE CONSTRUCTED WITH CLASS "A", "C", OR PAVER
CONCRETE. PAYMENT FOR THE JOINT SUPPORT SHALL BE FOR THE CONTRACT
UNIT PRICE Bid FOR THE CLASS OF CONCRETE USED. ALL OTHER WORK
AND MATERIALS REQUIRED FOR THE CONSTRUCTION OF THE JOINT SUPPORT
SHALL BE SUBSIDIARY TO THE ABOVE ITEMS.

DETAIL "A"

EXIT RAMP

EXIT RAMP

DETAILS OF STANDARD TURNOUT FOR
ENTRANCE & EXIT RAMPS

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD DRAWING TR-I
ENTRANCE RAMP

NOTES: Joints spacing on the main lanes shall be adjusted as necessary to conform to these and the main lane joint spacing may be reduced to a 5' minimum.

DETAIL OF EXPANSION JOINT & JOINT SUPPORT

NOTE: The expansion joints shall be measured and paid for as P.I.C.普通: Special Ramps for non-reinforced Ramps is applicable. The joint shall not be deteriorated. Contact the Joint Support shall be for the contract limit price and the Class of concrete specification are placed for the construction of the Joint Support shall be included in the price of the Joint Support.

EXIT RAMP

DETAIL "A"

EXIT RAMP

<table>
<thead>
<tr>
<th>Design Speed</th>
<th>Y</th>
<th>Noise Offset</th>
<th>L</th>
<th>Return Radius</th>
<th>C</th>
<th>Additional Surfacing</th>
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<tbody>
<tr>
<td>60</td>
<td>300</td>
<td>3.0</td>
<td>36.0</td>
<td>950</td>
<td>6</td>
<td>60-43</td>
</tr>
<tr>
<td>70</td>
<td>300</td>
<td>4.0</td>
<td>375.0</td>
<td>1200</td>
<td>6</td>
<td>60-99</td>
</tr>
</tbody>
</table>

DETAIL OF EXPANSION JOINT & JOINT SUPPORT

NOTE: The expansion joints shall be measured and paid for as P.I.C. Ordinary ramps for non-reinforced ramps is applicable. The joint shall not be deteriorated. Contact the Joint Support shall be for the contract limit price and the Class of concrete specification are placed for the construction of the Joint Support shall be included in the price of the Joint Support.

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD TURNOUT FOR ENTRANCE & EXIT RAMPS (NON-REINFORCED)

STANDARD DRAWING TR-1A
GENERAL NOTES:

These installations to be used where normal fencing installation would cause the collecting of drift in the channel or the depression will not permit normal installation. Installations will be made only where directed by the engineer. When a fence line approaches a ditch, gully or depression, the last post on level ground will be placed close enough to the edge of the drop off that the fence may be strung to the post in the depression without touching the ground. In terrain of such extreme irregularity that normal fencing on grade and the bales 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.

EXTRA LENGTH POST TO BE USED AS DIRECT BY THE ENGINEER.

2.00' steel or 3.00' aluminum posts

25'-0" maximum

Normal line fencing to continue on grade

Brace panel

Tie wire

Gaps

Date

WIRE FENCE WATER GAPS

STANDARD DRAWING

WF-2
### Typical Section M-W

**Bar List for Section A on 15' Span - One End Only:**

<table>
<thead>
<tr>
<th>Bar</th>
<th>Length</th>
<th>Diameter</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dimensions are in inches (3 and 31/2).**

---

### General Notes

- **Concrete:** All concrete is to be Class C, and shall be mixed in the dry. All exposed concrete surfaces are to be protected from exposure to sun, wind, or rain until the concrete has hardened to the extent that it is no longer susceptible to damage from these elements.
- **Bar Rebar:** All bars are to be 3/4" diameter unless otherwise specified.
- **Cover:** All concrete cover is to be maintained at a minimum of 2" from all exposed surfaces.

---

### Class 3 Concrete

**Arkansas State Highway Commission**

**Details of Standard Barrel Sections**

**Reinforced Concrete Box Culverts**

**15' Span - Sections X Only**

**45° x 60° x 10° Spans**

**21, 31, 41, 51**

**Singles**

**Over 50' Cover**

**Standard Drawing No.: A-1112X-1**
### Bar List for Section N on 30' Skew - One End Only

<table>
<thead>
<tr>
<th>Bar Type</th>
<th>Bar Dia</th>
<th>Length</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

### Typical Section B-M

#### Cross Section Diagram

- Bar Locations and Bar Details
- Details of Standard Barrels and Bar Configurations
- Section B-M Diagram

#### Materials

- Concrete
- Steel

### General Notes

- All sections are in conformance with standard barrel sections.
- All details are to be used in conjunction with standard barrel sections.
- All dimensions are standard.

### Reinforced Concrete Highway Culverts

- CLASS 3 CONCRETE
- DETAILS OF STANDARD BARREL SECTIONS
- BOX CULVERTS - ALL \( \leq 15 \)-ft SPANS
- OVER 15-FT SPANS

### Standard Drawing No. R-3002

- Double Slopes
- Over 5-ft Cover

---

*Note: Details and dimensions are provided for reference. Actual construction should follow standard specifications from Highway Commission and applicable local guidelines.*
### General Notes

**Concrete:** All concrete to be used shall be plain, and shall be placed in the day, at exposed surfaces, finishing to be determined by the architect in hand packet. Construction shown is with moderate degree of workmanship and care taken shall be only those shown in the plan. Specifications and methods of construction shall be in accordance with the American Standard Specifications for Highway Construction and approved Drawers FRIP Procedures.

Note: All sections of drawings where it is necessary to place one type of lift, the additional lift for each section.

---

### Reinforced Concrete Box Culvert 45° Skew—Sections A Only

<table>
<thead>
<tr>
<th>Class</th>
<th>Concrete</th>
<th>Details of Standard Barrel Sections 45° Skew</th>
<th>Reinforced Concrete Box Culverts 45° Skew—Sections A Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>95, 90, 95° spans</td>
<td>95, 100, 95° doubles</td>
<td>Over 50° cover</td>
<td>Standard Drawing No. CAR-2452-1</td>
</tr>
</tbody>
</table>

---

### Bar List for Section X on 45° Skew—One End Only

<table>
<thead>
<tr>
<th>Layer</th>
<th>Bar Type</th>
<th>Bar Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>A</td>
<td>6</td>
<td>10 ft</td>
</tr>
<tr>
<td>L2</td>
<td>B</td>
<td>8</td>
<td>15 ft</td>
</tr>
<tr>
<td>L3</td>
<td>C</td>
<td>10</td>
<td>20 ft</td>
</tr>
<tr>
<td>L4</td>
<td>D</td>
<td>12</td>
<td>25 ft</td>
</tr>
</tbody>
</table>

---

### Design Live Load

<table>
<thead>
<tr>
<th>Load Case</th>
<th>Load Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D1</strong></td>
<td>10 kips</td>
</tr>
<tr>
<td><strong>D2</strong></td>
<td>15 kips</td>
</tr>
</tbody>
</table>

---

### Barrel Dimensions

<table>
<thead>
<tr>
<th>Class</th>
<th>Reinforcing Steel</th>
<th>Details Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>95, 90, 95° spans</td>
<td>95, 100, 95° doubles</td>
<td>Over 50° cover</td>
</tr>
</tbody>
</table>