| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 1 | 29 |

(2) DITCH AT L.M. 10.96 STR. & APPRS. (S)

ARKANSAS DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS FOR STATE HIGHWAY

# DITCH AT L.M. 10.96
# STR. & APPRS. (S)

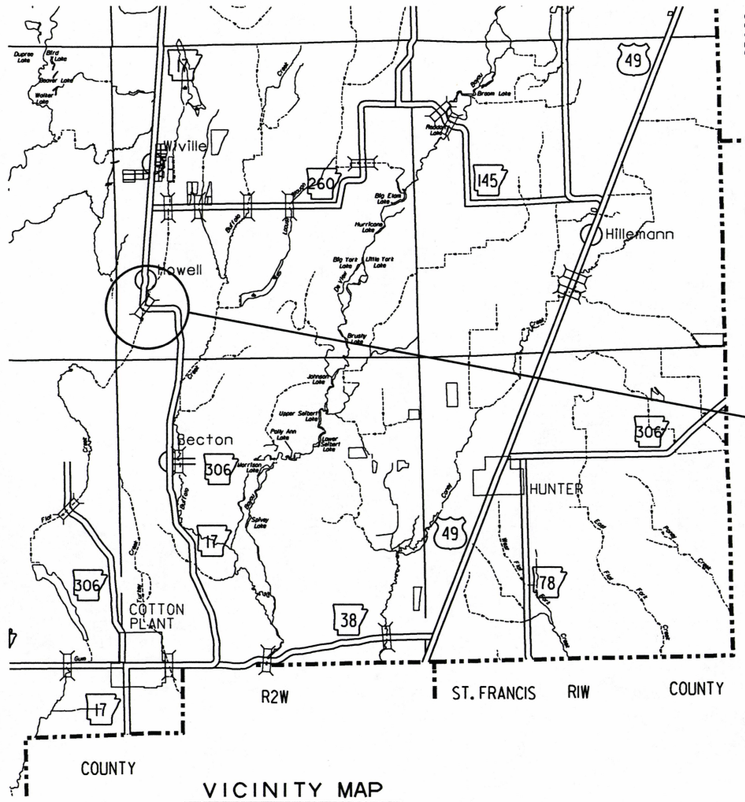
WOODRUFF COUNTY

ROUTE 17 SECTION 4

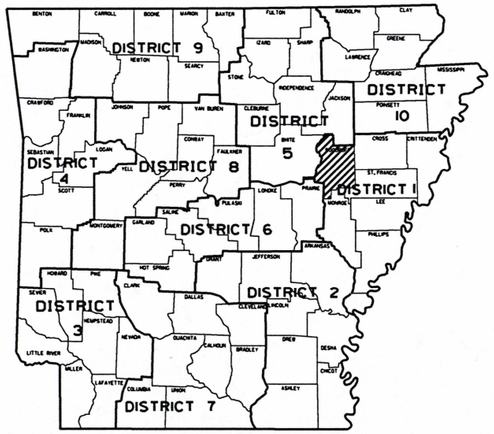
FED. AID PROJ. NHPP-0074(34)

# JOB 110620

NOT TO SCALE




VICINITY MAP



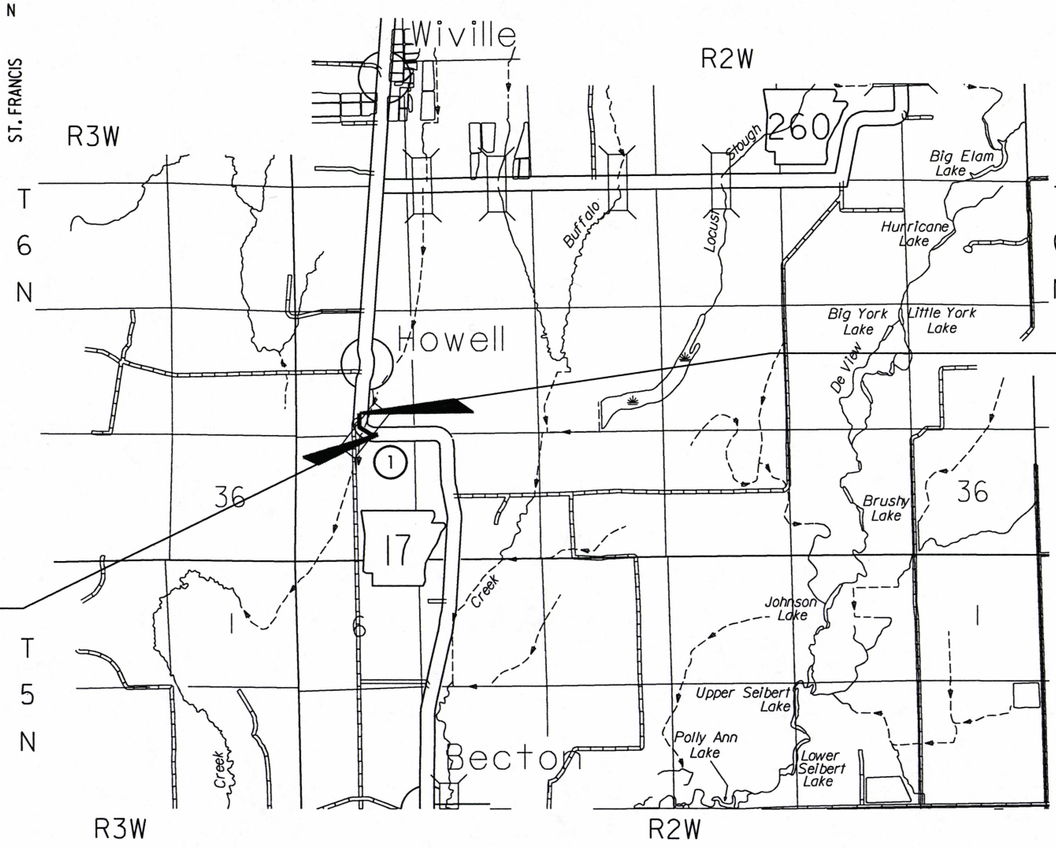

ARK. HWY. DIST. NO. 1

## DESIGN TRAFFIC DATA

| | |
|---|---|
| DESIGN YEAR | 2038 |
| 2018 ADT | 240 |
| 2038 ADT | 300 |
| 2038 DHV | 33 |
| DIRECTIONAL DISTRIBUTION | 0.60 |
| TRUCKS | 15% |
| DESIGN SPEED | 40 MPH |

(1) STRUCTURES OVER 20'-0" SPAN

STA. 113+66.00 CONSTRUCT
QUAD. 12' x 7' x 56' R.C.
BOX CULVERT ON 30° RT. FWD. SKEW
WITH 2:1 WINGS LT. & RT.
Q25= 730 CFS D.A. = 4.0 SQ. MILES
SPAN = 51.83'




STA. 113+00.00
BEGIN JOB 110620
L.M. 10.97

STA. 115+00.00
END JOB 110620

APPROVED

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7836
M.E. BANKS

4-20-18

DEPUTY DIRECTOR
AND CHIEF ENGINEER

| | BEGIN PROJECT | MID-POINT OF PROJECT | END PROJECT |
|---|---|---|---|
| LATITUDE | N 35°06'25" | N 35°06'25" | N 35°06'26" |
| LONGITUDE | W 91°14'45" | W 91°14'45" | W 91°14'46" |

LENGTH OF PROJECT CALCULATED ALONG C.L.

| | | | | | | |
|---|---|---|---|---|---|---|
| GROSS LENGTH OF PROJECT | 200.00 | FEET | OR | 0.038 | MILES |
| NET : : ROADWAY | 148.17 | : | | 0.028 | MILES |
| NET : : BRIDGES | 51.83 | : | | 0.010 | MILES |
| NET : : PROJECT | 200.00 | : | | 0.038 | MILES |

3/27/2018

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| 11/1/2018 | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 2 | 29 |

(2) INDEX OF SHEETS & STANDARD DRAWINGS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11/6/18

## INDEX OF SHEETS

| SHEET NO. | | TITLE |
|---|---|---|
| 1 | | TITLE SHEET |
| 2 | | INDEX OF SHEETS AND STANDARD DRAWINGS |
| 3 | | GOVERNING SPECIFICATIONS AND GENERAL NOTES |
| 4 - 5 | | TYPICAL SECTIONS OF IMPROVEMENT |
| 6 - 12 | | SPECIAL DETAILS |
| 13 - 14 | | TEMPORARY EROSION CONTROL DETAILS |
| 15 - 16 | | MAINTENANCE OF TRAFFIC |
| 17 | | PERMANENT PAVEMENT MARKING DETAILS |
| 18 - 21 | | QUANTITIES |
| 22 | | SUMMARY OF QUANTITIES AND REVISIONS |
| 23 - 24 | | SURVEY CONTROL DETAILS |
| 25 | | PLAN AND PROFILE SHEETS |
| 26 - 29 | | CROSS SECTIONS |

## ROADWAY STANDARD DRAWINGS

| DRWG.NO. | TITLE | DATE |
|---|---|---|
| PBC-1 | PRECAST CONCRETE BOX CULVERTS | 01-28-15 |
| PM-1 | PAVEMENT MARKING DETAILS | 06-01-17 |
| PU-1 | DETAILS OF PIPE UNDERDRAIN | 12-08-16 |
| RCB-1 | REINFORCED CONCRETE BOX CULVERT DETAILS | 07-26-12 |
| RCB-2 | EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS | 11-20-03 |
| SE-2 | TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC | 10-18-96 |
| SI-1 | DETAILS OF SPECIAL ITEMS | 10-25-18 |
| TC-1 | STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION | 04-13-17 |
| TC-2 | STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION | 09-02-15 |
| TC-3 | STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION | 09-02-15 |
| TEC-1 | TEMPORARY EROSION CONTROL DEVICES | 11-16-17 |
| TEC-2 | TEMPORARY EROSION CONTROL DEVICES | 06-02-94 |
| TEC-3 | TEMPORARY EROSION CONTROL DEVICES | 11-03-94 |

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|---|---|---|---|---|---|---|---|---|
| 11/1/2018 | | | | 6 | ARK. | | | |
| 11/8/2018 | | | | JOB NO. | | 110620 | 3 | 29 |
| 11/14/2018 | | | | (2) GOVERNING SPECIFICATIONS & GEN. NOTES | | | | |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-16-18

## GOVERNING SPECIFICATIONS

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

| NUMBER | TITLE |
|---|---|
| ERRATA____ | ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS |
| FHWA-1273__ | REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS |
| FHWA-1273__ | SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS |
| FHWA-1273__ | SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140) |
| FHWA-1273__ | SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES |
| FHWA-1273__ | SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS |
| FHWA-1273__ | SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS |
| FHWA-1273__ | SUPPLEMENT - WAGE RATE DETERMINATION |
| 100-3_____ | CONTRACTOR'S LICENSE |
| 100-4_____ | DEPARTMENT NAME CHANGE |
| 102-2_____ | ISSUANCE OF PROPOSALS |
| 108-1_____ | LIQUIDATED DAMAGES |
| 108-2_____ | WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER |
| 303-1_____ | AGGREGATE BASE COURSE |
| 306-1_____ | QUALITY CONTROL AND ACCEPTANCE |
| 400-1_____ | TACK COATS |
| 400-4_____ | DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES |
| 400-5_____ | PERCENT AIR VOIDS FOR ACHM MIX DESIGNS |
| 400-6_____ | LIQUID ANTI-STRIP ADDITIVE |
| 410-1_____ | CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES |
| 410-2_____ | DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS |
| 600-2_____ | INCIDENTAL CONSTRUCTION |
| 604-1_____ | RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES |
| 620-1_____ | MULCH COVER |
| 800-1_____ | STRUCTURES |
| 802-3_____ | CONCRETE FOR STRUCTURES |
| JOB 110620__ | BIDDING REQUIREMENTS AND CONDITIONS |
| JOB 110620__ | BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT |
| JOB 110620__ | BROADBAND INTERNET SERVICE FOR FIELD OFFICE |
| JOB 110620__ | CARGO PREFERENCE ACT REQUIREMENTS |
| JOB 110620__ | DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES |
| JOB 110620__ | FLEXIBLE BEGINNING OF WORK |
| JOB 110620__ | GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION |
| JOB 110620__ | MAINTENANCE OF TRAFFIC |
| JOB 110620__ | MANDATORY ELECTRONIC CONTRACT |
| JOB 110620__ | MANDATORY ELECTRONIC DOCUMENT SUBMITTAL |
| JOB 110620__ | NESTING SITES OF MIGRATORY BIRDS |
| JOB 110620__ | SETTLEMENT AGREEMENTS |
| JOB 110620__ | SHORING FOR CULVERTS |
| JOB 110620__ | SOIL STABILIZATION |
| JOB 110620__ | SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS |
| JOB 110620__ | UTILITY ADJUSTMENTS |
| JOB 110620__ | WARM MIX ASPHALT |

## GENERAL NOTES

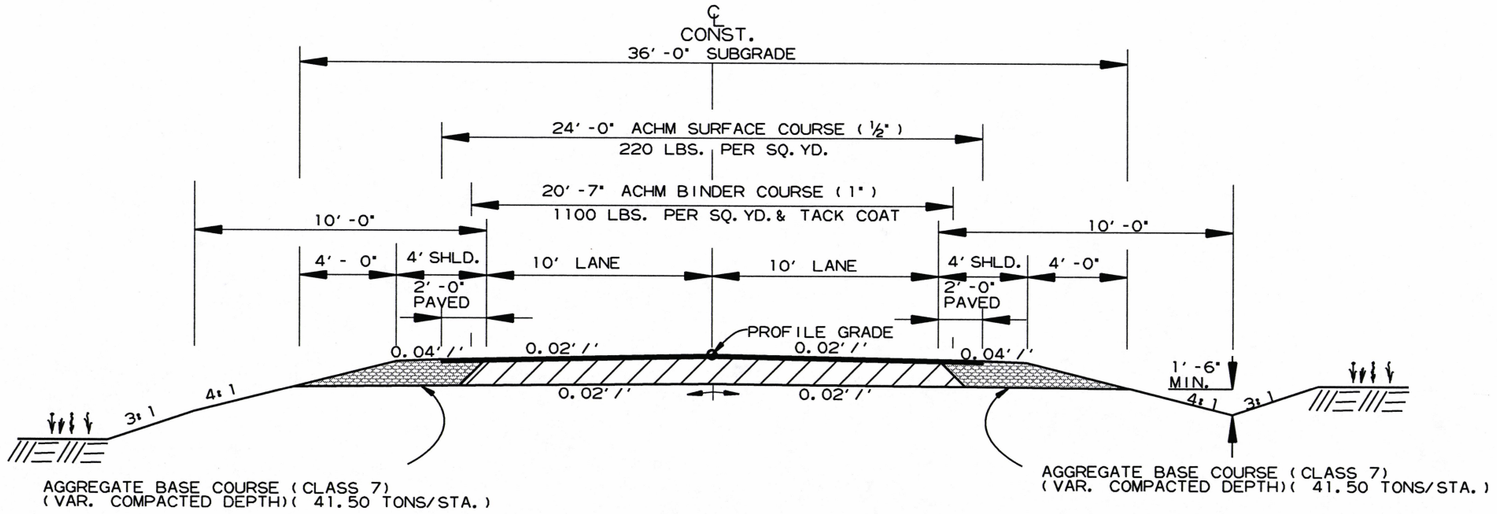
1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING U. S. MAILBOXES WITHIN THE PROJECT LIMITS IN SUCH A MANNER THAT THE PUBLIC MAY RECEIVE CONTINUED MAIL SERVICE. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS BID ITEMS.
5. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
6. ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INITIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
8. THE SEQUENCE AS SHOWN ON THE MAINTENANCE OF TRAFFIC PLANS IS A GENERAL OUTLINE FOR THE CONSTRUCTION OF THIS PROJECT, AND IN NO WAY IS IT INTENDED TO COVER EVERY ITEM IN THE PROJECT. ITEMS NOT CRITICAL TO THE CONSTRUCTION SEQUENCE MAY BE CONSTRUCTED IN ANY STAGE AS APPROVED BY THE
9. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
10. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A NEAT 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.
11. THIS PROJECT IS COVERED UNDER A NATIONWIDE 14 SECTION 404 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.

11/8/2018

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|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 4 | 29 |

(2) TYPICAL SECTION OF IMPROVEMENTS




HWY. 17 - FULL DEPTH

TYPICAL SECTION OF IMPROVEMENT

STA. 113+17.00 TO STA. 114+13.00

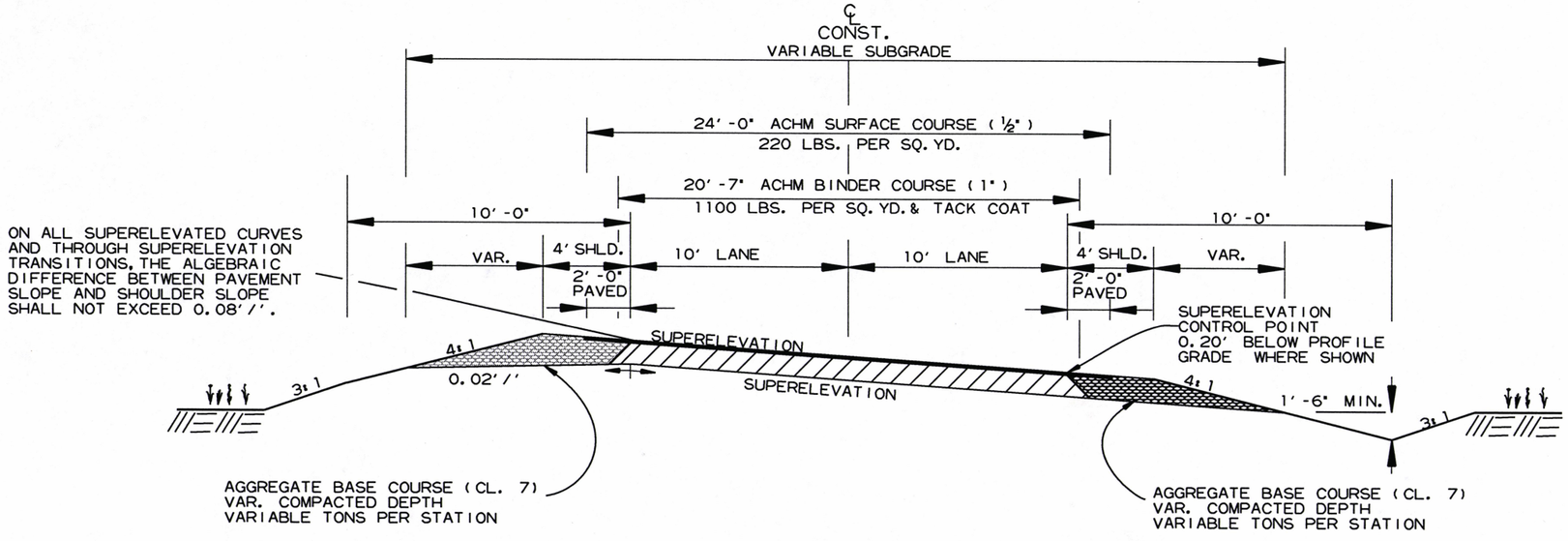
NOTES:
REFER TO CROSS SECTIONS FOR DEVIATION FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.

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

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

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

STATE OF ARKANSAS
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TRINITY D. SMITH
4-20-18




HWY. 17 - FULL DEPTH SUPERELEVATION

TYPICAL SECTION OF IMPROVEMENT

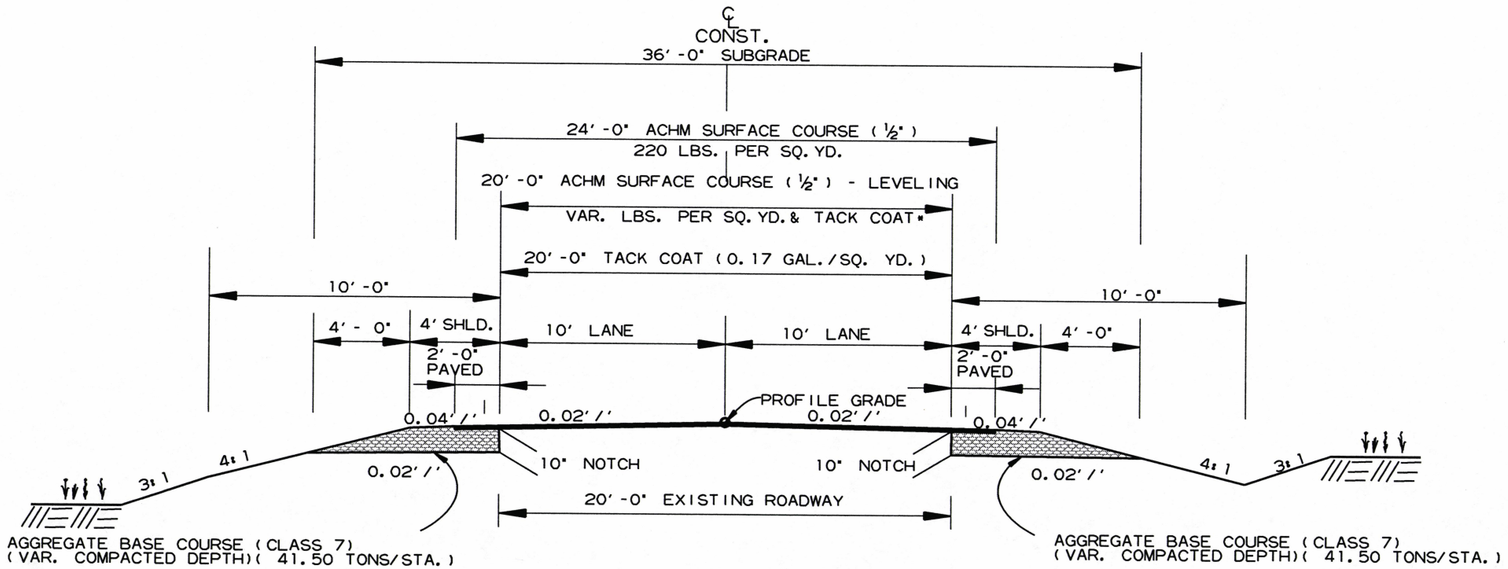
4/2/2018

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TYPICAL SECTIONS OF IMPROVEMENT

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 5 | 29 |

(2) TYPICAL SECTION OF IMPROVEMENTS




* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

HWY. 17 - FULL DEPTH

TYPICAL SECTION OF IMPROVEMENT

STA. 113+00.00 TO STA. 113+17.00
STA. 114+13.00 TO STA. 115+00.00

STATE OF ARKANSAS
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No. 11425
TRINITY D. SMITH
4-20-18

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

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

ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED ONLY IF AND WHERE DIRECTED BY THE ENGINEER. CALCULATIONS FOR THE AMOUNT OF LEVELING AND/OR LEVELING OPERATIONS SHALL BE PERFORMED BEFORE CONSTRUCTING NOTCH AND WIDENING. CALCULATIONS WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

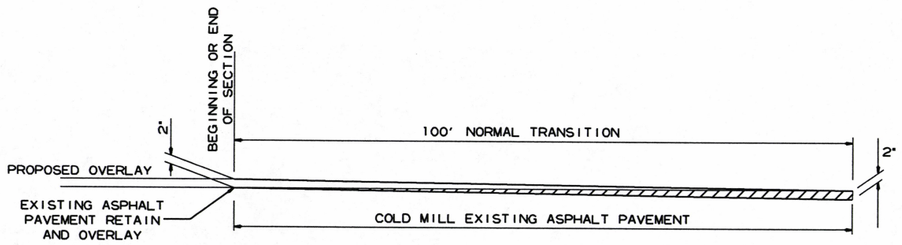
R110620.DGN 4/2/2018

TYPICAL SECTIONS OF IMPROVEMENT

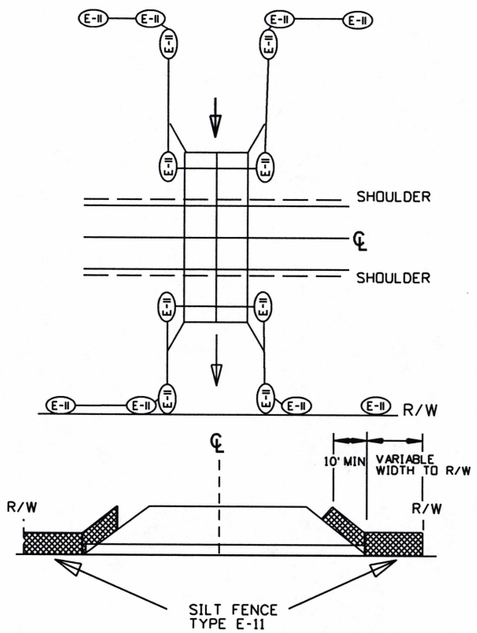
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|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 6 | 29 |

(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-2018




DETAIL FOR TRANSITIONS




DETAILS OF SILT FENCE
AT BOX CULVERTS

3/5/2018

R110620.DGN

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 7 | 29 |

① SPECIAL DETAILS

## INLET WINGWALL TABLE

| OVER ALL WIDTH | CLEAR HEIGHT | FOOTING THK. | WING WALL THK. | BOX SKEW (DEG.) | SLOPE | HDWL LENGTH | HEEL | WALL HEIGHT AT HDWL | WALL HEIGHT AT WING END | WINGWALL ANGLE (DEGREE) WING A | WINGWALL ANGLE (DEGREE) WING B | FOOTING WIDTH AT WALL END | WIDTH OF WING FOOTINGS AT HDWL WING A | WIDTH OF WING FOOTINGS AT HDWL WING B | FOOTING DIMENSION PARALLEL WITH HDWL WING A | FOOTING DIMENSION PARALLEL WITH HDWL WING B | LENGTH OF WINGWALLS WING A | LENGTH OF WINGWALLS WING B | LENGTH OF FOOTING HEEL WING A | LENGTH OF FOOTING HEEL WING B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OW | H | WB | CW | SK | SL | K | HL | WH1 | WH2 | AF1 | AF2 | WE | WF1 | WF2 | G1 | G2 | W1 | W2 | W3 | W4 |
| 51'-2" | 7'-0" | 0'-9" | 0'-8" | 30 | 2:1 | 57'-8 7/8" | 2'-0" | 7'-10" | 2'-4" | 0 | 60 | 3'-2" | 3'-5 5/8" | 4'-10 5/8" | 0'-9 5/8" | 2'-8 3/8" | 11'-0" | 22'-0" | 14'-5 3/8" | 25'-5 3/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| INLET | INLET |
| CU.YD | LBS. |
| 12.08 | 999 |

| WING | F1 BAR SIZE | F1 MAX. SPACING | F1 NO. REQ'D | F1 LENGTHS VARY | | | F2 BAR SIZE | F2 SPACING | F2 NO. REQ'D | F2 LENGTHS | | | F3 BAR SIZE | F3 SPACING | F3 NO. REQ'D | F3 LENGTHS | | | F4 BAR SIZE | F4 SPACING | F4 NO. REQ'D | F4 LENGTHS VARY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 12 | 11 | L | Min | 3'-8" | 4 | 12 | 2 | L | 3'-5" | | - | - | - | L | - | | 4 | 18 | 6 | Min |
| | | | | | Max | 8'-11" | | | | | | | | | | | | | | | | 2'-2" |
| | | | | X | Min | 0'-9" | | | | X | 1'-0" | | | | | X | - | | | | | Max |
| | | | | | Max | 1'-1" | | | | | | | | | | | | | | | | 8'-2" |
| | | | | Y | Min | 3'-0" | | | | Y | 2'-6" | | | | | Y | - | | | | | |
| | | | | | Max | 7'-11" | | | | | | | | | | | | | | | | |
| WING B | 4 | 12 | 22 | L | Min | 3'-5" | 4 | 12 | 8 | L | 5'-2" | | - | - | - | L | - | | 4 | 18 | 6 | Min |
| | | | | | Max | 10'-3" | | | | | | | | | | | | | | | | 4'-6" |
| | | | | X | Min | 0'-9" | | | | X | 1'-9" | | | | | X | - | | | | | Max |
| | | | | | Max | 2'-4" | | | | | | | | | | | | | | | | 16'-6" |
| | | | | Y | Min | 2'-9" | | | | Y | 3'-6" | | | | | Y | - | | | | | |
| | | | | | Max | 8'-0" | | | | | | | | | | | | | | | | |

| WING | F4 LENGTHS VARY | F5 BAR SIZE | F5 SPACING | F5 NO. REQ'D | F5 LENGTHS | F6 BAR SIZE | F6 SPACING | F6 NO. REQ'D | F6 LENGTHS VARY | | | F7 BAR SIZE | F7 NO. REQ'D | F7 LENGTHS | F8 BAR SIZE | F8 SPACING | F8 NO. REQ'D | F8 LENGTHS VARY | | | F9 BAR SIZE | F9 SPACING | F9 NO. REQ'D | F9 LENGTHS | | | F10 BAR SIZE | F10 NO. REQ'D | F10 LENGTHS | F11 BAR SIZE | F11 NO. REQ'D | F11 LENGTHS | F12 BAR SIZE | F12 SPACING | F12 NO. REQ'D | F12 LENGTHS | | | REINF. STEEL QTY. PER WING (LBS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | | 4 | 18 | 4 | 10'-8" | 4 | 18 | 8 | X | Min | 4'-11" | 4 | 8 | 15'-3" | 4 | 18 | 7 | Min | | | - | - | - | Min | | | 4 | 2 | 11'-10" | 4 | 2 | 11'-10" | 6 | 12 | 7 | L | 3'-4" | | 343 |
| | | | | | | | | | | Max | 10'-2" | | | | | | | 2'-8" | | | | | | - | | | | | | | | | | | | | | |
| | | | | | | | | | X | Min | 2'-4" | | | | | | | Max | | | | | | Max | | | | | | | | | | | | X | 1'-8" | |
| | | | | | | | | | | Max | 2'-4" | | | | | | | 2'-11" | | | | | | - | | | | | | | | | | | | | |
| | | | | | | | | | Y | Min | 2'-8" | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Max | 7'-11" | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WING B | | 4 | 18 | 4 | 21'-8" | 4 | 18 | 15 | X | Min | 5'-0" | 4 | 8 | 26'-3" | 4 | 18 | 16 | Min | | | 4 | 18 | 2 | Min | | | 4 | 2 | 22'-2" | 4 | 2 | 26'-10" | 6 | 12 | 7 | L | 3'-4" | | 656 |
| | | | | | | | | | | Max | 10'-3" | | | | | | | 2'-8" | | | | | | 23'-6" | | | | | | | | | | | | | |
| | | | | | | | | | X | Min | 2'-4" | | | | | | | Max | | | | | | Max | | | | | | | | | | | | X | 1'-8" | |
| | | | | | | | | | | Max | 2'-4" | | | | | | | 4'-4" | | | | | | 23'-6" | | | | | | | | | | | | | |
| | | | | | | | | | Y | Min | 2'-9" | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Max | 8'-0" | | | | | | | | | | | | | | | | | | | | | | | | | | | |

## MID-SECTION BAR LAP TABLE

| # of Long. Laps Req'd. | SL = Section Length |
|---|---|
| 0 | < 40.0 ft |
| 1 | >40.0 ft - 78.0 ft |
| 2 | >78.0 ft - 116.0 ft |
| 3 | >116.0 ft - 154.0 ft |
| 4 | >154.0 ft - 192.0 ft |
| 5 | >192.0 ft - 230.0 ft |
| 6 | >230.0 ft - 268.0 ft |
| 7 | >268.0 ft - 306.0 ft |
| 8 | >306.0 ft -344.0 ft |

| Min. Bar Lap Length | |
|---|---|
| #4 | 1'-9" |
| #5 | 2'-2" |
| #6 | 2'-7" |
| #7 | 3'-6" |
| #8 | 4'-7" |

| Bar Pin Dia. Table | |
|---|---|
| #4 | 3" |
| #5 | 3 3/4" |
| #6 | 4 1/2" |
| #7 | 5 1/4" |
| #8 | 6" |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
4-19-18

TABULAR DATA BY: BHS DATE: 2/15/18
CHECKED BY: DKS DATE: 2/22/18

This drawing to be used in conjunction with
SHEET 1 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", 'GENERAL NOTES & LONGITUDINAL SECTION LENGTH SCHEDULE',
SHEET 3 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", 'DETAILS OF MULTI-BARREL R.C. BOX CULVERT',
SHEET 4 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", 'DETAILS OF WINGWALLS', and
STANDARD DRAWING RCB-2.
For additional information and outlet sections, see Sheet 2 of 2.

## INLET SKEWED END SECTION

| SKEW (DEGREE) | SLOPE | DESIGN FILL DEPTH (FT.) | CLEAR SPAN (FT.) | CLEAR HEIGHT (FT.) | SECTION LENGTH | TOP SLAB THK. | HDWL DEPTH | BOTTOM SLAB THK. | SIDE WALL THK. | INTERIOR WALL THK. | OVER ALL WIDTH | OVER ALL HEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SK | SL | D | S | H | LL | T | HD | B | C | W | OW | OH |
| 30 | 2 | 2 | 12 | 7 | 16'-9" | 14.5 | 4.5 | 14.5 | 7 | 8 | 51'-2" | 9'-5" |

| TOP SLAB REINFORCING STEEL "a" SIZE | "a" SPACING | "a" LENGTHS VARY | "a" NO. REQ'D | "c" SIZE | "c" SPACING | "c" LENGTHS VARY | "c" NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 8 | 7 | Max 50'-10" | 48 | 8 | 5.5 | Max 50'-10" | 61 |
| | | Min 3'-1" | | | | Min 3'-1" | |
| | | 50'-10" | 4 | | | 50'-10" | 5 |

| BOTTOM SLAB REINFORCING STEEL "d" SIZE | "d" SPACING | "d" LENGTHS VARY | "d" NO. REQ'D | "f" SIZE | "f" SPACING | "f" LENGTHS VARY | "f" NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 5 | 7 | Max 50'-10" | 48 | 5 | 7 | Max 50'-10" | 48 |
| | | Min 3'-1" | | | | Min 3'-1" | |
| | | 50'-10" | 4 | | | 50'-10" | 4 |

| SIDE WALL REINFORCING STEEL "f0" SIZE | "f0" SPACING | "f0" NO. REQ'D | "f0" LENGTH | INTERIOR WALL REINFORCING STEEL "f1" SIZE | "f1" SPACING | "f1" NO. REQ'D | "f1" LENGTH |
|---|---|---|---|---|---|---|---|
| 6 | 7.5 | 55 | 9'-1" | 4 | 12 | 108 | 9'-1" |

| TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE | "g" SPACING | "g" NO. REQ'D | "g" LENGTHS VARY | BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE | "e" SPACING | "e" NO. REQ'D | "e" LENGTHS VARY |
|---|---|---|---|---|---|---|---|
| 4 | 7.5 | 167 | Max 31'-4" | 4 | 7.5 | 167 | Max 31'-4" |
| | | | Min 1'-10" | | | | Min 1'-10" |

| SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE | "d1" SPACING | "d1" NO. REQ'D | "d1" LENGTH | INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE | "d2" SPACING | "d2" NO. REQ'D | "d2" LENGTH |
|---|---|---|---|---|---|---|---|
| 4 | 12 | 7 | LONG 31'-2" | 4 | 12 | 14 | LONG 24'-0" |
| | | 7 | SHORT 2'-1" | | | 14 | MID 16'-7" |
| | | | | | | 14 | SHORT 9'-3" |

| CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | ① REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|
| 92.35 | 18771 |

① Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Gr. 60)."

| "k1" HDWL BARS SIZE | "k1" HDWL BARS LENGTH | "k1" HDWL BARS NO. REQ'D | "k2" HDWL BARS SIZE | "k2" HDWL BARS LENGTH | "k2" HDWL BARS NO. REQ'D | "h" HDWL BARS SIZE | "h" HDWL BARS LENGTH | "h" HDWL BARS Y | "h" HDWL BARS NO. REQ'D |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 30'-5" | 12 | 5 | 30'-5" | 12 | 4 | 2'-3" | 1'-3" | 61 |

## INLET SLOPE SECTION(S)

| R.C. BOX SECTION | DESIGN FILL DEPTH (FT.) | CLEAR SPAN (FT.) | CLEAR HEIGHT (FT.) | TOP SLAB THK. | BOTTOM SLAB THK | SIDE WALL THK | INTERIOR WALL THK. | OVER ALL WIDTH | OVER ALL HEIGHT | SECTION LENGTH (FT.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | D | S | H | T | B | C | W | OW | OH | SL |

TOP SLAB REINFORCING STEEL — LENGTH = OW - 4" + BENDS

| "a" SIZE | "a" L | Bent "b" SIZE | Bent "b" L | "c" SIZE | "c" L | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

BOTTOM SLAB REINFORCING STEEL — LENGTH = OW - 4" + BENDS

| "d" SIZE | "d" L | Bent "b1" SIZE | Bent "b1" L | "f" SIZE | "f" L | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

| SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH | INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

| TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D | BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE | SPACING | NO. REQ'D | SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D | INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |

| HDWL DEPTH. HD | ADDITIONAL REINF. FOR HDWL LBS. | "h" HDWL BARS SIZE | Y | LENGTH | NO. REQ'D |
|---|---|---|---|---|---|
| | | | | | |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| TOTAL | |
| | |

| Design Fill Depth | Range of Actual Fill Depth |
|---|---|
| 2 | 0.0 ft - 2.0 ft |
| 5 | >2.0 ft - 5.0 ft |
| 10 | >5.0 ft - 10.0 ft |
| 15 | >10.0 ft - 15.0 ft |
| 20 | >15.0 ft - 20.0 ft |
| 25 | >20.0 ft - 25.0 ft |
| 30 | >25.0 ft - 30.0 ft |
| 35 | >30.0 ft - 35.0 ft |
| 40 | >35.0 ft - 40.0 ft |

Data shown for Mid-Section, Slope Section(s), and Skewed End Section is based on the design fill depth shown in the table, see PLAN AND PROFILE SHEETS for actual fill depth.

## MID-SECTION

| R.C. BOX SECTION | DESIGN FILL DEPTH (FT.) | CLEAR SPAN (FT.) | CLEAR HEIGHT (FT.) | TOP SLAB THK. | BOTTOM SLAB THK. | SIDE WALL THK. | INTERIOR WALL THK. | OVER ALL WIDTH | OVER ALL HEIGHT | SECTION LENGTH (FT.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | D | S | H | T | B | C | W | OW | OH | SL |
| A | 2 | 12 | 7 | 14.5 | 14.5 | 7 | 8 | 51'-2" | 9'-5" | 22.5 |

TOP SLAB REINFORCING STEEL — LENGTH = OW - 4" + BENDS

| "a" SIZE | "a" L | Bent "b" SIZE | Bent "b" L | "c" SIZE | "c" L | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 4 | 50'-10" | 8 | 52'-3" | 6 | 50'-10" | 9 | 30 |

BOTTOM SLAB REINFORCING STEEL — LENGTH = OW - 4" + BENDS

| "d" SIZE | "d" L | Bent "b1" SIZE | Bent "b1" L | "f" SIZE | "f" L | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 5 | 50'-10" | 5 | 52'-2" | 5 | 50'-10" | 14 | 19 |

| SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH | INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|---|---|---|---|
| 6 | 7.5 | 72 | 9'-1" | 4 | 12 | 132 | 9'-1" |

| TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D | BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE | SPACING | NO. REQ'D | SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D | INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 7.5 | 167 | 4 | 7.5 | 167 | 4 | 12 | 14 | 4 | 12 | 42 |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| 121.52 | 18901 |

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUADRUPLE BARREL BOX CULVERT
Sta. 113+66

SPECIAL DETAILS

Ver. Lu14 bil0620_cl.dgn

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | B | 29 |

① SPECIAL DETAILS

STATE OF ARKANSAS
CHARLES R. ELLIS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS

TABULAR DATA BY: BHS DATE: 2/15/18
CHECKED BY: DKS DATE: 2/22/18

## OUTLET WINGWALL TABLE

| OVER ALL WIDTH | CLEAR HEIGHT | FOOTING THK. | WING WALL THK. | BOX SKEW (DEG.) | SLOPE | HDWL LENGTH | HEEL | WALL HEIGHT AT HDWL | WALL HEIGHT AT WING END | WINGWALL ANGLE (DEGREE) WING A | WINGWALL ANGLE (DEGREE) WING B | FOOTING WIDTH AT WALL END | WIDTH OF WING FOOTINGS AT HDWL WING A | WIDTH OF WING FOOTINGS AT HDWL WING B | FOOTING DIMENSION PARALLEL WITH HDWL WING A | FOOTING DIMENSION PARALLEL WITH HDWL WING B | LENGTH OF WINGWALLS WING A | LENGTH OF WINGWALLS WING B | LENGTH OF FOOTING HEEL WING A | LENGTH OF FOOTING HEEL WING B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OW | H | WB | CW | SK | SL | K | HL | WH1 | WH2 | AF1 | AF2 | WE | WF1 | WF2 | G1 | G2 | W1 | W2 | W3 | W4 |
| 51'-2" | 7'-0" | 0'-9" | 0'-8" | 30 | 2:1 | 57'-8 7/8" | 2'-0" | 7'-10" | 2'-4" | 0 | 30 | 3'-2" | 3'-5 5/8" | 4'-0 3/4" | 0'-9 5/8" | 1'-0 3/8" | 11'-0" | 12'-6" | 14'-5 3/8" | 12'-2" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| OUTLET | OUTLET |
| CU.YD | LBS. |
| 10.92 | 704 |

| WING | F1 BAR SIZE | F1 MAX. SPACING | F1 NO. REQ'D | F1 LENGTHS VARY | | | F2 BAR SIZE | F2 SPACING | F2 NO. REQ'D | F2 LENGTHS | | | F3 BAR SIZE | F3 SPACING | F3 NO. REQ'D | F3 LENGTHS | | | F4 BAR SIZE | F4 SPACING | F4 NO. REQ'D | F4 LENGTHS VARY | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 12 | 11 | L | Min | 3'-8" | 4 | 12 | 2 | L | 3'-5" | | - | - | - | L | - | | 4 | 18 | 6 | Min | |
| | | | | | Max | 8'-11" | | | | | | | | | | | | | | | | 2'-2" | |
| | | | | X | Min | 0'-9" | | | | X | 1'-0" | | | | | X | - | | | | | Max | |
| | | | | | Max | 1'-1" | | | | | | | | | | | | | | | | 8'-2" | |
| | | | | Y | Min | 3'-0" | | | | Y | 2'-6" | | | | | Y | - | | | | | | |
| | | | | | Max | 7'-11" | | | | | | | | | | | | | | | | | |
| WING B | 4 | 12 | 13 | L | Min | 3'-4" | 4 | 12 | 3 | L | 3'-11" | | - | - | - | L | - | | 4 | 18 | 6 | Min | |
| | | | | | Max | 9'-7" | | | | | | | | | | | | | | | | 2'-6" | |
| | | | | X | Min | 0'-9" | | | | X | 1'-6" | | | | | X | - | | | | | Max | |
| | | | | | Max | 1'-8" | | | | | | | | | | | | | | | | 9'-4" | |
| | | | | Y | Min | 2'-8" | | | | Y | 2'-6" | | | | | Y | - | | | | | | |
| | | | | | Max | 8'-0" | | | | | | | | | | | | | | | | | |

| WING | F4 LENGTHS | F5 BAR SIZE | F5 SPACING | F5 NO. REQ'D | F5 LENGTHS | F6 BAR SIZE | F6 SPACING | F6 NO. REQ'D | F6 LENGTHS VARY | | | F7 BAR SIZE | F7 NO. REQ'D | F7 LENGTHS | F8 BAR SIZE | F8 SPACING | F8 NO. REQ'D | F8 LENGTHS VARY | | | F9 BAR SIZE | F9 SPACING | F9 NO. REQ'D | F9 LENGTHS | | | F10 BAR SIZE | F10 NO. REQ'D | F10 LENGTHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | | 4 | 18 | 4 | 10'-8" | 4 | 18 | 8 | L | Min | 4'-11" | 4 | 8 | 15'-3" | 4 | 18 | 7 | Min | | | - | - | - | Min | | | 4 | 2 | 11'-10" |
| | | | | | | | | | | Max | 10'-2" | | | | | | | 2'-8" | | | | | | - | | | | |
| | | | | | | | | | X | Min | 2'-4" | | | | | | | Max | | | | | | Max | | | 4 | 2 | 11'-10" |
| | | | | | | | | | | Max | 2'-4" | | | | | | | 2'-11" | | | | | | - | | | | |
| | | | | | | | | | Y | Min | 2'-8" | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Max | 7'-11" | | | | | | | | | | | | | | | | | | |
| WING B | | 4 | 18 | 4 | 12'-2" | 4 | 18 | 9 | L | Min | 4'-11" | 4 | 8 | 11'-10" | 4 | 18 | 9 | Min | | | - | - | - | Min | | | 4 | 2 | 13'-2" |
| | | | | | | | | | | Max | 10'-3" | | | | | | | 2'-8" | | | | | | - | | | | |
| | | | | | | | | | X | Min | 2'-4" | | | | | | | Max | | | | | | Max | | | 4 | 2 | 14'-2" |
| | | | | | | | | | | Max | 2'-4" | | | | | | | 3'-7" | | | | | | - | | | | |
| | | | | | | | | | Y | Min | 2'-8" | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Max | 8'-0" | | | | | | | | | | | | | | | | | | |

| WING | F11 BAR SIZE | F11 NO. REQ'D | F11 LENGTHS | F12 BAR SIZE | F12 SPACING | F12 NO. REQ'D | F12 LENGTHS | | REINF. STEEL QTY. PER WING (LBS) |
|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 2 | 11'-10" | 6 | 12 | 7 | L | 3'-4" | 343 |
| | | | | | | | X | 1'-8" | |
| WING B | 4 | 2 | 14'-2" | 6 | 12 | 7 | L | 3'-4" | 361 |
| | | | | | | | X | 1'-8" | |

| Min. Bar Lap Length | |
|---|---|
| #4 | 1'-9" |
| #5 | 2'-2" |
| #6 | 2'-7" |
| #7 | 3'-6" |
| #8 | 4'-7" |

| Bar Pin Dia. Table | |
|---|---|
| #4 | 3" |
| #5 | 3 3/4" |
| #6 | 4 1/2" |
| #7 | 5 1/4" |
| #8 | 6" |

① Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Gr. 60)."

## OUTLET SKEWED END SECTION

| SKEW (DEGREE) | SLOPE | DESIGN FILL DEPTH (FT.) | CLEAR SPAN (FT.) | CLEAR HEIGHT (FT.) | SECTION LENGTH | TOP SLAB THK. | HDWL DEPTH | BOTTOM SLAB THK. | SIDE WALL THK. | INTERIOR WALL THK. | OVER ALL WIDTH | OVER ALL HEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SK | SL | D | S | H | LL | T | HD | B | C | W | OW | OH |
| 30 | 2:1 | 2 | 12 | 7 | 16'-9" | 14.5 | 4.5 | 14.5 | 7 | 8 | 51'-2" | 9'-5" |

| TOP SLAB REINFORCING STEEL "a" SIZE | "a" SPACING | "a" LENGTHS VARY | "a" NO. REQ'D | "c" SIZE | "c" SPACING | "c" LENGTHS VARY | "c" NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 8 | 7 | Max 50'-10" | 48 | 8 | 5.5 | Max 50'-10" | 61 |
| | | Min 3'-1" | | | | Min 3'-1" | |
| | | 50'-10" | 4 | | | 50'-10" | 5 |

| BOTTOM SLAB REINFORCING STEEL "d" SIZE | "d" SPACING | "d" LENGTHS VARY | "d" NO. REQ'D | "f" SIZE | "f" SPACING | "f" LENGTHS VARY | "f" NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 5 | 7 | Max 50'-10" | 48 | 5 | 7 | Max 50'-10" | 48 |
| | | Min 3'-1" | | | | Min 3'-1" | |
| | | 50'-10" | 4 | | | 50'-10" | 4 |

| SIDE WALL REINFORCING STEEL "f0" SIZE | "f0" SPACING | "f0" NO. REQ'D | "f0" LENGTH |
|---|---|---|---|
| 6 | 7.5 | 55 | 9'-1" |

| INTERIOR WALL REINFORCING STEEL "f1" SIZE | "f1" SPACING | "f1" NO. REQ'D | "f1" LENGTH |
|---|---|---|---|
| 4 | 12 | 108 | 9'-1" |

| TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE | "g" SPACING | "g" NO. REQ'D | "g" LENGTHS VARY |
|---|---|---|---|
| 4 | 7.5 | 167 | Max 31'-4" |
| | | | Min 1'-10" |

| BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE | "e" SPACING | "e" NO. REQ'D | "e" LENGTHS VARY |
|---|---|---|---|
| 4 | 7.5 | 167 | Max 31'-4" |
| | | | Min 1'-10" |

| SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE | "d1" SPACING | "d1" NO. REQ'D | "d1" LENGTH |
|---|---|---|---|
| 4 | 12 | 7 | LONG 31'-2" |
| | | | SHORT 2'-1" |

| INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE | "d2" SPACING | "d2" NO. REQ'D | "d2" LENGTH |
|---|---|---|---|
| 4 | 12 | 14 | LONG 24'-0" |
| | | | MID 16'-7" |
| | | 14 | SHORT 9'-3" |

| "k1" HDWL BARS SIZE | "k1" LENGTH | "k1" NO. REQ'D | "k2" HDWL BARS SIZE | "k2" LENGTH | "k2" NO. REQ'D | "h" HDWL BARS SIZE | "h" LENGTH | "h" Y | "h" NO. REQ'D |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 30'-5" | 12 | 5 | 30'-5" | 12 | 4 | 2'-3" | 1'-3" | 61 |

| CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | ① REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|
| 92.35 | 18771 |

## OUTLET SLOPE SECTION(S)

| R.C. BOX SECTION | DESIGN FILL DEPTH (FT.) D | CLEAR SPAN (FT.) S | CLEAR HEIGHT (FT.) H | TOP SLAB THK. T | BOTTOM SLAB THK B | SIDE WALL THK C | INTERIOR WALL THK. W | OVER ALL WIDTH OW | OVER ALL HEIGHT OH | SECTION LENGTH (FT.) SL |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |

TOP SLAB REINFORCING STEEL — LENGTH = OW - 4" + BENDS

| "a" SIZE | "a" L | Bent "b" SIZE | Bent "b" L | "c" SIZE | "c" L | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

BOTTOM SLAB REINFORCING STEEL — LENGTH = OW - 4" + BENDS

| "d" SIZE | "d" L | Bent "b1" SIZE | Bent "b1" L | "f" SIZE | "f" L | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

| SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| | | | |

| INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| | | | |

| TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| | | |

| BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| | | |

| SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| | | |

| INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| | | |

| HDWL DEPTH HD | ADDITIONAL REINF. FOR HDWL LBS. | "h" HDWL BARS SIZE | Y | LENGTH | NO. REQ'D |
|---|---|---|---|---|---|
| | | | | | |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| | |
| TOTAL | |
| | |

The required number of bars and lengths shown are for estimating purpose only. The actual number and length required shall be determined in field.

Unless otherwise noted, all dimensions are in inches.

SHEET 2 OF 2
DETAILS OF R.C. BOX CULVERT

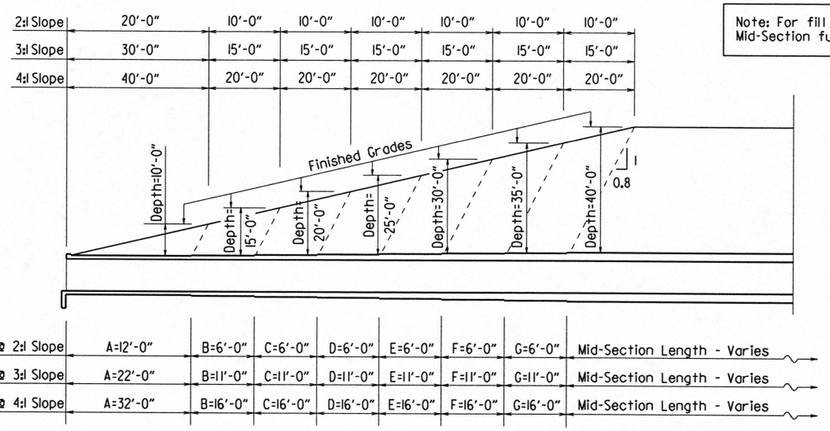
QUADRUPLE BARREL BOX CULVERT
Sta. 113+66

SPECIAL DETAILS

Ver. 1.14 bll0620_cl.dgn

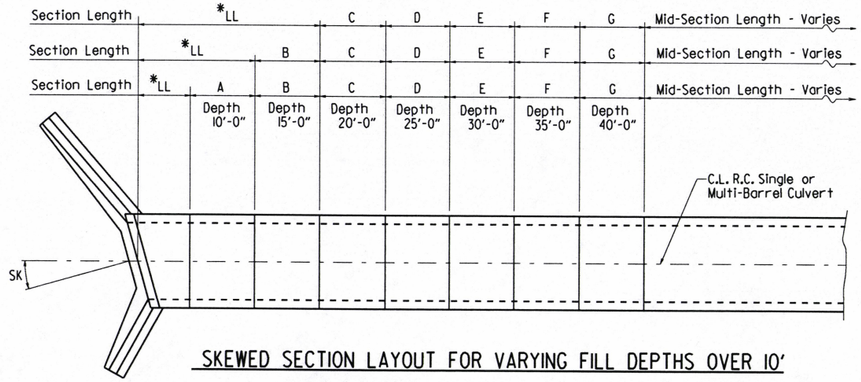
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| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 9 | 29 |

1 SPECIAL DETAILS




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

*LL = Skewed End Section Length - See "Skewed End Section Details" Length LL varies with skew angle, overall box width and fill depth and may eliminate the need for some slope section lengths as shown.

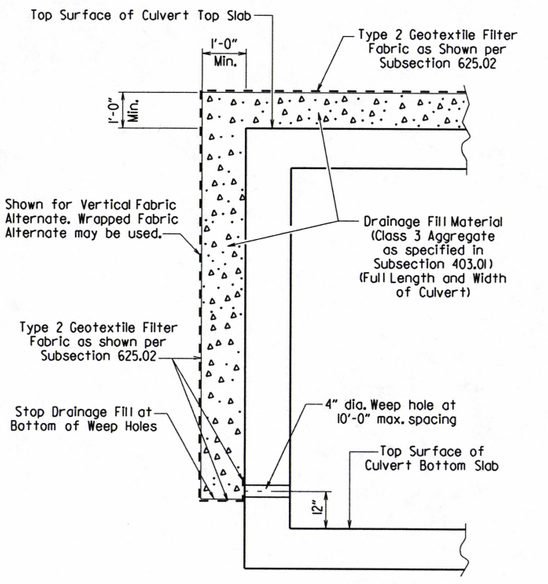



SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
4-19-18

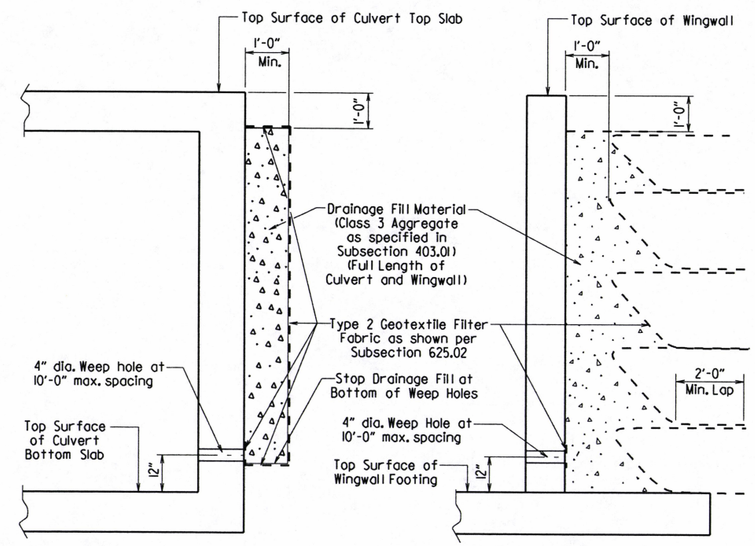
## LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'

Lengths for Non-Skewed Boxes




## CULVERT DRAINAGE DETAIL FOR ROCK FILL

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




VERTICAL FABRIC ALTERNATE
(Shown for Culvert, Similar for Wingwall)




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

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

## WINGWALL & CULVERT DRAINAGE DETAIL

**GENERAL NOTES:**

**CONSTRUCTION SPECIFICATIONS:** Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 edition) with applicable Supplemental Specifications and Special Provisions. Section and Subsection refer to the Standard Construction Specifications unless otherwise noted in the Plans.

**DESIGN SPECIFICATIONS:** AASHTO LRFD Bridge Design Specifications, Fifth Edition (2010) with 2010 interim revisions.

**LIVE LOADING:** HL-93

All concrete shall be Class S with a minimum 28-day compressive strength of 3,500 psi and shall be poured in the dry. All exposed corners to have ¾" chamfers.

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

Reinforcing Steel Tolerances: The tolerances for reinforcing steel shall meet those listed in 'Manual of Standard Practice' published by Concrete Reinforcing Steel Institute (CRSI) except that the tolerance for truss bars such as Figure 3 on page 7-4 of the CRSI Manual shall be minus zero to plus 1/2 inch.

Excavation and backfilling shall be in accordance with the requirements of Section 801.

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

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

Weep Holes in wingwalls shall have a maximum horizontal spacing of 10'-0" and shall be spaced to clear all reinforcing steel. There shall be a minimum of two (2) weep holes in each wingwall. The drain opening shall be 4" diameter and shall be placed 12" above the top of the wingwall footing.

The barrel components of the culvert may be constructed using continuous pours. For longer culvert construction, the Contractor may use multiple pours with transverse construction joints spaced a minimum of 50 feet apart unless superseded by stage construction or site constraints as approved by the Engineer. Construction joints between footings and walls shall be made only where shown in the Plans. Joints shall be normal to the centerline of barrel and shall be keyed. Longitudinal reinforcing shall be continuous through joints unless shown otherwise. All longitudinal construction joints shall be submitted to the Engineer for approval.

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

When the top slab of the box culvert serves as finished roadway surface, curing and finishing shall be in accordance with subsections 802.17 and 802.20 for bridge roadway surface and a tine finish shall be applied in accordance with subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Curing and finishing shall not be paid for directly, but shall be considered incidental to the item "Class S Concrete-Roadway". Class 1 Protective Surface Treatment shall be applied to the roadway surface and this work shall be paid for under the unit price bid for "Class 1 Protective Surface Treatment".

When precast reinforced concrete box culverts are substituted for cast in place box culverts, they shall be manufactured according to ASTM C 1577 and meet the requirements of Section 607. When the top slab of the box culvert serves as the finished roadway surface, a precast reinforced concrete box culvert substitution is not allowed.

SHEET 1 OF 4

# GENERAL DETAILS OF R.C. BOX CULVERT

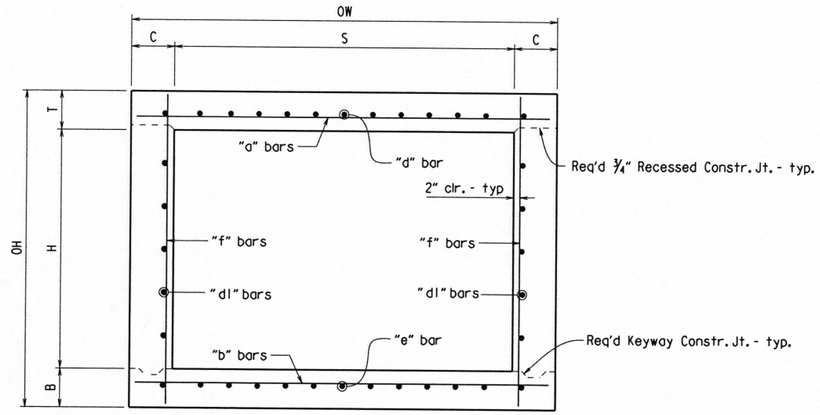
GENERAL NOTES &
LONGITUDINAL SECTION LENGTH SCHEDULE

SPECIAL DETAILS

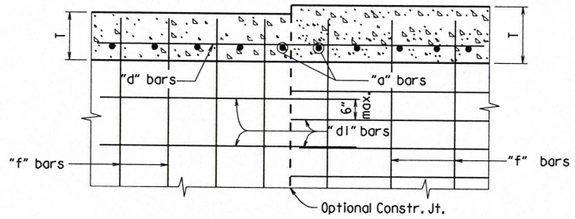
V 1.1.4 Culvert-General.dgn

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
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| | | | | JOB NO. | | 110620 | 10 | 29 |
| | | | | ① | | SPECIAL DETAILS | | |

Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



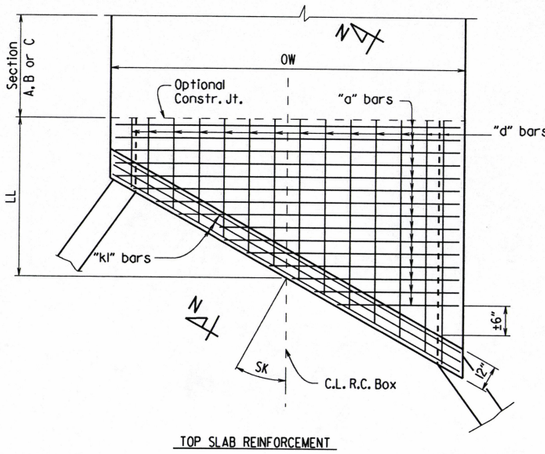

## TYPICAL SECTION M-M



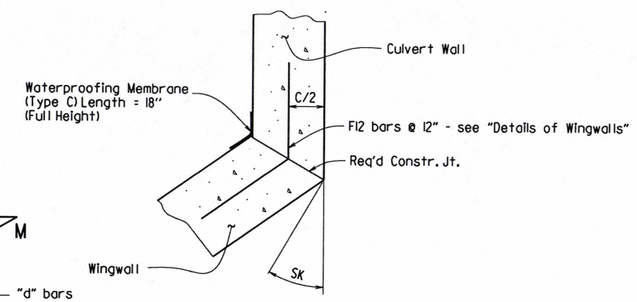

Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.

## LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

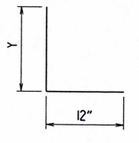



TOP SLAB REINFORCEMENT

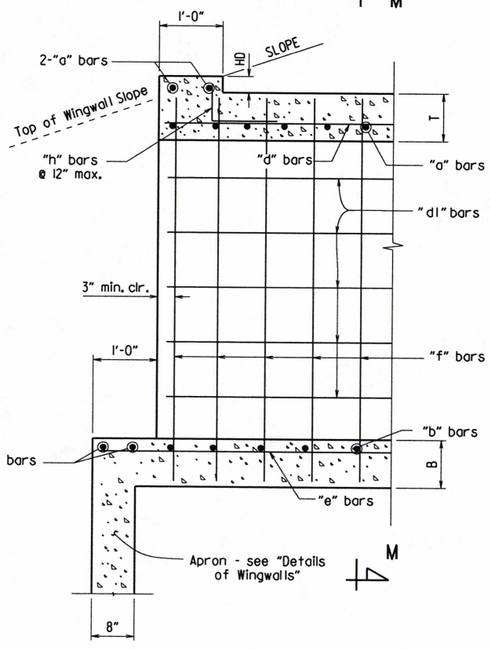



## WINGWALL ATTACHMENT

See "Details of Wingwalls" for additional information and wingwall details.

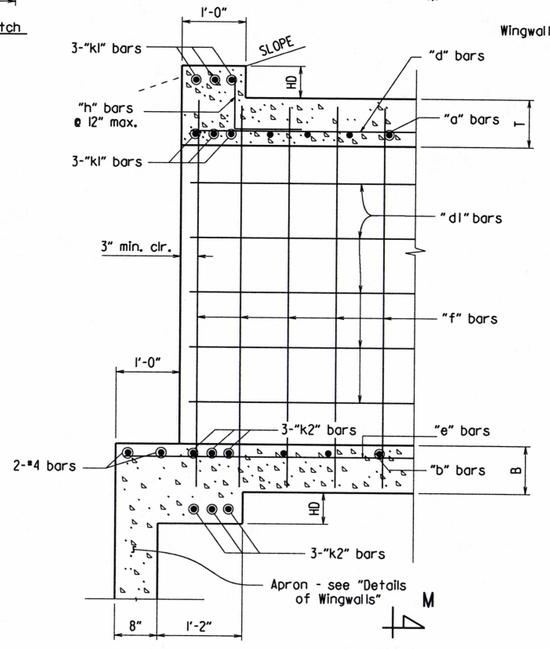



"h" bars sketch



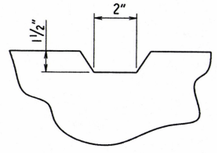

## PART LONGITUDINAL SECTION

(Non-Skewed Ends)



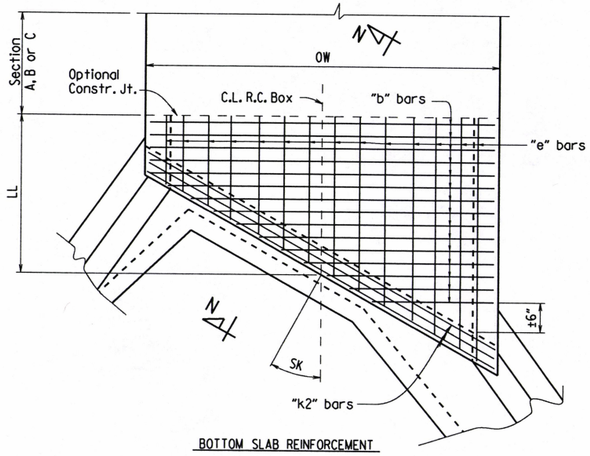

## PART LONGITUDINAL SECTION N-N

(Skewed Ends)




## TYPICAL KEYWAY DETAIL

(All Construction Joints)




BOTTOM SLAB REINFORCEMENT

## SKEWED END SECTION DETAILS

# SHEET 2 OF 4
# GENERAL DETAILS OF R.C. BOX CULVERT

DETAILS OF SINGLE BARREL
R.C. BOX CULVERT

SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
4-19-18

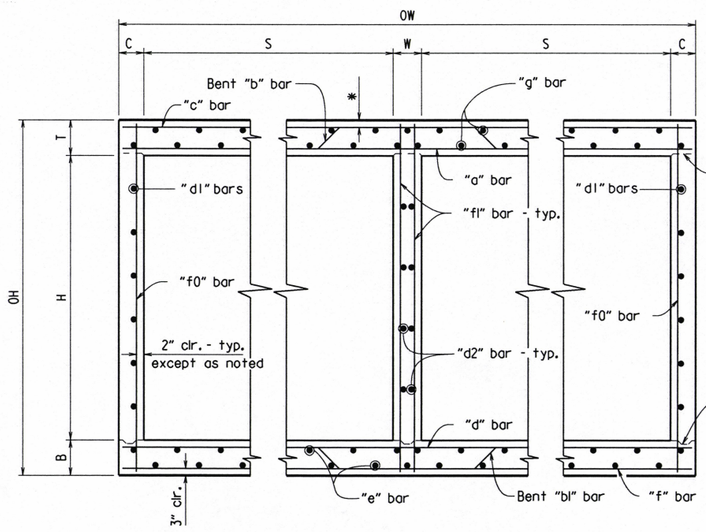
Culvert-General.dgn

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| | | | | JOB NO. | | 110620 | 11 | 29 |

1 SPECIAL DETAILS

*2" clr. for fill depth (D) greater than 2 ft.
2½" clr. for fill depth (D) equal to or less than 2 ft.

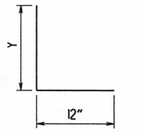
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



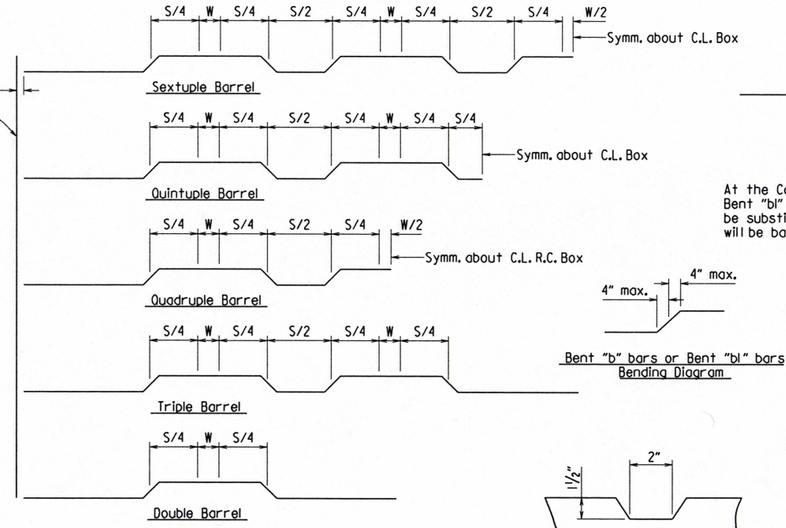

## TYPICAL SECTION M-M

Top Slab
Straight "c" bars shall alternate with Bent "b" bars in top.
Straight "a" bars shall alternate with Bent "b" bars in bottom.

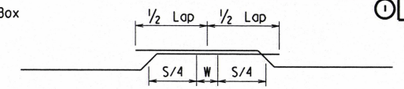
Bottom Slab
Straight "d" bars shall alternate with Bent "bl" bars in top.
Straight "f" bars shall alternate with Bent "bl" bars in bottom.




"h" bars sketch




## Bent "b" bars or Bent "bl" bars sketch



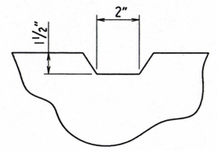

Lap Detail
For Bent "b" bars and Bent "bl" bars

At the Contractor's option in lieu of providing Bent "b" or Bent "bl" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment for the reinforcing will be based on the weight of the "b" or "bl" bar.



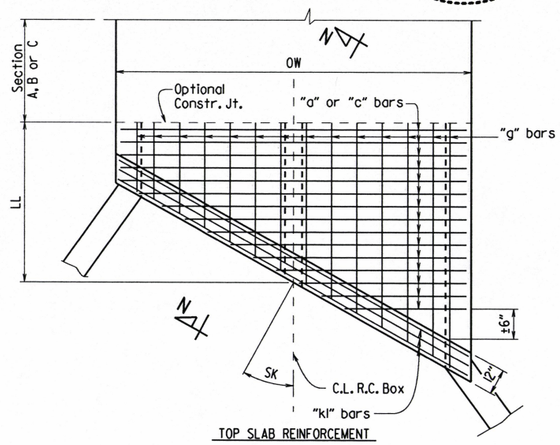

Bent "b" bars or Bent "bl" bars Bending Diagram

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REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
4-19-18

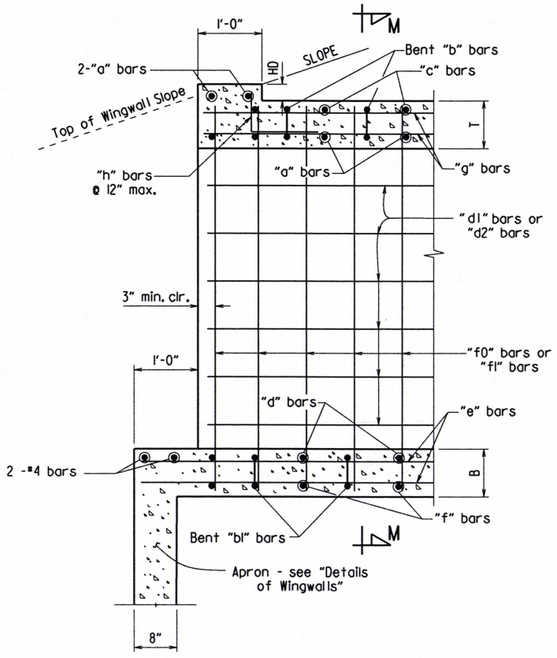



## TYPICAL KEYWAY DETAIL

(All Construction Joints)

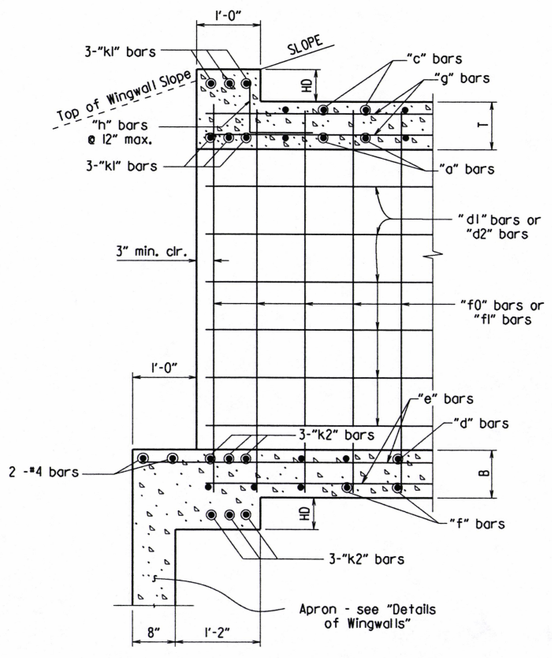



TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



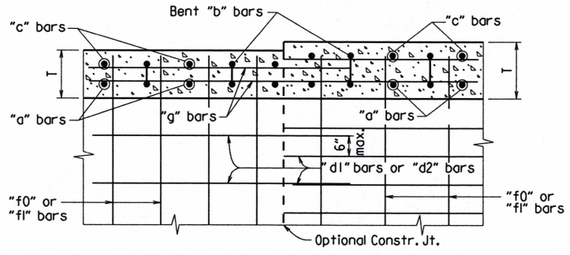

## PART LONGITUDINAL SECTION

(Non-Skewed Ends)




## PART LONGITUDINAL SECTION N-N

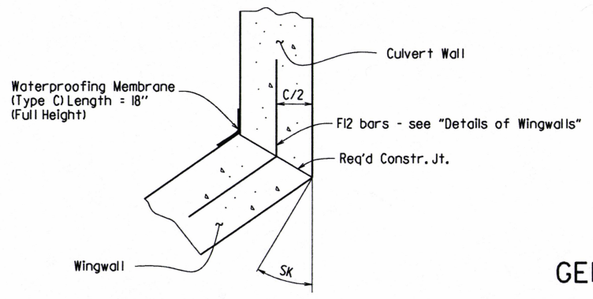
(Skewed Ends)




Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.

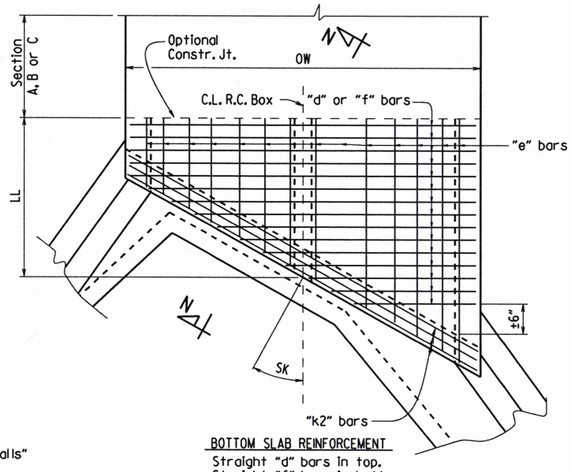
## LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR




## WINGWALL ATTACHMENT

See "Details of Wingwalls" for additional information and wingwall details.




BOTTOM SLAB REINFORCEMENT
Straight "d" bars in top.
Straight "f" bars in bottom.

## SKEWED END SECTION DETAILS

# SHEET 3 OF 4
# GENERAL DETAILS OF R.C. BOX CULVERT

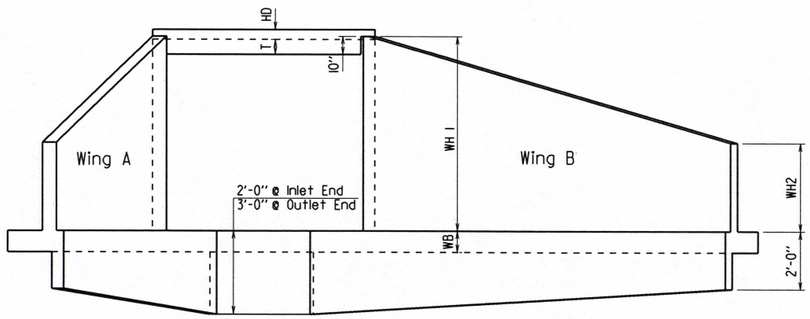
## DETAILS OF MULTI-BARREL R.C. BOX CULVERT

SPECIAL DETAILS

Culvert-General.dgn

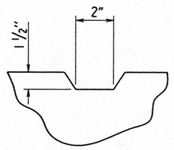
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| | | | | JOB NO. | | 110620 | 12 | 29 |

1 SPECIAL DETAILS



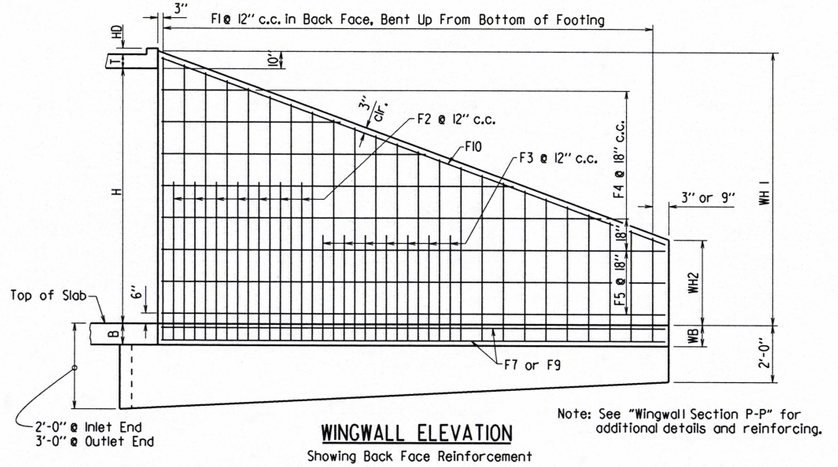

END ELEVATION

Flared Wingwalls Shown




TYPICAL KEYWAY DETAIL

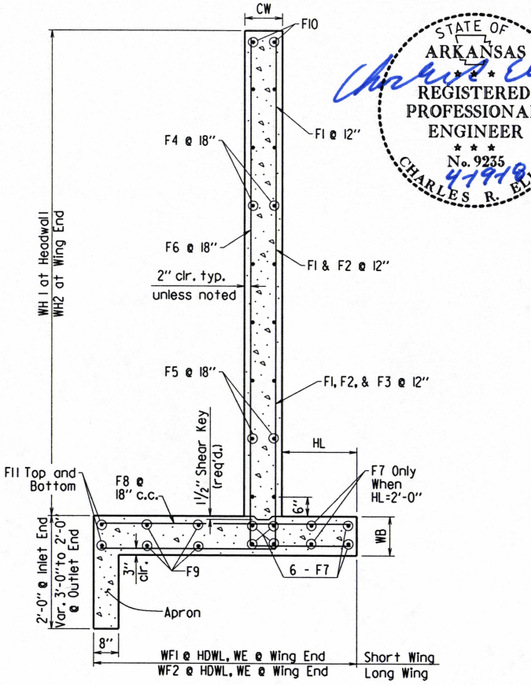
All Construction Joints




WINGWALL ELEVATION

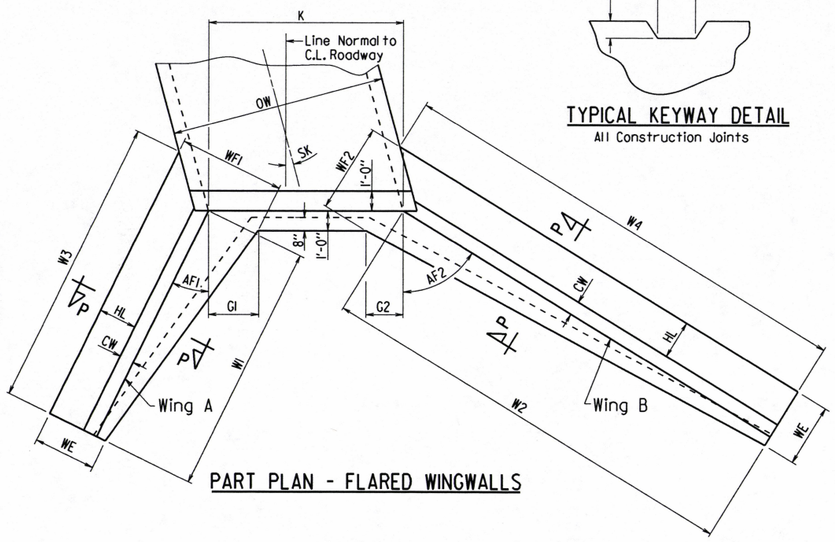
Showing Back Face Reinforcement

Note: See "Wingwall Section P-P" for additional details and reinforcing.

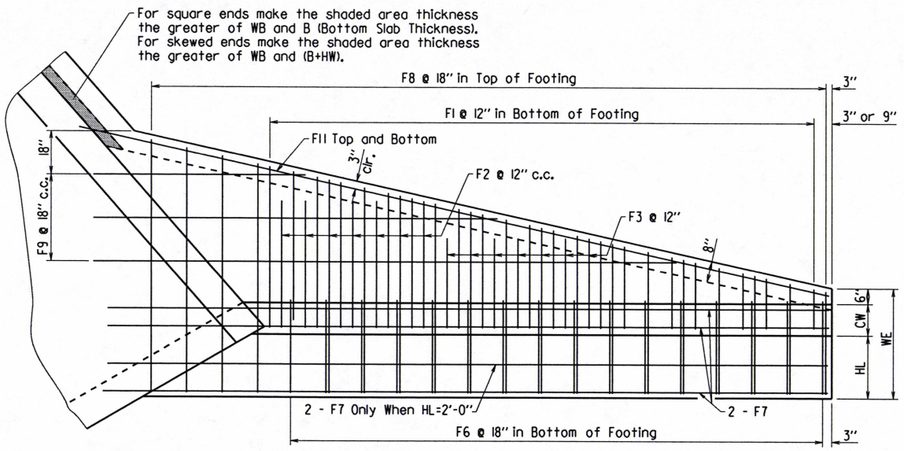



WINGWALL SECTION P-P

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
4-19-18

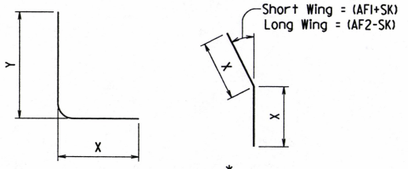



PART PLAN - FLARED WINGWALLS




PLAN - FLARED WINGWALLS

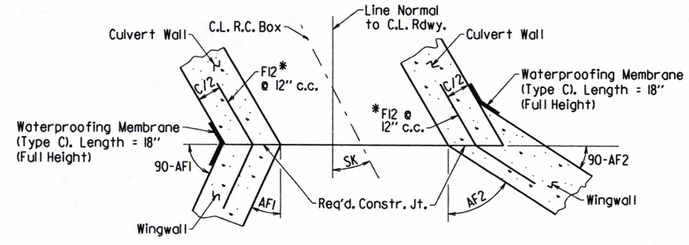
Showing Footing Reinforcement




F1, F2, F3, & F6 BARS

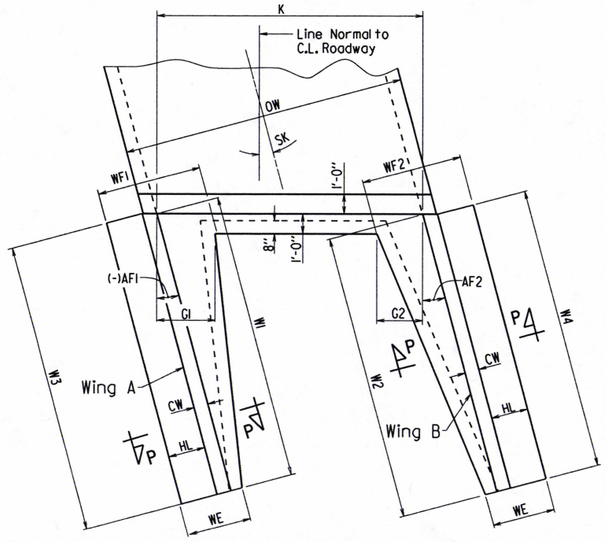
*F12 BAR

*F12 is a straight bar for parallel wingwalls

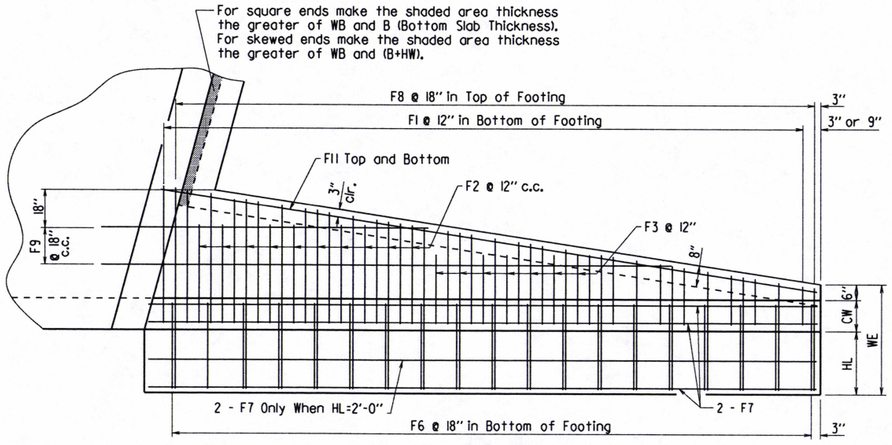



CONSTRUCTION JOINTS

Flared Wingwalls Shown




PART PLAN - PARALLEL WINGWALLS




PLAN - PARALLEL WINGWALLS

Showing Footing Reinforcement

# SHEET 4 OF 4
# GENERAL DETAILS OF R.C. BOX CULVERT
## DETAILS OF WINGWALLS
## SPECIAL DETAILS

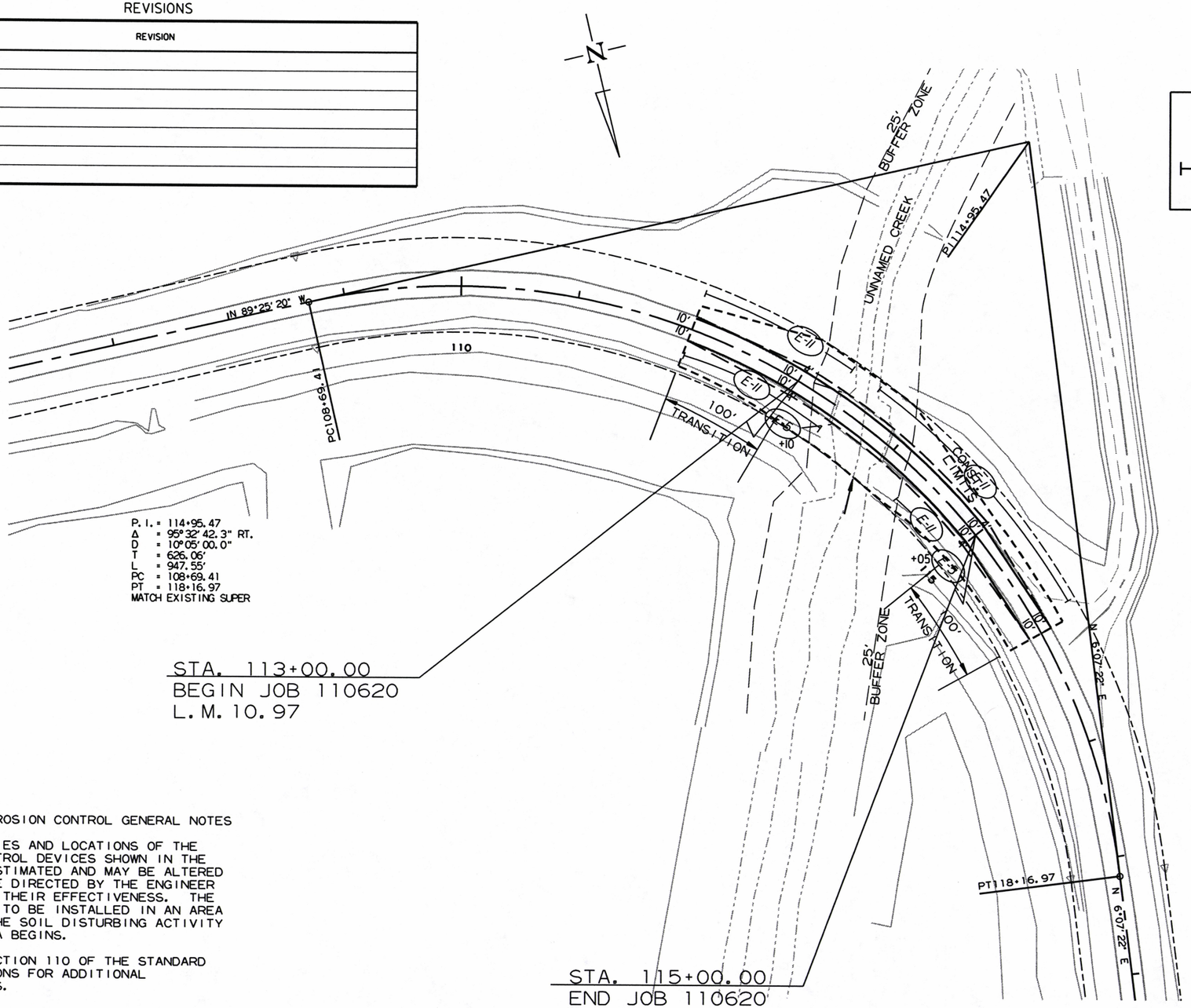
Culvert-General.dgn

REVISIONS

| DATE OF REVISION | REVISION |
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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 13 | 29 |

(2) TEMPORARY EROSION CONTROL DETAILS




P.I. = 114+95.47
Δ = 95°32'42.3" RT.
D = 10°05'00.0"
T = 626.06'
L = 947.55'
PC = 108+69.41
PT = 118+16.97
MATCH EXISTING SUPER

LEGEND

E-5 = SAND BAG DITCH CHECKS

E-11 = SILT FENCE

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-20-18

TEMPORARY EROSION CONTROL GENERAL NOTES

THE QUANTITIES AND LOCATIONS OF THE EROSION CONTROL DEVICES SHOWN IN THE PLANS ARE ESTIMATED AND MAY BE ALTERED IF AND WHERE DIRECTED BY THE ENGINEER TO MAXIMIZE THEIR EFFECTIVENESS. THE DEVICES ARE TO BE INSTALLED IN AN AREA ONLY WHEN THE SOIL DISTURBING ACTIVITY IN THAT AREA BEGINS.

REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SAND BAG DITCH CHECKS (E-5)

2 LOCATIONS = 44 BAGS

SILT FENCE (E-11)

| | | | |
|---|---|---|---|
| STA. 112+00 - STA. | 113+40 | LT. | 140' |
| STA. 113+60 - STA. | 115+90 | LT. | 230' |
| STA. 112+00 - STA. | 113+35 | RT. | 135' |
| STA. 114+30 - STA. | 115+00 | RT. | 70' |

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CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 14 | 29 |

(2) TEMPORARY EROSION CONTROL DETAILS

REVISIONS

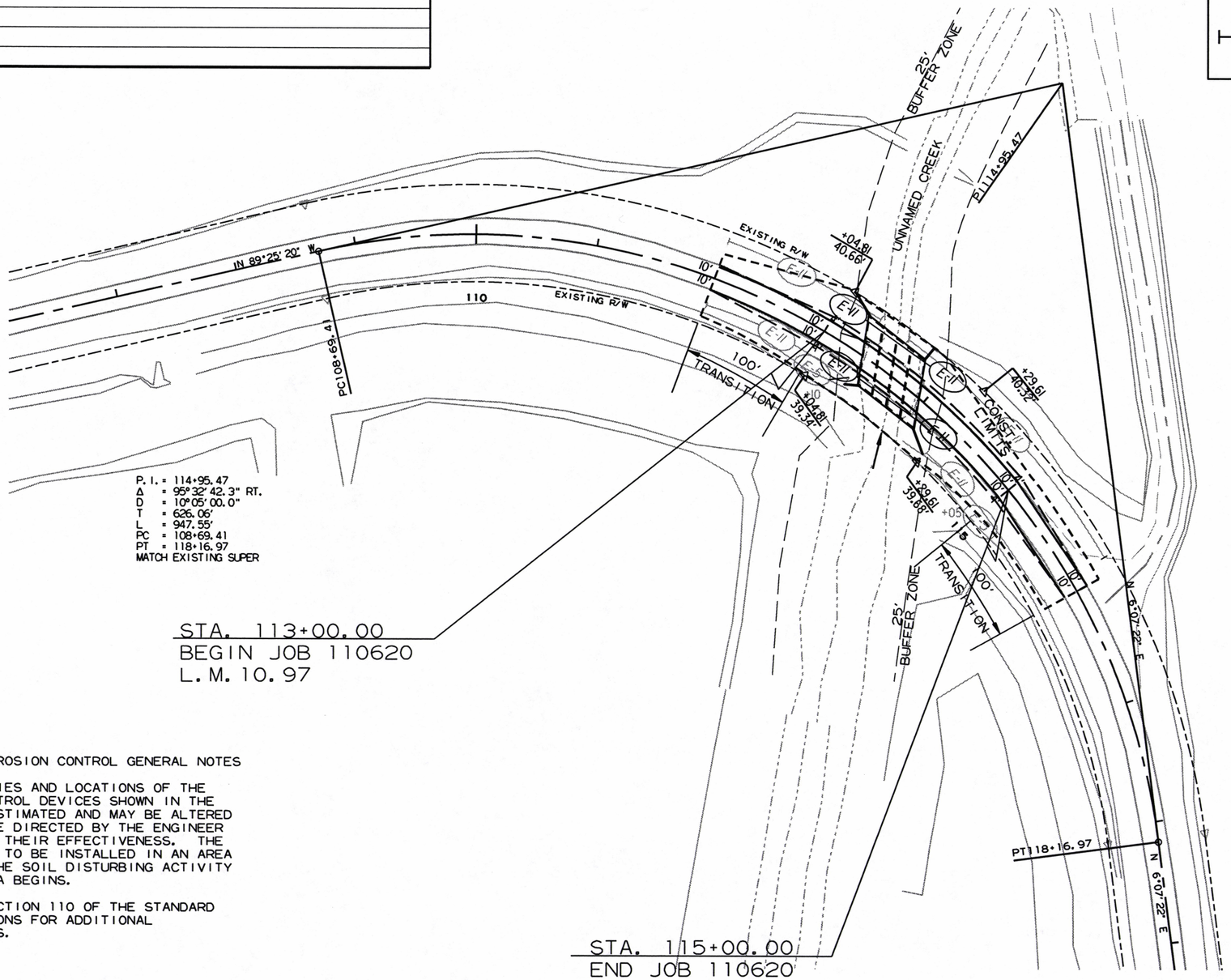
| DATE OF REVISION | REVISION |
|---|---|
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STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-20-18

LEGEND

E-5 = SAND BAG DITCH CHECKS

E-11 = SILT FENCE




P.I. = 114+95.47
Δ = 95°32' 42.3" RT.
D = 10°05' 00.0"
T = 626.06'
L = 947.55'
PC = 108+69.41
PT = 118+16.97
MATCH EXISTING SUPER

STA. 113+00.00
BEGIN JOB 110620
L.M. 10.97

STA. 115+00.00
END JOB 110620

SILT FENCE (E-11)

STA. 113+10 - STA. 114+00 LT. 90'
STA. 113+15 - STA. 114+25 LT. 110'

TEMPORARY EROSION CONTROL GENERAL NOTES

THE QUANTITIES AND LOCATIONS OF THE EROSION CONTROL DEVICES SHOWN IN THE PLANS ARE ESTIMATED AND MAY BE ALTERED IF AND WHERE DIRECTED BY THE ENGINEER TO MAXIMIZE THEIR EFFECTIVENESS. THE DEVICES ARE TO BE INSTALLED IN AN AREA ONLY WHEN THE SOIL DISTURBING ACTIVITY IN THAT AREA BEGINS.

REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

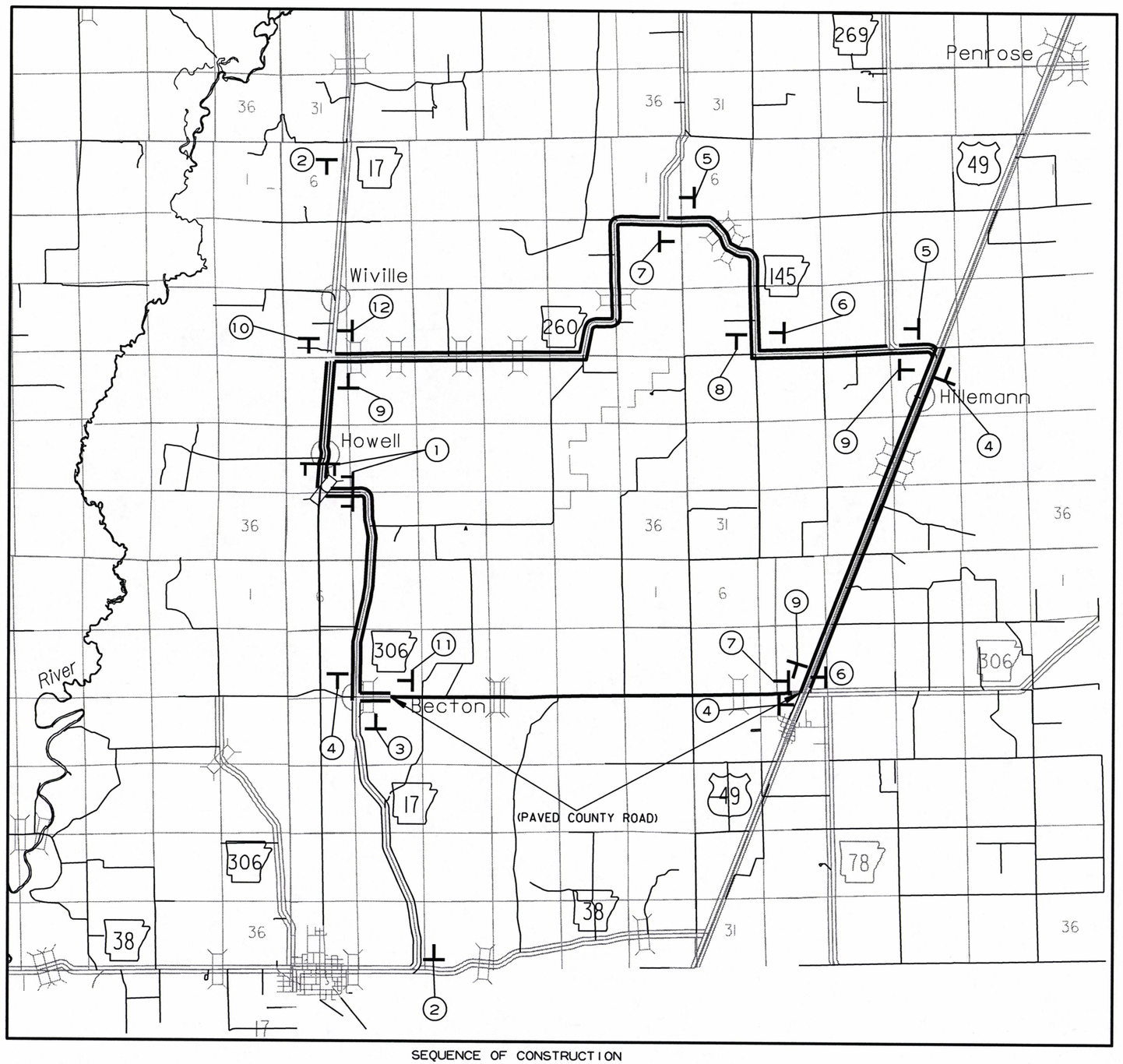
STAGE I
TEMPORARY EROSION CONTROL DETAILS

3/2/2018

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 15 | 29 |

(2) MAINTENANCE OF TRAFFIC




SEQUENCE OF CONSTRUCTION

STAGE 1 -
CLOSE ROADWAY SITE TO TRAFFIC (DO ALL WORK)

STAGE 2 -
REOPEN ROADWAY TO TRAFFIC

(1)
ROAD CLOSED — (1) R11-2 (48" X 30")
8' BARR. TYP. III RT.
8' BARR. TYP. III LT.

(2)
DETOUR AHEAD — (1) W20-2 (48" X 48")
17 — (1) M1-5 (MODIFIED) (24" X 24")
(1) M6-3 (21" X 15")
ROAD CLOSED MILES AHEAD LOCAL TRAFFIC ONLY — (1) R11-3a (60" X 30")

(3)
DETOUR — (1) M4-10R (48" X 18")
NORTH — (1) M3-1 (24" X 12")
17 — (1) M1-5 (MODIFIED) (24" X 24")
ROAD CLOSED TO THRU TRAFFIC — (1) R11-4 (60" X 30")

(4)
DETOUR — (1) M4-10L (48" X 18")
NORTH — (1) M3-1 (24" X 12")
17 — (1) M1-5 (MODIFIED) (24" X 24")

(5)
DETOUR — (1) M4-8 (24" X 12")
NORTH — (1) M3-1 (24" X 12")
17 — (1) M1-5 (MODIFIED) (24" X 24")7
(1) M6-3 (21" X 15")

(6)
DETOUR — (1) M4-10R (48" X 18")
NORTH — (1) M3-1 (24" X 12")
17 — (1) M1-5 (MODIFIED) (24" X 24")

(7)
DETOUR — (1) M4-8 (24" X 12")
SOUTH — (1) M3-3 (24" X 12")
17 — (1) M1-5 (MODIFIED) (24" X 24")
(1) M6-3 (21" X 15")

(8)
DETOUR — (1) M4-10L (48" X 18")
SOUTH — (1) M3-3 (24" X 12")
17 — (1) M1-5 (MODIFIED) (24" X 24")

(9)
DETOUR — (1) M4-10R (48" X 18")
SOUTH — (1) M3-3 (24" X 12")
17 — (1) M1-5 (MODIFIED) (24" X 24")

(10)
DETOUR — (1) M4-10L (48" X 18")
SOUTH — (1) M3-x (24" X 12")
17 — (1) M1-5 (MODIFIED) (24" X 24")
ROAD CLOSED TO THRU TRAFFIC — (1) R11-4 (60" X 30")

(11)
NORTH — (1) M3-1 (24" X 12")
17 — (1) M1-5 (MODIFIED) (24" X 24")
ROAD CLOSED TO THRU TRAFFIC — (1) R11-4 (60" X 30")

(12)
SOUTH — (1) M3-3 (24" X 12")
17 — (1) M1-5 (MODIFIED) (24" X 24")
ROAD CLOSED TO THRU TRAFFIC — (1) R11-4 (60" X 30")

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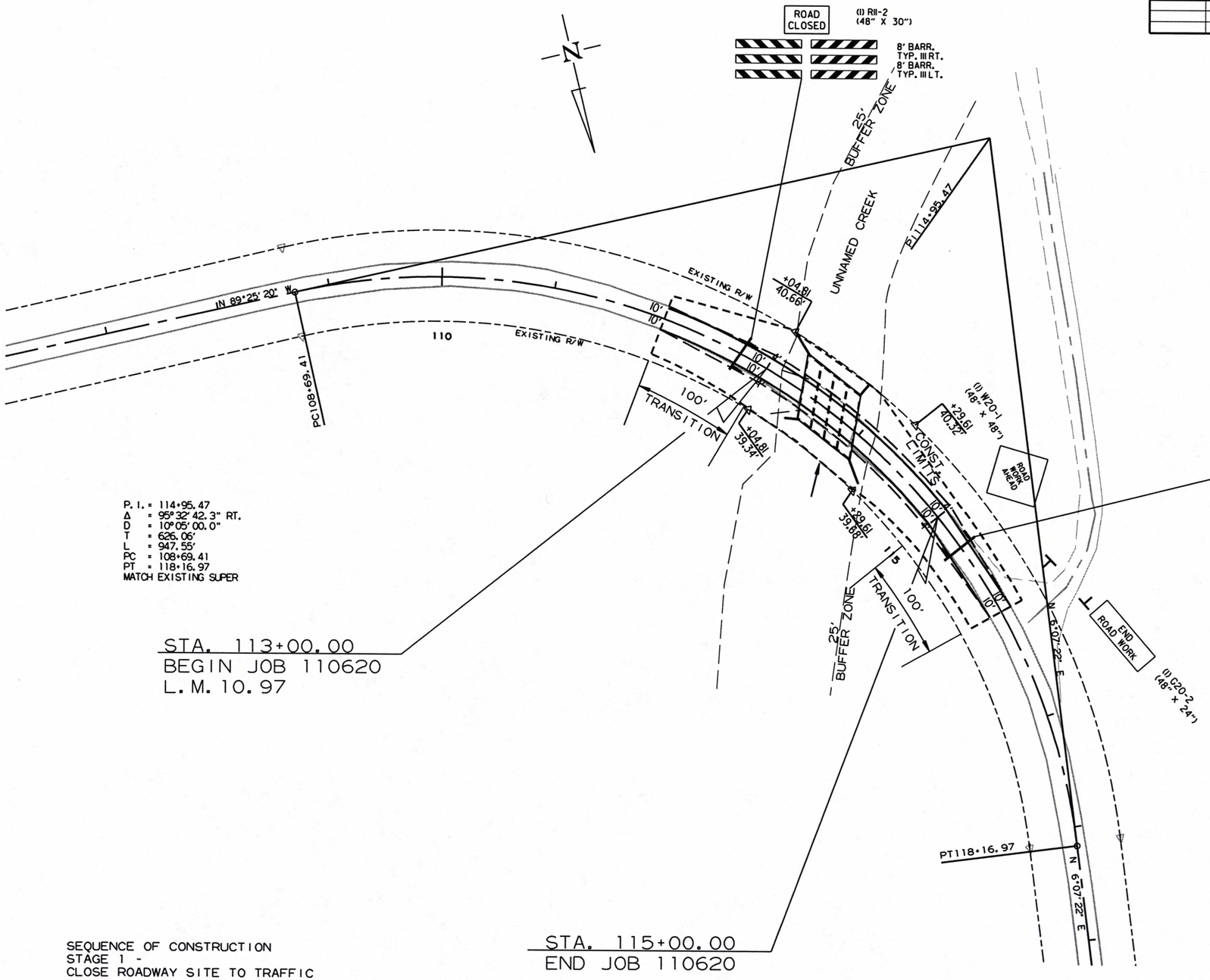
R110620.DGN

MAINTENANCE OF TRAFFIC

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 16 | 29 |

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-20-18




P. I. = 114+95.47
Δ = 95°32' 42.3" RT.
D = 10°05' 00.0"
T = 626.06'
L = 947.55'
PC = 108+69.41
PT = 118+16.97
MATCH EXISTING SUPER

STA. 113+00.00
BEGIN JOB 110620
L.M. 10.97

STA. 115+00.00
END JOB 110620

SEQUENCE OF CONSTRUCTION
STAGE 1 -
CLOSE ROADWAY SITE TO TRAFFIC
(DO ALL WORK)

STAGE 2 -
REOPEN ROADWAY TO TRAFFIC

3/2/2018

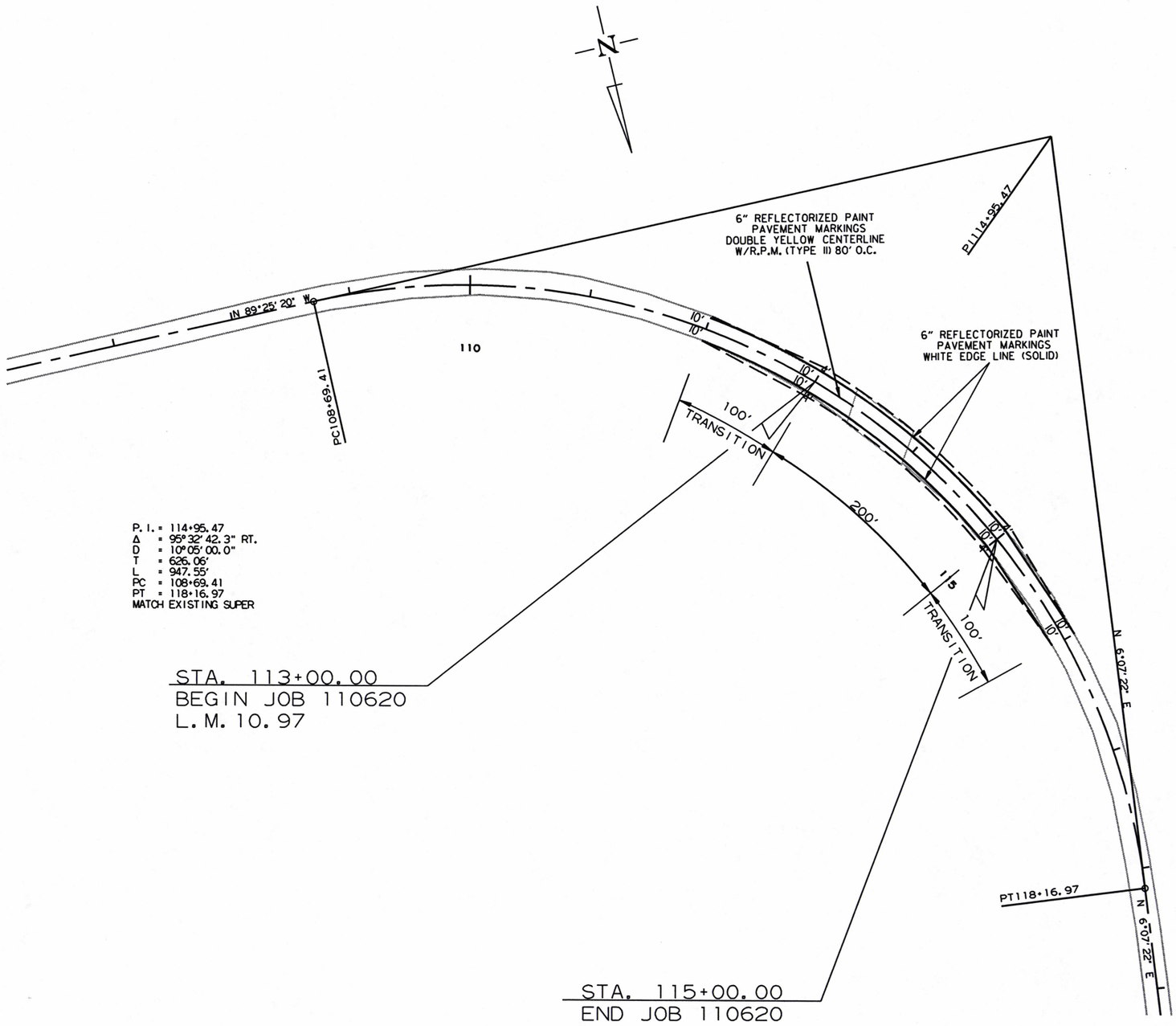
R110620.DGN

STAGE I
MAINTENANCE OF TRAFFIC

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 17 | 29 |

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-20-18




REFLECTORIZED PAINT PAVEMENT MARKINGS

6" WHITE SOLID = 800 LIN. FT.
6" DBL. YELLOW = 800 LIN. FT.

RAISED PAVEMENT MARKERS (TYPE II)

(YELLOW/YELLOW) (80' O.C.) = 5 EACH

* THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

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PERMANENT PAVEMENT MARKING DETAILS

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 18 | 29 |

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-20-18

## CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

| DESCRIPTION | STAGE 1 | END OF JOB | RAISED PAVEMENT MARKERS | REFLECTORIZED PAINT PAVEMENT MARKING | |
|---|---|---|---|---|---|
| | | | TYPE II | 6" | |
| | | | (YEL/YEL) | WHITE | YELLOW |
| | LIN. FT. - EACH | | EACH | LIN. FT. | |
| RAISED PAVEMENT MARKERS TYPE II (YEL/YEL) | 5 | | 5 | | |
| | | | | | |
| | | | | | |
| REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6") | 800 | | | 800 | |
| REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6") | 800 | | | | 800 |
| | | | | | |
| | | | | | |
| | | | | | |
| **TOTALS:** | | | **5** | **800** | **800** |

NOTE: THIS IS A LOW TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

NOTE: THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT.
THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING.
CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

## ADVANCE WARNING SIGNS AND DEVICES

| SIGN NUMBER | DESCRIPTION | SIGN SIZE | STAGE 1 | END OF JOB | MAXIMUM NUMBER REQUIRED | TOTAL SIGNS REQUIRED | | BARRICADES (TYPE III) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | RIGHT | LEFT |
| | | | LIN. FT. - EACH | | | NO. | SQ. FT. | LIN. FT. | |
| W20-1 | ROAD WORK AHEAD | 48"x48" | 1 | | 1 | 1 | 16.0 | | |
| G20-2 | END ROAD WORK | 48"x24" | 1 | | 1 | 1 | 8.0 | | |
| M1-5 | HWY. 17 | 24"x24" | 19 | | 19 | 19 | 76.0 | | |
| M3-1 | NORTH | 24'x12" | 9 | | 9 | 9 | 18.0 | | |
| M3-3 | SOUTH | 24'x12" | 8 | | 8 | 8 | 16.0 | | |
| M4-10L | DETOUR (ARROW) | 48"x18" | 5 | | 5 | 5 | 30.0 | | |
| M410R | DETOUR (ARROW) | 48"x18" | 6 | | 6 | 6 | 36.0 | | |
| M4-8 | DETOUR | 24"x12" | 4 | | 4 | 4 | 8.0 | | |
| M6-3 | ARROW | 21"x15" | 6 | | 6 | 6 | 13.1 | | |
| RII-2 | ROAD CLOSED | 48"x30" | 2 | | 2 | 2 | 20.0 | | |
| RII-3a | ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY | 60"x30" | 2 | | 2 | 2 | 25.0 | | |
| RII-4 | ROAD CLOSED TO THRU TRAFFIC | 60"x30" | 4 | | 4 | 4 | 50.0 | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | TYPE III BARRICADE-RT. (8') | | 2 | | 2 | | | 16 | |
| | TYPE III BARRICADE-LT. (8') | | 2 | | 2 | | | | 16 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| **TOTALS:** | | | | | | | **316.1** | **16** | **16** |

NOTE: THIS IS A LOW TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 19 | 29 |

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-20-18

## REMOVAL OF EXISTING BRIDGE STRUCTURE

| STATION | STATION | LOCATION | LUMP SUM |
|---|---|---|---|
| 113+36 | 113+94 | BRIDGE M3207 (SITE NO. 1) | 1.00 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | 1.00 |

## SOIL LOG

| STATION | LOCATION | DEPTH FEET | LIQUID LIMIT | PLASTICITY INDEX | AASHTO CLASSIFICATION | COLOR |
|---|---|---|---|---|---|---|
| 109+00 | 06' RT. | 0-5 | 36 | 20 | A-6(19) | GRAY |
| 109+00 | 20' RT. | 0-5 | 29 | 12 | A-6(8) | GRAY |
| 118+00 | 06' LT. | 0-5 | 26 | 6 | A-4(4) | GRAY |
| 118+00 | 15' LT. | 0-5 | 25 | 5 | A-4(4) | GRAY |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

SOIL CHARACTERISTICS TABULATED ABOVE ARE REPRESENTATIVE AT THE LOCATION OF THE SAMPLE, AND FROM SURFACE INDICATIONS ARE TYPICAL FOR THE LIMITS SHOWN. THESE DATA ARE SHOWN FOR INFORMATION ONLY. THE STATE WILL NOT BE RESPONSIBLE FOR VARIATIONS IN THE SOIL CHARACTERISTICS AND/OR EXTENT OF SAME DIFFERING FROM THE ABOVE TABULATIONS.
Z- AUGER REFUSAL
NP - NON-PLASTIC
ND - NOT DETERMINABLE

## EARTHWORK

| STATION | STATION | LOCATION / DESCRIPTION | UNCLASSIFIED EXCAVATION | COMPACTED EMBANKMENT | STONE BACKFILL | * SOIL STABILIZATION |
|---|---|---|---|---|---|---|
| | | | CU. YD. | | TON | TON |
| ENTIRE | PROJECT | STAGE 1-MAIN LANES | 655 | 424 | | |
| ENTIRE | PROJECT | R.C. BOX CULVERT | | | 680 | |
| | | | | | | |
| | | CHANNEL CHANGE | 790 | | | |
| | | | | | | |
| | | | | | | |
| * ENTIRE | PROJECT | TO BE USED IF AND WHERE | | | | 50 |
| | | DIRECTED BY THE ENGINEER | | | | |
| | | | | | | |
| **TOTALS:** | | | **1445** | **424** | **680** | **50** |

* QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.

NOTE: EARTHWORK QUANTITIES SHOWN ABOVE SHALL BE PAID AS PLAN QUANTITY.

## BENCH MARKS

| STATION | LOCATION | BENCH MARKS EACH |
|---|---|---|
| 113+24 | R.C. BOX CULVERT ON RT. | 1 |
| | | |
| | | |
| **TOTAL:** | | **1** |

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

## DUMPED RIPRAP AND FILTER BLANKET

| STATION | LOCATION | DUMPED RIPRAP CU. YD. | FILTER BLANKET SQ. YD. |
|---|---|---|---|
| 113+66 | WINGWALLS OF R.C. BOX CULVERT | 11 | 22 |
| | TO BE USED IF AND WHERE | | |
| | DIRECTED BY THE ENGINEER * | | |
| | | | |
| **TOTALS:** | | **11** | **22** |

*NOTE: QUANTITIES ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS

NOTE: FILTER BLANKET SHALL BE GEOTEXTILE FABRIC (TYPE 5).

## 4" PIPE UNDERDRAIN

| STATION | STATION | LOCATIONS | 4" PIPE UNDERDRAINS LIN. FT. | UNDERDRAIN OUTLET PROTECTORS EACH |
|---|---|---|---|---|
| * ENTIRE PROJECT TO BE USED IF AND | | | 50 | 2 |
| WHERE DIRECTED BY THE ENGINEER | | | | |
| | | | | |
| **TOTALS:** | | | **50** | **2** |

* NOTE: QUANTITIES ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.

## COLD MILLING ASPHALT PAVEMENT

| STATION | STATION | LOCATION | AVG. WIDTH FEET | COLD MILLING ASPHALT PAVEMENT SQ. YD. |
|---|---|---|---|---|
| 112+00.00 | 113+00.00 | MAIN LANES | 20.00 | 222.22 |
| 115+00.00 | 116+00.00 | MAIN LANES | 20.00 | 222.22 |
| | | | | |
| | | | | |
| **TOTAL:** | | | | **444.44** |

NOTE: AVERAGE MILLING DEPTH 1".

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 20 | 29 |

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-20-18

## CLEARING AND GRUBBING

| STATION | STATION | LOCATION | CLEARING | GRUBBING |
|---|---|---|---|---|
| | | | STATION | |
| 113+00 | 115+00 | | 2 | 2 |
| | | | | |
| | | | | |
| | | | | |
| TOTALS: | | | 2 | 2 |

## STRUCTURES OVER 20'-0" SPAN

| STATION | DESCRIPTION | SPAN | HEIGHT | LENGTH | CLASS S CONCRETE-ROADWAY | REINF. STEEL-ROADWAY (GRADE 60) | UNCL.EXC. FOR STR.-ROADWAY | SOLID SODDING | WATER | STD. DWG. NOS. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | LIN. FT. | | | CU.YD. | POUND | CU.YD. | SQ.YD. | M.GAL. | |
| 113+66 | CONSTRUCT QUAD. 12' X 7' X 56' | 12 | 7 | 56 | 329.22 | 58146 | 136 | 43 | 0.54 | PBC-1, RCB-1,RCB-2,SPECIAL DETAILS |
| | R.C. BOX CULVERT ON 30^ RT. FWD. SKEW | | | | | | | | | |
| | WITH 2:1 WINGS | | | | | | | | | |
| | | | | | | | | | | |
| TOTALS: | | | | | 329.22 | 58146 | 136 | 43 | 0.54 | |

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

## EROSION CONTROL

| STATION | STATION | LOCATION | PERMANENT EROSION CONTROL | | | | | TEMPORARY EROSION CONTROL | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SEEDING | LIME | MULCH COVER | WATER | SECOND SEEDING APPLICATION | TEMPORARY SEEDING | MULCH COVER | WATER | SAND BAG DITCH CHECKS (E-5) | SILT FENCE (E-11) |
| | | | ACRE | TON | ACRE | M.GAL. | ACRE | ACRE | ACRE | M.GAL. | BAG | LIN. FT. |
| ENTIRE | PROJECT | CLEARING AND GRUBBING | | | | | | 0.37 | 0.37 | 7.5 | | 575 |
| ENTIRE | PROJECT | STAGE 1 | 0.24 | 0.48 | 0.24 | 24.5 | 0.24 | 0.24 | 0.24 | 4.9 | 44 | 200 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| *ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER. | | | | | | | | 0.24 | 0.24 | 4.9 | | |
| | | | | | | | | | | | | |
| TOTALS: | | | 0.24 | 0.48 | 0.24 | 24.5 | 0.24 | 0.85 | 0.85 | 17.3 | 44 | 775 |

BASIS OF ESTIMATE:
LIME .....2 TONS / ACRE OF SEEDING
WATER.....102.0 M.G. / ACRE OF SEEDING
WATER.....20.4 M.G. / ACRE OF TEMPORARY SEEDING
SAND BAG DITCH CHECKS.....22 BAGS / LOCATION

NOTE: THE TEMPORARY EROSION CONTROL DEVICES SHOWN ABOVE AND ON THE PLANS SHALL BE INSTALLED IN SUCH A SEQUENCE AS TO DETER EROSION AND SEDIMENTATION ON U.S. WATERWAYS AS EXPLAINED BY THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT.

*QUANTITIES ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.

3/5/2018

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 21 | 29 |

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-20-18

## BASE AND SURFACING

| STATION | STATION | LOCATION | LENGTH | AGGREGATE BASE COURSE (CLASS 7) | | TACK COAT | | | | ACHM BINDER COURSE (1") | | | | ACHM SURFACE COURSE (1/2") | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TON / STATION | TON | AVG. WID. | SQ.YD. | GALLONS / SQ.YD. | GALLON | AVG. WID. | SQ.YD. | POUND / SQ.YD. | PG 64-22 | AVG. WID. | SQ.YD. | POUND / SQ.YD. | TOTAL PG 64-22 |
| | | | FEET | | | FEET | | | | FEET | | | TON | FEET | | | TON |
| MAIN LANES | | | | | | | | | | | | | | | | | |
| 112+00.00 | 113+00.00 | 100' TRANSITION | 100.00 | 41.50 | 41.50 | 20.00 | 222.22 | 0.17 | 37.78 | | | | | 22.00 | 244.44 | 220.00 | 26.89 |
| 113+00.00 | 113+17.00 | NOTCH & WIDEN - MAIN LANES | 17.00 | 83.00 | 14.11 | 20.00 | 37.78 | 0.17 | 6.42 | | | | | 24.00 | 45.33 | 220.00 | 4.99 |
| 113+17.00 | 114+13.00 | FULL DEPTH - MAIN LANES | 96.00 | 83.00 | 79.68 | 40.58 | 432.85 | 0.05 | 21.64 | 20.58 | 219.52 | 1100.00 | 120.74 | 24.00 | 256.00 | 220.00 | 28.16 |
| 114+13.00 | 115+00.00 | NOTCH & WIDEN - MAIN LANES | 87.00 | 83.00 | 72.21 | 20.00 | 193.33 | 0.17 | 32.87 | | | | | 24.00 | 232.00 | 220.00 | 25.52 |
| 115+00.00 | 116+00.00 | 100' TRANSITION | 100.00 | 41.50 | 41.50 | 20.00 | 222.22 | 0.17 | 37.78 | | | | | 22.00 | 244.44 | 220.00 | 26.89 |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| ADDITIONAL FOR LEVELING | | | | | | | | | | | | | | | | | |
| 113+00.00 | 113+17.00 | | 17.00 | | | 20.00 | 37.78 | 0.05 | 1.89 | | | | | 20.00 | 37.78 | VAR. | 4.16 |
| 114+13.00 | 115+00.00 | | 87.00 | | | 20.00 | 193.33 | 0.05 | 9.67 | | | | | 20.00 | 193.33 | VAR. | 21.27 |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| ADDITIONAL FOR SUPERELEVATION | | | | | | | | | | | | | | | | | |
| 113+00.00 | 115+00.00 | | 200.00 | 33.00 | 66.00 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| **TOTALS:** | | | | | **315.00** | | **1339.51** | | **148.05** | | **219.52** | | **120.74** | | **1253.32** | | **137.88** |

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.7% MIN. AGGR.....4.3% ASPHALT BINDER

MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

3/5/2018

R110620.DGN

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| 11/1/2018 | | | | 6 | ARK. | | | |
| 11/8/2018 | | | | JOB NO. | | 110620 | 22 | 29 |
| 11/14/2018 | | | | | | | | |

(2) SUMMARY OF QUANTITIES AND REVISIONS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-16-18

## SUMMARY OF QUANTITIES

| ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 201 | CLEARING | 2 | STATION |
| 201 | GRUBBING | 2 | STATION |
| 207 | STONE BACKFILL | 680 | TON |
| 210 | UNCLASSIFIED EXCAVATION | 1445 | CU. YD. |
| 210 | COMPACTED EMBANKMENT | 424 | CU. YD. |
| SP & 210 | SOIL STABILIZATION | 50 | TON |
| SS & 303 | AGGREGATE BASE COURSE (CLASS 7) | 315 | TON |
| SS & 401 | TACK COAT | 148 | GAL. |
| SP, SS, & 406 | MINERAL AGGREGATE IN ACHM BINDER COURSE (1") | 116 | TON |
| SP, SS, & 406 | ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1") | 5 | TON |
| SP, SS, & 407 | MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2") | 131 | TON |
| SP, SS, & 407 | ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2") | 7 | TON |
| 412 | COLD MILLING ASPHALT PAVEMENT | 444 | SQ. YD. |
| 601 | MOBILIZATION | 1.00 | LUMP SUM |
| SP & 602 | FURNISHING FIELD OFFICE | 1 | EACH |
| SP & 603 | MAINTENANCE OF TRAFFIC | 1.00 | LUMP SUM |
| SS & 604 | SIGNS | 316 | SQ. FT. |
| SS & 604 | BARRICADES | 32 | LIN. FT. |
| SS & 611 | 4" PIPE UNDERDRAINS | 50 | LIN. FT. |
| SS & 611 | UNDERDRAIN OUTLET PROTECTORS | 2 | EACH |
| 620 | LIME | 1 | TON |
| 620 | SEEDING | 0.24 | ACRE |
| SS & 620 | MULCH COVER | 1.09 | ACRE |
| 620 | WATER | 42.3 | M. GAL. |
| 621 | TEMPORARY SEEDING | 0.85 | ACRE |
| 621 | SILT FENCE | 775 | LIN. FT. |
| 621 | SAND BAG DITCH CHECKS | 44 | BAG |
| 623 | SECOND SEEDING APPLICATION | 0.24 | ACRE |
| 624 | SOLID SODDING | 43 | SQ. YD. |
| 635 | ROADWAY CONSTRUCTION CONTROL | 1.00 | LUMP SUM |
| 718 | REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6") | 800 | LIN. FT. |
| 718 | REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6") | 800 | LIN. FT. |
| 721 | RAISED PAVEMENT MARKERS (TYPE II) | 5 | EACH |
| 816 | FILTER BLANKET | 22 | SQ. YD. |
| 816 | DUMPED RIPRAP | 11 | CU. YD. |
| | | | |
| | | | |
| **STRUCTURES OVER 20' SPAN** | | | |
| 205 | REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1) | 1.00 | LUMP SUM |
| 801 | UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY | 136 | CU. YD. |
| SS & 802 | CLASS S CONCRETE-ROADWAY | 329.22 | CU. YD. |
| 804 | REINFORCING STEEL-ROADWAY (GRADE 60) | 58146 | POUND |
| | | | |

## REVISIONS

| DATE | REVISION | SHEET NUMBER |
|---|---|---|
| 11/1/2018 | REVISED STANDARD DRAWING - SI-1; ADDED SPECIAL PROVISIONS - FLEXIBLE BEGINNING OF WORK, SETTLEMENT AGREEMENTS; ADDED SUPPLEMENTAL SPECIFICATIONS - 400-5, 400-6, 410-2, 600-2, 800-1, 802-3; REVISED ALL SPECIAL PROVISIONS. | 2, 3, & 22 |
| 11/8/2018 | ADDED GENERAL NOTE NO. 8 | 3, 22 |
| 11/14/2018 | ADDED SUPPLEMENTAL SPECIFICATION; 306-1 | 3, 22 |
| | | |
| | | |
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| | | |

11/14/2018

R110620.DGN

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 23 | 29 |

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-20-18

SURVEY CONTROL COORDINATES

Project Name: s110620
Date: 8/15/2016
Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, BASED ON STATIC GPS PTS 1 - 6 PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

| Point Name | Northing | Easting | Elev | Feature | Description |
|---|---|---|---|---|---|
| 1 | 282258.3703 | 1540050.5864 | 215.183 | CTL | STD AHTD MON STAMPED PN: 1 |
| 2 | 282240.2627 | 1539180.7169 | 210.345 | CTL | STD AHTD MON STAMPED PN: 2 |
| 3 | 282248.4529 | 1538266.1886 | 204.712 | CTL | STD AHTD MON STAMPED PN: 3 |
| 4 | 282563.3504 | 1537857.0923 | 205.491 | CTL | STD AHTD MON STAMPED PN: 4 |
| 5 | 283166.7903 | 1537826.2221 | 203.018 | CTL | STD AHTD MON STAMPED PN: 5 |
| 6 | 284223.7352 | 1537924.4640 | 213.272 | CTL | STD AHTD MON STAMPED PN: 6 |
| 900 | 282448.4653 | 1537937.9885 | 207.424 | TBM | SQUARE CUT IN BR HUB RAIL |
| 990 | 292493.4486 | 1586587.7640 | 209.250 | BM | NGS BM Z 177 |

*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
ALL DISTANCES ARE GROUND.
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAF OF 0.9999602978 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAF.
GRID COORDINATES ARE STORED UNDER FILE NAME: s110620gi.CTL
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.

REFERENCE POINTS (1500 SERIES) ARE TO BE USED TO ESTABLISH CONTROL IF THE PRIMARY CONTROL POINTS LISTED ABOVE HAVE BEEN DESTROYED.
REFERENCE POINTS ARE NOT TO BE USED FOR VERTICAL CONTROL

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: BASED ON STATIC GPS POINTS 1-6
CONVERGENCE ANGLE: 00-26-22 RIGHT AT LT: N35-06-23 LG: W091-14-41
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

CONSTRUCT

| POINT NO. | TYPE | STATION | NORTHING | EASTING |
|---|---|---|---|---|
| 8000 | POB | 100+00.00 | 282251.5127 | 1539241.7536 |
| 8001 | PC | 108+69.41 | 282260.2804 | 1538372.3872 |
| 8003 | PT | 118+16.97 | 282889.0815 | 1537813.1364 |
| 8004 | POE | 126+01.87 | 283669.5081 | 1537896.8554 |

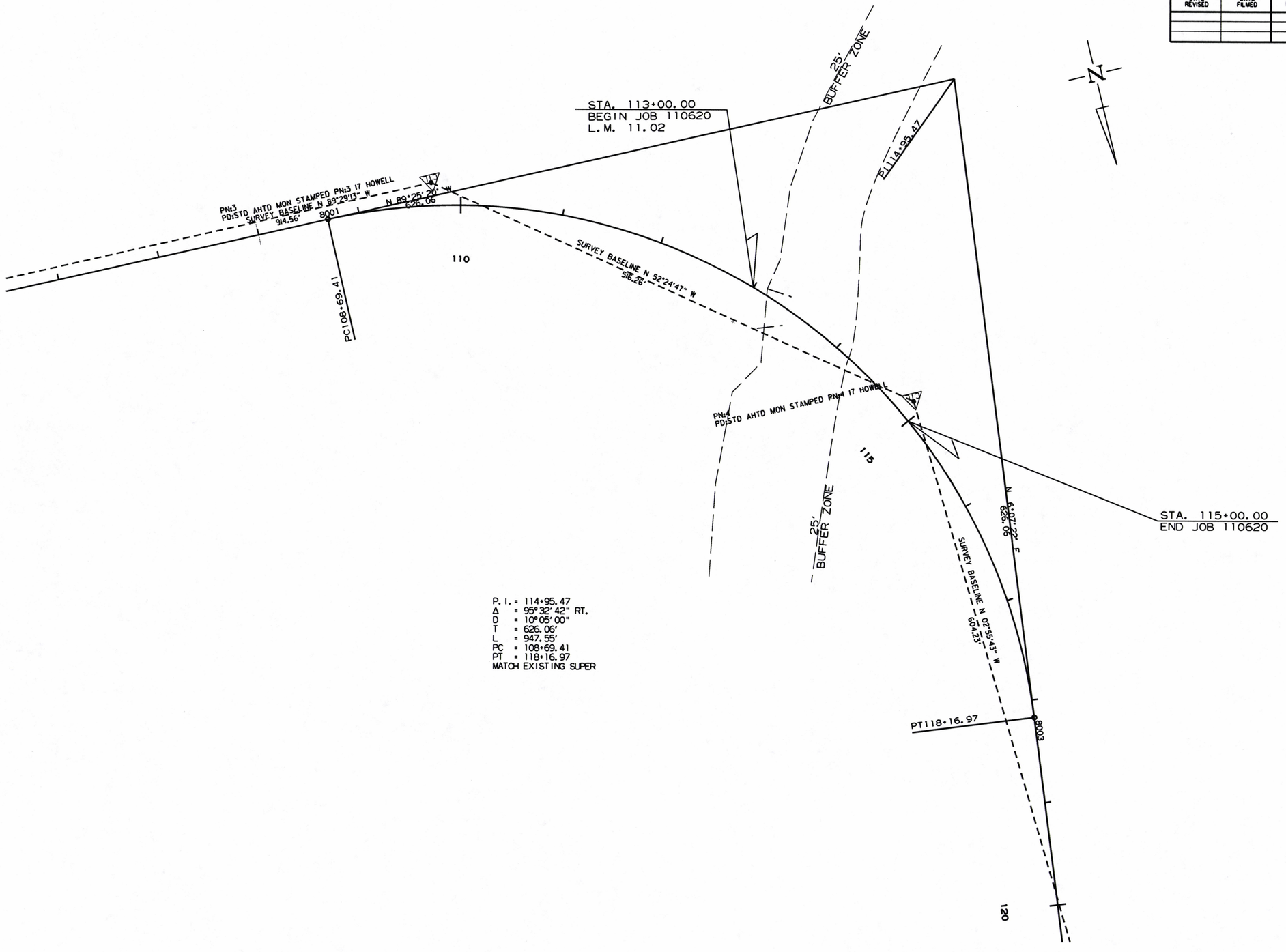
R110620.DGN 3/5/2018

SURVEY CONTROL DETAILS

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 24 | 29 |

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-20-18




3/5/2018

R110620.DGN

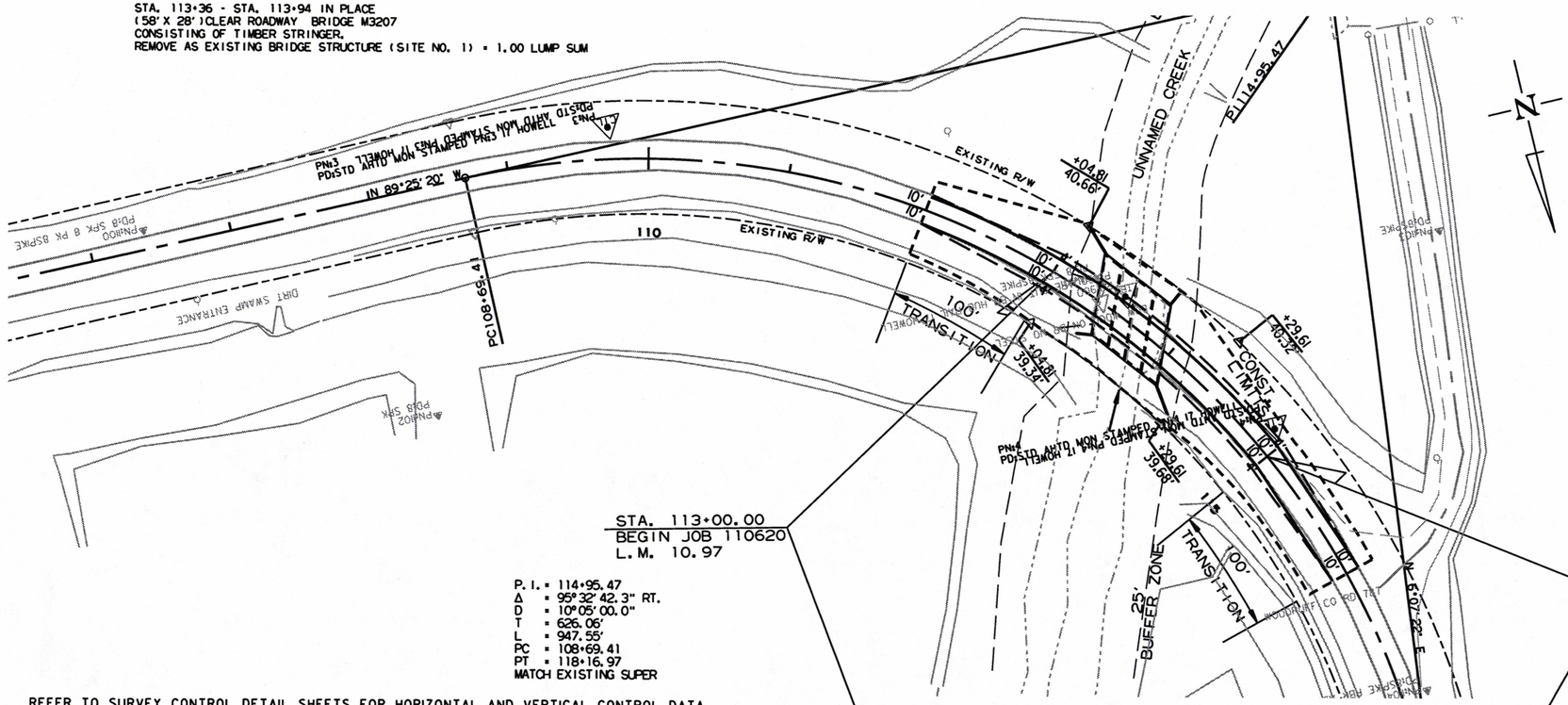
SURVEY CONTROL DETAILS

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 25 | 29 |

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-20-18

STA. 113+36 - STA. 113+94 IN PLACE
(58' X 28') CLEAR ROADWAY BRIDGE M3207
CONSISTING OF TIMBER STRINGER.
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1) = 1.00 LUMP SUM




P.I. = 114+95.47
Δ = 95° 32' 42.3" RT.
D = 10° 05' 00.0"
T = 626.06'
L = 947.55'
PC = 108+69.41
PT = 118+16.97
MATCH EXISTING SUPER

NOTE: ALL CONSTRUCTION MUST BE PERFORMED WITHIN EXISTING RIGHT OF WAY LIMITS.

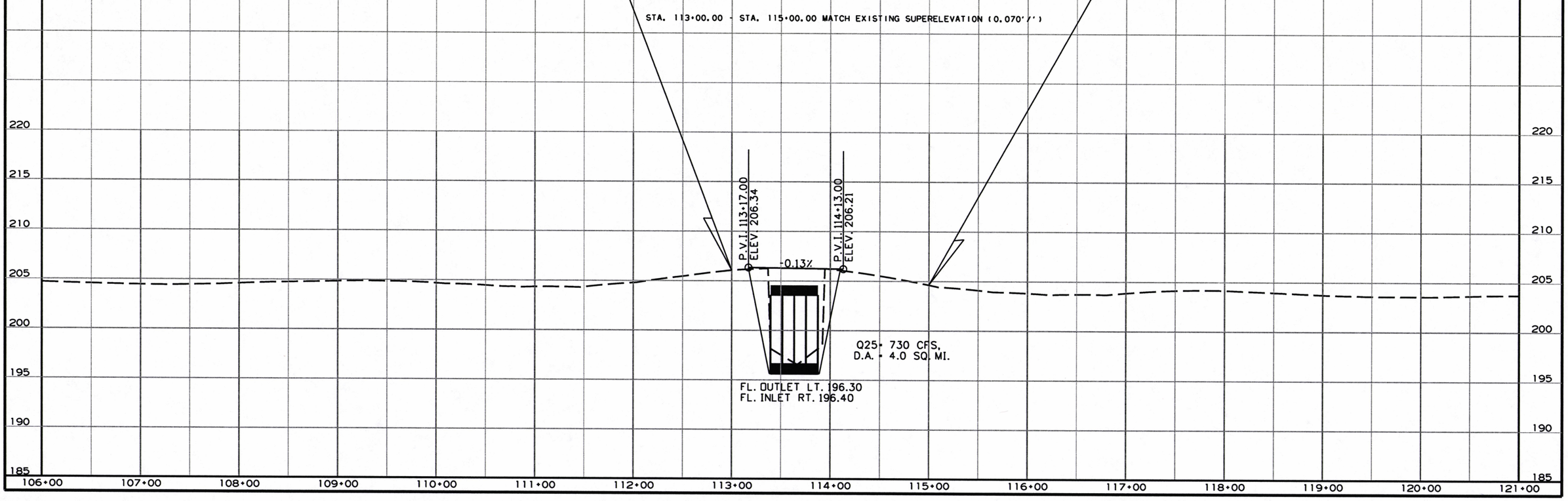
STA. 113+66.00 CONSTRUCT
QUAD. 12' X 7' X 56'
R.C. BOX CULVERT ON
30 RT. FWD. SKEW
WITH 2:1 WINGS LT. & RT.
Q25 = 730 CFS, D.A. = 4.0 SQ. MI.

NOTE:
STONE BACKFILL SHALL BE USED FOR UNDERCUT OF THE R.C. BOX CULVERT. THE UNDERCUT SHALL BE TO A DEPTH OF 3 FT. BELOW THE R.C. BOX CULVERT AND A LENGTH AND WIDTH OF 4 FT. BEYOND THE R.C. BOX CULVERT.
STONE BACKFILL = 680 TON

REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

HWY. 17 MAIN LANES

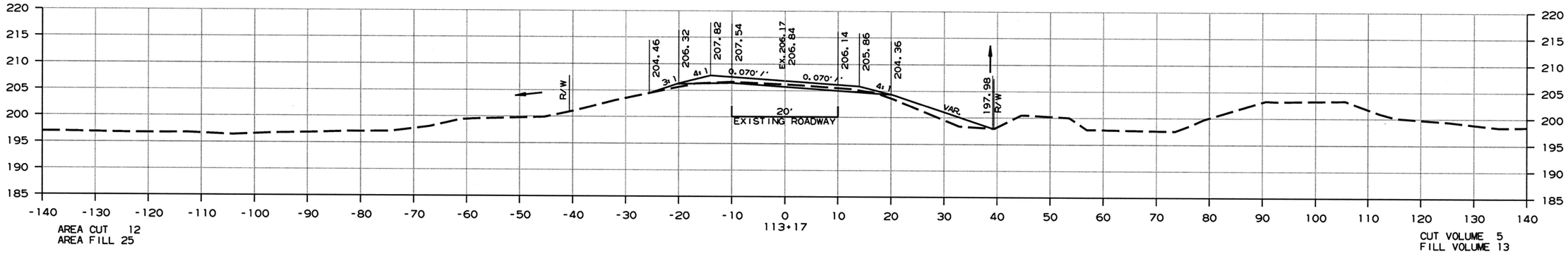
STA. 113+00.00 - STA. 115+00.00 MATCH EXISTING SUPERELEVATION (0.070'/')

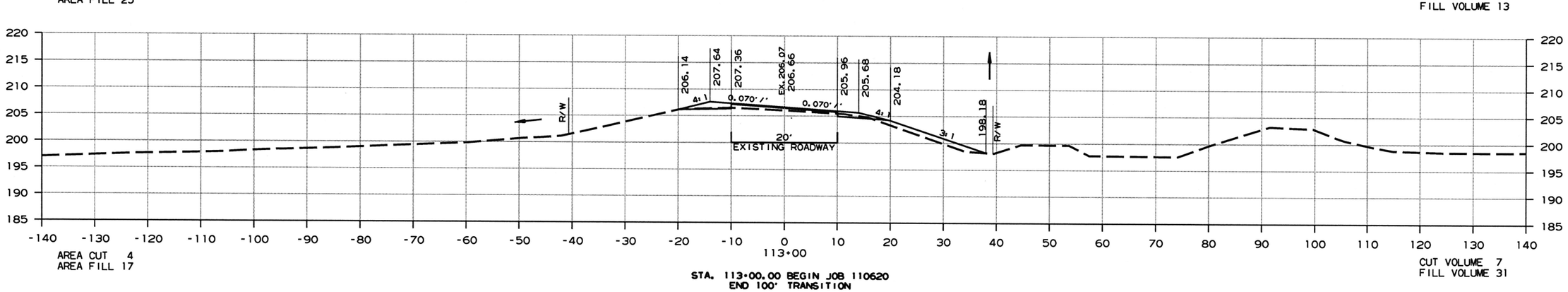



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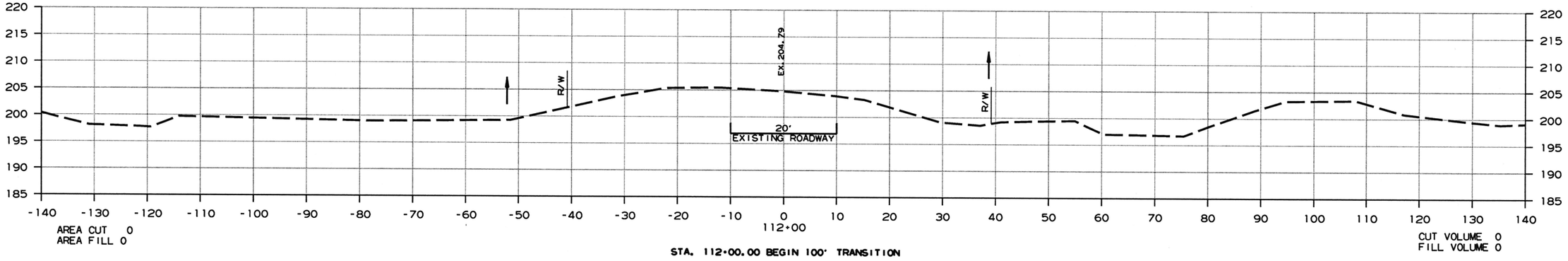
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|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 26 | 29 |

(2) CROSS SECTIONS




STA. 113+00.00 BEGIN JOB 110620
END 100' TRANSITION




STA. 112+00.00 BEGIN 100' TRANSITION

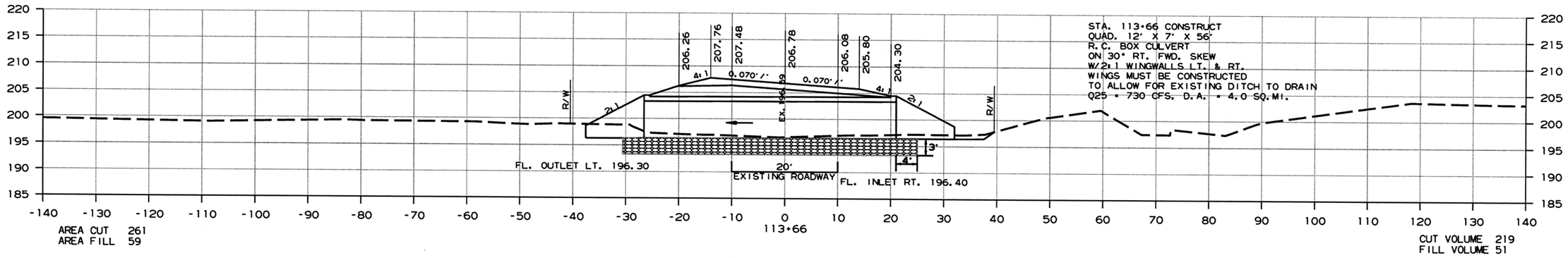
CROSS SECTION STA. 112+00 TO STA. 113+17

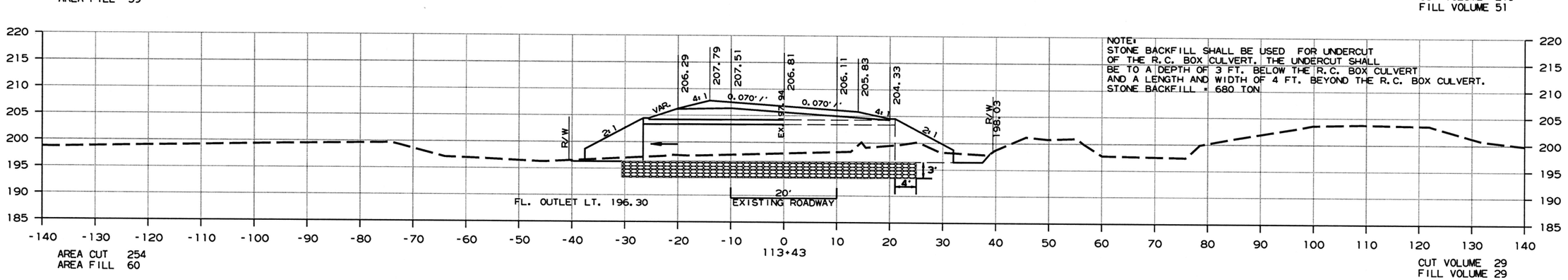
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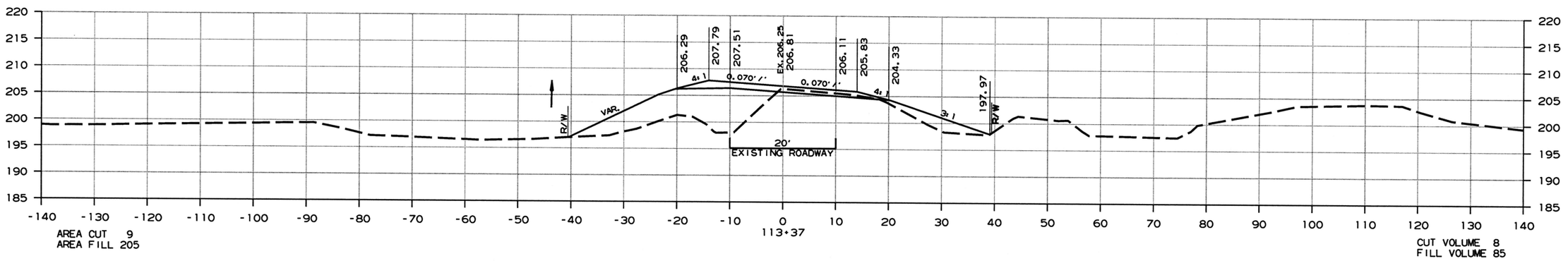
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|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 27 | 29 |

(2) CROSS SECTIONS



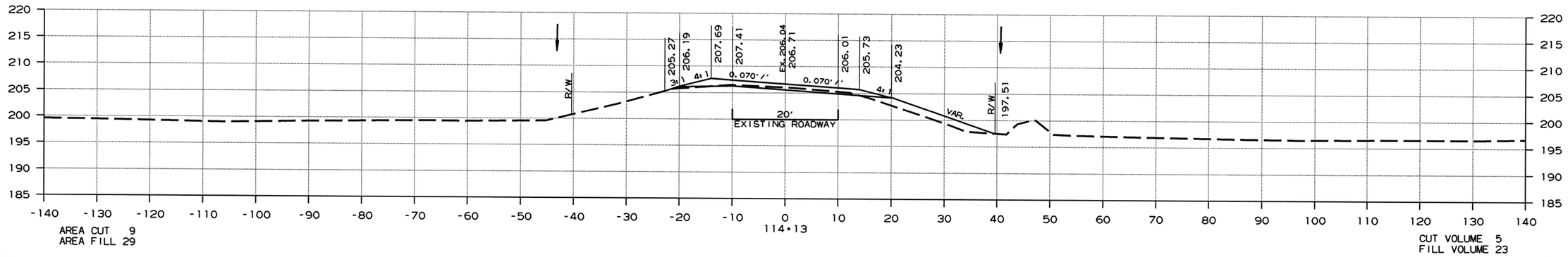

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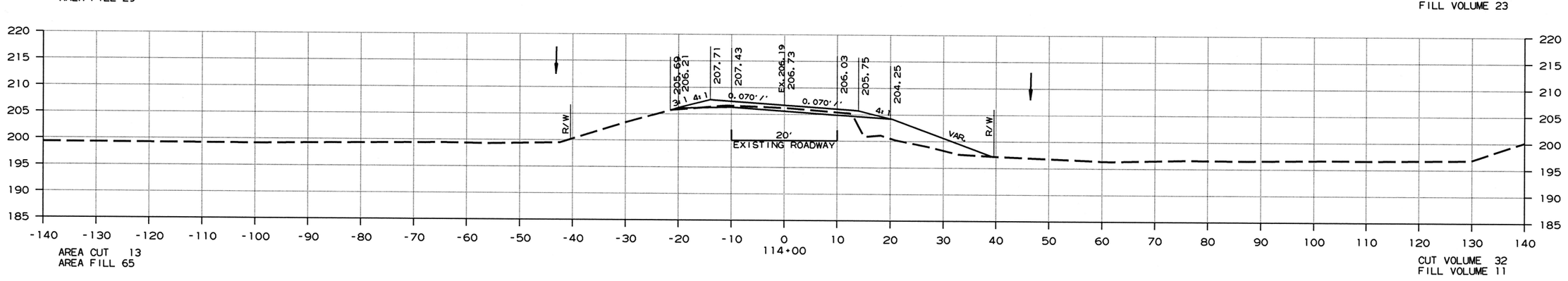
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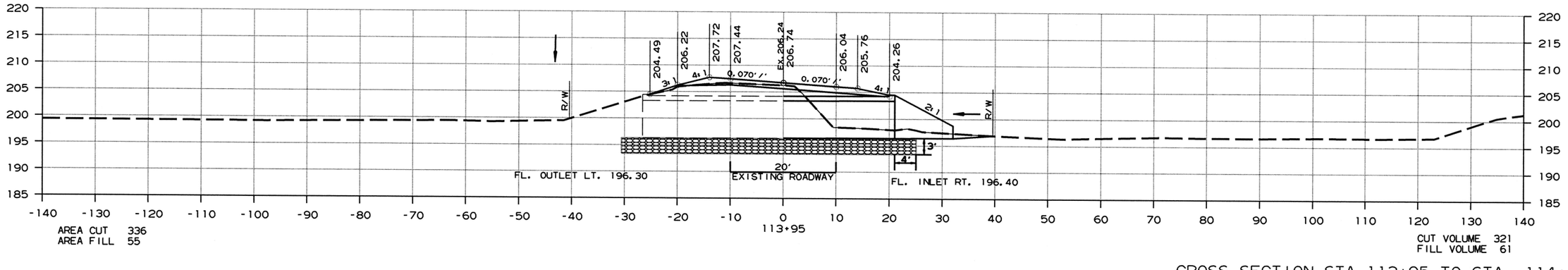
CROSS SECTION STA. 113+37 TO STA. 113+66

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | 110620 | 28 | 29 |

(2) CROSS SECTIONS



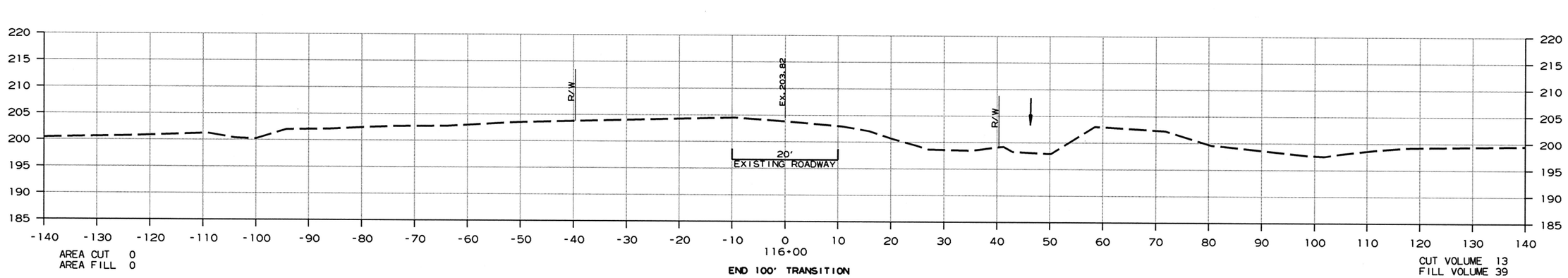

CROSS SECTION STA. 113+95 TO STA. 114+13

3/15/2018

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
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| | | | | JOB NO. | | 110620 | 29 | 29 |

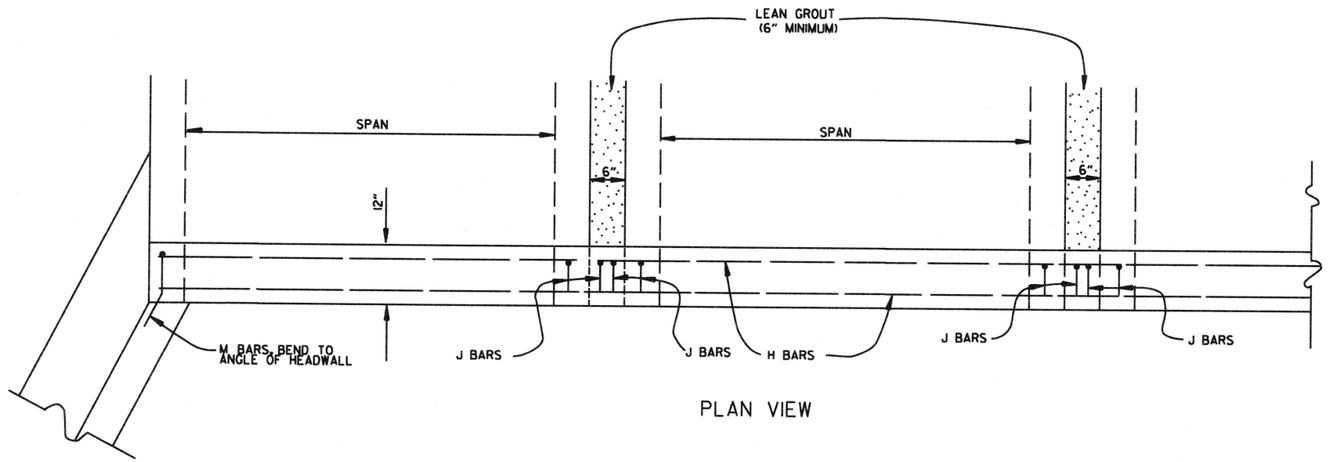
(2) CROSS SECTIONS




CROSS SECTION STA. 115+00 TO STA. 116+00

3/15/2018

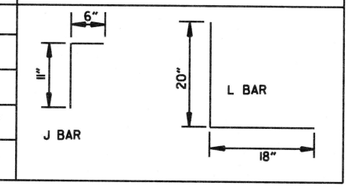
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PLAN VIEW

## BAR LIST

| BAR | NO. | SIZE | LENGTH | BAR BENDING DIAGRAM |
|---|---|---|---|---|
| H | 2 | #4 | • | |
| I | • | #4 | • | |
| J | • | #4 | 1'-5" | |
| L | • | #4 | 3'-2" | |
| M | • | #4 | 1'-8" | |




• NOTE: LENGTH AND NUMBER OF BARS VARIES WITH SIZE OF CULVERT

### GENERAL NOTES

WINGS, CURTAIN WALLS AND APRONS SHALL BE TIED TO THE PRECAST CULVERT SECTION BY CASTING BARS IN CULVERT END SECTIONS AS SHOWN OR BY DOWELING AND GROUTING. J BARS AND M BARS SHALL BE EMBEDDED A MINIMUM OF 10" IN PRECAST BOX.

WINGS, FOOTINGS, APRONS AND CURTAIN WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE WING DRAWING, STEEL AND CONCRETE QUANTITIES WILL BE ADJUSTED TO FIT THE IN-PLACE WIDTH & HEIGHT OF THE PRECAST CONCRETE BOX CULVERTS.

ALL EXPOSED CORNERS TO HAVE ¾" CHAMFERS.

WINGWALLS AND FOOTINGS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

ALL CONCRETE, REINFORCING STEEL, LEAN GROUT, MEMBRANE WATERPROOFING, DRAINAGE FILL MATERIAL, GEOTEXTILE FILTER FABRIC, LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR INSTALLING PRECAST BOX CULVERTS WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR THE ITEMS AS SPECIFIED IN SECTION 607 OF THE STANDARD SPECIFICATIONS.

LEAN GROUT SHALL CONSIST OF A SAND CEMENT MIXTURE MEETING THE FOLLOWING REQUIREMENTS:
PORTLAND CEMENT SHALL BE TYPE I AND SHALL MEET THE REQUIREMENTS OF AASHTO M 85.
SAND SHALL MEET THE REQUIREMENTS OF FINE AGGREGATE AS SPECIFIED IN SECTION 802.02 OF THE STANDARD SPECIFICATIONS.
THE SAND CEMENT MIXTURE SHALL CONSIST OF NOT LESS THAN 1.5 SACKS OF PORTLAND CEMENT PER TON OF MATERIAL MIXTURE.
THE MIXTURE SHALL CONTAIN SUFFICIENT WATER TO HYDRATE THE CEMENTS. THE SAND CEMENT MIXTURE SHALL BE PLACED IN MAXIMUM 8 INCH THICK LIFTS, LOOSE MEASURE, AND THOROUGHLY RODDED AND TAMPED AROUND BOX TO THOROUGHLY FILL ALL VOIDS.

MEMBRANE WATERPROOFING CONFORMING TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS SHALL BE APPLIED TO ALL BOX CULVERT JOINTS.

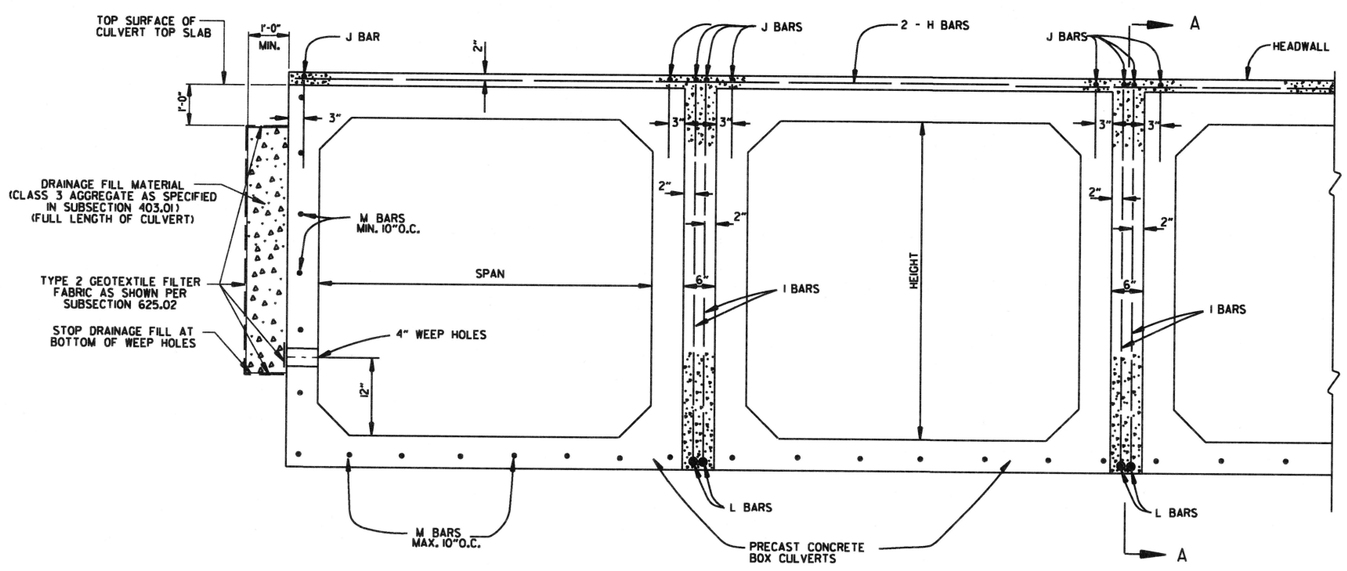
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

IN OUTER BARRELS, ONE WEEP HOLE IS REQUIRED IN EXTERIOR WALLS OF EACH PRECAST CULVERT SECTION. WEEP HOLES SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" IN THE ASSEMBLED CULVERT AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

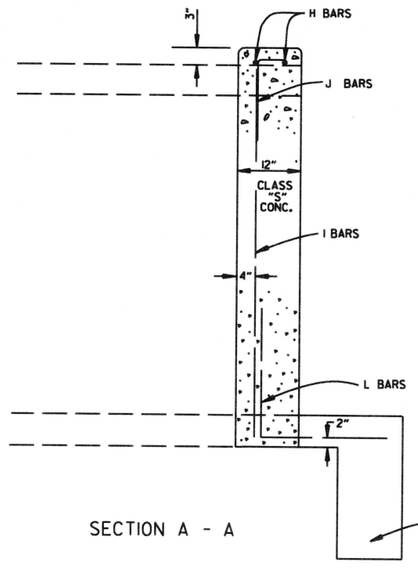
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

MINIMUM WIDTH SHALL BE 12" (6" ON EACH SIDE OF JOINT). ON MULTIPLE BARREL CULVERTS, MEMBRANE WATERPROOFING SHALL BE APPLIED TO EACH BARREL AS DESCRIBED ABOVE.

WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, FLOWABLE SELECT MATERIAL CONFORMING TO SECTION 206 OF THE STANDARD SPECIFICATIONS IN LIEU OF LEAN GROUT.




END VIEW




SECTION A - A

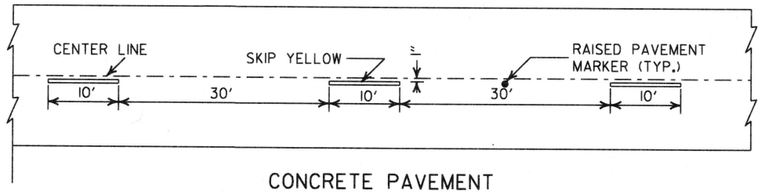
| DATE | REVISION | DATE FILMED |
|---|---|---|
| 1-28-15 | REVISED GEOTEXTILE FABRIC PLACEMENT | |
| 12-15-11 | ADDED NOTE & DTLS FOR WEEP HOLE AND DRAINAGE FILL | |
| 10-15-09 | ADDED GENERAL NOTE | |
| 11-10-05 | REVISED SPACING OF "M" BARS | |
| 4-10-03 | REVISED GENERAL NOTES | |
| 10-18-96 | CORRECTED AASHTO REF. | |
| 10-1-92 | ADDED NOTE FOR MEMBRANE WATERPROOFING | |
| 8-15-91 | ADDED NOTE FOR LEAN GROUT | |
| 11- 8-90 | REVISED FOR 1991 SPECS | |
| 11-30-89 | ISSUED: JABE | |

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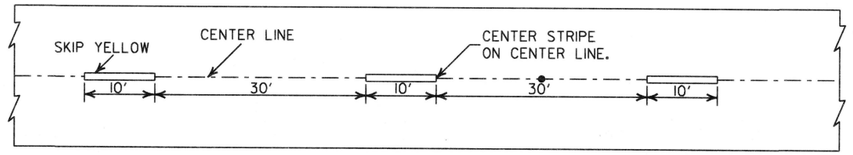
# PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

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

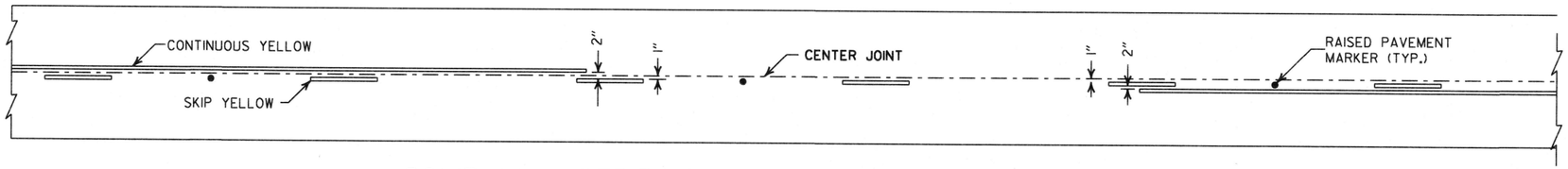



CONCRETE PAVEMENT

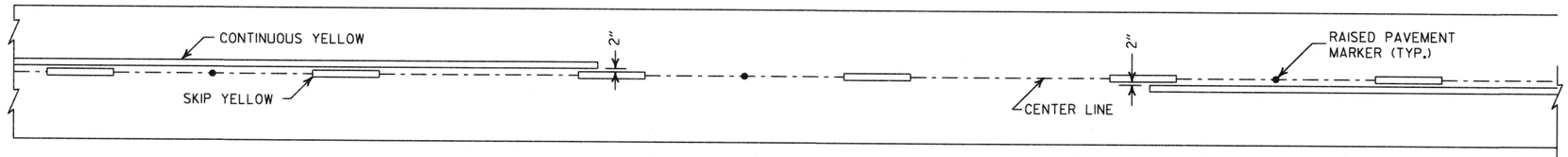



ASPHALT PAVEMENT

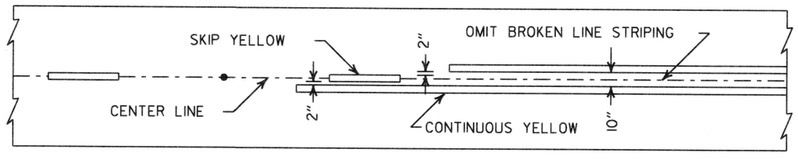
## BROKEN LINE STRIPING



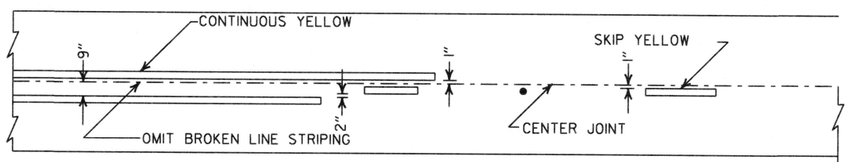

## SOLID LINE STRIPING ON CONCRETE PAVEMENT




## SOLID LINE STRIPING ON ASPHALT PAVEMENT

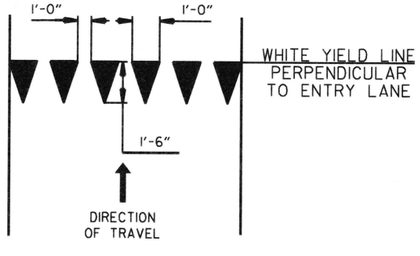



ASPHALT PAVEMENT

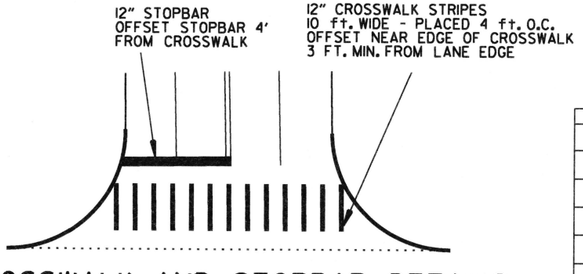



CONCRETE PAVEMENT

## STRIPING AT ADJACENT NO PASSING LANES

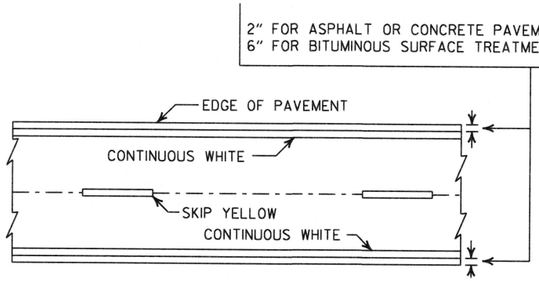



## YIELD LINE DETAIL




## CROSSWALK AND STOPBAR DETAILS

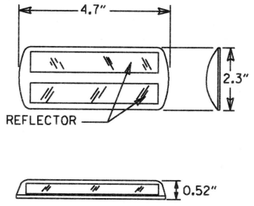
2" FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT




## PAVEMENT EDGE LINE MARKING

NOTE:
THE RED LENS OF THE TYPE II R.P.M. SHALL FACE THE INCORRECT TRAFFIC MOVEMENT.

TYPE II
RED/CLEAR OR
YELLOW/YELLOW




NOTE:
DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.

## DETAIL OF STANDARD RAISED PAVEMENT MARKERS

| DATE | REVISION | |
|---|---|---|
| 6-1-17 | ADDED YIELD LINE DETAIL | |
| 5-12-16 | REVISED LINE WIDTHS, SPACING, & NOTES | |
| 9-12-13 | REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS | |
| 11-17-10 | REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS | |
| 11-18-04 | REVISED NOTE 2 & GENERAL NOTES | |
| 8-22-02 | ADDED CROSSWALK & STOPBAR DTLS. | |
| 7-02-98 | ADDED DETAILS OF STD. RAISED PAV'T. MARKERS | |
| 4-26-96 | REV. NOTES 3&4; ADDED R.P.M. | |
| 9-30-80 | DRAWN | 1-9-30-80 |
| DATE | REVISION | FILMED |

ARKANSAS STATE HIGHWAY COMMISSION

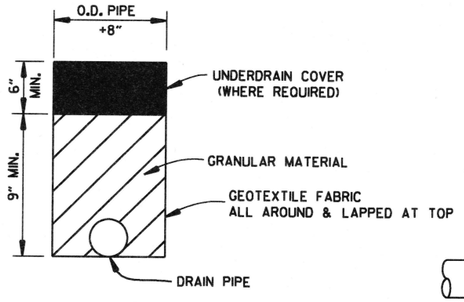
# PAVEMENT MARKING DETAILS

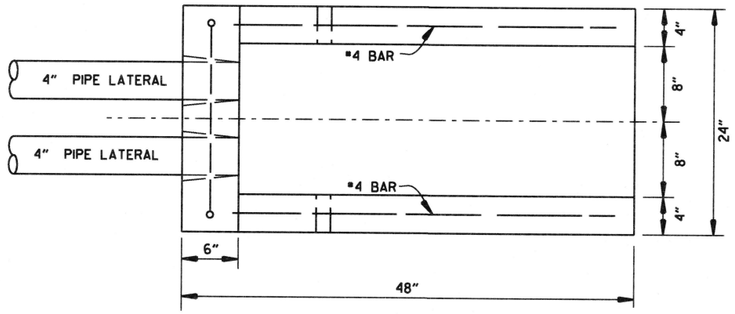
STANDARD DRAWING PM-1

NOTE:

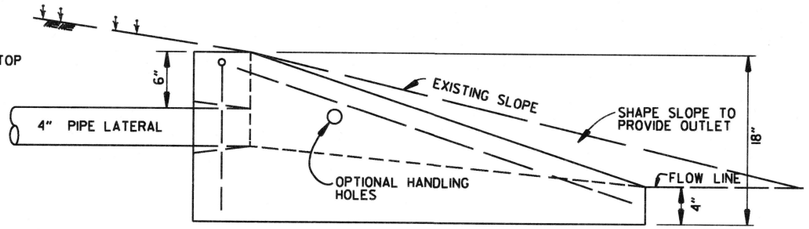
1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

2. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.

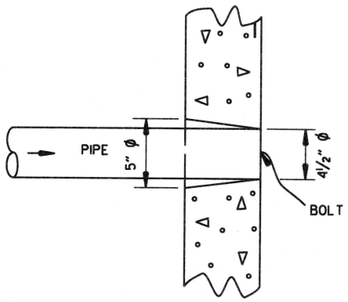


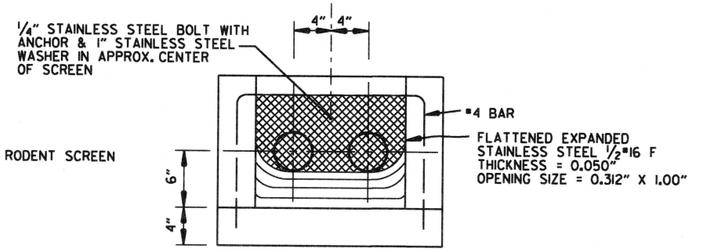

PLAN VIEW



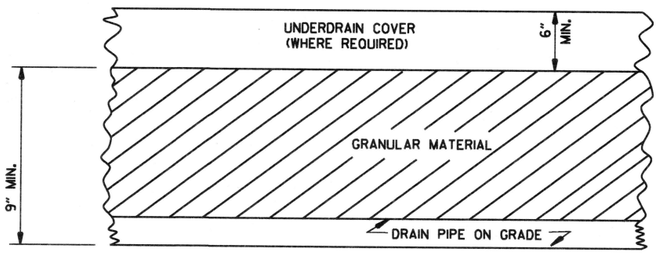

SIDE VIEW




DETAIL OF HOLE FOR 4" PIPE




FRONT VIEW
(DETAIL OF RODENT SCREEN)




DETAILS OF PIPE UNDERDRAIN

## NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE I. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS" IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

2. 4" NON-PERFORATED SCHEDULE 40 PVC PIPE LATERALS WITH OUTLET PROTECTORS SHALL BE INSTALLED AS SHOWN HEREON. 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 611 OF THE STANDARD SPECIFICATIONS.

3. EXISTING 4" PIPE UNDERDRAINS MAY BE CONNECTED TO PROPOSED DROP INLETS OR EXTENDED WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR CONNECTING TO DROP INLETS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR "4" PIPE UNDERDRAINS."

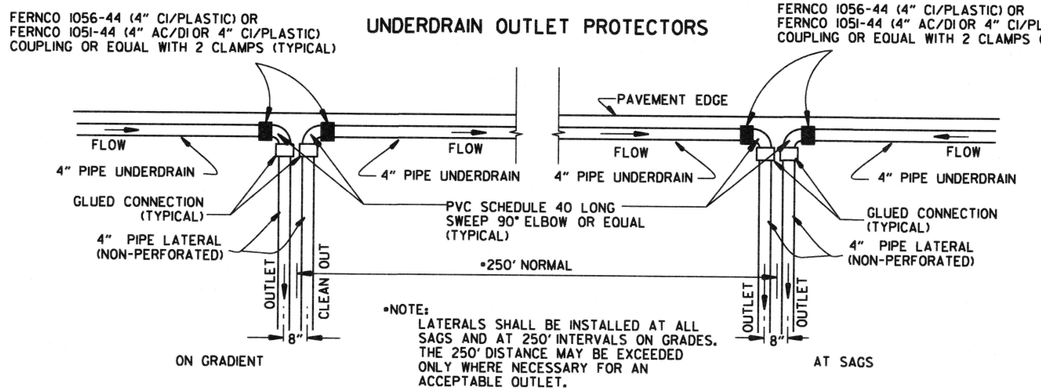
4. THE LOCATION OF ALL LATERALS SHALL BE MARKED WITH 4" X 12" PERMANENT PAVEMENT MARKING TAPE (TYPE III WHITE) AT THE OUTSIDE EDGE OF THE SHOULDER, PLACED TRANSVERSE TO TRAFFIC. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

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 WILL 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."

7. AT LOCATIONS WHERE A SINGLE LATERAL IS USED THE CONTRACTOR SHALL HAVE THE FOLLOWING OPTIONS: 1. INSTALL OUTLET PROTECTOR AS SHOWN ON STANDARD DRAWING PU-1 AND GROUT THE UNUSED HOLE OR 2. INSTALL AN OUTLET PROTECTOR WITH A SINGLE HOLE.

## UNDERDRAIN OUTLET PROTECTORS




### DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

NOTE: PVC PIPE FOR LATERALS SHALL MEET THE REQUIREMENTS OF ASTM D 1785 (LATEST REVISION) FOR SCHEDULE 40 PIPE.

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 12-8-16 | ADDED NOTES FOR PIPE UNDERDRAINS, REVISED RODENT SCREEN DETAIL AND NOTES, REMOVED NOTE 1 FOR GRANULAR MATERIAL, ADDED NOTE FOR GEOTEXTILE FABRIC | |
| 4-10-03 | REVISED NOTE 3 | |
| 1-12-00 | REVISED DETAIL OF UNDERDRAIN LATERALS | |
| 11-18-98 | REVISED NOTE | |
| 10-18-96 | REVISED MIN. DEPTH & GEOTEXTILE FABRIC | |
| 4-26-96 | ADDED LATERAL NOTE; 5½" TO 5" | |
| 11-22-95 | REVISED LATERALS | |
| 7-20-95 | REVISED LATERALS & ADDED NOTE | |
| 11- 3-94 | REVISED FOR DUAL LATERALS | 11- 3-94 |
| 10- 1-92 | SUBSTITUTED GEOTEXTILE | 10- 1-92 |
| 8-15-91 | ADDED POLYEDTHYLENE PIPE | 8-15-91 |
| 11- 8-90 | DELETED ALTERNATE NOTE | 11- 8-90 |
| 1-25-90 | ADDED 4" SNAP ADAPTER | 1-25-90 |
| 11-30-89 | DEL. (SUBGRADE); ADDED (WHERE REQUIRED) | 11-30-89 |
| 7-15-88 | ISSUED P.L.M. | 647-7-15-88 |

ARKANSAS STATE HIGHWAY COMMISSION

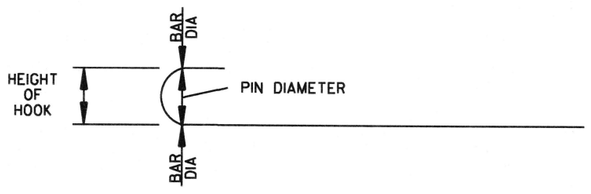
# DETAILS OF PIPE UNDERDRAIN

STANDARD DRAWING PU-1

STEEL FABRICATION: REINFORCING STEEL FABRICATION SHALL CONFORM TO THE DIMENSIONS LISTED IN THE TABLE BELOW:

| BAR SIZE | PIN DIAMETER | HOOK EXTENSION "K" |
|---|---|---|
| 3 | 2¼" | 4" |
| 4 | 3 " | 4½" |
| 5 | 3¾" | 5" |
| 6 | 4½" | 6" |
| 7 | 5¼" | 7" |
| 8 | 6" | 8" |

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2¾ INCHES, 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", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.




NOTE: DIMENSIONS OF BARS ARE MEASURED OUT TO OUT OF BARS.

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

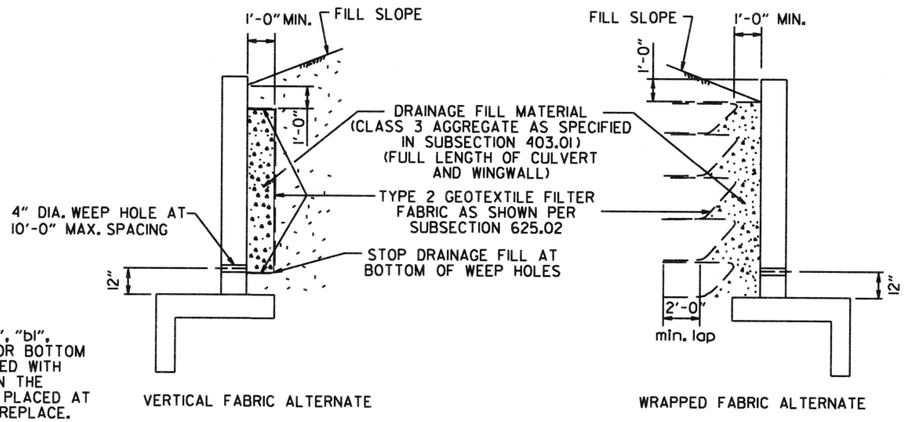
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

FOR SKEWED CULVERTS, THE REPLACEMENT STRAIGHT BAR MAY HAVE TO BE CUT IN FIELD TO FIT.

REPLACEMENT BAR LENGTHS TABLE

| BAR SIZE: "b", "b1", "b2" OR "b3" | LENGTH OF HOOKED BAR | LENGTH OF STRAIGHT BAR |
|---|---|---|
| #4 | L + 1' - 0" | SEE "c" BAR LENGTH |
| #5 | L + 1' - 2" | SEE "c" BAR LENGTH |
| #6 | L + 1' - 4" | SEE "c" BAR LENGTH |
| #7 | L + 1' - 8" | SEE "c" BAR LENGTH |
| #8 | L + 1' - 10" | SEE "c" BAR LENGTH |
| #9 | L + 2' - 6" | SEE "c" BAR LENGTH |

L = "OW" - 3 INCHES




WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI.

REINFORCING STEEL SHALL BE AASHTO M 31 OR M 53, GRADE 60.

CONSTRUCTION AND MATERIALS FOR WINGWALL & CULVERT DRAINAGE, INCLUDING WEEP HOLES AND GRANULAR MATERIAL, SHALL BE SUBSIDIARY TO THE BID ITEM, "CLASS S CONCRETE".

MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

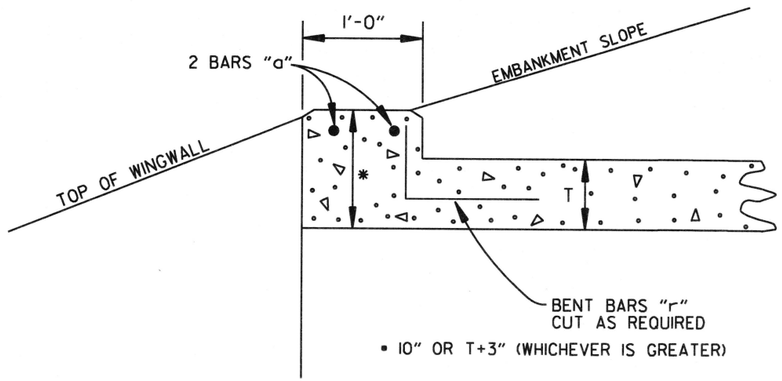
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS ½ 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 12" ABOVE THE TOP OF THE BOTTOM SLAB.

WEEP HOLES IN WINGWALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THERE SHALL BE A MINIMUM OF TWO (2) WEEP HOLES IN EACH WINGWALL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE WINGWALL FOOTING.

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




NOTE: FOR ALL SKEWED R.C. BOX CULVERTS THE LENGTH "K" OF THE MODIFIED HEADWALL SHALL BE EQUAL TO THE ROADWAY LENGTH "RL". THE ENDS OF THE HEADWALL SHALL BE CONSTRUCTED PARALLEL TO THE SKEW ANGLE OF THE BOX CULVERT.

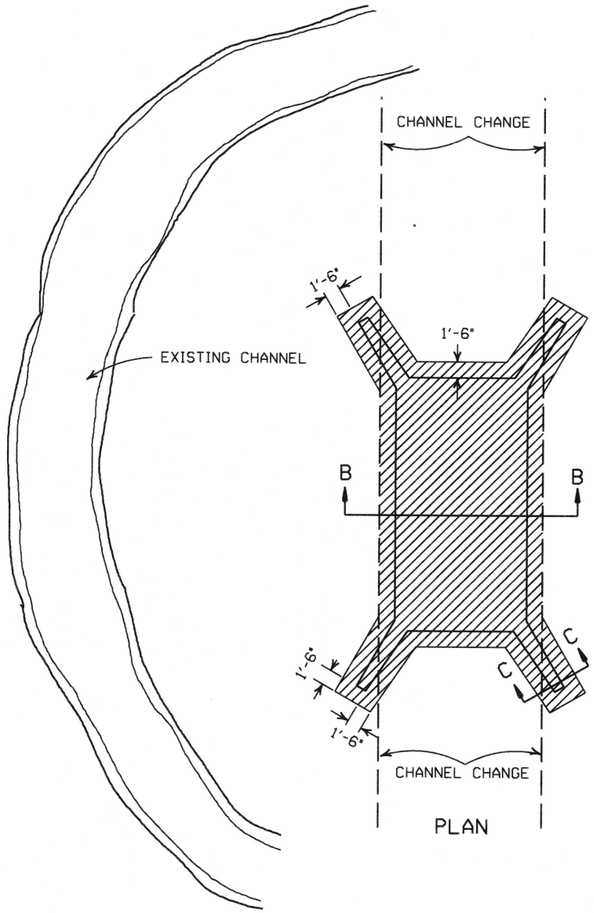
R.C. BOX CULVERT HEADWALL MODIFICATIONS

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 7/26/12 | REV. DRAINAGE FILL MATERIAL & DETAIL | |
| 12/15/11 | REQUIRE WEEP HOLES IN BOX CULVERT WALLS | |
| 5-25-06 | REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM | |
| 11-16-01 | ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES | |
| 10-18-96 | REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM | |
| 10-12-95 | MOVED SOLID SODDING DETAIL TO RCB-2 | |
| 6-2-94 | ADDED SOLID SODDING PLAN DETAIL | |
| 8-5-93 | REVISED PIN DIAMETER TO SPECS. | |
| 8-15-91 | DRAWN AND ISSUED | |

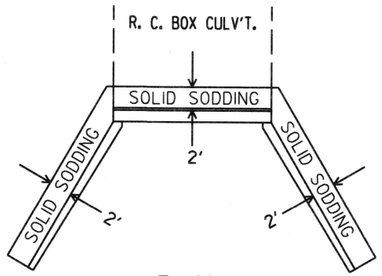
ARKANSAS STATE HIGHWAY COMMISSION

REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



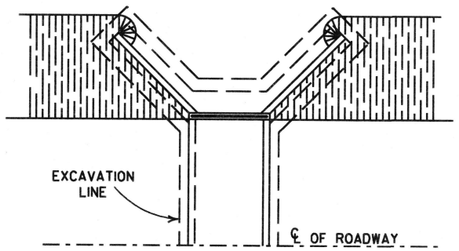

PLAN



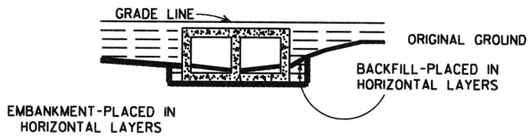

PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

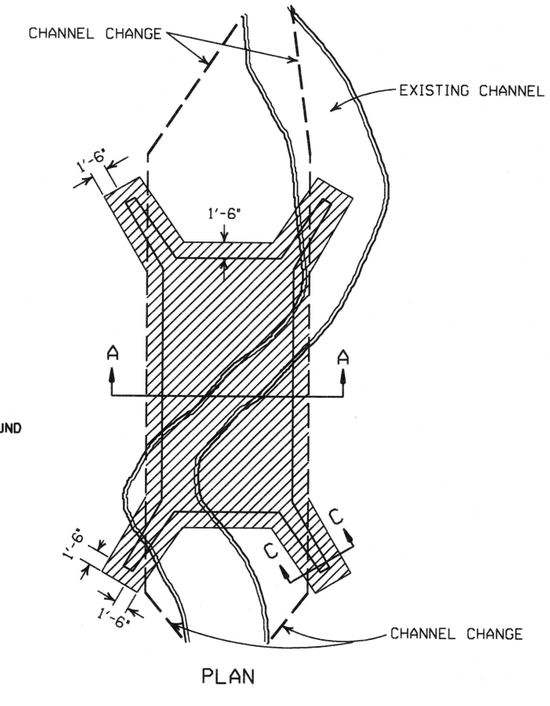



PLAN

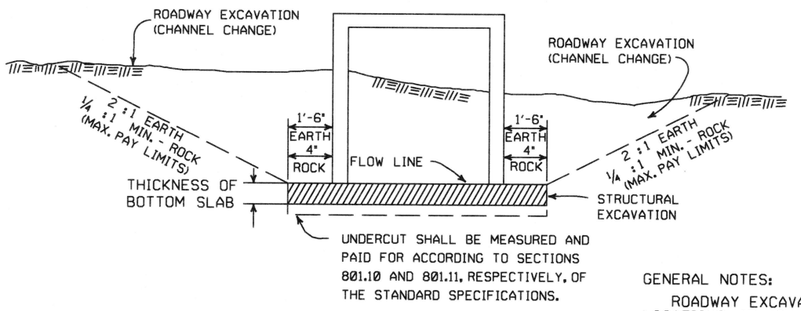



LONGITUDINAL SECTION

# BACKFILL DETAILS FOR BOX CULVERT

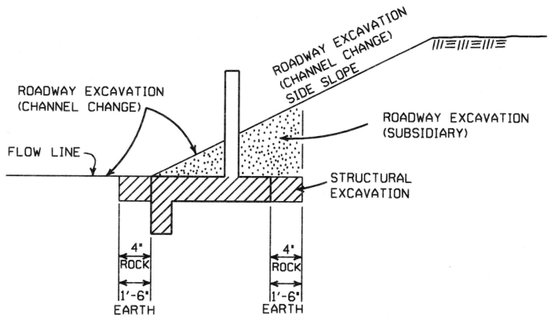



PLAN

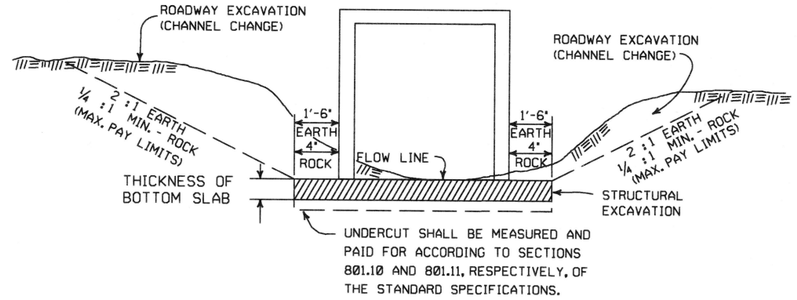



SECTION B-B

# DETAILS FOR NEW CHANNELS




SECTION C-C




SECTION A-A

# DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

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

EXCAVATION FOR STRUCTURES WILL BE PAID FOR AT ALL R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE.

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

| DATE | REVISION | FILMED |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| 11-20-03 | REVISED SECTION A-A NOTE | |
| 8-22-02 | REVISED SECTION B-B NOTE | |
| 10-12-95 | COMBINED 1891B AND 1888A | |
| 1-4-83 | REVISED GENERAL NOTES | 674-1-4-83 |
| | AND ADDED MAXIMUM PAY | |
| | LIMIT NOTES. | |
| 2-2-76 | EXCAV. PAY LIMITS | 917-2-2-76 |
| 10-2-72 | REVISED AND REDRAWN | 564-10-16-72 |

ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

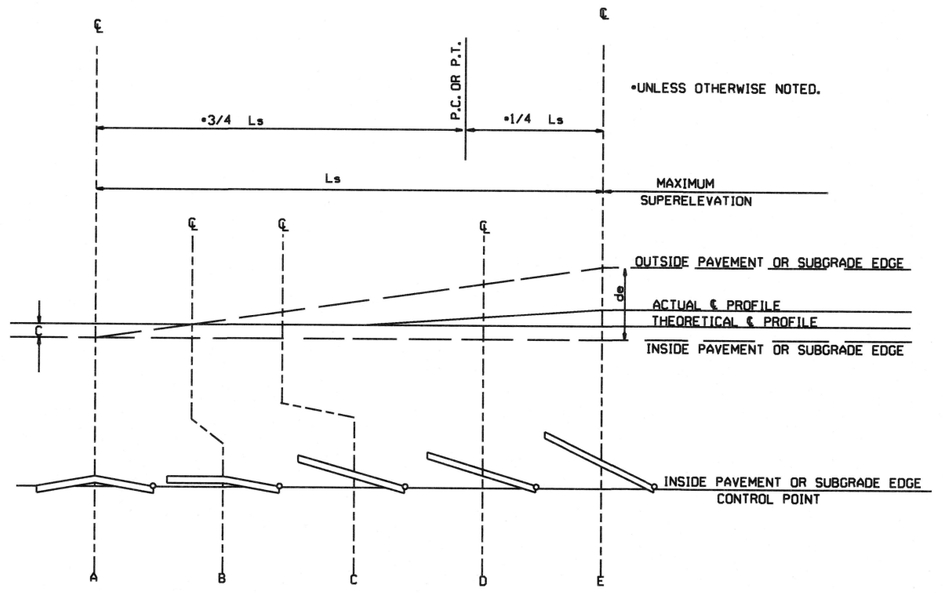
## SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

| DEGREE OF CURVE | 30 MPH e | 30 MPH Ls (FT) MINIMUM | 30 MPH Ls (FT) DESIRABLE | 40 MPH e | 40 MPH Ls (FT) MINIMUM | 40 MPH Ls (FT) DESIRABLE | 50 MPH e | 50 MPH Ls (FT) MINIMUM | 50 MPH Ls (FT) DESIRABLE | 55 MPH e | 55 MPH Ls (FT) MINIMUM | 55 MPH Ls (FT) DESIRABLE | 60 MPH e | 60 MPH Ls (FT) MINIMUM | 60 MPH Ls (FT) DESIRABLE | 70 MPH e | 70 MPH Ls (FT) MINIMUM | 70 MPH Ls (FT) DESIRABLE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° 15' | N.C. | | | N.C. | | | N.C. | | | N.C. | | | N.C. | | | N.C. | | |
| 0° 30' | N.C. | | | N.C. | | | N.C. | | | N.C. | | | N.C. | | | N.C. | | |
| 0° 45' | N.C. | | | N.C. | | | R.C. | | | 0.022 | | | 0.023 | | | 0.028 | | |
| 1° 00' | N.C. | | | N.C. | | | 0.021 | | | 0.026 | | | 0.030 | | | 0.037 | 275 | 300 |
| 1° 15' | N.C. | | | R.C. | | | 0.026 | | | 0.032 | | | 0.037 | | | 0.046 | | |
| 1° 30' | N.C. | | | 0.021 | | | 0.031 | 200 | | 0.037 | 225 | | 0.043 | 250 | | 0.054 | | |
| 1° 45' | N.C. | | | 0.025 | | | 0.036 | | | 0.043 | | 300 | 0.049 | | 300 | 0.062 | | |
| 2° 00' | R.C. | | | 0.028 | 175 | | 0.040 | | | 0.048 | | | 0.055 | | | 0.070 | | |
| 2° 15' | R.C. | | | 0.031 | | | 0.045 | | 250 | 0.053 | | | 0.061 | 300 | | 0.078 | 300 | 350 |
| 2° 30' | 0.021 | | | 0.034 | | | 0.049 | | | 0.058 | | | 0.067 | 315 | | 0.085 | 315 | |
| 2° 45' | 0.023 | | | 0.037 | | | 0.053 | | | 0.063 | | | 0.072 | 335 | | 0.091 | 335 | |
| 3° 00' | 0.025 | | | 0.040 | | 200 | 0.057 | | | 0.067 | 230 | | 0.077 | 260 | | 0.096 | 350 | |
| 3° 15' | 0.027 | | | 0.043 | | | 0.061 | | | 0.072 | 245 | | 0.082 | 275 | | 0.098 | 360 | 400 |
| 3° 30' | 0.029 | 150 | | 0.046 | | | 0.065 | 205 | | 0.076 | 255 | | 0.086 | 285 | | 0.100 | 360 | |
| 3° 45' | 0.031 | | | 0.049 | | | 0.069 | 215 | | 0.080 | 265 | | 0.090 | 295 | | | | |
| 4° 00' | 0.033 | | | 0.051 | | | 0.072 | 225 | | 0.083 | 270 | | 0.093 | 305 | 350 | | | |
| 4° 30' | 0.037 | | | 0.056 | | | 0.078 | 240 | | 0.087 | 280 | | 0.098 | 315 | | | | |
| 5° 00' | 0.040 | | | 0.061 | | | 0.083 | 250 | | 0.091 | 295 | | 0.098 | 320 | | | | |
| 5° 30' | 0.043 | | | 0.066 | 185 | | 0.088 | 260 | | 0.094 | 300 | 350 | | | | | | |
| 6° 00' | 0.046 | | | 0.070 | 190 | | 0.092 | 270 | | 0.096 | 305 | | | | | | | |
| 6° 30' | 0.050 | | | 0.074 | 200 | | 0.095 | 280 | | 0.100 | 315 | | | | | | | |
| 7° 00' | 0.053 | | | 0.078 | 210 | | 0.098 | 285 | | | | | | | | | | |
| 7° 30' | 0.056 | | | 0.081 | 215 | | 0.099 | 290 | | | | | | | | | | |
| 8° 00' | 0.058 | | | 0.084 | 220 | | 0.100 | 290 | | | | | | | | | | |
| 8° 30' | 0.061 | | | 0.087 | 225 | 250 | | | | | | | | | | | | |
| 9° 00' | 0.063 | | | 0.089 | 230 | | | | | | | | | | | | | |
| 10° 00' | 0.068 | 160 | | 0.094 | 235 | | | | | | | | | | | | | |
| 11° 00' | 0.072 | 170 | | 0.097 | 250 | | | | | | | | | | | | | |
| 12° 00' | 0.076 | 175 | | 0.099 | 250 | | | | | | | | | | | | | |
| 13° 00' | 0.080 | 180 | | 0.100 | 250 | | | | | | | | | | | | | |
| 14° 00' | 0.083 | 190 | | | | | | | | | | | | | | | | |
| 15° 00' | 0.086 | 195 | | | | | | | | | | | | | | | | |
| 16° 00' | 0.089 | 200 | | | | | | | | | | | | | | | | |
| 17° 00' | 0.091 | 200 | | | | | | | | | | | | | | | | |
| 18° 00' | 0.093 | 205 | | | | | | | | | | | | | | | | |
| 19° 00' | 0.095 | 210 | | | | | | | | | | | | | | | | |
| 20° 00' | 0.097 | 215 | 250 | | | | | | | | | | | | | | | |
| 21° 00' | 0.098 | 215 | | | | | | | | | | | | | | | | |
| 22° 00' | 0.099 | 215 | | | | | | | | | | | | | | | | |
| 23° 00' | 0.099 | 215 | | | | | | | | | | | | | | | | |
| 24° 00' | 0.100 | 220 | | | | | | | | | | | | | | | | |

D MAX = 24° 45' | D MAX = 13° 15' | D MAX = 8° 15' | D MAX = 6° 30' | D MAX = 5° 15' | D MAX = 3° 30'

ABBREVIATIONS

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




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

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

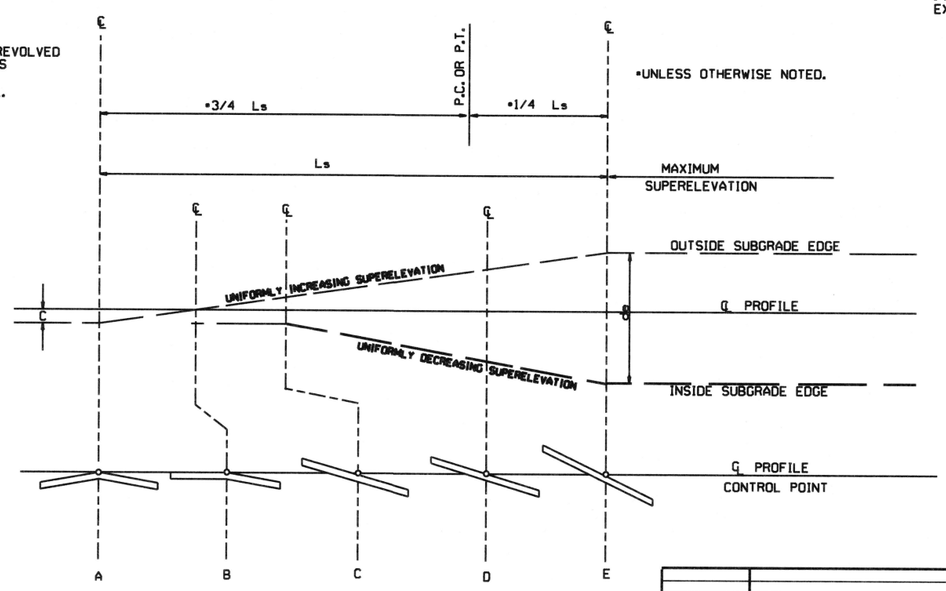
GENERAL NOTES

1. ON PAVEMENT WITH TWO-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE INSIDE PAVEMENT EDGE UNLESS OTHERWISE NOTED ON THE PLANS
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED TO OR SUBTRACTED FROM THE POINT OF CONTROL.
3. LENGTHS FOR L MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
4. PAVEMENTS WIDER THAN 2 LANES SHALL HAVE ADDITIONAL TRANSITION LENGTHS AS FOLLOWS:

3 LANE UNDIVIDED - - - - - +20%
4 LANE UNDIVIDED - - - - - +50%
5 LANE UNDIVIDED - - - - - +80%
6 LANE UNDIVIDED - - - - - +100%

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

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




STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

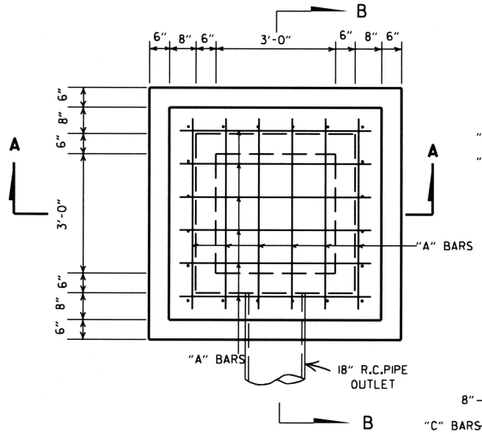
SUPERELEVATION FORMULA = $\frac{Lde}{Ls}$

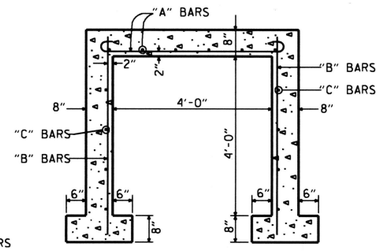
| DATE | REVISION | DATE FILMED |
|---|---|---|
| 10-18-96 | ADDED FORMULA | |
| 01-09-87 | ISSUED | 534-1-9-87 |

ARKANSAS STATE HIGHWAY COMMISSION

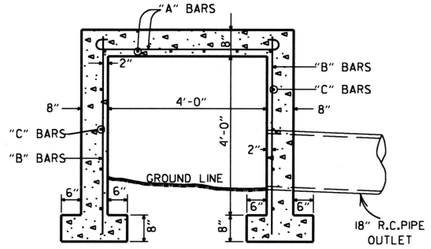
# TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2




SEC A-A



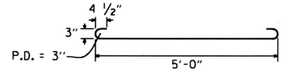

SEC B-B

NOTE: MAX FILL HEIGHT ABOVE TOP OF BOX = 13'-0".

STEEL SCHEDULE

| BARS | NUMBER | LENGTH | SPACING |
|---|---|---|---|
| "A" | 12 | 6'-0" | 10" |
| "B" | 20 | 5'-0" | 10 ½" |
| "C" | 16 | 5'-0" | 12" |

ALL STEEL TO BE #4 BARS



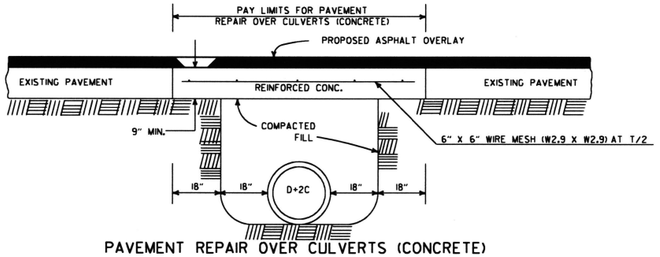

QUANTITIES

CONCRETE 3.31 CU. YDS.
REINFORCING STEEL 168 LB.

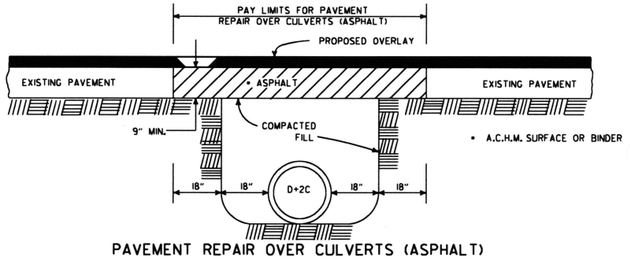
GENERAL NOTE:

THE PAY ITEMS FOR REINFORCED CONCRETE SPRING BOXES SHALL BE FOR THE QUANTITTIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL, EXCAVATION FOR STRUCTURES AND 18" R.C. PIPE CULVERT.

## REINFORCED CONCRETE SPRING BOX



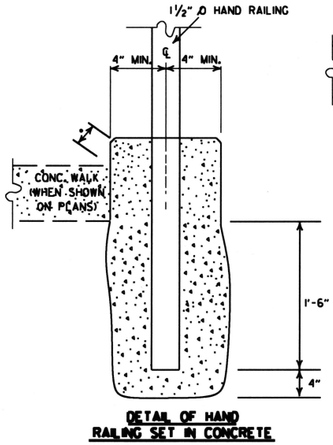

PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



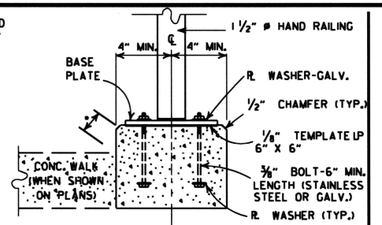

PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

## DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

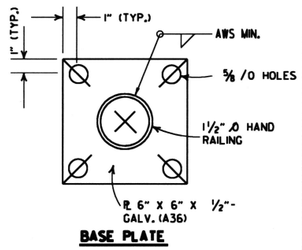
• A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.




DETAIL OF HAND RAILING SET IN CONCRETE

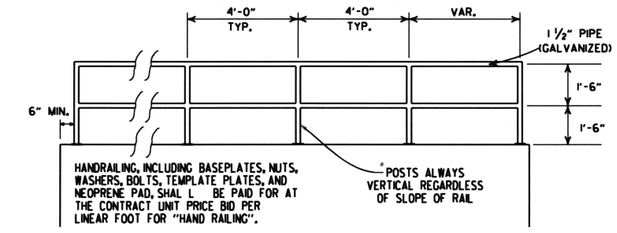



POST CONNECTION TO WALL

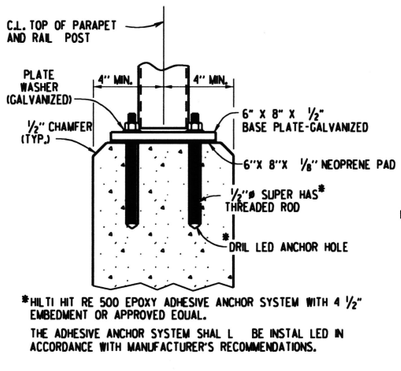



BASE PLATE

## POST CONNECTION DETAILS



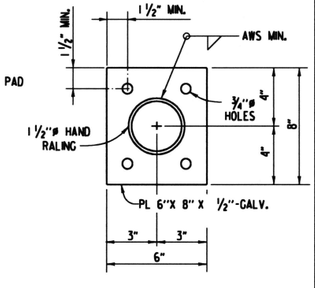

HAND RAILING SHALL CONFORM TO SECTION 633.




*HILTI HIT RE 500 EPOXY ADHESIVE ANCHOR SYSTEM WITH 4 ½" EMBEDMENT OR APPROVED EQUAL.

THE ADHESIVE ANCHOR SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

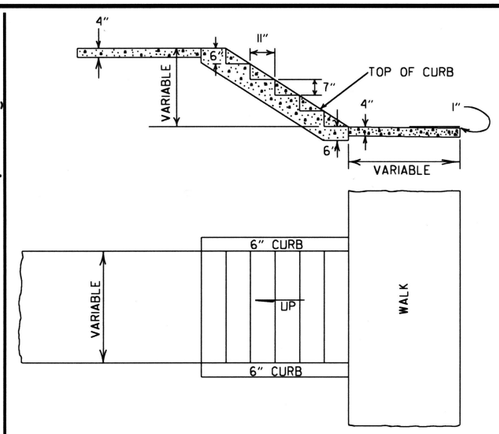
POST CONNECTION TO WALL




BASE PLATE

## DETAILS OF ALTERNATE POST ANCHOR SYSTEM (EPOXY ADHESIVE ANCHORS)

## HAND RAILING DETAILS




GENERAL NOTES

1. RISE AND TREAD DIMENSIONS OF STEPS MAY BE VARIED AS DIRECTED BY THE ENGINEER, HOWEVER, TREAD WIDTHS SHALL BE 11" MIN. ALL STEPS IN A FLIGHT SHALL HAVE CONSISTENT TREAD & RISER DIMENSIONS.
2. 1" TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE WALKS AT 45' INTERVALS.

## DETAILS OF CONCRETE STEPS & WALKS

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 10-25-18 | REVISED DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS | |
| 9-12-13 | REVISED REINFORCED CONCRETE SPRING BOX | |
| 7-26-12 | REMOVED RETAINING WALL DETAILS & REVISED HAND RAILING DETAILS | |
| 4-17-08 | REV. JOINT & FOOTING STEP DETAILS | |
| 11-29-07 | REVISED RETAINING WALL DRAINAGE | |
| 5-25-06 | REVISED PVMT REPAIR OVER CULVERTS (CONC); REVISED REINFORCED CONC SPRING BOX | |
| 10-9-03 | REVISED PIPE RAILING DETAILS TO HAND RAILING DETAILS | |
| 4-10-03 | REVISED RETAINING WALL DRAWING | |
| 8-22-02 | ADDED HAND RAILING DETAIL | |
| 11-16-01 | REVISED PVMT REPAIR OVER CULVERTS (CONC); CORRECTED SPELLING IN GENERAL NOTES | |
| 11-18-98 | ADDED GENERAL NOTES TO CONCRETE STEPS & WALKS | |
| 7-02-98 | ENLARGED PIPE | |
| 4-03-97 | ADDED NOTE TO STEEL BAR SCHED. | |
| 10-18-96 | CORRECTED SPELLING | |
| 4-26-96 | ADD WEEP HOLE;REV. JOINT SPACING IN RET. WALL | |
| 6-2-94 | CHANGED CONST. TO CONTRACTION JOINT | |
| 10-1-92 | CHANGED MESH FABRIC TO WIRE MESH | 10-1-92 |
| 8-15-91 | DELETED HDWL MODIFICATION DETAIL | 8-15-91 |
| 11-8-90 | DELETED COLD MIX FROM CULV'T. REPAIR | 11-8-90 |
| 11-30-89 | REV. RETAINING WALL STEEL SCHEDULE | 11-30-89 |
| 11-17-88 | V. BARS BEHIND ARROW | 665-11-17-88 |
| 7-15-88 | REV. PAVEMENT REPAIR ADDED HDWL. MODS, DEL. PIPE UNDERDRAINS | 649-7-15-88 |
| 11-1-84 | REV. TRENCH FOR PIPE UNDERDRAIN | 510-11-1-84 |
| 1-4-83 | ELIMINATED CONC. CLASS & ADDED CHAMFER NOTE | 682-1-4-83 |
| 3-2-81 | SPELLING OF "UNDERDRAIN" | 721-3-2-81 |
| 4-20-79 | REV. UNDERDRAIN DET.& PAVEMENT REPAIR | 674-4-20-79 |
| 2-2-76 | 12"MIN. GRAN. MAT'L. OVER PIPE | 919-2-2-76 |
| 4-10-75 | REM. SPECS. FOR GRAN. MAT'L. | 568-4-10-75-853 |
| 5-22-74 | GRANULAR MAT'L. TO BE SB-3 | 567-5-22-74-740 |
| 10-2-72 | REVISED AND REDRAWN | 564-10-16-72 |

ARKANSAS STATE HIGHWAY COMMISSION

# DETAILS OF SPECIAL ITEMS

STANDARD DRAWING SI-1

R1-1



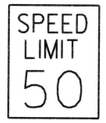

STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2




STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1




STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

W3-5




STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

W3-5a




STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

R4-1




STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R4-2




STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R5-1



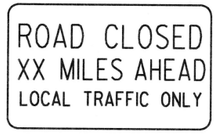

STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

R11-2



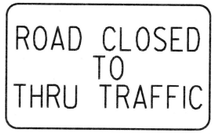

48"X30"

R11-3A




60"X30"

R11-4




60"X30"

W21-5a




STD. 36"X36"
FWY. 48"X48"

W1-1



STD. 36"X36"
FWY. 48"X48"

W1-2



STD. 36"X36"
FWY. 48"X48"

W1-3



STD. 48"X48"

W1-4



STD. 48"X48"

W1-6



STD. 48"X24"
SPECIAL 60"X30"

W1-8



STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



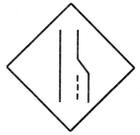
STD. 36"X36"
SPECIAL 48"X48"

W3-2



STD. 36"X36"
SPECIAL 48"X48"

W4-2



STD. 36"X36"
FWY. 48"X48"

W5-1




STD. 36"X36"
SPECIAL 48"X48"

W6-3



EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7




EXPWY. 36"X36"
FWY. 48"X48"

W9-2




STD. 36"X36"
FWY. 48"X48"

W13-1




STD. 24"X24"

W20-1




STD. 48"X48"

W20-2




STD. 48"X48"

W20-3




STD. 48"X48"

W20-4




STD. 48"X48"

W20-5




STD. 48"X48"

W20-7a




STD. 36"X36"
FWY. 48"X48"

W21-2




STD. 30"X30"
SPECIAL 36"X36"

W21-5




STD. 30"X30"
SPECIAL 36"X36"

W24-1



STD. 36"X36"

W1-4b



STD. 48"X48"

R56-1




STD. 18"X18"

W8-11



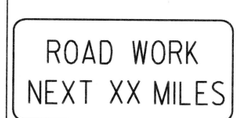

STD. 36"X36"
FWY. 48"X48"

W8-9



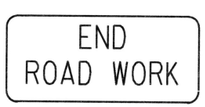

STD. 36"X36"
FWY. 48"X48"

G20-1



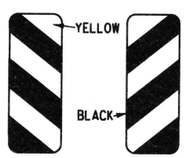

60"X24"

G20-2



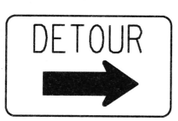

48"X24"

OM-3L OM-3R




12"X36"

M4-9



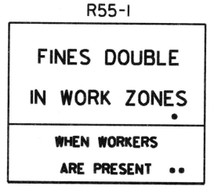

STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

M4-10




48"X18"

R55-1




36"X60"

• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

| | |
|---|---|
| 500 FT | 1/2 MILE |
| 1000 FT | 3/4 MILE |
| 1500 FT | 1 MILE |
| | AHEAD |

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.
3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.
- 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.
- 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.
6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.
7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.
8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.
10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

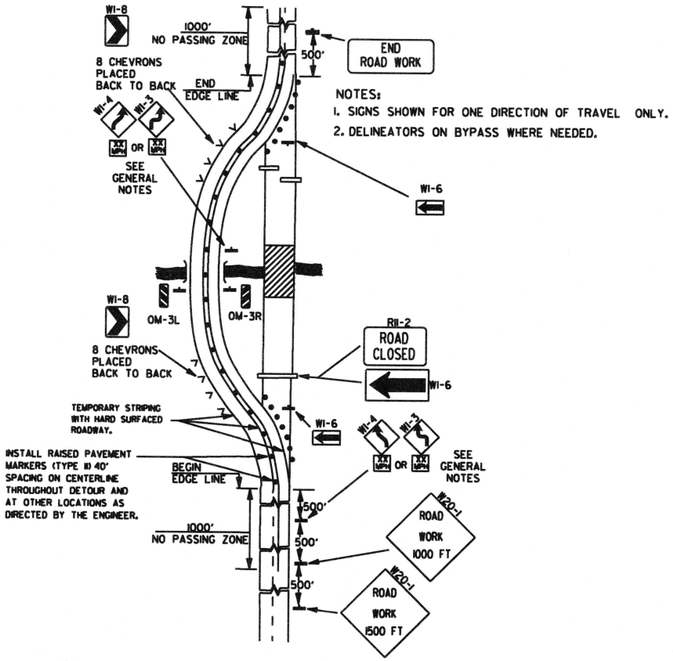
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED FOR ALL PROJECTS.

| DATE | REVISION | FILMED |
|---|---|---|
| 4-13-17 | DELETED RSP-1 & ADDED W21-5a | |
| 9-2-15 | REVISED REDUCED SPEED LIMIT AHEAD SIGNS<br>REVISED ROAD WORK NEXT XX MILES | |
| 12-15-11 | REVISED W24-1 | |
| 11-17-10 | DELETED W8-9a & ADDED W8-9 | |
| 10-15-09 | ADDED REFERENCE TO MASH & ADDED SIGN W24-1 | |
| 4-17-08 | REVISED SIGN DESIGNATIONS | |
| 11-18-04 | REVISED NOTES | |
| 10-9-03 | REVISED NOTE 1 | |
| 11-16-01 | REVISED NOTE 7 | |
| 9-28-00 | REVISED NOTE | |
| 11-18-98 | ADDED NOTE | |
| 6-26-97 | REVISED NOTE 5 | |
| 4-03-97 | REVISED NOTE 5 | |
| 10-18-96 | ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7 | |
| 10-12-95 | ADDED R55-1 | |
| 6-8-95 | REVISED TO CORRECT SIGN ILLUSTRATIONS | 6-8-95 |
| 2-2-95 | REVISED PER PART VI, MUTCD SEPT. 3, 1993 | |
| 8-15-91 | DRAWN AND PLACED IN USE | |

ARKANSAS STATE HIGHWAY COMMISSION

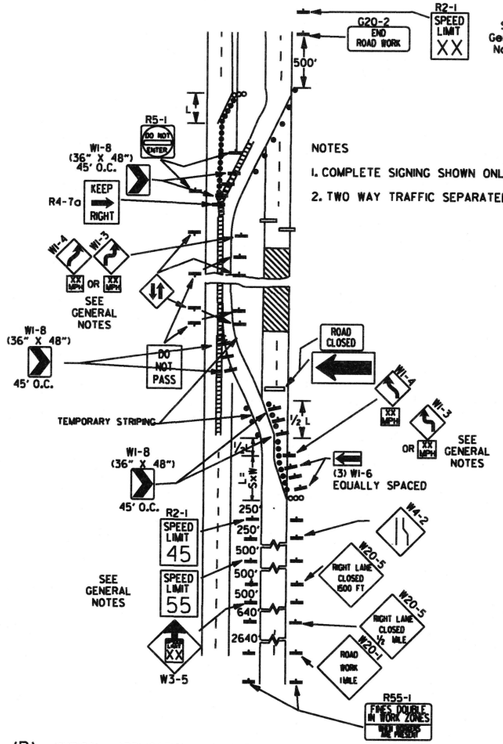
# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



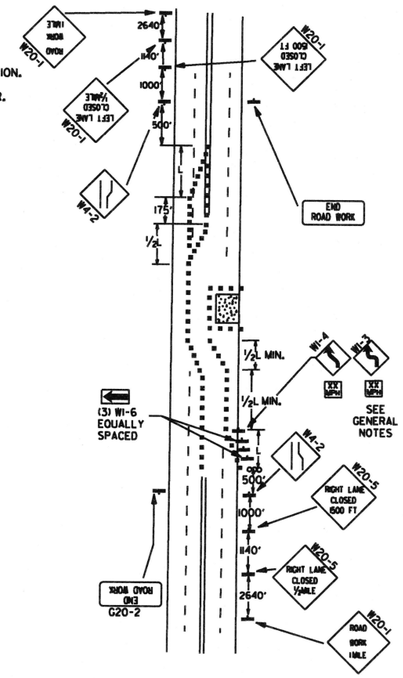

NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.

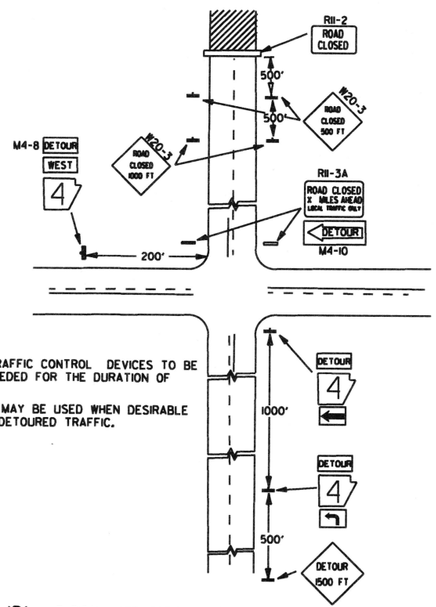



NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

(B) TYPICAL APPLICATION - 4-LANE DIVIDED ROADWAY WHERE ONE ROADWAY IS CLOSED.

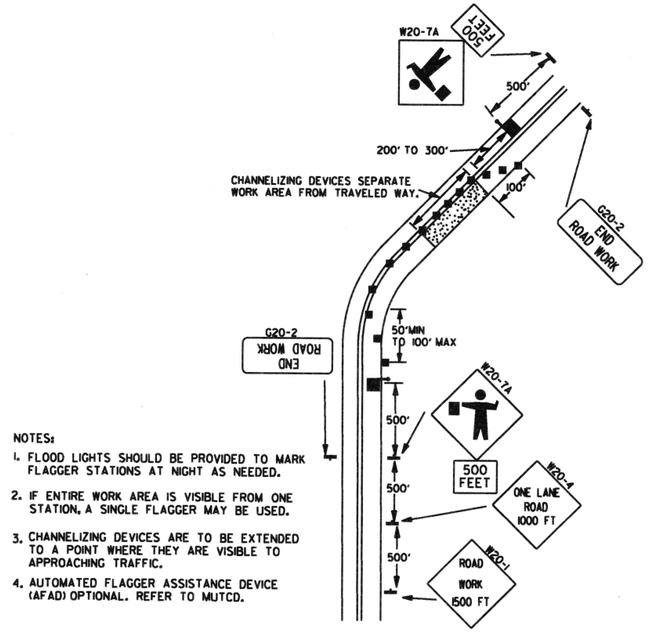



(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



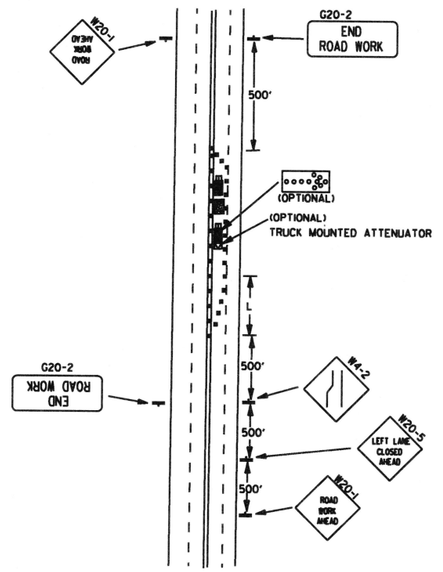

NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

(D) TYPICAL APPLICATION - ROADWAY CLOSED BEYOND DETOUR POINT.

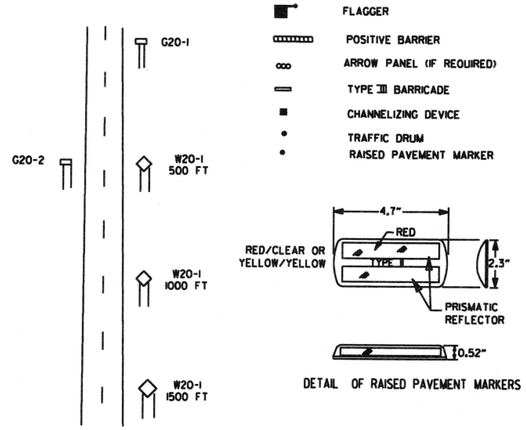



NOTES:
1. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
2. IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.
3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
4. AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD) OPTIONAL. REFER TO MUTCD.

(E) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON 2-LANE HIGHWAY WHERE ONE LANE IS CLOSED AND FLAGGING IS PROVIDED.




(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.




DETAIL OF RAISED PAVEMENT MARKERS

TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40MPH OR LESS.

WHERE:
L= MINIMUM LENGTH OF TAPER.
S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
W= WIDTH OF OFFSET.

GENERAL NOTES:

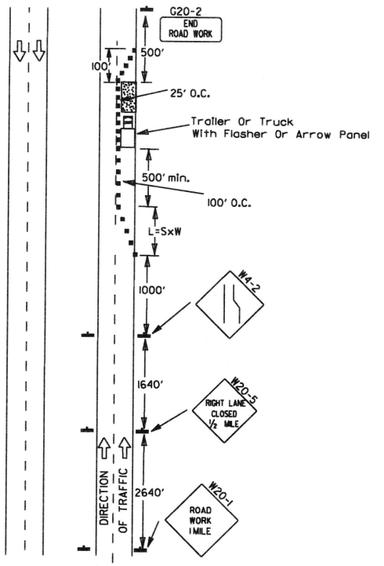
1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-1 55MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE.
8. DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.

| DATE | REVISION | FILMED |
|---|---|---|
| 9-2-15 | REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5 | |
| 9-12-13 | REVISED DETAIL OF RAISED PAVEMENT MARKERS | |
| 3-11-10 | ADDED (AFAD) | |
| 11-20-08 | REVISED SIGN DESIGNATIONS | |
| 11-18-04 | ADDED GENERAL NOTE | |
| 10-18-96 | ADDED R55-1 | |
| 4-26-96 | CORRECTED (a) BEHIND G20-2 | |
| 6-8-95 | CORRECTED SIGN IDENT. ON W1-4A | 6-8-95 |
| 2-2-95 | REVISED PER PART VI, MUTCD, SEPT. 3, 1993 | |
| 8-15-91 | DRAWN AND PLACED IN USE | |

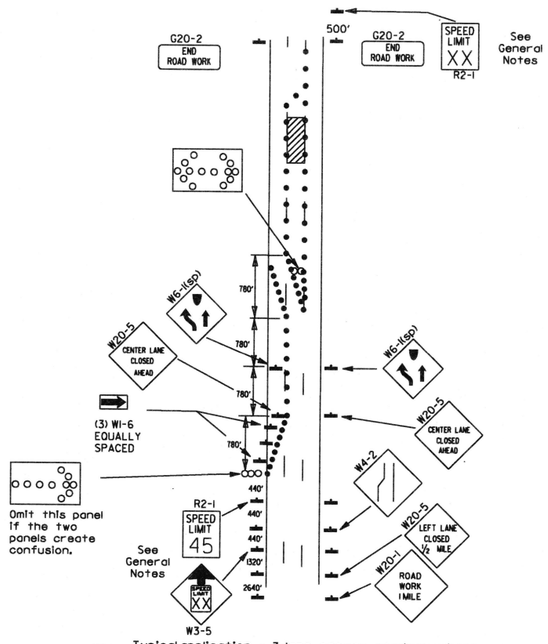
ARKANSAS STATE HIGHWAY COMMISSION

# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

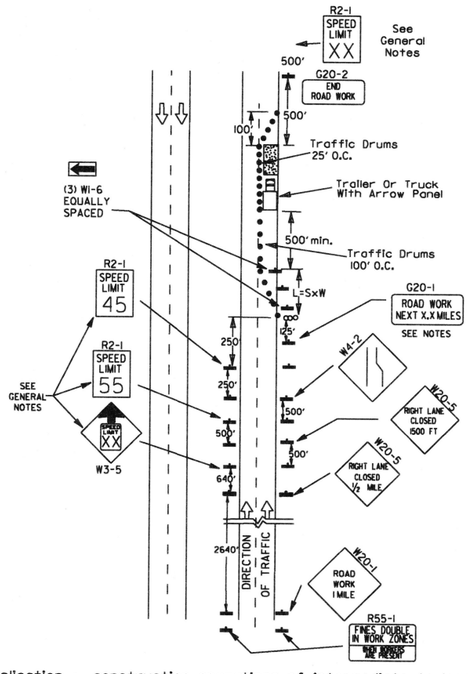
STANDARD DRAWING TC-2




(A) Typical application - daytime maintenance operations of short duration on a 4-lane divided roadway where half of the roadway is closed.




(B) Typical application - 3-lane oneway roadway where center lane is closed.




(C) Typical application - construction operatipns of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

KEY:

ooo Arrow Panel (If Required)

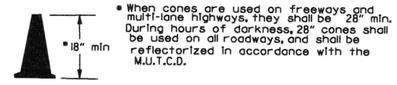
■ Channelizing Device

● Traffic drum

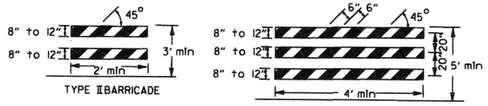
GENERAL NOTES:

1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional R2-1 45mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
3. When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(45) shall be omitted. Additional R2-1 55mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
4. The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit. Beyond the taper, maximum spacing shall be two times the speed limit or as directed by the Engineer.
5. Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
6. Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
7. The G20-1 sign will be required on jobs of over two miles in length. When the lane closure is not at the beginning of the project, the G20-1 sign shall be erected 125' in advance of the job limit. Additional W20-1 (1 MILE) signs are not required in advance of lane closures that begin inside the project limits.
8. Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
9. All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual For Assessing Safety Hardware (MASH).
10. Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.

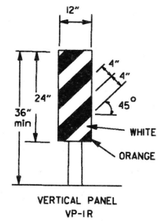
Channelizing devices




* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.




NOTE:
For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.



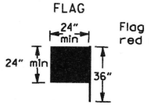

TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

| VERTICAL DIFFERENTIAL | LOCATIONS | TRAFFIC CONTROL |
|---|---|---|
| 1" to 3" | Centerline, lane lines | W8-11 |
| 1" to 3" | Edge of shoulder | W8-9 |
| Greater than 3" | Lane lines | Standard lane closure required |
| Greater than 3" | Edge of traveled lane | *RSP-1 and vertical panels, drums or concrete barrier |
| Greater than 3" | Edge of shoulder | *Vertical panels, drums or concrete barrier |

* When shown on the plans concrete barrier will be used.

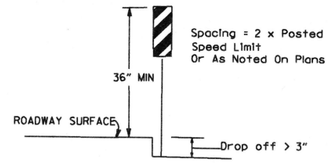
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

FLAG

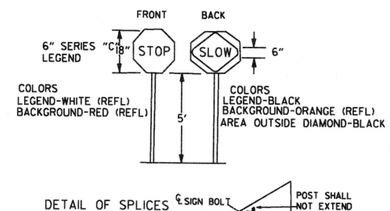


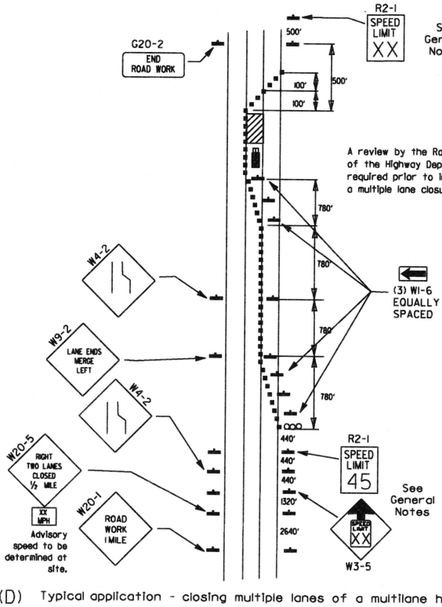

Flag shall be of good grade red material

VERTICAL PANEL PLACEMENT




STOP SLOW PADDLE

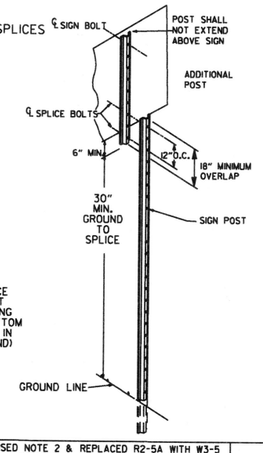



A review by the Roadway Design Division of the Highway Department will be required prior to implementing a multiple lane closure.

(D) Typical application - closing multiple lanes of a multilane highway.

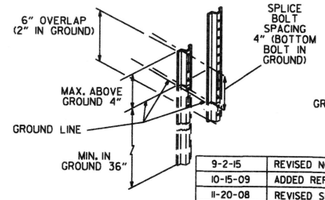
DETAIL OF SPLICES




NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)

NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.

SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.




| | | |
|---|---|---|
| 9-2-15 | REVISED NOTE 2 & REPLACED R2-5A WITH W3-5 | |
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 11-20-08 | REVISED SIGN DESIGNATIONS | |
| 11-18-04 | ADDED NOTE | |
| 10-1-98 | ADDED NOTE | |
| 4-03-97 | ADDED (SP) TO W6-1 & REVISED TRAFFIC CONTROL DEVICES NOTE | |
| 10-18-96 | ADDED R55-1 | |
| 10-12-95 | MOVED UPPER SPLICE | |
| 6-8-95 | REVISED SPLICE DETAIL, TEXT | 6-8-95 |
| 2-2-95 | REVISED PER PART VI, MUTCD, SEPT. 3, 1993 | |
| 8-15-91 | DRAWN AND PLACED IN USE | |
| DATE | REVISION | FILMED |

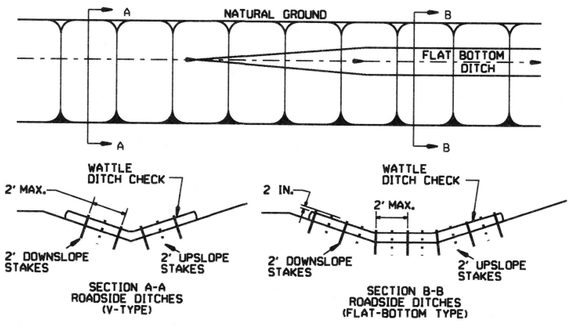
ARKANSAS STATE HIGHWAY COMMISSION

# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

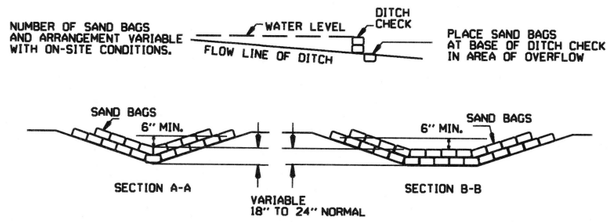
STANDARD DRAWING TC-3

## GENERAL NOTES

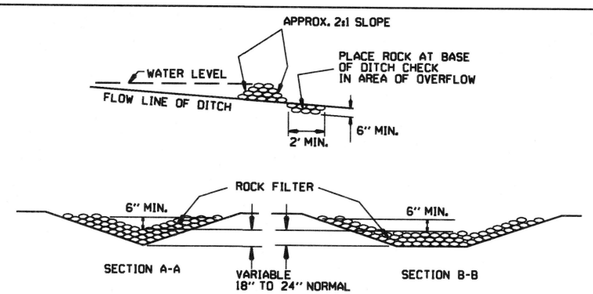
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.




## WATTLE DITCH CHECK (E-1)




## SAND BAG DITCH CHECK (E-5)

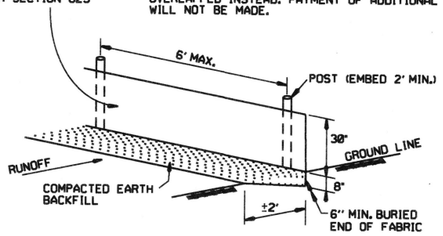



## ROCK DITCH CHECK (E-6)

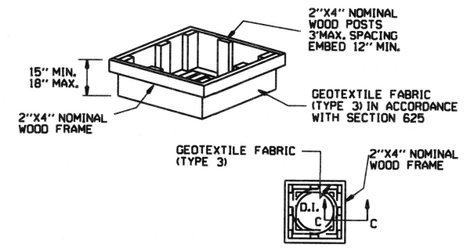
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

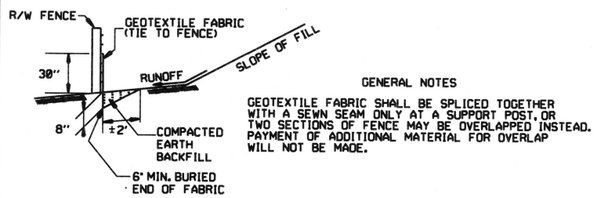
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.




## SILT FENCE (E-11)




## DROP INLET SILT FENCE (E-7)




GENERAL NOTES

GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN 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.

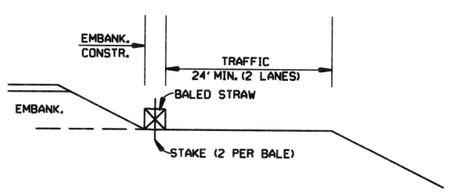
## SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

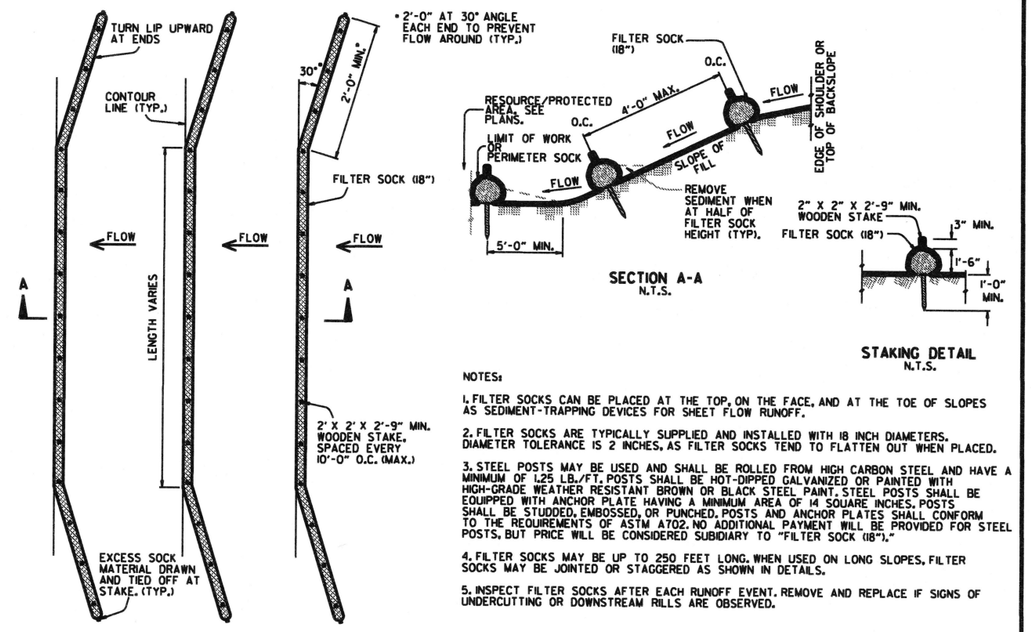
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.




## BALED STRAW FILTER BARRIER (E-2)




NOTES:

1. FILTER SOCKS CAN BE PLACED AT THE TOP, ON THE FACE, AND AT THE TOE OF SLOPES AS SEDIMENT-TRAPPING DEVICES FOR SHEET FLOW RUNOFF.

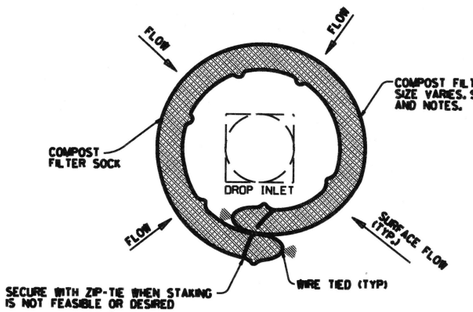
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

3. STEEL POSTS MAY BE USED AND SHALL BE ROLLED FROM HIGH CARBON STEEL AND HAVE A MINIMUM OF 1.25 LB./FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH-GRADE WEATHER RESISTANT BROWN OR BLACK STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR STEEL POSTS, BUT PRICE WILL BE CONSIDERED SUBIDIARY TO "FILTER SOCK (18")."

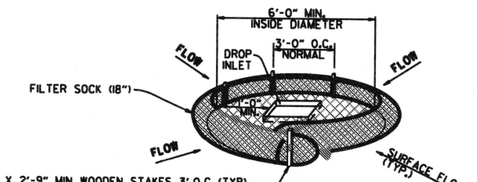
4. FILTER SOCKS MAY BE UP TO 250 FEET LONG. WHEN USED ON LONG SLOPES, FILTER SOCKS MAY BE JOINTED OR STAGGERED AS SHOWN IN DETAILS.

5. INSPECT FILTER SOCKS AFTER EACH RUNOFF EVENT. REMOVE AND REPLACE IF SIGNS OF UNDERCUTTING OR DOWNSTREAM RILLS ARE OBSERVED.

## FILTER SOCK ALONG SLOPE (E-3)




## DROP INLET PLAN VIEW
N.T.S.




## DROP INLET PERSPECTIVE VIEW
N.T.S.

NOTES:

1. OVERLAP ENDS OF SOCK (1' MIN. 3' MAX.).

2. USE 18" DIA. SOCK IN NON-TRAFFIC AREAS OR AREAS WHERE SAFETY IS NOT A CONCERN.

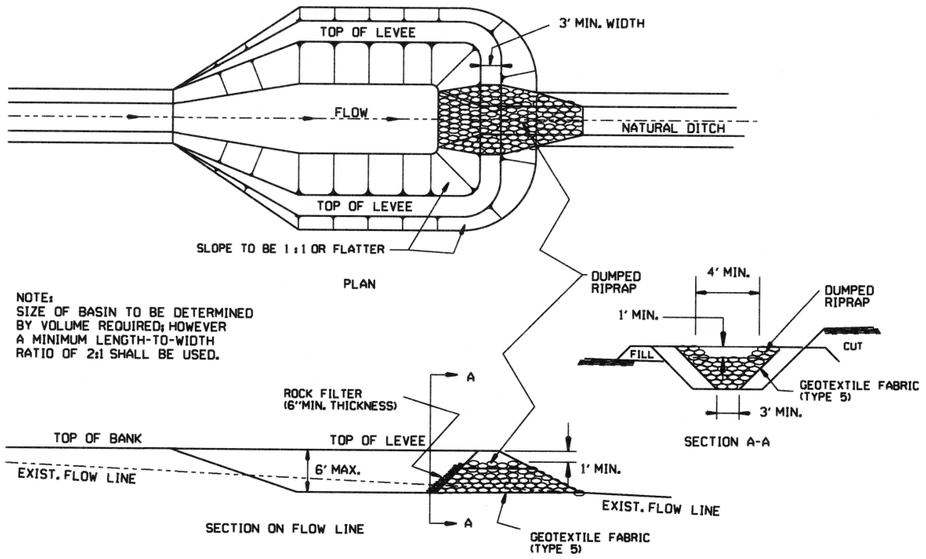
## COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

| DATE | REVISION | FILMED |
|---|---|---|
| 11-16-17 | ADDED FILTER SOCK E-3 AND E-13 | |
| 12-15-11 | DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK | |
| 11-18-98 | ADDED NOTES | |
| 07-02-98 | ADDED BALED STRAW FILTER BARRIER (E-2) | |
| 07-20-95 | REVISED SILT FENCE E-4 AND E-11 | 7-20-95 |
| 07-15-94 | REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC | |
| 06-02-94 | REVISED E-1,4,7 & 11; DELETED E-2 & 3 | 6-2-94 |
| 04-01-93 | REDRAWN | |
| 10-01-92 | REDRAWN | |
| 08-02-76 | ISSUED R.D.M. | 298-7-28-76 |

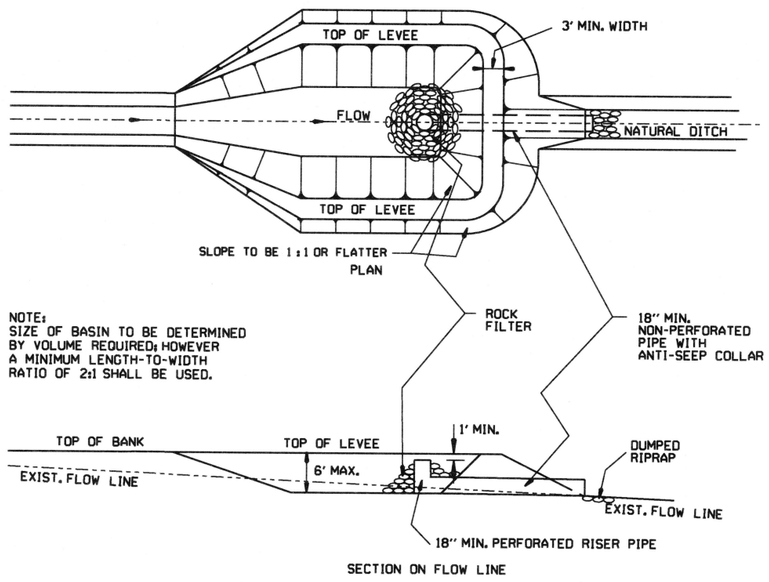
ARKANSAS STATE HIGHWAY COMMISSION

# TEMPORARY EROSION CONTROL DEVICES

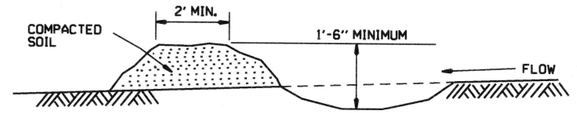
STANDARD DRAWING TEC-1



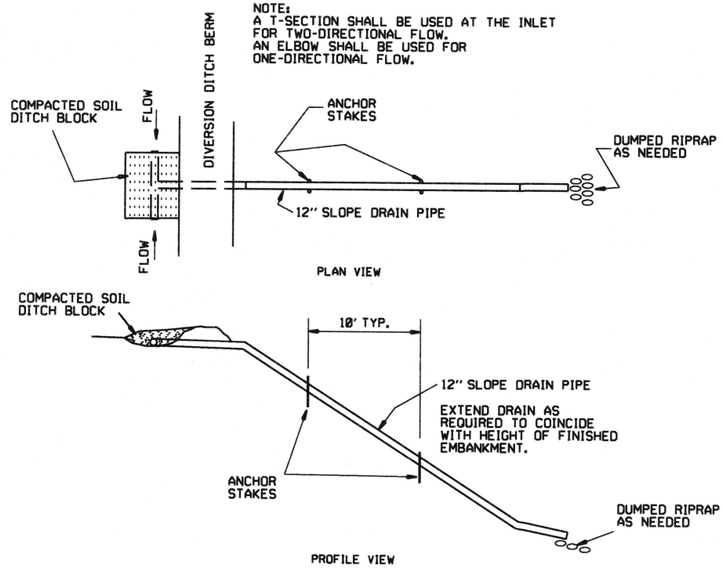

SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



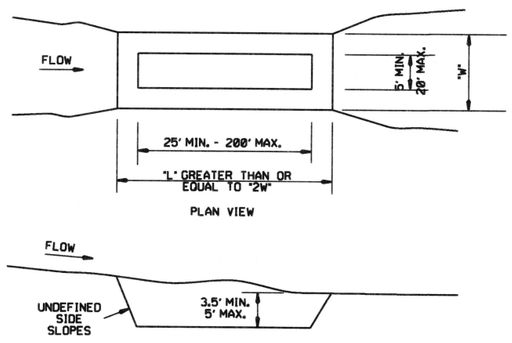

SEDIMENT BASIN WITH PIPE OUTLET (E-10)




DIVERSION DITCH (E-8)




SLOPE DRAIN (E-12)




SEDIMENT BASIN (E-14)

| DATE | REVISION | FILMED |
|---|---|---|
| 6-2-94 | Revised E-8 & E-12; Added E-14 & Deleted E-13 | |
| 4-1-93 | ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

# TEMPORARY EROSION CONTROL DEVICES

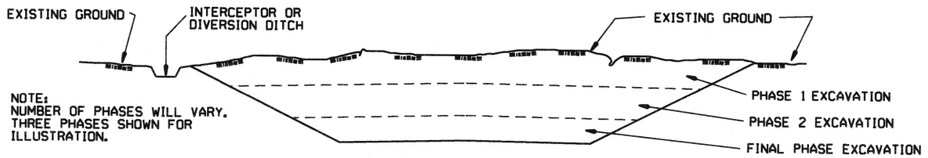
STANDARD DRAWING TEC-2

# CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

1. PLACE PERIMETER CONTROLS (I.E. SILT FENCES , DIVERSION DITCHES, SEDIMENT BASINS, ETC.)
2. PERFORM CLEARING AND GRUBBING OPERATION.

# EXCAVATION



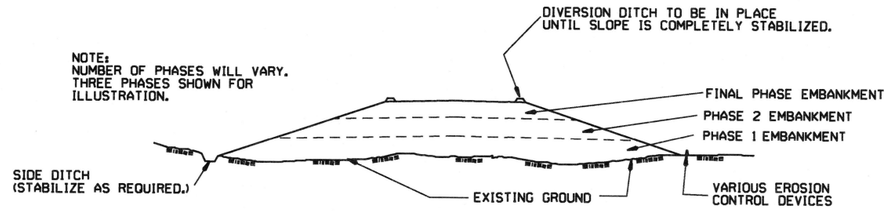

GENERAL NOTE

ALL CUT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE EXCAVATED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

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

# EMBANKMENT




GENERAL NOTE

ALL EMBANKMENT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE CONSTRUCTED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

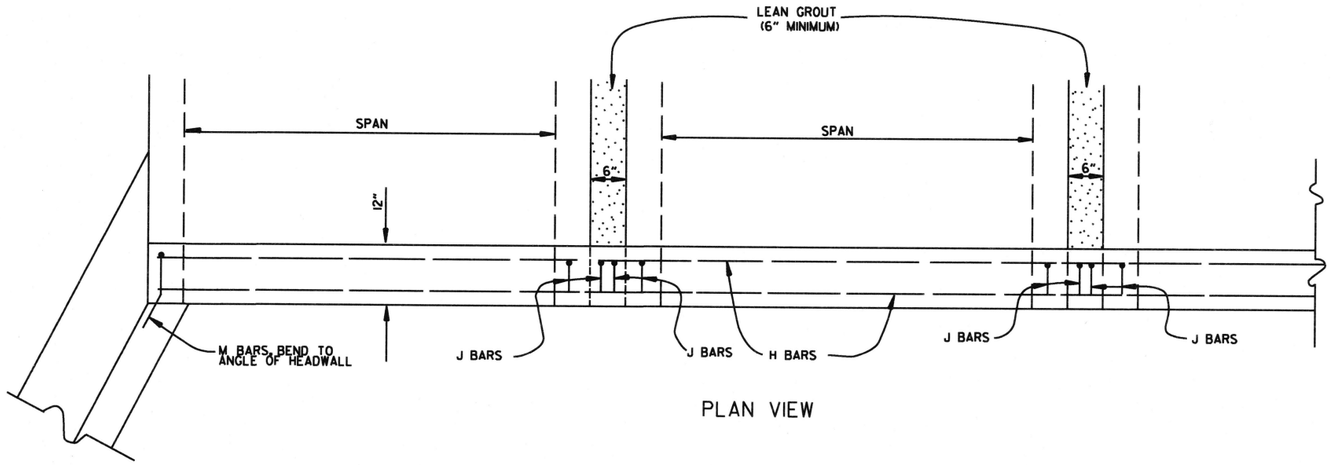
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
3. PLACE PHASE 2 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
4. PLACE FINAL PHASE OF EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PLACE DIVERSION DITCHES AND SLOPE DRAINS AND MAINTAIN UNTIL ENTIRE SLOPE IS STABILIZED.

| | | |
|---|---|---|
| 11-03-94 | CORRECTED SPELLING | |
| 6-2-94 | Drawn & Issued | 6-2-94 |
| DATE | REVISION | FILMED |

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

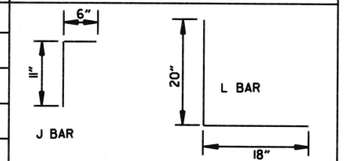
STANDARD DRAWING TEC-3



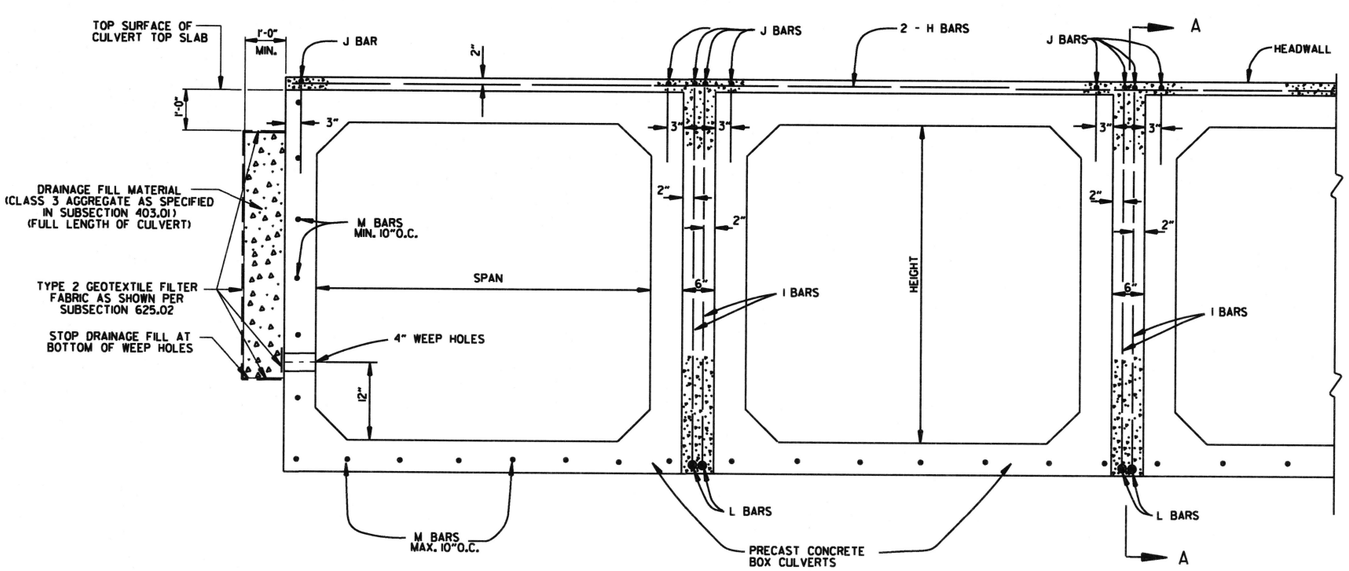

PLAN VIEW

## BAR LIST

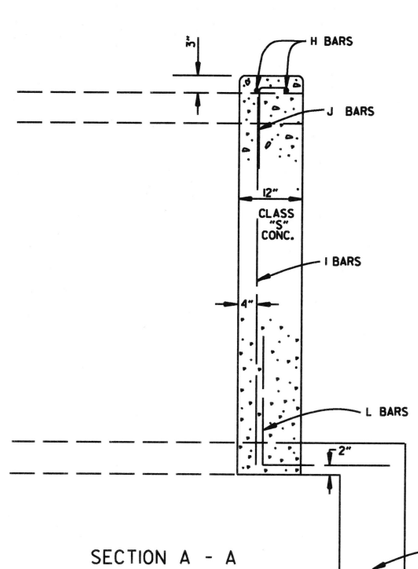
| BAR | NO. | SIZE | LENGTH | BAR BENDING DIAGRAM |
|---|---|---|---|---|
| H | 2 | #4 | * | |
| I | * | #4 | * | |
| J | * | #4 | 1'-5" | |
| L | * | #4 | 3'-2" | |
| M | * | #4 | 1'-8" | |




* NOTE: LENGTH AND NUMBER OF BARS VARIES WITH SIZE OF CULVERT




END VIEW




SECTION A - A

### GENERAL NOTES

WINGS, CURTAIN WALLS AND APRONS SHALL BE TIED TO THE PRECAST CULVERT SECTION BY CASTING BARS IN CULVERT END SECTIONS AS SHOWN OR BY DOWELING AND GROUTING. J BARS AND M BARS SHALL BE EMBEDDED A MINIMUM OF 10" IN PRECAST BOX.

WINGS, FOOTINGS, APRONS AND CURTAIN WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE WING DRAWING. STEEL AND CONCRETE QUANTITIES WILL BE ADJUSTED TO FIT THE IN-PLACE WIDTH & HEIGHT OF THE PRECAST CONCRETE BOX CULVERTS.

ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFERS.

WINGWALLS AND FOOTINGS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

ALL CONCRETE, REINFORCING STEEL, LEAN GROUT, MEMBRANE WATERPROOFING, DRAINAGE FILL MATERIAL, GEOTEXTILE FILTER FABRIC, LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR INSTALLING PRECAST BOX CULVERTS WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR THE ITEMS AS SPECIFIED IN SECTION 607 OF THE STANDARD SPECIFICATIONS.

LEAN GROUT SHALL CONSIST OF A SAND CEMENT MIXTURE MEETING THE FOLLOWING REQUIREMENTS:
PORTLAND CEMENT SHALL BE TYPE I AND SHALL MEET THE REQUIREMENTS OF AASHTO M 85.
SAND SHALL MEET THE REQUIREMENTS OF FINE AGGREGATE AS SPECIFIED IN SECTION 802.02 OF THE STANDARD SPECIFICATIONS.
THE SAND CEMENT MIXTURE SHALL CONSIST OF NOT LESS THAN 1.5 SACKS OF PORTLAND CEMENT PER TON OF MATERIAL MIXTURE.
THE MIXTURE SHALL CONTAIN SUFFICIENT WATER TO HYDRATE THE CEMENTS. THE SAND CEMENT MIXTURE SHALL BE PLACED IN MAXIMUM 8 INCH THICK LIFTS, LOOSE MEASURE, AND THOROUGHLY RODDED AND TAMPED AROUND BOX TO THOROUGHLY FILL ALL VOIDS.

MEMBRANE WATERPROOFING CONFORMING TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS SHALL BE APPLIED TO ALL BOX CULVERT JOINTS.

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

IN OUTER BARRELS, ONE WEEP HOLE IS REQUIRED IN EXTERIOR WALLS OF EACH PRECAST CULVERT SECTION. WEEP HOLES SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" IN THE ASSEMBLED CULVERT AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

MINIMUM WIDTH SHALL BE 12" (6" ON EACH SIDE OF JOINT). ON MULTIPLE BARREL CULVERTS, MEMBRANE WATERPROOFING SHALL BE APPLIED TO EACH BARREL AS DESCRIBED ABOVE.

WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, FLOWABLE SELECT MATERIAL CONFORMING TO SECTION 206 OF THE STANDARD SPECIFICATIONS IN LIEU OF LEAN GROUT.

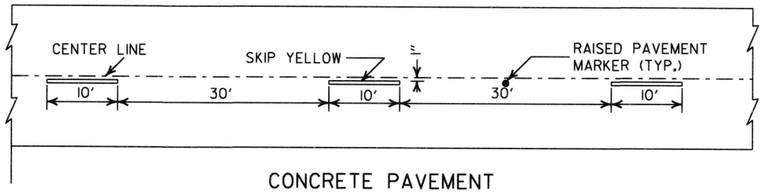
| DATE | REVISION | DATE FILMED |
|---|---|---|
| 1-28-15 | REVISED GEOTEXTILE FABRIC PLACEMENT | |
| 12-15-11 | ADDED NOTE & DTLS FOR WEEP HOLE AND DRAINAGE FILL | |
| 10-15-09 | ADDED GENERAL NOTE | |
| 11-10-05 | REVISED SPACING OF "M" BARS | |
| 4-16-03 | REVISED GENERAL NOTES | |
| 10-18-96 | CORRECTED AASHTO REF. | |
| 10-1-92 | ADDED NOTE FOR MEMBRANE WATERPROOFING | |
| 8-15-91 | ADDED NOTE FOR LEAN GROUT | |
| 11- 8-90 | REVISED FOR 1991 SPECS | |
| 11-30-89 | ISSUED; JABE | |

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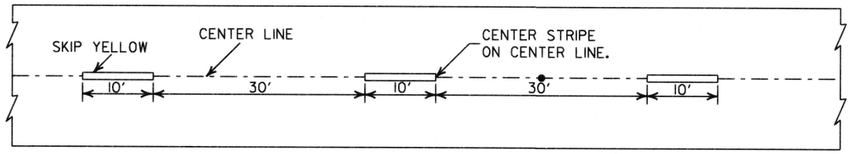
# PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

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

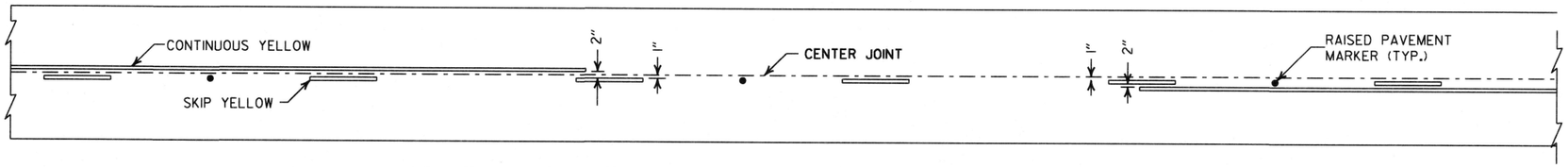



CONCRETE PAVEMENT

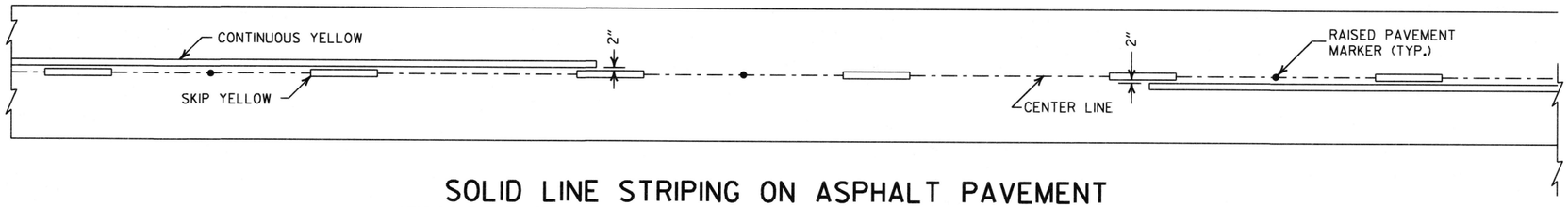



ASPHALT PAVEMENT

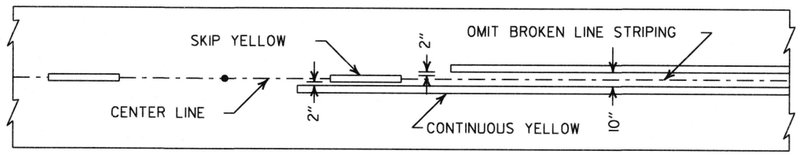
## BROKEN LINE STRIPING



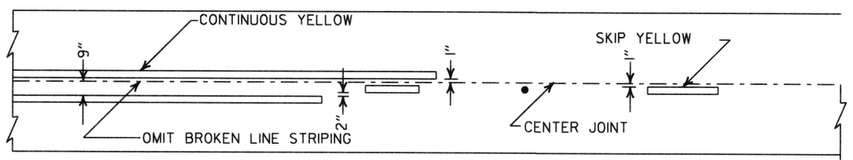

## SOLID LINE STRIPING ON CONCRETE PAVEMENT




## SOLID LINE STRIPING ON ASPHALT PAVEMENT

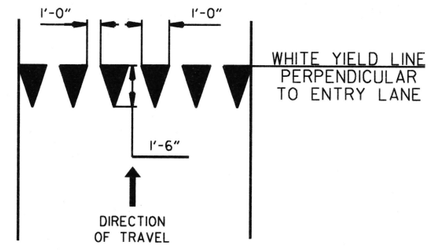



ASPHALT PAVEMENT

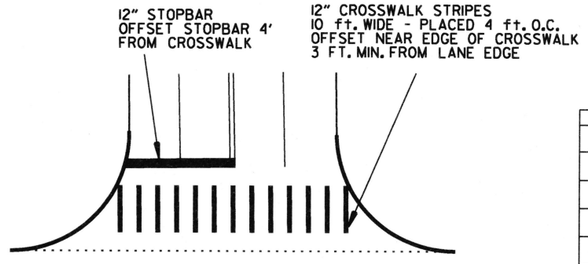



CONCRETE PAVEMENT

## STRIPING AT ADJACENT NO PASSING LANES

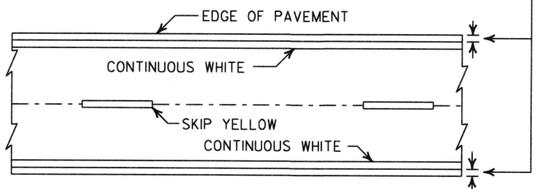



## YIELD LINE DETAIL




## CROSSWALK AND STOPBAR DETAILS

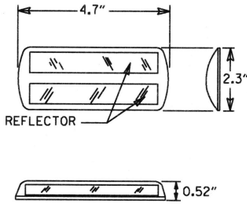
2" FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT




## PAVEMENT EDGE LINE MARKING

NOTE:
THE RED LENS OF THE TYPE II R.P.M. SHALL FACE THE INCORRECT TRAFFIC MOVEMENT.

TYPE II
RED/CLEAR OR
YELLOW/YELLOW




NOTE:
DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.

## DETAIL OF STANDARD RAISED PAVEMENT MARKERS

| DATE | REVISION | |
|---|---|---|
| 6-1-17 | ADDED YIELD LINE DETAIL | |
| 5-12-16 | REVISED LINE WIDTHS, SPACING, & NOTES | |
| 9-12-13 | REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS | |
| 11-17-10 | REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS | |
| 11-18-04 | REVISED NOTE 2 & GENERAL NOTES | |
| 8-22-02 | ADDED CROSSWALK & STOPBAR DTLS. | |
| 7-02-98 | ADDED DETAILS OF STD. RAISED PAV'T. MARKERS | |
| 4-26-96 | REV. NOTES 3&4; ADDED R.P.M. | |
| 9-30-80 | DRAWN | 1-9-30-80 |
| | | FILMED |

ARKANSAS STATE HIGHWAY COMMISSION

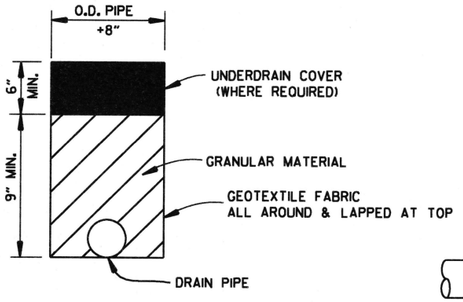
# PAVEMENT MARKING DETAILS

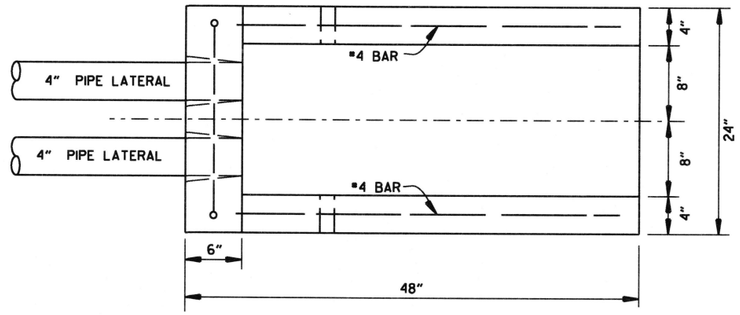
STANDARD DRAWING PM-1

NOTE:

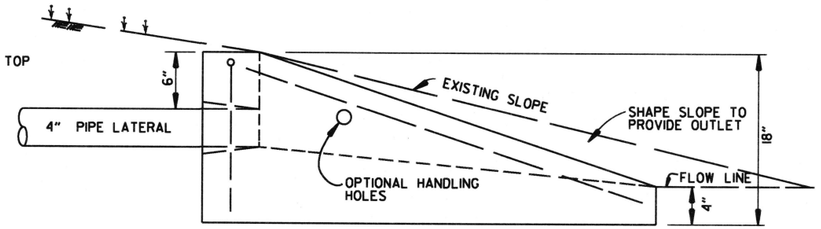
1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

2. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.

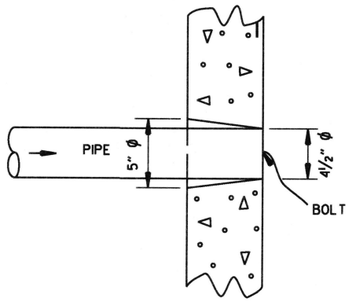


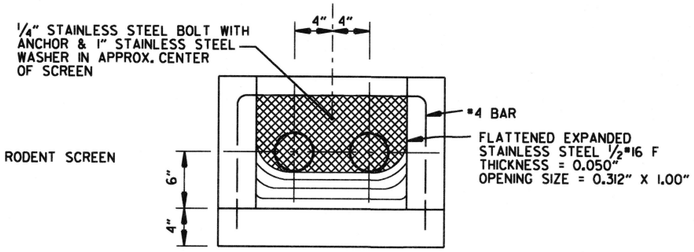

PLAN VIEW



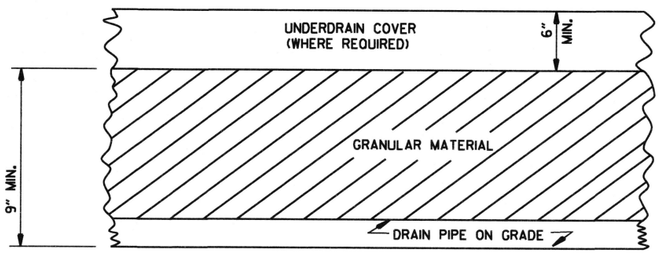

SIDE VIEW




DETAIL OF HOLE FOR 4" PIPE

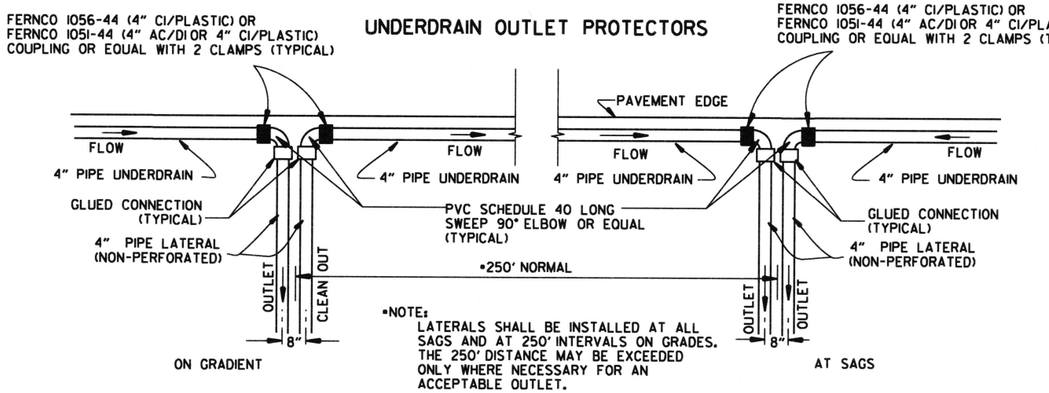



FRONT VIEW
(DETAIL OF RODENT SCREEN)




DETAILS OF PIPE UNDERDRAIN

## UNDERDRAIN OUTLET PROTECTORS




### DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

NOTE: PVC PIPE FOR LATERALS SHALL MEET THE REQUIREMENTS OF ASTM D 1785 (LATEST REVISION) FOR SCHEDULE 40 PIPE.

## NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE I. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS" IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

2. 4" NON-PERFORATED SCHEDULE 40 PVC PIPE LATERALS WITH OUTLET PROTECTORS SHALL BE INSTALLED AS SHOWN HEREON. 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 611 OF THE STANDARD SPECIFICATIONS.

3. EXISTING 4" PIPE UNDERDRAINS MAY BE CONNECTED TO PROPOSED DROP INLETS OR EXTENDED WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR CONNECTING TO DROP INLETS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR "4" PIPE UNDERDRAINS."

4. THE LOCATION OF ALL LATERALS SHALL BE MARKED WITH 4" X 12" PERMANENT PAVEMENT MARKING TAPE (TYPE III WHITE) AT THE OUTSIDE EDGE OF THE SHOULDER, 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 WILL 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."

7. AT LOCATIONS WHERE A SINGLE LATERAL IS USED THE CONTRACTOR SHALL HAVE THE FOLLOWING OPTIONS: 1. INSTALL OUTLET PROTECTOR AS SHOWN ON STANDARD DRAWING PU-1 AND GROUT THE UNUSED HOLE OR 2. INSTALL AN OUTLET PROTECTOR WITH A SINGLE HOLE.

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 12-8-16 | ADDED NOTES FOR PIPE UNDERDRAINS, REVISED RODENT SCREEN DETAIL AND NOTES, REMOVED NOTE 1 FOR GRANULAR MATERIAL, ADDED NOTE FOR GEOTEXTILE FABRIC | |
| 4-10-03 | REVISED NOTE 3 | |
| 1-12-00 | REVISED DETAIL OF UNDERDRAIN LATERALS | |
| 11-18-98 | REVISED NOTE | |
| 10-18-96 | REVISED MIN. DEPTH & GEOTEXTILE FABRIC | |
| 4-26-96 | ADDED LATERAL NOTE; 5½" TO 5" | |
| 11-22-95 | REVISED LATERALS | |
| 7-20-95 | REVISED LATERALS & ADDED NOTE | |
| 11- 3-94 | REVISED FOR DUAL LATERALS | 11- 3-94 |
| 10- 1-92 | SUBSTITUTED GEOTEXTILE | 10- 1-92 |
| 8-15-91 | ADDED POLYEDTHYLENE PIPE | 8-15-91 |
| 11- 8-90 | DELETED ALTERNATE NOTE | 11- 8-90 |
| 1-25-90 | ADDED 4" SNAP ADAPTER | 1-25-90 |
| 11-30-89 | DEL. (SUBGRADE); ADDED (WHERE REQUIRED) | 11-30-89 |
| 7-15-88 | ISSUED P.L.M. | 647-7-15-88 |

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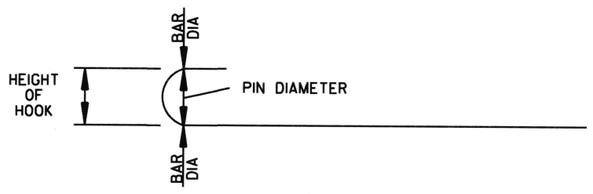
# DETAILS OF PIPE UNDERDRAIN

STANDARD DRAWING PU-1

STEEL FABRICATION: REINFORCING STEEL FABRICATION SHALL CONFORM TO THE DIMENSIONS LISTED IN THE TABLE BELOW:

| BAR SIZE | PIN DIAMETER | HOOK EXTENSION "K" |
|---|---|---|
| 3 | 2¼" | 4" |
| 4 | 3 " | 4½" |
| 5 | 3¾" | 5" |
| 6 | 4½" | 6" |
| 7 | 5¼" | 7" |
| 8 | 6" | 8" |

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2¾ INCHES, 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", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.




NOTE: DIMENSIONS OF BARS ARE MEASURED OUT TO OUT OF BARS.

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

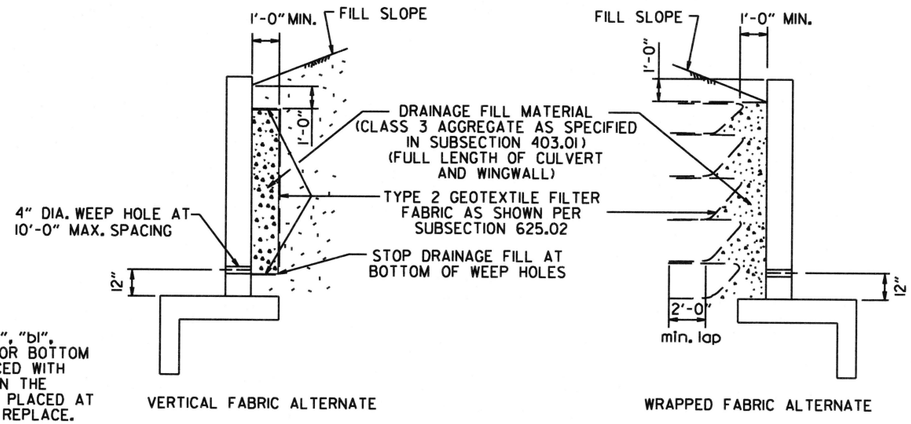
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

FOR SKEWED CULVERTS, THE REPLACEMENT STRAIGHT BAR MAY HAVE TO BE CUT IN FIELD TO FIT.

REPLACEMENT BAR LENGTHS TABLE

| BAR SIZE: "b", "b1", "b2" OR "b3" | LENGTH OF HOOKED BAR | LENGTH OF STRAIGHT BAR |
|---|---|---|
| #4 | L + 1' - 0" | SEE "c" BAR LENGTH |
| #5 | L + 1' - 2" | SEE "c" BAR LENGTH |
| #6 | L + 1' - 4" | SEE "c" BAR LENGTH |
| #7 | L + 1' - 8" | SEE "c" BAR LENGTH |
| #8 | L + 1' - 10" | SEE "c" BAR LENGTH |
| #9 | L + 2' - 6" | SEE "c" BAR LENGTH |

L = "OW" - 3 INCHES




WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI.

REINFORCING STEEL SHALL BE AASHTO M 31 OR M 53, GRADE 60.

CONSTRUCTION AND MATERIALS FOR WINGWALL & CULVERT DRAINAGE, INCLUDING WEEP HOLES AND GRANULAR MATERIAL, SHALL BE SUBSIDIARY TO THE BID ITEM, "CLASS S CONCRETE".

MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

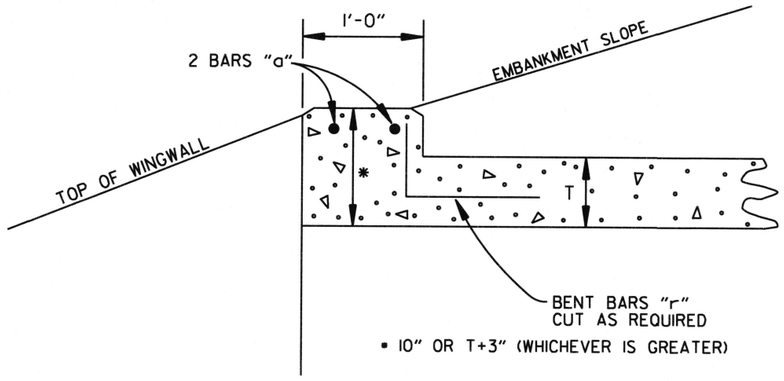
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS ½ 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 12" ABOVE THE TOP OF THE BOTTOM SLAB.

WEEP HOLES IN WINGWALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THERE SHALL BE A MINIMUM OF TWO (2) WEEP HOLES IN EACH WINGWALL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE WINGWALL FOOTING.

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




NOTE: FOR ALL SKEWED R.C. BOX CULVERTS THE LENGTH "K" OF THE MODIFIED HEADWALL SHALL BE EQUAL TO THE ROADWAY LENGTH "RL". THE ENDS OF THE HEADWALL SHALL BE CONSTRUCTED PARALLEL TO THE SKEW ANGLE OF THE BOX CULVERT.

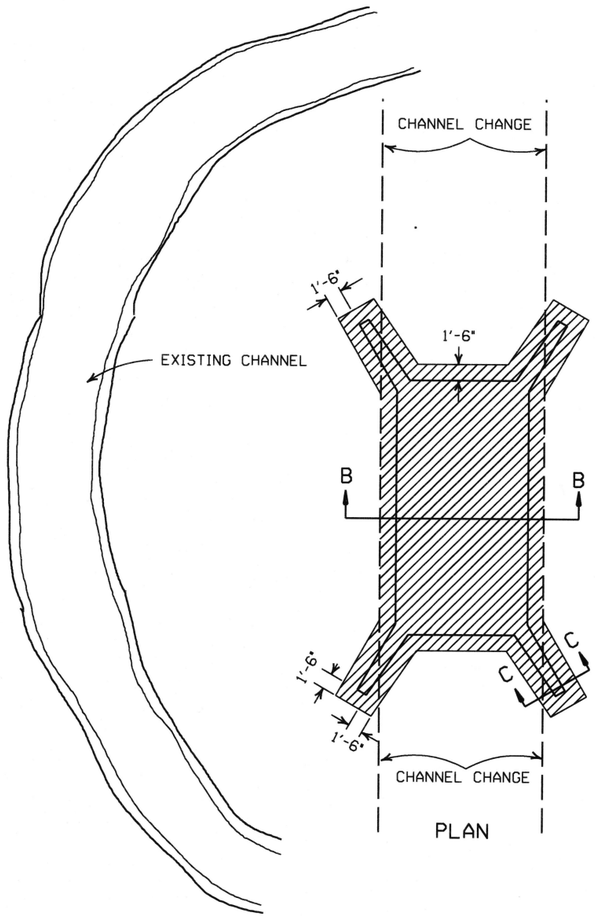
R.C. BOX CULVERT HEADWALL MODIFICATIONS

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 7/26/12 | REV. DRAINAGE FILL MATERIAL & DETAIL | |
| 12/15/11 | REQUIRE WEEP HOLES IN BOX CULVERT WALLS | |
| 5-25-06 | REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM | |
| 11-16-01 | ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES | |
| 10-18-96 | REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM | |
| 10-12-95 | MOVED SOLID SODDING DETAIL TO RCB-2 | |
| 6-2-94 | ADDED SOLID SODDING PLAN DETAIL | |
| 8-5-93 | REVISED PIN DIAMETER TO SPECS. | |
| 8-15-91 | DRAWN AND ISSUED | |

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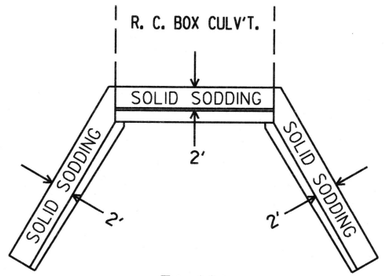
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1




PLAN

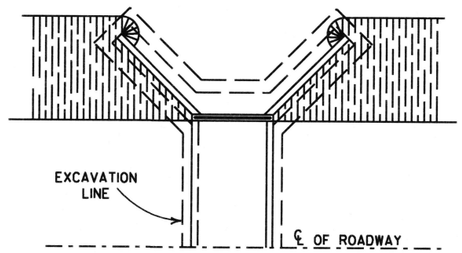
## SOLID SODDING



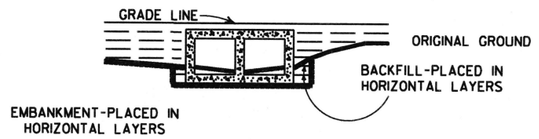

PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

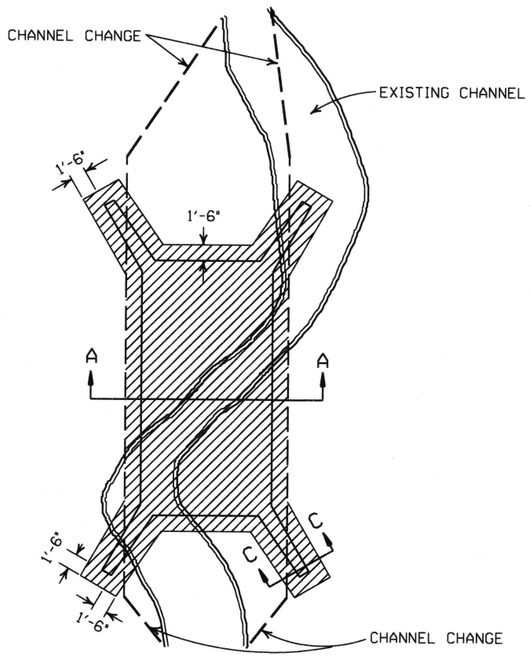



PLAN

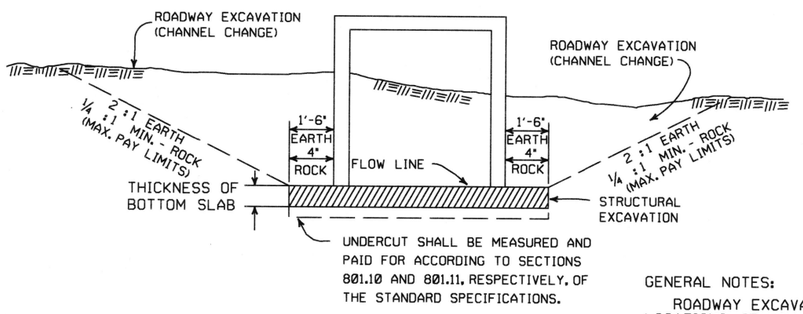



LONGITUDINAL SECTION

## BACKFILL DETAILS FOR BOX CULVERT

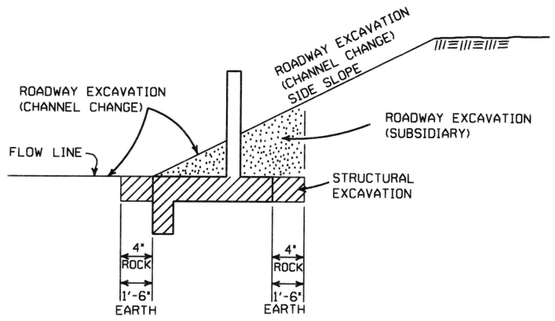



PLAN

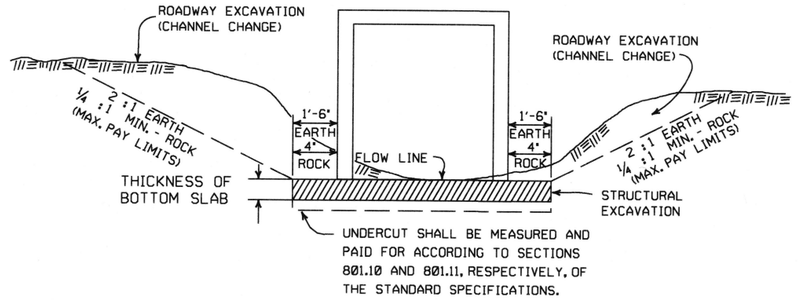



SECTION B-B

## DETAILS FOR NEW CHANNELS




SECTION C-C




SECTION A-A

## DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

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

EXCAVATION FOR STRUCTURES WILL BE PAID FOR AT ALL R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE.

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

| DATE | REVISION | FILMED |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| 11-20-03 | REVISED SECTION A-A NOTE | |
| 8-22-02 | REVISED SECTION B-B NOTE | |
| 10-12-95 | COMBINED 1891B AND 1888A | |
| 1-4-83 | REVISED GENERAL NOTES | 674-1-4-83 |
| | AND ADDED MAXIMUM PAY | |
| | LIMIT NOTES. | |
| 2-2-76 | EXCAV. PAY LIMITS | 917-2-2-76 |
| 10-2-72 | REVISED AND REDRAWN | 564-10-16-72 |

ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

## SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

| DEGREE OF CURVE | 30 MPH e | 30 MPH Ls (FT) MINIMUM | 30 MPH Ls (FT) DESIRABLE | 40 MPH e | 40 MPH Ls (FT) MINIMUM | 40 MPH Ls (FT) DESIRABLE | 50 MPH e | 50 MPH Ls (FT) MINIMUM | 50 MPH Ls (FT) DESIRABLE | 55 MPH e | 55 MPH Ls (FT) MINIMUM | 55 MPH Ls (FT) DESIRABLE | 60 MPH e | 60 MPH Ls (FT) MINIMUM | 60 MPH Ls (FT) DESIRABLE | 70 MPH e | 70 MPH Ls (FT) MINIMUM | 70 MPH Ls (FT) DESIRABLE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° 15' | N.C. | | | N.C. | | | N.C. | | | N.C. | | | N.C. | | | N.C. | | |
| 0° 30' | N.C. | | | N.C. | | | N.C. | | | N.C. | | | N.C. | | | N.C. | | |
| 0° 45' | N.C. | | | N.C. | | | R.C. | | | N.C. | | | 0.023 | | | 0.028 | | |
| 1° 00' | N.C. | | | N.C. | | | 0.021 | | | 0.026 | | | 0.030 | | | 0.037 | | |
| 1° 15' | N.C. | | | R.C. | | | 0.026 | | | 0.032 | | | 0.037 | | | 0.046 | | |
| 1° 30' | N.C. | | | 0.021 | | | 0.031 | | | 0.037 | | | 0.043 | | | 0.054 | | |
| 1° 45' | N.C. | | | 0.025 | | | 0.036 | | | 0.043 | | | 0.049 | | | 0.062 | | |
| 2° 00' | R.C. | | | 0.028 | 175 | | 0.040 | 200 | | 0.048 | 225 | | 0.055 | 250 | | 0.070 | 275 | |
| 2° 15' | R.C. | | | 0.031 | | | 0.045 | | | 0.053 | | | 0.061 | | | 0.078 | | 300 |
| 2° 30' | 0.021 | | | 0.034 | | | 0.049 | | | 0.058 | | | 0.067 | | | 0.085 | 315 | |
| 2° 45' | 0.023 | | | 0.037 | | | 0.053 | | | 0.063 | | | 0.072 | | | 0.091 | 335 | 350 |
| 3° 00' | 0.025 | | | 0.040 | | | 0.057 | | | 0.067 | 230 | | 0.077 | 260 | | 0.096 | 350 | |
| 3° 15' | 0.027 | | | 0.043 | | | 0.061 | | | 0.072 | 245 | | 0.082 | 275 | | 0.098 | 360 | |
| 3° 30' | 0.029 | | | 0.046 | | | 0.065 | 205 | | 0.075 | 255 | | 0.086 | 285 | | 0.100 | 360 | 400 |
| 3° 45' | 0.031 | | | 0.049 | | | 0.069 | 215 | | 0.080 | 265 | | 0.090 | 295 | | | | |
| 4° 00' | 0.033 | | | 0.051 | | | 0.072 | 225 | | 0.083 | 270 | | 0.093 | 305 | 350 | | | |
| 4° 30' | 0.037 | | | 0.056 | | | 0.078 | 240 | | 0.087 | 280 | | 0.096 | 315 | | | | |
| 5° 00' | 0.040 | | | 0.061 | | | 0.083 | 250 | | 0.091 | 295 | | 0.098 | 320 | | | | |
| 5° 30' | 0.043 | | | 0.066 | 185 | | 0.088 | 260 | | 0.094 | 300 | 350 | | | | | | |
| 6° 00' | 0.046 | | | 0.070 | 190 | | 0.092 | 270 | | 0.096 | 305 | | | | | | | |
| 6° 30' | 0.050 | | | 0.074 | 200 | | 0.095 | 280 | | 0.100 | 315 | | | | | | | |
| 7° 00' | 0.053 | | | 0.078 | 210 | | 0.098 | 285 | 300 | | | | | | | | | |
| 7° 30' | 0.056 | | | 0.081 | 215 | | 0.099 | 290 | | | | | | | | | | |
| 8° 00' | 0.058 | | | 0.084 | 220 | | 0.100 | 290 | | | | | | | | | | |
| 8° 30' | 0.061 | | | 0.087 | 225 | 250 | | | | | | | | | | | | |
| 9° 00' | 0.063 | | | 0.089 | 230 | | | | | | | | | | | | | |
| 10° 00' | 0.068 | 160 | | 0.094 | 235 | | | | | | | | | | | | | |
| 11° 00' | 0.072 | 170 | | 0.097 | 250 | | | | | | | | | | | | | |
| 12° 00' | 0.076 | 175 | | 0.099 | 250 | | | | | | | | | | | | | |
| 13° 00' | 0.080 | 180 | | 0.100 | 250 | | | | | | | | | | | | | |
| 14° 00' | 0.083 | 190 | | | | | | | | | | | | | | | | |
| 15° 00' | 0.086 | 195 | | | | | | | | | | | | | | | | |
| 16° 00' | 0.089 | 200 | | | | | | | | | | | | | | | | |
| 17° 00' | 0.091 | 200 | | | | | | | | | | | | | | | | |
| 18° 00' | 0.093 | 205 | | | | | | | | | | | | | | | | |
| 19° 00' | 0.095 | 210 | | | | | | | | | | | | | | | | |
| 20° 00' | 0.097 | 215 | 250 | | | | | | | | | | | | | | | |
| 21° 00' | 0.098 | 215 | | | | | | | | | | | | | | | | |
| 22° 00' | 0.099 | 215 | | | | | | | | | | | | | | | | |
| 23° 00' | 0.099 | 215 | | | | | | | | | | | | | | | | |
| 24° 00' | 0.100 | 220 | | | | | | | | | | | | | | | | |
| | D MAX = 24° 45' | | | D MAX = 13° 15' | | | D MAX = 8° 15' | | | D MAX = 6° 30' | | | D MAX = 5° 15' | | | D MAX = 3° 30' | | |

ABBREVIATIONS

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

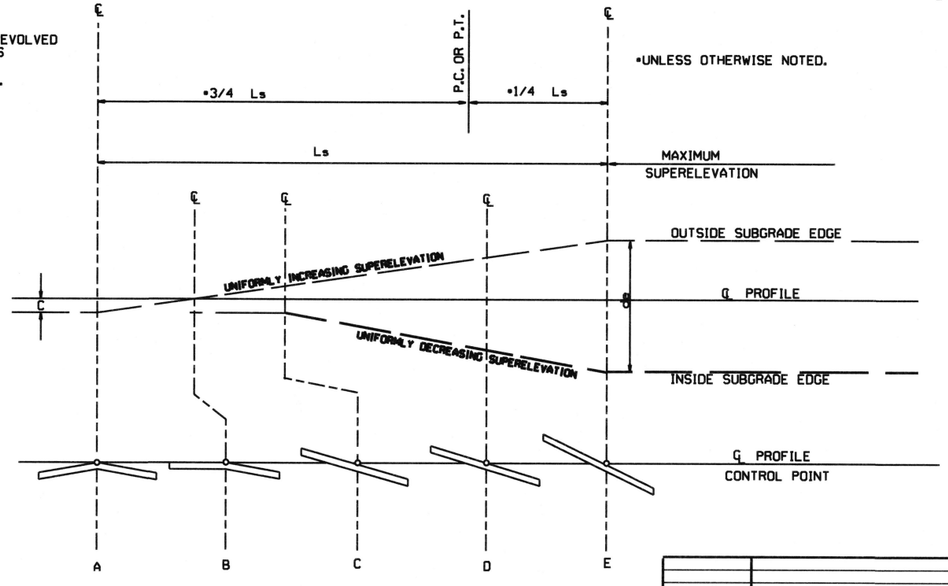
GENERAL NOTES

1. ON PAVEMENT WITH TWO-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE INSIDE PAVEMENT EDGE UNLESS OTHERWISE NOTED ON THE PLANS
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED TO OR SUBTRACTED FROM THE POINT OF CONTROL.
3. LENGTHS FOR L MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
4. PAVEMENTS WIDER THAN 2 LANES SHALL HAVE ADDITIONAL TRANSITION LENGTHS AS FOLLOWS:

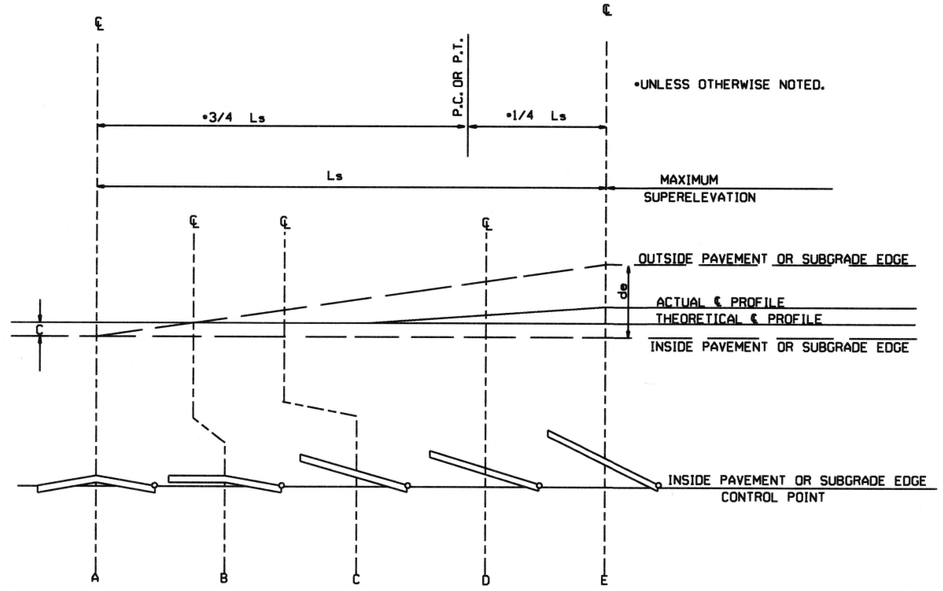
3 LANE UNDIVIDED - - - - - +20%
4 LANE UNDIVIDED - - - - - +50%
5 LANE UNDIVIDED - - - - - +80%
6 LANE UNDIVIDED - - - - - +100%

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

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




STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE




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

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

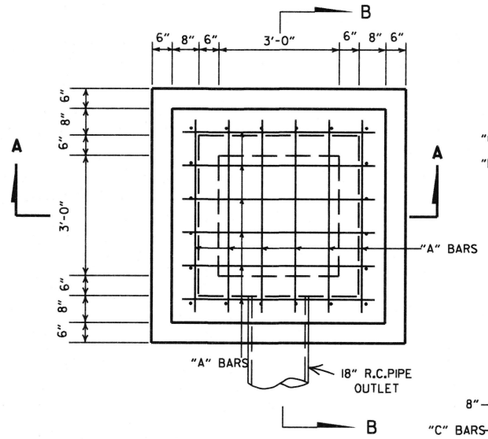
SUPERELEVATION FORMULA = $\frac{Lde}{Ls}$

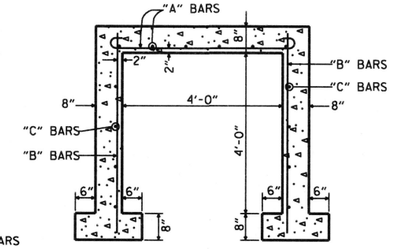
| DATE | REVISION | DATE FILMED |
|---|---|---|
| 10-18-96 | ADDED FORMULA | |
| 01-09-87 | ISSUED | 534-1-9-87 |

ARKANSAS STATE HIGHWAY COMMISSION

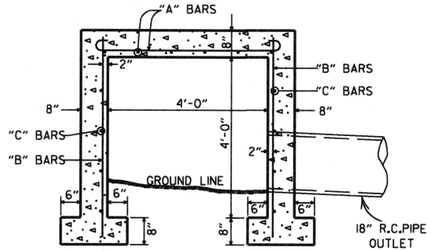
# TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2




SEC A-A



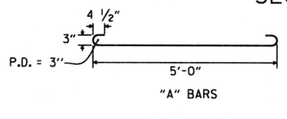

SEC B-B

NOTE: MAX FILL HEIGHT ABOVE TOP OF BOX = 13'-0".

STEEL SCHEDULE

| BARS | NUMBER | LENGTH | SPACING |
|---|---|---|---|
| "A" | 12 | 6'-0" | 10" |
| "B" | 20 | 5'-0" | 10 ½" |
| "C" | 16 | 5'-0" | 12" |

ALL STEEL TO BE #4 BARS




"A" BARS

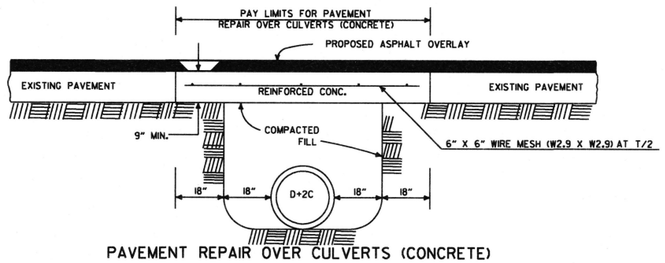
QUANTITIES

CONCRETE 3.31 CU. YDS.
REINFORCING STEEL 168 LB.

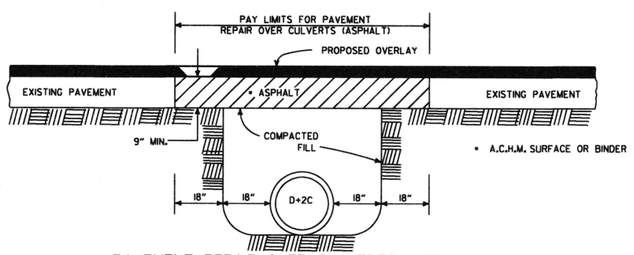
GENERAL NOTE:

THE PAY ITEMS FOR REINFORCED CONCRETE SPRING BOXES SHALL BE FOR THE QUANTITTIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL, EXCAVATION FOR STRUCTURES AND 18" R.C. PIPE CULVERT.

## REINFORCED CONCRETE SPRING BOX



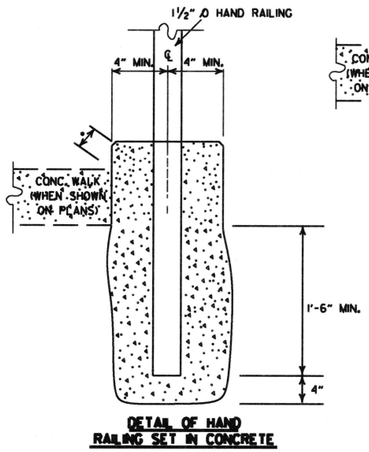

PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



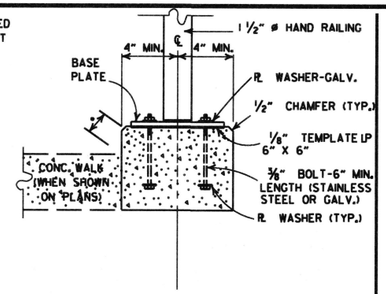

PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

## DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

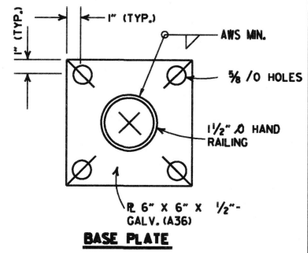
* A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.




DETAIL OF HAND RAILING SET IN CONCRETE

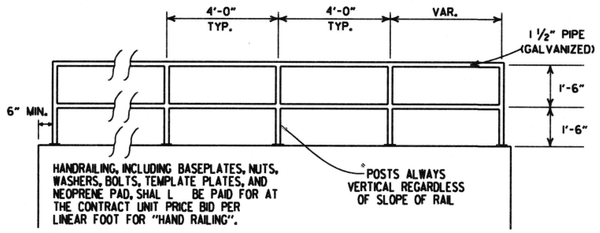



POST CONNECTION TO WALL

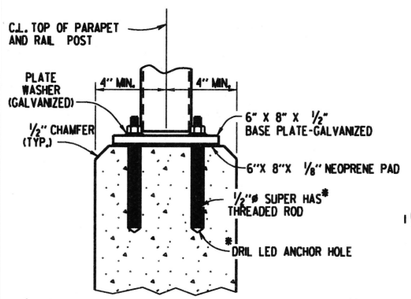



BASE PLATE

## POST CONNECTION DETAILS



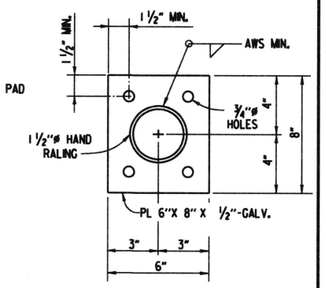

HAND RAILING SHALL CONFORM TO SECTION 633.




*HILTI HIT RE 500 EPOXY ADHESIVE ANCHOR SYSTEM WITH 4 ½" EMBEDMENT OR APPROVED EQUAL.

THE ADHESIVE ANCHOR SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

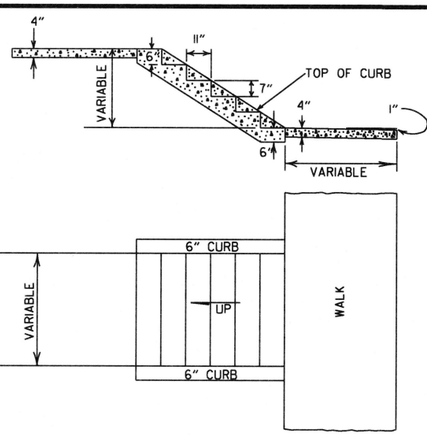
POST CONNECTION TO WALL




BASE PLATE

DETAILS OF ALTERNATE POST ANCHOR SYSTEM
(EPOXY ADHESIVE ANCHORS)

## HAND RAILING DETAILS




GENERAL NOTES

1. RISE AND TREAD DIMENSIONS OF STEPS MAY BE VARIED AS DIRECTED BY THE ENGINEER, HOWEVER, TREAD WIDTHS SHALL BE 11" MIN. ALL STEPS IN A FLIGHT SHALL HAVE CONSISTENT TREAD & RISER DIMENSIONS.
2. 1" TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE WALKS AT 45° INTERVALS.

## DETAILS OF CONCRETE STEPS & WALKS

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 10-25-18 | REVISED DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS | |
| 9-12-13 | REVISED REINFORCED CONCRETE SPRING BOX | |
| 7-26-12 | REMOVED RETAINING WALL DETAILS & REVISED HAND RAILING DETAILS | |
| 4-17-08 | REV. JOINT & FOOTING STEP DETAILS | |
| 11-29-07 | REVISED RETAINING WALL DRAINAGE | |
| 5-25-06 | REVISED PVMT REPAIR OVER CULVERTS (CONC); REVISED REINFORCED CONC SPRING BOX | |
| 10-9-03 | REVISED PIPE RAILING DETAILS TO HAND RAILING DETAILS | |
| 4-10-03 | REVISED RETAINING WALL DRAWING | |
| 8-22-02 | ADDED HAND RAILING DETAIL | |
| 11-16-01 | REVISED PVMT REPAIR OVER CULVERTS (CONC); CORRECTED SPELLING IN GENERAL NOTES | |
| 11-18-98 | ADDED GENERAL NOTES TO CONCRETE STEPS & WALKS | |
| 7-02-98 | ENLARGED PIPE | |
| 4-03-97 | ADDED NOTE TO STEEL BAR SCHED. | |
| 10-18-96 | CORRECTED SPELLING | |
| 4-26-96 | ADD WEEP HOLE;REV. JOINT SPACING IN RET. WALL | |
| 6-2-94 | CHANGED CONST. TO CONTRACTION JOINT | |
| 10-1-92 | CHANGED MESH FABRIC TO WIRE MESH | 10-1-92 |
| 8-15-91 | DELETED HDWL MODIFICATION DETAIL | 8-15-91 |
| 11-8-90 | DELETED COLD MIX FROM CULV'T. REPAIR | 11-8-90 |
| 11-30-89 | REV. RETAINING WALL STEEL SCHEDULE | 11-30-89 |
| 11-17-88 | V. BARS BEHIND ARROW | 665-11-17-88 |
| 7-15-88 | REV. PAVEMENT REPAIR ADDED HDWL. MODS, DEL. PIPE UNDERDRAINS | 649-7-15-88 |
| 11-1-84 | REV. TRENCH FOR PIPE UNDERDRAIN | 510-11-1-84 |
| 1-4-83 | ELIMINATED CONC. CLASS & ADDED CHAMFER NOTE | 682-1-4-83 |
| 3-2-81 | SPELLING OF "UNDERDRAIN" | 721-3-2-81 |
| 4-20-79 | REV. UNDERDRAIN DET& PAVEMENT REPAIR | 674-4-20-79 |
| 2-2-76 | 12"MIN. GRAN. MAT'L. OVER PIPE | 919-2-2-76 |
| 4-10-75 | REM. SPECS. FOR GRAN. MAT'L. | 568-4-10-75-853 |
| 5-22-74 | GRANULAR MAT'L. TO BE SB-3 | 567-5-22-74-740 |
| 10-2-72 | REVISED AND REDRAWN | 564-10-16-72 |

ARKANSAS STATE HIGHWAY COMMISSION

# DETAILS OF SPECIAL ITEMS

STANDARD DRAWING SI-1

R1-1




STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2




STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1




STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

W3-5




STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

W3-5a




STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

R4-1



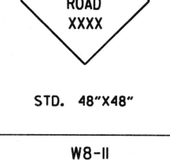

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R4-2



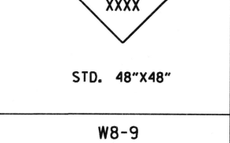

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R5-1



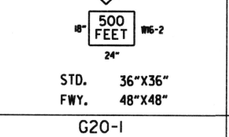

STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

RII-2



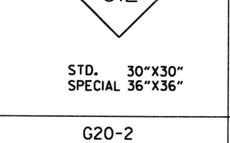

48"X30"

RII-3A



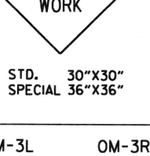

60"X30"

RII-4



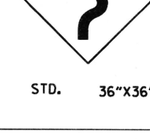

60"X30"

W21-5a



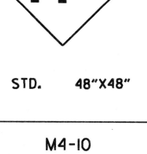

STD. 36"X36"
FWY. 48"X48"

WI-1



STD. 36"X36"
FWY. 48"X48"

WI-2



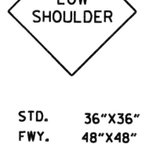
STD. 36"X36"
FWY. 48"X48"

WI-3



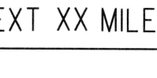
STD. 48"X48"

WI-4



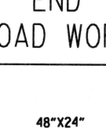
STD. 48"X48"

WI-6



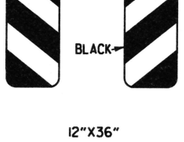
STD. 48"X24"
SPECIAL 60"X30"

WI-8



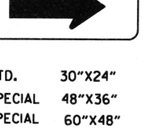
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



STD. 36"X36"
SPECIAL 48"X48"

W3-2



STD. 36"X36"
SPECIAL 48"X48"

W4-2



STD. 36"X36"
FWY. 48"X48"

W5-1




STD. 36"X36"
SPECIAL 48"X48"

W6-3



EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7




EXPWY. 36"X36"
FWY. 48"X48"

W9-2




STD. 36"X36"
FWY. 48"X48"

WI3-1




STD. 24"X24"

W20-1




STD. 48"X48"

W20-2




STD. 48"X48"

W20-3




STD. 48"X48"

W20-4




STD. 48"X48"

W20-5




STD. 48"X48"

W20-7a




STD. 36"X36"
FWY. 48"X48"

W21-2




STD. 30"X30"
SPECIAL 36"X36"

W21-5




STD. 30"X30"
SPECIAL 36"X36"

W24-1



STD. 36"X36"

WI-4b



STD. 48"X48"

R56-1




STD. 18"X18"

W8-11



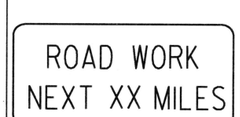

STD. 36"X36"
FWY. 48"X48"

W8-9



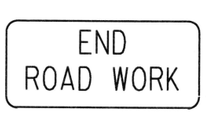

STD. 36"X36"
FWY. 48"X48"

G20-1




60"X24"

G20-2



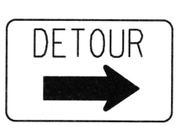

48"X24"

OM-3L OM-3R




12"X36"

M4-9



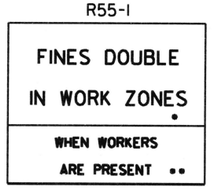

STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

M4-10




48"X18"

R55-1




36"X60"

• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

| | |
|---|---|
| 500 FT | ½ MILE |
| 1000 FT | ¾ MILE |
| 1500 FT | 1 MILE AHEAD |

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.
3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.
- 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.
- 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.
6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.
7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.
8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.
10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

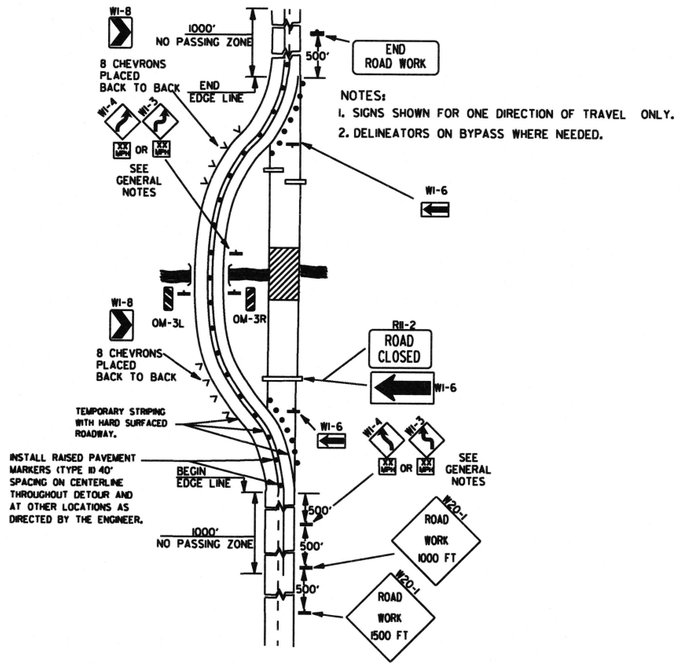
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED FOR ALL PROJECTS.

| DATE | REVISION | FILMED |
|---|---|---|
| 4-13-17 | DELETED RSP-1 & ADDED W21-5a | |
| 9-2-15 | REVISED REDUCED SPEED LIMIT AHEAD SIGNS<br>REVISED ROAD WORK NEXT XX MILES | |
| 12-15-11 | REVISED W24-1 | |
| 11-17-10 | DELETED W8-9a & ADDED W8-9 | |
| 10-15-09 | ADDED REFERENCE TO MASH & ADDED SIGN W24-1 | |
| 4-17-08 | REVISED SIGN DESIGNATIONS | |
| 11-18-04 | REVISED NOTES | |
| 10-9-03 | REVISED NOTE 1 | |
| 11-16-01 | REVISED NOTE 7 | |
| 9-28-00 | REVISED NOTE | |
| 11-18-98 | ADDED NOTE | |
| 6-26-97 | REVISED NOTE 5 | |
| 4-03-97 | REVISED NOTE 5 | |
| 10-18-96 | ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7 | |
| 10-12-95 | ADDED R55-1 | |
| 6-8-95 | REVISED TO CORRECT SIGN ILLUSTRATIONS | 6-8-95 |
| 2-2-95 | REVISED PER PART VI, MUTCD SEPT. 3, 1993 | |
| 8-15-91 | DRAWN AND PLACED IN USE | |

ARKANSAS STATE HIGHWAY COMMISSION

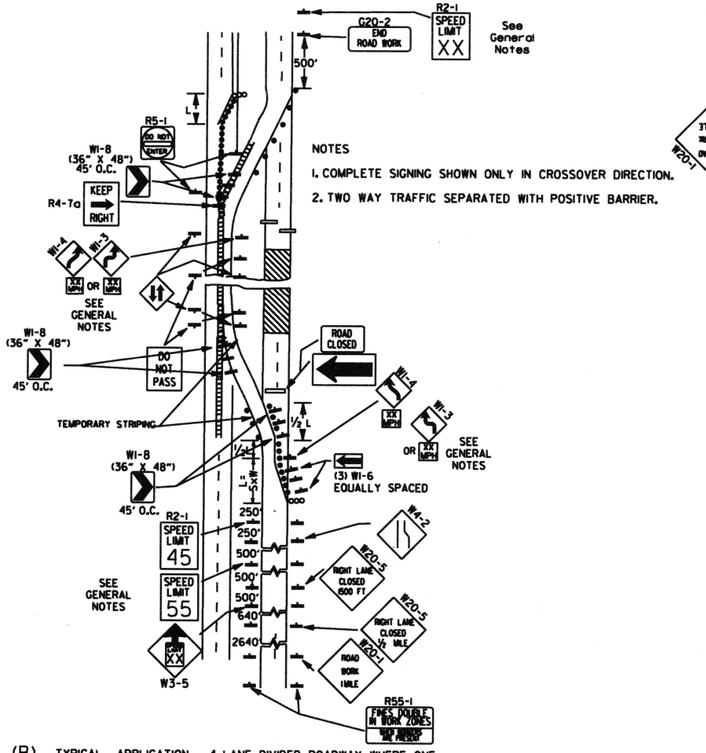
# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



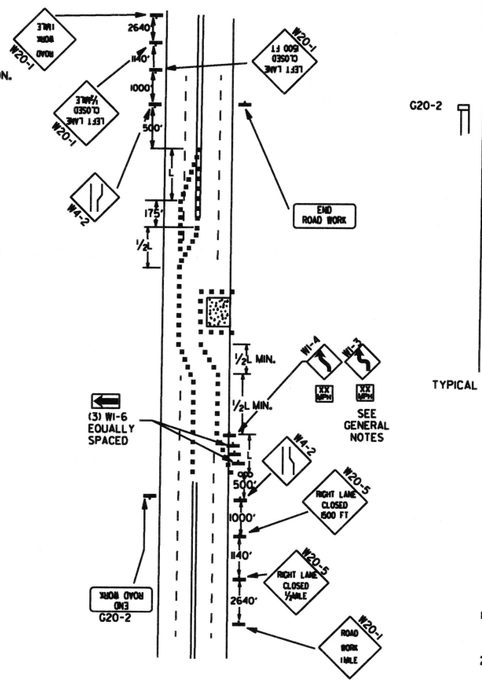

NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.

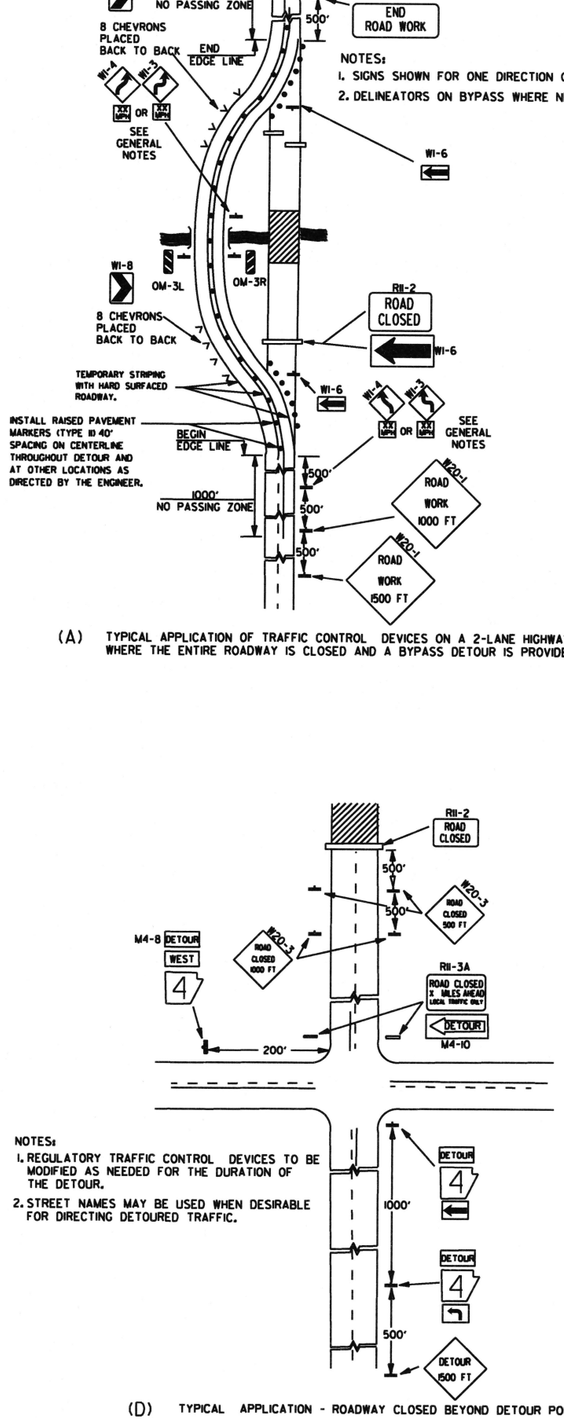



NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

(B) TYPICAL APPLICATION - 4-LANE DIVIDED ROADWAY WHERE ONE ROADWAY IS CLOSED.

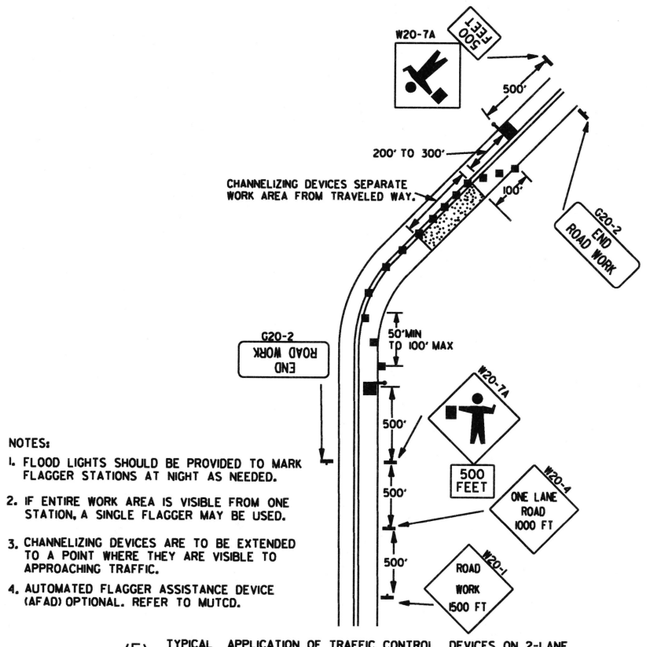



(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



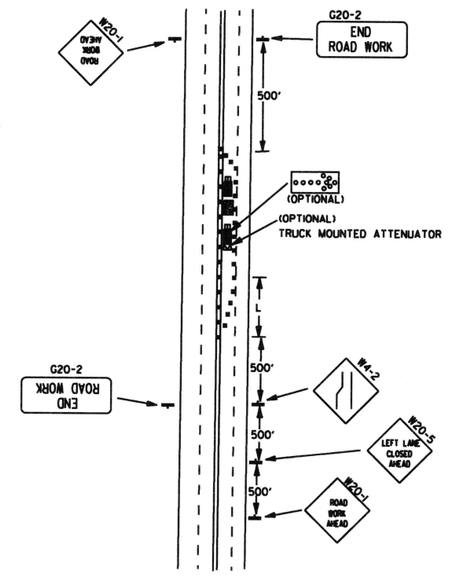

NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

(D) TYPICAL APPLICATION - ROADWAY CLOSED BEYOND DETOUR POINT.

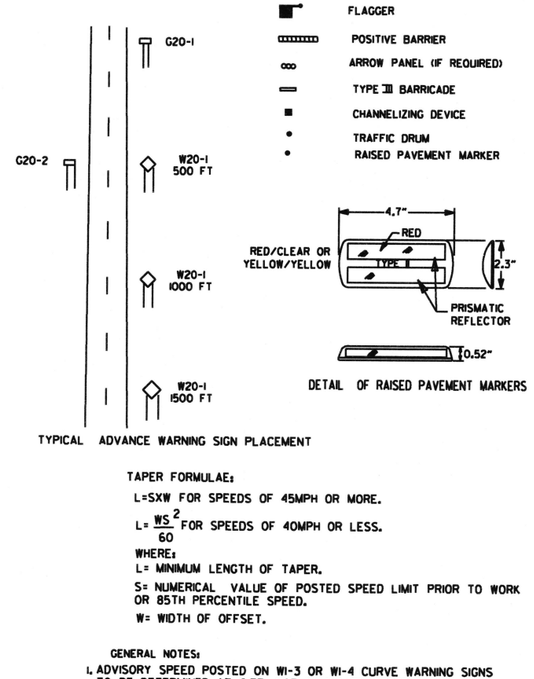



NOTES:
1. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
2. IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.
3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
4. AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD) OPTIONAL. REFER TO MUTCD.

(E) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON 2-LANE HIGHWAY WHERE ONE LANE IS CLOSED AND FLAGGING IS PROVIDED.




(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.




TYPICAL ADVANCE WARNING SIGN PLACEMENT




DETAIL OF RAISED PAVEMENT MARKERS

TAPER FORMULAE:

L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40MPH OR LESS.

WHERE:
L= MINIMUM LENGTH OF TAPER.
S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
W= WIDTH OF OFFSET.

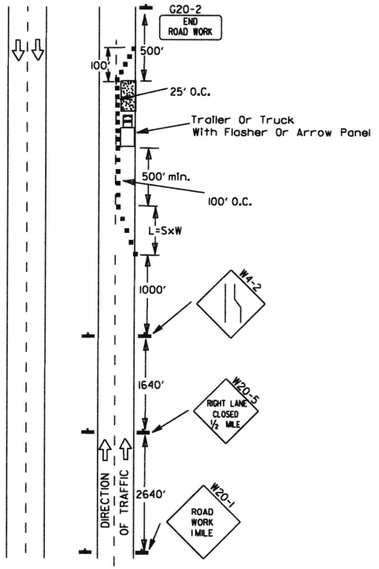
GENERAL NOTES:
1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-1 55MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE.
8. DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.

| DATE | REVISION | FILMED |
|---|---|---|
| 9-2-15 | REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5 | |
| 9-12-13 | REVISED DETAIL OF RAISED PAVEMENT MARKERS | |
| 3-11-10 | ADDED (AFAD) | |
| 11-20-08 | REVISED SIGN DESIGNATIONS | |
| 11-18-04 | ADDED GENERAL NOTE | |
| 10-18-96 | ADDED R55-1 | |
| 4-26-96 | CORRECTED (a) BEHIND G20-2 | |
| 6-8-95 | CORRECTED SIGN IDENT. ON W1-4A | 6-8-95 |
| 2-2-95 | REVISED PER PART VI, MUTCD, SEPT. 3, 1993 | |
| 8-15-91 | DRAWN AND PLACED IN USE | |

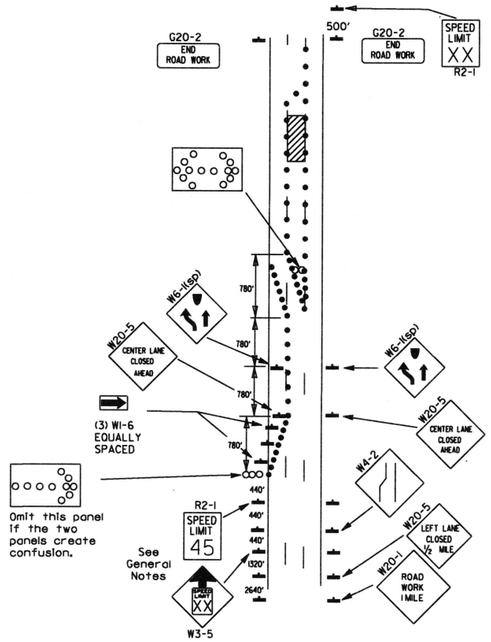
ARKANSAS STATE HIGHWAY COMMISSION

# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

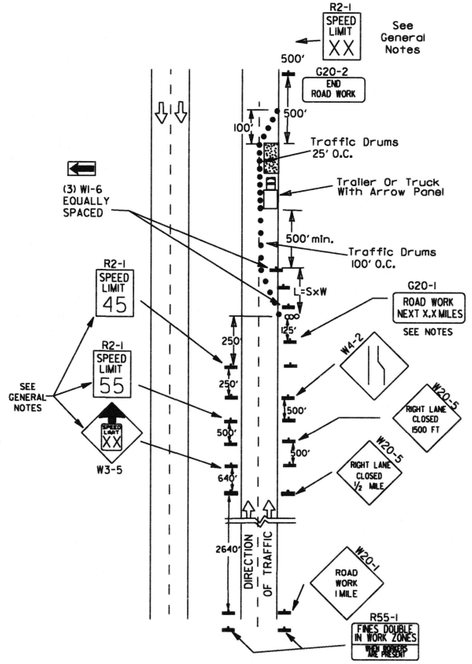
STANDARD DRAWING TC-2




(A) Typical application - daytime maintenance operations of short duration on a 4-lane divided roadway where half of the roadway is closed.




(B) Typical application - 3-lane oneway roadway where center lane is closed.




(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

KEY:

ooo Arrow Panel (If Required)

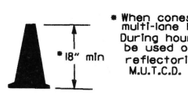
■ Channelizing Device

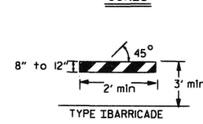
● Traffic drum

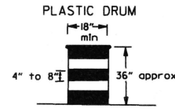
GENERAL NOTES:

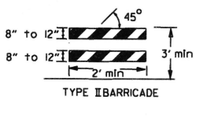
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional R2-1 45mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
3. When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(45) shall be omitted. Additional R2-1 55mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
4. The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit. Beyond the taper, maximum spacing shall be two times the speed limit or as directed by the Engineer.
5. Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
6. Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
7. The G20-1 sign will be required on jobs of over two miles in length. When the lane closure is not at the beginning of the project, the G20-1 sign shall be erected 125' in advance of the job limit. Additional W20-1 (1 MILE) signs are not required in advance of lane closures that begin inside the project limits.
8. Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
9. All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual For Assessing Safety Hardware (MASH).
10. Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.

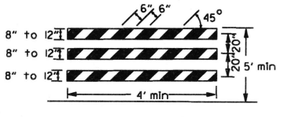
Channelizing devices



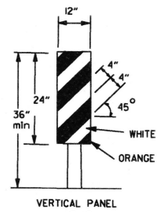



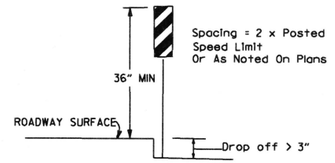




NOTE:
For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.




VERTICAL PANEL PLACEMENT

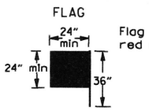



TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

| VERTICAL DIFFERENTIAL | LOCATIONS | TRAFFIC CONTROL |
|---|---|---|
| 1" to 3" | Centerline, lane lines | W8-11 |
| 1" to 3" | Edge of shoulder | W8-9 |
| Greater than 3" | Lane lines | Standard lane closure required |
| Greater than 3" | Edge of traveled lane | *RSP-1 and vertical panels, drums or concrete barrier |
| Greater than 3" | Edge of shoulder | *Vertical panels, drums or concrete barrier |

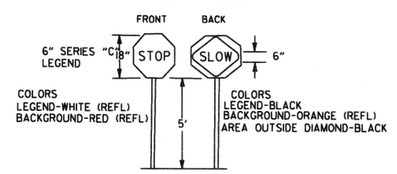
* When shown on the plans concrete barrier will be used.
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

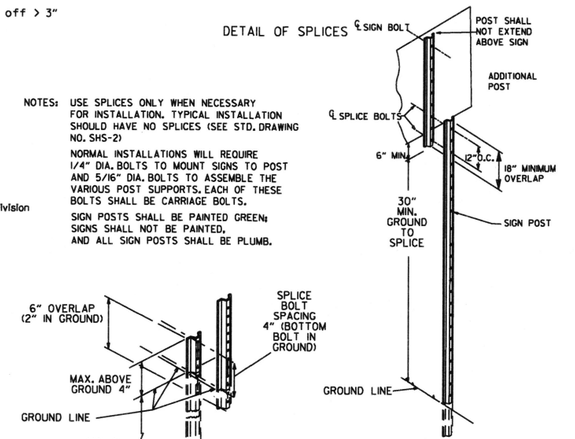
FLAG




Flag shall be of good grade red material

STOP SLOW PADDLE

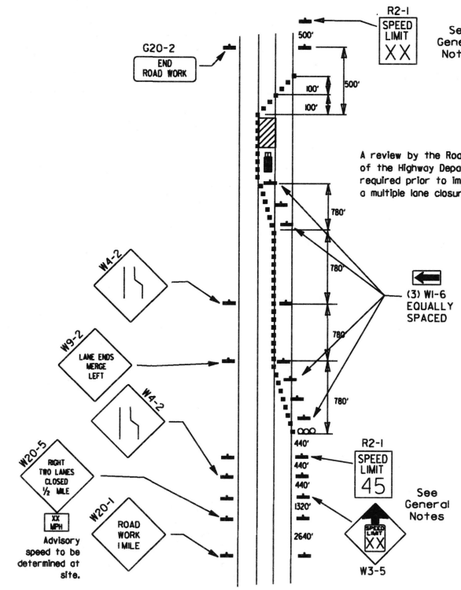



NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)

NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.

SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.




(D) Typical application - closing multiple lanes of a multilane highway.

| DATE | REVISION | FILMED |
|---|---|---|
| 9-2-15 | REVISED NOTE 2 & REPLACED R2-5A WITH W3-5 | |
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 11-20-08 | REVISED SIGN DESIGNATIONS | |
| 11-18-04 | ADDED NOTE | |
| 10-1-98 | ADDED NOTE | |
| 4-03-97 | ADDED (SP) TO W6-1 & REVISED TRAFFIC CONTROL DEVICES NOTE | |
| 10-18-96 | ADDED R55-1 | |
| 10-12-95 | MOVED UPPER SPLICE | |
| 6-8-95 | REVISED SPLICE DETAIL, TEXT | 6-8-95 |
| 2-2-95 | REVISED PER PART VI, MUTCD, SEPT. 3, 1993 | |
| 8-15-91 | DRAWN AND PLACED IN USE | |

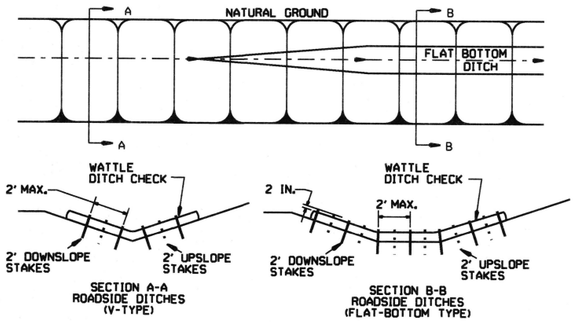
ARKANSAS STATE HIGHWAY COMMISSION

# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

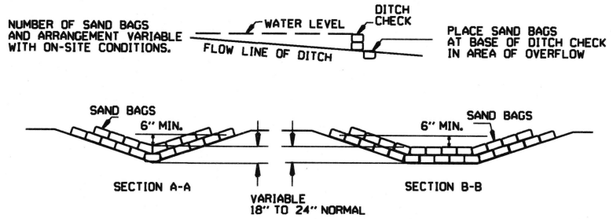
STANDARD DRAWING TC-3

GENERAL NOTES

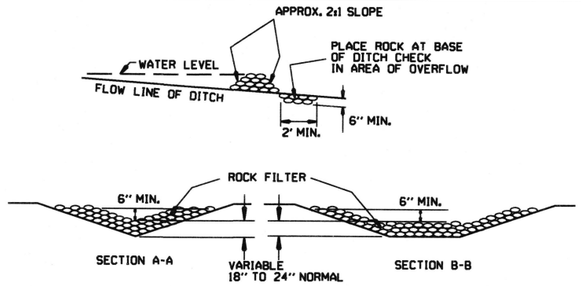
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.




## WATTLE DITCH CHECK (E-1)




## SAND BAG DITCH CHECK (E-5)

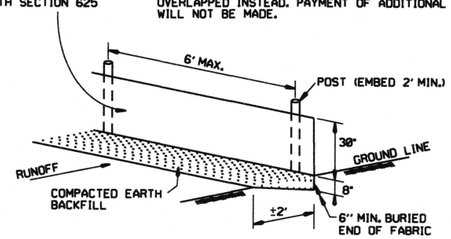



## ROCK DITCH CHECK (E-6)

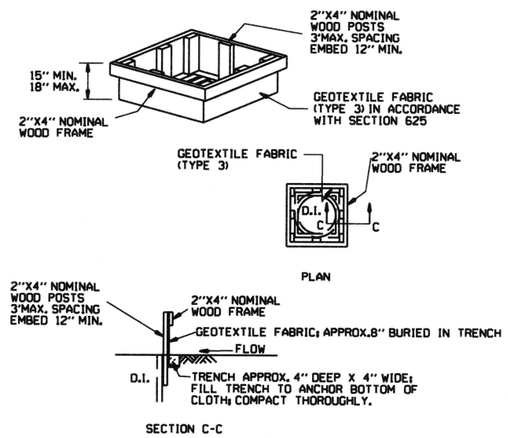
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

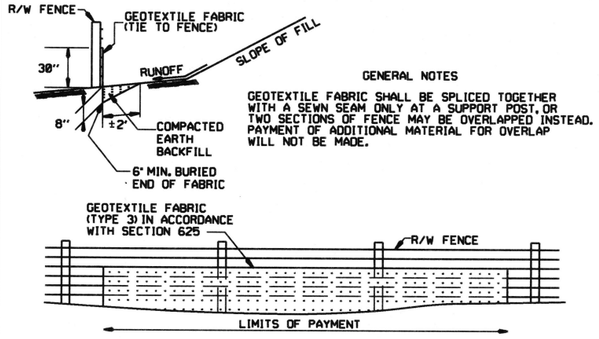
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.




## SILT FENCE (E-11)




## DROP INLET SILT FENCE (E-7)




GENERAL NOTES

GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN 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.

ELEVATION

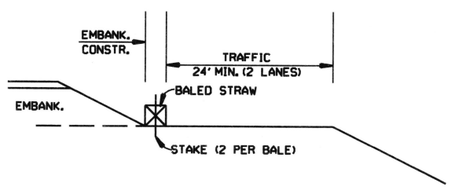
## SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

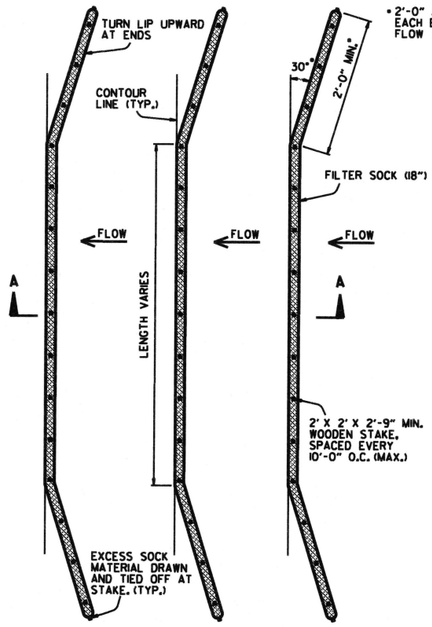
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

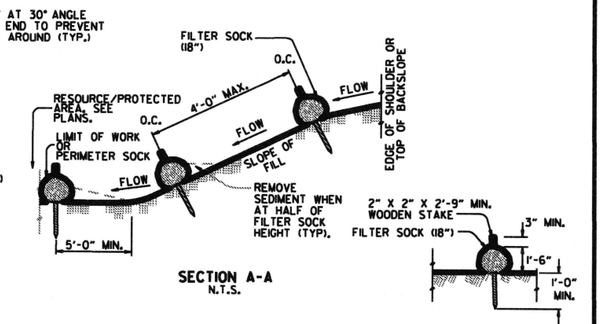
2. NO GAPS SHALL BE LEFT BETWEEN BALES.

3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.




## BALED STRAW FILTER BARRIER (E-2)




NOTES:

1. FILTER SOCKS CAN BE PLACED AT THE TOP, ON THE FACE, AND AT THE TOE OF SLOPES AS SEDIMENT-TRAPPING DEVICES FOR SHEET FLOW RUNOFF.

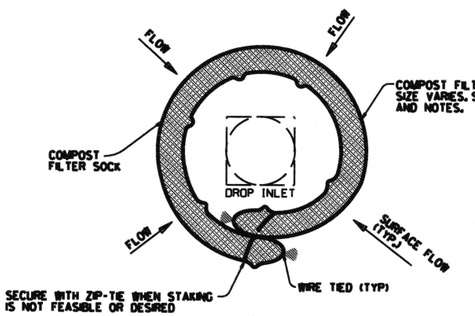
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

3. STEEL POSTS MAY BE USED AND SHALL BE ROLLED FROM HIGH CARBON STEEL AND HAVE A MINIMUM OF 1.25 LB./FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH-GRADE WEATHER RESISTANT BROWN OR BLACK STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR STEEL POSTS, BUT PRICE WILL BE CONSIDERED SUBIDIARY TO "FILTER SOCK (18")."

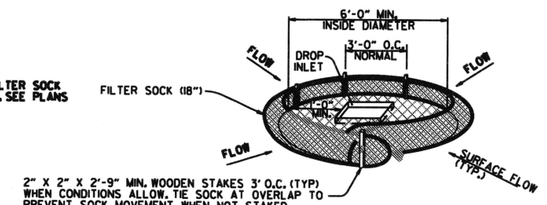
4. FILTER SOCKS MAY BE UP TO 250 FEET LONG. WHEN USED ON LONG SLOPES, FILTER SOCKS MAY BE JOINTED OR STAGGERED AS SHOWN IN DETAILS.

5. INSPECT FILTER SOCKS AFTER EACH RUNOFF EVENT. REMOVE AND REPLACE IF SIGNS OF UNDERCUTTING OR DOWNSTREAM RILLS ARE OBSERVED.

## FILTER SOCK ALONG SLOPE (E-3)




DROP INLET PLAN VIEW
N.T.S.




DROP INLET PERSPECTIVE VIEW
N.T.S.

NOTES:

1. OVERLAP ENDS OF SOCK (1' MIN. 3' MAX.).

2. USE 18" DIA. SOCK IN NON-TRAFFIC AREAS OR AREAS WHERE SAFETY IS NOT A CONCERN.

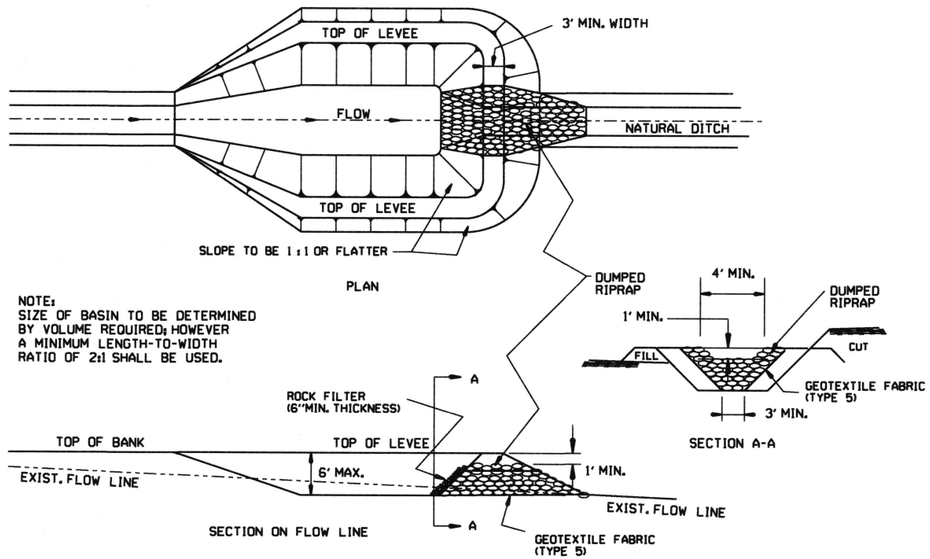
## COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

| DATE | REVISION | FILMED |
|---|---|---|
| 11-16-17 | ADDED FILTER SOCK E-3 AND E-13 | |
| 12-15-11 | DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK | |
| 11-18-98 | ADDED NOTES | |
| 07-02-98 | ADDED BALED STRAW FILTER BARRIER (E-2) | |
| 07-20-95 | REVISED SILT FENCE E-4 AND E-11 | 7-20-95 |
| 07-15-94 | REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC | |
| 06-02-94 | REVISED E-1,4,7 & 11; DELETED E-2 & 3 | 6-2-94 |
| 04-01-93 | REDRAWN | |
| 10-01-92 | REDRAWN | |
| 08-02-76 | ISSUED R.D.M. | 298-7-28-76 |

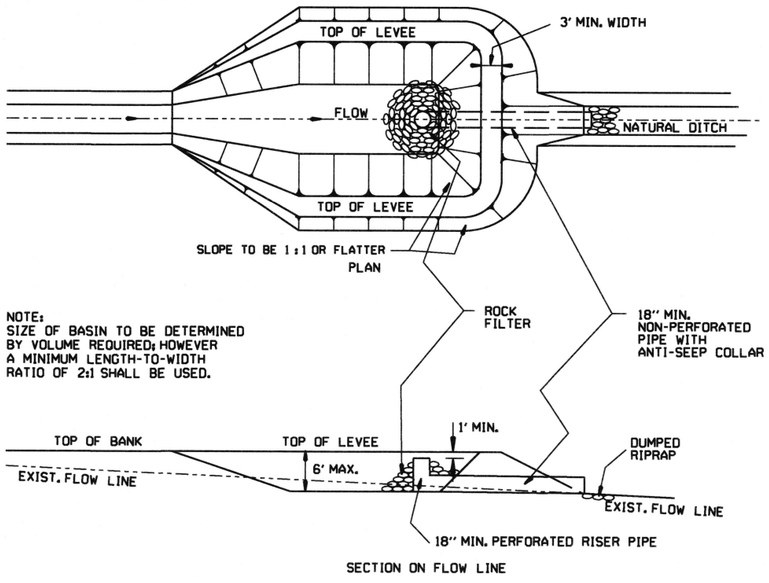
ARKANSAS STATE HIGHWAY COMMISSION

# TEMPORARY EROSION CONTROL DEVICES

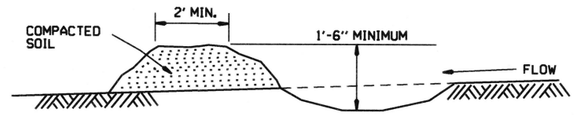
STANDARD DRAWING TEC-1



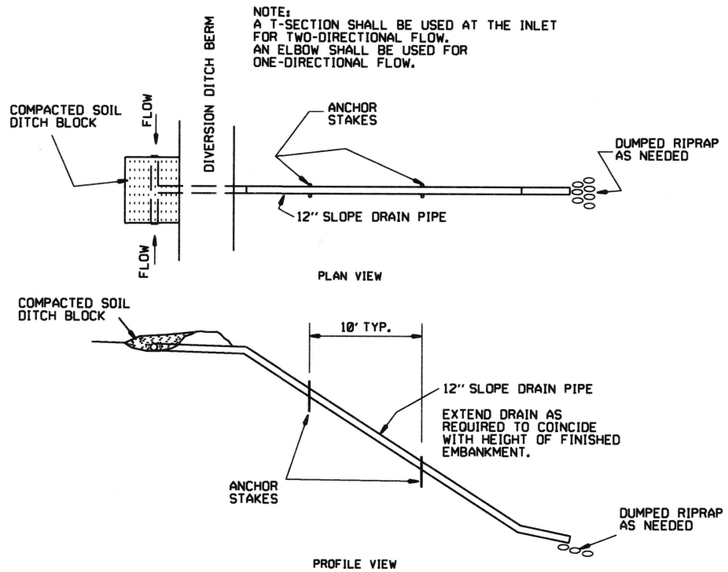

SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



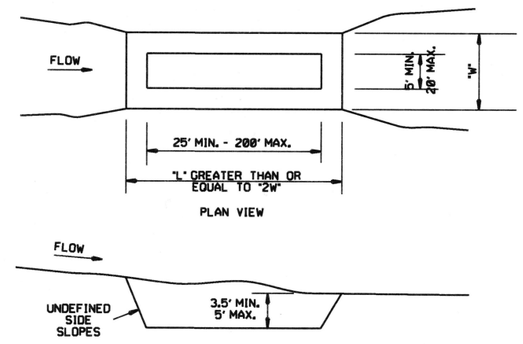

SEDIMENT BASIN WITH PIPE OUTLET (E-10)




DIVERSION DITCH (E-8)




SLOPE DRAIN (E-12)




SEDIMENT BASIN (E-14)

| DATE | REVISION | FILMED |
|---|---|---|
| 6-2-94 | Revised E-8 & E-12; Added E-14 & Deleted E-13 | |
| 4-1-93 | ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

# TEMPORARY EROSION CONTROL DEVICES

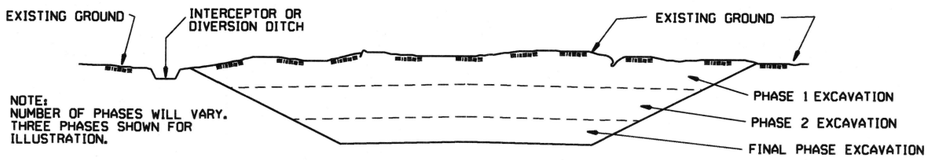
STANDARD DRAWING TEC-2

# CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

1. PLACE PERIMETER CONTROLS (I.E. SILT FENCES , DIVERSION DITCHES, SEDIMENT BASINS, ETC.)
2. PERFORM CLEARING AND GRUBBING OPERATION.

# EXCAVATION



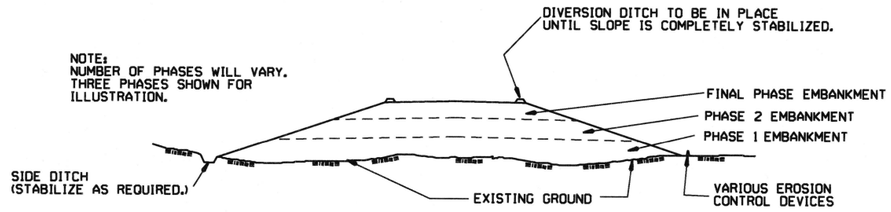

GENERAL NOTE

ALL CUT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE EXCAVATED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

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

# EMBANKMENT




GENERAL NOTE

ALL EMBANKMENT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE CONSTRUCTED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
3. PLACE PHASE 2 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
4. PLACE FINAL PHASE OF EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PLACE DIVERSION DITCHES AND SLOPE DRAINS AND MAINTAIN UNTIL ENTIRE SLOPE IS STABILIZED.

| DATE | REVISION | FILMED |
|---|---|---|
| 11-03-94 | CORRECTED SPELLING | |
| 6-2-94 | Drawn & Issued | 6-2-94 |

ARKANSAS STATE HIGHWAY COMMISSION

# TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3