| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.AID DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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| | | | | JOB NO. | | CA1003 | 1 | 503 |
| | | | | ② HWY. 67 - HWY. 141 (WIDENING)(S) | | | | |

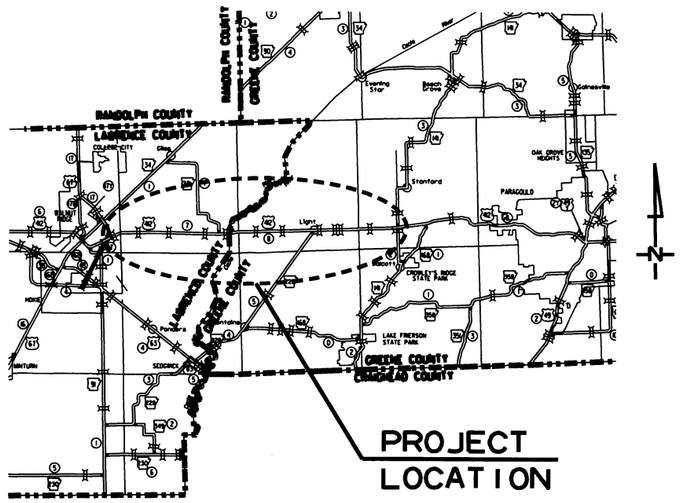
ARKANSAS DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS FOR STATE HIGHWAY

# HWY. 67 - HWY. 141 (WIDENING) (S)

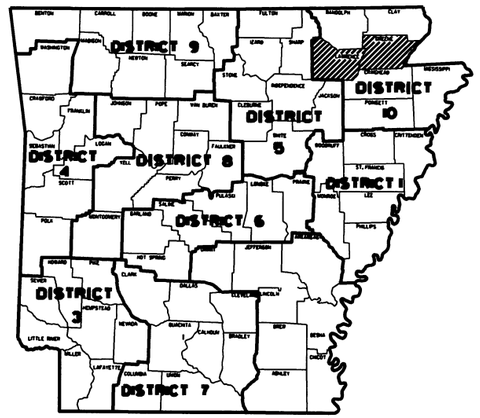
LAWRENCE & GREENE COUNTIES
ROUTE 412 SECTIONS 7 & 8

## JOB CA1003

FED. AID PROJ. 9991




VICINITY MAP




ArDOT DIST. NO. 10

STRUCTURES OVER 20'-0" SPAN

① STA. 94+34 IN PLACE
DBL. 11' X 10' X 114' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
RETAIN & EXTEND 2' LT. & 4' RT.
050 = 326 CFS D.A. = 758 ACRES
SPAN = 24.67'

② STA. 162+20 CONSTRUCT
TRIP. 12' X 12' X 121' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
050 = 1546 CFS D.A. = 4243 ACRES
SPAN = 40.00'

③ STA. 243+27 CONSTRUCT
TRIP. 10' X 10' X 122' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
5° RT. FWD. SKEW
050 = 417 CFS D.A. = 1037 ACRES
SPAN = 33.55'

④ STA. 339+06 CONSTRUCT
QUAD. 10' X 10' X 123' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
10° LT. FWD. SKEW
050 = 439 CFS D.A. = 1446 ACRES
SPAN = 44.17'

⑤ STA. 393+35 IN PLACE
TRIP. 8' X 4' X 108' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
RETAIN & EXTEND 6' LT. & 6' RT.
050 =35 CFS D.A. = 82 ACRES
SPAN = 26.44'

⑥ STA. 475+86 CONSTRUCT
TRIP. 8' X 7' X 171' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
45° RT. FWD. SKEW
050 = 301 CFS D.A. = 1306 ACRES
SPAN = 37.83'

⑦ STA. 545+55 CONSTRUCT
TRIP. 12' X 8' X 210' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
55° LT. FWD. SKEW
050 = 510 CFS D.A. = 1747 ACRES
SPAN = 67.85'

⑧ STA. 605+29 CONSTRUCT
TRIP. 7' X 4' X 128' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
4° RT. FWD. SKEW
050 = 200 CFS D.A. = 395 ACRES
SPAN = 23.39'

⑨ STA. 645+07 CONSTRUCT
TRIP. 9' X 9' X 121' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
050 = 86 CFS D.A. = 659 ACRES
SPAN = 30.17'

⑪ STA. 694+25 CONSTRUCT
QUAD. 8' X 6' X 148' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
34° RT. FWD. SKEW
050 = 145 CFS D.A. = 691 ACRES
SPAN = 42.31'

⑫ STA. 706+09 CONSTRUCT
QUAD. 10' X 10' X 163' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
42° LT. FWD. SKEW
050 = 930 CFS D.A. = 1939 ACRES
SPAN = 58.54'

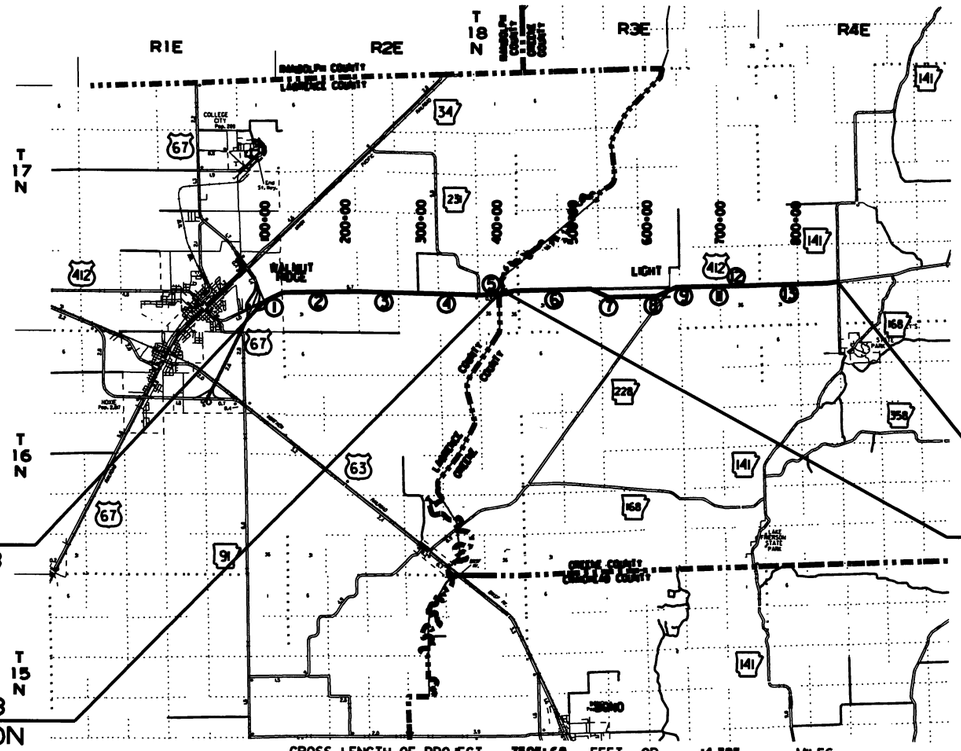
⑬ STA. 783+43 CONSTRUCT
QUAD. 12' X 12' X 140' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
27° LT. FWD. SKEW
050 = 2214 CFS D.A. = 6336 ACRES
SPAN = 58.17'

EXCEPTION TO JOB CA1003

STA 404+54.13 - STA 409+11.60 = 457.47'

TOTAL EXCEPTIONS = 457.47'

NOT TO SCALE




STA. 93+50.00
BEGIN JOB CA1003
LOG MILE 1.73

STA. 404+54.13
BEGIN EXCEPTION

STA. 853+01.68
END JOB CA1003
LOG MILE 8.31

STA. 409+11.60
END EXCEPTION

• DESIGN TRAFFIC DATA •

| | |
|---|---|
| DESIGN YEAR | 2038 |
| 2018 ADT | 5,600 |
| 2038 ADT | 7,400 |
| 2038 DHV | 800 |
| TRUCKS | 15% |
| DESIGN SPEED | 60 MPH |

| | | | | | | |
|---|---|---|---|---|---|---|
| GROSS LENGTH OF PROJECT | 759516.8 | FEET | OR | 14.385 | MILES | |
| NET " " ROADWAY | 750071.2 | " | " | 14.206 | " | |
| NET " " BRIDGES | 487.09 | " | " | 0.092 | " | |
| NET " " PROJECT | 754942.1 | " | " | 14.298 | " | |

BEGINNING OF PROJECT
LAT. = N 36°04' 12.4"
LONG. = W 90°55' 45.9"

MID-POINT OF PROJECT
LAT. = N 36°04' 13.1"
LONG. = N 90°48' 01.3"

END OF PROJECT
LAT. = N 36°04' 08.8"
LONG. = W 90°40' 20.0"

P.E. CA1003
NON-PART.

CERTIFICATE OF AUTHORIZATION
ATKINS NORTH AMERICA, INC.
No. 502
ARKANSAS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
6/29/18

6/29/2018 12:22:26 PM
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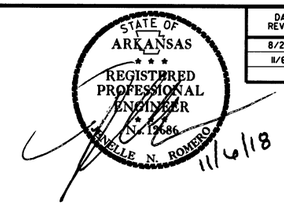


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|---|---|---|---|---|---|---|---|---|
| 8/27/18 | | | | 6 | ARK. | | | |
| 11/6/18 | | | | JOB NO. | | CA1003 | 2 | 503 |

② INDEX OF SHEETS & STANDARD DRAWINGS

## INDEX OF SHEETS


| SHEET NO. | TITLE |
|---|---|
| 1 | TITLE SHEET |
| 2 | INDEX OF SHEETS AND STANDARD DRAWINGS |
| 3 | GOVERNING SPECIFICATIONS AND GENERAL NOTES |
| 4 - 9 | TYPICAL SECTIONS OF IMPROVEMENT |
| 10 - 38 | SPECIAL DETAILS |
| 39 - 99 | TEMPORARY EROSION CONTROL DETAILS |
| 100 - 122 | MAINTENANCE OF TRAFFIC |
| 123 - 149 | PERMANENT PAVEMENT MARKING DETAILS |
| 149A | SOIL BORING LOG |
| 150 - 158 | QUANTITIES |
| 159 | SUMMARY OF QUANTITIES AND REVISIONS |
| 160 - 189 | SURVEY CONTROL DETAILS |
| 190 - 244 | PLAN AND PROFILE SHEETS |
| 245 - 503 | CROSS SECTIONS |


NOTE: CROSS SECTIONS NOT NORMALLY INCLUDED IN PLANS SOLD TO PROSPECTIVE BIDDERS,

## ROADWAY STANDARD DRAWINGS

| DRWG.NO. | TITLE | DATE |
|---|---|---|
| CDP-1 | CONCRETE DITCH PAVING | 12-08-16 |
| DR-1 | DETAILS OF DRIVEWAYS & ISLANDS | 02-27-14 |
| FES-1 | FLARED END SECTION | 10-18-96 |
| FES-2 | FLARED END SECTION | 10-18-96 |
| GR-8 | GUARD RAIL DETAILS | 11-16-17 |
| GR-9 | GUARD RAIL DETAILS | 04-17-08 |
| GR-9A | GUARD RAIL DETAILS | 04-17-08 |
| GR-10 | GUARD RAIL DETAILS | 11-16-17 |
| GR-11 | GUARD RAIL DETAILS | 11-16-17 |
| GR-12 | GUARD RAIL DETAILS | 07-14-10 |
| GRT-1 | GUARD RAIL DETAILS | 07-14-10 |
| IB-1 | IMPACT ATTENUATION BARRIER | 10-15-09 |
| MB-1 | MAILBOX DETAILS | 11-18-04 |
| PBC-1 | PRECAST CONCRETE BOX CULVERTS | 01-28-15 |
| PCC-1 | CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING | 02-27-14 |
| PCM-1 | METAL PIPE CULVERT FILL HEIGHTS & BEDDING | 02-27-14 |
| PCP-1 | PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE) | 02-27-14 |
| PCP-2 | PLASTIC PIPE CULVERT (PVC F949) | 02-27-14 |
| PM-1 | PAVEMENT MARKING DETAILS | 06-01-17 |
| RCB-1 | REINFORCED CONCRETE BOX CULVERT DETAILS | 07-26-12 |
| RCB-2 | EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS | 11-20-03 |
| RCB-3 | METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS | 10-12-95 |
| SE-2 | TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC | 10-18-96 |
| SI-1 | DETAILS OF SPECIAL ITEMS | 10-25-18 |
| SI-2 | REINFORCED CONCRETE RETAINING WALL (WITHOUT LIVE LOAD SURCHARGE) | 05-12-16 |
| 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 |
| TC-4 | STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER | 02-27-14 |
| TC-5 | STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER | 10-15-09 |
| 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 |
| WF-1 | WIRE FENCE TYPE A AND B | 08-22-02 |
| WF-2 | WIRE FENCE WATER GAPS | 04-20-79 |
| R-100X-0 | DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS | 02-08-63 |
| R-200X-0 | DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS | 02-15-63 |
| R-300X-0 | DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS | 02-28-63 |
| R-145X-0 | DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS - 45° SKEW | 07-10-64 |
| W-X003-1 | DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS | 05-10-66 |
| W-X003-2 | DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS | 12-31-62 |
| W-X45 | DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS - 45° SKEW | 06-15-64 |
| W-X453-1 | DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS - 45° SKEW | 05-10-66 |

INDEX OF SHEETS & STANDARD DRAWINGS

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② GOV. SPECS. AND GENERAL NOTES

## 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 - TRAINING PROGRAM - JOB CA1003 |
| 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 |
| 110-1 | PROTECTION OF WATER QUALITY AND WETLANDS |
| 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 |
| 605-1 | CONCRETE DITCH PAVING |
| 606-1 | PIPE CULVERTS FOR SIDE DRAINS |
| 617-1 | GUARDRAIL TERMINAL (TYPE 2) |
| 620-1 | MULCH COVER |
| 632-1 | CONCRETE ISLAND |
| 800-1 | STRUCTURES |
| 802-3 | CONCRETE FOR STRUCTURES |
| JOB CA1003 | BIDDING REQUIREMENTS AND CONDITIONS |
| JOB CA1003 | BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT |
| JOB CA1003 | BROADBAND INTERNET SERVICE FOR FIELD OFFICE |
| JOB CA1003 | CARGO PREFERENCE ACT REQUIREMENTS |
| JOB CA1003 | CLEARING AND GRUBBING |
| JOB CA1003 | CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS |
| JOB CA1003 | CONSTRUCTION PROJECT INFORMATION SIGN |
| JOB CA1003 | CULVERT CLEAN OUT |
| JOB CA1003 | DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES |
| JOB CA1003 | ELECTRONIC DOCUMENT MANAGEMENT - CONNECTING ARKANSAS PROGRAM |
| JOB CA1003 | EMBANKMENT CONSTRUCTION |
| JOB CA1003 | EMPLOYMENT REPORTING |
| JOB CA1003 | FLEXIBLE BEGINNING OF WORK - WORKING DAY CONTRACT |
| JOB CA1003 | GOALS FOR ARKANSAS OWNED MINORITY BUSINESS ENTERPRISE |
| JOB CA1003 | GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION |
| JOB CA1003 | MANDATORY ELECTRONIC CONTRACT |
| JOB CA1003 | NESTING SITES OF MIGRATORY BIRDS |
| JOB CA1003 | OFF-SITE RESTRAINING CONDITIONS FOR BATS |
| JOB CA1003 | PARTNERING REQUIREMENTS |
| JOB CA1003 | PERCENT WITHIN LIMITS/PAVEMENT SMOOTHNESS (IRI) |
| JOB CA1003 | PLASTIC PIPE |
| JOB CA1003 | PRICE ADJUSTMENT FOR ASPHALT BINDER |
| JOB CA1003 | PROSECUTION AND PROGRESS WITH BID SCHEDULE - WORKING DAY CONTRACT |
| JOB CA1003 | REMOVAL AND DISPOSAL OF GUARDRAIL |
| JOB CA1003 | REMOVAL AND DISPOSAL OF IMPACT ATTENUATION BARRIERS |
| JOB CA1003 | RESTRAINING CONDITIONS |
| JOB CA1003 | SETTLEMENT AGREEMENTS |
| JOB CA1003 | SHORING FOR CULVERTS |
| JOB CA1003 | SITE USE (A+C METHOD) - WORKING DAY CONTRACT |
| JOB CA1003 | SOIL STABILIZATION |
| JOB CA1003 | STORM WATER POLLUTION PREVENTION PLAN |
| JOB CA1003 | SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS |
| JOB CA1003 | UTILITY ADJUSTMENTS |
| JOB CA1003 | VALUE ENGINEERING |
| JOB CA1003 | 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. THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 14 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.
9. 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 RESIDENT ENGINEER.

GOVERNING SPECIFICATIONS AND GENERAL NOTES

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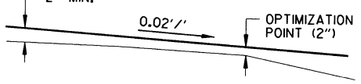
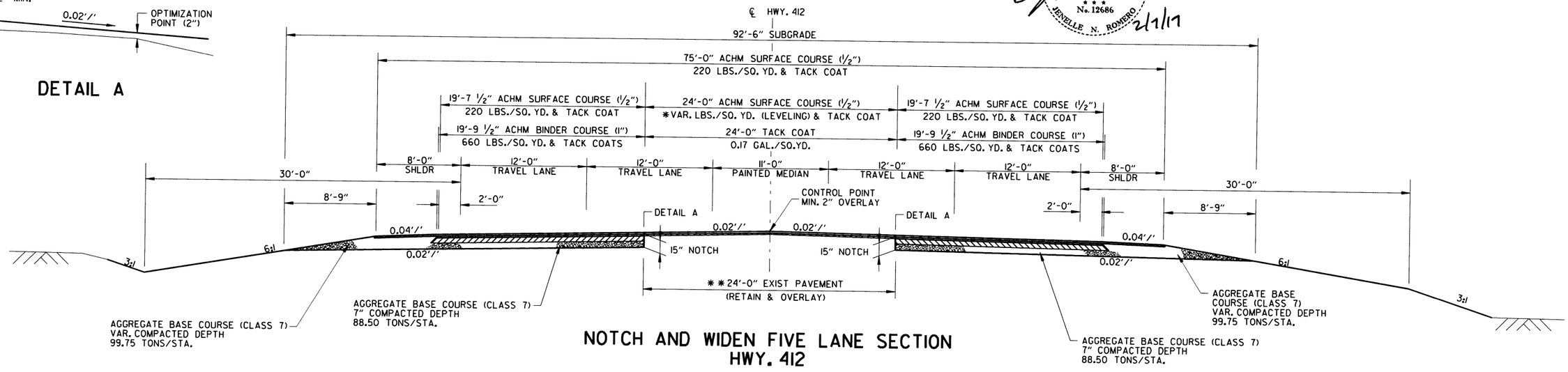
| | | | | JOB NO. | | CA1003 | 4 | 503 |

② TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17




DETAIL A



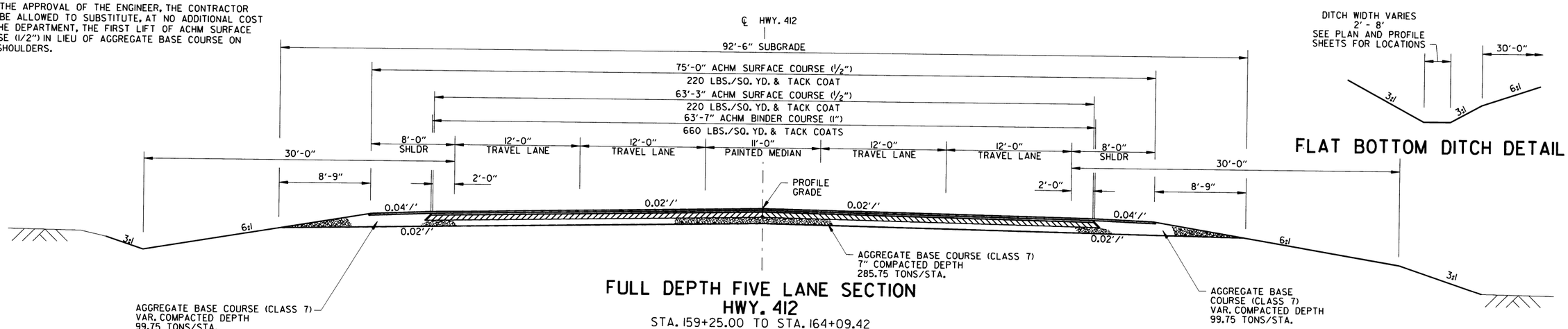

## NOTCH AND WIDEN FIVE LANE SECTION HWY. 412

STA. 93+50.00 TO STA. 107+43.87
STA. 123+74.65 TO STA. 159+25.00
STA. 164+09.42 TO STA. 240+66.63
STA. 244+64.51 TO STA. 330+46.15
STA. 346+31.31 TO STA. 393+22.11
STA. 404+54.13 TO STA. 409+11.60 - EXCEPTION
STA. 409+11.60 TO STA. 419+50.55
STA. 431+11.66 TO STA. 469+10.00
STA. 481+20.00 TO STA. 537+53.58
STA. 708+34.31 TO STA. 743+78.01
STA. 755+13.26 TO STA. 780+46.29
STA. 785+75.00 TO STA. 830+83.65
STA. 846+55.95 TO STA. 853+01.68

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

** EXISTING PAVEMENT IS WIDER THAN 24' THROUGH THE FOLLOWING LIMITS:
VARIES 56' @ STA. 93+50.00 TO 24' @ STA. 101+80.00
VARIES 24' @ STA. 371+47.00 TO 35'-6" @ STA. 375+99.00
VARIES 35'-6" @ STA. 375+99.00 TO 24' @ STA. 382+00.00
VARIES 24' @ STA. 389+48.00 TO 55' @ STA. 398+30.00
VARIES 55' @ STA. 398+30.00 TO 24' @ STA. 429+57.00
VARIES 24' @ 833+85.00 TO 58' @ STA. 853+01.68

NOTES:
1. 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.
2. 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.
3. THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.
4. 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.
5. WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, THE FIRST LIFT OF ACHM SURFACE COURSE (1/2") IN LIEU OF AGGREGATE BASE COURSE ON THE SHOULDERS.




## FULL DEPTH FIVE LANE SECTION HWY. 412

STA. 159+25.00 TO STA. 164+09.42
STA. 240+66.63 TO STA. 244+64.51
STA. 330+46.15 TO STA. 346+31.31
STA. 469+10.00 TO STA. 481+20.00
STA. 537+53.58 TO STA. 552+52.15
STA. 579+84.76 TO STA. 584+39.48
STA. 612+27.57 TO STA. 651+40.43
STA. 677+42.52 TO STA. 681+98.07
STA. 780+46.29 TO STA. 785+75.00




FLAT BOTTOM DITCH DETAIL

# TYPICAL SECTIONS OF IMPROVEMENT

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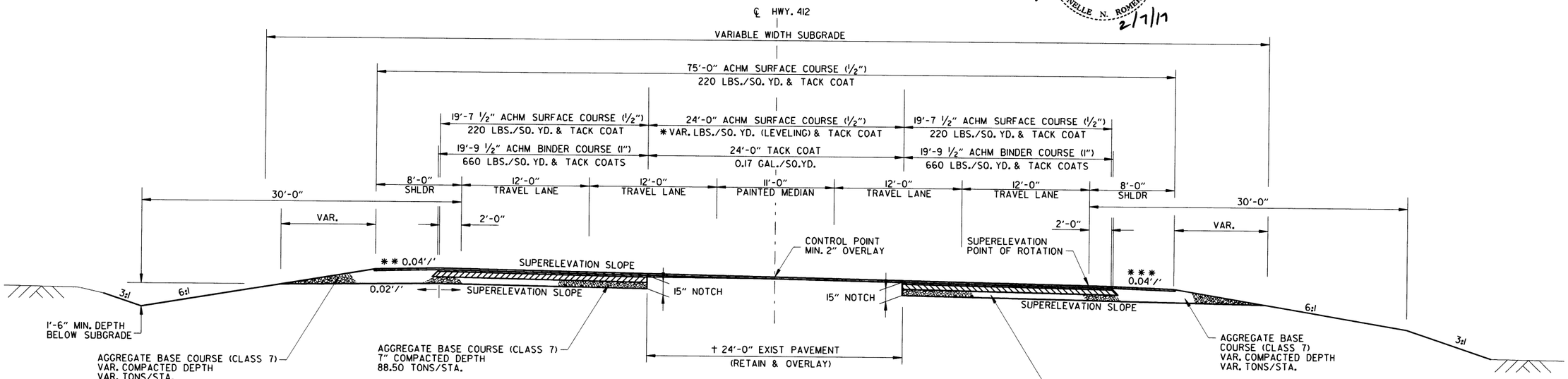
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 5 | 503 |

② TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17




# SUPERELEVATION NOTCH AND WIDEN FIVE LANE SECTION HWY. 412

STA. 107+43.87 TO STA. 123+74.65
STA. 393+22.11 TO STA. 404+54.13
STA. 419+50.55 TO STA. 431+11.66
STA. 707+24.00 TO STA. 708+34.31
STA. 743+78.01 TO STA. 755+13.26
STA. 830+83.65 TO STA. 846+55.95

NOTES:

1. 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.
2. 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.
3. THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.
4. 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.
5. WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, THE FIRST LIFT OF ACHM SURFACE COURSE (1/2") IN LIEU OF AGGREGATE BASE COURSE ON THE SHOULDERS.

* TO BE USED IF & WHERE DIRECTED BY THE ENGINEER

** ON ALL SUPERELEVATED CURVES AND THRU SUPERELEVATION TRANSITIONS, THE ALGEBRAIC DIFFERENCE BETWEEN PAVEMENT SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 0.08'/'.

*** SLOPE = 0.04 '/' OR S.E. SLOPE, WHICHEVER IS GREATER.

† EXISTING PAVEMENT IS WIDER THAN 24' THROUGH THE FOLLOWING LIMITS:
VARIES 24' @ STA. 389+48.00 TO 55' @ STA. 398+30.00
VARIES 55' @ STA. 398+30.00 TO 24' @ STA. 429+57.00
VARIES 24' @ STA. 833+85.00 TO 58' @ STA. 853+01.68

TYPICAL SECTIONS OF IMPROVEMENT

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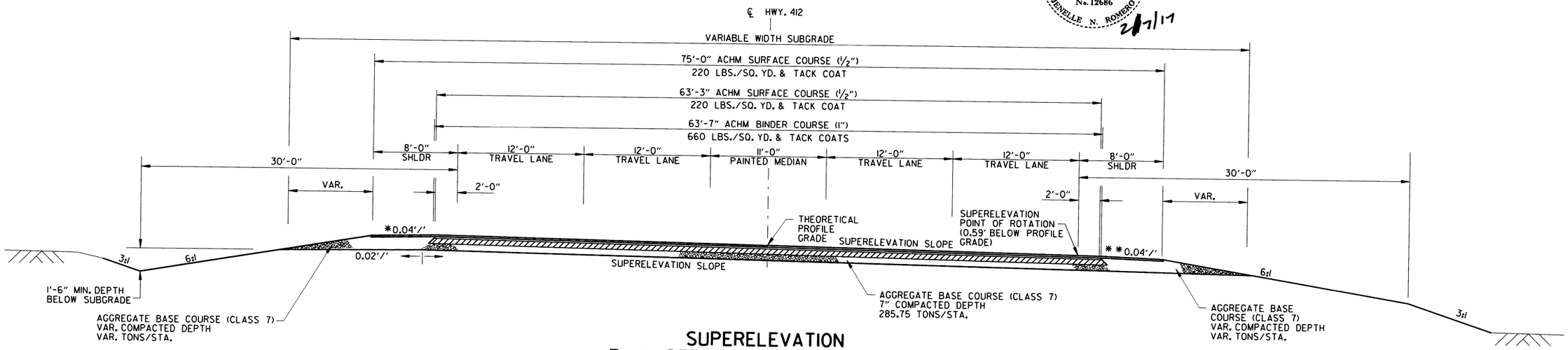
| JOB NO. | | CA1003 | 6 | 503 |

② TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17




# SUPERELEVATION
# FULL DEPTH FIVE LANE SECTION
# HWY. 412

STA. 552+52.15 TO STA. 579+84.76
STA. 584+39.48 TO STA. 612+27.57
STA. 651+40.43 TO STA. 677+42.52
STA. 681+98.07 TO STA. 707+24.00

NOTES:

1. 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.
2. 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.
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5. WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, THE FIRST LIFT OF ACHM SURFACE COURSE (1/2") IN LIEU OF AGGREGATE BASE COURSE ON THE SHOULDERS.

* ON ALL SUPERELEVATED CURVES AND THRU SUPERELEVATION TRANSITIONS, THE ALGEBRAIC DIFFERENCE BETWEEN PAVEMENT SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 0.08'/'.

** SLOPE = 0.04 '/' OR S.E. SLOPE, WHICHEVER IS GREATER.

TYPICAL SECTIONS OF IMPROVEMENT

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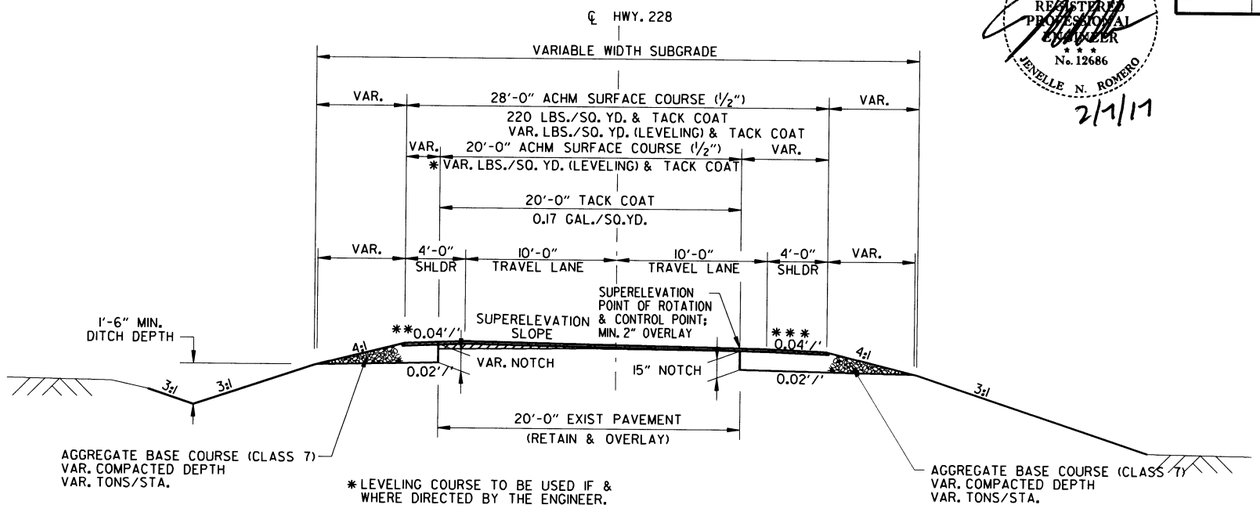
② TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17




## SUPERELEVATION NOTCH AND WIDEN TWO LANE SECTION HWY. 228

STA. 20+28.82 TO STA. 23+21.31
STA. 32+43.24 TO STA. 35+41.54

NOTES:

1. 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.
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* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

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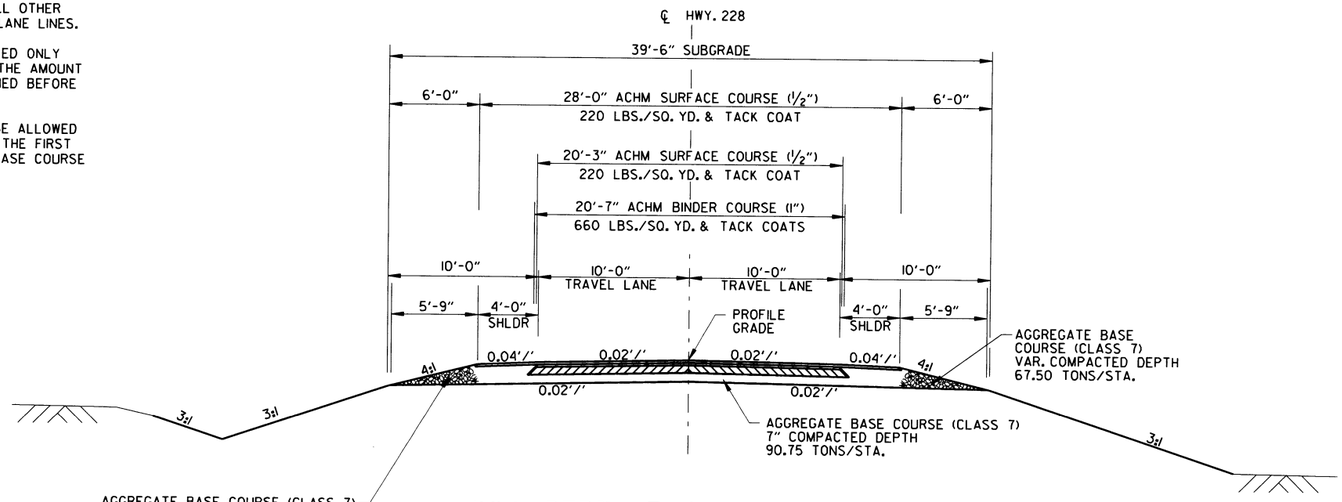
*** SLOPE = 0.04 '/' OR S.E. SLOPE, WHICHEVER IS GREATER.




## FULL DEPTH TWO LANE SECTION HWY. 228

STA. 24+38.82 TO STA. 24+64.84
STA. 26+64.84 TO STA. 29+06.03
STA. 31+06.03 TO STA. 31+31.54

TYPICAL SECTIONS OF IMPROVEMENT

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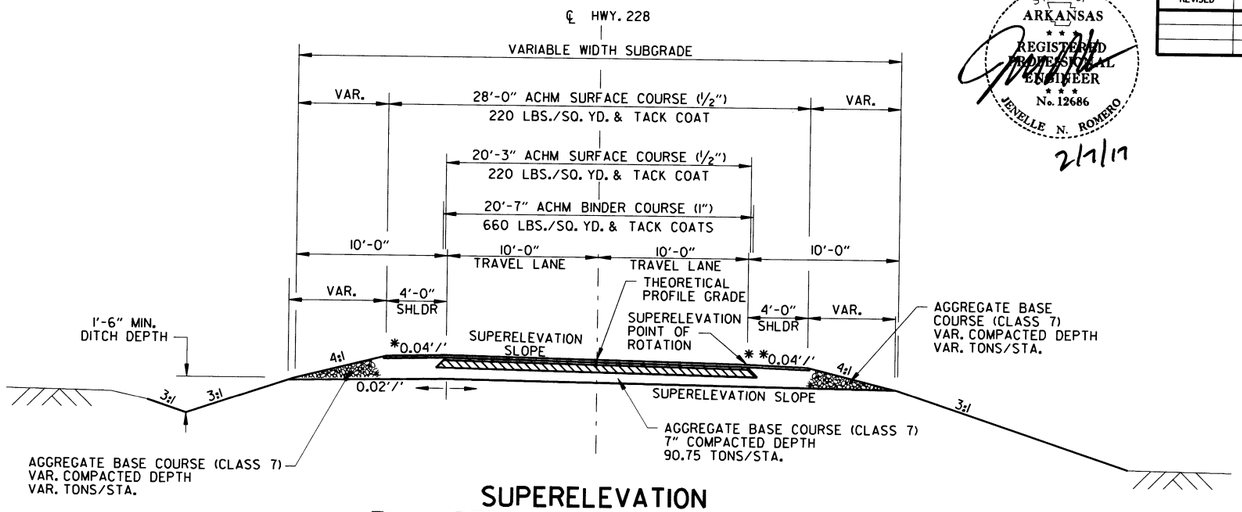
② TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17




## SUPERELEVATION FULL DEPTH TWO LANE SECTION HWY. 228

STA. 23+21.31 TO STA. 24+38.82
STA. 24+64.84 TO STA. 26+64.84
STA. 29+06.03 TO STA. 31+06.03
STA. 31+31.54 TO STA. 32+43.24

* ON ALL SUPERELEVATED CURVES AND THRU SUPERELEVATION TRANSITIONS, THE ALGEBRAIC DIFFERENCE BETWEEN PAVEMENT SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 0.08'/'.

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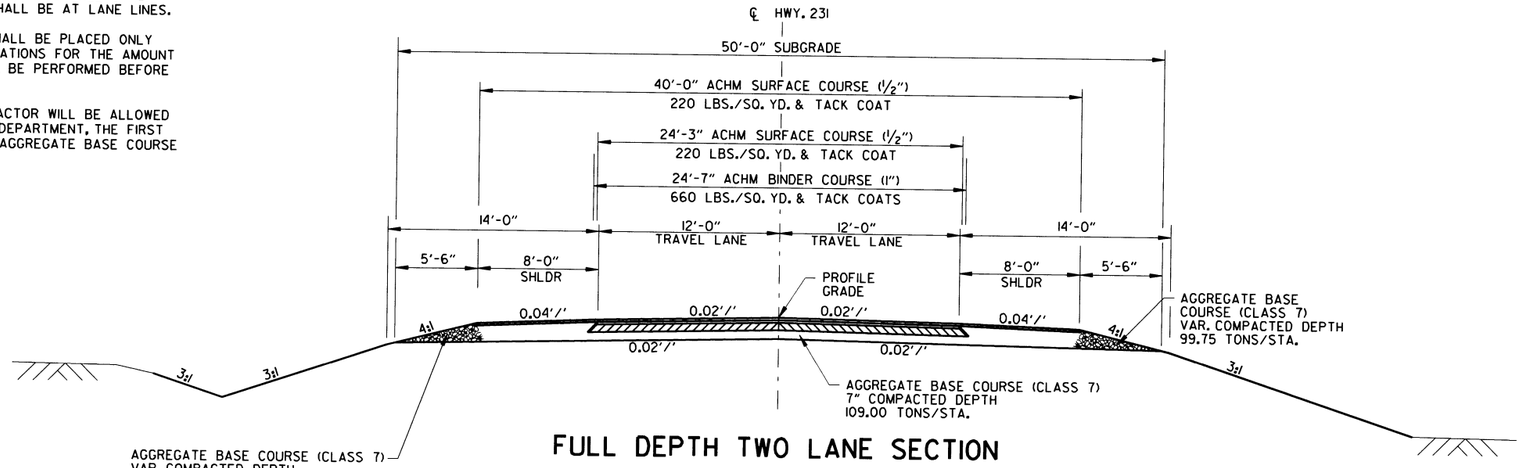


## FULL DEPTH TWO LANE SECTION

### WEST CONNECTOR

STA. 10+37.50 TO STA. 15+14.00

### EAST CONNECTOR

STA. 10+37.50 TO STA. 18+45.00

## TYPICAL SECTIONS OF IMPROVEMENT

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STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

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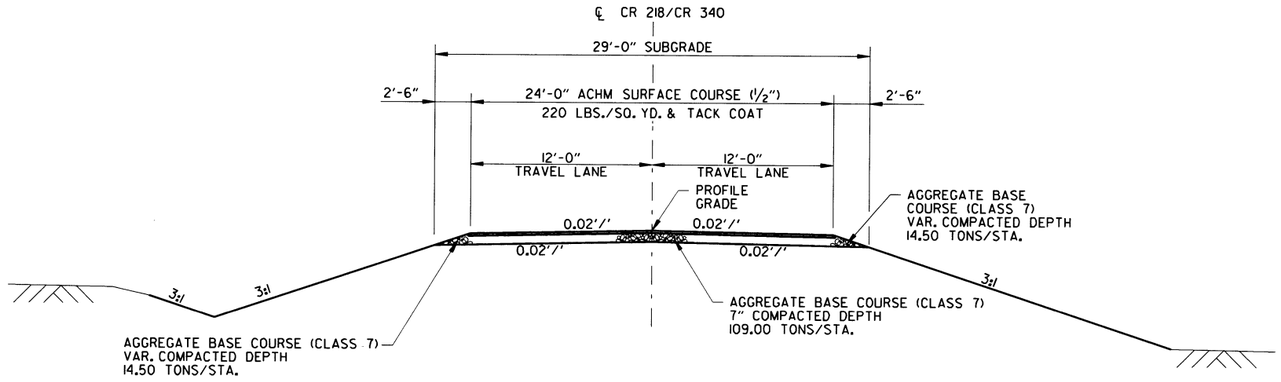
② TYPICAL SECTIONS OF IMPROVEMENT




NOTES:
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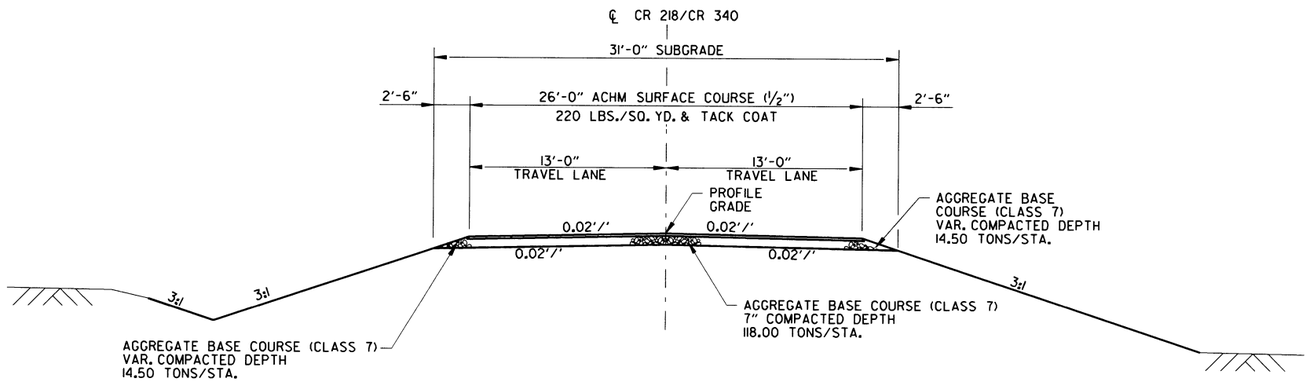
## FULL DEPTH TWO LANE SECTION
## CR 218
STA. 10+31.50 TO STA. 14+37.61

## CR 340
STA. 10+31.57 TO STA. 13+40.00




## FULL DEPTH TWO LANE SECTION
## CR 332
STA. 10+29.88 TO STA. 12+88.23

TYPICAL SECTIONS OF IMPROVEMENT

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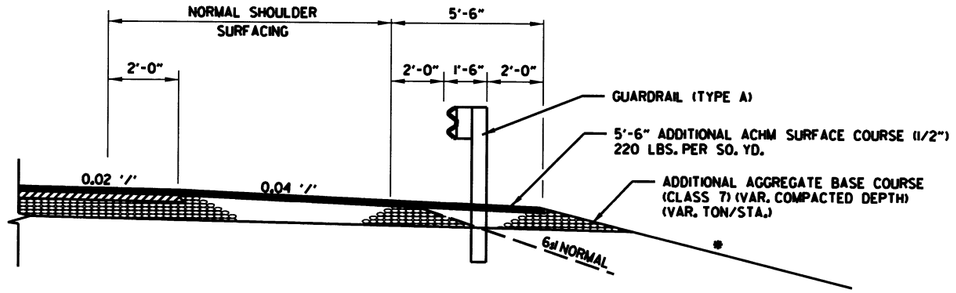
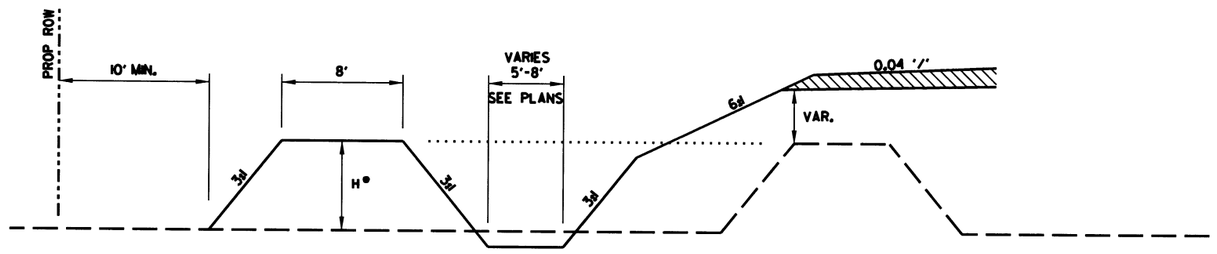
SPECIAL DETAILS




## WIDENING FOR GUARDRAIL AT OUTSIDE SHOULDER

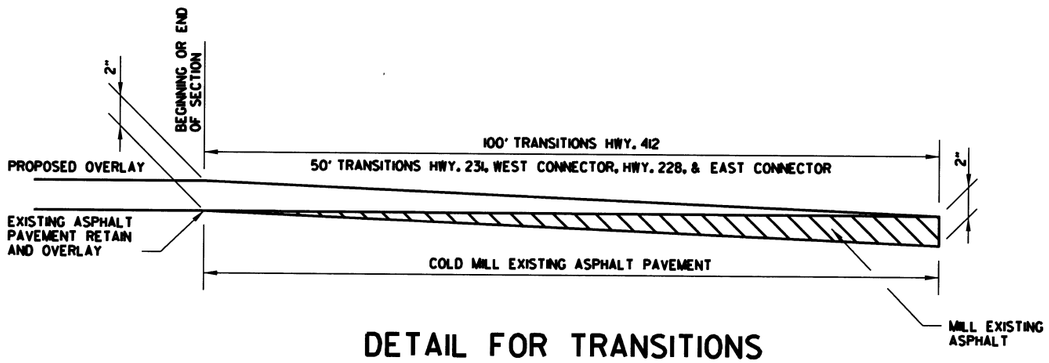
* NOTE: REFER TO STANDARD DRAWINGS GR-9A AND CROSS SECTIONS FOR SLOPE REQUIREMENTS BEHIND GUARDRAIL.



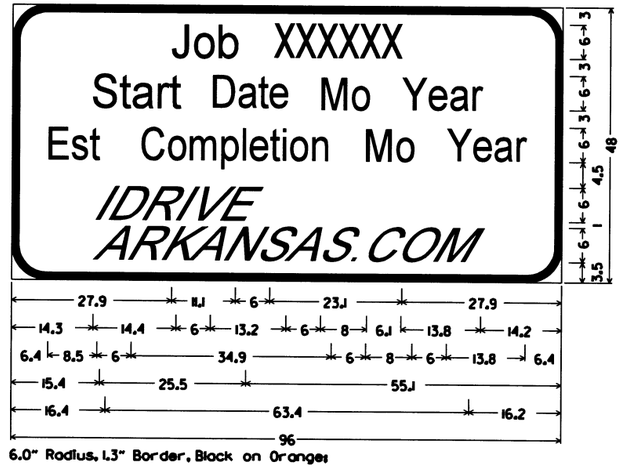

*HEIGHT OF BERM, H, IS DETERMINED BY MATCHING TOP ELEVATION OF ADJACENT EXISTING BERM TO BE REMOVED.

## COMPACTED EMBANKMENT DETAIL

STA. 694+35.00 TO STA. 703+50.00 RT.
STA. 804+26.00 TO STA. 834+50.00 LT.




## DETAIL FOR TRANSITIONS




6.0" Radius, 1.3" Border, Black on Orange;
"Job XXXXXX" C 2K; "Start Date Mo Year" C 2K;
"Est Completion Mo Year" C 2K; "IDRIVE" Arial;
"ARKANSAS.COM" Arial;

## CONSTRUCTION PROJECT INFORMATION SIGN

SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
STEVELLE N. ROMERO
7/2/18

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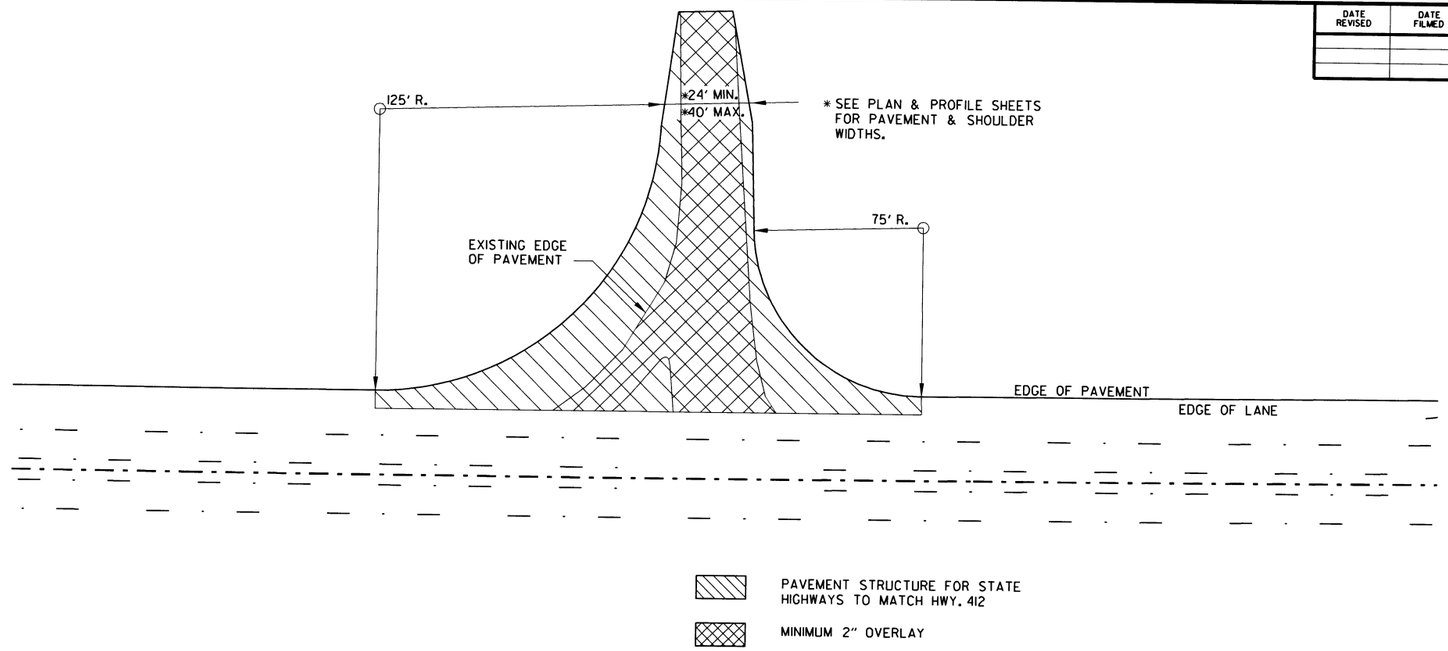
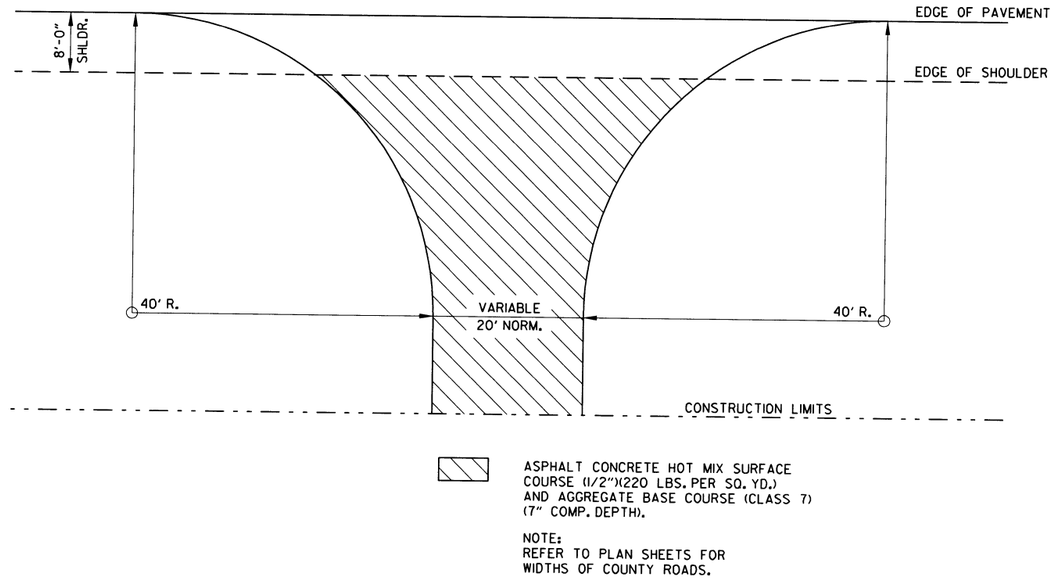
| JOB NO. | | CA1003 | ■ | 503 |

② SPECIAL DETAILS

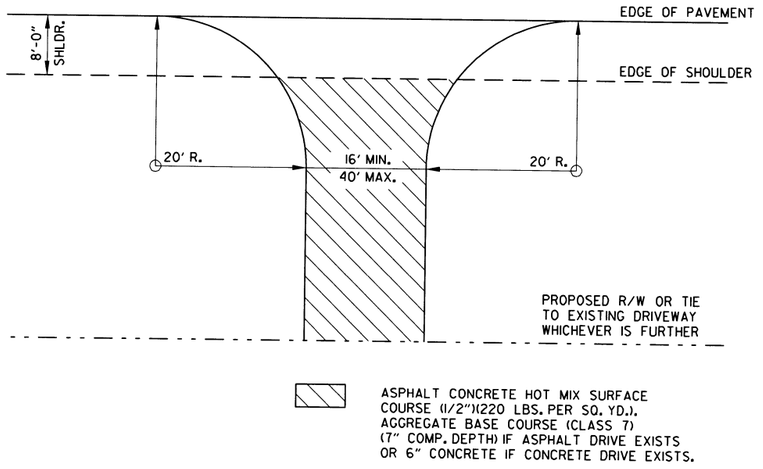
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17




## STATE HWY. TURNOUTS




## COUNTY ROAD TURNOUTS




## DRIVEWAY TURNOUTS

## SPECIAL DETAILS

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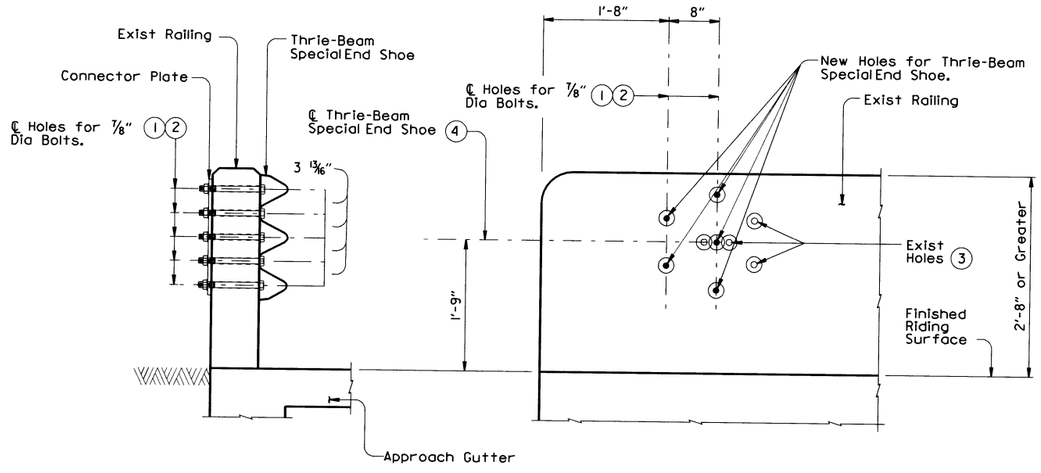
② SPECIAL DETAILS




SECTION ELEVATION

## TERMINAL CONNECTION ON EXISTING RAIL WITHOUT OVERLAY

(1) ℄ 5 - 1" Dia holes. Holes must be core drilled. Percussion drilling is not permitted. Concrete spalls in rail exceeding 1/2" from edge of holes will be patched as approved by the engineer

(2) ℄ 5 - 7/8" Dia A325 Bolts with two 1 3/4" O.D. washers. Place washer under each head and nut. The 5 Terminal Connection Bolts must be tightened in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the W-Beam Transition.

(3) Existing anchor bolt holes in rail that can not be utilized and are within 3" of a new bolt hole must be filled with an epoxy grout prior to coring new holes.

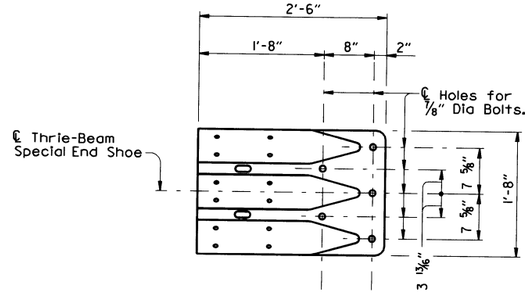
(4) Special End Shoes and associated hardware are to be paid for under the item "Thrie Beam Guard Rail Terminal". W-Beam Guard Fence Transitions must be attached to the bridge rail and extended along the embankment unless otherwise shown in the plans.

**CONSTRUCTION NOTES:**
Remove any W-beams and attachment hardware, from the face of rail if present, prior to installation of new MBGF Transition. Dispose of these materials as directed by the Engineer. Plugging of exposed existing bolt holes is not necessary except as stated herein or otherwise indicated on the plans. This work is considered subsidiary to the pertinent bid items.

**MATERIAL NOTES:**
Galvanize all steel components unless otherwise noted.

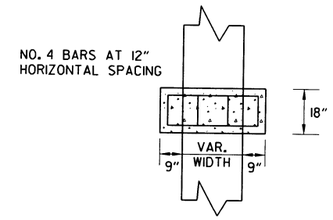
**GENERAL NOTES:**
These details are shown for retrofitting W-Beam transitions to existing rails only and not used for new construction. Shop drawings are not required for this installation. Materials, fabrication and installation of this assembly are to be included in the price bid for "Thrie Beam Guard Rail Terminal."

See AHTD Guard Rail Details standard drawing GR-10 for notes and details not shown.



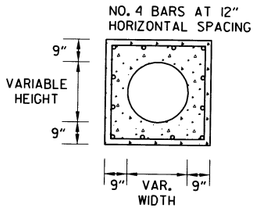

THRIE-BEAM SPECIAL END SHOE (4)

## W-BEAM TERMINAL TRANSITION RETROFIT GUIDE

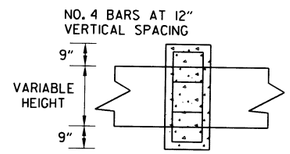



TOP VIEW

MIN. 3" COVER



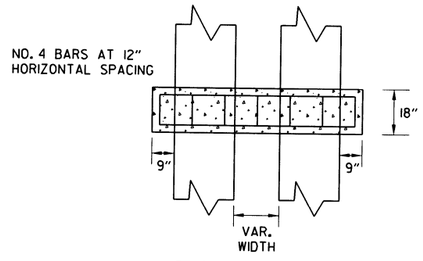

FRONT VIEW




SIDE VIEW

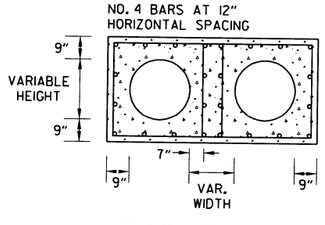
## PIPE EXTENSION REINFORCED CONCRETE COLLAR DETAIL

NOTE:
PIPE COLLAR TO BE UTILIZED IF AND WHERE DIRECTED BY THE ENGINEER.

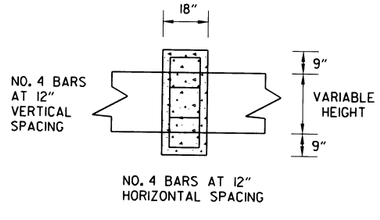



TOP VIEW

MIN. 3" COVER




FRONT VIEW




SIDE VIEW

## PIPE EXTENSION REINFORCED CONCRETE COLLAR DETAIL

NOTE:
PIPE COLLAR TO BE UTILIZED IF AND WHERE DIRECTED BY THE ENGINEER.

## SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

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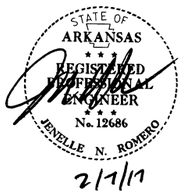
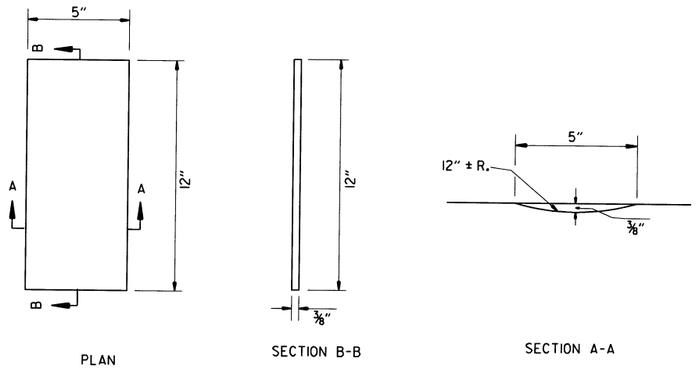
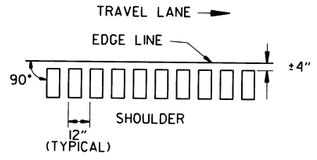
| | | | | JOB NO. | | CA1003 | 13 | 503 |

② SPECIAL DETAILS

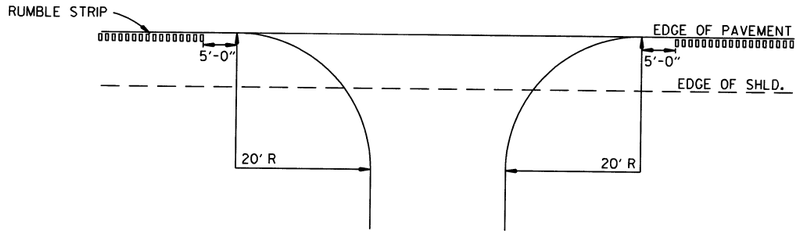


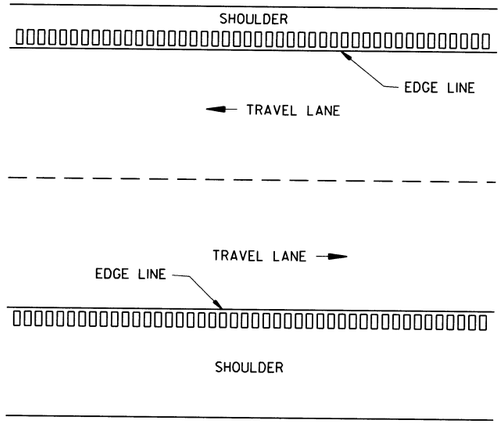

## DETAILS OF RUMBLE STRIPS




## LOCATION PLAN OF RUMBLE STRIPS LEFT OR RIGHT SHOULDER



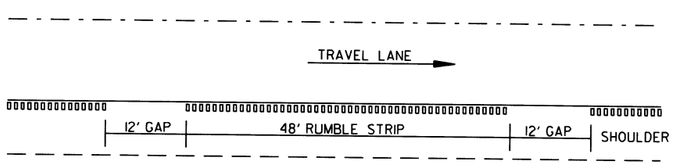

## DETAIL FOR RUMBLE STRIP GAP AT DRIVEWAY TURNOUTS




## PLAN VIEW

GENERAL NOTES

1. RUMBLE STRIPS SHALL NOT BE INSTALLED ON CURB SECTIONS, BRIDGE DECKS, APPROACH SLABS, INTERSECTING STREETS OR ROADWAYS, RESIDENTIAL OR COMMERCIAL DRIVEWAYS OR ACROSS TRANSVERSE JOINTS OF CONCRETE SHOULDERS.
2. RUMBLE STRIPS SHALL NOT BE INSTALLED ON A PAVED SHOULDER THAT IS USED AS A DECELERATION LANE FOR THE LENGTH DEEMED APPROPRIATE BY THE ENGINEER.
3. THE 4" OFFSET FROM THE EDGE LINE MAY BE INCREASED TO AVOID LONGITUDINAL JOINTS. IN ALL CASES, THE LATERAL DEVIATION FROM THE PLANNED OFFSET SHOULD BE KEPT TO A MINIMUM.
4. RUMBLE STRIPS SHALL BE MEASURED BY THE LINEAR FOOT LONGITUDINALLY ALONG THE SHOULDER. PAYMENT SHALL ONLY INCLUDE THAT PORTION OF THE SHOULDER ON WHICH RUMBLE STRIPS HAVE BEEN CONSTRUCTED. NO MEASUREMENT OR PAYMENT WILL BE MADE FOR GAPS, DRIVEWAYS, TURNOUTS, OR OTHER PUBLIC ROAD INTERSECTIONS WHERE RUMBLE STRIPS HAVE NOT BEEN CONSTRUCTED.
5. THE 3/8" DEPTH SHALL GENERALLY APPLY FOR THE ENTIRE 12" LENGTH. SOME VARIATION TO SUIT SHOULDER SLOPE BREAKS MAY BE NECESSARY.




NOTE: GAP PATTERN SHALL BE ADJUSTED BY THE ENGINEER IN THE FIELD ALLOWING FOR DRIVEWAYS TO SERVE AS THE GAP.

## DETAIL FOR GAP PATTERN RUMBLE STRIP

## SPECIAL DETAILS

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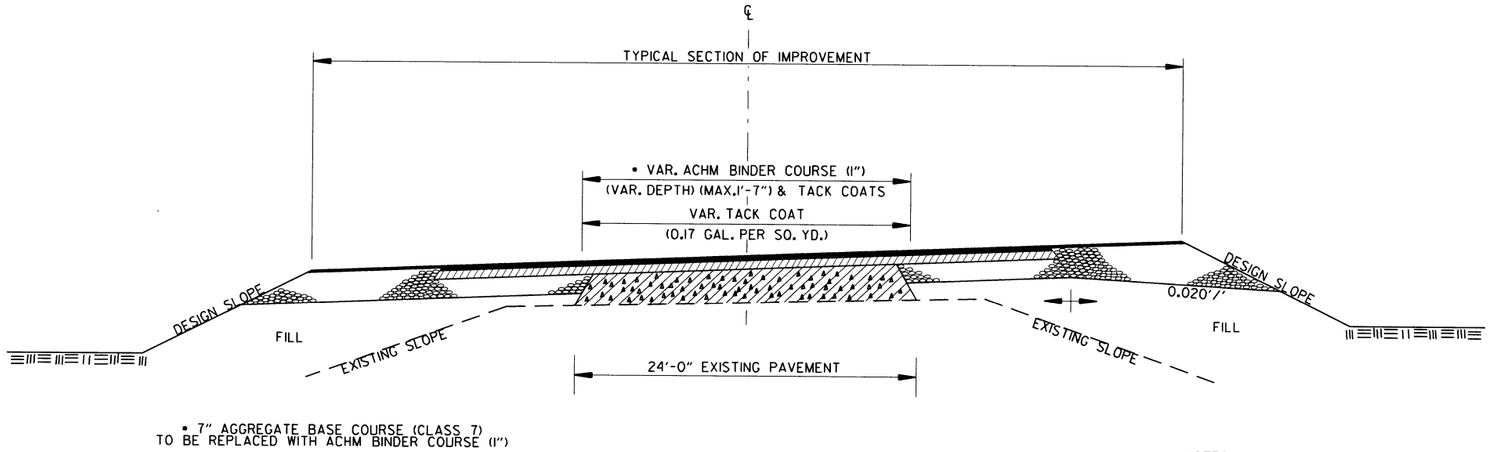
| | | | | JOB NO. | | CA1003 | 14 | 503 |

② SPECIAL DETAILS

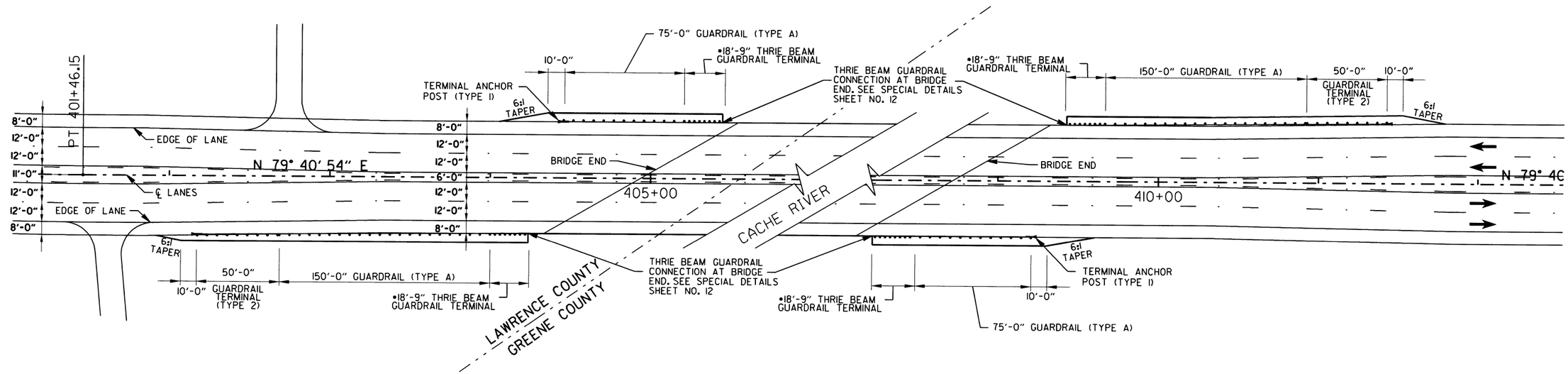
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/14/17




## METHOD OF RAISING GRADE

NOTES:

1. THIS DETAIL TO BE USED ONLY WHERE DIRECTED BY THE ENGINEER.
2. QUANTITIES FOR METHOD OF GRADE RAISE USING ASPHALT WERE CALCULATED ON THIS PROJECT AT LOCATIONS WHERE THE DISTANCE BETWEEN THE EXISTING ASPHALT ROADWAY AND THE PROPOSED SUBGRADE WAS ONE FOOT OR LESS.
3. IN LOCATIONS WHERE THE DISTANCE BETWEEN THE PROPOSED SUBGRADE AND THE EXISTING ASPHALT ROADWAY IS MORE THAN ONE FOOT, SCARIFICATION OF THE EXISTING ASPHALT ROADWAY WILL BE REQUIRED AS STATED IN SECTION 210, SUBSECTION 210.09 OF THE STANDARD SPECIFICATIONS.




## LAYOUT OF GUARDRAIL AT BRIDGE ENDS

## SPECIAL DETAILS

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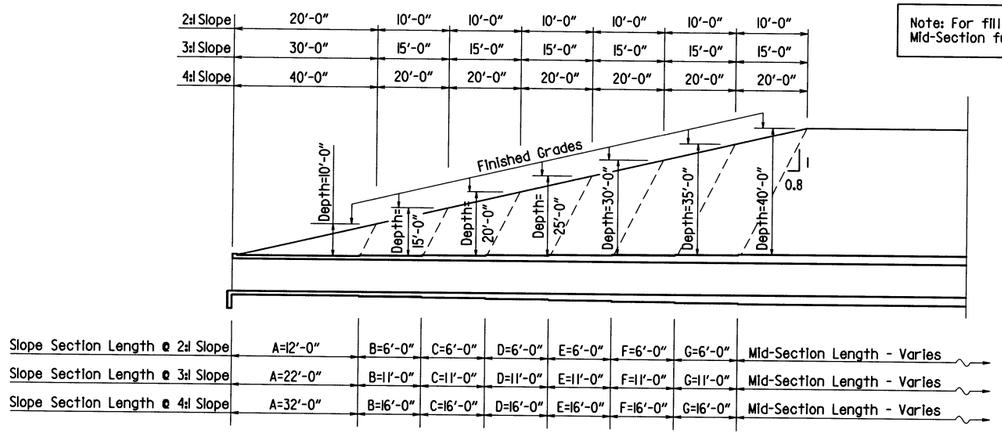
SPECIAL DETAILS

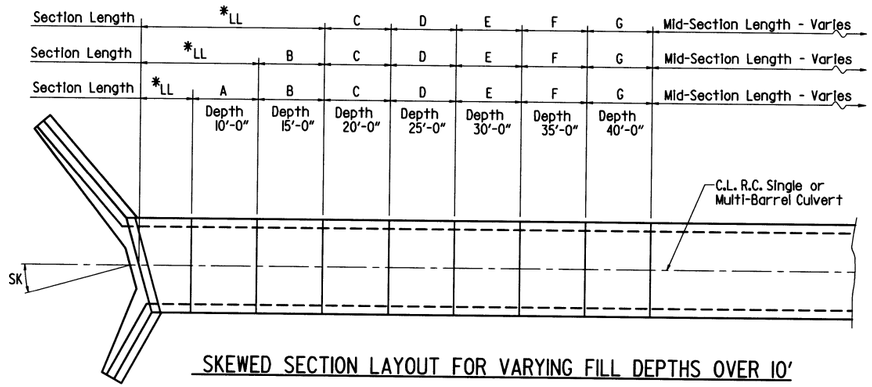



Note: For fill depths 10' and under, use Mid-Section full length of box culvert.

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

Lengths for Non-Skewed Boxes

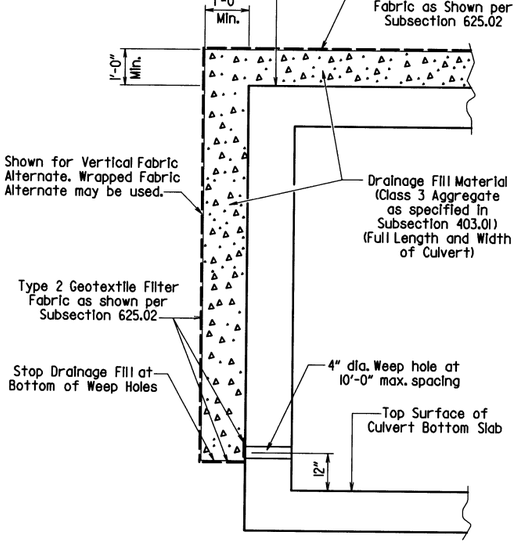
*LL = Skewed End Section Length - See "Skewed End Section Details" Length LL varies with skew angle, overall box width and fill depth and may eliminate the need for some slope section lengths as shown.




## SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

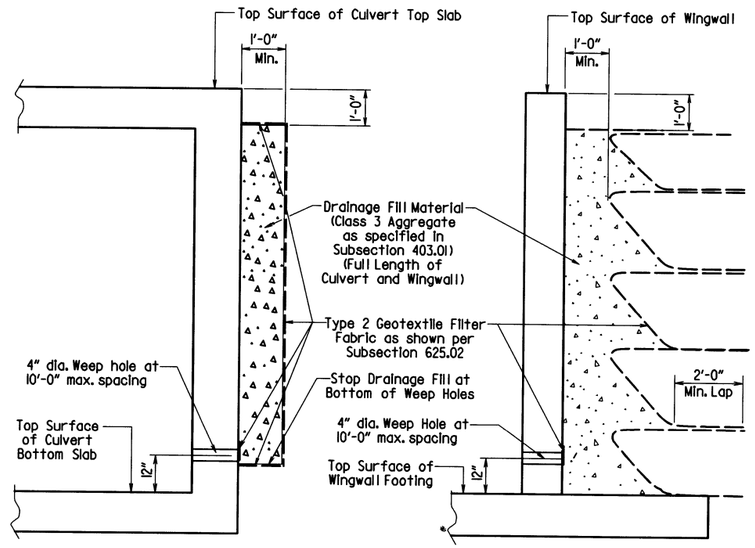
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 12686 JENELLE N. ROMERO

2/7/14




## 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

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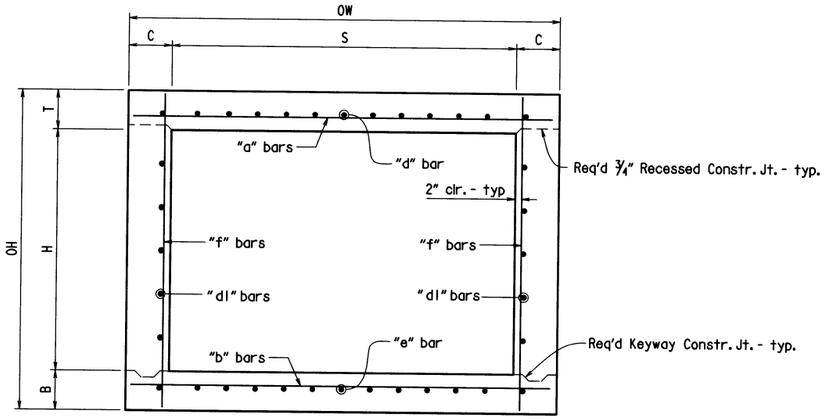
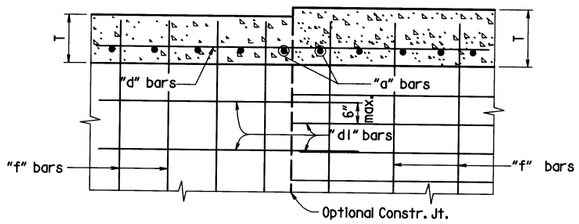
1 SPECIAL DETAILS

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



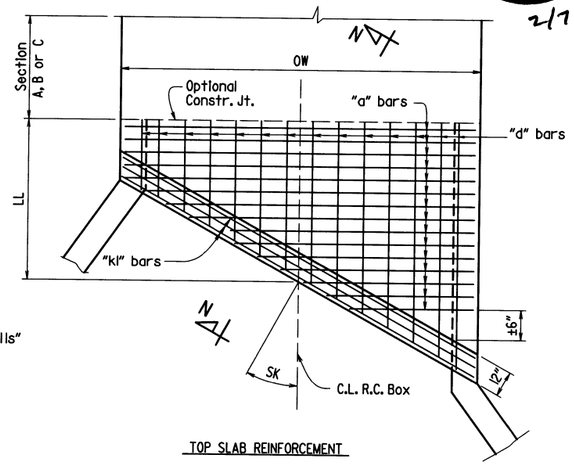

## TYPICAL SECTION M-M



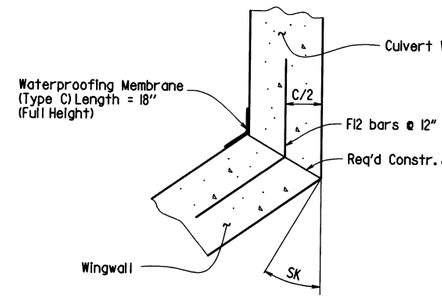

Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.

## LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

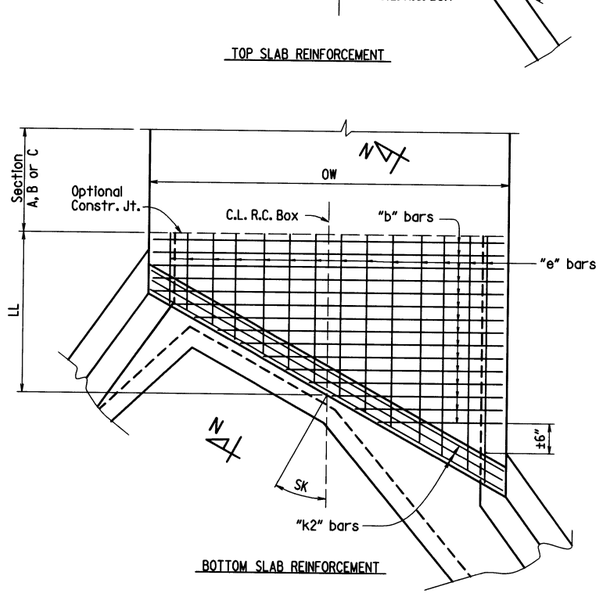



TOP SLAB REINFORCEMENT

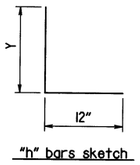



## WINGWALL ATTACHMENT

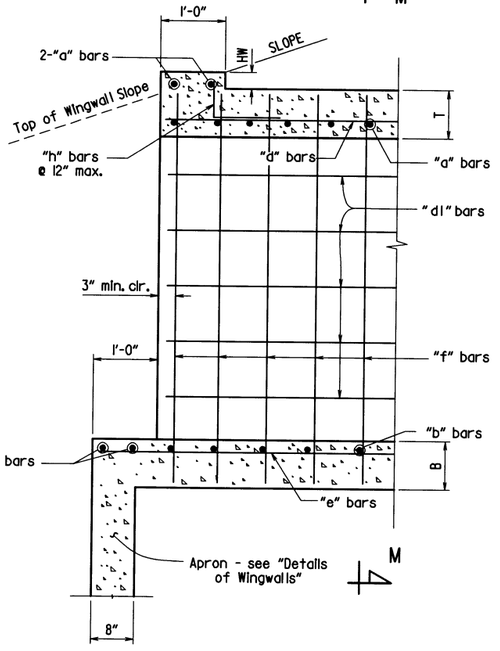
See "Details of Wingwalls" for additional information and wingwall details.




BOTTOM SLAB REINFORCEMENT

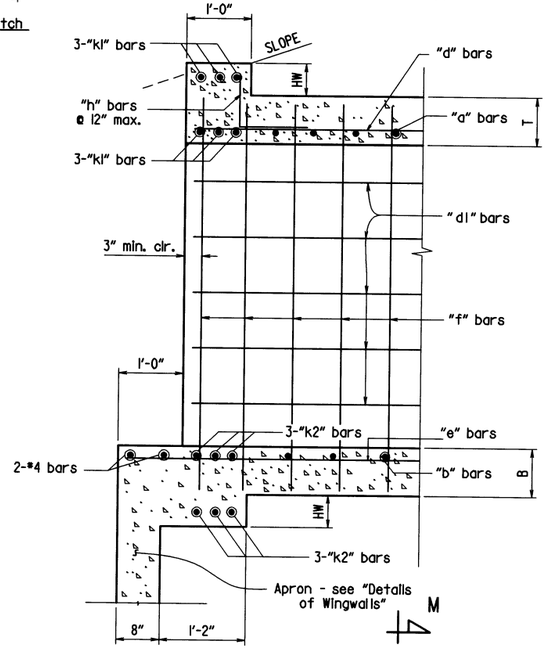



"h" bars sketch



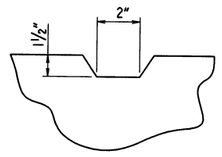

## PART LONGITUDINAL SECTION

(Non-Skewed Ends)




## PART LONGITUDINAL SECTION N-N

(Skewed Ends)




## TYPICAL KEYWAY DETAIL

(All Construction Joints)

## 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. 12686
JENELLE N. ROMERO
2/7/19

FILENAME

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| | | | | JOB NO. | | CA1003 | 17 | 503 |

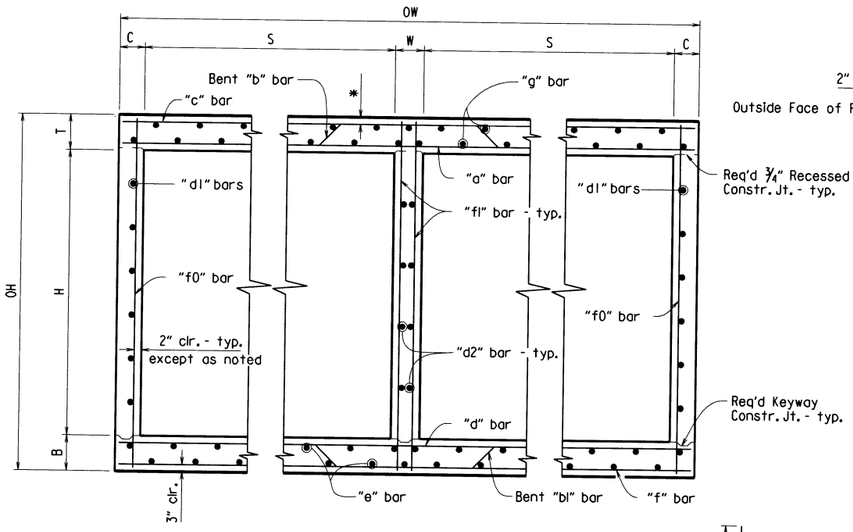
SPECIAL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 12686 JENELLE N. ROMERO

2/7/17

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

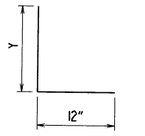
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



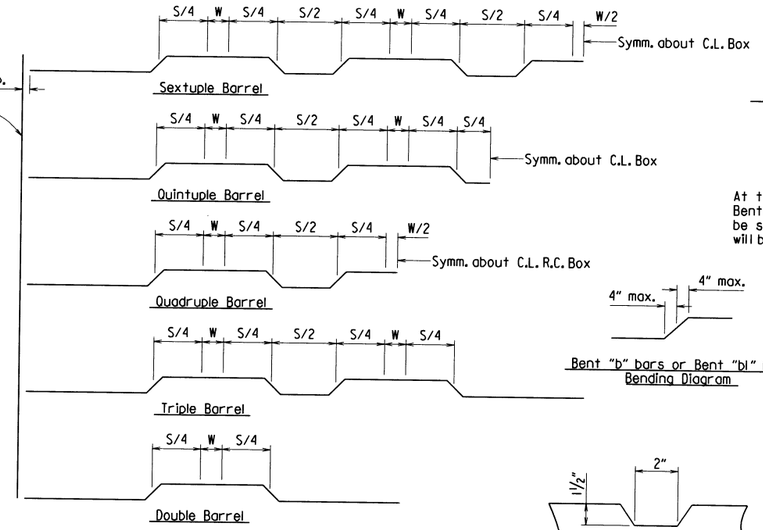

## TYPICAL SECTION M-M

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

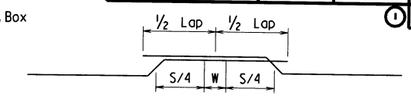
Bottom Slab
Straight "d" bars shall alternate with Bent "bl" bars in top.
Straight "f" bars shall alternate with Bent "bl" bars in bottom.




"h" bars sketch

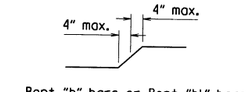



## Bent "b" bars or Bent "bl" bars sketch

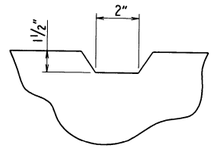



Lap Detail
For Bent "b" bars and Bent "bl" bars

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.

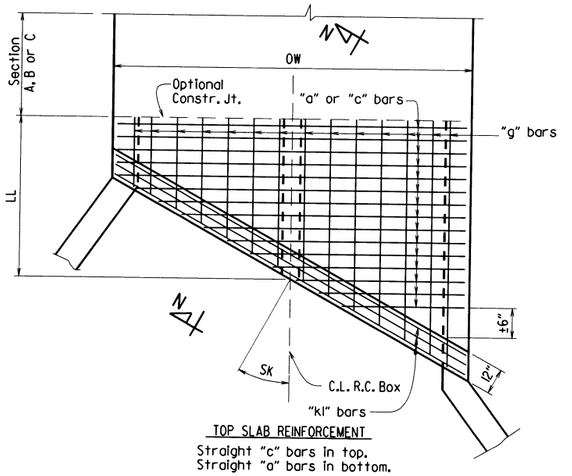



Bent "b" bars or Bent "bl" bars Bending Diagram

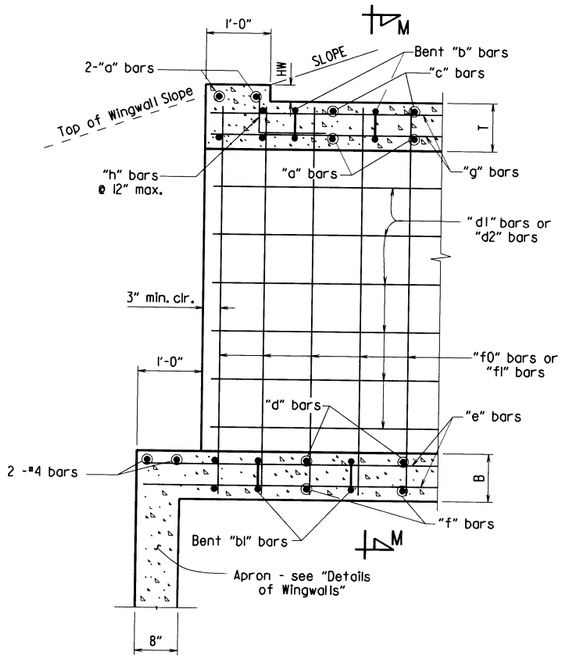



## TYPICAL KEYWAY DETAIL

(All Construction Joints)

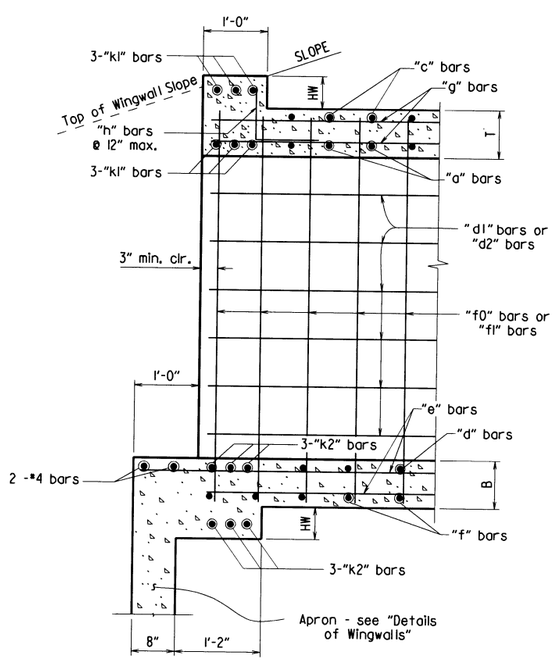



TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



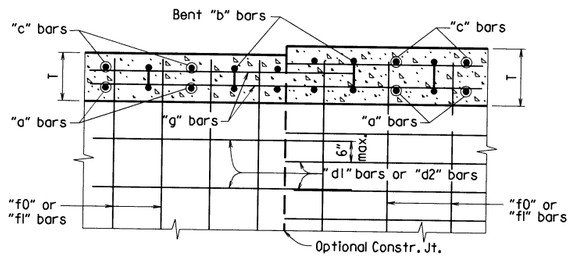

## PART LONGITUDINAL SECTION

(Non-Skewed Ends)




## PART LONGITUDINAL SECTION N-N

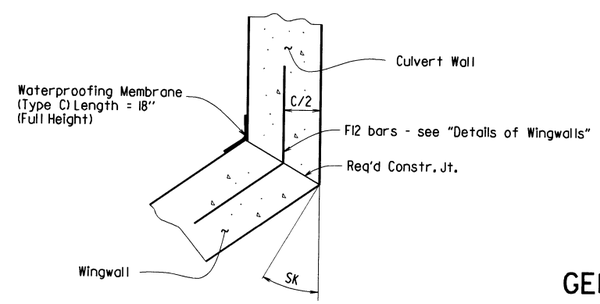
(Skewed Ends)




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

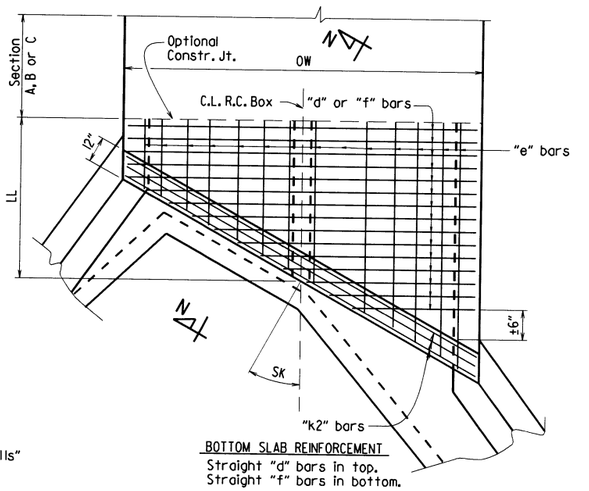
## LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

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

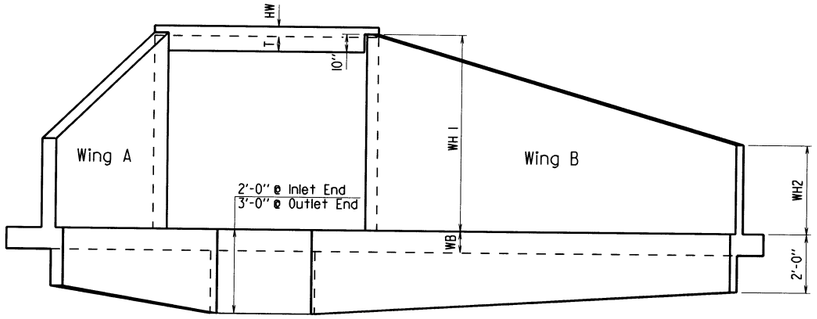
## DETAILS OF MULTI-BARREL R.C. BOX CULVERT

## SPECIAL DETAILS

FILENAME

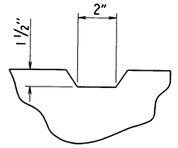
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 18 | 503 |

SPECIAL DETAILS



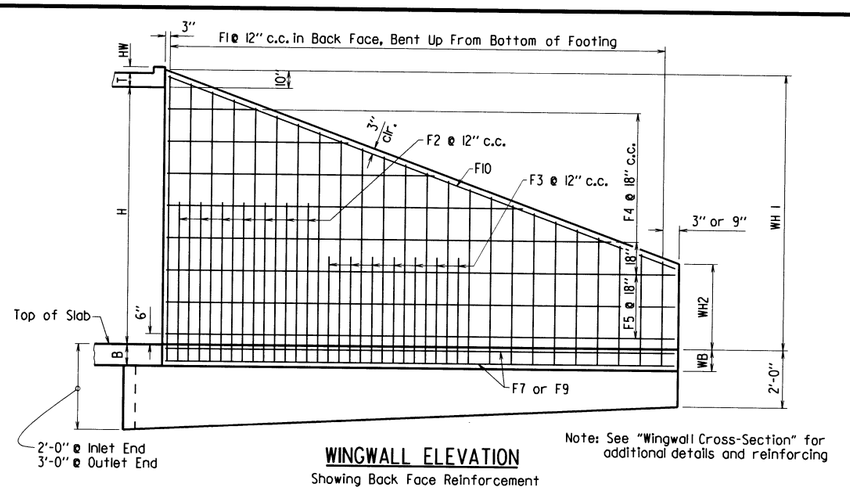

## END ELEVATION

Flared Wingwalls Shown




## TYPICAL KEYWAY DETAIL

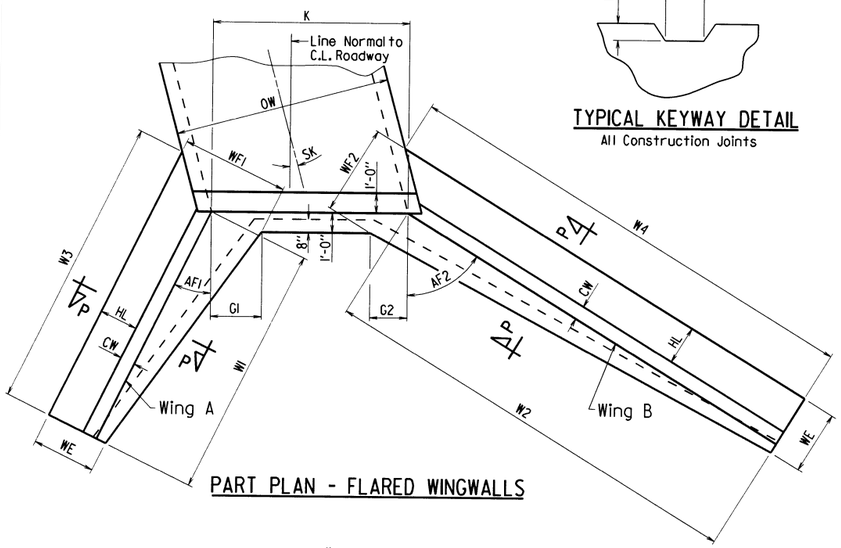
All Construction Joints



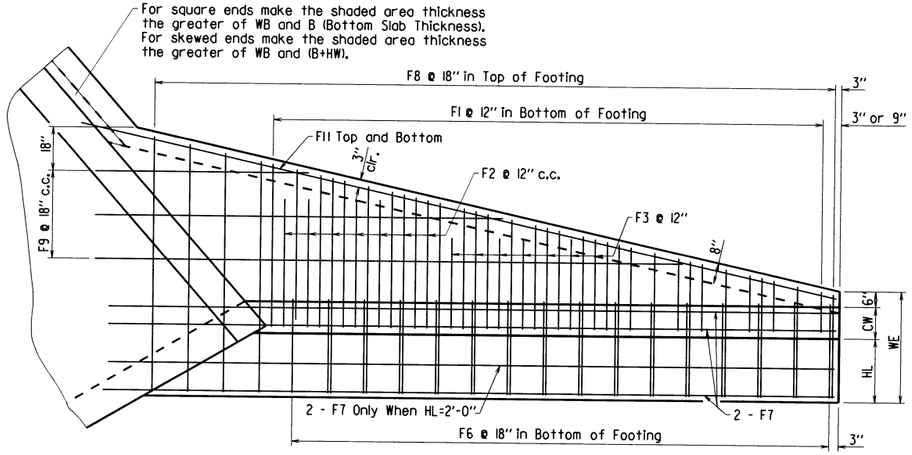

## WINGWALL ELEVATION

Showing Back Face Reinforcement

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

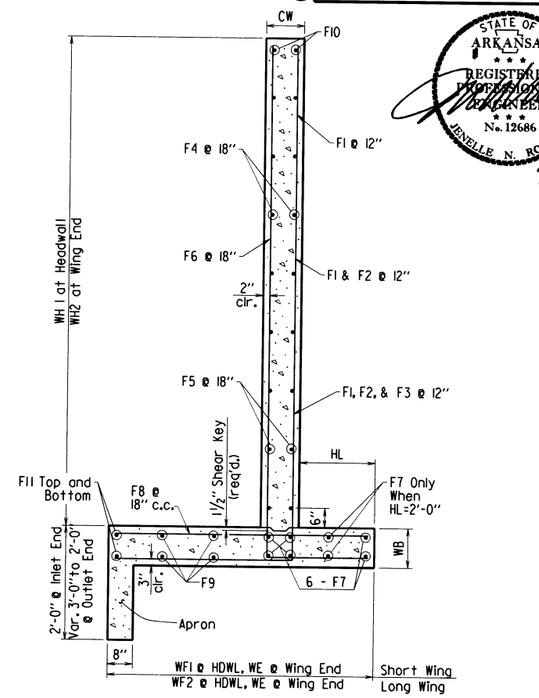



## PART PLAN - FLARED WINGWALLS

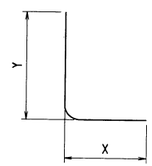



## PLAN - FLARED WINGWALLS

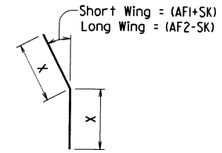
Showing Footing Reinforcement




## WINGWALL SECTION P-P

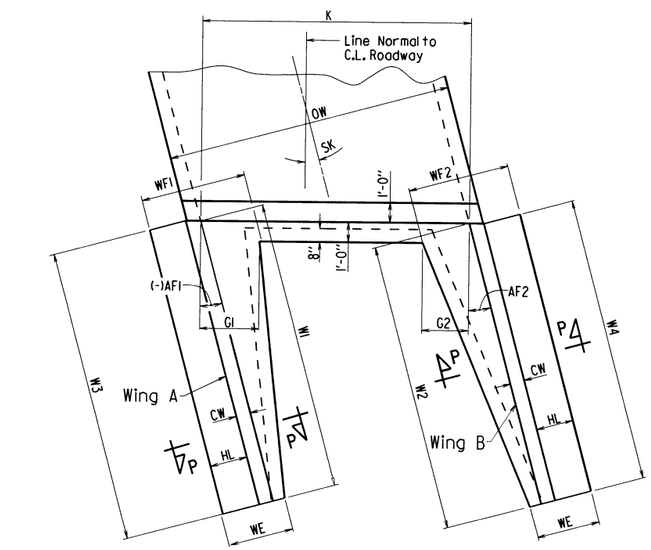



## F1, F2, F3, & F6 BARS

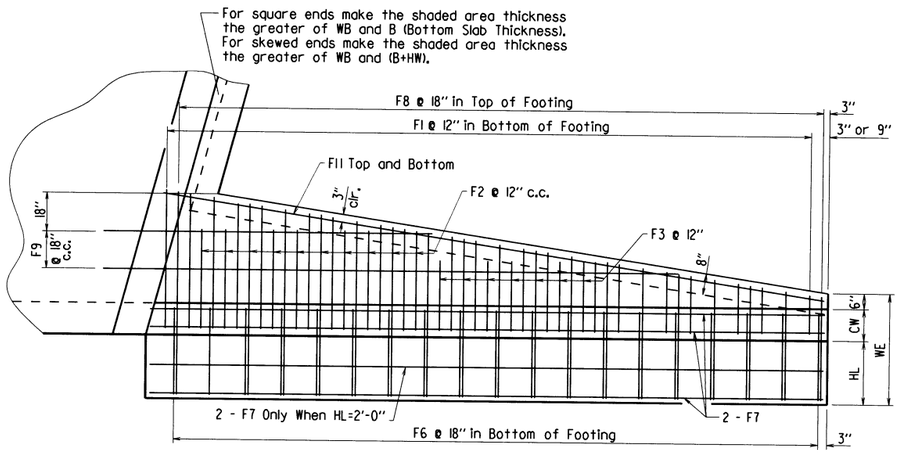



## *F12 BAR

*F12 is a straight bar for parallel wingwalls

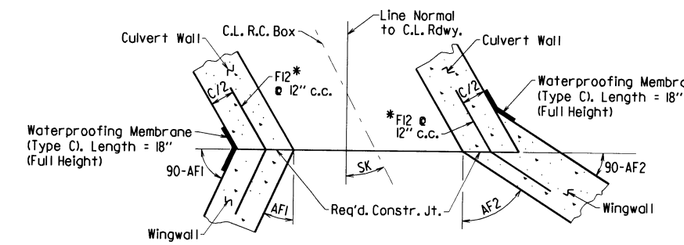



## PART PLAN - PARALLEL WINGWALLS




## PLAN - PARALLEL WINGWALLS

Showing Footing Reinforcement




## CONSTRUCTION JOINTS

Flared Wingwalls Shown

## SHEET 4 OF 4

## GENERAL DETAILS OF R.C. BOX CULVERT

## DETAILS OF WINGWALLS

## SPECIAL DETAILS

FILENAME

| 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. | | CA1003 | 19 | 503 |

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 |
| 40'-0" | 12'-0" | 1'-1" | 1'-0" | 0 | 3:1 | 37'-4" | 2'-0" | 12'-10" | 4'-0" | 30 | 30 | 3'-6" | 6'-6" | 6'-6" | 3'-5 1/2" | 3'-5 1/2" | 30'-6" | 30'-6" | 33'-0 3/8" | 33'-0 3/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| INLET | INLET |
| CU.YD | LBS. |
| 34.85 | 2620 |

| 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 | 31 | L | Min | 5'-8" | 6 | 12 | 11 | L | 10'-3" | | 4 | 12 | 7 | L | 6'-1" | | 4 | 18 | 10 | Min |
| | | | | | Max | 17'-3" | | | | | | | | | | | | | | | | 5'-7" |
| | | | | X | Min | 1'-1" | | | | X | 3'-0" | | | | | X | 2'-4" | | | | | Max |
| | | | | | Max | 4'-0" | | | | | | | | | | | | | | | | 26'-4" |
| | | | | Y | Min | 4'-8" | | | | Y | 7'-4" | | | | | Y | 3'-10" | | | | |
| | | | | | Max | 13'-4" | | | | | | | | | | | | | | | | |
| WING B | 4 | 12 | 31 | L | Min | 5'-8" | 6 | 12 | 11 | L | 10'-3" | | 4 | 12 | 7 | L | 6'-1" | | 4 | 18 | 10 | Min |
| | | | | | Max | 17'-3" | | | | | | | | | | | | | | | | 5'-7" |
| | | | | X | Min | 1'-1" | | | | X | 3'-0" | | | | | X | 2'-4" | | | | | Max |
| | | | | | Max | 4'-0" | | | | | | | | | | | | | | | | 26'-4" |
| | | | | Y | Min | 4'-8" | | | | Y | 7'-4" | | | | | Y | 3'-10" | | | | |
| | | | | | Max | 13'-4" | | | | | | | | | | | | | | | | |

| WING | 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 | 6 | 30'-2" | 4 | 18 | 21 | L | Min | 7'-3" | 4 | 8 | 33'-10" | 4 | 18 | 21 | Min | | | 4 | 18 | 4 | Min | | 4 | 2 | 31'-3" | 4 | 2 | 33'-7" | 6 | 12 | 12 | L | 3'-4" | 1310 |
| | | | | | | | | | Max | 15'-11" | | | | | | | 3'-0" | | | | | | 17'-8" | | | | | | | | | | | | |
| | | | | | | | | X | Min | 2'-8" | | | | | | | Max | | | | | | Max | | | | | | | | | | X | 1'-8" | |
| | | | | | | | | | Max | 2'-8" | | | | | | | 5'-11" | | | | | | 33'-4" | | | | | | | | | | | | |
| | | | | | | | | Y | Min | 4'-8" | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Max | 13'-4" | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WING B | 4 | 18 | 6 | 30'-2" | 4 | 18 | 21 | L | Min | 7'-3" | 4 | 8 | 33'-10" | 4 | 18 | 21 | Min | | | 4 | 18 | 4 | Min | | 4 | 2 | 31'-3" | 4 | 2 | 33'-7" | 6 | 12 | 12 | L | 3'-4" | 1310 |
| | | | | | | | | | Max | 15'-11" | | | | | | | 3'-0" | | | | | | 17'-8" | | | | | | | | | | | | |
| | | | | | | | | X | Min | 2'-8" | | | | | | | Max | | | | | | Max | | | | | | | | | | X | 1'-8" | |
| | | | | | | | | | Max | 2'-8" | | | | | | | 5'-11" | | | | | | 33'-4" | | | | | | | | | | | | |
| | | | | | | | | Y | Min | 4'-8" | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Max | 13'-4" | | | | | | | | | | | | | | | | | | | | | | | | | | |

## 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. 12686 JENELLE N. ROMERO 2/28/16

TABULAR DATA BY: BCK DATE: 2/28/2016
CHECKED BY: JNR DATE: 2/28/2016

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

| TOP SLAB REINFORCING STEEL "a" SIZE | "a" SPACING | "a" LENGTHS VARY | "a" NO. REQ'D | TOP SLAB REINFORCING STEEL "c" SIZE | "c" SPACING | "c" LENGTHS VARY | "c" NO. REQ'D |
|---|---|---|---|---|---|---|---|
| | | Max | | | | Max | |
| | | | | | | | |
| | | Min | | | | Min | |
| | | | | | | | |

| BOTTOM SLAB REINFORCING STEEL "d" SIZE | "d" SPACING | "d" LENGTHS VARY | "d" NO. REQ'D | BOTTOM SLAB REINFORCING STEEL "f" SIZE | "f" SPACING | "f" LENGTHS VARY | "f" NO. REQ'D |
|---|---|---|---|---|---|---|---|
| | | Max | | | | Max | |
| | | | | | | | |
| | | Min | | | | Min | |
| | | | | | | | |

| 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 |
|---|---|---|---|
| | | | |

| TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE | "g" SPACING | "g" NO. REQ'D | "g" LENGTHS VARY |
|---|---|---|---|
| | | | Max |
| | | | |
| | | | Min |
| | | | |

| BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE | "e" SPACING | "e" NO. REQ'D | "e" LENGTHS VARY |
|---|---|---|---|
| | | | Max |
| | | | |
| | | | Min |
| | | | |

| SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE | "d1" SPACING | "d1" NO. REQ'D | "d1" LENGTH |
|---|---|---|---|
| | | | LONG |
| | | | |
| | | | SHORT |
| | | | |

| INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE | "d2" SPACING | "d2" NO. REQ'D | "d2" LENGTH |
|---|---|---|---|
| | | | LONG |
| | | | |
| | | | SHORT |
| | | | |

| "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 |
|---|---|---|---|
| | | | |

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

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

## INLET 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |

| LENGTH = OW - 4" + BENDS "a" SIZE | "a" L | Bent "b" SIZE | Bent "b" L | "c" SIZE | "c" L | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

| 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 REINFORCING STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| | | |

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

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

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

| HDWL DEPTH | ADDITIONAL REINF. FOR HDWL LBS. | "h" HDWL BARS SIZE | Y | LENGTH | NO. REQ'D |
|---|---|---|---|---|---|
| HD | | | | | |
| 3' | 52 | 4 | 0'-10" | 1'-10" | 41 |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| 0.36 | 102 |
| | |
| | |
| | |
| | |
| | |
| | |
| TOTAL | |
| 0.36 | 102 |

| 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.) 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 5 | 12 | 12 | 11.5 | 11.5 | 16 | 8 | 40'-0" | 13'-11" | 121 |

| 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 39'-8" | 8 | 40'-4" | 6 | 39'-8" | 13 | 111 |

| 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 |
|---|---|---|---|---|---|---|---|
| | 4 39'-8" | 5 | 40'-3" | 4 | 39'-8" | 10 | 145 |

| SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| | 5 6 | 484 | 13'-7" |

| INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| | 4 12 | 484 | 13'-7" |

| TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| | 4 9 | 101 |

| BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| | 4 9 | 101 |

| SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| | 4 6.5 | 46 |

| INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| | 4 12 | 48 |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| 558.69 | 71645 |

# SHEET 1 OF 2
# DETAILS OF R.C. BOX CULVERT
## TRIPLE BARREL BOX CULVERT
## Sta. 162+20

SPECIAL DETAILS

Ver. LI14 FILENAME

| 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. | | CA1003 | 20 | 503 |

(1) SPECIAL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 12686 JENELLE N. ROMERO 2/28/16

TABULAR DATA BY: BCK DATE: 2/28/2016
CHECKED BY: JNR DATE: 2/28/2016

# 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 |
| 40'-0" | 12'-0" | 1'-1" | 1'-0" | 0 | 3:1 | 37'-4" | 2'-0" | 12'-10" | 4'-0" | 30 | 30 | 3'-6" | 6'-6" | 6'-6" | 3'-5 1/2" | 3'-5 1/2" | 30'-6" | 30'-6" | 33'-0 3/8" | 33'-0 3/8" |

| CLASS "S" CONCRETE (Includes apron) OUTLET | REINFORCING STEEL (Includes apron and laps if required) OUTLET |
|---|---|
| CU.YD | LBS. |
| 36.38 | 2620 |

| 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 | 31 | L Min 5'-8" Max 17'-3"<br>X Min 1'-1" Max 4'-0"<br>Y Min 4'-8" Max 13'-4" | 6 | 12 | 11 | L 10'-3"<br>X 3'-0"<br>Y 7'-4" | 4 | 12 | 7 | L 6'-1"<br>X 2'-4"<br>Y 3'-10" | 4 | 18 | 10 | Min 5'-7"<br>Max 26'-4" |
| WING B | 4 | 12 | 31 | L Min 5'-8" Max 17'-3"<br>X Min 1'-1" Max 4'-0"<br>Y Min 4'-8" Max 13'-4" | 6 | 12 | 11 | L 10'-3"<br>X 3'-0"<br>Y 7'-4" | 4 | 12 | 7 | L 6'-1"<br>X 2'-4"<br>Y 3'-10" | 4 | 18 | 10 | Min 5'-7"<br>Max 26'-4" |

| WING | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 18 | 6 | 30'-2" | 4 | 18 | 21 | L Min 7'-3" Max 15'-11"<br>X Min 2'-8" Max 2'-8"<br>Y Min 4'-8" Max 13'-4" | 4 | 8 | 33'-10" | 4 | 18 | 21 | Min 3'-0"<br>Max 5'-11" |
| WING B | 4 | 18 | 6 | 30'-2" | 4 | 18 | 21 | L Min 7'-3" Max 15'-11"<br>X Min 2'-8" Max 2'-8"<br>Y Min 4'-8" Max 13'-4" | 4 | 8 | 33'-10" | 4 | 18 | 21 | Min 3'-0"<br>Max 5'-11" |

| WING | 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 | Min 17'-8"<br>Max 33'-4" | 4 | 2 | 31'-3" | 4 | 2 | 33'-7" | 6 | 12 | 12 | L 3'-4"<br>X 1'-8" | 1310 |
| WING B | 4 | 18 | 4 | Min 17'-8"<br>Max 33'-4" | 4 | 2 | 31'-3" | 4 | 2 | 33'-7" | 6 | 12 | 12 | L 3'-4"<br>X 1'-8" | 1310 |

| 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) SK | SLOPE SL | DESIGN FILL DEPTH (FT.) D | CLEAR SPAN (FT.) S | CLEAR HEIGHT (FT.) H | SECTION LENGTH LL | TOP SLAB THK. T | HDWL DEPTH HD | BOTTOM SLAB THK. B | SIDE WALL THK. C | INTERIOR WALL THK. W | OVER ALL WIDTH OW | OVER ALL HEIGHT OH | 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 | 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 | 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 | 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 | 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 | CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | (1) REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Max<br>Min | | | | Max<br>Min | | | | Max<br>Min | | | | Max<br>Min | | | | | | | | | | | | | Max<br>Min | | | | Max<br>Min | | | | LONG<br>SHORT | | | | LONG<br>SHORT | | |

| "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 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

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

| HDWL DEPTH HD | ADDITIONAL REINF. FOR HDWL LBS. | "h" HDWL BARS SIZE | Y | LENGTH | NO. REQ'D |
|---|---|---|---|---|---|
| 3" | 52 | 4 | 0'-7" | 1'-7" | 40 |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| TOTAL | |
| 0.36 | 94 |

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
## TRIPLE BARREL BOX CULVERT
## Sta. 162+20
## SPECIAL DETAILS

LRFD

Ver. 1.114 FILENAME

| 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. | | CA1003 | 21 | 503 |

① SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/17/17

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

## 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 |
| 33'-5" | 10'-0" | 0'-11" | 0'-10" | 5 | 3:1 | 31'-5 1/2" | 2'-0" | 10'-10" | 3'-4" | 25 | 35 | 3'-4" | 5'-4 1/8" | 5'-7 3/4" | 2'-3 5/8" | 2'-8 3/4" | 24'-6" | 27'-0" | 27'-3 7/8" | 29'-9 7/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| INLET | INLET |
| CU.YD | LBS. |
| 22.22 | 1797 |

| WING | BAR SIZE | MAX. SPACING | 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 | 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 | 12 | 25 | L | Min | 4'-8" | 5 | 12 | 4 | L 7'-6" | 4 | 12 | 7 | L 5'-8" | 4 | 18 | 10 | Min | 4 | 18 | 4 | 24'-2" | 4 | 18 | 17 | L Min 6'-3" | | | 4 | 8 | 28'-2" | 4 | 18 | 17 | Min | | | 4 | 18 | 2 | Min 20'-4" | | | 4 | 2 | 25'-2" | 4 | 2 | 26'-8" | 6 | 12 | 10 | L | 3'-4" | 844 |
| | | | | | Max | 14'-0" | | | | | | | | | | | | 3'-8" | | | | | | | | Max 13'-7" | | | | | | | | | 2'-10" | | | | | Max 20'-4" | | | | | | | | | | X | 1'-8" | |
| | | | | X | Min | 0'-11" | | | | X Min 0'-8" | | | | X Min 2'-1" | | | | Max | | | | | | | | X Min 2'-6" | | | | | | | | | Max | | | | | | | | | | | | | | | | |
| | | | | | Max | 2'-11" | | | | Max 2'-11" | | | | Max 3'-8" | | | | 23'-3" | | | | | | | | Max 2'-6" | | | | | | | | | 4'-10" | | | | | | | | | | | | | | | | |
| | | | | Y | Min | 3'-10" | | | | Y Min 4'-11" | | | | Y Min 3'-8" | | | | | | | | | | | | Y Min 3'-10" | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Max | 11'-2" | | | | | | | | | | | | | | | | | | | | Max 11'-2" | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WING B | 4 | 12 | 27 | L | Min | 4'-10" | 5 | 12 | 8 | L 8'-5" | 4 | 12 | 8 | L 5'-7" | 4 | 18 | 10 | Min | 4 | 18 | 4 | 26'-8" | 4 | 18 | 18 | L Min 6'-6" | | | 4 | 8 | 30'-8" | 4 | 18 | 19 | Min | | | 4 | 18 | 2 | Min 20'-0" | | | 4 | 2 | 27'-6" | 4 | 2 | 30'-0" | 6 | 12 | 10 | L | 3'-4" | 953 |
| | | | | | Max | 14'-3" | | | | | | | | | | | | 4'-0" | | | | | | | | Max 13'-7" | | | | | | | | | 2'-10" | | | | | Max 20'-0" | | | | | | | | | | X | 1'-8" | |
| | | | | X | Min | 0'-11" | | | | X Min 0'-8" | | | | X Min 2'-0" | | | | Max | | | | | | | | X Min 2'-6" | | | | | | | | | Max | | | | | | | | | | | | | | | | |
| | | | | | Max | 3'-2" | | | | Max 3'-2" | | | | Max 3'-8" | | | | 25'-8" | | | | | | | | Max 2'-6" | | | | | | | | | 5'-1" | | | | | | | | | | | | | | | | |
| | | | | Y | Min | 4'-0" | | | | Y Min 5'-11" | | | | Y Min 3'-8" | | | | | | | | | | | | Y Min 4'-1" | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Max | 11'-2" | | | | | | | | | | | | | | | | | | | | Max 11'-2" | | | | | | | | | | | | | | | | | | | | | | | | | | |

## 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" |

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 | TOP SLAB REINFORCING STEEL "a" SIZE | "a" SPACING | "a" LENGTHS VARY | "a" NO. REQ'D | TOP SLAB REINFORCING STEEL "c" SIZE | "c" SPACING | "c" LENGTHS VARY | "c" NO. REQ'D | BOTTOM SLAB REINFORCING STEEL "d" SIZE | "d" SPACING | "d" LENGTHS VARY | "d" NO. REQ'D | BOTTOM SLAB REINFORCING STEEL "f" SIZE | "f" SPACING | "f" LENGTHS VARY | "f" NO. REQ'D | 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 | 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 | 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 | CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | ①REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SK | SL | D | S | H | LL | T | HD | B | C | W | OW | OH | SIZE | SPACING | LENGTHS VARY | NO. REQ'D | SIZE | SPACING | LENGTHS VARY | NO. REQ'D | SIZE | SPACING | LENGTHS VARY | NO. REQ'D | SIZE | SPACING | LENGTHS VARY | NO. REQ'D | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | LENGTHS VARY | SIZE | SPACING | NO. REQ'D | LENGTHS VARY | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | LENGTH | | |
| 5 | 3:1 | 5 | 10 | 10 | 3'-6" | 10.5 | 3 | 10.5 | 12.5 | 8 | 33'-5" | 11'-9" | 5 | 5 | Max 33'-1" Min 17'-11" 33'-1" | 4 5 | 6 | 6 | Max 33'-1" Min 17'-11" 33'-1" | 3 4 | 4 | 5 | Max 33'-1" Min 17'-11" 33'-1" | 4 5 | 4 | 6 | Max 33'-1" Min 17'-11" 33'-1" | 3 4 | 4 | 4 | 21 | 11'-5" | 4 | 12 | 16 | 11'-5" | 4 | 10 | 77 | Max 4'-9" Min 1'-10" | 4 | 10 | 77 | Max 4'-9" Min 1'-10" | 4 | 8.5 | 15 15 | LONG 4'-8" SHORT 1'-11" | 4 | 12 | 20 20 | LONG 3'-9" SHORT 2'-10" | 12.55 | 1993 |

| "k1" HDWL BARS SIZE | LENGTH | NO. REQ'D | "k2" HDWL BARS SIZE | LENGTH | NO. REQ'D | "h" HDWL BARS SIZE | LENGTH | Y | NO. REQ'D |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 33'-3" | 6 | 4 | 33'-3" | 6 | 4 | 1'-9" | 0'-9" | 35 |

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

## INLET 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 REINFORCING STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D | BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" LENGTH = SL SIZE | SPACING | NO. REQ'D | SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D | INTERIOR WALL DISTRIBUTION REINFORCING 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.) 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 5 | 10 | 10 | 10.5 | 10.5 | 12.5 | 8 | 33'-5" | 11'-9" | 115 | 4 | 33'-1" | 8 | 33'-8" | 5 | 33'-1" | 15 | 92 | 4 | 33'-1" | 5 | 33'-7" | 4 | 33'-1" | 13 | 106 | 4 | 4 | 690 | 11'-5" | 4 | 12 | 460 | 11'-5" | 4 | 10 | 77 | 4 | 10 | 77 | 4 | 8.5 | 30 | 4 | 12 | 40 |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| 394.60 | 48389 |

# SHEET 1 OF 2
# DETAILS OF R.C. BOX CULVERT
## TRIPLE BARREL BOX CULVERT
## Sta. 243+27

# SPECIAL DETAILS

Ver. LI14 FILENAME

| 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. | | CA1003 | 22 | 503 |

① SPECIAL DETAILS

STATE OF ARKANSAS — REGISTERED PROFESSIONAL ENGINEER — No. 12686 — ESTELLE N. ROMERO — 2/17/17

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

## 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 |
| 33'-5" | 10'-0" | 0'-11" | 0'-10" | 5 | 3:1 | 31'-5 1/2" | 2'-0" | 10'-10" | 3'-4" | 25 | 35 | 3'-4" | 5'-4 1/8" | 5'-7 3/4" | 2'-3 5/8" | 2'-8 3/4" | 24'-6" | 27'-0" | 27'-3 7/8" | 29'-9 7/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| OUTLET | OUTLET |
| CU.YD | LBS. |
| 23.52 | 1797 |

| | | F1 | | | | | F2 | | | | F3 | | | | F4 | | | F5 | | | F6 | | | | F7 | | F8 | | | F9 | | | F10 | | F11 | | F12 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | WING | BAR SIZE | MAX. SPACING | NO. REQ'D | LENGTHS VARY | | BAR SIZE | SPACING | NO. REQ'D | LENGTHS | BAR SIZE | SPACING | NO. REQ'D | LENGTHS | BAR SIZE | SPACING | NO. REQ'D | LENGTHS VARY | BAR SIZE | SPACING | NO. REQ'D | LENGTHS | BAR SIZE | SPACING | NO. REQ'D | LENGTHS VARY | | BAR SIZE | NO. REQ'D | LENGTHS | BAR SIZE | SPACING | NO. REQ'D | LENGTHS VARY | BAR SIZE | SPACING | NO. REQ'D | LENGTHS | BAR SIZE | NO. REQ'D | LENGTHS | BAR SIZE | NO. REQ'D | LENGTHS | REINF. STEEL QTY. PER WING (LBS) |
| | WING A | 4 | 12 | 25 | L | Min | 5 | 12 | 4 | L 7'-6" | 4 | 12 | 7 | L 5'-8" | 4 | 18 | 10 | Min 3'-8" | 4 | 18 | 4 | 24'-2" | 4 | 18 | 17 | L Min 6'-3" | | 4 | 8 | 28'-2" | 4 | 18 | 17 | Min 2'-10" | 4 | 18 | 2 | Min 20'-4" | 4 | 2 | 25'-2" | 4 | 2 | 26'-8" | 6 | 12 | 10 | L 3'-4" | 844 |
| | | | | | | Max 14'-0" | | | | | | | | | | | | Max 23'-3" | | | | | | | | Max 13'-7" | | | | | | | | Max 4'-10" | | | | Max 20'-4" | | | | | | | | X 1'-8" | |
| | | | | | X | Min 0'-11" | | | | X 2'-8" | | | | X 2'-1" | | | | | | | | | | | | X Min 2'-6" | | | | | | | | | | | | | | | | | | | |
| | | | | | | Max 2'-11" | | | | | | | | | | | | | | | | | | | | Max 2'-6" | | | | | | | | | | | | | | | | | | | |
| | | | | | Y | Min 3'-10" | | | | Y 4'-11" | | | | Y 3'-8" | | | | | | | | | | | | Y Min 3'-10" | | | | | | | | | | | | | | | | | | | |
| | | | | | | Max 11'-2" | | | | | | | | | | | | | | | | | | | | Max 11'-2" | | | | | | | | | | | | | | | | | | | |
| | WING B | 4 | 12 | 27 | L | Min | 5 | 12 | 8 | L 8'-5" | 4 | 12 | 8 | L 5'-7" | 4 | 18 | 10 | Min 4'-0" | 4 | 18 | 4 | 26'-8" | 4 | 18 | 18 | L Min 6'-6" | | 4 | 8 | 30'-8" | 4 | 18 | 19 | Min 2'-10" | 4 | 18 | 2 | Min 20'-0" | 4 | 2 | 27'-6" | 4 | 2 | 30'-0" | 6 | 12 | 10 | L 3'-4" | 953 |
| | | | | | | Max 14'-3" | | | | | | | | | | | | Max 25'-8" | | | | | | | | Max 13'-7" | | | | | | | | Max 5'-1" | | | | Max 20'-0" | | | | | | | | X 1'-8" | |
| | | | | | X | Min 0'-11" | | | | X 2'-7" | | | | X 2'-0" | | | | | | | | | | | | X Min 2'-6" | | | | | | | | | | | | | | | | | | | |
| | | | | | | Max 3'-2" | | | | | | | | | | | | | | | | | | | | Max 2'-6" | | | | | | | | | | | | | | | | | | | |
| | | | | | Y | Min 4'-0" | | | | Y 5'-11" | | | | Y 3'-8" | | | | | | | | | | | | Y Min 4'-1" | | | | | | | | | | | | | | | | | | | |
| | | | | | | Max 11'-2" | | | | | | | | | | | | | | | | | | | | Max 11'-2" | | | | | | | | | | | | | | | | | | | |

| 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 | TOP SLAB REINFORCING STEEL "a" SIZE | "a" SPACING | "a" LENGTHS VARY | "a" NO. REQ'D | TOP SLAB REINFORCING STEEL "c" SIZE | "c" SPACING | "c" LENGTHS VARY | "c" NO. REQ'D | BOTTOM SLAB REINFORCING STEEL "d" SIZE | "d" SPACING | "d" LENGTHS VARY | "d" NO. REQ'D | BOTTOM SLAB REINFORCING STEEL "f" SIZE | "f" SPACING | "f" LENGTHS VARY | "f" NO. REQ'D | 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 | 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SK | SL | D | S | H | LL | T | HD | B | C | W | OW | OH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 3:1 | 5 | 10 | 10 | 3'-6" | 10.5 | 3 | 10.5 | 12.5 | 8 | 33'-5" | 11'-9" | 5 | 5 | Max 33'-1" Min 17'-11" | 4 | 6 | 6 | Max 33'-1" Min 17'-11" | 3 | 4 | 5 | Max 33'-1" Min 17'-11" | 4 | 4 | 6 | Max 33'-1" Min 17'-11" | 3 | 4 | 4 | 21 | 11'-5" | 4 | 12 | 16 | 11'-5" | 4 | 10 | 77 | Max 4'-9" Min 1'-10" | 4 | 10 | 77 | Max 4'-9" Min 1'-10" | 4 | 8.5 | 15 | LONG 4'-8" SHORT 1'-11" | 4 | 12 | 20 | LONG 3'-9" SHORT 2'-10" |
| | | | | | | | | | | | | | | | | 5 | | | | 5 | | | 33'-1" | 5 | | | 33'-1" | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| CLASS "S" CONCRETE (Includes HDWL) | ① REINFORCING STEEL (GR 60) (Includes HDWL) |
|---|---|
| CU. YDS. | LBS. |
| 12.55 | 1993 |

| "k1" HDWL BARS | | | "k2" HDWL BARS | | | "h" HDWL BARS | | | |
|---|---|---|---|---|---|---|---|---|---|
| SIZE | LENGTH | NO. REQ'D | SIZE | LENGTH | NO. REQ'D | SIZE | LENGTH | Y | NO. REQ'D |
| 4 | 33'-3" | 6 | 4 | 33'-3" | 6 | 4 | 1'-9" | 0'-9" | 35 |

## OUTLET 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.) | 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" SPACING | NO. REQ'D | LENGTH | INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SPACING | NO. REQ'D | LENGTH | TOP SLAB DISTRIBUTION REINFORCING STEEL "g" LENGTH = SL SPACING | NO. REQ'D | BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" LENGTH = SL SPACING | NO. REQ'D | SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" LENGTH = SL SPACING | NO. REQ'D | INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" LENGTH = SL SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | S | H | T | B | C | W | OW | OH | SL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

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

TRIPLE BARREL BOX CULVERT
Sta. 243+27

SPECIAL DETAILS

Ver. LJ14 FILENAME

| 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. | | CA1003 | 23 | 503 |

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 |
| 43'-6" | 10'-0" | 0'-11" | 0'-10" | 10 | 3:1 | 42'-7 3/4" | 2'-0" | 10'-10" | 3'-4" | 20 | 40 | 3'-4" | 5'-3 7/8" | 5'-8" | 2'-3 3/8" | 2'-10 1/4" | 23'-6" | 29'-0" | 26'-10 7/8" | 32'-4 7/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| INLET | INLET |
| CU.YD | LBS. |
| 23.38 | 1852 |

| WING | BAR SIZE | MAX. SPACING | NO. REQ'D | LENGTHS VARY | | | F2 BAR SIZE | 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 | 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 | 12 | 24 | L | Min | 4'-8" | 5 | 12 | 4 | L | 7'-6" | 4 | 12 | 7 | L | 5'-8" | 4 | 18 | 10 | Min | 3'-6" | 4 | 18 | 4 | 23'-2" | 4 | 18 | 16 | L | Min | 6'-5" | 4 | 8 | 27'-9" | 4 | 18 | 16 | Min | 2'-10" | 4 | 18 | 2 | Min | 19'-6" | 4 | 2 | 24'-2" | 4 | 2 | 25'-4" | 6 | 12 | 10 | L | 3'-4" | 825 |
| | | | | | Max | 14'-0" | | | | | | | | | | | | | | | Max | 22'-3" | | | | | | | | Max | 13'-7" | | | | | | | Max | 4'-9" | | | | Max | 19'-6" | | | | | | | | | | | |
| | | | | X | Min | 0'-11" | | | | X | 2'-1" | | | | X | 3'-8" | | | | | | | | | | | | X | Min | 2'-6" | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Max | 2'-11" | | | | | | | | | | | | | | | | | | | | | | | | Max | 2'-6" | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Y | Min | 3'-10" | | | | Y | 4'-11" | | | | Y | 3'-8" | | | | | | | | | | | | Y | Min | 4'-0" | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Max | 11'-2" | | | | | | | | | | | | | | | | | | | | | | | | Max | 11'-2" | | | | | | | | | | | | | | | | | | | | | | |
| WING B | 4 | 12 | 29 | L | Min | 4'-9" | 5 | 12 | 8 | L | 8'-5" | 4 | 12 | 8 | L | 5'-7" | 4 | 18 | 10 | Min | 4'-4" | 4 | 18 | 4 | 28'-8" | 4 | 18 | 20 | L | Min | 6'-3" | 4 | 8 | 33'-3" | 4 | 18 | 21 | Min | 2'-10" | 4 | 18 | 2 | Min | 21'-5" | 4 | 2 | 29'-6" | 4 | 2 | 32'-5" | 6 | 12 | 10 | L | 3'-4" | 1027 |
| | | | | | Max | 14'-3" | | | | | | | | | | | | | | | Max | 27'-7" | | | | | | | | Max | 13'-7" | | | | | | | Max | 5'-2" | | | | Max | 21'-5" | | | | | | | | | | | |
| | | | | X | Min | 0'-11" | | | | X | 2'-0" | | | | X | 3'-8" | | | | | | | | | | | | X | Min | 2'-6" | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Max | 3'-2" | | | | | | | | | | | | | | | | | | | | | | | | Max | 2'-6" | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Y | Min | 3'-11" | | | | Y | 5'-11" | | | | Y | 3'-8" | | | | | | | | | | | | Y | Min | 3'-10" | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Max | 11'-2" | | | | | | | | | | | | | | | | | | | | | | | | Max | 11'-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 | TOP SLAB REINF. "a" SIZE | "a" SPACING | "a" LENGTHS VARY | "a" NO. REQ'D | "c" SIZE | "c" SPACING | "c" LENGTHS VARY | "c" NO. REQ'D | BOTTOM SLAB REINF. "d" SIZE | "d" SPACING | "d" LENGTHS VARY | "d" NO. REQ'D | "f" SIZE | "f" SPACING | "f" LENGTHS VARY | "f" NO. REQ'D | SIDE WALL REINF. "f0" SIZE | "f0" SPACING | "f0" NO. REQ'D | "f0" LENGTH | INTERIOR WALL REINF. "f1" SIZE | "f1" SPACING | "f1" NO. REQ'D | "f1" LENGTH | TOP SLAB DIST. REINF. "g" SIZE | "g" SPACING | "g" NO. REQ'D | "g" LENGTHS VARY | BOTTOM SLAB DIST. REINF. "e" SIZE | "e" SPACING | "e" NO. REQ'D | "e" LENGTHS VARY | SIDE WALL DIST. REINF. "d1" SIZE | "d1" SPACING | "d1" NO. REQ'D | "d1" LENGTH | INTERIOR WALL DIST. REINF. "d2" SIZE | "d2" SPACING | "d2" NO. REQ'D | "d2" LENGTH | CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SK | SL | D | S | H | LL | T | HD | B | C | W | OW | OH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 3 | 5 | 10 | 10 | 5'-10" | 12 | 3 | 12 | 9 | 8 | 43'-6" | 12'-0" | 5 | 6 | Max 43'-2" Min 9'-0" | 13 | 4 | 4.5 | Max 43'-2" Min 9'-0" | 17 | 4 | 5.5 | Max 43'-2" Min 9'-0" | 14 | 4 | 7.5 | Max 43'-2" Min 9'-0" | 10 | 6 | 5 | 29 | 11'-8" | 4 | 12 | 42 | 11'-8" | 4 | 9 | 119 | Max 9'-6" Min 1'-10" | 4 | 9 | 119 | Max 9'-6" Min 1'-10" | 4 | 12 | 10 | LONG 9'-5" SHORT 1'-11" | 4 | 12 | 20 | LONG 7'-7" MID 5'-8" SHORT 3'-9" | 27.25 | 4145 |
| | | | | | | | | | | | | | | | 43'-2" | 4 | | | 43'-2" | 6 | | | 43'-2" | 5 | | | 43'-2" | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| "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 |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 22'-10" | 12 | 4 | 22'-10" | 12 | 4 | 1'-11" | 0'-11" | 46 |

# 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.) | TOP SLAB REINF. LENGTH = OW - 4" + BENDS "a" SIZE | "a" L | Bent "b" SIZE | Bent "b" L | "c" SIZE | "c" L | SPACING | NO. REQ'D | BOTTOM SLAB REINF. LENGTH = OW - 4" + BENDS "d" SIZE | "d" L | Bent "b1" SIZE | Bent "b1" L | "f" SIZE | "f" L | SPACING | NO. REQ'D | SIDE WALL REINF. "f0" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH | INTERIOR WALL REINF. "f1" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH | TOP SLAB DIST. REINF. "g" LENGTH = SL SIZE | SPACING | NO. REQ'D | BOTTOM SLAB DIST. REINF. "e" LENGTH = SL SIZE | SPACING | NO. REQ'D | SIDE WALL DIST. REINF. "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D | INTERIOR WALL DIST. REINF. "d2" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | S | H | T | B | C | W | OW | OH | SL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

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

# 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.) | TOP SLAB REINF. LENGTH = OW - 4" + BENDS "a" SIZE | "a" L | Bent "b" SIZE | Bent "b" L | "c" SIZE | "c" L | SPACING | NO. REQ'D | BOTTOM SLAB REINF. LENGTH = OW - 4" + BENDS "d" SIZE | "d" L | Bent "b1" SIZE | Bent "b1" L | "f" SIZE | "f" L | SPACING | NO. REQ'D | SIDE WALL REINF. "f0" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH | INTERIOR WALL REINF. "f1" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH | TOP SLAB DIST. REINF. "g" LENGTH = SL SIZE | SPACING | NO. REQ'D | BOTTOM SLAB DIST. REINF. "e" LENGTH = SL SIZE | SPACING | NO. REQ'D | SIDE WALL DIST. REINF. "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D | INTERIOR WALL DIST. REINF. "d2" LENGTH = SL SIZE | SPACING | NO. REQ'D | CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | S | H | T | B | C | W | OW | OH | SL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | 5 | 10 | 10 | 12 | 12 | 9 | 8 | 43'-6" | 12'-0" | 111.8 | 5 | 43'-2" | 7 | 44'-3" | 4 | 43'-2" | 17 | 78 | 4 | 43'-2" | 4 | 44'-2" | 4 | 43'-2" | 11 | 121 | 6 | 5 | 536 | 11'-8" | 4 | 12 | 666 | 11'-8" | 4 | 9 | 119 | 4 | 9 | 119 | 4 | 12 | 20 | 4 | 12 | 60 | 505.17 | 63986 |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| 505.17 | 63986 |

## 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. 12686 JENELLE N. ROMERO 2/17/17

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

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.

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

| 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.

# SHEET 1 OF 2
# DETAILS OF R.C. BOX CULVERT
## QUADRUPLE BARREL BOX CULVERT
## Sta. 339+06

## SPECIAL DETAILS

Ver. 1.1.4 FILENAME

| 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. | | CA1003 | 24 | 503 |

(1) SPECIAL DETAILS

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

# 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 |
| 43'-6" | 10'-0" | 0'-11" | 0'-10" | 10 | 3:1 | 42'-7 3/4" | 2'-0" | 10'-10" | 3'-4" | 20 | 40 | 3'-4" | 5'-3 7/8" | 5'-8" | 2'-3 3/8" | 2'-10 1/4" | 23'-6" | 29'-0" | 26'-10 7/8" | 32'-4 7/8" |

| CLASS "S" CONCRETE (Includes apron) OUTLET | REINFORCING STEEL (Includes apron and laps if required) OUTLET |
|---|---|
| CU.YD | LBS. |
| 24.97 | 1852 |

| 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 | 24 | L Min 4'-8" Max 14'-0"; X Min 0'-11" Max 2'-11"; Y Min 3'-10" Max 11'-2" | 5 | 12 | 4 | L 7'-6"; X 2'-8"; Y 4'-11" | 4 | 12 | 7 | L 5'-8"; X 2'-1"; Y 3'-8" | 4 | 18 | 10 | Min 3'-6"; Max 22'-3" |
| WING B | 4 | 12 | 29 | L Min 4'-9" Max 14'-3"; X Min 0'-11" Max 3'-2"; Y Min 3'-11" Max 11'-2" | 5 | 12 | 8 | L 8'-5"; X 2'-7"; Y 5'-11" | 4 | 12 | 8 | L 5'-7"; X 2'-0"; Y 3'-8" | 4 | 18 | 10 | Min 4'-4"; Max 27'-7" |

| WING | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 18 | 4 | 23'-2" | 4 | 18 | 16 | L Min 6'-5" Max 13'-7"; X Min 2'-6" Max 2'-6"; Y Min 4'-0" Max 11'-2" | 4 | 8 | 27'-9" | 4 | 18 | 16 | Min 2'-10"; Max 4'-9" |
| WING B | 4 | 18 | 4 | 28'-8" | 4 | 18 | 20 | L Min 6'-3" Max 13'-7"; X Min 2'-6" Max 2'-6"; Y Min 3'-10" Max 11'-2" | 4 | 8 | 33'-3" | 4 | 18 | 21 | Min 2'-10"; Max 5'-2" |

| WING | 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 | 2 | Min 19'-6"; Max 19'-6" | 4 | 2 | 24'-2" | 4 | 2 | 25'-4" | 6 | 12 | 10 | L 3'-4"; X 1'-8" | 825 |
| WING B | 4 | 18 | 2 | Min 21'-5"; Max 21'-5" | 4 | 2 | 29'-6" | 4 | 2 | 32'-5" | 6 | 12 | 10 | L 3'-4"; X 1'-8" | 1027 |

| 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 |
| 10 | 3:1 | 5 | 10 | 10 | 5'-10" | 12 | 3 | 12 | 9 | 8 | 43'-6" | 12'-0" |

| 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 |
|---|---|---|---|---|---|---|---|
| 5 | 6 | Max 43'-2"; Min 9'-0" | 13 | 4 | 4.5 | Max 43'-2"; Min 9'-0" | 17 |
| | | 43'-2" | 4 | | | 43'-2" | 6 |

| 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 |
|---|---|---|---|---|---|---|---|
| 4 | 5.5 | Max 43'-2"; Min 9'-0" | 14 | 4 | 7.5 | Max 43'-2"; Min 9'-0" | 10 |
| | | 43'-2" | 5 | | | 43'-2" | 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 | 5 | 29 | 11'-8" | 4 | 12 | 42 | 11'-8" |

| 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 | 9 | 119 | Max 9'-6"; Min 1'-10" | 4 | 9 | 119 | Max 9'-6"; 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 | 10 | LONG 9'-5" | 4 | 12 | 20 | LONG 7'-7" |
| | | 10 | SHORT 1'-11" | | | 20 | MID 5'-8" |
| | | | | | | 20 | SHORT 3'-9" |

| CLASS "S" CONCRETE (Includes HDWL) | (1) REINFORCING STEEL (GR 60) (Includes HDWL) |
|---|---|
| CU. YDS. | LBS. |
| 27.25 | 4145 |

| "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 |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 22'-10" | 12 | 4 | 22'-10" | 12 | 4 | 1'-11" | 0'-11" | 46 |

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

| CLASS "S" CONCRETE | REINFORCING STEEL (GR. 60) |
|---|---|
| CU. YDS. | 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. 339+06

SPECIAL DETAILS

LRFD

Ver. 1.114 FILENAME

| 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. | | CA1003 | 25 | 503 |

① SPECIAL DETAILS

# INLET WINGWALL TABLE

| OVER ALL WIDTH | CLEAR HEIGHT | FOOTING THK. | WINGWALL 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 |
| 26'-9" | 7'-0" | 0'-9" | 0'-8" | 45 | 3:1 | 35'-9 7/8" | 2'-0" | 7'-10" | 2'-4" | 0 | 60 | 3'-2" | 3'-5 3/4" | 4'-2 1/4" | 0'-9 3/4" | 1'-3 5/8" | 16'-6" | 33'-0" | 18'-2" | 40'-2 5/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| INLET | INLET |
| CU.YD | LBS. |
| 14.85 | 1363 |

| WING | F1 BAR SIZE | F1 MAX. SPACING | F1 NO. REQD | F1 LENGTHS VARY | F2 BAR SIZE | F2 SPACING | F2 NO. REQD | F2 LENGTHS | F3 BAR SIZE | F3 SPACING | F3 NO. REQD | F3 LENGTHS | F4 BAR SIZE | F4 SPACING | F4 NO. REQD | F4 LENGTHS VARY | F5 BAR SIZE | F5 SPACING | F5 NO. REQD | F5 LENGTHS | F6 BAR SIZE | F6 SPACING | F6 NO. REQD | F6 LENGTHS VARY | F7 BAR SIZE | F7 NO. REQD | F7 LENGTHS | F8 BAR SIZE | F8 SPACING | F8 NO. REQD | F8 LENGTHS VARY | F9 BAR SIZE | F9 SPACING | F9 NO. REQD | F9 LENGTHS | F10 BAR SIZE | F10 NO. REQD | F10 LENGTHS | F11 BAR SIZE | F11 NO. REQD | F11 LENGTHS | F12 BAR SIZE | F12 SPACING | F12 NO. REQD | F12 LENGTHS | REINF. STEEL QTY. PER WING (LBS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 12 | 17 | L Min 3'-4" Max 9'-0" | 4 | 12 | 3 | L 3'-5" | - | - | - | L - | 4 | 18 | 6 | Min 3'-4" | 4 | 18 | 4 | 16'-2" | 4 | 18 | 11 | L Min 5'-3" Max 10'-3" | 4 | 8 | 19'-0" | 4 | 18 | 11 | Min 2'-8" | - | - | - | Min - | 4 | 2 | 16'-11" | 4 | 2 | 17'-4" | 6 | 12 | 7 | L 3'-4" | 437 |
| | | | | X Min 0'-9" Max 1'-1" | | | | X 1'-0" | | | | X - | | | | Max 12'-4" | | | | | | | | X Min 2'-4" Max 2'-4" | | | | | | | Max 3'-0" | | | | Max - | | | | | | | | | | X 1'-8" | |
| | | | | Y Min 2'-8" Max 8'-0" | | | | Y 2'-6" | | | | Y - | | | | | | | | | | | | Y Min 3'-0" Max 8'-0" | | | | | | | | | | | | | | | | | | | | | | |
| WING B | 4 | 12 | 33 | L Min 3'-4" Max 9'-8" | 4 | 12 | 6 | L 4'-0" | - | - | - | L - | 4 | 18 | 6 | Min 6'-10" | 4 | 18 | 4 | 32'-8" | 4 | 18 | 22 | L Min 5'-1" Max 10'-3" | 4 | 8 | 41'-1" | 4 | 18 | 23 | Min 2'-8" | 4 | 18 | 2 | Min 52'-2" | 4 | 2 | 33'-0" | 4 | 2 | 36'-7" | 6 | 12 | 7 | L 3'-4" | 926 |
| | | | | X Min 0'-9" Max 1'-9" | | | | X 1'-7" | | | | X - | | | | Max 24'-10" | | | | | | | | X Min 2'-4" Max 2'-4" | | | | | | | Max 3'-8" | | | | Max 52'-2" | | | | | | | | | | X 1'-8" | |
| | | | | Y Min 2'-8" Max 8'-0" | | | | Y 2'-6" | | | | Y - | | | | | | | | | | | | Y Min 2'-10" 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. 12686 JENELLE N. ROMERO

2/17/17

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

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.

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

# 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 | TOP SLAB "a" SIZE | "a" SPACING | "a" LENGTHS VARY | "a" NO. REQ'D | TOP SLAB "c" SIZE | "c" SPACING | "c" LENGTHS VARY | "c" NO. REQ'D | BOTTOM SLAB "d" SIZE | "d" SPACING | "d" LENGTHS VARY | "d" NO. REQ'D | BOTTOM SLAB "f" SIZE | "f" SPACING | "f" LENGTHS VARY | "f" NO. REQ'D | SIDE WALL "f0" SIZE | "f0" SPACING | "f0" NO. REQ'D | "f0" LENGTH | INTERIOR WALL "f1" SIZE | "f1" SPACING | "f1" NO. REQ'D | "f1" LENGTH | TOP SLAB DISTRIBUTION "g" SIZE | "g" SPACING | "g" NO. REQ'D | "g" LENGTHS VARY | BOTTOM SLAB DISTRIBUTION "e" SIZE | "e" SPACING | "e" NO. REQ'D | "e" LENGTHS VARY | SIDE WALL DISTRIBUTION "d1" SIZE | "d1" SPACING | "d1" NO. REQ'D | "d1" LENGTH | INTERIOR WALL DISTRIBUTION "d2" SIZE | "d2" SPACING | "d2" NO. REQ'D | "d2" LENGTH | CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | ① REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SK | SL | D | S | H | LL | T | HD | B | C | W | OW | OH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | 3:1 | 5 | 8 | 7 | 15'-4" | 9 | 3 | 9 | 8.5 | 8 | 26'-9" | 8'-6" | 6 | 9 | Max 26'-5" Min 2'-3" | 33 | 7 | 9 | Max 26'-5" Min 2'-3" | 33 | 4 | 6.5 | Max 26'-5" Min 2'-3" | 45 | 4 | 7.5 | Max 26'-5" Min 2'-3" | 39 | 4 | 5 | 74 | 8'-2" | 4 | 12 | 66 | 8'-2" | 4 | 12 | 53 | Max 28'-7" Min 1'-10" | 4 | 12 | 53 | Max 28'-7" Min 1'-10" | 4 | 12 | 7 | LONG 28'-0" | 4 | 12 | 14 | LONG 19'-7" | 34.57 | 5684 |
| | | | | | | | | | | | | | | | 26'-5" | 3 | | | 26'-5" | 3 | | | 26'-5" | 4 | | | 26'-5" | 4 | | | | | | | | | | | | | | | | | | | 7 | SHORT 2'-4" | | | 14 | SHORT 10'-11" | | |

| "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 | 37'-6" | 6 | 5 | 37'-6" | 6 | 4 | 1'-8" | 0'-8" | 39 |

# 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.) | TOP SLAB (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 REINFORCING STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D | BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" LENGTH = SL SIZE | SPACING | NO. REQ'D | SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D | INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | S | H | T | B | C | W | OW | OH | SL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

| CLASS "S" CONCRETE | REINFORCING STEEL (GR. 60) |
|---|---|
| CU. YDS. | 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.) | TOP SLAB (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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | S | H | T | B | C | W | OW | OH | SL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | 5 | 8 | 7 | 9 | 9 | 8.5 | 8 | 26'-9" | 8'-6" | 140.34 | 4 | 26'-5" | 8 | 26'-10" | 6 | 26'-5" | 18 | 93 | 4 | 26'-5" | 4 | 26'-9" | 4 | 26'-5" | 13 | 129 | 4 | 5 | 672 | 8'-2" | 4 | 12 | 560 | 8'-2" | 4 | 12 | 53 | 4 | 12 | 53 | 4 | 12 | 14 | 4 | 12 | 28 |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| 308.62 | 40084 |

# SHEET 1 OF 2
# DETAILS OF R.C. BOX CULVERT
## TRIPLE BARREL BOX CULVERT
## Sta. 475+86

# SPECIAL DETAILS

LRFD

Ver. 1.114 FILENAME

| 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. | | CA1003 | 26 | 503 |

① SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/17/16

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

## 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 |
| 26'-9" | 7'-0" | 0'-9" | 0'-8" | 45 | 3:1 | 35'-9 7/8" | 2'-0" | 7'-10" | 2'-4" | 0 | 60 | 3'-2" | 3'-5 3/4" | 4'-2 1/4" | 0'-9 3/4" | 1'-3 5/8" | 16'-6" | 33'-0" | 18'-2" | 40'-2 5/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| OUTLET | OUTLET |
| CU.YD | LBS. |
| 16.29 | 1363 |

| 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 | 17 | L | Min | 3'-4" | 4 | 12 | 3 | L | 3'-5" | | - | - | - | L | - | | 4 | 18 | 6 | Min |
| | | | | | Max | 9'-0" | | | | | | | | | | | | | | | | 3'-4" |
| | | | | X | Min | 0'-9" | | | | X | 1'-0" | | | | | X | - | | | | | Max |
| | | | | | Max | 1'-1" | | | | | | | | | | | | | | | | 12'-4" |
| | | | | Y | Min | 2'-8" | | | | Y | 2'-6" | | | | | Y | - | | | | | |
| | | | | | Max | 8'-0" | | | | | | | | | | | | | | | | |
| WING B | 4 | 12 | 33 | L | Min | 3'-4" | 4 | 12 | 6 | L | 4'-0" | | - | - | - | L | - | | 4 | 18 | 6 | Min |
| | | | | | Max | 9'-8" | | | | | | | | | | | | | | | | 6'-10" |
| | | | | X | Min | 0'-9" | | | | X | 1'-7" | | | | | X | - | | | | | Max |
| | | | | | Max | 1'-9" | | | | | | | | | | | | | | | | 24'-10" |
| | | | | Y | Min | 2'-8" | | | | Y | 2'-6" | | | | | Y | - | | | | | |
| | | | | | Max | 8'-0" | | | | | | | | | | | | | | | | |

| WING | 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 | 16'-2" | 4 | 18 | 11 | L | Min | 5'-3" | 4 | 8 | 19'-0" | 4 | 18 | 11 | Min | | - | - | - | - | 4 | 2 | 16'-11" | 4 | 2 | 17'-4" | 6 | 12 | 7 | L | 3'-4" | 437 |
| | | | | | | | | | Max | 10'-3" | | | | | | | 2'-8" | | | | | | | | | | | | | | | | | |
| | | | | | | | | X | Min | 2'-4" | | | | | | | Max | | | | | Max | | | | | | | | | | | X | 1'-8" | |
| | | | | | | | | | Max | 2'-4" | | | | | | | | | | | | - | | | | | | | | | | | |
| | | | | | | | | Y | Min | 3'-0" | | | | | | | 3'-0" | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Max | 8'-0" | | | | | | | | | | | | | | | | | | | | | | | |
| WING B | 4 | 18 | 4 | 32'-8" | 4 | 18 | 22 | L | Min | 5'-1" | 4 | 8 | 41'-1" | 4 | 18 | 23 | Min | | - | - | - | - | 4 | 2 | 33'-0" | 4 | 2 | 36'-7" | 6 | 12 | 7 | L | 3'-4" | 926 |
| | | | | | | | | | Max | 10'-3" | | | | | | | 2'-8" | | | | | 52'-2" | | | | | | | | | | | |
| | | | | | | | | X | Min | 2'-4" | | | | | | | Max | | | | | Max | | | | | | | | | | | X | 1'-8" | |
| | | | | | | | | | Max | 2'-4" | | | | | | | | | | | | - | | | | | | | | | | | |
| | | | | | | | | Y | Min | 2'-10" | | | | | | | 3'-8" | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Max | 8'-0" | | | | | | | | | | | | | | | | | | | | | | | |

| 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 |
| 45 | 3:1 | 5 | 8 | 7 | 15'-4" | 9 | 3 | 9 | 8.5 | 8 | 26'-9" | 8'-6" |

| TOP SLAB REINFORCING STEEL "a" SIZE | "a" SPACING | "a" LENGTHS VARY | "a" NO. REQ'D | TOP SLAB REINFORCING STEEL "c" SIZE | "c" SPACING | "c" LENGTHS VARY | "c" NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 6 | 9 | Max 26'-5" | 33 | 7 | 9 | Max 26'-5" | 33 |
| | | Min 2'-3" | | | | Min 2'-3" | |
| | | 26'-5" | 3 | | | 26'-5" | 3 |

| BOTTOM SLAB REINFORCING STEEL "d" SIZE | "d" SPACING | "d" LENGTHS VARY | "d" NO. REQ'D | BOTTOM SLAB REINFORCING STEEL "f" SIZE | "f" SPACING | "f" LENGTHS VARY | "f" NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 4 | 6.5 | Max 26'-5" | 45 | 4 | 7.5 | Max 26'-5" | 39 |
| | | Min 2'-3" | | | | Min 2'-3" | |
| | | 26'-5" | 4 | | | 26'-5" | 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 |
|---|---|---|---|---|---|---|---|
| 4 | 5 | 74 | 8'-2" | 4 | 12 | 66 | 8'-2" |

| 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 | 12 | 53 | Max 28'-7" | 4 | 12 | 53 | Max 28'-7" |
| | | | 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 28'-0" | 4 | 12 | 14 | LONG 19'-7" |
| | | 7 | SHORT 2'-4" | | | 14 | SHORT 10'-11" |

| CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | ①REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|
| 34.57 | 5684 |

| "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 |
|---|---|---|---|---|---|
| 5 | 37'-6" | 6 | 5 | 37'-6" | 6 |

| "h" HDWL BARS SIZE | "h" HDWL BARS LENGTH | "h" HDWL BARS Y | "h" HDWL BARS NO. REQ'D |
|---|---|---|---|
| 4 | 1'-8" | 0'-8" | 39 |

## OUTLET 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 |

| 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 REINFORCING STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|

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

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

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

| HDWL DEPTH HD | ADDITIONAL REINF. FOR HDWL LBS. | "h" HDWL BARS SIZE | "h" HDWL BARS Y | "h" HDWL BARS LENGTH | "h" HDWL BARS 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

TRIPLE BARREL BOX CULVERT
Sta. 475+86

SPECIAL DETAILS

Ver. Lin FILENAME

| 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. | | CA1003 | 27 | 503 |

(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 |
| 38'-11" | 8'-0" | 0'-9" | 0'-8" | 55 | 3:1 | 65'-1 1/8" | 2'-0" | 8'-10" | 2'-8" | 0 | 60 | 3'-2" | 3'-10 1/2" | 4'-9 7/8" | 1'-2 1/2" | 2'-7" | 18'-6" | 37'-0" | 19'-4 3/4" | 58'-4 3/4" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| INLET | INLET |
| CU.YD | LBS. |
| 19.74 | 1731 |

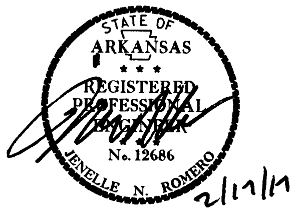
| WING | F1 | | | | F2 | | | | F3 | | | | F4 | | | | F5 | | | | F6 | | | | F7 | | | F8 | | | | F9 | | | | F10 | | | F11 | | | F12 | | | | REINF. STEEL QTY. PER WING (LBS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BAR SIZE | MAX. SPACING | NO. REQ'D | LENGTHS VARY | BAR SIZE | SPACING | NO. REQ'D | LENGTHS | BAR SIZE | SPACING | NO. REQ'D | LENGTHS | BAR SIZE | SPACING | NO. REQ'D | LENGTHS VARY | BAR SIZE | SPACING | NO. REQ'D | LENGTHS | BAR SIZE | SPACING | NO. REQ'D | LENGTHS VARY | BAR SIZE | NO. REQ'D | LENGTHS | BAR SIZE | SPACING | NO. REQ'D | LENGTHS VARY | BAR SIZE | SPACING | NO. REQ'D | LENGTHS | BAR SIZE | NO. REQ'D | LENGTHS | BAR SIZE | NO. REQ'D | LENGTHS | BAR SIZE | SPACING | NO. REQ'D | LENGTHS | |
| WING A | 4 | 12 | 19 | L Min 3'-8" Max 10'-5"<br>X Min 0'-9" Max 1'-6"<br>Y Min 3'-0" Max 9'-0" | 4 | 12 | 6 | L 4'-8"<br>X 1'-3"<br>Y 3'-6" | - | - | - | L -<br>X -<br>Y - | 4 | 18 | 6 | Min 6'-4"<br>Max 15'-4" | 4 | 18 | 4 | 18'-2" | 4 | 18 | 13 | L Min 5'-3" Max 11'-3"<br>X Min 2'-4" Max 2'-4"<br>Y Min 3'-0" Max 9'-0" | 4 | 8 | 20'-3" | 4 | 18 | 12 | Min 2'-8"<br>Max 3'-4" | - | - | - | Min -<br>Max - | 4 | 2 | 19'-0" | 4 | 2 | 19'-4" | 6 | 12 | 8 | L 3'-4"<br>X 1'-8" | 543 |
| WING B | 4 | 12 | 37 | L Min 3'-8" Max 11'-4"<br>X Min 0'-9" Max 2'-4"<br>Y Min 3'-0" Max 9'-1" | 4 | 12 | 12 | L 5'-3"<br>X 1'-10"<br>Y 3'-6" | - | - | - | L -<br>X -<br>Y - | 4 | 18 | 8 | Min 3'-10"<br>Max 30'-10" | 4 | 18 | 4 | 36'-8" | 4 | 18 | 25 | L Min 5'-3" Max 11'-4"<br>X Min 2'-4" Max 2'-4"<br>Y Min 3'-0" Max 9'-1" | 4 | 8 | 59'-3" | 4 | 18 | 26 | Min 2'-8"<br>Max 4'-3" | 4 | 18 | 2 | Min 37'-9"<br>Max 37'-9" | 4 | 2 | 37'-0" | 4 | 2 | 41'-9" | 6 | 12 | 8 | L 3'-4"<br>X 1'-8" | 1188 |

## 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" |




TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

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.

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

## 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 | TOP SLAB REINFORCING STEEL "a" | | | | TOP SLAB REINFORCING STEEL "c" | | | | BOTTOM SLAB REINFORCING STEEL "d" | | | | BOTTOM SLAB REINFORCING STEEL "f" | | | | SIDE WALL REINFORCING STEEL "f0" | | | | INTERIOR WALL REINFORCING STEEL "f1" | | | | TOP SLAB DISTRIBUTION REINFORCING STEEL "g" | | | | BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" | | | | SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" | | | | INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SK | SL | D | S | H | LL | T | HD | B | C | W | OW | OH | SIZE | SPACING | LENGTHS VARY | NO. REQ'D | SIZE | SPACING | LENGTHS VARY | NO. REQ'D | SIZE | SPACING | LENGTHS VARY | NO. REQ'D | SIZE | SPACING | LENGTHS VARY | NO. REQ'D | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | LENGTHS VARY | SIZE | SPACING | NO. REQ'D | LENGTHS VARY | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | LENGTH |
| 55 | 3:1 | 5 | 12 | 8 | 29'-9" | 11.5 | 13 | 11.5 | 9.5 | 8 | 38'-11" | 9'-11" | 5 | 4.5 | Max 38'-7"<br>Min 2'-0"<br>38'-7" | 140<br>6 | 7 | 7 | Max 38'-7"<br>Min 2'-0"<br>38'-7" | 90<br>4 | 4 | 4 | Max 38'-7"<br>Min 2'-0"<br>38'-7" | 157<br>6 | 5 | 8 | Max 38'-7"<br>Min 2'-0"<br>38'-7" | 79<br>3 | 5 | 7 | 103 | 9'-7" | 4 | 12 | 122 | 9'-7" | 4 | 9 | 101 | Max 57'-5"<br>Min 1'-10" | 4 | 9 | 101 | Max 57'-5"<br>Min 1'-10" | 4 | 11 | 9<br>9 | LONG 56'-6"<br>SHORT 2'-9" | 4 | 12 | 16<br>16 | LONG 38'-8"<br>SHORT 20'-7" |

| CLASS "S" CONCRETE (Includes HDWL) | (1) REINFORCING STEEL (GR 60) (Includes HDWL) |
|---|---|
| CU. YDS. | LBS. |
| 113.94 | 21003 |

| "k1" HDWL BARS | | | "k2" HDWL BARS | | | "h" HDWL BARS | | | |
|---|---|---|---|---|---|---|---|---|---|
| SIZE | LENGTH | NO. REQ'D | SIZE | LENGTH | NO. REQ'D | SIZE | LENGTH | Y | NO. REQ'D |
| 9 | 67'-6" | 6 | 9 | 67'-6" | 6 | 4 | 2'-8" | 1'-8" | 69 |

## 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.) | LENGTH = OW - 4" + BENDS "a" | | Bent "b" | | "c" | | | | BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" | | Bent "b1" | | "f" | | | | SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" | | | | INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" | | | | TOP SLAB DISTRIBUTION REINFORCING STEEL "g" LENGTH = SL | | | BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" LENGTH = SL | | | SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" LENGTH = SL | | | INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" LENGTH = SL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | S | H | T | B | C | W | OW | OH | SL | SIZE | L | SIZE | L | SIZE | L | SPACING | NO. REQ'D | SIZE | L | SIZE | L | SIZE | L | SPACING | NO. REQ'D | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | SIZE | SPACING | NO. REQ'D | SIZE | SPACING | NO. REQ'D | SIZE | SPACING | NO. REQ'D |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

| CLASS "S" CONCRETE | REINFORCING STEEL (GR. 60) |
|---|---|
| CU. YDS. | 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.) | TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" | | Bent "b" | | "c" | | | | BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" | | Bent "b1" | | "f" | | | | SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" | | | | INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" | | | | TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL | | | BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL | | | SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL | | | INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | S | H | T | B | C | W | OW | OH | SL | SIZE | L | SIZE | L | SIZE | L | SPACING | NO. REQ'D | SIZE | L | SIZE | L | SIZE | L | SPACING | NO. REQ'D | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | SIZE | SPACING | NO. REQ'D | SIZE | SPACING | NO. REQ'D | SIZE | SPACING | NO. REQ'D |
| A | 5 | 12 | 8 | 11.5 | 11.5 | 9.5 | 8 | 38'-11" | 9'-11" | 150.5 | 4 | 38'-7" | 8 | 39'-3" | 6 | 38'-7" | 14 | 129 | 4 | 38'-7" | 4 | 39'-2" | 4 | 38'-7" | 9 | 200 | 5 | 7 | 516 | 9'-7" | 4 | 12 | 600 | 9'-7" | 4 | 9 | 101 | 4 | 9 | 101 | 4 | 11 | 18 | 4 | 12 | 32 |

| CLASS "S" CONCRETE | REINFORCING STEEL (GR. 60) |
|---|---|
| CU. YDS. | LBS. |
| 545.83 | 75143 |

# SHEET 1 OF 2
# DETAILS OF R.C. BOX CULVERT
## TRIPLE BARREL BOX CULVERT
## Sta. 545+55

## SPECIAL DETAILS

LRFD

Ver. 1.114 FILENAME

| 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. | | CA1003 | 28 | 503 |

① SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

## 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 |
| 38'-11" | 8'-0" | 0'-9" | 0'-8" | 55 | 3:1 | 65'-1 1/8" | 2'-0" | 8'-10" | 2'-8" | 0 | 60 | 3'-2" | 3'-10 1/2" | 4'-9 7/8" | 1'-2 1/2" | 2'-7" | 18'-6" | 37'-0" | 19'-4 3/4" | 58'-4 3/4" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| OUTLET | OUTLET |
| CU.YD | LBS. |
| 21.95 | 1731 |

| 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 | F5 BAR SIZE | F5 SPACING | F5 NO. REQ'D | F5 LENGTHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 12 | 19 | L Min 3'-8" Max 10'-5"<br>X Min 0'-9" Max 1'-6"<br>Y Min 3'-0" Max 9'-0" | 4 | 12 | 6 | L 4'-8"<br>X 1'-3"<br>Y 3'-6" | - | - | - | L -<br>X -<br>Y - | 4 | 18 | 6 | Min 6'-4"<br>Max 15'-4" | 4 | 18 | 4 | 18'-2" |
| WING B | 4 | 12 | 37 | L Min 3'-8" Max 11'-4"<br>X Min 0'-9" Max 2'-4"<br>Y Min 3'-0" Max 9'-1" | 4 | 12 | 12 | L 5'-3"<br>X 1'-10"<br>Y 3'-6" | - | - | - | L -<br>X -<br>Y - | 4 | 18 | 8 | Min 3'-10"<br>Max 30'-10" | 4 | 18 | 4 | 36'-8" |

| WING | 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 | 13 | L Min 5'-3" Max 11'-3"<br>X Min 2'-4" Max 2'-4"<br>Y Min 3'-0" Max 9'-0" | 4 | 8 | 20'-3" | 4 | 18 | 12 | Min 2'-8"<br>Max 3'-4" | - | - | - | Min -<br>Max - | 4 | 2 | 19'-0" | 4 | 2 | 19'-4" | 6 | 12 | 8 | L 3'-4"<br>X 1'-8" | 543 |
| WING B | 4 | 18 | 25 | L Min 5'-3" Max 11'-4"<br>X Min 2'-4" Max 2'-4"<br>Y Min 3'-0" Max 9'-1" | 4 | 8 | 59'-3" | 4 | 18 | 26 | Min 2'-8"<br>Max 4'-3" | 4 | 18 | 2 | Min 37'-9"<br>Max 37'-9" | 4 | 2 | 37'-0" | 4 | 2 | 41'-9" | 6 | 12 | 8 | L 3'-4"<br>X 1'-8" | 1188 |

| 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 |
| 55 | 3:1 | 5 | 12 | 8 | 29'-9" | 11.5 | 13 | 11.5 | 9.5 | 8 | 38'-11" | 9'-11" |

| 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 | 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 | 4.5 | Max 38'-7"<br>Min 2'-0" | 140 | 7 | 7 | Max 38'-7"<br>Min 2'-0" | 90 | 4 | 4 | Max 38'-7"<br>Min 2'-0" | 157 | 5 | 8 | Max 38'-7"<br>Min 2'-0" | 79 |
| | | 38'-7" | 6 | | | 38'-7" | 4 | | | 38'-7" | 6 | | | 38'-7" | 3 |

| 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 7 | 103 | 9'-7" | 4 | 12 | 122 | 9'-7" | 4 | 9 | 101 | Max 57'-5"<br>Min 1'-10" | 4 | 9 | 101 | Max 57'-5"<br>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 | CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | ① REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 11 | 9<br>9 | LONG 56'-6"<br>SHORT 2'-9" | 4 | 12 | 16<br>16 | LONG 38'-8"<br>SHORT 20'-7" | 113.94 | 21003 |

| "k1" HDWL BARS SIZE | LENGTH | NO. REQ'D | "k2" HDWL BARS SIZE | LENGTH | NO. REQ'D | "h" HDWL BARS SIZE | LENGTH | Y | NO, REQ'D |
|---|---|---|---|---|---|---|---|---|---|
| 9 | 67'-6" | 6 | 9 | 67'-6" | 6 | 4 | 2'-8" | 1'-8" | 69 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
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| | | | | | | | | | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | |

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

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

| 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
## TRIPLE BARREL BOX CULVERT
## Sta. 545+55

## SPECIAL DETAILS

LRFD

Ver. 1.114 FILENAME

## INLET WINGWALL TABLE

| OVER ALL WIDTH | CLEAR HEIGHT | FOOTING THK. | WING WALL THK. | BOX SKEW (DEG.) | SLOPE | HDWL LENGTH | HEEL | WALL HEIGHT | | WINGWALL ANGLE (DEGREE) | | FOOTING WIDTH AT WALL END | WIDTH OF WING FOOTINGS AT HDWL | | FOOTING DIMENSION PARALLEL WITH HDWL | | LENGTH OF WINGWALLS | | LENGTH OF FOOTING HEEL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | AT HDWL | AT WING END | WING A | WING B | | WING A | WING B | WING A | WING B | WING A | WING B | WING A | WING B |
| OW | H | WB | CW | SK | SL | K | HL | WH1 | WH2 | AF1 | AF2 | WE | WF1 | WF2 | G1 | G2 | W1 | W2 | W3 | W4 |
| 23'-4" | 4'-0" | 0'-9" | 0'-8" | 4 | 3:1 | 22'-4 5/8" | 1'-0" | 4'-10" | 1'-4" | 26 | 34 | 2'-2" | 2'-5 3/4" | 2'-6 3/4" | 0'-5" | 0'-4 7/8" | 11'-6" | 12'-6" | 13'-4 5/8" | 14'-4 5/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| INLET | INLET |
| CU.YD | LBS. |
| 5.41 | 465 |

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

| WING | F5 BAR SIZE | F5 SPACING | F5 NO. REQ'D | F5 LENGTHS | F6 BAR SIZE | F6 SPACING | F6 NO. REQ'D | F6 LENGTHS VARY | | F6 | F7 BAR SIZE | F7 NO. REQ'D | F7 LENGTHS | F8 BAR SIZE | F8 SPACING | F8 NO. REQ'D | F8 LENGTHS VARY | F8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 18 | 2 | 11'-2" | 4 | 18 | 8 | L | Min | 3'-1" | 4 | 6 | 14'-3" | 4 | 18 | 8 | Min | |
| | | | | | | | | | Max | 6'-3" | | | | | | | 1'-8" | |
| | | | | | | | | X | Min | 1'-4" | | | | | | | Max | |
| | | | | | | | | | Max | 1'-4" | | | | | | | 2'-0" | |
| | | | | | | | | Y | Min | 1'-10" | | | | | | | | |
| | | | | | | | | | Max | 5'-0" | | | | | | | | |
| WING B | 4 | 18 | 2 | 12'-2" | 4 | 18 | 9 | L | Min | 2'-11" | 4 | 6 | 15'-3" | 4 | 18 | 8 | Min | |
| | | | | | | | | | Max | 6'-3" | | | | | | | 1'-8" | |
| | | | | | | | | X | Min | 1'-4" | | | | | | | Max | |
| | | | | | | | | | Max | 1'-4" | | | | | | | 2'-0" | |
| | | | | | | | | Y | Min | 1'-8" | | | | | | | | |
| | | | | | | | | | Max | 5'-0" | | | | | | | | |

| WING | 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 | - | - | - | Min | 4 | 2 | 11'-7" | 4 | 2 | 12'-9" | 6 | 12 | 4 | L | 3'-4" | 225 |
| | | | | - | | | | | | | | | | X | 1'-8" | |
| | | | | Max | | | | | | | | | | | | |
| | | | | - | | | | | | | | | | | | |
| WING B | - | - | - | Min | 4 | 2 | 12'-6" | 4 | 2 | 14'-0" | 6 | 12 | 4 | L | 3'-4" | 240 |
| | | | | - | | | | | | | | | | X | 1'-8" | |
| | | | | Max | | | | | | | | | | | | |
| | | | | - | | | | | | | | | | | | |

## 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 |
| 4 | 3:1 | 5 | 7 | 4 | 2'-10" | 8.5 | 3 | 9 | 6 | 8 | 23'-4" | 5'-5 1/2" |

| TOP SLAB REINFORCING STEEL "a" SIZE | "a" SPACING | "a" LENGTHS VARY | "a" NO. REQ'D | TOP SLAB REINFORCING STEEL "c" SIZE | "c" SPACING | "c" LENGTHS VARY | "c" NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 4 | 4 | Max 23'-0" | 1 | 5 | 6 | Max 23'-0" | 1 |
| | | Min 21'-8" | | | | Min 21'-8" | |
| | | 23'-0" | 6 | | | 23'-0" | 4 |

| BOTTOM SLAB REINFORCING STEEL "d" SIZE | "d" SPACING | "d" LENGTHS VARY | "d" NO. REQ'D | BOTTOM SLAB REINFORCING STEEL "f" SIZE | "f" SPACING | "f" LENGTHS VARY | "f" NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 4 | 7.5 | Max 23'-0" | 1 | 4 | 10 | Max 23'-0" | 1 |
| | | Min 21'-8" | | | | Min 21'-8" | |
| | | 23'-0" | 4 | | | 23'-0" | 3 |

| SIDE WALL REINFORCING STEEL "f0" SIZE | "f0" SPACING | "f0" NO. REQ'D | "f0" LENGTH |
|---|---|---|---|
| 4 | 9 | 8 | 5'-2" |

| INTERIOR WALL REINFORCING STEEL "f1" SIZE | "f1" SPACING | "f1" NO. REQ'D | "f1" LENGTH |
|---|---|---|---|
| 4 | 12 | 16 | 5'-2" |

| TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE | "g" SPACING | "g" NO. REQ'D | "g" LENGTHS VARY |
|---|---|---|---|
| 4 | 12 | 47 | Max 3'-6" |
| | | | Min 1'-10" |

| BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE | "e" SPACING | "e" NO. REQ'D | "e" LENGTHS VARY |
|---|---|---|---|
| 4 | 12 | 47 | Max 3'-6" |
| | | | Min 1'-10" |

| SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE | "d1" SPACING | "d1" NO. REQ'D | "d1" LENGTH |
|---|---|---|---|
| 4 | 12 | 4 | LONG 3'-5" |
| | | 4 | SHORT 1'-10" |

| INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE | "d2" SPACING | "d2" NO. REQ'D | "d2" LENGTH |
|---|---|---|---|
| 4 | 12 | 8 | LONG 2'-11" |
| | | 8 | SHORT 2'-5" |

| CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|
| 4.99 | 868 |

| "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 |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 23'-1" | 6 | 4 | 23'-1" | 6 | 4 | 1'-7" | 0'-7" | 25 |

## 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.) | 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 REINFORCING STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D | BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" LENGTH = SL SIZE | SPACING | NO. REQ'D | SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D | INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | S | H | T | B | C | W | OW | OH | SL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| 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 | |
| | |

## 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.) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | S | H | T | B | C | W | OW | OH | SL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | 5 | 7 | 4 | 8.5 | 9 | 6 | 8 | 23'-4" | 5'-5 1/2" | 122.3 | 4 | 23'-0" | 7 | 23'-4" | 4 | 23'-0" | 15 | 97 | 4 | 23'-0" | 4 | 23'-4" | 4 | 23'-0" | 15 | 97 | 4 | 9 | 326 | 5'-2" | 4 | 12 | 488 | 5'-2" | 4 | 12 | 47 | 4 | 12 | 47 | 4 | 12 | 8 | 4 | 12 | 16 |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| 196.41 | 25072 |

## 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" |

| 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 |

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.

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.

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

| 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. | | CA1003 | 29 | 503 |

① SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/17/17

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

# SHEET 1 OF 2
# DETAILS OF R.C. BOX CULVERT
## TRIPLE BARREL BOX CULVERT
## Sta. 605+29

# SPECIAL DETAILS

LRFD

Ver. LJ14 FILENAME

| 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. | | CA1003 | 30 | 503 |

① SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/17/17

## 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 |
| 23'-4" | 4'-0" | 0'-9" | 0'-8" | 4 | 3:1 | 22'-4 5/8" | 1'-0" | 4'-10" | 1'-4" | 26 | 34 | 2'-2" | 2'-5 3/4" | 2'-6 3/4" | 0'-5" | 0'-4 7/8" | 11'-6" | 12'-6" | 13'-4 5/8" | 14'-4 5/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| OUTLET | OUTLET |
| CU.YD | LBS. |
| 6.22 | 465 |

| WING | F1 BAR SIZE | F1 MAX. SPACING | F1 NO. REQD | 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 | F5 BAR SIZE | F5 SPACING | F5 NO. REQ'D | F5 LENGTHS | F6 BAR SIZE | F6 SPACING | F6 NO. REQ'D | F6 LENGTHS VARY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 12 | 12 | L | Min | 2'-4" | - | - | - | L | - | - | - | - | L | - | 4 | 18 | 4 | Min | 4 | 18 | 2 | 11'-2" | 4 | 18 | 8 | L | Min | 3'-1" |
| | | | | | Max | 6'-0" | | | | | | | | | | | | | | 3'-8" | | | | | | | | | Max | 6'-3" |
| | | | | X | Min | 0'-9" | | | | X | - | | | | X | - | | | | Max | | | | | | | | X | Min | 1'-4" |
| | | | | | Max | 1'-1" | | | | | | | | | | | | | | | | | | | | | | | Max | 1'-4" |
| | | | | Y | Min | 1'-8" | | | | Y | - | | | | Y | - | | | | 8'-7" | | | | | | | | Y | Min | 1'-10" |
| | | | | | Max | 5'-0" | | | | | | | | | | | | | | | | | | | | | | | Max | 5'-0" |
| WING B | 4 | 12 | 13 | L | Min | 2'-4" | - | - | - | L | - | - | - | - | L | - | 4 | 18 | 4 | Min | 4 | 18 | 2 | 12'-2" | 4 | 18 | 9 | L | Min | 2'-11" |
| | | | | | Max | 6'-1" | | | | | | | | | | | | | | 4'-0" | | | | | | | | | Max | 6'-3" |
| | | | | X | Min | 0'-9" | | | | X | - | | | | X | - | | | | Max | | | | | | | | X | Min | 1'-4" |
| | | | | | Max | 1'-2" | | | | | | | | | | | | | | | | | | | | | | | Max | 1'-4" |
| | | | | Y | Min | 1'-8" | | | | Y | - | | | | Y | - | | | | 9'-4" | | | | | | | | Y | Min | 1'-8" |
| | | | | | Max | 5'-0" | | | | | | | | | | | | | | | | | | | | | | | Max | 5'-0" |

| WING | 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 | 6 | 14'-3" | 4 | 18 | 8 | Min | - | - | - | Min | 4 | 2 | 11'-7" | 4 | 2 | 12'-9" | 6 | 12 | 4 | L | 3'-4" | 225 |
| | | | | | | | 1'-8" | | | | - | | | | | | | | | | | | |
| | | | | | | | Max | | | | Max | | | | | | | | | | X | 1'-8" | |
| | | | | | | | 2'-0" | | | | - | | | | | | | | | | | | |
| WING B | 4 | 6 | 15'-3" | 4 | 18 | 8 | Min | - | - | - | Min | 4 | 2 | 12'-6" | 4 | 2 | 14'-0" | 6 | 12 | 4 | L | 3'-4" | 240 |
| | | | | | | | 1'-8" | | | | - | | | | | | | | | | | | |
| | | | | | | | Max | | | | Max | | | | | | | | | | X | 1'-8" | |
| | | | | | | | 2'-0" | | | | - | | | | | | | | | | | | |

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

| 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 |
| 4 | 3:1 | 5 | 7 | 4 | 2'-10" | 8.5 | 3 | 9 | 6 | 8 | 23'-4" | 5'-5 1/2" |

| 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 4 | Max 23'-0" Min 21'-8" | 1 | 5 | 6 | Max 23'-0" Min 21'-8" | 1 | 4 | 7.5 | Max 23'-0" Min 21'-8" | 1 | 4 | 10 | Max 23'-0" Min 21'-8" | 1 |
| | | 23'-0" | 6 | | | 23'-0" | 4 | | | 23'-0" | 4 | | | 23'-0" | 3 |

| 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 | 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 | 9 | 8 | 5'-2" | 4 | 12 | 16 | 5'-2" | 4 | 12 | 47 | Max 3'-6" Min 1'-10" | 4 | 12 | 47 | Max 3'-6" 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 | CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | ① REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 12 | 4 | LONG 3'-5" | 4 | 12 | 8 | LONG 2'-11" | 4.99 | 868 |
| | | 4 | SHORT 1'-10" | | | 8 | SHORT 2'-5" | | |

| "k1" HDWL BARS SIZE | LENGTH | NO. REQ'D | "k2" HDWL BARS SIZE | LENGTH | NO. REQ'D | "h" HDWL BARS SIZE | LENGTH | Y | NO, REQ'D |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 23'-1" | 6 | 4 | 23'-1" | 6 | 4 | 1'-7" | 0'-7" | 25 |

## 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 | 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 REINFORCING STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D | BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" LENGTH = SL SIZE | SPACING | NO. REQ'D | SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D | INTERIOR WALL DISTRIBUTION REINFORCING 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

TRIPLE BARREL BOX CULVERT
Sta. 605+29

SPECIAL DETAILS

LRFD

Ver. 1.114 FILENAME

| 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. | | CA1003 | 31 | 503 |

(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 |
| 30'-2" | 9'-0" | 0'-10" | 0'-9" | 0 | 3:1 | 28'-4" | 2'-0" | 9'-10" | 3'-0" | 30 | 30 | 3'-3" | 4'-10" | 4'-10" | 1'-10" | 1'-10" | 23'-6" | 23'-6" | 26'-5 1/8" | 26'-5 1/8" |

| CLASS "S" CONCRETE (Includes apron) INLET | REINFORCING STEEL (Includes apron and laps if required) INLET |
|---|---|
| CU.YD | LBS. |
| 17.27 | 1514 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 12 | 24 | L Min 4'-2" Max 12'-5" | 4 | 12 | 11 | L 6'-3" | - | - | - | L - |
| | | | | X Min 0'-10" Max 2'-5" | | | | X 1'-9" | | | | X - |
| | | | | Y Min 3'-5" Max 10'-1" | | | | Y 4'-7" | | | | Y - |
| WING B | 4 | 12 | 24 | L Min 4'-2" Max 12'-5" | 4 | 12 | 11 | L 6'-3" | - | - | - | L - |
| | | | | X Min 0'-10" Max 2'-5" | | | | X 1'-9" | | | | X - |
| | | | | Y Min 3'-5" Max 10'-1" | | | | Y 4'-7" | | | | Y - |

| WING | F4 BAR SIZE | F4 SPACING | F4 NO. REQ'D | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 18 | 8 | Min 5'-7" | 4 | 18 | 4 | 23'-2" | 4 | 18 | 16 | L Min 5'-11" Max 12'-5" |
| | | | | Max 21'-0" | | | | | | | | X Min 2'-5" Max 2'-5" |
| | | | | | | | | | | | | Y Min 3'-7" Max 10'-1" |
| WING B | 4 | 18 | 8 | Min 5'-7" | 4 | 18 | 4 | 23'-2" | 4 | 18 | 16 | L Min 5'-11" Max 12'-5" |
| | | | | Max 21'-0" | | | | | | | | X Min 2'-5" Max 2'-5" |
| | | | | | | | | | | | | Y Min 3'-7" Max 10'-1" |

| WING | 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 | 8 | 27'-3" | 4 | 18 | 16 | Min 2'-9" | 4 | 18 | 2 | Min 24'-3" | 4 | 2 | 24'-0" | 4 | 2 | 25'-8" | 6 | 12 | 9 | L 3'-4" | 757 |
| | | | | | | | Max 4'-3" | | | | Max 24'-3" | | | | | | | | | | X 1'-8" | |
| WING B | 4 | 8 | 27'-3" | 4 | 18 | 16 | Min 2'-9" | 4 | 18 | 2 | Min 24'-3" | 4 | 2 | 24'-0" | 4 | 2 | 25'-8" | 6 | 12 | 9 | L 3'-4" | 757 |
| | | | | | | | Max 4'-3" | | | | Max 24'-3" | | | | | | | | | | X 1'-8" | |

## 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. 12686
JENELLE N. ROMERO
2/29/16

TABULAR DATA BY: BCK DATE: 2/28/2016
CHECKED BY: JNR DATE: 2/28/2016

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.

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

## 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 |
| | | | | | | | | | | | | |

| TOP SLAB "a" SIZE | "a" SPACING | "a" LENGTHS VARY | "a" NO. REQ'D | TOP SLAB "c" SIZE | "c" SPACING | "c" LENGTHS VARY | "c" NO. REQ'D | BOTTOM SLAB "d" SIZE | "d" SPACING | "d" LENGTHS VARY | "d" NO. REQ'D | BOTTOM SLAB "f" SIZE | "f" SPACING | "f" LENGTHS VARY | "f" NO. REQ'D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Max | | | | Max | | | | Max | | | | Max | |
| | | Min | | | | Min | | | | Min | | | | Min | |

| 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 | 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Max | | | | Max | | | | LONG | | | | LONG |
| | | | | | | | | | | | Min | | | | Min | | | | SHORT | | | | SHORT |

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

| "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 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

## 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 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

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

| HDWL DEPTH | ADDITIONAL REINF. FOR HDWL | "h" HDWL BARS SIZE | "h" Y | "h" LENGTH | "h" NO. REQ'D |
|---|---|---|---|---|---|
| HD | LBS. | SIZE | Y | LENGTH | NO. REQ'D |
| 3" | 39 | 4 | 0'-7" | 1'-7" | 31 |

| CLASS "S" CONCRETE | REINFORCING STEEL (GR. 60) |
|---|---|
| CU. YDS. | LBS. |
| 0.28 | 72 |
| | |
| | |
| | |
| | |
| | |
| | |
| TOTAL | |
| 0.28 | 72 |

| 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.) 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 5 | 9 | 9 | 9.5 | 9.5 | 11 | 8 | 30'-2" | 10'-7" | 121 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 29'-10" | 8 | 30'-3" | 6 | 29'-10" | 14 | 103 | 4 | 29'-10" | 4 | 30'-3" | 4 | 29'-10" | 11 | 132 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 7 | 414 | 10'-3" | 4 | 12 | 484 | 10'-3" | 4 | 11 | 65 | 4 | 11 | 65 | 4 | 10 | 22 | 4 | 12 | 36 |

| CLASS "S" CONCRETE | REINFORCING STEEL (GR. 60) |
|---|---|
| CU. YDS. | LBS. |
| 341.78 | 46624 |

# SHEET 1 OF 2
# DETAILS OF R.C. BOX CULVERT
## TRIPLE BARREL BOX CULVERT
## Sta. 645+07

# SPECIAL DETAILS

LRFD

Ver. L114 FILENAME

| 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. | | CA1003 | 32 | 503 |

① SPECIAL DETAILS

STATE OF ARKANSAS ★ ★ ★ REGISTERED PROFESSIONAL ENGINEER ★ ★ ★ No. 12686 JENELLE N. ROMERO

2/28/16

TABULAR DATA BY: BCK DATE: 2/28/2016
CHECKED BY: JNR DATE: 2/28/2016

# 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 |
| 30'-2" | 9'-0" | 0'-10" | 0'-9" | 0 | 3:1 | 28'-4" | 2'-0" | 9'-10" | 3'-0" | 30 | 30 | 3'-3" | 4'-10" | 4'-10" | 1'-10" | 1'-10" | 23'-6" | 23'-6" | 26'-5 1/8" | 26'-5 1/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| OUTLET | OUTLET |
| CU.YD | LBS. |
| 18.46 | 1514 |

| 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 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 12 | 24 | L | Min | 4'-2" | 4 | 12 | 11 | L | 6'-3" | - | - | - | L | - |
| | | | | | Max | 12'-5" | | | | | | | | | | |
| | | | | X | Min | 0'-10" | | | | X | 1'-9" | | | | X | - |
| | | | | | Max | 2'-5" | | | | | | | | | | |
| | | | | Y | Min | 3'-5" | | | | Y | 4'-7" | | | | Y | - |
| | | | | | Max | 10'-1" | | | | | | | | | | |
| WING B | 4 | 12 | 24 | L | Min | 4'-2" | 4 | 12 | 11 | L | 6'-3" | - | - | - | L | - |
| | | | | | Max | 12'-5" | | | | | | | | | | |
| | | | | X | Min | 0'-10" | | | | X | 1'-9" | | | | X | - |
| | | | | | Max | 2'-5" | | | | | | | | | | |
| | | | | Y | Min | 3'-5" | | | | Y | 4'-7" | | | | Y | - |
| | | | | | Max | 10'-1" | | | | | | | | | | |

| WING | F4 BAR SIZE | F4 SPACING | F4 NO. REQ'D | 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 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 18 | 8 | Min | 4 | 18 | 4 | 23'-2" | 4 | 18 | 16 | L | Min | 5'-11" |
| | | | | 5'-7" | | | | | | | | | Max | 12'-5" |
| | | | | Max | | | | | | | | X | Min | 2'-5" |
| | | | | 21'-0" | | | | | | | | | Max | 2'-5" |
| | | | | | | | | | | | | Y | Min | 3'-7" |
| | | | | | | | | | | | | | Max | 10'-1" |
| WING B | 4 | 18 | 8 | Min | 4 | 18 | 4 | 23'-2" | 4 | 18 | 16 | L | Min | 5'-11" |
| | | | | 5'-7" | | | | | | | | | Max | 12'-5" |
| | | | | Max | | | | | | | | X | Min | 2'-5" |
| | | | | 21'-0" | | | | | | | | | Max | 2'-5" |
| | | | | | | | | | | | | Y | Min | 3'-7" |
| | | | | | | | | | | | | | Max | 10'-1" |

| WING | 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 | 8 | 27'-3" | 4 | 18 | 16 | Min | 4 | 18 | 2 | Min | 4 | 2 | 24'-0" | 4 | 2 | 25'-8" | 6 | 12 | 9 | L | 3'-4" | 757 |
| | | | | | | | 2'-9" | | | | 24'-3" | | | | | | | | | | | | |
| | | | | | | | Max | | | | Max | | | | | | | | | | X | 1'-8" | |
| | | | | | | | 4'-3" | | | | 24'-3" | | | | | | | | | | | | |
| WING B | 4 | 8 | 27'-3" | 4 | 18 | 16 | Min | 4 | 18 | 2 | Min | 4 | 2 | 24'-0" | 4 | 2 | 25'-8" | 6 | 12 | 9 | L | 3'-4" | 757 |
| | | | | | | | 2'-9" | | | | 24'-3" | | | | | | | | | | | | |
| | | | | | | | Max | | | | Max | | | | | | | | | | X | 1'-8" | |
| | | | | | | | 4'-3" | | | | 24'-3" | | | | | | | | | | | | |

| 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 |
| | | | | | | | | | | | | |

| 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Max | | | | Max | | | | Max | | | | Max | |
| | | | | | | | | | | | | | | | |
| | | Min | | | | Min | | | | Min | | | | Min | |
| | | | | | | | | | | | | | | | |

| 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 | 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Max | | | | Max | | | | LONG | | | | LONG |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | Min | | | | Min | | | | SHORT | | | | SHORT |
| | | | | | | | | | | | | | | | | | | | | | | | |

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

| "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 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

# OUTLET 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 |
| | | | | | | | | | | |

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

| HDWL DEPTH | ADDITIONAL REINF. FOR HDWL | "h" HDWL BARS SIZE | "h" Y | "h" LENGTH | "h" NO. REQ'D |
|---|---|---|---|---|---|
| HD | LBS. | SIZE | Y | LENGTH | NO. REQ'D |
| 3" | 39 | 4 | 0'-7" | 1'-7" | 31 |

| CLASS "S" CONCRETE | REINFORCING STEEL (GR. 60) |
|---|---|
| CU. YDS. | LBS. |
| | |
| TOTAL | |
| 0.27 | 72 |

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

TRIPLE BARREL BOX CULVERT
Sta. 645+07

SPECIAL DETAILS

LRFD

Ver. 1.114 FILENAME

| 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. | | CA1003 | 33 | 503 |
| | | | | 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 |
| 35'-1" | 6'-0" | 0'-9" | 0'-8" | 34 | 3:1 | 41'-0 1/8" | 2'-0" | 6'-10" | 2'-0" | 0 | 60 | 3'-2" | 3'-2" | 3'-9" | 0'-6" | 0'-5 1/8" | 14'-6" | 29'-0" | 17'-5 7/8" | 33'-2 3/4" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| INLET | INLET |
| CU.YD | LBS. |
| 12.67 | 1054 |

| WING | BAR SIZE | MAX. SPACING | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 12 | 15 | L | Min | 3'-0" | | | | L - | | | | L - |
| | | | | | Max | 7'-8" | | | | | | | | |
| | | | | X | Min | 0'-9" | - | - | - | X - | - | - | - | X - |
| | | | | | Max | 0'-9" | | | | | | | | |
| | | | | Y | Min | 2'-4" | | | | Y - | | | | Y - |
| | | | | | Max | 7'-0" | | | | | | | | |
| WING B | 4 | 12 | 29 | L | Min | 3'-0" | | | | L - | | | | L - |
| | | | | | Max | 8'-3" | | | | | | | | |
| | | | | X | Min | 0'-9" | - | - | - | X - | - | - | - | X - |
| | | | | | Max | 1'-4" | | | | | | | | |
| | | | | Y | Min | 2'-4" | | | | Y - | | | | Y - |
| | | | | | Max | 7'-0" | | | | | | | | |

| WING | F4 BAR SIZE | F4 SPACING | F4 NO. REQ'D | 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 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 18 | 4 | Min | 4 | 18 | 4 | 14'-2" | 4 | 18 | 10 | L | Min | 4'-9" |
| | | | | 4'-10" | | | | | | | | | Max | 9'-3" |
| | | | | Max | | | | | | | | X | Min | 2'-4" |
| | | | | 9'-4" | | | | | | | | | Max | 2'-4" |
| | | | | | | | | | | | | Y | Min | 2'-6" |
| | | | | | | | | | | | | | Max | 7'-0" |
| WING B | 4 | 18 | 4 | Min | 4 | 18 | 4 | 28'-8" | 4 | 18 | 20 | L | Min | 4'-7" |
| | | | | 9'-10" | | | | | | | | | Max | 9'-3" |
| | | | | Max | | | | | | | | X | Min | 2'-4" |
| | | | | 18'-10" | | | | | | | | | Max | 2'-4" |
| | | | | | | | | | | | | Y | Min | 2'-4" |
| | | | | | | | | | | | | | Max | 7'-0" |

| WING | 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 | 8 | 18'-4" | 4 | 18 | 10 | Min | | | | Min | 4 | 2 | 14'-10" | 4 | 2 | 15'-4" | 6 | 12 | 6 | L | 3'-4" | 374 |
| | | | | | | | 2'-8" | | | | - | | | | | | | | | | X | 1'-8" | |
| | | | | | | | Max | | | | Max | | | | | | | | | | | | |
| | | | | | | | 2'-8" | | | | - | | | | | | | | | | | | |
| WING B | 4 | 8 | 34'-1" | 4 | 18 | 20 | Min | | | | Min | 4 | 2 | 28'-11" | 4 | 2 | 31'-9" | 6 | 12 | 6 | L | 3'-4" | 680 |
| | | | | | | | 2'-8" | | | | - | | | | | | | | | | X | 1'-8" | |
| | | | | | | | Max | | | | Max | | | | | | | | | | | | |
| | | | | | | | 3'-3" | | | | - | | | | | | | | | | | | |

| 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" |

## 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 |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/16/17

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

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 |
| 34 | 3 | 5 | 8 | 6 | 13'-10" | 10 | 3 | 10 | 6.5 | 8 | 35'-1" | 7'-8" |

| 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 |
|---|---|---|---|---|---|---|---|
| 6 | 9 | Max 34'-9" | 29 | 5 | 5 | Max 34'-9" | 52 |
| | | Min 2'-9" | | | | Min 2'-9" | |
| | | 34'-9" | 3 | | | 34'-9" | 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 |
|---|---|---|---|---|---|---|---|
| 4 | 6 | Max 34'-9" | 44 | 4 | 8.5 | Max 34'-9" | 31 |
| | | Min 2'-9" | | | | Min 2'-9" | |
| | | 34'-9" | 4 | | | 34'-9" | 3 |

| SIDE WALL REINFORCING STEEL "f0" SIZE | "f0" SPACING | "f0" NO. REQ'D | "f0" LENGTH |
|---|---|---|---|
| 5 | 7 | 48 | 7'-4" |

| INTERIOR WALL REINFORCING STEEL "f1" SIZE | "f1" SPACING | "f1" NO. REQ'D | "f1" LENGTH |
|---|---|---|---|
| 4 | 12 | 90 | 7'-4" |

| TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE | "g" SPACING | "g" NO. REQ'D | "g" LENGTHS VARY |
|---|---|---|---|
| 4 | 11 | 79 | Max 25'-6" |
| | | | Min 1'-10" |

| BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE | "e" SPACING | "e" NO. REQ'D | "e" LENGTHS VARY |
|---|---|---|---|
| 4 | 11 | 79 | Max 25'-6" |
| | | | Min 1'-10" |

| SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE | "d1" SPACING | "d1" NO. REQ'D | "d1" LENGTH |
|---|---|---|---|
| 4 | 12 | 6 | LONG 25'-3" |
| | | 6 | SHORT 2'-1" |

| INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE | "d2" SPACING | "d2" NO. REQ'D | "d2" LENGTH |
|---|---|---|---|
| 4 | 12 | 12 | LONG 19'-7" |
| | | 12 | MID 13'-8" |
| | | 12 | SHORT 7'-9" |

| CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | ① REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|
| 40.28 | 6363 |

| "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 |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 21'-10" | 12 | 4 | 21'-10" | 12 | 4 | 1'-9" | 0'-9" | 44 |

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

# 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 | 5 | 8 | 6 | 10 | 10 | 6.5 | 8 | 35'-1" | 7'-8" | 120.3 |

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 | 34'-9" | 8 | 35'-6" | 5 | 34'-9" | 18 | 80 |

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 |
|---|---|---|---|---|---|---|---|
| 4 | 34'-9" | 4 | 35'-5" | 4 | 34'-9" | 12 | 120 |

| SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| 5 | 7 | 412 | 7'-4" |

| INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| 4 | 12 | 720 | 7'-4" |

| TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 4 | 11 | 79 |

| BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 4 | 11 | 79 |

| SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 4 | 12 | 12 |

| INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 4 | 12 | 36 |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| 342.95 | 44769 |

# SHEET 1 OF 2
# DETAILS OF R.C. BOX CULVERT
## QUADRUPLE BARREL BOX CULVERT
## Sta. 694+25

# SPECIAL DETAILS

Ver. 1.1.4 FILENAME

| 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. | | CA1003 | 34 | 503 |

(1) SPECIAL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 12686 JENELLE N. ROMERO 2/17/17

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

## OUTLET WINGWALL TABLE

| OVER ALL WIDTH | CLEAR HEIGHT | FOOTING THK. | WINGWALL 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 |
| 35'-1" | 6'-0" | 0'-9" | 0'-8" | 34 | 3:1 | 41'-0 1/8" | 2'-0" | 6'-10" | 2'-0" | 0 | 60 | 3'-2" | 3'-2" | 3'-9" | 0'-6" | 0'-5 1/8" | 14'-6" | 29'-0" | 17'-5 7/8" | 33'-2 3/4" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| OUTLET | OUTLET |
| CU.YD | LBS. |
| 14.18 | 1054 |

| 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 | F5 BAR SIZE | F5 SPACING | F5 NO. REQ'D | F5 LENGTHS | F6 BAR SIZE | F6 SPACING | F6 NO. REQ'D | F6 LENGTHS VARY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 12 | 15 | L: Min 3'-0", Max 7'-8"; X: Min 0'-9", Max 0'-9"; Y: Min 2'-4", Max 7'-0" | - | - | - | L -; X -; Y - | - | - | - | L -; X -; Y - | 4 | 18 | 4 | Min 4'-10"; Max 9'-4" | 4 | 18 | 4 | 14'-2" | 4 | 18 | 10 | L: Min 4'-9", Max 9'-3"; X: Min 2'-4", Max 2'-4"; Y: Min 2'-6", Max 7'-0" |
| WING B | 4 | 12 | 29 | L: Min 3'-0", Max 8'-3"; X: Min 0'-9", Max 1'-4"; Y: Min 2'-4", Max 7'-0" | - | - | - | L -; X -; Y - | - | - | - | L -; X -; Y - | 4 | 18 | 4 | Min 9'-10"; Max 18'-10" | 4 | 18 | 4 | 28'-8" | 4 | 18 | 20 | L: Min 4'-7", Max 9'-3"; X: Min 2'-4", Max 2'-4"; Y: Min 2'-4", Max 7'-0" |

| WING | 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 | 8 | 18'-4" | 4 | 18 | 10 | Min 2'-8"; Max 2'-8" | - | - | - | Min -; Max - | 4 | 2 | 14'-10" | 4 | 2 | 15'-4" | 6 | 12 | 6 | L 3'-4"; X 1'-8" | 374 |
| WING B | 4 | 8 | 34'-1" | 4 | 18 | 20 | Min 2'-8"; Max 3'-3" | - | - | - | Min -; Max - | 4 | 2 | 28'-11" | 4 | 2 | 31'-9" | 6 | 12 | 6 | L 3'-4"; X 1'-8" | 680 |

| 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 |
| 34 | 3:1 | 5 | 8 | 6 | 13'-10" | 10 | 3 | 10 | 6.5 | 8 | 35'-1" | 7'-8" |

| | SIZE | SPACING | LENGTHS VARY | NO. REQ'D |
|---|---|---|---|---|
| TOP SLAB REINFORCING STEEL "a" | 6 | 9 | Max 34'-9"; Min 2'-9" | 29 |
| | | | 34'-9" | 3 |
| TOP SLAB REINFORCING STEEL "c" | 5 | 5 | Max 34'-9"; Min 2'-9" | 52 |
| | | | 34'-9" | 5 |
| BOTTOM SLAB REINFORCING STEEL "d" | 4 | 6 | Max 34'-9"; Min 2'-9" | 44 |
| | | | 34'-9" | 4 |
| BOTTOM SLAB REINFORCING STEEL "f" | 4 | 8.5 | Max 34'-9"; Min 2'-9" | 31 |
| | | | 34'-9" | 3 |

| | SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|---|
| SIDE WALL REINFORCING STEEL "f0" | 5 | 7 | 48 | 7'-4" |
| INTERIOR WALL REINFORCING STEEL "f1" | 4 | 12 | 90 | 7'-4" |
| TOP SLAB DISTRIBUTION REINFORCING STEEL "g" | 4 | 11 | 79 | LENGTHS VARY: Max 25'-6"; Min 1'-10" |
| BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" | 4 | 11 | 79 | LENGTHS VARY: Max 25'-6"; Min 1'-10" |
| SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" | 4 | 12 | 6 | LONG 25'-3" |
| | | | 6 | SHORT 2'-1" |
| INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" | 4 | 12 | 12 | LONG 19'-7" |
| | | | 12 | MID 13'-8" |
| | | | 12 | SHORT 7'-9" |

| CLASS "S" CONCRETE (Includes HDWL) | (1) REINFORCING STEEL (GR 60) (Includes HDWL) |
|---|---|
| CU. YDS. | LBS. |
| 40.28 | 6363 |

| "k1" HDWL BARS SIZE | LENGTH | NO. REQ'D | "k2" HDWL BARS SIZE | LENGTH | NO. REQ'D | "h" HDWL BARS SIZE | LENGTH | Y | NO. REQ'D |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 21'-10" | 12 | 4 | 21'-10" | 12 | 4 | 1'-9" | 0'-9" | 44 |

## OUTLET 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.) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | S | H | T | B | C | W | OW | OH | SL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

| CLASS "S" CONCRETE | REINFORCING STEEL (GR. 60) |
|---|---|
| CU. YDS. | 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. 694+25

SPECIAL DETAILS

LRFD

Ver. 1.114 FILENAME

| 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. | | CA1003 | 35 | 503 |

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 |
| 43'-6" | 10'-0" | 0'-11" | 0'-10" | 42 | 3:1 | 56'-6 1/4" | 2'-0" | 10'-10" | 3'-4" | 0 | 60 | 3'-4" | 4'-9 1/4" | 6'-0 3/8" | 1'-11 1/4" | 4'-7 7/8" | 22'-6" | 45'-0" | 24'-6 1/4" | 51'-3 1/2" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| INLET | INLET |
| CU.YD | LBS. |
| 30.31 | 2440 |

| WING | BAR SIZE | MAX. SPACING | 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 | F5 BAR SIZE | F5 SPACING | F5 NO. REQ'D | F5 LENGTHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 12 | 23 | L | Min | 4'-8" | 5 | 12 | 3 | L 7'-1" | 4 | 12 | 6 | L 5'-5" | 4 | 18 | 10 | Min 3'-4" | 4 | 18 | 4 | 22'-2" |
| | | | | | Max | 13'-6" | | | | | | | | | | | | Max | | | | |
| | | | | X | Min | 0'-11" | | | | X 2'-3" | | | | X 1'-10" | | | | | | | | |
| | | | | | Max | 2'-5" | | | | | | | | | | | | | | | | |
| | | | | Y | Min | 3'-10" | | | | Y 4'-11" | | | | Y 3'-8" | | | | Max 21'-4" | | | | |
| | | | | | Max | 11'-2" | | | | | | | | | | | | | | | | |
| WING B | 4 | 12 | 45 | L | Min | 4'-8" | 5 | 12 | 12 | L 8'-7" | 4 | 12 | 12 | L 5'-8" | 4 | 18 | 10 | Min 6'-10" | 4 | 18 | 4 | 44'-8" |
| | | | | | Max | 14'-6" | | | | | | | | | | | | Max | | | | |
| | | | | X | Min | 0'-11" | | | | X 2'-9" | | | | X 2'-1" | | | | | | | | |
| | | | | | Max | 3'-5" | | | | | | | | | | | | | | | | |
| | | | | Y | Min | 3'-10" | | | | Y 5'-11" | | | | Y 3'-8" | | | | Max 42'-10" | | | | |
| | | | | | Max | 11'-2" | | | | | | | | | | | | | | | | |

| WING | 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 | 15 | X | Min | 6'-7" | 4 | 8 | 25'-4" | 4 | 18 | 15 | Min | | 4 | 18 | 2 | Min 24'-4" | 4 | 2 | 23'-3" | 4 | 2 | 23'-5" | 6 | 12 | 10 | L | 3'-4" | 783 |
| | | | | | Max | 13'-7" | | | | | | | Max | | | | | Max | | | | | | | | | | | | |
| | | | | X | Min | 2'-6" | | | | | | | Min | | | | | | | | | | | | | | | X | 1'-8" | |
| | | | | | Max | 2'-6" | | | | | | | 2'-10" | | | | | | | | | | | | | | | | | |
| | | | | Y | Min | 4'-2" | | | | | | | Max | | | | | | | | | | | | | | | | | |
| | | | | | Max | 11'-2" | | | | | | | 4'-3" | | | | | | | | | | | | | | | | | |
| WING B | 4 | 18 | 30 | L | Min | 6'-5" | 4 | 8 | 52'-2" | 4 | 18 | 33 | Min | | 4 | 18 | 4 | Min 29'-8" | 4 | 2 | 45'-2" | 4 | 2 | 51'-9" | 6 | 12 | 10 | L | 3'-4" | 1657 |
| | | | | | Max | 13'-7" | | | | | | | Max | | | | | Max | | | | | | | | | | | | |
| | | | | X | Min | 2'-6" | | | | | | | Min | | | | | | | | | | | | | | | X | 1'-8" | |
| | | | | | Max | 2'-6" | | | | | | | 2'-10" | | | | | | | | | | | | | | | | | |
| | | | | Y | Min | 4'-0" | | | | | | | Max | | | | | | | | | | | | | | | | | |
| | | | | | Max | 11'-2" | | | | | | | 5'-6" | | | | | | | | | | | | | | | | | |

## 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. 12686
JENELLE N. ROMERO
2/17/17

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

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 |
| 42 | 3 | 5 | 10 | 10 | 21'-7" | 12 | 3 | 12 | 9 | 8 | 43'-6" | 12'-0" |

| 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 |
|---|---|---|---|---|---|---|---|
| 5 | 6 | Max 43'-2" / Min 2'-6" / 43'-2" | 74 / 4 | 4 | 4.5 | Max 43'-2" / Min 2'-6" / 43'-2" | 98 / 6 |

| 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 |
|---|---|---|---|---|---|---|---|
| 4 | 5.5 | Max 43'-2" / Min 2'-6" / 43'-2" | 80 / 5 | 4 | 7.5 | Max 43'-2" / Min 2'-6" / 43'-2" | 59 / 4 |

| SIDE WALL REINFORCING STEEL "f0" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| 6 | 5 | 104 | 11'-8" |

| INTERIOR WALL REINFORCING STEEL "f1" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| 4 | 12 | 136 | 11'-8" |

| TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE | SPACING | NO. REQ'D | LENGTHS VARY |
|---|---|---|---|
| 4 | 9 | 119 | Max 41'-0" / Min 1'-10" |

| BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE | SPACING | NO. REQ'D | LENGTHS VARY |
|---|---|---|---|
| 4 | 9 | 119 | Max 41'-0" / Min 1'-10" |

| SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| 4 | 12 | 10 | LONG 40'-6" |
| | | | SHORT 2'-4" |

| INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| 4 | 12 | 20 | LONG 31'-3" |
| | | | MID 21'-5" |
| | | 20 | SHORT 11'-8" |

| CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | 1 REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|
| 98.70 | 14596 |

| "k1" HDWL BARS SIZE | LENGTH | NO. REQ'D |
|---|---|---|
| 6 | 30'-5" | 12 |

| "k2" HDWL BARS SIZE | LENGTH | NO. REQ'D |
|---|---|---|
| 6 | 30'-5" | 12 |

| "h" HDWL BARS SIZE | LENGTH | Y | NO. REQ'D |
|---|---|---|---|
| 4 | 1'-11" | 0'-11" | 60 |

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

# 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 | 5 | 10 | 10 | 12 | 12 | 9 | 8 | 43'-6" | 12'-0" | 119.7 |

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 |
|---|---|---|---|---|---|---|---|
| 5 | 43'-2" | 7 | 44'-3" | 4 | 43'-2" | 17 | 84 |

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 |
|---|---|---|---|---|---|---|---|
| 4 | 43'-2" | 4 | 44'-2" | 4 | 43'-2" | 11 | 130 |

| SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| 6 | 5 | 574 | 11'-8" |

| INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| 4 | 12 | 714 | 11'-8" |

| TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 4 | 9 | 119 |

| BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 4 | 9 | 119 |

| SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 4 | 12 | 20 |

| INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 4 | 12 | 60 |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| 540.87 | 68826 |

# SHEET 1 OF 2
# DETAILS OF R.C. BOX CULVERT
## QUADRUPLE BARREL BOX CULVERT
## Sta. 706+09

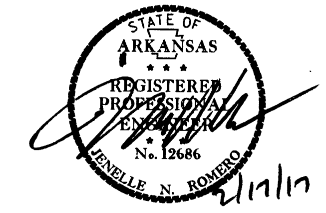
# SPECIAL DETAILS

LRFD

Ver. 1.1.4 FILENAME

| 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. | | CA1003 | 36 | 503 |

① SPECIAL DETAILS




TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

# 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 |
| 43'-6" | 10'-0" | 0'-11" | 0'-10" | 42 | 3:1 | 56'-6 1/4" | 2'-0" | 10'-10" | 3'-4" | 0 | 60 | 3'-4" | 4'-9 1/4" | 6'-0 3/8" | 1'-11 1/4" | 4'-7 7/8" | 22'-6" | 45'-0" | 24'-6 1/4" | 51'-3 1/2" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| OUTLET | OUTLET |
| CU.YD | LBS. |
| 32.41 | 2440 |

| 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 | 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 | 12 | 23 | L Min 4'-8" Max 13'-6"<br>X Min 0'-11" Max 2'-5"<br>Y Min 3'-10" Max 11'-2" | 5 | 12 | 3 | L 7'-1"<br>X 2'-3"<br>Y 4'-11" | 4 | 12 | 6 | L 5'-5"<br>X 1'-10"<br>Y 3'-8" | 4 | 18 | 10 | Min 3'-4"<br>Max 21'-4" | 4 | 18 | 4 | 22'-2" | 4 | 18 | 15 | L Min 6'-7" Max 13'-7"<br>X Min 2'-6" Max 2'-6"<br>Y Min 4'-2" Max 11'-2" | 4 | 8 | 25'-4" | 4 | 18 | 15 | Min 2'-10"<br>Max 4'-3" | 4 | 18 | 2 | Min 24'-4"<br>Max 24'-4" | 4 | 2 | 23'-3" | 4 | 2 | 23'-5" | 6 | 12 | 10 | L 3'-4"<br>X 1'-8" | 783 |
| WING B | 4 | 12 | 45 | L Min 4'-8" Max 14'-6"<br>X Min 0'-11" Max 3'-5"<br>Y Min 3'-10" Max 11'-2" | 5 | 12 | 12 | L 8'-7"<br>X 2'-9"<br>Y 5'-11" | 4 | 12 | 12 | L 5'-8"<br>X 2'-1"<br>Y 3'-8" | 4 | 18 | 10 | Min 6'-10"<br>Max 42'-10" | 4 | 18 | 4 | 44'-8" | 4 | 18 | 30 | L Min 6'-5" Max 13'-7"<br>X Min 2'-6" Max 2'-6"<br>Y Min 4'-0" Max 11'-2" | 4 | 8 | 52'-2" | 4 | 18 | 33 | Min 2'-10"<br>Max 5'-6" | 4 | 18 | 4 | Min 29'-8"<br>Max 56'-8" | 4 | 2 | 45'-2" | 4 | 2 | 51'-9" | 6 | 12 | 10 | L 3'-4"<br>X 1'-8" | 1657 |

| 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 | TOP SLAB "a" SIZE | "a" SPACING | "a" LENGTHS VARY | "a" NO. REQ'D | TOP SLAB "c" SIZE | "c" SPACING | "c" LENGTHS VARY | "c" NO. REQ'D | BOTTOM SLAB "d" SIZE | "d" SPACING | "d" LENGTHS VARY | "d" NO. REQ'D | BOTTOM SLAB "f" SIZE | "f" SPACING | "f" LENGTHS VARY | "f" NO. REQ'D | SIDE WALL "f0" SIZE | "f0" SPACING | "f0" NO. REQ'D | "f0" LENGTH | INTERIOR WALL "f1" SIZE | "f1" SPACING | "f1" NO. REQ'D | "f1" LENGTH | TOP SLAB DISTRIBUTION "g" SIZE | "g" SPACING | "g" NO. REQ'D | "g" LENGTHS VARY | BOTTOM SLAB DISTRIBUTION "e" SIZE | "e" SPACING | "e" NO. REQ'D | "e" LENGTHS VARY | SIDE WALL DISTRIBUTION "d1" SIZE | "d1" SPACING | "d1" NO. REQ'D | "d1" LENGTH | INTERIOR WALL DISTRIBUTION "d2" SIZE | "d2" SPACING | "d2" NO. REQ'D | "d2" LENGTH | CLASS "S" CONCRETE (Includes HDWL) | ① REINFORCING STEEL (GR 60) (Includes HDWL) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SK | SL | D | S | H | LL | T | HD | B | C | W | OW | OH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | CU. YDS. | LBS. |
| 42 | 3:1 | 5 | 10 | 10 | 21'-7" | 12 | 3 | 12 | 9 | 8 | 43'-6" | 12'-0" | 5 | 6 | Max 43'-2"<br>Min 2'-6" | 74 | 4 | 4.5 | Max 43'-2"<br>Min 2'-6" | 98 | 4 | 5.5 | Max 43'-2"<br>Min 2'-6" | 80 | 4 | 7.5 | Max 43'-2"<br>Min 2'-6" | 59 | 6 | 5 | 104 | 11'-8" | 4 | 12 | 136 | 11'-8" | 4 | 9 | 119 | Max 41'-0"<br>Min 1'-10" | 4 | 9 | 119 | Max 41'-0"<br>Min 1'-10" | 4 | 12 | 10<br>10 | LONG 40'-6"<br>SHORT 2'-4" | 4 | 12 | 20<br>20<br>20 | LONG 31'-3"<br>MID 21'-5"<br>SHORT 11'-8" | 98.70 | 14596 |
| | | | | | | | | | | | | | | | 43'-2" | 4 | | | 43'-2" | 6 | | | 43'-2" | 5 | | | 43'-2" | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

| "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 |
|---|---|---|---|---|---|---|---|---|---|
| 6 | 30'-5" | 12 | 6 | 30'-5" | 12 | 4 | 1'-11" | 0'-11" | 60 |

# OUTLET 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.) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | S | H | T | B | C | W | OW | OH | SL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

| CLASS "S" CONCRETE | REINFORCING STEEL (GR. 60) |
|---|---|
| CU. YDS. | 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. 706+09

## SPECIAL DETAILS

Ver. 1.14 FILENAME

| 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. | | CA1003 | 37 | 503 |

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'-10" | 12'-0" | 1'-1" | 1'-0" | 27 | 3:1 | 56'-1 3/8" | 2'-0" | 12'-10" | 4'-0" | 3 | 57 | 3'-6" | 6'-1" | 7'-4 1/4" | 3'-0 3/8" | 6'-5 3/8" | 26'-6" | 48'-6" | 29'-10 3/8" | 51'-10 3/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| INLET | INLET |
| CU.YD | LBS. |
| 44.23 | 3180 |

| 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 | 27 | L | Min | 5'-8" | 5 | 12 | 6 | L | 10'-2" | 4 | 12 | 9 | L | 7'-0" | 4 | 18 | 10 | Min |
| | | | | | Max | 17'-0" | | | | | | | | | | | | | | 4'-10" |
| | | | | X | Min | 1'-1" | | | | X | 3'-2" | | | | X | 2'-3" | | | | Max |
| | | | | | Max | 3'-9" | | | | | | | | | | | | | | 22'-10" |
| | | | | Y | Min | 4'-8" | | | | Y | 7'-1" | | | | Y | 4'-10" | | | | |
| | | | | | Max | 13'-4" | | | | | | | | | | | | | | |
| WING B | 4 | 12 | 49 | L | Min | 5'-8" | 6 | 12 | 17 | L | 10'-8" | 4 | 12 | 11 | L | 6'-4" | 4 | 18 | 10 | Min |
| | | | | | Max | 17'-10" | | | | | | | | | | | | | | 9'-0" |
| | | | | X | Min | 1'-1" | | | | X | 3'-5" | | | | X | 2'-7" | | | | Max |
| | | | | | Max | 4'-7" | | | | | | | | | | | | | | 41'-11" |
| | | | | Y | Min | 4'-8" | | | | Y | 7'-4" | | | | Y | 3'-10" | | | | |
| | | | | | Max | 13'-4" | | | | | | | | | | | | | | |

| WING | F4 SPACING | F4 NO. REQ'D | F5 BAR SIZE | F5 SPACING | F5 NO. REQ'D | F5 LENGTHS | F6 BAR SIZE | F6 SPACING | F6 NO. REQ'D | F6 LENGTHS VARY | | | 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 | 6 | 26'-2" | 4 | 18 | 18 | L | Min | 7'-5" | 4 | 30'-8" | 4 | 18 | 18 | Min | | | | Min | | | | | | | | | | L | 3'-4" | 1103 |
| | | | | | | | | | | | Max | 15'-11" | | | | | | 3'-0" | | | | 16'-9" | | | | | | | | | | | |
| | | | | | | | | | | X | Min | 2'-8" | | | | | | Max | 4 | 18 | 4 | Max | 4 | 2 | 27'-6" | 4 | 2 | 27'-8" | 6 | 12 | 12 | | |
| | | | | | | | | | | | Max | 2'-8" | | | | | | 5'-7" | | | | 31'-8" | | | | | | | | | | X | 1'-8" |
| | | | | | | | | | | Y | Min | 4'-10" | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | Max | 13'-4" | | | | | | | | | | | | | | | | | | | | |
| WING B | | | 4 | 18 | 10 | 48'-2" | 4 | 18 | 33 | L | Min | 7'-3" | 4 | 52'-8" | 4 | 18 | 36 | Min | | | | Min | | | | | | | | | | L | 3'-4" | 2077 |
| | | | | | | | | | | | Max | 15'-11" | | | | | | 3'-0" | | | | 23'-4" | | | | | | | | | | | |
| | | | | | | | | | | X | Min | 2'-8" | | | | | | Max | 4 | 18 | 4 | Max | 4 | 2 | 48'-10" | 4 | 2 | 56'-6" | 6 | 12 | 12 | | |
| | | | | | | | | | | | Max | 2'-8" | | | | | | 6'-10" | | | | 44'-1" | | | | | | | | | | X | 1'-8" |
| | | | | | | | | | | Y | Min | 4'-8" | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | Max | 13'-4" | | | | | | | | | | | | | | | | | | | | |

## MID-SLOPE SECTION

| SKEW (DEGREE) SK | SLOPE SL | DESIGN FILL DEPTH (FT.) D | CLEAR SPAN (FT.) S | CLEAR HEIGHT (FT.) H | SECTION LENGTH LL | TOP SLAB THK. T | HDWL DEPTH HD | BOTTOM SLAB THK. B | SIDE WALL THK. C | INTERIOR WALL THK. W | OVER ALL WIDTH OW | OVER ALL HEIGHT OH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | 3 | 5 | 12 | 12 | 15'-2" | 14 | 3 | 14 | 11 | 8 | 51'-10" | 14'-4" |

| 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 |
|---|---|---|---|---|---|---|---|
| 7 | 10 | Max 51'-6" | 30 | 5 | 6 | Max 51'-6" | 49 |
| | | Min 3'-9" | | | | Min 3'-9" | |
| | | 51'-6" | 3 | | | 51'-6" | 4 |

| 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 |
|---|---|---|---|---|---|---|---|
| 4 | 4.5 | Max 51'-6" | 65 | 5 | 10 | Max 51'-6" | 30 |
| | | Min 3'-9" | | | | Min 3'-9" | |
| | | 51'-6" | 6 | | | 51'-6" | 3 |

| SIDE WALL REINFORCING STEEL "f0" SIZE | "f0" SPACING | "f0" NO. REQ'D | "f0" LENGTH |
|---|---|---|---|
| 8 | 8.5 | 44 | 14'-0" |

| INTERIOR WALL REINFORCING STEEL "f1" SIZE | "f1" SPACING | "f1" NO. REQ'D | "f1" LENGTH |
|---|---|---|---|
| 4 | 12 | 98 | 14'-0" |

| TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE | "g" SPACING | "g" NO. REQ'D | "g" LENGTHS VARY |
|---|---|---|---|
| 5 | 12 | 103 | Max 28'-3" |
| | | | Min 1'-10" |

| BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE | "e" SPACING | "e" NO. REQ'D | "e" LENGTHS VARY |
|---|---|---|---|
| 5 | 12 | 103 | Max 28'-3" |
| | | | Min 1'-10" |

| SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE | "d1" SPACING | "d1" NO. REQ'D | "d1" LENGTH |
|---|---|---|---|
| 4 | 10 | 15 | LONG 27'-10" |
| | | | SHORT 2'-3" |

| INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE | "d2" SPACING | "d2" NO. REQ'D | "d2" LENGTH |
|---|---|---|---|
| 4 | 12 | 24 | LONG 21'-8" |
| | | 24 | MID 15'-0" |
| | | 24 | SHORT 8'-5" |

| CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | ① REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|
| 95.18 | 13447 |

| "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 |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 29'-10" | 12 | 4 | 29'-10" | 12 | 4 | 2'-1" | 1'-1" | 60 |

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

## MID-SECTION

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 5 | 12 | 12 | 14 | 14 | 11 | 8 | 51'-10" | 14'-4" | 109.5 |

| TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" SIZE | "a" L | "b" SIZE | "b" L | "c" SIZE | "c" L | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 5 | 51'-6" | 8 | 52'-10" | 4 | 51'-6" | 18 | 73 |

| BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE | "d" L | "b1" SIZE | "b1" L | "f" SIZE | "f" L | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|
| 4 | 51'-6" | 5 | 52'-9" | 5 | 51'-6" | 13 | 101 |

| SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| 8 | 8.5 | 308 | 14'-0" |

| INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|
| 4 | 12 | 654 | 14'-0" |

| TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 5 | 12 | 103 |

| BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 5 | 12 | 103 |

| SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 4 | 10 | 30 |

| INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE | SPACING | NO. REQ'D |
|---|---|---|
| 4 | 12 | 72 |

| CLASS "S" CONCRETE CU. YDS. | REINFORCING STEEL (GR. 60) LBS. |
|---|---|
| 677.05 | 82775 |

## INLET 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 | "b" SIZE | "b" L | "c" SIZE | "c" L | SPACING | NO. REQ'D |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

| BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE | "d" L | "b1" SIZE | "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 | |
| | |

## 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. 12686 JENELLE N. ROMERO 2/16/16

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

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.

| 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.

# SHEET 1 OF 2
# DETAILS OF R.C. BOX CULVERT
## QUADRUPLE BARREL BOX CULVERT
## Sta. 783+43

## SPECIAL DETAILS

Ver. 1.1.14 FILENAME

| 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. | | CA1003 | 38 | 503 |

① SPECIAL DETAILS

TABULAR DATA BY: BCK DATE: 2/16/2016
CHECKED BY: JNR DATE: 2/16/2016

# 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'-10" | 12'-0" | 1'-1" | 1'-0" | 27 | 3:1 | 56'-1 3/8" | 2'-0" | 12'-10" | 4'-0" | 3 | 57 | 3'-6" | 6'-1" | 7'-4 1/4" | 3'-0 3/8" | 6'-5 3/8" | 26'-6" | 48'-6" | 29'-10 3/8" | 51'-10 3/8" |

| CLASS "S" CONCRETE (Includes apron) | REINFORCING STEEL (Includes apron and laps if required) |
|---|---|
| OUTLET | OUTLET |
| CU.YD | LBS. |
| 46.36 | 3180 |

| WING | F1 BAR SIZE | F1 MAX. SPACING | F1 NO. REQD | F1 LENGTHS VARY | F2 BAR SIZE | F2 SPACING | F2 NO. REQD | F2 LENGTHS | F3 BAR SIZE | F3 SPACING | F3 NO. REQD | F3 LENGTHS | F4 BAR SIZE | F4 SPACING | F4 NO. REQD | F4 LENGTHS VARY | F5 BAR SIZE | F5 SPACING | F5 NO. REQD | F5 LENGTHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 12 | 27 | L: Min 5'-8", Max 17'-0"<br>X: Min 1'-1", Max 3'-9"<br>Y: Min 4'-8", Max 13'-4" | 5 | 12 | 6 | L: 10'-2"<br>X: 3'-2"<br>Y: 7'-1" | 4 | 12 | 9 | L: 7'-0"<br>X: 2'-3"<br>Y: 4'-10" | 4 | 18 | 10 | Min 4'-10"<br>Max 22'-10" | 4 | 18 | 6 | 26'-2" |
| WING B | 4 | 12 | 49 | L: Min 5'-8", Max 17'-10"<br>X: Min 1'-1", Max 4'-7"<br>Y: Min 4'-8", Max 13'-4" | 6 | 12 | 17 | L: 10'-8"<br>X: 3'-5"<br>Y: 7'-4" | 4 | 12 | 11 | L: 6'-4"<br>X: 2'-7"<br>Y: 3'-10" | 4 | 18 | 10 | Min 9'-0"<br>Max 41'-11" | 4 | 18 | 6 | 48'-2" |

| WING | F6 BAR SIZE | F6 SPACING | F6 NO. REQD | F6 LENGTHS VARY | F7 BAR SIZE | F7 NO. REQD | F7 LENGTHS | F8 BAR SIZE | F8 SPACING | F8 NO. REQD | F8 LENGTHS VARY | F9 BAR SIZE | F9 SPACING | F9 NO. REQD | F9 LENGTHS | F10 BAR SIZE | F10 NO. REQD | F10 LENGTHS | F11 BAR SIZE | F11 NO. REQD | F11 LENGTHS | F12 BAR SIZE | F12 SPACING | F12 NO. REQD | F12 LENGTHS | REINF. STEEL QTY. PER WING (LBS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WING A | 4 | 18 | 18 | L: Min 7'-5", Max 15'-11"<br>X: Min 2'-8", Max 2'-8"<br>Y: Min 4'-10", Max 13'-4" | 4 | 8 | 30'-8" | 4 | 18 | 18 | Min 3'-0"<br>Max 5'-7" | 4 | 18 | 4 | Min 16'-9"<br>Max 31'-8" | 4 | 2 | 27'-6" | 4 | 2 | 27'-8" | 6 | 12 | 12 | L: 3'-4"<br>X: 1'-8" | 1103 |
| WING B | 4 | 18 | 33 | L: Min 7'-3", Max 15'-11"<br>X: Min 2'-8", Max 2'-8"<br>Y: Min 4'-8", Max 13'-4" | 4 | 8 | 52'-8" | 4 | 18 | 36 | Min 3'-0"<br>Max 6'-10" | 4 | 18 | 4 | Min 23'-4"<br>Max 44'-1" | 4 | 2 | 48'-10" | 4 | 2 | 56'-6" | 6 | 12 | 12 | L: 3'-4"<br>X: 1'-8" | 2077 |

| 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 |
| 27 | 3:1 | 5 | 12 | 12 | 15'-2" | 14 | 3 | 14 | 11 | 8 | 51'-10" | 14'-4" |

| 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 10 | Max 51'-6"<br>Min 3'-9" | 30 | 5 | 6 | Max 51'-6"<br>Min 3'-9" | 49 | 4 | 4.5 | Max 51'-6"<br>Min 3'-9" | 65 | 5 | 10 | Max 51'-6"<br>Min 3'-9" | 30 |
| | | 51'-6" | 3 | | | 51'-6" | 4 | | | 51'-6" | 6 | | | 51'-6" | 3 |

| 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 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 8.5 | 44 | 14'-0" | 4 | 12 | 98 | 14'-0" | 5 | 12 | 103 | Max 28'-3"<br>Min 1'-10" | 5 | 12 | 103 | Max 28'-3"<br>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 | CLASS "S" CONCRETE (Includes HDWL) CU. YDS. | ① REINFORCING STEEL (GR 60) (Includes HDWL) LBS. |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 10 | 15 | LONG 27'-10" | 4 | 12 | 24 | LONG 21'-8" | 95.18 | 13447 |
| | | 15 | SHORT 2'-3" | | | 24 | MID 15'-0" | | |
| | | | | | | 24 | SHORT 8'-5" | | |

| "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 |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 29'-10" | 12 | 4 | 29'-10" | 12 | 4 | 2'-1" | 1'-1" | 60 |

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

| CLASS "S" CONCRETE | REINFORCING STEEL (GR. 60) |
|---|---|
| CU. YDS. | 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. 783+43

SPECIAL DETAILS

LRFD

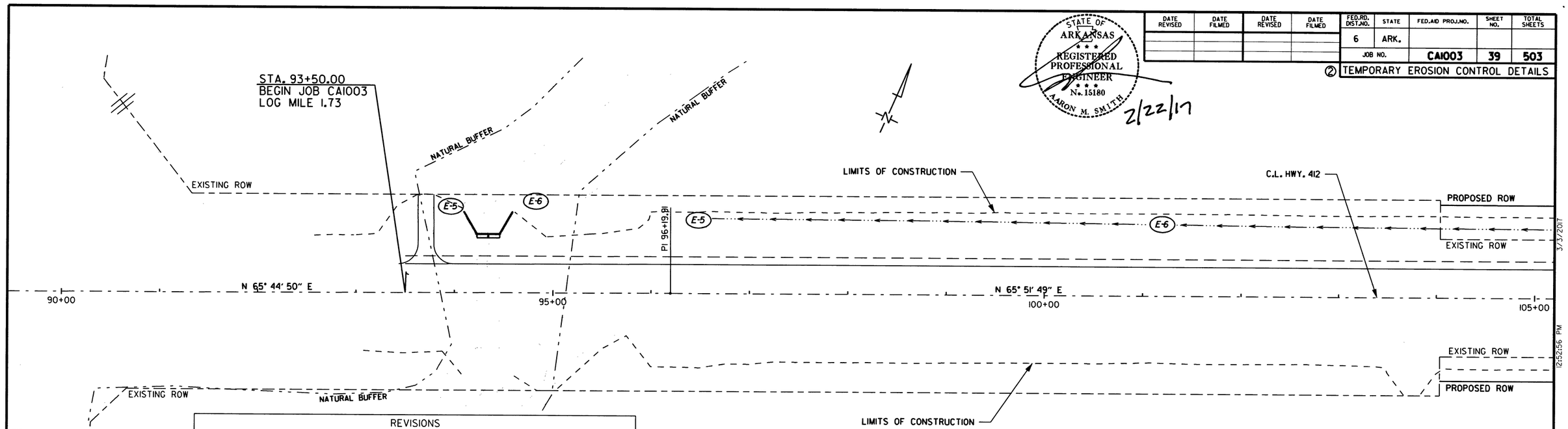
Ver. 1.114 FILENAME

| 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. | | CA1003 | 39 | 503 |

# ② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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| DATE OF REVISION | REVISION |
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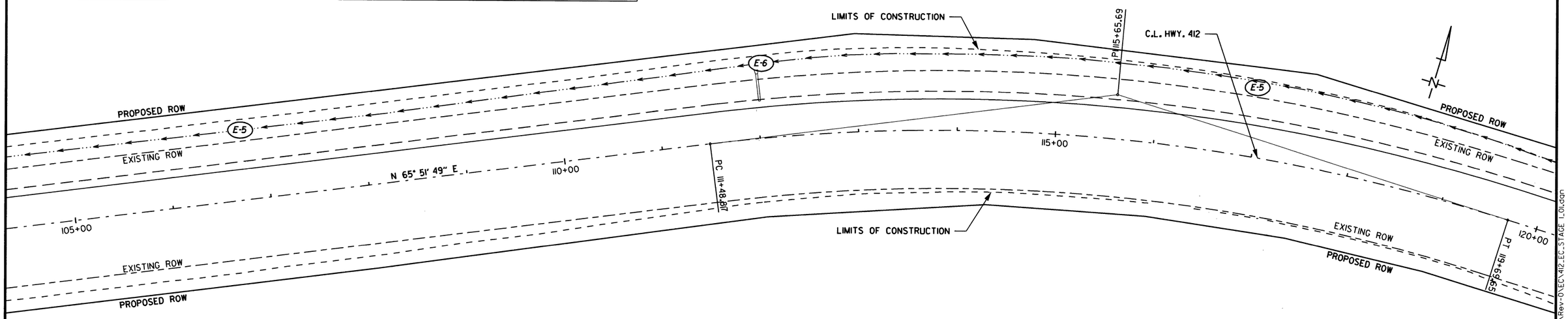
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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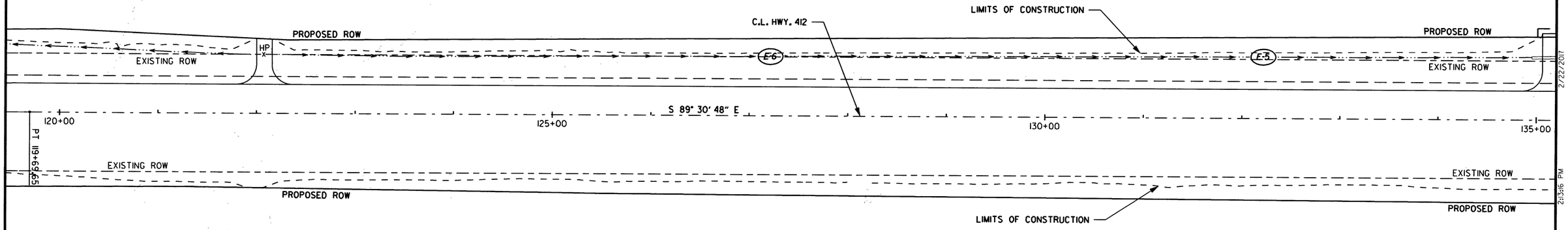
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 40 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- (E-11) SILT FENCE
- (E-5) SAND DITCH CHECKS
- (E-6) ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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| DATE OF REVISION | REVISION |
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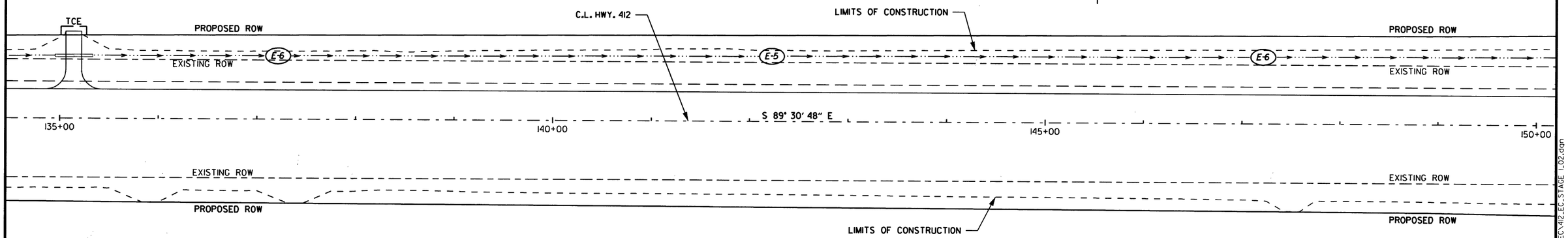
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| (E-5) | SAND BAG DITCH CHECKS | 2 EA |
| (E-6) | ROCK DITCH CHECKS | 3 EA |
| (E-11) | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 41 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

PC ℄ HWY 412 STA 157+07.61 -17.50'
PT ℄ HWY 412 STA 158+13.02 -24.68'
PC ℄ HWY 412 STA 159+72.47 -33.33'
PI ℄ HWY 412 STA 160+55.03 -40.50'
PT ℄ HWY 412 STA 161+37.89 -40.50'
PC ℄ HWY 412 STA 161+37.89 -40.50'
PI ℄ HWY 412 STA 163+85.75 -40.50'
PT ℄ HWY 412 STA 164+68.32 -33.33'

PROPOSED ROW
LIMITS OF CONSTRUCTION
EXISTING ROW
E-5
E-6
C-1
C-2
C-3
N 85° 31' 05" E
S 89° 30' 48" E
S 89° 30' 48" E
150+00
155+00
160+00
165+00
C.L. HWY. 412
NATURAL BUFFER
YELLOW CANAL
PI ℄ HWY 412 STA 157+90.47 -17.50'

C-1
Δ = 4°58'07.23" RT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

C-2
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

C-3
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

LEGEND
E-11 SILT FENCE
E-5 SAND DITCH CHECKS
E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |

PC ℄ HWY 412 STA 165+67.76 -24.68'
PT ℄ HWY 412 STA 167+33.17 -17.50'
PI ℄ HWY 412 STA 166+50.31 -17.50'
C-4
S 84° 32' 40" E
165+00
170+00
175+00
180+00

C-4
Δ = 4°58'07.23" RT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

# TEMPORARY EROSION CONTROL DETAILS STAGE I

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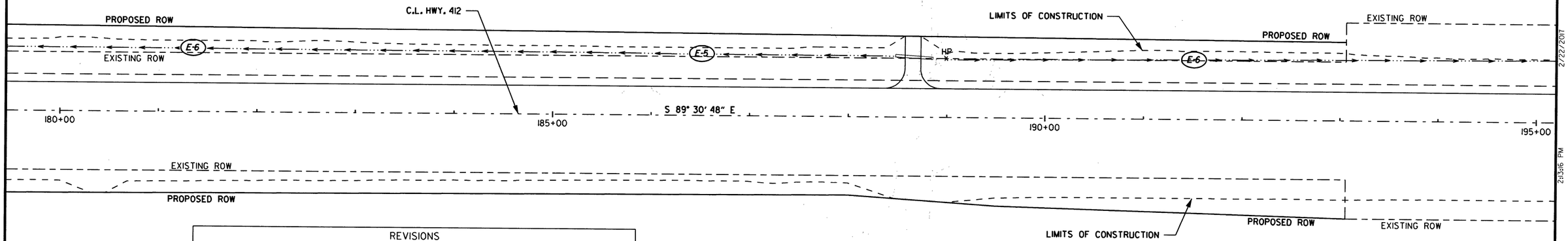
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 42 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- (E-11) SILT FENCE
- (E-5) SAND DITCH CHECKS
- (E-6) ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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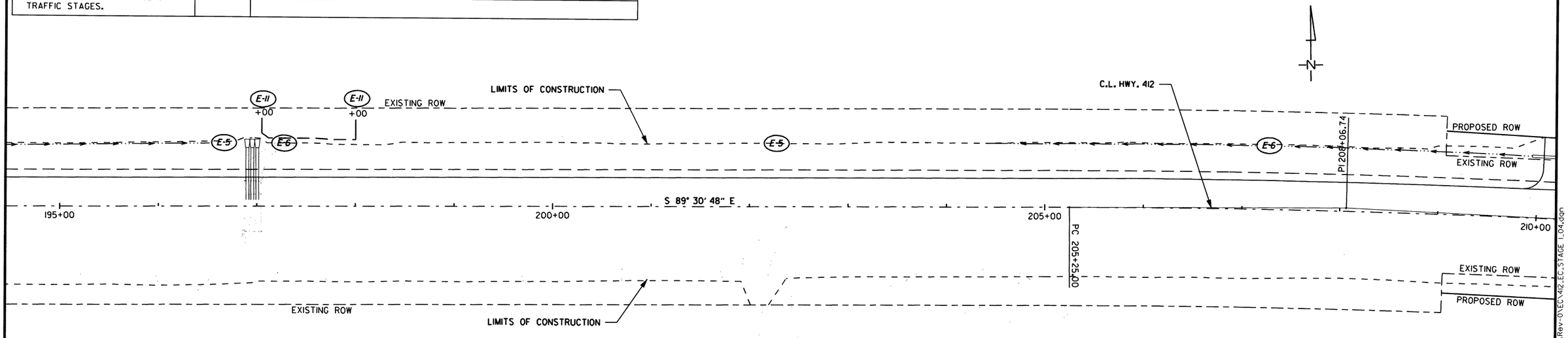
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 100 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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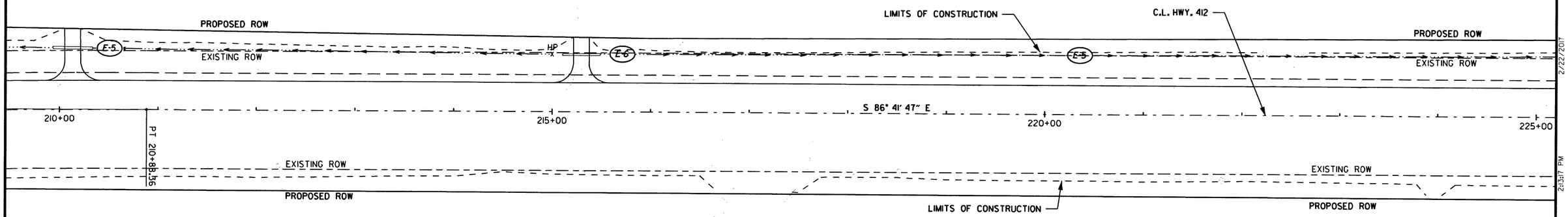
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 43 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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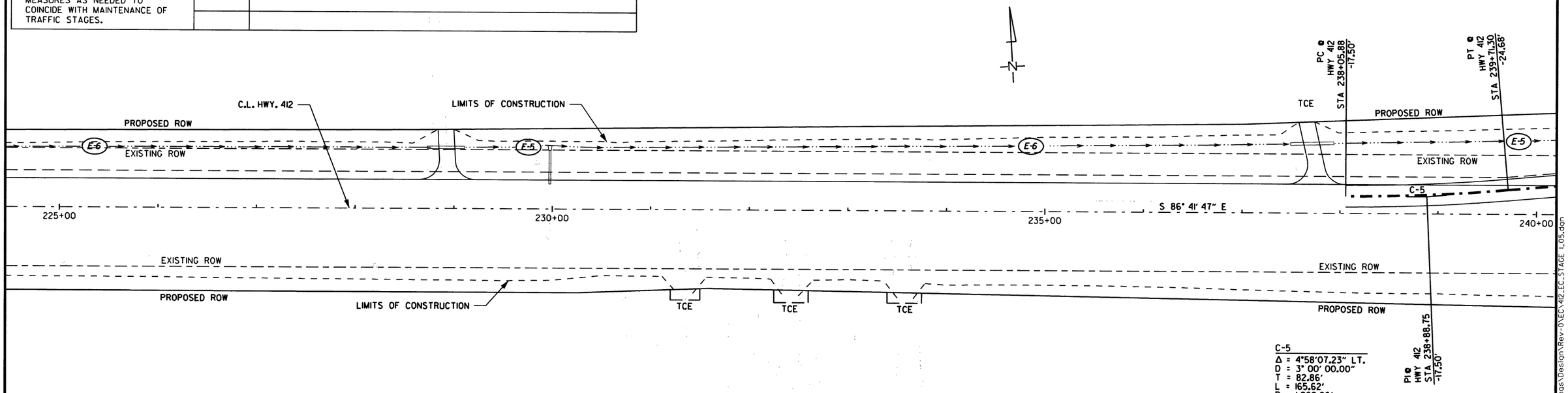
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |




C-5
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

# TEMPORARY EROSION CONTROL DETAILS STAGE I

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 44 | 503 |

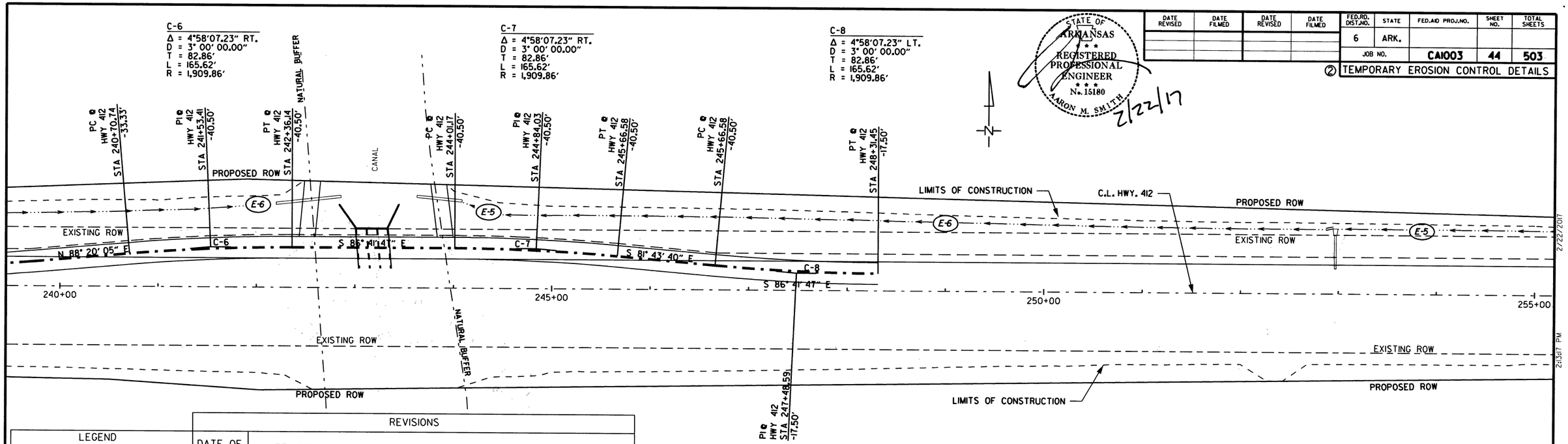
② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

C-6
Δ = 4°58'07.23" RT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

C-7
Δ = 4°58'07.23" RT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

C-8
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'




INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |

LEGEND

| | |
|---|---|
| E-11 | SILT FENCE |
| E-5 | SAND DITCH CHECKS |
| E-6 | ROCK DITCH CHECKS |

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

REVISIONS

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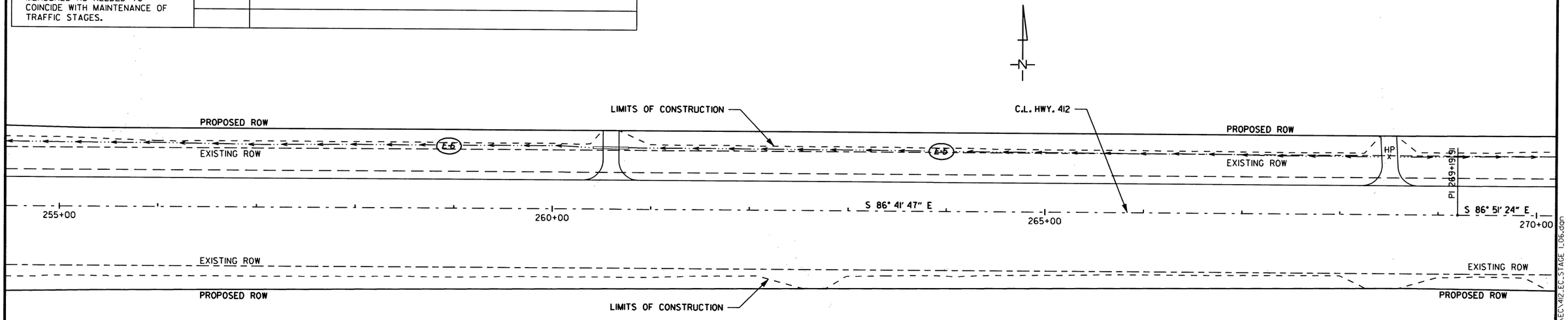


# TEMPORARY EROSION CONTROL DETAILS STAGE I

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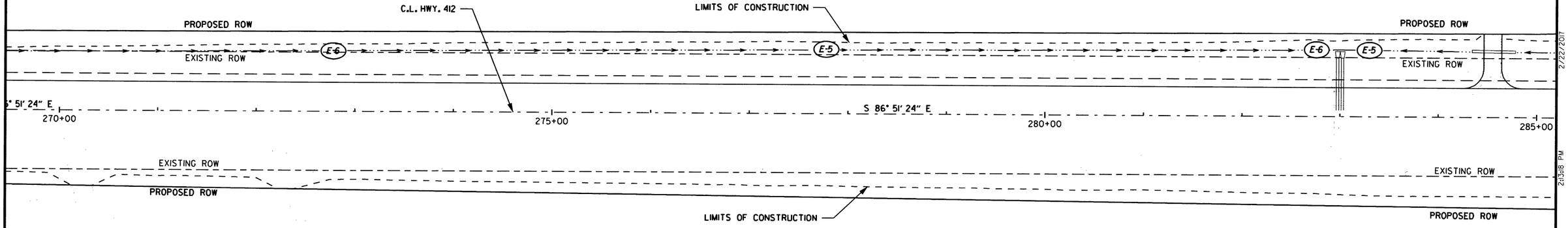
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 45 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




| REVISIONS | |
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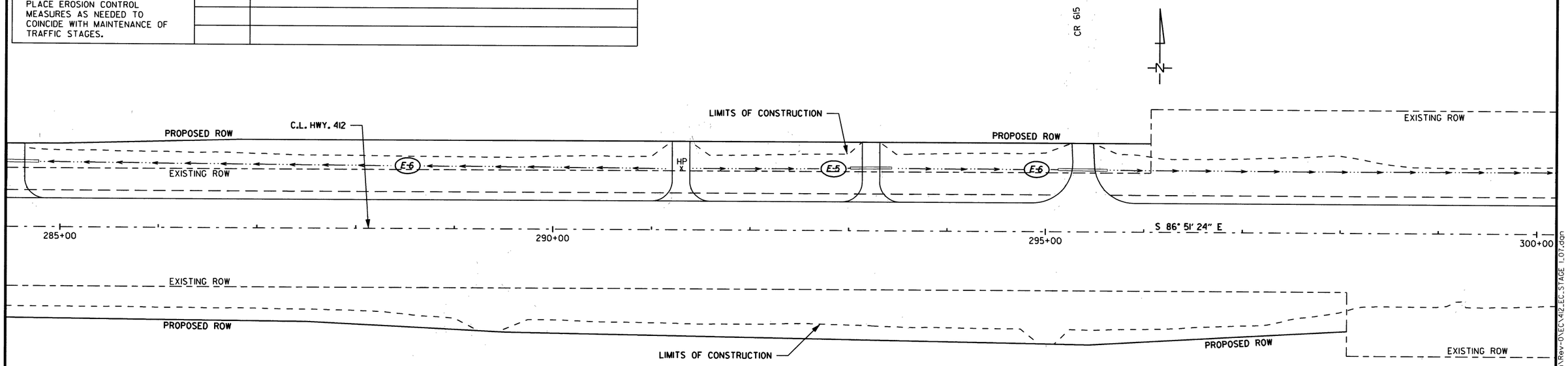
LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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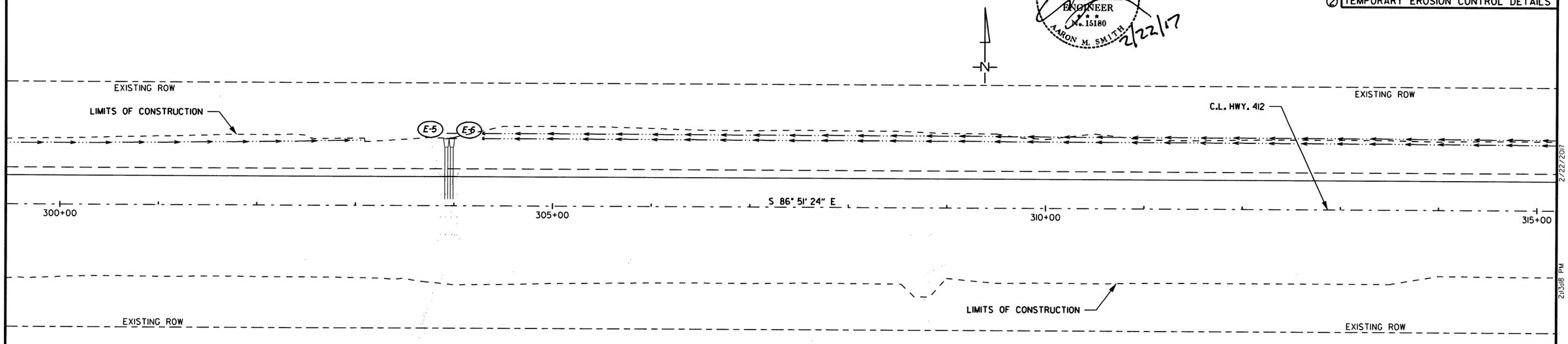
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 46 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
|---|---|
| DATE OF REVISION | REVISION |
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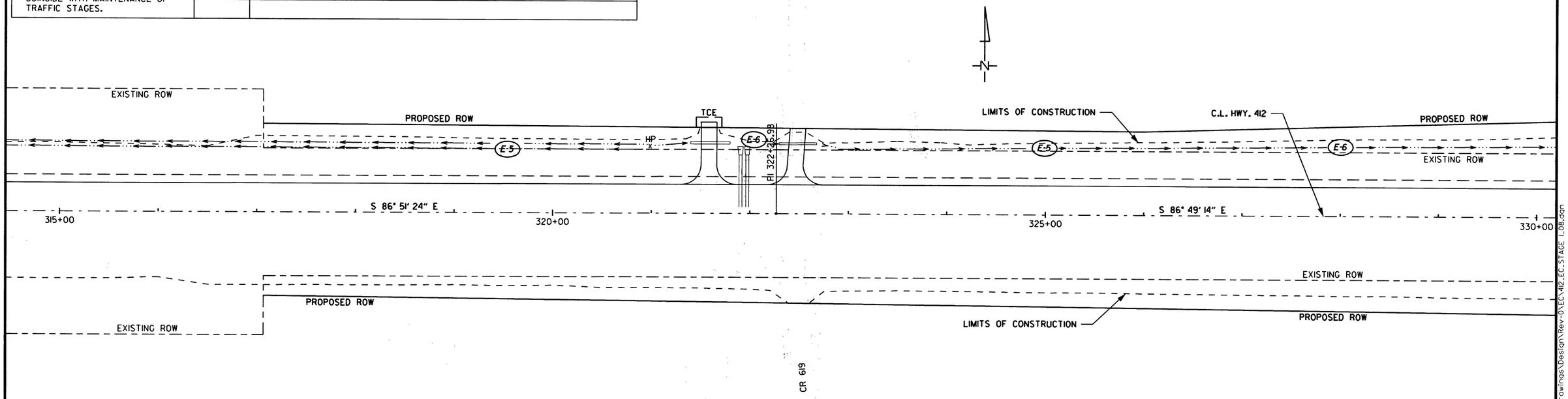
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

2/22/2017 2:13:18 PM

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 47 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

C-9
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

C-10
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

PC @ HWY 412 STA 334+02.30 -17.50'
PT @ HWY 412 STA 335+67.11 -24.68'
PC @ HWY 412 STA 336+67.17 -35.33'
PI @ HWY 412 STA 337+49.72 -40.50'
PT @ HWY 412 STA 338+32.58 -40.50'
PC @ HWY 412 STA 339+97.58 -40.50'
PI @ HWY 412 STA 340+80.44 -40.50'
PT @ HWY 412 STA 341+63.00 -35.33'
PC @ HWY 412 STA 342+62.45 -24.68'
PT @ HWY 412 STA 344+27.86 -17.50'
PI @ HWY 412 STA 334+85.16 -17.50'
PI @ HWY 412 STA 343+46.00 -17.50'

NATURAL BUFFER
FLOAT ROAD SLOUGH
NATURAL BUFFER

LIMITS OF CONSTRUCTION
PROPOSED ROW
EXISTING ROW
C.L. HWY. 412
N 88° 12' 39" E
S 86° 49' 14" E
S 81° 56' 06" E
330+00
335+00
340+00
345+00

C-11
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

C-12
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |

LEGEND

| | |
|---|---|
| E-11 | SILT FENCE |
| E-5 | SAND DITCH CHECKS |
| E-6 | ROCK DITCH CHECKS |

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

REVISIONS

| DATE OF REVISION | REVISION |
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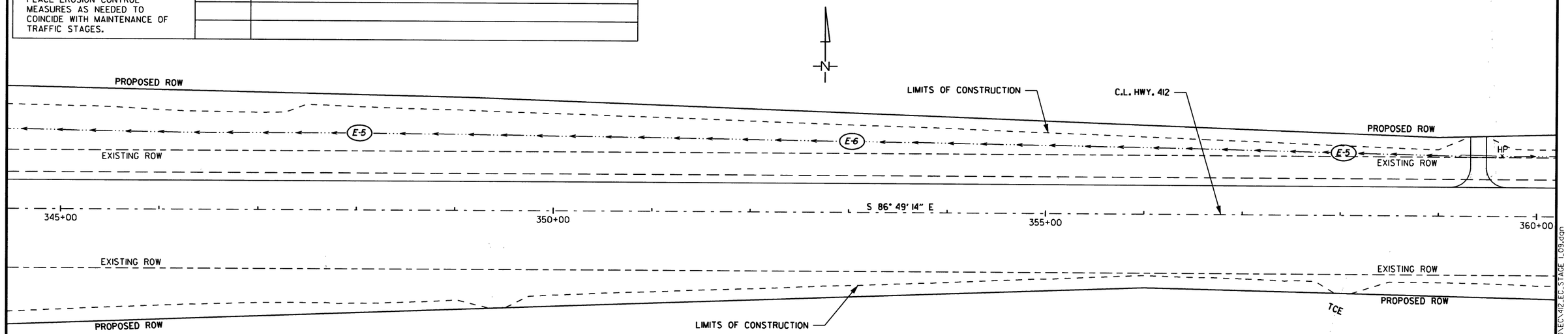


TEMPORARY EROSION CONTROL DETAILS
STAGE I

2/22/2017 2:13:18 PM
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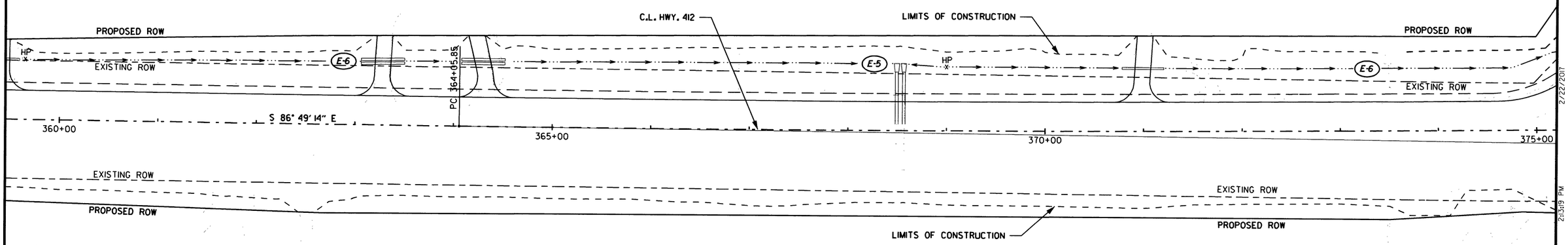
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 48 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
|---|---|
| DATE OF REVISION | REVISION |
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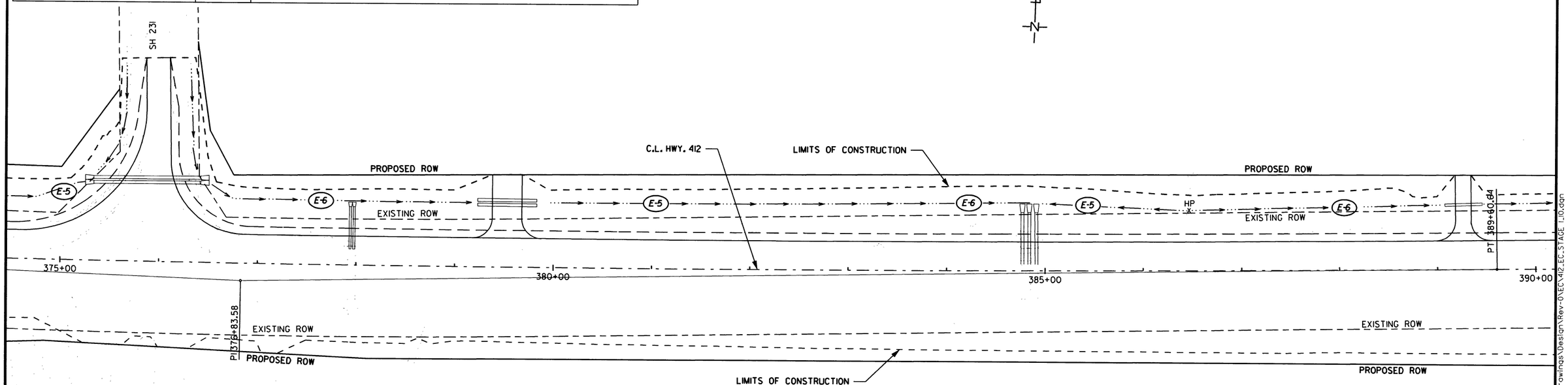
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 5 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

2/22/2017 2:13:19 PM

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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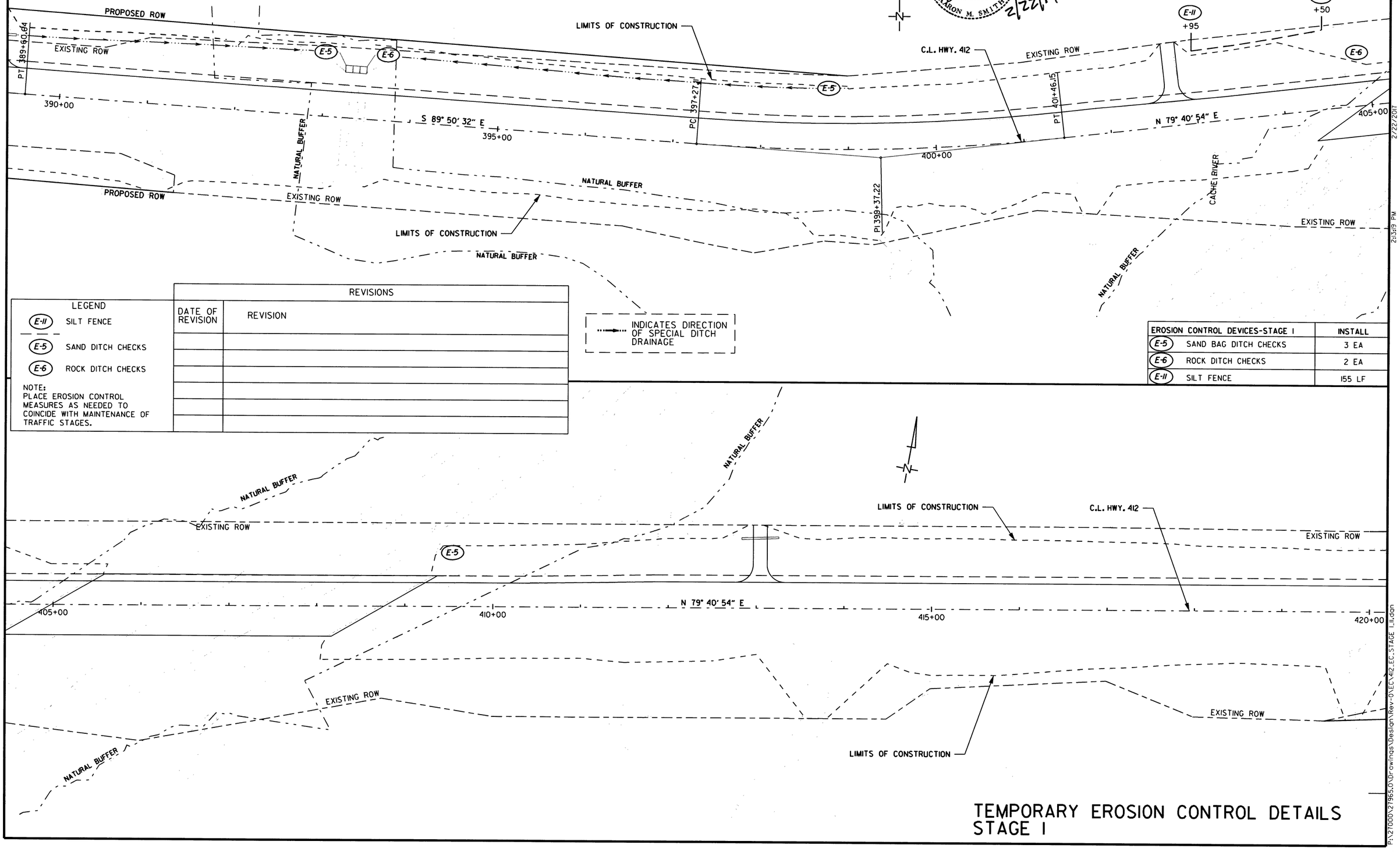
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 49 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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| DATE OF REVISION | REVISION |
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INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 155 LF |

# TEMPORARY EROSION CONTROL DETAILS STAGE I

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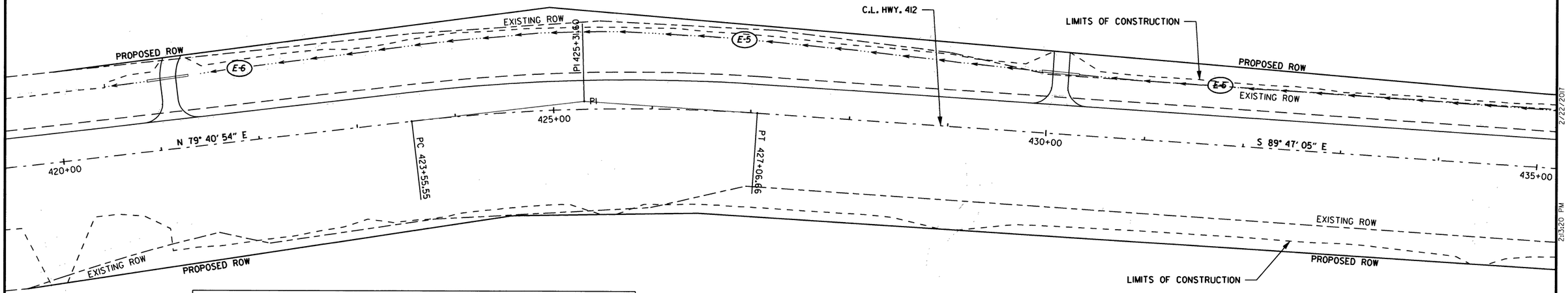
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 50 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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| DATE OF REVISION | REVISION |
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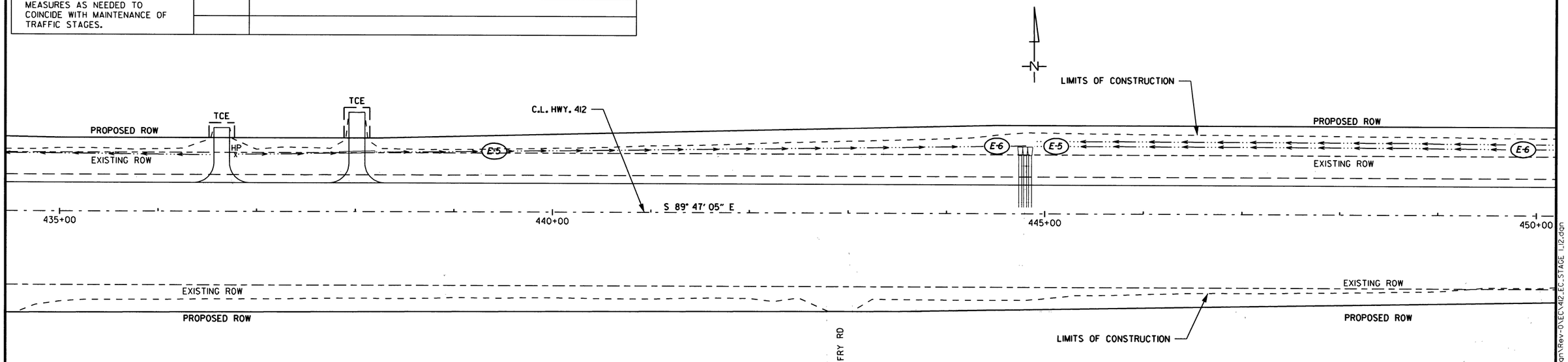
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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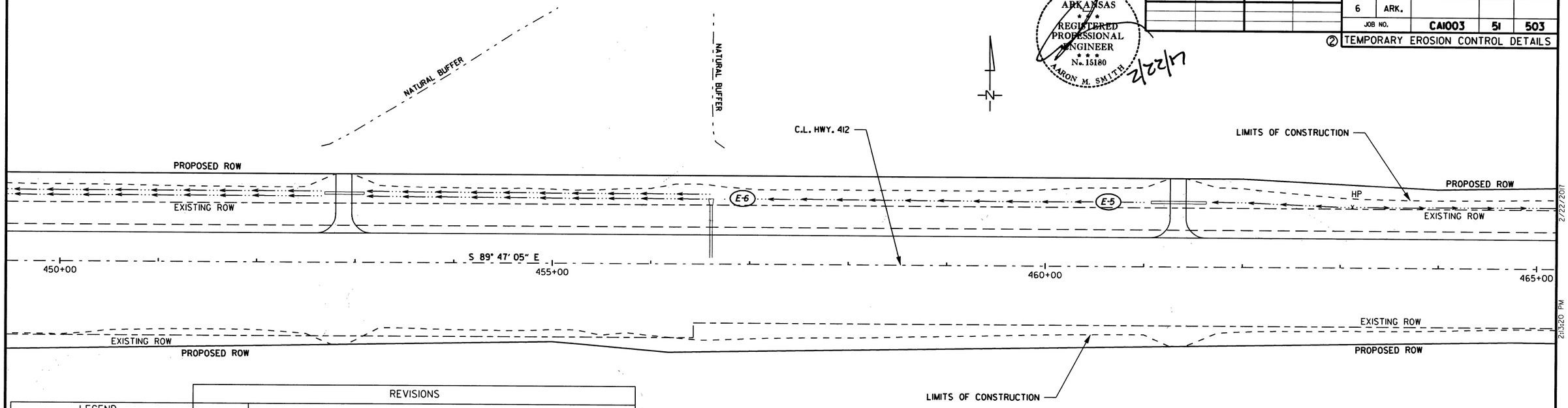
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 51 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




| LEGEND | |
|---|---|
| E-11 | SILT FENCE |
| E-5 | SAND DITCH CHECKS |
| E-6 | ROCK DITCH CHECKS |

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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| DATE OF REVISION | REVISION |
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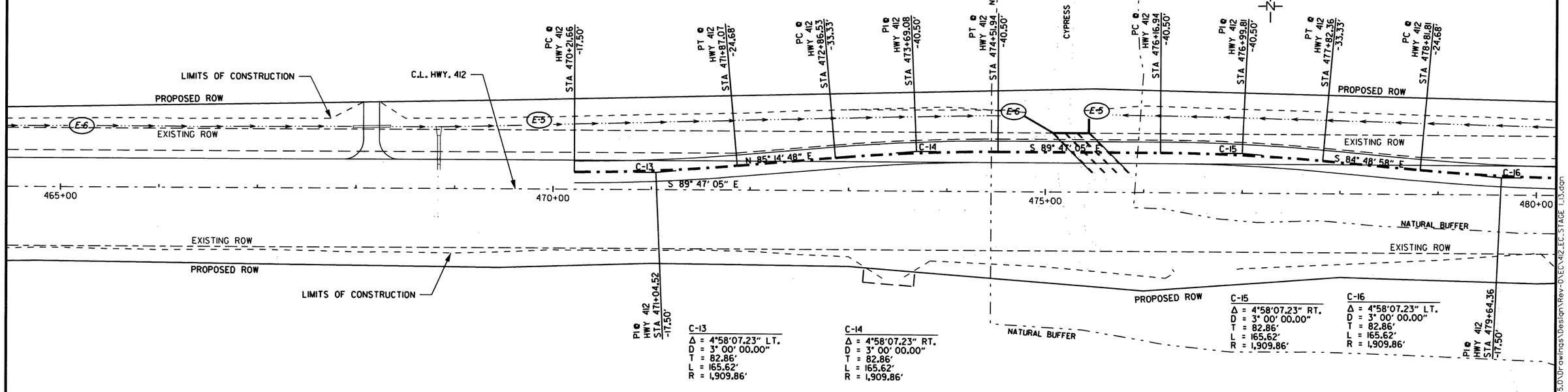
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |




C-13
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

C-14
Δ = 4°58'07.23" RT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

C-15
Δ = 4°58'07.23" RT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

C-16
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

# TEMPORARY EROSION CONTROL DETAILS STAGE I

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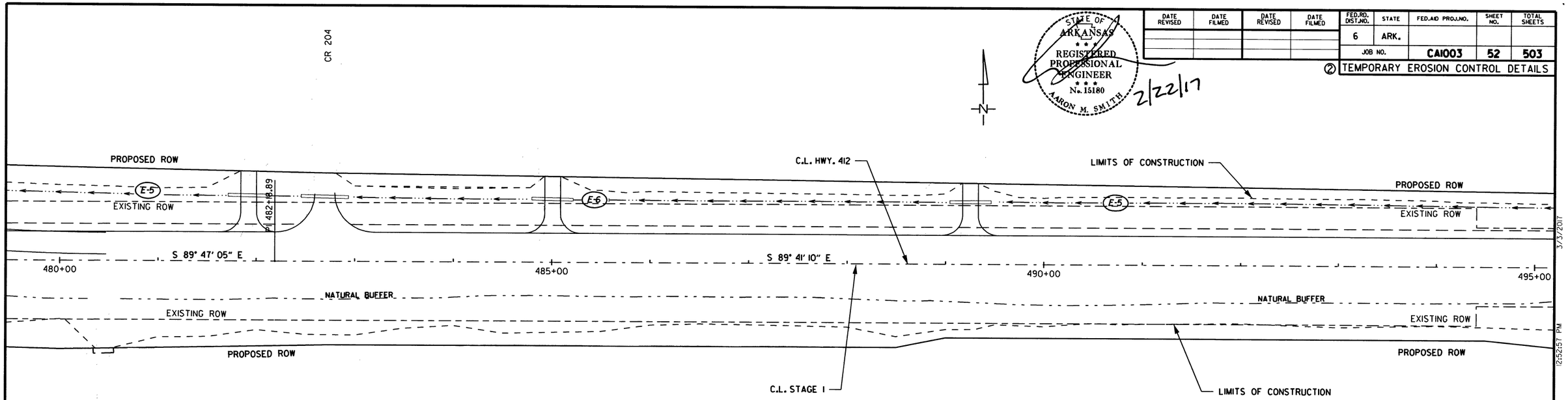
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 52 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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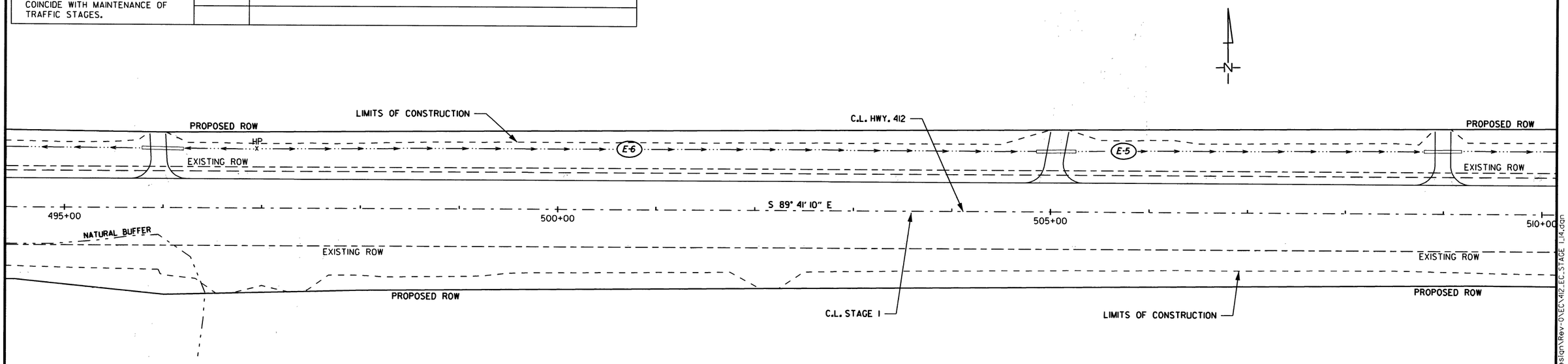
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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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 |
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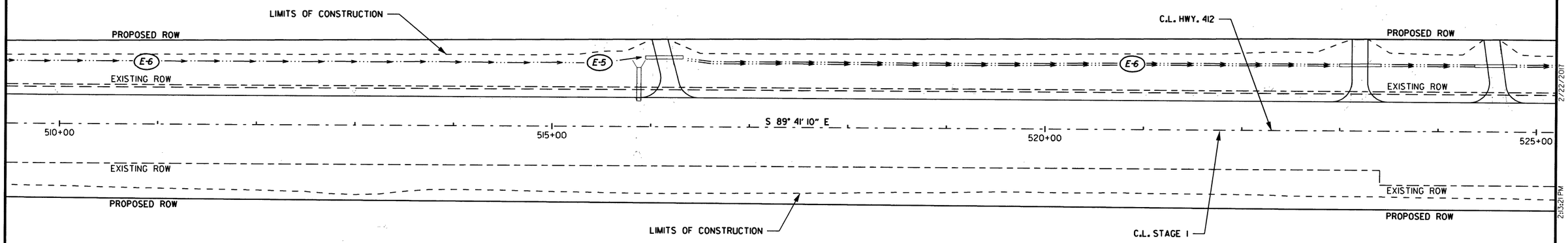
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 53 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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| DATE OF REVISION | REVISION |
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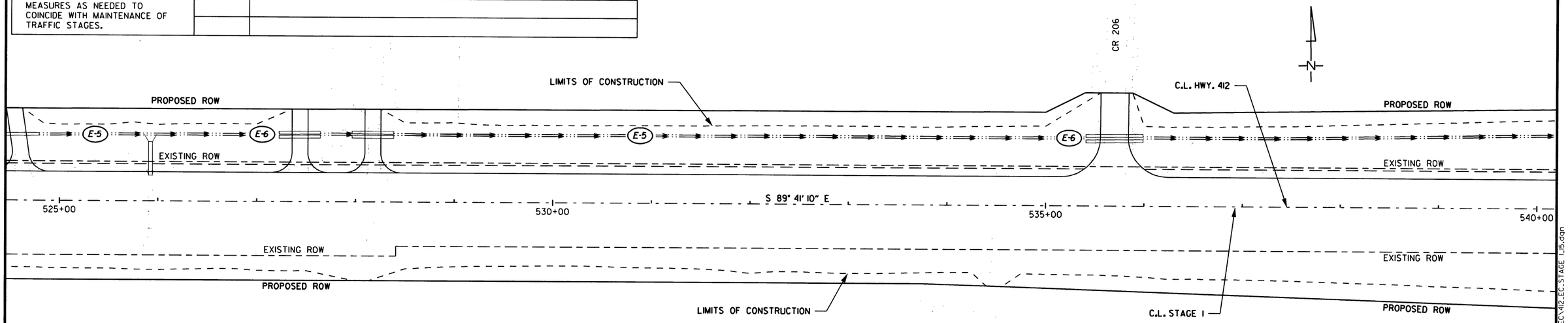
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

2/22/2017 2:13:21 PM

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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. | | CA1003 | 54 | 503 |

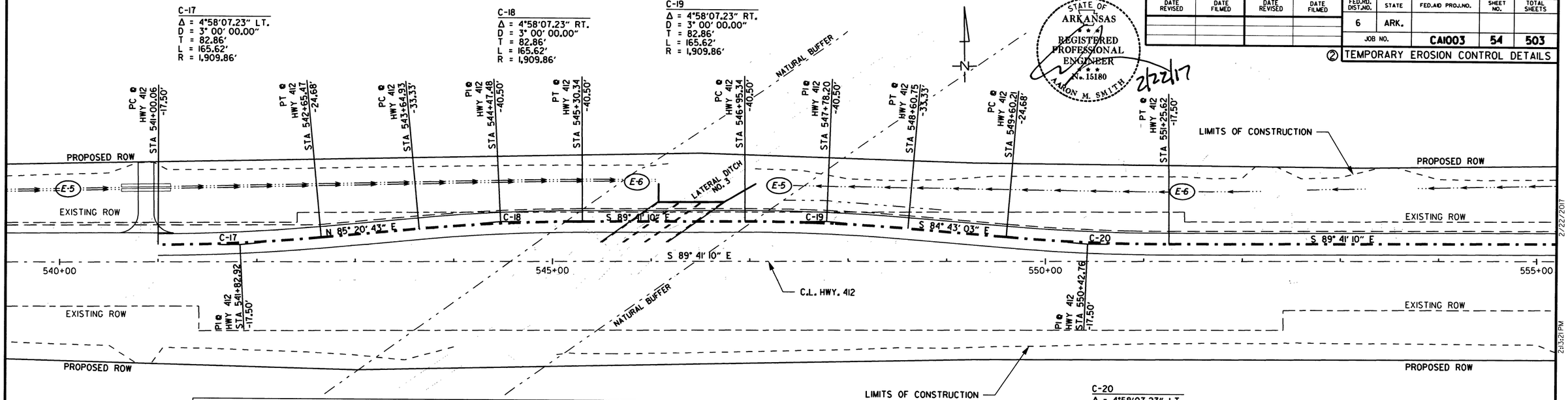
② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

C-17
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

C-18
Δ = 4°58'07.23" RT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

C-19
Δ = 4°58'07.23" RT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'




| REVISIONS | |
|---|---|
| DATE OF REVISION | REVISION |
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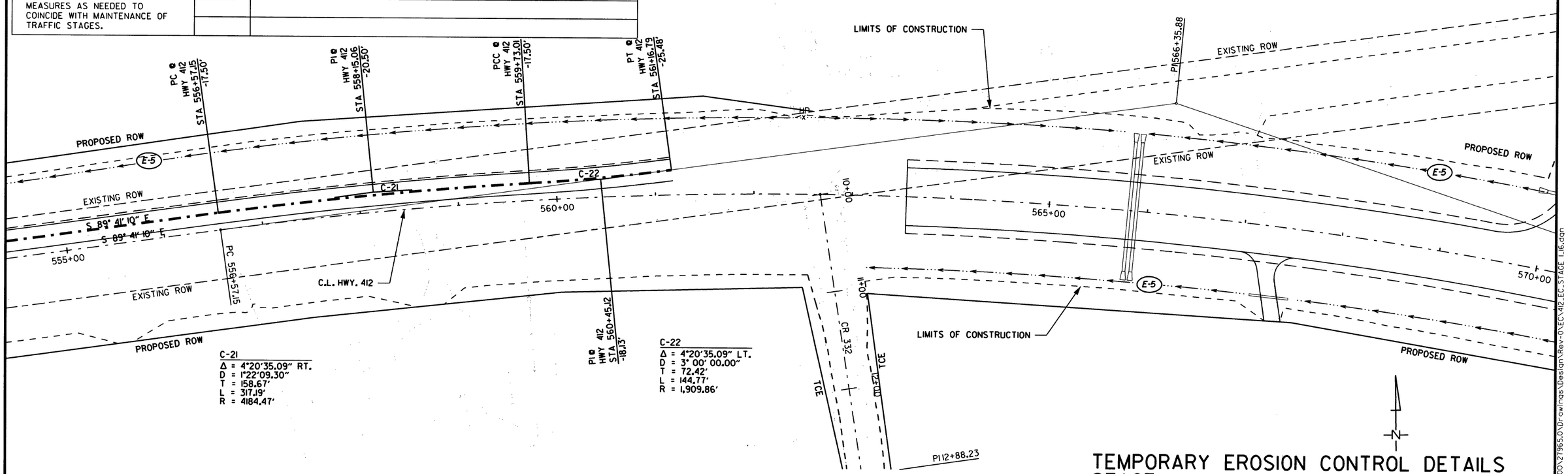
LEGEND
- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 5 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 0 LF |




C-21
Δ = 4°20'35.09" RT.
D = 1°22'09.30"
T = 158.67'
L = 317.19'
R = 4184.47'

C-22
Δ = 4°20'35.09" LT.
D = 3° 00' 00.00"
T = 72.42'
L = 144.77'
R = 1,909.86'

# TEMPORARY EROSION CONTROL DETAILS STAGE I

2/22/2017 2:13:21 PM

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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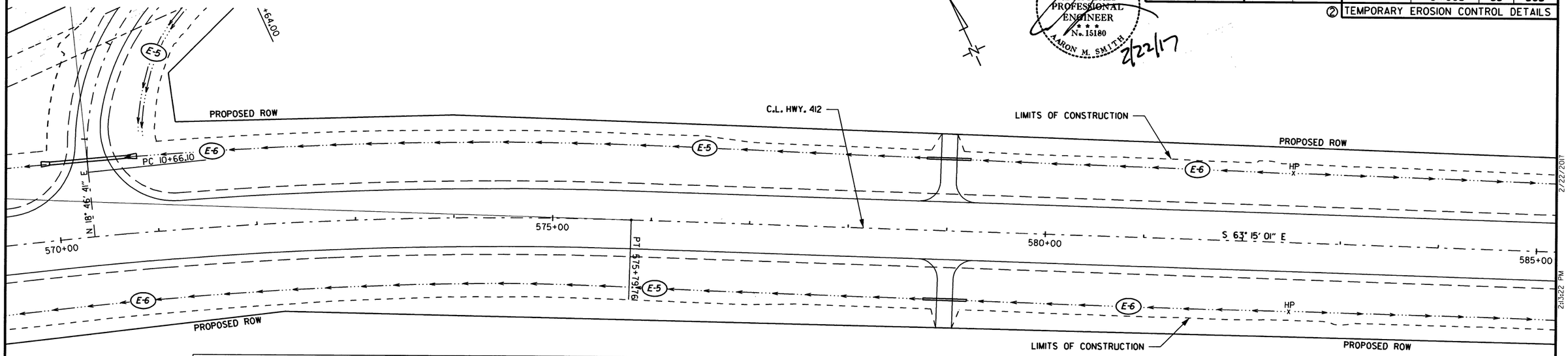
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 55 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




| REVISIONS | |
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LEGEND

E-11 SILT FENCE

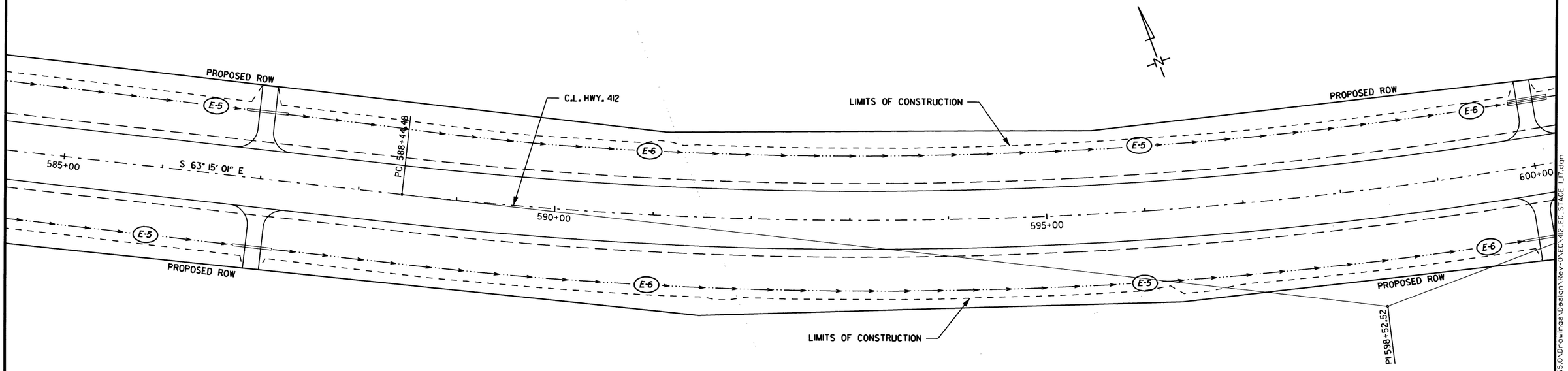
E-5 SAND DITCH CHECKS

E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 6 EA |
| E-6 | ROCK DITCH CHECKS | 8 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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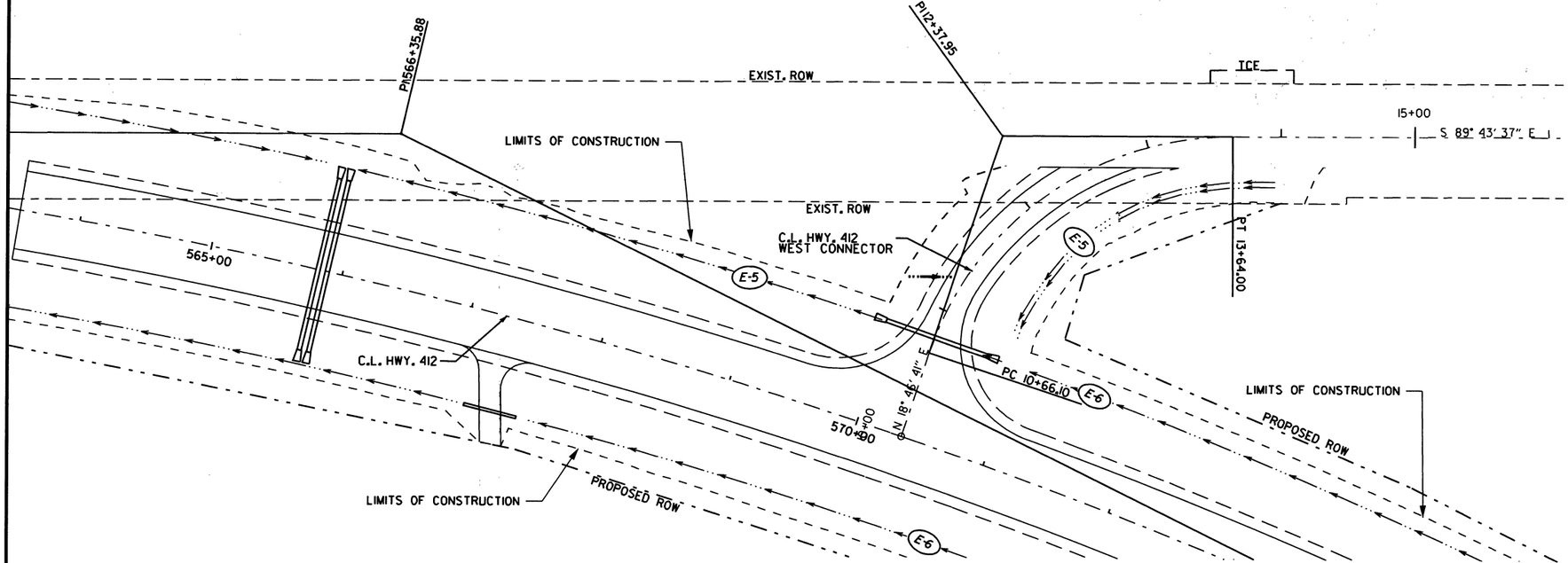
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 56 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




HWY 412 WEST CONNECTOR

HWY 412 WEST CONNECTOR ONLY

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 1 EA |
| E-6 | ROCK DITCH CHECKS | 0 EA |
| E-11 | SILT FENCE | 0 LF |

LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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INDICATES DIRECTION OF DITCH DRAINAGE

# TEMPORARY EROSION CONTROL DETAILS STAGE I

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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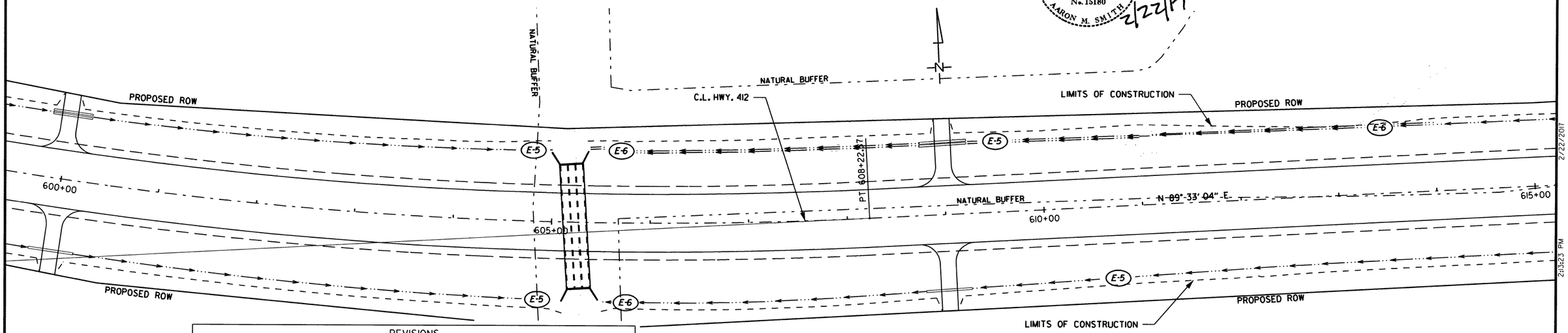
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 57 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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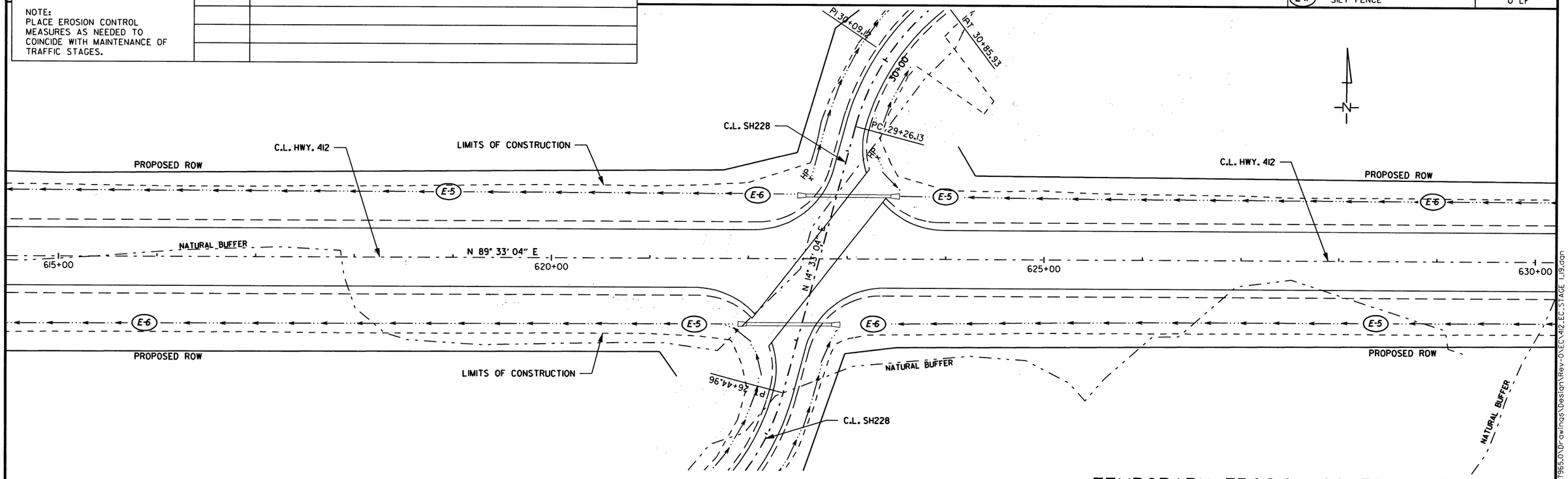
LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 8 EA |
| E-6 | ROCK DITCH CHECKS | 7 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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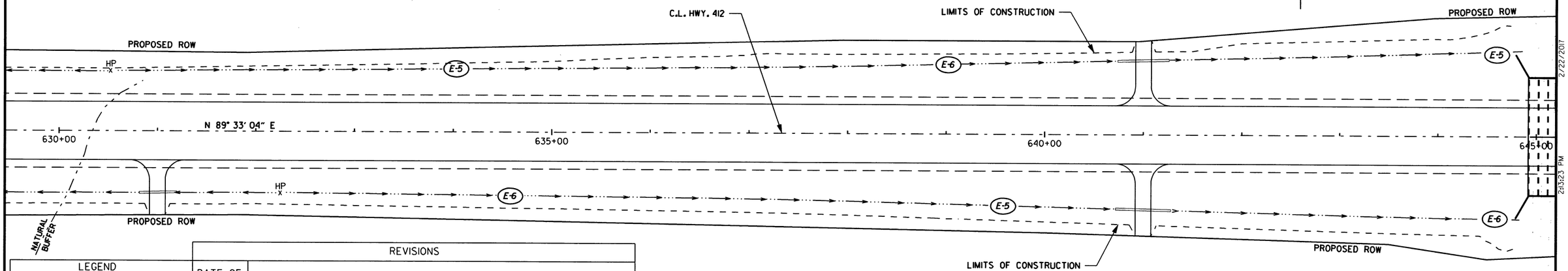
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 58 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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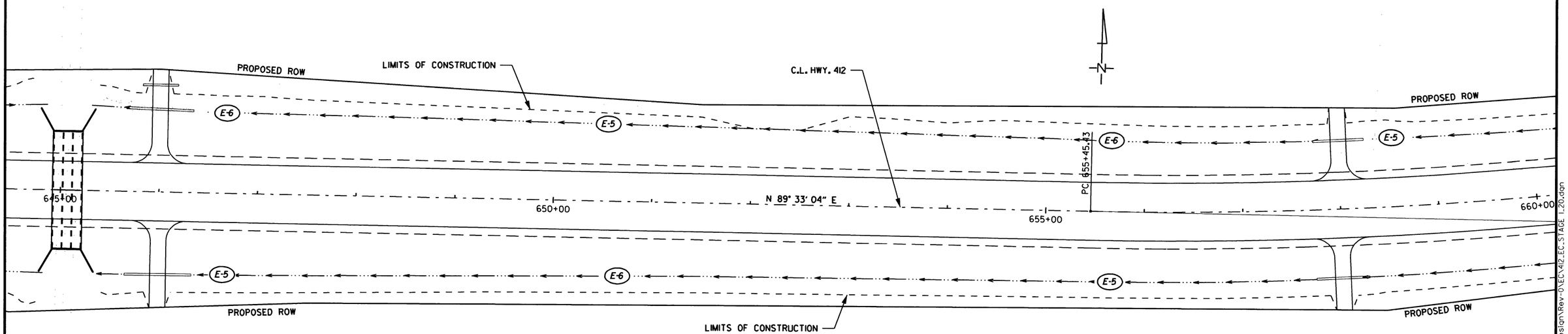
LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 7 EA |
| E-6 | ROCK DITCH CHECKS | 6 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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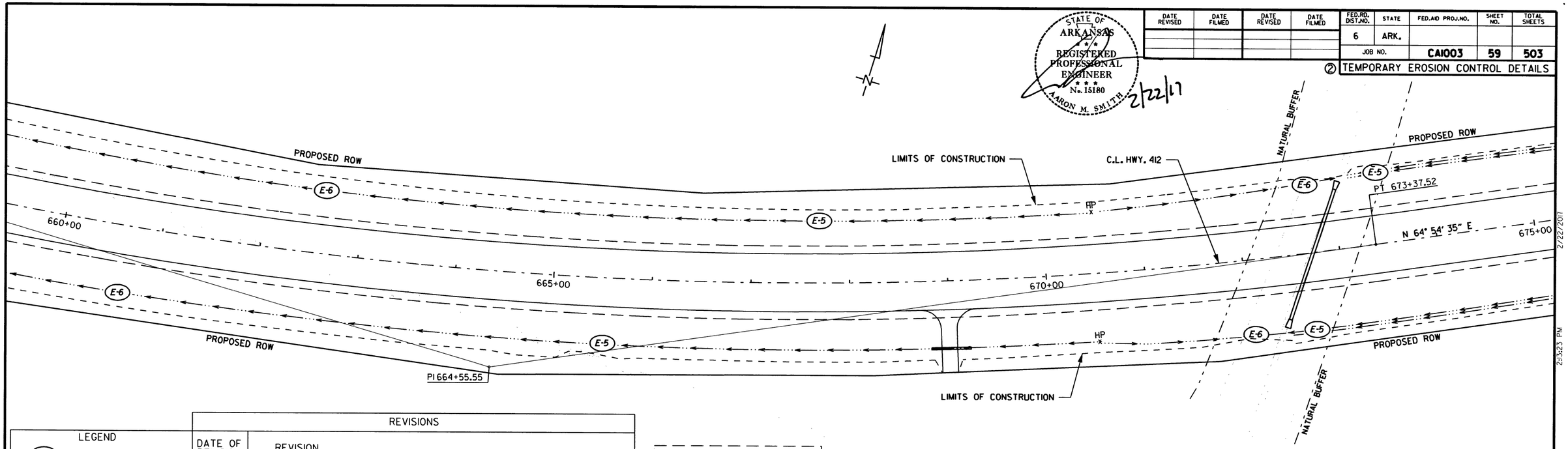
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 59 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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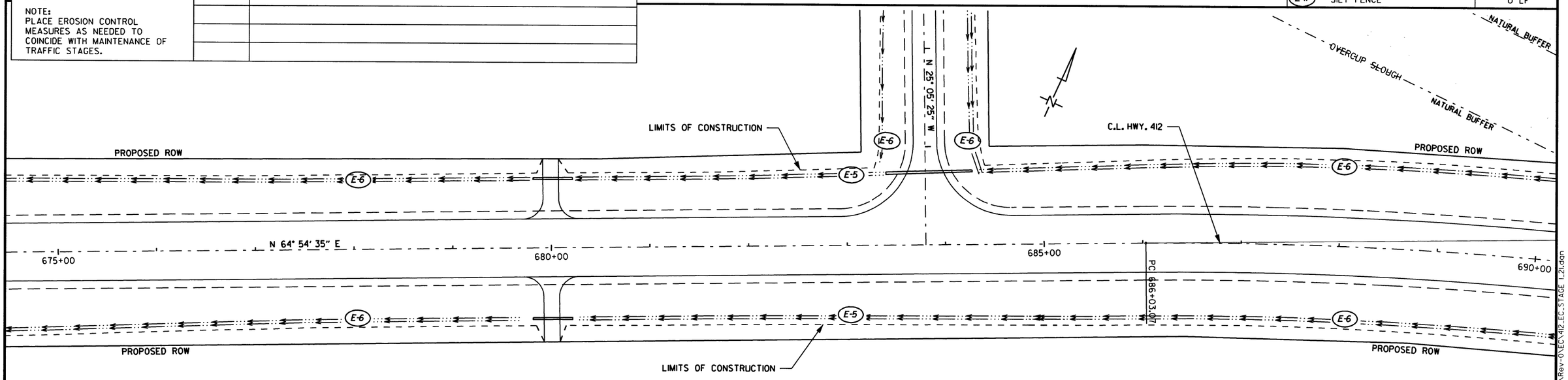
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 6 EA |
| E-6 | ROCK DITCH CHECKS | 8 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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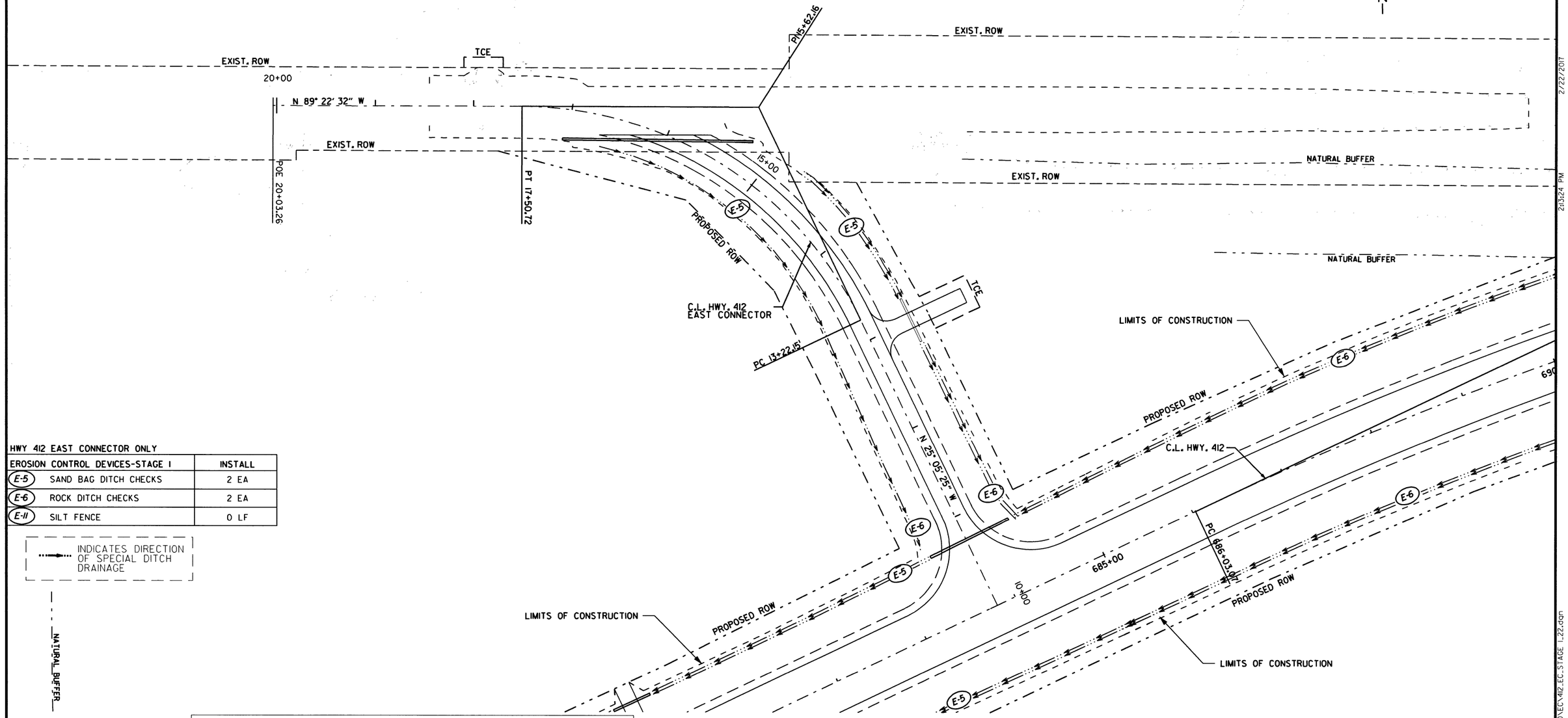
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 60 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




HWY 412 EAST CONNECTOR

HWY 412 EAST CONNECTOR ONLY

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 2 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 0 LF |

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

NATURAL BUFFER

| LEGEND | |
|---|---|
| E-11 | SILT FENCE |
| E-5 | SAND DITCH CHECKS |
| E-6 | ROCK DITCH CHECKS |

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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# TEMPORARY EROSION CONTROL DETAILS STAGE I

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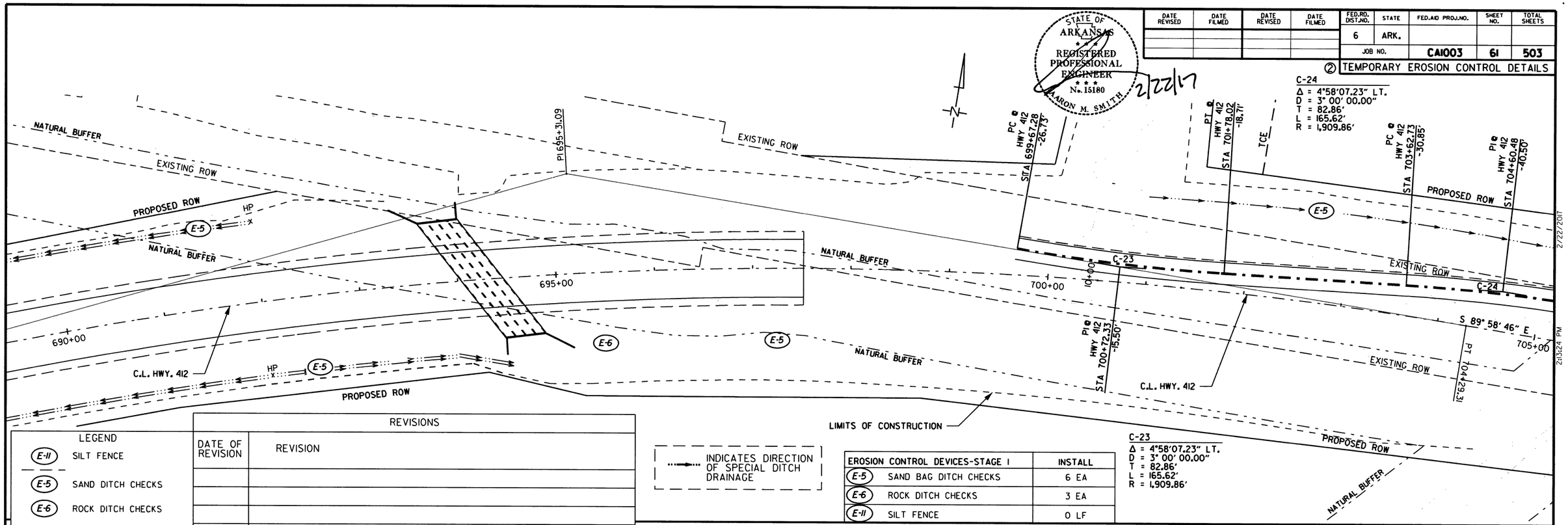
| | | | | JOB NO. | | CA1003 | 61 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




| LEGEND | |
|---|---|
| E-11 | SILT FENCE |
| E-5 | SAND DITCH CHECKS |
| E-6 | ROCK DITCH CHECKS |

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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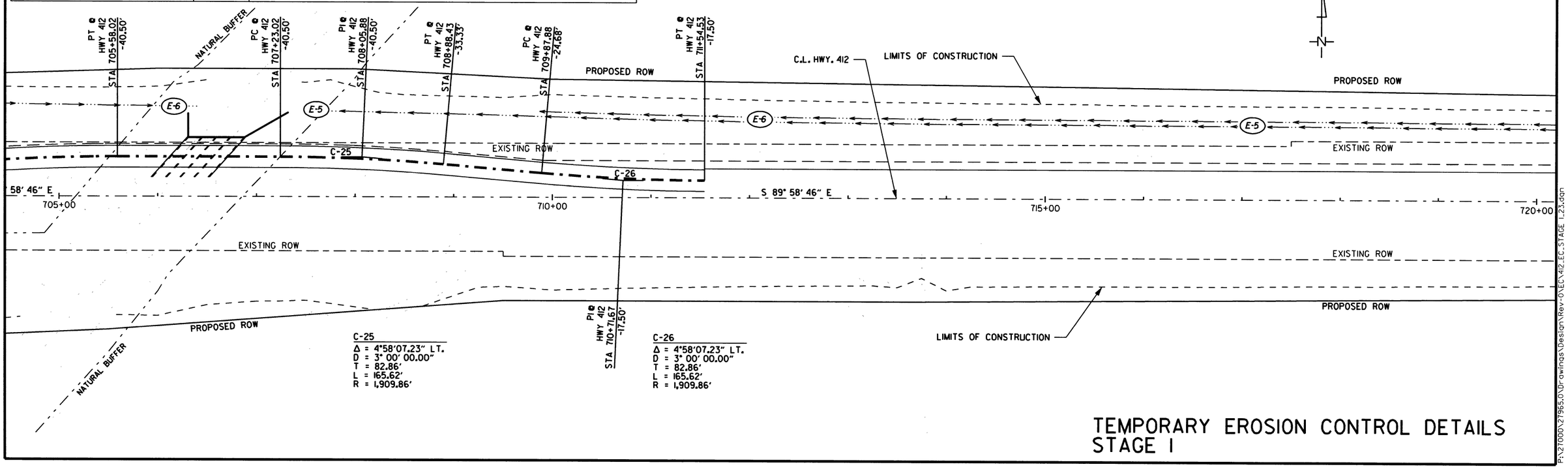
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 6 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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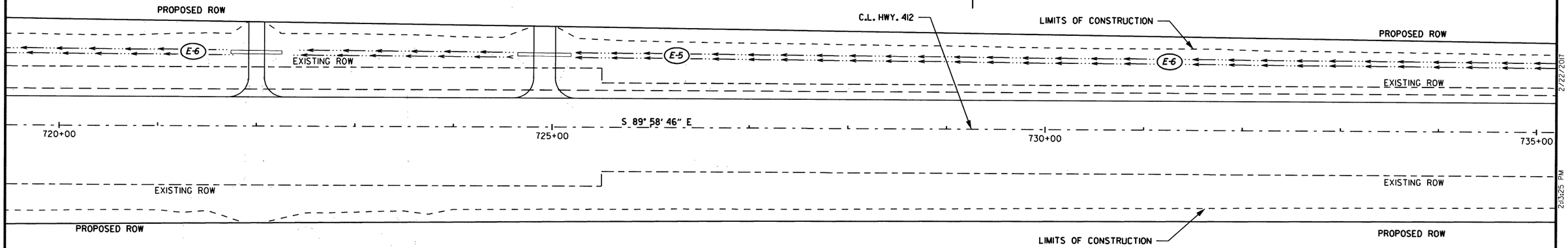
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 62 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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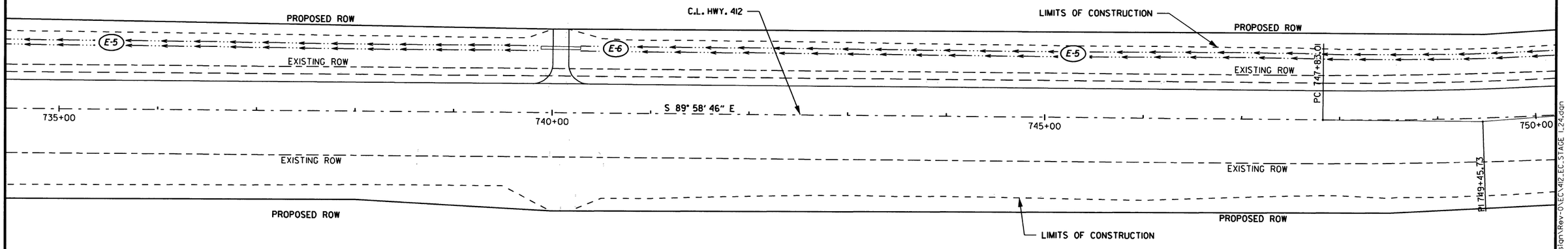
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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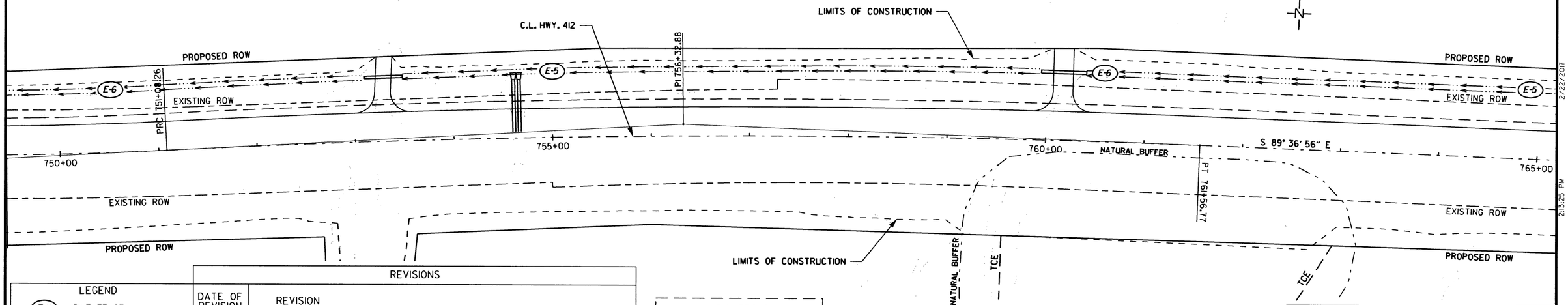
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 63 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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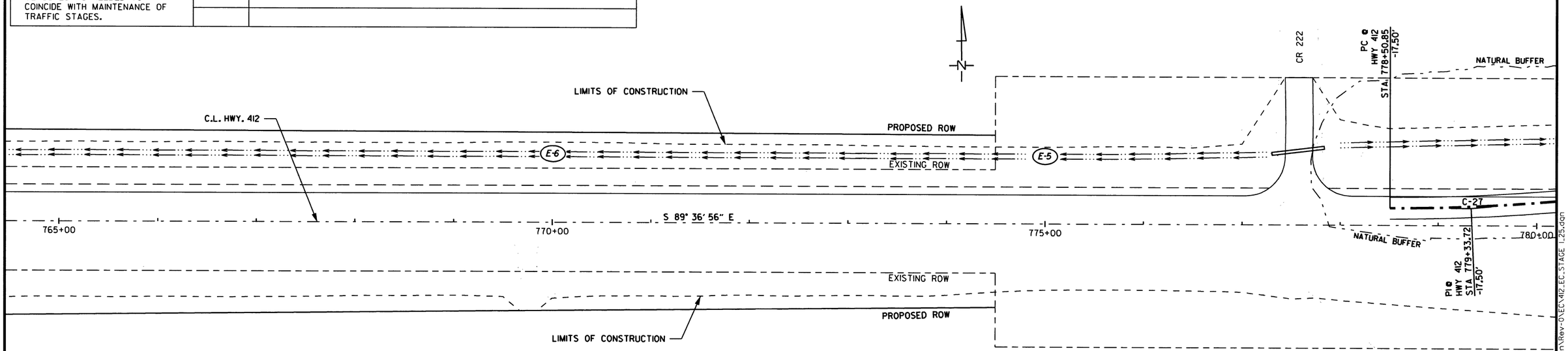
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |




C-27
Δ = 4°58'07.23" LT.
D = 3° 00' 00.00"
T = 82.86'
L = 165.62'
R = 1,909.86'

# TEMPORARY EROSION CONTROL DETAILS STAGE I

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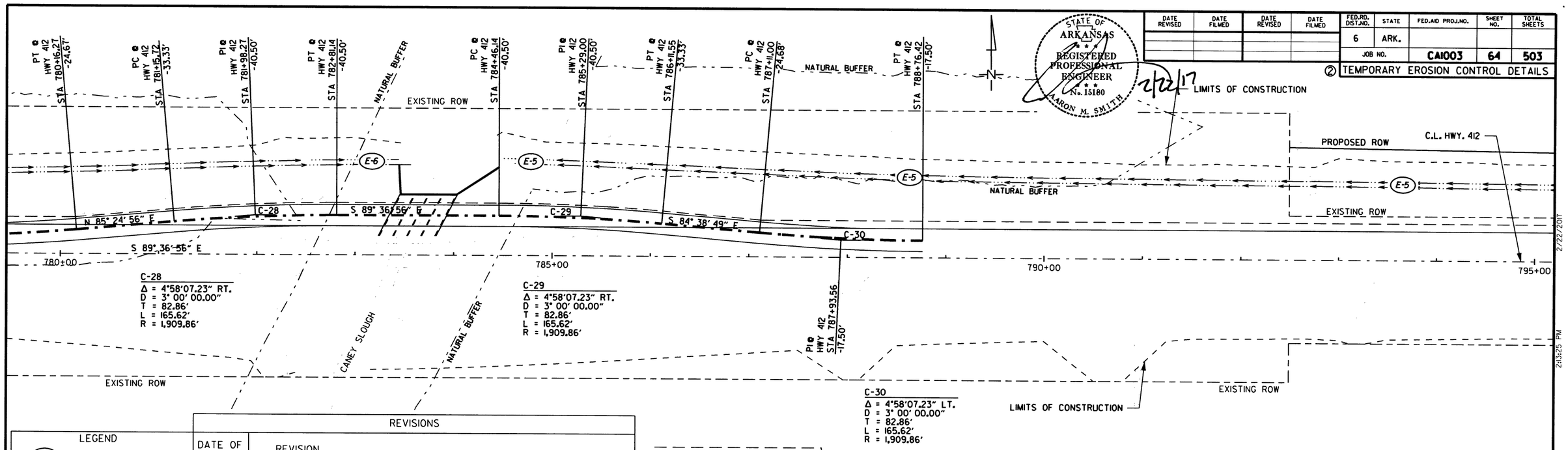
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 64 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 585 LF |

LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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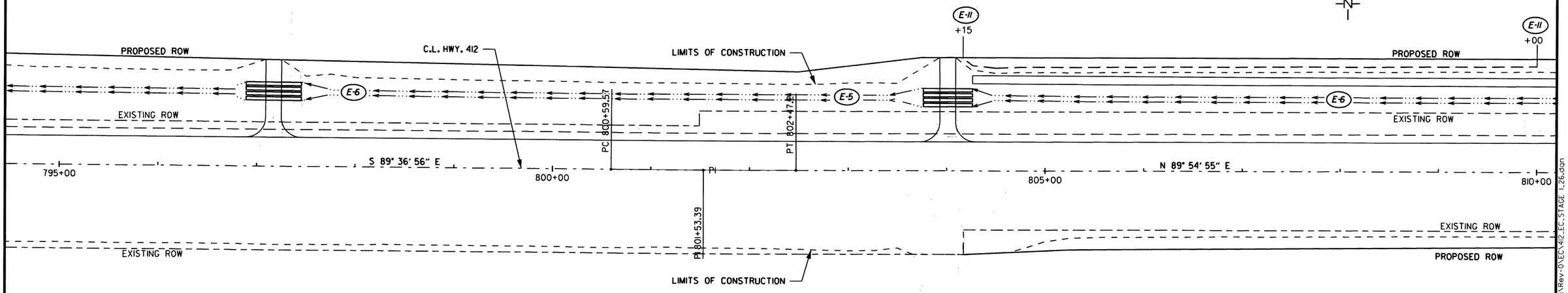
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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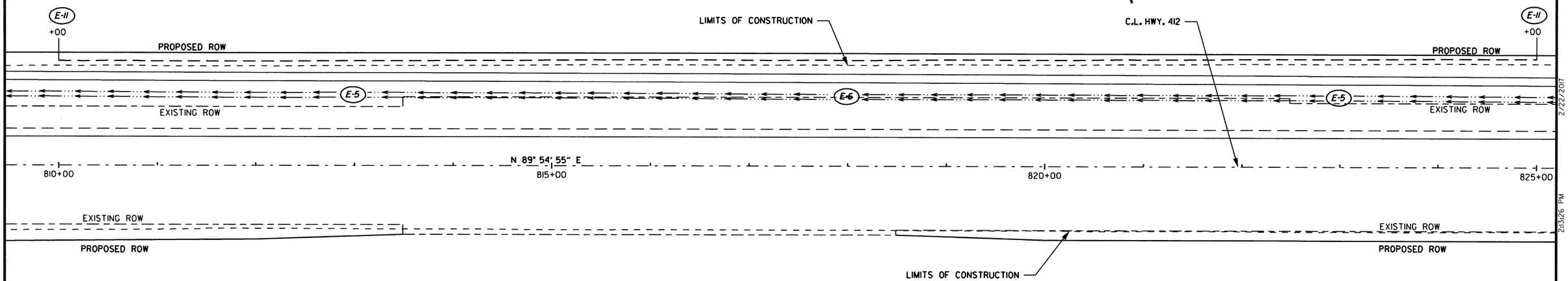
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 65 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
4/22/17

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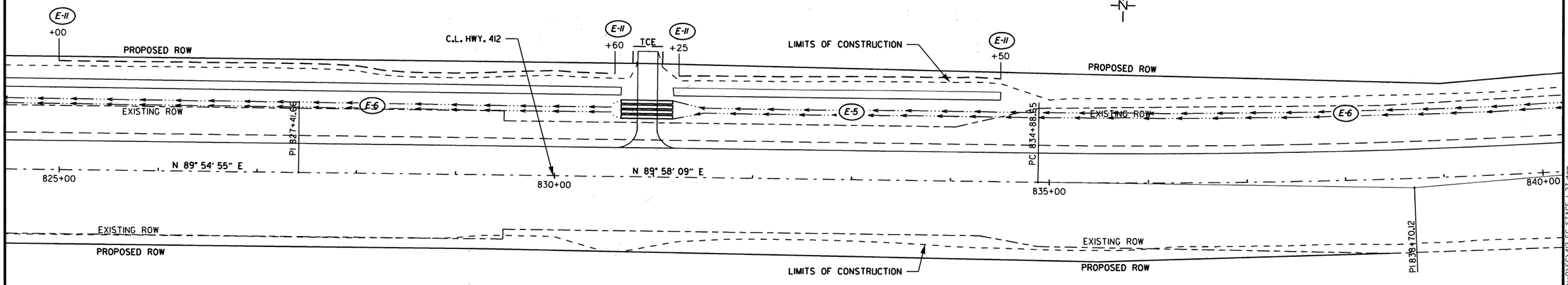
LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 2385 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE I

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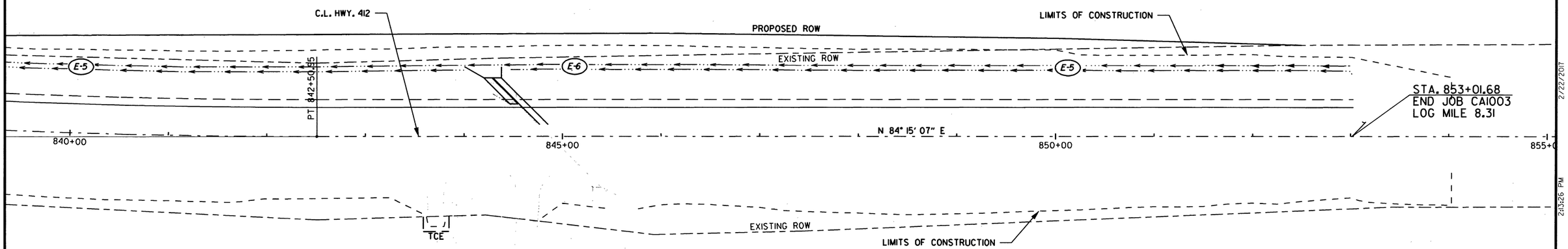
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 66 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- (E-11) SILT FENCE
- (E-5) SAND DITCH CHECKS
- (E-6) ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE I | INSTALL |
|---|---|
| (E-5) SAND BAG DITCH CHECKS | 2 EA |
| (E-6) ROCK DITCH CHECKS | 1 EA |
| (E-11) SILT FENCE | 0 LF |

# TEMPORARY EROSION CONTROL DETAILS STAGE I

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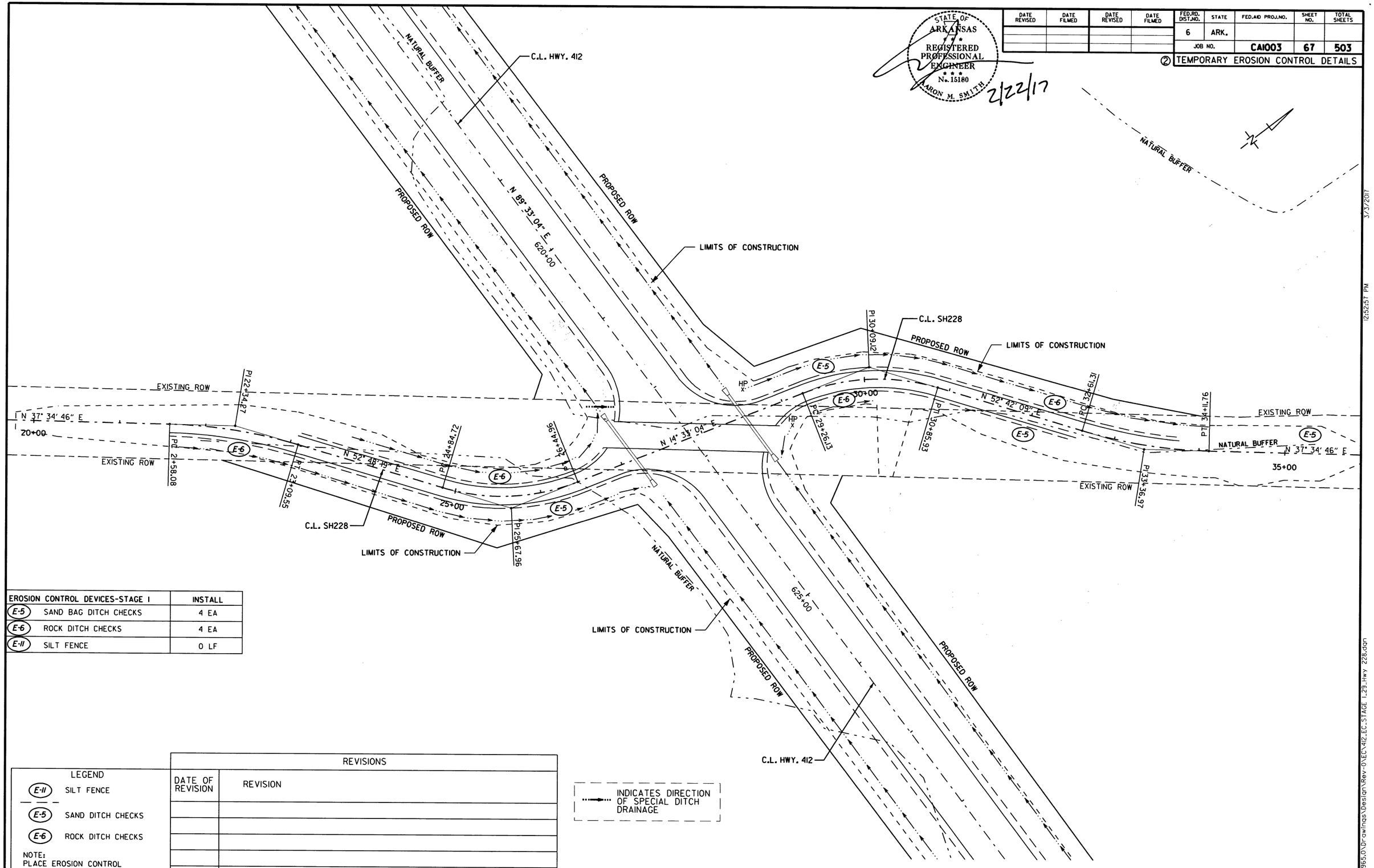
| | | | | JOB NO. | | CA1003 | 67 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




| EROSION CONTROL DEVICES-STAGE I | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 0 LF |

LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

# TEMPORARY EROSION CONTROL DETAILS STAGE I

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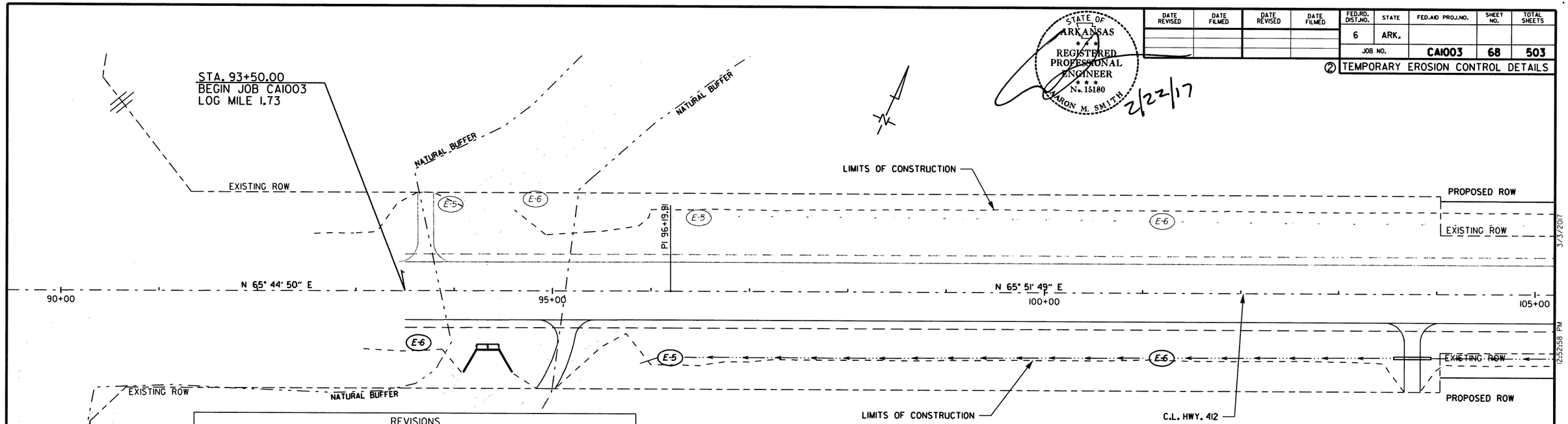
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 68 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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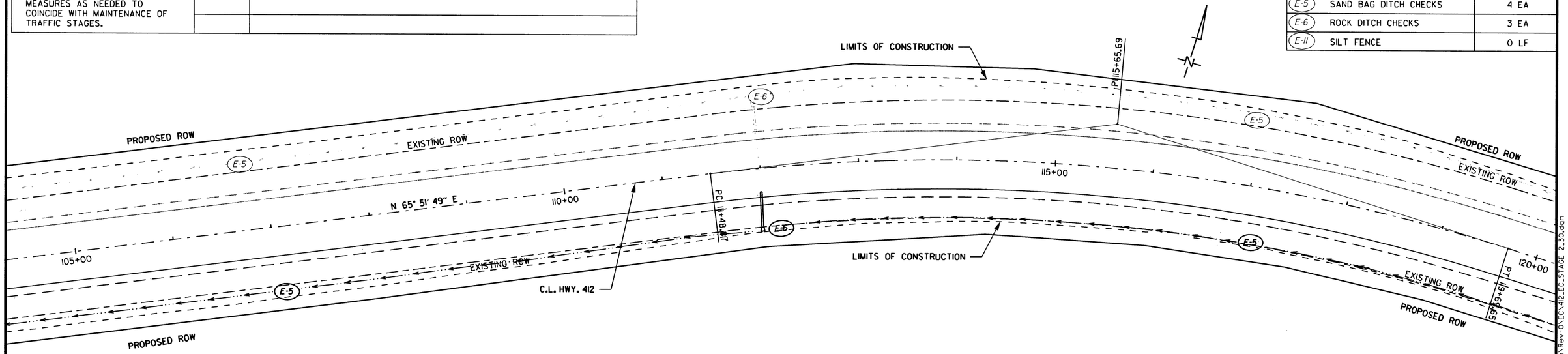
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | INSTALL |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 3 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 2 | RETAIN |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 4 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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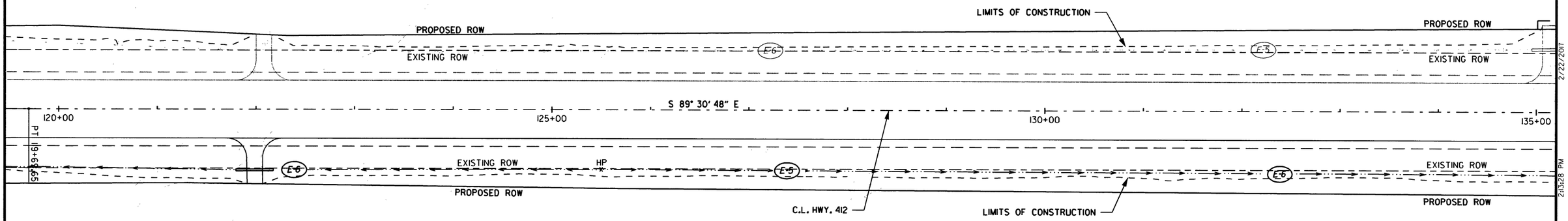
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 69 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- (E-11) SILT FENCE
- (E-5) SAND DITCH CHECKS
- (E-6) ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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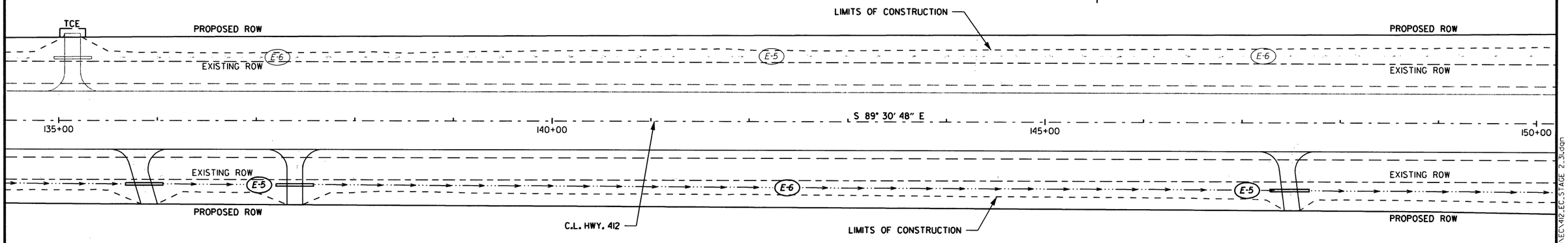
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | INSTALL |
|---|---|
| (E-5) SAND BAG DITCH CHECKS | 3 EA |
| (E-6) ROCK DITCH CHECKS | 3 EA |
| (E-11) SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | **RETAIN** |
| (E-5) SAND BAG DITCH CHECKS | 2 EA |
| (E-6) ROCK DITCH CHECKS | 3 EA |
| (E-11) SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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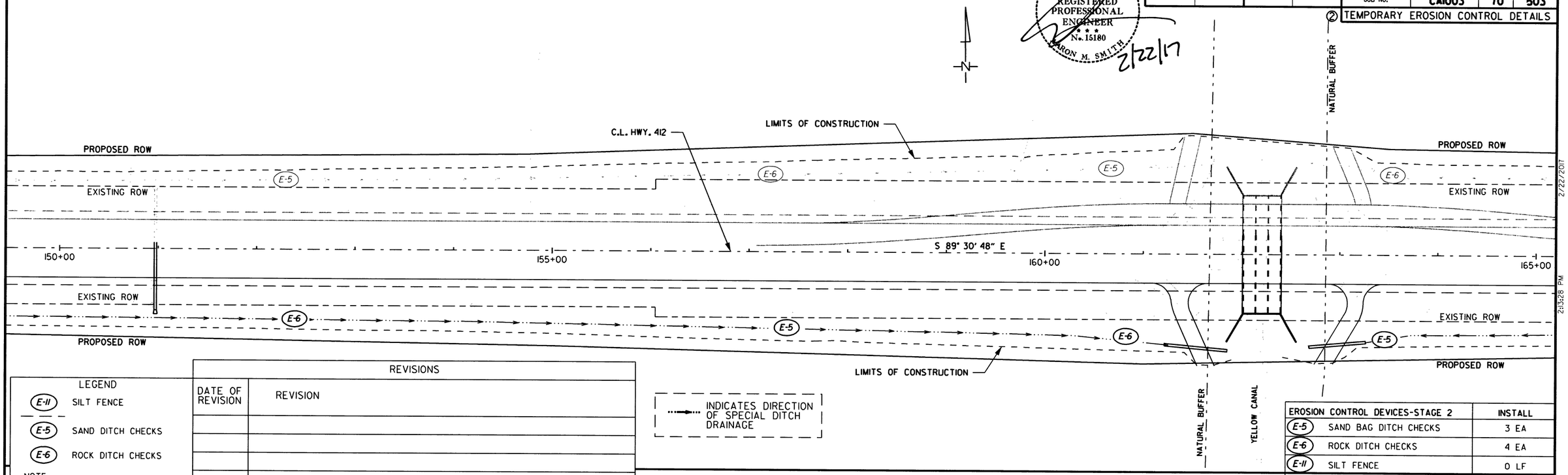
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 70 | 503 |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

## ② TEMPORARY EROSION CONTROL DETAILS




| LEGEND | |
|---|---|
| E-11 | SILT FENCE |
| E-5 | SAND DITCH CHECKS |
| E-6 | ROCK DITCH CHECKS |

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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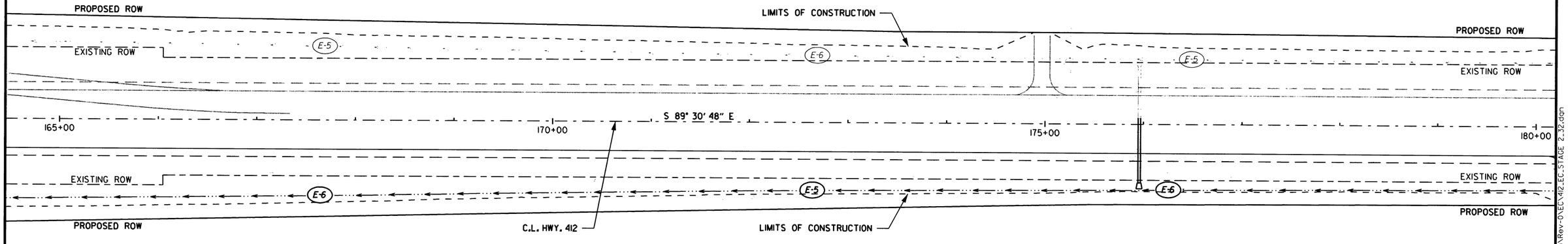
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | INSTALL |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 3 EA |
| E-6 ROCK DITCH CHECKS | 4 EA |
| E-11 SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 1 | RETAIN |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 4 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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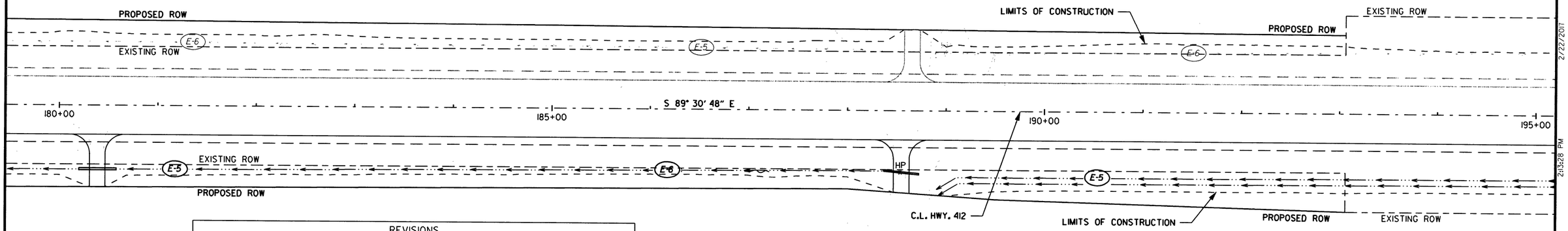
| | | | | JOB NO. | | CA1003 | 71 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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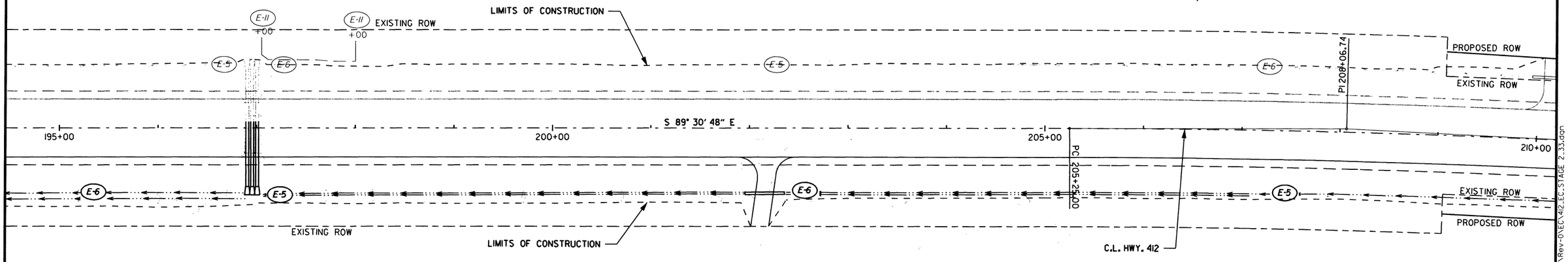
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | | **RETAIN** |
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 100 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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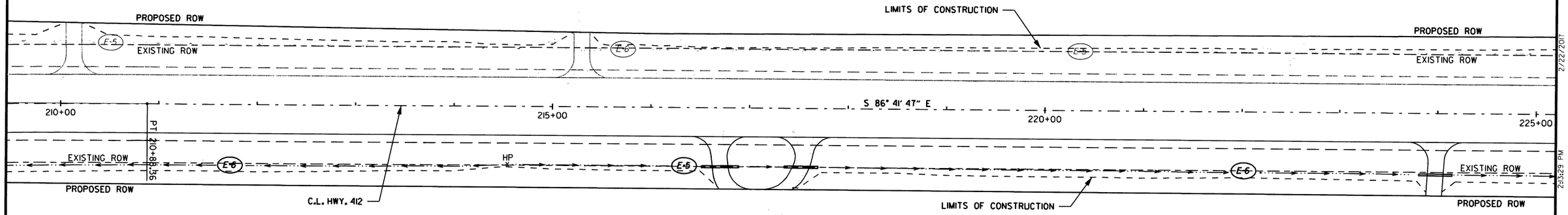
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 72 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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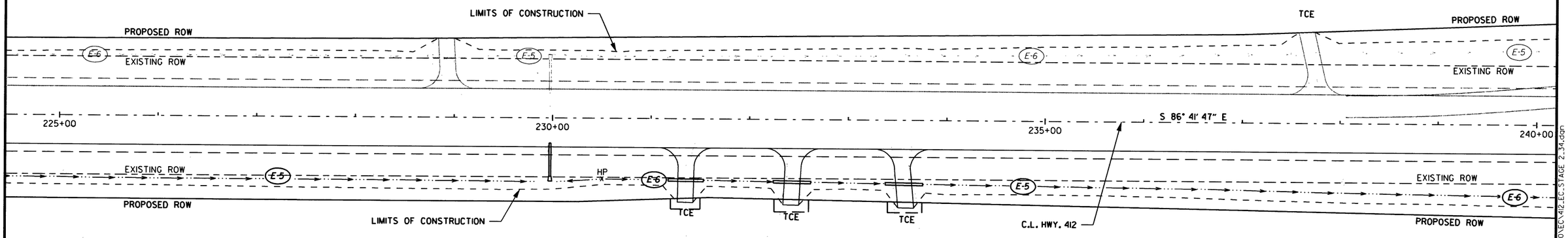
LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 0 LF |
| EROSION CONTROL DEVICES-STAGE 1 | | RETAIN |
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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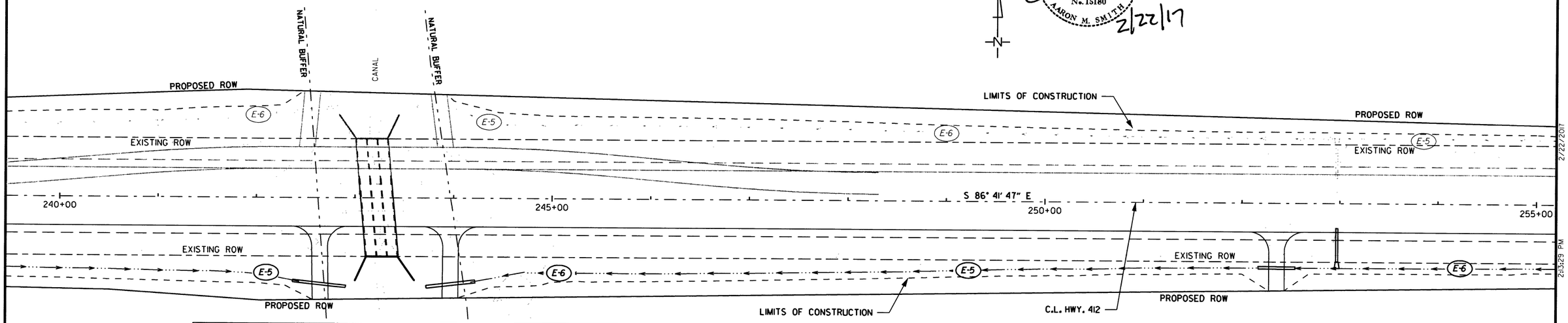
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 73 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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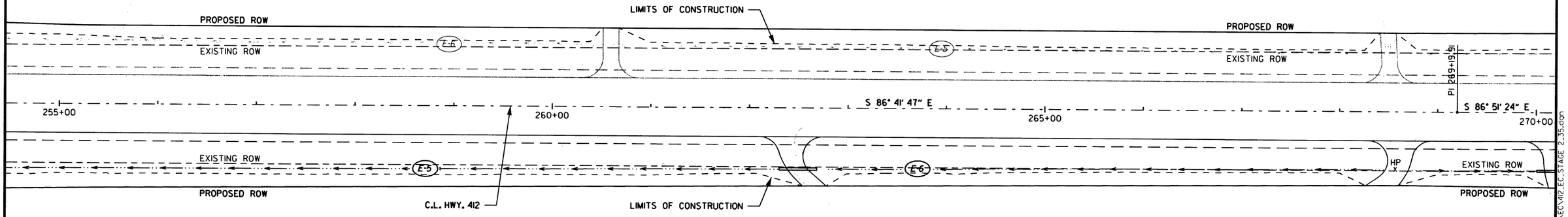
LEGEND

- (E-11) SILT FENCE
- (E-5) SAND DITCH CHECKS
- (E-6) ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| (E-5) | SAND BAG DITCH CHECKS | 3 EA |
| (E-6) | ROCK DITCH CHECKS | 3 EA |
| (E-11) | SILT FENCE | 0 LF |
| EROSION CONTROL DEVICES-STAGE 1 | | RETAIN |
| (E-5) | SAND BAG DITCH CHECKS | 3 EA |
| (E-6) | ROCK DITCH CHECKS | 3 EA |
| (E-11) | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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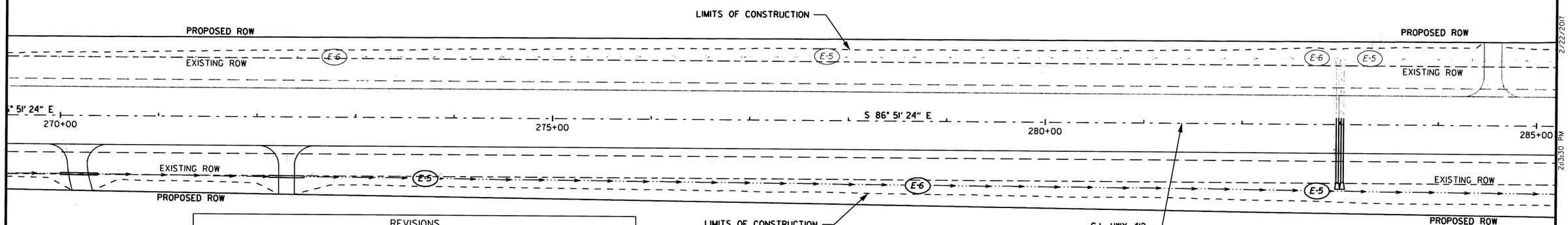
| | | | | JOB NO. | | CA1003 | 74 | 503 |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

② TEMPORARY EROSION CONTROL DETAILS




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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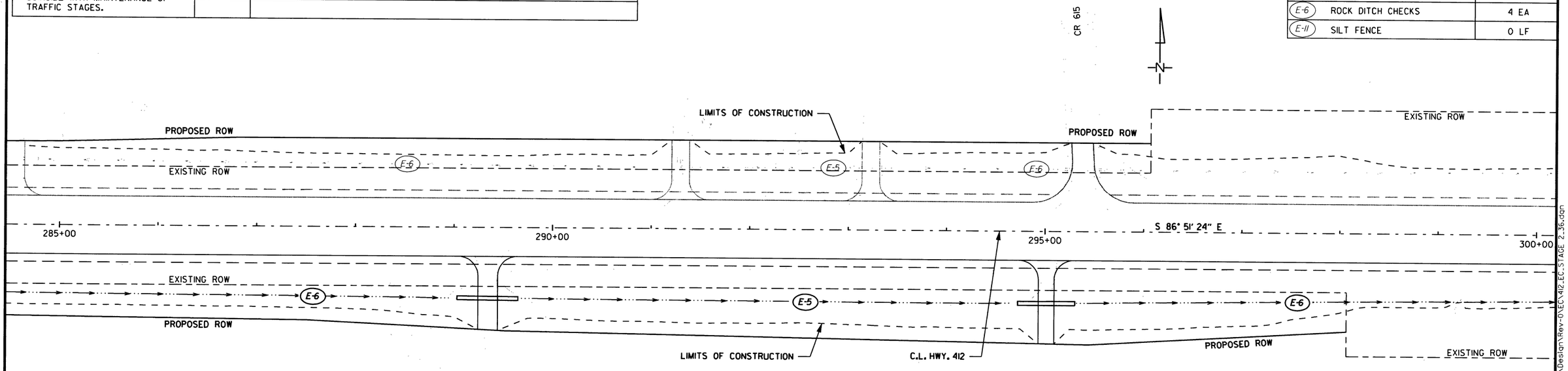
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | INSTALL |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 3 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | **RETAIN** |
| E-5 SAND BAG DITCH CHECKS | 3 EA |
| E-6 ROCK DITCH CHECKS | 4 EA |
| E-11 SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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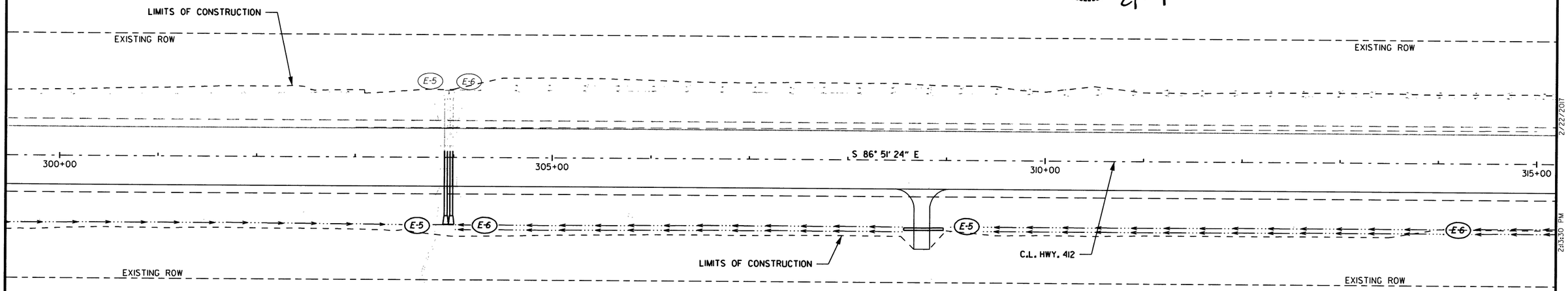
| JOB NO. | | CA1003 | 75 | 503 |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

# ② TEMPORARY EROSION CONTROL DETAILS

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LEGEND

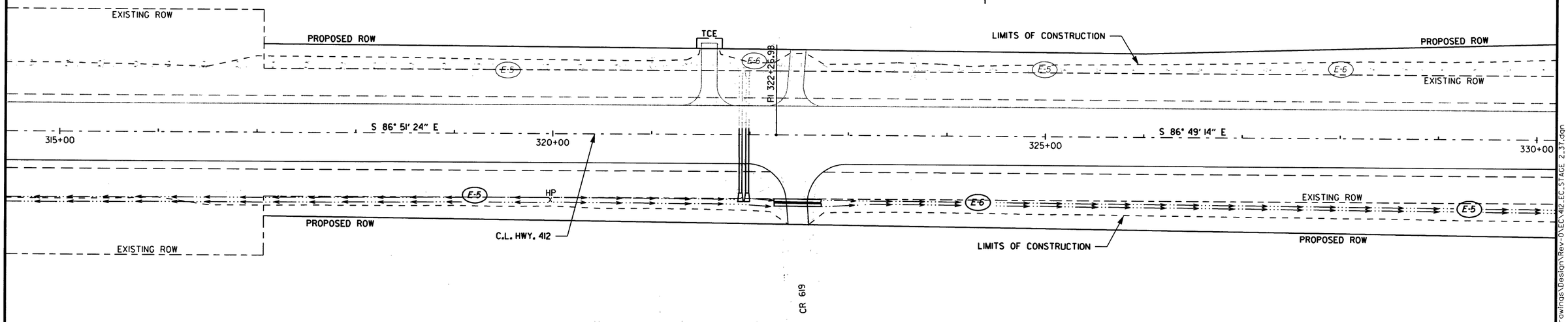
- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | INSTALL |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 4 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 1 | RETAIN |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 3 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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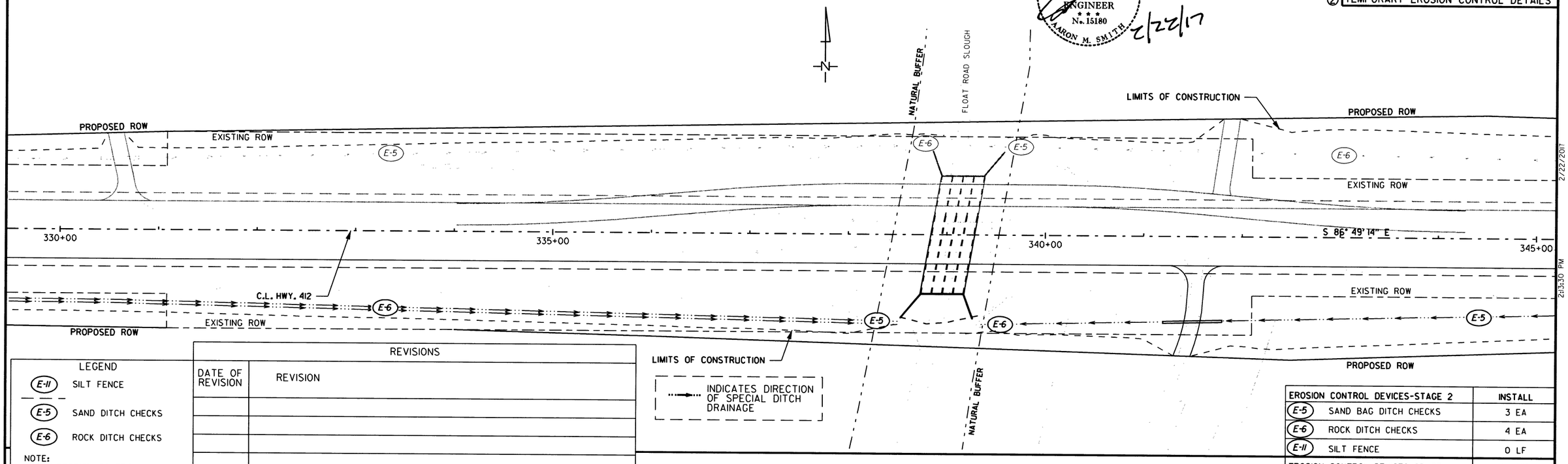
| | | | | JOB NO. | | CA1003 | 76 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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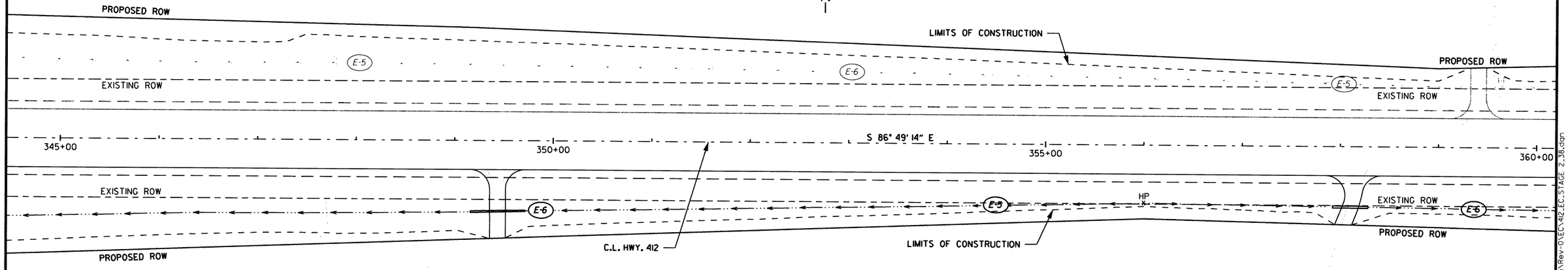
| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | | **RETAIN** |
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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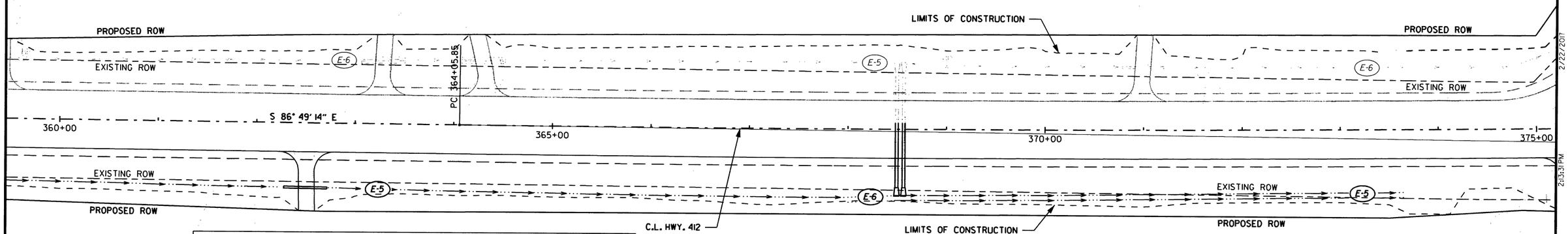
| JOB NO. | | CA1003 | 77 | 503 |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

# ② TEMPORARY EROSION CONTROL DETAILS




| LEGEND | |
|---|---|
| E-11 | SILT FENCE |
| E-5 | SAND DITCH CHECKS |
| E-6 | ROCK DITCH CHECKS |

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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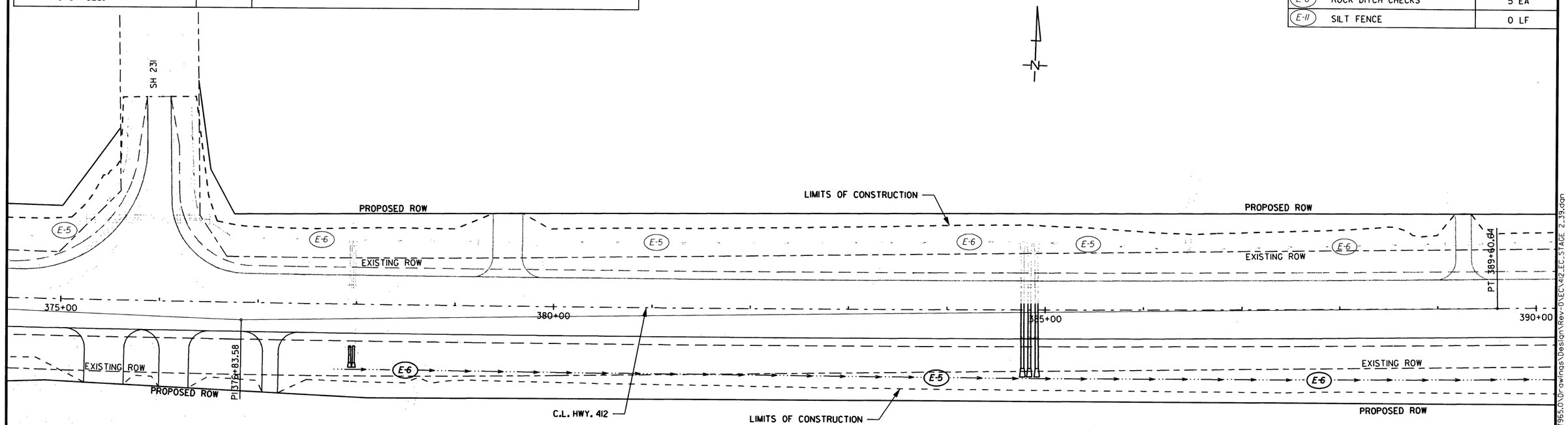
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | | **RETAIN** |
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 5 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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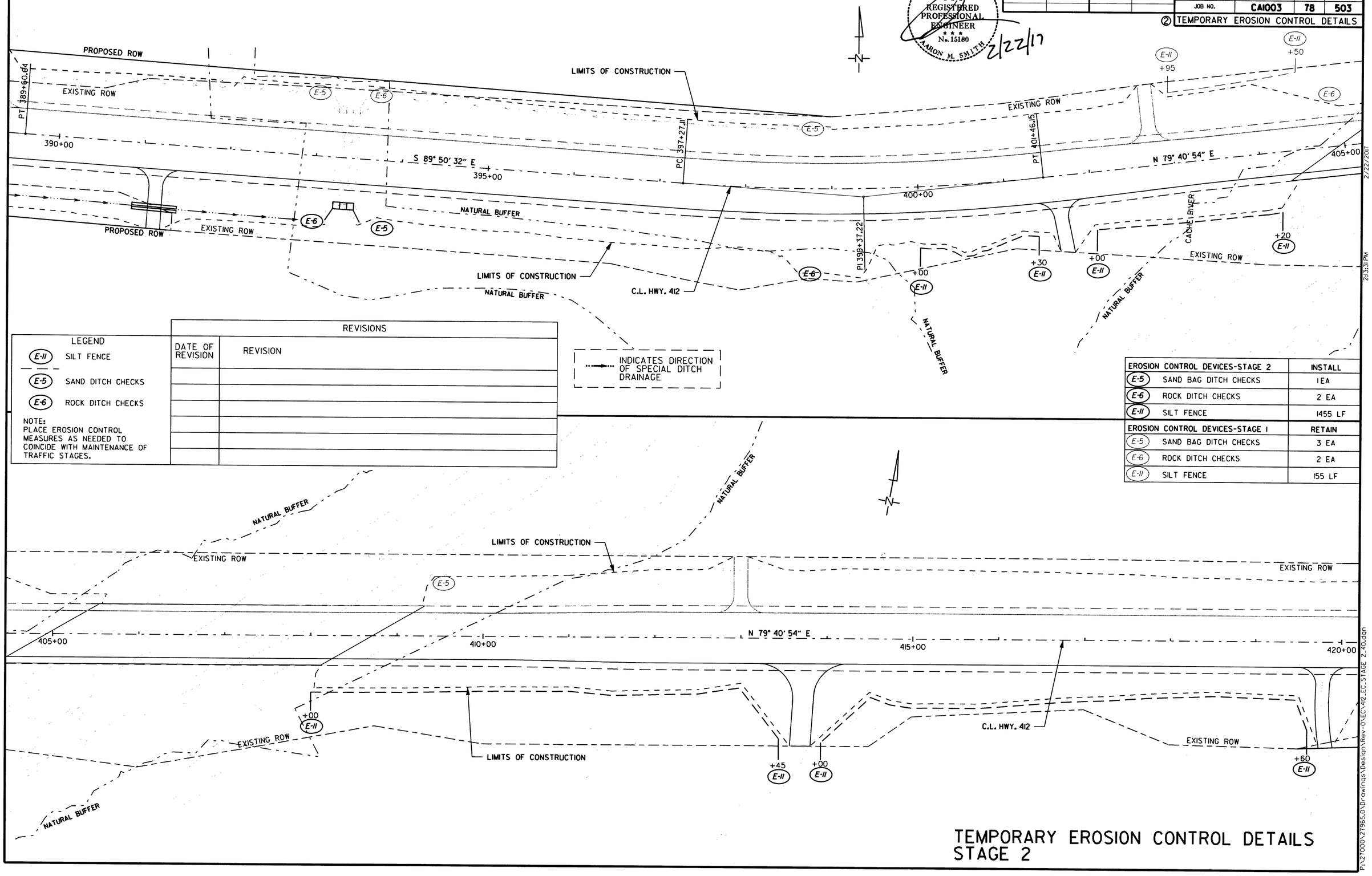
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 78 | 503 |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

# ② TEMPORARY EROSION CONTROL DETAILS




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 1 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 1455 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | | **RETAIN** |
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 155 LF |

# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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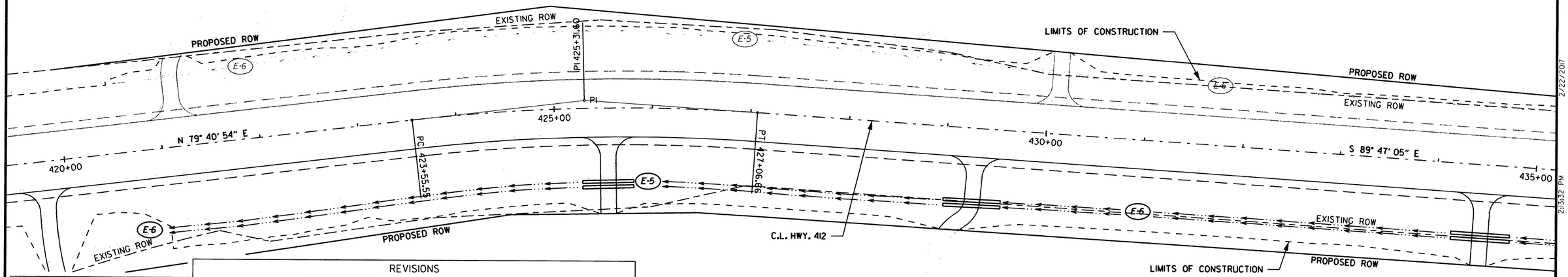
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 79 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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LEGEND

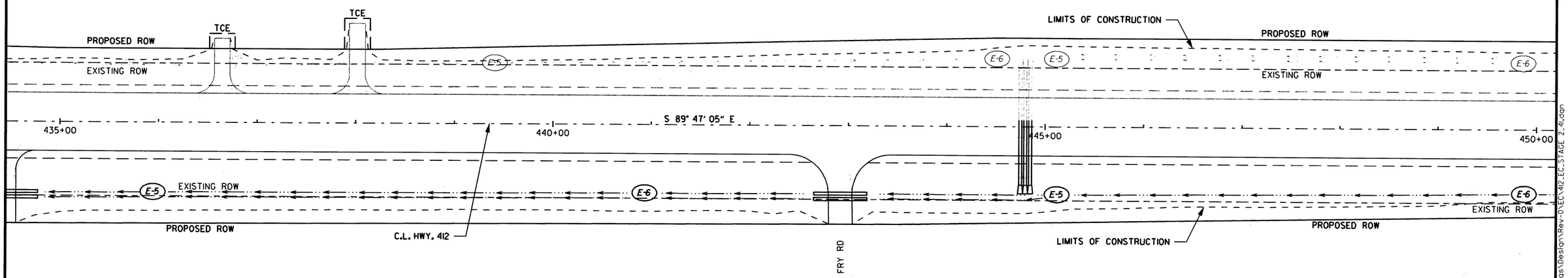
- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 1 | | RETAIN |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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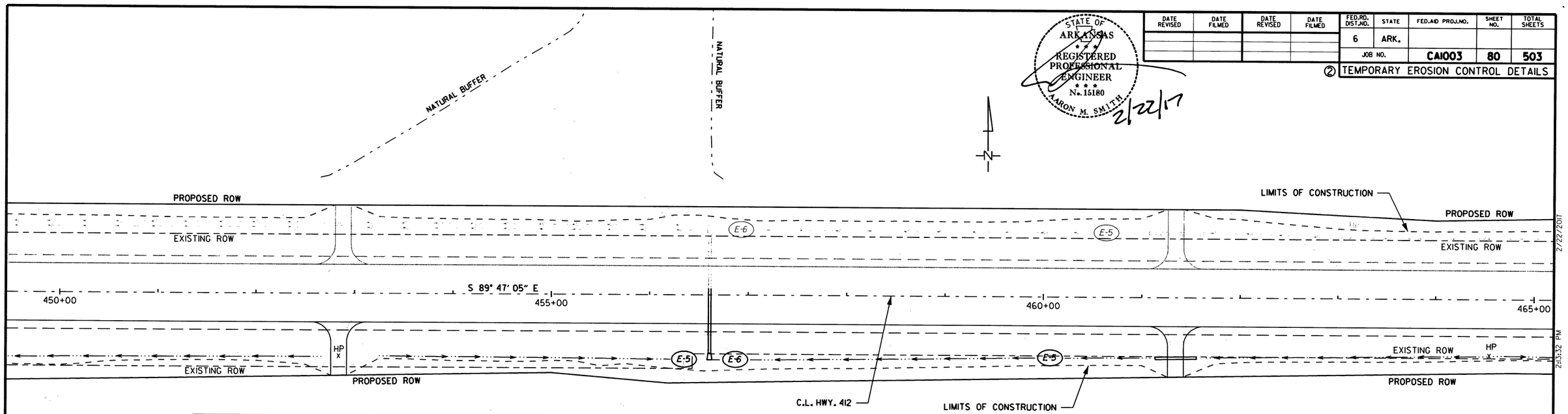
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 80 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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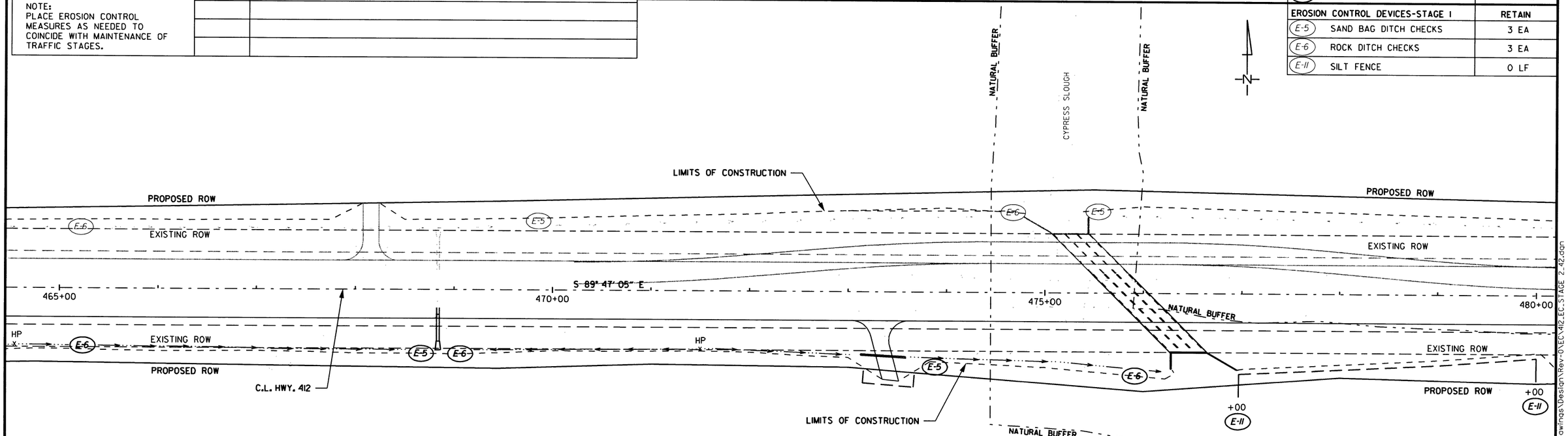
LEGEND

- (E-11) SILT FENCE
- (E-5) SAND DITCH CHECKS
- (E-6) ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | INSTALL |
|---|---|
| (E-5) SAND BAG DITCH CHECKS | 4 EA |
| (E-6) ROCK DITCH CHECKS | 4 EA |
| (E-11) SILT FENCE | 300 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | **RETAIN** |
| (E-5) SAND BAG DITCH CHECKS | 3 EA |
| (E-6) ROCK DITCH CHECKS | 3 EA |
| (E-11) SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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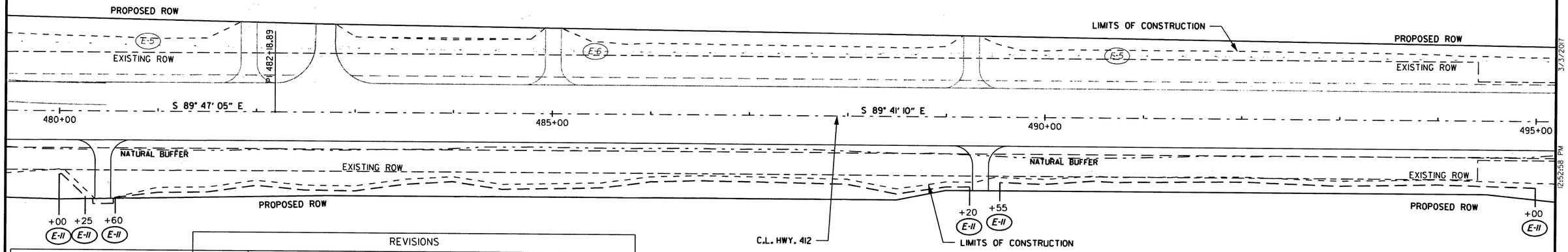
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 81 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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LEGEND

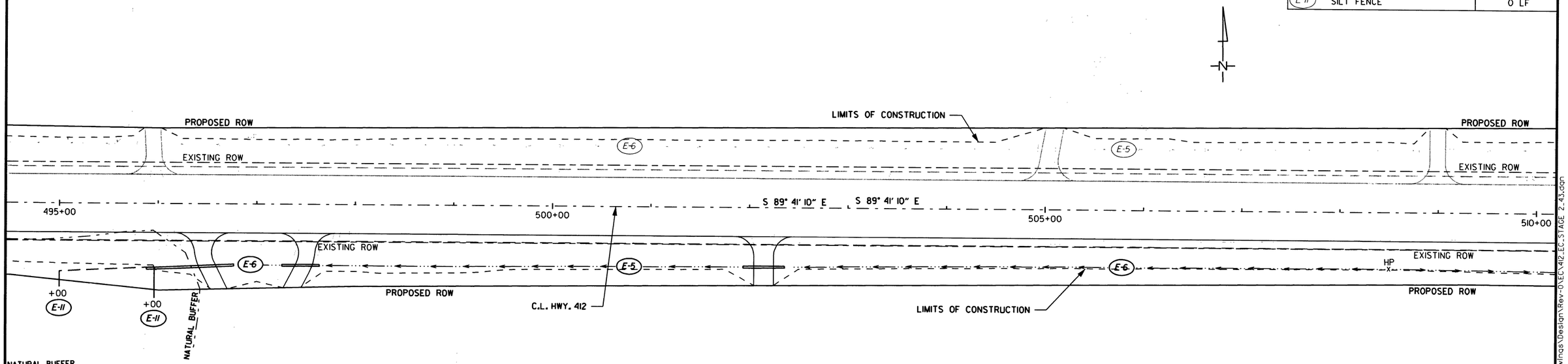
- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

NATURAL BUFFER

| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 1 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 1530 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | | **RETAIN** |
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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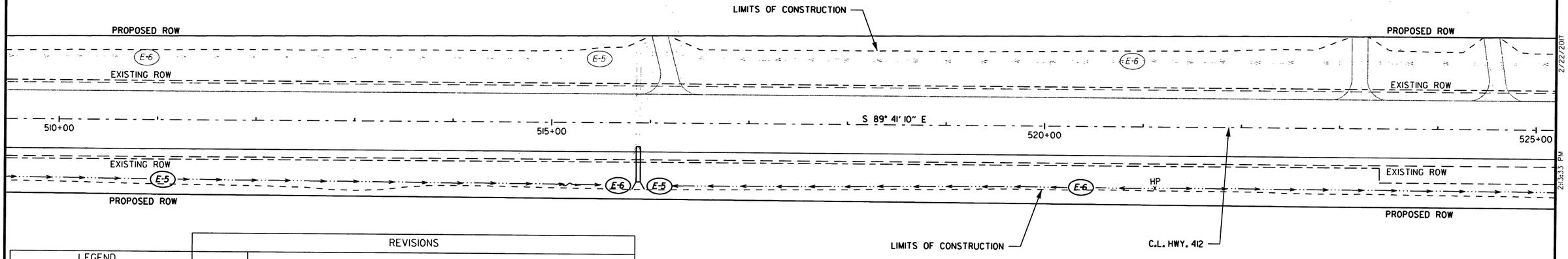
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 82 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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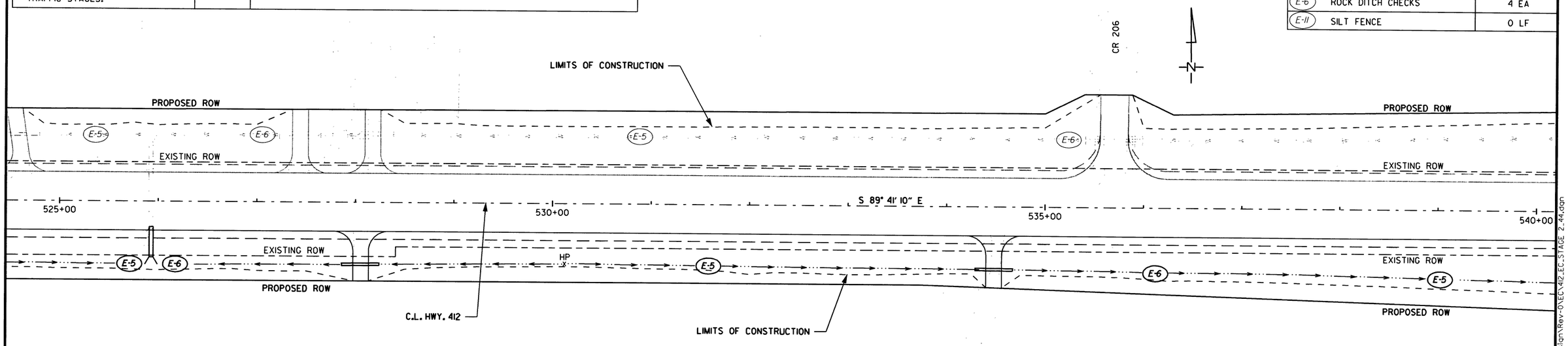
LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 5 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | | **RETAIN** |
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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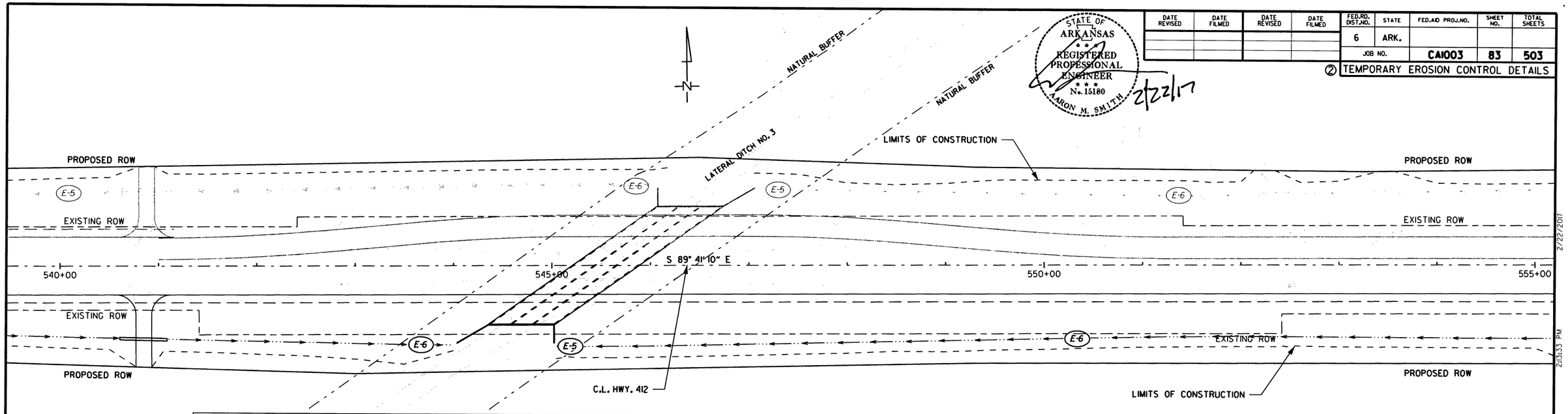
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 83 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

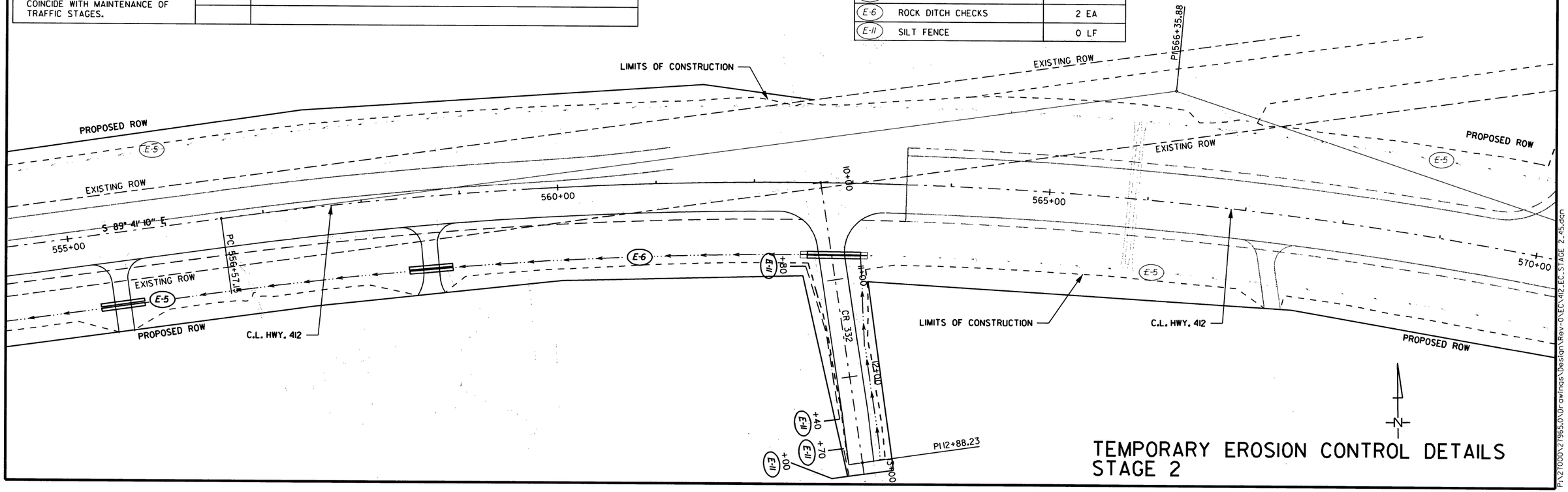
NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 2 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 190 LF |

| EROSION CONTROL DEVICES-STAGE 1 | | RETAIN |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 5 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 1 FOR STATIONS 563+54 TO 697+51 | | RETAIN |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 30 EA |
| E-6 | ROCK DITCH CHECKS | 31 EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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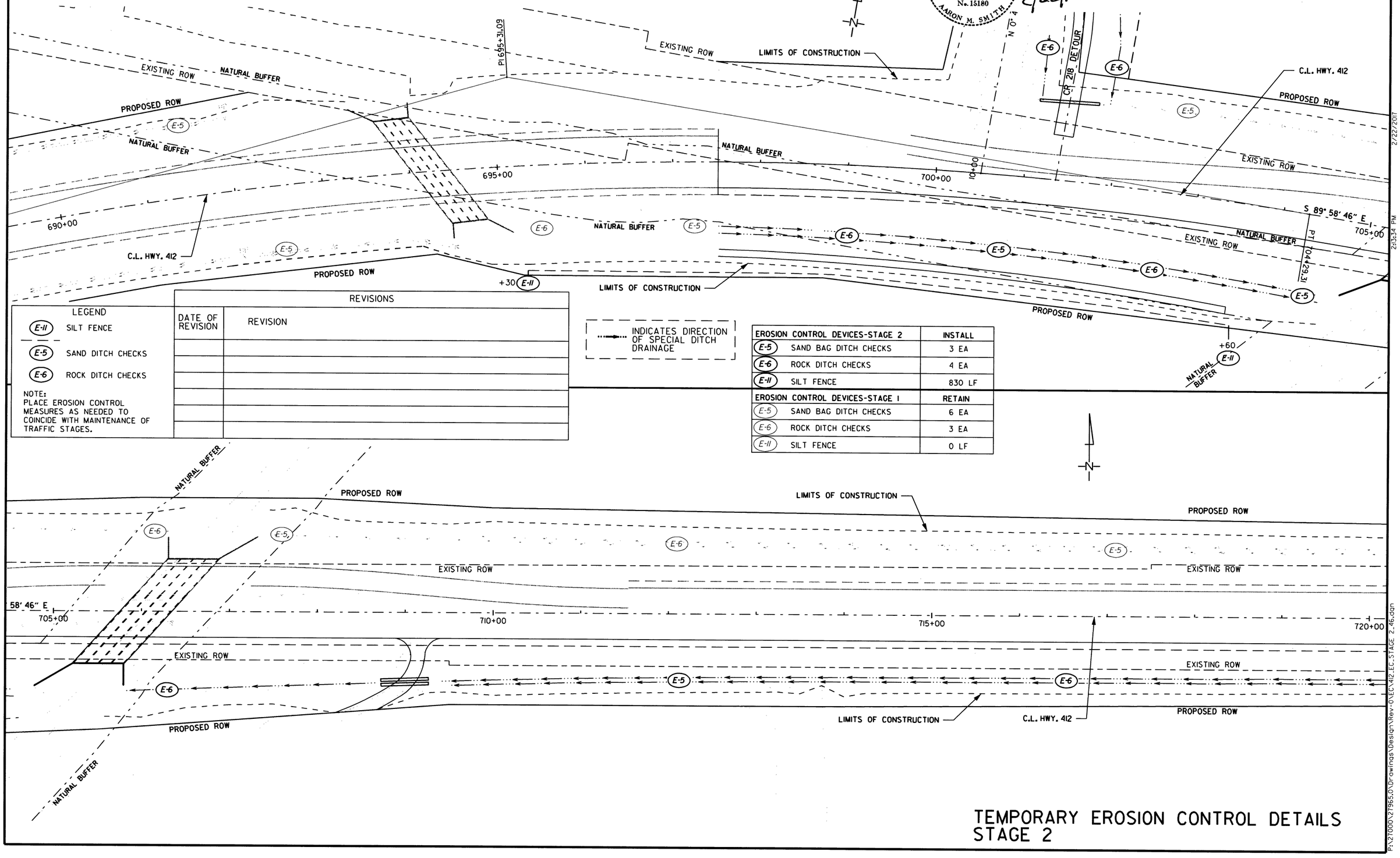
| | | | | JOB NO. | | CA1003 | 84 | 503 |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

# ② TEMPORARY EROSION CONTROL DETAILS




## LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 3 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 830 LF |

| EROSION CONTROL DEVICES-STAGE 1 | | RETAIN |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 6 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |

# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 85 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 2 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 0 LF |

LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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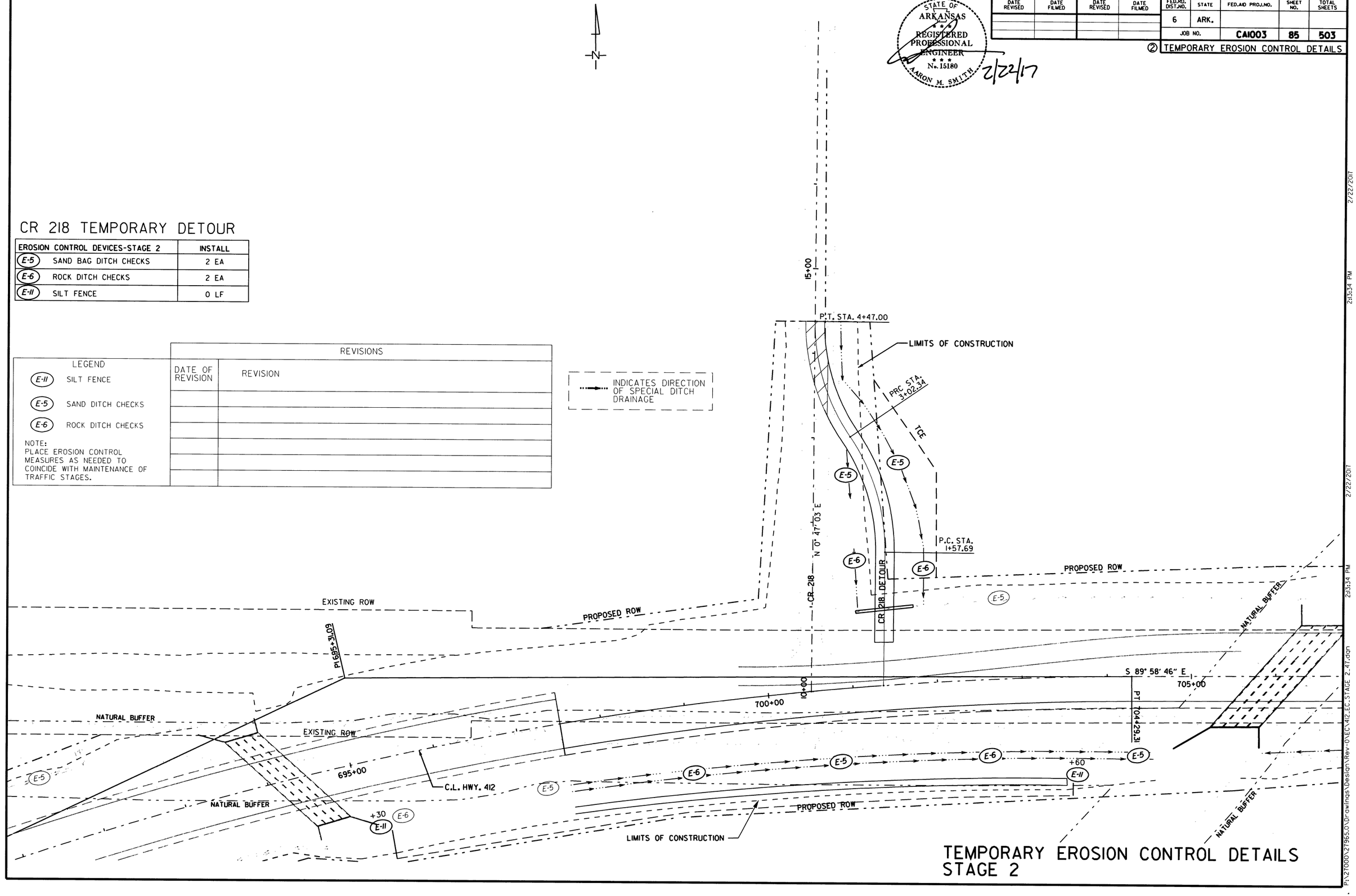
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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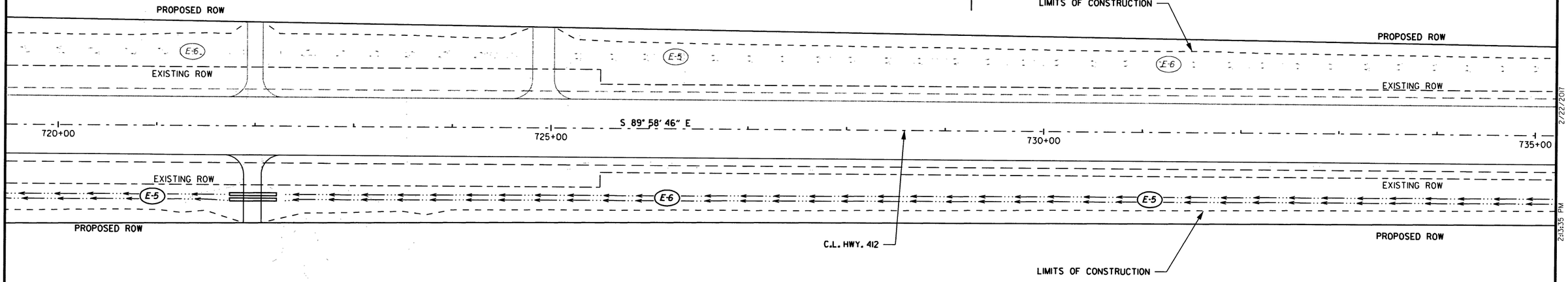
② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




| LEGEND | |
|---|---|
| E-11 | SILT FENCE |
| E-5 | SAND DITCH CHECKS |
| E-6 | ROCK DITCH CHECKS |

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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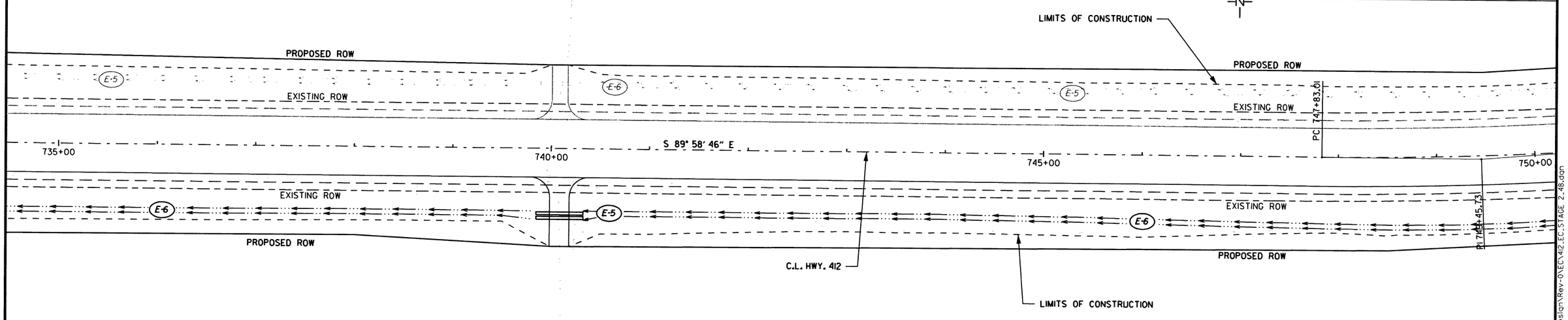
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | INSTALL |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 3 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | **RETAIN** |
| E-5 SAND BAG DITCH CHECKS | 3 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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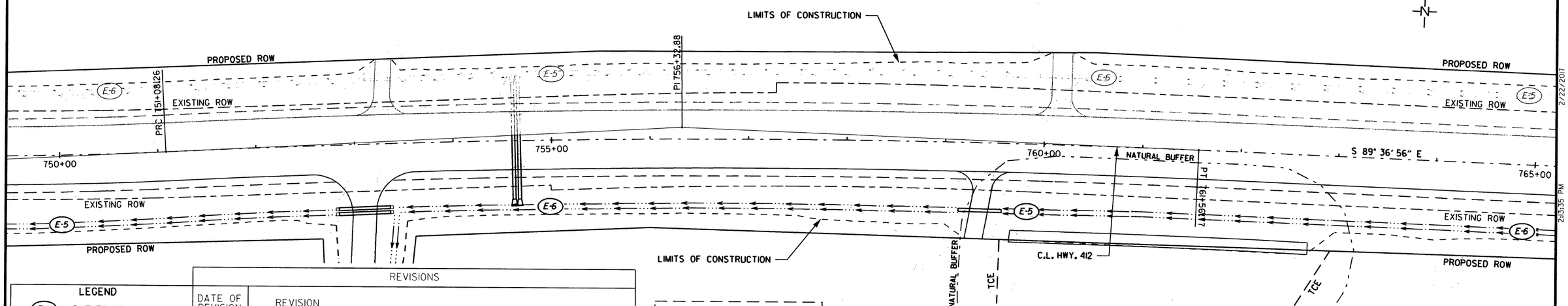
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 87 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

| | |
|---|---|
| E-11 | SILT FENCE |
| E-5 | SAND DITCH CHECKS |
| E-6 | ROCK DITCH CHECKS |

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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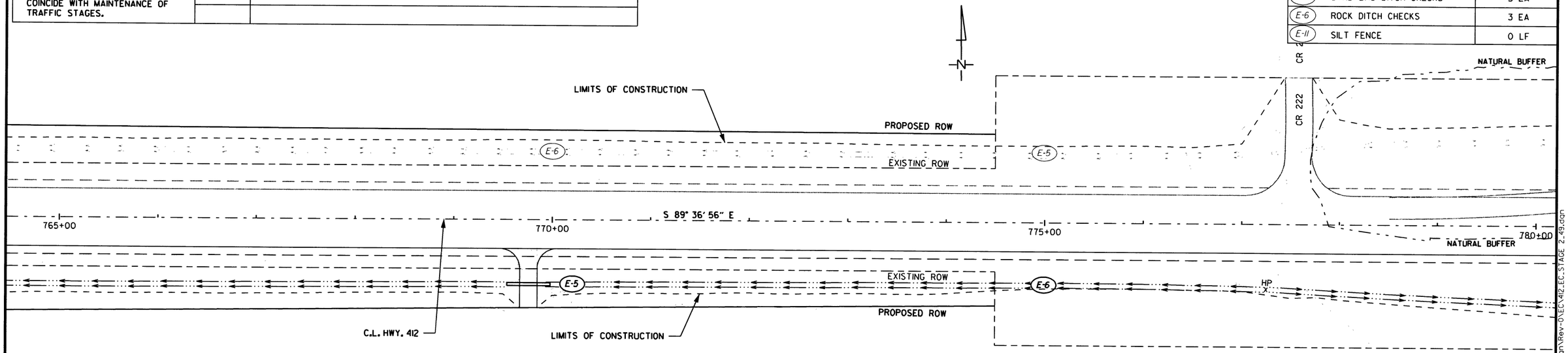
| EROSION CONTROL DEVICES-STAGE 2 | INSTALL |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 3 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 1 | RETAIN |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 3 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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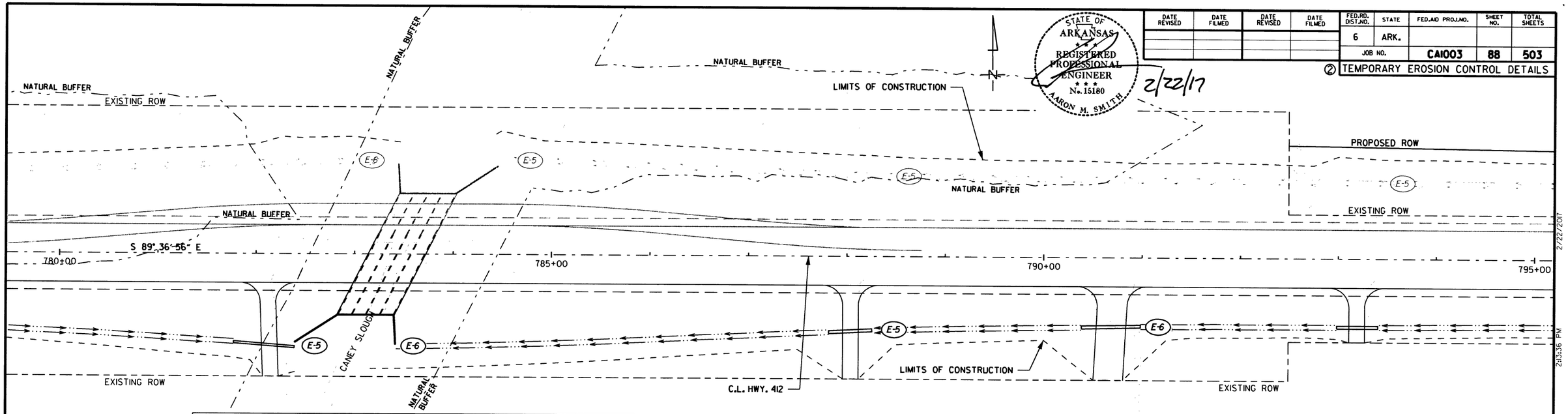
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 88 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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LEGEND

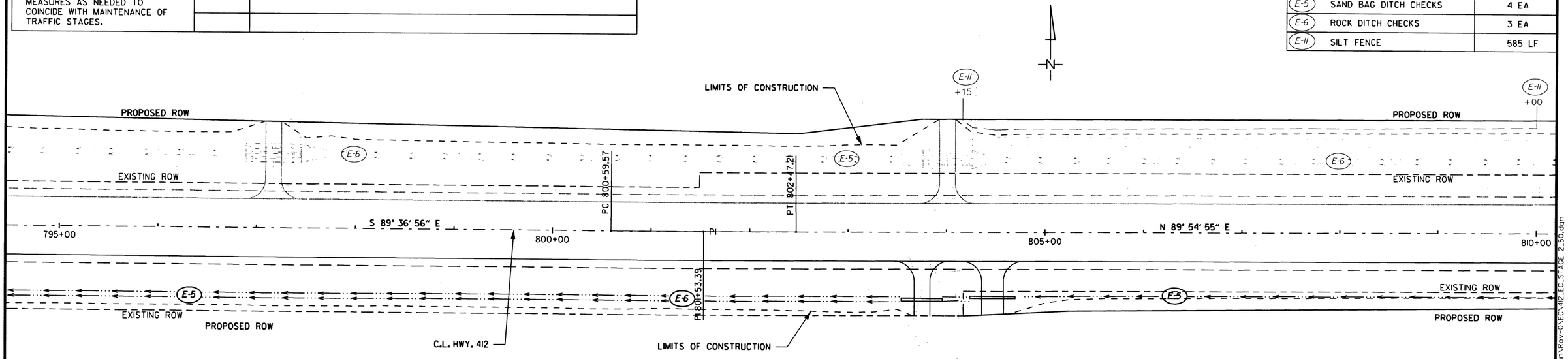
- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | INSTALL |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 4 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 1 | RETAIN |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 4 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 585 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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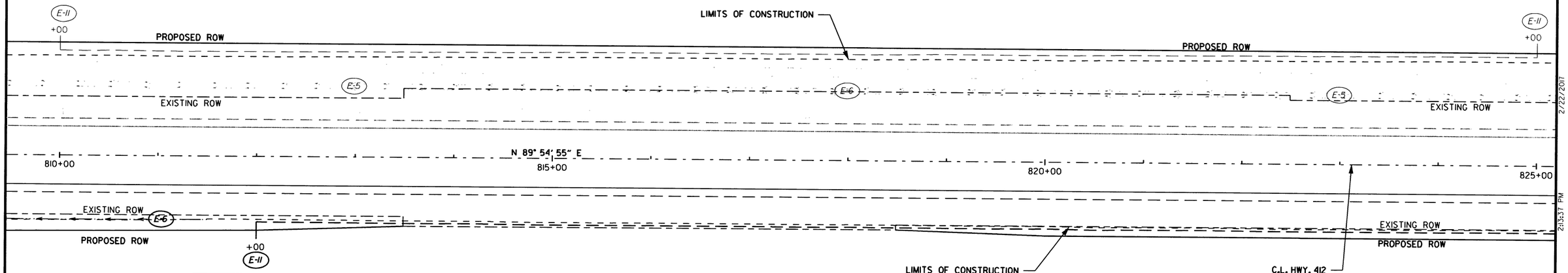
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 89 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/11

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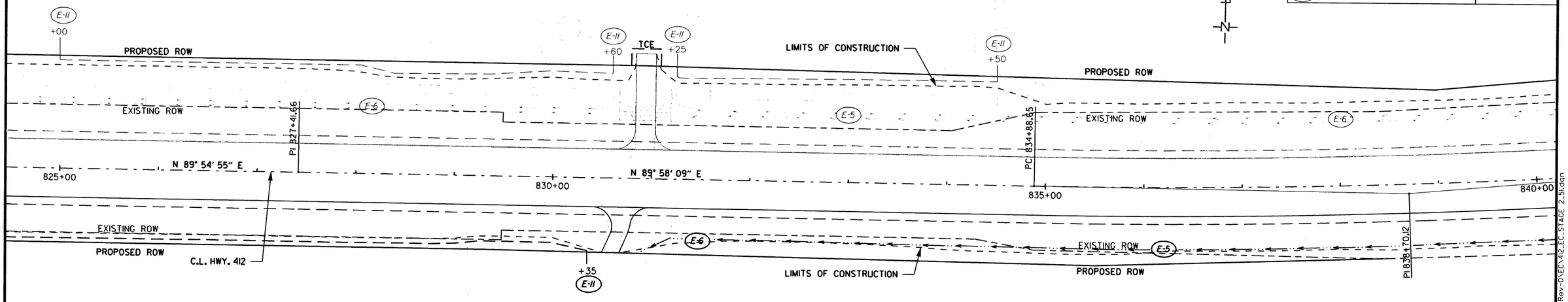
LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | INSTALL |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 1 EA |
| E-6 ROCK DITCH CHECKS | 2 EA |
| E-11 SILT FENCE | 1835 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | **RETAIN** |
| E-5 SAND BAG DITCH CHECKS | 3 EA |
| E-6 ROCK DITCH CHECKS | 3 EA |
| E-11 SILT FENCE | 2385 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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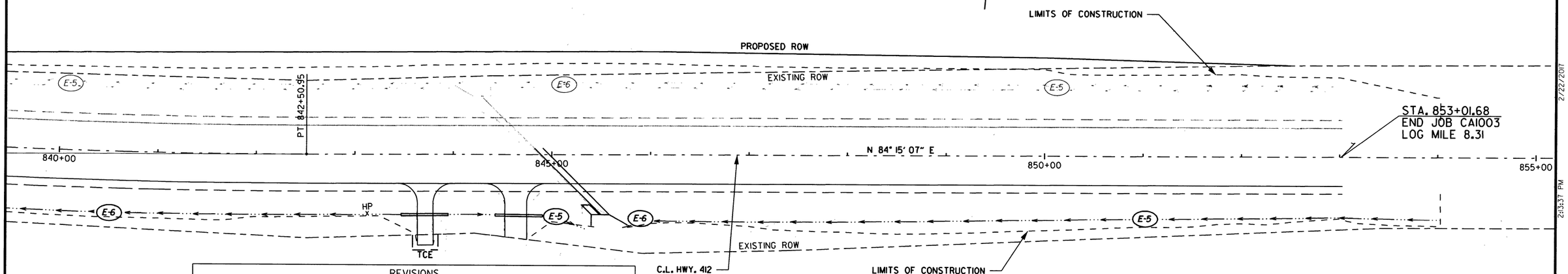
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 90 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 2 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 2** | | **RETAIN** |
| E-5 | SAND BAG DITCH CHECKS | 2 EA |
| E-6 | ROCK DITCH CHECKS | 1 EA |
| E-11 | SILT FENCE | 0 LF |

# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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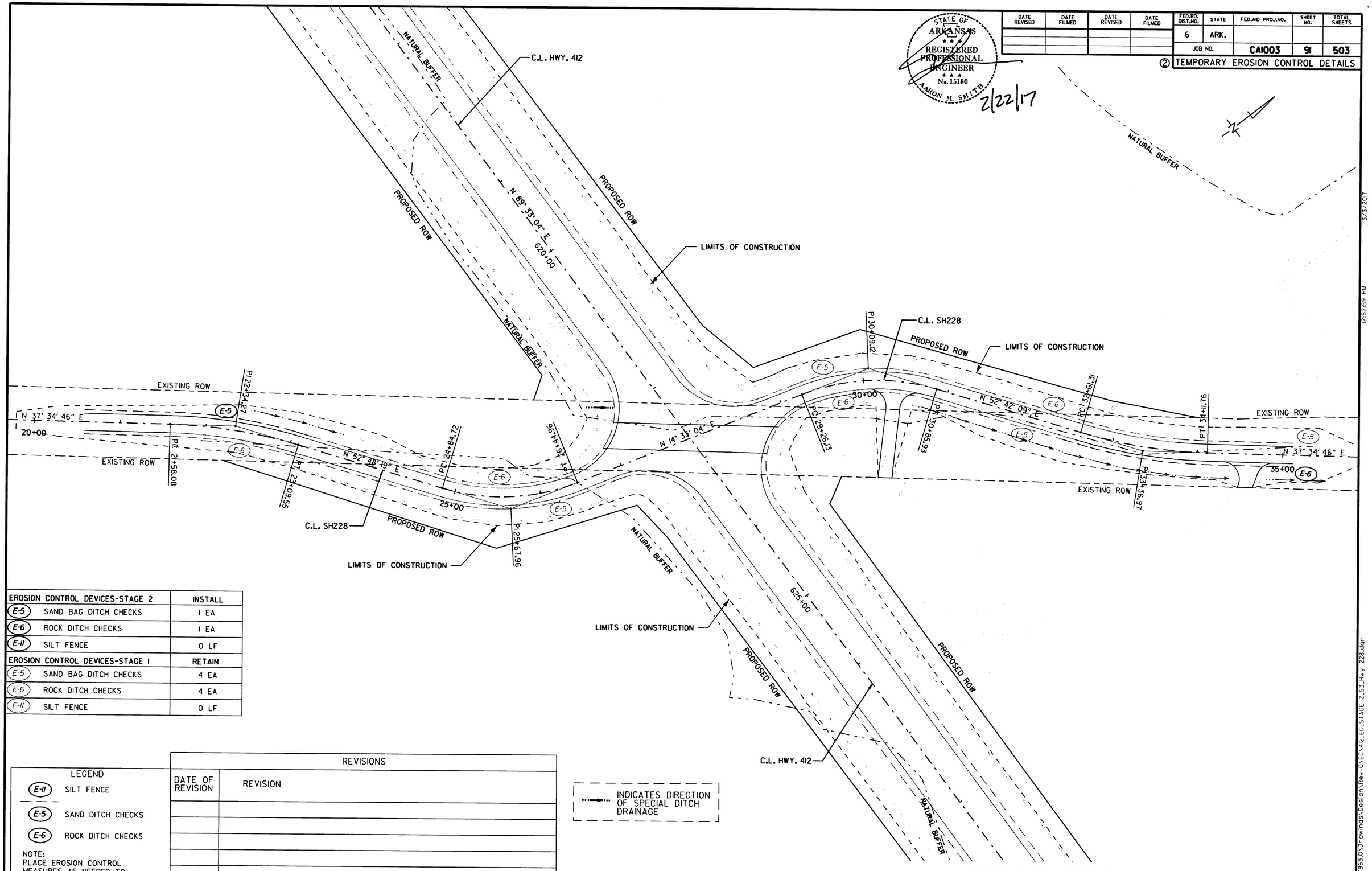
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 91 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




| EROSION CONTROL DEVICES-STAGE 2 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 1 EA |
| E-6 | ROCK DITCH CHECKS | 1 EA |
| E-11 | SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 1** | | **RETAIN** |
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 4 EA |
| E-11 | SILT FENCE | 0 LF |

LEGEND

E-11 SILT FENCE

E-5 SAND DITCH CHECKS

E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

# TEMPORARY EROSION CONTROL DETAILS STAGE 2

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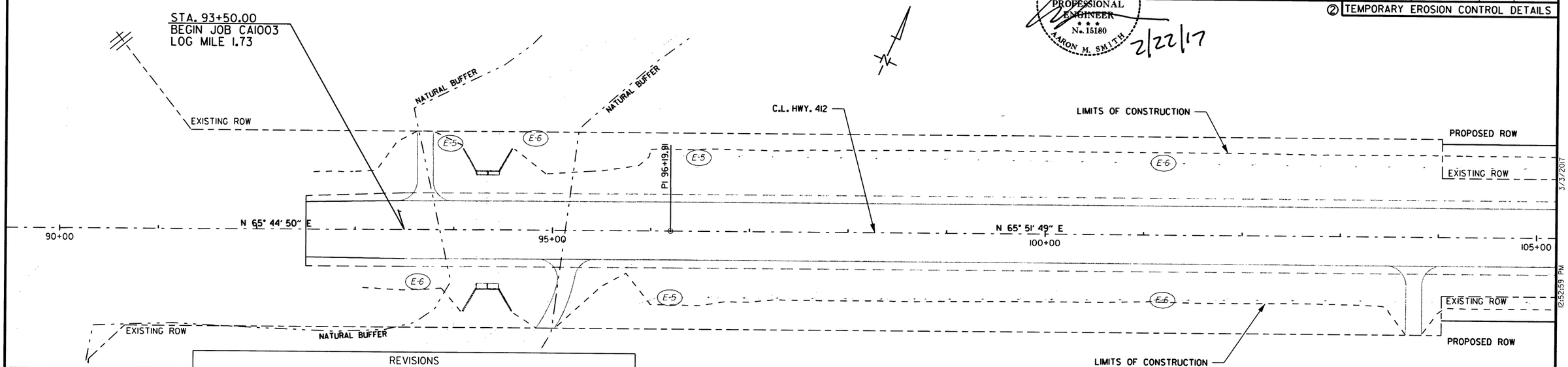
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 92 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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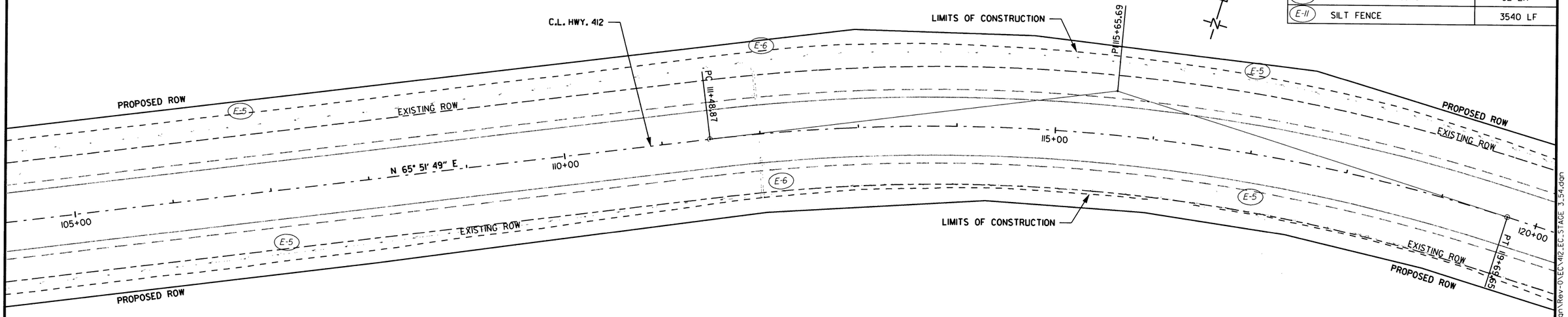
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 2 | RETAIN |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 7 EA |
| E-6 ROCK DITCH CHECKS | 6 EA |
| E-11 SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 1 FOR STATIONS 120+00 TO 540+00 | RETAIN |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 88 EA |
| E-6 ROCK DITCH CHECKS | 92 EA |
| E-11 SILT FENCE | 3540 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 3

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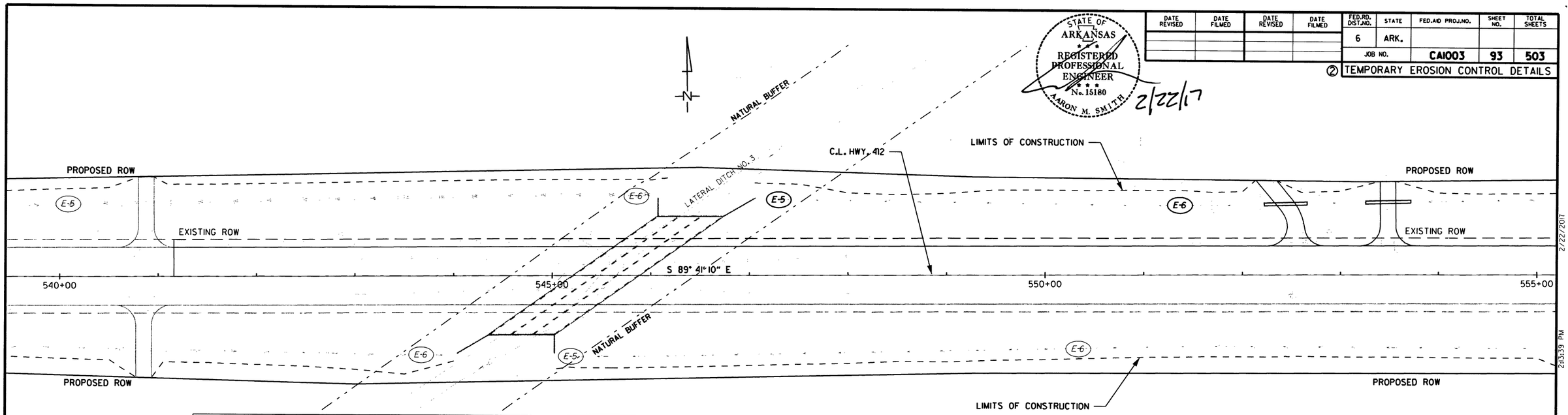
| | | | | JOB NO. | | CA1003 | 93 | 503 |

# ② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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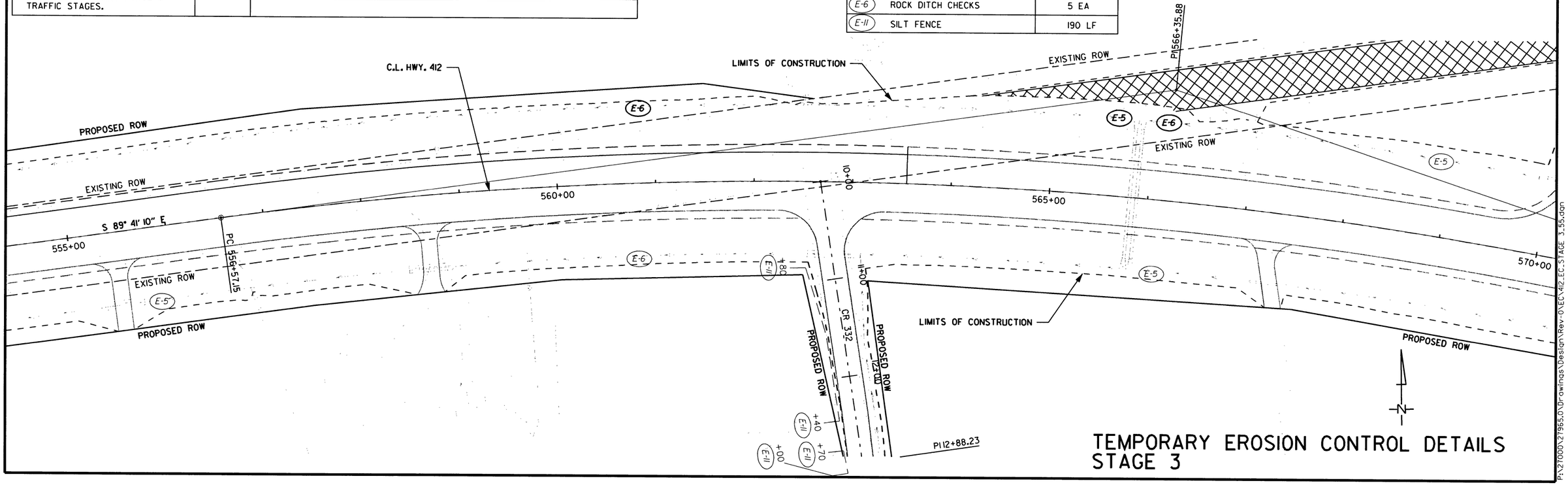
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 3 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 2 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 2 | | RETAIN |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 7 EA |
| E-6 | ROCK DITCH CHECKS | 5 EA |
| E-11 | SILT FENCE | 190 LF |

| EROSION CONTROL DEVICES-STAGE 1 FOR STATIONS 563+54 TO 697+51 | | RETAIN |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 30 EA |
| E-6 | ROCK DITCH CHECKS | 31EA |
| E-11 | SILT FENCE | 0 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 3

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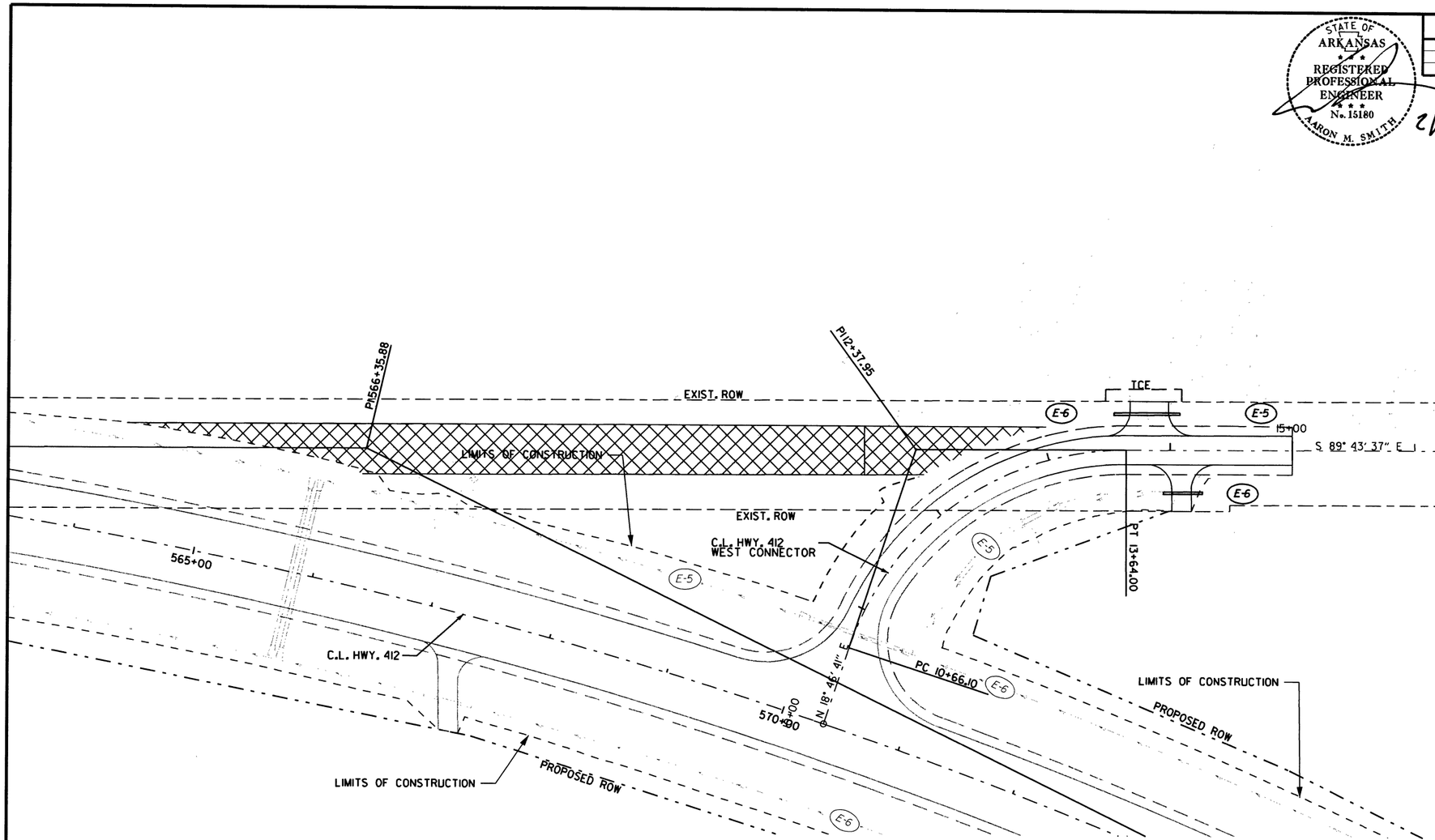
| JOB NO. | | CA1003 | 94 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




HWY 412 WEST CONNECTOR

HWY 412 WEST CONNECTOR ONLY

| EROSION CONTROL DEVICES-STAGE 1 | RETAIN |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 1 EA |
| E-6 ROCK DITCH CHECKS | 0 EA |
| E-11 SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 2** | **RETAIN** |
| E-5 SAND BAG DITCH CHECKS | 0 EA |
| E-6 ROCK DITCH CHECKS | 0 EA |
| E-11 SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 3 | INSTALL |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 1 EA |
| E-6 ROCK DITCH CHECKS | 2 EA |
| E-11 SILT FENCE | 0 LF |

LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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INDICATES DIRECTION OF DITCH DRAINAGE

# TEMPORARY EROSION CONTROL DETAILS STAGE 3

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| | | | | 6 | ARK. | | | |
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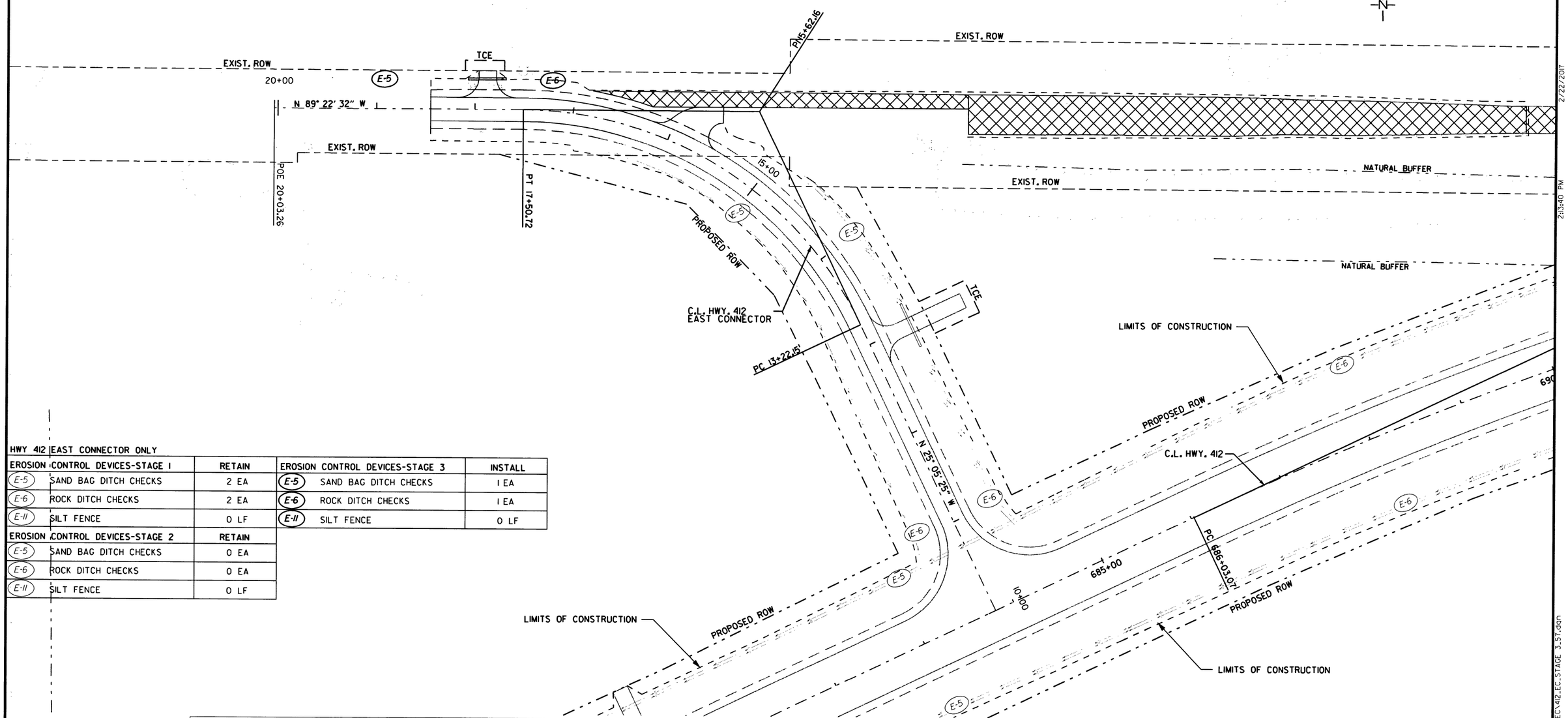
② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




HWY 412 EAST CONNECTOR ONLY

| EROSION CONTROL DEVICES-STAGE 1 | | RETAIN |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 2 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 2** | | **RETAIN** |
| E-5 | SAND BAG DITCH CHECKS | 0 EA |
| E-6 | ROCK DITCH CHECKS | 0 EA |
| E-11 | SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 3 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 1 EA |
| E-6 | ROCK DITCH CHECKS | 1 EA |
| E-11 | SILT FENCE | 0 LF |

LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

# HWY 412 EAST CONNECTOR

# TEMPORARY EROSION CONTROL DETAILS STAGE 3

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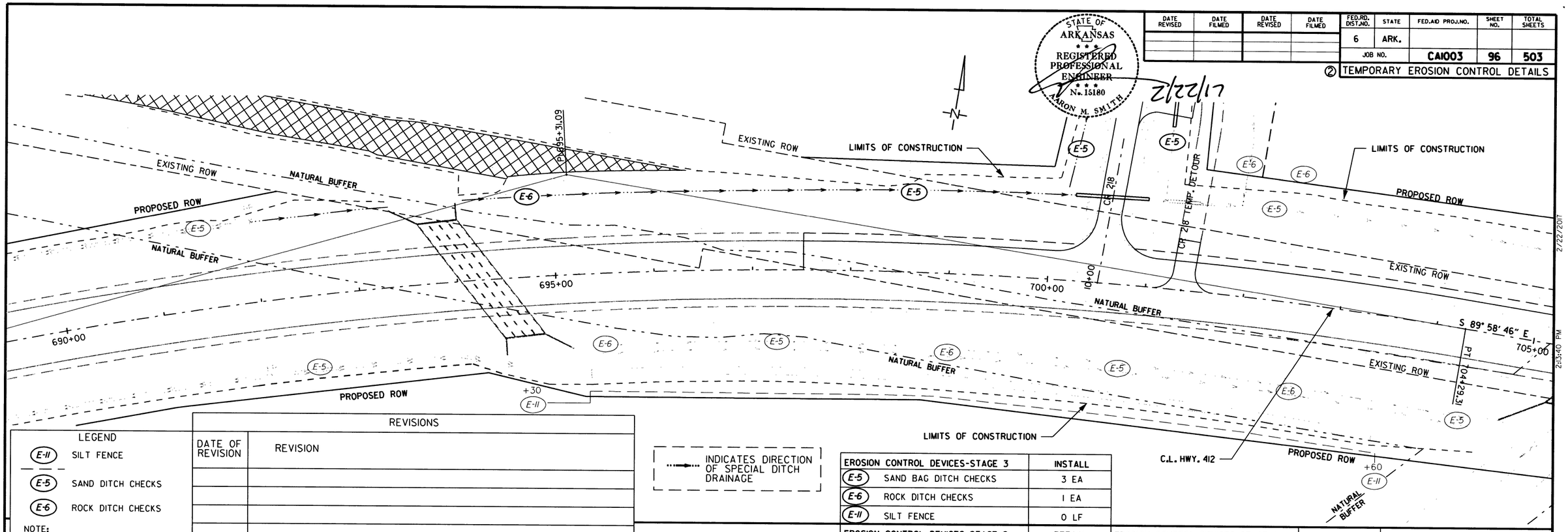
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 96 | 503 |

# ② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

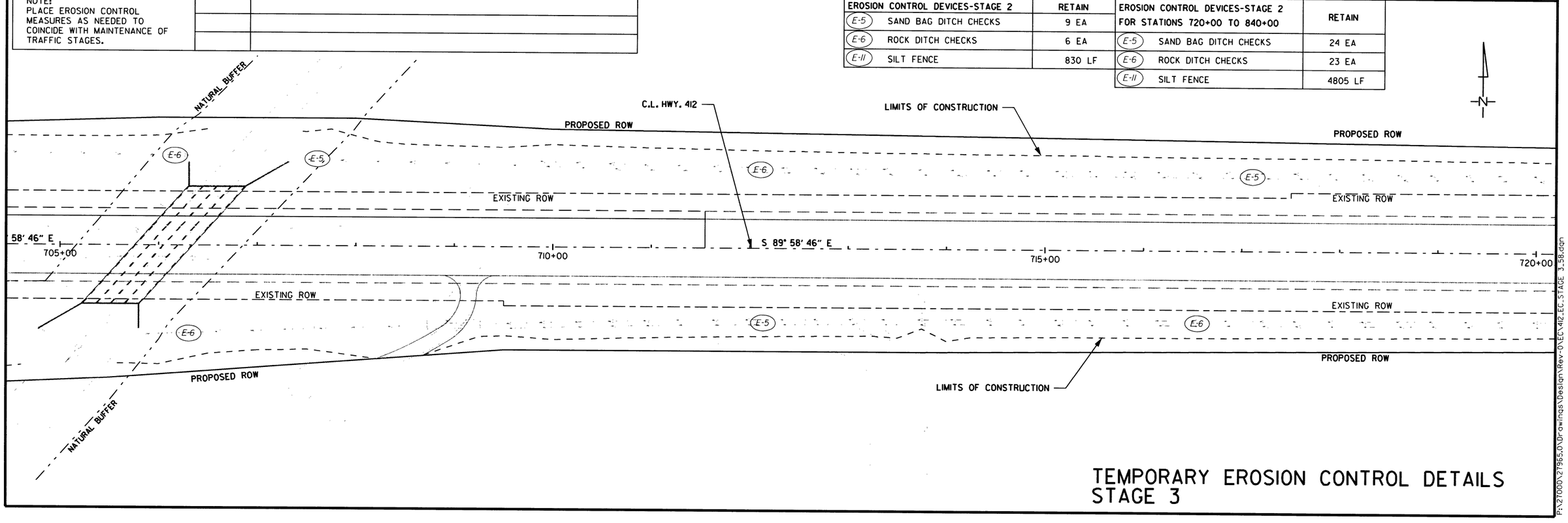
NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 3 | INSTALL |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 3 EA |
| E-6 ROCK DITCH CHECKS | 1 EA |
| E-11 SILT FENCE | 0 LF |

| EROSION CONTROL DEVICES-STAGE 2 | RETAIN |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 9 EA |
| E-6 ROCK DITCH CHECKS | 6 EA |
| E-11 SILT FENCE | 830 LF |

| EROSION CONTROL DEVICES-STAGE 2 FOR STATIONS 720+00 TO 840+00 | RETAIN |
|---|---|
| E-5 SAND BAG DITCH CHECKS | 24 EA |
| E-6 ROCK DITCH CHECKS | 23 EA |
| E-11 SILT FENCE | 4805 LF |




# TEMPORARY EROSION CONTROL DETAILS STAGE 3

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② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

# CR 218 TEMPORARY DETOUR

| EROSION CONTROL DEVICES-STAGE 3 | | INSTALL |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 1 EA |
| E-6 | ROCK DITCH CHECKS | 1 EA |
| E-11 | SILT FENCE | 0 LF |
| **EROSION CONTROL DEVICES-STAGE 2** | | **RETAIN** |
| E-5 | SAND BAG DITCH CHECKS | 2 EA |
| E-6 | ROCK DITCH CHECKS | 2 EA |
| E-11 | SILT FENCE | 0 LF |

LEGEND

E-11 SILT FENCE

E-5 SAND DITCH CHECKS

E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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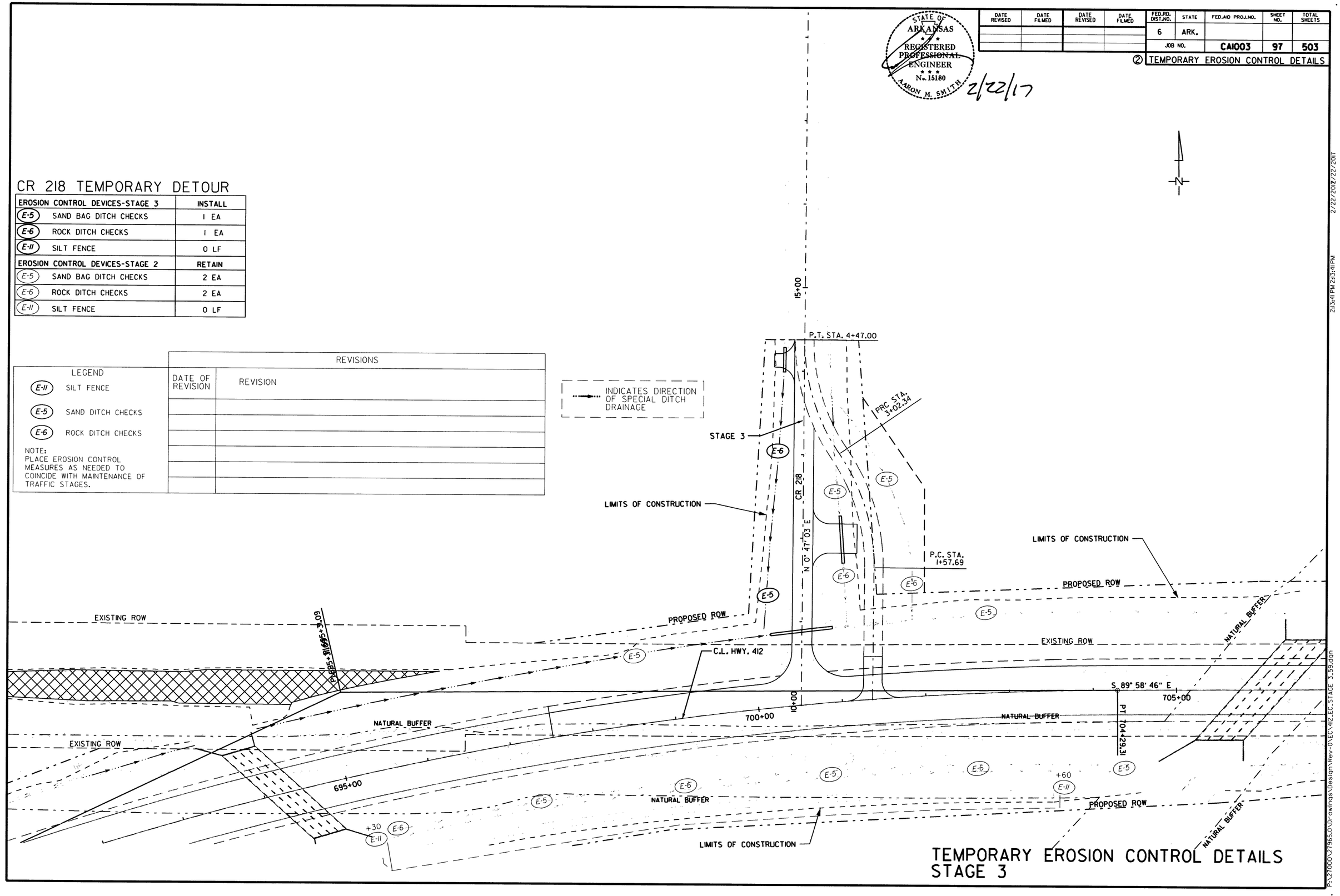
INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE




TEMPORARY EROSION CONTROL DETAILS
STAGE 3

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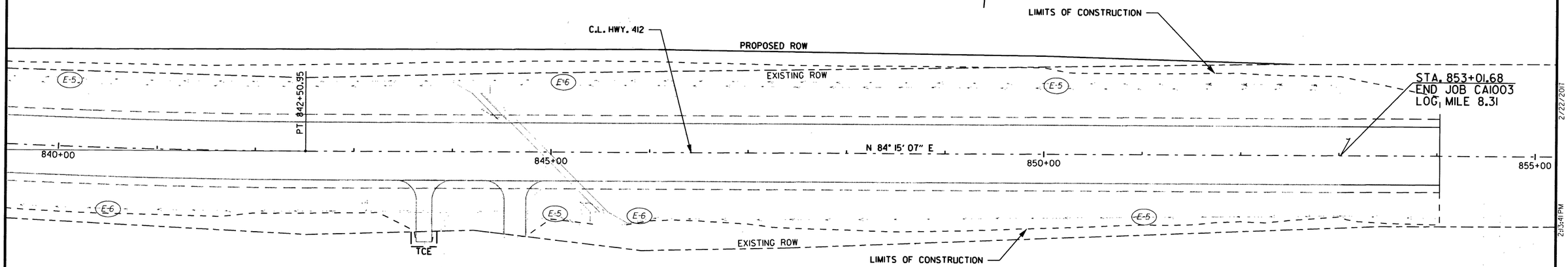
| | | | | JOB NO. | | CA1003 | 98 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

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INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

| EROSION CONTROL DEVICES-STAGE 3 | | RETAIN |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 4 EA |
| E-6 | ROCK DITCH CHECKS | 3 EA |
| E-11 | SILT FENCE | 0 LF |

TEMPORARY EROSION CONTROL DETAILS
STAGE 3

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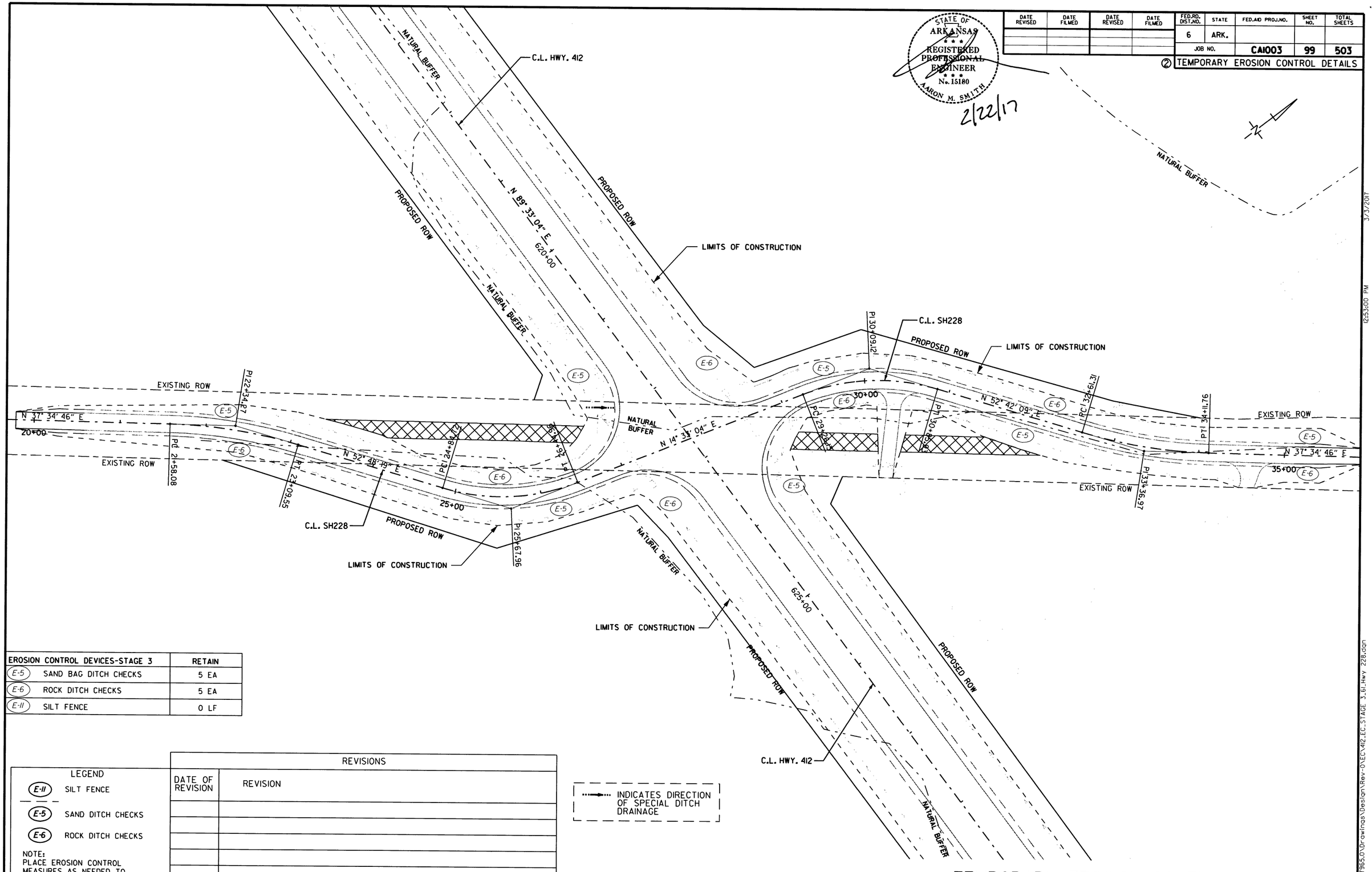
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 99 | 503 |

② TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




| EROSION CONTROL DEVICES-STAGE 3 | | RETAIN |
|---|---|---|
| E-5 | SAND BAG DITCH CHECKS | 5 EA |
| E-6 | ROCK DITCH CHECKS | 5 EA |
| E-11 | SILT FENCE | 0 LF |

LEGEND

- E-11 SILT FENCE
- E-5 SAND DITCH CHECKS
- E-6 ROCK DITCH CHECKS

NOTE:
PLACE EROSION CONTROL MEASURES AS NEEDED TO COINCIDE WITH MAINTENANCE OF TRAFFIC STAGES.

| REVISIONS | |
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INDICATES DIRECTION OF SPECIAL DITCH DRAINAGE

# TEMPORARY EROSION CONTROL DETAILS STAGE 3

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② MAINTENANCE OF TRAFFIC

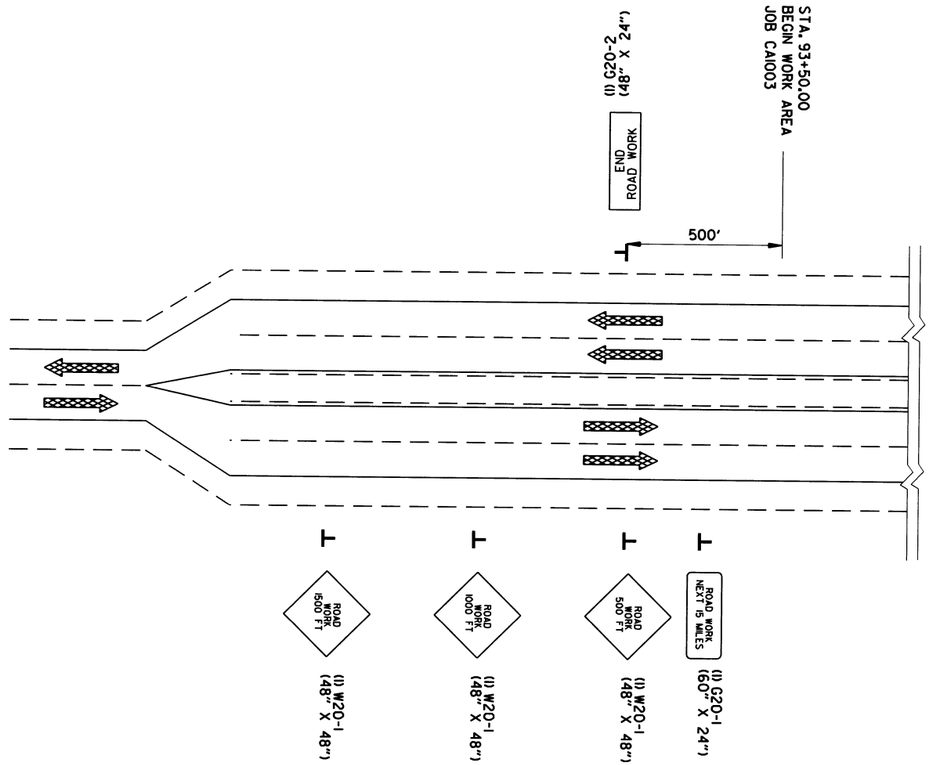
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
7/3/18

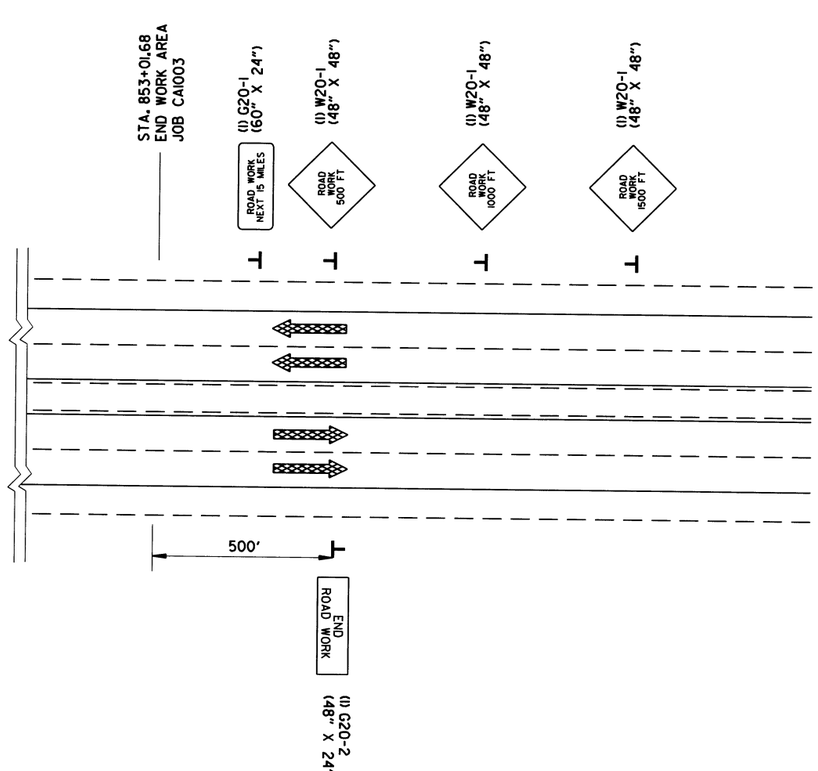
SHOULDER WORK (1) W21-5A (30" X 30")

LOW SHOULDER (1) W8-9A (36" X 36")

DO NOT PASS (1) R4-1 (24" X 30")

IF AND WHERE DIRECTED BY ENGINEER.




## ADVANCE SIGNS AT BEGINNING AND END OF JOB ALL STAGES

| CONSTRUCTION SIGNS FOR SIDE ROADS | |
|---|---|
| ROAD WORK AHEAD (W20-1) | 14 |

ROAD WORK AHEAD (14) W20-1 (48" X 48") SIDE ROADS

## MAINTENANCE OF TRAFFIC ADVANCE SIGNS AT JOB ENDS

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② MAINTENANCE OF TRAFFIC

SEQUENCE OF CONSTRUCTION NOTES:
STAGE 1:
APPLY LEVELING COURSE IF AND WHERE DIRECTED BY THE ENGINEER.
PLACE STAGE 1 CONSTRUCTION PAVEMENT MARKINGS, SIGNS, AND DEVICES.
WIDEN ROADWAY TO LT. STA. 93+50.00 TO STA. 541+00.06; STA. 711+54.53 TO STA. 853+01.68.
CONSTRUCT CULVERTS (SEE TYPICAL CULVERT INSTALLATION PLAN FOR STATION RANGES).
CONSTRUCT TEMPORARY PAVEMENT WIDENING TO LT. OF CENTER FROM STA. 551+25.62 TO STA. 563+54.86.
CONSTRUCT PORTIONS OF SH231 BY CLOSING ONE LANE AT A TIME. UTILIZE A FLAGGER DURING CONSTRUCTION.
CONSTRUCT BYPASS SECTION STA. 563+54.86 TO 697+51.76; WITH EXCEPTION OF SH228 INTERSECTION.
CONSTRUCT CONNECTOR PORTIONS SHOWN ON PLAN.
CONSTRUCT PORTIONS OF SH228 SHOWN ON PLAN.
DO NOT PLACE FINAL 2" SURFACE COURSE UNTIL STAGE 3.

STAGE 2:
APPLY LEVELING COURSE IF AND WHERE DIRECTED BY THE ENGINEER.
REMOVE UNUSED STAGE 1 CONSTRUCTION PAVEMENT MARKINGS AND DEVICES.
PLACE STAGE 2 CONSTRUCTION PAVEMENT MARKINGS, SIGNS, AND DEVICES.
SHIFT TRAFFIC TO LOCATION SHOWN ON TYPICAL SECTIONS.
COMPLETE ROADWAY ON RT. STA. 93+50.00 TO STA. 541+00.06; STA. 711+54.53 TO STA. 853+01.68.
COMPLETE ROADWAY ON RT. STA. STA. 551+25.62 TO STA. 563+54.86.
REMOVE BRIDGES/STRUCTURES AND COMPLETE CULVERT INSTALLATION AND ROADWAY OVER CULVERT TO RT.
CONSTRUCT CR218 DETOUR PAVEMENT.
CONSTRUCT SH228 ENDS AND HWY. 412/SH228 INTERSECTION UNDER SH228 TRAFFIC.
DO NOT PLACE FINAL 2" SURFACE COURSE UNTIL STAGE 3.

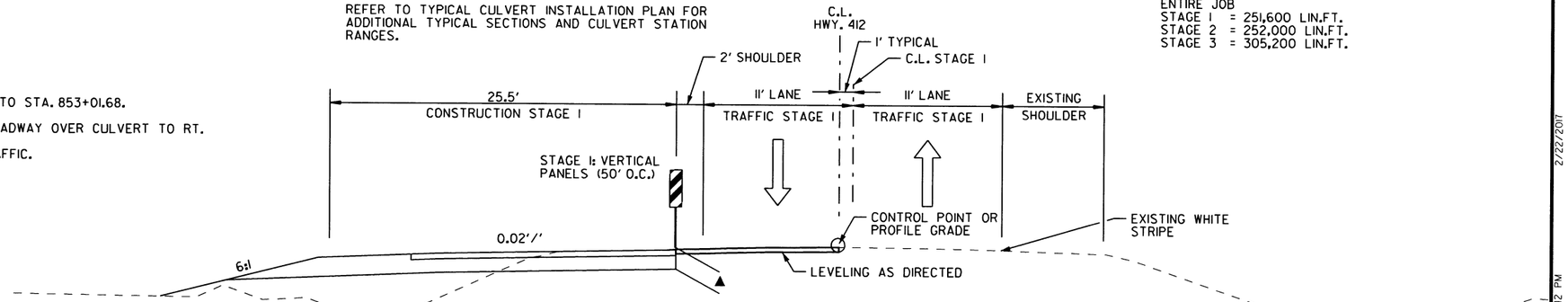
STAGE 3:
REMOVE UNUSED STAGE 2 CONSTRUCTION PAVEMENT MARKINGS AND DEVICES.
PLACE STAGE 3 CONSTRUCTION PAVEMENT MARKINGS, SIGNS, AND DEVICES.
OPEN NEW BYPASS STA. 563+54.86 TO 697+51.76.
COMPLETE ROADWAY ON LT. 551+25.62 TO STA. 563+54.86.
COMPLETE CR218 CONSTRUCTION.
COMPLETE ALL UNCONSTRUCTED ROADWAY PORTIONS.
CONSTRUCT REMAINING PORTIONS OF CONNECTORS.
OBLITERATE TERMINAL ENDS OF EXISTING HWY. 412.
OBLITERATE TEMPORARY DETOUR WIDENING AND FINALIZE CULVERT LOCATIONS.
PLACE FINAL 2" OF SURFACE COURSE.
PLACE PERMANENT PAVEMENT MARKINGS.
FINALIZE CONSTRUCTION.

NOTES:
THE QUANTITY OF VERTICAL PANELS PROVIDED IN THE CONTRACT IS FOR ONE SIDE OF THE ROADWAY FOR 2 MILES. THIS IS THE MAXIMUM QUANTITY REQUIRED TO ALLOW THE CONTRACTOR TO NOTCH ONE MILE. BACKFILL TO A POINT WHERE THE VERTICAL DIFFERENTIAL IS 4" OR LESS AND THEN NOTCH ANOTHER ONE-MILE SECTION. THIS IS THE MAXIMUM NUMBER OF VERTICAL PANELS THAT WILL BE PAID FOR. REFER TO SECTION 603.02 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION REQUIREMENTS.

REFER TO TYPICAL CULVERT INSTALLATION PLAN FOR ADDITIONAL TYPICAL SECTIONS AND CULVERT STATION RANGES.

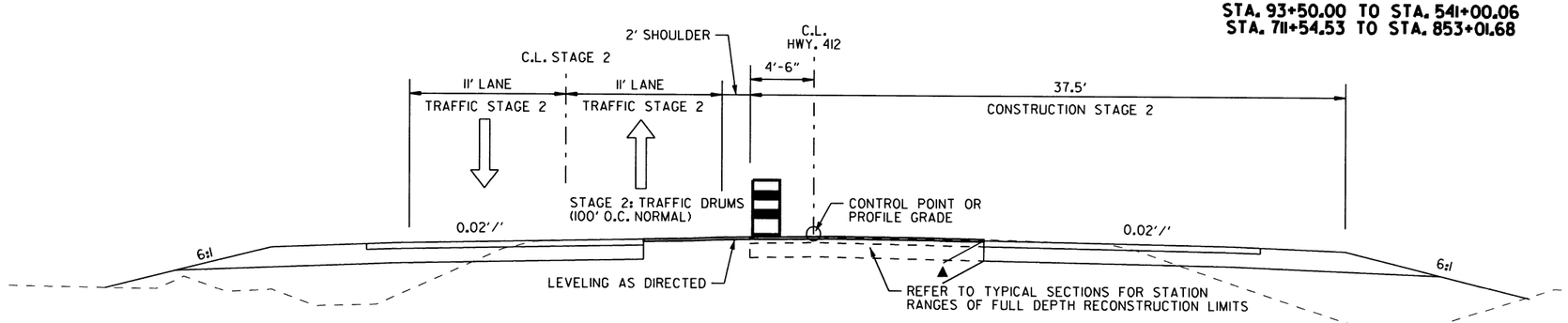
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

PLACE CONSTRUCTION PAVEMENT MARKINGS
LT. & RT. EDGE LINES + DBL. CENTERLINE
ENTIRE JOB
STAGE 1 = 251,600 LIN.FT.
STAGE 2 = 252,000 LIN.FT.
STAGE 3 = 305,200 LIN.FT.



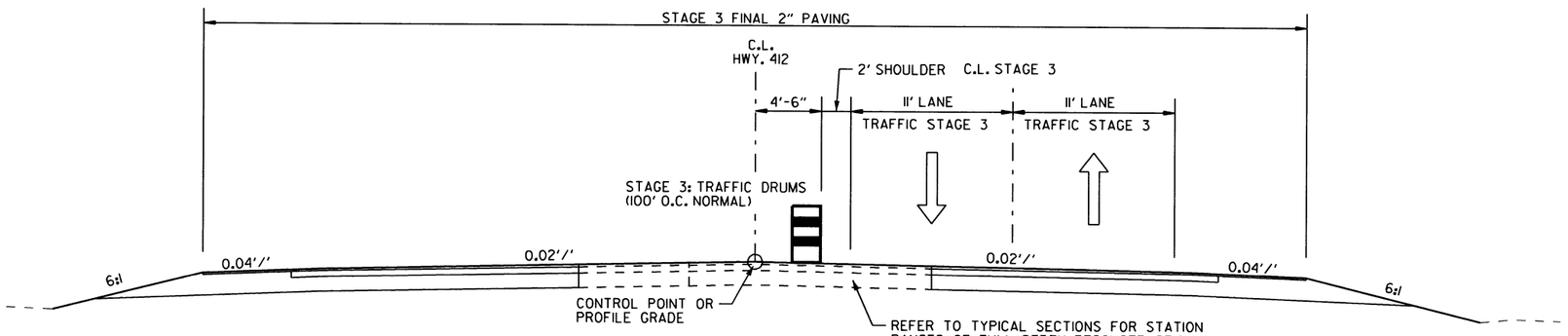

## MAINTENANCE OF TRAFFIC TYPICAL SECTION STAGE 1

**STA. 93+50.00 TO STA. 541+00.06**
**STA. 711+54.53 TO STA. 853+01.68**




## MAINTENANCE OF TRAFFIC TYPICAL SECTION STAGE 2

**STA. 93+50.00 TO STA. 541+00.06**
**STA. 711+54.53 TO STA. 853+01.68**




## MAINTENANCE OF TRAFFIC TYPICAL SECTION STAGE 3

**STA. 93+50.00 TO STA. 541+00.06**
**STA. 711+54.53 TO STA. 853+01.68**

▲ REFER TO TYPICAL SECTIONS FOR DEPTH OF NOTCH. FINAL SURFACE COURSE TO BE PLACED AFTER STAGE 3 AND ALL OTHER CONSTRUCTION IS COMPLETE.

# MAINTENANCE OF TRAFFIC TYPICAL SECTION STAGES 1, 2, & 3

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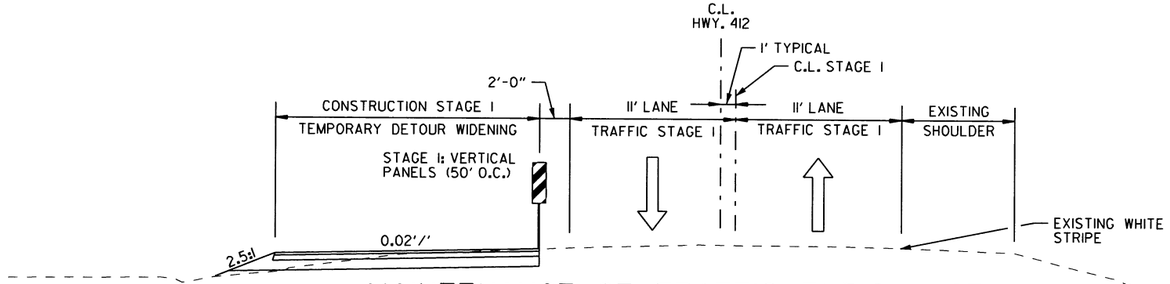
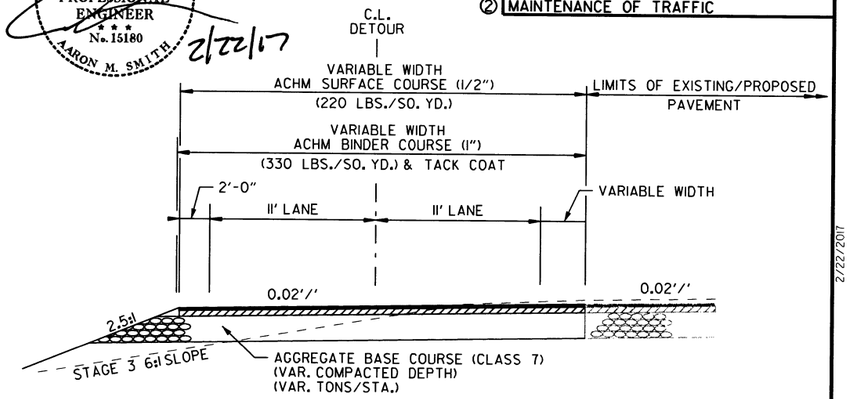
② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

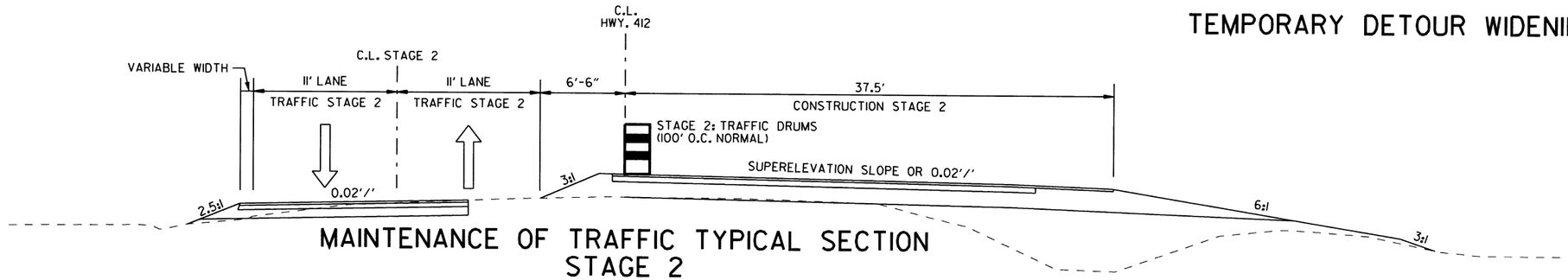



## MAINTENANCE OF TRAFFIC TYPICAL SECTION STAGE 1

**STA. 551+25.62 TO 563+54.86**
**STA. 697+51.76 TO 699+67.28**
**SECTION ALSO APPLIES AT CULVERT DETOUR END TRANSITIONS**

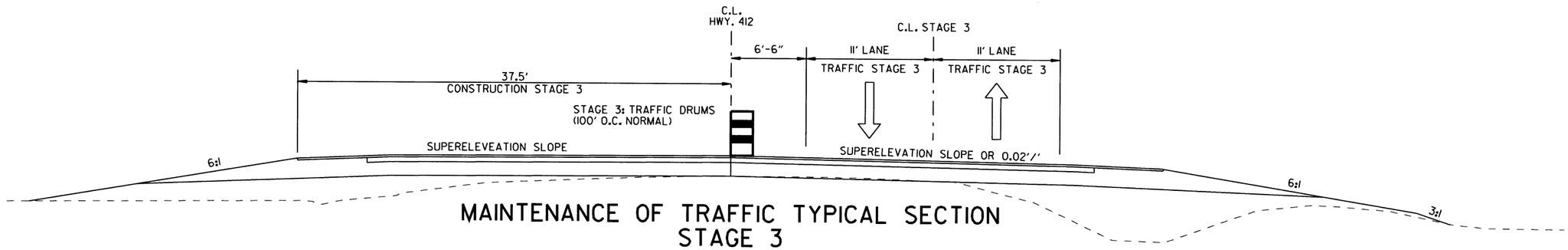



## TEMPORARY DETOUR WIDENING DETAIL




## MAINTENANCE OF TRAFFIC TYPICAL SECTION STAGE 2

**STA. 551+25.62 TO 563+54.86**
**STA. 697+51.76 TO 699+67.28**
**SECTION ALSO APPLIES AT CULVERT DETOUR END TRANSITIONS**




## MAINTENANCE OF TRAFFIC TYPICAL SECTION STAGE 3

**STA. 551+25.62 TO 563+54.86**
**STA. 697+51.76 TO 699+67.28**
**SECTION ALSO APPLIES AT CULVERT DETOUR END TRANSITIONS**

## MAINTENANCE OF TRAFFIC - STAGE 3

**STA. 563+54.86 TO 697+51.76**
**OPEN MINIMUM OF TWO LANES OF TRAFFIC AFTER SH228 CONSTRUCTION IS COMPLETE**

# MAINTENANCE OF TRAFFIC TYPICAL SECTIONS STAGES 1, 2, & 3

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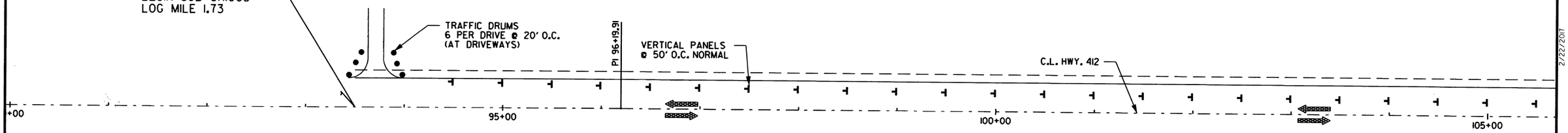
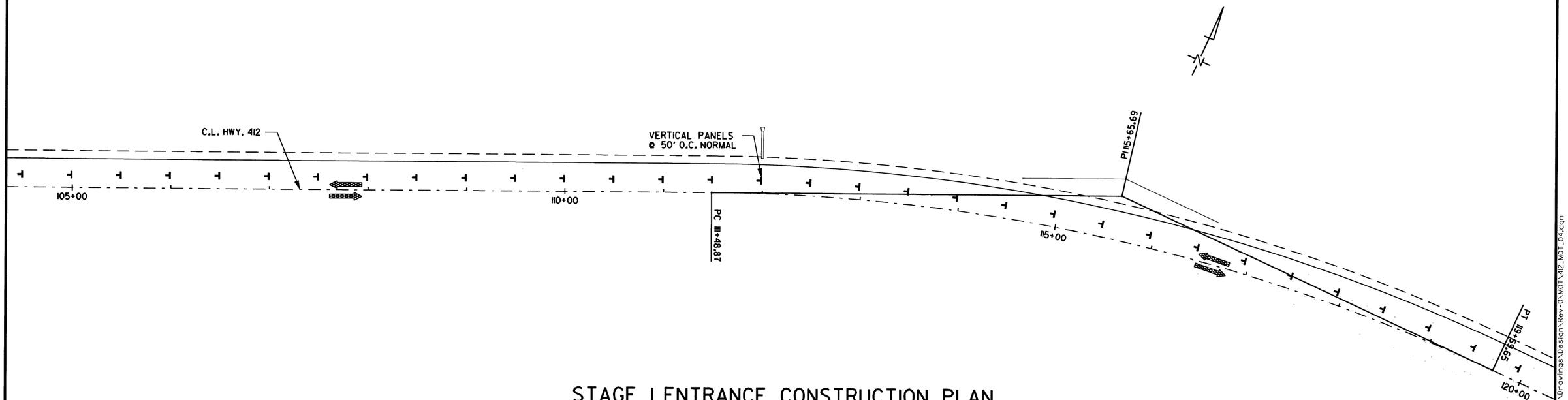
| JOB NO. | | CA1003 | 103 | 503 |

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH

2/22/17




## STAGE I ENTRANCE CONSTRUCTION PLAN

**STA. 93+50.00 TO STA. 120+00.00**
**CONSTRUCTION/WIDENING TO OCCUR LT. OF EXISTING EDGE OF PAVEMENT**

## MAINTENANCE OF TRAFFIC
## STAGE I ROADWAY CONSTRUCTION PLAN

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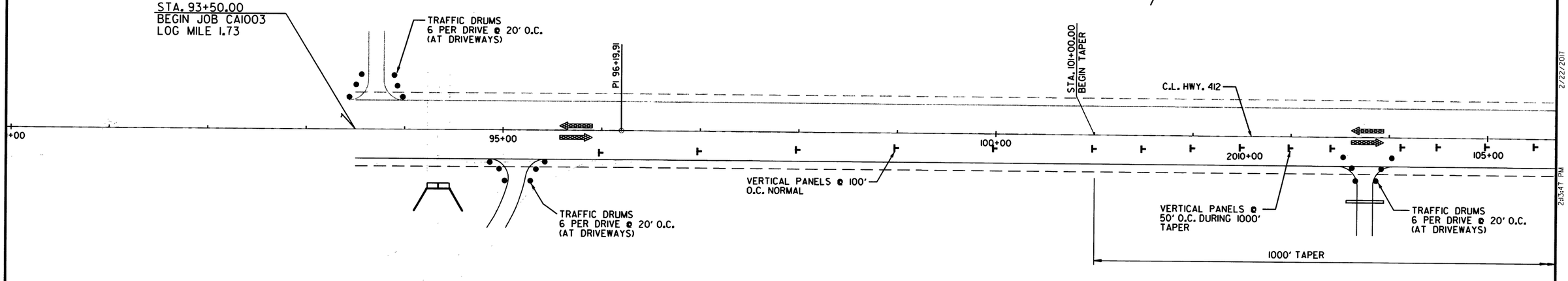
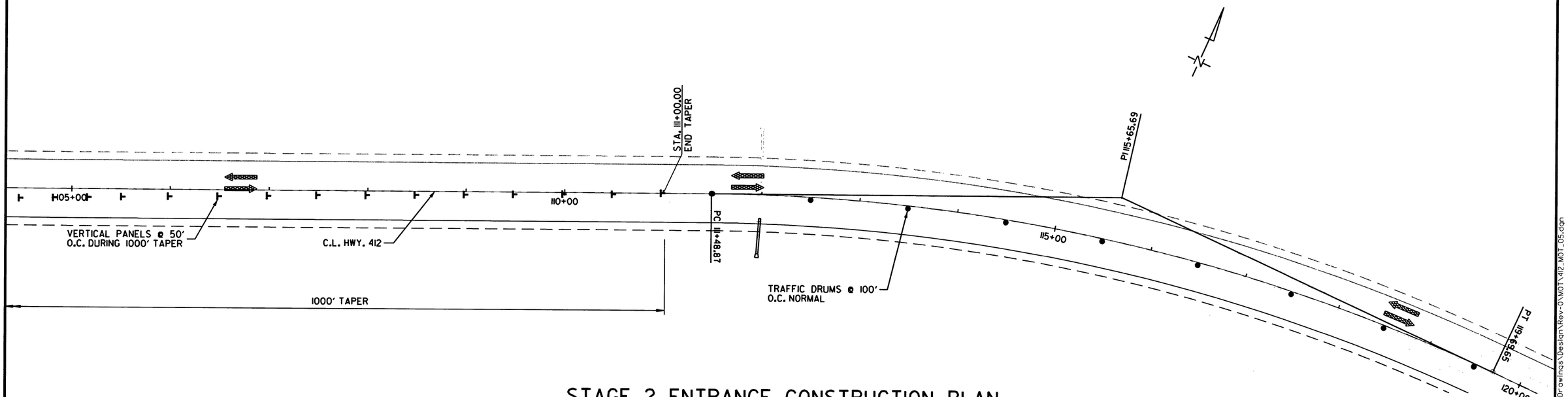
② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH

2/22/17




## STAGE 2 ENTRANCE CONSTRUCTION PLAN

STA. 93+50.00 TO STA. 120+00.00
CONSTRUCTION/WIDENING TO OCCUR RT. OF C.L.

## MAINTENANCE OF TRAFFIC
## STAGE 2 ROADWAY CONSTRUCTION PLAN

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| 6 | ARK. | | | |
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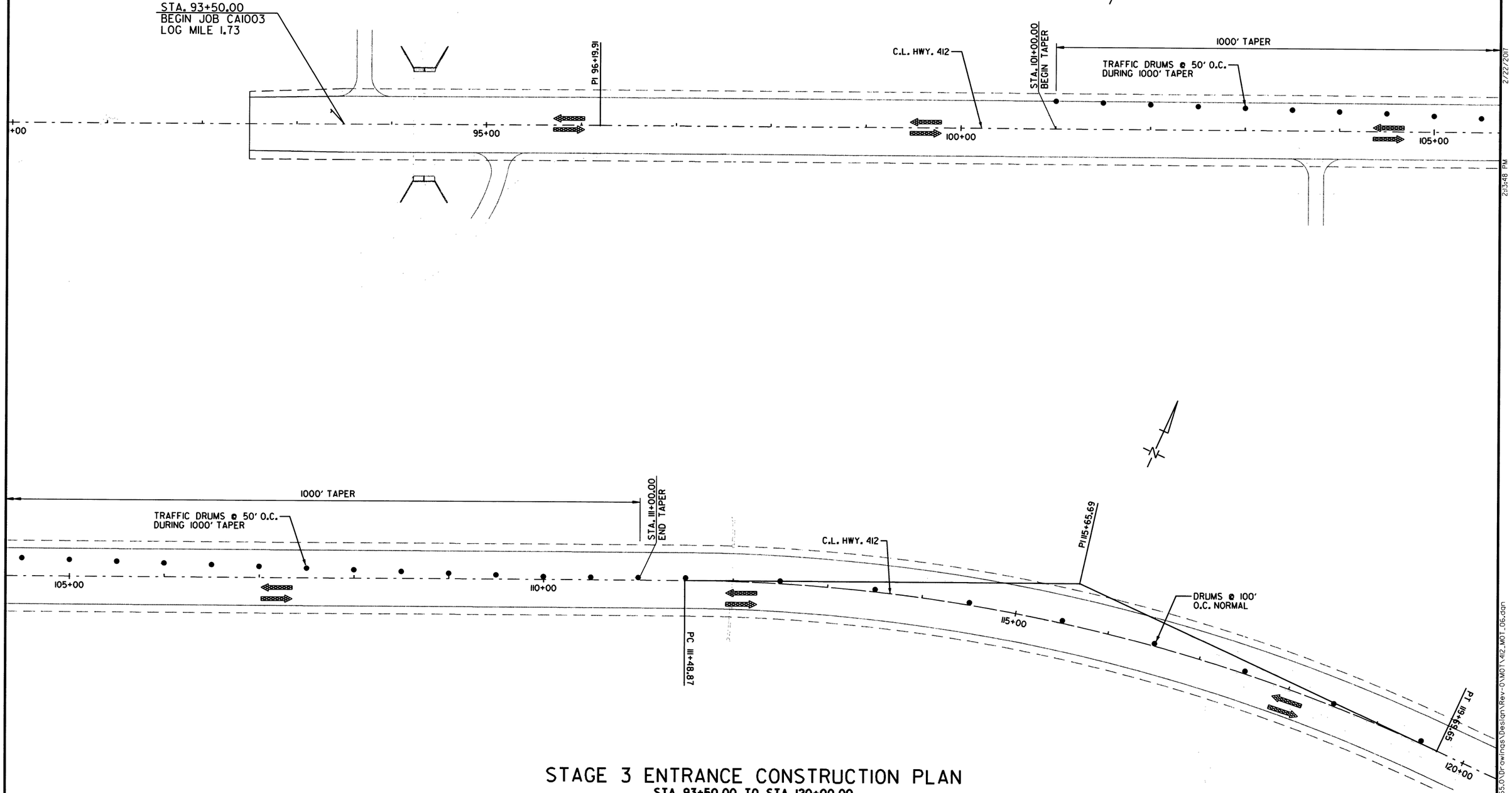
② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH

2/22/17




## STAGE 3 ENTRANCE CONSTRUCTION PLAN

STA. 93+50.00 TO STA. 120+00.00
CONSTRUCTION/WIDENING TO OCCUR LT. OF C.L.

## MAINTENANCE OF TRAFFIC
## STAGE 3 ROADWAY CONSTRUCTION PLAN

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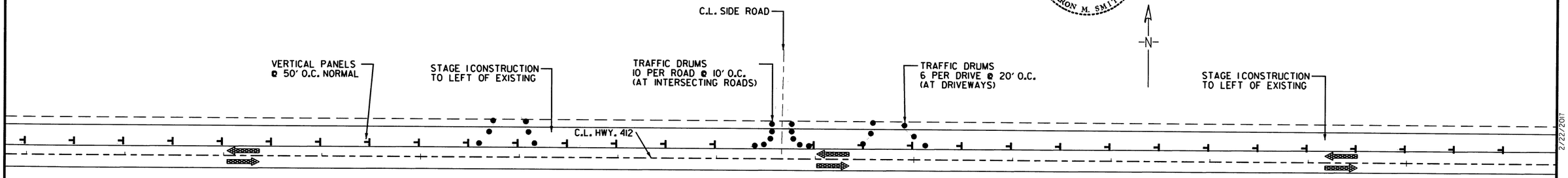
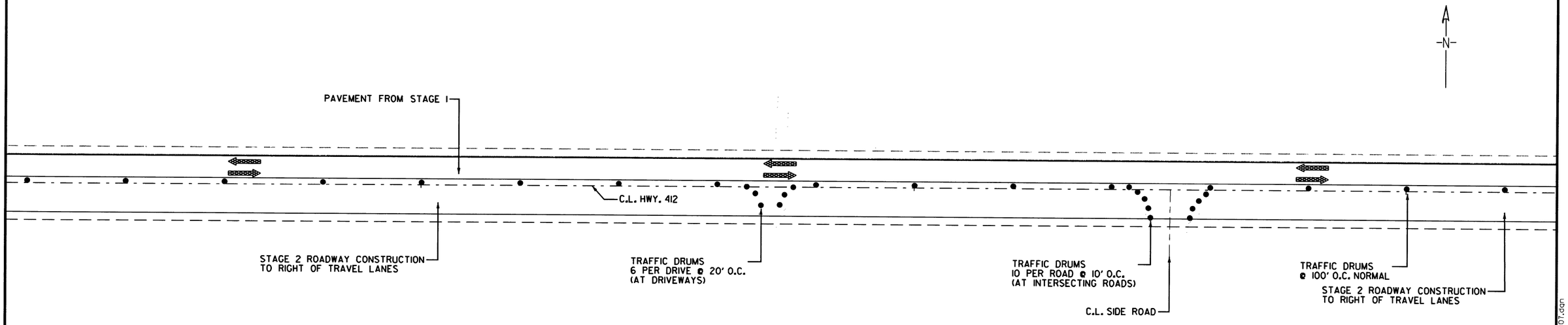
② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




## STAGE I TYPICAL ROADWAY CONSTRUCTION PLAN

STA. 93+50.00 TO STA. 541+00.06
STA. 711+54.53 TO STA. 853+01.68
CONSTRUCTION/WIDENING TO OCCUR LT. OF C.L.




## STAGE 2 TYPICAL ROADWAY CONSTRUCTION PLAN

STA. 93+50.00 TO STA. 541+00.06
STA. 711+54.53 TO STA. 853+01.68
CONSTRUCTION/WIDENING TO OCCUR RT. OF C.L.

# MAINTENANCE OF TRAFFIC
# STAGES I AND 2 TYPICAL ROADWAY CONSTRUCTION PLAN

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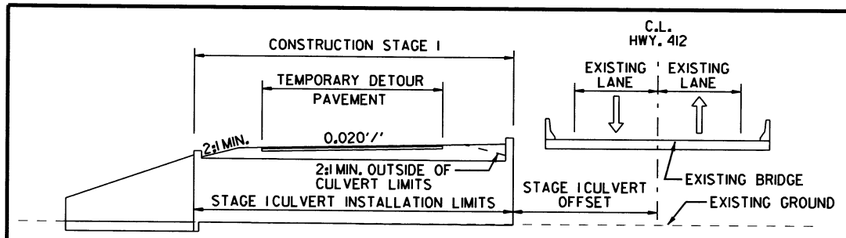
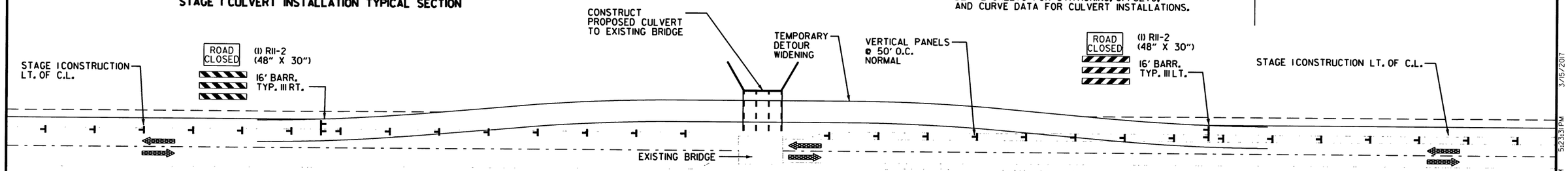
② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
3/16/17




STAGE 1 CULVERT INSTALLATION TYPICAL SECTION



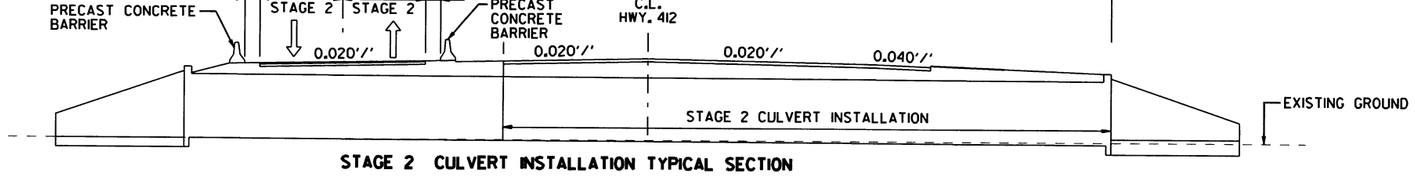

REFER TO STAGE 1 TEMPORARY EROSION CONTROL DETAIL SHEETS FOR STATIONING, OFFSETS, AND CURVE DATA FOR CULVERT INSTALLATIONS.

N

## STAGE 1 TYPICAL CULVERT INSTALLATION PLAN

CULVERT INSTALLATION STATION RANGES
STA. 157+07.61 TO 167+33.17
238+05.88 TO 248+31.45
334+02.30 TO 344+27.86
470+21.66 TO 480+47.23
541+00.06 TO 551+25.62
699+67.28 TO 711+54.53
778+50.85 TO 788+76.42

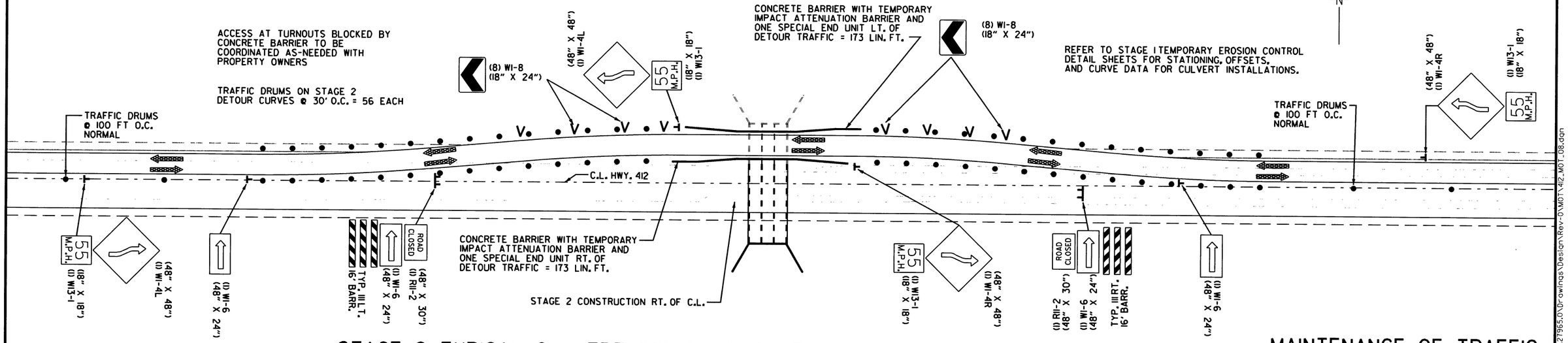
AN AS DIRECTED BY ENGINEER QUANTITY OF 346 LIN. FT. OF CONCRETE BARRIER, TWO (2) TEMPORARY IMPACT ATTENUATION BARRIERS, AND TWO (2) SPECIAL END UNITS, HAS BEEN PROVIDED FOR USE AT CULVERT RECONSTRUCTION LOCATIONS AT STA. 196+96, 282+97, 303+98, 377+96, 444+80, 754+64, AS NEEDED DURING STAGES.




STAGE 2 CULVERT INSTALLATION TYPICAL SECTION

ACCESS AT TURNOUTS BLOCKED BY CONCRETE BARRIER TO BE COORDINATED AS-NEEDED WITH PROPERTY OWNERS

TRAFFIC DRUMS ON STAGE 2 DETOUR CURVES @ 30' O.C. = 56 EACH




## STAGE 2 TYPICAL CULVERT INSTALLATION PLAN

## MAINTENANCE OF TRAFFIC
## STAGE 1 AND STAGE 2 TYPICAL CULVERT INSTALLATION PLAN

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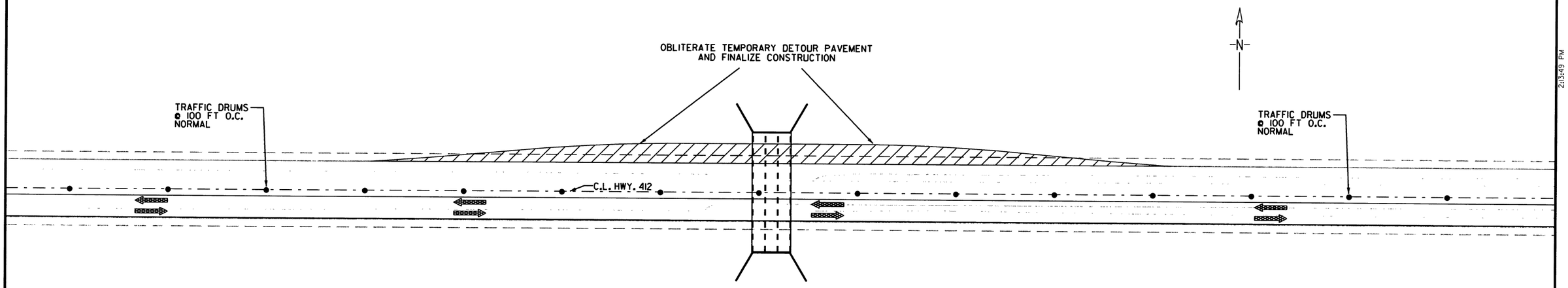
② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




STAGE 3 TYPICAL CULVERT INSTALLATION PLAN

MAINTENANCE OF TRAFFIC
STAGE 3 TYPICAL CULVERT INSTALLATION PLAN

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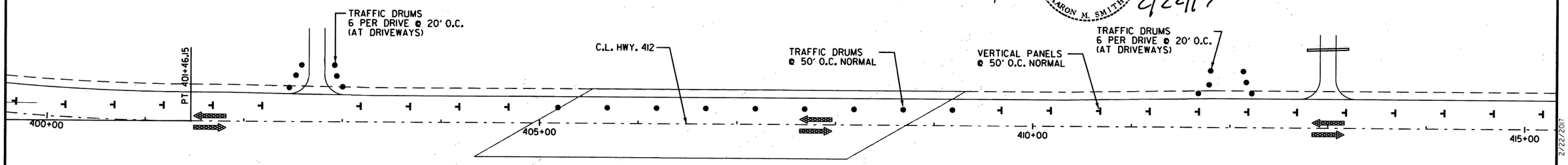
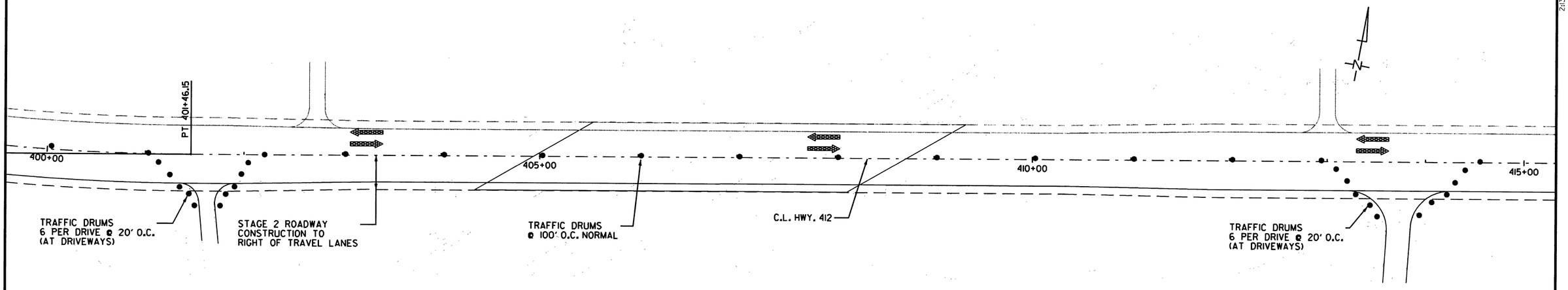
② MAINTENANCE OF TRAFFIC

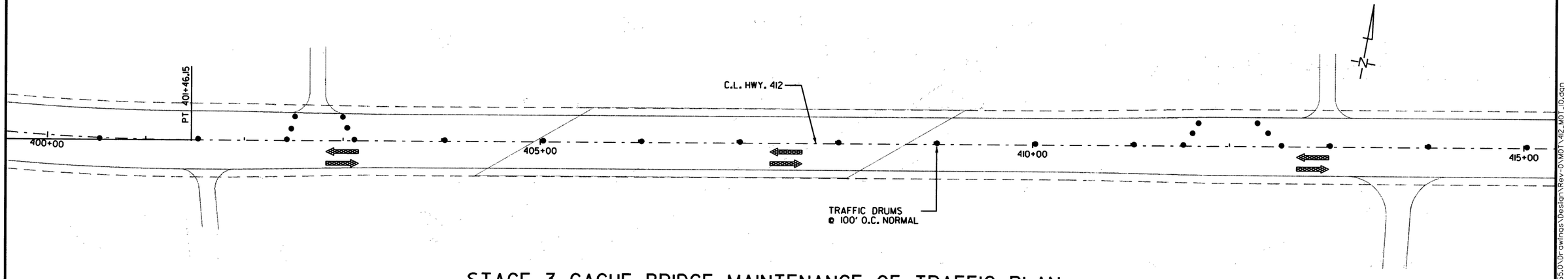
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




STAGE 1 CACHE BRIDGE MAINTENANCE OF TRAFFIC PLAN




STAGE 2 CACHE BRIDGE MAINTENANCE OF TRAFFIC PLAN




STAGE 3 CACHE BRIDGE MAINTENANCE OF TRAFFIC PLAN

MAINTENANCE OF TRAFFIC
STAGE 1, 2, 3 CACHE BRIDGE INSTALLATION PLAN

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| | | | | JOB NO. | | CA1003 | 110 | 503 |

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

STAGE I CONSTRUCTION LT. OF C.L.

STAGE I TEMPORARY DETOUR WIDENING REFER TO STAGE I TYPICAL CULVERT INSTALLATION PLAN

VERTICAL PANELS @ 50' O.C. NORMAL

PI 566+35.88

J7.95

00

PC 556+57.15

C.L. HWY. 412

560+00

10+00

STA. 563+54.86
BEGIN BYPASS CONSTRUCTION

565+00

## STAGE I BYPASS ENTRANCE INSTALLATION PLAN

TRAFFIC DRUMS @ 30' O.C. NORMAL, REFER TO STAGE 2 TYPICAL CULVERT INSTALLATION PLAN

TRAFFIC DRUMS @ 30 FT O.C. NORMAL

TRAFFIC DRUMS @ 50' O.C. NORMAL

(48" X 48")
(1) WI-4R

(1) WI3-1
(18" X 18")
55 M.P.H.

PI 566+35.88

PI 12+37.95

00

PC 556+57.15

C.L. HWY. 412

560+00

10+00

565+00

TRAFFIC DRUMS
6 PER DRIVE @ 20' O.C.
(AT DRIVEWAYS)

STAGE 2
CONSTRUCTION
RT. OF C.L.

ROAD CLOSED

(1) RII-2
(48" X 30")

(1) WI-6
(48" X 24")

8' BARR.
TYP. III RT.

(1) WI-6
(48" X 24")

TRAFFIC DRUMS
10 PER ROAD @ 10' O.C.
(AT INTERSECTING ROADS)

11+00

C.L. HWY. 412

## STAGE 2 BYPASS ENTRANCE INSTALLATION PLAN

C.L. HWY. 412

TRAFFIC DRUMS @ 100' O.C. NORMAL

PI 566+35.88

PI 12+37.95

00

PC 556+57.15

560+00

10+00

565+00

11+00

## STAGE 3 BYPASS ENTRANCE INSTALLATION PLAN

# MAINTENANCE OF TRAFFIC
# STAGE 1, 2, 3 BYPASS INSTALLATION PLAN

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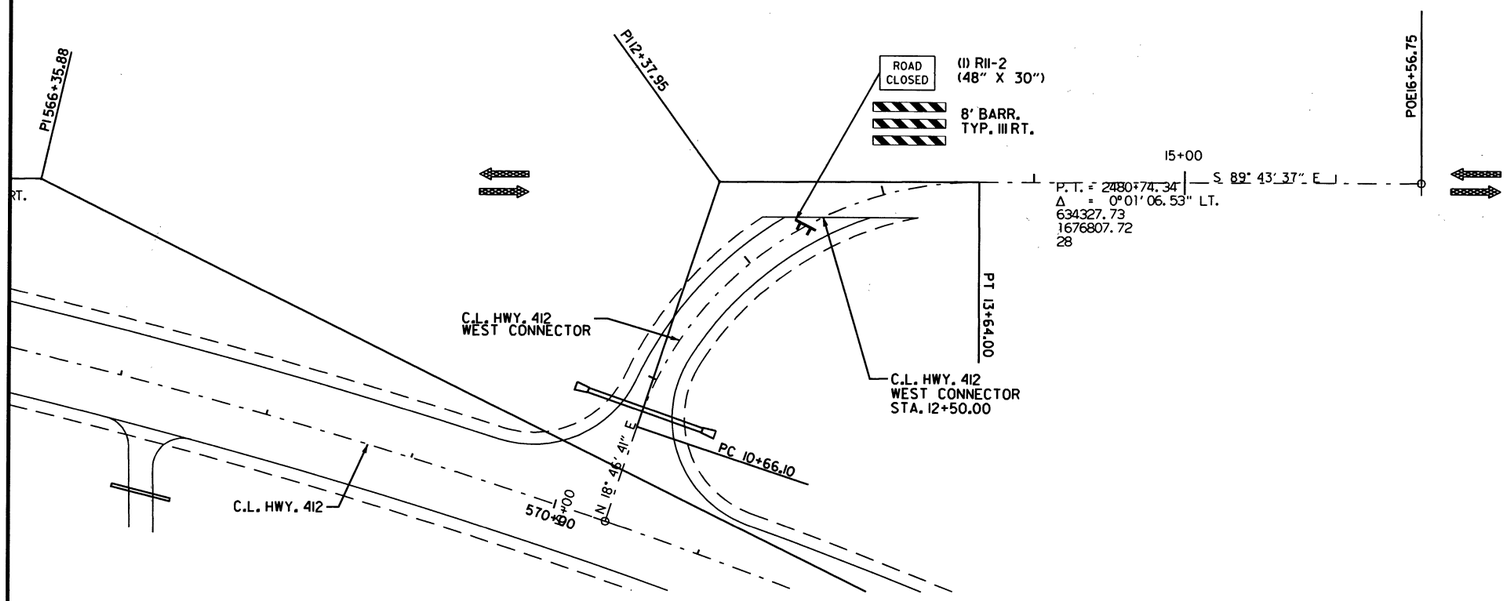
| | | | | JOB NO. | | CA1003 | III | 503 |

② MAINTENANCE OF TRAFFIC

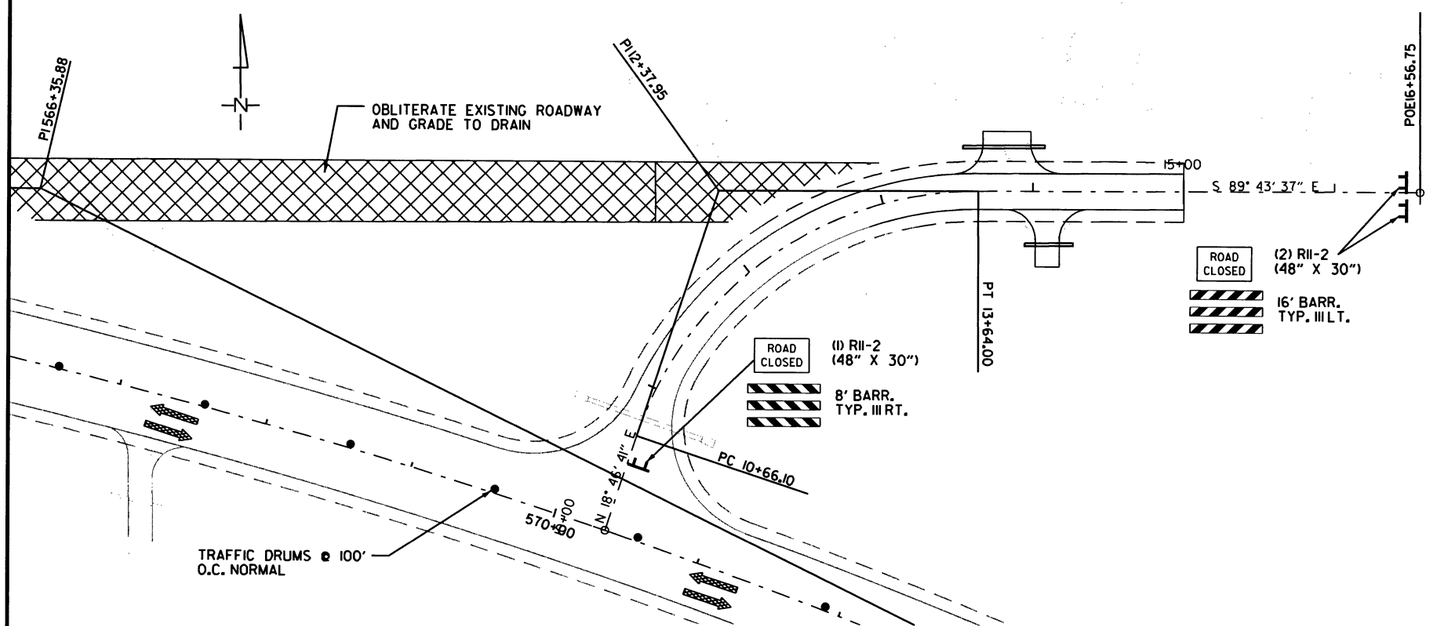
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




STAGE 1 HWY. 412 WEST CONNECTOR TIE-IN

**STAGE 2 HWY 412 WEST CONNECTOR TIE-IN NOTES:**

FOR STAGE 2 CONSTRUCTION, RETAIN ALL SIGNAGE, BARRICADES AND TRAFFIC CONTROL DEVICES FROM STAGE 1 CONSTRUCTION.




STAGE 3 HWY. 412 WEST CONNECTOR TIE-IN

**STAGE 3 HWY 412 WEST CONNECTOR TIE-IN NOTES:**

REFER TO STAGE 3 EAST CONNECTOR TIE-IN PLAN FOR MAINTENANCE OF TRAFFIC PLAN FOR EXISTING INTERSECTION OF SH 228 AND SH 412.

# MAINTENANCE OF TRAFFIC STAGE 1, 3 HWY. 412 WEST CONNECTOR PLAN

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STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

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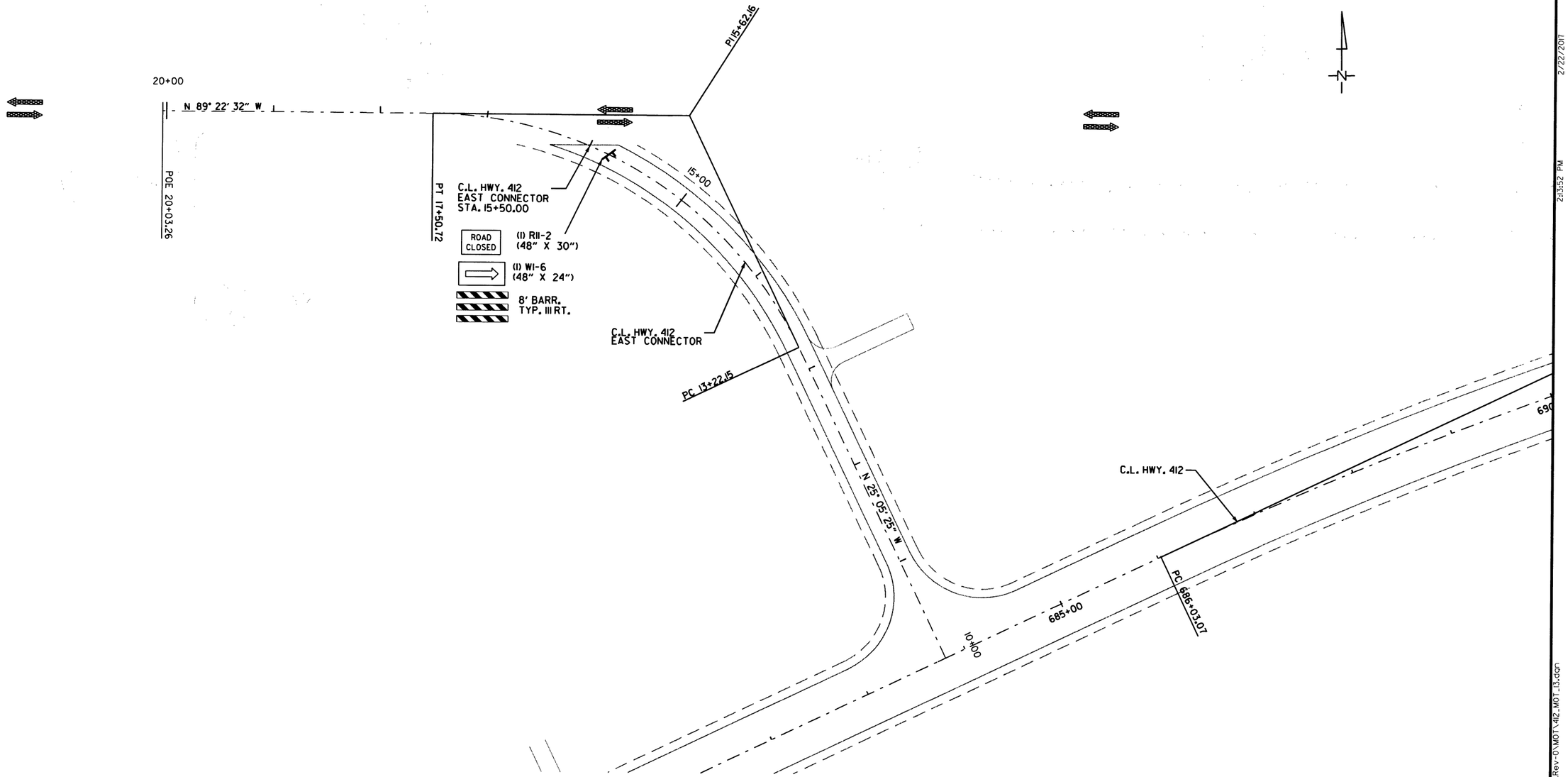
| | | | | JOB NO. | | CA1003 | 12 | 503 |

② MAINTENANCE OF TRAFFIC




STAGE I HWY. 412 EAST CONNECTOR TIE-IN

MAINTENANCE OF TRAFFIC
STAGE I HWY. 412 EAST CONNECTOR PLAN

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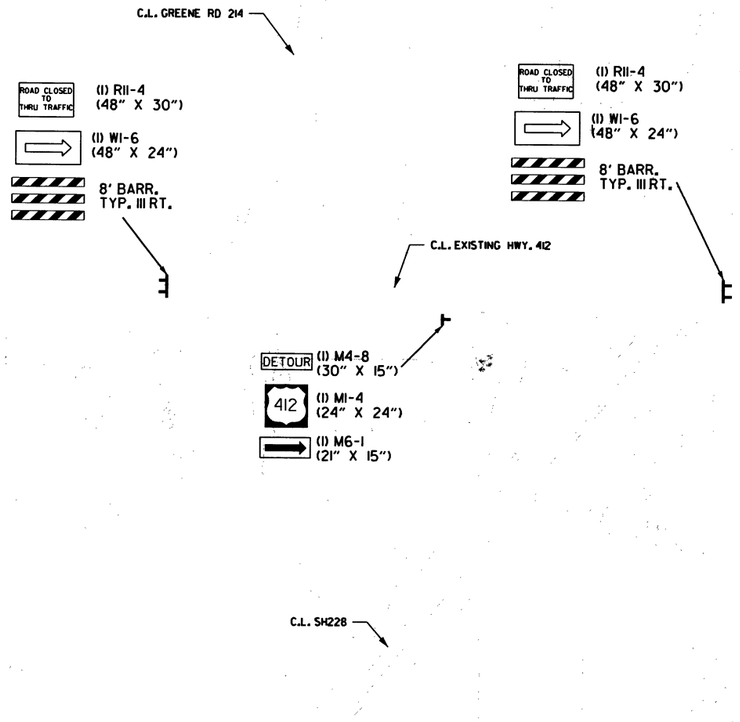


STAGE 3 HWY. 412 AND SH228 INTERSECTION

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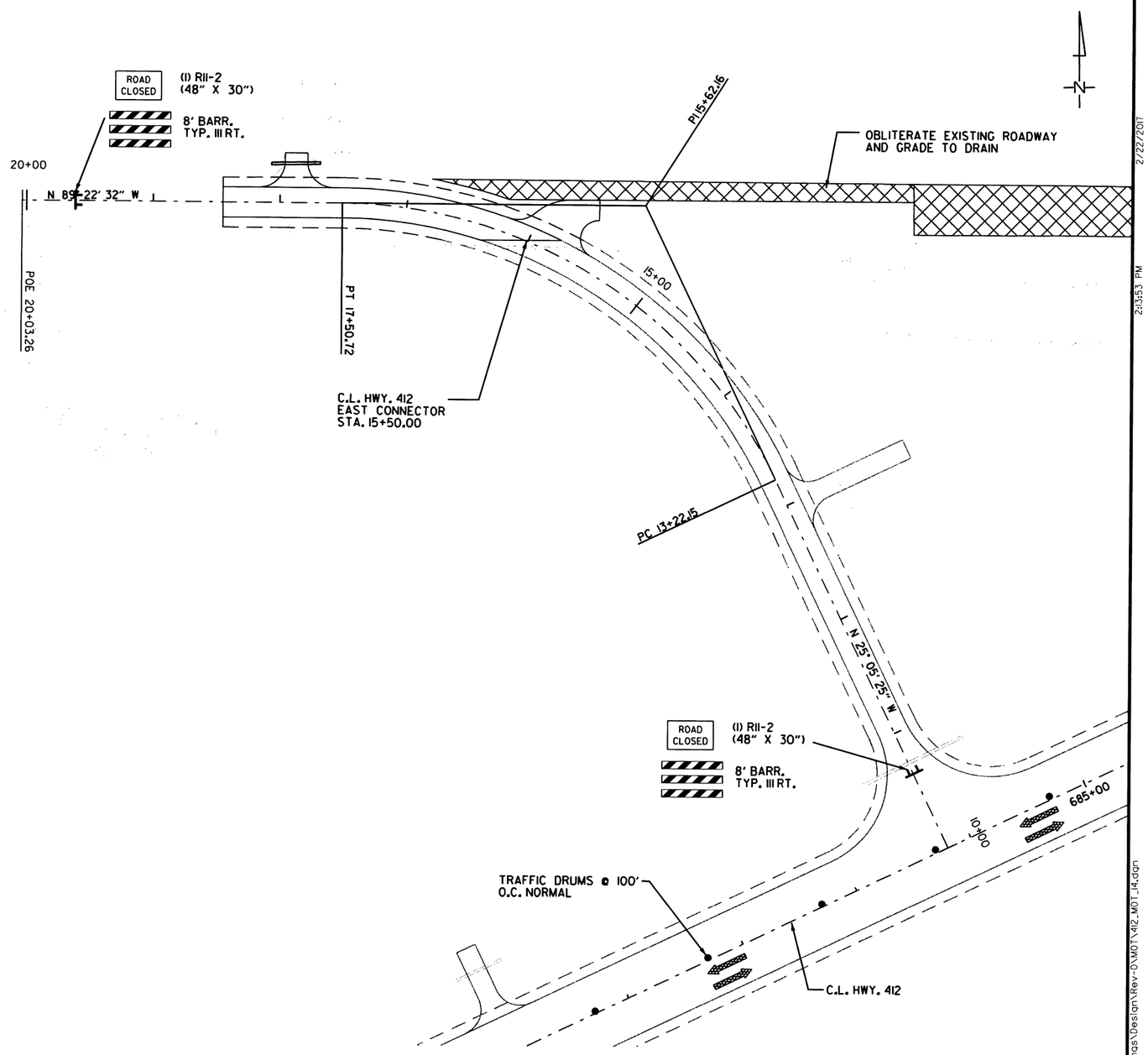
| | | | | JOB NO. | | CA1003 | 13 | 503 |

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




STAGE 3 HWY. 412 EAST CONNECTOR TIE-IN

MAINTENANCE OF TRAFFIC
STAGE 3 HWY. 412 EAST CONNECTOR PLAN

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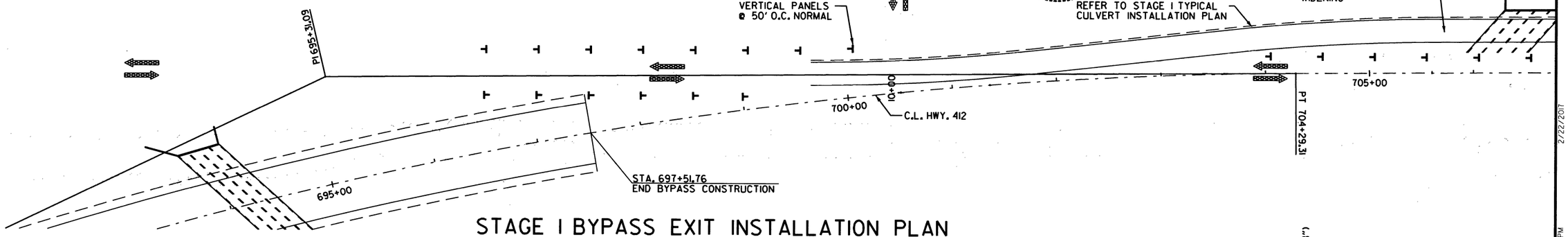
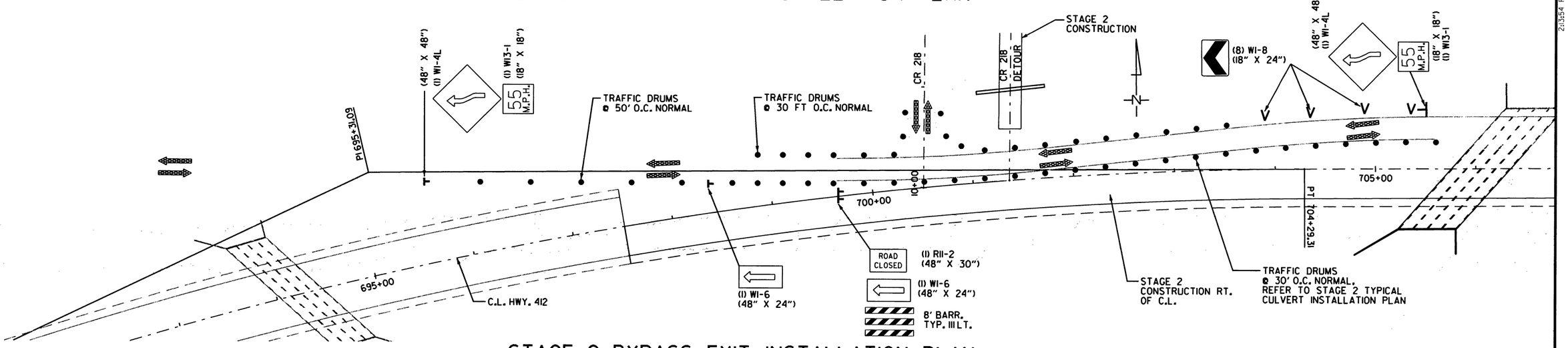
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 114 | 503 |

② MAINTENANCE OF TRAFFIC

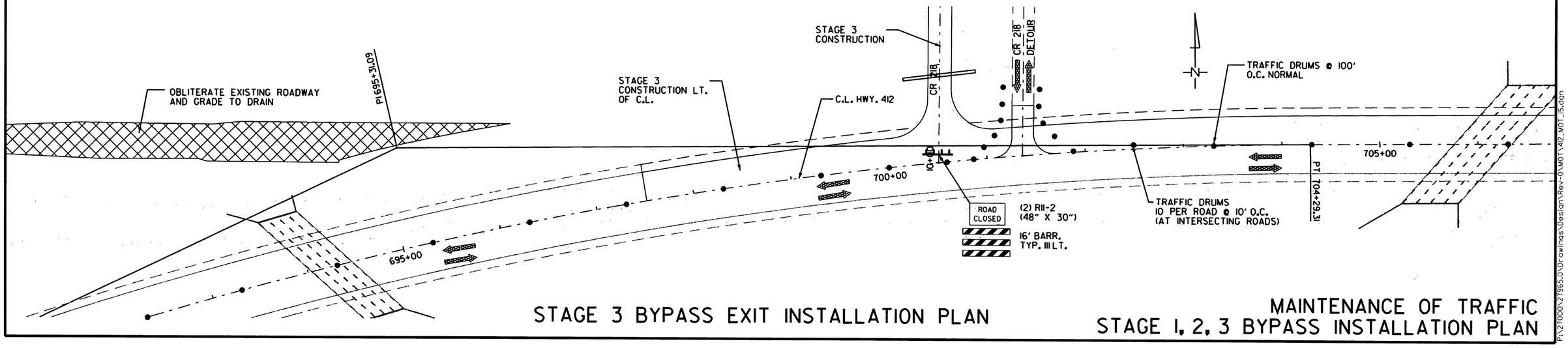
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




## STAGE I BYPASS EXIT INSTALLATION PLAN




## STAGE 2 BYPASS EXIT INSTALLATION PLAN




## STAGE 3 BYPASS EXIT INSTALLATION PLAN

# MAINTENANCE OF TRAFFIC STAGE 1, 2, 3 BYPASS INSTALLATION PLAN

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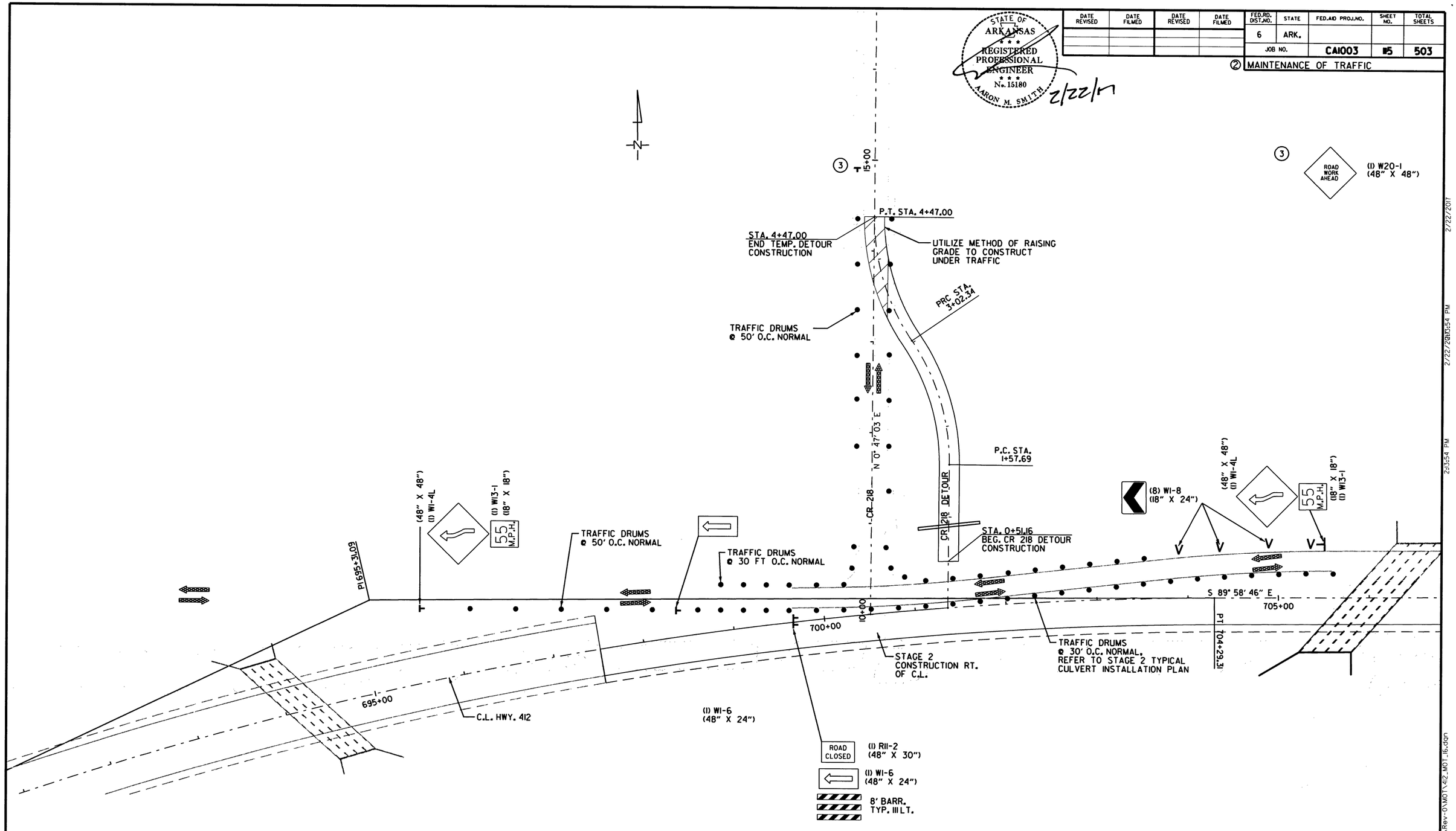
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 15 | 503 |

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




STAGE 2 BYPASS EXIT AND CR 218 TEMPORARY DETOUR PLAN

MAINTENANCE OF TRAFFIC
STAGE 2 CR 218 INSTALLATION PLAN

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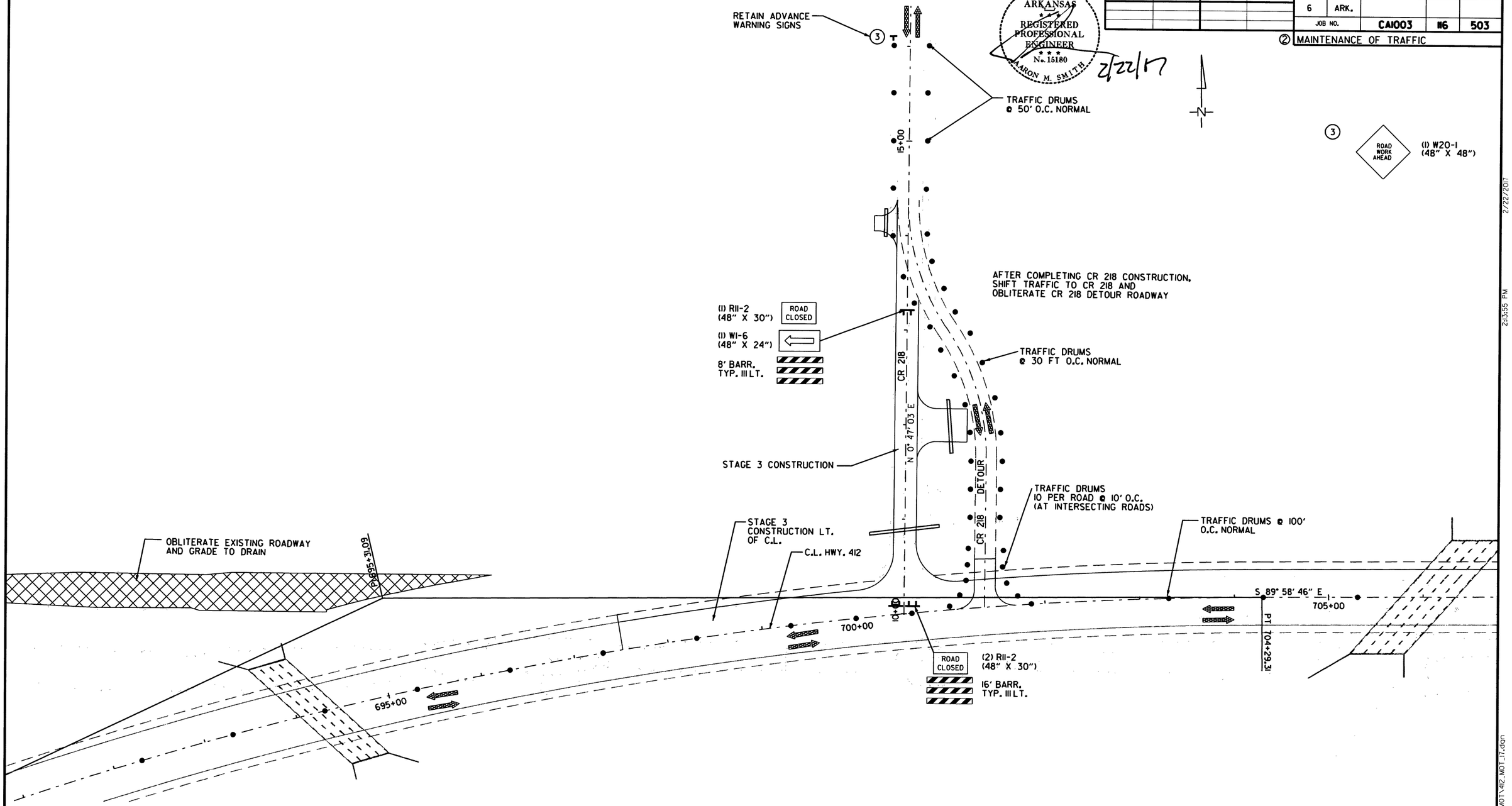
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 116 | 503 |

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




STAGE 3 BYPASS EXIT AND CR 218 TEMPORARY DETOUR PLAN

MAINTENANCE OF TRAFFIC
STAGE 3 CR 218 INSTALLATION PLAN

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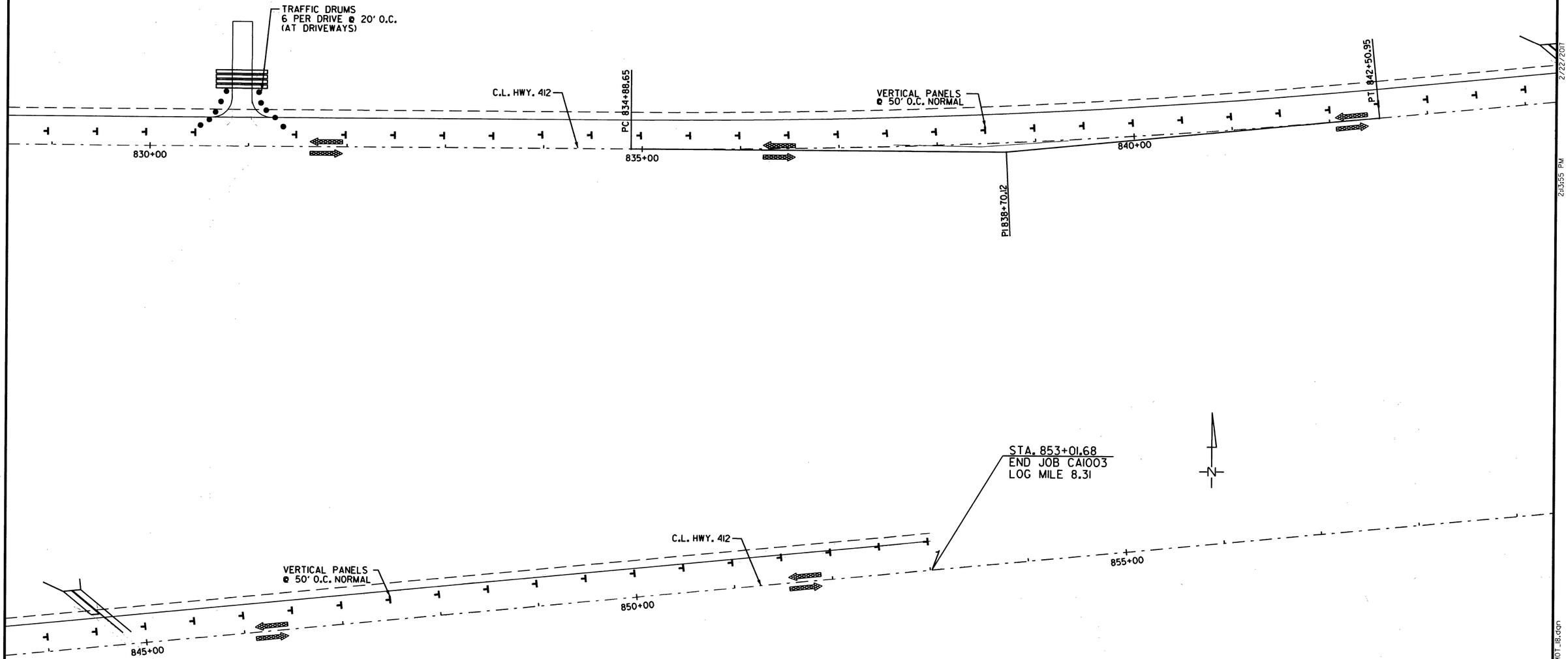
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 17 | 503 |

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




## STAGE I EXIT CONSTRUCTION PLAN

**STA. 829+00.00 TO STA. 853+01.68**
**CONSTRUCTION/WIDENING TO OCCUR LT. OF EXISTING EDGE OF PAVEMENT**

## MAINTENANCE OF TRAFFIC
## STAGE I ROADWAY CONSTRUCTION PLAN

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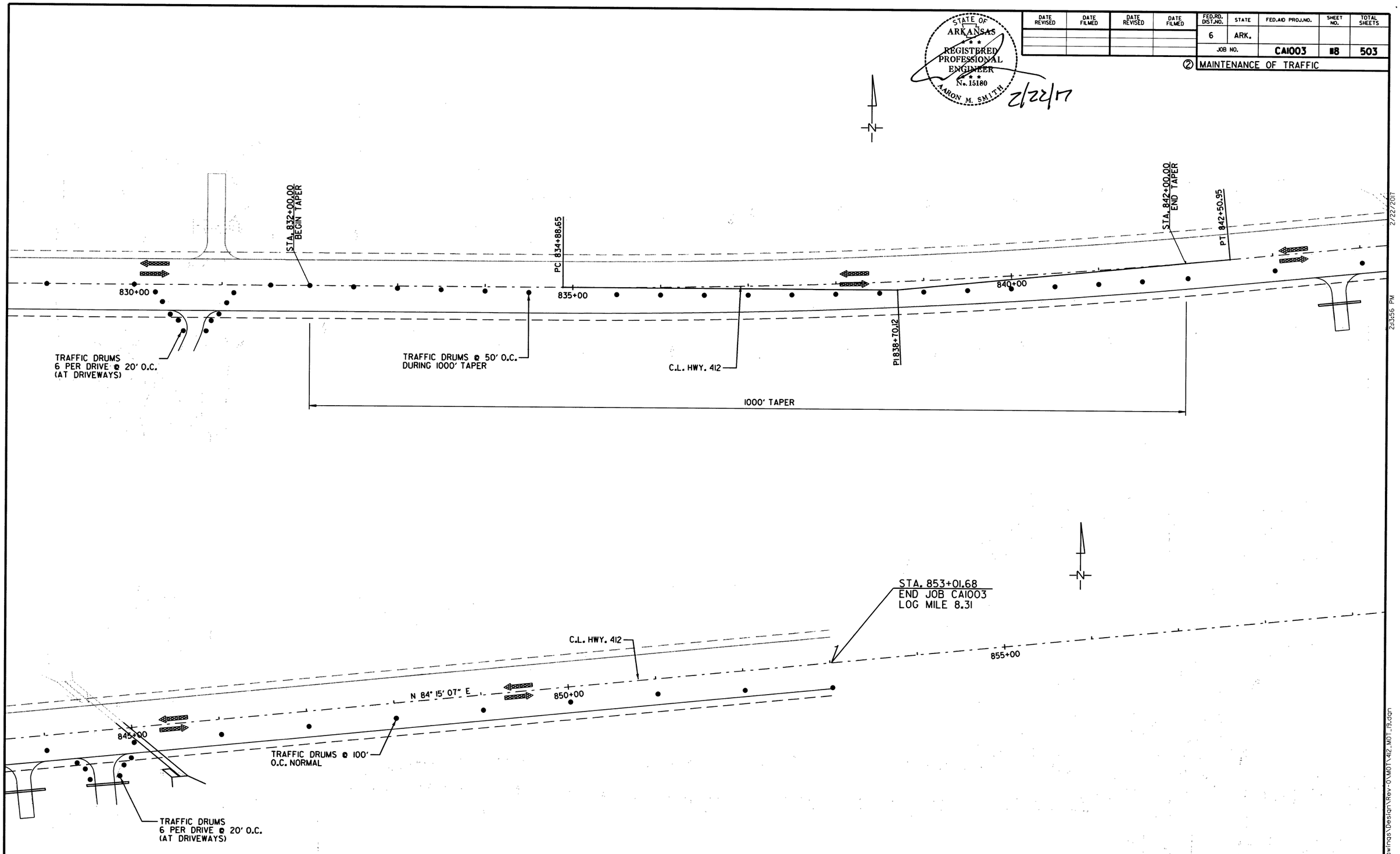
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 18 | 503 |

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




## STAGE 2 EXIT CONSTRUCTION PLAN

**STA. 829+00.00 TO STA. 853+01.68**
**CONSTRUCTION/WIDENING TO OCCUR RT. OF C.L.**

## MAINTENANCE OF TRAFFIC
## STAGE 2 ROADWAY CONSTRUCTION PLAN

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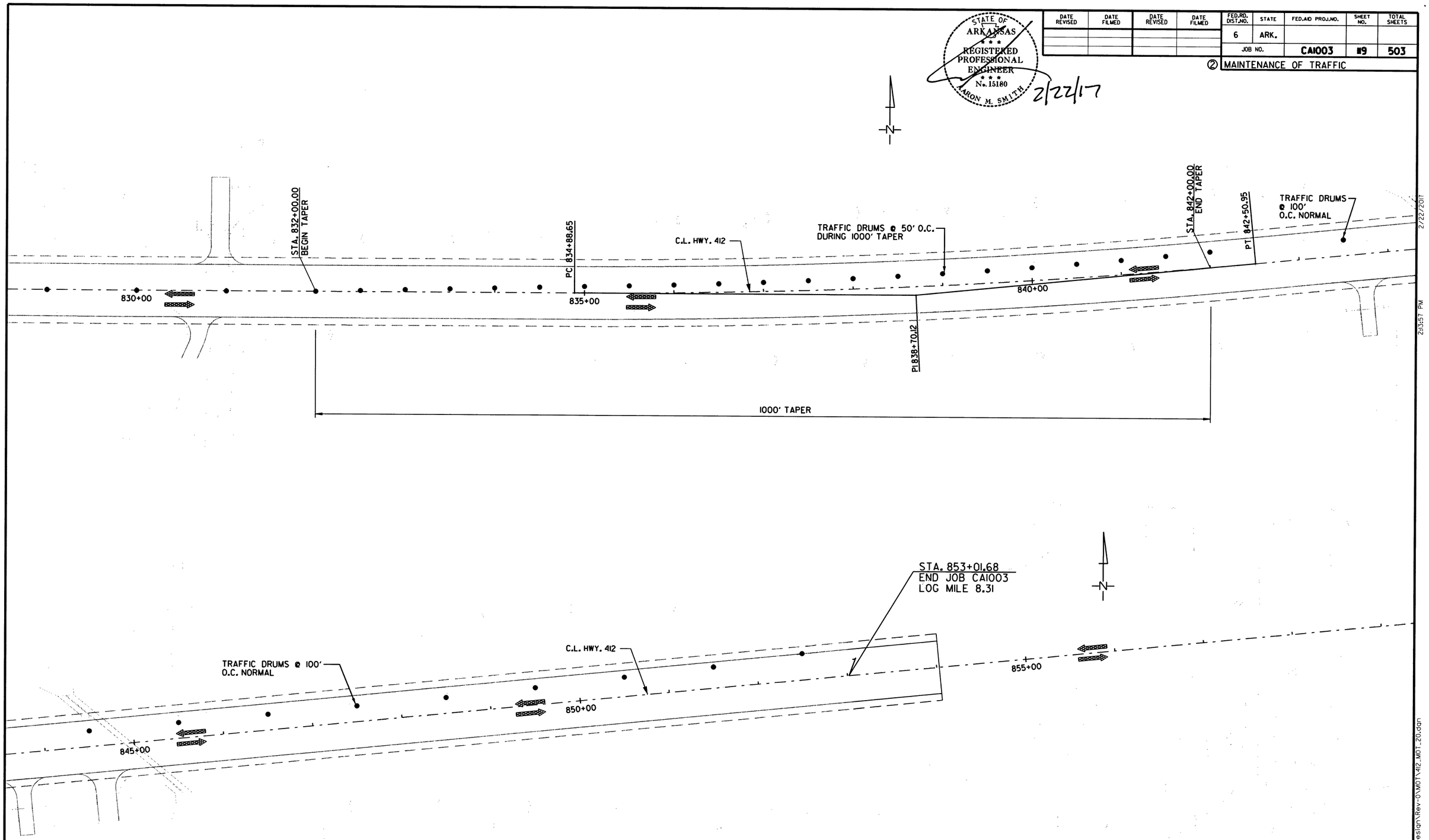
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 19 | 503 |

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




## STAGE 3 EXIT CONSTRUCTION PLAN

STA. 829+00.00 TO STA. 853+01.68
CONSTRUCTION/WIDENING TO OCCUR LT. OF C.L.

## MAINTENANCE OF TRAFFIC
## STAGE 3 ROADWAY CONSTRUCTION PLAN

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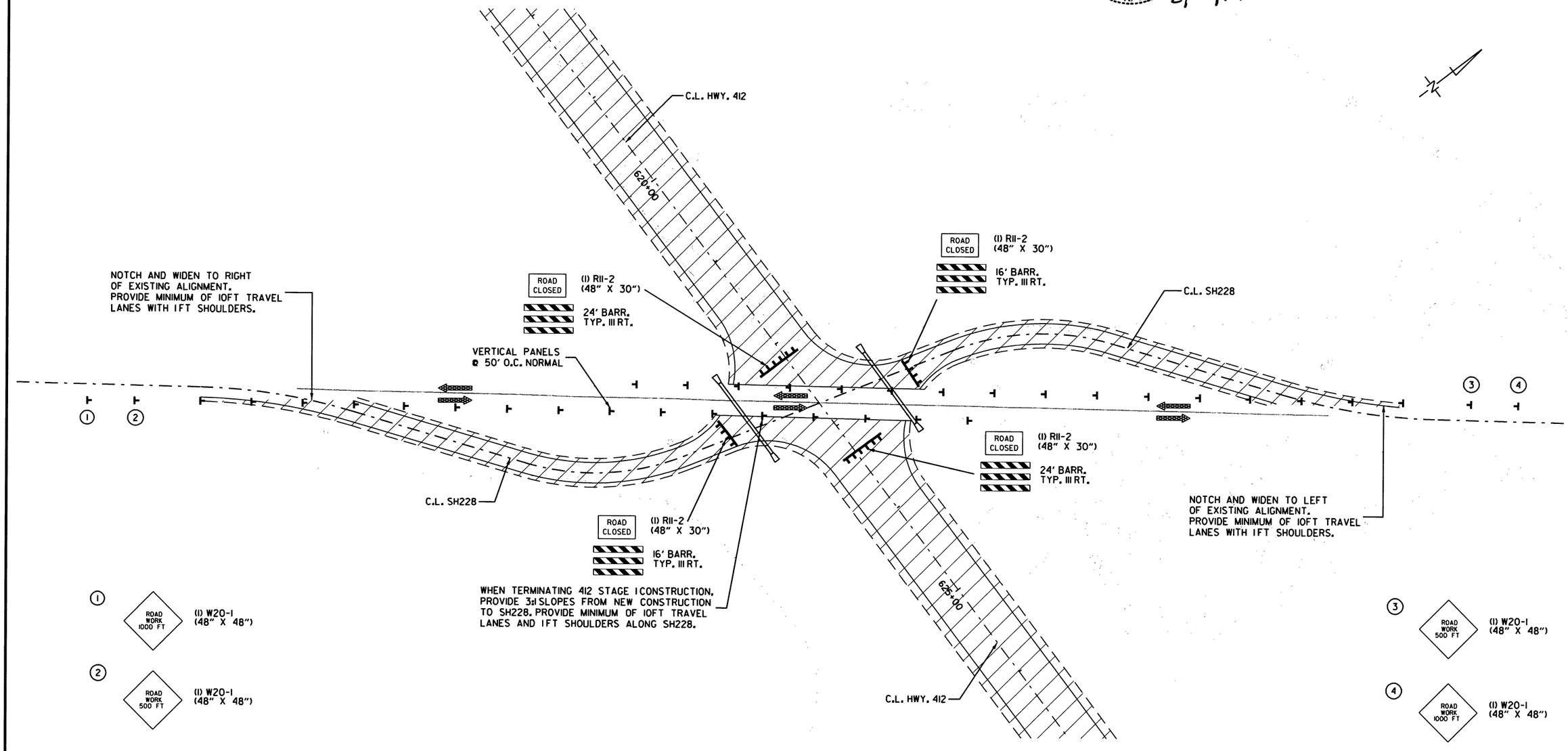
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 120 | 503 |

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17




## STAGE I HWY. 412 AND SH228 INTERSECTION PLAN

LEGEND

- AREA UNDER CONSTRUCTION
- PAVEMENT REMOVAL

## MAINTENANCE OF TRAFFIC
## STAGE I SH228 INTERSECTION INSTALLATION PLAN

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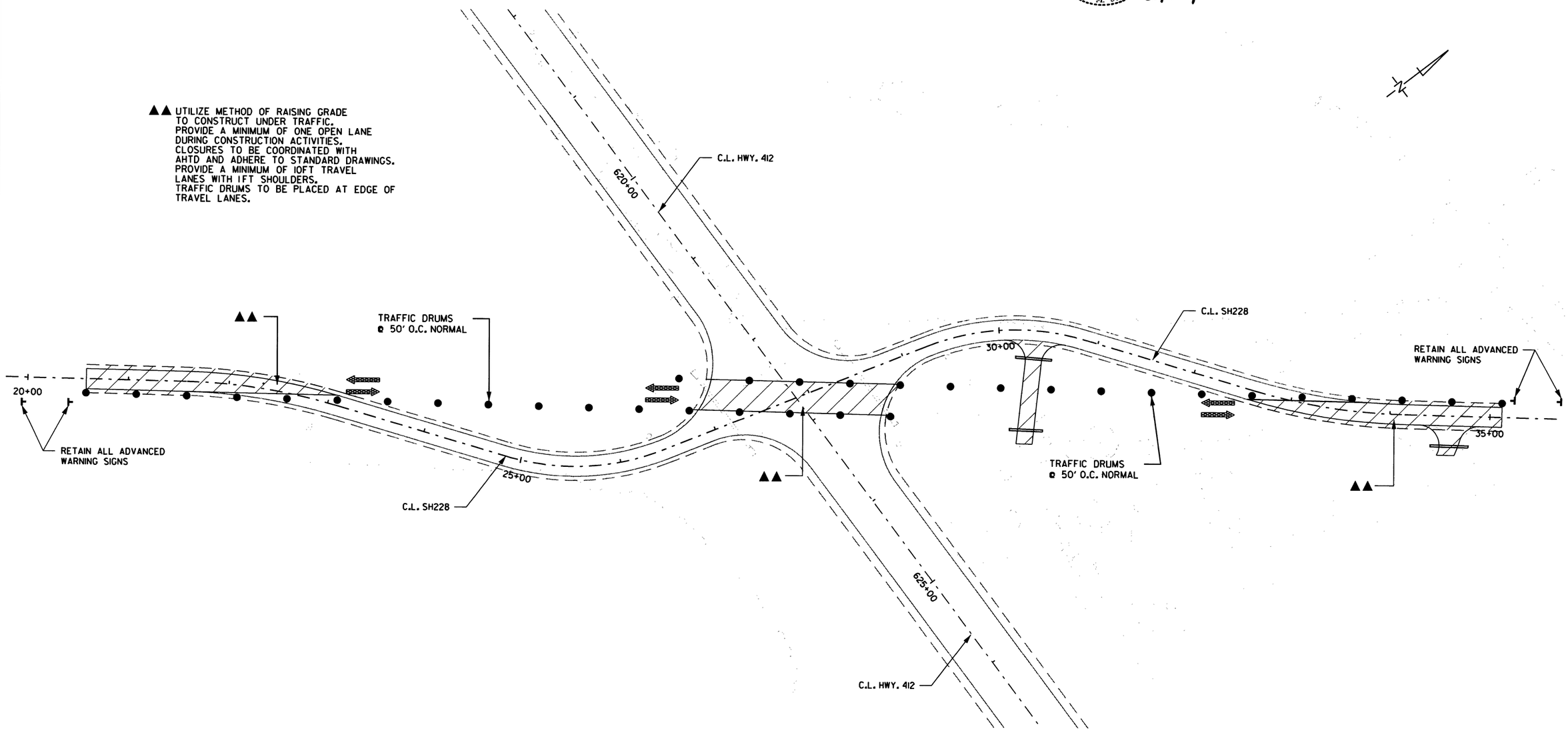
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 121 | 503 |

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

▲▲ UTILIZE METHOD OF RAISING GRADE TO CONSTRUCT UNDER TRAFFIC. PROVIDE A MINIMUM OF ONE OPEN LANE DURING CONSTRUCTION ACTIVITIES. CLOSURES TO BE COORDINATED WITH AHTD AND ADHERE TO STANDARD DRAWINGS. PROVIDE A MINIMUM OF 10FT TRAVEL LANES WITH 1FT SHOULDERS. TRAFFIC DRUMS TO BE PLACED AT EDGE OF TRAVEL LANES.




STAGE 2 HWY. 412 AND SH228 INTERSECTION PLAN

LEGEND

AREA UNDER CONSTRUCTION

PAVEMENT REMOVAL

MAINTENANCE OF TRAFFIC
STAGE 2 SH228 INTERSECTION INSTALLATION PLAN

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| | | | | JOB NO. | | CA1003 | 122 | 503 |

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
2/22/17

PROVIDE A MINIMUM OF 10FT TRAVEL LANES WITH 1FT SHOULDERS. TRAFFIC DRUMS TO BE PLACED A MINIMUM OF 1FT FROM EDGE OF TRAVEL LANES.

TRAFFIC DRUMS @ 100' O.C. NORMAL

620+00

C.L. HWY. 412

ROAD CLOSED
(1) R11-2 (48" X 30")
(1) W1-6 (48" X 24")
8' BARR. TYP. III RT.

DETOUR
(1) M4-8 (30" X 15")
412
(1) M1-4 (45" X 36")
END
(1) M4-8b (24" X 12")

C.L. SH228

30+00

RETAIN ALL ADVANCED WARNING SIGNS

35+00

TRAFFIC DRUMS @ 50' O.C. NORMAL

20+00

RETAIN ALL ADVANCED WARNING SIGNS

C.L. SH228

25+00

ROAD CLOSED
(1) R11-2 (48" X 30")
(1) W1-6 (48" X 24")
8' BARR. TYP. III RT.

TRAFFIC DRUMS @ 50' O.C. NORMAL

625+00

C.L. HWY. 412

LEGEND

AREA UNDER CONSTRUCTION

PAVEMENT REMOVAL

## STAGE 3 HWY. 412 AND SH228 INTERSECTION PLAN

## MAINTENANCE OF TRAFFIC
## STAGE 3 SH228 INTERSECTION INSTALLATION PLAN

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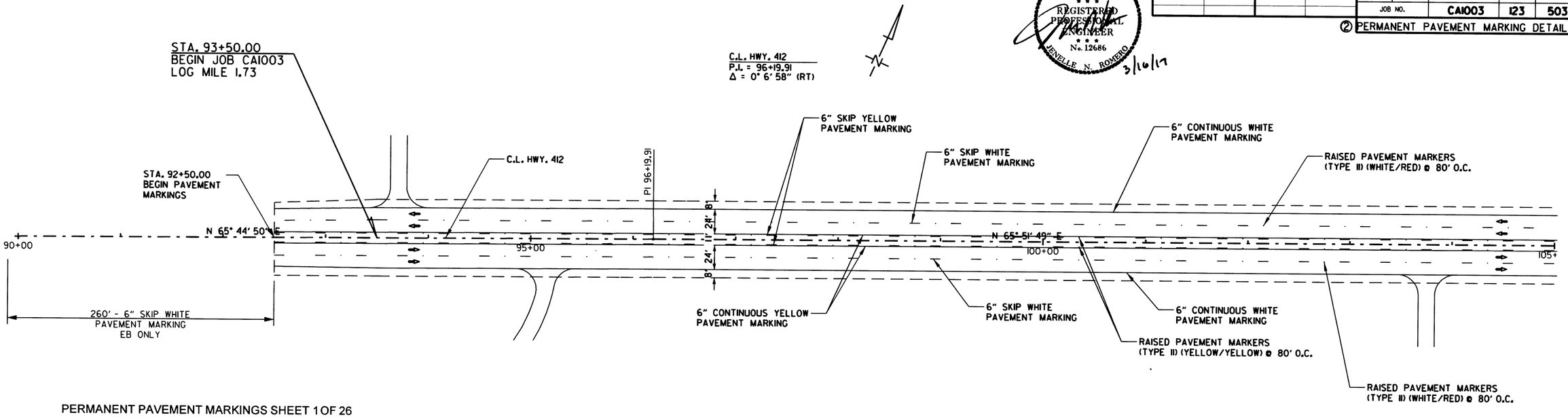
| | | | | JOB NO. | | CA1003 | 123 | 503 |

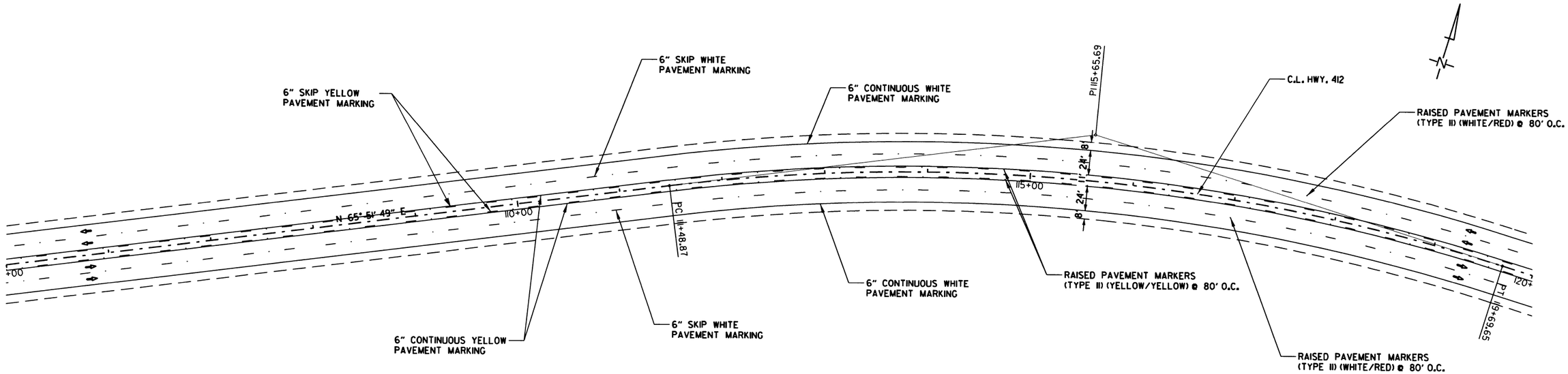
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17




PERMANENT PAVEMENT MARKINGS SHEET 1 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 6940 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 6875 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 87 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 86 EA. |




# PERMANENT PAVEMENT MARKING DETAILS

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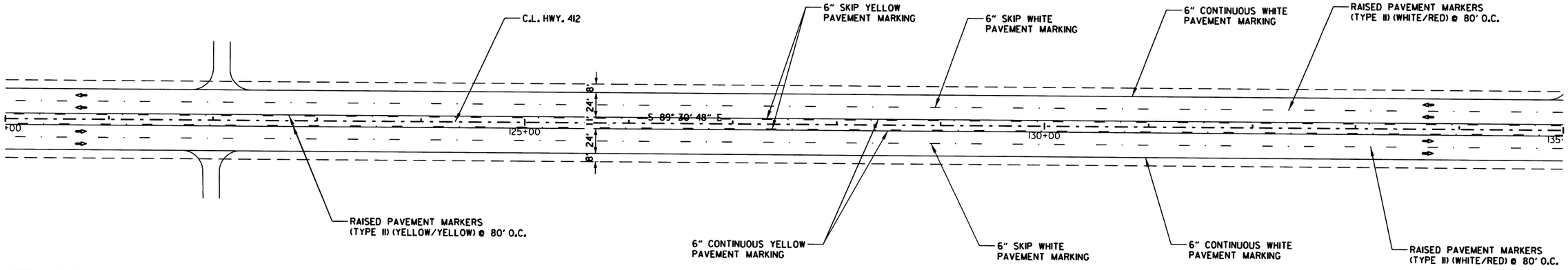
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 124 | 503 |

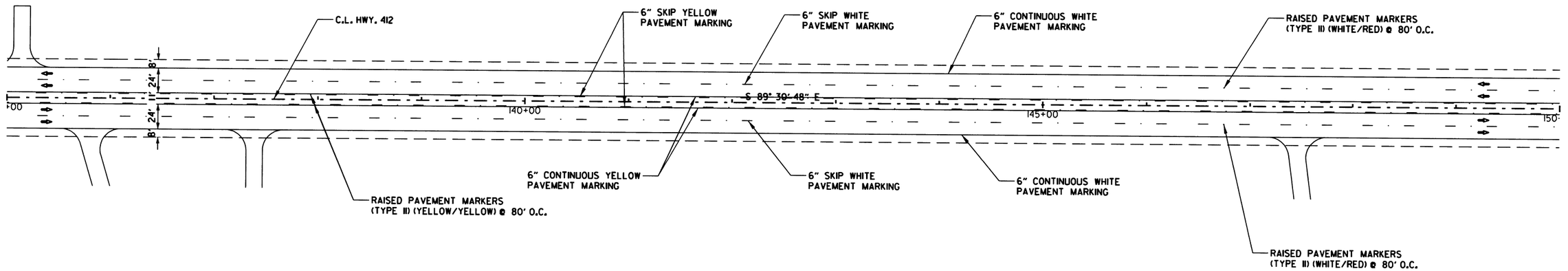
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17




PERMANENT PAVEMENT MARKINGS SHEET 2 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 EA. |




# PERMANENT PAVEMENT MARKING DETAILS

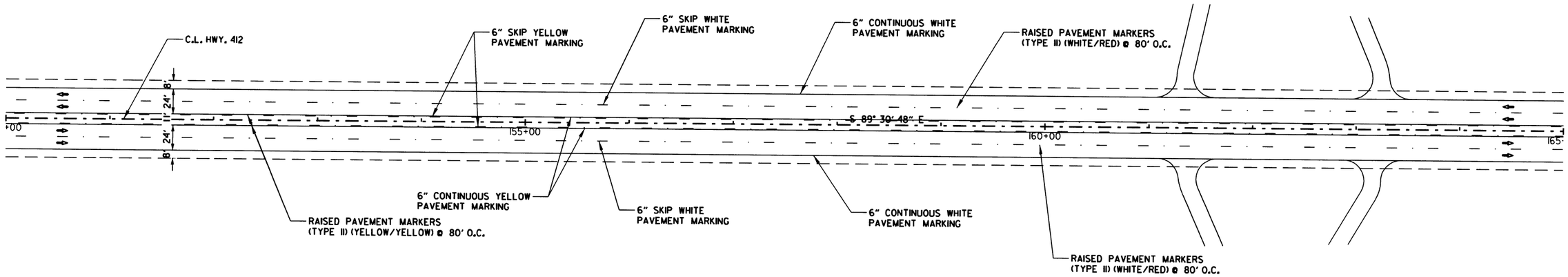
3/16/2017 2:10:52 PM
c:\dpw_work\arkansas\projects\cam030\ll412_PM_2.dgn

| 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. | | CA1003 | 125 | 503 |

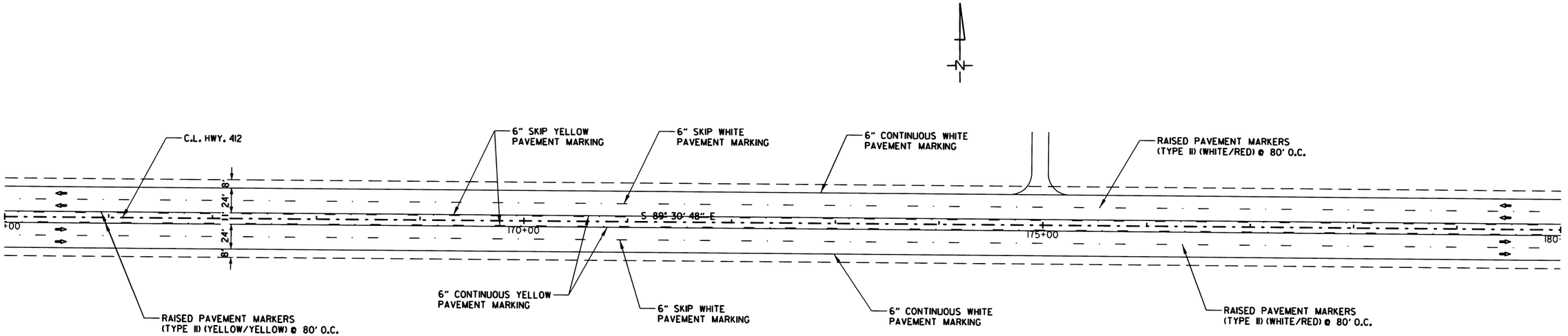
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

② PERMANENT PAVEMENT MARKING DETAILS




PERMANENT PAVEMENT MARKINGS SHEET 3 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 EA. |




# PERMANENT PAVEMENT MARKING DETAILS

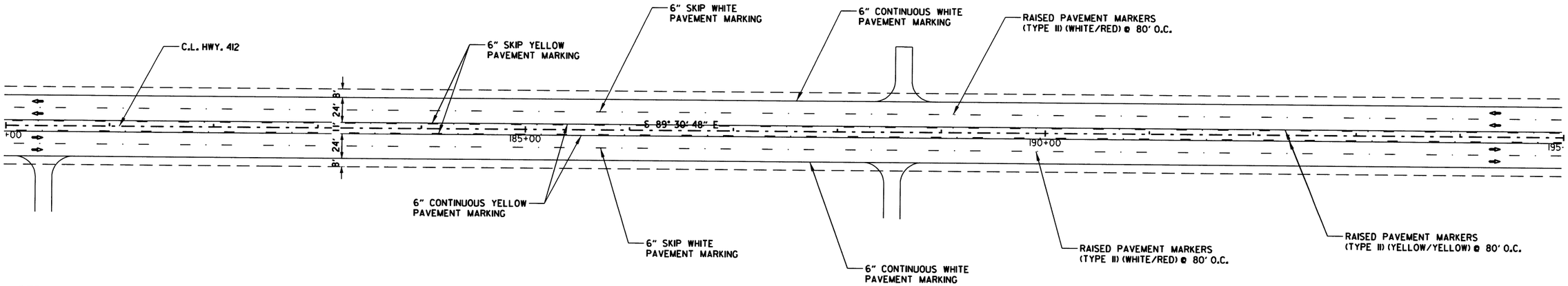
3/16/2017 2:15:25 PM

c:\dw_work\arkhwtx01\rome62243\dms030111412_PM_3.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. | | CA1003 | 126 | 503 |

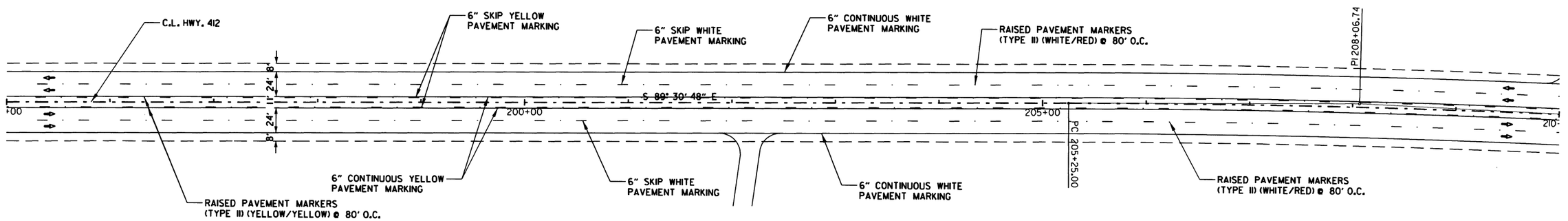
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17




PERMANENT PAVEMENT MARKINGS SHEET 4 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 EA. |




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:11:12 PM

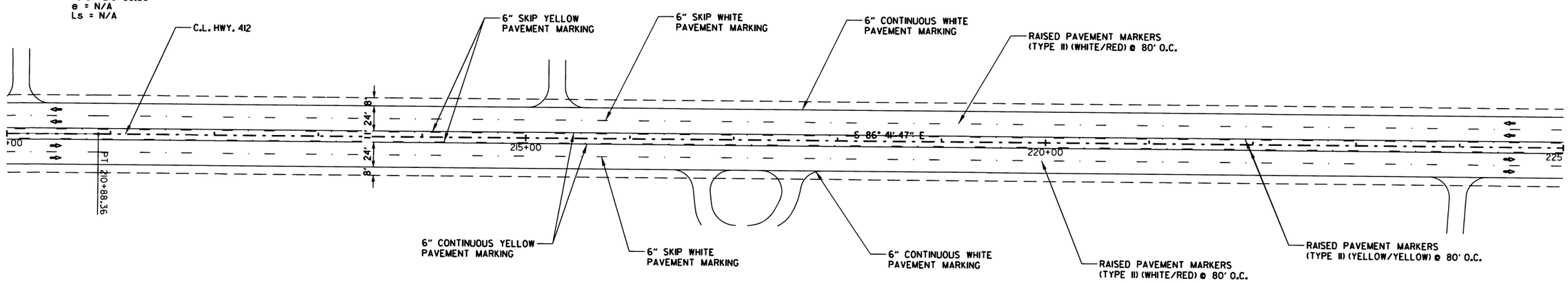
c:\pw_work\arkansas\roms2243\dms030\ln412_PM_4.dgn

| 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. | | CA1003 | 127 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS

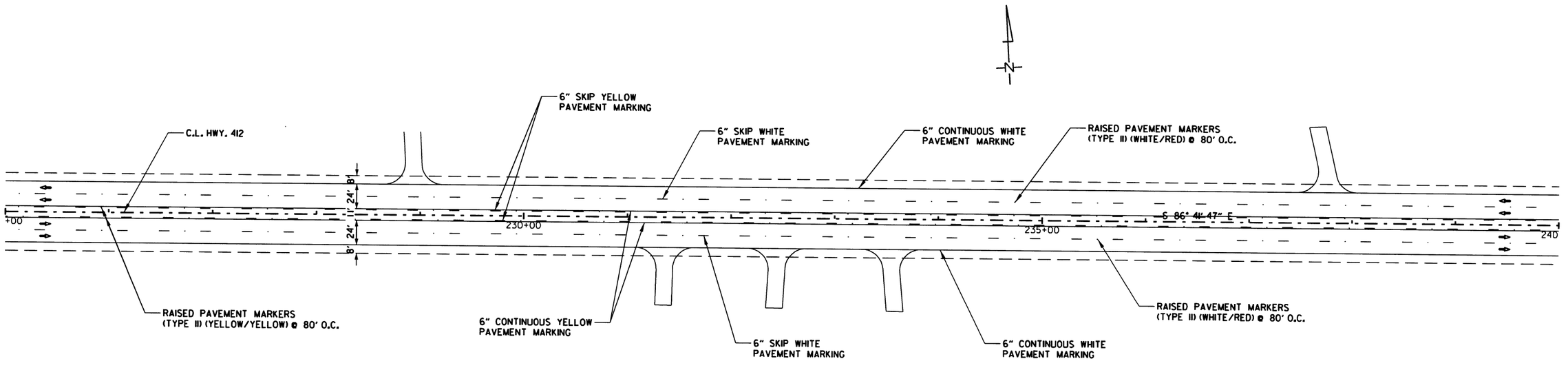
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

C.L. HWY. 412
P.I. = 208+06.74
Δ = 2° 49' 00" (RT)
D = 0° 30' 00"
T = 281.73'
L = 563.35'
R = 11,459.16'
P.C. = 205+25.00
P.T. = 210+88.36
e = N/A
Ls = N/A




PERMANENT PAVEMENT MARKINGS SHEET 5 OF 26

| | | | |
|---|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 | L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 | L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 | EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 | EA. |



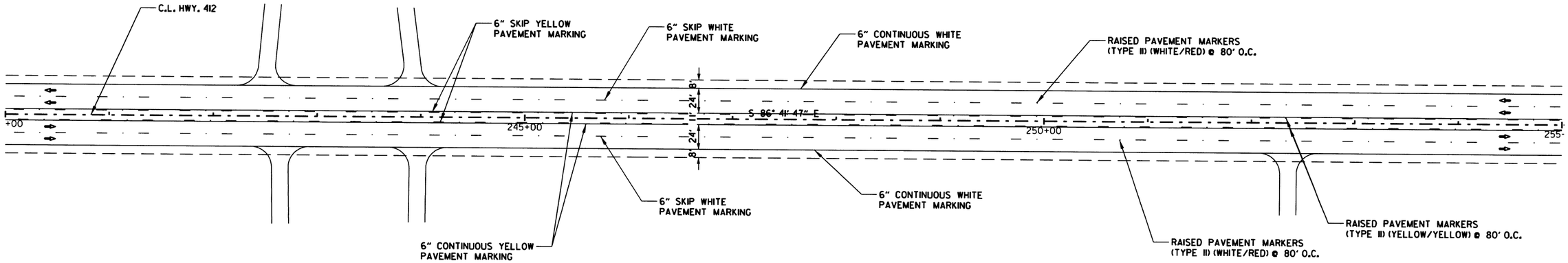

# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:19:46 PM
c:\dw_work\dtknott\01\ome2243\dms0301\412_PM_5.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. | | CA1003 | 128 | 503 |

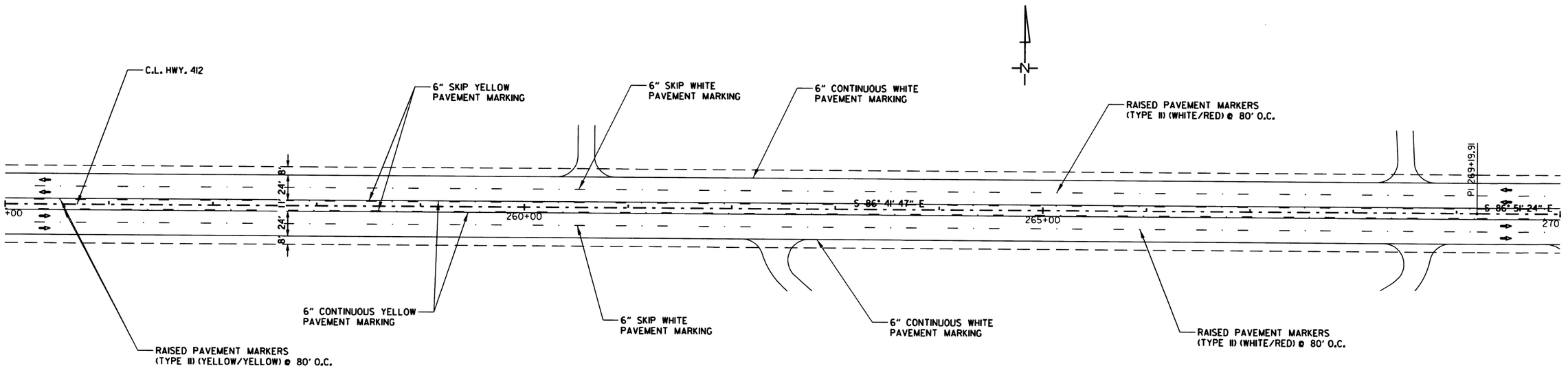
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

## ② PERMANENT PAVEMENT MARKING DETAILS




PERMANENT PAVEMENT MARKINGS SHEET 6 OF 26

| | | | |
|---|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 | L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 | L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 | EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 | EA. |



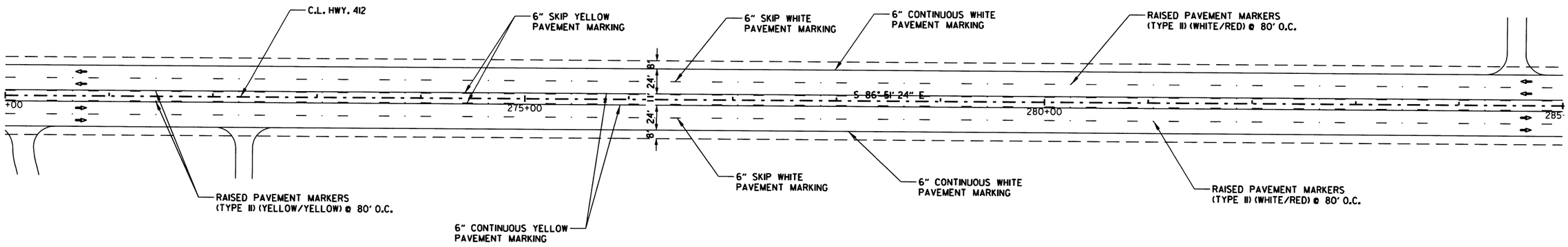

# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:29:43 PM
c:\dw_work\0tknqtx01\rome2243\dms03011\412_PM_6.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. | | CA1003 | 129 | 503 |

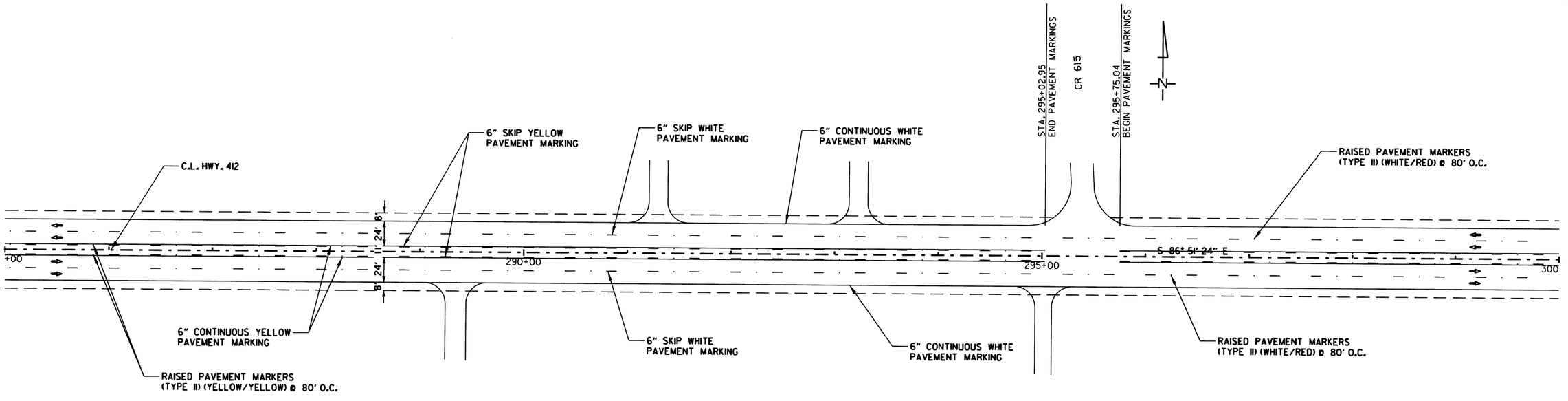
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17




PERMANENT PAVEMENT MARKINGS SHEET 7 OF 26

| | | | |
|---|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7398 | L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7320 | L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 93 | EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 92 | EA. |



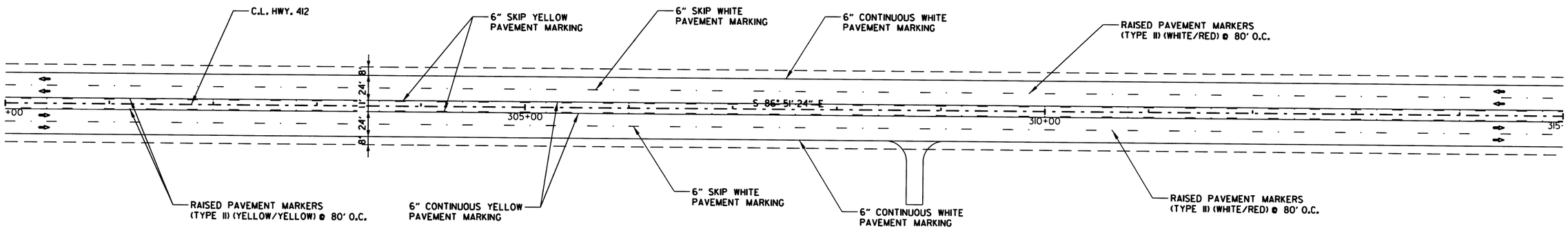

# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:33:01 PM
c:\dw_work\arkmatx01\rome2243\cms030II\412_PM_7.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. | | CA1003 | 130 | 503 |

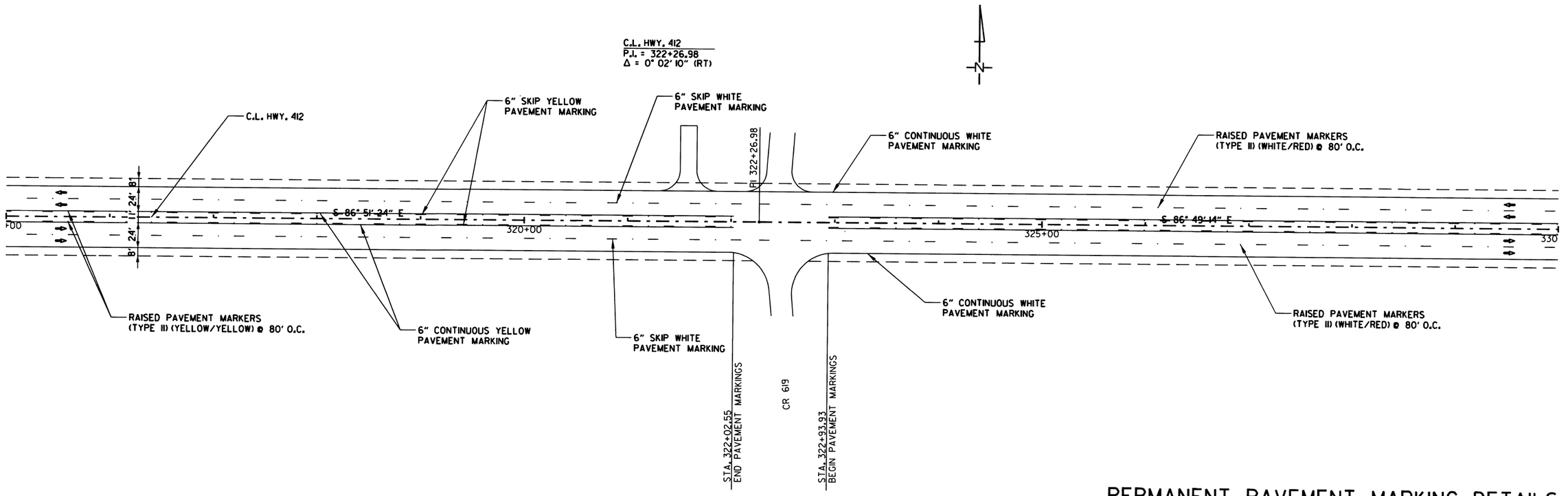
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/14/17




PERMANENT PAVEMENT MARKINGS SHEET 8 OF 26

| | | | |
|---|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7398 | L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7270 | L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 93 | EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 91 | EA. |



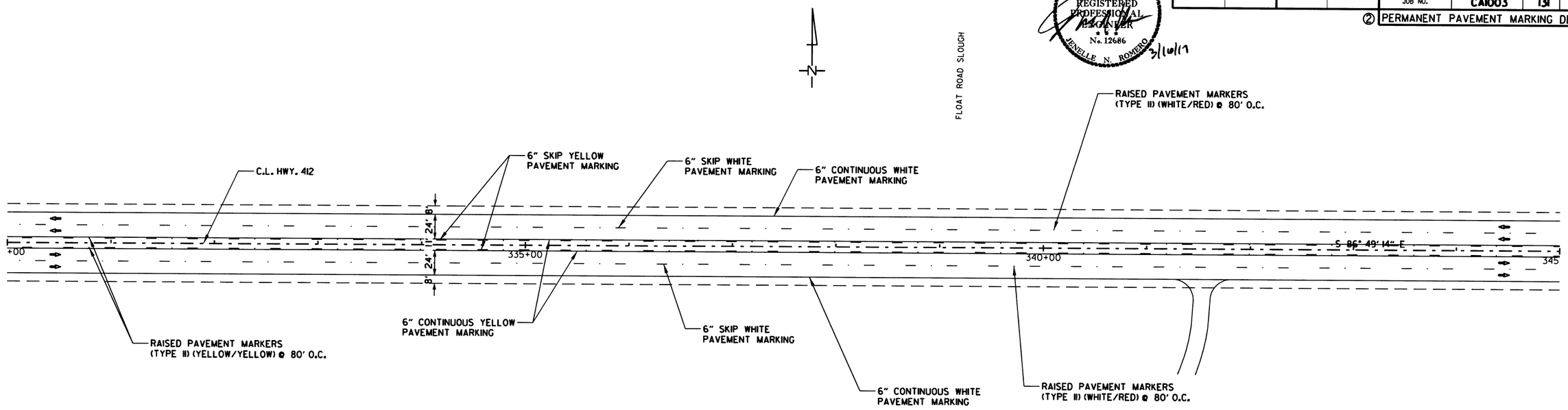

# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:33:48 PM
c:\pw_work\dfw\natx01\rome62243\dms030\II\412_PM_8.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. | | CA1003 | 131 | 503 |

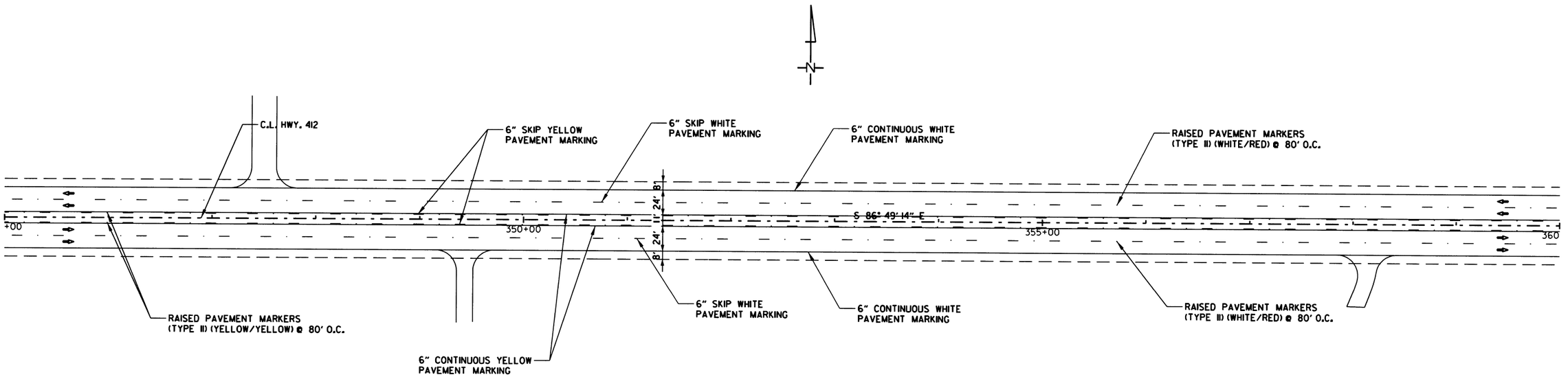
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/10/17




PERMANENT PAVEMENT MARKINGS SHEET 9 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 EA. |




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:35:57 PM
c:\pw_work\atknotx01\rome2243\dms0301\1412_PW_3.dgn

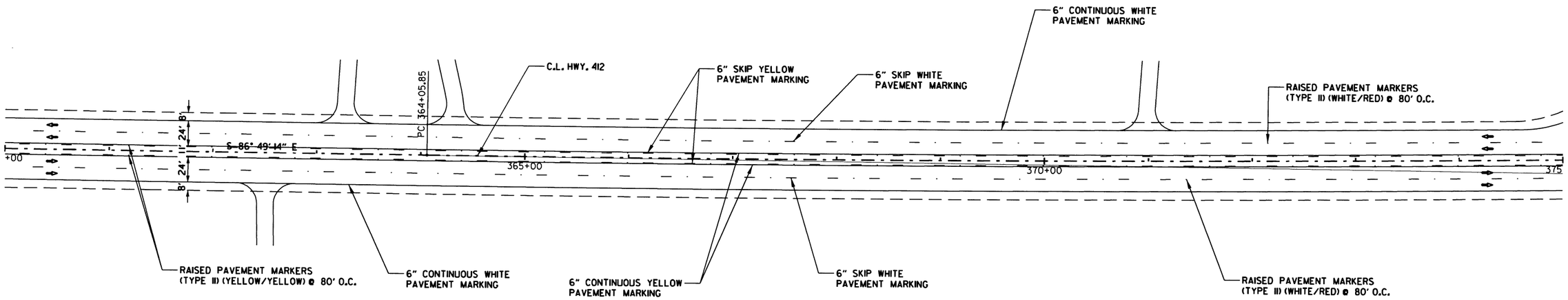
HWY 412 ONLY
PERMANENT PAVEMENT MARKINGS SHEET 10 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7267 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7300 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 91 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 92 EA. |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

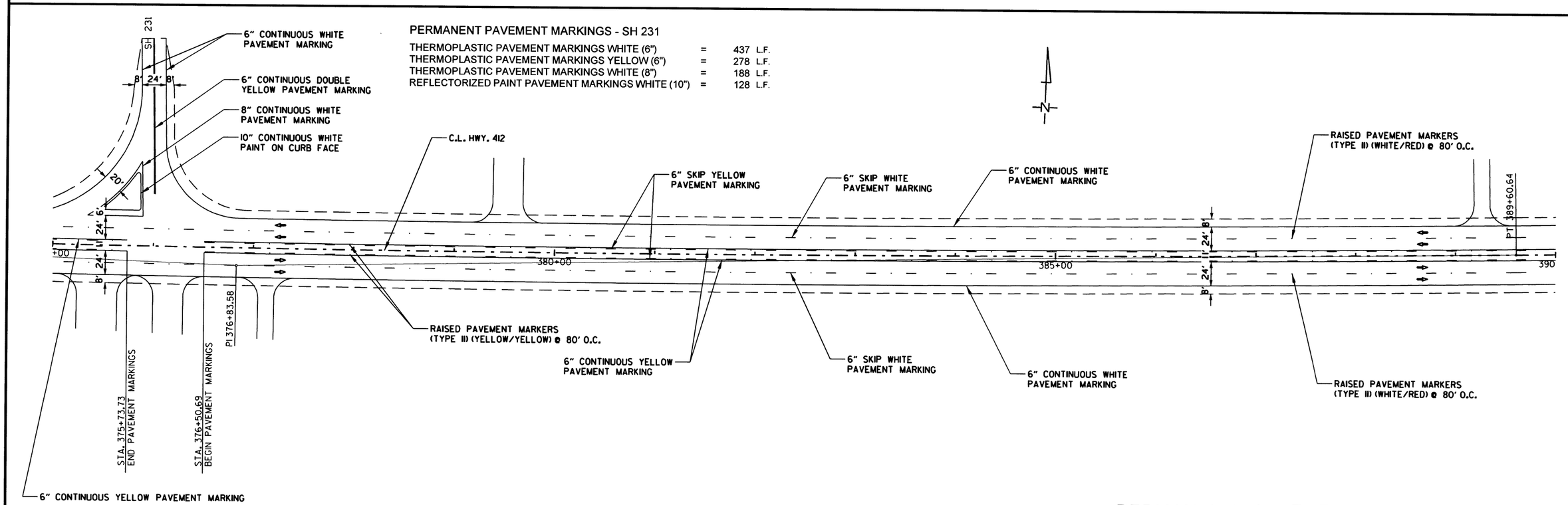
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 132 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS




PERMANENT PAVEMENT MARKINGS - SH 231

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 437 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 278 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (8") | = | 188 L.F. |
| REFLECTORIZED PAINT PAVEMENT MARKINGS WHITE (10") | = | 128 L.F. |




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:39:14 PM
c:\dgn_work\arkansas\rome2243\dms030III412_PM_10.dgn

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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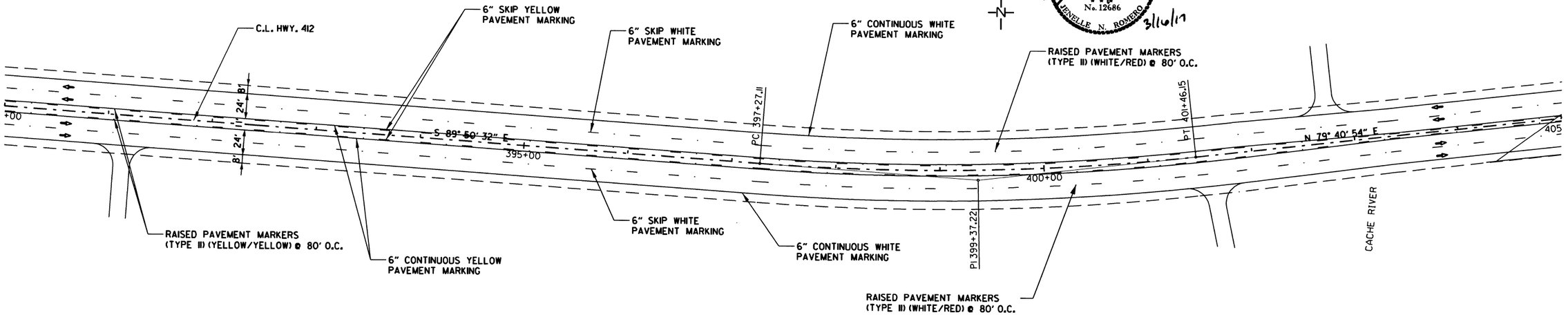
| | | | |
| | | | |

| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 133 | 503 |

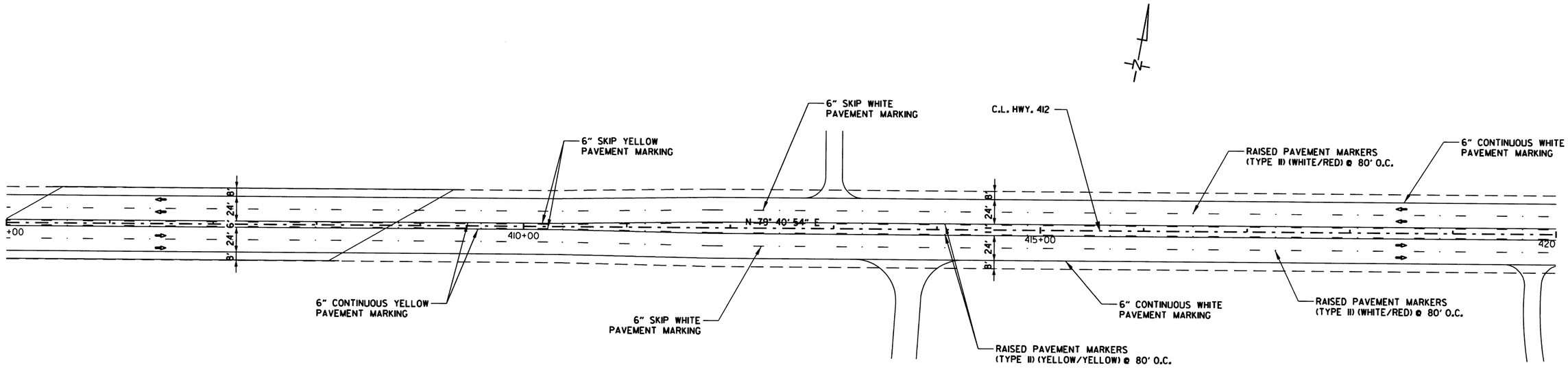
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17




PERMANENT PAVEMENT MARKINGS SHEET 11 OF 26

| | | | |
|---|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 | L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 | L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 | EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 | EA. |




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:40:06 PM
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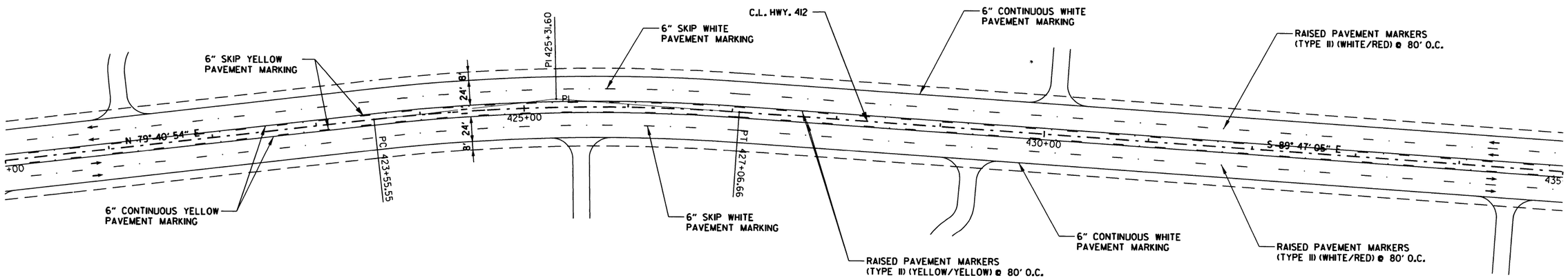
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 134 | 503 |

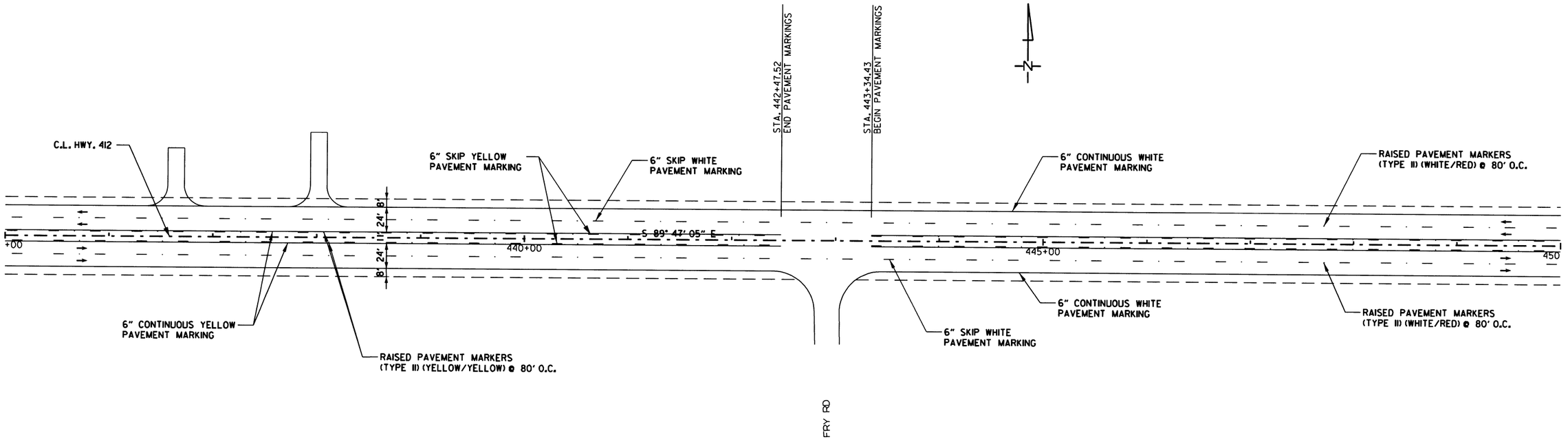
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17




PERMANENT PAVEMENT MARKINGS SHEET 12 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7396 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7283 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 93 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 92 EA. |




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:40:55 PM
C:\pw_work\arkna1x01\rome2243\dms03011\412_PM_12.dgn

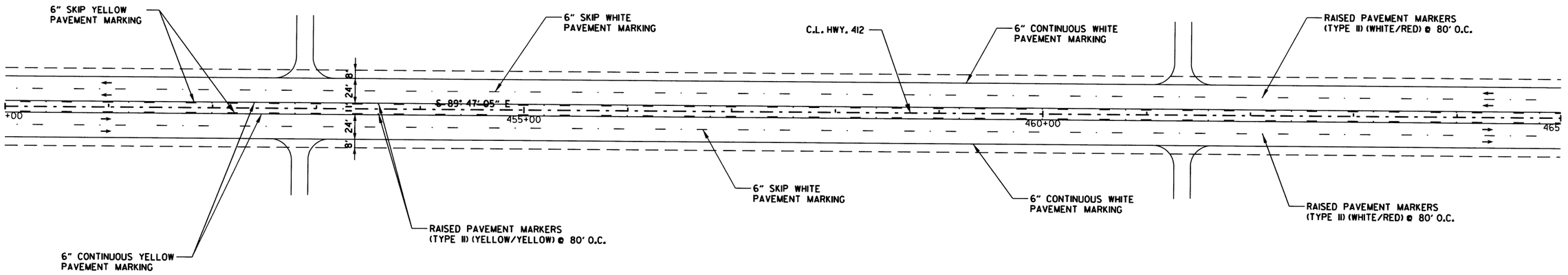
PERMANENT PAVEMENT MARKINGS SHEET 13 OF 26

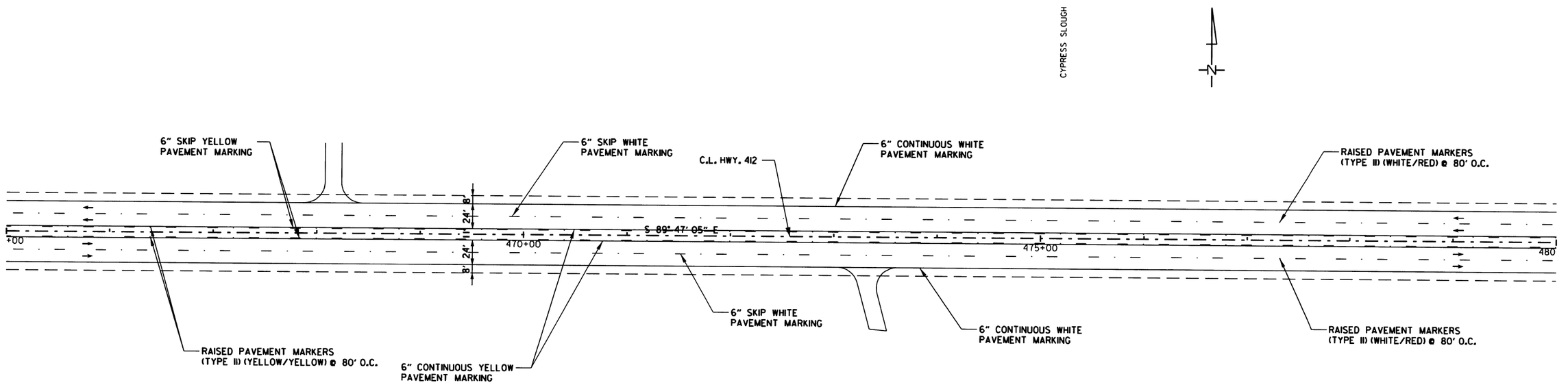
| | | | |
|---|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 | L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 | L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 | EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 | EA. |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

| 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. | | CA1003 | 135 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:44:39 PM
C:\pw_work\dfkndtx01\rome2243\dms03011\412_PM_13.dgn

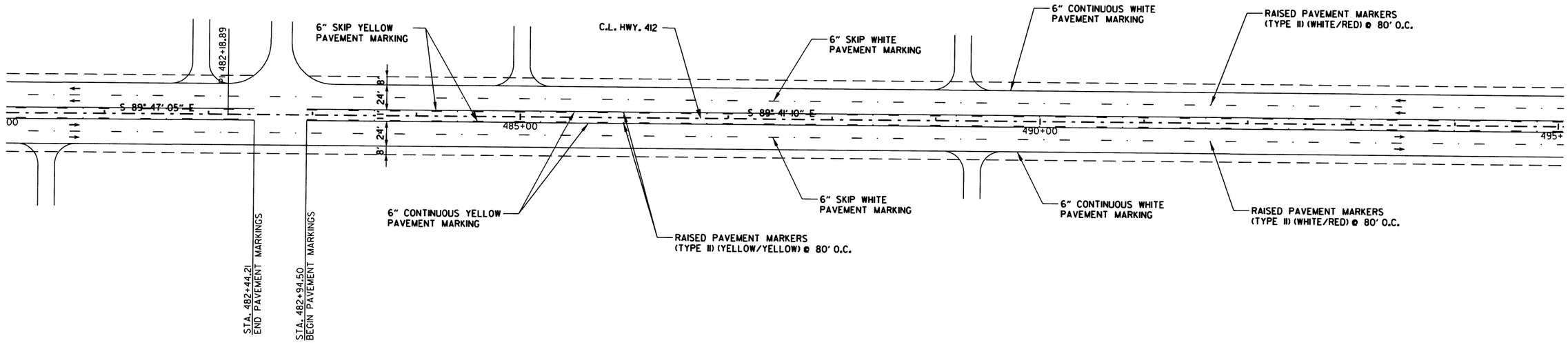
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 136 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL
No. 12686
JENELLE N. ROMERO
3/10/17

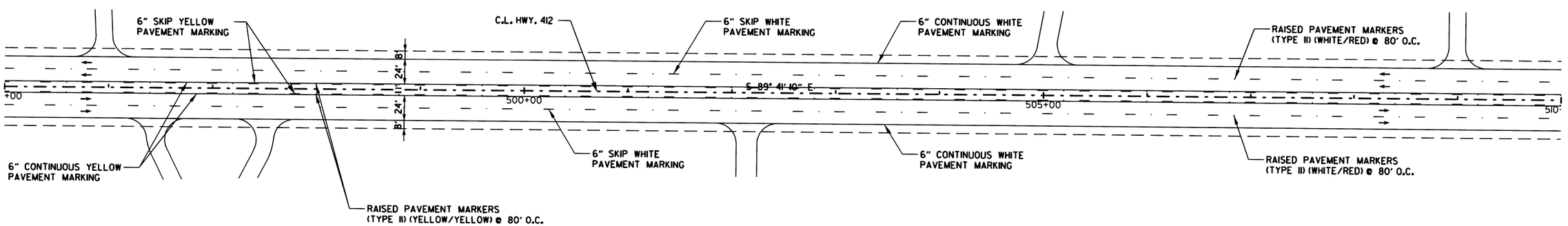
C.L. HWY. 412
P.I. = 482+18.89
Δ = 0° 05' 55" (LT)

CR 204




PERMANENT PAVEMENT MARKINGS SHEET 14 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7399 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7375 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 93 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 93 EA. |




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 1:29:18 PM
c:\pw_work\gthnatfx01\rome2243\dms0301\1412_PM_14.dgn

PERMANENT PAVEMENT MARKINGS SHEET 15 OF 26

| | | | |
|---|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7392 | L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7355 | L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 93 | EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 92 | EA. |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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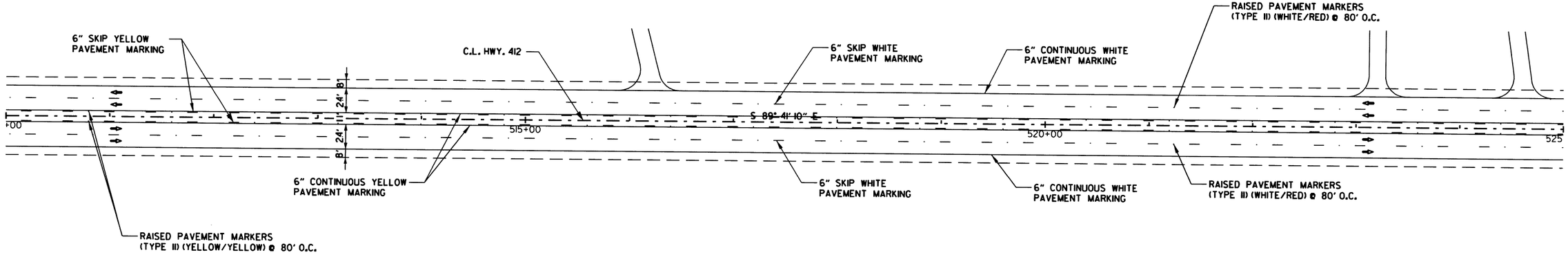
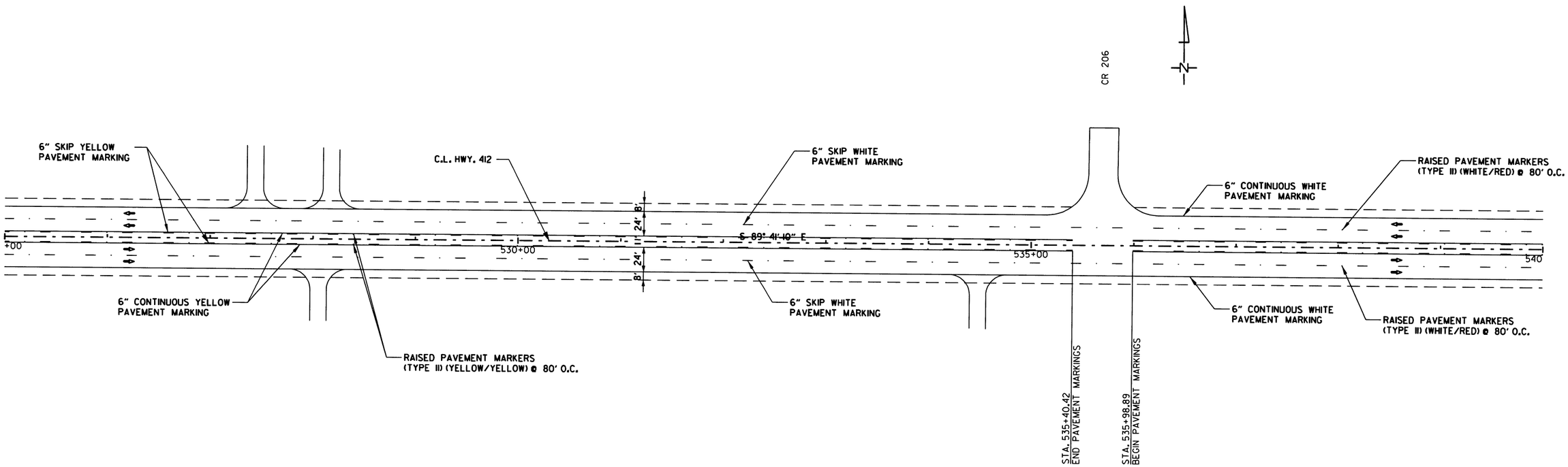
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 137 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 1:31:29 PM
G:\dw_work\arkansas\x01\rome2245\dms030\N412_PM_15.dgn

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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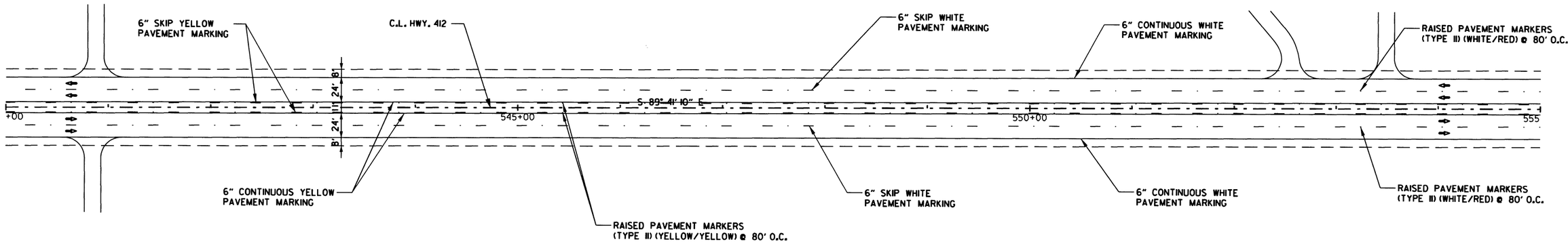
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 138 | 503 |

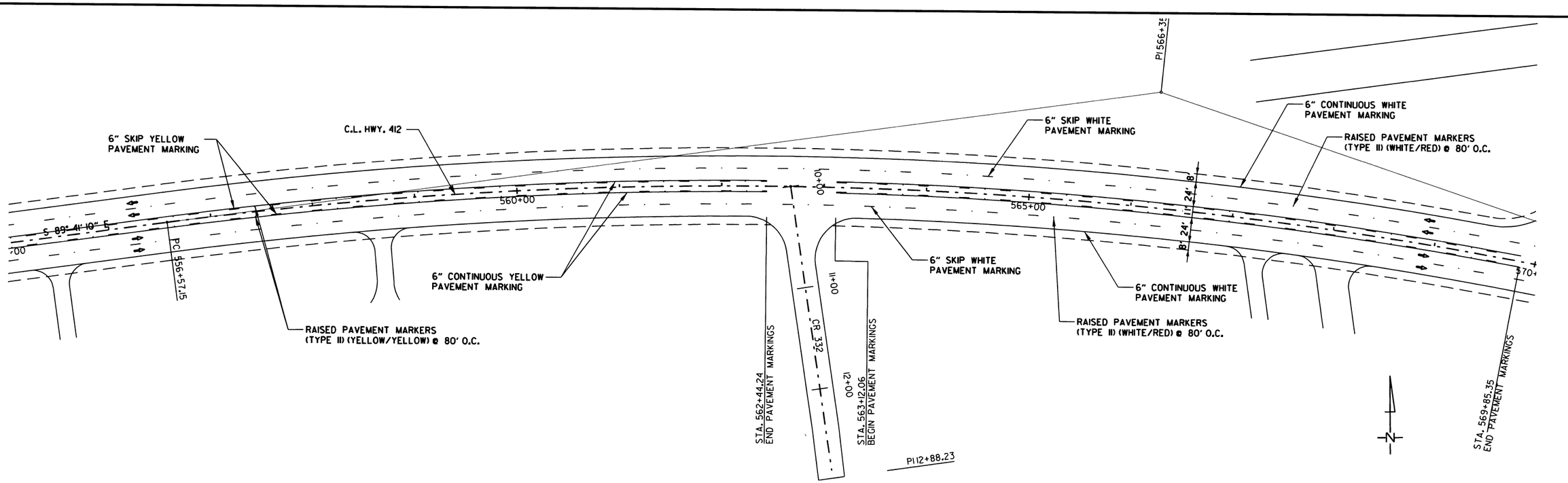
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17




PERMANENT PAVEMENT MARKINGS SHEET 16 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7375 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7294 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 93 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 92 EA. |




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 1:34:10 PM
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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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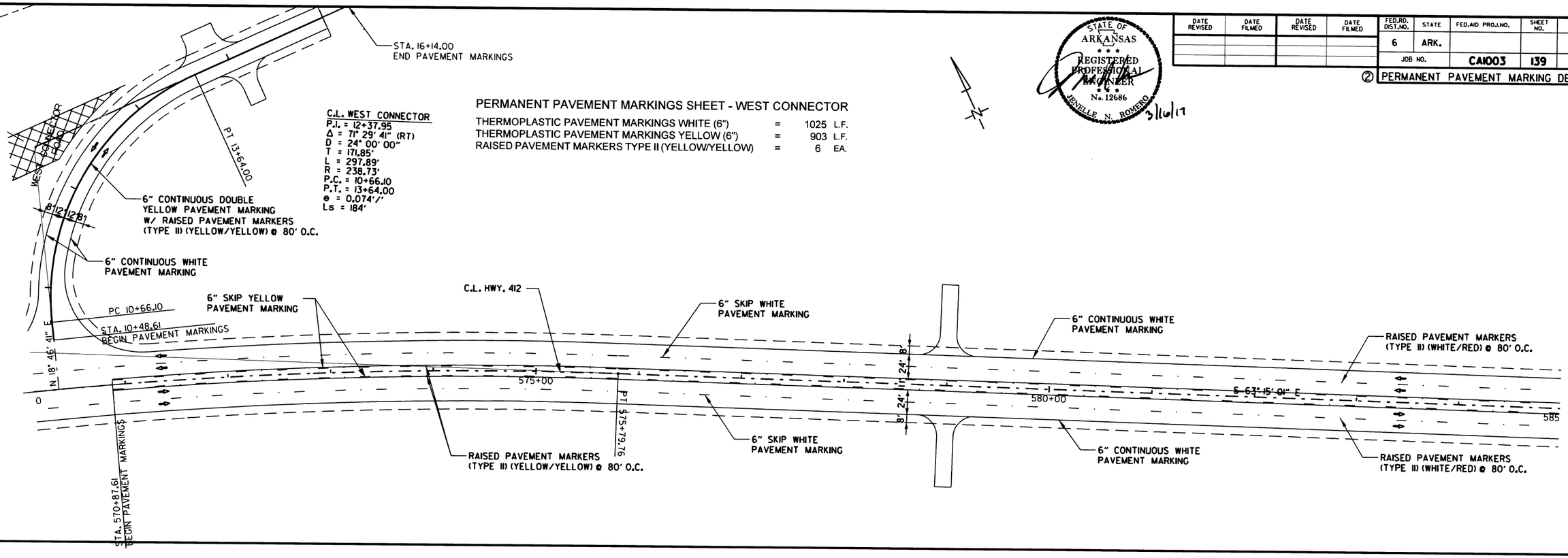
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | C.A1003 | 139 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

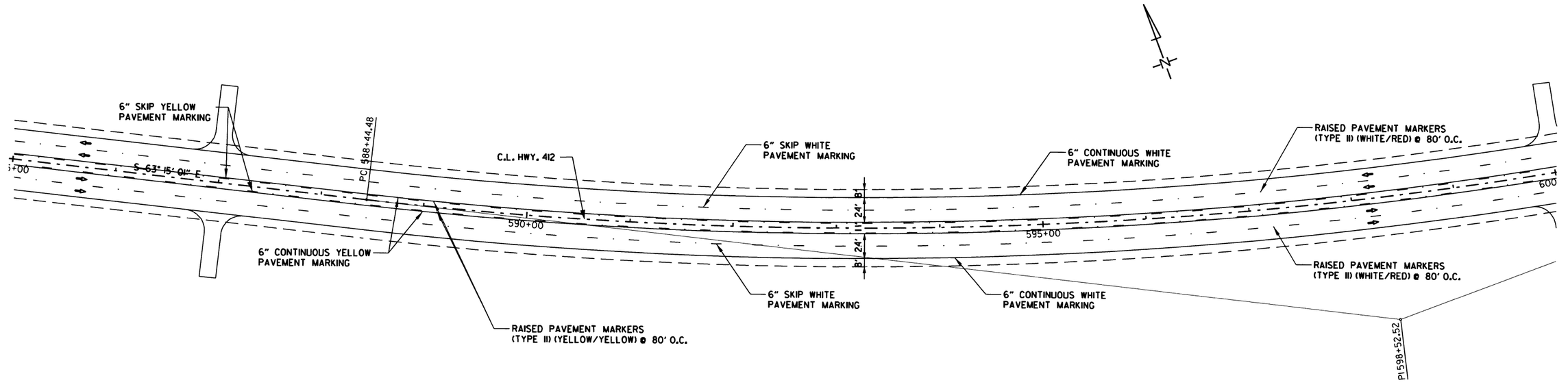



## PERMANENT PAVEMENT MARKINGS SHEET - WEST CONNECTOR

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 1025 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 903 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 6 EA. |

## PERMANENT PAVEMENT MARKINGS SHEET 17 OF 26 - HWY. 412 ONLY

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7376 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7281 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 93 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 92 EA. |




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 1:35:43 PM
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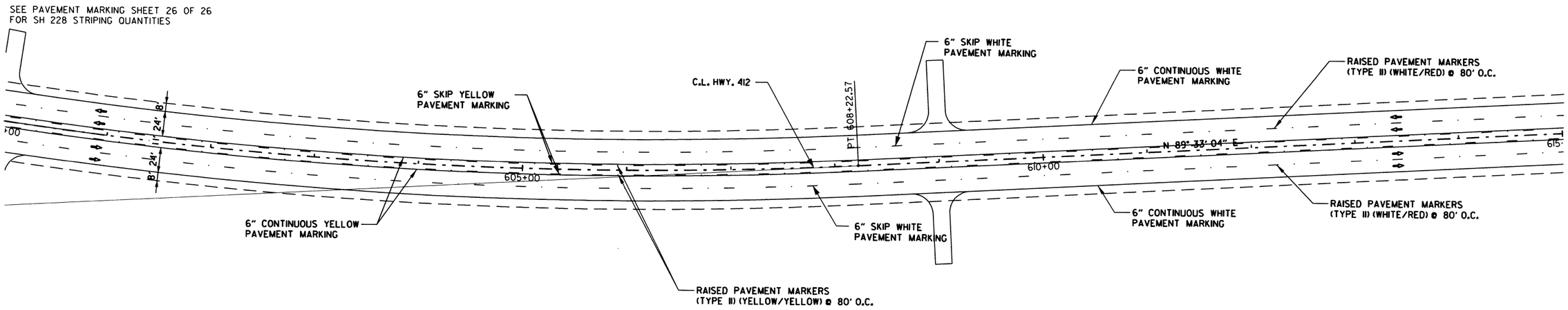
## PERMANENT PAVEMENT MARKINGS SHEET 18 OF 26

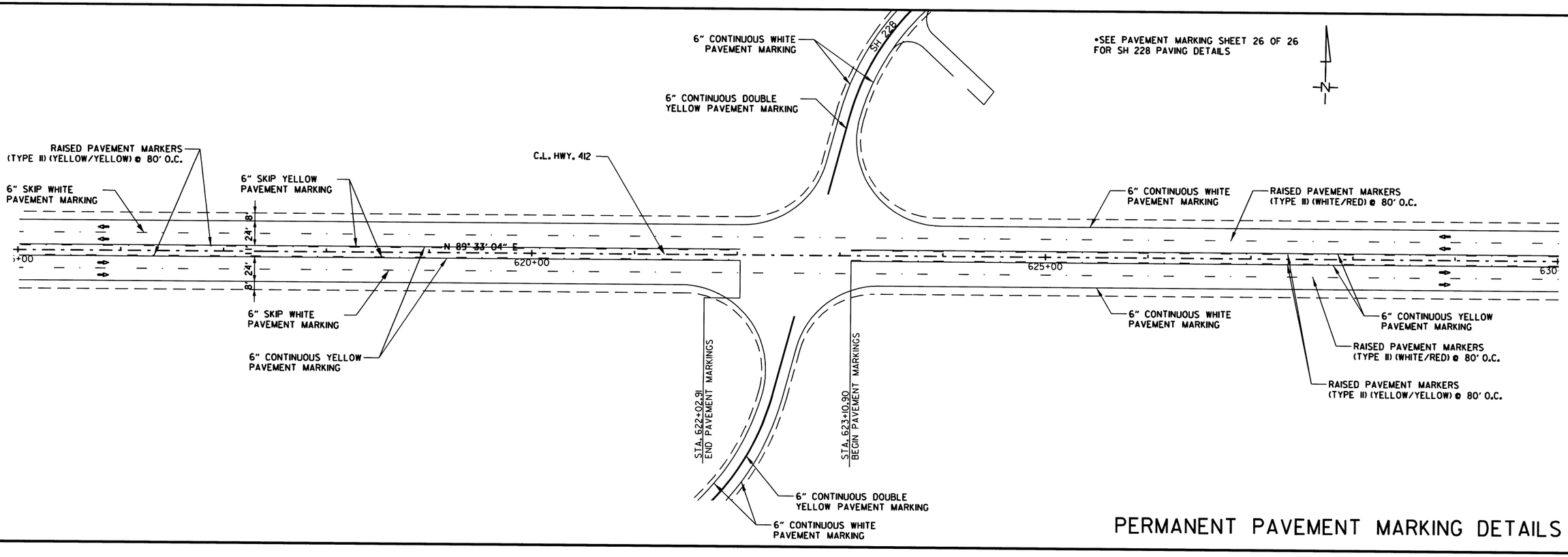
| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7115 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7230 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 89 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 91 EA. |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

| 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. | | CA1003 | 140 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 1:37:31 PM
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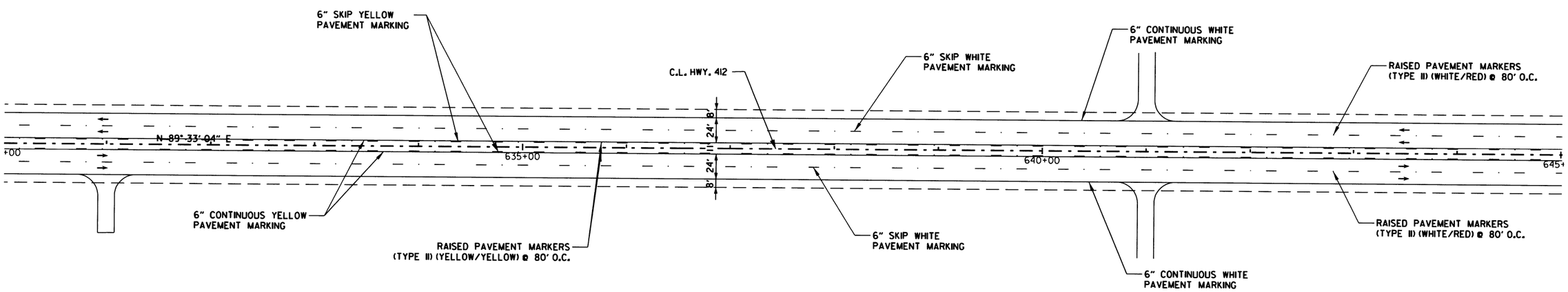
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 141 | 503 |

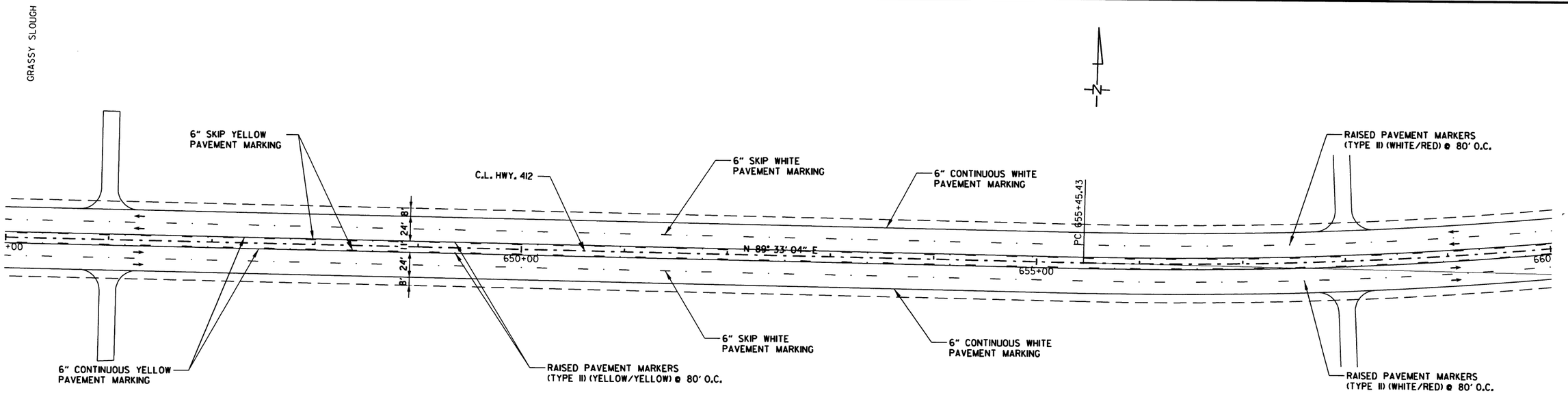
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/14/17




PERMANENT PAVEMENT MARKINGS SHEET 19 OF 26

| | | | |
|---|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 | L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 | L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 | EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 | EA. |




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 1:38:47 PM
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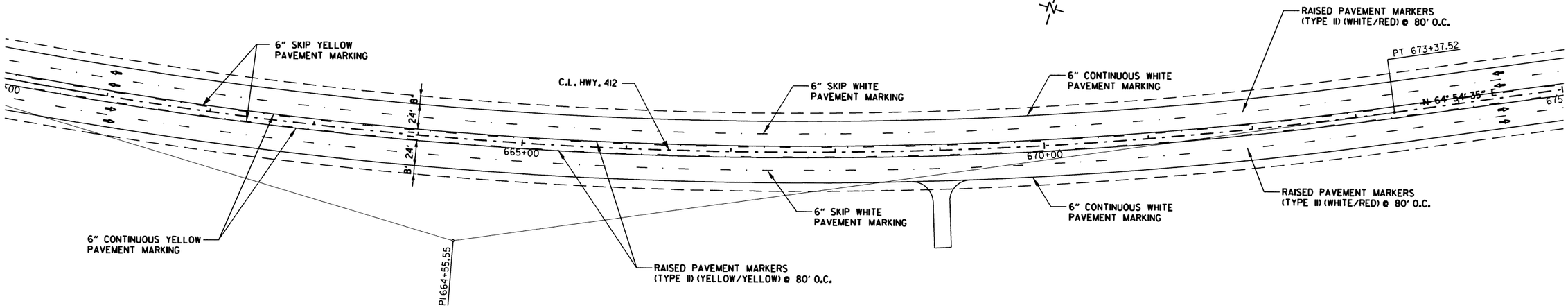
HWY 412 ONLY
PERMANENT PAVEMENT MARKINGS SHEET 20 OF 26

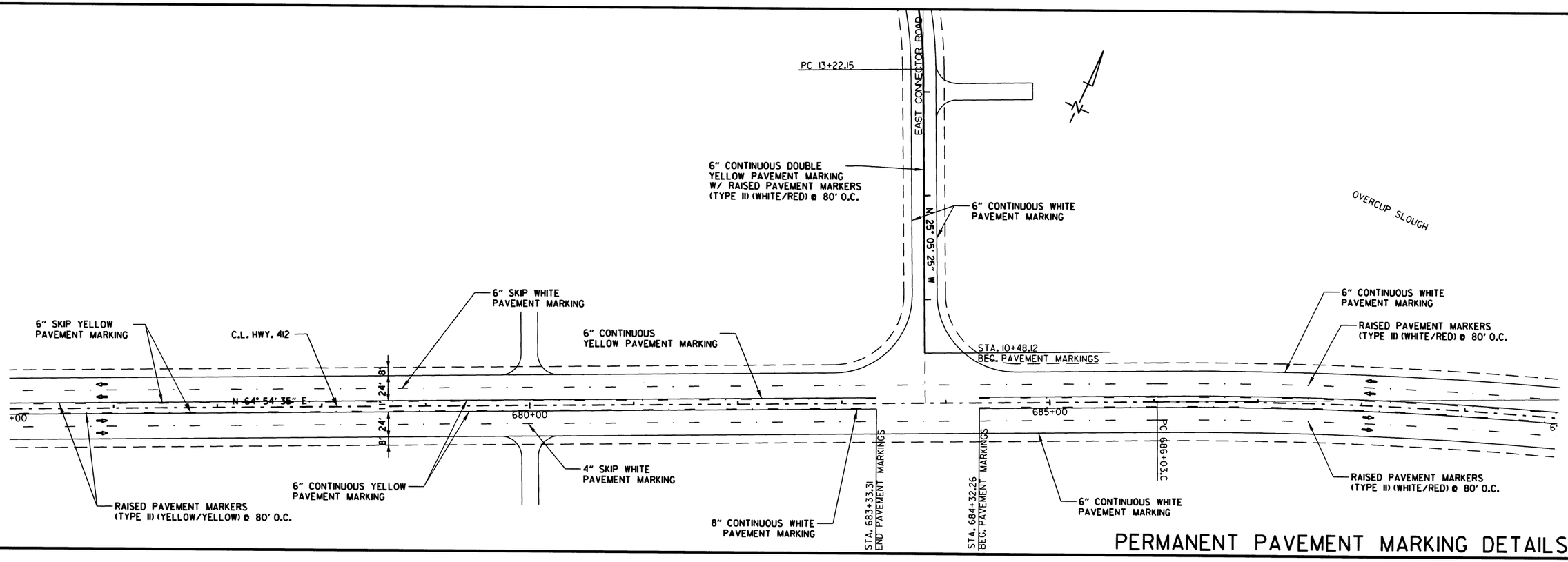
| | | | |
|---|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7300 | L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7227 | L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 92 | EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 91 | EA. |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/16/17

| 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. | | CA1003 | 142 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 1:49:09 PM
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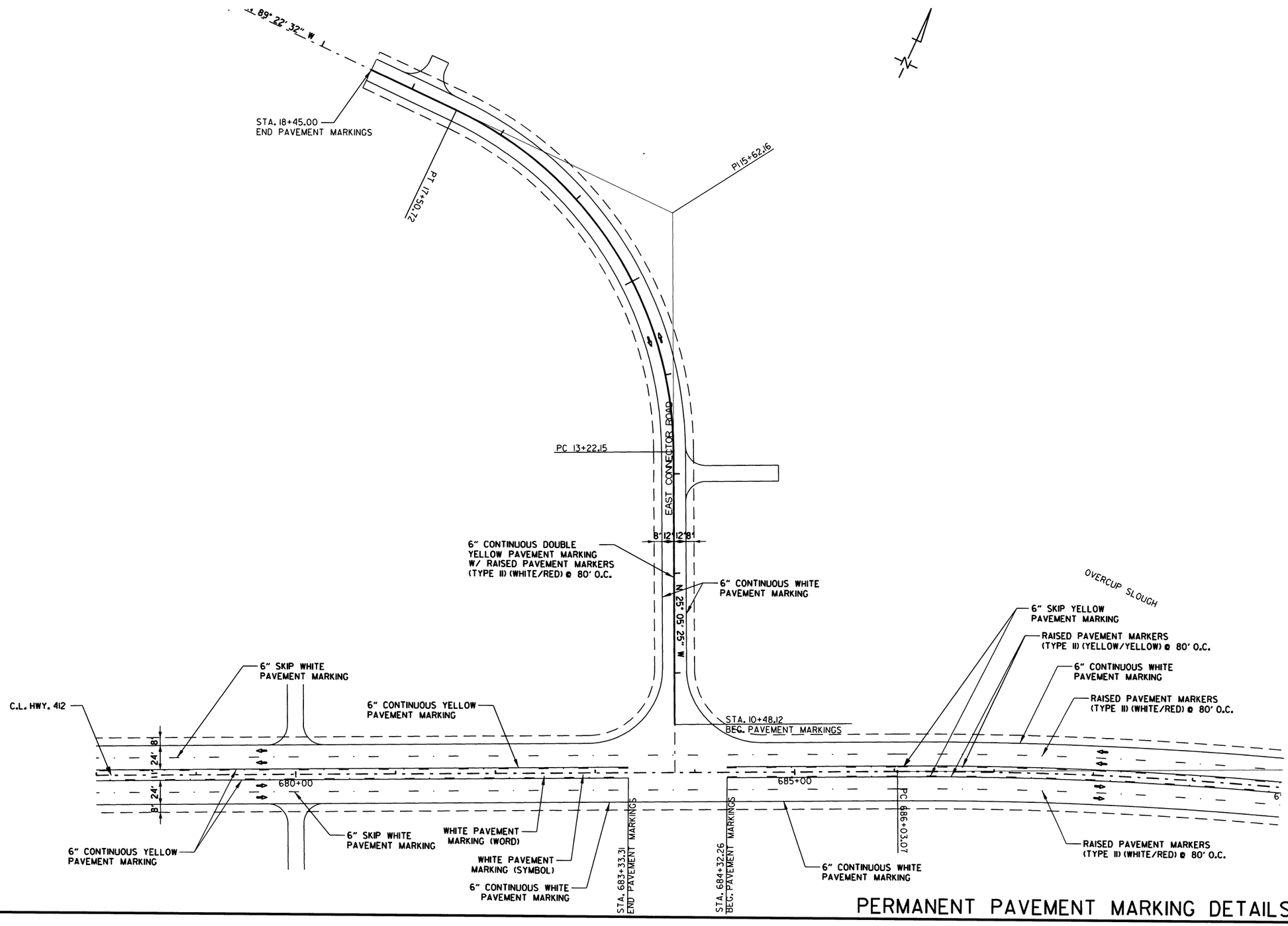
HWY 412 EAST CONNECTOR ROAD ONLY
PERMANENT PAVEMENT MARKINGS SHEET 20 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 1717 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 1605 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 10 EA. |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

| 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. | | CA1003 | 143 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 1:43:58 PM
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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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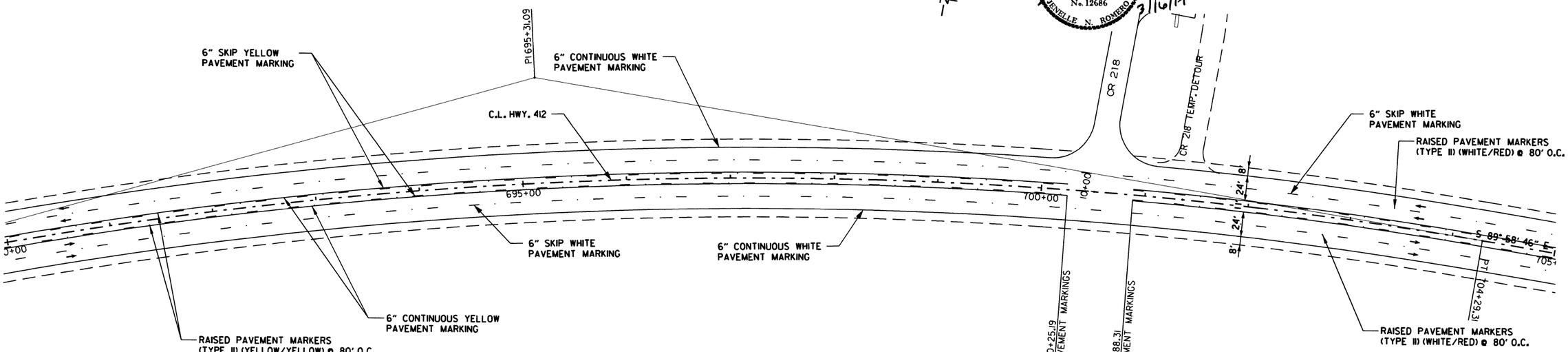
| | | | |

| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 144 | 503 |

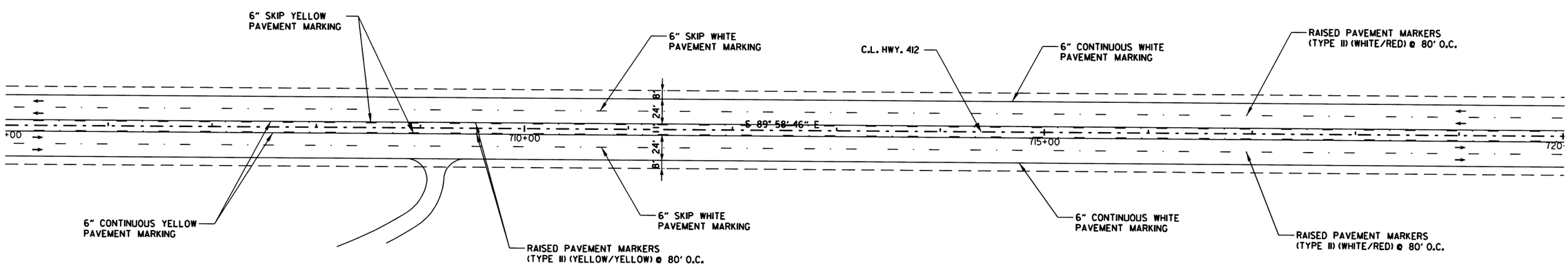
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17




PERMANENT PAVEMENT MARKINGS SHEET 21 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7397 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7343 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 93 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 92 EA. |




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 1:47:01 PM
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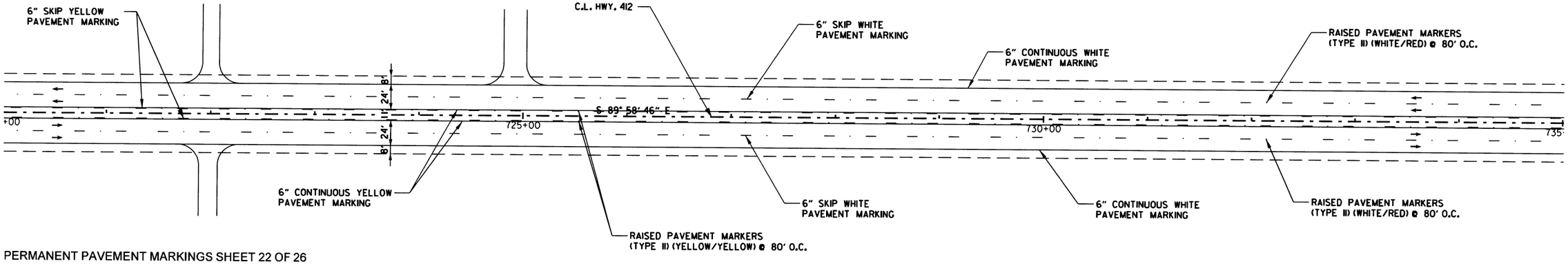
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 145 | 503 |

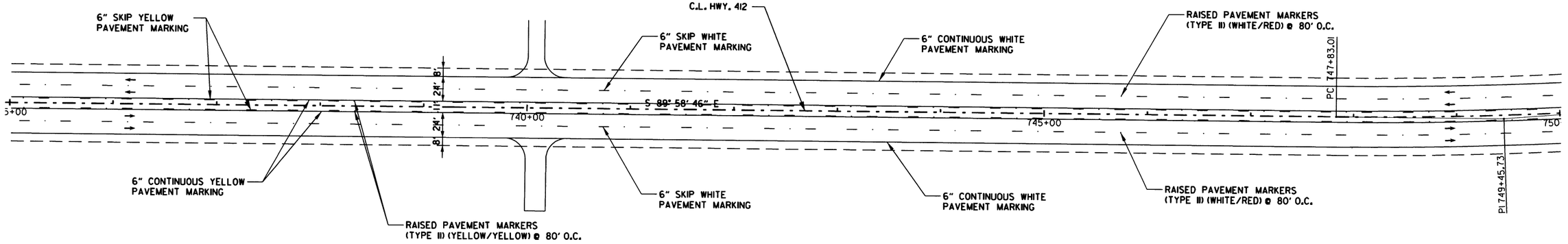
② PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17




PERMANENT PAVEMENT MARKINGS SHEET 22 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 EA. |




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 1:54:24 PM

c:\pw_work\arkhartx01\rome2243\dms030111412_PM_22.dgn

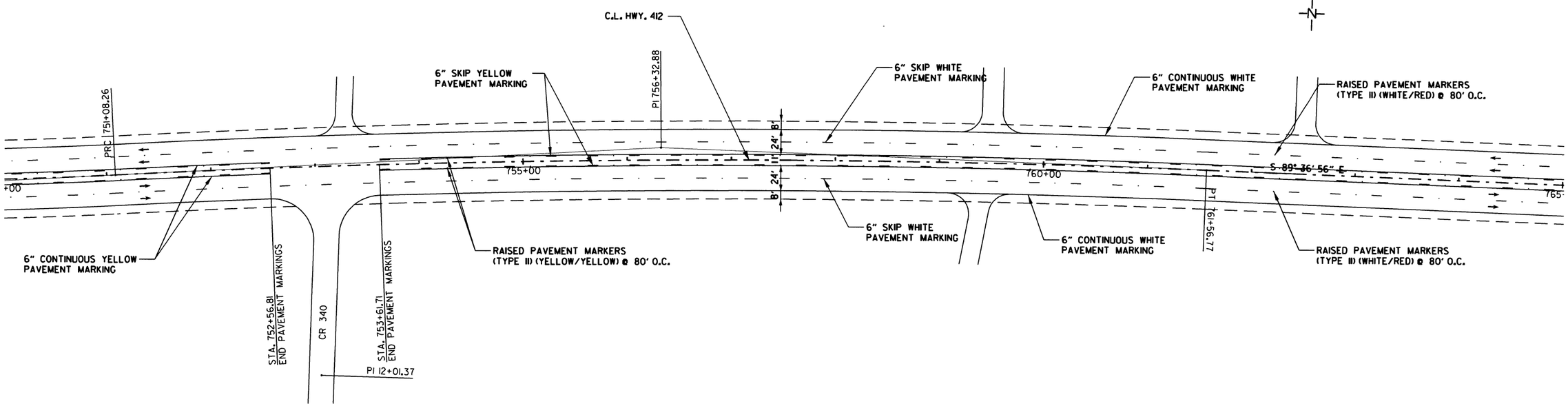
## PERMANENT PAVEMENT MARKINGS SHEET 23 OF 26

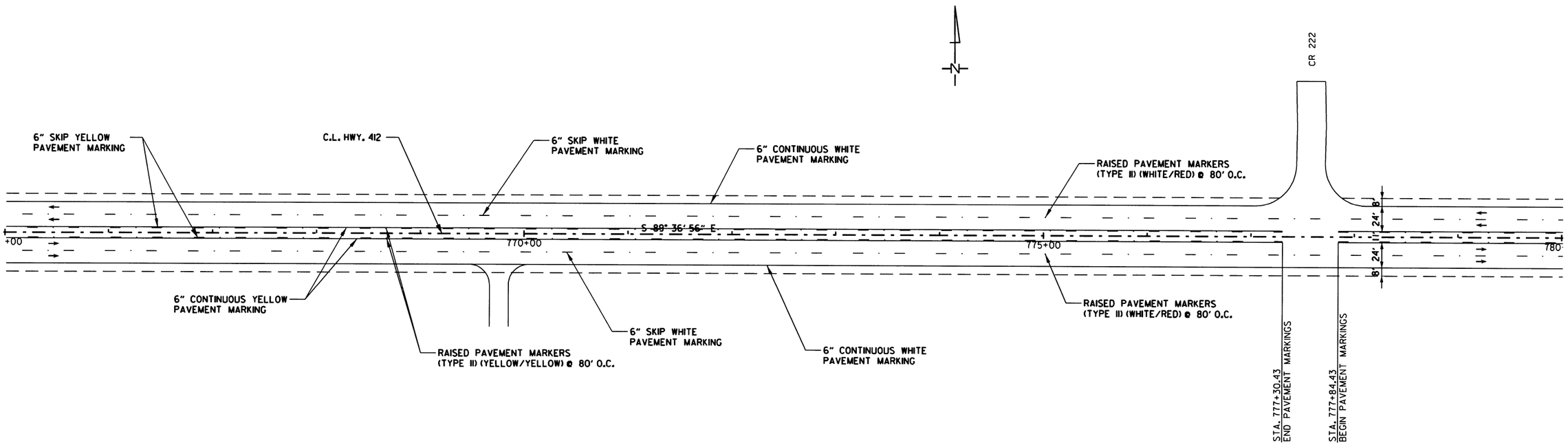
| | | | |
|---|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7287 | L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7103 | L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 92 | EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 89 | EA. |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

| 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. | | CA1003 | 146 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 11:55:43 PM
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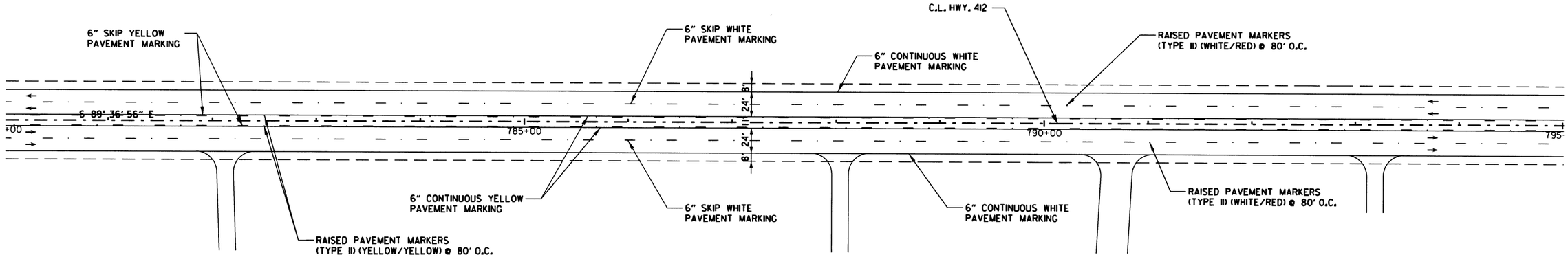
## PERMANENT PAVEMENT MARKINGS SHEET 24 OF 26

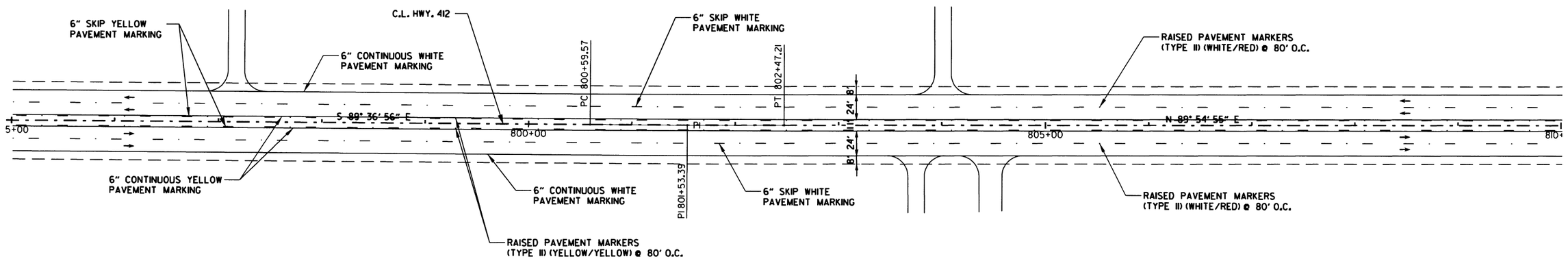
| | | | |
|---|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 | L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 | L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 | EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 | EA. |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/14/17

| 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. | | CA1003 | 147 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 1:58:34 PM
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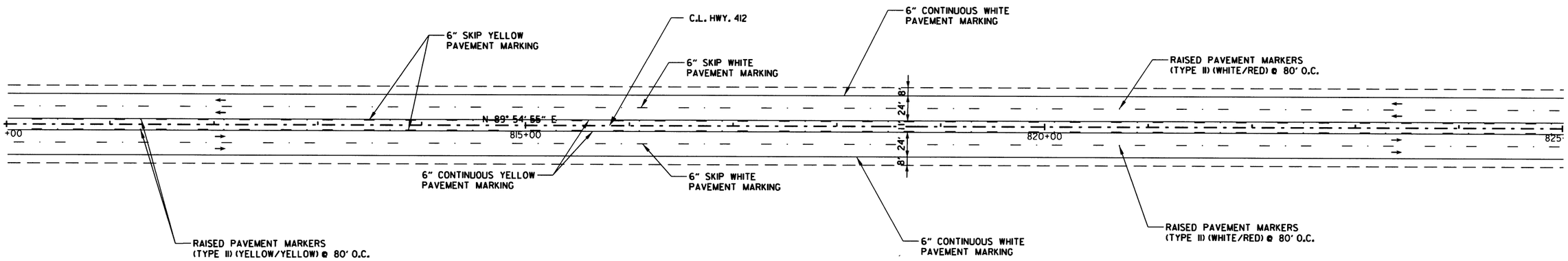
PERMANENT PAVEMENT MARKINGS SHEET 25 OF 26

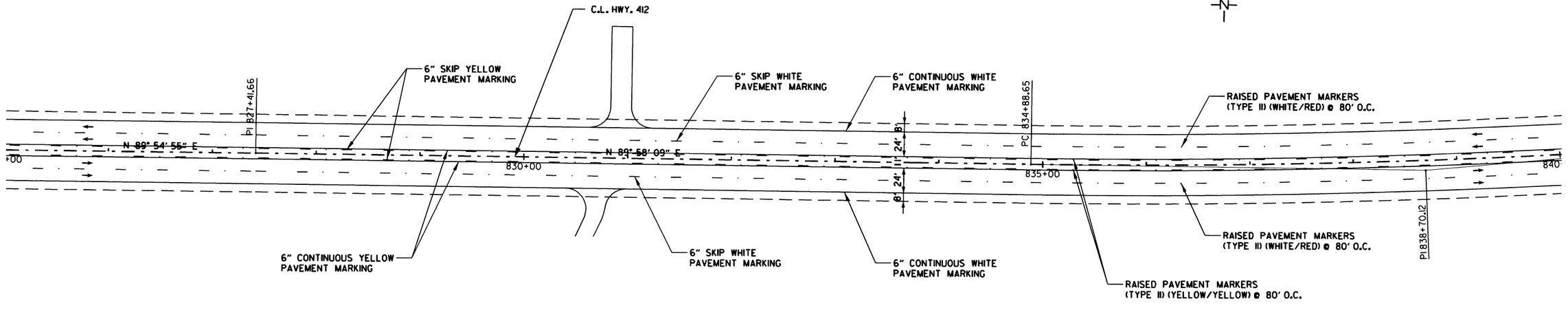
| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 7500 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 7500 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 94 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 94 EA. |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

| 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. | | CA1003 | 148 | 503 |

② PERMANENT PAVEMENT MARKING DETAILS




# PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:00:25 PM

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PERMANENT PAVEMENT MARKINGS SHEET 26 OF 26

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 3582 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 3504 L.F. |
| RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) | = | 45 EA. |
| RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) | = | 44 EA. |

STATE OF ARKANSAS
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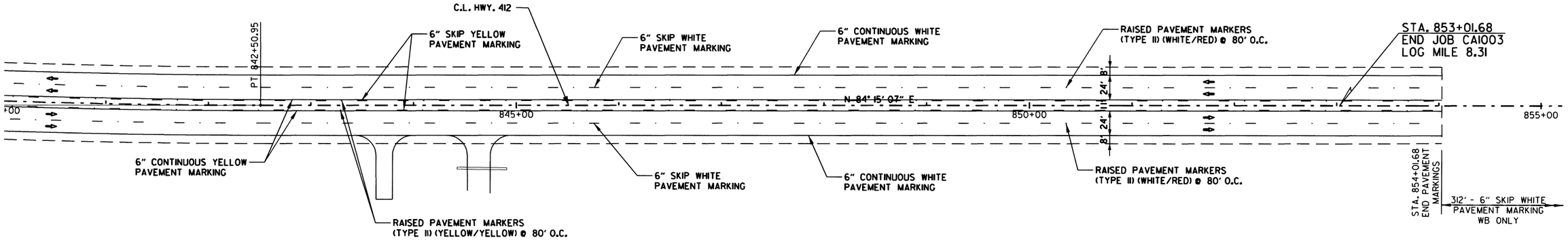
No. 12686
JENELLE N. ROMERO
3/16/17

| 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. | | CA1003 | 149 | 503 |

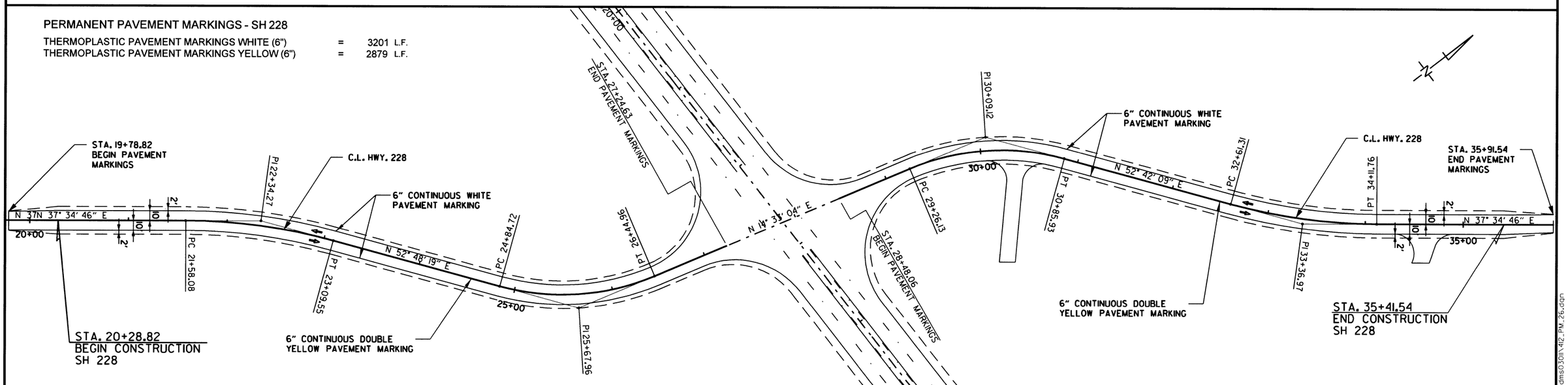
② PERMANENT PAVEMENT MARKING DETAILS




HWY. 412

PERMANENT PAVEMENT MARKINGS - SH 228

| | | |
|---|---|---|
| THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") | = | 3201 L.F. |
| THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") | = | 2879 L.F. |




HWY. 228

PERMANENT PAVEMENT MARKING DETAILS

3/16/2017 2:03:16 PM

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# SOIL BORING LOG (BOX 1 OF 2)

| LOCATION | | | | DESCRIPTION | DEPTH | LIQUID | PLASTICITY | COLOR OF TOP LAYER |
|---|---|---|---|---|---|---|---|---|
| STATION | OFFSET | NORTHING | EASTING | | FEET | LIMIT | INDEX | |
| 91+00 | 75' L | 634038.33 | 1628848.67 | SHOULDER BORING B-1 | 0-10 | 40 | 25 | GRAY TO GRAYISH-BROWN |
| 98+00 | 75' R | 634171.19 | 1629528.75 | SHOULDER BORING B-2 | 0-10 | 59 | 34 | GRAY TO GRAYISH-BROWN |
| 106+00 | 75' L | 634584.90 | 1630216.91 | SHOULDER BORING B-3 | 0-10 | 73 | 41 | GRAY TO BROWN |
| 114+00 | 75' R | 634823.33 | 1630995.86 | SHOULDER BORING B-4 | 0-10 | 57 | 27 | GRAY TO GRAYISH-BROWN |
| 122+00 | 75' L | 635038.64 | 1631747.30 | SHOULDER BORING B-5 | 0-10 | 32 | 13 | LIGHT BROWN |
| 130+00 | 75' L | 634977.95 | 1632563.53 | SHOULDER BORING B-6 | 0-10 | 52 | 30 | GRAY TO GRAYISH-BROWN |
| 138+00 | 75' R | 634865.48 | 1633348.34 | SHOULDER BORING B-7 | 0-10 | 42 | 23 | BROWN TO GRAYISH-BROWN |
| 146+00 | 75' L | 635000.85 | 1634182.48 | SHOULDER BORING B-8 | 0-10 | 44 | 23 | DARK BROWN TO REDDISH-BROWN |
| 154+00 | 75' R | 634810.54 | 1634962.93 | SHOULDER BORING B-9 | 0-10 | 47 | 27 | GRAYISH-BROWN TO RED |
| 161+50 | 75' L | 635025.87 | 1635753.57 | SHOULDER BORING B-10 | 0-10 | 43 | 23 | BROWN TO LIGHT BROWN |
| 170+00 | 75' R | 634839.43 | 1636640.89 | SHOULDER BORING B-11 | 0-10 | 75 | 51 | GRAYISH-BROWN |
| 178+00 | 75' L | 634978.62 | 1637336.43 | SHOULDER BORING B-12 | 0-10 | 41 | 20 | GRAY |
| 186+00 | 75' R | 634828.48 | 1638332.25 | SHOULDER BORING B-13 | 0-10 | 30 | 16 | BROWN TO LIGHT GRAY |
| 194+00 | 75' L | 634951.11 | 1638935.66 | SHOULDER BORING B-14 | 0-10 | 55 | 38 | BROWN |
| 202+00 | 75' R | 634801.44 | 163975.20 | SHOULDER BORING B-15 | 0-10 | 41 | 23 | BROWN |
| 210+00 | 75' L | 634939.80 | 1640569.40 | SHOULDER BORING B-16 | 0-10 | 36 | 14 | BROWN TO LIGHT BROWN |
| 218+00 | 75' R | 634745.78 | 1641341.68 | SHOULDER BORING B-17 | 0-10 | 50 | 29 | BROWN |
| 226+00 | 75' L | 634845.51 | 1642146.00 | SHOULDER BORING B-18 | 0-10 | 70 | 45 | DARK BROWN |
| 234+00 | 75' L | 634809.99 | 1642931.18 | SHOULDER BORING B-19 | 0-10 | 53 | 32 | GRAY TO BROWN |
| 242+00 | 75' L | 634772.84 | 1643796.00 | SHOULDER BORING B-20 | 0-10 | 44 | 23 | GRAY TO DARK GRAY |
| 250+00 | 75' R | 634556.65 | 1644600.52 | SHOULDER BORING B-21 | 0-10 | 67 | 44 | MEDIUM BROWN |
| 258+00 | 75' L | 634664.80 | 1645372.38 | SHOULDER BORING B-22 | 0-10 | 68 | 47 | MEDIUM BROWN |
| 266+00 | 75' R | 634452.96 | 1646128.99 | SHOULDER BORING B-23 | 0-10 | 62 | 40 | DARK BROWN |
| 272+00 | 75' L | 634578.59 | 1646771.08 | SHOULDER BORING B-24 | 0-10 | 38 | 15 | BROWN |
| 280+00 | 75' R | 634373.46 | 1647593.84 | SHOULDER BORING B-25 | 0-10 | 37 | 15 | BROWN TO GRAY |
| 288+00 | 75' R | 634342.51 | 1648362.15 | SHOULDER BORING B-26 | 0-10 | 55 | 30 | GRAY TO BROWN |
| 296+00 | 75' L | 634462.17 | 1649142.81 | SHOULDER BORING B-27 | 0-10 | 41 | 17 | BROWN |
| 304+00 | 75' R | 634212.33 | 1649895.46 | SHOULDER BORING B-28 | 0-10 | 39 | 17 | BROWN TO GRAY |
| 312+00 | 75' L | 634396.36 | 1650754.19 | SHOULDER BORING B-29 | 0-10 | 24 | 8 | GRAY TO BROWN |
| 320+00 | 75' L | 634332.08 | 1651541.64 | SHOULDER BORING B-30 | 0-10 | 30 | 15 | GRAY TO DARK BROWN |
| 328+00 | 75' L | 634295.87 | 1652413.49 | SHOULDER BORING B-31 | 0-10 | 29 | 12 | GRAY TO BROWN |
| 336+00 | 75' R | 634077.28 | 1653134.45 | SHOULDER BORING B-32 | 0-10 | 42 | 25 | BROWNISH GRAY |
| 344+00 | 75' L | 634192.85 | 1653956.56 | SHOULDER BORING B-33 | 0-10 | 35 | 18 | BROWN |
| 352+00 | 75' R | 634035.50 | 1654724.62 | SHOULDER BORING B-34 | 0-10 | 23 | 5 | DARK BROWN |
| 360+00 | 75' L | 634114.01 | 1655485.78 | SHOULDER BORING B-35 | 0-10 | 28 | 9 | LIGHT BROWN |
| 368+00 | 75' R | 633898.64 | 1656364.81 | SHOULDER BORING B-36 | 0-10 | 40 | 17 | LIGHT GRAY TO BROWN |
| 375+00 | 75' L | 634057.97 | 1657054.44 | SHOULDER BORING B-37 | 0-10 | 20 | 4 | GRAY TO BROWN |
| 384+00 | 75' R | 633861.82 | 1657897.13 | SHOULDER BORING B-38 | 0-10 | 35 | 18 | GRAYISH-BROWN |
| 392+00 | 75' R | 633822.17 | 1658721.96 | SHOULDER BORING B-39 | 0-10 | 31 | 13 | LIGHT GRAY TO BROWN |
| 400+00 | 75' L | 634050.37 | 1659554.75 | SHOULDER BORING B-40 | 0-10 | 42 | 28 | GRAY |
| 416+00 | 75' R | 634120.29 | 1661087.26 | SHOULDER BORING B-41 | 0-10 | 33 | 19 | GRAY TO LIGHT BROWN |
| 424+00 | 75' L | 634480.60 | 1661855.05 | SHOULDER BORING B-42 | 0-10 | 54 | 36 | DARK GRAY TO DARK BROWN |
| 432+00 | 75' R | 634609.01 | 1662672.83 | SHOULDER BORING B-43 | 0-10 | 42 | 26 | DARK GRAY TO DARK BROWN |
| 440+00 | 75' L | 634472.99 | 1663475.92 | SHOULDER BORING B-44 | 0-10 | 42 | 25 | LIGHT BROWN |
| 448+00 | 75' L | 634465.73 | 1664266.21 | SHOULDER BORING B-45 | 0-10 | 36 | 18 | GRAY TO BROWN |
| 456+00 | 75' R | 634294.01 | 1665125.28 | SHOULDER BORING B-46 | 0-10 | 28 | 13 | GRAY TO BROWN |
| 464+00 | 75' L | 634467.56 | 1665906.16 | SHOULDER BORING B-47 | 0-10 | 46 | 22 | GRAY |
| 472+00 | 75' R | 634321.47 | 1666717.22 | SHOULDER BORING B-48 | 0-10 | 39 | 23 | LIGHT BROWN |
| 480+00 | 75' L | 634448.61 | 1667508.59 | SHOULDER BORING B-49 | 0-10 | 36 | 23 | GRAYISH-BROWN |
| 488+00 | 75' R | 634323.71 | 1668321.75 | SHOULDER BORING B-50 | 0-10 | 38 | 23 | BROWN TO LIGHT BROWN |
| 496+00 | 75' L | 634434.81 | 1669098.84 | SHOULDER BORING B-51 | 0-10 | 29 | 10 | BROWN |
| 504+00 | 75' R | 634306.79 | 1669906.04 | SHOULDER BORING B-52 | 0-10 | 18 | 5 | LIGHT GRAY TO BROWN |
| 512+00 | 75' L | 634419.33 | 1670727.04 | SHOULDER BORING B-53 | 0-10 | 42 | 28 | GRAY TO BROWN |
| 520+00 | 75' R | 634306.59 | 1671519.79 | SHOULDER BORING B-54 | 0-10 | 19 | 1 | GRAY TO BROWN |
| 528+00 | 75' R | 634290.10 | 1672314.19 | SHOULDER BORING B-55 | 0-10 | 19 | 4 | BROWN |
| 536+00 | 75' L | 634421.71 | 1673028.57 | SHOULDER BORING B-56 | 0-10 | 39 | 25 | BROWN |
| 544+00 | 75' R | 634285.91 | 1673595.49 | SHOULDER BORING B-57 | 0-10 | 27 | 9 | BROWNISH-GRAY |
| 552+00 | 75' R | 634285.45 | 1674678.67 | SHOULDER BORING B-58 | 0-10 | 49 | 33 | BROWN |
| 560+00 | 75' L | 634393.71 | 1675492.90 | SHOULDER BORING B-59 | 0-10 | 40 | 22 | BROWN |
| 568+00 | 75' R | 634279.52 | 1676287.54 | SHOULDER BORING B-60 | 0-10 | 20 | 4 | BROWN TO GRAY |
| 576+00 | 75' R | 634262.90 | 1677058.33 | SHOULDER BORING B-61 | 0-10 | 24 | 9 | LIGHT BROWN TO BROWN |
| 584+00 | 75' R | 634257.80 | 1677900.31 | SHOULDER BORING B-62 | 0-10 | 23 | 7 | MEDIUM BROWN |
| 592+00 | 75' R | 634271.49 | 1678695.72 | SHOULDER BORING B-63 | 0-10 | 21 | 14 | BROWN |
| 600+00 | 75' R | 634268.95 | 1679519.15 | SHOULDER BORING B-64 | 0-10 | 28 | 10 | MEDIUM BROWN |
| 608+00 | 75' R | 634284.11 | 1680292.01 | SHOULDER BORING B-65 | 0-10 | 30 | 4 | DARK BROWN |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
8/29/18

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| 8/27/18 | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 149A | 503 |

② SOIL BORING LOG

# SOIL BORING LOG (BOX 2 OF 2)

| LOCATION | | | | DESCRIPTION | DEPTH | LIQUID | PLASTICITY | COLOR OF TOP LAYER |
|---|---|---|---|---|---|---|---|---|
| STATION | OFFSET | NORTHING | EASTING | | FEET | LIMIT | INDEX | |
| 616+00 | 75' R | 634248.34 | 1681100.19 | SHOULDER BORING B-66 | 0-10 | 23 | 5 | DARK BROWN |
| 624+00 | 75' L | 634375.83 | 1681565.37 | SHOULDER BORING B-67 | 0-10 | 24 | 8 | BROWNISH-GRAY |
| 632+00 | 75' R | 634280.78 | 1682707.54 | SHOULDER BORING B-68 | 0-10 | 19 | 7 | REDDISH-BROWN |
| 640+00 | 75' L | 634370.48 | 1683489.8 | SHOULDER BORING B-69 | 0-10 | 24 | 11 | GRAY TO BROWN |
| 648+00 | 75' R | 634247.69 | 1684228.54 | SHOULDER BORING B-70 | 0-10 | 25 | 12 | BROWN |
| 656+00 | 75' L | 634338.93 | 1685146.16 | SHOULDER BORING B-71 | 0-10 | 20 | 5 | BROWN |
| 664+00 | 75' R | 634211.23 | 1685902.62 | SHOULDER BORING B-72 | 0-10 | 34 | 13 | DARK BROWN |
| 672+00 | 75' L | 634323.22 | 1686719.41 | SHOULDER BORING B-73 | 0-10 | 17 | 5 | BROWN |
| 680+00 | 75' L | 634311.89 | 1687486.73 | SHOULDER BORING B-74 | 0-10 | 20 | 7 | DARK BROWN |
| 688+00 | 75' L | 634318.72 | 1688293.12 | SHOULDER BORING B-75 | 0-10 | 36 | 21 | GRAYISH-BROWN |
| 710+40 | 75' L | 634326.26 | 1689085.83 | SHOULDER BORING B-76 | 0-10 | 38 | 20 | GRAYISH-BROWN |
| 709+00 | 75' R | 634123.20 | 1689867.07 | SHOULDER BORING B-77 | 0-10 | 36 | 9 | LIGHT GRAY TO LIGHT BROWN |
| 717+00 | 75' L | 634608.49 | 1690668.63 | SHOULDER BORING B-78 | 0-10 | 36 | 19 | GRAYISH-BROWN |
| 725+25 | 75' R | 634180.03 | 1691475.77 | SHOULDER BORING B-79 | 0-10 | 42 | 22 | DARK BROWN |
| 730+50 | 75' L | 634308.04 | 1692266.49 | SHOULDER BORING B-80 | 0-10 | 49 | 30 | DARK GRAY TO DARK BROWN |
| 741+00 | 75' R | 634128.78 | 1693000.53 | SHOULDER BORING B-81 | 0-10 | 40 | 23 | LIGHT BROWN TO REDDISH-BROWN |
| 749+00 | 75' L | 634295.49 | 1693848.97 | SHOULDER BORING B-82 | 0-10 | 41 | 23 | DARK GRAY TO DARK BROWN |
| 757+00 | 75' L | 634354.83 | 1694632.54 | SHOULDER BORING B-83 | 0-10 | 32 | 14 | DARK BROWN TO DARK GRAY |
| 765+00 | 75' L | 634362.02 | 1695456.88 | SHOULDER BORING B-84 | 0-10 | 51 | 31 | GRAY TO BROWN |
| 773+00 | 75' R | 634212.40 | 1696270.31 | SHOULDER BORING B-85 | 0-10 | 42 | 23 | GRAY TO REDDISH-BROWN |
| 781+00 | 75' R | 634170.75 | 1697207.25 | SHOULDER BORING B-86 | 0-10 | 34 | 19 | BROWN TO REDDISH-BROWN |
| 789+30 | 75' R | 634182.41 | 1698044.80 | SHOULDER BORING B-87 | 0-10 | 28 | 14 | DARK GRAY TO DARK BROWN |
| 797+00 | 75' L | 634375.24 | 1698989.93 | SHOULDER BORING B-88 | 0-10 | -- | -- | GRAY TO BROWN |
| 805+30 | 75' R | 634162.06 | 1699425.37 | SHOULDER BORING B-89 | 0-10 | 37 | 18 | BROWN TO DARK BROWN |
| 813+30 | 75' L | 634365.08 | 1700301.04 | SHOULDER BORING B-90 | 0-10 | 40 | 23 | BROWN TO DARK BROWN |
| 821+30 | 75' R | 634200.94 | 1701065.79 | SHOULDER BORING B-91 | 0-10 | 35 | 18 | LIGHT GRAY TO REDDISH-BROWN |
| 829+30 | 75' L | 634346.87 | 1701951.12 | SHOULDER BORING B-92 | 0-10 | 25 | 13 | GRAY TO REDDISH-BROWN |
| 566+00 | 30' L | 634254.55 | 1676097.64 | BYPASS BORING B-60BP | 0-4 | 27 | 10 | DARK BROWN |
| 574+00 | 30' R | 633940.87 | 1676834.67 | BYPASS BORING B-61BP | 0-10 | 21 | 6 | GRAY, BROWN AND REDDISH-BROWN |
| 582+00 | 30' L | 633638.42 | 1677576.59 | BYPASS BORING B-62BP | 0-10 | 27 | 7 | GRAY, BROWN TO DARK GRAY |
| 590+00 | 30' R | 633226.89 | 1678266.25 | BYPASS BORING B-63BP | 0-10 | 23 | 6 | GRAY AND BROWN |
| 598+00 | 30' L | 633021.80 | 1679040.55 | BYPASS BORING B-64BP | 0-10 | 24 | 7 | GRAY AND LIGHT GRAY |
| 606+00 | 30' R | 632849.96 | 1679822.90 | BYPASS BORING B-65BP | 0-40 | 28 | 9 | LIGHT GRAY, GRAY AND BROWN |
| 614+00 | 30' R | 632850.26 | 1680624.42 | BYPASS BORING B-66BP | 0-10 | 42 | 28 | BROWN |
| 622+30 | 30' L | 632916.76 | 1681453.93 | BYPASS BORING B-67BP | 0-10 | 34 | 11 | BROWN AND GRAY |
| 630+00 | 30' R | 632862.79 | 1682224.37 | BYPASS BORING B-68BP | 0-10 | 27 | 10 | BROWN AND LIGHT GRAY |
| 638+00 | 30' L | 632929.06 | 1683023.88 | BYPASS BORING B-69BP | 0-10 | 27 | 11 | DARK BROWN AND LIGHT GRAY |
| 645+00 | 30' R | 632874.55 | 1683724.33 | BYPASS BORING B-70BP | 0-40 | 25 | 14 | BROWN |
| 654+00 | 30' L | 632941.59 | 1684623.83 | BYPASS BORING B-71BP | 0-11.5 | 45 | 29 | DARK BROWN AND GRAY |
| 662+00 | 30' R | 632939.55 | 1685425.87 | BYPASS BORING B-72BP | 0-10 | 54 | 10 | BROWN |
| 670+00 | 30' L | 633203.31 | 1686182.21 | BYPASS BORING B-73BP | 0-10 | 43 | 31 | BROWN |
| 678+00 | 30' R | 633474.74 | 1686935.38 | BYPASS BORING B-74BP | 0-5.5 | 48 | 33 | GRAY AND BROWN |
| 684+00 | 30' L | 633783.50 | 1687453.32 | BYPASS BORING B-75BP | 0-5 | 35 | 21 | DARK GRAY AND BROWN |
| 692+00 | 30' R | 634027.34 | 1688215.52 | BYPASS BORING B-76BP | 0-40 | 48 | 33 | LIGHT GRAY AND BROWN |

SOIL CHARACTERIISTICS TABULATED ABOVE ARE PREPRESENTATIVE 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.

SOIL BORING LOG

8/29/2018 9:39:24 AM
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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 |
|---|---|---|---|---|---|---|---|---|
| 9/6/18 | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 150 | 503 |
| | | | | ② | QUANTITIES | | | |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 15180
AARON M. SMITH
9/6/18

# CONSTRUCTION PAVEMENT MARKINGS

| DESCRIPTION | STAGE 1 | STAGE 2 | STAGE 3 | FINAL | CONSTRUCTION PAVEMENT MARKINGS | REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS | REMOVAL OF PERMANENT PAVEMENT MARKINGS |
|---|---|---|---|---|---|---|---|
| | LIN.FT. | | | | LIN.FT. | | |
| CONSTRUCTION PAVEMENT MARKINGS | 251600 | 254200 | 308800 | | 814600 | | |
| REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS | | 51775 | 1600 | 312600 | | 365975 | |
| REMOVAL OF PERMENANT PAVEMENT MARKINGS | 244400 | 122200 | | | | | 366600 |
| TOTALS: | | | | | 814600 | 365975 | 366600 |

NOTE: THIS IS A HIGH VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2014 EDITION.

# EROSION CONTROL

| LOCATION | TEMPORARY EROSION CONTROL | | | | | | | | | | | | PERMANENT EROSION CONTROL | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TEMPORARY SEEDING | MULCH COVER | WATER | ROCK DITCH CHECKS (E-6) | SAND BAG DITCH CHECKS (E-5) | SILT FENCE (E-11) | SEDIMENT BASINS (E-14) | OBLITERATION OF SEDIMENT BASIN | *SEDIMENT REMOVAL & DISPOSAL | DIVERSION DITCH | SLOPE DRAIN (E-12) PIPE FOR SLOPE DRAINS | SLOPE DRAIN (E-12) DUMPED RIPRAP | SEEDING | LIME | MULCH COVER | SECOND SEEDING APPLICATION | WATER |
| | ACRE | ACRE | M.GAL. | C.Y. | BAG | L.F. | C.Y. | C.Y. | C.Y. | L.F. | L.F. | C.Y. | ACRE | TON | ACRE | ACRE | M.GAL. |
| STAGE 1 | | | | 315 | 2156 | 3225 | | | | | | | 87.78 | 175.56 | 87.78 | 87.78 | 8953.6 |
| STAGE 2 | | | | 213 | 1474 | 6140 | | | | | | | 57.64 | 115.28 | 57.64 | 57.64 | 5879.3 |
| STAGE 3 | | | | 24 | 286 | | | | | | | | 3.37 | 6.73 | 3.37 | 3.37 | 343.4 |
| * ENTIRE PROJECT IF AND WHERE DIRECTED BY THE ENGINEER | 148.79 | 148.79 | 3035.3 | 108 | | | 4000 | 4000 | 4000 | 2800 | 1120 | 50 | | | | | |
| TOTALS: | 148.79 | 148.79 | 3035.3 | 660 | 3916 | 9365 | 4000 | 4000 | 4000 | 2800 | 1120 | 50 | 148.79 | 297.57 | 148.79 | 148.79 | 15176.3 |

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
ROCK DITCH CHECKS 3 CY/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 OF U.S. WATERWAYS AS EXPLAINED BY THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT.

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

# ADVANCE WARNING SIGNS AND DEVICES

| SIGN NUMBER | DESCRIPTION | SIGN SIZE | STAGE 1 | STAGE 2 | STAGE 3 | BEGIN/END OF JOB | MAXIMUM NUMBER REQUIRED | TOTAL SIGNS REQUIRED | | CONSTRUCTION PROJECT INFORMATION SIGN UPDATE | TRAFFIC DRUMS | VERTICAL PANELS | BARRICADES (TYPE III) | | FURNISHING & INSTALLING PRECAST CONCRETE BARRIER | TEMPORARY IMPACT ATTENUATION BARRIER | TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | RT. | LT. | | | |
| | | | LIN.FT.-EACH | | | | | NO. | SQ.FT. | EACH | | | LIN.FT. | | LIN.FT. | EACH | EACH |
| W20-1 | ROAD WORK 500FT | 48" X 48" | 2 | 2 | 2 | 2 | 4 | 4 | 64.0 | | | | | | | | |
| W20-1 | ROAD WORK 1000FT | 48" X 48" | 2 | 2 | 2 | 2 | 4 | 4 | 64.0 | | | | | | | | |
| W20-1 | ROAD WORK 1500 FT. | 48" X 48" | | | | 2 | 2 | 2 | 32.0 | | | | | | | | |
| W20-1 | ROAD WORK AHEAD | 48" X 48" | | | | 14 | 14 | 14 | 224.0 | | | | | | | | |
| G20-2 | END ROAD WORK | 48" X 24" | | | | 2 | 2 | 2 | 16.0 | | | | | | | | |
| G20-1 | ROAD WORK NEXT 15 MILES | 60" X 24" | | | | 2 | 2 | 2 | 20.0 | | | | | | | | |
| W1-4R | REVERSE CURVE RT. | 48" X 48" | | 15 | | | 15 | 15 | 240.0 | | | | | | | | |
| W1-4L | REVERSE CURVE LT. | 48" X 48" | | 15 | | | 15 | 15 | 240.0 | | | | | | | | |
| W13-1 | SPEED LIMIT (ADVISORY) | 18" X18" | | 30 | | | 30 | 30 | 67.5 | | | | | | | | |
| W1-6 | ARROW | 48" X 24" | 1 | 34 | 5 | | 34 | 34 | 272.0 | | | | | | | | |
| W1-8 | CHEVRONS | 18" X 24" | | 112 | | | 112 | 112 | 336.0 | | | | | | | | |
| R11-2 | ROAD CLOSED | 48" X 30" | 20 | 17 | 10 | | 20 | 20 | 200.0 | | | | | | | | |
| R11-4 | ROAD CLOSED TO THRU TRAFFIC | 48" X 30" | | | 2 | | 2 | 2 | 20.0 | | | | | | | | |
| M1-4 | U.S. ROUTE SIGN (3 DIGITS) | 45" X 36" | | | 2 | | 2 | 2 | 22.5 | | | | | | | | |
| M4-8 | DETOUR | 30" X 15" | | | 2 | | 2 | 2 | 6.3 | | | | | | | | |
| M4-8b | END | 24" X 12" | | | 1 | | 1 | 1 | 2.0 | | | | | | | | |
| M6-1 | DIRECTIONAL ARROW | 30" X 21" | | | 1 | | 1 | 1 | 4.4 | | | | | | | | |
| SPECIAL | CONSTRUCTION PROJECT INFORMATION SIGN | 96"X48" | 2 | 2 | 2 | 2 | 2 | 2 | 64.0 | | | | | | | | |
| | CONSTRUCTION PROJECT INFORMATION SIGN | | | | | | | | | 10 | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | TRAFFIC DRUMS | | 528 | 1513 | 893 | | | | | | 1513 | | | | | | |
| | VERTICAL PANELS | | 212 | 28 | | | | | | | | 212 | | | | | |
| | TYPE III BARRICADE- 8' RT. | | 16 | 8 | 56 | | | | | | | | 56 | | | | |
| | TYPE III BARRICADE- 16' RT. | | 144 | 112 | | | | | | | | | 144 | | | | |
| | TYPE III BARRICADE- 24' RT. | | 48 | | | | | | | | | | 48 | | | | |
| | TYPE III BARRICADE- 8' LT. | | | 8 | 8 | | | | | | | | | 8 | | | |
| | TYPE III BARRICADE- 16' LT. | | 112 | 112 | 32 | | | | | | | | | 112 | | | |
| | FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER | | | 2422 | | | | | | | | | | | 2422 | | |
| | TEMPORARY IMPACT ATTENUATION BARRIER | | | 14 | | | | | | | | | | | | 14 | |
| | TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR) | | | 14 | | | | | | | | | | | | | 14 |
| | | | | | | | | | | | | | | | | | |
| | ENTIRE PROJECT IF AND WHERE DIRECTED BY THE ENGINEER | | | | | | | | | | | | | | | | |
| W21-5A | SHOULDER WORK | 30" X 30" | | | | | 4 | 4 | 25.0 | | | | | | | | |
| W8-9A | LOW SHOULDER | 36" X 36" | | | | | 4 | 4 | 36.0 | | | | | | | | |
| R4-1 | DO NOT PASS | 24" X 30" | | | | | 4 | 4 | 20.0 | | | | | | | | |
| | FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER | | | | | | | | | | | | | | 346 | | |
| | TEMPORARY IMPACT ATTENUATION BARRIER | | | | | | | | | | | | | | | 2 | |
| | TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR) | | | | | | | | | | | | | | | | 2 |
| TOTALS: | | | | | | | | | 1975.7 | 10 | 1513 | 212 | 248 | 120 | 2768 | 16 | 16 |

NOTE: THIS IS A HIGH VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2014 EDITION.
THE QUANTITY OF VERTICAL PANELS PROVIDED IN THE CONTRACT IS FOR ONE SIDE OF THE ROADWAY FOR 2 MILES. THIS IS THE MAXIMUM QUANTITY REQUIRED TO ALLOW THE CONTRACTOR TO NOTCH ONE MILE, BACKFILL TO A POINT WHERE THE VERTICAL DIFFERENTIAL IS 4" OR LESS, AND THEN NOTCH ANOTHER ONE-MILE SECTION. THIS IS THE MAXIMUM NUMBER OF VERTICAL PANELS THAT WILL BE PAID FOR. REFER TO SECTION 603.02 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION REQUIREMENTS.

QUANTITIES

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STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
11/6/18

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| 11/6/18 | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 151 | 503 |

② QUANTITIES

# REMOVAL AND DISPOSAL OF ITEMS

| STATION | STATION | LOCATION | GUARD RAIL | IMPACT ATTENUATION BARRIER | APPROACH SLAB AND GUTTERS | BUILDINGS | FENCE | MAIL BOXES | CONCRETE SLABS | SIGNS | SIGN FOUNDATIONS | LIGHT POLE | ELECTRICAL TRANS FORMER | WELL | RISER | GATES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | LIN. FT. | EACH | EACH | EACH | LIN. FT. | EACH | SQ. YD. | EACH | EACH | EACH | EACH | EACH | EACH | EACH |
| 121+00 | | HWY. 412 LT. | | | | | | | | 1 | 1 | | | | | |
| 161+68 | 161+90 | HWY. 412 RT. | | 1 | | | | | | | | | | | | |
| 161+68 | 161+90 | HWY. 412 LT. | | 1 | | | | | | | | | | | | |
| 161+95 | 162+41 | HWY. 412 | | | 2 | | | | | | | | | | | |
| 162+48 | 162+68 | HWY. 412 RT. | | 1 | | | | | | | | | | | | |
| 162+48 | 162+68 | HWY. 412 LT. | | 1 | | | | | | | | | | | | |
| 233+50 | | HWY. 412 RT. | | | | | | | | | | 1 | | | | |
| 242+78 | 243+04 | HWY. 412 RT. | | 1 | | | | | | | | | | | | |
| 242+78 | 243+04 | HWY. 412 LT. | | 1 | | | | | | | | | | | | |
| 243+04 | 243+50 | HWY. 412 | | | 2 | | | | | | | | | | | |
| 243+50 | 243+76 | HWY. 412 RT. | | 1 | | | | | | | | | | | | |
| 243+50 | 243+76 | HWY. 412 LT. | | 1 | | | | | | | | | | | | |
| 244+75 | | HWY. 412 RT. | | | | | | | 79 | | | | | | | |
| 283+30 | | HWY. 412 LT. | | | | | | | 15 | | | | | | | |
| 291+80 | 292+36 | HWY. 412 LT. | | | | | | | 187 | | | | | | | |
| 292+35 | | HWY. 412 LT. | | | | | | | 8 | | | | | | | |
| 292+65 | 292+74 | HWY. 412 LT. | | | | | | | 2 | | | | | | | |
| 293+70 | | HWY. 412 LT. | | | | | | | | | 1 | | | | | |
| 308+85 | | HWY. 412 RT. | | | | | | | | | | | | 1 | | |
| 335+95 | 338+45 | HWY. 412 RT. | 250 | | | | | | | | | | | | | |
| 335+95 | 338+45 | HWY. 412 LT. | 250 | | | | | | | | | | | | | |
| 338+45 | 339+45 | HWY. 412 | | | 2 | | | | | | | | | | | |
| 339+45 | 339+72 | HWY. 412 RT. | | 1 | | | | | | | | | | | | |
| 339+45 | 339+72 | HWY. 412 LT. | | 1 | | | | | | | | | | | | |
| 340+00 | 342+35 | HWY. 412 RT. | | | | | 300 | | | | | | | | | 1 |
| 347+70 | | HWY. 412 LT. | | | | | | | | | | | | 1 | | |
| 361+90 | | HWY. 412 LT. | | | | | | | | | | | | 1 | | |
| 373+40 | | HWY. 412 RT. | | | | | | | | | | | 1 | | | |
| 374+65 | | HWY. 412 RT. ** | | | | | | | | | | | | | | |
| 467+30 | | HWY. 412 RT. | | | | | | | | | | | | | 1 | |
| 472+79 | 475+04 | HWY. 412 LT. | 225 | | | | | | | | | | | | | |
| 473+55 | 475+05 | HWY. 412 RT. | 150 | | | | | | | | | | | | | |
| 475+05 | 475+50 | HWY. 412 | | | 2 | | | | | | | | | | | |
| 475+50 | 477+75 | HWY. 412 RT. | 225 | | | | | | | | | | | | | |
| 475+50 | 478+00 | HWY. 412 LT. | 250 | | | | | | | | | | | | | |
| 515+60 | | HWY. 412 LT. | | | | | | | | | | | | 1 | | |
| 527+90 | 528+00 | HWY. 412 LT. | | | | | | | 9 | | | | | | | |
| 542+48 | 544+98 | HWY. 412 RT. | 250 | | | | | | | | | | | | | |
| 542+95 | 545+20 | HWY. 412 LT. | 225 | | | | | | | | | | | | | |
| 545+09 | 545+99 | HWY. 412 | | | 2 | | | | | | | | | | | |
| 545+87 | 548+12 | HWY. 412 RT. | 225 | | | | | | | | | | | | | |
| 546+12 | 548+62 | HWY. 412 LT. | 250 | | | | | | | | | | | | | |
| 550+75 | 551+15 | HWY. 412 LT. | | | | | | | 134 | | | | | | | |
| 551+70 | 552+20 | HWY. 412 LT. | | | | | | | 139 | | | | | | | |
| 618+15 | | HWY. 412 LT. | | | | | | | | | | | | 1 | | |
| 621+50 | 621+75 | HWY. 412 CL. | | | | | 50 | | 84 | | | | | | | |
| 657+90 | | HWY. 412 LT. | | | | | | | | | | | | | 1 | |
| 658+35 | | HWY. 412 LT. | | | | | | | | | | | | | 1 | |
| 690+56 | 691+11 | HWY. 412 LT.* | 950 | | 2 | | | | | | | | | | | |
| 702+40 | | HWY. 412 LT. | | | | | | | | | | | | 1 | | |
| 703+64 | 705+64 | HWY. 412 RT. | 200 | | | | | | | | | | | | | |
| 703+79 | 705+79 | HWY. 412 LT. | 200 | | | | | | | | | | | | | |
| 705+71 | 706+41 | HWY. 412 | | | 2 | | | | | | | | | | | |
| 706+34 | 707+34 | HWY. 412 RT. | 100 | | | | | | | | | | | | | |
| 706+49 | 708+49 | HWY. 412 LT. | 200 | | | | | | | | | | | | | |
| 722+95 | 723+25 | HWY. 412 LT. | | | | | | | 94 | | | | | | | |
| 759+10 | | HWY. 412 RT. | | | | | | | | 1 | 1 | | | | | |
| 770+00 | | HWY. 412 RT. | | | | | | | | | | | | 1 | | |
| 781+16 | 783+16 | HWY. 412 LT. | 200 | | | | | | | | | | | | | |
| 782+27 | 783+02 | HWY. 412 RT. | 75 | | | | | | | | | | | | | |
| 783+08 | 783+78 | HWY. 412 | | | 2 | | | | | | | | | | | |
| 783+70 | 785+70 | HWY. 412 LT. | 200 | | | | | | | | | | | | | |
| 783+84 | 785+84 | HWY. 412 RT. | 200 | | | | | | | | | | | | | |
| 828+30 | 829+10 | HWY. 412 LT. | | | | | | | 267 | | | | | | | |
| 829+30 | 829+35 | HWY. 412 LT. | | | | | | | 9 | | | | | | | |
| 11+75 | 12+15 | CR 332 RT. | | | | | | | 134 | | | | | | | |
| 12+70 | | WEST CONNECTOR RT. | | | | | | | | | | | | 1 | | |
| ENTIRE PROJECT | | | | | | 5 | 1542 | 21 | | | | | | | | |
| TOTALS: | | | 4625 | 10 | 16 | 5 | 1892 | 21 | 1161 | 2 | 3 | 1 | 1 | 8 | 3 | 1 |

* BRIDGE IS LOCATED ON OLD PORTION OF HWY. 412 WEST OF C.R. 218
** BLOWER WITH TANK FOR GRAIN BIN
NOTE: CAP ALL WELLS

## SOIL STABILIZATION

| LOCATION | QUICKLIME | PORTLAND CEMENT | FLY ASH |
|---|---|---|---|
| | TON | | |
| ENTIRE PROJECT* | 2700 | 8100 | 2700 |

* QUANTITIES ESTIMATED. TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER, SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

## REMOVAL OF EXISTING BRIDGE STRUCTURES

| STATION | STATION | LOCATION | EXISTING BRIDGE STRUCTURE |
|---|---|---|---|
| 161+95 | 162+41 | HWY. 412 (SITE NO. 2) | 1.00 |
| 243+04 | 243+50 | HWY. 412 (SITE NO. 3) | 1.00 |
| 338+45 | 339+45 | HWY. 412 (SITE NO. 4) | 1.00 |
| 475+05 | 475+50 | HWY. 412 (SITE NO. 6) | 1.00 |
| 545+09 | 545+99 | HWY. 412 (SITE NO. 7) | 1.00 |
| 690+56 | 691+11 | HWY. 412 (SITE NO. 10)* | 1.00 |
| 705+71 | 706+41 | HWY. 412 (SITE NO. 12) | 1.00 |
| 783+08 | 783+78 | HWY. 412 (SITE NO. 13) | 1.00 |

* BRIDGE IS LOCATED ON OLD PORTION OF HWY. 412 WEST OF C.R. 218

## FENCING

| STATION | STATION | SIDE | WIRE FENCE (TYPE A) | 16' GATES |
|---|---|---|---|---|
| | | | LIN.FT. | EACH |
| 340+14.53 | 342+22.04 | RT. | 208 | |
| 341+39.03 | | RT. | | 1 |
| | | | | |
| TOTALS: | | | 208 | 1 |

## EARTHWORK

| STATION | STATION | LOCATION | UNCLASSIFIED EXCAVATION | COMPACTED EMBANKMENT |
|---|---|---|---|---|
| | | | CU. YD. | |
| 93+50.00 | 853+02.91 | HWY. 412 | 270388 | 583060 |
| 10+37.50 | 11+91.03 | HWY. 231 | 537 | 41 |
| 10+37.50 | 12+88.23 | C.R. 332 | 79 | 261 |
| 10+37.50 | 15+00.00 | WEST CONNECTOR | 1056 | 2248 |
| 20+28.82 | 35+41.54 | HWY. 228 | 1513 | 2861 |
| 10+37.50 | 18+45.00 | EAST CONNECTOR | 460 | 6090 |
| 10+37.50 | 14+37.60 | C.R. 218 | 2612 | 2043 |
| 0+37.50 | 4+47.00 | C.R. 218 TEMP. DETOUR | 127 | 504 |
| 10+37.50 | 13+40.01 | C.R. 340 | 228 | 430 |
| ENTIRE PROJECT | | DRIVEWAYS | 11112 | |
| ENTIRE PROJECT* | | DITCHES | 190000 | 190000 |
| | | | | |
| TOTALS: | | | 478112 | 787538 |

* QUANTITIES ESTIMATED. TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER, SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

QUANTITIES

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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. | | CA1003 | 152 | 503 |

② QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

## REMOVAL AND DISPOSAL OF DRAINAGE ITEMS (BOX 1 OF 3)

| STATION | | DESCRIPTION | PIPE CULVERT | BOX CULVERT |
|---|---|---|---|---|
| | | | EACH | EACH |
| 93+72 | LT. | 36" X 63' C.M. PIPE CULVERT | 1 | |
| 103+76 | RT. | 30" X 20' C.M. PIPE CULVERT | 1 | |
| 121+98 | RT. | 24" X 20' C.M. PIPE CULVERT | 1 | |
| 135+15 | LT. | 24" X 20' C.M. PIPE CULVERT | 1 | |
| 135+82 | RT. | 24" X 20' C.M. PIPE CULVERT | 1 | |
| 137+40 | RT. | 24" X 20' C.M. PIPE CULVERT | 1 | |
| 140+00 | LT. | LEVEE DRAIN PIPE | 1 | |
| 147+47 | RT. | 24" X 20' C.M. PIPE CULVERT | 1 | |
| 148+05 | LT. | LEVEE DRAIN PIPE | 1 | |
| 150+97 | LT. | 27" X 68' R.C. PIPE CULVERT | 1 | |
| 157+10 | LT. | LEVEE DRAIN PIPE | 1 | |
| 161+48 | LT. | 24" X 72' C.M. PIPE CULVERT | 1 | |
| 161+44 | RT. | 30" X 72' C.M. PIPE CULVERT | 1 | |
| 163+02 | RT. | 24" X 48' C.M. PIPE CULVERT | 1 | |
| 163+11 | LT. | 24" X 72' C.M. PIPE CULVERT | 1 | |
| 166+70 | LT. | LEVEE DRAIN PIPE | 1 | |
| 169+30 | LT. | LEVEE DRAIN PIPE | 1 | |
| 173+10 | LT. | LEVEE DRAIN PIPE | 1 | |
| 174+98 | LT. | 18" X 20' R.C. PIPE CULVERT | 1 | |
| 175+96 | LT. | 24" X 59' R.C. PIPE CULVERT | 1 | |
| 180+37 | RT. | 24" X 30' C.M. PIPE CULVERT | 1 | |
| 188+55 | RT. | 18" X 15' C.M. PIPE CULVERT | 1 | |
| 196+96 | | TRIP. 5' X 2' X 52' R.C. BOX CULVERT | | 1 |
| 202+18 | RT. | 24" X 36' C.M. PIPE CULVERT | 1 | |
| 210+14 | LT. | 24" X 12" X 20' C.M. ARCH PIPE | 1 | |
| 215+30 | LT. | 24" X 20' C.M. PIPE CULVERT | 1 | |
| 216+70 | RT. | 24" X 24' C.M. PIPE CULVERT | 1 | |
| 217+56 | RT. | 18" X 20' C.M. PIPE CULVERT | 1 | |
| 223+99 | RT. | 27" X 18" X 25' C.M. ARCH PIPE | 1 | |
| 228+96 | LT. | 27" X 18" X 20' C.M. ARCH PIPE | 1 | |
| 229+98 | LT. | 24" X 59' R.C. PIPE CULVERT | 1 | |
| 230+35 | LT. | LEVEE DRAIN PIPE | 1 | |
| 231+37 | RT. | 18" X 25' C.M. PIPE CULVERT | 1 | |
| 232+45 | RT. | 18" X 25' C.M. PIPE CULVERT | 1 | |
| 233+55 | RT. | 18" X 25' C.M. PIPE CULVERT | 1 | |
| 237+50 | LT. | LEVEE DRAIN PIPE | 1 | |
| 241+00 | LT. | LEVEE DRAIN PIPE | 1 | |
| 241+70 | RT. | LEVEE DRAIN PIPE | 1 | |
| 242+55 | RT. | 24" X 70' C.M. PIPE CULVERT | 1 | |
| 242+59 | LT. | 24" X 69' C.M. PIPE CULVERT | 1 | |
| 244+02 | RT. | 27" X 60' C.P. PIPE CULVERT | 1 | |
| 244+05 | LT. | 24" X 59' C.M. PIPE CULVERT | 1 | |
| 245+30 | RT. | LEVEE DRAIN PIPE | 1 | |
| 248+80 | RT. | LEVEE DRAIN PIPE | 1 | |
| 252+36 | RT. | 24" X 20' C.I. PIPE CULVERT | 1 | |
| 252+97 | LT. | 24" X 59' R.C. PIPE CULVERT | 1 | |
| 255+80 | LT. | Cross Drain | 1 | |
| 260+61 | LT. | 18" X 24' R.C. PIPE CULVERT | 1 | |
| 262+42 | RT. | 24" X 25' C.M. PIPE CULVERT | 1 | |
| 270+18 | RT. | 18" X 21' C.M. PIPE CULVERT | 1 | |
| 272+31 | RT. | 18" X 20' C.M. PIPE CULVERT | 1 | |
| 282+97 | | 5' X 2' X 52' R.C. BOX CULVERT | | 1 |
| 284+57 | LT. | 24" X 20' C.M. PIPE CULVERT | 1 | |
| 289+36 | RT. | 42" X 40' C.M. PIPE CULVERT | 1 | |
| 293+23 | LT. | 18" X 40' C.M. PIPE CULVERT | 1 | |
| 295+03 | RT. | 42" X 30' C.M. PIPE CULVERT | 1 | |
| 295+41 | LT. | 24" X 40" C.M. PIPE CULVERT | 1 | |
| 297+65 | LT. | LEVEE DRAIN PIPE | 1 | |
| 303+98 | | TRIP. 5' X 3' X 60' R.C. BOX CULVERT | | 1 |
| 308+77 | RT. | 24" X 22' C.M. PIPE CULVERT | 1 | |
| 321+59 | LT. | 24" X 30' C.M. PIPE CULVERT | 1 | |
| 321+94 | RT. | 24" X 65' R.C. PIPE CULVERT | 1 | |
| 322+42 | RT. | 24" X 40' C.M. PIPE CULVERT | 1 | |
| 322+47 | LT. | 20" X 20' R.C. PIPE CULVERT | 1 | |
| 330+70 | LT. | 27" X 21" X 30' C.M. ARCH PIPE | 1 | |
| 341+55 | RT. | 30" X 18" X 24' C.M. ARCH PIPE | 1 | |
| 349+45 | RT. | 18" X 49' R.C. PIPE CULVERT | 1 | |
| 358+16 | RT. | 24" X 23' C.M. PIPE CULVERT | 1 | |
| 359+41 | LT. | 24" X 23' C.M. PIPE CULVERT | 1 | |
| SUBTOTALS (BOX 1 OF 3): | | | 66 | 3 |

## REMOVAL AND DISPOSAL OF DRAINAGE ITEMS (BOX 2 OF 3)

| STATION | | DESCRIPTION | PIPE CULVERT | BOX CULVERT |
|---|---|---|---|---|
| | | | EACH | EACH |
| 362+52 | RT. | 24" X 44' C.M. PIPE CULVERT | 1 | |
| 363+28 | LT. | 24" X 24' C.M. PIPE CULVERT | 1 | |
| 364+34 | LT. | 24" X 24' C.M. PIPE CULVERT | 1 | |
| 368+53 | RT. | 24" X 76' R.C. PIPE CULVERT | 1 | |
| 371+00 | LT. | 27" X 18" X 24' C.M. ARCH PIPE | 1 | |
| 376+02 | LT. | 30" X 65' R.C. PIPE CULVERT | 1 | |
| 377+45 | LT. | LEVEE DRAIN PIPE | 1 | |
| 384+84 | | DBL. 8' X 3' X 52' R.C. BOX CULVERT | | 1 |
| 386+45 | LT. | LEVEE DRAIN PIPE | 1 | |
| 389+27 | LT. | 24" X 33' C.M. PIPE CULVERT | 1 | |
| 391+16 | RT. | 30" X 28' C.M. PIPE CULVERT | 1 | |
| 411+97 | LT. | 24" X 42' R.C. PIPE CULVERT | 1 | |
| 421+15 | LT. | 24" X 29' C.M. PIPE CULVERT | 1 | |
| 425+56 | RT. | 24" X 29' C.M. PIPE CULVERT | 1 | |
| 429+31 | RT. | 24" X 38' C.M. PIPE CULVERT | 1 | |
| 430+12 | LT. | 24" X 24' C.M. PIPE CULVERT | 1 | |
| 430+95 | RT. | LEVEE DRAIN PIPE | 1 | |
| 434+48 | RT. | 24" X 29' C.M. PIPE CULVERT | 1 | |
| 438+02 | LT. | PIPE CULVERT | 1 | |
| 438+90 | RT. | LEVEE DRAIN PIPE | 1 | |
| 442+92 | RT. | 24" X 31' C.M. PIPE CULVERT | 1 | |
| 443+30 | LT. | LEVEE DRAIN PIPE | 1 | |
| 444+80 | | 24" X 103' R.C. PIPE CULVERT | 1 | |
| 449+15 | RT. | LEVEE DRAIN PIPE | 1 | |
| 450+00 | RT. | LEVEE DRAIN PIPE | 1 | |
| 452+40 | LT. | LEVEE DRAIN PIPE | 1 | |
| 452+89 | LT. | 24" X 30' C.M. PIPE CULVERT | 1 | |
| 456+20 | LT. | LEVEE DRAIN PIPE | 1 | |
| 456+60 | | 24" X 86' R.C. PIPE CULVERT | 1 | |
| 461+34 | RT. | 30" X 24' C.M. ARCH CULVERT | 1 | |
| 461+34 | LT. | 30" X 24' C.M. ARCH CULVERT | 1 | |
| 468+16 | LT. | 24" X 22' C.M. PIPE CULVERT | 1 | |
| 473+33 | RT. | 24" X 23' C.M. PIPE CULVERT | 1 | |
| 474+85 | LT. | LEVEE DRAIN PIPE | 1 | |
| 481+93 | LT. | 30" X 27' C.M. ARCH CULVERT | 1 | |
| 482+69 | LT. | 30" X 30' C.M. ARCH CULVERT | 1 | |
| 485+01 | LT. | 30" X 24' C.M. ARCH CULVERT | 1 | |
| 489+26 | LT. | 30" X 22' C.M. ARCH CULVERT | 1 | |
| 489+36 | RT. | 30" X 24' C.M. ARCH CULVERT | 1 | |
| 496+45 | RT. | 24" X 182' C.M. ARCH CULVERT | 1 | |
| 497+49 | RT. | 24" X 27' C.M. PIPE CULVERT | 1 | |
| 523+21 | LT. | 24" X 16' C.M. PIPE CULVERT | 1 | |
| 524+61 | LT. | 24" X 22' R.C. PIPE CULVERT | 1 | |
| 527+44 | LT. | 24" X 24' C.M. PIPE CULVERT | 1 | |
| 528+06 | RT. | 24" X 23' C.M. PIPE CULVERT | 1 | |
| 528+18 | LT. | 24" X 23' C.M. PIPE CULVERT | 1 | |
| 534+48 | RT. | 24" X 24' C.M. PIPE CULVERT | 1 | |
| 535+70 | LT. | 36" X 36' C.M. PIPE CULVERT | 1 | |
| 540+85 | RT. | 24" X 23' C.M. PIPE CULVERT | 1 | |
| 540+88 | LT. | 24" X 28' R.C. PIPE CULVERT | 1 | |
| 544+60 | RT. | LEVEE DRAIN PIPE | 1 | |
| 552+55 | LT. | 5' X 2.5' X 16' CONC. BOX | | 1 |
| 553+49 | LT. | 30" X 30' C.M. PIPE CULVERT | 1 | |
| 555+47 | RT. | 24" X 24' C.M. PIPE CULVERT | 1 | |
| 558+66 | RT. | 24" X 24' C.M. PIPE CULVERT | 1 | |
| 562+68 | RT. | 24" X 28' C.M. PIPE CULVERT | 1 | |
| 658+25 | LT. | LEVEE DRAIN PIPE | 1 | |
| 658+35 | CL. | LEVEE DRAIN PIPE | 1 | |
| 700+51 | LT. | 36" X 37' R.C. PIPE CULVERT | 1 | |
| 709+10 | LT. | LEVEE DRAIN PIPE | 1 | |
| 709+15 | RT. | 36" X 36' C.M. PIPE CULVERT | 1 | |
| 720+50 | LT. | LEVEE DRAIN PIPE | 1 | |
| 720+95 | RT. | LEVEE DRAIN PIPE | 1 | |
| 721+98 | RT. | 16.5' X 18.9' CONC. BRIDGE | 1 | |
| 722+00 | LT. | 42" X 24' R.C. PIPE CULVERT | 1 | |
| 724+93 | LT. | 60" X 41' C.M. PIPE CULVERT | 1 | |
| 723+65 | RT. | LEVEE DRAIN PIPE | 1 | |
| 725+20 | RT. | LEVEE DRAIN PIPE | 1 | |
| 725+70 | LT. | LEVEE DRAIN PIPE | 1 | |
| SUBTOTALS (BOX 2 OF 3): | | | 67 | 2 |

## REMOVAL AND DISPOSAL OF DRAINAGE ITEMS (BOX 3 OF 3)

| STATION | | DESCRIPTION | PIPE CULVERT | BOX CULVERT |
|---|---|---|---|---|
| | | | EACH | EACH |
| 738+60 | RT. | LEVEE DRAIN PIPE | 1 | |
| 740+08 | LT. | 36" X 23.8' C.M. PIPE CULVERT | 1 | |
| 740+08 | RT. | 18' X 19' CONC. BRIDGE | 1 | |
| 741+10 | LT. | LEVEE DRAIN PIPE | 1 | |
| 746+55 | LT. | LEVEE DRAIN PIPE | 1 | |
| 751+00 | LT. | LEVEE DRAIN PIPE | 1 | |
| 753+10 | RT. | 16' X 24' CONC. BRIDGE | 1 | |
| 753+30 | LT. | 30" X 20.7' R.C. PIPE CULVERT | 1 | |
| 759+40 | RT. | 36" X 27.5' C.M. PIPE CULVERT | 1 | |
| 760+16 | LT. | 36" X 28' R.C. PIPE CULVERT | 1 | |
| 769+76 | RT. | 16' X 19' CONC. BRIDGE | 1 | |
| 775+45 | LT. | LEVEE DRAIN PIPE | 1 | |
| 777+57 | LT. | 36" X 32.2' C.M. PIPE CULVERT | 1 | |
| 790+70 | RT. | 30" X 45.5' C.M. PIPE CULVERT | 1 | |
| 793+20 | RT. | 30" X 23.5' C.M. PIPE CULVERT | 1 | |
| 797+17 | LT. | 15' X 19' CONC. BRIDGE | 1 | |
| 803+76 | RT. | 24" X 20' R.C. PIPE CULVERT | 1 | |
| 804+01 | LT. | 19' X 20.5' CONC. BRIDGE | 1 | |
| 804+48 | RT. | 24" X 40' C.M. PIPE CULVERT | 1 | |
| 809+98 | LT. | WOODEN BRIDGE | 1 | |
| 830+94 | LT. | 15' X 19.3' CONC. BRIDGE | 1 | |
| 843+71 | RT. | 48" X 30' C.M. PIPE CULVERT | 1 | |
| 34+60 | RT. | 18" X 28' C.M. PIPE CULVERT (HWY. 228) | 1 | |
| SUBTOTALS (BOX 1 OF 3): | | | 66 | 3 |
| SUBTOTALS (BOX 2 OF 3): | | | 67 | 2 |
| SUBTOTALS (BOX 3 OF 3): | | | 23 | 0 |
| TOTALS: | | | 156 | 5 |

NOTE: PIPE CULVERT & BOX CULVERT QUANTITIES SHOWN ABOVE SHALL INCLUDE REMOVAL & DISPOSAL OF ALL HEADWALLS & FLARED END SECTIONS IF APPLICABLE.

## RUMBLE STRIPS IN ASPHALT SHOULDERS

| STATION | STATION | LOCATION | *RUMBLE STRIPS |
|---|---|---|---|
| | | | LIN.FT. |
| 92+50.00 | 399+46.15 | LT. SHOULDER | 30696 |
| 92+50.00 | 399+46.15 | RT. SHOULDER | 30696 |
| 404+54.13 | 854+01.68 | LT. SHOULDER | 44948 |
| 404+54.13 | 854+01.68 | RT. SHOULDER | 44948 |
| | | | |
| TOTAL: | | | 151288 |

* QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.
TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

## MAILBOXES

| LOCATION | MAILBOXES | MAILBOX SUPPORTS (SINGLE) | MAILBOX SUPPORTS (DOUBLE) |
|---|---|---|---|
| | EACH | | |
| ENTIRE PROJECT | 21 | 7 | 7 |
| TOTALS: | 21 | 7 | 7 |

## PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

| STATION | LOCATION | WIDTH | LENGTH | SQ. YD. | TON |
|---|---|---|---|---|---|
| | | FEET | | | |
| 150+97 | HWY. 412 | 8.50 | 122 | 115.22 | 13 |
| 175+96 | HWY. 412 | 8.50 | 119 | 40.58 | 4 |
| 196+96 | HWY. 412 | 15.00 | 120 | 72.22 | 8 |
| 282+97 | HWY. 412 | 12.00 | 119 | 57.30 | 6 |
| 303+98 | HWY. 412 | 12.00 | 119 | 57.30 | 6 |
| 321+94 | HWY. 412 | 12.00 | 119 | 57.30 | 6 |
| 368+53 | HWY. 412 | 12.00 | 119 | 57.30 | 6 |
| 376+02 | HWY. 412 | 12.00 | 108 | 52.00 | 6 |
| 384+84 | HWY. 412 | 15.00 | 119 | 71.62 | 8 |
| 444+80 | HWY. 412 | 15.00 | 119 | 71.62 | 8 |
| 456+60 | HWY. 412 | 8.50 | 119 | 40.58 | 4 |
| 565+87 | HWY. 412 | 12.00 | 132 | 63.56 | 7 |
| 754+64 | HWY. 412 | 12.00 | 119 | 57.30 | 6 |
| 27+17 | HWY. 228 | 9.00 | 86 | 31.06 | 3 |
| 28+56 | HWY. 228 | 9.00 | 86 | 31.06 | 3 |
| | | | | | |
| TOTAL: | | | | | 94 |

# QUANTITIES

2/19/2018 11:56:30 AM
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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. | | CA1003 | 153 | 503 |

② QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/16/17

# STRUCTURES - PIPE CULVERTS

| STATION | DESCRIPTION | REINFORCED CONCRETE PIPE CULVERT (CLASS III) | | | REINFORCED CONCRETE PIPE CULVERT (CLASS IV) | | REINFORCED CONCRETE PIPE CULVERT (CLASS V) | FLARED END SECTIONS FOR R.C. PIPE CULVERTS | | | SOLID SODDING | WATER | STD. DWG. NOS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24" | 30" | 36" | 24" | 36" | 36" | 24" | 30" | 36" | | | |
| | | LIN. FT. | | | LIN. FT. | | LIN. FT. | EA. | | | SQ. YD. | M. GAL. | |
| 111+99 | EXTEND R.C. PIPE CULVERT | | | | 64 | | | 2 | | | 16 | 0.20 | PCC-1, FES-1, FES-2 |
| 150+97 | CONST. R.C. PIPE CULVERT | | 122 | | | | | | 2 | | 26 | 0.33 | PCC-1, FES-1, FES-2 |
| 175+96 | CONST. R.C. PIPE CULVERT | | 119 | | | | | | 2 | | 26 | 0.33 | PCC-1, FES-1, FES-2 |
| 196+96 | CONST. TRIPLE R.C. PIPE CULVERT | | | 357 | | | | | | 6 | 38 | 0.48 | PCC-1, FES-1, FES-2 |
| 229+98 | EXTEND R.C. PIPE CULVERT | 68 | | | | | | 2 | | | 16 | 0.20 | PCC-1, FES-1, FES-2 |
| 252+97 | EXTEND R.C. PIPE CULVERT | 68 | | | | | | 2 | | | 16 | 0.20 | PCC-1, FES-1, FES-2 |
| 282+97 | CONST. DBL. R.C. PIPE CULVERT | | | 238 | | | | | | 4 | 36 | 0.45 | PCC-1, FES-1, FES-2 |
| 303+98 | CONST. DBL. R.C. PIPE CULVERT | | | 238 | | | | | | 4 | 36 | 0.45 | PCC-1, FES-1, FES-2 |
| 321+94 | CONST. DBL. R.C. PIPE CULVERT | | | 238 | | | | | | 4 | 36 | 0.45 | PCC-1, FES-1, FES-2 |
| 368+53 | CONST. DBL. R.C. PIPE CULVERT | | | 238 | | | | | | 4 | 36 | 0.45 | PCC-1, FES-1, FES-2 |
| 377+96 | EXTEND DBL. R.C. PIPE CULVERT | 120 | | | | | | 4 | | | 18 | 0.23 | PCC-1, FES-1, FES-2 |
| 384+84 | CONST. TRIPLE R.C. PIPE CULVERT | | | 357 | | | | | | 6 | 38 | 0.48 | PCC-1, FES-1, FES-2 |
| 444+80 | CONST. TRIPLE R.C. PIPE CULVERT | | | 357 | | | | | | 6 | 38 | 0.48 | PCC-1, FES-1, FES-2 |
| 456+60 | CONST. R.C. PIPE CULVERT | | 119 | | | | | | 2 | | 26 | 0.33 | PCC-1, FES-1, FES-2 |
| 468+84 | EXTEND. R.C. PIPE CULVERT | 69 | | | | | | 2 | | | 16 | 0.20 | PCC-1, FES-1, FES-2 |
| 565+87 | CONST. DBL. R.C. PIPE CULVERT | | | 264 | | | | | | 4 | 36 | 0.45 | PCC-1, FES-1, FES-2 |
| 672+73 | CONST. R.C. PIPE CULVERT | | | 140 | | | | | | 2 | 34 | 0.43 | PCC-1, FES-1, FES-2 |
| 754+64 | CONST. DBL. R.C. PIPE CULVERT | | | | | 238 | | | | 4 | 36 | 0.45 | PCC-1, FES-1, FES-2 |
| 10+83 | CONST. DBL. R.C. PIPE CULVERT (HWY. 231) | | | | | | 216 | | | 4 | 36 | 0.45 | PCC-1, FES-1, FES-2 |
| 10+78 | CONST. R.C. PIPE CULVERT (W. CONN.) | | | 80 | | | | | | 2 | 34 | 0.43 | PCC-1, FES-1, FES-2 |
| 27+17 | CONST. R.C. PIPE CULVERT (HWY. 228) | | | 86 | | | | | | 2 | 34 | 0.43 | PCC-1, FES-1, FES-2 |
| 28+56 | CONST. R.C. PIPE CULVERT (HWY. 228) | | | 86 | | | | | | 2 | 34 | 0.43 | PCC-1, FES-1, FES-2 |
| 10+74 | CONST. R.C. PIPE CULVERT (E. CONN.) | | 80 | | | | | | | 2 | 26 | 0.33 | PCC-1, FES-1, FES-2 |
| | | | | | | | | | | | | | |
| TOTALS: | | 325 | 440 | 2679 | 64 | 238 | 216 | 12 | 6 | 56 | 688 | 8.66 | |

NOTE: FOR R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE SPECIFIED.
BASIS OF ESTIMATE:
WATER_____12.6 GAL./SQ.YD. OF SOLID SODDING

## CULVERT CLEAN OUT

| STATION | LOCATION | EACH |
|---|---|---|
| 94+34 | DBL. R.C. BOX CULVERT | 1 |
| 111+99 | R.C. PIPE CULVERT | 1 |
| 229+98 | R.C. PIPE CULVERT | 1 |
| 252+97 | R.C. PIPE CULVERT | 1 |
| 377+96 | DBL. R.C. PIPE CULVERT | 1 |
| 393+35 | TRIPLE R.C. BOX CULVERT | 1 |
| 468+84 | R.C. PIPE CULVERT | 1 |
| 515+88 | R.C. BOX CULVERT | 1 |
| 525+93 | R.C. BOX CULVERT | 1 |
| 844+84 | R.C. BOX CULVERT | 1 |
| | | |
| TOTAL: | | 10 |

# STRUCTURES - R.C. BOX CULVERTS

| STATION | DESCRIPTION | SPAN | HEIGHT | LENGTH | CLASS S CONCRETE - ROADWAY | REINF. STEEL-ROADWAY (GRADE 60) | UNCL. EXC. FOR STR.- ROADWAY | STONE BACKFILL | SOLID SODDING | WATER | STD. DWG. NOS. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LIN. FT. | | | CU.YD. | POUND | CU.YD. | TON | SQ. YD. | M. GAL. | |
| 515+88 | EXTEND R.C. BOX CULVERT | 4 | 2 | 70 | 25.03 | 3164 | 145 | 2 | 10 | 0.13 | R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3 |
| 525+93 | EXTEND R.C. BOX CULVERT | 4 | 2 | 65 | 23.68 | 3032 | 141 | 2 | 10 | 0.13 | R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3 |
| 844+84 | CONST. & EXTEND R.C. BOX CULVERT | 6 | 3 | 224 | 110.74 | 15140 | 38 | 219 | 18 | 0.23 | W-X45, W-X453-1, R-145X-0, PBC-1, RCB-1, RCB-2, RCB-3 |
| | | | | | | | | | | | |
| SUBTOTALS: | | | | | 159.45 | 21336 | 324 | 223 | 38 | 0.49 | |
| | STRUCTURES OVER 20'-0" SPAN | | | | | | | | | | |
| 94+34 | EXTEND DBL. R.C. BOX CULVERT | 11 | 10 | 10 | 68.69 | 6755 | 197 | 30 | 36 | 0.45 | R-200X-0, W-X003-2, RCB-1, RCB-2, RCB-3 |
| 162+20 | CONSTRUCT TRIPLE R.C. BOX CULVERT W/3:1WINGS LT. & RT. | 12 | 12 | 121 | 629.92 | 76885 | 229 | 928 | 45 | 0.57 | RCB-1, RCB-2, SPECIAL DETAILS |
| 243+27 | CONSTRUCT TRIPLE R.C. BOX CULVERT W/3:1WINGS LT. & RT. | 10 | 10 | 122 | 465.44 | 55969 | 178 | 804 | 38 | 0.48 | RCB-1, RCB-2, SPECIAL DETAILS |
| 339+06 | CONSTRUCT QUAD R.C. BOX CULVERT W/3:1WINGS LT. & RT. | 10 | 10 | 123 | 608.02 | 75980 | 253 | 963 | 43 | 0.54 | RCB-1, RCB-2, SPECIAL DETAILS |
| 393+35 | EXTEND TRIPLE R.C. BOX CULVERT | 8 | 4 | 16 | 40.45 | 6012 | 117 | 5 | 20 | 0.25 | R-300X-0, W-X003-1, RCB-1, RCB-2, RCB-3 |
| 475+86 | CONSTRUCT TRIPLE R.C. BOX CULVERT W/3:1WINGS LT. & RT. | 8 | 7 | 171 | 408.90 | 54178 | 170 | 897 | 34 | 0.43 | RCB-1, RCB-2, SPECIAL DETAILS |
| 545+55 | CONSTRUCT TRIPLE R.C. BOX CULVERT W/3:1WINGS LT. & RT. | 12 | 8 | 210 | 815.40 | 120611 | 352 | 1375 | 42 | 0.53 | RCB-1, RCB-2, SPECIAL DETAILS |
| 605+29 | CONSTRUCT TRIPLE R.C. BOX CULVERT W/3:1WINGS LT. & RT. | 7 | 4 | 128 | 218.02 | 27738 | 108 | 585 | 21 | 0.26 | RCB-1, RCB-2, SPECIAL DETAILS |
| 645+07 | CONSTRUCT TRIPLE R.C. BOX CULVERT W/3:1WINGS LT. & RT. | 9 | 9 | 121 | 377.51 | 49652 | 147 | 736 | 34 | 0.43 | RCB-1, RCB-2, SPECIAL DETAILS |
| 694+25 | CONSTRUCT QUAD R.C. BOX CULVERT W/3:1WINGS LT. & RT. | 8 | 6 | 148 | 450.36 | 59603 | 204 | 933 | 35 | 0.44 | RCB-1, RCB-2, SPECIAL DETAILS |
| 706+09 | CONSTRUCT QUAD R.C. BOX CULVERT W/3:1WINGS LT. & RT. | 10 | 10 | 163 | 800.99 | 102898 | 331 | 1248 | 49 | 0.62 | RCB-1, RCB-2, SPECIAL DETAILS |
| 783+43 | CONSTRUCT QUAD R.C. BOX CULVERT W/3:1WINGS LT. & RT. | 12 | 12 | 140 | 958.00 | 116029 | 396 | 1278 | 56 | 0.71 | RCB-1, RCB-2, SPECIAL DETAILS |
| | | | | | | | | | | | |
| SUBTOTALS: | | | | | 5841.70 | 752310 | 2682 | 9782 | 453 | 5.71 | |
| TOTALS: | | | | | 6001.15 | 773646 | 3006 | 10005 | 491 | 6.20 | |

NOTE: LENGTH AND QUANTITIES INCLUDE "BREAKBACK" DISTANCE
BASIS OF ESTIMATE:
WATER_____12.6 GAL./SQ.YD. OF SOLID SODDING

## BENCH MARKS

| LOCATION | BENCH MARKS |
|---|---|
| | EACH |
| STA. 162+20 - RT. R.C. BOX CULVERT HEADWALL | 1 |
| STA. 243+27 - LT. R.C. BOX CULVERT HEADWALL | 1 |
| STA. 339+06 - RT. R.C. BOX CULVERT HEADWALL | 1 |
| STA. 475+86 - LT. R.C. BOX CULVERT HEADWALL | 1 |
| STA. 545+55 - RT. R.C. BOX CULVERT HEADWALL | 1 |
| STA. 605+29 - LT. R.C. BOX CULVERT HEADWALL | 1 |
| STA. 645+07 - RT. R.C. BOX CULVERT HEADWALL | 1 |
| STA. 694+25 - LT. R.C. BOX CULVERT HEADWALL | 1 |
| STA. 706+09 - RT. R.C. BOX CULVERT HEADWALL | 1 |
| STA. 783+43 - LT. R.C. BOX CULVERT HEADWALL | 1 |
| | |
| TOTAL: | 10 |

NOTE: SHOWN FOR INFORMATIONAL PURPOSES ONLY. BENCH MARKS TO BE FURNISHED, PLACED, AND RECORDED BY STATE FORCES.

## CONCRETE DITCH PAVING

| STATION | STATION | LOCATION | LENGTH | CONCRETE DITCH PAVING WIDTH | CONCRETE DITCH PAVING TYPE B | SOLID SODDING | WATER |
|---|---|---|---|---|---|---|---|
| | | | LIN. FT. | FT. | SQ. YD. | SQ. YD. | M. GAL. |
| 161+73.00 | 161+87.00 | LT. OF ROADWAY | 16 | 6 | 11 | 2 | 0.03 |
| 162+59.00 | 162+79.00 | RT. OF ROADWAY | 24 | 6 | 16 | 2 | 0.03 |
| 162+59.00 | 162+83.00 | LT. OF ROADWAY | 29 | 6 | 19 | 2 | 0.03 |
| 242+90.00 | 243+02.00 | RT. OF ROADWAY | 14 | 6 | 9 | 2 | 0.03 |
| 243+63.00 | 243+72.00 | RT. OF ROADWAY | 11 | 6 | 7 | 2 | 0.03 |
| 243+48.00 | 243+63.00 | LT. OF ROADWAY | 18 | 6 | 12 | 2 | 0.03 |
| 496+76.83 | 497+25.52 | RT. OF ROADWAY | 49 | 6 | 33 | 2 | 0.03 |
| | | | | | | | |
| TOTALS: | | | | | 107 | 14 | 0.21 |

BASIS OF ESTIMATE:
WATER_____12.6 GAL./SQ.YD. OF SOLID SODDING

## SELECTED PIPE BEDDING

| LOCATION | SELECTED PIPE BEDDING |
|---|---|
| | CU. YD. |
| ENTIRE PROJECT TO BE USED IF | 200 |
| AND WHERE DIRECTED BY THE | |
| ENGINEER | |
| | |
| TOTAL: | 200 |

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

## CONCRETE ISLAND

| STATION | LOCATION | CURB FACE TYPE | CONCRETE ISLAND |
|---|---|---|---|
| | | | SQ. YD. |
| 375+67 | HWY. 231 LT. OF HWY. 412 | 8 | 732 |
| | | | |
| TOTAL: | | | 732 |

QUANTITIES

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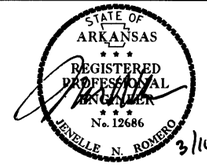


3/16/17

| 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. | | CA1003 | 154 | 503 |

② QUANTITIES

## BASE AND SURFACING (BOX 1 OF 2)

| STATION | STATION | LOCATION | LENGTH | AGGREGATE BASE COURSE (CLASS 7) | | TACK COAT | | | | | | ACHM BINDER COURSE (1") | | | | ACHM SURFACE COURSE (1/2") | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TON / STATION | TON | TOTAL WIDTH | SQUARE YARDS | 0.05 G/SY | AVG. WIDTH | SQUARE YARDS | 0.17 G/SY | AVG. WID. | SQ.YD. | POUND/ SQ.YD. | PG 64-22 | AVG. WID. | SQ.YD. | POUND / SQ.YD. | PG 64-22 |
| | | | FEET | | | FEET | | GAL. | FEET | | GAL. | FEET | | | TON | FEET | | | TON |
| 93+50.00 | 101+80.00 | HWY. 412 NOTCH & WIDEN (VARIABLE WIDTH) | 830.00 | 338.80 | 2812.04 | 110.41 | 10182.26 | 509.11 | 40.00 | 3688.89 | 5644.00 | 23.58 | 2174.60 | 660.00 | 717.62 | 98.25 | 9060.83 | 220.00 | 996.69 |
| 101+80.00 | 107+43.87 | HWY. 412 NOTCH & WIDEN | 563.87 | 376.50 | 2122.97 | 142.41 | 8922.30 | 446.12 | 24.00 | 1503.65 | 2300.58 | 39.58 | 2479.77 | 660.00 | 818.32 | 114.25 | 7158.02 | 220.00 | 787.38 |
| 107+43.87 | 112+83.87 | HWY. 412 NOTCH & WIDEN (SUPER TRANS.) | 540.00 | 419.40 | 2264.76 | 142.41 | 8544.60 | 427.23 | 24.00 | 1440.00 | 2203.20 | 39.58 | 2374.80 | 660.00 | 783.68 | 114.25 | 6855.00 | 220.00 | 754.05 |
| 112+83.87 | 118+34.65 | HWY. 412 NOTCH & WIDEN (FULL SUPER) | 550.78 | 500.00 | 2753.90 | 142.41 | 8715.18 | 435.76 | 24.00 | 1468.75 | 2247.19 | 39.58 | 2422.21 | 660.00 | 799.33 | 114.25 | 6991.85 | 220.00 | 769.10 |
| 118+34.65 | 123+74.65 | HWY. 412 NOTCH & WIDEN (SUPER TRANS.) | 540.00 | 419.40 | 2264.76 | 142.41 | 8544.60 | 427.23 | 24.00 | 1440.00 | 2203.20 | 39.58 | 2374.80 | 660.00 | 783.68 | 114.25 | 6855.00 | 220.00 | 754.05 |
| 118+34.65 | 159+25.00 | HWY. 412 NOTCH & WIDEN | 4090.35 | 376.50 | 15400.17 | 142.41 | 64722.97 | 3236.15 | 24.00 | 10907.60 | 16688.63 | 39.58 | 17988.45 | 660.00 | 5936.19 | 114.25 | 51924.72 | 220.00 | 5711.72 |
| 159+25.00 | 164+09.42 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS | 484.42 | 485.25 | 2350.65 | 189.75 | 10213.19 | 510.66 | | | | 63.58 | 3422.16 | 660.00 | 1129.31 | 138.25 | 7441.23 | 220.00 | 818.54 |
| 164+09.42 | 240+66.63 | HWY. 412 NOTCH & WIDEN | 7657.21 | 376.50 | 28829.40 | 142.41 | 121162.59 | 6058.13 | 24.00 | 20419.23 | 31241.42 | 39.58 | 33674.71 | 660.00 | 11112.65 | 114.25 | 97204.03 | 220.00 | 10692.44 |
| 240+66.63 | 244+64.51 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS | 397.88 | 485.25 | 1930.71 | 189.75 | 8388.64 | 419.43 | | | | 63.58 | 2810.80 | 660.00 | 927.56 | 138.25 | 6111.88 | 220.00 | 672.31 |
| 244+64.51 | 330+46.15 | HWY. 412 NOTCH & WIDEN | 8581.64 | 376.50 | 32309.87 | 142.41 | 135790.15 | 6789.51 | 24.00 | 22884.37 | 35013.09 | 39.58 | 37740.15 | 660.00 | 12454.25 | 114.25 | 108939.15 | 220.00 | 11983.31 |
| 330+46.15 | 346+31.31 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS | 1585.16 | 485.25 | 7691.99 | 189.75 | 33420.46 | 1671.02 | | | | 63.58 | 11198.27 | 660.00 | 3695.43 | 138.25 | 24349.82 | 220.00 | 2678.48 |
| 346+31.31 | 371+47.00 | HWY. 412 NOTCH & WIDEN | 2515.69 | 376.50 | 9471.57 | 142.41 | 39806.60 | 1990.33 | 24.00 | 6708.51 | 10264.02 | 39.58 | 11063.45 | 660.00 | 3650.94 | 114.25 | 31935.29 | 220.00 | 3512.88 |
| 371+47.00 | 375+99.00 | HWY. 412 NOTCH & WIDEN (VARIABLE WIDTH) | 452.00 | 349.07 | 1577.80 | 130.91 | 6574.59 | 328.73 | 29.75 | 1494.11 | 2285.99 | 33.83 | 1699.02 | 660.00 | 560.68 | 108.50 | 5449.11 | 220.00 | 599.40 |
| 375+99.00 | 382+00.00 | HWY. 412 NOTCH & WIDEN (VARIABLE WIDTH) | 601.00 | 349.07 | 2097.91 | 130.91 | 8741.88 | 437.09 | 29.75 | 1986.64 | 3039.56 | 33.83 | 2259.09 | 660.00 | 745.50 | 108.50 | 7245.39 | 220.00 | 796.99 |
| 382+00.00 | 398+62.11 | HWY. 412 NOTCH & WIDEN (SUPER TRANS.) | 1662.11 | 430.13 | 7149.23 | 142.41 | 26300.12 | 1315.01 | 24.00 | 4432.29 | 6781.40 | 39.58 | 7309.59 | 660.00 | 2412.16 | 114.25 | 21099.56 | 220.00 | 2320.95 |
| 398+62.11 | 399+46.15 | HWY. 412 NOTCH & WIDEN (FULL SUPER) | 84.04 | 483.75 | 406.54 | 142.41 | 1329.79 | 66.49 | 24.00 | 224.11 | 342.89 | 39.58 | 369.59 | 660.00 | 121.96 | 114.25 | 1066.84 | 220.00 | 117.35 |
| 399+46.15 | 404+54.13 | HWY. 412 NOTCH & WIDEN (SUPER TRANS.) | 507.98 | 430.13 | 2184.97 | 142.41 | 8037.94 | 401.90 | 24.00 | 1354.61 | 2072.55 | 39.58 | 2233.98 | 660.00 | 737.21 | 114.25 | 6448.52 | 220.00 | 709.34 |
| 404+54.13 | 419+50.55 | HWY. 412 NOTCH & WIDEN | 1496.42 | 376.50 | 5634.02 | 142.41 | 23678.35 | 1183.92 | 24.00 | 3990.45 | 6105.39 | 39.58 | 6580.92 | 660.00 | 2171.70 | 114.25 | 18996.22 | 220.00 | 2089.58 |
| 419+50.55 | 424+90.55 | HWY. 412 NOTCH & WIDEN (SUPER TRANS.) | 540.00 | 438.25 | 2366.55 | 142.41 | 8544.60 | 427.23 | 24.00 | 1440.00 | 2203.20 | 39.58 | 2374.80 | 660.00 | 783.68 | 114.25 | 6855.00 | 220.00 | 754.05 |
| 424+90.55 | 425+71.66 | HWY. 412 NOTCH & WIDEN (FULL SUPER) | 81.11 | 500.00 | 405.55 | 142.41 | 1283.43 | 64.17 | 24.00 | 216.29 | 330.92 | 39.58 | 356.70 | 660.00 | 117.71 | 114.25 | 1029.65 | 220.00 | 113.26 |
| 425+71.66 | 431+11.66 | HWY. 412 NOTCH & WIDEN (SUPER TRANS.) | 540.00 | 438.25 | 2366.55 | 142.41 | 8544.60 | 427.23 | 24.00 | 1440.00 | 2203.20 | 39.58 | 2374.80 | 660.00 | 783.68 | 114.25 | 6855.00 | 220.00 | 754.05 |
| 431+11.66 | 469+10.00 | HWY. 412 NOTCH & WIDEN | 3798.34 | 376.50 | 14300.75 | 142.41 | 60102.40 | 3005.12 | 24.00 | 10128.91 | 15497.23 | 39.58 | 16704.26 | 660.00 | 5512.41 | 114.25 | 48217.82 | 220.00 | 5303.96 |
| 469+10.00 | 481+20.00 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS | 1210.00 | 485.25 | 5871.53 | 189.75 | 25510.83 | 1275.54 | | | | 63.58 | 8547.98 | 660.00 | 2820.83 | 138.25 | 18586.94 | 220.00 | 2044.56 |
| 481+20.00 | 537+53.58 | HWY. 412 NOTCH & WIDEN | 5633.58 | 376.50 | 21210.43 | 142.41 | 89142.01 | 4457.10 | 24.00 | 15022.88 | 22985.01 | 39.58 | 24775.23 | 660.00 | 8175.83 | 114.25 | 71515.17 | 220.00 | 7866.67 |
| 537+53.58 | 552+52.15 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS | 1498.57 | 485.25 | 7271.81 | 189.75 | 31594.85 | 1579.74 | | | | 63.58 | 10586.56 | 660.00 | 3493.56 | 138.25 | 23019.70 | 220.00 | 2532.17 |
| 552+52.15 | 557+92.15 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS (SUPER TRANS.) | 540.00 | 466.25 | 2517.75 | 189.75 | 11385.00 | 569.25 | | | | 63.58 | 3814.80 | 660.00 | 1258.88 | 138.25 | 8295.00 | 220.00 | 912.45 |
| 557+92.15 | 574+44.76 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS (FULL SUPER) | 1652.61 | 447.25 | 7391.30 | 189.75 | 34842.53 | 1742.13 | | | | 63.58 | 11674.77 | 660.00 | 3852.67 | 138.25 | 25385.93 | 220.00 | 2792.45 |
| 574+44.76 | 579+84.76 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS (SUPER TRANS.) | 540.00 | 466.25 | 2517.75 | 189.75 | 11385.00 | 569.25 | | | | 63.58 | 3814.80 | 660.00 | 1258.88 | 138.25 | 8295.00 | 220.00 | 912.45 |
| 579+84.76 | 584+39.48 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS | 454.72 | 485.25 | 2206.53 | 189.75 | 9587.01 | 479.35 | | | | 63.58 | 3212.34 | 660.00 | 1060.07 | 138.25 | 6985.00 | 220.00 | 768.35 |
| 584+39.48 | 589+79.48 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS (SUPER TRANS.) | 540.00 | 466.25 | 2517.75 | 189.75 | 11385.00 | 569.25 | | | | 63.58 | 3814.80 | 660.00 | 1258.88 | 138.25 | 8295.00 | 220.00 | 912.45 |
| 589+79.48 | 606+87.57 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS (FULL SUPER) | 1708.09 | 447.25 | 7639.43 | 189.75 | 36012.23 | 1800.61 | | | | 63.58 | 12066.71 | 660.00 | 3982.01 | 138.25 | 26238.16 | 220.00 | 2886.20 |
| 606+87.57 | 612+27.57 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS (SUPER TRANS.) | 540.00 | 466.25 | 2517.75 | 189.75 | 11385.00 | 569.25 | | | | 63.58 | 3814.80 | 660.00 | 1258.88 | 138.25 | 8295.00 | 220.00 | 912.45 |
| 612+27.57 | 651+40.43 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS | 3912.86 | 485.25 | 18987.15 | 189.75 | 82496.13 | 4124.81 | | | | 63.58 | 27642.18 | 660.00 | 9121.92 | 138.25 | 60105.88 | 220.00 | 6611.65 |
| 651+40.43 | 656+80.43 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS (SUPER TRANS.) | 540.00 | 466.25 | 2517.75 | 189.75 | 11385.00 | 569.25 | | | | 63.58 | 3814.80 | 660.00 | 1258.88 | 138.25 | 8295.00 | 220.00 | 912.45 |
| 656+80.43 | 672+02.52 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS (FULL SUPER) | 1522.09 | 447.25 | 6807.55 | 189.75 | 32090.73 | 1604.54 | | | | 63.58 | 10752.72 | 660.00 | 3548.40 | 138.25 | 23380.99 | 220.00 | 2571.91 |
| 672+02.52 | 677+45.52 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS (SUPER TRANS.) | 543.00 | 466.25 | 2531.74 | 189.75 | 11448.25 | 572.41 | | | | 63.58 | 3835.99 | 660.00 | 1265.88 | 138.25 | 8341.08 | 220.00 | 917.52 |
| 677+45.52 | 681+98.07 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS | 452.55 | 485.25 | 2196.00 | 189.75 | 9541.26 | 477.06 | | | | 63.58 | 3197.01 | 660.00 | 1055.01 | 138.25 | 6951.67 | 220.00 | 764.68 |
| 681+98.07 | 687+38.07 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS (SUPER TRANS.) | 540.00 | 466.25 | 2517.75 | 189.75 | 11385.00 | 569.25 | | | | 63.58 | 3814.80 | 660.00 | 1258.88 | 138.25 | 8295.00 | 220.00 | 912.45 |
| 687+38.07 | 702+94.31 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS (FULL SUPER) | 1556.24 | 447.25 | 6960.28 | 189.75 | 32810.73 | 1640.54 | | | | 63.58 | 10993.97 | 660.00 | 3628.01 | 138.25 | 23905.58 | 220.00 | 2629.61 |
| 702+94.31 | 707+24.00 | HWY. 412 NOTCH & WIDEN (FULL SUPER) | 429.69 | 500.00 | 2148.45 | 142.41 | 6799.13 | 339.96 | 24.00 | 1145.84 | 1753.14 | 39.58 | 1889.68 | 660.00 | 623.59 | 114.25 | 5454.68 | 220.00 | 600.01 |
| 707+24.00 | 708+34.31 | HWY. 412 NOTCH & WIDEN (SUPER TRANS.) | 110.31 | 438.25 | 483.43 | 142.41 | 1745.47 | 87.27 | 24.00 | 294.16 | 450.06 | 39.58 | 485.12 | 660.00 | 160.09 | 114.25 | 1400.32 | 220.00 | 154.04 |
| 708+34.31 | 743+78.01 | HWY. 412 NOTCH & WIDEN | 3543.70 | 376.50 | 13342.03 | 142.41 | 56073.15 | 2803.66 | 24.00 | 9449.87 | 14458.30 | 39.58 | 15584.41 | 660.00 | 5142.86 | 114.25 | 44985.30 | 220.00 | 4948.38 |
| 743+78.01 | 749+18.01 | HWY. 412 NOTCH & WIDEN (SUPER TRANS.) | 540.00 | 386.78 | 2088.61 | 142.41 | 8544.60 | 427.23 | 24.00 | 1440.00 | 2203.20 | 39.58 | 2374.80 | 660.00 | 783.68 | 114.25 | 6855.00 | 220.00 | 754.05 |
| 749+18.01 | 749+73.26 | HWY. 412 NOTCH & WIDEN (FULL SUPER) | 55.25 | 397.06 | 219.38 | 142.41 | 874.24 | 43.71 | 24.00 | 147.33 | 225.41 | 39.58 | 242.98 | 660.00 | 80.18 | 114.25 | 701.37 | 220.00 | 77.15 |
| 749+73.26 | 755+13.26 | HWY. 412 NOTCH & WIDEN (SUPER TRANS.) | 540.00 | 386.78 | 2088.61 | 142.41 | 8544.60 | 427.23 | 24.00 | 1440.00 | 2203.20 | 39.58 | 2374.80 | 660.00 | 783.68 | 114.25 | 6855.00 | 220.00 | 754.05 |
| 755+13.26 | 780+46.29 | HWY. 412 NOTCH & WIDEN | 2533.03 | 376.50 | 9536.86 | 142.41 | 40080.98 | 2004.05 | 24.00 | 6754.75 | 10334.77 | 39.58 | 11139.70 | 660.00 | 3676.10 | 114.25 | 32155.41 | 220.00 | 3537.10 |
| 780+46.29 | 785+75.00 | HWY. 412 FULL DEPTH W/PARTIAL FULL DEPTH SHOULDERS | 528.71 | 485.25 | 2565.57 | 189.75 | 11146.97 | 557.35 | | | | 63.58 | 3735.04 | 660.00 | 1232.56 | 138.25 | 8121.57 | 220.00 | 893.37 |
| 785+75.00 | 830+83.65 | HWY. 412 NOTCH & WIDEN | 4508.65 | 376.50 | 16975.07 | 142.41 | 71341.87 | 3567.09 | 24.00 | 12023.07 | 18395.30 | 39.58 | 19828.04 | 660.00 | 6543.25 | 114.25 | 57234.81 | 220.00 | 6295.83 |
| 830+83.65 | 836+23.65 | HWY. 412 NOTCH & WIDEN (SUPER TRANS.) | 540.00 | 376.94 | 2035.48 | 142.41 | 8544.60 | 427.23 | 24.00 | 1440.00 | 2203.20 | 39.58 | 2374.80 | 660.00 | 783.68 | 114.25 | 6855.00 | 220.00 | 754.05 |
| 836+23.65 | 841+15.95 | HWY. 412 NOTCH & WIDEN (FULL SUPER) | 492.30 | 377.38 | 1857.84 | 142.41 | 7789.83 | 389.49 | 24.00 | 1312.80 | 2008.58 | 39.58 | 2165.03 | 660.00 | 714.46 | 114.25 | 6249.48 | 220.00 | 687.44 |
| 841+15.95 | 846+55.95 | HWY. 412 NOTCH & WIDEN (SUPER TRANS.) | 540.00 | 318.43 | 1719.52 | 142.41 | 8544.60 | 427.23 | 24.00 | 1440.00 | 2203.20 | 39.58 | 2374.80 | 660.00 | 783.68 | 114.25 | 6855.00 | 220.00 | 754.05 |
| 846+55.95 | 853+01.68 | HWY. 412 NOTCH & WIDEN (VARIABLE WIDTH) | 645.73 | 259.47 | 1675.48 | 67.41 | 4836.52 | 241.83 | 61.50 | 4412.49 | 6751.11 | 14.08 | 1010.21 | 660.00 | 333.37 | 92.50 | 6636.67 | 220.00 | 730.03 |
| | | | | | | | | | | | | | | | | | | | |
| 93+50.00 | 159+25.00 | HWY. 412 LEVELING | 6575.00 | | | | | | 24.00 | 17533.33 | 26825.99 | | | | | 24.00 | 17533.33 | VAR. | 511.19 |
| 164+09.00 | 240+66.63 | HWY. 412 LEVELING | 7657.63 | | | | | | 24.00 | 20420.35 | 31243.14 | | | | | 24.00 | 20420.35 | VAR. | 299.36 |
| 244+65.00 | 330+46.15 | HWY. 412 LEVELING | 8581.15 | | | | | | 24.00 | 22883.07 | 35011.10 | | | | | 24.00 | 22883.07 | VAR. | 4795.16 |
| 346+31.00 | 404+54.13 | HWY. 412 LEVELING | 5823.13 | | | | | | 24.00 | 15528.35 | 23758.38 | | | | | 24.00 | 15528.35 | VAR. | 6491.75 |
| 409+11.60 | 466+45.12 | HWY. 412 LEVELING | 5733.52 | | | | | | 24.00 | 15289.39 | 23392.77 | | | | | 24.00 | 15289.39 | VAR. | 5291.53 |
| 485+00.00 | 537+53.58 | HWY. 412 LEVELING | 5253.58 | | | | | | 24.00 | 14009.55 | 21434.61 | | | | | 24.00 | 14009.55 | VAR. | 436.30 |
| 707+24.00 | 780+46.29 | HWY. 412 LEVELING | 7322.29 | | | | | | 24.00 | 19526.11 | 29874.95 | | | | | 24.00 | 19526.11 | VAR. | 484.52 |
| 785+75.00 | 853+02.91 | HWY. 412 LEVELING | 6727.91 | | | | | | 24.00 | 17941.09 | 27449.87 | | | | | 24.00 | 17941.09 | VAR. | 523.08 |
| | | | | | | | | | | | | | | | | | | | |
| SUBTOTALS (BOX 1 OF 2): | | | | | 309609.24 | | 1309804.36 | 65490.23 | | 296622.84 | 453832.95 | | 387740.59 | | 127954.30 | | 1165766.88 | | 131322.79 |

QUANTITIES

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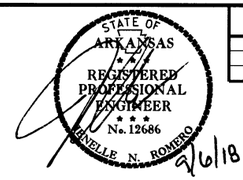


| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| 9/6/18 | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 155 | 503 |

② QUANTITIES

# BASE AND SURFACING (BOX 2 OF 2)

| STATION | STATION | LOCATION | LENGTH | AGGREGATE BASE COURSE (CLASS 7) | | TACK COAT | | | | | | ACHM BINDER COURSE (1") | | | | ACHM SURFACE COURSE (1/2") | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TON / STATION | TON | TOTAL WIDTH | SQUARE YARDS | 0.05 G/SY | AVG. WIDTH | SQUARE YARDS | 0.17 G/SY | AVG. WID. | SQ.YD. | POUND/ SQ.YD. | PG 64-22 | AVG. WID. | SQ.YD. | POUND / SQ.YD. | PG 64-22 |
| | | | FEET | | | FEET | | GAL. | FEET | | GAL. | FEET | | | TON | FEET | | | TON |
| HWY. 231 | | | | | | | | | | | | | | | | | | | |
| 10+29.50 | 11+57.76 | HWY. 231 FULL DEPTH | 128.26 | 300.73 | 385.72 | 72.00 | 1026.08 | 51.30 | | | | 24.00 | 342.03 | 660.00 | 112.87 | 40.00 | 912.07 | 220.00 | 100.33 |
| 11+57.76 | 12+07.76 | HWY. 231 OVERLAY | 50.00 | | | | | | | | | | | | | 40.00 | 222.22 | 220.00 | 24.44 |
| WEST CONNECTOR | | | | | | | | | | | | | | | | | | | |
| 10+29.50 | 14+50.00 | CONN. RD. 412 WEST FULL DEPTH | 420.50 | 300.73 | 1264.57 | 72.00 | 3364.00 | 168.20 | | | | 24.00 | 1121.33 | 660.00 | 370.04 | 40.00 | 2990.22 | 220.00 | 328.92 |
| 14+50.00 | 15+00.00 | CONN. RD. 412 WEST OVERLAY | 50.00 | | | | | | | | | | | | | 40.00 | 222.22 | 220.00 | 24.44 |
| HWY. 228 | | | | | | | | | | | | | | | | | | | |
| 19+78.82 | 20+28.82 | HWY. 228 NOTCH & WIDEN | 50.00 | 95.07 | 47.54 | 28.00 | 155.56 | 7.78 | 20.00 | 111.11 | 170.00 | | | | | 20.00 | 111.11 | 220.00 | 12.22 |
| 20+28.82 | 23+21.31 | HWY. 228 NOTCH & WIDEN | 292.49 | 135.40 | 396.03 | 36.00 | 1169.96 | 58.50 | 20.00 | 649.98 | 994.47 | | | | | 28.00 | 909.97 | 220.00 | 100.10 |
| 23+21.31 | 26+45.98 | HWY. 228 FULL DEPTH | 324.67 | 217.39 | 705.80 | 60.00 | 2164.47 | 108.22 | | | | 20.00 | 721.49 | 660.00 | 238.09 | 28.00 | 1731.57 | 220.00 | 190.47 |
| 26+45.98 | 27+42.32 | HWY. 228 FULL DEPTH | 96.34 | 323.55 | 311.71 | 212.19 | 2271.38 | 113.57 | | | | 70.73 | 757.13 | 660.00 | 249.85 | 102.07 | 1849.73 | 220.00 | 203.47 |
| 28+30.37 | 29+26.13 | HWY. 228 FULL DEPTH | 95.76 | 323.55 | 309.83 | 212.19 | 2257.70 | 112.89 | | | | 70.73 | 752.57 | 660.00 | 248.35 | 102.07 | 1838.59 | 220.00 | 202.24 |
| 29+26.13 | 32+43.24 | HWY. 228 FULL DEPTH | 317.11 | 217.39 | 689.37 | 60.00 | 2114.07 | 105.70 | | | | 20.00 | 704.69 | 660.00 | 232.55 | 28.00 | 1691.25 | 220.00 | 186.04 |
| 32+43.24 | 35+41.54 | HWY. 228 NOTCH & WIDEN | 298.30 | 135.40 | 403.90 | 36.00 | 1193.20 | 59.66 | 20.00 | 662.89 | 1014.22 | | | | | 28.00 | 928.04 | 220.00 | 102.08 |
| 35+41.54 | 35+91.54 | HWY. 228 NOTCH & WIDEN | 50.00 | 95.07 | 47.54 | 28.00 | 155.56 | 7.78 | 20.00 | 111.11 | 170.00 | | | | | 20.00 | 111.11 | 220.00 | 12.22 |
| EAST CONNECTOR | | | | | | | | | | | | | | | | | | | |
| 10+29.50 | 17+95.00 | CONN. RD. 412 EAST FULL DEPTH | 765.50 | 300.73 | 2302.09 | 72.00 | 6124.00 | 306.20 | | | | 24.00 | 2041.33 | 660.00 | 673.64 | 40.00 | 5443.56 | 220.00 | 598.79 |
| 17+95.00 | 18+45.00 | CONN. RD. 412 EAST OVERLAY | 50.00 | | | | | | | | | | | | | 40.00 | 222.22 | 220.00 | 24.44 |
| HWY. 412 CULVERT DETOURS | | | | | | | | | | | | | | | | | | | |
| 157+07.61 | 167+33.17 | HWY. 412 CULVERT DETOUR - LT. | 1025.56 | VAR. | 690.43 | 13.40 | 1526.39 | 76.32 | | | | 13.40 | 1526.39 | 330.00 | 251.85 | 11.62 | 1324.63 | 220.00 | 145.71 |
| 238+05.88 | 248+31.45 | HWY. 412 CULVERT DETOUR - LT. | 1025.57 | VAR. | 613.69 | 13.23 | 1507.16 | 75.36 | | | | 13.23 | 1507.16 | 330.00 | 248.68 | 10.96 | 1248.48 | 220.00 | 137.33 |
| 334+02.30 | 344+27.86 | HWY. 412 CULVERT DETOUR - LT. | 1025.56 | VAR. | 951.67 | 14.37 | 1637.51 | 81.88 | | | | 14.37 | 1637.51 | 330.00 | 270.19 | 14.37 | 1637.51 | 220.00 | 180.13 |
| 470+21.66 | 480+47.23 | HWY. 412 CULVERT DETOUR - LT. | 1025.57 | VAR. | 951.67 | 14.37 | 1637.51 | 81.88 | | | | 14.37 | 1637.51 | 330.00 | 270.19 | 14.37 | 1637.51 | 220.00 | 180.13 |
| 541+00.06 | 561+16.79 | HWY. 412 CULVERT DETOUR - LT. | 2016.73 | VAR. | 2147.89 | 16.76 | 3754.61 | 187.73 | | | | 16.76 | 3754.61 | 330.00 | 619.51 | 16.76 | 3754.61 | 220.00 | 413.01 |
| 699+67.28 | 711+54.53 | HWY. 412 CULVERT DETOUR - LT. | 1187.25 | VAR. | 1019.70 | 15.20 | 2005.49 | 100.27 | | | | 15.20 | 2005.49 | 330.00 | 330.91 | 14.19 | 1871.90 | 220.00 | 205.91 |
| 778+50.85 | 788+76.42 | HWY. 412 CULVERT DETOUR - LT. | 1025.57 | VAR. | 728.16 | 13.48 | 1536.23 | 76.81 | | | | 13.48 | 1536.23 | 330.00 | 253.48 | 11.98 | 1364.77 | 220.00 | 150.12 |
| | | | | | | | | | | | | | | | | | | | |
| | | * ENTIRE PROJECT | | | | | | | | | | | | | 5000.00 | | | | |
| SUBTOTALS (BOX 1 OF 2): | | | | | 309609.24 | | 1309804.36 | 65490.23 | | 296622.84 | 453832.95 | | 387740.59 | | 127954.30 | | 1165766.88 | | 131322.79 |
| SUBTOTALS (BOX 2 OF 2): | | | | | 13967.32 | | 35600.87 | 1780.04 | | 1535.09 | 2348.69 | | 20045.46 | | 9370.20 | | 32023.28 | | 3522.53 |
| TOTALS: | | | | | 323576.56 | | 1345405.23 | 67270.27 | | 298157.93 | 456181.64 | | 407786.05 | | 137324.50 | | 1197790.16 | | 134845.32 |

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.8% MIN. AGGR.....5.2% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.9% MIN. AGGR.....4.1% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115

* QUANTITY ESTIMATED. TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

## COLD MILLING ASPHALT PAVEMENT

| STATION | STATION | LOCATION | AVG. WIDTH | COLD MILLING ASPHALT PAVEMENT |
|---|---|---|---|---|
| | | | FEET | SQ. YD. |
| 92+50.00 | 93+50.00 | HWY. 412 | 67.00 | 744.44 |
| 853+01.68 | 854+01.68 | HWY. 412 | 67.00 | 744.44 |
| 11+57.76 | 12+07.76 | HWY. 231 | 39.77 | 220.94 |
| 14+50.00 | 15+00.00 | WEST CONNECTOR | 39.77 | 220.94 |
| 19+78.82 | 20+28.82 | HWY. 228 | 23.98 | 133.22 |
| 34+41.54 | 34+91.54 | HWY. 228 | 23.70 | 131.67 |
| 17+95.00 | 18+45.00 | EAST CONNECTOR | 39.80 | 221.11 |
| | | | | |
| TOTAL: | | | | 2416.76 |

## ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

| LOCATION | TON | TACK COAT GALLON |
|---|---|---|
| ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER | 358 | 715 |
| TOTALS: | 358 | 715 |

BASIS OF ESTIMATE:
PATCHING: 25 TONS PER MILE; TACK COAT: 50 GAL. PER MILE
QUANTITY ESTIMATED. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

## ACHM PATCHING OF EXISTING ROADWAY

| DESCRIPTION | TON |
|---|---|
| ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER | 200 |
| TOTAL: | 200 |

QUANTITY ESTIMATED. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

QUANTITIES

9/6/2018 3:38:52 PM

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# DRIVEWAYS AND TURNOUTS (BOX 1 OF 3)

| STATION | SIDE | DESCRIPTION | WIDTH | ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG64-22) | | AGGREGATE BASE COURSE (CLASS 7) | SIDE DRAINS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 18" | 24" | 30" | 36" | 42" | 48" |
| | | | FEET | SQ. YD. | TON | TON | LIN. FT. | | | | | |
| 93+72 | LT. | DRIVEWAY | 16 | 115.40 | 12.69 | 47.09 | | | | 68 | | |
| 95+15 | RT. | DRIVEWAY | 16 | 124.10 | 13.65 | 50.65 | | | | | | |
| 103+76 | RT. | DRIVEWAY | 16 | 114.50 | 12.60 | 46.73 | | | 38 | | | |
| 121+98 | RT. | DRIVEWAY | 16 | 75.60 | 8.32 | 30.85 | | 38 | | | | |
| 122+09 | LT. | DRIVEWAY | 16 | 71.90 | 7.91 | 29.34 | | | | | | |
| 135+15 | LT. | DRIVEWAY | 16 | 87.30 | 9.60 | 35.63 | | | 38 | | | |
| 135+82 | RT. | DRIVEWAY | 16 | 93.80 | 10.32 | 38.28 | | | 38 | | | |
| 137+40 | RT. | DRIVEWAY | 16 | 89.10 | 9.80 | 36.36 | | | 38 | | | |
| 147+47 | RT. | DRIVEWAY | 16 | 97.00 | 10.67 | 39.59 | | | 40 | | | |
| 161+44 | RT. | DRIVEWAY | 16 | 150.90 | 16.60 | 61.58 | | | 64 | | | |
| 161+48 | LT. | DRIVEWAY | 16 | 153.10 | 16.84 | 62.48 | | | | 62 | | |
| 163+06 | RT. | DRIVEWAY | 24 | 224.55 | 24.70 | 91.64 | | | 64 | | | |
| 163+11 | LT. | DRIVEWAY | 16 | 137.90 | 15.17 | 56.28 | | | 52 | | | |
| 174+98 | LT. | DRIVEWAY | 16 | 96.70 | 10.64 | 39.46 | 36 | | | | | |
| 180+37 | RT. | DRIVEWAY | 16 | 84.40 | 9.28 | 34.44 | | 38 | | | | |
| 188+55 | RT. | DRIVEWAY | 24 | 128.25 | 14.11 | 52.34 | 44 | | | | | |
| 188+66 | LT. | DRIVEWAY | 16 | 83.40 | 9.17 | 34.04 | | | 38 | | | |
| 201+50 | RT. | DRIVEWAY | 32 | 260.20 | 28.62 | 106.19 | | | 54 | | | |
| 202+18 | RT. | DRIVEWAY | 18 | 130.10 | 14.31 | 53.09 | | | 40 | | | |
| 210+14 | LT. | DRIVEWAY | 16 | 83.30 | 9.16 | 33.99 | | | 40 | | | |
| 215+30 | LT. | DRIVEWAY | 16 | 71.60 | 7.88 | 29.22 | | 38 | | | | |
| 216+70 | RT. | DRIVEWAY | 16 | 85.60 | 9.42 | 34.93 | | 38 | | | | |
| 217+56 | RT. | DRIVEWAY | 16 | 89.20 | 9.81 | 36.40 | | 34 | | | | |
| 223+99 | RT. | DRIVEWAY | 24 | 119.85 | 13.18 | 48.91 | | 42 | | | | |
| 228+96 | LT. | DRIVEWAY | 24 | 120.75 | 13.28 | 49.28 | | | 46 | | | |
| 231+37 | RT. | DRIVEWAY | 24 | 131.85 | 14.50 | 53.81 | | | 44 | | | |
| 232+45 | RT. | DRIVEWAY | 16 | 91.70 | 10.09 | 37.42 | | | 38 | | | |
| 233+55 | RT. | DRIVEWAY | 24 | 143.70 | 15.81 | 58.64 | | | 46 | | | |
| 242+51 | RT. | DRIVEWAY | 24 | 182.66 | 20.09 | 74.54 | | | 62 | | | |
| 242+55 | LT. | DRIVEWAY | 24 | 195.62 | 21.52 | 79.83 | | | 74 | | | |
| 244+09 | LT. | DRIVEWAY | 24 | 188.94 | 20.78 | 77.11 | | | 54 | | | |
| 244+10 | RT. | DRIVEWAY | 32 | 236.50 | 26.02 | 96.52 | | | | 66 | | |
| 252+36 | RT. | DRIVEWAY | 16 | 95.90 | 10.55 | 39.14 | | | 38 | | | |
| 262+42 | RT. | DRIVEWAY | 16 | 109.20 | 12.01 | 44.56 | | | 38 | | | |
| 268+53 | LT. | DRIVEWAY | 24 | 118.65 | 13.05 | 48.42 | | | | | | |
| 268+63 | RT. | DRIVEWAY | 20 | 110.60 | 12.17 | 45.14 | | | | | | |
| 270+18 | RT. | DRIVEWAY | 20 | 91.70 | 10.09 | 37.42 | | 38 | | | | |
| 272+31 | RT. | DRIVEWAY | 16 | 77.10 | 8.48 | 31.46 | | 36 | | | | |
| 284+57 | LT. | DRIVEWAY | 18 | 106.00 | 11.66 | 43.26 | | | 44 | | | |
| 289+36 | RT. | DRIVEWAY | 20 | 151.30 | 16.64 | 61.75 | | | | | | 62 |
| 291+30 | LT. | DRIVEWAY | 18 | 113.20 | 12.45 | 46.20 | | | | | | |
| 293+23 | LT. | DRIVEWAY | 24 | 153.73 | 16.91 | 62.74 | | 48 | | | | |
| 295+03 | RT. | DRIVEWAY | 16 | 146.20 | 16.08 | 59.66 | | | | | | 58 |
| 295+41 | LT. | COUNTY ROAD 615 | 22 | 224.80 | 24.73 | 91.74 | | 50 | | | | |
| 308+77 | RT. | DRIVEWAY | 16 | 98.10 | 10.79 | 40.03 | | | 40 | | | |
| 321+59 | LT. | DRIVEWAY | 16 | 101.71 | 11.19 | 41.51 | | | 40 | | | |
| 322+42 | RT. | COUNTY ROAD 619 | 22 | 221.60 | 24.38 | 90.43 | | | | 96 | | |
| 322+47 | LT. | DRIVEWAY | 24 | 126.75 | 13.94 | 51.73 | | 46 | | | | |
| 341+55 | RT. | DRIVEWAY | 16 | 156.40 | 17.20 | 63.83 | | 60 | | | | |
| 347+50 | LT. | DRIVEWAY | 24 | 121.50 | 13.37 | 49.58 | | 44 | | | | |
| 349+45 | RT. | DRIVEWAY | 16 | 113.30 | 12.46 | 46.24 | 56 | | | | | |
| 358+16 | RT. | DRIVEWAY | 16 | 83.80 | 9.22 | 34.20 | | 36 | | | | |
| 362+52 | RT. | DRIVEWAY | 16 | 96.10 | 10.57 | 39.22 | | 44 | | | | |
| 363+28 | LT. | DRIVEWAY | 16 | 98.80 | 10.87 | 40.32 | | | 88 | | | |
| 364+34 | LT. | DRIVEWAY | 16 | 103.20 | 11.35 | 42.12 | | | 88 | | | |
| 371+00 | LT. | DRIVEWAY | 16 | 109.60 | 12.06 | 44.73 | | 42 | | | | |
| 375+43 | RT. | DRIVEWAY | 40 | 214.60 | 23.61 | 87.58 | | | | | | |
| 376+17 | RT. | DRIVEWAY | 30 | 170.10 | 18.71 | 69.42 | | | | | | |
| 377+14 | RT. | DRIVEWAY | 16 | 98.70 | 10.86 | 40.28 | | | | | | |
| 379+55 | LT. | DRIVEWAY | 30 | 192.90 | 21.22 | 78.72 | | | | 120 | | |
| 389+27 | LT. | DRIVEWAY | 16 | 108.00 | 11.88 | 44.07 | | | 38 | | | |
| 391+16 | RT. | DRIVEWAY | 16 | 113.50 | 12.49 | 46.32 | | | | 104 | | |
| 401+63 | RT. | DRIVEWAY | 16 | 96.40 | 10.60 | 39.34 | | | | | | |
| 402+75 | LT. | DRIVEWAY | 16 | 110.00 | 12.10 | 44.89 | | | | | | |
| 413+00 | LT. | DRIVEWAY | 16 | 105.30 | 11.58 | 42.97 | | 42 | | | | |
| 413+74 | RT. | DRIVEWAY | 24 | 268.80 | 29.57 | 109.70 | | | | | | |
| 419+79 | RT. | DRIVEWAY | 16 | 156.70 | 17.24 | 63.95 | | | | | | |
| 421+15 | LT. | DRIVEWAY | 16 | 105.30 | 11.58 | 42.97 | | 42 | | | | |
| 425+56 | RT. | DRIVEWAY | 16 | 135.20 | 14.87 | 55.18 | | | | 104 | | |
| 429+31 | RT. | DRIVEWAY | 16 | 137.20 | 15.09 | 55.99 | | | | 116 | | |
| 430+12 | LT. | DRIVEWAY | 16 | 85.70 | 9.43 | 34.97 | | 38 | | | | |
| 434+48 | RT. | DRIVEWAY | 16 | 115.50 | 12.71 | 47.14 | | | | 120 | | |
| 436+65 | LT. | DRIVEWAY | 16 | 88.56 | 9.74 | 36.14 | | | | | | |
| SUBTOTALS (BOX 1 OF 3): | | | | 9291.17 | 1022.04 | 3791.72 | 136 | 794 | 1322 | 856 | 0 | 120 |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

| 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. | | CA1003 | 156 | 503 |

② QUANTITIES

## REMOVAL AND DISPOSAL OF ASPHALT PAVEMENT

| STATION | STATION | LOCATION | ASPHALT PAVEMENT | |
|---|---|---|---|---|
| | | | SQ. YD. | SQ. YD. |
| 93+50.00 | 161+66.50 | HWY. 412 SHOULDER REMOVAL LT. & RT. | 12009.7 | |
| 162+70.40 | 242+74.40 | HWY. 412 SHOULDER REMOVAL LT. & RT. | 13729.3 | |
| 243+79.20 | 338+44.70 | HWY. 412 SHOULDER REMOVAL LT. & RT. | 16808.2 | |
| 339+45.80 | 405+40.90 | HWY. 412 SHOULDER REMOVAL LT. & RT. | 11983.0 | |
| 408+51.30 | 475+05.60 | HWY. 412 SHOULDER REMOVAL LT. & RT. | 12609.5 | |
| 475+50.13 | 545+22.70 | HWY. 412 SHOULDER REMOVAL LT. & RT. | 12693.6 | |
| 545+85.80 | 564+07.60 | HWY. 412 SHOULDER REMOVAL LT. & RT. | 3283.5 | |
| 561+20.20 | 564+07.60 | HWY. 412 REMOVAL | 515.6 | |
| 690+52.30 | 699+82.60 | HWY. 412 REMOVAL | 2263.2 | |
| 697+00.50 | 705+79.60 | HWY. 412 SHOULDER REMOVAL LT. & RT. | 1485.4 | |
| 706+33.50 | 783+16.00 | HWY. 412 SHOULDER REMOVAL LT. & RT. | 12864.5 | |
| 783+70.40 | 853+02.90 | HWY. 412 SHOULDER REMOVAL LT. & RT. | 11911.4 | |
| 2028.08 | 3541.76 | HWY. 228 SHOULDER REMOVAL LT. & RT. | 3112.9 | |
| | | | | |
| ENTIRE | PROJECT | DRIVEWAYS | | 11112.0 |
| | | | | |
| TOTALS: | | | 115269.8 | 11112.0 |

NOTE: REMOVAL AND DISPOSAL OF ASPHALT PAVEMENT IS FOR INFORMATION ONLY.
COST SHALL BE INCLUDED IN UNCLASSIFIED EXCAVATION.

QUANTITIES

2/26/2018
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# DRIVEWAYS AND TURNOUTS (BOX 2 OF 3)

| STATION | SIDE | DESCRIPTION | WIDTH | ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG64-22) | | AGGREGATE BASE COURSE (CLASS 7) | SIDE DRAINS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 18" | 24" | 30" | 36" | 42" | 48" |
| | | | FEET | SQ. YD. | TON | TON | LIN. FT. | | | | | |
| 438+02 | LT. | DRIVEWAY | 16 | 116.82 | 12.85 | 47.67 | | 36 | | | | |
| 442+92 | RT. | FRY ROAD | 24 | 185.40 | 20.39 | 75.66 | | | | 108 | | |
| 452+84 | RT. | DRIVEWAY | 16 | 93.20 | 10.25 | 38.03 | | | | | | |
| 452+89 | LT. | DRIVEWAY | 16 | 96.73 | 10.64 | 39.48 | | | 40 | | | |
| 461+34 | RT. | DRIVEWAY | 16 | 87.70 | 9.65 | 35.79 | | | 42 | | | |
| 461+34 | LT. | DRIVEWAY | 16 | 102.50 | 11.28 | 41.83 | | | 56 | | | |
| 468+16 | LT. | DRIVEWAY | 16 | 92.50 | 10.18 | 37.75 | | 38 | | | | |
| 473+33 | RT. | DRIVEWAY | 16 | 109.20 | 12.01 | 44.56 | 46 | | | | | |
| 480+45 | RT. | DRIVEWAY | 16 | 108.00 | 11.88 | 44.07 | | | | | | |
| 481+93 | LT. | DRIVEWAY | 16 | 101.60 | 11.18 | 41.46 | | | | 42 | | |
| 482+69 | LT. | COUNTY ROAD 204 | 22 | 211.60 | 23.28 | 86.35 | | | | 48 | | |
| 485+01 | LT. | DRIVEWAY | 16 | 92.60 | 10.19 | 37.79 | | | | 42 | | |
| 489+26 | LT. | DRIVEWAY | 16 | 83.90 | 9.23 | 34.24 | | | | 42 | | |
| 489+36 | RT. | DRIVEWAY | 16 | 43.40 | 4.77 | 17.71 | | | | | | |
| 495+96 | LT. | DRIVEWAY | 16 | 70.30 | 7.73 | 28.69 | | | | 42 | | |
| 496+45 | RT. | DRIVEWAY | 16 | 103.15 | 11.35 | 42.10 | | 50 | | | | |
| 497+49 | RT. | DRIVEWAY | 16 | 112.40 | 12.36 | 45.87 | | 38 | | | | |
| 502+15 | RT. | DRIVEWAY | 20 | 100.80 | 11.09 | 41.14 | | 42 | | | | |
| 505+03 | LT. | DRIVEWAY | 18 | 93.30 | 10.26 | 38.08 | | | | 40 | | |
| 509+00 | LT. | DRIVEWAY | 16 | 86.10 | 9.47 | 35.14 | | | | 38 | | |
| 516+24 | LT. | DRIVEWAY | 16 | 94.80 | 10.43 | 38.69 | | | | 38 | | |
| 523+21 | LT. | DRIVEWAY | 16 | 102.90 | 11.32 | 41.99 | | | | 42 | | |
| 524+61 | LT. | DRIVEWAY | 16 | 104.80 | 11.53 | 42.77 | | | | 42 | | |
| 527+44 | LT. | DRIVEWAY | 16 | 103.80 | 11.42 | 42.36 | | | | 84 | | |
| 528+06 | RT. | DRIVEWAY | 16 | 79.00 | 8.69 | 32.24 | | | 38 | | | |
| 528+18 | LT. | DRIVEWAY | 16 | 103.90 | 11.43 | 42.40 | | | | 84 | | |
| 534+48 | RT. | DRIVEWAY | 16 | 83.20 | 9.15 | 33.95 | | | 38 | | | |
| 535+70 | LT. | COUNTY ROAD 206 | 28 | 346.80 | 38.15 | 141.53 | | | | 116 | | |
| 540+85 | RT. | DRIVEWAY | 24 | 179.85 | 19.78 | 73.40 | | | 58 | | | |
| 540+88 | LT. | DRIVEWAY | 16 | 116.50 | 12.82 | 47.54 | | | | 96 | | |
| 552+55 | LT. | DRIVEWAY | 16 | 131.40 | 14.45 | 53.62 | | | | 44 | | |
| 553+49 | LT. | DRIVEWAY | 16 | 114.40 | 12.58 | 46.69 | | | | 46 | | |
| 555+47 | RT. | DRIVEWAY | 24 | 177.30 | 19.50 | 72.36 | | | | 104 | | |
| 558+66 | RT. | DRIVEWAY | 16 | 139.30 | 15.32 | 56.85 | | | | 88 | | |
| 562+68 | RT. | COUNTY ROAD 332 | 26 | 825.80 | 90.84 | 337.01 | | | | 136 | | |
| 567+22 | RT. | DRIVEWAY | 16 | 113.30 | 12.46 | 46.24 | | 40 | | | | |
| 573+00 | RT. | DRIVEWAY | 30 | 206.67 | 22.73 | 84.34 | | 54 | | | | |
| 579+00 | LT. | DRIVEWAY | 24 | 167.89 | 18.47 | 68.52 | | 52 | | | | |
| 583+00 | RT. | DRIVEWAY | 24 | 169.64 | 18.66 | 69.23 | | 52 | | | | |
| 590+00 | RT. | DRIVEWAY | 24 | 151.54 | 16.67 | 61.84 | | 48 | | | | |
| 590+00 | LT. | DRIVEWAY | 24 | 157.40 | 17.31 | 64.23 | | 50 | | | | |
| 600+00 | RT. | DRIVEWAY | 16 | 109.36 | 12.03 | 44.63 | | | | 46 | | |
| 600+00 | LT. | DRIVEWAY | 16 | 92.62 | 10.19 | 37.80 | | | | 80 | | |
| 609+00 | RT. | DRIVEWAY | 16 | 108.54 | 11.94 | 44.30 | | | | 46 | | |
| 609+00 | LT. | DRIVEWAY | 16 | 96.74 | 10.64 | 39.48 | | | | 96 | | |
| 632+10 | RT. | DRIVEWAY | 16 | 88.79 | 9.77 | 36.24 | | 38 | | | | |
| 641+00 | LT. | DRIVEWAY | 16 | 96.66 | 10.63 | 39.45 | | 52 | | | | |
| 644+70 | RT. | DRIVEWAY | 16 | 114.77 | 12.62 | 46.84 | | 56 | | | | |
| 646+00 | RT. | DRIVEWAY | 16 | 145.62 | 16.02 | 59.43 | | 68 | | | | |
| 646+00 | LT. | DRIVEWAY | 16 | 158.46 | 17.43 | 64.67 | | 36 | | 68 | | |
| 658+00 | RT. | DRIVEWAY | 16 | 114.43 | 12.59 | 46.70 | | 54 | | | | |
| 658+00 | LT. | DRIVEWAY | 16 | 96.82 | 10.65 | 39.51 | | | | 52 | | |
| 669+00 | RT. | DRIVEWAY | 16 | 103.05 | 11.34 | 42.05 | | 40 | | | | |
| 680+00 | RT. | DRIVEWAY | 16 | 106.31 | 11.69 | 43.39 | | | 40 | | | |
| 680+00 | LT. | DRIVEWAY | 16 | 97.05 | 10.68 | 39.61 | | | 40 | | | |
| 700+51 | LT. | COUNTY ROAD 218 | 24 | 1148.20 | 126.30 | 468.58 | | | | 74 | | |
| 701+36 | LT. | COUNTY ROAD 218 DETOUR | 22 | | | | | | | 68 | | |
| 709+15 | RT. | DRIVEWAY | 16 | 200.90 | 22.10 | 81.99 | | | | 108 | | |
| 721+98 | RT. | DRIVEWAY | 18 | 125.70 | 13.83 | 51.30 | | | | 96 | | |
| 722+00 | LT. | DRIVEWAY | 16 | 133.60 | 14.70 | 54.52 | | | | | 52 | |
| 724+93 | LT. | DRIVEWAY | 22 | 172.20 | 18.94 | 70.27 | | | | | 54 | |
| 740+08 | LT. | DRIVEWAY | 16 | 87.90 | 9.67 | 35.87 | | | | 40 | | |
| 740+08 | RT. | DRIVEWAY | 20 | 142.20 | 15.64 | 58.03 | | | | 96 | | |
| 753+10 | RT. | COUNTY ROAD 340 | 24 | 905.60 | 99.62 | 369.58 | | | | 116 | | |
| 753+30 | LT. | DRIVEWAY | 16 | 90.10 | 9.91 | 36.77 | | | 38 | | | |
| 759+30 | RT. | DRIVEWAY | 20 | 140.89 | 15.50 | 57.50 | | | | 46 | | |
| 759+30 | LT. | DRIVEWAY | 20 | 128.90 | 14.18 | 52.60 | | | | 46 | | |
| 762+50 | LT. | DRIVEWAY | 20 | 128.90 | 14.18 | 52.60 | | | | 46 | | |
| 769+76 | RT. | DRIVEWAY | 20 | 119.89 | 13.19 | 48.93 | | | | 46 | | |
| 777+40 | RT. | DRIVEWAY | 20 | 204.88 | 22.54 | 83.61 | | 66 | | | | |
| 777+57 | LT. | COUNTY ROAD 222 | 28 | 451.40 | 49.65 | 184.22 | | | | 58 | | |
| 790+70 | RT. | DRIVEWAY | 30 | 295.60 | 32.52 | 120.63 | | | | 60 | | |
| 793+20 | RT. | DRIVEWAY | 20 | 109.81 | 12.08 | 44.81 | | | | 46 | | |
| 797+17 | LT. | DRIVEWAY | 20 | 162.63 | 17.89 | 66.37 | | | | | 240 | |
| 803+76 | RT. | DRIVEWAY | 16 | 87.84 | 9.66 | 35.85 | | | | 42 | | |
| SUBTOTALS (BOX 2 OF 3): | | | | 12127.75 | 1334.07 | 4949.34 | 46 | 910 | 390 | 2698 | 346 | 0 |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

| 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. | | CA1003 | 157 | 503 |

② QUANTITIES

QUANTITIES

2/16/2018
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## DRIVEWAYS AND TURNOUTS (BOX 3 OF 3)

| STATION | SIDE | DESCRIPTION | WIDTH | ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG64-22) | | AGGREGATE BASE COURSE (CLASS 7) | SIDE DRAINS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 18" | 24" | 30" | 36" | 42" | 48" |
| | | | FEET | SQ. YD. | TON | TON | LIN. FT. | | | | | |
| 804+01 | LT. | DRIVEWAY | 16 | 123.40 | 13.57 | 50.36 | | | | | 452 | |
| 804+48 | RT. | DRIVEWAY | 22 | 143.60 | 15.80 | 58.60 | | 46 | | | | |
| 804+63 | LT. | DRIVEWAY | 20 | 154.25 | 16.97 | 62.95 | | | | | | |
| 830+71 | RT. | DRIVEWAY | 16 | 79.60 | 8.76 | 32.48 | | | | | | |
| 830+89 | LT. | DRIVEWAY | 40 | 302.10 | 33.23 | 123.29 | | | | | 288 | |
| 843+71 | RT. | DRIVEWAY | 16 | 81.70 | 8.99 | 33.34 | | 48 | | | | 48 |
| 844+65 | RT. | DRIVEWAY | 22 | 119.60 | 13.16 | 48.81 | | 48 | | | | |
| SH 228 | | | | | | | | | | | | |
| 30+37 | RT. | DRIVEWAY | 16 | 188.60 | 20.75 | 76.97 | | 72 | | | | |
| 34+60 | RT. | DRIVEWAY | 16 | 62.60 | 6.89 | 25.55 | | 38 | | | | |
| W. CONN. | | | | | | | | | | | | |
| 13+83 | LT. | DRIVEWAY | 32 | 72.86 | 8.01 | 29.73 | | 54 | | | | |
| 14+10 | RT. | DRIVEWAY | 16 | 56.96 | 6.27 | 23.25 | | 40 | | | | |
| 15+69 | LT. | DRIVEWAY | 24 | 58.64 | 6.45 | 23.93 | | 42 | | | | |
| | | | | | | | | | | | | |
| E. CONN. | | | | | | | | | | | | |
| 13+00 | RT. | DRIVEWAY | 16 | 155.00 | 17.05 | 63.26 | | 48 | | | | |
| 17+87 | RT. | DRIVEWAY | 18 | 42.00 | 4.62 | 17.14 | | 38 | | | | |
| CR 218 | | | | | | | | | | | | |
| 12+50 | RT. | DRIVEWAY | 35 | 223.87 | 24.63 | 91.36 | | | | | | 52 |
| 14+13 | LT. | DRIVEWAY | 35 | 60.21 | 6.62 | 24.57 | | 30 | | | | |
| | | | | | | | | | | | | |
| * ENTIRE PROJECT TEMPORARY DRIVES | | | | | | 1000.00 | | | | | | |
| | | | | | | | | | | | | |
| SUBTOTALS (BOX 1 OF 3): | | | | 9291.17 | 1022.04 | 3791.72 | 136 | 794 | 1322 | 856 | 0 | 120 |
| SUBTOTALS (BOX 2 OF 3): | | | | 12127.75 | 1334.07 | 4949.34 | 46 | 910 | 390 | 2698 | 346 | 0 |
| SUBTOTALS (BOX 3 OF 3): | | | | 1924.99 | 211.77 | 1785.59 | 0 | 504 | 0 | 0 | 740 | 100 |
| TOTALS: | | | | 23343.91 | 2567.88 | 10526.65 | 182 | 2208 | 1712 | 3554 | 1086 | 220 |

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.8% MIN. AGGR.....5.2% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

* QUANTITY ESTIMATED
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.
TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

NOTE: FOR R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE SPECIFIED.
NOTE: FOR C.M. PIPE CULVERT INSTALLATIONS USE TYPE 2 BEDDING UNLESS OTHERWISE SPECIFIED.

THE CONTRACTOR, WITH THE APPROVAL OF THE ENGINEER, WILL BE ALLOWED TO SUBSTITUTE A HIGHER PERFORMANCE GRADE ASPHALT SURFACE COURSE FOR DRIVEWAYS AND MINOR SIDE STREET CONSTRUCTION AT NO ADDITIONAL COST TO THE DEPARTMENT.

** DRIVEWAY AT 830+89: WIDTH AT TURNOUT = 40 FT; WIDTH AT PROPOSED ROW = 20 FT

## PERMANENT PAVEMENT MARKINGS

| STATION | STATION | RAISED PAVEMENT MARKERS | | THERMOPLASTIC PAVEMENT MARKING 6" | | THERMOPLASTIC PAVEMENT MARKING 8" | REFLECTORIZED PAINT PAVEMENT MARKING 10" |
|---|---|---|---|---|---|---|---|
| | | TYPE II (WHT/RED) | TYPE II (YEL/YEL) | WHITE | YELLOW | WHITE | WHITE |
| | | EA. | EA. | L.F. | L.F. | L.F. | L.F. |
| 92+50.00 | 854+02.91 | 2368 | 2357 | 188622 | 187760 | | |
| | | | | | | | |
| HWY. 231 | | | | | | | |
| 10+27.28 | 12+00.00 | | | 437 | 278 | 188 | 128 |
| | | | | | | | |
| WEST CONNECTOR | | | | | | | |
| 19+78.82 | 35+91.54 | | 6 | 1025 | 903 | | |
| | | | | | | | |
| HWY. 228 | | | | | | | |
| 19+78.82 | 35+91.54 | | | 3201 | 2879 | | |
| | | | | | | | |
| EAST CONNECTOR | | | | | | | |
| 19+78.82 | 35+91.54 | | 10 | 1717 | 1605 | | |
| | | | | | | | |
| TOTALS: | | 2368 | 2373 | 195002 | 193425 | 188 | 128 |

NOTE: THIS IS A HIGH VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2014 EDITION.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

| 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. | | CA1003 | 158 | 503 |

② QUANTITIES

## GUARDRAIL

| STATION | STATION | LOCATION | GUARDRAIL (TYPE A) | THRIE BEAM GUARDRAIL TERMINAL | GUARDRAIL TERMINAL (TYPE 2) | TERMINAL ANCHOR POSTS (TYPE 1) |
|---|---|---|---|---|---|---|
| | | | LIN.FT. | EACH | EACH | EACH |
| 402+05.06 | 404+23.81 | RT. SHOULDER AT CACHE RIVER | 150 | 1 | 1 | |
| 404+50.80 | 405+44.55 | LT. SHOULDER AT CACHE RIVER | 75 | 1 | | 1 |
| 408+21.85 | 409+15.60 | RT. SHOULDER AT CACHE RIVER | 75 | 1 | | 1 |
| 409+42.68 | 411+61.43 | LT. SHOULDER AT CACHE RIVER | 150 | 1 | 1 | |
| | | | | | | |
| TOTALS: | | | 450 | 4 | 2 | 2 |

## CLEARING AND GRUBBING (BOX 1 OF 2)

| STATION | STATION | LOCATION | CLEARING | GRUBBING |
|---|---|---|---|---|
| | | | STA. | STA. |
| 93+00 | 95+00 | HWY. 412 LT. & RT. | 2 | 2 |
| 98+00 | 101+00 | HWY. 412 LT. & RT. | 3 | 3 |
| 116+00 | 118+00 | HWY. 412 LT. & RT. | 2 | 2 |
| 121+00 | 122+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 123+00 | 124+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 125+00 | 126+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 135+00 | 136+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 136+00 | 137+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 148+00 | 151+00 | HWY. 412 LT. & RT. | 3 | 3 |
| 153+00 | 155+00 | HWY. 412 LT. & RT. | 2 | 2 |
| 162+00 | 163+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 163+00 | 172+00 | HWY. 412 LT. & RT. | 9 | 9 |
| 180+00 | 181+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 188+00 | 189+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 197+00 | 202+00 | HWY. 412 LT. & RT. | 5 | 5 |
| 205+00 | 206+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 210+00 | 211+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 212+00 | 213+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 215+00 | 216+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 217+00 | 218+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 224+00 | 234+00 | HWY. 412 LT. & RT. | 10 | 10 |
| 236+00 | 246+00 | HWY. 412 LT. & RT. | 10 | 10 |
| 248+00 | 249+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 251+00 | 253+00 | HWY. 412 LT. & RT. | 2 | 2 |
| 254+00 | 255+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 256+00 | 258+00 | HWY. 412 LT. & RT. | 2 | 2 |
| 266+00 | 269+00 | HWY. 412 LT. & RT. | 3 | 3 |
| 277+00 | 287+00 | HWY. 412 LT. & RT. | 10 | 10 |
| 290+00 | 300+00 | HWY. 412 LT. & RT. | 10 | 10 |
| 320+00 | 322+00 | HWY. 412 LT. & RT. | 2 | 2 |
| 331+00 | 332+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 338+00 | 341+00 | HWY. 412 LT. & RT. | 3 | 3 |
| 342+00 | 343+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 347+00 | 348+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 361+00 | 363+00 | HWY. 412 LT. & RT. | 2 | 2 |
| 364+00 | 369+00 | HWY. 412 LT. & RT. | 5 | 5 |
| 372+00 | 378+00 | HWY. 412 LT. & RT. | 6 | 6 |
| 379+00 | 392+00 | HWY. 412 LT. & RT. | 13 | 13 |
| 393+00 | 401+00 | HWY. 412 LT. & RT. | 8 | 8 |
| | | | | |
| SUBTOTALS (BOX 1 OF 2): | | | 130 | 130 |

## CLEARING AND GRUBBING (BOX 2 OF 2)

| STATION | STATION | LOCATION | CLEARING | GRUBBING |
|---|---|---|---|---|
| | | | STA. | STA. |
| 402+00 | 403+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 407+00 | 416+00 | HWY. 412 LT. & RT. | 9 | 9 |
| 421+00 | 424+00 | HWY. 412 LT. & RT. | 3 | 3 |
| 426+00 | 433+00 | HWY. 412 LT. & RT. | 7 | 7 |
| 434+00 | 435+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 440+00 | 441+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 442+00 | 449+00 | HWY. 412 LT. & RT. | 7 | 7 |
| 451+00 | 452+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 453+00 | 460+00 | HWY. 412 LT. & RT. | 7 | 7 |
| 474+00 | 476+00 | HWY. 412 LT. & RT. | 2 | 2 |
| 479+00 | 480+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 481+00 | 484+00 | HWY. 412 LT. & RT. | 3 | 3 |
| 486+00 | 487+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 491+00 | 496+00 | HWY. 412 LT. & RT. | 5 | 5 |
| 504+00 | 505+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 522+00 | 526+00 | HWY. 412 LT. & RT. | 4 | 4 |
| 528+00 | 536+00 | HWY. 412 LT. & RT. | 8 | 8 |
| 546+00 | 553+00 | HWY. 412 LT. & RT. | 7 | 7 |
| 557+00 | 560+00 | HWY. 412 LT. & RT. | 3 | 3 |
| 611+00 | 630+00 | HWY. 412 LT. & RT. | 19 | 19 |
| 645+00 | 647+00 | HWY. 412 LT. & RT. | 2 | 2 |
| 651+00 | 652+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 667+00 | 673+00 | HWY. 412 LT. & RT. | 6 | 6 |
| 691+00 | 709+00 | HWY. 412 LT. & RT. | 18 | 18 |
| 740+00 | 754+00 | HWY. 412 LT. & RT. | 14 | 14 |
| 757+00 | 763+00 | HWY. 412 LT. & RT. | 6 | 6 |
| 777+00 | 797+00 | HWY. 412 LT. & RT. | 20 | 20 |
| 802+00 | 803+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 804+00 | 806+00 | HWY. 412 LT. & RT. | 2 | 2 |
| 819+00 | 820+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 827+00 | 828+00 | HWY. 412 LT. & RT. | 1 | 1 |
| 829+00 | 831+00 | HWY. 412 LT. & RT. | 2 | 2 |
| 847+00 | 850+00 | HWY. 412 LT. & RT. | 3 | 3 |
| | | | | |
| 20+00 | 26+00 | HWY. 228 LT. & RT. | 5 | 5 |
| 29+00 | 36+00 | HWY. 228 LT. & RT. | 6 | 6 |
| | | | | |
| SUBTOTALS (BOX 1 OF 2): | | | 130 | 130 |
| SUBTOTALS (BOX 2 OF 2): | | | 179 | 179 |
| TOTALS: | | | 309 | 309 |

QUANTITIES

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# SUMMARY OF QUANTITIES (BOX 1 OF 2)

| ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| SP & 201 | CLEARING | 309 | STATION |
| SP & 201 | GRUBBING | 309 | STATION |
| 202 | REMOVAL AND DISPOSAL OF WELL | 8 | EACH |
| 202 | REMOVAL AND DISPOSAL OF FENCE | 1892 | LIN. FT. |
| 202 | REMOVAL AND DISPOSAL OF GATES | 1 | EACH |
| 202 | REMOVAL AND DISPOSAL OF CONCRETE SLABS | 1161 | SQ. YD. |
| 202 | REMOVAL AND DISPOSAL OF APPROACH SLAB AND GUTTERS | 16 | EACH |
| 202 | REMOVAL AND DISPOSAL OF SIGN FOUNDATIONS | 3 | EACH |
| 202 | REMOVAL AND DISPOSAL OF RISER | 3 | EACH |
| 202 | REMOVAL AND DISPOSAL OF PIPE CULVERTS | 156 | EACH |
| 202 | REMOVAL AND DISPOSAL OF BOX CULVERTS | 5 | EACH |
| 202 | REMOVAL AND DISPOSAL OF BUILDINGS | 5 | EACH |
| 202 | REMOVAL AND DISPOSAL OF SIGNS | 2 | EACH |
| 202 | REMOVAL AND DISPOSAL OF MAILBOXES | 21 | EACH |
| 202 | REMOVAL AND DISPOSAL OF LIGHT POLE | 1 | EACH |
| 202 | REMOVAL AND DISPOSAL OF ELECTRICAL TRANSFORMER | 1 | EACH |
| SP & 202 | REMOVAL AND DISPOSAL OF GUARDRAIL | 4625 | LIN. FT. |
| SP | REMOVAL AND DISPOSAL OF IMPACT ATTENUATION BARRIER | 10 | EACH |
| 207 | STONE BACKFILL | 10005 | TON |
| 210 | UNCLASSIFIED EXCAVATION | 478112 | CU. YD. |
| SP & 210 | COMPACTED EMBANKMENT | 787538 | CU. YD. |
| SP & 210 | SOIL STABILIZATION - QUICKLIME | 2700 | TON |
| SP & 210 | SOIL STABILIZATION - PORTLAND CEMENT | 8100 | TON |
| SP & 210 | SOIL STABILIZATION - FLY ASH | 2700 | TON |
| SS & 303 | AGGREGATE BASE COURSE (CLASS 7) | 334103 | TON |
| SS & 401 | TACK COAT | 524167 | GAL. |
| SP,SS, & 406 | MINERAL AGGREGATE IN ACHM BINDER COURSE (1") | 131695 | TON |
| SP,SS, & 406 | ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1") | 5630 | TON |
| SP,SS, & 407 | MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2") | 130267 | TON |
| SP,SS, & 407 | ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2") | 7145 | TON |
| 412 | COLD MILLING ASPHALT PAVEMENT | 2417 | SQ. YD. |
| SP, SS, & 414 | ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC | 358 | TON |
| SP, SS, & 415 | ACHM PATCHING OF EXISTING ROADWAY | 200 | TON |
| 601 | MOBILIZATION | 1.00 | LUMP SUM |
| SP & 602 | FURNISHING FIELD OFFICE | 1 | EACH |
| 603 | MAINTENANCE OF TRAFFIC | 1.00 | LUMP SUM |
| SS & 604 | SIGNS | 1976 | SQ. FT. |
| SP, SS, & 604 | CONSTRUCTION PROJECT INFORMATION SIGN UPDATE | 10 | EACH |
| SS & 604 | BARRICADES | 368 | LIN. FT. |
| SS & 604 | TRAFFIC DRUMS | 1513 | EACH |
| 604 | FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER | 2768 | LIN. FT. |
| 604 | CONSTRUCTION PAVEMENT MARKINGS | 814600 | LIN. FT. |
| 604 | REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS | 365975 | LIN. FT. |
| 604 | REMOVAL OF PERMANENT PAVEMENT MARKINGS | 366600 | LIN. FT. |
| SS & 604 | VERTICAL PANELS | 212 | EACH |
| SS & 605 | CONCRETE DITCH PAVING (TYPE B) | 107 | SQ. YD. |
| SP | CULVERT CLEAN OUT | 10 | EACH |
| 606 | 24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III) | 325 | LIN. FT. |
| 606 | 24" REINFORCED CONCRETE PIPE CULVERTS (CLASS IV) | 64 | LIN. FT. |
| 606 | 30" REINFORCED CONCRETE PIPE CULVERTS (CLASS III) | 440 | LIN. FT. |
| 606 | 36" REINFORCED CONCRETE PIPE CULVERTS (CLASS III) | 2679 | LIN. FT. |
| 606 | 36" REINFORCED CONCRETE PIPE CULVERTS (CLASS IV) | 238 | LIN. FT. |
| 606 | 36" REINFORCED CONCRETE PIPE CULVERTS (CLASS V) | 216 | LIN. FT. |
| SP,SS, & 606 | 18" SIDE DRAIN | 182 | LIN. FT. |
| SP,SS, & 606 | 24" SIDE DRAIN | 2208 | LIN. FT. |
| SP,SS, & 606 | 30" SIDE DRAIN | 1712 | LIN. FT. |
| SP,SS, & 606 | 36" SIDE DRAIN | 3554 | LIN. FT. |
| SP,SS, & 606 | 42" SIDE DRAIN | 1086 | LIN. FT. |
| SP,SS, & 606 | 48" SIDE DRAIN | 220 | LIN. FT. |
| 606 | 24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS | 12 | EACH |
| 606 | 30" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS | 6 | EACH |
| 606 | 36" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS | 56 | EACH |
| 606 | SELECTED PIPE BEDDING | 200 | CU. YD. |
| 615 | PAVEMENT REPAIR OVER CULVERTS (ASPHALT) | 94 | TON |
| SS & 617 | GUARDRAIL (TYPE A) | 450 | LIN. FT. |
| SS & 617 | TERMINAL ANCHOR POSTS (TYPE 1) | 2 | EACH |
| SS & 617 | GUARDRAIL TERMINAL (TYPE 2) | 2 | EACH |
| SS & 617 | THRIE BEAM GUARDRAIL TERMINAL | 4 | EACH |
| 619 | WIRE FENCE (TYPE A) | 208 | LIN. FT. |
| * 619 | 16' STEEL GATES (ALTERNATE NO. 1) | 1 | EACH |
| * 619 | 16' ALUMINUM GATES (ALTERNATE NO. 2) | 1 | EACH |
| 620 | LIME | 298 | TON |

* DENOTES ALTERNATE BID ITEMS.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
1/9/19

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| 8/9/18 | | 11/6/18 | | 6 | ARK. | | | |
| 8/27/18 | | 1/9/19 | | JOB NO. | | CA1003 | 159 | 503 |
| 9/6/18 | | | | ② SUMMARY OF QUANTITIES AND REVISIONS | | | | |

# SUMMARY OF QUANTITIES (BOX 2 OF 2)

| ITEM NUMBER | ITEM | QUANTITY | UNIT |
|---|---|---|---|
| 620 | SEEDING | 148.79 | ACRE |
| SS & 620 | MULCH COVER | 297.58 | ACRE |
| 620 | WATER | 18226.7 | M. GAL. |
| 621 | TEMPORARY SEEDING | 148.79 | ACRE |
| 621 | SILT FENCE | 9365 | LIN. FT. |
| 621 | SAND BAG DITCH CHECKS | 3916 | BAG |
| 621 | DIVERSION DITCH | 2800 | LIN. FT. |
| 621 | SEDIMENT BASIN | 4000 | CU. YD. |
| 621 | OBLITERATION OF SEDIMENT BASIN | 4000 | CU. YD. |
| 621 | SEDIMENT REMOVAL AND DISPOSAL | 4000 | CU. YD. |
| 621 | PIPE FOR SLOPE DRAINS | 1120 | LIN. FT. |
| 621 | ROCK DITCH CHECKS | 660 | CU. YD. |
| 623 | SECOND SEEDING APPLICATION | 148.79 | ACRE |
| 624 | SOLID SODDING | 1193 | SQ. YD. |
| SS & 632 | CONCRETE ISLAND | 732 | SQ. YD. |
| 635 | ROADWAY CONSTRUCTION CONTROL | 1.00 | LUMP SUM |
| 637 | MAILBOXES | 21 | EACH |
| 637 | MAILBOX SUPPORTS (SINGLE) | 7 | EACH |
| 637 | MAILBOX SUPPORTS (DOUBLE) | 7 | EACH |
| 642 | RUMBLE STRIPS IN ASPHALT SHOULDERS | 151288 | LIN. FT. |
| 718 | REFLECTORIZED PAINT PAVEMENT MARKING WHITE (10") | 128 | LIN. FT. |
| 719 | THERMOPLASTIC PAVEMENT MARKING WHITE (6") | 195002 | LIN. FT. |
| 719 | THERMOPLASTIC PAVEMENT MARKING WHITE (8") | 188 | LIN. FT. |
| 719 | THERMOPLASTIC PAVEMENT MARKING YELLOW (6") | 193425 | LIN. FT. |
| 721 | RAISED PAVEMENT MARKERS (TYPE II) | 4741 | EACH |
| 731 | TEMPORARY IMPACT ATTENUATION BARRIER | 16 | EACH |
| 731 | TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR) | 16 | EACH |
| 801 | UNCLASSIFIED EXCAVATION FOR STRUCTURES - ROADWAY | 324 | CU. YD. |
| SS & 802 | CLASS S CONCRETE - ROADWAY | 159.45 | CU. YD. |
| 804 | REINFORCING STEEL - ROADWAY (GRADE 60) | 21336 | LB. |
| 816 | DUMPED RIPRAP | 50 | CU. YD. |
| | STRUCTURES OVER 20' SPAN | | |
| 205 | REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 2) | 1.00 | LUMP SUM |
| 205 | REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 3) | 1.00 | LUMP SUM |
| 205 | REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 4) | 1.00 | LUMP SUM |
| 205 | REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 6) | 1.00 | LUMP SUM |
| 205 | REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 7) | 1.00 | LUMP SUM |
| 205 | REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 10) | 1.00 | LUMP SUM |
| 205 | REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 12) | 1.00 | LUMP SUM |
| 205 | REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 13) | 1.00 | LUMP SUM |
| 801 | UNCLASSIFIED EXCAVATION FOR STRUCTURES - ROADWAY | 2682 | CU. YD. |
| SS & 802 | CLASS S CONCRETE - ROADWAY | 5841.70 | CU. YD. |
| 804 | REINFORCING STEEL - ROADWAY (GRADE 60) | 752310 | LB. |

## REVISIONS

| DATE | REVISION | SHEET NUMBER |
|---|---|---|
| 8/9/18 | ADDED "PRICE ADJUSTMENT FOR ASPHALT BINDER" SPECIAL PROVISION | 3, 159 |
| 8/9/18 | DELETED "DELAY IN RIGHT OF WAY OCCUPANCY" SPECIAL PROVISION | 3, 159 |
| 8/27/18 | ADDED "LIQUID ANT-STRIPPING ADDITIVE" SPECIAL PROVISION | 3, 159 |
| 8/27/18 | ADDED SOIL BORING LOG | 2, 149A, 159 |
| 9/6/18 | REDUCED REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS | 150, 159 |
| 9/6/18 | ADDED PAVEMENT QUANTITIES FOR CULVERT DETOURS | 155, 159 |
| 11/6/18 | REVISED "SOIL STABILIZATION" SPECIAL PROVISION; STANDARD DRAWING SI-1; AND GENERAL NOTES. ADDED 110-1, 306-1, 400-5, 400-6, 410-2, 600-2, 800-1, AND 802-3 SUPPLEMENTAL SPECIFICATIONS; "SETTLEMENT AGREEMENTS", "FLEXIBLE BEGINNING OF WORK - WORKING DAY CONTRACT", "PROSECUTION AND PROGRESS WITH BID SCHEDULE - WORKING DAY CONTRACT", AND "SITE USE (A+C METHOD) - WORKING DAY CONTRACT" ADDED "PERCENT WITHIN LIMITS/PAVEMENT SMOOTHNESS (IRI)" SPECIAL PROVISIONS. DELETED "PROSECUTION AND PROGRESS WITH BID SCHEDULE", "FLEXIBLE BEGINNING OF WORK - CALENDAR DAY CONTRACT", "LIQUID ANIT-STRIPPING ADDITIVE", "PROTECTION OF WATER QUALITY AND WETLANDS" AND "PERCENT WITHIN LIMITS/PAVEMENT SMOOTHNESS" SPECIAL PROVISIONS. REVISED SOIL STABILIZATION QUANTITY. | 2, 3, 151, 159 |
| 1/9/19 | REVISED "PERCENT WITHIN LIMITS/PAVEMENT SMOOTHNESS (IRI)" SPECIAL PROVISION | 159 |

SUMMARY OF QUANTITIES AND REVISIONS

1/9/2019 3:07:40 PM
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Project Name: CA1003
Date: 1/28/2015
Coordinate System: Arkansas State Plane Coordinates
Based on AHTD GPS PTS : *280020 - 280020A, 280021 - 280021A, 380012 - 380012A, 380013 - 380013A, 380014 - 380014A*
Projected to Ground Coordinates
Units: U.S. Survey Foot

*COORDINATES LISTED BELOW ARE GROUND (Localized) COORDINATES !!!!*

| Point No. | Northing | SY | Easting | SX | Elevation | SZ | Feature Code | Point Description |
|---|---|---|---|---|---|---|---|---|
| 1 | 634117.8982 | 0.0130 | 1629348.4036 | 0.0100 | 266.75 | 0.010 | CTL | STD AHTD MONUMENT |
| 2 | 634444.9035 | 0.0130 | 1630023.3045 | 0.0110 | 267.34 | 0.010 | CTL | STD AHTD MONUMENT |
| 3 | 634773.2505 | 0.0180 | 1630747.4425 | 0.0160 | 267.44 | 0.009 | CTL | STD AHTD MONUMENT |
| 4 | 634932.8311 | 0.0130 | 1631468.1643 | 0.0110 | 266.92 | 0.009 | CTL | STD AHTD MONUMENT |
| 5 | 634928.6791 | 0.0140 | 1632148.6844 | 0.0110 | 267.27 | 0.009 | CTL | STD AHTD MONUMENT |
| 6 | 634920.8434 | 0.0140 | 1633020.7528 | 0.0120 | 267.45 | 0.008 | CTL | STD AHTD MONUMENT |
| 7 | 634912.8896 | 0.0120 | 1634027.4218 | 0.0110 | 267.73 | 0.007 | CTL | STD AHTD MONUMENT |
| 8 | 634904.9127 | 0.0120 | 1634989.6250 | 0.0110 | 268.08 | 0.006 | CTL | STD AHTD MONUMENT |
| 9 | 634897.4411 | 0.0140 | 1635737.8270 | 0.0110 | 269.98 | 0.005 | CTL | STD AHTD MONUMENT |
| 10 | 634891.6836 | 0.0160 | 1636607.5712 | 0.0110 | 268.27 | 0.003 | CTL | STD AHTD MONUMENT |
| 11 | 634882.0274 | 0.0150 | 1637628.3039 | 0.0100 | 267.52 | 0.006 | CTL | STD AHTD MONUMENT |
| 12 | 634874.1404 | 0.0130 | 1638457.6394 | 0.0100 | 267.38 | 0.007 | CTL | STD AHTD MONUMENT |
| 13 | 634866.4550 | 0.0130 | 1639489.3026 | 0.0100 | 267.53 | 0.007 | CTL | STD AHTD MONUMENT |
| 14 | 634852.5425 | 0.0140 | 1640484.0041 | 0.0110 | 267.62 | 0.007 | CTL | STD AHTD MONUMENT |
| 15 | 634797.5754 | 0.0170 | 1641417.3641 | 0.0150 | 266.86 | 0.008 | CTL | STD AHTD MONUMENT |
| 16 | 634741.7573 | 0.0170 | 1642390.7307 | 0.0140 | 266.72 | 0.008 | CTL | STD AHTD MONUMENT |
| 17 | 634684.8897 | 0.0170 | 1643374.0458 | 0.0150 | 267.85 | 0.008 | CTL | STD AHTD MONUMENT |
| 18 | 634626.3574 | 0.0150 | 1644352.8027 | 0.0140 | 267.55 | 0.008 | CTL | STD AHTD MONUMENT |
| 19 | 634573.2052 | 0.0150 | 1645321.4391 | 0.0130 | 266.32 | 0.008 | CTL | STD AHTD MONUMENT |
| 20 | 634517.8194 | 0.0150 | 1646287.6555 | 0.0120 | 266.03 | 0.008 | CTL | STD AHTD MONUMENT |
| 21 | 634463.4012 | 0.0150 | 1647270.4245 | 0.0120 | 265.53 | 0.008 | CTL | STD AHTD MONUMENT |
| 22 | 634406.4664 | 0.0130 | 1648244.7952 | 0.0110 | 263.85 | 0.007 | CTL | STD AHTD MONUMENT |
| 23 | 634340.6303 | 0.0130 | 1649479.1650 | 0.0110 | 260.75 | 0.007 | CTL | STD AHTD MONUMENT |
| 24 | 634287.7376 | 0.0180 | 1650454.7548 | 0.0120 | 259.91 | 0.006 | CTL | STD AHTD MONUMENT |
| 25 | 634233.8032 | 0.0160 | 1651426.5864 | 0.0120 | 259.14 | 0.005 | CTL | STD AHTD MONUMENT |
| 26 | 634182.2241 | 0.0140 | 1652388.6055 | 0.0120 | 259.67 | 0.005 | CTL | STD AHTD MONUMENT |
| 27 | 634121.8290 | 0.0140 | 1653495.8379 | 0.0130 | 260.99 | 0.006 | CTL | STD AHTD MONUMENT |
| 28 | 634061.5754 | 0.0140 | 1654546.8339 | 0.0120 | 265.05 | 0.007 | CTL | STD AHTD MONUMENT |
| 29 | 634013.3915 | 0.0170 | 1655396.6402 | 0.0120 | 265.39 | 0.007 | CTL | STD AHTD MONUMENT |
| 30 | 633965.8077 | 0.0140 | 1656273.0677 | 0.0100 | 264.20 | 0.007 | CTL | STD AHTD MONUMENT |
| 31 | 633910.7477 | 0.0140 | 1657047.2309 | 0.0120 | 260.82 | 0.008 | CTL | STD AHTD MONUMENT |
| 32 | 633912.1449 | 0.0150 | 1657984.2230 | 0.0120 | 260.47 | 0.008 | CTL | STD AHTD MONUMENT |
| 33 | 633896.1961 | 0.0130 | 1658911.5086 | 0.0100 | 260.70 | 0.008 | CTL | STD AHTD MONUMENT |
| 34 | 633932.0526 | 0.0150 | 1659732.8798 | 0.0110 | 266.17 | 0.008 | CTL | STD AHTD MONUMENT |
| 35 | 634093.2432 | 0.0180 | 1660622.5769 | 0.0140 | 264.97 | 0.008 | CTL | STD AHTD MONUMENT |
| 36 | 634244.0685 | 0.0150 | 1661402.8363 | 0.0120 | 263.27 | 0.008 | CTL | STD AHTD MONUMENT |
| 37 | 634350.0342 | 0.0180 | 1662078.5462 | 0.0130 | 260.79 | 0.008 | CTL | STD AHTD MONUMENT |
| 38 | 634367.1091 | 0.0150 | 1662967.2952 | 0.0110 | 261.07 | 0.008 | CTL | STD AHTD MONUMENT |
| 39 | 634362.9461 | 0.0130 | 1664756.1077 | 0.0110 | 260.27 | 0.007 | CTL | STD AHTD MONUMENT |
| 40 | 634360.9557 | 0.0120 | 1665608.5132 | 0.0120 | 260.77 | 0.007 | CTL | STD AHTD MONUMENT |
| 41 | 634355.5649 | 0.0110 | 1666809.8296 | 0.0110 | 261.46 | 0.006 | CTL | STD AHTD MONUMENT |
| 42 | 634347.2137 | 0.0120 | 1667569.9792 | 0.0110 | 259.95 | 0.005 | CTL | STD AHTD MONUMENT |
| 43 | 634347.3177 | 0.0120 | 1668457.0971 | 0.0110 | 262.01 | 0.005 | CTL | STD AHTD MONUMENT |
| 44 | 634338.7280 | 0.0130 | 1669324.5912 | 0.0110 | 262.77 | 0.005 | CTL | STD AHTD MONUMENT |
| 45 | 634337.7565 | 0.0140 | 1670755.8585 | 0.0120 | 262.60 | 0.006 | CTL | STD AHTD MONUMENT |
| 46 | 634333.5069 | 0.0140 | 1671577.1436 | 0.0120 | 262.20 | 0.007 | CTL | STD AHTD MONUMENT |
| 47 | 634328.2971 | 0.0150 | 1672536.0307 | 0.0120 | 262.23 | 0.007 | CTL | STD AHTD MONUMENT |
| 48 | 634322.5791 | 0.0160 | 1673568.1528 | 0.0130 | 262.42 | 0.008 | CTL | STD AHTD MONUMENT |
| 49 | 634317.6670 | 0.0170 | 1674591.9656 | 0.0130 | 261.94 | 0.008 | CTL | STD AHTD MONUMENT |
| 50 | 634312.5536 | 0.0170 | 1675465.2290 | 0.0120 | 261.42 | 0.008 | CTL | STD AHTD MONUMENT |
| 51 | 634306.4227 | 0.0140 | 1676270.5135 | 0.0140 | 261.11 | 0.008 | CTL | STD AHTD MONUMENT |
| 52 | 634300.0300 | 0.0150 | 1677127.8221 | 0.0140 | 263.02 | 0.009 | CTL | STD AHTD MONUMENT |
| 53 | 634293.1895 | 0.0160 | 1677938.3678 | 0.0130 | 261.80 | 0.008 | CTL | STD AHTD MONUMENT |
| 54 | 634294.7804 | 0.0180 | 1678775.6137 | 0.0120 | 263.22 | 0.009 | CTL | STD AHTD MONUMENT |
| 55 | 634293.8132 | 0.0170 | 1679542.4725 | 0.0110 | 263.73 | 0.009 | CTL | STD AHTD MONUMENT |
| 56 | 634292.8764 | 0.0140 | 1680483.8788 | 0.0120 | 263.62 | 0.009 | CTL | STD AHTD MONUMENT |
| 57 | 634291.2958 | 0.0150 | 1681349.2368 | 0.0110 | 262.90 | 0.008 | CTL | STD AHTD MONUMENT |
| 58 | 634293.0841 | 0.0140 | 1682215.9779 | 0.0130 | 264.17 | 0.009 | CTL | STD AHTD MONUMENT |
| 59 | 634324.4355 | 0.0170 | 1683224.5980 | 0.0170 | 263.97 | 0.008 | CTL | STD AHTD MONUMENT |
| 60 | 634262.5159 | 0.0160 | 1683985.0916 | 0.0150 | 265.31 | 0.008 | CTL | STD AHTD MONUMENT |
| 61 | 634259.3858 | 0.0160 | 1684894.6245 | 0.0130 | 264.48 | 0.008 | CTL | STD AHTD MONUMENT |
| 62 | 634247.0276 | 0.0150 | 1685911.4090 | 0.0130 | 265.09 | 0.008 | CTL | STD AHTD MONUMENT |
| 63 | 634237.7820 | 0.0140 | 1686960.3229 | 0.0120 | 265.41 | 0.006 | CTL | STD AHTD MONUMENT |
| 64 | 634228.9408 | 0.0130 | 1687691.6842 | 0.0120 | 266.17 | 0.007 | CTL | STD AHTD MONUMENT |
| 65 | 634262.1183 | 0.0160 | 1688516.1665 | 0.0120 | 266.26 | 0.005 | CTL | STD AHTD MONUMENT |
| 66 | 634216.3220 | 0.0120 | 1689296.2788 | 0.0110 | 268.30 | 0.005 | CTL | STD AHTD MONUMENT |
| 67 | 634214.7510 | 0.0160 | 1690862.1048 | 0.0120 | 267.05 | 0.005 | CTL | STD AHTD MONUMENT |
| 68 | 634213.8401 | 0.0140 | 1691861.8886 | 0.0120 | 267.03 | 0.006 | CTL | STD AHTD MONUMENT |
| 69 | 634212.1050 | 0.0140 | 1692923.1040 | 0.0130 | 266.93 | 0.006 | CTL | STD AHTD MONUMENT |
| 70 | 634214.8253 | 0.0190 | 1693930.4131 | 0.0120 | 268.13 | 0.007 | CTL | STD AHTD MONUMENT |
| 71 | 634259.7181 | 0.0180 | 1694632.3352 | 0.0130 | 268.47 | 0.007 | CTL | STD AHTD MONUMENT |
| 72 | 634266.0127 | 0.0130 | 1695421.4549 | 0.0110 | 270.19 | 0.007 | CTL | STD AHTD MONUMENT |
| 73 | 634259.7621 | 0.0150 | 1696250.2794 | 0.0120 | 270.11 | 0.007 | CTL | STD AHTD MONUMENT |
| 74 | 634253.3374 | 0.0160 | 1697167.4687 | 0.0120 | 274.02 | 0.008 | CTL | STD AHTD MONUMENT |
| 75 | 634249.0322 | 0.0150 | 1697994.4310 | 0.0110 | 271.41 | 0.007 | CTL | STD AHTD MONUMENT |
| 76 | 634243.4193 | 0.0140 | 1698636.8335 | 0.0110 | 271.73 | 0.007 | CTL | STD AHTD MONUMENT |
| 77 | 634240.7723 | 0.0130 | 1699322.1419 | 0.0100 | 273.09 | 0.008 | CTL | STD AHTD MONUMENT |
| 78 | 634241.3767 | 0.0130 | 1700181.0516 | 0.0120 | 273.88 | 0.007 | CTL | STD AHTD MONUMENT |
| 79 | 634242.7252 | 0.0140 | 1701113.9755 | 0.0130 | 275.39 | 0.007 | CTL | STD AHTD MONUMENT |
| 80 | 634241.9774 | 0.0180 | 1702089.9403 | 0.0170 | 277.35 | 0.007 | CTL | STD AHTD MONUMENT |
| 81 | 634245.7391 | 0.0180 | 1702850.3588 | 0.0160 | 280.29 | 0.006 | CTL | STD AHTD MONUMENT |
| 82 | 634325.2068 | 0.0130 | 1703840.3122 | 0.0120 | 283.18 | 0.005 | CTL | STD AHTD MONUMENT |
| 83 | 634394.7747 | 0.0120 | 1704710.4834 | 0.0120 | 287.08 | 0.005 | CTL | STD AHTD MONUMENT |
| 84 | 634490.3795 | 0.0130 | 1705527.8074 | 0.0120 | 292.52 | 0.004 | CTL | STD AHTD MONUMENT |
| 85 | 634566.8653 | 0.0120 | 1706256.3366 | 0.0120 | 298.55 | 0.004 | CTL | STD AHTD MONUMENT |
| 86 | 634686.7063 | 0.0140 | 1707442.2333 | 0.0120 | 308.03 | 0.005 | CTL | STD AHTD MONUMENT |
| 87 | 634756.1595 | 0.0130 | 1708126.8426 | 0.0120 | 313.31 | 0.006 | CTL | STD AHTD MONUMENT |
| 88 | 634826.3759 | 0.0150 | 1708814.2690 | 0.0130 | 318.61 | 0.007 | CTL | STD AHTD MONUMENT |
| 89 | 634895.1462 | 0.0130 | 1709494.6712 | 0.0110 | 322.86 | 0.008 | CTL | STD AHTD MONUMENT |
| 90 | 635020.7995 | 0.0140 | 1710762.3444 | 0.0110 | 337.08 | 0.008 | CTL | STD AHTD MONUMENT |
| 91 | 635094.6452 | 0.0150 | 1711501.8740 | 0.0120 | 365.59 | 0.010 | CTL | STD AHTD MONUMENT |
| 92 | 635148.7767 | 0.0170 | 1712034.6068 | 0.0120 | 379.09 | 0.010 | CTL | STD AHTD MONUMENT |
| 93 | 633823.6027 | 0.0140 | 1677107.4273 | 0.0120 | 261.57 | 0.003 | CTL | PD:STD AHTD MON. STAMPED PN:93 |
| 94 | 633563.1745 | 0.0140 | 1677618.4411 | 0.0130 | 261.11 | 0.004 | CTL | PD:STD AHTD MON. STAMPED PN:94 |

SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JEREMY WADE N. ROMERO
2/1/17

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.AID PROJ.NO. | STATE | JOB NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | CA1003 | 160 | 503 |

② SURVEY CONTROL DETAILS

c:\pw_work\atknatx01\wel14483\dms03013\412_SV_001.dgn 1:01:37 PM 2/3/2017

| Point No. | Northing | SY | Easting | SX | Elevation | SZ | Feature Code | Point Description |
|---|---|---|---|---|---|---|---|---|
| 95 | 633330.4227 | 0.0120 | 1678405.0658 | 0.0120 | 261.15 | 0.003 | CTL | PD:STD AHTD MON. STAMPED PN:95 |
| 96 | 632950.0730 | 0.0120 | 1678974.8722 | 0.0110 | 261.68 | 0.004 | CTL | PD:STD AHTD MON. STAMPED PN:96 |
| 97 | 632927.8643 | 0.0120 | 1679734.2697 | 0.0120 | 261.79 | 0.004 | CTL | PD:STD AHTD MON. STAMPED PN:97 |
| 98 | 632926.3995 | 0.0160 | 1680510.7369 | 0.0160 | 260.67 | 0.004 | CTL | PD:STD AHTD MON. STAMPED PN:98 |
| 99 | 632844.5790 | 0.0130 | 1681076.3251 | 0.0120 | 261.15 | 0.004 | CTL | PD:STD AHTD MON. STAMPED PN:99 |
| 100 | 635615.1237 | 0.0100 | 1689019.3960 | 0.0100 | 264.26 | 0.005 | GPS | PD:AHTD GPS 280020 |
| 101 | 634177.7162 | 0.0100 | 1689931.0980 | 0.0100 | 265.35 | 0.003 | GPS | PD:AHTD GPS 280020A |
| 102 | 634553.1272 | 0.0100 | 1704854.8116 | 0.0100 | 287.90 | 0.003 | GPS | PD:AHTD GPS 280021 |
| 103 | 634586.8007 | 0.0100 | 1706760.0221 | 0.0100 | 299.86 | 0.004 | GPS | PD:AHTD GPS 280021A |
| 104 | 635266.7698 | 0.0100 | 1628001.2780 | 0.0100 | 291.23 | 0.013 | GPS | PD:AHTD GPS 380012 |
| 105 | 633495.8630 | 0.0100 | 1627955.9300 | 0.0100 | 289.09 | 0.012 | GPS | PD:AHTD GPS 380012A |
| 106 | 635048.0494 | 0.0100 | 1649114.1134 | 0.0100 | 266.35 | 0.006 | GPS | PD:AHTD GPS 380013 |
| 107 | 634311.4559 | 0.0100 | 1651819.9842 | 0.0100 | 256.65 | 0.003 | GPS | PD:AHTD GPS 380013A |
| 108 | 634435.8712 | 0.0100 | 1667827.3732 | 0.0100 | 259.94 | 0.004 | GPS | PD:AHTD GPS 380014 |
| 109 | 634323.5674 | 0.0100 | 1669698.2922 | 0.0100 | 262.13 | 0.004 | GPS | PD:AHTD GPS 380014A |
| 115 | 632853.3952 | 0.0130 | 1681452.3472 | 0.0130 | 263.94 | 0.004 | CTL | PD:STD AHTD MON. STAMPED PN:115 |
| 116 | 632899.7986 | 0.0130 | 1682181.5174 | 0.0140 | 260.16 | 0.005 | CTL | PD:STD AHTD MON. STAMPED PN:116 |
| 117 | 632995.9244 | 0.0130 | 1682908.4985 | 0.0130 | 262.01 | 0.005 | CTL | PD:STD AHTD MON. STAMPED PN:117 |
| 118 | 633133.7777 | 0.0110 | 1683696.1492 | 0.0110 | 265.10 | 0.005 | CTL | PD:STD AHTD MON. STAMPED PN:118 |
| 119 | 632982.3440 | 0.0130 | 1684311.7016 | 0.0130 | 262.24 | 0.004 | CTL | PD:STD AHTD MON. STAMPED PN:119 |
| 120 | 632959.9411 | 0.0120 | 1685053.9323 | 0.0110 | 262.63 | 0.004 | CTL | PD:STD AHTD MON. STAMPED PN:120 |
| 121 | 632944.8653 | 0.0130 | 1685729.8672 | 0.0130 | 262.62 | 0.004 | CTL | PD:STD AHTD MON. STAMPED PN:121 |
| 122 | 633220.6374 | 0.0180 | 1686078.0761 | 0.0180 | 261.98 | 0.003 | CTL | PD:STD AHTD MON. STAMPED PN:122 |
| 123 | 633263.8297 | 0.0120 | 1686468.0428 | 0.0120 | 261.63 | 0.003 | CTL | PD:STD AHTD MON. STAMPED PN:123 |
| 708 | 633815.1262 | 0.0180 | 1628706.2461 | 0.0130 | 267.05 | 0.026 | CTL | STD AHTD MONUMENT |
| 900 | 634033.4231 | 30.0000 | 1629185.8587 | 30.0000 | 265.98 | 0.010 | TBM | PD:AHTD 3.75"ALUM DISK IN HW |
| 901 | 634784.7781 | 30.0000 | 1630793.9245 | 30.0000 | 266.39 | 0.009 | TBM | PD:CHISELED SQ. ON HW |
| 902 | 634907.9999 | 30.0000 | 1635760.4690 | 30.0000 | 273.62 | 0.004 | TBM | PD:CHISELED SQ. SW COR OF BR "412-7A, 3.04" |
| 903 | 634939.4813 | 30.0000 | 1637161.7410 | 30.0000 | 265.75 | 0.005 | TBM | PD:CHISELED SQ. ON HW |
| 904 | 634917.6211 | 30.0000 | 1639261.2628 | 30.0000 | 266.69 | 0.007 | TBM | PD:CHISELED SQ. ON HW |
| 905 | 634785.6099 | 30.0000 | 1642560.9540 | 30.0000 | 265.21 | 0.007 | TBM | PD:CHISELED SQ. ON HW |
| 906 | 634694.7840 | 30.0000 | 1643863.6257 | 30.0000 | 272.41 | 0.008 | TBM | PD:CHISELED SQ. NW COR OF BR "412-7A,4.60 |
| 907 | 634652.6372 | 30.0000 | 1644856.6092 | 30.0000 | 264.68 | 0.008 | TBM | PD:CHISELED SQ. ON HW |
| 908 | 634479.9441 | 30.0000 | 1647851.2534 | 30.0000 | 264.50 | 0.007 | TBM | PD:CHISELED SQ. ON HW |
| 909 | 634309.8526 | 30.0000 | 1649943.7069 | 30.0000 | 258.15 | 0.007 | TBM | PD:CHISELED SQ. ON HW |
| 910 | 634209.9841 | 30.0000 | 1651739.8668 | 30.0000 | 257.59 | 0.004 | TBM | PD:CHISELED SQ. ON HW |
| 911 | 634156.9983 | 30.0000 | 1653491.2737 | 30.0000 | 264.48 | 0.006 | TBM | PD:CHISELED SQ. NE COR OF BR "412-7,6.41" |
| 912 | 634020.4861 | 30.0000 | 1656394.6730 | 30.0000 | 260.85 | 0.007 | TBM | PD:CHISELED SQ. ON HW |
| 913 | 633906.9590 | 30.0000 | 1657335.3222 | 30.0000 | 259.46 | 0.008 | TBM | PD:CHISELED SQ. ON HW |
| 914 | 633910.5915 | 30.0000 | 1658025.2197 | 30.0000 | 260.42 | 0.008 | TBM | PD:CHISELED SQ. ON HW |
| 915 | 633983.7172 | 30.0000 | 1658889.1197 | 30.0000 | 258.83 | 0.008 | TBM | PD:AHTD 3.75"ALUM DISK NE COR HW PD:TRIPLE BOX CU N.SIDE OF 412 |
| 916 | 633975.5348 | 30.0000 | 1659899.1089 | 30.0000 | 266.76 | 0.008 | TBM | PD:COE BRASS CAP IN S.EDGE OF BR APPROACH |
| 917 | 633986.1367 | 30.0000 | 1659940.0347 | 30.0000 | 269.77 | 0.008 | TBM | AHTD 3.75"ALUM DISK STAMPED "R335 2012" IN TOP OF BARRIER CB AT SW COR BR |
| 918 | 634013.5402 | 30.0000 | 1660114.7311 | 30.0000 | 269.76 | 0.008 | TBM | PD:CHISELED SQ. ON S.BARRIER WL PD:MIDDLE OF BR |
| 919 | 634346.2264 | 30.0000 | 1665158.4470 | 30.0000 | 256.91 | 0.007 | TBM | PD:CHISELED SQ. ON HW |
| 920 | 634354.4418 | 30.0000 | 1666996.6036 | 30.0000 | 265.24 | 0.006 | TBM | PD:CHISELED SQ. ON BARRIER WL PD:SW COR OF BR |
| 921 | 634384.4264 | 30.0000 | 1671093.2559 | 30.0000 | 260.83 | 0.007 | TBM | PD:CHISELED SQ. ON HW |
| 922 | 634386.2718 | 30.0000 | 1672062.0694 | 30.0000 | 261.02 | 0.007 | TBM | PD:CHISELED SQ. ON HW |
| 923 | 634350.0209 | 30.0000 | 1674033.0357 | 30.0000 | 267.51 | 0.008 | TBM | PD:CHISELED SQ. ON BARRIER WL PD:NW COR OF BR "412-8, 2.67" |
| 924 | 634347.2575 | 30.0000 | 1677859.1704 | 30.0000 | 263.27 | 0.008 | TBM | PD:CHISELED SQ. ON HW |
| 925 | 634339.8369 | 30.0000 | 1678877.3690 | 30.0000 | 263.76 | 0.009 | TBM | PD:CHISELED SQ. ON HW |
| 926 | 634340.8575 | 30.0000 | 1680560.5180 | 30.0000 | 264.31 | 0.008 | TBM | PD:CHISELED SQ. ON HW |
| 927 | 634285.6821 | 30.0000 | 1681792.8018 | 30.0000 | 264.08 | 0.009 | TBM | PD:CHISELED SQ. ON HW |
| 928 | 634271.6758 | 30.0000 | 1683870.2577 | 30.0000 | 270.11 | 0.007 | TBM | PD:CHISELED SQ. ON NEW BARRIER WL PD:SW COR OF BR "412-8, 4.54" |
| 929 | 634264.6492 | 30.0000 | 1688049.5475 | 30.0000 | 271.21 | 0.007 | TBM | PD:CHISELED SQ. NE COR OF BR "412-8, 5.31" |
| 930 | 634223.4125 | 30.0000 | 1689552.6278 | 30.0000 | 272.65 | 0.004 | TBM | PD:CHISELED SQ. SW COR OF BR "412-8, 5.61" |
| 931 | 634297.3513 | 30.0000 | 1694445.2142 | 30.0000 | 268.66 | 0.007 | TBM | PD:CHISELED SQ. ON DBL. BOX CU HW |
| 932 | 634264.1106 | 30.0000 | 1697294.7571 | 30.0000 | 275.62 | 0.008 | TBM | PD:CHISELED SQ. SW COR OF BR "412-8, 7.08" |
| 933 | 634355.9824 | 30.0000 | 1703426.9285 | 30.0000 | 279.57 | 0.006 | TBM | PD:CHISELED SQ. ON HW |
| 934 | 634286.3051 | 30.0000 | 1703509.9721 | 30.0000 | 280.13 | 0.006 | TBM | PD:CHISELED SQ. ON HW |
| 935 | 634642.4133 | 30.0000 | 1705919.1142 | 30.0000 | 294.18 | 0.005 | TBM | PD:CHISELED SQ. ON FLARED-END PIPE |
| 936 | 634877.9416 | 30.0000 | 1708370.8971 | 30.0000 | 311.62 | 0.007 | TBM | PD:CHISELED SQ. ON FLARED-END PIPE |
| 937 | 635193.0063 | 30.0000 | 1711445.5576 | 30.0000 | 361.02 | 0.010 | TBM | PD:CHISELED SQ. ON FLARED-END PIPE |

*Standard Primary Control Monument - Rebar and Cap - Standard - 5/8"x 24" Rebar with 2"Aluminum Cap stamped: "*(include all common information here)*" plus other markings indicated in the point description of the individual point. AHTD monuments will be stamped "Arkansas Hwy & Trans Dept" with "PN: ###" & "Job ######". Monuments that are set by Consultants will be stamped "Arkansas Hwy & Trans Dept" with "PN:###", "Job:####", & "PS####". The consultant Professional Surveyor in charge will stamp his/her PS license number on the cap.

**Standard GPS Control Point Monument - 5/8" x 48" Rebar with 2.5"Aluminum Cap stamped: "*JOB:080426, T-#*" point description of the individual point. These monuments will be stamped "Ark. State Hwy Trans. Dept.", "GPS Survey", & "Point No. ######".

SX, SY, SZ – Represents the standard error estimate of the coordinate values of each point at the 67% confidence level (one sigma) based on the least squares analysis of the control network. See the AASHTO SDMS Technical Data Guide data tag definition for SX:, SY:, and SZ: for additional information. These values shall be used when control points are added and the entire network is reprocessed using least square analysis. A value of 0.001 is defined as fixed (no adjustment) in the least square analysis process. A value of 30 is defined as location by handheld GPS device or scaled from USGS Quadmap.

Reference Control points (1500 series) shall be used to re-establish horizontal datum if the primary control has been destroyed. These reference control points shall not be used for vertical control unless the elevation has been established from the project datum with 3-wire level techiniques.

All additional project control shall be occupied, measured, and adjusted with direct survey ties to at least two of the control points listed in the table above. New survey control shall not be independent of the survey control listed above. This includes horizontal coordinates and elevations.

| | | |
|---|---|---|
| Positional Accuracy: | Horizontal - GPS (1.0 cm± 1PPM) | *PN: 1-123* |
| | Horizontal - Primary (2.0cm± 20PPM): | *PN:1-123* |
| | Horizontal - Secondary (3 cm ± 50PPM): | *PN:1500-1509* |
| | Vertical - NGS 1st Order (±4mm x √dist in km) | *N/A* |
| | Vertical - NGS 2nd Order (±6mm x √dist in km) | *PN:990 & 991* |
| | Vertical - NGS 3rd Order (±8mm x √dist in km) | *PN:900-928* |

Horizontal Datum: NAD 1983 (1997) State Plane Zone: 0301 - North Zone

*The adjustment year is based on metadata in the SDMS Control file*

A project CAF of: 0.999957209 has been used to compute the above coordinates.

*The project CAF shall have a minimum precision of 9 digits right of the decimal.*

This CAF is intended for use within the project limits only.

Grid Distance = Ground Distance X CAF

If Coordinates are listed as Ground:

To compute Grid Coordinates, multiply the Ground Coordinates by CAF about the origin of X=0 & Y=0

If Coordinates are listed as Grid:

To compute Ground Coordinates, divide the Ground Coordinates by CAF about the origin of X=0 & Y=0

STATE OF ARKANSAS REGISTERED PROFESSIONAL LAND SURVEYOR JENNIFER N. ROMERO No. 12686

2/7/17

SURVEY CONTROL DETAILS

② SURVEY CONTROL DETAILS

| DATE REVISED | DATE FILED | DATE REVISED | DATE FILED | FED.REG. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | CAK003 | 161 | 503 |

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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. | | CA1003 | 162 | 503 |

## ② SURVEY CONTROL DETAILS

| POINT NO. | TYPE | STATION | NORTHING | EASTING |
|---|---|---|---|---|
| HWY. 412 | | | | |
| 8000 | POT | 88+20.13 | 633836.6850 | 1628613.3973 |
| 8001 | PI | 96+19.91 | 634165.2035 | 1629342.5912 |
| 8002 | PC | 111+48.87 | 634790.4123 | 1630737.8835 |
| 8003 | PI | 115+65.69 | 634960.8550 | 1631118.2643 |
| 8004 | CC | | 633047.5233 | 1631518.8450 |
| 8005 | PT | 119+69.65 | 634957.3137 | 1631535.0710 |
| 8006 | PC | 205+25.00 | 634884.6281 | 1640090.1188 |
| 8007 | PI | 208+06.74 | 634882.2345 | 1640371.8417 |
| 8008 | CC | | 623425.8857 | 1639992.7627 |
| 8009 | PT | 210+88.36 | 634865.9994 | 1640653.1065 |
| 8010 | PI | 269+19.91 | 634529.9511 | 1646474.9684 |
| 8011 | PI | 322+26.98 | 634238.9442 | 1651774.0574 |
| 8012 | PC | 364+05.85 | 634007.1637 | 1655946.4951 |
| 8013 | PI | 376+83.58 | 633936.2947 | 1657222.2547 |
| 8014 | CC | | 679773.2282 | 1658488.8173 |
| 8015 | PT | 389+60.64 | 633936.6059 | 1658499.9812 |
| 8016 | PC | 397+27.11 | 633934.4943 | 1659266.4460 |
| 8017 | PI | 399+37.22 | 633933.9155 | 1659476.5523 |
| 8018 | CC | | 636226.3167 | 1659272.7600 |
| 8019 | PT | 401+46.15 | 633971.5488 | 1659683.2616 |
| 8020 | PC | 423+55.55 | 634367.2844 | 1661856.9241 |
| 8021 | PI | 425+31.60 | 634398.8186 | 1662030.1323 |
| 8022 | CC | | 632488.3111 | 1662199.0087 |
| 8023 | PT | 427+06.66 | 634398.1569 | 1662206.1864 |
| 8024 | PI | 482+18.89 | 634377.4408 | 1667718.3721 |
| 8025 | PC | 556+57.15 | 634336.6820 | 1675156.5223 |
| 8026 | PI | 566+35.88 | 634331.3190 | 1676135.2366 |
| 8027 | CC | | 630169.7788 | 1675133.6890 |
| 8028 | PT | 575+79.76 | 633890.7973 | 1677009.2223 |
| 8029 | PC | 588+44.48 | 633321.5528 | 1678138.5913 |
| 8030 | PI | 598+52.52 | 632867.8359 | 1679038.7560 |
| 8031 | CC | | 637042.5713 | 1680014.1246 |
| 8032 | PT | 608+22.57 | 632875.7334 | 1680046.7706 |
| 8033 | PC | 655+45.43 | 632912.7346 | 1684769.4907 |
| 8034 | PI | 664+55.55 | 632919.8648 | 1685679.5804 |
| 8035 | CC | | 637079.5725 | 1684736.8447 |
| 8036 | PT | 673+37.52 | 633305.7946 | 1686503.8208 |
| 8037 | PC | 686+03.07 | 633842.4439 | 1687649.9569 |
| 8038 | PI | 695+31.09 | 634235.9644 | 1688490.4092 |
| 8039 | CC | | 630068.6660 | 1689416.9330 |
| 8040 | PT | 704+29.31 | 634235.6315 | 1689418.4277 |
| 8041 | PC | 747+83.01 | 634234.0699 | 1693772.1286 |
| 8042 | PI | 749+45.73 | 634234.0115 | 1693934.8506 |
| 8043 | CC | | 638053.7883 | 1693773.4987 |
| 8044 | PRC | 751+08.26 | 634247.7923 | 1694096.9880 |
| 8045 | PI | 756+32.88 | 634292.2221 | 1694619.7245 |
| 8046 | CC | | 622829.8045 | 1695067.4560 |
| 8047 | PT | 761+56.77 | 634288.7025 | 1695144.3338 |
| 8048 | PC | 800+59.57 | 6342625192 | 1699047.0465 |
| 8049 | PI | 801+53.39 | 634261.8898 | 1699140.8677 |
| 8050 | CC | | 657180.3153 | 1699200.8021 |
| 8051 | PT | 802+47.21 | 634262.0285 | 1699234.6910 |
| 8052 | PI | 827+41.66 | 634265.7170 | 1701729.1370 |
| 8053 | PC | 834+88.65 | 634266.1172 | 1702476.1258 |
| 8054 | PI | 838+70.12 | 634266.3216 | 1702857.5930 |
| 8055 | CC | | 641905.5534 | 1702472.0330 |
| 8056 | PT | 842+50.95 | 634304.5265 | 1703237.1422 |
| 8057 | POT | 853+01.68 | 634409.7596 | 1704282.5874 |

| POINT NO. | TYPE | STATION | NORTHING | EASTING |
|---|---|---|---|---|
| SH 228 | | | | |
| 8058 | POT | 20+28.82 | 632304.5885 | 1681047.9277 |
| 8059 | PC | 21+58.08 | 632407.0291 | 1681126.7593 |
| 8060 | PI | 22+34.27 | 632467.4055 | 1681173.2210 |
| 8061 | CC | | 632059.4077 | 1681578.4886 |
| 8062 | PT | 23+09.55 | 632513.4609 | 1681233.9081 |
| 8063 | PC | 24+84.72 | 632619.3547 | 1681373.4441 |
| 8064 | PI | 25+67.95 | 632669.6720 | 1681439.7472 |
| 8065 | CC | | 632810.5349 | 1681228.3576 |
| 8066 | PT | 26+44.96 | 632750.2365 | 1681460.6593 |
| 8067 | PC | 29+26.13 | 633022.3857 | 1681531.3010 |
| 8068 | PI | 30+09.12 | 633102.7173 | 1681552.1526 |
| 8069 | CC | | 632962.0872 | 1681763.6027 |
| 8070 | PT | 30+85.93 | 633153.0075 | 1681618.1742 |
| 8071 | PC | 32+61.31 | 633259.2744 | 1681757.6826 |
| 8072 | PI | 33+36.97 | 633305.1237 | 1681817.8741 |
| 8073 | CC | | 633712.7100 | 1681412.2899 |
| 8074 | PT | 34+11.76 | 633365.0887 | 1681864.0193 |
| 8075 | POT | 35+41.54 | 633467.9432 | 1681943.1694 |
| SH 231 | | | | |
| 8076 | POT | 10+00.00 | 633956.4149 | 1657141.3443 |
| 8077 | POT | 18+44.49 | 634800.9057 | 1657143.3058 |
| CR 332 | | | | |
| 8078 | POT | 10+00.00 | 634288.7465 | 1675764.3308 |
| 8079 | PI | 12+88.23 | 634000.5245 | 1675766.4846 |
| 8080 | POT | 13+70.21 | 633918.5496 | 1675766.0057 |
| CR 218 | | | | |
| 8081 | POT | 10+00.00 | 634218.5831 | 1689040.3803 |
| 8082 | POT | 21+12.63 | 635331.1127 | 1689055.6069 |
| CR 340 | | | | |
| 8083 | POT | 10+00.00 | 634263.3318 | 1694301.4869 |
| 8084 | POT | 12+01.37 | 634061.9584 | 1694301.2932 |
| 8085 | POT | 13+46.66 | 633916.6880 | 1694303.6621 |
| W CONNECTOR | | | | |
| 8086 | POT | 10+00.00 | 634103.5402 | 1676508.1433 |
| 8087 | PC | 10+66.10 | 634166.1261 | 1676529.4226 |
| 8088 | PI | 12+37.95 | 634328.8254 | 1676584.7408 |
| 8089 | CC | | 634089.2770 | 1676755.4478 |
| 8090 | PT | 13+64.00 | 634328.0067 | 1676756.5852 |
| 8091 | POT | 16+56.75 | 634326.6120 | 1677049.3314 |
| E CONNECTOR | | | | |
| 8092 | POT | 10+00.00 | 633747.8504 | 1687447.9312 |
| 8093 | PC | 13+22.15 | 634039.6027 | 1687311.3256 |
| 8094 | PI | 15+62.16 | 634256.9634 | 1687209.5519 |
| 8095 | CC | | 633877.6298 | 1686965.3959 |
| 8096 | PT | 17+50.72 | 634259.5790 | 1686969.5588 |
| 8097 | POT | 20+03.67 | 634262.3357 | 1686716.6271 |

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

Vertical Datum: NAVD 1988 based NGS BM:
A project Elevation Factor of: 0.9999849862 has been computed and incorporated in the above CAF.
This is based on the average elevation of the project: 313.88 Feet
3-Wire Leveling techniques have been used to establish elevations on

Points: 1-123 From NGS BM: V335, W335, X335, F335, J335, Q335

Basis of Bearing: Grid Bearings based on AHTD GPS points: *280020 - 280020A, 280021 - 280021A, 380012 - 380012A, 380013 - 380013A, 380014 - 380014A*
Convergence Angle is: 0°42'20.10" Left at PN: 45
LT: 36-04-12 N LG: 90-47-15 W
Grid Azimuth = Astronomical Azimuth - Convergence Angle

***Note: Information in Italics is for clarification only. It is not to be part of the actual Control Table or Control Detail Sheets.***

SURVEY CONTROL DETAILS

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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. | | CA1003 | 163 | 503 |

② SURVEY CONTROL DETAILS

0 50 100
1" = 100'

ALL BEARINGS ARE GRID BASED ON GPS
ALL DISTANCES ARE GROUND

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

STA. 93+50.00
BEGIN JOB CA1003
LOG MILE 1.73

POT 88+20.13

C.L. HWY. 412

PI 96+19.91

N 65° 44' 50" E

8000 90+00 95+00 8001

SURVEY BASELINE N 66°57'00" E
815.42'

SURVEY BASELINE N 64°45'23" E
709.96'

PN:708
PD:2"ALUM CAP 5/8RBR

PN:1
PD:2"ALUM CAP 5/8RBR

C.L. HWY. 412
P.I. = 96+19.91
Δ = 0° 06' 58" (RT)

HWY. 412

0 50 100
1" = 100'

ALL BEARINGS ARE GRID BASED ON GPS
ALL DISTANCES ARE GROUND

C.L. HWY. 412

PC 111+48.87

N 65° 51' 49" E

100+00 105+00 110+00 8002

SURVEY BASELINE N 64°08'55" E
749.95'

SURVEY BASELINE N 65°36'32" E
795.10'

PN:2
PD:2"ALUM CAP 5/8RBR

PN:3
PD:2"ALUM CAP 5/8RBR

# SURVEY CONTROL DETAILS

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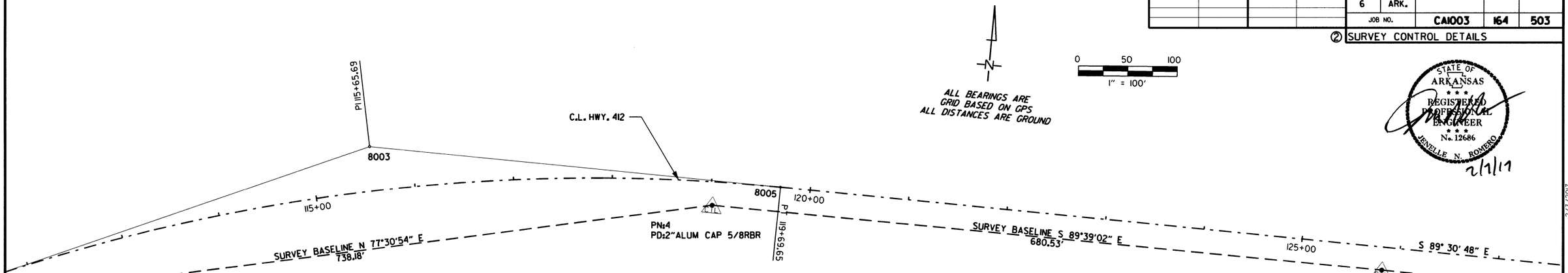
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 164 | 503 |

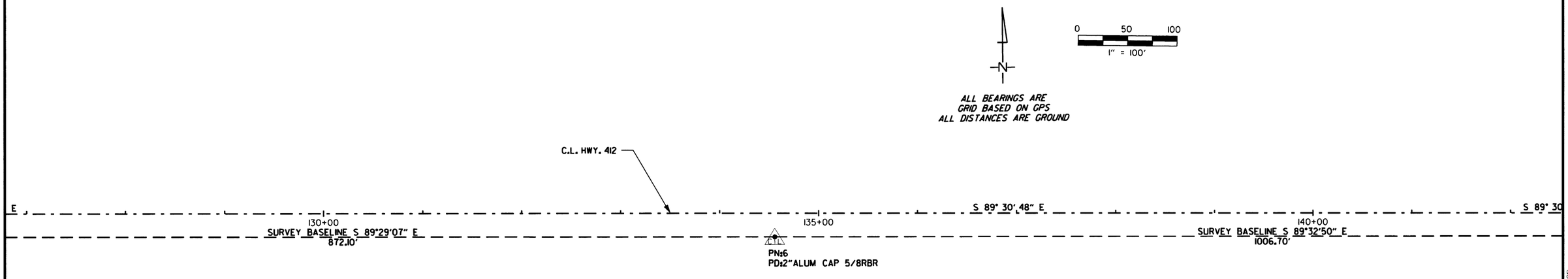
② SURVEY CONTROL DETAILS




C.L. HWY. 412
P.I. = 115+65.69
Δ = 24° 37' 24" (RT)
D = 3° 00' 00"
T = 416.82'
L = 820.77'
R = 1,909.86'
P.C. = 111+48.87
P.T. = 119+69.65
e = 0.077'/'
Ls = 540'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

HWY. 412




SURVEY CONTROL DETAILS

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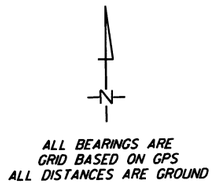
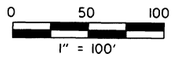
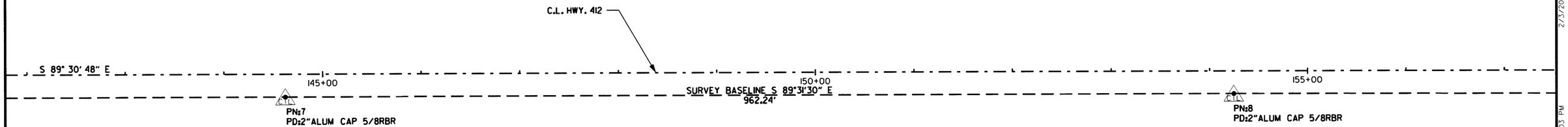
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 165 | 503 |

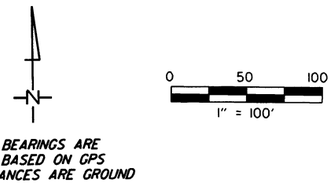
② SURVEY CONTROL DETAILS



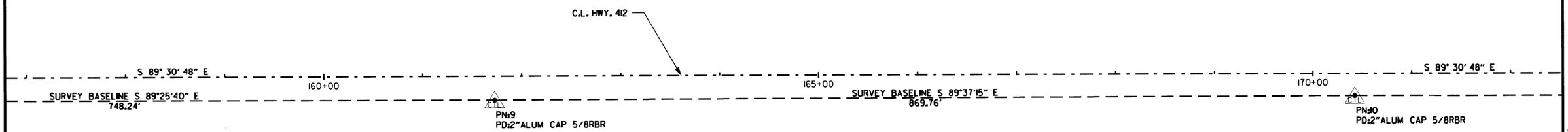



HWY. 412










SURVEY CONTROL DETAILS

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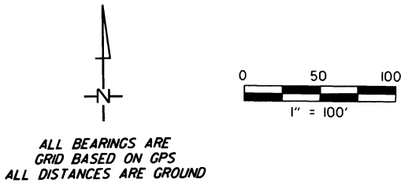
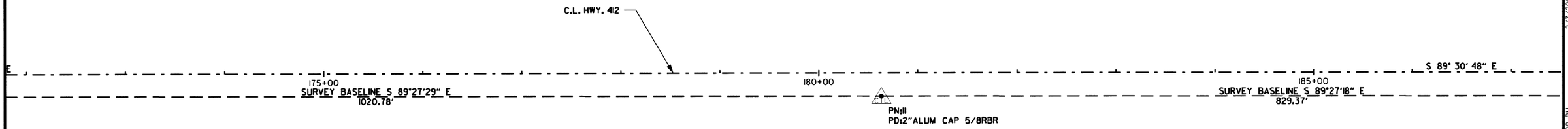
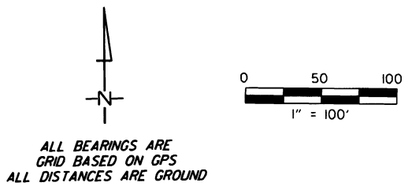
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 166 | 503 |

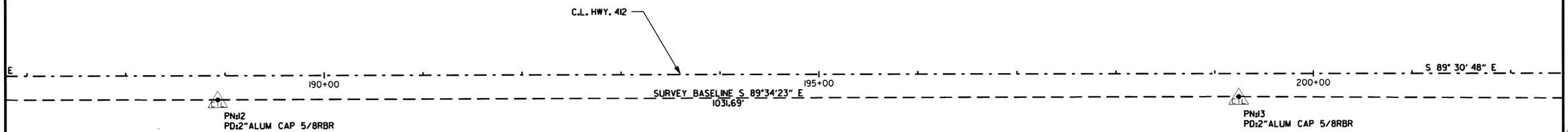
② SURVEY CONTROL DETAILS






HWY. 412




SURVEY CONTROL DETAILS

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 167 | 503 |

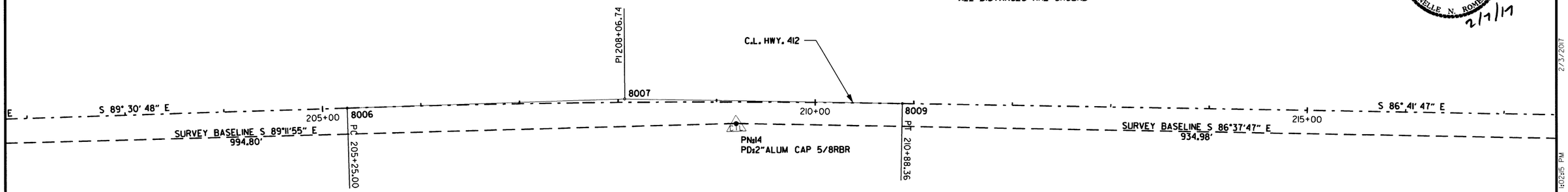
② SURVEY CONTROL DETAILS

C.L. HWY. 412
P.I. = 208+06.74
Δ = 2° 49' 00" (RT)
D = 0° 30' 00"
T = 281.73'
L = 563.35'
R = 11,459.16'
P.C. = 205+25.00
P.T. = 210+88.36
e = N/A
Ls = N/A

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

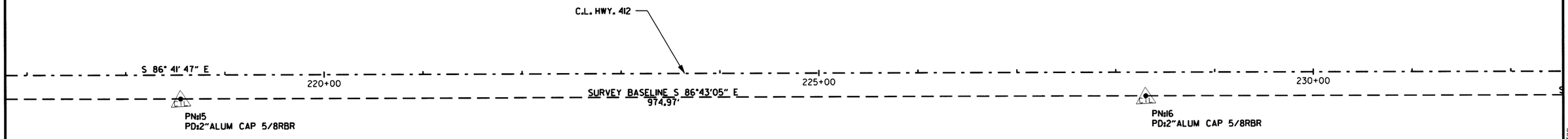
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17




HWY. 412

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'




SURVEY CONTROL DETAILS

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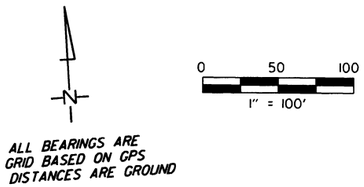
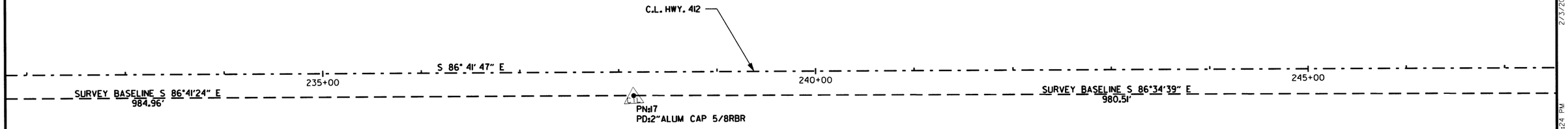
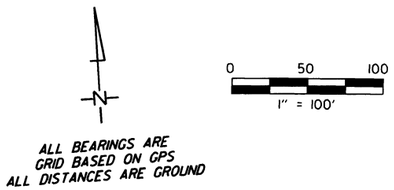
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 168 | 503 |

② SURVEY CONTROL DETAILS



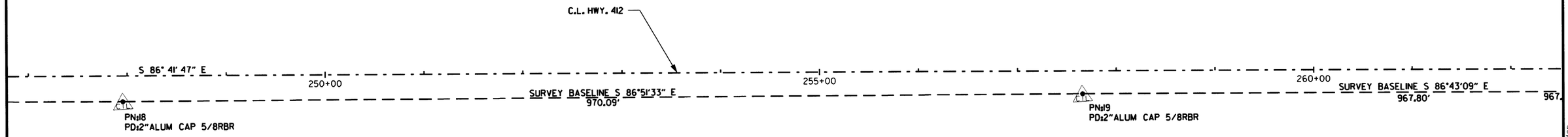



HWY. 412










SURVEY CONTROL DETAILS

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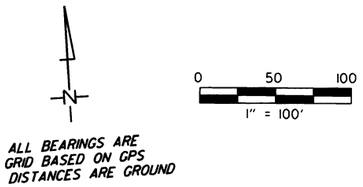
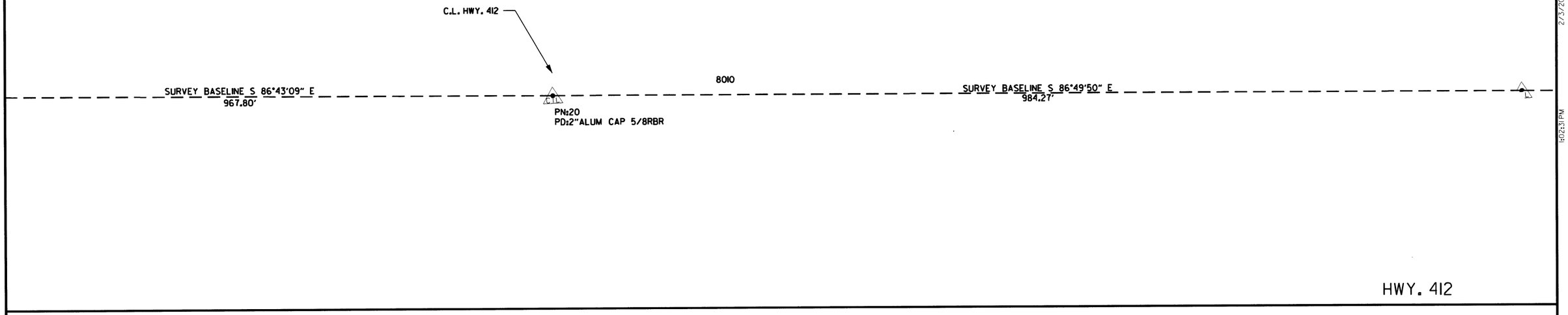
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 169 | 503 |

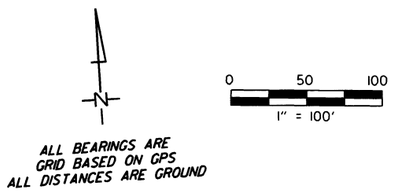
② SURVEY CONTROL DETAILS

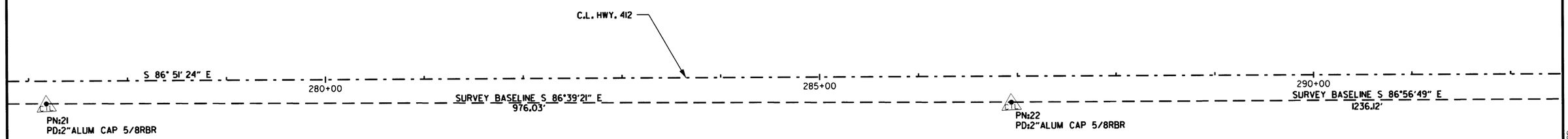
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17




HWY. 412




SURVEY CONTROL DETAILS

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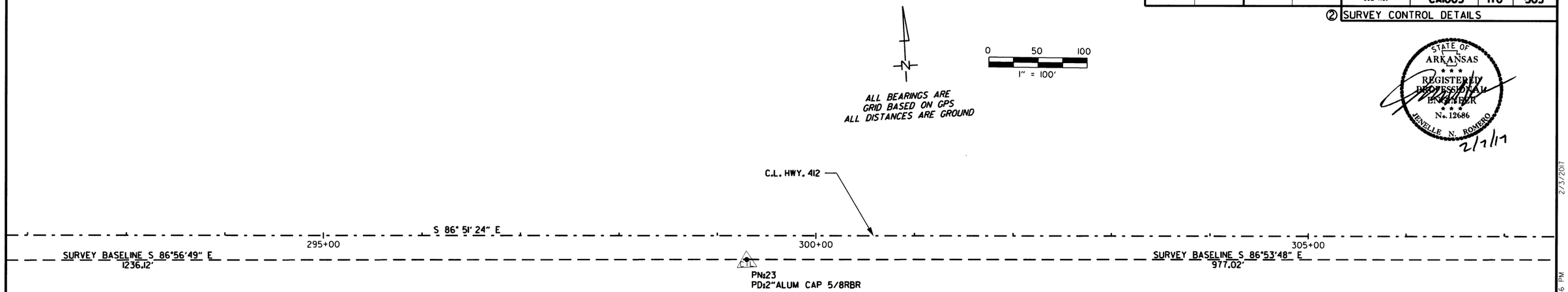
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 170 | 503 |

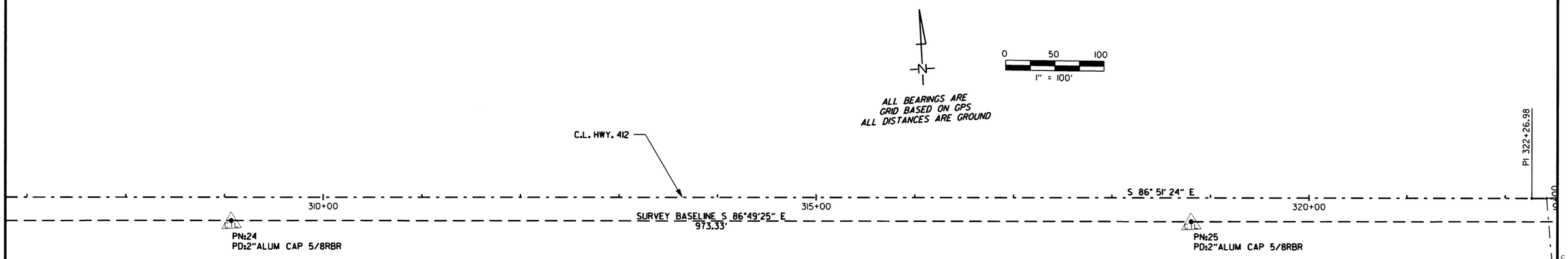
② SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

2/3/2017




HWY. 412




SURVEY CONTROL DETAILS

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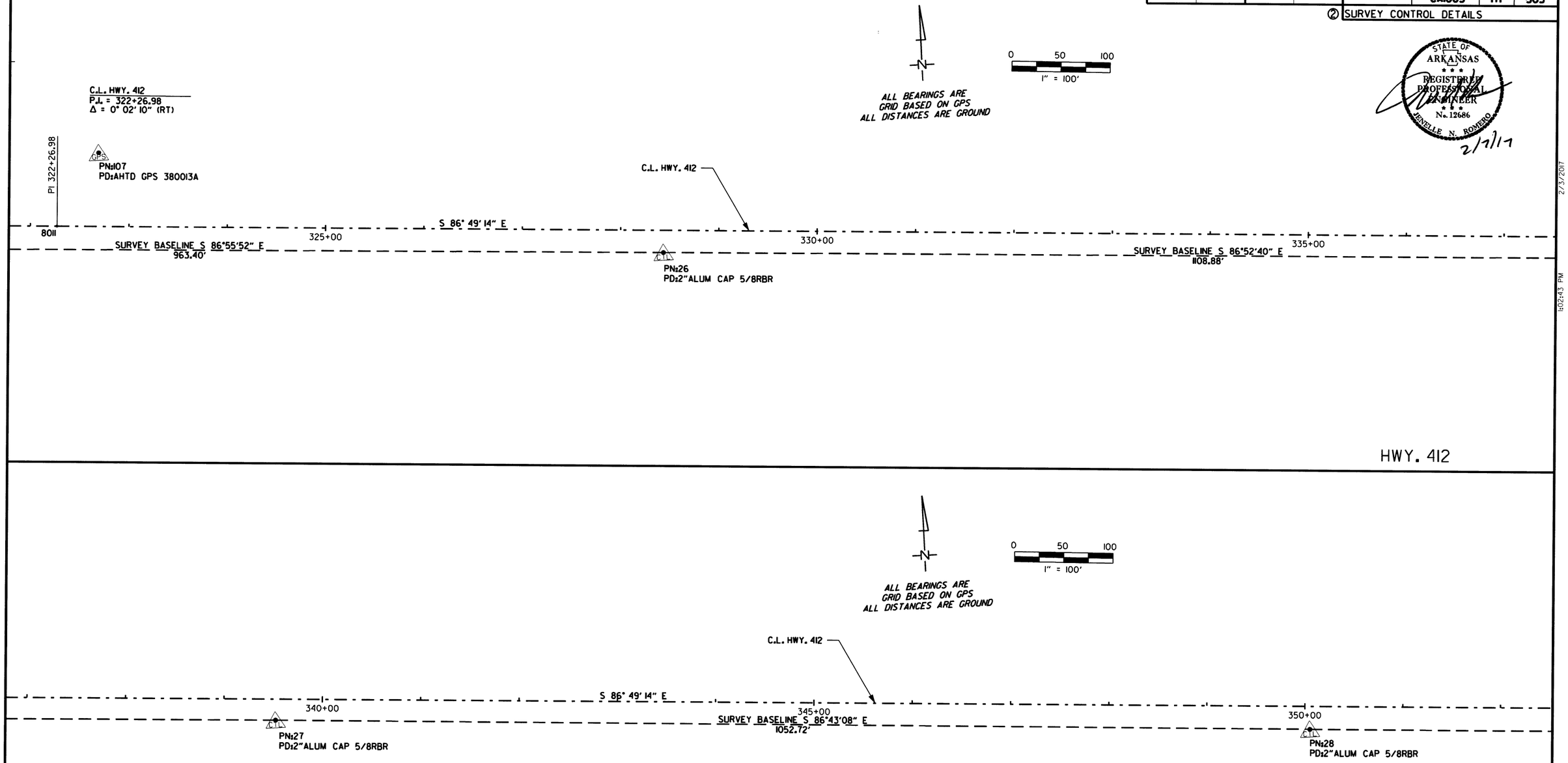
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 171 | 503 |

② SURVEY CONTROL DETAILS

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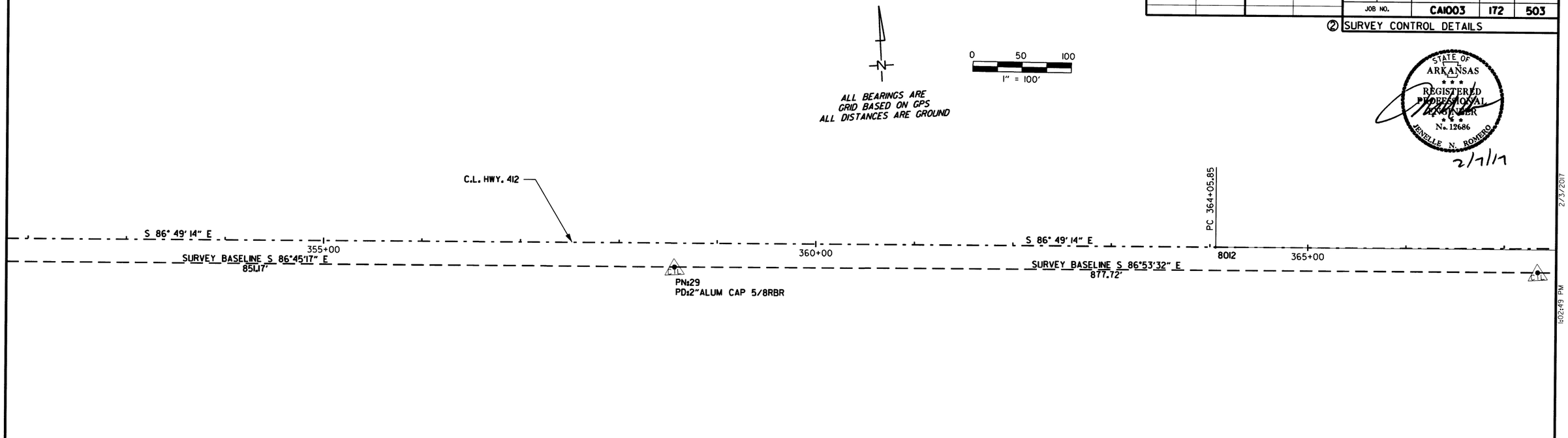
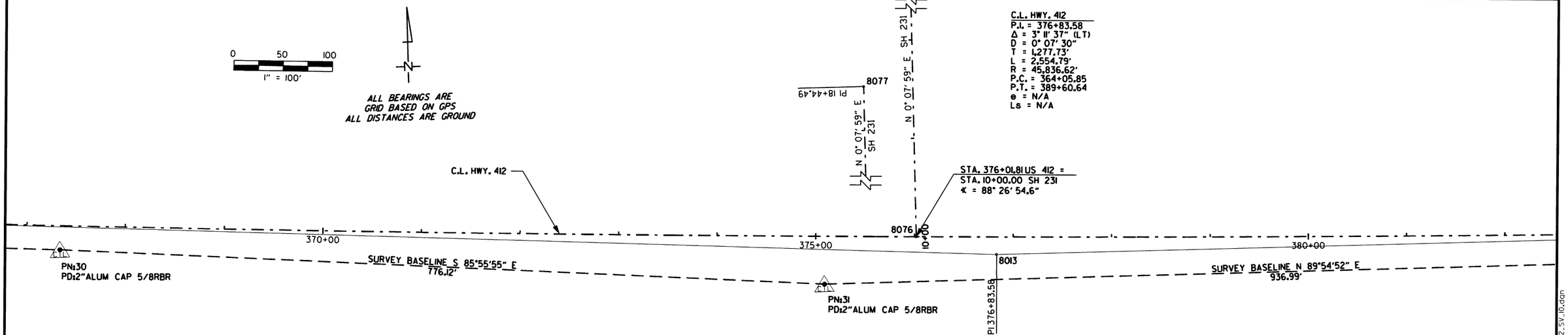
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 172 | 503 |

② SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17




HWY. 412




SURVEY CONTROL DETAILS

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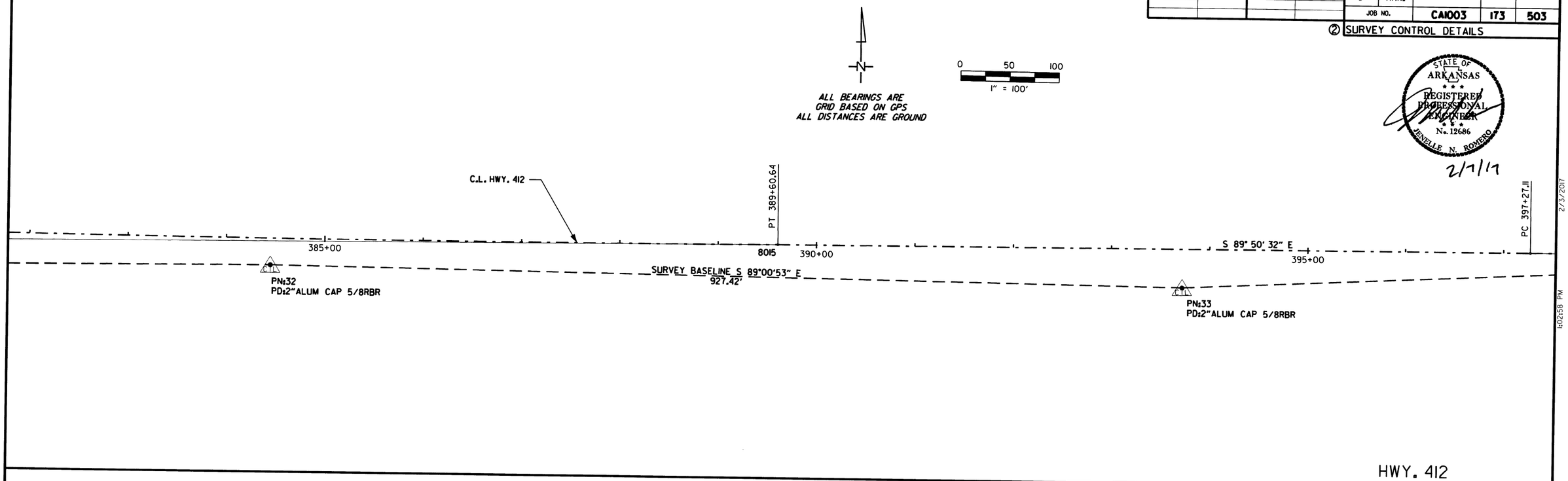
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 173 | 503 |

② SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

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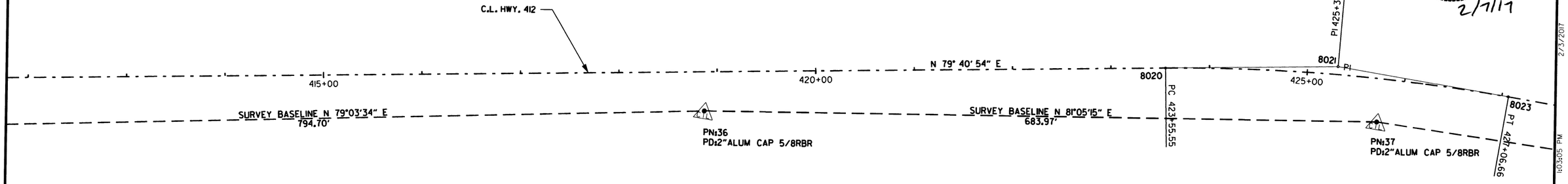
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 174 | 503 |

② SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

ALL BEARINGS ARE GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

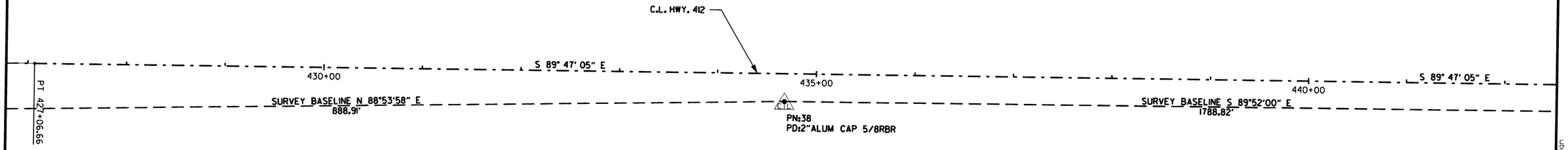



C.L. HWY. 412
P.I. = 425+31.60
Δ = 10° 32' 01" (RT)
D = 3° 00' 00"
T = 176.06'
L = 351.12'
R = 1,909.86'
P.C. = 423+55.55
P.T. = 427+06.66
e = 0.077'/'
Ls = 540'

HWY. 412

ALL BEARINGS ARE GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'




SURVEY CONTROL DETAILS

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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. | | CA1003 | 175 | 503 |

② SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

C.L. HWY. 412

E

445+00

SURVEY BASELINE S 89°52'00" E
1788.82'

450+00

S 89° 47' 05" E

455+00

SURVEY BASELINE S 89°51'58" E
852.41'

PN:39
PD:2"ALUM CAP 5/8RBR

HWY. 412

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

C.L. HWY. 412

460+00

PN:40
PD:2"ALUM CAP 5/8RBR

465+00

SURVEY BASELINE S 89°44'34" E
1201.33'

S 89° 47' 05" E

470+00

SURVEY CONTROL DETAILS

2/3/2017 1:03:12 PM

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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. | | CA1003 | 176 | 503 |

② SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

C.L. HWY. 412
P.I. = 482+18.89
Δ = 0° 05' 55" (LT)

C.L. HWY. 412

PI 482+18.89

PN:108
PD:AHTD GPS 380014

475+00

480+00

485+00

S 89° 47' 05" E

8024

S 89° 41' 10" E

SURVEY BASELINE S 89°22'14" E
760.20'

SURVEY BASELINE N 89°59'36" E
887.12'

PN:41
PD:2"ALUM CAP 5/8RBR

PN:42
PD:2"ALUM CAP 5/8RBR

HWY. 412

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

C.L. HWY. 412

S 89° 41' 10" E

490+00

495+00

500+00

SURVEY BASELINE S 89°25'58" E
867.54'

SURVEY BASELINE S 87°40'37" E
374.01'

PN:43
PD:2"ALUM CAP 5/8RBR

PN:44
PD:2"ALUM CAP 5/8RBR

PN:109
PD:AHTD GPS 380014A

SURVEY CONTROL DETAILS

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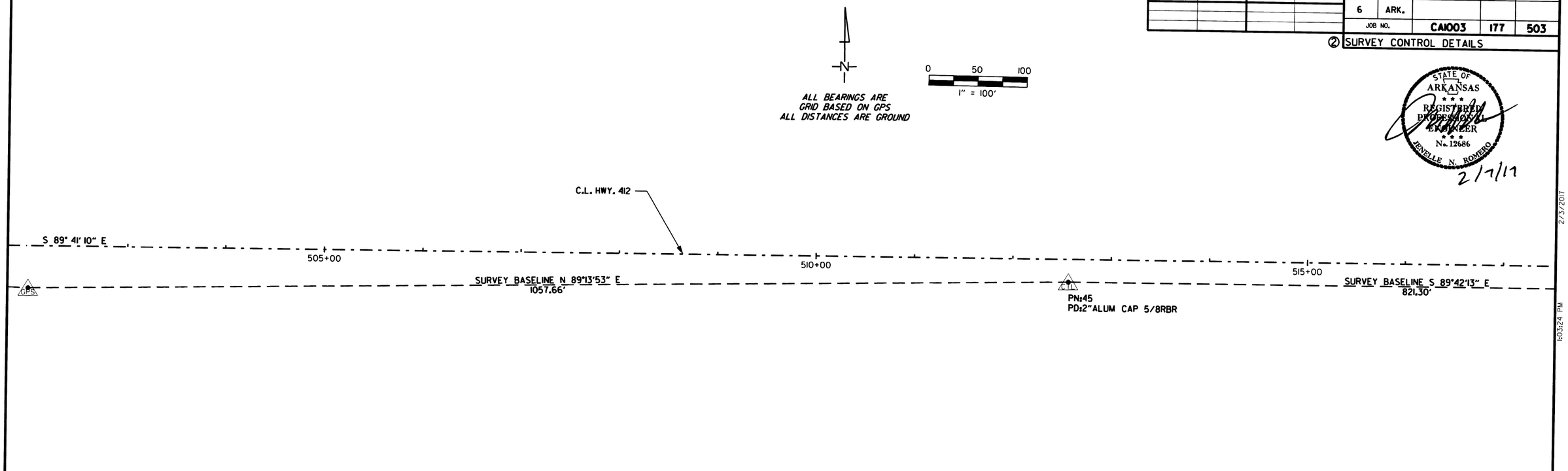
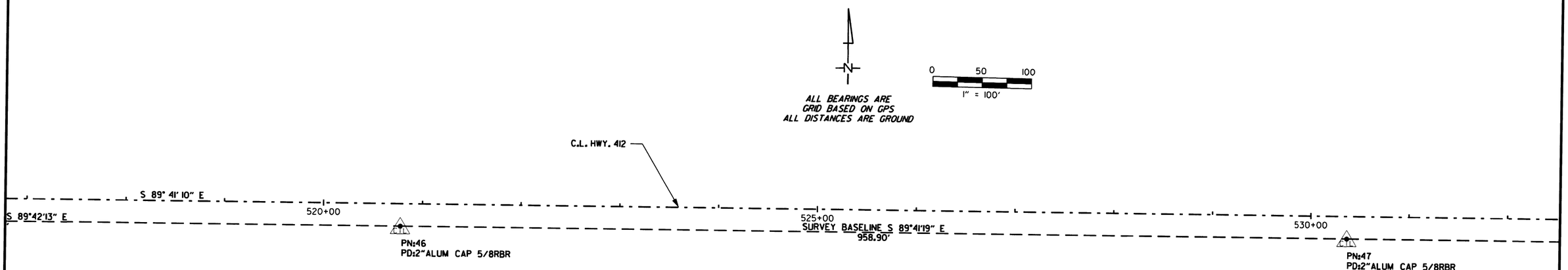
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 177 | 503 |

② SURVEY CONTROL DETAILS




HWY. 412




SURVEY CONTROL DETAILS

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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. | | CA1003 | 178 | 503 |

② SURVEY CONTROL DETAILS

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

C.L. HWY. 412

S 89° 41' 10" E

535+00
SURVEY BASELINE S 89°40'57" E
1032.14'

540+00

545+00
SURVEY BASELINE S 89°43'30" E
1023.82'

PN:48
PD:2"ALUM CAP 5/8RBR

HWY. 412

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

C.L. HWY. 412
P.I. = 566+35.88
Δ = 26° 26' 09" (RT)
D = 1° 22' 30"
T = 978.73'
L = 1,922.61'
R = 4,166.97'
P.C. = 556+57.15
P.T. = 575+79.76
e = 0.040'/'
Ls = 540'

C.L. HWY. 412

550+00

PN:49
PD:2"ALUM CAP 5/8RBR

S 89° 41' 10" E

555+00
SURVEY BASELINE S 89°39'52" E
873.28'

8025

PC 556+57.15

560+00

PN:50
PD:2"ALUM CAP 5/8RBR

SURVEY CONTROL DETAILS

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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. | | CA1003 | 179 | 503 |

② SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

0 50 100
1" = 100'

ALL BEARINGS ARE GRID BASED ON GPS
ALL DISTANCES ARE GROUND

PI 12+37.95

8088

8090

15+00

S 89° 43' 37" E

8091

POE 16+56.75

C.L. WEST CONNECTOR

PT 13+64.00

**C.L. WEST CONNECTOR**
P.I. = 12+37.95
Δ = 71° 29' 41" (RT)
D = 24° 00' 00"
T = 171.85'
L = 297.89'
R = 238.73'
P.C. = 10+66.10
P.T. = 13+64.00
e = 0.074'/'
Ls = 184'

PI 566+35.88

8026

PN±51
PD±2"ALUM CAP 5/8RBR

SURVEY BASELINE S 89°33'50" E
805.31'

C.L. HWY. 412

10+80

8078

565+00

STA. 562+68.40 US 412 =
STA. 10+00.00 CR 332
∢ = 80° 51' 11"

8087

PC 10+66.10

N 18° 46' 41" E

570+00

8086

SURVEY BASELINE S 60°01'09" E
966.20'

STA. 570+35.00 US 412 =
STA. 10+00.00 CONNECTOR ROAD WEST
∢ = 90° 33' 48"

575+00

8028

PT 575+79.76

11+00

S 0° 25' 41" E

CR 332

12+00

**C.L. HWY. 412**
P.I. = 566+35.88
Δ = 26° 26' 09" (RT)
D = 1° 22' 30"
T = 978.73'
L = 1,922.61'
R = 4,166.97'
P.C. = 556+57.15
P.T. = 575+79.76
e = 0.040'/'
Ls = 540'

PI 12+88.23

8079

13+00

S 0° 20' 50" W

POE 13+70.21

8080

**C.L. CR 332**
P.I. = 12+88.23
Δ = 0° 45' 46" (RT)

HWY. 412

0 50 100
1" = 100'

ALL BEARINGS ARE GRID BASED ON GPS
ALL DISTANCES ARE GROUND

**C.L. HWY. 412**
P.I. = 598+52.52
Δ = 27° 11' 55" (LT)
D = 1° 22' 30"
T = 1,008.05'
L = 1,978.09'
R = 4,166.97'
P.C. = 588+44.48
P.T. = 608+22.57
e = 0.040'/'
Ls = 540'

PN±95
PD±STD AHTD MON. STAMPED PN±95 LIGHT

C.L. HWY. 412

SURVEY BASELINE S 73°31'02" E
820.34'

PC 588+44.48

8029

S 63° 15' 01" E

S 63° 15' 01" E

SURVEY BASELINE S 62°59'43" E
573.55'

580+00

585+00

590+00

PN±93
PD±STD AHTD MON. STAMPED PN±93 LIGHT

PN±94
PD±STD AHTD MON. STAMPED PN±94 LIGHT

SURVEY CONTROL DETAILS

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|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 180 | 503 |

② SURVEY CONTROL DETAILS

C.L. HWY. 412
P.I. = 598+52.52
Δ = 27° 11' 55" (LT)
D = 1° 22' 30"
T = 1,008.05'
L = 1,978.09'
R = 4,166.97'
P.C. = 588+44.48
P.T. = 608+22.57
e = 0.040'/'
Ls = 540'

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

SURVEY BASELINE S 56°16'36" E
685.09'

595+00

C.L. HWY. 412

PN:96
PD:STD AHTD MON. STAMPED PN:96 LIGHT

SURVEY BASELINE S 88°19'29" E
759.72'

600+00

PN:97
PD:STD AHTD MON. STAMPED
PN:97 LIGHT

605+00

8030

PI 598+52.52

HWY. 412

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

PT 608+22.57

SURVEY BASELINE S 89°53'31" E
776.47'

8032

610+00

N 89° 33' 04" E

PN:98
PD:STD AHTD MON. STAMPED PN:98 LIGHT

SURVEY BASELINE S 81°46'06" E
571.48'

615+00

C.L. HWY. 412

N 89° 33' 04" E

620+00

SURVEY BASELINE N 88°39'25" E
376.13'

PN:99
PD:STD AHTD MON. STAMPED PN:99 LIGHT

HWY. 228

SURVEY CONTROL DETAILS

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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. | | CA1003 | 181 | 503 |

② SURVEY CONTROL DETAILS

C.L. HWY. 228
P.I. = 30+09.12
Δ = 38° 09' 05" (RT)
D = 24° 00' 00"
T = 82.99'
L = 159.81'
R = 238.73'
P.C. = 29+26.13
P.T. = 30+85.93
e = 0.040'/'
Ls = 100'

N 52° 42' 09" E

PI 30+09.12

PT 30+85.93

30+00

C.L. HWY. 228 (SEE SHEET 189 FOR MORE INFORMATION)

PC 29+26.13

STA. 622+72.02 HWY 412 =
STA. 27+86.35 HWY 228
∢ = 75°00'00"

C.L. HWY. 412

N 14° 33' 04" E

625+00

SURVEY BASELINE N 86°21'31" E
730.65'

PN:115
PD:STD AHTD MON. STAMPED PN:115 LIGHT

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

SURVEY BASELINE N 82°28'04" E
733.31'

PN:117
PD:STD AHTD MON. STAMPED PN:117 LIGHT

630+00

PN:116
PD:STD AHTD MON. STAMPED PN:116 LIGHT

N 89° 33' 04" E

635+00

HWY. 412

PN:118
PD:STD AHTD MON. STAMPED PN:118 LIGHT

SURVEY BASELINE N 80°04'22" E
799.62'

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

SURVEY BASELINE S 76°10'44" E
633.91'

C.L. HWY. 412

PN:119
PD:STD AHTD MON. STAMPED PN:119 LIGHT

640+00

N 89° 33' 04" E

645+00

650+00

SURVEY CONTROL DETAILS

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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. | | CA1003 | 182 | 503 |

② SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

C.L. HWY. 412
P.I. = 664+55.55
Δ = 24° 38' 29" (LT)
D = 1° 22' 30"
T = 910.12'
L = 1,792.09'
R = 4,166.97'
P.C. = 655+45.43
P.T. = 673+37.52
e = 0.040'/'
Ls = 540'

ALL BEARINGS ARE GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

SURVEY BASELINE S 88°16'16" E
742.51'

N 89° 33' 04" E

PC 655+45.43

655+00

8033

PN#120
PD=STD AHTD MON. STAMPED PN#120 LIGHT

660+00

C.L. HWY. 412

665+00

SURVEY BASELINE S 88°43'20" E
676.10'

SURVEY BASELINE N 51°37'18" E
444.18'

8034

PN#121
PD=STD AHTD MON. STAMPED PN#121 LIGHT

PI 664+55.55

HWY. 412

C.L. HWY. 412
P.I. = 664+55.55
Δ = 24° 38' 29" (LT)
D = 1° 22' 30"
T = 910.12'
L = 1,792.09'
R = 4,166.97'
P.C. = 655+45.43
P.T. = 673+37.52
e = 0.040'/'
Ls = 540'

SURVEY BASELINE N 26°48'51" E
109.29'

ALL BEARINGS ARE GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

PN#122
PD=STD AHTD MON. STAMPED PN#122 LIGHT

SURVEY BASELINE N 51°37'18" E
444.18'

SURVEY BASELINE N 83°40'47" E
392.35'

670+00

PT 673+37.52

N 64° 54' 35" E

8036

675+00

N 64° 54' 35" E

C.L. HWY. 412

680+00

PN#123
PD=STD AHTD MON. STAMPED PN#123 LIGHT

SURVEY CONTROL DETAILS

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|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 183 | 503 |

② SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

20+00
8097
N 89° 22' 32" W
POC 20+03.26
8096
PN:63
PD:2"ALUM CAP 5/8RBR
PT 17+50.72
P.I. 15+62.16
8094
15+00
SURVEY BASELINE N 25°48'51" E
109.29'
SURVEY BASELINE S 89°18'27" E
731.41'
PN:64
PD:2"ALUM CAP 5/8RBR
SURVEY BASELINE N 87°41'44" E
825.15'

ALL BEARINGS ARE GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

C.L. EAST CONNECTOR
P.I. = 15+62.16
Δ = 64° 17' 08" (LT)
D = 15° 00' 00"
T = 240.00'
L = 428.57'
R = 381.97'
P.C. = 13+22.15
P.T. = 17+50.72
e = 0.086'/'
Ls = 250'

PC 13+22.15
8093
C.L. EAST CONNECTOR
N 25° 05' 25" W
C.L. HWY. 412
N 64° 54' 35" E
680+00
8092
10+00
685+00
8037
PC 686+03.07
690+00

STA. 683+80.00 US 412 =
STA. 10+00.00 EAST
CONNECTOR ROAD
∢ = 90° 00' 00"

C.L. HWY. 412
P.I. = 695+31.09
Δ = 25° 06' 39" (RT)
D = 1° 22' 30"
T = 928.02'
L = 1,826.23'
R = 4,166.97'
P.C. = 686+03.07
P.T. = 704+29.31
e = 0.040'/'
Ls = 540'

SURVEY CONTROL DETAILS

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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. | | CA1003 | 184 | 503 |

② SURVEY CONTROL DETAILS

C.L. HWY. 412
P.I. = 695+31.09
Δ = 25° 06' 39" (RT)
D = 1° 22' 30"
T = 928.02'
L = 1,826.23'
R = 4,166.97'
P.C. = 686+03.07
P.T. = 704+29.31
e = 0.040'/'
Ls = 540'

POT 21+12.63
8082

CR 218
N 0° 47' 03" E
20+00

CR 218
N 0° 47' 03" E

C.L. CR 218

SURVEY BASELINE N 87°41'44" E
825.15'

PI 695+31.09

PN:65
PD:2"ALUM CAP 5/8RBR

8038

SURVEY BASELINE S 86°38'25" E
781.46'

C.L. HWY. 412

695+00

700+00

10+00

8081

STA. 700+50.75 US 412 =
STA. 10+00.00 CR 218
∡ = 84° 01' 52"

S 89° 58' 46" E

8040

705+00

PN:66
PD:2"ALUM CAP 5/8RBR

PT 704+29.31

SURVEY BASELINE S 86°31'12" E
635.99'

HWY. 412

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

C.L. HWY. 412

710+00

S 89° 58' 46" E

715+00

720+00

SURVEY BASELINE N 87°43'19" E
931.74'

GPS
PN:101
PD:AHTD GPS 280020A

CTL
PN:67
PD:2"ALUM CAP 5/8RBR

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

C.L. HWY. 412

SURVEY CONTROL DETAILS

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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. | | CA1003 | 185 | 503 |

② SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

C.L. HWY. 412

SURVEY BASELINE S 89°56'52" E
999.78'

725+00

S 89° 58' 46" E

730+00

735+00

SURVEY BASELINE S 89°54'23" E
1061.22'

PN=68
PD=2"ALUM CAP 5/8RBR

HWY. 412

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

C.L. HWY. 412

740+00

S 89° 58' 46" E

745+00

750+00

SURVEY BASELINE N 89°50'43" E
1007.31'

PN=69
PD=2"ALUM CAP 5/8RBR

PC 747+83.01

8041

8042

PRC 751+08.26

8044

PN=70
PD=2"ALUM CAP 5/8RBR

PI 749+45.73

C.L. HWY. 412
P.I. = 756+32.88
Δ = 5° 14' 33" (RT)
D = 0° 30' 00"
T = 524.62'
L = 1,048.51'
R = 11,459.16'
P.C. = 751+08.26
P.T. = 761+56.77
e = N/A
Ls = N/A

C.L. HWY. 412
P.I. = 749+45.73
Δ = 4° 52' 43" (LT)
D = 1° 30' 00"
T = 162.72'
L = 325.25'
R = 3,819.72'
P.C. = 747+83.01
P.T. = 751+08.26
e = 0.043'/'
Ls = 540'

SURVEY CONTROL DETAILS

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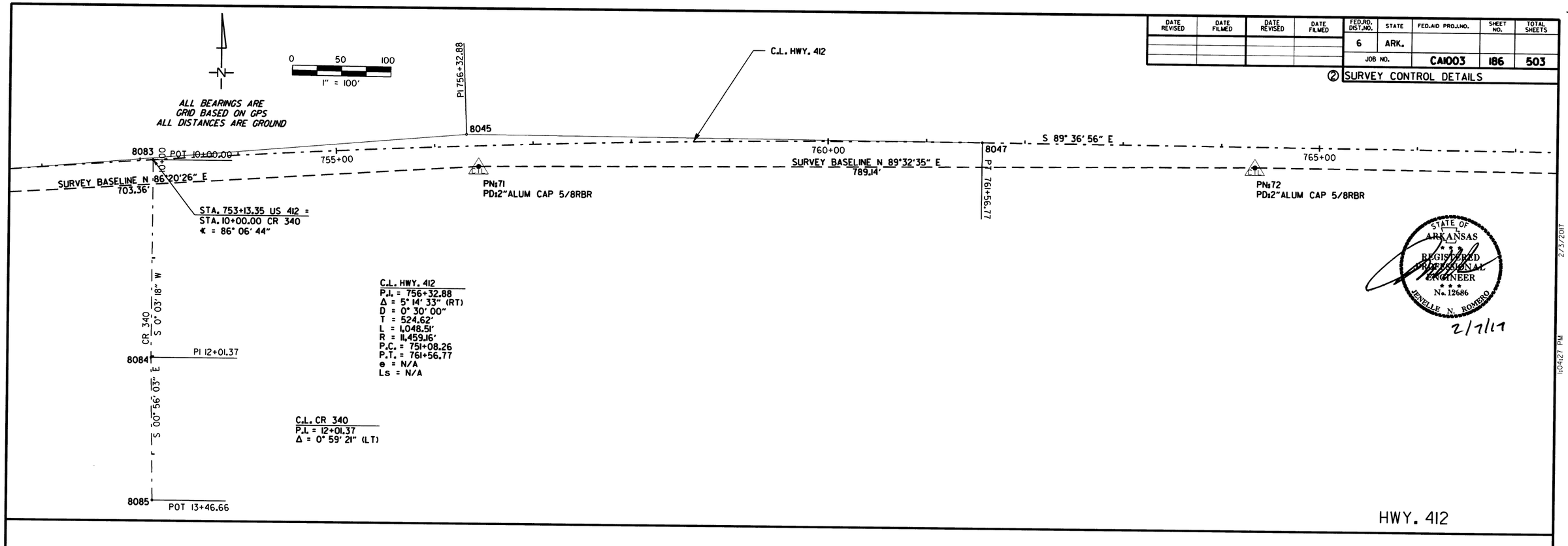
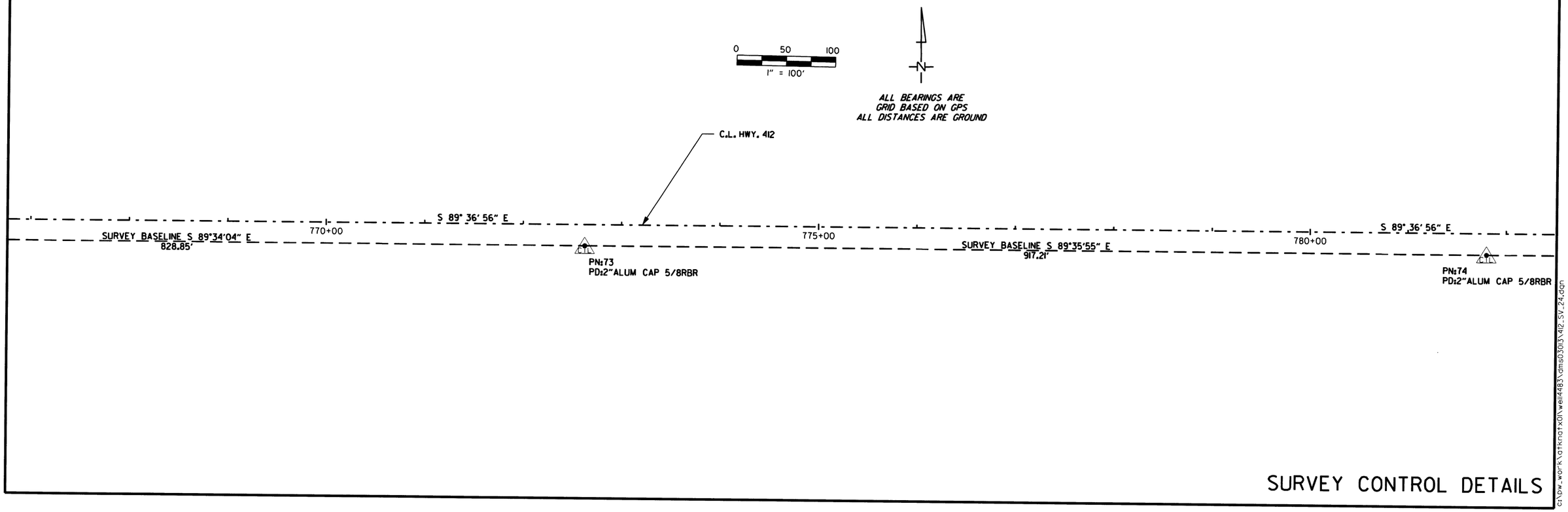
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 186 | 503 |

② SURVEY CONTROL DETAILS

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|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 187 | 503 |

② SURVEY CONTROL DETAILS

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

C.L. HWY. 412

785+00
SURVEY BASELINE S 89°42'06" E
826.97'

790+00
PN:75
PD:2"ALUM CAP 5/8RBR

S 89° 36' 56" E

SURVEY BASELINE S 89°29'58" E
642.43'

795+00
PN:76
PD:2"ALUM CAP 5/8RBR

HWY. 412

ALL BEARINGS ARE
GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

C.L. HWY. 412

PC 800+59.57

PT 802+47.21

S 89° 36' 56" E

800+00
SURVEY BASELINE S 89°46'43" E
685.31'

8048

8049
PI

8051

PI 801+53.39

805+00
PN:77
PD:2"ALUM CAP 5/8RBR

N 89° 54' 55" E

SURVEY BASELINE N 89°57'35" E
858.91'

810+00
PN:78
PD:2"ALUM CAP 5/8RBR

C.L. HWY. 412
P.I. = 801+53.39
Δ = 0° 28' 09" (LT)
D = 0° 15' 00"
T = 93.82'
L = 187.65'
R = 22,918.31'
P.C. = 800+59.57
P.T. = 802+47.21
e = N/A
Ls = N/A

SURVEY CONTROL DETAILS

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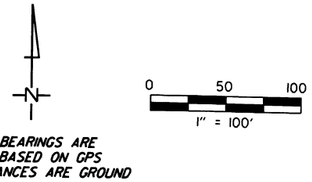
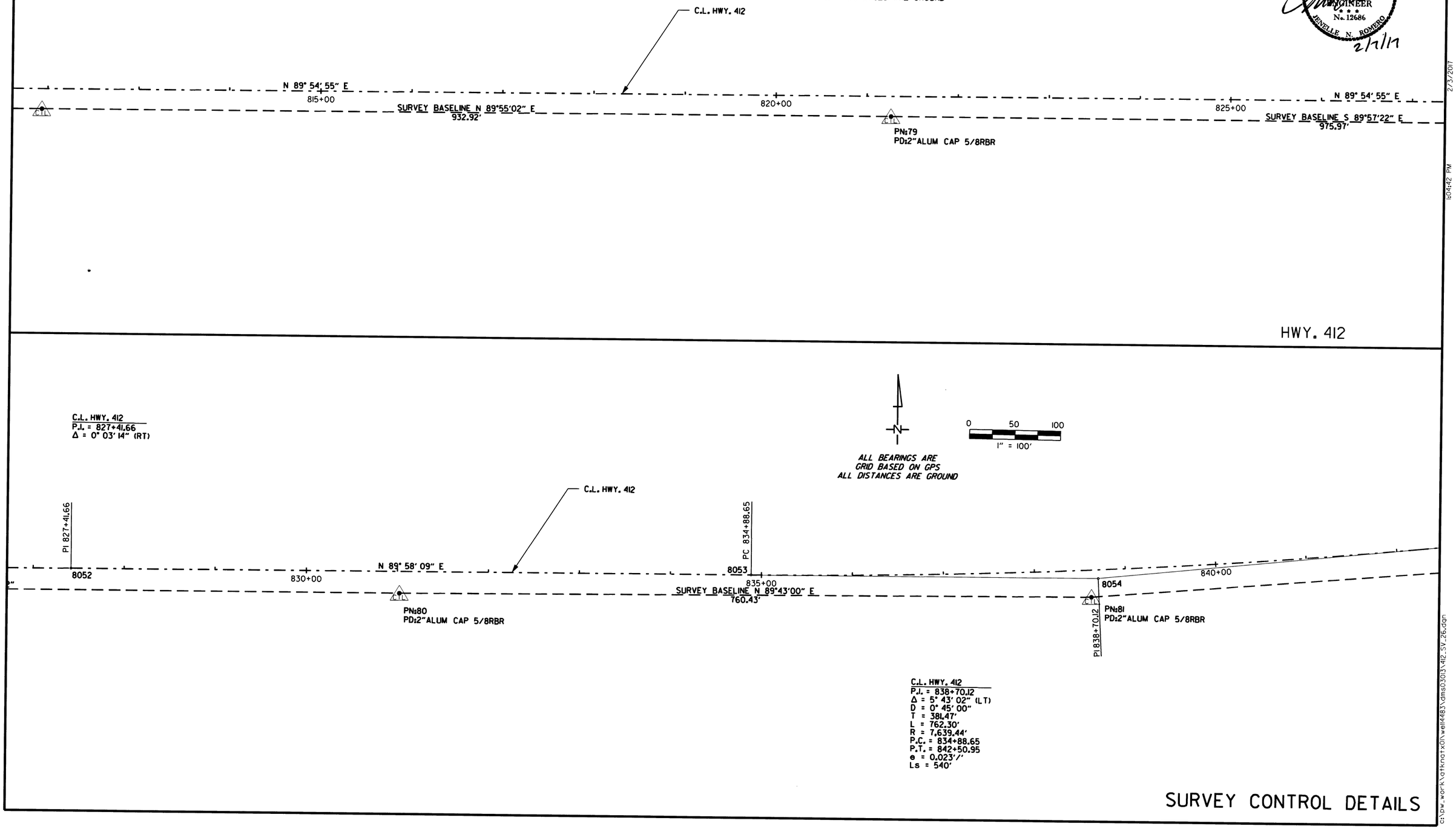
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 188 | 503 |

② SURVEY CONTROL DETAILS

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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. | | CA1003 | 189 | 503 |

② SURVEY CONTROL DETAILS

C.L. HWY. 412
P.I. = 838+70.12
Δ = 5° 43' 02" (LT)
D = 0° 45' 00"
T = 381.47'
L = 762.30'
R = 7,639.44'
P.C. = 834+88.65
P.T. = 842+50.95
e = 0.023'/'
Ls = 540'

ALL BEARINGS ARE GRID BASED ON GPS
ALL DISTANCES ARE GROUND

0 50 100
1" = 100'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

C.L. HWY. 412

PT 842+50.95

8056

845+00

N 84° 15' 07" E

850+00

8057

855+00

STA. 853+01.68
END JOB CA1003
LOG MILE 8.31

SURVEY BASELINE N 85°24'38" E
993.14'

PN:82
PD:2"ALUM CAP 5/8RBR

SURVEY BASELINE N 85°25'45" E
872.95'

HWY. 412

620+00

SURVEY BASELINE N 88°39'25" E
316.13'

N 89° 33' 04" E

C.L. HWY. 412

0 50 100
1" = 100'

ALL BEARINGS ARE GRID BASED ON GPS
ALL DISTANCES ARE GROUND

C.L. HWY. 228
P.I. = 33+36.97
Δ = 15° 07' 23" (LT)
D = 10° 00' 00"
T = 75.66'
L = 150.45'
R = 572.96'
P.C. = 32+61.31
P.T. = 34+11.76
e = 0.056'/'
Ls = 205'

C.L. HWY. 228
P.I. = 25+67.95
Δ = 38° 15' 15" (LT)
D = 24° 00' 00"
T = 83.23'
L = 160.24'
R = 238.73'
P.C. = 24+84.72
P.T. = 26+44.96
e = 0.040'/'
Ls = 100'

C.L. EXISTING HWY. 228

PI 22+34.27

PI 30+09.12

C.L. HWY. 228

8067

PC 29+26.13

8068

30+00

8070

PT 30+85.83

N 52° 42' 09" E

PC 32+61.31

8071

PT 34+11.76

8074

8072

PI 33+36.97

N 37° 34' 46" E

8075

35+00

N 37° 34' 46" E

8058

20+00

8059

PC 21+58.08

8060

8062

PT 23+09.55

N 52° 48' 19" E

PC 24+84.72

8063

25+00

PT 26+44.96

8066

8064

PI 25+67.96

PN#15
PD:STD/AHTD MON. STAMPED PN#15 LIGHT

N 14° 35' 04" E

STA. 622+72.02 HWY 412 =
STA. 27+86.35 HWY 228
∡ = 75°00'00"

C.L. HWY. 228
P.I. = 30+09.12
Δ = 38° 08' 05" (RT)
D = 10° 00' 00"
T = 196.13'
L = 381.47'
R = 572.96'
P.C. = 28+26.13
P.T. = 32+07.60
e = 0.040'/'
Ls = 100'

SURVEY BASELINE N 86°21'31" E
730.65'

625+00

STA. 20+28.82
BEGIN HWY. 228

C.L. HWY. 228
P.I. = 22+34.27
Δ = 15° 13' 32" (RT)
D = 10° 00' 00"
T = 76.18'
L = 151.47'
R = 572.96'
P.C. = 21+58.08
P.T. = 23+09.55
e = 0.056'/'
Ls = 205'

HWY. 228

SURVEY CONTROL DETAILS

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

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 190 | 503 |

② PLAN & PROF STA 90+00-105+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
DENELLE N. ROMERO
2/7/17

STA. 93+72 IN PLACE
36" X 63' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 68' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 1.0 CU. YD.

WHITE OAK SLOUGH

SPECIAL FLOOD HAZARD AREA
STA. 93+50 TO 99+18

STA. 93+50.00
BEGIN JOB CA1003
LOG MILE 1.73

+32.88
100.99'

EXISTING ROW

16'

STA. 94+34 IN PLACE
DBL. 11' X 10' X 114' R.C. BOX CULVERT
WITH 3rd WINGS LT. & RT.
RETAIN & EXTEND R.C. BOX 2' LT. & 4' RT.
Q50 = 326 CFS D.A. = 758 ACRES
SPAN = 24.67'

C.L. HWY. 412
P.I. = 96+19.91
Δ = 0° 6' 58" (RT)

SPECIAL FLOOD HAZARD AREA

C.L. HWY. 412

LIMITS OF CONSTRUCTION

+03.80
100'

+03.80
95'

PROPOSED ROW

EXISTING ROW

PI 96+19.91

24'

24'

8'

8'

N 65° 44' 50" E

90+00

95+00

N 65° 51' 49" E

100+00

105+00

SPECIAL FLOOD HAZARD AREA

PN1900

100' TRANSITION TO EXISTING PVMT

EXISTING ROW

16'

+66.38
98.88'

PN1100
POST 600NL. TRIG ELEV

STA. 95+15 IN PLACE
24" X 32' C.M. PIPE CULVERT
RT. SIDE DRAIN
(RETAIN)
CONSTRUCT APPR. = 1.0 CU. YD.

LIMITS OF CONSTRUCTION

EXISTING ROW

PROPOSED ROW

16'

STA. 103+76 IN PLACE
30" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 17.5 CU. YD.

+03.80
100'

+03.80
85'

HWY. 412

3/2/2018

9:58:49 AM

280
270
260
250

STA. 93+50.00
BEGIN JOB CA1003
LOG MILE 1.73

96+00.00
262.29 RT.

EXISTING GROUND LINE

RT. DITCH GRADE +0.07%

LT. DITCH GRADE +0.23%

96+00.00
259.02 LT.

STA. 94+34
F.L. INLET (LT.) = 255.63
F.L. OUTLET (RT.) = 255.21

90+00
95+00
100+00
105+00

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

| 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. | | CA1003 | 191 | 503 |

② PLAN & PROF STA 105+00-120+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

LIMITS OF CONSTRUCTION
C.L. HWY. 412
PROPOSED ROW
EXISTING ROW
N 65° 51' 49" E
105+00
110+00
115+00
120+00
PC 111+48.87
PI 115+65.69
PT 119+69.65
PI 111+99
+00 100'
+74.07 95'
+50 95'
+00 85'
+00 80'
+30.45 75'
+00 75'
+50 75'
+00 75'
+00 85'
81'
24'
11'
24'
81'
S 89° 30' 48" E
LIMITS OF CONSTRUCTION

STA. 111+99 IN PLACE
24" X 67.5' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. & EXTEND R.C. PIPE
24' LT. AND 32' RT.
WITH F.E.S. LT. & RT.
(CLASS IV) (TYPE 3 BEDDING)
050= 14.2 CFS D.A.= 3.2 ACRES
24" R.C. PIPE = 64 LIN. FT.
24" F.E.S. = 2 EACH

C.L. HWY. 412
P.I. = 115+65.69
Δ = 24° 37' 24" (RT)
D = 3° 00' 00"
T = 416.82'
L = 820.77'
R = 1,909.86'
P.C. = 111+48.87
P.T. = 119+69.65
e = 0.077'/'
Ls = 540'

HWY. 412

STA. 107+43.87 BEGIN SUPERELEVATION
STA. 112+83.87 MAX. SUPERELEVATION (0.077 FT./FT.)
STA. 118+34.65 MAX. SUPERELEVATION (0.077 FT./FT.)
STA. 123+74.65 END SUPERELEVATION

EXISTING GROUND LINE
111+98.00 263.40 RT.
112+00.00 262.85 LT.
STA. 111+99
F.L. INLET (RT.) = 263.39
F.L. OUTLET (LT.) = 263.15
RT. DITCH GRADE +0.07%
LT. DITCH GRADE +0.23%
RT. DITCH GRADE +0.04%
LT. DITCH GRADE +0.17%

280
270
260
250
105+00
110+00
115+00
120+00

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

| 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. | | CA1003 | 192 | 503 |

② PLAN & PROF STA 120+00-135+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

STA. 122+09
CONSTRUCT APPR. = 5.7 CU. YD.

LIMITS OF CONSTRUCTION

C.L. HWY. 412

+00 85'

PROPOSED ROW

16'

+32.33 75'

HP

EXISTING ROW

+01.20 84.61'

+01.20 93.40'

+27.20 93.40'

+27.20 84.80'

TCE 85'

PROPOSED ROW

EXISTING ROW

120+00

PT

125+00

S 89° 30' 48" E

130+00

135+00

24'

8'

24'

8'

EXISTING ROW

16'

HP

PROPOSED ROW

+30 75'

+50 80'

EXISTING ROW

PROPOSED ROW

STA. 121+98 IN PLACE
24" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 15.0 CU. YD.

LIMITS OF CONSTRUCTION

POND

HWY. 412

280
270
260

LT. DITCH GRADE +0.17%

120+59.85
264.11' LT.

LT. DITCH GRADE +0.88%

121+90.20
265.25' LT.

LT. DITCH GRADE -0.34%

RT. DITCH GRADE +0.04%

124+50.00
264.36' LT.

EXISTING GROUND LINE

125+64.94
263.89' RT.

LT. DITCH GRADE -0.10%

RT. DITCH GRADE -0.10%

280
270
260
250

120+00
125+00
130+00
135+00

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

| 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. | | CA1003 | 193 | 503 |

② PLAN & PROF STA 135+00-150+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

STA. 135+15 IN PLACE
24" X 20' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 16.4 CU. YD.

+01.20 84.68' | +01.20 93.40' | +21.20 93.40' | +21.20 84.80' | +53.13 85°

TCE

16'

PROPOSED ROW

EXISTING ROW

24' 8" | 24' 11" | 24' 8"

135+00

EXISTING ROW

16'

PROPOSED ROW

16'

+55.87 85°

LIMITS OF CONSTRUCTION

C.L. HWY. 412

S 89° 30' 48" E

140+00

145+00

LIMITS OF CONSTRUCTION

+85.33 90°

PROPOSED ROW

EXISTING ROW

150+00

EXISTING ROW

16'

+87.84 90°

PROPOSED ROW

STA. 135+82 IN PLACE
24" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 17.8 CU. YD.

STA. 137+40 IN PLACE
24" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 20.2 CU. YD.

STA. 147+47 IN PLACE
24" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 20.0 CU. YD.

HWY. 412

280
270
260

EXISTING GROUND LINE

LT. DITCH GRADE -0.10%
RT. DITCH GRADE -0.10%

135+80.00
262.89' RT.

135+00 | 140+00 | 145+00 | 150+00

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

| REMOVAL AND DISPOSAL OF GUARDRAIL | REM. & DISP. OF IMPACT ATTENUATION BARRIER | REM. & DISP. OF APPROACH SLAB AND GUTTERS |
|---|---|---|
| | EA. | EA. |
| STA. 161+68 - STA. 161+90 (RT. SHLDR.) | 1 | 1 |
| STA. 161+68 - STA. 161+90 (LT. SHLDR.) | 1 | |
| STA. 162+48 - STA. 162+68 (RT. SHLDR.) | 1 | |
| STA. 162+48 - STA. 162+68 (LT. SHLDR.) | 1 | 1 |

STA. 161+94.60 - STA. 162+41.10
(46.5' X 27' CLEAR ROADWAY BRIDGE)
CONSISTING OF 1 SPAN CONC. DECK WITH STEEL BEAMS AND CONC. PILES
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 2) = 1.00 LUMP SUM

| 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. | | CA1003 | 194 | 503 |

② PLAN & PROF STA 150+00-165+00

STA. 150+97 IN PLACE
27" X 68' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE & CONSTRUCT
30" X 122' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
Q50= N/A CFS D.A.= N/A ACRES
30" R.C. PIPE = 122 LIN. FT.
30" F.E.S = 2 EACH

STA. 162+20 CONSTRUCT
TRIP. 12' X 12' X 121' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
Q50 = 1546 CFS D.A. = 4243 ACRES
SPAN = 40.00'

STA. 163+11 IN PLACE
30" X 72' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 52' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =
58.0 CU. YD.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

STA. 161+48 IN PLACE
24" X 72' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 62' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 91.2 CU. YD.

STA 159+25.00
END NOTCH &
WIDENING SECTION
BEGIN FULL DEPTH
RECONSTRUCTION

LIMITS OF CONSTRUCTION

C.L. HWY. 412

FRY DITCH

PROPOSED ROW

EXISTING ROW

+75 95'

+50 120'

+50 105'

16'

24' 8"

24' 11"

8'

150+00

155+00

160+00

165+00

S 89° 30' 48" E

PN 902

24' A.M. 3.04 16.5 W 27.2 SPAN BR #889

+00 100'

+00 115'

24'

LIMITS OF CONSTRUCTION

CONCRETE DITCH PAVING (TYPE B)

| STA. | STA. | SIDE | "W" | SQ. YDS. |
|---|---|---|---|---|
| 161+73.00 | 161+87.00 | LT. | 6' | 11 |
| 162+59.00 | 162+79.00 | RT. | 6' | 16 |
| 162+59.00 | 162+83.00 | LT. | 6' | 19 |

STA. 161+44 IN PLACE
24" X 86' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 64' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 77.3 CU. YD.

STA. 163+06 IN PLACE
24" X 48' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 64' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 92.6 CU. YD.

HWY. 412

STA 164+09.42
END FULL DEPTH
RECONSTRUCTION
BEGIN WIDENING

290
280
270
260

STA 159+25.00
BEGIN FULL DEPTH
RECONSTRUCTION
EL.=271.71

159+71.63
EL. = 271.86

VPC 160+35.00
EL. = 272.21'

PROFILE GRADE

VPT 162+15.00
EL. = 272.39'

STA 164+09.42
END FULL DEPTH
RECONSTRUCTION
EL.=271.69

(+)0.32 %

(+)0.55 %

(-)0.35 %

STA = 161+25.00
EL = 272.70'
SSD = 1289'
ex = -0.20'
K = 200
L = 180.00'

151+00.00
261.71 LT.

151+00.00
261.36 RT.

LT. DITCH GRADE -0.10%

RT. DITCH GRADE -0.10%

STA. 150+97
F.L. INLET (LT.) = 261.66
F.L. OUTLET (RT.) = 261.03

EXISTING GROUND LINE

LT. DITCH GRADE -0.29%

RT. DITCH GRADE -0.18%

161+24.00
259.52 RT.

RT. DITCH GRADE -6.06%

161+15.00
258.80 LT.

161+73.00
256.30 LT.

161+87.00
255.70 LT.

RT. DITCH GRADE -0.06%

162+59.00
255.70 LT.

162+83.00
257.16 LT.

LT. DITCH GRADE +0.16%

RT. DITCH GRADE +6.18%

163+29.00
260.00 RT.

163+37.47
260.40 LT.

$HW_{50}$ = 265.99'

LT. DITCH GRADE +0.16%

RT. DITCH GRADE +0.19%

CONC. DITCH PAVING LT. ONLY

2' FOUND. BKFL MATL

162+59.00
255.70 RT.

162+73.00
256.89 RT.

RT. DITCH GRADE +6.18%

CONC. DITCH PAVING LT. & RT.

STA. 162+20
F.L. INLET (LT.)= 255.70
F.L. OUTLET (RT.) = 255.70

150+00 155+00 160+00 165+00

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

| 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. | | CA1003 | 195 | 503 |

② PLAN & PROF STA 165+00-180+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/9/17

STA. 174+98 IN PLACE
18" X 20' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 16.8 CU. YD.

STA. 175+96 IN PLACE
24" X 59' R.C. PIPE CULVERT
REMOVE AND CONSTRUCT
30" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
Q50= 26.3 CFS D.A.= 84.5 ACRES
30" R.C. PIPE = 119 LIN. FT.
30" F.E.S. = 2 EA.

LIMITS OF CONSTRUCTION
C.L. HWY. 412
PROPOSED ROW
EXISTING ROW
+50 90°
+44.84 90°
16'
PROPOSED ROW
EXISTING ROW
PN:903
18"
24"
24"
8'
8'
165+00
170+00
S 89° 30' 48" E
175+00
180+00
EXISTING ROW
EXISTING ROW
PROPOSED ROW
PROPOSED ROW
+46.76 85°
LIMITS OF CONSTRUCTION

HWY. 412

290
280
270
260
PROPOSED ELEV
EXISTING ELEV
LT. DITCH GRADE +0.16%
RT. DITCH GRADE +0.19%
EXISTING GROUND LINE
176+00.00 262.44 LT.
175+91.00 262.39 RT.
STA. 175+96
F.L. INLET (LT.) = 262.42
F.L. OUTLET (RT.) = 262.38
RT. DITCH GRADE +0.15%
LT. DITCH GRADE +0.10%
165+00
170+00
175+00
180+00

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

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 196 | 503 |

② PLAN & PROF STA 180+00-195+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

STA. 188+66 IN PLACE
36" X 24" X 25' C.M. ARCH
LT. SIDE DRAIN PIPE CULVERT
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 19.1 CU. YD.

LIMITS OF CONSTRUCTION

C.L. HWY. 412

PROPOSED ROW

EXISTING ROW

24' 8'

8' 24'

180+00

185+00

S 89° 30' 48" E

190+00

195+00

EXISTING ROW

16'

PROPOSED ROW

LIMITS OF CONSTRUCTION

STA. 180+37 IN PLACE
24" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 11.3 CU. YD.

+06.10 80'

+06.10 100'

PROPOSED ROW

EXISTING ROW

16'

HP

HP

+00 80'

24'

+50 90'

EXISTING ROW

PROPOSED ROW

+06.10 100'

STA. 188+55 IN PLACE
18" X 15' R.C. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 18.9 CU. YD.

STA. 188+84
BEGIN 6' FLAT
BOTTOM DITCH

HWY. 412

280
270
260

EXISTING GROUND LINE

RT. DITCH GRADE +0.15%
LT. DITCH GRADE +0.10%

188+36.00 RT. 264.25

188+18.00 LT. 263.68

188+84.00 RT. 261.88

188+00.00 LT. 264.89

LT. DITCH GRADE -0.25%

RT. DITCH GRADE +0.05%

280
270
260
250

180+00
185+00
190+00
195+00

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

| 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. | | CA1003 | 197 | 503 |

② PLAN & PROF STA 195+00-210+00

STA. 196+96 IN PLACE
TRIP. 5' X 2' X 52' R.C. BOX CULVERT
WITH 3#1 WINGS LT. & RT.
REMOVE AND CONSTRUCT
TRIP. 36" X 119' R.C. PIPE CULVERT
(CLASS IV)(TYPE 3 BEDDING)
WITH F.E.S. LT. & RT.
Q50= 38.4 CFS D.A.= 104.6 ACRES
36" R.C. PIPE= 357 LIN. FT
36" FES= 6 EA.

C.L. HWY. 412
P.I. = 208+06.74
Δ = 2° 49' 00" (RT)
D = 0° 30' 00"
T = 281.73'
L = 563.35'
R = 11,459.16'
P.C. = 205+25.00
P.T. = 210+88.36
e = N/A
Ls = N/A

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

LIMITS OF CONSTRUCTION
C.L. HWY. 412
EXISTING ROW
PROPOSED ROW
EXISTING ROW
PROPOSED ROW
EXISTING ROW
PN=904
24'
8'
11'
24'
8'
S 89° 30' 48" E
195+00
200+00
205+00
210+00
PI 208+06.74
PC 205+25.00
+06.61 85' LT.
+06.61 100' LT.
+06.61 100' LT.
+06.61 100' LT.
+06.61 80' LT.
32'
18'

STA. 196+96
END 6' FLAT
BOTTOM DITCH

STA. 197+00
BEG. 2' FLAT
BOTTOM DITCH

LIMITS OF CONSTRUCTION

STA. 201+50
INSTALL 30" X 54' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =38.0 CU. YD.

STA. 202+18 IN PLACE
24" X 36' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 34.0 CU. YD.

STA. 207+00
END 2' FLAT
BOTTOM DITCH

HWY. 412

280
270
260
250

EXISTING GROUND LINE

196+96.00 LT. 262.86

LT. DITCH GRADE -0.25%
RT. DITCH GRADE +0.05%

STA. 196+96
F.L. INLET (LT.) = 262.85
F.L. OUTLET (RT.) = 262.26

204+50.00 LT. 262.86

208+00.00 LT. 262.86

RT. DITCH GRADE +0.09%
LT. DITCH GRADE +0.00%
LT. DITCH GRADE +0.27%

195+00
200+00
205+00
210+00

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

| 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. | | CA1003 | 198 | 503 |

② PLAN & PROF STA 210+00-225+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

STA. 210+14 IN PLACE
24" X 12" X 20' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 15.9 CU. YD.

C.L. HWY. 412
P.I. = 208+06.74
Δ = 2° 49' 00" (RT)
D = 0° 30' 00"
T = 281.73'
L = 563.35'
R = 11,459.16'
P.C. = 205+25.00
P.T. = 210+88.36
e = N/A
Ls = N/A

STA. 215+30 IN PLACE
24" X 20' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 12.5 CU. YD.

LIMITS OF CONSTRUCTION

16' PROPOSED ROW
EXISTING ROW
HP
16'
+00 75'
C.L. HWY. 412
PROPOSED ROW
EXISTING ROW
8' 24' 11' 24' 8'
210+00
P.T. 208+88.36
215+00
S 86° 41' 47" E
220+00
225+00
EXISTING ROW
HP
EXISTING ROW
24' PROPOSED ROW
PROPOSED ROW

STA. 216+70 IN PLACE
24" X 24' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 13.7 CU. YD.

16' 16'

STA. 217+56 IN PLACE
18" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 34' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 14.3 CU. YD.

LIMITS OF CONSTRUCTION

STA. 223+99 IN PLACE
27" X 18" X 25' C.M. ARCH PIPE
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 27.3 CU. YD.

HWY. 412

280
270
260

EXISTING GROUND LINE

215+00.00 264.72 LT.

LT. DITCH GRADE +0.27%
RT. DITCH GRADE +0.09%

HP

LT. DITCH GRADE -0.17%

LT. DITCH GRADE -0.17%
RT. DITCH GRADE -0.15%

214+00.00 263.87 RT.

214+50.00 264.34 RT.

RT. DITCH GRADE +1.34%

280
270
260
250

210+00 215+00 220+00 225+00

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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. | | CA1003 | 199 | 503 |

② PLAN & PROF STA 225+00-240+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/5/18

STA. 228+96 IN PLACE
27" X 18" X 20' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 44.0 CU. YD.

STA. 229+98 IN PLACE
24" X 59' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. & EXTEND R.C. PIPE
30' LT. AND 30' RT.
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
050= N/A D.A.= N/A
24" R.C. PIPE = 68 LIN. FT.
24" F.E.S. = 2 EA.

STA. 237+78 IN PLACE
30" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE

LIMITS OF CONSTRUCTION

PROPOSED ROW

EXISTING ROW

+58.30 80' 24'

PN:905 TBM

C.L. HWY. 412

S 86° 41' 47" E

225+00 230+00 235+00 240+00

+00 90'

+68.01 85'

+25 85'

+16 81.59' +16 92' +54 80.16' +54 92'

+58.32 80'

+25 81.12' +25 94' +60 81.71' +60 94'

+36 82.99' +36 94'

+79 83.71' +79 94'

24' TCE 16' TCE 24' TCE

HP

STA. 231+37 IN PLACE
18" X 25' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 21.8 CU. YD.

STA. 232+45 IN PLACE
18" X 25' R.C. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 18.5 CU. YD.

STA. 233+55 IN PLACE
18" X 25' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 28.7 CU. YD.

HWY. 412

280 270 260 250

RT. DITCH GRADE +2.00%

230+00.00 RT. 262.28

230+50.00 RT. 263.28

230+00.00 LT. 262.10

STA. 229+98
F.L. INLET (RT.) = 262.28
F.L. OUTLET (LT.) = 262.10

RT. DITCH GRADE -0.15%
LT. DITCH GRADE -0.17%

RT. DITCH GRADE -0.26%
LT. DITCH GRADE -0.39%

234+00.00 RT. 262.38

EXISTING GROUND LINE

RT. DITCH GRADE -0.20%
LT. DITCH GRADE -0.19%

225+00 230+00 235+00 240+00

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

| 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. | | CA1003 | 200 | 503 |

② PLAN & PROF STA 240+00-255+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

STA. 242+55 IN PLACE
24" X 69' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 74' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 209.1 CU. YD.

STA. 243+04.50 - STA. 243+51.00
(46.5' X 27' CLEAR ROADWAY BRIDGE)
CONSISTING OF 1 SPAN CONC. DECK WITH
STEEL BEAMS AND CONC. PILES
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 3) = 1.00 LUMP SUM

STA. 244+09 IN PLACE
24" X 59' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 54' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 106.7 CU. YD.

STA 240+66.63
END WIDENING
BEGIN FULL DEPTH
RECONSTRUCTION

+90.76
110'

PROPOSED ROW

24'

KELLOW DITCH

24'

STA 244+16
BEGIN 2' FLAT
BOTTOM DITCH

STA 244+64.51
END FULL DEPTH
RECONSTRUCTION
BEGIN WIDENING

C.L. HWY. 412

LIMITS OF CONSTRUCTION

STA. 252+97 IN PLACE
24" X 59' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. & EXTEND R.C. PIPE
30' LT. AND 30' RT.
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
050= N/A D.A.= N/A
24" R.C. PIPE = 68 LIN. FT.
24" F.E.S = 2 EA.

STA. 252+97
END 2' FLAT
BOTTOM DITCH

PROPOSED ROW

EXISTING ROW

PN#906

PN#907

24'

8'

24'

8'

S 86° 41' 47" E

240+00

245+00

250+00

255+00

EXISTING ROW

EXISTING ROW

+50
95'

PROPOSED ROW

+03.31
105'

24'

32'

16'

PROPOSED ROW

LIMITS OF CONSTRUCTION

STA. 252+36 IN PLACE
24" X 20' C.I. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 16.9 CU. YD.

STA. 242+51 IN PLACE
24" X 70' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 62' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 118.5 CU. YD.

STA. 243+27 CONSTRUCT
TRIP. 10' X 10' X 122' R.C. BOX CULVERT
WITH 3# WINGS LT. & RT.
5° RT. FWD. SKEW
050 = 417 CFS D.A. = 1037 ACRES
SPAN = 33.55'

STA. 244+10 IN PLACE
27" X 60' C.P. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
36" X 66' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 137.2 CU. YD.

CONCRETE DITCH PAVING (TYPE B)

| STA. | STA. | SIDE | "W" | SQ. YDS. |
|---|---|---|---|---|
| 242+90.00 | 243+02.00 | RT. | 6' | 9 |
| 243+63.00 | 243+72.00 | RT. | 6' | 7 |
| 243+48.00 | 243+63.00 | LT. | 6' | 12 |

HWY. 412

280
270
260

STA 240+66.63
BEGIN FULL DEPTH
RECONSTRUCTION
EL.=270.47

VPT 242+57.00
EL. = 270.84'

PROFILE
GRADE

STA 244+64.51
END FULL DEPTH
RECONSTRUCTION
EL.=270.43

EXISTING
GROUND LINE

(+)0.55 %

(-)0.20 %

VPC 240+77.00
EL. = 270.53'

STA = 241+67.00
EL = 271.02'
SSD = 1529'
ex = -0.17'
K = 240
L = 180.00'

242+39.00
260.73 RT.

RT. DITCH GRADE -6.1%

242+90.00
257.60 RT.

243+02.00
256.88 RT.

243+48.00
257.00 LT.

243+63.00
257.97 LT.

LT. DITCH GRADE +6.4%

244+08.00
260.85 LT.

HW$_{50}$ = 262.68'

RT. DITCH GRADE -0.20%

LT. DITCH GRADE -0.19%

RT. DITCH GRADE 0.11%

LT. DITCH GRADE 0.07%

242+25.05
259.77 LT.

LT. DITCH GRADE -4.8%

RT. DITCH GRADE +5.7%

CONC. DITCH PAVING RT. ONLY

242+97.00
256.52 LT.

243+63.00
256.88 RT.

243+72.00
257.40 RT.

244+25.00
260.44 RT.

CONC. DITCH PAVING LT. & RT.

2' FOUND. BKFL MATL

STA. 243+27
F.L. INLET (LT.) = 257.00
F.L. OUTLET (RT.) = 256.88

STA. 252+97
F.L. INLET (LT.) = 261.49
F.L. OUTLET (RT.) = 261.45

240+00
245+00
250+00
255+00

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

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 201 | 503 |

② PLAN & PROF STA 255+00-270+00

STA. 260+61 IN PLACE
18" X 24' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE

STA. 268+53
CONSTRUCT APPR. = 3.9 CU. YD.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
NEVELLE N. ROMERO
2/27/18

C.L. HWY. 412
P.I. = 269+19.91
Δ = 0° 09' 37" (LT)

C.L. HWY. 412

LIMITS OF CONSTRUCTION

+26.82
80'
PROPOSED ROW
EXISTING ROW
24' 8"
11'
24'
8"
EXISTING ROW
255+00
260+00
S 86° 41' 47" E
265+00
PI 269+19.91
S 86° 51' 24" E
270+00
+60.79
80'
24'
PROPOSED ROW
HP
EXISTING ROW
HP
EXISTING ROW
+36.38
85'
PROPOSED ROW
16'
20'
+69.79
75'
PROPOSED ROW

LIMITS OF CONSTRUCTION

STA. 262+42 IN PLACE
24" X 25' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 16.3 CU. YD.

STA. 268+63
CONSTRUCT APPR. = 5.3 CU. YD.

HWY. 412

280
270
260
250

EXISTING GROUND LINE

255+70.00
261.77 RT.
RT. DITCH GRADE +0.12%
LT. DITCH GRADE +0.07%
255+69.58
261.69 LT.

RT. DITCH GRADE +0.12%
LT. DITCH GRADE +0.16%

268+58.88
263.36 RT.
HP
RT. DITCH GRADE -0.32%
LT. DITCH GRADE -0.17%
268+57.80
263.35 LT.

255+00
260+00
265+00
270+00

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

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 202 | 503 |

② PLAN & PROF STA 270+00-285+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

STA. 282+97 IN PLACE
5' X 2' X 52' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
REMOVE AND CONSTRUCT
DBL. 36" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS IIIXTYPE 2 BEDDING)
050= 40.4 CFS D.A.= 90.2 ACRES
36" R.C. PIPE = 238 LIN. FT.
36" F.E.S. = 4 EA.

STA. 284+57 IN PLACE
24" X 20' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 41.0 CU. YD.

LIMITS OF CONSTRUCTION
C.L. HWY. 412
PROPOSED ROW
EXISTING ROW
24" F
270+00
275+00
280+00
285+00
S 86° 51' 24" E
24'
8'
PN 908
18'
+00
85°
+06.80
90°
20'
16'
PROPOSED ROW
EXISTING ROW
PROPOSED ROW
EXISTING ROW
PROPOSED ROW
LIMITS OF CONSTRUCTION

STA. 270+18 IN PLACE
18" X 21' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 15.4 CU. YD.

STA. 272+31 IN PLACE
18" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 36' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 15.2 CU. YD.

HWY. 412

280
270
260
250
EXISTING GROUND LINE
RT. DITCH GRADE -0.32%
LT. DITCH GRADE -0.17%
RT. DITCH GRADE -0.30%
LT. DITCH GRADE +0.16%
RT. DITCH GRADE -0.25%
273+50.00 26.80 RT.
283+00.00 259.00 LT.
284+00.00 258.55 RT.
STA. 282+97
F.L. INLET (LT.) = 259.00
F.L. OUTLET (RT.) = 258.80
270+00
275+00
280+00
285+00

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

| 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. | | CA1003 | 203 | 503 |

② PLAN & PROF STA 285+00-300+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

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STA. 291+30
CONSTRUCT APPR. = 40.6 CU. YD.

STA. 293+23 IN PLACE
18" X 40' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 56.7 CU. YD.

STA. 295+41 IN PLACE
24" X 40' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 50' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 57.5 CU. YD.

STA. 289+36 IN PLACE
42" X 40' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
48" X 62' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 96.7 CU. YD.

STA. 295+03 IN PLACE
42" X 30' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
48" X 58' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 100.3 CU. YD.

LIMITS OF CONSTRUCTION
C.L. HWY. 412
CR 615
PROPOSED ROW
EXISTING ROW
POND
+82.09 90'
+07.02 125'
+07.02 90'
+07.02 100'
+07.02 125'
+50 95'
+53.02 105'
+44.51 115'
18'
24'
22'
20'
16'
HP
RADIO
TOWER
285+00
290+00
295+00
300+00
S 86° 51' 24" E
24"
18"
24"
HWY. 412

EXISTING GROUND LINE
29+37.00 260.30 LT.
295+48.02 253.03 LT.
LT. DITCH GRADE +0.16%
LT. DITCH GRADE -0.31%
LT. DITCH GRADE -0.60%
RT. DITCH GRADE -0.25%

280
270
260
250

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

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 204 | 503 |

② PLAN & PROF STA 300+00-315+00

STA. 303+98 IN PLACE
TRIP. 5' X 3' X 60' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
REMOVE & CONSTRUCT
DBL. 36" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 2 BEDDING)
Q50= 39.5 CFS D.A.= 100.4 ACRES
36" R.C. PIPE = 238 LIN. FT.
36" F.E.S. = 4 EA.

SPECIAL FLOOD HAZARD AREA
STA. 301+44 TO 341+44

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

SPECIAL FLOOD HAZARD AREA

LIMITS OF CONSTRUCTION

EXISTING ROW

STA. 303+98
BEG. 5' FLAT
BOTTOM DITCH

C.L. HWY. 412

EXISTING ROW

24' | 8' | 24' | 8'

300+00

S 86° 51' 24" E

305+00

310+00

315+00

PN:909

PN:1106
PD:5.7 OONI

16'

EXISTING ROW

SPECIAL FLOOD HAZARD AREA

STA. 303+98
BEG. 5' FLAT
BOTTOM DITCH

LIMITS OF CONSTRUCTION

STA. 308+77 IN PLACE
24" X 22' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 24.0 CU. YD.

EXISTING ROW

SPECIAL FLOOD HAZARD AREA

HWY. 412

280
270
260

EXISTING GROUND LINE

303+09.40
254.48 LT.

LT. DITCH GRADE -0.60%

RT. DITCH GRADE -0.25%

303+98.00
253.65 RT.&LT.

STA. 303+98
F.L. INLET (LT.) = 253.65
F.L. OUTLET (RT.) = 253.65

RT. DITCH GRADE +0.07%

LT. DITCH GRADE +0.06%

300+00 305+00 310+00 315+00

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 205 | 503 |

② PLAN & PROF STA 315+00-330+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/16/17

SPECIAL FLOOD HAZARD AREA
STA. 301+44 TO 341+44

STA. 321+59 IN PLACE
24" X 30' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 15.6 CU. YD.

STA. 322+47 IN PLACE
20" X 20' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 33.8 CU. YD.

C.L. HWY. 412
P.I. = 322+26.98
Δ = 0° 02' 10" (RT)

EXISTING ROW
PROPOSED ROW
C.L. HWY. 412
+06.63 125'
+06.63 90'
+45.54 97.80'
+45.54 87.43'
+71.54 97.80'
+71.54 87.28'
TCE
16'
24'
+00 85'
HP
PI 322+26.98
STA. 321+35
END 5' FLAT
BOTTOM DITCH
SPECIAL FLOOD HAZARD AREA
LIMITS OF CONSTRUCTION
S 86° 51' 24" E
S 86° 49' 14" E
315+00
320+00
325+00
330+00
24'
8'
24'
8'
PNI910
HP
STA. 321+94
END 5' FLAT
BOTTOM DITCH
STA. 321+94 IN PLACE
24" X 65' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE AND CONSTRUCT
DBL. 36" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS IV (TYPE 3 BEDDING)
050= 33.0 CFS D.A.= 51.6 ACRES
36" R.C. PIPE = 238 LIN. FT.
36" F.E.S. = 4 EA.
22'
STA. 322+42 IN PLACE
24" X 40' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 35.5 CU. YD.
STA. 323+00
BEG. 3' FLAT
BOTTOM DITCH
CR-619
LIMITS OF CONSTRUCTION
SPECIAL FLOOD HAZARD AREA
+06.63 125'
+06.63 85'
EXISTING ROW
PROPOSED ROW
EXISTING ROW
PROPOSED ROW

HWY. 412

280
270
260
250
EXISTING GROUND LINE
320+00 RT. 254.70 RT.
321+00 LT. 254.70 LT.
322+00 LT. 254.55 LT.
322+50 LT. 254.54 LT.
322+00 RT. 254.33 RT.
HP
HP
RT. DITCH GRADE +0.07%
LT. DITCH GRADE +0.06%
LT. DITCH GRADE -0.15%
RT. DITCH GRADE -0.20%
LT. DITCH GRADE -0.27%
RT. DITCH GRADE -0.20%
STA. 321+94
F.L. INLET (LT.) = 254.58
F.L. OUTLET (RT.) = 254.33
315+00
320+00
325+00
330+00

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 206 | 503 |

② PLAN & PROF STA 330+00-345+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/10/17

REMOVAL AND DISPOSAL OF EXISTING GUARDRAIL

| STA. | STA. | SIDE | UNIT |
|---|---|---|---|
| 335+95 | 338+45 | RT. | 250 LIN.FT. |
| 335+95 | 338+45 | LT. | 250 LIN.FT. |

STA. 330+70 IN PLACE
27" X 21" X 30' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE

STA. 338+44.39 - STA. 339+45.89
(101.5' X 24' CLEAR ROADWAY BRIDGE)
CONSISTING OF 4 SPAN CONC. DECK WITH
STEEL BEAMS AND CONC. PILES
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 4) = 1.00 LUMP SUM

STA. 339+06 CONSTRUCT
QUAD. 10' X 10' X 123' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
10° LT. FWD. SKEW
050 = 439 CFS D.A. = 1446 ACRES
SPAN = 44.17'

FLOAT ROAD SLOUGH

SPECIAL FLOOD HAZARD AREA
STA. 301+44 TO 341+44

STA. 341+79 IN PLACE
30" X 18" X 24' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE

STA 330+46.15
END WIDENING
BEGIN FULL DEPTH
RECONSTRUCTION

LIMITS OF CONSTRUCTION

C.L. HWY. 412

SPECIAL FLOOD HAZARD AREA

PROPOSED ROW

EXISTING ROW

+08.48 100'

+00 100'

+91.67 105'

+50 125'

PN:1107 PD:ST60UNL

PN:1108 PD:STCPS

PN:911

330+00

335+00

340+00

345+00

S 86° 49' 14" E

24' 8"

24' 8"

STA. 338+47
END 3' FLAT
BOTTOM DITCH

STA. 341+55 IN PLACE
30" X 18" X 24' C.M. ARCH PIPE
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 60' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 155.6 CU. YD.

HWY. 412

REMOVAL AND DISPOSAL OF EXISTING FENCE

| STA. | STA. | SIDE | UNIT |
|---|---|---|---|
| 340+25 | 342+34 | RT. | 294 LIN.FT. |

PROPOSED FENCE

| STA. | STA. | SIDE | UNIT |
|---|---|---|---|
| 340+14.53 | 342+22.04 | RT. | 208 LIN.FT. |

280
270
260
250

STA 330+46.15
BEGIN FULL DEPTH
RECONSTRUCTION
EL.=261.11

330+46.15
EL.=261.11

PROFILE GRADE

(+)0.50 %

STA = 338+85.00
EL = 265.31'
SSD = 2248'
ex = -0.11'
K = 360
L = 180.00'

(+)0.00 %

VPC 337+95.00
EL. = 264.86'

RT. DITCH GRADE -2.50%

338+50.00
255.00 RT.

338+40.00
250.25 RT.

339+40.00
250.49 LT.

VPT 339+75.00
EL. = 265.31'

HW$_{50}$ = 257.22'

EXISTING GROUND LINE

RT. DITCH GRADE +0.20%
LT. DITCH GRADE +0.27%

RT. DITCH GRADE +0.71%
LT. DITCH GRADE +0.58%

339+32.00
250.24 RT.

339+00.00
250.26 LT.

2' FOUND. BKFL MATL

STA. 339+06
F.L. INLET (LT.) = 249.72
F.L. OUTLET (RT.) = 249.65

330+00 335+00 340+00 345+00

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

| 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. | | CA1003 | 207 | 503 |

② PLAN & PROF STA 345+00-360+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/16/17

STA. 347+50 INSTALL
24" X 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 97.7 CU. YD.

STA 346+31.31
END FULL DEPTH
RECONSTRUCTION
BEGIN WIDENING

PROPOSED ROW
EXISTING ROW
24'
+18.58
115'
C.L. HWY. 412
LIMITS OF CONSTRUCTION
STA. 359+41 IN PLACE
24" X 23' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE
+00
80'
HP
345+00
350+00
355+00
360+00
S 86° 49' 14" E
24'
8'
PN:1109
PD:ST60DNL
PN:1110
PD:ST60DNL
16'
+00
75'
STA. 349+45 IN PLACE
18" X 49' R.C. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 56' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 78.5 CU. YD.
STA. 358+16 IN PLACE
24" X 23' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 36' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 12.5 CU. YD.

HWY. 412

280
270
260
250
PROFILE GRADE
346+31.31
EL.=265.31
STA 346+31.31
END FULL DEPTH
RECONSTRUCTION
EL.=265.31
EXISTING GROUND LINE
RT. DITCH GRADE +0.71%
LT. DITCH GRADE +0.58%
355+89.59
263.00 RT.
RT. DITCH GRADE -0.46%
LT. DITCH GRADE -0.47%
359+53.47
262.15 LT.

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

| 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. | | CA1003 | 208 | 503 |

② PLAN & PROF STA 360+00-375+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
VENELLE N. ROMERO
3/2/18

STA. 363+28 IN PLACE
24" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 30" X 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 51.0 CU. YD.

STA. 364+34 IN PLACE
24" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 30" X 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 35.1 CU. YD.

C.L. HWY. 412
P.I. = 376+83.58
Δ = 3° 11' 37" (LT)
D = 0° 07' 30"
T = 1,277.73'
L = 2,554.79'
R = 45,836.62'
P.C. = 364+05.85
P.T. = 389+60.64
e = N/A
Ls = N/A

STA. 371+00 IN PLACE
27" X 18" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 37.6 CU. YD.

LIMITS OF CONSTRUCTION

C.L. HWY. 412

PROPOSED ROW

EXISTING ROW

+58.56 90'

16'

PC 364+05.85

S 86° 49' 14" E

24'

11'

8'

HP

PN:912

+00 95'

360+00

365+00

370+00

375+00

STA. 362+52 IN PLACE
24" X 44' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 34.3 CU. YD.

+67.32 90'

LIMITS OF CONSTRUCTION

STA. 368+53 IN PLACE
24" X 76' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE AND CONSTRUCT
DBL. 36" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III(TYPE 2 BEDDING)
Q50= 79.7 CFS D.A. = 198.6 ACRES
36" R.C. PIPE = 238 LIN. FT.
36" F.E.S. = 4 EA.

STA. 368+00
BEGIN 5' FLAT
BOTTOM DITCH

STA. 373+68
END 5' FLAT
BOTTOM DITCH

+50 90'

+85 83'

HWY. 412

280
270
260
250

EXISTING GROUND LINE

LT. DITCH GRADE -0.47%
RT. DITCH GRADE -0.46%

LT. DITCH GRADE +2.13%

368+53.00 257.90 LT.
369+00.00 258.90 LT.
368+53.00 257.30 RT.

STA. 368+53
F.L. INLET (LT.) = 257.82
F.L. OUTLET (RT.) = 257.30

LT. DITCH GRADE -0.25%
RT. DITCH GRADE -0.13%

373+75.00 256.61 RT.

360+00
365+00
370+00
375+00

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

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 209 | 503 |

② PLAN & PROF STA 375+00-390+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

STA. 10+83 IN PLACE
30" X 65' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE AND CONSTRUCT
DBL. 36" X 108' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS VXTYPE 3 BEDDING)
36" R.C. PIPE = 216 LIN. FT.
36" F.E.S. = 4 EA.

C.L. HWY. 412
P.I. = 376+83.58
Δ = 3° 11' 37" (LT)
D = 0° 07' 30"
T = 1,277.73'
L = 2,554.79'
R = 45,836.62'
P.C. = 364+05.85
P.T. = 389+60.64
e = N/A
Ls = N/A

STA. 379+55
INSTALL DBL. 36" X 60'
PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 55.4 CU. YD.

STA. 377+96 IN PLACE
DBL. 24" X 64' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. & EXTEND R.C. PIPES
39' LT. AND 13' RT.
(CLASS IIIXTYPE 3 BEDDING)
WITH F.E.S. LT. & RT.
050= N/A CFS D.A.= N/A ACRES
24" R.C. PIPE = 120 LIN. FT.
24" F.E.S. = 4 EA.

STA. 384+84 IN PLACE
DBL. 8' X 3' X 52' R.C. BOX CULVERT
WITH 3øl WINGS LT. & RT.
REMOVE & CONSTRUCT
TRIP. 36" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS IIIXTYPE 2 BEDDING)
050= 87.1 CFS D.A.= 48.5 ACRES
36" R.C. PIPE = 357 LIN. FT.
36" F.E.S. = 6 EA.

STA. 389+27 IN PLACE
24" X 33' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 30.7 CU. YD.

STA. 375+45
CONSTRUCT APPR. = 1.0 CU. YD.

STA. 376+16
CONSTRUCT APPR. = 1.0 CU. YD.

STA. 376+01.81 HWY. 412 =
STA. 10+00.00 SH 231
∢ = 88° 26' 54.6"

STA. 377+13
CONSTRUCT APPR. = 0 CU. YD.

HWY. 412

SH 231 PROFILE

10+00.00 EL. = 263.12'
10+29.50 EL. = 262.52'
10+38.84 EL. = 262.38'
12+07.76 EL. = 262.48'
(-) 1.50 %
EXISTING GROUND LINE
PROFILE GRADE
LT. DITCH GRADE +3.73%
RT. DITCH GRADE +4.15%
10+83.00 EL.=257.30
10+83.00 EL.=256.57
11+50.00 EL.=259.35
11+50.00 EL.=259.80

LT. DITCH GRADE -0.25%
375+60.32 257.29 LT.
LT. DITCH GRADE -0.86%
376+37.21 256.59 LT.
LT. DITCH GRADE -0.13%
377+95.00 256.39 LT.
377+95.00 256.04 RT.
EXISTING GROUND LINE
LT. DITCH GRADE -0.27%
RT. DITCH GRADE -0.25%
384+83.00 254.55 LT.
LT. DITCH GRADE +1.49%
386+48.33 257.01 LT.
LT. DITCH GRADE -0.61%
RT. DITCH GRADE -0.25%

STA. 377+96
F.L. INLET (LT.) = 256.40
F.L. OUTLET (RT.) = 256.00

STA. 384+84
F.L. INLET (LT.) = 254.50
F.L. OUTLET (RT.) = 254.40

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

**GUARD RAIL (TYPE A)**

| STA. | STA. | GUARD RAIL (TYPE A) | THRIE BEAM GUARD RAIL TERMINAL | GUARD RAIL TERMINAL (TYPE 2) | TERMINAL ANCHOR POSTS (TYPE I) |
|---|---|---|---|---|---|
| 402+05.06 | 404+23.81 | 150 LIN.FT. | 1 | 1 | |
| 404+50.80 | 405+44.55 | 75 LIN.FT. | 1 | | 1 |

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 210 | 503 |

② PLAN & PROF STA 390+00-405+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/22/17

STA. 393+35 IN PLACE
TRIP. 8' X 4' X 108' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN & EXTEND 6' LT. & 6' RT.
Q50= 35 CFS D.A.= 82 ACRES
SPAN = 26.44'

SPECIAL FLOOD HAZARD AREA
STA. 391+09 TO 488+03

C.L. HWY. 412
P.I. = 399+37.22
Δ = 10° 28' 34" (LT)
D = 2° 30' 00"
T = 210.11'
L = 419.04'
R = 2,291.83'
P.C. = 397+27.11
P.T. = 401+46.15
e = 0.067'/'
Ls = 540'

SPECIAL FLOOD HAZARD AREA

LIMITS OF CONSTRUCTION

PROPOSED ROW

EXISTING ROW

PN:915

TBM

390+00

S 89° 50' 32" E

395+00

PC 397+27.11

+99.04
83.97'

+04.59
90.51'

PT 401+46.15

STA. 404+54.13
BEGIN EXCEPTION

150' TRANSITION

100' TRANSITION
(VERTICAL)

STA 404+92.01
BR. END

N 79° 40' 54" E

405+00

PN:916

PN:917

PN:1116
PD:STCPS

400+00

PT 399+37.22

+37.29
99.67'

+35.29
99.72'

EXISTING BRIDGE SHALL NOT BE DISTURBED

LAWRENCE COUNTY
GREENE COUNTY

HWY. 412

STA. 391+16 IN PLACE
30" X 28' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 70.4 CU. YD.

STA. 393+22.11 BEGIN SUPERELEVATION
STA. 398+62.11 MAX. SUPERELEVATION (0.067 FT./FT.)
STA. 399+46.15 MAX. SUPERELEVATION (0.067 FT./FT.)
STA. 404+54.13 END SUPERELEVATION

280
270
260
250

EXISTING GROUND LINE

STA 404+92.01
BEGIN BRIDGE
(RETAIN)

393+00.00
255.79 LT.

393+38.00
252.82 LT.

$HW_{50}$ = 255.06'

LT. DITCH GRADE -0.6%

RT. DITCH GRADE -0.25%

LT. DITCH GRADE +0.53%

393+38.00
252.25 RT.

STA. 393+35
F.L. INLET (LT.) = 253.76
F.L. OUTLET (RT.) = 253.25

390+00 395+00 400+00 405+00

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

STA. 404+92.01 - STA. 408+72.61
(380' X 70' CLEAR ROADWAY BRIDGE)
CONSISTING OF 5 SPAN CONC. DECK WITH
CONTINUOUS COMP. W-BEAM UNIT
AND CONC. PILES
(RETAIN)

SPECIAL FLOOD HAZARD AREA
STA. 391+09 TO 488+03

LAWRENCE COUNTY
GREENE COUNTY

GUARD RAIL (TYPE A)

| STA. | STA. | GUARD RAIL (TYPE A) | THRIE BEAM GUARD RAIL TERMINAL | GUARD RAIL TERMINAL (TYPE 2) | TERMINAL ANCHOR POSTS (TYPE I) |
|---|---|---|---|---|---|
| 408+21.85 | 409+15.60 | 75 LIN.FT. | 1 | | 1 |
| 409+42.68 | 411+61.43 | 150 LIN.FT. | 1 | 1 | |

STA. 411+97 IN PLACE
REMOVE 24" X 42'
R.C. PIPE CULVERT
LT. SIDE DRAIN

STA. 413+00
INSTALL 24" X 42'
PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 33.1 CU. YD.

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 21 | 503 |

② PLAN & PROF STA 405+00-420+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/22/17

EXISTING ROW
CACHE RIVER
STA 408+72.61 BR. END
100' TRANSITION (VERTICAL)
150' TRANSITION
C.L. HWY. 412
+98.52 / 34.45'
LIMITS OF CONSTRUCTION
EXISTING ROW
16'
24'
8'
N 79° 40' 54" E
405+00
410+00
415+00
420+00
PN:1124
PN:1125
BENCH MAR. TRIG ELEV
PN:918
PN:1117
PD:STCPS
STA. 409+11.60
END EXCEPTION
CACHE RIVER
EXISTING ROW
EXISTING ROW
LIMITS OF CONSTRUCTION
EXISTING BRIDGE SHALL
NOT BE DISTURBED
PN:1118
PD:STCPS
24'
STA. 413+69
CONSTRUCT APPR. = 0 CU. YD.
EXISTING ROW
EXISTING ROW
STA. 419+79 IN PLACE
24" X 35' C.M.
RT. SIDE DRAIN
(RETAIN)
CONSTRUCT APPR. = 0 CU. YD.
+98.66 / 124.00'
+48.66 / 124.50'
16'
HWY. 412

STA. 419+50.55 BEGIN SUPERELEVATION
STA. 424+90.55 MAX. SUPERELEVATION (0.077 FT./FT.)
STA. 425+71.66 MAX. SUPERELEVATION (0.077 FT./FT.)
STA. 431+11.66 END SUPERELEVATION

280
270
260
250
STA 408+72.61
END BRIDGE
(RETAIN)
CACHE
RIVER
EXISTING
GROUND LINE
405+00
410+00
415+00
420+00

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

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 212 | 503 |

② PLAN & PROF STA 420+00-435+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/28/17

STA. 421+15 IN PLACE
24" X 29' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 40.4 CU. YD.

SPECIAL FLOOD HAZARD AREA
STA. 391+09 TO 488+03

STA. 430+12 IN PLACE
24" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 12.0 CU. YD.

LIMITS OF CONSTRUCTION

C.L. HWY. 412

+63.25
77.21'
+63.24
86.47'

EXISTING ROW
16'
PROPOSED ROW
+00
75'

PI 425+31.60

24"
24"

PI
425+00

N 79° 40' 54" E

PC 423+55.55

PT 427+06.66

420+00

430+00

S 89° 47' 05" E

435+00

+50
105'

16'

EXISTING ROW
PROPOSED ROW

STA. 421+00
BEGIN 5' FLAT
BOTTOM DITCH

LIMITS OF CONSTRUCTION

C.L. HWY. 412
P.I. = 425+31.60
Δ = 10° 32' 01" (RT)
D = 3° 00' 00"
T = 176.06'
L = 351.12'
R = 1,909.86'
P.C. = 423+55.55
P.T. = 427+06.66
e = 0.077'/'
Ls = 540'

STA. 425+56 IN PLACE
24" X 34' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 88.0 CU. YD.

STA. 429+31 IN PLACE
24" X 38' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 58' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 79.7 CU. YD.

STA. 434+48 IN PLACE
24" X 29' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 60' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 94.3 CU. YD.

HWY. 412

STA. 419+50.55 BEGIN SUPERELEVATION
STA. 424+90.55 MAX. SUPERELEVATION (0.077 FT./FT.)
STA. 425+71.66 MAX. SUPERELEVATION (0.077 FT./FT.)
STA. 431+11.66 END SUPERELEVATION

280
270
260

EXISTING GROUND LINE

420+50.00
256.92 LT.

LT. DITCH GRADE +0.10%

421+00.00
252.99 RT.

RT. DITCH GRADE +0.10%

433+44.67
254.20 RT.

RT. DITCH GRADE +0.03%

250

420+00
425+00
430+00
435+00

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

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 213 | 503 |

② PLAN & PROF STA 435+00-450+00

SPECIAL FLOOD HAZARD AREA
STA. 391+09 TO 488+03

STA. 436+65
CONSTRUCT APPR. = 0.4 CU. YD.

STA. 438+02 IN PLACE
PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 36.0 CU. YD.

STA. 444+80 IN PLACE
24" X 103' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE AND CONSTRUCT
TRIP. 36" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS IIIXTYPE 2 BEDDING)
050= 34.0 CFS D.A.= 69.9 ACRES
36" R.C. PIPE = 357 LIN. FT.
36" F.E.S. = 6 EA.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

LIMITS OF CONSTRUCTION

+77.52 90.40'
+51.52 90.40'
+51.52 75'
+77.52 75'
TCE
16'
HP
+88.61 106.30'
+14.61 106.30'
TCE
+88.61 75'
16'
+14.61 75'
+25 75'
+00 75'

PROPOSED ROW
EXISTING ROW

C.L. HWY. 412

S 89° 47' 05" E

435+00
440+00
445+00
450+00

24' 8' 24' 8'

PN#120
PD:ST60DNL

PN#121
PD:ST60DNL

+50 90'

STA. 444+80
BEGIN 5' FLAT
BOTTOM DITCH

STA. 444+80
END 5' FLAT
BOTTOM DITCH

+50 100'

24'

STA. 442+92 IN PLACE
24" X 31' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 54' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 88.5 CU. YD.

FRY RD

HWY. 412

280
270
260
250

436+62.17
258.55 LT.
HP

LT. DITCH GRADE +0.10%
LT. DITCH GRADE -0.49%
RT. DITCH GRADE +0.03%

EXISTING GROUND LINE

444+80.00
254.57 LT.
444+80.00
254.50 RT.

RT. DITCH GRADE +0.20%
LT. DITCH GRADE +0.05%

STA. 444+80
F.L. INLET (LT.) = 254.57
F.L. OUTLET (RT.) = 254.50

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

| 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. | | CA1003 | 214 | 503 |

② PLAN & PROF STA 450+00-465+00

SPECIAL FLOOD HAZARD AREA
STA. 391+09 TO 488+03

STA. 452+89 IN PLACE
24" X 30' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 24.9 CU. YD.

STA. 456+60 IN PLACE
24" X 86' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE AND CONSTRUCT
30" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 2 BEDDING)
Q50= 16.3 CFS D.A.= 2.0 ACRES
30" R.C. PIPE = 119 LIN. FT.
30" F.E.S. = 2 EA.

STA. 461+34 IN PLACE
30" X 24' C.M. ARCH CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 56' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 43.8 CU. YD.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

STA. 456+60
END 5' FLAT
BOTTOM DITCH

PROPOSED ROW
EXISTING ROW
16'
24'
81'
11'
24'
81'
HP
450+00
455+00
460+00
465+00
S 89° 47' 05" E
PN:1122
PD:ST60DN
PN:919
C.L. HWY. 412
LIMITS OF CONSTRUCTION
+00 90'
+00 80'
+18.48 90'
+75 75'

STA. 461+34 IN PLACE
30" X 24' C.M. ARCH CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 16.3 CU. YD.

HWY. 412

280
270
260
250

EXISTING GROUND LINE

453+00.00
256.11 RT.

456+60.00
255.21 RT.

462+00.00
255.50 LT.

463+11.10
257.09 LT.

464+66.03
258.29 RT.

RT. DITCH GRADE +0.20%
RT. DITCH GRADE -0.25%
LT. DITCH GRADE +0.05%
RT. DITCH GRADE +0.38%
LT. DITCH GRADE +1.43%
LT. DITCH GRADE -0.10%
RT. DITCH GRADE -0.35%

STA. 456+60
F.L. INLET (RT.) = 255.21
F.L. OUTLET (LT.) = 255.21

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

| 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. | | CA1003 | 215 | 503 |

② PLAN & PROF STA 465+00-480+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

SPECIAL FLOOD HAZARD AREA
STA. 391+09 TO 488+03

STA. 468+16 IN PLACE
24" X 22' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" x 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 11.1 CU. YD.

REMOVAL AND DISPOSAL OF EXISTING GUARDRAIL

| STA. | STA. | SIDE | UNIT |
|---|---|---|---|
| 472+79 | 475+04 | RT. | 225 LIN.FT. |
| 473+55 | 475+05 | LT. | 150 LIN.FT. |
| 475+50 | 477+75 | RT. | 225 LIN.FT. |
| 475+50 | 478+00 | LT. | 250 LIN.FT. |

STA. 475+04.67 - STA. 475+51.17
(46.5' X 27' CLEAR ROADWAY BRIDGE)
CONSISTING OF 1 SPAN CONC. DECK WITH
STEEL BEAMS AND CONC. PILES
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 6) = 1.00 LUMP SUM

STA. 475+86 CONSTRUCT
TRIP. 8' X 7' X 171' R.C. BOX CULVERT
WITH 3# WINGS LT. & RT.
45° RT. FWD. SKEW
050 = 301 CFS D.A. = 1306 ACRES
SPAN = 37.83'

STA 469+10.00
END WIDENING
BEGIN FULL DEPTH
RECONSTRUCTION

C.L. HWY. 412

LIMITS OF CONSTRUCTION

NEGRO HEAD SLOUGH

PROPOSED ROW

EXISTING ROW

16'

+43.92 90'

+50 105'

24' 8'

24' 8'

S 89° 47' 05" E

465+00

470+00

475+00

480+00

HP

PI Nº920

+00 75'

+44.90 80'

+00 77'

+15.88 78.22'

+14.76 92.90'

16' TCE

+67.75 82.19'

+66.63 96.87'

+00 85'

+00 90'

+00 100'

STA. 468+84 IN PLACE
24" X 57' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. & EXTEND R.C. PIPE
31' LT. AND 30' RT.
(CLASS III) (TYPE 2 BEDDING)
WITH F.E.S. LT. & RT.
050= 9.9 CFS D.A.= 1.7 ACRES
24" R.C. PIPE = 69 LIN. FT.
24" F.E.S. = 2 EA.

STA. 473+33 IN PLACE
24" X 23' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" x 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 31.6 CU. YD.

HWY. 412

280 270 260 250

STA 469+10.00
BEGIN FULL DEPTH
RECONSTRUCTION
EL.=262.19

469+10.00
EL.=262.19

PROFILE GRADE

EXISTING GROUND LINE

468+84.00
256.82 RT.

468+84.00
256.54 LT.

471+75.18
259.03 RT.

HP

STA. 468+84
F.L. INLET (RT.) = 256.95
F.L. OUTLET (LT.) = 256.56

RT. DITCH GRADE -0.35%

LT. DITCH GRADE -0.10%

RT. DITCH GRADE +0.76%

LT. DITCH GRADE -0.42%

STA = 474+00.00
EL = 264.64'
SSD = 1419'
ex = -0.11'
K = 360
L = 180.00'

(+)0.50 %

0.00 %

(-)0.50 %

VPC 473+10.00
EL.=264.19

VPT 474+90.00
EL.=264.64

VPC 475+60.00
EL.=264.64

STA = 476+50.00
EL = 264.64'
SSD = 1419'
ex = -0.11'
K = 360
L = 180.00'

HW50 = 259.69'

475+30.00
253.67 LT.

475+00.00
253.95 LT.

2' FOUND. BKFL MATL

476+28.00
255.83 RT.

VPT 477+40.00
EL.=264.19

RT. DITCH GRADE -0.71%

LT. DITCH GRADE +0.28%

STA. 475+86
F.L. INLET (LT.) = 253.80
F.L. OUTLET (RT.) = 253.50

465+00 470+00 475+00 480+00

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

SPECIAL FLOOD HAZARD AREA
STA. 391+09 TO 488+03

STA. 481+93 IN PLACE
30" X 27' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 28.8 CU. YD.

STA. 482+69 IN PLACE
30" X 30' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 35.3 CU. YD.

STA. 485+01 IN PLACE
30" X 24' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 27.1 CU. YD.

STA. 489+26 IN PLACE
30" X 22' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 24.5 CU. YD.

SPECIAL FLOOD HAZARD AREA

C.L. HWY. 412
P.I. = 482+18.89
Δ = 0° 05' 55" (LT)

CR-204

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 216 | 503 |

② PLAN & PROF STA 480+00-495+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
VENELLE N. ROMERO
2/7/17

PROPOSED ROW
EXISTING ROW
16'
22'
+71.05
90'
PI 482+18.89
S 89° 47' 05" E
24' 8"
24'
8'
480+00
485+00
490+00
495+00
LIMITS OF CONSTRUCTION
C.L. HWY. 412
S 89° 41' 10" E
NEGRO HEAD SLOUGH
+71.60
85'
+00
90'
+34.23
89.38'
+34.23
94.54'
TCE
+55.15
89'
+55.15
94.16'
+50
85'
+00
75'
+50
75'

STA. 480+45 IN PLACE
78" X 31' C.L. PIPE CULVERT
RT. SIDE DRAIN
(RETAIN)

STA. 481+20.00
END FULL DEPTH
RECONSTRUCTION
BEGIN WIDENING

STA. 489+36 IN PLACE
30" X 24' C.M. ARCH PIPE
RT. SIDE DRAIN
REMOVE

HWY. 412

280
270
260
250

481+20.00
EL.=262.29

PROFILE GRADE

STA 481+20.00
END FULL DEPTH
RECONSTRUCTION
EL.=262.29

EXISTING GROUND LINE

LT. DITCH GRADE +0.28%

LT. DITCH GRADE +0.10%

489+41.00
257.63 LT.

480+00
485+00
490+00
495+00

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

| 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. | | CA1003 | 217 | 503 |

② PLAN & PROF STA 495+00-510+00

SPECIAL FLOOD HAZARD AREA
STA. 503+66 TO 509+26

SPECIAL FLOOD HAZARD AREA

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/2/17

STA. 495+96 INSTALL
36" X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 21.4 CU. YD.

STA. 505+03 INSTALL
36" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 24.8 CU. YD.

STA. 509+00 INSTALL
36" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 21.4 CU. YD.

+00.26
75'

16'

PROPOSED ROW

HP

EXISTING ROW

C.L. HWY. 412

LIMITS OF CONSTRUCTION

18'

PROPOSED ROW

16'

EXISTING ROW

24'

8'

24'

8'

S 89° 41' 10" E

495+00

500+00

505+00

510+00

EXISTING ROW

HP

EXISTING ROW

16'

16'

+00.83
90'

+98.79
85'

20'

PROPOSED ROW

PROPOSED ROW

+29.90
75'

CONCRETE DITCH PAVING (TYPE B)

| STA. | STA. | SIDE | "W" | SQ. YDS. |
|---|---|---|---|---|
| 496+76.83 | 497+25.52 | RT. | 6' | 33 |

STA. 496+45 IN PLACE
24" X 182' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 50' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 37.1 CU. YD.

STA. 497+49 IN PLACE
24" X 47' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 20.6 CU. YD.

STA. 502+15 INSTALL
24" X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 11.4 CU. YD.

LIMITS OF CONSTRUCTION

HWY. 412

280
270
260

EXISTING GROUND LINE

497+00.00
258.80 LT.

RT. DITCH GRADE +5.5%

LT. DITCH GRADE +0.10%

496+76.83
257.00 RT.
496+93.32
257.00 RT.

497+25.52
258.77 RT.

CONC. DITCH PAVING

RT. DITCH GRADE +0.10%

LT. DITCH GRADE -0.08%

508+51.31
259.98 RT.

HP

RT. DITCH GRADE -0.31%

280
270
260
250

495+00
500+00
505+00
510+00

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

SPECIAL FLOOD HAZARD AREA
STA. 512+89 TO 569+13

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 218 | 503 |

② PLAN & PROF STA 510+00-525+00

STA. 516+24 INSTALL
36" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 21.8 CU. YD.

STA. 523+21 IN PLACE
24" X 16' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 33.3 CU. YD.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

SPECIAL FLOOD HAZARD AREA

C.L. HWY. 412

STA. 516+37
BEGIN 2' FLAT
BOTTOM DITCH

LIMITS OF CONSTRUCTION

PROPOSED ROW

EXISTING ROW

16'

24'

8'

PN:921

S 89° 41' 10" E

510+00

515+00

520+00

525+00

+58.9
93.43'

+59.22
80'

STA. 515+88 IN PLACE
4' X 2' X 54' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND R.C. BOX CULVERT
32' LT. AND 34' RT.
Q50= 10.8 CFS D.A.= 2.2 ACRES

LIMITS OF CONSTRUCTION

STA. 524+61 IN PLACE
24" X 22' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 32.9 CU. YD.

HWY. 412

280
270
260
250

EXISTING GROUND LINE

515+87.55
257.60 RT.

521+09.16
258.30 RT.

RT. DITCH GRADE -0.31%

LT. DITCH GRADE -0.08%

RT. DITCH GRADE +0.12%

RT. DITCH GRADE -0.15%

LT. DITCH GRADE -0.08%

515+50.00
257.20 LT.

516+00.00
257.18 LT.

LT. DITCH GRADE -0.04%

STA. 515+88
F.L. INLET (RT.) = 257.64
F.L. OUTLET (LT.) = 257.19

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

SPECIAL FLOOD HAZARD AREA
STA. 512+89 TO 569+13

| 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. | | CA1003 | 219 | 503 |

② PLAN & PROF STA 525+00-540+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

STA. 527+44 IN PLACE
24" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 27.3 CU. YD.

STA. 528+18 IN PLACE
24" X 23' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 35.4 CU. YD.

STA. 535+70 IN PLACE
36" X 36' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 58' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 73.7 CU. YD.

STA 537+53.58
END WIDENING
BEGIN FULL DEPTH
RECONSTRUCTION

+91.26 93.85'
+03.58 90°
+50 85'
+23.56 85'
+23.60 94.27'
+40 115'
+88.42 115'
+30 95'
+00 95'

PROPOSED ROW
EXISTING ROW
LIMITS OF CONSTRUCTION
C.L. HWY. 412
CR 206
OVERHEAD POWER
16'
28'
40' R.
PN=922
525+00
530+00
535+00
540+00
S 89° 41' 10" E
24"
36"
HP
PN=926
POST60DNL

STA. 525+93 IN PLACE
4' X 2' X 56' R.C. BOX CULVERT
WITH 30° WINGS LT. & RT.
RETAIN AND EXTEND R.C. BOX CULVERT
32' LT. AND 29' RT.
Q50= 10.4 CFS D.A.= 1.6 ACRES

STA. 528+06 IN PLACE
24" X 23' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 16.4 CU. YD.

+74.01 80°

STA. 534+48 IN PLACE
24" X 24' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 15.9 CU. YD.

HWY. 412

280
270
260
250

525+91.98 257.58' RT.
530+13.88 258.30' RT.
537+53.58 EL.=263.14

RT. DITCH GRADE -0.15%
RT. DITCH GRADE +0.18%
RT. DITCH GRADE -0.26%
LT. DITCH GRADE -0.08%
LT. DITCH GRADE -0.08%

EXISTING GROUND LINE
PROFILE GRADE

STA 537+53.58
BEGIN FULL DEPTH
RECONSTRUCTION
EL.=263.14

STA. 525+93
F.L. INLET (RT.) = 257.58
F.L. OUTLET (LT.) = 256.35

525+00 530+00 535+00 540+00

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

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 220 | 503 |

② PLAN & PROF STA 540+00-555+00

STA. 540+88 IN PLACE
24" X 28' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" x 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 67.1 CU. YD.

REMOVAL AND DISPOSAL OF EXISTING GUARDRAIL

| STA. | STA. | SIDE | UNIT |
|---|---|---|---|
| 542+48 | 544+98 | RT. | 250 LIN.FT. |
| 542+95 | 545+20 | LT. | 225 LIN.FT. |
| 545+87 | 548+12 | RT. | 225 LIN.FT. |
| 546+12 | 548+62 | LT. | 250 LIN.FT. |

STA. 545+08.36 - STA. 546+01.06
(92.7' X 24' CLEAR ROADWAY BRIDGE)
CONSISTING OF 3 SPAN CONC. DECK WITH
RCD GIRDER SPANS AND CONC. PILES
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 7) = 1.00 LUMP SUM

STA. 545+55 CONSTRUCT
TRIP. 12' X 8' X 210' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
55° LT. FWD. SKEW
Q50 = 510 CFS D.A. = 1747 ACRES
SPAN = 67.85'

SPECIAL FLOOD HAZARD AREA
STA. 512+89 TO 569+13

STA. 552+55 IN PLACE
5' X 2.5' X 16' CONC. BOX
W/EARTH FLOOR
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 42.9 CU. YD.

STA. 553+49 IN PLACE
30" X 30' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 44.0 CU. YD.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/22/18

LIMITS OF CONSTRUCTION
SPECIAL FLOOD HAZARD AREA
STA. 546+33 END 2' FLAT BOTTOM DITCH
LATERAL DITCH NO. 3
C.L. HWY. 412
PN:H30 PD:ST6ODNL,TRIG ELEV
PN:H31 PD:ST6ODNL,TRIG ELEV
PN:H32 PD:ST6ODNL,TRIG ELEV
PN:H33 PD:ST6ODNL,TRIG ELEV
PN:923
TBM
S 89° 41' 10" E
16' PROPOSED ROW
24' PROPOSED ROW
EXISTING ROW
+50 110'
+00 110'
+28.94 100'
+24.93 95'
+29.06 100'
540+00
545+00
550+00
555+00

STA. 540+85 IN PLACE
24" X 23' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 58' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 100.7 CU. YD.

HWY. 412

STA. 552+52.15 BEGIN SUPERELEVATION
STA. 557+92.15 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 574+44.76 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 579+84.76 END SUPERELEVATION

PROFILE GRADE
STA = 545+43.00
EL = 267.21'
SSD = 1169'
ex = -0.23'
K = 180
L = 180.00'
(+)0.50 %
(-)0.50 %
VPC 544+53.00 EL. = 266.76'
VPT 546+33.00 EL. = 266.76'
VPC 550+70.00 EL. = 264.57'
VPT 552+50.00 EL. = 264.44'
(-)0.50 %
(+)0.35 %
STA = 551+60.00
EL = 264.12'
ex = 0.19'
K = 212
L = 180.00'
HW50 = 259.69'
547+00.00 255.74 LT.
546+40.00 254.73 LT.
2' FOUND. BKFL MATL
EXISTING GROUND LINE
RT. DITCH GRADE -0.26%
LT. DITCH GRADE -0.08%
RT. DITCH GRADE +0.08%
LT. DITCH GRADE +0.09%
RT. DITCH GRADE -0.00%
RT. DITCH GRADE -0.00%
543+50.00 254.80 RT.
544+10.00 254.80 RT.
544+60.00 254.80 RT.
545+50.00 254.80 RT.
STA. 545+55
F.L. INLET (LT.) = 254.22
F.L. OUTLET (RT.) = 254.22
280
270
260
250
540+00
545+00
550+00
555+00

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

LEGEND

SPECIAL FLOOD HAZARD AREA
STA. 512+89 TO 569+13

EXISTING PAVEMENT TO BE REMOVED

| 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. | | CA1003 | 221 | 503 |

PLAN & PROF STA 555+00-570+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

LIMITS OF CONSTRUCTION

C.L. HWY. 412

PROPOSED ROW

EXISTING ROW

S 89° 41' 10" E

STA. 555+47 IN PLACE
24" X 24' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 64.2 CU. YD.

PC 555+57.14

STA. 558+66 IN PLACE
24" X 24' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 48.4 CU. YD.

STA. 562+68.40 US 412 =
STA. 10+00.00 CR 332
∝ = 80° 51' 11"

40' R.

CR 332
S 0° 25' 41" E

STA. 562+68 IN PLACE
24" X 28' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 68' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 152.9 CU. YD.

STA. 565+90 IN PLACE
24" X 43' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE

PI 566+35.88

STA. 566+98.86 ②
154.16' LT.

STA. 567+09.11
114.22' LT.

CR 332
STA. 12+88.23
END PAVEMENT
RECONSTRUCTION

PI 12+88.23

C.L. HWY. 412
P.I. = 566+35.88
Δ = 26° 26' 09" (RT)
D = 1° 22' 30"
T = 978.73'
L = 1,922.61'
R = 4,166.97'
P.C. = 556+57.15
P.T. = 575+79.76
e = 0.040'/'
Ls = 540'

C.L. CR 332
P.I. = 12+88.23
Δ = 0° 45' 46" (RT)

STA. 567+22
INSTALL
24" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 37.3 CU. YD.

STA. 565+87 CONSTRUCT
DBL. 36" X 132' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
Q50= 30.1 CFS D.A.= 14.7 ACRES
36" R.C. PIPE = 264 LIN. FT.
36' F.E.S. = 4 EA.

STA. 570+35.00 US 412 =
STA. 10+00.00 CONNECTOR
ROAD WEST
∝ = 90° 33' 48"

SPECIAL FLOOD HAZARD AREA

HWY. 412

STA. 552+52.15 BEGIN SUPERELEVATION
STA. 557+92.15 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 574+44.76 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 579+84.76 END SUPERELEVATION

STA = 556+82.00
EL = 265.95'
SSD = 317.3'
ex = -0.08'
K = 514
L = 180.00'

PROFILE GRADE

(+)0.35 %

(+)0.00 %

VPC 555+92.00
EL. = 265.64'

VPT 557+72.00
EL. = 265.95'

EXISTING GROUND LINE

LT. DITCH GRADE +0.09%

RT. DITCH GRADE +0.08%

562+50.00 LT.
251.20

HP

LT. DITCH GRADE -0.19%

565+87.00 LT.
256.57

565+86.36 RT.
256.45

STA. 565+87
F.I. INLET (LT.) = 256.57
F.I. OUTLET (RT.) = 256.45

LT. DITCH GRADE +0.11%

RT. DITCH GRADE +0.14%

CR 332 PROFILE

10+00.00 EL.=265.95
10+30.10 EL.=264.76
VPC 10+64.96 EL.=263.31
VPT 12+39.96 EL.=259.97
12+67.35 EL.=260.06
12+88.23 EL.=260.04

STA = 11+52.46
EL = 259.68'
ex = 0.98'
K = 39
L = 175.00'

(-)13.96%
(-)14.15%
(+)0.33%
(-)10.11%

PROFILE GRADE

EXISTING GROUND LINE

LT. DITCH GRADE 1.08%

LT. DITCH GRADE 0.50%

10+76.00 256.25

11+76.00 257.34

12+88.00 257.90

555+00 560+00 565+00 570+00

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

| 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. | | CA1003 | 222 | 503 |

② PLAN & PROF STA 570+00-585+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/5/18

EXISTING ROW

C.L. WEST CONNECTOR
P.I. = 12+37.95
Δ = 71° 29' 41" (RT)
D = 24° 00' 00"
T = 171.85'
L = 297.89'
R = 238.73'
P.C. = 10+66.10
P.T. = 13+64.00
e = 0.074'/'
Ls = 184'

16'
+00 50.12'
PT 13+64.00
+00 65'
+25 110'
+00 105'
PROPOSED ROW
PC 10+66.10
N 18° 45' 41" E
570+00
PROPOSED ROW
+23.77 90'
30'

STA. 570+35.00 HWY. 412
STA. 10+00.00 CONNECTOR
ROAD WEST
∝ = 90° 33' 48"

STA. 573+00
INSTALL
24" X 54' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 69.9 CU. YD.

C.L. HWY. 412
P.I. = 566+35.88
Δ = 26° 26' 09" (RT)
D = 1° 22' 30"
T = 978.73'
L = 1,922.61'
R = 4,166.97'
P.C. = 556+57.15
P.T. = 575+79.76
e = 0.040'/'
Ls = 540'

C.L. HWY. 412
575+00
PT 575+79.76
580+00
S 63° 15' 01" E
585+00

LIMITS OF CONSTRUCTION

STA. 579+00
INSTALL
24" X 52' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 51.0 CU. YD.

24'
8'
24'
8'
24'
HP
HP
PROPOSED ROW
PROPOSED ROW

LIMITS OF CONSTRUCTION

STA. 583+10
INSTALL
24" X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 51.0 CU. YD.

HWY. 412

3/2/2018
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STA. 552+52.15 BEGIN SUPERELEVATION
STA. 557+92.15 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 574+44.76 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 579+84.76 END SUPERELEVATION

STA. 584+39.48 BEGIN SUPERELEVATION
STA. 589+79.48 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 606+87.57 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 612+27.57 END SUPERELEVATION

280
270
260
250

VPC 573+55.00
EL. = 265.95'
VPT 575+35.00
EL. = 266.27'
PROFILE GRADE
STA = 582+12.00
EL = 268.63'
SSD = 1741'
ex = -0.35'
K = 571
L = 400.00'
(+)0.35 %
(-)0.35 %
(+)0.00 %
(+)0.35 %
VPC 580+12.00
EL. = 267.93'
VPT 584+12.00
EL. = 267.93'
STA = 574+45.00
EL = 265.95'
ex = 0.08'
K = 514
L = 180.00'
RT. DITCH GRADE +0.14%
LT. DITCH GRADE +0.11%
LT. DITCH GRADE +0.16%
RT. DITCH GRADE -0.03%
LT. DITCH GRADE -0.02%
576+30.06
257.68 LT.
582+50.00
258.70 RT.
582+49.91
258.70 LT. HP
EXISTING GROUND LINE

570+00
575+00
580+00
585+00

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

| 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. | | CA1003 | 223 | 503 |

② PLAN & PROF STA 585+00-600+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

STA. 590+00
INSTALL
24" X 50' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 37.5 CU. YD.

C.L. HWY. 412
P.I. = 598+52.52
Δ = 27° 11' 55" (LT)
D = 1° 22' 30"
T = 1,008.05'
L = 1,978.09'
R = 4,166.97'
P.C. = 588+44.48
P.T. = 608+22.57
e = 0.040'/'
Ls = 540'

STA. 600+00
INSTALL
DBL. 36" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 22 CU. YD.

PROPOSED ROW
LIMITS OF CONSTRUCTION
C.L. HWY. 412
PC 588+44.48
585+00
590+00
595+00
600+00
S 63° 15' 01" E
24'
16'
+09.98 85'
+50 85'
+50 100'
+31.34 95'
24' 8'
8' 24'

STA. 590+00
INSTALL
24" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 40.5 CU. YD.

PI 598+52.52

STA. 600+00
INSTALL
36" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 38 CU. YD.

HWY. 412

STA. 584+39.48 BEGIN SUPERELEVATION
STA. 589+79.48 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 606+87.57 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 612+27.57 END SUPERELEVATION

280
270
260
250

VPC 588+90.00
EL. = 266.26'
(-)0.35 %
VPT 590+70.00
EL. = 265.95'
(+)0.00 %
STA = 589+80.00
EL = 265.95'
ex = 0.08'
K = 514
L = 180.00'
590+91.30
258.30 Lt.
PROFILE GRADE
EXISTING GROUND LINE
VPC 599+92.00
EL. = 265.95'
(+)0.00 %
LT. DITCH GRADE -0.02%
RT. DITCH GRADE -0.03%
LT. DITCH GRADE -0.03%

585+00
590+00
595+00
600+00

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

| 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. | | CA1003 | 224 | 503 |

② PLAN & PROF STA 600+00-615+00

SPECIAL FLOOD HAZARD AREA
STA. 610+77 TO 616+88

STA. 600+00
INSTALL
DBL. 36" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 22 CU. YD.

C.L. HWY. 412
P.I. = 598+52.52
Δ = 27° 11' 55" (LT)
D = 1° 22' 30"
T = 1,008.05'
L = 1,978.09'
R = 4,166.97'
P.C. = 588+44.48
P.T. = 608+22.57
e = 0.040'/'
Ls = 540'

STA. 605+29 CONSTRUCT
TRIP. 7' X 4' X 128' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
4° RT. FWD. SKEW
Q50= 200 CFS D.A.= 395 ACRES
SPAN = 23.39'

STA. 605+38
BEGIN 2' FLAT
BOTTOM DITCH

LIMITS OF CONSTRUCTION

STA. 609+00
INSTALL
DBL. 36" X 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 48 CU. YD.

STA. 614+00
END 2' FLAT
BOTTOM DITCH

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/17/17

PROPOSED ROW

PN#155
PD:8 SPIKE

C.L. HWY. 412

PT 608+22.57

N 89° 33' 04" E

STA. 600+00
INSTALL
36" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 38 CU. YD.

LIMITS OF CONSTRUCTION

STA. 609+00
INSTALL
36" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 35 CU. YD.

SPECIAL FLOOD HAZARD AREA

HWY. 412

STA. 584+39.48 BEGIN SUPERELEVATION
STA. 589+79.48 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 606+87.57 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 612+27.57 END SUPERELEVATION

STA = 600+82.00
EL = 265.95'
ex = 0.08'
K = 514
L = 180.00'

VPT 601+72.00
EL. = 266.26'

PROFILE GRADE

STA = 606+90.00
EL = 268.07'
SSD = 163'
ex = -0.16'
K = 257
L = 180.00'

(+)0.00 %
(+)0.35 %
(+)0.35 %
(-)0.35 %
(+)0.00 %

VPC 606+00.00
EL. = 267.76'

VPT 607+80.00
EL. = 267.76'

605+05.00
258.02 LT.

605+35.00
258.00 LT.

$HW_{50}$ = 261.25'

LT. DITCH GRADE -0.03%
RT. DITCH GRADE -0.03%

2' FOUND. BKFL MATL

605+10.00
257.92 RT.
605+30.00
257.50 RT.

EXISTING GROUND LINE

VPC 612+10.00
EL. = 266.25'

STA = 613+00.00
EL = 265.94'
ex = 0.08'
K = 514
L = 180.00'

VPT 613+90.00
EL. = 265.94'

LT. DITCH GRADE +0.07%
RT. DITCH GRADE +0.02%

STA. 605+29
F.L. INLET (LT.) = 258.44
F.L. OUTLET (RT.) = 257.91

280
270
260
250

600+00
605+00
610+00
615+00

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

LEGEND

EXISTING PAVEMENT TO BE REMOVED

SPECIAL FLOOD HAZARD AREA STA. 610+77 TO 616+88

SPECIAL FLOOD HAZARD AREA

LIMITS OF CONSTRUCTION

PROPOSED ROW

C.L. HWY. 412

N 89° 33' 04" E

615+00 620+00 625+00 630+00

24' 8' 24' 8'

PN:1157 PD:8 SPIKE

PN:1158 PD:8 SPIKE

PN:1159 PD:8 SPIKE

+00 85'

+75 90'

+85 50'

+10 95'

+27.68 120'

+00 60'

PI 30+09.12

SH 228 N

C.L. HWY. 228
P.I. = 30+09.12
Δ = 38° 09' 05" (RT)

30'x30' EXISTING ROW

EXISTING ROW

+12.61 115'

STA. 622+72.02 US 412 = STA. 27+86.35 SH 228
∢ = 75° 00' 00"

SEE SHEET 241 FOR ADDITIONAL SH 228 PLAN & PROFILE DETAILS

+30 85'

+00 50'

+50 90'

75'

N 14° 33' 04" E

TOTAL AREAS
AREA OF WETLAND NO.4 = 5.03 AC.
AREA OF IMPACT WETLAND NO.4 = 0.14 AC.
VOLUME OF FILL = 247.62 CY

HWY. 412

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 225 | 503 |

② PLAN & PROF STA 615+00-630+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/11

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280 270 260 250

PROFILE GRADE

EXISTING GROUND LINE

VPC 622+55.00
EL. = 265.94'

(+)0.00 %

STA = 623+45.00
EL = 265.94'
SSD = 373'
ex = -0.08'
K = 514
L = 180.00'

(-)0.35 %

VPC 624+60.00
EL. = 265.54'

(-)0.35 %

VPT 624+35.00
EL. = 265.62'

STA = 625+50.00
EL = 265.22'
ex = 0.08'
K = 514
L = 180.00'

VPT 626+40.00
EL. = 265.22'

(+)0.00 %

623+00.00
259.23 LT.

623+08.00
258.32 RT.

624+00.00
259.32 LT.

LT. DITCH GRADE +0.09%

LT. DITCH GRADE +0.07%

RT. DITCH GRADE +0.02%

LT. DITCH GRADE +0.06%

RT. DITCH GRADE +0.02%

615+00 620+00 625+00 630+00

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

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 226 | 503 |

② PLAN & PROF STA 630+00-645+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

PROPOSED ROW
+91.65 80'
HP
N 89° 33' 04" E
630+00
635+00
640+00
645+00
C.L. HWY. 412
24' 8' 4' 24' 8'
+94.44 95'
+95.27 95'
16'
+96.90 120'
PROPOSED ROW
GRASSY SLOUGH
+89.30 85'
HP
16'
PROPOSED ROW
+00 100'
+50 110'
+50 125'
16'
PROPOSED ROW

STA. 641+00
INSTALL
24" X 52' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 56.0 CU. YD.

LIMITS OF CONSTRUCTION

STA. 632+10
INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 21.0 CU. YD.

LIMITS OF CONSTRUCTION

STA. 644+42
INSTALL
24" X 56' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 66.0 CU. YD.

HWY. 412

280
270
260
250

PROFILE GRADE
EXISTING GROUND LINE

LT. DITCH GRADE +0.06%
630+52.33
260.27 LT.
HP
RT. DITCH GRADE +0.02%
HP
632+11.55
258.50 RT.

VPC 636+50.00
EL. = 265.22'
(+)0.00 %

STA = 637+40.00
EL = 265.22'
ex = 0.11'
K = 360
L = 180.00'

VPT 638+30.00
EL. = 265.67'
(+)0.50 %

LT. DITCH GRADE -0.30%
RT. DITCH GRADE -0.23%

VPC 642+90.00
EL. = 267.97'
(+)0.50 %

STA = 643+80.00
EL = 268.42'
SSD = 224.8'
ex = 0.11'
K = 360
L = 180.00'

(+)0.00 %
VPT 644+70.00
EL. = 268.42'

644+85.00
256.05 LT.
2' FOUND. BKFL MATL
644+90.00
255.54 RT.

630+00
635+00
640+00
645+00

2/13/2018
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REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 227 | 503 |

② PLAN & PROF STA 645+00-660+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

STA. 645+47 IN PLACE
18" X 30' PIPE CULVERT
LT. SIDE DRAIN
REMOVE

STA. 646+00
INSTALL
36" X 68' PIPE CULVERT
24" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 147 CU. YD.

GRASSY SLOUGH

LIMITS OF CONSTRUCTION

C.L. HWY. 412
P.I. = 664+55.55
Δ = 24° 38' 29" (LT)
D = 1° 22' 30"
T = 910.12'
L = 1,792.09'
R = 4,166.97'
P.C. = 655+45.43
P.T. = 673+37.52
e = 0.040'/'
Ls = 540'

STA. 658+00
INSTALL
36" X 52' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 58 CU. YD.

+00 / 120 — 16' — PROPOSED ROW

PVd1156 DIAMETER IN INCHES

+50 / 100'

C.L. HWY. 412

24' 8" — 24' — 8"

N 89° 33' 04" E

PC 655+45.43

645+00 — 650+00 — 655+00 — 660+00

+60.87 / 100' — 16' — PROPOSED ROW

3/2/2018

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16' PROPOSED ROW — +50 / 110'

STA. 645+07 CONSTRUCT
TRIP. 9' X 9' X 121' R.C. BOX CULVERT
WITH 3# WINGS LT. & RT.
Q50 = 86 CFS D.A. = 659 ACRES
SPAN = 30.17'

STA. 646+00
INSTALL
24" X 68' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 116 CU. YD.

LIMITS OF CONSTRUCTION

16' — PROPOSED ROW — +42.54 / 105'

STA. 658+00
INSTALL
24" X 54' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 61 CU. YD.

HWY. 412

STA. 651+40.43 BEGIN SUPERELEVATION
STA. 656+80.43 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 672+02.52 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 677+42.52 END SUPERELEVATION

280 / 270 / 260

STA = 646+80.00
EL = 268.42'
SSD = 317.3'
ex = -0.08'
K = 514
L = 180.00'

(+)0.00 %

VPC 645+90.00
EL. = 268.42'

(-)0.35 %

VPT 647+70.00
EL. = 268.11'

PROFILE GRADE

VPC 655+00.00
EL. = 265.55'

(-)0.35 %

STA = 655+90.00
EL = 265.24'
ex = 0.08'
K = 514
L = 180.00'

VPT 656+80.00
EL. = 265.24'

(+)0.00 %

645+30.00
256.01 LT.

HW50 = 257.36'

RT. DITCH GRADE +0.18%

LT. DITCH GRADE +0.04%

EXISTING GROUND LINE

LT. DITCH GRADE +0.31%

645+25.00
255.56 RT.
2' FOUND. BKFL MATL

658+35.56
256.52 LT.

STA. 645+07
F.L. INLET (LT.) = 254.94
F.L. OUTLET (RT.) = 254.68

280 / 270 / 260 / 250

645+00 — 650+00 — 655+00 — 660+00

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

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 228 | 503 |

② PLAN & PROF STA 660+00-675+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/11

C.L. HWY. 412
P.I. = 664+55.55
Δ = 24° 38' 29" (LT)
D = 1° 22' 30"
T = 910.12'
L = 1,792.09'
R = 4,166.97'
P.C. = 655+45.43
P.T. = 673+37.52
e = 0.040'/'
Ls = 540'

PROPOSED ROW
+50 90'
660+00
665+00
670+00
675+00
24' 8'
24' 8'
C.L. HWY. 412
LIMITS OF CONSTRUCTION
LIMITS OF CONSTRUCTION
PROPOSED ROW
PROPOSED ROW
PROPOSED ROW
PI 664+55.55
+50 105'
+23.63 95'
+70.54 90'
+68.41 100'
HP
HP
HP
PT 673+37.52
N 64° 54' 35" E

STA. 673+03
BEGIN 3' FLAT
BOTTOM DITCH

STA. 672+44
BEGIN 3' FLAT
BOTTOM DITCH

STA. 669+00
INSTALL
24" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 25 CU. YD.

STA. 672+73 CONSTRUCT
36" X 140' R.C. PIPE CULVERT
25° LT. FWD. SKEW
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
Q50= 27.4 CFS D.A.= 23.3 ACRES
36" R.C. PIPE = 140 LIN. FT.
36" F.E.S. = 2 EA.

HWY. 412

STA. 651+40.43 BEGIN SUPERELEVATION
STA. 656+80.43 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 672+02.52 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 677+42.52 END SUPERELEVATION

280
270
260
250

VPC 661+40.00
EL. = 265.24'
VPT 663+20.00
EL. = 265.55'
(+)0.00 %
(+)0.35 %
PROFILE GRADE
EXISTING GROUND LINE
RT. DITCH GRADE +0.18%
LT. DITCH GRADE +0.31%
STA = 662+30.00
EL = 265.24'
ex = 0.08'
K = 514
L = 180.00'

STA = 674+08.00
EL = 269.36'
SSD = 163'
ex = -0.16'
K = 257
L = 180.00'
(+)0.35 %
(-)0.35
VPC 673+18.00
EL. = 269.05'
VPT 674+98.00
EL. = 269.05'
673+02.36
259.86 LT.
670+53.00
260.23 RT.
670+43.19
260.25 LT.
672+43.82
259.74 RT.
LT. DITCH GRADE -0.20%
RT. DITCH GRADE -0.26%
LT. DITCH GRADE +0.02%
RT. DITCH GRADE +0.02%

STA. 672+73
F.L. INLET (LT.) = 259.80
F.L. OUTLET (RT.) = 259.75

660+00
665+00
670+00
675+00

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

| 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. | | CA1003 | 229 | 503 |

② PLAN & PROF STA 675+00-690+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

STA. 680+00
INSTALL
30" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 28 CU. YD.

C.L. HWY. 412

LIMITS OF CONSTRUCTION

3' FLAT BOTTOM DITCH

PROPOSED ROW

16'

+50 / 90'

+15 / 95'

N 25° 06' 25" W

+45 / 100'

+00 / 100'

+00 / 100'

PROPOSED ROW

UVERCUP SLOUGH

8' 24"

N 64° 54' 35" E

675+00

680+00

685+00

690+00

PC 686+03.07

PROPOSED ROW

16'

STA. 680+00
INSTALL
30" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 31 CU. YD.

LIMITS OF CONSTRUCTION

3' FLAT BOTTOM DITCH

STA. 683+80.00 HWY. 412 =
STA. 10+00.00 EAST
CONNECTOR ROAD
∢ 90° 00' 00"

+42.11 / 95'

+75 / 95'

PROPOSED ROW

C.L. HWY. 412
P.I. = 695+31.09
Δ = 25° 06' 39" (RT)
D = 1° 22' 30"
T = 928.02'
L = 1,826.23'
R = 4,166.97'
P.C. = 686+03.07
P.T. = 704+29.31
e = 0.040'/'
Ls = 540'

HWY. 412

STA. 651+40.43 BEGIN SUPERELEVATION
STA. 656+80.43 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 672+02.52 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 677+42.52 END SUPERELEVATION

STA. 681+98.07 BEGIN SUPERELEVATION
STA. 687+38.07 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 702+94.31 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 708+34.31 END SUPERELEVATION

280
270
260

VPC 676+60.00
EL. = 268.48'

VPT 678+40.00
EL. = 268.16'

VPC 681+0.00
EL. = 268.16'

VPT 682+80.00
EL. = 268.48'

PROFILE GRADE

(-)0.35 %

(+)0.00 %

(+)0.00 %

(+)0.35 %

EXISTING GROUND LINE

LT. DITCH GRADE +0.02%
RT. DITCH GRADE +0.02%

STA = 677+50.00
EL = 268.16'
ex = 0.08'
K = 514
L = 180.00'

STA = 682+00.00
EL = 268.16'
ex = 0.08'
K = 514
L = 180.00'

(+)0.35 %

STA = 688+50.00
EL = 270.44'
SSD = 317.3'
ex = -0.08'
K = 514
L = 180.00'

(+)0.00 %

VPC 687+60.00
EL. = 270.12'

VPT 689+40.00
EL. = 270.44'

280
270
260
250

675+00
680+00
685+00
690+00

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

LEGEND

EXISTING PAVEMENT, SUB-BASE & GUARDRAIL TO BE REMOVED

LIMITS OF CONSTRUCTION

SPECIAL FLOOD HAZARD AREA
STA. 703+07 TO 716+22

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 230 | 503 |

② PLAN & PROF STA 690+00-705+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

STA. 690+56.26, 249.03' LT. -
STA. 691+11.19, 228.83' LT.
(61.5' X 27' CLEAR ROADWAY BRIDGE)
CONSISTING OF 2 SPAN CONC. DECK WITH RCD GIRDER SPANS AND CONC. PILES
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 10) = 1.00 LUMP SUM

STA. 690+60.78
261.93' LT.
PK=929

STA. 690+52.26
236.32' LT.

OVERCUP SLOUGH

EXISTING ROW

+28.85
110'

PROPOSED ROW

HP

STA. 691+97
END 3' FLAT
BOTTOM DITCH

C.L. HWY. 412

695+00

690+00

+25
95'

HP

PROPOSED ROW

+00
95'

STA. 694+35
BEG. 8'
COMPACTED
EMBANKMENT

STA. 694+45
END 3' FLAT
BOTTOM DITCH

STA. 695+16
BEG. 8' FLAT
BOTTOM DITCH

+25
125'

COMPACTED EMBANKMENT

+75
130'

REMOVAL AND DISPOSAL OF EXISTING GUARDRAIL

| STA. | STA. | SIDE | UNIT |
|---|---|---|---|
| 690+56 | 691+11 | LT. | 950 LIN.FT. |

STA. 694+25 CONSTRUCT
QUAD. 8' X 6' X 148' R.C. BOX CULVERT
WITH 31 WINGS LT. & RT.
34° RT. FWD. SKEW
Q50 = 145 CFS D.A. = 691 ACRES
SPAN = 42.31'

C.L. HWY. 412
P.I. = 695+31.09
Δ = 25° 06' 39" (RT)
D = 1° 22' 30"
T = 928.02'
L = 1,826.23'
R = 4,166.97'
P.C. = 686+03.07
P.T. = 704+29.31
e = 0.040'/'
Ls = 540'

STA. 700+51 IN PLACE
36" X 37' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 74' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 292.9 CU. YD.

STA. 701+47
LT. SIDE DRAIN
INSTALL TEMP.
36" X 68' PIPE CULVERT
LT. SIDE DRAIN

LIMITS OF CONSTRUCTION

STA. 700+50.75 US 412 =
STA. 10+00.00 CR 218
℄ = 84° 01' 52"

STA. 701+36.12 US 412 =
STA. 1+00.00 TEMP. DETOUR CR 218
℄ = 84° 05' 00"

+70.75
129.93'

+48.82
115'

+00
115'

PROPOSED ROW

EXISTING ROW

N 0° 47' 05" E

24'

35'

PROPOSED ROW

TCE

+05.41
123.38'

+50
125'

PROPOSED ROW

40' R.

40' R.

EXISTING ROW

700+00

10+00

24'

14'

8'

24'

8'

S 89° 58' 46" E

705+00

EXISTING ROW

+28.31

STA. 703+50
END 8'
COMPACTED
EMBANKMENT

STA. 704+73
END 8' FLAT
BOTTOM DITCH

PROPOSED ROW

+50
135'

HWY. 412

SPECIAL FLOOD HAZARD AREA

3/2/2018 10:03:16 AM

STA. 681+98.07 BEGIN SUPERELEVATION
STA. 687+38.07 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 702+94.31 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 708+34.31 END SUPERELEVATION

280
270
260

PROFILE GRADE

(+)0.00 %

(-)0.50 %

VPC 692+45.00
EL. = 270.44'

STA = 693+35.00
EL = 270.44'
SSD = 2248'
ex = -0.11'
K = 360
L = 180.00'

VPT 694+25.00
EL. = 269.99'

692+00.00 RT.
260.20 RT.

691+97.28
260.20 LT.

HP

HP

RT. DITCH GRADE +0.02%
LT. DITCH GRADE +0.02%

RT. DITCH GRADE -0.10%
LT. DITCH GRADE -0.17%

693+50.00
259.34 LT.

694+00.00
260.00 RT.

694+00.00
259.80 LT.

$HW_{50}$ = 263.29'

2' FOUND. BKFL MATL

STA. 694+25
F.I. INLET (LT.) = 260.00
F.I. OUTLET (RT.) = 260.00

VPC 696+30.00
EL. = 268.96'

(-)0.50 %

STA = 697+20.00
EL = 268.51'
ex = 0.22'
K = 180
L = 180.00'

VPT 698+10.00
EL. = 268.96'

(+)0.50 %

RT. DITCH GRADE -0.32%
LT. DITCH GRADE -0.27%

EXISTING GROUND LINE

(+)0.50 %

VPC 702+85.00
EL. = 271.34'

STA = 703+75.00
EL = 271.79'
SSD = 1359'
ex = -0.19'
K = 212
L = 180.00'

(-)0.35 %

VPT 704+65.00
EL. = 271.47'

690+00

695+00

700+00

705+00

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

STA. 705+71.37 - STA. 706+42.37
(71.0' X 24' CLEAR ROADWAY BRIDGE)
CONSISTING OF 3 SPAN CONC. DECK WITH
RCD GIRDER SPANS AND CONC. PILES
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 12) = 1.00 LUMP SUM

STA. 706+09 CONSTRUCT
QUAD. 10' X 10' X 163' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
42° LT. FWD. SKEW
050 = 930 CFS D.A. = 1939 ACRES
SPAN = 56.54'

SPECIAL FLOOD HAZARD AREA
STA. 703+07 TO 716+22

REMOVAL AND DISPOSAL OF EXISTING GUARDRAIL

| STA. | STA. | SIDE | UNIT |
|---|---|---|---|
| 703+64 | 705+64 | RT. | 200 LIN.FT. |
| 703+79 | 705+79 | LT. | 200 LIN.FT. |
| 706+34 | 707+34 | RT. | 100 LIN.FT. |
| 706+49 | 708+49 | LT. | 200 LIN.FT. |

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 231 | 503 |

② PLAN & PROF STA 705+00-720+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

SPECIAL FLOOD HAZARD AREA

STA 707+24.00
END FULL DEPTH
RECONSTRUCTION
BEGIN WIDENING

LIMITS OF CONSTRUCTION

STA. 709+50
BEGIN 5' FLAT
BOTTOM DITCH

C.L. HWY. 412

PROPOSED ROW

EXISTING ROW

PN:1141
PD:ST60DNL, TRIG ELEV

PN1930

PN:1142
PD:STCPS, TRIG ELEV

PN:1143
PD:STCPS, TRIG ELEV

S 89° 58' 46" E

705+00

710+00

715+00

720+00

24'

16'

+00 130'

+50 135'

+50 105'

+68.15 105'

STA. 709+15 IN PLACE
36" X 16' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 54' PIPE CULVERT
RT. SIDE DRAIN
RT. SIDE DRAIN
CONSTRUCT APPR. = 67.4 CU. YD.

HWY. 412

STA. 681+98.07 BEGIN SUPERELEVATION
STA. 687+38.07 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 702+94.31 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 708+34.31 END SUPERELEVATION

280
270
260
250

PROPOSED PGL

707+24.00
EL.=270.57

STA 707+24.00
END FULL DEPTH
RECONSTRUCTION
EL.=270.57

$HW_{50}$ = 263.29'

708+92.77
258.82 RT.

EXISTING GROUND LINE

LT. DITCH GRADE -0.27%
RT. DITCH GRADE -0.32%
705+80.00
256.37 RT.
706+03.00
256.30 RT.
2' FOUND. BKFL MATL
706+50.00
256.37 LT.

RT. DITCH GRADE +0.87%

707+50.00
256.81 LT.

RT. DITCH GRADE +0.11%

LT. DITCH GRADE +0.17%

STA. 706+09
F.L. INLET (LT.) = 256.24
F.L. OUTLET (RT.) = 256.18

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

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 232 | 503 |

② PLAN & PROF STA 720+00-735+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

STA. 722+00 IN PLACE
42" X 24' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
42" X 52' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 80.3 CU. YD.

STA. 724+93 IN PLACE
60" X 41' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
42" X 54' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 91.4 CU. YD.

C.L. HWY. 412

LIMITS OF CONSTRUCTION

PROPOSED ROW 16' 22' PROPOSED ROW

EXISTING ROW EXISTING ROW

24' 8' 24' 8'

S 89° 58' 46" E

720+00 725+00 730+00 735+00

16.5' X 18.9' CONC.

EXISTING ROW EXISTING ROW

PROPOSED ROW 18' PROPOSED ROW

+83.70 95

LIMITS OF CONSTRUCTION

STA. 721+98 IN PLACE
16.5' X 18.9' CONC. BRIDGE
REMOVE AND INSTALL
DBL. 36" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 62.1 CU. YD.

HWY. 412

280 270 260

EXISTING GROUND LINE

RT. DITCH GRADE +0.11%

LT. DITCH GRADE +0.17%

720+00 725+00 730+00 735+00

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

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 233 | 503 |

② PLAN & PROF STA 735+00-750+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/2/11

STA. 740+08 IN PLACE
36" X 23.8' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 31.2 CU. YD.

LIMITS OF CONSTRUCTION

PROPOSED ROW

EXISTING ROW

+00.07 85' 16'

C.L. HWY. 412

PROPOSED ROW

EXISTING ROW

P.C. 747+83.01

+50 85'

735+00

24' 8"

24' 8"

740+00

S 89° 58' 46" E

745+00

750+00

EXISTING ROW

EXISTING ROW

P.T. 749+45.73

PROPOSED ROW

+00 95'

20'

+99.28 100'

PROPOSED ROW

+50 95'

LIMITS OF CONSTRUCTION

STA. 740+08 IN PLACE
18' X 19' CONC. BRIDGE
REMOVE AND INSTALL
DBL. 36" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 42.4 CU. YD.

C.L. HWY. 412
P.I. = 749+45.73
Δ = 4° 52' 43" (LT)
D = 1° 30' 00"
T = 162.72'
L = 325.25'
R = 3,819.72'
P.C. = 747+83.01
P.T. = 751+08.26
e = 0.043'/'
Ls = 540'

HWY. 412

STA. 743+78.01 BEGIN SUPERELEVATION
STA. 749+18.01 MAX. SUPERELEVATION (0.043 FT./FT.)
STA. 749+73.26 MAX. SUPERELEVATION (0.043 FT./FT.)
STA. 755+13.26 END SUPERELEVATION

280
270
260

EXISTING GROUND LINE

739+95.81 262.25' Lt.

LT. DITCH GRADE +0.17%

LT. DITCH GRADE +0.11%
RT. DITCH GRADE +0.11%

735+00 740+00 745+00 750+00

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

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 234 | 503 |

② PLAN & PROF STA 750+00-765+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

STA. 753+30 IN PLACE
30" X 20.7' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 21.8 CU. YD.

STA. 754+64 IN PLACE
DBL. 6' X 3' X 53' R.C. BOX CULVERT
WITH 3sl WINGS LT. & RT.
REMOVE AND CONSTRUCT
DBL. 36" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS IV)(TYPE 3 BEDDING)
Q50= 37.6 CFS D.A.= 13.1 ACRES
36" R.C. PIPE = 238 LIN. FT.
36" F.E.S. = 4 EA.

STA. 759+30 INSTALL
36" X 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 55.0 CU. YD.

LIMITS OF CONSTRUCTION
5' FLAT BOTTOM DITCH
C.L. HWY. 412

STA. 760+16 IN PLACE
36" X 28' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE

STA. 762+50 INSTALL
36" X 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 55.0 CU. YD.

PROPOSED ROW
EXISTING ROW
PRC 751+08.26
PI 756+32.88
PI 761+56.77
PN 931
POT 10+00.00
POT 13+46.6
750+00
755+00
760+00
765+00
S 89° 36' 56" E
16'
20'
24'
8'
40' R.
+50 90'
+50 95'
+00 90'
+65 95'
+60 95'
+00 45'
+45 25'
+45 40'
+56.68 98.15'
+55.76 182.63'
+95.08 96.52'
+78.01 275.67'
+44.49 338.52'
+31.42 370.95'
+61.97 392.21'
+49.14 402.79'
TCE
COMPACTED EMBANKMENT
HWY. 412

CR 340 STA. 13+40.00
END PAVEMENT
RECONSTRUCTION

STA. 753+10 IN PLACE
16' X 24' CONC. BRIDGE
REMOVE AND INSTALL
DBL. 36" X 58' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 78.2 CU. YD.

S 0° 03' 18" W
S 00° 56' 03" E

STA. 753+13.35 US 412 =
STA. 10+00.00 CR 340
✱ = 86° 06' 44"

C.L. HWY. 412
P.I. = 756+32.88
Δ = 5° 14' 33" (RT)
D = 0° 30' 00"
T = 524.62'
L = 1,048.51'
R = 11,459.16'
P.C. = 751+08.26
P.T. = 761+56.77
e = N/A
Ls = N/A

C.L. CR 340
P.I. = 12+01.37
Δ = 0° 59' 21" (LT)

STA. 759+30 IN PLACE
36" X 27.5' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
36" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 59.4 CU. YD.

STA. 759+66
BEG. 12'
COMPACTED
EMBANKMENT

STA. 762+67
END 12'
COMPACTED
EMBANKMENT

CR 340 PROFILE
STA = 12+47.39
EL = 265.79'
ex = 0.63'
K = 64
L = 180.00'
PROFILE GRADE
(+)0.36%
(+)0.36%
(-)2.50%
(-)2.50%
(+)0.30%
VPC 11+57.39 Elev 268.04
VPT 11+56.67 Elev 268.06
PVT 13+37.39 Elev 266.06
10+00.00 269.29
13+40.00 EL.=266.07
STA = 10+94.07
EL = 269.62'
ex = 0.45'
K = 44
L = 125.00'
10+70.00 EL.=263.86
13+00.00 EL.=263.42
13+40.00 EL.=263.21
LT. DITCH GRADE -0.9%
LT. DITCH GRADE -0.53%
EXISTING GROUND LINE
LT. DITCH GRADE -0.25%
LT. DITCH GRADE +0.11%
RT. DITCH GRADE +0.11%
754+44.00 263.76 LT.
754+64.00 263.71 LT.
759+50.00 264.20 RT.
764+00.00 264.68 RT.
RT. DITCH GRADE +0.11%
LT. DITCH GRADE +0.03%
290
280
270
260
250
10+00
11+00
12+00
13+00
14+00

STA. 743+78.01 BEGIN SUPERELEVATION
STA. 749+18.01 MAX. SUPERELEVATION (0.043 FT./FT.)
STA. 749+73.26 MAX. SUPERELEVATION (0.043 FT./FT.)
STA. 755+13.26 END SUPERELEVATION

STA. 754+64
F.I. INLET (LT.) = 263.72
F.I. OUTLET (RT.) = 263.68

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

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|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 235 | 503 |

② PLAN & PROF STA 765+00-780+00

SPECIAL FLOOD HAZARD AREA
STA. 776+65 TO 790+86

STA. 777+57 IN PLACE
36" X 32.2' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 54' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 195.7 CU. YD.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

STA. 777+25
END 5' FLAT
BOTTOM DITCH

STA. 778+00
BEGIN 5' FLAT
BOTTOM DITCH

C.L. HWY. 412

+49.56 150'

+49.56 90'

EXISTING ROW

LIMITS OF CONSTRUCTION

CR 222

28'

PROPOSED ROW

PROPOSED ROW

EXISTING ROW

S 89° 36' 56" E

765+00

770+00

775+00

780+00

APN:145
PDISTCPS

24"

8'

24"

EXISTING ROW

HP

PROPOSED ROW

20'

PROPOSED ROW

LIMITS OF CONSTRUCTION

+49.56 85'

+49.56 125'

STA. 777+07
END 5' FLAT
BOTTOM DITCH

EXISTING ROW

20'

STA. 777+73
BEGIN 5' FLAT
BOTTOM DITCH

STA. 777+40 INSTALL
24" X 66' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 47.0 CU. YD.

STA. 769+76 IN PLACE
16' X 19' CONC. BRIDGE
REMOVE AND INSTALL
36" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 39.0 CU. YD.

SPECIAL FLOOD HAZARD AREA

HWY. 412

290
280
270
260

EXISTING GROUND LINE

RT. DITCH GRADE +0.11%

LT. DITCH GRADE +0.03%

RT. DITCH GRADE -0.89%

LT. DITCH GRADE -0.20%

777+28.61
266.09 RT.

HP

777+30.00
264.39 LT.

778+00.00
262.00 LT.

765+00 770+00 775+00 780+00

2/9/2018

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

STA. 783+07.01 - STA. 783+78.01
(71.0' X 24' CLEAR ROADWAY BRIDGE)
CONSISTING OF 3 SPAN CONC. DECK WITH
RCD GIRDER SPANS AND CONC. PILES
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 13) = 1.00 LUMP SUM

STA. 783+43 CONSTRUCT
QUAD. 12' X 12' X 140' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
27° LT. FWD. SKEW
Q50 = 2214 CFS D.A. = 6336 ACRES
SPAN = 58.17'

STA. 783+50
END 5' FLAT
BOTTOM DITCH

PN:1148
PD:ST60DNL,TRIG ELEV

PN:1147
PD:ST60DNL,TRIG ELEV

STA. 784+20
BEGIN 5' FLAT
BOTTOM DITCH

REMOVAL AND DISPOSAL OF EXISTING GUARD RAIL

| STA. | STA. | SIDE | UNIT |
|---|---|---|---|
| 781+16 | 783+16 | RT. | 200 LIN.FT. |
| 782+27 | 783+02 | LT. | 75 LIN.FT. |
| 783+70 | 785+70 | RT. | 200 LIN.FT. |
| 783+84 | 785+84 | LT. | 200 LIN.FT. |

SPECIAL FLOOD HAZARD AREA
STA. 776+65 TO 790+86

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 236 | 503 |

② PLAN & PROF STA 780+00-795+00

SPECIAL FLOOD HAZARD AREA

EXISTING ROW

LIMITS OF CONSTRUCTION

PROPOSED ROW

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/27/18

STA 780+46.29
END WIDENING
BEGIN FULL DEPTH
RECONSTRUCTION

STA 785+75.00
END FULL DEPTH
RECONSTRUCTION
BEGIN WIDENING

C.L. HWY. 412

S 89°-36'-56" E

PN:932

PN:1146
PD:STCPS

PN:1149
PD:STMAG,TRIG ELEV

780+00

785+00

790+00

795+00

24'

8'

8'

24'

EXISTING ROW

EXISTING ROW

EXISTING ROW

20'

30'

+49.36
150'
+49.36
115'

+49.36
125'
+49.36
85'

PN:1150
PD:ST60DNL,TRIG ELEV

PN:51
PD:STCPS,TRIG ELEV

STA. 783+10
BEGIN 5' FLAT
BOTTOM DITCH

STA. 782+90
END 5' FLAT
BOTTOM DITCH

CANEY SLOUGH

LIMITS OF CONSTRUCTION

STA. 790+70 IN PLACE
30" X 45.5' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
36" X 60' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 96.0 CU. YD.

STA. 793+20 IN PLACE
30" X 23.5' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
36" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 42.3 CU. YD.

HWY. 412

STA = 782+25.00
EL = 276.38'
SSD = 1028'
ex = -0.26'
K = 157
L = 180.00'

STA = 784+60.00
EL = 276.38'
SSD = 1071'
ex = -0.22'
K = 164
L = 180.00'

PROFILE GRADE

STA 780+46.29
BEGIN FULL DEPTH
RECONSTRUCTION
EL.=274.25

STA 785+75.00
END FULL DEPTH
RECONSTRUCTION
EL.=275.24

780+46.29
EL.=274.25

785+75.00
EL.=275.24

(+)1.15 %

(+)0.00 %

(+)0.00 %

(-)0.99 %

VPC 781+35.00
EL. = 275.34'

VPT 783+15.00
EL. = 276.38'

VPC 783+70.00
EL. = 276.38'

VPT 785+50.00
EL. = 275.49'

783+10.00
261.05 RT.

782+90.00
261.05 RT.

783+60.00
260.88 LT.

784+20.00
260.02 LT.

$HW_{50}$ = 268.60'

STA. 783+43
F.L. INLET (LT.) = 259.88
F.L. OUTLET (RT.) = 259.88

2' FOUND. BKFL MATL

EXISTING GROUND LINE

791+00.00
265.00 RT.

RT. DITCH GRADE -0.89%

LT. DITCH GRADE -0.20%

RT. DITCH GRADE +0.50%

RT. DITCH GRADE +0.17%

LT. DITCH GRADE +0.29%

290
280
270
260

780+00
785+00
790+00
795+00

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

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|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 237 | 503 |

## ② PLAN & PROF STA 795+00-810+00

STA. 797+17 IN PLACE
15' X 19' CONC. BRIDGE
REMOVE AND INSTALL
QUAD. 42" X 60' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 109.4 CU. YD.

C.L. HWY. 412

LIMITS OF CONSTRUCTION

STA. 804+01 IN PLACE
19' X 20.5' CONC. BRIDGE
REMOVE AND INSTALL
QUAD. 42" X 113' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 41.4 CU. YD.

STA. 804+63 INSTALL
LT. SIDE DRAIN
CONSTRUCT APPR. = 51.8 CU. YD.

STA. 804+89
BEGIN 8' WIDE
COMPACTED EMBANKMENT

PROPOSED ROW

EXISTING ROW

COMPACTED EMBANKMENT

15' W-19 CONC. BRIDGE DECK

15' W=30.5 CONC. BRIDGE DECK

S 89° 36' 56" E

N 89° 54' 55" E

795+00

800+00

805+00

810+00

PC 800+59.57

PT 802+47.21

PI 801+53.39

C.L. HWY. 412
P.I. = 801+53.39
Δ = 0° 28' 09" (LT)
D = 0° 15' 00"
T = 93.82'
L = 187.65'
R = 22,918.31'
P.C. = 800+59.57
P.T. = 802+47.21
e = N/A
Ls = N/A

STA. 803+76 IN PLACE
24" X 20' R.C. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
36" X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 30.7 CU. YD.

STA. 804+24
END 5' FLAT
BOTTOM DITCH

STA. 804+48 IN PLACE
24" X 40' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 39.7 CU. YD.

STA. 809+98 IN PLACE
WOODEN BRIDGE LT.
REMOVE

HWY. 412

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/21/18

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290
280
270
260

EXISTING GROUND LINE

RT. DITCH GRADE +0.17%

LT. DITCH GRADE +0.29%

RT. DITCH GRADE +0.23%

LT. DITCH GRADE +0.23%

797+71.66
284.00 LT.

807+61.24
287.38 RT.

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

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② PLAN & PROF STA 810+00-825+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/18

LIMITS OF CONSTRUCTION
PROPOSED ROW
EXISTING ROW
C.L. HWY. 412
N 89° 54' 55" E
810+00
815+00
820+00
825+00
COMPACTED EMBANKMENT
24'
8'
8'
24'
+00 75'
+48.97 70'
+48.89 70'
+00 75'
LIMITS OF CONSTRUCTION

HWY. 412

EXISTING GROUND LINE
RT. DITCH GRADE +0.23%
LT. DITCH GRADE +0.23%
811+50.00 268.99 RT.

290
280
270
260

274.85 274.87 274.90 274.94 275.00 275.14 275.27 275.34 275.41 275.53 275.64 275.75 275.77 275.84 275.84 275.93 275.95 276.08 276.23 276.36 276.44 276.55 276.63 276.70 276.84 276.96 277.07 277.13 277.22 277.22 277.26

810+00 815+00 820+00 825+00

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

STA. 830+89 IN PLACE
15' X 19.3' CONC. BRIDGE
WITH RETAINING WALLS
REMOVE AND INSTALL
QUAD. 42" X 72' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 163.6 CU. YD.

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| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 239 | 503 |

② PLAN & PROF STA 825+00-840+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
3/5/18

C.L. HWY. 412
P.I. = 827+41.66
Δ = 0° 03' 14" (RT)

PROPOSED ROW
COMPACTED EMBANKMENT
EXISTING ROW
PI 827+41.66
N 89° 54' 55" E
825+00
EXISTING ROW
PROPOSED ROW
+28.96
75'
16'
C.L. HWY. 412
+73.17
132.20'
+73.17
114.99'
+90.51
115'
TCE
+03.17
132.20'
+03.17
114.86'
20'
40'
15' W-19.3 CONC BRIDGE DECK
N 89° 58' 09" E
830+00
LIMITS OF CONSTRUCTION
LIMITS OF CONSTRUCTION
STA. 834+50
END 8' WIDE
COMPACTED
EMBANKMENT
PC 834+88.65
81' 24" RT
81' 24" LT
835+00
PROPOSED ROW
COMPACTED EMBANKMENT
EXISTING ROW
+00
95'
PROPOSED ROW
EXISTING ROW
840+00
PI 838+70.12
+41.70
75.18'
EXISTING ROW
PROPOSED ROW
+50
80'

C.L. HWY. 412
P.I. = 838+70.12
Δ = 5° 43' 02" (LT)
D = 0° 45' 00"
T = 381.47'
L = 762.30'
R = 7,639.44'
P.C. = 834+88.65
P.T. = 842+50.95
e = 0.023'/'
Ls = 540'

HWY. 412

STA. 830+83.65 BEGIN SUPERELEVATION
STA. 836+23.65 MAX. SUPERELEVATION (0.023 FT./FT.)
STA. 841+15.95 MAX. SUPERELEVATION (0.023 FT./FT.)
STA. 846+55.95 END SUPERELEVATION

EXISTING GROUND LINE

831+00.00
293.50' RT.

RT. DITCH GRADE +0.31%

LT. DITCH GRADE +0.23%

300
290
280
270

825+00 830+00 835+00 840+00

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

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 6 | ARK. | | | |
| JOB NO. | | CA1003 | 240 | 503 |

② PLAN & PROF STA 840+00-853+01.68

C.L. HWY. 412
P.I. = 838+70.12
Δ = 5° 43' 02" (LT)
D = 0° 45' 00"
T = 381.47'
L = 762.30'
R = 7,639.44'
P.C. = 834+88.65
P.T. = 842+50.95
e = 0.023'/'
Ls = 540'

STA. 844+84 IN PLACE
6' X 3' X 123' R.C. BOX CULVERT
45° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
RETAIN & EXTEND
R.C. BOX CULVERT 37' LT. AND 13' RT.
CONSTRUCT 6' X 3' X 170' R.C. BOX CULVERT
45° RT. FWD. SKEW
ADJACENT TO EXISTING
WITH 3:1 WINGS LT. & RT.
050= 153.7 CFS D.A.= 174.3 ACRES

LIMITS OF CONSTRUCTION

STA. 853+00
END 5' FLAT
BOTTOM DITCH

PROPOSED ROW
EXISTING ROW
PT 842+50.95
PN:933
840+00
845+00
850+00
855+00
N 84° 15' 07" E
C.L. HWY. 412
24'
8'
PROPOSED ROW
EXISTING ROW
STA. 853+01.68
END JOB CA1003
LOG MILE 8.31
PN:1153
PD:STCPS, TRIG ELEV.
PN:1154
PD:STCPS, TRIG ELEV.
EXISTING ROW
100' TRANSITION
TO EXISTING PVMT
LIMITS OF CONSTRUCTION
HWY. 412

HP
EXISTING ROW
+50.95
85'
+58.57
81.93'
+58.57
97.10'
16'
TCE
+84.57
81.93'
+84.57
97.10'
22'
+21.66
80.13'
+91.74
100.11'
PN:934

STA. 843+71 IN PLACE
48" X 30' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 21.1 CU. YD.

STA. 844+65 IN PLACE
48" X 30' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 41.5 CU. YD.

STA. 830+83.65 BEGIN SUPERELEVATION
STA. 836+23.65 MAX. SUPERELEVATION (0.023 FT./FT.)
STA. 841+15.95 MAX. SUPERELEVATION (0.023 FT./FT.)
STA. 846+55.95 END SUPERELEVATION

300
290
280
270

EXISTING GROUND LINE

845+25.00
217.35 RT.
HP
RT. DITCH GRADE +0.31%
LT. DITCH GRADE +0.23%
RT. DITCH GRADE -0.51%
844+79.14
275.00 LT.
2' FOUND. BKFL MATL
STA. 844+84
F.L. INLET (RT.) = 276.16
F.L. OUTLET (LT.) = 275.00
845+50.00
276.16 RT.
RT. DITCH GRADE +0.13%
847+50.00
276.40 RT.
RT. DITCH GRADE +1.03%
LT. DITCH GRADE +0.63%
853+01.00
282.10 RT.
853+02.00
280.20 LT.
STA. 853+01.68
END JOB CA1003
LOG MILE 8.31

840+00
845+00
850+00
855+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/1/17

3/2/2018 10:04:32 AM

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

| 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. | | CA1003 | 241 | 503 |

② PLAN & PROF HWY. 228

LEGEND

EXISTING PAVEMENT TO BE REMOVED

STA. 19+78.82 TO STA. 20+28.82
CONSTRUCT TAPER LT. & RT. FROM
EXISTING SECTION TO PROPOSED SECTION

C.L. EXISTING HWY. 228

STA. 23+21.31
END NOTCH & WIDEN
BEGIN FULL DEPTH
CONSTRUCTION

LIMITS OF CONSTRUCTION

EXISTING ROW

N 37° 34' 46" E

20+00

EXISTING ROW

STA. 20+28.82
BEGIN CONSTRUCTION
HWY. 228

C.L. HWY. 228
P.I. = 22+34.27
Δ = 15° 13' 32" (RT)
D = 10° 00' 00"
T = 76.18'
L = 151.47'
R = 572.96'
P.C. = 21+58.08
P.T. = 23+09.55
e = 0.056'/'
Ls = 205'

P.C. 21+58.08

+25
36.89'

P.I. 22+34.27

P.T. 23+09.55

N 52° 48' 19" E

PROPOSED ROW

25+00

C.L. HWY. 228

LIMITS OF CONSTRUCTION

+50
60'

P.I. 25+67.96

C.L. HWY. 228
P.I. = 25+67.95
Δ = 38° 15' 15" (LT)
D = 24° 00' 00"
T = 83.23'
L = 160.24'
R = 238.73'
P.C. = 24+84.72
P.T. = 26+44.96
e = 0.040'/'
Ls = 100'

P.C. 24+84.72

+10
95'

+27.68
120'

P.T. 26+44.96

75' R

N 89° 33' 04.0" E

520.00'

PROPOSED ROW

AT FINISH PDSP SPIKE

AT FINISH PDSP SPIKE

AT FINISH PDSP SPIKE

STA. 27+17 CONSTRUCT
36" X 86' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS IIIXTYPE 2 BEDDING)
Q50= 16.4 CFS D.A.= 5.4 ACRES
36" R.C. PIPE = 86 LIN. FT.
36" F.E.S. = 2 EA.

CL HWY 228
STA. 27+86.35 =
CL HWY 412
STA. 622+72.02
∡ = 75°00'00"

+00
50'

75' R

+50
90'

HWY 412

625.00'

PROPOSED ROW

STA. 28+56 CONSTRUCT
36" X 86' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS IVXTYPE 3 BEDDING)
Q50= 7.7 CFS D.A.= 1.3 ACRES
36" R.C. PIPE = 86 LIN. FT.
36" F.E.S. = 2 EA.

+75
90'

+85
50'

75' R

HP

STA. 30+37 IN PLACE
18" X 26' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
2-24" X 36' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 39.5 CU. YD.

+00
60'

P.I. 30+09.12

LIMITS OF CONSTRUCTION

PROPOSED ROW

C.L. HWY. 228
P.I. = 33+36.97
Δ = 15° 07' 23" (LT)
D = 10° 00' 00"
T = 75.66'
L = 150.45'
R = 572.96'
P.C. = 32+61.31
P.T. = 34+11.76
e = 0.056'/'
Ls = 205'

+00
40.37'

+86.87
45'

P.C. 32+61.31

P.T. 34+11.76

EXISTING ROW

N 52° 42' 09" E

SH 228

30+00

P.I. 30+88.83

HP

29+26.13

75' R

C.L. HWY. 228

+12.6
115'

+30
85'

PROPOSED ROW

LIMITS OF CONSTRUCTION (RT)

STA. 32+43.24
END FULL DEPTH
CONSTRUCTION
BEGIN NOTCH & WIDEN

P.I. 33+36.97

EXISTING ROW

N 37° 34' 46" E

35+00

STA. 35+41.54
END CONSTRUCTION
HWY. 228

STA. 35+41.54 TO STA. 35+91.54
CONSTRUCT TAPER LT. & RT. FROM
PROPOSED SECTION TO EXISTING SECTION

STA. 34+60 IN PLACE
18" X 28' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 10.1 CU. YD.

HWY. 228

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

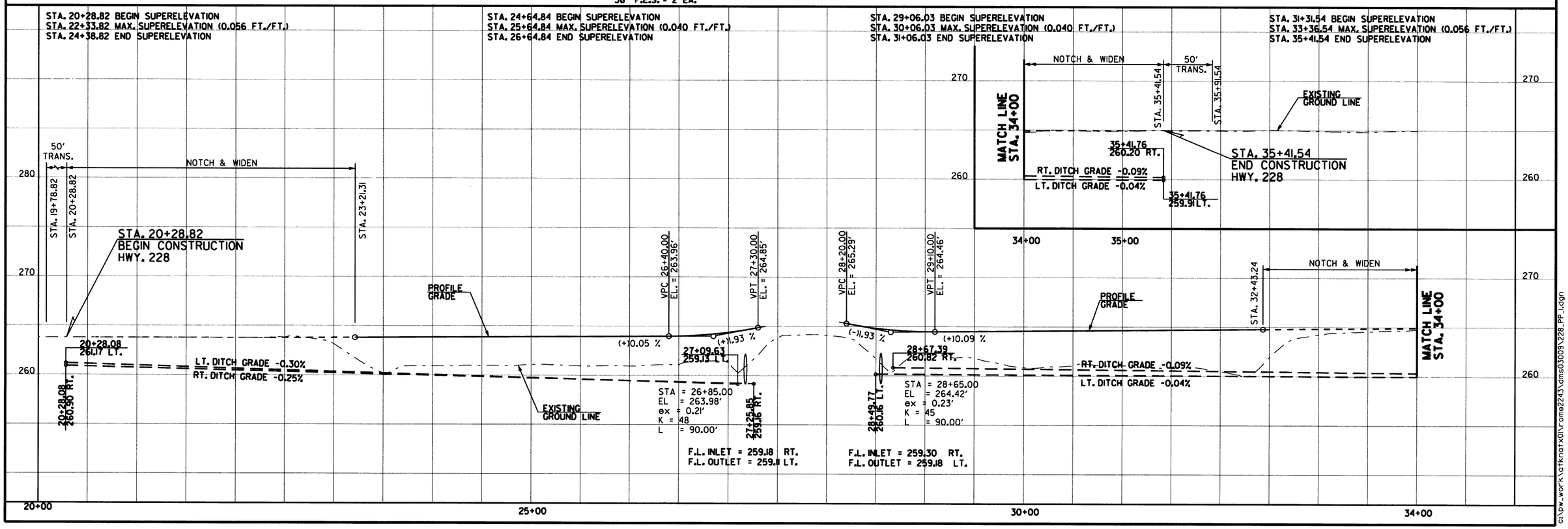
3/2/2018 10:04:38 AM

STA. 20+28.82 BEGIN SUPERELEVATION
STA. 22+33.82 MAX. SUPERELEVATION (0.056 FT./FT.)
STA. 24+38.82 END SUPERELEVATION

STA. 24+64.84 BEGIN SUPERELEVATION
STA. 25+64.84 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 26+64.84 END SUPERELEVATION

STA. 29+06.03 BEGIN SUPERELEVATION
STA. 30+06.03 MAX. SUPERELEVATION (0.040 FT./FT.)
STA. 31+06.03 END SUPERELEVATION

STA. 31+31.54 BEGIN SUPERELEVATION
STA. 33+36.54 MAX. SUPERELEVATION (0.056 FT./FT.)
STA. 35+41.54 END SUPERELEVATION

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

| 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. | | CA1003 | 242 | 503 |

② PLAN & PROF CR 218

C.L. HWY. 412
P.I. = 695+31.09
Δ = 25° 06' 39" (RT)
D = 1° 22' 30"
T = 928.02'
L = 1,826.23'
R = 4,166.97'
P.C. = 686+03.07
P.T. = 704+29.31
e = 0.0400'/'
Ls = 540'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

STA. 700+50.75 US 412 =
STA. 10+00.00 CR 218
℄ = 84° 01' 52"

STA. 701+36.12 US 412 =
STA. 0+00.00 TEMP. DETOUR CR 218
℄ = 84° 05' 00"

C.L. HWY. 412

+75
130'

8' 24' 24' 8'

PROPOSED ROW

COMPACTED EMBANKMENT

EXISTING ROW

EXISTING ROW

100'+R

40'+R

40'+R

LIMITS OF CONSTRUCTION

+00
115'

C.L. CR 218

PROPOSED ROW

35'

CR 218
N 0° 47' 03 E

24'

10+00

0+00

CR 218 TEMP. DETOUR
N 0° 47' 03 E

35'

24'

PROPOSED ROW

+50
125'

P.C. STA. 1+57.69

+05.41
123.38'

TCE

+12.30
249.31'

TCE

STA. 14+13
INSTALL
24" X 30' PIPE CULVERT
16 LT. SIDE DRAIN
CONSTRUCT APPR. =
10.0 CU. YD.

CR 218
STA. 14+37.62
END PAVEMENT
RECONSTRUCTION

CR 218 TEMP. DETOUR
STA. 9+06.00
END PAVEMENT
CONSTRUCTION

+50
440'

STA. 16+71.70 CR 218=
STA. 7+93.50 TEMP. DETOUR CR 218

15+00

20+00

+91.39
435.53'

P.T. STA. 4+47.00

POT 21+12.63

P.C. STA. 1+57.69

+50
361.46'

+50
430'

LIMITS OF CONSTRUCTION

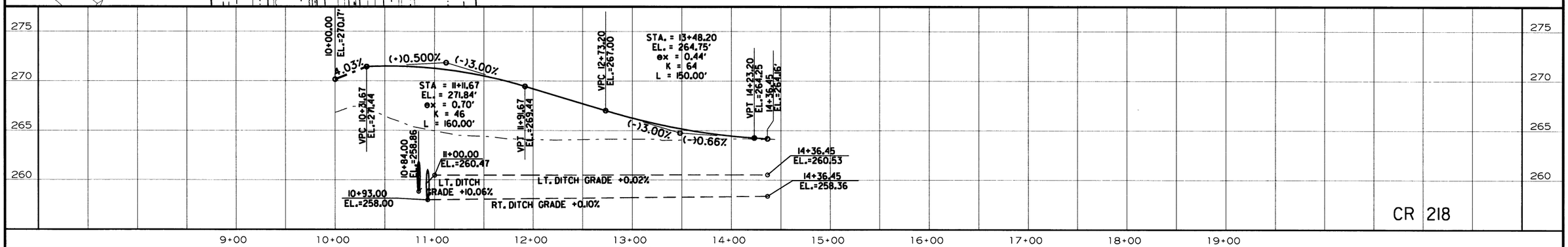
C.L. CR 218 DETOUR

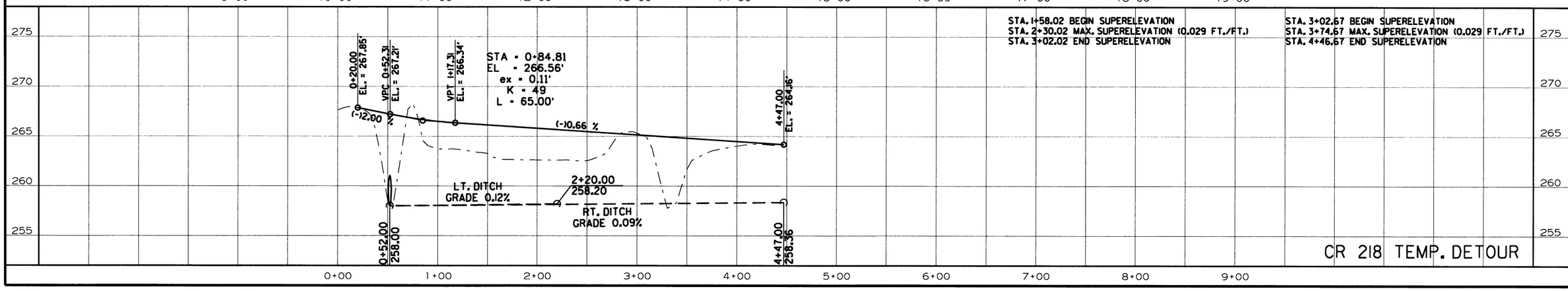
STA. 12+50
INSTALL
48" X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 169.0 CU. YD.

C.L. DETOUR CR 218
P.I. = 2+32.32
Δ = 34° 43' 01" (LT)
D = 24° 00' 00"
T = 74.62'
L = 144.65'
R = 238.73'
P.C. = 1+57.69
P.T. = 3+02.34
e = 0.029'/'
Ls = 72'

C.L. DETOUR CR 218
P.I. = 3+76.97
Δ = 34° 43' 01" (LT)
D = 24° 00' 00"
T = 74.62'
L = 144.65'
R = 238.73'
P.C. = 3+02.34
P.T. = 4+47.00
e = 0.029'/'
Ls = 72'

CR 218

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

LEGEND

EXISTING PAVEMENT TO BE REMOVED

| 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. | | CA1003 | 243 | 503 |

② PLAN & PROF WEST CONNECTOR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/7/17

STA. 570+35.00 HWY. 412 = STA. 10+00.00 WEST CONNECTOR
℄ = 90° 33' 48"

STA. 566+98.86
154.16' LT.

PI 566+35.88

PI 12+37.95

C.L. WEST CONNECTOR

EXISTING ROW

+50.47
50'

+50
40.40'

T.C.E.
32'

+10
50'

+10
39.87'

STA. 13+83
INSTALL
24" X 54' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 9.5 CU. YD.

POE 16+56.75

C.L. (OLD) HWY 412

15+00

S 89° 43' 37" E

STA. 12+00.00
72.00' LT.

8'
12'
12'
8'

16'

50' TRANSITION TO EXISTING PVMT

EXISTING ROW

LT 13+64.00

+00
50.12'

STA. 13+94
END 4' FLAT
BOTTOM DITCH

STA. 14+10
INSTALL
24" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR.
= 39.7 CU. YD.

C.L. WEST CONNECTOR
P.I. = 12+37.95
Δ = 71° 29' 41" (RT)
D = 24° 00' 00"
T = 171.85'
L = 297.89'
R = 238.73'
P.C. = 10+66.10
P.T. = 13+64.00
e = 0.074'/'
Ls = 184'

+00
65'

+25
110'

STA. 11+00
BEG. 4' FLAT
BOTTOM DITCH

STA. 10+78 CONSTRUCT
36" X 80' R.C. PIPE CULVERT
WITH F.E.S. LT & RT.
(CLASS III XTYPE 3 BEDDING)
Q50= 20.5 CFS D.A.= 7.7 ACRES
36" R.C. PIPE = 80 LIN. FT.
36" F.E.S. = 2 EA.

PC 10+66.10

PROPOSED ROW

+00
105'

LIMITS OF CONSTRUCTION

C.L. (OLD) HWY 412

8'
24'
41'
24'
8'

+00
570+90

18°

16' 41"

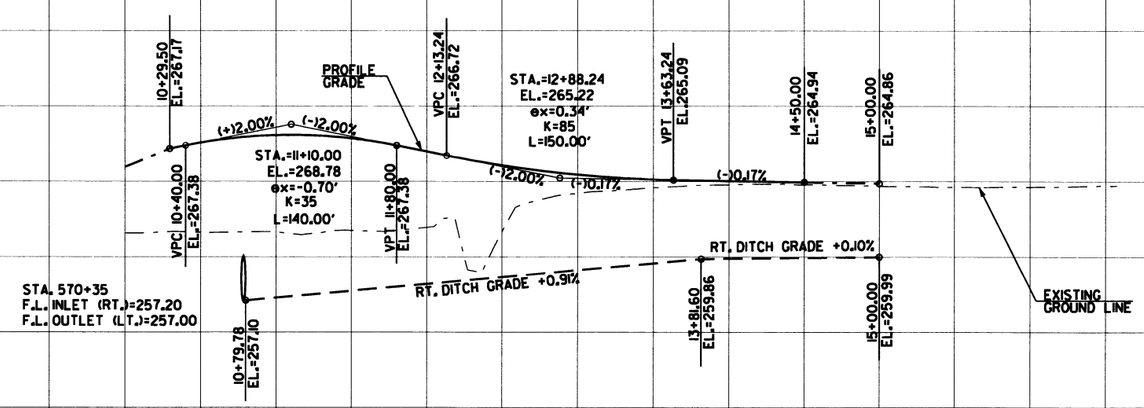
+59.53
95'

PROPOSED ROW

LIMITS OF CONSTRUCTION

WEST CONNECTOR

STA. 10+31.05 BEGIN SUPERELEVATION
STA. 12+15.05 MAX. SUPERELEVATION (0.074 FT./FT.)
STA. 13+99.05 END SUPERELEVATION

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

| 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. | | CA1003 | 244 | 503 |

② PLAN & PROF EAST CONNECTOR

LEGEND

EXISTING PAVEMENT TO BE REMOVED

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 12686
JENELLE N. ROMERO
2/17/17

C.L. EAST CONNECTOR
P.I. = 15+62.16
Δ = 64° 17' 08" (LT)
D = 15° 00' 00"
T = 240.00'
L = 428.57'
R = 381.97'
P.C. = 13+22.15
P.T. = 17+50.72
e = 0.086'/'
Ls = 250'

50' TRANSITION TO EXISTING PVMT

EXISTING ROW

N 69° 22' 32" W

POE 20+03.26

20+00

+75 45.72'

PT 17+50.72

+10 39.30'

+10 50'

LIMITS OF CONSTRUCTION

18' T.C.E

+70 50'

+70 38.28'

STA. 17+87.17
INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR.
= 3.2 CU. YD.

C.L. HWY 412

PROPOSED ROW

STA. 13+00.00
INSTALL
24" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR.
= 180.4 CU. YD.

+50 90'

+50 50'

C.L. EAST CONNECTOR

+15 95'

+00 65'

+00 60'

PC 13+22.15

15+00

STA. 10+74 CONSTRUCT
30" X 88' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS IIIXTYPE 3 BEDDING)
Q50 = 36.3 CFS D.A. = 23.3 ACRES
30" R.C. PIPE = 88 LIN. FT.
30" F.E.S. = 2 EA.

STA. 683+80.00 HWY. 412 =
STA. 10+00.00 EAST CONNECTOR
∝ = 90° 00' 00"

10+00

N 25° 05' 25" W

8'
12'
12'
8'

STA. 14+70
END 4' FLAT
BOTTOM DITCH

C.L. (OLD) HWY 412

+31.06 75'

PI N5+62.16

+45 100'

+85 65'

+18 63.99'

+00 65'

STA. 10+77
BEG. 4' FLAT
BOTTOM DITCH

16' T.C.E

+82 115'

+18 115'

EAST CONNECTOR

STA. 12+86.44 BEGIN SUPERELEVATION
STA. 15+36.44 MAX. SUPERELEVATION (0.086 FT./FT.)
STA. 17+86.44 END SUPERELEVATION

285 275 265 255

280 270 260 250

10+29.50 EL.=268.81

VPC 11+25.44 EL.=268.76

(-)0.05%

(-)0.50%

STA.=12+00.44
EL.=268.72
ex=+0.08'
K=333
L=150.00'

VPT 12+75.44 EL.=268.34

PROFILE GRADE

VPC 14+85.06 EL.=267.30

STA.=15+60.06
EL.=266.92
ex=0.06'
SSD 1841.98'
L=150.00'

(-)0.50%

(-)0.20%

VPT 16+35.06 EL.=266.77

(-)0.20%

17+95.00 EL.=266.46

18+45.00 EL.=266.36

LT. DITCH GRADE +0.15%

RT. DITCH GRADE +0.38%

10+79.90 EL.=260.74

10+82.40 EL.=260.08

14+55.00 EL.=261.08

14+70.00 EL.=262.05

EXISTING GROUND LINE

16+95.00 EL.=261.69

8+00 10+00 12+00 14+00 16+00 18+00 20+00 22+00

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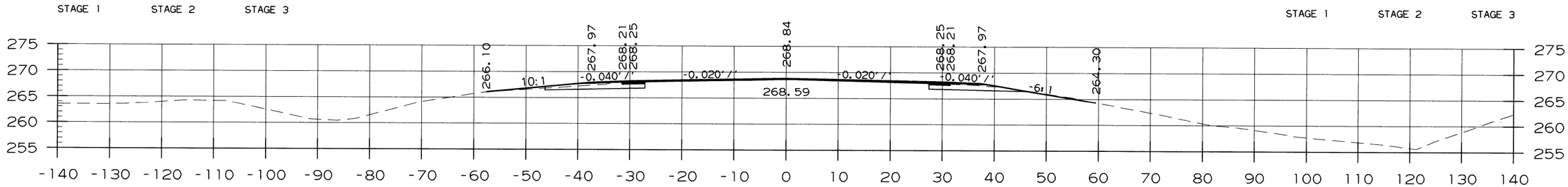
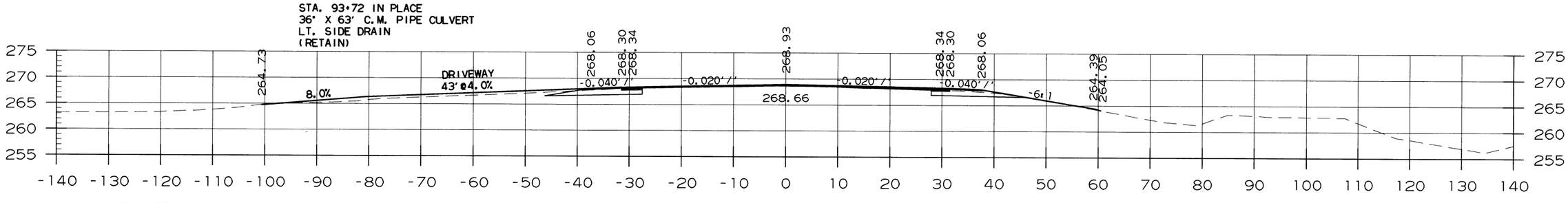
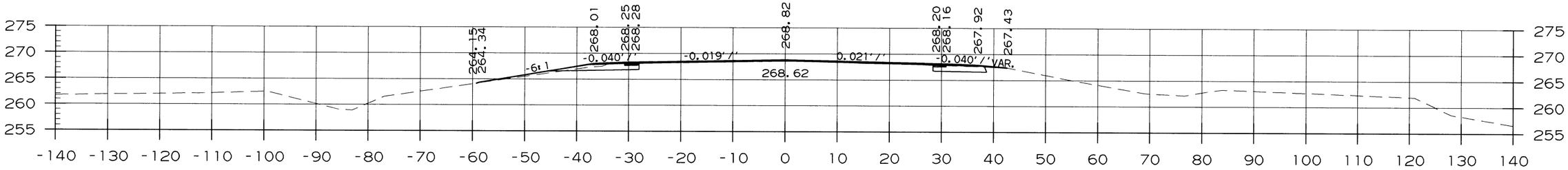
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 245 | 503 |

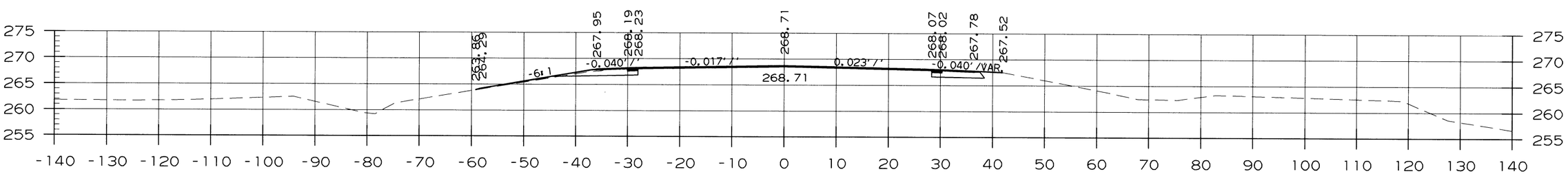
② CROSS SECTIONS




BEGIN JOB CA1003
STA. 93+50.00




CROSS SECTION
STA. 92+50 TO STA. 94+00

2/3/2017

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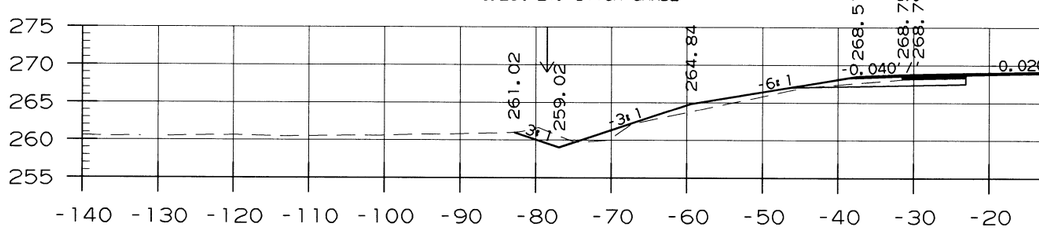
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 246 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

STA. 96+00.00 BEGIN
+0.23% LT. DITCH GRADE




AREA CUT : 20 AREA CUT : 20 AREA CUT : 0
AREA FILL : 20 AREA FILL : 4 AREA FILL : 0

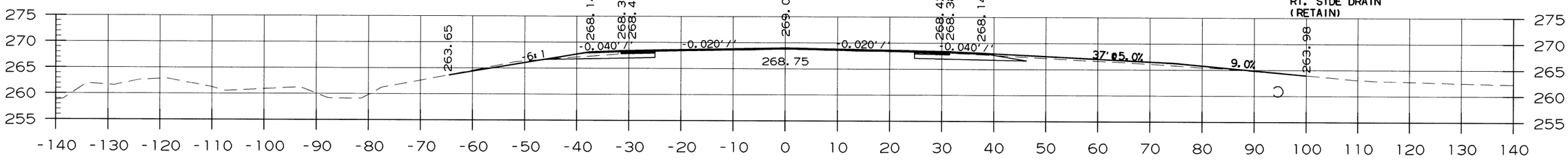
96+00

STA. 96+00.00 BEGIN
+0.07% RT. DITCH GRADE

STAGE 1 STAGE 2 STAGE 3

CUT VOL. : 53 CUT VOL. : 85 CUT VOL. : 0
FILL VOL. : 34 FILL VOL. : 9 FILL VOL. : 0

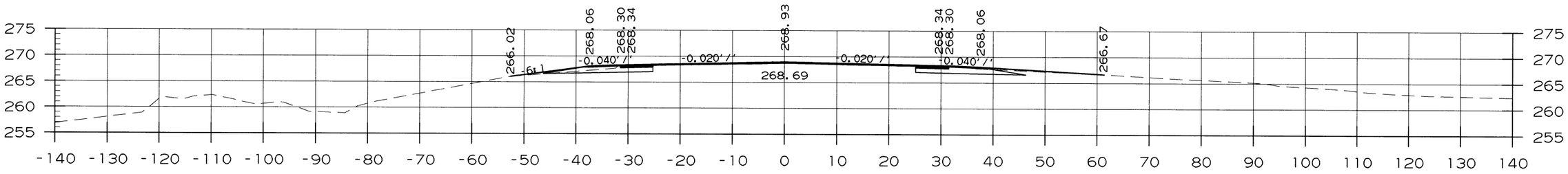
STA. 95+15 IN PLACE
24" X 32' C.M. PIPE CULVERT
RT. SIDE DRAIN
(RETAIN)




AREA CUT : 13 AREA CUT : 34 AREA CUT : 0
AREA FILL : 1 AREA FILL : 2 AREA FILL : 0

95+15

CUT VOL. : 10 CUT VOL. : 20 CUT VOL. : 0
FILL VOL. : 1 FILL VOL. : 1 FILL VOL. : 0

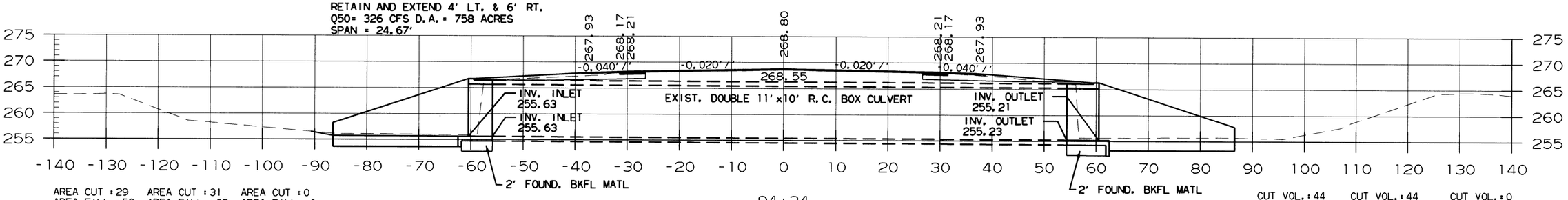



AREA CUT : 23 AREA CUT : 38 AREA CUT : 0
AREA FILL : 1 AREA FILL : 1 AREA FILL : 0

95+00

CUT VOL. : 64 CUT VOL. : 85 CUT VOL. : 0
FILL VOL. : 66 FILL VOL. : 77 FILL VOL. : 0

STA. 94+34 IN PLACE
DBL. 11' X 10' X 114' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 4' LT. & 6' RT.
Q50= 326 CFS D.A. = 758 ACRES
SPAN = 24.67'




AREA CUT : 29 AREA CUT : 31 AREA CUT : 0
AREA FILL : 53 AREA FILL : 62 AREA FILL : 0

94+34

CUT VOL. : 44 CUT VOL. : 44 CUT VOL. : 0
FILL VOL. : 34 FILL VOL. : 41 FILL VOL. : 0

CROSS SECTION
STA. 94+34 TO STA. 96+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 247 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 97+00 TO STA. 100+00

2/3/2017

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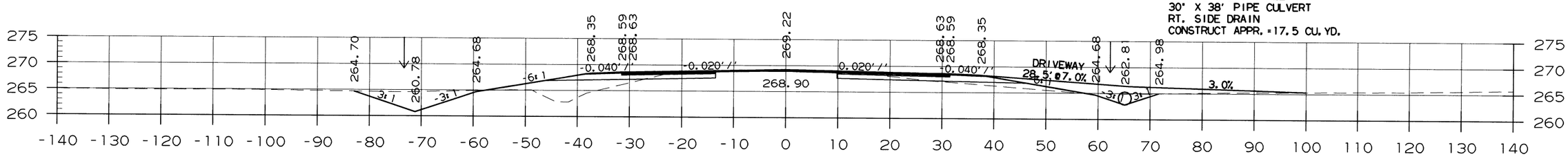
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 248 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

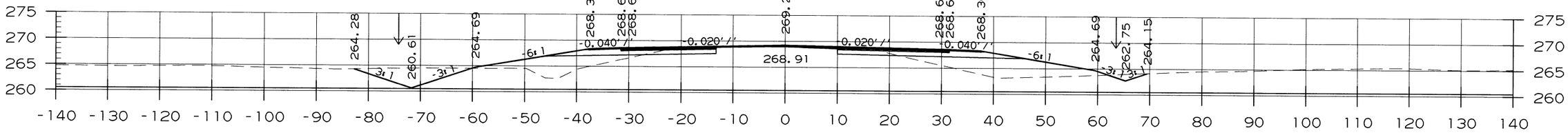
STA. 103+76 IN PLACE
30" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =17.5 CU. YD.




AREA CUT : 57 AREA CUT : 22 AREA CUT : 0
AREA FILL : 60 AREA FILL : 81 AREA FILL : 0

103+76

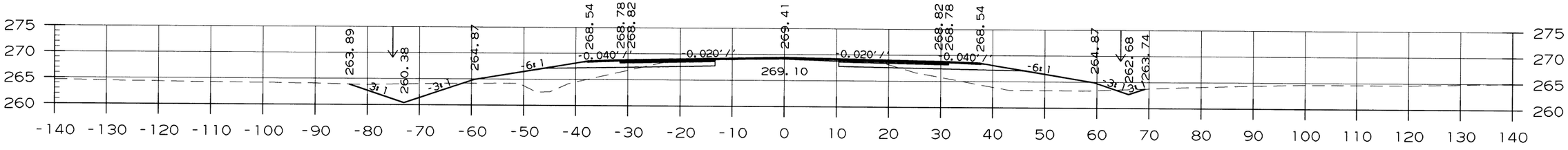
CUT VOL. : 157 CUT VOL. : 48 CUT VOL. : 0
FILL VOL. : 175 FILL VOL. : 248 FILL VOL. : 0




AREA CUT : 55 AREA CUT : 12 AREA CUT : 0
AREA FILL : 64 AREA FILL : 96 AREA FILL : 0

103+00

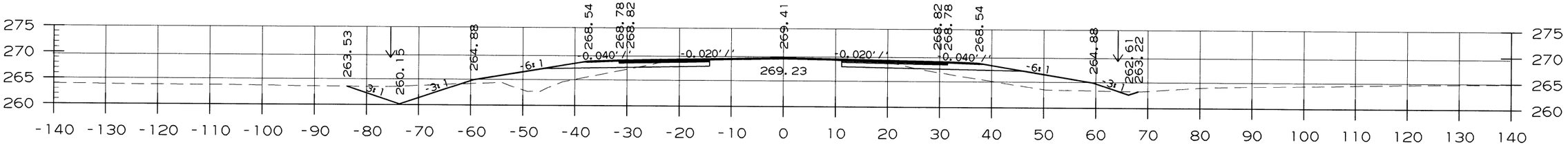
CUT VOL. : 194 CUT VOL. : 39 CUT VOL. : 0
FILL VOL. : 256 FILL VOL. : 361 FILL VOL. : 0




AREA CUT : 50 AREA CUT : 9 AREA CUT : 0
AREA FILL : 74 AREA FILL : 99 AREA FILL : 0

102+00

CUT VOL. : 181 CUT VOL. : 38 CUT VOL. : 0
FILL VOL. : 260 FILL VOL. : 317 FILL VOL. : 0




AREA CUT : 48 AREA CUT : 11 AREA CUT : 0
AREA FILL : 66 AREA FILL : 72 AREA FILL : 0

101+00

CUT VOL. : 179 CUT VOL. : 44 CUT VOL. : 0
FILL VOL. : 237 FILL VOL. : 219 FILL VOL. : 0

# CROSS SECTION
# STA. 101+00 TO STA. 103+76

2/3/2017

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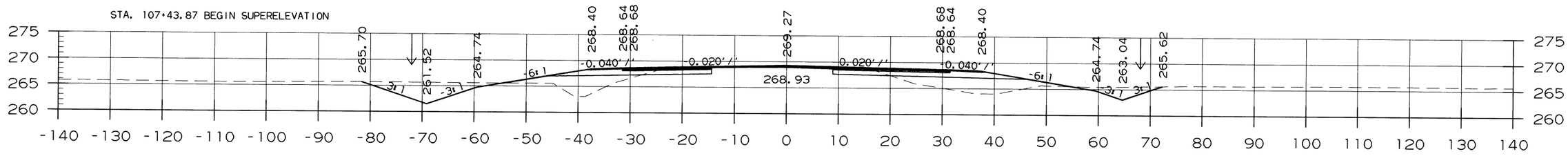
| | | | | JOB NO. | | CA1003 | 249 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

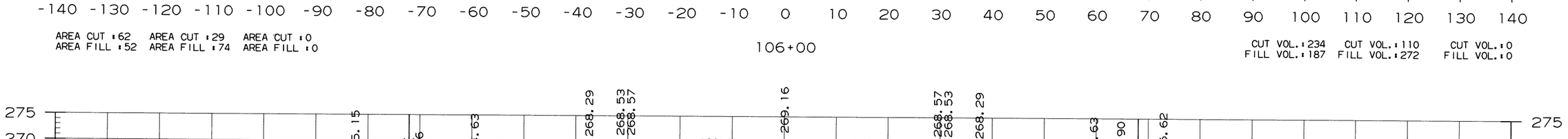
STA. 107+43.87 BEGIN SUPERELEVATION




AREA CUT : 63 AREA CUT : 26 AREA CUT : 0
AREA FILL : 50 AREA FILL : 68 AREA FILL : 0

107+00

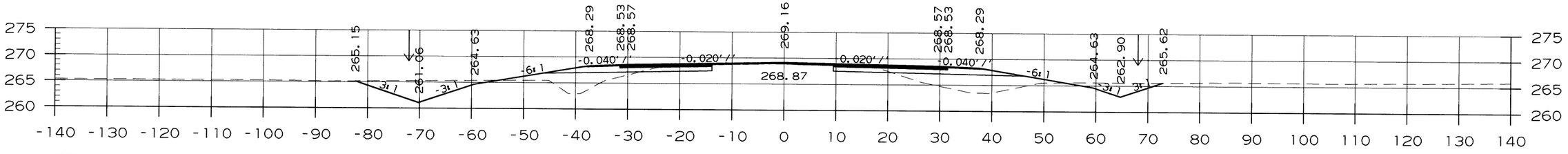
CUT VOL. : 231 CUT VOL. : 102 CUT VOL. : 0
FILL VOL. : 189 FILL VOL. : 264 FILL VOL. : 0




AREA CUT : 62 AREA CUT : 29 AREA CUT : 0
AREA FILL : 52 AREA FILL : 74 AREA FILL : 0

106+00

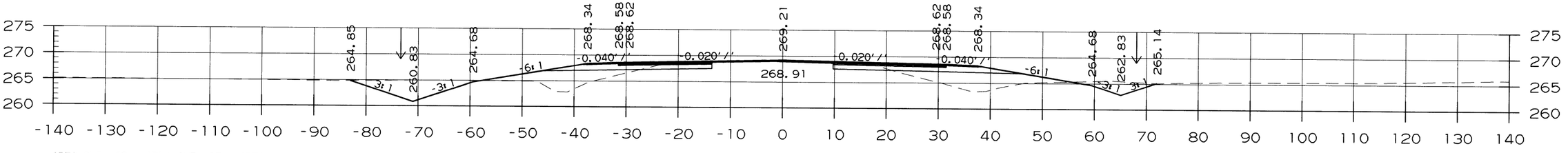
CUT VOL. : 234 CUT VOL. : 110 CUT VOL. : 0
FILL VOL. : 187 FILL VOL. : 272 FILL VOL. : 0




AREA CUT : 65 AREA CUT : 31 AREA CUT : 0
AREA FILL : 49 AREA FILL : 72 AREA FILL : 0

105+00

CUT VOL. : 234 CUT VOL. : 108 CUT VOL. : 0
FILL VOL. : 198 FILL VOL. : 266 FILL VOL. : 0




AREA CUT : 62 AREA CUT : 27 AREA CUT : 0
AREA FILL : 58 AREA FILL : 71 AREA FILL : 0

104+00

CUT VOL. : 53 CUT VOL. : 22 CUT VOL. : 0
FILL VOL. : 52 FILL VOL. : 68 FILL VOL. : 0

# CROSS SECTION
# STA. 104+00 TO STA. 107+00

2/3/2017

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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 |
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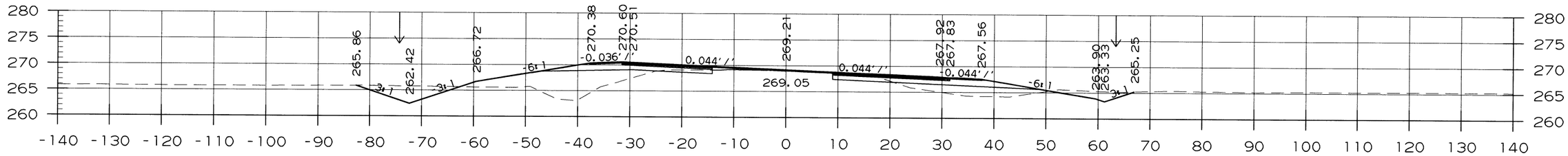
② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

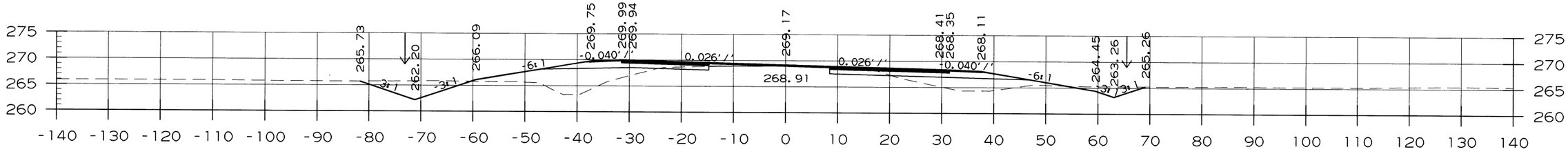
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 37 AREA CUT : 26 AREA CUT : 0
AREA FILL : 110 AREA FILL : 44 AREA FILL : 0

111+00

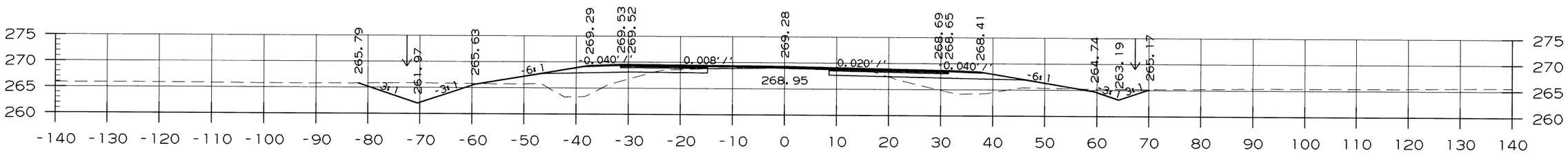
CUT VOL. : 145 CUT VOL. : 90 CUT VOL. : 0
FILL VOL. : 373 FILL VOL. : 181 FILL VOL. : 0




AREA CUT : 42 AREA CUT : 22 AREA CUT : 0
AREA FILL : 91 AREA FILL : 54 AREA FILL : 0

110+00

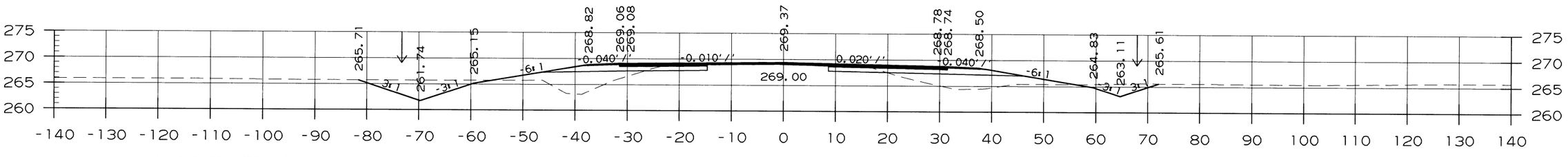
CUT VOL. : 168 CUT VOL. : 79 CUT VOL. : 0
FILL VOL. : 313 FILL VOL. : 224 FILL VOL. : 0




AREA CUT : 49 AREA CUT : 20 AREA CUT : 0
AREA FILL : 78 AREA FILL : 67 AREA FILL : 0

109+00

CUT VOL. : 195 CUT VOL. : 85 CUT VOL. : 0
FILL VOL. : 261 FILL VOL. : 247 FILL VOL. : 0




AREA CUT : 56 AREA CUT : 26 AREA CUT : 0
AREA FILL : 63 AREA FILL : 66 AREA FILL : 0

108+00

CUT VOL. : 221 CUT VOL. : 96 CUT VOL. : 0
FILL VOL. : 210 FILL VOL. : 248 FILL VOL. : 0

# CROSS SECTION
# STA. 108+00 TO STA. 111+00

2/3/2017

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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 |
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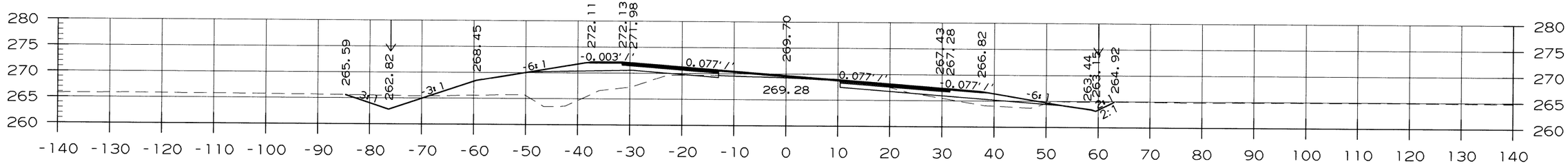
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 251 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

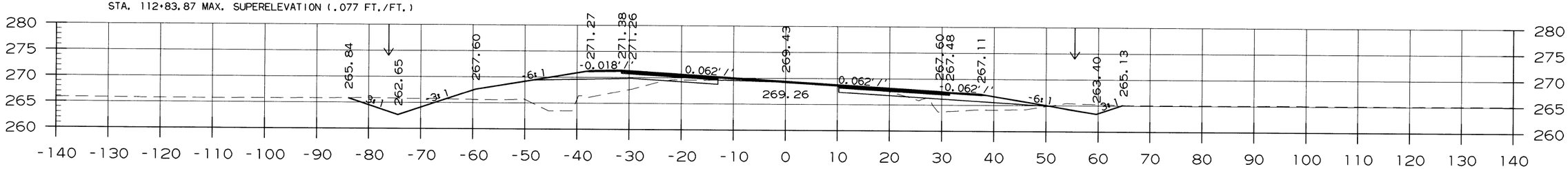



AREA CUT : 22 AREA CUT : 24 AREA CUT : 0
AREA FILL : 177 AREA FILL : 26 AREA FILL : 0

113+00

CUT VOL. : 101 CUT VOL. : 93 CUT VOL. : 0
FILL VOL. : 569 FILL VOL. : 119 FILL VOL. : 0

STA. 112+83.87 MAX. SUPERELEVATION (.077 FT./FT.)

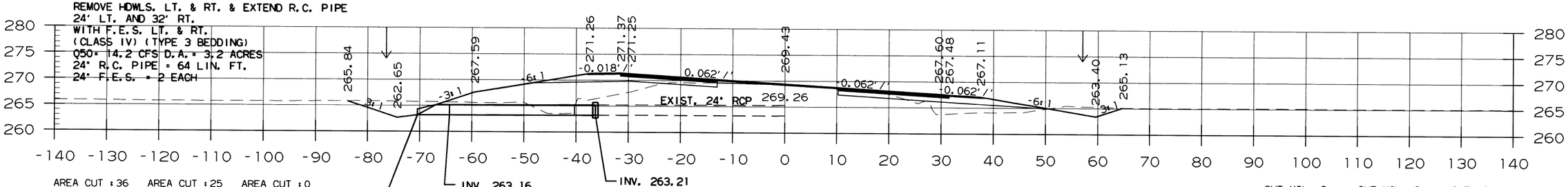



AREA CUT : 32 AREA CUT : 27 AREA CUT : 0
AREA FILL : 131 AREA FILL : 38 AREA FILL : 0

112+00

CUT VOL. : 1 CUT VOL. : 1 CUT VOL. : 0
FILL VOL. : 5 FILL VOL. : 1 FILL VOL. : 0

STA. 111+99 IN PLACE
24" X 67.5' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. & EXTEND R.C. PIPE
24' LT. AND 32' RT.
WITH F.E.S. LT. & RT.
(CLASS IV) (TYPE 3 BEDDING)
Q50= 14.2 CFS D.A.= 3.2 ACRES
24" R.C. PIPE = 64 LIN. FT.
24" F.E.S. = 2 EACH




AREA CUT : 36 AREA CUT : 25 AREA CUT : 0
AREA FILL : 117 AREA FILL : 37 AREA FILL : 0

INV. 263.16
INV. 263.21
INV. OUTLET 263.15

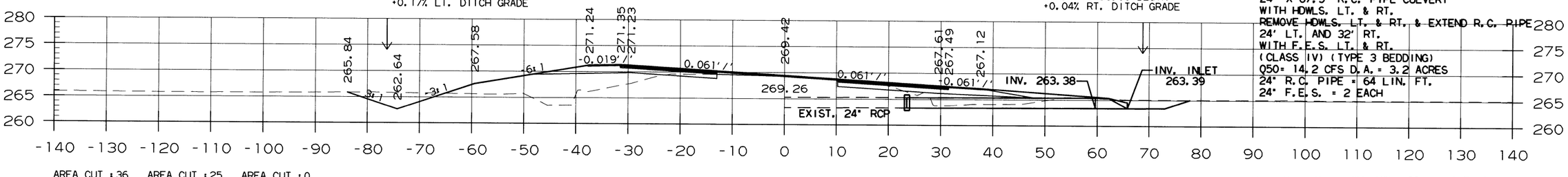
111+99

CUT VOL. : 3 CUT VOL. : 2 CUT VOL. : 0
FILL VOL. : 9 FILL VOL. : 3 FILL VOL. : 0

STA. 112+00.00 END
+0.23% LT. DITCH GRADE
STA. 112+00.00 BEGIN
+0.17% LT. DITCH GRADE

STA. 111+98.00 END
+0.07% RT. DITCH GRADE
STA. 111+98.00 BEGIN
+0.04% RT. DITCH GRADE

STA. 111+99 IN PLACE
24" X 67.5' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. & EXTEND R.C. PIPE
24' LT. AND 32' RT.
WITH F.E.S. LT. & RT.
(CLASS IV) (TYPE 3 BEDDING)
Q50= 14.2 CFS D.A.= 3.2 ACRES
24" R.C. PIPE = 64 LIN. FT.
24" F.E.S. = 2 EACH




INV. 263.38
INV. INLET 263.39

AREA CUT : 36 AREA CUT : 25 AREA CUT : 0
AREA FILL : 117 AREA FILL : 37 AREA FILL : 0

111+97

CUT VOL. : 131 CUT VOL. : 92 CUT VOL. : 0
FILL VOL. : 408 FILL VOL. : 146 FILL VOL. : 0

# CROSS SECTION
# STA. 111+97 TO STA. 113+00

2/3/2017

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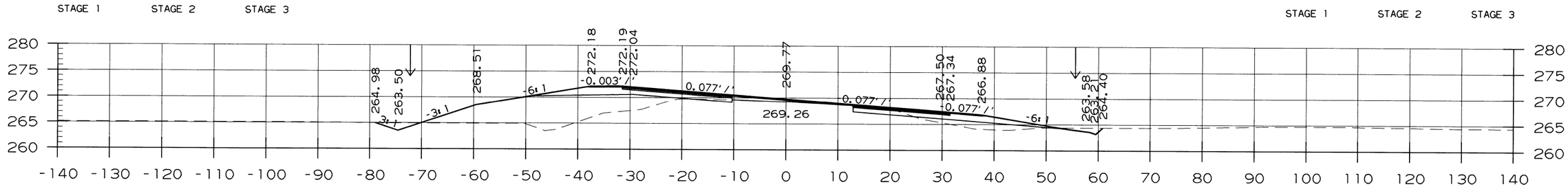
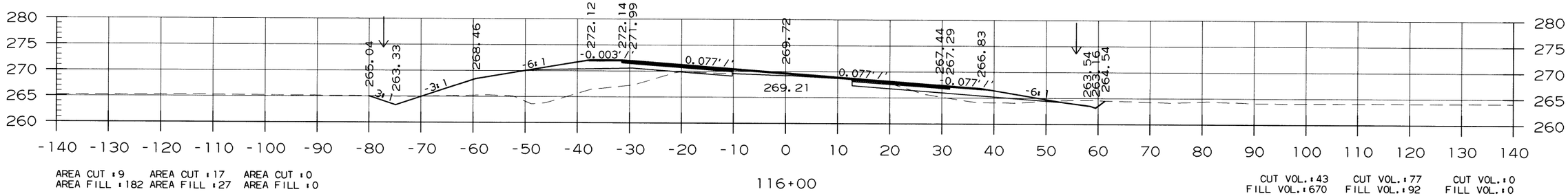
② CROSS SECTIONS




AREA CUT : 7 AREA CUT : 15 AREA CUT : 0
AREA FILL : 188 AREA FILL : 29 AREA FILL : 0

117+00

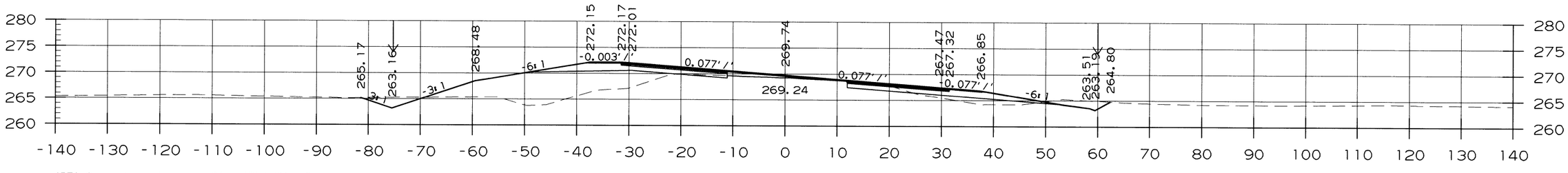
CUT VOL. : 31 CUT VOL. : 60 CUT VOL. : 0
FILL VOL. : 685 FILL VOL. : 103 FILL VOL. : 0




AREA CUT : 9 AREA CUT : 17 AREA CUT : 0
AREA FILL : 182 AREA FILL : 27 AREA FILL : 0

116+00

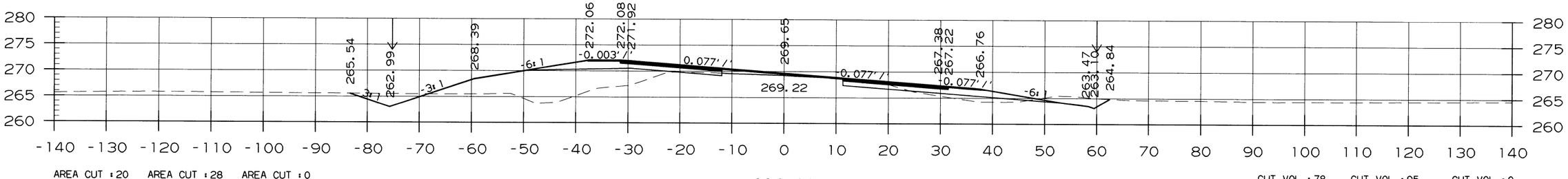
CUT VOL. : 43 CUT VOL. : 77 CUT VOL. : 0
FILL VOL. : 670 FILL VOL. : 92 FILL VOL. : 0




AREA CUT : 14 AREA CUT : 24 AREA CUT : 0
AREA FILL : 180 AREA FILL : 23 AREA FILL : 0

115+00

CUT VOL. : 62 CUT VOL. : 96 CUT VOL. : 0
FILL VOL. : 653 FILL VOL. : 79 FILL VOL. : 0




AREA CUT : 20 AREA CUT : 28 AREA CUT : 0
AREA FILL : 173 AREA FILL : 20 AREA FILL : 0

114+00

CUT VOL. : 78 CUT VOL. : 95 CUT VOL. : 0
FILL VOL. : 647 FILL VOL. : 86 FILL VOL. : 0

# CROSS SECTION
# STA. 114+00 TO STA. 117+00

2/3/2017

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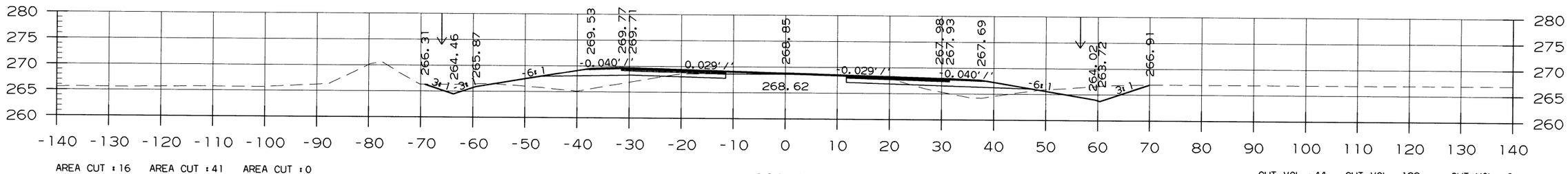
| | | | | JOB NO. | | CA1003 | 253 | 503 |

② CROSS SECTIONS

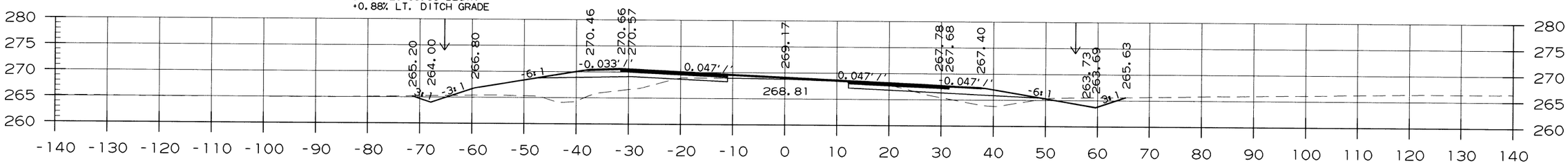



AREA CUT : 16 AREA CUT : 41 AREA CUT : 0
AREA FILL : 61 AREA FILL : 34 AREA FILL : 0

121+00

CUT VOL. : 44 CUT VOL. : 122 CUT VOL. : 0
FILL VOL. : 333 FILL VOL. : 127 FILL VOL. : 0

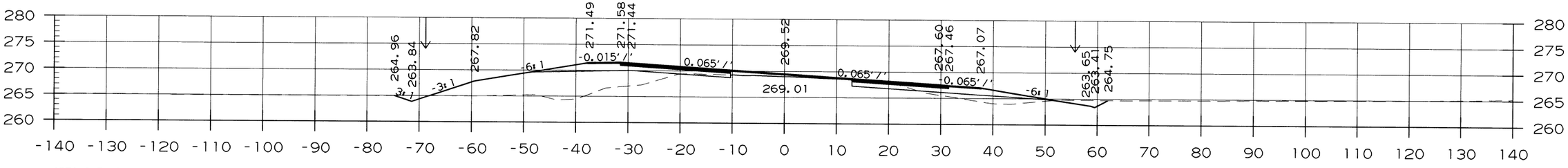
STA. 120+59.85 END
+0.17% LT. DITCH GRADE
STA. 120+59.85 BEGIN
+0.88% LT. DITCH GRADE




AREA CUT : 7 AREA CUT : 25 AREA CUT : 0
AREA FILL : 119 AREA FILL : 35 AREA FILL : 0

120+00

CUT VOL. : 23 CUT VOL. : 80 CUT VOL. : 0
FILL VOL. : 519 FILL VOL. : 118 FILL VOL. : 0

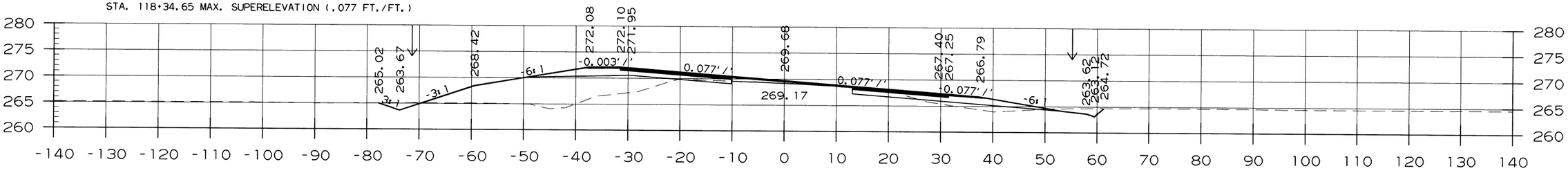



AREA CUT : 5 AREA CUT : 18 AREA CUT : 0
AREA FILL : 161 AREA FILL : 29 AREA FILL : 0

119+00

CUT VOL. : 22 CUT VOL. : 69 CUT VOL. : 0
FILL VOL. : 636 FILL VOL. : 94 FILL VOL. : 0

STA. 118+34.65 MAX. SUPERELEVATION (.077 FT./FT.)




AREA CUT : 7 AREA CUT : 19 AREA CUT : 0
AREA FILL : 182 AREA FILL : 22 AREA FILL : 0

118+00

CUT VOL. : 26 CUT VOL. : 64 CUT VOL. : 0
FILL VOL. : 685 FILL VOL. : 94 FILL VOL. : 0

# CROSS SECTION
# STA. 118+00 TO STA. 121+00

2/3/2017

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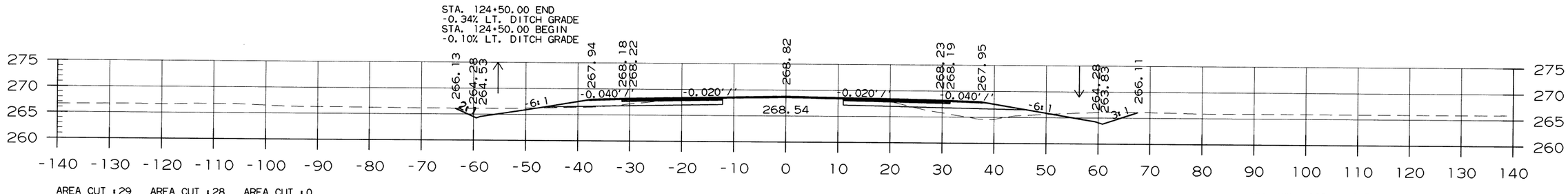
| | | | | JOB NO. | | CA1003 | 254 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

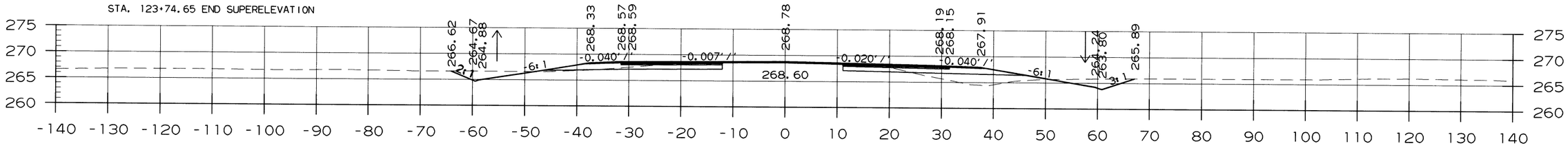
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 29 AREA CUT : 28 AREA CUT : 0
AREA FILL : 5 AREA FILL : 36 AREA FILL : 0

124+00

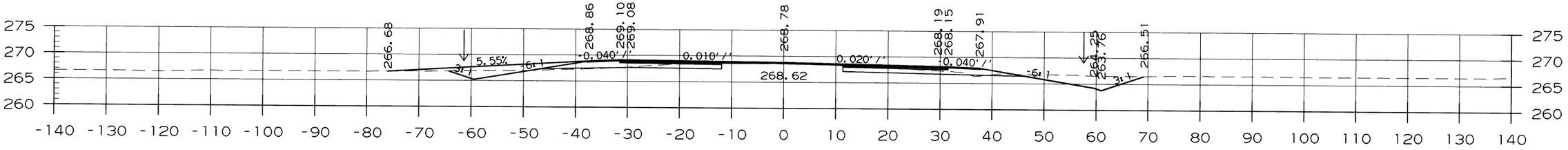
CUT VOL. : 108 CUT VOL. : 99 CUT VOL. : 0
FILL VOL. : 16 FILL VOL. : 134 FILL VOL. : 0




AREA CUT : 30 AREA CUT : 25 AREA CUT : 0
AREA FILL : 4 AREA FILL : 37 AREA FILL : 0

123+00

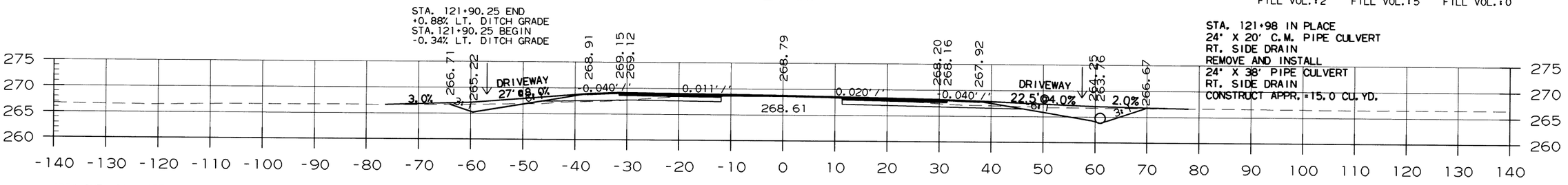
CUT VOL. : 98 CUT VOL. : 88 CUT VOL. : 0
FILL VOL. : 12 FILL VOL. : 115 FILL VOL. : 0




AREA CUT : 28 AREA CUT : 27 AREA CUT : 0
AREA FILL : 3 AREA FILL : 31 AREA FILL : 0

122+08

CUT VOL. : 7 CUT VOL. : 12 CUT VOL. : 0
FILL VOL. : 2 FILL VOL. : 5 FILL VOL. : 0




STA. 121+98 IN PLACE
24" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 15.0 CU. YD.

AREA CUT : 20 AREA CUT : 55 AREA CUT : 0
AREA FILL : 8 AREA FILL : 0 AREA FILL : 0

122+00

CUT VOL. : 66 CUT VOL. : 177 CUT VOL. : 0
FILL VOL. : 128 FILL VOL. : 64 FILL VOL. : 0

# CROSS SECTION
# STA. 122+00 TO STA. 124+00

2/3/2017

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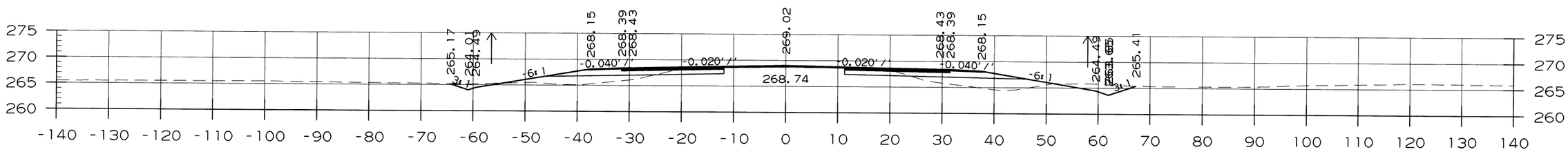
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 255 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

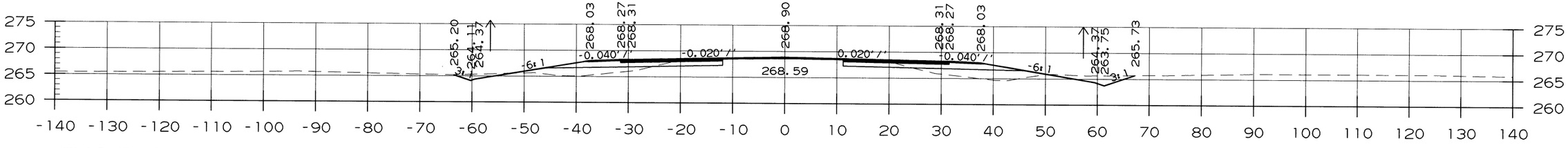
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 16 AREA CUT : 25 AREA CUT : 0
AREA FILL : 35 AREA FILL : 44 AREA FILL : 0

128+00

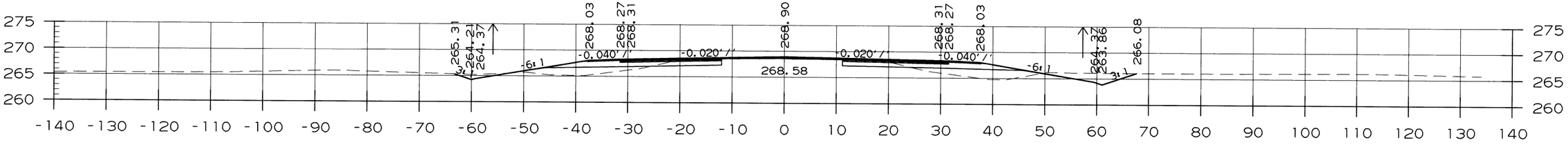
CUT VOL. : 60 CUT VOL. : 93 CUT VOL. : 0
FILL VOL. : 122 FILL VOL. : 149 FILL VOL. : 0




AREA CUT : 17 AREA CUT : 25 AREA CUT : 0
AREA FILL : 31 AREA FILL : 37 AREA FILL : 0

127+00

CUT VOL. : 60 CUT VOL. : 101 CUT VOL. : 0
FILL VOL. : 114 FILL VOL. : 133 FILL VOL. : 0

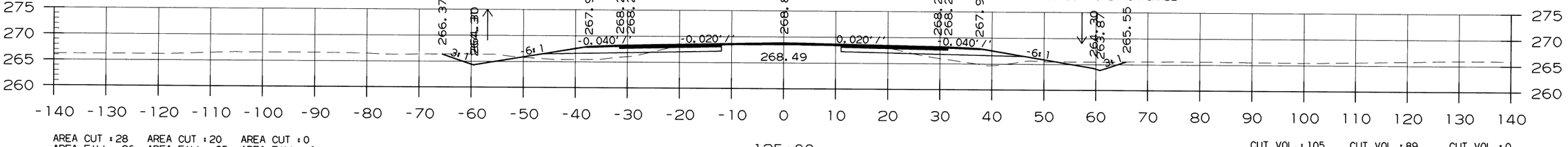



AREA CUT : 16 AREA CUT : 29 AREA CUT : 0
AREA FILL : 30 AREA FILL : 35 AREA FILL : 0

126+00

CUT VOL. : 80 CUT VOL. : 92 CUT VOL. : 0
FILL VOL. : 105 FILL VOL. : 129 FILL VOL. : 0

STA. 125+64.94 END
+0.04% RT. DITCH GRADE
STA. 125+64.94 BEGIN
-0.10% RT. DITCH GRADE




AREA CUT : 28 AREA CUT : 20 AREA CUT : 0
AREA FILL : 26 AREA FILL : 35 AREA FILL : 0

125+00

CUT VOL. : 105 CUT VOL. : 89 CUT VOL. : 0
FILL VOL. : 58 FILL VOL. : 131 FILL VOL. : 0

# CROSS SECTION
# STA. 125+00 TO STA. 128+00

2/3/2017

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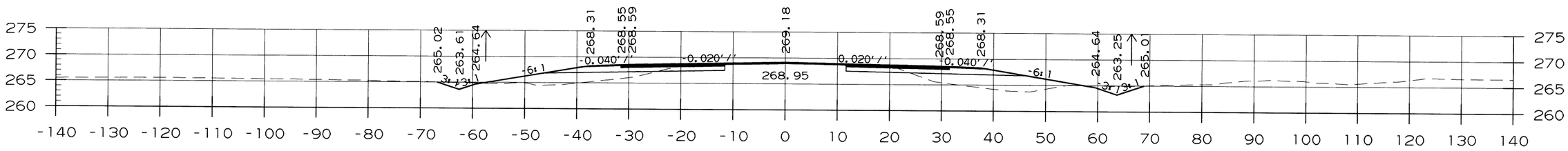
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 256 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

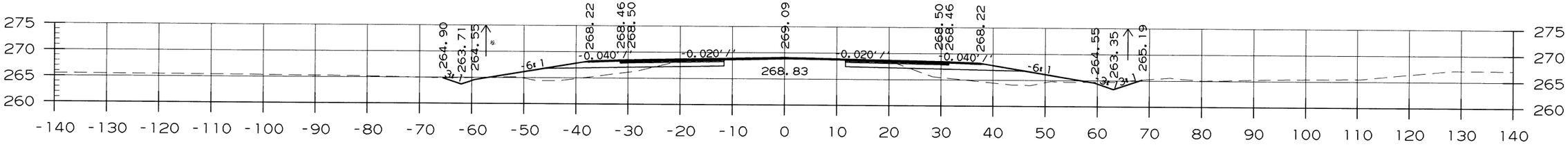
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 15 AREA CUT : 19 AREA CUT : 0
AREA FILL : 50 AREA FILL : 67 AREA FILL : 0

132+00

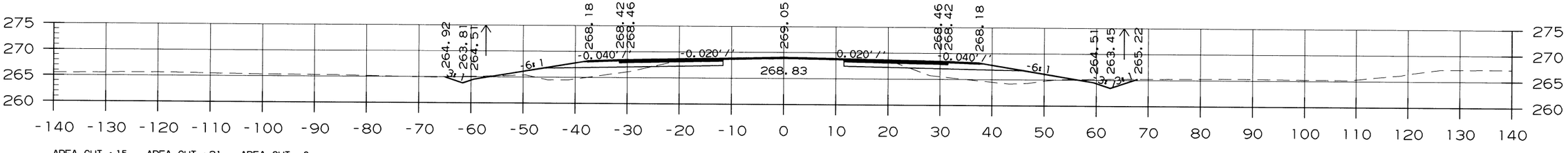
CUT VOL. : 55 CUT VOL. : 68 CUT VOL. : 0
FILL VOL. : 180 FILL VOL. : 238 FILL VOL. : 0




AREA CUT : 15 AREA CUT : 18 AREA CUT : 0
AREA FILL : 47 AREA FILL : 61 AREA FILL : 0

131+00

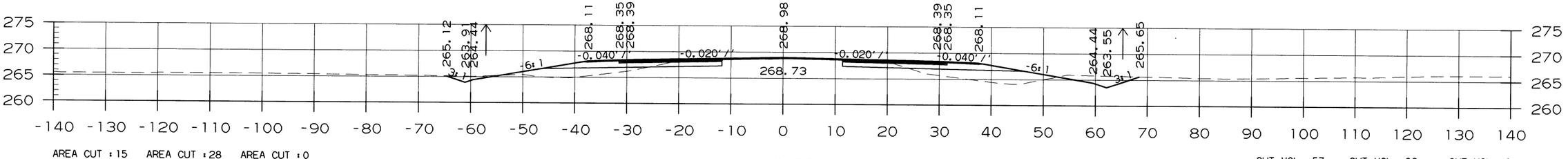
CUT VOL. : 56 CUT VOL. : 71 CUT VOL. : 0
FILL VOL. : 166 FILL VOL. : 215 FILL VOL. : 0




AREA CUT : 15 AREA CUT : 21 AREA CUT : 0
AREA FILL : 43 AREA FILL : 55 AREA FILL :

130+00

CUT VOL. : 57 CUT VOL. : 90 CUT VOL. : 0
FILL VOL. : 145 FILL VOL. : 195 FILL VOL. : 0




AREA CUT : 15 AREA CUT : 28 AREA CUT : 0
AREA FILL : 36 AREA FILL : 50 AREA FILL : 0

129+00

CUT VOL. : 57 CUT VOL. : 98 CUT VOL. : 0
FILL VOL. : 130 FILL VOL. : 174 FILL VOL. : 0

# CROSS SECTION
# STA. 129+00 TO STA. 132+00

2/3/2017

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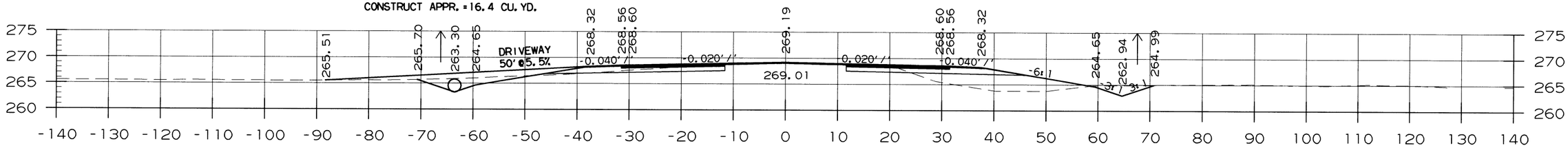
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 257 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

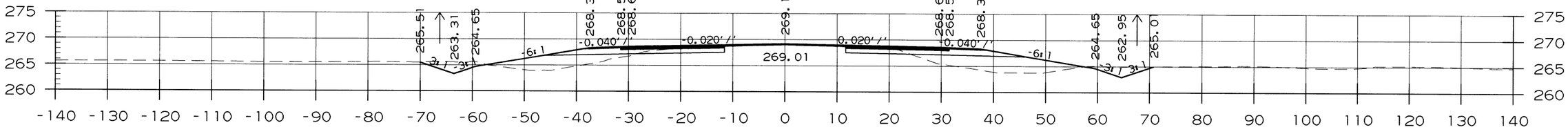
STA. 135+15 IN PLACE
24" X 20' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 16.4 CU. YD.




AREA CUT = 24 AREA CUT = 26 AREA CUT = 0
AREA FILL = 47 AREA FILL = 67 AREA FILL = 0

135+15

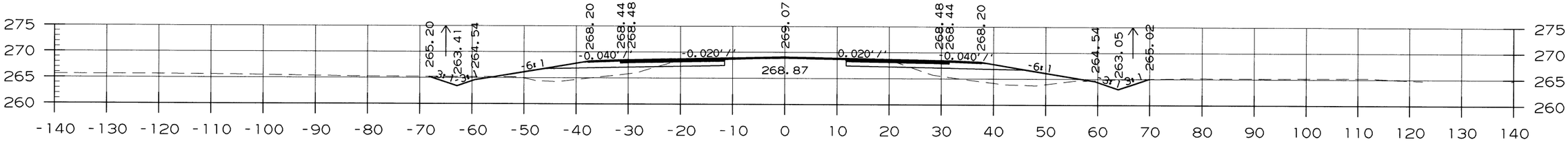
CUT VOL. = 14 CUT VOL. = 14 CUT VOL. = 0
FILL VOL. = 27 FILL VOL. = 39 FILL VOL. = 0




AREA CUT = 26 AREA CUT = 24 AREA CUT = 0
AREA FILL = 51 AREA FILL = 72 AREA FILL = 0

135+00

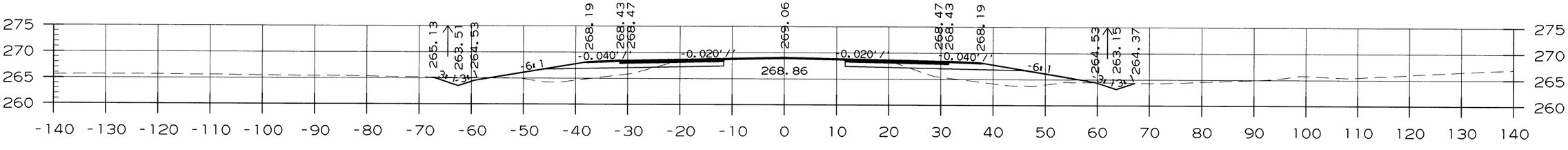
CUT VOL. = 86 CUT VOL. = 83 CUT VOL. = 0
FILL VOL. = 187 FILL VOL. = 258 FILL VOL. = 0




AREA CUT = 20 AREA CUT = 21 AREA CUT = 0
AREA FILL = 51 AREA FILL = 67 AREA FILL = 0

134+00

CUT VOL. = 70 CUT VOL. = 67 CUT VOL. = 0
FILL VOL. = 187 FILL VOL. = 254 FILL VOL. = 0




AREA CUT = 18 AREA CUT = 15 AREA CUT = 0
AREA FILL = 51 AREA FILL = 70 AREA FILL = 0

133+00

CUT VOL. = 61 CUT VOL. = 64 CUT VOL. = 0
FILL VOL. = 187 FILL VOL. = 255 FILL VOL. = 0

# CROSS SECTION
# STA. 133+00 TO STA. 135+15

2/3/2017

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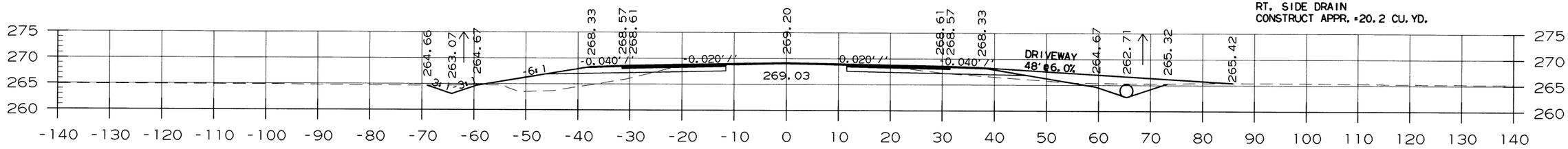
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 258 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

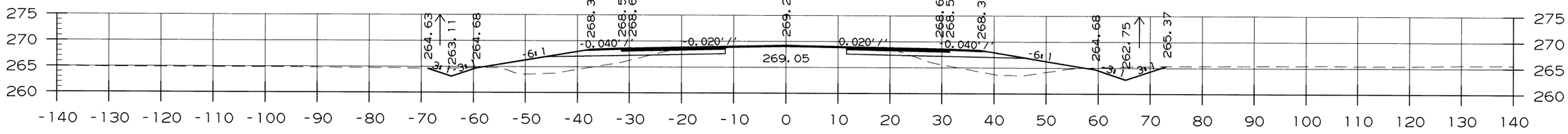
STA. 137+40 IN PLACE
24' X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30' X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =20.2 CU. YD.




AREA CUT : 18 AREA CUT : 31 AREA CUT : 0
AREA FILL : 65 AREA FILL : 67 AREA FILL : 0

137+40

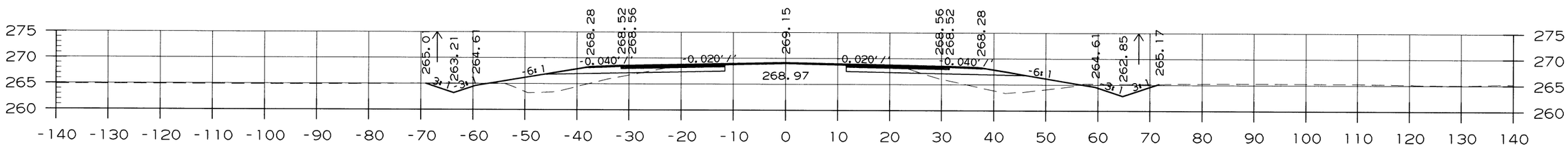
CUT VOL. : 27 CUT VOL. : 44 CUT VOL. : 0
FILL VOL. : 95 FILL VOL. : 103 FILL VOL. : 0




AREA CUT : 18 AREA CUT : 29 AREA CUT : 0
AREA FILL : 64 AREA FILL : 72 AREA FILL : 0

137+00

CUT VOL. : 74 CUT VOL. : 107 CUT VOL. : 0
FILL VOL. : 223 FILL VOL. : 253 FILL VOL. : 0



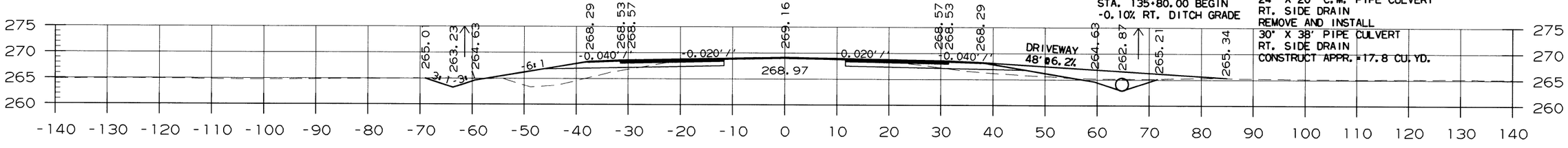

AREA CUT : 22 AREA CUT : 28 AREA CUT : 0
AREA FILL : 57 AREA FILL : 65 AREA FILL : 0

136+00

CUT VOL. : 15 CUT VOL. : 18 CUT VOL. : 0
FILL VOL. : 35 FILL VOL. : 44 FILL VOL. : 0

STA. 135+80.00 END
-0.10% RT. DITCH GRADE
STA. 135+80.00 BEGIN
-0.10% RT. DITCH GRADE

STA. 135+82 IN PLACE
24' X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30' X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =17.8 CU. YD.




AREA CUT : 24 AREA CUT : 26 AREA CUT : 0
AREA FILL : 47 AREA FILL : 67 AREA FILL : 0

135+82

CUT VOL. : 61 CUT VOL. : 64 CUT VOL. : 0
FILL VOL. : 118 FILL VOL. : 166 FILL VOL. : 0

# CROSS SECTION
# STA. 135+82 TO STA. 137+40

2/3/2017

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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 |
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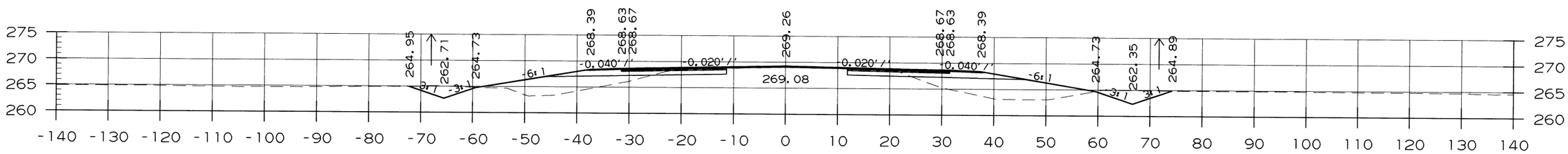
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

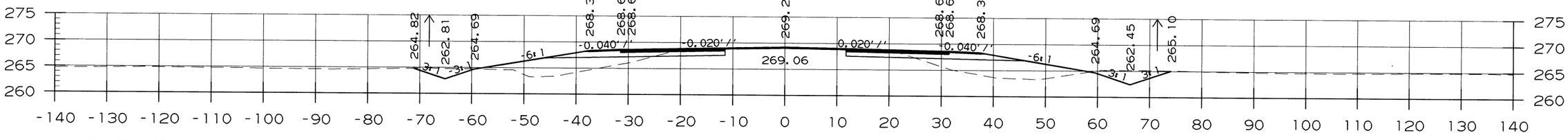
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 26 AREA CUT : 31 AREA CUT : 0
AREA FILL : 69 AREA FILL : 92 AREA FILL : 0

141+00

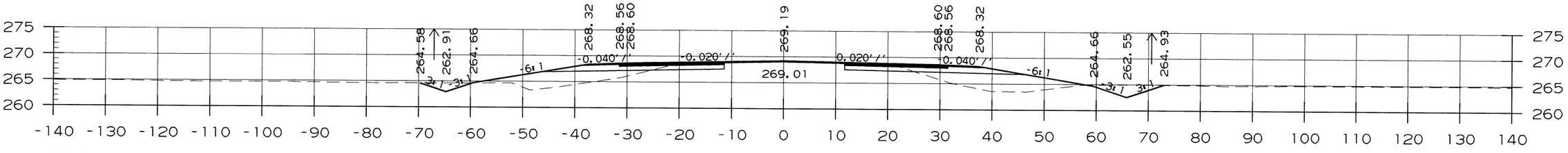
CUT VOL. : 89 CUT VOL. : 118 CUT VOL. : 0
FILL VOL. : 254 FILL VOL. : 316 FILL VOL. : 0




AREA CUT : 22 AREA CUT : 33 AREA CUT : 0
AREA FILL : 68 AREA FILL : 78 AREA FILL : 0

140+00

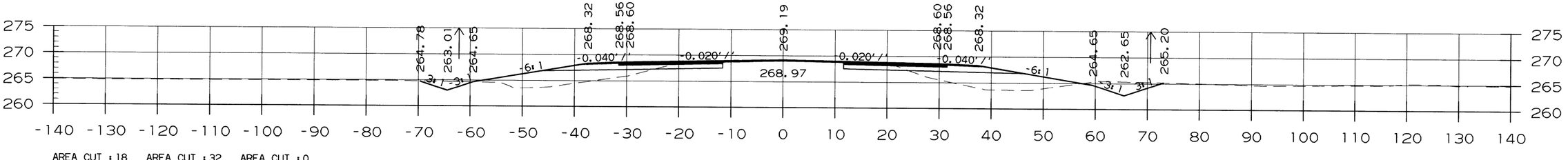
CUT VOL. : 76 CUT VOL. : 114 CUT VOL. : 0
FILL VOL. : 243 FILL VOL. : 281 FILL VOL. : 0




AREA CUT : 19 AREA CUT : 29 AREA CUT : 0
AREA FILL : 63 AREA FILL : 74 AREA FILL : 0

139+00

CUT VOL. : 68 CUT VOL. : 111 CUT VOL. : 0
FILL VOL. : 241 FILL VOL. : 275 FILL VOL. : 0




AREA CUT : 18 AREA CUT : 32 AREA CUT : 0
AREA FILL : 67 AREA FILL : 75 AREA FILL : 0

138+00

CUT VOL. : 40 CUT VOL. : 69 CUT VOL. : 0
FILL VOL. : 147 FILL VOL. : 158 FILL VOL. : 0

# CROSS SECTION
# STA. 138+00 TO STA. 141+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
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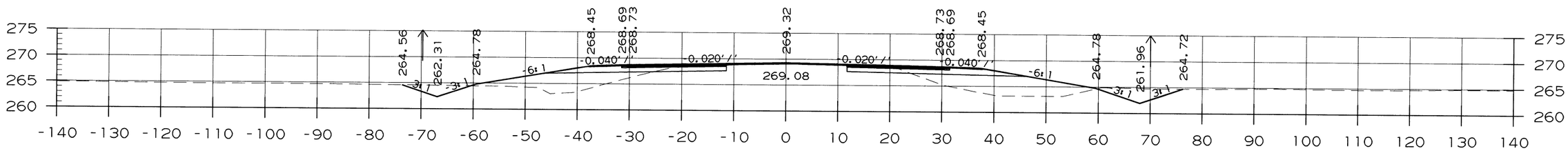
| | | | | JOB NO. | | CA1003 | 260 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

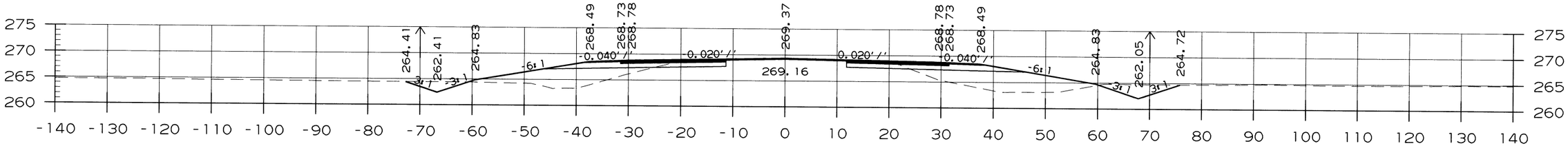
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 24 AREA CUT : 35 AREA CUT : 0
AREA FILL : 75 AREA FILL : 95 AREA FILL : 0

145+00

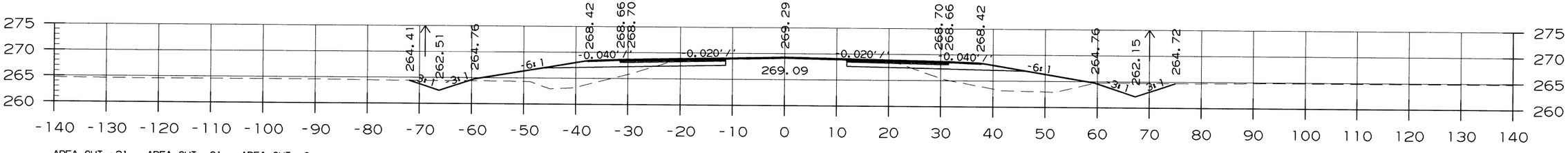
CUT VOL. : 86 CUT VOL. : 126 CUT VOL. : 0
FILL VOL. : 284 FILL VOL. : 353 FILL VOL. : 0




AREA CUT : 22 AREA CUT : 33 AREA CUT : 0
AREA FILL : 78 AREA FILL : 96 AREA FILL : 0

144+00

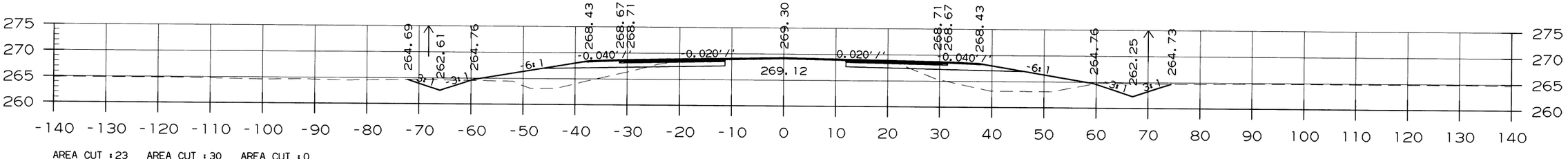
CUT VOL. : 81 CUT VOL. : 119 CUT VOL. : 0
FILL VOL. : 294 FILL VOL. : 349 FILL VOL. : 0




AREA CUT : 21 AREA CUT : 31 AREA CUT : 0
AREA FILL : 81 AREA FILL : 93 AREA FILL : 0

143+00

CUT VOL. : 82 CUT VOL. : 114 CUT VOL. : 0
FILL VOL. : 283 FILL VOL. : 346 FILL VOL. : 0




AREA CUT : 23 AREA CUT : 30 AREA CUT : 0
AREA FILL : 72 AREA FILL : 94 AREA FILL : 0

142+00

CUT VOL. : 90 CUT VOL. : 112 CUT VOL. : 0
FILL VOL. : 261 FILL VOL. : 346 FILL VOL. : 0

# CROSS SECTION
# STA. 142+00 TO STA. 145+00

2/3/2017

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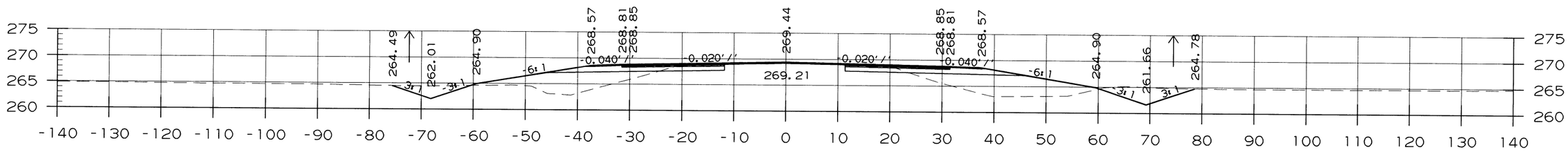
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 261 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

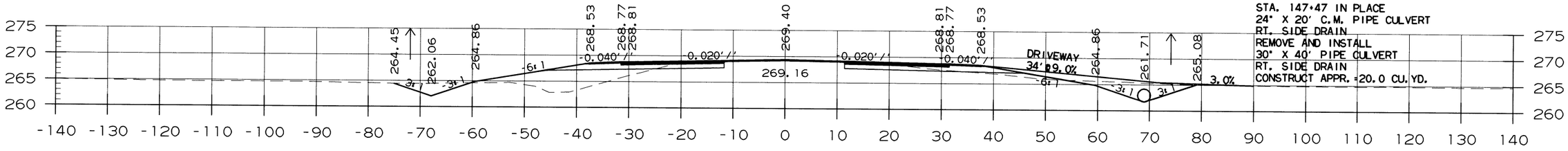
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 28 AREA CUT : 42 AREA CUT : 0
AREA FILL : 82 AREA FILL : 101 AREA FILL : 0

148+00

CUT VOL. : 54 CUT VOL. : 97 CUT VOL. : 0
FILL VOL. : 159 FILL VOL. : 107 FILL VOL. : 0

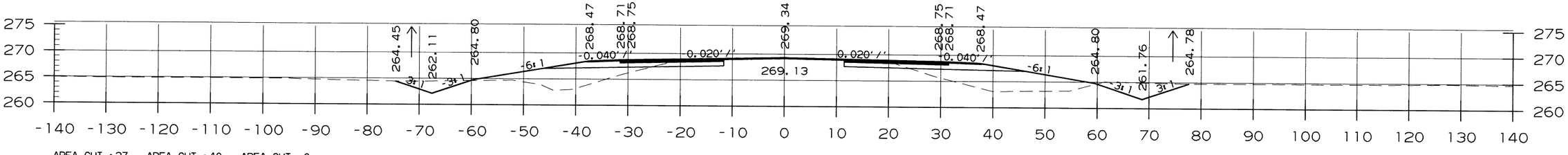



STA. 147+47 IN PLACE
24" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 20.0 CU. YD.

AREA CUT : 27 AREA CUT : 56 AREA CUT : 0
AREA FILL : 79 AREA FILL : 9 AREA FILL : 0

147+47

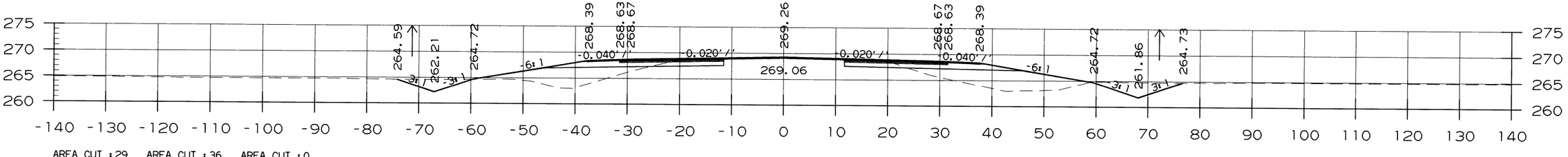
CUT VOL. : 48 CUT VOL. : 84 CUT VOL. : 0
FILL VOL. : 135 FILL VOL. : 90 FILL VOL. : 0




AREA CUT : 27 AREA CUT : 40 AREA CUT : 0
AREA FILL : 75 AREA FILL : 95 AREA FILL : 0

147+00

CUT VOL. : 102 CUT VOL. : 141 CUT VOL. : 0
FILL VOL. : 272 FILL VOL. : 341 FILL VOL. : 0




AREA CUT : 29 AREA CUT : 36 AREA CUT : 0
AREA FILL : 71 AREA FILL : 89 AREA FILL : 0

146+00

CUT VOL. : 97 CUT VOL. : 132 CUT VOL. : 0
FILL VOL. : 272 FILL VOL. : 341 FILL VOL. : 0

CROSS SECTION
STA. 146+00 TO STA. 148+00

2/3/2017

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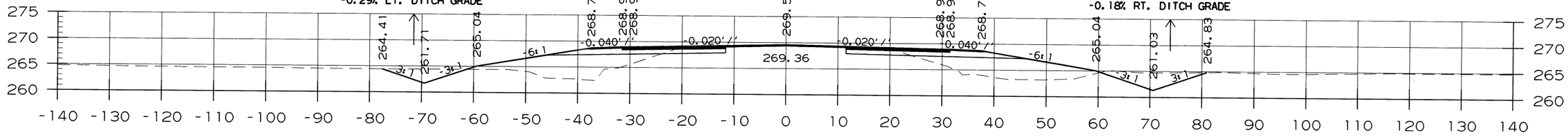
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 262 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STA. 151+00.00 END
-0.10% LT. DITCH GRADE
STA. 151+00.00 BEGIN
-0.29% LT. DITCH GRADE

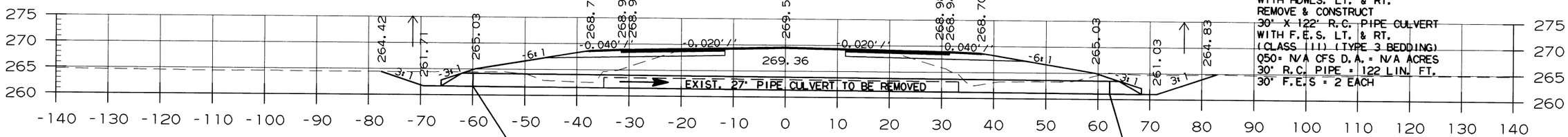



AREA CUT : 31 AREA CUT : 46 AREA CUT : 0
AREA FILL : 102 AREA FILL : 99 AREA FILL : 0

151+00

CUT VOL. : 3 CUT VOL. : 5 CUT VOL. : 0
FILL VOL. : 11 FILL VOL. : 11 FILL VOL. : 0

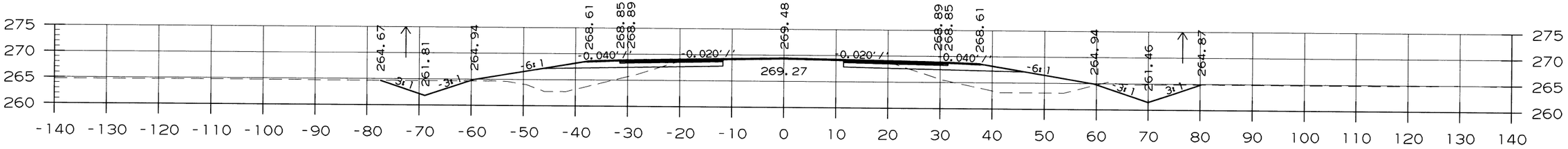
STA. 150+97 IN PLACE
27" X 68' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE & CONSTRUCT
30" X 122' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
Q50= N/A CFS D.A. = N/A ACRES
30" R.C. PIPE = 122 LIN. FT.
30" F.E.S = 2 EACH




AREA CUT : 31 AREA CUT : 46 AREA CUT : 0
AREA FILL : 96 AREA FILL : 100 AREA FILL : 0

150+97

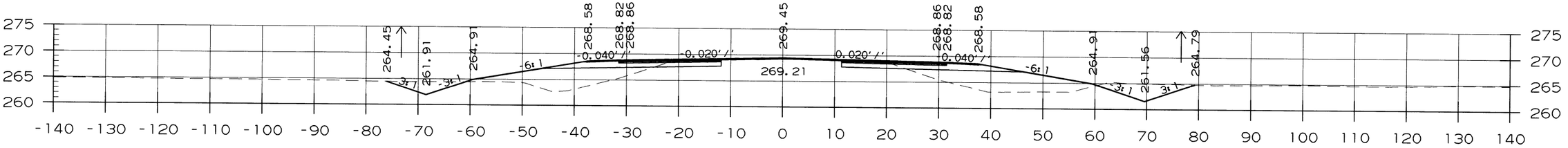
CUT VOL. : 115 CUT VOL. : 165 CUT VOL. : 0
FILL VOL. : 335 FILL VOL. : 356 FILL VOL. : 0




AREA CUT : 33 AREA CUT : 46 AREA CUT : 46
AREA FILL : 91 AREA FILL : 98 AREA FILL : 98

150+00

CUT VOL. : 115 CUT VOL. : 168 CUT VOL. : 0
FILL VOL. : 331 FILL VOL. : 367 FILL VOL. : 0




AREA CUT : 29 AREA CUT : 45 AREA CUT : 0
AREA FILL : 88 AREA FILL : 101 AREA FILL : 0

149+00

CUT VOL. : 104 CUT VOL. : 162 CUT VOL. : 0
FILL VOL. : 315 FILL VOL. : 373 FILL VOL. : 0

# CROSS SECTION
# STA. 149+00 TO STA. 151+00

2/3/2017

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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 |
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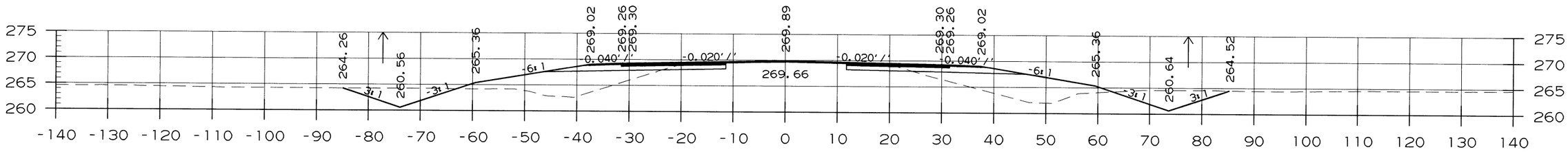
| | | | | JOB NO. | | CA1003 | 263 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

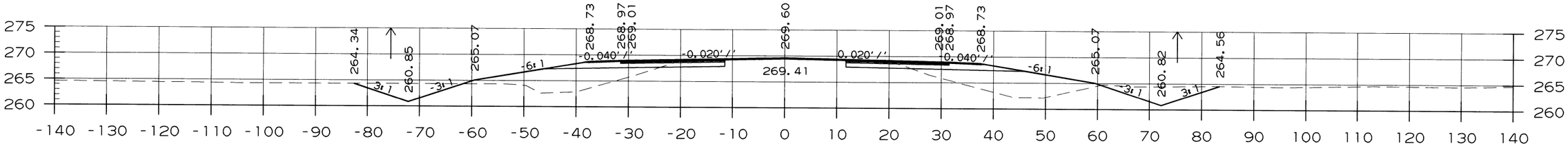
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 50 AREA CUT : 55 AREA CUT : 0
AREA FILL : 109 AREA FILL : 113 AREA FILL : 0

155+00

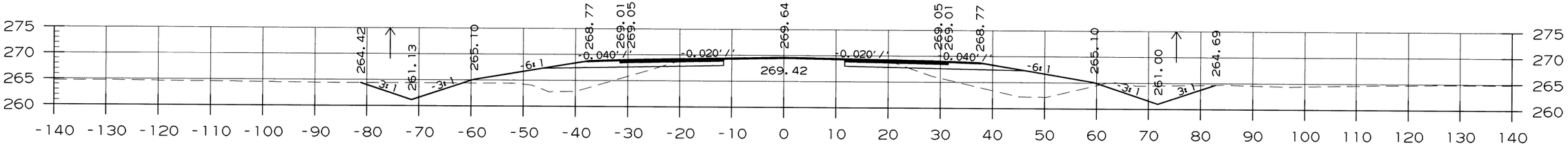
CUT VOL. : 180 CUT VOL. : 198 CUT VOL. : 0
FILL VOL. : 386 FILL VOL. : 415 FILL VOL. : 0




AREA CUT : 47 AREA CUT : 51 AREA CUT : 0
AREA FILL : 100 AREA FILL : 111 AREA FILL : 0

154+00

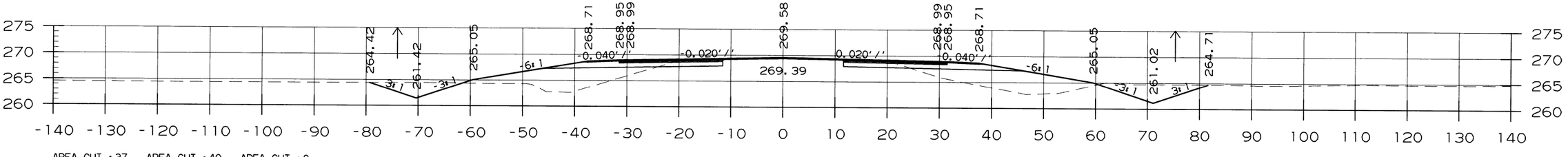
CUT VOL. : 163 CUT VOL. : 189 CUT VOL. : 0
FILL VOL. : 364 FILL VOL. : 412 FILL VOL. : 0




AREA CUT : 42 AREA CUT : 50 AREA CUT : 0
AREA FILL : 97 AREA FILL : 111 AREA FILL : 0

153+00

CUT VOL. : 145 CUT VOL. : 184 CUT VOL. : 0
FILL VOL. : 354 FILL VOL. : 386 FILL VOL. : 0




AREA CUT : 37 AREA CUT : 49 AREA CUT : 0
AREA FILL : 94 AREA FILL : 97 AREA FILL : 0

152+00

CUT VOL. : 125 CUT VOL. : 177 CUT VOL. : 0
FILL VOL. : 363 FILL VOL. : 363 FILL VOL. : 0

# CROSS SECTION
# STA. 152+00 TO STA. 155+00

2/3/2017

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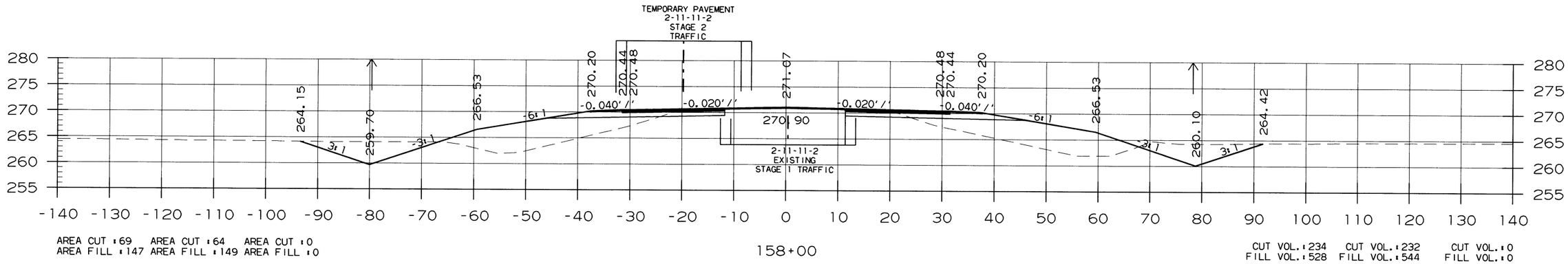
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 264 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

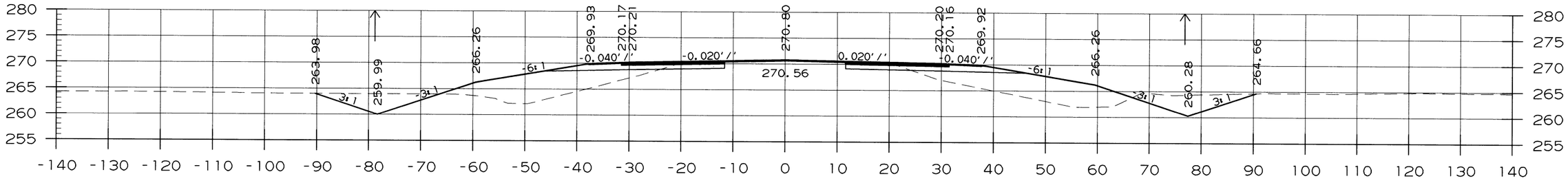
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 69 AREA CUT : 64 AREA CUT : 0
AREA FILL : 147 AREA FILL : 149 AREA FILL : 0

158+00

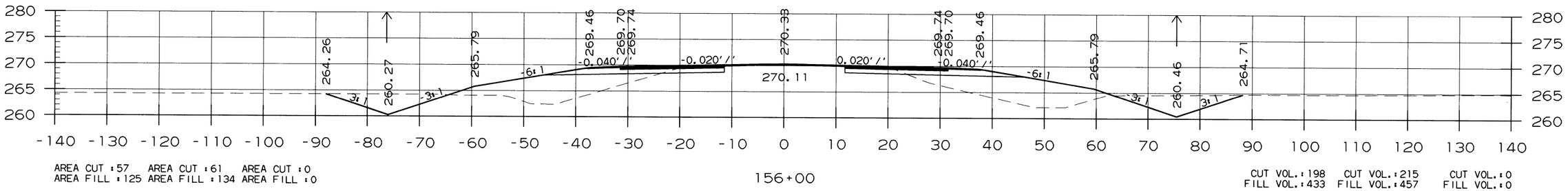
CUT VOL. : 234 CUT VOL. : 232 CUT VOL. : 0
FILL VOL. : 528 FILL VOL. : 544 FILL VOL. : 0




AREA CUT : 57 AREA CUT : 62 AREA CUT : 0
AREA FILL : 138 AREA FILL : 145 AREA FILL : 0

157+00

CUT VOL. : 211 CUT VOL. : 228 CUT VOL. : 0
FILL VOL. : 486 FILL VOL. : 515 FILL VOL. : 0




AREA CUT : 57 AREA CUT : 61 AREA CUT : 0
AREA FILL : 125 AREA FILL : 134 AREA FILL : 0

156+00

CUT VOL. : 198 CUT VOL. : 215 CUT VOL. : 0
FILL VOL. : 433 FILL VOL. : 457 FILL VOL. : 0

# CROSS SECTION
# STA. 156+00 TO STA. 158+00

2/3/2017

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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 |
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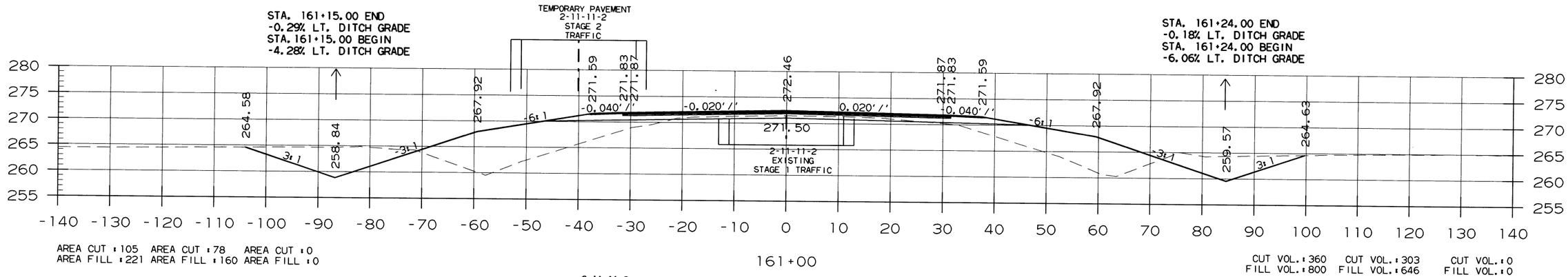
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 265 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

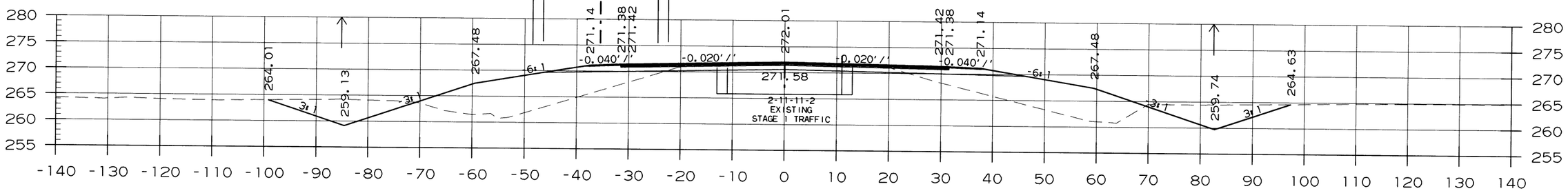
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 105 AREA CUT : 78 AREA CUT : 0
AREA FILL : 221 AREA FILL : 160 AREA FILL : 0

161+00

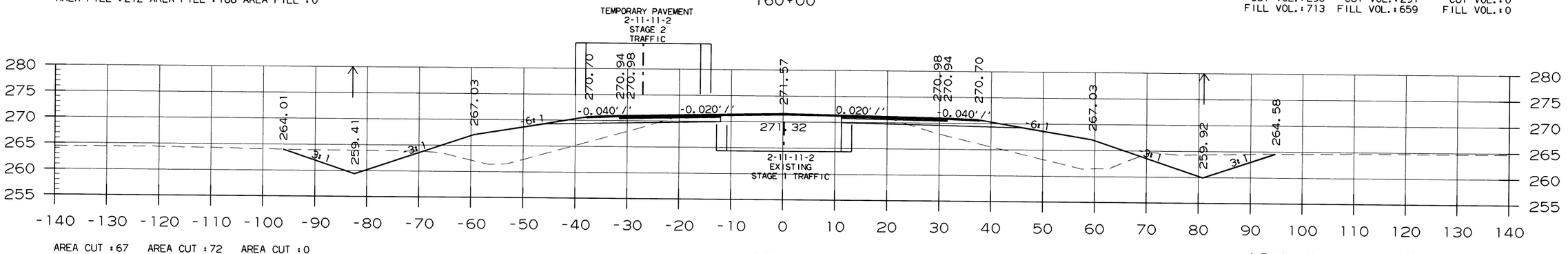
CUT VOL. : 360 CUT VOL. : 303 CUT VOL. : 0
FILL VOL. : 800 FILL VOL. : 646 FILL VOL. : 0




AREA CUT : 89 AREA CUT : 85 AREA CUT : 0
AREA FILL : 212 AREA FILL : 188 AREA FILL : 0

160+00

CUT VOL. : 293 CUT VOL. : 291 CUT VOL. : 0
FILL VOL. : 713 FILL VOL. : 659 FILL VOL. : 0




AREA CUT : 67 AREA CUT : 72 AREA CUT : 0
AREA FILL : 173 AREA FILL : 168 AREA FILL : 0

159+00

CUT VOL. : 256 CUT VOL. : 251 CUT VOL. : 0
FILL VOL. : 594 FILL VOL. : 587 FILL VOL. : 0

# CROSS SECTION
# STA. 159+00 TO STA. 161+00

2/3/2011

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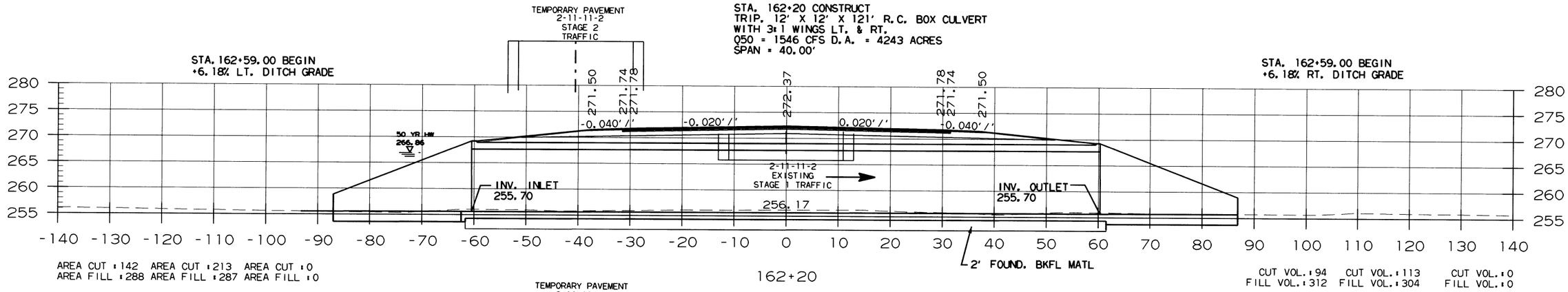
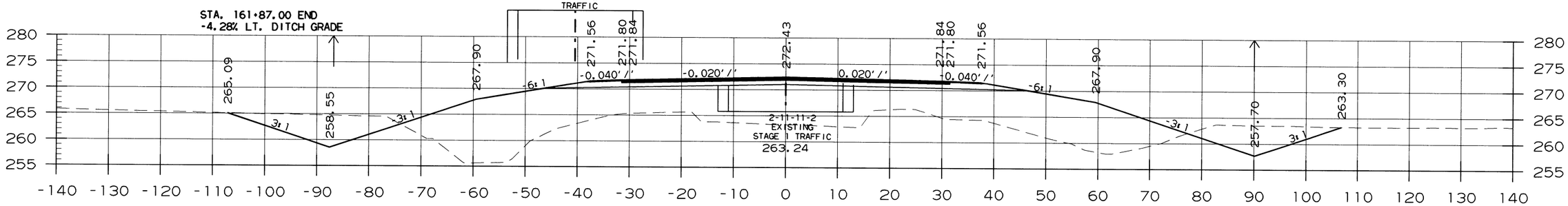
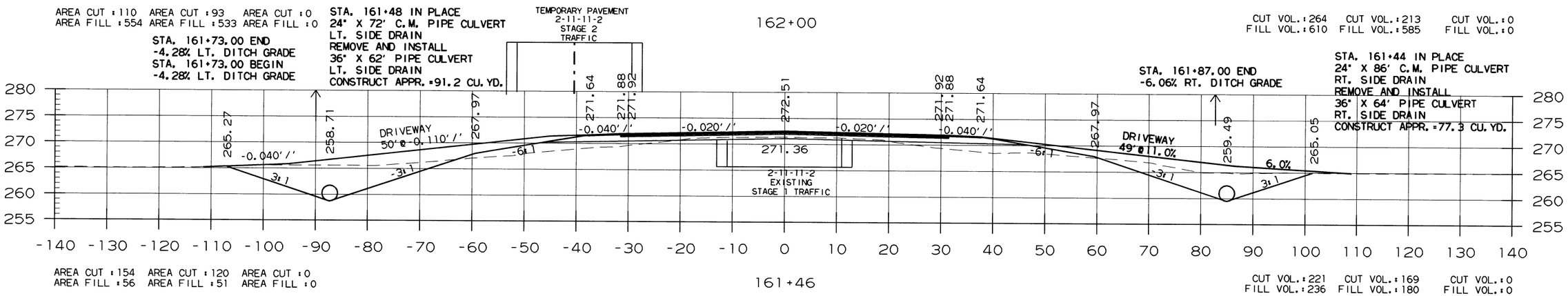
② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3




# CROSS SECTION
# STA. 161+46 TO STA. 162+20

2/3/2017

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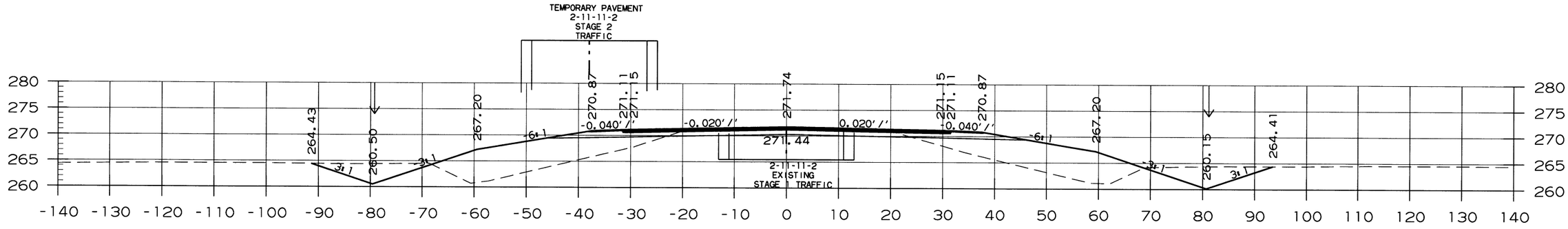
② CROSS SECTIONS

1/31/2018

STAGE 1 STAGE 2 STAGE 3

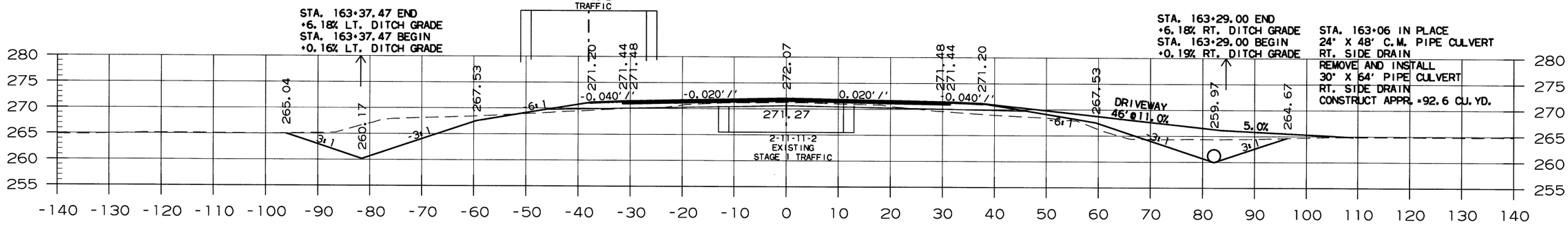
STAGE 1 STAGE 2 STAGE 3




AREA CUT = 66 AREA CUT = 72 AREA CUT = 0
AREA FILL = 184 AREA FILL = 175 AREA FILL = 0

164+00

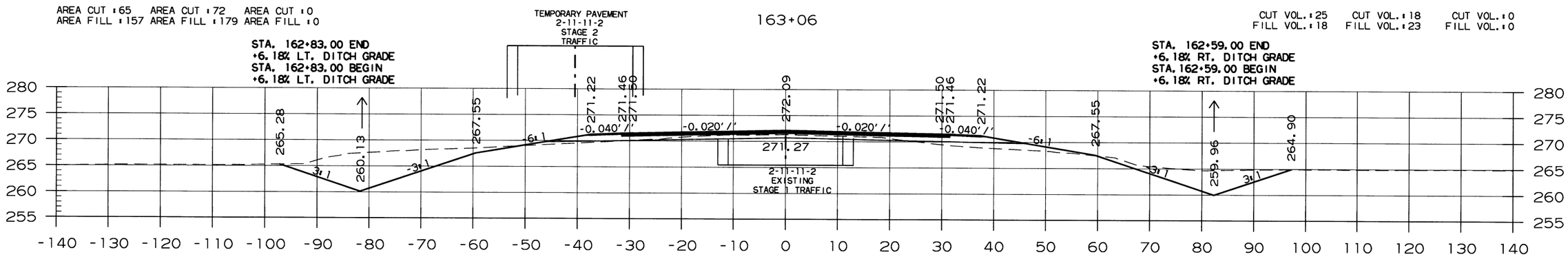
CUT VOL. = 229 CUT VOL. = 250 CUT VOL. = 0
FILL VOL. = 594 FILL VOL. = 617 FILL VOL. = 0




AREA CUT = 65 AREA CUT = 72 AREA CUT = 0
AREA FILL = 157 AREA FILL = 179 AREA FILL = 0

163+06

CUT VOL. = 25 CUT VOL. = 18 CUT VOL. = 0
FILL VOL. = 18 FILL VOL. = 23 FILL VOL. = 0




AREA CUT = 162 AREA CUT = 87 AREA CUT = 0
AREA FILL = 9 AREA FILL = 31 AREA FILL = 0

163+00

CUT VOL. = 452 CUT VOL. = 445 CUT VOL. = 0
FILL VOL. = 440 FILL VOL. = 471 FILL VOL. = 0

# CROSS SECTION
# STA. 163+00 TO STA. 164+00

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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 |
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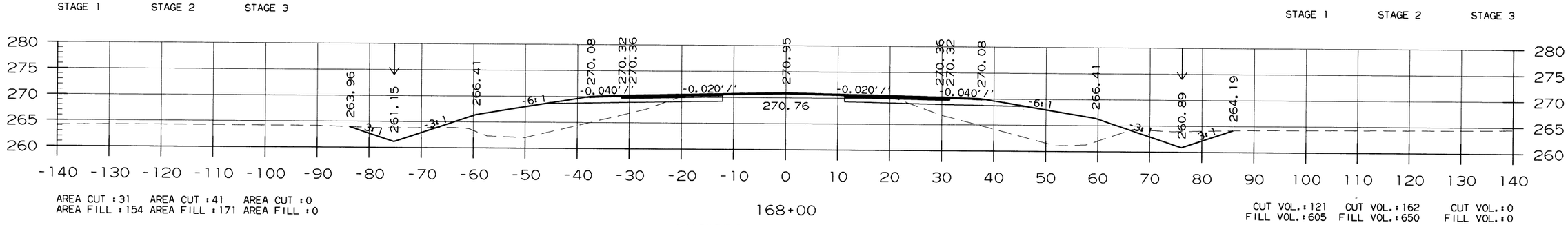
| | | | | JOB NO. | | CA1003 | 268 | 503 |

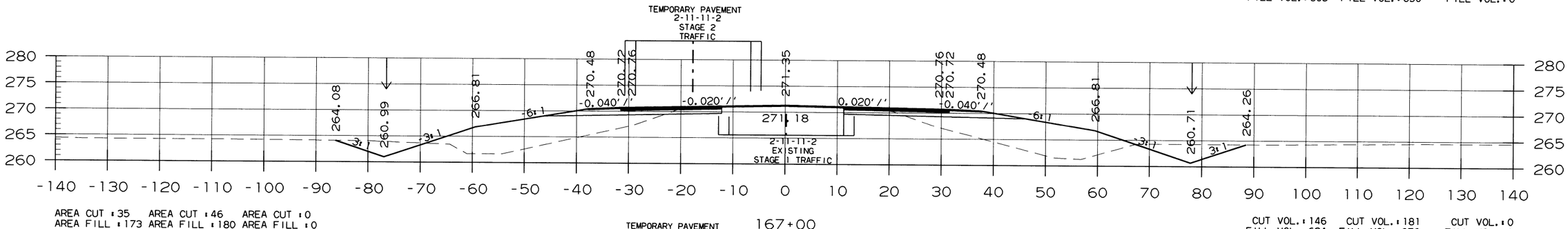
② CROSS SECTIONS




AREA CUT : 31 AREA CUT : 41 AREA CUT : 0
AREA FILL : 154 AREA FILL : 171 AREA FILL : 0

168+00

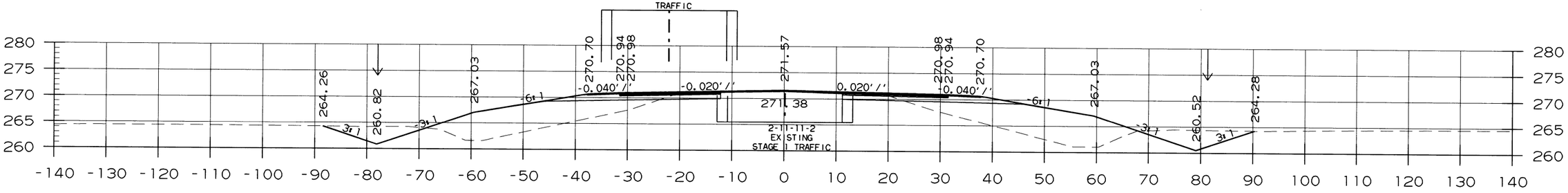
CUT VOL. : 121 CUT VOL. : 162 CUT VOL. : 0
FILL VOL. : 605 FILL VOL. : 650 FILL VOL. : 0




AREA CUT : 35 AREA CUT : 46 AREA CUT : 0
AREA FILL : 173 AREA FILL : 180 AREA FILL : 0

167+00

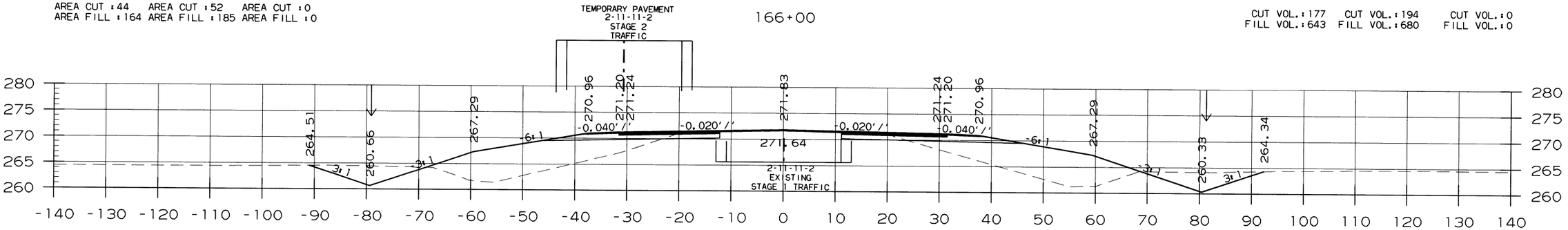
CUT VOL. : 146 CUT VOL. : 181 CUT VOL. : 0
FILL VOL. : 624 FILL VOL. : 676 FILL VOL. : 0




AREA CUT : 44 AREA CUT : 52 AREA CUT : 0
AREA FILL : 164 AREA FILL : 185 AREA FILL : 0

166+00

CUT VOL. : 177 CUT VOL. : 194 CUT VOL. : 0
FILL VOL. : 643 FILL VOL. : 680 FILL VOL. : 0




AREA CUT : 52 AREA CUT : 53 AREA CUT : 0
AREA FILL : 183 AREA FILL : 183 AREA FILL : 0

165+00

CUT VOL. : 218 CUT VOL. : 232 CUT VOL. : 0
FILL VOL. : 680 FILL VOL. : 664 FILL VOL. : 0

# CROSS SECTION
# STA. 165+00 TO STA. 168+00

2/3/2017

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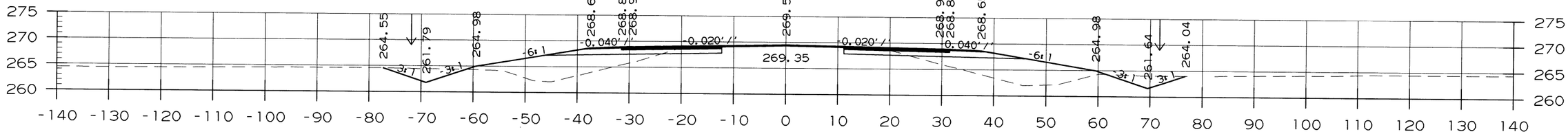
| | | | | JOB NO. | | CA1003 | 269 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

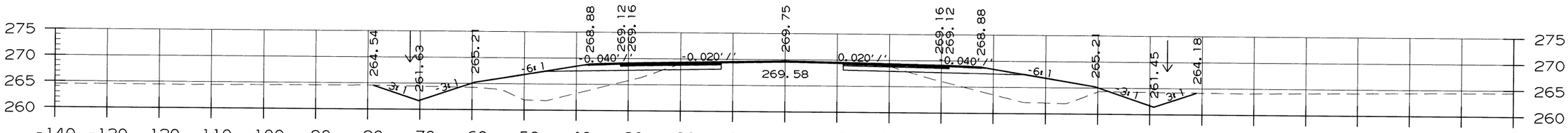



AREA CUT : 30 AREA CUT : 27 AREA CUT : 0
AREA FILL : 103 AREA FILL : 110 AREA FILL : 0

172+00

STAGE 1 STAGE 2 STAGE 3

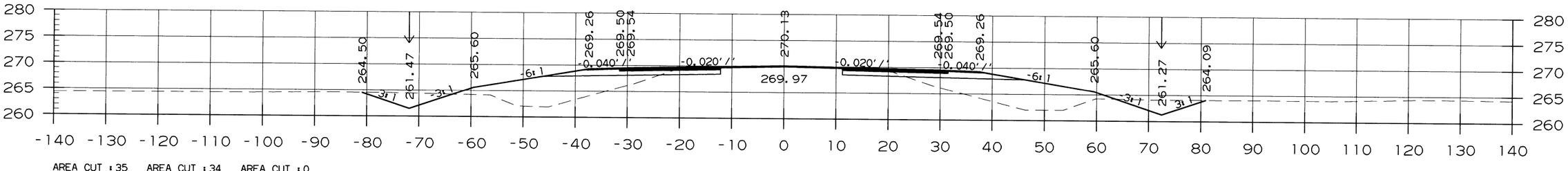
CUT VOL. : 115 CUT VOL. : 111 CUT VOL. : 0
FILL VOL. : 409 FILL VOL. : 425 FILL VOL. : 0




AREA CUT : 32 AREA CUT : 33 AREA CUT : 0
AREA FILL : 118 AREA FILL : 119 AREA FILL : 0

171+00

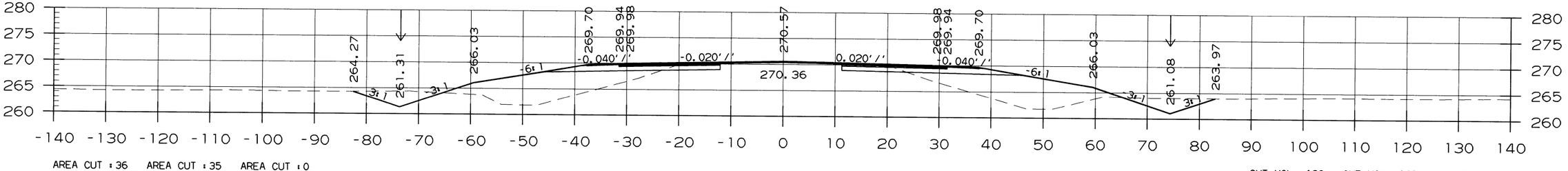
CUT VOL. : 124 CUT VOL. : 123 CUT VOL. : 0
FILL VOL. : 457 FILL VOL. : 467 FILL VOL. : 0




AREA CUT : 35 AREA CUT : 34 AREA CUT : 0
AREA FILL : 129 AREA FILL : 133 AREA FILL : 0

170+00

CUT VOL. : 131 CUT VOL. : 127 CUT VOL. : 0
FILL VOL. : 511 FILL VOL. : 517 FILL VOL. : 0




AREA CUT : 36 AREA CUT : 35 AREA CUT : 0
AREA FILL : 147 AREA FILL : 146 AREA FILL : 0

169+00

CUT VOL. : 123 CUT VOL. : 142 CUT VOL. : 0
FILL VOL. : 557 FILL VOL. : 587 FILL VOL. : 0

# CROSS SECTION
# STA. 169+00 TO STA. 172+00

2/3/2017

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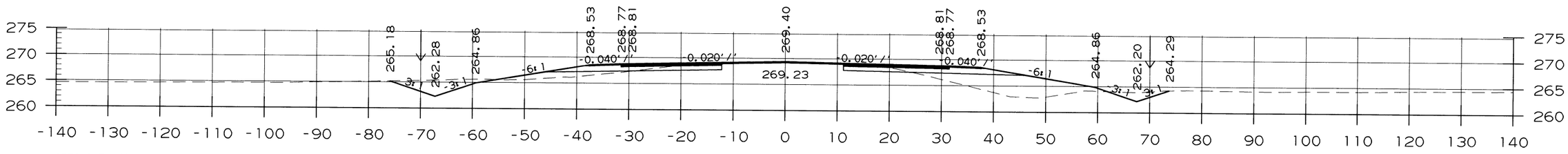
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 270 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

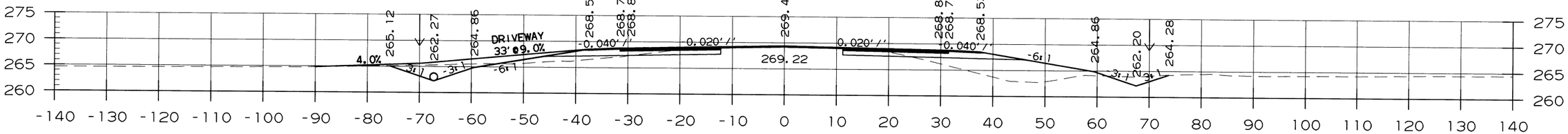
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 40 AREA CUT : 20 AREA CUT : 0
AREA FILL : 95 AREA FILL : 90 AREA FILL : 0

175+00

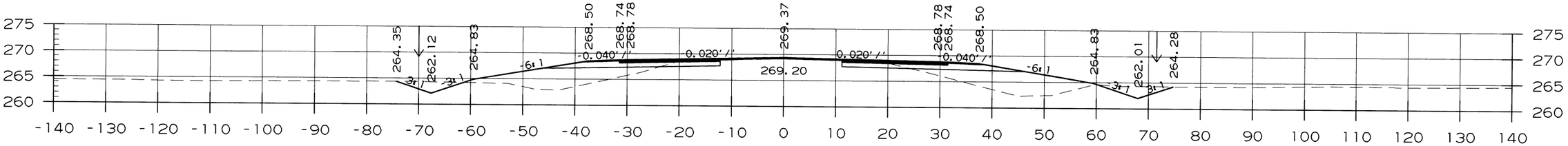
CUT VOL. : 2 CUT VOL. : 2 CUT VOL. : 0
FILL VOL. : 4 FILL VOL. : 7 FILL VOL. : 0




AREA CUT : 19 AREA CUT : 22 AREA CUT : 0
AREA FILL : 95 AREA FILL : 92 AREA FILL : 0

174+98

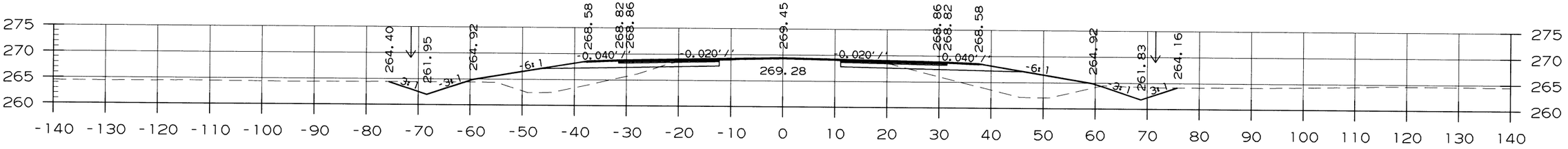
CUT VOL. : 75 CUT VOL. : 87 CUT VOL. : 0
FILL VOL. : 336 FILL VOL. : 342 FILL VOL. : 0




AREA CUT : 23 AREA CUT : 26 AREA CUT : 0
AREA FILL : 90 AREA FILL : 97 AREA FILL : 0

174+00

CUT VOL. : 91 CUT VOL. : 98 CUT VOL. : 0
FILL VOL. : 350 FILL VOL. : 376 FILL VOL. : 0




AREA CUT : 26 AREA CUT : 27 AREA CUT : 0
AREA FILL 99 AREA FILL : 106 AREA FILL : 0

173+00

CUT VOL. : 104 CUT VOL. : 101 CUT VOL. : 0
FILL VOL. : 373 FILL VOL. : 400 FILL VOL. : 0

# CROSS SECTION
# STA. 173+00 TO STA. 175+00

2/3/2017

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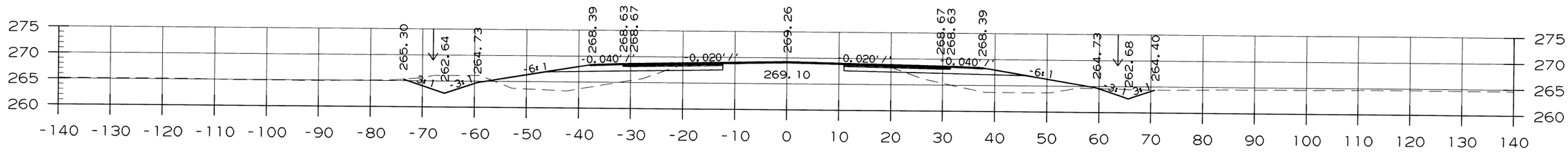
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 271 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

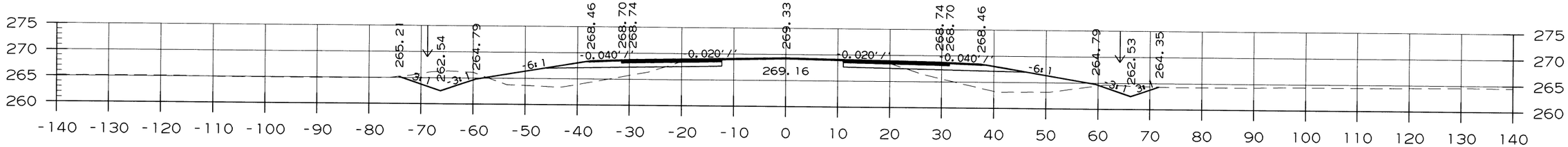
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 40 AREA CUT : 19 AREA CUT : 0
AREA FILL : 82 AREA FILL : 83 AREA FILL : 0

178+00

CUT VOL. : 151 CUT VOL. : 75 CUT VOL. : 0
FILL VOL. : 300 FILL VOL. : 326 FILL VOL. : 0

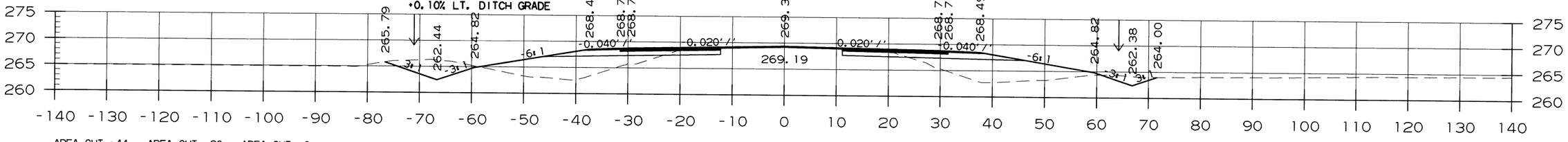



AREA CUT : 42 AREA CUT : 21 AREA CUT : 0
AREA FILL : 80 AREA FILL : 93 AREA FILL : 0

177+00

CUT VOL. : 160 CUT VOL. : 76 CUT VOL. : 0
FILL VOL. : 325 FILL VOL. : 360 FILL VOL. : 0

STA. 176+00.00 END
+0.16% LT. DITCH GRADE
STA. 176+00.00 BEGIN
+0.10% LT. DITCH GRADE



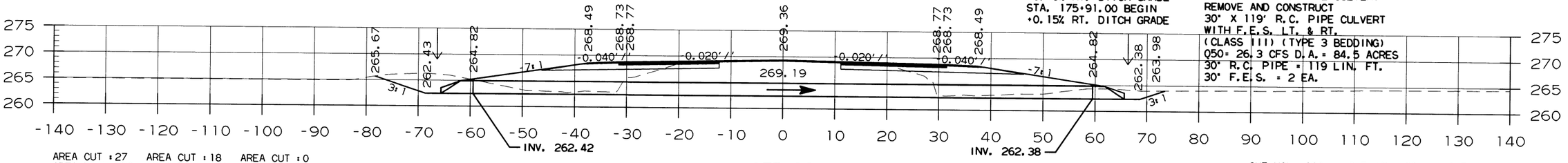

AREA CUT : 44 AREA CUT : 20 AREA CUT : 0
AREA FILL : 96 AREA FILL : 101 AREA FILL : 0

176+00

CUT VOL. : 5 CUT VOL. : 3 CUT VOL. : 0
FILL VOL. : 14 FILL VOL. : 14 FILL VOL. : 0

STA. 175+91.00 END
+0.19% RT. DITCH GRADE
STA. 175+91.00 BEGIN
+0.15% RT. DITCH GRADE

STA. 175+96 IN PLACE
24" X 59' R.C. PIPE CULVERT
REMOVE AND CONSTRUCT
30" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
Q50= 26.3 CFS D.A.= 84.5 ACRES
30" R.C. PIPE = 119 LIN. FT.
30" F.E.S. = 2 EA.




AREA CUT : 27 AREA CUT : 18 AREA CUT : 0
AREA FILL : 90 AREA FILL : 82 AREA FILL : 0

175+96

CUT VOL. : 120 CUT VOL. : 68 CUT VOL. : 0
FILL VOL. : 198 FILL VOL. : 306 FILL VOL. : 0

# CROSS SECTION
# STA. 175+96 TO STA. 178+00

2/3/2017

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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 |
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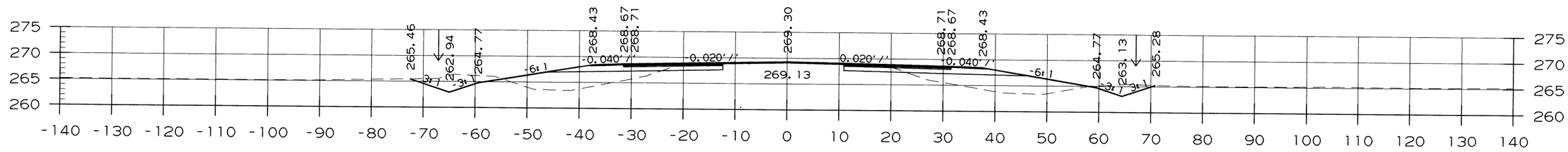
| | | | | JOB NO. | | CA1003 | 272 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

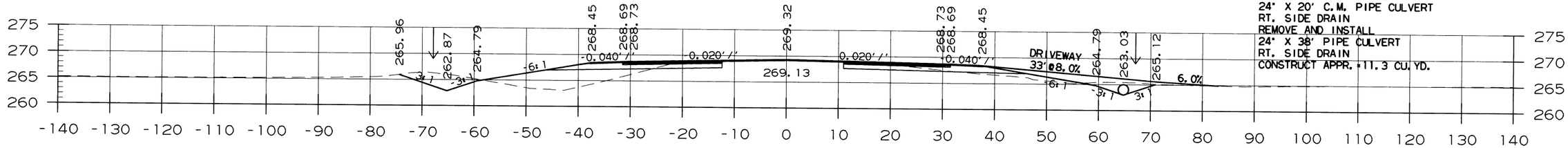
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 38 AREA CUT : 24 AREA CUT : 0
AREA FILL : 72 AREA FILL : 81 AREA FILL : 0

181+00

CUT VOL. : 93 CUT VOL. : 60 CUT VOL. : 0
FILL VOL. : 171 FILL VOL. : 155 FILL VOL. : 0

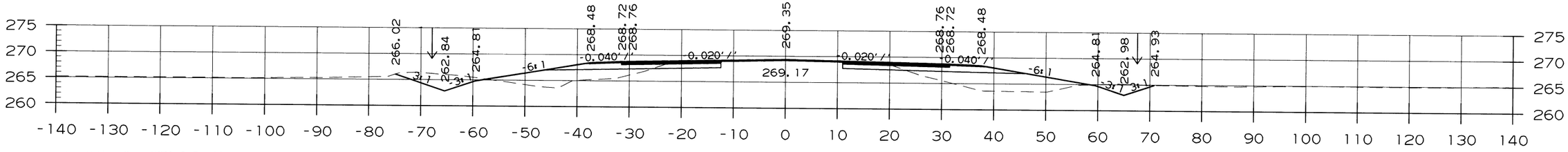



STA. 180+37 IN PLACE
24" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 11.3 CU. YD.

AREA CUT : 41 AREA CUT : 28 AREA CUT : 0
AREA FILL : 74 AREA FILL : 52 AREA FILL : 0

180+37

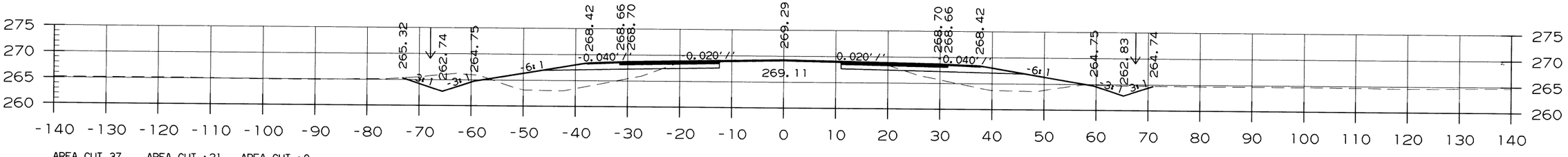
CUT VOL. : 56 CUT VOL. : 35 CUT VOL. : 0
FILL VOL. : 93 FILL VOL. : 93 FILL VOL. : 0




AREA CUT : 40 AREA CUT : 22 AREA CUT : 0
AREA FILL : 62 AREA FILL : 85 AREA FILL : 0

180+00

CUT VOL. : 144 CUT VOL. : 80 CUT VOL. : 0
FILL VOL. : 276 FILL VOL. : 301 FILL VOL. : 0




AREA CUT 37 AREA CUT : 21 AREA CUT : 0
AREA FILL : 87 AREA FILL : 78 AREA FILL : 0

179+00

CUT VOL. : 143 CUT VOL. : 74 CUT VOL. : 0
FILL VOL. : 314 FILL VOL. : 297 FILL VOL. : 0

# CROSS SECTION
# STA. 179+00 TO STA. 181+00

2/3/2017

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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 |
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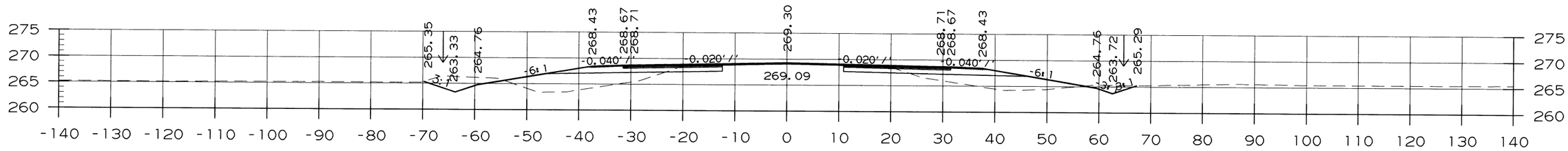
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 273 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

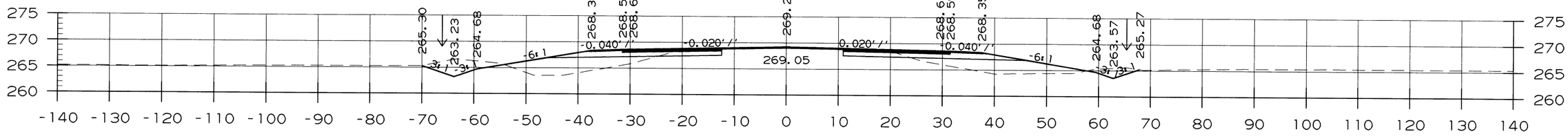
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 33 AREA CUT : 18 AREA CUT : 0
AREA FILL : 75 AREA FILL : 61 AREA FILL : 0

185+00

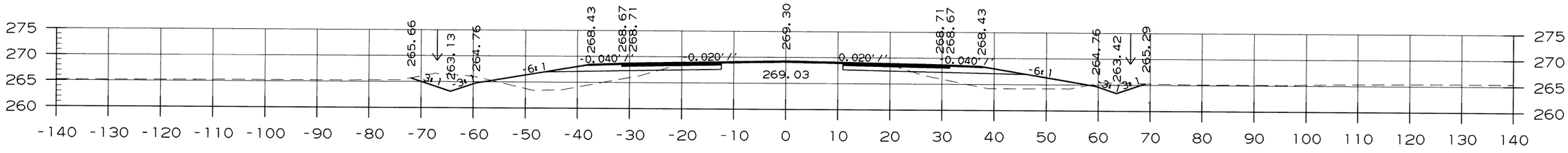
CUT VOL. : 126 CUT VOL. : 71 CUT VOL. : 0
FILL VOL. : 259 FILL VOL. : 225 FILL VOL. : 0




AREA CUT : 36 AREA CUT : 21 AREA CUT : 0
AREA FILL : 65 AREA FILL : 61 AREA FILL : 0

184+00

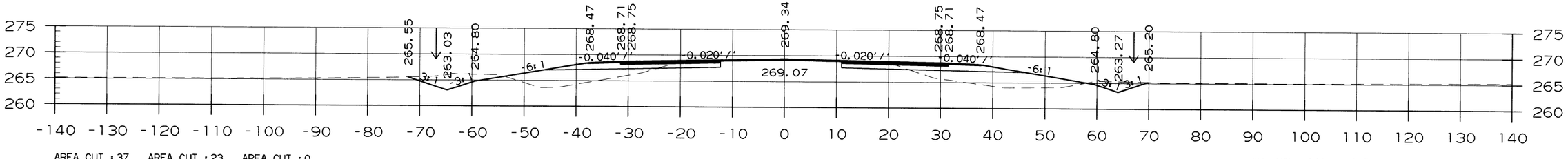
CUT VOL. : 134 CUT VOL. : 78 CUT VOL. : 0
FILL VOL. : 253 FILL VOL. : 240 FILL VOL. : 0




AREA CUT : 37 AREA CUT : 21 AREA CUT : 0
AREA FILL : 72 AREA FILL : 69 AREA FILL : 0

183+00

CUT VOL. : 137 CUT VOL. : 81 CUT VOL. : 0
FILL VOL. : 249 FILL VOL. : 259 FILL VOL. : 0




AREA CUT : 37 AREA CUT : 23 AREA CUT : 0
AREA FILL : 63 AREA FILL : 72 AREA FILL : 0

182+00

CUT VOL. : 140 CUT VOL. : 86 CUT VOL. : 0
FILL VOL. : 250 FILL VOL. : 283 FILL VOL. : 0

# CROSS SECTION
# STA. 182+00 TO STA. 185+00

273201T

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 274 | 503 |

② CROSS SECTIONS

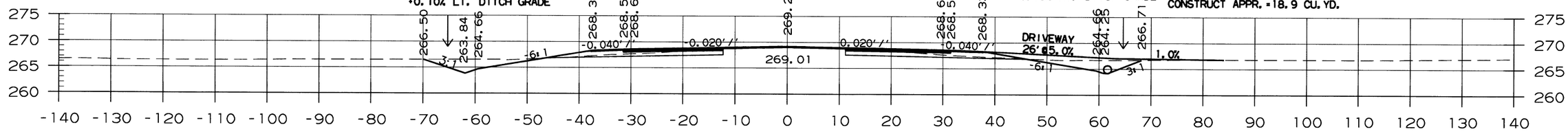
STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

STA. 188+48.00 END
+0.10% LT. DITCH GRADE

STA. 188+56.00 END
+0.15% RT. DITCH GRADE

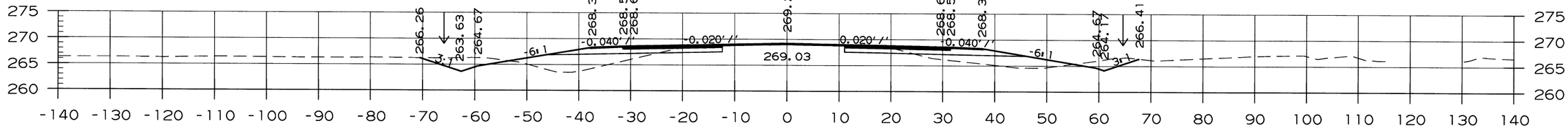
STA. 188+55 IN PLACE
18" X 15' R.C. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 18.9 CU. YD.




AREA CUT = 33 AREA CUT = 39 AREA CUT = 0
AREA FILL = 38 AREA FILL = 1 AREA FILL = 0

188+55

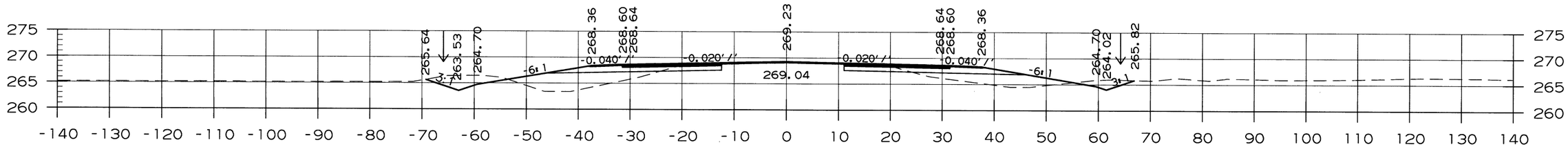
CUT VOL. = 65 CUT VOL. = 64 CUT VOL. = 0
FILL VOL. = 99 FILL VOL. = 48 FILL VOL. = 0




AREA CUT = 31 AREA CUT = 24 AREA CUT = 0
AREA FILL = 60 AREA FILL = 46 AREA FILL = 0

188+00

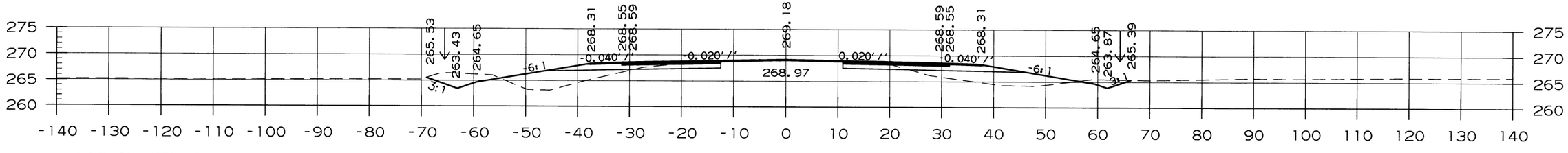
CUT VOL. = 117 CUT VOL. = 84 CUT VOL. = 0
FILL VOL. = 236 FILL VOL. = 178 FILL VOL. = 0




AREA CUT = 32 AREA CUT = 21 AREA CUT = 0
AREA FILL = 68 AREA FILL = 50 AREA FILL = 0

187+00

CUT VOL. = 122 CUT VOL. = 73 CUT VOL. = 0
FILL VOL. = 228 FILL VOL. = 200 FILL VOL. = 0




AREA CUT = 34 AREA CUT = 18 AREA CUT = 0
AREA FILL = 55 AREA FILL = 58 AREA FILL = 0

186+00

CUT VOL. = 123 CUT VOL. = 67 CUT VOL. = 0
FILL VOL. = 242 FILL VOL. = 220 FILL VOL. = 0

# CROSS SECTION
# STA. 186+00 TO STA. 188+55

1/31/2018

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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 |
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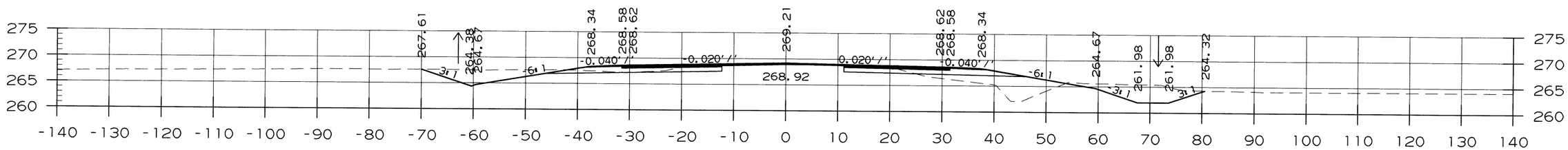
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

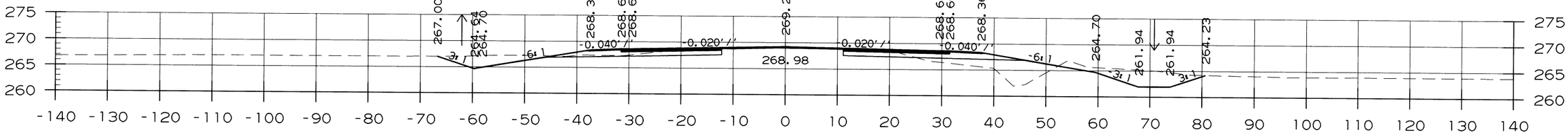
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 54 AREA CUT : 61 AREA CUT : 0
AREA FILL : 3 AREA FILL : 60 AREA FILL : 0

191+00

CUT VOL. : 176 CUT VOL. : 229 CUT VOL. : 0
FILL VOL. : 7 FILL VOL. : 217 FILL VOL. : 0

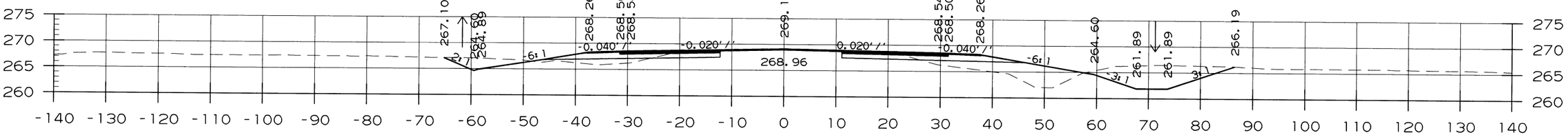



AREA CUT : 41 AREA CUT : 63 AREA CUT : 0
AREA FILL : 1 AREA FILL : 57 AREA FILL : 0

190+00

CUT VOL. : 135 CUT VOL. : 285 CUT VOL. : 0
FILL VOL. : 37 FILL VOL. : 233 FILL VOL. : 0

STA. 189+00.00 BEGIN
-0.25% LT. DITCH GRADE




AREA CUT : 32 AREA CUT : 91 AREA CUT : 0
AREA FILL : 19 AREA FILL : 69 AREA FILL : 0

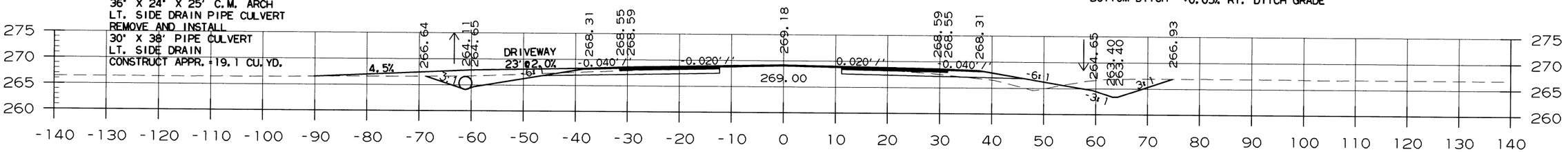
189+00

CUT VOL. : 41 CUT VOL. : 82 CUT VOL. : 0
FILL VOL. : 36 FILL VOL. : 44 FILL VOL. : 0

STA. 188+66 IN PLACE
36" X 24" X 25' C.M. ARCH
LT. SIDE DRAIN PIPE CULVERT
REMOVE AND INSTALL
30" X 38" PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 19.1 CU.YD.

STA. 188+84
BEG. 6' FLAT
BOTTOM DITCH

STA. 188+84.00 BEGIN
+0.05% RT. DITCH GRADE




AREA CUT : 33 AREA CUT : 39 AREA CUT : 0
AREA FILL : 38 AREA FILL : 1 AREA FILL : 0

188+66

CUT VOL. : 13 CUT VOL. : 16 CUT VOL. : 0
FILL VOL. : 15 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 188+66 TO STA. 191+00

2/3/2017

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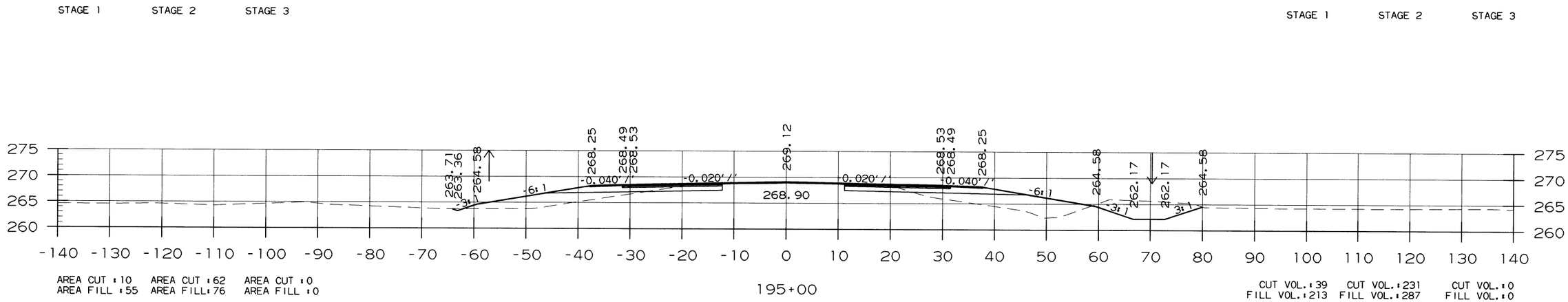
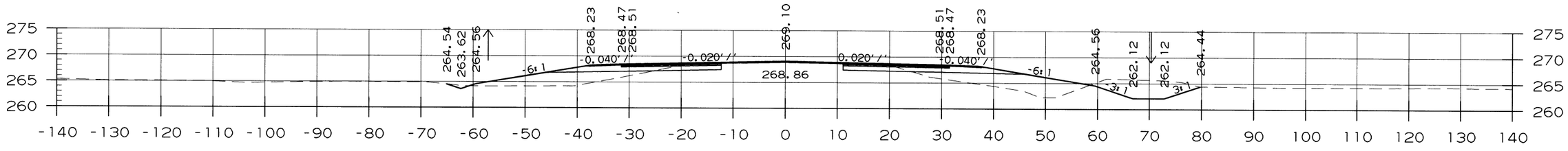
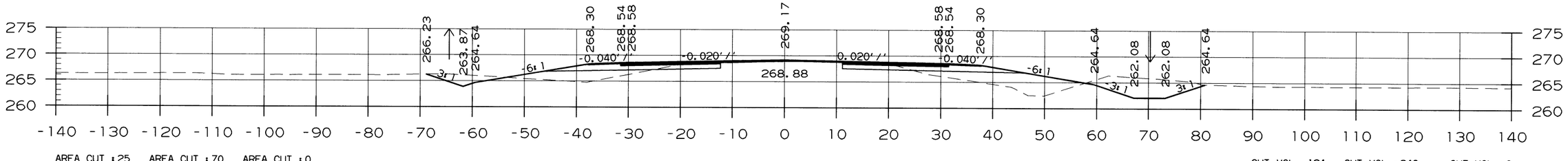
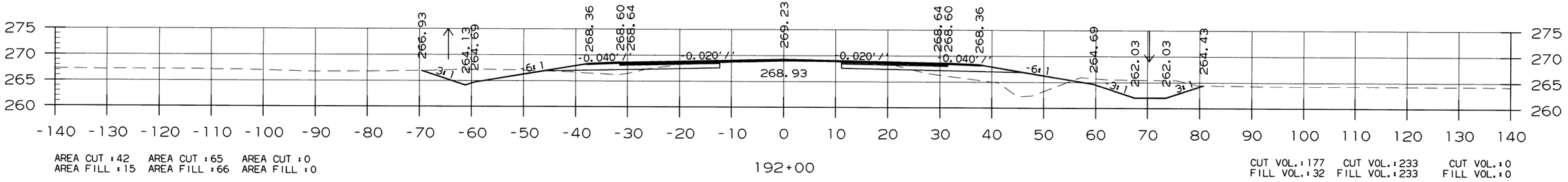
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 276 | 503 |

② CROSS SECTIONS




CROSS SECTION
STA. 192+00 TO STA. 195+00

2/3/2017

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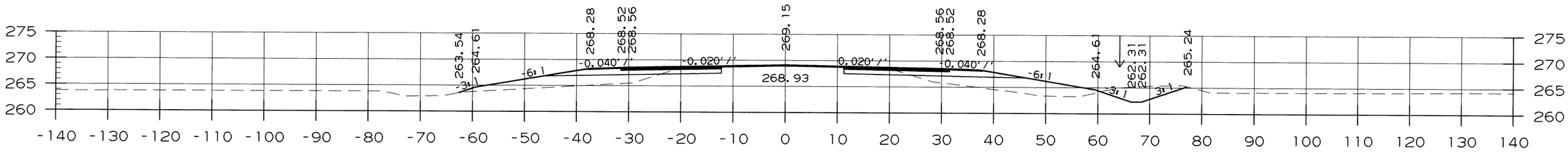
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 277 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

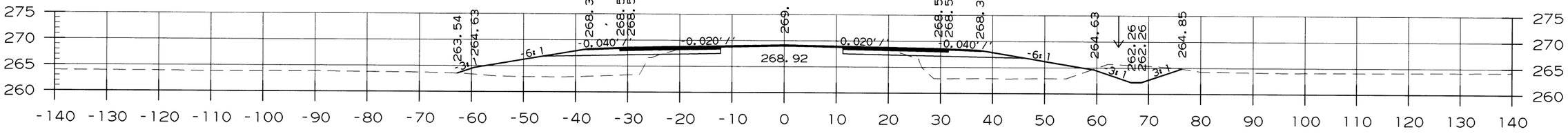



AREA CUT : 10 AREA CUT : 39 AREA CUT : 0
AREA FILL : 63 AREA FILL : 76 AREA FILL : 0

198+00

STAGE 1 STAGE 2 STAGE 3

CUT VOL. : 36 CUT VOL. : 154 CUT VOL. : 0
FILL VOL. : 339 FILL VOL. : 364 FILL VOL. : 0




AREA CUT : 10 AREA CUT : 44 AREA CUT : 0
AREA FILL : 120 AREA FILL : 121 AREA FILL : 0

197+00

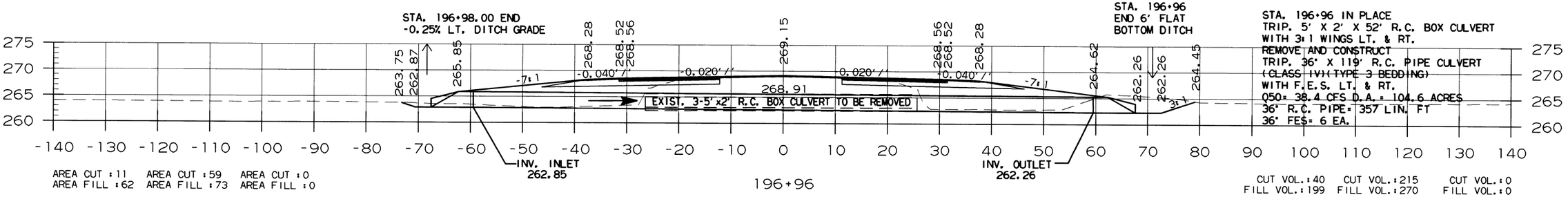
STA. 196+96
BEG. 2' FLAT
BOTTOM DITCH

CUT VOL. : 2 CUT VOL. : 8 CUT VOL. : 0
FILL VOL. : 13 FILL VOL. : 14 FILL VOL. : 0

STA. 196+98.00 END
-0.25% LT. DITCH GRADE

STA. 196+96
END 6' FLAT
BOTTOM DITCH

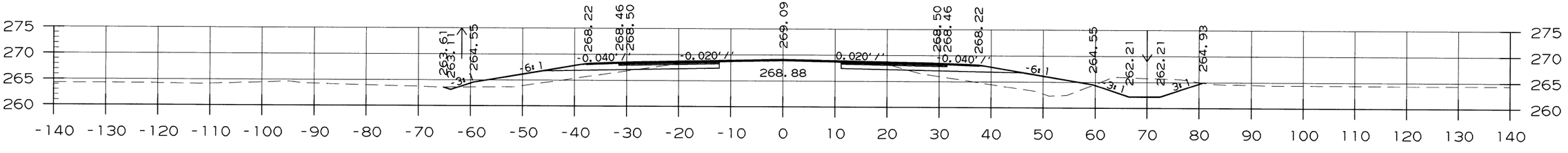
STA. 196+96 IN PLACE
TRIP. 5' X 2' X 52' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
REMOVE AND CONSTRUCT
TRIP. 36" X 119' R.C. PIPE CULVERT
(CLASS IV)(TYPE 3 BEDDING)
WITH F.E.S. LT. & RT.
Q50= 38.4 CFS D.A. = 104.6 ACRES
36" R.C. PIPE= 357 LIN. FT
36" FES= 6 EA.




AREA CUT : 11 AREA CUT : 59 AREA CUT : 0
AREA FILL : 62 AREA FILL : 73 AREA FILL : 0

196+96

CUT VOL. : 40 CUT VOL. : 215 CUT VOL. : 0
FILL VOL. : 199 FILL VOL. : 270 FILL VOL. : 0




AREA CUT : 11 AREA CUT : 62 AREA CUT : 0
AREA FILL : 50 AREA FILL : 79 AREA FILL : 0

196+00

CUT VOL. : 40 CUT VOL. : 229 CUT VOL. : 0
FILL VOL. : 196 FILL VOL. : 287 FILL VOL. : 0

# CROSS SECTION
# STA. 196+00 TO STA. 198+00

2/3/2017

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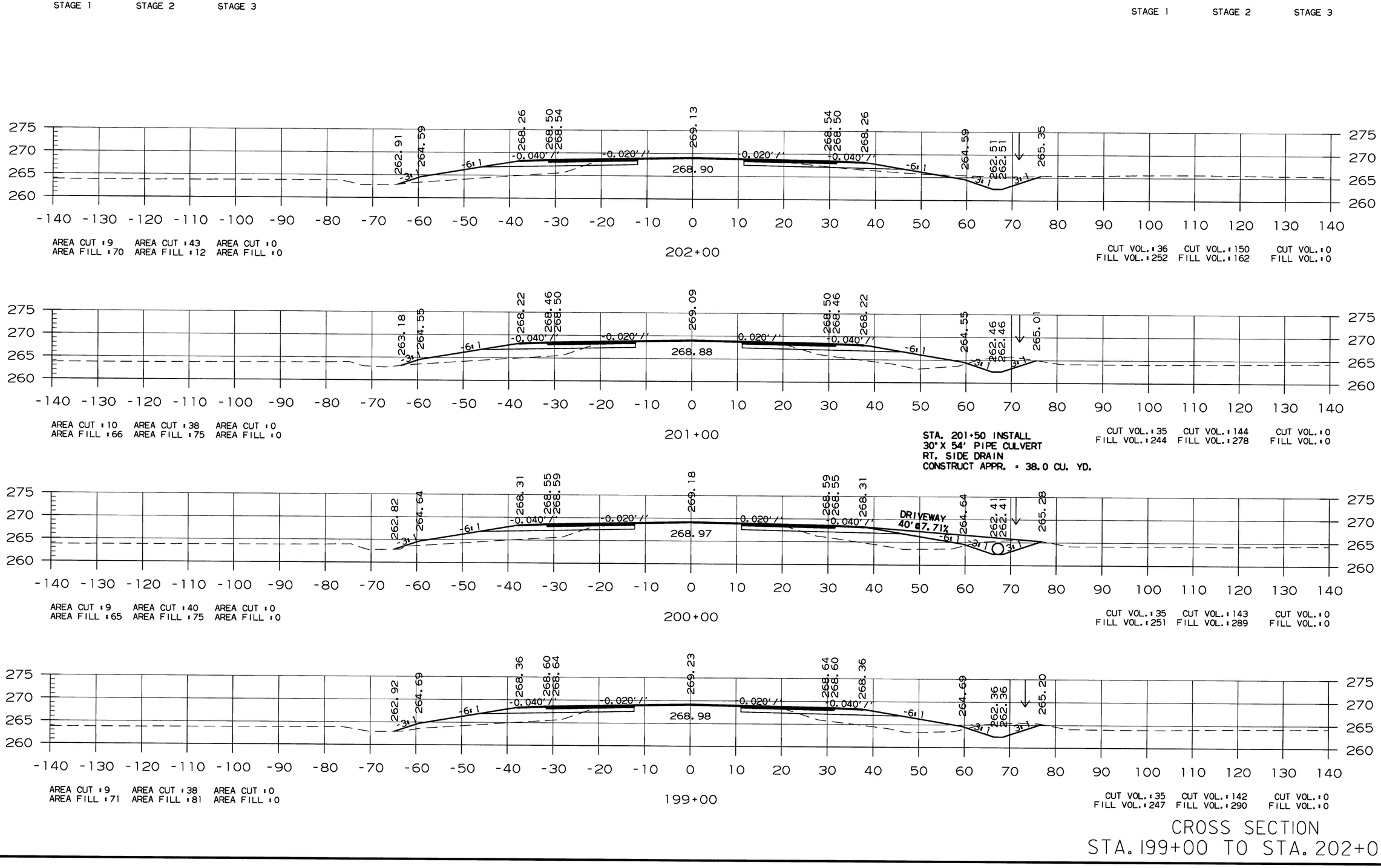
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 278 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




CROSS SECTION
STA. 199+00 TO STA. 202+00

2/9/2018

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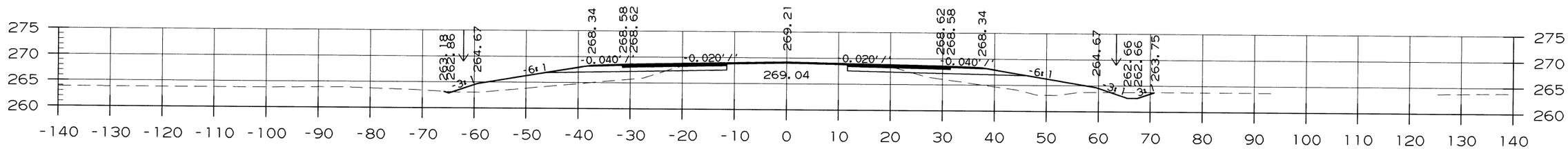
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 279 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

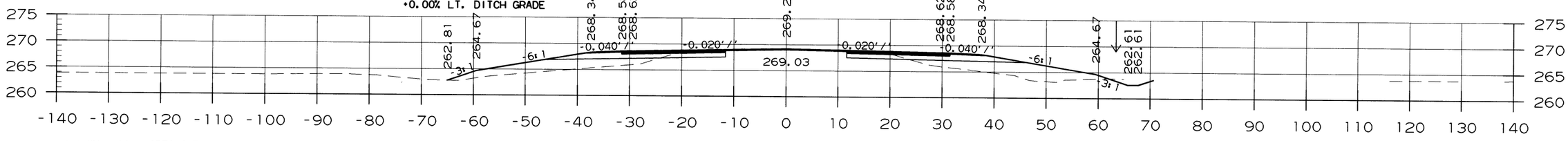



AREA CUT : 10 AREA CUT : 15 AREA CUT : 0
AREA FILL : 77 AREA FILL : 74 AREA FILL : 0

205+00

CUT VOL. : 38 CUT VOL. : 49 CUT VOL. : 0
FILL VOL. : 264 FILL VOL. : 274 FILL VOL. : 0

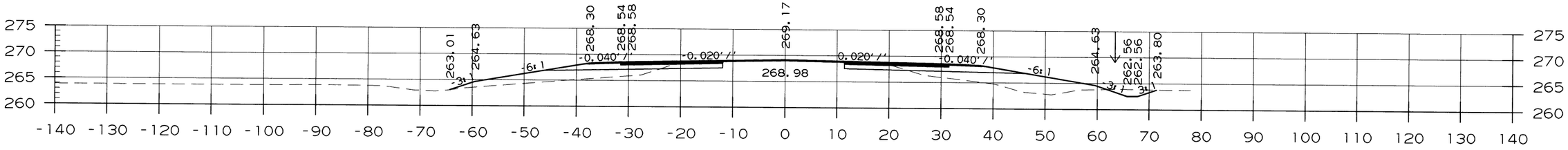
STA. 204+50.00 BEGIN
+0.00% LT. DITCH GRADE




AREA CUT : 11 AREA CUT : 11 AREA CUT : 0
AREA FILL : 65 AREA FILL : 74 AREA FILL : 0

204+00

CUT VOL. : 39 CUT VOL. : 52 CUT VOL. : 0
FILL VOL. : 235 FILL VOL. : 281 FILL VOL. : 0

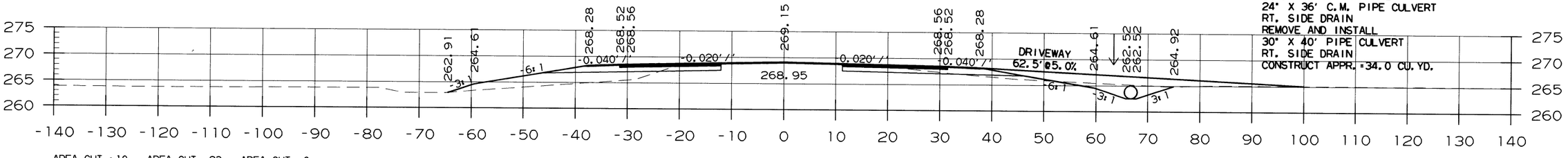



AREA CUT : 11 AREA CUT : 17 AREA CUT : 0
AREA FILL : 61 AREA FILL : 78 AREA FILL : 0

203+00

CUT VOL. : 32 CUT VOL. : 60 CUT VOL. : 0
FILL VOL. : 199 FILL VOL. : 215 FILL VOL. : 0

STA. 202+18 IN PLACE
24" X 36' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =34.0 CU. YD.




AREA CUT : 10 AREA CUT : 23 AREA CUT : 0
AREA FILL : 70 AREA FILL : 63 AREA FILL : 0

202+18

CUT VOL. : 7 CUT VOL. : 22 CUT VOL. : 0
FILL VOL. : 47 FILL VOL. : 25 FILL VOL. : 0

# CROSS SECTION
# STA. 202+18 TO STA. 205+00

2/3/2017

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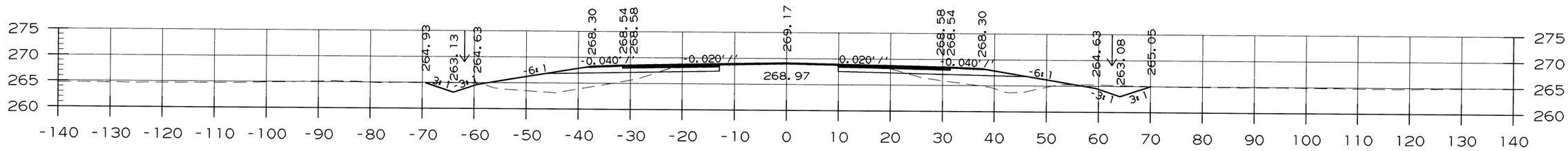
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 280 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

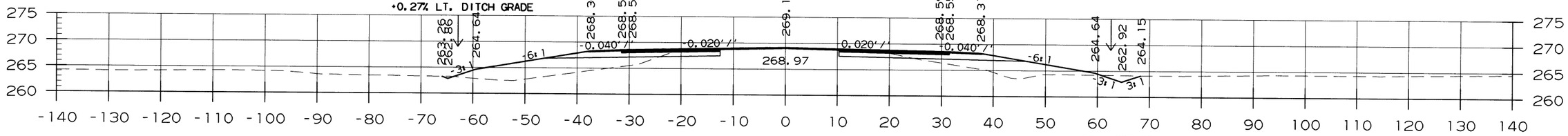



AREA CUT : 20 AREA CUT : 24 AREA CUT : 0
AREA FILL : 79 AREA FILL : 57 AREA FILL : 0

209+00

CUT VOL. : 55 CUT VOL. : 71 CUT VOL. : 0
FILL VOL. : 321 FILL VOL. : 221 FILL VOL. : 0

STA. 208+00.00 END
+0.00% LT. DITCH GRADE
STA. 208+00.00 BEGIN
+0.27% LT. DITCH GRADE

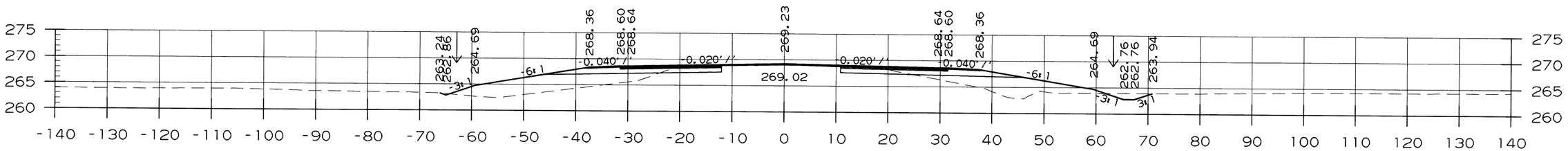



AREA CUT : 10 AREA CUT : 15 AREA CUT : 0
AREA FILL : 95 AREA FILL : 62 AREA FILL : 0

208+00

STA. 207+00
END 2' FLAT
BOTTOM DITCH

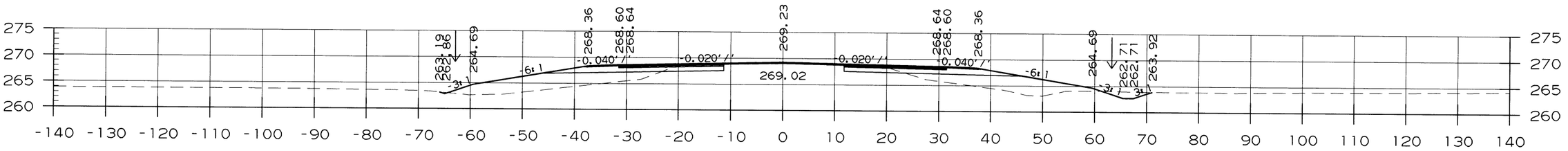
CUT VOL. : 39 CUT VOL. : 56 CUT VOL. : 0
FILL VOL. : 352 FILL VOL. : 251 FILL VOL. : 0




AREA CUT : 11 AREA CUT : 16 AREA CUT : 0
AREA FILL : 95 AREA FILL : 73 AREA FILL : 0

207+00

CUT VOL. : 39 CUT VOL. : 58 CUT VOL. : 0
FILL VOL. : 349 FILL VOL. : 279 FILL VOL. : 0




AREA CUT : 10 AREA CUT : 16 AREA CUT : 0
AREA FILL : 93 AREA FILL : 77 AREA FILL : 0

206+00

CUT VOL. : 38 CUT VOL. : 57 CUT VOL. : 0
FILL VOL. : 315 FILL VOL. : 280 FILL VOL. : 0

# CROSS SECTION
# STA. 206+00 TO STA. 209+00

2/3/2017

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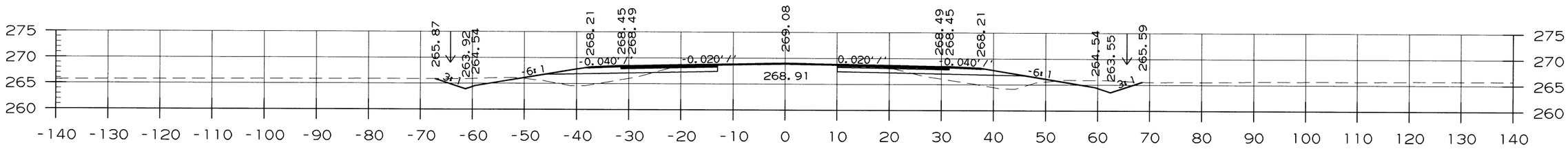
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 281 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

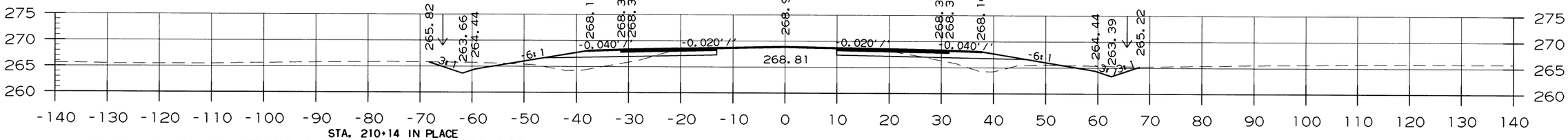



AREA CUT : 25 AREA CUT : 29 AREA CUT : 0
AREA FILL : 38 AREA FILL : 44 AREA FILL : 0

212+00

CUT VOL. : 92 CUT VOL. : 99 CUT VOL. : 0
FILL VOL. : 152 FILL VOL. : 150 FILL VOL. : 0

STAGE 1 STAGE 2 STAGE 3

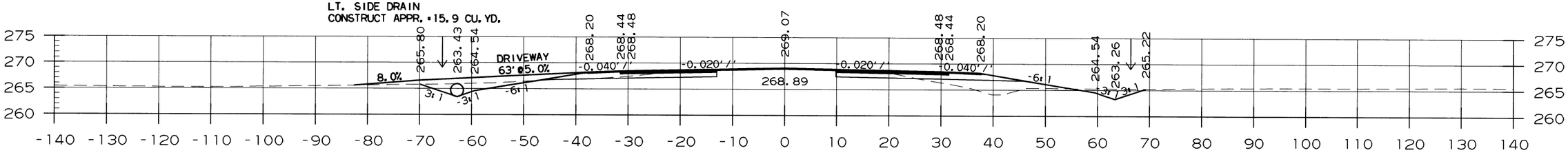



AREA CUT : 24 AREA CUT : 25 AREA CUT : 0
AREA FILL : 44 AREA FILL : 37 AREA FILL : 0

STA. 210+14 IN PLACE
24" X 12" X 20' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 15.9 CU. YD.

211+00

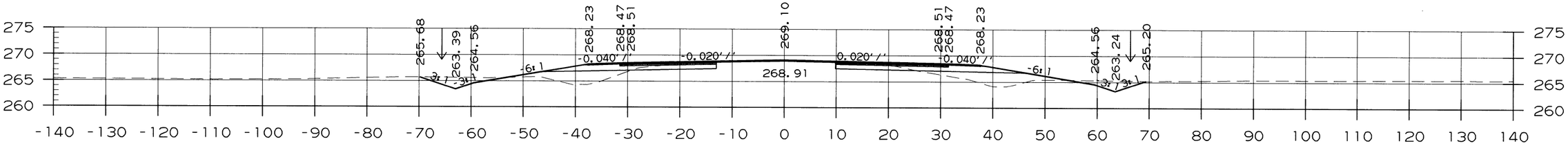
CUT VOL. : 92 CUT VOL. : 78 CUT VOL. : 0
FILL VOL. : 129 FILL VOL. : 123 FILL VOL. : 0




AREA CUT : 33 AREA CUT : 24 AREA CUT : 0
AREA FILL : 37 AREA FILL : 40 AREA FILL : 0

210+14

CUT VOL. : 16 CUT VOL. : 13 CUT VOL. : 0
FILL VOL. : 19 FILL VOL. : 22 FILL VOL. : 0




AREA CUT : 29 AREA CUT : 25 AREA CUT : 0
AREA FILL : 36 AREA FILL : 43 AREA FILL : 0

210+00

CUT VOL. : 89 CUT VOL. : 91 CUT VOL. : 0
FILL VOL. : 213 FILL VOL. : 186 FILL VOL. : 0

# CROSS SECTION
# STA. 210+00 TO STA. 212+00

2/3/2017

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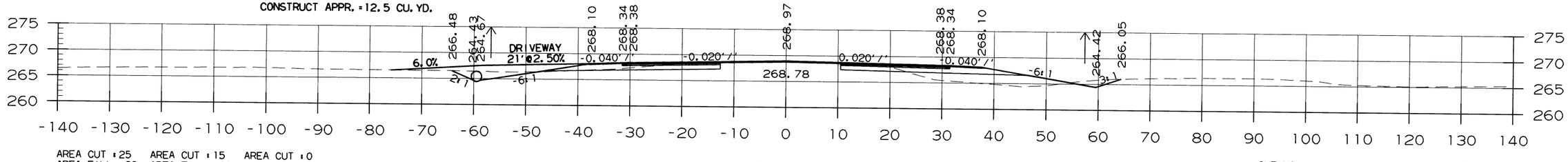
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 282 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STA. 215+30 IN PLACE
24" X 20' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 12.5 CU. YD.

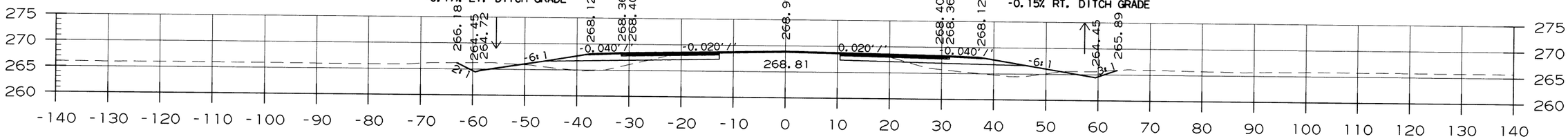



AREA CUT = 25 AREA CUT = 15 AREA CUT = 0
AREA FILL = 29 AREA FILL = 49 AREA FILL = 0

215+30

CUT VOL. = 26 CUT VOL. = 18 CUT VOL. = 0
FILL VOL. = 34 FILL VOL. = 53 FILL VOL. = 0

STA. 215+00.00 END
+0.27% LT. DITCH GRADE
STA. 215+00.00 BEGIN
-0.17% LT. DITCH GRADE



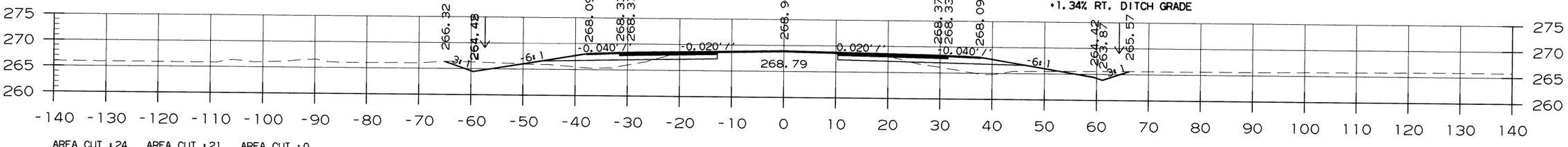

AREA CUT = 22 AREA CUT = 16 AREA CUT = 0
AREA FILL = 33 AREA FILL = 46 AREA FILL = 0

215+00

CUT VOL. = 85 CUT VOL. = 70 CUT VOL. = 0
FILL VOL. = 113 FILL VOL. = 151 FILL VOL. = 0

STA. 214+50.00 END
+1.34% RT. DITCH GRADE
STA. 214+50.00 BEGIN
-0.15% RT. DITCH GRADE

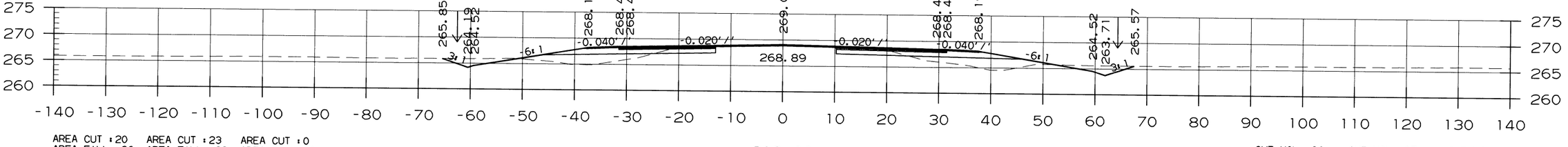
STA. 214+00.00 END
+0.09% RT. DITCH GRADE
STA. 214+00.00 BEGIN
+1.34% RT. DITCH GRADE




AREA CUT = 24 AREA CUT = 21 AREA CUT = 0
AREA FILL = 28 AREA FILL = 35 AREA FILL = 0

214+00

CUT VOL. = 81 CUT VOL. = 83 CUT VOL. = 0
FILL VOL. = 119 FILL VOL. = 138 FILL VOL. = 0




AREA CUT = 20 AREA CUT = 23 AREA CUT = 0
AREA FILL = 36 AREA FILL = 39 AREA FILL = 0

213+00

CUT VOL. = 84 CUT VOL. = 97 CUT VOL. = 0
FILL VOL. = 137 FILL VOL. = 154 FILL VOL. = 0

# CROSS SECTION
# STA. 213+00 TO STA. 215+30

2/3/2017

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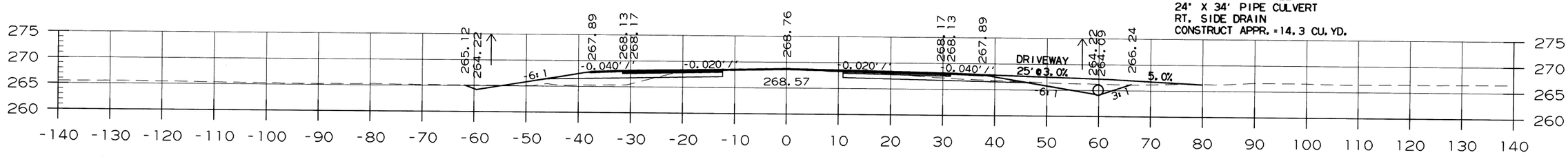
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 283 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

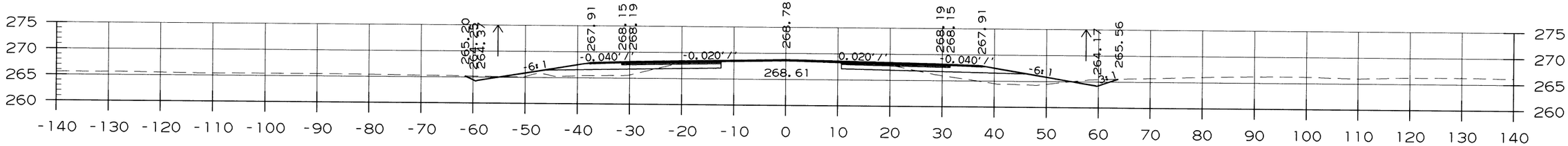
STA. 217+56 IN PLACE
18' X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24' X 34' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =14.3 CU. YD.




AREA CUT : 13 AREA CUT : 32 AREA CUT : 0
AREA FILL : 32 AREA FILL : 1 AREA FILL : 0

217+56

CUT VOL. : 27 CUT VOL. : 49 CUT VOL. : 0
FILL VOL. : 62 FILL VOL. : 47 FILL VOL. : 0

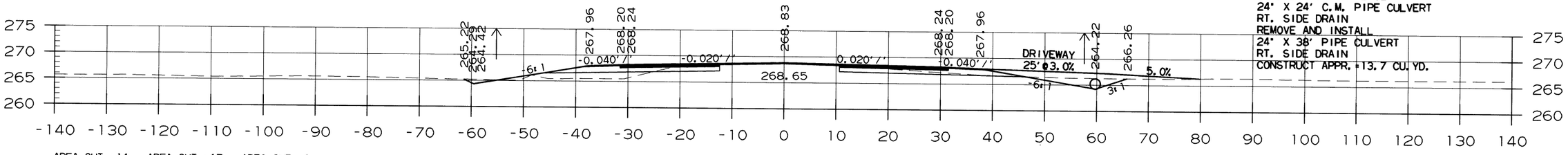



AREA CUT : 13 AREA CUT : 16 AREA CUT : 0
AREA FILL : 29 AREA FILL : 45 AREA FILL : 0

217+00

CUT VOL. : 15 CUT VOL. : 18 CUT VOL. : 0
FILL VOL. : 113 FILL VOL. : 49 FILL VOL. : 0

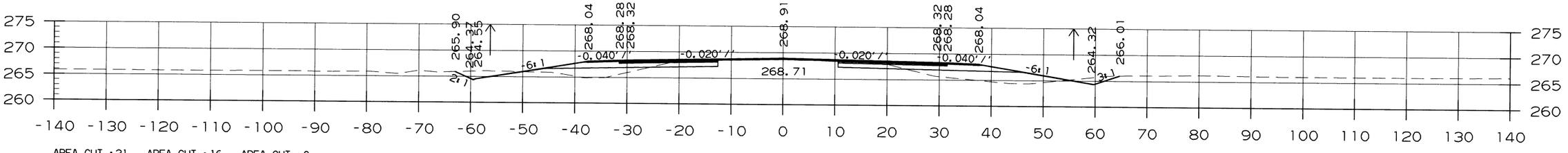
STA. 216+70 IN PLACE
24' X 24' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24' X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =13.7 CU. YD.




AREA CUT : 14 AREA CUT : 17 AREA CUT : 0
AREA FILL : 29 AREA FILL : 43 AREA FILL : 0

216+70

CUT VOL. : 46 CUT VOL. : 43 CUT VOL. : 0
FILL VOL. : 75 FILL VOL. : 118 FILL VOL. : 0




AREA CUT : 21 AREA CUT : 16 AREA CUT : 0
AREA FILL : 29 AREA FILL : 48 AREA FILL : 0

216+00

CUT VOL. : 60 CUT VOL. : 41 CUT VOL. : 0
FILL VOL. : 75 FILL VOL. : 127 FILL VOL. : 0

# CROSS SECTION
# STA. 216+00 TO STA. 217+56

2/3/2011

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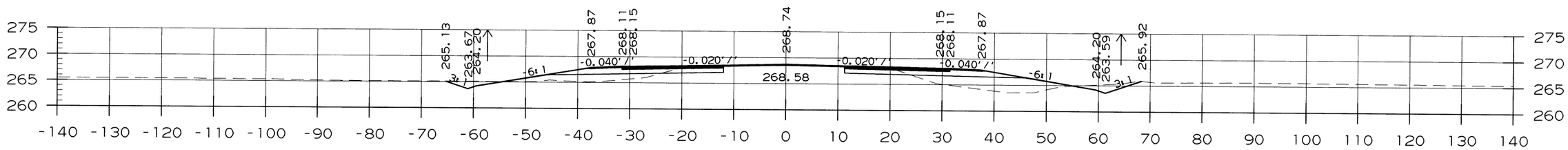
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 284 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

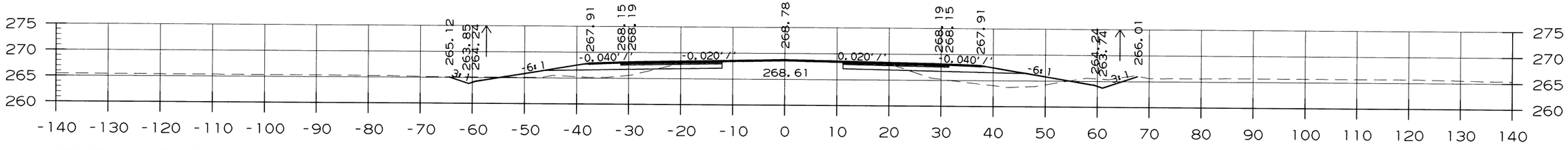
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 17 AREA CUT : 20 AREA CUT : 0
AREA FILL : 33 AREA FILL : 61 AREA FILL : 0

221+00

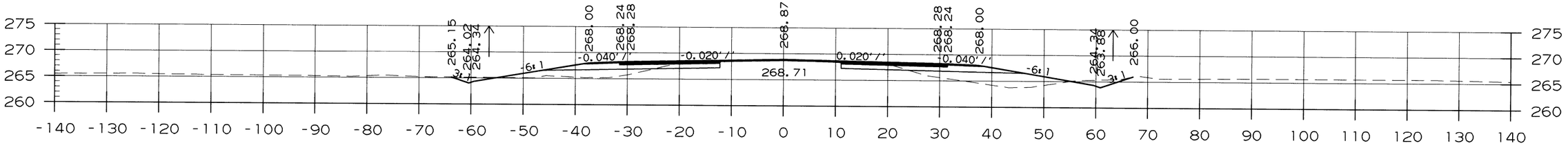
CUT VOL. : 60 CUT VOL. : 78 CUT VOL. : 0
FILL VOL. : 124 FILL VOL. : 220 FILL VOL. : 0




AREA CUT : 16 AREA CUT : 22 AREA CUT : 0
AREA FILL : 33 AREA FILL : 58 AREA FILL : 0

220+00

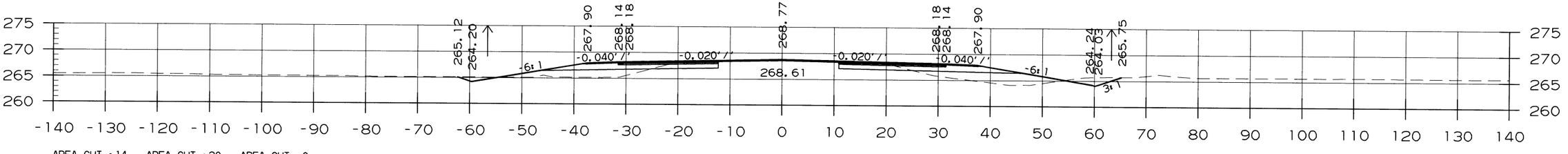
CUT VOL. : 55 CUT VOL. : 72 CUT VOL. : 0
FILL VOL. : 127 FILL VOL. : 212 FILL VOL. : 0




AREA CUT : 14 AREA CUT : 17 AREA CUT : 0
AREA FILL : 35 AREA FILL : 56 AREA FILL : 0

219+00

CUT VOL. : 52 CUT VOL. : 69 CUT VOL. : 0
FILL VOL. : 129 FILL VOL. : 189 FILL VOL. : 0




AREA CUT : 14 AREA CUT : 20 AREA CUT : 0
AREA FILL : 34 AREA FILL : 46 AREA FILL : 0

218+00

CUT VOL. : 23 CUT VOL. : 43 CUT VOL. : 0
FILL VOL. : 55 FILL VOL. : 39 FILL VOL. : 0

# CROSS SECTION
# STA. 218+00 TO STA. 221+00

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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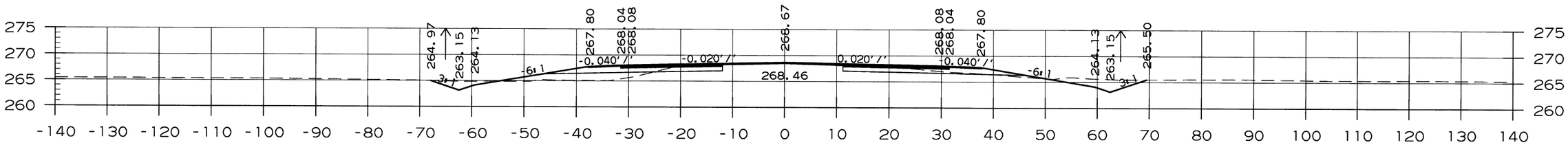
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 285 | 503 |

②

CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

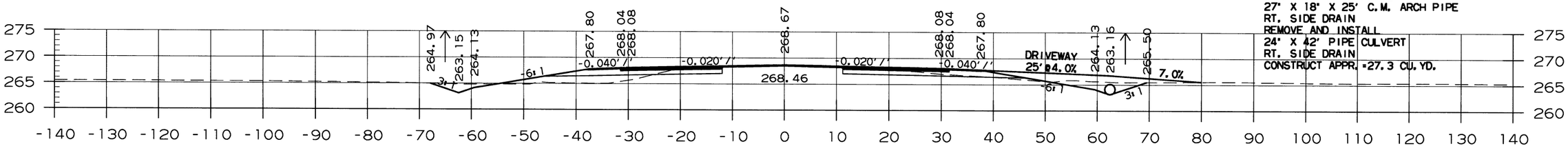
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 20 AREA CUT : 35 AREA CUT : 0
AREA FILL : 34 AREA FILL : 5 AREA FILL : 0

224+00

CUT VOL. : 1 CUT VOL. : 1 CUT VOL. : 0
FILL VOL. : 1 FILL VOL. : 0 FILL VOL. : 0

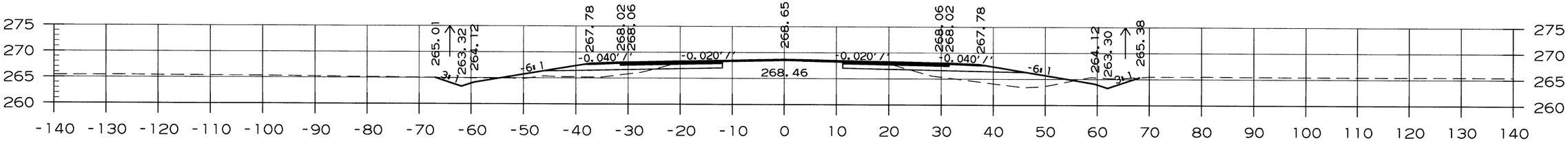



STA. 223+99 IN PLACE
27" X 18" X 25' C.M. ARCH PIPE
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 42" PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =27.3 CU. YD.

AREA CUT : 20 AREA CUT : 35 AREA CUT : 0
AREA FILL : 34 AREA FILL : 5 AREA FILL : 0

223+99

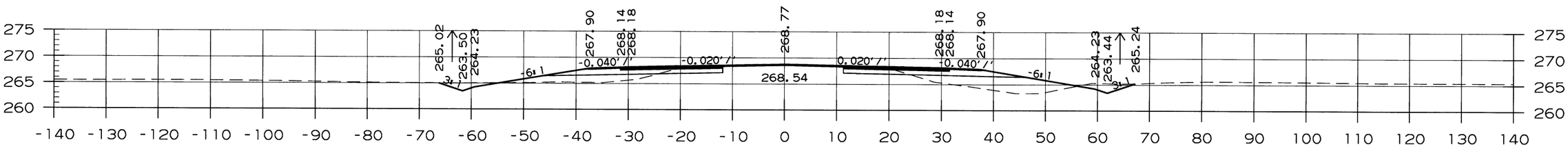
CUT VOL. : 73 CUT VOL. : 102 CUT VOL. : 0
FILL VOL. : 119 FILL VOL. : 117 FILL VOL. : 0




AREA CUT : 20 AREA CUT : 21 AREA CUT : 0
AREA FILL : 31 AREA FILL : 59 AREA FILL : 0

223+00

CUT VOL. : 70 CUT VOL. : 75 CUT VOL. : 0
FILL VOL. : 121 FILL VOL. : 232 FILL VOL. : 0




AREA CUT : 18 AREA CUT : 20 AREA CUT : 0
AREA FILL : 34 AREA FILL : 66 AREA FILL : 0

222+00

CUT VOL. : 64 CUT VOL. : 74 CUT VOL. : 0
FILL VOL. : 125 FILL VOL. : 235 FILL VOL. : 0

# CROSS SECTION
# STA. 222+00 TO STA. 224+00

1/31/2018

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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 |
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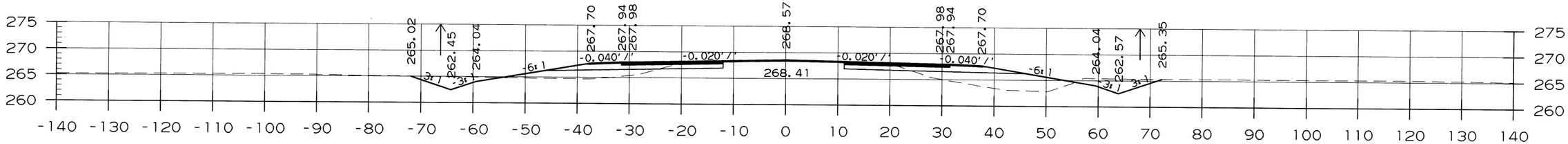
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 286 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

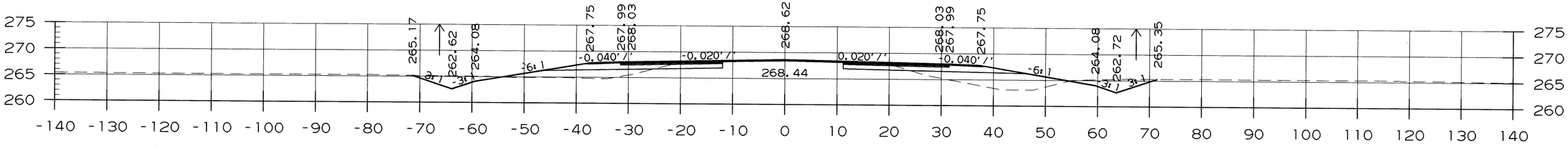
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 29 AREA CUT : 35 AREA CUT : 0
AREA FILL : 39 AREA FILL : 71 AREA FILL : 0

228+00

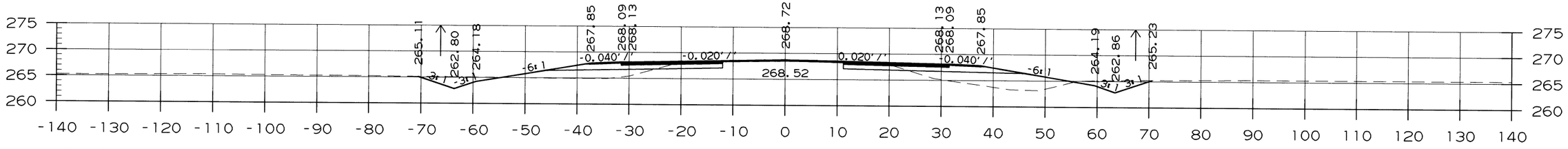
CUT VOL. : 109 CUT VOL. : 122 CUT VOL. : 0
FILL VOL. : 140 FILL VOL. : 251 FILL VOL. : 0




AREA CUT : 30 AREA CUT : 31 AREA CUT : 0
AREA FILL : 37 AREA FILL : 65 AREA FILL : 0

227+00

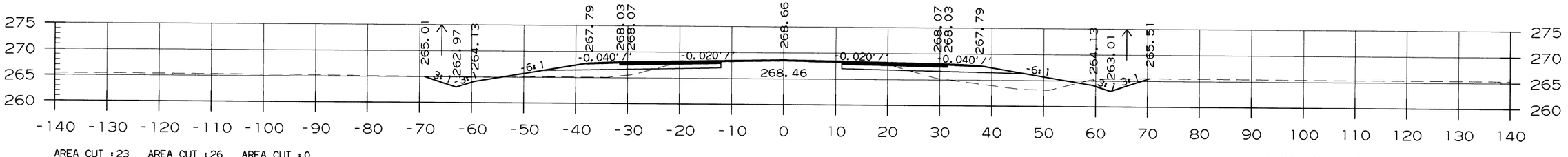
CUT VOL. : 105 CUT VOL. : 106 CUT VOL. : 0
FILL VOL. : 139 FILL VOL. : 247 FILL VOL. : 0




AREA CUT : 27 AREA CUT : 26 AREA CUT : 0
AREA FILL : 38 AREA FILL : 68 AREA FILL : 0

226+00

CUT VOL. : 92 CUT VOL. : 97 CUT VOL. : 0
FILL VOL. : 133 FILL VOL. : 249 FILL VOL. : 0




AREA CUT : 23 AREA CUT : 26 AREA CUT : 0
AREA FILL : 34 AREA FILL : 66 AREA FILL : 0

225+00

CUT VOL. : 80 CUT VOL. : 113 CUT VOL. : 0
FILL VOL. : 126 FILL VOL. : 131 FILL VOL. : 0

# CROSS SECTION
# STA. 225+00 TO STA. 228+00

2/3/2017

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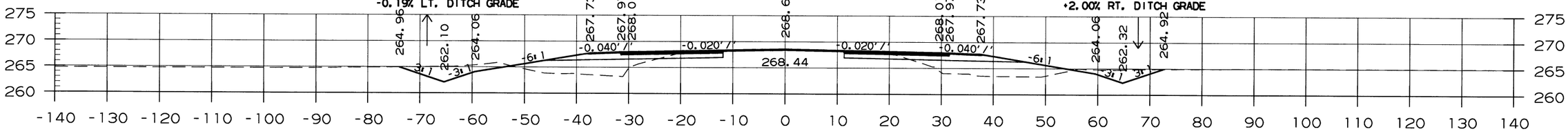
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 287 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STA. 230+00.00 END
-0.17% LT. DITCH GRADE
STA. 230+00.00 BEGIN
-0.19% LT. DITCH GRADE

STA. 230+00.00 END
-0.15% RT. DITCH GRADE
STA. 230+00.00 BEGIN
+2.00% RT. DITCH GRADE

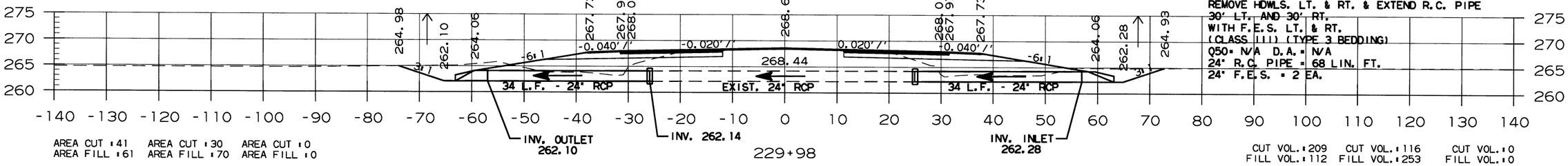



AREA CUT = 41 AREA CUT = 30 AREA CUT = 0
AREA FILL = 61 AREA FILL = 70 AREA FILL = 0

230+00

CUT VOL. = 3 CUT VOL. = 2 CUT VOL. = 0
FILL VOL. = 5 FILL VOL. = 5 FILL VOL. = 0

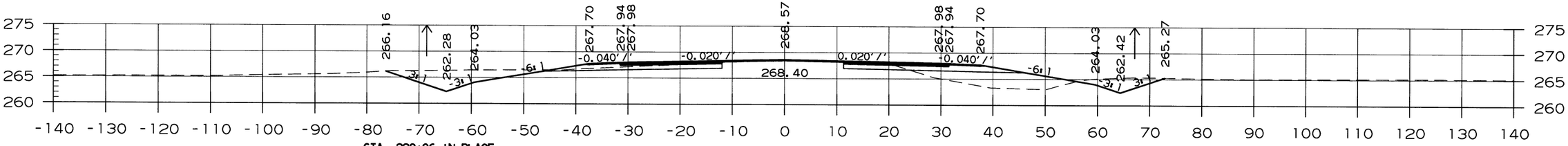
STA. 229+98 IN PLACE
24" X 59' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. & EXTEND R.C. PIPE
30' LT. AND 30' RT.
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
Q50 = N/A D.A. = N/A
24" R.C. PIPE = 68 LIN. FT.
24" F.E.S. = 2 EA.




AREA CUT = 41 AREA CUT = 30 AREA CUT = 0
AREA FILL = 61 AREA FILL = 70 AREA FILL = 0

229+98

CUT VOL. = 209 CUT VOL. = 116 CUT VOL. = 0
FILL VOL. = 112 FILL VOL. = 253 FILL VOL. = 0

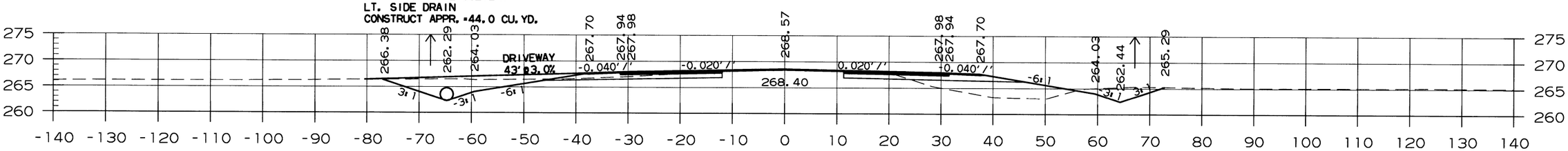



AREA CUT = 74 AREA CUT = 34 AREA CUT = 0
AREA FILL = 1 AREA FILL = 70 AREA FILL = 0

STA. 228+96 IN PLACE
27" X 18" X 20' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 44.0 CU. YD.

229+00

CUT VOL. = 14 CUT VOL. = 10 CUT VOL. = 0
FILL VOL. = 6 FILL VOL. = 21 FILL VOL. = 0




AREA CUT = 24 AREA CUT = 34 AREA CUT = 0
AREA FILL = 40 AREA FILL = 71 AREA FILL = 0

228+92

CUT VOL. = 90 CUT VOL. = 118 CUT VOL. = 0
FILL VOL. = 134 FILL VOL. = 242 FILL VOL. = 0

CROSS SECTION
STA. 228+92 TO STA. 230+00

1/31/2018

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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 |
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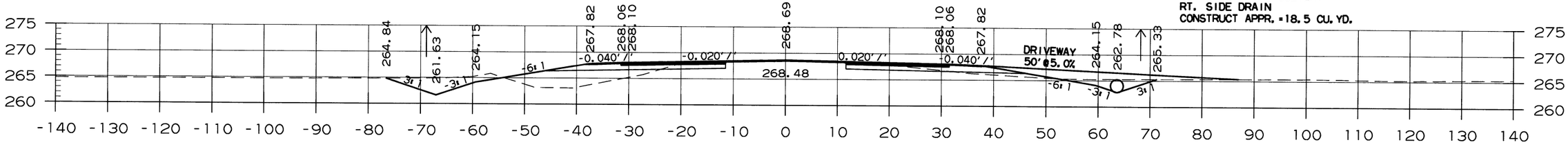
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 288 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

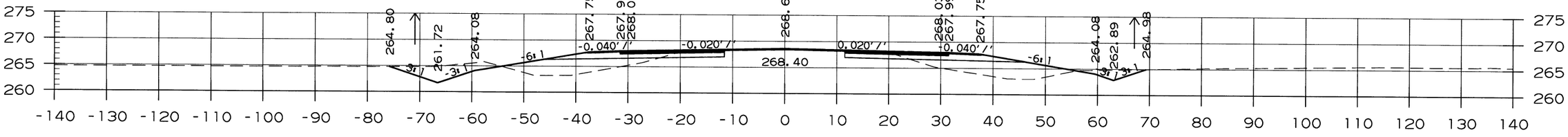
STA. 232+45 IN PLACE
18" X 25' R.C PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =18.5 CU. YD.




AREA CUT =47 AREA CUT =33 AREA CUT =0
AREA FILL =68 AREA FILL =10 AREA FILL =0

232+45

CUT VOL.=77 CUT VOL.=46 CUT VOL.=0
FILL VOL.=109 FILL VOL.=68 FILL VOL.=0

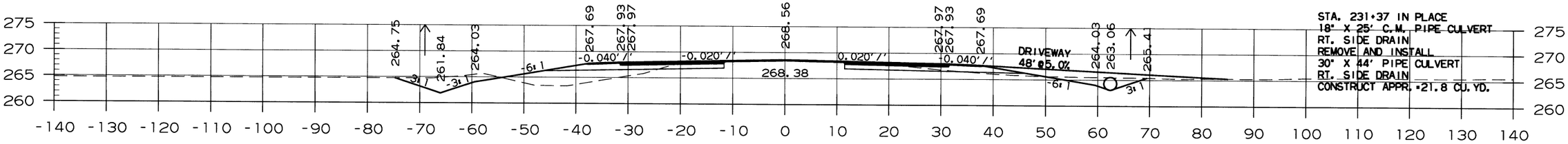



AREA CUT =46 AREA CUT =22 AREA CUT =0
AREA FILL =63 AREA FILL =71 AREA FILL =0

232+00

CUT VOL.=107 CUT VOL.=53 CUT VOL.=0
FILL VOL.=148 FILL VOL.=164 FILL VOL.=0

STA. 231+37 IN PLACE
18" X 25' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =21.8 CU. YD.

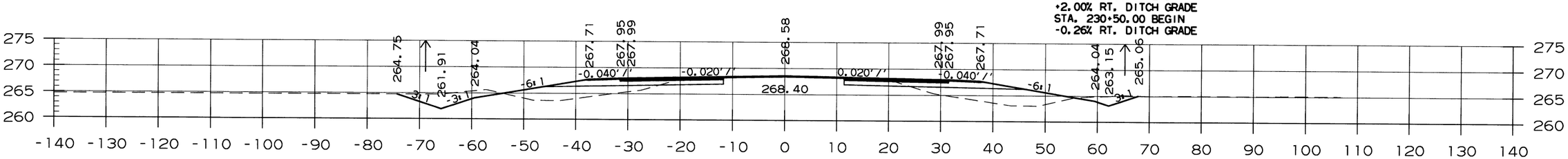



AREA CUT =43 AREA CUT =23 AREA CUT =0
AREA FILL =60 AREA FILL =65 AREA FILL =0

231+35

CUT VOL.=54 CUT VOL.=28 CUT VOL.=0
FILL VOL.=73 FILL VOL.=87 FILL VOL.=0

STA. 230+50.00 END
+2.00% RT. DITCH GRADE
STA. 230+50.00 BEGIN
-0.26% RT. DITCH GRADE




AREA CUT =41 AREA CUT =21 AREA CUT =0
AREA FILL =53 AREA FILL =69 AREA FILL =0

231+00

CUT VOL.=151 CUT VOL.=94 CUT VOL.=0
FILL VOL.=212 FILL VOL.=256 FILL VOL.=0

# CROSS SECTION
# STA. 231+00 TO STA. 232+45

1/31/2018

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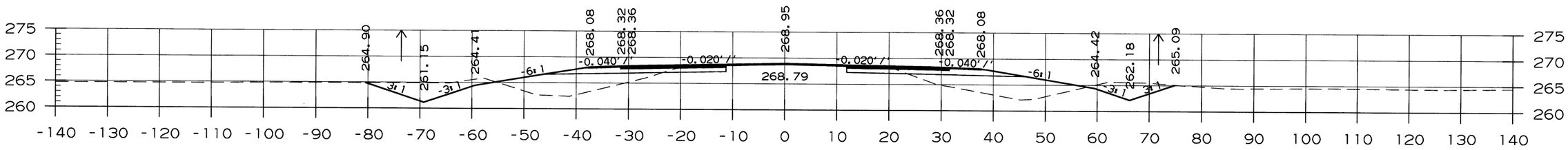
| | | | | JOB NO. | | CA1003 | 289 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

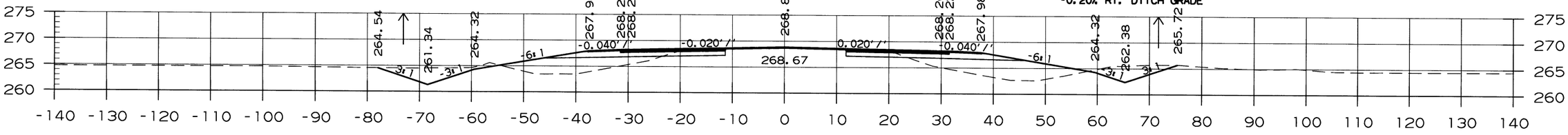



AREA CUT = 57 AREA CUT = 40 AREA CUT = 0
AREA FILL = 85 AREA FILL = 93 AREA FILL = 0

235+00

CUT VOL. = 185 CUT VOL. = 144 CUT VOL. = 0
FILL VOL. = 280 FILL VOL. = 331 FILL VOL. = 0

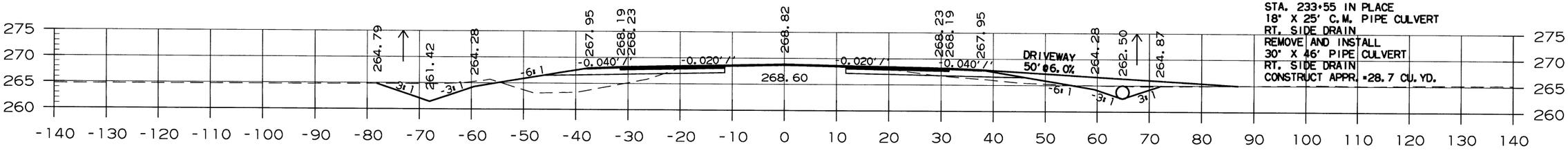
STA. 234+00.00 END
-0.26% RT. DITCH GRADE
STA. 234+00.00 BEGIN
-0.20% RT. DITCH GRADE




AREA CUT = 43 AREA CUT = 38 AREA CUT = 0
AREA FILL = 66 AREA FILL = 86 AREA FILL = 0

234+00

CUT VOL. = 77 CUT VOL. = 57 CUT VOL. = 0
FILL VOL. = 115 FILL VOL. = 85 FILL VOL. = 0

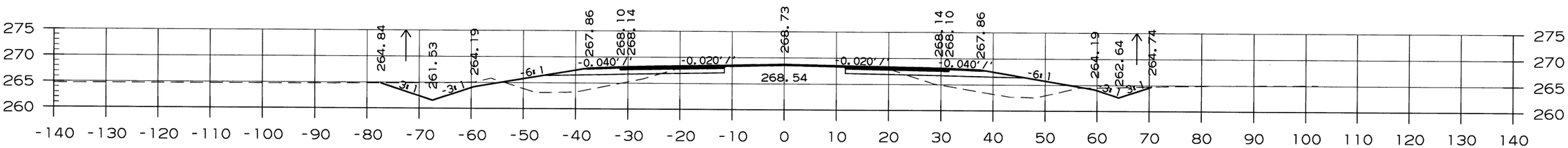



STA. 233+55 IN PLACE
18" X 25' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 28.7 CU. YD.

AREA CUT = 50 AREA CUT = 30 AREA CUT = 0
AREA FILL = 72 AREA FILL = 16 AREA FILL = 0

233+55

CUT VOL. = 100 CUT VOL. = 52 CUT VOL. = 0
FILL VOL. = 142 FILL VOL. = 102 FILL VOL. = 0




AREA CUT = 48 AREA CUT = 21 AREA CUT = 0
AREA FILL = 67 AREA FILL = 84 AREA FILL = 0

233+00

CUT VOL. = 97 CUT VOL. = 55 CUT VOL. = 0
FILL VOL. = 137 FILL VOL. = 96 FILL VOL. = 0

# CROSS SECTION
# STA. 233+00 TO STA. 235+00

1/31/2018

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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 |
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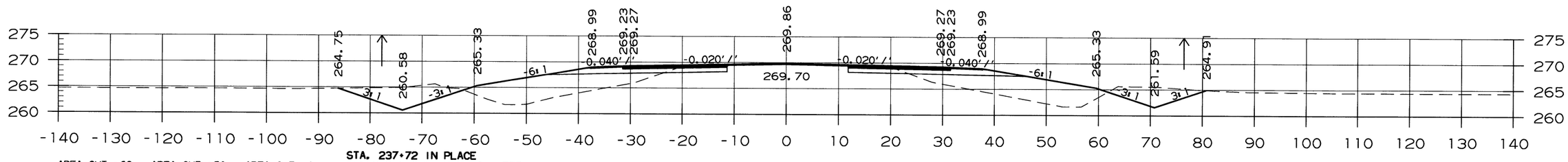
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 290 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

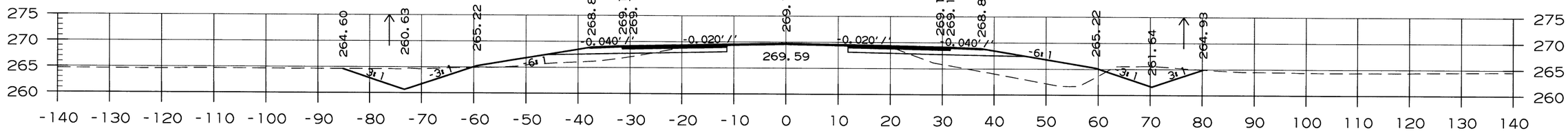



AREA CUT : 68 AREA CUT : 51 AREA CUT : 0
AREA FILL : 123 AREA FILL : 122 AREA FILL : 0

**STA. 237+72 IN PLACE**
**30" X 24' C.M. PIPE CULVERT**
**LT. SIDE DRAIN**
**REMOVE**

238+00

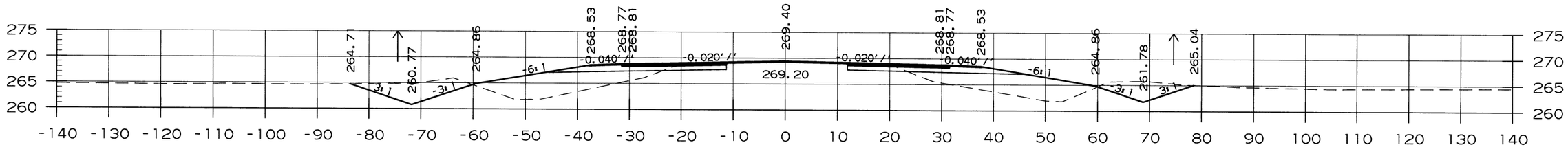
CUT VOL. : 65 CUT VOL. : 52 CUT VOL. : 0
FILL VOL. : 131 FILL VOL. : 125 FILL VOL. : 0




AREA CUT : 58 AREA CUT : 50 AREA CUT : 0
AREA FILL : 130 AREA FILL : 119 AREA FILL : 0

237+72

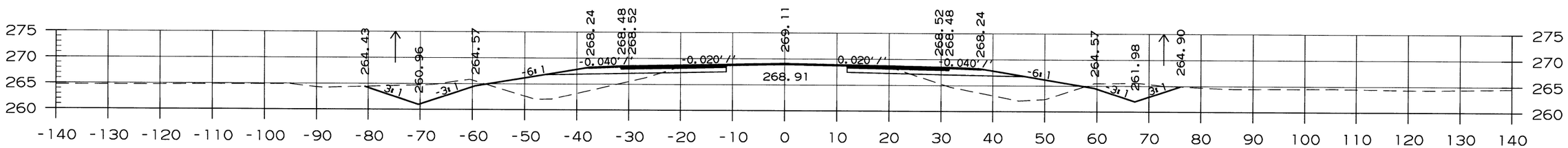
CUT VOL. : 164 CUT VOL. : 132 CUT VOL. : 0
FILL VOL. : 322 FILL VOL. : 304 FILL VOL. : 0




AREA CUT : 65 AREA CUT : 49 AREA CUT : 0
AREA FILL : 112 AREA FILL : 110 AREA FILL : 0

237+00

CUT VOL. : 227 CUT VOL. : 5171 CUT VOL. : 0
FILL VOL. : 377 FILL VOL. : 382 FILL VOL. : 0




AREA CUT : 58 AREA CUT : 43 AREA CUT : 0
AREA FILL : 92 AREA FILL : 96 AREA FILL : 0

236+00

CUT VOL. : 211 CUT VOL. : 154 CUT VOL. : 0
FILL VOL. : 328 FILL VOL. : 351 FILL VOL. : 0

# CROSS SECTION
# STA. 236+00 TO STA. 238+00

1/31/2018

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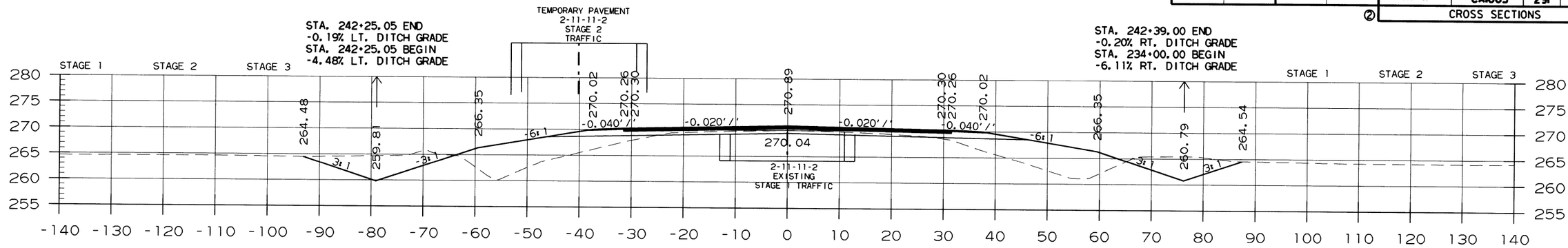
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 291 | 503 |

②

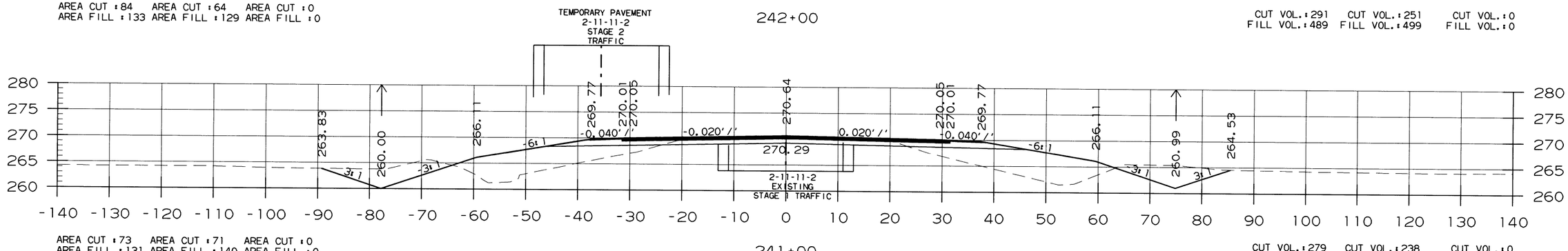
CROSS SECTIONS




AREA CUT : 84 AREA CUT : 64 AREA CUT : 0
AREA FILL : 133 AREA FILL : 129 AREA FILL : 0

242+00

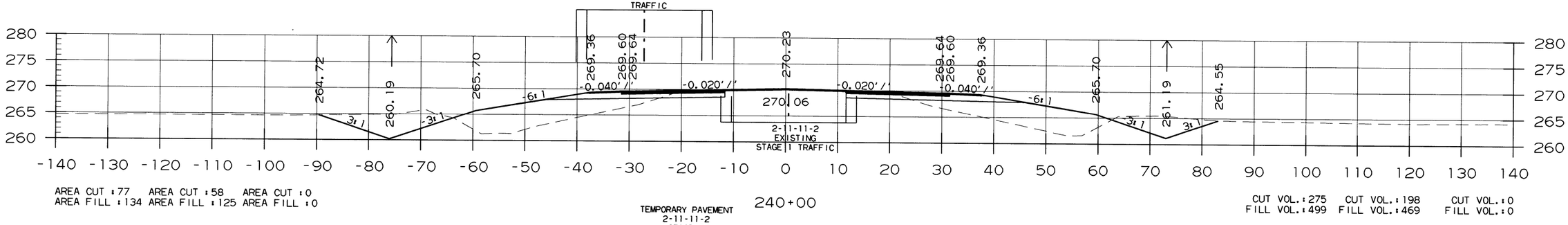
CUT VOL. : 291 CUT VOL. : 251 CUT VOL. : 0
FILL VOL. : 489 FILL VOL. : 499 FILL VOL. : 0




AREA CUT : 73 AREA CUT : 71 AREA CUT : 0
AREA FILL : 131 AREA FILL : 140 AREA FILL : 0

241+00

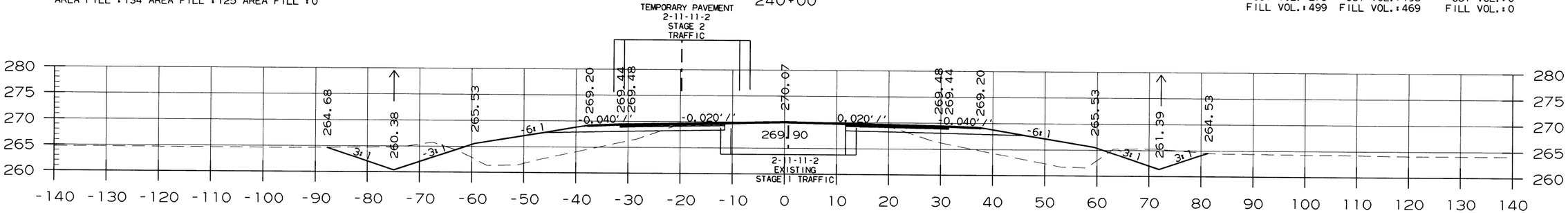
CUT VOL. : 279 CUT VOL. : 238 CUT VOL. : 0
FILL VOL. : 491 FILL VOL. : 491 FILL VOL. : 0




AREA CUT : 77 AREA CUT : 58 AREA CUT : 0
AREA FILL : 134 AREA FILL : 125 AREA FILL : 0

240+00

CUT VOL. : 275 CUT VOL. : 198 CUT VOL. : 0
FILL VOL. : 499 FILL VOL. : 469 FILL VOL. : 0




AREA CUT : 71 AREA CUT : 49 AREA CUT : 0
AREA FILL : 135 AREA FILL : 128 AREA FILL : 0

239+00

CUT VOL. : 257 CUT VOL. : 185 CUT VOL. : 0
FILL VOL. : 479 FILL VOL. : 464 FILL VOL. : 0

# CROSS SECTION
# STA. 239+00 TO STA. 242+00

2/3/2017

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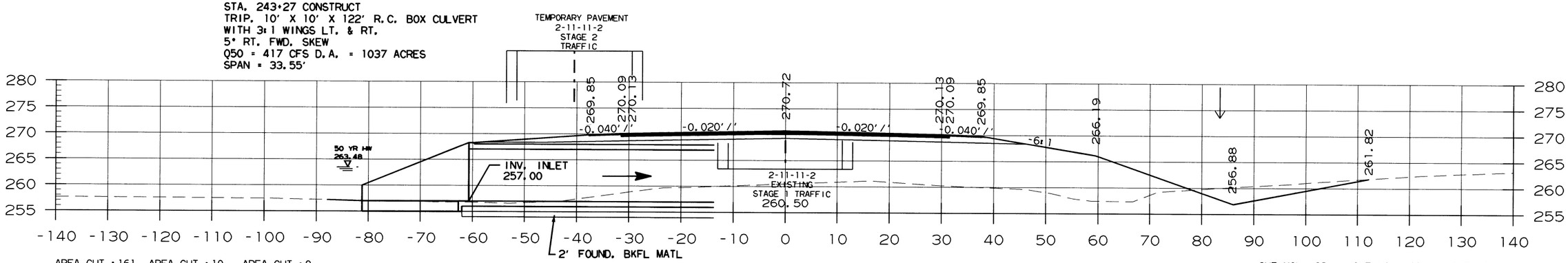
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 292 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

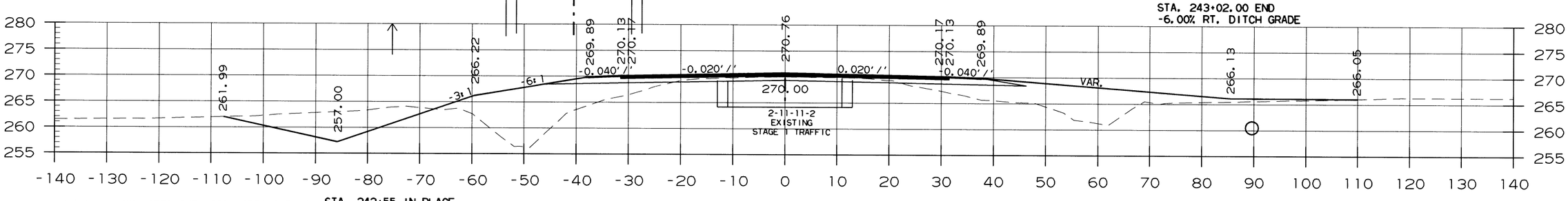
STA. 243+27 CONSTRUCT
TRIP. 10' X 10' X 122' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
5° RT. FWD. SKEW
Q50 = 417 CFS D.A. = 1037 ACRES
SPAN = 33.55'




AREA CUT : 161 AREA CUT : 10 AREA CUT : 0
AREA FILL : 211 AREA FILL : 271 AREA FILL : 0

243+17

CUT VOL. : 92 CUT VOL. : 41 CUT VOL. : 0
FILL VOL. : 145 FILL VOL. : 126 FILL VOL. : 0

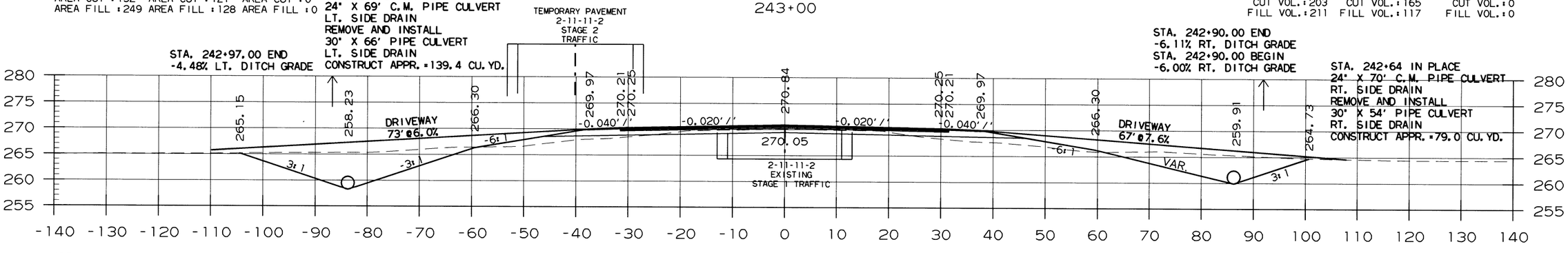



AREA CUT : 132 AREA CUT : 121 AREA CUT : 0
AREA FILL : 249 AREA FILL : 128 AREA FILL : 0

STA. 242+55 IN PLACE
24" X 69' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 66' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 139.4 CU. YD.

243+00

CUT VOL. : 203 CUT VOL. : 165 CUT VOL. : 0
FILL VOL. : 211 FILL VOL. : 117 FILL VOL. : 0




AREA CUT : 136 AREA CUT : 96 AREA CUT : 0
AREA FILL : 29 AREA FILL : 26 AREA FILL : 0

242+59

CUT VOL. : 239 CUT VOL. : 176 CUT VOL. : 0
FILL VOL. : 177 FILL VOL. : 170 FILL VOL. : 0

# CROSS SECTION
# STA. 242+59 TO STA. 243+17

2/3/2017

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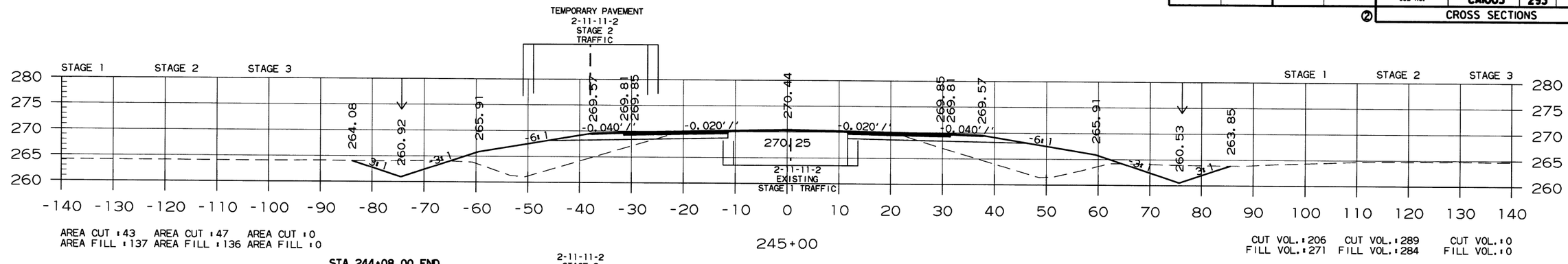
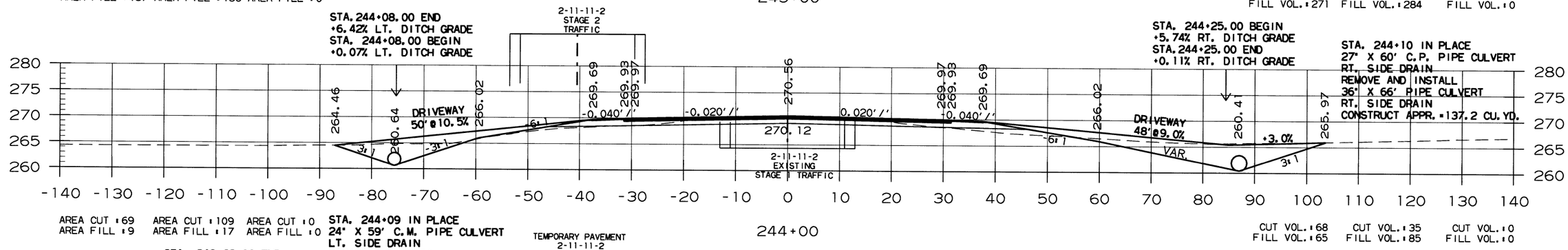
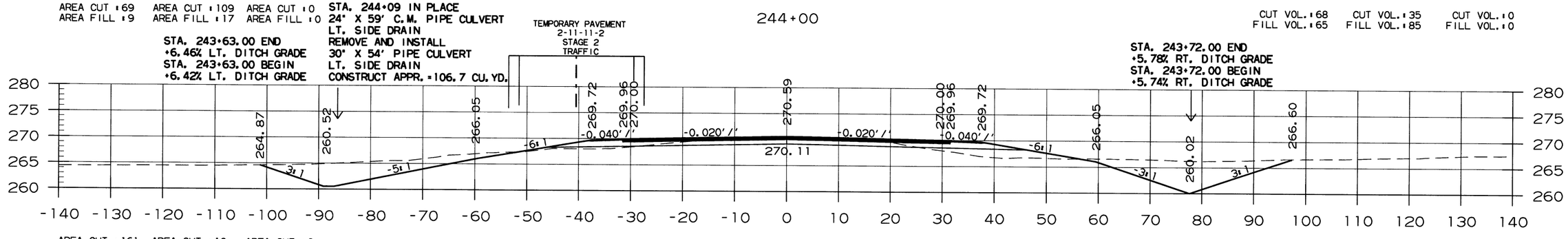
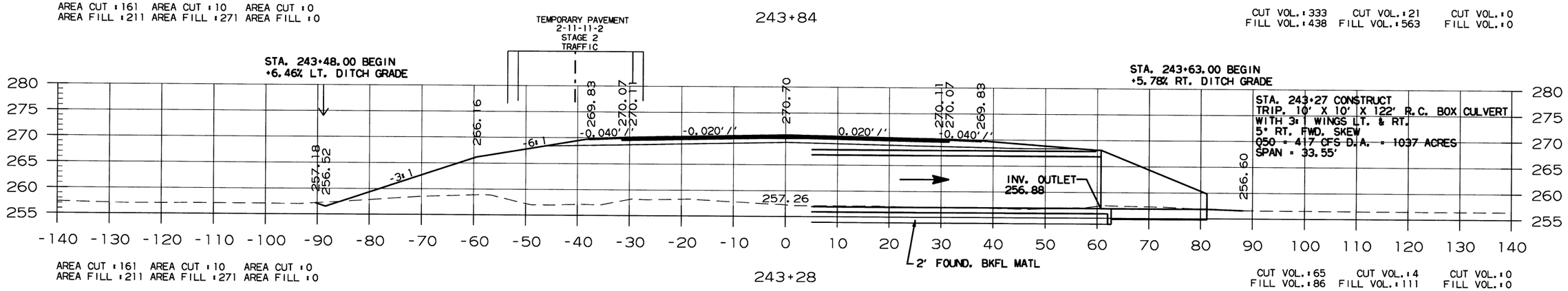
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 293 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 243+28 TO STA. 245+00

1/31/2018

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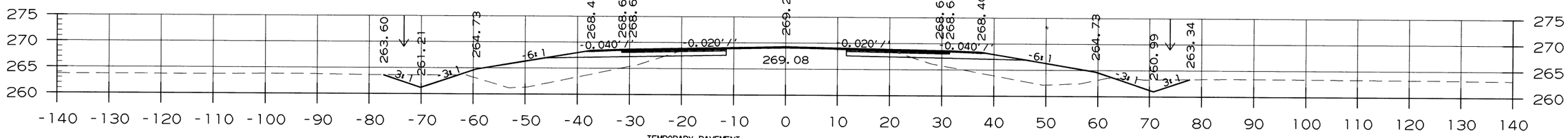
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 294 | 503 |

② CROSS SECTIONS

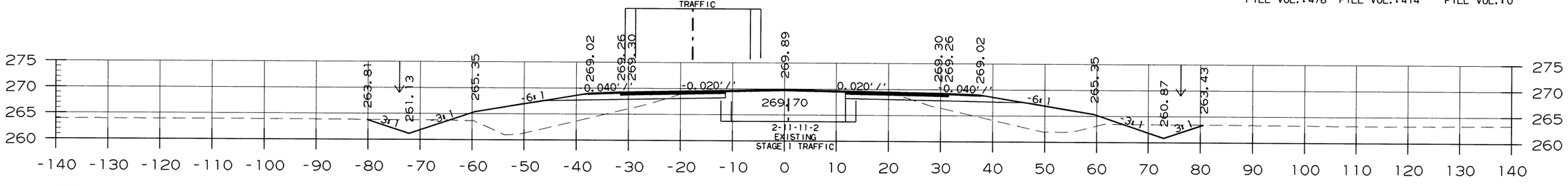
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 27 AREA CUT : 26 AREA CUT : 0
AREA FILL : 122 AREA FILL : 103 AREA FILL : 0

249+00

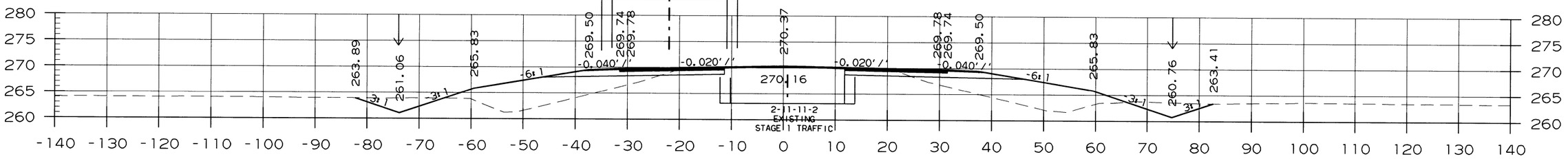
CUT VOL. : 106 CUT VOL. : 105 CUT VOL. : 0
FILL VOL. : 478 FILL VOL. : 414 FILL VOL. : 0




AREA CUT : 30 AREA CUT : 31 AREA CUT : 0
AREA FILL : 136 AREA FILL : 121 AREA FILL : 0

248+00

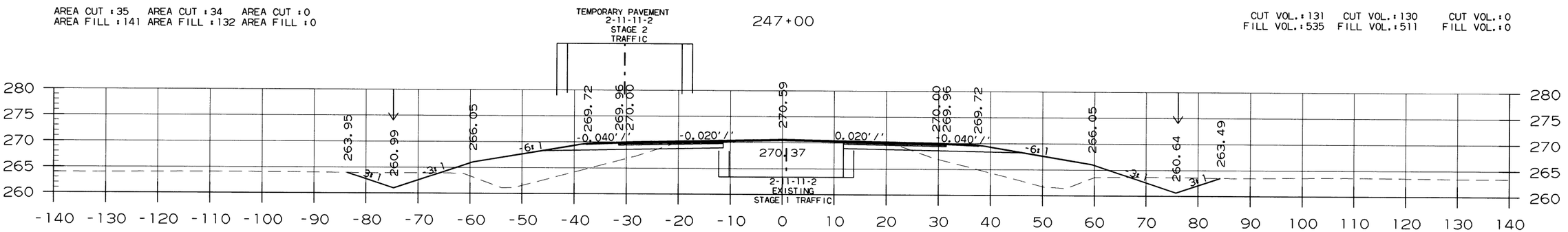
CUT VOL. : 120 CUT VOL. : 120 CUT VOL. : 0
FILL VOL. : 513 FILL VOL. : 469 FILL VOL. : 0




AREA CUT : 35 AREA CUT : 34 AREA CUT : 0
AREA FILL : 141 AREA FILL : 132 AREA FILL : 0

247+00

CUT VOL. : 131 CUT VOL. : 130 CUT VOL. : 0
FILL VOL. : 535 FILL VOL. : 511 FILL VOL. : 0




AREA CUT : 36 AREA CUT : 36 AREA CUT : 0
AREA FILL : 149 AREA FILL : 144 AREA FILL : 0

246+00

CUT VOL. : 146 CUT VOL. : 154 CUT VOL. : 0
FILL VOL. : 529 FILL VOL. : 519 FILL VOL. : 0

# CROSS SECTION
# STA. 246+00 TO STA. 249+00

2/3/2017

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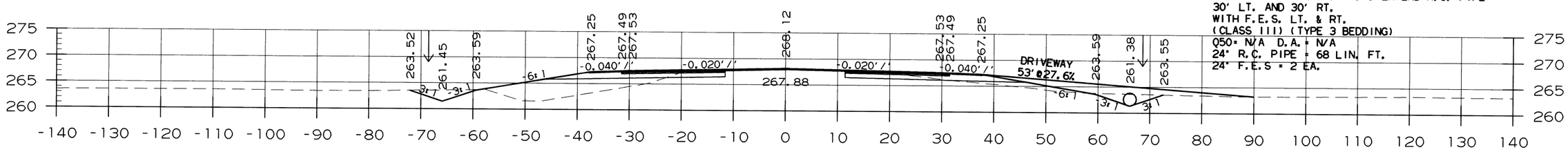
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 295 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

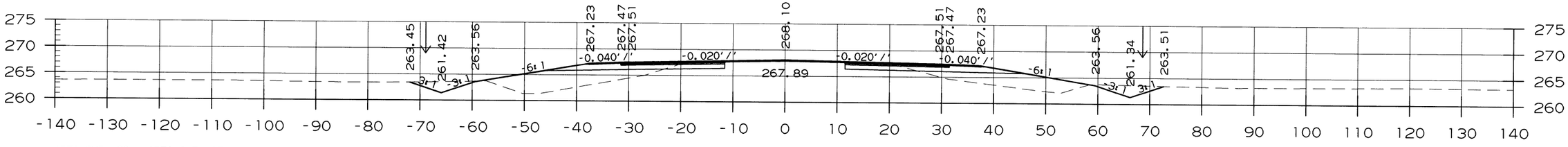
STA. 252+97 IN PLACE
24" X 59' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. & EXTEND R.C. PIPE
30' LT. AND 30' RT.
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
Q50= N/A D.A.= N/A
24" R.C. PIPE = 68 LIN. FT.
24" F.E.S = 2 EA.




AREA CUT = 23 AREA CUT = 31 AREA CUT = 0
AREA FILL = 86 AREA FILL = 57 AREA FILL = 0

252+36

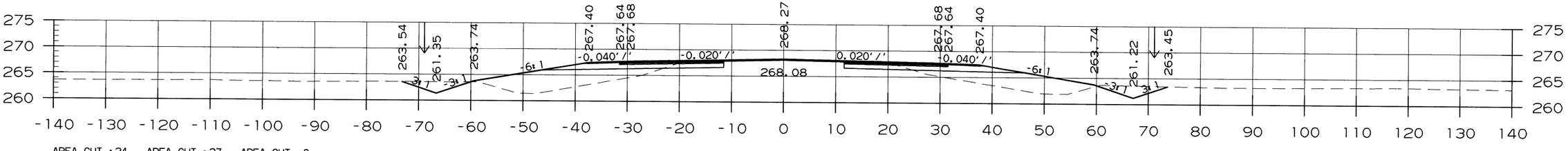
CUT VOL. = 31 CUT VOL. = 38 CUT VOL. = 0
FILL VOL. = 116 FILL VOL. = 82 FILL VOL. = 0




AREA CUT = 23 AREA CUT = 27 AREA CUT = 0
AREA FILL = 88 AREA FILL = 67 AREA FILL = 0

252+00

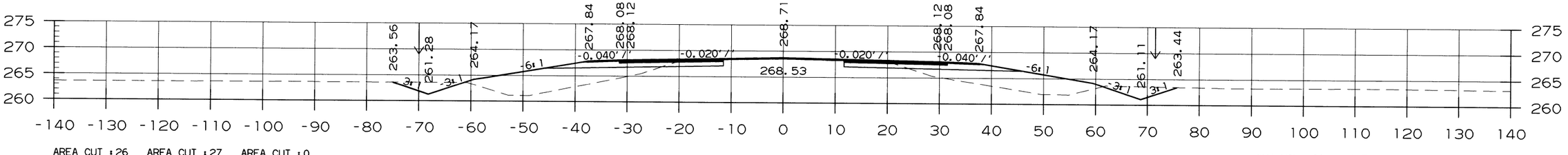
CUT VOL. = 88 CUT VOL. = 99 CUT VOL. = 0
FILL VOL. = 342 FILL VOL. = 271 FILL VOL. = 0




AREA CUT = 24 AREA CUT = 27 AREA CUT = 0
AREA FILL = 96 AREA FILL = 80 AREA FILL = 0

251+00

CUT VOL. = 93 CUT VOL. = 100 CUT VOL. = 0
FILL VOL. = 385 FILL VOL. = 326 FILL VOL. = 0




AREA CUT = 26 AREA CUT = 27 AREA CUT = 0
AREA FILL = 112 AREA FILL = 96 AREA FILL = 0

250+00

CUT VOL. = 99 CUT VOL. = 99 CUT VOL. = 0
FILL VOL. = 432 FILL VOL. = 368 FILL VOL. = 0

# CROSS SECTION
# STA. 250+00 TO STA. 252+36

2/3/2017

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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 |
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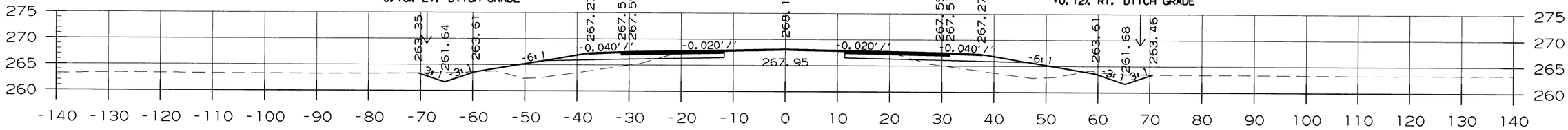
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 296 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

STA. 255+69.58 END
+0.07% LT. DITCH GRADE
STA. 255+69.58 BEGIN
+0.16% LT. DITCH GRADE

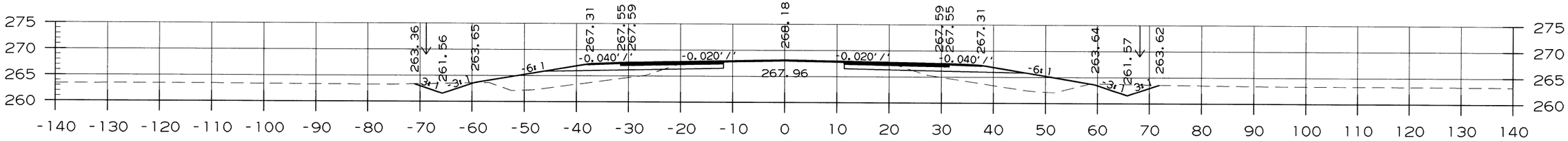
STA. 255+70.00 END
+0.11% RT. DITCH GRADE
STA. 255+70.00 BEGIN
+0.12% RT. DITCH GRADE




AREA CUT : 20 AREA CUT : 22 AREA CUT : 0
AREA FILL : 64 AREA FILL : 59 AREA FILL : 0

255+00

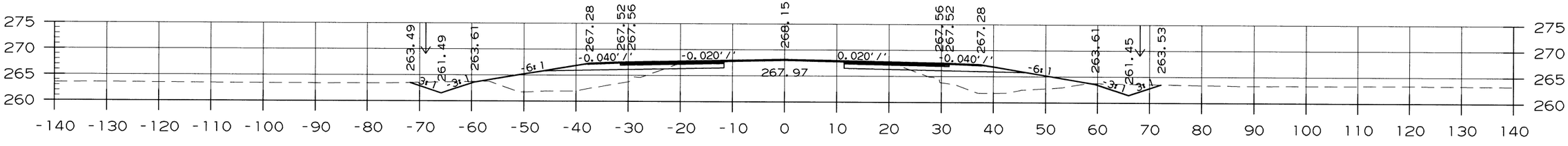
CUT VOL. : 75 CUT VOL. : 87 CUT VOL. : 0
FILL VOL. : 260 FILL VOL. : 244 FILL VOL. : 0




AREA CUT : 20 AREA CUT : 25 AREA CUT : 0
AREA FILL : 76 AREA FILL : 73 AREA FILL : 0

254+00

CUT VOL. : 80 CUT VOL. : 92 CUT VOL. : 0
FILL VOL. : 318 FILL VOL. : 301 FILL VOL. : 0

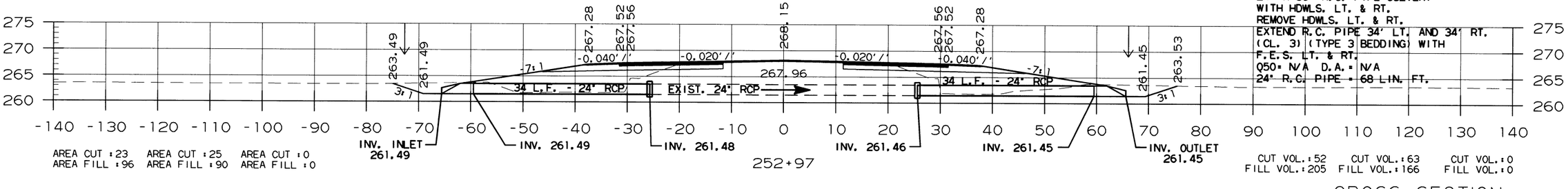



AREA CUT : 23 AREA CUT : 25 AREA CUT : 52
AREA FILL : 96 AREA FILL : 90 AREA FILL : 178

253+00

CUT VOL. : 3 CUT VOL. : 3 CUT VOL. : 0
FILL VOL. : 11 FILL VOL. : 10 FILL VOL. : 0

STA. 252+97 IN PLACE
24" X 59' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT.
EXTEND R.C. PIPE 34' LT. AND 34' RT.
(CL. 3) (TYPE 3 BEDDING) WITH
F.E.S. LT. & RT.
Q50= N/A D.A. = N/A
24" R.C. PIPE = 68 LIN. FT.




AREA CUT : 23 AREA CUT : 25 AREA CUT : 0
AREA FILL : 96 AREA FILL : 90 AREA FILL : 0

252+97

CUT VOL. : 52 CUT VOL. : 63 CUT VOL. : 0
FILL VOL. : 205 FILL VOL. : 166 FILL VOL. : 0

# CROSS SECTION
# STA. 252+97 TO STA. 255+00

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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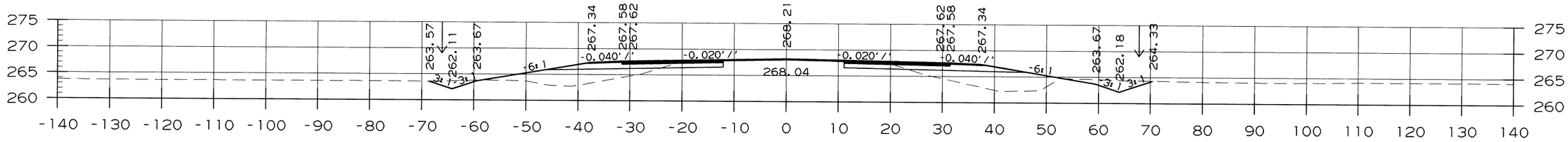
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 297 | 503 |

CROSS SECTIONS

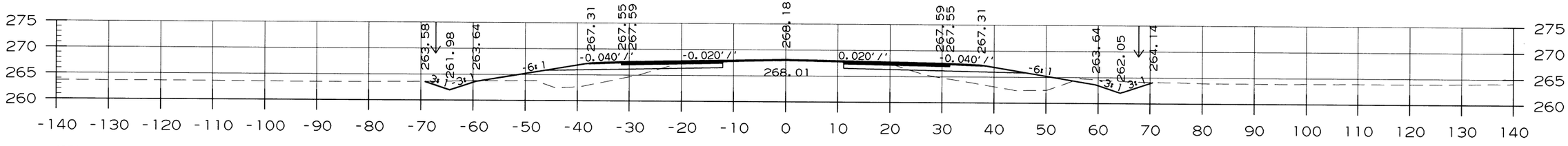
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 17 AREA CUT : 26 AREA CUT : 0
AREA FILL : 65 AREA FILL : 73 AREA FILL : 0

259+00

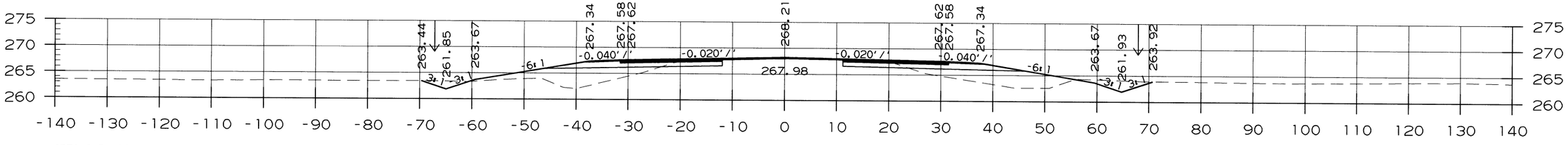
CUT VOL. : 63 CUT VOL. : 99 CUT VOL. : 0
FILL VOL. : 244 FILL VOL. : 263 FILL VOL. : 0




AREA CUT : 17 AREA CUT : 27 AREA CUT : 0
AREA FILL : 67 AREA FILL : 69 AREA FILL : 0

258+00

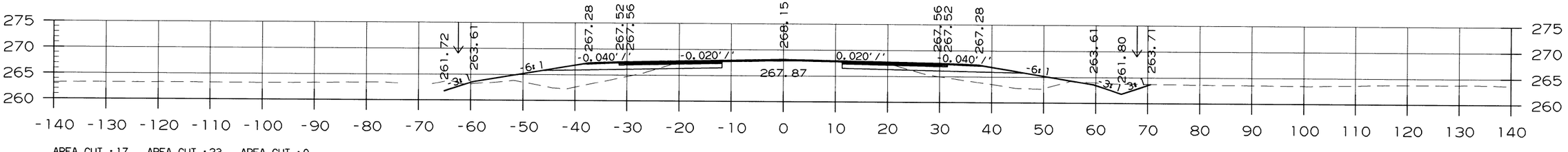
CUT VOL. : 61 CUT VOL. : 97 CUT VOL. : 0
FILL VOL. : 259 FILL VOL. : 255 FILL VOL. : 0




AREA CUT : 16 AREA CUT : 25 AREA CUT : 0
AREA FILL : 73 AREA FILL : 69 AREA FILL : 0

257+00

CUT VOL. : 61 CUT VOL. : 89 CUT VOL. : 0
FILL VOL. : 268 FILL VOL. : 239 FILL VOL. : 0




AREA CUT : 17 AREA CUT : 23 AREA CUT : 0
AREA FILL : 72 AREA FILL : 60 AREA FILL : 0

256+00

CUT VOL. : 69 CUT VOL. : 84 CUT VOL. : 0
FILL VOL. : 252 FILL VOL. : 221 FILL VOL. : 0

CROSS SECTION
STA. 256+00 TO STA. 259+00

2/3/2017

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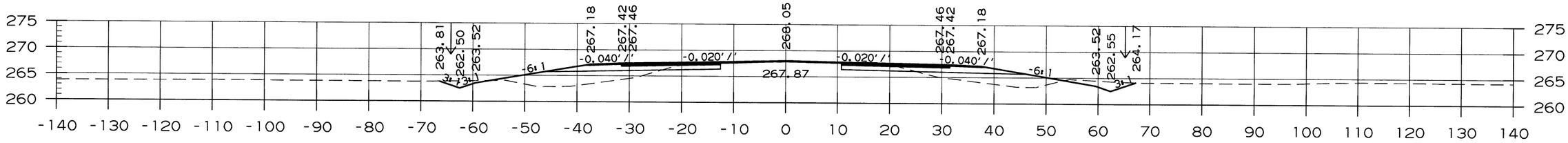
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 298 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

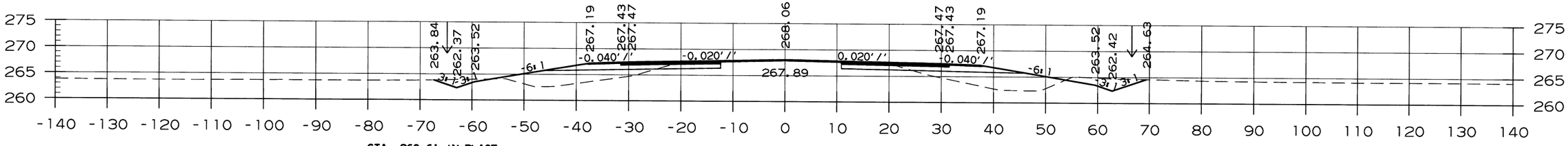
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 14 AREA CUT : 23 AREA CUT : 23
AREA FILL : 63 AREA FILL : 48 AREA FILL : 48

262+00

CUT VOL. : 56 CUT VOL. : 99 CUT VOL. : 0
FILL VOL. : 228 FILL VOL. : 212 FILL VOL. : 0

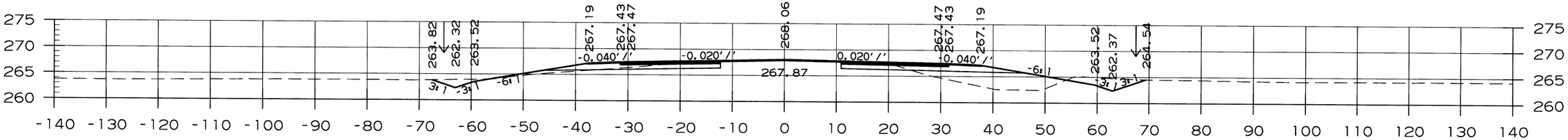



AREA CUT : 17 AREA CUT : 30 AREA CUT : 0
AREA FILL : 60 AREA FILL : 66 AREA FILL : 0

**STA. 260+61 IN PLACE**
**18" X 24' R.C. PIPE CULVERT**
**LT. SIDE DRAIN**
**REMOVE**

261+00

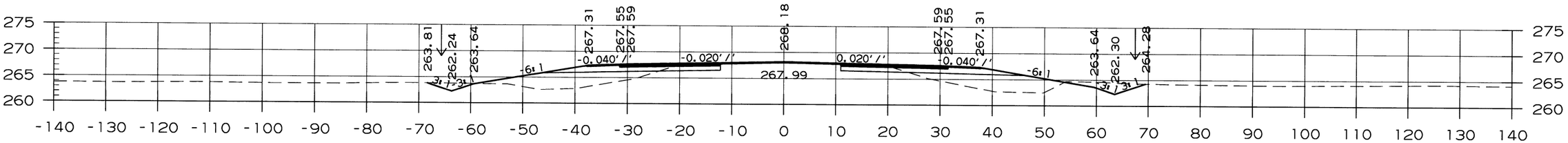
CUT VOL. : 28 CUT VOL. : 43 CUT VOL. : 0
FILL VOL. : 54 FILL VOL. : 96 FILL VOL. : 0




AREA CUT : 21 AREA CUT : 30 AREA CUT : 0
AREA FILL : 14 AREA FILL : 67 AREA FILL : 87

260+61

CUT VOL. : 42 CUT VOL. : 64 CUT VOL. : 0
FILL VOL. : 96 FILL VOL. : 154 FILL VOL. : 0




AREA CUT : 16 AREA CUT : 26 AREA CUT : 0
AREA FILL : 71 AREA FILL : 69 AREA FILL : 0

260+00

CUT VOL. : 61 CUT VOL. : 97 CUT VOL. : 0
FILL VOL. : 251 FILL VOL. : 264 FILL VOL. : 0

CROSS SECTION
STA. 260+00 TO STA. 262+00

1/31/2018

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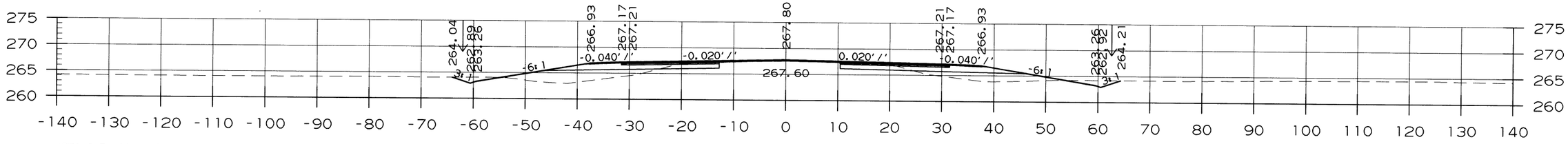
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 299 | 503 |

② CROSS SECTIONS

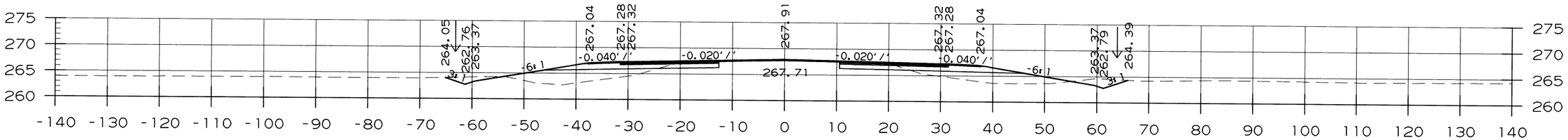
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 13 AREA CUT : 18 AREA CUT : 0
AREA FILL : 51 AREA FILL : 36 AREA FILL : 0

265+00

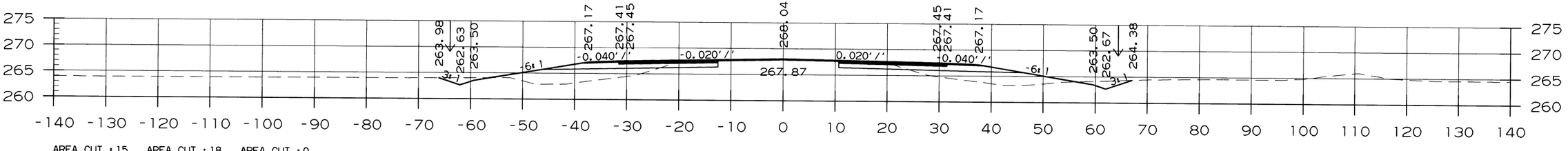
CUT VOL. : 53 CUT VOL. : 73 CUT VOL. : 0
FILL VOL. : 197 FILL VOL. : 152 FILL VOL. : 0




AREA CUT : 16 AREA CUT : 21 AREA CUT : 21
AREA FILL : 55 AREA FILL : 46 AREA FILL : 46

264+00

CUT VOL. : 58 CUT VOL. : 73 CUT VOL. : 0
FILL VOL. : 216 FILL VOL. : 183 FILL VOL. : 0

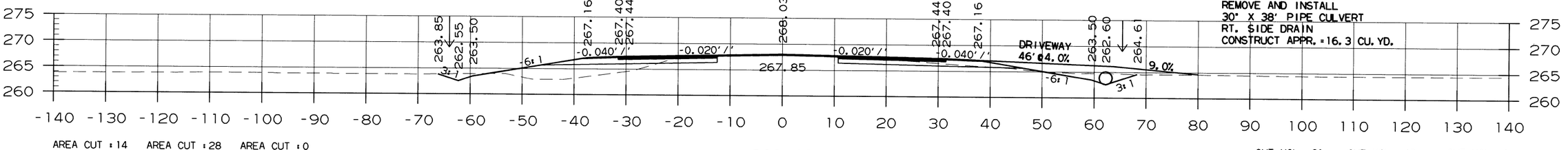



AREA CUT : 15 AREA CUT : 18 AREA CUT : 0
AREA FILL : 61 AREA FILL : 53 AREA FILL : 0

263+00

CUT VOL. : 31 CUT VOL. : 50 CUT VOL. : 0
FILL VOL. : 130 FILL VOL. : 80 FILL VOL. : 0

STA. 262+42 IN PLACE
24" X 25' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 16.3 CU. YD.




AREA CUT : 14 AREA CUT : 28 AREA CUT : 0
AREA FILL : 60 AREA FILL : 21 AREA FILL : 0

262+42

CUT VOL. : 21 CUT VOL. : 40 CUT VOL. : 0
FILL VOL. : 96 FILL VOL. : 54 FILL VOL. : 0

# CROSS SECTION
# STA. 262+42 TO STA. 265+00

2/3/2017

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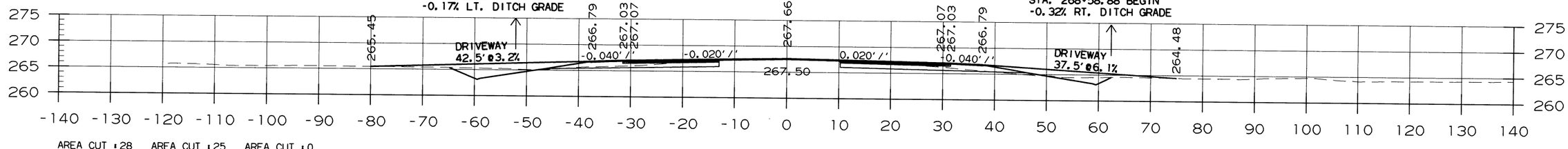
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 300 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STA. 268+57.80 END
+0.16% LT. DITCH GRADE
STA. 268+57.80 BEGIN
-0.17% LT. DITCH GRADE

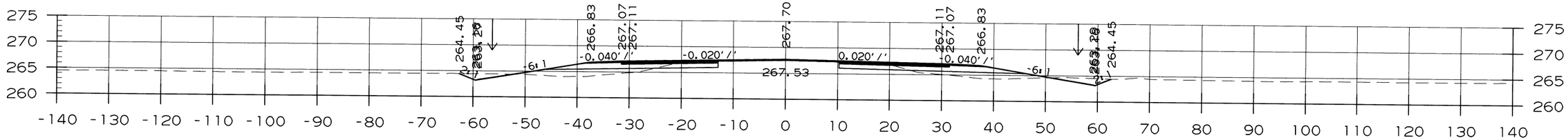
STA. 268+58.88 END
+0.12% RT. DITCH GRADE
STA. 268+58.88 BEGIN
-0.32% RT. DITCH GRADE




AREA CUT : 28 AREA CUT : 25 AREA CUT : 0
AREA FILL : 2 AREA FILL : 9 AREA FILL : 0

268+53

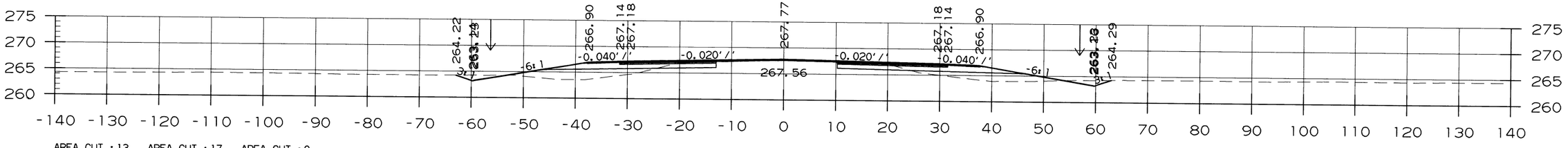
CUT VOL. : 43 CUT VOL. : 44 CUT VOL. : 0
FILL VOL. : 31 FILL VOL. : 33 FILL VOL. : 0




AREA CUT : 15 AREA CUT : 20 AREA CUT : 0
AREA FILL : 30 AREA FILL : 24 AREA FILL : 0

268+00

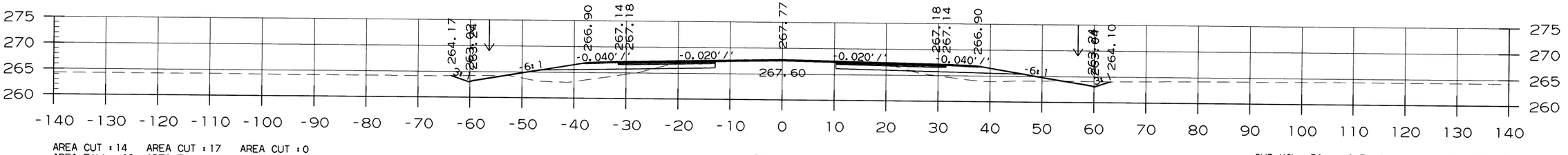
CUT VOL. : 52 CUT VOL. : 68 CUT VOL. : 0
FILL VOL. : 132 FILL VOL. : 109 FILL VOL. : 0




AREA CUT : 13 AREA CUT : 17 AREA CUT : 0
AREA FILL : 42 AREA FILL : 34 AREA FILL : 0

267+00

CUT VOL. : 51 CUT VOL. : 62 CUT VOL. : 0
FILL VOL. : 163 FILL VOL. : 126 FILL VOL. : 0




AREA CUT : 14 AREA CUT : 17 AREA CUT : 0
AREA FILL : 46 AREA FILL : 34 AREA FILL : 0

266+00

CUT VOL. : 50 CUT VOL. : 64 CUT VOL. : 0
FILL VOL. : 180 FILL VOL. : 130 FILL VOL. : 0

# CROSS SECTION
# STA. 266+00 TO STA. 268+53

2/3/2017

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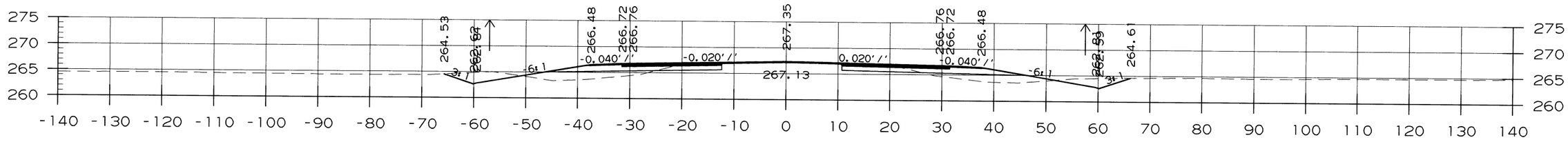
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 301 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

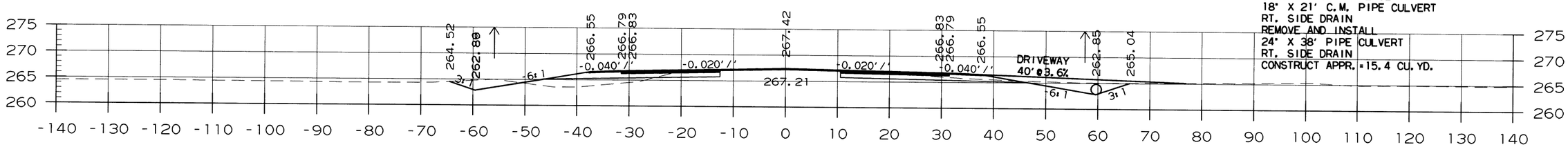
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 28 AREA CUT : 27 AREA CUT : 0
AREA FILL : 33 AREA FILL : 30 AREA FILL : 0

271+00

CUT VOL. : 81 CUT VOL. : 79 CUT VOL. : 0
FILL VOL. : 99 FILL VOL. : 82 FILL VOL. : 0

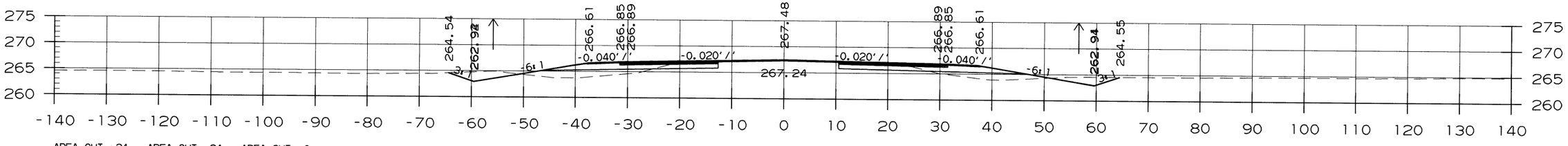



STA. 270+18 IN PLACE
18' X 21' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24' X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 15.4 CU. YD.

AREA CUT : 25 AREA CUT : 26 AREA CUT : 0
AREA FILL : 32 AREA FILL : 24 AREA FILL : 0

270+18

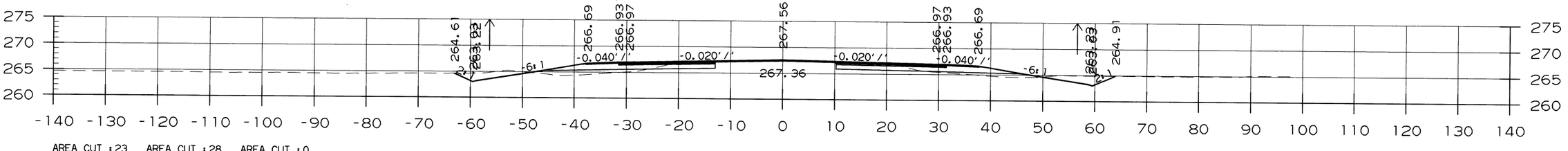
CUT VOL. : 16 CUT VOL. : 17 CUT VOL. : 0
FILL VOL. : 21 FILL VOL. : 16 FILL VOL. : 0




AREA CUT : 24 AREA CUT : 24 AREA CUT : 0
AREA FILL : 31 AREA FILL : 24 AREA FILL : 0

270+00

CUT VOL. : 87 CUT VOL. : 98 CUT VOL. : 0
FILL VOL. : 91 FILL VOL. : 68 FILL VOL. : 0




AREA CUT : 23 AREA CUT : 28 AREA CUT : 0
AREA FILL : 18 AREA FILL : 12 AREA FILL : 0

269+00

CUT VOL. : 45 CUT VOL. : 46 CUT VOL. : 0
FILL VOL. : 18 FILL VOL. : 18 FILL VOL. : 0

# CROSS SECTION
# STA. 269+00 TO STA. 271+00

2/3/2017

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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 |
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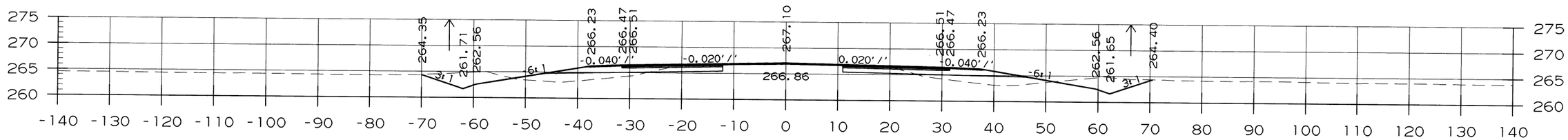
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 302 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3



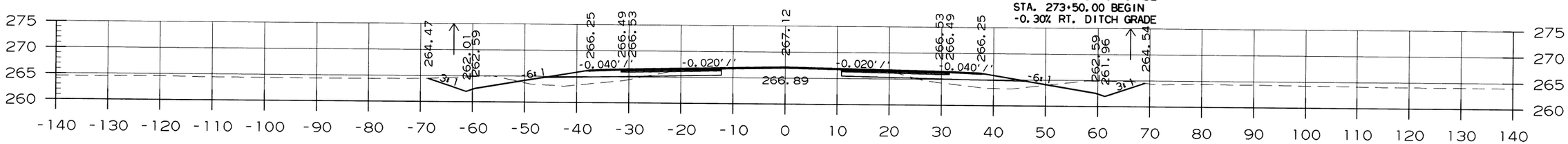

AREA CUT : 39 AREA CUT : 40 AREA CUT : 0
AREA FILL : 32 AREA FILL : 34 AREA FILL : 0

274+00

STAGE 1 STAGE 2 STAGE 3

CUT VOL. : 141 CUT VOL. : 149 CUT VOL. : 0
FILL VOL. : 115 FILL VOL. : 119 FILL VOL. : 0

STA. 273+50.00 END
-0.32% RT. DITCH GRADE
STA. 273+50.00 BEGIN
-0.30% RT. DITCH GRADE

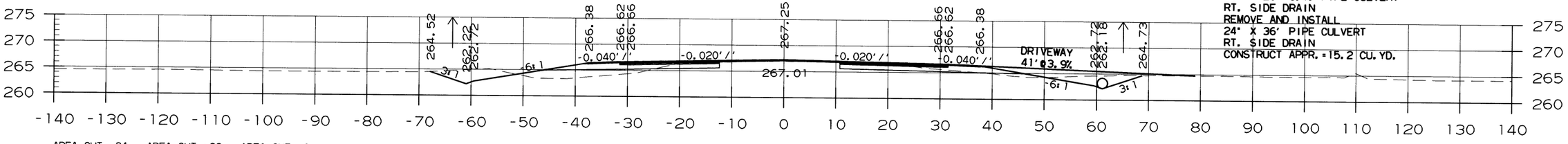



AREA CUT : 36 AREA CUT : 40 AREA CUT : 0
AREA FILL : 30 AREA FILL : 31 AREA FILL : 0

273+00

CUT VOL. : 90 CUT VOL. : 100 CUT VOL. : 0
FILL VOL. : 79 FILL VOL. : 79 FILL VOL. : 0

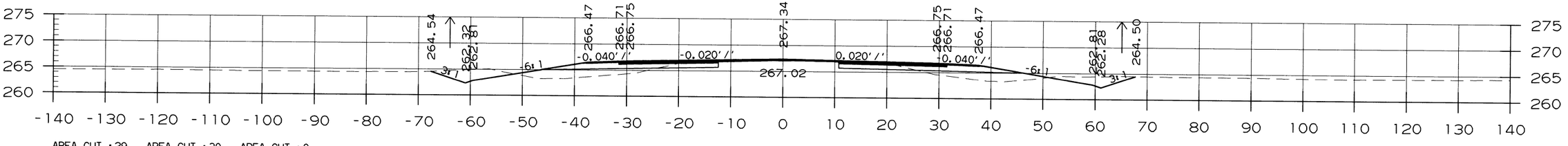
STA. 272+31 IN PLACE
18" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 36' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 15.2 CU. YD.




AREA CUT : 34 AREA CUT : 38 AREA CUT : 0
AREA FILL : 32 AREA FILL : 31 AREA FILL : 0

272+31

CUT VOL. : 37 CUT VOL. : 39 CUT VOL. : 0
FILL VOL. : 40 FILL VOL. : 36 FILL VOL. : 0




AREA CUT : 29 AREA CUT : 30 AREA CUT : 0
AREA FILL : 38 AREA FILL : 33 AREA FILL : 0

272+00

CUT VOL. : 106 CUT VOL. : 104 CUT VOL. : 0
FILL VOL. : 131 FILL VOL. : 116 FILL VOL. : 0

# CROSS SECTION
# STA. 272+00 TO STA. 274+00

2/3/2017

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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 |
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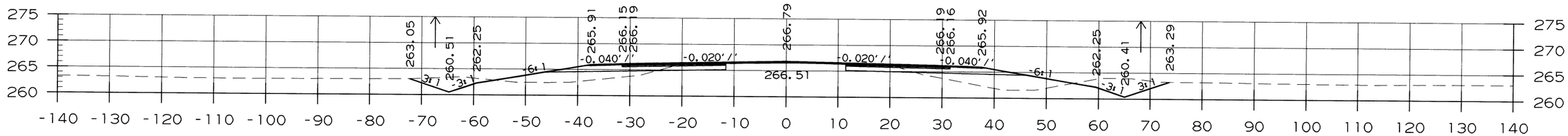
| | | | | JOB NO. | | CA1003 | 303 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

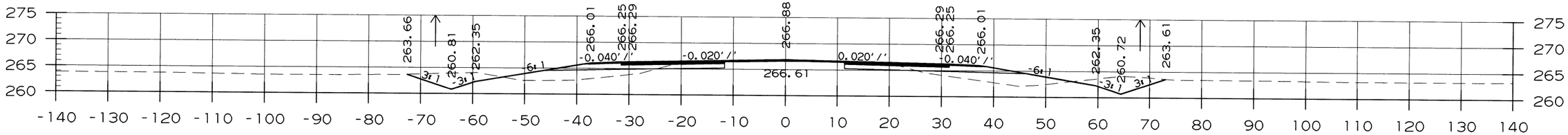



AREA CUT : 33 AREA CUT : 44 AREA CUT : 0
AREA FILL : 45 AREA FILL : 57 AREA FILL : 0

278+00

CUT VOL. : 135 CUT VOL. : 158 CUT VOL. : 0
FILL VOL. : 166 FILL VOL. : 188 FILL VOL. : 0

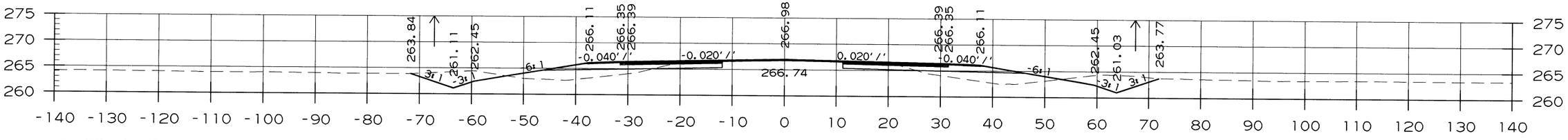
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 39 AREA CUT : 41 AREA CUT : 0
AREA FILL : 44 AREA FILL : 44 AREA FILL : 0

277+00

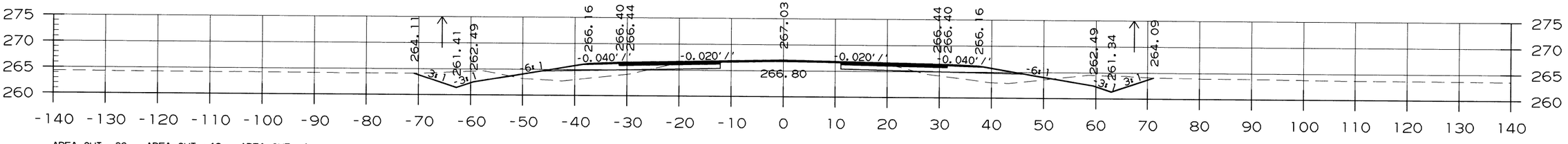
CUT VOL. : 145 CUT VOL. : 156 CUT VOL. : 0
FILL VOL. : 156 FILL VOL. : 159 FILL VOL. : 0




AREA CUT : 39 AREA CUT : 43 AREA CUT : 0
AREA FILL : 40 AREA FILL : 42 AREA FILL : 0

276+00

CUT VOL. : 144 CUT VOL. : 157 CUT VOL. : 0
FILL VOL. : 142 FILL VOL. : 142 FILL VOL. : 0




AREA CUT : 39 AREA CUT : 42 AREA CUT : 0
AREA FILL : 37 AREA FILL : 35 AREA FILL : 0

275+00

CUT VOL. : 145 CUT VOL. : 151 CUT VOL. : 0
FILL VOL. : 128 FILL VOL. : 127 FILL VOL. : 0

# CROSS SECTION
# STA. 275+00 TO STA. 278+00

2/3/2017

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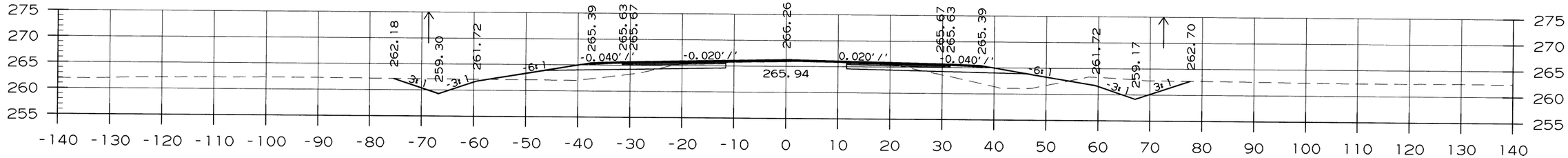
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 304 | 503 |

② CROSS SECTIONS

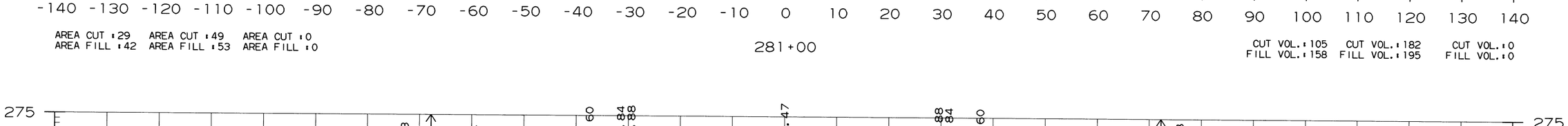
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 33 AREA CUT : 56 AREA CUT : 0
AREA FILL : 46 AREA FILL : 51 AREA FILL : 0

282+00

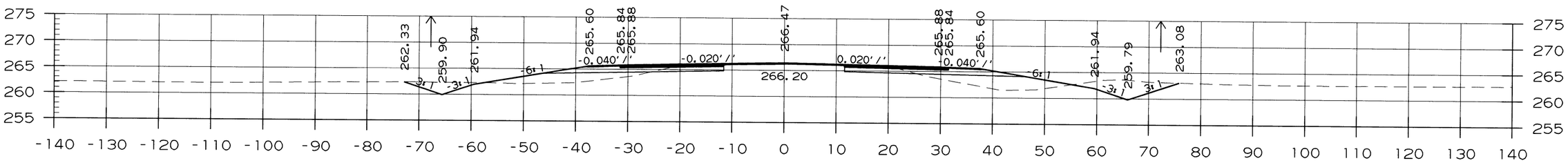
CUT VOL. : 116 CUT VOL. : 195 CUT VOL. : 0
FILL VOL. : 162 FILL VOL. : 193 FILL VOL. : 0




AREA CUT : 29 AREA CUT : 49 AREA CUT : 0
AREA FILL : 42 AREA FILL : 53 AREA FILL : 0

281+00

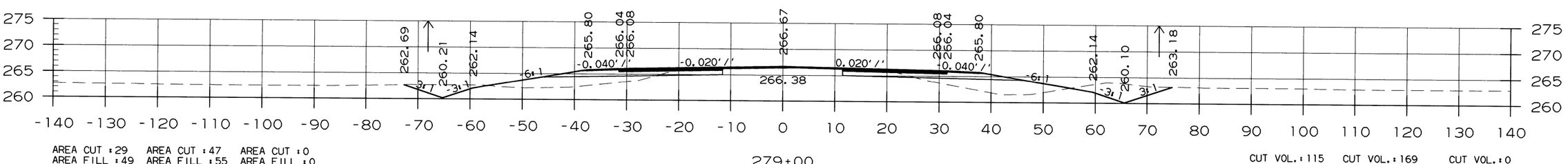
CUT VOL. : 105 CUT VOL. : 182 CUT VOL. : 0
FILL VOL. : 158 FILL VOL. : 195 FILL VOL. : 0




AREA CUT : 27 AREA CUT : 49 AREA CUT : 0
AREA FILL : 44 AREA FILL : 52 AREA FILL : 0

280+00

CUT VOL. : 104 CUT VOL. : 178 CUT VOL. : 0
FILL VOL. : 171 FILL VOL. : 199 FILL VOL. : 0




AREA CUT : 29 AREA CUT : 47 AREA CUT : 0
AREA FILL : 49 AREA FILL : 55 AREA FILL : 0

279+00

CUT VOL. : 115 CUT VOL. : 169 CUT VOL. : 0
FILL VOL. : 174 FILL VOL. : 209 FILL VOL. : 0

# CROSS SECTION
# STA. 279+00 TO STA. 282+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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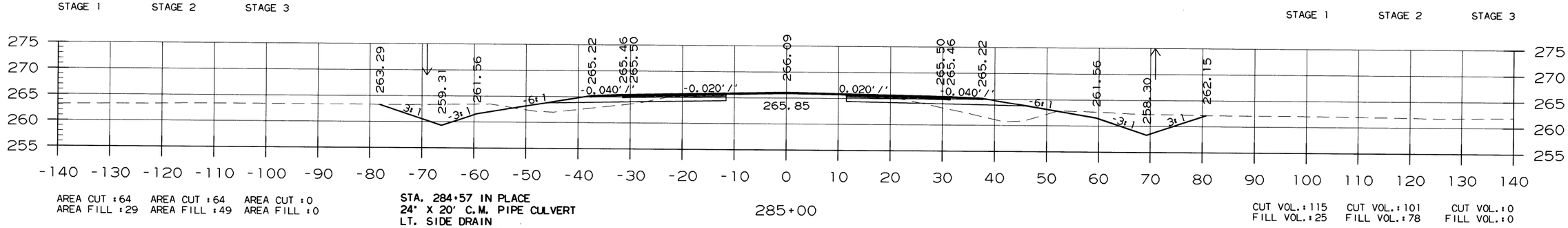
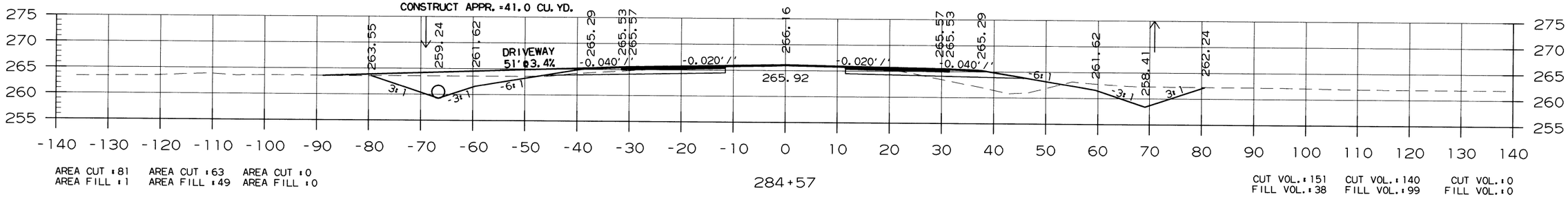
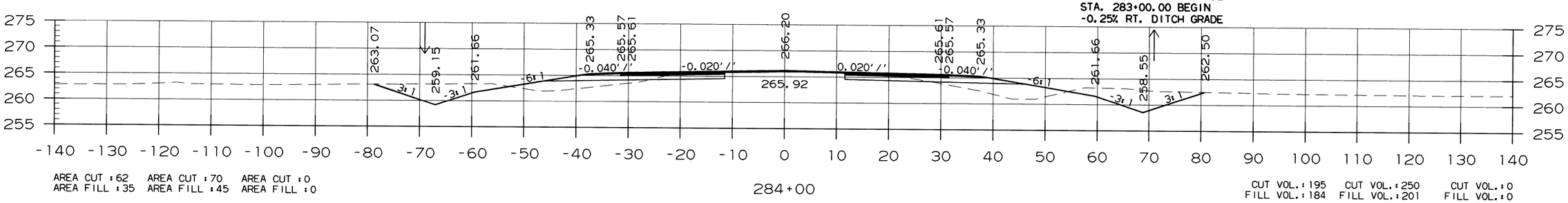
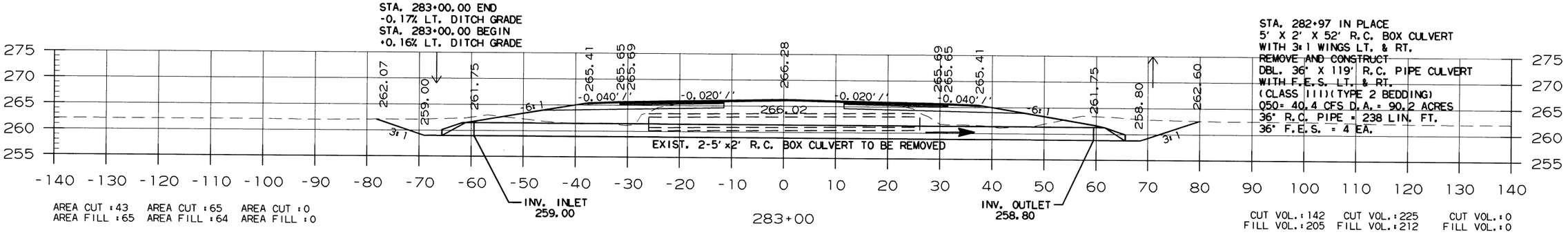
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 305 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 283+00 TO STA. 285+00

2/3/2017

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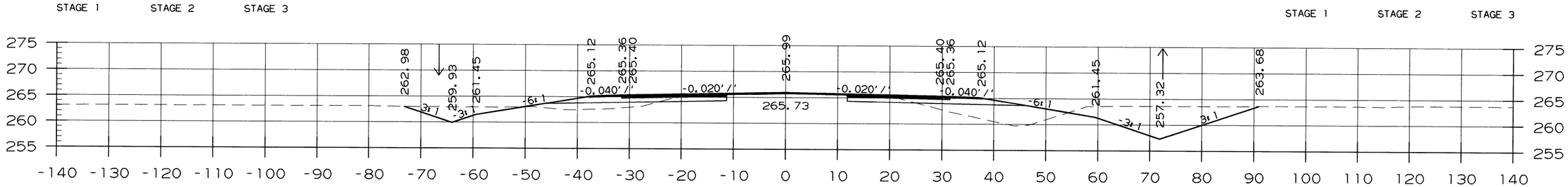
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 306 | 503 |

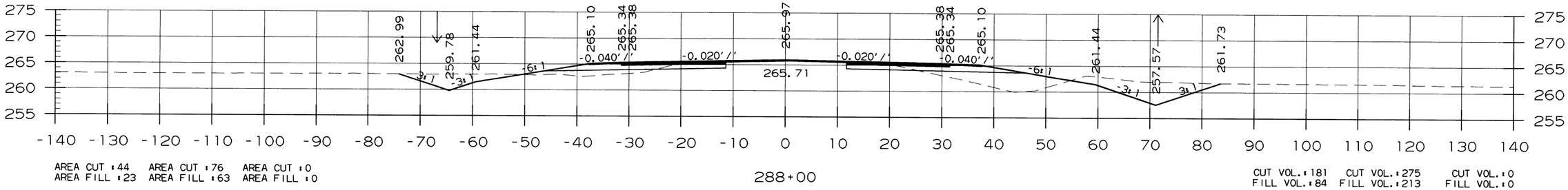
② CROSS SECTIONS




AREA CUT : 40 AREA CUT : 129 AREA CUT : 0
AREA FILL : 29 AREA FILL : 69 AREA FILL : 0

289+00

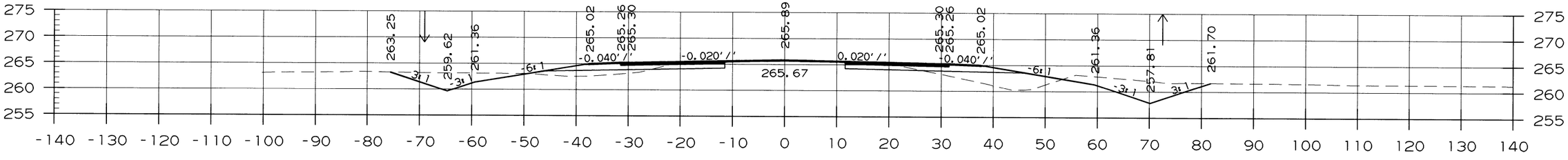
CUT VOL. : 156 CUT VOL. : 379 CUT VOL. : 0
FILL VOL. : 97 FILL VOL. : 244 FILL VOL. : 0




AREA CUT : 44 AREA CUT : 76 AREA CUT : 0
AREA FILL : 23 AREA FILL : 63 AREA FILL : 0

288+00

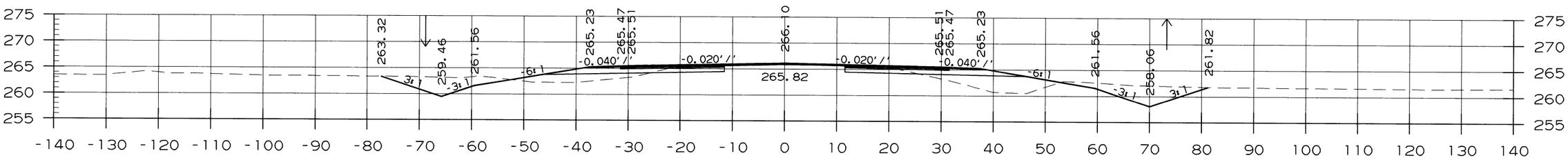
CUT VOL. : 181 CUT VOL. : 275 CUT VOL. : 0
FILL VOL. : 84 FILL VOL. : 213 FILL VOL. : 0




AREA CUT : 53 AREA CUT : 73 AREA CUT : 0
AREA FILL : 22 AREA FILL : 52 AREA FILL : 0

287+00

CUT VOL. : 200 CUT VOL. : 237 CUT VOL. : 0
FILL VOL. : 118 FILL VOL. : 196 FILL VOL. : 0




AREA CUT : 55 AREA CUT : 64 AREA CUT : 0
AREA FILL : 34 AREA FILL : 57 AREA FILL : 0

286+00

CUT VOL. : 219 CUT VOL. : 237 CUT VOL. : 0
FILL VOL. : 118 FILL VOL. : 196 FILL VOL. : 0

# CROSS SECTION
# STA. 286+00 TO STA. 289+00

2/3/2017

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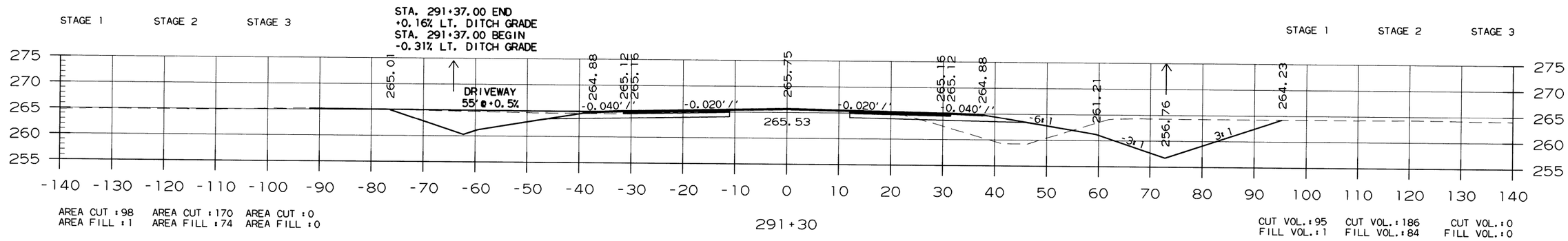
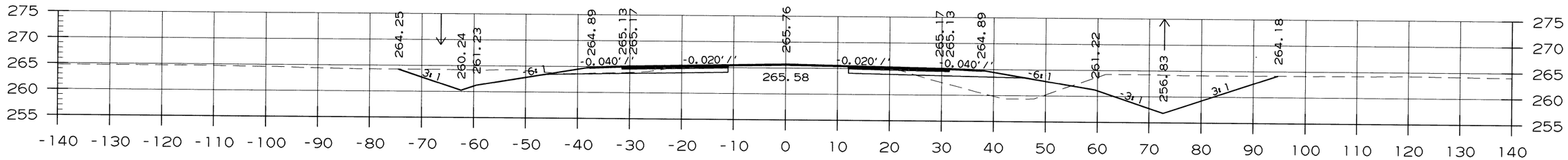
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 307 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




AREA CUT : 98 AREA CUT : 170 AREA CUT : 0
AREA FILL : 1 AREA FILL : 74 AREA FILL : 0

291+30

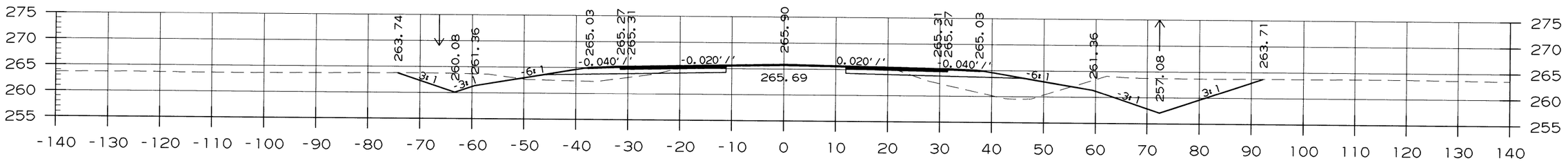
CUT VOL. : 95 CUT VOL. : 186 CUT VOL. : 0
FILL VOL. : 1 FILL VOL. : 84 FILL VOL. : 0




AREA CUT : 73 AREA CUT : 165 AREA CUT : 0
AREA FILL : 1 AREA FILL : 77 AREA FILL : 0

291+00

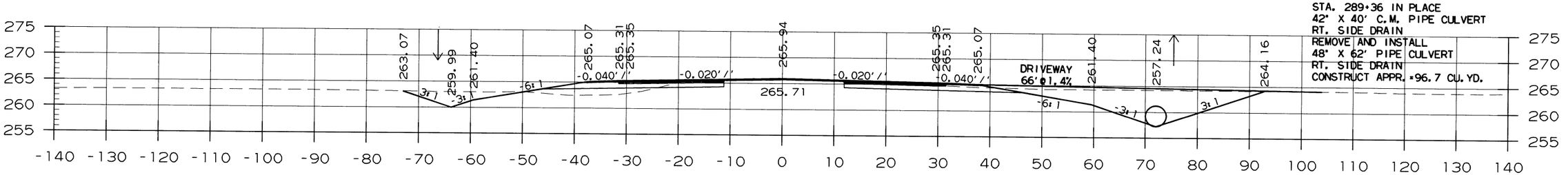
CUT VOL. : 231 CUT VOL. : 563 CUT VOL. : 0
FILL VOL. : 54 FILL VOL. : 286 FILL VOL. : 0




AREA CUT : 52 AREA CUT : 140 AREA CUT : 0
AREA FILL : 28 AREA FILL : 78 AREA FILL : 0

290+00

CUT VOL. : 113 CUT VOL. : 352 CUT VOL. : 0
FILL VOL. : 67 FILL VOL. : 100 FILL VOL. : 0




STA. 289+36 IN PLACE
42" X 40' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
48" X 62' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =96.7 CU. YD.

AREA CUT : 43 AREA CUT : 158 AREA CUT : 0
AREA FILL : 29 AREA FILL : 7 AREA FILL : 0

289+36

CUT VOL. : 55 CUT VOL. : 191 CUT VOL. : 0
FILL VOL. : 38 FILL VOL. : 50 FILL VOL. : 0

CROSS SECTION
STA. 289+36 TO STA. 291+30

2/3/2017

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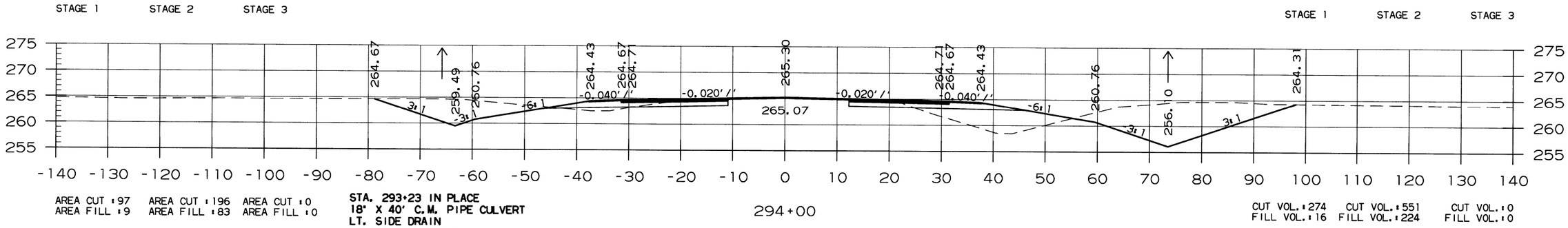
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 308 | 503 |

② CROSS SECTIONS

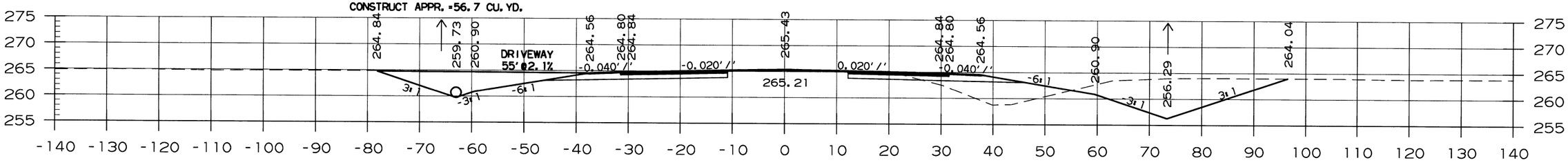



AREA CUT : 97 AREA CUT : 196 AREA CUT : 0
AREA FILL : 9 AREA FILL : 83 AREA FILL : 0

**STA. 293+23 IN PLACE**
**18" X 40' C.M. PIPE CULVERT**
**LT. SIDE DRAIN**
**REMOVE AND INSTALL**
**24" X 48' PIPE CULVERT**
**LT. SIDE DRAIN**
**CONSTRUCT APPR. =56.7 CU. YD.**

294+00

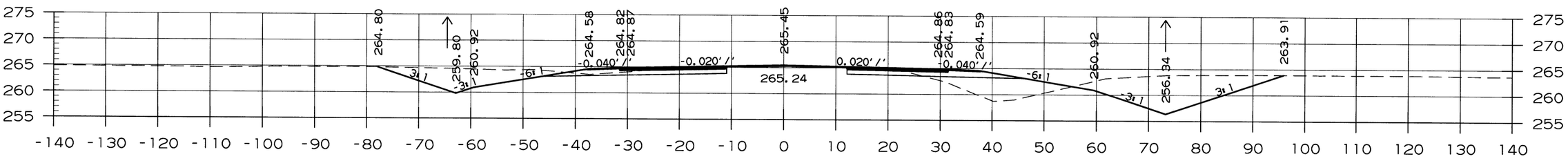
CUT VOL. : 274 CUT VOL. : 551 CUT VOL. : 0
FILL VOL. : 16 FILL VOL. : 224 FILL VOL. : 0




AREA CUT : 95 AREA CUT : 190 AREA CUT : 0
AREA FILL : 2 AREA FILL : 74 AREA FILL : 0

293+23

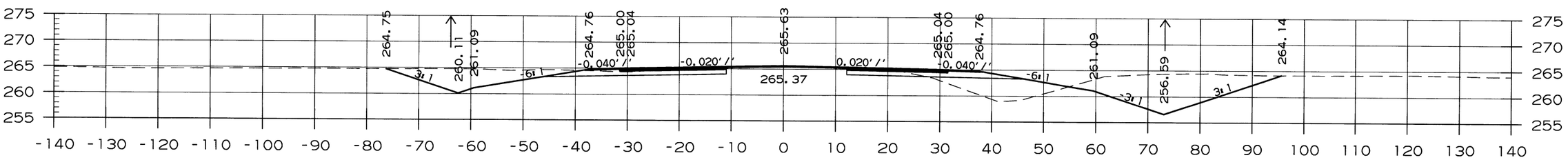
CUT VOL. : 85 CUT VOL. : 152 CUT VOL. : 0
FILL VOL. : 1 FILL VOL. : 63 FILL VOL. : 0




AREA CUT : 104 AREA CUT : 165 AREA CUT : 0
AREA FILL : 1 AREA FILL : 74 AREA FILL : 0

293+00

CUT VOL. : 392 CUT VOL. : 631 CUT VOL. : 0
FILL VOL. : 2 FILL VOL. : 270 FILL VOL. : 0




AREA CUT : 108 AREA CUT : 175 AREA CUT : 0
AREA FILL : 1 AREA FILL : 72 AREA FILL : 0

292+00

CUT VOL. : 267 CUT VOL. : 447 CUT VOL. : 0
FILL VOL. : 1 FILL VOL. : 188 FILL VOL. : 0

# CROSS SECTION
# STA. 292+00 TO STA. 294+00

2/9/2018

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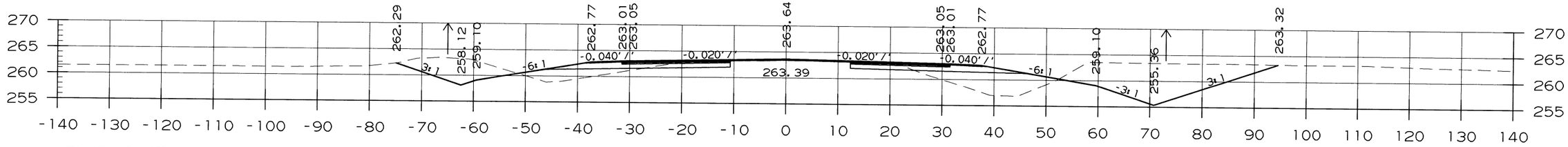
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 309 | 503 |

② CROSS SECTIONS

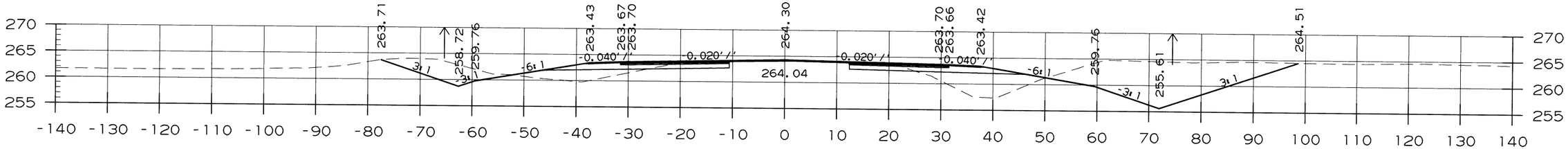
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 76 AREA CUT : 195 AREA CUT : 0
AREA FILL : 36 AREA FILL : 79 AREA FILL : 0

297+00

CUT VOL. : 264 CUT VOL. : 802 CUT VOL. : 0
FILL VOL. : 139 FILL VOL. : 278 FILL VOL. : 0



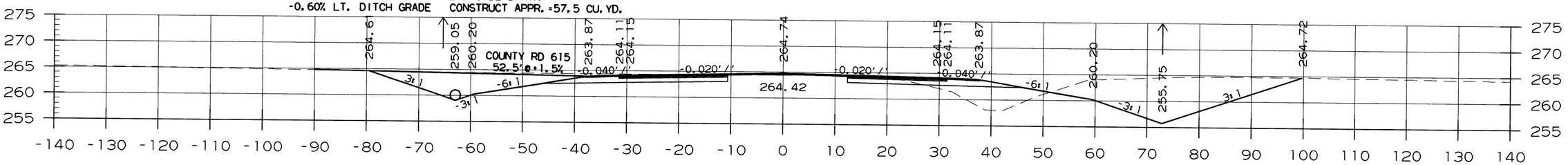

AREA CUT : 66 AREA CUT : 238 AREA CUT : 0
AREA FILL : 39 AREA FILL : 71 AREA FILL : 0

296+00

CUT VOL. : 226 CUT VOL. : 514 CUT VOL. : 0
FILL VOL. : 43 FILL VOL. : 149 FILL VOL. : 0

STA. 295+48.02 END
-0.31% LT. DITCH GRADE
STA. 295+48.02 BEGIN
-0.60% LT. DITCH GRADE

STA. 295+41 IN PLACE
24" X 40' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 50' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 57.5 CU. YD.

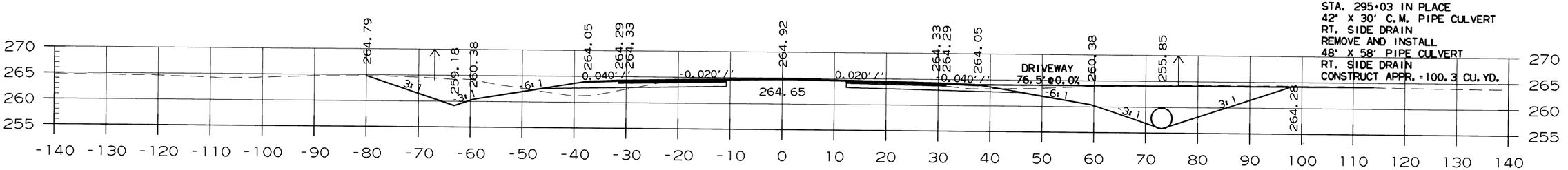



AREA CUT : 140 AREA CUT : 232 AREA CUT : 0
AREA FILL : 1 AREA FILL : 65 AREA FILL : 85

295+41

CUT VOL. : 179 CUT VOL. : 358 CUT VOL. : 0
FILL VOL. : 17 FILL VOL. : 50 FILL VOL. : 0

STA. 295+03 IN PLACE
42" X 30' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
48" X 58' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 100.3 CU. YD.




AREA CUT : 95 AREA CUT : 239 AREA CUT : 0
AREA FILL : 22 AREA FILL : 0 AREA FILL : 0

295+00

CUT VOL. : 355 CUT VOL. : 807 CUT VOL. : 0
FILL VOL. : 57 FILL VOL. : 153 FILL VOL. : 0

# CROSS SECTION
# STA. 295+00 TO STA. 297+00

2/3/2017

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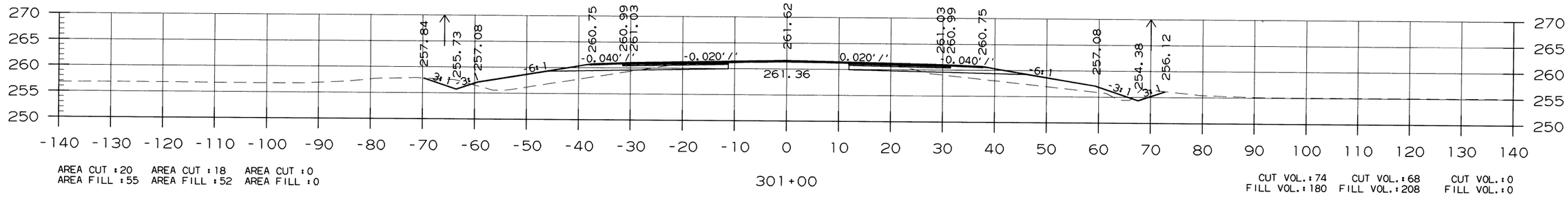
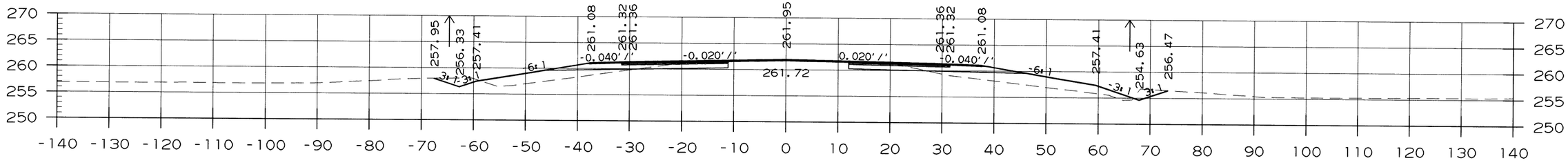
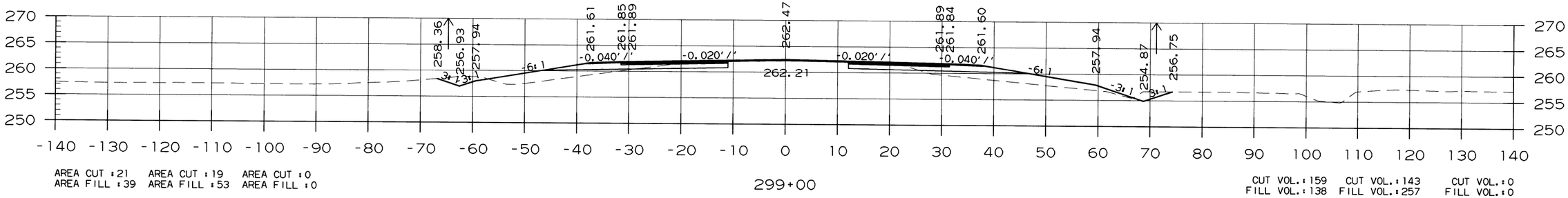
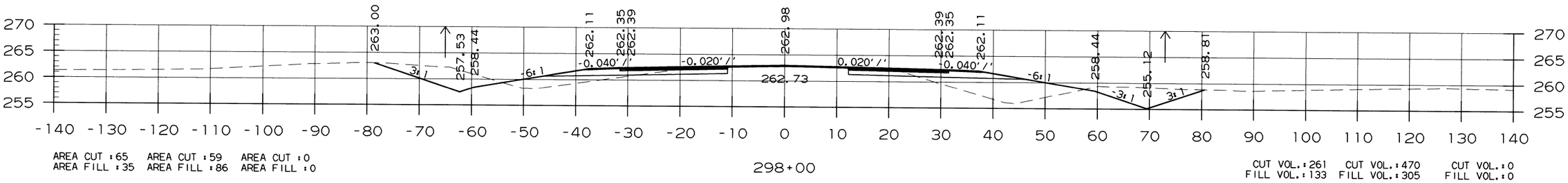
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 310 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




# CROSS SECTION
# STA. 298+00 TO STA. 301+00

2/3/2017

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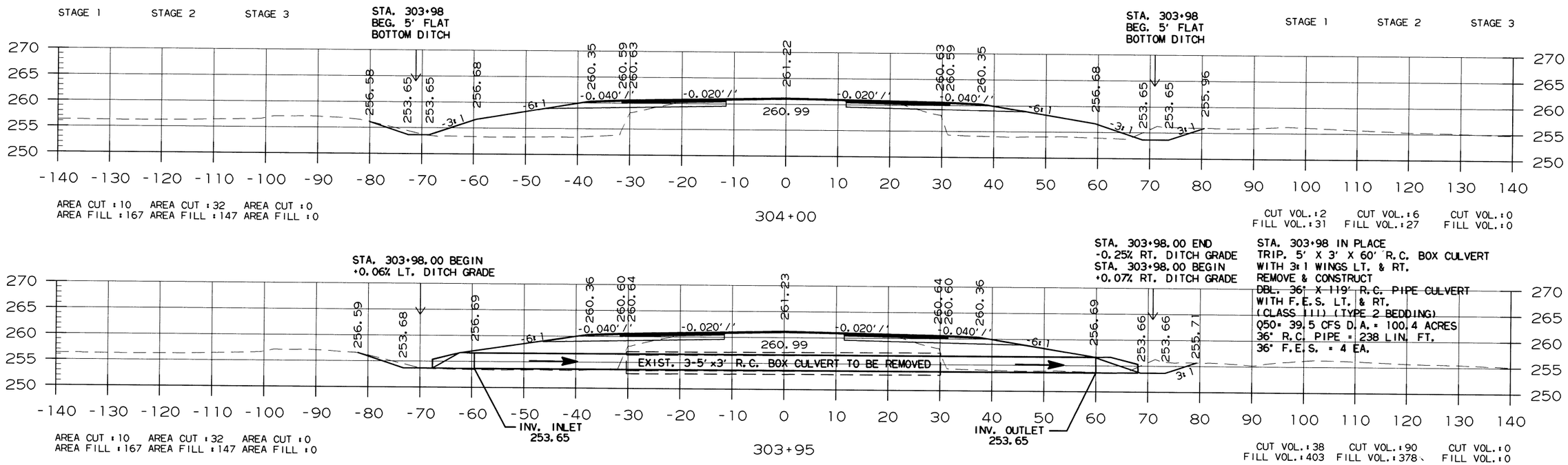
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 31 | 503 |

② CROSS SECTIONS




CROSS SECTION
STA. 302+00 TO STA. 304+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 312 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 305+00 TO STA. 308+00

2/3/2017

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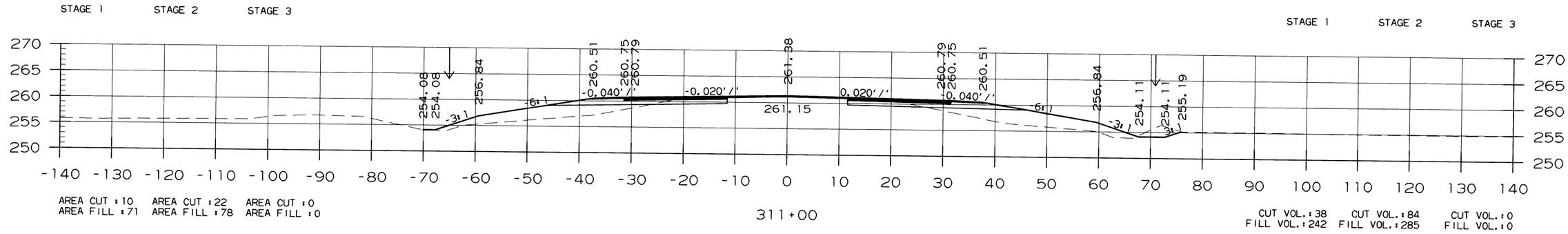
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 313 | 503 |

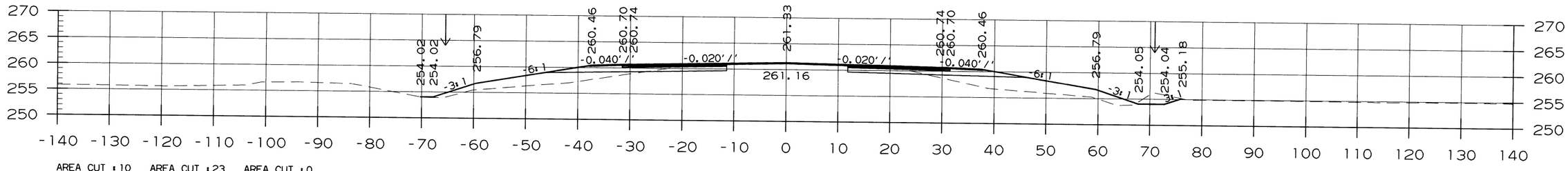
② CROSS SECTIONS




AREA CUT : 10 AREA CUT : 22 AREA CUT : 0
AREA FILL : 71 AREA FILL : 78 AREA FILL : 0

311+00

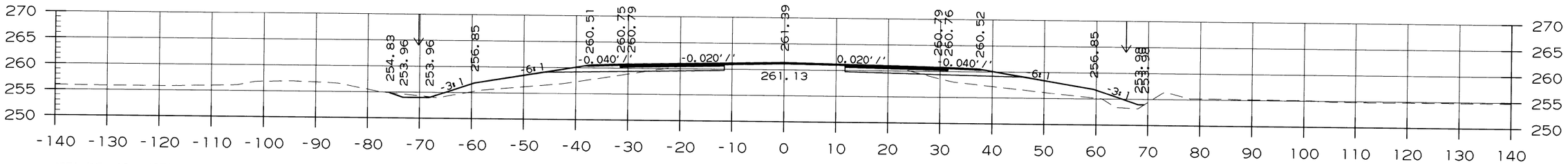
CUT VOL. : 38 CUT VOL. : 84 CUT VOL. : 0
FILL VOL. : 242 FILL VOL. : 285 FILL VOL. : 0




AREA CUT : 10 AREA CUT : 23 AREA CUT : 0
AREA FILL : 60 AREA FILL : 76 AREA FILL : 0

310+00

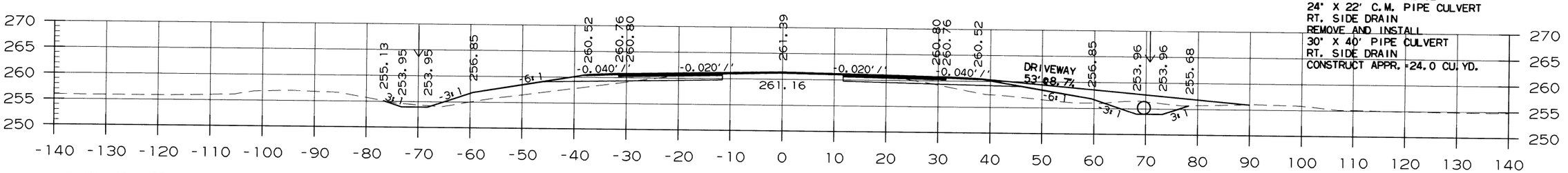
CUT VOL. : 42 CUT VOL. : 78 CUT VOL. : 0
FILL VOL. : 232 FILL VOL. : 281 FILL VOL. : 0




AREA CUT : 12 AREA CUT : 19 AREA CUT : 0
AREA FILL : 65 AREA FILL : 76 AREA FILL : 0

309+00

CUT VOL. : 12 CUT VOL. : 19 CUT VOL. : 0
FILL VOL. : 53 FILL VOL. : 68 FILL VOL. : 0




AREA CUT : 16 AREA CUT : 26 AREA CUT : 0
AREA FILL : 59 AREA FILL : 85 AREA FILL : 0

308+77

CUT VOL. : 48 CUT VOL. : 70 CUT VOL. : 0
FILL VOL. : 167 FILL VOL. : 240 FILL VOL. : 0

STA. 308+77 IN PLACE
24" X 22' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =24.0 CU. YD.

# CROSS SECTION
# STA. 308+77 TO STA. 311+00

2/3/2017

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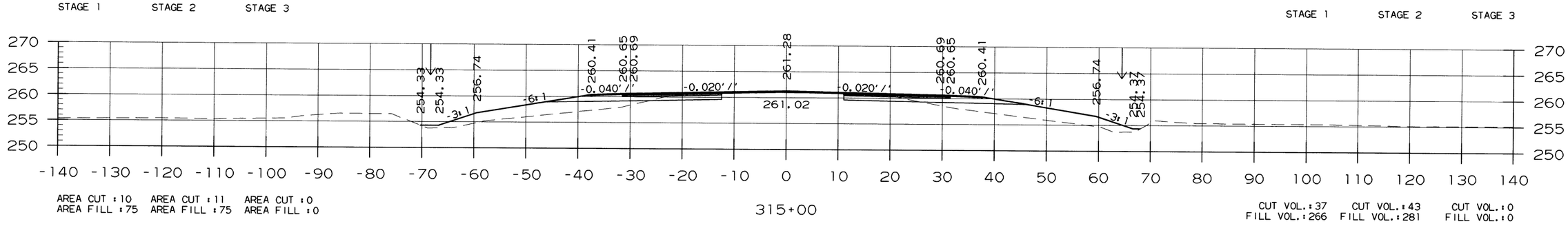
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 314 | 503 |

②

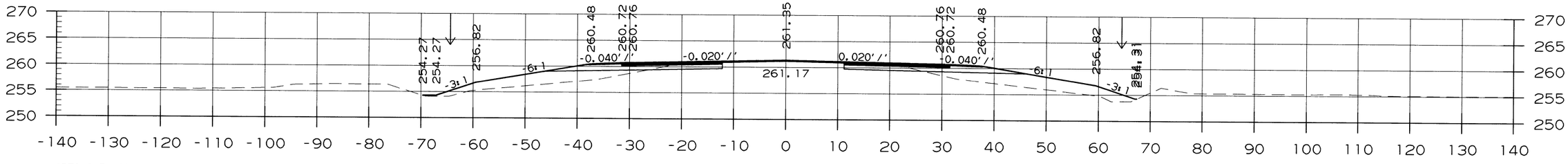
CROSS SECTIONS




AREA CUT : 10 AREA CUT : 11 AREA CUT : 0
AREA FILL : 75 AREA FILL : 75 AREA FILL : 0

315+00

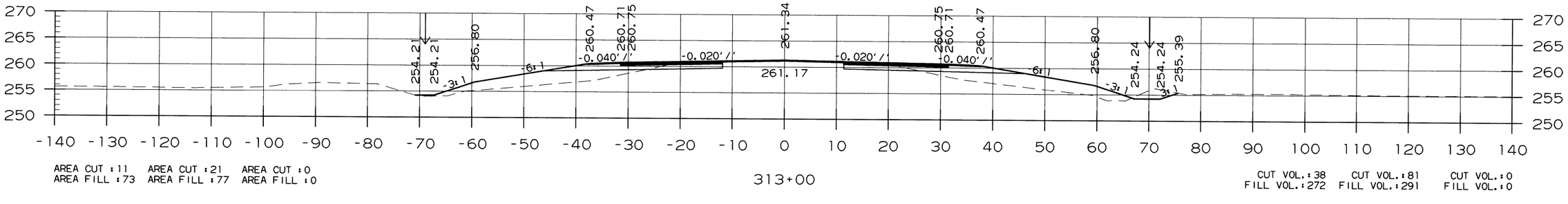
CUT VOL. : 37 CUT VOL. : 43 CUT VOL. : 0
FILL VOL. : 266 FILL VOL. : 281 FILL VOL. : 0




AREA CUT : 10 AREA CUT : 12 AREA CUT : 0
AREA FILL : 68 AREA FILL : 77 AREA FILL : 0

314+00

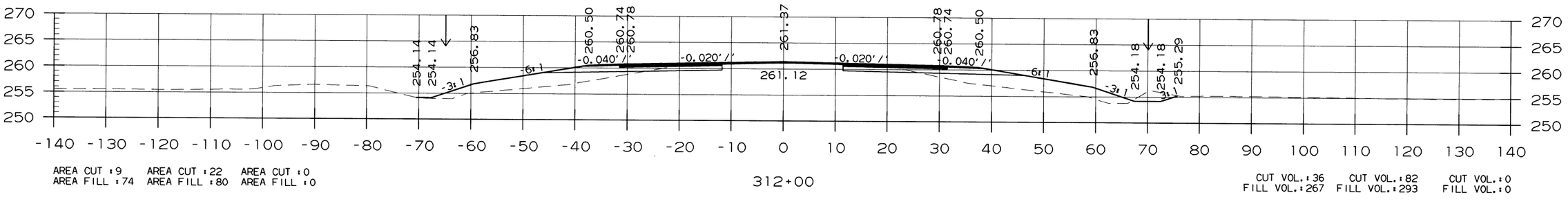
CUT VOL. : 39 CUT VOL. : 62 CUT VOL. : 0
FILL VOL. : 261 FILL VOL. : 285 FILL VOL. : 0




AREA CUT : 11 AREA CUT : 21 AREA CUT : 0
AREA FILL : 73 AREA FILL : 77 AREA FILL : 0

313+00

CUT VOL. : 38 CUT VOL. : 81 CUT VOL. : 0
FILL VOL. : 272 FILL VOL. : 291 FILL VOL. : 0




AREA CUT : 9 AREA CUT : 22 AREA CUT : 0
AREA FILL : 74 AREA FILL : 80 AREA FILL : 0

312+00

CUT VOL. : 36 CUT VOL. : 82 CUT VOL. : 0
FILL VOL. : 267 FILL VOL. : 293 FILL VOL. : 0

# CROSS SECTION
# STA. 312+00 TO STA. 315+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
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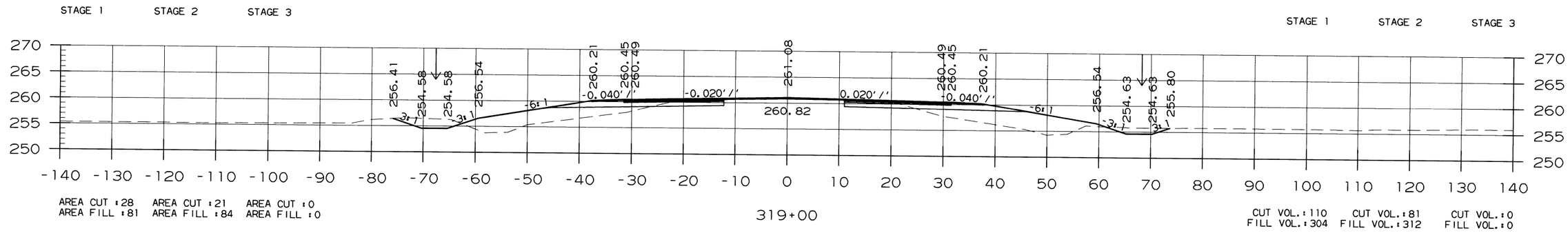
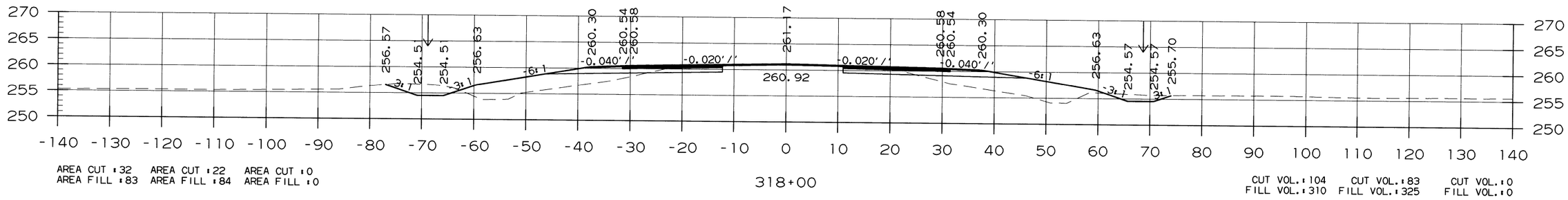
| | | | | JOB NO. | | CA1003 | 315 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




AREA CUT : 28 AREA CUT : 21 AREA CUT : 0
AREA FILL : 81 AREA FILL : 84 AREA FILL : 0

319+00

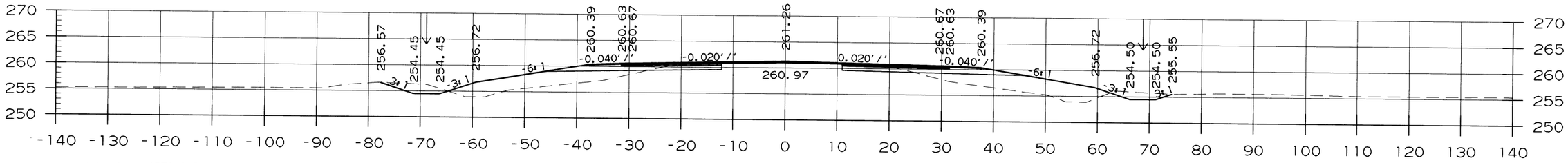
CUT VOL. : 110 CUT VOL. : 81 CUT VOL. : 0
FILL VOL. : 304 FILL VOL. : 312 FILL VOL. : 0




AREA CUT : 32 AREA CUT : 22 AREA CUT : 0
AREA FILL : 83 AREA FILL : 84 AREA FILL : 0

318+00

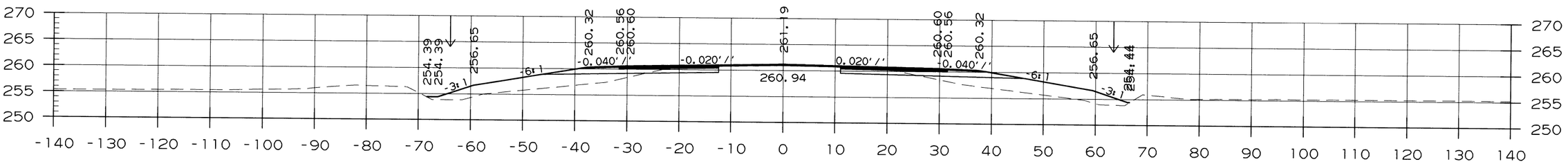
CUT VOL. : 104 CUT VOL. : 83 CUT VOL. : 0
FILL VOL. : 310 FILL VOL. : 325 FILL VOL. : 0




AREA CUT : 25 AREA CUT : 23 AREA CUT : 0
AREA FILL : 84 AREA FILL : 91 AREA FILL : 0

317+00

CUT VOL. : 64 CUT VOL. : 63 CUT VOL. : 0
FILL VOL. : 302 FILL VOL. : 313 FILL VOL. : 0




AREA CUT : 10 AREA CUT : 11 AREA CUT : 0
AREA FILL : 79 AREA FILL : 78 AREA FILL : 0

316+00

CUT VOL. : 37 CUT VOL. : 42 CUT VOL. : 0
FILL VOL. : 286 FILL VOL. : 284 FILL VOL. : 0

# CROSS SECTION
# STA. 316+00 TO STA. 319+00

2/3/2017

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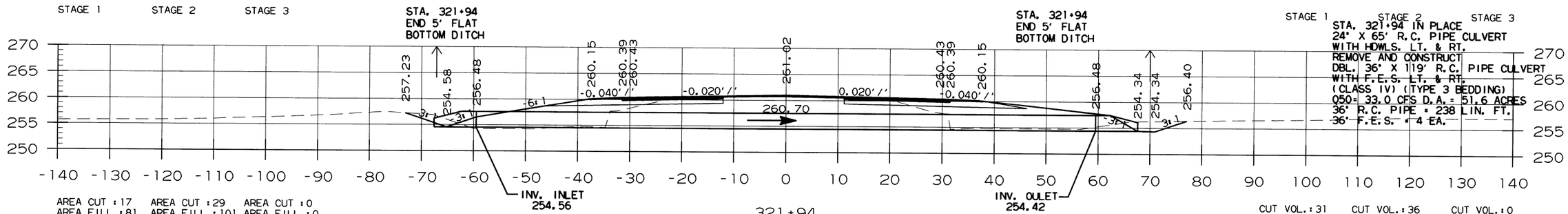
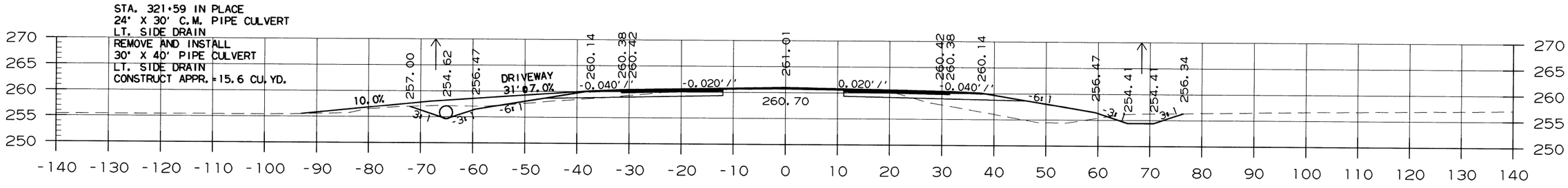
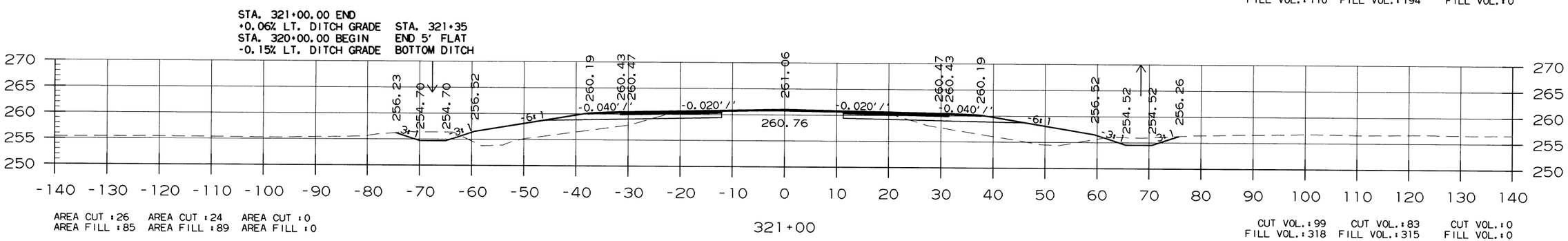
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 316 | 503 |

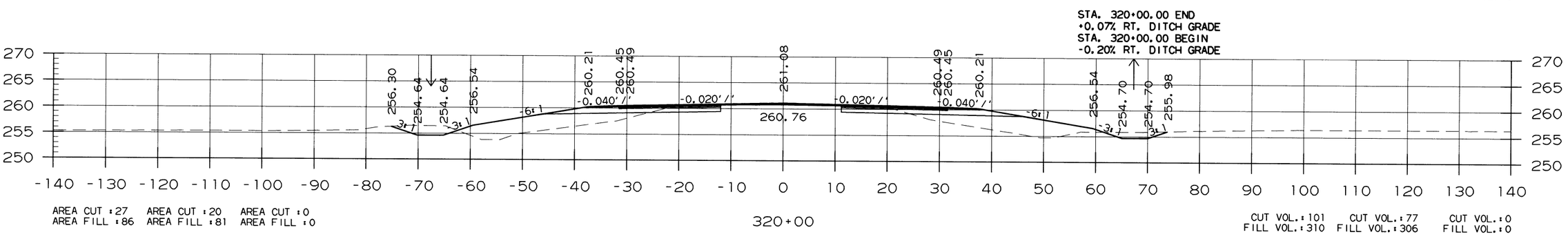
②

## CROSS SECTIONS




# CROSS SECTION
# STA. 320+00 TO STA. 321+94

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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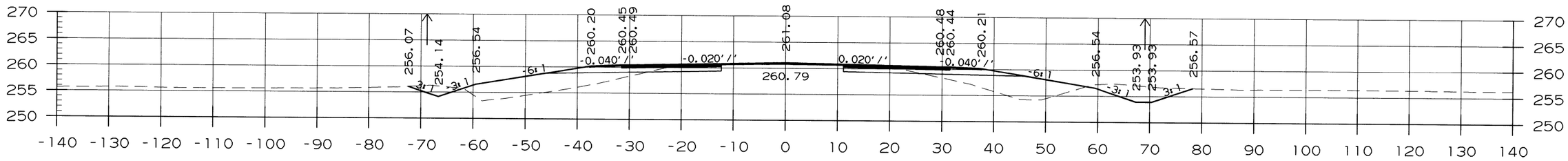
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 317 | 503 |

②

CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3



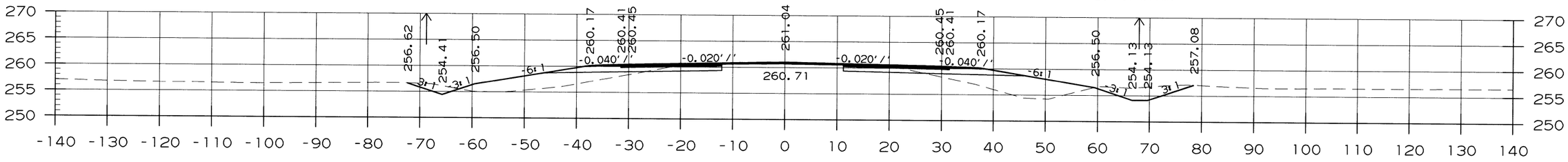

AREA CUT : 22 AREA CUT : 49 AREA CUT : 0
AREA FILL : 93 AREA FILL : 78 AREA FILL : 0

324+00

STAGE 1 STAGE 2 STAGE 3

CUT VOL. : 78 CUT VOL. : 164 CUT VOL. : 0
FILL VOL. : 302 FILL VOL. : 289 FILL VOL. : 0

STA. 323+00
BEG. 3' FLAT
BOTTOM DITCH




AREA CUT : 20 AREA CUT : 40 AREA CUT : 0
AREA FILL : 70 AREA FILL : 78 AREA FILL : 0

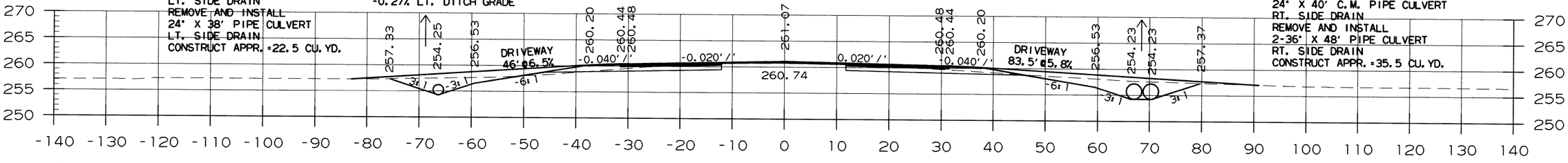
323+00

CUT VOL. : 61 CUT VOL. : 109 CUT VOL. : 0
FILL VOL. : 72 FILL VOL. : 75 FILL VOL. : 0

STA. 322+49 IN PLACE
20' X 20' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24' X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =22.5 CU. YD.

STA. 322+50.00 BEGIN
-0.27% LT. DITCH GRADE

STA. 322+49 IN PLACE
24' X 40' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
2-36' X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =35.5 CU. YD.



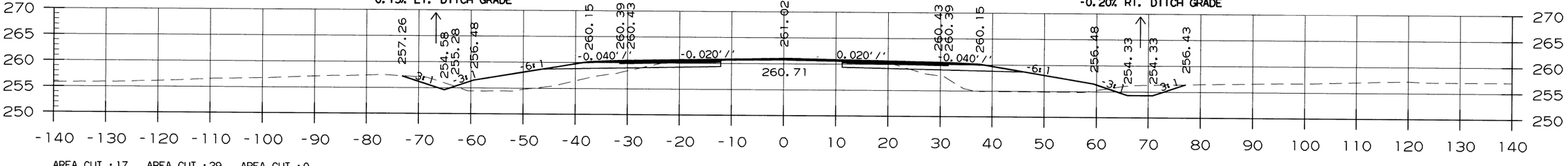

AREA CUT : 45 AREA CUT : 75 AREA CUT : 0
AREA FILL : 6 AREA FILL : 2 AREA FILL : 0

322+49

CUT VOL. : 55 CUT VOL. : 95 CUT VOL. : 0
FILL VOL. : 79 FILL VOL. : 93 FILL VOL. : 0

STA. 322+00.00 END
-0.15% LT. DITCH GRADE

STA. 322+00.00 END
-0.20% RT. DITCH GRADE
STA. 322+00.00 BEGIN
-0.20% RT. DITCH GRADE




AREA CUT : 17 AREA CUT : 29 AREA CUT : 0
AREA FILL : 81 AREA FILL : 101 AREA FILL : 0

322+00

CUT VOL. : 4 CUT VOL. : 6 CUT VOL. : 0
FILL VOL. : 18 FILL VOL. : 23 FILL VOL. : 0

# CROSS SECTION
# STA. 322+00 TO STA. 324+00

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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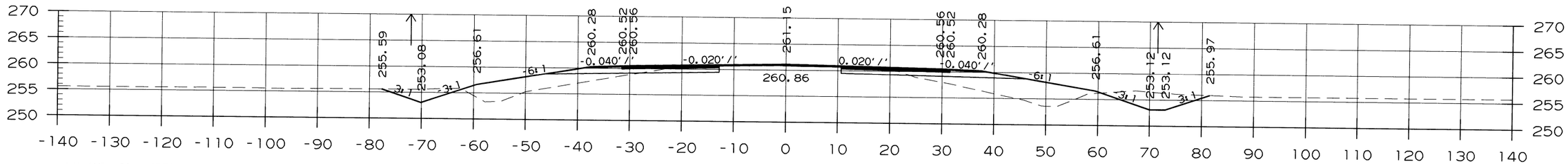
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 318 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

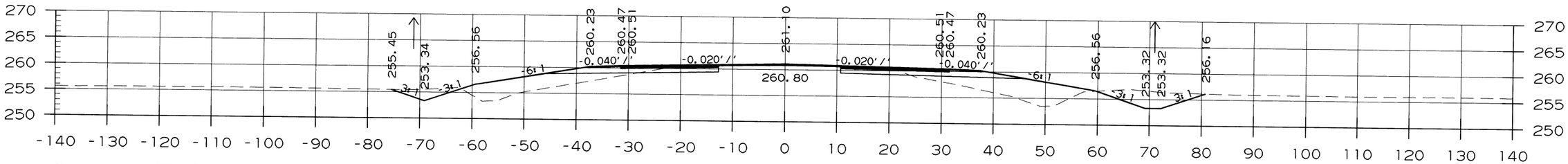



AREA CUT : 31 AREA CUT : 51 AREA CUT : 0
AREA FILL : 76 AREA FILL : 95 AREA FILL : 0

328+00

STAGE 1 STAGE 2 STAGE 3

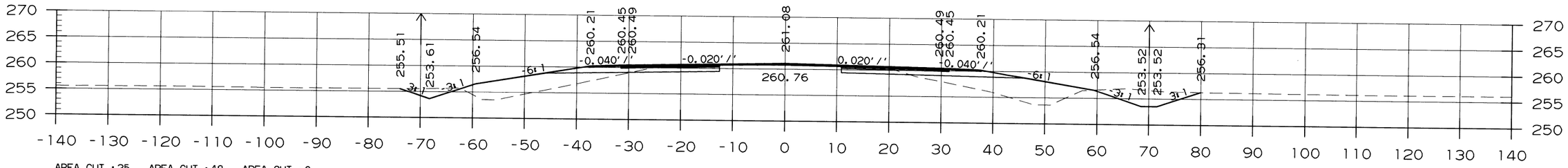
CUT VOL. : 106 CUT VOL. : 188 CUT VOL. : 0
FILL VOL. : 281 FILL VOL. : 341 FILL VOL. : 0




AREA CUT : 26 AREA CUT : 51 AREA CUT : 0
AREA FILL : 76 AREA FILL : 89 AREA FILL : 0

327+00

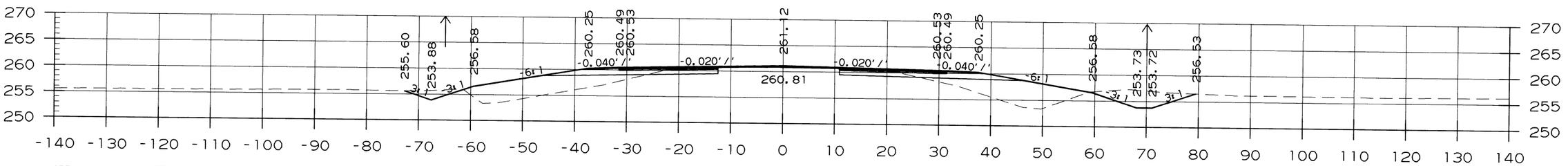
CUT VOL. : 95 CUT VOL. : 183 CUT VOL. : 0
FILL VOL. : 287 FILL VOL. : 332 FILL VOL. : 0




AREA CUT : 25 AREA CUT : 48 AREA CUT : 0
AREA FILL : 80 AREA FILL : 90 AREA FILL : 0

326+00

CUT VOL. : 85 CUT VOL. : 183 CUT VOL. : 0
FILL VOL. : 327 FILL VOL. : 338 FILL VOL. : 0




AREA CUT : 21 AREA CUT : 51 AREA CUT : 0
AREA FILL : 97 AREA FILL : 92 AREA FILL : 0

325+00

CUT VOL. : 80 CUT VOL. : 184 CUT VOL. : 0
FILL VOL. : 352 FILL VOL. : 315 FILL VOL. : 0

# CROSS SECTION
# STA. 325+00 TO STA. 328+00

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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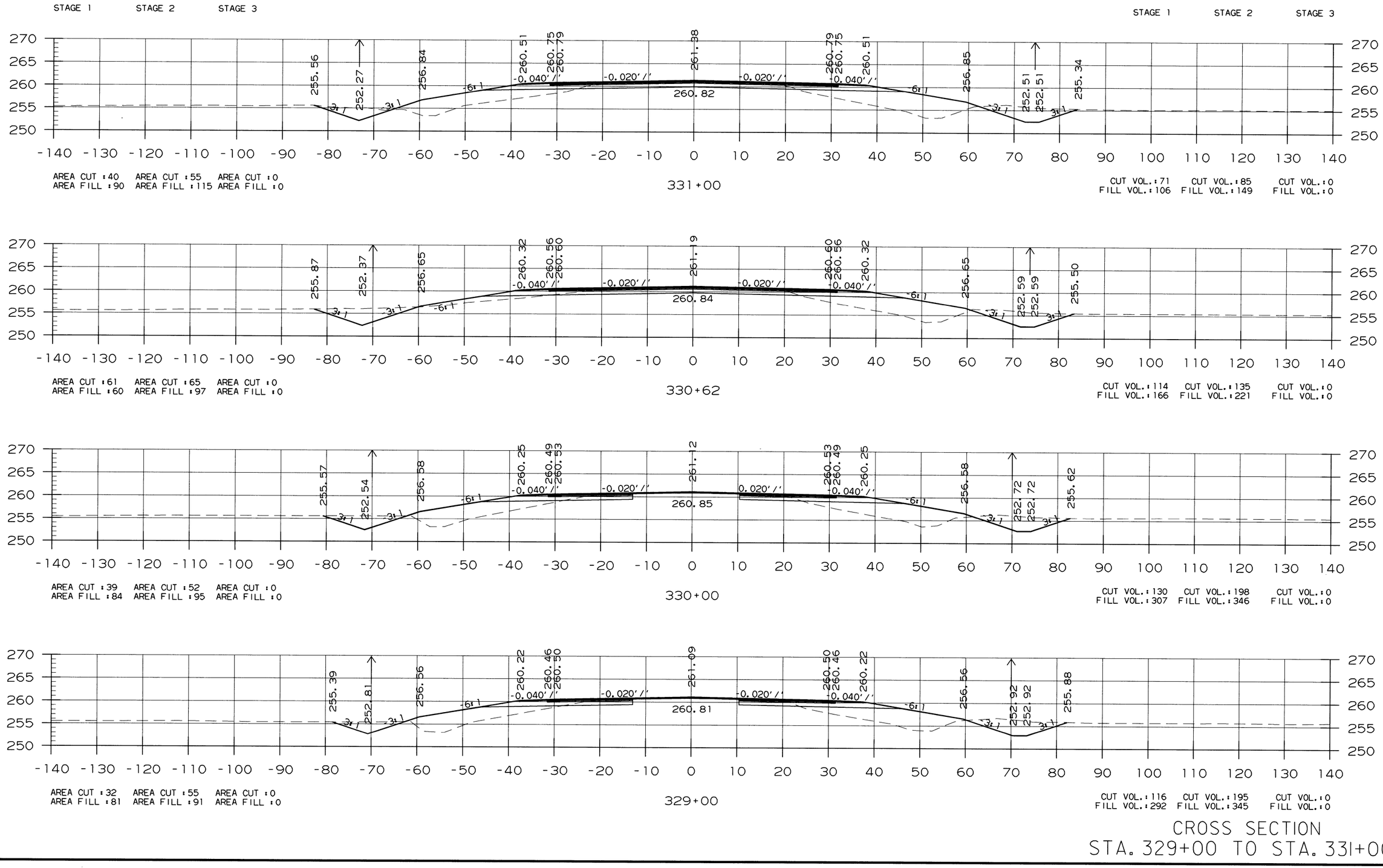
| JOB NO. | | CA1003 | 319 | 503 |

②

CROSS SECTIONS




CROSS SECTION
STA. 329+00 TO STA. 331+00

2/22/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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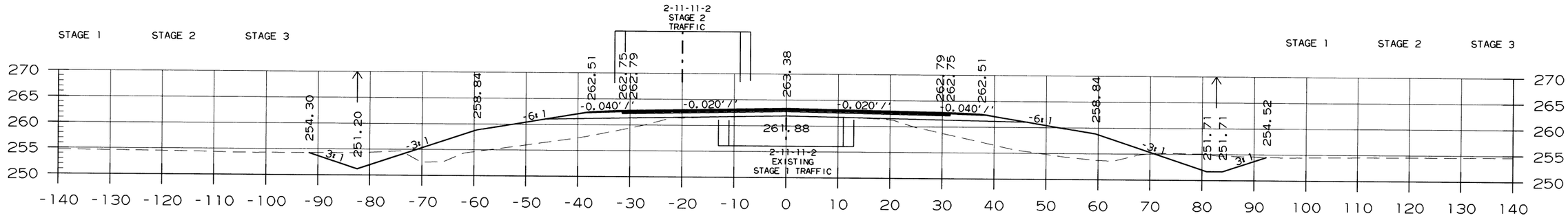
| JOB NO. | | CA1003 | 320 | 503 |

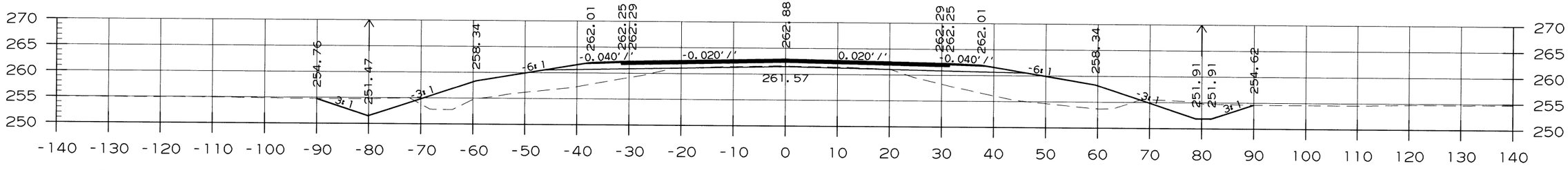
② CROSS SECTIONS




AREA CUT : 31 AREA CUT : 40 AREA CUT : 0
AREA FILL : 173 AREA FILL : 197 AREA FILL : 0

335+00

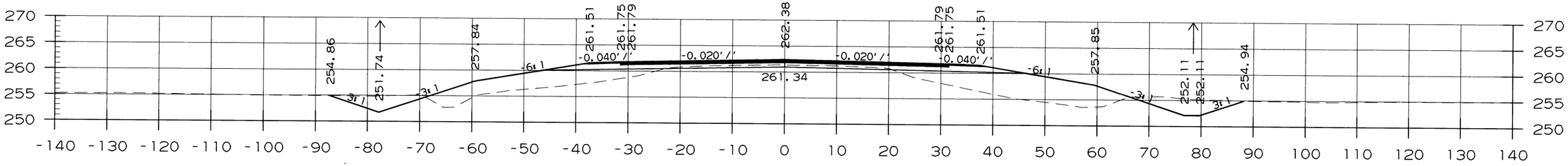
CUT VOL. : 118 CUT VOL. : 145 CUT VOL. : 0
FILL VOL. : 588 FILL VOL. : 698 FILL VOL. : 0




AREA CUT : 33 AREA CUT : 38 AREA CUT : 0
AREA FILL : 144 AREA FILL : 179 AREA FILL : 0

334+00

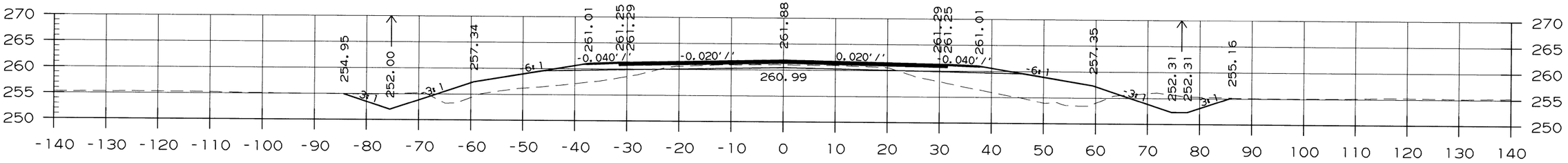
CUT VOL. : 126 CUT VOL. : 154 CUT VOL. : 0
FILL VOL. : 485 FILL VOL. : 628 FILL VOL. : 0




AREA CUT : 35 AREA CUT : 45 AREA CUT : 0
AREA FILL : 117 AREA FILL : 160 AREA FILL : 0

333+00

CUT VOL. : 132 CUT VOL. : 174 CUT VOL. : 0
FILL VOL. : 402 FILL VOL. : 552 FILL VOL. : 0




AREA CUT : 36 AREA CUT : 49 AREA CUT : 0
AREA FILL : 100 AREA FILL : 138 AREA FILL : 0

332+00

CUT VOL. : 141 CUT VOL. : 194 CUT VOL. : 0
FILL VOL. : 351 FILL VOL. : 469 FILL VOL. : 0

## CROSS SECTION
## STA. 332+00 TO STA. 335+00

2/3/2017

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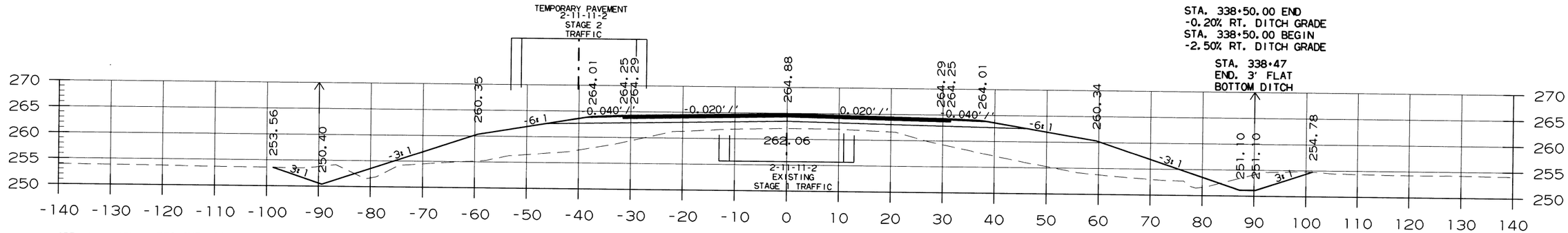
| | | | | JOB NO. | | CA1003 | 321 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

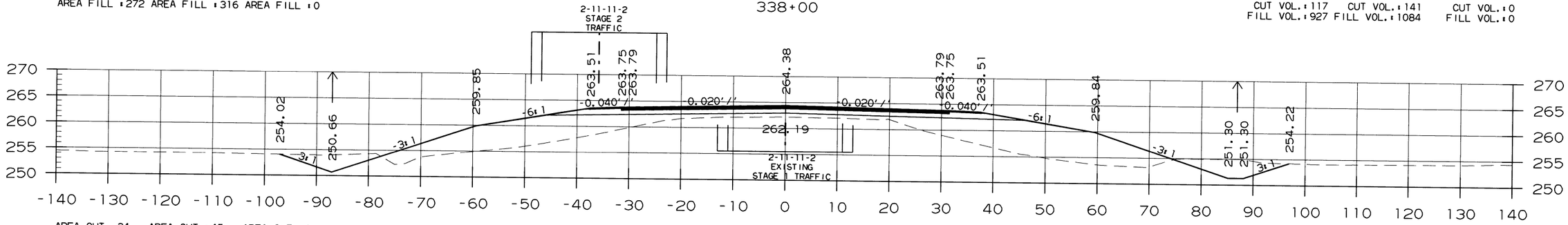
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 29 AREA CUT : 31 AREA CUT : 0
AREA FILL : 272 AREA FILL : 316 AREA FILL : 0

338+00

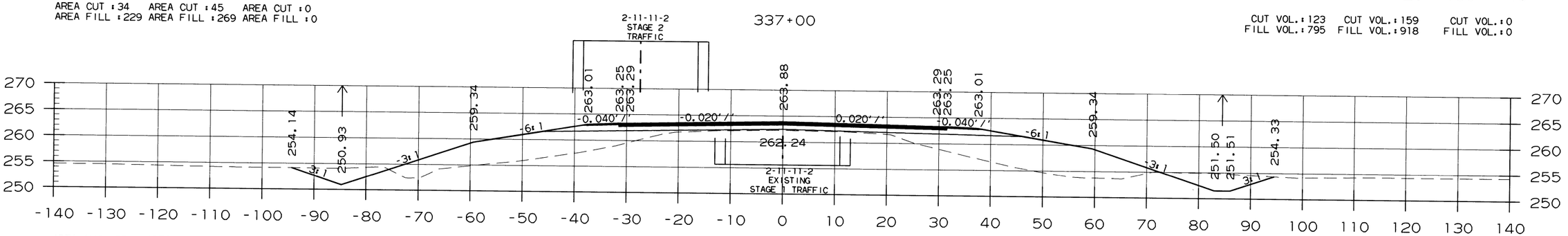
CUT VOL. : 117 CUT VOL. : 141 CUT VOL. : 0
FILL VOL. : 927 FILL VOL. : 1084 FILL VOL. : 0




AREA CUT : 34 AREA CUT : 45 AREA CUT : 0
AREA FILL : 229 AREA FILL : 269 AREA FILL : 0

337+00

CUT VOL. : 123 CUT VOL. : 159 CUT VOL. : 0
FILL VOL. : 795 FILL VOL. : 918 FILL VOL. : 0




AREA CUT : 32 AREA CUT : 41 AREA CUT : 0
AREA FILL : 200 AREA FILL : 227 AREA FILL : 0

336+00

CUT VOL. : 115 CUT VOL. : 150 CUT VOL. : 0
FILL VOL. : 691 FILL VOL. : 785 FILL VOL. : 0

# CROSS SECTION
# STA. 336+00 TO STA. 338+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 322 | 503 |

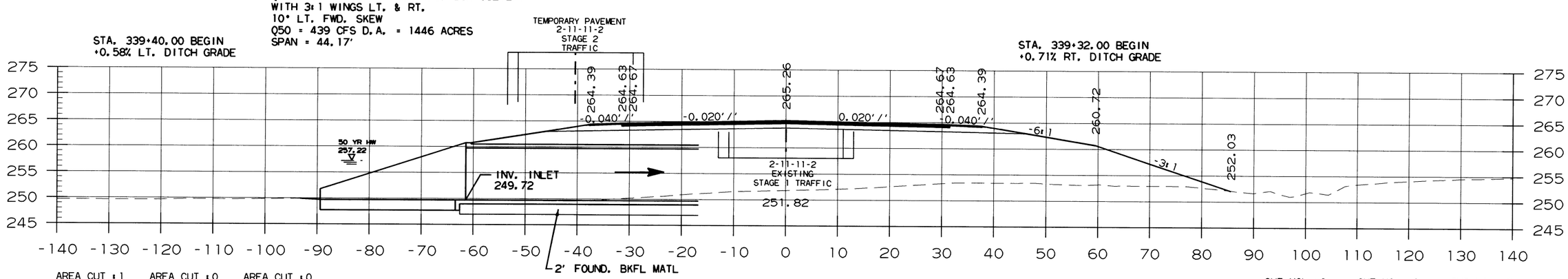
② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STA. 339+06 CONSTRUCT
QUAD. 10' X 10' X 123' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
10° LT. FWD. SKEW
Q50 = 439 CFS D.A. = 1446 ACRES
SPAN = 44.17'

STA. 339+40.00 BEGIN
+0.58% LT. DITCH GRADE

STA. 339+32.00 BEGIN
+0.71% RT. DITCH GRADE

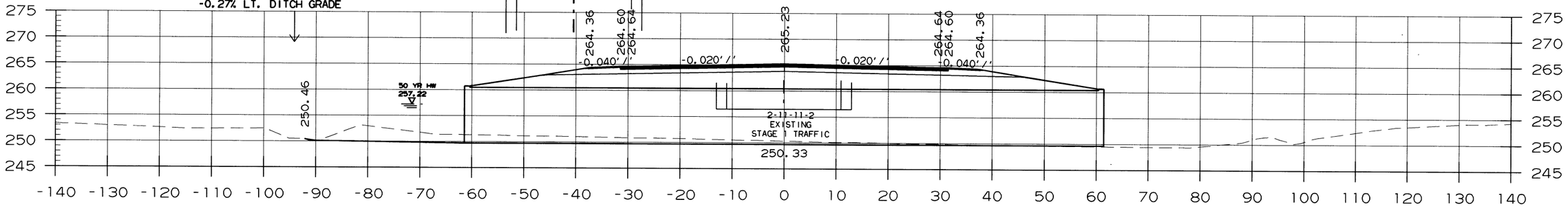



AREA CUT : 1 AREA CUT : 0 AREA CUT : 0
AREA FILL : 846 AREA FILL : 1003 AREA FILL : 0

339+17

CUT VOL. : 0 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 533 FILL VOL. : 631 FILL VOL. : 0

STA. 339+00.00 END
-0.27% LT. DITCH GRADE



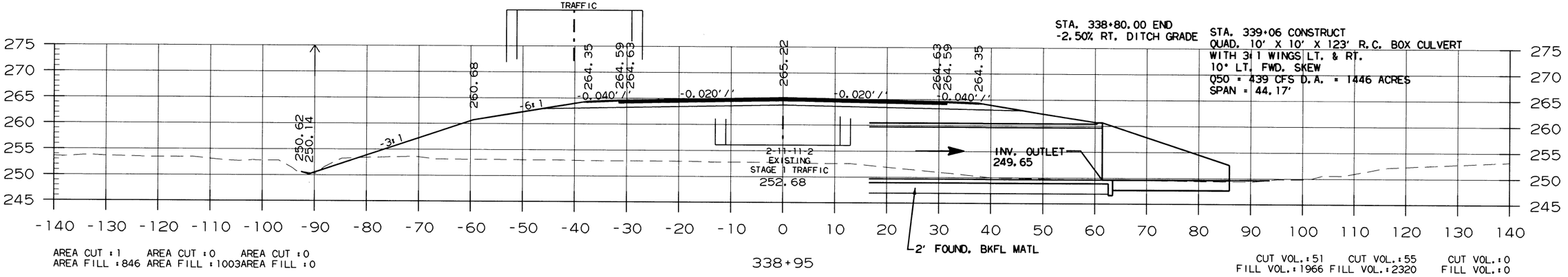

AREA CUT : 1 AREA CUT : 0 AREA CUT : 0
AREA FILL : 846 AREA FILL : 1003 AREA FILL : 0

339+00

CUT VOL. : 0 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 157 FILL VOL. : 186 FILL VOL. : 0

STA. 338+80.00 END
-2.50% RT. DITCH GRADE

STA. 339+06 CONSTRUCT
QUAD. 10' X 10' X 123' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
10° LT. FWD. SKEW
Q50 = 439 CFS D.A. = 1446 ACRES
SPAN = 44.17'




AREA CUT : 1 AREA CUT : 0 AREA CUT : 0
AREA FILL : 846 AREA FILL : 1003 AREA FILL : 0

338+95

CUT VOL. : 51 CUT VOL. : 55 CUT VOL. : 0
FILL VOL. : 1966 FILL VOL. : 2320 FILL VOL. : 0

# CROSS SECTION
# STA. 338+95 TO STA. 339+17

2/3/2017

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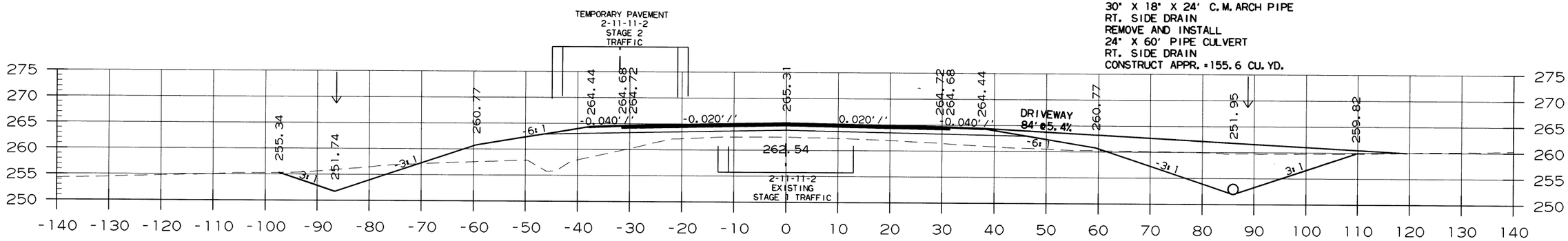
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 323 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

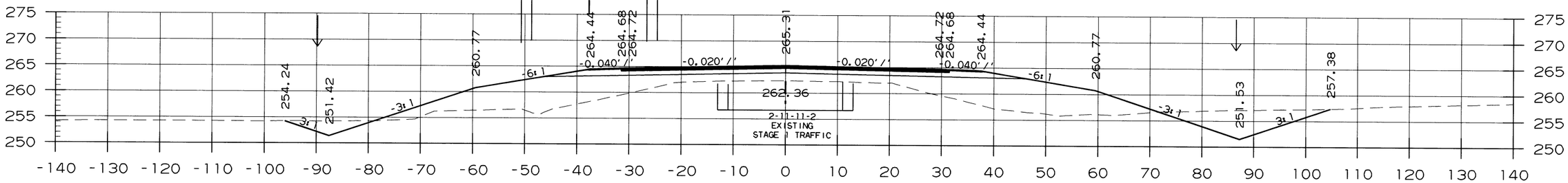
STA. 341+55 IN PLACE
30" X 18" X 24' C.M. ARCH PIPE
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 60' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 155.6 CU. YD.




AREA CUT = 45 AREA CUT = 188 AREA CUT = 0
AREA FILL = 216 AREA FILL = 109 AREA FILL = 0

341+55

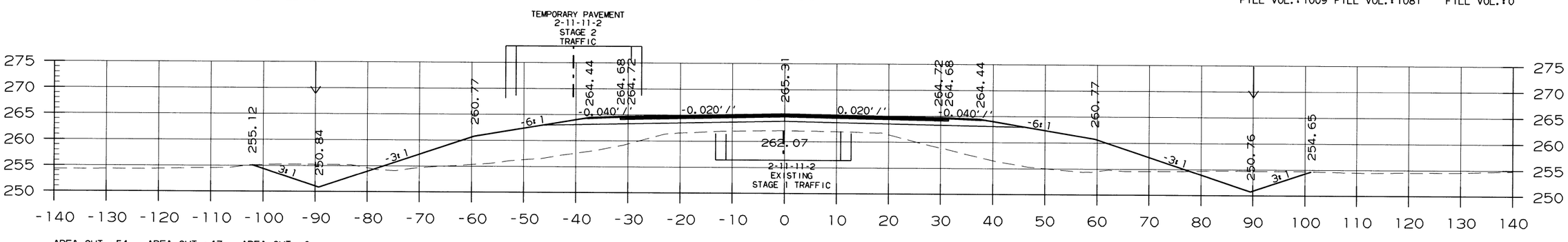
CUT VOL. = 70 CUT VOL. = 285 CUT VOL. = 0
FILL VOL. = 481 FILL VOL. = 373 FILL VOL. = 0




AREA CUT = 24 AREA CUT = 92 AREA CUT = 0
AREA FILL = 256 AREA FILL = 258 AREA FILL = 0

341+00

CUT VOL. = 145 CUT VOL. = 256 CUT VOL. = 0
FILL VOL. = 1009 FILL VOL. = 1081 FILL VOL. = 0




AREA CUT = 54 AREA CUT = 47 AREA CUT = 0
AREA FILL = 289 AREA FILL = 326 AREA FILL = 0

340+00

CUT VOL. = 84 CUT VOL. = 72 CUT VOL. = 0
FILL VOL. = 1744 FILL VOL. = 2043 FILL VOL. = 0

# CROSS SECTION
# STA. 340+00 TO STA. 341+55

2/3/2017

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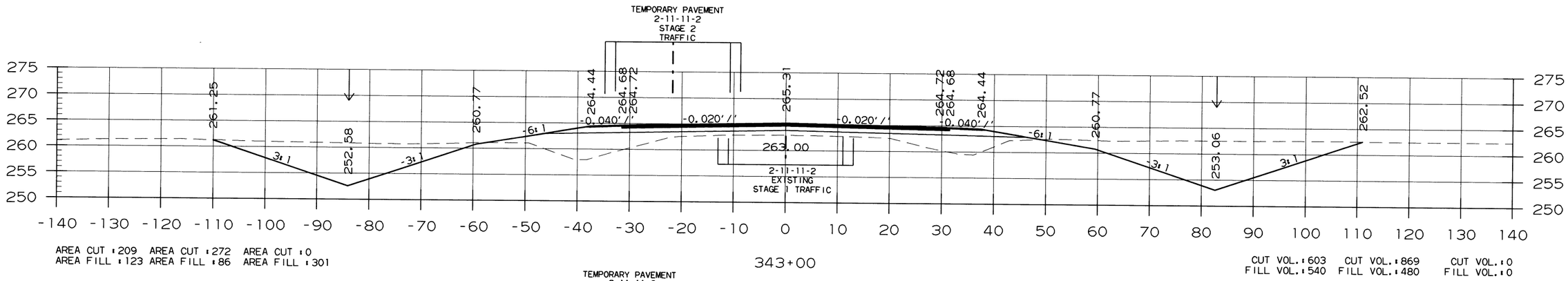
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 324 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

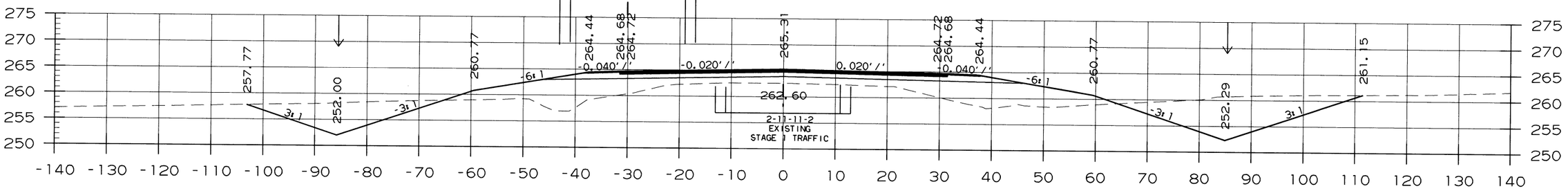
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 209 AREA CUT : 272 AREA CUT : 0
AREA FILL : 123 AREA FILL : 86 AREA FILL : 301

343+00

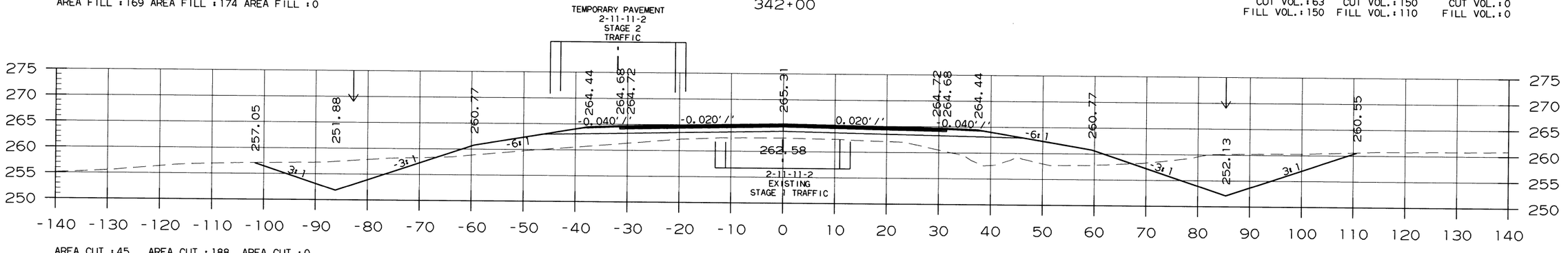
CUT VOL. : 603 CUT VOL. : 869 CUT VOL. : 0
FILL VOL. : 540 FILL VOL. : 480 FILL VOL. : 0




AREA CUT : 117 AREA CUT : 197 AREA CUT : 0
AREA FILL : 169 AREA FILL : 174 AREA FILL : 0

342+00

CUT VOL. : 63 CUT VOL. : 150 CUT VOL. : 0
FILL VOL. : 150 FILL VOL. : 110 FILL VOL. : 0




AREA CUT : 45 AREA CUT : 188 AREA CUT : 0
AREA FILL : 216 AREA FILL : 109 AREA FILL : 0

341+79

CUT VOL. : 40 CUT VOL. : 167 CUT VOL. : 0
FILL VOL. : 192 FILL VOL. : 97 FILL VOL. : 0

# CROSS SECTION
# STA. 341+79 TO STA. 343+00

2/22/2017

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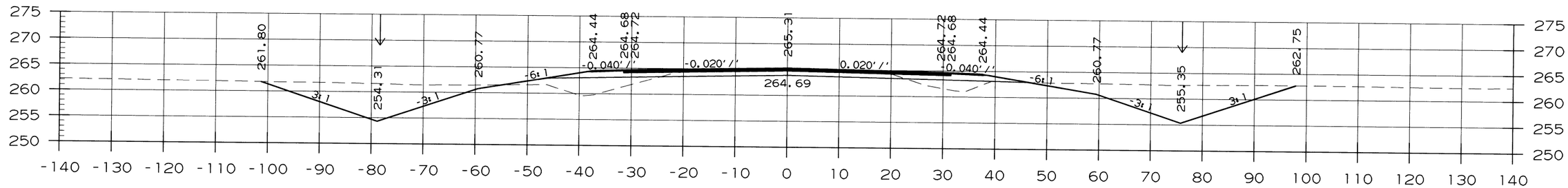
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 325 | 503 |

② CROSS SECTIONS

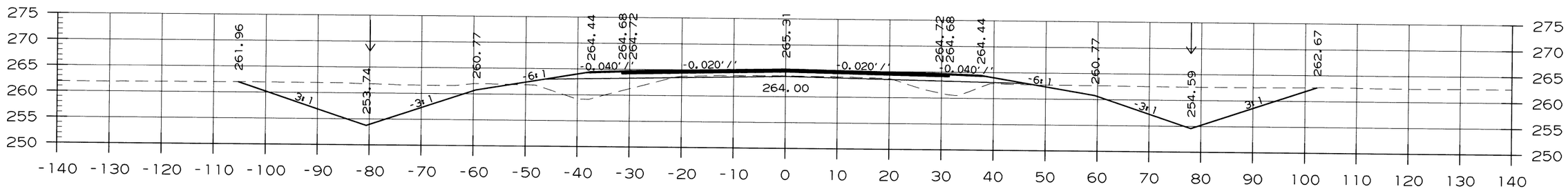
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 177 AREA CUT : 185 AREA CUT : 0
AREA FILL : 55 AREA FILL : 27 AREA FILL : 0

346+00

CUT VOL. : 696 CUT VOL. : 710 CUT VOL. : 0
FILL VOL. : 226 FILL VOL. : 118 FILL VOL. : 0

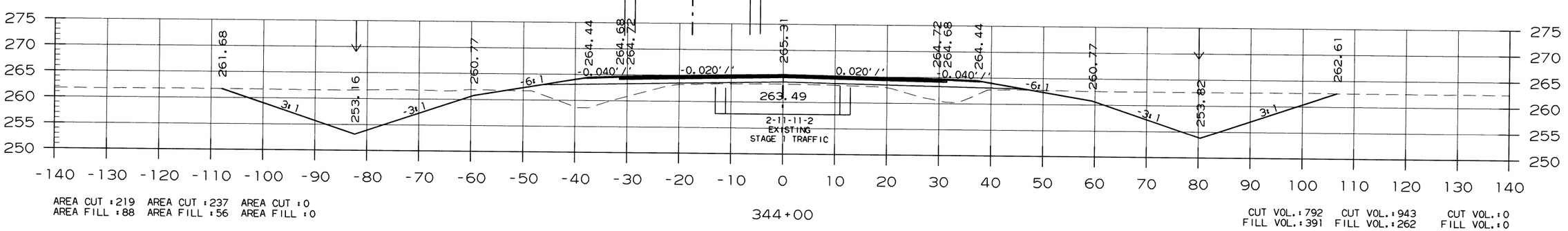



AREA CUT : 199 AREA CUT : 199 AREA CUT : 0
AREA FILL : 67 AREA FILL : 37 AREA FILL : 0

TEMPORARY PAVEMENT
2-11-11-2
STAGE 2
TRAFFIC

345+00

CUT VOL. : 775 CUT VOL. : 808 CUT VOL. : 0
FILL VOL. : 287 FILL VOL. : 172 FILL VOL. : 0




AREA CUT : 219 AREA CUT : 237 AREA CUT : 0
AREA FILL : 88 AREA FILL : 56 AREA FILL : 0

344+00

CUT VOL. : 792 CUT VOL. : 943 CUT VOL. : 0
FILL VOL. : 391 FILL VOL. : 262 FILL VOL. : 0

# CROSS SECTION
# STA. 344+00 TO STA. 346+00

2/3/2017

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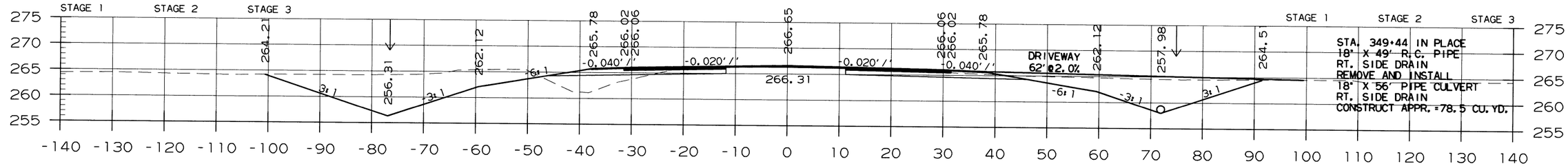
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 326 | 503 |

②

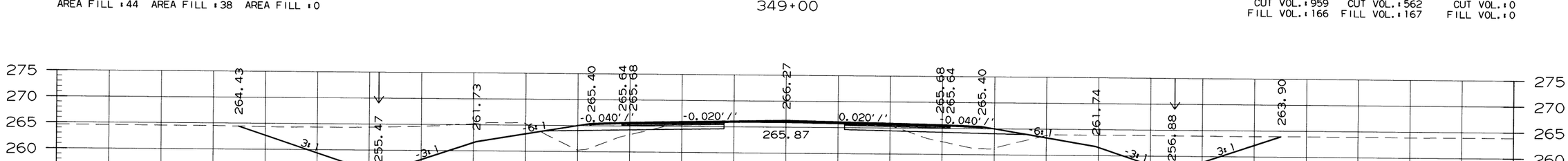
CROSS SECTIONS




AREA CUT : 227 AREA CUT : 160 AREA CUT : 0
AREA FILL : 42 AREA FILL : 2 AREA FILL : 0

349+44

CUT VOL. : 382 CUT VOL. : 244 CUT VOL. : 0
FILL VOL. : 70 FILL VOL. : 32 FILL VOL. : 0




AREA CUT : 243 AREA CUT : 140 AREA CUT : 0
AREA FILL : 44 AREA FILL : 38 AREA FILL : 0

349+00

CUT VOL. : 959 CUT VOL. : 562 CUT VOL. : 0
FILL VOL. : 166 FILL VOL. : 167 FILL VOL. : 0

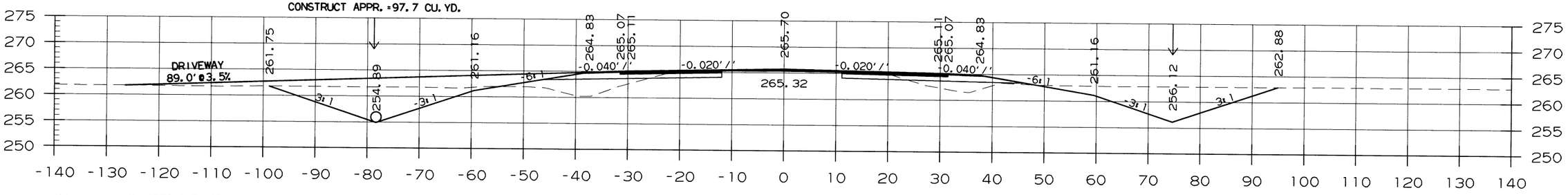



AREA CUT : 275 AREA CUT : 164 AREA CUT : 0
AREA FILL : 46 AREA FILL : 52 AREA FILL : 0

348+00

CUT VOL. : 792 CUT VOL. : 583 CUT VOL. : 0
FILL VOL. : 181 FILL VOL. : 153 FILL VOL. : 0

STA. 347+50 INSTALL
24" X 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =97.7 CU. YD.




AREA CUT : 153 AREA CUT : 151 AREA CUT : 0
AREA FILL : 52 AREA FILL : 30 AREA FILL : 0

347+00

CUT VOL. : 610 CUT VOL. : 622 CUT VOL. : 0
FILL VOL. : 199 FILL VOL. : 106 FILL VOL. : 0

# CROSS SECTION
# STA. 347+00 TO STA. 349+44

2/22/2017

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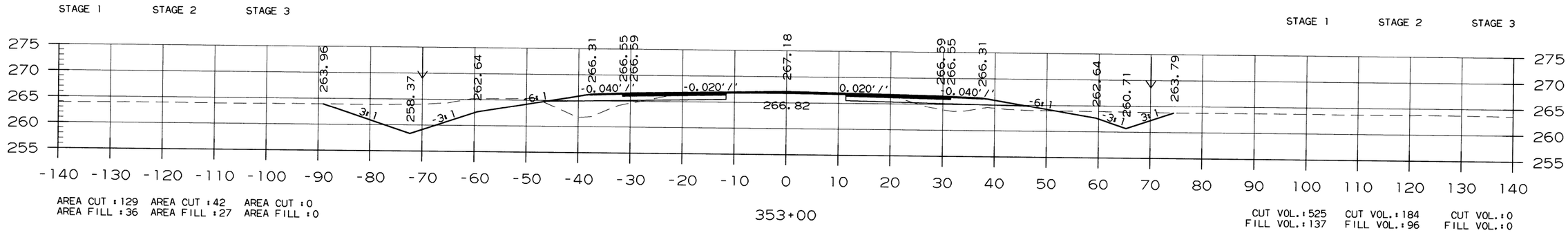
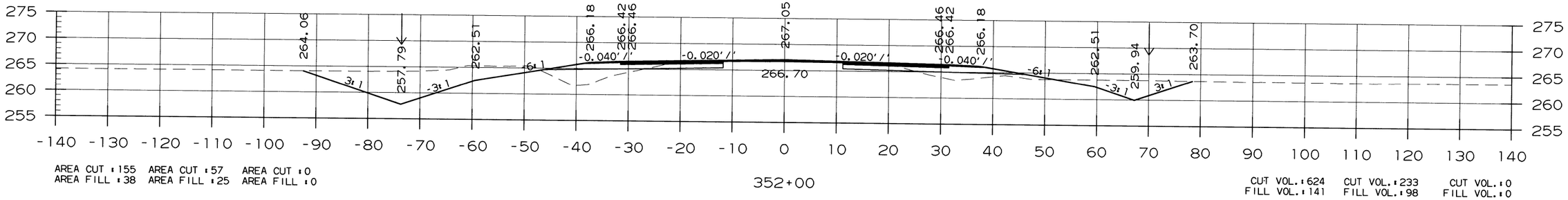
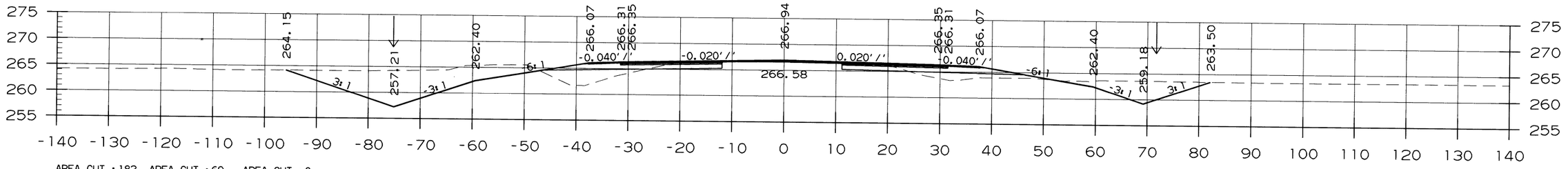
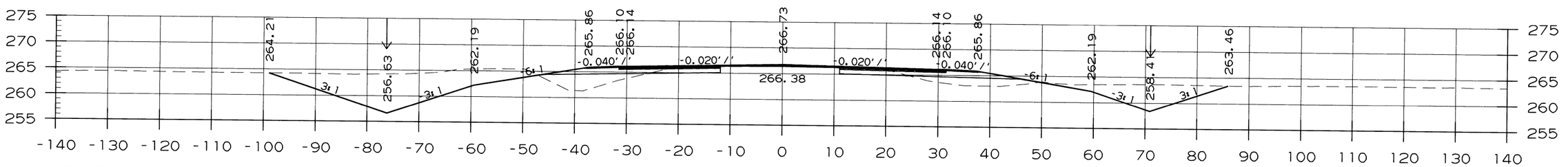
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 327 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 350+00 TO STA. 353+00

2/3/2017

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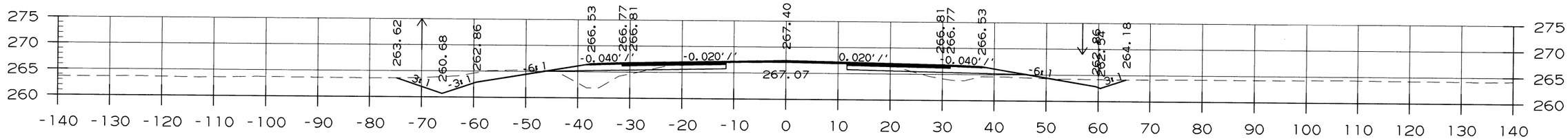
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 328 | 503 |

② CROSS SECTIONS

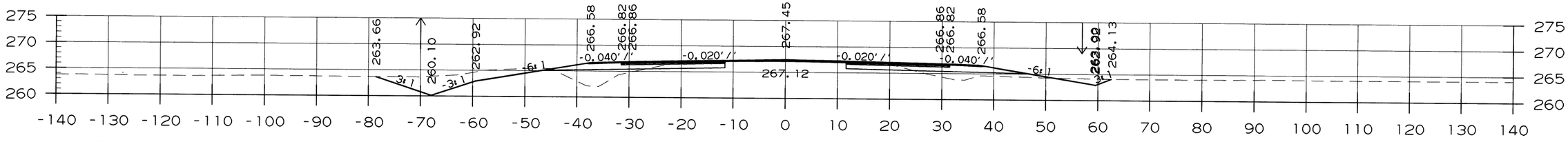
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 57 AREA CUT : 21 AREA CUT : 0
AREA FILL : 34 AREA FILL : 25 AREA FILL : 0

357+00

CUT VOL. : 234 CUT VOL. : 68 CUT VOL. : 0
FILL VOL. : 124 FILL VOL. : 95 FILL VOL. : 0

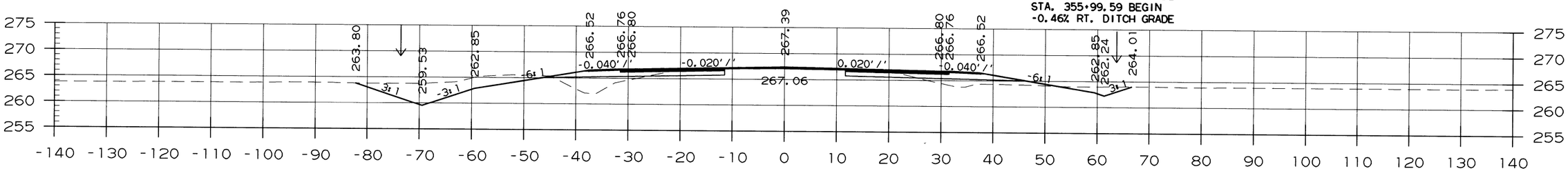



AREA CUT : 89 AREA CUT : 16 AREA CUT : 0
AREA FILL : 50 AREA FILL : 26 AREA FILL : 0

356+00

CUT VOL. : 290 CUT VOL. : 69 CUT VOL. : 0
FILL VOL. : 121 FILL VOL. : 98 FILL VOL. : 0

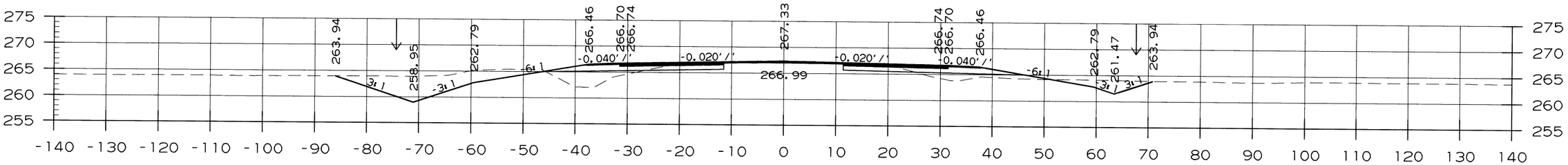
STA. 355+99.59 END
+0.71% RT. DITCH GRADE
STA. 355+99.59 BEGIN
-0.46% RT. DITCH GRADE




AREA CUT : 88 AREA CUT : 21 AREA CUT : 0
AREA FILL : 32 AREA FILL : 27 AREA FILL : 0

355+00

CUT VOL. : 362 CUT VOL. : 101 CUT VOL. : 0
FILL VOL. : 126 FILL VOL. : 95 FILL VOL. : 0




AREA CUT : 108 AREA CUT : 33 AREA CUT : 0
AREA FILL : 36 AREA FILL : 25 AREA FILL : 0

354+00

CUT VOL. : 439 CUT VOL. : 140 CUT VOL. : 0
FILL VOL. : 134 FILL VOL. : 96 FILL VOL. : 0

# CROSS SECTION
# STA. 354+00 TO STA. 357+00

2/3/2017

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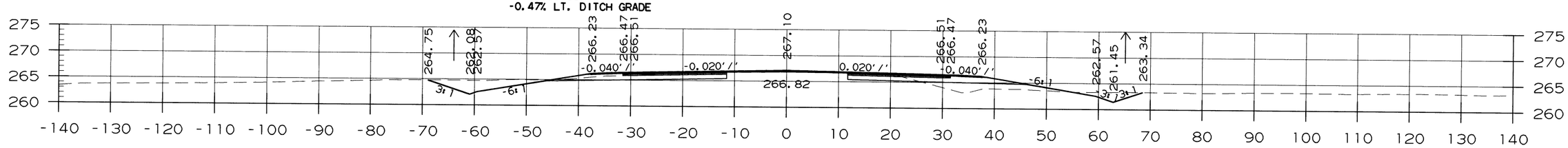
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 329 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

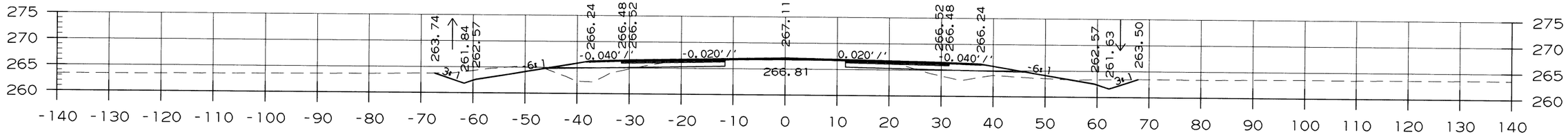
STA. 359+53.47 END
+0.58% LT. DITCH GRADE
STA. 359+53.47 BEGIN
-0.47% LT. DITCH GRADE




AREA CUT : 52 AREA CUT : 23 AREA CUT : 0
AREA FILL : 1 AREA FILL : 34 AREA FILL : 0

359+41

CUT VOL. : 69 CUT VOL. : 34 CUT VOL. : 0
FILL VOL. : 27 FILL VOL. : 51 FILL VOL. : 0

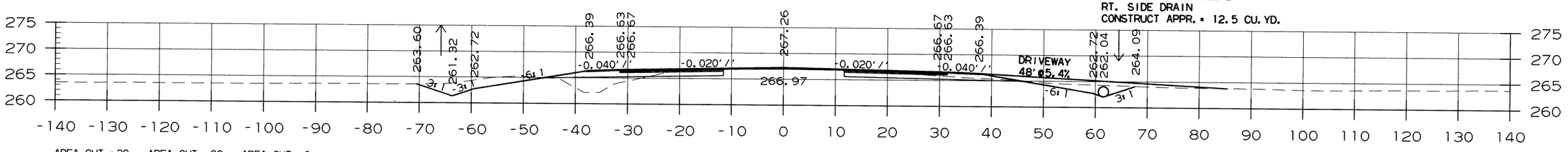



AREA CUT : 39 AREA CUT : 22 AREA CUT : 0
AREA FILL : 34 AREA FILL : 33 AREA FILL : 0

359+00

STA. 358+10 IN PLACE
24" X 23' C.M. PIPE
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 36' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 12.5 CU. YD.

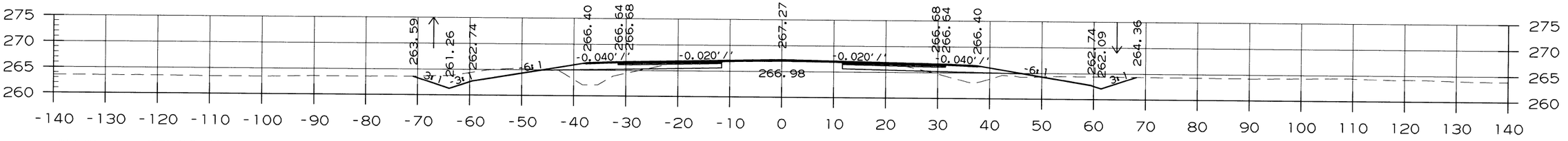
CUT VOL. : 140 CUT VOL. : 91 CUT VOL. : 0
FILL VOL. : 112 FILL VOL. : 97 FILL VOL. : 0




AREA CUT : 39 AREA CUT : 33 AREA CUT : 0
AREA FILL : 34 AREA FILL : 25 AREA FILL : 0

358+10

CUT VOL. : 17 CUT VOL. : 12 CUT VOL. : 0
FILL VOL. : 12 FILL VOL. : 9 FILL VOL. : 0




AREA CUT : 45 AREA CUT : 33 AREA CUT : 0
AREA FILL : 34 AREA FILL : 25 AREA FILL : 0

358+00

CUT VOL. : 189 CUT VOL. : 99 CUT VOL. : 0
FILL VOL. : 126 FILL VOL. : 92 FILL VOL. : 0

# CROSS SECTION
# STA. 358+00 TO STA. 359+41

2/22/2017

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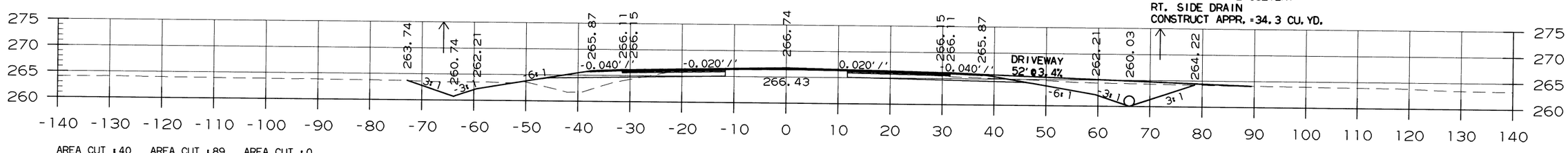
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 330 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

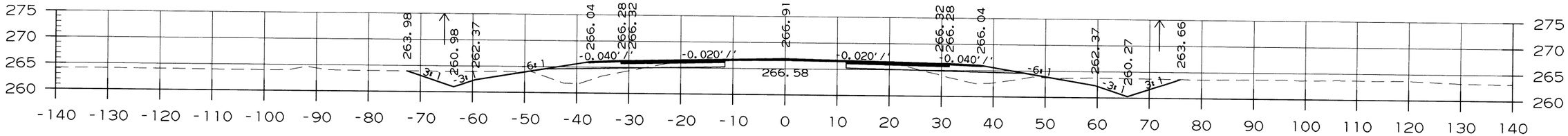
STA. 362+52 IN PLACE
24' X 44' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24' X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =34.3 CU. YD.




AREA CUT : 40 AREA CUT : 89 AREA CUT : 0
AREA FILL : 43 AREA FILL : 1 AREA FILL : 0

362+52

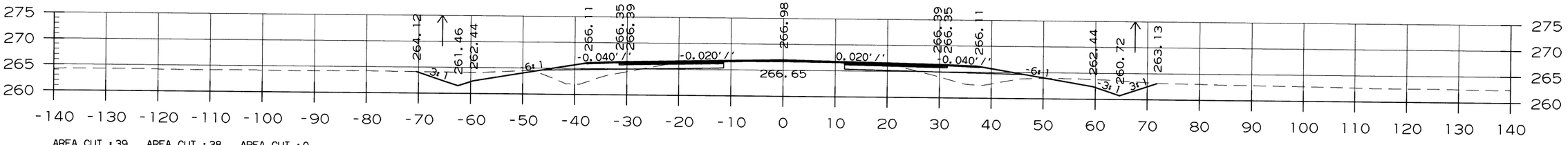
CUT VOL. : 80 CUT VOL. : 134 CUT VOL. : 0
FILL VOL. : 80 FILL VOL. : 35 FILL VOL. : 0




AREA CUT : 43 AREA CUT : 50 AREA CUT : 0
AREA FILL : 41 AREA FILL : 36 AREA FILL : 0

362+00

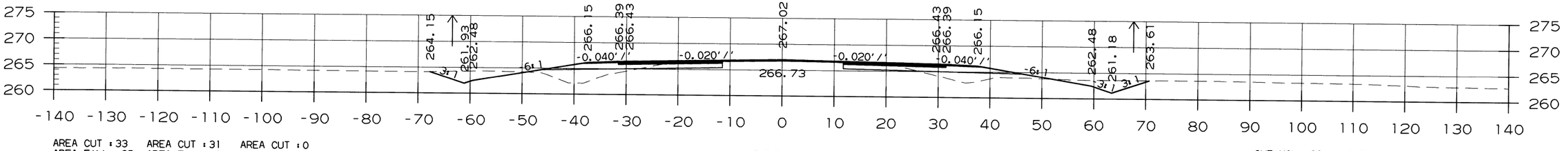
CUT VOL. : 152 CUT VOL. : 164 CUT VOL. : 0
FILL VOL. : 142 FILL VOL. : 137 FILL VOL. : 0




AREA CUT : 39 AREA CUT : 38 AREA CUT : 0
AREA FILL : 36 AREA FILL : 38 AREA FILL : 0

361+00

CUT VOL. : 133 CUT VOL. : 129 CUT VOL. : 0
FILL VOL. : 130 FILL VOL. : 126 FILL VOL. : 0




AREA CUT : 33 AREA CUT : 31 AREA CUT : 0
AREA FILL : 35 AREA FILL : 30 AREA FILL : 0

360+00

CUT VOL. : 92 CUT VOL. : 60 CUT VOL. : 0
FILL VOL. : 39 FILL VOL. : 69 FILL VOL. : 0

# CROSS SECTION
# STA. 360+00 TO STA. 362+52

2/3/2017

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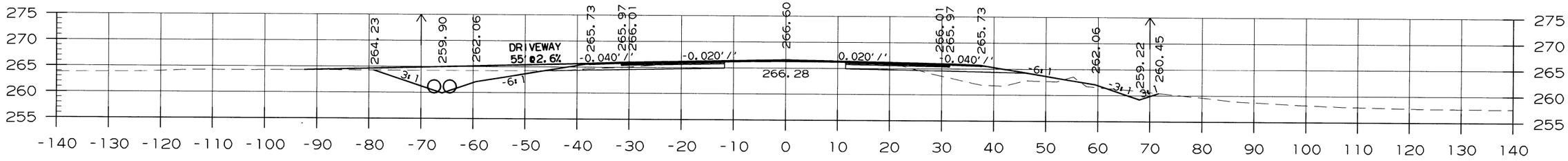
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 331 | 503 |

②

# CROSS SECTIONS

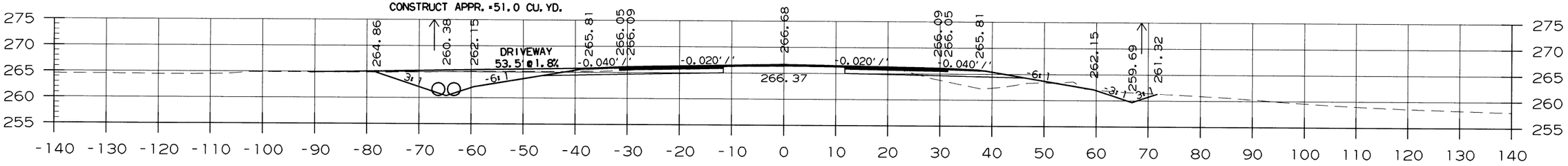
STA. 364+30 IN PLACE
24' X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 30" X 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =35.1 CU. YD.




AREA CUT : 43 AREA CUT : 17 AREA CUT : 0
AREA FILL : 59 AREA FILL : 56 AREA FILL : 0

364+30

CUT VOL. : 51 CUT VOL. : 26 CUT VOL. : 0
FILL VOL. : 60 FILL VOL. : 56 FILL VOL. : 0




AREA CUT : 49 AREA CUT : 30 AREA CUT : 0
AREA FILL : 49 AREA FILL : 44 AREA FILL : 0

364+00

CUT VOL. : 131 CUT VOL. : 67 CUT VOL. : 0
FILL VOL. : 122 FILL VOL. : 117 FILL VOL. : 0

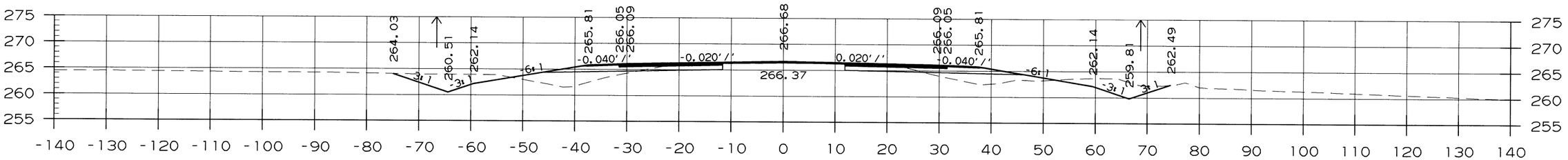
STA. 363+28 IN PLACE
24' X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 30" X 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =51.0 CU. YD.




AREA CUT : 49 AREA CUT : 20 AREA CUT : 0
AREA FILL : 43 AREA FILL : 44 AREA FILL : 0

363+28

CUT VOL. : 51 CUT VOL. : 35 CUT VOL. : 0
FILL VOL. : 44 FILL VOL. : 40 FILL VOL. : 0




AREA CUT : 50 AREA CUT : 46 AREA CUT : 0
AREA FILL : 43 AREA FILL : 33 AREA FILL : 0

363+00

CUT VOL. : 80 CUT VOL. : 120 CUT VOL. : 0
FILL VOL. : 76 FILL VOL. : 31 FILL VOL. : 0

## CROSS SECTION
## STA. 363+00 TO STA. 364+30

2/3/2017

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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 |
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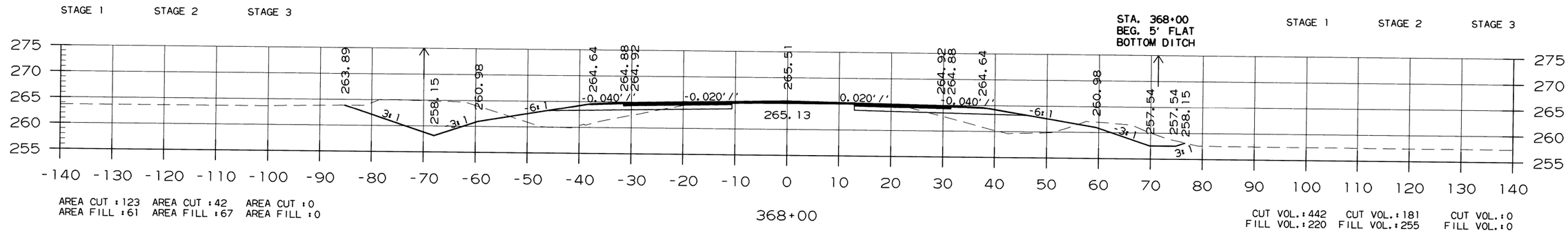
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 332 | 503 |

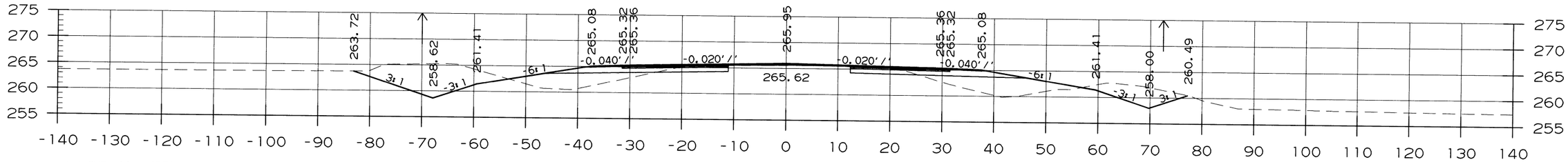
② CROSS SECTIONS




AREA CUT : 123 AREA CUT : 42 AREA CUT : 0
AREA FILL : 61 AREA FILL : 67 AREA FILL : 0

368+00

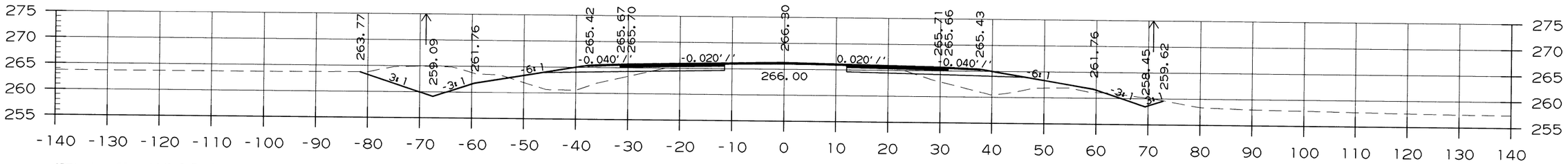
CUT VOL. : 442 CUT VOL. : 181 CUT VOL. : 0
FILL VOL. : 220 FILL VOL. : 255 FILL VOL. : 0




AREA CUT : 11 AREA CUT : 56 AREA CUT : 0
AREA FILL : 58 AREA FILL : 71 AREA FILL : 0

367+00

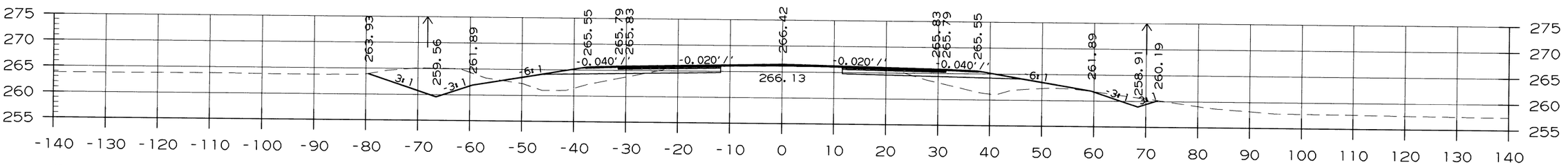
CUT VOL. : 389 CUT VOL. : 143 CUT VOL. : 0
FILL VOL. : 216 FILL VOL. : 261 FILL VOL. : 0




AREA CUT : 95 AREA CUT : 21 AREA CUT : 21
AREA FILL : 59 AREA FILL : 70 AREA FILL : 70

366+00

CUT VOL. : 332 CUT VOL. : 81 CUT VOL. : 0
FILL VOL. : 207 FILL VOL. : 233 FILL VOL. : 0




AREA CUT : 84 AREA CUT : 22 AREA CUT : 0
AREA FILL : 53 AREA FILL : 56 AREA FILL : 66

365+00

CUT VOL. : 165 CUT VOL. : 52 CUT VOL. : 0
FILL VOL. : 145 FILL VOL. : 146 FILL VOL. : 0

# CROSS SECTION
# STA. 365+00 TO STA. 368+00

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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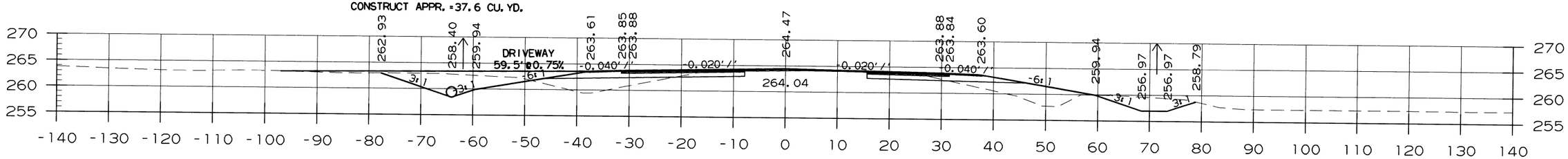
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 333 | 503 |

②

CROSS SECTIONS

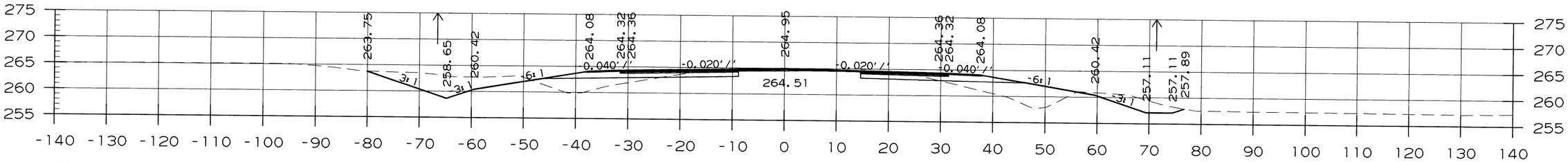
STA. 371+00 IN PLACE
27" X 18" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =37.6 CU. YD.




AREA CUT : 71 AREA CUT : 44 AREA CUT : 0
AREA FILL : 56 AREA FILL : 57 AREA FILL : 0

371+00

CUT VOL. : 277 CUT VOL. : 137 CUT VOL. : 0
FILL VOL. : 189 FILL VOL. : 248 FILL VOL. : 0

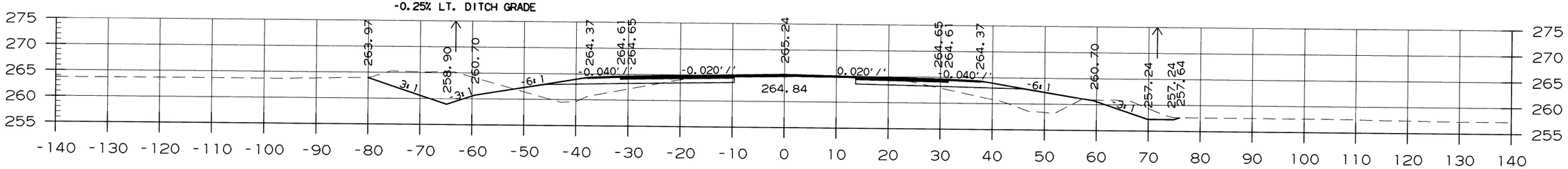



AREA CUT : 78 AREA CUT : 40 AREA CUT : 0
AREA FILL : 46 AREA FILL : 65 AREA FILL : 0

370+00

CUT VOL. : 335 CUT VOL. : 137 CUT VOL. : 0
FILL VOL. : 189 FILL VOL. : 248 FILL VOL. : 0

STA. 369+00.00 END
+2.13% LT. DITCH GRADE
STA. 369+00.00 BEGIN
-0.25% LT. DITCH GRADE




AREA CUT : 103 AREA CUT : 34 AREA CUT : 0
AREA FILL : 57 AREA FILL : 69 AREA FILL : 0

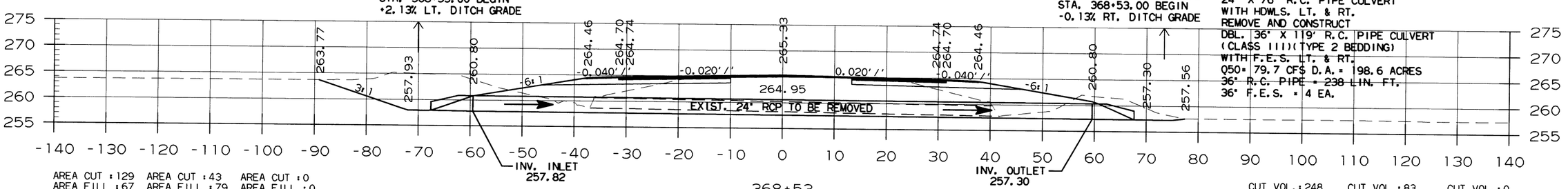
369+00

CUT VOL. : 202 CUT VOL. : 67 CUT VOL. : 0
FILL VOL. : 108 FILL VOL. : 129 FILL VOL. : 0

STA. 368+53.00 END
-0.47% LT. DITCH GRADE
STA. 368+53.00 BEGIN
+2.13% LT. DITCH GRADE

STA. 368+53.00 END
-0.46% RT. DITCH GRADE
STA. 368+53.00 BEGIN
-0.13% RT. DITCH GRADE

STA. 368+53 IN PLACE
24" X 76' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE AND CONSTRUCT
DBL. 36" X 119' R.C. PIPE CULVERT
(CLASS III)(TYPE 2 BEDDING)
WITH F.E.S. LT. & RT.
Q50= 79.7 CFS D.A. = 198.6 ACRES
36" R.C. PIPE = 238 LIN. FT.
36" F.E.S. = 4 EA.




AREA CUT : 129 AREA CUT : 43 AREA CUT : 0
AREA FILL : 67 AREA FILL : 79 AREA FILL : 0

368+53

CUT VOL. : 248 CUT VOL. : 83 CUT VOL. : 0
FILL VOL. : 126 FILL VOL. : 143 FILL VOL. : 0

# CROSS SECTION
# STA. 368+53 TO STA. 371+00

2/3/2017

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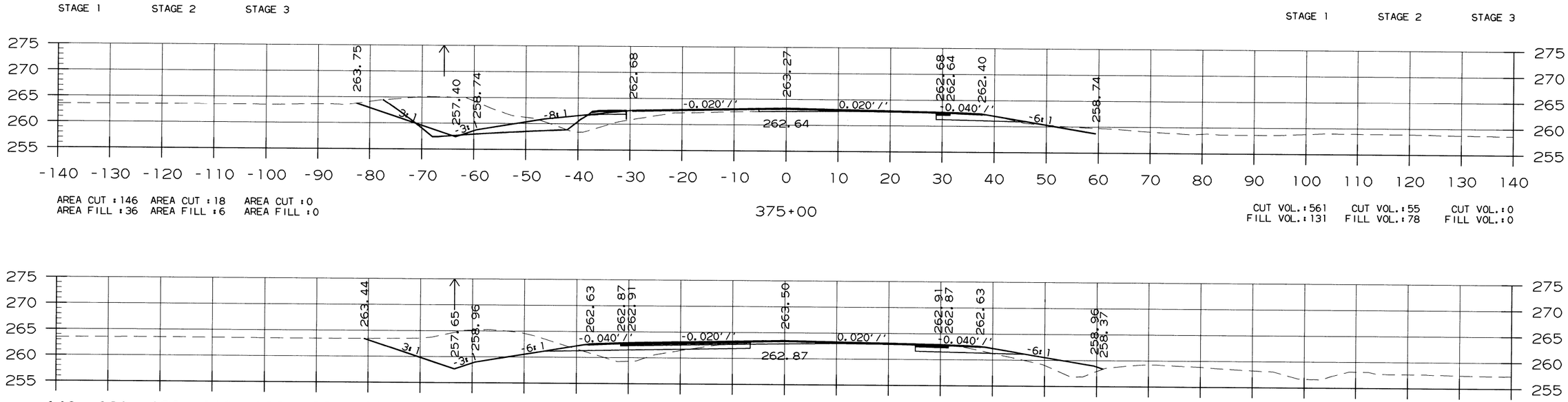
| | | | | ② | | CROSS SECTIONS | | |




# CROSS SECTION
# STA. 372+00 TO STA. 375+00

2/3/2017

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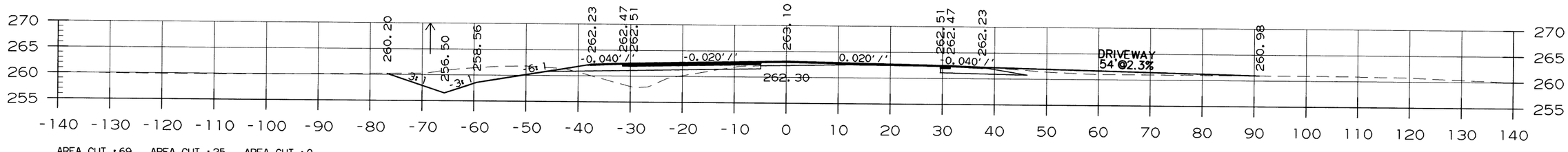
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 335 | 503 |

② CROSS SECTIONS

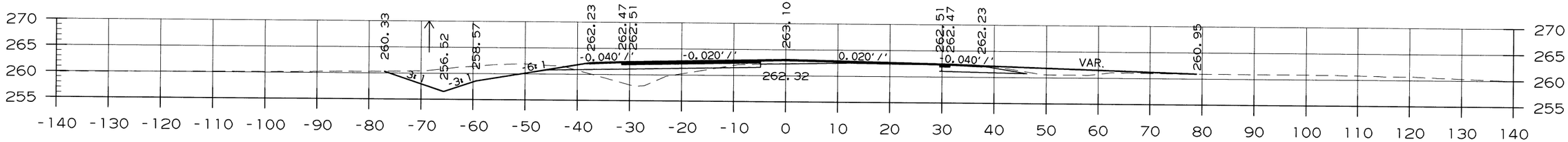
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 69 AREA CUT : 25 AREA CUT : 0
AREA FILL : 63 AREA FILL : 7 AREA FILL : 0

377+13

CUT VOL. : 36 CUT VOL. : 13 CUT VOL. : 0
FILL VOL. : 28 FILL VOL. : 3 FILL VOL. : 0



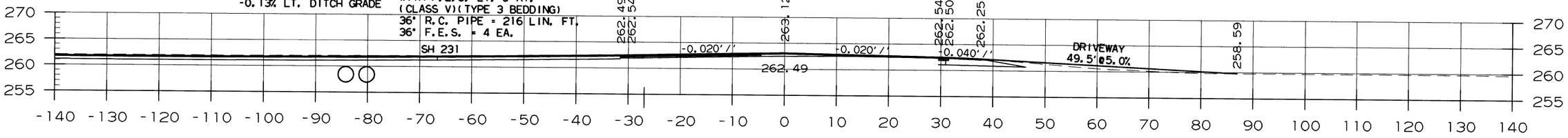

AREA CUT : 79 AREA CUT : 28 AREA CUT : 0
AREA FILL : 53 AREA FILL : 6 AREA FILL : 0

377+00

CUT VOL. : 393 CUT VOL. : 114 CUT VOL. : 0
FILL VOL. : 107 FILL VOL. : 21 FILL VOL. : 0

STA. 376+37.21 END
-0.86% LT. DITCH GRADE
STA. 376+37.21 BEGIN
-0.13% LT. DITCH GRADE

STA. 10+83 IN PLACE
30" X 65' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE AND CONSTRUCT
DBL. 36" X 108' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS V)(TYPE 3 BEDDING)
36" R.C. PIPE = 216 LIN. FT.
36" F.E.S. = 4 EA.

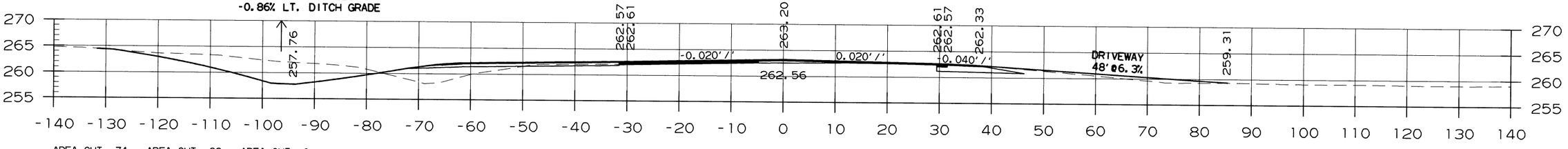



AREA CUT : 133 AREA CUT : 34 AREA CUT : 0
AREA FILL : 4 AREA FILL : 5 AREA FILL : 0

376+00

CUT VOL. : 215 CUT VOL. : 69 CUT VOL. : 0
FILL VOL. : 58 FILL VOL. : 10 FILL VOL. : 0

STA. 375+60.32 END
-0.25% LT. DITCH GRADE
STA. 375+60.32 BEGIN
-0.86% LT. DITCH GRADE




AREA CUT : 74 AREA CUT : 33 AREA CUT : 0
AREA FILL : 51 AREA FILL : 5 AREA FILL : 0

375+44

CUT VOL. : 180 CUT VOL. : 42 CUT VOL. : 0
FILL VOL. : 71 FILL VOL. : 9 FILL VOL. : 0

# CROSS SECTION
# STA. 375+44 TO STA. 377+13

2/3/2017

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| | | | | 10 | ARK. | | | |
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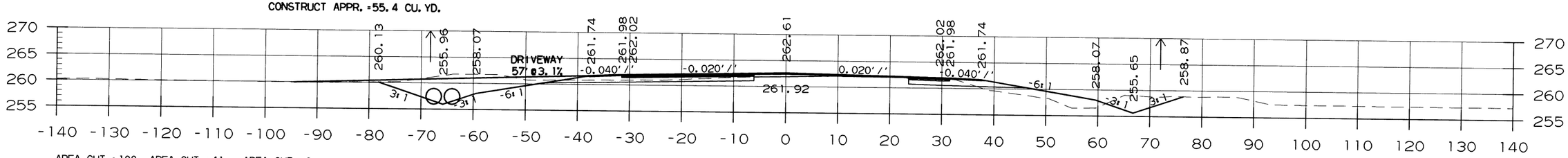
② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

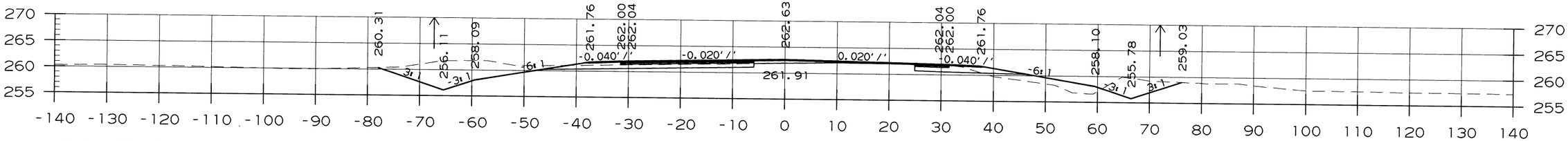
STA. 379+55 INSTALL
DBL. 36" X 60' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =55.4 CU. YD.




379+55

AREA CUT = 100 AREA CUT = 41 AREA CUT = 0
AREA FILL = 9 AREA FILL = 45 AREA FILL = 0

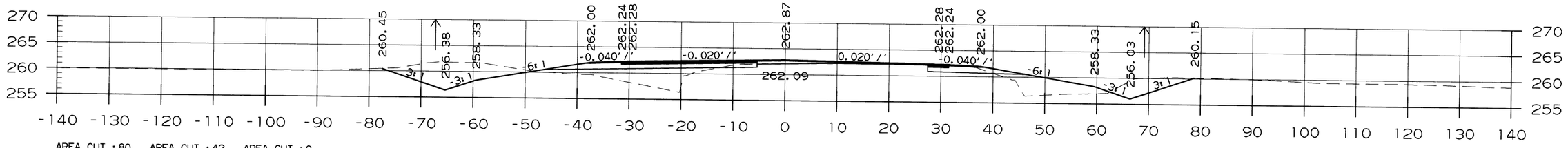
CUT VOL. = 213 CUT VOL. = 85 CUT VOL. = 0
FILL VOL. = 12 FILL VOL. = 80 FILL VOL. = 0




379+00

AREA CUT = 109 AREA CUT = 42 AREA CUT = 0
AREA FILL = 3 AREA FILL = 34 AREA FILL = 0

CUT VOL. = 352 CUT VOL. = 156 CUT VOL. = 0
FILL VOL. = 141 FILL VOL. = 163 FILL VOL. = 0




378+00

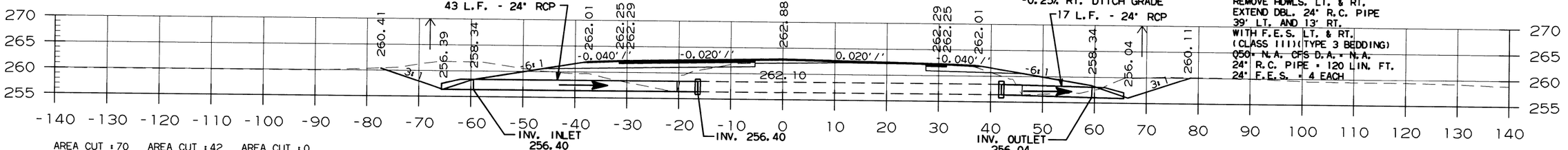
AREA CUT = 80 AREA CUT = 42 AREA CUT = 0
AREA FILL = 73 AREA FILL = 54 AREA FILL = 0

CUT VOL. = 12 CUT VOL. = 6 CUT VOL. = 0
FILL VOL. = 11 FILL VOL. = 8 FILL VOL. = 0

STA. 377+95.00 END
-0.13% LT. DITCH GRADE
STA. 376+37.21 BEGIN
-0.27% LT. DITCH GRADE
43 L.F. - 24" RCP

STA. 377+95.00 BEGIN
-0.25% RT. DITCH GRADE
17 L.F. - 24" RCP

STA. 377+96 IN PLACE
DBL. 24" X 64' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT.
EXTEND DBL. 24" R.C. PIPE
39' LT. AND 13' RT.
WITH F.E.S. LT. & RT.
(CLASS III)(TYPE 3 BEDDING)
050= N.A. CFS D.A.= N.A.
24" R.C. PIPE = 120 LIN. FT.
24" F.E.S. = 4 EACH




INV. INLET 256.40
INV. 256.40
INV. OUTLET 256.04

377+96

AREA CUT = 70 AREA CUT = 42 AREA CUT = 0
AREA FILL = 73 AREA FILL = 54 AREA FILL = 0

CUT VOL. = 230 CUT VOL. = 103 CUT VOL. = 0
FILL VOL. = 210 FILL VOL. = 94 FILL VOL. = 0

# CROSS SECTION
# STA. 377+96 TO STA. 379+55

2/3/2017

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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 |
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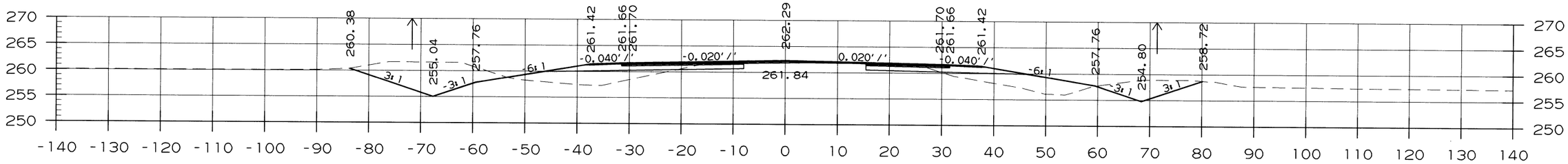
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

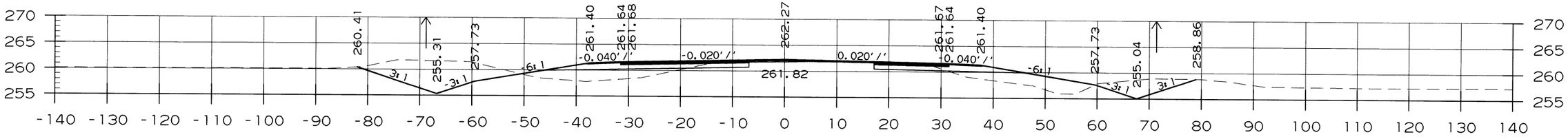



AREA CUT : 117 AREA CUT : 55 AREA CUT : 0
AREA FILL : 63 AREA FILL : 62 AREA FILL : 0

383+00

CUT VOL. : 425 CUT VOL. : 193 CUT VOL. : 0
FILL VOL. : 216 FILL VOL. : 217 FILL VOL. : 0

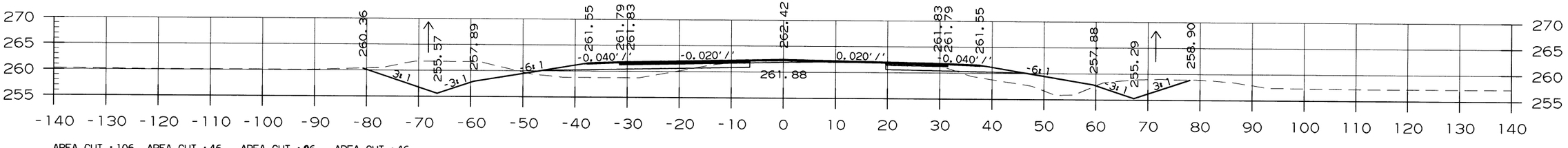
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 113 AREA CUT : 49 AREA CUT : 0
AREA FILL : 54 AREA FILL : 55 AREA FILL : 0

382+00

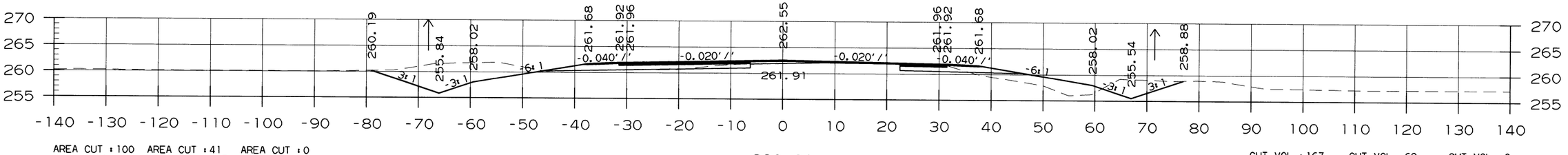
CUT VOL. : 405 CUT VOL. : 177 CUT VOL. : 0
FILL VOL. : 183 FILL VOL. : 203 FILL VOL. : 0




AREA CUT : 106 AREA CUT : 46 AREA CUT : 06 AREA CUT : 46
AREA FILL : 45 AREA FILL : 54 AREA FILL : 0

381+00

CUT VOL. : 381 CUT VOL. : 162 CUT VOL. : 0
FILL VOL. : 99 FILL VOL. : 184 FILL VOL. : 0




AREA CUT : 100 AREA CUT : 41 AREA CUT : 0
AREA FILL : 9 AREA FILL : 45 AREA FILL : 0

380+00

CUT VOL. : 167 CUT VOL. : 69 CUT VOL. : 0
FILL VOL. : 14 FILL VOL. : 75 FILL VOL. : 0

# CROSS SECTION
# STA. 380+00 TO STA. 383+00

2/3/2017

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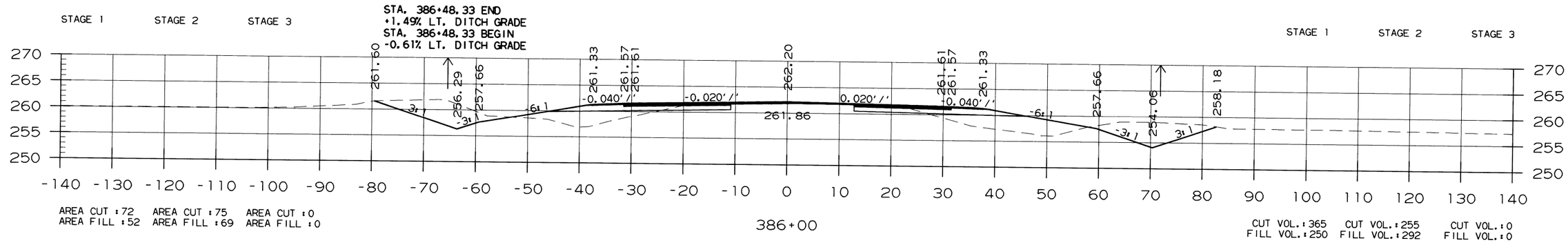
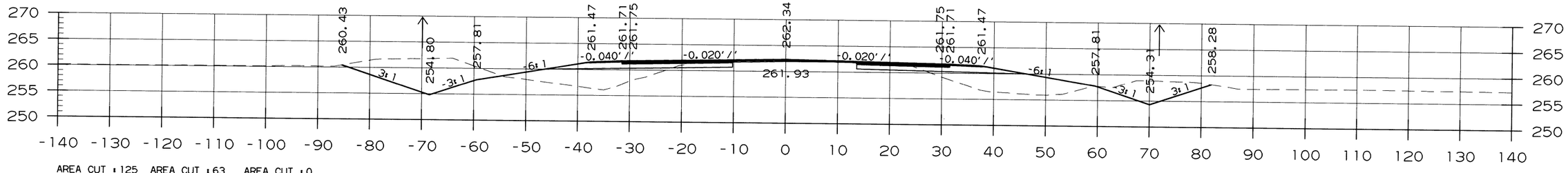
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 338 | 503 |

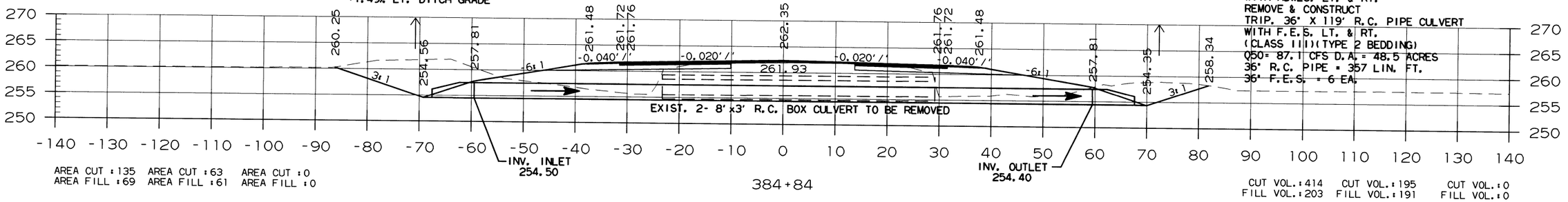
② CROSS SECTIONS

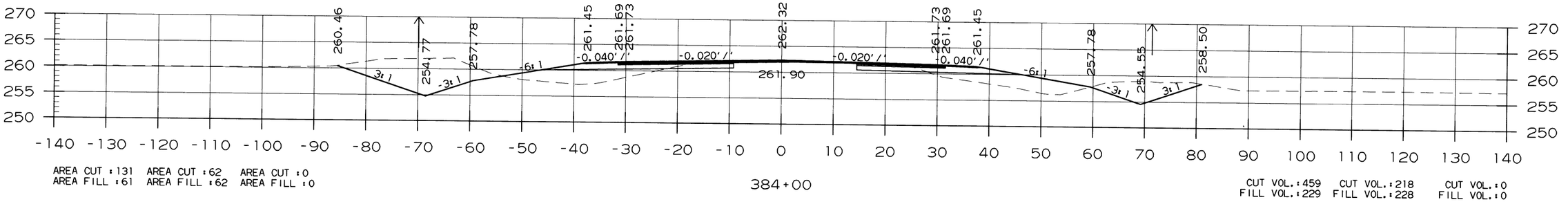



STA. 384+83.00 END
-0.27% LT. DITCH GRADE
STA. 384+83.00 BEGIN
+1.49% LT. DITCH GRADE

STA. 384+84 IN PLACE
DBL. 8' X 3' X 52' R.C. BOX CULVERT
WITH HDWLS. LT. & RT.
REMOVE & CONSTRUCT
TRIP. 36" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III)(TYPE 2 BEDDING)
Q50= 87.1 CFS D.A.= 48.5 ACRES
36" R.C. PIPE = 357 LIN. FT.
36" F.E.S. = 6 EA.




# CROSS SECTION
# STA. 384+00 TO STA. 386+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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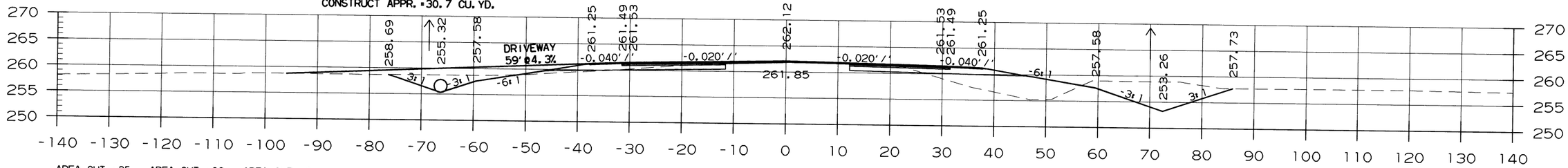
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 339 | 503 |

② CROSS SECTIONS

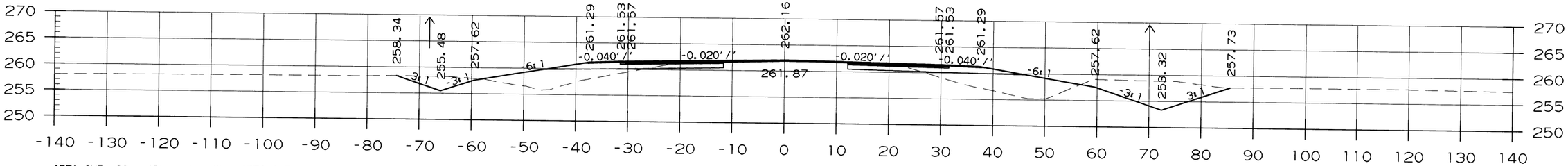
STA. 389+27 IN PLACE
24" X 33' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =30.7 CU. YD.




AREA CUT =35 AREA CUT =98 AREA CUT =0
AREA FILL =65 AREA FILL =83 AREA FILL =0

389+27

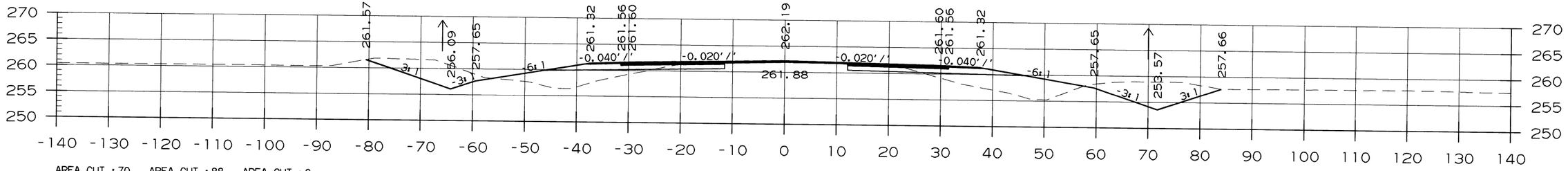
CUT VOL.=33 CUT VOL.=97 CUT VOL.=0
FILL VOL.=71 FILL VOL.=83 FILL VOL.=0




AREA CUT =30 AREA CUT =96 AREA CUT =0
AREA FILL =77 AREA FILL =83 AREA FILL =0

389+00

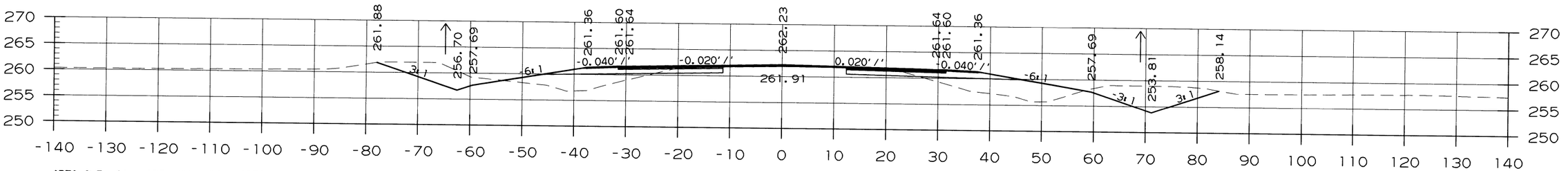
CUT VOL.=187 CUT VOL.=340 CUT VOL.=0
FILL VOL.=259 FILL VOL.=303 FILL VOL.=0




AREA CUT =70 AREA CUT =88 AREA CUT =0
AREA FILL =63 AREA FILL =80 AREA FILL =0

388+00

CUT VOL.=241 CUT VOL.=317 CUT VOL.=0
FILL VOL.=226 FILL VOL.=291 FILL VOL.=0




AREA CUT =60 AREA CUT =84 AREA CUT =0
AREA FILL =59 AREA FILL =77 AREA FILL =0

387+00

CUT VOL.=245 CUT VOL.=294 CUT VOL.=0
FILL VOL.=206 FILL VOL.=271 FILL VOL.=0

# CROSS SECTION
# STA. 387+00 TO STA. 389+27

2/3/2017

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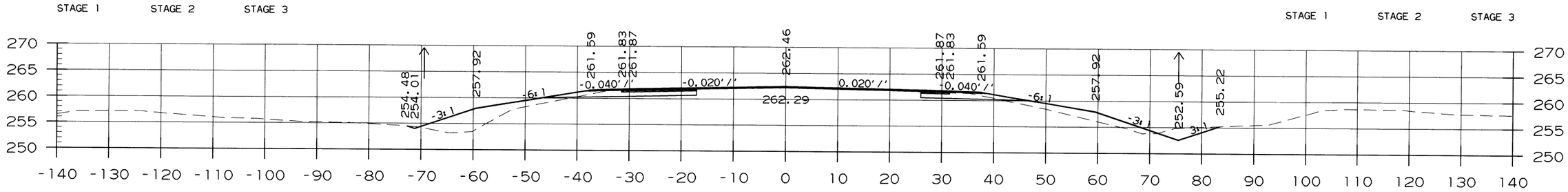
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 340 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

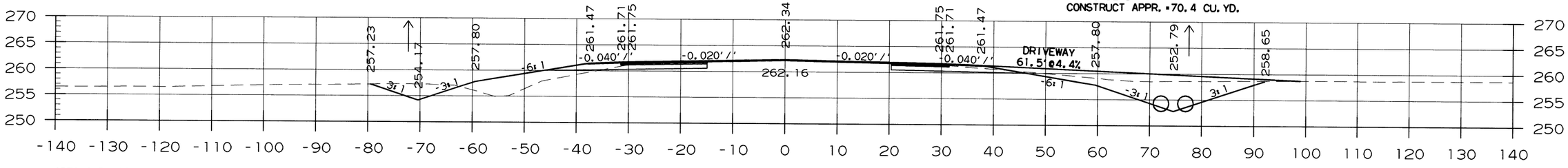



AREA CUT : 22 AREA CUT : 25 AREA CUT : 0
AREA FILL : 72 AREA FILL : 35 AREA FILL : 0

392+00

STA. 391+16 IN PLACE
30" X 28' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =70.4 CU. YD.

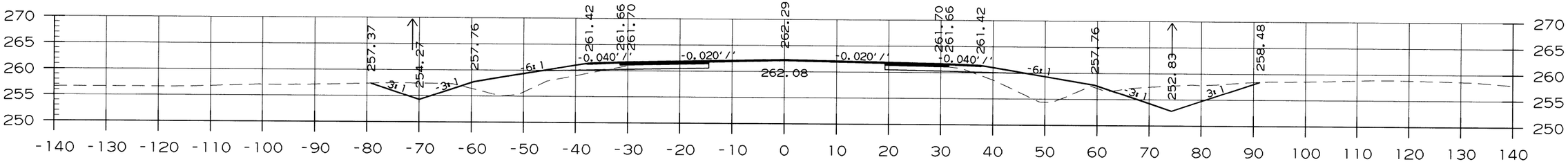
CUT VOL. : 93 CUT VOL. : 95 CUT VOL. : 0
FILL VOL. : 191 FILL VOL. : 146 FILL VOL. : 0




AREA CUT : 44 AREA CUT : 36 AREA CUT : 0
AREA FILL : 59 AREA FILL : 58 AREA FILL : 0

391+16

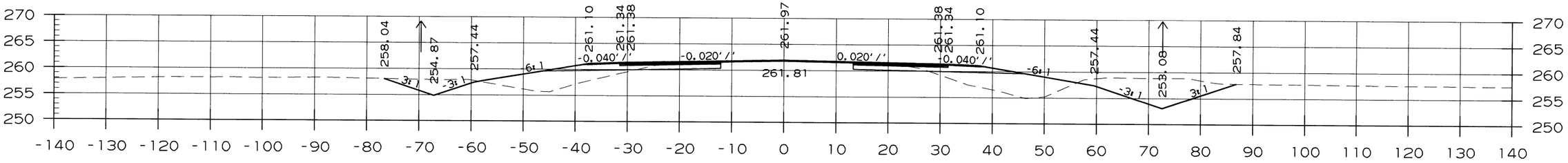
CUT VOL. : 24 CUT VOL. : 35 CUT VOL. : 0
FILL VOL. : 33 FILL VOL. : 37 FILL VOL. : 0




AREA CUT : 44 AREA CUT : 83 AREA CUT : 0
AREA FILL : 59 AREA FILL : 68 AREA FILL : 0

391+00

CUT VOL. : 155 CUT VOL. : 344 CUT VOL. : 0
FILL VOL. : 233 FILL VOL. : 271 FILL VOL. : 0




AREA CUT : 40 AREA CUT : 103 AREA CUT : 0
AREA FILL : 67 AREA FILL : 78 AREA FILL : 0

390+00

CUT VOL. : 102 CUT VOL. : 272 CUT VOL. : 0
FILL VOL. : 178 FILL VOL. : 218 FILL VOL. : 0

# CROSS SECTION
# STA. 390+00 TO STA. 392+00

2/3/2017

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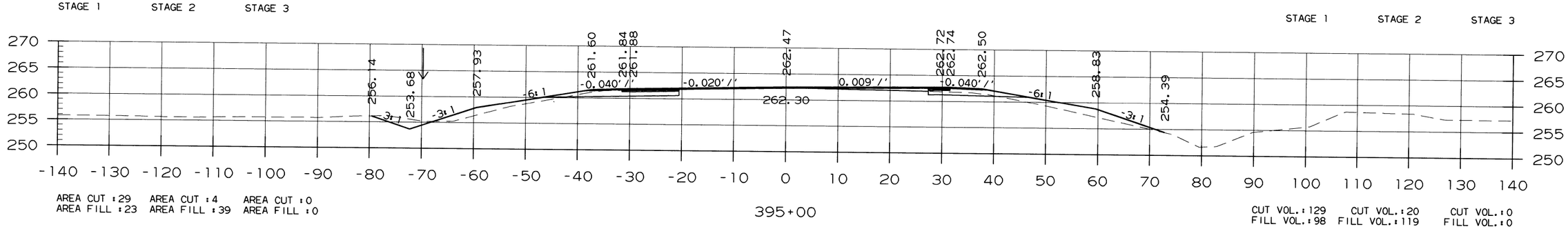
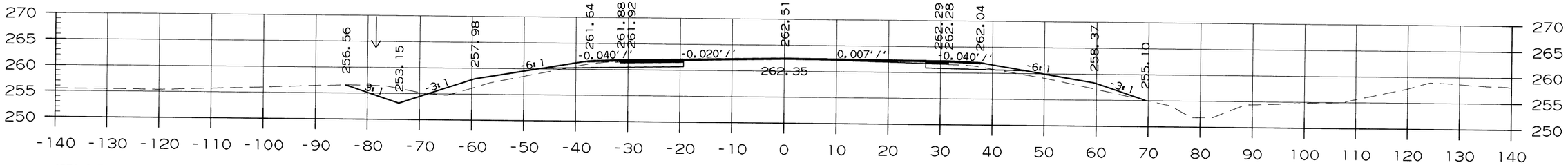
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 341 | 503 |

② CROSS SECTIONS

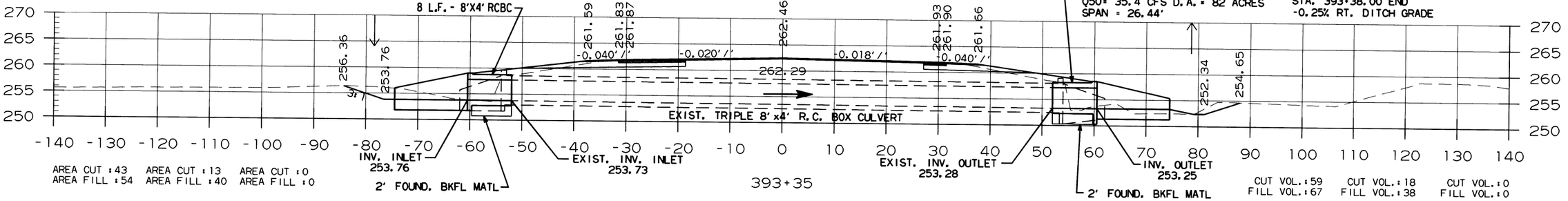


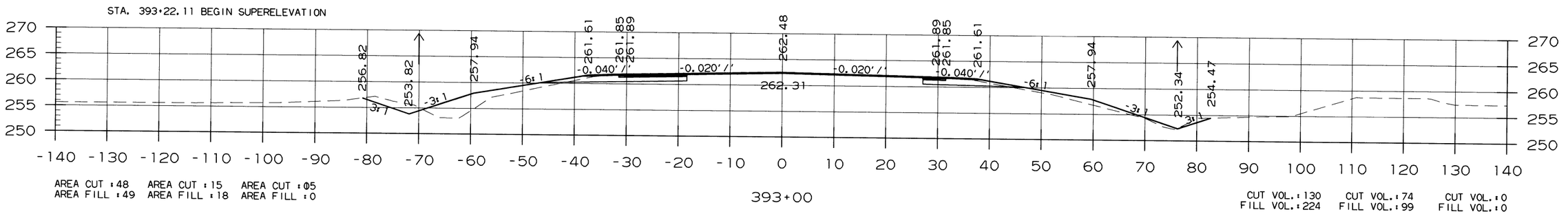

STA. 393+38.00 END
-0.61% LT. DITCH GRADE
STA. 393+38.00 BEGIN
+0.53% LT. DITCH GRADE

STA. 393+35 IN PLACE
TRIP. 8' X 4' X 108' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN & EXTEND 6' LT. & 6' RT.
Q50= 35.4 CFS D.A. = 82 ACRES
SPAN = 26.44'

STA. 393+38.00 END
-0.25% RT. DITCH GRADE




STA. 393+22.11 BEGIN SUPERELEVATION




# CROSS SECTION
# STA. 393+00 TO STA. 395+00

2/3/2017

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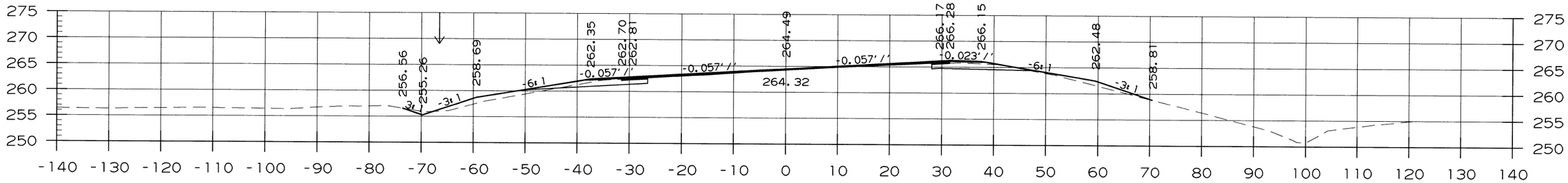
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 342 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

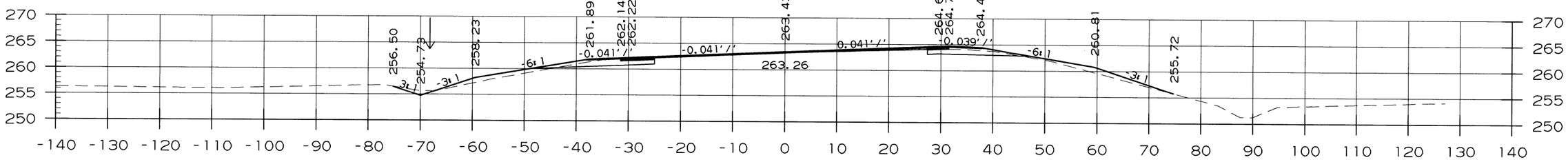
STA. 398+62.11 MAX. SUPERELEVATION (0.67 FT./FT.)




AREA CUT : 13 AREA CUT : 14 AREA CUT : 0
AREA FILL : 22 AREA FILL : 13 AREA FILL : 0

398+00

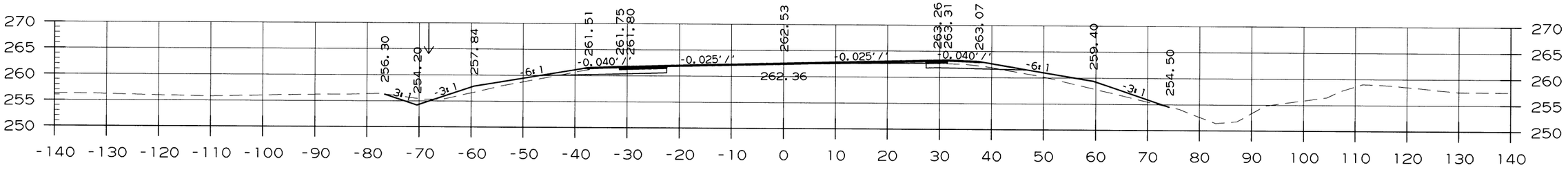
CUT VOL. : 57 CUT VOL. : 45 CUT VOL. : 0
FILL VOL. : 70 FILL VOL. : 61 FILL VOL. : 0




AREA CUT : 18 AREA CUT : 10 AREA CUT : 0
AREA FILL : 16 AREA FILL : 20 AREA FILL : 0

397+00

CUT VOL. : 77 CUT VOL. : 32 CUT VOL. : 0
FILL VOL. : 62 FILL VOL. : 96 FILL VOL. : 0




AREA CUT : 24 AREA CUT : 7 AREA CUT : 0
AREA FILL : 18 AREA FILL : 31 AREA FILL : 0

396+00

CUT VOL. : 98 CUT VOL. : 20 CUT VOL. : 0
FILL VOL. : 75 FILL VOL. : 130 FILL VOL. : 0

# CROSS SECTION
# STA. 396+00 TO STA. 398+00

2/3/2017

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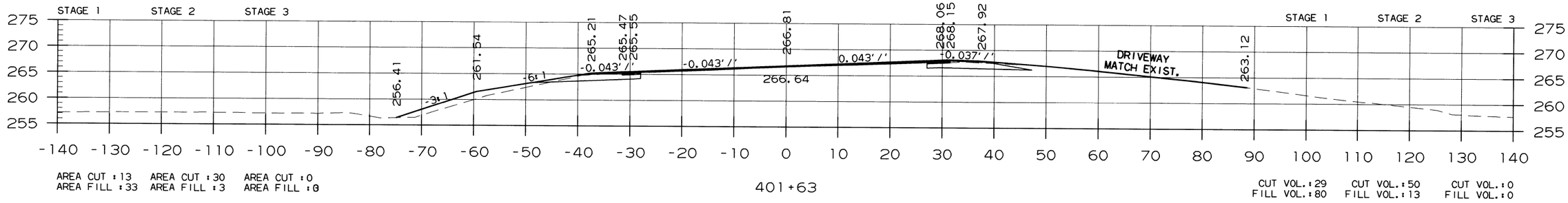
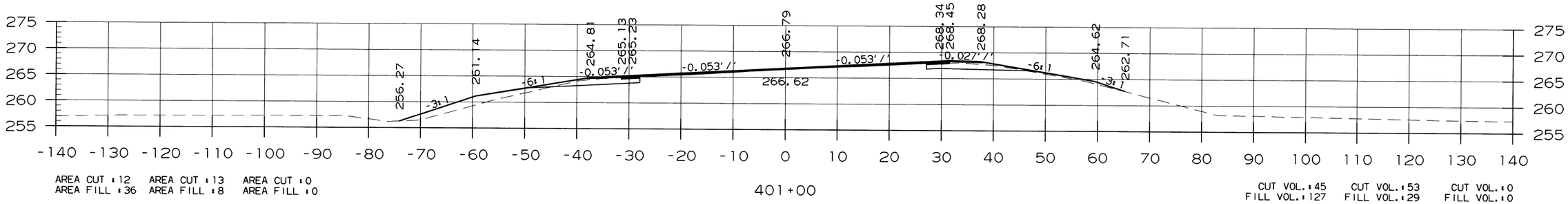
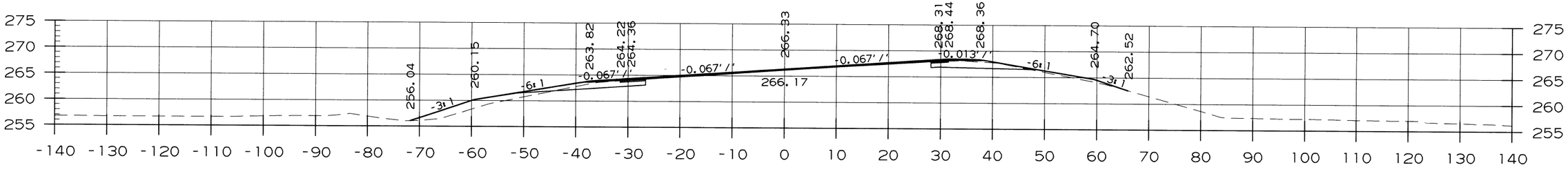
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 343 | 503 |

② CROSS SECTIONS

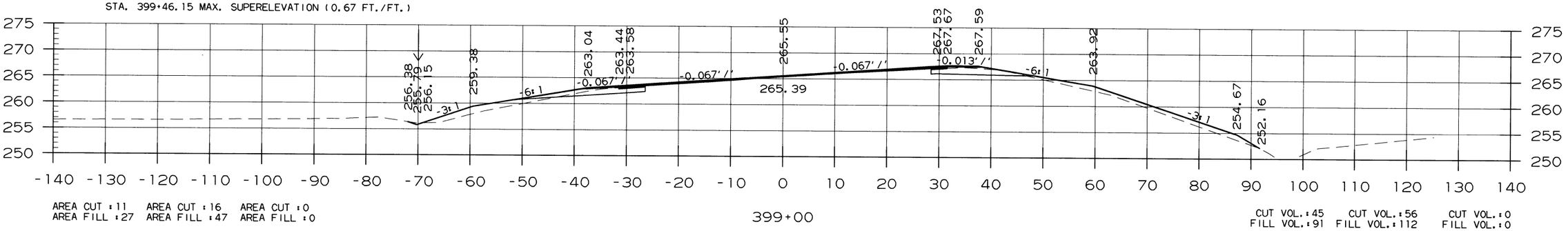



STA. 399+00.00 END
+0.53% LT. DITCH GRADE

STA. 399+46.15 MAX. SUPERELEVATION (0.67 FT./FT.)




# CROSS SECTION
# STA. 399+00 TO STA. 401+63

2/3/2017

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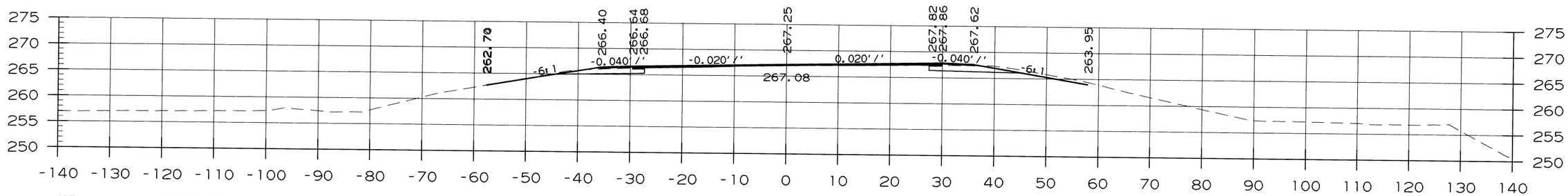
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 344 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

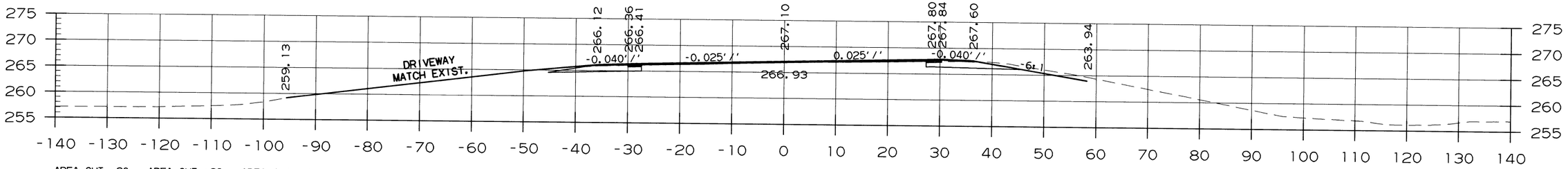
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 12 AREA CUT : 22 AREA CUT : 0
AREA FILL : 3 AREA FILL : 3 AREA FILL : 0

403+00

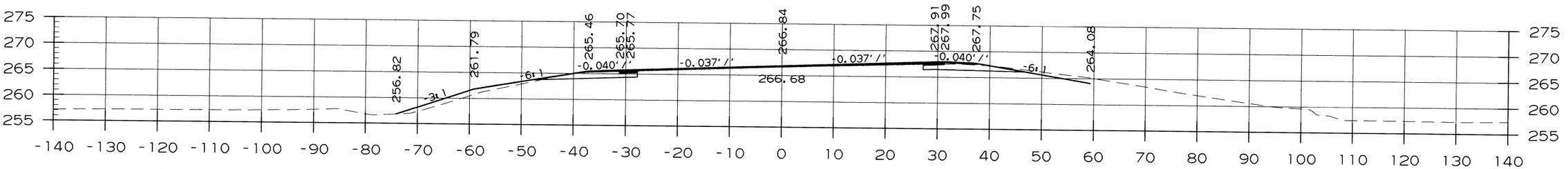
CUT VOL. : 16 CUT VOL. : 25 CUT VOL. : 0
FILL VOL. : 2 FILL VOL. : 3 FILL VOL. : 0




AREA CUT : 20 AREA CUT : 29 AREA CUT : 0
AREA FILL : 1 AREA FILL : 3 AREA FILL : 0

402+74

CUT VOL. : 48 CUT VOL. : 73 CUT VOL. : 0
FILL VOL. : 29 FILL VOL. : 8 FILL VOL. : 0




AREA CUT : 15 AREA CUT : 25 AREA CUT : 0
AREA FILL : 21 AREA FILL : 3 AREA FILL : 0

402+00

CUT VOL. : 19 CUT VOL. : 37 CUT VOL. : 0
FILL VOL. : 37 FILL VOL. : 4 FILL VOL. : 0

# CROSS SECTION
# STA. 402+00 TO STA. 403+00

2/3/2017

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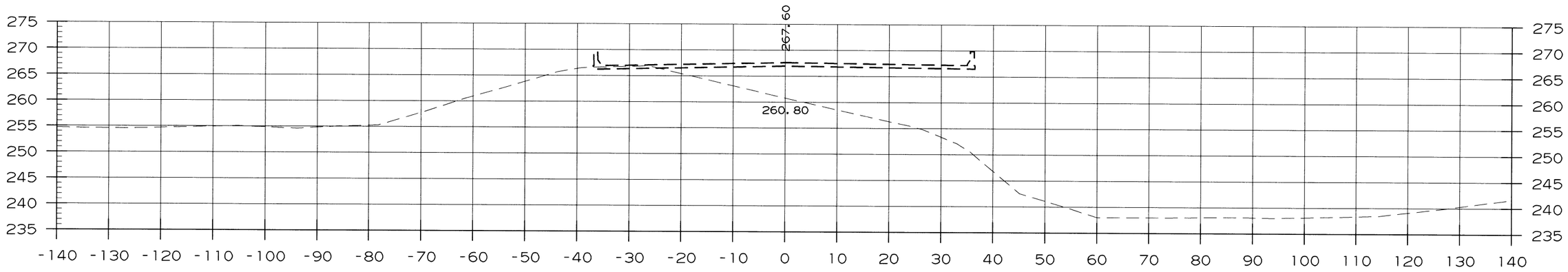
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 345 | 503 |

② CROSS SECTIONS

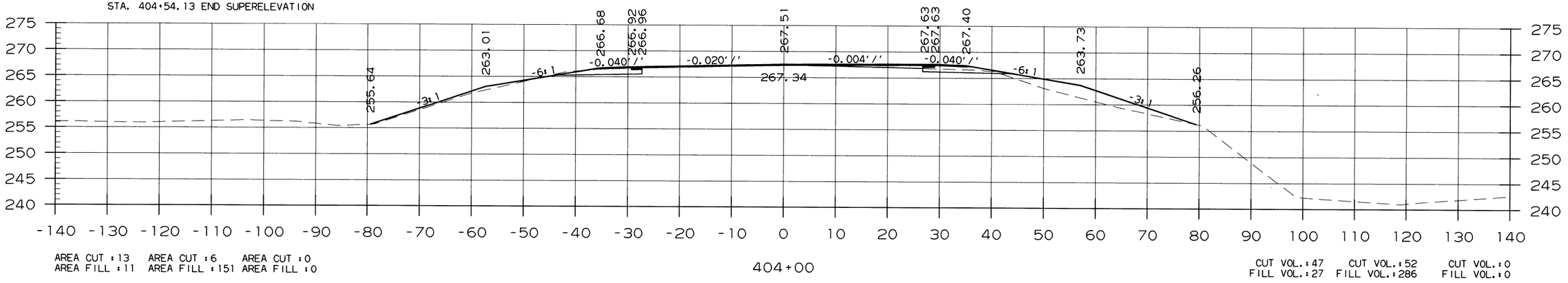
STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3




BEGIN EXCEPTION
STA. 404+54.13

STA. 404+54.13 END SUPERELEVATION




CROSS SECTION
STA. 404+00 TO STA. 405+00

2/3/2017

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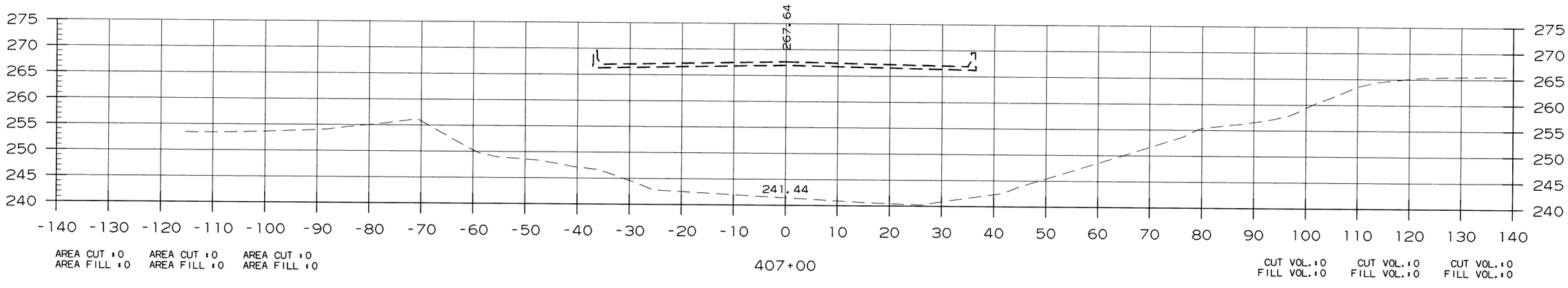
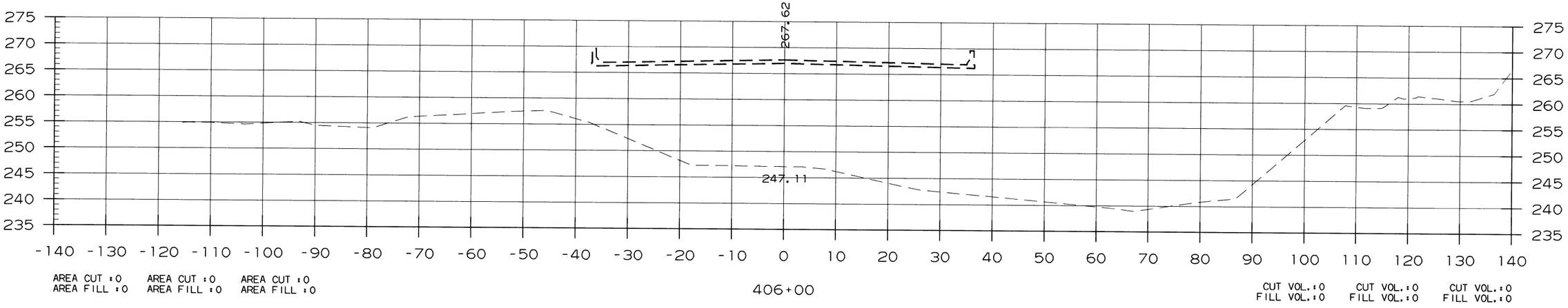
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 346 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3




# CROSS SECTION
# STA. 406+00 TO STA. 407+00

2/3/2017

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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 |
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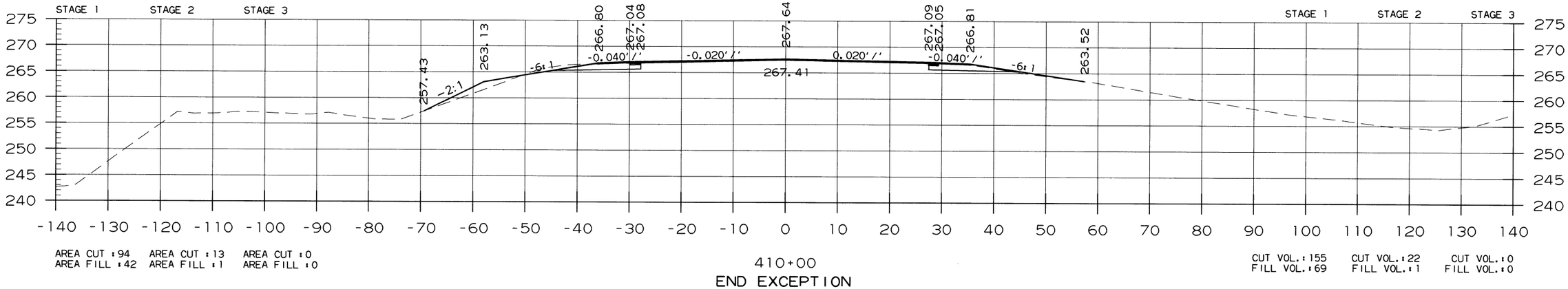
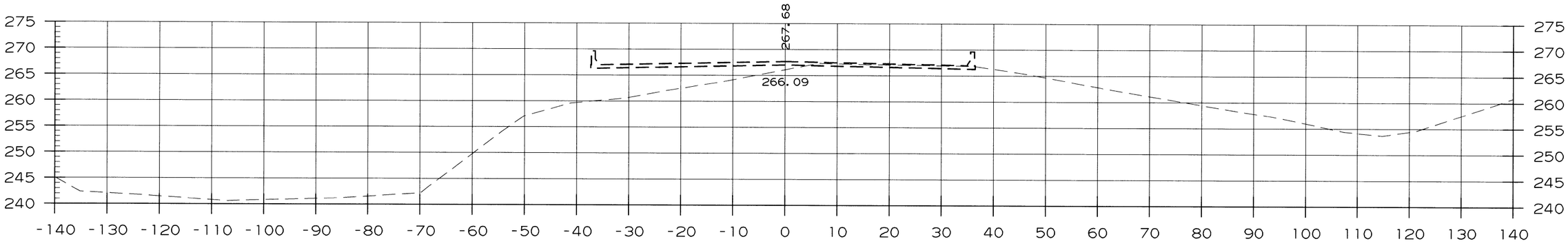
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 347 | 503 |

② CROSS SECTIONS

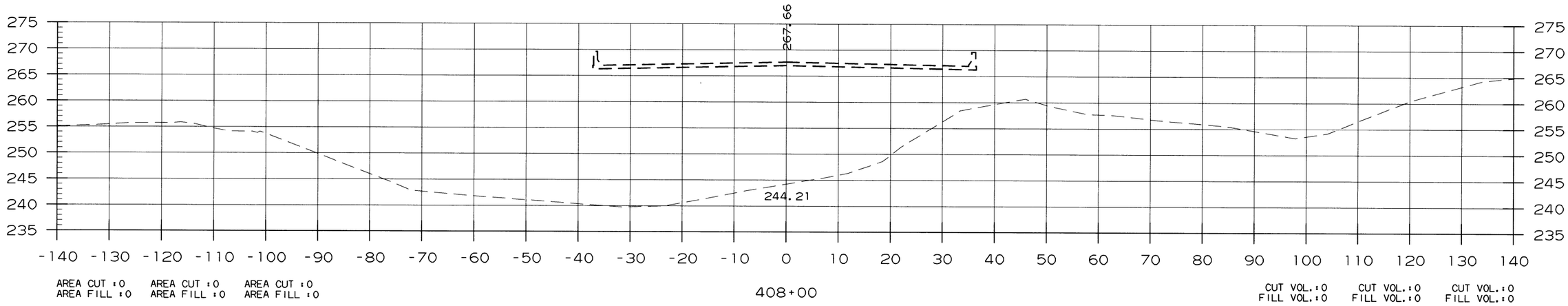



410+00

END EXCEPTION
STA. 409+11.60




409+00




408+00

CROSS SECTION
STA. 408+00 TO STA. 410+00

2/3/2017

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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 |
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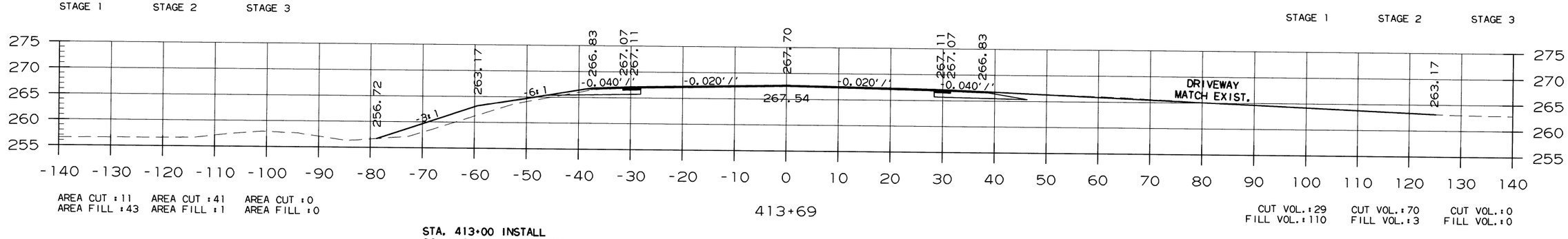
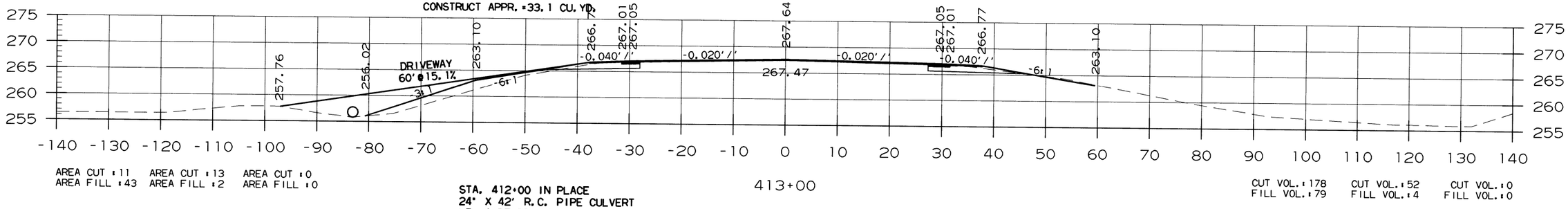
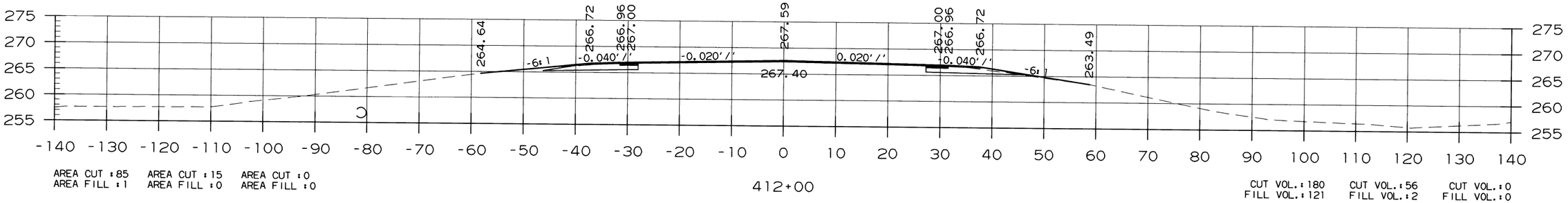
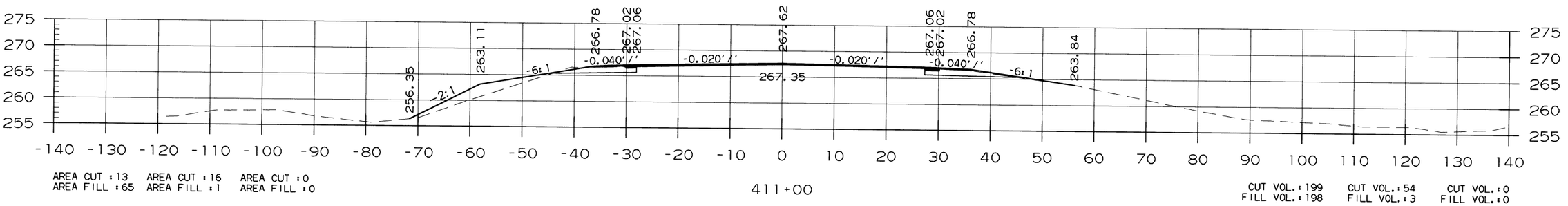
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 348 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 411+00 TO STA. 413+69

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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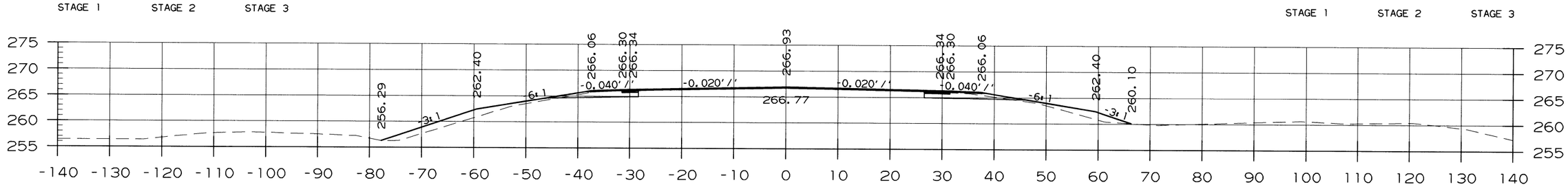
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 349 | 503 |

②

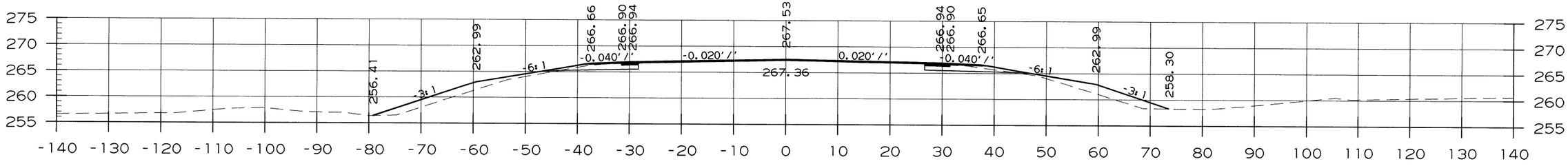
CROSS SECTIONS




AREA CUT : 12 AREA CUT : 11 AREA CUT : 0
AREA FILL : 33 AREA FILL : 19 AREA FILL : 0

417+00

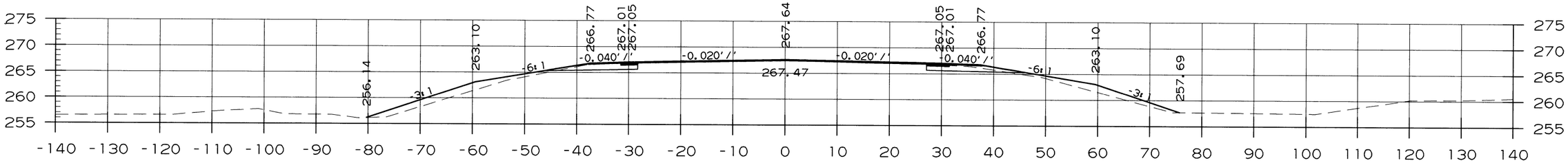
CUT VOL. : 41 CUT VOL. : 40 CUT VOL. : 0
FILL VOL. : 132 FILL VOL. : 97 FILL VOL. : 0




AREA CUT : 11 AREA CUT : 11 AREA CUT : 0
AREA FILL : 38 AREA FILL : 33 AREA FILL : 0

416+00

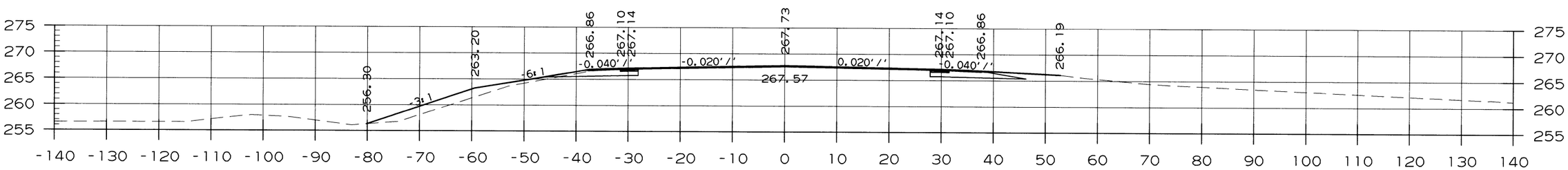
CUT VOL. : 42 CUT VOL. : 38 CUT VOL. : 0
FILL VOL. : 141 FILL VOL. : 114 FILL VOL. : 0




AREA CUT : 12 AREA CUT : 10 AREA CUT : 0
AREA FILL : 38 AREA FILL : 28 AREA FILL : 0

415+00

CUT VOL. : 43 CUT VOL. : 96 CUT VOL. : 0
FILL VOL. : 149 FILL VOL. : 53 FILL VOL. : 0




AREA CUT : 11 AREA CUT : 42 AREA CUT : 0
AREA FILL : 42 AREA FILL : 0 AREA FILL : 0

414+00

CUT VOL. : 13 CUT VOL. : 48 CUT VOL. : 0
FILL VOL. : 49 FILL VOL. : 1 FILL VOL. : 0

# CROSS SECTION
# STA. 414+00 TO STA. 417+00

2/3/2017

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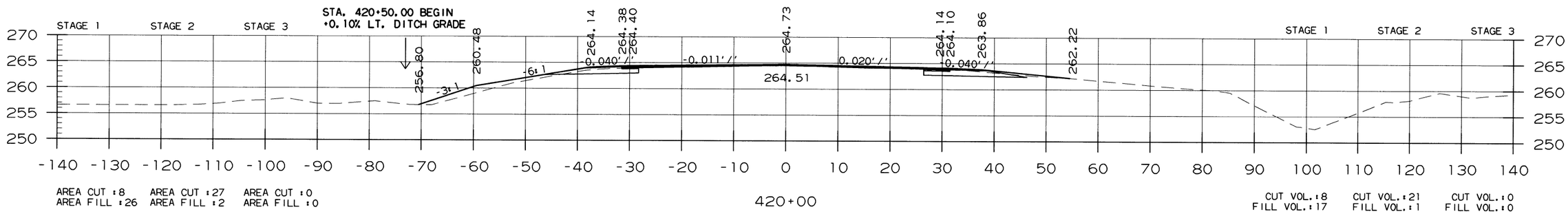
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 350 | 503 |

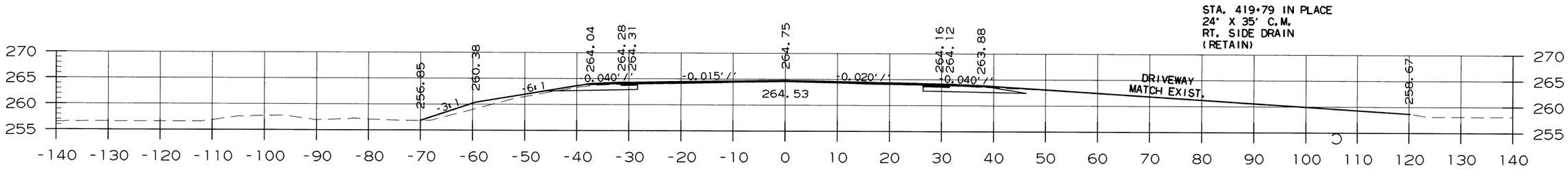
② CROSS SECTIONS




AREA CUT : 8 AREA CUT : 27 AREA CUT : 0
AREA FILL : 26 AREA FILL : 2 AREA FILL : 0

420+00

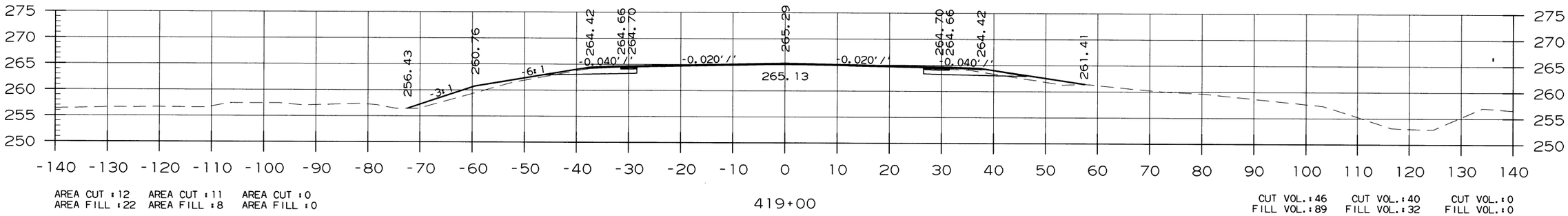
CUT VOL. : 8 CUT VOL. : 21 CUT VOL. : 0
FILL VOL. : 17 FILL VOL. : 1 FILL VOL. : 0




AREA CUT : 12 AREA CUT : 26 AREA CUT : 0
AREA FILL : 17 AREA FILL : 1 AREA FILL : 0

419+79

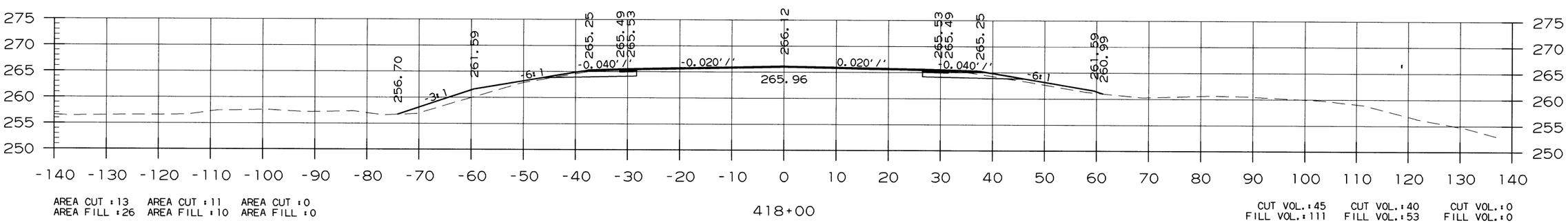
CUT VOL. : 36 CUT VOL. : 54 CUT VOL. : 0
FILL VOL. : 56 FILL VOL. : 13 FILL VOL. : 0




AREA CUT : 12 AREA CUT : 11 AREA CUT : 0
AREA FILL : 22 AREA FILL : 8 AREA FILL : 0

419+00

CUT VOL. : 46 CUT VOL. : 40 CUT VOL. : 0
FILL VOL. : 89 FILL VOL. : 32 FILL VOL. : 0




AREA CUT : 13 AREA CUT : 11 AREA CUT : 0
AREA FILL : 26 AREA FILL : 10 AREA FILL : 0

418+00

CUT VOL. : 45 CUT VOL. : 40 CUT VOL. : 0
FILL VOL. : 111 FILL VOL. : 53 FILL VOL. : 0

# CROSS SECTION
# STA. 418+00 TO STA. 420+00

2/3/2017

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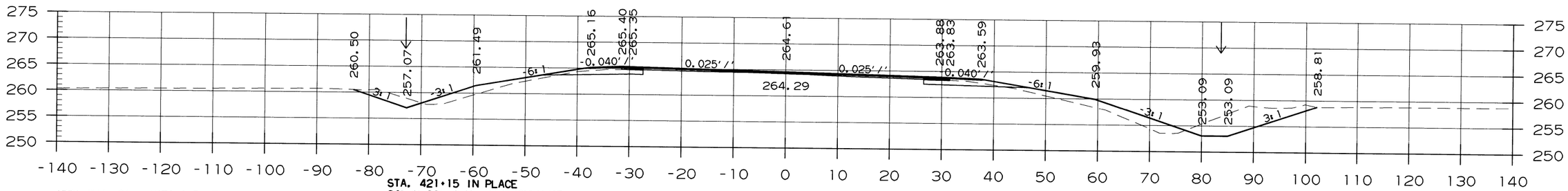
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 351 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

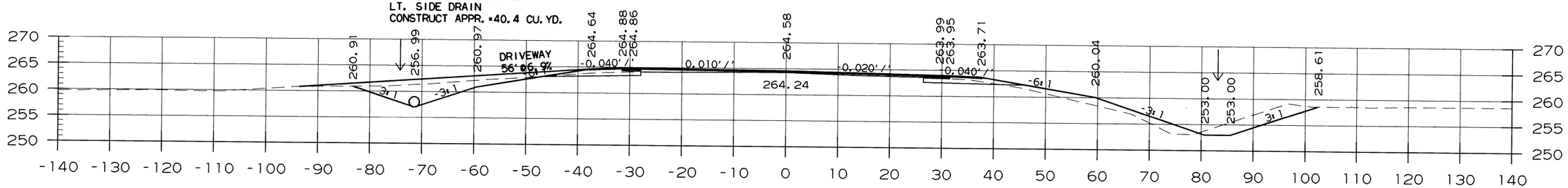



AREA CUT : 24 AREA CUT : 74 AREA CUT : 0
AREA FILL : 35 AREA FILL : 53 AREA FILL : 0

STA. 421+15 IN PLACE
24" X 29' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 40.4 CU. YD.

422+00

CUT VOL. : 70 CUT VOL. : 213 CUT VOL. : 0
FILL VOL. : 111 FILL VOL. : 181 FILL VOL. : 0



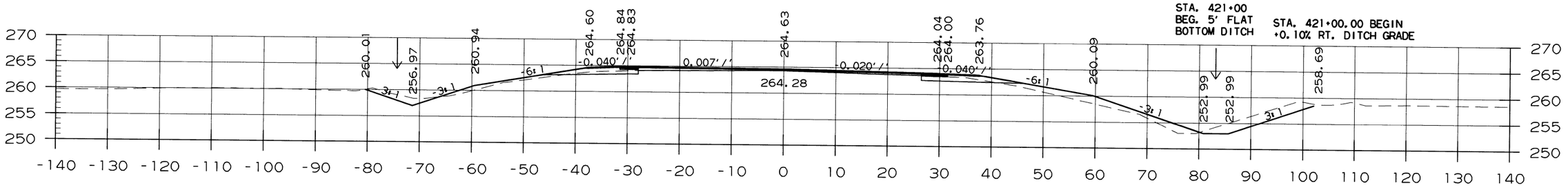

AREA CUT : 20 AREA CUT : 62 AREA CUT : 0
AREA FILL : 36 AREA FILL : 62 AREA FILL : 0

421+15

CUT VOL. : 10 CUT VOL. : 29 CUT VOL. : 0
FILL VOL. : 16 FILL VOL. : 30 FILL VOL. : 0

STA. 421+00
BEG. 5' FLAT
BOTTOM DITCH

STA. 421+00.00 BEGIN
+0.10% RT. DITCH GRADE




AREA CUT : 16 AREA CUT : 44 AREA CUT : 0
AREA FILL : 22 AREA FILL : 46 AREA FILL : 0

421+00

CUT VOL. : 45 CUT VOL. : 131 CUT VOL. : 0
FILL VOL. : 90 FILL VOL. : 90 FILL VOL. : 0

# CROSS SECTION
# STA. 421+00 TO STA. 422+00

2/3/2017

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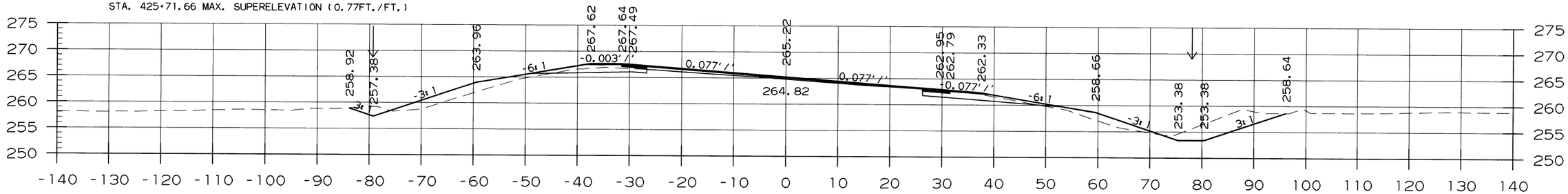
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 352 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

STA. 425+71.66 MAX. SUPERELEVATION (0.77FT./FT.)

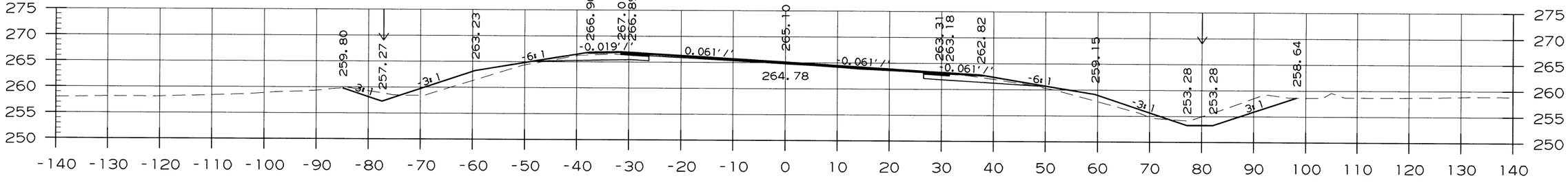



AREA CUT : 17 AREA CUT : 67 AREA CUT : 0
AREA FILL : 49 AREA FILL : 24 AREA FILL : 0

425+00

CUT VOL. : 73 CUT VOL. : 227 CUT VOL. : 0
FILL VOL. : 160 FILL VOL. : 90 FILL VOL. : 0

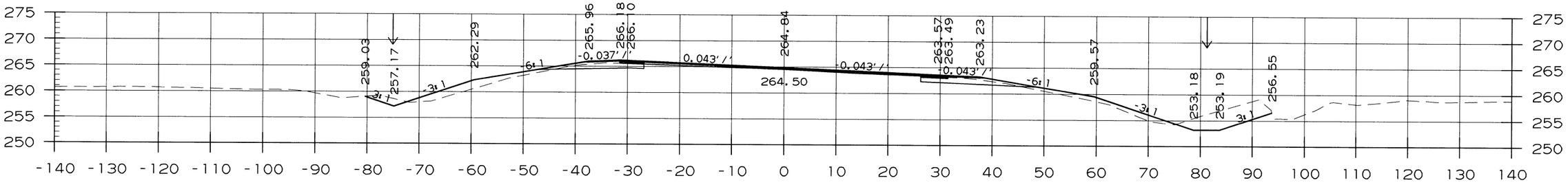
STA. 424+90.55 MAX. SUPERELEVATION (0.77FT./FT.)




AREA CUT : 23 AREA CUT : 55 AREA CUT : 0
AREA FILL : 37 AREA FILL : 25 AREA FILL : 0

424+00

CUT VOL. : 74 CUT VOL. : 219 CUT VOL. : 0
FILL VOL. : 138 FILL VOL. : 117 FILL VOL. : 0




AREA CUT : 17 AREA CUT : 63 AREA CUT : 0
AREA FILL : 37 AREA FILL : 38 AREA FILL : 0

423+00

CUT VOL. : 77 CUT VOL. : 253 CUT VOL. : 0
FILL VOL. : 133 FILL VOL. : 170 FILL VOL. : 0

# CROSS SECTION
# STA. 423+00 TO STA. 425+00

2/3/2017

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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 |
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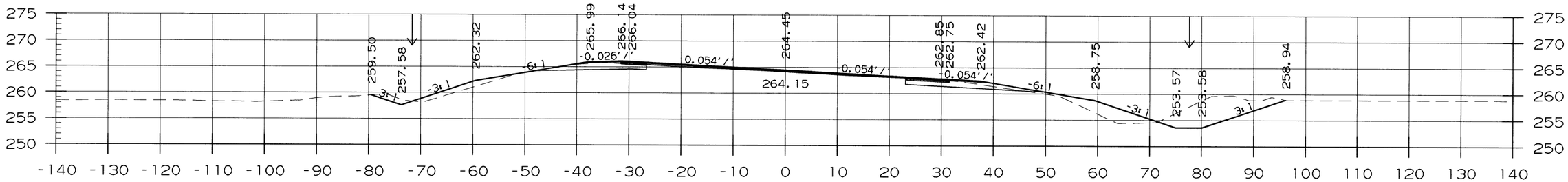
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 353 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

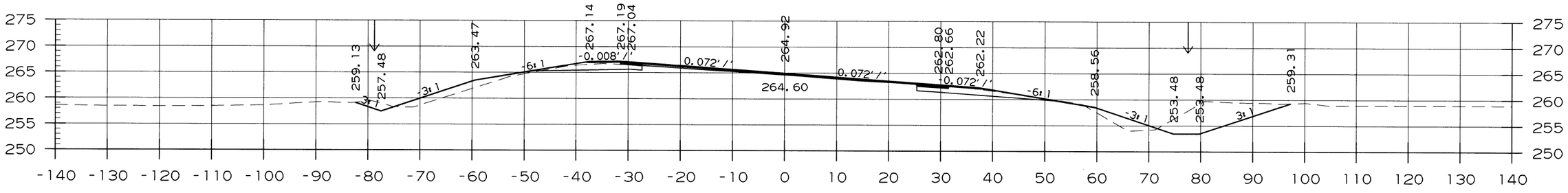



AREA CUT : 21 AREA CUT : 89 AREA CUT : 0
AREA FILL : 22 AREA FILL : 38 AREA FILL : 0

427+00

CUT VOL. : 77 CUT VOL. : 350 CUT VOL. : 0
FILL VOL. : 133 FILL VOL. : 111 FILL VOL. : 0

STAGE 1 STAGE 2 STAGE 3

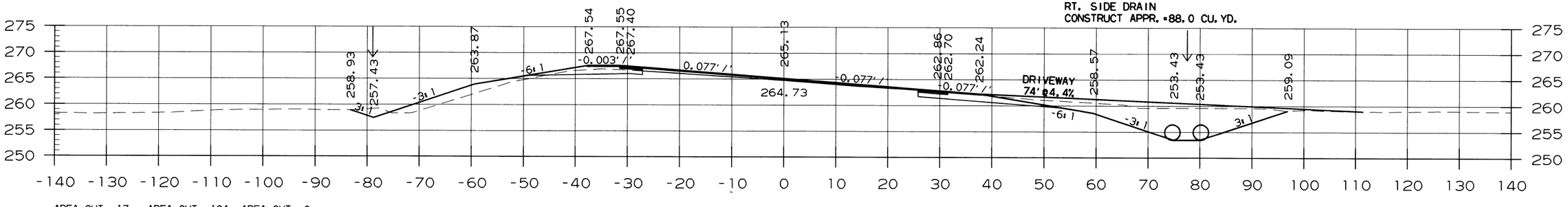



AREA CUT : 20 AREA CUT : 100 AREA CUT : 0
AREA FILL : 34 AREA FILL : 22 AREA FILL : 0

426+00

STA. 425+56 IN PLACE
24' X 34' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36' X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =88.0 CU. YD.

CUT VOL. : 31 CUT VOL. : 232 CUT VOL. : 0
FILL VOL. : 67 FILL VOL. : 22 FILL VOL. : 0




AREA CUT : 17 AREA CUT : 184 AREA CUT : 0
AREA FILL : 48 AREA FILL : 4 AREA FILL : 0

425+56

CUT VOL. : 35 CUT VOL. : 261 CUT VOL. : 0
FILL VOL. : 101 FILL VOL. : 30 FILL VOL. : 0

# CROSS SECTION
# STA. 425+56 TO STA. 427+00

2/3/2017

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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 |
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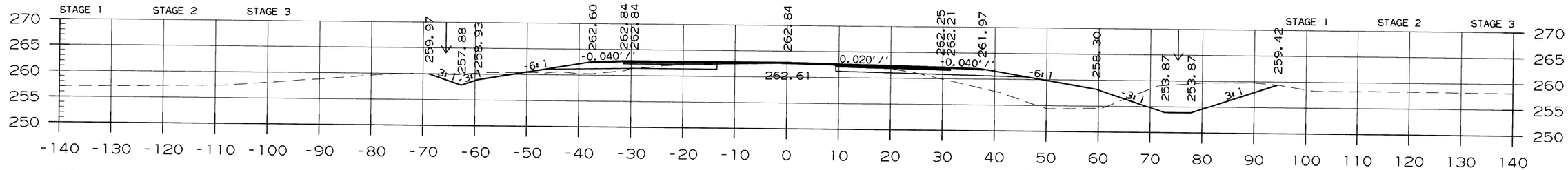
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 354 | 503 |

② CROSS SECTIONS

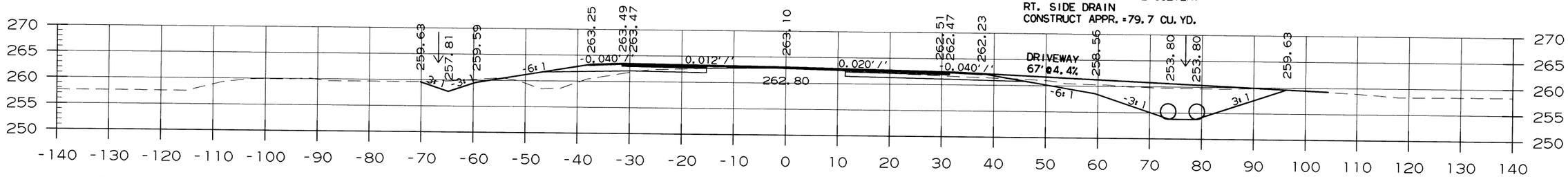



AREA CUT : 24 AREA CUT : 110 AREA CUT : 0
AREA FILL : 18 AREA FILL : 124 AREA FILL : 0

430+00

STA. 429+31 IN PLACE
24" X 38' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 58' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 79.7 CU. YD.

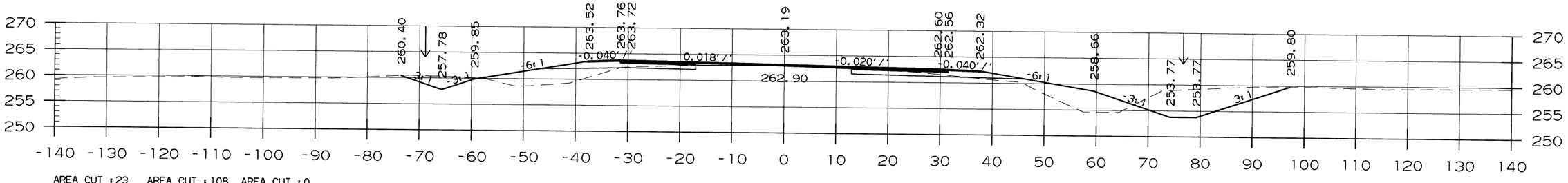
CUT VOL. : 54 CUT VOL. : 308 CUT VOL. : 0
FILL VOL. : 85 FILL VOL. : 248 FILL VOL. : 0




AREA CUT : 18 AREA CUT : 131 AREA CUT : 0
AREA FILL : 49 AREA FILL : 70 AREA FILL : 0

429+31

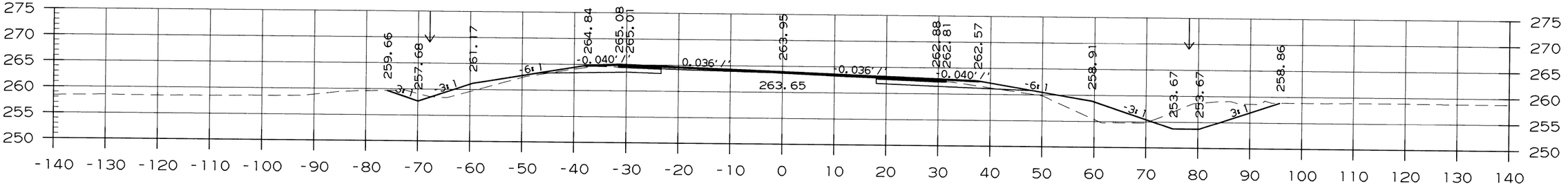
CUT VOL. : 24 CUT VOL. : 137 CUT VOL. : 0
FILL VOL. : 62 FILL VOL. : 78 FILL VOL. : 0




AREA CUT : 23 AREA CUT : 108 AREA CUT : 0
AREA FILL : 60 AREA FILL : 67 AREA FILL : 0

429+00

CUT VOL. : 83 CUT VOL. : 354 CUT VOL. : 0
FILL VOL. : 154 FILL VOL. : 218 FILL VOL. : 0




AREA CUT : 22 AREA CUT : 83 AREA CUT : 0
AREA FILL : 24 AREA FILL : 51 AREA FILL : 0

428+00

CUT VOL. : 80 CUT VOL. : 319 CUT VOL. : 0
FILL VOL. : 84 FILL VOL. : 165 FILL VOL. : 0

# CROSS SECTION
# STA. 428+00 TO STA. 430+00

2/3/2017

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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 |
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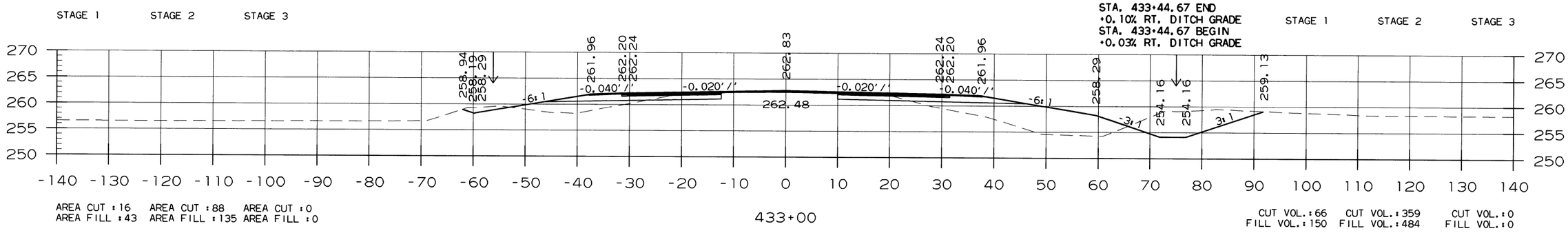
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 355 | 503 |

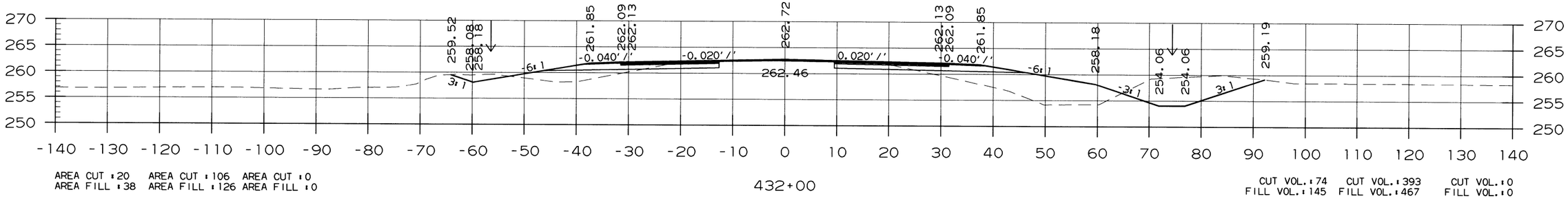
② CROSS SECTIONS




AREA CUT : 16 AREA CUT : 88 AREA CUT : 0
AREA FILL : 43 AREA FILL : 135 AREA FILL : 0

433+00

CUT VOL. : 66 CUT VOL. : 359 CUT VOL. : 0
FILL VOL. : 150 FILL VOL. : 484 FILL VOL. : 0

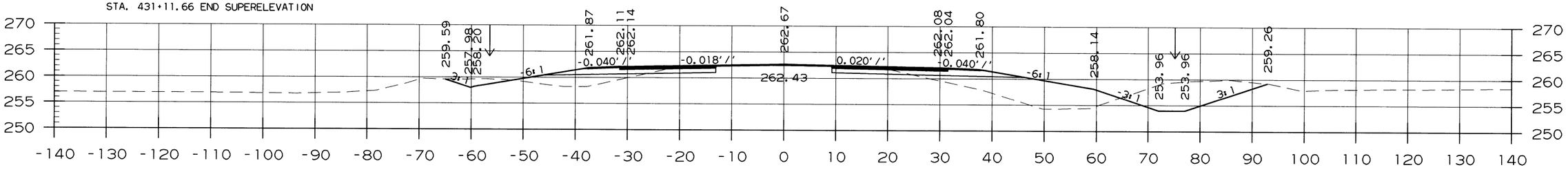



AREA CUT : 20 AREA CUT : 106 AREA CUT : 0
AREA FILL : 38 AREA FILL : 126 AREA FILL : 0

432+00

CUT VOL. : 74 CUT VOL. : 393 CUT VOL. : 0
FILL VOL. : 145 FILL VOL. : 467 FILL VOL. : 0

STA. 431+11.66 END SUPERELEVATION

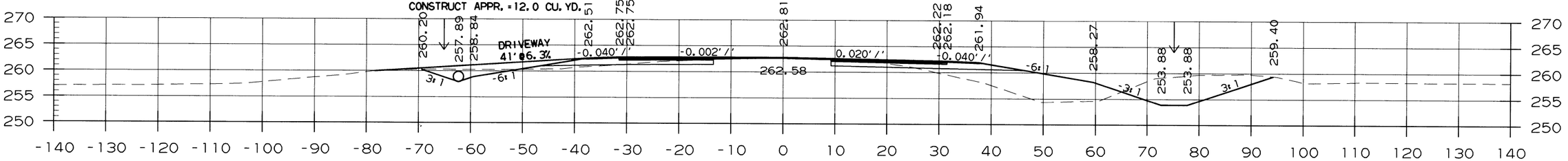



AREA CUT : 20 AREA CUT : 106 AREA CUT : 0
AREA FILL : 40 AREA FILL : 126 AREA FILL : 0

431+00

CUT VOL. : 74 CUT VOL. : 356 CUT VOL. : 0
FILL VOL. : 93 FILL VOL. : 412 FILL VOL. : 0

STA. 430+11 IN PLACE
24" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 12.0 CU. YD.




AREA CUT : 24 AREA CUT : 110 AREA CUT : 0
AREA FILL : 16 AREA FILL : 124 AREA FILL : 0

430+11

CUT VOL. : 10 CUT VOL. : 45 CUT VOL. : 0
FILL VOL. : 7 FILL VOL. : 51 FILL VOL. : 0

# CROSS SECTION
# STA. 430+11 TO STA. 433+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
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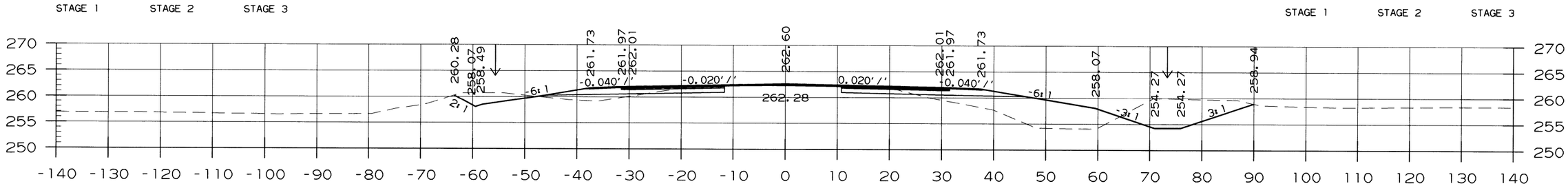
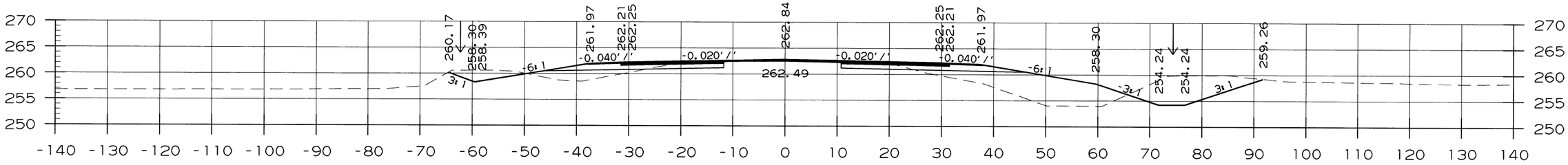
| | | | | JOB NO. | | CA1003 | 356 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




AREA CUT : 34 AREA CUT : 100 AREA CUT : 0
AREA FILL : 20 AREA FILL : 127 AREA FILL : 0

436+00

CUT VOL. : 121 CUT VOL. : 364 CUT VOL. : 0
FILL VOL. : 97 FILL VOL. : 489 FILL VOL. : 0

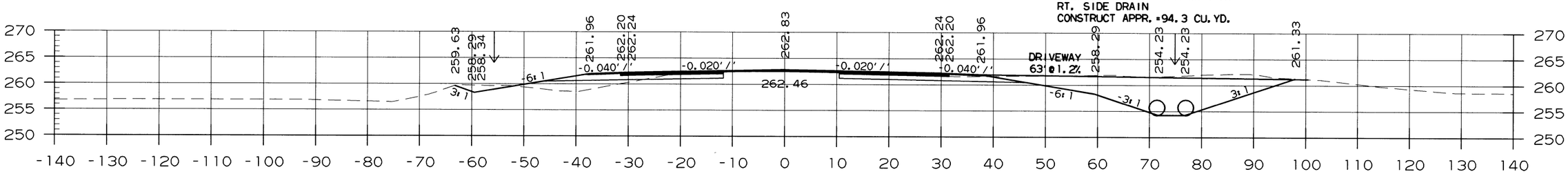



AREA CUT : 31 AREA CUT : 96 AREA CUT : 0
AREA FILL : 33 AREA FILL : 137 AREA FILL : 0

435+00

STA. 434+48 IN PLACE
24' X 29' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36' X 60' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =94.3 CU. YD.

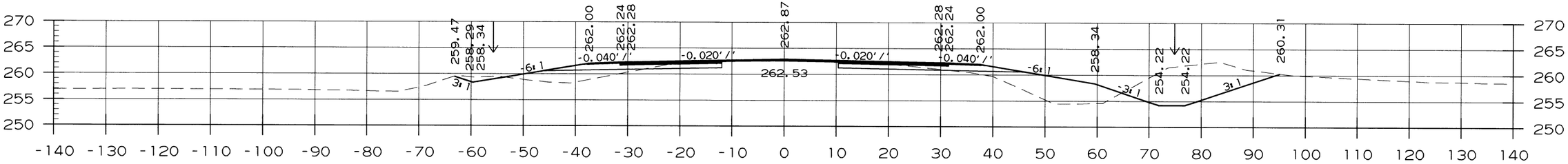
CUT VOL. : 49 CUT VOL. : 335 CUT VOL. : 0
FILL VOL. : 65 FILL VOL. : 134 FILL VOL. : 0




AREA CUT : 20 AREA CUT : 252 AREA CUT : 0
AREA FILL : 35 AREA FILL : 2 AREA FILL : 0

434+48

CUT VOL. : 32 CUT VOL. : 356 CUT VOL. : 0
FILL VOL. : 68 FILL VOL. : 84 FILL VOL. : 0




AREA CUT : 16 AREA CUT : 149 AREA CUT : 0
AREA FILL : 42 AREA FILL : 92 AREA FILL : 0

434+00

CUT VOL. : 60 CUT VOL. : 438 CUT VOL. : 0
FILL VOL. : 156 FILL VOL. : 421 FILL VOL. : 0

# CROSS SECTION
# STA. 434+00 TO STA. 436+00

2/3/2017

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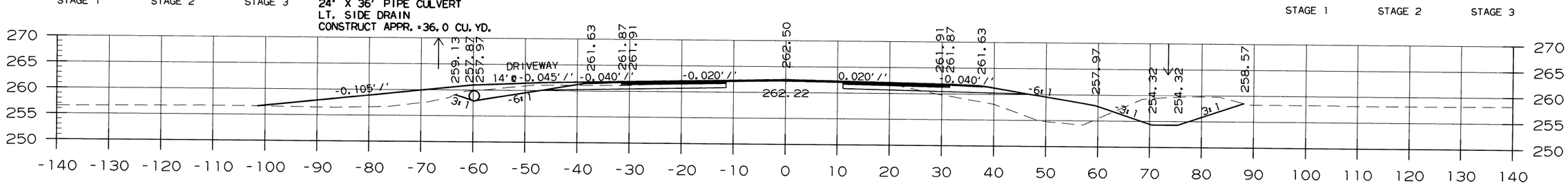
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 357 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

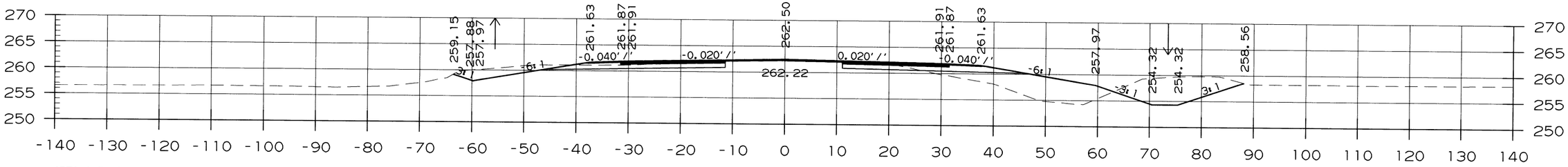
STA. 438+02 IN PLACE
PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24' X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =36.0 CU. YD.




AREA CUT : 51 AREA CUT : 97 AREA CUT : 0
AREA FILL : 1 AREA FILL : 103 AREA FILL : 0

438+02

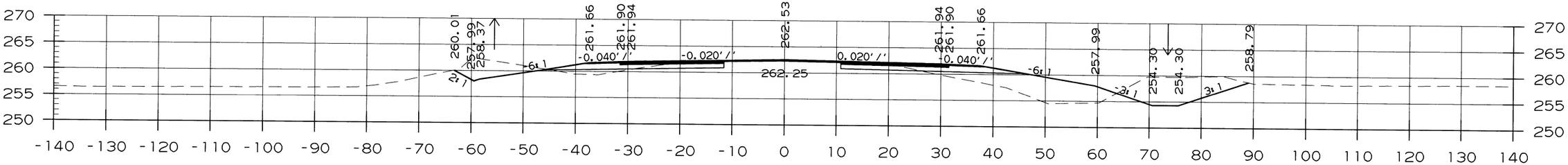
CUT VOL. : 4 CUT VOL. : 7 CUT VOL. : 0
FILL VOL. : 0 FILL VOL. : 8 FILL VOL. : 0




AREA CUT : 51 AREA CUT : 97 AREA CUT : 0
AREA FILL : 1 AREA FILL : 103 AREA FILL : 0

438+00

CUT VOL. : 189 CUT VOL. : 367 CUT VOL. : 0
FILL VOL. : 28 FILL VOL. : 385 FILL VOL. : 0

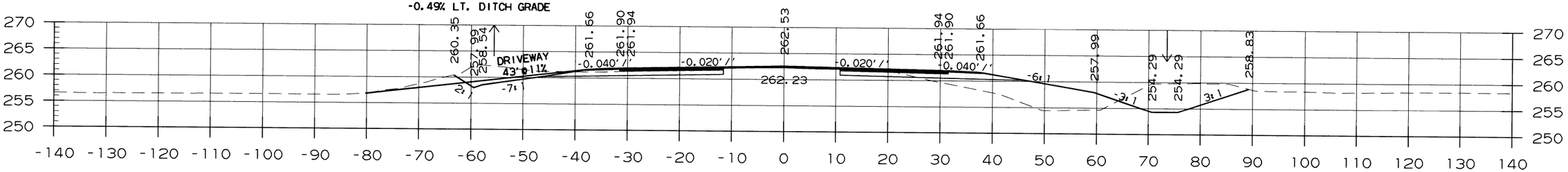



AREA CUT : 51 AREA CUT : 101 AREA CUT : 0
AREA FILL : 14 AREA FILL : 105 AREA FILL : 0

437+00

CUT VOL. : 80 CUT VOL. : 127 CUT VOL. : 0
FILL VOL. : 10 FILL VOL. : 143 FILL VOL. : 0

STA. 436+62.17 END
+0.10% LT. DITCH GRADE
STA. 436+62.17 BEGIN
-0.49% LT. DITCH GRADE




AREA CUT : 72 AREA CUT : 96 AREA CUT : 0
AREA FILL : 2 AREA FILL : 116 AREA FILL : 0

436+65

CUT VOL. : 128 CUT VOL. : 236 CUT VOL. : 0
FILL VOL. : 26 FILL VOL. : 293 FILL VOL. : 0

CROSS SECTION
STA. 436+65 TO STA. 438+02

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
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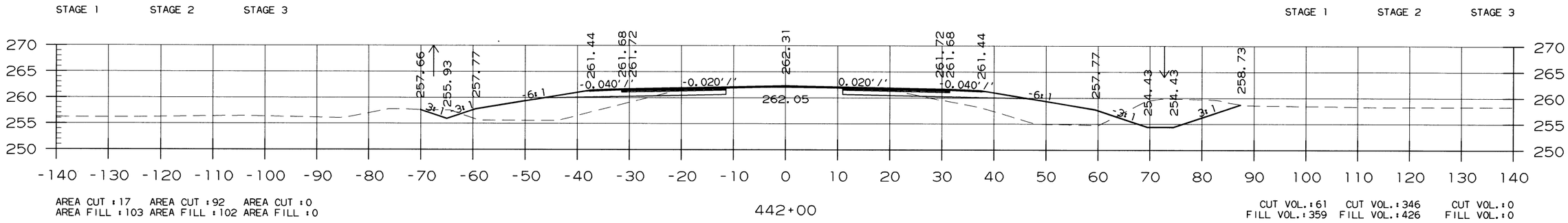
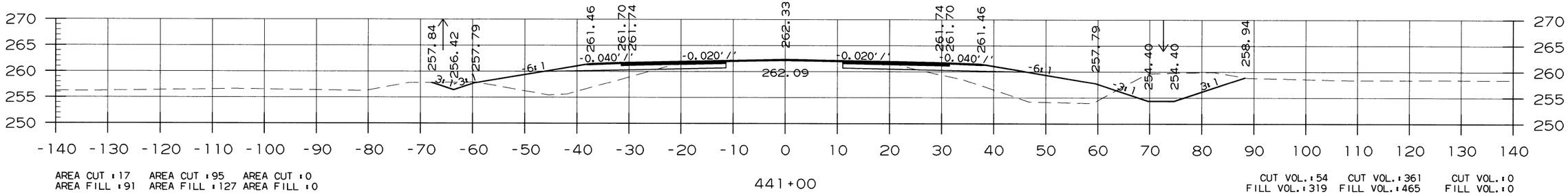
| | | | | JOB NO. | | CA1003 | 358 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




AREA CUT : 17 AREA CUT : 92 AREA CUT : 0
AREA FILL : 103 AREA FILL : 102 AREA FILL : 0

442+00

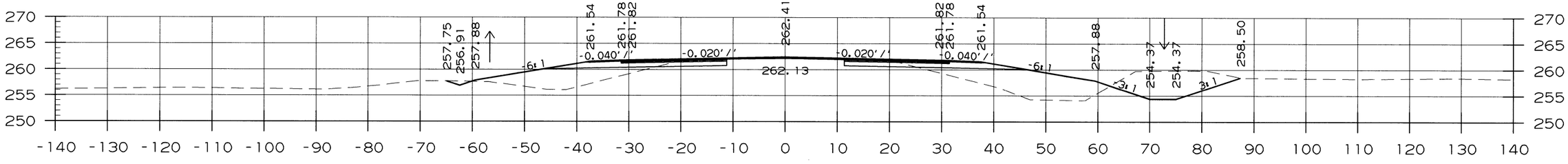
CUT VOL. : 61 CUT VOL. : 346 CUT VOL. : 0
FILL VOL. : 359 FILL VOL. : 426 FILL VOL. : 0




AREA CUT : 17 AREA CUT : 95 AREA CUT : 0
AREA FILL : 91 AREA FILL : 127 AREA FILL : 0

441+00

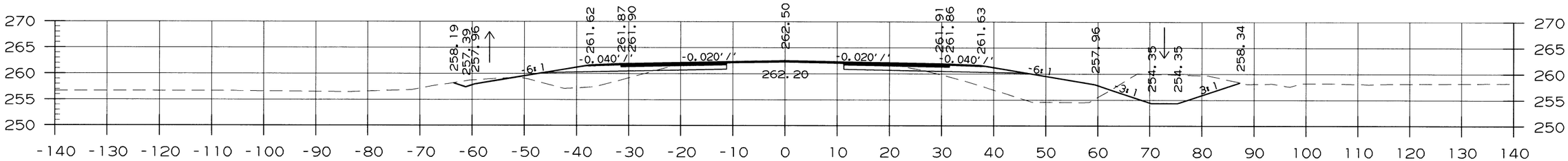
CUT VOL. : 54 CUT VOL. : 361 CUT VOL. : 0
FILL VOL. : 319 FILL VOL. : 465 FILL VOL. : 0




AREA CUT : 13 AREA CUT : 100 AREA CUT : 0
AREA FILL : 82 AREA FILL : 124 AREA FILL : 0

440+00

CUT VOL. : 54 CUT VOL. : 372 CUT VOL. : 0
FILL VOL. : 252 FILL VOL. : 443 FILL VOL. : 0




AREA CUT : 17 AREA CUT : 101 AREA CUT : 0
AREA FILL : 54 AREA FILL : 116 AREA FILL : 0

439+00

CUT VOL. : 122 CUT VOL. : 360 CUT VOL. : 0
FILL VOL. : 101 FILL VOL. : 397 FILL VOL. : 0

# CROSS SECTION
# STA. 439+00 TO STA. 442+00

2/3/2017

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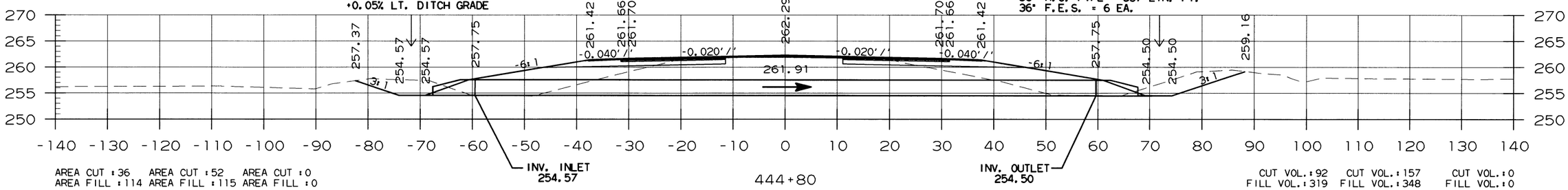
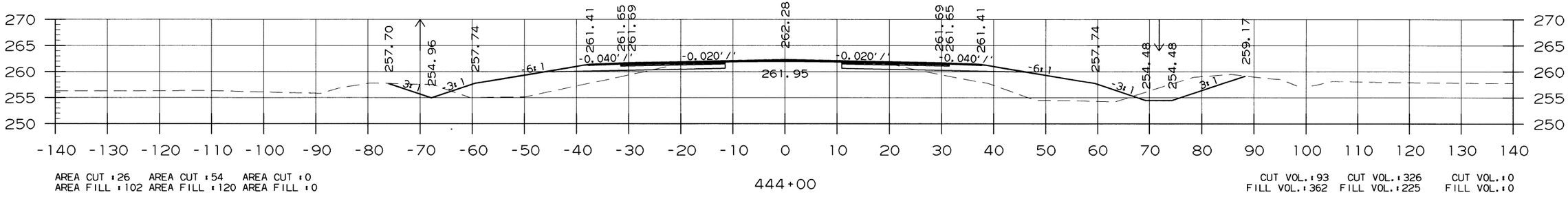
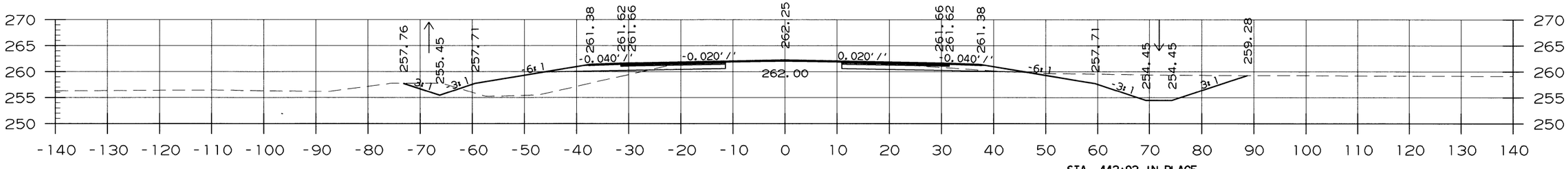
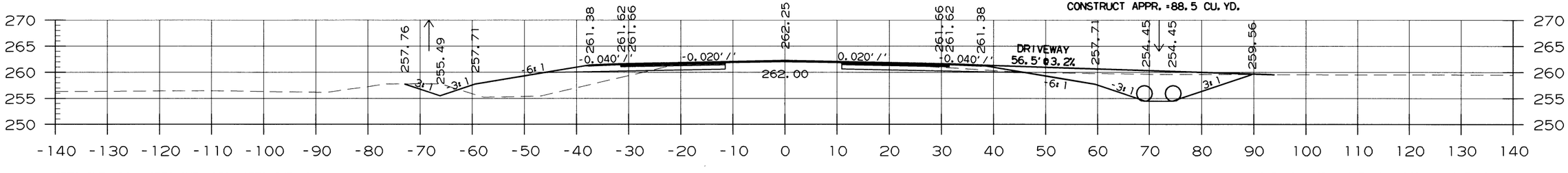
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 359 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




STA. 442+92 IN PLACE
24" X 31' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 54' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =88.5 CU. YD.




CROSS SECTION
STA. 442+92 TO STA. 444+80

2/3/2017

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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 |
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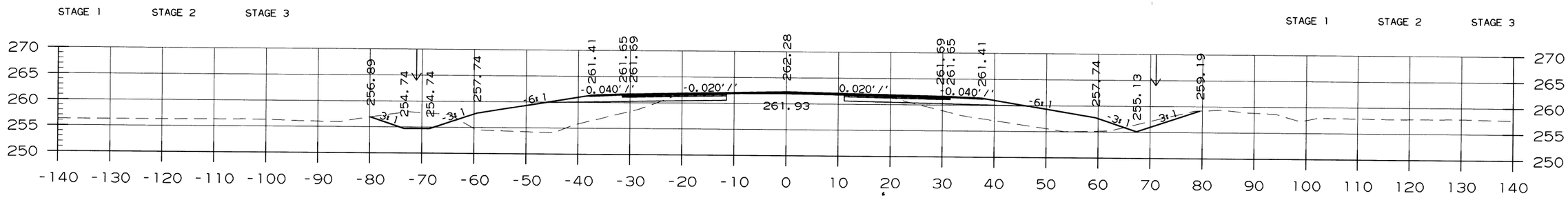
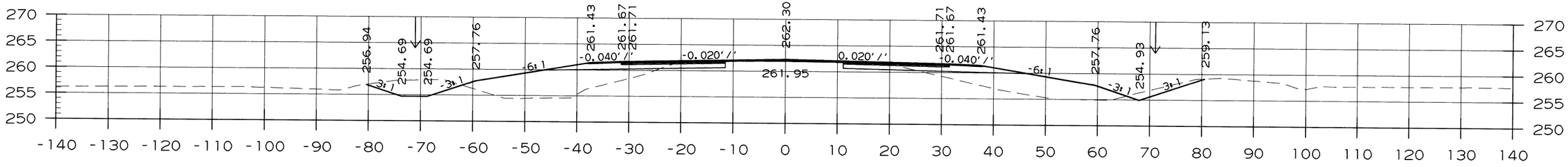
| | | | | JOB NO. | | CA1003 | 360 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




AREA CUT : 46 AREA CUT : 20 AREA CUT : 0
AREA FILL : 140 AREA FILL : 108 AREA FILL : 0

448+00

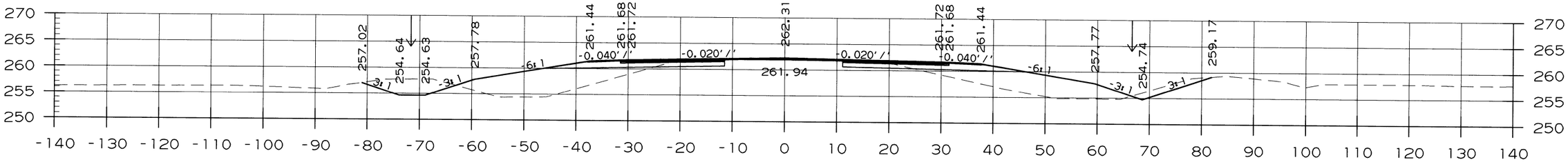
CUT VOL. : 175 CUT VOL. : 78 CUT VOL. : 0
FILL VOL. : 503 FILL VOL. : 402 FILL VOL. : 0




AREA CUT : 49 AREA CUT : 22 AREA CUT : 0
AREA FILL : 132 AREA FILL : 109 AREA FILL : 0

447+00

CUT VOL. : 180 CUT VOL. : 85 CUT VOL. : 0
FILL VOL. : 476 FILL VOL. : 413 FILL VOL. : 0

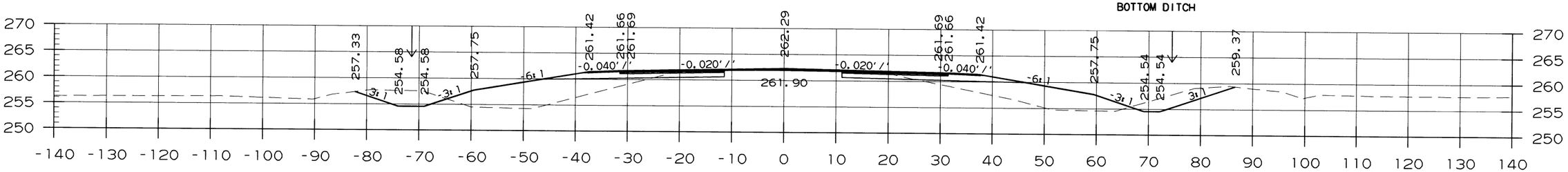



AREA CUT : 48 AREA CUT : 23 AREA CUT : 0
AREA FILL : 126 AREA FILL : 114 AREA FILL : 0

446+00

CUT VOL. : 172 CUT VOL. : 124 CUT VOL. : 0
FILL VOL. : 468 FILL VOL. : 413 FILL VOL. : 0

**STA. 444+80**
**END 5' FLAT**
**BOTTOM DITCH**




AREA CUT : 45 AREA CUT : 43 AREA CUT : 0
AREA FILL : 127 AREA FILL : 109 AREA FILL : 0

**STA. 444+80**
**BEG. 5' FLAT**
**BOTTOM DITCH**

445+00

CUT VOL. : 30 CUT VOL. : 35 CUT VOL. : 0
FILL VOL. : 89 FILL VOL. : 83 FILL VOL. : 0

# CROSS SECTION
# STA. 445+00 TO STA. 448+00

2/3/2017

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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 |
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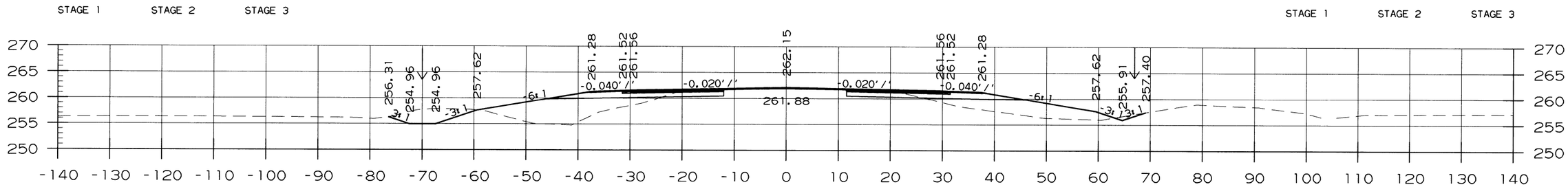
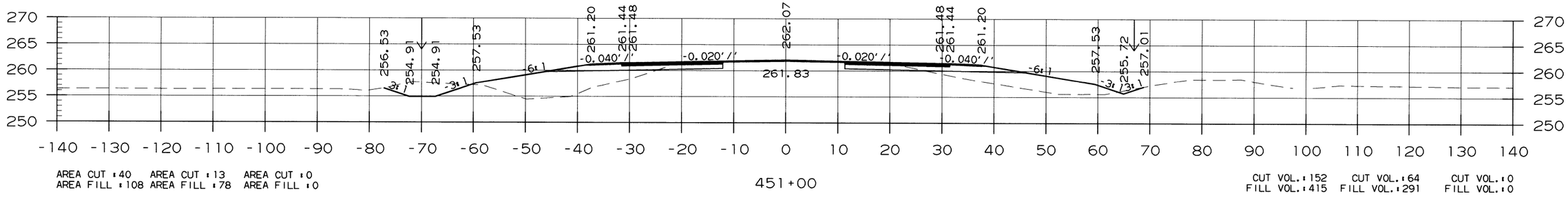
| | | | | JOB NO. | | CA1003 | 361 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




AREA CUT : 40 AREA CUT : 14 AREA CUT : 0
AREA FILL : 101 AREA FILL : 76 AREA FILL : 0

452+00

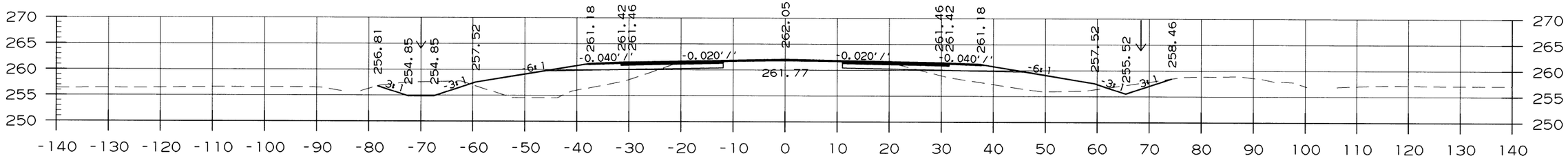
CUT VOL. : 148 CUT VOL. : 50 CUT VOL. : 0
FILL VOL. : 388 FILL VOL. : 284 FILL VOL. : 0




AREA CUT : 40 AREA CUT : 13 AREA CUT : 0
AREA FILL : 108 AREA FILL : 78 AREA FILL : 0

451+00

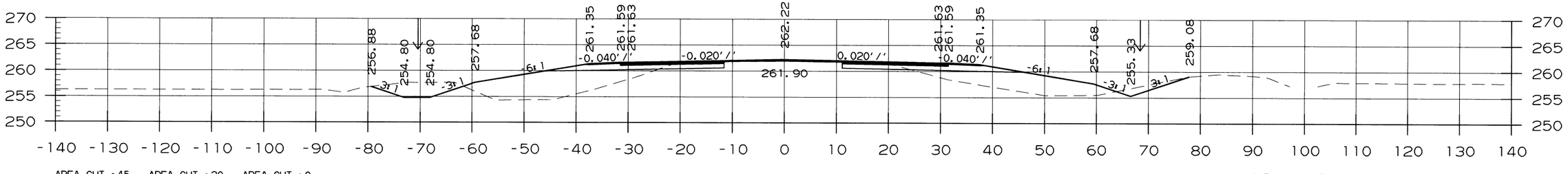
CUT VOL. : 152 CUT VOL. : 64 CUT VOL. : 0
FILL VOL. : 415 FILL VOL. : 291 FILL VOL. : 0




AREA CUT : 42 AREA CUT : 21 AREA CUT : 0
AREA FILL : 116 AREA FILL : 79 AREA FILL : 0

450+00

CUT VOL. : 161 CUT VOL. : 77 CUT VOL. : 0
FILL VOL. : 459 FILL VOL. : 334 FILL VOL. : 0




AREA CUT : 45 AREA CUT : 20 AREA CUT : 0
AREA FILL : 132 AREA FILL : 101 AREA FILL : 0

449+00

CUT VOL. : 167 CUT VOL. : 74 CUT VOL. : 0
FILL VOL. : 504 FILL VOL. : 387 FILL VOL. : 0

CROSS SECTION
STA. 449+00 TO STA. 452+00

2/3/2017

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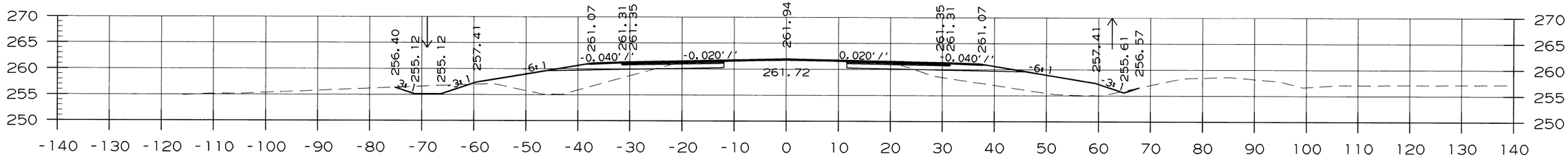
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 362 | 503 |

② CROSS SECTIONS

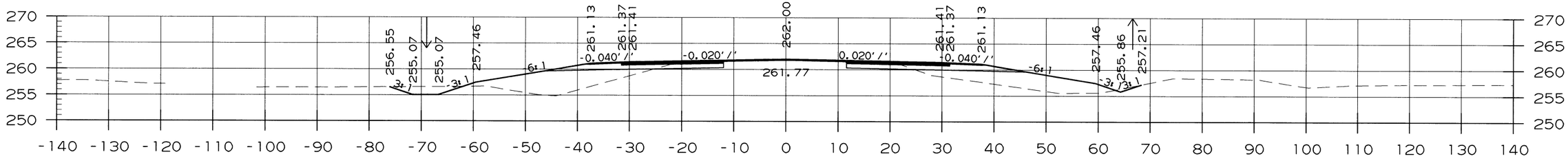
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 25 AREA CUT : 11 AREA CUT : 0
AREA FILL : 89 AREA FILL : 97 AREA FILL : 0

455+00

CUT VOL. : 93 CUT VOL. : 44 CUT VOL. : 0
FILL VOL. : 343 FILL VOL. : 338 FILL VOL. : 0

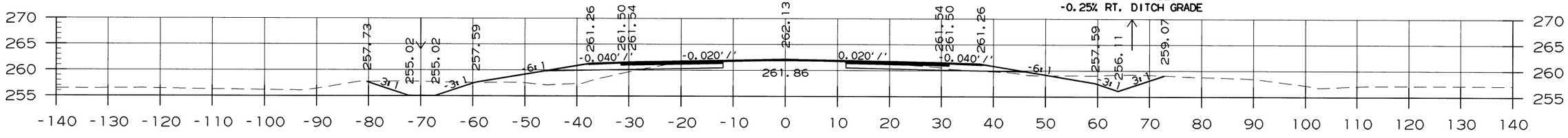



AREA CUT : 25 AREA CUT : 12 AREA CUT : 0
AREA FILL : 96 AREA FILL : 86 AREA FILL : 0

454+00

CUT VOL. : 134 CUT VOL. : 105 CUT VOL. : 0
FILL VOL. : 273 FILL VOL. : 171 FILL VOL. : 0

STA. 453+00.00 END
+0.20% RT. DITCH GRADE
STA. 453+00.00 BEGIN
-0.25% RT. DITCH GRADE

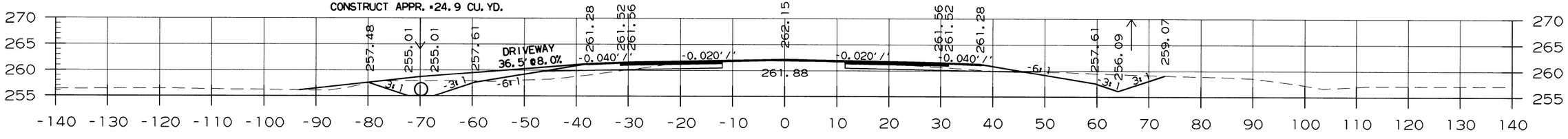



AREA CUT : 47 AREA CUT : 45 AREA CUT : 0
AREA FILL : 51 AREA FILL : 6 AREA FILL : 0

STA. 452+89 IN PLACE
24" X 30' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =24.9 CU. YD.

453+00

CUT VOL. : 18 CUT VOL. : 13 CUT VOL. : 0
FILL VOL. : 30 FILL VOL. : 11 FILL VOL. : 0




AREA CUT : 42 AREA CUT : 21 AREA CUT : 0
AREA FILL : 95 AREA FILL : 47 AREA FILL : 0

452+89

CUT VOL. : 136 CUT VOL. : 58 CUT VOL. : 0
FILL VOL. : 323 FILL VOL. : 202 FILL VOL. : 0

# CROSS SECTION
# STA. 452+89 TO STA. 455+00

2/3/2017
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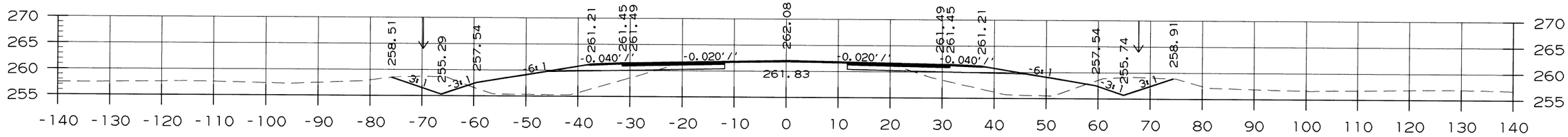
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 363 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

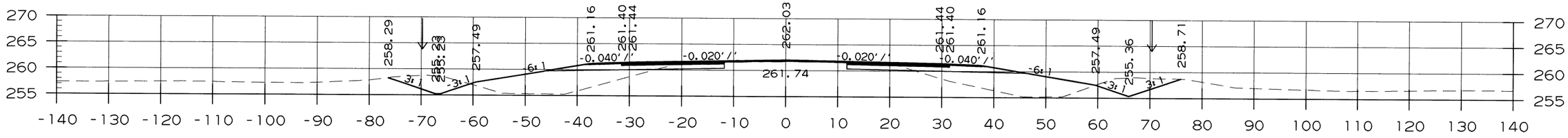
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 37 AREA CUT : 39 AREA CUT : 0
AREA FILL : 107 AREA FILL : 91 AREA FILL : 0

458+00

CUT VOL. : 142 CUT VOL. : 149 CUT VOL. : 0
FILL VOL. : 386 FILL VOL. : 347 FILL VOL. : 0



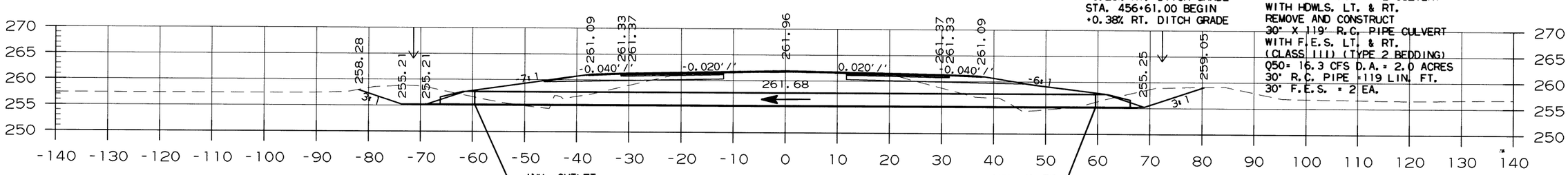

AREA CUT : 40 AREA CUT : 41 AREA CUT : 0
AREA FILL : 101 AREA FILL : 97 AREA FILL : 0

457+00

CUT VOL. : 65 CUT VOL. : 49 CUT VOL. : 0
FILL VOL. : 140 FILL VOL. : 142 FILL VOL. : 0

STA. 456+61.00 END
-0.25% RT. DITCH GRADE
STA. 456+61.00 BEGIN
+0.38% RT. DITCH GRADE

STA. 456+60 IN PLACE
24" X 86' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE AND CONSTRUCT
30" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 2 BEDDING)
Q50= 16.3 CFS D.A. = 2.0 ACRES
30" R.C. PIPE = 119 LIN. FT.
30" F.E.S. = 2 EA.




AREA CUT : 50 AREA CUT : 27 AREA CUT : 0
AREA FILL : 92 AREA FILL : 100 AREA FILL : 0

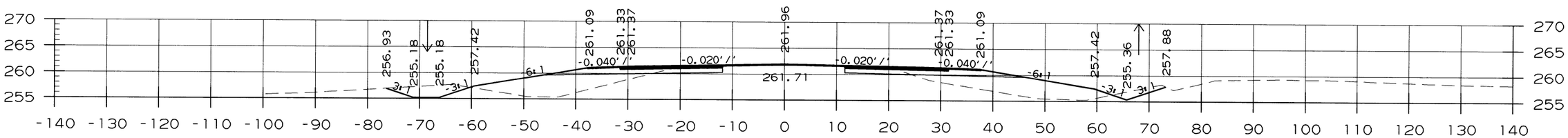
STA. 456+60
END 5' FLAT
BOTTOM DITCH

INV. OUTLET
255.21

456+61

INV. INLET
255.21

CUT VOL. : 96 CUT VOL. : 53 CUT VOL. : 0
FILL VOL. : 203 FILL VOL. : 220 FILL VOL. : 0




AREA CUT : 35 AREA CUT : 20 AREA CUT : 0
AREA FILL : 88 AREA FILL : 95 AREA FILL : 0

456+00

CUT VOL. : 111 CUT VOL. : 58 CUT VOL. : 0
FILL VOL. : 327 FILL VOL. : 355 FILL VOL. : 0

# CROSS SECTION
# STA. 456+00 TO STA. 458+00

2/3/2017

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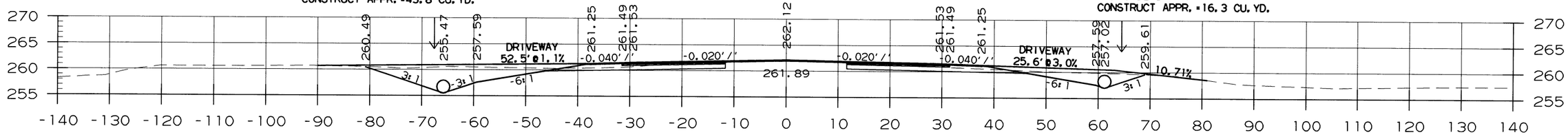
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 364 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STA. 461+34 IN PLACE
30" X 24' C.M. ARCH CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 56' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =43.8 CU. YD.

STAGE 1 STAGE 2 STAGE 3

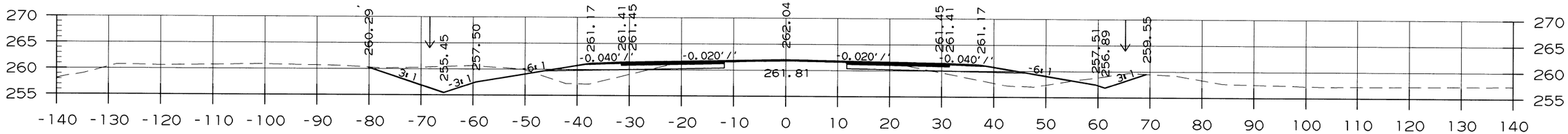
STA. 461+34 IN PLACE
30" X 24' C.M. ARCH CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =16.3 CU. YD.




AREA CUT = 94 AREA CUT = 34 AREA CUT = 0
AREA FILL = 29 AREA FILL = 35 AREA FILL = 0

461+34

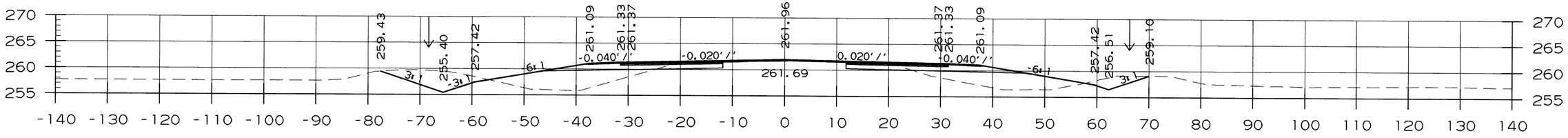
CUT VOL. = 116 CUT VOL. = 40 CUT VOL. = 0
FILL VOL. = 43 FILL VOL. = 50 FILL VOL. = 0




AREA CUT = 90 AREA CUT = 29 AREA CUT = 0
AREA FILL = 40 AREA FILL = 45 AREA FILL = 0

461+00

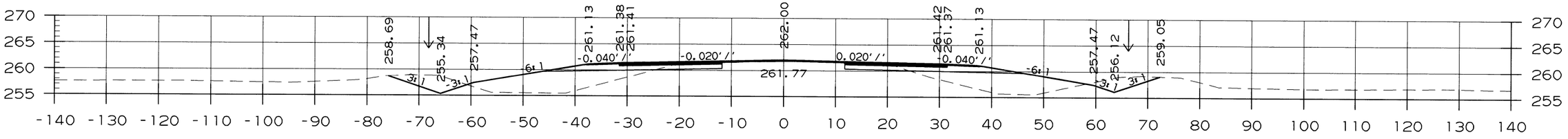
CUT VOL. = 266 CUT VOL. = 99 CUT VOL. = 0
FILL VOL. = 223 FILL VOL. = 216 FILL VOL. = 0




AREA CUT = 53 AREA CUT = 25 AREA CUT = 0
AREA FILL = 80 AREA FILL = 72 AREA FILL = 0

460+00

CUT VOL. = 266 CUT VOL. = 101 CUT VOL. = 0
FILL VOL. = 332 FILL VOL. = 296 FILL VOL. = 0




AREA CUT = 36 AREA CUT = 30 AREA CUT = 0
AREA FILL = 99 AREA FILL = 88 AREA FILL = 0

459+00

CUT VOL. = 135 CUT VOL. = 128 CUT VOL. = 0
FILL VOL. = 382 FILL VOL. = 331 FILL VOL. = 0

# CROSS SECTION
# STA. 459+00 TO STA. 461+34

2/5/2017

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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 |
|---|---|---|---|---|---|---|---|---|
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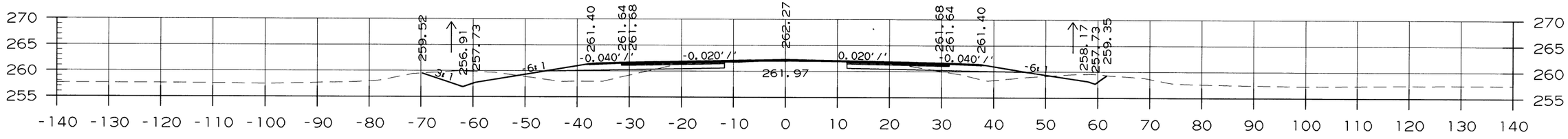
| | | | | JOB NO. | | CA1003 | 365 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

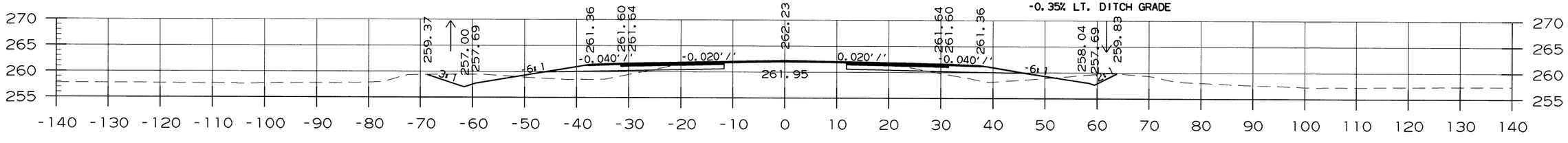



AREA CUT : 37 AREA CUT : 23 AREA CUT : 0
AREA FILL : 42 AREA FILL : 26 AREA FILL : 0

465+00

CUT VOL. : 125 CUT VOL. : 87 CUT VOL. : 0
FILL VOL. : 136 FILL VOL. : 101 FILL VOL. : 0

STA. 464+66.03 END
+0.38% LT. DITCH GRADE
STA. 464+66.03 BEGIN
-0.35% LT. DITCH GRADE

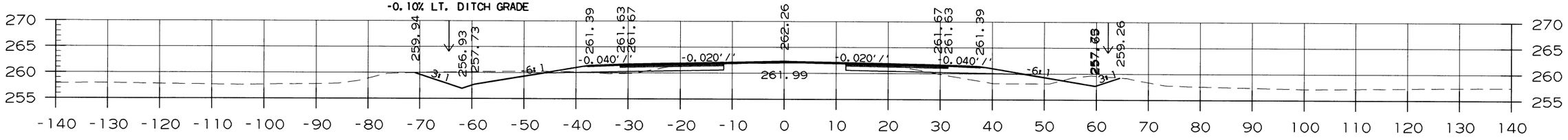



AREA CUT : 30 AREA CUT : 25 AREA CUT : 0
AREA FILL : 32 AREA FILL : 29 AREA FILL : 0

464+00

CUT VOL. : 151 CUT VOL. : 89 CUT VOL. : 0
FILL VOL. : 70 FILL VOL. : 119 FILL VOL. : 0

STA. 463+11.10 END
+1.43% LT. DITCH GRADE
STA. 462+00.00 BEGIN
-0.10% LT. DITCH GRADE

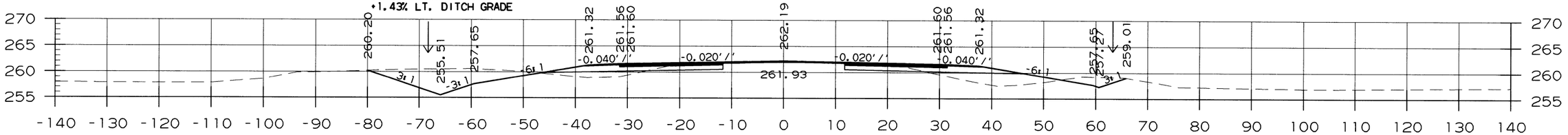



AREA CUT : 51 AREA CUT : 24 AREA CUT : 0
AREA FILL : 6 AREA FILL : 35 AREA FILL : 0

463+00

CUT VOL. : 264 CUT VOL. : 89 CUT VOL. : 0
FILL VOL. : 47 FILL VOL. : 144 FILL VOL. : 0

STA. 462+00.00 END
+0.05% LT. DITCH GRADE
STA. 462+00.00 BEGIN
+1.43% LT. DITCH GRADE




AREA CUT : 91 AREA CUT : 25 AREA CUT : 0
AREA FILL : 20 AREA FILL : 42 AREA FILL : 0

462+00

CUT VOL. : 226 CUT VOL. : 72 CUT VOL. : 0
FILL VOL. : 59 FILL VOL. : 95 FILL VOL. : 0

# CROSS SECTION
# STA. 462+00 TO STA. 465+00

2/3/2017

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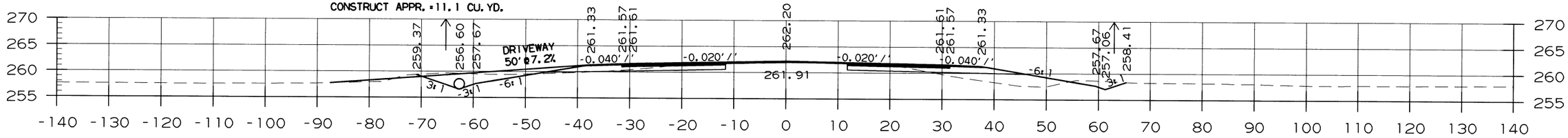
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 366 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

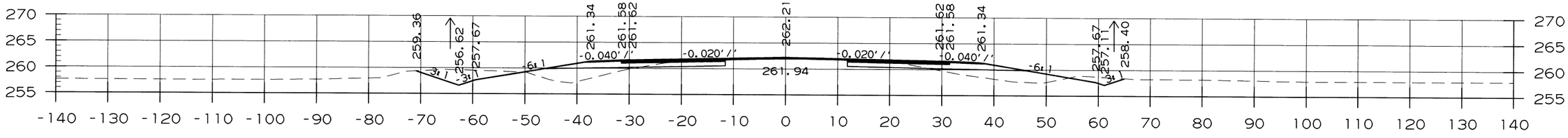
STA. 468+16 IN PLACE
24" X 22' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" x 38' PIPE CULVERTS
LT. SIDE DRAIN
CONSTRUCT APPR. = 11.1 CU. YD.




AREA CUT = 36 AREA CUT = 22 AREA CUT = 0
AREA FILL = 57 AREA FILL = 39 AREA FILL = 0

468+16

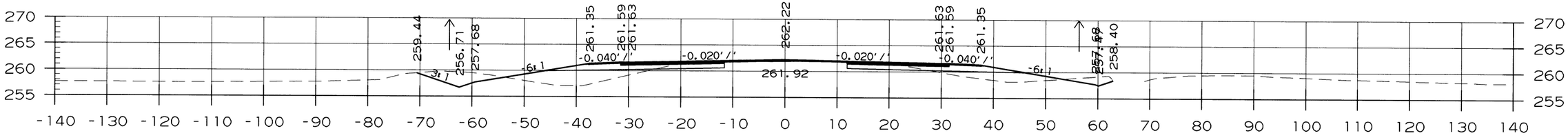
CUT VOL. = 23 CUT VOL. = 12 CUT VOL. = 0
FILL VOL. = 28 FILL VOL. = 24 FILL VOL. = 0




AREA CUT = 40 AREA CUT = 20 AREA CUT = 0
AREA FILL = 38 AREA FILL = 40 AREA FILL = 0

468+00

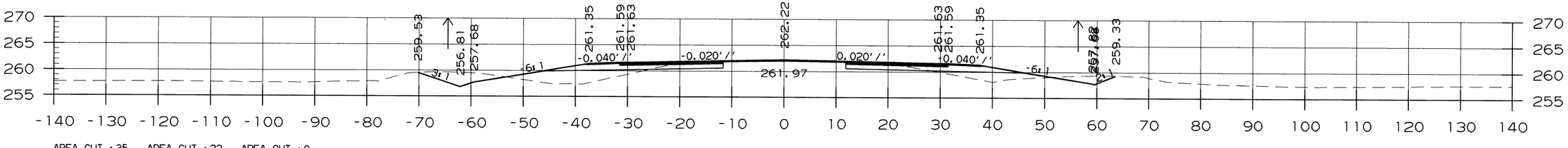
CUT VOL. = 138 CUT VOL. = 74 CUT VOL. = 0
FILL VOL. = 173 FILL VOL. = 133 FILL VOL. = 0




AREA CUT = 34 AREA CUT = 20 AREA CUT = 0
AREA FILL = 55 AREA FILL = 32 AREA FILL = 0

467+00

CUT VOL. = 128 CUT VOL. = 79 CUT VOL. = 0
FILL VOL. = 192 FILL VOL. = 108 FILL VOL. = 0




AREA CUT = 35 AREA CUT = 22 AREA CUT = 0
AREA FILL = 48 AREA FILL = 27 AREA FILL = 0

466+00

CUT VOL. = 134 CUT VOL. = 83 CUT VOL. = 0
FILL VOL. = 167 FILL VOL. = 97 FILL VOL. = 0

# CROSS SECTION
# STA. 466+00 TO STA. 468+16

2/3/2017

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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 |
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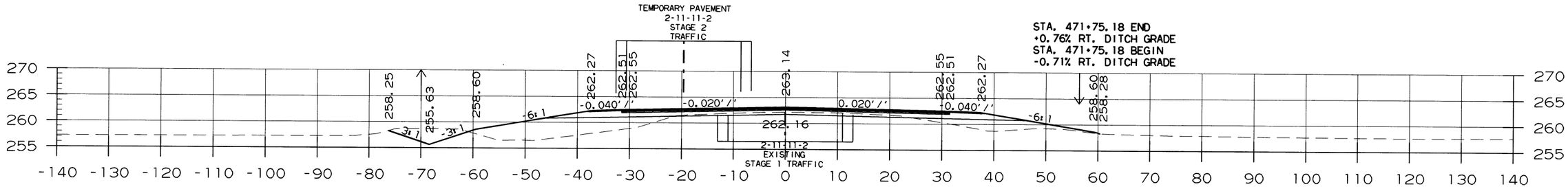
| | | | | JOB NO. | | CA1003 | 367 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

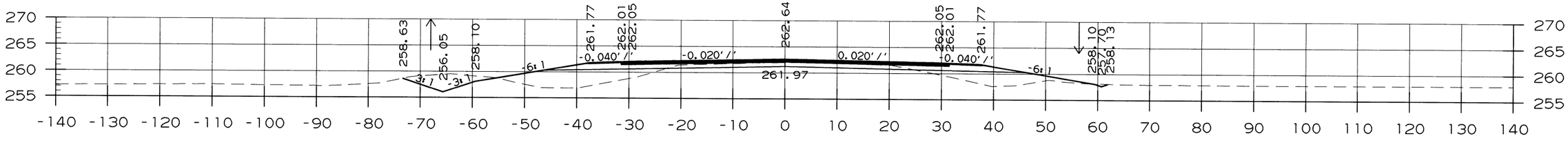
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 30 AREA CUT : 7 AREA CUT : 0
AREA FILL : 106 AREA FILL : 44 AREA FILL : 0

471+00

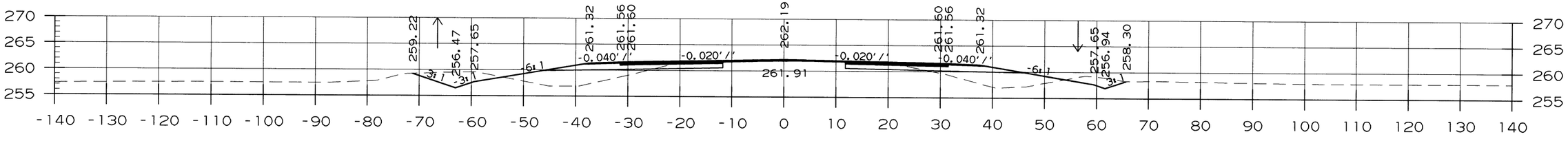
CUT VOL. : 132 CUT VOL. : 41 CUT VOL. : 0
FILL VOL. : 336 FILL VOL. : 176 FILL VOL. : 0




AREA CUT : 42 AREA CUT : 15 AREA CUT : 0
AREA FILL : 76 AREA FILL : 51 AREA FILL : 0

470+00

CUT VOL. : 145 CUT VOL. : 74 CUT VOL. : 0
FILL VOL. : 249 FILL VOL. : 186 FILL VOL. : 0




AREA CUT : 37 AREA CUT : 25 AREA CUT : 0
AREA FILL : 59 AREA FILL : 49 AREA FILL : 0

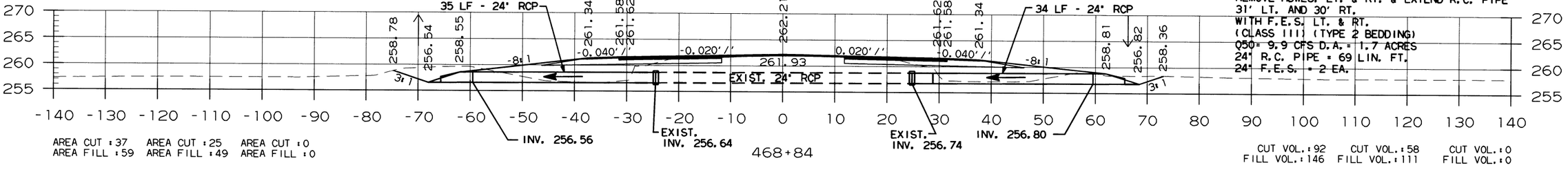
469+00

CUT VOL. : 22 CUT VOL. : 15 CUT VOL. : 0
FILL VOL. : 35 FILL VOL. : 29 FILL VOL. : 0

STA. 468+84.00 END
-0.10% LT. DITCH GRADE
STA. 468+84.00 BEGIN
-0.42% LT. DITCH GRADE

STA. 468+84.00 END
-0.35% RT. DITCH GRADE
STA. 468+84.00 BEGIN
+0.76% RT. DITCH GRADE

STA. 468+84 IN PLACE
24" X 57' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. & EXTEND R.C. PIPE
31' LT. AND 30' RT.
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 2 BEDDING)
Q50= 9.9 CFS D.A.= 1.7 ACRES
24" R.C. PIPE = 69 LIN. FT.
24" F.E.S. = 2 EA.




AREA CUT : 37 AREA CUT : 25 AREA CUT : 0
AREA FILL : 59 AREA FILL : 49 AREA FILL : 0

468+84

CUT VOL. : 92 CUT VOL. : 58 CUT VOL. : 0
FILL VOL. : 146 FILL VOL. : 111 FILL VOL. : 0

# CROSS SECTION
# STA. 468+84 TO STA. 471+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
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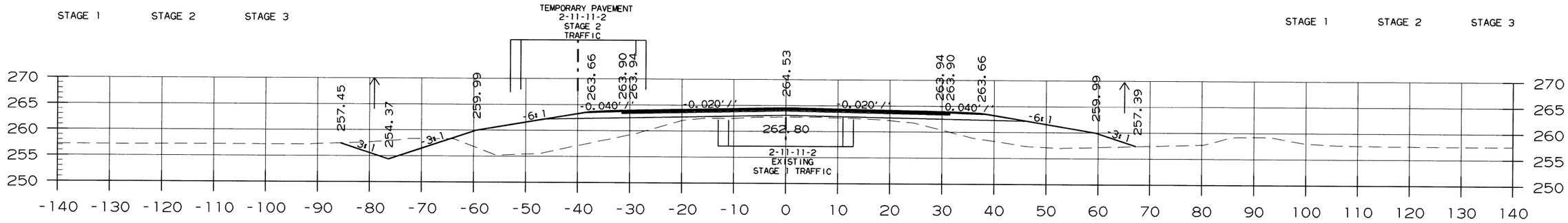
| | | | | JOB NO. | | CA1003 | 368 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

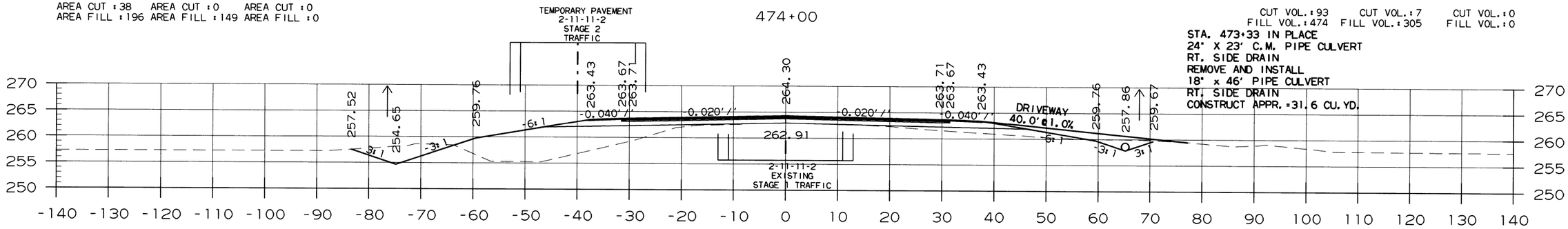



AREA CUT : 38 AREA CUT : 0 AREA CUT : 0
AREA FILL : 196 AREA FILL : 149 AREA FILL : 0

474+00

CUT VOL. : 93 CUT VOL. : 7 CUT VOL. : 0
FILL VOL. : 474 FILL VOL. : 305 FILL VOL. : 0

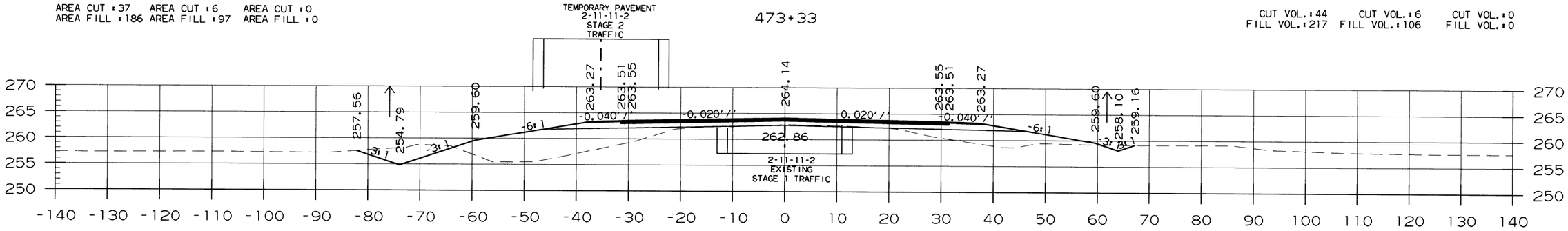
STA. 473+33 IN PLACE
24' X 23' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18' x 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 31.6 CU. YD.




AREA CUT : 37 AREA CUT : 6 AREA CUT : 0
AREA FILL : 186 AREA FILL : 97 AREA FILL : 0

473+33

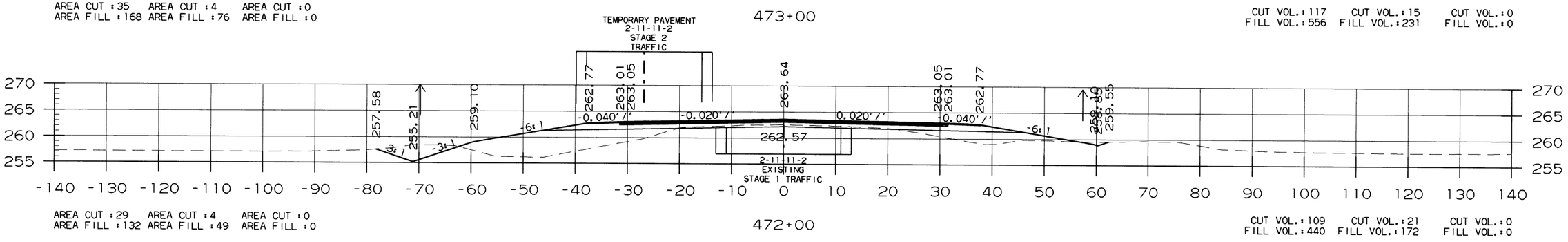
CUT VOL. : 44 CUT VOL. : 6 CUT VOL. : 0
FILL VOL. : 217 FILL VOL. : 106 FILL VOL. : 0




AREA CUT : 35 AREA CUT : 4 AREA CUT : 0
AREA FILL : 168 AREA FILL : 76 AREA FILL : 0

473+00

CUT VOL. : 117 CUT VOL. : 15 CUT VOL. : 0
FILL VOL. : 556 FILL VOL. : 231 FILL VOL. : 0




AREA CUT : 29 AREA CUT : 4 AREA CUT : 0
AREA FILL : 132 AREA FILL : 49 AREA FILL : 0

472+00

CUT VOL. : 109 CUT VOL. : 21 CUT VOL. : 0
FILL VOL. : 440 FILL VOL. : 172 FILL VOL. : 0

# CROSS SECTION
# STA. 472+00 TO STA. 474+00

2/5/2017

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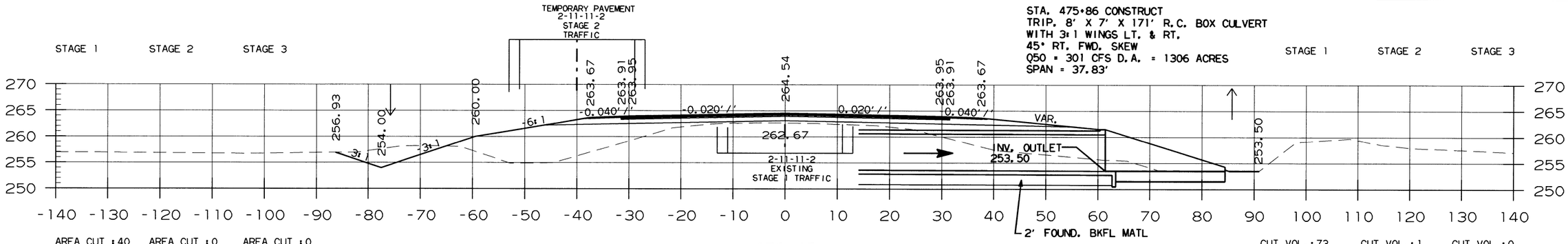
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 369 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 475+00 TO STA. 476+45

2/3/2017

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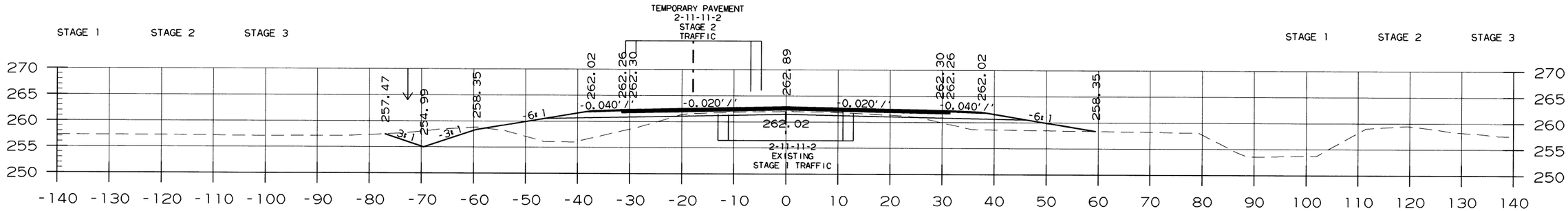
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 370 | 503 |

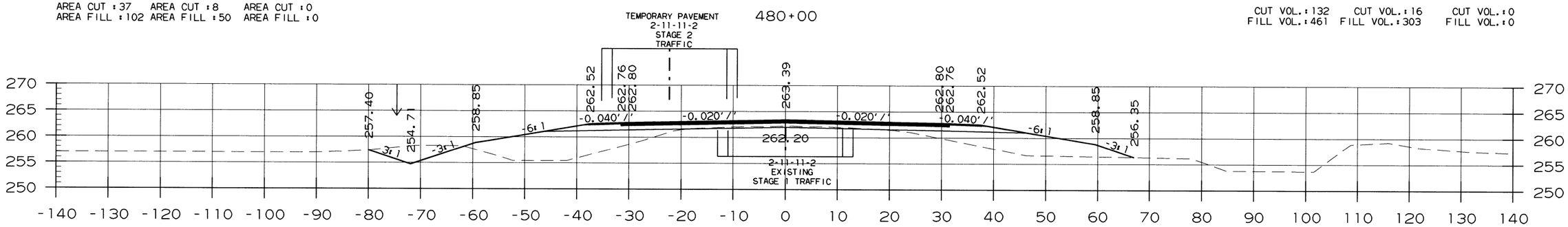
② CROSS SECTIONS




AREA CUT : 37 AREA CUT : 8 AREA CUT : 0
AREA FILL : 102 AREA FILL : 50 AREA FILL : 0

480+00

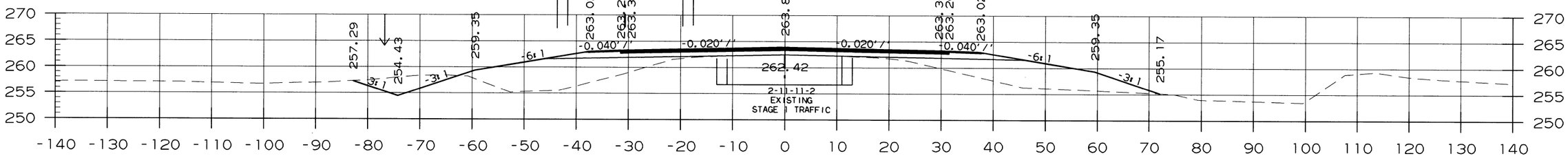
CUT VOL. : 132 CUT VOL. : 16 CUT VOL. : 0
FILL VOL. : 461 FILL VOL. : 303 FILL VOL. : 0




AREA CUT : 34 AREA CUT : 1 AREA CUT : 0
AREA FILL : 147 AREA FILL : 114 AREA FILL : 0

479+00

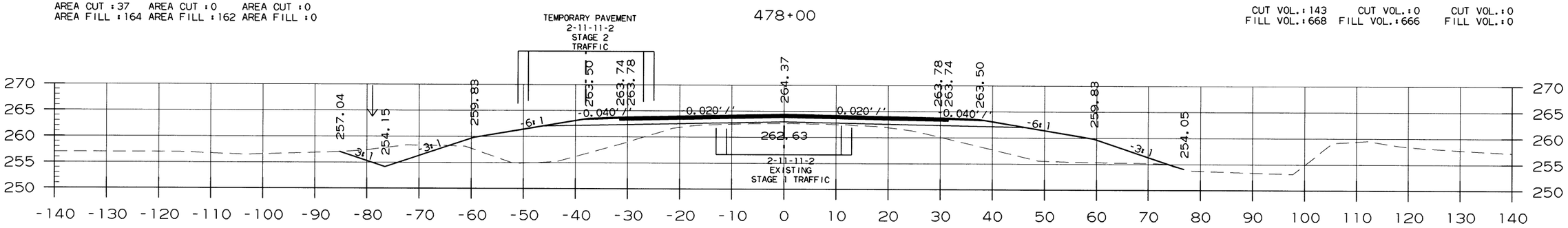
CUT VOL. : 131 CUT VOL. : 2 CUT VOL. : 0
FILL VOL. : 577 FILL VOL. : 510 FILL VOL. : 0




AREA CUT : 37 AREA CUT : 0 AREA CUT : 0
AREA FILL : 164 AREA FILL : 162 AREA FILL : 0

478+00

CUT VOL. : 143 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 668 FILL VOL. : 666 FILL VOL. : 0




AREA CUT : 40 AREA CUT : 0 AREA CUT : 0
AREA FILL : 196 AREA FILL : 198 AREA FILL : 0

477+00

CUT VOL. : 81 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 410 FILL VOL. : 413 FILL VOL. : 0

# CROSS SECTION
# STA. 477+00 TO STA. 480+00

2/3/2017

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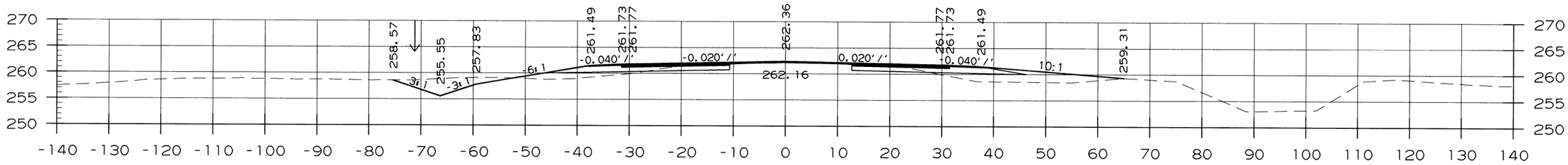
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 371 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

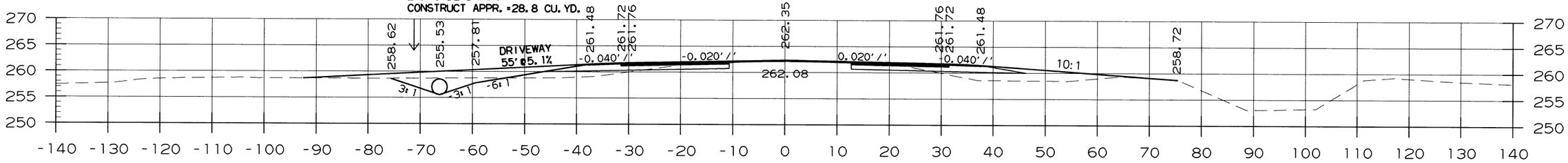



AREA CUT : 46 AREA CUT : 12 AREA CUT : 0
AREA FILL : 24 AREA FILL : 33 AREA FILL : 0

STA. 481+93 IN PLACE
30" X 27' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 28.8 CU. YD.

482+00

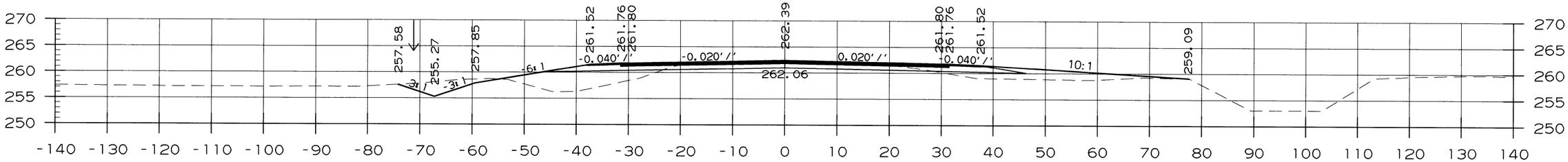
CUT VOL. : 12 CUT VOL. : 3 CUT VOL. : 0
FILL VOL. : 6 FILL VOL. : 9 FILL VOL. : 0




AREA CUT : 46 AREA CUT : 12 AREA CUT : 0
AREA FILL : 24 AREA FILL : 33 AREA FILL : 0

481+93

CUT VOL. : 157 CUT VOL. : 62 CUT VOL. : 0
FILL VOL. : 174 FILL VOL. : 97 FILL VOL. : 0

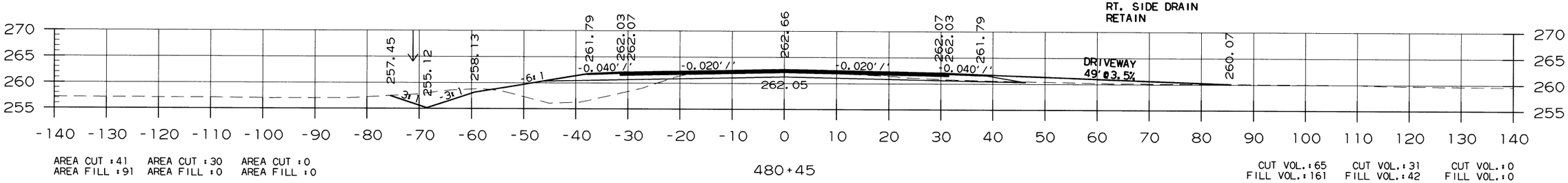



AREA CUT : 45 AREA CUT : 24 AREA CUT : 0
AREA FILL : 77 AREA FILL : 23 AREA FILL : 0

481+00

CUT VOL. : 88 CUT VOL. : 54 CUT VOL. : 0
FILL VOL. : 171 FILL VOL. : 24 FILL VOL. : 0

STA. 480+45 IN PLACE
78" X 31' C. I.
RT. SIDE DRAIN
RETAIN




AREA CUT : 41 AREA CUT : 30 AREA CUT : 0
AREA FILL : 91 AREA FILL : 0 AREA FILL : 0

480+45

CUT VOL. : 65 CUT VOL. : 31 CUT VOL. : 0
FILL VOL. : 161 FILL VOL. : 42 FILL VOL. : 0

# CROSS SECTION
# STA. 480+45 TO STA. 482+00

2/5/2017

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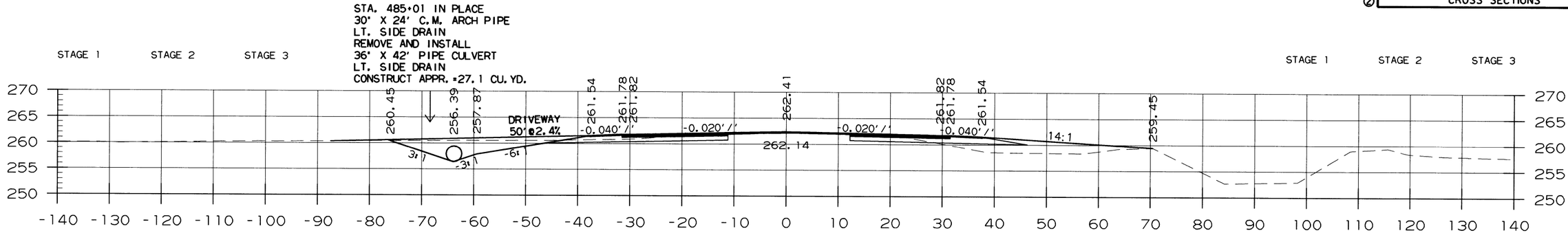
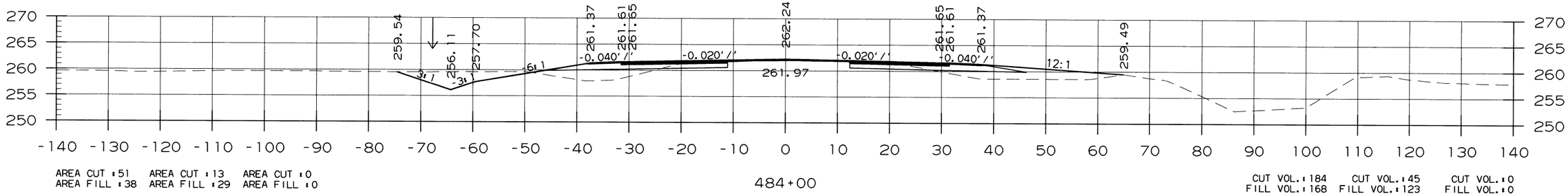
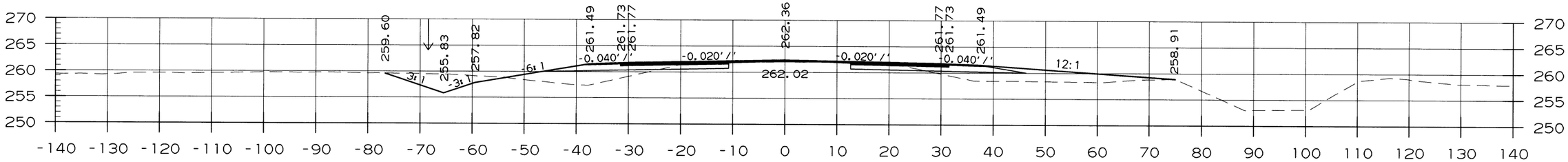
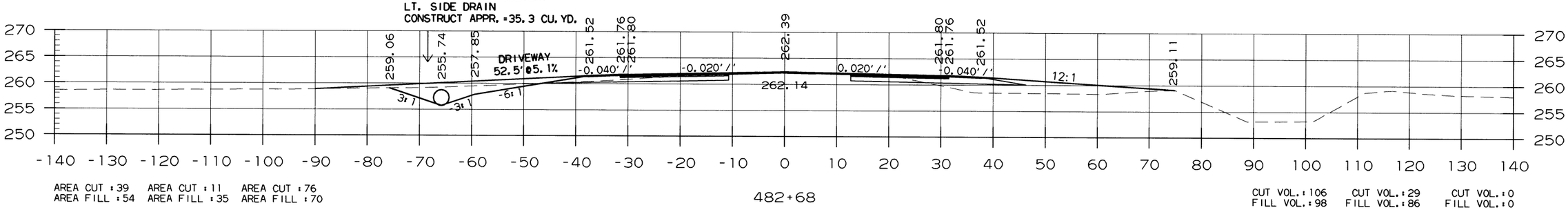
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 372 | 503 |

② CROSS SECTIONS




CROSS SECTION
STA. 482+68 TO STA. 485+00

2/3/2017

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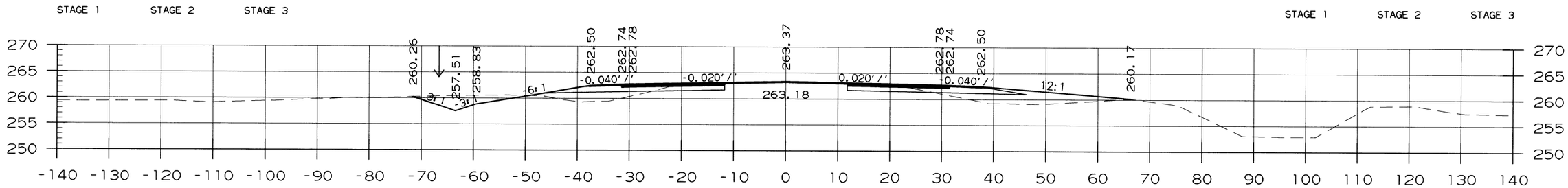
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 373 | 503 |

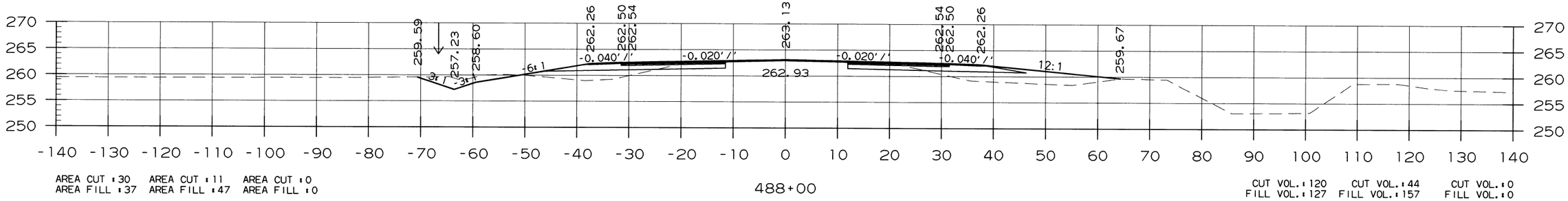
② CROSS SECTIONS




AREA CUT : 41 AREA CUT : 14 AREA CUT : 0
AREA FILL : 31 AREA FILL : 36 AREA FILL : 0

489+00

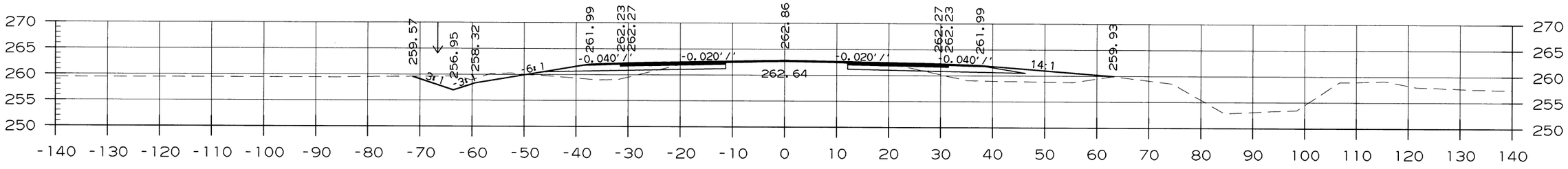
CUT VOL. : 132 CUT VOL. : 47 CUT VOL. : 0
FILL VOL. : 126 FILL VOL. : 155 FILL VOL. : 0




AREA CUT : 30 AREA CUT : 11 AREA CUT : 0
AREA FILL : 37 AREA FILL : 47 AREA FILL : 0

488+00

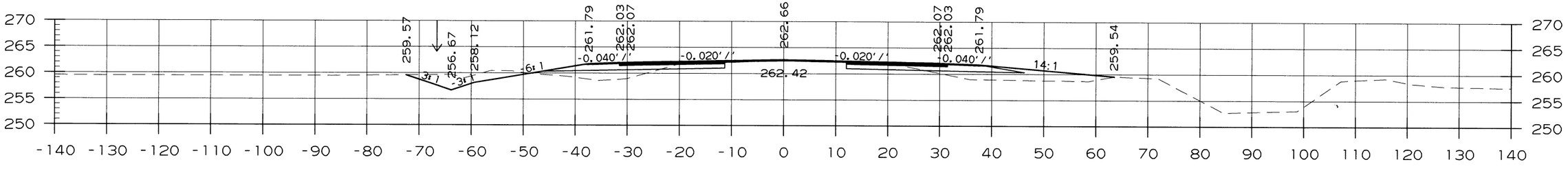
CUT VOL. : 120 CUT VOL. : 44 CUT VOL. : 0
FILL VOL. : 127 FILL VOL. : 157 FILL VOL. : 0




AREA CUT : 35 AREA CUT : 12 AREA CUT : 0
AREA FILL : 32 AREA FILL : 38 AREA FILL : 0

487+00

CUT VOL. : 145 CUT VOL. : 45 CUT VOL. : 0
FILL VOL. : 122 FILL VOL. : 131 FILL VOL. : 0




AREA CUT : 43 AREA CUT : 12 AREA CUT : 0
AREA FILL : 34 AREA FILL : 33 AREA FILL : 0

486+00

CUT VOL. : 228 CUT VOL. : 45 CUT VOL. : 0
FILL VOL. : 65 FILL VOL. : 123 FILL VOL. : 0

# CROSS SECTION
# STA. 486+00 TO STA. 489+00

2/3/2017

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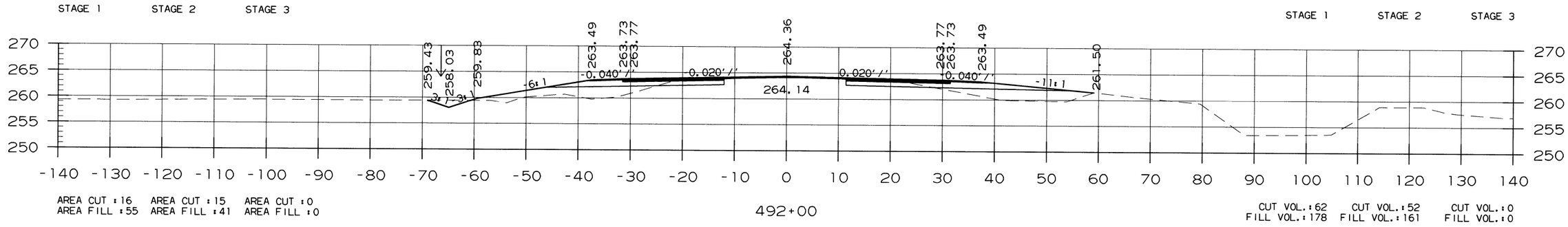
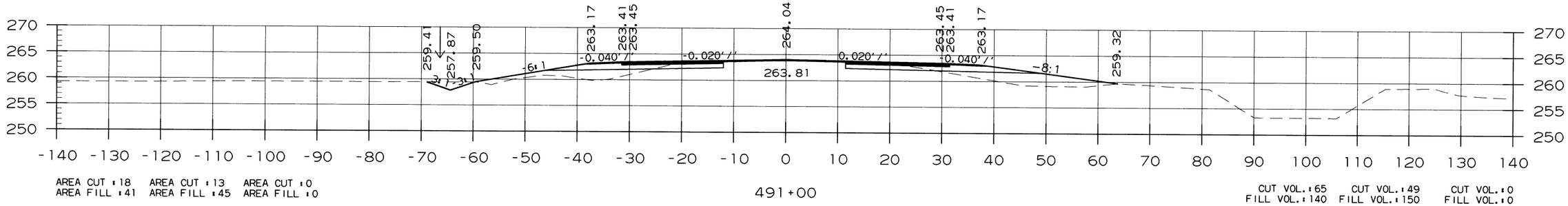
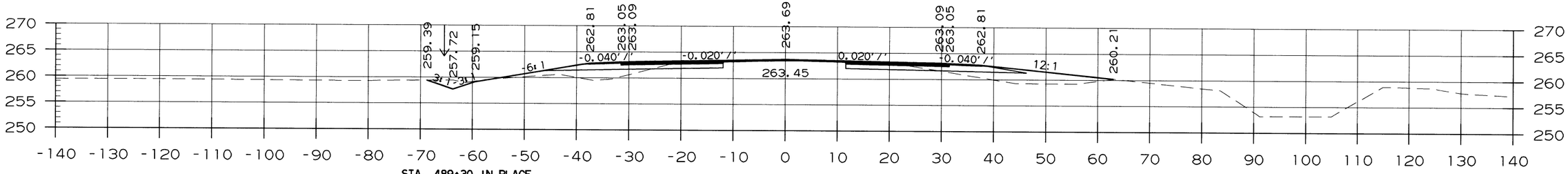
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 374 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

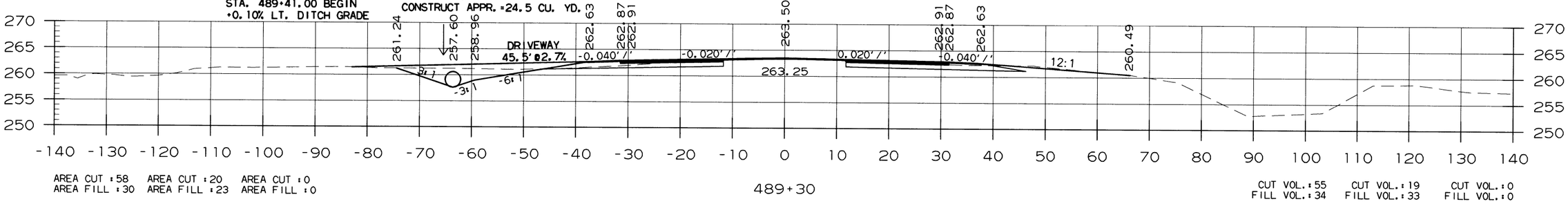



STA. 489+30 IN PLACE
30" X 22' C.M. ARCH PIPE
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =24.5 CU. YD.

STA. 489+41.00 END
+0.28% LT. DITCH GRADE
STA. 489+41.00 BEGIN
+0.10% LT. DITCH GRADE




CROSS SECTION
STA. 489+30 TO STA. 492+00

2/3/2017

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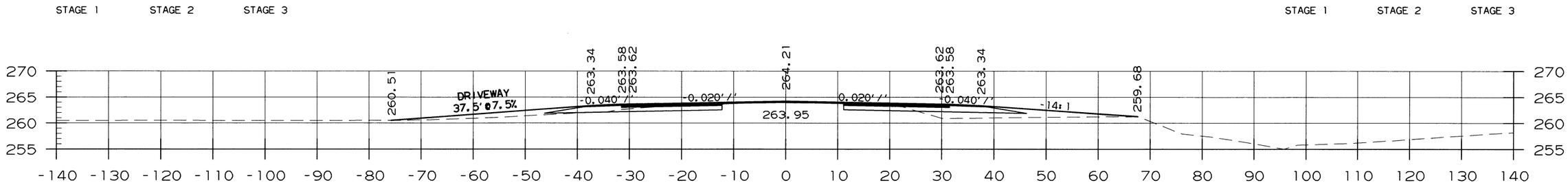
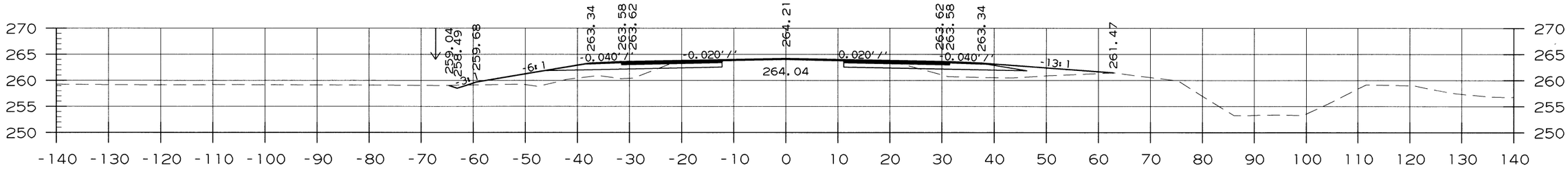
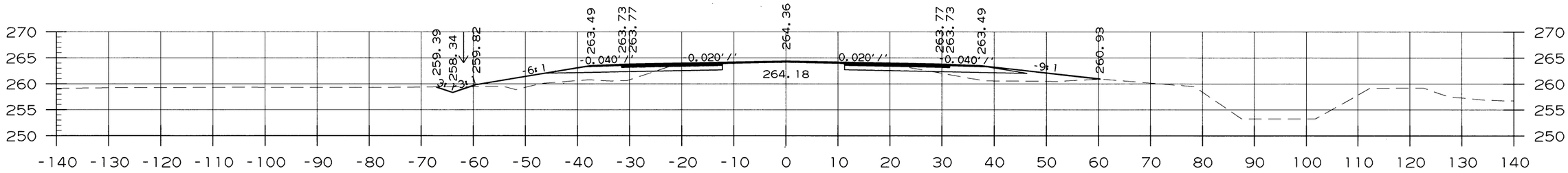
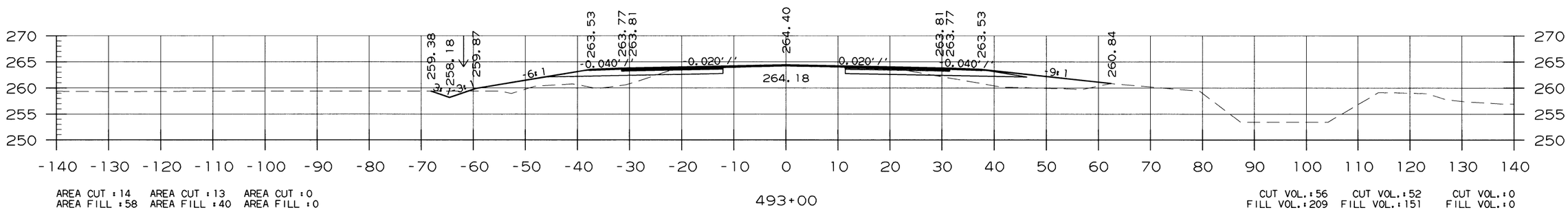
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 375 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 493+00 TO STA. 495+95

2/3/2017

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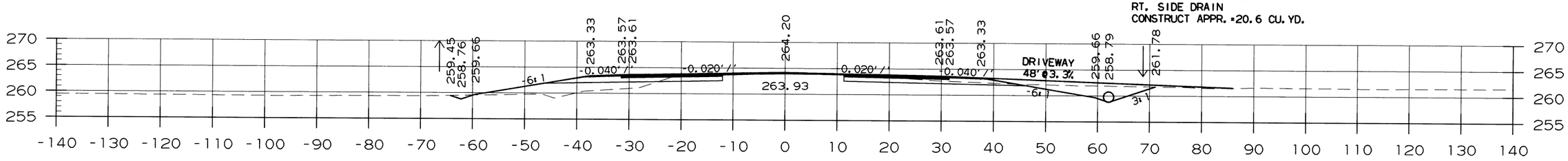
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 376 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

STA. 497+49 IN PLACE
24" X 47' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =20.6 CU. YD.



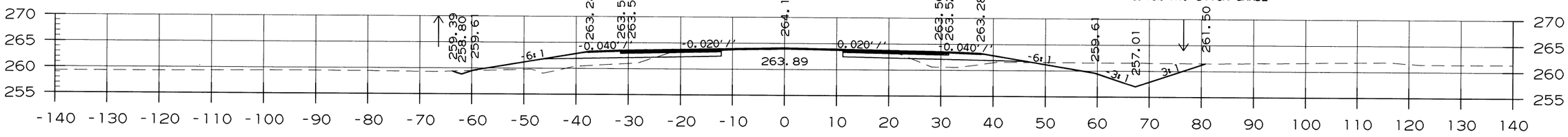

AREA CUT : 11 AREA CUT : 56 AREA CUT : 0
AREA FILL : 54 AREA FILL : 0 AREA FILL : 0

497+49

CUT VOL. : 20 CUT VOL. : 122 CUT VOL. : 0
FILL VOL. : 94 FILL VOL. : 22 FILL VOL. : 0

STA. 497+00.00 END
+0.10% LT. DITCH GRADE
STA. 497+00.00 BEGIN
-0.08% LT. DITCH GRADE

STA. 497+25.52 END
+5.53% RT. DITCH GRADE
STA. 497+25.52 BEGIN
+0.10% RT. DITCH GRADE



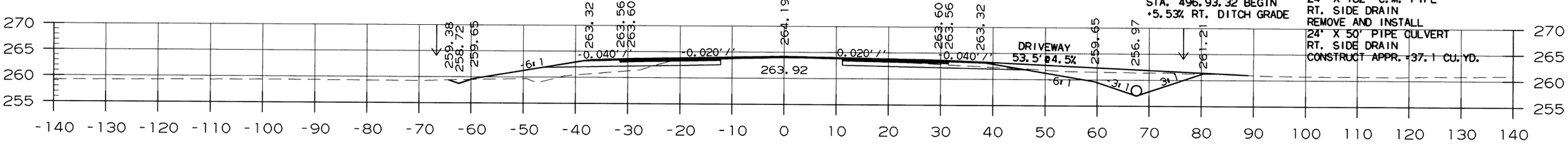

AREA CUT : 11 AREA CUT : 78 AREA CUT : 0
AREA FILL : 49 AREA FILL : 23 AREA FILL : 0

497+00

CUT VOL. : 23 CUT VOL. : 165 CUT VOL. : 0
FILL VOL. : 101 FILL VOL. : 24 FILL VOL. : 0

STA. 496.93.32 END
0.00% RT. DITCH GRADE
STA. 496.93.32 BEGIN
+5.53% RT. DITCH GRADE

STA. 496+45 IN PLACE
24" X 182' C.M. PIPE
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 50' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =37.1 CU. YD.

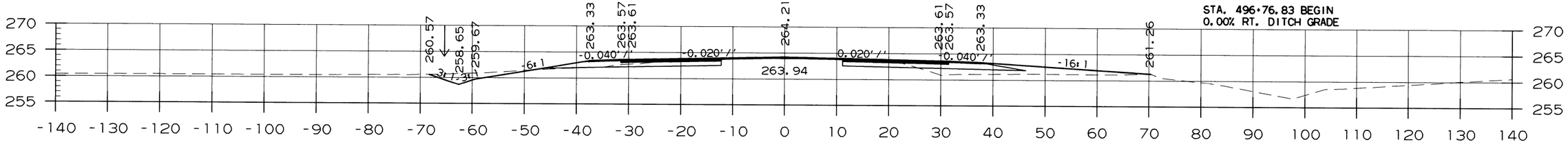



AREA CUT : 11 AREA CUT : 83 AREA CUT : 0
AREA FILL : 50 AREA FILL : 0 AREA FILL : 0

496+45

CUT VOL. : 36 CUT VOL. : 95 CUT VOL. : 0
FILL VOL. : 45 FILL VOL. : 19 FILL VOL. : 0

STA. 496+76.83 BEGIN
0.00% RT. DITCH GRADE




AREA CUT : 33 AREA CUT : 31 AREA CUT : 0
AREA FILL : 4 AREA FILL : 23 AREA FILL : 0

496+00

CUT VOL. : 6 CUT VOL. : 6 CUT VOL. : 0
FILL VOL. : 1 FILL VOL. : 4 FILL VOL. : 0

# CROSS SECTION
# STA. 496+00 TO STA. 497+49

2/3/2017

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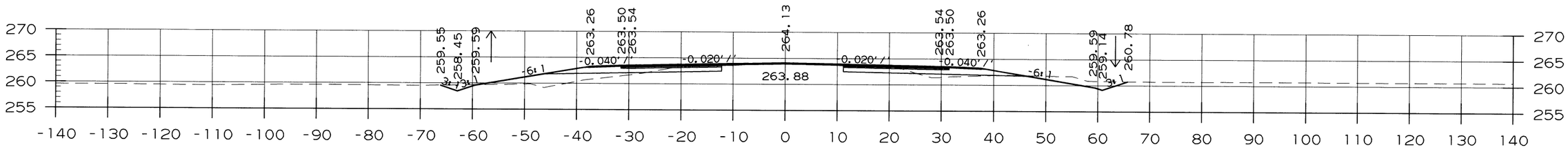
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 377 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

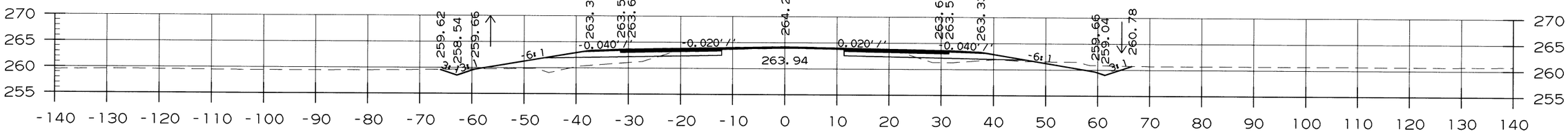



AREA CUT : 14 AREA CUT : 30 AREA CUT : 0
AREA FILL : 40 AREA FILL : 9 AREA FILL : 0

501+00

CUT VOL. : 50 CUT VOL. : 108 CUT VOL. : 0
FILL VOL. : 169 FILL VOL. : 43 FILL VOL. : 0

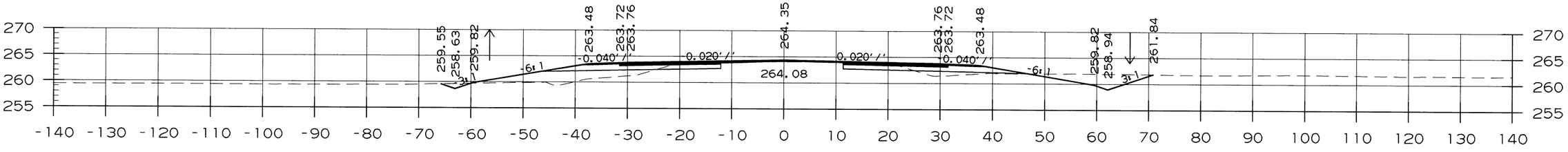
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 13 AREA CUT : 29 AREA CUT : 0
AREA FILL : 51 AREA FILL : 14 AREA FILL : 0

500+00

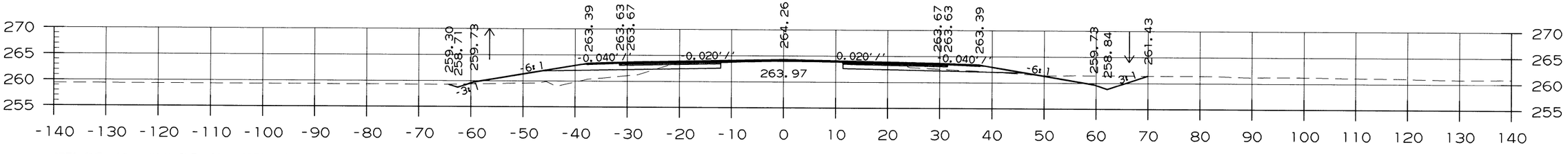
CUT VOL. : 46 CUT VOL. : 135 CUT VOL. : 0
FILL VOL. : 194 FILL VOL. : 50 FILL VOL. : 0




AREA CUT : 12 AREA CUT : 44 AREA CUT : 0
AREA FILL : 54 AREA FILL : 13 AREA FILL : 0

499+00

CUT VOL. : 41 CUT VOL. : 152 CUT VOL. : 0
FILL VOL. : 209 FILL VOL. : 31 FILL VOL. : 0




AREA CUT : 10 AREA CUT : 38 AREA CUT : 0
AREA FILL : 59 AREA FILL : 3 AREA FILL : 0

498+00

CUT VOL. : 20 CUT VOL. : 88 CUT VOL. : 0
FILL VOL. : 106 FILL VOL. : 4 FILL VOL. : 0

# CROSS SECTION
# STA. 498+00 TO STA. 501+00

2/3/2017

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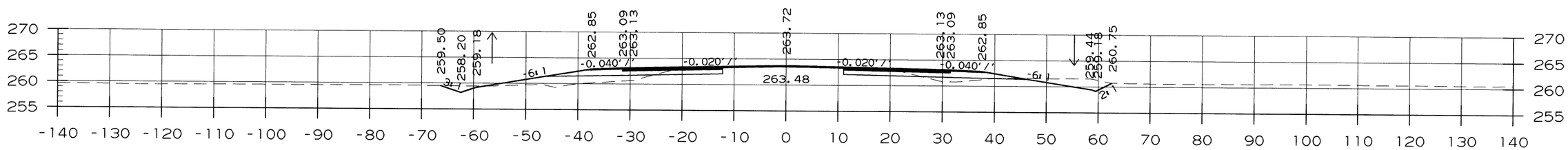
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 378 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

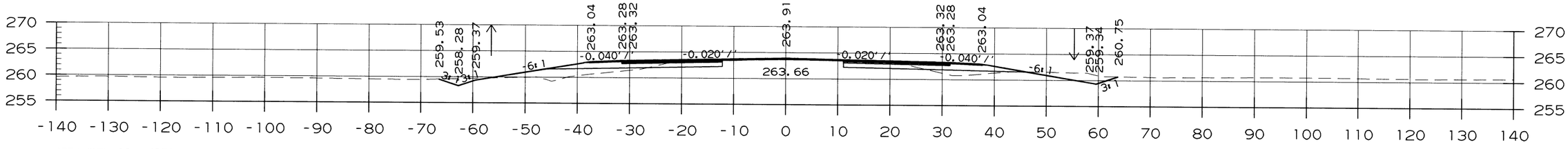
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 15 AREA CUT : 32 AREA CUT : 0
AREA FILL : 40 AREA FILL : 10 AREA FILL : 0

504+00

CUT VOL. : 59 CUT VOL. : 113 CUT VOL. : 0
FILL VOL. : 138 FILL VOL. : 44 FILL VOL. : 0

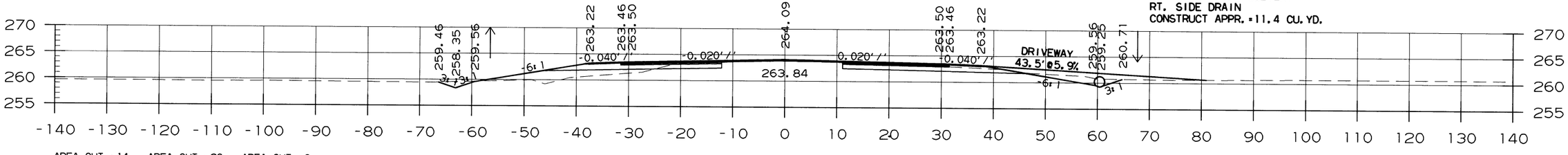



AREA CUT : 16 AREA CUT : 29 AREA CUT : 0
AREA FILL : 34 AREA FILL : 13 AREA FILL : 0

503+00

CUT VOL. : 49 CUT VOL. : 91 CUT VOL. : 0
FILL VOL. : 115 FILL VOL. : 36 FILL VOL. : 0

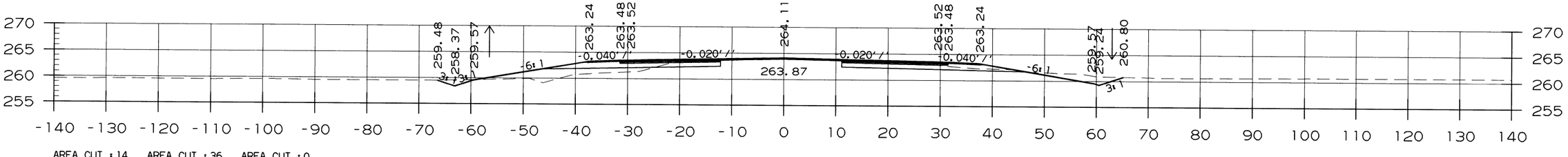
STA. 502+15 INSTALL
24" X 42" PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 11.4 CU. YD.




AREA CUT : 14 AREA CUT : 29 AREA CUT : 0
AREA FILL : 41 AREA FILL : 10 AREA FILL : 0

502+15

CUT VOL. : 8 CUT VOL. : 18 CUT VOL. : 0
FILL VOL. : 22 FILL VOL. : 3 FILL VOL. : 0




AREA CUT : 14 AREA CUT : 36 AREA CUT : 0
AREA FILL : 41 AREA FILL : 0 AREA FILL : 0

502+00

CUT VOL. : 52 CUT VOL. : 122 CUT VOL. : 0
FILL VOL. : 151 FILL VOL. : 18 FILL VOL. : 0

# CROSS SECTION
# STA. 502+00 TO STA. 504+00

2/3/2017

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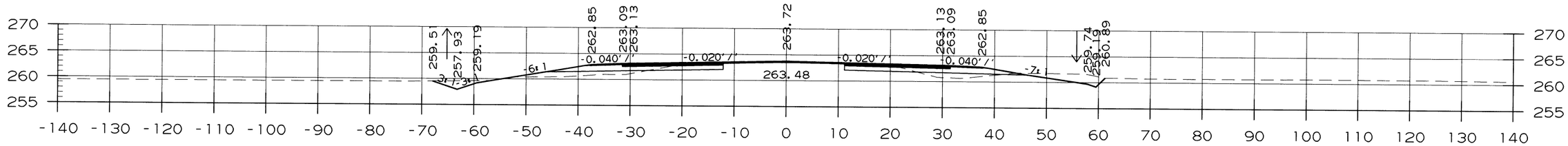
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 379 | 503 |

② CROSS SECTIONS

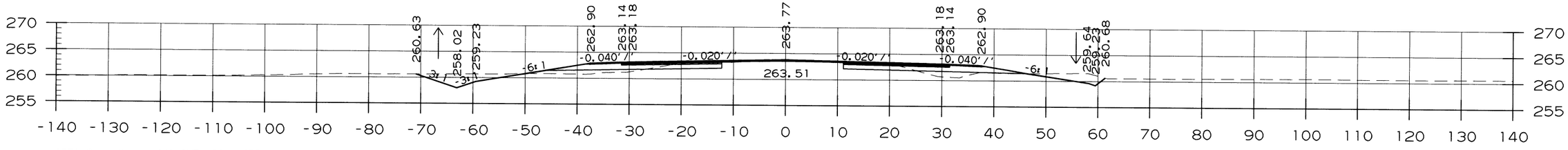
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 19 AREA CUT : 32 AREA CUT : 0
AREA FILL : 21 AREA FILL : 13 AREA FILL : 0

507+00

CUT VOL. : 99 CUT VOL. : 111 CUT VOL. : 0
FILL VOL. : 69 FILL VOL. : 48 FILL VOL. : 0

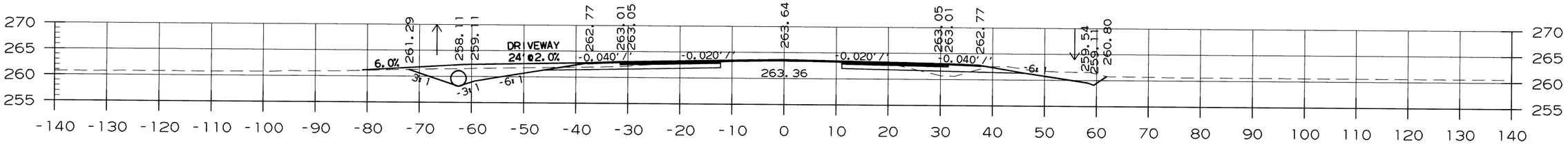



AREA CUT : 35 AREA CUT : 28 AREA CUT : 0
AREA FILL : 16 AREA FILL : 13 AREA FILL : 0

506+00

CUT VOL. : 17 CUT VOL. : 124 CUT VOL. : 0
FILL VOL. : 31 FILL VOL. : 38 FILL VOL. : 0

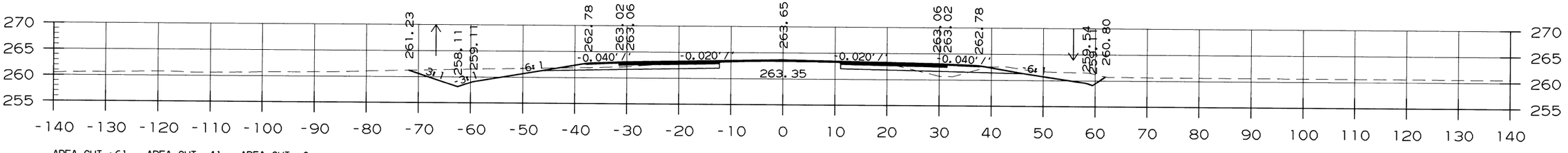
STA. 505+03 INSTALL
36" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =24.8 CU. YD.




AREA CUT : 61 AREA CUT : 41 AREA CUT : 0
AREA FILL : 1 AREA FILL : 8 AREA FILL : 0

505+03

CUT VOL. : 7 CUT VOL. : 5 CUT VOL. : 0
FILL VOL. : 0 FILL VOL. : 1 FILL VOL. : 0




AREA CUT : 61 AREA CUT : 41 AREA CUT : 0
AREA FILL : 1 AREA FILL : 8 AREA FILL : 0

505+00

CUT VOL. : 142 CUT VOL. : 135 CUT VOL. : 0
FILL VOL. : 76 FILL VOL. : 34 FILL VOL. : 0

# CROSS SECTION
# STA. 505+00 TO STA. 507+00

2/3/2017

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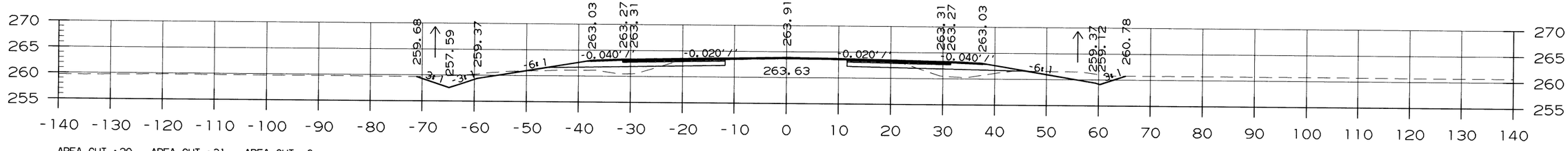
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 380 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

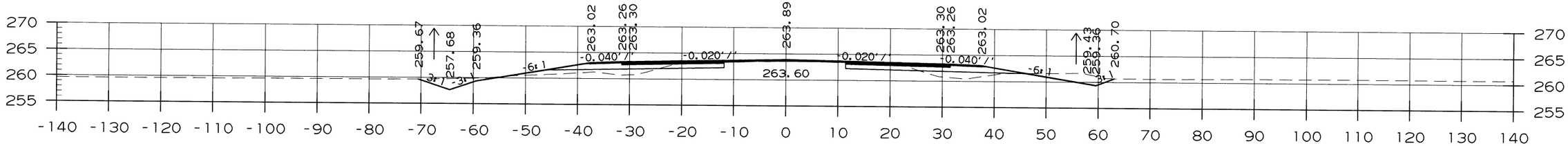
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 29 AREA CUT : 31 AREA CUT : 0
AREA FILL : 24 AREA FILL : 21 AREA FILL : 0

511+00

CUT VOL. : 97 CUT VOL. : 112 CUT VOL. : 0
FILL VOL. : 89 FILL VOL. : 72 FILL VOL. : 0

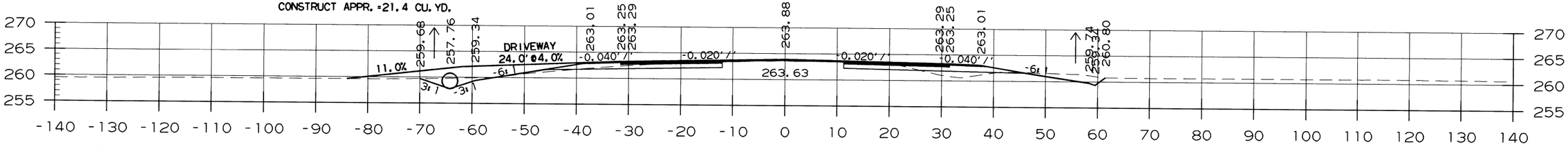



AREA CUT : 23 AREA CUT : 30 AREA CUT : 0
AREA FILL : 24 AREA FILL : 17 AREA FILL : 0

510+00

CUT VOL. : 97 CUT VOL. : 106 CUT VOL. : 0
FILL VOL. : 54 FILL VOL. : 56 FILL VOL. : 0

STA. 509+00 INSTALL
36" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 21.4 CU. YD.

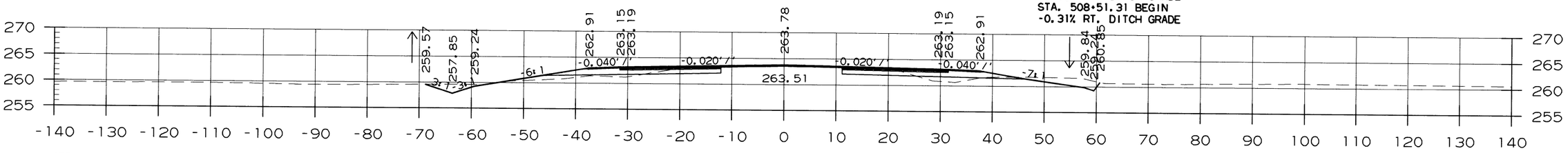



AREA CUT : 29 AREA CUT : 27 AREA CUT : 0
AREA FILL : 5 AREA FILL : 13 AREA FILL : 0

509+00

CUT VOL. : 90 CUT VOL. : 107 CUT VOL. : 0
FILL VOL. : 39 FILL VOL. : 45 FILL VOL. : 0

STA. 508+51.31 END
+0.10% RT. DITCH GRADE
STA. 508+51.31 BEGIN
-0.31% RT. DITCH GRADE




AREA CUT : 20 AREA CUT : 31 AREA CUT : 0
AREA FILL : 16 AREA FILL : 11 AREA FILL : 0

508+00

CUT VOL. : 71 CUT VOL. : 116 CUT VOL. : 0
FILL VOL. : 68 FILL VOL. : 45 FILL VOL. : 0

# CROSS SECTION
# STA. 508+00 TO STA. 511+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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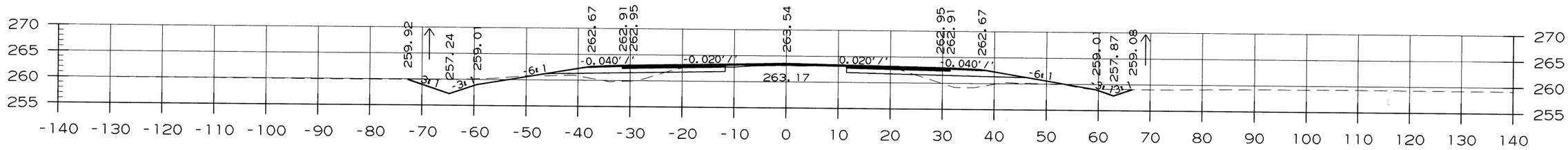
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 381 | 503 |

② CROSS SECTIONS

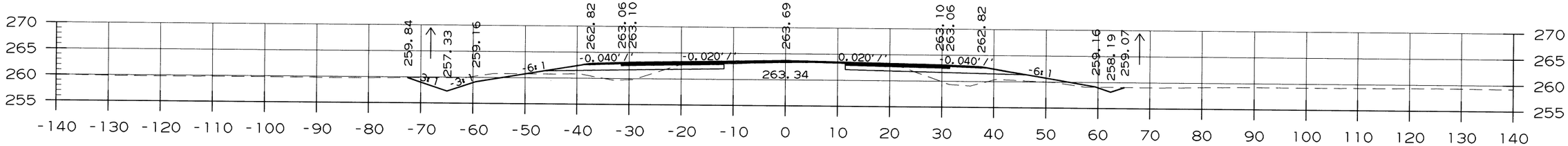
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 33 AREA CUT : 15 AREA CUT : 0
AREA FILL : 31 AREA FILL : 41 AREA FILL : 0

515+00

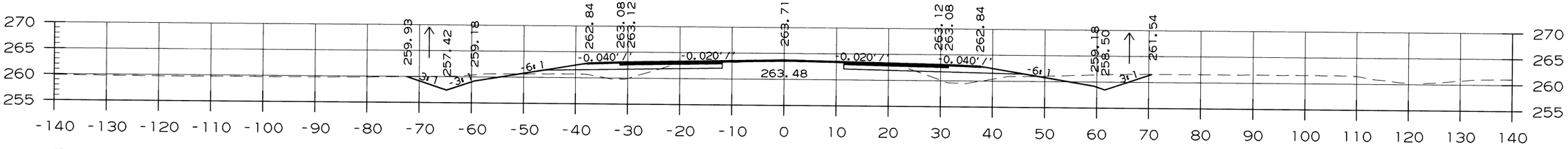
CUT VOL. : 124 CUT VOL. : 55 CUT VOL. : 0
FILL VOL. : 121 FILL VOL. : 158 FILL VOL. : 0




AREA CUT : 34 AREA CUT : 14 AREA CUT : 0
AREA FILL : 34 AREA FILL : 44 AREA FILL : 0

514+00

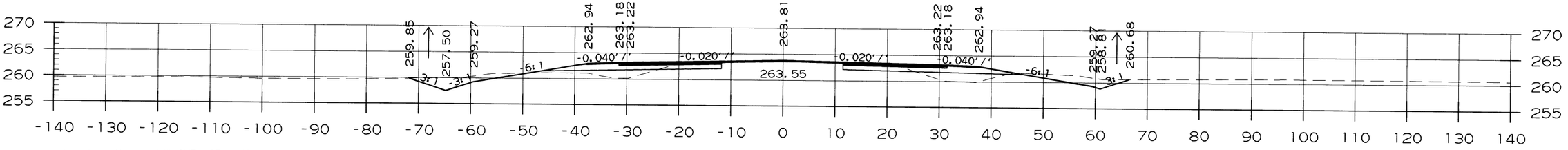
CUT VOL. : 127 CUT VOL. : 106 CUT VOL. : 0
FILL VOL. : 120 FILL VOL. : 137 FILL VOL. : 0




AREA CUT : 35 AREA CUT : 43 AREA CUT : 0
AREA FILL : 31 AREA FILL : 30 AREA FILL : 0

513+00

CUT VOL. : 128 CUT VOL. : 144 CUT VOL. : 0
FILL VOL. : 101 FILL VOL. : 100 FILL VOL. : 0




AREA CUT : 34 AREA CUT : 35 AREA CUT : 0
AREA FILL : 24 AREA FILL : 24 AREA FILL : 0

512+00

CUT VOL. : 117 CUT VOL. : 121 CUT VOL. : 0
FILL VOL. : 88 FILL VOL. : 84 FILL VOL. : 0

# CROSS SECTION
# STA. 512+00 TO STA. 515+00

2/3/2017

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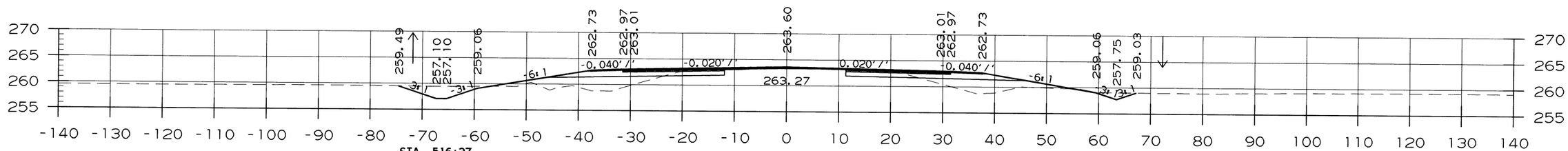
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 382 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3



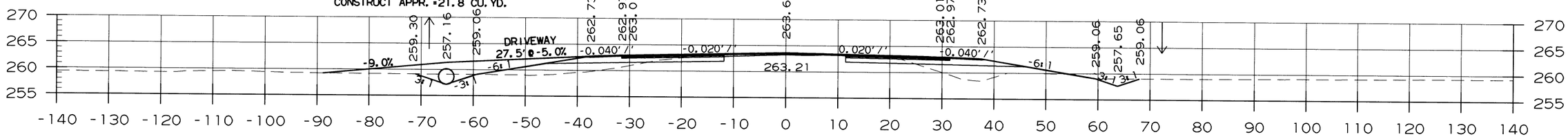

AREA CUT : 29 AREA CUT : 17 AREA CUT : 0
AREA FILL : 58 AREA FILL : 45 AREA FILL : 0

STA. 516+37
BEG. 2' FLAT
BOTTOM DITCH

517+00

CUT VOL. : 84 CUT VOL. : 48 CUT VOL. : 0
FILL VOL. : 162 FILL VOL. : 126 FILL VOL. : 0

STA. 516+24 INSTALL
36" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 21.8 CU. YD.

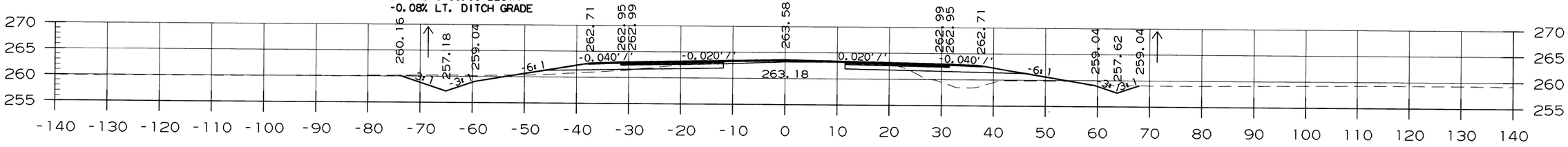



AREA CUT : 31 AREA CUT : 17 AREA CUT : 0
AREA FILL : 57 AREA FILL : 45 AREA FILL : 0

516+24

CUT VOL. : 30 CUT VOL. : 15 CUT VOL. : 0
FILL VOL. : 34 FILL VOL. : 44 FILL VOL. : 0

STA. 516+00.00 END
-0.04% LT. DITCH GRADE
STA. 516+00.00 BEGIN
-0.08% LT. DITCH GRADE




AREA CUT : 37 AREA CUT : 17 AREA CUT : 0
AREA FILL : 19 AREA FILL : 54 AREA FILL : 0

516+00

CUT VOL. : 23 CUT VOL. : 8 CUT VOL. : 0
FILL VOL. : 12 FILL VOL. : 21 FILL VOL. : 0

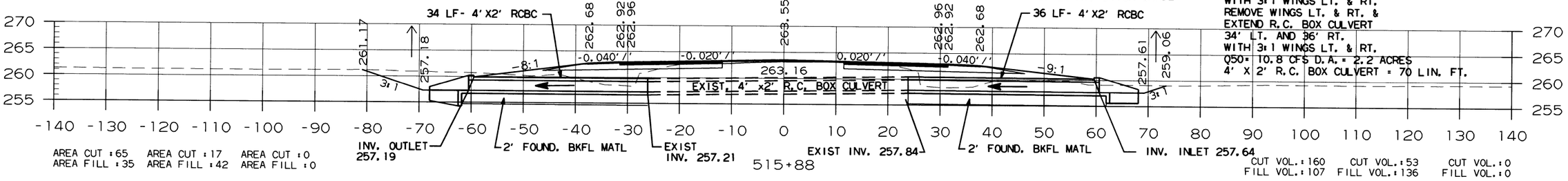
STA. 515+50.00 END
-0.08% LT. DITCH GRADE
STA. 515+50.00 BEGIN
-0.04% LT. DITCH GRADE

34 LF- 4'X2' RCBC

STA. 515+87.55 END
-0.31% RT. DITCH GRADE
STA. 515+87.55 BEGIN
+0.12% RT. DITCH GRADE

36 LF- 4'X2' RCBC

STA. 515+88 IN PLACE
4' X 2' X 54' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
REMOVE WINGS LT. & RT. &
EXTEND R.C. BOX CULVERT
34' LT. AND 36' RT.
WITH 3:1 WINGS LT. & RT.
Q50= 10.8 CFS D.A. = 2.2 ACRES
4' X 2' R.C. BOX CULVERT = 70 LIN. FT.




INV. OUTLET 257.19
2' FOUND. BKFL MATL
EXIST INV. 257.21
EXIST INV. 257.84
2' FOUND. BKFL MATL
INV. INLET 257.64

AREA CUT : 65 AREA CUT : 17 AREA CUT : 0
AREA FILL : 35 AREA FILL : 42 AREA FILL : 0

515+88

CUT VOL. : 160 CUT VOL. : 53 CUT VOL. : 0
FILL VOL. : 107 FILL VOL. : 136 FILL VOL. : 0

# CROSS SECTION
# STA. 515+88 TO STA. 517+00

2/3/2011

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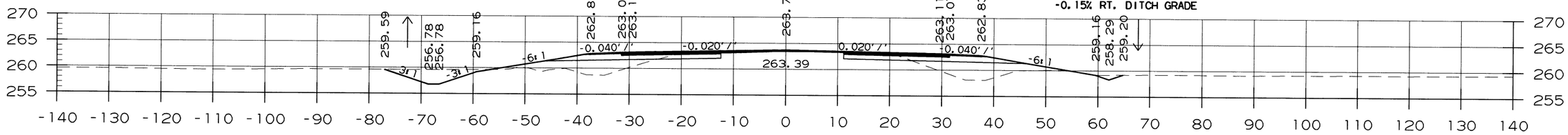
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 383 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

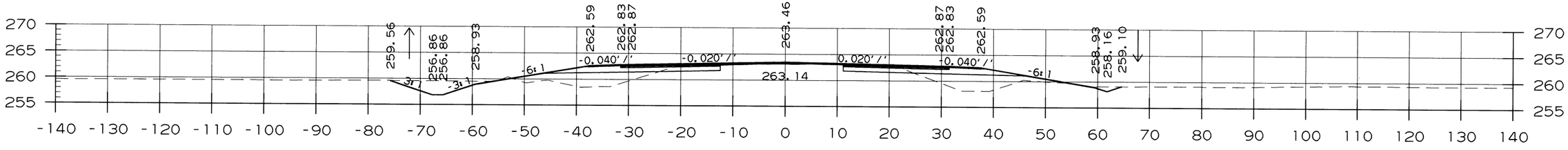
STA. 521+09.16 END
+0.12% RT. DITCH GRADE
STA. 521+09.16 BEGIN
-0.15% RT. DITCH GRADE




AREA CUT : 38 AREA CUT : 14 AREA CUT : 0
AREA FILL : 56 AREA FILL : 59 AREA FILL : 0

521+00

CUT VOL. : 136 CUT VOL. : 53 CUT VOL. : 0
FILL VOL. : 213 FILL VOL. : 210 FILL VOL. : 0




AREA CUT : 36 AREA CUT : 15 AREA CUT : 0
AREA FILL : 59 AREA FILL : 55 AREA FILL : 0

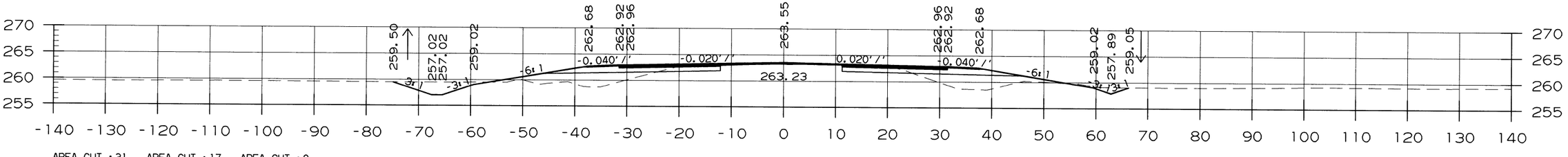
520+00

CUT VOL. : 131 CUT VOL. : 57 CUT VOL. : 0
FILL VOL. : 214 FILL VOL. : 181 FILL VOL. : 0

AREA CUT : 35 AREA CUT : 16 AREA CUT : 0
AREA FILL : 56 AREA FILL : 43 AREA FILL : 0

519+00

CUT VOL. : 123 CUT VOL. : 60 CUT VOL. : 0
FILL VOL. : 208 FILL VOL. : 173 FILL VOL. : 0




AREA CUT : 31 AREA CUT : 17 AREA CUT : 0
AREA FILL : 56 AREA FILL : 50 AREA FILL : 0

518+00

CUT VOL. : 112 CUT VOL. : 63 CUT VOL. : 0
FILL VOL. : 212 FILL VOL. : 176 FILL VOL. : 0

# CROSS SECTION
# STA. 518+00 TO STA. 521+00

2/3/2017

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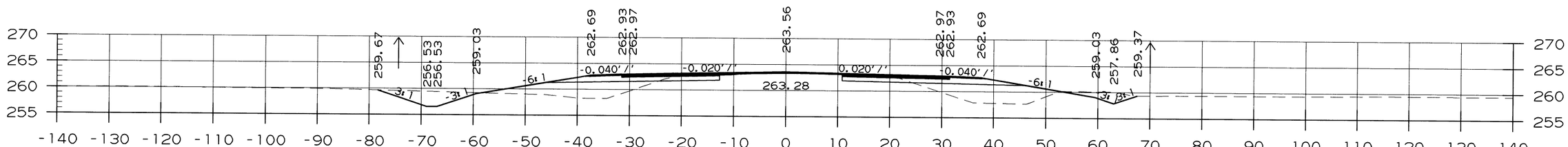
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 384 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

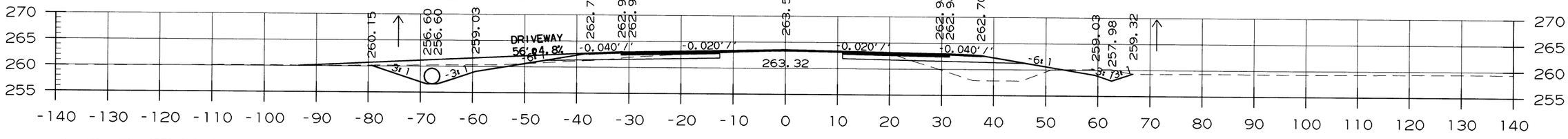



AREA CUT : 39 AREA CUT : 26 AREA CUT : 0
AREA FILL : 73 AREA FILL : 73 AREA FILL : 0

STA. 523+21 IN PLACE
24' X 16' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36' X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 33.3 CU. YD.

524+00

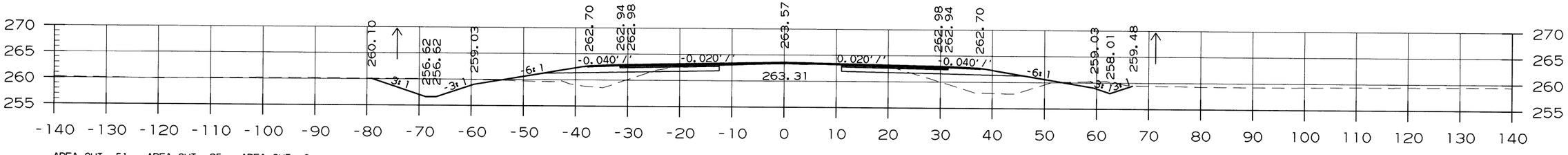
CUT VOL. : 126 CUT VOL. : 74 CUT VOL. : 0
FILL VOL. : 207 FILL VOL. : 210 FILL VOL. : 0




AREA CUT : 47 AREA CUT : 24 AREA CUT : 0
AREA FILL : 68 AREA FILL : 71 AREA FILL : 0

523+21

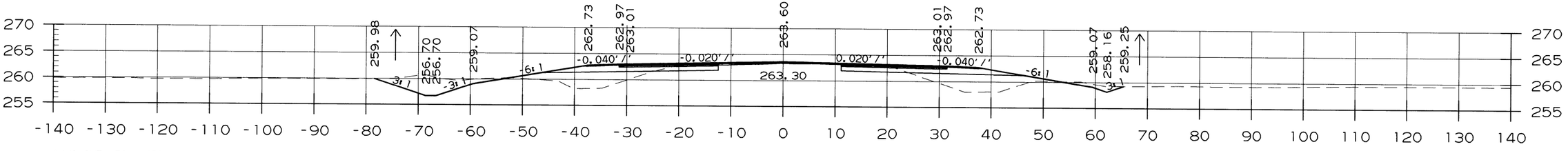
CUT VOL. : 38 CUT VOL. : 19 CUT VOL. : 0
FILL VOL. : 47 FILL VOL. : 53 FILL VOL. : 0




AREA CUT : 51 AREA CUT : 25 AREA CUT : 0
AREA FILL : 53 AREA FILL : 67 AREA FILL : 0

523+00

CUT VOL. : 189 CUT VOL. : 80 CUT VOL. : 0
FILL VOL. : 204 FILL VOL. : 238 FILL VOL. : 0




AREA CUT : 51 AREA CUT : 18 AREA CUT : 0
AREA FILL : 58 AREA FILL : 62 AREA FILL : 0

522+00

CUT VOL. : 165 CUT VOL. : 59 CUT VOL. : 0
FILL VOL. : 211 FILL VOL. : 223 FILL VOL. : 0

# CROSS SECTION
# STA. 522+00 TO STA. 524+00

2/3/2017

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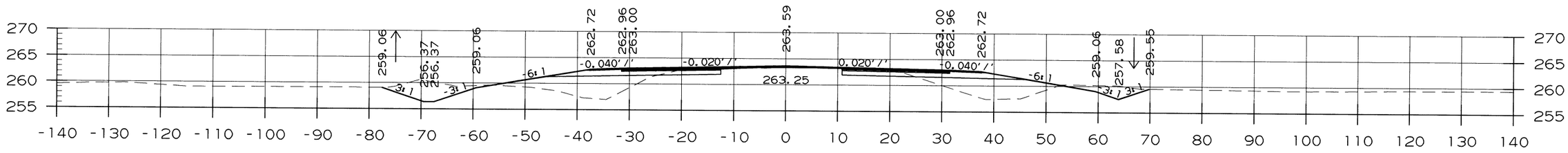
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 385 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

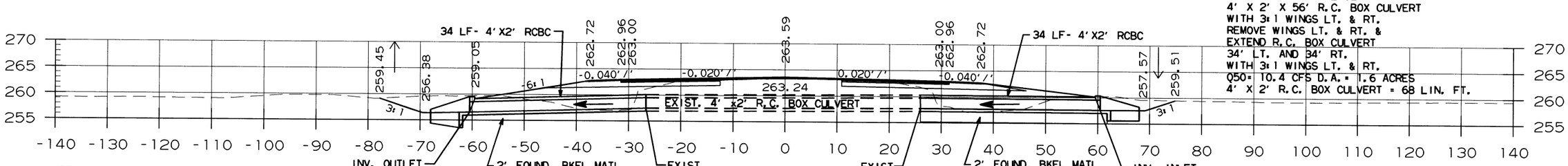



AREA CUT : 48 AREA CUT : 32 AREA CUT : 0
AREA FILL : 87 AREA FILL : 72 AREA FILL : 0

526+00

CUT VOL. : 12 CUT VOL. : 8 CUT VOL. : 0
FILL VOL. : 23 FILL VOL. : 19 FILL VOL. : 0

STA. 525+93 IN PLACE
4' X 2' X 56' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
REMOVE WINGS LT. & RT. &
EXTEND R.C. BOX CULVERT
34' LT. AND 34' RT.
WITH 3:1 WINGS LT. & RT.
Q50= 10.4 CFS D.A. = 1.6 ACRES
4' X 2' R.C. BOX CULVERT = 68 LIN. FT.

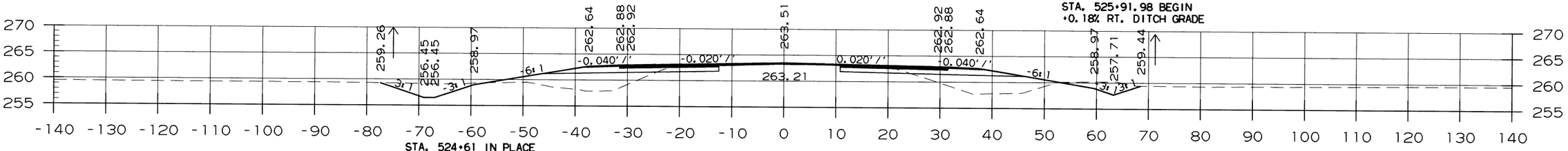



AREA CUT : 48 AREA CUT : 32 AREA CUT : 0
AREA FILL : 87 AREA FILL : 72 AREA FILL : 0

525+93

CUT VOL. : 144 CUT VOL. : 105 CUT VOL. : 0
FILL VOL. : 284 FILL VOL. : 243 FILL VOL. : 0

STA. 525+91.98 END
-0.15% RT. DITCH GRADE
STA. 525+91.98 BEGIN
+0.18% RT. DITCH GRADE

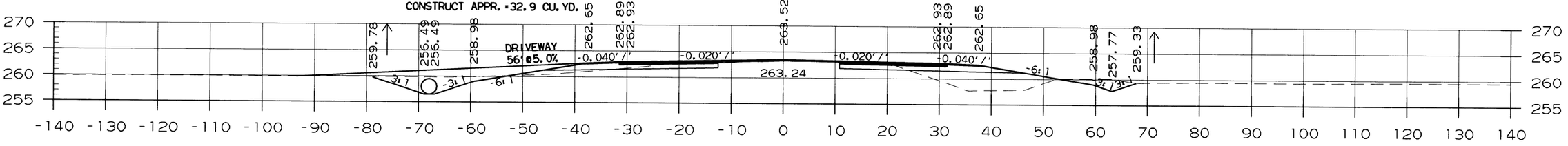



AREA CUT : 36 AREA CUT : 29 AREA CUT : 0
AREA FILL : 78 AREA FILL : 70 AREA FILL : 0

525+00

CUT VOL. : 60 CUT VOL. : 41 CUT VOL. : 0
FILL VOL. : 97 FILL VOL. : 105 FILL VOL. : 0

STA. 524+61 IN PLACE
24" X 22' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =32.9 CU. YD.




AREA CUT : 46 AREA CUT : 28 AREA CUT : 0
AREA FILL : 57 AREA FILL : 76 AREA FILL : 0

524+61

CUT VOL. : 96 CUT VOL. : 61 CUT VOL. : 0
FILL VOL. : 147 FILL VOL. : 168 FILL VOL. : 0

# CROSS SECTION
# STA. 524+61 TO STA. 526+00

2/3/2017

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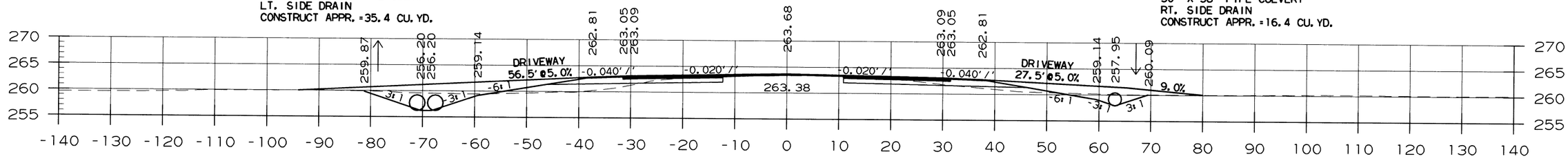
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 386 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

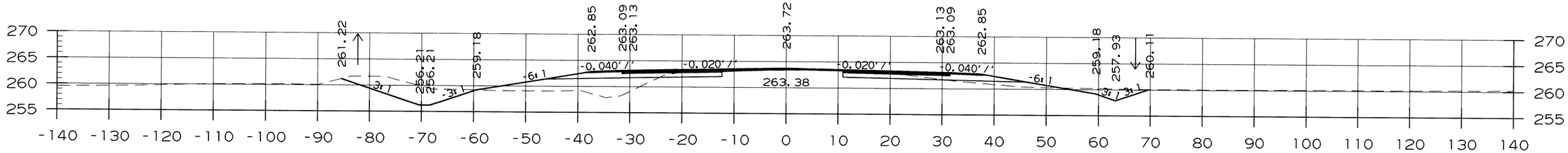
STA. 528+18 IN PLACE
24" X 23' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 42" PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =35.4 CU. YD.




AREA CUT =48 AREA CUT =25 AREA CUT =0
AREA FILL =82 AREA FILL =56 AREA FILL =0

528+11

CUT VOL.=23 CUT VOL.=11 CUT VOL.=0
FILL VOL.=32 FILL VOL.=14 FILL VOL.=0

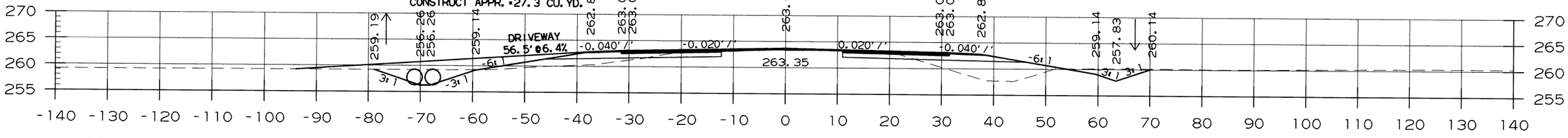



AREA CUT =67 AREA CUT =30 AREA CUT =0
AREA FILL =75 AREA FILL =15 AREA FILL =0

528+00

CUT VOL.=112 CUT VOL.=61 CUT VOL.=0
FILL VOL.=118 FILL VOL.=85 FILL VOL.=0

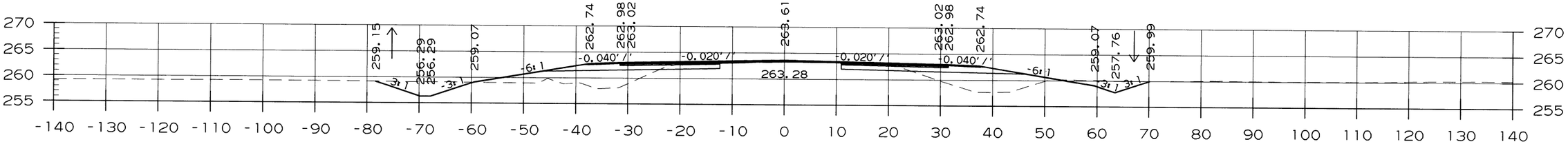
STA. 527+44 IN PLACE
24" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 42" PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =27.3 CU. YD.




AREA CUT =41 AREA CUT =29 AREA CUT =0
AREA FILL =39 AREA FILL =67 AREA FILL =0

527+44

CUT VOL.=63 CUT VOL.=47 CUT VOL.=0
FILL VOL.=98 FILL VOL.=111 FILL VOL.=0




AREA CUT =37 AREA CUT =29 AREA CUT =0
AREA FILL =82 AREA FILL =69 AREA FILL =0

527+00

CUT VOL.=156 CUT VOL.=113 CUT VOL.=0
FILL VOL.=313 FILL VOL.=261 FILL VOL.=0

# CROSS SECTION
# STA. 527+00 TO STA. 528+11

2/3/2017

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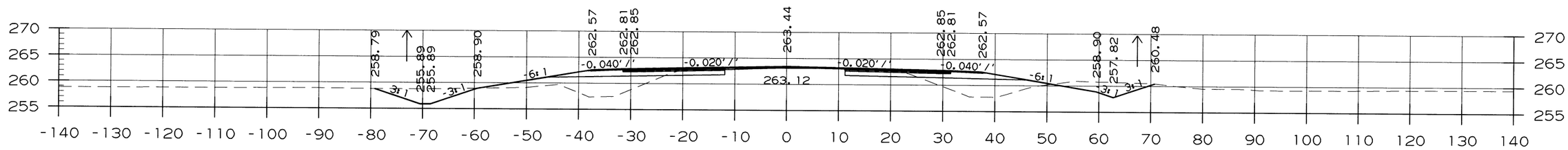
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 387 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

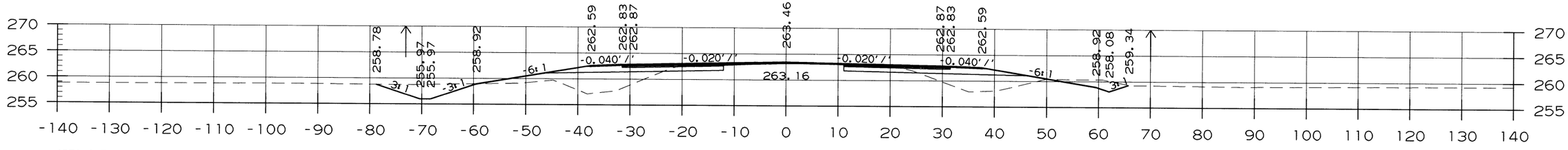
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 39 AREA CUT : 41 AREA CUT : 0
AREA FILL : 75 AREA FILL : 58 AREA FILL : 0

532+00

CUT VOL. : 141 CUT VOL. : 124 CUT VOL. : 0
FILL VOL. : 281 FILL VOL. : 210 FILL VOL. : 0

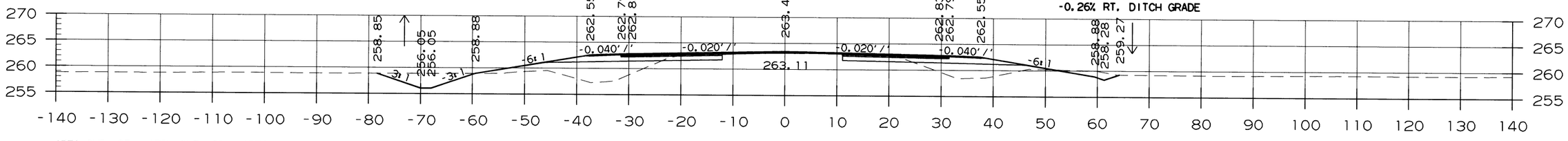



AREA CUT : 38 AREA CUT : 26 AREA CUT : 0
AREA FILL : 77 AREA FILL : 55 AREA FILL : 0

531+00

CUT VOL. : 139 CUT VOL. : 87 CUT VOL. : 0
FILL VOL. : 288 FILL VOL. : 191 FILL VOL. : 0

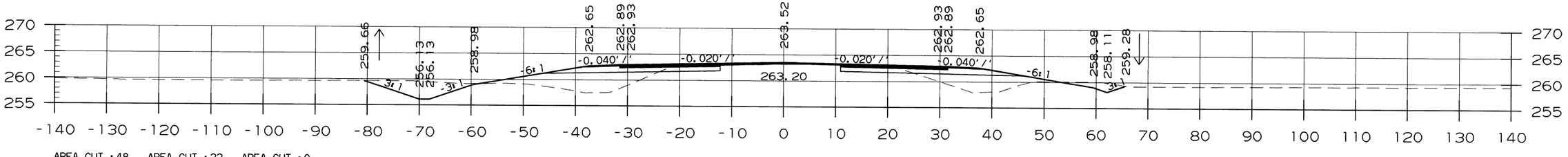
STA. 530+13.98 END
+0.18% RT. DITCH GRADE
STA. 530+13.98 BEGIN
-0.26% RT. DITCH GRADE




AREA CUT : 37 AREA CUT : 21 AREA CUT : 0
AREA FILL : 79 AREA FILL : 48 AREA FILL : 0

530+00

CUT VOL. : 158 CUT VOL. : 80 CUT VOL. : 0
FILL VOL. : 299 FILL VOL. : 193 FILL VOL. : 0




AREA CUT : 48 AREA CUT : 22 AREA CUT : 0
AREA FILL : 83 AREA FILL : 56 AREA FILL : 0

529+00

CUT VOL. : 158 CUT VOL. : 79 CUT VOL. : 0
FILL VOL. : 272 FILL VOL. : 185 FILL VOL. : 0

# CROSS SECTION
# STA. 529+00 TO STA. 532+00

2/3/2017

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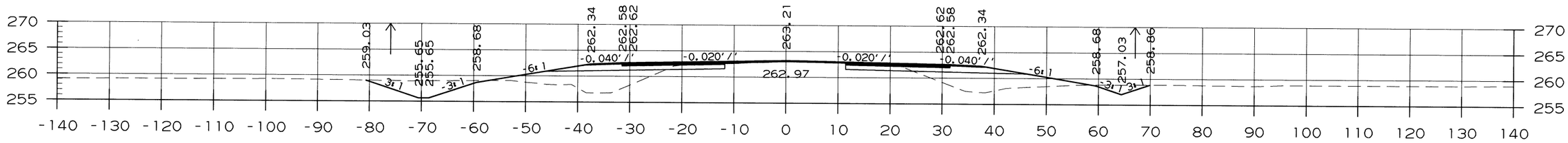
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 388 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

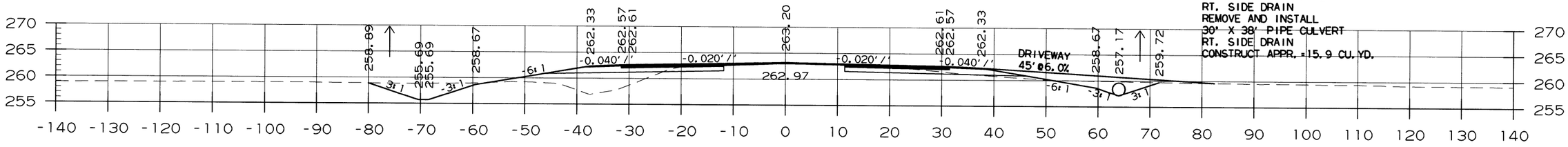



AREA CUT : 48 AREA CUT : 21 AREA CUT : 0
AREA FILL : 84 AREA FILL : 78 AREA FILL : 0

535+00

CUT VOL. : 90 CUT VOL. : 60 CUT VOL. : 0
FILL VOL. : 150 FILL VOL. : 82 FILL VOL. : 0

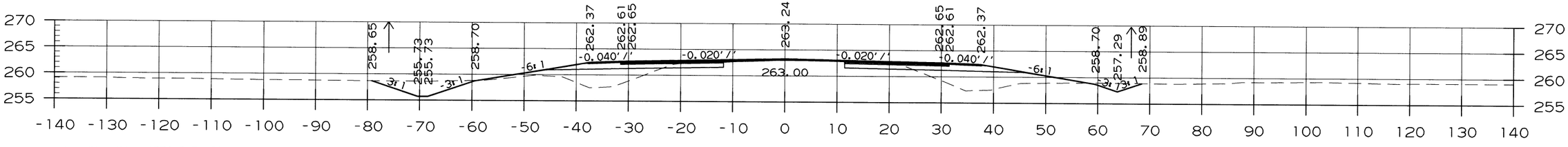
STA. 534+48 IN PLACE
24' X 24' C.M. PIPE
RT. SIDE DRAIN
REMOVE AND INSTALL
30' X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 15.9 CU. YD.




AREA CUT : 46 AREA CUT : 41 AREA CUT : 0
AREA FILL : 72 AREA FILL : 7 AREA FILL : 0

534+48

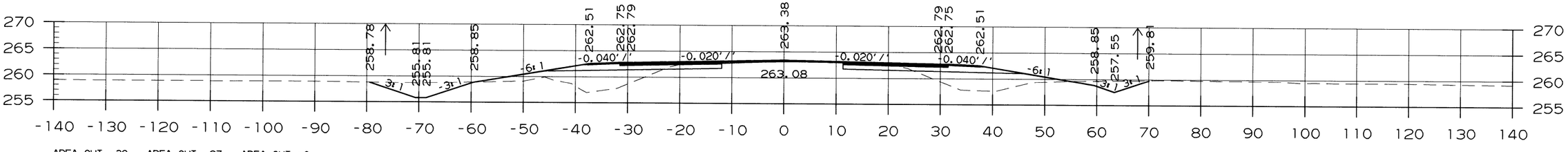
CUT VOL. : 76 CUT VOL. : 54 CUT VOL. : 0
FILL VOL. : 118 FILL VOL. : 72 FILL VOL. : 0




AREA CUT : 39 AREA CUT : 20 AREA CUT : 0
AREA FILL : 61 AREA FILL : 74 AREA FILL : 0

534+00

CUT VOL. : 145 CUT VOL. : 87 CUT VOL. : 0
FILL VOL. : 252 FILL VOL. : 264 FILL VOL. : 0




AREA CUT : 39 AREA CUT : 27 AREA CUT : 0
AREA FILL : 75 AREA FILL : 68 AREA FILL : 0

533+00

CUT VOL. : 144 CUT VOL. : 125 CUT VOL. : 0
FILL VOL. : 278 FILL VOL. : 234 FILL VOL. : 0

CROSS SECTION
STA. 533+00 TO STA. 535+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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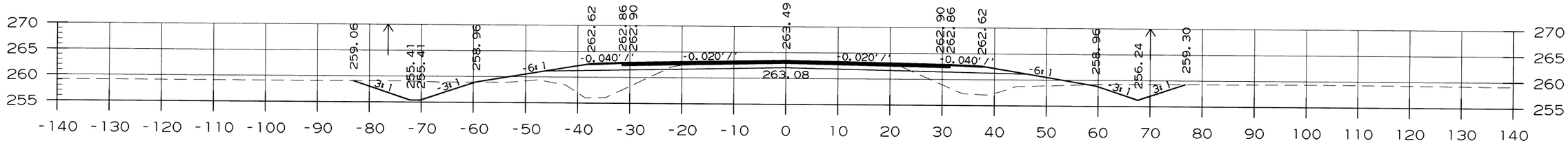
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 389 | 503 |
| ② | CROSS SECTIONS | | | |

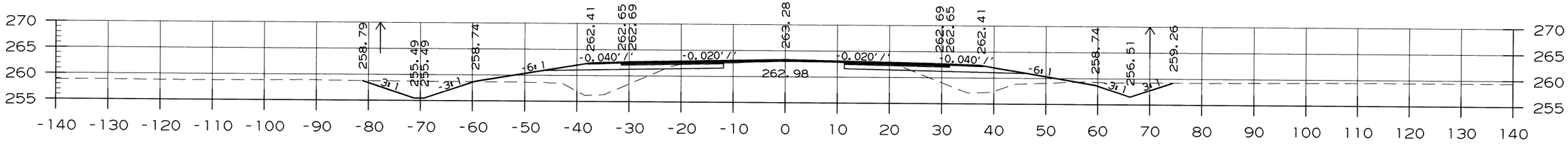
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 62 AREA CUT : 48 AREA CUT : 0
AREA FILL : 93 AREA FILL : 82 AREA FILL : 0

538+00

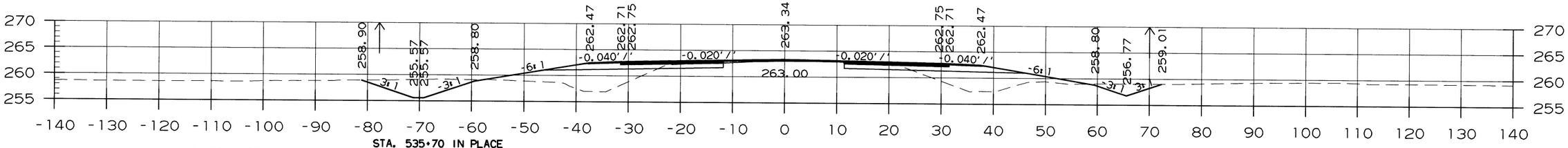
CUT VOL. : 198 CUT VOL. : 152 CUT VOL. : 0
FILL VOL. : 344 FILL VOL. : 286 FILL VOL. : 0




AREA CUT : 45 AREA CUT : 34 AREA CUT : 0
AREA FILL : 93 AREA FILL : 72 AREA FILL : 0

537+00

CUT VOL. : 177 CUT VOL. : 113 CUT VOL. : 0
FILL VOL. : 322 FILL VOL. : 267 FILL VOL. : 0

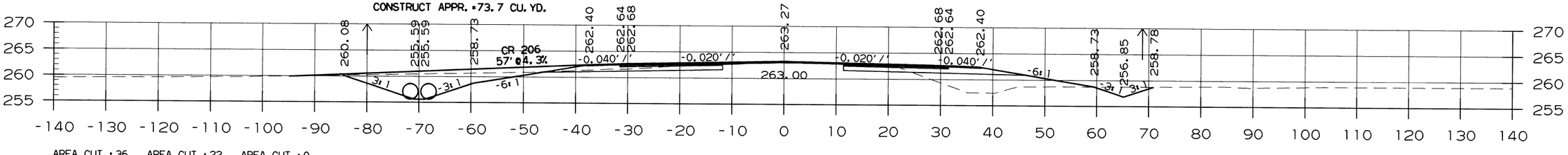



AREA CUT : 51 AREA CUT : 26 AREA CUT : 0
AREA FILL : 81 AREA FILL : 72 AREA FILL : 0

STA. 535+70 IN PLACE
36" X 36' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 58' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =73.7 CU. YD.

536+00

CUT VOL. : 48 CUT VOL. : 27 CUT VOL. : 0
FILL VOL. : 89 FILL VOL. : 80 FILL VOL. : 0




AREA CUT : 36 AREA CUT : 22 AREA CUT : 0
AREA FILL : 80 AREA FILL : 72 AREA FILL : 0

535+70

CUT VOL. : 109 CUT VOL. : 57 CUT VOL. : 0
FILL VOL. : 212 FILL VOL. : 195 FILL VOL. : 0

# CROSS SECTION
# STA. 535+70 TO STA. 538+00

2/3/2017

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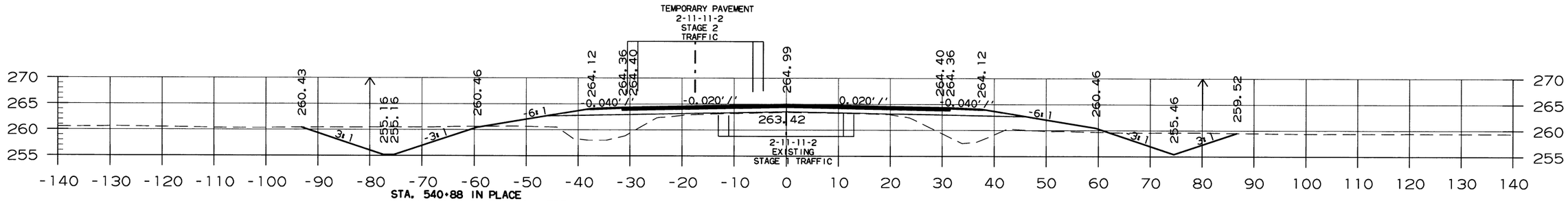
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 390 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3



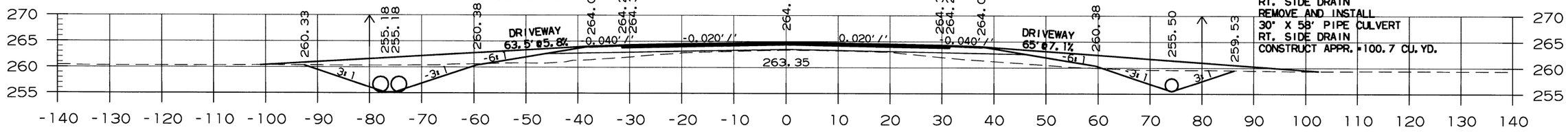

AREA CUT : 0 AREA CUT : 51 AREA CUT : 96
AREA FILL : 29 AREA FILL : 114 AREA FILL : 74

STA. 540+88 IN PLACE
24" X 28' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" x 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =67.1 CU. YD.

541+00

CUT VOL. : 0 CUT VOL. : 27 CUT VOL. : 81
FILL VOL. : 0 FILL VOL. : 63 FILL VOL. : 80

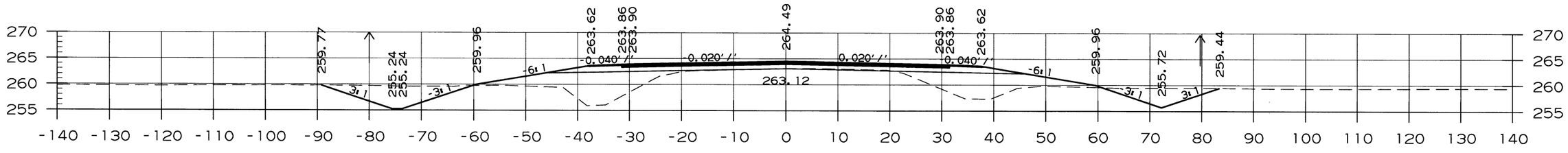
STA. 540+85 IN PLACE
24" X 23' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 58' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =100.7 CU. YD.




AREA CUT : 70 AREA CUT : 46 AREA CUT : 0
AREA FILL : 125 AREA FILL : 111 AREA FILL : 0

540+85

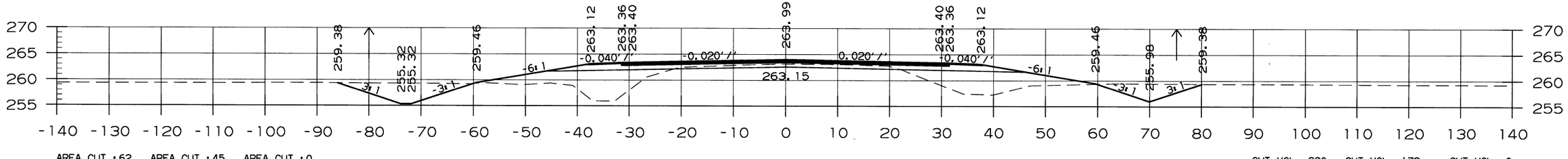
CUT VOL. : 223 CUT VOL. : 138 CUT VOL. : 0
FILL VOL. : 386 FILL VOL. : 341 FILL VOL. : 0




AREA CUT : 67 AREA CUT : 42 AREA CUT : 0
AREA FILL : 120 AREA FILL : 106 AREA FILL : 0

540+00

CUT VOL. : 239 CUT VOL. : 161 CUT VOL. : 0
FILL VOL. : 414 FILL VOL. : 379 FILL VOL. : 0




AREA CUT : 62 AREA CUT : 45 AREA CUT : 0
AREA FILL : 103 AREA FILL : 99 AREA FILL : 0

539+00

CUT VOL. : 230 CUT VOL. : 172 CUT VOL. : 0
FILL VOL. : 364 FILL VOL. : 335 FILL VOL. : 0

# CROSS SECTION
# STA. 539+00 TO STA. 541+00

1/31/2018

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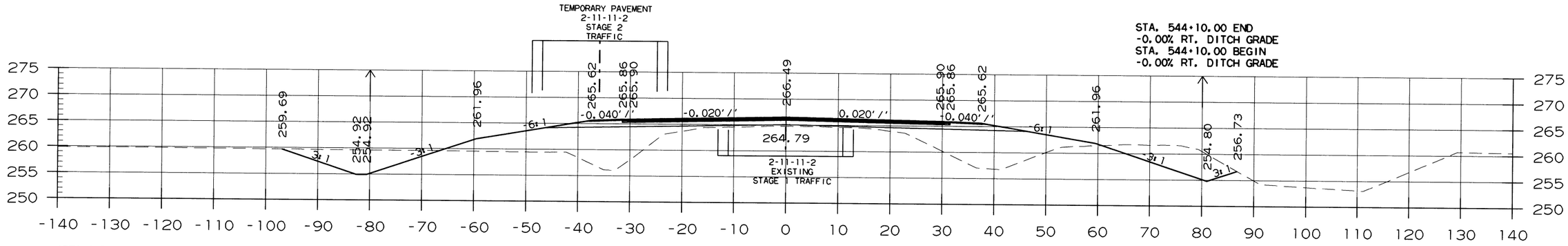
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 391 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

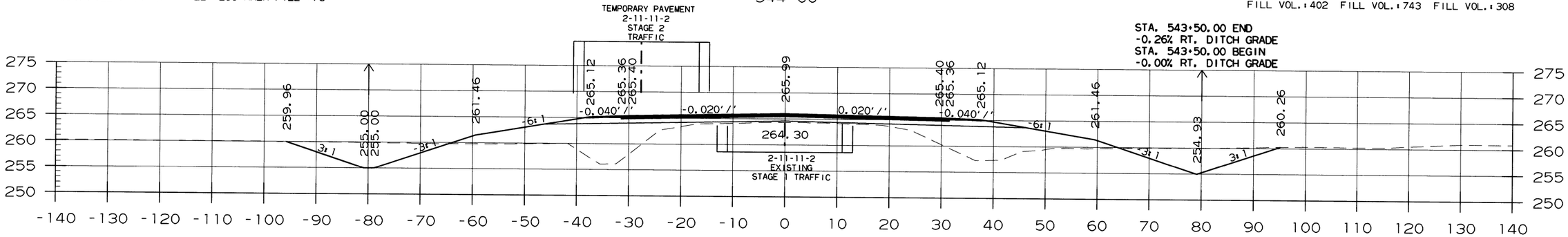
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 0 AREA CUT : 82 AREA CUT : 76
AREA FILL : 130 AREA FILL : 235 AREA FILL : 78

544+00

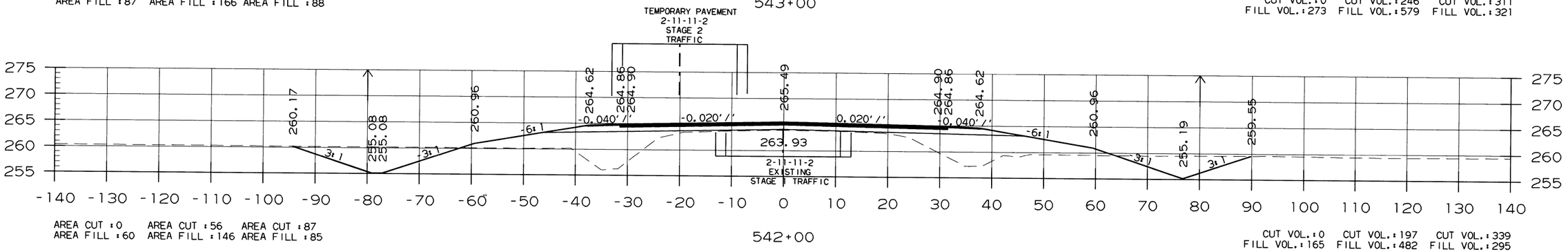
CUT VOL. : 0 CUT VOL. : 295 CUT VOL. : 291
FILL VOL. : 402 FILL VOL. : 743 FILL VOL. : 308




AREA CUT : 0 AREA CUT : 77 AREA CUT : 81
AREA FILL : 87 AREA FILL : 166 AREA FILL : 88

543+00

CUT VOL. : 0 CUT VOL. : 246 CUT VOL. : 311
FILL VOL. : 273 FILL VOL. : 579 FILL VOL. : 321




AREA CUT : 0 AREA CUT : 56 AREA CUT : 87
AREA FILL : 60 AREA FILL : 146 AREA FILL : 85

542+00

CUT VOL. : 0 CUT VOL. : 197 CUT VOL. : 339
FILL VOL. : 165 FILL VOL. : 482 FILL VOL. : 295

# CROSS SECTION
# STA. 542+00 TO STA. 544+00

2/3/2017

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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 |
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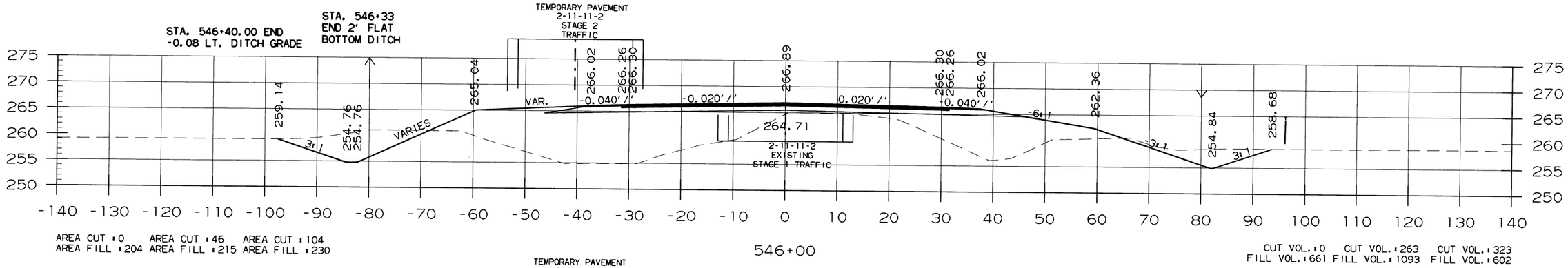
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 392 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

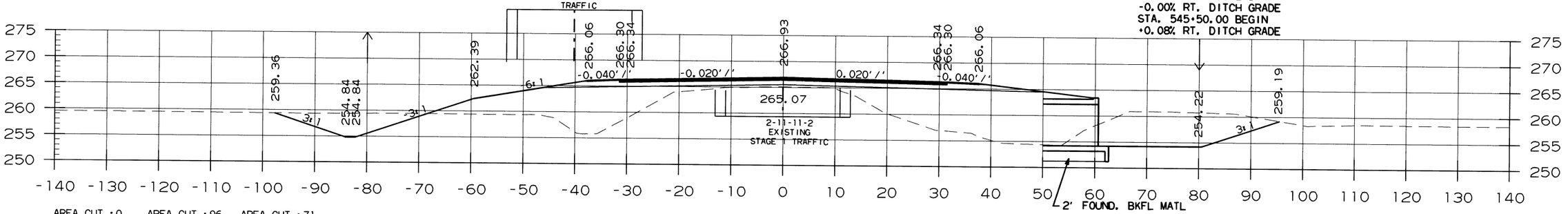
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 0 AREA CUT : 46 AREA CUT : 104
AREA FILL : 204 AREA FILL : 215 AREA FILL : 230

546+00

CUT VOL. : 0 CUT VOL. : 263 CUT VOL. : 323
FILL VOL. : 661 FILL VOL. : 1093 FILL VOL. : 602




AREA CUT : 0 AREA CUT : 96 AREA CUT : 71
AREA FILL : 152 AREA FILL : 375 AREA FILL : 94

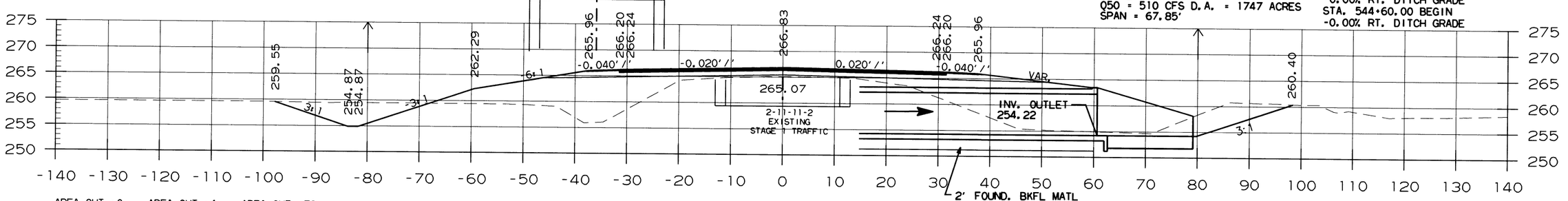
545+00

STA. 545+50.00 END
-0.00% RT. DITCH GRADE
STA. 545+50.00 BEGIN
+0.08% RT. DITCH GRADE

CUT VOL. : 0 CUT VOL. : 59 CUT VOL. : 85
FILL VOL. : 181 FILL VOL. : 393 FILL VOL. : 103

STA. 545+55 CONSTRUCT
TRIP. 12' X 8' X 210' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
55° LT. FWD. SKEW
Q50 = 510 CFS D.A. = 1747 ACRES
SPAN = 67.85'

STA. 544+60.00 END
-0.00% RT. DITCH GRADE
STA. 544+60.00 BEGIN
-0.00% RT. DITCH GRADE




AREA CUT : 0 AREA CUT : 4 AREA CUT : 73
AREA FILL : 154 AREA FILL : 287 AREA FILL : 79

544+68

CUT VOL. : 0 CUT VOL. : 109 CUT VOL. : 188
FILL VOL. : 357 FILL VOL. : 658 FILL VOL. : 198

# CROSS SECTION
# STA. 544+68 TO STA. 546+00

2/3/2017

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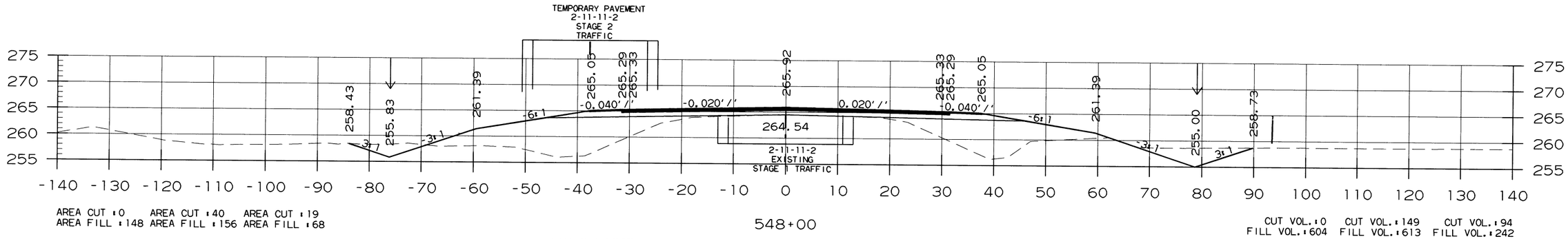
| | | | | JOB NO. | | CA1003 | 393 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

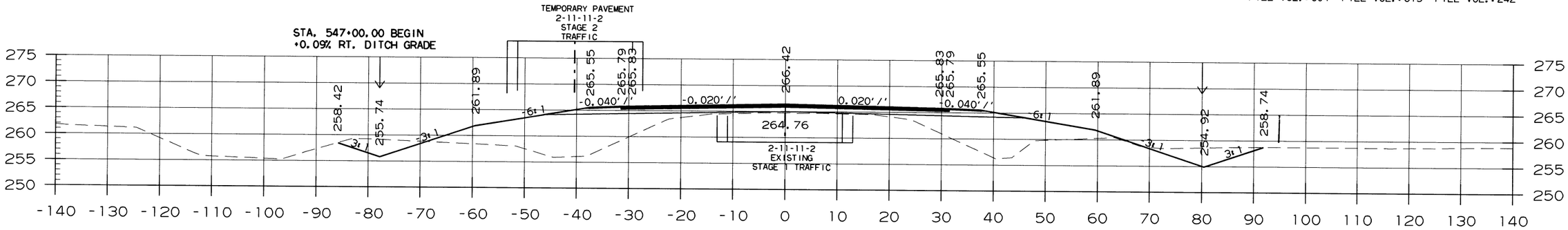
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 0 AREA CUT : 40 AREA CUT : 19
AREA FILL : 148 AREA FILL : 156 AREA FILL : 68

548+00

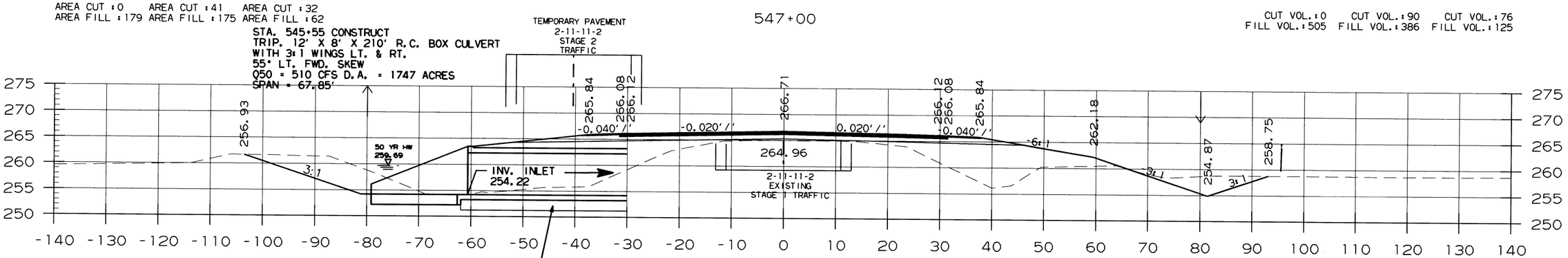
CUT VOL. : 0 CUT VOL. : 149 CUT VOL. : 94
FILL VOL. : 604 FILL VOL. : 613 FILL VOL. : 242




AREA CUT : 0 AREA CUT : 41 AREA CUT : 32
AREA FILL : 179 AREA FILL : 175 AREA FILL : 62

547+00

CUT VOL. : 0 CUT VOL. : 90 CUT VOL. : 76
FILL VOL. : 505 FILL VOL. : 386 FILL VOL. : 125




AREA CUT : 0 AREA CUT : 43 AREA CUT : 39
AREA FILL : 291 AREA FILL : 185 AREA FILL : 54

546+42

CUT VOL. : 0 CUT VOL. : 69 CUT VOL. : 111
FILL VOL. : 385 FILL VOL. : 311 FILL VOL. : 221

# CROSS SECTION
# STA. 546+42 TO STA. 548+00

2/3/2017

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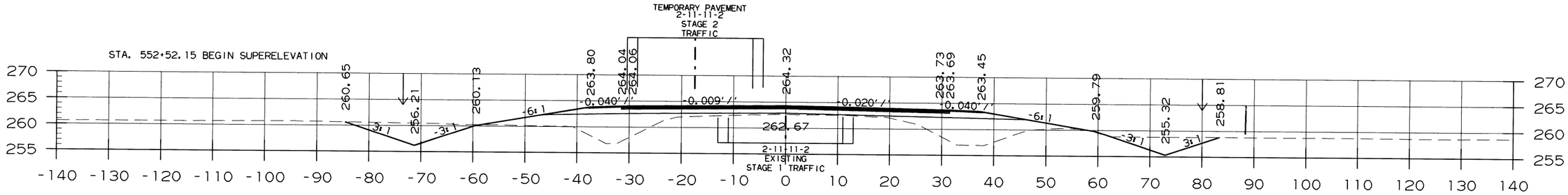
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 394 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

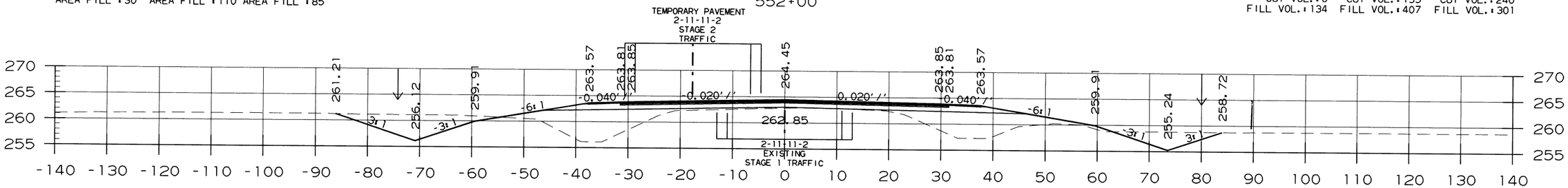
STA. 552+52.15 BEGIN SUPERELEVATION




AREA CUT : 0 AREA CUT : 36 AREA CUT : 55
AREA FILL : 30 AREA FILL : 110 AREA FILL : 85

552+00

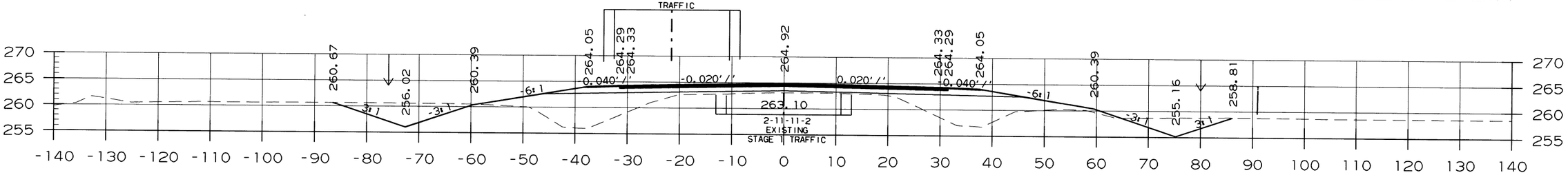
CUT VOL. : 0 CUT VOL. : 135 CUT VOL. : 240
FILL VOL. : 134 FILL VOL. : 407 FILL VOL. : 301




AREA CUT : 0 AREA CUT : 37 AREA CUT : 75
AREA FILL : 42 AREA FILL : 110 AREA FILL : 77

551+00

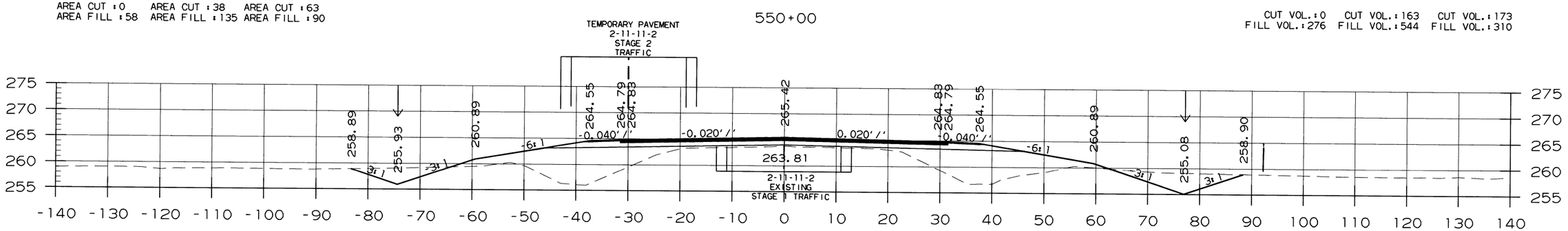
CUT VOL. : 0 CUT VOL. : 139 CUT VOL. : 256
FILL VOL. : 185 FILL VOL. : 455 FILL VOL. : 310




AREA CUT : 0 AREA CUT : 38 AREA CUT : 63
AREA FILL : 58 AREA FILL : 135 AREA FILL : 90

550+00

CUT VOL. : 0 CUT VOL. : 163 CUT VOL. : 173
FILL VOL. : 276 FILL VOL. : 544 FILL VOL. : 310




AREA CUT : 0 AREA CUT : 50 AREA CUT : 30
AREA FILL : 91 AREA FILL : 159 AREA FILL : 77

549+00

CUT VOL. : 0 CUT VOL. : 167 CUT VOL. : 91
FILL VOL. : 442 FILL VOL. : 583 FILL VOL. : 270

# CROSS SECTION
# STA. 549+00 TO STA. 552+00

2/3/2017

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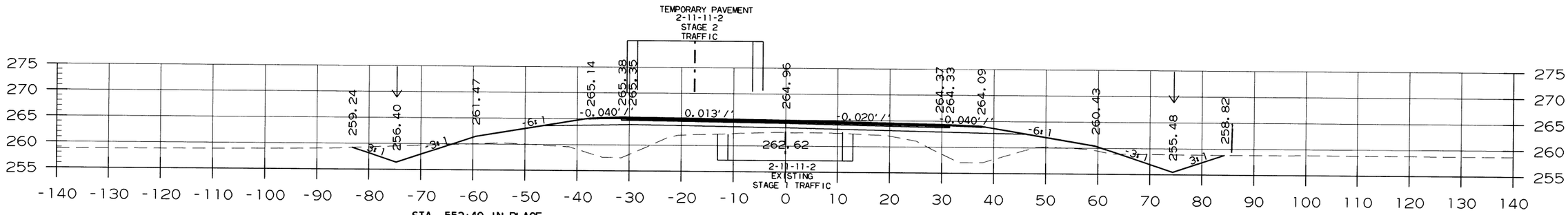
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 395 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

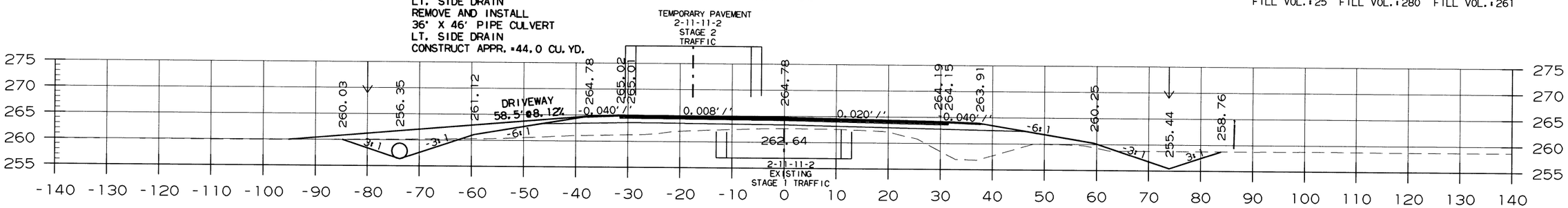



AREA CUT : 0 AREA CUT : 34 AREA CUT : 30
AREA FILL : 27 AREA FILL : 152 AREA FILL : 164

STA. 553+49 IN PLACE
30' X 30' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36' X 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =44.0 CU. YD.

554+00

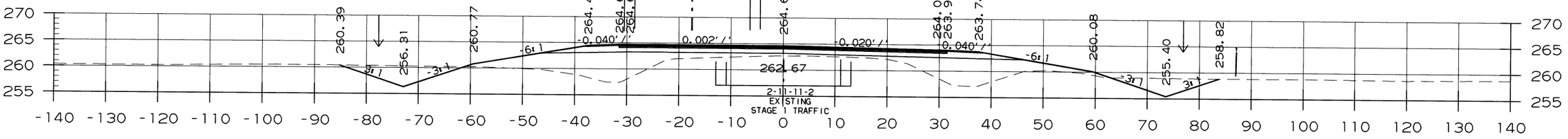
CUT VOL. : 0 CUT VOL. : 63 CUT VOL. : 69
FILL VOL. : 25 FILL VOL. : 280 FILL VOL. : 261




AREA CUT : 0 AREA CUT : 33 AREA CUT : 43
AREA FILL : 0 AREA FILL : 145 AREA FILL : 112

TEMPORARY PAVEMENT 553+49

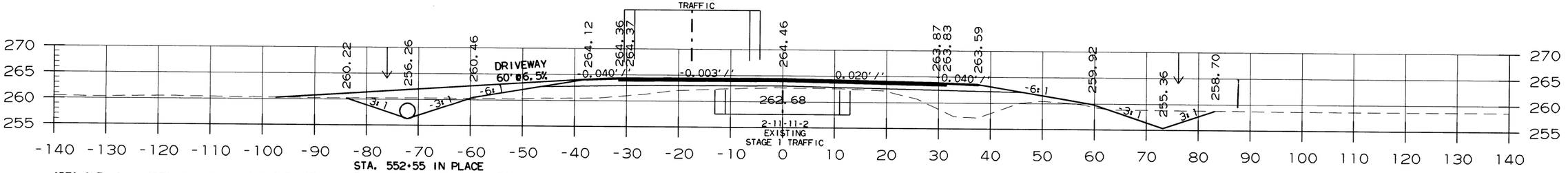
CUT VOL. : 0 CUT VOL. : 63 CUT VOL. : 82
FILL VOL. : 25 FILL VOL. : 245 FILL VOL. : 216




AREA CUT : 0 AREA CUT : 36 AREA CUT : 48
AREA FILL : 28 AREA FILL : 126 AREA FILL : 126

TEMPORARY PAVEMENT 553+00

CUT VOL. : 0 CUT VOL. : 56 CUT VOL. : 79
FILL VOL. : 23 FILL VOL. : 196 FILL VOL. : 180




AREA CUT : 0 AREA CUT : 31 AREA CUT : 47
AREA FILL : 0 AREA FILL : 110 AREA FILL : 90

STA. 552+55 IN PLACE
5' X 2.5' X 16' CONC. BOX
W/EARTH FLOOR
LT. SIDE DRAIN
REMOVE AND INSTALL
36' X 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =42.9 CU. YD.

552+55

CUT VOL. : 0 CUT VOL. : 68 CUT VOL. : 104
FILL VOL. : 31 FILL VOL. : 223 FILL VOL. : 179

# CROSS SECTION
# STA. 552+55 TO STA. 554+00

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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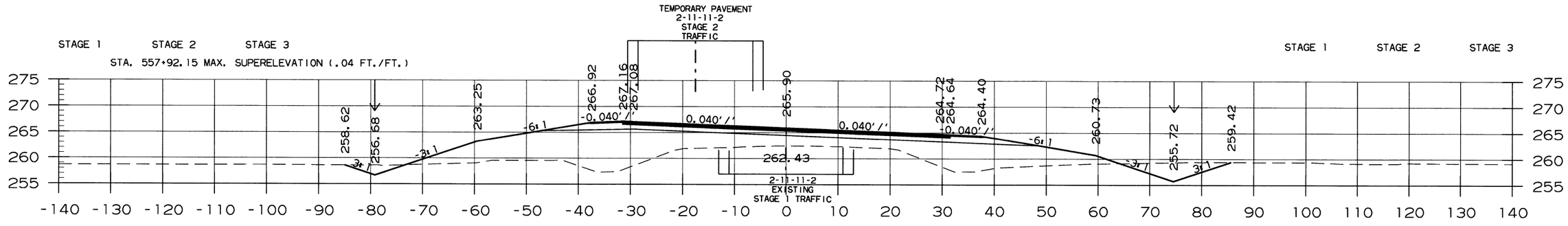
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 396 | 503 |

CROSS SECTIONS

1/31/2018

STAGE 1 STAGE 2 STAGE 3

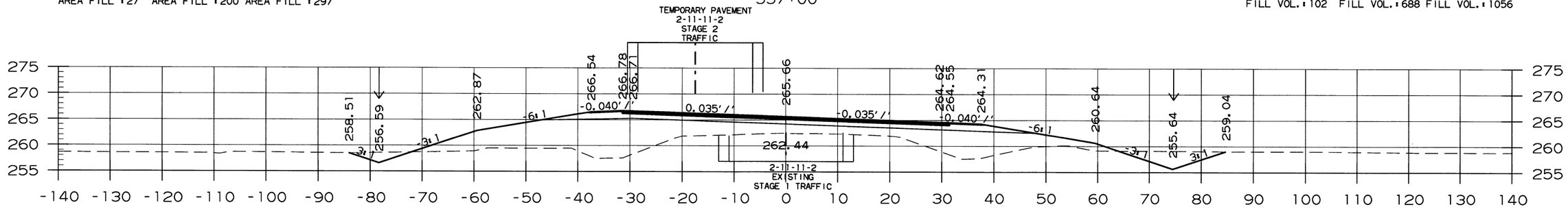
STA. 557+92.15 MAX. SUPERELEVATION (.04 FT./FT.)




AREA CUT = 0 AREA CUT = 39 AREA CUT = 11
AREA FILL = 27 AREA FILL = 200 AREA FILL = 297

557+00

CUT VOL. = 0 CUT VOL. = 138 CUT VOL. = 42
FILL VOL. = 102 FILL VOL. = 688 FILL VOL. = 1056

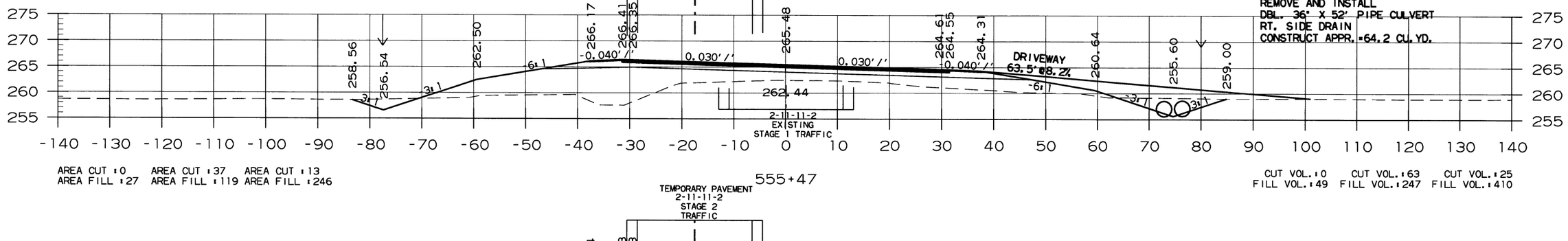



AREA CUT = 0 AREA CUT = 36 AREA CUT = 12
AREA FILL = 28 AREA FILL = 171 AREA FILL = 273

556+00

CUT VOL. = 0 CUT VOL. = 71 CUT VOL. = 25
FILL VOL. = 54 FILL VOL. = 284 FILL VOL. = 510

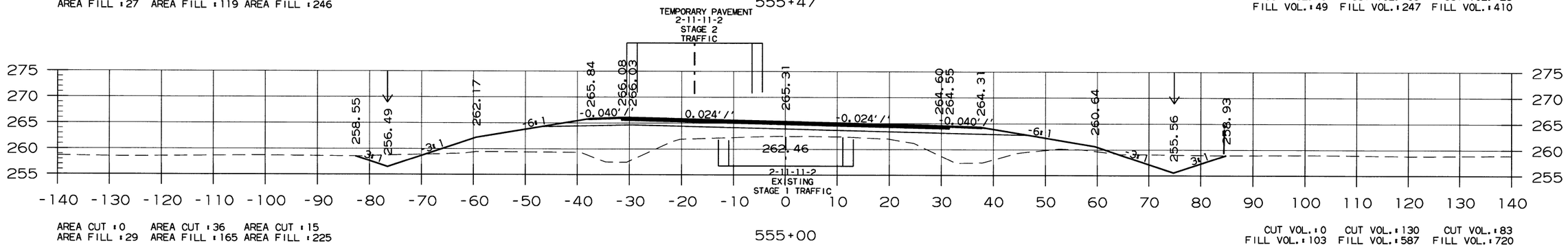
STA. 555+47 IN PLACE
24" X 24' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 64.2 CU. YD.




AREA CUT = 0 AREA CUT = 37 AREA CUT = 13
AREA FILL = 27 AREA FILL = 119 AREA FILL = 246

555+47

CUT VOL. = 0 CUT VOL. = 63 CUT VOL. = 25
FILL VOL. = 49 FILL VOL. = 247 FILL VOL. = 410




AREA CUT = 0 AREA CUT = 36 AREA CUT = 15
AREA FILL = 29 AREA FILL = 165 AREA FILL = 225

555+00

CUT VOL. = 0 CUT VOL. = 130 CUT VOL. = 83
FILL VOL. = 103 FILL VOL. = 587 FILL VOL. = 720

# CROSS SECTION
# STA. 555+00 TO STA. 557+00

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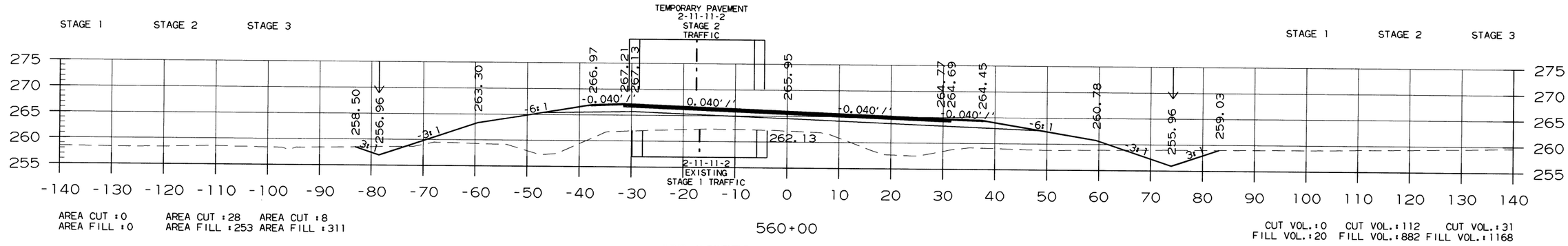
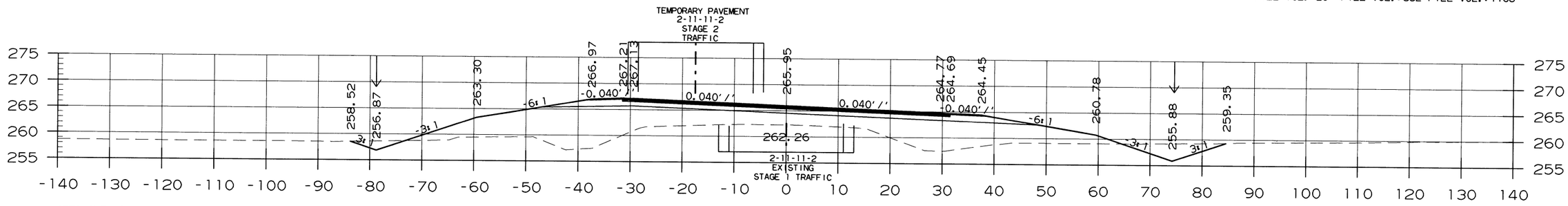
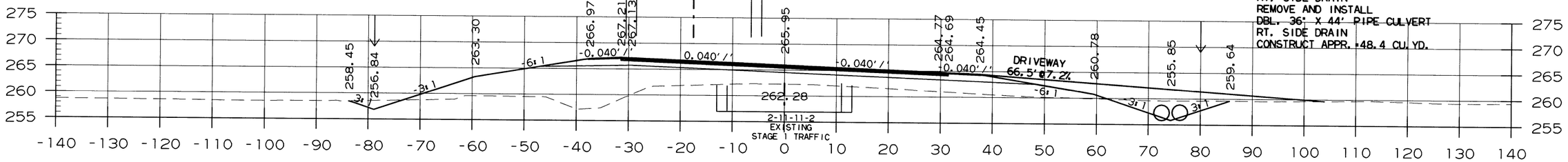
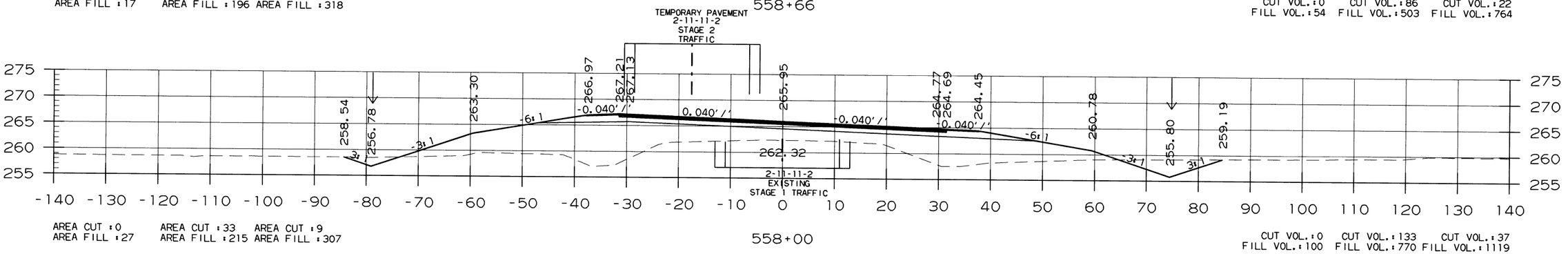
| | | | | ② | | CROSS SECTIONS | | |




STA. 558+66 IN PLACE
24' X 24' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. +48.4 CU. YD.




CROSS SECTION
STA. 558+00 TO STA. 560+00

2/3/2017

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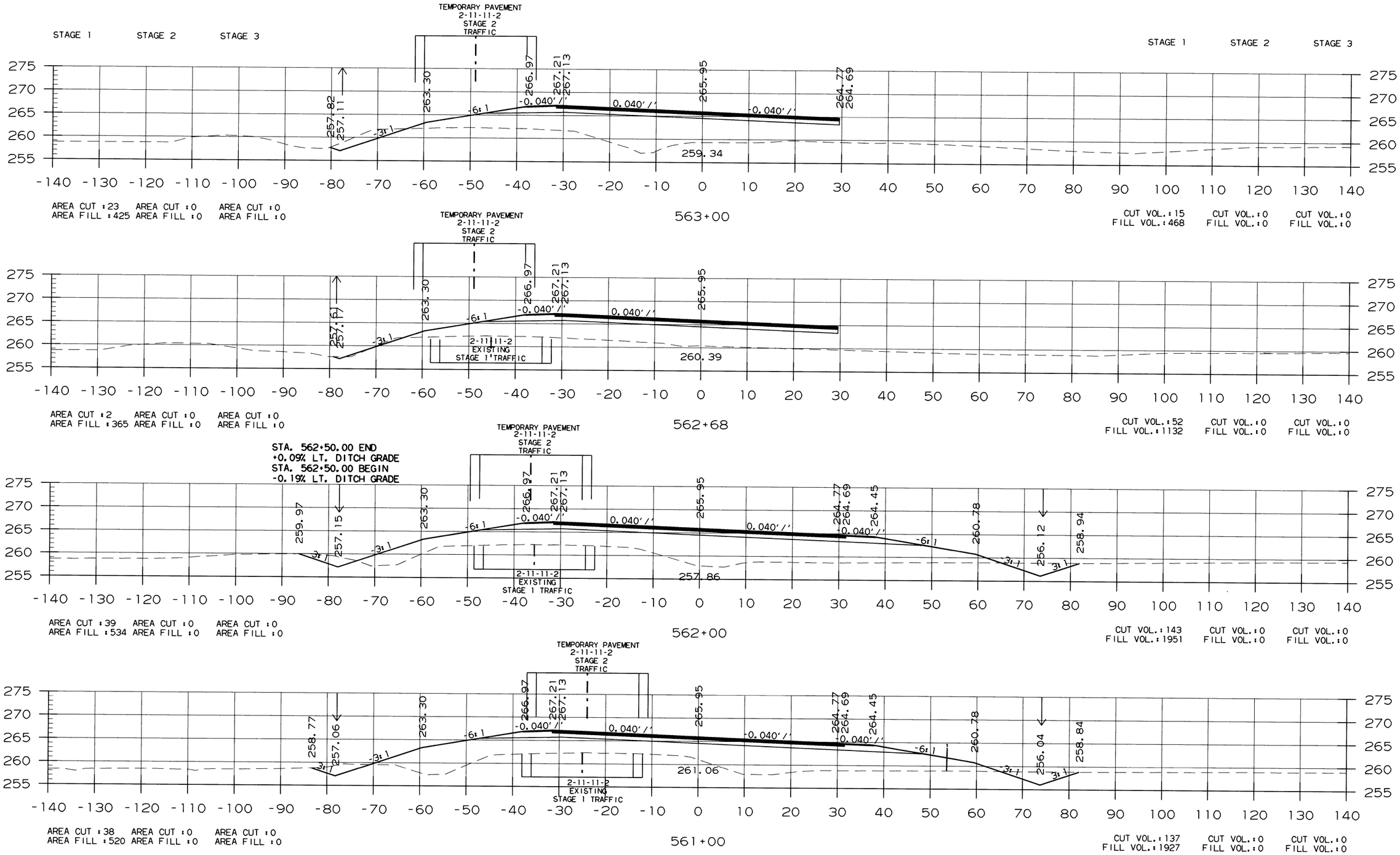
| | | | | ② | | CROSS SECTIONS | | |




# CROSS SECTION
# STA. 561+00 TO STA. 563+00

2/3/2017

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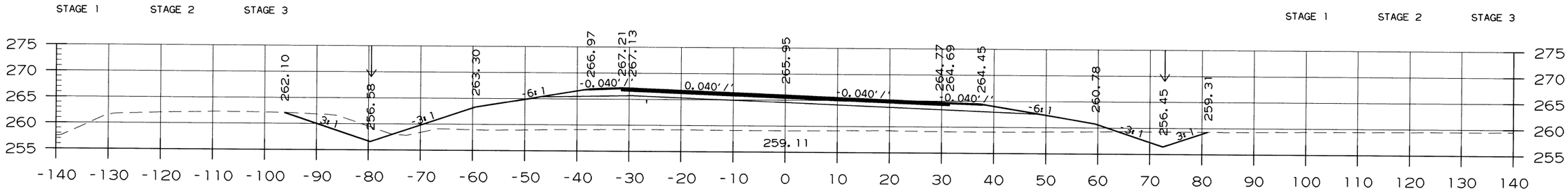
| | | | | JOB NO. | | CA1003 | 399 | 503 |

② CROSS SECTIONS




AREA CUT : 64 AREA CUT : 0 AREA CUT : 0
AREA FILL : 633 AREA FILL : 0 AREA FILL : 0

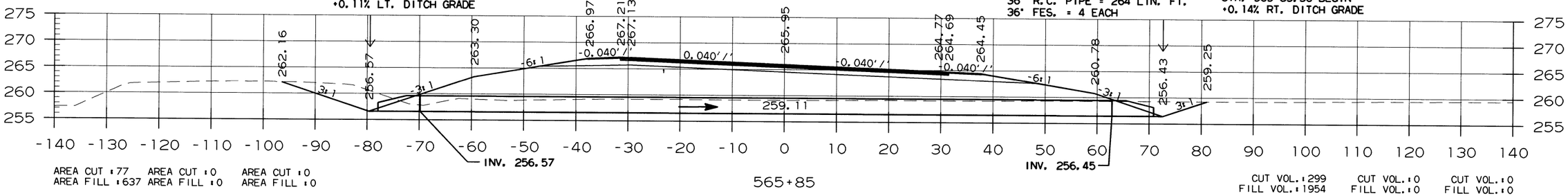
566+00

STA. 565+85 CONSTRUCT
DBL. 36" X 132' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
Q50= 30.1 CFS D.A. = 14.7 ACRES
36" R.C. PIPE = 264 LIN. FT.
36" FES. = 4 EACH

CUT VOL. : 39 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 351 FILL VOL. : 0 FILL VOL. : 0

STA. 565+87.00 END
-0.19% LT. DITCH GRADE
STA. 565+87.00 BEGIN
+0.11% LT. DITCH GRADE

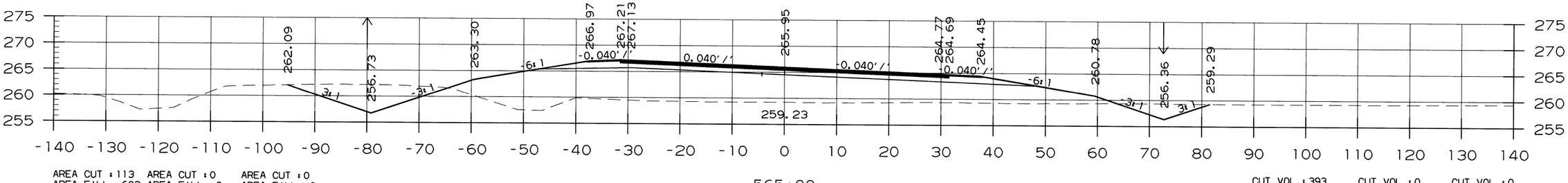
STA. 565+83.36 END
+0.08% RT. DITCH GRADE
STA. 565+83.36 BEGIN
+0.14% RT. DITCH GRADE




AREA CUT : 77 AREA CUT : 0 AREA CUT : 0
AREA FILL : 637 AREA FILL : 0 AREA FILL : 0

565+85

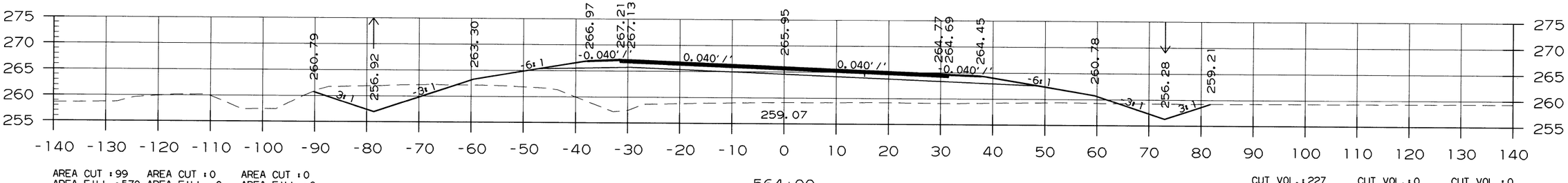
CUT VOL. : 299 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1954 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 113 AREA CUT : 0 AREA CUT : 0
AREA FILL : 603 AREA FILL : 0 AREA FILL : 0

565+00

CUT VOL. : 393 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2173 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 99 AREA CUT : 0 AREA CUT : 0
AREA FILL : 570 AREA FILL : 0 AREA FILL : 0

564+00

CUT VOL. : 227 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1842 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 564+00 TO STA. 566+00

2/3/2017

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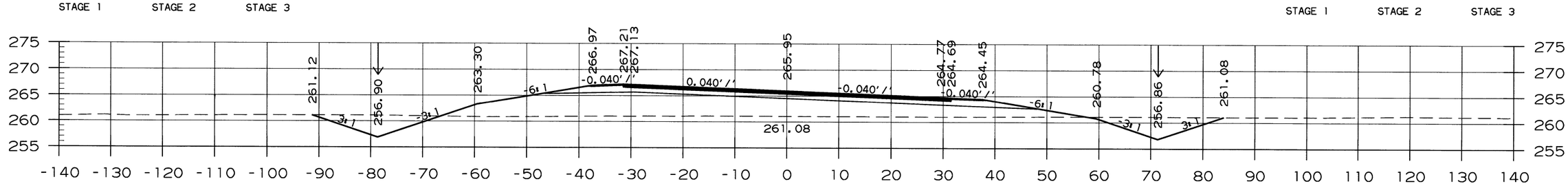
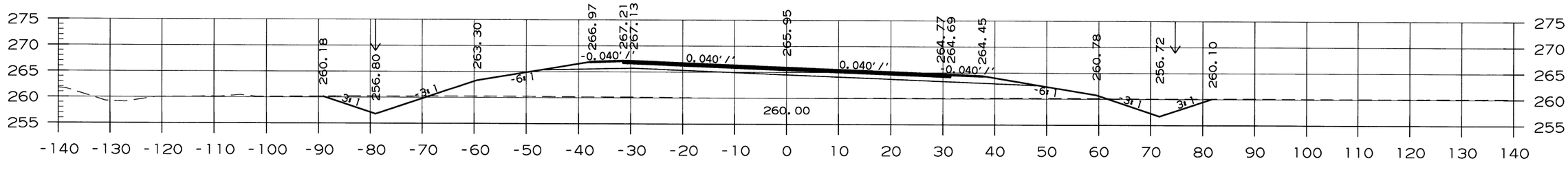
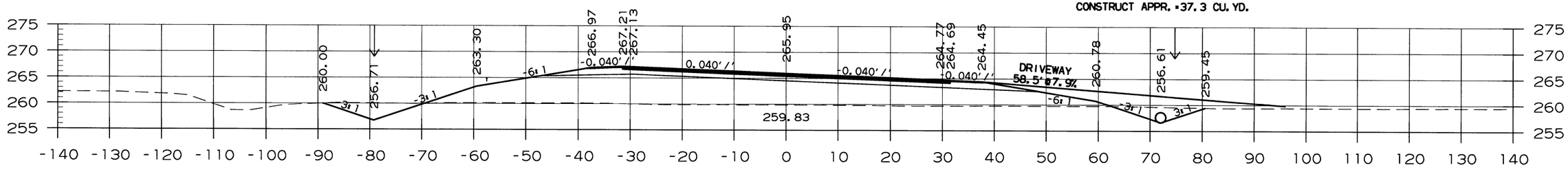
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 400 | 503 |

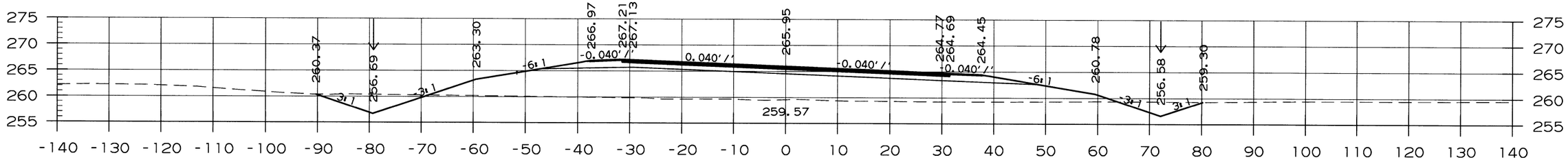
② CROSS SECTIONS




**STA. 567+22**
**INSTALL**
**24" X 40' PIPE CULVERT**
**RT. SIDE DRAIN**
**CONSTRUCT APPR. = 37.3 CU. YD.**




# CROSS SECTION
# STA. 567+00 TO STA. 569+00

2/8/2018

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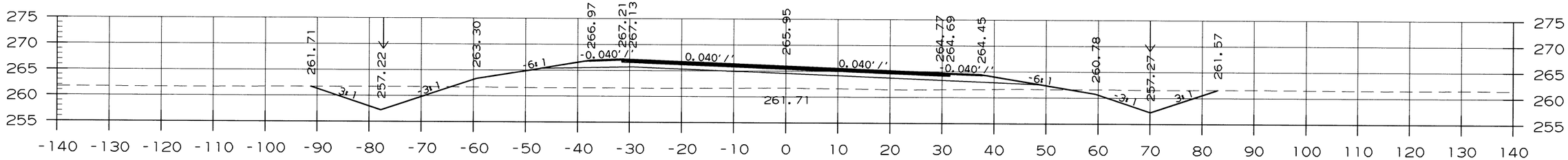
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 401 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

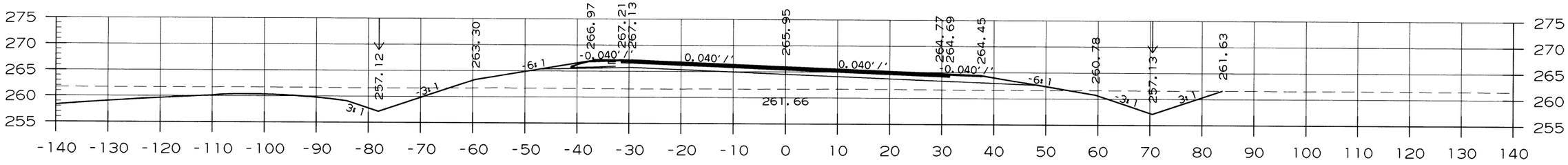



AREA CUT : 117 AREA CUT : 0 AREA CUT : 0
AREA FILL : 309 AREA FILL : 0 AREA FILL : 0

572+00

STAGE 1 STAGE 2 STAGE 3

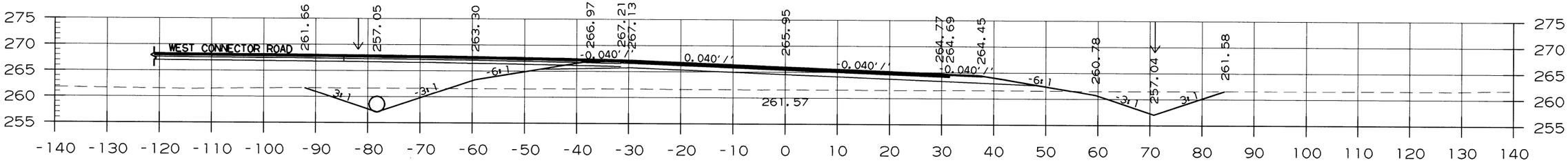
CUT VOL. : 425 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1136 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 113 AREA CUT : 0 AREA CUT : 0
AREA FILL : 304 AREA FILL : 0 AREA FILL : 0

571+00

CUT VOL. : 286 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 741 FILL VOL. : 0 FILL VOL. : 0

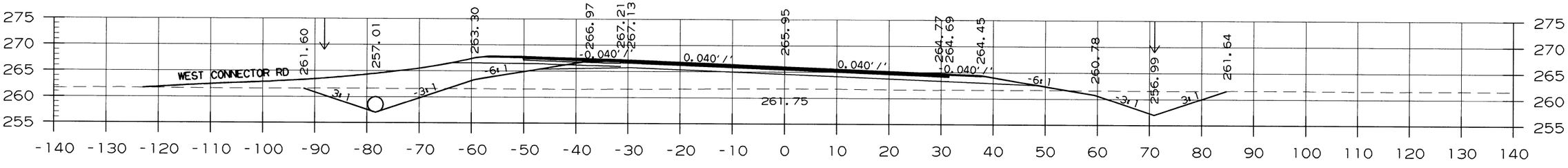



AREA CUT : 125 AREA CUT : 0 AREA CUT : 0
AREA FILL : 311 AREA FILL : 0 AREA FILL : 0

FOR DETAILS
SEE WEST CONNECTOR ROAD
CROSS SECTIONS

570+35

CUT VOL. : 164 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 399 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 128 AREA CUT : 0 AREA CUT : 0
AREA FILL : 305 AREA FILL : 0 AREA FILL : 0

570+00

CUT VOL. : 435 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1268 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 570+00 TO STA. 572+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
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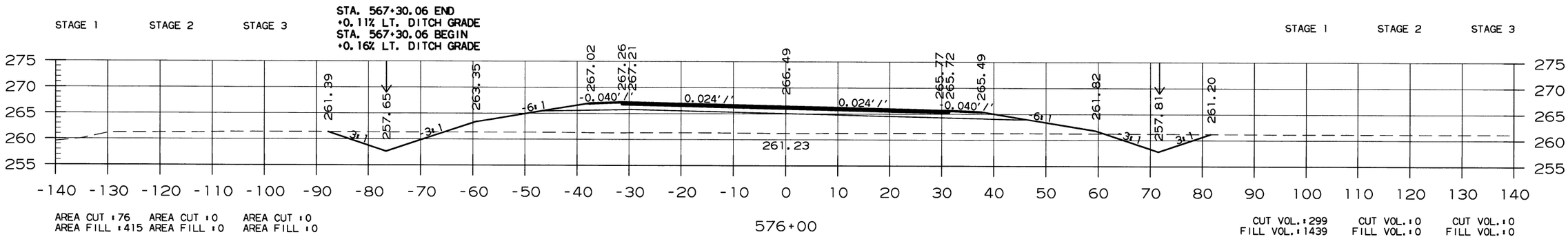
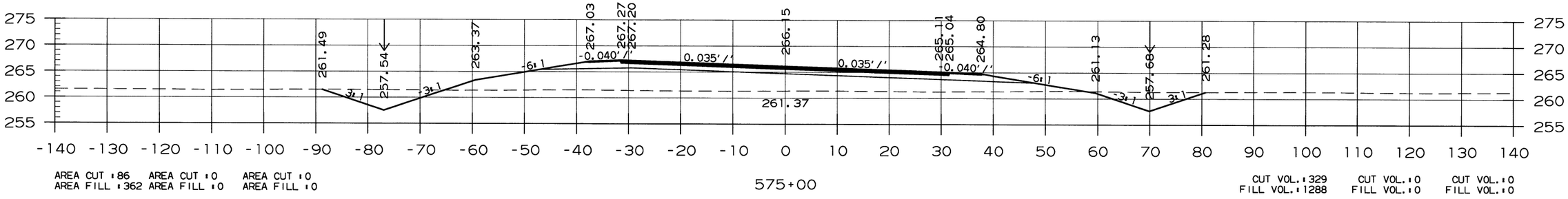
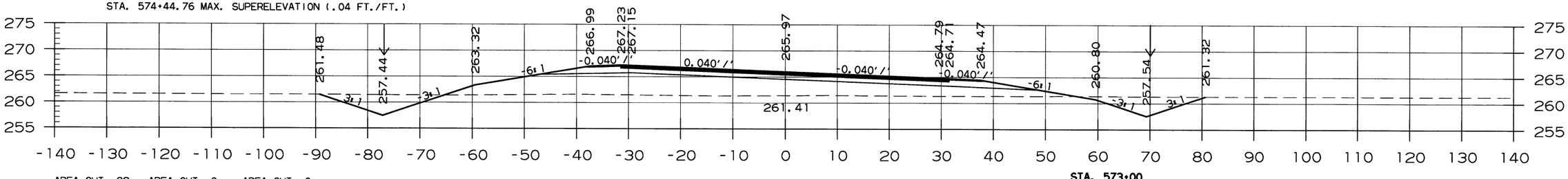
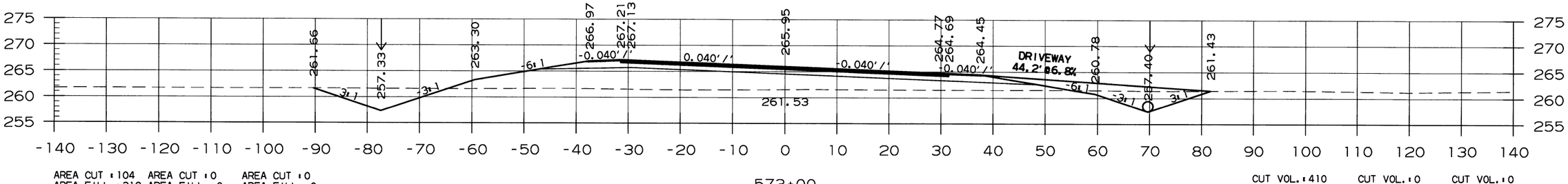
| | | | | JOB NO. | | CA1003 | 402 | 503 |

② CROSS SECTIONS




CROSS SECTION
STA. 573+00 TO STA. 576+00

2/9/2018

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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 |
|---|---|---|---|---|---|---|---|---|
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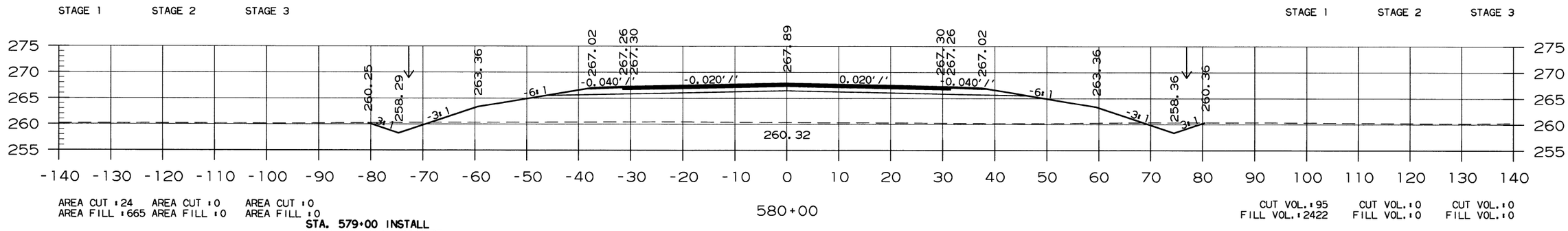
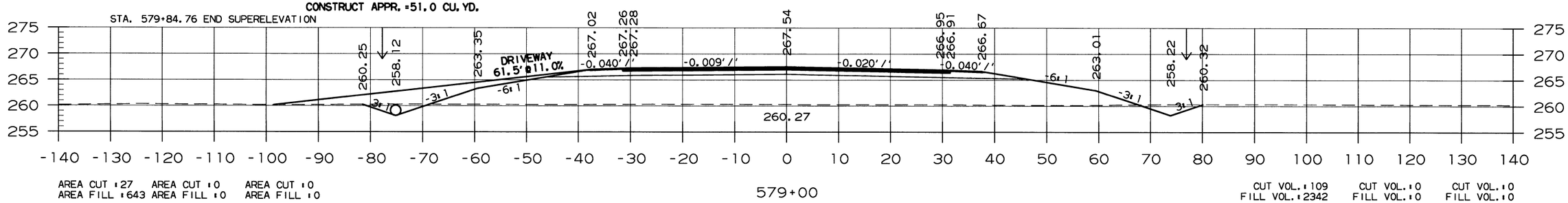
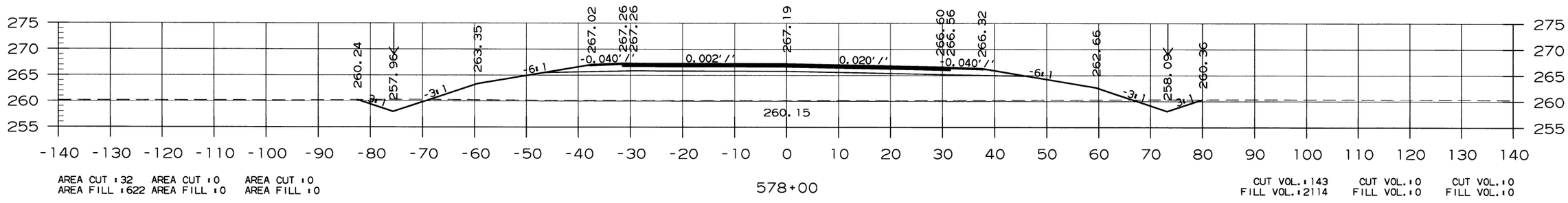
| | | | | JOB NO. | | CA1003 | 403 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

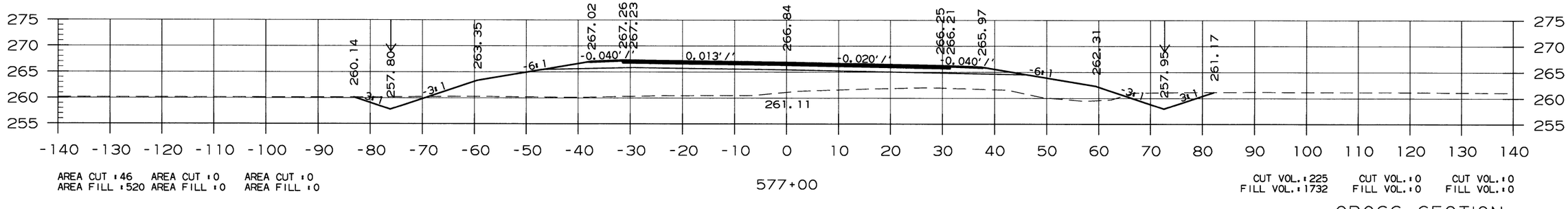



STA. 579+00 INSTALL
24" X 52" PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =51.0 CU. YD.

STA. 579+84.76 END SUPERELEVATION




CROSS SECTION
STA. 577+00 TO STA. 580+00

2/26/2018

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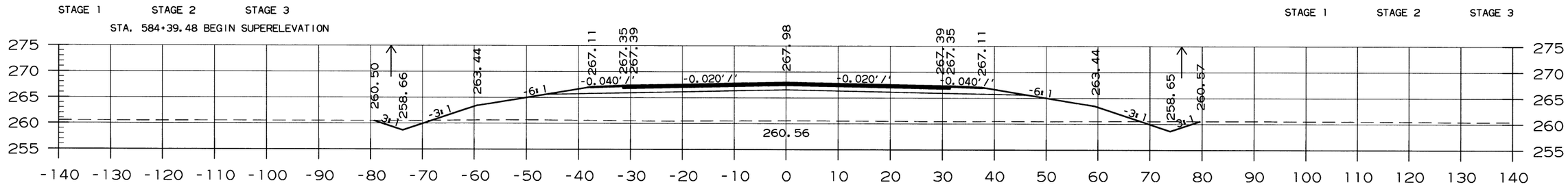
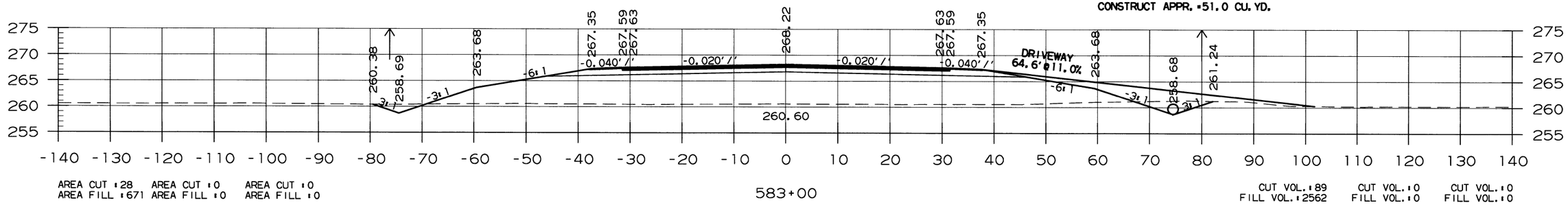
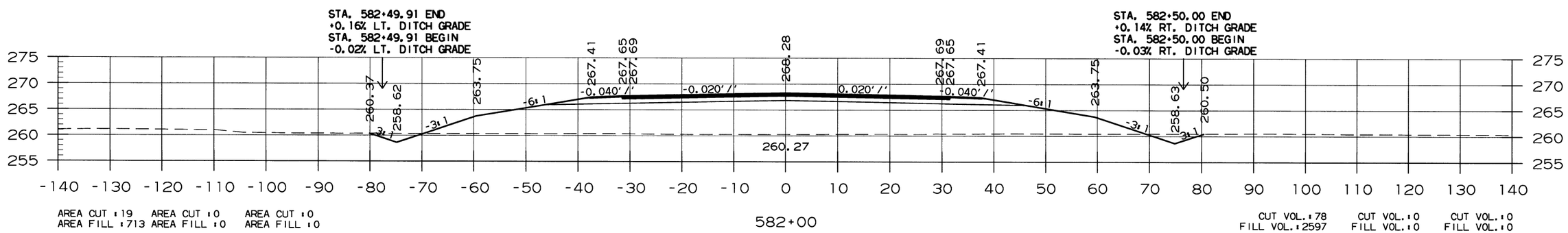
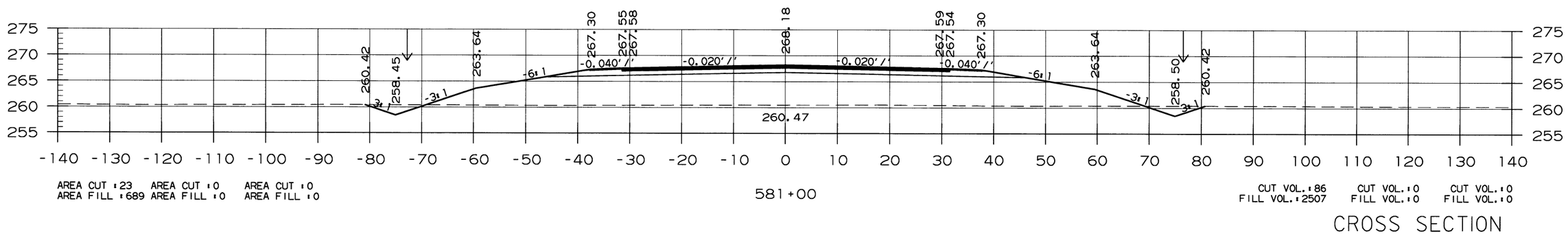
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 404 | 503 |

② CROSS SECTIONS




CROSS SECTION
STA. 581+00 TO STA. 584+00

2/14/2018

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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 |
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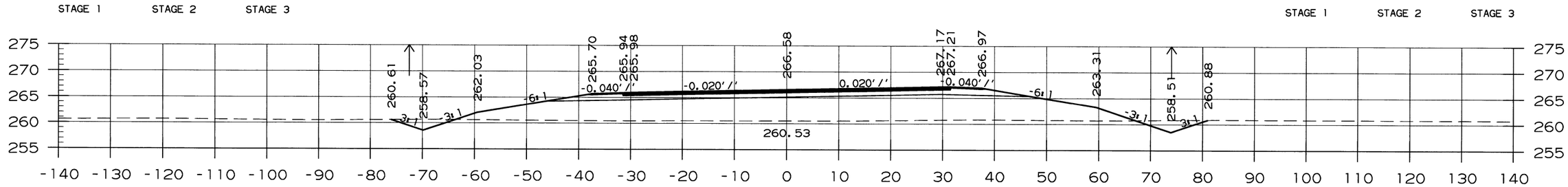
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 405 | 503 |

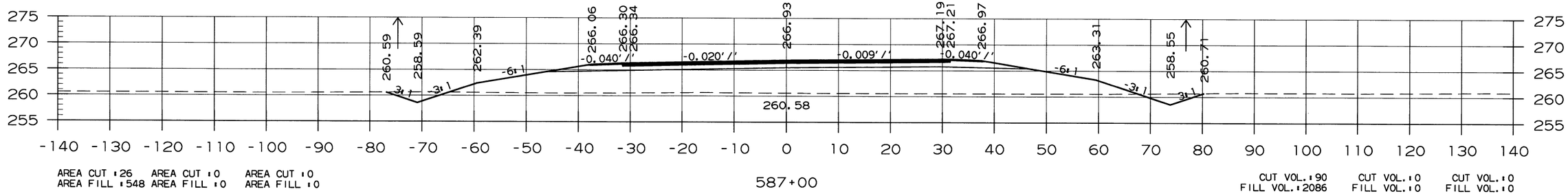
② CROSS SECTIONS




AREA CUT : 29 AREA CUT : 0 AREA CUT : 0
AREA FILL : 512 AREA FILL : 0 AREA FILL : 0

588+00

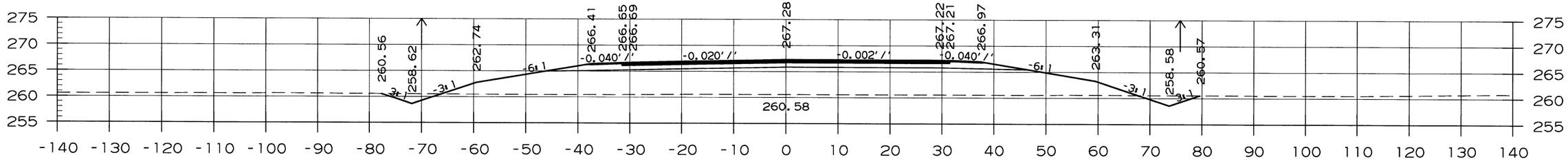
CUT VOL. : 101 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1963 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 26 AREA CUT : 0 AREA CUT : 0
AREA FILL : 548 AREA FILL : 0 AREA FILL : 0

587+00

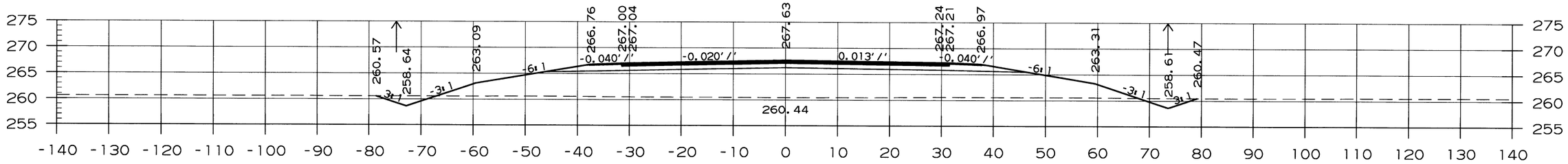
CUT VOL. : 90 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2086 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 23 AREA CUT : 0 AREA CUT : 0
AREA FILL : 579 AREA FILL : 0 AREA FILL : 0

586+00

CUT VOL. : 83 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2202 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 22 AREA CUT : 0 AREA CUT : 0
AREA FILL : 610 AREA FILL : 0 AREA FILL : 0

585+00

CUT VOL. : 80 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2328 FILL VOL. : 0 FILL VOL. : 0

CROSS SECTION
STA. 585+00 TO STA. 588+00

2/8/2018

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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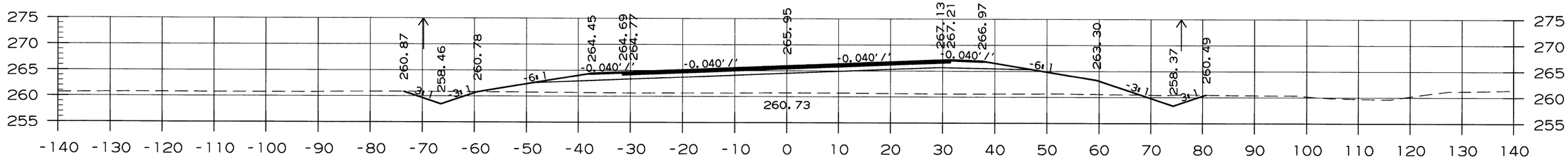
| JOB NO. | | CA1003 | 406 | 503 |

②

# CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

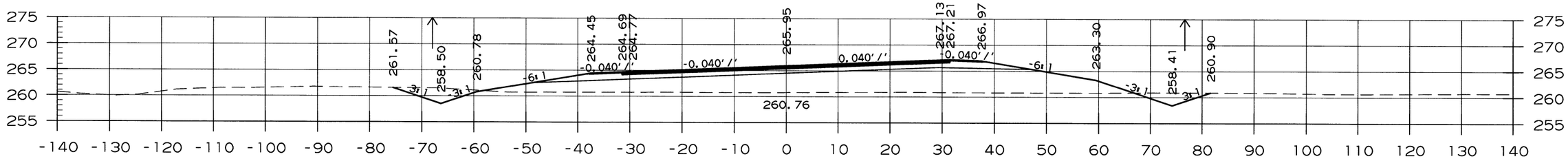



AREA CUT = 30 AREA CUT = 0 AREA CUT = 0
AREA FILL = 425 AREA FILL = 0 AREA FILL = 0

592+00

STAGE 1 STAGE 2 STAGE 3

CUT VOL. = 137 CUT VOL. = 0 CUT VOL. = 0
FILL VOL. = 1541 FILL VOL. = 0 FILL VOL. = 0




AREA CUT = 44 AREA CUT = 0 AREA CUT = 0
AREA FILL = 408 AREA FILL = 0 AREA FILL = 0

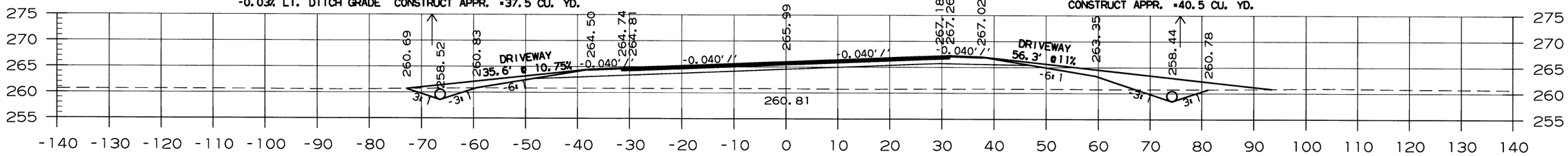
591+00

CUT VOL. = 139 CUT VOL. = 0 CUT VOL. = 0
FILL VOL. = 1520 FILL VOL. = 0 FILL VOL. = 0

STA. 590+91.30 END
-0.02% LT. DITCH GRADE
STA. 590+91.30 BEGIN
-0.03% LT. DITCH GRADE

STA. 590+00
24' X 50' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 37.5 CU. YD.

STA. 590+00
24' X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 40.5 CU. YD.

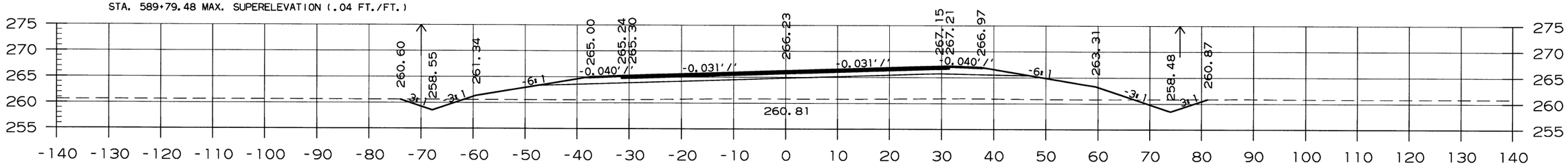



AREA CUT = 31 AREA CUT = 0 AREA CUT = 0
AREA FILL = 413 AREA FILL = 0 AREA FILL = 0

590+00

CUT VOL. = 112 CUT VOL. = 0 CUT VOL. = 0
FILL VOL. = 1595 FILL VOL. = 0 FILL VOL. = 0

STA. 589+79.48 MAX. SUPERELEVATION (.04 FT./FT.)




AREA CUT = 29 AREA CUT = 0 AREA CUT = 0
AREA FILL = 449 AREA FILL = 0 AREA FILL = 0

589+00

CUT VOL. = 108 CUT VOL. = 0 CUT VOL. = 0
FILL VOL. = 1779 FILL VOL. = 0 FILL VOL. = 0

## CROSS SECTION
## STA. 589+00 TO STA. 592+00

2/14/2018

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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 |
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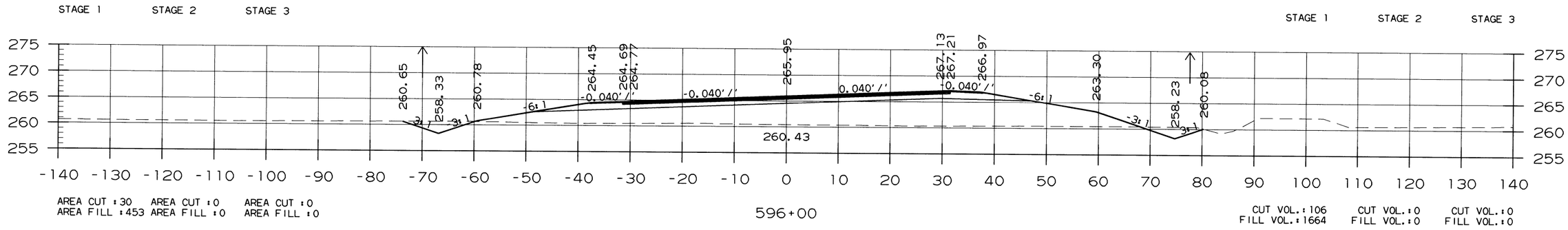
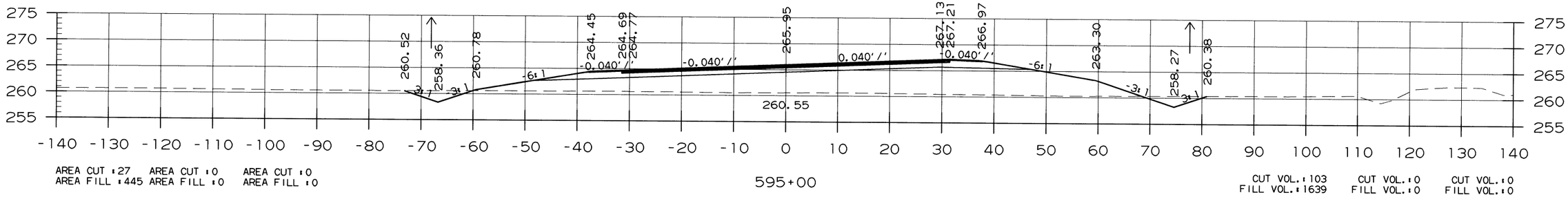
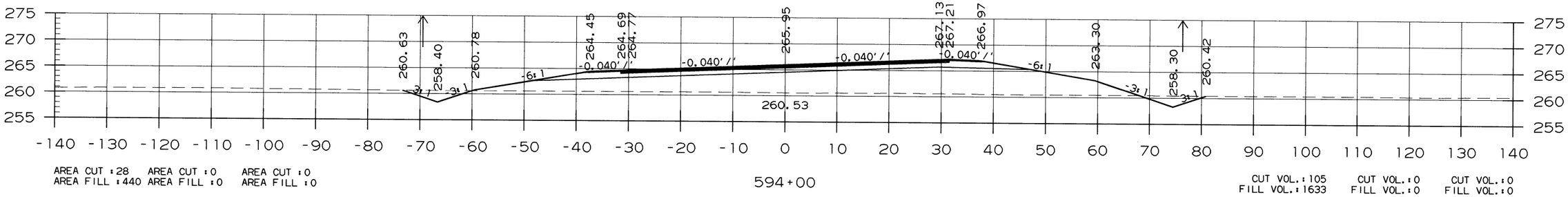
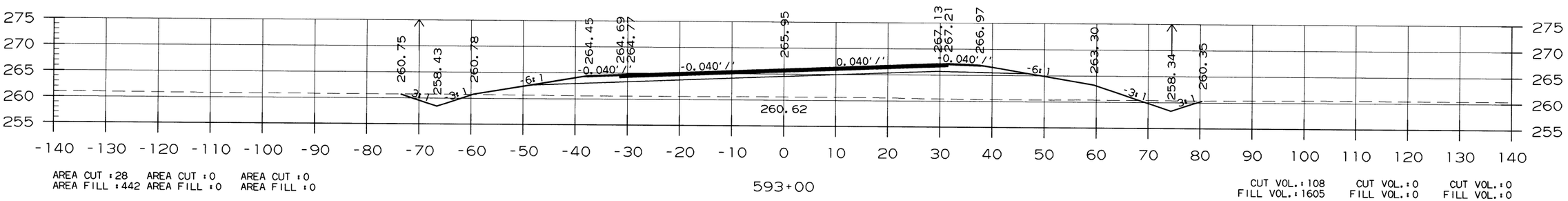
| | | | | JOB NO. | | CA1003 | 407 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




CROSS SECTION
STA. 593+00 TO STA. 596+00

2/3/2017

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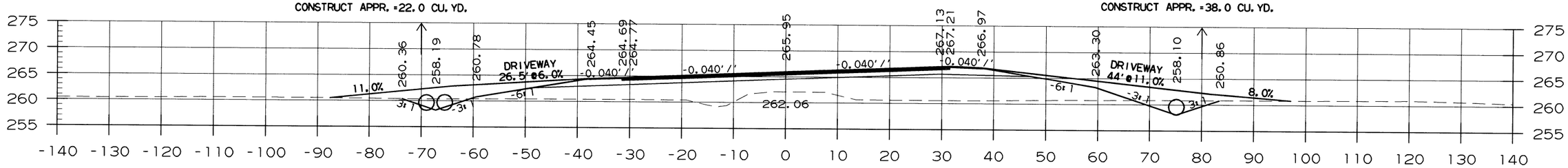
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 408 | 503 |

②

CROSS SECTIONS

STA. 600+00 INSTALL
36" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =22.0 CU. YD.

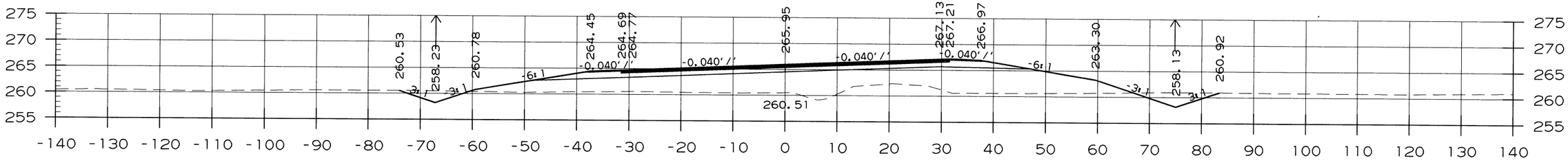
STA. 600+00 INSTALL
36" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =38.0 CU. YD.




AREA CUT : 37 AREA CUT : 0 AREA CUT : 0
AREA FILL : 419 AREA FILL : 0 AREA FILL : 0

600+00

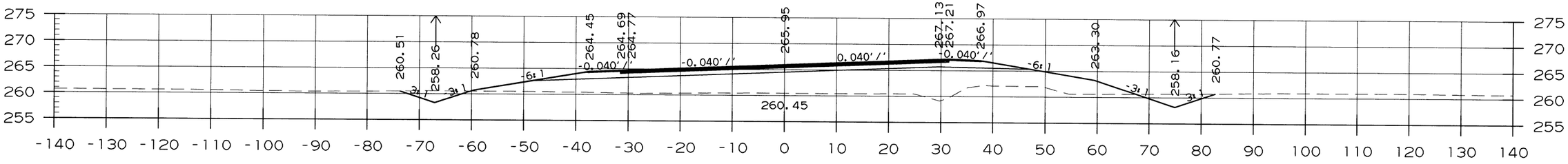
CUT VOL. : 140 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1559 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 39 AREA CUT : 0 AREA CUT : 0
AREA FILL : 423 AREA FILL : 0 AREA FILL : 0

599+00

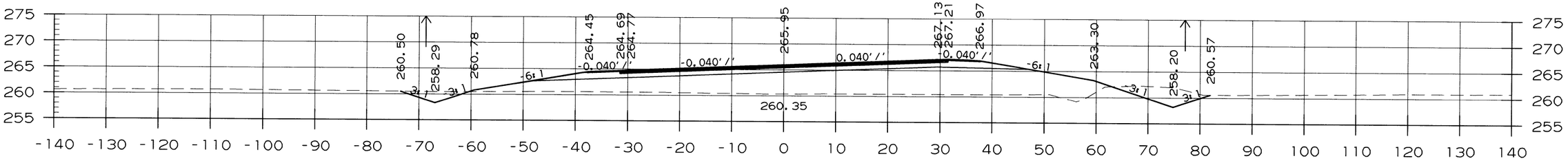
CUT VOL. : 136 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1578 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 35 AREA CUT : 0 AREA CUT : 0
AREA FILL : 429 AREA FILL : 0 AREA FILL : 0

598+00

CUT VOL. : 158 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1623 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 50 AREA CUT : 0 AREA CUT : 0
AREA FILL : 447 AREA FILL : 0 AREA FILL : 0

597+00

CUT VOL. : 149 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1668 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 597+00 TO STA. 600+00

2/3/2017

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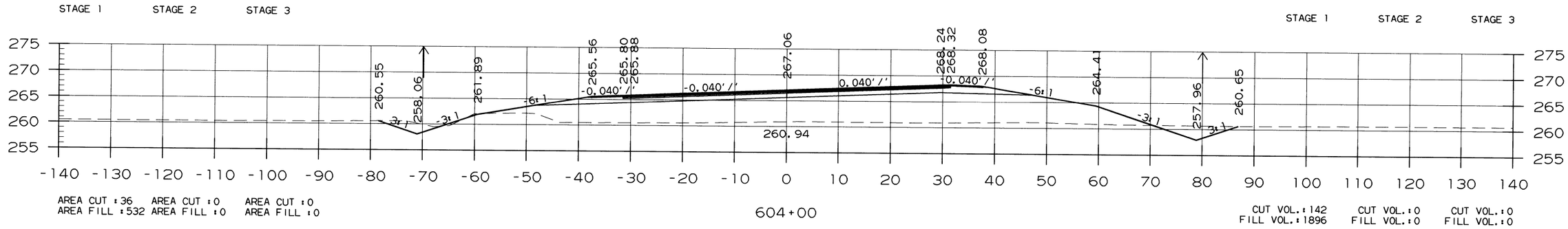
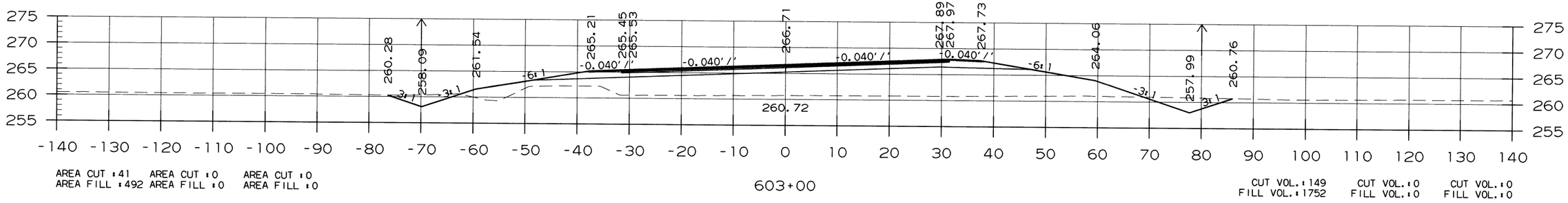
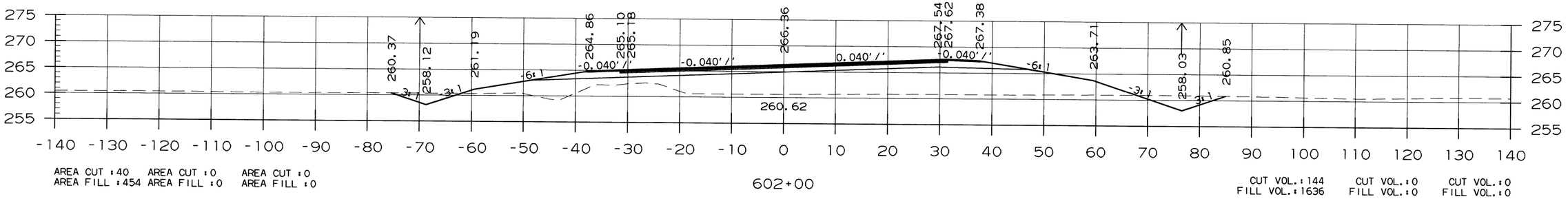
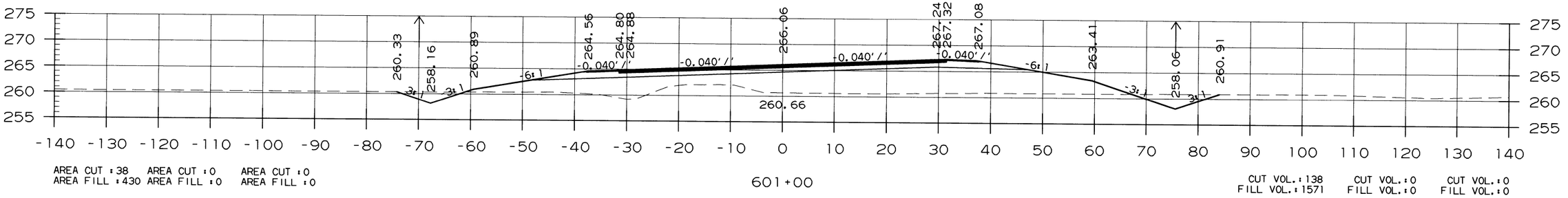
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 409 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




CROSS SECTION
STA. 601+00 TO STA. 604+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
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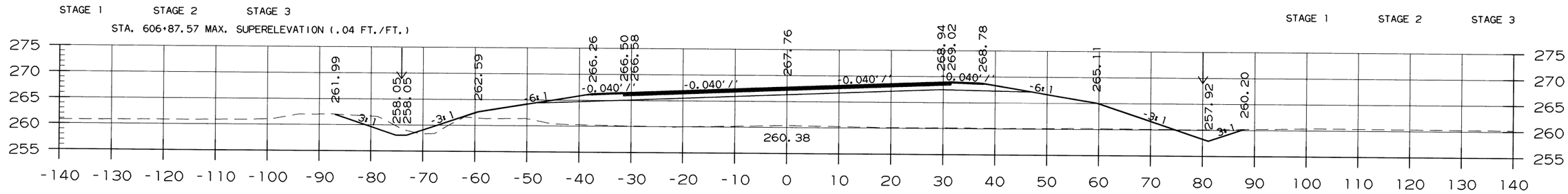
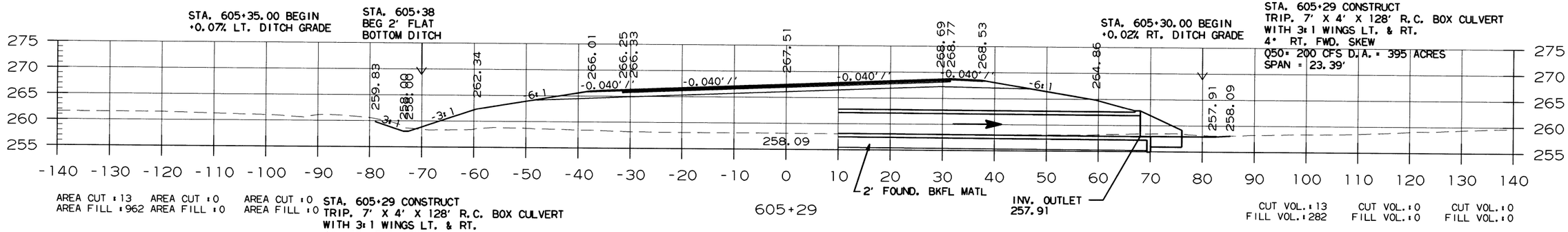
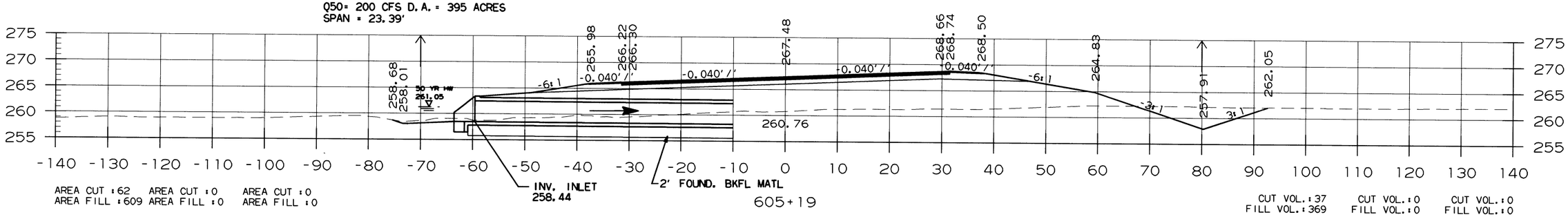
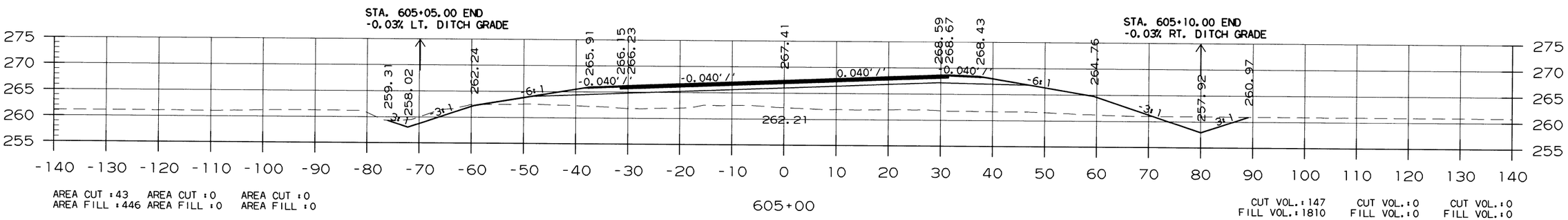
| | | | | JOB NO. | | CA1003 | 410 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




# CROSS SECTION
# STA. 605+00 TO STA. 606+00

2/3/2017

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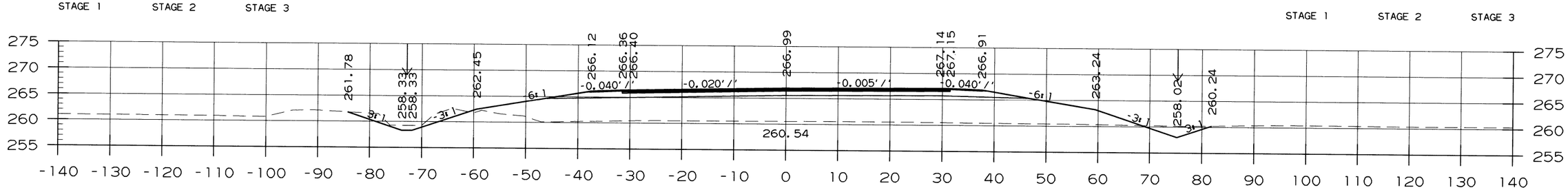
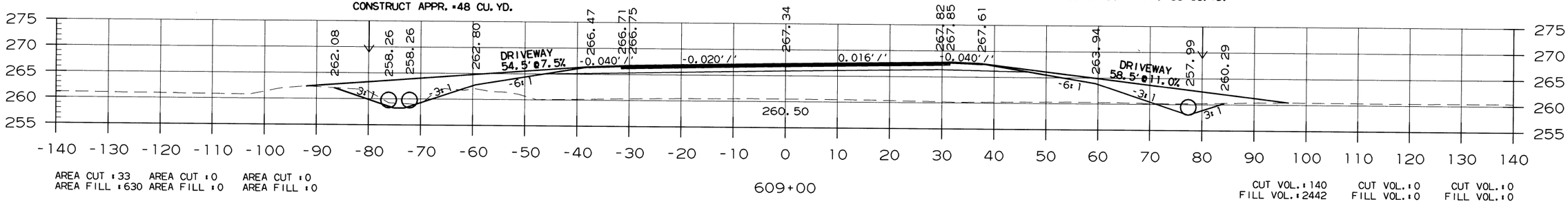
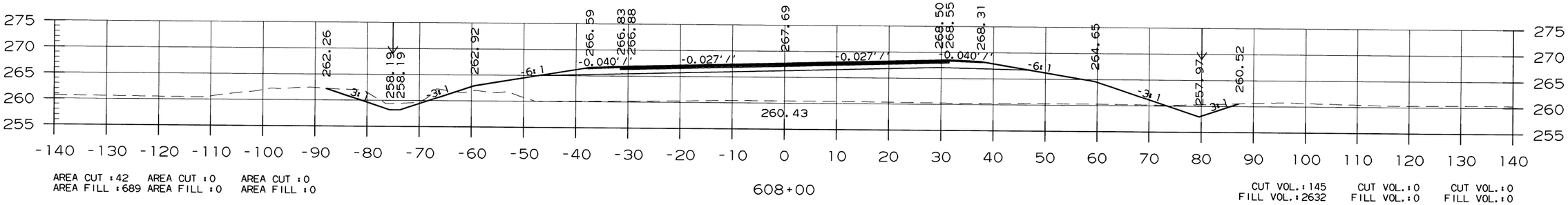
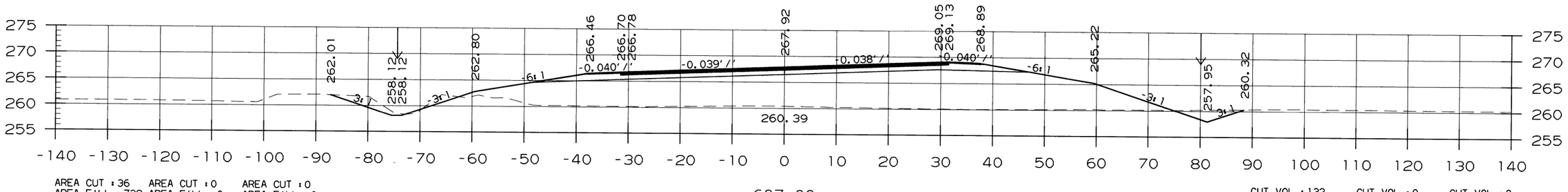
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 41 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 607+00 TO STA. 610+00

2/3/2017

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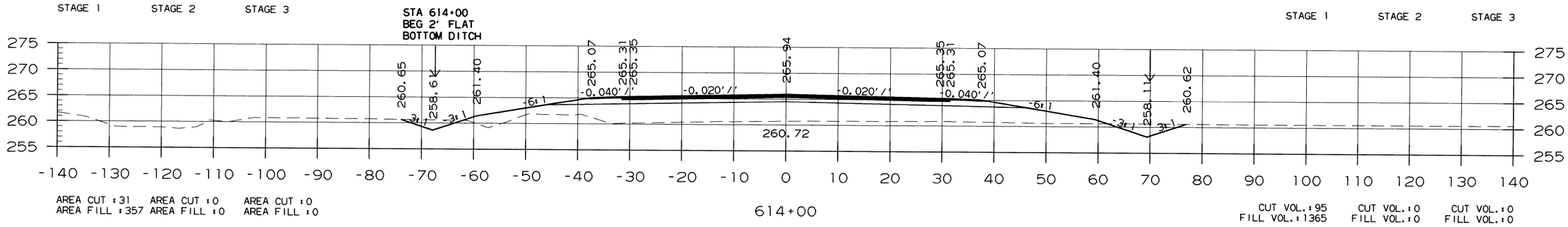
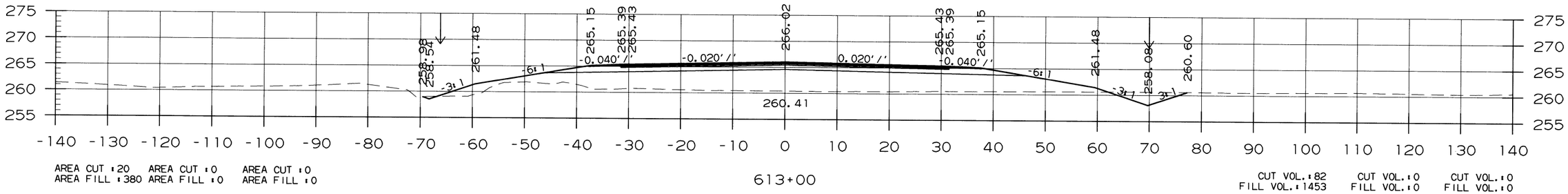
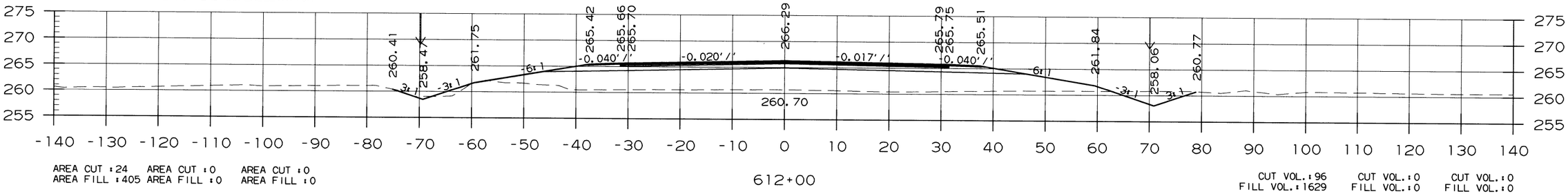
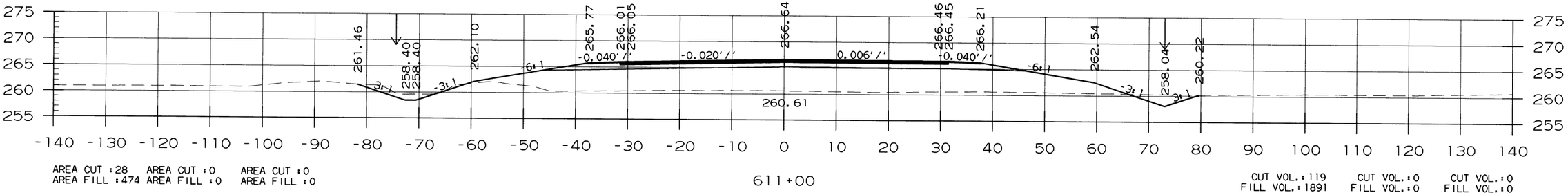
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 412 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 611+00 TO STA. 614+00

2/3/2017

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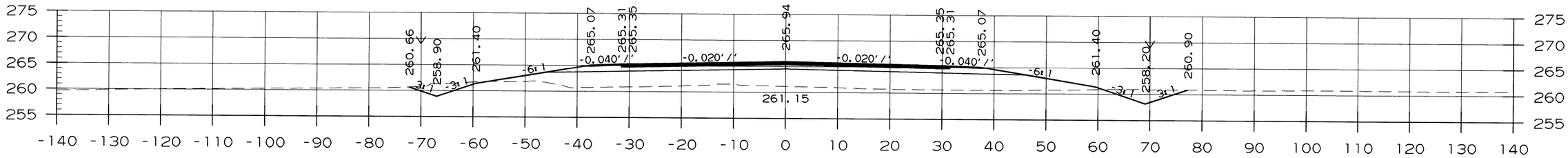
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 413 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

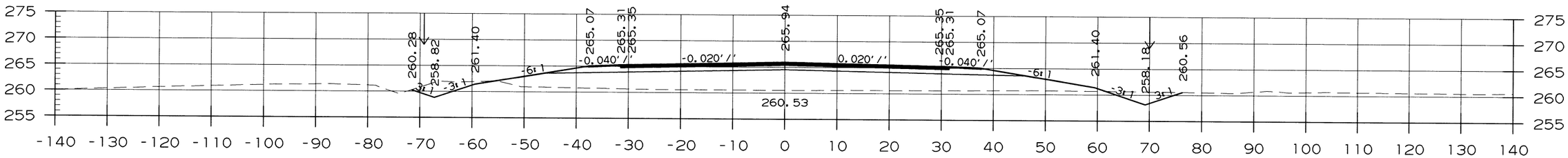



AREA CUT : 38 AREA CUT : 0 AREA CUT : 0
AREA FILL : 321 AREA FILL : 0 AREA FILL : 0

618+00

STAGE 1 STAGE 2 STAGE 3

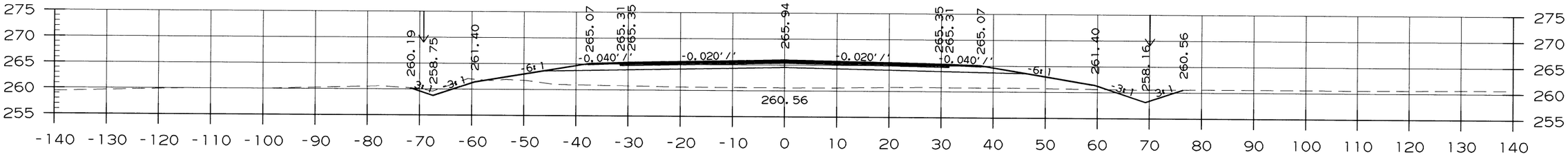
CUT VOL. : 143 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1255 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 39 AREA CUT : 0 AREA CUT : 0
AREA FILL : 356 AREA FILL : 0 AREA FILL : 0

617+00

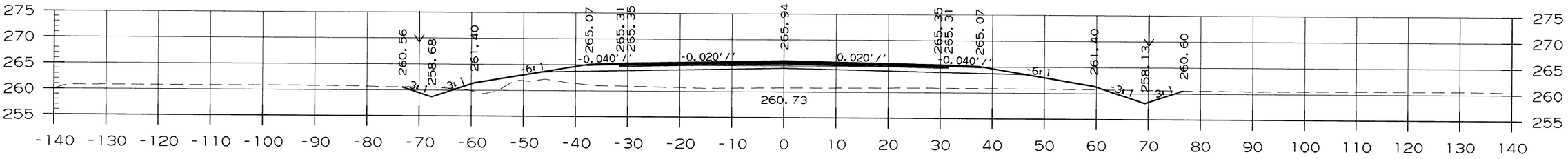
CUT VOL. : 122 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1298 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 27 AREA CUT : 0 AREA CUT : 0
AREA FILL : 345 AREA FILL : 0 AREA FILL : 0

616+00

CUT VOL. : 104 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1272 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 29 AREA CUT : 0 AREA CUT : 0
AREA FILL : 343 AREA FILL : 0 AREA FILL : 0

615+00

CUT VOL. : 111 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1296 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 615+00 TO STA. 618+00

2/3/2017

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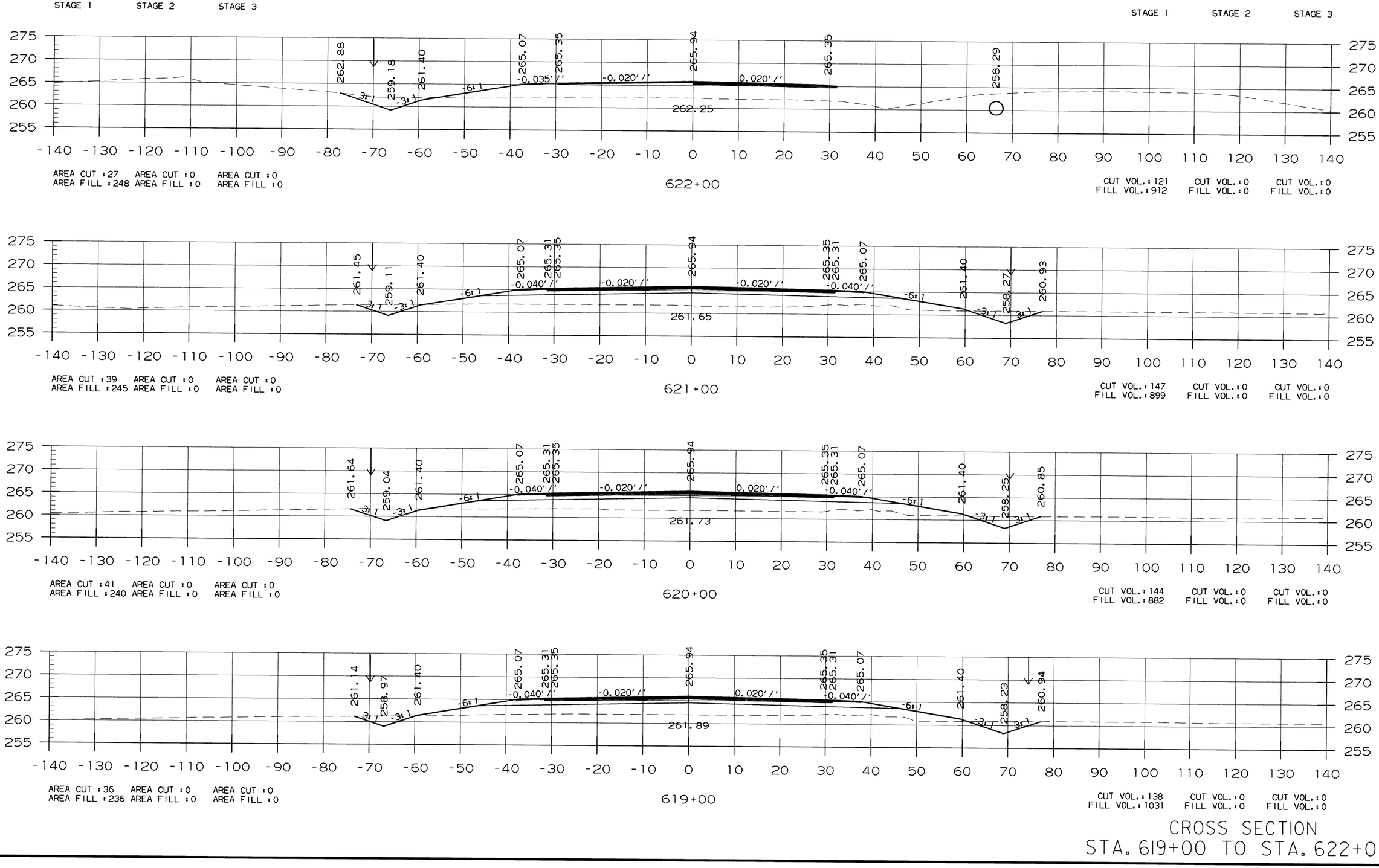
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 414 | 503 |

②

CROSS SECTIONS




CROSS SECTION
STA. 619+00 TO STA. 622+00

2/3/2017

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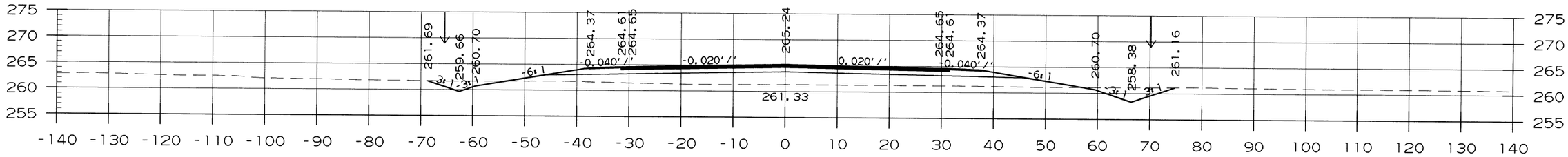
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 415 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

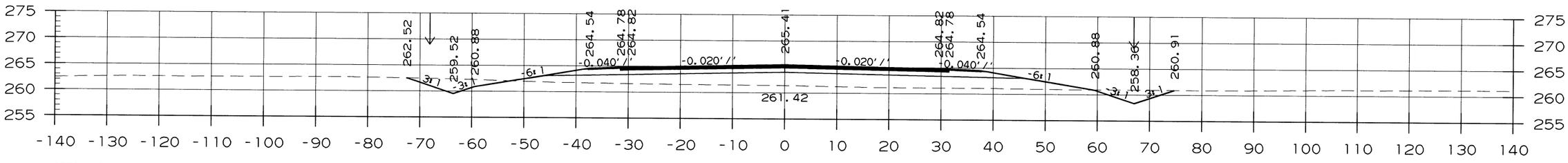



AREA CUT : 37 AREA CUT : 0 AREA CUT : 0
AREA FILL : 200 AREA FILL : 0 AREA FILL : 0

626+00

STAGE 1 STAGE 2 STAGE 3

CUT VOL. : 153 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 772 FILL VOL. : 0 FILL VOL. : 0

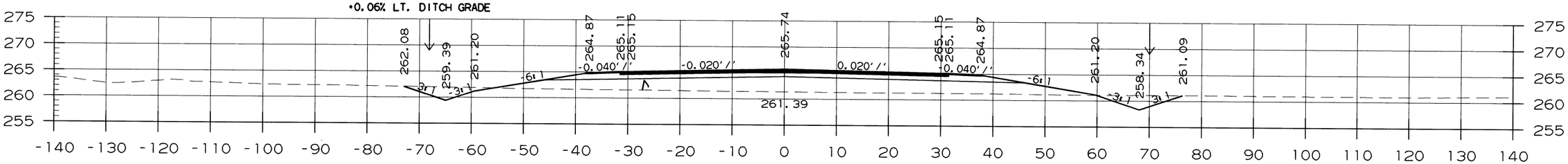



AREA CUT : 46 AREA CUT : 0 AREA CUT : 0
AREA FILL : 217 AREA FILL : 0 AREA FILL : 0

625+00

CUT VOL. : 164 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 864 FILL VOL. : 0 FILL VOL. : 0

STA. 624+00.00 END
+0.09% LT. DITCH GRADE
STA. 624+00.00 BEGIN
+0.06% LT. DITCH GRADE



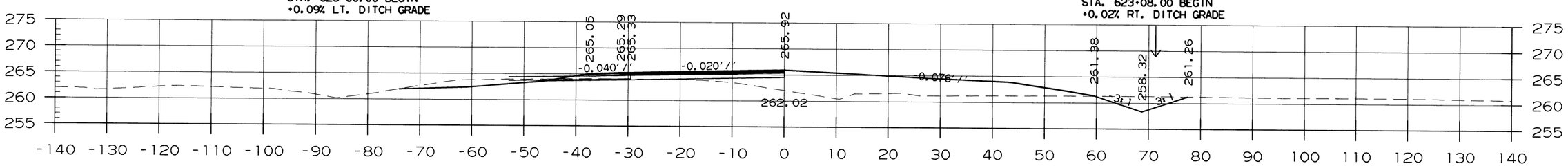

AREA CUT : 43 AREA CUT : 0 AREA CUT : 0
AREA FILL : 249 AREA FILL : 0 AREA FILL : 0

624+00

CUT VOL. : 183 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 830 FILL VOL. : 0 FILL VOL. : 0

STA. 623+00.00 END
+0.07% LT. DITCH GRADE
STA. 623+00.00 BEGIN
+0.09% LT. DITCH GRADE

STA. 623+08.00 END
+0.02% RT. DITCH GRADE
STA. 623+08.00 BEGIN
+0.02% RT. DITCH GRADE




AREA CUT : 56 AREA CUT : 0 AREA CUT : 0
AREA FILL : 199 AREA FILL : 0 AREA FILL : 0

623+00

CUT VOL. : 153 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 826 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 623+00 TO STA. 626+00

2/3/2017

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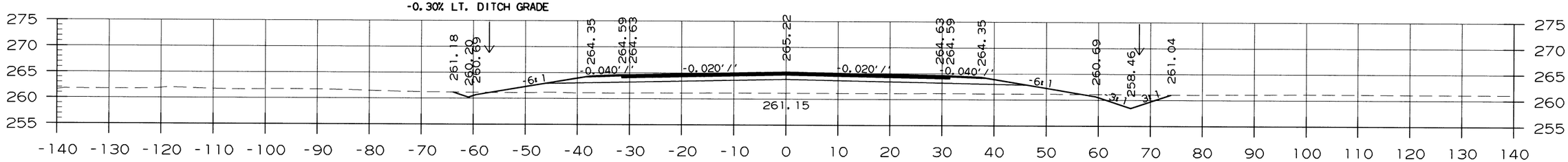
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 416 | 503 |

② CROSS SECTIONS

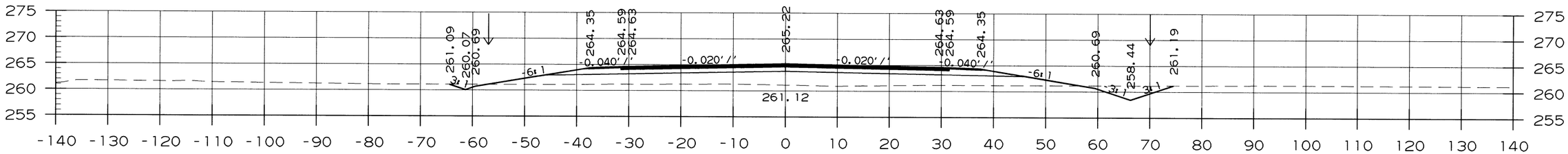
STA. 630+52.33 END
+0.06% LT. DITCH GRADE
STA. 624+00.00 BEGIN
-0.30% LT. DITCH GRADE




AREA CUT : 24 AREA CUT : 0 AREA CUT : 0
AREA FILL : 223 AREA FILL : 0 AREA FILL : 0

630+00

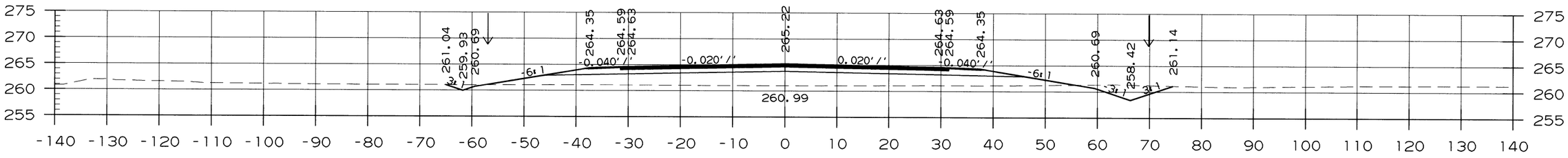
CUT VOL. : 93 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 823 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 26 AREA CUT : 0 AREA CUT : 0
AREA FILL : 222 AREA FILL : 0 AREA FILL : 0

629+00

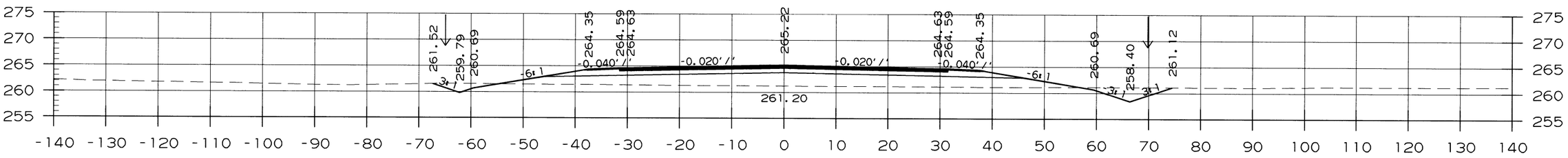
CUT VOL. : 103 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 839 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 29 AREA CUT : 0 AREA CUT : 0
AREA FILL : 231 AREA FILL : 0 AREA FILL : 0

628+00

CUT VOL. : 115 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 818 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 33 AREA CUT : 0 AREA CUT : 0
AREA FILL : 210 AREA FILL : 0 AREA FILL : 0

627+00

CUT VOL. : 128 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 760 FILL VOL. : 0 FILL VOL. : 0

CROSS SECTION
STA. 627+00 TO STA. 630+00

2/3/2017

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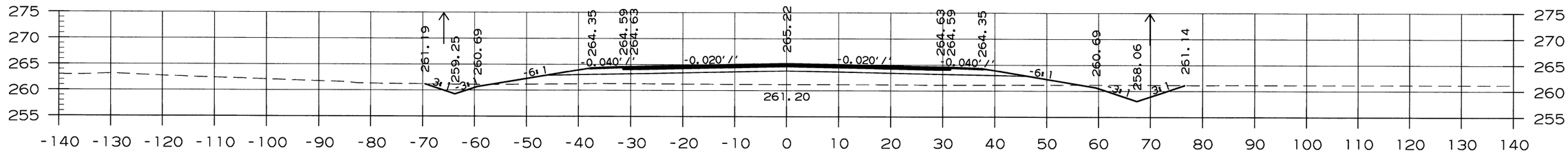
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 417 | 503 |

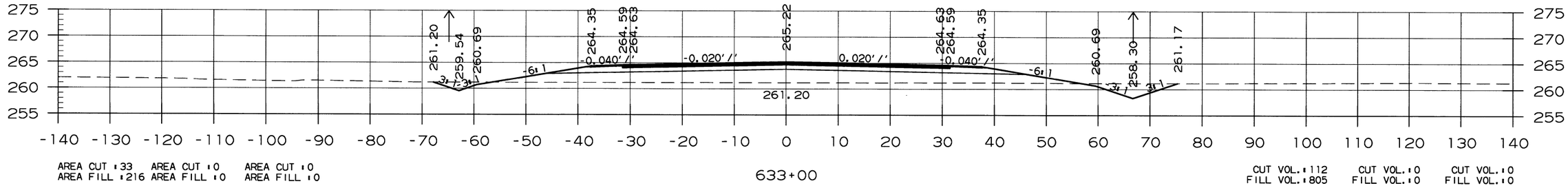
② CROSS SECTIONS




AREA CUT : 40 AREA CUT : 0 AREA CUT : 0
AREA FILL : 217 AREA FILL : 0 AREA FILL : 0

634+00

CUT VOL. : 136 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 802 FILL VOL. : 0 FILL VOL. : 0



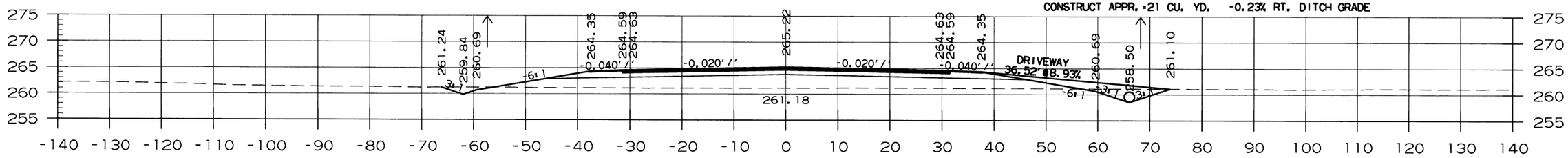

AREA CUT : 33 AREA CUT : 0 AREA CUT : 0
AREA FILL : 216 AREA FILL : 0 AREA FILL : 0

633+00

CUT VOL. : 112 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 805 FILL VOL. : 0 FILL VOL. : 0

STA. 632+10 INSTALL
24" x 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =21 CU. YD.

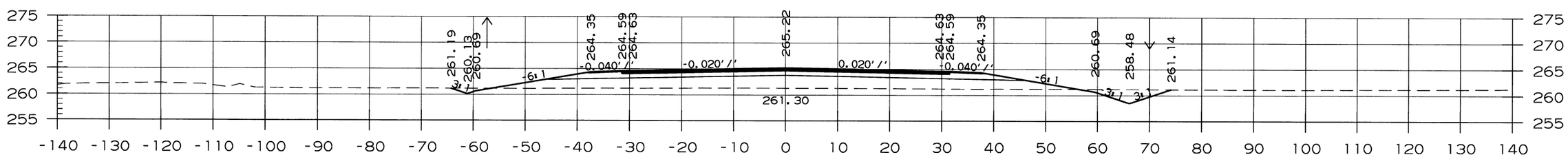
STA. 632+11.55 END
+0.02% RT. DITCH GRADE
STA. 632+11.55 BEGIN
-0.23% RT. DITCH GRADE




AREA CUT : 27 AREA CUT : 0 AREA CUT : 0
AREA FILL : 219 AREA FILL : 0 AREA FILL : 0

632+00

CUT VOL. : 98 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 795 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 26 AREA CUT : 0 AREA CUT : 0
AREA FILL : 211 AREA FILL : 0 AREA FILL : 0

631+00

CUT VOL. : 92 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 803 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 631+00 TO STA. 634+00

2/12/2018

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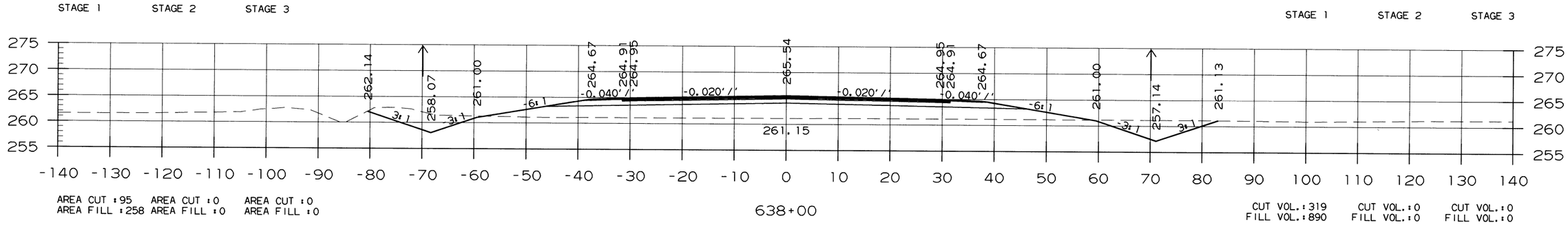
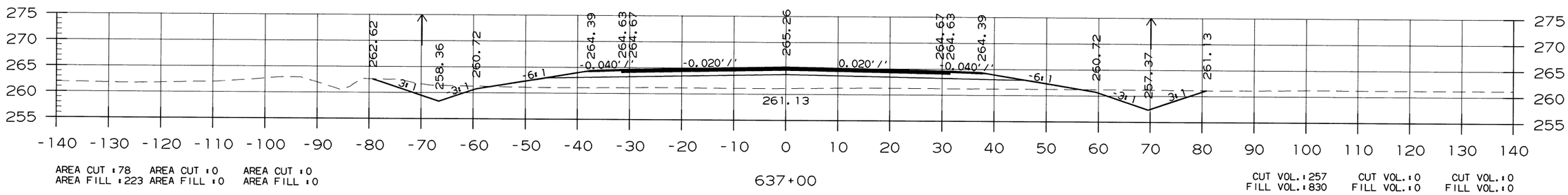
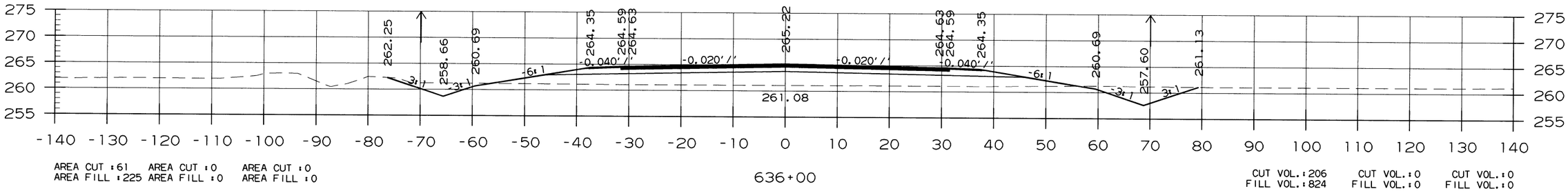
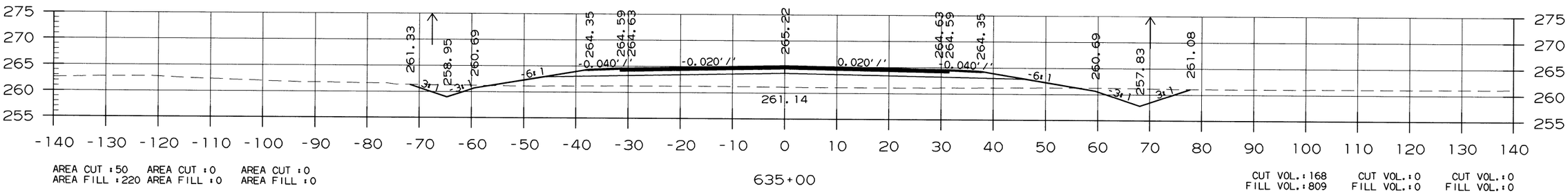
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 418 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




CROSS SECTION
STA. 635+00 TO STA. 638+00

2/3/2017

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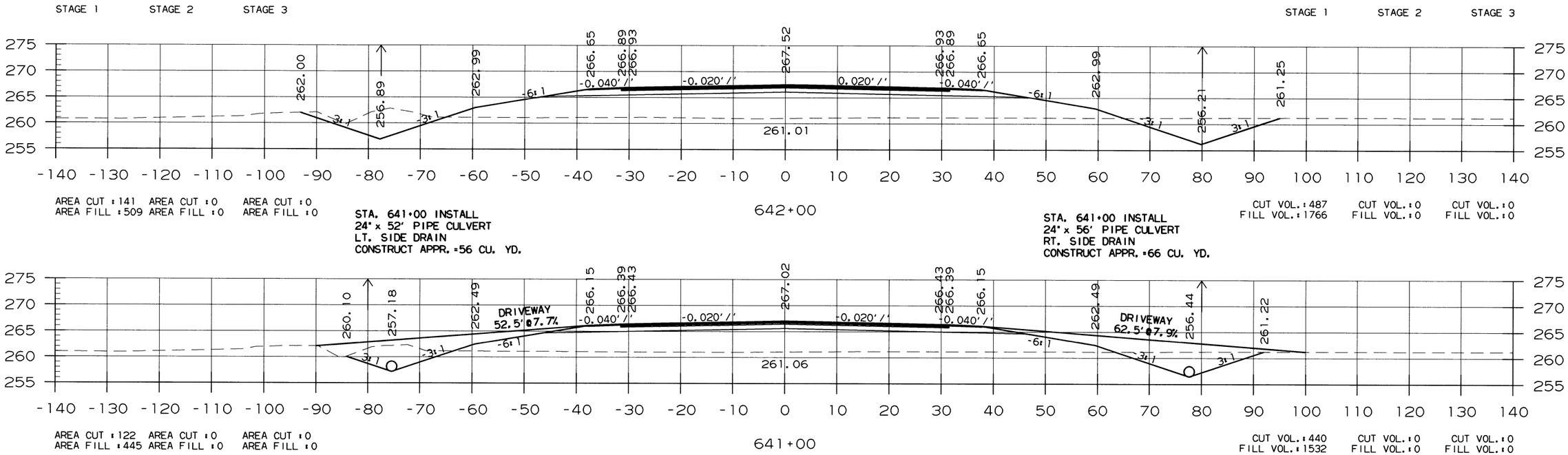
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 419 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 639+00 TO STA. 642+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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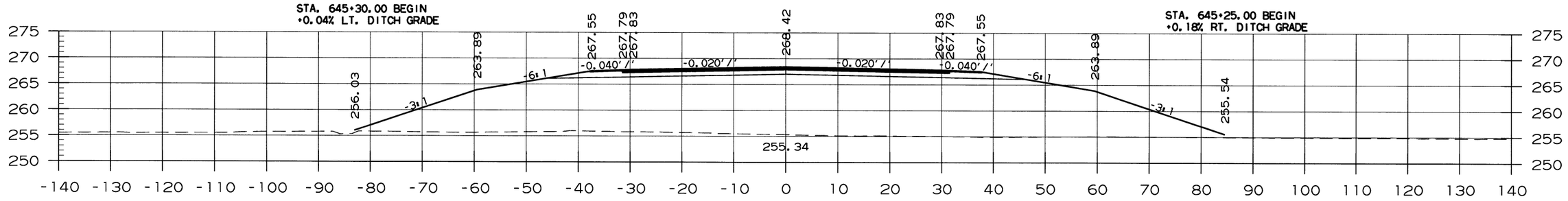
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 420 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

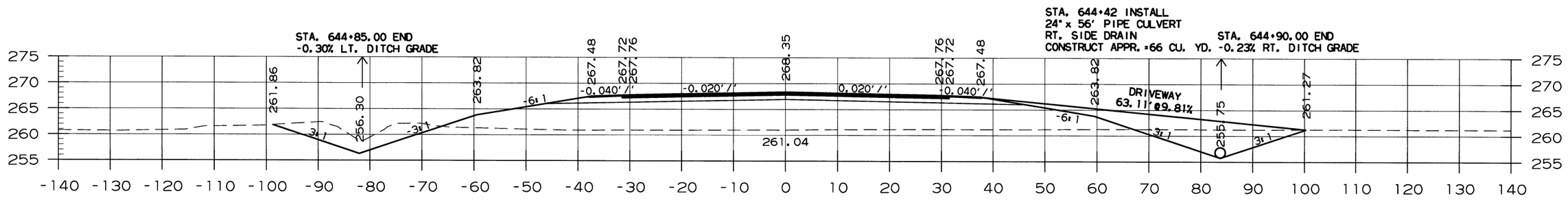
2/14/2018




AREA CUT : 0 AREA CUT : 0 AREA CUT : 0
AREA FILL : 1504 AREA FILL : 0 AREA FILL : 0

645+00

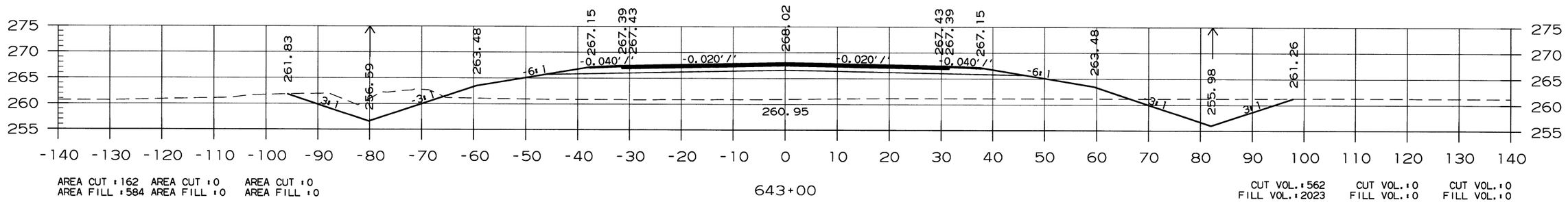
CUT VOL. : 315 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 3932 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 170 AREA CUT : 0 AREA CUT : 0
AREA FILL : 619 AREA FILL : 0 AREA FILL : 0

644+00

CUT VOL. : 616 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2228 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 162 AREA CUT : 0 AREA CUT : 0
AREA FILL : 584 AREA FILL : 0 AREA FILL : 0

643+00

CUT VOL. : 562 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2023 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 643+00 TO STA. 645+00

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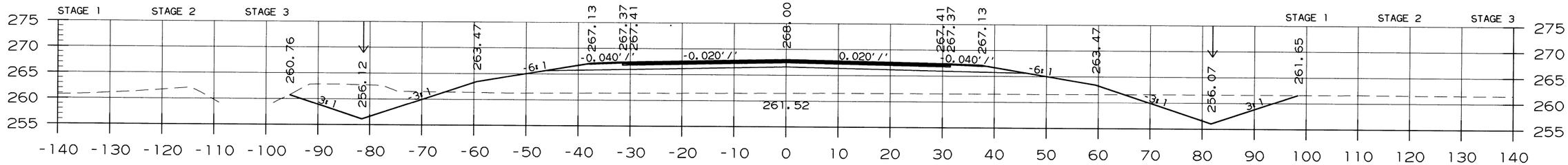
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 421 | 503 |

②

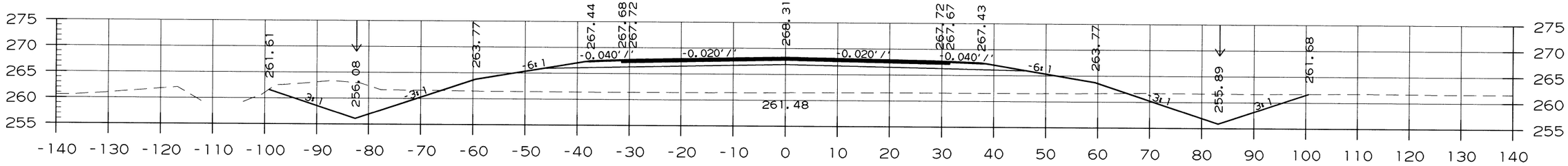
CROSS SECTIONS




AREA CUT : 200 AREA CUT : 0 AREA CUT : 0
AREA FILL : 522 AREA FILL : 0 AREA FILL : 0

648+00

CUT VOL. : 774 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2006 FILL VOL. : 0 FILL VOL. : 0



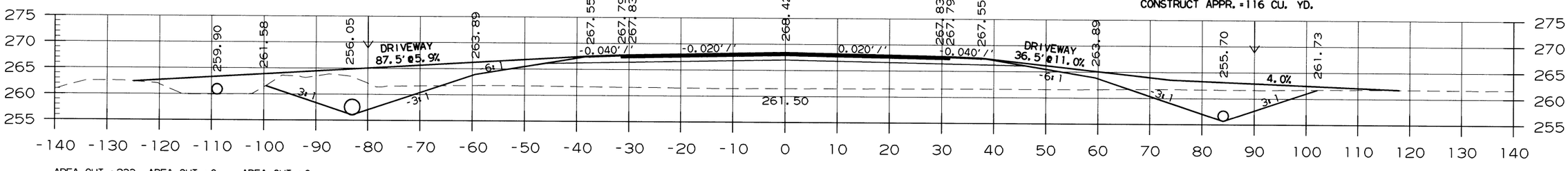

AREA CUT : 218 AREA CUT : 0 AREA CUT : 0
AREA FILL : 561 AREA FILL : 0 AREA FILL : 0

STA. 646+00 INSTALL
36" X 68' PIPE CULVERT
24" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 147 CU. YD.

647+00

CUT VOL. : 836 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2081 FILL VOL. : 0 FILL VOL. : 0

STA. 646+00 INSTALL
24" x 68' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 116 CU. YD.

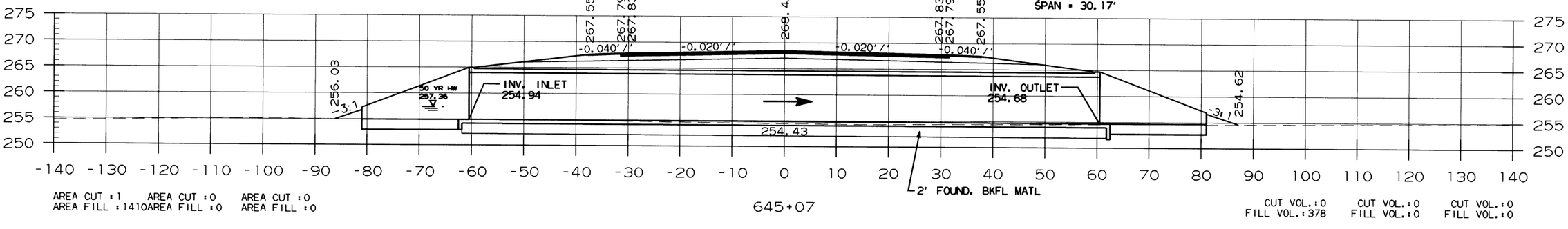



AREA CUT : 233 AREA CUT : 0 AREA CUT : 0
AREA FILL : 563 AREA FILL : 0 AREA FILL : 0

646+00

CUT VOL. : 403 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 3398 FILL VOL. : 0 FILL VOL. : 0

STA. 645+07 CONSTRUCT
TRIP. 9' X 9' X 121' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
Q50 = 86 CFS D.A. = 659 ACRES
SPAN = 30.17'




AREA CUT : 1 AREA CUT : 0 AREA CUT : 0
AREA FILL : 1410 AREA FILL : 0 AREA FILL : 0

645+07

CUT VOL. : 0 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 378 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 645+07 TO STA. 648+00

2/3/2017

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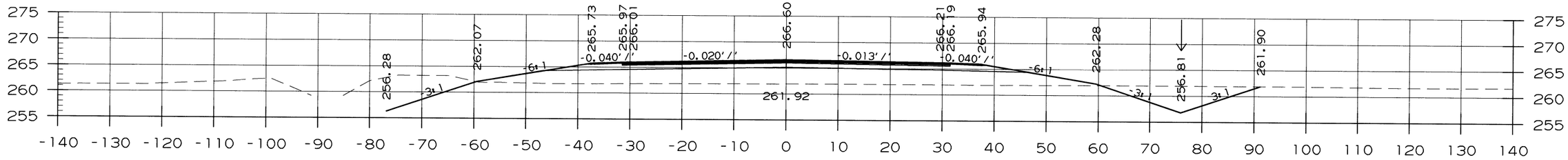
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 422 | 503 |

②

CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3



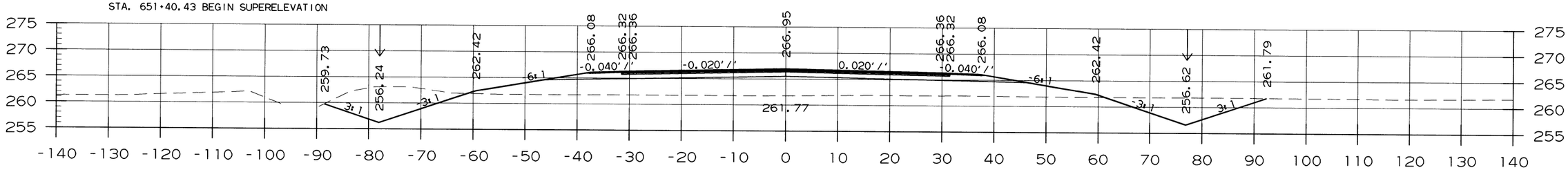

AREA CUT : 144 AREA CUT : 0 AREA CUT : 0
AREA FILL : 306 AREA FILL : 0 AREA FILL : 0

652+00

STAGE 1 STAGE 2 STAGE 3

CUT VOL. : 604 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1212 FILL VOL. : 0 FILL VOL. : 0

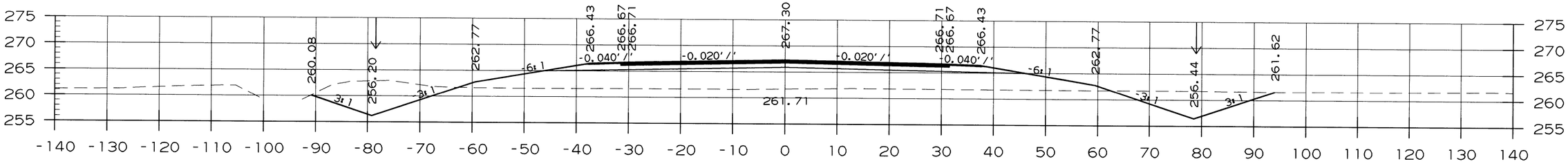
STA. 651+40.43 BEGIN SUPERELEVATION




AREA CUT : 182 AREA CUT : 0 AREA CUT : 0
AREA FILL : 348 AREA FILL : 0 AREA FILL : 0

651+00

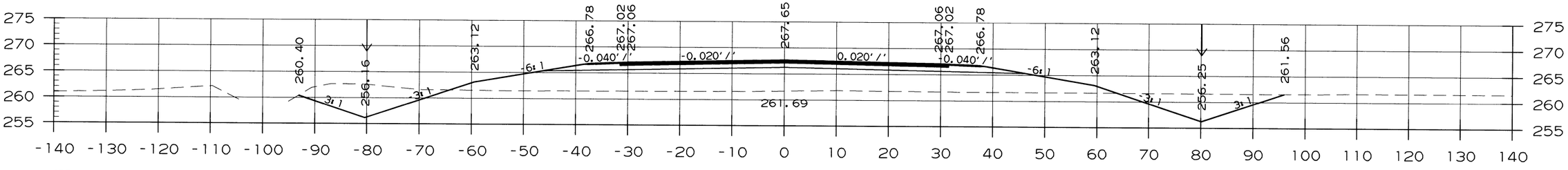
CUT VOL. : 678 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1393 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 185 AREA CUT : 0 AREA CUT : 0
AREA FILL : 404 AREA FILL : 0 AREA FILL : 0

650+00

CUT VOL. : 685 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1601 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 185 AREA CUT : 0 AREA CUT : 0
AREA FILL : 461 AREA FILL : 0 AREA FILL : 0

649+00

CUT VOL. : 714 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1820 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 649+00 TO STA. 652+00

2/5/2017

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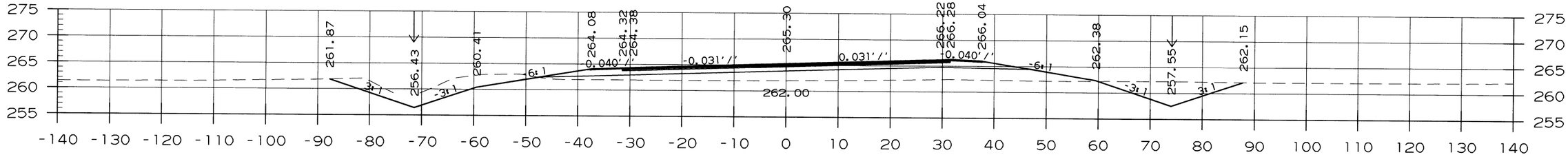
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 423 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

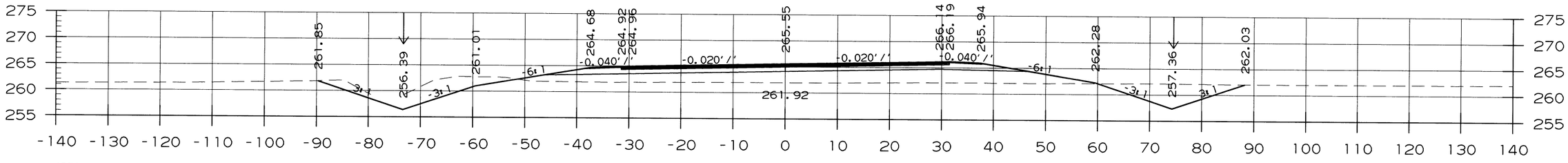
STA. 656+80.43 MAX. SUPERELEVATION (.04 FT./FT.)




AREA CUT : 132 AREA CUT : 0 AREA CUT : 0
AREA FILL : 176 AREA FILL : 0 AREA FILL : 0

656+00

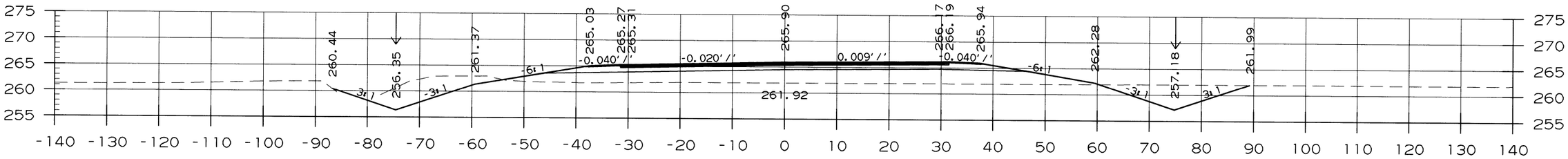
CUT VOL. : 483 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 726 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 129 AREA CUT : 0 AREA CUT : 0
AREA FILL : 217 AREA FILL : 0 AREA FILL : 0

655+00

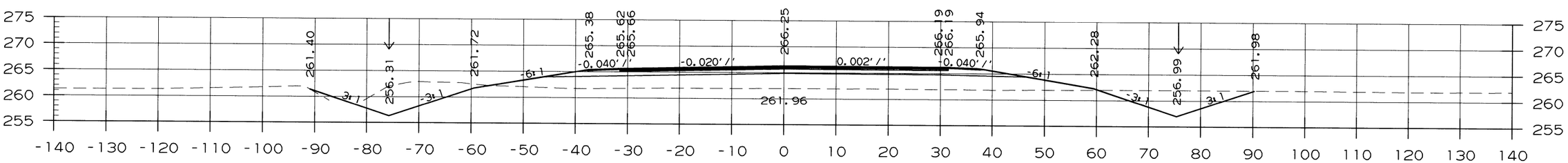
CUT VOL. : 493 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 864 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 137 AREA CUT : 0 AREA CUT : 0
AREA FILL : 250 AREA FILL : 0 AREA FILL : 0

654+00

CUT VOL. : 537 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 974 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 153 AREA CUT : 0 AREA CUT : 0
AREA FILL : 276 AREA FILL : 0 AREA FILL : 0

653+00

CUT VOL. : 550 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1078 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 653+00 TO STA. 656+00

2/3/2017

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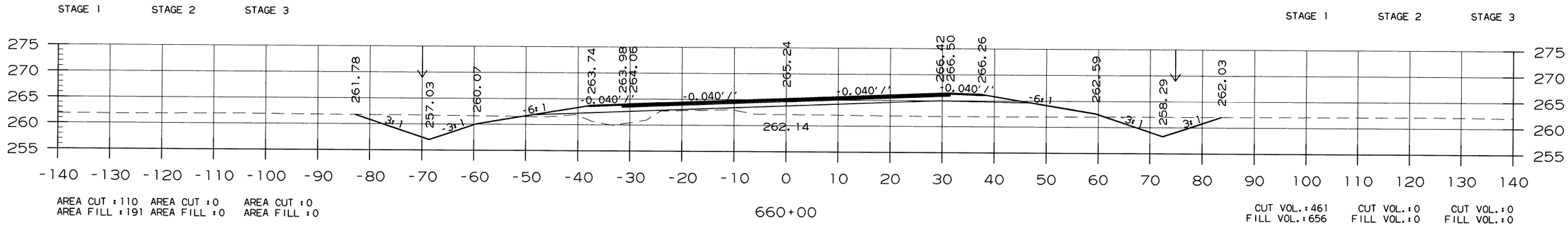
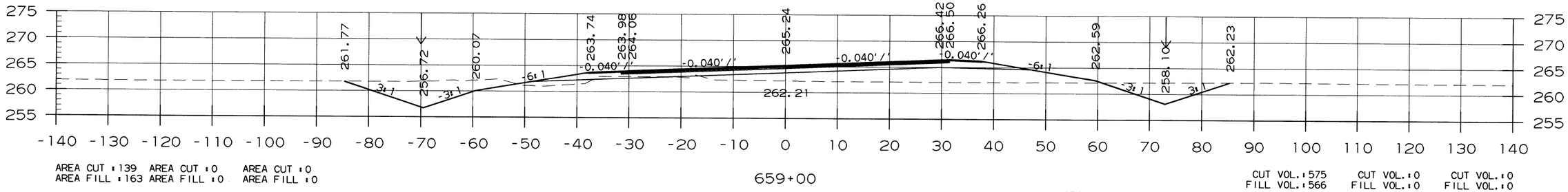
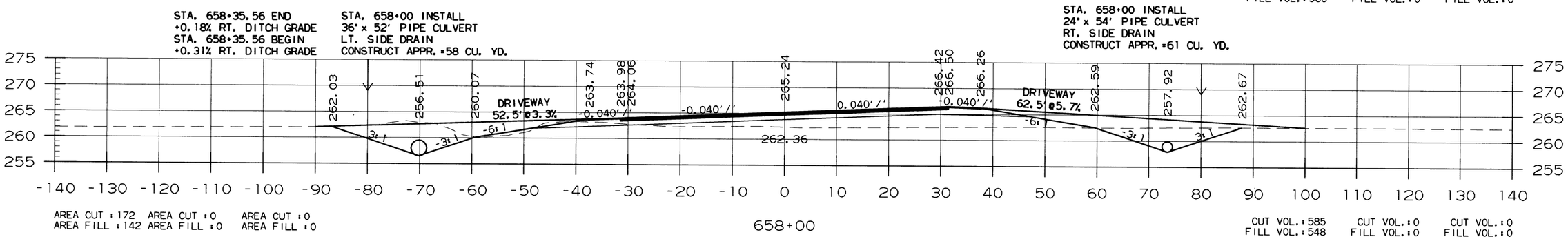
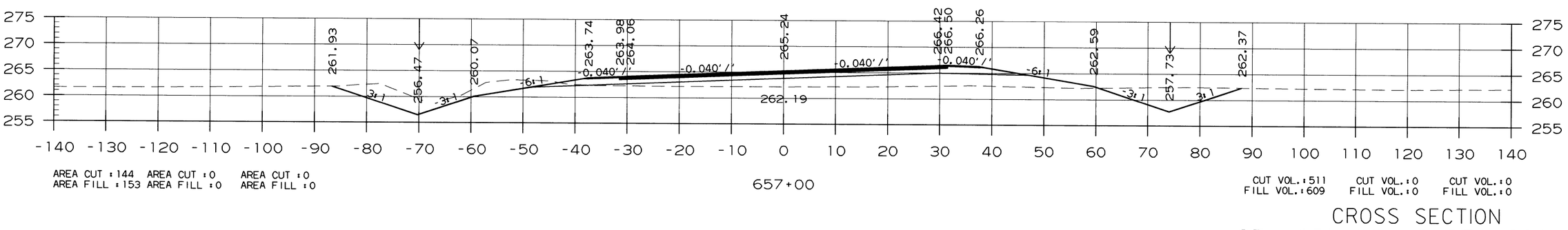
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 424 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




CROSS SECTION
STA. 657+00 TO STA. 660+00

2/3/2017

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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 |
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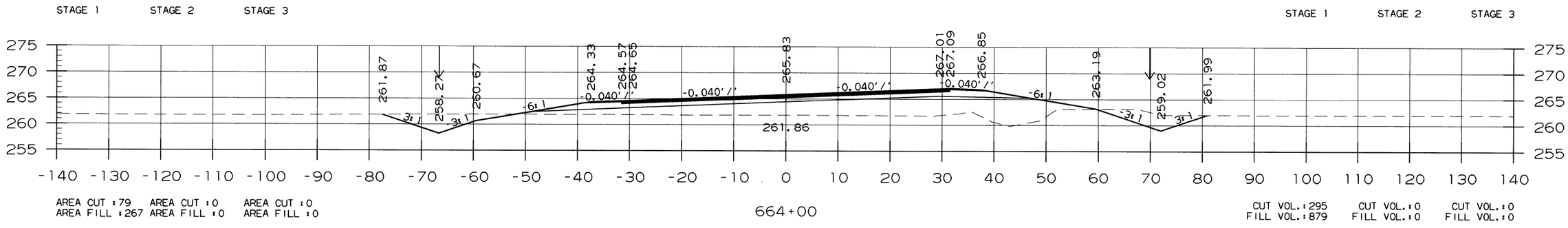
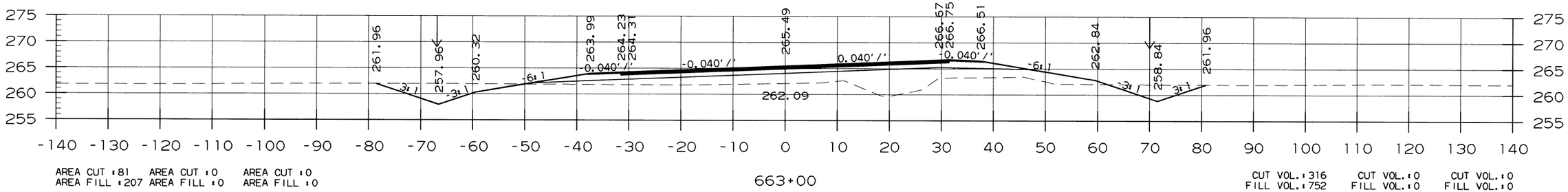
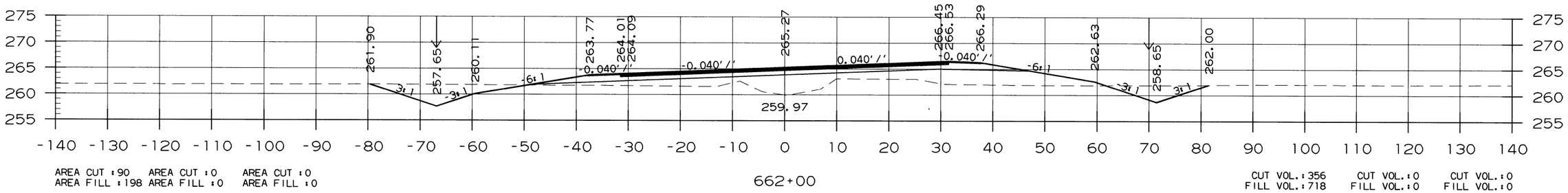
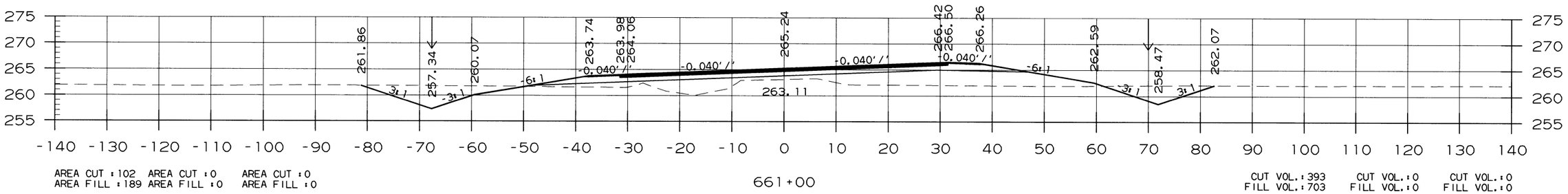
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 425 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 661+00 TO STA. 664+00

2/3/2017

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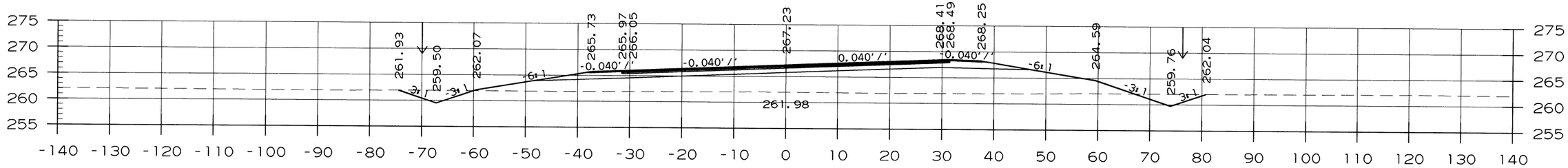
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 426 | 503 |

② CROSS SECTIONS

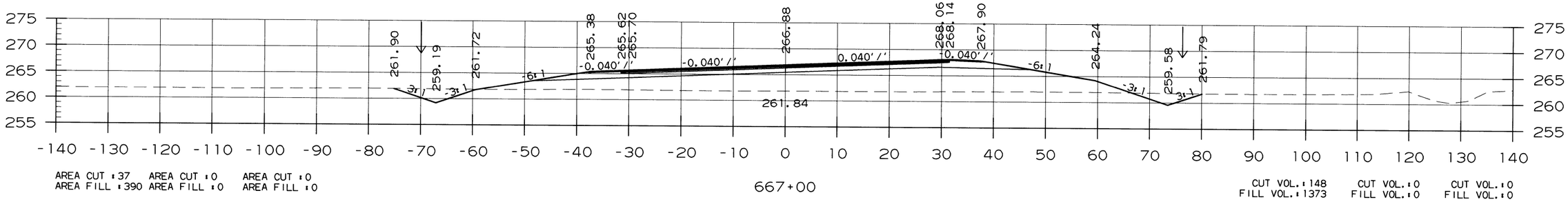
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 33 AREA CUT : 0 AREA CUT : 0
AREA FILL : 427 AREA FILL : 0 AREA FILL : 0

668+00

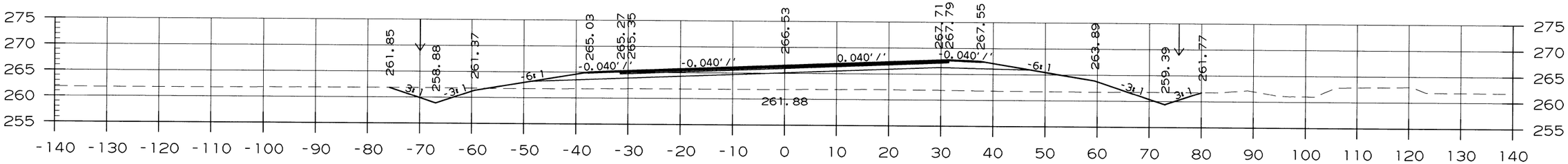
CUT VOL. : 129 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1513 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 37 AREA CUT : 0 AREA CUT : 0
AREA FILL : 390 AREA FILL : 0 AREA FILL : 0

667+00

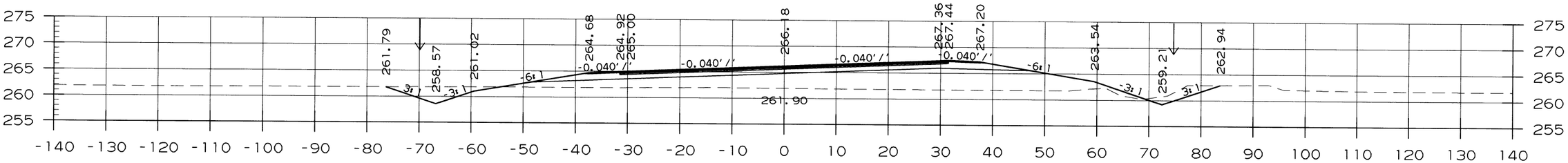
CUT VOL. : 148 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1373 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 43 AREA CUT : 0 AREA CUT : 0
AREA FILL : 351 AREA FILL : 0 AREA FILL : 0

666+00

CUT VOL. : 172 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1223 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 50 AREA CUT : 0 AREA CUT : 0
AREA FILL : 309 AREA FILL : 0 AREA FILL : 0

665+00

CUT VOL. : 237 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1068 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 665+00 TO STA. 668+00

2/3/2017

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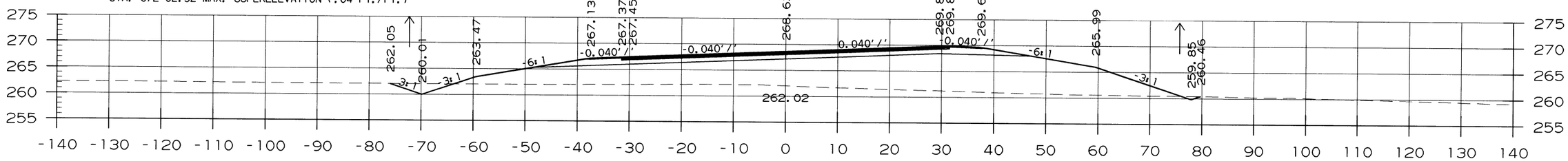
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 427 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

STA. 672+02.52 MAX. SUPERELEVATION (.04 FT./FT.)

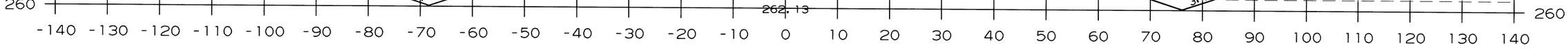



AREA CUT : 13 AREA CUT : 0 AREA CUT : 0
AREA FILL : 661 AREA FILL : 0 AREA FILL : 0

672+00

CUT VOL.: 71 CUT VOL.: 0 CUT VOL.: 0
FILL VOL.: 2210 FILL VOL.: 0 FILL VOL.: 0

STAGE 1 STAGE 2 STAGE 3



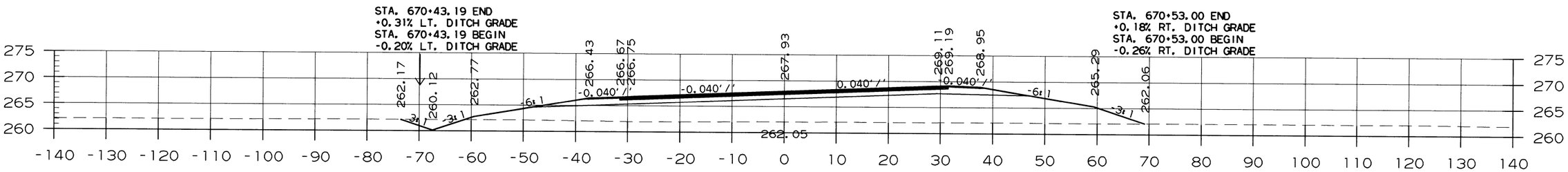

AREA CUT : 25 AREA CUT : 0 AREA CUT : 0
AREA FILL : 532 AREA FILL : 0 AREA FILL : 0

671+00

CUT VOL.: 69 CUT VOL.: 0 CUT VOL.: 0
FILL VOL.: 1914 FILL VOL.: 0 FILL VOL.: 0

STA. 670+43.19 END
+0.31% LT. DITCH GRADE
STA. 670+43.19 BEGIN
-0.20% LT. DITCH GRADE

STA. 670+53.00 END
+0.18% RT. DITCH GRADE
STA. 670+53.00 BEGIN
-0.26% RT. DITCH GRADE

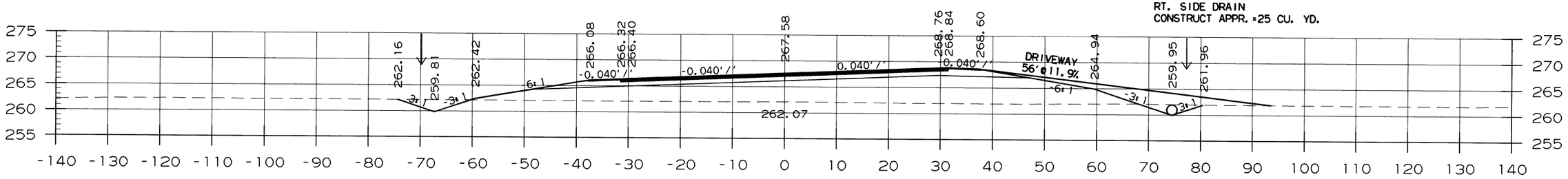



AREA CUT : 13 AREA CUT : 0 AREA CUT : 0
AREA FILL : 502 AREA FILL : 0 AREA FILL : 0

670+00

CUT VOL.: 78 CUT VOL.: 0 CUT VOL.: 0
FILL VOL.: 1780 FILL VOL.: 0 FILL VOL.: 0

STA. 669+00 INSTALL
24" x 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =25 CU. YD.




AREA CUT : 29 AREA CUT : 0 AREA CUT : 0
AREA FILL : 460 AREA FILL : 0 AREA FILL : 0

669+00

CUT VOL.: 116 CUT VOL.: 0 CUT VOL.: 0
FILL VOL.: 1642 FILL VOL.: 0 FILL VOL.: 0

# CROSS SECTION
# STA. 669+00 TO STA. 672+00

2/3/2017

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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 |
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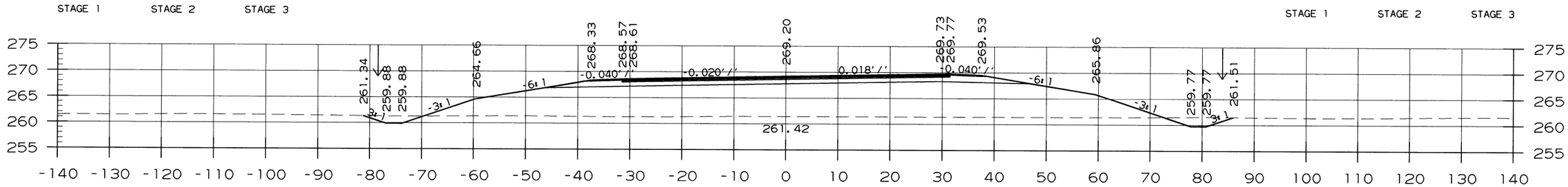
| | | | | JOB NO. | | CA1003 | 428 | 503 |

② CROSS SECTIONS



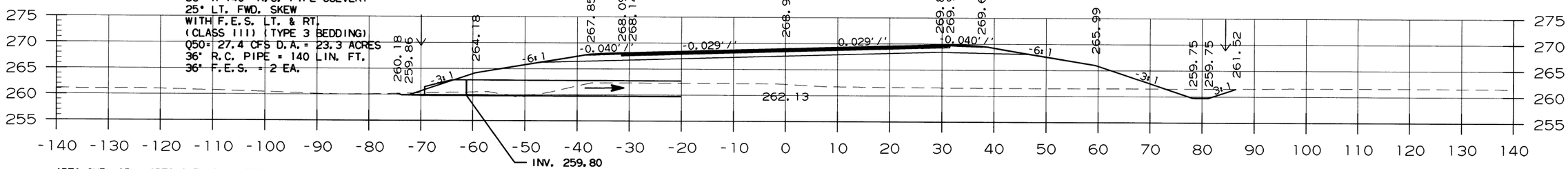

AREA CUT : 25 AREA CUT : 0 AREA CUT : 0
AREA FILL : 764 AREA FILL : 0 AREA FILL : 0

STA. 673+03
BEG. 3' FLAT
BOTTOM DITCH

674+00

CUT VOL. : 72 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2670 FILL VOL. : 0 FILL VOL. : 0

STA. 672+73 CONSTRUCT
36" X 140' R.C. PIPE CULVERT
25° LT. FWD. SKEW
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
Q50= 27.4 CFS D.A. = 23.3 ACRES
36" R.C. PIPE = 140 LIN. FT.
36" F.E.S. = 2 EA.

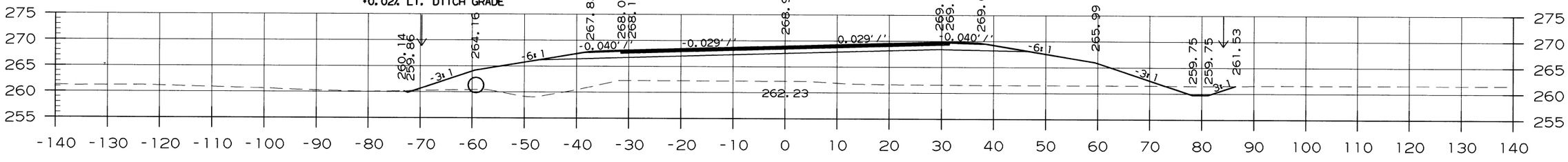



AREA CUT : 15 AREA CUT : 0 AREA CUT : 0
AREA FILL : 718 AREA FILL : 0 AREA FILL : 0

673+03

CUT VOL. : 1 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 72 FILL VOL. : 0 FILL VOL. : 0

STA. 673+02.36 END
-0.20% LT. DITCH GRADE
STA. 673+02.36 BEGIN
+0.02% LT. DITCH GRADE




AREA CUT : 15 AREA CUT : 0 AREA CUT : 0
AREA FILL : 732 AREA FILL : 0 AREA FILL : 0

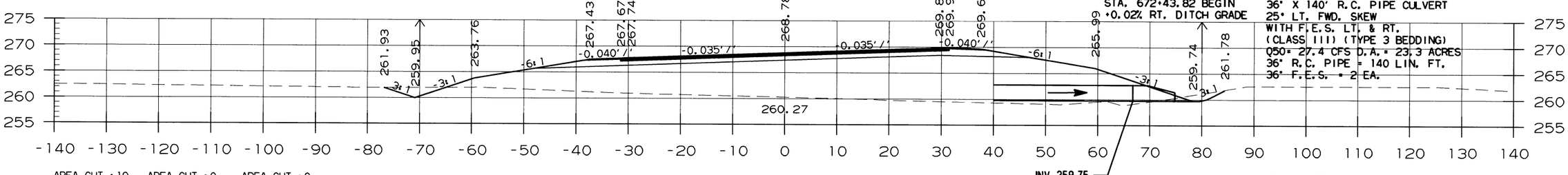
673+00

CUT VOL. : 36 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1696 FILL VOL. : 0 FILL VOL. : 0

STA. 672+44
BEG. 3' FLAT
BOTTOM DITCH

STA. 672+43.82 END
-0.26% RT. DITCH GRADE
STA. 672+43.82 BEGIN
+0.02% RT. DITCH GRADE

STA. 672+73 CONSTRUCT
36" X 140' R.C. PIPE CULVERT
25° LT. FWD. SKEW
WITH F.E.S. LT. & RT.
(CLASS III) (TYPE 3 BEDDING)
Q50= 27.4 CFS D.A. = 23.3 ACRES
36" R.C. PIPE = 140 LIN. FT.
36" F.E.S. = 2 EA.




AREA CUT : 19 AREA CUT : 0 AREA CUT : 0
AREA FILL : 861 AREA FILL : 0 AREA FILL : 0

672+43

CUT VOL. : 25 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1199 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 672+43 TO STA. 674+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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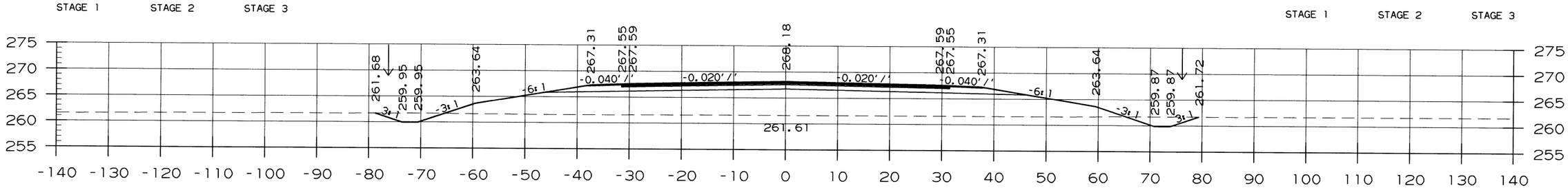
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 429 | 503 |

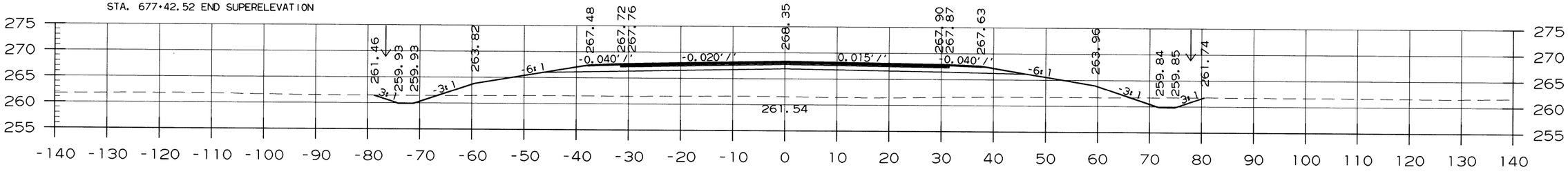
② CROSS SECTIONS




AREA CUT : 30 AREA CUT : 0 AREA CUT : 0
AREA FILL : 531 AREA FILL : 0 AREA FILL : 0

678+00

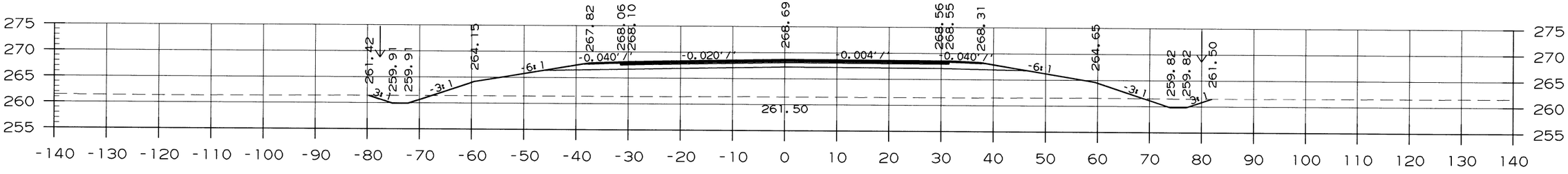
CUT VOL. : 107 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2036 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 28 AREA CUT : 0 AREA CUT : 0
AREA FILL : 569 AREA FILL : 0 AREA FILL : 0

677+00

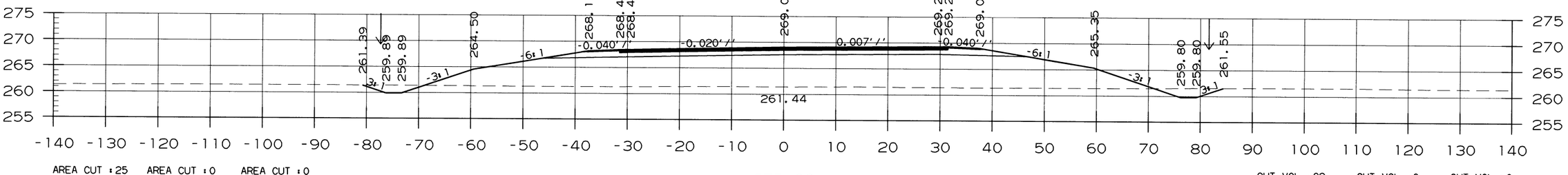
CUT VOL. : 98 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2238 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 25 AREA CUT : 0 AREA CUT : 0
AREA FILL : 639 AREA FILL : 0 AREA FILL : 0

676+00

CUT VOL. : 93 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2517 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 25 AREA CUT : 0 AREA CUT : 0
AREA FILL : 720 AREA FILL : 0 AREA FILL : 0

675+00

CUT VOL. : 92 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2747 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 675+00 TO STA. 678+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
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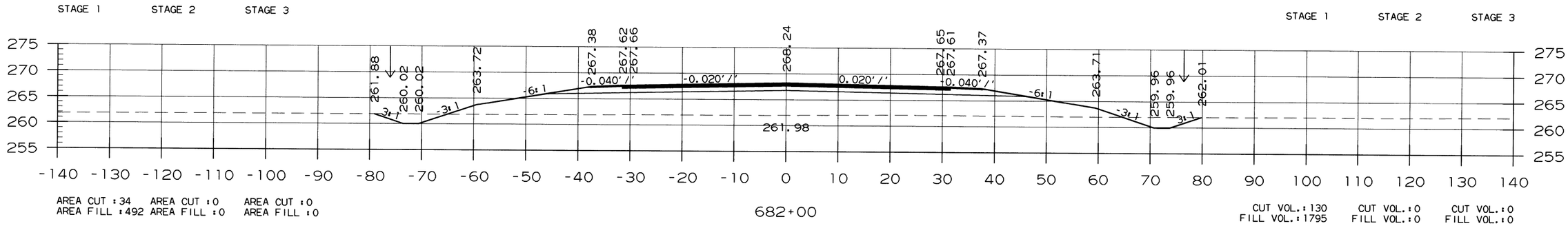
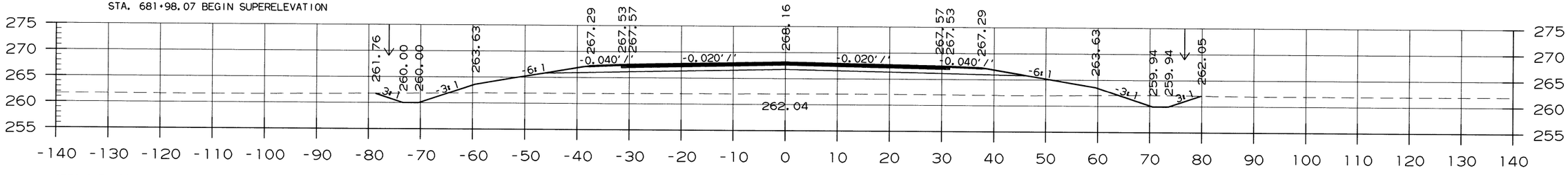
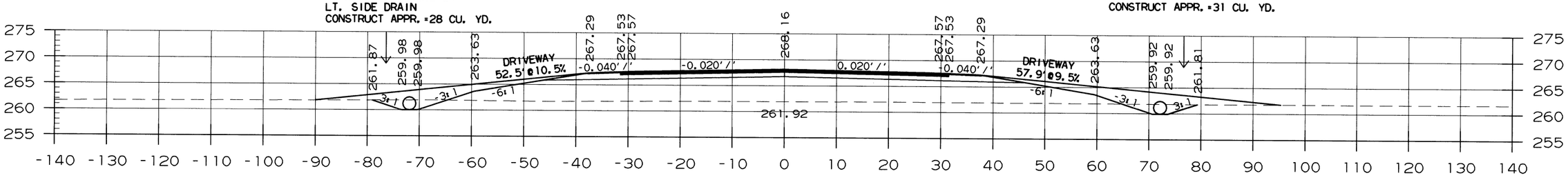
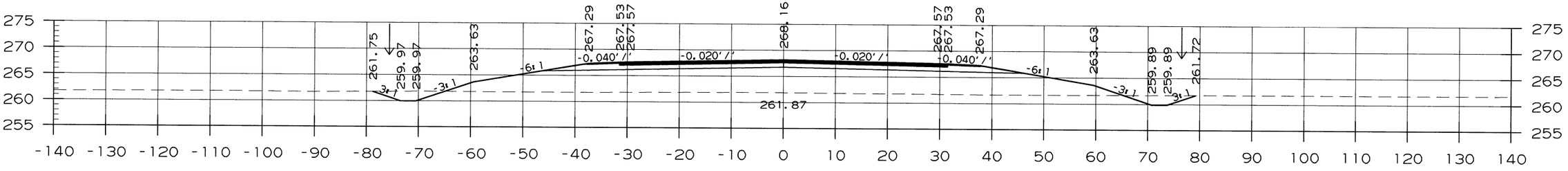
| | | | | JOB NO. | | CA1003 | 430 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




CROSS SECTION
STA. 679+00 TO STA. 682+00

2/5/2017

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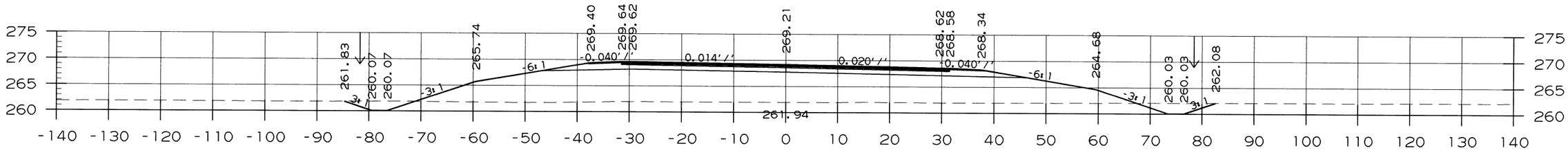
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 431 | 503 |

② CROSS SECTIONS

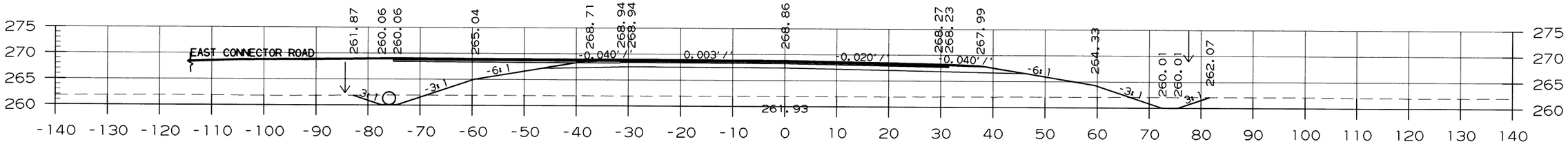
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 33 AREA CUT : 0 AREA CUT : 0
AREA FILL : 682 AREA FILL : 0 AREA FILL : 0

685+00

CUT VOL. : 126 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2395 FILL VOL. : 0 FILL VOL. : 0

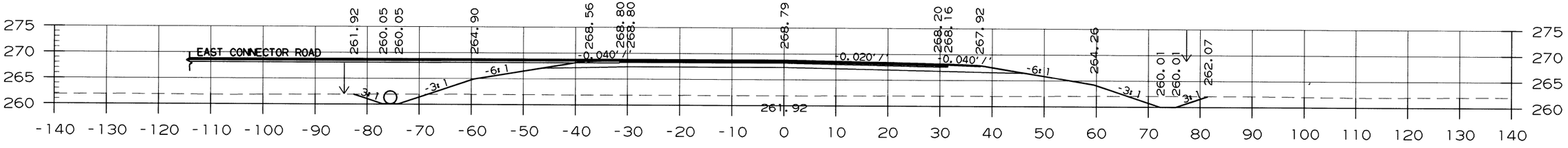



AREA CUT : 35 AREA CUT : 0 AREA CUT : 0
AREA FILL : 611 AREA FILL : 0 AREA FILL : 0

STA. 683+80 INSTALL
30" x 88' PIPE CULVERT
LT. SIDE DRAIN

684+00

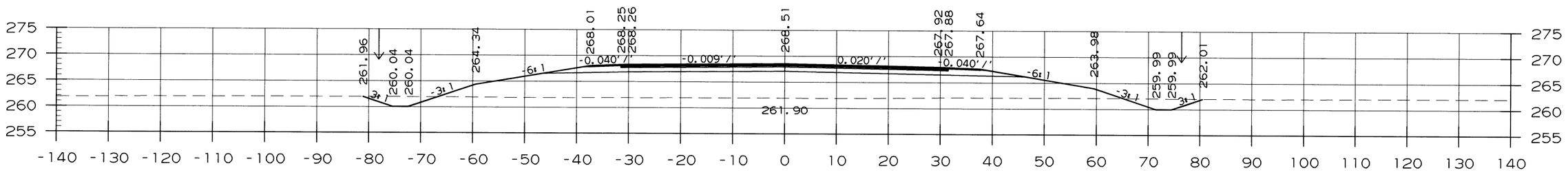
CUT VOL. : 26 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 448 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 35 AREA CUT : 0 AREA CUT : 0
AREA FILL : 598 AREA FILL : 0 AREA FILL : 0

683+80

CUT VOL. : 105 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1695 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 35 AREA CUT : 0 AREA CUT : 0
AREA FILL : 546 AREA FILL : 0 AREA FILL : 0

683+00

CUT VOL. : 129 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1922 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 683+00 TO STA. 685+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
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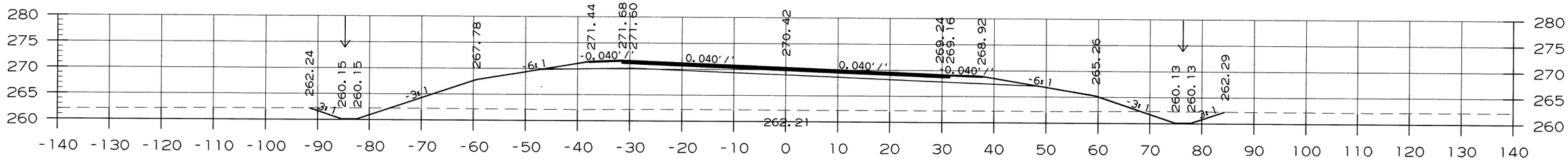
② CROSS SECTIONS

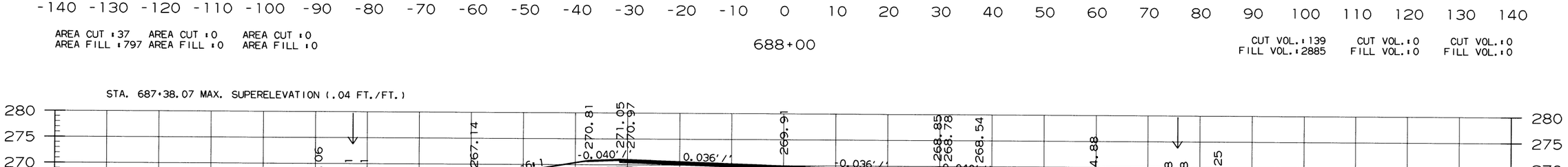
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 41 AREA CUT : 0 AREA CUT : 0
AREA FILL : 822 AREA FILL : 0 AREA FILL : 0

689+00

CUT VOL. : 144 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2998 FILL VOL. : 0 FILL VOL. : 0

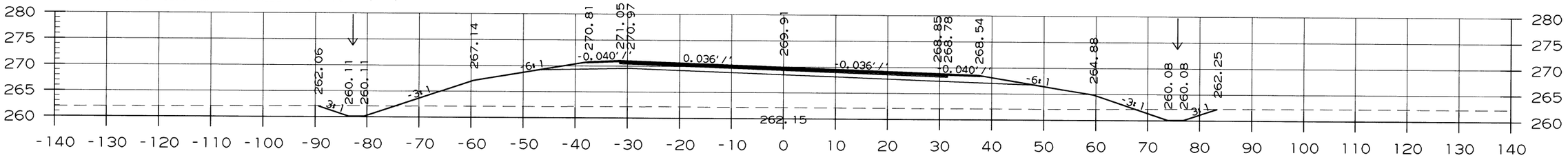



AREA CUT : 37 AREA CUT : 0 AREA CUT : 0
AREA FILL : 797 AREA FILL : 0 AREA FILL : 0

688+00

CUT VOL. : 139 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2885 FILL VOL. : 0 FILL VOL. : 0

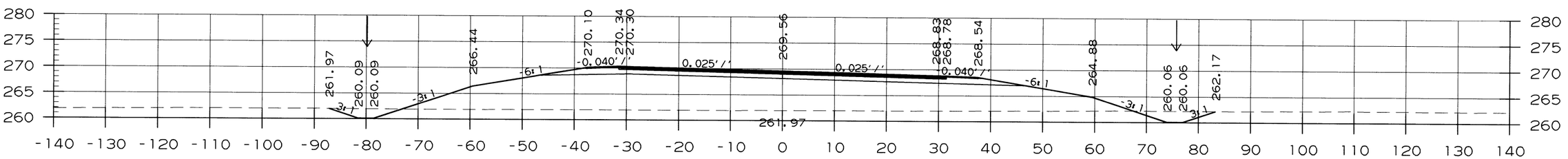
STA. 687+38.07 MAX. SUPERELEVATION (.04 FT./FT.)




AREA CUT : 38 AREA CUT : 0 AREA CUT : 0
AREA FILL : 761 AREA FILL : 0 AREA FILL : 0

687+00

CUT VOL. : 136 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2767 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 36 AREA CUT : 0 AREA CUT : 0
AREA FILL : 733 AREA FILL : 0 AREA FILL : 0

686+00

CUT VOL. : 128 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2622 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 686+00 TO STA. 689+00

2/3/2017

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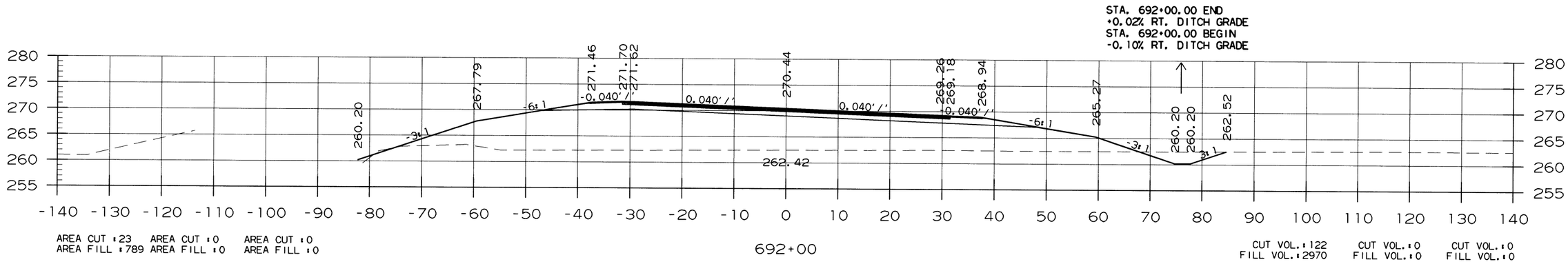
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 433 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

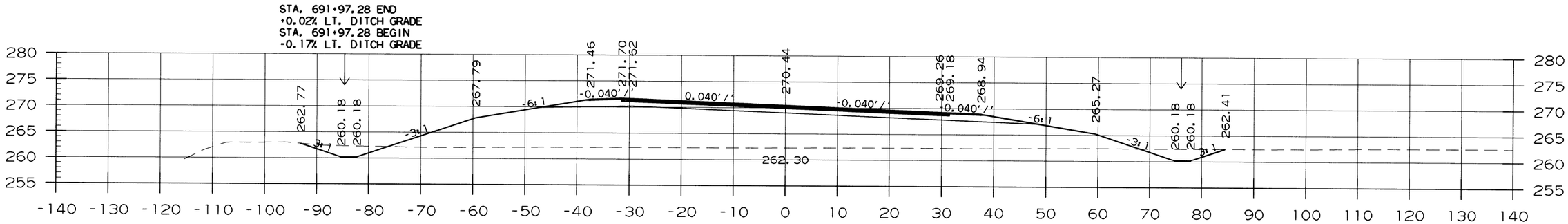
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 23 AREA CUT : 0 AREA CUT : 0
AREA FILL : 789 AREA FILL : 0 AREA FILL : 0

692+00

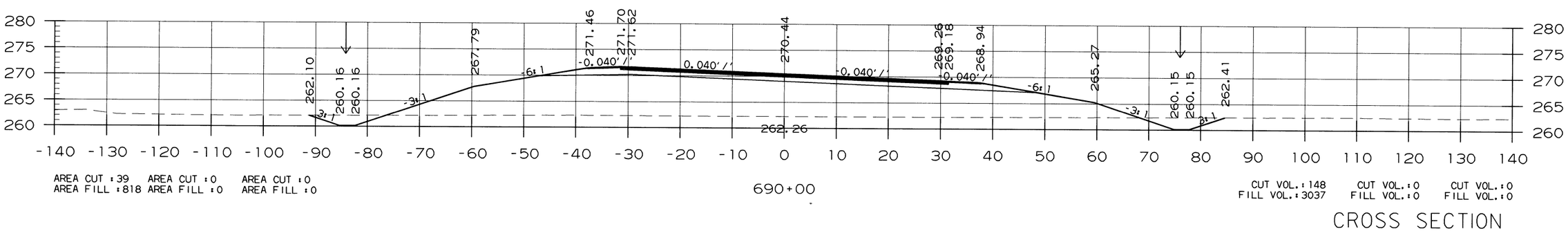
CUT VOL. : 122 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2970 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 42 AREA CUT : 0 AREA CUT : 0
AREA FILL : 815 AREA FILL : 0 AREA FILL : 0

691+00

CUT VOL. : 151 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 3025 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 39 AREA CUT : 0 AREA CUT : 0
AREA FILL : 818 AREA FILL : 0 AREA FILL : 0

690+00

CUT VOL. : 148 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 3037 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 690+00 TO STA. 692+00

2/3/2017

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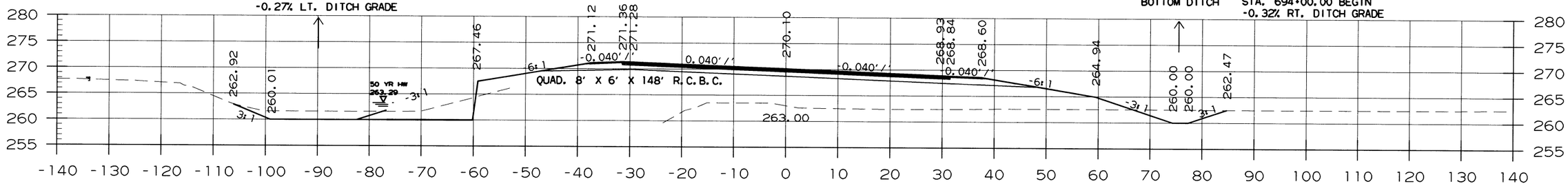
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 434 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

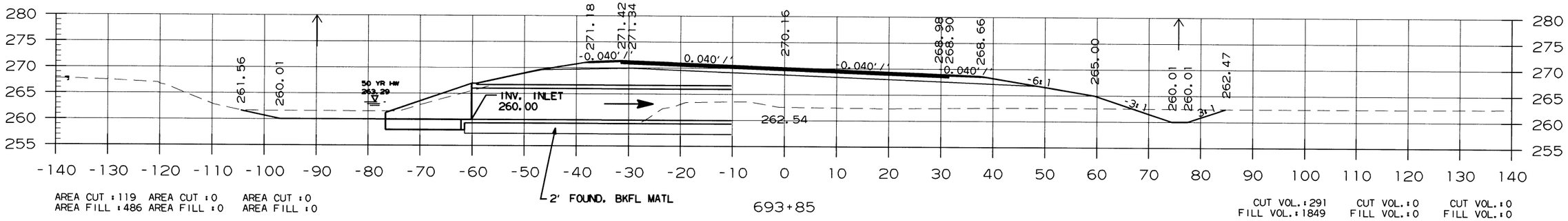



AREA CUT : 108 AREA CUT : 0 AREA CUT : 0
AREA FILL : 466 AREA FILL : 0 AREA FILL : 0

STA. 694+25 CONSTRUCT
QUAD. 8' X 6' X 148' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
34° RT. FWD. SKEW
Q50 = 145 CFS D.A. = 691 ACRES
SPAN = 42.31'

694+00

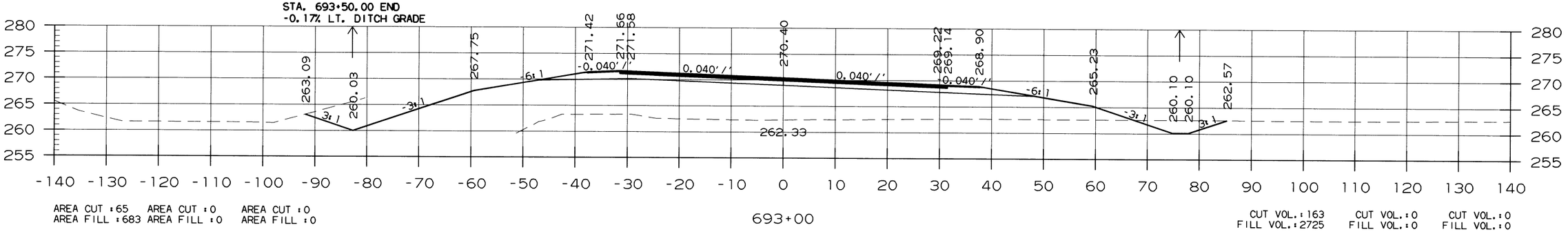
CUT VOL. : 61 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 257 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 119 AREA CUT : 0 AREA CUT : 0
AREA FILL : 486 AREA FILL : 0 AREA FILL : 0

693+85

CUT VOL. : 291 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1849 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 65 AREA CUT : 0 AREA CUT : 0
AREA FILL : 683 AREA FILL : 0 AREA FILL : 0

693+00

CUT VOL. : 163 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 2725 FILL VOL. : 0 FILL VOL. : 0

CROSS SECTION
STA. 693+00 TO STA. 694+00

2/3/2017

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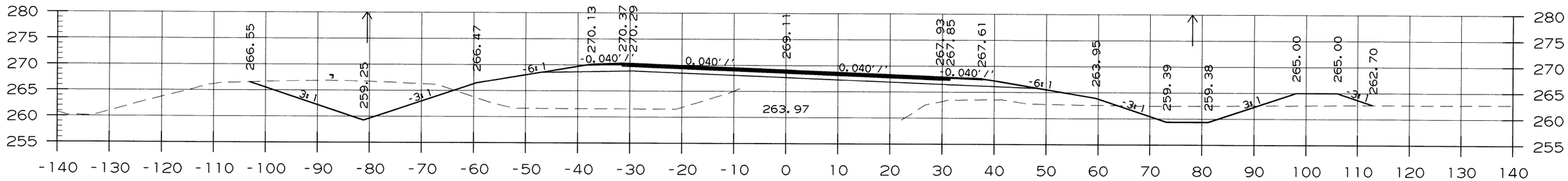
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 435 | 503 |

②

# CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

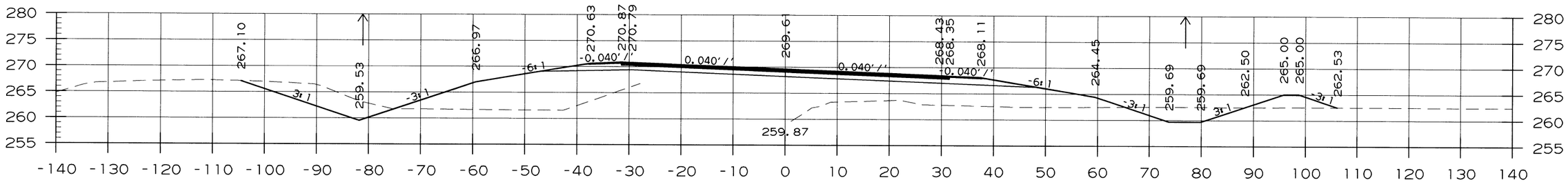



AREA CUT : 211 AREA CUT : 0 AREA CUT : 0
AREA FILL : 472 AREA FILL : 0 AREA FILL : 0

696+00

CUT VOL. : 606 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1758 FILL VOL. : 0 FILL VOL. : 0

STA. 695+32
BEG. 8' FLAT
BOTTOM DITCH

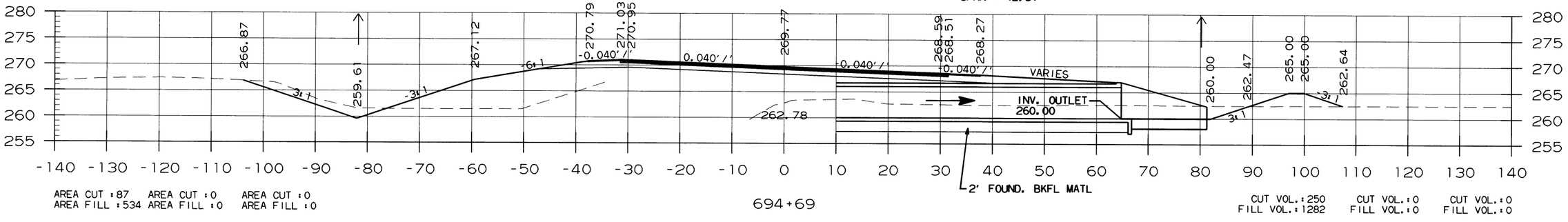



AREA CUT : 117 AREA CUT : 0 AREA CUT : 0
AREA FILL : 477 AREA FILL : 0 AREA FILL : 0

695+00

CUT VOL. : 117 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 578 FILL VOL. : 0 FILL VOL. : 0

STA. 694+25 CONSTRUCT
QUAD. 8' X 6' X 148' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
34° RT. FWD. SKEW
Q50 = 145 CFS D.A. = 691 ACRES
SPAN = 42.31'




AREA CUT : 87 AREA CUT : 0 AREA CUT : 0
AREA FILL : 534 AREA FILL : 0 AREA FILL : 0

694+69

CUT VOL. : 250 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1282 FILL VOL. : 0 FILL VOL. : 0

## CROSS SECTION
## STA. 694+69 TO STA. 696+00

2/3/2017

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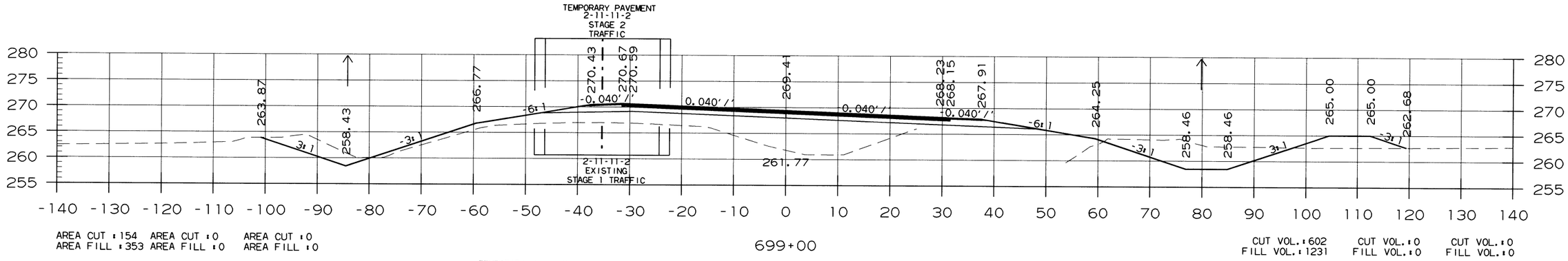
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 436 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

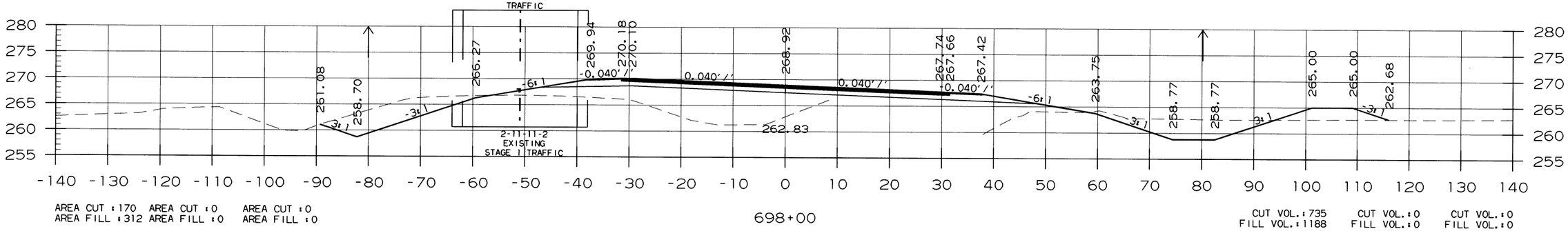
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 154 AREA CUT : 0 AREA CUT : 0
AREA FILL : 353 AREA FILL : 0 AREA FILL : 0

699+00

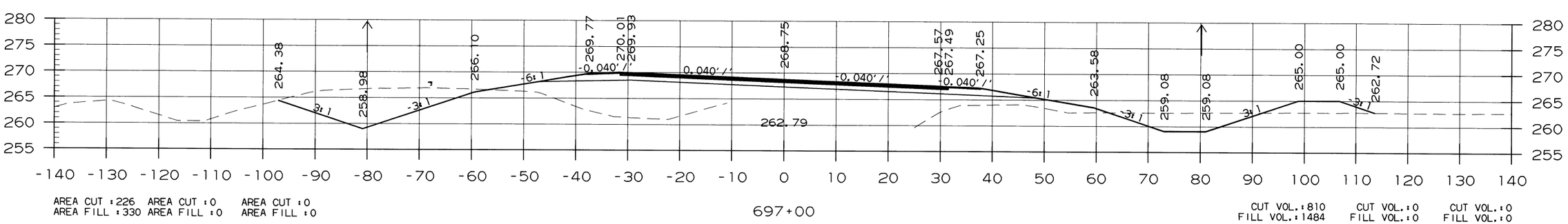
CUT VOL. : 602 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1231 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 170 AREA CUT : 0 AREA CUT : 0
AREA FILL : 312 AREA FILL : 0 AREA FILL : 0

698+00

CUT VOL. : 735 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1188 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 226 AREA CUT : 0 AREA CUT : 0
AREA FILL : 330 AREA FILL : 0 AREA FILL : 0

697+00

CUT VOL. : 810 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1484 FILL VOL. : 0 FILL VOL. : 0

# CROSS SECTION
# STA. 697+00 TO STA. 699+00

2/3/2011

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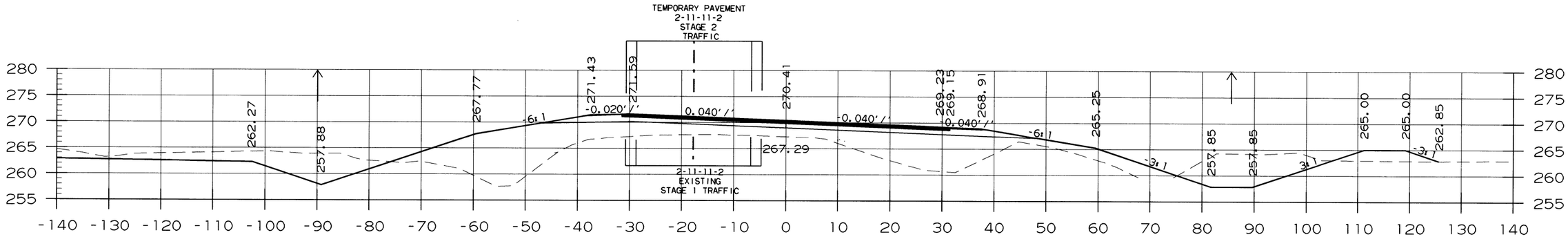
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 437 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

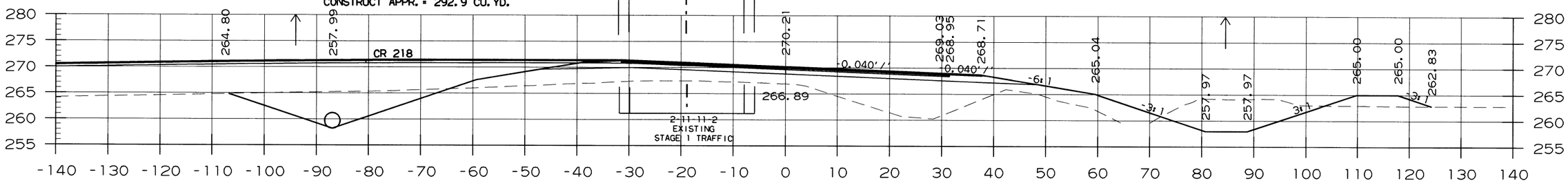



AREA CUT : 217 AREA CUT : 0 AREA CUT : 0
AREA FILL : 632 AREA FILL : 0 AREA FILL : 0

STA. 700+59 IN PLACE
36" X 37' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 74' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 292.9 CU. YD.

701+00

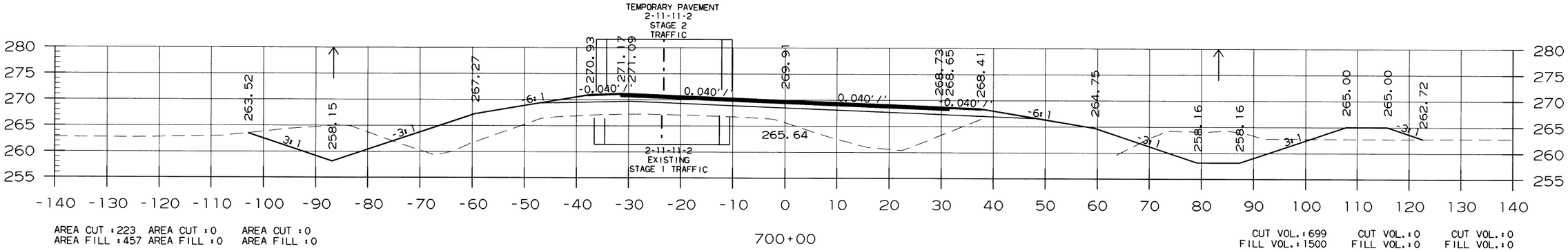
CUT VOL. : 372 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 851 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 273 AREA CUT : 0 AREA CUT : 0
AREA FILL : 490 AREA FILL : 0 AREA FILL : 0

700+59

CUT VOL. : 542 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1034 FILL VOL. : 0 FILL VOL. : 0




AREA CUT : 223 AREA CUT : 0 AREA CUT : 0
AREA FILL : 457 AREA FILL : 0 AREA FILL : 0

700+00

CUT VOL. : 699 CUT VOL. : 0 CUT VOL. : 0
FILL VOL. : 1500 FILL VOL. : 0 FILL VOL. : 0

CROSS SECTION
STA. 700+00 TO STA. 701+00

2/3/2017

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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 |
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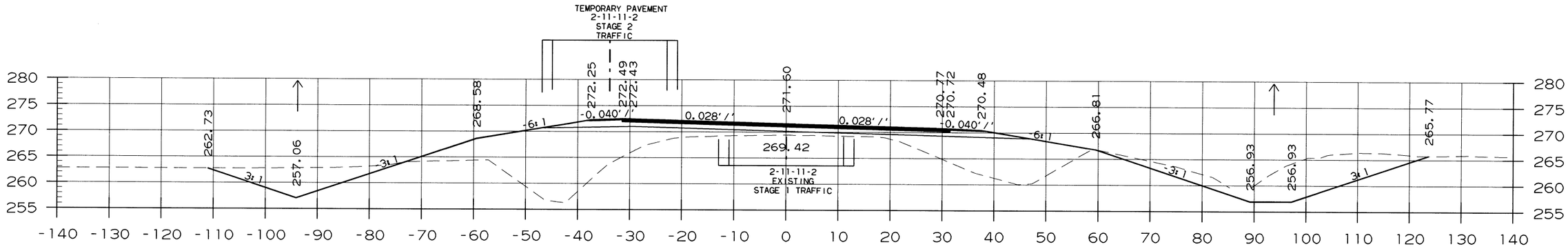
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 438 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

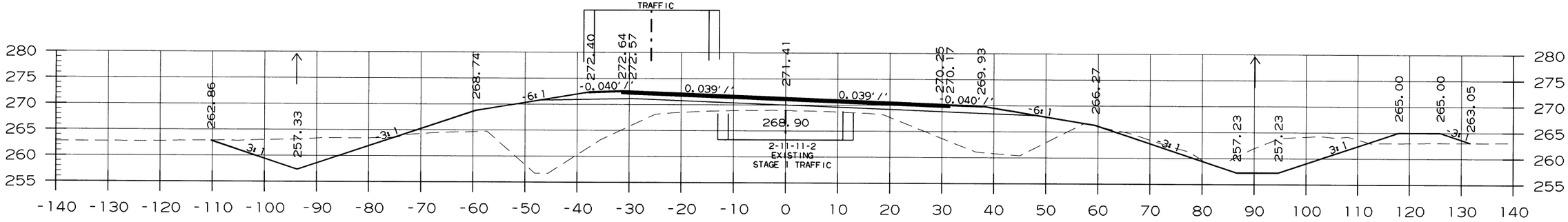
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 0 AREA CUT : 133 AREA CUT : 103
AREA FILL : 184 AREA FILL : 494 AREA FILL : 190

704+00

CUT VOL. : 0 CUT VOL. : 494 CUT VOL. : 380
FILL VOL. : 569 FILL VOL. : 865 FILL VOL. : 838

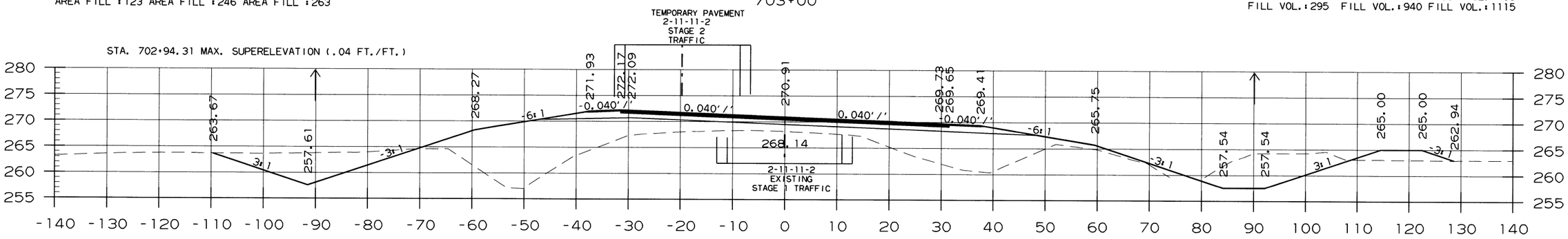



AREA CUT : 0 AREA CUT : 134 AREA CUT : 102
AREA FILL : 123 AREA FILL : 246 AREA FILL : 263

703+00

CUT VOL. : 0 CUT VOL. : 488 CUT VOL. : 405
FILL VOL. : 295 FILL VOL. : 940 FILL VOL. : 1115

STA. 702+94.31 MAX. SUPERELEVATION (.04 FT./FT.)




AREA CUT : 0 AREA CUT : 130 AREA CUT : 117
AREA FILL : 36 AREA FILL : 262 AREA FILL : 339

702+00

CUT VOL. : 0 CUT VOL. : 489 CUT VOL. : 400
FILL VOL. : 66 FILL VOL. : 987 FILL VOL. : 1292

# CROSS SECTION
# STA. 702+00 TO STA. 704+00

2/3/2017

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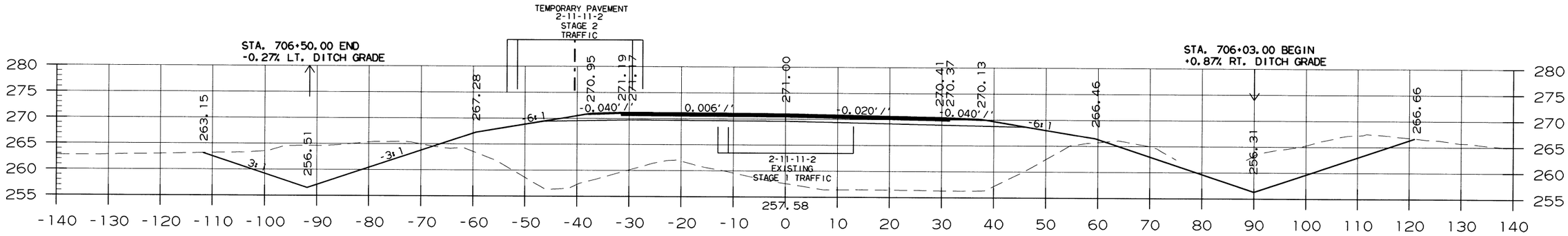
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 439 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

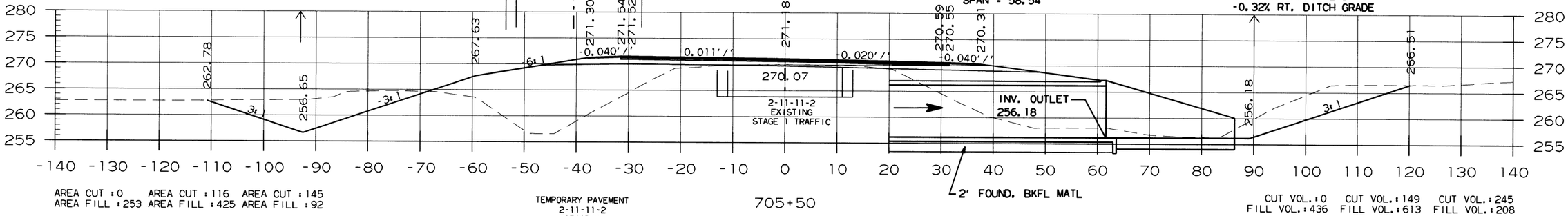
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 0 AREA CUT : 170 AREA CUT : 186
AREA FILL : 235 AREA FILL : 629 AREA FILL : 377

706+00

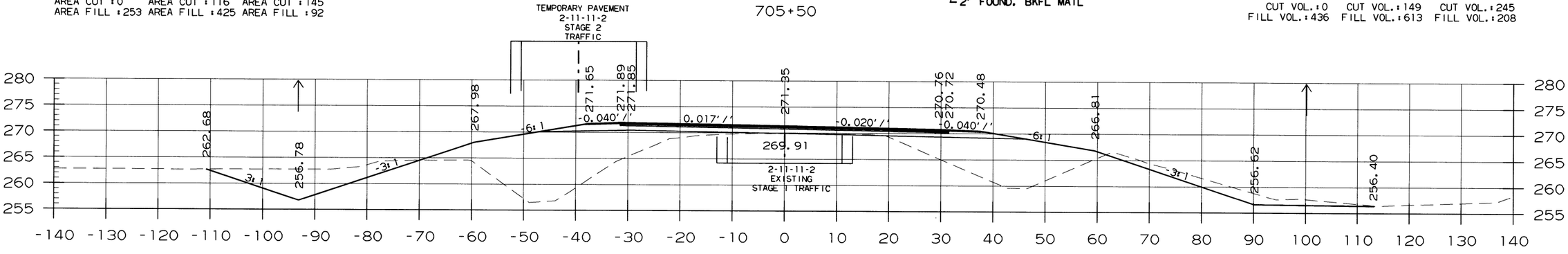
CUT VOL. : 0 CUT VOL. : 265 CUT VOL. : 307
FILL VOL. : 452 FILL VOL. : 976 FILL VOL. : 435




AREA CUT : 0 AREA CUT : 116 AREA CUT : 145
AREA FILL : 253 AREA FILL : 425 AREA FILL : 92

705+50

CUT VOL. : 0 CUT VOL. : 149 CUT VOL. : 245
FILL VOL. : 436 FILL VOL. : 613 FILL VOL. : 208




AREA CUT : 0 AREA CUT : 45 AREA CUT : 120
AREA FILL : 217 AREA FILL : 237 AREA FILL : 132

705+00

CUT VOL. : 0 CUT VOL. : 330 CUT VOL. : 412
FILL VOL. : 743 FILL VOL. : 848 FILL VOL. : 596

# CROSS SECTION
# STA. 705+00 TO STA. 706+00

2/3/2017

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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 |
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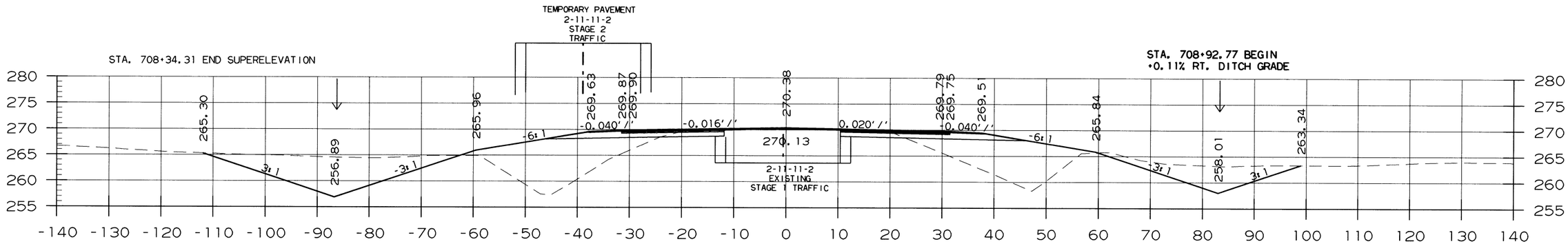
| | | | | ② | | CROSS SECTIONS | | |

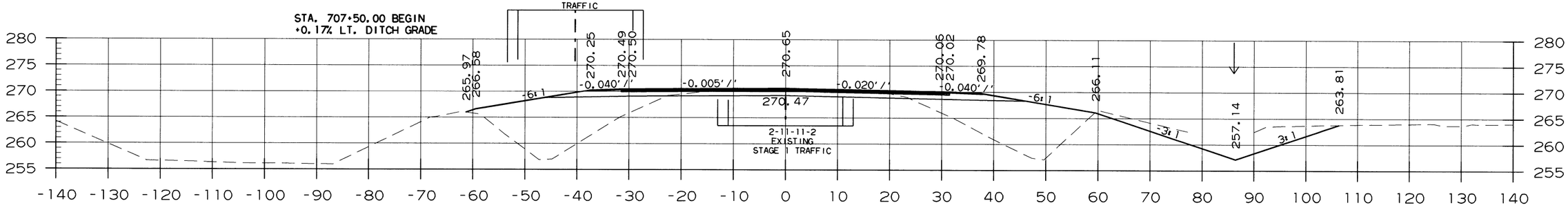
STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3




AREA CUT : 0 AREA CUT : 104 AREA CUT : 195
AREA FILL : 206 AREA FILL : 175 AREA FILL : 6

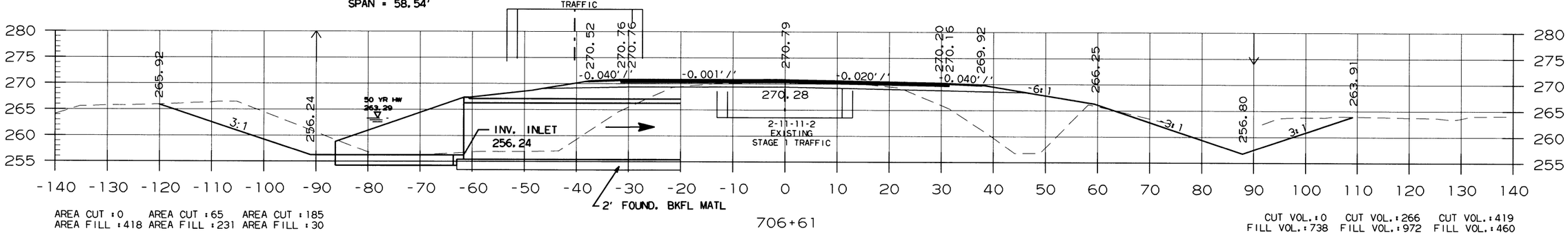
CUT VOL. : 0 CUT VOL. : 350 CUT VOL. : 713
FILL VOL. : 805 FILL VOL. : 708 FILL VOL. : 315




AREA CUT : 0 AREA CUT : 85 AREA CUT : 190
AREA FILL : 229 AREA FILL : 207 AREA FILL : 164

CUT VOL. : 0 CUT VOL. : 108 CUT VOL. : 271
FILL VOL. : 467 FILL VOL. : 316 FILL VOL. : 140

STA. 706+09 CONSTRUCT
QUAD. 10' X 10' X 163' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
42 LT. FWD. SKEW
Q50 = 930 CFS D.A. = 1939 ACRES
SPAN = 58.54'




AREA CUT : 0 AREA CUT : 65 AREA CUT : 185
AREA FILL : 418 AREA FILL : 231 AREA FILL : 30

CUT VOL. : 0 CUT VOL. : 266 CUT VOL. : 419
FILL VOL. : 738 FILL VOL. : 972 FILL VOL. : 460

# CROSS SECTION
# STA. 706+61 TO STA. 708+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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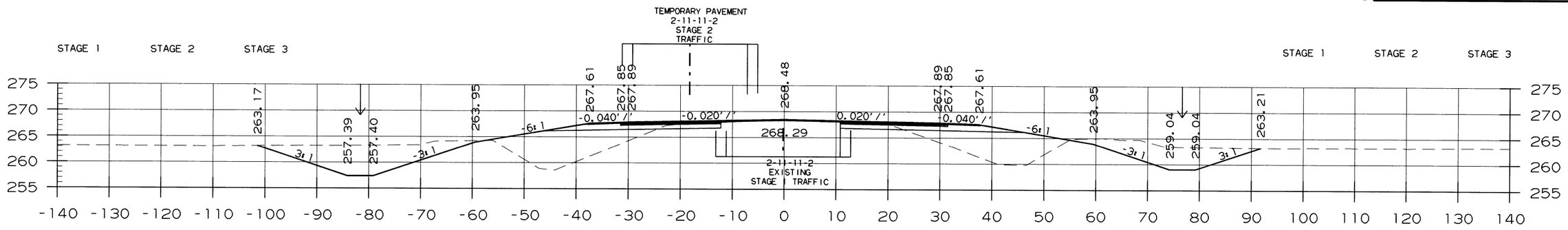
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 441 | 503 |

②

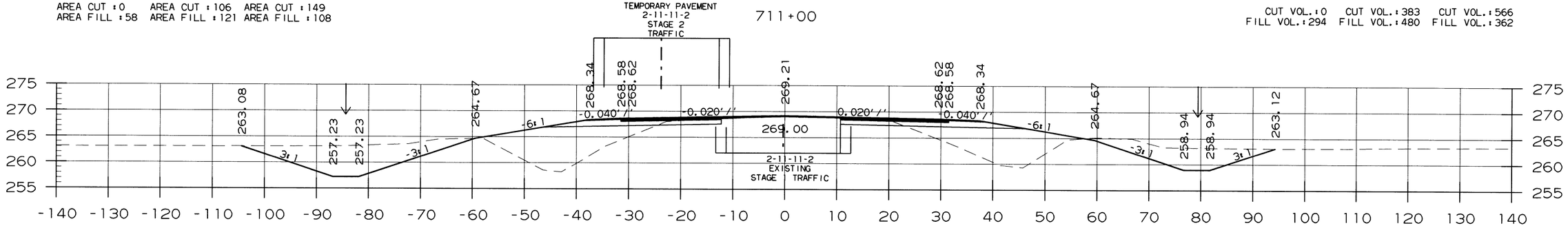
# CROSS SECTIONS




AREA CUT : 0 AREA CUT : 106 AREA CUT : 149
AREA FILL : 58 AREA FILL : 121 AREA FILL : 108

711+00

CUT VOL. : 0 CUT VOL. : 383 CUT VOL. : 566
FILL VOL. : 294 FILL VOL. : 480 FILL VOL. : 362




AREA CUT : 0 AREA CUT : 101 AREA CUT : 157
AREA FILL : 101 AREA FILL : 138 AREA FILL : 87

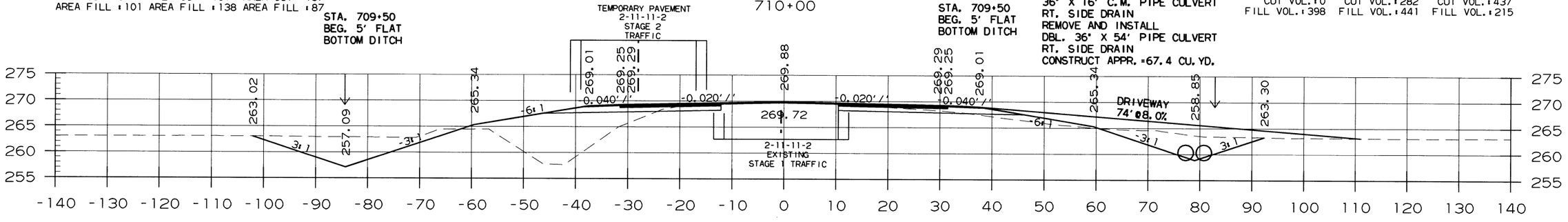
710+00

STA. 709+15 IN PLACE
36' X 16' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36' X 54' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =67.4 CU. YD.

CUT VOL. : 0 CUT VOL. : 282 CUT VOL. : 437
FILL VOL. : 398 FILL VOL. : 441 FILL VOL. : 215

STA. 709+50
BEG. 5' FLAT
BOTTOM DITCH

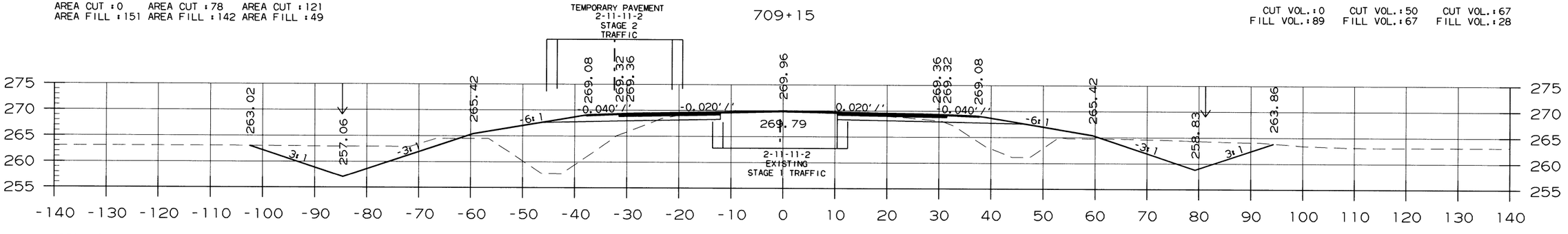
STA. 709+50
BEG. 5' FLAT
BOTTOM DITCH




AREA CUT : 0 AREA CUT : 78 AREA CUT : 121
AREA FILL : 151 AREA FILL : 142 AREA FILL : 49

709+15

CUT VOL. : 0 CUT VOL. : 50 CUT VOL. : 67
FILL VOL. : 89 FILL VOL. : 67 FILL VOL. : 28




AREA CUT : 0 AREA CUT : 104 AREA CUT : 119
AREA FILL : 167 AREA FILL : 100 AREA FILL : 52

709+00

CUT VOL. : 0 CUT VOL. : 385 CUT VOL. : 582
FILL VOL. : 690 FILL VOL. : 509 FILL VOL. : 108

## CROSS SECTION
## STA. 709+00 TO STA. 711+00

2/3/2017

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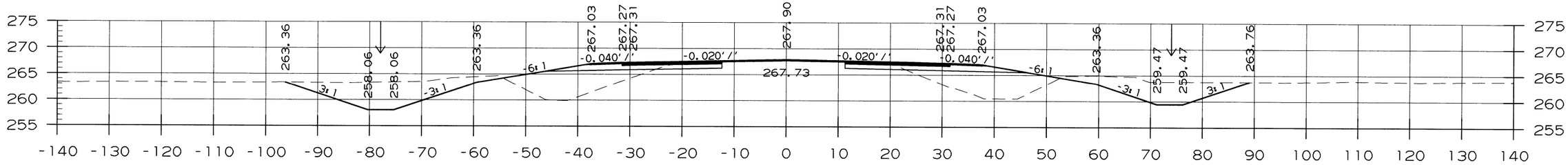
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 442 | 503 |

② CROSS SECTIONS

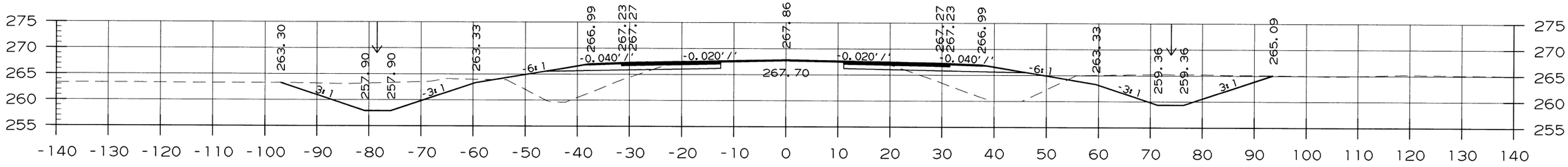
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 133 AREA CUT : 102 AREA CUT : 0
AREA FILL : 116 AREA FILL : 100 AREA FILL : 0

715+00

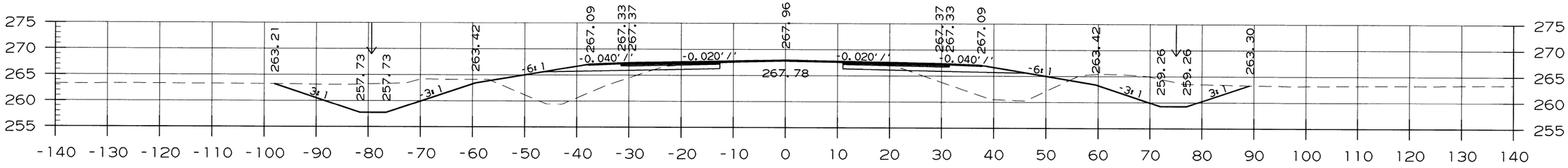
CUT VOL. : 487 CUT VOL. : 451 CUT VOL. : 0
FILL VOL. : 435 FILL VOL. : 385 FILL VOL. : 0




AREA CUT : 130 AREA CUT : 141 AREA CUT : 0
AREA FILL : 119 AREA FILL : 0 AREA FILL : 0

714+00

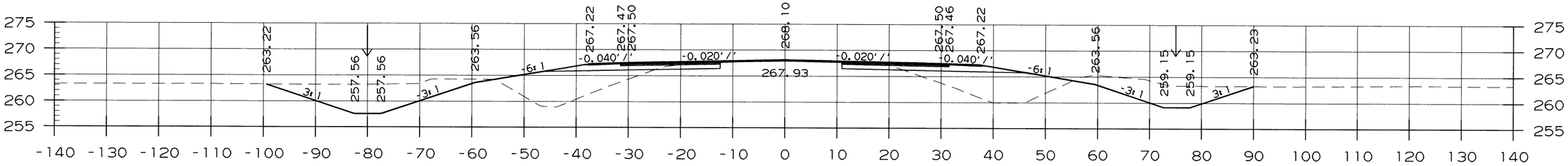
CUT VOL. : 496 CUT VOL. : 472 CUT VOL. : 0
FILL VOL. : 467 FILL VOL. : 391 FILL VOL. : 0




AREA CUT : 137 AREA CUT : 114 AREA CUT : 0
AREA FILL : 133 AREA FILL : 103 AREA FILL : 0

713+00

CUT VOL. : 521 CUT VOL. : 405 CUT VOL. : 0
FILL VOL. : 213 FILL VOL. : 406 FILL VOL. : 0




AREA CUT : 0 AREA CUT : 105 AREA CUT : 144
AREA FILL : 0 AREA FILL : 116 AREA FILL : 144

712+00

CUT VOL. : 0 CUT VOL. : 390 CUT VOL. : 542
FILL VOL. : 107 FILL VOL. : 438 FILL VOL. : 467

# CROSS SECTION
# STA. 712+00 TO STA. 715+00

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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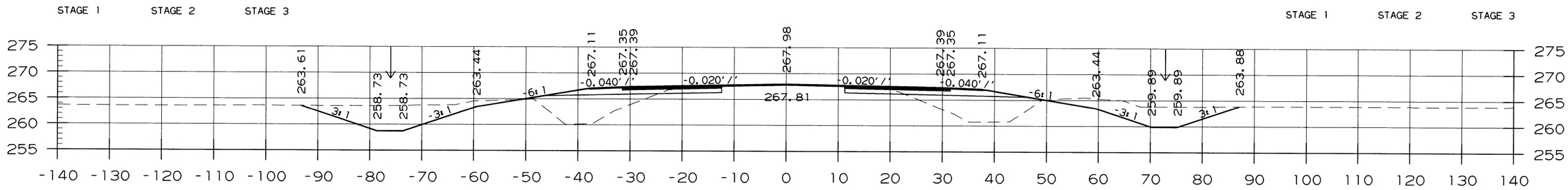
| JOB NO. | | CA1003 | 443 | 503 |

②

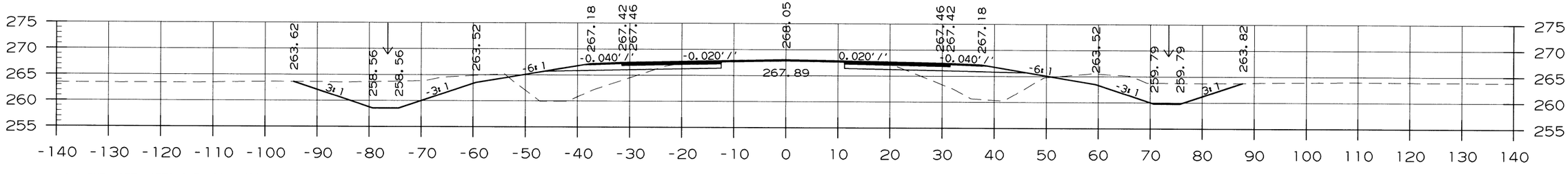
CROSS SECTIONS




AREA CUT : 114 AREA CUT : 96 AREA CUT : 0
AREA FILL : 92 AREA FILL : 89 AREA FILL : 0

719+00

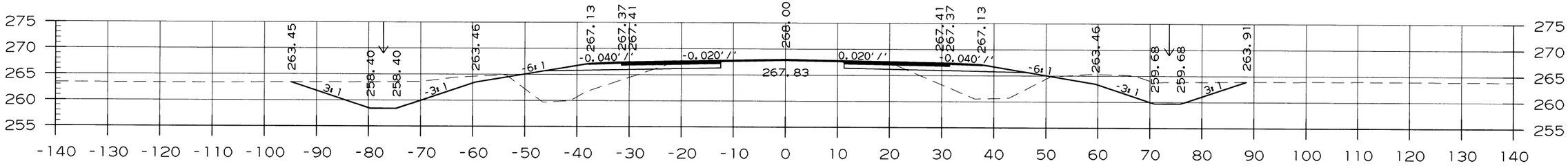
CUT VOL.: 447 CUT VOL.: 360 CUT VOL.: 0
FILL VOL.: 368 FILL VOL.: 337 FILL VOL.: 0




AREA CUT : 127 AREA CUT : 99 AREA CUT : 0
AREA FILL : 107 AREA FILL : 93 AREA FILL : 0

718+00

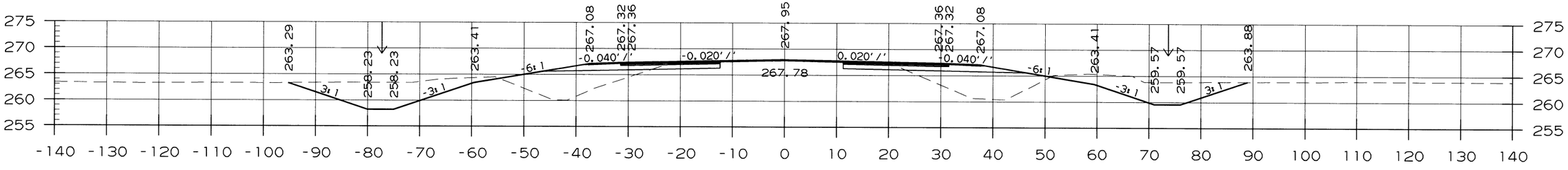
CUT VOL.: 468 CUT VOL.: 375 CUT VOL.: 0
FILL VOL.: 400 FILL VOL.: 346 FILL VOL.: 0




AREA CUT : 125 AREA CUT : 104 AREA CUT : 0
AREA FILL : 110 AREA FILL : 94 AREA FILL : 0

717+00

CUT VOL.: 465 CUT VOL.: 389 CUT VOL.: 0
FILL VOL.: 402 FILL VOL.: 350 FILL VOL.: 0




AREA CUT : 125 AREA CUT : 106 AREA CUT : 0
AREA FILL : 108 AREA FILL : 95 AREA FILL : 0

716+00

CUT VOL.: 478 CUT VOL.: 387 CUT VOL.: 0
FILL VOL.: 415 FILL VOL.: 361 FILL VOL.: 0

# CROSS SECTION
# STA. 716+00 TO STA. 719+00

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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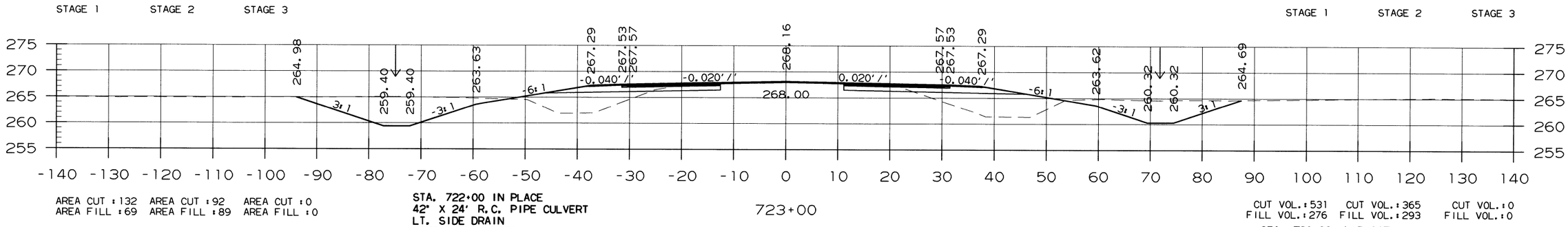
| JOB NO. | | CA1003 | 444 | 503 |

② CROSS SECTIONS

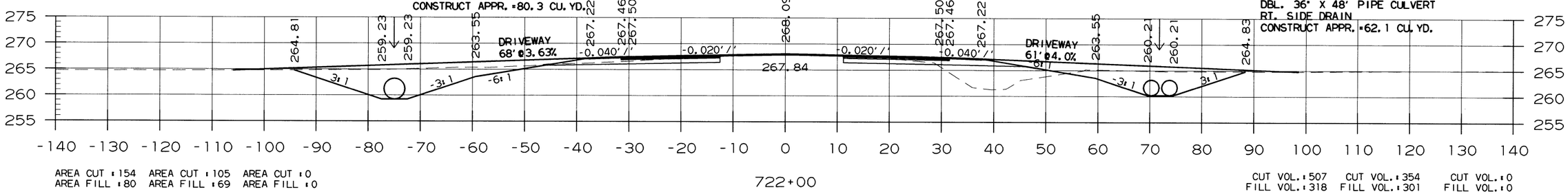



AREA CUT : 132 AREA CUT : 92 AREA CUT : 0
AREA FILL : 69 AREA FILL : 89 AREA FILL : 0

STA. 722+00 IN PLACE
42" X 24' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
42" X 52' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =80.3 CU. YD.

723+00

CUT VOL. : 531 CUT VOL. : 365 CUT VOL. : 0
FILL VOL. : 276 FILL VOL. : 293 FILL VOL. : 0

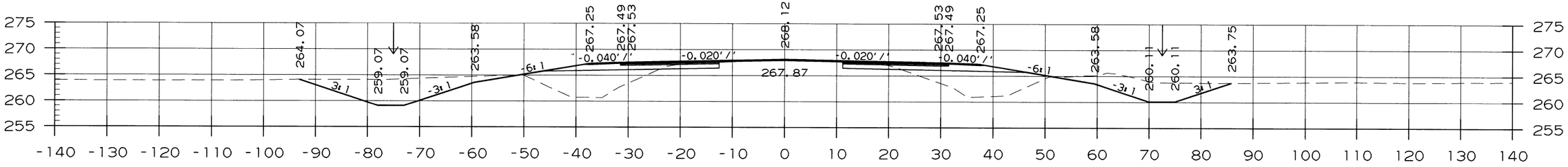



AREA CUT : 154 AREA CUT : 105 AREA CUT : 0
AREA FILL : 80 AREA FILL : 69 AREA FILL : 0

722+00

CUT VOL. : 507 CUT VOL. : 354 CUT VOL. : 0
FILL VOL. : 318 FILL VOL. : 301 FILL VOL. : 0

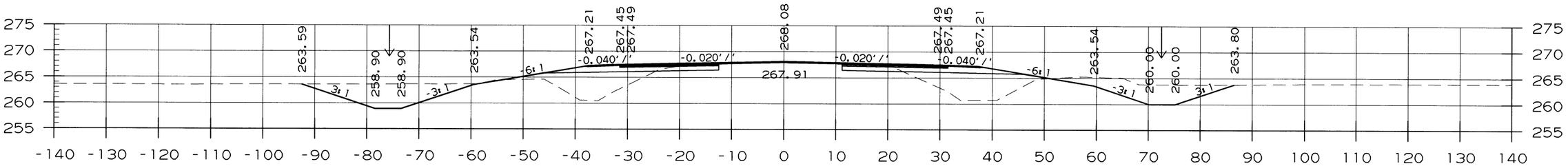
STA. 721+98 IN PLACE
16.5' X 18.9' CONC. BRIDGE
REMOVE AND INSTALL
DBL. 36" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =62.1 CU. YD.




AREA CUT : 120 AREA CUT : 86 AREA CUT : 0
AREA FILL : 91 AREA FILL : 93 AREA FILL : 0

721+00

CUT VOL. : 406 CUT VOL. : 323 CUT VOL. : 0
FILL VOL. : 327 FILL VOL. : 341 FILL VOL. : 0




AREA CUT : 100 AREA CUT : 88 AREA CUT : 0
AREA FILL : 85 AREA FILL : 91 AREA FILL : 0

720+00

CUT VOL. : 395 CUT VOL. : 341 CUT VOL. : 0
FILL VOL. : 328 FILL VOL. : 333 FILL VOL. : 0

# CROSS SECTION
# STA. 720+00 TO STA. 723+00

2/3/2017

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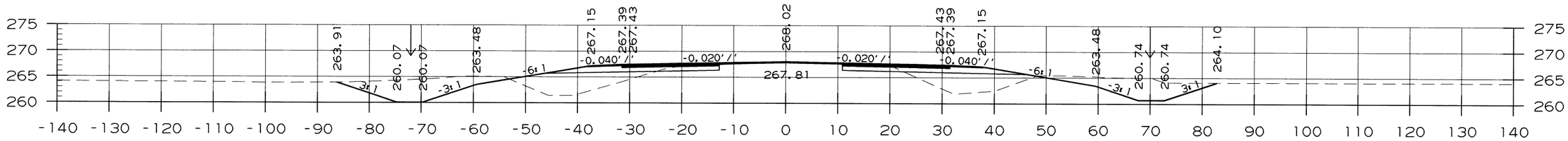
| | | | | ② | | CROSS SECTIONS | | |

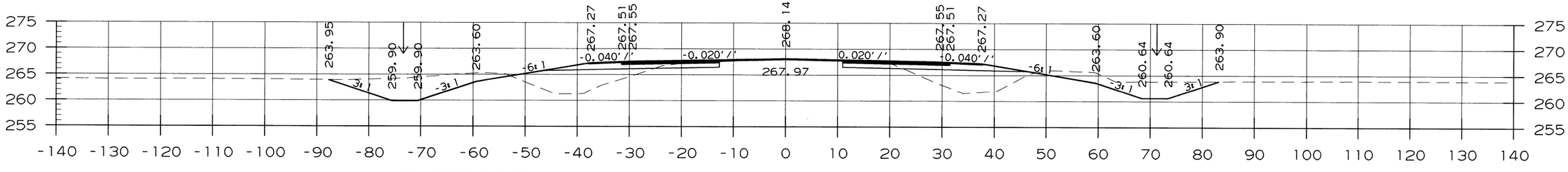
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 91 AREA CUT : 83 AREA CUT : 0
AREA FILL : 77 AREA FILL : 68 AREA FILL : 0

727+00

CUT VOL. : 349 CUT VOL. : 290 CUT VOL. : 0
FILL VOL. : 290 FILL VOL. : 265 FILL VOL. : 0

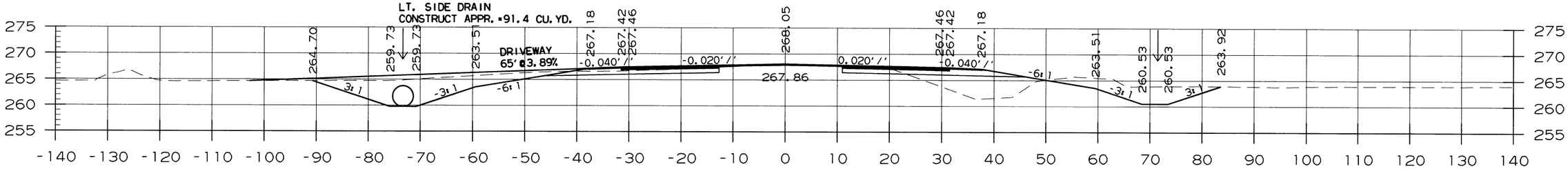



AREA CUT : 97 AREA CUT : 74 AREA CUT : 0
AREA FILL : 80 AREA FILL : 75 AREA FILL : 0

STA. 724+93 IN PLACE
60" X 41' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
42" X 54' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =91.4 CU. YD.

726+00

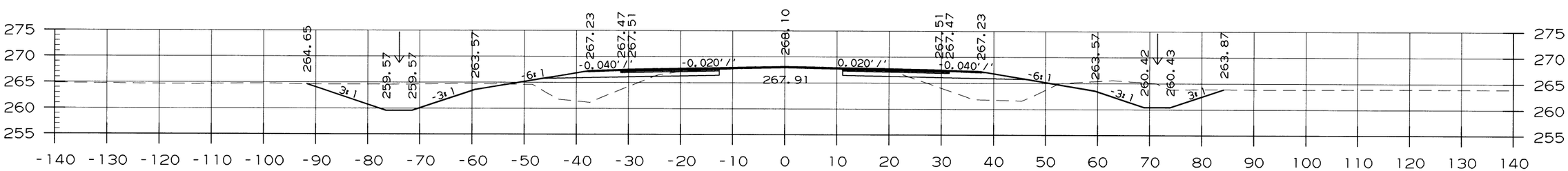
CUT VOL. : 449 CUT VOL. : 283 CUT VOL. : 0
FILL VOL. : 290 FILL VOL. : 283 FILL VOL. : 0




AREA CUT : 146 AREA CUT : 79 AREA CUT : 0
AREA FILL : 77 AREA FILL : 78 AREA FILL : 0

725+00

CUT VOL. : 477 CUT VOL. : 311 CUT VOL. : 0
FILL VOL. : 280 FILL VOL. : 304 FILL VOL. : 0




AREA CUT : 112 AREA CUT : 89 AREA CUT : 0
AREA FILL : 74 AREA FILL : 86 AREA FILL : 0

724+00

CUT VOL. : 452 CUT VOL. : 335 CUT VOL. : 0
FILL VOL. : 266 FILL VOL. : 324 FILL VOL. : 0

# CROSS SECTION
# STA. 724+00 TO STA. 727+00

2/3/2017

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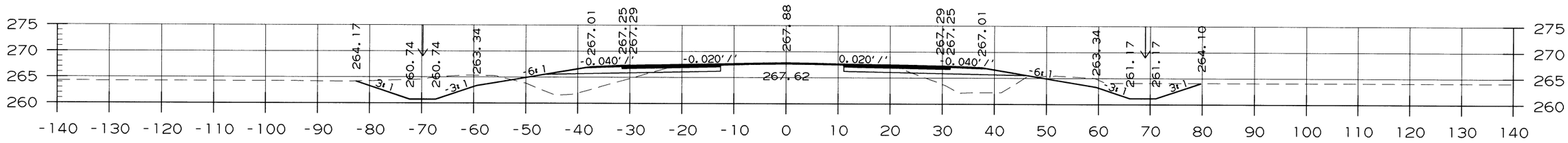
| JOB NO. | | CA1003 | 446 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

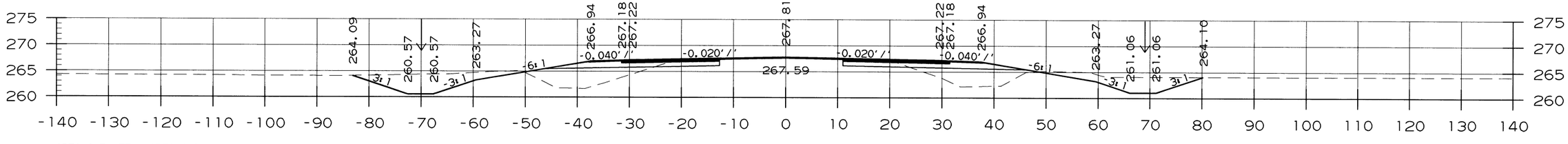
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 81 AREA CUT : 63 AREA CUT : 0
AREA FILL : 65 AREA FILL : 57 AREA FILL : 0

731+00

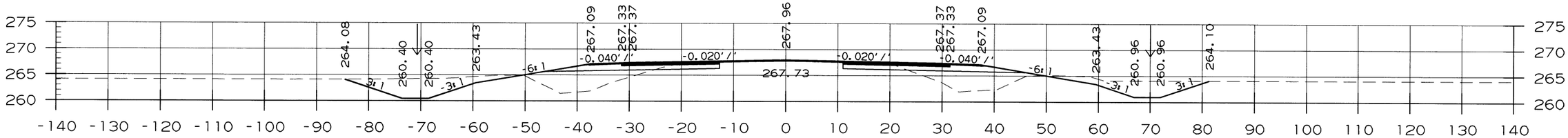
CUT VOL. : 293 CUT VOL. : 234 CUT VOL. : 0
FILL VOL. : 239 FILL VOL. : 209 FILL VOL. : 0




AREA CUT : 77 AREA CUT : 63 AREA CUT : 0
AREA FILL : 64 AREA FILL : 56 AREA FILL : 0

730+00

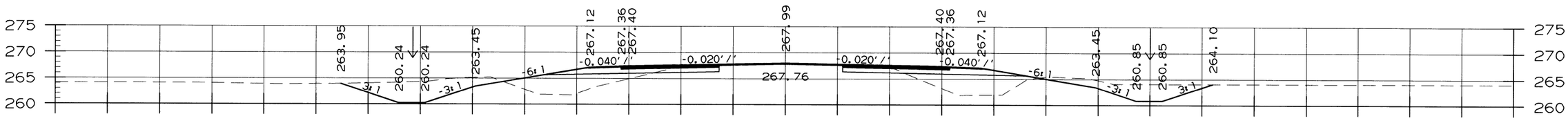
CUT VOL. : 286 CUT VOL. : 234 CUT VOL. : 0
FILL VOL. : 241 FILL VOL. : 217 FILL VOL. : 0




AREA CUT : 77 AREA CUT : 63 AREA CUT : 0
AREA FILL : 66 AREA FILL : 61 AREA FILL : 0

729+00

CUT VOL. : 301 CUT VOL. : 244 CUT VOL. : 0
FILL VOL. : 251 FILL VOL. : 242 FILL VOL. : 0




AREA CUT : 86 AREA CUT : 69 AREA CUT : 0
AREA FILL : 70 AREA FILL : 70 AREA FILL : 0

728+00

CUT VOL. : 327 CUT VOL. : 281 CUT VOL. : 0
FILL VOL. : 271 FILL VOL. : 256 FILL VOL. : 0

# CROSS SECTION
# STA. 728+00 TO STA. 731+00

2/3/2017

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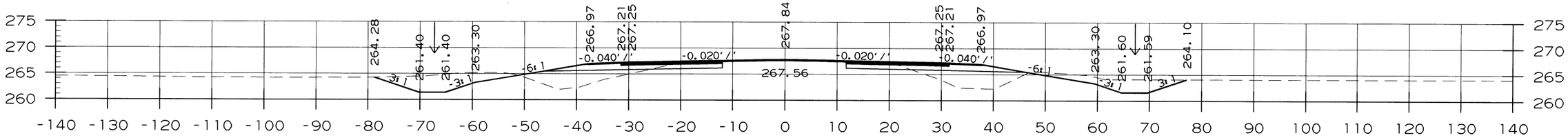
② CROSS SECTIONS

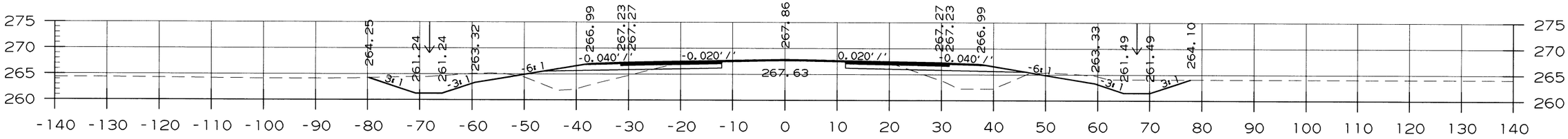
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 64 AREA CUT : 52 AREA CUT : 0
AREA FILL : 52 AREA FILL : 53 AREA FILL : 0

735+00

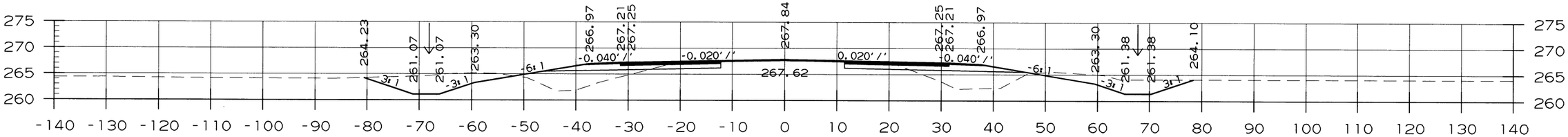
CUT VOL. : 240 CUT VOL. : 197 CUT VOL. : 0
FILL VOL. : 201 FILL VOL. : 199 FILL VOL. : 0




AREA CUT : 65 AREA CUT : 54 AREA CUT : 0
AREA FILL : 57 AREA FILL : 55 AREA FILL : 0

734+00

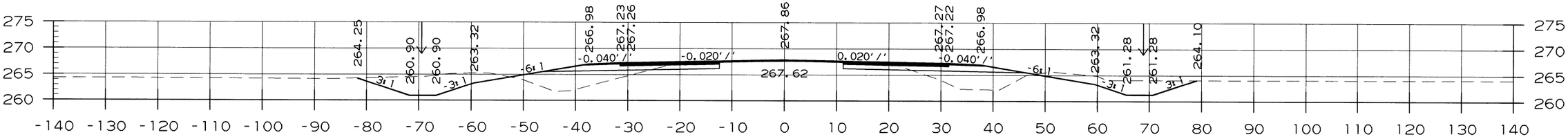
CUT VOL. : 254 CUT VOL. : 211 CUT VOL. : 0
FILL VOL. : 210 FILL VOL. : 205 FILL VOL. : 0




AREA CUT : 72 AREA CUT : 60 AREA CUT : 0
AREA FILL : 57 AREA FILL : 56 AREA FILL : 0

733+00

CUT VOL. : 272 CUT VOL. : 225 CUT VOL. : 0
FILL VOL. : 218 FILL VOL. : 207 FILL VOL. : 0




AREA CUT : 76 AREA CUT : 61 AREA CUT : 0
AREA FILL : 61 AREA FILL : 55 AREA FILL : 0

732+00

CUT VOL. : 290 CUT VOL. : 231 CUT VOL. : 0
FILL VOL. : 232 FILL VOL. : 207 FILL VOL. : 0

CROSS SECTION
STA. 732+00 TO STA. 735+00

2/3/2017

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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 |
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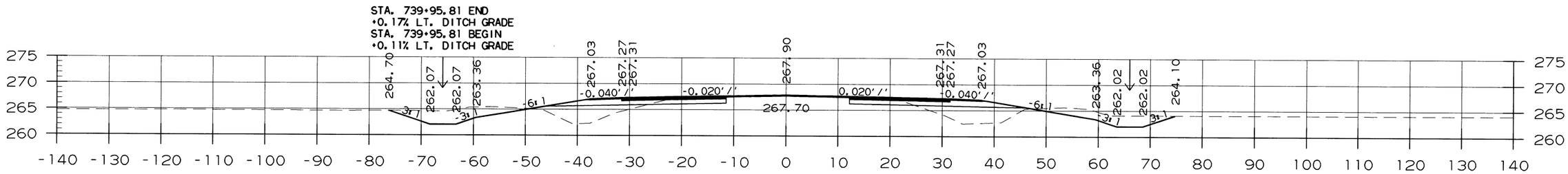
STAGE 1 STAGE 2 STAGE 3

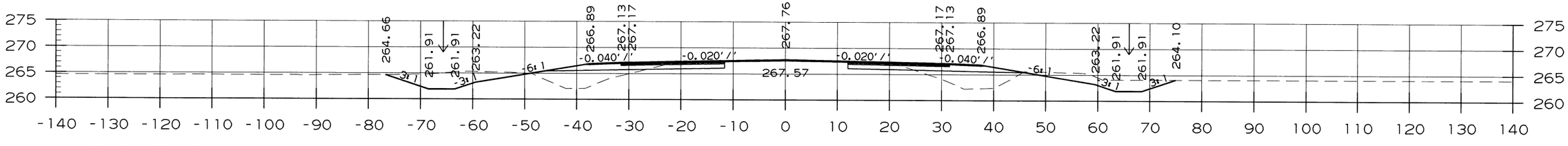
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 55 AREA CUT : 48 AREA CUT : 0
AREA FILL : 44 AREA FILL : 48 AREA FILL : 0

739+00

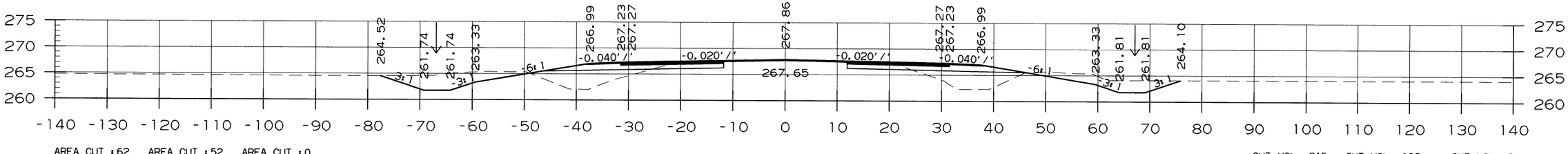
CUT VOL. : 216 CUT VOL. : 180 CUT VOL. : 0
FILL VOL. : 168 FILL VOL. : 175 FILL VOL. : 0




AREA CUT : 61 AREA CUT : 50 AREA CUT : 0
AREA FILL : 46 AREA FILL : 46 AREA FILL : 0

738+00

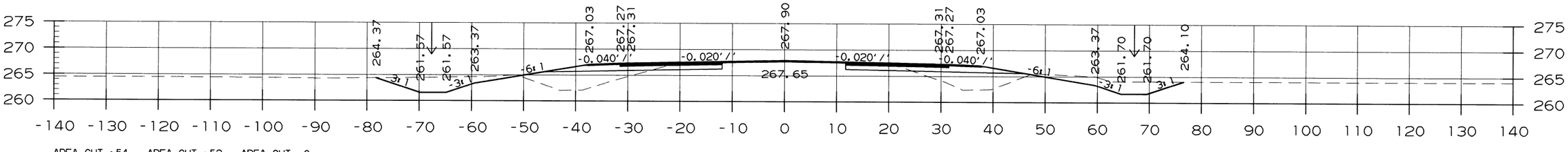
CUT VOL. : 228 CUT VOL. : 188 CUT VOL. : 0
FILL VOL. : 182 FILL VOL. : 177 FILL VOL. : 0




AREA CUT : 62 AREA CUT : 52 AREA CUT : 0
AREA FILL : 52 AREA FILL : 49 AREA FILL : 0

737+00

CUT VOL. : 215 CUT VOL. : 192 CUT VOL. : 0
FILL VOL. : 203 FILL VOL. : 185 FILL VOL. : 0




AREA CUT : 54 AREA CUT : 52 AREA CUT : 0
AREA FILL : 58 AREA FILL : 50 AREA FILL : 0

736+00

CUT VOL. : 219 CUT VOL. : 193 CUT VOL. : 0
FILL VOL. : 203 FILL VOL. : 191 FILL VOL. : 0

# CROSS SECTION
# STA. 736+00 TO STA. 739+00

2/3/2017

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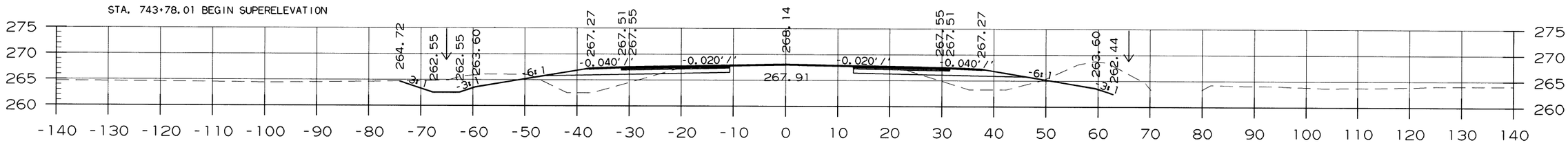
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 449 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

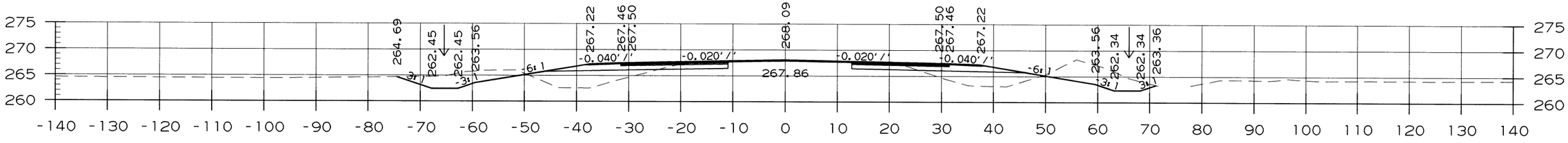
STA. 743+78.01 BEGIN SUPERELEVATION




AREA CUT : 55 AREA CUT : 80 AREA CUT : 0
AREA FILL : 54 AREA FILL : 46 AREA FILL : 0

743+00

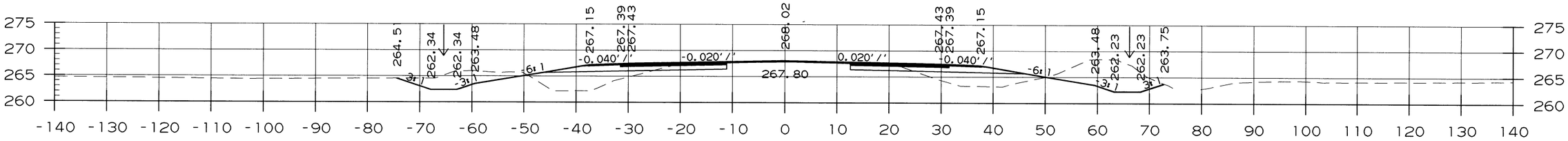
CUT VOL. : 202 CUT VOL. : 271 CUT VOL. : 0
FILL VOL. : 204 FILL VOL. : 175 FILL VOL. : 0




AREA CUT : 54 AREA CUT : 67 AREA CUT : 0
AREA FILL : 56 AREA FILL : 48 AREA FILL : 0

742+00

CUT VOL. : 204 CUT VOL. : 288 CUT VOL. : 0
FILL VOL. : 214 FILL VOL. : 181 FILL VOL. : 0



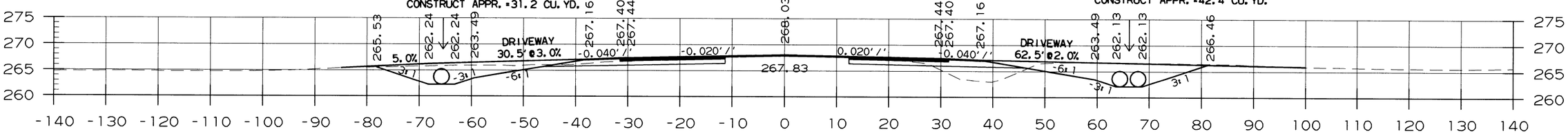

AREA CUT : 56 AREA CUT : 89 AREA CUT : 0
AREA FILL : 60 AREA FILL : 49 AREA FILL : 0

STA. 740+08 IN PLACE
36" X 23.8' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 31.2 CU. YD.

741+00

STA. 740+08 IN PLACE
18' X 19' CONC. BRIDGE
REMOVE AND INSTALL
DBL. 36" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 42.4 CU. YD.

CUT VOL. : 262 CUT VOL. : 360 CUT VOL. : 0
FILL VOL. : 207 FILL VOL. : 161 FILL VOL. : 0




AREA CUT : 85 AREA CUT : 106 AREA CUT : 0
AREA FILL : 52 AREA FILL : 37 AREA FILL : 0

740+00

CUT VOL. : 260 CUT VOL. : 284 CUT VOL. : 0
FILL VOL. : 179 FILL VOL. : 159 FILL VOL. : 0

# CROSS SECTION
# STA. 740+00 TO STA. 743+00

2/3/2011

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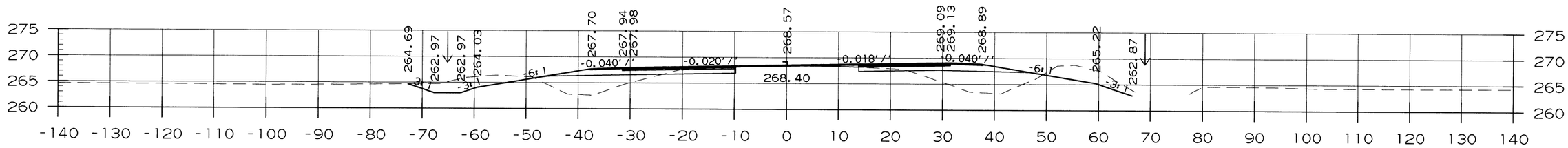
| | | | | JOB NO. | | CA1003 | 450 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

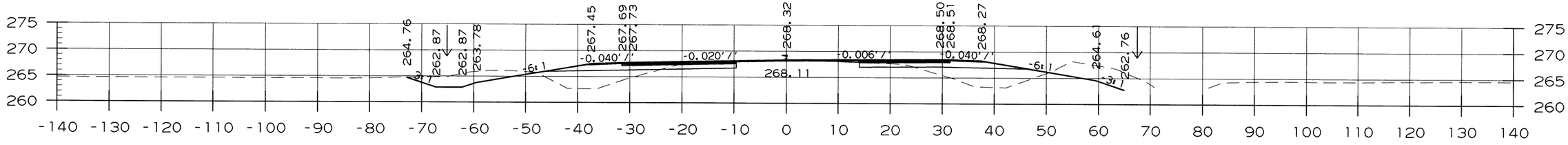
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 49 AREA CUT : 39 AREA CUT : 0
AREA FILL : 57 AREA FILL : 74 AREA FILL : 0

747+00

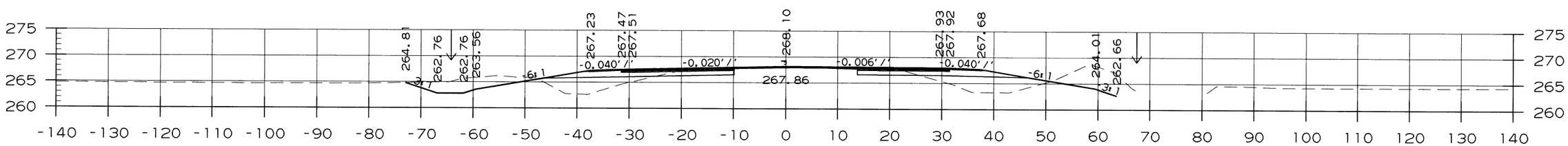
CUT VOL. : 183 CUT VOL. : 162 CUT VOL. : 0
FILL VOL. : 205 FILL VOL. : 256 FILL VOL. : 0




AREA CUT : 50 AREA CUT : 48 AREA CUT : 0
AREA FILL : 54 AREA FILL : 64 AREA FILL : 0

746+00

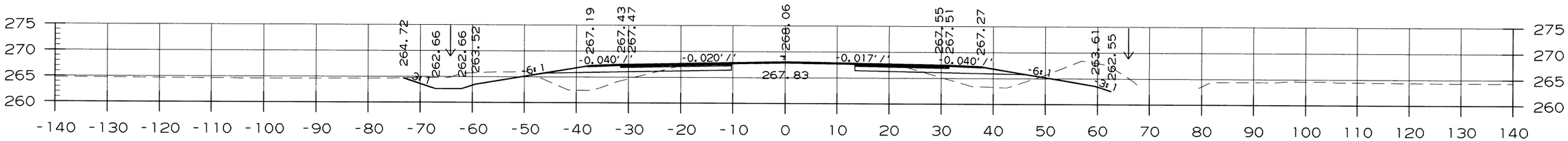
CUT VOL. : 192 CUT VOL. : 189 CUT VOL. : 0
FILL VOL. : 186 FILL VOL. : 218 FILL VOL. : 0




AREA CUT : 54 AREA CUT : 54 AREA CUT : 0
AREA FILL : 46 AREA FILL : 54 AREA FILL : 0

745+00

CUT VOL. : 195 CUT VOL. : 198 CUT VOL. : 0
FILL VOL. : 181 FILL VOL. : 178 FILL VOL. : 0




AREA CUT : 52 AREA CUT : 53 AREA CUT : 0
AREA FILL : 52 AREA FILL : 42 AREA FILL : 0

744+00

CUT VOL. : 198 CUT VOL. : 246 CUT VOL. : 0
FILL VOL. : 197 FILL VOL. : 163 FILL VOL. : 0

# CROSS SECTION
# STA. 744+00 TO STA. 747+00

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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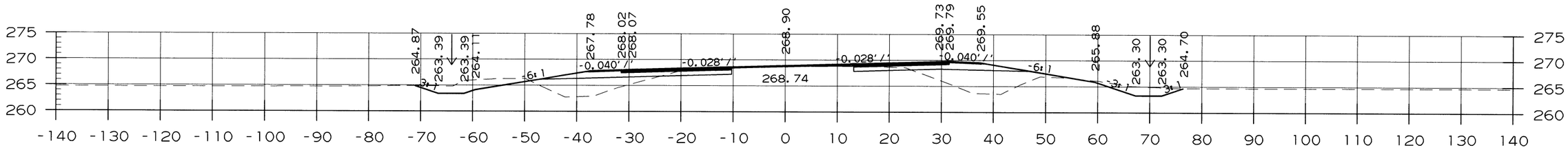
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 451 | 503 |

②

CROSS SECTIONS

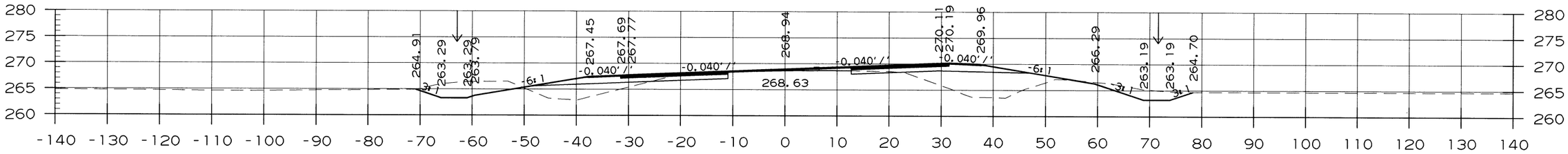
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 40 AREA CUT : 25 AREA CUT : 0
AREA FILL : 57 AREA FILL : 79 AREA FILL : 0

751+00

CUT VOL. : 173 CUT VOL. : 95 CUT VOL. : 0
FILL VOL. : 193 FILL VOL. : 333 FILL VOL. : 0

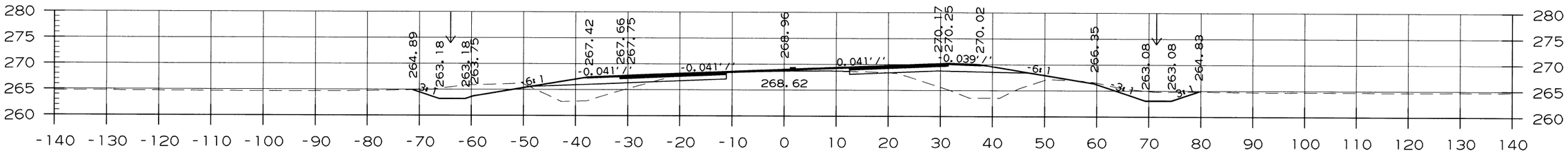



AREA CUT : 54 AREA CUT : 26 AREA CUT : 0
AREA FILL : 48 AREA FILL : 100 AREA FILL : 0

750+00

CUT VOL. : 187 CUT VOL. : 93 CUT VOL. : 0
FILL VOL. : 179 FILL VOL. : 376 FILL VOL. : 0

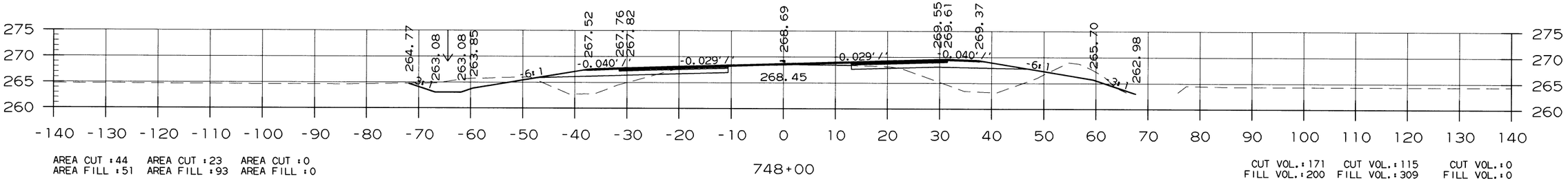
STA. 749+18.01 MAX. SUPERELEVATION (.043 FT./FT.)
STA. 749+73.26 MAX. SUPERELEVATION (.043 FT./FT.)




AREA CUT : 47 AREA CUT : 24 AREA CUT : 0
AREA FILL : 49 AREA FILL : 103 AREA FILL : 0

749+00

CUT VOL. : 168 CUT VOL. : 87 CUT VOL. : 0
FILL VOL. : 185 FILL VOL. : 362 FILL VOL. : 0




AREA CUT : 44 AREA CUT : 23 AREA CUT : 0
AREA FILL : 51 AREA FILL : 93 AREA FILL : 0

748+00

CUT VOL. : 171 CUT VOL. : 115 CUT VOL. : 0
FILL VOL. : 200 FILL VOL. : 309 FILL VOL. : 0

CROSS SECTION
STA. 748+00 TO STA. 751+00

2/3/2017

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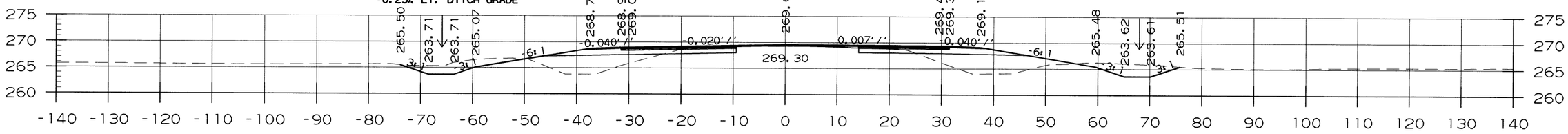
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 452 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STA. 754+44.00 END
+0.11% LT. DITCH GRADE
STA. 754+44.00 BEGIN
-0.25% LT. DITCH GRADE

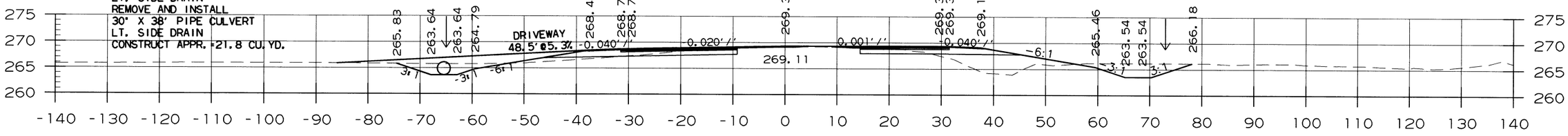



AREA CUT : 40 AREA CUT : 35 AREA CUT : 0
AREA FILL : 63 AREA FILL : 75 AREA FILL : 0

754+00

CUT VOL. : 98 CUT VOL. : 105 CUT VOL. : 0
FILL VOL. : 157 FILL VOL. : 177 FILL VOL. : 0

STA. 753+30 IN PLACE
30" X 20.7' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
30" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 21.8 CU. YD.

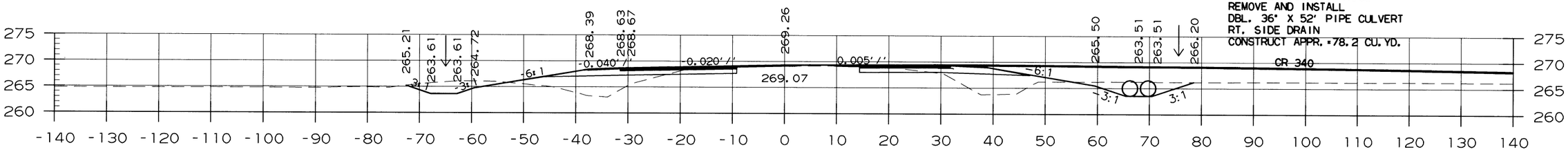



AREA CUT : 35 AREA CUT : 46 AREA CUT : 0
AREA FILL : 58 AREA FILL : 61 AREA FILL : 0

753+30

CUT VOL. : 41 CUT VOL. : 50 CUT VOL. : 0
FILL VOL. : 70 FILL VOL. : 68 FILL VOL. : 0

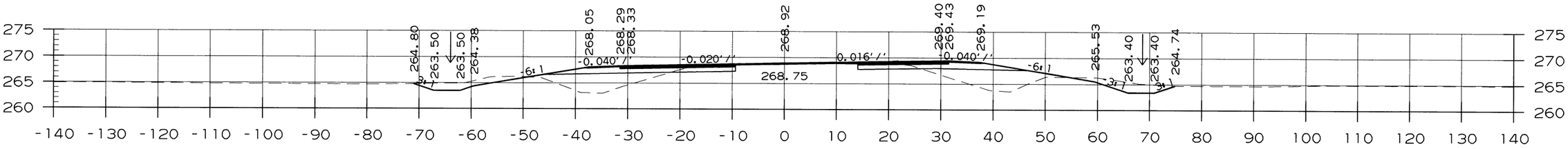
STA. 753+10 IN PLACE
16' X 24' CONC. BRIDGE
REMOVE AND INSTALL
DBL. 36" X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 78.2 CU. YD.




AREA CUT : 38 AREA CUT : 44 AREA CUT : 0
AREA FILL : 68 AREA FILL : 61 AREA FILL : 0

753+00

CUT VOL. : 128 CUT VOL. : 138 CUT VOL. : 0
FILL VOL. : 237 FILL VOL. : 235 FILL VOL. : 0




AREA CUT : 31 AREA CUT : 31 AREA CUT : 0
AREA FILL : 60 AREA FILL : 66 AREA FILL : 0

752+00

CUT VOL. : 131 CUT VOL. : 103 CUT VOL. : 0
FILL VOL. : 216 FILL VOL. : 269 FILL VOL. : 0

# CROSS SECTION
# STA. 752+00 TO STA. 754+00

2/3/2017

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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 |
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| | | | | 10 | ARK. | | | |
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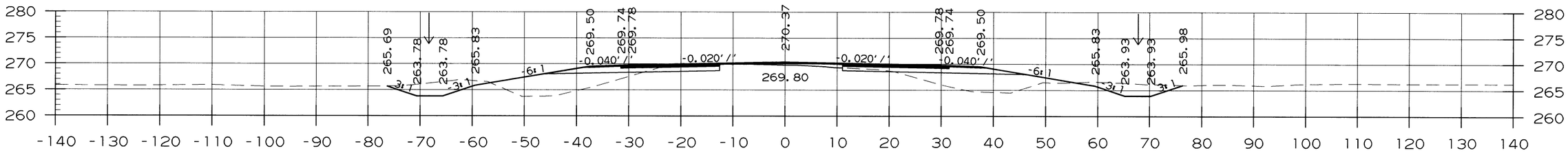
| | | | | ② | | CROSS SECTIONS | | |

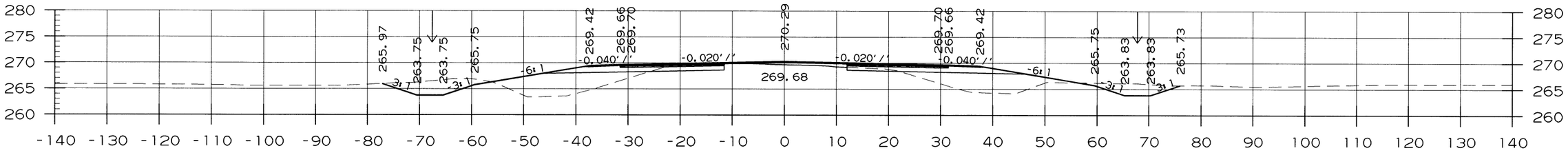
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 46 AREA CUT : 31 AREA CUT : 0
AREA FILL : 82 AREA FILL : 82 AREA FILL : 0

757+00

CUT VOL. : 177 CUT VOL. : 110 CUT VOL. : 0
FILL VOL. : 321 FILL VOL. : 312 FILL VOL. : 0

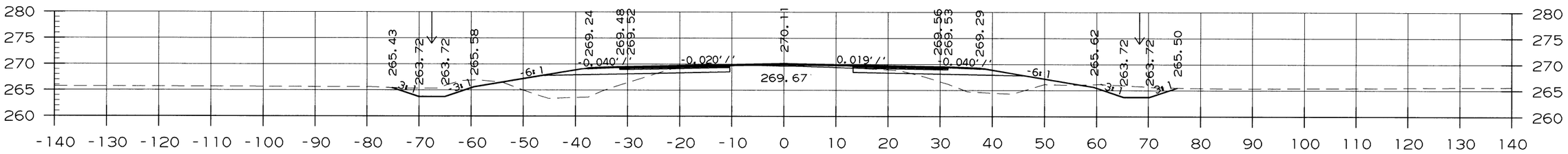



AREA CUT : 50 AREA CUT : 28 AREA CUT : 0
AREA FILL : 91 AREA FILL : 87 AREA FILL : 0

756+00

CUT VOL. : 165 CUT VOL. : 106 CUT VOL. : 0
FILL VOL. : 329 FILL VOL. : 295 FILL VOL. : 0

STA. 755+13.26 END SUPERELEVATION

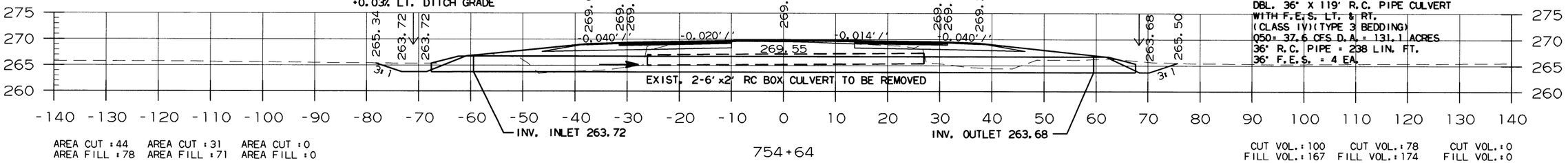



AREA CUT : 40 AREA CUT : 29 AREA CUT : 0
AREA FILL : 87 AREA FILL : 73 AREA FILL : 0

755+00

CUT VOL. : 56 CUT VOL. : 40 CUT VOL. : 80
FILL VOL. : 110 FILL VOL. : 96 FILL VOL. : 216

STA. 754+64.00 END
-0.25% LT. DITCH GRADE
STA. 754+64.00 BEGIN
+0.03% LT. DITCH GRADE




AREA CUT : 44 AREA CUT : 31 AREA CUT : 0
AREA FILL : 78 AREA FILL : 71 AREA FILL : 0

754+64

CUT VOL. : 100 CUT VOL. : 78 CUT VOL. : 0
FILL VOL. : 167 FILL VOL. : 174 FILL VOL. : 0

STA. 754+64 IN PLACE
DBL. 6' X 3' X 53' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
REMOVE AND CONSTRUCT
DBL. 36" X 119' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS IV)(TYPE 3 BEDDING)
Q50= 37.6 CFS D.A. = 131.1 ACRES
36" R.C. PIPE = 238 LIN. FT.
36" F.E.S. = 4 EA.

# CROSS SECTION
# STA. 754+64 TO STA. 757+00

2/3/2017

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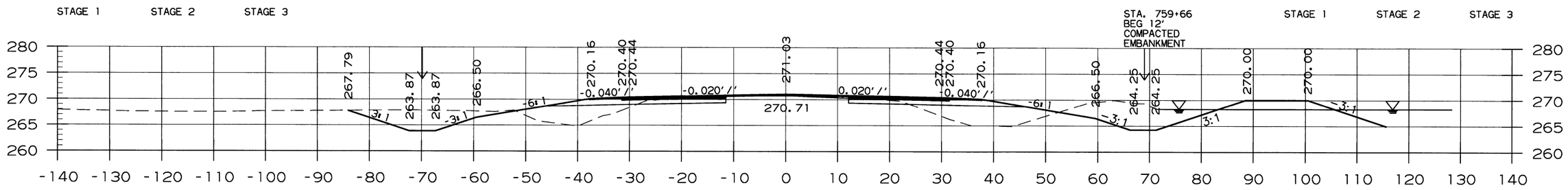
② CROSS SECTIONS




STA. 759+66
BEG 12'
COMPACTED
EMBANKMENT

AREA CUT : 52 AREA CUT : 47 AREA CUT : 0
AREA FILL : 58 AREA FILL : 79 AREA FILL : 0

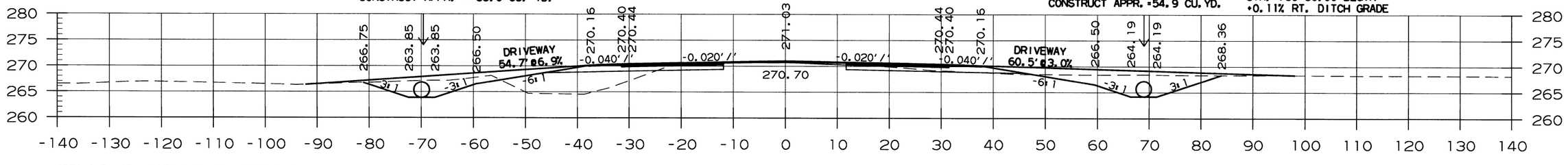
760+00

CUT VOL. : 163 CUT VOL. : 134 CUT VOL. : 0
FILL VOL. : 164 FILL VOL. : 106 FILL VOL. : 0

STA. 759+30 INSTALL
36" X 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 55.0 CU. YD.

STA. 759+30 IN PLACE
36" X 27.5' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
36" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =54.9 CU. YD.

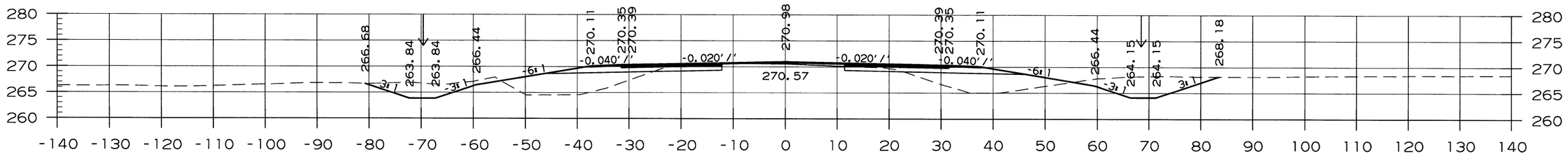
STA. 759+50.00 END
+0.11% RT. DITCH GRADE
STA. 759+50.00 BEGIN
+0.11% RT. DITCH GRADE




AREA CUT : 65 AREA CUT : 73 AREA CUT : 0
AREA FILL : 90 AREA FILL : 16 AREA FILL : 0

759+40

CUT VOL. : 89 CUT VOL. : 107 CUT VOL. : 0
FILL VOL. : 132 FILL VOL. : 74 FILL VOL. : 0

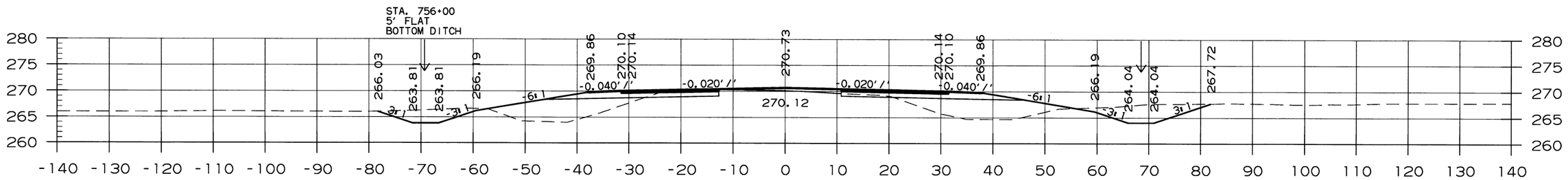



AREA CUT : 55 AREA CUT : 72 AREA CUT : 0
AREA FILL : 88 AREA FILL : 85 AREA FILL : 0

759+00

CUT VOL. : 187 CUT VOL. : 230 CUT VOL. : 0
FILL VOL. : 330 FILL VOL. : 336 FILL VOL. : 0

STA. 756+00
5' FLAT
BOTTOM DITCH




AREA CUT : 45 AREA CUT : 53 AREA CUT : 0
AREA FILL : 90 AREA FILL : 97 AREA FILL : 97

758+00

CUT VOL. : 169 CUT VOL. : 155 CUT VOL. : 0
FILL VOL. : 319 FILL VOL. : 332 FILL VOL. : 0

CROSS SECTION
STA. 758+00 TO STA. 760+00

2/8/2018

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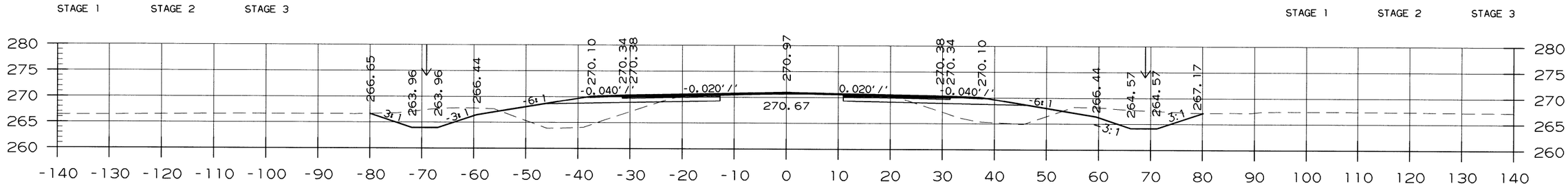
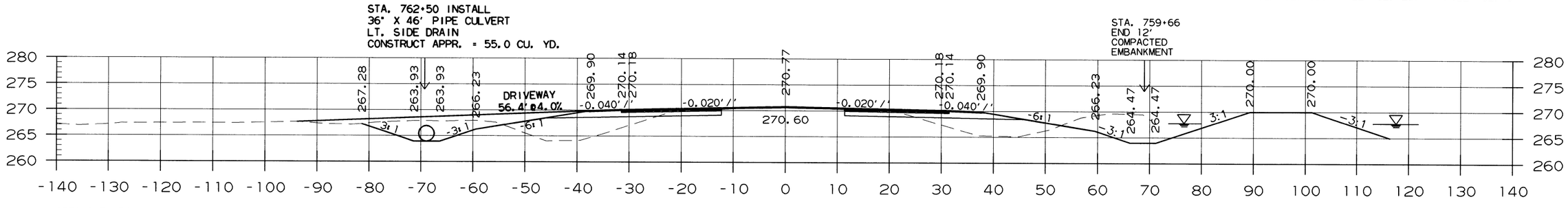
| | | | | JOB NO. | | CA1003 | 455 | 503 |
| | | | | ② | CROSS SECTIONS | | | |



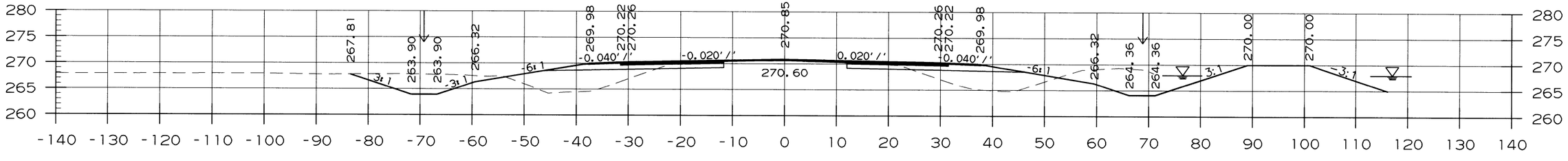

AREA CUT : 59 AREA CUT : 60 AREA CUT : 0
AREA FILL : 96 AREA FILL : 73 AREA FILL : 0

CUT VOL. : 246 CUT VOL. : 193 CUT VOL. : 0
FILL VOL. : 336 FILL VOL. : 257 FILL VOL. : 0



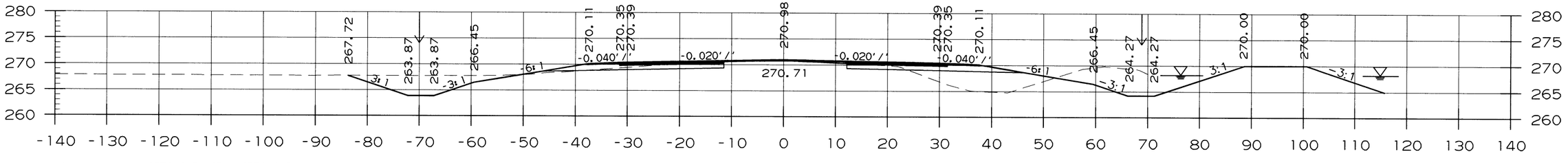

AREA CUT : 74 AREA CUT : 44 AREA CUT : 0
AREA FILL : 85 AREA FILL : 65 AREA FILL : 0

CUT VOL. : 278 CUT VOL. : 158 CUT VOL. : 0
FILL VOL. : 312 FILL VOL. : 258 FILL VOL. : 0




AREA CUT : 76 AREA CUT : 41 AREA CUT : 0
AREA FILL : 83 AREA FILL : 74 AREA FILL : 0

CUT VOL. : 235 CUT VOL. : 134 CUT VOL. : 0
FILL VOL. : 241 FILL VOL. : 231 FILL VOL. : 0




75
AREA FILL : 72 AREA CUT : 45 AREA CUT : 0
AREA FILL : 75 AREA FILL : 0

CUT VOL. : 47 CUT VOL. : 27 CUT VOL. : 0
FILL VOL. : 38 FILL VOL. : 46 FILL VOL. : 0

# CROSS SECTION
# STA. 760+16 TO STA. 763+00

3/6/2011

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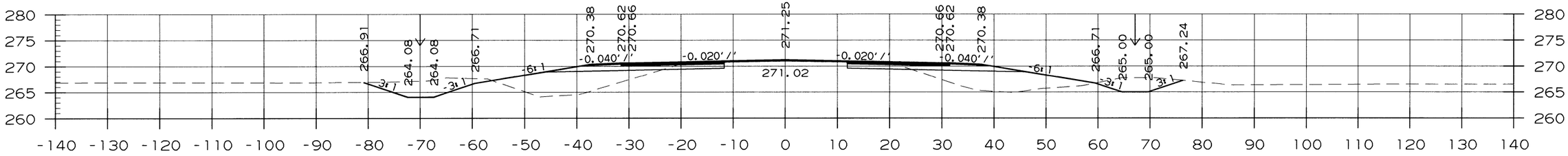
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 456 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

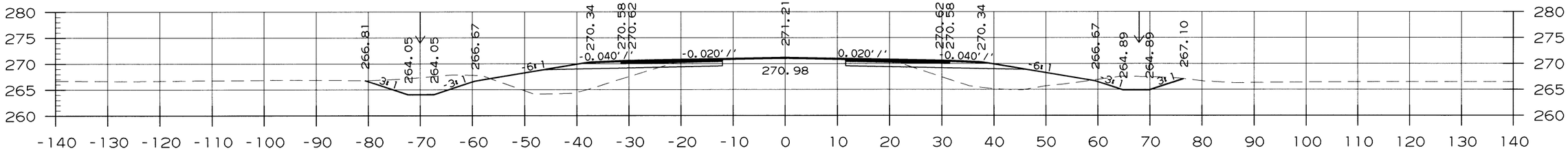
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 57 AREA CUT : 40 AREA CUT : 0
AREA FILL : 96 AREA FILL : 90 AREA FILL : 0

767+00

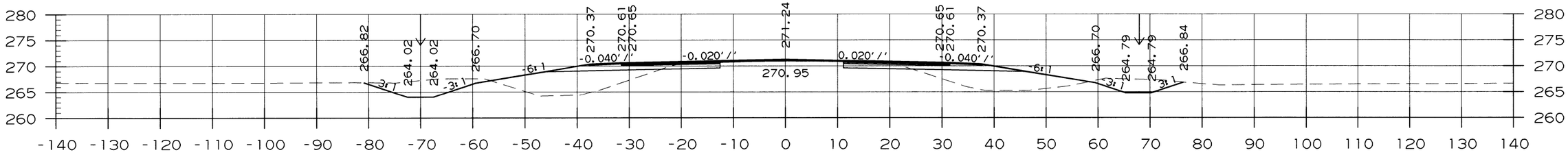
CUT VOL. : 215 CUT VOL. : 150 CUT VOL. : 0
FILL VOL. : 358 FILL VOL. : 330 FILL VOL. : 0




AREA CUT : 59 AREA CUT : 40 AREA CUT : 0
AREA FILL : 97 AREA FILL : 88 AREA FILL : 0

766+00

CUT VOL. : 212 CUT VOL. : 154 CUT VOL. : 0
FILL VOL. : 365 FILL VOL. : 326 FILL VOL. : 0

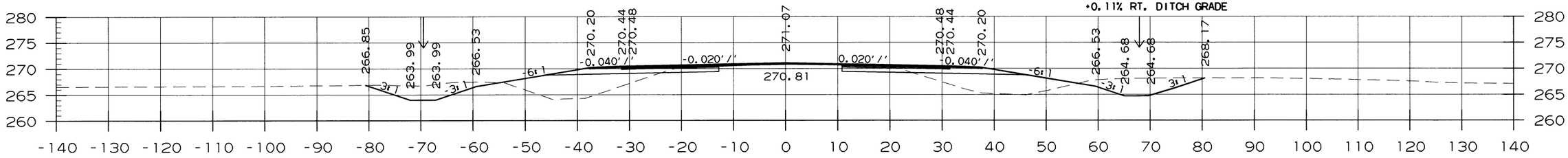



AREA CUT : 55 AREA CUT : 43 AREA CUT : 0
AREA FILL : 100 AREA FILL : 88 AREA FILL : 0

765+00

CUT VOL. : 197 CUT VOL. : 193 CUT VOL. : 0
FILL VOL. : 355 FILL VOL. : 312 FILL VOL. : 0

STA. 764+00.00 END
+0.11% RT. DITCH GRADE
STA. 764+00.00 BEGIN
+0.11% RT. DITCH GRADE




AREA CUT : 51 AREA CUT : 61 AREA CUT : 0
AREA FILL : 91 AREA FILL : 81 AREA FILL : 0

764+00

CUT VOL. : 203 CUT VOL. : 224 CUT VOL. : 0
FILL VOL. : 346 FILL VOL. : 285 FILL VOL. : 0

# CROSS SECTION
# STA. 764+00 TO STA. 767+00

2/3/2017

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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 |
|---|---|---|---|---|---|---|---|---|
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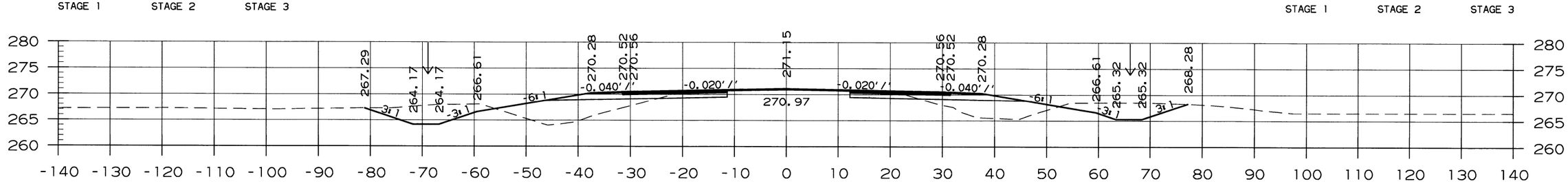
| | | | | JOB NO. | | CA1003 | 457 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

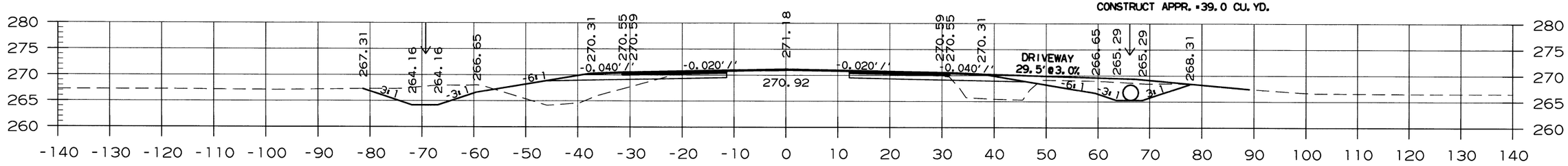



AREA CUT = 66 AREA CUT = 59 AREA CUT = 0
AREA FILL = 84 AREA FILL = 63 AREA FILL = 0

770+00

STA. 769+76 IN PLACE
16' X 19' CONC. BRIDGE
REMOVE AND INSTALL
36" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 39.0 CU. YD.

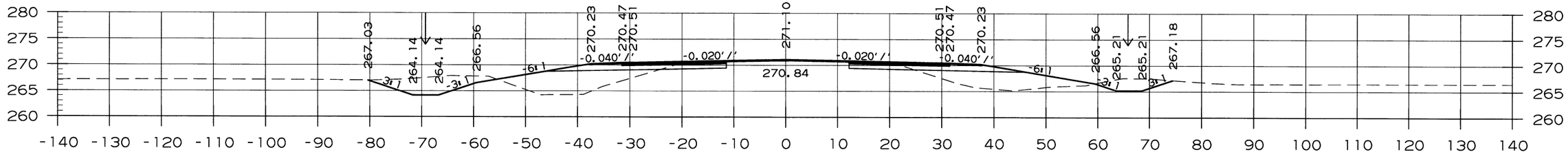
CUT VOL. = 57 CUT VOL. = 42 CUT VOL. = 0
FILL VOL. = 77 FILL VOL. = 62 FILL VOL. = 0




AREA CUT = 64 AREA CUT = 35 AREA CUT = 0
AREA FILL = 90 AREA FILL = 78 AREA FILL = 0

769+76

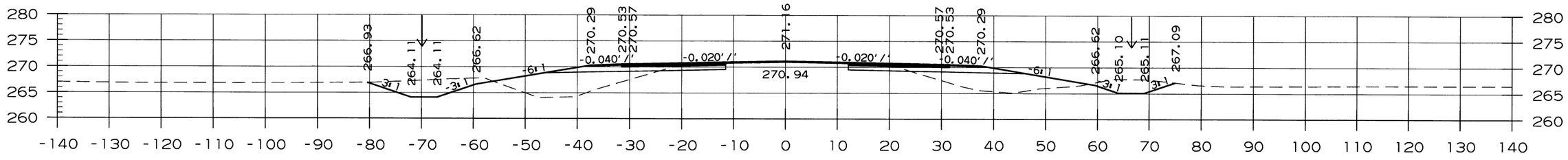
CUT VOL. = 177 CUT VOL. = 96 CUT VOL. = 0
FILL VOL. = 256 FILL VOL. = 224 FILL VOL. = 0




AREA CUT = 62 AREA CUT = 34 AREA CUT = 0
AREA FILL = 92 AREA FILL = 81 AREA FILL = 0

769+00

CUT VOL. = 225 CUT VOL. = 133 CUT VOL. = 0
FILL VOL. = 343 FILL VOL. = 301 FILL VOL. = 0




AREA CUT = 59 AREA CUT = 38 AREA CUT = 0
AREA FILL = 94 AREA FILL = 81 AREA FILL = 0

768+00

CUT VOL. = 215 CUT VOL. = 146 CUT VOL. = 0
FILL VOL. = 352 FILL VOL. = 317 FILL VOL. = 0

CROSS SECTION
STA. 768+00 TO STA. 770+00

2/19/2018

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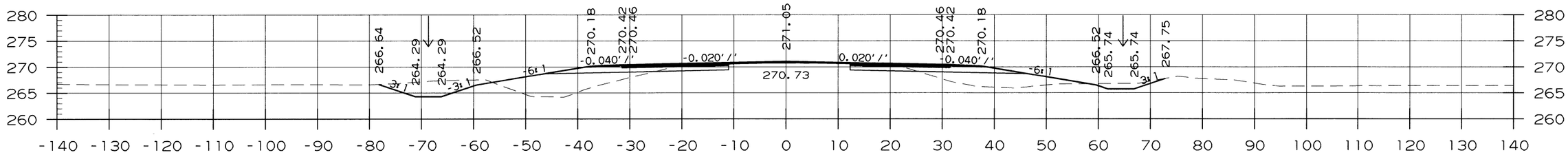
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 458 | 503 |
| | | | | ② | CROSS SECTIONS | | | |

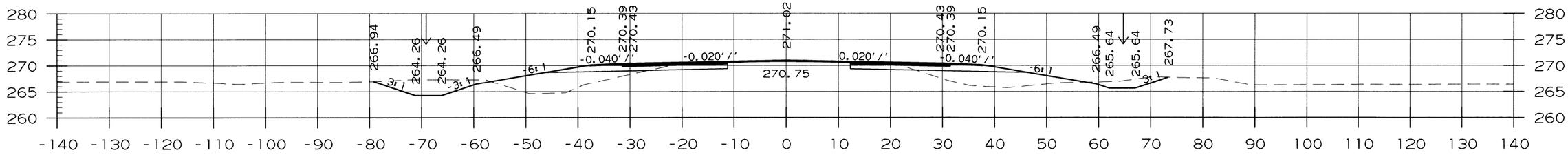
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 50 AREA CUT : 20 AREA CUT : 0
AREA FILL : 84 AREA FILL : 62 AREA FILL : 0

774+00

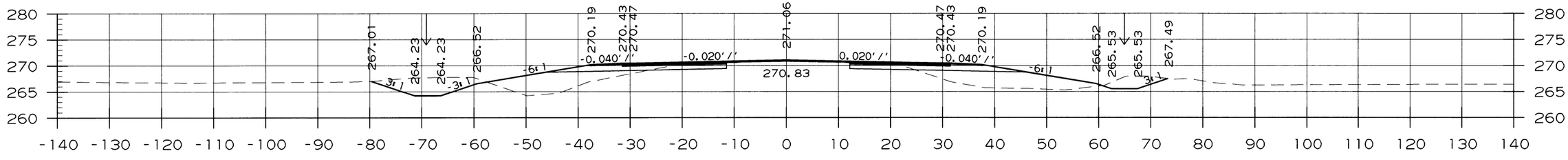
CUT VOL. : 190 CUT VOL. : 86 CUT VOL. : 0
FILL VOL. : 288 FILL VOL. : 235 FILL VOL. : 0




AREA CUT : 53 AREA CUT : 26 AREA CUT : 0
AREA FILL : 72 AREA FILL : 65 AREA FILL : 0

773+00

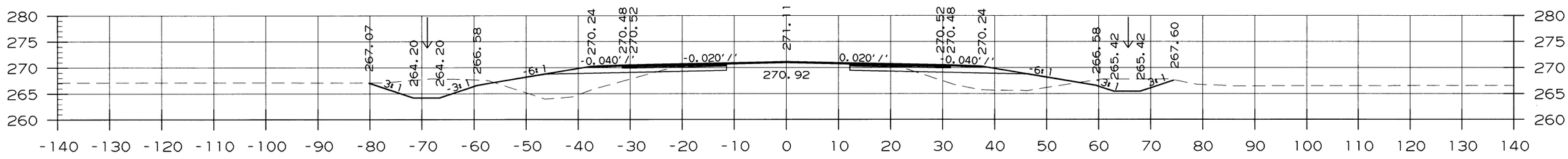
CUT VOL. : 209 CUT VOL. : 102 CUT VOL. : 0
FILL VOL. : 268 FILL VOL. : 273 FILL VOL. : 0




AREA CUT : 60 AREA CUT : 29 AREA CUT : 0
AREA FILL : 73 AREA FILL : 82 AREA FILL : 0

772+00

CUT VOL. : 222 CUT VOL. : 123 CUT VOL. : 0
FILL VOL. : 295 FILL VOL. : 287 FILL VOL. : 0




AREA CUT : 60 AREA CUT : 38 AREA CUT : 0
AREA FILL : 86 AREA FILL : 73 AREA FILL : 0

771+00

CUT VOL. : 233 CUT VOL. : 179 CUT VOL. : 0
FILL VOL. : 315 FILL VOL. : 250 FILL VOL. : 0

# CROSS SECTION
# STA. 771+00 TO STA. 774+00

2/3/2017

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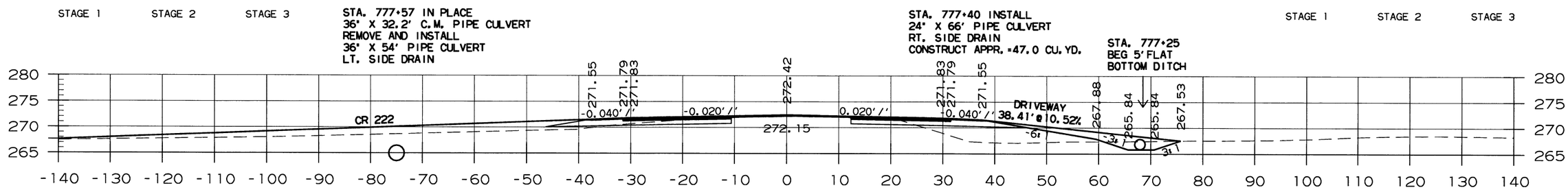
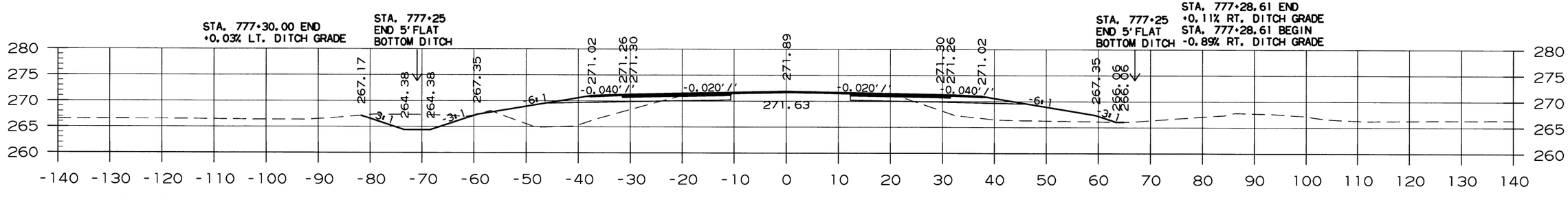
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 459 | 503 |
| | | | | ② | CROSS SECTIONS | | | |




AREA CUT = 37 AREA CUT = 24 AREA CUT = 0
AREA FILL = 14 AREA FILL = 77 AREA FILL = 0

777+56

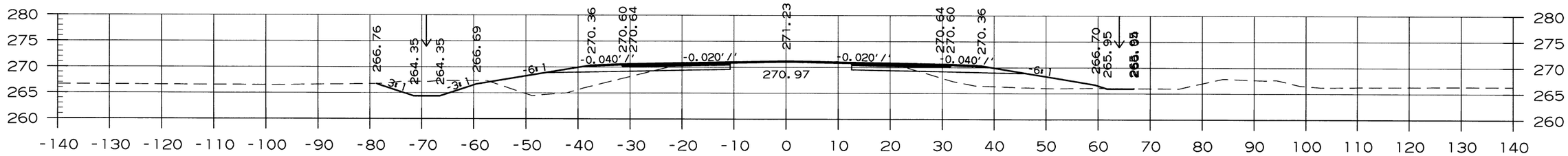
CUT VOL. = 90 CUT VOL. = 36 CUT VOL. = 0
FILL VOL. = 110 FILL VOL. = 171 FILL VOL. = 0




AREA CUT = 50 AREA CUT = 10 AREA CUT = 0
AREA FILL = 92 AREA FILL = 88 AREA FILL = 0

777+00

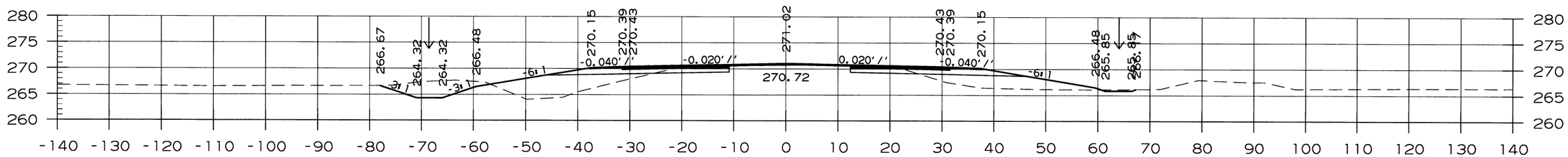
CUT VOL. = 184 CUT VOL. = 40 CUT VOL. = 0
FILL VOL. = 319 FILL VOL. = 392 FILL VOL. = 0




AREA CUT = 50 AREA CUT = 11 AREA CUT = 0
AREA FILL = 80 AREA FILL = 70 AREA FILL = 0

776+00

CUT VOL. = 188 CUT VOL. = 44 CUT VOL. = 0
FILL VOL. = 300 FILL VOL. = 245 FILL VOL. = 0




AREA CUT = 52 AREA CUT = 13 AREA CUT = 0
AREA FILL = 82 AREA FILL = 63 AREA FILL = 0

775+00

CUT VOL. = 188 CUT VOL. = 62 CUT VOL. = 0
FILL VOL. = 308 FILL VOL. = 230 FILL VOL. = 0

# CROSS SECTION
# STA. 775+00 TO STA. 777+56

2/8/2018

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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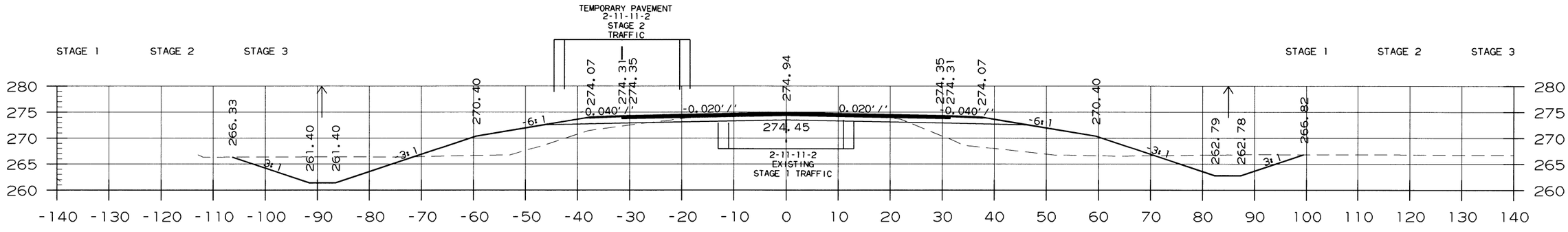
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 460 | 503 |

②

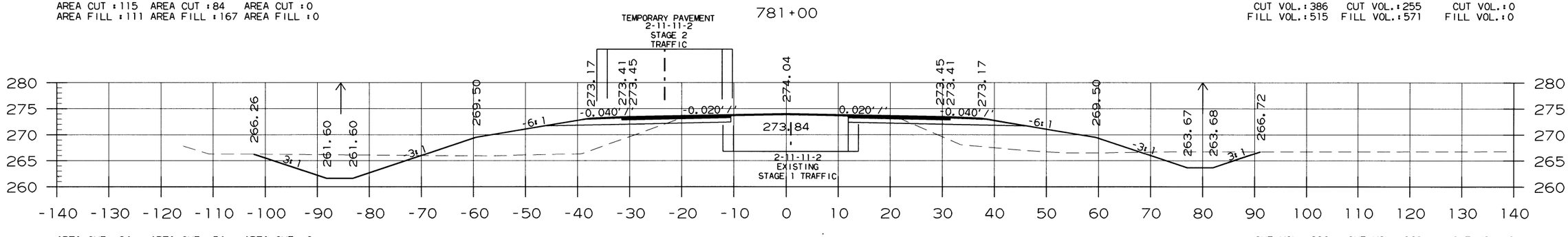
CROSS SECTIONS




AREA CUT : 115 AREA CUT : 84 AREA CUT : 0
AREA FILL : 111 AREA FILL : 167 AREA FILL : 0

781+00

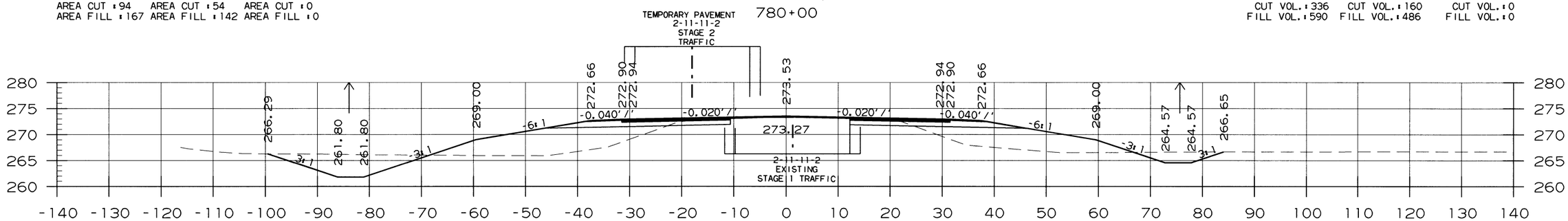
CUT VOL. : 386 CUT VOL. : 255 CUT VOL. : 0
FILL VOL. : 515 FILL VOL. : 571 FILL VOL. : 0




AREA CUT : 94 AREA CUT : 54 AREA CUT : 0
AREA FILL : 167 AREA FILL : 142 AREA FILL : 0

780+00

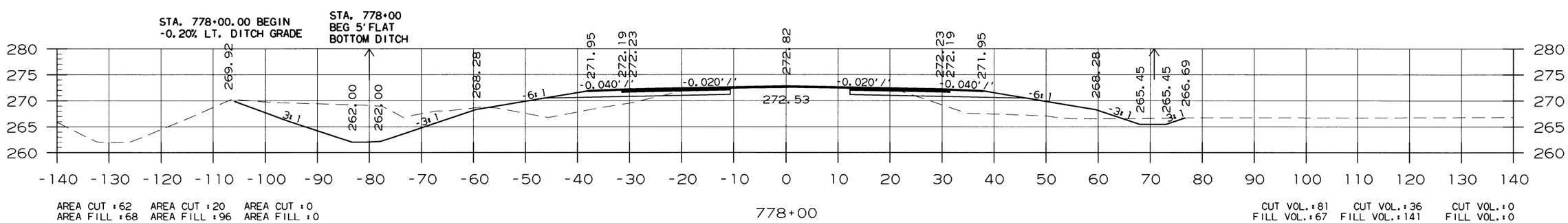
CUT VOL. : 336 CUT VOL. : 160 CUT VOL. : 0
FILL VOL. : 590 FILL VOL. : 486 FILL VOL. : 0




AREA CUT : 87 AREA CUT : 33 AREA CUT : 0
AREA FILL : 151 AREA FILL : 121 AREA FILL : 0

779+00

CUT VOL. : 277 CUT VOL. : 98 CUT VOL. : 0
FILL VOL. : 407 FILL VOL. : 401 FILL VOL. : 0




AREA CUT : 62 AREA CUT : 20 AREA CUT : 0
AREA FILL : 68 AREA FILL : 96 AREA FILL : 0

778+00

CUT VOL. : 81 CUT VOL. : 36 CUT VOL. : 0
FILL VOL. : 67 FILL VOL. : 141 FILL VOL. : 0

# CROSS SECTION
# STA. 778+00 TO STA. 781+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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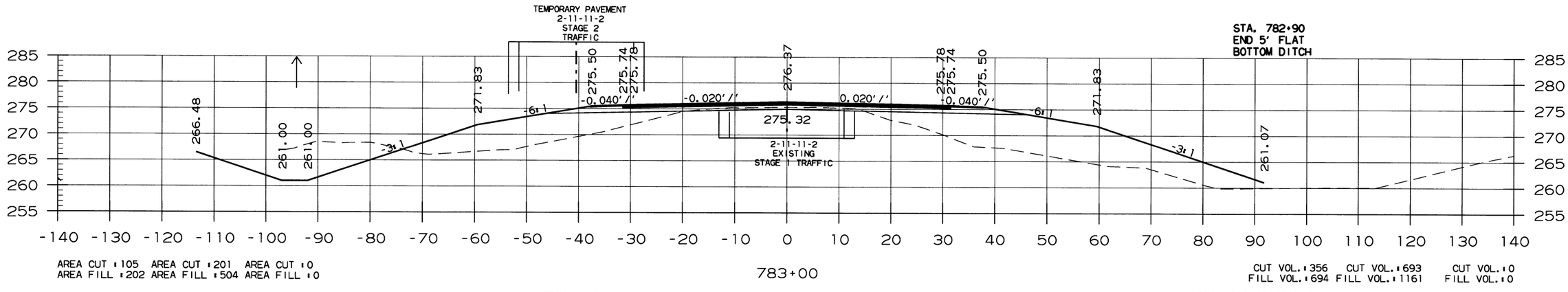
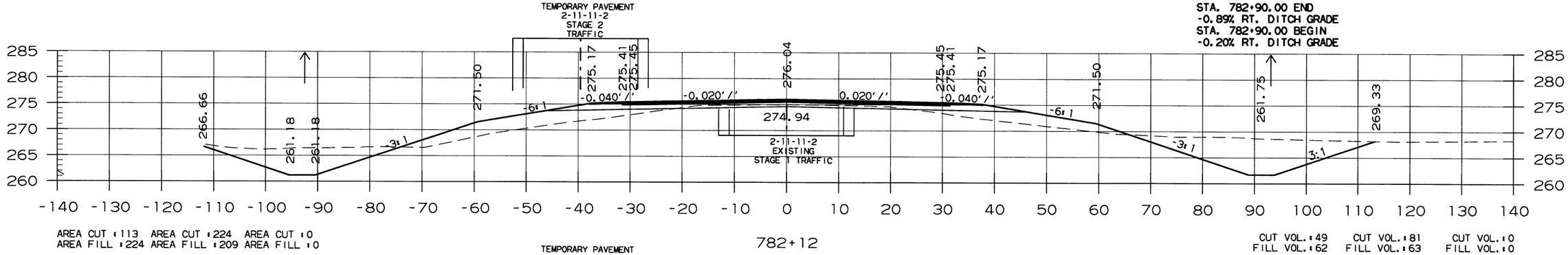
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 461 | 503 |

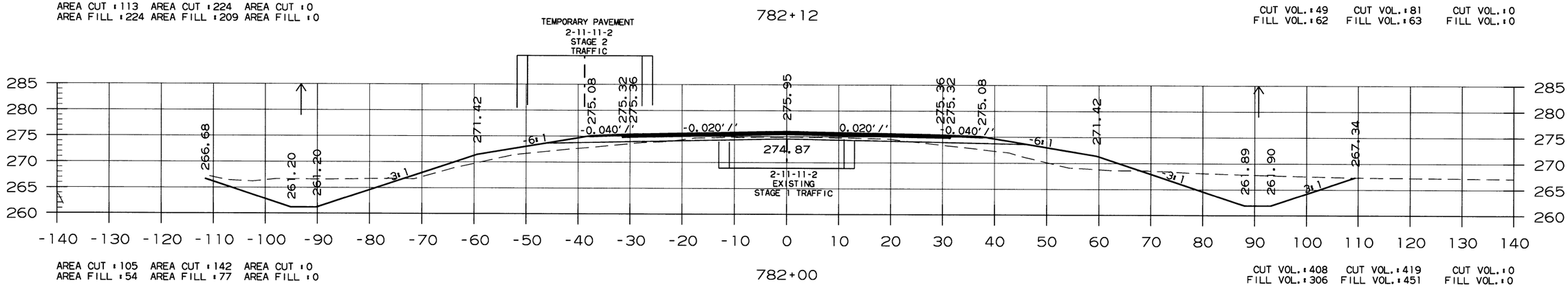
② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3




# CROSS SECTION
# STA. 782+00 TO STA. 783+00

2/8/2018

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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 |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 462 | 503 |

② CROSS SECTIONS

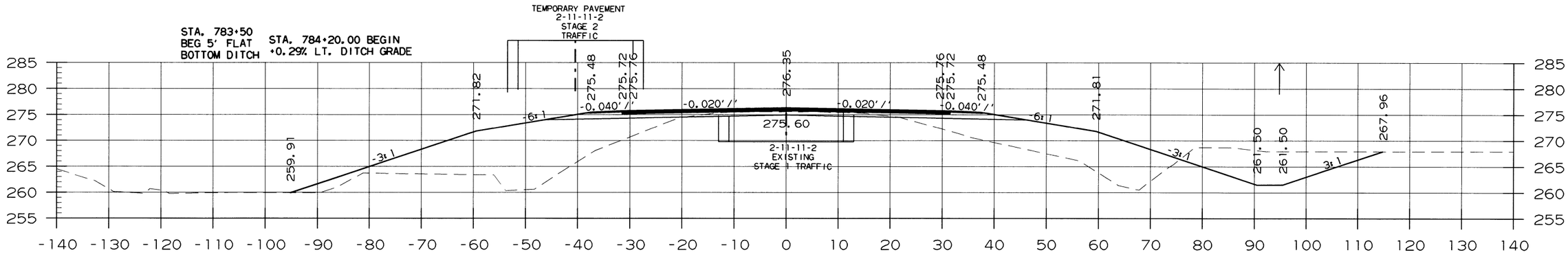
STAGE 1 STAGE 2 STAGE 3

STA. 783+50
BEG 5' FLAT
BOTTOM DITCH

STA. 784+20.00 BEGIN
+0.29% LT. DITCH GRADE

TEMPORARY PAVEMENT
2-11-11-2
STAGE 2
TRAFFIC

2-11-11-2
EXISTING
STAGE 1 TRAFFIC




AREA CUT : 156 AREA CUT : 170 AREA CUT : 0
AREA FILL : 535 AREA FILL : 265 AREA FILL : 0

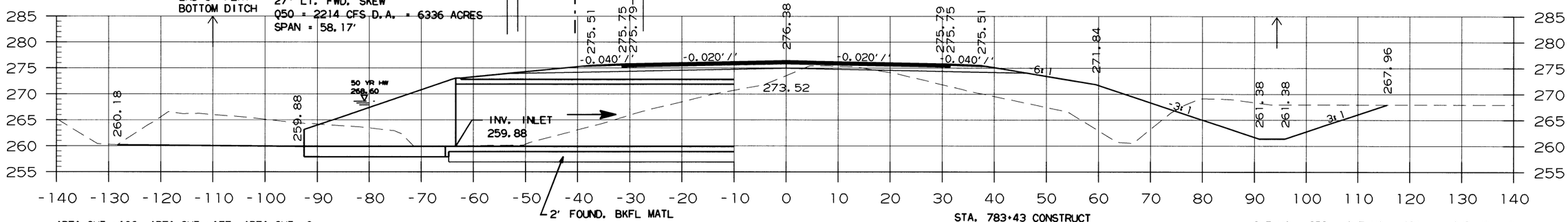
784+00

CUT VOL. : 122 CUT VOL. : 161 CUT VOL. : 0
FILL VOL. : 614 FILL VOL. : 438 FILL VOL. : 0

STA. 783+50
END 5' FLAT
BOTTOM DITCH

STA. 783+43 CONSTRUCT
QUAD. 12' X 12' X 140' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
27° LT. FWD. SKEW
Q50 = 2214 CFS D.A. = 6336 ACRES
SPAN = 58.17'

TEMPORARY PAVEMENT
2-11-11-2
STAGE 2
TRAFFIC




2' FOUND. BKFL MATL

AREA CUT : 106 AREA CUT : 177 AREA CUT : 0
AREA FILL : 709 AREA FILL : 681 AREA FILL : 0

783+75

CUT VOL. : 252 CUT VOL. : 420 CUT VOL. : 0
FILL VOL. : 1874 FILL VOL. : 1615 FILL VOL. : 0

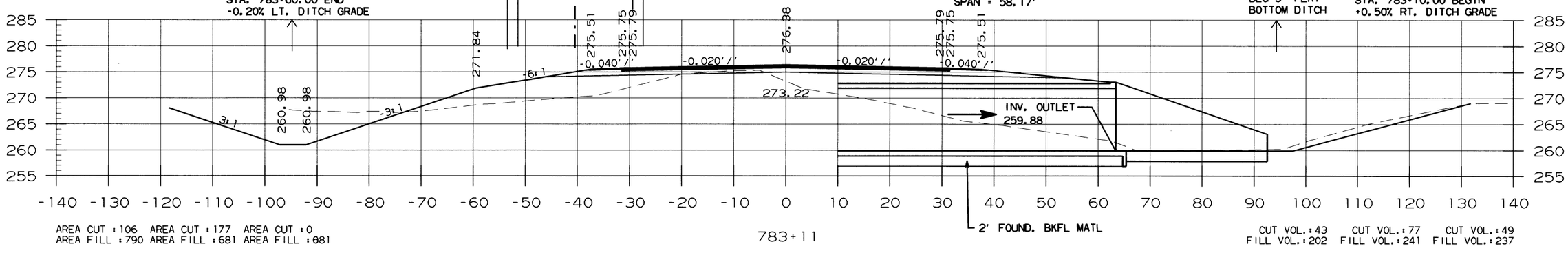
STA. 783+60.00 END
-0.20% LT. DITCH GRADE

TEMPORARY PAVEMENT
2-11-11-2
STAGE 2
TRAFFIC

STA. 783+43 CONSTRUCT
QUAD. 12' X 12' X 140' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
27° LT. FWD. SKEW
Q50 = 2214 CFS D.A. = 6336 ACRES
SPAN = 58.17'

STA. 783+10
BEG 5' FLAT
BOTTOM DITCH

STA. 783+10.00 END
-0.20% RT. DITCH GRADE
STA. 783+10.00 BEGIN
+0.50% RT. DITCH GRADE




2' FOUND. BKFL MATL

AREA CUT : 106 AREA CUT : 177 AREA CUT : 0
AREA FILL : 790 AREA FILL : 681 AREA FILL : 681

783+11

CUT VOL. : 43 CUT VOL. : 77 CUT VOL. : 49
FILL VOL. : 202 FILL VOL. : 241 FILL VOL. : 237

# CROSS SECTION
# STA. 783+11 TO STA. 784+00

2/3/2017

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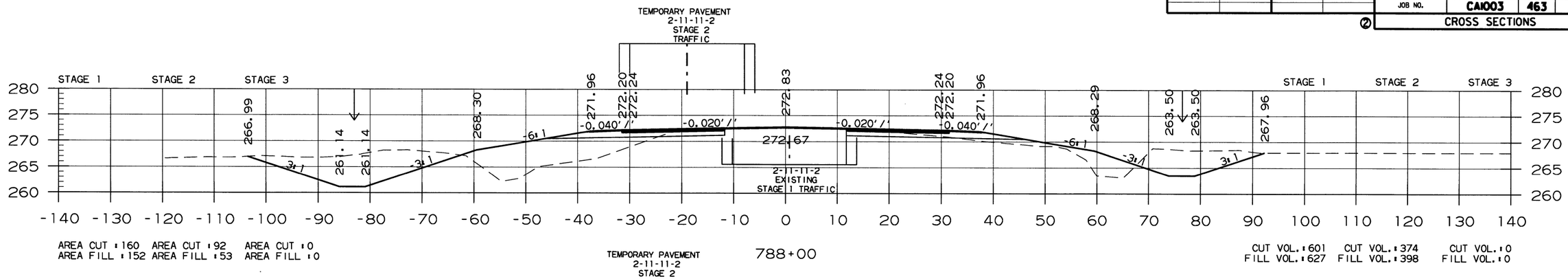
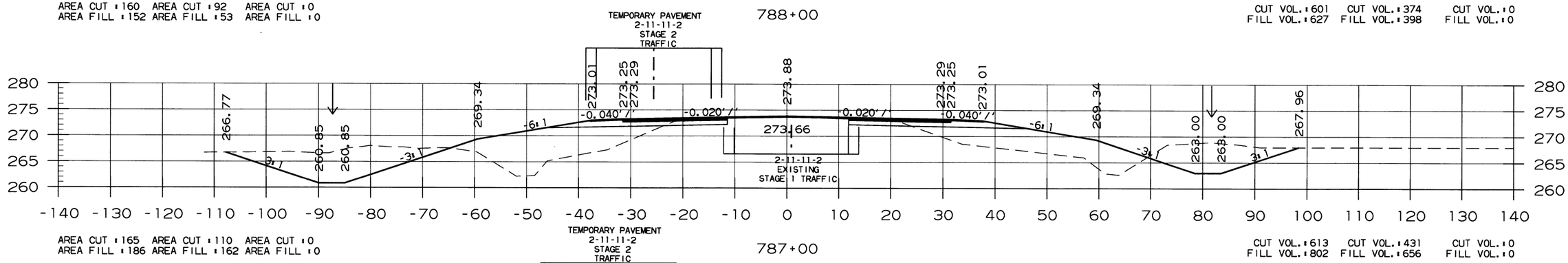
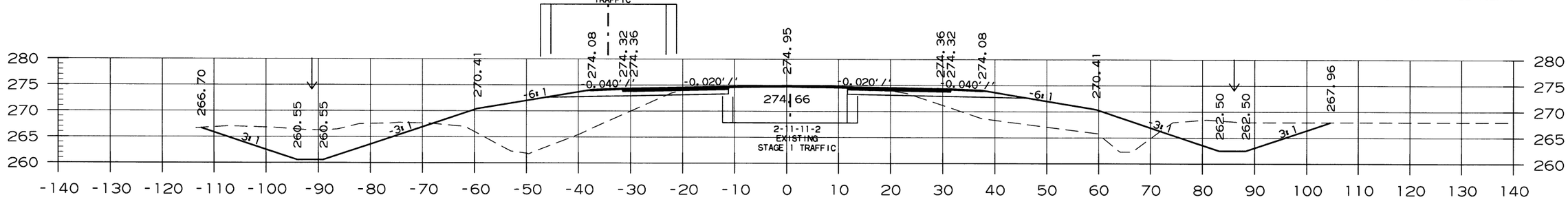
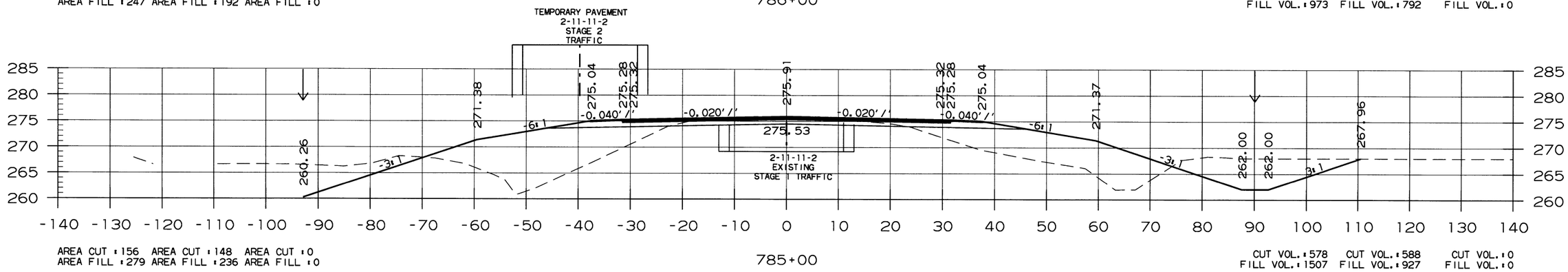
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 463 | 503 |

② CROSS SECTIONS




# CROSS SECTION
# STA. 785+00 TO STA. 788+00

1/31/2018

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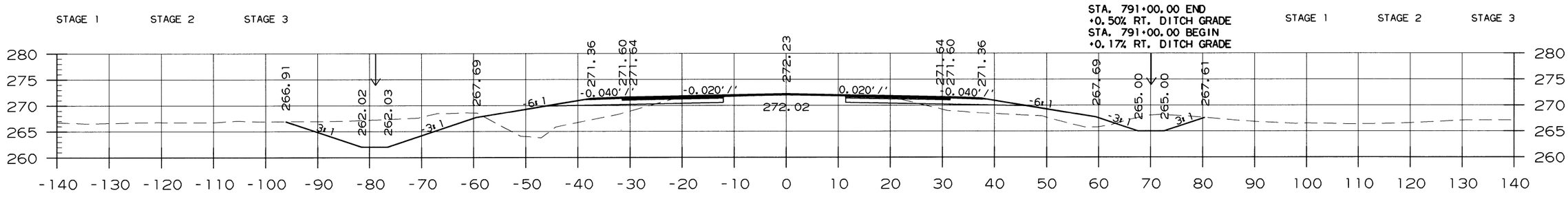
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 464 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

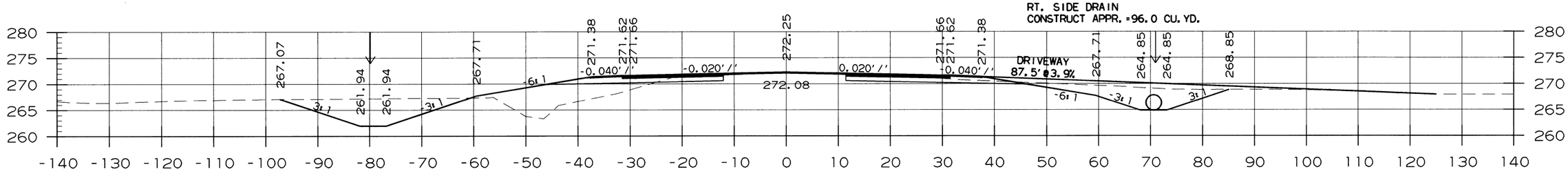



AREA CUT : 127 AREA CUT : 45 AREA CUT : 0
AREA FILL : 101 AREA FILL : 63 AREA FILL : 0

791+00

STA. 790+70 IN PLACE
30" X 45.5' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
36" X 60' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =96.0 CU. YD.

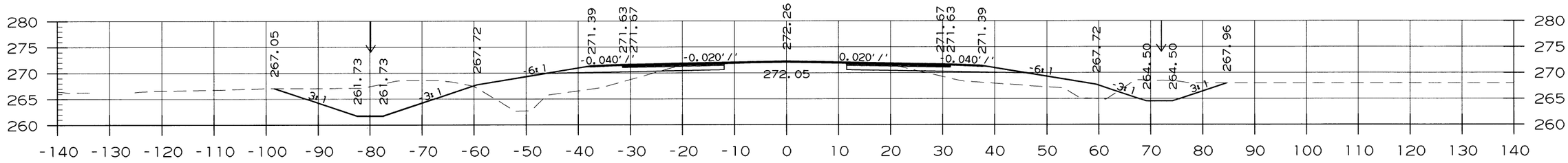
CUT VOL. : 140 CUT VOL. : 68 CUT VOL. : 0
FILL VOL. : 118 FILL VOL. : 42 FILL VOL. : 0




AREA CUT : 124 AREA CUT : 77 AREA CUT : 0
AREA FILL : 111 AREA FILL : 12 AREA FILL : 0

790+70

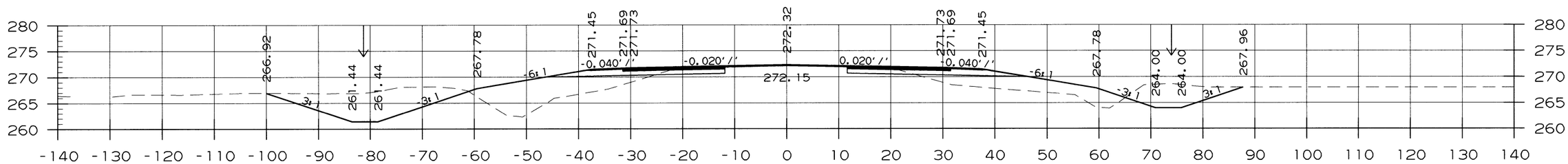
CUT VOL. : 348 CUT VOL. : 182 CUT VOL. : 0
FILL VOL. : 301 FILL VOL. : 115 FILL VOL. : 0




AREA CUT : 144 AREA CUT : 63 AREA CUT : 0
AREA FILL : 121 AREA FILL : 77 AREA FILL : 0

790+00

CUT VOL. : 534 CUT VOL. : 251 CUT VOL. : 0
FILL VOL. : 459 FILL VOL. : 311 FILL VOL. : 0




AREA CUT : 144 AREA CUT : 73 AREA CUT : 0
AREA FILL : 127 AREA FILL : 91 AREA FILL : 0

789+00

CUT VOL. : 563 CUT VOL. : 305 CUT VOL. : 0
FILL VOL. : 517 FILL VOL. : 266 FILL VOL. : 0

# CROSS SECTION
# STA. 789+00 TO STA. 791+00

2/3/2017

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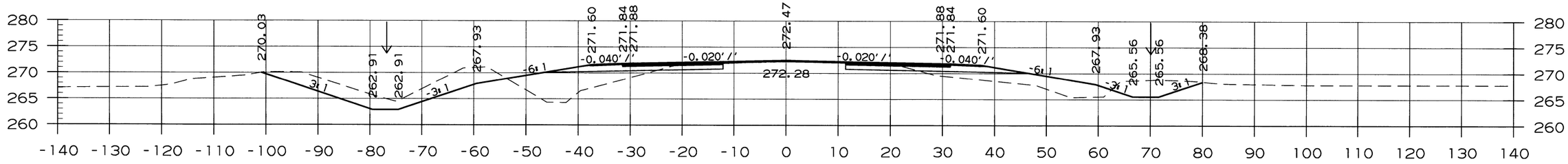
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 465 | 503 |

② CROSS SECTIONS

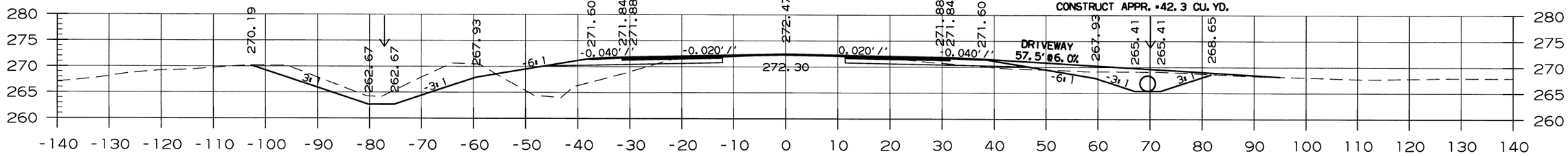



AREA CUT : 122 AREA CUT : 49 AREA CUT : 0
AREA FILL : 90 AREA FILL : 72 AREA FILL : 0

794+00

STA. 793+20 IN PLACE
30" X 23.5' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
36" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =42.3 CU. YD.

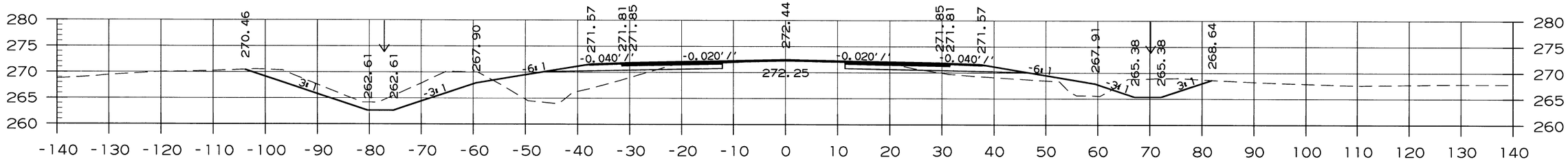
CUT VOL. : 358 CUT VOL. : 149 CUT VOL. : 0
FILL VOL. : 274 FILL VOL. : 201 FILL VOL. : 0




AREA CUT : 120 AREA CUT : 52 AREA CUT : 0
AREA FILL : 95 AREA FILL : 63 AREA FILL : 0

793+20

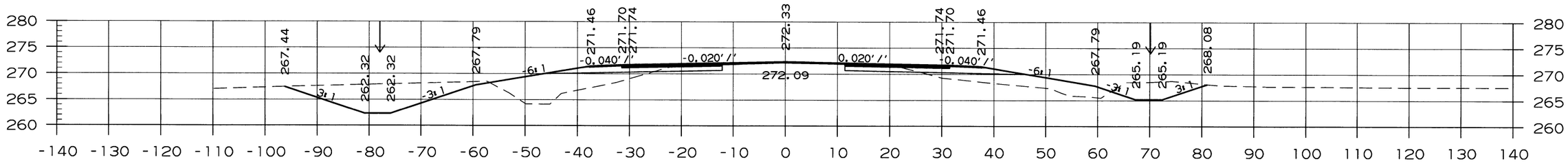
CUT VOL. : 86 CUT VOL. : 39 CUT VOL. : 0
FILL VOL. : 74 FILL VOL. : 41 FILL VOL. : 0




AREA CUT : 111 AREA CUT : 55 AREA CUT : 0
AREA FILL : 104 AREA FILL : 48 AREA FILL : 0

793+00

CUT VOL. : 453 CUT VOL. : 201 CUT VOL. : 0
FILL VOL. : 370 FILL VOL. : 217 FILL VOL. : 0




AREA CUT : 133 AREA CUT : 53 AREA CUT : 0
AREA FILL : 96 AREA FILL : 69 AREA FILL : 0

792+00

CUT VOL. : 482 CUT VOL. : 182 CUT VOL. : 0
FILL VOL. : 365 FILL VOL. : 245 FILL VOL. : 0

CROSS SECTION
STA. 792+00 TO STA. 794+00

1/31/2018

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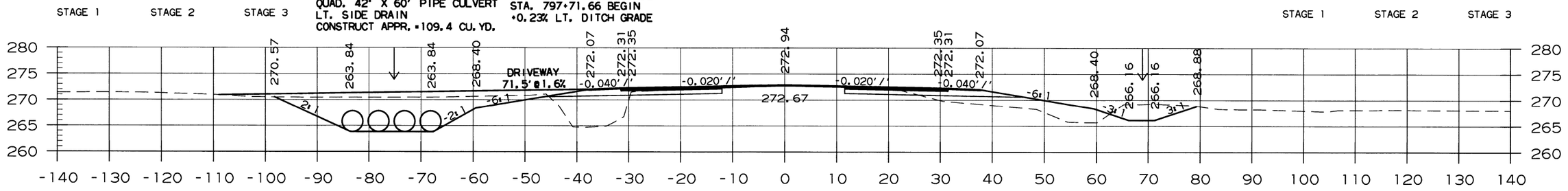
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 466 | 503 |

②

CROSS SECTIONS

STA. 797+17 IN PLACE
15' X 19' CONC. BRIDGE
REMOVE AND INSTALL
QUAD. 42" X 60" PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =109.4 CU. YD.

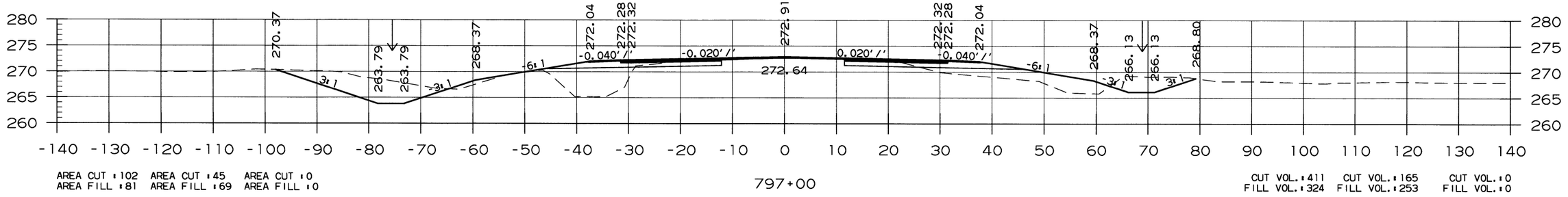
STA. 797+71.66 END
+0.29% LT. DITCH GRADE
STA. 797+71.66 BEGIN
+0.23% LT. DITCH GRADE




AREA CUT = 104 AREA CUT = 43 AREA CUT = 0
AREA FILL = 122 AREA FILL = 78 AREA FILL = 0

797+17

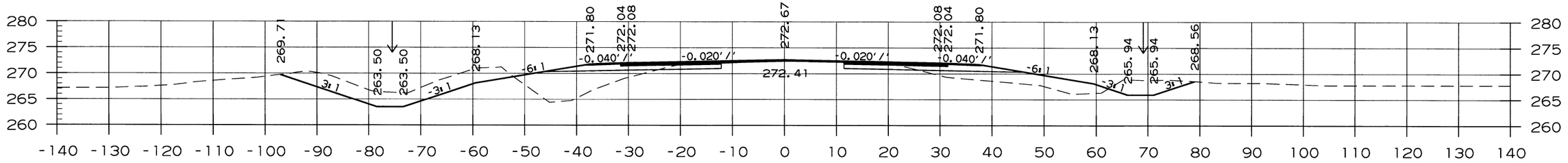
CUT VOL. = 65 CUT VOL. = 28 CUT VOL. = 0
FILL VOL. = 64 FILL VOL. = 46 FILL VOL. = 0




AREA CUT = 102 AREA CUT = 45 AREA CUT = 0
AREA FILL = 81 AREA FILL = 69 AREA FILL = 0

797+00

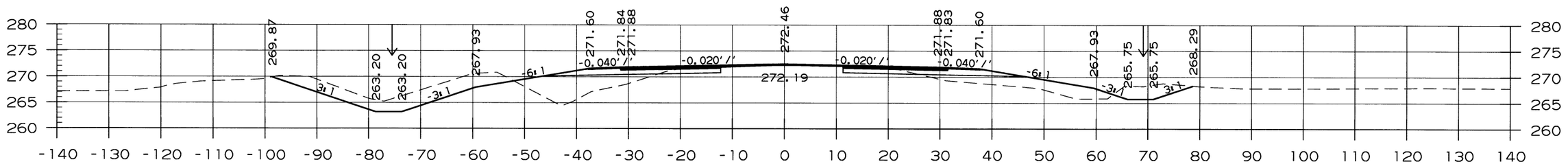
CUT VOL. = 411 CUT VOL. = 165 CUT VOL. = 0
FILL VOL. = 324 FILL VOL. = 253 FILL VOL. = 0




AREA CUT = 120 AREA CUT = 44 AREA CUT = 0
AREA FILL = 94 AREA FILL = 68 AREA FILL = 0

796+00

CUT VOL. = 434 CUT VOL. = 154 CUT VOL. = 0
FILL VOL. = 330 FILL VOL. = 246 FILL VOL. = 0




AREA CUT = 114 AREA CUT = 40 AREA CUT = 0
AREA FILL = 85 AREA FILL = 65 AREA FILL = 0

795+00

CUT VOL. = 437 CUT VOL. = 164 CUT VOL. = 0
FILL VOL. = 323 FILL VOL. = 255 FILL VOL. = 0

CROSS SECTION
STA. 795+00 TO STA. 797+17

1/31/2018

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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 |
|---|---|---|---|---|---|---|---|---|
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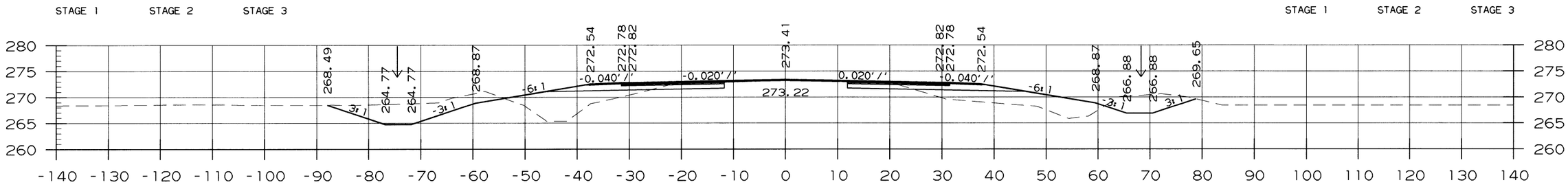
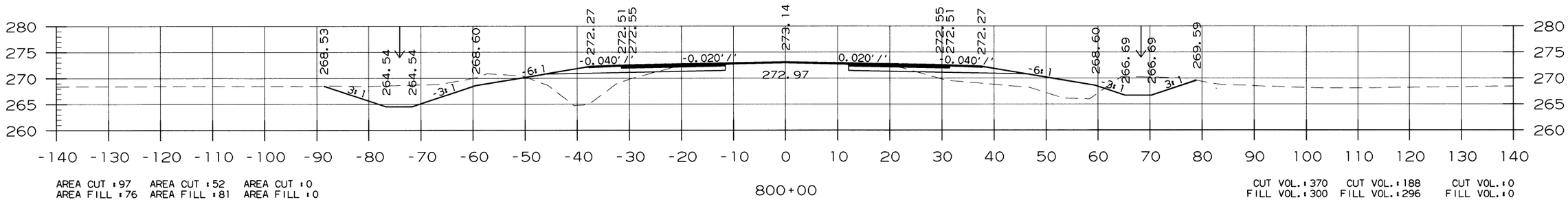
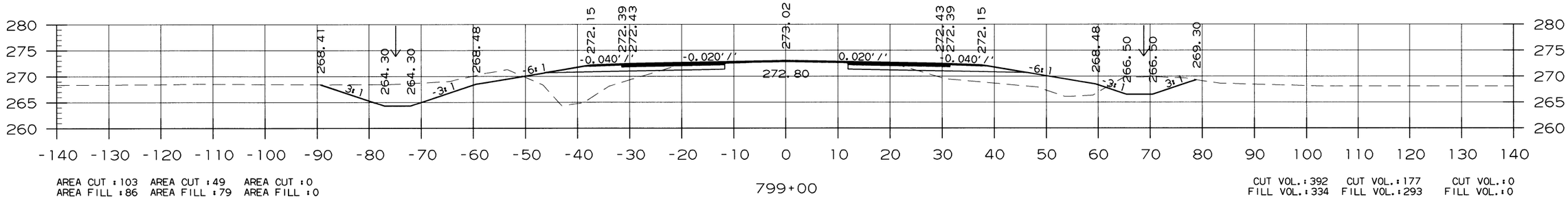
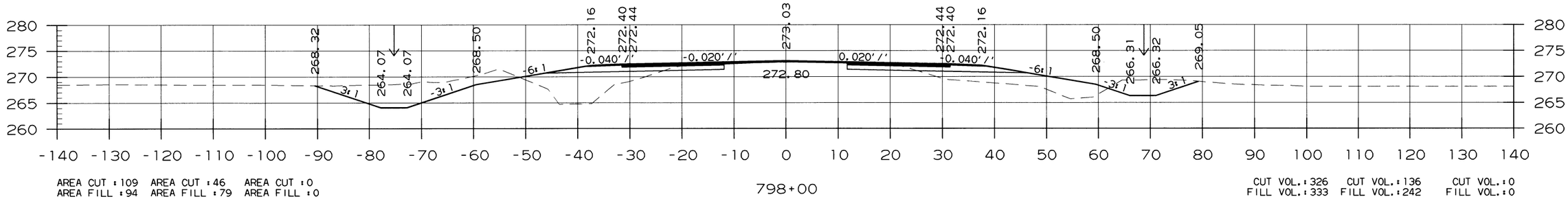
| | | | | JOB NO. | | CA1003 | 467 | 503 |
| | | | | ② | CROSS SECTIONS | | | |




# CROSS SECTION
# STA. 798+00 TO STA. 801+00

2/3/2017

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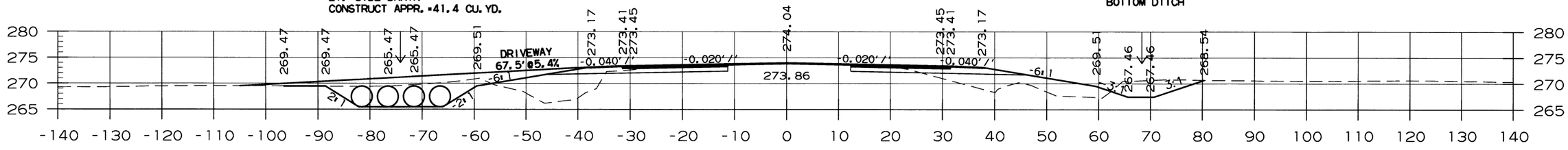
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 468 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STA. 804+01 IN PLACE
19' X 20.5' CONC. BRIDGE
REMOVE AND INSTALL
QUAD. 42" X 113' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. =41.4 CU. YD.

STA. 804+24
END 5' FLAT
BOTTOM DITCH

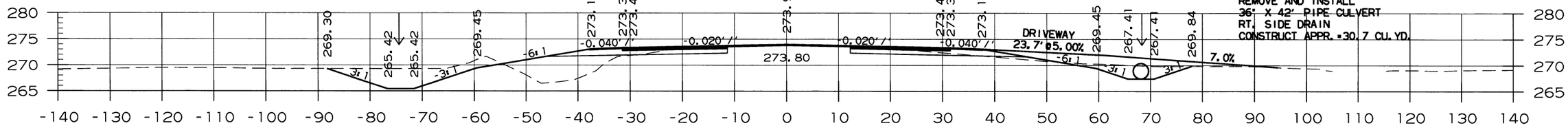



AREA CUT = 96 AREA CUT = 49 AREA CUT = 0
AREA FILL = 76 AREA FILL = 79 AREA FILL = 0

804+00

CUT VOL. = 87 CUT VOL. = 48 CUT VOL. = 0
FILL VOL. = 68 FILL VOL. = 66 FILL VOL. = 0

STA. 803+76 IN PLACE
24' X 20' R.C. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
36' X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =30.7 CU. YD.

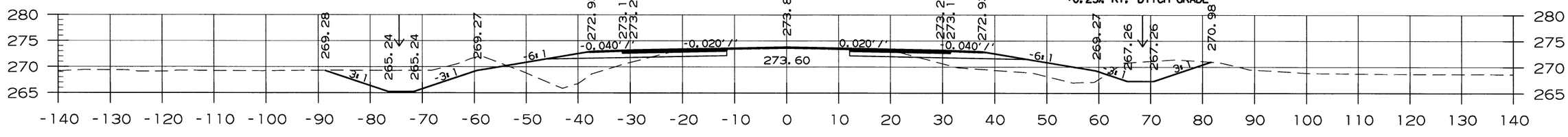



AREA CUT = 100 AREA CUT = 59 AREA CUT = 0
AREA FILL = 78 AREA FILL = 70 AREA FILL = 0

803+76

CUT VOL. = 281 CUT VOL. = 168 CUT VOL. = 0
FILL VOL. = 219 FILL VOL. = 209 FILL VOL. = 0

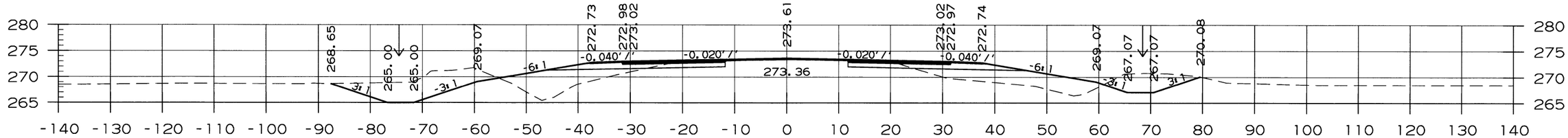
STA. 803+61.24 END
+0.17% RT. DITCH GRADE
STA. 803+61.24 BEGIN
+0.23% RT. DITCH GRADE




AREA CUT = 100 AREA CUT = 60 AREA CUT = 0
AREA FILL = 78 AREA FILL = 78 AREA FILL = 0

803+00

CUT VOL. = 376 CUT VOL. = 213 CUT VOL. = 0
FILL VOL. = 286 FILL VOL. = 301 FILL VOL. = 0




AREA CUT = 103 AREA CUT = 55 AREA CUT = 0
AREA FILL = 76 AREA FILL = 85 AREA FILL = 0

802+00

CUT VOL. = 359 CUT VOL. = 198 CUT VOL. = 0
FILL VOL. = 291 FILL VOL. = 317 FILL VOL. = 0

CROSS SECTION
STA. 802+00 TO STA. 804+00

2/8/2018

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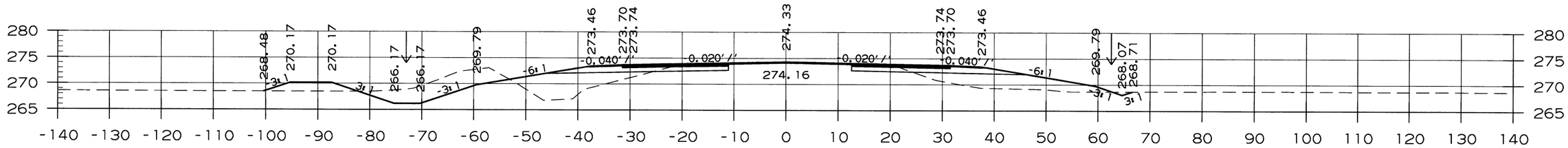
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 469 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

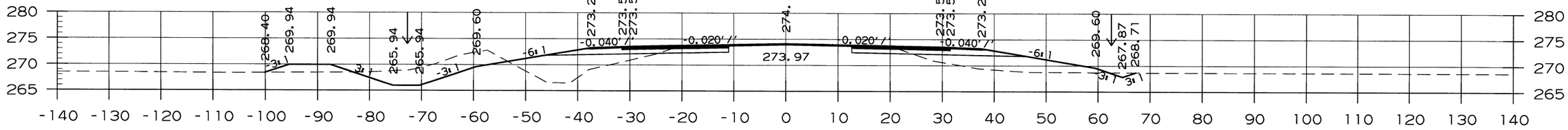
STAGE 1 STAGE 2 STAGE 3




AREA CUT = 84 AREA CUT = 11 AREA CUT = 0
AREA FILL = 101 AREA FILL = 79 AREA FILL = 0

807+00

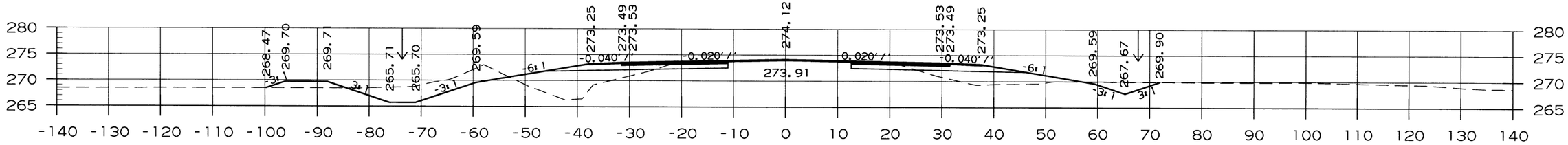
CUT VOL. = 312 CUT VOL. = 42 CUT VOL. = 0
FILL VOL. = 371 FILL VOL. = 286 FILL VOL. = 0




AREA CUT = 84 AREA CUT = 12 AREA CUT = 0
AREA FILL = 100 AREA FILL = 76 AREA FILL = 0

806+00

CUT VOL. = 305 CUT VOL. = 68 CUT VOL. = 0
FILL VOL. = 362 FILL VOL. = 243 FILL VOL. = 0




AREA CUT = 81 AREA CUT = 25 AREA CUT = 0
AREA FILL = 96 AREA FILL = 55 AREA FILL = 0

805+00

CUT VOL. = 157 CUT VOL. = 55 CUT VOL. = 0
FILL VOL. = 179 FILL VOL. = 64 FILL VOL. = 0

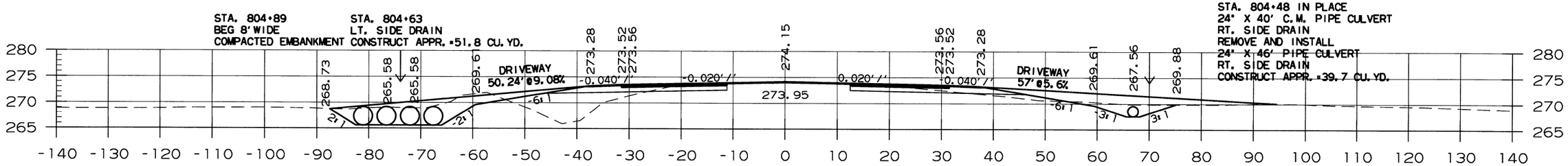
STA. 804+89
BEG 8' WIDE
COMPACTED EMBANKMENT CONSTRUCT APPR. = 51.8 CU. YD.

STA. 804+63
LT. SIDE DRAIN

DRIVEWAY
50. 24' @ 9. 08%

DRIVEWAY
57' @ 5. 6%

STA. 804+48 IN PLACE
24" X 40' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 39.7 CU. YD.




AREA CUT = 82 AREA CUT = 32 AREA CUT = 0
AREA FILL = 90 AREA FILL = 11 AREA FILL = 0

804+48

CUT VOL. = 158 CUT VOL. = 72 CUT VOL. = 0
FILL VOL. = 147 FILL VOL. = 80 FILL VOL. = 0

# CROSS SECTION
# STA. 804+48 TO STA. 807+00

2/19/2018

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|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 470 | 503 |

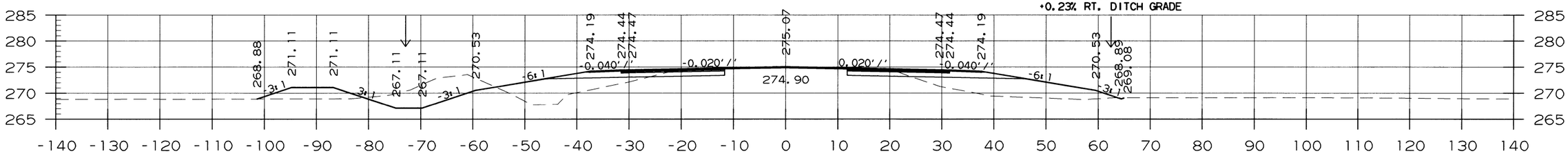
② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

STA. 811+50
END 'V'
BOTTOM DITCH

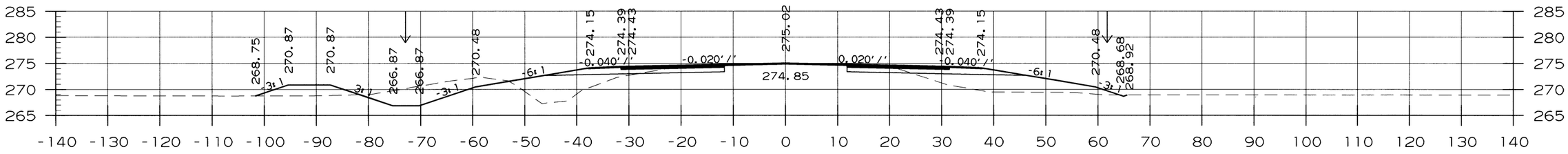
STA. 811+50.00 END
+0.23% RT. DITCH GRADE




AREA CUT : 84 AREA CUT : 11 AREA CUT : 0
AREA FILL : 107 AREA FILL : 96 AREA FILL : 0

811+00

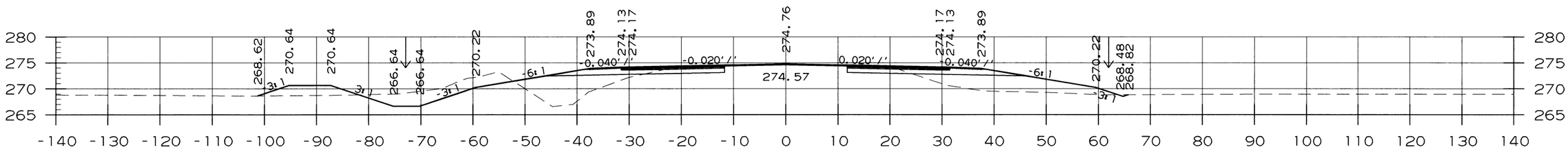
CUT VOL. : 290 CUT VOL. : 40 CUT VOL. : 0
FILL VOL. : 383 FILL VOL. : 343 FILL VOL. : 0




AREA CUT : 73 AREA CUT : 11 AREA CUT : 0
AREA FILL : 100 AREA FILL : 89 AREA FILL : 0

810+00

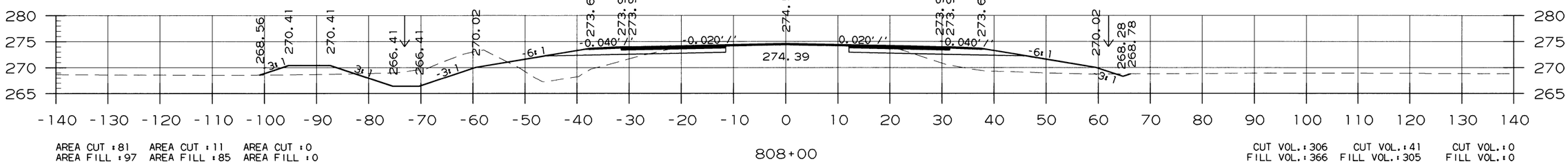
CUT VOL. : 263 CUT VOL. : 40 CUT VOL. : 0
FILL VOL. : 379 FILL VOL. : 324 FILL VOL. : 0




AREA CUT : 69 AREA CUT : 11 AREA CUT : 0
AREA FILL : 105 AREA FILL : 86 AREA FILL : 0

809+00

CUT VOL. : 277 CUT VOL. : 41 CUT VOL. : 0
FILL VOL. : 374 FILL VOL. : 317 FILL VOL. : 0




AREA CUT : 81 AREA CUT : 11 AREA CUT : 0
AREA FILL : 97 AREA FILL : 85 AREA FILL : 0

808+00

CUT VOL. : 306 CUT VOL. : 41 CUT VOL. : 0
FILL VOL. : 366 FILL VOL. : 305 FILL VOL. : 0

# CROSS SECTION
# STA. 808+00 TO STA. 811+00

2/3/2017

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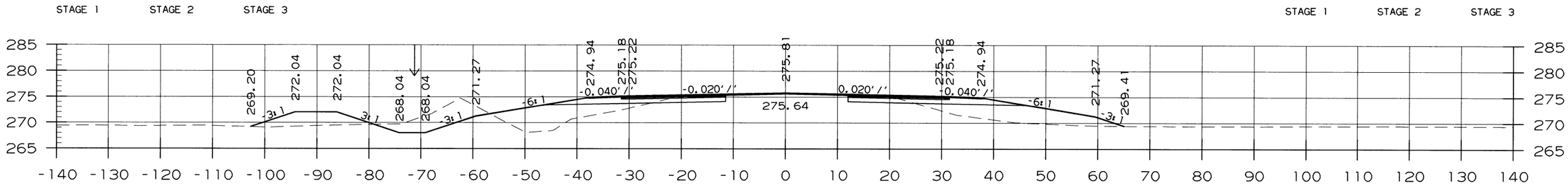
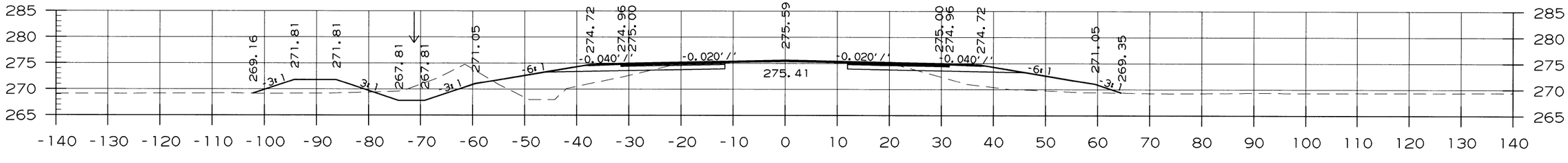
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 471 | 503 |
| | | | | ② | | CROSS SECTIONS | | |




AREA CUT : 64 AREA CUT : 10 AREA CUT : 0
AREA FILL : 126 AREA FILL : 92 AREA FILL : 0

815+00

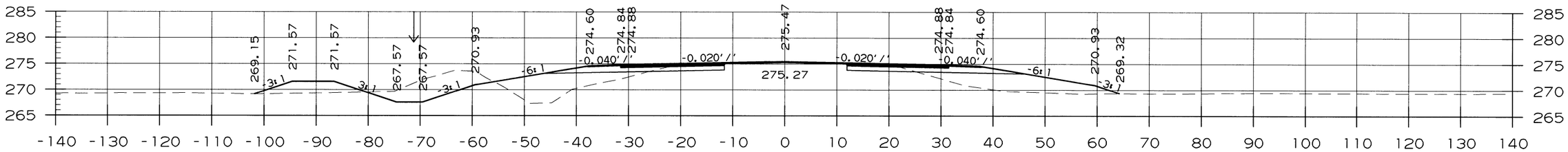
CUT VOL. : 245 CUT VOL. : 39 CUT VOL. : 0
FILL VOL. : 462 FILL VOL. : 330 FILL VOL. : 0




AREA CUT : 68 AREA CUT : 11 AREA CUT : 0
AREA FILL : 123 AREA FILL : 87 AREA FILL : 0

814+00

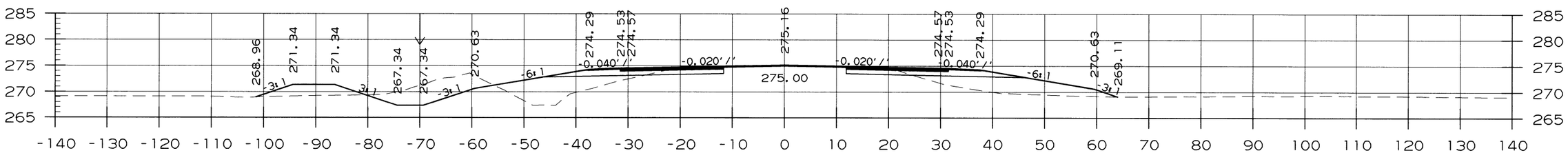
CUT VOL. : 270 CUT VOL. : 39 CUT VOL. : 0
FILL VOL. : 451 FILL VOL. : 329 FILL VOL. : 0




AREA CUT : 78 AREA CUT : 10 AREA CUT : 0
AREA FILL : 120 AREA FILL : 91 AREA FILL : 0

813+00

CUT VOL. : 283 CUT VOL. : 38 CUT VOL. : 0
FILL VOL. : 431 FILL VOL. : 325 FILL VOL. : 0




AREA CUT : 75 AREA CUT : 10 AREA CUT : 0
AREA FILL : 112 AREA FILL : 84 AREA FILL : 0

812+00

CUT VOL. : 295 CUT VOL. : 40 CUT VOL. : 0
FILL VOL. : 407 FILL VOL. : 335 FILL VOL. : 0

# CROSS SECTION
# STA. 812+00 TO STA. 815+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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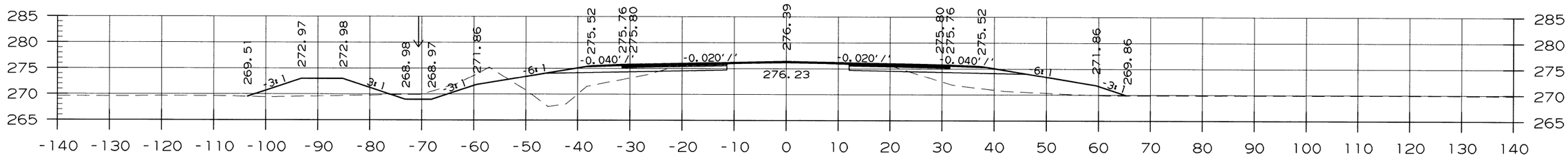
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 472 | 503 |
| ② | CROSS SECTIONS | | | |

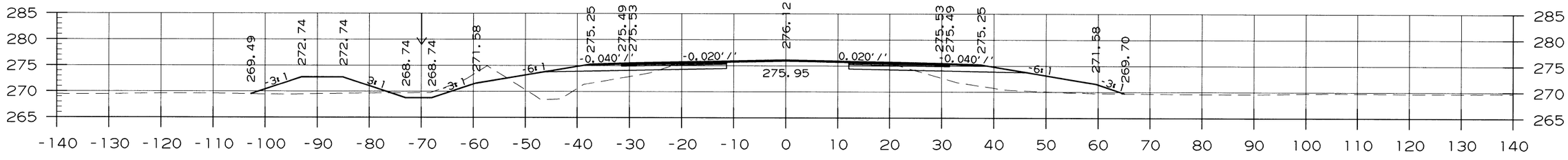
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 42 AREA CUT : 8 AREA CUT : 0
AREA FILL : 147 AREA FILL : 101 AREA FILL : 0

819+00

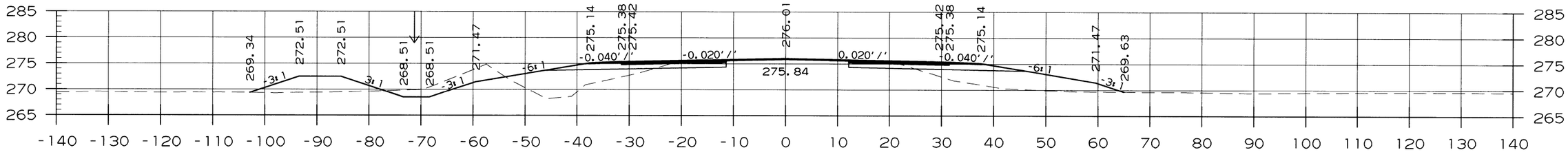
CUT VOL. : 149 CUT VOL. : 33 CUT VOL. : 0
FILL VOL. : 523 FILL VOL. : 363 FILL VOL. : 0




AREA CUT : 39 AREA CUT : 10 AREA CUT : 0
AREA FILL : 135 AREA FILL : 95 AREA FILL : 0

818+00

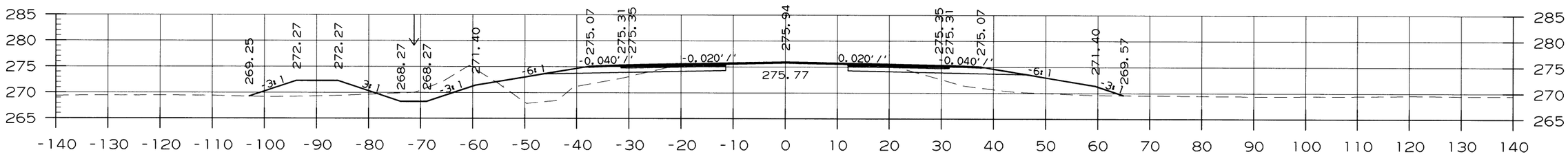
CUT VOL. : 167 CUT VOL. : 37 CUT VOL. : 0
FILL VOL. : 503 FILL VOL. : 351 FILL VOL. : 0




AREA CUT : 51 AREA CUT : 10 AREA CUT : 0
AREA FILL : 136 AREA FILL : 95 AREA FILL : 0

817+00

CUT VOL. : 207 CUT VOL. : 39 CUT VOL. : 0
FILL VOL. : 495 FILL VOL. : 345 FILL VOL. : 0




AREA CUT : 61 AREA CUT : 10 AREA CUT : 0
AREA FILL : 131 AREA FILL : 91 AREA FILL : 0

816+00

CUT VOL. : 231 CUT VOL. : 38 CUT VOL. : 0
FILL VOL. : 477 FILL VOL. : 339 FILL VOL. : 0

# CROSS SECTION
# STA. 816+00 TO STA. 819+00

2/3/2017

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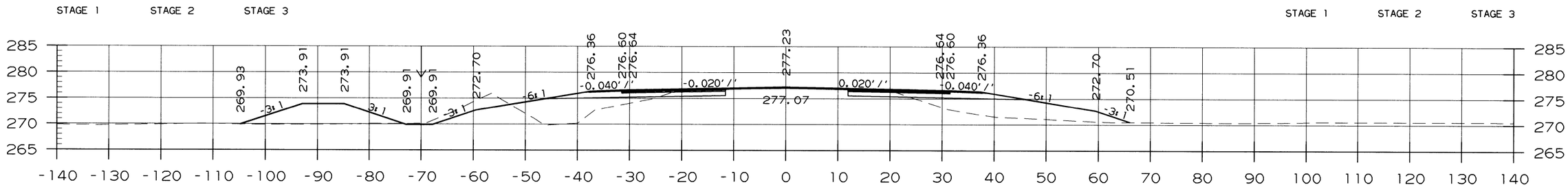
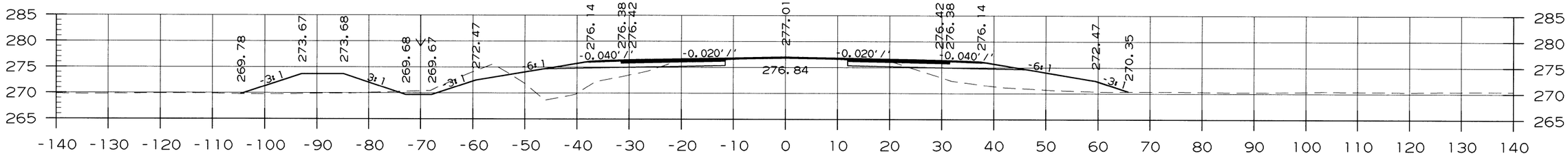
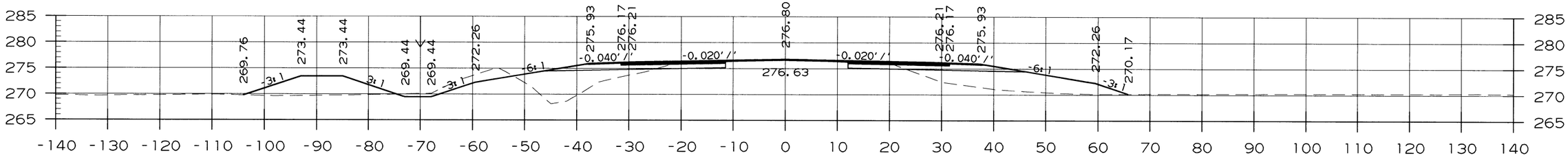
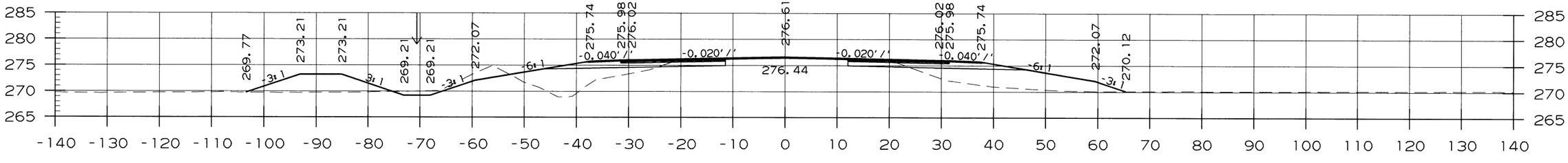
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 473 | 503 |

CROSS SECTIONS




CROSS SECTION
STA. 820+00 TO STA. 823+00

2/3/2017

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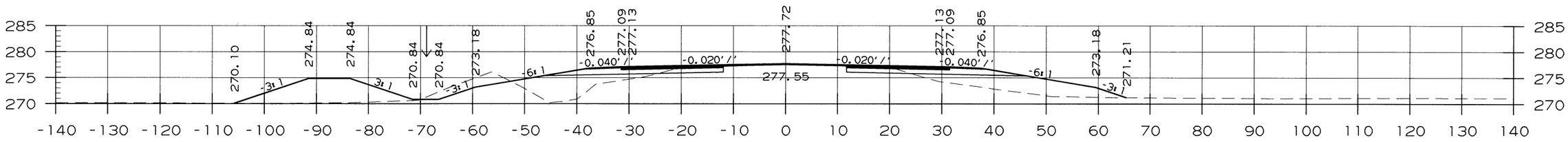
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 474 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

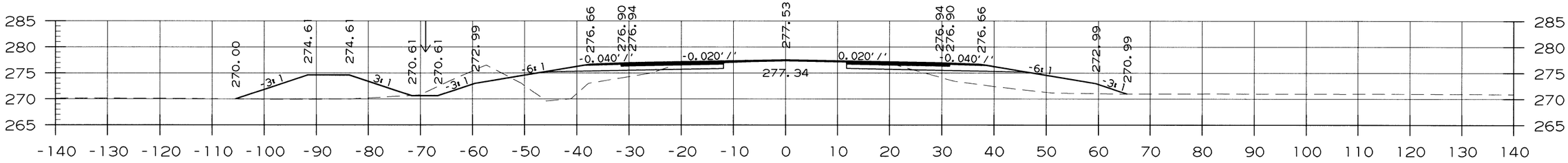



AREA CUT : 33 AREA CUT : 10 AREA CUT : 0
AREA FILL : 174 AREA FILL : 90 AREA FILL : 0

827+00

STAGE 1 STAGE 2 STAGE 3

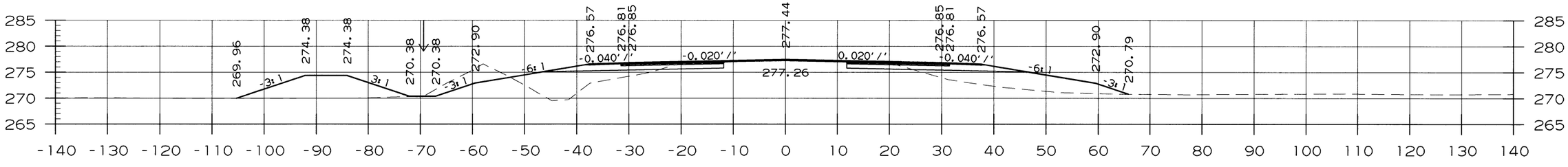
CUT VOL. : 139 CUT VOL. : 38 CUT VOL. : 0
FILL VOL. : 650 FILL VOL. : 342 FILL VOL. : 0




AREA CUT : 42 AREA CUT : 11 AREA CUT : 0
AREA FILL : 177 AREA FILL : 94 AREA FILL : 0

826+00

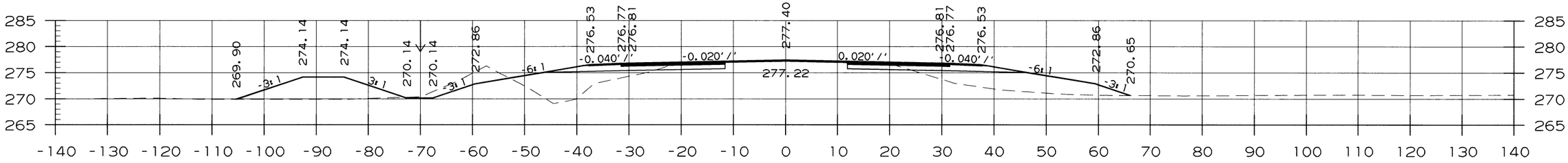
CUT VOL. : 151 CUT VOL. : 39 CUT VOL. : 0
FILL VOL. : 641 FILL VOL. : 349 FILL VOL. : 0




AREA CUT : 40 AREA CUT : 11 AREA CUT : 0
AREA FILL : 169 AREA FILL : 94 AREA FILL : 0

825+00

CUT VOL. : 145 CUT VOL. : 38 CUT VOL. : 0
FILL VOL. : 622 FILL VOL. : 367 FILL VOL. : 0




AREA CUT : 39 AREA CUT : 10 AREA CUT : 0
AREA FILL : 166 AREA FILL : 104 AREA FILL : 0

824+00

CUT VOL. : 133 CUT VOL. : 37 CUT VOL. : 0
FILL VOL. : 599 FILL VOL. : 387 FILL VOL. : 0

# CROSS SECTION
# STA. 824+00 TO STA. 827+00

2/3/2017

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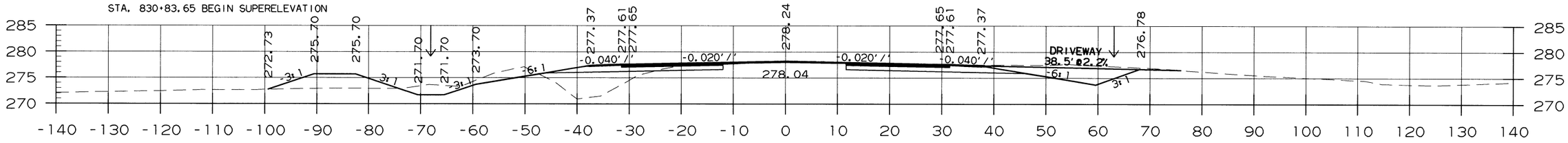
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 475 | 503 |
| | | | | ② | | CROSS SECTIONS | | |

STAGE 1 STAGE 2 STAGE 3

STAGE 1 STAGE 2 STAGE 3

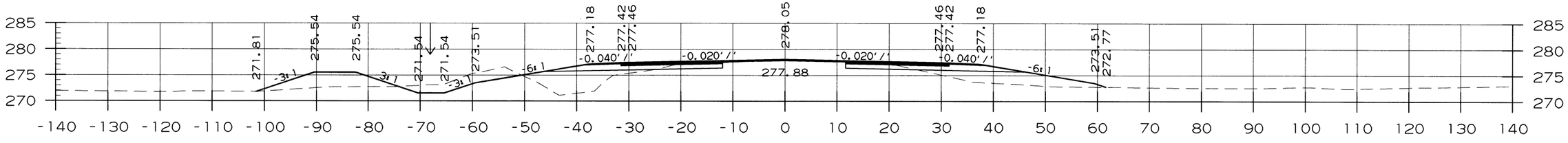
STA. 830+83.65 BEGIN SUPERELEVATION




AREA CUT : 42 AREA CUT : 37 AREA CUT : 0
AREA FILL : 111 AREA FILL : 6 AREA FILL : 0

830+66

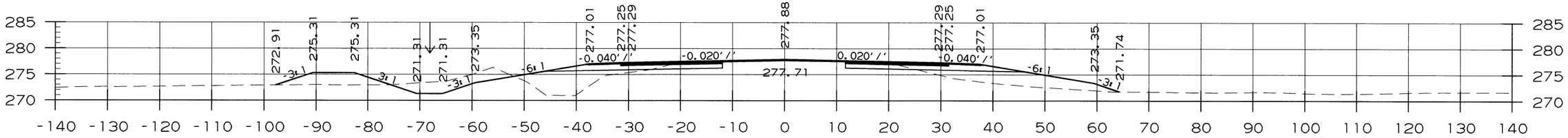
CUT VOL. : 105 CUT VOL. : 58 CUT VOL. : 0
FILL VOL. : 276 FILL VOL. : 86 FILL VOL. : 0




AREA CUT : 44 AREA CUT : 10 AREA CUT : 0
AREA FILL : 114 AREA FILL : 64 AREA FILL : 0

830+00

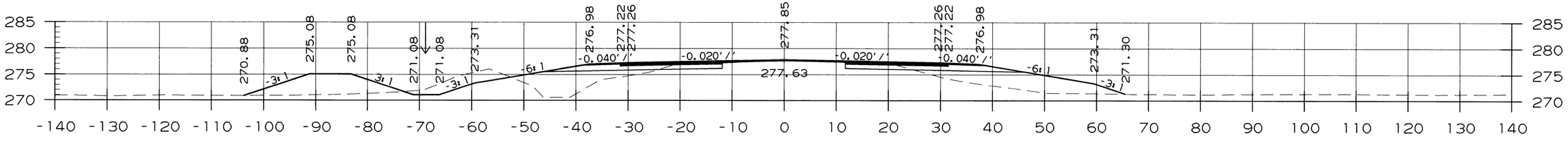
CUT VOL. : 175 CUT VOL. : 38 CUT VOL. : 0
FILL VOL. : 395 FILL VOL. : 250 FILL VOL. : 0




AREA CUT : 50 AREA CUT : 11 AREA CUT : 0
AREA FILL : 99 AREA FILL : 71 AREA FILL : 0

829+00

CUT VOL. : 169 CUT VOL. : 40 CUT VOL. : 0
FILL VOL. : 464 FILL VOL. : 301 FILL VOL. : 0




AREA CUT : 41 AREA CUT : 11 AREA CUT : 0
AREA FILL : 151 AREA FILL : 92 AREA FILL : 0

828+00

CUT VOL. : 138 CUT VOL. : 38 CUT VOL. : 0
FILL VOL. : 603 FILL VOL. : 337 FILL VOL. : 0

# CROSS SECTION
# STA. 828+00 TO STA. 830+66

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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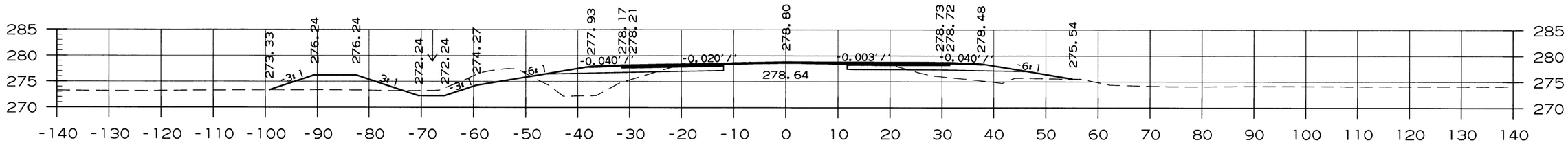
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 476 | 503 |
| ② | CROSS SECTIONS | | | |

STAGE 1 STAGE 2 STAGE 3

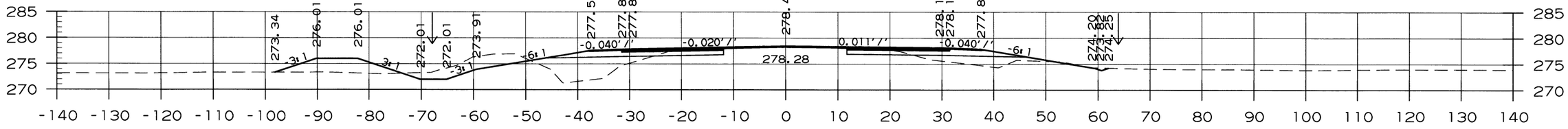
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 47 AREA CUT : 9 AREA CUT : 0
AREA FILL : 116 AREA FILL : 48 AREA FILL : 0

833+00

CUT VOL. : 183 CUT VOL. : 35 CUT VOL. : 0
FILL VOL. : 421 FILL VOL. : 155 FILL VOL. : 0

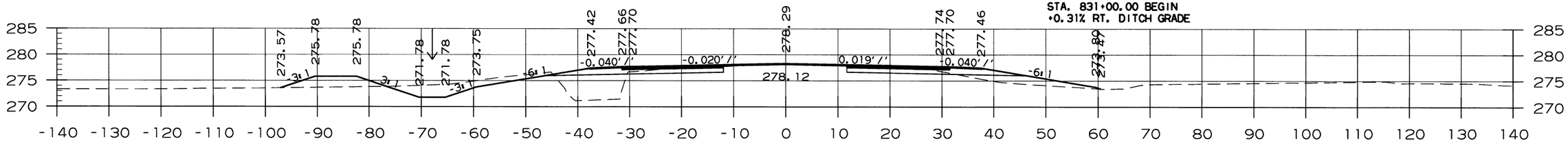



AREA CUT : 52 AREA CUT : 10 AREA CUT : 0
AREA FILL : 112 AREA FILL : 36 AREA FILL : 0

832+00

CUT VOL. : 197 CUT VOL. : 49 CUT VOL. : 0
FILL VOL. : 369 FILL VOL. : 132 FILL VOL. : 0

STA. 831+00.00 BEGIN
+0.31% RT. DITCH GRADE

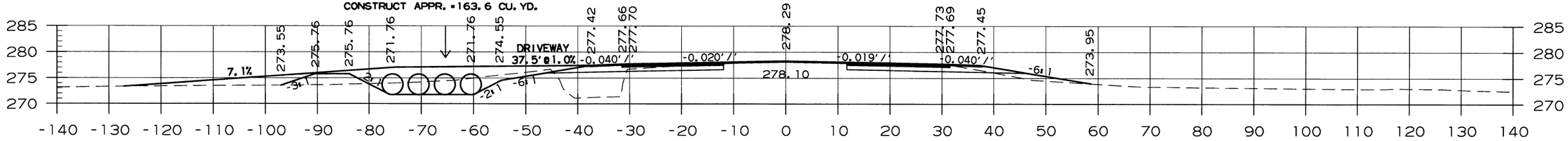



AREA CUT : 55 AREA CUT : 16 AREA CUT : 0
AREA FILL : 87 AREA FILL : 35 AREA FILL : 0

STA. 830+89 IN PLACE
15' X 19.3' CONC. BRIDGE
WITH RETAINING WALLS
REMOVE AND INSTALL
QUAD. 42" X 72" PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 163.6 CU. YD.

831+00

CUT VOL. : 12 CUT VOL. : 5 CUT VOL. : 0
FILL VOL. : 21 FILL VOL. : 6 FILL VOL. : 0




AREA CUT : 53 AREA CUT : 27 AREA CUT : 0
AREA FILL : 103 AREA FILL : 21 AREA FILL : 0

830+94

CUT VOL. : 49 CUT VOL. : 33 CUT VOL. : 0
FILL VOL. : 111 FILL VOL. : 14 FILL VOL. : 0

# CROSS SECTION
# STA. 830+94 TO STA. 833+00

2/8/2018

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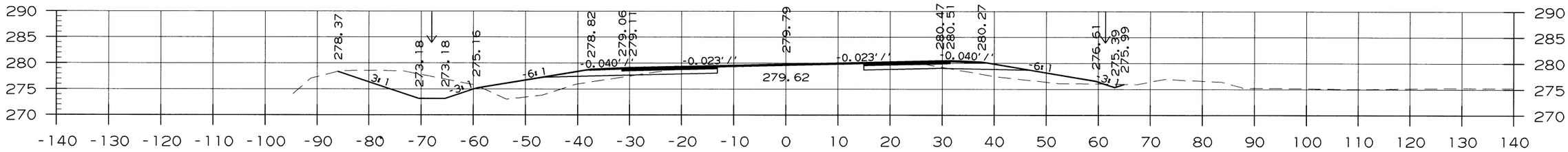
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 477 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

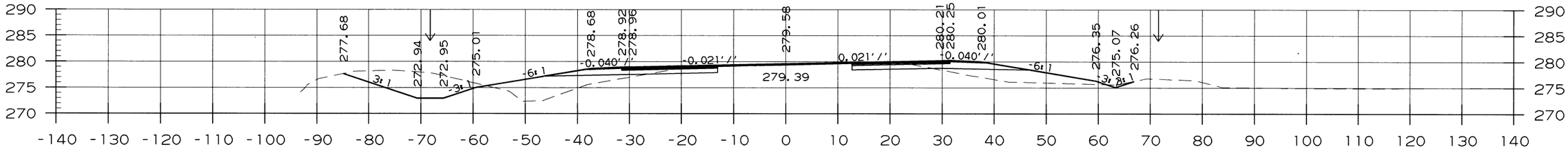



AREA CUT : 85 AREA CUT : 14 AREA CUT : 0
AREA FILL : 58 AREA FILL : 39 AREA FILL : 0

837+00

CUT VOL. : 323 CUT VOL. : 51 CUT VOL. : 0
FILL VOL. : 239 FILL VOL. : 169 FILL VOL. : 0

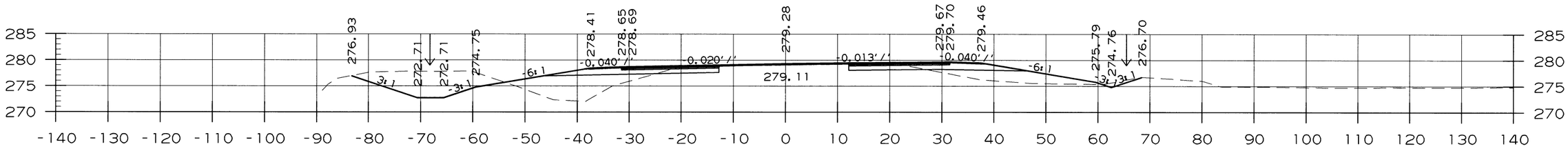
STA. 836+23.65 MAX. SUPERELEVATION (.023 FT./FT.)




AREA CUT : 89 AREA CUT : 14 AREA CUT : 0
AREA FILL : 70 AREA FILL : 52 AREA FILL : 0

836+00

CUT VOL. : 355 CUT VOL. : 54 CUT VOL. : 0
FILL VOL. : 287 FILL VOL. : 192 FILL VOL. : 0



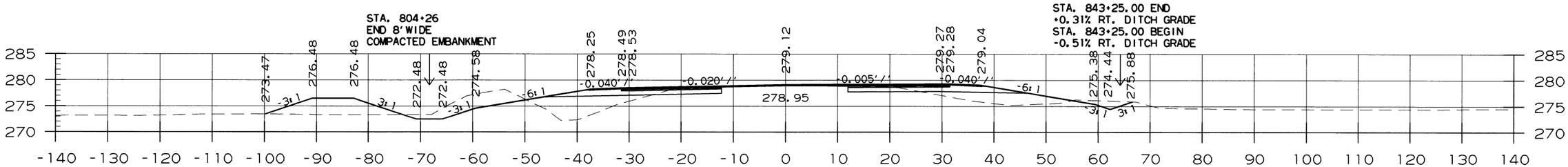

AREA CUT : 102 AREA CUT : 15 AREA CUT : 0
AREA FILL : 85 AREA FILL : 52 AREA FILL : 0

835+00

CUT VOL. : 290 CUT VOL. : 60 CUT VOL. : 0
FILL VOL. : 373 FILL VOL. : 183 FILL VOL. : 0

STA. 804+26
END 8' WIDE
COMPACTED EMBANKMENT

STA. 843+25.00 END
+0.31% RT. DITCH GRADE
STA. 843+25.00 BEGIN
-0.51% RT. DITCH GRADE




AREA CUT : 54 AREA CUT : 17 AREA CUT : 0
AREA FILL : 117 AREA FILL : 47 AREA FILL : 0

834+00

CUT VOL. : 187 CUT VOL. : 47 CUT VOL. : 0
FILL VOL. : 431 FILL VOL. : 175 FILL VOL. : 0

# CROSS SECTION
# STA. 834+00 TO STA. 837+00

2/3/2017

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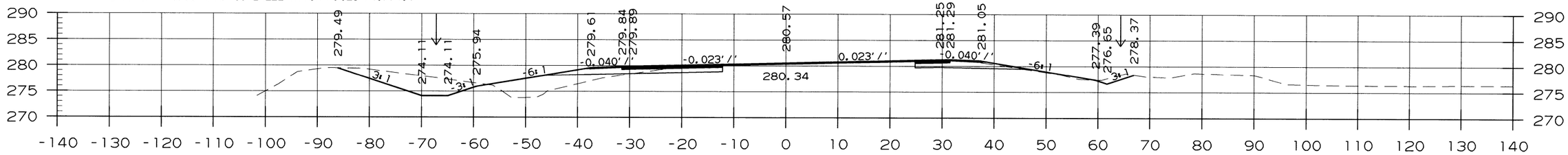
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 478 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

STA. 841+15.95 MAX. SUPERELEVATION (.023 FT./FT.)

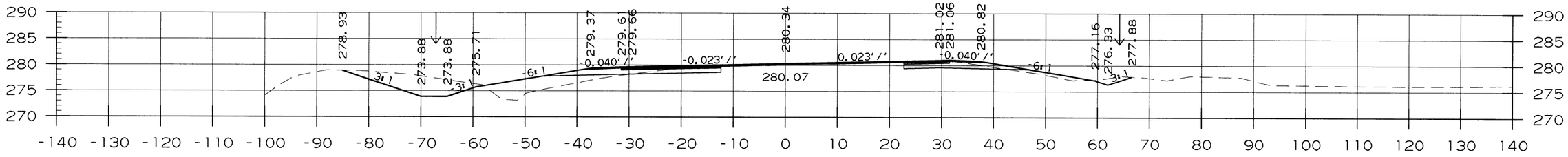



STAGE 1 STAGE 2 STAGE 3

AREA CUT :75 AREA CUT :22 AREA CUT :0
AREA FILL :57 AREA FILL :3 AREA FILL :0

841+00

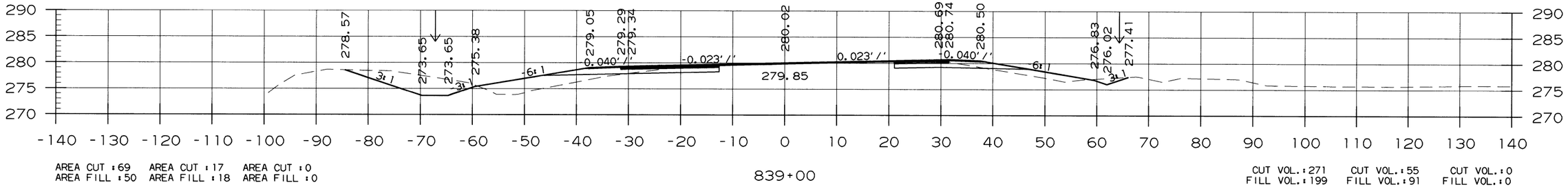
CUT VOL.:271 CUT VOL.:80 CUT VOL.:0
FILL VOL.:199 FILL VOL.:25 FILL VOL.:0




AREA CUT :72 AREA CUT :21 AREA CUT :0
AREA FILL :55 AREA FILL :10 AREA FILL :0

840+00

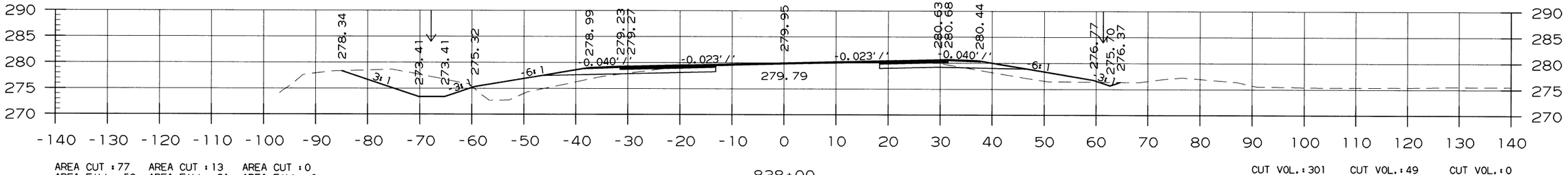
CUT VOL.:261 CUT VOL.:70 CUT VOL.:0
FILL VOL.:193 FILL VOL.:53 FILL VOL.:0




AREA CUT :69 AREA CUT :17 AREA CUT :0
AREA FILL :50 AREA FILL :18 AREA FILL :0

839+00

CUT VOL.:271 CUT VOL.:55 CUT VOL.:0
FILL VOL.:199 FILL VOL.:91 FILL VOL.:0




AREA CUT :77 AREA CUT :13 AREA CUT :0
AREA FILL :58 AREA FILL :31 AREA FILL :0

838+00

CUT VOL.:301 CUT VOL.:49 CUT VOL.:0
FILL VOL.:216 FILL VOL.:129 FILL VOL.:0

# CROSS SECTION
# STA. 838+00 TO STA. 841+00

2/3/2017

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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 |
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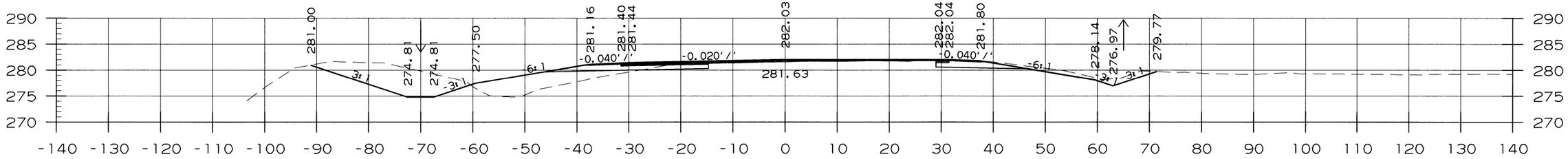
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 479 | 503 |

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3

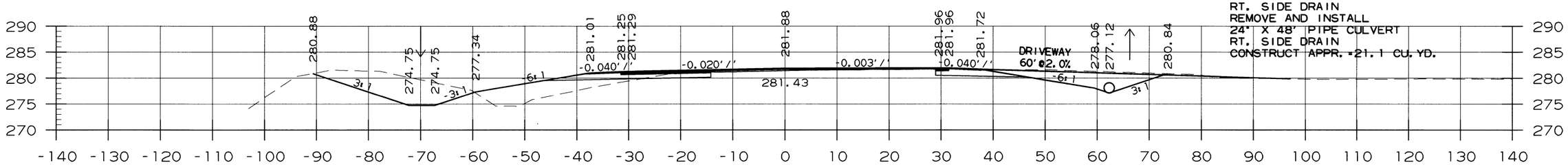



AREA CUT : 113 AREA CUT : 36 AREA CUT : 0
AREA FILL : 78 AREA FILL : 3 AREA FILL : 0

844+00

CUT VOL. : 118 CUT VOL. : 31 CUT VOL. : 0
FILL VOL. : 84 FILL VOL. : 4 FILL VOL. : 0

STA. 843+71 IN PLACE
48" X 30' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. -21.1 CU. YD.

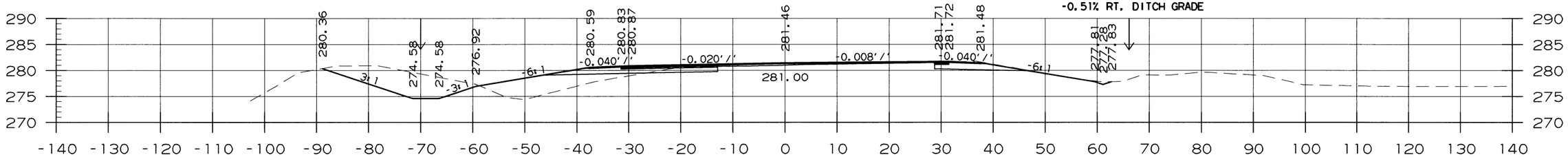



AREA CUT : 107 AREA CUT : 21 AREA CUT : 0
AREA FILL : 79 AREA FILL : 4 AREA FILL : 0

843+71

CUT VOL. : 273 CUT VOL. : 52 CUT VOL. : 0
FILL VOL. : 204 FILL VOL. : 11 FILL VOL. : 0

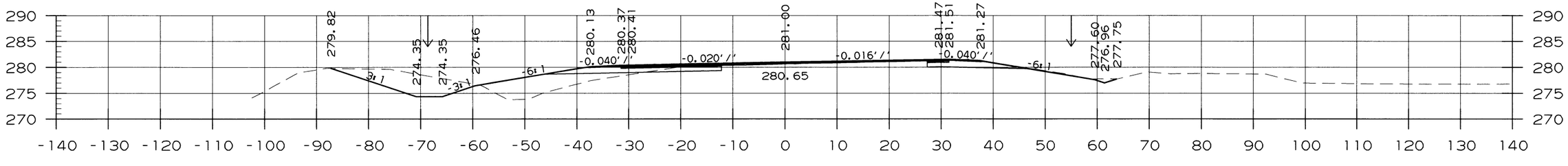
STA. 843+25.00 END
+0.31% RT. DITCH GRADE
STA. 844+79.14 BEGIN
-0.51% RT. DITCH GRADE




AREA CUT : 100 AREA CUT : 18 AREA CUT : 0
AREA FILL : 76 AREA FILL : 4 AREA FILL : 0

843+00

CUT VOL. : 334 CUT VOL. : 73 CUT VOL. : 0
FILL VOL. : 277 FILL VOL. : 14 FILL VOL. : 0




AREA CUT : 80 AREA CUT : 21 AREA CUT : 0
AREA FILL : 74 AREA FILL : 3 AREA FILL : 0

842+00

CUT VOL. : 286 CUT VOL. : 81 CUT VOL. : 0
FILL VOL. : 243 FILL VOL. : 12 FILL VOL. : 0

# CROSS SECTION
# STA. 842+00 TO STA. 844+00

2/3/2017

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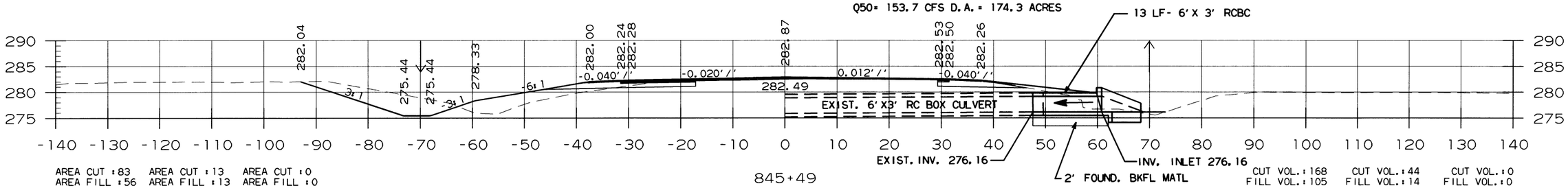
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 480 | 503 |

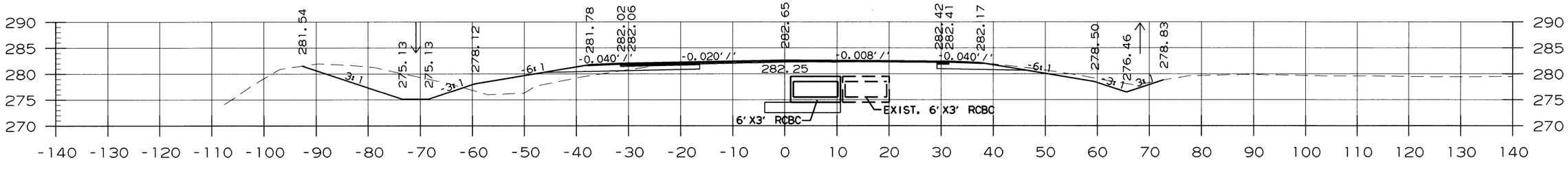
② CROSS SECTIONS

STA. 844+84 IN PLACE
6' X 3' X 123' R.C. BOX CULVERT
45° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
REMOVE WINGS LT. & RT. & EXTEND
R.C. BOX CULVERT 37' LT. AND 13' RT.
6' X 3' R.C. BOX CULVERT = 50 LIN. FT.
CONSTRUCT 6' X 3' X 170' R.C. BOX CULVERT
45° RT. FWD. SKEW
ADJACENT TO EXISTING
WITH 3:1 WINGS LT. & RT.
Q50= 153.7 CFS D.A.= 174.3 ACRES

STA. 845+60.00 END
-0.51% RT. DITCH GRADE
STA. 845+60.00 BEGIN
+0.13% RT. DITCH GRADE



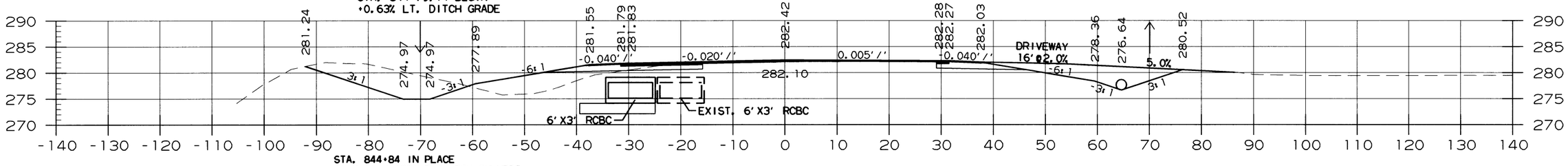

AREA CUT : 83 AREA CUT : 13 AREA CUT : 0
AREA FILL : 56 AREA FILL : 13 AREA FILL : 0
CUT VOL. : 168 CUT VOL. : 44 CUT VOL. : 0
FILL VOL. : 105 FILL VOL. : 14 FILL VOL. : 0




AREA CUT : 102 AREA CUT : 36 AREA CUT : 0
AREA FILL : 60 AREA FILL : 2 AREA FILL : 0
CUT VOL. : 138 CUT VOL. : 77 CUT VOL. : 0
FILL VOL. : 100 FILL VOL. : 3 FILL VOL. : 0

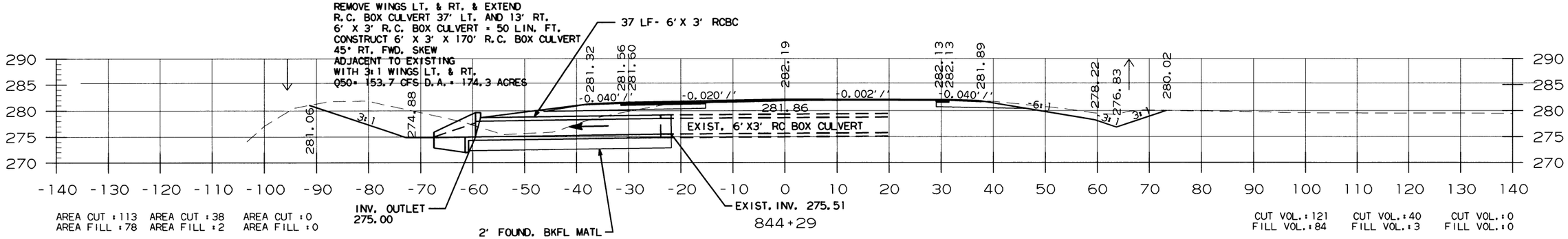
STA. 844+79.14 END
+0.23% LT. DITCH GRADE
STA. 844+79.14 BEGIN
+0.63% LT. DITCH GRADE

STA. 844+65 INSTALL
24" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. =41.5 CU. YD.




AREA CUT : 207 AREA CUT : 83 AREA CUT : 0
AREA FILL : 62 AREA FILL : 1 AREA FILL : 0
CUT VOL. : 149 CUT VOL. : 81 CUT VOL. : 0
FILL VOL. : 115 FILL VOL. : 3 FILL VOL. : 0

STA. 844+84 IN PLACE
6' X 3' X 123' R.C. BOX CULVERT
45° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
REMOVE WINGS LT. & RT. & EXTEND
R.C. BOX CULVERT 37' LT. AND 13' RT.
6' X 3' R.C. BOX CULVERT = 50 LIN. FT.
CONSTRUCT 6' X 3' X 170' R.C. BOX CULVERT
45° RT. FWD. SKEW
ADJACENT TO EXISTING
WITH 3:1 WINGS LT. & RT.
Q50= 153.7 CFS D.A.= 174.3 ACRES




AREA CUT : 113 AREA CUT : 38 AREA CUT : 0
AREA FILL : 78 AREA FILL : 2 AREA FILL : 0
CUT VOL. : 121 CUT VOL. : 40 CUT VOL. : 0
FILL VOL. : 84 FILL VOL. : 3 FILL VOL. : 0

# CROSS SECTION
# STA. 844+29 TO STA. 845+49

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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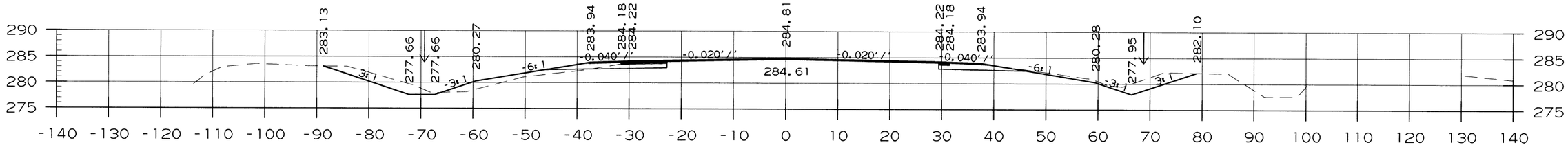
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 481 | 503 |

② CROSS SECTIONS

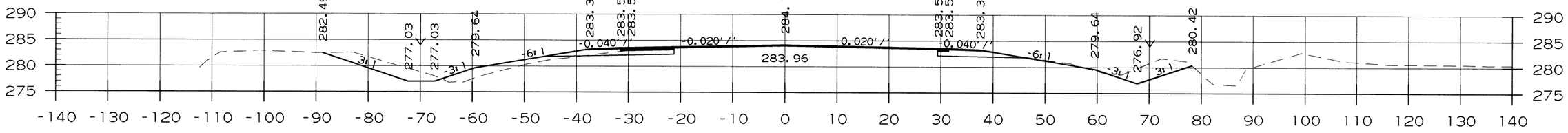
STAGE 1 STAGE 2 STAGE 3




AREA CUT : 40 AREA CUT : 43 AREA CUT : 0
AREA FILL : 27 AREA FILL : 0 AREA FILL : 0

849+00

CUT VOL. : 164 CUT VOL. : 165 CUT VOL. : 0
FILL VOL. : 109 FILL VOL. : 2 FILL VOL. : 0

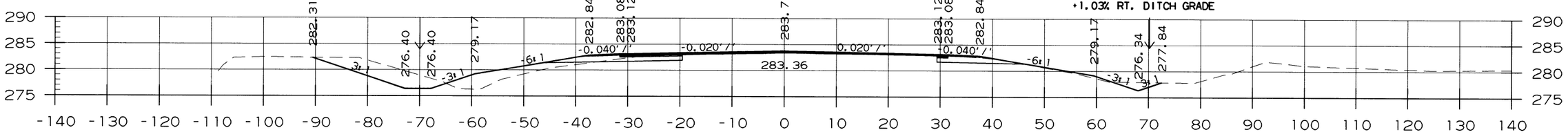



AREA CUT : 49 AREA CUT : 45 AREA CUT : 0
AREA FILL : 32 AREA FILL : 1 AREA FILL : 0

848+00

CUT VOL. : 213 CUT VOL. : 119 CUT VOL. : 0
FILL VOL. : 147 FILL VOL. : 15 FILL VOL. : 0

STA. 847+50.00 END
+0.13% RT. DITCH GRADE
STA. 847+50.00 BEGIN
+1.03% RT. DITCH GRADE

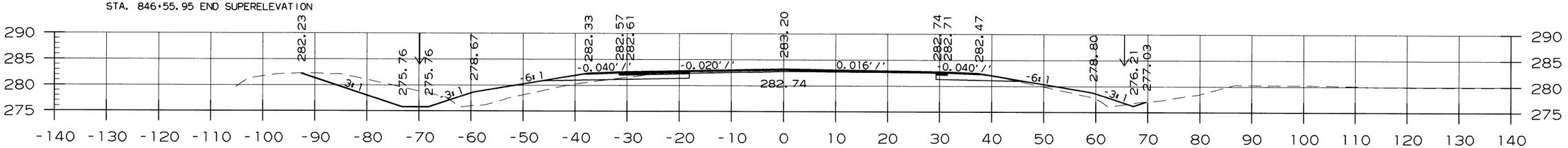



AREA CUT : 66 AREA CUT : 19 AREA CUT : 0
AREA FILL : 47 AREA FILL : 7 AREA FILL : 0

847+00

CUT VOL. : 263 CUT VOL. : 59 CUT VOL. : 0
FILL VOL. : 195 FILL VOL. : 49 FILL VOL. : 0

STA. 846+55.95 END SUPERELEVATION




AREA CUT : 76 AREA CUT : 13 AREA CUT : 0
AREA FILL : 58 AREA FILL : 20 AREA FILL : 0

846+00

CUT VOL. : 149 CUT VOL. : 24 CUT VOL. : 0
FILL VOL. : 107 FILL VOL. : 31 FILL VOL. : 0

# CROSS SECTION
# STA. 846+00 TO STA. 849+00

2/3/2017

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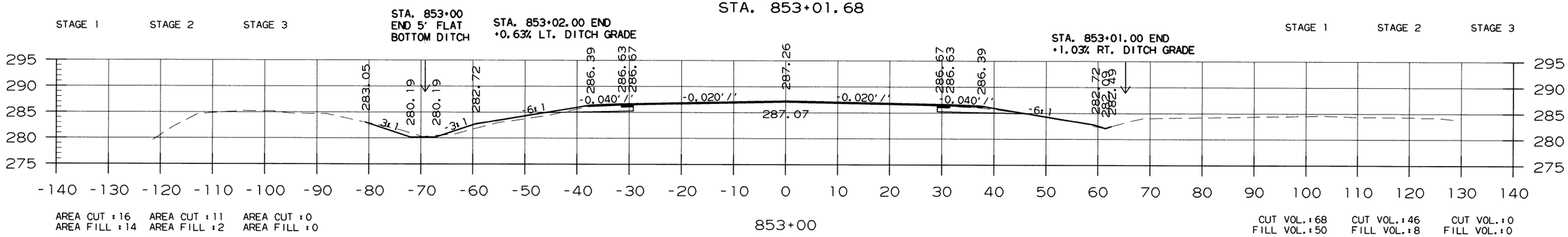
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 482 | 503 |
| CROSS SECTIONS | | | | |

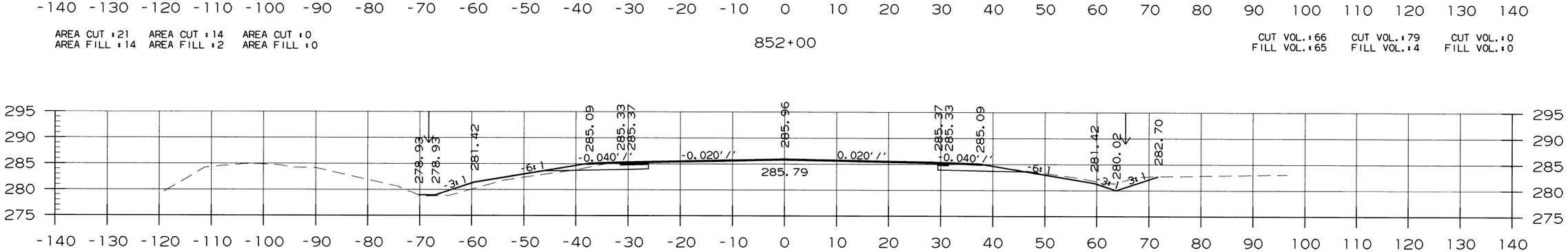
# END JOB CA1003
# STA. 853+01.68




AREA CUT : 16 AREA CUT : 11 AREA CUT : 0
AREA FILL : 14 AREA FILL : 2 AREA FILL : 0

853+00

CUT VOL. : 68 CUT VOL. : 46 CUT VOL. : 0
FILL VOL. : 50 FILL VOL. : 8 FILL VOL. : 0




AREA CUT : 21 AREA CUT : 14 AREA CUT : 0
AREA FILL : 14 AREA FILL : 2 AREA FILL : 0

852+00

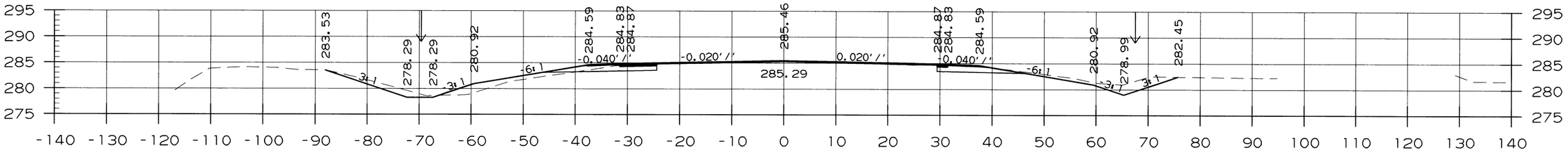
CUT VOL. : 66 CUT VOL. : 79 CUT VOL. : 0
FILL VOL. : 65 FILL VOL. : 4 FILL VOL. : 0




AREA CUT : 15 AREA CUT : 28 AREA CUT : 0
AREA FILL : 21 AREA FILL : 0 AREA FILL : 0

851+00

CUT VOL. : 75 CUT VOL. : 127 CUT VOL. : 0
FILL VOL. : 84 FILL VOL. : 2 FILL VOL. : 0




AREA CUT : 25 AREA CUT : 40 AREA CUT : 0
AREA FILL : 24 AREA FILL : 1 AREA FILL : 0

850+00

CUT VOL. : 121 CUT VOL. : 154 CUT VOL. : 0
FILL VOL. : 94 FILL VOL. : 1 FILL VOL. : 0

# CROSS SECTION
# STA. 850+00 TO STA. 853+00

2/5/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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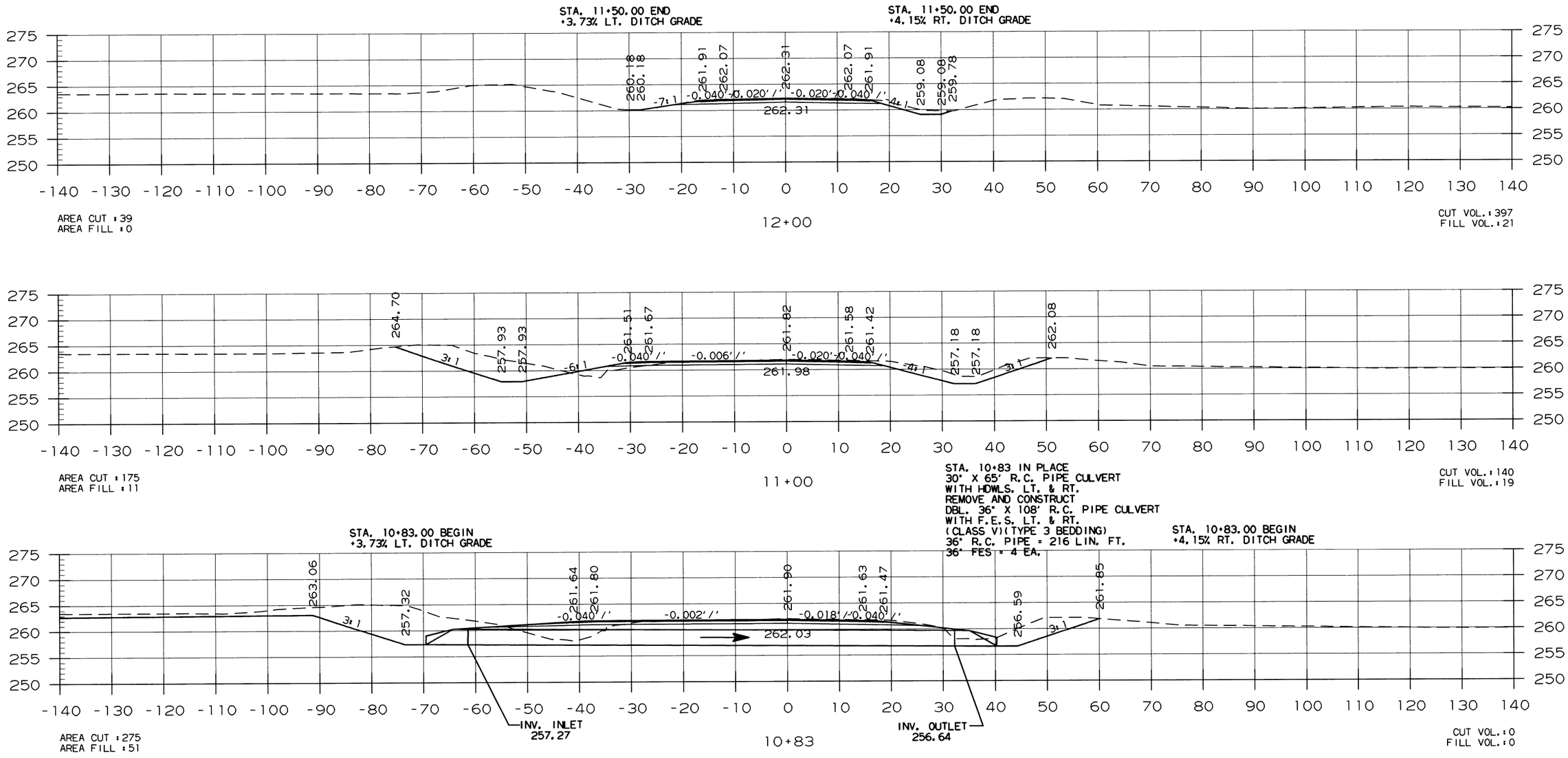
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 483 | 503 |
| ② | CROSS SECTIONS - SH 231 | | | |




# CROSS SECTION
# STA. 10+83 TO STA. 12+00

2/3/2017

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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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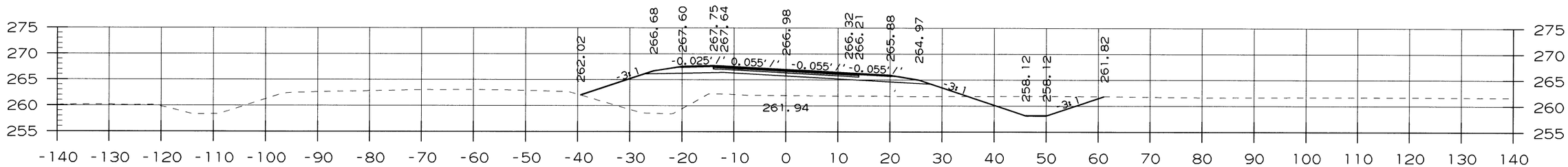
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 484 | 503 |

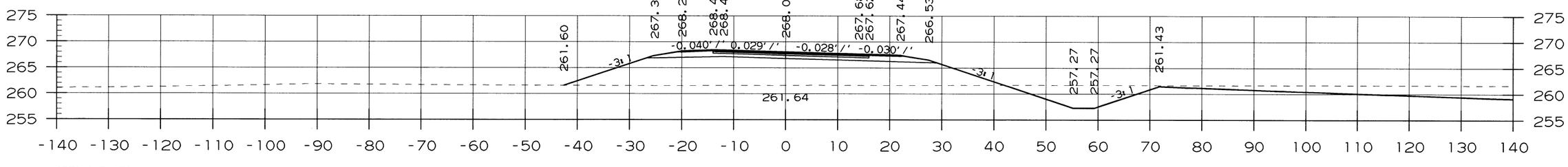
(2) CROSS SECTIONS - WEST CONNECTOR




AREA CUT : 56
AREA FILL : 285

12+00

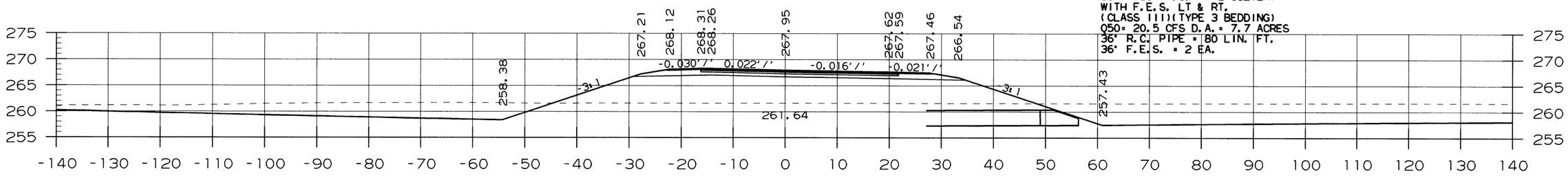
CUT VOL. : 244
FILL VOL. : 1131




AREA CUT : 76
AREA FILL : 354

11+00

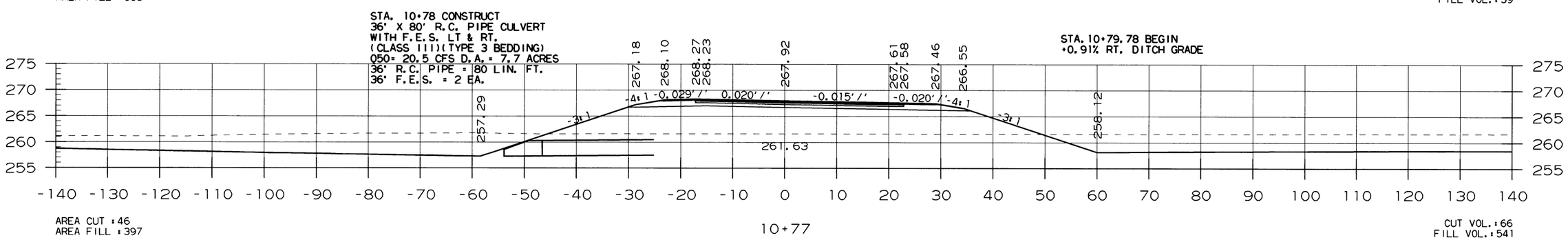
CUT VOL. : 44
FILL VOL. : 267




AREA CUT : 42
AREA FILL : 388

10+80

CUT VOL. : 5
FILL VOL. : 39




AREA CUT : 46
AREA FILL : 397

10+77

CUT VOL. : 66
FILL VOL. : 541

# CROSS SECTION
# STA. 10+77 TO STA. 12+00

2/3/2017

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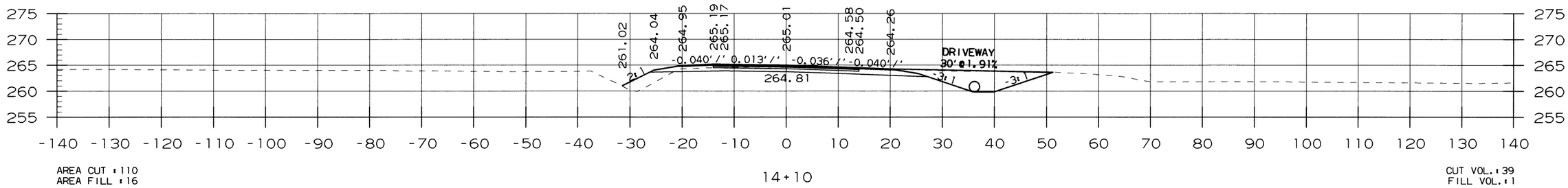
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 485 | 503 |

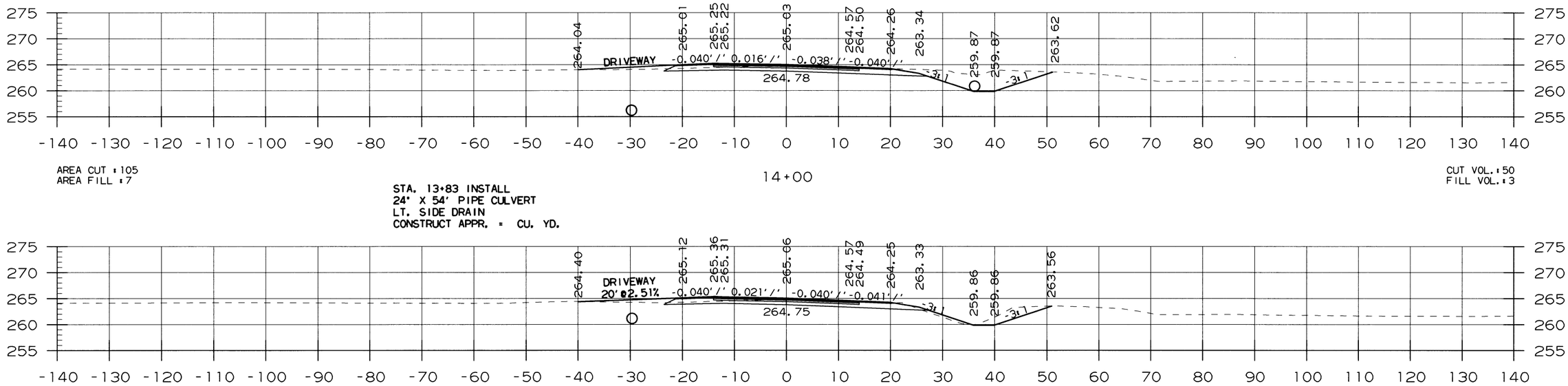
② CROSS SECTIONS - WEST CONNECTOR




AREA CUT = 110
AREA FILL = 16

14+10

CUT VOL. = 39
FILL VOL. = 1




AREA CUT = 105
AREA FILL = 7

14+00

CUT VOL. = 50
FILL VOL. = 3

STA. 13+83 INSTALL
24" X 54' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = CU. YD.

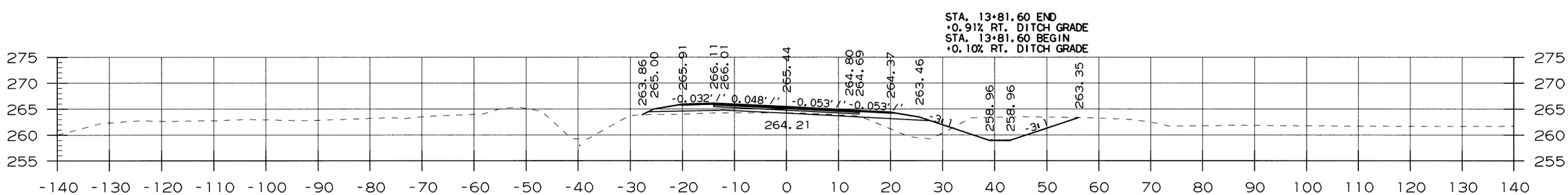



AREA CUT = 51
AREA FILL = 11

13+83

CUT VOL. = 183
FILL VOL. = 79

STA. 13+81.60 END
+0.91% RT. DITCH GRADE
STA. 13+81.60 BEGIN
+0.10% RT. DITCH GRADE




AREA CUT = 68
AREA FILL = 48

13+00

CUT VOL. = 224
FILL VOL. = 586

CROSS SECTION
STA. 13+00 TO STA. 14+10

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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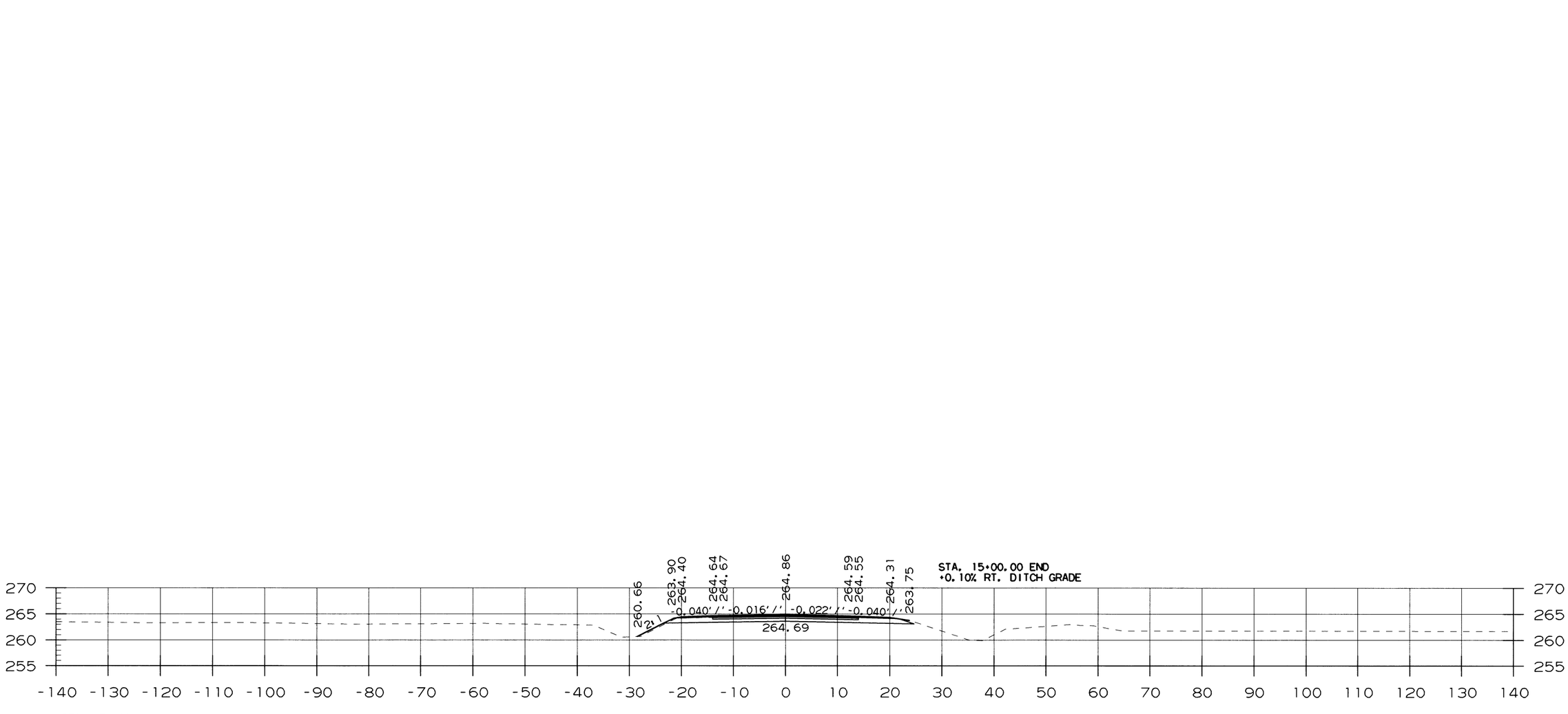
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 486 | 503 |

② CROSS SECTIONS - WEST CONNECTOR




AREA CUT : 48
AREA FILL : 1

15+00

END CONSTRUCTION
WEST CONNECTOR

STA. 14+10 INSTALL
24" X 32' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = CU. YD.

CUT VOL. : 262
FILL VOL. : 15

# CROSS SECTION
# STA. 15+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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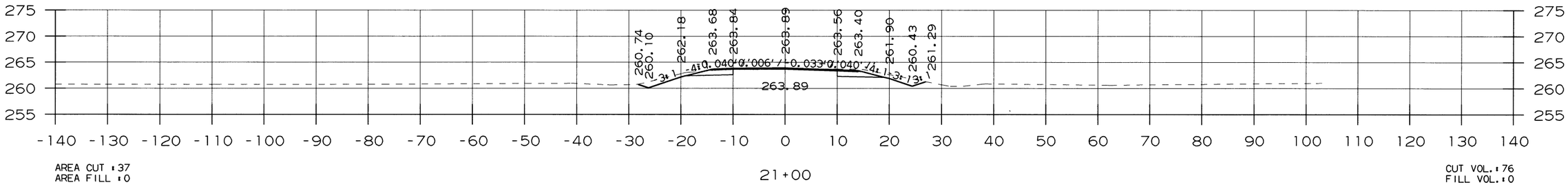
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 487 | 503 |
| ② | CROSS SECTIONS - SH 228 | | | |

2/3/2017




AREA CUT : 37
AREA FILL : 0

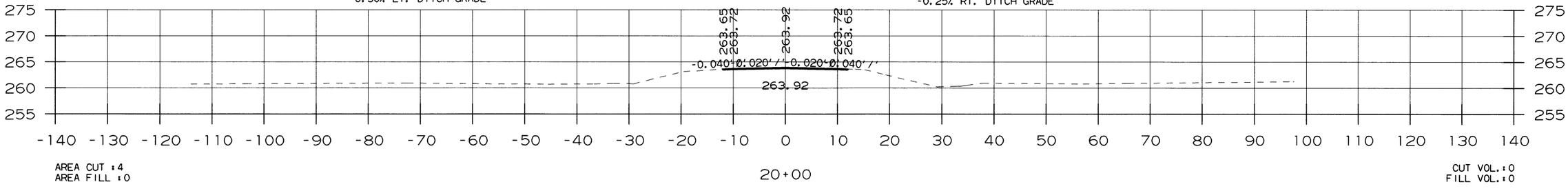
21+00

CUT VOL. : 76
FILL VOL. : 0

STA. 20+28.82 BEGIN SUPERELEVATION

STA. 20+28.08 BEGIN
-0.30% LT. DITCH GRADE

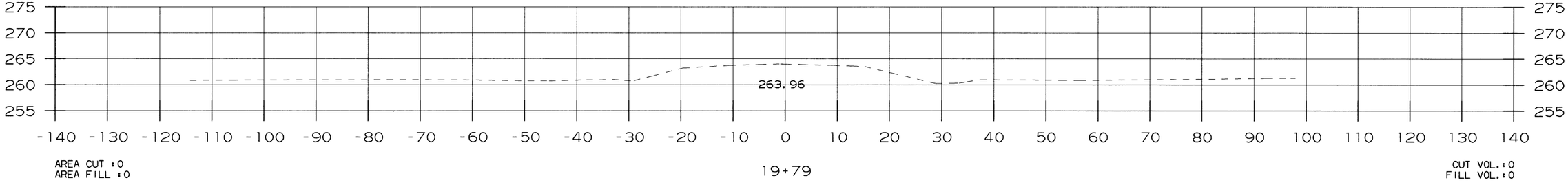
STA. 20+28.08 BEGIN
-0.25% RT. DITCH GRADE




AREA CUT : 4
AREA FILL : 0

20+00

CUT VOL. : 0
FILL VOL. : 0




AREA CUT : 0
AREA FILL : 0

19+79

CUT VOL. : 0
FILL VOL. : 0

# CROSS SECTION
# STA. 19+79 TO STA. 21+00

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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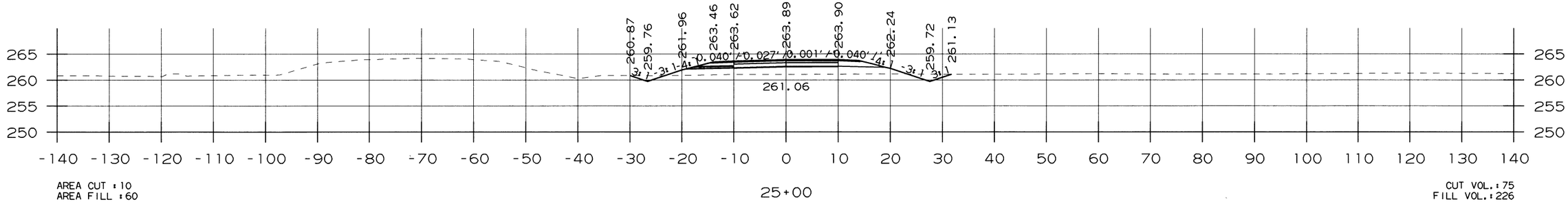
| JOB NO. | | CA1003 | 488 | 503 |

② CROSS SECTIONS - SH 228

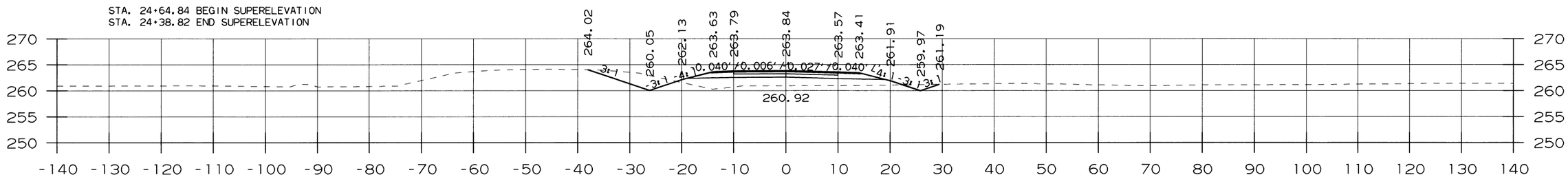



AREA CUT : 10
AREA FILL : 60

25+00

CUT VOL. : 75
FILL VOL. : 226

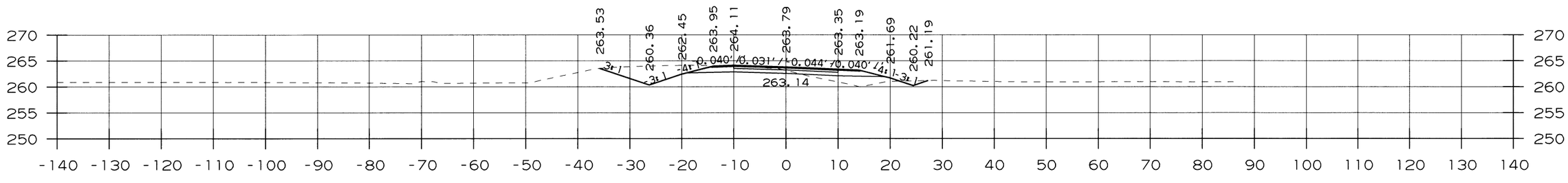
STA. 24+64.84 BEGIN SUPERELEVATION
STA. 24+38.82 END SUPERELEVATION




AREA CUT : 31
AREA FILL : 62

24+00

CUT VOL. : 171
FILL VOL. : 152

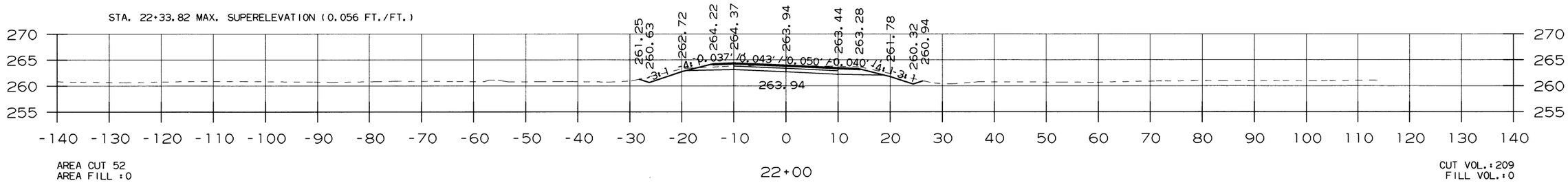



AREA CUT : 61
AREA FILL : 20

23+00

CUT VOL. : 113
FILL VOL. : 37

STA. 22+33.82 MAX. SUPERELEVATION (0.056 FT./FT.)




AREA CUT 52
AREA FILL : 0

22+00

CUT VOL. : 209
FILL VOL. : 0

# CROSS SECTION
# STA. 22+00 TO STA. 25+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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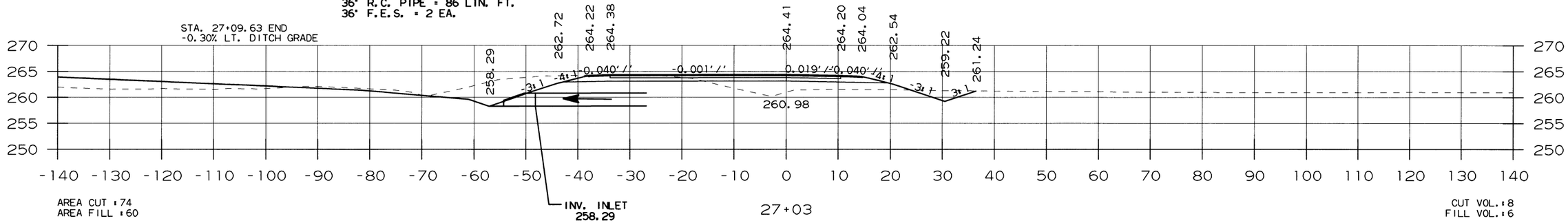
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 489 | 503 |

② CROSS SECTIONS - SH 228

2/3/2017

STA. 27+17 CONSTRUCT
36" X 86' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III)(TYPE 2 BEDDING)
Q50= 16.4 CFS D.A.= 5.4 ACRES
36" R.C. PIPE = 86 LIN. FT.
36" F.E.S. = 2 EA.

STA. 27+09.63 END
-0.30% LT. DITCH GRADE

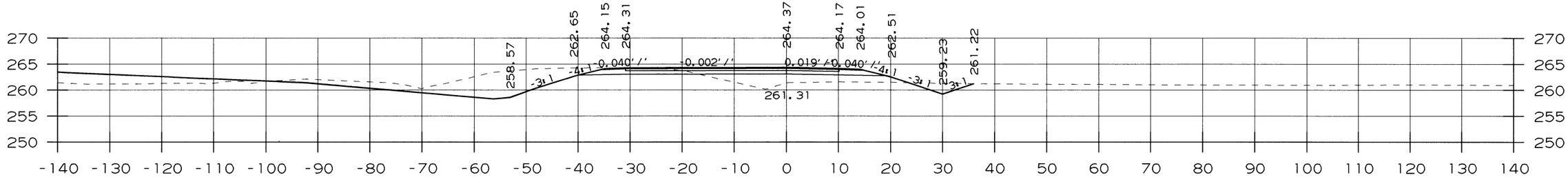



AREA CUT : 74
AREA FILL : 60

INV. IN LET
258.29

27+03

CUT VOL. : 8
FILL VOL. : 6

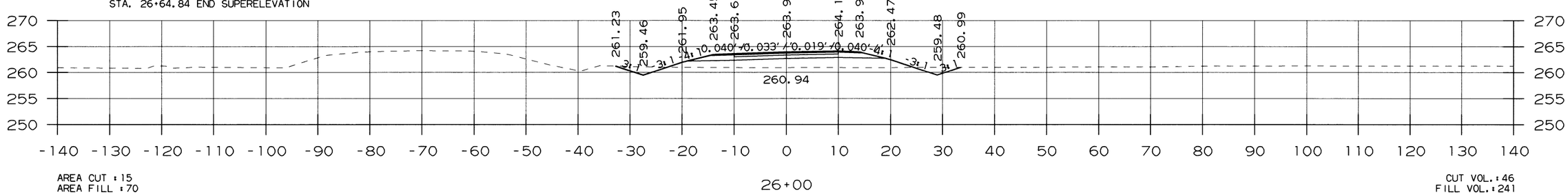



AREA CUT : 80
AREA FILL : 59

27+00

CUT VOL. : 176
FILL VOL. : 239

STA. 26+64.84 END SUPERELEVATION




AREA CUT : 15
AREA FILL : 70

26+00

CUT VOL. : 46
FILL VOL. : 241

# CROSS SECTION
# STA. 26+00 TO STA. 27+03

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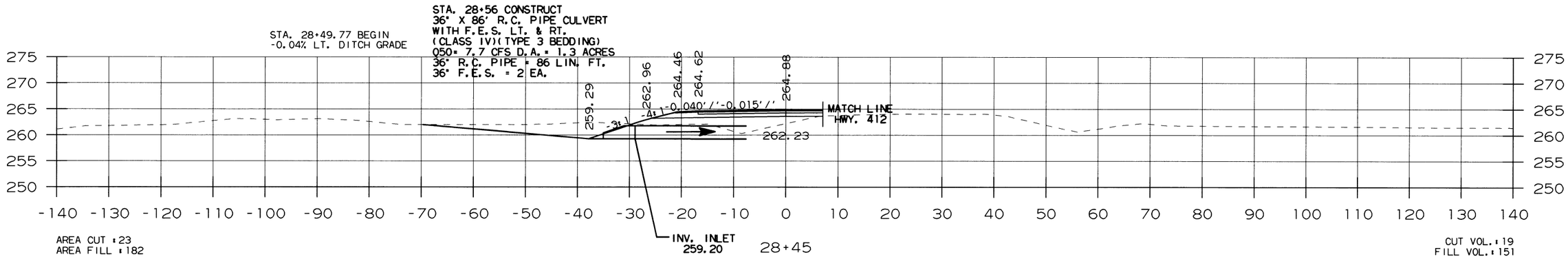
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 490 | 503 |
| ② | CROSS SECTIONS - SH 228 | | | |

2/3/2017




# CROSS SECTION
# STA. 27+25 TO STA. 28+45

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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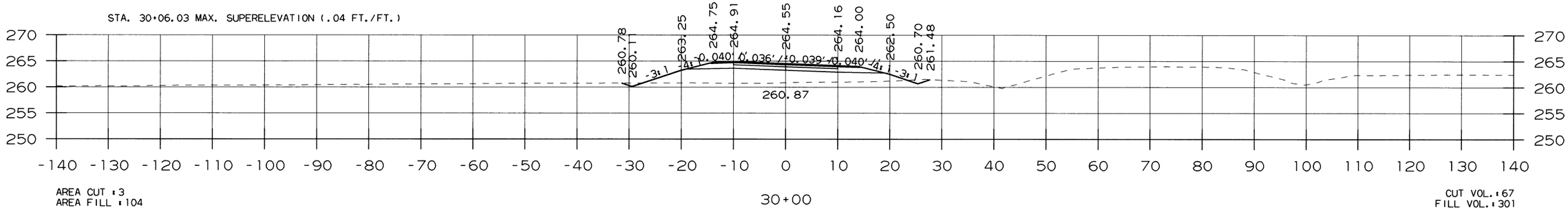
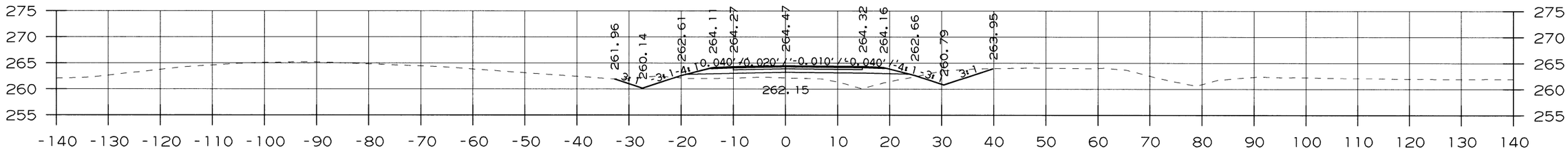
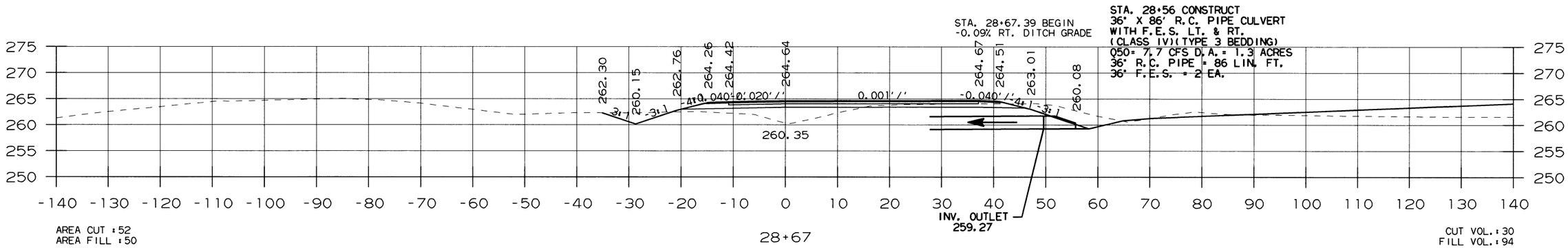
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 491 | 503 |

② CROSS SECTIONS - SH 228




CROSS SECTION
STA. 28+67 TO STA. 30+00

2/3/2017

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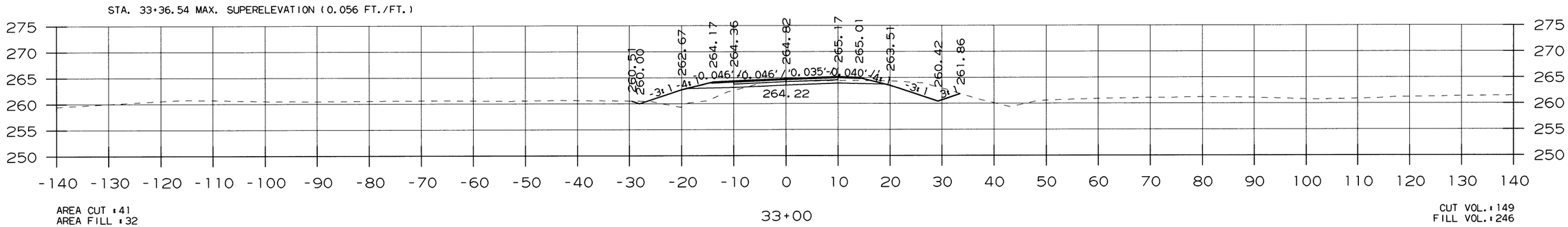
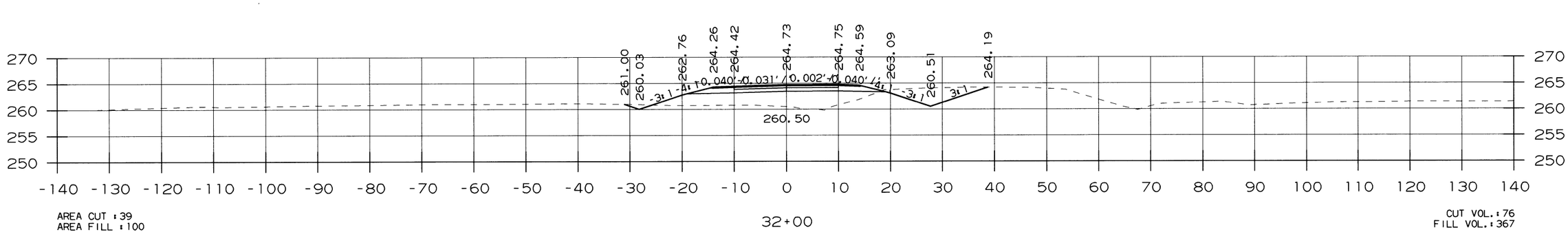
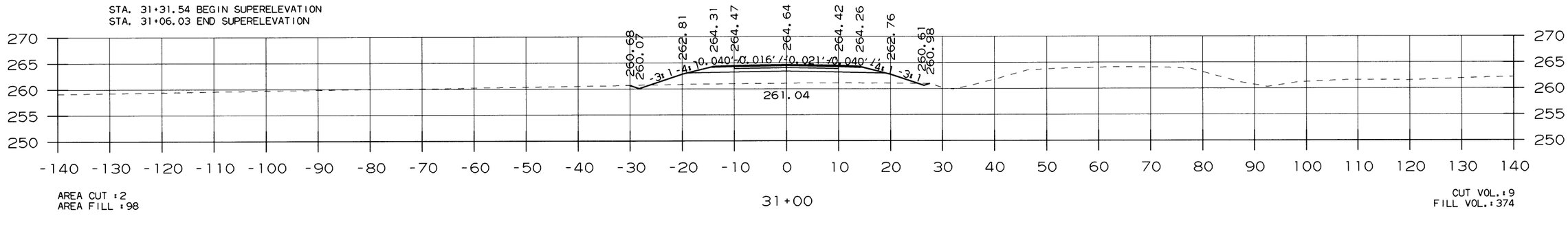
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 492 | 503 |

② CROSS SECTIONS - SH 228




# CROSS SECTION
# STA. 31+00 TO STA. 33+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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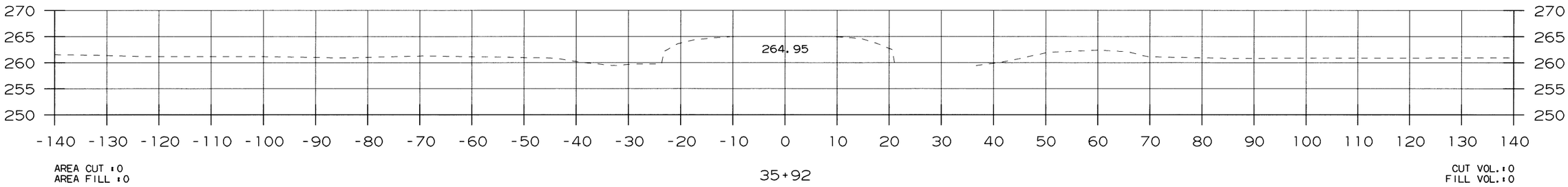
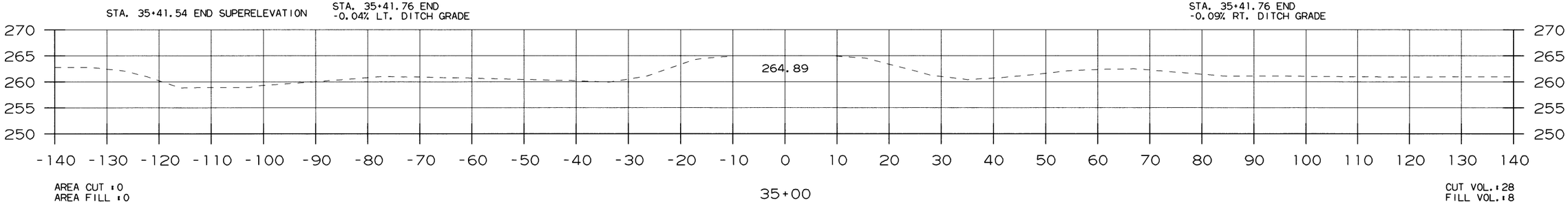
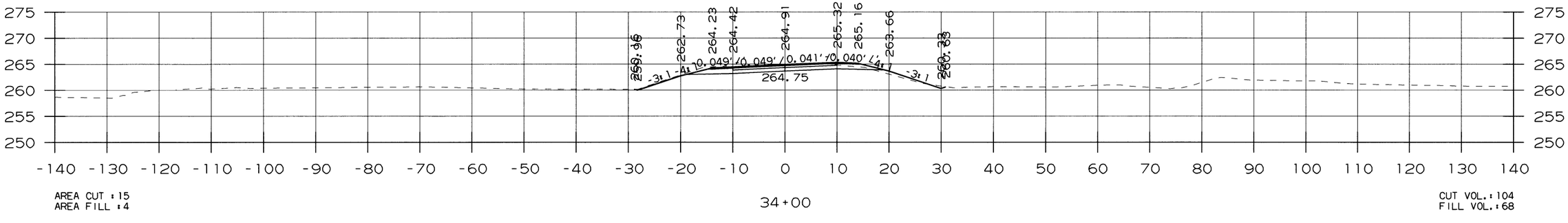
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 493 | 503 |

CROSS SECTIONS - SH 228




CROSS SECTION
STA. 34+00 TO STA. 35+92

2/3/2017

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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 |
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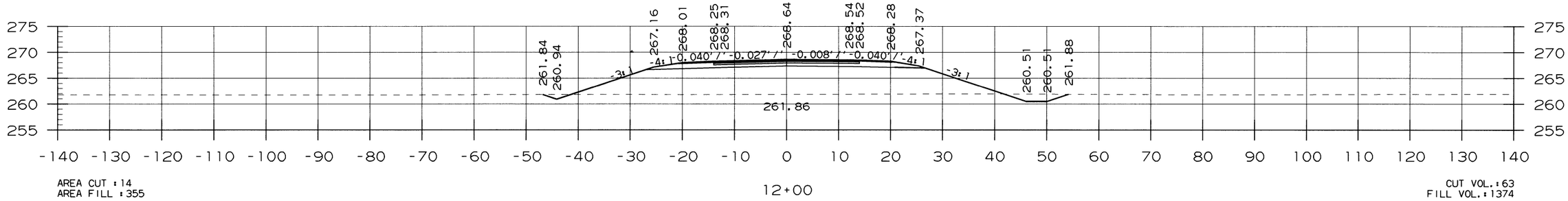
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 494 | 503 |

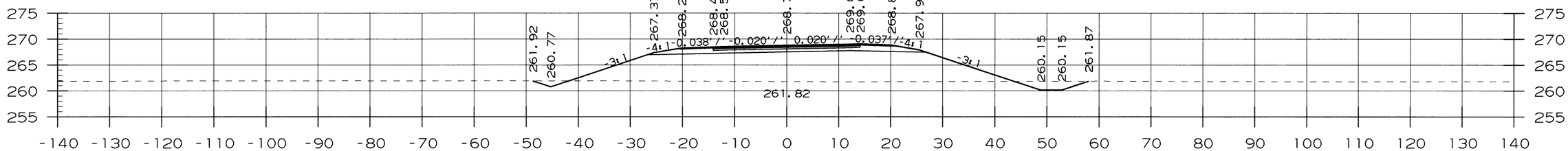
② CROSS SECTIONS - EAST CONNECTOR




AREA CUT : 14
AREA FILL : 355

12+00

CUT VOL. : 63
FILL VOL. : 1374




AREA CUT : 20
AREA FILL : 387

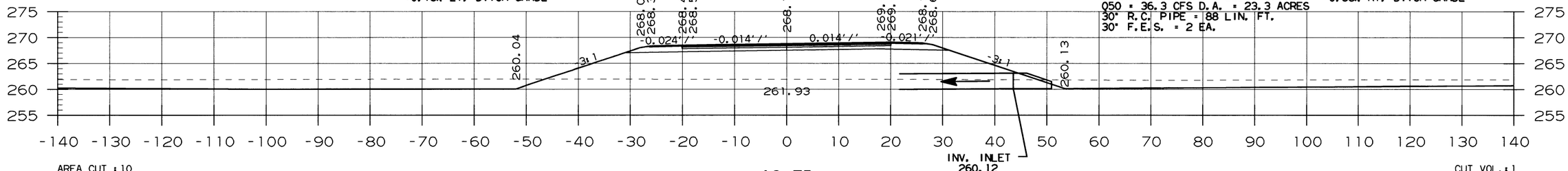
11+00

CUT VOL. : 14
FILL VOL. : 380

STA. 10+79.90 BEGIN
+0.15% LT. DITCH GRADE

STA. 10+74 CONSTRUCT
30" X 88' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III)(TYPE 3 BEDDING)
Q50 = 36.3 CFS D.A. = 23.3 ACRES
30" R.C. PIPE = 88 LIN. FT.
30" F.E.S. = 2 EA.

STA. 10+82.40 BEGIN
+0.38% RT. DITCH GRADE

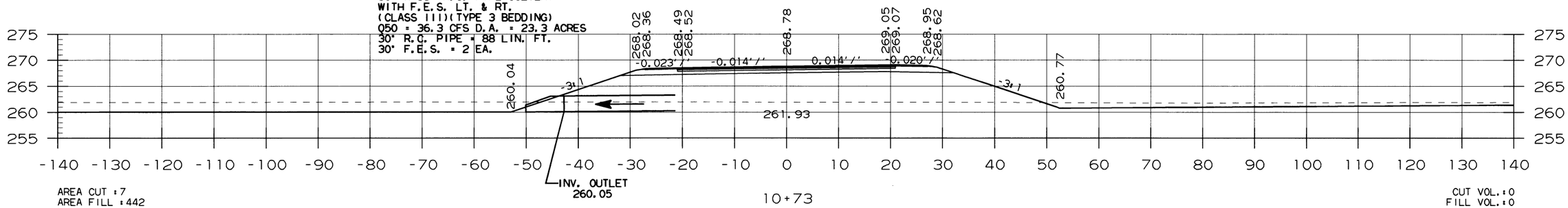



AREA CUT : 10
AREA FILL : 433

10+75

CUT VOL. : 1
FILL VOL. : 32

STA. 10+74 CONSTRUCT
30" X 88' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
(CLASS III)(TYPE 3 BEDDING)
Q50 = 36.3 CFS D.A. = 23.3 ACRES
30" R.C. PIPE = 88 LIN. FT.
30" F.E.S. = 2 EA.




AREA CUT : 7
AREA FILL : 442

10+73

CUT VOL. : 0
FILL VOL. : 0

# CROSS SECTION
# STA. 10+73 TO STA. 12+00

2/3/2011

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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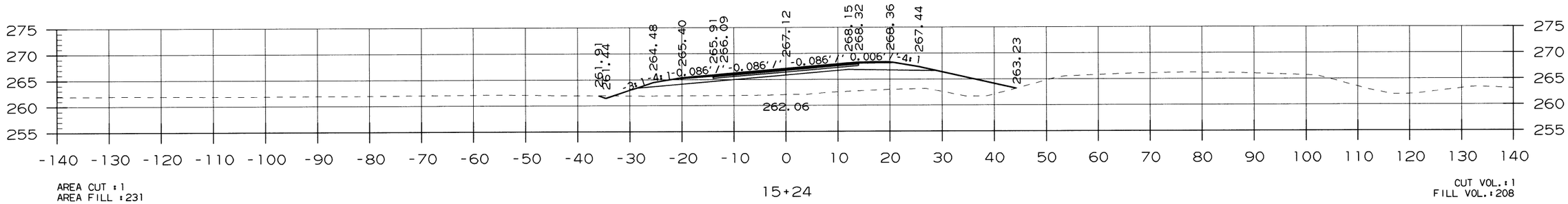
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 495 | 503 |

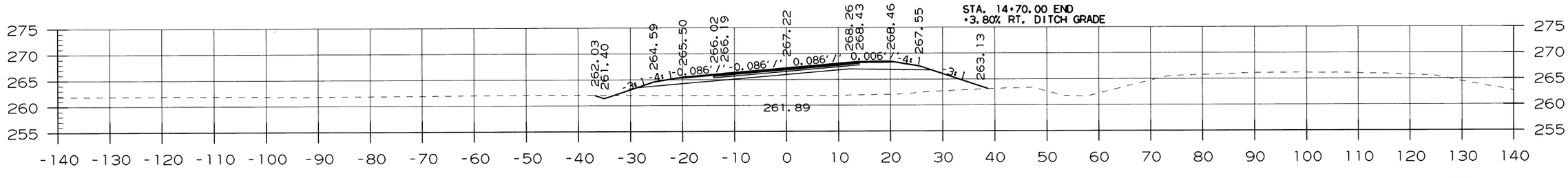
② CROSS SECTIONS - EAST CONNECTOR




AREA CUT : 1
AREA FILL : 231

15+24

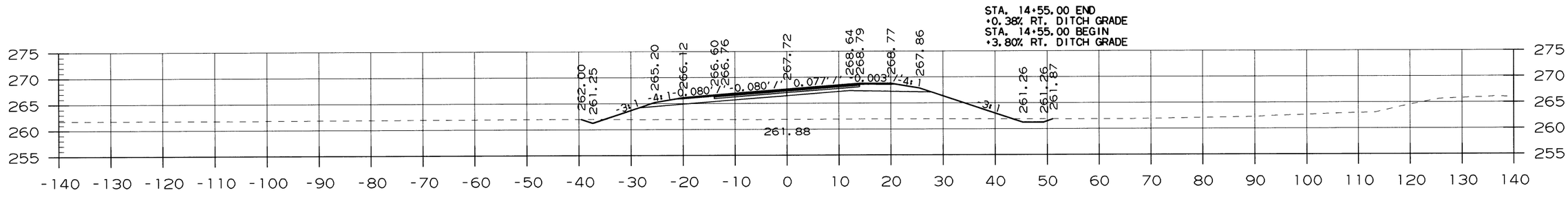
CUT VOL. : 1
FILL VOL. : 208




AREA CUT : 1
AREA FILL : 237

15+00

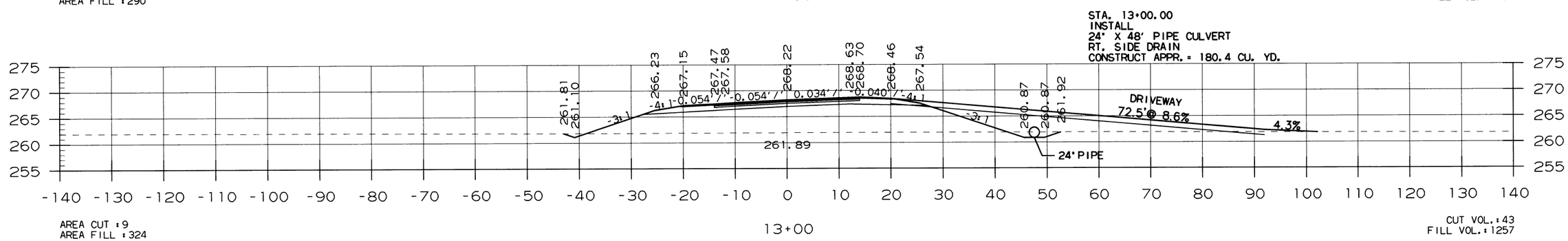
CUT VOL. : 11
FILL VOL. : 976




AREA CUT : 5
AREA FILL : 290

14+00

CUT VOL. : 26
FILL VOL. : 1137




AREA CUT : 9
AREA FILL : 324

13+00

CUT VOL. : 43
FILL VOL. : 1257

# CROSS SECTION
# STA. 13+00 TO STA. 15+24

2/3/2017

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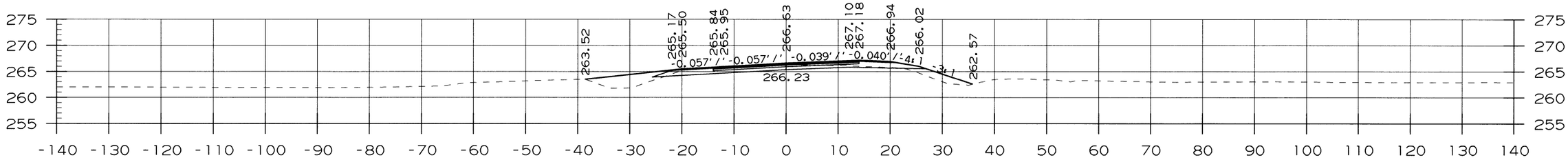
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 496 | 503 |

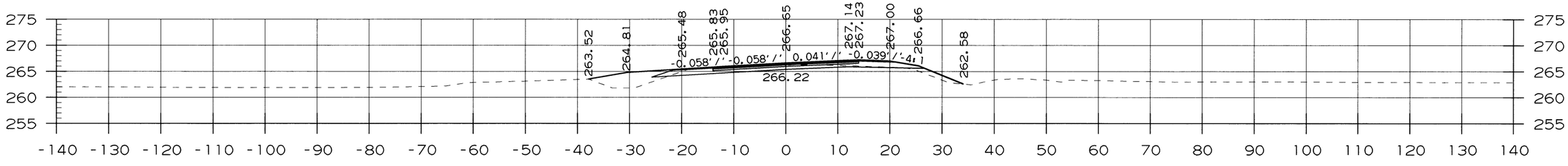
② CROSS SECTIONS - EAST CONNECTOR




AREA CUT : 32
AREA FILL : 40

17+06

CUT VOL. : 7
FILL VOL. : 9

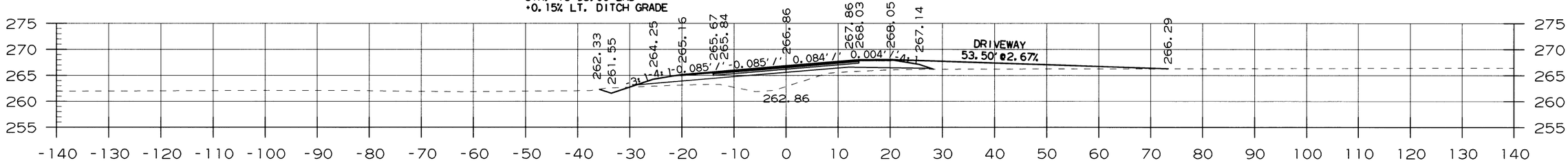



AREA CUT : 31
AREA FILL : 38

17+00

CUT VOL. : 65
FILL VOL. : 204

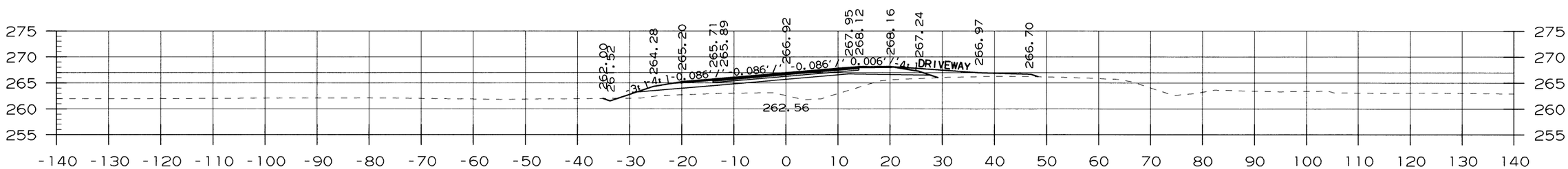
STA. 16+95.00 END
+0.15% LT. DITCH GRADE




AREA CUT : 4
AREA FILL : 72

16+00

CUT VOL. : 2
FILL VOL. : 77




AREA CUT : 1
AREA FILL : 118

15+78

CUT VOL. : 2
FILL VOL. : 349

STA. 17+87.17
INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 3.2 CU. YD.

# CROSS SECTION
## STA. 15+78 TO STA. 17+06

2/3/2017

c:\pw_work\arkansas\xdh\well4483\dms0301f\CA1003_CX_ECONN.dgn

| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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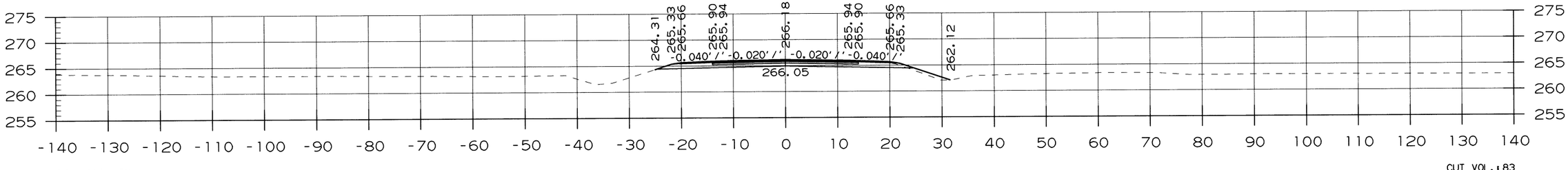
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 497 | 503 |

② CROSS SECTIONS - EAST CONNECTOR

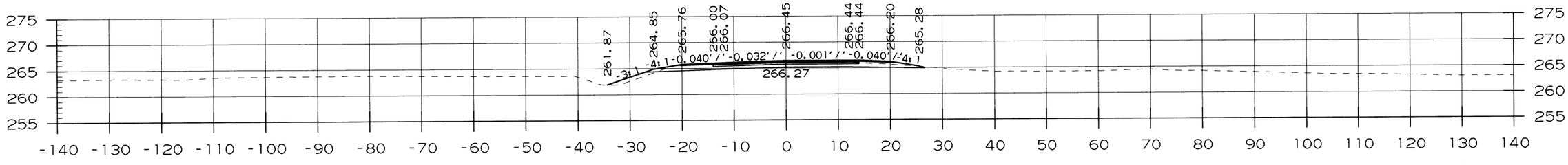



AREA CUT : 50
AREA FILL : 4

18+45

END CONSTRUCTION
EAST CONNECTOR

CUT VOL. : 83
FILL VOL. : 8

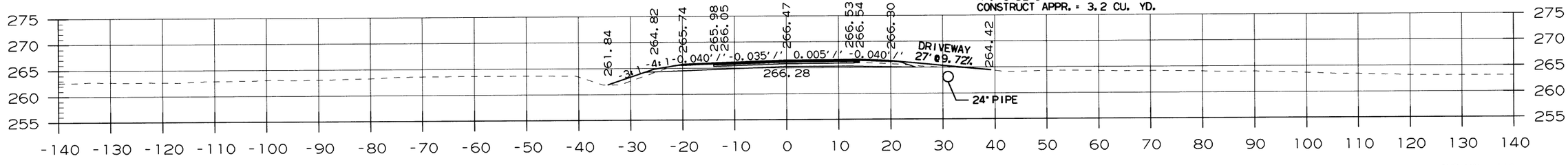



AREA CUT : 50
AREA FILL : 6

18+00

CUT VOL. : 23
FILL VOL. : 4

STA. 17+87.17
INSTALL
24" X 38" PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 3.2 CU. YD.




AREA CUT : 47
AREA FILL : 10

17+87

CUT VOL. : 119
FILL VOL. : 75

# CROSS SECTION
# STA. 17+87 TO STA. 18+45

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
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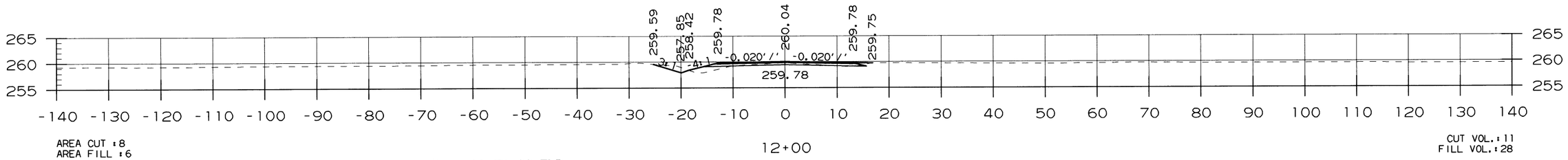
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 498 | 503 |

②

CROSS SECTIONS - CR 332

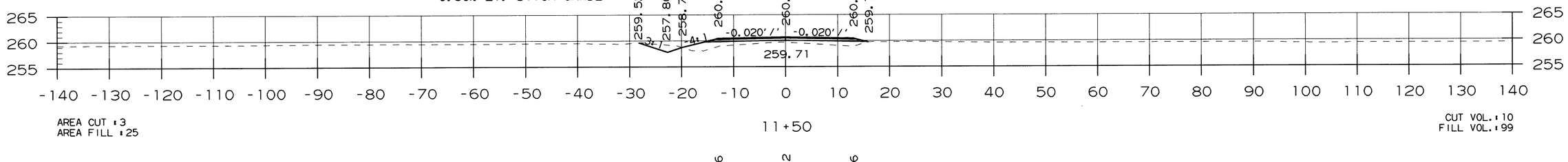



AREA CUT : 8
AREA FILL : 6

12+00

CUT VOL. : 11
FILL VOL. : 28

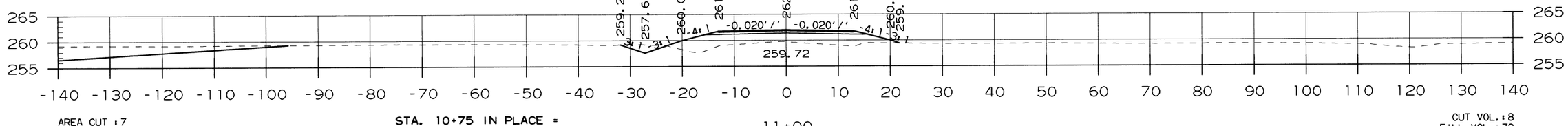
STA. 11+76.00 END
+1.08% LT. DITCH GRADE
STA. 11+76.00 BEGIN
+0.50% LT. DITCH GRADE




AREA CUT : 3
AREA FILL : 25

11+50

CUT VOL. : 10
FILL VOL. : 99

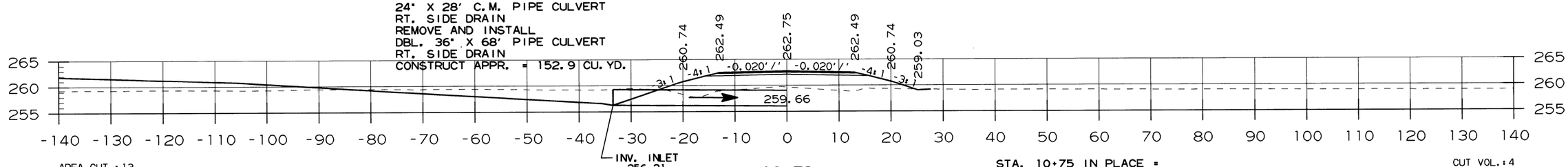



AREA CUT : 7
AREA FILL : 82

STA. 10+75 IN PLACE =
HWY. 412 STA. 562+68
24" X 28' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 68' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 152.9 CU. YD.

11+00

CUT VOL. : 8
FILL VOL. : 78




AREA CUT : 13
AREA FILL : 118

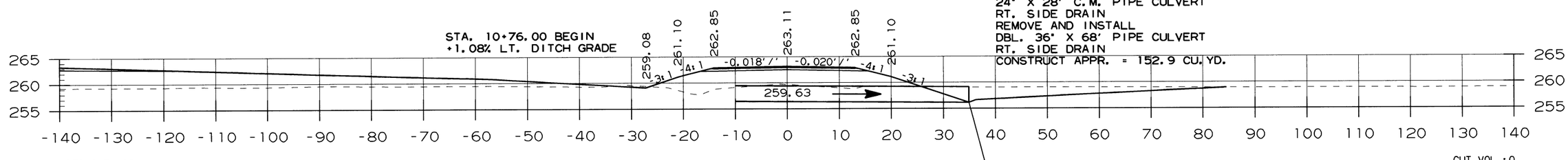
INV. INLET
256.21

10+79

CUT VOL. : 4
FILL VOL. : 43

STA. 10+75 IN PLACE =
HWY. 412 STA. 562+68
24" X 28' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 68' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 152.9 CU. YD.

STA. 10+76.00 BEGIN
+1.08% LT. DITCH GRADE




AREA CUT : 10
AREA FILL : 141

10+70

INV. OUTLET
256.16

CUT VOL. : 0
FILL VOL. : 0

# CROSS SECTION
# STA. 10+70 TO STA. 12+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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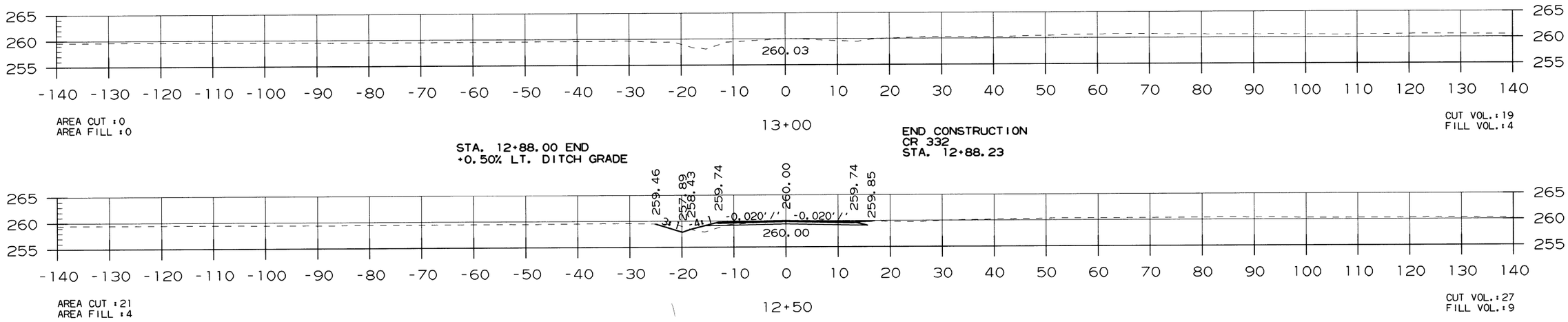
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 499 | 503 |

②

CROSS SECTIONS - CR 332

2/3/2017




CROSS SECTION
STA. 12+50 TO STA. 13+00

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
|---|---|---|---|
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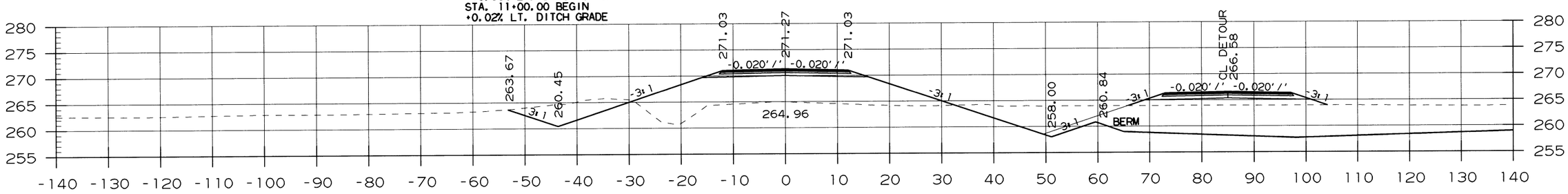
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 500 | 503 |

②

# CROSS SECTIONS - CR 218

STA. 11+00.00 END
+10.06% LT. DITCH GRADE
STA. 11+00.00 BEGIN
+0.02% LT. DITCH GRADE




11+00

AREA CUT : 589
AREA FILL : 282

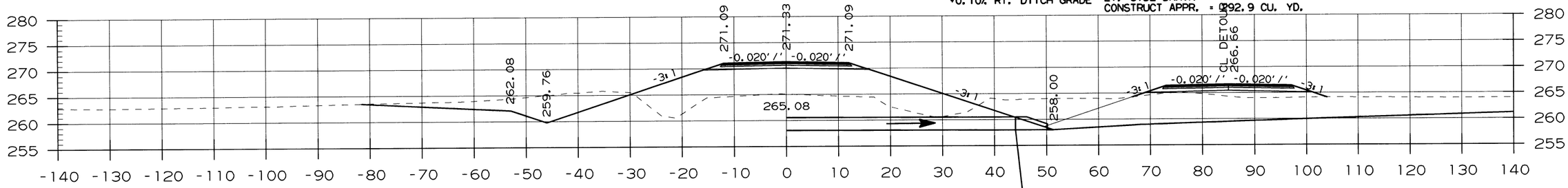
AREA CUT : 0
AREA FILL : 42

HWY. 412. STA. 700+51 =
C.R. 218 STA. 10+88 IN PLACE
36" X 37' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 74' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 292.9 CU. YD.

CUT VOL. : 147
FILL VOL. : 79

CUT VOL. : 19
FILL VOL. : 5

STA. 10+93.00 BEGIN
+0.10% RT. DITCH GRADE




10+93

INV. OUTLET
258.00

AREA CUT : 546
AREA FILL : 329

AREA CUT : 0
AREA FILL : 29

HWY. 412. STA. 700+51 =
C.R. 218 STA. 10+88 IN PLACE
36" X 37' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 74' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPR. = 292.9 CU. YD.

HWY. 412 STA. 701+47 =
C.R. 218 TEMP DETOUR STA. 0+89
INSTALL 36" X 68'
TEMP PIPE CULVERT

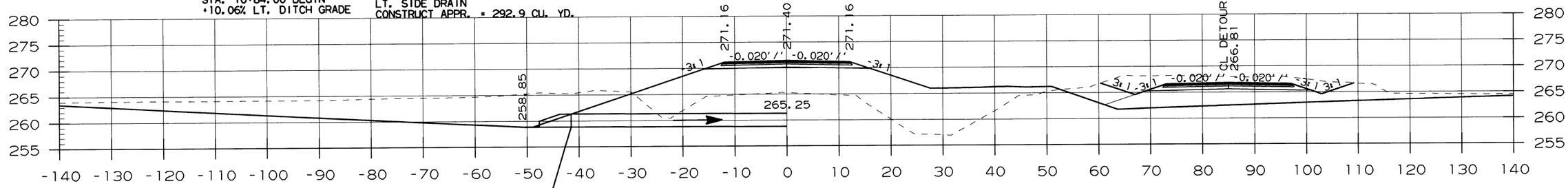
CUT VOL. : 202
FILL VOL. : 131

C.R. 218

CUT VOL. : 0
FILL VOL. : 0

C.R. 218 TEMP DETOUR

STA. 10+84.00 BEGIN
+10.06% LT. DITCH GRADE




10+84

INV. INLET
258.84

AREA CUT : 669
AREA FILL : 454

C.R. 218

AREA CUT : 114
AREA FILL : 0

C.R. 218 TEMP DETOUR

CUT VOL. : 0
FILL VOL. : 0

CUT VOL. : 0
FILL VOL. : 0

## CROSS SECTION
## STA. 10+84 TO STA. 11+00

2/3/2011

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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 |
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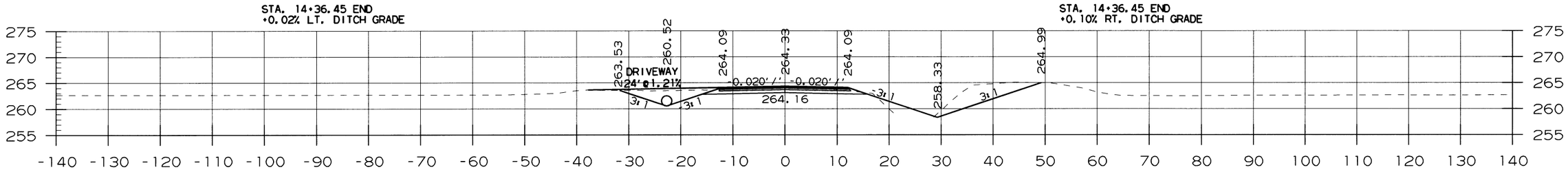
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 501 | 503 |
| | | | | ② | | CROSS SECTIONS - CR 218 | | |

STA. 14+13
INSTALL
24" X 30' PIPE CULVERT
16 LT. SIDE DRAIN
CONSTRUCT APPR. = 10.0 CU. YD.

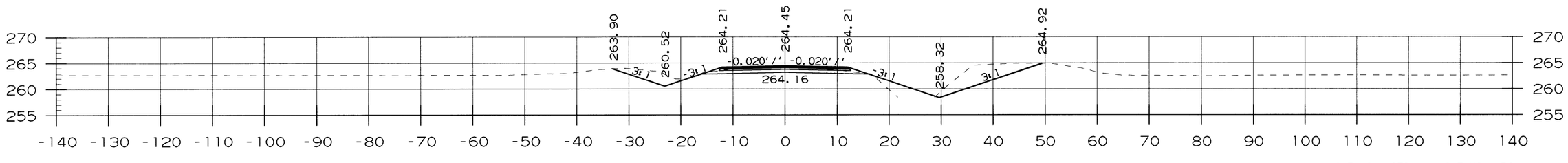



AREA CUT : 111
AREA FILL : 8

14+13

CUT VOL. : 45
FILL VOL. : 7

CUT VOL. : 0
FILL VOL. : 0

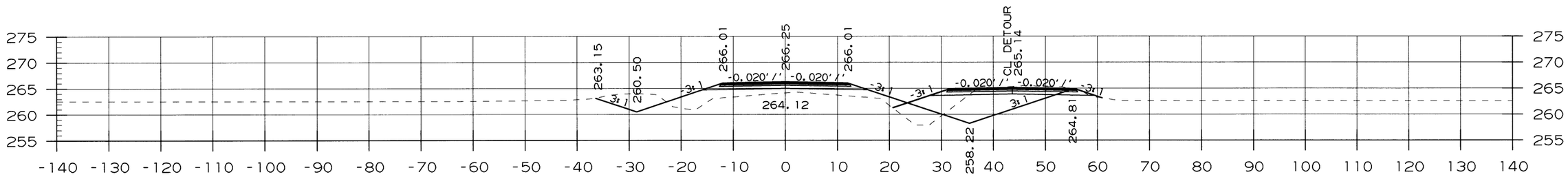



AREA CUT : 100
AREA FILL : 10

14+00

CUT VOL. : 372
FILL VOL. : 189

CUT VOL. : 54
FILL VOL. : 86




AREA CUT : 121
AREA FILL : 95

AREA CUT : 27
AREA FILL : 24

13+00

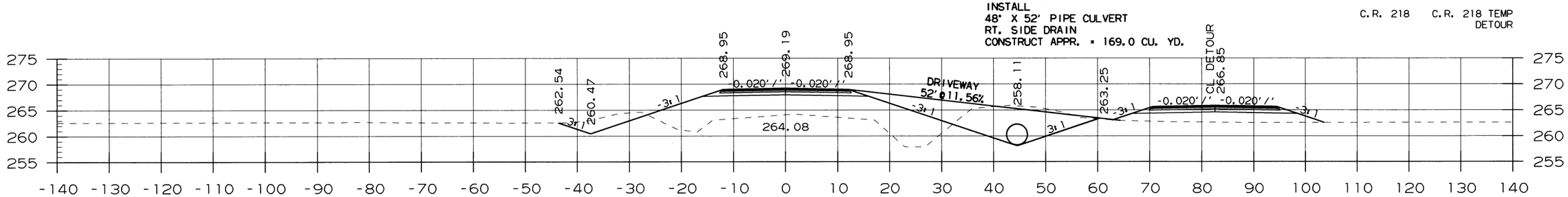
CUT VOL. : 482
FILL VOL. : 636

C.R. 218

CUT VOL. : 54
FILL VOL. : 206

C.R. 218 TEMP DETOUR

STA. 12+50
INSTALL
48" X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 169.0 CU. YD.




AREA CUT : 146
AREA FILL : 271

C.R. 218

AREA CUT : 0
AREA FILL : 70

C.R. 218 TEMP DETOUR

12+00

CUT VOL. : 1362
FILL VOL. : 1001

CUT VOL. : 0
FILL VOL. : 198

# CROSS SECTION
# STA. 12+00 TO STA. 14+13

2/3/2017

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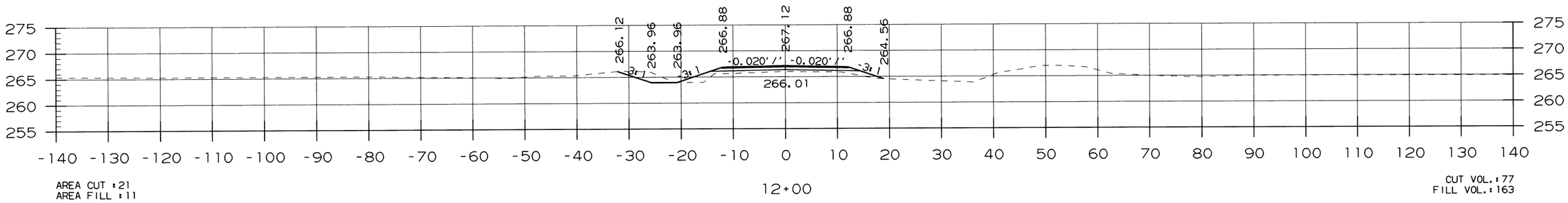
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | ARK. | | | |
| | | | | JOB NO. | | CA1003 | 502 | 503 |

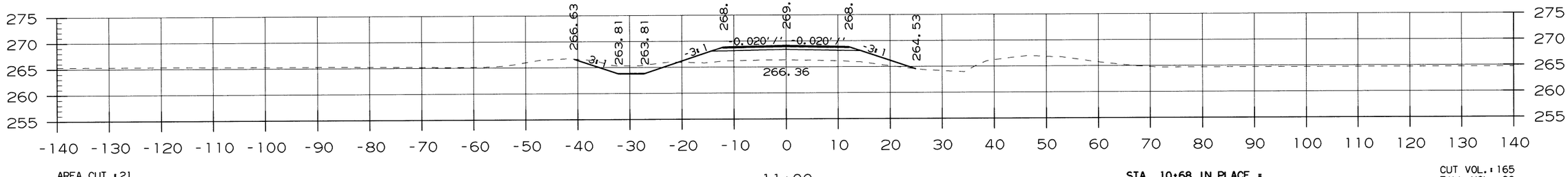
② CROSS SECTIONS - CR 340




AREA CUT : 21
AREA FILL : 11

12+00

CUT VOL. : 77
FILL VOL. : 163



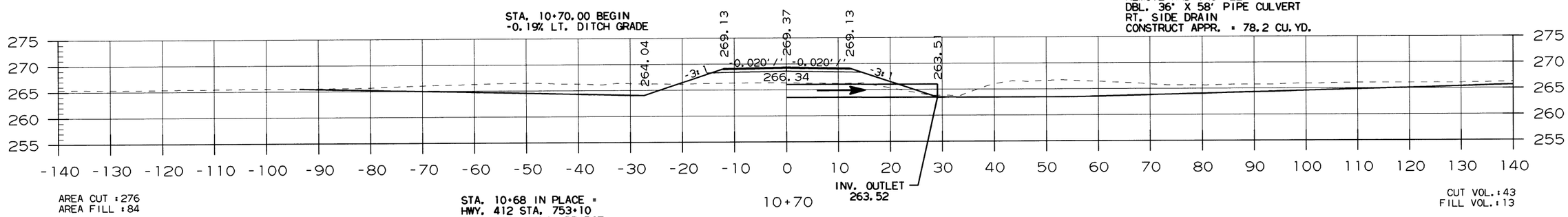

AREA CUT : 21
AREA FILL : 77

11+00

CUT VOL. : 165
FILL VOL. : 89

STA. 10+68 IN PLACE =
HWY. 412 STA. 753+10
16' X 24' CONC. BRIDGE
REMOVE AND INSTALL
DBL. 36" X 58' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 78.2 CU. YD.

STA. 10+70.00 BEGIN
-0.19% LT. DITCH GRADE



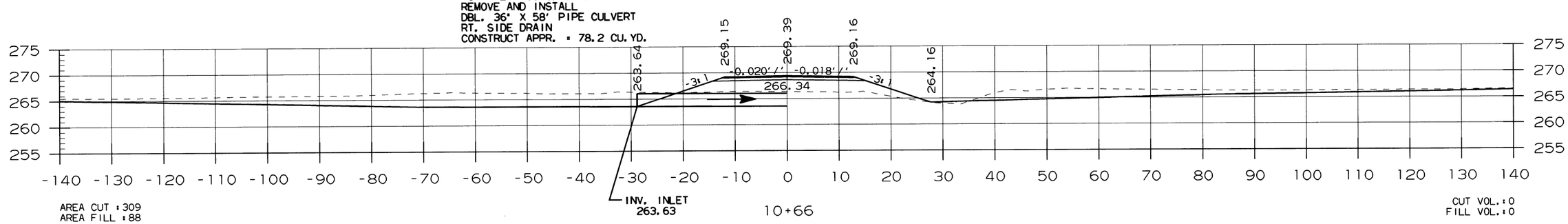

INV. OUTLET
263.52

AREA CUT : 276
AREA FILL : 84

10+70

CUT VOL. : 43
FILL VOL. : 13

STA. 10+68 IN PLACE =
HWY. 412 STA. 753+10
16' X 24' CONC. BRIDGE
REMOVE AND INSTALL
DBL. 36" X 58' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPR. = 78.2 CU. YD.




INV. INLET
263.63

AREA CUT : 309
AREA FILL : 88

10+66

CUT VOL. : 0
FILL VOL. : 0

# CROSS SECTION
# STA. 10+66 TO STA. 12+00

2/3/2017

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| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED |
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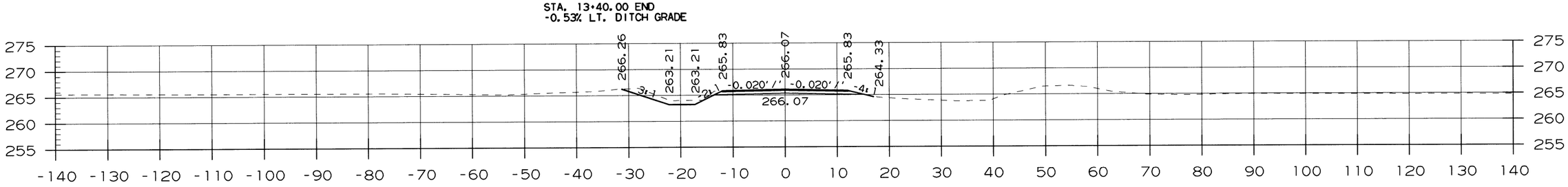
| FED.RD. DIST.NO. | STATE | FED.AID PROJ.NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 10 | ARK. | | | |
| JOB NO. | | CA1003 | 503 | 503 |

②

CROSS SECTIONS - CR 340

STA. 13+40.00 END
-0.53% LT. DITCH GRADE

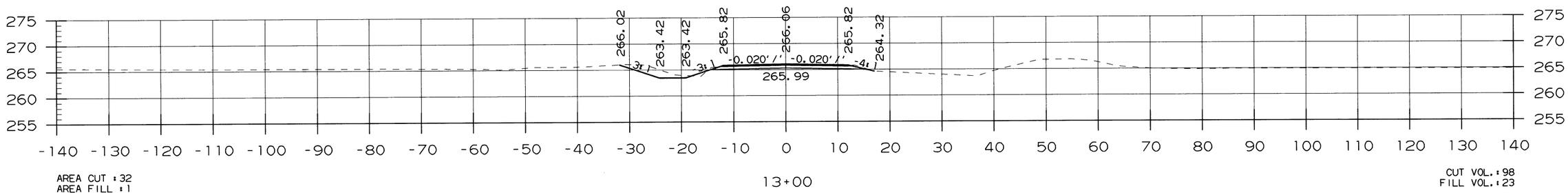



AREA CUT : 32
AREA FILL : 0

13+40

CUT VOL. : 48
FILL VOL. : 1

STA. 13+00.00 END
-0.19% LT. DITCH GRADE
STA. 13+00.00 BEGIN
-0.53% LT. DITCH GRADE




AREA CUT : 32
AREA FILL : 1

13+00

CUT VOL. : 98
FILL VOL. : 23

# CROSS SECTION
# STA. 13+00 TO STA. 13+40

2/3/2011

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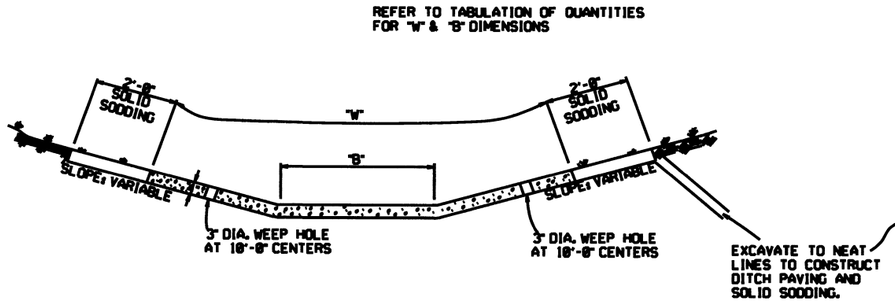
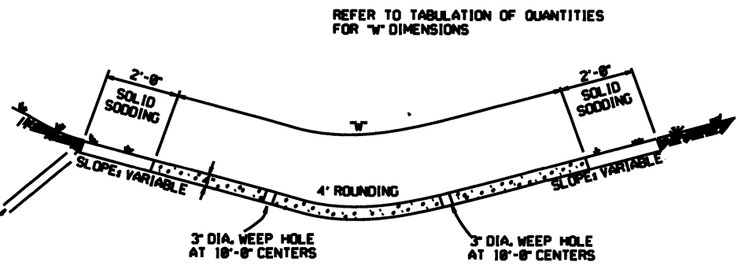
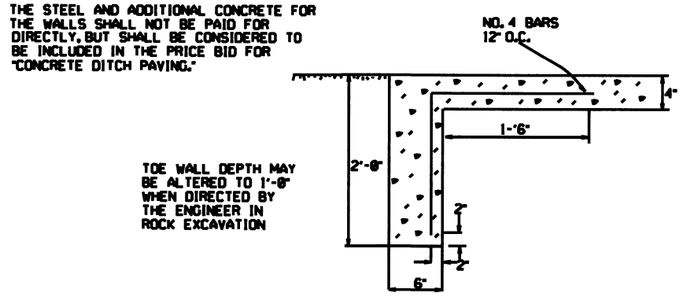



TYPE A

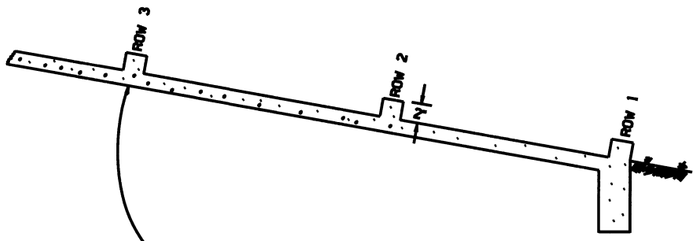



TYPE B

THE STEEL AND ADDITIONAL CONCRETE FOR THE WALLS SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR "CONCRETE DITCH PAVING."




TOE WALL DETAIL FOR CONCRETE DITCH PAVING




ENERGY DISSIPATORS
(NO SCALE)

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

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

TOE WALLS TO BE CONSTRUCTED FULL WIDTH AT EACH END OF DITCH PAVING, AND POURED MONOLITHICALLY.

SOLID SOD ALONG DITCH PAVING TO BE PLACED WITHIN 14 DAYS OF DITCH PAVING CONSTRUCTION.

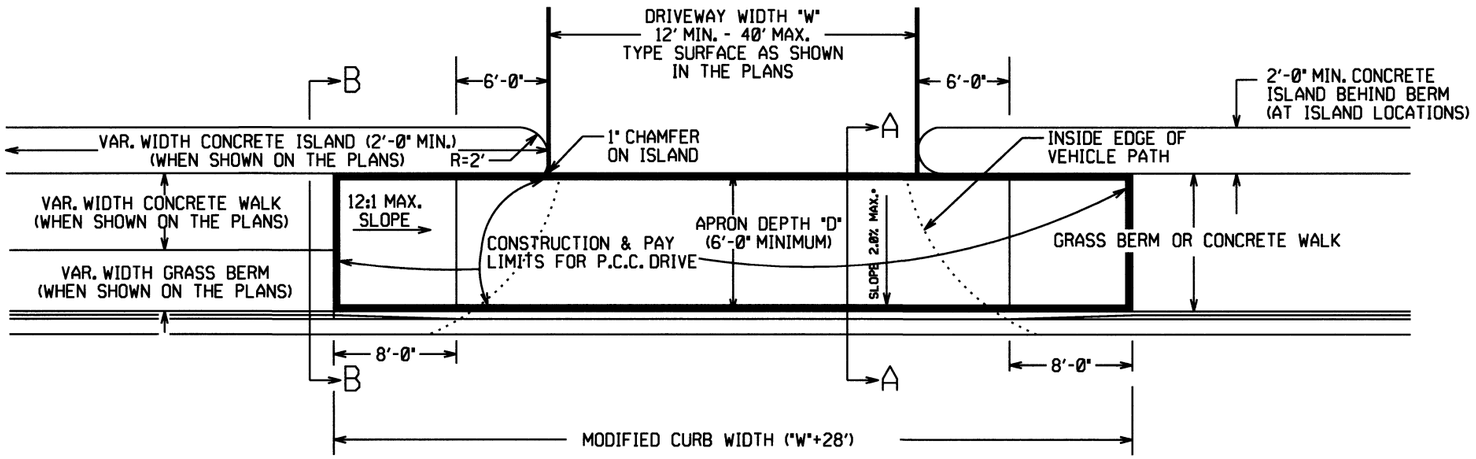
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

| DATE | REVISION | DATE FILM'D |
|---|---|---|
| 12-8-16 | CORRECTED ENERGY DISSIPATOR DRAWING AND NOTE | |
| 11-17-10 | ADDED GENERAL NOTE | |
| 8-2-94 | ADDED GENERAL NOTE ABOUT SOLID SODDING | |
| 11-30-8 | ELIMINATED MIN. ROWS OF ELEMENTS | 111-30-89 |
| 7-15-88 | REVISED DISSIPATOR NOTE | 883-7-15-88 |
| 4-3-87 | REVISED ENERGY DISSIPATOR | 871-4-3-87 |
| 1-9-87 | MODIFIED NOTE ON ENERGY DISS. | 832-1-9-87 |
| 11-3-86 | ADDED NOTE TO ENERGY DISS. | 799-12-1-86 |
| 11-1-84 | ENERGY DISSIPATOR DETAILS ADDED | 508-11-1-84 |
| 11-1-84 | EXCAVATION DETAILS ADDED TYPES A & B | |
| 10-2-72 | REVISED AND REDRAWN | 508-10-2-72 |

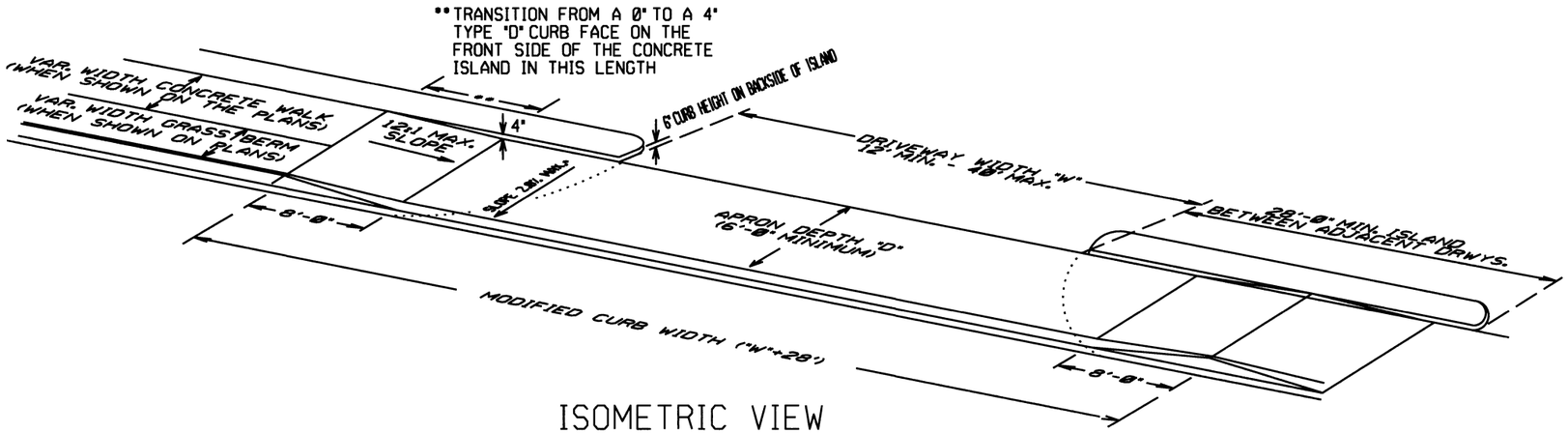
ARKANSAS STATE HIGHWAY COMMISSION

# CONCRETE DITCH PAVING

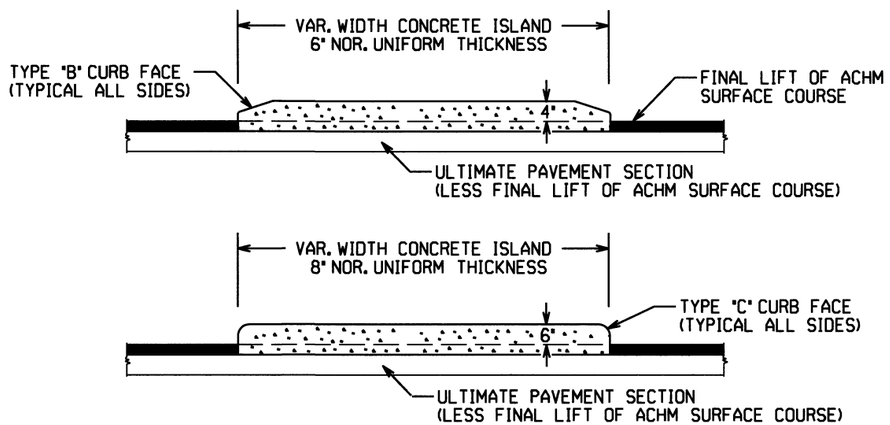
STANDARD DRAWING CDP-1




PLAN VIEW

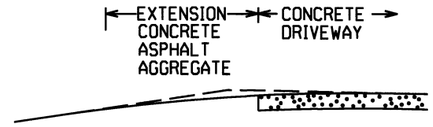



ISOMETRIC VIEW




CURBED ISLANDS FOR CHANNELIZATION

REFER TO PLANS FOR TYPE OF CURB FACE TO BE USED. NO DIRECT PAYMENT WILL BE MADE FOR THE CURB FACES SHOWN ON THE ISLAND DETAILS. PAYMENT FOR THE CURB FACE WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM "CONCRETE ISLAND".




EXTENSION TYPICAL SECTIONS

1: CONCRETE - 6" P.C. CONCRETE DRIVEWAY

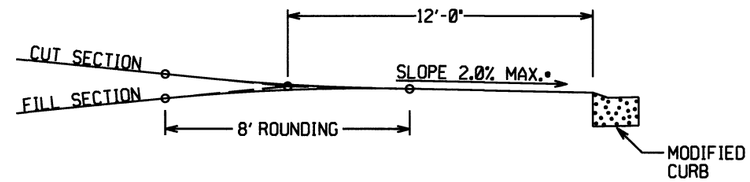
2: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
4" ACHM BINDER COURSE.(1") OR
4" ACHM BASE COURSE (1-1/2")

3: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
7" AGGREGATE BASE COURSE

4: AGGREGATE - 6" AGGREGATE BASE COURSE

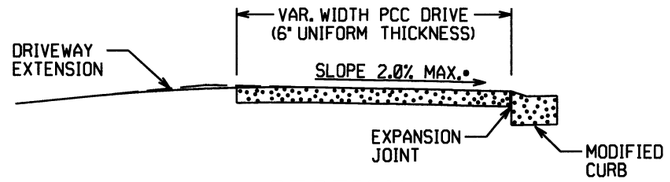
THE TYPE OF EXTENSION SHALL BE AS SHOWN IN THE PLANS. THE CONTRACTOR MAY, WITH THE APPROVAL OF THE ENGINEER, SUBSTITUTE A LOWER NUMBERED TYPE OF EXTENSION IN LIEU OF THE TYPE SPECIFIED IN THE PLANS, BUT AT NO ADDITIONAL COST TO THE DEPARTMENT.

DRIVEWAY EXTENSION DETAILS

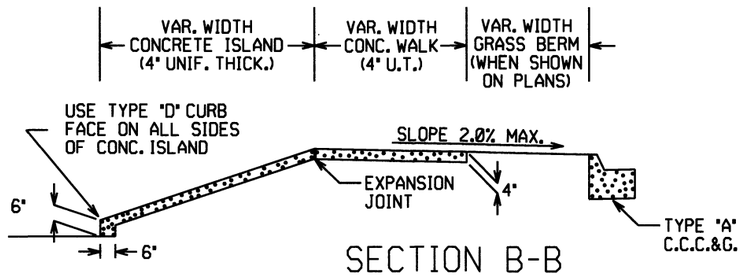



DRIVEWAY VERTICAL ALIGNMENT DETAILS

- NOTE: DRIVEWAYS MAY NOT BE SLOPED AWAY FROM THE ROADWAY UNLESS APPROVED BY THE ENGINEER.




SECTION A-A



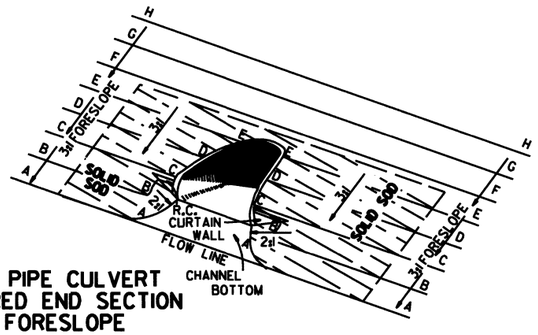

SECTION B-B
CURBED ISLAND BEHIND WALK

| DATE REV | DATE FILMED | DESCRIPTION |
|---|---|---|
| 2-27-14 | | REVISED PLAN & ISOMETRIC VIEW |
| 11-29-07 | | ADDED CHANNELIZATION ISLAND WITH TYPE C CURB FACE & REVISED DRIVEWAY SLOPE NOTE & VERTICAL ALIGNMENT DETAIL |
| 11-10-05 | | REV. APRON SLOPE & DEPTH OF AGG. BASE. |
| 8-22-02 | | ADDED ISLAND DETAILS & NOTES |
| 3-30-00 | | REV. MOD. CURB WIDTH & TRANS. NOTE |
| 11-19-98 | | REVISED NOTES |
| 11-18-98 | | REDRAWN AND REISSUED |

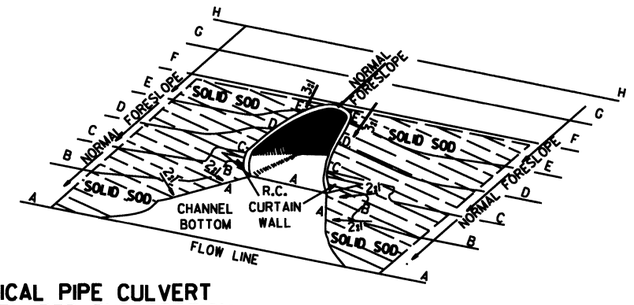
ARKANSAS STATE HIGHWAY COMMISSION

**DETAILS OF DRIVEWAYS & ISLANDS**

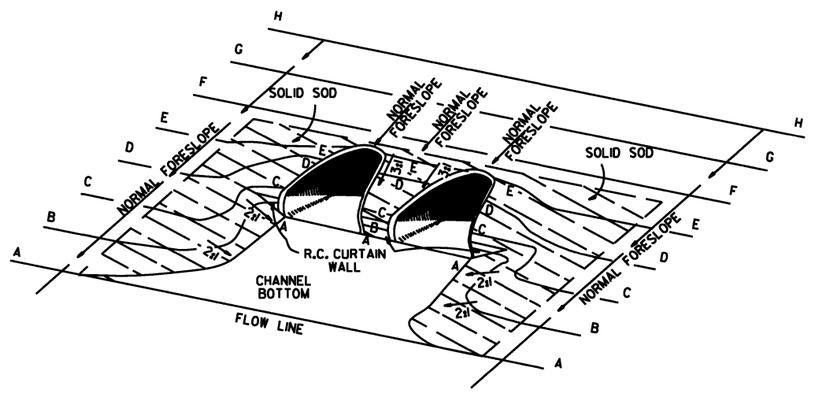
STANDARD DRAWING DR-1




TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE




TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& FLATTENED ADJACENT SLOPES




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

## R.C. CURTAIN WALL DIMENSIONS & QUANTITIES

| PIPE DIA. | $H_1$ | $L_1$ | L | L (DBL.)/2 | SINGLE R.C.P.C. | | DOUBLE R.C.P.C. | |
|---|---|---|---|---|---|---|---|---|
| | | | | | CONC. | REINF. STEEL | CONC. | REINF. STEEL |
| | | | | | CU. YDS. | LBS. | CU. YDS. | LBS. |
| 18" | 1'-11½" | 3'-5" | 8'-0" | 6'-3" | 0.31 | 27.7 | 0.45 | 39.5 |
| 24" | 1'-0½" | 4'-6" | 9'-6" | 7'-6" | 0.37 | 33.4 | 0.53 | 48.0 |
| 30" | 1'-3½" | 5'-7" | 11'-0" | 9'-0" | 0.45 | 39.0 | 0.67 | 59.0 |
| 36" | 1'-7" | 6'-8" | 13'-0" | 10'-6" | 0.58 | 52.6 | 0.83 | 73.9 |
| 42" | 2'-1½" | 7'-3" | 15'-6" | 12'-0" | 0.82 | 77.1 | 1.10 | 100.7 |
| 48" | 2'-5" | 7'-10" | 17'-0" | 13'-0" | 0.98 | 94.9 | 1.27 | 120.4 |
| 54" | 2'-9½" | 8'-5" | 18'-6" | 14'-0" | 1.16 | 115.8 | 1.47 | 143.7 |
| 60" | 3'-4" | 9'-0" | 20'-6" | 15'-6" | 1.47 | 149.7 | 1.84 | 180.3 |
| 72" | 4'-5" | 10'-2" | 25'-6" | 18'-6" | 2.31 | 232.6 | 2.73 | 271.0 |

NOTE: QUANTITIES SHOWN ARE FOR ONE (1) CURTAIN WALL.

## REINFORCING STEEL SCHEDULE

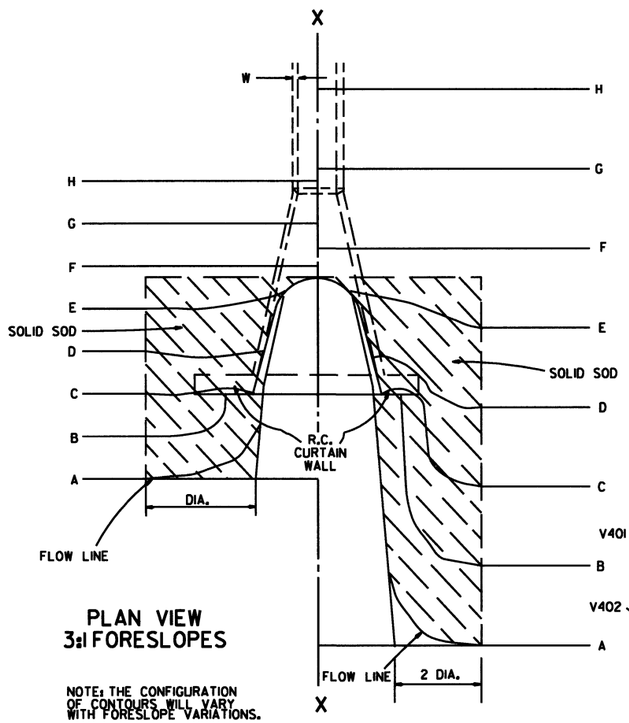
| PIPE DIA. | SINGLE R.C. PIPE CULVERT | | | | | | | | DOUBLE R.C. PIPE CULVERT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H401 | | H402 | | V401 | | V402 | | H401 | | H402 | | H403 | | V401 | | V402 | |
| | L | NO. | L | NO. | L | NO. | L | NO. | L | NO. | L | NO. | L | NO. | L | NO. | L | NO. |
| 18" | 7'-8" | 2 | 1'-11½" | 4 | 1'-7½" | 8 | 8" | 8 | 12'-2" | 2 | 1'-11½" | 4 | 8" | 2 | 1'-7½" | 10 | 8" | 14 |
| 24" | 9'-2" | 2 | 2'-2" | 4 | 1'-8½" | 10 | 8" | 9 | 14'-8" | 2 | 2'-2" | 4 | 8" | 2 | 1'-8½" | 12 | 8" | 18 |
| 30" | 10'-8" | 2 | 2'-4½" | 4 | 1'-11½" | 10 | 8" | 12 | 17'-8" | 2 | 2'-4½" | 4 | 8" | 2 | 1'-11½" | 14 | 8" | 22 |
| 36" | 12'-8" | 2 | 2'-10" | 6 | 2'-3" | 12 | 8" | 14 | 20'-8" | 2 | 2'-10" | 6 | 8" | 3 | 2'-3" | 14 | 8" | 28 |
| 42" | 15'-2" | 2 | 3'-9½" | 8 | 2'-9½" | 16 | 8" | 15 | 23'-8" | 2 | 3'-9½" | 8 | 8" | 4 | 2'-9½" | 18 | 8" | 30 |
| 48" | 16'-8" | 2 | 4'-3" | 10 | 3'-1" | 18 | 8" | 16 | 25'-8" | 2 | 4'-3" | 10 | 8" | 5 | 3'-1" | 20 | 8" | 32 |
| 54" | 18'-2" | 2 | 4'-8½" | 12 | 3'-5½" | 20 | 8" | 17 | 27'-8" | 2 | 4'-9" | 12 | 8" | 6 | 3'-5½" | 22 | 8" | 34 |
| 60" | 20'-2" | 2 | 5'-5" | 14 | 4'-0" | 24 | 8" | 18 | 30'-8" | 2 | 5'-5" | 14 | 8" | 7 | 4'-0" | 26 | 8" | 36 |
| 72" | 25'-2" | 2 | 7'-4" | 18 | 5'-1" | 30 | 8" | 20 | 36'-8" | 2 | 7'-4" | 18 | 8" | 9 | 5'-1" | 33 | 8" | 40 |

ALL REINFORCING STEEL #4 BARS @ 6" O.C.

## SOLID SODDING

| PIPE DIA. | SINGLE R.C.P.C. | | | DOUBLE R.C.P.C. | | |
|---|---|---|---|---|---|---|
| | 3:1 | 4:1 | 6:1 | 3:1 | 4:1 | 6:1 |
| | SQ. YDS. | | | SQ. YDS. | | |
| 18" | 5 | 7 | 12 | 6 | 8 | 13 |
| 24" | 8 | 12 | 19 | 9 | 13 | 20 |
| 30" | 13 | 18 | 29 | 14 | 19 | 30 |
| 36" | 17 | 26 | 41 | 18 | 28 | 43 |
| 42" | 23 | 35 | 55 | 25 | 37 | 57 |
| 48" | 29 | 46 | 68 | 31 | 48 | 70 |
| 54" | 36 | 57 | 85 | 37 | 59 | 87 |
| 60" | 45 | 69 | 104 | 48 | 65 | 107 |
| 72" | 64 | 96 | 156 | 67 | 95 | 159 |

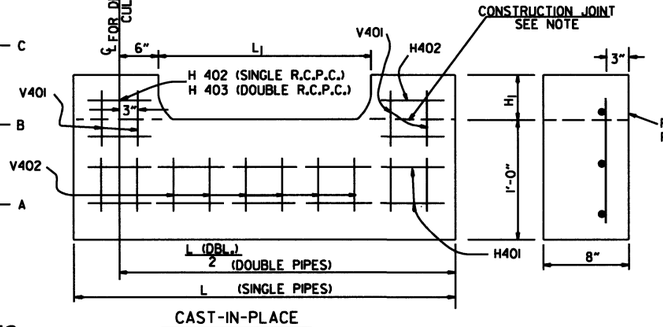
NOTE: QUANTITIES SHOWN ABOVE ARE FOR ONE (1) END OF F.E.S.




PLAN VIEW
3:1 FORESLOPES

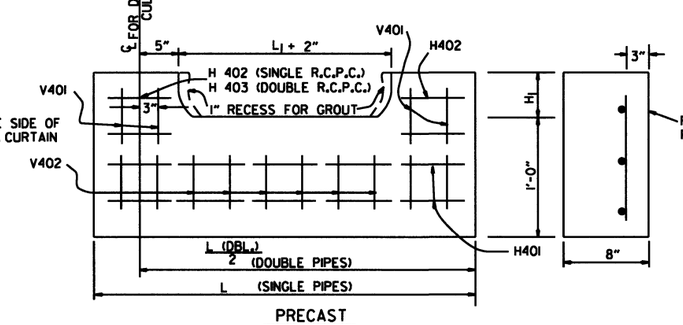
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW
FLATTENED FORESLOPES




CAST-IN-PLACE

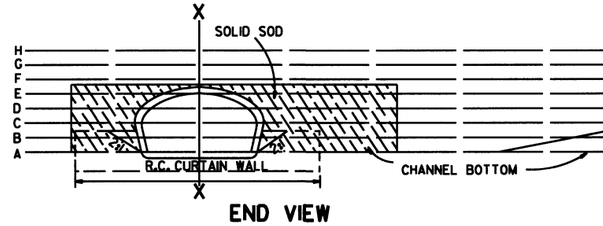
NOTE: THE PORTION OF THE R.C. CURTAIN WALL BENEATH THE FLARED END SECTION (LOWER 1'-0") SHALL BE PLACED MONOLITHICALLY. THE FLARED END SECTION SHALL THEN BE SET IN PLACE & THE REMAINING PORTIONS OF THE R.C. CURTAIN WALL PLACED.



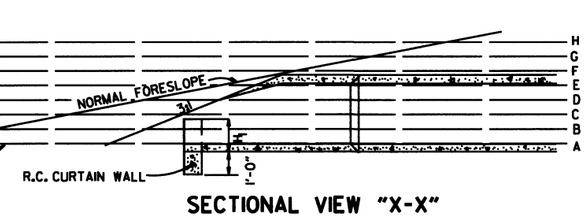

PRECAST

NOTE: THE PRECAST CURTAIN WALL WILL BE SET AND BACKFILLED WITH COMPACTED MATERIAL. THE FLARED END SECTION SHALL THEN BE SET IN PLACE AND THE 1" RECESS FILLED WITH GROUT. WHERE "L" EXCEEDS 11' THE CURTAIN WALL MAY BE CAST IN TWO (2) OR MORE SECTIONS. THE METHOD OF JOINING THE SECTIONS FOR INSTALLATION SHALL BE APPROVED BY THE ENGINEER.

R.C. CURTAIN WALL DETAILS




END VIEW




SECTIONAL VIEW "X-X"

### GENERAL NOTES

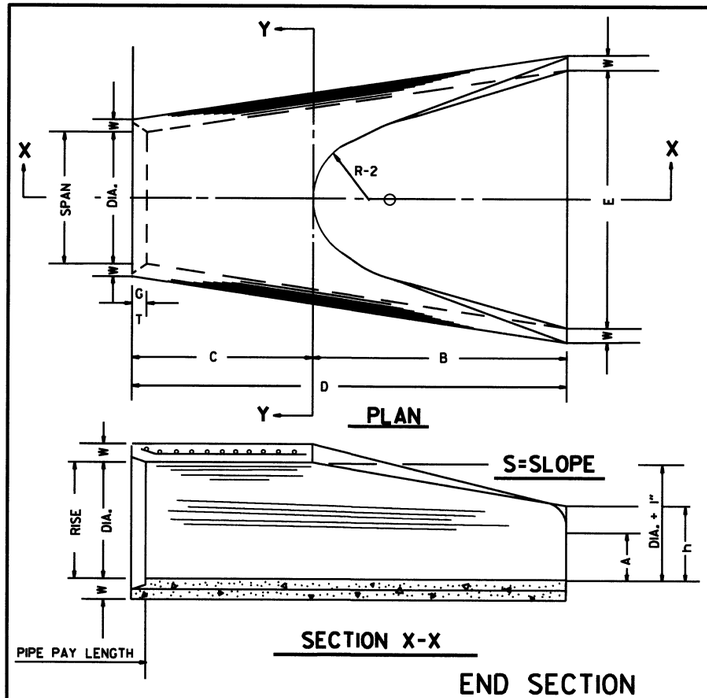
1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE: FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL, AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED ¾".
3. CONCRETE FOR CURTAIN WALL SHALL MEET THE REQUIREMENTS FOR CLASS A OR S CONCRETE AS PROVIDED IN SECTION 802 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 501 OF THE STANDARD SPECIFICATIONS.
4. WELDED WIRE MESH 3 x 3 W10 x W10 MAY BE USED IN LIEU OF REINFORCING BARS.

| DATE | REVISION | FILMED |
|---|---|---|
| 10-18-96 | ADDED NOTE TO SOLID SODDING | |
| 10-12-95 | CORRECTED SPELLING | |
| 11-3-94 | ADDED GENERAL NOTE NO. 4 | |
| 8-15-91 | REV. CURTAIN WALL QUANT. STEEL SCH. & SOLID SOD QUANT. | |
| 3-2-81 | ALLOW PRECAST IN 2 OR MORE PIECES CHAMFER EDGES | |
| 5-15-80 | ADDED PRECAST WALL & GENERAL NOTES | |
| 10-2-72 | REVISED AND REDRAWN | |

ARKANSAS STATE HIGHWAY COMMISSION

# FLARED END SECTION

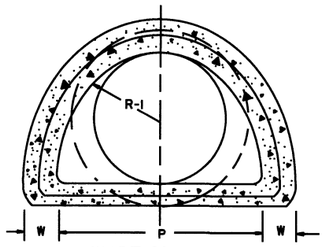
STANDARD DRAWING FES-1



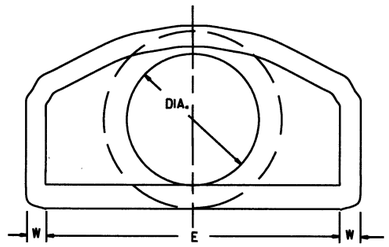

SECTION X-X

## TABLE OF DIMENSIONS

| DIA. | WALL | A | B | C | D | E | S | DIA. + I" | P | R-I | R-2 | G-T | WT. | h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18" | 2½" | 9" | 2'-3" | 3'-10" | 6'-1" | 3'-0" | 3:1 | 19" | 29" | 15½" | 12" | 2" | 1000 | 1'-0½" |
| 24" | 3" | 9½" | 3'-7½" | 2'-6" | 6'-11½" | 4'-0" | 3:1 | 25" | 33⅜" | 16⅝" | 14" | 2½" | 1600 | 1'-1½" |
| 30" | 3½" | 1'-0" | 4'-6" | 1'-7⅜" | 6'-1¾" | 5'-0" | 3:1 | 31" | 37" | 18½" | 15" | 3¼" | 1940 | 1'-4⅝" |
| 36" | 4" | 1'-3" | 5'-3" | 2'-10¾" | 8'-1¾" | 6'-0" | 3:1 | 37" | 47⅝" | 24⅛" | 20" | 3½" | 4100 | 1'-8" |
| 42" | 4½" | 1'-9" | 5'-3" | 2'-11" | 8'-2" | 6'-6" | 3:1 | 43" | 53⅛" | 27½" | 22" | 3½" | 5380 | 2'-2½" |
| 48" | 5" | 2'-0" | 6'-0" | 2'-2" | 8'-2" | 7'-0" | 3:1 | 49" | 56½" | 28½" | 22" | 3½" | 6550 | 2'-6" |
| 54" | 5½" | 2'-4" | 6'-6" | 1'-10" | 8'-4" | 7'-6" | 3:1 | 55" | 65½" | 33⅛" | 24" | 4" | 8750 | 2'-10½" |
| 60" | 6" | 2'-10" | 6'-6" | 1'-10" | 8'-4" | 8'-0" | 3:1 | 61" | 72½" | 36⅝" | 24" | 4" | 9270 | 3'-5" |
| 72" | 7" | 3'-10" | 6'-6" | 1'-10" | 8'-4" | 9'-0" | 3:1 | 73" | 77⅝" | 38⅝" | 24" | 5" | 13250 | 4'-6" |




SECTION Y-Y




END VIEW

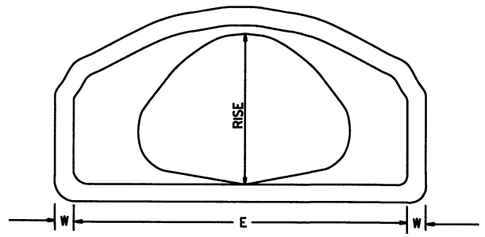
NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

# END SECTION
# FOR REINFORCED CONCRETE PIPE CULVERTS

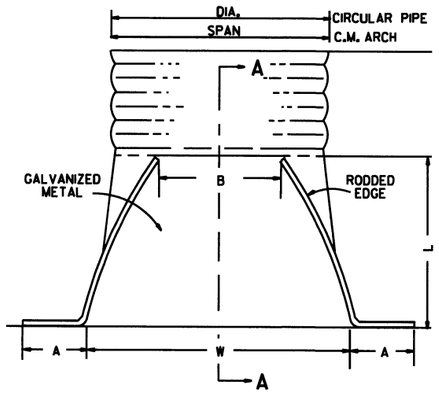
## ARCH PIPE

| EQUIV. DIA. | • SPAN | | • RISE | | W | A | B | C | D | E | P | R2 | G-T | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AASHTO M 206 | AHD NOMINAL | AASHTO M 206 | AHD NOMINAL | | | | | | | | | | |
| | INCHES | | | | | | | | | | | | | |
| 15 | 18 | 18 | 11 | 11 | 2" | 4" | 2'-0" | 4'-0" | 6'-0" | 3'-0" | 29" | 12" | 1½" | 2½:1 |
| 18 | 22 | 22 | 13½ | 14 | 2½" | 5" | 2'-0" | 4'-1" | 6'-1" | 3'-6" | 32⅛" | 13" | 2½" | 2½:1 |
| 21 | 26 | 26 | 15½ | 16 | 2¾" | 7" | 2'-3" | 3'-10" | 6'-1" | 4'-0" | 34⅛" | 14" | 2½" | 2½:1 |
| 24 | 28½ | 29 | 18 | 18 | 3" | 9" | 2'-3" | 3'-10" | 6'-1" | 5'-0" | 36⅛" | 15" | 2½" | 2½:1 |
| 30 | 36¼ | 36 | 22½ | 23 | 3½" | 10" | 3'-1" | 3'-0½" | 6'-1½" | 6'-0" | 47⅝" | 20" | 3" | 2½:1 |
| 36 | 43¾ | 44 | 26⅝ | 27 | 4" | 10½" | 4'-0" | 2'-11½" | 6'-1½" | 6'-6" | 54⅝" | 22" | 3½" | 2½:1 |
| 42 | 51⅛ | 51 | 31⅝ | 31 | 4½" | 11½" | 4'-7" | 1-10¼" | 6'-5¼" | 7'-2" | 59½" | 23" | 3¾" | 2½:1 |
| 48 | 58½ | 59 | 36 | 36 | 5" | 1'-3" | 5'-3" | 2'-10¾" | 8'-1¾" | 7'-10" | 70⅝" | 24" | 4¼" | 2½:1 |
| 54 | 65 | 65 | 40 | 40 | 5½" | 1'-7" | 5'-3" | 2'-11" | 8'-2" | 8'-6" | 72⅛" | 24" | 4¾" | 2¼:1 |
| 60 | 73 | 73 | 45 | 45 | 6" | 1'-10" | 5'-6" | 2'-8" | 8'-2" | 9'-0" | 77⅝" | 24" | 5" | 2¼:1 |

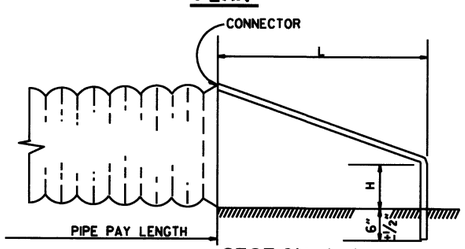
• THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PER CENT FROM THE VALUES SPECIFIED BY AASHTO M 206.




END VIEW
CONCRETE ARCH PIPE

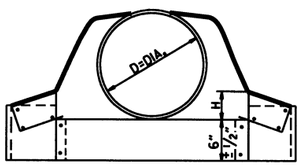



PLAN

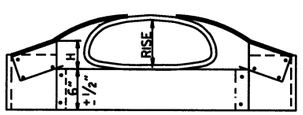



SECTION A-A

NOTE: ALTERNATE CONNECTIONS TO THE PIPE CULVERTS, IN ACCORDANCE WITH MANUFACTURER'S STANDARD PRACTICES, MAY BE MADE SUBJECT TO THE APPROVAL OF THE ENGINEER.




CIRCULAR PIPE




C.M. ARCH PIPE

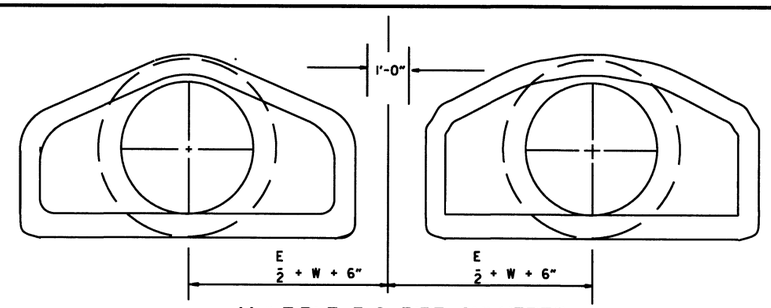
## CIRCULAR PIPE

| D. DIA. | GAUGE | A I" ± | B. MAX. | H I" ± | L 1½" ± | W 2" ± | S |
|---|---|---|---|---|---|---|---|
| | | INCHES | | | | | |
| 12 | 16 | 6 | 6 | 6 | 21 | 24 | 2½:1 |
| 15 | 16 | 7 | 8 | 6 | 26 | 30 | 2½:1 |
| 18 | 16 | 8 | 10 | 6 | 31 | 36 | 2½:1 |
| 21 | 16 | 9 | 12 | 6 | 36 | 42 | 2½:1 |
| 24 | 16 | 10 | 13 | 6 | 41 | 48 | 2½:1 |
| 30 | 14 | 12 | 16 | 8 | 51 | 60 | 2½:1 |
| 36 | 14 | 14 | 19 | 9 | 60 | 72 | 2½:1 |
| 42 | 12 | 16 | 22 | 11 | 69 | 84 | 2½:1 |
| 48 | 12 | 18 | 27 | 12 | 78 | 90 | 2½:1 |
| 54 | 12 | 18 | 30 | 12 | 84 | 102 | 2:1 |
| 60 | 12 | 18 | 33 | 12 | 87 | 114 | 1¾:1 |
| 66 | 12 | 18 | 36 | 12 | 87 | 120 | 1½:1 |
| 72 | 12 | 18 | 39 | 12 | 87 | 126 | 1 1/3:1 |

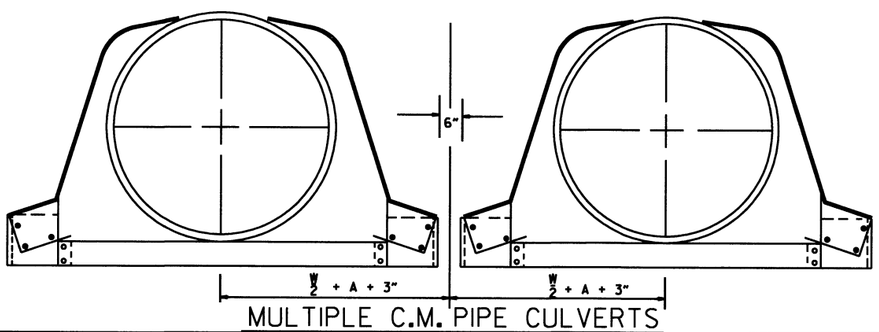
## C.M. ARCH PIPE

| EQUIV. DIA. | SPAN | RISE | A I" ± | B MAX. | H I" ± | L 1½" ± | W 2" ± | S | GAUGE |
|---|---|---|---|---|---|---|---|---|---|
| | INCHES | | | | | | | | |
| 15" | 17 | 13 | 7 | 9 | 6 | 19 | 30 | 2½:1 | 16 |
| 18" | 21 | 15 | 7 | 10 | 6 | 23 | 36 | 2½:1 | 16 |
| 21" | 24 | 18 | 8 | 12 | 6 | 28 | 42 | 2½:1 | 16 |
| 24" | 28 | 20 | 9 | 14 | 6 | 32 | 48 | 2½:1 | 16 |
| 30" | 35 | 24 | 10 | 16 | 6 | 39 | 60 | 2½:1 | 14 |
| 36" | 42 | 29 | 12 | 18 | 8 | 46 | 75 | 2½:1 | 14 |
| 42" | 49 | 33 | 15 | 21 | 9 | 53 | 85 | 2½:1 | 12 |
| 48" | 57 | 38 | 18 | 26 | 12 | 63 | 90 | 2½:1 | 12 |
| 54" | 64 | 43 | 18 | 30 | 12 | 70 | 102 | 2¼:1 | 12 |
| 60" | 71 | 47 | 18 | 33 | 12 | 77 | 114 | 2¼:1 | 12 |

# END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS




MULTIPLE R.C. PIPE CULVERTS



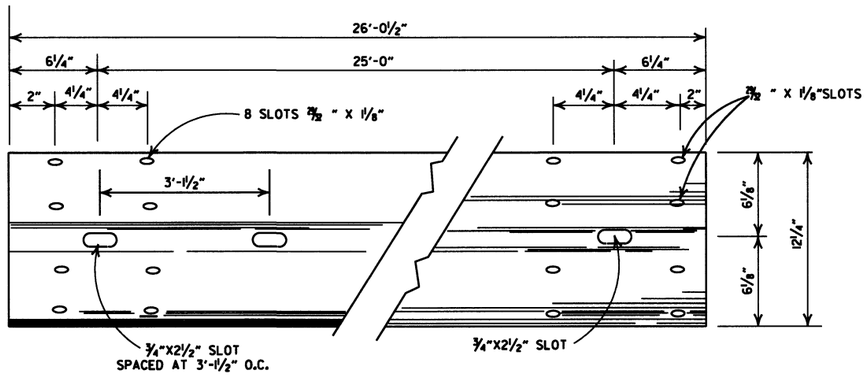

MULTIPLE C.M. PIPE CULVERTS

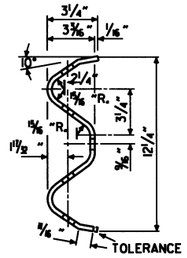
| DATE | REVISION | FILMED |
|---|---|---|
| 10-18-96 | REVISED ASTM REF. TO AASHTO | |
| 5-15-80 | REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S. | 664-5-15-80 |
| 7-14-78 | C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES | 752-7-14-78 |
| 8-22-75 | ADDED MULTIPLE PIPE CULVERTS | 517-8-22-75 |
| 12-5-74 | REMOVED NOTE RE REINF. FOR R.C. F.E.S. | 500-12-5-74 |
| 5-24-73 | CMP END SECTION, SHOW PIPE PAY LENGTH | 627-5-24-73 |
| 10-2-72 | REVISED AND REDRAWN | 760-10-2-72 |

ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

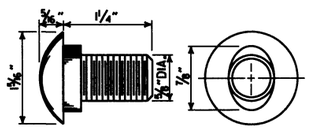
STANDARD DRAWING FES-2



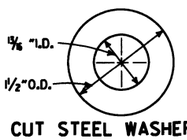




## DETAILS OF W-BEAM GUARD RAIL

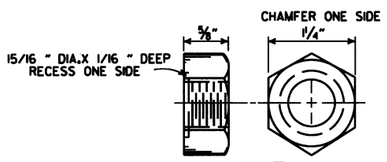
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



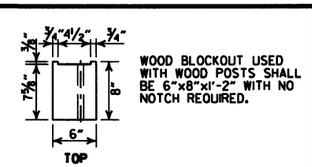

## SPLICE BOLT
## POST BOLT - SAME EXCEPT LENGTH




CUT STEEL WASHER

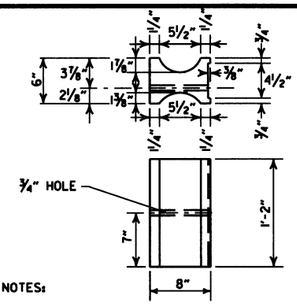



NUT




WOOD BLOCKOUT USED WITH WOOD POSTS SHALL BE 6"x8"x1'-2" WITH NO NOTCH REQUIRED.

## WOOD BLOCKOUT (W-BEAM)

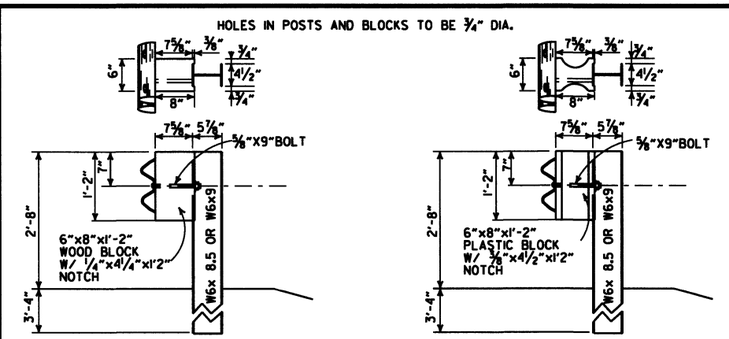



NOTES:

1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

## PLASTIC BLOCKOUT (W-BEAM)

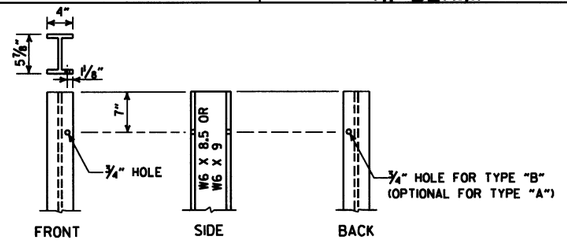
HOLES IN POSTS AND BLOCKS TO BE ¾" DIA.



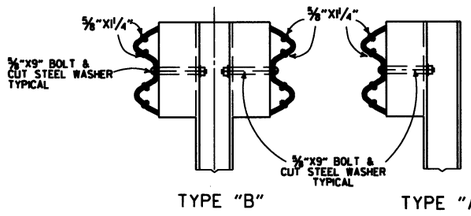

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

## DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)




## STEEL POST




TYPE "B" TYPE "A"

## DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

### -GENERAL NOTES-

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN ¾" BEYOND IT.

WHERE W-BEAM GUARD RAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.

W-BEAM GUARD RAIL REPRESENTING INTERMEDIATE SECTIONS WILL BE MEASURED ALONG THE ROADWAY FACE FROM CENTERLINE OF POST TO CENTERLINE OF POST.

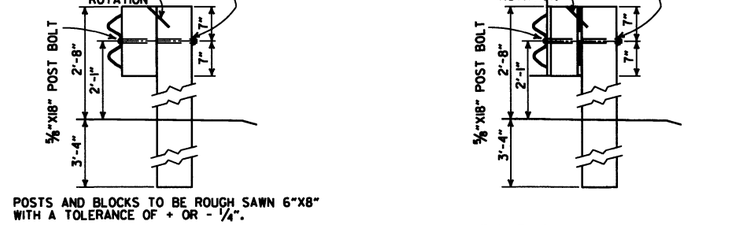
USE W-BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. FOR EXTENSIONS OR MODIFICATION OF EXISTING GUARD RAIL, W-BEAM GUARD RAIL COMPONENTS OF THE SAME TYPE AS THOSE EXISTING SHALL BE USED.

ANY BACKFILLING UNDER OR AROUND POST SHALL BE DAMP SAND THOROUGHLY TAMPED IN PLACE.

WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO.1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO.1 1350 f SOUTHERN PINE.

CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

HOLES IN POSTS AND BLOCKS TO BE ¾" DIA.




POSTS AND BLOCKS TO BE ROUGH SAWN 6"X8" WITH A TOLERANCE OF + OR - ¼".

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

## DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

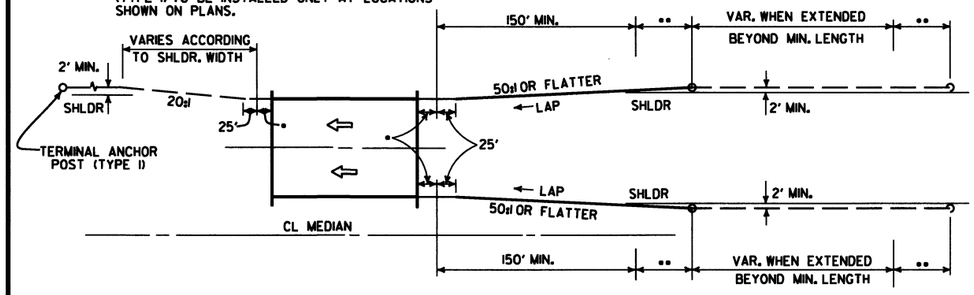
| DATE | REVISION | FILMED |
|---|---|---|
| 11-16-17 | REVISED GENERAL NOTES AND RAISED GUARD RAIL HEIGHT 3" | |
| 07-14-10 | RAISED HEIGHT OF GUARD RAIL 1" | |
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 04-10-03 | REVISED GENERAL NOTES | |
| 08-22-02 | REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & STEEL POST | |
| 11-16-01 | REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS | |
| 03-30-00 | REMOVED GUARD RAIL AT BRIDGE ENDS | |
| 01-12-00 | ADDED PLASTIC BLOCKOUT | |
| 08-12-98 | REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARD RAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK, & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE. REVISED HOLES IN STEEL POLES | |
| 04-03-97 | REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS | |
| 10-18-96 | REVISED WOOD POST NOTE | |
| 06-02-94 | ADDED ALT. STEEL POST SIZE | |
| 08-05-93 | REVISED STEEL POST SIZE | 8-5-93 |
| 10-01-92 | REDRAWN & REVISED | 10-1-92 |
| 08-15-91 | REVISED WASHER NOTE | 8-15-91 |
| 08-02-90 | REV. GEN. NOTE & DEPTH OF ANC. POST IN ROCK | 8-2-90 |
| 07-15-88 | REVISED SECTION 3 & GENERAL NOTES | |
| 03-04-88 | REV. ANCHOR POST ,ELEV. NOTES & POST IN ROCK | 780-3-4-88 |
| 10-30-87 | REVISED WOOD LINE POST DETAIL | 546-10-30-87 |
| 10-09-87 | REDRAWN & REVISED | 802-10-9-87 |

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

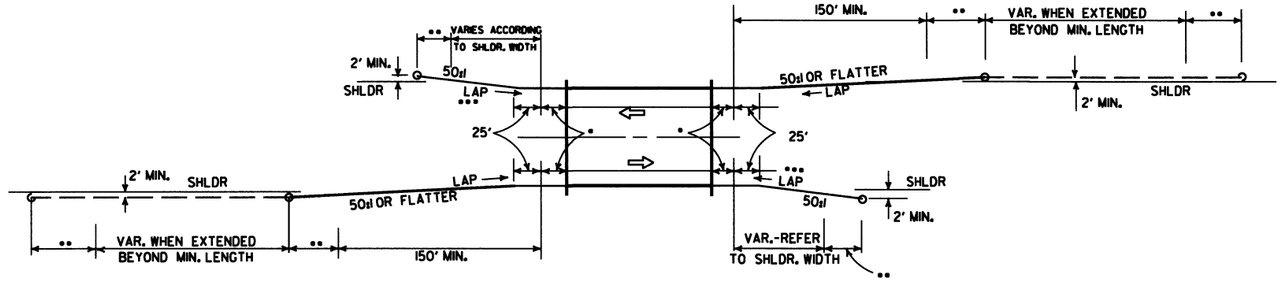
STANDARD DRAWING GR-8

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




ONE-WAY TRAFFIC

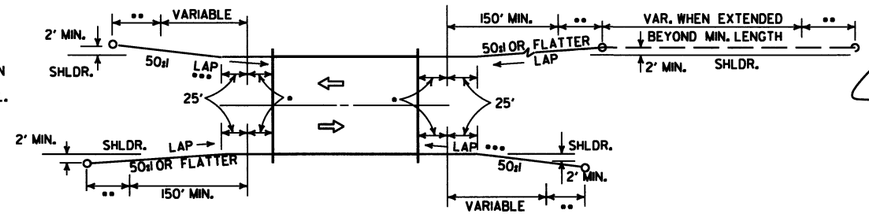
••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.




TWO-WAY TRAFFIC

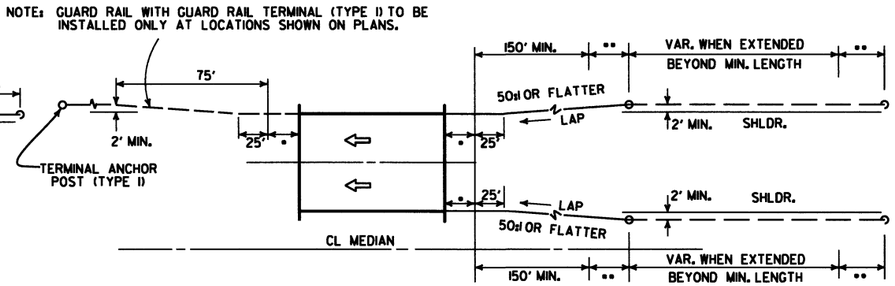
## METHODS OF INSTALLATION OF GUARD RAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.




TWO-WAY TRAFFIC

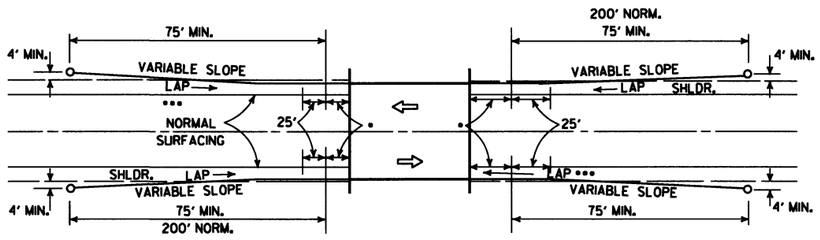
NOTE: GUARD RAIL WITH GUARD RAIL TERMINAL (TYPE I) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.




ONE-WAY TRAFFIC

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

••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.




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

LEGEND

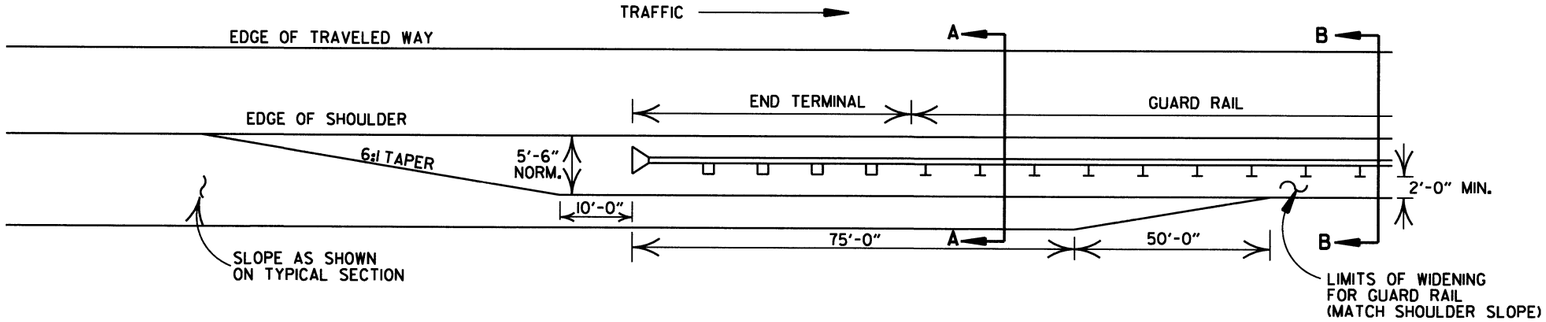
- • THRIE BEAM GUARD RAIL TERMINAL
- •• GUARD RAIL TERMINAL (TYPE 2)

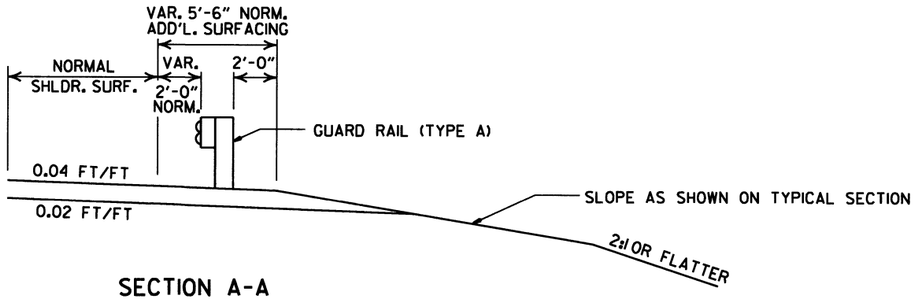
| DATE | REVISION | DATE FILM |
|---|---|---|
| 4-17-08 | REVISED LAYOUTS | |
| 11-10-05 | REMOVED GUARD RAIL NOTES AND DETAILS | |
| 11-16-01 | DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I) | |
| 1-12-00 | ADDED CONSTRUCTION NOTE | 1-12-00 |
| 6-26-97 | REVISED LAYOUT | |
| 10-1-92 | REDRAWN & REVISED | 10-1-92 |
| | ADDED NOTE | |
| 10-9-87 | REDRAWN & REVISED | |

ARKANSAS STATE HIGHWAY COMMISSION

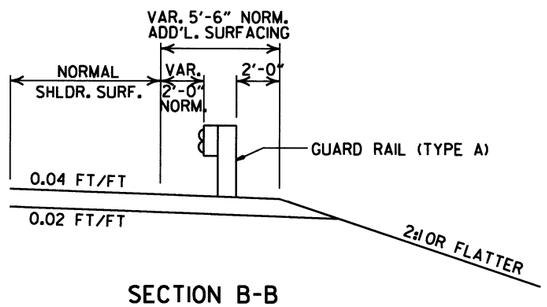
# GUARD RAIL DETAILS

STANDARD DRAWING GR-9



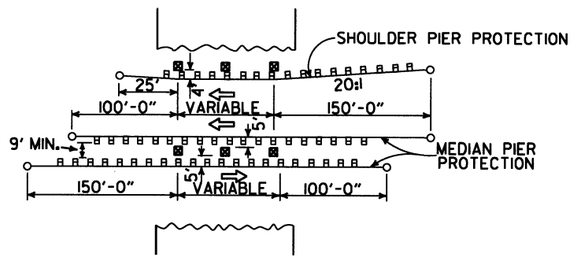




SECTION A-A



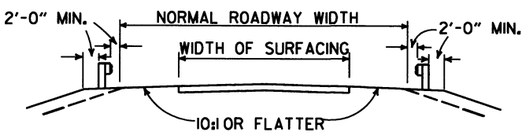

SECTION B-B

## DETAILS OF WIDENING FOR GUARD RAIL

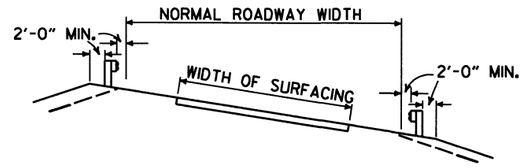



## METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

NOTE: NORMAL SECTION TO BE WIDENED APPROX. 5'-6" EACH SIDE TO SUPPORT GUARD RAIL.




SECTION ON TANGENT




SECTION ON CURVE

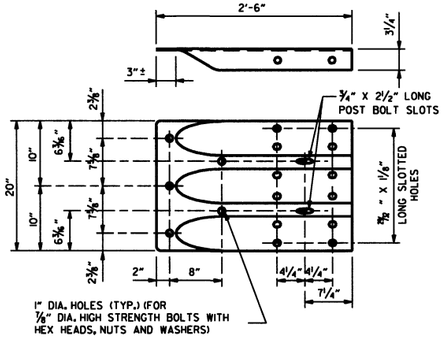
## DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY

| DATE | REVISION | DATE FILM |
|---|---|---|
| 4-17-08 | MINOR REVISION | |
| 11-10-05 | DRAWN | |

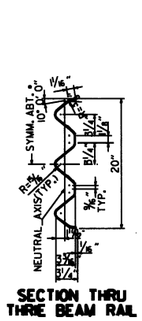
ARKANSAS STATE HIGHWAY COMMISSION

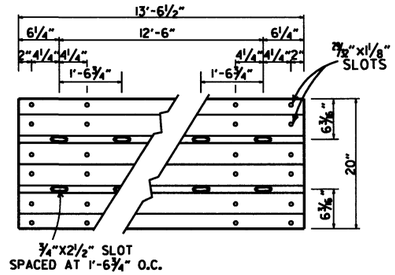
# GUARD RAIL DETAILS

STANDARD DRAWING GR-9A

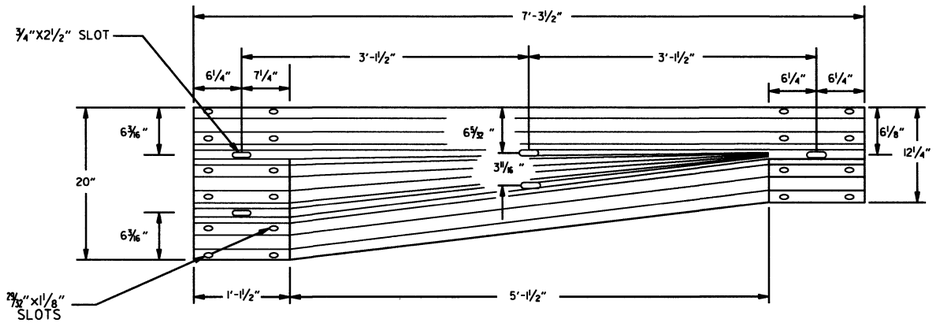



## SPECIAL END SHOE

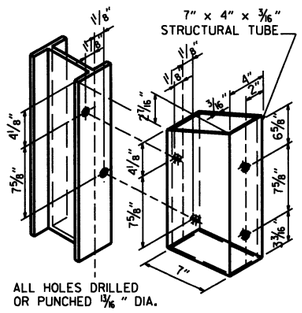



## THRIE BEAM RAIL

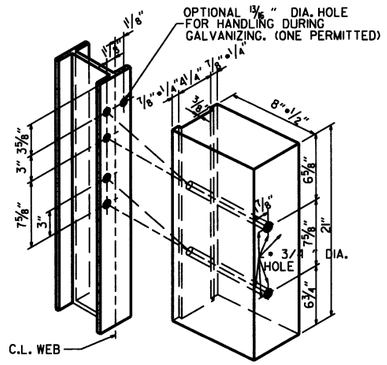



## TRANSITION SECTION




ATTACH BLOCKOUT TO POST USING ⅝" DIA. HEX HEAD BOLTS WITH 1½" O.D. CUT STEEL WASHERS AND NUT.

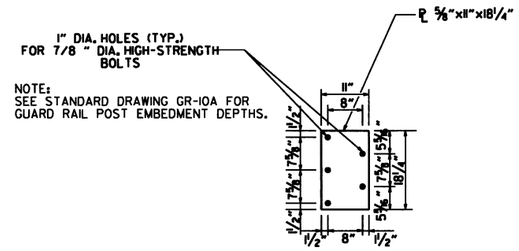
## STRUCTURAL STEEL TUBING BLOCKOUT DETAIL




ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

## HOLE PUNCHING DETAIL FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

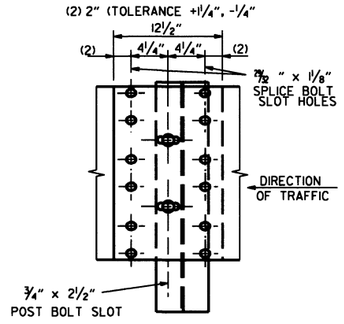
NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.




NOTE:
SEE STANDARD DRAWING GR-10A FOR GUARD RAIL POST EMBEDMENT DEPTHS.

## CONNECTOR PLATE

CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING ⅞" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.




## THRIE BEAM RAIL SPLICE AT POST

GENERAL NOTES:

THE THRIE BEAM RAIL, SPECIAL END SHOE, AND THE TRANSITION SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAGE. ZINC COATING SHALL BE TYPE I.

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3"4" BEYOND IT.

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-13.

REFER TO STD. DRWG. GR-11 FOR POST DETAILS.

USE THRIE BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.

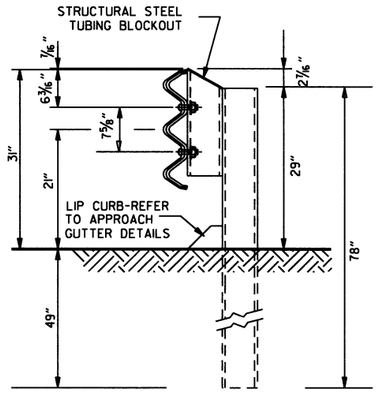
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

| DATE | REVISION | FILMED |
|---|---|---|
| 11-16-17 | REVISED TRANSITION SECTION, GUARD RAIL HEIGHT, AND GENERAL NOTES; MOVED THRIE BEAM GUARD RAIL CONNECTIONS AT BRIDGES ENDS TO STD. DRWG. GR-12 | |
| 07-14-10 | RAISED HEIGHT OF W-BEAM 1" | |
| 11-29-07 | ADDED PLASTIC BLOCKOUTS | |
| 11-10-05 | ADDED NOTE FOR ATTACHING STEEL BLOCKOUT | |
| 11-18-04 | REVISED GENERAL NOTES | |
| 10-9-03 | REVISED GENERAL NOTES | |
| 04-10-03 | REVISED GENERAL NOTES | |
| 08-22-02 | REVISED NOTE (2) | |
| 06-29-00 | MOVED DIMENSION LINES | |
| 05-18-00 | ADDED NOTE | |
| 03-30-00 | DRAWN & ISSUED | |

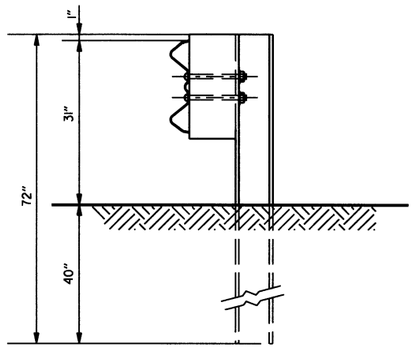
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

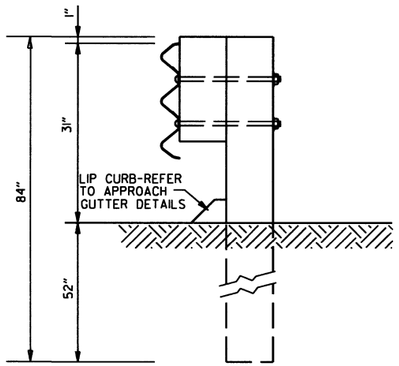
STANDARD DRAWING GR-10



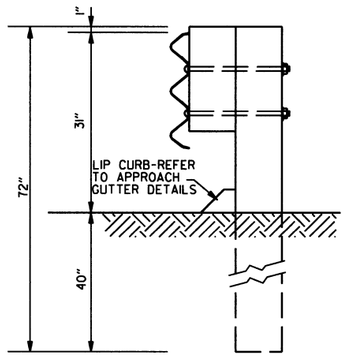

THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7



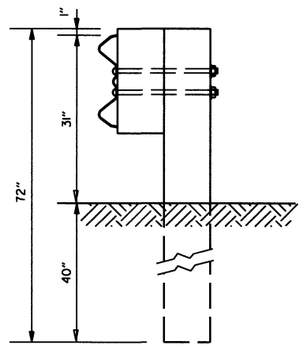

W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8




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




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




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

GENERAL NOTES:

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

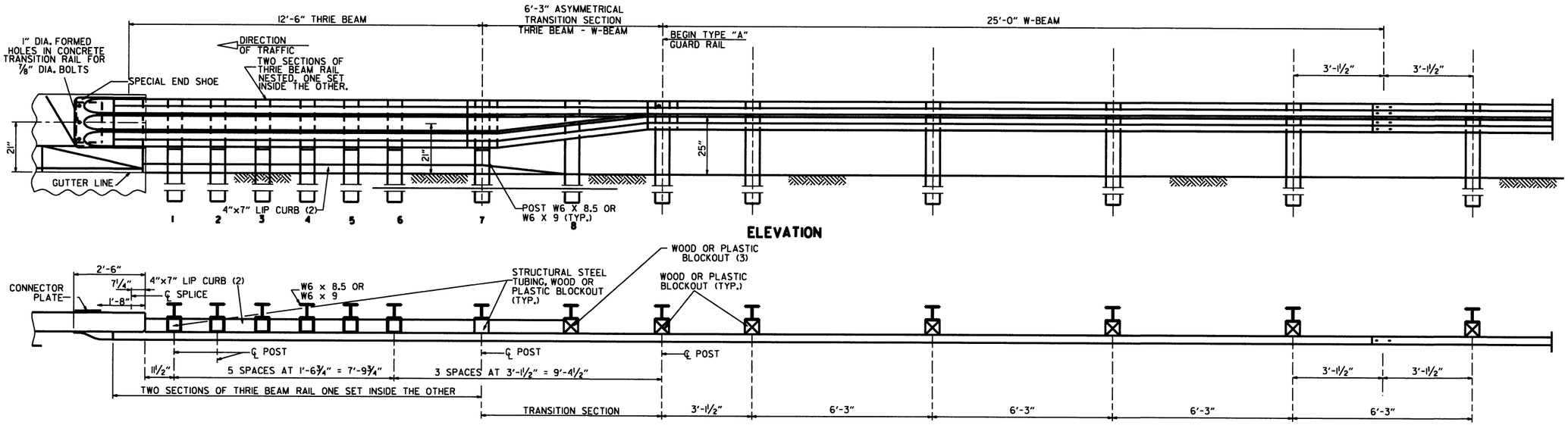
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

| DATE | REVISION | FILMED |
|---|---|---|
| 11-16-17 | REVISED GUARD RAIL HEIGHT, CHANGED STD. DWG. NUMBER FROM GR-10A TO GR-11 | |
| 07-14-10 | REVISED POST & DIMENSIONS | |
| 11-29-07 | ADDED PLASTIC BLOCKOUTS | |
| 08-22-02 | REVISED LIP CURB NOTE | |
| 03-30-00 | DRAWN & ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-11




(1) VERIFY BOLT SPACING FROM RAIL TRANSITION PRODUCER.
(2) REFER TO APPROACH GUTTER DETAILS.
(3) LENGTH OF BLOCKOUT ON POST 8 TO BE MODIFIED TO FIT RAIL WIDTH.

# THRIE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS

GENERAL NOTES:

THE THRIE BEAM RAIL, SPECIAL END SHOE, AND THE TRANSITION SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAGE. ZINC COATING SHALL BE TYPE 1.

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3#4" BEYOND IT.

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-13.

REFER TO STD. DRWG. GR-11 FOR POST DETAILS.

USE THRIE BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.

POSTS SHALL BE PLACED AT THE MID-SPAN OF THE W-BEAM.

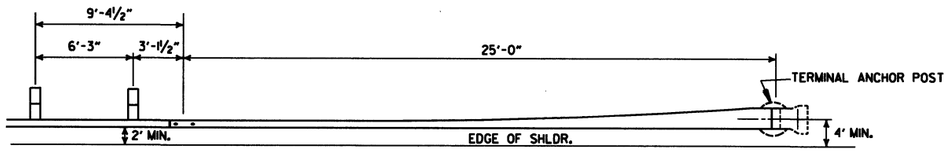
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7# (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

| DATE | REVISION | FILMED |
|---|---|---|
| 11-16-17 | RE-DRAWN FROM STD. DWG. GR-10 & ISSUED | |

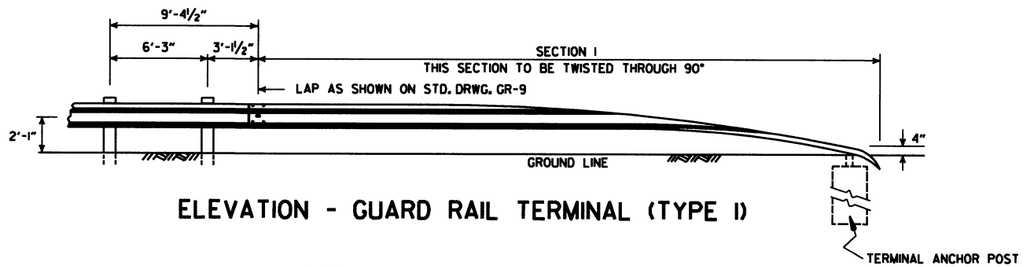
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-12

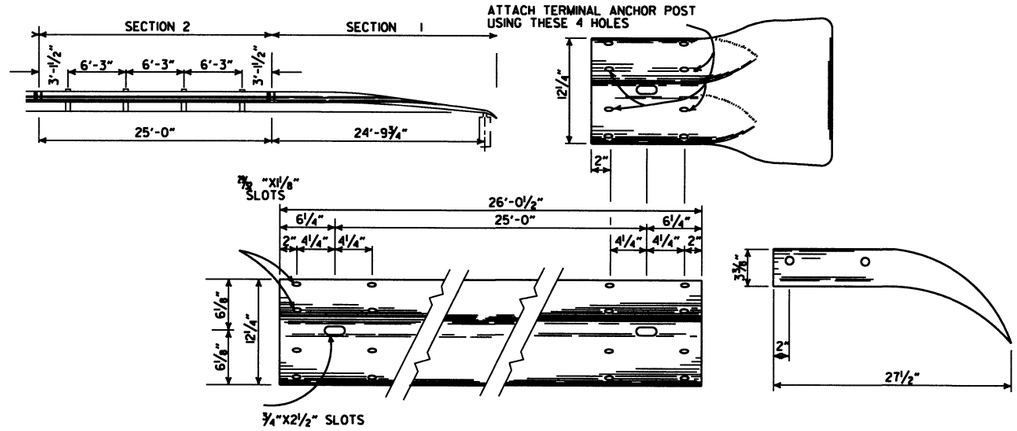



PLAN - GUARD RAIL TERMINAL (TYPE I)



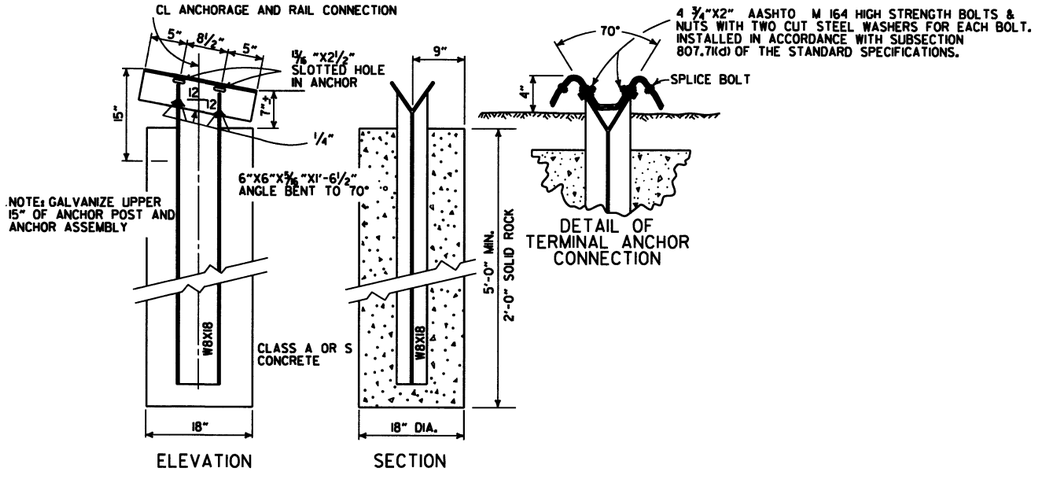

ELEVATION - GUARD RAIL TERMINAL (TYPE I)

NOTE:
SECTIONS I AND 2 OF GUARD RAIL TERMINAL SHALL BE PAID FOR AT THE PRICE BID PER LINEAR FOOT OF THE TYPE OF GUARD RAIL SPECIFIED.




SECTION I

TERMINAL SECTION




NOTE: RAIL MEMBERS MAY BE BOLTED TO ANGLE AT TERMINAL ANCHOR AND THE TWO ASSEMBLIES POSITIONED TO PROPER ALIGNMENT PRIOR TO PLACING CONCRETE AROUND 8 WF 17 POST IF CONTRACTOR SO DESIRES.

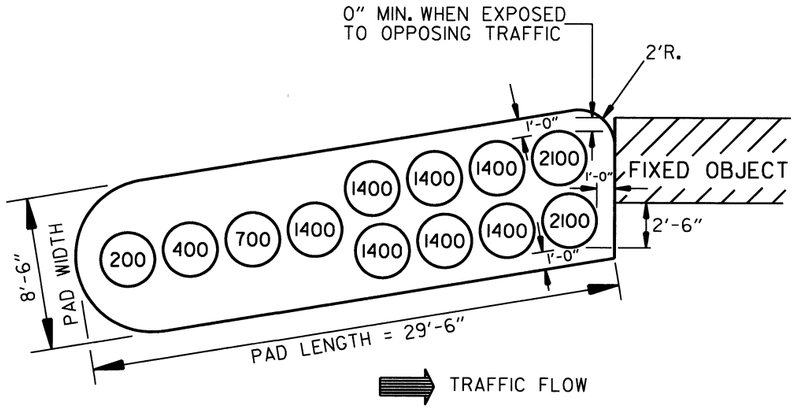
DETAIL OF TERMINAL ANCHOR POST (TYPE I)

| DATE | REVISION | FILMED |
|---|---|---|
| | | |
| | | |
| 8-16-17 | REVISED GUARD RAIL HEIGHT AND LOCATION OF POSTS | |
| 07-14-10 | RAISED HEIGHT OF GUARD RAIL 1" | |
| 06-26-97 | REVISED LAP NOTE | |
| 10-18-96 | REVISED ASTM REF. TO AASHTO | |
| 8-05-94 | DIMENSION TERMINAL DETAIL | |
| 8-11-92 | ADDED NOTE FOR PAYMENT | 8-11-92 |
| 10-01-92 | DRAWN & ISSUED | 10-1-92 |

ARKANSAS STATE HIGHWAY COMMISSION

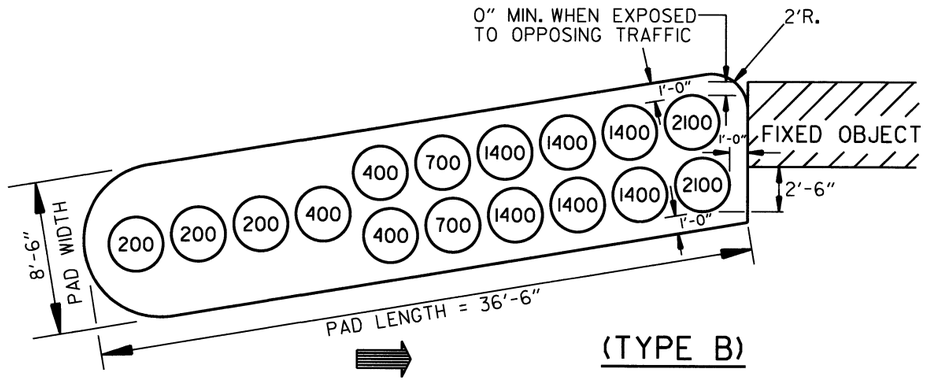
GUARD RAIL DETAILS

STANDARD DRAWING GRT-1



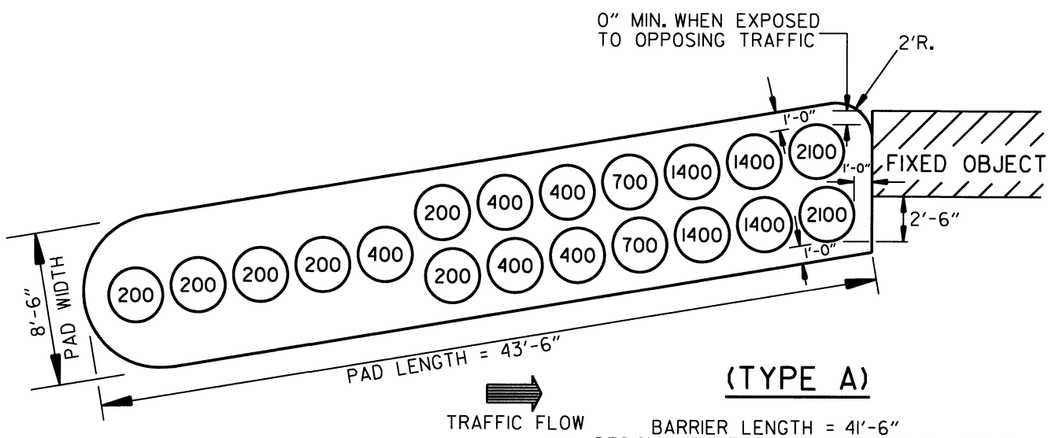

## (TYPE C)

BARRIER LENGTH = 27'-6"
DESIGN IMPACT SPEED = 50 M.P.H.= 73.3 fps



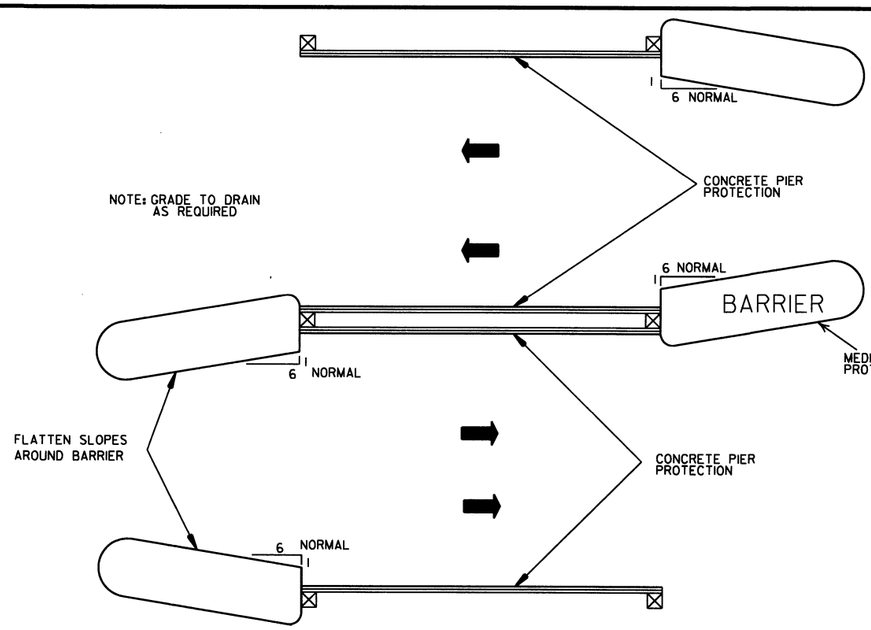

## (TYPE B)

BARRIER LENGTH = 34'-6"
DESIGN IMPACT SPEED = 60 M.P.H.= 88 fps

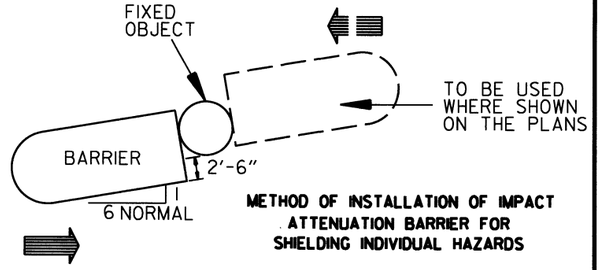



## (TYPE A)

BARRIER LENGTH = 41'-6"
DESIGN IMPACT SPEED = 70 M.P.H.= 103 fps




**METHOD OF INSTALLATION OF IMPACT ATTENUATION BARRIER FOR PIER PROTECTION**




**METHOD OF INSTALLATION OF IMPACT ATTENUATION BARRIER FOR SHIELDING INDIVIDUAL HAZARDS**

### APPROXIMATE QUANTITIES PER PAD

| TYPE | ALTERNATE #1 | | ALTERNATE #2 |
|---|---|---|---|
| | AGGR. BASE COURSE | A.C.H.M. SURFACE COURSE | P.C.CONC. BASE (4"U.T.) |
| | TONS | TONS | SQ.YDS. |
| A | 9.7 | 4.6 | 41.6 |
| B | 8.1 | 3.8 | 34.9 |
| C | 6.6 | 3.1 | 28.3 |

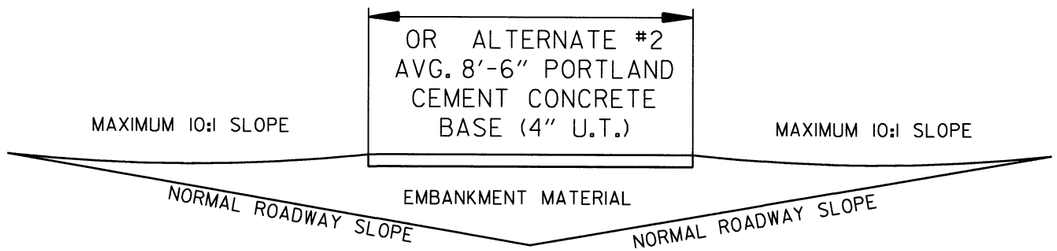
NOTE: APPROXIMATE QUANTITIES SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY. PAYMENT TO BE INCLUDED IN UNIT PRICE BID FOR IMPACT ATTENUATION BARRIER.

GENERAL NOTES

1. DIMENSIONS SHOWN ARE TO TOP OF PLASTIC MODULES.
2. SPACING BETWEEN PLASTIC MODULES SHALL NOT EXCEED 6" AT THE TOP.
3. PLASTIC MODULES SHALL MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).

ALTERNATE #1
AVG. 8'-6" A.C.H.M. SURF. COURSE(1/2")
220 LBS. PER SQ. YD. &
AGGREGATE BASE COURSE
(4" COMPACTED DEPTH)

OR ALTERNATE #2
AVG. 8'-6" PORTLAND CEMENT CONCRETE BASE (4" U.T.)




## DETAIL OF BARRIER PAD

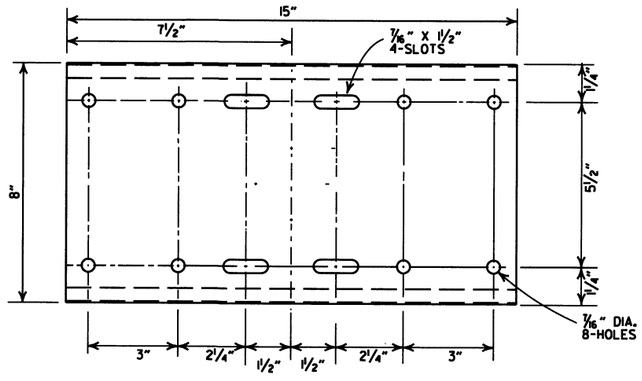
NOTE: BARRIER PAD TO BE SKEWED TOWARD ONCOMING TRAFFIC
A MAXIMUM OF 6:1 WITH 6:1 BEING NORMAL

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 11-29-07 | REVISED TY. A & TY. C ARRAYS | |
| 11-19-98 | REVISED FIXED OBJECT | |
| 11-18-98 | REV. NOTES & TYPE A MOD. WTS. | |
| 10-18-96 | REDRAWN | |
| 7-15-88 | CONFORMED TO 1988 SPECS | |
| 7-29-87 | REDRAWN | |

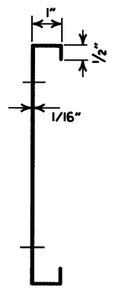
**ARKANSAS STATE HIGHWAY COMMISSION**

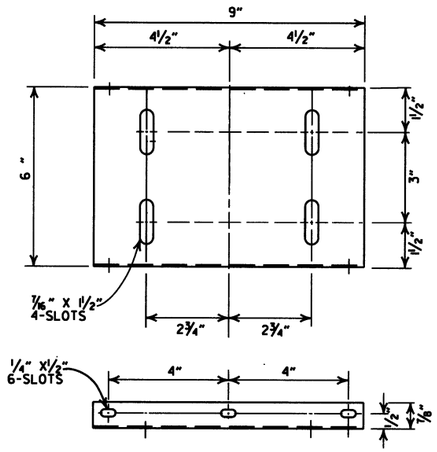
# IMPACT ATTENUATION BARRIER

**STANDARD DRAWING IB-1**

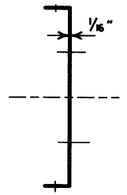


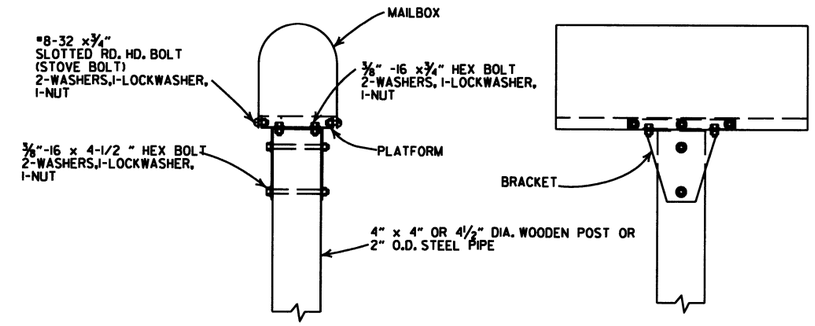

SHELF



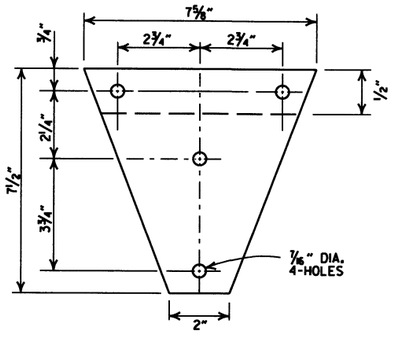



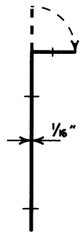

PLATFORM




SINGLE INSTALLATION

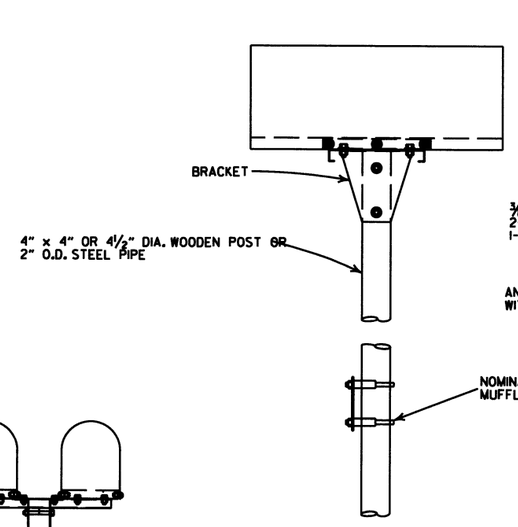


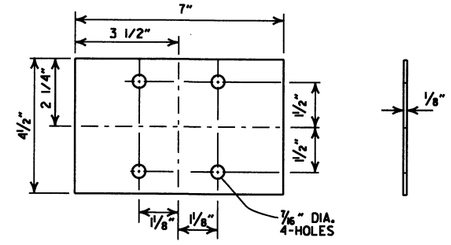

BRACKET

**GENERAL NOTES**

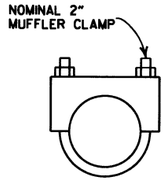
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL. HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF ¾" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X¾" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE AHTD QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



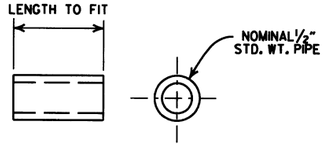

DOUBLE INSTALLATION



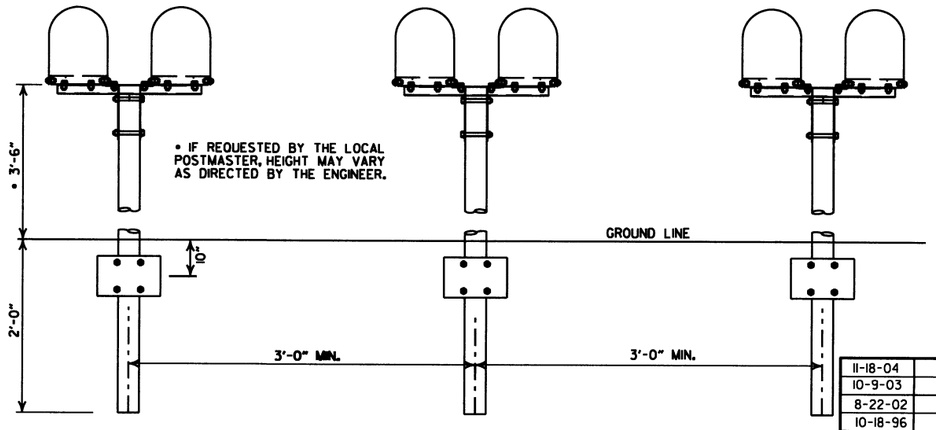

ANTI-TWIST PLATE




CLAMP




SPACER



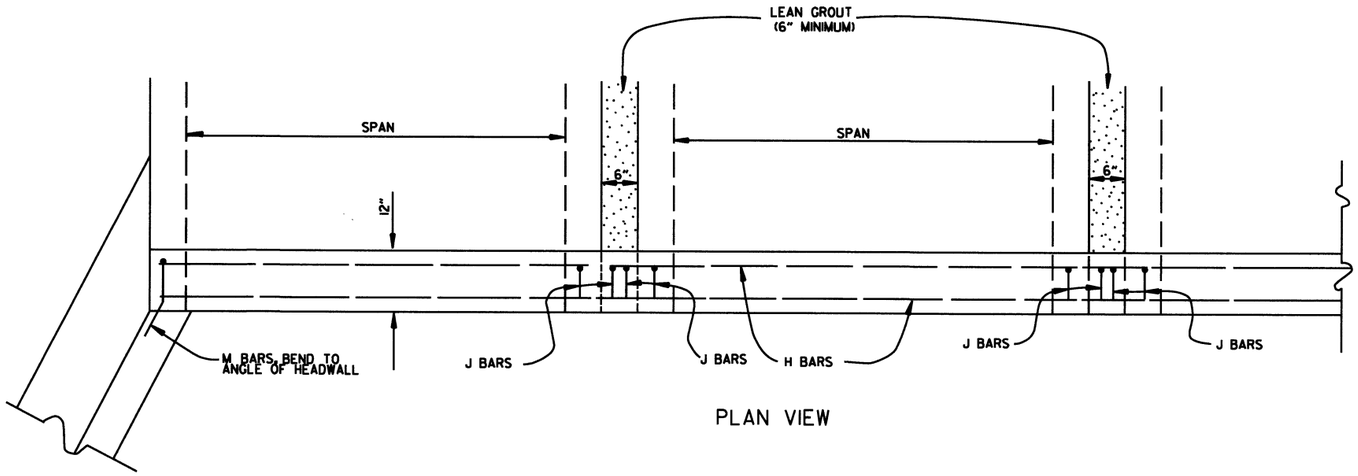

SPACING FOR MULTIPLE POST INSTALLATION

| DATE | FILMED | REVISION |
|---|---|---|
| 11-18-04 | | REVISED NOTES |
| 10-9-03 | | REVISED NOTE 6 |
| 8-22-02 | | REVISED NOTE 6 |
| 10-18-96 | | CORRECTED AASHTO |
| 10-1-92 | | CORRECTED SPELLING |
| 9-26-91 | | NEW PHONE NUMBER |
| 8-15-91 | | ADDED NOTE |
| 11-30-89 | | ADJUSTED HEIGHT & ADDED NOTE |
| 2-16-89 | | DELETED SLOTS FROM SHELF & PLTF |
| 11-17-88 | 10-1-92 | ADJUSTED DIMENSIONS OF STEEL POSTS |
| 7-15-88 | 20-7-15-88 | ISSUED |

ARKANSAS STATE HIGHWAY COMMISSION

# MAILBOX DETAILS

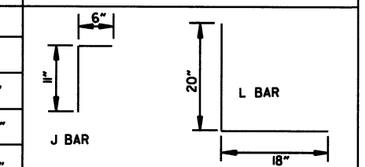
STANDARD DRAWING MB-1




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.

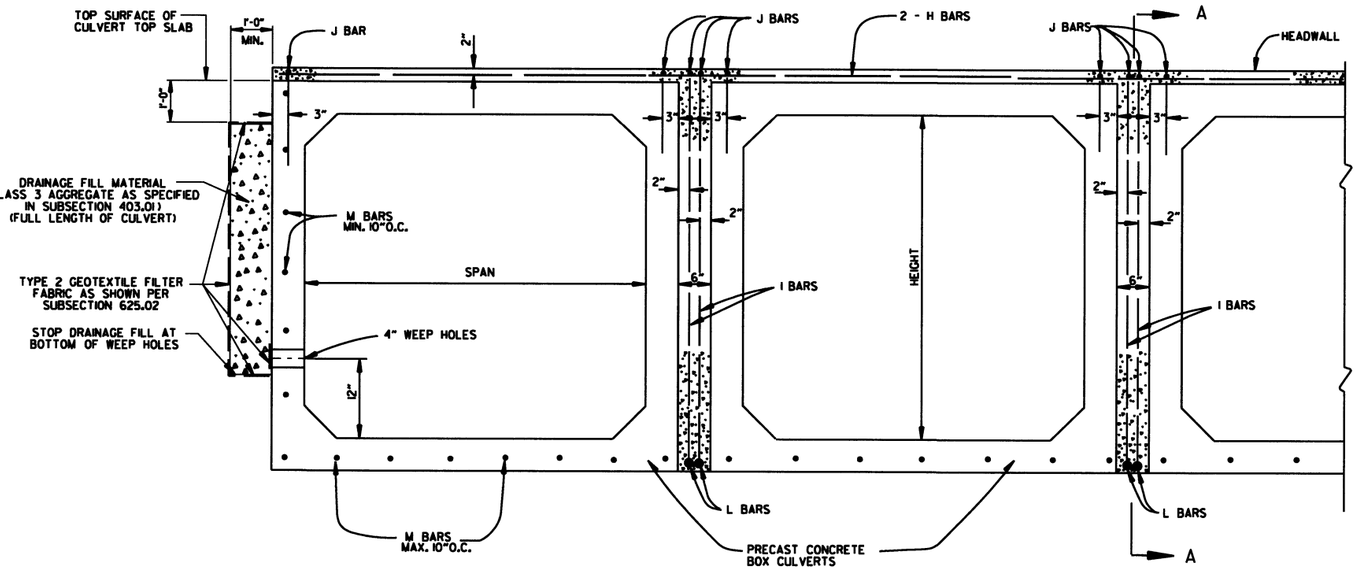
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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.

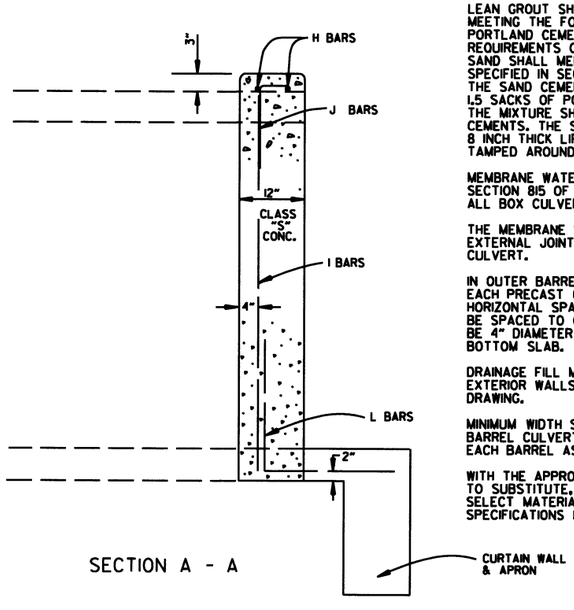
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

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 | |

ARKANSAS STATE HIGHWAY COMMISSION

# PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

## REINFORCED CONCRETE ARCH PIPE DIMENSIONS

| EQUIV. DIA. | SPAN | | RISE | |
|---|---|---|---|---|
| | AASHTO M 206 | AHTD NOMINAL | AASHTO M 206 | AHTD NOMINAL |
| INCHES | INCHES | | | |
| 15 | 18 | 18 | 11 | 11 |
| 18 | 22 | 22 | 13½ | 14 |
| 21 | 26 | 26 | 15½ | 16 |
| 24 | 28½ | 29 | 18 | 18 |
| 30 | 36¼ | 36 | 22½ | 23 |
| 36 | 43⅜ | 44 | 26⅝ | 27 |
| 42 | 51⅛ | 51 | 31⅜ | 31 |
| 48 | 58½ | 59 | 36 | 36 |
| 54 | 65 | 65 | 40 | 40 |
| 60 | 73 | 73 | 45 | 45 |
| 72 | 88 | 88 | 54 | 54 |
| 84 | 102 | 102 | 62 | 62 |
| 90 | 115 | 115 | 72 | 72 |
| 96 | 122 | 122 | 77½ | 77 |
| 108 | 138 | 138 | 87⅛ | 87 |
| 120 | 154 | 154 | 96⅞ | 97 |
| 132 | 168¾ | 169 | 106½ | 107 |

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M206.

## REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

| EQUIV. DIA. | AASHTO M 207 | |
|---|---|---|
| | SPAN | RISE |
| INCHES | INCHES | |
| 18 | 23 | 14 |
| 24 | 30 | 19 |
| 27 | 34 | 22 |
| 30 | 38 | 24 |
| 33 | 42 | 27 |
| 36 | 45 | 29 |
| 39 | 49 | 32 |
| 42 | 53 | 34 |
| 48 | 60 | 38 |
| 54 | 68 | 43 |
| 60 | 76 | 48 |
| 66 | 83 | 53 |
| 72 | 91 | 58 |
| 78 | 98 | 63 |
| 84 | 106 | 68 |

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M207.

## CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SUBSECTION 606.03.(f)(1).

**NOTE: HAUNCH AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF CONCRETE PIPE.**

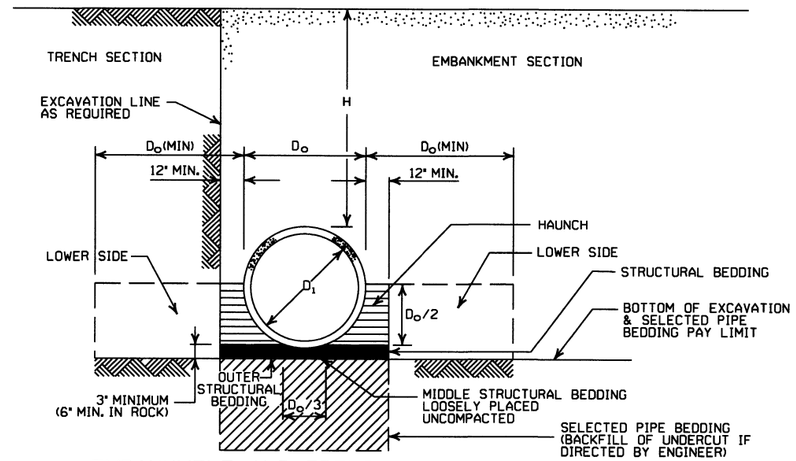
## - LEGEND -

$D_1$ = NORMAL INSIDE DIAMETER OF PIPE
$D_o$ = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
▨ = UNDISTURBED SOIL

| INSTALLATION TYPE | MATERIAL REQUIREMENTS FOR HAUNCH AND STRUCTURAL BEDDING |
|---|---|
| TYPE 1 | AGGREGATE BASE COURSE (CLASS 5 OR CLASS 7) |
| TYPE 2 | SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL* |
| TYPE 3** | AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL |

* SM-3 WILL NOT BE ALLOWED.

** MATERIALS SHALL NOT INCLUDE ORGANIC MATERIALS OR STONES LARGER THAN 3 INCHES.




## EMBANKMENT AND TRENCH INSTALLATIONS

1. MATERIAL IN THE HAUNCH AND OUTER STRUCTURAL BEDDING SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. FOR TRENCHES WITH WALLS OF NATURAL SOIL, THE DENSITY OF THE SOIL IN THE LOWER SIDE ZONE SHALL BE AS FIRM AS THE 95% DENSITY REQUIRED FOR THE HAUNCH. IF THE EXISTING SOIL DOES NOT MEET THIS CRITERIA, IT SHALL BE REMOVED AND RECOMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OF MATERIAL USED.
3. FOR EMBANKMENTS, THE MATERIAL IN THE LOWER SIDE ZONE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

## GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170, R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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

| | CLASS OF PIPE | | | |
|---|---|---|---|---|
| | CLASS III | | CLASS IV | CLASS V |
| INSTALLATION TYPE | TYPE 1 OR 2 | TYPE 3 | ALL | ALL |
| PIPE ID (IN.) | FEET | | | |
| 12-15 | 2 | 2.5 | 2 | 1 |
| 18-24 | 2.5 | 3 | 2 | 1 |
| 27-33 | 3 | 4 | 2 | 1 |
| 36-42 | 3.5 | 5 | 2 | 1 |
| 48 | 4.5 | 5.5 | 2 | 1 |
| 54-60 | 5 | 7 | 2 | 1 |
| 66-78 | 6 | 8 | 2 | 1 |
| 84-108 | 7.5 | 8 | 2 | 1 |

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

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

| INSTALLATION TYPE | CLASS OF PIPE | | |
|---|---|---|---|
| | CLASS III | CLASS IV | CLASS V |
| | FEET | | |
| TYPE 1 | 21 | 32 | 50 |
| TYPE 2 | 16 | 25 | 39 |
| TYPE 3 | 12 | 20 | 30 |

NOTE: IF FILL HEIGHT EXCEEDS 50 FEET, A SPECIAL DESIGN CONCRETE PIPE WILL BE REQUIRED USING TYPE 1 INSTALLATION.

## MINIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

| INSTALLATION TYPE | CLASS OF PIPE | |
|---|---|---|
| | CLASS III | CLASS IV |
| | FEET | |
| TYPE 2 OR TYPE 3 | 2.5 | 1.5 |

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

## MAXIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

| INSTALLATION TYPE | CLASS OF PIPE | |
|---|---|---|
| | CLASS III | CLASS IV |
| | FEET | |
| TYPE 2 | 13 | 21 |
| TYPE 3 | 10 | 16 |

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 2-27-14 | REVISED GENERAL NOTE 1. | |
| 12-15-11 | REVISED FOR LRFD DESIGN SPECIFICATIONS | |
| 5-18-00 | REVISED TYPE 3 BEDDING & ADDED NOTE | |
| 3-30-00 | REVISED INSTALLATIONS | |
| 11-06-97 | ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

# CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

## CORRUGATED STEEL PIPE (ROUND)

| PIPE DIAMETER (INCHES) | ① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET) | MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET) | | | | |
|---|---|---|---|---|---|---|
| | | METAL THICKNESS (INCHES) | | | | |
| | | 0.064 | 0.079 | 0.109 | 0.138 | 0.168 |
| 2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM | | | | | | |
| 12 | 1 | 84 | 91 | | | |
| 15 | 1 | 67 | 73 | | | |
| 18 | 1 | 56 | 61 | | | |
| 24 | 1 | 42 | 46 | 59 | | |
| 30 | 2 | 34 | 36 | 47 | | |
| 36 | 2 | | 30 | 39 | 41 | |
| 42 | 2 | | 43 | 67 | 70 | 73 |
| 48 | 2 | | 37 | 58 | 61 | 64 |
| ② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM | | | | | | |
| 36 | 1 | 48 | 60 | 88 | 111 | 118 |
| 42 | 1 | 41 | 51 | 72 | 90 | 102 |
| 48 | 1 | 36 | 45 | 64 | 77 | 85 |
| 54 | 2 | 32 | 40 | 59 | 71 | 79 |
| 60 | 2 | 29 | 36 | 53 | 64 | 71 |
| 66 | 2 | 26 | 33 | 47 | 58 | 64 |
| 72 | 2 | 24 | 30 | 44 | 53 | 59 |
| 78 | 2 | | 28 | 41 | 49 | 54 |
| 84 | 2 | | 26 | 38 | 45 | 51 |
| 90 | 2 | | 24 | 35 | 43 | 45 |
| 96 | 2 | | 22 | 33 | 40 | 44 |
| 102 | 2 | | | 31 | 38 | 42 |
| 108 | 2 | | | 30 | 35 | 39 |
| 114 | 2 | | | 28 | 34 | 37 |
| 120 | 2 | | | 27 | 32 | 35 |

## CORRUGATED ALUMINUM PIPE (ROUND)

| PIPE DIAMETER (INCHES) | ① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET) | MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET) | | | | |
|---|---|---|---|---|---|---|
| | | METAL THICKNESS IN INCHES | | | | |
| | | 0.060 | 0.075 | 0.105 | 0.135 | 0.164 |
| | | 2⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM | | | | |
| 12 | 1 | 45 | 45 | | | |
| 18 | 2 | 30 | 30 | 52 | | |
| 24 | 2 | 22 | 22 | 39 | 41 | |
| 30 | 2 | | 18 | 31 | 32 | 34 |
| 36 | 2.5 | | 15 | 26 | 27 | 28 |
| 42 | 2 | | | 43 | 43 | 44 |
| 48 | 2 | | | 40 | 41 | 43 |
| 54 | 2 | | | 35 | 37 | 38 |
| 60 | 2 | | | | 33 | 34 |
| 66 | 2 | | | | | 31 |
| 72 | 2 | | | | | 29 |

## CORRUGATED METAL PIPE ARCHES

| EQUIV. DIA. (INCHES) | PIPE DIMENSION SPAN X RISE (INCHES) | MINUMUM CORNER RADIUS (INCHES) | STEEL | | | | | ALUMINUM | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | MIN. THICKNESS REQUIRED INCHES | ① MIN. HEIGHT OF FILL, "H" (FT.) | | MAX. HEIGHT OF FILL, "H" (FT.) | | MIN. THICKNESS REQUIRED INCHES | ① MIN. HEIGHT OF FILL, "H" (FT.) | | MAX. HEIGHT OF FILL, "H" (FT.) | |
| | | | | INSTALLATION | | INSTALLATION | | | INSTALLATION | | INSTALLATION | |
| | | | | TYPE 1 | | TYPE 1 | | | TYPE 1 | | TYPE 1 | |
| | | | 2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM | | | | | 2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM | | | | |
| 15 | 17x13 | 3 | 0.064 | 2 | | 15 | | 0.060 | 2 | | 15 | |
| 18 | 21x15 | 3 | 0.064 | 2 | | 15 | | 0.060 | 2 | | 15 | |
| 21 | 24x18 | 3 | 0.064 | 2.25 | | 15 | | 0.060 | 2.25 | | 15 | |
| 24 | 28x20 | 3 | 0.064 | 2.5 | | 15 | | 0.075 | 2.5 | | 15 | |
| 30 | 35x24 | 3 | 0.079 | 3 | | 12 | | 0.075 | 3 | | 12 | |
| 36 | 42x29 | 3½ | 0.079 | 3 | | 12 | | 0.105 | 3 | | 12 | |
| 42 | 49x33 | 4 | 0.079 | 3 | | 12 | | 0.105 | 3 | | 12 | |
| 48 | 57x38 | 5 | 0.109 | 3 | | 13 | | 0.135 | 3 | | 13 | |
| 54 | 64x43 | 6 | 0.109 | 3 | | 14 | | 0.135 | 3 | | 14 | |
| 60 | 71x47 | 7 | 0.138 | 3 | | 15 | | 0.164 | 3 | | 15 | |
| 66 | 77x52 | 8 | 0.168 | 3 | | 15 | | | | | | |
| 72 | 83x57 | 9 | 0.168 | 3 | | 15 | | | | | | |
| | | | ② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM | | | | | | | | | |
| | | | | INSTALLATION | | INSTALLATION | | | | | | |
| | | | | TYPE 2 | TYPE 1 | TYPE 2 | TYPE 1 | | | | | |
| 36 | 40x31 | 5 | 0.079 | 3 | 2 | 12 | 15 | | | | | |
| 42 | 46x36 | 6 | 0.079 | 3 | 2 | 13 | 15 | | | | | |
| 48 | 53x41 | 7 | 0.079 | 3 | 2 | 13 | 15 | | | | | |
| 54 | 60x46 | 8 | 0.079 | 3 | 2 | 13 | 15 | | | | | |
| 60 | 66x51 | 9 | 0.079 | 3 | 2 | 13 | 15 | | | | | |
| 66 | 73x55 | 12 | 0.079 | 3 | 2 | 15 | 15 | | | | | |
| 72 | 81x59 | 14 | 0.079 | 3 | 2 | 15 | 15 | | | | | |
| 78 | 87x63 | 14 | 0.079 | 3 | 2 | 15 | 15 | | | | | |
| 84 | 95x67 | 16 | 0.109 | 3 | 2 | 15 | 15 | | | | | |
| 90 | 103x71 | 16 | 0.109 | 3 | 2 | 15 | 15 | | | | | |
| 96 | 112x75 | 18 | 0.109 | 3 | 2 | 15 | 15 | | | | | |
| 102 | 117x79 | 18 | 0.109 | 3 | 2 | 15 | 15 | | | | | |
| 108 | 128x83 | 18 | 0.138 | 3 | 2 | 15 | 15 | | | | | |

## CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE. THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT EXCEED 24 INCHES OR 1/3 THE SIZE OF THE PIPE, WHICHEVER IS LESS.

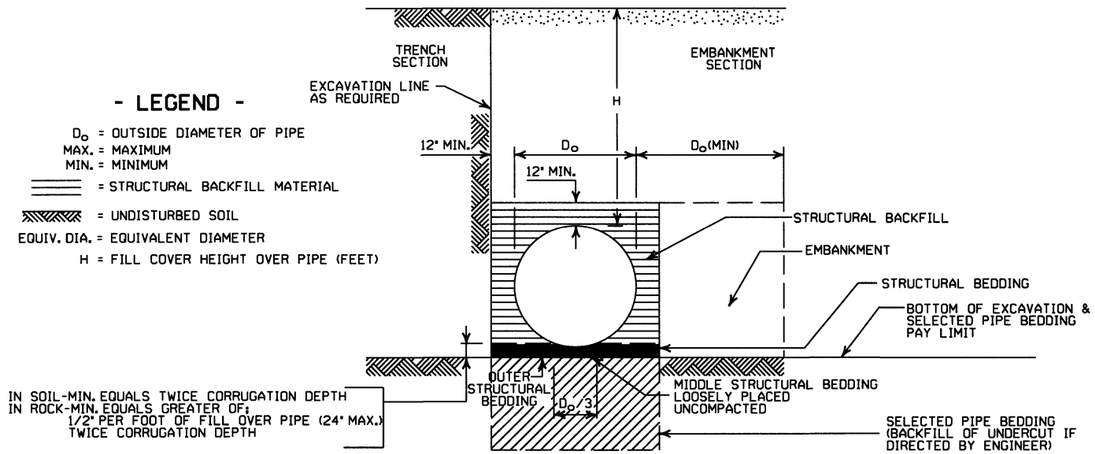
NOTE: STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF METAL PIPE.

| INSTALLATION TYPE | MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING |
|---|---|
| TYPE 1 | AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) |
| TYPE 2 | SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL ③ |

③ SM-3 WILL NOT BE ALLOWED.

## EQUIVALENT METAL THICKNESSES AND GAUGES

| METAL THICKNESS IN INCHES | | | GAUGE NUMBER |
|---|---|---|---|
| STEEL | | | |
| ZINC COATED | UNCOATED | ALUMINUM | |
| 0.064 | 0.0598 | 0.060 | 16 |
| 0.079 | 0.0747 | 0.075 | 14 |
| 0.109 | 0.1046 | 0.105 | 12 |
| 0.138 | 0.1345 | 0.135 | 10 |
| 0.168 | 0.1644 | 0.164 | 8 |




## EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALALTION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2⅔" X ½" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

## GENERAL NOTES

1. METAL PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

① FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

② WHERE THE STANDARD 2 2/3"x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 2-27-14 | REVISED GENERAL NOTE 1. | |
| 12-15-11 | REVISED FOR LRFD DESIGN SPECS | |
| 3-30-00 | REVISED INSTALLATIONS | |
| 11-06-97 | ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

# METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

| INSTALLATION TYPE | •• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING |
|---|---|
| TYPE 2 | •SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-4) |

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

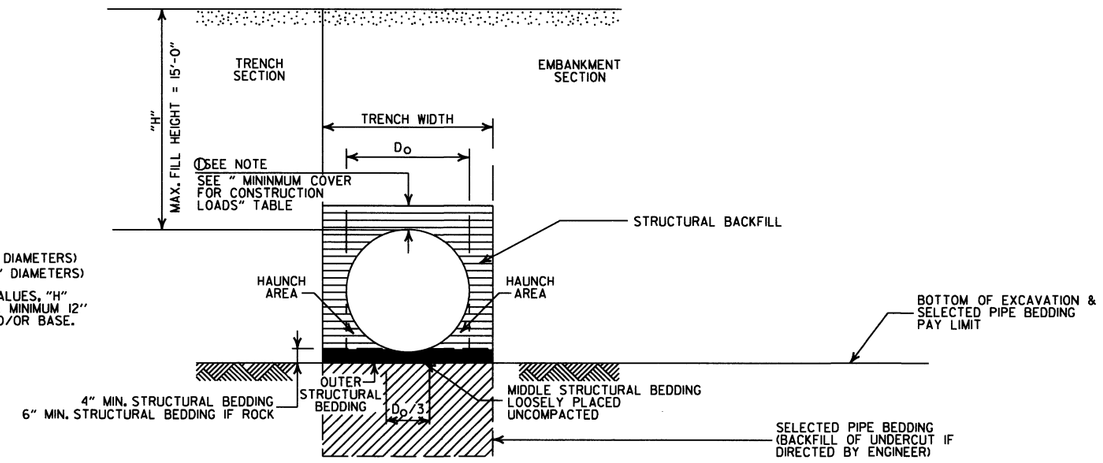
STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF HDPE PIPE.

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

| PIPE DIAMETER | TRENCH WIDTH (FEET) "H" < 10'-0" | TRENCH WIDTH (FEET) "H" >OR= 10'-0" |
|---|---|---|
| 18" | 4'-6" | 4'-6" |
| 24" | 5'-0" | 6'-0" |
| 30" | 5'-6" | 7'-6" |
| 36" | 6'-0" | 9'-0" |
| 42" | 7'-0" | 10'-6" |
| 48" | 8'-0" | 12'-0" |

①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)

MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.




## TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

## MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

| PIPE DIAMETER | CLEAR DISTANCE BETWEEN PIPES |
|---|---|
| 18" | 1'-6" |
| 24" | 2'-0" |
| 30" | 2'-6" |
| 36" | 3'-0" |
| 42" | 3'-6" |
| 48" | 4'-0" |

## MINIMUM COVER FOR CONSTRUCTION LOADS

| PIPE DIAMETER | ② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS 18.0-50.0 (KIPS) | 50.0-75.0 (KIPS) | 75.0-110.0 (KIPS) | 110.0-175.0 (KIPS) |
|---|---|---|---|---|
| 36" OR LESS | 2'-0" | 2'-6" | 3'-0" | 3'-0" |
| 42" OR GREATER | 3'-0" | 3'-0" | 3'-6" | 4'-0" |

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.

## CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

## GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M294, TYPE S. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

## - LEGEND -

H = FILL HEIGHT (FT.)
Ø = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 2-27-14 | REVISED GENERAL NOTE 1. | |
| 12-15-11 | REVISED GENERAL NOTES & MINIMUM COVER NOTE | |
| 11-17-10 | ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

# PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

| INSTALLATION TYPE | •• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING |
|---|---|
| TYPE 2 | •SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) |

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF PVC PIPE.

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

| PIPE DIAMETER | TRENCH WIDTH (FEET) | |
|---|---|---|
| | "H" < 10'-0" | "H" >OR= 10'-0" |
| 18" | 4'-6" | 4'-6" |
| 24" | 5'-0" | 6'-0" |
| 30" | 5'-6" | 7'-6" |
| 36" | 6'-0" | 9'-0" |

## MULTIPLE INSTALLATION OF PVC PIPES

| PIPE DIAMETER | CLEAR DISTANCE BETWEEN PIPES |
|---|---|
| 18" | 1'-6" |
| 24" | 2'-0" |
| 30" | 2'-6" |
| 36" | 3'-0" |

## MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

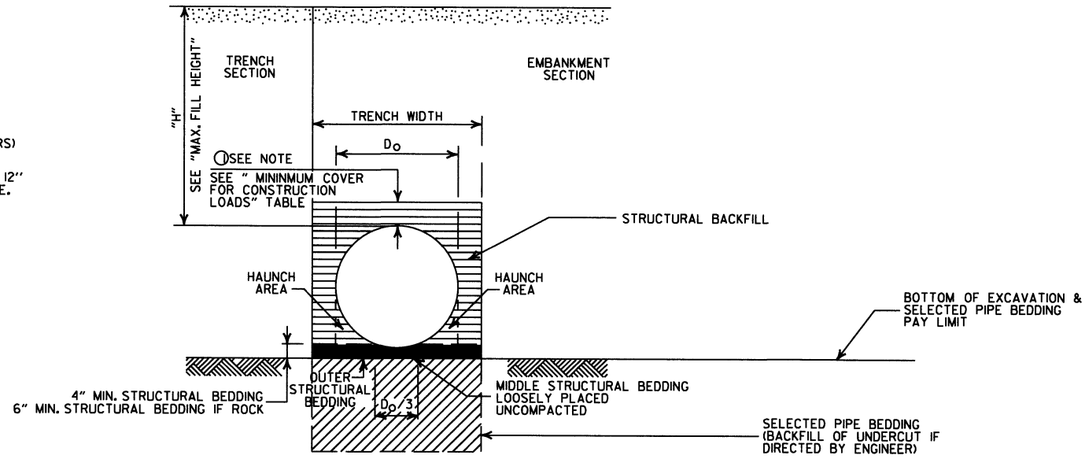
| PIPE DIAMETER | "H" |
|---|---|
| 18" | 45'-0" |
| 24" | 45'-0" |
| 30" | 40'-0" |
| 36" | 40'-0" |

① NOTE:
12" MIN. (18" - 36" DIAMETERS)
MINIMUM COVER VALUE, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

## MINIMUM COVER FOR CONSTRUCTION LOADS

| PIPE DIAMETER | ② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS | | | |
|---|---|---|---|---|
| | 18.0-50.0 (KIPS) | 50.0-75.0 (KIPS) | 75.0-110.0 (KIPS) | 110.0-175.0 (KIPS) |
| 18" THRU 36" | 2'-0" | 2'-6" | 3'-0" | 3'-0" |

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.




## TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

## CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

## GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

## - LEGEND -

H = FILL HEIGHT (FT.)
$D_O$ = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

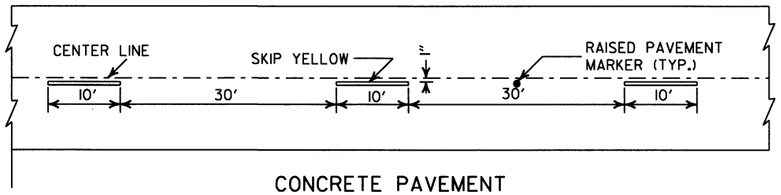
= UNDISTURBED SOIL

| DATE | REVISION | DATE FILMED |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| 2-27-14 | REVISED GENERAL NOTE 1. | |
| 12-15-11 | REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL | |
| 11-17-10 | ISSUED | |

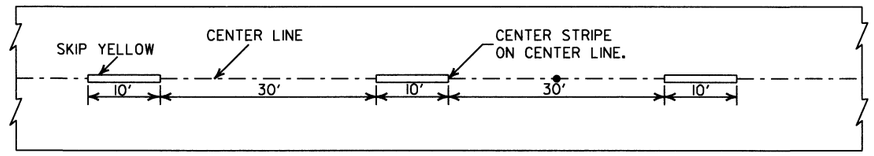
ARKANSAS STATE HIGHWAY COMMISSION

# PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

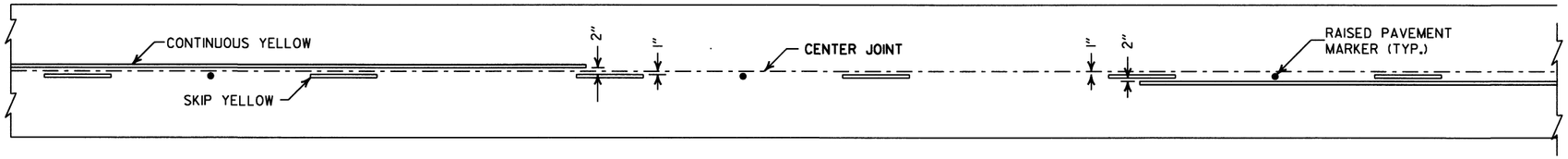



CONCRETE PAVEMENT

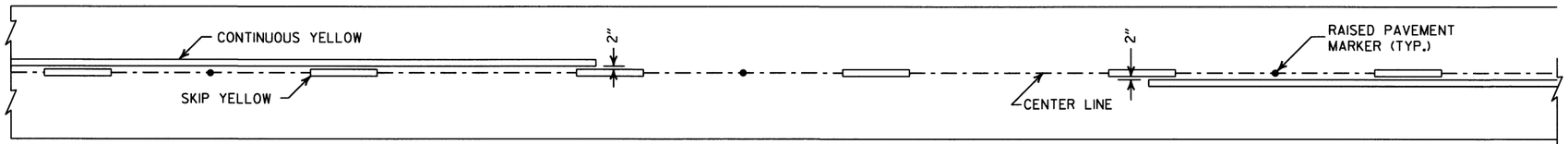



ASPHALT PAVEMENT

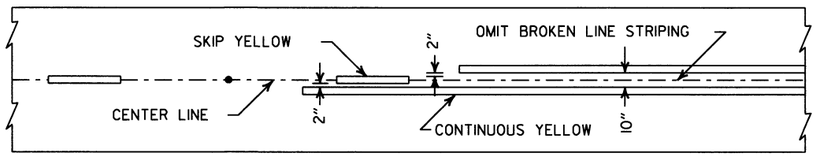
## BROKEN LINE STRIPING



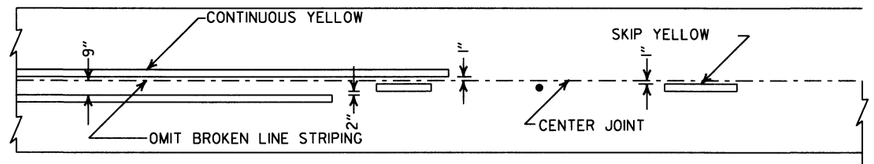

## SOLID LINE STRIPING ON CONCRETE PAVEMENT




## SOLID LINE STRIPING ON ASPHALT PAVEMENT

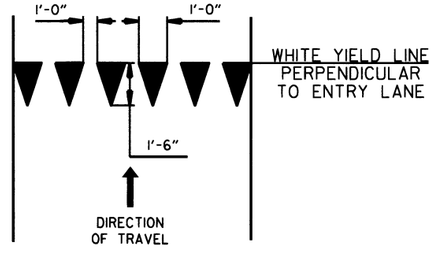



ASPHALT PAVEMENT

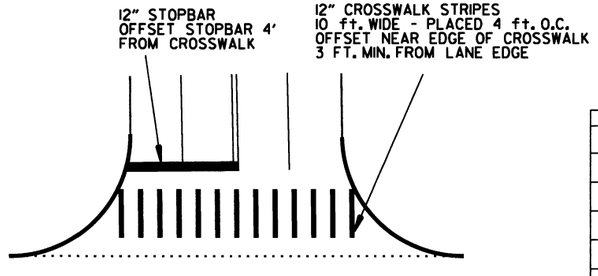



CONCRETE PAVEMENT

## STRIPING AT ADJACENT NO PASSING LANES

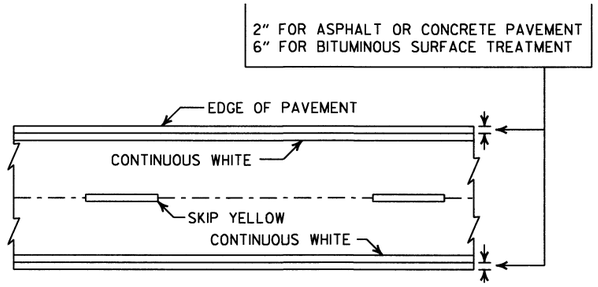



## YIELD LINE DETAIL



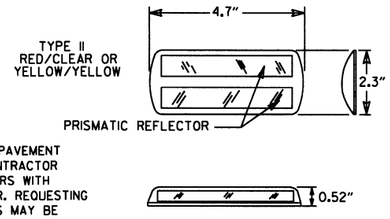

## CROSSWALK AND STOPBAR DETAILS

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.




## PAVEMENT EDGE LINE MARKING

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




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 | FILMED |
|---|---|---|
| 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 |

ARKANSAS STATE HIGHWAY COMMISSION

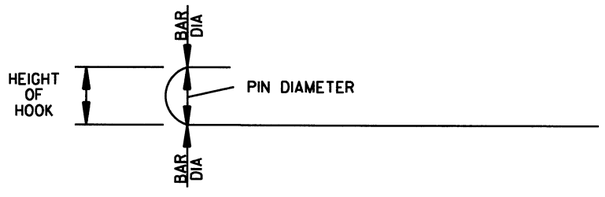
# PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-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

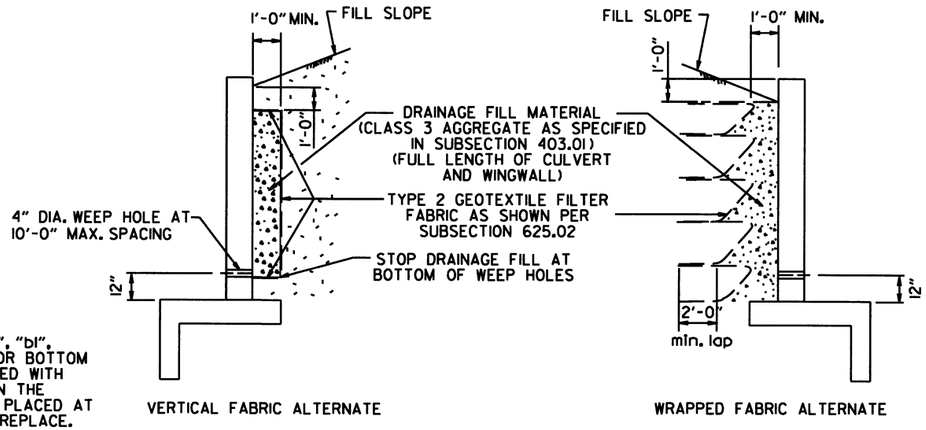
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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.

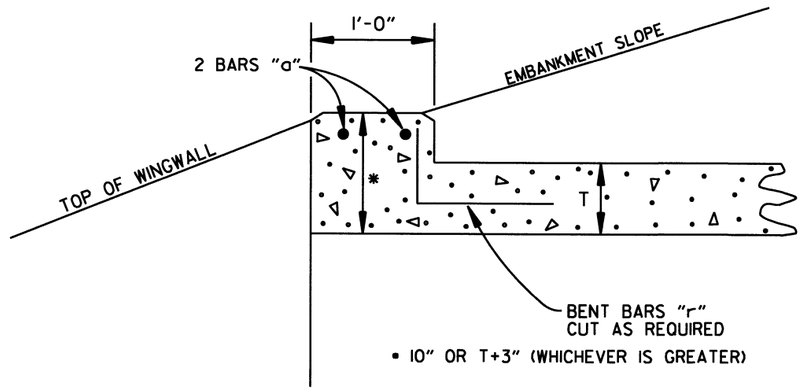
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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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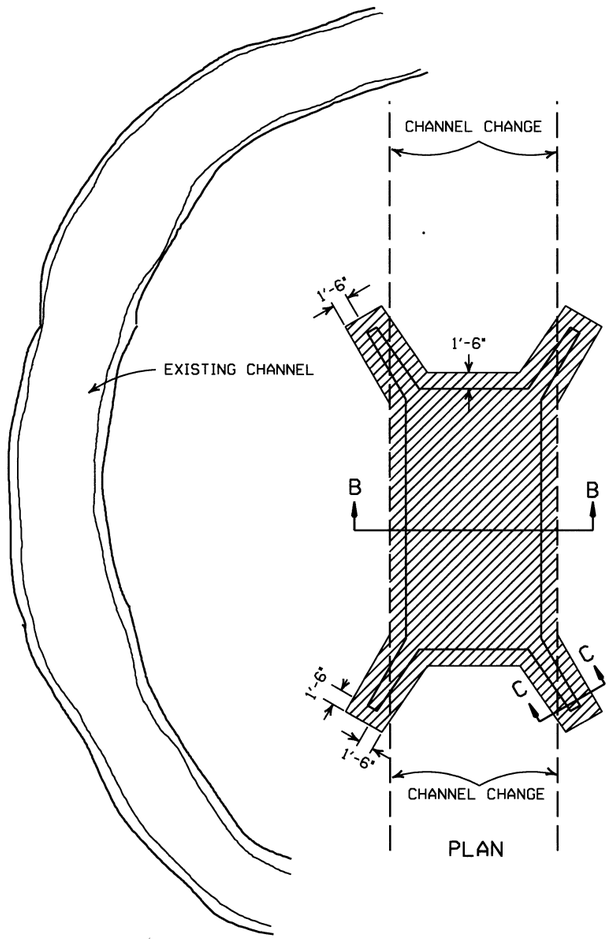
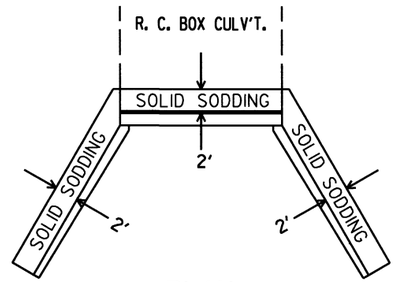
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1




PLAN

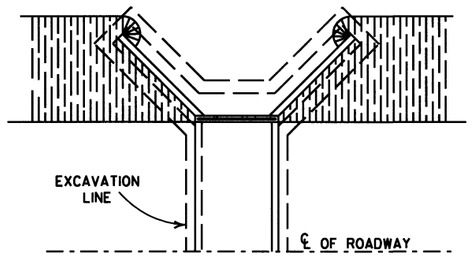
## SOLID SODDING



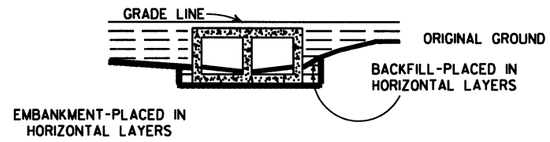

PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

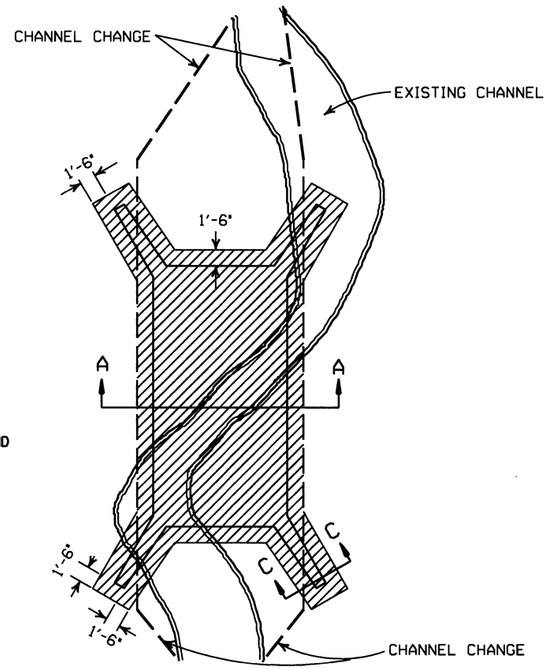



PLAN

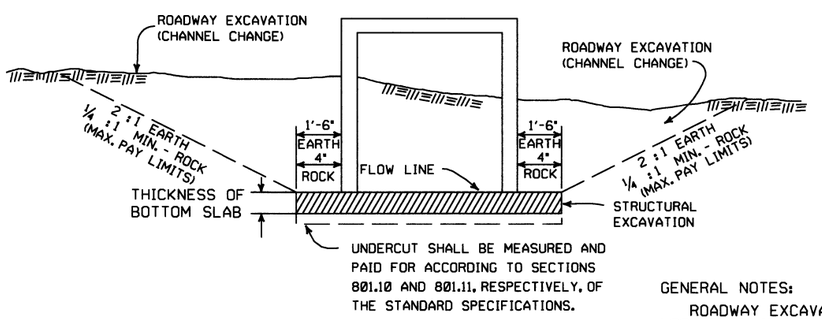



LONGITUDINAL SECTION

## BACKFILL DETAILS FOR BOX CULVERT

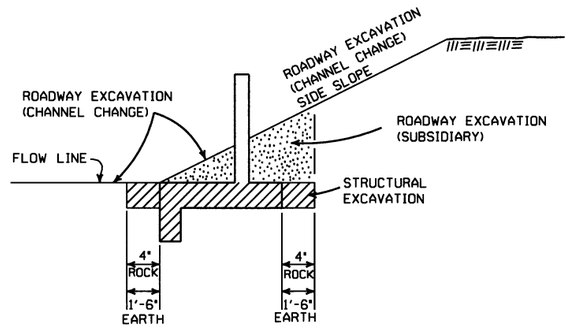



PLAN

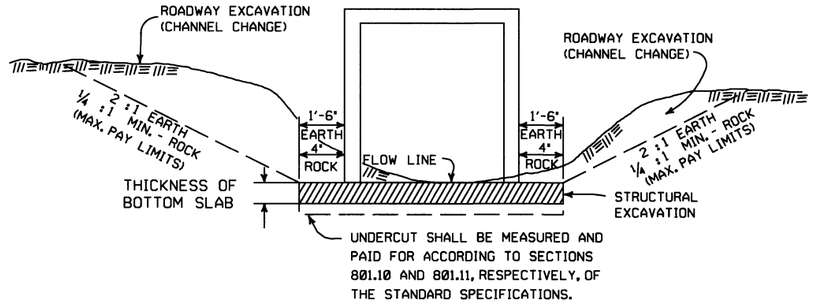



SECTION B-B

## 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.

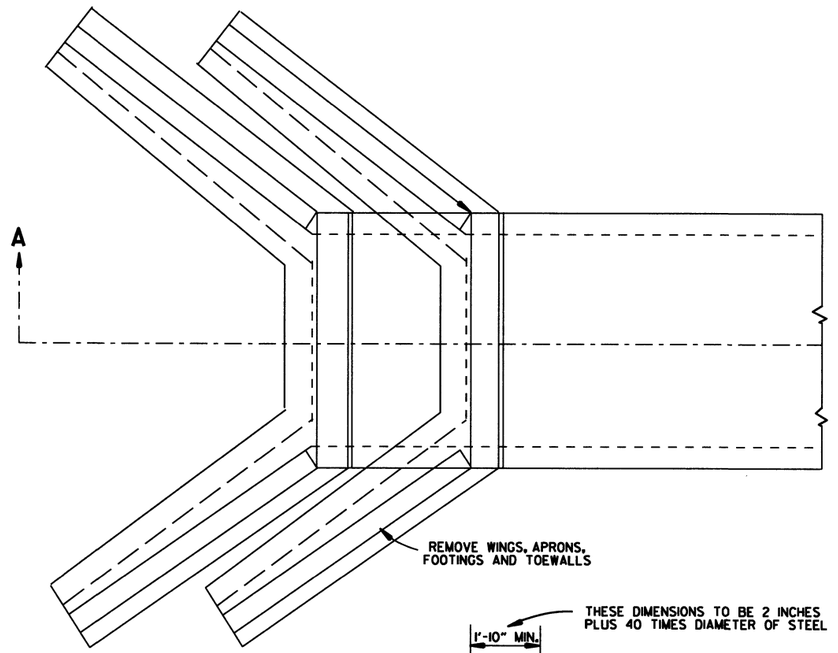
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

| 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 AND ADDED MAXIMUM PAY LIMIT NOTES. | 674-1-4-83 |
| 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

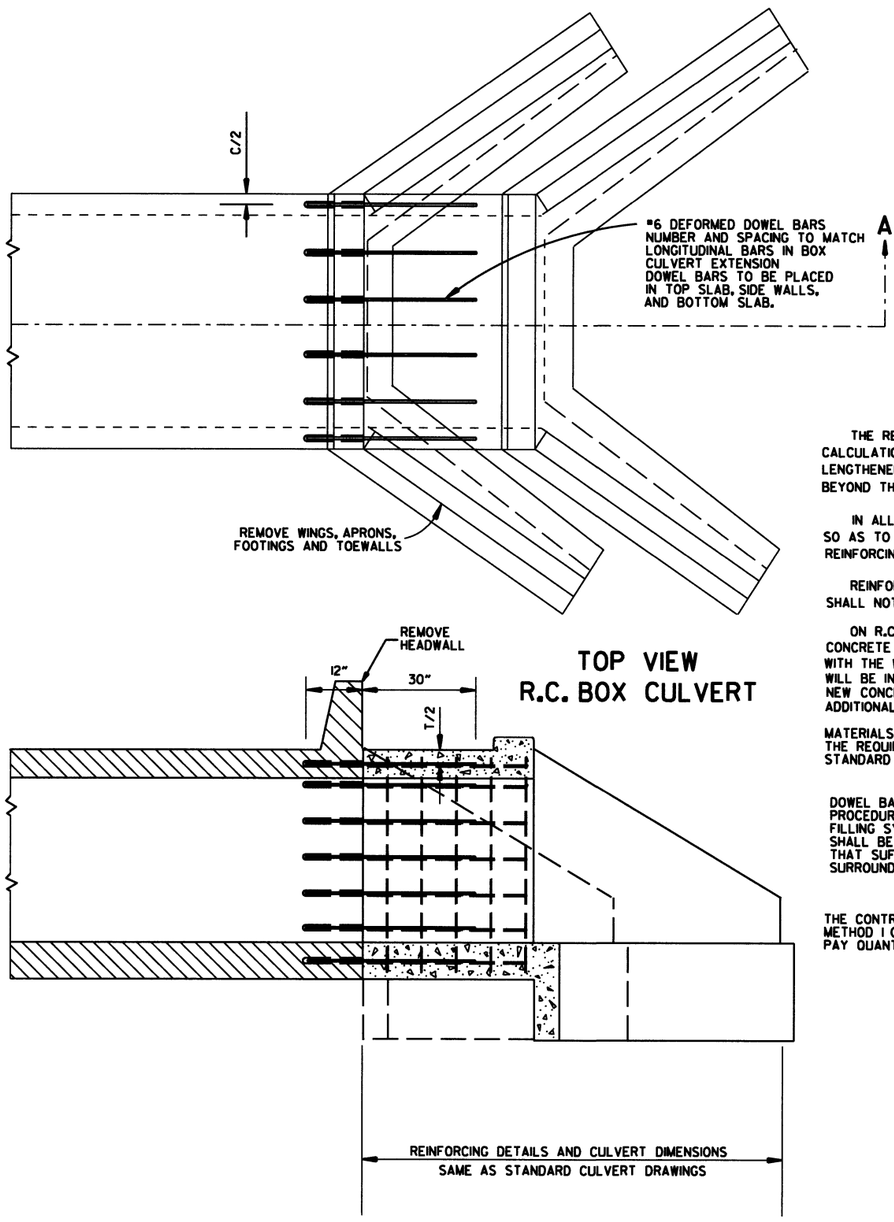
STANDARD DRAWING RCB-2




TOP VIEW
R.C. BOX CULVERT

SECTION A-A

METHOD 1




TOP VIEW
R.C. BOX CULVERT

SECTION A-A

METHOD 2

GENERAL NOTES

| | USE FOR METHOD |
|---|---|
| THE RESIDENT ENGINEER WILL MAKE INDIVIDUAL CALCULATIONS OF QUANTITIES FOR EACH STRUCTURE LENGTHENED, MAKING NO ALLOWANCE FOR OVERBREAKAGE BEYOND THE LINES INDICATED. | 1 |
| IN ALL INSTANCES CONCRETE SHALL BE REMOVED SO AS TO PERMIT FULL 40 DIAMETER SPLICE OF REINFORCING STEEL. | 1 |
| REINFORCING STEEL REMOVED FROM EXISTING STRUCTURE SHALL NOT BE REUSED IN CONSTRUCTING EXTENSION. | 1&2 |
| ON R.C. BOX CULVERTS THAT HAVE AN EXISTING CONCRETE APRON; THE CONCRETE APRON SHALL BE REMOVED WITH THE WINGS. THE COST OF REMOVING ALL OLD CONCRETE WILL BE INCLUDED IN THE PRICE BID PER CUBIC YARD FOR NEW CONCRETE OF THE CLASS SPECIFIED AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED. | 1&2 |
| MATERIALS FOR SECURING DOWEL BARS SHALL MEET THE REQUIREMENTS OF SECTION 507.02 OF THE STANDARD SPECIFICATIONS. | 2 |
| DOWEL BARS SHALL BE INSTALLED AS FOLLOWS: THE DRILLING PROCEDURE SHALL BE APPROVED BY THE ENGINEER, THE FILLING SYSTEM SHALL BE APPROVED BY THE ENGINEER, AND SHALL BE AN INJECTION-TYPE SYSTEM WHICH WILL INSURE THAT SUFFICIENT MATERIAL IS INJECTED SO IT COMPLETELY SURROUNDS THE BARS AND FILLS THE HOLES. | 2 |
| THE CONTRACTOR SHALL HAVE THE OPTION OF USING EITHER METHOD 1 OR METHOD 2, REGARDLESS OF WHICH METHOD IS USED, PAY QUANTITIES WILL BE CALCULATED BASED ON METHOD 1. | 1&2 |

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

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

| DATE | REVISION | DATE FILM |
|---|---|---|
| 10-12-95 | CHANGED DRAWING # FROM 144-A | |
| 4-1-93 | ADDED GENERAL NOTE | |
| 10-1-92 | ADDED ALT. METHOD OF EXTENSION | |
| 8-30-89 | REDRAWN | |
| 1-4-83 | ELIMINATED CONCRETE CLASS | |
| 12-20-56 | RETRACED | |

ARKANSAS STATE HIGHWAY COMMISSION

# METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS

# STANDARD DRAWING RCB-3

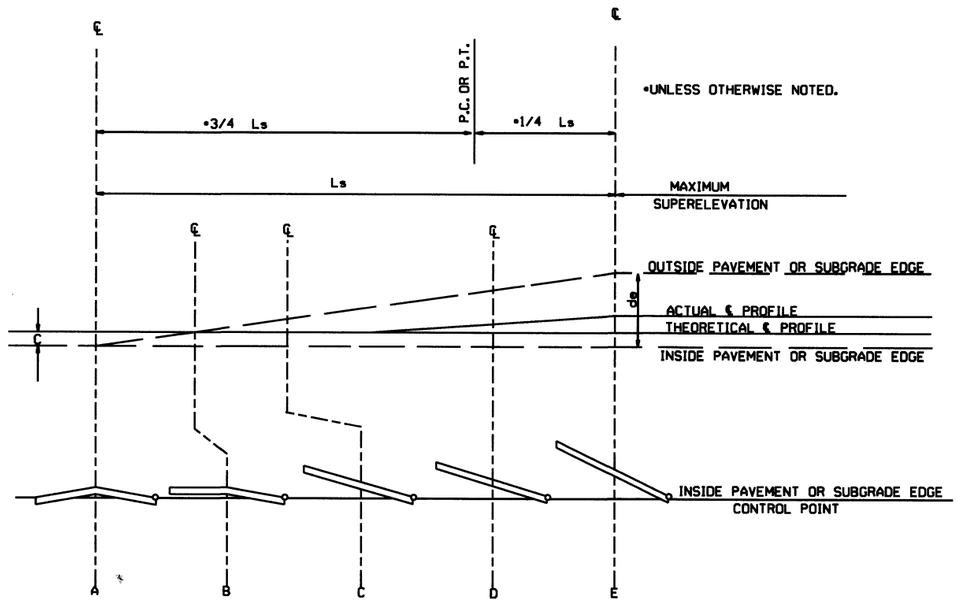
# SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

| 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 | 175 | | 0.036 | | | 0.043 | | 300 | 0.049 | | 300 | 0.062 | | |
| 2° 00' | R.C. | | | 0.028 | | | 0.040 | | | 0.048 | | | 0.055 | | | 0.070 | | |
| 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 | 350 |
| 2° 45' | 0.023 | | | 0.037 | | | 0.053 | | | 0.063 | | | 0.072 | | | 0.091 | 335 | |
| 3° 00' | 0.025 | | | 0.040 | | | 0.057 | | | 0.067 | 230 | | 0.077 | 260 | | 0.096 | 350 | |
| 3° 15' | 0.027 | 150 | | 0.043 | | 200 | 0.061 | | | 0.072 | 245 | | 0.082 | 275 | | 0.098 | 360 | 400 |
| 3° 30' | 0.029 | | | 0.046 | | | 0.065 | 205 | | 0.076 | 255 | | 0.086 | 285 | | 0.100 | 360 | |
| 3° 45' | 0.031 | | 200 | 0.049 | | | 0.069 | 215 | | 0.080 | 265 | | 0.090 | 295 | 350 | | | |
| 4° 00' | 0.033 | | | 0.051 | | | 0.072 | 225 | | 0.083 | 270 | | 0.093 | 305 | | | | |
| 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 | 300 | 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.

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

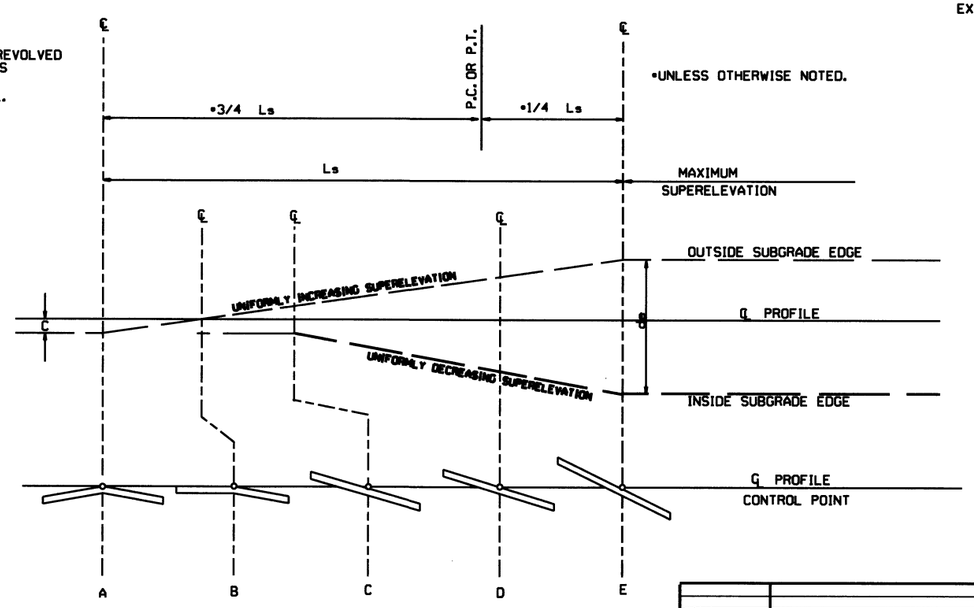
GENERAL NOTES

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.



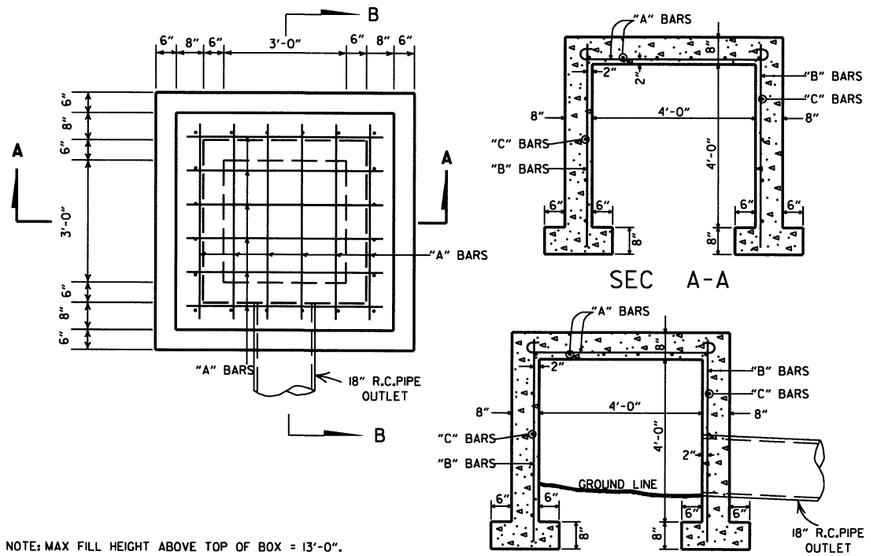

STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

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

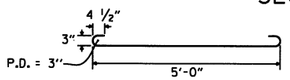
ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2




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 1/2" |
| "C" | 16 | 5'-0" | 12" |

ALL STEEL TO BE #4 BARS

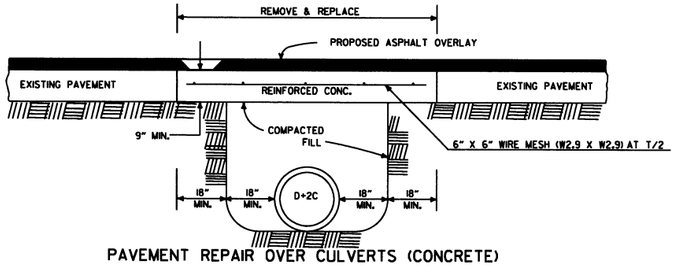
QUANTITIES

CONCRETE 3.31 CU. YDS.
REINFORCING STEEL 168 LB.

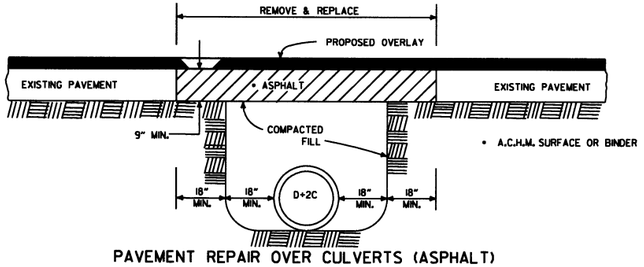
GENERAL NOTE:

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



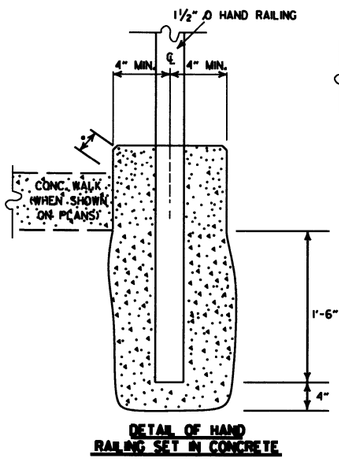

PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



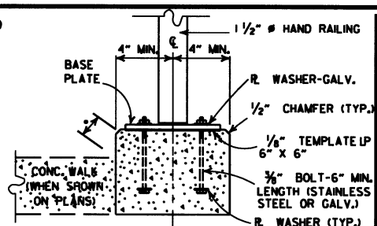

PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

## DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

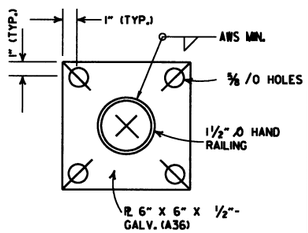
* A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.




DETAIL OF HAND RAILING SET IN CONCRETE

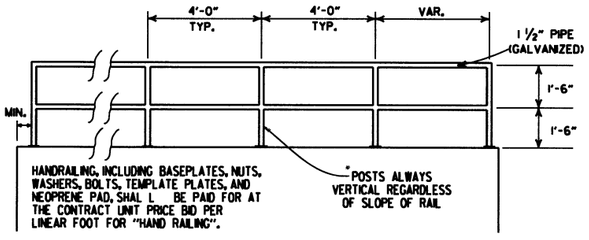



POST CONNECTION TO WALL

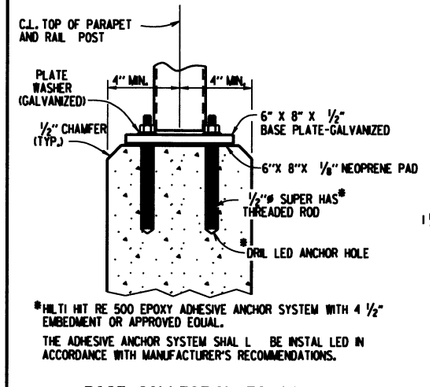



BASE PLATE

## POST CONNECTION DETAILS



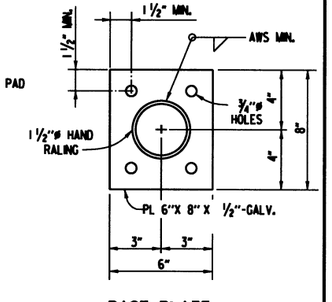

HAND RAILING SHALL CONFORM TO SECTION 633.




*HILTI HIT RE 500 EPOXY ADHESIVE ANCHOR SYSTEM WITH 4 1/2" EMBEDMENT OR APPROVED EQUAL.

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

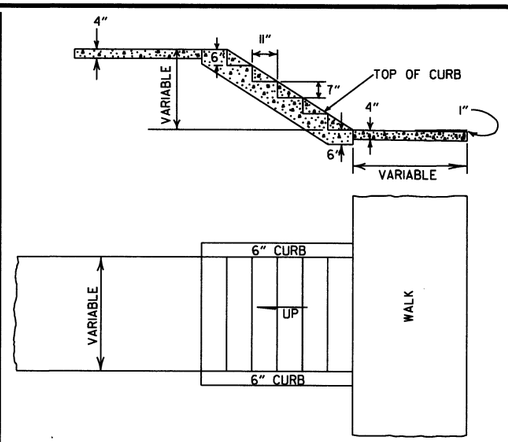
POST CONNECTION TO WALL




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.

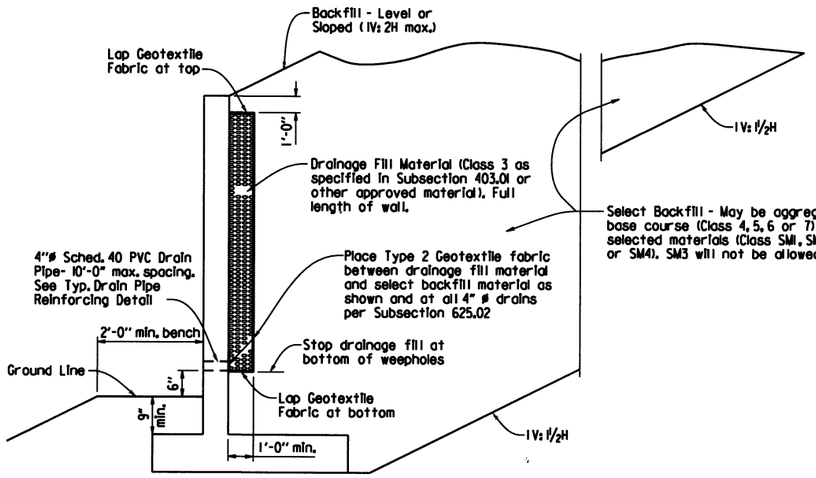
## DETAILS OF CONCRETE STEPS & WALKS

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 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

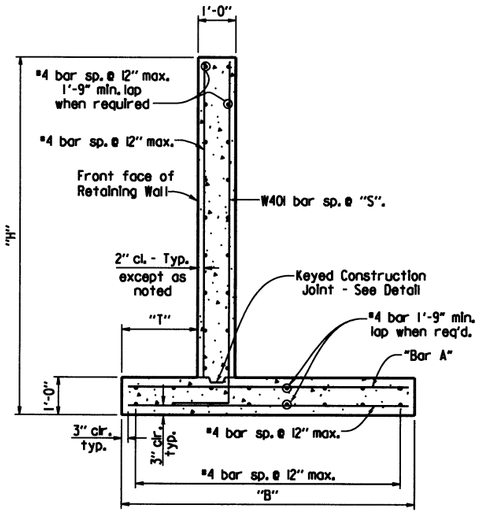
# DETAILS OF SPECIAL ITEMS

STANDARD DRAWING SI - 1



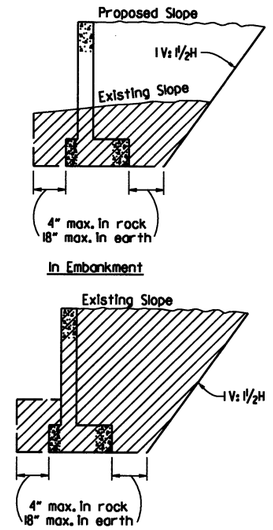

## TYPICAL DRAINAGE & BACKFILL DETAILS

N.T.S




## TYPICAL SECTION

N.T.S




NOTE: Hatched area denotes maximum limits of pay excavation.

## DETAILS OF EXCAVATION

N.T.S

GENERAL NOTES

CONSTRUCTION SPECIFICATIONS: Arkansas state Highway and Transportation Department Standard Specifications for Highway Construction (Current Edition) with applicable supplemental specifications and special provisions. Unless otherwise noted in the plans, Section and Subsection refer to the Standard Construction Specifications.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Sixth Edition (2012).

LIVE LOAD: Live Load Surcharge is not included in the design of these walls. Vehicular Live Load shall not be allowed within a distance equal to one-half the height of the wall.

CONCRETE: Concrete shall be poured in the dry and all exposed corners to be chamfered ½". All concrete shall be Class S with a minimum 28 day compressive strength f'c = 3,500 psi. A Class 2 Surface finish shall be used on all surfaces of the concrete unless otherwise noted.

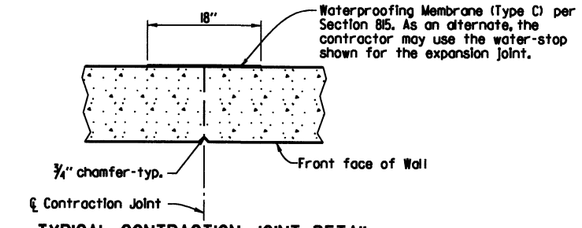
REINFORCING STEEL: All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.

Foundations for footings shall be prepared in accordance with subsection 801.04. Backfill for retaining walls shall be in accordance with subsection 801.08.

Waterproof Membrane (Type C), waterstops, preformed joints, weep holes & geotextile fabric shall not be paid for directly, but shall be considered subsidiary to Class S Concrete.

Drainage fill material (Class 3) and select backfill shall be measured and paid for as Compacted Embankment.

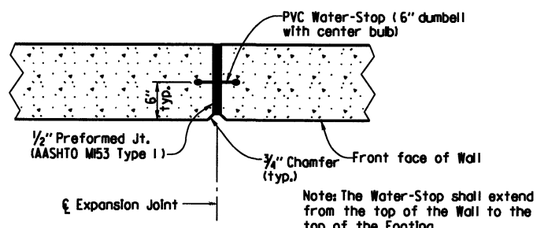
These details are not intended for use along streams or ditches without consideration for scour.




## TYPICAL CONTRACTION JOINT DETAIL

N.T.S.

Note: 20'-0" Max. Spacing between Contraction Joints. Horizontal reinforcement shall be continuous through Contraction Joints.

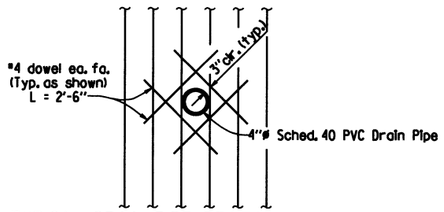



Note: The Water-Stop shall extend from the top of the Wall to the top of the Footing.

## TYPICAL EXPANSION JOINT DETAIL

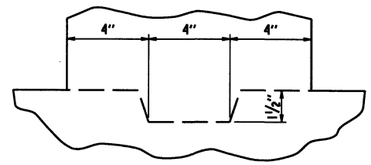
N.T.S.

Note: 60'-0" Max. Spacing between Expansion Joints. Horizontal reinforcing shall stop 2" from ℄ Expansion Joint.




## TYPICAL DRAIN PIPE REINFORCING DETAIL

N.T.S




## KEYED CONSTRUCTION JOINT DETAIL

N.T.S

SEISMIC ZONE: These walls have been designed for the following site adjusted peak ground accelerations ($A_S$):
Level Backfill - $A_S \leq .40g$
Sloped Backfill (1V:2H max.) - $A_S \leq .30g$

## TABLE OF RETAINING WALL VARIABLES (LEVEL BACKFILL)

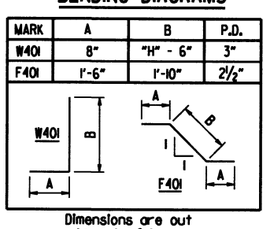
| "H" | "T" | "B" | "S" | "Bar A" Size @ Spacing |
|---|---|---|---|---|
| 3'-0" | 9" | 2'-6" | 12" | #4 @ 12" |
| 4'-0" | 9" | 3'-6" | 12" | #4 @ 12" |
| 5'-0" | 9" | 4'-0" | 12" | #4 @ 12" |
| 6'-0" | 9" | 4'-6" | 12" | #4 @ 12" |
| 7'-0" | 9" | 5'-6" | 12" | #4 @ 10" |
| 8'-0" | 9" | 6'-0" | 12" | #5 @ 10" |
| 9'-0" | 1'-0" | 7'-0" | 12" | #5 @ 6½" |

## TABLE OF RETAINING WALL VARIABLES (SLOPED BACKFILL) (1V:2H MAX.)

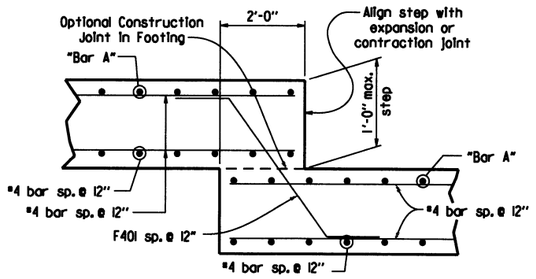
| "H" | "T" | "B" | "S" | "Bar A" Size @ Spacing |
|---|---|---|---|---|
| 3'-0" | 9" | 2'-6" | 12" | #4 @ 12" |
| 4'-0" | 9" | 3'-6" | 12" | #4 @ 12" |
| 5'-0" | 9" | 4'-6" | 12" | #4 @ 12" |
| 6'-0" | 9" | 5'-6" | 12" | #4 @ 6" |
| 7'-0" | 9" | 6'-6" | 12" | #5 @ 6½" |
| 8'-0" | 1'-6" | 8'-0" | 7½" | #6 @ 6" |
| 9'-0" | 1'-11" | 9'-6" | 5" | #8 @ 6" |

## BENDING DIAGRAMS

| MARK | A | B | P.D. |
|---|---|---|---|
| W401 | 8" | "H" - 6" | 3" |
| F401 | 1'-6" | 1'-10" | 2½" |




Dimensions are out to out of bars.




## FOOTING STEP DETAIL

N.T.S.

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 5-12-16 | REVISED SLOPES FOR SELECT BACKFILL | |
| 2-27-14 | REVISED GENERAL NOTES | |
| 7-26-12 | DRAWING ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

# REINFORCED CONCRETE RETAINING WALL (WITHOUT LIVE LOAD SURCHARGE)

STANDARD DRAWING SI - 2

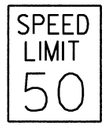
R1-1

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"

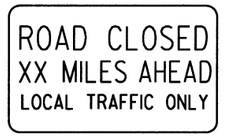
R5-1

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"

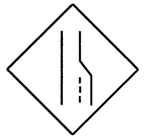
W3-1

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"

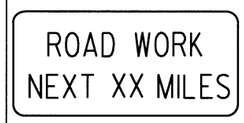
W8-11

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

W8-9

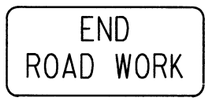
STD. 36"X36"
FWY. 48"X48"

G20-1



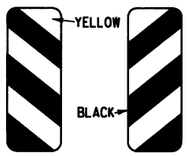

60"X24"

G20-2




48"X24"

OM-3L OM-3R




12"X36"

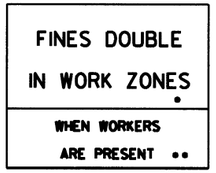
M4-9

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.

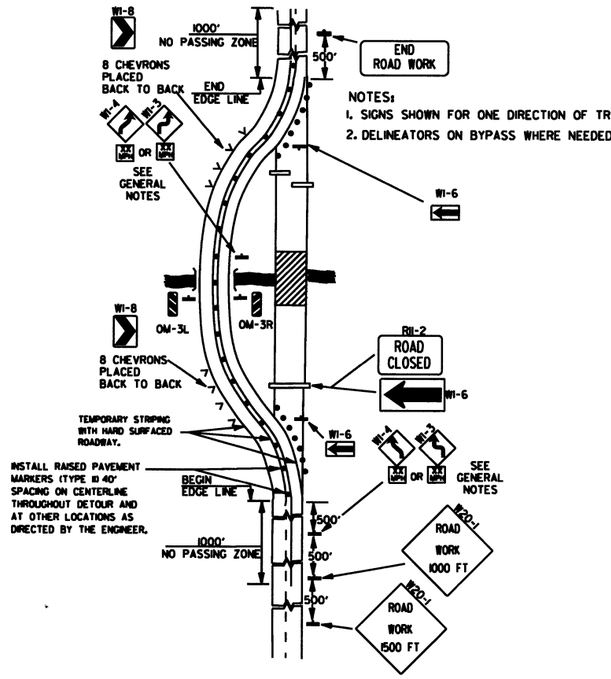
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

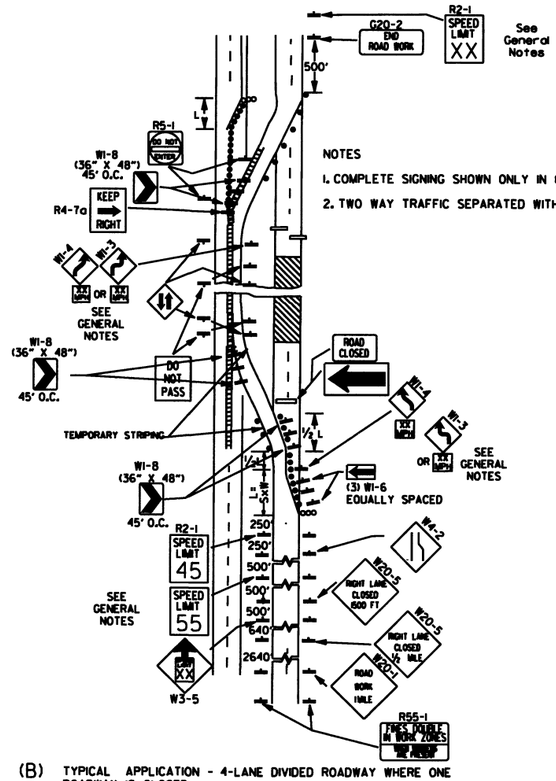
ARKANSAS STATE HIGHWAY COMMISSION

# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

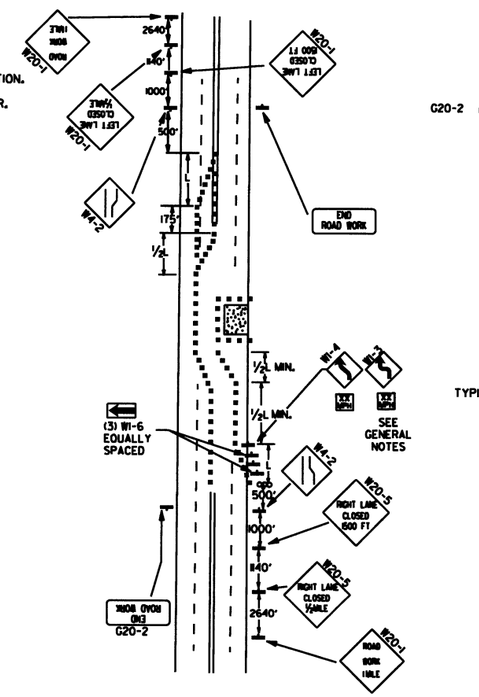
STANDARD DRAWING TC-1



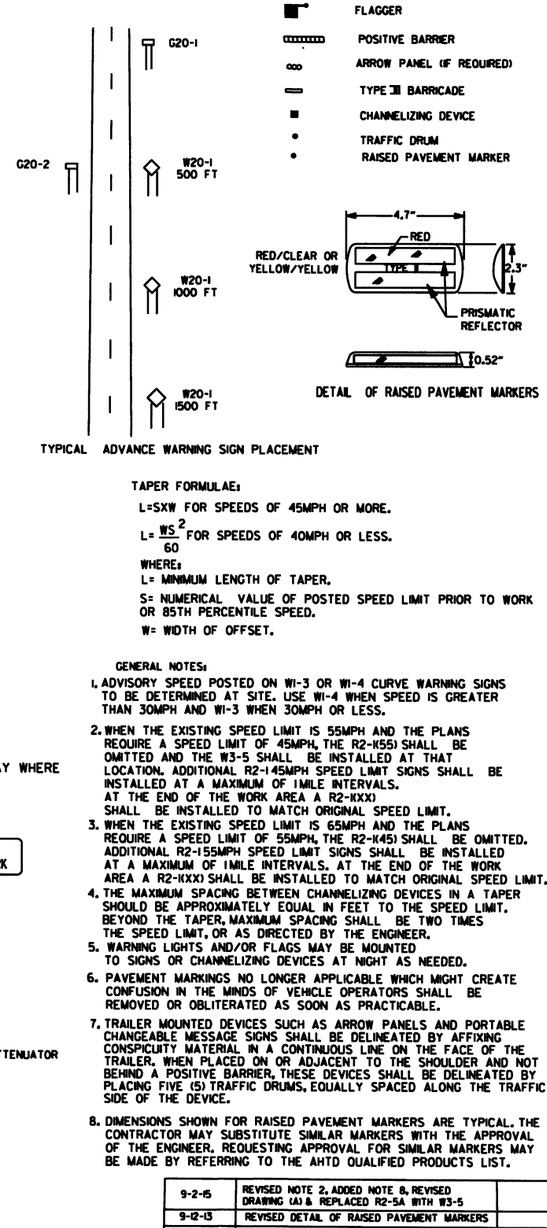

(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.




(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.




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:

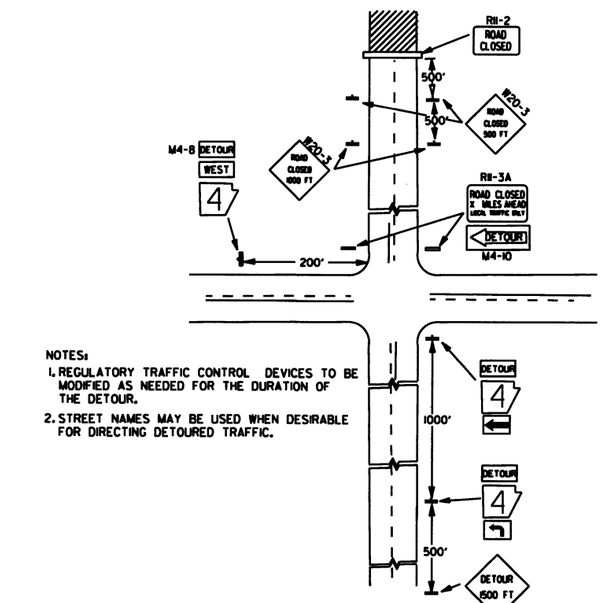
L= MINIMUM LENGTH OF TAPER.

S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.

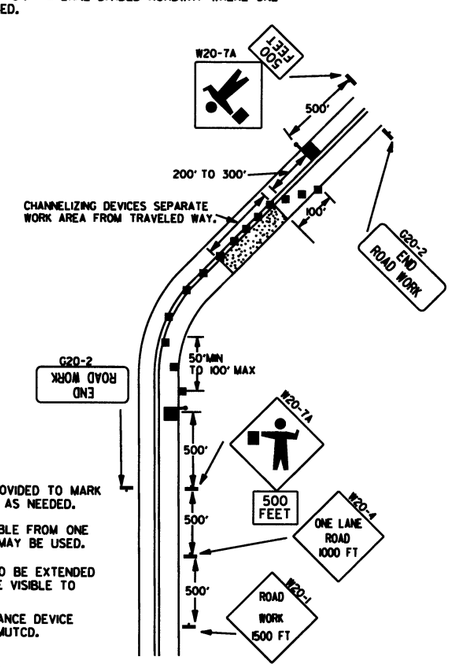
W= WIDTH OF OFFSET.

GENERAL NOTES:

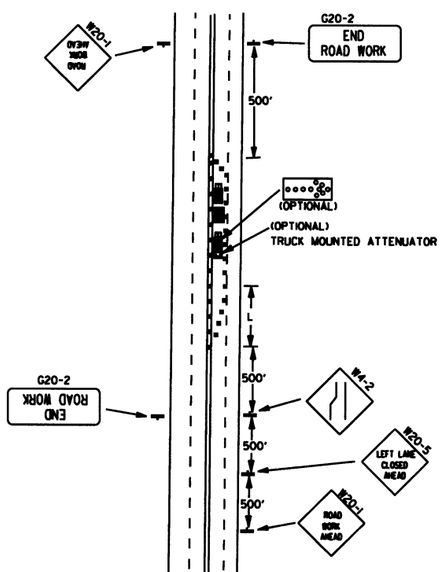
1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED 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.




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




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



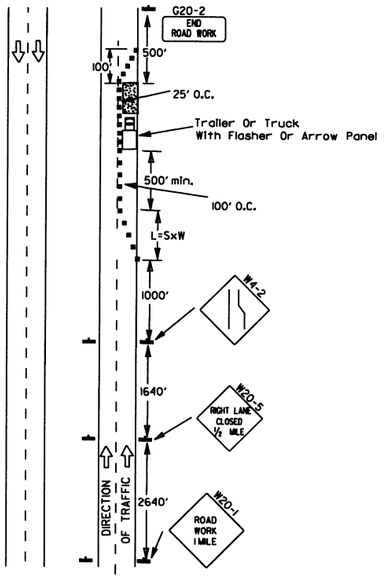

(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

| | | |
|---|---|---|
| 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 | |
| 3-8-10 | ADDED (AFAD) | |
| 8-20-08 | REVISED SIGN DESIGNATIONS | |
| 8-18-04 | 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 | |
| DATE | REVISION | FILMED |

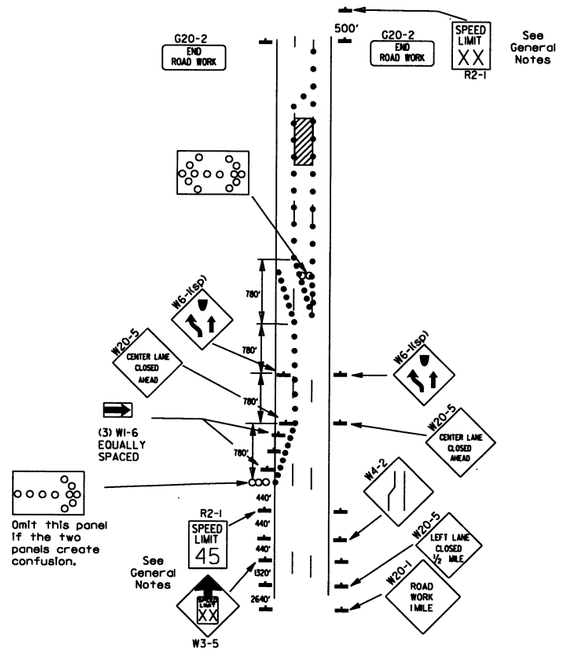
ARKANSAS STATE HIGHWAY COMMISSION

# 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.



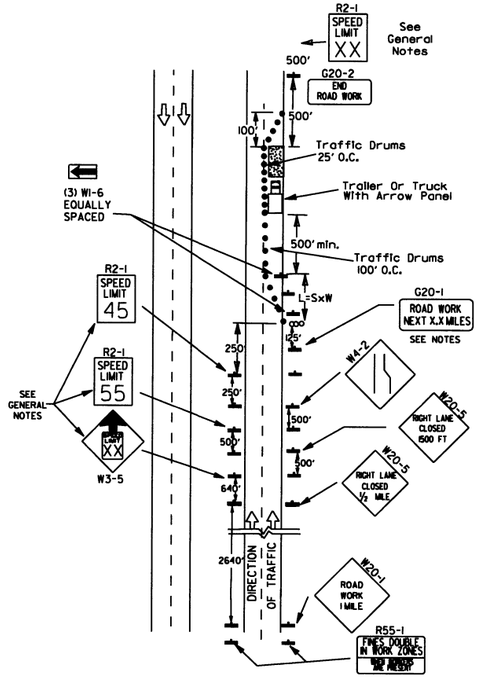

(B) Typical application - 3-lane oneway roadway where center lane is closed.

KEY:

- ○○○ Arrow Panel (If Required)
- ■ Channelizing Device
- ● Traffic drum

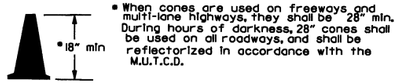
GENERAL NOTES:

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.

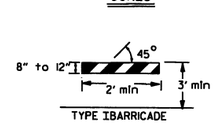


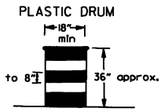

(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

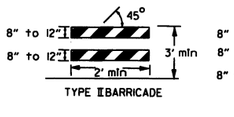
Channelizing devices

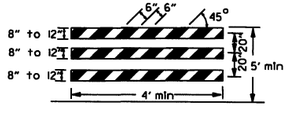



- When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

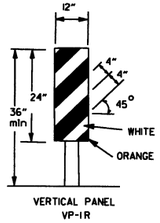


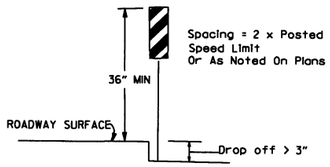




NOTE:
For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.




VERTICAL PANEL PLACEMENT



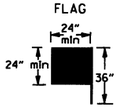

TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

| 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.

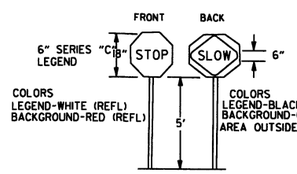
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

FLAG




Flag shall be of good grade red material

STOP SLOW PADDLE

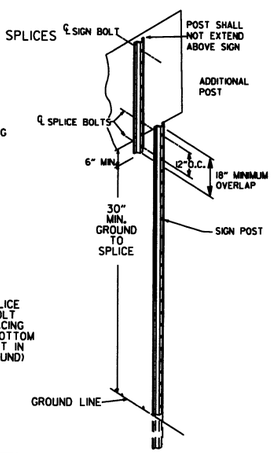






(D) Typical application - closing multiple lanes of a multilane highway.

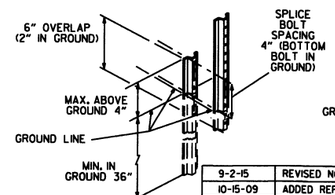
DETAIL OF SPLICES




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.




| 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 | |

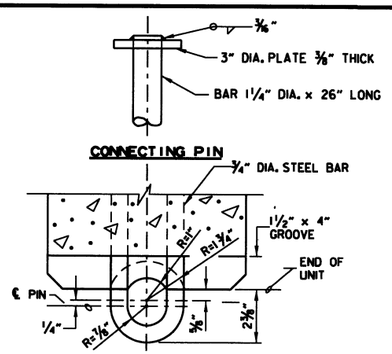
ARKANSAS STATE HIGHWAY COMMISSION

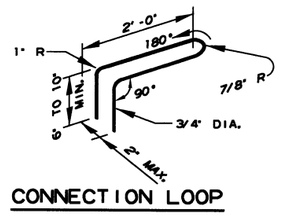
# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

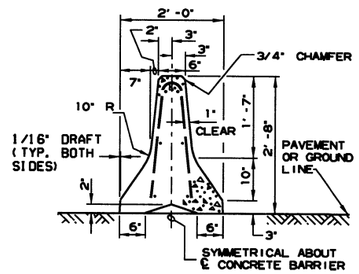
STANDARD DRAWING TC-3

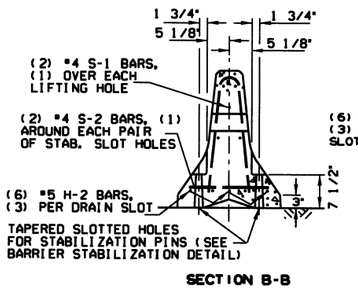
## REINFORCING BAR TABLE PER BARRIER UNIT

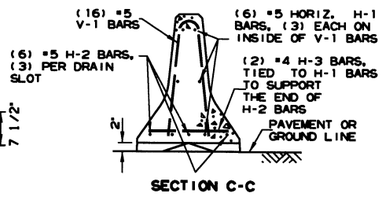
| MARK | LOCATION | BAR SIZE | (NO. BARS) | SKETCH |
|---|---|---|---|---|
| H-1 | HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS | #5 | (6) | 19'-3" |
| H-2 | CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY | #5 | (6) | 6'-6" |
| H-3 | TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1 | #4 | (2) | 1'-6" |
| S-1 | OVER LIFT HOLES | #4 | (2) | 2'-5", LIFTING HOLE, 90°, 3 3/8" R |
| S-2 | HORIZ. AROUND SLOTS BETWEEN V-1'S @ DRAIN SLOTS | #4 | (2) | 1 1/2" R, SLOTS, 7", 1'-6", 1" MIN. CLEAR TO BAR; 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP |
| V-1 | VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS | #5 | (16) | TOTAL LENGTH 4'-9"; 2 3/16" R; 12°; 9 1/2"; 2'-1 3/8"; 4 3/8" |

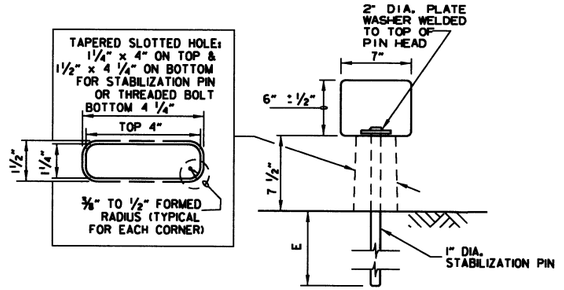


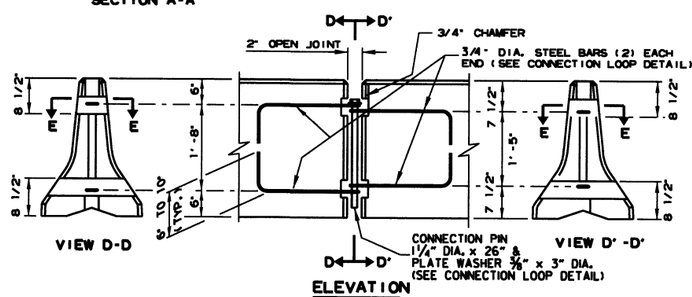



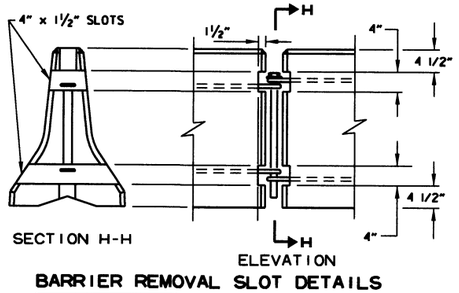



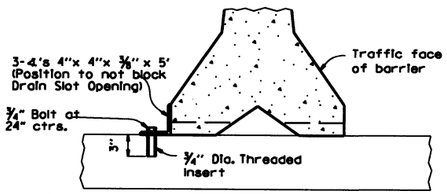



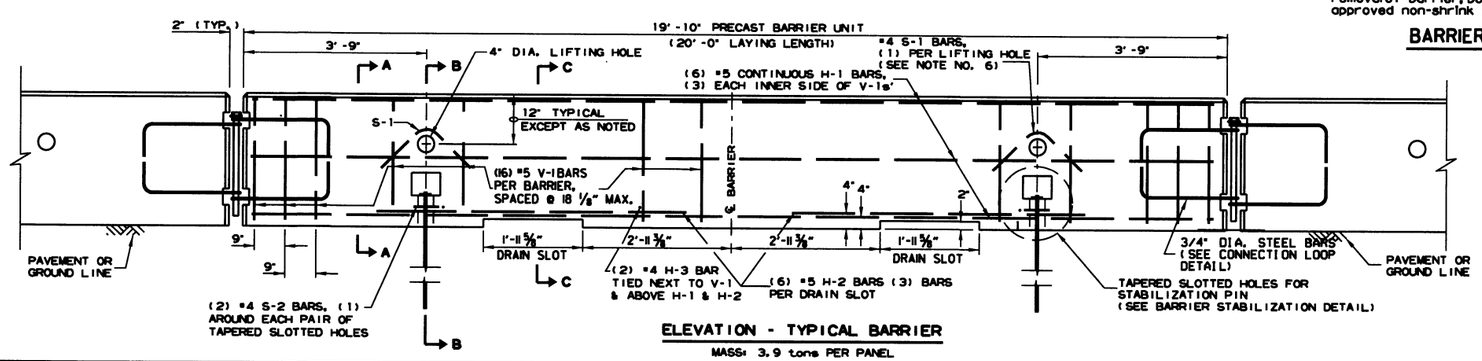




### General Notes

1. The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.

2. Materials shall meet the following minimum requirements:
   Concrete: 2500 psi compressive strength at 28 days.
   Reinforcing Steel: AASHTO M 31 or M 53, Grade 60
   Structural Steel: AASHTO-M270 Grade 36 shall be used for the Connection Pin, Connection Loops, and Stabilization Pins. A One Piece Pin with a 3" rounded top may be used in place of the detailed Connection Pin.
   Delineators: Delineators shall be mounted at 10' spacing on top of precast barrier.

   In applications where barrier walls within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers.
   Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices.
   Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.

3. Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.

4. Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.

5. Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.

6. A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

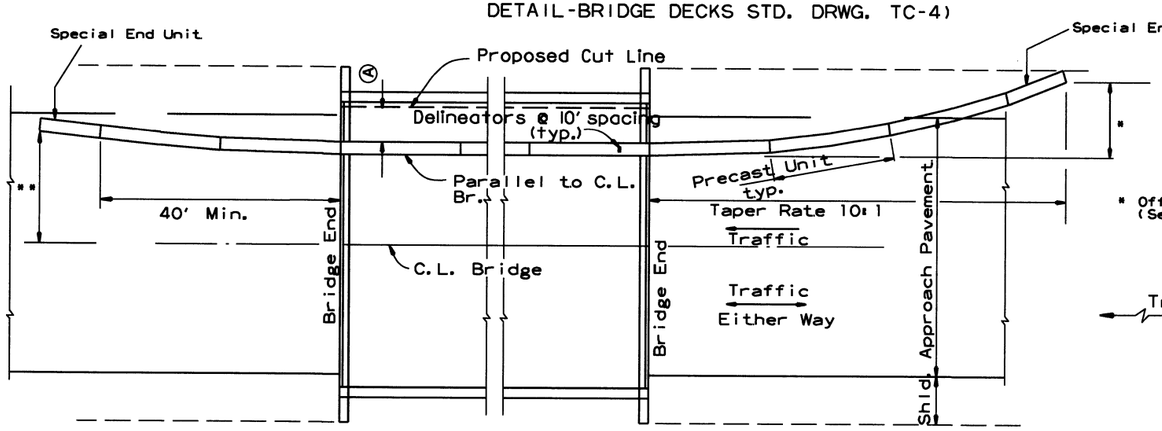
| DATE | REVISION | FILMED |
|---|---|---|
| 2-27-14 | REVISED BARRIER STABILIZATION DETAIL | |
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 8-5-09 | REV. NOTE 3 CONCERNING DRAIN SLOTS | |
| 11-29-07 | REVISED NOTE 3 | |
| 5-25-06 | DELETED GENERAL NOTE 7 | |
| 11-18-04 | REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS | |
| 4-10-03 | REVISED GENERAL NOTE 2 | |
| 8-22-02 | ISSUED NEW DRAWING | |

**ARKANSAS STATE HIGHWAY COMMISSION**

**STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER**

STANDARD DRAWING TC-4

Ⓐ 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)

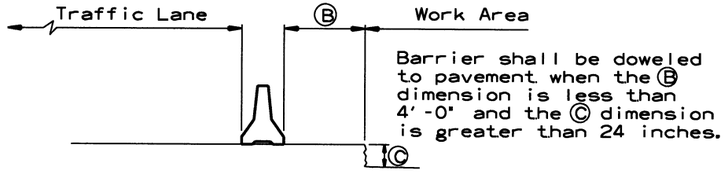



BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

** Offset Distance for Two Way Traffic Only

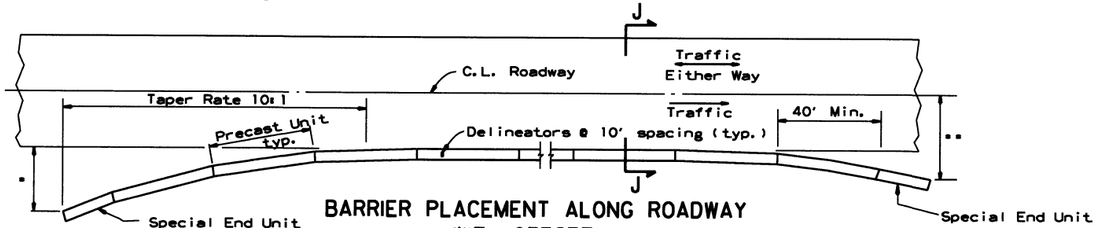
* Offset Distance (See Table)




Barrier shall be doweled to pavement when the Ⓑ dimension is less than 4'-0" and the Ⓒ dimension is greater than 24 inches.

SECTION J-J

No Scale




BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

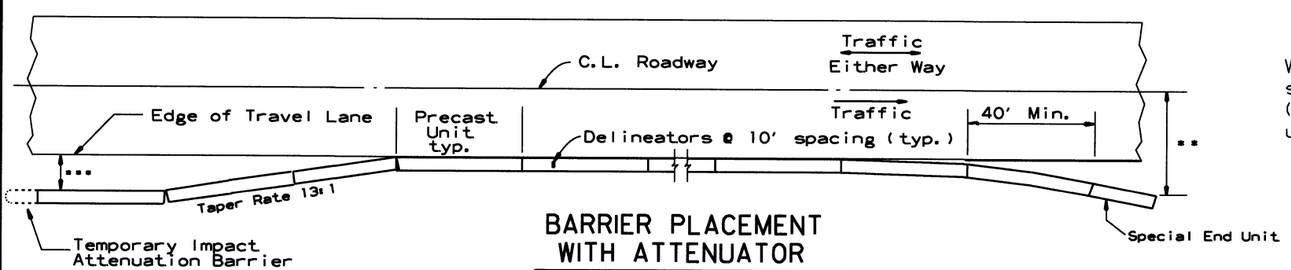
* Offset Distance (See Table)

** Offset Distance For Two Way Traffic Only

Offset Distance Table

| Speed (MPH) | Offset Distance (FT.) |
|---|---|
| ≤ 45 | 12 |
| > 45 | 18 |

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

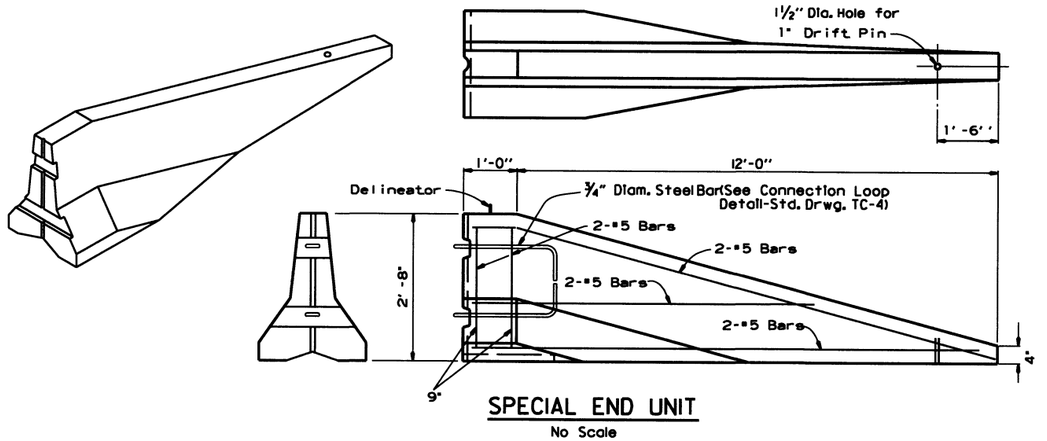



BARRIER PLACEMENT WITH ATTENUATOR

No Scale

*** Min. 3'-0" From Edge of Travel Lane to Nearest Edge of Attenuator

** Offset Distance For Two Way Traffic Only




SPECIAL END UNIT

No Scale

General Notes

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with an NCHRP-350 or Manual For Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of "Temporary Impact Attenuation Barrier."

| DATE | REVISION | FILMED |
|---|---|---|
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 5-25-06 | REVISED BARRIER PLACEMENT | |
| 8-22-02 | ISSUED NEW DRAWING | |

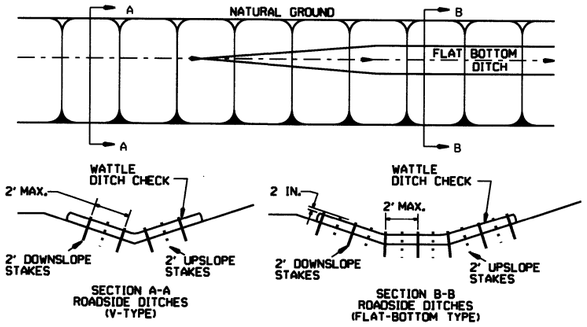
**ARKANSAS STATE HIGHWAY COMMISSION**

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

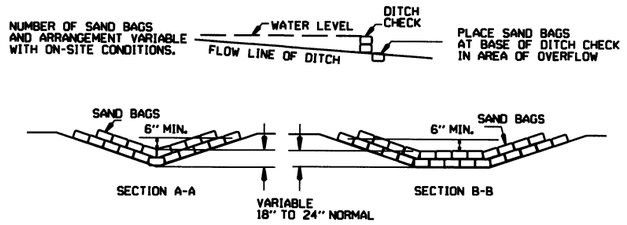
STANDARD DRAWING TC-5

GENERAL NOTES

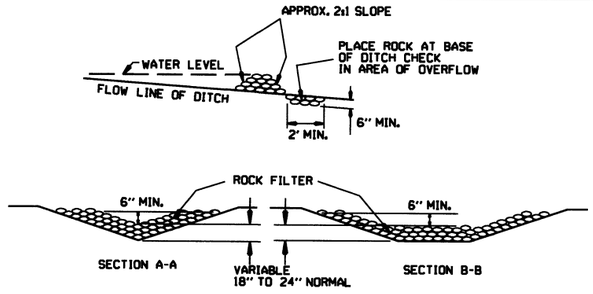
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.




## WATTLE DITCH CHECK (E-1)




## SAND BAG DITCH CHECK (E-5)

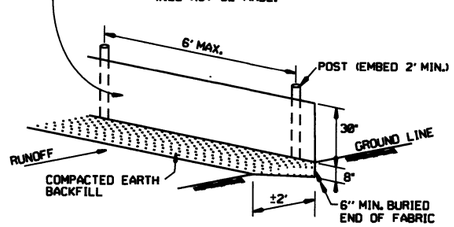



## ROCK DITCH CHECK (E-6)

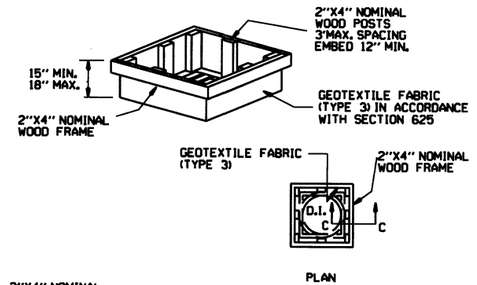
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

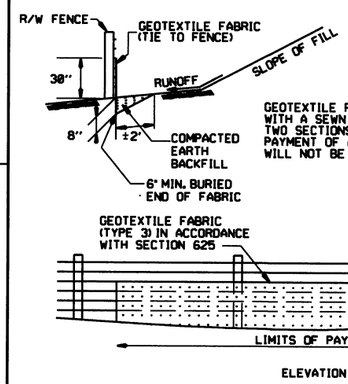
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.




## 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.

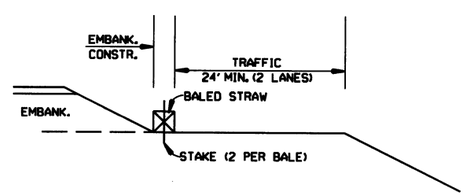
## SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

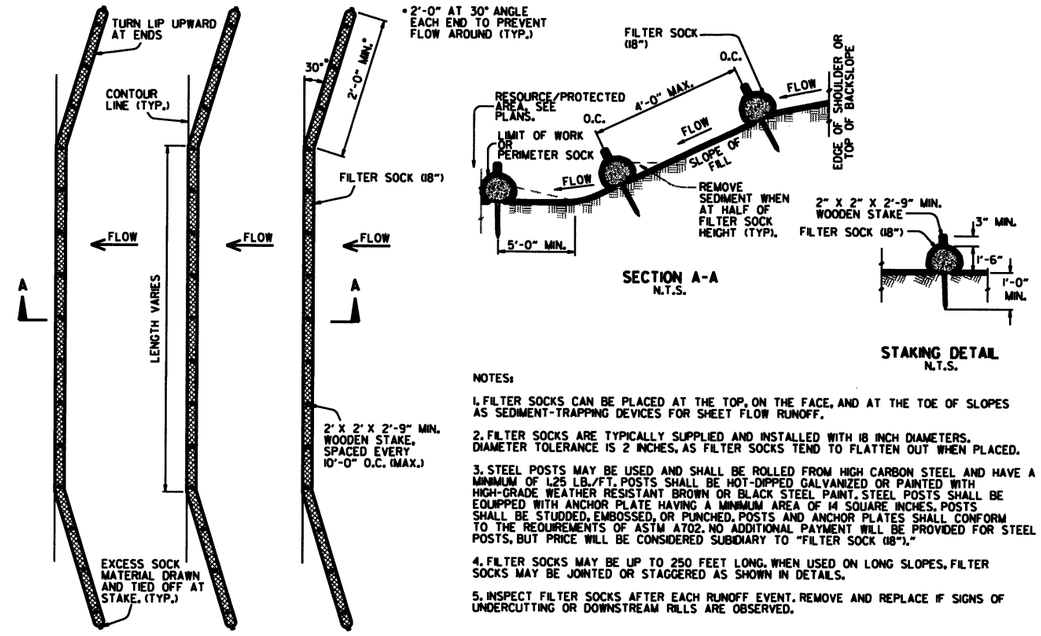
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

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.

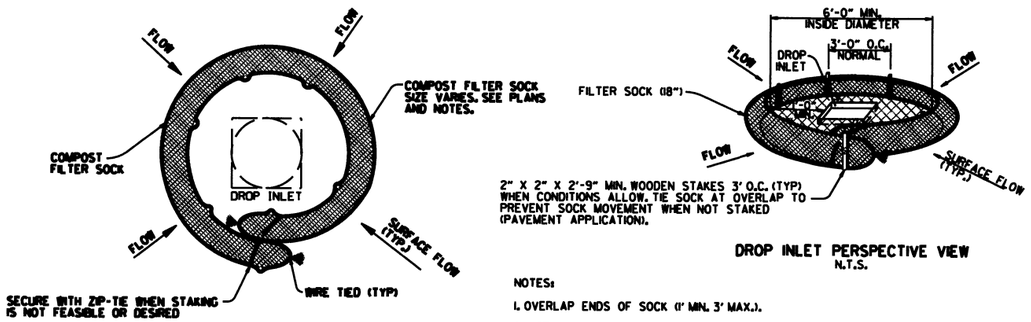
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

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 SUBSIDIARY 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)




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.

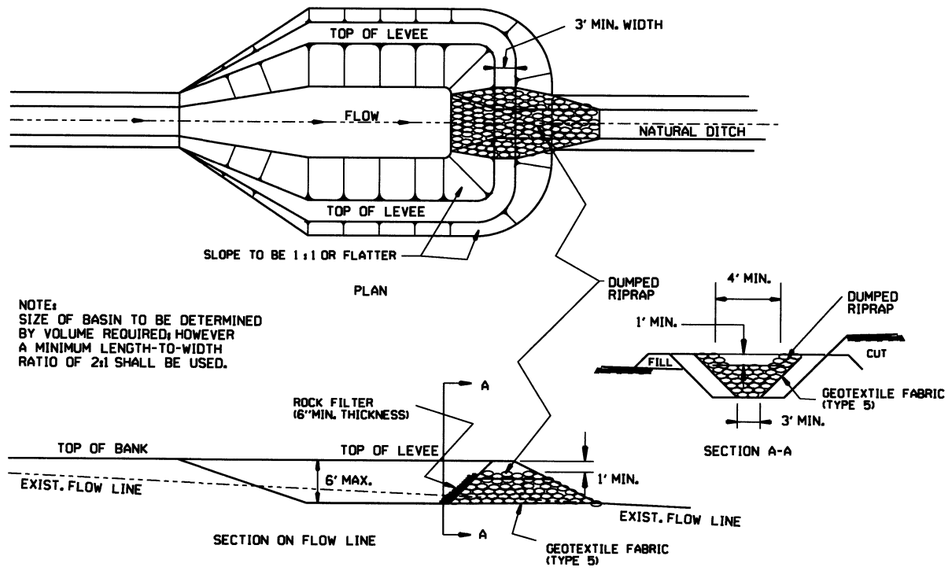
## COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

| DATE | REVISION | FILMED |
|---|---|---|
| 11-15-17 | 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 |

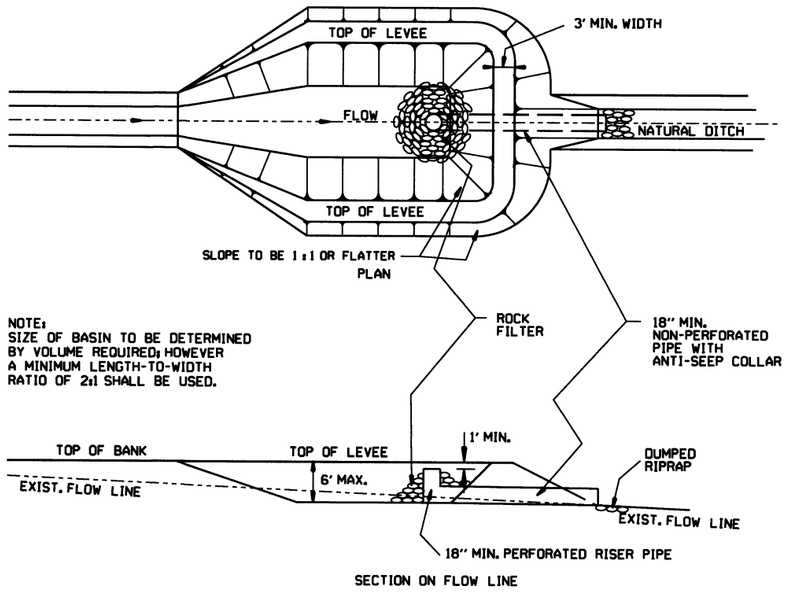
ARKANSAS STATE HIGHWAY COMMISSION

# TEMPORARY EROSION CONTROL DEVICES

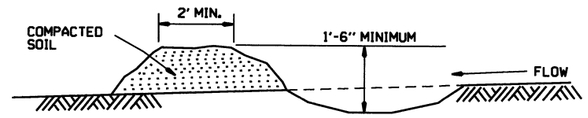
STANDARD DRAWING TEC-1



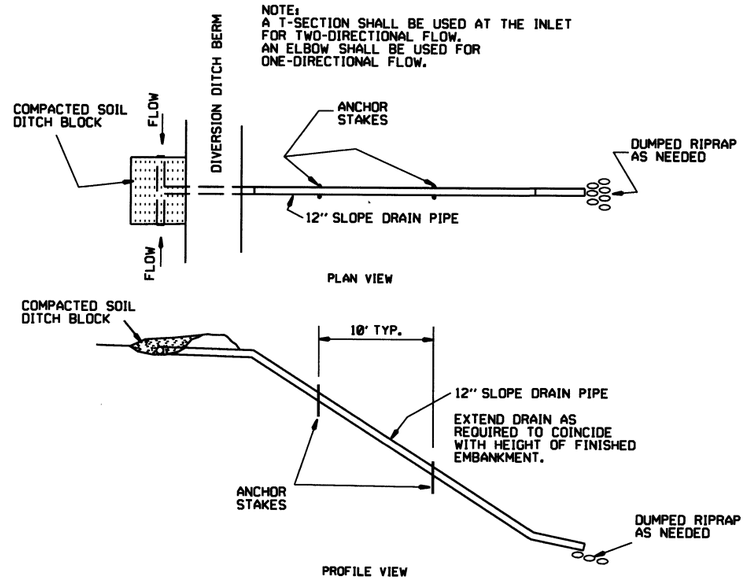

SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



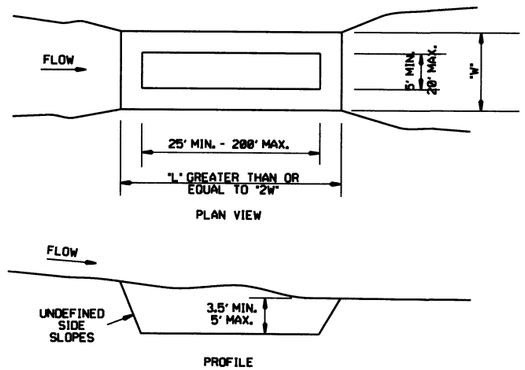

SEDIMENT BASIN WITH PIPE OUTLET (E-10)




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

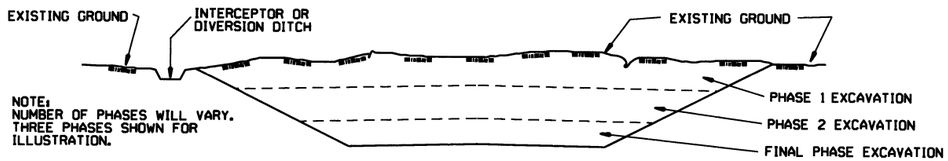
STANDARD DRAWING TEC-2

# 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



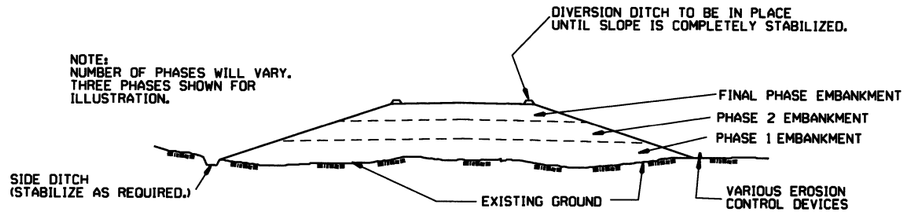

GENERAL NOTE

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

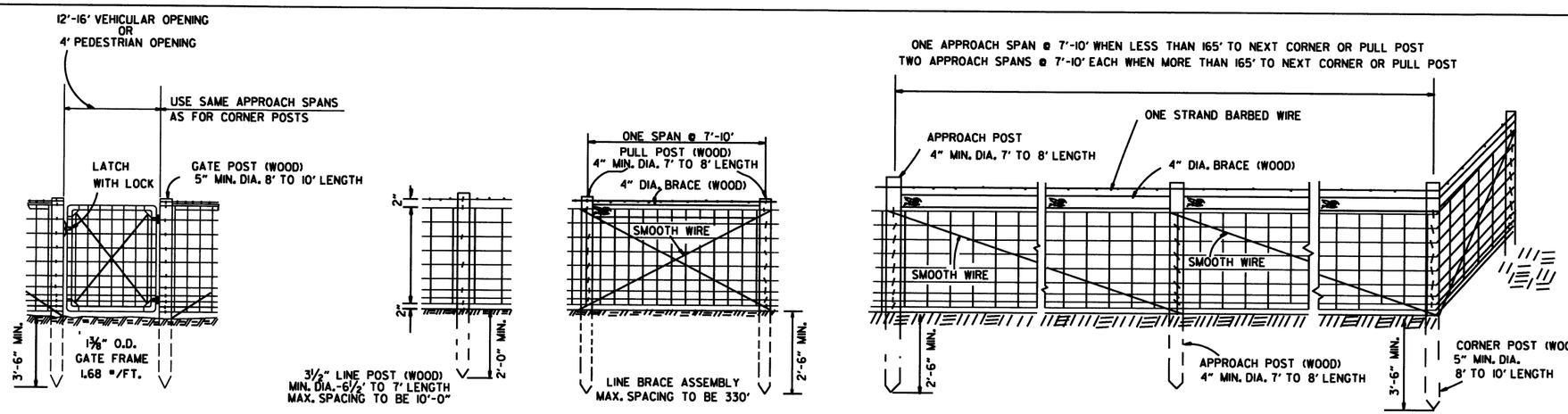
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD 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

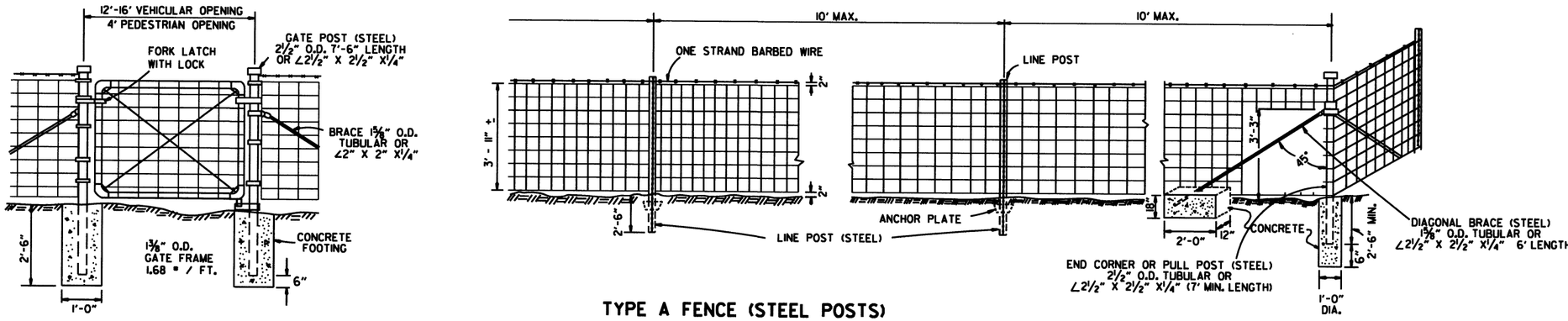
# TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3

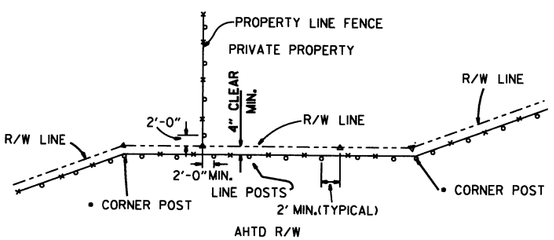



NOTE: STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

## TYPE A FENCE (WOOD POSTS)



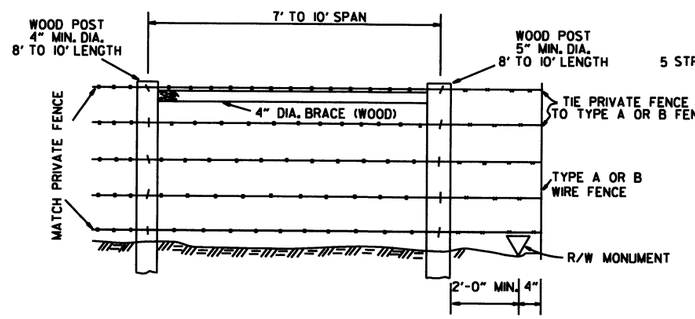

## TYPE A FENCE (STEEL POSTS)




*NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

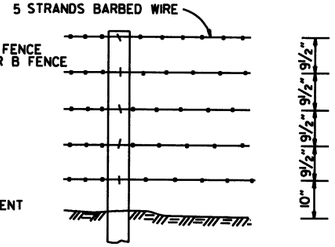
△ - R/W MONUMENTS
○ - FENCE POSTS

## RIGHT-OF-WAY FENCE LOCATION



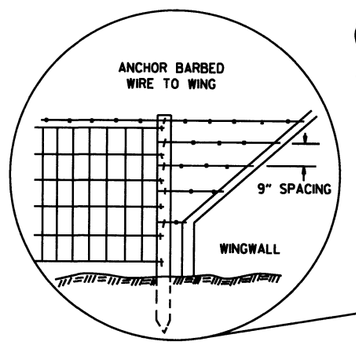

WHERE EXISTING PRIVATE FENCE CONSISTS OF STEEL POSTS, USE END POST ASSEMBLY AS SHOWN WITH TYPE A FENCE OR OTHER END POST ASSEMBLY AS APPROVED BY THE ENGINEER.

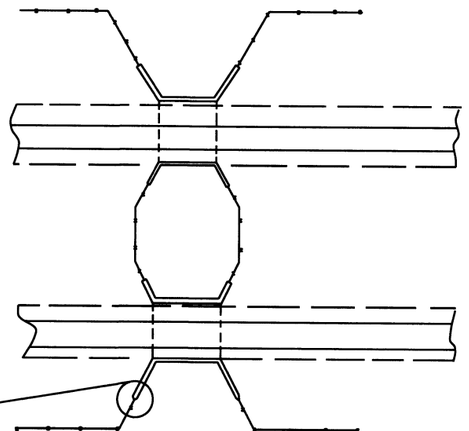
## PRIVATE FENCE TERMINAL INSTALLATION




SPACING AND SIZE OF POSTS FOR TYPE B FENCE SHALL BE THE SAME AS TYPE A FENCE.

## TYPE B FENCE



DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

GENERAL NOTES:

STEEL LINE POSTS SHALL BE GALVANIZED, 7 FT. IN LENGTH.

TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK).

THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF WOOD LINE POSTS OF 7' LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

GATE HINGES AND LATCHES WITH LOCKS TO BE OF A TYPE APPROVED BY THE ENGINEER. DRIVEWAY GATES, EITHER SINGLE 12' OR 16' OR DOUBLE 6' TO 8' OPENINGS OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE FOR USE BY MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON THE PLANS OR AS DESIGNATED BY THE ENGINEER.

AT STREAM CROSSINGS THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF BANK TO THE BRIDGE STRUCTURE, A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFIEICNT, THE FENCE SHALL BE TERMINATED WITH CROSS CONNECTIONS AND END POSTS ADJACENT TO THE BRIDGE ABUTMENTS OR CULVERT WINGWALLS.

SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE "WESTERN UNION METHOD" AS DESCRIBED AS FOLLOWS: THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

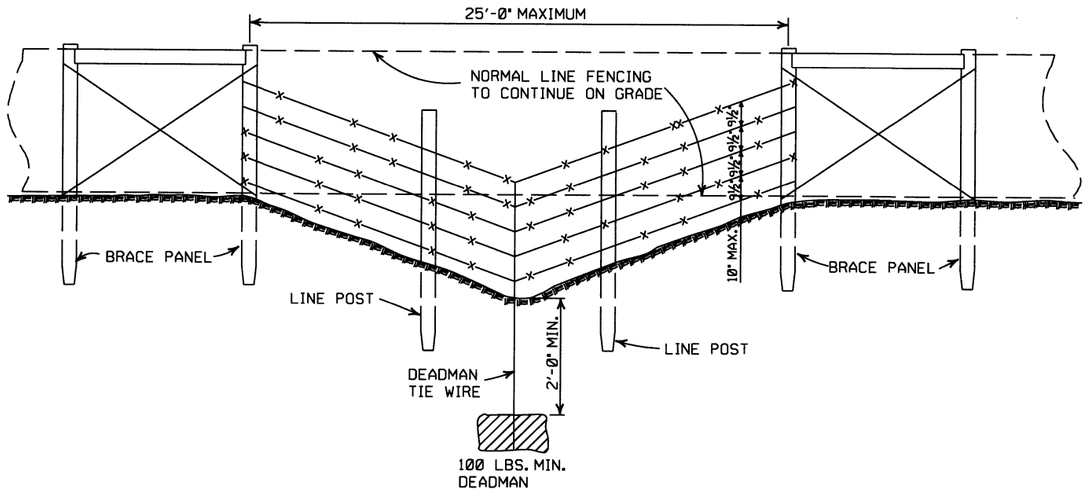
SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE "EYE METHOD": AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRE A MINIMUM OF 4 TIMES FOR EACH WIRE LOOP.

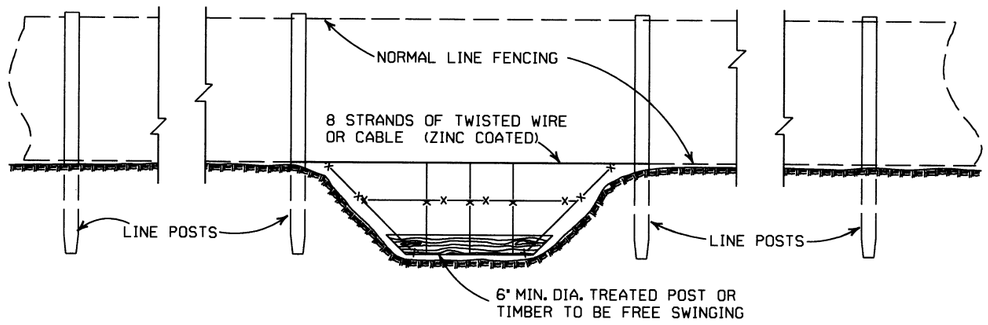
| DATE | REVISION | DATE FILMED |
|---|---|---|
| 8-22-02 | REVISED GENERAL NOTES | |
| 10-18-96 | REVISED ASTM REF. TO AASHTO | |
| 11-22-95 | REVISED R-O-W LOCATION DETAIL | |
| 6-2-94 | ADDED CORNER POST NOTE | 6-2-94 |
| 8-5-93 | REVISED R-O-W LOCATION DETAIL | 8-5-93 |
| 10-1-92 | ADDED STAPLE NOTE | |
| 8-2-90 | REV'D PULL POST LENGTH | |
| 11-30-89 | DELETED CLASS CONC. | |
| 7-15-88 | ADDED SPLICE NOTES | |
| 7-15-88 | ADDED HEIGHT DIMENSION | |
| 4-3-87 | REVISED VARIOUS NOTES AND GENERAL NOTES | |
| 11-1-84 | MAX. POST SPACING | |
| 1-4-83 | MIN. DIA. LINE POST | |
| 10-2-72 | REVISED & REDRAWN | |

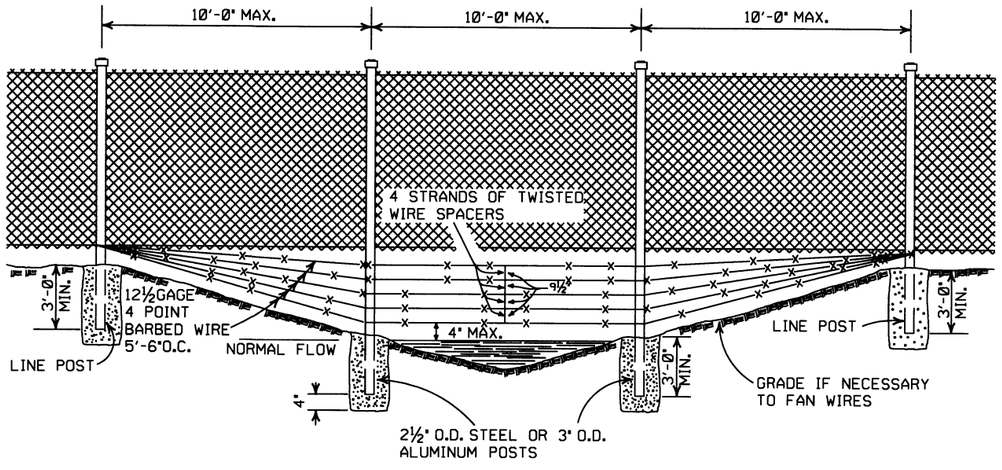
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE
TYPE A AND B

STANDARD DRAWING WF-1




GENERAL NOTES:

THESE INSTALLATIONS TO BE USED WHERE NORMAL FENCING INSTALLATION WOULD CAUSE THE COLLECTING OF DRIFT IN THE CHANNEL OR THE DEPRESSION WILL NOT PERMIT NORMAL INSTALLATION. INSTALLATIONS WILL BE MADE ONLY WHERE DIRECTED BY THE ENGINEER.

WHEN A FENCE LINE APPROACHES A DITCH, GULLY OR DEPRESSION, THE LAST POST ON LEVEL GROUND SHALL BE PLACED CLOSE ENOUGH TO THE EDGE OF THE DROP OFF THAT THE FENCE MAY BE STRUNG TO THE POST IN THE DEPRESSION WITHOUT TOUCHING THE GROUND.

IN TERRAIN OF SUCH EXTREME IRREGULARITY THAT MINOR GRADING WILL NOT BE FEASIBLE, THE NORMAL FENCE SHALL CONTINUE ON GRADE AND THE GULLIES OR DEPRESSIONS TREATED BY AUXILIARY FENCES AS SHOWN.

PAYMENT FOR THE TYPE INSTALLATION USED WILL NOT BE MADE DIRECTLY BUT WILL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR WIRE FENCE OR CHAIN LINK FENCE.

| DATE | REVISION | FILMED |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| 4-20-79 | REVISED TOP RAIL & TENSION WIRE | 696-4-20-79 |
| 10-2-72 | REVISED AND REDRAWN | 529-10-2-72 |

ARKANSAS STATE HIGHWAY COMMISSION

# WIRE FENCE WATER GAPS

STANDARD DRAWING WF-2

| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |

# BAR LIST FOR BARREL SECTION 60°-0" IN LENGTH

| DEPTH OF COVER | CLEAR SPAN | CLEAR HEIGHT | "a" bars STRAIGHT In Top and Bottom Slabs of Barrel. 2 Add'l in Apron and Headwall- Each. | | | | "b" bars Bent - See Diagram below. In Top and Bottom Slabs of Barrel. Alternate with "a" bars. | | | | | "d" bars STRAIGHT. Longitudinal in Top Slab of Barrel | | | | "d'" bars STRAIGHT. Longitudinal in Sidewalls | | | "e" bars. Longitudinal in Bottom Slab of Barrel | | | | "f" bars STRAIGHT Verticals in Sidewalls | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NUMBER REQ'D | | | | NUMBER REQ'D | | | | | | | | | | | | | | | NUMBER REQ'D | | |
| D | S | H | SIZE | SPACING | 3:1 | 4:1 | LENGTH | SIZE | SPACING | 3:1 | 4:1 | LENGTH | X | SIZE | SPACING | No. REQ'D | LENGTH | SIZE | SPACING | No. REQ'D | LENGTH | SIZE | SPACING | No. REQ'D | LENGTH | SIZE | SPACING | 3:1 | 4:1 | LENGTH |
| 0'-0" TO 5'-0" MAXIMUM | 1 @ 4' | 2' | #5 | 13" | 120 | 120 | 4'-9" | #6 | 13" | 110 | 110 | 5'-10" | 4'-8" | #5 | 10½" | 6 | | #4 | 12" | 4 | | #4 | 12" | 5 | | #4 | 12" | 120 | 120 | 2'-11" |
| | | 3' | | | 120 | 120 | 4'-9" | | | 110 | 110 | 5'-10" | 4'-8" | | | 6 | | | | 6 | | | | 5 | | | | 120 | 120 | 3'-11" |
| | | 4' | | | 120 | 120 | 4'-9" | | | 110 | 110 | 5'-10" | 4'-8" | | | 6 | | | | 8 | | | | 6 | | | | 120 | 120 | 4'-11" |
| | | 5' | | | 120 | 120 | 4'-9" | | | 110 | 110 | 5'-10" | 4'-8" | | | 6 | | | | 10 | | | | 5 | | | | 120 | 120 | 5'-11" |
| | | 6' | | | 120 | 120 | 4'-11" | | | 110 | 110 | 6'-0" | 4'-10" | | | 6 | | | | 12 | | | | 5 | | | | 120 | 120 | 6'-11" |
| | 1 @ 5' | 3' | #6 | 13" | 120 | 120 | 5'-9" | #6 | 13" | 110 | 110 | 6'-10" | 5'-8" | | | 7 | | | | 6 | | | | 6 | | | | 120 | 120 | 4'-0" |
| | | 4' | | | 120 | 120 | 5'-9" | | | 110 | 110 | 6'-10" | 5'-8" | | | 7 | | | | 8 | | | | 6 | | | | 120 | 120 | 5'-0" |
| | | 5' | | | 120 | 120 | 5'-9" | | | 110 | 110 | 6'-10" | 5'-8" | #5 | 10⅝" | 7 | | #4 | 12" | 10 | | #4 | 12" | 6 | | #4 | 12" | 120 | 120 | 6'-0" |
| | | 6' | | | 120 | 120 | 5'-11" | | | 110 | 110 | 7'-0" | 5'-10" | | | 7 | | | | 12 | | | | 6 | | | | 120 | 120 | 7'-0" |
| | | 7' | | | 120 | 120 | 6'-0" | | | 110 | 110 | 7'-1" | 5'-11" | | | 7 | | | | 16 | | | | 6 | | | | 120 | 120 | 8'-0" |
| | 1 @ 6' | 3' | #6 | 12" | 128 | 128 | 6'-9" | #6 | 12" | 118 | 118 | 7'-10" | 6'-8" | | | 8 | | | | 6 | | | | 7 | | | | 120 | 120 | 4'-1" |
| | | 4' | | | 128 | 128 | 6'-9" | | | 118 | 118 | 7'-10" | 6'-8" | | | 8 | | | | 8 | | | | 7 | | | | 120 | 120 | 5'-1" |
| | | 5' | | | 128 | 128 | 6'-9" | | | 118 | 118 | 7'-10" | 6'-8" | #5 | 10⅝" | 8 | | #4 | 12" | 10 | | #4 | 12" | 7 | | #4 | 12" | 120 | 120 | 6'-1" |
| | | 6' | | | 128 | 128 | 6'-11" | | | 118 | 118 | 8'-0" | 6'-10" | | | 8 | | | | 12 | | | | 7 | | | | 120 | 120 | 7'-1" |
| | | 7' | | | 128 | 128 | 7'-0" | | | 118 | 118 | 8'-1" | 6'-11" | | | 8 | | | | 14 | | | | 7 | | | | 120 | 120 | 8'-1" |
| | | 8' | | | 128 | 128 | 7'-1" | | | 118 | 118 | 8'-2" | 7'-0" | | | 8 | | | | 16 | | | | 7 | | | | | | |
| | 1 @ 7' | 4' | #6 | 11" | 140 | 140 | 7'-9" | #6 | 11" | 130 | 130 | 8'-10" | 7'-8" | | | 9 | | | | 8 | | | | 8 | | #5 | 12" | 120 | 120 | 5'-2" |
| | | 5' | | | 140 | 140 | 7'-9" | | | 130 | 130 | 8'-10" | 7'-8" | | | 9 | | | | 10 | | | | 8 | | #4 | 12" | 120 | 120 | 6'-2" |
| | | 6' | | | 140 | 140 | 7'-11" | | | 130 | 130 | 9'-0" | 7'-10" | #5 | 10⅝" | 9 | | #4 | 12" | 12 | | #4 | 12" | 8 | | | | 120 | 120 | 7'-2" |
| | | 7' | | | 140 | 140 | 8'-0" | | | 130 | 130 | 9'-1" | 7'-11" | | | 9 | | | | 14 | | | | 8 | | | | 120 | 120 | 8'-2" |
| | | 8' | | | 140 | 140 | 8'-1" | | | 130 | 130 | 9'-2" | 8'-0" | | | 9 | | | | 16 | | | | 8 | | | | | | |
| | | 9' | | | 140 | 140 | 8'-3" | | | 130 | 130 | 9'-4" | 8'-2" | | | 9 | | | | 18 | | | | 8 | | #5 | 12" | 120 | 120 | 10'-2" |
| | 1 @ 8' | 4' | #7 | 12" | 128 | 128 | 8'-9" | #6 | 12" | 118 | 118 | 9'-10" | 8'-8" | | | 11 | | | | 8 | | | | 9 | | #4 | 12" | 120 | 120 | 5'-8" |
| | | 5' | | | 128 | 128 | 8'-11" | | | 118 | 118 | 10'-0" | 8'-10" | | | 11 | | | | 10 | | | | 9 | | | | 120 | 120 | 6'-8" |
| | | 6' | | | 128 | 128 | 8'-11" | | | 118 | 118 | 10'-0" | 8'-10" | | | 11 | | | | 12 | | | | 9 | | | | 120 | 120 | 7'-8" |
| | | 7' | | | 128 | 128 | 9'-0" | #6 | 12" | 118 | 118 | 10'-1" | 8'-11" | #5 | 10" | 11 | | #4 | 12" | 14 | | #4 | 12" | 9 | | | | 120 | 120 | 8'-8" |
| | | 8' | | | 128 | 128 | 9'-1" | | | 118 | 118 | 10'-2" | 9'-0" | | | 11 | | | | 16 | | | | 9 | | | | | | |
| | | 9' | | | 128 | 128 | 9'-3" | | | 118 | 118 | 10'-4" | 9'-2" | | | 11 | | | | 18 | | | | 9 | | #5 | 12" | 120 | 120 | 10'-2" |
| | | 10' | | | 128 | 128 | 9'-5" | | | 118 | 118 | 10'-5" | 9'-3" | | | 11 | | | | 20 | | | | 9 | | #6 | 12" | 120 | 120 | 11'-8" |
| | 1 @ 9' | 5' | #7 | 11" | 140 | 140 | 9'-11" | | | 130 | 130 | 11'-0" | 9'-10" | | | 12 | | | | 10 | | | | 10 | | | | | | |
| | | 6' | | | 140 | 140 | 10'-0" | | | 130 | 130 | 11'-1" | 9'-11" | | | 12 | | | | 12 | | | | 10 | | | | | | |
| | | 7' | | | 140 | 140 | 10'-0" | | | 130 | 130 | 11'-1" | 9'-11" | | | 12 | | | | 14 | | | | 10 | | | | | | |
| | | 8' | | | 140 | 140 | 10'-1" | #6 | 11" | 130 | 130 | 11'-2" | 10'-0" | #5 | 10" | 12 | | #4 | 12" | 16 | | #4 | 12" | 10 | | | | | | |
| | | 9' | | | 140 | 140 | 10'-3" | | | 130 | 130 | 11'-4" | 10'-2" | | | 12 | | | | 18 | | | | 10 | | | | | | |
| | | 10' | | | 140 | 140 | 10'-5" | | | 130 | 130 | 11'-5" | 10'-4" | | | 12 | | | | 20 | | | | 10 | | #5 | 12" | | | |
| | | 11' | | | 140 | 140 | 10'-7" | | | 130 | 130 | 11'-8" | 10'-6" | | | 12 | | | | 22 | | | | 10 | | | | | | |
| | 1 @ 10' | 5' | #7 | 12" | 128 | 128 | 10'-11" | | | 118 | 118 | 12'-2" | 10'-10" | | | 13 | | | | 10 | | | | 11 | | | | 120 | 120 | 6'-6" |
| | | 6' | | | 128 | 128 | 11'-0" | | | 118 | 118 | 12'-3" | 10'-11" | | | 13 | | | | 12 | | | | 11 | | | | 120 | 120 | 7'-6" |
| | | 7' | | | 128 | 128 | 11'-0" | | | 118 | 118 | 12'-3" | 10'-11" | | | 13 | | | | 14 | | | | 11 | | | | 120 | 120 | 8'-6" |
| | | 8' | | | 128 | 128 | 11'-1" | #7 | 12" | 118 | 118 | 12'-4" | 11'-0" | #5 | 10" | 13 | | #4 | 12" | 16 | | #4 | 12" | 11 | | | | 10" | 144 | 144 | 9'-6" |
| | | 9' | | | 128 | 128 | 11'-3" | | | 118 | 118 | 12'-6" | 11'-2" | | | 13 | | | | 18 | | | | 11 | | | | 12" | 120 | 120 | 10'-6" |
| | | 10' | | | 128 | 128 | 11'-5" | | | 118 | 118 | 12'-8" | 11'-4" | | | 13 | | | | 20 | | | | 11 | | #5 | 12" | 11" | 132 | 132 | 11'-6" |
| | | 11' | | | 128 | 128 | 11'-7" | | | 118 | 118 | 12'-10" | 11'-6" | | | 13 | | | | 22 | | | | 11 | | | | 10" | 144 | 144 | 12'-6" |
| | | 12' | | | 128 | 128 | 11'-9" | | | 118 | 118 | 13'-0" | 11'-8" | | | 13 | | | | 24 | | | | 11 | | #6 | 12" | 120 | 120 | 13'-6" |
| | 1 @ 11' | 6' | #7 | 11" | 140 | 140 | 12'-1" | | | 130 | 130 | 13'-6" | 12'-0" | | | 15 | | | | 12 | | | | 12 | | #4 | 12" | 120 | 120 | 7'-7" |
| | | 7' | | | 140 | 140 | 12'-1" | | | 130 | 130 | 13'-6" | 12'-0" | | | 15 | | | | 14 | | | | 12 | | | | 120 | 120 | 8'-7" |
| | | 8' | | | 140 | 140 | 12'-1" | | | 130 | 130 | 13'-6" | 12'-0" | | | 15 | | | | 16 | | | | 12 | | | | 10" | 144 | 144 | 9'-7" |
| | | 9' | | | 140 | 140 | 12'-3" | #7 | 11" | 130 | 130 | 13'-7" | 12'-2" | #5 | 9½" | 15 | | #4 | 12" | 18 | | #4 | 12" | 12 | | | | 12" | 120 | 120 | 10'-7" |
| | | 10' | | | 140 | 140 | 12'-5" | | | 130 | 130 | 13'-8" | 12'-4" | | | 15 | | | | 20 | | | | 12 | | | | 11" | 132 | 132 | 11'-7" |
| | | 11' | | | 140 | 140 | 12'-7" | | | 130 | 130 | 13'-10" | 12'-6" | | | 15 | | | | 22 | | | | 12 | | | | 10" | 144 | 144 | 12'-7" |
| | | 12' | | | 140 | 140 | 12'-9" | | | 130 | 130 | 14'-0" | 12'-8" | | | 15 | | | | 24 | | | | 12 | | | | 12" | 120 | 120 | 13'-7" |
| | 1 @ 12' | 6' | #8 | 12" | 128 | 128 | 13'-1" | | | 118 | 118 | 14'-4" | 13'-0" | | | 16 | | | | 12 | | | | 13 | | #4 | 12" | 120 | 120 | 7'-9" |
| | | 7' | | | 128 | 128 | 13'-1" | | | 118 | 118 | 14'-5" | 13'-1" | | | 16 | | | | 14 | | | | 13 | | | | 120 | 120 | 8'-9" |
| | | 8' | | | 128 | 128 | 13'-1" | | | 118 | 118 | 14'-5" | 13'-0" | | | 16 | | | | 16 | | | | 13 | | | | 10" | 144 | 144 | 9'-9" |
| | | 9' | | | 128 | 128 | 13'-3" | #7 | 12" | 118 | 118 | 14'-6" | 13'-2" | #5 | 9½" | 16 | | #4 | 12" | 18 | | #4 | 12" | 13 | | | | 12" | 120 | 120 | 10'-9" |
| | | 10' | | | 128 | 128 | 13'-5" | | | 118 | 118 | 14'-8" | 13'-4" | | | 16 | | | | 20 | | | | 13 | | | | 11" | 132 | 132 | 11'-9" |
| | | 11' | | | 128 | 128 | 13'-7" | | | 118 | 118 | 14'-10" | 13'-6" | | | 16 | | | | 22 | | | | 13 | | | | 10" | 144 | 144 | 12'-9" |
| | | 12' | | | 128 | 128 | 13'-9" | | | 118 | 118 | 15'-0" | 13'-8" | | | 16 | | | | 24 | | | | 13 | | | | 12" | 120 | 120 | 13'-9" |

| BAR SIZE | PIN DIAM. | K | ADD FOR 2 HOOKS | BENDING DIAGRAM Bars "b". |
|---|---|---|---|---|
| #6 | 3" | 5" | 1'-2" | K, Pin Diam., X |
| #7 | 3⅝" | 5¾" | 1'-4" | |

NOTE:- Dimensions are to centers of bars.

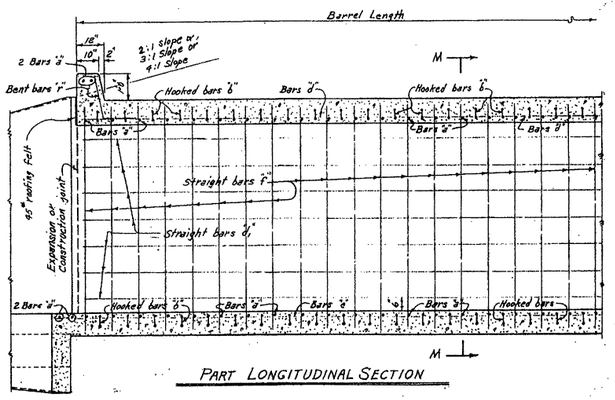
## DOWEL BARS FOR TWO HEADWALLS

| SPAN | SIZE | SPACING | NO. REQ'D | LENGTH | X | Bars "r" Dowel bars in Headwalls. |
|---|---|---|---|---|---|---|
| 4' | #4 | 11"± | 12 | 2'-6" | 1'-3" | |
| 5' | #4 | 11"± | 14 | 2'-7" | 1'-3⅜" | |
| 6' | #4 | 11"± | 16 | 2'-8" | 1'-4" | |
| 7' | #4 | 11"± | 18 | 2'-9" | 1'-4⅝" | |
| 8' | #4 | 11⅛"± | 20 | 2'-11" | 1'-5⅝" | |
| 9' | #4 | 11⅛"± | 22 | 3'-0" | 1'-6" | |
| 10' | #4 | 11⅛"± | 24 | 3'-1" | 1'-6⅝" | |
| 11' | #4 | 12"± | 26 | 3'-2" | 1'-7" | |
| 12' | #4 | 12"± | 28 | 3'-3" | 1'-7⅛" | |

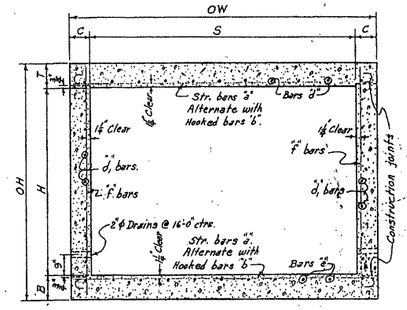
# DIMENSIONS AND QUANTITIES

| MIN. DESIGN DEPTH OF COVER | BARREL DIMENSIONS CLEAR SPAN | CLEAR HEIGHT | SQ. FT. OPENING | OVERALL WIDTH | THICKNESS OF TOP SLAB | THICKNESS OF SIDEWALLS | THICKNESS OF BOTTOM SLAB | OVERALL HEIGHT | UNIT QUANTITIES CLASS 'S' CONC. PER LIN. FT. OF BARREL | REINFORCING STEEL PER LIN. FT. OF BARREL | REINFORCING STEEL ADDITIONAL PER LAP | REINFORCING STEEL ADDITIONAL TWO HEADWALLS & APRONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | S | H | A | OW | T | C | B | OH | CU.YD. | LB. | LB. | LB. |
| 5'-0" | 1 @ 4' | 2' | 8 | 5'-0" | 7" | 6" | 6½" | 3'-1⅞" | 0.282 | 41.49 | 17.95 | 66.35 |
| | | 3' | 12 | 5'-0" | | 6" | | 4'-1⅞" | 0.319 | 44.16 | 19.62 | 66.35 |
| | | 4' | 16 | 5'-0" | | 6" | | 5'-1⅞" | 0.356 | 46.83 | 21.29 | 66.85 |
| | | 5' | 20 | 5'-0" | | 6" | | 6'-1⅞" | 0.394 | 49.50 | 22.96 | 66.35 |
| | | 6' | 24 | 5'-2" | | 7" | | 7'-1⅞" | 0.474 | 52.96 | 24.63 | 67.75 |
| | 1 @ 5' | 3' | 15 | 6'-0" | 7½" | 6" | 7" | 4'-2⅝" | 0.380 | 55.55 | 22.19 | 101.27 |
| | | 4' | 20 | 6'-0" | | 6" | | 5'-2⅝" | 0.417 | 58.23 | 23.86 | 101.27 |
| | | 5' | 25 | 6'-0" | | 6" | | 6'-2⅝" | 0.454 | 60.90 | 25.53 | 101.27 |
| | | 6' | 30 | 6'-2" | | 7" | | 7'-2⅝" | 0.535 | 64.49 | 27.20 | 103.27 |
| | | 7' | 35 | 6'-3" | | 7½" | | 8'-2⅝" | 0.604 | 67.63 | 28.87 | 104.27 |
| | 1 @ 6' | 3' | 18 | 7'-0" | 8" | 6" | 7½" | 4'-3½" | 0.496 | 66.29 | 29.76 | 118.96 |
| | | 4' | 24 | 7'-0" | | 6" | | 5'-3½" | 0.983 | 68.96 | 26.93 | 118.96 |
| | | 5' | 30 | 7'-0" | | 6" | | 6'-3½" | 0.520 | 71.64 | 28.10 | 118.96 |
| | | 6' | 36 | 7'-2" | | 7" | | 7'-3½" | 0.602 | 75.81 | 29.77 | 120.96 |
| | | 7' | 42 | 7'-3" | | 7½" | | 8'-3½" | 0.671 | 78.98 | 31.94 | 121.97 |
| | | 8' | 48 | 7'-4" | | 8" | | 9'-3½" | 0.746 | 88.97 | 33.11 | 122.97 |
| | 1 @ 7' | 4' | 28 | 8'-0" | 8½" | 6" | 8½" | 5'-3" | 0.568 | 81.32 | 29.01 | 136.88 |
| | | 5' | 35 | 8'-0" | | 6" | | 6'-3" | 0.605 | 84.00 | 30.68 | 136.88 |
| | | 6' | 42 | 8'-2" | | 7" | | 7'-3" | 0.688 | 87.76 | 32.35 | 138.88 |
| | | 7' | 49 | 8'-3" | | 7½" | | 8'-3" | 0.757 | 90.98 | 34.02 | 139.88 |
| | | 8' | 56 | 8'-4" | | 8" | | 9'-3" | 0.832 | 96.65 | 35.69 | 140.88 |
| | | 9' | 63 | 8'-6" | | 9" | | 10'-3" | 0.996 | 105.59 | 37.36 | 142.89 |
| | 1 @ 8' | 4' | 32 | 9'-0" | 9" | 6" | 9½" | 5'-3" | 0.676 | 95.26 | 38.32 | 194.07 |
| | | 5' | 40 | 9'-2" | | 7" | | 6'-3" | 0.754 | 99.12 | 39.99 | 196.80 |
| | | 6' | 48 | 9'-2" | | 7" | | 7'-3" | 0.797 | 101.79 | 36.66 | 196.80 |
| | | 7' | 56 | 9'-3" | | 7½" | | 8'-3" | 0.867 | 105.05 | 38.33 | 198.16 |
| | | 8' | 64 | 9'-4" | | 8" | | 9'-3" | 0.942 | 110.81 | 40.00 | 199.52 |
| | | 9' | 72 | 9'-6" | | 9" | | 10'-3" | 1.057 | 119.92 | 41.67 | 202.25 |
| | | 10' | 80 | 9'-8" | | 10" | | 11'-3" | 1.184 | 126.67 | 43.34 | 204.97 |
| | 1 @ 9' | 5' | 45 | 10'-2" | 10" | 7" | 10" | 6'-8" | 0.849 | 119.72 | 37.56 | 219.61 |
| | | 6' | 54 | 10'-3" | | 7½" | | 7'-8" | 0.910 | 118.06 | 39.23 | 220.97 |
| | | 7' | 63 | 10'-3" | | 7½" | | 8'-8" | 0.957 | 120.71 | 40.90 | 220.97 |
| | | 8' | 72 | 10'-4" | | 8" | | 9'-8" | 1.033 | 126.54 | 42.57 | 222.33 |
| | | 9' | 81 | 10'-6" | | 9" | | 10'-8" | 1.198 | 135.80 | 44.24 | 225.01 |
| | | 10' | 90 | 10'-8" | | 10" | | 11'-8" | 1.276 | 192.66 | 45.91 | 227.78 |
| | | 11' | 99 | 10'-10" | | 11" | | 12'-8" | 1.916 | 150.90 | 97.58 | 230.51 |
| | 1 @ 10' | 5' | 50 | 11'-2" | 10⅝" | 7" | 11" | 6'-9½" | 0.957 | 130.64 | 90.13 | 292.69 |
| | | 6' | 60 | 11'-3" | | 7½" | | 7'-9½" | 1.024 | 133.99 | 91.80 | 294.00 |
| | | 7' | 70 | 11'-3" | | 7½" | | 8'-9½" | 1.071 | 136.64 | 93.97 | 294.00 |
| | | 8' | 80 | 11'-4" | | 8" | | 9'-9½" | 1.147 | 142.55 | 95.14 | 295.36 |
| | | 9' | 90 | 11'-6" | | 9" | | 10'-9½" | 1.263 | 151.92 | 96.81 | 298.09 |
| | | 10' | 100 | 11'-8" | | 10" | | 11'-9½" | 1.391 | 158.89 | 98.98 | 300.81 |
| | | 11' | 110 | 11'-10" | | 11" | | 12'-9½" | 1.532 | 166.71 | 50.15 | 253.59 |
| | | 12' | 120 | 12'-0" | | 12" | | 13'-9½" | 1.685 | 178.47 | 51.82 | 256.26 |
| | 1 @ 11' | 6' | 66 | 12'-9" | 11" | 8" | 11⅝" | 7'-10⅝" | 1.153 | 156.16 | 96.12 | 268.62 |
| | | 7' | 77 | 12'-9" | | 8" | | 8'-10⅝" | 1.202 | 157.83 | 97.79 | 268.62 |
| | | 8' | 88 | 12'-9" | | 8" | | 9'-10⅝" | 1.252 | 163.06 | 99.96 | 268.62 |
| | | 9' | 99 | 12'-6" | | 9" | | 10'-10⅝" | 1.368 | 172.60 | 51.18 | 271.39 |
| | | 10' | 110 | 12'-8" | | 10" | | 11'-10⅝" | 1.497 | 179.70 | 52.80 | 274.07 |
| | | 11' | 121 | 12'-10" | | 11" | | 12'-10⅝" | 1.638 | 187.67 | 54.97 | 276.79 |
| | | 12' | 132 | 13'-0" | | 12" | | 13'-10⅝" | 1.792 | 193.79 | 56.14 | 278.52 |
| | 1 @ 12' | 6' | 72 | 13'-4" | 11⅝" | 8" | 12⅝" | 8'-0" | 1.284 | 172.20 | 98.69 | 357.62 |
| | | 7' | 84 | 13'-4" | | 8" | | 9'-0" | 1.333 | 174.87 | 50.86 | 357.62 |
| | | 8' | 96 | 13'-5" | | 8" | | 10'-0" | 1.383 | 180.15 | 52.03 | 357.62 |
| | | 9' | 108 | 13'-6" | | 9" | | 11'-0" | 1.500 | 189.85 | 58.70 | 361.18 |
| | | 10' | 120 | 13'-8" | | 10" | | 12'-0" | 1.630 | 197.07 | 55.37 | 364.74 |
| | | 11' | 132 | 13'-10" | | 11" | | 13'-0" | 1.772 | 205.16 | 57.04 | 368.30 |
| | | 12' | 144 | 14'-0" | | 12" | | 14'-0" | 1.926 | 217.95 | 58.71 | 371.86 |

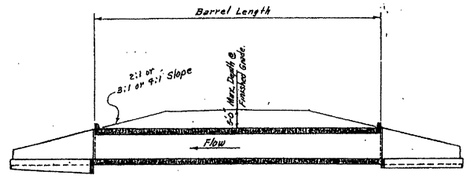
W-X002-1, W-X003-1 or W-X004-1.
W-X002-2, W-X003-2 or W-X004-2.




PART LONGITUDINAL SECTION




TYPICAL SECTION M-M




LONGITUDINAL SECTION

NOTE:- For details of wings and bar bends, see Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 38'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

## DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 25,000 Lb. Axles @ 9'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 24,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 on W-X002-2.

CLASS S CONCRETE

# ARKANSAS STATE HIGHWAY COMMISSION

## DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

4,5,6,7,8,9,10,11&12' SPANS — 3:1 OR 4:1 SLOPES
SINGLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-100X-0

Designed By:- W.C.H. 1-23-63. Checked By:- RWG 5-24-63
Drawn By:- W.C.H. 2-8-63. Checked By:- RWG 5-24-63
Quantities By:- W.C.H. 2-12-63. Checked By:- RWG 5-24-63

| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |

## BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

Depth of Cover (D): 0'-0" TO 5'-0" MAXIMUM.

"a" bars — STRAIGHT — In Top and Bottom Slab of Barrel. 2 Add'l in Apron and Headwall - Each.
"b" bars — BENT - See Diagram below. In Bottom of Top Slab bent up over Division Wall - hooked. Alternate with "a" and "c" bars.

| Clear Span S | Clear Height H | "a" Size | "a" Spacing | "a" No. Req'd 3:1 | "a" No. Req'd 4:1 | "a" Length | "b" Size | "b" Spacing | "b" No. Req'd 3:1 | "b" No. Req'd 4:1 | "b" Length | X | Y | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 @ 4' | 2' | #5 | 12" | 128 | 128 | 9'-5" | #5 | 12" | 59 | 59 | 10'-6" | 0'-3" | 2'-2 1/2" | 3'-4" |
| | 3' | | | 128 | 128 | 9'-5" | | | 59 | 59 | 10'-6" | 0'-3" | 2'-2 1/2" | 3'-4" |
| | 4' | | | 128 | 128 | 9'-5" | | | 59 | 59 | 10'-6" | 0'-3" | 2'-2 1/2" | 3'-4" |
| | 5' | | | 128 | 128 | 9'-5" | | | 59 | 59 | 10'-6" | 0'-3" | 2'-2 1/2" | 3'-4" |
| | 6' | | | 128 | 128 | 9'-8" | | | 59 | 59 | 10'-9" | 0'-3" | 2'-3 1/2" | 3'-5" |
| 2 @ 5' | 3' | #6 | 12" | 128 | 128 | 11'-5" | #5 | 12" | 59 | 59 | 12'-7" | 0'-3 1/2" | 2'-7 1/2" | 4'-1" |
| | 4' | | | 128 | 128 | 11'-5" | | | 59 | 59 | 12'-7" | 0'-3 1/2" | 2'-7 1/2" | 4'-1" |
| | 5' | | | 128 | 128 | 11'-5" | | | 59 | 59 | 12'-7" | 0'-3 1/2" | 2'-7 1/2" | 4'-1" |
| | 6' | | | 128 | 128 | 11'-8" | | | 59 | 59 | 12'-10" | 0'-3 1/2" | 2'-8 1/2" | 4'-2" |
| | 7' | | | 128 | 128 | 11'-10" | | | 59 | 59 | 13'-0" | 0'-3 1/2" | 2'-9 1/2" | 4'-2 1/2" |
| 2 @ 6' | 3' | #6 | 11" | 140 | 140 | 13'-5" | #5 | 11" | 65 | 65 | 14'-7" | 0'-4" | 3'-0 1/2" | 4'-10" |
| | 4' | | | 140 | 140 | 13'-5" | | | 65 | 65 | 14'-7" | 0'-4" | 3'-0 1/2" | 4'-10" |
| | 5' | | | 140 | 140 | 13'-5" | | | 65 | 65 | 14'-7" | 0'-4" | 3'-0 1/2" | 4'-10" |
| | 6' | | | 140 | 140 | 13'-8" | | | 65 | 65 | 14'-10" | 0'-4" | 3'-1 1/2" | 4'-11" |
| | 7' | | | 140 | 140 | 13'-10" | | | 65 | 65 | 15'-0" | 0'-4" | 3'-2 1/2" | 4'-11 1/2" |
| | 8' | | | 140 | 140 | 13'-11" | | | 65 | 65 | 15'-1" | 0'-4" | 3'-2 1/2" | 5'-0" |
| 2 @ 7' | 4' | #6 | 12" | 128 | 128 | 15'-5" | #6 | 12" | 59 | 59 | 16'-9" | 0'-4 1/2" | 3'-5" | 5'-7" |
| | 5' | | | 128 | 128 | 15'-5" | | | 59 | 59 | 16'-9" | 0'-4 1/2" | 3'-5" | 5'-7" |
| | 6' | | | 128 | 128 | 15'-8" | | | 59 | 59 | 17'-0" | 0'-4 1/2" | 3'-6" | 5'-8" |
| | 7' | | | 128 | 128 | 15'-10" | | | 59 | 59 | 17'-2" | 0'-4 1/2" | 3'-7" | 5'-8 1/2" |
| | 8' | | | 128 | 128 | 15'-11" | | | 59 | 59 | 17'-3" | 0'-4 1/2" | 3'-7" | 5'-9" |
| | 9' | | | 128 | 128 | 16'-2" | | | 59 | 59 | 17'-6" | 0'-4 1/2" | 3'-8" | 5'-10" |
| 2 @ 8' | 4' | #6 | 11" | 140 | 140 | 17'-5" | #6 | 11" | 65 | 65 | 18'-10" | 0'-5" | 3'-10" | 6'-4" |
| | 5' | | | 140 | 140 | 17'-8" | | | 65 | 65 | 19'-1" | 0'-5" | 3'-11" | 6'-5" |
| | 6' | | | 140 | 140 | 17'-8" | | | 65 | 65 | 19'-1" | 0'-5" | 3'-11" | 6'-5" |
| | 7' | | | 140 | 140 | 17'-10" | | | 65 | 65 | 19'-3" | 0'-5" | 4'-0" | 6'-5 1/2" |
| | 8' | | | 140 | 140 | 17'-11" | | | 65 | 65 | 19'-4" | 0'-5" | 4'-0" | 6'-6" |
| | 9' | | | 140 | 140 | 18'-2" | | | 65 | 65 | 19'-7" | 0'-5" | 4'-1" | 6'-7" |
| | 10' | | | 140 | 140 | 18'-5" | | | 65 | 65 | 19'-10" | 0'-5" | 4'-2" | 6'-8" |
| 2 @ 9' | 5' | #6 | 11" | 140 | 140 | 19'-8" | #6 | 11" | 65 | 65 | 21'-1" | 0'-5 1/2" | 4'-4" | 7'-2" |
| | 6' | | | 140 | 140 | 19'-10" | | | 65 | 65 | 21'-3" | 0'-5 1/2" | 4'-5" | 7'-2 1/2" |
| | 7' | | | 140 | 140 | 19'-10" | | | 65 | 65 | 21'-3" | 0'-5 1/2" | 4'-5" | 7'-2 1/2" |
| | 8' | | | 140 | 140 | 19'-11" | | | 65 | 65 | 21'-4" | 0'-5 1/2" | 4'-5" | 7'-3" |
| | 9' | | | 140 | 140 | 20'-2" | | | 65 | 65 | 21'-7" | 0'-5 1/2" | 4'-6" | 7'-4" |
| | 10' | | | 140 | 140 | 20'-5" | | | 65 | 65 | 21'-10" | 0'-5 1/2" | 4'-7" | 7'-5" |
| | 11' | | | 140 | 140 | 20'-7" | | | 65 | 65 | 22'-0" | 0'-5 1/2" | 4'-7" | 7'-6" |
| 2 @ 10' | 5' | #7 | 12" | 128 | 128 | 21'-8" | #6 | 12" | 59 | 59 | 23'-2" | 0'-6" | 4'-9" | 7'-11" |
| | 6' | | | 128 | 128 | 21'-10" | | | 59 | 59 | 23'-4" | 0'-6" | 4'-10" | 7'-11 1/2" |
| | 7' | | | 128 | 128 | 21'-10" | | | 59 | 59 | 23'-4" | 0'-6" | 4'-10" | 7'-11 1/2" |
| | 8' | | | 128 | 128 | 21'-11" | | | 59 | 59 | 23'-5" | 0'-6" | 4'-10" | 8'-0" |
| | 9' | | | 128 | 128 | 22'-2" | | | 59 | 59 | 23'-8" | 0'-6" | 4'-11" | 8'-1" |
| | 10' | | | 128 | 128 | 22'-5" | | | 59 | 59 | 23'-11" | 0'-6" | 5'-0" | 8'-2" |
| | 11' | | | 128 | 128 | 22'-7" | | | 59 | 59 | 24'-1" | 0'-6" | 5'-0" | 8'-3" |
| | 12' | | | 128 | 128 | 22'-9" | | | 59 | 59 | 24'-3" | 0'-6" | 5'-0" | 8'-4" |
| 2 @ 11' | 6' | #7 | 12" | 128 | 128 | 23'-11" | #6 | 12" | 59 | 59 | 25'-5" | 0'-6 1/2" | 5'-3" | 8'-9" |
| | 7' | | | 128 | 128 | 23'-11" | | | 59 | 59 | 25'-5" | 0'-6 1/2" | 5'-3" | 8'-9" |
| | 8' | | | 128 | 128 | 23'-11" | | | 59 | 59 | 25'-5" | 0'-6 1/2" | 5'-3" | 8'-9" |
| | 9' | | | 128 | 128 | 24'-2" | | | 59 | 59 | 25'-8" | 0'-6 1/2" | 5'-4" | 8'-10" |
| | 10' | | | 128 | 128 | 24'-5" | | | 59 | 59 | 25'-11" | 0'-6 1/2" | 5'-5" | 8'-11" |
| | 11' | | | 128 | 128 | 24'-7" | | | 59 | 59 | 26'-1" | 0'-6 1/2" | 5'-5" | 9'-0" |
| | 12' | | | 128 | 128 | 24'-9" | | | 59 | 59 | 26'-3" | 0'-6 1/2" | 5'-5" | 9'-1" |
| 2 @ 12' | 6' | #7 | 11" | 140 | 140 | 25'-11" | #6 | 11" | 65 | 65 | 27'-5" | 0'-7" | 5'-8" | 9'-6" |
| | 7' | | | 140 | 140 | 25'-11" | | | 65 | 65 | 27'-5" | 0'-7" | 5'-8" | 9'-6" |
| | 8' | | | 140 | 140 | 25'-11" | | | 65 | 65 | 27'-5" | 0'-7" | 5'-8" | 9'-6" |
| | 9' | | | 140 | 140 | 26'-2" | | | 65 | 65 | 27'-8" | 0'-7" | 5'-9" | 9'-7" |
| | 10' | | | 140 | 140 | 26'-5" | | | 65 | 65 | 27'-11" | 0'-7" | 5'-10" | 9'-8" |
| | 11' | | | 140 | 140 | 26'-7" | | | 65 | 65 | 28'-1" | 0'-7" | 5'-10" | 9'-9" |
| | 12' | | | 140 | 140 | 26'-9" | | | 65 | 65 | 28'-3" | 0'-7" | 5'-10" | 9'-10" |

"b2" bars — BENT - See Diagram below. In Top of Bottom Slab bent down under Division Wall - hooked. Alternate with "a" and "c" bars.
"c" bars — STRAIGHT — In Top and Bottom Slab of Barrel. Alternate with "b" and "b2" bars.

| Clear Span S | Clear Height H | "b2" Size | "b2" Spacing | "b2" No. Req'd 3:1 | "b2" No. Req'd 4:1 | "b2" Length | X | Y | Z | "c" Size | "c" Spacing | "c" No. Req'd 3:1 | "c" No. Req'd 4:1 | "c" Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 @ 4' | 2' | #5 | 12" | 59 | 59 | 10'-6" | 0'-2 1/2" | 2'-3 1/2" | 3'-4" | #5 | 12" | 120 | 120 | 4'-8" |
| | 3' | | | 59 | 59 | 10'-6" | 0'-2 1/2" | 2'-3 1/2" | 3'-4" | | | 120 | 120 | 4'-8" |
| | 4' | | | 59 | 59 | 10'-6" | 0'-2 1/2" | 2'-3 1/2" | 3'-4" | | | 120 | 120 | 4'-8" |
| | 5' | | | 59 | 59 | 10'-6" | 0'-2 1/2" | 2'-3 1/2" | 3'-4" | | | 120 | 120 | 4'-8" |
| | 6' | | | 59 | 59 | 10'-9" | 0'-2 1/2" | 2'-4 1/2" | 3'-5" | | | 120 | 120 | 4'-9" |
| 2 @ 5' | 3' | #5 | 12" | 59 | 59 | 12'-6" | 0'-3" | 2'-8 1/2" | 4'-1" | #6 | 12" | 120 | 120 | 5'-8" |
| | 4' | | | 59 | 59 | 12'-6" | 0'-3" | 2'-8 1/2" | 4'-1" | | | 120 | 120 | 5'-8" |
| | 5' | | | 59 | 59 | 12'-6" | 0'-3" | 2'-8 1/2" | 4'-1" | | | 120 | 120 | 5'-8" |
| | 6' | | | 59 | 59 | 12'-9" | 0'-3" | 2'-9 1/2" | 4'-2" | | | 120 | 120 | 5'-9" |
| | 7' | | | 59 | 59 | 12'-11" | 0'-3" | 2'-10 1/2" | 4'-2 1/2" | | | 120 | 120 | 5'-10" |
| 2 @ 6' | 3' | #5 | 11" | 65 | 65 | 14'-7" | 0'-4" | 3'-0 1/2" | 4'-10" | #6 | 11" | 132 | 132 | 6'-8" |
| | 4' | | | 65 | 65 | 14'-7" | 0'-4" | 3'-0 1/2" | 4'-10" | | | 132 | 132 | 6'-8" |
| | 5' | | | 65 | 65 | 14'-7" | 0'-4" | 3'-0 1/2" | 4'-10" | | | 132 | 132 | 6'-8" |
| | 6' | | | 65 | 65 | 14'-10" | 0'-4" | 3'-1 1/2" | 4'-11" | | | 132 | 132 | 6'-9" |
| | 7' | | | 65 | 65 | 15'-0" | 0'-4" | 3'-2 1/2" | 4'-11 1/2" | | | 132 | 132 | 6'-10" |
| | 8' | | | 65 | 65 | 15'-1" | 0'-4" | 3'-2 1/2" | 5'-0" | | | 132 | 132 | 6'-10" |
| 2 @ 7' | 4' | #6 | 12" | 59 | 59 | 16'-9" | 0'-4 1/2" | 3'-5" | 5'-7" | #6 | 12" | 120 | 120 | 7'-8" |
| | 5' | | | 59 | 59 | 16'-9" | 0'-4 1/2" | 3'-5" | 5'-7" | | | 120 | 120 | 7'-8" |
| | 6' | | | 59 | 59 | 17'-0" | 0'-4 1/2" | 3'-6" | 5'-8" | | | 120 | 120 | 7'-9" |
| | 7' | | | 59 | 59 | 17'-2" | 0'-4 1/2" | 3'-7" | 5'-8 1/2" | | | 120 | 120 | 7'-10" |
| | 8' | | | 59 | 59 | 17'-3" | 0'-4 1/2" | 3'-7" | 5'-9" | | | 120 | 120 | 7'-10" |
| | 9' | | | 59 | 59 | 17'-6" | 0'-4 1/2" | 3'-8" | 5'-10" | | | 120 | 120 | 7'-11" |
| 2 @ 8' | 4' | #6 | 11" | 65 | 65 | 18'-10" | 0'-5" | 3'-10" | 6'-4" | #6 | 11" | 132 | 132 | 8'-8" |
| | 5' | | | 65 | 65 | 19'-1" | 0'-5" | 3'-11" | 6'-5" | | | 132 | 132 | 8'-9" |
| | 6' | | | 65 | 65 | 19'-1" | 0'-5" | 3'-11" | 6'-5" | | | 132 | 132 | 8'-9" |
| | 7' | | | 65 | 65 | 19'-3" | 0'-5" | 4'-0" | 6'-5 1/2" | | | 132 | 132 | 8'-10" |
| | 8' | | | 65 | 65 | 19'-4" | 0'-5" | 4'-0" | 6'-6" | | | 132 | 132 | 8'-10" |
| | 9' | | | 65 | 65 | 19'-7" | 0'-5" | 4'-1" | 6'-7" | | | 132 | 132 | 8'-11" |
| | 10' | | | 66 | 65 | 19'-10" | 0'-5" | 4'-2" | 6'-8" | | | 132 | 132 | 9'-0" |
| 2 @ 9' | 5' | #6 | 11" | 65 | 65 | 21'-1" | 0'-5 3/4" | 4'-3 1/2" | 7'-2" | #6 | 11" | 132 | 132 | 9'-9" |
| | 6' | | | 65 | 65 | 21'-3" | 0'-5 3/4" | 4'-4 1/2" | 7'-2 1/2" | | | 132 | 132 | 9'-10" |
| | 7' | | | 65 | 65 | 21'-3" | 0'-5 3/4" | 4'-4 1/2" | 7'-2 1/2" | | | 132 | 132 | 9'-10" |
| | 8' | | | 65 | 65 | 21'-4" | 0'-5 3/4" | 4'-4 1/2" | 7'-3" | | | 132 | 132 | 9'-10" |
| | 9' | | | 65 | 65 | 21'-7" | 0'-5 3/4" | 4'-5 1/2" | 7'-4" | | | 132 | 132 | 9'-11" |
| | 10' | | | 65 | 65 | 21'-10" | 0'-5 3/4" | 4'-6 1/2" | 7'-5" | | | 132 | 132 | 10'-0" |
| | 11' | | | 65 | 65 | 22'-0" | 0'-5 3/4" | 4'-6 1/2" | 7'-6" | | | 132 | 132 | 10'-0" |
| 2 @ 10' | 5' | #6 | 12" | 59 | 59 | 23'-2" | 0'-6 1/2" | 4'-8" | 7'-11" | #7 | 12" | 120 | 120 | 10'-9" |
| | 6' | | | 59 | 59 | 23'-4" | 0'-6 1/2" | 4'-9" | 7'-11 1/2" | | | 120 | 120 | 10'-10" |
| | 7' | | | 59 | 59 | 23'-4" | 0'-6 1/2" | 4'-9" | 7'-11 1/2" | | | 120 | 120 | 10'-10" |
| | 8' | | | 59 | 59 | 23'-5" | 0'-6 1/2" | 4'-9" | 8'-0" | | | 120 | 120 | 10'-10" |
| | 9' | | | 59 | 59 | 23'-8" | 0'-6 1/2" | 4'-10" | 8'-1" | | | 120 | 120 | 10'-11" |
| | 10' | | | 59 | 59 | 23'-11" | 0'-6 1/2" | 4'-11" | 8'-2" | | | 120 | 120 | 11'-0" |
| | 11' | | | 59 | 59 | 24'-1" | 0'-6 1/2" | 4'-11" | 8'-3" | | | 120 | 120 | 11'-0" |
| | 12' | | | 59 | 59 | 24'-3" | 0'-6 1/2" | 4'-11" | 8'-4" | | | 120 | 120 | 11'-0" |
| 2 @ 11' | 6' | #6 | 12" | 59 | 59 | 25'-6" | 0'-7 1/2" | 5'-1" | 8'-9" | #7 | 12" | 120 | 120 | 11'-10" |
| | 7' | | | 59 | 59 | 25'-6" | 0'-7 1/2" | 5'-1" | 8'-9" | | | 120 | 120 | 11'-10" |
| | 8' | | | 59 | 59 | 25'-6" | 0'-7 1/2" | 5'-1" | 8'-9" | | | 120 | 120 | 11'-10" |
| | 9' | | | 59 | 59 | 25'-9" | 0'-7 1/2" | 5'-2" | 8'-10" | | | 120 | 120 | 11'-11" |
| | 10' | | | 59 | 59 | 26'-0" | 0'-7 1/2" | 5'-3" | 8'-11" | | | 120 | 120 | 12'-0" |
| | 11' | | | 59 | 59 | 26'-2" | 0'-7 1/2" | 5'-3" | 9'-0" | | | 120 | 120 | 12'-0" |
| | 12' | | | 59 | 59 | 26'-4" | 0'-7 1/2" | 5'-3" | 9'-1" | | | 120 | 120 | 12'-0" |
| 2 @ 12' | 6' | #6 | 11" | 65 | 65 | 27'-7" | 0'-8 1/2" | 5'-5" | 9'-6" | #7 | 11" | 132 | 132 | 12'-10" |
| | 7' | | | 65 | 65 | 27'-7" | 0'-8 1/2" | 5'-5" | 9'-6" | | | 132 | 132 | 12'-10" |
| | 8' | | | 65 | 65 | 27'-7" | 0'-8 1/2" | 5'-5" | 9'-6" | | | 132 | 132 | 12'-10" |
| | 9' | | | 65 | 65 | 27'-10" | 0'-8 1/2" | 5'-6" | 9'-7" | | | 132 | 132 | 12'-11" |
| | 10' | | | 65 | 65 | 28'-1" | 0'-8 1/2" | 5'-7" | 9'-8" | | | 132 | 132 | 13'-0" |
| | 11' | | | 65 | 65 | 28'-3" | 0'-8 1/2" | 5'-7" | 9'-9" | | | 132 | 132 | 13'-0" |
| | 12' | | | 65 | 65 | 28'-5" | 0'-8 1/2" | 5'-7" | 9'-10" | | | 132 | 132 | 13'-0" |

"d" bars — STRAIGHT — Longitudinal in Top Slab of Barrel.
"d1" bars — STRAIGHT — Longitudinal in Sidewalls and Division Walls.
"e" bars — STRAIGHT — Longitudinal in Bottom Slab of Barrel.
"f" bars — STRAIGHT — Vertical in Sidewalls and Division Walls.

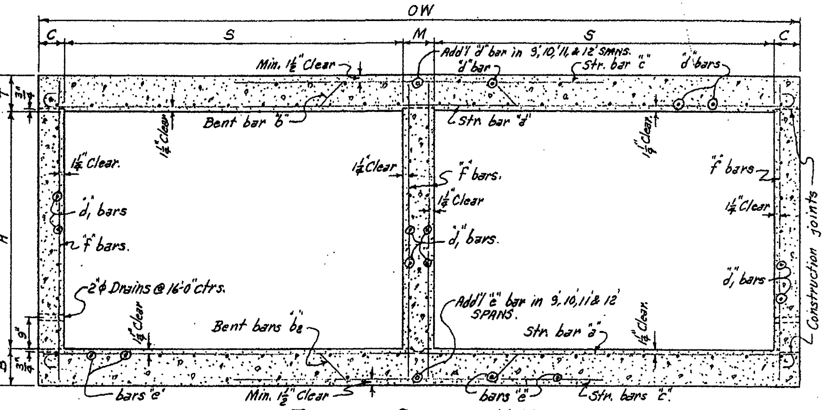
| Clear Span S | Clear Height H | "d" Size | "d" Spacing | "d" No. Req'd | "d1" Size | "d1" Spacing | "d1" No. Req'd | "e" Size | "e" Spacing | "e" No. Req'd | "f" Size | "f" Spacing | "f" No. Req'd 3:1 | "f" No. Req'd 4:1 | "f" Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 @ 4' | 2' | #5 | 12" | 14 | #4 | 12" | 8 | #4 | 12" | 14 | #4 | 12" | 240 | 240 | 2'-10" |
| | 3' | | | 14 | | | 12 | | | 14 | | | 240 | 240 | 3'-10" |
| | 4' | | | 14 | | | 16 | | | 14 | | | 240 | 240 | 4'-10" |
| | 5' | | | 14 | | | 20 | | | 14 | | | 240 | 240 | 5'-10" |
| | 6' | | | 14 | | | 24 | | | 14 | | | 240 | 240 | 6'-10" |
| 2 @ 5' | 3' | #5 | 11 1/2" | 16 | #4 | 12" | 12 | #4 | 12" | 16 | #4 | 12" | 240 | 240 | 3'-11" |
| | 4' | | | 16 | | | 16 | | | 16 | | | 240 | 240 | 4'-11" |
| | 5' | | | 16 | | | 20 | | | 16 | | | 240 | 240 | 5'-11" |
| | 6' | | | 16 | | | 24 | | | 16 | | | 240 | 240 | 6'-11" |
| | 7' | | | 16 | | | 28 | | | 16 | | | 240 | 240 | 7'-11" |
| 2 @ 6' | 3' | #5 | 11 1/2" | 18 | #4 | 12" | 12 | #4 | 12" | 18 | #4 | 12" | 240 | 240 | 4'-0" |
| | 4' | | | 18 | | | 16 | | | 18 | | | 240 | 240 | 5'-0" |
| | 5' | | | 18 | | | 20 | | | 18 | | | 240 | 240 | 6'-0" |
| | 6' | | | 18 | | | 24 | | | 18 | | | 240 | 240 | 7'-0" |
| | 7' | | | 18 | | | 28 | | | 18 | | | 240 | 240 | 8'-0" |
| | 8' | | | 18 | | | 32 | | | 18 | | 10" | 288 | 288 | 9'-0" |
| 2 @ 7' | 4' | #5 | 11 1/2" | 20 | #4 | 12" | 16 | #4 | 12" | 20 | #4 | 12" | 240 | 240 | 5'-1" |
| | 5' | | | 20 | | | 20 | | | 20 | | | 240 | 240 | 6'-1" |
| | 6' | | | 20 | | | 24 | | | 20 | | | 240 | 240 | 7'-1" |
| | 7' | | | 20 | | | 28 | | | 20 | | | 240 | 240 | 8'-1" |
| | 8' | | | 20 | | | 32 | | | 20 | | 10" | 288 | 288 | 9'-1" |
| | 9' | | | 20 | | | 36 | | | 20 | #5 | 12" | 240 | 240 | 10'-1" |
| 2 @ 8' | 4' | #5 | 11 1/2" | 23 | #4 | 12" | 16 | #4 | 12" | 22 | #4 | 12" | 240 | 240 | 5'-2" |
| | 5' | | | 23 | | | 20 | | | 22 | | | 240 | 240 | 6'-2" |
| | 6' | | | 23 | | | 24 | | | 22 | | | 240 | 240 | 7'-2" |
| | 7' | | | 23 | | | 28 | | | 22 | | | 240 | 240 | 8'-2" |
| | 8' | | | 23 | | | 32 | | | 22 | | 10" | 288 | 288 | 9'-2" |
| | 9' | | | 23 | | | 36 | | | 22 | #5 | 12" | 240 | 240 | 10'-2" |
| | 10' | | | 23 | | | 40 | | | 22 | | 11" | 264 | 264 | 11'-2" |
| 2 @ 9' | 5' | #5 | 11 1/2" | 26 | #4 | 12" | 20 | #4 | 12" | 25 | #4 | 12" | 240 | 240 | 6'-3" |
| | 6' | | | 26 | | | 24 | | | 25 | | | 240 | 240 | 7'-3" |
| | 7' | | | 26 | | | 28 | | | 25 | | | 240 | 240 | 8'-3" |
| | 8' | | | 26 | | | 32 | | | 25 | | 10" | 288 | 288 | 9'-3" |
| | 9' | | | 26 | | | 36 | | | 25 | #5 | 12" | 240 | 240 | 10'-3" |
| | 10' | | | 26 | | | 40 | | | 25 | | 11" | 264 | 264 | 11'-3" |
| | 11' | | | 26 | | | 44 | | | 25 | | 10" | 288 | 288 | 12'-3" |
| 2 @ 10' | 5' | #5 | 11 1/2" | 28 | #4 | 12" | 20 | #4 | 12" | 27 | #4 | 12" | 240 | 240 | 6'-4" |
| | 6' | | | 28 | | | 24 | | | 27 | | | 240 | 240 | 7'-4" |
| | 7' | | | 28 | | | 28 | | | 27 | | | 240 | 240 | 8'-4" |
| | 8' | | | 28 | | | 32 | | | 27 | | 10" | 288 | 288 | 9'-4" |
| | 9' | | | 28 | | | 36 | | | 27 | #5 | 12" | 240 | 240 | 10'-4" |
| | 10' | | | 28 | | | 40 | | | 27 | | 11" | 264 | 264 | 11'-4" |
| | 11' | | | 28 | | | 44 | | | 27 | | 10" | 288 | 288 | 12'-4" |
| | 12' | | | 28 | | | 48 | | | 27 | #6 | 12" | 240 | 240 | 13'-4" |
| 2 @ 11' | 6' | #5 | 11 1/2" | 30 | #4 | 12" | 24 | #4 | 12" | 29 | #4 | 12" | 240 | 240 | 7'-6" |
| | 7' | | | 30 | | | 28 | | | 29 | | | 240 | 240 | 8'-6" |
| | 8' | | | 30 | | | 32 | | | 29 | | 10" | 288 | 288 | 9'-6" |
| | 9' | | | 30 | | | 36 | | | 29 | #5 | 12" | 240 | 240 | 10'-6" |
| | 10' | | | 30 | | | 40 | | | 29 | | 11" | 264 | 264 | 11'-6" |
| | 11' | | | 30 | | | 44 | | | 29 | | 10" | 288 | 288 | 12'-6" |
| | 12' | | | 30 | | | 48 | | | 29 | #6 | 12" | 240 | 240 | 13'-6" |
| 2 @ 12' | 6' | #5 | 11 1/2" | 32 | #4 | 12" | 24 | #4 | 12" | 31 | #4 | 12" | 240 | 240 | 7'-7" |
| | 7' | | | 32 | | | 28 | | | 31 | | | 240 | 240 | 8'-7" |
| | 8' | | | 32 | | | 32 | | | 31 | | 10" | 288 | 288 | 9'-7" |
| | 9' | | | 32 | | | 36 | | | 31 | | 12" | 240 | 240 | 10'-7" |
| | 10' | | | 32 | | | 40 | | | 31 | #5 | 11" | 264 | 264 | 11'-7" |
| | 11' | | | 32 | | | 44 | | | 31 | | 10" | 288 | 288 | 12'-7" |
| | 12' | | | 32 | | | 48 | | | 31 | #6 | 12" | 240 | 240 | 13'-7" |

"d" bars Length: 2 @ 30'-8" for 60'-0" Length Barrel (1'-8" Lap)
"d1" bars Length: 2 @ 30'-6" for 60'-0" Length Barrel (1'-3" Lap)
"e" bars Length: 2 @ 31'-6" for 60'-0" Length Barrel (1'-3" Lap)

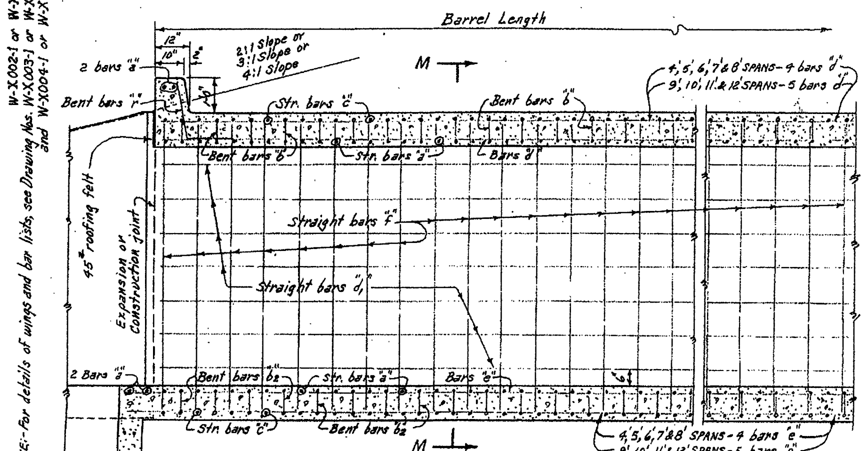
## DIMENSIONS / QUANTITIES

Max. Design Depth of Cover (D): 5'-0"

| Clear Spans S | Clear Height H | Sq. Ft. Opening A | Overall Width OW | Thickness of Top Slab T | Thickness of Sidewalls C | Thickness of Division Wall M | Thickness of Bottom Slab B | Overall Height OH | Class S Conc. per Lin. Ft. of Barrel (CU. YD.) | Reinforcing Steel per Lin. Ft. of Barrel (LB.) | Additional per Lap (LB.) | Additional Two Headwalls & Aprons (LB.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 @ 4' | 2' | 16 | 9'-8" | 6 1/2" | 6" | 8" | 6" | 3'-0 1/2" | 0.496 | 88.15 | 42.71 | 129.56 |
| | 3' | 24 | 9'-8" | | 6" | 8" | | 4'-0 1/2" | 0.558 | 93.49 | 46.05 | 129.56 |
| | 4' | 32 | 9'-8" | | 6" | 8" | | 5'-0 1/2" | 0.620 | 98.84 | 49.39 | 129.56 |
| | 5' | 40 | 9'-8" | | 6" | 8" | | 6'-0 1/2" | 0.682 | 104.18 | 52.73 | 129.56 |
| | 6' | 48 | 9'-11" | | 7" | 9" | | 7'-0 1/2" | 0.809 | 110.74 | 56.07 | 131.65 |
| 2 @ 5' | 3' | 30 | 11'-8" | 7" | 6" | 8" | 6 1/2" | 4'-1 1/2" | 0.671 | 123.34 | 51.19 | 198.64 |
| | 4' | 40 | 11'-8" | | 6" | 8" | | 5'-1 1/2" | 0.733 | 128.68 | 54.53 | 198.64 |
| | 5' | 50 | 11'-8" | | 6" | 8" | | 6'-1 1/2" | 0.795 | 134.03 | 57.87 | 198.64 |
| | 6' | 60 | 11'-11" | | 7" | 9" | | 7'-1 1/2" | 0.922 | 140.89 | 61.21 | 201.64 |
| | 7' | 70 | 12'-1" | | 7 1/2" | 10" | | 8'-1 1/2" | 1.044 | 147.34 | 64.55 | 203.65 |
| 2 @ 6' | 3' | 36 | 13'-8" | 7 1/2" | 6" | 8" | 7 1/2" | 4'-3" | 0.818 | 148.50 | 56.34 | 233.58 |
| | 4' | 48 | 13'-8" | | 6" | 8" | | 5'-3" | 0.880 | 153.85 | 59.68 | 233.58 |
| | 5' | 60 | 13'-8" | | 6" | 8" | | 6'-3" | 0.941 | 159.19 | 63.02 | 233.58 |
| | 6' | 72 | 13'-11" | | 7" | 9" | | 7'-3" | 1.070 | 166.20 | 66.36 | 236.59 |
| | 7' | 84 | 14'-1" | | 7 1/2" | 10" | | 8'-3" | 1.192 | 172.74 | 69.70 | 238.59 |
| | 8' | 96 | 14'-2" | | 8" | 10" | | 9'-3" | 1.298 | 183.36 | 73.04 | 239.59 |
| 2 @ 7' | 4' | 56 | 15'-8" | 8" | 6" | 8" | 8" | 5'-4" | 1.021 | 178.15 | 64.83 | 268.97 |
| | 5' | 70 | 15'-8" | | 6" | 8" | | 6'-4" | 1.082 | 183.49 | 68.17 | 268.97 |
| | 6' | 84 | 15'-11" | | 7" | 9" | | 7'-4" | 1.212 | 190.59 | 71.51 | 271.97 |
| | 7' | 98 | 16'-1" | | 7 1/2" | 10" | | 8'-4" | 1.339 | 197.19 | 74.85 | 273.98 |
| | 8' | 112 | 16'-2" | | 8" | 10" | | 9'-4" | 1.440 | 207.89 | 78.19 | 274.98 |
| | 9' | 126 | 16'-5" | | 9" | 11" | | 10'-4" | 1.616 | 225.25 | 81.53 | 277.98 |
| 2 @ 8' | 4' | 64 | 17'-8" | 8 1/2" | 6" | 8" | 8 1/2" | 5'-5" | 1.174 | 210.37 | 71.71 | 304.80 |
| | 5' | 80 | 17'-11" | | 7" | 9" | | 6'-5" | 1.295 | 217.63 | 75.05 | 307.81 |
| | 6' | 96 | 17'-11" | | 7" | 9" | | 7'-5" | 1.366 | 222.97 | 78.39 | 307.81 |
| | 7' | 112 | 18'-1" | | 7 1/2" | 10" | | 8'-5" | 1.489 | 229.68 | 81.73 | 309.81 |
| | 8' | 128 | 18'-2" | | 8" | 10" | | 9'-5" | 1.695 | 240.47 | 85.07 | 310.81 |
| | 9' | 144 | 18'-5" | | 9" | 11" | | 10'-5" | 1.772 | 258.08 | 88.41 | 313.82 |
| | 10' | 160 | 18'-8" | | 10" | 12" | | 11'-5" | 1.967 | 271.07 | 91.75 | 316.82 |
| 2 @ 9' | 5' | 90 | 19'-11" | 9" | 7" | 9" | 9 1/2" | 6'-6 1/2" | 1.477 | 239.37 | 82.77 | 345.42 |
| | 6' | 108 | 20'-1" | | 7 1/2" | 10" | | 7'-6 1/2" | 1.594 | 246.08 | 86.11 | 347.43 |
| | 7' | 126 | 20'-1" | | 7 1/2" | 10" | | 8'-6 1/2" | 1.671 | 251.43 | 89.45 | 347.43 |
| | 8' | 144 | 20'-2" | | 8" | 10" | | 9'-6 1/2" | 1.778 | 262.26 | 92.79 | 348.93 |
| | 9' | 162 | 20'-5" | | 9" | 11" | | 10'-6 1/2" | 1.956 | 279.95 | 96.13 | 351.43 |
| | 10' | 180 | 20'-8" | | 10" | 12" | | 11'-6 1/2" | 2.152 | 292.97 | 99.47 | 354.43 |
| | 11' | 198 | 20'-10" | | 11" | 12" | | 12'-6 1/2" | 2.328 | 306.86 | 102.81 | 356.44 |
| 2 @ 10' | 5' | 100 | 21'-11" | 9 1/2" | 7" | 9" | 10" | 6'-7 1/2" | 1.674 | 279.64 | 87.92 | 479.99 |
| | 6' | 120 | 22'-1" | | 7 1/2" | 10" | | 7'-7 1/2" | 1.792 | 286.50 | 91.26 | 482.71 |
| | 7' | 140 | 22'-1" | | 7 1/2" | 10" | | 8'-7 1/2" | 1.869 | 291.85 | 94.60 | 482.71 |
| | 8' | 160 | 22'-2" | | 8" | 10" | | 9'-7 1/2" | 1.976 | 302.77 | 97.94 | 484.08 |
| | 9' | 180 | 22'-5" | | 9" | 11" | | 10'-7 1/2" | 2.155 | 320.74 | 101.28 | 488.16 |
| | 10' | 200 | 22'-8" | | 10" | 12" | | 11'-7 1/2" | 2.352 | 333.99 | 104.62 | 492.25 |
| | 11' | 220 | 22'-10" | | 11" | 12" | | 12'-7 1/2" | 2.529 | 348.01 | 107.96 | 494.98 |
| | 12' | 240 | 23'-0" | | 12" | 12" | | 13'-7 1/2" | 2.718 | 370.23 | 111.30 | 497.70 |
| 2 @ 11' | 6' | 132 | 24'-2" | 10" | 8" | 10" | 11" | 7'-9" | 2.048 | 309.36 | 96.41 | 530.03 |
| | 7' | 154 | 24'-2" | | 8" | 10" | | 8'-9" | 2.128 | 314.70 | 99.75 | 530.03 |
| | 8' | 176 | 24'-2" | | 8" | 10" | | 9'-9" | 2.208 | 325.12 | 103.09 | 530.03 |
| | 9' | 198 | 24'-5" | | 9" | 11" | | 10'-9" | 2.388 | 343.25 | 106.43 | 534.12 |
| | 10' | 220 | 24'-8" | | 10" | 12" | | 11'-9" | 2.586 | 356.57 | 109.77 | 538.21 |
| | 11' | 242 | 24'-10" | | 11" | 12" | | 12'-9" | 2.764 | 370.67 | 113.11 | 540.93 |
| | 12' | 264 | 25'-0" | | 12" | 12" | | 13'-9" | 2.957 | 393.05 | 116.45 | 543.66 |
| 2 @ 12' | 6' | 144 | 26'-2" | 10 1/2" | 8" | 10" | 12" | 7'-10 1/2" | 2.299 | 353.31 | 101.55 | 576.43 |
| | 7' | 168 | 26'-2" | | 8" | 10" | | 8'-10 1/2" | 2.379 | 358.65 | 104.89 | 576.43 |
| | 8' | 192 | 26'-2" | | 8" | 10" | | 9'-10 1/2" | 2.459 | 369.12 | 108.23 | 576.43 |
| | 9' | 216 | 26'-5" | | 9" | 11" | | 10'-10 1/2" | 2.640 | 387.52 | 111.57 | 580.52 |
| | 10' | 240 | 26'-8" | | 10" | 12" | | 11'-10 1/2" | 2.840 | 401.07 | 114.91 | 584.60 |
| | 11' | 264 | 26'-10" | | 11" | 12" | | 12'-10 1/2" | 3.018 | 415.31 | 118.25 | 587.33 |
| | 12' | 288 | 27'-0" | | 12" | 12" | | 13'-10 1/2" | 3.208 | 437.88 | 121.59 | 590.05 |

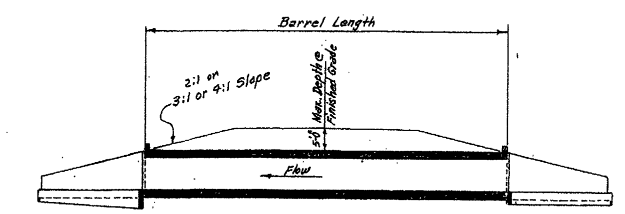



TYPICAL SECTION M-M




PART LONGITUDINAL SECTION

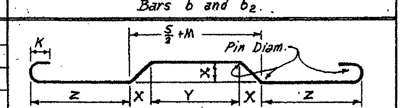
NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X002-2, W-X003-1 or W-X003-2, and W-X004-1 or W-X004-2.




LONGITUDINAL SECTION

| BAR SIZE | PIN DIAM. | K | ADD FOR 2 HOOKS |
|---|---|---|---|
| #5 | 2 1/2" | 4 1/4" | 0'-11 1/2" |
| #6 | 3" | 5" | 1'-2" |

BENDING DIAGRAM FOR Bars "b" and "b2".

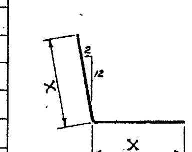



NOTE:- Dimensions are to centers of bars. (Bars "b" and "b2")

### DOWEL BARS FOR TWO HEADWALLS

| 2 Spans @ | Size | Spacing | No. Req'd | Length | X |
|---|---|---|---|---|---|
| 4' | #4 | 12"± | 20 | 2'-5" | 1'-2 1/2" |
| 5' | #4 | 12"± | 24 | 2'-6" | 1'-3" |
| 6' | #4 | 12"± | 28 | 2'-7" | 1'-3 1/2" |
| 7' | #4 | 12"± | 32 | 2'-8" | 1'-4" |
| 8' | #4 | 12"± | 36 | 2'-9" | 1'-4 1/2" |
| 9' | #4 | 12"± | 40 | 2'-10" | 1'-5" |
| 10' | #4 | 12"± | 46 | 2'-11" | 1'-5 1/2" |
| 11' | #4 | 12"± | 50 | 3'-0" | 1'-6" |
| 12' | #4 | 12"± | 54 | 3'-1" | 1'-6 1/2" |

Bars "r" — Dowel bars in Headwalls.




GENERAL NOTES:-
CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have 3/4" chamfers.
REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, division walls and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD
H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
4,5,6,7,8,9,10,11 & 12 SPANS — 3:1 OR 4:1 SLOPES
DOUBLES — UNDER 5'-0" COVER
STANDARD DRAWING NO. R-200X-0.

Designed by:- W.C.H. 1-17-63. Checked by:- RHS 5-14-63
Drawn by:- W.C.H. 2-15-63. Checked by:- RHS 5-24-63
Quantities by:- W.C.H. 2-19-63. Checked by:- RHS 5-24-63

| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |

## BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

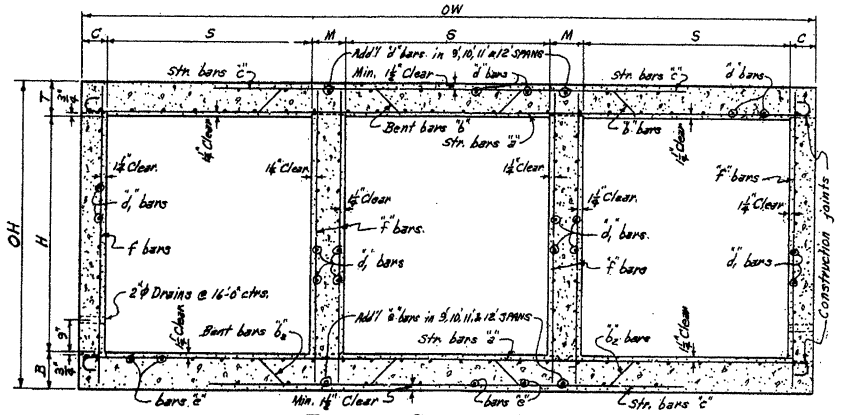
| DEPTH OF COVER | CLEAR SPAN | CLEAR HEIGHT | "a" bars — STRAIGHT — In Top and Bottom Slab of Barrel. 2 Add'l in Apron and Headwall - Each. | | | | | "b" bars — BENT - See Diagram below. — In Bottom of Top Slab bent up over Division Walls - hooked. Alternate with "a" and "c" bars. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | S | H | SIZE | SPACING | NUMBER REQ'D 3:1 | NUMBER REQ'D 4:1 | LENGTH | SIZE | SPACING | NUMBER REQ'D 3:1 | NUMBER REQ'D 4:1 | LENGTH | X | Y | Z |
| 0'-0" TO 5'-0" MAXIMUM | 3 @ 4' | 2' | #5 | 12" | 128 | 128 | 14'-1" | #5 | 12" | 59 | 59 | 15'-4" | 0'-3" | 2'-2" | 3'-4½" |
| | | 3' | | | 128 | 128 | 14'-1" | | | 59 | 59 | 15'-4" | 0'-3" | 2'-2" | 3'-4½" |
| | | 4' | | | 128 | 128 | 14'-1" | | | 59 | 59 | 15'-4" | 0'-3" | 2'-2" | 3'-4½" |
| | | 5' | | | 128 | 128 | 14'-1" | | | 59 | 59 | 15'-4" | 0'-3" | 2'-2" | 3'-4½" |
| | | 6' | | | 128 | 128 | 14'-5" | | | 59 | 59 | 15'-8" | 0'-3" | 2'-3" | 3'-5½" |
| | 3 @ 5' | 3' | #6 | 12" | 128 | 128 | 17'-1" | #5 | 12" | 59 | 59 | 18'-5" | 0'-3½" | 2'-7" | 4'-1½" |
| | | 4' | | | 128 | 128 | 17'-1" | | | 59 | 59 | 18'-5" | 0'-3½" | 2'-7" | 4'-1½" |
| | | 5' | | | 128 | 128 | 17'-1" | | | 59 | 59 | 18'-5" | 0'-3½" | 2'-7" | 4'-1½" |
| | | 6' | | | 128 | 128 | 17'-5" | | | 59 | 59 | 18'-9" | 0'-3½" | 2'-8" | 4'-2½" |
| | | 7' | | | 128 | 128 | 17'-8" | | | 59 | 59 | 19'-0" | 0'-3½" | 2'-9" | 4'-2¾" |
| | 3 @ 6' | 3' | #6 | 11" | 140 | 140 | 20'-1" | #5 | 11" | 65 | 65 | 21'-6" | 0'-4" | 3'-0" | 4'-10½" |
| | | 4' | | | 140 | 140 | 20'-1" | | | 65 | 65 | 21'-6" | 0'-4" | 3'-0" | 4'-10½" |
| | | 5' | | | 140 | 140 | 20'-1" | | | 65 | 65 | 21'-6" | 0'-4" | 3'-0" | 4'-10½" |
| | | 6' | | | 140 | 140 | 20'-5" | | | 65 | 65 | 21'-10" | 0'-4" | 3'-1" | 4'-11½" |
| | | 7' | | | 140 | 140 | 20'-8" | | | 65 | 65 | 22'-1" | 0'-4" | 3'-2" | 4'-11¾" |
| | | 8' | | | 140 | 140 | 20'-9" | | | 65 | 65 | 22'-2" | 0'-4" | 3'-2" | 5'-0½" |
| | 3 @ 7' | 4' | #6 | 12" | 128 | 128 | 23'-1" | #6 | 12" | 59 | 59 | 24'-8" | 0'-4½" | 3'-5" | 5'-7" |
| | | 5' | | | 128 | 128 | 23'-1" | | | 59 | 59 | 24'-8" | 0'-4½" | 3'-5" | 5'-7" |
| | | 6' | | | 128 | 128 | 23'-5" | | | 59 | 59 | 25'-0" | 0'-4½" | 3'-6" | 5'-8" |
| | | 7' | | | 128 | 128 | 23'-8" | | | 59 | 59 | 25'-3" | 0'-4½" | 3'-7" | 5'-8½" |
| | | 8' | | | 128 | 128 | 23'-9" | | | 59 | 59 | 25'-4" | 0'-4½" | 3'-7" | 5'-9" |
| | | 9' | | | 128 | 128 | 24'-1" | | | 59 | 59 | 25'-8" | 0'-4½" | 3'-8" | 5'-10" |
| | 3 @ 8' | 4' | #6 | 11" | 140 | 140 | 26'-1" | #6 | 11" | 65 | 65 | 27'-9" | 0'-5" | 3'-10" | 6'-4" |
| | | 5' | | | 140 | 140 | 26'-5" | | | 65 | 65 | 28'-1" | 0'-5" | 3'-11" | 6'-5" |
| | | 6' | | | 140 | 140 | 26'-5" | | | 65 | 65 | 28'-1" | 0'-5" | 3'-11" | 6'-5" |
| | | 7' | | | 140 | 140 | 26'-8" | | | 65 | 65 | 28'-4" | 0'-5" | 4'-0" | 6'-5½" |
| | | 8' | | | 140 | 140 | 26'-9" | | | 65 | 65 | 28'-5" | 0'-5" | 4'-0" | 6'-6" |
| | | 9' | | | 140 | 140 | 27'-1" | | | 65 | 65 | 28'-9" | 0'-5" | 4'-1" | 6'-7" |
| | | 10' | | | 140 | 140 | 27'-5" | | | 65 | 65 | 29'-1" | 0'-5" | 4'-2" | 6'-8" |
| | 3 @ 9' | 5' | #6 | 11" | 140 | 140 | 29'-5" | #6 | 11" | 65 | 65 | 31'-2" | 0'-5½" | 4'-4" | 7'-2" |
| | | 6' | | | 140 | 140 | 29'-8" | | | 65 | 65 | 31'-5" | 0'-5½" | 4'-5" | 7'-2½" |
| | | 7' | | | 140 | 140 | 29'-8" | | | 65 | 65 | 31'-5" | 0'-5½" | 4'-5" | 7'-2½" |
| | | 8' | | | 140 | 140 | 29'-9" | | | 65 | 65 | 31'-6" | 0'-5½" | 4'-5" | 7'-3" |
| | | 9' | | | 140 | 140 | 30'-1" | | | 65 | 65 | 31'-10" | 0'-5½" | 4'-6" | 7'-4" |
| | | 10' | | | 140 | 140 | 30'-5" | | | 65 | 65 | 32'-2" | 0'-5½" | 4'-7" | 7'-5" |
| | | 11' | | | 140 | 140 | 30'-7" | | | 65 | 65 | 32'-4" | 0'-5½" | 4'-7" | 7'-6" |
| | 3 @ 10' | 5' | #7 | 12" | 128 | 128 | 32'-5" | #6 | 12" | 59 | 59 | 34'-3" | 0'-6" | 4'-9" | 7'-11" |
| | | 6' | | | 128 | 128 | 32'-8" | | | 59 | 59 | 34'-6" | 0'-6" | 4'-10" | 7'-11½" |
| | | 7' | | | 128 | 128 | 32'-8" | | | 59 | 59 | 34'-6" | 0'-6" | 4'-10" | 7'-11½" |
| | | 8' | | | 128 | 128 | 32'-9" | | | 59 | 59 | 34'-7" | 0'-6" | 4'-10" | 8'-0" |
| | | 9' | | | 128 | 128 | 33'-1" | | | 59 | 59 | 34'-11" | 0'-6" | 4'-11" | 8'-1" |
| | | 10' | | | 128 | 128 | 33'-5" | | | 59 | 59 | 35'-3" | 0'-6" | 5'-0" | 8'-2" |
| | | 11' | | | 128 | 128 | 33'-7" | | | 59 | 59 | 35'-5" | 0'-6" | 5'-0" | 8'-3" |
| | | 12' | | | 128 | 128 | 33'-9" | | | 59 | 59 | 35'-7" | 0'-6" | 5'-0" | 8'-4" |
| | 3 @ 11' | 6' | #7 | 11" | 140 | 140 | 35'-9" | #6 | 11" | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" |
| | | 7' | | | 140 | 140 | 35'-9" | | | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" |
| | | 8' | | | 140 | 140 | 35'-9" | | | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" |
| | | 9' | | | 140 | 140 | 36'-1" | | | 65 | 65 | 38'-0" | 0'-6½" | 5'-4" | 8'-10" |
| | | 10' | | | 140 | 140 | 36'-5" | | | 65 | 65 | 38'-4" | 0'-6½" | 5'-5" | 8'-11" |
| | | 11' | | | 140 | 140 | 36'-7" | | | 65 | 65 | 38'-6" | 0'-6½" | 5'-5" | 9'-0" |
| | | 12' | | | 140 | 140 | 36'-9" | | | 65 | 65 | 38'-8" | 0'-6½" | 5'-5" | 9'-1" |
| | 3 @ 12' | 6' | #7 | 11" | 140 | 140 | 38'-9" | #6 | 11" | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" |
| | | 7' | | | 140 | 140 | 38'-9" | | | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" |
| | | 8' | | | 140 | 140 | 38'-9" | | | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" |
| | | 9' | | | 140 | 140 | 39'-1" | | | 65 | 65 | 41'-1" | 0'-7" | 5'-9" | 9'-7" |
| | | 10' | | | 140 | 140 | 39'-5" | | | 65 | 65 | 41'-5" | 0'-7" | 5'-10" | 9'-8" |
| | | 11' | | | 140 | 140 | 39'-7" | | | 65 | 65 | 41'-7" | 0'-7" | 5'-10" | 9'-9" |
| | | 12' | | | 140 | 140 | 39'-9" | | | 65 | 65 | 41'-9" | 0'-7" | 5'-10" | 9'-10" |

| CLEAR SPAN | CLEAR HEIGHT | "b2" bars — BENT - See Diagram below. — In Top of Bottom Slab bent down under Division Walls - hooked. Alternate with "a" and "c" bars. | | | | | | | | "c" bars — STRAIGHT — In Top and Bottom Slab of Barrel. Alternate with "b" and "b2" bars. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | H | SIZE | SPACING | NUMBER REQ'D 3:1 | NUMBER REQ'D 4:1 | LENGTH | X | Y | Z | SIZE | SPACING | NUMBER REQ'D 3:1 | NUMBER REQ'D 4:1 | LENGTH |
| 3 @ 4' | 2' | #5 | 12" | 59 | 59 | 15'-3" | 0'-2½" | 2'-3" | 3'-4½" | #5 | 12" | 120 | 120 | 9'-4" |
| | 3' | | | 59 | 59 | 15'-3" | 0'-2½" | 2'-3" | 3'-4½" | | | 120 | 120 | 9'-4" |
| | 4' | | | 59 | 59 | 15'-3" | 0'-2½" | 2'-3" | 3'-4½" | | | 120 | 120 | 9'-4" |
| | 5' | | | 59 | 59 | 15'-3" | 0'-2½" | 2'-3" | 3'-4½" | | | 120 | 120 | 9'-4" |
| | 6' | | | 59 | 59 | 15'-7" | 0'-2½" | 2'-4" | 3'-5½" | | | 120 | 120 | 9'-6" |
| 3 @ 5' | 3' | #5 | 12" | 59 | 59 | 18'-4" | 0'-3" | 2'-8" | 4'-1½" | #6 | 12" | 120 | 120 | 11'-4" |
| | 4' | | | 59 | 59 | 18'-4" | 0'-3" | 2'-8" | 4'-1½" | | | 120 | 120 | 11'-4" |
| | 5' | | | 59 | 59 | 18'-4" | 0'-3" | 2'-8" | 4'-1½" | | | 120 | 120 | 11'-4" |
| | 6' | | | 59 | 59 | 18'-8" | 0'-3" | 2'-9" | 4'-2½" | | | 120 | 120 | 11'-6" |
| | 7' | | | 59 | 59 | 18'-11" | 0'-3" | 2'-10" | 4'-2¾" | | | 120 | 120 | 11'-8" |
| 3 @ 6' | 3' | #5 | 11" | 65 | 65 | 21'-5" | 0'-3½" | 3'-1" | 4'-10½" | #6 | 11" | 132 | 132 | 13'-4" |
| | 4' | | | 65 | 65 | 21'-5" | 0'-3½" | 3'-1" | 4'-10½" | | | 132 | 132 | 13'-4" |
| | 5' | | | 65 | 65 | 21'-5" | 0'-3½" | 3'-1" | 4'-10½" | | | 132 | 132 | 13'-4" |
| | 6' | | | 65 | 65 | 21'-9" | 0'-3½" | 3'-2" | 4'-11½" | | | 132 | 132 | 13'-6" |
| | 7' | | | 65 | 65 | 22'-0" | 0'-3½" | 3'-3" | 4'-11¾" | | | 132 | 132 | 13'-8" |
| | 8' | | | 65 | 65 | 22'-1" | 0'-3½" | 3'-3" | 5'-0½" | | | 132 | 132 | 13'-8" |
| 3 @ 7' | 4' | #6 | 12" | 59 | 59 | 24'-8" | 0'-4½" | 3'-5½" | 5'-7" | #6 | 12" | 120 | 120 | 15'-4" |
| | 5' | | | 59 | 59 | 24'-8" | 0'-4½" | 3'-5½" | 5'-7" | | | 120 | 120 | 15'-4" |
| | 6' | | | 59 | 59 | 25'-0" | 0'-4½" | 3'-6½" | 5'-8" | | | 120 | 120 | 15'-6" |
| | 7' | | | 59 | 59 | 25'-3" | 0'-4½" | 3'-7½" | 5'-8½" | | | 120 | 120 | 15'-8" |
| | 8' | | | 59 | 59 | 25'-4" | 0'-4½" | 3'-7½" | 5'-9" | | | 120 | 120 | 15'-8" |
| | 9' | | | 59 | 59 | 25'-8" | 0'-4½" | 3'-8½" | 5'-10" | | | 120 | 120 | 15'-10" |
| 3 @ 8' | 4' | #6 | 11" | 65 | 65 | 27'-9" | 0'-5" | 3'-10" | 6'-4" | #6 | 11" | 132 | 132 | 17'-4" |
| | 5' | | | 65 | 65 | 28'-1" | 0'-5" | 3'-11" | 6'-5" | | | 132 | 132 | 17'-6" |
| | 6' | | | 65 | 65 | 28'-1" | 0'-5" | 3'-11" | 6'-5" | | | 132 | 132 | 17'-6" |
| | 7' | | | 65 | 65 | 28'-4" | 0'-5" | 4'-0" | 6'-5½" | | | 132 | 132 | 17'-8" |
| | 8' | | | 65 | 65 | 28'-5" | 0'-5" | 4'-0" | 6'-6" | | | 132 | 132 | 17'-8" |
| | 9' | | | 65 | 65 | 28'-9" | 0'-5" | 4'-1" | 6'-7" | | | 132 | 132 | 17'-10" |
| | 10' | | | 65 | 65 | 29'-1" | 0'-5" | 4'-2" | 6'-8" | | | 132 | 132 | 18'-0" |
| 3 @ 9' | 5' | #6 | 11" | 65 | 65 | 31'-2" | 0'-5½" | 4'-4" | 7'-2" | #6 | 11" | 132 | 132 | 19'-6" |
| | 6' | | | 65 | 65 | 31'-5" | 0'-5½" | 4'-5" | 7'-2½" | | | 132 | 132 | 19'-8" |
| | 7' | | | 65 | 65 | 31'-5" | 0'-5½" | 4'-5" | 7'-2½" | | | 132 | 132 | 19'-8" |
| | 8' | | | 65 | 65 | 31'-6" | 0'-5½" | 4'-5" | 7'-3" | | | 132 | 132 | 19'-8" |
| | 9' | | | 65 | 65 | 31'-10" | 0'-5½" | 4'-6" | 7'-4" | | | 132 | 132 | 19'-10" |
| | 10' | | | 65 | 65 | 32'-2" | 0'-5½" | 4'-7" | 7'-5" | | | 132 | 132 | 20'-0" |
| | 11' | | | 65 | 65 | 32'-4" | 0'-5½" | 4'-7" | 7'-6" | | | 132 | 132 | 20'-0" |
| 3 @ 10' | 5' | #6 | 12" | 59 | 59 | 34'-3" | 0'-6" | 4'-9" | 7'-11" | #7 | 12" | 120 | 120 | 21'-6" |
| | 6' | | | 59 | 59 | 34'-6" | 0'-6" | 4'-10" | 7'-11½" | | | 120 | 120 | 21'-8" |
| | 7' | | | 59 | 59 | 34'-6" | 0'-6" | 4'-10" | 7'-11½" | | | 120 | 120 | 21'-8" |
| | 8' | | | 59 | 59 | 34'-7" | 0'-6" | 4'-10" | 8'-0" | | | 120 | 120 | 21'-8" |
| | 9' | | | 59 | 59 | 34'-11" | 0'-6" | 4'-11" | 8'-1" | | | 120 | 120 | 21'-10" |
| | 10' | | | 59 | 59 | 35'-3" | 0'-6" | 5'-0" | 8'-2" | | | 120 | 120 | 22'-0" |
| | 11' | | | 59 | 59 | 35'-5" | 0'-6" | 5'-0" | 8'-3" | | | 120 | 120 | 22'-0" |
| | 12' | | | 59 | 59 | 35'-7" | 0'-6" | 5'-0" | 8'-4" | | | 120 | 120 | 22'-0" |
| 3 @ 11' | 6' | #6 | 11" | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" | #7 | 11" | 132 | 132 | 23'-8" |
| | 7' | | | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" | | | 132 | 132 | 23'-8" |
| | 8' | | | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" | | | 132 | 132 | 23'-8" |
| | 9' | | | 65 | 65 | 38'-0" | 0'-6½" | 5'-4" | 8'-10" | | | 132 | 132 | 23'-10" |
| | 10' | | | 65 | 65 | 38'-4" | 0'-6½" | 5'-5" | 8'-11" | | | 132 | 132 | 24'-0" |
| | 11' | | | 65 | 65 | 38'-6" | 0'-6½" | 5'-5" | 9'-0" | | | 132 | 132 | 24'-0" |
| | 12' | | | 65 | 65 | 38'-8" | 0'-6½" | 5'-5" | 9'-1" | | | 132 | 132 | 24'-0" |
| 3 @ 12' | 6' | #6 | 11" | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" | #7 | 11" | 132 | 132 | 25'-8" |
| | 7' | | | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" | | | 132 | 132 | 25'-8" |
| | 8' | | | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" | | | 132 | 132 | 26'-8" |
| | 9' | | | 65 | 65 | 41'-1" | 0'-7" | 5'-9" | 9'-7" | | | 132 | 132 | 25'-10" |
| | 10' | | | 65 | 65 | 41'-5" | 0'-7" | 5'-10" | 9'-8" | | | 132 | 132 | 26'-0" |
| | 11' | | | 65 | 65 | 41'-7" | 0'-7" | 5'-10" | 9'-9" | | | 132 | 132 | 26'-0" |
| | 12' | | | 65 | 65 | 41'-9" | 0'-7" | 5'-10" | 9'-10" | | | 132 | 132 | 26'-0" |

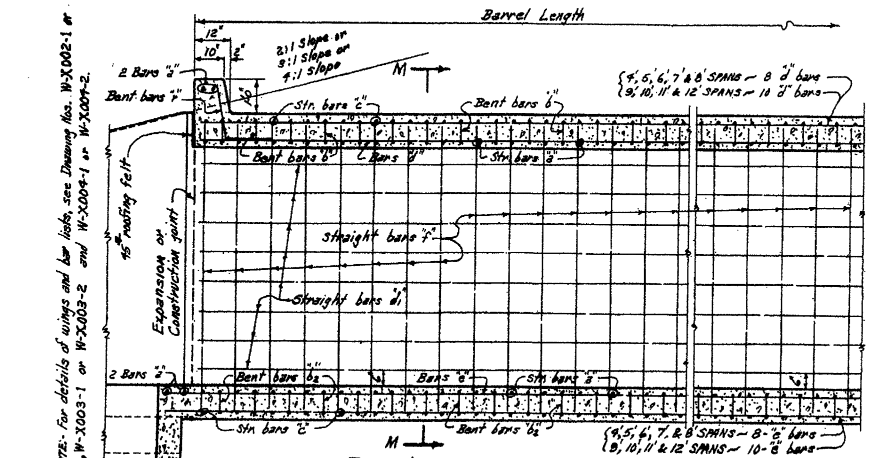
| CLEAR SPAN | CLEAR HEIGHT | "d" bars — STRAIGHT — Longitudinal in Top Slab of Barrel | | | | "d1" bars — STRAIGHT — Longitudinal in Sidewalls and Division Walls | | | | "e" bars — STRAIGHT — Longitudinal in Bottom Slab of Barrel. | | | | "f" bars — STRAIGHT — Vertical in Sidewalls and Division Walls | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | H | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NO. REQ'D | LENGTH | SIZE | SPACING | NUMBER REQ'D 3:1 | NUMBER REQ'D 4:1 | LENGTH |
| 3 @ 4' | 2' | #5 | 12" | 22 | 2 @ 30'-8" for 60'-0" Length Barrel. (1'-8" Lap.) | #4 | 12" | 12 | 2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap.) | #4 | 12" | 22 | 2 @ 31'-6" for 60'-0" Length Barrel. (1'-3" Lap.) | #4 | 12" | 360 | 360 | 2'-10" |
| | 3' | | | 22 | | | | 18 | | | | 22 | | | | 360 | 360 | 3'-10" |
| | 4' | | | 22 | | | | 24 | | | | 22 | | | | 360 | 360 | 4'-10" |
| | 5' | | | 22 | | | | 30 | | | | 22 | | | | 360 | 360 | 5'-10" |
| | 6' | | | 22 | | | | 36 | | | | 22 | | | | 360 | 360 | 6'-10" |
| 3 @ 5' | 3' | #5 | 11½" | 26 | | #4 | 12" | 18 | | #4 | 12" | 25 | | #4 | 12" | 360 | 360 | 3'-11" |
| | 4' | | | 26 | | | | 24 | | | | 25 | | | | 360 | 360 | 4'-11" |
| | 5' | | | 26 | | | | 30 | | | | 25 | | | | 360 | 360 | 5'-11" |
| | 6' | | | 26 | | | | 36 | | | | 25 | | | | 360 | 360 | 6'-11" |
| | 7' | | | 26 | | | | 42 | | | | 25 | | | | 360 | 360 | 7'-11" |
| 3 @ 6' | 3' | #5 | 11½" | 30 | | #4 | 12" | 18 | | #4 | 12" | 28 | | #4 | 12" | 360 | 360 | 4'-0" |
| | 4' | | | 30 | | | | 24 | | | | 28 | | | | 360 | 360 | 5'-0" |
| | 5' | | | 30 | | | | 30 | | | | 28 | | | | 360 | 360 | 6'-0" |
| | 6' | | | 30 | | | | 36 | | | | 28 | | | | 360 | 360 | 7'-0" |
| | 7' | | | 30 | | | | 42 | | | | 28 | | | | 360 | 360 | 8'-0" |
| | 8' | | | 30 | | | | 48 | | | | 28 | | | 10" | 432 | 432 | 9'-0" |
| 3 @ 7' | 4' | #5 | 11½" | 32 | | #4 | 12" | 24 | | #4 | 12" | 31 | | #4 | 12" | 360 | 360 | 5'-1" |
| | 5' | | | 32 | | | | 30 | | | | 31 | | | | 360 | 360 | 6'-1" |
| | 6' | | | 32 | | | | 36 | | | | 31 | | | | 360 | 360 | 7'-1" |
| | 7' | | | 32 | | | | 42 | | | | 31 | | | | 360 | 360 | 8'-1" |
| | 8' | | | 32 | | | | 48 | | | | 31 | | | 10" | 432 | 432 | 9'-1" |
| | 9' | | | 32 | | | | 54 | | | | 31 | | #5 | 12" | 360 | 360 | 10'-1" |
| 3 @ 8' | 4' | #5 | 11½" | 36 | | #4 | 12" | 24 | | #4 | 12" | 35 | | #4 | 12" | 360 | 360 | 5'-2" |
| | 5' | | | 36 | | | | 30 | | | | 35 | | | | 360 | 360 | 6'-2" |
| | 6' | | | 36 | | | | 36 | | | | 35 | | | | 360 | 360 | 7'-2" |
| | 7' | | | 36 | | | | 42 | | | | 35 | | | | 360 | 360 | 8'-2" |
| | 8' | | | 36 | | | | 48 | | | | 35 | | | 10" | 432 | 432 | 9'-2" |
| | 9' | | | 36 | | | | 54 | | | | 35 | | #5 | 12" | 360 | 360 | 10'-2" |
| | 10' | | | 36 | | | | 60 | | | | 35 | | | 11" | 396 | 396 | 11'-2" |
| 3 @ 9' | 5' | #5 | 11½" | 41 | | #4 | 12" | 30 | | #4 | 12" | 40 | | #4 | 12" | 360 | 360 | 6'-3" |
| | 6' | | | 41 | | | | 36 | | | | 40 | | | | 360 | 360 | 7'-3" |
| | 7' | | | 41 | | | | 42 | | | | 40 | | | | 360 | 360 | 8'-3" |
| | 8' | | | 41 | | | | 48 | | | | 40 | | | 10" | 432 | 432 | 9'-3" |
| | 9' | | | 41 | | | | 54 | | | | 40 | | #5 | 12" | 360 | 360 | 10'-3" |
| | 10' | | | 41 | | | | 60 | | | | 40 | | | 11" | 396 | 396 | 11'-3" |
| | 11' | | | 41 | | | | 66 | | | | 40 | | | 10" | 432 | 432 | 12'-3" |
| 3 @ 10' | 5' | #5 | 11½" | 44 | | #4 | 12" | 30 | | #4 | 12" | 43 | | #4 | 12" | 360 | 360 | 6'-4" |
| | 6' | | | 44 | | | | 36 | | | | 43 | | | | 360 | 360 | 7'-4" |
| | 7' | | | 44 | | | | 42 | | | | 43 | | | | 360 | 360 | 8'-4" |
| | 8' | | | 44 | | | | 48 | | | | 43 | | | 10" | 432 | 432 | 9'-4" |
| | 9' | | | 44 | | | | 54 | | | | 43 | | #5 | 12" | 360 | 360 | 10'-4" |
| | 10' | | | 44 | | | | 60 | | | | 43 | | | 11" | 396 | 396 | 11'-4" |
| | 11' | | | 44 | | | | 66 | | | | 43 | | | 10" | 432 | 432 | 12'-4" |
| | 12' | | | 44 | | | | 72 | | | | 43 | | #6 | 12" | 360 | 360 | 13'-4" |
| 3 @ 11' | 6' | #5 | 11½" | 48 | | #4 | 12" | 36 | | #4 | 12" | 46 | | #4 | 12" | 360 | 360 | 7'-5" |
| | 7' | | | 48 | | | | 42 | | | | 46 | | | | 360 | 360 | 8'-5" |
| | 8' | | | 48 | | | | 48 | | | | 46 | | | 10" | 432 | 432 | 9'-5" |
| | 9' | | | 48 | | | | 54 | | | | 46 | | #5 | 12" | 360 | 360 | 10'-5" |
| | 10' | | | 48 | | | | 60 | | | | 46 | | | 11" | 396 | 396 | 11'-5" |
| | 11' | | | 48 | | | | 66 | | | | 46 | | | 10" | 432 | 432 | 12'-5" |
| | 12' | | | 48 | | | | 72 | | | | 46 | | #6 | 12" | 360 | 360 | 13'-5" |
| 3 @ 12' | 6' | #5 | 11½" | 51 | | #4 | 12" | 36 | | #4 | 12" | 49 | | #4 | 12" | 360 | 360 | 7'-6" |
| | 7' | | | 51 | | | | 42 | | | | 49 | | | | 360 | 360 | 8'-6" |
| | 8' | | | 51 | | | | 48 | | | | 49 | | | 10" | 432 | 432 | 9'-6" |
| | 9' | | | 51 | | | | 54 | | | | 49 | | #5 | 12" | 360 | 360 | 10'-6" |
| | 10' | | | 51 | | | | 60 | | | | 49 | | | 11" | 396 | 396 | 11'-6" |
| | 11' | | | 51 | | | | 66 | | | | 49 | | | 10" | 432 | 432 | 12'-6" |
| | 12' | | | 51 | | | | 72 | | | | 49 | | #6 | 12" | 360 | 360 | 13'-6" |

## DIMENSIONS / QUANTITIES

| MAX. DESIGN DEPTH OF COVER | BARREL DIMENSIONS — CLEAR SPANS | CLEAR HEIGHT | SQ. FT. OPENING | OVERALL WIDTH | THICKNESS OF TOP SLAB | THICKNESS OF SIDEWALLS | THICKNESS OF DIVISION WALLS | THICKNESS OF BOTTOM SLAB | OVERALL HEIGHT | UNIT QUANTITIES — CLASS S CONC. PER LIN. FT. OF BARREL | REINFORCING STEEL — PER LIN. FT. OF BARREL | ADDITIONAL — PER LAP | ADDITIONAL — TWO HEADWALLS & APRONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | S | H | A | OW | T | C | M | B | OH | CU.YD. | LB. | LB. | LB. |
| 5'-0" | 3 @ 4' | 2' | 24 | 14'-4" | 6½" | 6" | 8" | 6" | 3'-0½" | 0.726 | 137.76 | 66.63 | 195.33 |
| | | 3' | 36 | 14'-4" | | 6" | 8" | | 4'-0½" | 0.812 | 145.78 | 71.64 | 195.33 |
| | | 4' | 48 | 14'-4" | | 6" | 8" | | 5'-0½" | 0.899 | 153.79 | 76.65 | 195.33 |
| | | 5' | 60 | 14'-4" | | 6" | 8" | | 6'-0½" | 0.985 | 161.81 | 81.66 | 195.33 |
| | | 6' | 72 | 14'-8" | | 7" | 9" | | 7'-0½" | 1.158 | 171.56 | 86.67 | 198.11 |
| | 3 @ 5' | 3' | 45 | 17'-4" | 7" | 6" | 8" | 6½" | 4'-1½" | 0.981 | 195.23 | 81.10 | 298.79 |
| | | 4' | 60 | 17'-4" | | 6" | 8" | | 5'-1½" | 1.068 | 203.25 | 86.11 | 298.79 |
| | | 5' | 75 | 17'-4" | | 6" | 8" | | 6'-1½" | 1.154 | 211.27 | 91.12 | 298.79 |
| | | 6' | 90 | 17'-8" | | 7" | 9" | | 7'-1½" | 1.329 | 221.98 | 96.13 | 302.80 |
| | | 7' | 105 | 17'-11" | | 7½" | 10" | | 8'-1½" | 1.503 | 231.27 | 101.14 | 305.80 |
| | 3 @ 6' | 3' | 54 | 20'-4" | 7½" | 6" | 8" | 7" | 4'-2½" | 1.169 | 236.39 | 90.56 | 351.21 |
| | | 4' | 72 | 20'-4" | | 6" | 8" | | 5'-2½" | 1.266 | 244.41 | 95.57 | 351.21 |
| | | 5' | 90 | 20'-4" | | 6" | 8" | | 6'-2½" | 1.342 | 252.42 | 100.58 | 351.21 |
| | | 6' | 108 | 20'-8" | | 7" | 9" | | 7'-2½" | 1.517 | 262.84 | 105.59 | 355.21 |
| | | 7' | 126 | 20'-11" | | 7½" | 10" | | 8'-2½" | 1.692 | 272.79 | 110.60 | 358.22 |
| | | 8' | 144 | 21'-0" | | 8" | 10" | | 9'-2½" | 1.829 | 288.48 | 116.61 | 359.22 |
| | 3 @ 7' | 4' | 84 | 23'-4" | 8" | 6" | 8" | 7¾" | 5'-3¾" | 1.480 | 279.99 | 101.55 | 404.29 |
| | | 5' | 105 | 23'-4" | | 6" | 8" | | 6'-3¾" | 1.566 | 288.01 | 106.56 | 409.29 |
| | | 6' | 126 | 23'-8" | | 7" | 9" | | 7'-3¾" | 1.743 | 298.53 | 111.57 | 408.29 |
| | | 7' | 147 | 23'-11" | | 7½" | 10" | | 8'-3¾" | 1.919 | 308.56 | 116.58 | 411.30 |
| | | 8' | 168 | 24'-0" | | 8" | 10" | | 9'-3¾" | 2.056 | 324.34 | 121.59 | 412.30 |
| | | 9' | 189 | 24'-4" | | 9" | 11" | | 10'-3¾" | 2.294 | 350.27 | 126.60 | 416.30 |
| | 3 @ 8' | 4' | 96 | 26'-4" | 8½" | 6" | 8" | 8½" | 5'-5" | 1.727 | 330.89 | 111.85 | 459.38 |
| | | 5' | 120 | 26'-8" | | 7" | 9" | | 6'-5" | 1.893 | 341.64 | 116.86 | 463.38 |
| | | 6' | 144 | 26'-8" | | 7" | 9" | | 7'-5" | 1.992 | 349.65 | 121.87 | 463.38 |
| | | 7' | 168 | 26'-11" | | 7½" | 10" | | 8'-5" | 2.168 | 359.85 | 126.88 | 466.38 |
| | | 8' | 192 | 27'-0" | | 8" | 10" | | 9'-5" | 2.306 | 375.76 | 131.89 | 467.39 |
| | | 9' | 216 | 27'-4" | | 9" | 11" | | 10'-5" | 2.645 | 402.04 | 136.90 | 471.39 |
| | | 10' | 240 | 27'-8" | | 10" | 12" | | 11'-5" | 2.810 | 421.39 | 141.91 | 475.40 |
| | 3 @ 9' | 5' | 135 | 29'-8" | 9" | 7" | 9" | 9" | 6'-6" | 2.142 | 377.01 | 129.72 | 520.47 |
| | | 6' | 162 | 29'-11" | | 7½" | 10" | | 7'-6" | 2.310 | 387.21 | 134.73 | 523.48 |
| | | 7' | 189 | 29'-11" | | 7½" | 10" | | 8'-6" | 2.418 | 396.23 | 139.74 | 523.48 |
| | | 8' | 216 | 30'-0" | | 8" | 10" | | 9'-6" | 2.556 | 411.21 | 144.75 | 524.48 |
| | | 9' | 243 | 30'-4" | | 9" | 11" | | 10'-6" | 2.796 | 437.60 | 149.76 | 528.48 |
| | | 10' | 270 | 30'-8" | | 10" | 12" | | 11'-6" | 3.062 | 457.00 | 154.77 | 532.49 |
| | | 11' | 297 | 30'-10" | | 11" | 12" | | 12'-6" | 3.275 | 477.29 | 159.78 | 534.49 |
| | 3 @ 10' | 5' | 150 | 32'-8" | 9½" | 7" | 9" | 9½" | 6'-7" | 2.409 | 443.34 | 137.44 | 716.12 |
| | | 6' | 180 | 32'-11" | | 7½" | 10" | | 7'-7" | 2.578 | 453.81 | 142.45 | 720.20 |
| | | 7' | 210 | 32'-11" | | 7½" | 10" | | 8'-7" | 2.686 | 461.88 | 147.46 | 720.20 |
| | | 8' | 240 | 33'-0" | | 8" | 10" | | 9'-7" | 2.824 | 477.91 | 152.47 | 721.57 |
| | | 9' | 270 | 33'-4" | | 9" | 11" | | 10'-7" | 3.066 | 504.74 | 157.48 | 727.02 |
| | | 10' | 300 | 33'-8" | | 10" | 12" | | 11'-7" | 3.332 | 524.50 | 162.49 | 732.97 |
| | | 11' | 330 | 33'-10" | | 11" | 12" | | 12'-7" | 3.546 | 544.94 | 167.50 | 735.19 |
| | | 12' | 360 | 34'-0" | | 12" | 12" | | 13'-7" | 3.772 | 577.87 | 172.51 | 737.92 |
| | 3 @ 11' | 6' | 198 | 36'-0" | 10" | 8" | 10" | 10" | 7'-8" | 2.889 | 522.98 | 151.91 | 790.33 |
| | | 7' | 231 | 36'-0" | | 8" | 10" | | 8'-8" | 3.000 | 581.00 | 156.92 | 790.33 |
| | | 8' | 264 | 36'-0" | | 8" | 10" | | 9'-8" | 3.111 | 596.56 | 161.93 | 790.33 |
| | | 9' | 297 | 36'-4" | | 9" | 11" | | 10'-8" | 3.354 | 573.79 | 166.94 | 795.78 |
| | | 10' | 330 | 36'-8" | | 10" | 12" | | 11'-8" | 3.621 | 593.87 | 171.95 | 801.23 |
| | | 11' | 363 | 36'-10" | | 11" | 12" | | 12'-8" | 3.835 | 614.97 | 176.96 | 803.96 |
| | | 12' | 396 | 37'-0" | | 12" | 12" | | 13'-8" | 4.062 | 647.44 | 181.97 | 806.68 |
| | 3 @ 12' | 6' | 216 | 39'-0" | 10½" | 8" | 10" | 10½" | 7'-9" | 3.194 | 560.85 | 159.63 | 859.76 |
| | | 7' | 252 | 39'-0" | | 8" | 10" | | 8'-9" | 3.306 | 568.87 | 164.64 | 859.76 |
| | | 8' | 288 | 39'-0" | | 8" | 10" | | 9'-9" | 3.417 | 584.50 | 169.65 | 859.76 |
| | | 9' | 324 | 39'-4" | | 9" | 11" | | 10'-9" | 3.660 | 611.85 | 174.66 | 865.21 |
| | | 10' | 360 | 39'-8" | | 10" | 12" | | 11'-9" | 3.929 | 631.98 | 179.67 | 870.66 |
| | | 11' | 396 | 39'-10" | | 11" | 12" | | 12'-9" | 4.144 | 652.63 | 184.68 | 873.39 |
| | | 12' | 432 | 40'-0" | | 12" | 12" | | 13'-9" | 4.870 | 685.72 | 189.69 | 876.110 |

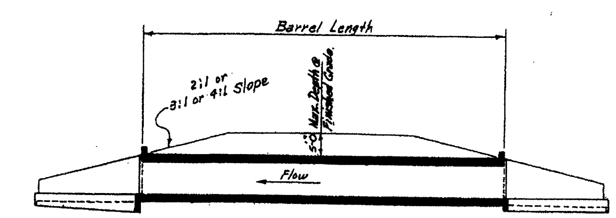



TYPICAL SECTION M-M




PART LONGITUDINAL SECTION

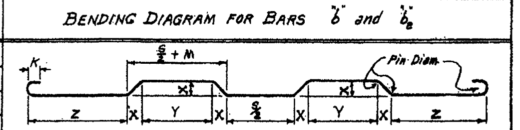
NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X002-2, W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2.




LONGITUDINAL SECTION

| BAR SIZE | PIN DIAM. | K | ADD FOR 2 HOOKS |
|---|---|---|---|
| #5 | 2½" | 4⅛" | 0'-11½" |
| #6 | 3" | 5" | 1'-2" |

BENDING DIAGRAM FOR BARS "b" and "b2"

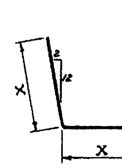



NOTE:- Dimensions are to centers of bars ("b" and "b2")

### DOWEL BARS FOR TWO HEADWALLS

| 3 SPANS @ | SIZE | SPACING | NO. REQ'D | LENGTH | X |
|---|---|---|---|---|---|
| 4' | #4 | 12"± | 30 | 2'-5" | 1'-2½" |
| 5' | #4 | 12"± | 36 | 2'-6" | 1'-3" |
| 6' | #4 | 12"± | 42 | 2'-7" | 1'-3½" |
| 7' | #4 | 12"± | 48 | 2'-8" | 1'-4" |
| 8' | #4 | 12"± | 54 | 2'-9" | 1'-4½" |
| 9 | #4 | 12"± | 60 | 2'-10" | 1'-5" |
| 10' | #4 | 12"± | 66 | 2'-11" | 1'-5½" |
| 11' | #4 | 12"± | 72 | 3'-0" | 1'-6" |
| 12' | #4 | 12"± | 78 | 3'-1" | 1'-6½" |

Bars "r"
Dowel bars in Headwalls.




GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 38'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, division walls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING.
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 OR 4:1 SLOPES
TRIPLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-300X-O

Designed By:- W.C.H. 1-22-63. Checked By:- B.H.S. 5-17-63
Drawn By:- W.C.H. 2-28-63. Checked By:- B.H.S. 5-24-63
Quantities By:- W.C.H. 3-4-63. Checked By:- B.H.S. 5-24-63

## BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH - TWO 45° SKEWED ENDS.

| DEPTH OF COVER | CLEAR SPAN | CLEAR HEIGHT | "a" bars | | | | "a1" bars | | | | | "b" bars | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | STRAIGHT | | | | | | | | | BENT - See Diagrams below | | | | |
| | | | In Top and Bottom Slabs of Barrel. | | | | In Top and Bottom Slab of Barrel- (Four of each Length) | | | | | In Top and Bottom Slabs of Barrel-hooked. Alternate with "a" bars | | | | |
| D | S | H | SIZE | SPACING | No. REQ'D | LENGTH | SIZE | SPACING | No. REQ'D | LENGTH MAX. | LENGTH MIN. | SIZE | SPACING | No. REQ'D | LENGTH | X |
| 0'-0" TO 5'-0" MAXIMUM | 1 @ 4' | 2' | #5 | 13" | 104 | 4'-9" | #5 | 13" | 8 | 3'-8" | 2'-7" | #6 | 13" | 104 | 5'-10" | 4'-8" |
| | | 3' | | | 104 | 4'-9" | | | 8 | " | " | | | 104 | 5'-10" | " |
| | | 4' | | | 104 | 4'-9" | | | 8 | " | " | | | 104 | 5'-10" | " |
| | | 5' | | | 104 | 4'-9" | | | 8 | " | " | | | 104 | 5'-10" | " |
| | | 6' | | | 104 | 4'-11" | | | 8 | 3'-10" | 2'-9" | | | 104 | 6'-0" | 4'-10" |
| | 1 @ 5' | 3' | #6 | 13" | 102 | 5'-9" | #6 | 13" | 12 | 4'-8" | 2'-6" | #6 | 13" | 102 | 6'-10" | 5'-8" |
| | | 4' | | | 102 | 5'-9" | | | 12 | " | " | | | 102 | 6'-10" | " |
| | | 5' | | | 102 | 5'-9" | | | 12 | " | " | | | 102 | 6'-10" | " |
| | | 6' | | | 102 | 5'-11" | | | 12 | 4'-10" | 2'-8" | | | 102 | 7'-0" | 5'-10" |
| | | 7' | | | 102 | 6'-0" | | | 12 | 4'-11" | 2'-9" | | | 102 | 7'-1" | 5'-11" |
| | 1 @ 6' | 3' | #6 | 12" | 110 | 6'-9" | #6 | 12" | 16 | 5'-9" | 2'-9" | #6 | 12" | 108 | 7'-10" | 6'-8" |
| | | 4' | | | 110 | 6'-9" | | | 16 | " | " | | | 108 | 7'-10" | " |
| | | 5' | | | 110 | 6'-9" | | | 16 | " | " | | | 108 | 7'-10" | " |
| | | 6' | | | 108 | 6'-11" | | | 16 | 5'-11" | 2'-11" | | | 108 | 8'-0" | 6'-10" |
| | | 7' | | | 108 | 7'-0" | | | 16 | 6'-0" | 3'-0" | | | 108 | 8'-1" | 6'-11" |
| | | 8' | | | 108 | 7'-1" | | | 16 | 6'-1" | 3'-1" | | | 108 | 8'-2" | 7'-0" |
| | 1 @ 7' | 4' | #6 | 11" | 116 | 7'-9" | #6 | 11" | 24 | 6'-10" | 2'-3" | #6 | 11" | 116 | 8'-10" | 7'-8" |
| | | 5' | | | 116 | 7'-9" | | | 24 | " | " | | | 116 | 8'-10" | " |
| | | 6' | | | 116 | 7'-11" | | | 24 | 7'-0" | 2'-5" | | | 116 | 9'-0" | 7'-10" |
| | | 7' | | | 116 | 8'-0" | | | 24 | 7'-1" | 2'-6" | | | 116 | 9'-1" | 7'-11" |
| | | 8' | | | 116 | 8'-1" | | | 24 | 7'-2" | 2'-7" | | | 114 | 9'-2" | 8'-0" |
| | | 9' | | | 116 | 8'-3" | | | 24 | 7'-4" | 2'-9" | | | 114 | 9'-4" | 8'-2" |
| | 1 @ 8' | 4' | #7 | 12" | 106 | 8'-9" | #7 | 12" | 24 | 7'-9" | 2'-9" | #6 | 12" | 104 | 9'-10" | 8'-8" |
| | | 5' | | | 104 | 8'-11" | | | 24 | 7'-11" | 2'-11" | | | 104 | 10'-0" | 8'-10" |
| | | 6' | | | 104 | 8'-11" | | | 24 | " | " | | | 104 | 10'-0" | " |
| | | 7' | | | 104 | 9'-0" | | | 24 | 8'-0" | 3'-0" | | | 104 | 10'-1" | 8'-11" |
| | | 8' | | | 104 | 9'-1" | | | 24 | 8'-1" | 3'-1" | | | 104 | 10'-2" | 9'-0" |
| | | 9' | | | 104 | 9'-3" | | | 24 | 8'-3" | 3'-3" | | | 104 | 10'-4" | 9'-2" |
| | | 10' | | | 104 | 9'-5" | | | 28 | 8'-5" | 2'-5" | | | 102 | 10'-6" | 9'-4" |
| | 1 @ 9' | 5' | #7 | 11" | 112 | 9'-11" | #7 | 11" | 32 | 9'-0" | 2'-7" | #6 | 11" | 110 | 11'-0" | 9'-10" |
| | | 6' | | | 112 | 10'-0" | | | 32 | 9'-1" | 2'-8" | | | 110 | 11'-1" | 9'-11" |
| | | 7' | | | 112 | 10'-0" | | | 32 | " | " | | | 110 | 11'-1" | 9'-11" |
| | | 8' | | | 112 | 10'-1" | | | 32 | 9'-2" | 2'-9" | | | 110 | 11'-2" | 10'-0" |
| | | 9' | | | 112 | 10'-3" | | | 32 | 9'-4" | 2'-11" | | | 110 | 11'-4" | 10'-2" |
| | | 10' | | | 110 | 10'-5" | | | 32 | 9'-6" | 3'-1" | | | 110 | 11'-6" | 10'-4" |
| | | 11' | | | 110 | 10'-7" | | | 32 | 9'-8" | 3'-3" | | | 110 | 11'-8" | 10'-6" |
| | 1 @ 10' | 5' | #7 | 12" | 100 | 10'-11" | #7 | 12" | 32 | 9'-11" | 2'-11" | #7 | 12" | 100 | 12'-2" | 10'-10" |
| | | 6' | | | 100 | 11'-0" | | | 32 | 10'-0" | 3'-0" | | | 100 | 12'-3" | 10'-11" |
| | | 7' | | | 100 | 11'-0" | | | 32 | " | " | | | 100 | 12'-3" | " |
| | | 8' | | | 100 | 11'-1" | | | 32 | 10'-1" | 3'-1" | | | 100 | 12'-4" | 11'-0" |
| | | 9' | | | 100 | 11'-3" | | | 32 | 10'-3" | 3'-3" | | | 100 | 12'-6" | 11'-2" |
| | | 10' | | | 100 | 11'-5" | | | 36 | 10'-5" | 2'-5" | | | 98 | 12'-8" | 11'-4" |
| | | 11' | | | 100 | 11'-7" | | | 36 | 10'-7" | 2'-7" | | | 98 | 12'-10" | 11'-6" |
| | | 12' | | | 100 | 11'-9" | | | 36 | 10'-9" | 2'-9" | | | 98 | 13'-0" | 11'-8" |
| | 1 @ 11' | 6' | #7 | 11" | 108 | 12'-1" | #7 | 11" | 40 | 11'-2" | 2'-11" | #7 | 11" | 106 | 13'-4" | 12'-0" |
| | | 7' | | | 106 | 12'-1" | | | 40 | " | " | | | 106 | 13'-4" | " |
| | | 8' | | | 106 | 12'-1" | | | 40 | " | " | | | 106 | 13'-4" | " |
| | | 9' | | | 106 | 12'-3" | | | 40 | 11'-4" | 3'-1" | | | 106 | 13'-6" | 12'-2" |
| | | 10' | | | 106 | 12'-5" | | | 44 | 11'-6" | 2'-4" | | | 106 | 13'-8" | 12'-4" |
| | | 11' | | | 106 | 12'-7" | | | 44 | 11'-8" | 2'-6" | | | 106 | 13'-10" | 12'-6" |
| | | 12' | | | 106 | 12'-9" | | | 44 | 11'-10" | 2'-8" | | | 104 | 14'-0" | 12'-8" |
| | 1 @ 12' | 6' | #8 | 12" | 96 | 13'-1" | #8 | 12" | 40 | 12'-1" | 3'-1" | #7 | 12" | 96 | 14'-4" | 13'-0" |
| | | 7' | | | 96 | 13'-1" | | | 40 | " | " | | | 96 | 14'-4" | " |
| | | 8' | | | 96 | 13'-1" | | | 40 | " | " | | | 96 | 14'-4" | " |
| | | 9' | | | 96 | 13'-3" | | | 40 | 12'-3" | 3'-1" | | | 96 | 14'-6" | 13'-2" |
| | | 10' | | | 96 | 13'-5" | | | 44 | 12'-5" | 2'-5" | | | 94 | 14'-8" | 13'-4" |
| | | 11' | | | 96 | 13'-7" | | | 44 | 12'-7" | 2'-7" | | | 94 | 14'-10" | 13'-6" |
| | | 12' | | | 96 | 13'-9" | | | 44 | 12'-9" | 2'-9" | | | 94 | 15'-0" | 13'-8" |

| CLEAR SPAN | CLEAR HEIGHT | "b1" bars | | | | | | | "d" bars | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BENT - See Diagrams below | | | | | | | STRAIGHT | | | |
| | | In Top and Bottom Slabs of Barrel- one end hooked. (Four of each Length) Alternate with "a1" bars. | | | | | | | Longitudinal in Top Slab of Barrel. | | | |
| S | H | SIZE | SPACING | No. REQ'D | LENGTH MAX. | LENGTH MIN. | X MAX. | X MIN. | SIZE | SPACING | No. REQ'D | LENGTH |
| 1 @ 4' | 2' | #6 | 13" | 8 | 4'-9" | 3'-8" | 4'-2" | 3'-1" | #5 | 10½" | 6 | 2 @ 30'-8", for 60'-0" Length Barrel. (1'-8" Lap) |
| | 3' | | | 8 | " | " | " | " | | | 6 | |
| | 4' | | | 8 | " | " | " | " | | | 6 | |
| | 5' | | | 8 | " | " | " | " | | | 6 | |
| | 6' | | | 8 | 4'-11" | 3'-10" | 4'-4" | 3'-3" | | | 6 | |
| 1 @ 5' | 3' | #6 | 13" | 12 | 5'-9" | 3'-7" | 5'-2" | 3'-0" | #5 | 10½" | 7 | |
| | 4' | | | 12 | " | " | " | " | | | 7 | |
| | 5' | | | 12 | " | " | " | " | | | 7 | |
| | 6' | | | 12 | 5'-11" | 3'-9" | 5'-4" | 3'-2" | | | 7 | |
| | 7' | | | 12 | 6'-0" | 3'-10" | 5'-5" | 3'-3" | | | 7 | |
| 1 @ 6' | 3' | #6 | 12" | 16 | 6'-9" | 3'-9" | 6'-2" | 3'-2" | #5 | 10½" | 8 | |
| | 4' | | | 16 | " | " | " | " | | | 8 | |
| | 5' | | | 16 | " | " | " | " | | | 8 | |
| | 6' | | | 20 | 6'-11" | 2'-11" | 6'-4" | 2'-4" | | | 8 | |
| | 7' | | | 20 | 7'-0" | 3'-0" | 6'-5" | 2'-5" | | | 8 | |
| | 8' | | | 20 | 7'-1" | 3'-1" | 6'-6" | 2'-6" | | | 8 | |
| 1 @ 7' | 4' | #6 | 11" | 24 | 7'-10" | 3'-3" | 7'-3" | 2'-8" | #5 | 10½" | 9 | |
| | 5' | | | 24 | " | " | " | " | | | 9 | |
| | 6' | | | 24 | 8'-0" | 3'-5" | 7'-5" | 2'-10" | | | 9 | |
| | 7' | | | 24 | 8'-1" | 3'-6" | 7'-6" | 2'-11" | | | 9 | |
| | 8' | | | 24 | 8'-2" | 3'-7" | 7'-7" | 3'-0" | | | 9 | |
| | 9' | | | 24 | 8'-4" | 3'-9" | 7'-9" | 3'-2" | | | 9 | |
| 1 @ 8' | 4' | #6 | 12" | 24 | 8'-9" | 3'-9" | 8'-2" | 3'-2" | #5 | 10" | 11 | |
| | 5' | | | 28 | 8'-11" | 2'-11" | 8'-4" | 2'-4" | | | 11 | |
| | 6' | | | 28 | " | " | " | " | | | 11 | |
| | 7' | | | 28 | 9'-0" | 3'-0" | 8'-5" | 2'-5" | | | 11 | |
| | 8' | | | 28 | 9'-1" | 3'-1" | 8'-6" | 2'-6" | | | 11 | |
| | 9' | | | 28 | 9'-3" | 3'-3" | 8'-8" | 2'-8" | | | 11 | |
| | 10' | | | 28 | 9'-5" | 3'-5" | 8'-10" | 2'-10" | | | 11 | |
| 1 @ 9' | 5' | #6 | 11" | 32 | 10'-0" | 3'-7" | 9'-5" | 3'-0" | #5 | 10" | 12 | |
| | 6' | | | 32 | 10'-1" | 3'-8" | 9'-6" | 3'-1" | | | 12 | |
| | 7' | | | 32 | " | " | " | " | | | 12 | |
| | 8' | | | 32 | 10'-2" | 3'-9" | 9'-7" | 3'-2" | | | 12 | |
| | 9' | | | 36 | 10'-4" | 3'-0" | 9'-9" | 2'-5" | | | 12 | |
| | 10' | | | 36 | 10'-6" | 3'-2" | 9'-11" | 2'-7" | | | 12 | |
| | 11' | | | 36 | 10'-8" | 3'-4" | 10'-1" | 2'-9" | | | 12 | |
| 1 @ 10' | 5' | #7 | 12" | 36 | 11'-0" | 3'-0" | 10'-4" | 2'-4" | #5 | 10" | 13 | |
| | 6' | | | 36 | 11'-1" | 3'-1" | 10'-5" | 2'-5" | | | 13 | |
| | 7' | | | 36 | " | " | " | " | | | 13 | |
| | 8' | | | 36 | 11'-2" | 3'-2" | 10'-6" | 2'-6" | | | 13 | |
| | 9' | | | 36 | 11'-4" | 3'-4" | 10'-8" | 2'-8" | | | 13 | |
| | 10' | | | 36 | 11'-6" | 3'-6" | 10'-10" | 2'-10" | | | 13 | |
| | 11' | | | 36 | 11'-8" | 3'-8" | 11'-0" | 3'-0" | | | 13 | |
| | 12' | | | 36 | 11'-10" | 3'-10" | 11'-2" | 3'-2" | | | 13 | |
| 1 @ 11' | 6' | #7 | 11" | 44 | 12'-3" | 4'-1" | 11'-7" | 2'-5" | #5 | 9½" | 15 | |
| | 7' | | | 44 | " | " | " | " | | | 15 | |
| | 8' | | | 44 | " | " | " | " | | | 15 | |
| | 9' | | | 44 | 12'-5" | 4'-3" | 11'-9" | 2'-7" | | | 15 | |
| | 10' | | | 44 | 12'-7" | 4'-5" | 11'-11" | 2'-9" | | | 15 | |
| | 11' | | | 44 | 12'-9" | 4'-7" | 12'-1" | 2'-11" | | | 15 | |
| | 12' | | | 44 | 12'-11" | 4'-9" | 12'-3" | 3'-1" | | | 15 | |
| 1 @ 12' | 6' | #7 | 12" | 44 | 13'-2" | 3'-2" | 12'-6" | 2'-6" | #5 | 9½" | 16 | |
| | 7' | | | 44 | " | " | " | " | | | 16 | |
| | 8' | | | 44 | " | " | " | " | | | 16 | |
| | 9' | | | 44 | 13'-4" | 3'-4" | 12'-8" | 2'-8" | | | 16 | |
| | 10' | | | 44 | 13'-6" | 3'-6" | 12'-10" | 2'-10" | | | 16 | |
| | 11' | | | 44 | 13'-8" | 3'-8" | 13'-0" | 3'-0" | | | 16 | |
| | 12' | | | 44 | 13'-10" | 3'-10" | 13'-2" | 3'-2" | | | 16 | |

| CLEAR SPAN | CLEAR HEIGHT | "d1" bars | | | | "e" bars | | | | "f" bars | | | | "k1" bars | | | "k2" bars | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | STRAIGHT | | | | | | | | STRAIGHT | | | | STRAIGHT | | | | | |
| | | Longitudinal in Sidewalls. | | | | Longitudinal in Bottom Slab of Barrel. | | | | Verticals in Sidewalls. | | | | In Bottom of Headwall. | | | In Top of Headwall and Apron. (2 Each) | | |
| S | H | SIZE | SPACING | No. REQ'D | LENGTH | SIZE | SPACING | No. REQ'D | LENGTH | SIZE | SPACING | No. REQ'D | LENGTH | SIZE | No. REQ'D | LENGTH | SIZE | No. REQ'D | LENGTH |
| 1 @ 4' | 2' | #4 | 12" | 4 | 2 @ 30'-6", for 60'-0" Length Barrel. (1'-3" Lap) | #4 | 12" | 5 | 2 @ 31'-10", for 60'-0" Length Barrel. (1'-3" Lap) | #4 | 12" | 120 | 2'-11" | #5 | 6 | 6'-9" | #5 | 8 | 8'-10" |
| | 3' | | | 6 | | | | 5 | | | | 120 | 3'-11" | | 6 | " | | 8 | |
| | 4' | | | 8 | | | | 5 | | | | 120 | 4'-11" | | 6 | " | | 8 | " |
| | 5' | | | 10 | | | | 5 | | | | 120 | 5'-11" | | 6 | " | | 8 | " |
| | 6' | | | 12 | | | | 5 | | | | 120 | 6'-11" | | 6 | 6'-11" | | 8 | 9'-0" |
| 1 @ 5' | 3' | #4 | 12" | 6 | | #4 | 12" | 6 | | #4 | 12" | 120 | 4'-0" | #6 | 6 | 8'-1" | #6 | 8 | 10'-3" |
| | 4' | | | 8 | | | | 6 | | | | 120 | 5'-0" | | 6 | " | | 8 | " |
| | 5' | | | 10 | | | | 6 | | | | 120 | 6'-0" | | 6 | " | | 8 | " |
| | 6' | | | 12 | | | | 6 | | | | 120 | 7'-0" | | 6 | 8'-4" | | 8 | 10'-5" |
| | 7' | | | 14 | | | | 6 | | | | 120 | 8'-0" | | 6 | 8'-5" | | 8 | 10'-7" |
| 1 @ 6' | 3' | #4 | 12" | 6 | | #4 | 12" | 7 | | #4 | 12" | 120 | 4'-1" | #6 | 6 | 9'-6" | #6 | 8 | 11'-7" |
| | 4' | | | 8 | | | | 7 | | | | 120 | 5'-1" | | 6 | " | | 8 | " |
| | 5' | | | 10 | | | | 7 | | | | 120 | 6'-1" | | 6 | " | | 8 | " |
| | 6' | | | 12 | | | | 7 | | | | 120 | 7'-1" | | 6 | 9'-9" | | 8 | 11'-10" |
| | 7' | | | 14 | | | | 7 | | | | 120 | 8'-1" | | 6 | 9'-10" | | 8 | 12'-0" |
| | 8' | | | 16 | | | | 7 | | #5 | 12" | 120 | 9'-1" | | 6 | 10'-0" | | 8 | 12'-1" |
| 1 @ 7' | 4' | #4 | 12" | 8 | | #4 | 12" | 8 | | #4 | 12" | 120 | 5'-2" | #7 | 6 | 10'-11" | #7 | 8 | 13'-0" |
| | 5' | | | 10 | | | | 8 | | | | 120 | 6'-2" | | 6 | " | | 8 | " |
| | 6' | | | 12 | | | | 8 | | | | 120 | 7'-2" | | 6 | 11'-2" | | 8 | 13'-3" |
| | 7' | | | 14 | | | | 8 | | | | 120 | 8'-2" | | 6 | 11'-3" | | 8 | 13'-5" |
| | 8' | | | 16 | | | | 8 | | | 10" | 144 | 9'-2" | | 6 | 11'-4" | | 8 | 13'-6" |
| | 9' | | | 18 | | | | 8 | | #5 | 12" | 120 | 10'-2" | | 6 | 11'-7" | | 8 | 13'-9" |
| 1 @ 8' | 4' | #4 | 12" | 8 | | #4 | 12" | 9 | | #4 | 12" | 120 | 5'-4" | #7 | 6 | 12'-4" | #7 | 8 | 14'-5" |
| | 5' | | | 10 | | | | 9 | | | | 120 | 6'-4" | | 6 | 12'-7" | | 8 | 14'-8" |
| | 6' | | | 12 | | | | 9 | | | | 120 | 7'-4" | | 6 | " | | 8 | " |
| | 7' | | | 14 | | | | 9 | | | | 120 | 8'-4" | | 6 | 12'-8" | | 8 | 14'-10" |
| | 8' | | | 16 | | | | 9 | | | 10" | 144 | 9'-4" | | 6 | 12'-10" | | 8 | 14'-11" |
| | 9' | | | 18 | | | | 9 | | #5 | 12" | 120 | 10'-4" | | 6 | 13'-0" | | 8 | 15'-2" |
| | 10' | | | 20 | | | | 9 | | | 11" | 132 | 11'-4" | | 6 | 13'-3" | | 8 | 15'-5" |
| 1 @ 9' | 5' | #4 | 12" | 10 | | #4 | 12" | 10 | | #4 | 12" | 120 | 6'-5" | #8 | 6 | 14'-0" | #8 | 8 | 16'-1" |
| | 6' | | | 12 | | | | 10 | | | | 120 | 7'-5" | | 6 | 14'-1" | | 8 | 16'-3" |
| | 7' | | | 14 | | | | 10 | | | | 120 | 8'-5" | | 6 | " | | 8 | " |
| | 8' | | | 16 | | | | 10 | | | 10" | 144 | 9'-5" | | 6 | 14'-2" | | 8 | 16'-4" |
| | 9' | | | 18 | | | | 10 | | #5 | 12" | 120 | 10'-5" | | 6 | 14'-5" | | 8 | 16'-7" |
| | 10' | | | 20 | | | | 10 | | | 11" | 132 | 11'-5" | | 6 | 14'-8" | | 8 | 16'-10" |
| | 11' | | | 22 | | | | 10 | | | 10" | 144 | 12'-5" | | 6 | 14'-11" | | 8 | 17'-0" |
| 1 @ 10' | 5' | #4 | 12" | 10 | | #4 | 12" | 11 | | #4 | 12" | 120 | 6'-6" | #8 | 6 | 15'-5" | #8 | 8 | 17'-6" |
| | 6' | | | 12 | | | | 11 | | | | 120 | 7'-6" | | 6 | 15'-6" | | 8 | 17'-8" |
| | 7' | | | 14 | | | | 11 | | | | 120 | 8'-6" | | 6 | " | | 8 | " |
| | 8' | | | 16 | | | | 11 | | | 10" | 144 | 9'-6" | | 6 | 15'-7" | | 8 | 17'-9" |
| | 9' | | | 18 | | | | 11 | | #5 | 12" | 120 | 10'-6" | | 6 | 15'-10" | | 8 | 18'-0" |
| | 10' | | | 20 | | | | 11 | | | 11" | 132 | 11'-6" | | 6 | 16'-1" | | 8 | 18'-3" |
| | 11' | | | 22 | | | | 11 | | | 10" | 144 | 12'-6" | | 6 | 16'-4" | | 8 | 18'-5" |
| | 12' | | | 24 | | | | 11 | | #6 | 12" | 120 | 13'-6" | | 6 | 16'-7" | | 8 | 18'-8" |
| 1 @ 11' | 6' | #4 | 12" | 12 | | #4 | 12" | 12 | | #4 | 12" | 120 | 7'-7" | #9 | 6 | 17'-0" | #9 | 8 | 19'-2" |
| | 7' | | | 14 | | | | 12 | | | | 120 | 8'-7" | | 6 | " | | 8 | " |
| | 8' | | | 16 | | | | 12 | | | 10" | 144 | 9'-7" | | 6 | " | | 8 | " |
| | 9' | | | 18 | | | | 12 | | #5 | 12" | 120 | 10'-7" | | 6 | 17'-3" | | 8 | 19'-5" |
| | 10' | | | 20 | | | | 12 | | | 11" | 132 | 11'-7" | | 6 | 17'-6" | | 8 | 19'-8" |
| | 11' | | | 22 | | | | 12 | | | 10" | 144 | 12'-7" | | 6 | 17'-9" | | 8 | 19'-10" |
| | 12' | | | 24 | | | | 12 | | #6 | 12" | 120 | 13'-7" | | 6 | 18'-0" | | 8 | 20'-1" |
| 1 @ 12' | 6' | #4 | 12" | 12 | | #4 | 12" | 13 | | #4 | 12" | 120 | 7'-9" | #9 | 6 | 18'-5" | #9 | 8 | 20'-7" |
| | 7' | | | 14 | | | | 13 | | | | 120 | 8'-9" | | 6 | " | | 8 | " |
| | 8' | | | 16 | | | | 13 | | | 10" | 144 | 9'-9" | | 6 | " | | 8 | " |
| | 9' | | | 18 | | | | 13 | | #5 | 12" | 120 | 10'-9" | | 6 | 18'-8" | | 8 | 20'-10" |
| | 10' | | | 20 | | | | 13 | | | 11" | 132 | 11'-9" | | 6 | 18'-11" | | 8 | 21'-1" |
| | 11' | | | 22 | | | | 13 | | | 10" | 144 | 12'-9" | | 6 | 19'-2" | | 8 | 21'-3" |
| | 12' | | | 24 | | | | 13 | | #6 | 12" | 120 | 13'-9" | | 6 | 19'-5" | | 8 | 21'-6" |

These bars are in the skewed portion of barrel only. The length of "a1" bars and overall length X of "b1" bars vary by 1'-1" for 13" spacing, 1'-0" for 12" spacing and 0'-11" for 11" spacing.

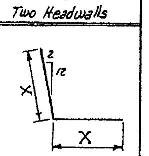
| BAR SIZE | PIN DIAM | K | ADD FOR HOOKS | BENDING DIAGRAMS FOR BARS "b" & "b1" |
|---|---|---|---|---|
| #6 | 3" | 5" | 1'-2" | 2 Hooks — "b" bars (K, Pin diam., X) |
| #7 | 3½" | 5¾" | 1'-4" | |
| #6 | 3" | 5" | 0'-7" | 1 Hook — "b1" bars (K, Pin diam., X) |
| #7 | 3½" | 5¾" | 0'-8" | |

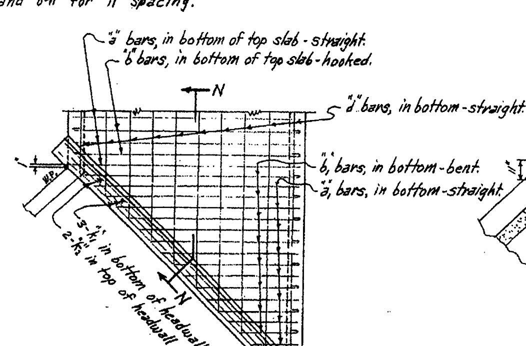
NOTE:- Dimensions are to centers of bars. ("b" and "b1")

### DOWEL BARS FOR TWO HEADWALLS

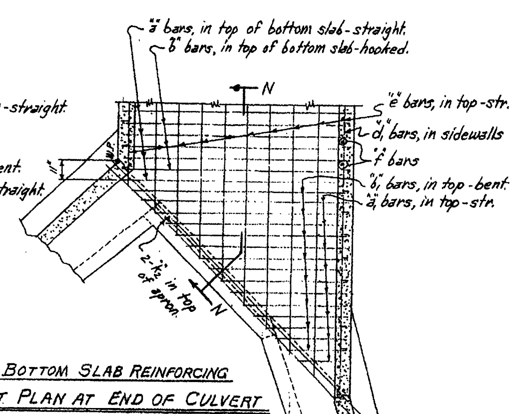
| SPAN | SIZE | SPACING | No. REQ'D | LENGTH | X |
|---|---|---|---|---|---|
| 4' | #4 | 12"± | 16 | 2'-6" | 1'-3" |
| 5' | #4 | 12"± | 18 | 2'-7" | 1'-3½" |
| 6' | #4 | 12"± | 22 | 2'-8" | 1'-4" |
| 7' | #4 | 12"± | 24 | 2'-9" | 1'-4½" |
| 8' | #4 | 12"± | 28 | 2'-11" | 1'-5½" |
| 9' | #4 | 12"± | 30 | 3'-0" | 1'-6" |
| 10' | #4 | 12"± | 34 | 3'-1" | 1'-6½" |
| 11' | #4 | 12"± | 36 | 3'-2" | 1'-7" |
| 12' | #4 | 12"± | 40 | 3'-3" | 1'-7½" |

Dowel bars "r" in Two Headwalls



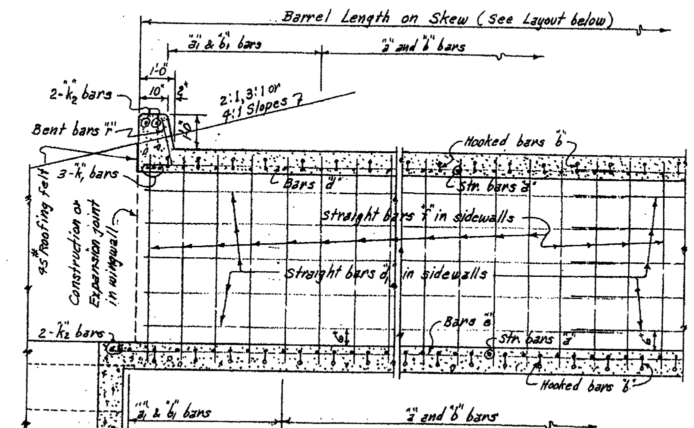

TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT



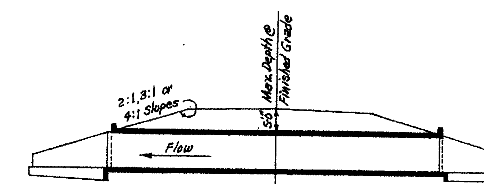

BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT


Designed by:- W.C.H. 1-23-63. Checked by:- R.H.S. 5-8-63
Drawn by:- W.C.H. 7-10-64 Checked by:-
Quantities by:- W.C.H. 9-30-64 Checked by:-

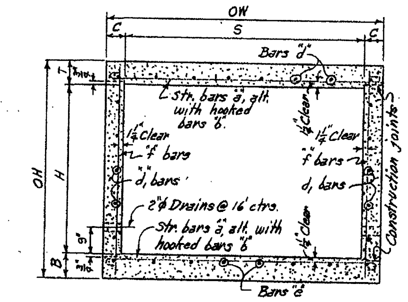

NOTE:- For Details of Standard Wings and bar lists, see Drawing No. W-X452-1 or W-X452-2; W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.



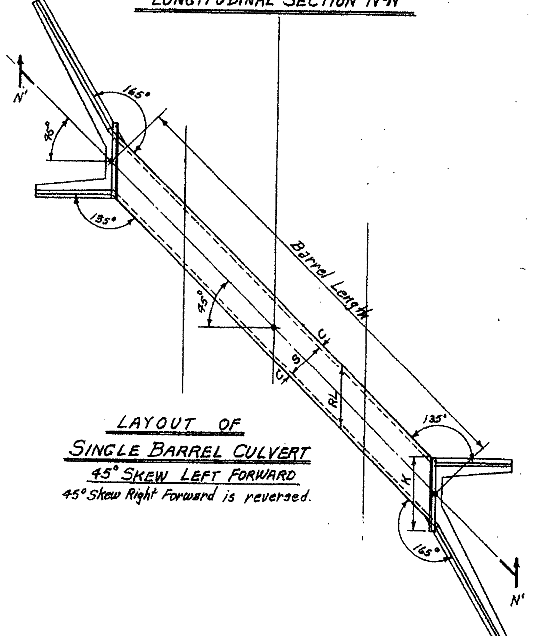

SECTION N-N




LONGITUDINAL SECTION N-N'




TYPICAL SECTION M-M




LAYOUT OF SINGLE BARREL CULVERT
45° SKEW LEFT FORWARD
45° Skew Right Forward is reversed.

### DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 20,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X452-1 or W-X452-2, W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.

### GENERAL NOTES

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters min.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

| MAX. DESIGN DEPTH OF COVER | CLEAR SPANS | CLEAR HEIGHT | SQ. FT. OPENING | OVERALL WIDTH | THICKNESS OF TOP SLAB | THICKNESS OF SIDEWALLS | THICKNESS OF BOTTOM SLAB | OVERALL HEIGHT | ROADWAY LENGTH | LENGTH OF HEADWALL | * CLASS S CONC. PER LIN. FT. OF BARREL | REINFORCING STEEL: TOTAL FOR 60'-0" LENGTH OF BARREL | PER LIN. FT. OF BARREL | ADDITIONAL PER LAP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BARREL DIMENSIONS | | | | | | | | | | * QUANTITIES | | | |
| D. | S | H | A | OW | T | C | B | OH | RL | K | CU.YD. | LB. | LB. | LB. |
| 5'-0" | 1 @ 4' | 2' | 8 | 5'-0" | 7" | 6" | 6½" | 3'-1½" | 7'-0⅝" | 9'-0⅝" | 0.282 | 2635 | 41.49 | 17.95 |
| | | 3' | 12 | 5'-0" | | 6" | | 4'-1½" | " | " | 0.319 | 2797 | 44.16 | 19.62 |
| | | 4' | 16 | 5'-0" | | 6" | | 5'-1½" | " | " | 0.356 | 2958 | 46.83 | 21.29 |
| | | 5' | 20 | 5'-0" | | 6" | | 6'-1½" | " | " | 0.394 | 3120 | 49.50 | 22.96 |
| | | 6' | 24 | 5'-2" | | 7" | | 7'-1½" | 7'-3⅝" | 9'-3⅝" | 0.474 | 3336 | 52.96 | 24.63 |
| | 1 @ 5' | 3' | 15 | 6'-0" | 7½" | 6" | 7" | 4'-2½" | 8'-5⅝" | 10'-5⅝" | 0.380 | 3572 | 55.55 | 22.19 |
| | | 4' | 20 | 6'-0" | | 6" | | 5'-2½" | " | " | 0.417 | 3733 | 58.23 | 23.86 |
| | | 5' | 25 | 6'-0" | | 6" | | 6'-2½" | " | " | 0.454 | 3895 | 60.90 | 25.53 |
| | | 6' | 30 | 6'-2" | | 7" | | 7'-2½" | 8'-8⅝" | 10'-8⅝" | 0.535 | 4115 | 64.49 | 27.20 |
| | | 7' | 35 | 6'-3" | | 7½" | | 8'-2½" | 8'-10⅝" | 10'-10⅝" | 0.604 | 4308 | 67.63 | 28.87 |
| | 1 @ 6' | 3' | 18 | 7'-0" | 8" | 6" | 7½" | 4'-3½" | 9'-10¾" | 11'-10¾" | 0.446 | 4260 | 66.29 | 24.76 |
| | | 4' | 24 | 7'-0" | | 6" | | 5'-3½" | " | " | 0.483 | 4421 | 68.96 | 26.43 |
| | | 5' | 30 | 7'-0" | | 6" | | 6'-3½" | " | " | 0.520 | 4583 | 71.64 | 28.10 |
| | | 6' | 36 | 7'-2" | | 7" | | 7'-3½" | 10'-1⅝" | 12'-1⅝" | 0.602 | 4813 | 75.31 | 29.77 |
| | | 7' | 42 | 7'-3" | | 7½" | | 8'-3½" | 10'-3" | 12'-3" | 0.671 | 5008 | 78.98 | 31.44 |
| | | 8' | 48 | 7'-4" | | 8" | | 9'-3½" | 10'-4⅝" | 12'-4⅝" | 0.746 | 5610 | 88.97 | 33.11 |
| | 1 @ 7' | 4' | 28 | 8'-0" | 8½" | 6" | 8½" | 5'-5" | 11'-3¾" | 13'-3¾" | 0.568 | 5303 | 81.32 | 29.01 |
| | | 5' | 35 | 8'-0" | | 6" | | 6'-5" | " | " | 0.605 | 5464 | 84.00 | 30.68 |
| | | 6' | 42 | 8'-2" | | 7" | | 7'-5" | 11'-6⅝" | 13'-6⅝" | 0.688 | 5700 | 87.76 | 32.35 |
| | | 7' | 49 | 8'-3" | | 7½" | | 8'-5" | 11'-8" | 13'-8" | 0.757 | 5901 | 90.98 | 34.02 |
| | | 8' | 56 | 8'-4" | | 8" | | 9'-5" | 11'-9⅜" | 13'-9⅜" | 0.832 | 6219 | 96.65 | 35.69 |
| | | 9' | 63 | 8'-6" | | 9" | | 10'-5" | 12'-0¼" | 14'-0¼" | 0.946 | 6976 | 105.59 | 37.36 |
| | 1 @ 8' | 4' | 32 | 9'-0" | 9½" | 6" | 9½" | 5'-7" | 12'-8¾" | 14'-8¾" | 0.676 | 6196 | 95.26 | 33.32 |
| | | 5' | 40 | 9'-2" | | 7" | | 6'-7" | 12'-11⅝" | 14'-11½" | 0.754 | 6423 | 99.12 | 34.99 |
| | | 6' | 48 | 9'-2" | | 7" | | 7'-7" | " | " | 0.797 | 6584 | 101.79 | 36.66 |
| | | 7' | 56 | 9'-3" | | 7½" | | 8'-7" | 13'-1" | 15'-1" | 0.867 | 6788 | 105.05 | 38.33 |
| | | 8' | 64 | 9'-4" | | 8" | | 9'-7" | 13'-2½" | 15'-2½" | 0.942 | 7141 | 110.81 | 40.00 |
| | | 9' | 72 | 9'-6" | | 9" | | 10'-7" | 13'-5¼" | 15'-5¼" | 1.057 | 7701 | 119.92 | 41.67 |
| | | 10' | 80 | 9'-8" | | 10" | | 11'-7" | 13'-8" | 15'-8" | 1.184 | 8121 | 126.67 | 43.34 |
| | 1 @ 9' | 5' | 45 | 10'-2" | 10" | 7" | 10" | 6'-8" | 14'-4½" | 16'-4½" | 0.844 | 7535 | 114.72 | 37.56 |
| | | 6' | 54 | 10'-3" | | 7½" | | 7'-8" | 14'-6" | 16'-6" | 0.910 | 7745 | 118.04 | 39.23 |
| | | 7' | 63 | 10'-3" | | 7½" | | 8'-8" | " | " | 0.957 | 7906 | 120.71 | 40.90 |
| | | 8' | 72 | 10'-4" | | 8" | | 9'-8" | 14'-7⅜" | 16'-7¼" | 1.033 | 8264 | 126.54 | 42.57 |
| | | 9' | 81 | 10'-6" | | 9" | | 10'-8" | 14'-10⅛" | 16'-10⅛" | 1.148 | 8856 | 135.80 | 44.24 |
| | | 10' | 90 | 10'-8" | | 10" | | 11'-8" | 15'-1" | 17'-1" | 1.276 | 9248 | 142.68 | 45.91 |
| | | 11' | 99 | 10'-10" | | 11" | | 12'-8" | 15'-3⅞" | 17'-3¾" | 1.416 | 9717 | 150.40 | 47.58 |
| | 1 @ 10' | 5' | 50 | 11'-2" | 10½" | 7" | 11" | 6'-9½" | 15'-9½" | 17'-9½" | 0.957 | 8572 | 130.64 | 40.13 |
| | | 6' | 60 | 11'-3" | | 7½" | | 7'-9½" | 15'-11" | 17'-11" | 1.024 | 8784 | 133.99 | 41.80 |
| | | 7' | 70 | 11'-3" | | 7½" | | 8'-9½" | " | " | 1.071 | 8946 | 136.66 | 43.47 |
| | | 8' | 80 | 11'-4" | | 8" | | 9'-9½" | 16'-0⅜" | 18'-0¼" | 1.147 | 9308 | 142.55 | 45.14 |
| | | 9' | 90 | 11'-6" | | 9" | | 10'-9½" | 16'-3⅛" | 18'-3¼" | 1.263 | 9891 | 151.92 | 46.81 |
| | | 10' | 100 | 11'-8" | | 10" | | 11'-9½" | 16'-6" | 18'-6" | 1.391 | 10,310 | 158.89 | 48.48 |
| | | 11' | 110 | 11'-10" | | 11" | | 12'-9½" | 16'-8⅞" | 18'-8¾" | 1.532 | 10,785 | 166.71 | 50.15 |
| | | 12' | 120 | 12'-0" | | 12" | | 13'-9½" | 16'-11⅝" | 18'-11¾" | 1.685 | 11,524 | 178.67 | 51.92 |
| | 1 @ 11' | 6' | 66 | 12'-4" | 11" | 8" | 11½" | 7'-10½" | 17'-5¼" | 19'-5¼" | 1.153 | 10,378 | 155.16 | 46.12 |
| | | 7' | 77 | 12'-4" | | 8" | | 8'-10½" | " | " | 1.202 | 10,539 | 157.83 | 47.79 |
| | | 8' | 88 | 12'-4" | | 8" | | 9'-10½" | " | " | 1.252 | 10,855 | 163.06 | 49.46 |
| | | 9' | 99 | 12'-6" | | 9" | | 10'-10½" | 17'-8⅛" | 19'-8¼" | 1.368 | 11,493 | 172.60 | 51.13 |
| | | 10' | 110 | 12'-8" | | 10" | | 11'-10½" | 17'-11" | 19'-11" | 1.497 | 11,886 | 179.70 | 52.80 |
| | | 11' | 121 | 12'-10" | | 11" | | 12'-10½" | 18'-1⅞" | 20'-1¾" | 1.638 | 12,374 | 187.67 | 54.47 |
| | | 12' | 132 | 13'-0" | | 12" | | 13'-10½" | 18'-4⅝" | 20'-4½" | 1.792 | 13,071 | 199.79 | 56.14 |
| | 1 @ 12' | 6' | 72 | 13'-4" | 11¾" | 8" | 12¼" | 8'-0" | 18'-10¼" | 20'-10¼" | 1.284 | 11,420 | 172.20 | 48.69 |
| | | 7' | 84 | 13'-4" | | 8" | | 9'-0" | " | " | 1.333 | 11,581 | 174.87 | 50.36 |
| | | 8' | 96 | 13'-4" | | 8" | | 10'-0" | " | " | 1.383 | 11,899 | 180.15 | 52.03 |
| | | 9' | 108 | 13'-6" | | 9" | | 11'-0" | 19'-1⅛" | 21'-1" | 1.500 | 12,500 | 189.85 | 53.70 |
| | | 10' | 120 | 13'-8" | | 10" | | 12'-0" | 19'-3⅞" | 21'-4" | 1.630 | 12,948 | 197.07 | 55.37 |
| | | 11' | 132 | 13'-10" | | 11" | | 13'-0" | 19'-6¾" | 21'-6¾" | 1.772 | 13,496 | 205.16 | 57.04 |
| | | 12' | 144 | 14'-0" | | 12" | | 14'-0" | 19'-9⅝" | 21'-9½" | 1.926 | 14,212 | 217.45 | 58.71 |

* For remainder of quantities see Std. Wing Drawings listed at left. Total steel quantities listed above include one lap of longitudinal bars.

CLASS S CONCRETE

# ARKANSAS STATE HIGHWAY COMMISSION

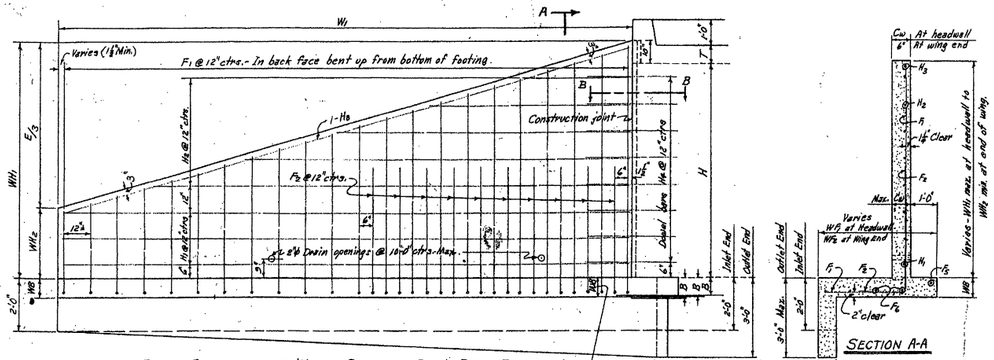
## DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

### 45° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — SINGLES
2:1, 3:1 OR 4:1 SLOPES — UNDER 5'-0" COVER

STANDARD DRAWING No. R-145X-D

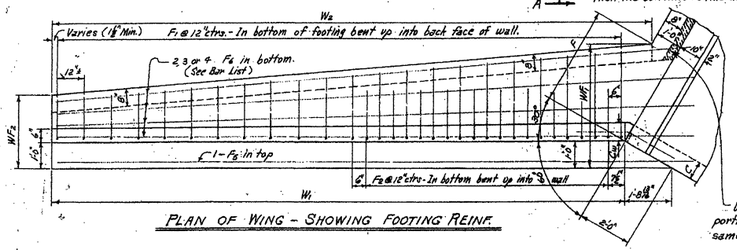
| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |




REAR ELEVATION OF WING - SHOWING BACK FACE REINF.

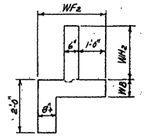



SECTION A-A

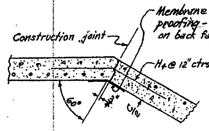



PLAN OF WING - SHOWING FOOTING REINF.

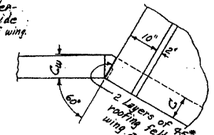
When B is more than WB, the shaded portion of the apron shall be made the same thickness as the barrel base B.




END VIEW OF WING




SECTION B-B THRU CONSTRUCTION JOINT




DETAIL AT TOP OF WING

Note:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.

## WING DIMENSIONS

| CLEAR HEIGHT OF BOX | THICKNESS OF WING FOOTING | THICKNESS OF WING AT HEADWALL = C | WINGWALL HEIGHTS | | WIDTHS OF WING FOOTINGS | | PERPENDICULAR DIST. FROM HDWL. TO END OF WING | PERPENDICULAR FOOTING DIMENSION | LENGTH OF WING WALLS | INSIDE FOOTING DIMENSION | * QUANTITY PER WING CLASS S CONCRETE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AT HEADWALL | AT END OF WING | AT HEADWALL | AT END OF WING | PERPENDICULAR TO WING | | | | INLET END | OUTLET END |
| H | WB | Cw | WH1 | WH2 | WF1 | WF2 | F | E | W1 | W2 | CU.YD. | CU.YD. |
| 2' | 7" | 6" | 2'-10" | 0'-8" | 2'-9" | 2'-0" | 0'-11⅜" | 6'-6" | 7'-6" | 7'-1½" | 0.889 | 0.986 |
| 3' | 7" | 6" | 3'-10" | 1'-0" | 2'-8" | 2'-1⅜" | 1'-4⅜" | 8'-6" | 9'-3½" | 9'-2½" | 1.338 | 1.466 |
| 4' | 7" | 6" | 4'-10" | 1'-4" | 3'-0" | 2'-3" | 1'-9" | 10'-6" | 12'-1⅝" | 12'-1⅝" | 1.868 | 2.027 |
| 5' | 7' | 6" | 5'-10" | 1'-8" | 3'-6" | 2'-6⅜" | 2'-1⅝" | 12'-6" | 14'-5⅝" | 14'-1⅞" | 2.978 | 2.668 |
| | | 7" | 5'-11" | 1'-8" | 3'-6" | 2'-6⅜" | 2'-1⅝" | 12'-6" | 14'-5⅝" | 14'-1⅞" | 2.982 | 2.772 |
| 6' | 8" | 7" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-6⅜" | 14'-6" | 16'-9" | 17'-1⅝" | 3.940 | 3.661 |
| | | 7⅝" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-6⅜" | 14'-6" | 16'-9" | 17'-1½" | 3.811 | 3.732 |
| | | 8" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-6⅜" | 14'-6" | 16'-9" | 17'-1½" | 3.582 | 3.803 |
| 7' | 8½" | 7⅝" | 7'-10" | 2'-9" | 4'-2" | 2'-7½" | 3'-1⅜" | 16'-6" | 19'-0⅝" | 19'-8⅜" | 4.505 | 4.758 |
| | | 8" | 7'-10" | 2'-9" | 4'-2" | 2'-7½" | 3'-1⅜" | 16'-6" | 19'-0⅝" | 19'-8⅜" | 4.597 | 4.851 |
| 8' | 9" | 8" | 8'-10" | 2'-8" | 4'-8" | 2'-9" | 3'-8" | 18'-6" | 21'-0⅝" | 22'-0⅝" | 5.761 | 6.047 |

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W3.

## APRON DIMENSION W3

W3 = (OW - 2F)

| CLEAR SPAN S | CLEAR HEIGHT H | 2 × FOOTING DIMENSION 2F | SINGLE BARREL CULVERT OW | SINGLE BARREL CULVERT W3 | DOUBLE BARREL CULVERT OW | DOUBLE BARREL CULVERT W3 | TRIPLE BARREL CULVERT OW | TRIPLE BARREL CULVERT W3 | QUADRUPLE BARREL CULVERT OW | QUADRUPLE BARREL CULVERT W3 | QUINTUPLE BARREL CULVERT OW | QUINTUPLE BARREL CULVERT W3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4' | 2' | 1'-11⅛" | 5'-0" | 3'-0⅛" | 9'-8" | 7'-8⅛" | 14'-4" | 12'-4⅛" | 18'-0" | 17'-0⅛" | 23'-8" | 21'-8⅛" |
| | 3' | 2'-8⅛" | 5'-0" | 2'-3⅛" | 9'-8" | 6'-11⅛" | 14'-4" | 11'-7⅛" | 19'-0" | 16'-3⅛" | 23'-8" | 20'-11⅛" |
| | 4' | 3'-6" | 5'-0" | 1'-6" | 9'-8" | 6'-2" | 14'-4" | 10'-10" | 19'-0" | 15'-10" | 23'-8" | 20'-2" |
| | 5' | 4'-3⅜" | 5'-0" | 0'-8⅜" | 9'-8" | 5'-7⅜" | 14'-4" | 10'-0⅜" | 19'-0" | 14'-10⅜" | 23'-8" | 19'-7⅜" |
| | 6' | 5'-0⅝" | 5'-2" | 0'-1⅛" | 9'-11" | 4'-10⅛" | 14'-8" | 9'-7⅛" | 19'-5" | 14'-4⅛" | 24'-2" | 19'-1⅛" |
| 5' | 3' | 2'-8⅛" | 6'-0" | 3'-3⅛" | 11'-8" | 8'-11⅛" | 17'-4" | 14'-7⅛" | 23'-0" | 20'-3⅛" | 28'-8" | 26'-11⅛" |
| | 4' | 3'-6" | 6'-0" | 2'-6" | 11'-8" | 8'-2" | 17'-4" | 13'-10" | 23'-0" | 19'-6" | 28'-8" | 25'-2" |
| | 5' | 4'-3⅜" | 6'-0" | 1'-8⅜" | 11'-8" | 7'-7⅜" | 17'-4" | 13'-0⅜" | 23'-0" | 18'-9⅜" | 28'-8" | 24'-7⅜" |
| | 6' | 5'-0⅝" | 6'-2" | 1'-1⅛" | 11'-11" | 6'-10⅛" | 17'-8" | 12'-4⅛" | 23'-5" | 18'-4⅛" | 29'-2" | 24'-1⅛" |
| | 7' | 6'-2⅛" | 6'-5" | 0'-0⅝" | 12'-1" | 5'-10⅞" | 17'-11" | 11'-8⅝" | 23'-9" | 17'-10⅞" | 29'-7" | 23'-6⅝" |
| 6' | 3' | 2'-8⅛" | 7'-0" | 4'-3⅛" | 13'-8" | 10'-11⅛" | 20'-4" | 17'-7⅛" | 27'-0" | 24'-3⅛" | 33'-8" | 30'-11⅛" |
| | 4' | 3'-6" | 7'-0" | 3'-6" | 13'-8" | 10'-2" | 20'-4" | 16'-10" | 27'-0" | 23'-6" | 33'-8" | 30'-2" |
| | 5' | 4'-3⅜" | 7'-0" | 2'-8⅜" | 13'-8" | 9'-7⅜" | 20'-4" | 16'-0⅜" | 27'-0" | 22'-8⅜" | 33'-8" | 29'-7⅜" |
| | 6' | 5'-0⅝" | 7'-2" | 2'-1⅛" | 13'-11" | 8'-10⅛" | 20'-8" | 15'-7⅛" | 27'-5" | 22'-1⅛" | 34'-2" | 29'-1⅛" |
| | 7' | 6'-2⅛" | 7'-5" | 1'-0⅝" | 14'-1" | 7'-10⅞" | 20'-11" | 14'-8⅝" | 27'-9" | 21'-4⅝" | 34'-7" | 28'-6⅝" |
| | 8' | 7'-1⅝" | 7'-8" | 0'-0" | 14'-5" | 6'-10" | 21'-0" | 13'-8" | 27'-10" | 20'-6" | 34'-8" | 27'-8" |
| 7' | 4' | 3'-6" | 8'-0" | 4'-6" | 15'-6" | 12'-5" | 23'-8" | 19'-10" | 31'-0" | 27'-6" | 38'-8" | 35'-2" |
| | 5' | 4'-3⅜" | 8'-0" | 3'-8⅜" | 15'-8" | 11'-7⅜" | 23'-8" | 19'-0⅜" | 31'-0" | 26'-8⅜" | 38'-8" | 34'-7⅜" |
| | 6' | 5'-0⅝" | 8'-2" | 3'-1⅛" | 15'-11" | 10'-10⅛" | 23'-8" | 18'-3⅛" | 31'-5" | 26'-1⅛" | 39'-2" | 34'-1⅛" |
| | 7' | 6'-2⅛" | 8'-5" | 2'-0⅝" | 16'-1" | 9'-10⅞" | 23'-11" | 17'-2⅝" | 31'-9" | 25'-4⅝" | 39'-7" | 33'-6⅝" |
| | 8' | 7'-1⅝" | 8'-8" | 1'-0" | 16'-5" | 8'-10" | 24'-0" | 16'-2" | 31'-10" | 24'-6" | 39'-8" | 32'-8" |
| 8' | 4' | 3'-6" | 9'-0" | 5'-6" | 17'-6" | 14'-5" | 26'-8" | 22'-10" | 35'-0" | 31'-6" | 43'-8" | 40'-2" |
| | 5' | 4'-3⅜" | 9'-2" | 4'-8⅜" | 17'-11" | 13'-7⅜" | 26'-8" | 22'-0⅜" | 35'-5" | 31'-1⅜" | 44'-2" | 39'-10⅜" |
| | 6' | 5'-0⅝" | 9'-2" | 4'-1⅛" | 17'-11" | 12'-10⅛" | 26'-8" | 21'-3⅛" | 35'-5" | 30'-4⅛" | 44'-2" | 39'-1⅛" |
| | 7' | 6'-2⅛" | 9'-5" | 3'-0⅝" | 18'-1" | 11'-10⅞" | 26'-11" | 20'-0⅝" | 35'-9" | 29'-6⅝" | 44'-7" | 38'-4⅝" |
| | 8' | 7'-1⅝" | 9'-8" | 2'-0" | 18'-5" | 10'-10" | 27'-0" | 19'-0" | 35'-10" | 28'-6" | 44'-8" | 37'-4" |
| 9' | 5' | 4'-3⅜" | 10'-2" | 5'-10⅜" | 19'-11" | 15'-7⅜" | 29'-8" | 25'-4⅜" | 39'-5" | 35'-1⅜" | 49'-2" | 44'-10⅜" |
| | 6' | 5'-0⅝" | 10'-3" | 5'-2⅛" | 20'-1" | 15'-0⅛" | 29'-11" | 24'-7⅛" | 39'-9" | 34'-5⅛" | 49'-7" | 44'-2⅛" |
| | 7' | 6'-2⅛" | 10'-5" | 4'-0⅝" | 20'-1" | 13'-10⅞" | 29'-11" | 23'-5⅝" | 39'-9" | 33'-5⅝" | 49'-7" | 43'-0⅝" |
| | 8' | 7'-1⅝" | 10'-8" | 3'-0" | 20'-5" | 12'-10" | 30'-0" | 22'-5" | 39'-10" | 32'-6" | 49'-8" | 42'-0" |
| 10' | 5' | 4'-3⅜" | 11'-2" | 6'-0⅜" | 21'-10" | 17'-7⅜" | 32'-8" | 28'-4⅜" | 43'-5" | 39'-1⅜" | 54'-2" | 49'-10⅜" |
| | 6' | 5'-0⅝" | 11'-3" | 6'-2⅛" | 22'-1" | 17'-0⅛" | 32'-11" | 27'-10⅛" | 43'-9" | 38'-6⅛" | 54'-7" | 49'-2⅛" |
| | 7' | 6'-2⅛" | 11'-5" | 5'-0⅝" | 22'-1" | 15'-10⅞" | 32'-11" | 26'-8⅝" | 43'-9" | 37'-6⅝" | 54'-7" | 48'-0⅝" |
| | 8' | 7'-1⅝" | 11'-8" | 4'-0" | 22'-5" | 14'-10" | 33'-0" | 25'-8" | 43'-10" | 36'-6" | 54'-8" | 47'-0" |
| 11' | 6' | 5'-0⅝" | 12'-4" | 7'-3⅛" | 24'-2" | 19'-1⅛" | 36'-0" | 30'-11⅛" | 47'-10" | 42'-3⅛" | | |
| | 7' | 6'-2⅛" | 12'-6" | 6'-1⅝" | 24'-2" | 17'-11⅞" | 36'-0" | 29'-9⅝" | 47'-10" | 41'-3⅝" | | |
| | 8' | 7'-1⅝" | 12'-9" | 5'-1" | 24'-6" | 16'-10" | 36'-0" | 28'-8" | 47'-10" | 40'-6" | | |
| 12' | 6' | 5'-0⅝" | 13'-4" | 8'-3⅛" | 26'-5" | 21'-1⅛" | 39'-0" | 33'-11⅛" | 51'-10" | 46'-3⅛" | | |
| | 7' | 6'-2⅛" | 13'-6" | 7'-1⅝" | 26'-5" | 19'-11⅞" | 39'-0" | 32'-9⅝" | 51'-10" | 45'-3⅝" | | |
| | 8' | 7'-1⅝" | 13'-9" | 6'-1" | 26'-9" | 18'-10" | 39'-0" | 31'-8" | 51'-10" | 44'-6" | | |

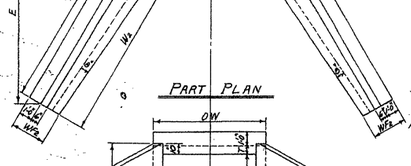
Membrane waterproofing - 12" wide on back face of wing.

Construction Joint

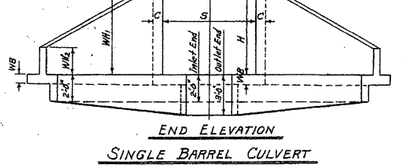
H4 @ 12" ctrs.

60°

WB

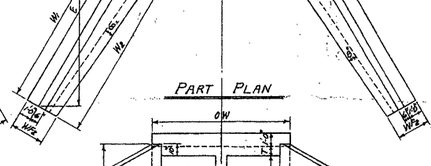



PART PLAN

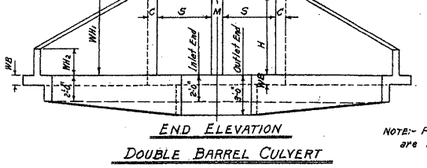



END ELEVATION

SINGLE BARREL CULVERT

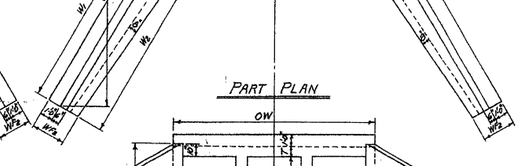



PART PLAN

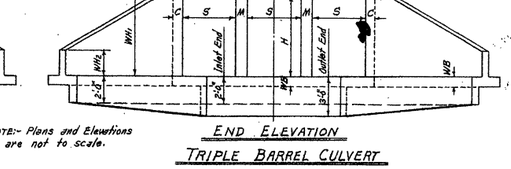



END ELEVATION

DOUBLE BARREL CULVERT



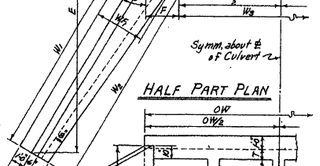

PART PLAN




END ELEVATION

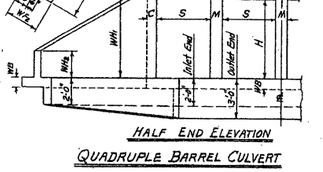
TRIPLE BARREL CULVERT

NOTE:- Plans and Elevations are not to scale.



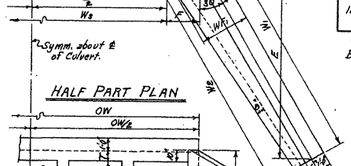

Symm. about ℄ of Culvert

HALF PART PLAN



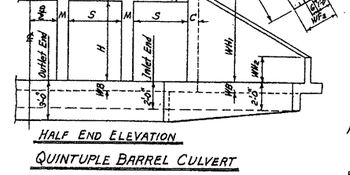

HALF END ELEVATION

QUADRUPLE BARREL CULVERT




℄ Symm. about ℄ of Culvert.

HALF PART PLAN




HALF END ELEVATION

QUINTUPLE BARREL CULVERT

## BAR LIST FOR ONE WING - 4 REQUIRED

| CLEAR HEIGHT H | F1 BENT: In bottom of footing, bent up into back face of wing. One bar of each length. SIZE | SPACING | No. REQ'D | LENGTHS VARY MIN. | MAX. | X MIN. | X MAX. | Y MIN. | Y MAX. | F2 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE | SPACING | No. REQ'D | LENGTH | F3 STRAIGHT: Longitudinal in top of wing footing heel. SIZE | No. REQ'D | LENGTH | F4 STRAIGHT: Longitudinal in bottom of wing footing toe. SIZE | No. REQ'D | LENGTH | H1 STRAIGHT: Horizontal in back face of wing. One bar of each length. SIZE | SPACING | No. REQ'D | LENGTH | H2 STRAIGHT: Horizontal in back face of wing. One bar of each length. SIZE | SPACING | No. REQ'D | LENGTHS VARY MAX. | MIN. | H3 STRAIGHT: In back face of wing at top - on slope. SIZE | No. REQ'D | LENGTH | H4 BENT: Dowels thru construction joint at headwall. SIZE | SPACING | No. REQ'D | LENGTH | X | QUANTITY REINFORCING STEEL PER WING LB. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2' | #3 | 12" | 8 | 1'-6" | 3'-10" | 0'-8" | 1'-0" | 0'-11" | 2'-11" | — | — | — | — | #3 | 1 | 9'-8" | #3 | 2 | 8'-6" | #3 | 12" | 1 | 7'-1" | #3 | 12" | 1 | 7'-6" | #3 | 12" | 2 | 2'-8" | 1'-9" | #3 | 1 | 7'-4" | #3 | 12" | 2 | 2'-8" | 1'-9" | 27.0 |
| 3' | #3 | 12" | 10 | 2'-2" | 5'-2" | 0'-10" | 1'-5" | 1'-5" | 4'-0" | — | — | — | — | #3 | 1 | 12'-0" | #3 | 2 | 11'-0" | #3 | 12" | 1 | 9'-6" | #3 | 12" | 2 | 7'-6" | 4'-0" | #8 | 1 | 9'-9" | #3 | 12" | 3 | 2'-8" | 1'-9" | 41.1 |
| 4' | #3 | 12" | 13 | 2'-9" | 6'-6" | 0'-11" | 1'-7" | 1'-11" | 5'-0" | — | — | — | — | #3 | 1 | 14'-9" | #3 | 3 | 13'-6" | #3 | 12" | 1 | 11'-10" | #3 | 12" | 3 | 10'-11" | 4'-0" | #3 | 1 | 12'-2" | #3 | 12" | 4 | 2'-8" | 1'-9" | 63.7 |
| 5' | #3 | 12" | 15 | 2'-11" | 7'-10" | 1'-1" | 1'-11" | 1'-11" | 6'-0" | #3 | 12" | 4 | 3'-6" | #3 | 1 | 16'-8" | #3 | 3 | 16'-0" | #8 | 12" | 2 | 14'-2" | #3 | 12" | 3 | 10'-11" | 4'-0" | #3 | 1 | 14'-5" | #3 | 12" | 5 | 2'-8" | 1'-9" | 89.5 |
| 6' | #4 | 12" | 17 | 3'-6" | 9'-3" | 1'-2" | 2'-3" | 2'-5" | 7'-1" | #3 | 12" | 4 | 4'-6" | #3 | 1 | 18'-0" | #3 | 3 | 18'-6" | #3 | 12" | 2 | 16'-6" | #3 | 12" | 4 | 14'-4" | 4'-0" | #3 | 1 | 17'-0" | #3 | 12" | 6 | 2'-8" | 1'-9" | 145.8 |
| 7' | #4 | 12" | 20 | 3'-9" | 10'-9" | 1'-3" | 2'-9" | 2'-7" | 8'-1" | #4 | 12" | 7 | 5'-6" | 1'-7" | 4'-0" | #4 | 1 | 21'-6" | #4 | 4 | 21'-0" | #4 | 12" | 2 | 18'-9" | #4 | 12" | 5 | 17'-9" | 4'-0" | #4 | 1 | 19'-5" | #4 | 12" | 7 | 3'-6" | 1'-9" | 283.7 |
| 8' | #4 | 12" | 22 | 4'-4" | 12'-3" | 1'-5" | 3'-2" | 3'-0" | 9'-2" | #4 | 12" | 10 | 6'-6" | 1'-10" | 4'-9" | #4 | 1 | 23'-8" | #4 | 4 | 22'-9" | #4 | 12" | 3 | 21'-1" | #4 | 12" | 5 | 17'-9" | 4'-0" | #4 | 1 | 21'-10" | #4 | 12" | 8 | 3'-6" | 1'-9" | 356.4 |

BAR BENDING DIAGRAMS




NOTE:- Dimensions are to bar centers.

## QUANTITIES

| CLEAR SPAN S | CLEAR HEIGHT H | THICKNESS OF WING FOOTING Cw | THICKNESS OF WING FOOTING WB | REINFORCING STEEL - LB. FOR 4 WINGS | CLASS S CONCRETE - 4 WINGS: HEADWALLS, WINGWALLS, FOOTINGS, TOE WALLS AND APRONS — SINGLE BARREL CULVERT | DOUBLE BARREL CULVERT | TRIPLE BARREL CULVERT | QUADRUPLE BARREL CULVERT | QUINTUPLE BARREL CULVERT |
|---|---|---|---|---|---|---|---|---|---|
| S | H | Cw | WB | LB. | CU.YD. | CU.YD. | CU.YD. | CU.YD. | CU.YD. |
| 4' | 2' | 6" | 7" | 108.0 | 4.50 | 5.96 | 6.42 | 7.38 | 8.34 |
| | 3' | 6" | 7" | 169.2 | 6.26 | 7.21 | 8.17 | 9.13 | 10.09 |
| | 4' | 6" | 7" | 251.6 | 8.33 | 9.28 | 10.24 | 11.20 | 12.16 |
| | 5' | 6" | 7" | 357.8 | 10.72 | 11.68 | 12.64 | 13.60 | 14.56 |
| | 6' | 7" | 8" | 583.1 | 14.55 | 15.53 | 16.52 | 17.51 | 18.49 |
| 5' | 3' | 6" | 7" | 164.9 | 6.97 | 7.63 | 8.79 | 9.96 | 11.12 |
| | 4' | 6" | 7" | 254.6 | 8.54 | 9.70 | 10.87 | 10.03 | 13.20 |
| | 5' | 6" | 7" | 357.8 | 10.94 | 12.10 | 13.26 | 14.43 | 15.59 |
| | 6' | 7" | 8" | 583.1 | 14.77 | 15.96 | 17.15 | 18.34 | 19.54 |
| | 7' | 7½" | 8½" | 1184.6 | 18.94 | 20.15 | 21.37 | 22.59 | 23.80 |
| 6' | 3' | 6" | 7" | 164.9 | 6.68 | 8.06 | 9.92 | 10.80 | 12.18 |
| | 4' | 6" | 7" | 254.6 | 8.75 | 10.14 | 11.99 | 12.87 | 14.25 |
| | 5' | 6" | 7" | 357.8 | 11.15 | 12.53 | 13.89 | 15.27 | 16.65 |
| | 6' | 7" | 8" | 583.1 | 14.98 | 16.39 | 17.78 | 19.18 | 20.59 |
| | 7' | 7½" | 8½" | 1139.6 | 19.15 | 20.58 | 22.00 | 23.93 | 24.86 |
| | 8' | 8" | 9" | 1925.6 | 24.09 | 25.53 | 26.96 | 28.39 | 29.83 |
| 7' | 4' | 6" | 7" | 254.6 | 8.97 | 10.58 | 12.15 | 13.76 | 15.35 |
| | 5' | 6" | 7" | 357.8 | 11.36 | 12.97 | 14.54 | 16.15 | 17.75 |
| | 6' | 7" | 8" | 583.1 | 15.20 | 16.82 | 18.92 | 20.04 | 21.66 |
| | 7' | 7½" | 8½" | 1139.6 | 19.38 | 21.02 | 22.64 | 24.28 | 25.92 |
| | 8' | 8" | 9" | 1925.6 | 24.32 | 25.97 | 27.60 | 29.25 | 30.89 |
| 8' | 4' | 6" | 7" | 254.6 | 9.19 | 11.03 | 12.82 | 14.65 | 16.45 |
| | 5' | 7" | 7" | 357.8 | 12.03 | 13.89 | 15.70 | 17.55 | 19.36 |
| | 6' | 7" | 8" | 583.1 | 15.92 | 17.27 | 19.09 | 20.93 | 22.75 |
| | 7' | 7½" | 8½" | 1139.6 | 19.59 | 21.96 | 23.30 | 25.16 | 26.99 |
| | 8' | 8" | 9" | 1925.6 | 24.54 | 26.91 | 28.29 | 30.11 | 31.96 |
| 9' | 5' | 7" | 7" | 357.8 | 12.26 | 14.39 | 16.37 | 18.45 | 20.47 |
| | 6' | 7½" | 8" | 583.1 | 15.96 | 18.04 | 20.09 | 22.19 | 24.23 |
| | 7' | 7½" | 8½" | 1139.6 | 19.81 | 21.91 | 23.96 | 26.06 | 28.10 |
| | 8' | 8" | 9" | 1925.6 | 24.76 | 26.86 | 28.91 | 31.00 | 33.05 |
| 10' | 5' | 7" | 7" | 357.8 | 12.99 | 14.80 | 17.05 | 19.24 | 21.52 |
| | 6' | 7½" | 8" | 583.1 | 16.17 | 18.50 | 20.77 | 22.99 | 25.28 |
| | 7' | 7½" | 8½" | 1139.6 | 20.04 | 22.37 | 24.64 | 26.87 | 29.15 |
| | 8' | 8" | 9" | 1925.6 | 24.98 | 27.31 | 29.58 | 31.81 | 34.10 |
| 11' | 6' | 8" | 9" | 583.1 | 16.69 | 19.27 | 21.76 | 24.23 | |
| | 7' | 8" | 8½" | 1139.6 | 20.64 | 23.22 | 25.71 | 28.18 | |
| | 8' | 8" | 9" | 1925.6 | 25.19 | 27.77 | 30.27 | 32.74 | |
| 12' | 6' | 8" | 9" | 583.1 | 16.92 | 19.75 | 22.95 | 25.18 | |
| | 7' | 8" | 8½" | 1139.6 | 20.87 | 23.69 | 26.90 | 29.13 | |
| | 8' | 8" | 9" | 1925.6 | 25.92 | 28.25 | 30.96 | 33.69 | |

* For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾ chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"

Reinforcing Steel 20,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos. as listed below.

| SINGLES | DOUBLES | TRIPLES | QUADRUPLES | QUINTUPLES |
|---|---|---|---|---|
| R-100X-0 | R-200X-0 | R-300X-0 | R-400X-0 | R-500X-0 |
| R-100X-X1 | R-200X-X1 | R-300X-X1 | R-400X-X1 | R-500X-X1 |
| R-100X-X2 | R-200X-X2 | R-300X-X2 | R-400X-X2 | |
| | R-200X-X3 | R-300X-X3 | | |

CLASS S CONCRETE

# ARKANSAS STATE HIGHWAY COMMISSION

## DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X003-1

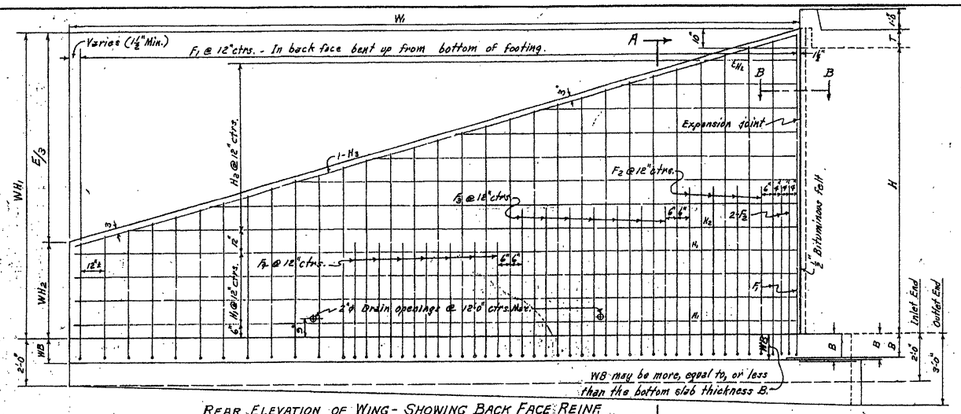
MEMBRANE:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

REVISIONS:- Membrane added. 5-10-66 W.C.H.

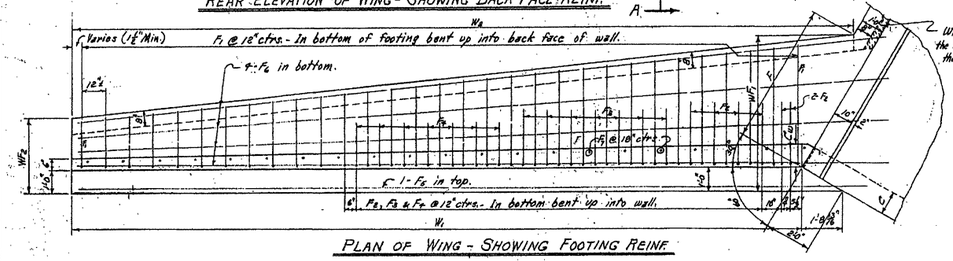
Designed By:- W.C.H. 6-20-62. Checked By:- RMS 1-9-63
Drawn By:- W.C.H. 12-4-62. Checked By:- RMS 1-31-63
Quantities By:- W.C.H. 12-14-62. Rechecked By:- RMS 3-29-63

MYLAR

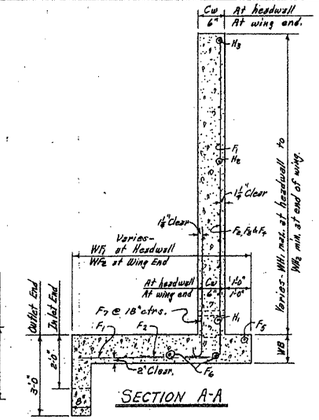
| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No: | | | | | |



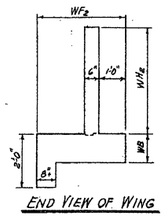

REAR ELEVATION OF WING - SHOWING BACK FACE REINF.




PLAN OF WING - SHOWING FOOTING REINF.

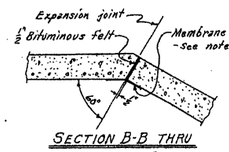



SECTION A-A

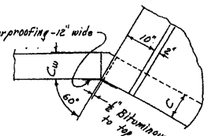



END VIEW OF WING

When B is more than WB, the shaded portion of the apron shall be made the same thickness as the barrel base B.




SECTION B-B THRU EXPANSION JOINT



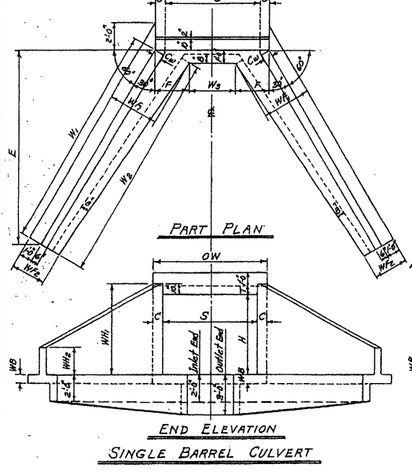

DETAIL AT TOP OF WING

## WING DIMENSIONS

| CLEAR HEIGHT OF BOX | THICKNESS OF WING FOOTING | THICKNESS OF WING AT HEADWALL = C. | WINGWALL HEIGHTS: AT HEADWALL | WINGWALL HEIGHTS: AT END OF WING | WIDTHS OF WING FOOTINGS: AT HEADWALL | WIDTHS OF WING FOOTINGS: AT END OF WING | PERPENDICULAR FOOTING DIMENSION F | * QUANTITY PER WING CLASS S CONCRETE: PERPENDICULAR DIST. FROM HDWL. TO END OF WING E | LENGTH OF WING WALLS W1 | INSIDE FOOTING DIMENSION W2 | INLET END Cu.Yd. | OUTLET END Cu.Yd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | WB | Cw | WH1 | WH2 | WF1 | WF2 | F | E | W1 | W2 | Cu.Yd. | Cu.Yd. |
| 9' | 10" | 9" | 9'-10" | 3'-0" | 5'-8" | 2'-10½" | 4'-3" | 20'-6" | 23'-8" | 24'-11" | 7.492 | 7.810 |
| 10' | 11" | 10" | 10'-10" | 3'-9" | 5'-8" | 3'-0" | 4'-10" | 22'-6" | 25'-11⅛" | 27'-6⅝" | 9.564 | 9.905 |
| 11' | 12" | 11" | 11'-10" | 3'-8" | 6'-2" | 3'-1⅝" | 5'-5" | 24'-6" | 28'-3⅝" | 30'-1⅛" | 11.977 | 12.361 |
| 12' | 13" | 12" | 12'-10" | 4'-0" | 6'-8" | 3'-3" | 6'-0" | 26'-6" | 30'-7⅛" | 32'-5⅝" | 14.791 | 15.206 |

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W3.

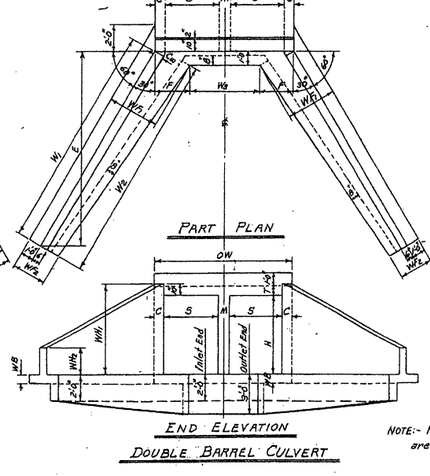
| CLEAR SPAN | CLEAR HEIGHT | 2' FOOTING DIMENSION | W3 = (OW - 2F) SINGLE BARREL CULVERT OW | SINGLE BARREL CULVERT W3 | DOUBLE BARREL CULVERT OW | DOUBLE BARREL CULVERT W3 | TRIPLE BARREL CULVERT OW | TRIPLE BARREL CULVERT W3 | QUADRUPLE BARREL CULVERT OW | QUADRUPLE BARREL CULVERT W3 | QUINTUPLE BARREL CULVERT OW | QUINTUPLE BARREL CULVERT W3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | H | 2F | OW | W3 | OW | W3 | OW | W3 | OW | W3 | OW | W3 |
| 7' | 9' | 8'-6" | 8'-6" | 0'-0" | 16'-5" | 7'-11" | 24'-6" | 15'-10" | 32'-8" | 23'-9" | 40'-2" | 31'-8" |
| 8' | 9' | 9'-6" | 9'-6" | 1'-0" | 18'-5" | 9'-11" | 27'-6" | 18'-10" | 36'-8" | 27'-9" | 45'-2" | 36'-8" |
| | 10' | 9'-8" | 9'-8" | 0'-10" | 18'-8" | 9'-10" | 27'-8" | 18'-0" | 36'-8" | 27'-6" | 45'-8" | 36'-0" |
| 9' | 9' | 8'-6" | 10'-6" | 2'-0" | 20'-5" | 11'-11" | 30'-6" | 21'-10" | 40'-8" | 31'-9" | 50'-8" | 41'-8" |
| | 10' | 9'-8" | 10'-8" | 1'-0" | 20'-8" | 11'-0" | 30'-8" | 21'-0" | 40'-8" | 31'-0" | 50'-8" | 41'-0" |
| | 11' | 10'-10" | 10'-10" | 0'-10" | 20'-10" | 10'-10" | 30'-10" | 20'-0" | 40'-10" | 30'-0" | 50'-10" | 40'-0" |
| 10' | 9' | 8'-6" | 11'-6" | 3'-0" | 22'-5" | 13'-11" | 33'-6" | 24'-10" | 44'-8" | 35'-9" | 55'-8" | 46'-8" |
| | 10' | 9'-8" | 11'-8" | 2'-0" | 22'-8" | 13'-0" | 33'-8" | 24'-0" | 44'-8" | 35'-0" | 55'-8" | 46'-0" |
| | 11' | 10'-10" | 11'-10" | 1'-0" | 22'-10" | 12'-0" | 33'-10" | 23'-0" | 44'-10" | 34'-0" | 55'-10" | 45'-0" |
| | 12' | 12'-0" | 12'-0" | 0'-0" | 23'-0" | 11'-0" | 34'-0" | 22'-0" | 45'-0" | 33'-0" | 56'-0" | 44'-0" |
| 11' | 9' | 8'-6" | 12'-6" | 4'-0" | 24'-5" | 15'-11" | 36'-6" | 27'-10" | 48'-8" | 39'-9" | | |
| | 10' | 9'-8" | 12'-8" | 3'-0" | 24'-8" | 15'-0" | 36'-8" | 27'-0" | 48'-8" | 39'-0" | | |
| | 11' | 10'-10" | 12'-10" | 2'-0" | 24'-10" | 14'-0" | 36'-10" | 26'-0" | 48'-10" | 38'-0" | | |
| | 12' | 12'-0" | 13'-0" | 1'-0" | 25'-0" | 13'-0" | 37'-0" | 25'-0" | 49'-0" | 37'-0" | | |
| 12' | 9' | 8'-6" | 13'-6" | 5'-0" | 26'-5" | 17'-11" | 39'-6" | 30'-10" | 52'-8" | 43'-9" | | |
| | 10' | 9'-8" | 13'-8" | 4'-0" | 26'-8" | 17'-0" | 39'-8" | 30'-0" | 52'-8" | 43'-0" | | |
| | 11' | 10'-10" | 13'-10" | 3'-0" | 26'-10" | 16'-0" | 39'-10" | 29'-0" | 52'-10" | 42'-0" | | |
| | 12' | 12'-0" | 14'-0" | 2'-0" | 27'-0" | 15'-0" | 40'-0" | 28'-0" | 53'-0" | 41'-0" | | |




PART PLAN

END ELEVATION

SINGLE BARREL CULVERT

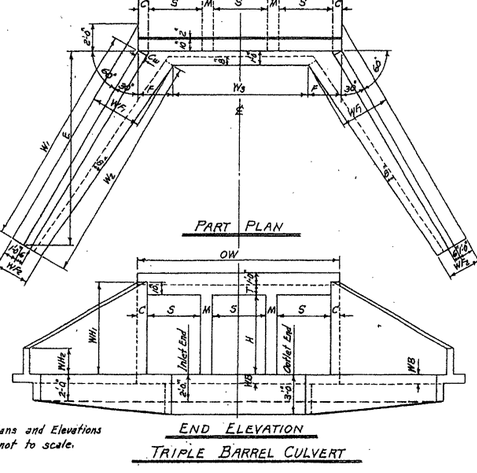



PART PLAN

END ELEVATION

DOUBLE BARREL CULVERT

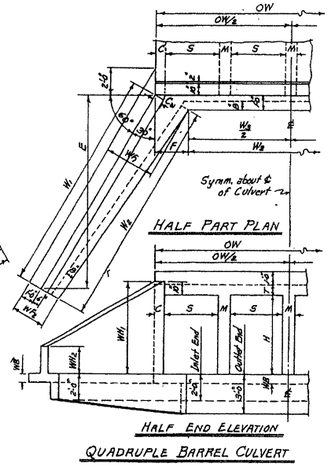
NOTE:- Plans and Elevations are not to scale.




PART PLAN

END ELEVATION

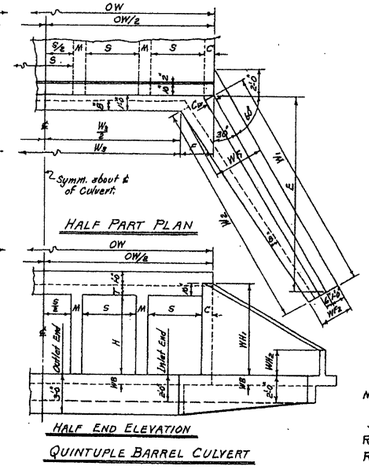
TRIPLE BARREL CULVERT




HALF PART PLAN

HALF END ELEVATION

QUADRUPLE BARREL CULVERT




HALF PART PLAN

HALF END ELEVATION

QUINTUPLE BARREL CULVERT

## BAR LIST FOR ONE WING - 4 REQUIRED

| CLEARANCE HEIGHT H | F1 BENT: In bottom of footing, bent up into back face of wing. One bar of each length. Size | Spacing | No. Reqd | Lengths Vary Min. | Lengths Vary Max. | X Min. | X Max. | Y Min. | Y Max. |
|---|---|---|---|---|---|---|---|---|---|
| 9' | #5 | 12" | 24 | 5'-8" | 13'-10" | 1'-6" | 3'-8" | 3'-7" | 10'-9" |
| 10' | #5 | 12" | 27 | 5'-8" | 15'-5" | 1'-7" | 4'-2" | 3'-10" | 11'-6" |
| 11' | #5 | 12" | 29 | 6'-0" | 16'-11" | 1'-9" | 4'-7" | 4'-4" | 12'-5" |
| 12' | #5 | 12" | 31 | 6'-8" | 18'-5" | 1'-11" | 5'-0" | 4'-10" | 13'-6" |

| CLEARANCE HEIGHT H | F2 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. Size | Spacing | No. Reqd | Length | X | Y |
|---|---|---|---|---|---|---|
| 9' | #6 | 12" | 3 | 7'-6" | 2'-1" | 5'-6" |
| 10' | #6 | 12" | 2 | 8'-6" | 2'-9" | 6'-3" |
| 11' | #6 | 12" | 6 | 8'-6" | 2'-9" | 6'-3" |
| 12' | #7 | 12" | 6 | 9'-6" | 2'-9" | 7'-0" |

| CLEARANCE HEIGHT H | F3 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. Size | Spacing | No. Reqd | Length | X | Y |
|---|---|---|---|---|---|---|
| 9' | #5 | 12" | 7 | 6'-6" | 1'-10" | 4'-9" |
| 10' | #5 | 12" | 9 | 7'-6" | 2'-1" | 5'-6" |
| 11' | #5 | 12" | 9 | 7'-6" | 2'-1" | 5'-6" |
| 12' | #6 | 12" | 7 | 8'-6" | 2'-4" | 6'-3" |

| CLEARANCE HEIGHT H | F4 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. Size | Spacing | No. Reqd | Length | X | Y |
|---|---|---|---|---|---|---|
| 9' | — | — | — | — | — | — |
| 10' | — | — | — | — | — | — |
| 11' | — | — | — | — | — | — |
| 12' | — | — | — | — | — | — |

| CLEARANCE HEIGHT H | F5 STRAIGHT: Longitudinal in top of wing footing heel. Size | No. Reqd | Length |
|---|---|---|---|
| 9' | #4 | 1 | 26'-0" |
| 10' | #4 | 1 | 28'-9" |
| 11' | #4 | 1 | 30'-8" |
| 12' | #4 | 1 | 33'-0" |

| CLEARANCE HEIGHT H | F6 STRAIGHT: Longitudinal in bottom of wing footing toe. Size | No. Reqd | Length |
|---|---|---|---|
| 9' | #4 | 4 | 26'-3" |
| 10' | #4 | 4 | 29'0" |
| 11' | #4 | 4 | 31'-6" |
| 12' | #4 | 4 | 33'-0" |

| CLEARANCE HEIGHT H | H1 STRAIGHT: Horizontal in back face of wing. Size | Spacing | No. Reqd | Length |
|---|---|---|---|---|
| 9' | #4 | 12" | 3 | 23'-5" |
| 10' | #4 | 12" | 3 | 25'-8" |
| 11' | #4 | 12" | 4 | 28'-0" |
| 12' | #4 | 12" | 4 | 30'-8" |

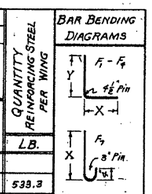
| CLEARANCE HEIGHT H | H2 STRAIGHT: Horizontal in back face of wing. One bar of each length. Size | Spacing | No. Reqd | Lengths Vary Max. | Lengths Vary Min. |
|---|---|---|---|---|---|
| 9' | #4 | 12" | 6 | 21'-5" | 4'-0" |
| 10' | #4 | 12" | 7 | 24'-7" | 4'-0" |
| 11' | #4 | 12" | 7 | 24'-7" | 4'-0" |
| 12' | #4 | 12" | 8 | 28'-0" | 4'-0" |

| CLEARANCE HEIGHT H | H3 STRAIGHT: In back face of wing at top - on slope Size | No. Reqd | Length |
|---|---|---|---|
| 9' | #4 | 1 | 29'-1" |
| 10' | #4 | 1 | 26'-6" |
| 11' | #4 | 1 | 28'-11" |
| 12' | #4 | 1 | 31'-6" |

| CLEARANCE HEIGHT H | F7 BENT: Footing dowels extending up into front face of wing. Size | Spacing | No. Reqd | Length | X |
|---|---|---|---|---|---|
| 9' | #4 | 18" | 16 | 4'-0" | 3'-6" |
| 10' | #4 | 18" | 18 | 4'-3" | 3'-9" |
| 11' | #4 | 18" | 19 | 4'-9" | 4'-3" |
| 12' | #4 | 18" | 21 | 5'-0" | 4'-6" |

| CLEARANCE HEIGHT H | QUANTITY REINFORCING STEEL PER WING LB. |
|---|---|
| 9' | 533.3 |
| 10' | 662.9 |
| 11' | 810.8 |
| 12' | 1018.3 |

BAR BENDING DIAGRAMS




NOTE:- Dimensions are to bar centers.

* Except as shown at headwall.

## QUANTITIES

| CLEAR SPAN | CLEAR HEIGHT | THICKNESS OF WING AT HEADWALL | THICKNESS OF WING FOOTING | REINFORCING STEEL - ALL 4 WINGS | CLASS S CONCRETE - 4 WINGS: HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS: SINGLE BARREL CULVERT | DOUBLE BARREL CULVERT | TRIPLE BARREL CULVERT | QUADRUPLE BARREL CULVERT | QUINTUPLE BARREL CULVERT |
|---|---|---|---|---|---|---|---|---|---|
| S | H | Cw | WB | LB. | CU.YD. | CU.YD. | CU.YD. | CU.YD. | CU.YD. |
| 7' | | | | | | | | | |
| | 9' | 9" | 10" | 2133.2 | 31.16 | 32.84 | 34.51 | 36.19 | 37.87 |
| 8' | 9' | 9" | 10" | 2133.2 | 31.39 | 33.28 | 35.16 | 37.05 | 38.94 |
| | 10' | 10" | 11" | 2651.5 | 39.56 | 41.98 | 43.90 | 45.33 | 47.25 |
| 9' | 9' | 9" | 10" | 2133.2 | 31.61 | 33.73 | 35.81 | 37.91 | 40.01 |
| | 10' | 10" | 11" | 2651.6 | 39.78 | 41.93 | 44.05 | 46.20 | 48.33 |
| | 11' | 11" | 12" | 3243.1 | 49.39 | 51.55 | 53.70 | 55.87 | 58.02 |
| 10' | 9' | 9" | 10" | 2133.2 | 31.83 | 34.17 | 36.47 | 38.73 | 41.12 |
| | 10' | 10" | 11" | 2651.5 | 40.01 | 42.37 | 44.70 | 47.05 | 49.41 |
| | 11' | 11" | 12" | 3243.1 | 49.62 | 52.00 | 54.36 | 56.73 | 59.11 |
| | 12' | 12" | 13" | 4098.2 | 60.79 | 63.19 | 65.57 | 67.97 | 70.37 |
| 11' | 9' | 9" | 10" | 2133.2 | 32.04 | 34.64 | 37.15 | 39.68 | |
| | 10' | 10" | 11" | 2651.5 | 40.22 | 42.83 | 45.37 | 47.99 | |
| | 11' | 11" | 12" | 3243.1 | 49.84 | 52.45 | 55.02 | 57.61 | |
| | 12' | 12" | 13" | 4098.2 | 61.01 | 63.64 | 66.24 | 68.85 | |
| 12' | 9' | 9" | 10" | 2133.2 | 32.27 | 35.11 | 37.84 | 40.69 | |
| | 10' | 10" | 11" | 2651.5 | 40.44 | 43.30 | 46.06 | 48.92 | |
| | 11' | 11" | 12" | 3243.1 | 50.06 | 52.92 | 55.68 | 58.98 | |
| | 12' | 12" | 13" | 4098.2 | 61.24 | 64.10 | 66.90 | 69.73 | |

* For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾ chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, footings and sidewalls shall be only where shown on plans.

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the expansion joints.

Payment for the membrane waterproofing and bituminous felt shall be included in unit price bid for Class S Concrete.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-

Class S Concrete (n=10) 1200#/"

Reinforcing Steel 20,000#/"

NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos. as listed below.

| SINGLES | DOUBLES | TRIPLES | QUADRUPLES | QUINTUPLES |
|---|---|---|---|---|
| R-100X-0 | R-200X-0 | R-300X-0 | R-400X-0 | R-500X-0 |
| R-100X-X2 | R-200X-X2 | R-300X-X2 | R-400X-X2 | |
| | R-200X-X3 | R-300X-X3 | | |

CLASS S CONCRETE

# ARKANSAS STATE HIGHWAY COMMISSION

## DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

7', 8', 9', 10', 11' & 12' SPANS

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES.

3:1 SLOPES

ALL DEPTHS OF COVER FOR H = 9'-0" & OVER.

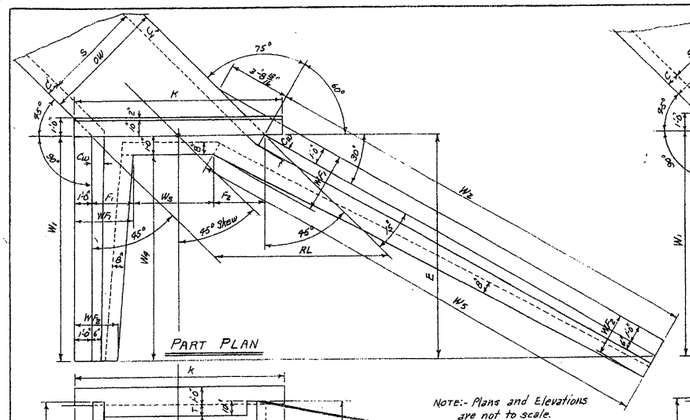
STANDARD DRAWING NO. W-X003-2

Designed By:- W.C.H. 7-25-62 Checked By:- RHS 1-3-63

Drawn By:- W.C.H. 12-31-62 Checked By:- RHS 1-31-63

Quantities By:- W.C.H. 1-11-63 Rechecked By:-

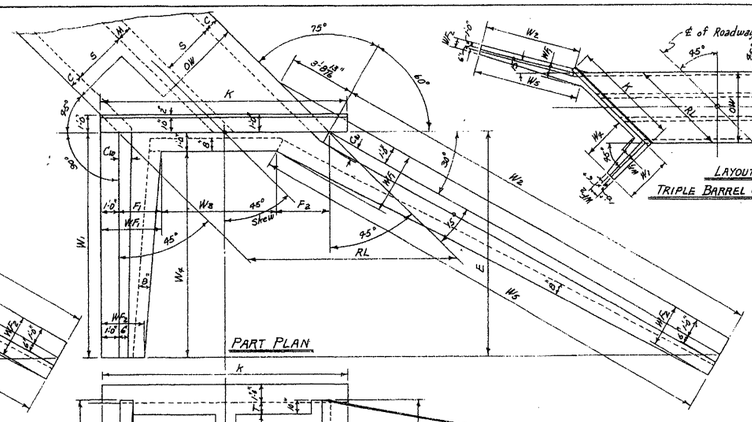
| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |




SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

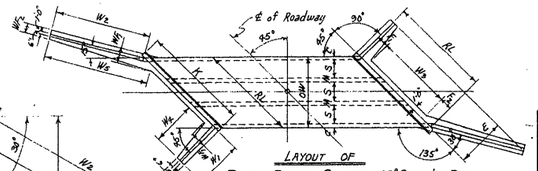
*Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.*

Note:- Plans and Elevations are not to scale.

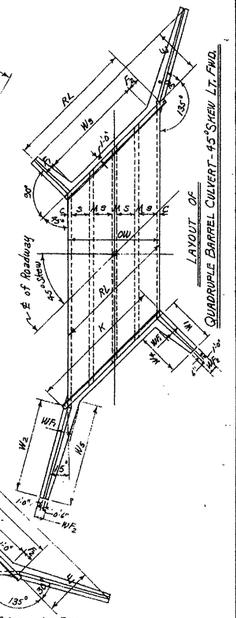



DOUBLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

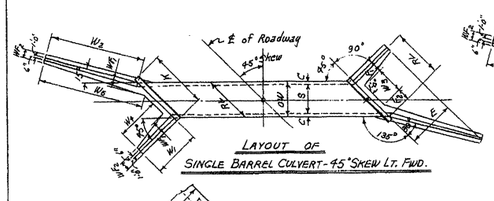
*Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.*



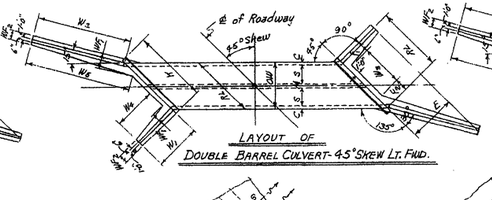

LAYOUT OF TRIPLE BARREL CULVERT - 45° SKEW LT. FWD.



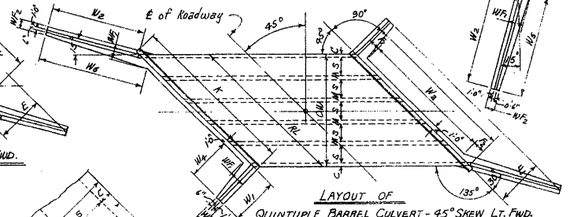

LAYOUT OF QUADRUPLE BARREL CULVERT - 45° SKEW LT. FWD.



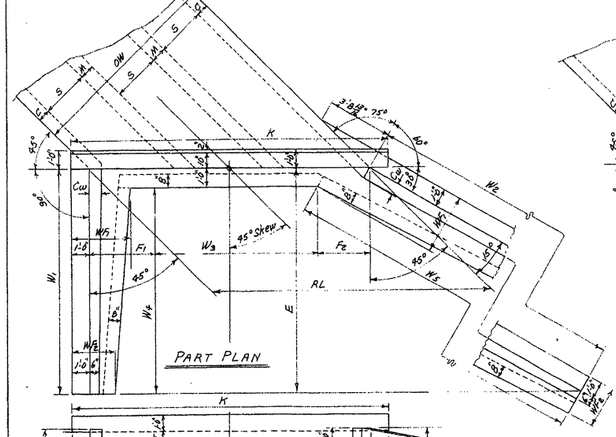

LAYOUT OF SINGLE BARREL CULVERT - 45° SKEW LT. FWD.




LAYOUT OF DOUBLE BARREL CULVERT - 45° SKEW LT. FWD.

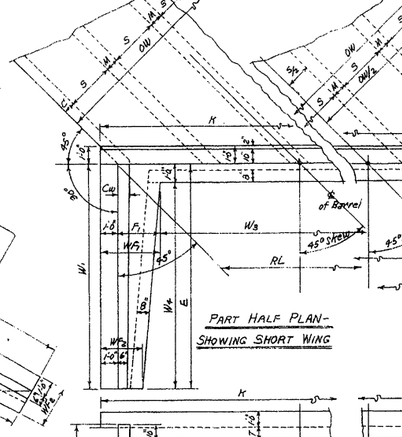



LAYOUT OF QUINTUPLE BARREL CULVERT - 45° SKEW LT. FWD.




TRIPLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

*Details of Culvert with 45° Skew Left Forward is reversed, see Layout at top center of sheet.*

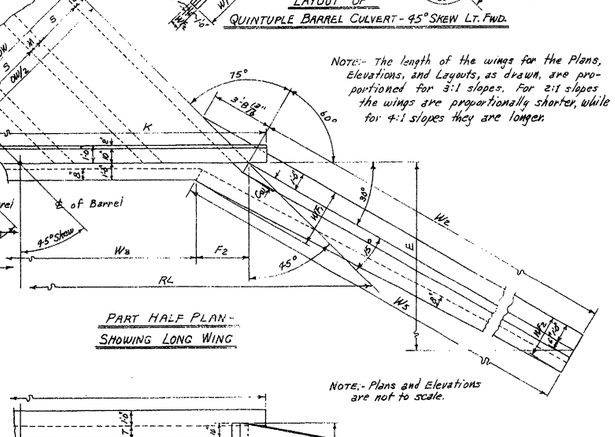



QUADRUPLE BARREL CULVERT - 45° SKEW RT. FWD.

*Details of Culvert with 45° Skew Left Forward is reversed, see Layout at above center.*

Note:- The length of the wings for the Plans, Elevations, and Layouts, as drawn, are proportioned for 3:1 slopes. For 2:1 slopes the wings are proportionally shorter, while for 4:1 slopes they are longer.

Note:- Plans and Elevations are not to scale.




QUINTUPLE BARREL CULVERT - 45° SKEW RT. FWD.

*Details of Culvert with 45° Skew Left Forward is reversed, see Layout above.*

Designed by:- W.C.H. 5-16-63 Checked by:-
Drawn by:- W.C.H. 6-15-64 Checked by:-
Quantities by:- Checked by:- JEM. 6-23-64

ROADWAY LENGTH RL — HEADWALL LENGTH K — APRON DIMENSION $W_3$

RL = OW × 1.4142 + 1

K = RL + (2'0")

$W_3$ = RL − ($F_1$ + $F_2$)

| USE WITH DRAWING NO. | CLEAR SPAN | CLEAR HEIGHT | SLOPE OF HEADWALL DIMENSIONS | SINGLE BARREL CULVERT | | | | DOUBLE BARREL CULVERT | | | | TRIPLE BARREL CULVERT | | | | QUADRUPLE BARREL CULVERT | | | | QUINTUPLE BARREL CULVERT | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S | H | $F_1$ & $F_2$ | OW | RL | K | $W_3$ | OW | RL | K | $W_3$ | OW | RL | K | $W_3$ | OW | RL | K | $W_3$ | OW | RL | K | $W_3$ |
| W-X452-1, W-X453-1 OR W-X454-1. (FOR H=8'0" OR LESS) | 4' | 2' | 3'-3⅛" | 5'-0" | 7'-0⅞" | 9'-0⅞" | 4'-9⅝" | 9'-8" | 13'-8" | 15'-8" | 11'-4⅝" | 14'-4" | 20'-3½" | 22'-3⅜" | 18'-0" | 19'-0" | 26'-10⅝" | 28'-10⅝" | 24'-7⅛" | 23'-8" | 33'-5⅜" | 35'-5⅜" | 31'-2⅝" |
| | | 3' | 3'-3⅛" | 5'-0" | " | " | 3'-7⅛" | 9'-8" | " | " | 10'-4⅜" | 14'-4" | " | " | 17'-0" | 19'-0" | " | " | 23'-7⅛" | 23'-8" | " | " | 30'-2⅝" |
| | | 4' | 4'-3⅛" | 5'-0" | " | " | 2'-5⅜" | 9'-8" | " | " | 9'-0⅜" | 14'-4" | " | " | 16'-0" | 19'-0" | " | " | 22'-7½" | 23'-8" | " | " | 29'-2⅝" |
| | | 5' | 5'-3⅛" | 5'-0" | 7'-0⅞" | 9'-0⅞" | 1'-9⅜" | 9'-8" | 13'-8" | 15'-8" | 8'-8⅝" | 14'-4" | 20'-3½" | 22'-3⅜" | 15'-0" | 19'-0" | 26'-10⅝" | 28'-10⅝" | 21'-7⅛" | 23'-8" | 33'-5⅜" | 35'-5⅜" | 28'-2⅝" |
| | | 6' | 6'-3⅛" | 5'-2" | 7'-3⅜" | 9'-3⅜" | 1'-0⅝" | 9'-11" | 14'-0⅝" | 16'-0⅝" | 7'-0⅜" | 14'-8" | 20'-8⅜" | 22'-9" | 14'-5⅜" | 19'-5" | 27'-5⅝" | 29'-5⅝" | 21'-6⅝" | 24'-2" | 34'-2⅜" | 36'-2" | 27'-10⅜" |
| | 5' | 3' | 3'-3⅛" | 6'-0" | 8'-5⅞" | 10'-5⅞" | 5'-2⅜" | 11'-8" | 16'-6" | 18'-6" | 13'-3⅞" | 17'-4" | 24'-6⅝" | 26'-6⅝" | 21'-3" | 23'-0" | 32'-6⅝" | 34'-6⅝" | 29'-1⅝" | 28'-8" | 40'-6⅝" | 42'-6⅝" | 37'-3⅜" |
| | | 4' | 4'-3⅛" | 6'-0" | " | " | 4'-2⅝" | 11'-8" | " | " | 12'-2⅝" | 17'-4" | " | " | 20'-3" | 23'-0" | " | " | 28'-3⅜" | 28'-8" | " | " | 36'-3⅝" |
| | | 5' | 5'-3⅛" | 6'-0" | 8'-5⅞" | 10'-5⅞" | 3'-2⅜" | 11'-8" | 16'-6" | 18'-6" | 11'-2⅜" | 17'-4" | 24'-6⅝" | 26'-6⅝" | 19'-3" | 23'-0" | 32'-6⅝" | 34'-6⅝" | 27'-1⅜" | 28'-8" | 40'-6⅝" | 42'-6⅝" | 35'-3⅜" |
| | | 6' | 6'-3⅛" | 6'-2" | 8'-8⅜" | 10'-8⅜" | 2'-5⅛" | 11'-11" | 16'-10⅜" | 18'-10⅜" | 10'-1" | 17'-8" | 25'-0⅛" | 27'-0" | 18'-0⅜" | 23'-5" | 33'-1⅜" | 35'-1⅜" | 26'-10⅜" | 29'-2" | 41'-3" | 43'-3" | 34'-11⅜" |
| | | 7' | 7'-3⅛" | 6'-3" | 8'-10⅝" | 10'-10⅝" | 1'-0⅜" | 12'-1" | 17'-1" | 19'-1" | 9'-3⅜" | 17'-11" | 25'-4" | 27'-4" | 17'-6⅝" | 23'-9" | 33'-5" | 35'-5" | 26'-9⅝" | 29'-7" | 41'-10" | 43'-10" | 34'-6⅜" |
| | 6' | 3' | 3'-3⅛" | 7'-0" | 9'-10⅜" | 11'-10⅜" | 6'-7⅞" | 13'-8" | 19'-3⅜" | 21'-3" | 16'-0⅜" | 20'-4" | 28'-9⅝" | 30'-9" | 25'-5⅜" | 27'-0" | 38'-2⅝" | 40'-2⅝" | 34'-11" | 33'-8" | 47'-7⅜" | 49'-7⅜" | 43'-4" |
| | | 4' | 4'-3⅛" | 7'-0" | " | " | 5'-7⅞" | 13'-8" | " | " | 15'-0⅜" | 20'-4" | " | " | 29'-5⅝" | 27'-0" | " | " | 33'-11" | 33'-8" | " | " | 43'-4" |
| | | 5' | 5'-3⅛" | 7'-0" | 9'-10⅜" | 11'-10⅜" | 4'-7⅞" | 13'-8" | 19'-3⅜" | 21'-3" | 14'-0⅜" | 20'-4" | 28'-9⅝" | 30'-9" | 23'-5⅜" | 27'-0" | 38'-2⅝" | 40'-2⅝" | 32'-11" | 33'-8" | 47'-7⅜" | 49'-7⅜" | 42'-4" |
| | | 6' | 6'-3⅛" | 7'-2" | 10'-1⅜" | 12'-1⅜" | 3'-10⅜" | 13'-11" | 19'-10⅜" | 21'-10⅜" | 13'-5" | 20'-10" | 29'-2⅜" | 31'-2⅜" | 22'-11⅛" | 27'-5" | 38'-9⅜" | 40'-9⅜" | 32'-6" | 34'-2" | 48'-3⅜" | 50'-3⅜" | 42'-0⅜" |
| | | 7' | 7'-3⅛" | 7'-3" | 10'-3" | 12'-3" | 2'-5⅜" | 14'-1" | 19'-11" | 21'-11" | 12'-1⅜" | 20'-11" | 29'-7" | 31'-7" | 21'-9⅜" | 27'-9" | 39'-3" | 41'-3" | 31'-5⅜" | 34'-7" | 48'-10⅜" | 50'-11" | 41'-7⅜" |
| | | 8' | 8'-3⅛" | 7'-4" | 10'-4½" | 12'-4½" | 1'-1⅛" | 14'-2" | 20'-0⅛" | 22'-0⅛" | 10'-9⅜" | 21'-0" | 29'-8⅜" | 31'-10½" | 20'-5⅝" | 27'-10" | 39'-4⅜" | 41'-4⅜" | 30'-1" | 34'-10" | 49'-0⅝" | 51'-0⅝" | 39'-3" |
| | 7' | 4' | 4'-3⅛" | 8'-0" | 11'-3⅜" | 13'-3⅜" | 7'-0⅛" | 15'-8" | 22'-1⅛" | 24'-1⅛" | 17'-10⅛" | 23'-4" | 33'-0" | 35'-0" | 28'-8⅜" | 31'-0" | 43'-10⅛" | 45'-10⅛" | 39'-6⅜" | 38'-8" | 54'-6⅜" | 56'-6⅜" | 50'-5" |
| | | 5' | 5'-3⅛" | 8'-0" | 11'-3⅜" | 13'-3⅜" | 6'-0⅛" | 15'-8" | 22'-1⅛" | 24'-1⅛" | 16'-10⅛" | 23'-4" | 33'-0" | 35'-0" | 27'-8⅜" | 31'-0" | 43'-10⅛" | 45'-10⅛" | 38'-6⅜" | 38'-8" | 54'-6⅜" | 56'-6⅜" | 49'-5" |
| | | 6' | 6'-3⅛" | 8'-2" | 11'-5⅜" | 13'-5⅜" | 5'-3⅛" | 15'-11" | 22'-4⅛" | 24'-4⅛" | 16'-2⅝" | 23'-8" | 33'-5⅛" | 35'-5⅛" | 27'-2⅛" | 31'-5" | 44'-3⅛" | 46'-3⅛" | 38'-1" | 39'-2" | 55'-4⅛" | 57'-4⅛" | 49'-1⅛" |
| | | 7' | 7'-3⅛" | 8'-3" | 11'-8" | 13'-8" | 4'-3⅜" | 16'-1" | 22'-6" | 24'-6" | 14'-7⅜" | 23'-11" | 33'-9⅛" | 35'-11" | 26'-0⅜" | 31'-9" | 44'-10⅜" | 46'-10⅜" | 37'-7½" | 39'-7" | 56'-0⅛" | 58'-0⅛" | 48'-10⅜" |
| | | 8' | 8'-3⅛" | 8'-4" | 11'-9⅜" | 13'-9⅜" | 3'-4⅝" | 16'-2" | 22'-7⅜" | 24'-7⅜" | 13'-7" | 24'-0" | 33'-11⅛" | 36'-1⅛" | 24'-8" | 31'-10" | 45'-0⅝" | 47'-0⅝" | 35'-9" | 39'-8" | 56'-11⅝" | 58'-11⅝" | 48'-6" |
| | 8' | 4' | 4'-3⅛" | 9'-0" | 12'-8⅜" | 14'-8⅜" | 8'-5⅛" | 17'-8" | 24'-11⅛" | 26'-11⅛" | 20'-0¼" | 26'-8" | 37'-2⅛" | 39'-4" | 32'-1¼" | 35'-0" | 49'-6" | 51'-6" | 45'-2⅜" | 43'-8" | 61'-9" | 63'-9" | 57'-6⅜" |
| | | 5' | 5'-3⅛" | 9'-2" | 12'-11⅜" | 14'-11⅜" | 7'-8⅝" | 17'-11" | 25'-1" | 27'-1" | 20'-0⅜" | 26'-8" | 37'-10⅝" | 39'-10⅝" | 32'-1⅝" | 35'-5" | 50'-1" | 52'-1" | 44'-3⅜" | 44'-2" | 62'-5½" | 64'-5½" | 57'-1⅝" |
| | | 6' | 6'-3⅛" | 9'-2" | 12'-11⅜" | 14'-11⅜" | 6'-10⅜" | 17'-11" | 25'-1" | 27'-1" | 19'-0⅜" | 26'-8" | 37'-10⅝" | 39'-10⅝" | 31'-5⅛" | 35'-5" | 50'-1" | 52'-1" | 43'-10⅜" | 44'-2" | 62'-5½" | 64'-5½" | 56'-10⅝" |
| | | 7' | 7'-3⅛" | 9'-3" | 13'-1" | 15'-1" | 5'-11⅜" | 18'-1" | 25'-3⅛" | 27'-3" | 17'-9⅜" | 26'-11" | 38'-0⅛" | 40'-0⅛" | 30'-8⅝" | 35'-9" | 50'-6⅝" | 52'-6⅝" | 42'-10⅜" | 44'-7" | 63'-0⅝" | 65'-0⅝" | 55'-5⅜" |
| | | 8' | 8'-3⅛" | 9'-4" | 13'-2⅝" | 15'-2⅝" | 5'-1⅛" | 18'-2" | 25'-5⅜" | 27'-5⅜" | 16'-5" | 27'-2" | 38'-2¾" | 40'-2¾" | 28'-11" | 35'-11" | 50'-10" | 52'-10" | 42'-3" | 44'-8" | 63'-12" | 65'-12" | 53'-10⅜" |
| | 9' | 5' | 5'-3⅛" | 10'-2" | 14'-4⅝" | 16'-4⅝" | 9'-1⅜" | 19'-11" | 28'-2" | 30'-2" | 22'-10⅜" | 29'-8" | 41'-11⅝" | 43'-11⅝" | 36'-8⅛" | 39'-5" | 55'-10⅜" | 57'-9" | 50'-5⅛" | 49'-2" | 69'-1⅝" | 71'-1⅝" | 63'-9" |
| | | 6' | 6'-3⅛" | 10'-3" | 14'-6" | 16'-6" | 8'-2⅝" | 20'-1" | 28'-3⅝" | 30'-4⅜" | 22'-1⅝" | 29'-11" | 42'-3⅛" | 44'-3⅛" | 36'-4⅛" | 39'-9" | 56'-2⅜" | 58'-2⅜" | 49'-11⅝" | 49'-7" | 70'-1½" | 72'-1½" | 63'-10⅝" |
| | | 7' | 7'-3⅛" | 10'-3" | 14'-6" | 16'-6" | 6'-11⅜" | 20'-1" | 28'-3⅝" | 30'-4⅜" | 20'-7¼" | 29'-11" | 42'-3⅛" | 44'-3⅛" | 34'-11⅝" | 39'-9" | 56'-2⅜" | 58'-2⅜" | 48'-5⅝" | 49'-7" | 70'-1½" | 72'-1½" | 62'-4⅝" |
| | | 8' | 8'-3⅛" | 10'-4" | 14'-7⅝" | 16'-7⅝" | 5'-5⅛" | 20'-2" | 28'-4⅛" | 30'-6⅛" | 19'-3" | 30'-0" | 42'-5⅜" | 44'-5" | 33'-5" | 39'-10" | 56'-6" | 58'-6" | 47'-0⅜" | 49'-8" | 70'-2⅜" | 72'-3" | 60'-11⅜" |
| | 10' | 5' | 5'-3⅛" | 11'-2" | 15'-9⅛" | 17'-9⅛" | 10'-1¾" | 21'-11" | 31'-0" | 33'-0" | 25'-6⅜" | 32'-8" | 46'-2⅝" | 48'-2⅝" | 40'-0" | 43'-9" | 61'-4⅛" | 63'-4⅛" | 56'-0⅜" | 56'-5" | 76'-7½" | 78'-7½" | 71'-4" |
| | | 6' | 6'-3⅛" | 11'-3" | 15'-11" | 17'-11" | 9'-7⅜" | 22'-1" | 31'-2⅝" | 33'-2⅝" | 24'-9⅛" | 32'-8" | 46'-2⅝" | 48'-2⅝" | 39'-7⅜" | 43'-9" | 61'-4⅛" | 63'-4⅛" | 55'-4⅜" | 56'-5" | 76'-7½" | 78'-7½" | 70'-11" |
| | | 7' | 7'-3⅛" | 11'-3" | 15'-11" | 17'-11" | 8'-1⅜" | 22'-1" | 31'-2⅝" | 33'-2⅝" | 23'-5" | 32'-8" | 46'-2⅝" | 48'-2⅝" | 38'-3⅛" | 43'-9" | 61'-4⅛" | 63'-4⅛" | 54'-8⅜" | 56'-5" | 76'-7½" | 78'-7½" | 69'-5" |
| | | 8' | 8'-3⅛" | 11'-4" | 16'-0⅛" | 18'-0⅛" | 6'-9⅝" | 22'-2" | 31'-3⅛" | 33'-3⅛" | 22'-1" | 33'-0" | 46'-5⅜" | 48'-5" | 37'-0⅝" | 43'-10" | 61'-5⅝" | 63'-5⅝" | 53'-11⅜" | 56'-6" | 76'-8½" | 78'-8½" | 68'-10⅜" |
| | 11' | 6' | 6'-3⅛" | 12'-9" | 17'-5⅝" | 19'-5⅝" | 11'-2⅝" | 24'-2" | 34'-2⅛" | 36'-2" | 27'-11" | 36'-0" | 50'-11" | 52'-11" | 44'-7⅛" | 47'-10" | 67'-7⅝" | 69'-7⅝" | 61'-4⅜" | — | — | — | — |
| | | 7' | 7'-3⅛" | 12'-9" | " | " | 9'-8⅛" | 24'-2" | " | " | 26'-5" | 36'-0" | " | " | 43'-1⅝" | 47'-10" | " | " | 57'-10⅝" | — | — | — | — |
| | | 8' | 8'-3⅛" | 12'-9" | " | " | 8'-2⅝" | 24'-2" | " | " | 24'-11" | 36'-0" | " | " | 41'-7⅜" | 47'-10" | " | " | 53'-10⅝" | — | — | — | — |
| | 12' | 6' | 6'-3⅛" | 13'-6" | 18'-10⅛" | 20'-10⅛" | 12'-7⅞" | 26'-2" | 37'-0⅝" | 39'-0" | 30'-8⅝" | 39'-0" | " | " | 47'-6⅝" | 51'-10" | 73'-3⅜" | 75'-3⅜" | 67'-0⅛" | — | — | — | — |
| | | 7' | 7'-3⅛" | 13'-6" | " | " | 11'-1½" | 26'-2" | " | " | 29'-2⅝" | 39'-0" | " | " | 47'-6⅝" | 51'-10" | " | " | 63'-6⅛" | — | — | — | — |
| | | 8' | 8'-3⅛" | 13'-6" | " | " | 9'-7⅞" | 26'-2" | " | " | 27'-10⅝" | 39'-0" | " | " | 46'-0⅝" | 51'-10" | " | " | 60'-0⅛" | — | — | — | — |
| W-X452-2, W-X453-2 OR W-X454-2 (FOR H=9'0" & OVER) | 7' | 9' | 10'-9⅜" | 8'-6" | 12'-0⅛" | 14'-0⅛" | 7'-3" | 16'-5" | 23'-2⅜" | 25'-2⅜" | 12'-5⅜" | 24'-4" | 34'-5" | 36'-5" | 23'-7⅜" | 32'-3" | 45'-7⅛" | 47'-7⅛" | 39'-10" | 40'-2" | 56'-9⅜" | 58'-9⅜" | 41'-10⅜" |
| | 8' | 9' | 10'-9⅜" | 9'-6" | 13'-5⅜" | 15'-5⅜" | 2'-8" | 18'-5" | 26'-0⅛" | 28'-0⅛" | 15'-4⅝" | 27'-4" | 38'-7⅞" | 40'-8" | 27'-10⅝" | 36'-3" | 51'-3⅝" | 53'-3⅝" | 40'-6" | 45'-2" | 63'-10⅝" | 65'-10⅝" | 53'-1⅝" |
| | | 10' | 12'-3⅜" | 9'-8" | 13'-8⅝" | 15'-8" | 1'-10⅝" | 18'-8" | 26'-4⅝" | 28'-4⅝" | 14'-1⅝" | 27'-8" | 39'-1⅛" | 41'-1⅛" | 28'-10⅛" | 36'-8" | 51'-10⅝" | 53'-10⅝" | 39'-7" | 45'-8" | 64'-5" | 66'-5" | 52'-3⅝" |
| | 9' | 9' | 10'-9⅜" | 10'-6" | 14'-10⅛" | 16'-10⅛" | 4'-1" | 20'-5" | 28'-10⅝" | 30'-10⅝" | 18'-1⅛" | 30'-8" | 42'-10⅛" | 44'-10⅛" | 32'-1½" | 40'-3" | 56'-11⅛" | 58'-11" | 46'-7⅜" | 50'-2" | 70'-11⅝" | 72'-11" | 60'-2⅝" |
| | | 10' | 12'-3⅜" | 10'-8" | 15'-1" | 17'-1" | 2'-9⅜" | 20'-8" | 29'-2⅝" | 31'-2⅝" | 16'-11⅝" | 30'-8" | 43'-1⅛" | 45'-1⅛" | 32'-4" | 40'-8" | 57'-6⅝" | 59'-6⅝" | 46'-3" | 50'-8" | 71'-7⅝" | 73'-7⅝" | 59'-10⅝" |
| | | 11' | 13'-3⅜" | 10'-10" | 15'-3⅜" | 17'-3⅜" | 1'-4⅝" | 20'-10" | 29'-5⅛" | 31'-5⅛" | 15'-10⅛" | 30'-10" | 43'-4" | 45'-4" | 32'-6⅜" | 40'-10" | 57'-9" | 59'-9" | 45'-11⅜" | 50'-10" | 71'-10⅝" | 73'-10⅝" | 58'-1⅞" |
| | 10' | 9' | 10'-9⅜" | 11'-6" | 16'-3⅝" | 18'-3⅝" | 5'-4" | 22'-5" | 31'-8⅜" | 33'-8⅜" | 20'-11⅛" | 33'-4" | 47'-1⅛" | 49'-1⅛" | 36'-6⅝" | 44'-3" | 62'-1⅞" | 64'-1⅞" | 51'-9⅜" | 55'-2" | 78'-0⅝" | 80'-0⅝" | 63'-3" |
| | | 10' | 12'-3⅜" | 11'-8" | 16'-6" | 18'-6" | 4'-2⅝" | 22'-10" | 32'-1⅝" | 34'-1⅝" | 19'-3⅝" | 33'-8" | 47'-7⅞" | 49'-7⅞" | 35'-10⅝" | 44'-8" | 63'-2" | 65'-2" | 50'-10⅜" | 55'-8" | 78'-10⅝" | 80'-8⅝" | 61'-3⅝" |
| | | 11' | 13'-3⅜" | 11'-10" | 16'-8⅜" | 18'-8⅜" | 2'-11⅝" | 22'-10" | 32'-3⅜" | 34'-3⅜" | 18'-6⅜" | 33'-10" | 47'-10⅝" | 49'-10⅝" | 34'-11" | 44'-10" | 63'-4⅝" | 65'-5" | 49'-7⅝" | 55'-10" | 78'-11⅛" | 80'-11⅛" | 60'-12⅝" |
| | | 12' | 15'-3⅜" | 12'-0" | 16'-11⅛" | 18'-11⅛" | 1'-8⅝" | 23'-0" | 32'-5⅛" | 34'-5⅛" | 17'-8" | 34'-0" | 48'-1" | 50'-1" | 33'-3⅜" | 45'-0" | 63'-7⅛" | 65'-7⅛" | 48'-4⅞" | 56'-0" | 79'-0⅜" | 81'-0⅜" | 59'-11⅜" |
| | 11' | 9' | 10'-9⅜" | 12'-6" | 17'-8⅝" | 19'-8⅝" | 6'-10⅝" | 24'-5" | 34'-6⅜" | 36'-6⅜" | 23'-9⅝" | 34'-8" | 48'-11⅝" | 50'-11⅝" | 37'-5⅜" | 45'-9" | 64'-6⅝" | 66'-6⅝" | 52'-3⅛" | — | — | — | — |
| | | 10' | 12'-3⅜" | 12'-8" | 17'-11" | 19'-11" | 5'-7⅜" | 24'-5" | 34'-10⅝" | 36'-10⅝" | 22'-7⅜" | 34'-8" | 48'-11⅝" | 50'-11⅝" | 36'-10⅝" | 45'-9" | 64'-6⅝" | 66'-6⅝" | 51'-6" | — | — | — | — |
| | | 11' | 13'-3⅜" | 12'-10" | 18'-1⅜" | 20'-1⅜" | 4'-4⅛" | 24'-10" | 35'-1⅜" | 37'-1⅜" | 21'-4⅝" | 34'-10" | 49'-1⅜" | 51'-1⅜" | 36'-3⅛" | 45'-9" | 64'-6⅝" | 66'-6⅝" | 50'-8⅜" | — | — | — | — |
| | | 12' | 15'-3⅜" | 13'-0" | 18'-4⅝" | 20'-4⅝" | 3'-1⅜" | 25'-0" | 35'-4⅝" | 37'-4⅝" | 20'-1" | 35'-0" | 49'-4⅝" | 51'-4⅝" | 35'-1⅝" | 45'-9" | 64'-6⅝" | 66'-6⅝" | 49'-10⅝" | — | — | — | — |
| | 12' | 9' | 10'-9⅜" | 13'-6" | 19'-1⅜" | 21'-1" | 8'-3⅝" | 26'-5" | 37'-0⅝" | 39'-0⅝" | 26'-7" | 39'-0" | 55'-1⅝" | 57'-1⅝" | 44'-8⅝" | 52'-3" | 73'-10⅝" | 75'-10⅝" | 63'-1⅞" | — | — | — | — |
| | | 10' | 12'-3⅜" | 13'-8" | 19'-3⅝" | 21'-3⅝" | 7'-0⅜" | 26'-9" | 37'-10⅝" | 39'-10⅝" | 25'-5⅝" | 39'-0" | 55'-1⅝" | 57'-1⅝" | 43'-10⅜" | 52'-3" | 73'-10⅝" | 75'-10⅝" | 62'-2⅝" | — | — | — | — |
| | | 11' | 13'-3⅜" | 13'-10" | 19'-6⅛" | 21'-6⅛" | 5'-5⅜" | 26'-10" | 37'-11⅜" | 39'-11⅜" | 24'-2⅜" | 39'-0" | 55'-1⅝" | 57'-1⅝" | 43'-0" | 52'-3" | 73'-10⅝" | 75'-10⅝" | 60'-11⅜" | — | — | — | — |
| | | 12' | 15'-3⅜" | 14'-0" | 19'-9⅝" | 21'-9⅝" | 3'-9⅝" | 27'-0" | 38'-0⅝" | 40'-0⅝" | 22'-11" | 39'-0" | 55'-1⅝" | 57'-1⅝" | 42'-1⅜" | 52'-3" | 73'-10⅝" | 75'-10⅝" | 59'-8⅞" | — | — | — | — |

Note:- This drawing to be used in conjunction with Standard Wing Drawings for 45° Skews for each slope as listed below.

| 2:1 Slopes | 3:1 Slopes | 4:1 Slopes |
|---|---|---|
| W-X452-1 or W-X452-2 | W-X453-1 or W-X453-2 | W-X454-1 or W-X454-2. |

Note:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.-

| SINGLES | DOUBLES | TRIPLES | QUADRUPLES | QUINTUPLES |
|---|---|---|---|---|
| R-145X-0 | R-245X-01 | R-345X-01 | R-445X-01 | R-545X-01 |
| | R-245X-02 | R-345X-02 | R-445X-02 | R-545X-02 |
| R-145X-1 | R-245X-1 | R-345X-1 | R-445X-1 | |
| | R-245X-2 | R-345X-2 | | |

CLASS S CONCRETE

# ARKANSAS STATE HIGHWAY COMMISSION

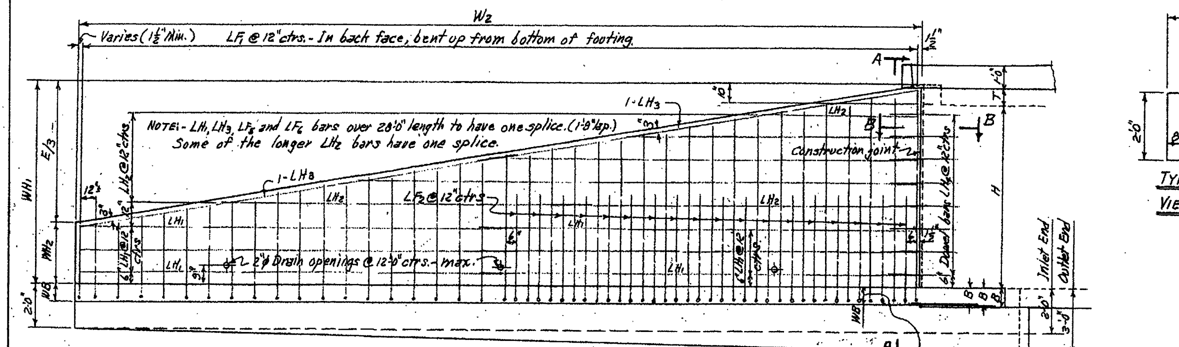
## DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 45° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 2:1, 3:1 & 4:1 SLOPES

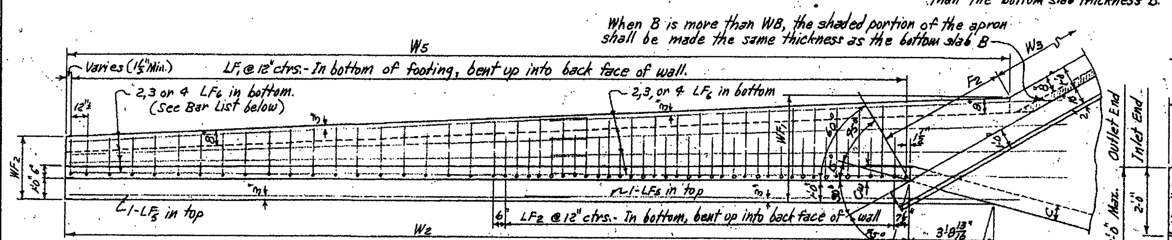
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER. H= 2', 3', 4', 5', 6', 7', 8', 9', 10', 11' & 12'

STANDARD DRAWING No. W-X45

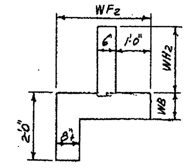
| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |



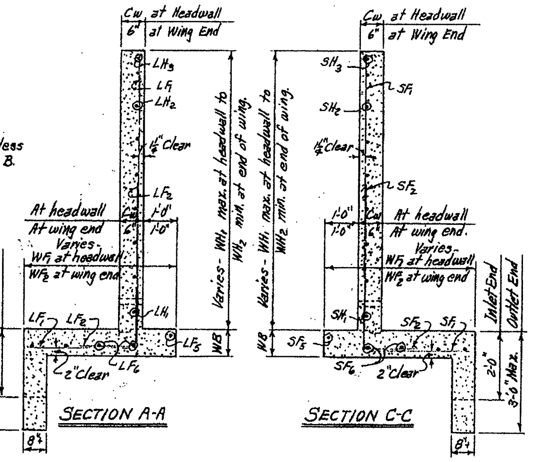

REAR ELEVATION OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING

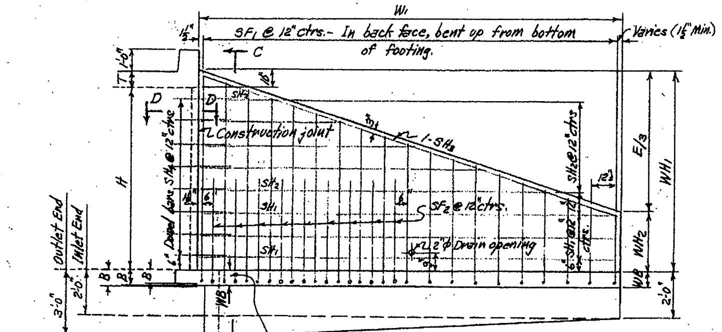



PLAN OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING FOOTING REINFORCING

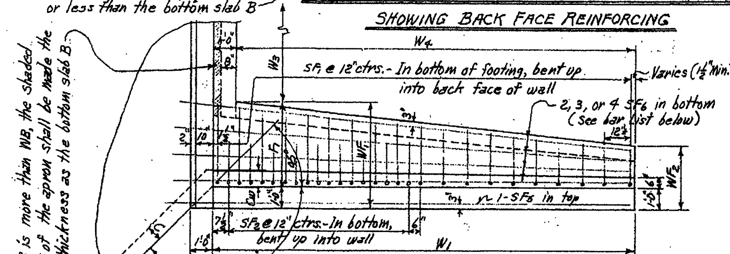



TYPICAL END VIEW OF WING

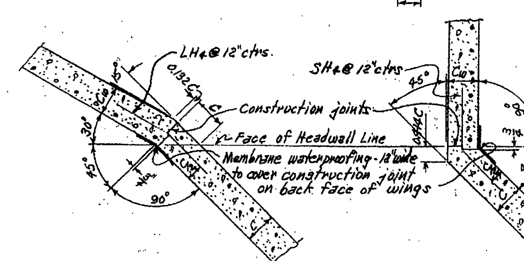



REAR ELEVATION OF SHORT WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING




PLAN OF SHORT WING - 45° SKEW RIGHT FORWARD SHOWING FOOTING REINFORCING

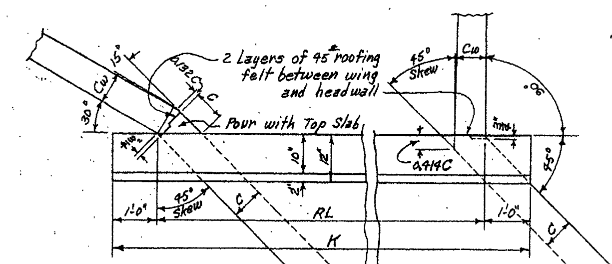



SECTION B-B

SECTION D-D

SECTIONS THRU CONSTRUCTION JOINTS

NOTE:- Payment for the membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.




DETAILS AT TOP OF WINGS - 45° SKEW RIGHT FORWARD

REGULAR WING DIMENSIONS - 3:1 SLOPES

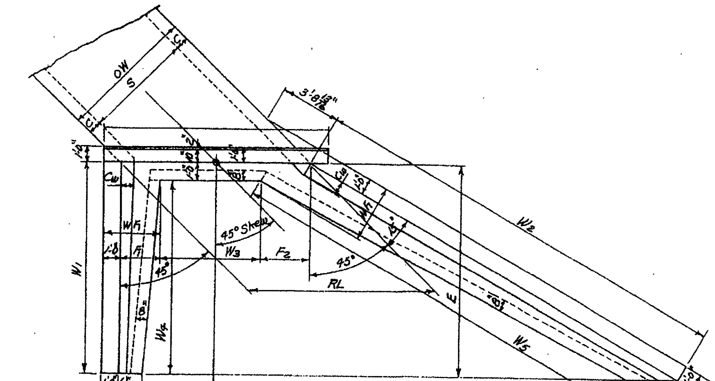
| CLEAR HEIGHT OF BOX | THICKNESS OF WING FOOTING | THICKNESS OF WING AT HDWL = C | WINGWALL HEIGHTS: AT HEADWALL | WINGWALL HEIGHTS: AT END OF WING | WIDTHS OF WING FOOTINGS: AT HEADWALL | WIDTHS OF WING FOOTINGS: AT END OF WING | FOOTING DIMENSION PARALLEL WITH HEADWALL: SHORT WING | FOOTING DIMENSION PARALLEL WITH HEADWALL: LONG WING | PERPENDICULAR DIST. FROM HDWL TO END OF WING | LENGTHS OF WINGWALLS: SHORT WING | LENGTHS OF WINGWALLS: LONG WING | INSIDE FOOTING DIMENSION: SHORT WING | INSIDE FOOTING DIMENSION: LONG WING | * QUANTITY PER WING, CLASS S CONCRETE: INLET END SHORT WING | INLET END LONG WING | OUTLET END SHORT WING | OUTLET END LONG WING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | WB | Cw | WH1 | WH2 | WF1 | WF2 | F1 | F2 | E | W1 | W2 | W4 | W5 | CU. YD. | CU. YD. | CU. YD. | CU. YD. |
| 2' | 7" | 6" | 2'-10" | 0'-8" | 2'-4" | 2'-0" | 1'-4" | 0'-11⅝" | 6'-6" | 6'-6" | 13'-0" | 5'-6" | 13'-3¾" | 0.743 | 1.572 | 0.827 | 1.741 |
| 3' | 7" | 6" | 3'-10" | 1'-0" | 2'-8" | 2'-1½" | 1'-8" | 1'-7¾" | 8'-6" | 8'-6" | 17'-0" | 7'-6" | 17'-10¾" | 1.120 | 2.364 | 1.229 | 2.590 |
| 4' | 7" | 6" | 4'-10" | 1'-4" | 3'-0" | 2'-3" | 2'-0" | 2'-3¼" | 10'-6" | 10'-6" | 21'-0" | 9'-6" | 22'-5½" | 1.567 | 3.295 | 1.700 | 3.577 |
| 5' | 7" | 6" | 5'-10" | 1'-8" | 3'-4" | 2'-4½" | 2'-4" | 2'-11⅛" | 12'-6" | 12'-6" | 25'-0" | 11'-6" | 27'-0½" | 2.082 | 4.367 | 2.241 | 4.705 |
| | | 7" | 5'-10" | 1'-8" | 3'-4" | 2'-4½" | 2'-4" | 2'-11⅛" | 12'-6" | 12'-6" | 25'-0" | 11'-6" | 27'-0½" | 2.166 | 4.551 | 2.325 | 4.889 |
| 6' | 8" | 7" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-8" | 3'-7¼" | 14'-6" | 14'-6" | 29'-0" | 13'-6" | 31'-7½" | 2.894 | 6.055 | 3.078 | 6.950 |
| | | 7½" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-8" | 3'-7¼" | 14'-6" | 14'-6" | 29'-0" | 13'-6" | 31'-7½" | 2.952 | 6.180 | 3.135 | 6.575 |
| | | 8" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-8" | 3'-7¼" | 14'-6" | 14'-6" | 29'-0" | 13'-6" | 31'-7½" | 3.009 | 6.305 | 3.192 | 6.700 |
| 7' | 8½" | 7½" | 7'-10" | 2'-4" | 4'-2" | 2'-7½" | 3'-2" | 4'-7¼" | 16'-6" | 16'-6" | 33'-0" | 15'-6" | 36'-5¾" | 3.794 | 7.930 | 4.003 | 8.385 |
| | | 8" | 7'-10" | 2'-4" | 4'-2" | 2'-7½" | 3'-2" | 4'-7¼" | 16'-6" | 16'-6" | 33'-0" | 15'-6" | 36'-5¾" | 3.870 | 8.093 | 4.078 | 8.598 |
| 8' | 9" | 8" | 8'-10" | 2'-8" | 4'-8" | 2'-9" | 3'-8" | 5'-7¼" | 18'-6" | 18'-6" | 37'-0" | 17'-6" | 41'-4¼" | 4.855 | 10.136 | 5.088 | 10.651 |

* Quantity per wing does not include headwall or that portion of apron or toewall for the length $W_3$.

QUANTITIES

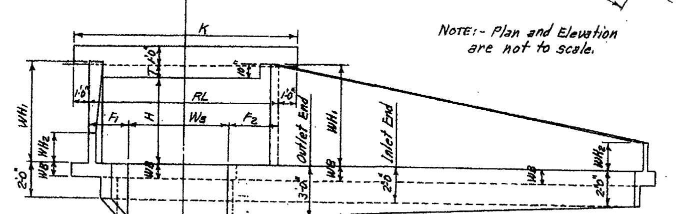
| CLEAR SPAN | CLEAR HEIGHT | THICKNESS OF WING AT HEADWALL | THICKNESS OF WING FOOTING | ⊕ REINFORCING STEEL - FOR 4 WINGS | CLASS S CONCRETE - 4 WINGS (HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS): SINGLE BARREL CULVERT | DOUBLE BARREL CULVERT | TRIPLE BARREL CULVERT | QUADRUPLE BARREL CULVERT | QUINTUPLE BARREL CULVERT |
|---|---|---|---|---|---|---|---|---|---|
| S | H | Cw | WB | LB. | CU. YD. | CU. YD. | CU. YD. | CU. YD. | CU. YD. |
| 4' | 2' | 6" | 7" | 142 | 6.15 | 7.50 | 8.86 | 10.22 | 11.58 |
| | 3' | 6" | 7" | 214 | 8.44 | 9.79 | 11.14 | 12.50 | 13.86 |
| | 4' | 6" | 7" | 328 | 11.13 | 12.48 | 13.84 | 15.20 | 16.56 |
| | 5' | 6" | 7" | 463 | 14.25 | 15.60 | 16.96 | 18.32 | 19.68 |
| | 6' | 7" | 8" | 763 | 19.23 | 20.62 | 22.02 | 23.41 | 24.81 |
| 5' | 3' | 6" | 7" | 214 | 8.74 | 10.38 | 12.03 | 13.67 | 15.32 |
| | 4' | 6" | 7" | 328 | 11.43 | 13.07 | 14.72 | 16.37 | 18.02 |
| | 5' | 6" | 7" | 463 | 14.55 | 16.19 | 17.84 | 19.49 | 21.14 |
| | 6' | 7" | 8" | 763 | 19.53 | 21.21 | 22.90 | 24.59 | 26.28 |
| | 7' | 7½" | 8½" | 1475 | 24.98 | 26.69 | 28.41 | 30.14 | 31.86 |
| 6' | 3' | 6" | 7" | 214 | 9.03 | 10.99 | 12.91 | 14.86 | 16.79 |
| | 4' | 6" | 7" | 328 | 11.73 | 13.69 | 15.60 | 17.56 | 19.48 |
| | 5' | 6" | 7" | 463 | 14.85 | 16.80 | 18.72 | 20.68 | 22.60 |
| | 6' | 7" | 8" | 763 | 19.83 | 21.82 | 23.79 | 25.78 | 27.76 |
| | 7' | 7½" | 8½" | 1475 | 25.28 | 27.30 | 29.31 | 31.33 | 33.35 |
| | 8' | 8" | 9" | 1872 | 31.70 | 33.74 | 35.75 | 37.79 | 39.81 |
| 7' | 4' | 6" | 7" | 328 | 12.04 | 14.31 | 16.54 | 18.81 | 21.02 |
| | 5' | 6" | 7" | 463 | 15.15 | 17.43 | 19.65 | 21.93 | 24.13 |
| | 6' | 7" | 8" | 763 | 20.14 | 22.44 | 24.69 | 26.99 | 29.24 |
| | 7' | 7½" | 8½" | 1475 | 25.59 | 27.91 | 30.21 | 32.58 | 34.83 |
| | 8' | 8" | 9" | 1872 | 32.02 | 34.35 | 36.66 | 38.99 | 41.31 |
| 8' | 4' | 6" | 7" | 328 | 12.35 | 14.95 | 17.49 | 20.08 | 22.57 |
| | 5' | 7" | 7" | 463 | 16.05 | 18.67 | 21.24 | 23.86 | 26.37 |
| | 6' | 7" | 8" | 763 | 20.45 | 23.07 | 25.64 | 28.26 | 30.77 |
| | 7' | 7½" | 8½" | 1475 | 25.90 | 28.54 | 31.13 | 33.78 | 36.32 |
| | 8' | 8" | 9" | 1872 | 32.33 | 34.97 | 37.56 | 40.21 | 42.80 |
| 9' | 5' | 7" | 7" | 463 | 16.37 | 19.32 | 22.18 | 25.02 | 27.91 |
| | 6' | 7½" | 8" | 763 | 21.16 | 24.13 | 27.02 | 29.89 | 32.81 |
| | 7' | 7½" | 8½" | 1475 | 26.21 | 29.18 | 32.08 | 34.94 | 37.86 |
| | 8' | 8" | 9" | 1872 | 32.63 | 35.61 | 38.51 | 41.37 | 44.29 |
| 10' | 5' | 7" | 7" | 463 | 16.69 | 19.96 | 23.14 | 26.27 | 29.47 |
| | 6' | 7½" | 8" | 763 | 21.48 | 24.77 | 27.99 | 31.13 | 34.36 |
| | 7' | 7½" | 8½" | 1475 | 26.53 | 29.82 | 33.04 | 36.19 | 39.42 |
| | 8' | 8" | 9" | 1872 | 32.95 | 36.25 | 39.46 | 42.62 | 45.85 |
| 11' | 6' | 8" | 8" | 763 | 22.18 | 25.83 | 29.35 | 32.84 | — |
| | 7' | 8" | 8½" | 1475 | 27.33 | 30.99 | 34.51 | 38.01 | — |
| | 8' | 8" | 9" | 1872 | 33.26 | 36.91 | 40.43 | 43.93 | — |
| 12' | 6' | 8" | 8" | 763 | 22.50 | 26.51 | 30.33 | 34.19 | — |
| | 7' | 8" | 8½" | 1475 | 27.66 | 31.66 | 35.49 | 39.35 | — |
| | 8' | 8" | 9" | 1872 | 33.58 | 37.58 | 41.41 | 45.27 | — |

⊕ For reinforcing steel in Headwalls and Aprons, see Drawing Nos. of Barrel Sections listed below.




PART PLAN

NOTE:- Plan and Elevation are not to scale.




END ELEVATION

SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Drawing No. W-X45.

TYPICAL WING DETAILS

NOTE:-
For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X45.
For values of RL, K and $W_3$ for each box, see above std. also.

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

REVISIONS:- Membrane Added. 5-10-66 W.C.H.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:-
This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.-

| SINGLES | DOUBLES | TRIPLES | QUADRUPLES | QUINTUPLES |
|---|---|---|---|---|
| R-145X-0 | R-245X-01 | R-345X-01 | R-445X-01 | R-545X-01 |
| | R-245X-02 | R-345X-02 | R-445X-02 | R-545X-02 |
| R-145X-1 | R-245X-1 | R-345X-1 | R-445X-1 | |
| | R-245X-2 | R-345X-2 | | |

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

SF1 & LF1 — BENT — In bottom of footing, bent up into back face of wing. One bar (or two bars) of each length.
SF2 & LF2 — BENT — In bottom of footing, bent up into back face of wing. Alt. with F1 bars.

| CLEAR HEIGHT H | WING LOCATION (SHORT OR LONG) | SF1 & LF1 SIZE | SPACING | NO. REQD | LENGTHS VARY MIN. | LENGTHS VARY MAX. | X MIN. | X MAX. | Y MIN. | Y MAX. | SF2 & LF2 SIZE | SPACING | NO. REQD | LENGTH | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2' | Short | #3 | 12" | 7 | 1'-7" | 3'-11" | 0'-8" | 1'-0" | 1'-0" | 3'-0" | — | — | — | — | — | — |
| | Long | #3 | 12" | 14 | 1'-5" | 3'-11" | 0'-8" | 1'-0" | 0'-10" | 3'-0" | — | — | — | — | — | — |
| 3' | Short | #3 | 12" | 9 | 2'-1" | 5'-3" | 0'-10" | 1'-4" | 1'-4" | 4'-0" | — | — | — | — | — | — |
| | Long | #3 | 12" | 18 | 1'-11" | 5'-3" | 0'-10" | 1'-4" | 1'-2" | 4'-0" | — | — | — | — | — | — |
| 4' | Short | #3 | 12" | 11 | 2'-6" | 6'-7" | 0'-11" | 1'-8" | 1'-8" | 5'-0" | — | — | — | — | — | — |
| | Long | #3 | 12" | 22 | 2'-4" | 6'-6" | 0'-11" | 1'-7" | 1'-6" | 5'-0" | — | — | — | — | — | — |
| 5' | Short | #3 | 12" | 13 | 2'-11" | 7'-11" | 1'-0" | 2'-0" | 2'-0" | 6'-0" | #3 | 12" | 3 | 3'-6" | 1'-1" | 2'-6" |
| | Long | #3 | 12" | 26 | 2'-9" | 7'-10" | 1'-0" | 1'-11" | 1'-10" | 6'-0" | #3 | 12" | 6 | 3'-6" | 1'-1" | 2'-6" |
| 6' | Short | #4 | 12" | 15 | 3'-6" | 9'-4" | 1'-2" | 2'-4" | 2'-5" | 7'-1" | #3 | 12" | 3 | 4'-6" | 1'-4" | 3'-3" |
| | Long | #4 | 12" | 30 | 3'-4" | 9'-3" | 1'-2" | 2'-3" | 2'-3" | 7'-1" | #3 | 12" | 6 | 4'-6" | 1'-4" | 3'-3" |
| 7' | Short | #4 | 12" | 17 | 3'-11" | 10'-10" | 1'-3" | 2'-10" | 2'-9" | 8'-1" | #4 | 12" | 6 | 5'-6" | 1'-7" | 4'-0" |
| | Long | #4 | 12" | 34 | 3'-9" | 10'-8" | 1'-3" | 2'-8" | 2'-7" | 8'-1" | #4 | 12" | 12 | 5'-6" | 1'-7" | 4'-0" |
| 8' | Short | #4 | 12" | 19 | 4'-6" | 12'-5" | 1'-5" | 3'-4" | 3'-2" | 9'-2" | #4 | 12" | 9 | 6'-6" | 1'-10" | 4'-9" |
| | Long | #4 | 12" | 38 | 4'-4" | 12'-3" | 1'-5" | 3'-2" | 3'-0" | 9'-2" | #4 | 12" | 18 | 6'-6" | 1'-10" | 4'-9" |

STRAIGHT: SF5 & LF5 — Longitudinal in top of wing footing heel. SF6 & LF6 — Longitudinal in bottom of wing footing toe. SH1 & LH1 — Horizontal in back face of wing. SH2 & LH2 — Horizontal in back face of wing. One bar of each length.*

| H | SHORT OR LONG | SF5 & LF5 SIZE | NO. REQD | LENGTH | SF6 & LF6 SIZE | NO. REQD | LENGTH | SH1 & LH1 SIZE | SPACING | NO. REQD | LENGTH | SH2 & LH2 SIZE | SPACING | NO. REQD | LENGTHS VARY MAX. | LENGTHS VARY MIN. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2' | Short | #3 | 1 | 8'-4" | #3 | 2 | 8'-0" | #3 | 12" | 1 | 6'-3" | #3 | 12" | 1 | — | 3'-3" |
| | Long | #3 | 1 | 17'-6" | #3 | 2 | 15'-6" | #3 | 12" | 1 | 12'-9" | #3 | 12" | 1 | — | 6'-6" |
| 3' | Short | #3 | 1 | 10'-4" | #3 | 2 | 10'-0" | #3 | 12" | 1 | 8'-3" | #3 | 12" | 2 | 6'-3" | 3'-3" |
| | Long | #3 | 1 | 21'-6" | #3 | 2 | 20'-2" | #3 | 12" | 1 | 16'-8" | #3 | 12" | 2 | 12'-6" | 6'-6" |
| 4' | Short | #3 | 1 | 12'-4" | #3 | 3 | 12'-0" | #3 | 12" | 1 | 10'-3" | #3 | 12" | 3 | 9'-3" | 3'-3" |
| | Long | #3 | 1 | 25'-6" | #3 | 3 | 24'-10" | #3 | 12" | 1 | 20'-8" | #3 | 12" | 3 | 18'-6" | 6'-6" |
| 5' | Short | #3 | 1 | 14'-4" | #3 | 3 | 14'-0" | #3 | 12" | 2 | 12'-3" | #3 | 12" | 3 | 9'-3" | 3'-3" |
| | Long | #3 | 2 | 15'-8" | #3 | 6 | 15'-7" | #3 | 12" | 2 | 24'-8" | #3 | 12" | 3 | 18'-6" | 6'-6" |
| 6' | Short | #3 | 1 | 16'-4" | #3 | 3 | 16'-0" | #3 | 12" | 2 | 14'-3" | #3 | 12" | 4 | 12'-3" | 3'-3" |
| | Long | #3 | 2 | 17'-8" | #3 | 6 | 18'-0" | #3 | 12" | 4 | 15'-2" | #3 | 12" | 4 | 24'-6" | 6'-6" |
| 7' | Short | #4 | 1 | 18'-4" | #4 | 4 | 18'-0" | #4 | 12" | 2 | 16'-3" | #4 | 12" | 5 | 15'-3" | 3'-3" |
| | Long | #4 | 2 | 19'-8" | #4 | 8 | 20'-4" | #4 | 12" | 4 | 17'-2" | #4 | 12" | 5 | *30'-6" | 6'-6" |
| 8' | Short | #4 | 1 | 20'-4" | #4 | 4 | 20'-0" | #4 | 12" | 3 | 18'-3" | #4 | 12" | 5 | 15'-3" | 3'-3" |
| | Long | #4 | 2 | 21'-8" | #4 | 8 | 22'-9" | #4 | 12" | 6 | 19'-2" | #4 | 12" | 5 | *30'-6" | 6'-6" |

SH3 & LH3 — STRAIGHT — In back face of wing at top - on slope. SH4 & LH4 — BENT — Dowels thru construction joint at headwall.

| H | SHORT OR LONG | SH3 & LH3 SIZE | NO. REQD | LENGTH | SH4 & LH4 SIZE | SPACING | NO. REQD | LENGTH | X | QUANTITY: REINFORCING STEEL PER WING - LBS. SHORT WING | LONG WING |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2' | Short | #3 | 1 | 6'-7" | #3 | 12" | 2 | 2'-8" | 1'-4" | 24.4 | 46.3 |
| | Long | #3 | 1 | 12'-11" | #3 | 12" | 2 | " | " | | |
| 3' | Short | #3 | 1 | 8'-8" | #3 | 12" | 3 | " | " | 36.8 | 70.3 |
| | Long | #3 | 1 | 16'-11" | #3 | 12" | 3 | " | " | | |
| 4' | Short | #3 | 1 | 10'-9" | #3 | 12" | 4 | " | " | 55.9 | 107.9 |
| | Long | #3 | 1 | 21'-0" | #3 | 12" | 4 | " | " | | |
| 5' | Short | #3 | 1 | 12'-11" | #3 | 12" | 5 | " | " | 77.7 | 153.7 |
| | Long | #3 | 1 | 25'-1" | #3 | 12" | 5 | " | " | | |
| 6' | Short | #3 | 1 | 15'-0" | #3 | 12" | 6 | " | " | 127.6 | 253.9 |
| | Long | #3 | 2 | 15'-5" | #3 | 12" | 6 | 2'-8" | 1'-4" | | |
| 7' | Short | #4 | 1 | 17'-1" | #4 | 12" | 7 | 3'-6" | 1'-9" | 246.5 | 491.1 |
| | Long | #4 | 2 | 17'-5" | #4 | 12" | 7 | " | " | | |
| 8' | Short | #4 | 1 | 19'-3" | #4 | 12" | 8 | " | " | 312.5 | 623.6 |
| | Long | #4 | 2 | 19'-6" | #4 | 12" | 8 | 3'-6" | 1'-9" | | |

BAR BENDING DIAGRAM: SF1 & SF2, LF1 & LF2 (Y, X, 3" Pin); SH4 (X, 12/12); LH4 (X, 3½/12). NOTE:- Dimensions are to bar centers.

NOTE:- Bars for short wing shall be marked with prefix letter "S", while those for long wing shall be marked with letter "L".

* Length without splice. Bars over 28'-0" length may be spliced. (1'-8" lap)

Designed By:- W.C.H. 5-13-63 Checked By:-
Drawn By:- W.C.H. 6-5-64 Checked By:- J.E.M. 7-21-64
Quantities By:- W.C.H. 7-2-64 Checked By:- J.E.M. 7-21-64

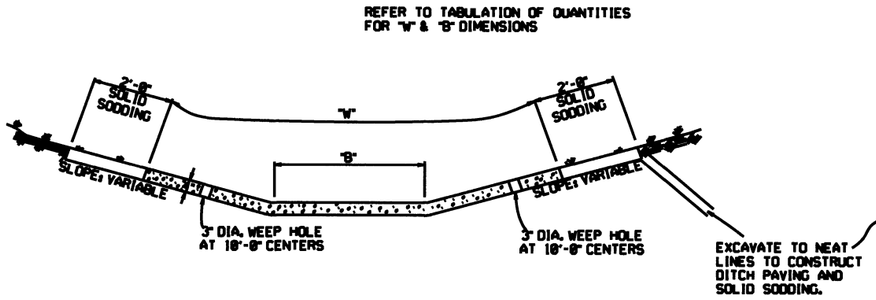
CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

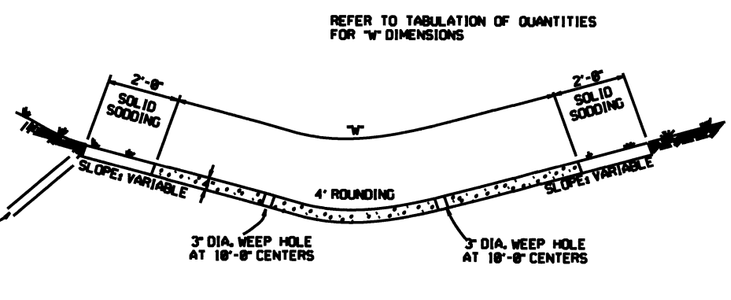
DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 45° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

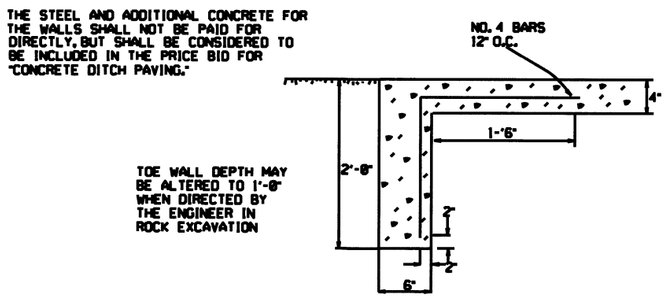
STANDARD DRAWING No. W-X453-1



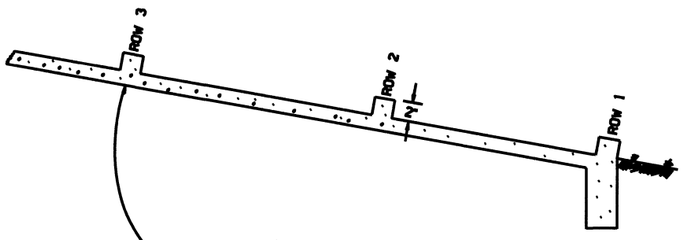

TYPE A




TYPE B




TOE WALL DETAIL FOR CONCRETE DITCH PAVING




ENERGY DISSIPATORS
(NO SCALE)

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

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

TOE WALLS TO BE CONSTRUCTED FULL WIDTH AT EACH END OF DITCH PAVING, AND POURED MONOLITHICALLY.

SOLID SOD ALONG DITCH PAVING TO BE PLACED WITHIN 14 DAYS OF DITCH PAVING CONSTRUCTION.

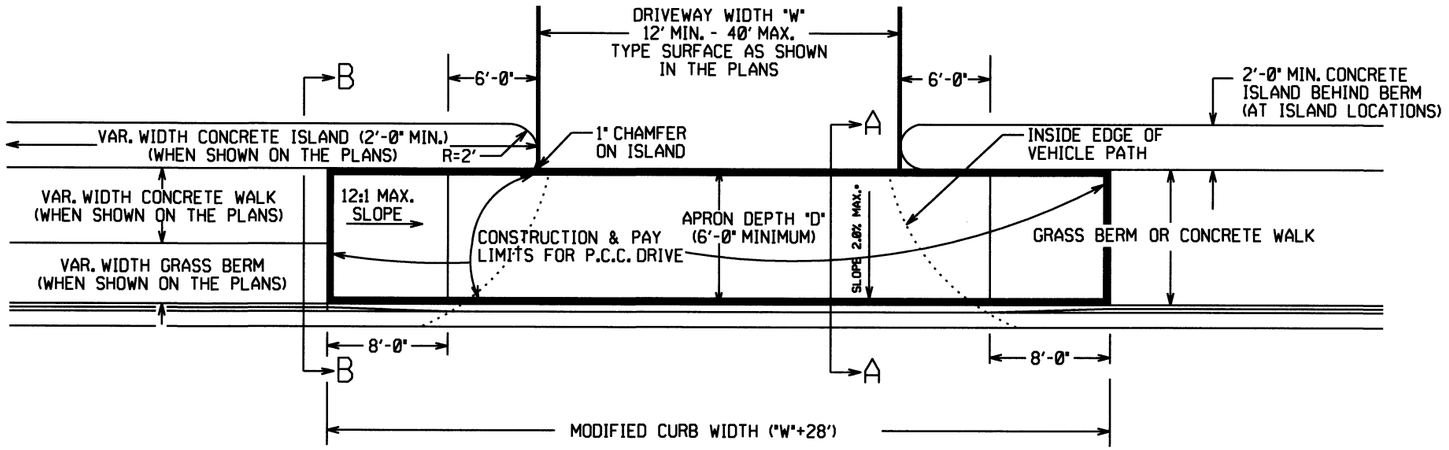
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

| DATE | REVISION | DATE FILM'D |
|---|---|---|
| 12-8-16 | CORRECTED ENERGY DISSIPATOR DRAWING AND NOTE | |
| 11-17-10 | ADDED GENERAL NOTE | |
| 6-2-94 | ADDED GENERAL NOTE ABOUT SOLID SODDING | |
| 11-30-8 | ELIMINATED MIN. ROWS OF ELEMENTS | 111-30-89 |
| 7-19-88 | REVISED DISSIPATOR NOTE | 683-7-19-88 |
| 4-3-87 | REVISED ENERGY DISSIPATOR | 671-4-3-87 |
| 1-9-87 | MODIFIED NOTE ON ENERGY DISS. | 632-1-9-87 |
| 11-3-86 | ADDED NOTE TO ENERGY DISS. | 596-12-1-86 |
| 11-1-84 | ENERGY DISSIPATOR DETAILS ADDED | 508-11-1-84 |
| 11-1-84 | EXCAVATION DETAILS ADDED TYPES A & B | |
| 10-2-72 | REVISED AND REDRAWN | 508-10-2-72 |

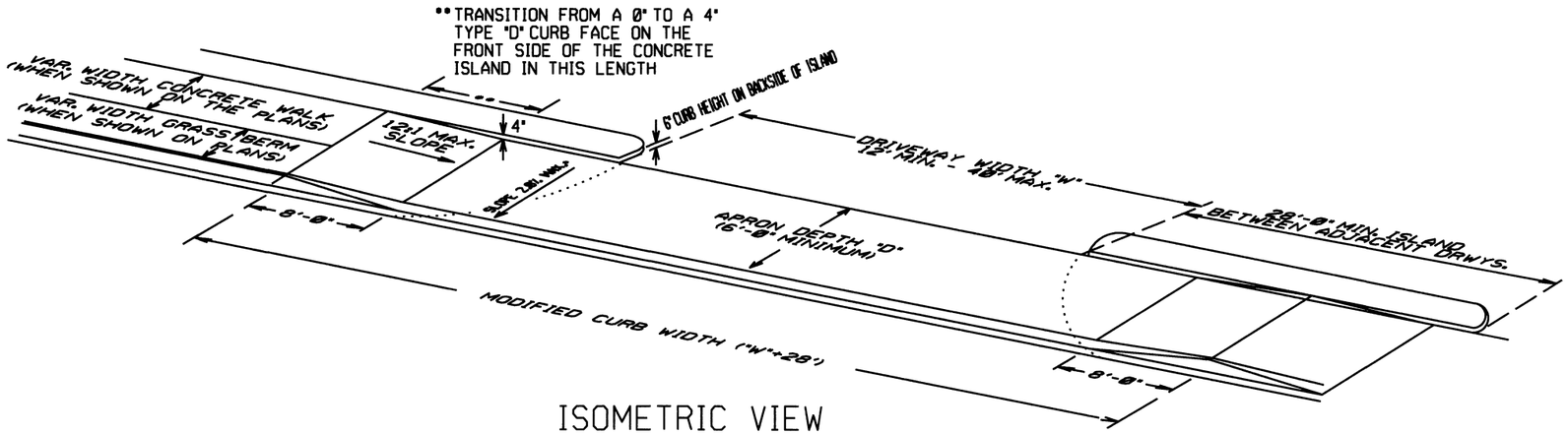
ARKANSAS STATE HIGHWAY COMMISSION

# CONCRETE DITCH PAVING

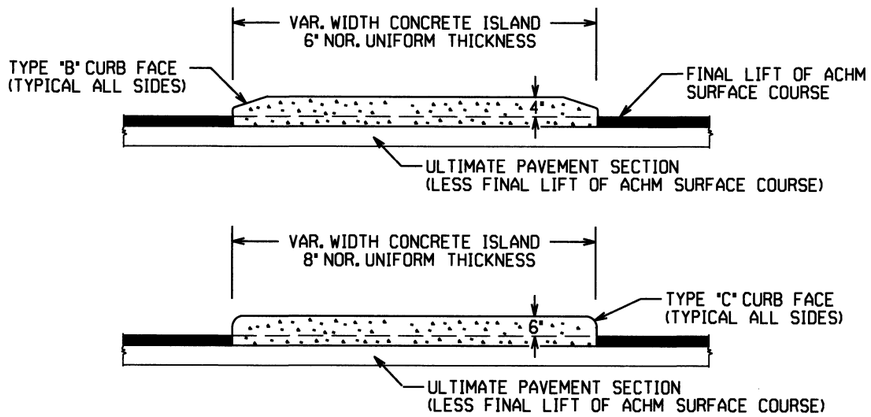
STANDARD DRAWING CDP-1




PLAN VIEW

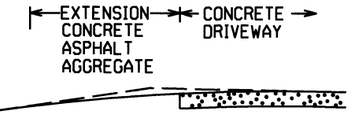



ISOMETRIC VIEW




CURBED ISLANDS FOR CHANNELIZATION

REFER TO PLANS FOR TYPE OF CURB FACE TO BE USED. NO DIRECT PAYMENT WILL BE MADE FOR THE CURB FACES SHOWN ON THE ISLAND DETAILS. PAYMENT FOR THE CURB FACE WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM "CONCRETE ISLAND".




EXTENSION TYPICAL SECTIONS

1: CONCRETE - 6" P.C. CONCRETE DRIVEWAY

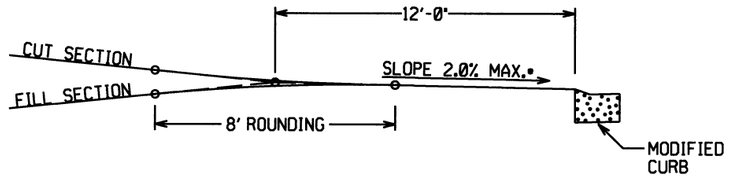
2: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
4" ACHM BINDER COURSE.(1") OR
4" ACHM BASE COURSE (1-1/2")

3: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
7" AGGREGATE BASE COURSE

4: AGGREGATE - 6" AGGREGATE BASE COURSE

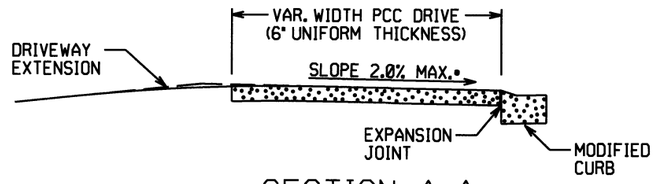
THE TYPE OF EXTENSION SHALL BE AS SHOWN IN THE PLANS. THE CONTRACTOR MAY, WITH THE APPROVAL OF THE ENGINEER, SUBSTITUTE A LOWER NUMBERED TYPE OF EXTENSION IN LIEU OF THE TYPE SPECIFIED IN THE PLANS, BUT AT NO ADDITIONAL COST TO THE DEPARTMENT.

## DRIVEWAY EXTENSION DETAILS

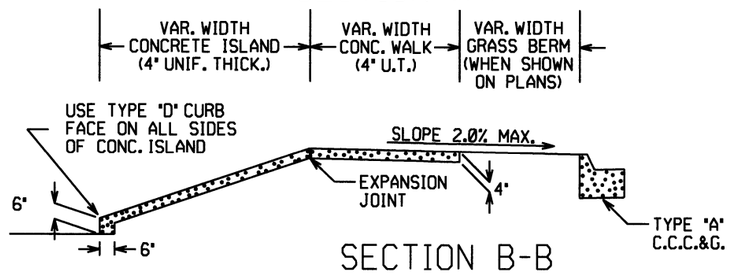



## DRIVEWAY VERTICAL ALIGNMENT DETAILS

- NOTE: DRIVEWAYS MAY NOT BE SLOPED AWAY FROM THE ROADWAY UNLESS APPROVED BY THE ENGINEER.




SECTION A-A



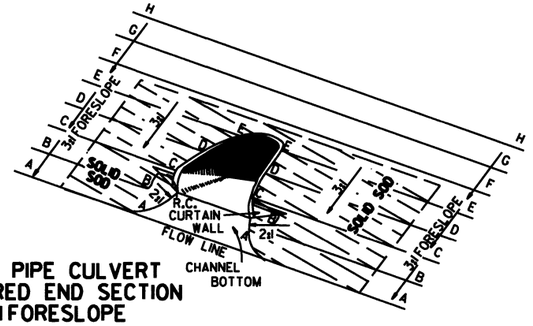

SECTION B-B
CURBED ISLAND BEHIND WALK

| DATE REV | DATE FILMED | DESCRIPTION |
|---|---|---|
| 2-27-14 | | REVISED PLAN & ISOMETRIC VIEW |
| 11-29-07 | | ADDED CHANNELIZATION ISLAND WITH TYPE C CURB FACE & REVISED DRIVEWAY SLOPE NOTE & VERTICAL ALIGNMENT DETAIL |
| 11-10-05 | | REV. APRON SLOPE & DEPTH OF AGG. BASE. |
| 8-22-02 | | ADDED ISLAND DETAILS & NOTES |
| 3-30-00 | | REV. MOD. CURB WIDTH & TRANS. NOTE |
| 11-19-98 | | REVISED NOTES |
| 11-18-98 | | REDRAWN AND REISSUED |

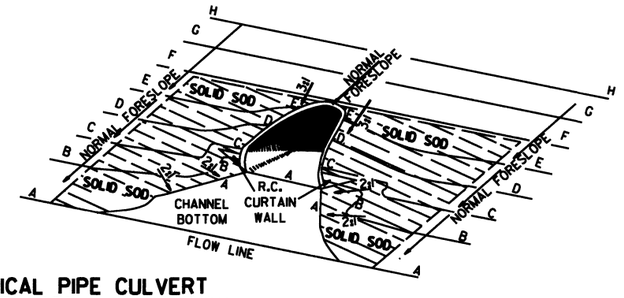
ARKANSAS STATE HIGHWAY COMMISSION

**DETAILS OF DRIVEWAYS & ISLANDS**

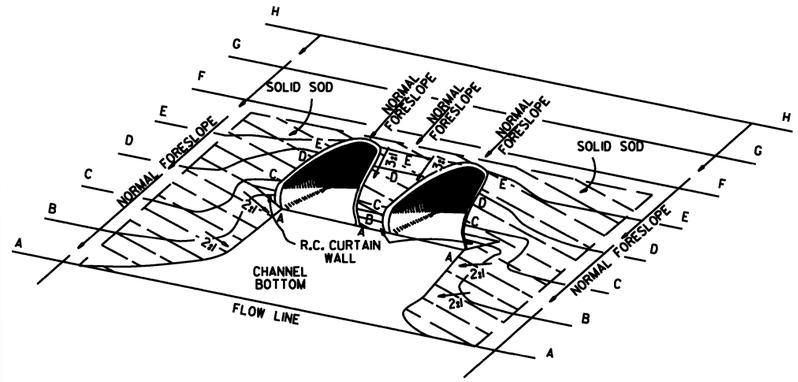
STANDARD DRAWING DR-1



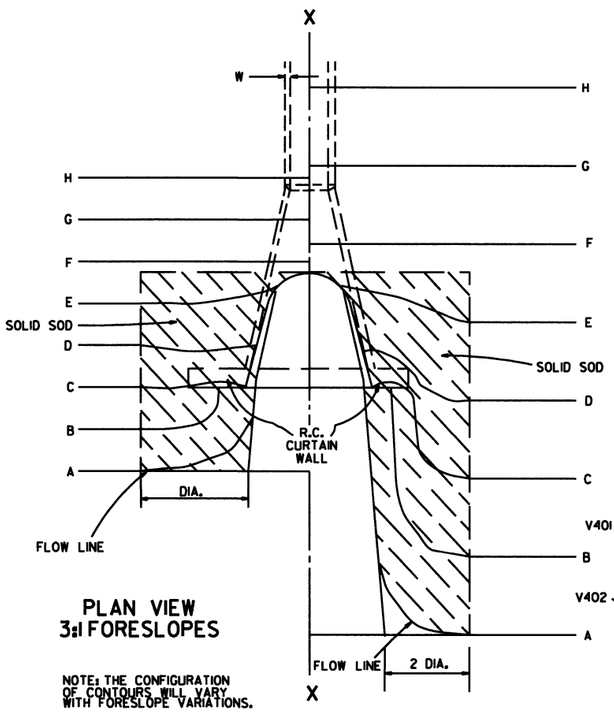

TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE




TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& FLATTENED ADJACENT SLOPES




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




PLAN VIEW
3:1 FORESLOPES

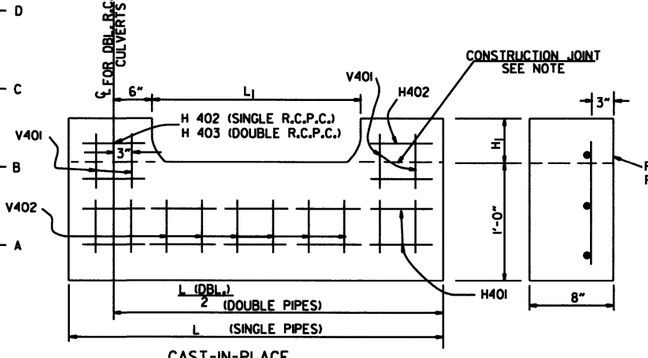
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW
FLATTENED FORESLOPES

## R.C. CURTAIN WALL
## DIMENSIONS & QUANTITIES

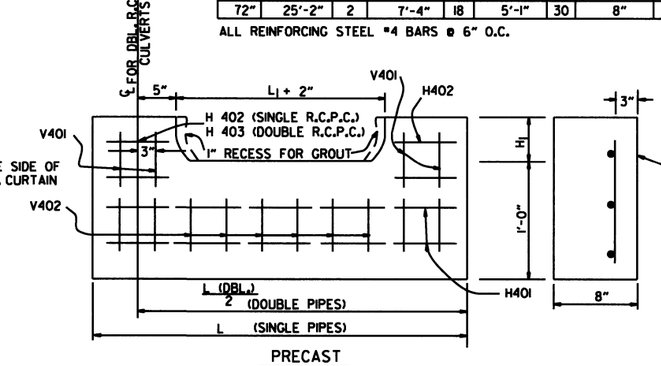
| PIPE DIA. | $H_1$ | $L_1$ | L | L (DBL.) / 2 | SINGLE R.C.P.C. | | DOUBLE R.C.P.C. | |
|---|---|---|---|---|---|---|---|---|
| | | | | | CONC. | REINF. STEEL | CONC. | REINF. STEEL |
| | | | | | CU. YDS. | LBS. | CU. YDS. | LBS. |
| 18" | 11½" | 3'-5" | 8'-0" | 6'-3" | 0.31 | 27.7 | 0.45 | 39.5 |
| 24" | 1'-0½" | 4'-6" | 9'-6" | 7'-6" | 0.37 | 33.4 | 0.53 | 48.0 |
| 30" | 1'-3½" | 5'-7" | 11'-0" | 9'-0" | 0.45 | 39.0 | 0.67 | 59.0 |
| 36" | 1'-7" | 6'-8" | 13'-0" | 10'-6" | 0.58 | 52.6 | 0.83 | 73.9 |
| 42" | 2'-1½" | 7'-3" | 15'-6" | 12'-0" | 0.82 | 77.1 | 1.10 | 100.7 |
| 48" | 2'-5" | 7'-10" | 17'-0" | 13'-0" | 0.98 | 94.9 | 1.27 | 120.4 |
| 54" | 2'-9½" | 8'-5" | 18'-6" | 14'-0" | 1.16 | 115.8 | 1.47 | 143.7 |
| 60" | 3'-4" | 9'-0" | 20'-6" | 15'-6" | 1.47 | 149.7 | 1.84 | 180.3 |
| 72" | 4'-5" | 10'-2" | 25'-6" | 18'-6" | 2.31 | 232.6 | 2.73 | 271.0 |

NOTE: QUANTITIES SHOWN ARE FOR ONE (1) CURTAIN WALL.




CAST-IN-PLACE

NOTE: THE PORTION OF THE R.C. CURTAIN WALL BENEATH THE FLARED END SECTION (LOWER 1'-0") SHALL BE PLACED MONOLITHICALLY. THE FLARED END SECTION SHALL THEN BE SET IN PLACE & THE REMAINING PORTIONS OF THE R.C. CURTAIN WALL PLACED.




PRECAST

NOTE: THE PRECAST CURTAIN WALL WILL BE SET AND BACKFILLED WITH COMPACTED MATERIAL. THE FLARED END SECTION SHALL THEN BE SET IN PLACE AND THE 1" RECESS FILLED WITH GROUT. WHERE "L" EXCEEDS 11' THE CURTAIN WALL MAY BE CAST IN TWO (2) OR MORE SECTIONS. THE METHOD OF JOINING THE SECTIONS FOR INSTALLATION SHALL BE APPROVED BY THE ENGINEER.

R.C. CURTAIN WALL DETAILS

## REINFORCING STEEL SCHEDULE

| PIPE DIA. | SINGLE R.C. PIPE CULVERT | | | | | | | | DOUBLE R.C. PIPE CULVERT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H401 | | H402 | | V401 | | V402 | | H401 | | H402 | | H403 | | V401 | | V402 | |
| | L | NO. | L | NO. | L | NO. | L | NO. | L | NO. | L | NO. | L | NO. | L | NO. | L | NO. |
| 18" | 7'-8" | 2 | 1'-11½" | 4 | 1'-7½" | 8 | 8" | 8 | 12'-2" | 2 | 1'-11½" | 4 | 8" | 2 | 1'-7½" | 10 | 8" | 14 |
| 24" | 9'-2" | 2 | 2'-2" | 4 | 1'-8½" | 10 | 8" | 9 | 14'-8" | 2 | 2'-2" | 4 | 8" | 2 | 1'-8½" | 12 | 8" | 18 |
| 30" | 10'-8" | 2 | 2'-4½" | 4 | 1'-11½" | 10 | 8" | 12 | 17'-8" | 2 | 2'-4½" | 4 | 8" | 2 | 1'-11½" | 14 | 8" | 22 |
| 36" | 12'-8" | 2 | 2'-10" | 6 | 2'-3" | 12 | 8" | 14 | 20'-8" | 2 | 2'-10" | 6 | 8" | 3 | 2'-3" | 14 | 8" | 28 |
| 42" | 15'-2" | 2 | 3'-9½" | 8 | 2'-9½" | 16 | 8" | 15 | 23'-8" | 2 | 3'-9½" | 8 | 8" | 4 | 2'-9½" | 18 | 8" | 30 |
| 48" | 16'-8" | 2 | 4'-3" | 10 | 3'-1" | 18 | 8" | 16 | 25'-8" | 2 | 4'-3" | 10 | 8" | 5 | 3'-1" | 20 | 8" | 32 |
| 54" | 18'-2" | 2 | 4'-8½" | 12 | 3'-5½" | 20 | 8" | 17 | 27'-8" | 2 | 4'-9" | 12 | 8" | 6 | 3'-5½" | 22 | 8" | 34 |
| 60" | 20'-2" | 2 | 5'-5" | 14 | 4'-0" | 24 | 8" | 18 | 30'-8" | 2 | 5'-5" | 14 | 8" | 7 | 4'-0" | 26 | 8" | 36 |
| 72" | 25'-2" | 2 | 7'-4" | 18 | 5'-1" | 30 | 8" | 20 | 36'-8" | 2 | 7'-4" | 18 | 8" | 9 | 5'-1" | 33 | 8" | 40 |

ALL REINFORCING STEEL #4 BARS @ 6" O.C.

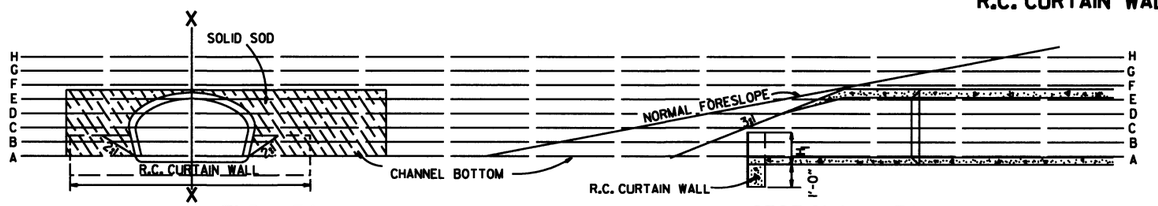
## SOLID SODDING

| PIPE DIA. | SINGLE R.C.P.C. | | | DOUBLE R.C.P.C. | | |
|---|---|---|---|---|---|---|
| | 3:1 | 4:1 | 6:1 | 3:1 | 4:1 | 6:1 |
| | SQ. YDS. | | | SQ. YDS. | | |
| 18" | 5 | 7 | 12 | 6 | 8 | 13 |
| 24" | 8 | 12 | 19 | 9 | 13 | 20 |
| 30" | 13 | 18 | 29 | 14 | 19 | 30 |
| 36" | 17 | 26 | 41 | 18 | 28 | 43 |
| 42" | 23 | 35 | 55 | 25 | 37 | 57 |
| 48" | 29 | 46 | 68 | 31 | 48 | 70 |
| 54" | 35 | 57 | 85 | 37 | 59 | 87 |
| 60" | 45 | 67 | 104 | 48 | 69 | 107 |
| 72" | 64 | 92 | 156 | 67 | 95 | 159 |

NOTE: QUANTITIES SHOWN ABOVE ARE FOR ONE (1) END OF F.E.S.

GENERAL NOTES

1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE: FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL, AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED ¾".
3. CONCRETE FOR CURTAIN WALL SHALL MEET THE REQUIREMENTS FOR CLASS A OR S CONCRETE AS PROVIDED IN SECTION 802 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 501 OF THE STANDARD SPECIFICATIONS.
4. WELDED WIRE MESH 3 × 3 W10 × W10 MAY BE USED IN LIEU OF REINFORCING BARS.




END VIEW

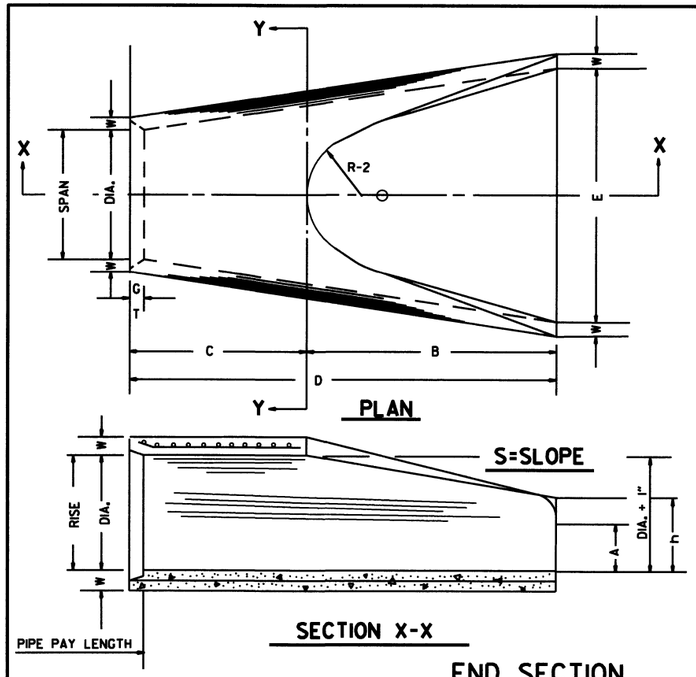
SECTIONAL VIEW "X-X"

| DATE | REVISION | FILMED |
|---|---|---|
| 10-18-96 | ADDED NOTE TO SOLID SODDING | |
| 10-12-95 | CORRECTED SPELLING | |
| 11-3-94 | ADDED GENERAL NOTE NO. 4 | |
| 8-15-91 | REV. CURTAIN WALL QUANT. STEEL SCH. & SOLID SOD QUANT. | |
| 3-2-81 | ALLOW PRECAST IN 2 OR MORE PIECES CHAMFER EDGES | |
| 5-15-80 | ADDED PRECAST WALL & GENERAL NOTES | |
| 10-2-72 | REVISED AND REDRAWN | |

ARKANSAS STATE HIGHWAY COMMISSION

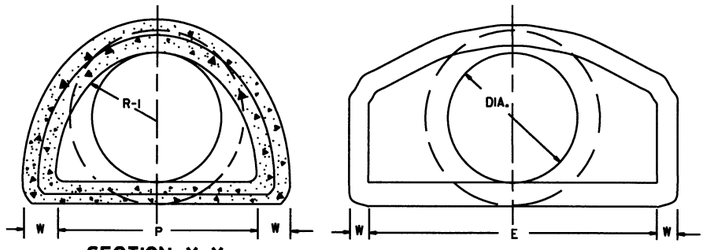
# FLARED END SECTION

STANDARD DRAWING FES-1




## TABLE OF DIMENSIONS

| DIA. | WALL | A | B | C | D | E | S | DIA. + I" | P | R-I | R-2 | G-T | WT. | h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 18" | 2½" | 9" | 2'-3" | 3'-10" | 6'-1" | 3'-0" | 3sl | 19" | 29" | 15½" | 12" | 2" | 1000 | 1'-0½" |
| 24" | 3" | 9½" | 3'-7½" | 2'-6" | 6'-1½" | 4'-0" | 3sl | 25" | 33⅜" | 16⅛" | 14" | 2½" | 1600 | 1'-1½" |
| 30" | 3½" | 1'-0" | 4'-6" | 1'-7¾" | 6'-1¾" | 5'-0" | 3sl | 31" | 37" | 18½" | 15" | 3¼" | 1940 | 1'-4⅝" |
| 36" | 4" | 1'-3" | 5'-3" | 2'-10¾" | 8'-1¾" | 6'-0" | 3sl | 37" | 47⅛" | 24⅛" | 20" | 3½" | 4100 | 1'-8" |
| 42" | 4½" | 1'-9" | 5'-3" | 2'-11" | 8'-2" | 6'-6" | 3sl | 43" | 53⅛" | 27½" | 22" | 3½" | 5380 | 2'-2½" |
| 48" | 5" | 2'-0" | 6'-0" | 2'-2" | 8'-2" | 7'-0" | 3sl | 49" | 56½" | 28½" | 22" | 3½" | 6550 | 2'-6" |
| 54" | 5½" | 2'-4" | 6'-6" | 1'-10" | 8'-4" | 7'-6" | 3sl | 55" | 65½" | 33⅛" | 24" | 4" | 8750 | 2'-10½" |
| 60" | 6" | 2'-10" | 6'-6" | 1'-10" | 8'-4" | 8'-0" | 3sl | 61" | 72½" | 36⅛" | 24" | 4" | 9270 | 3'-5" |
| | | | | | | | | | | | | | | |
| 72" | 7" | 3'-10" | 6'-6" | 1'-10" | 8'-4" | 9'-0" | 3sl | 73" | 77⅛" | 38⅛" | 24" | 5" | 13250 | 4'-6" |



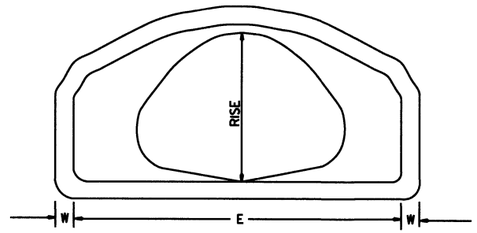

NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

# END SECTION
# FOR REINFORCED CONCRETE PIPE CULVERTS

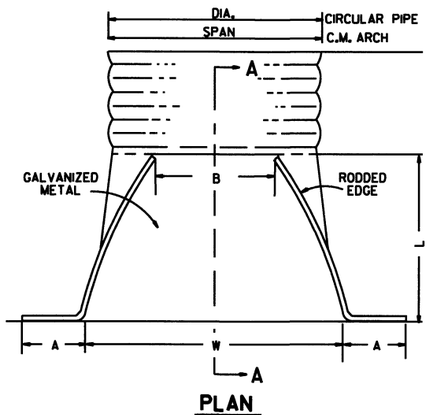
## ARCH PIPE

| EQUIV. DIA. | • SPAN | | • RISE | | W | A | B | C | D | E | P | R2 | G-T | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AASHTO M 206 | AHD NOMINAL | AASHTO M 206 | AHD NOMINAL | | | | | | | | | | |
| | INCHES | | | | | | | | | | | | | |
| 15 | 18 | 18 | 11 | 11 | 2" | 4" | 2'-0" | 4'-0" | 6'-0" | 3'-0" | 29" | 12" | 1½" | 2½sl |
| 18 | 22 | 22 | 13½ | 14 | 2½" | 5" | 2'-0" | 4'-1" | 6'-1" | 3'-6" | 32⅛" | 13" | 2½" | 2½sl |
| 21 | 26 | 26 | 15½ | 16 | 2¾" | 7" | 2'-3" | 3'-10" | 6'-1" | 4'-0" | 34⅛" | 14" | 2½" | 2½sl |
| 24 | 28½ | 29 | 18 | 18 | 3" | 9" | 2'-3" | 3'-10" | 6'-1" | 5'-0" | 36⅛" | 15" | 2½" | 2½sl |
| 30 | 36¼ | 36 | 22½ | 23 | 3½" | 10" | 3'-1" | 3'-0½" | 6'-1½" | 6'-0" | 47⅛" | 20" | 3" | 2½sl |
| 36 | 43¾ | 44 | 26⅝ | 27 | 4" | 10½" | 4'-0" | 2'-1½" | 6'-1½" | 6'-6" | 54⅛" | 22" | 3½" | 2½sl |
| 42 | 51⅛ | 51 | 31⅝ | 31 | 4½" | 11½" | 4'-7" | 1-10¼" | 6'-5¼" | 7'-2" | 59½" | 23" | 3¾" | 2½sl |
| 48 | 58½ | 59 | 36 | 36 | 5" | 1'-3" | 5'-3" | 2'-10¾" | 8'-1¾" | 7'-10" | 70⅝" | 24" | 4¼" | 2½sl |
| 54 | 65 | 65 | 40 | 40 | 5½" | 1'-7" | 5'-3" | 2'-11" | 8'-2" | 8'-6" | 72⅞" | 24" | 4¾" | 2½sl |
| 60 | 73 | 73 | 45 | 45 | 6" | 1'-10" | 5'-6" | 2'-8" | 8'-2" | 9'-0" | 77⅝" | 24" | 5" | 2½sl |

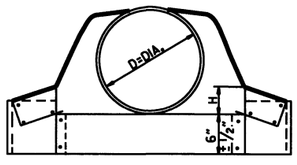
• THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PER CENT FROM THE VALUES SPECIFIED BY AASHTO M 206.



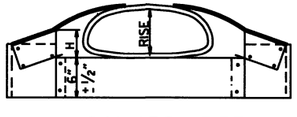

END VIEW
CONCRETE ARCH PIPE




NOTE: ALTERNATE CONNECTIONS TO THE PIPE CULVERTS, IN ACCORDANCE WITH MANUFACTURER'S STANDARD PRACTICES, MAY BE MADE SUBJECT TO THE APPROVAL OF THE ENGINEER.




CIRCULAR PIPE



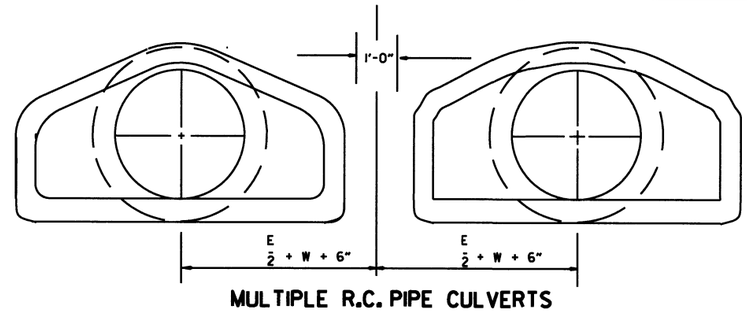

C.M. ARCH PIPE

## CIRCULAR PIPE

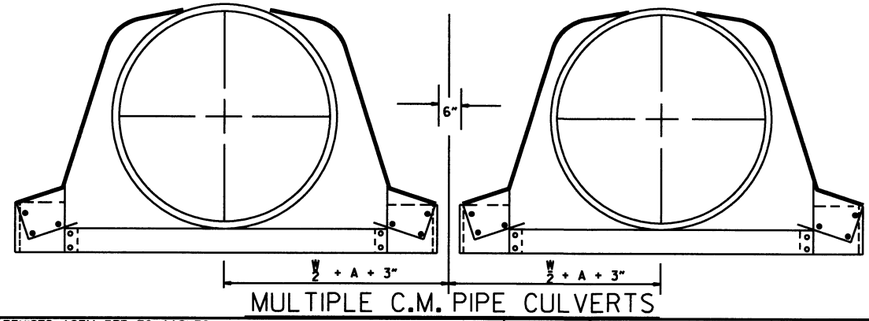
| D. DIA. | GAUGE | A I" ± | B. MAX. | H I" ± | L 1½" ± | W 2" ± | S |
|---|---|---|---|---|---|---|---|
| | | INCHES | | | | | |
| 12 | 16 | 6 | 6 | 6 | 21 | 24 | 2½sl |
| 15 | 16 | 7 | 8 | 6 | 26 | 30 | 2½sl |
| 18 | 16 | 8 | 10 | 6 | 31 | 36 | 2½sl |
| 21 | 16 | 9 | 12 | 6 | 36 | 42 | 2½sl |
| 24 | 16 | 10 | 13 | 6 | 41 | 48 | 2½sl |
| 30 | 14 | 12 | 16 | 8 | 51 | 60 | 2½sl |
| 36 | 14 | 14 | 19 | 9 | 60 | 72 | 2½sl |
| 42 | 12 | 16 | 22 | 11 | 69 | 84 | 2½sl |
| 48 | 12 | 18 | 27 | 12 | 78 | 90 | 2½sl |
| 54 | 12 | 18 | 30 | 12 | 84 | 102 | 2sl |
| 60 | 12 | 18 | 33 | 12 | 87 | 114 | 1½sl |
| 66 | 12 | 18 | 36 | 12 | 87 | 120 | 1½sl |
| 72 | 12 | 18 | 39 | 12 | 87 | 126 | 1 1/3sl |

## C.M. ARCH PIPE

| EQUIV. DIA. | SPAN | RISE | A I" ± | B MAX. | H I" ± | L 1½" ± | W 2" ± | S | GAUGE |
|---|---|---|---|---|---|---|---|---|---|
| | INCHES | | | | | | | | |
| 15" | 17 | 13 | 7 | 9 | 6 | 19 | 30 | 2½sl | 16 |
| 18" | 21 | 15 | 7 | 10 | 6 | 23 | 36 | 2½sl | 16 |
| 21" | 24 | 18 | 8 | 12 | 6 | 28 | 42 | 2½sl | 16 |
| 24" | 28 | 20 | 9 | 14 | 6 | 32 | 48 | 2½sl | 16 |
| 30" | 35 | 24 | 10 | 16 | 6 | 39 | 60 | 2½sl | 14 |
| 36" | 42 | 29 | 12 | 18 | 8 | 46 | 75 | 2½sl | 14 |
| 42" | 49 | 33 | 15 | 21 | 9 | 53 | 85 | 2½sl | 12 |
| 48" | 57 | 38 | 18 | 26 | 12 | 63 | 90 | 2½sl | 12 |
| 54" | 64 | 43 | 18 | 30 | 12 | 70 | 102 | 2½sl | 12 |
| 60" | 71 | 47 | 18 | 33 | 12 | 77 | 114 | 2½sl | 12 |




MULTIPLE R.C. PIPE CULVERTS




MULTIPLE C.M. PIPE CULVERTS

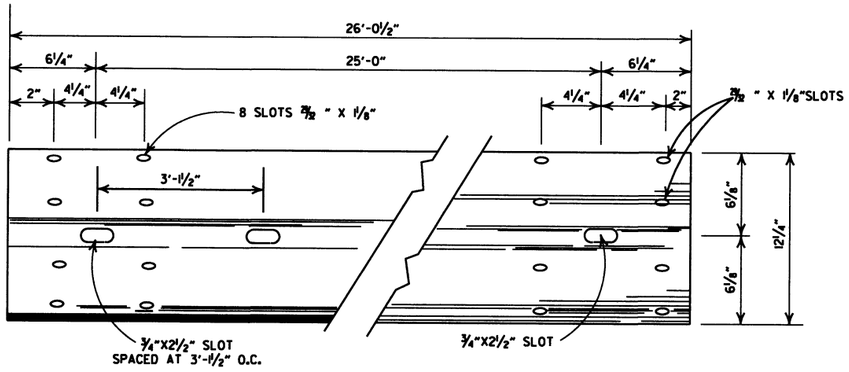
| DATE | REVISION | FILMED |
|---|---|---|
| 10-18-96 | REVISED ASTM REF. TO AASHTO | |
| 5-15-80 | REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S. | 664-5-15-80 |
| 7-14-78 | C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES | 752-7-14-78 |
| 8-22-75 | ADDED MULTIPLE PIPE CULVERTS | 517-8-22-75 |
| 12-5-74 | REMOVED NOTE RE REINF. FOR R.C. F.E.S. | 500-12-5-74 |
| 5-24-73 | CMP END SECTION, SHOW PIPE PAY LENGTH | 627-5-24-73 |
| 10-2-72 | REVISED AND REDRAWN | 760-10-2-72 |

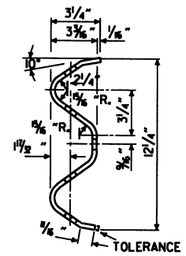
ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

STANDARD DRAWING FES-2

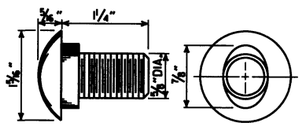
# END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



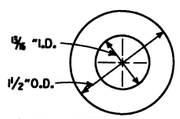




## DETAILS OF W-BEAM GUARD RAIL

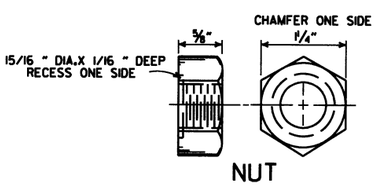
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



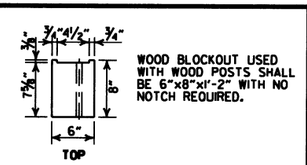

## SPLICE BOLT
## POST BOLT - SAME EXCEPT LENGTH




CUT STEEL WASHER

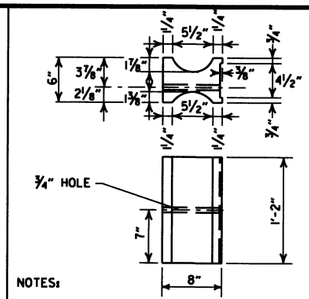



NUT




WOOD BLOCKOUT USED WITH WOOD POSTS SHALL BE 6"x8"x1'-2" WITH NO NOTCH REQUIRED.

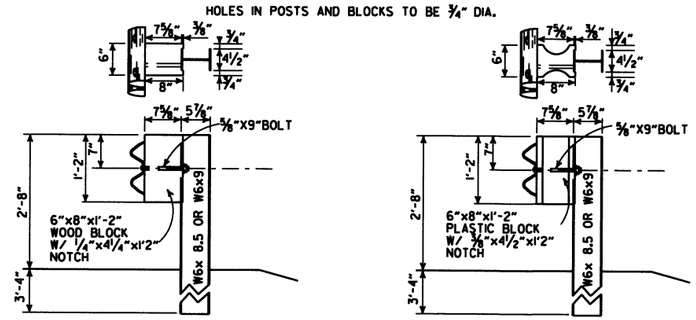
## WOOD BLOCKOUT (W-BEAM)



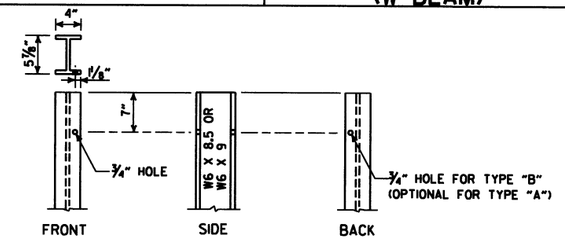

NOTES:

1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

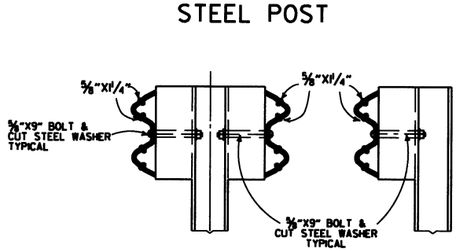
## PLASTIC BLOCKOUT (W-BEAM)




## DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)




## STEEL POST




TYPE "B" TYPE "A"

## DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

### -GENERAL NOTES-

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN ¾" BEYOND IT.

WHERE W-BEAM GUARD RAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.

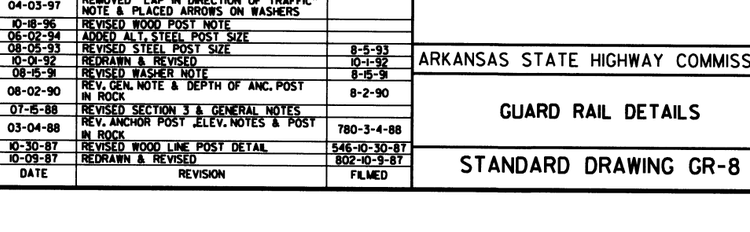
W-BEAM GUARD RAIL REPRESENTING INTERMEDIATE SECTIONS WILL BE MEASURED ALONG THE ROADWAY FACE FROM CENTERLINE OF POST TO CENTERLINE OF POST.

USE W-BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. FOR EXTENSIONS OR MODIFICATION OF EXISTING GUARD RAIL, W-BEAM GUARD RAIL COMPONENTS OF THE SAME TYPE AS THOSE EXISTING SHALL BE USED.

ANY BACKFILLING UNDER OR AROUND POST SHALL BE DAMP SAND THOROUGHLY TAMPED IN PLACE.

WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.



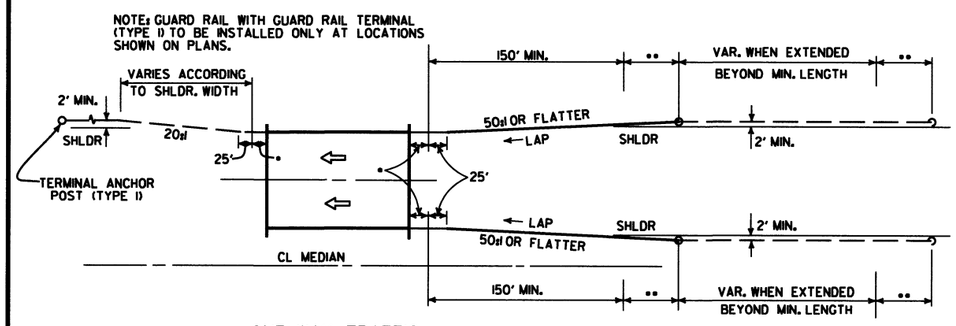

## DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

| DATE | REVISION | FILMED |
|---|---|---|
| 11-16-17 | REVISED GENERAL NOTES AND RAISED GUARD RAIL HEIGHT 3" | |
| 07-14-10 | RAISED HEIGHT OF GUARD RAIL 1" | |
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 04-10-03 | REVISED GENERAL NOTES | |
| 08-22-02 | REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & STEEL POST | |
| 11-16-01 | REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS | |
| 03-30-00 | REMOVED GUARD RAIL AT BRIDGE ENDS | |
| 01-12-00 | ADDED PLASTIC BLOCKOUT | |
| 08-12-98 | REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARD RAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK, & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE. REVISED HOLES IN STEEL POLES | |
| 04-03-97 | REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS | |
| 10-18-96 | REVISED WOOD POST NOTE | |
| 06-02-94 | ADDED ALT. STEEL POST SIZE | |
| 08-05-93 | REVISED STEEL POST SIZE | 8-5-93 |
| 10-01-92 | REDRAWN & REVISED | 10-1-92 |
| 08-15-91 | REVISED WASHER NOTE | 8-15-91 |
| 08-02-90 | REV. GEN. NOTE & DEPTH OF ANC. POST IN ROCK | 8-2-90 |
| 07-15-88 | REVISED SECTION 3 & GENERAL NOTES | |
| 03-04-88 | REV. ANCHOR POST ,ELEV. NOTES & POST IN ROCK | 780-3-4-88 |
| 10-30-87 | REVISED WOOD LINE POST DETAIL | 546-10-30-87 |
| 10-09-87 | REDRAWN & REVISED | 802-10-9-87 |

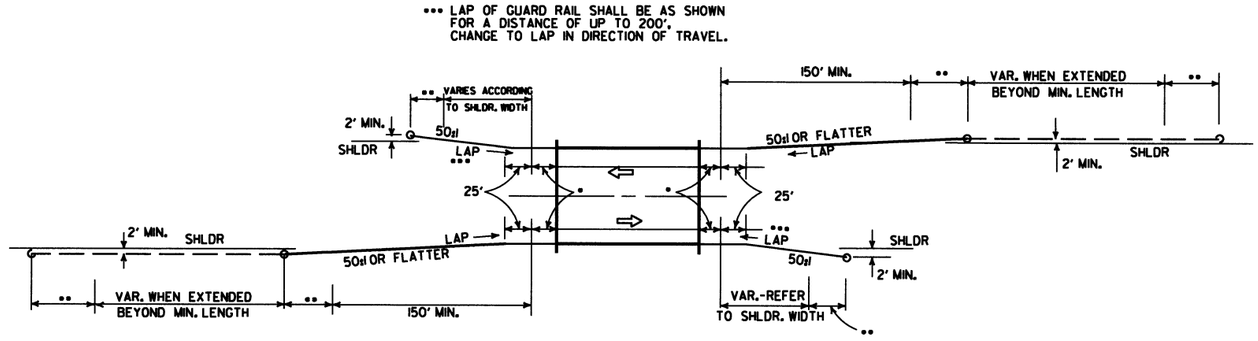
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8



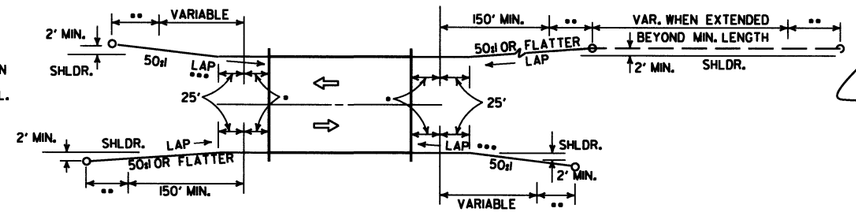

ONE-WAY TRAFFIC



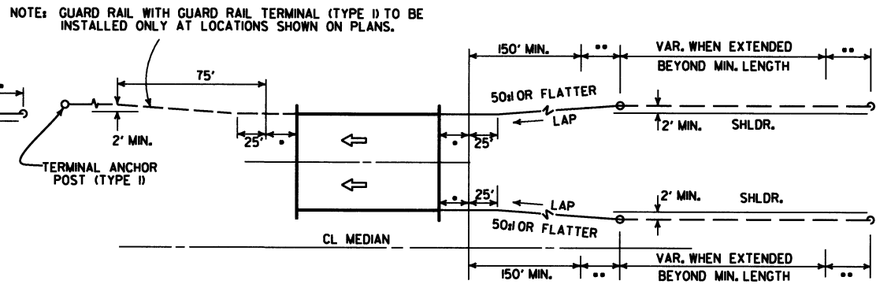

TWO-WAY TRAFFIC

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

••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



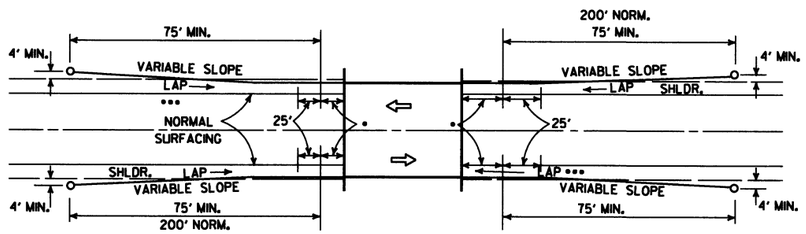

TWO-WAY TRAFFIC




ONE-WAY TRAFFIC

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

••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.




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

LEGEND

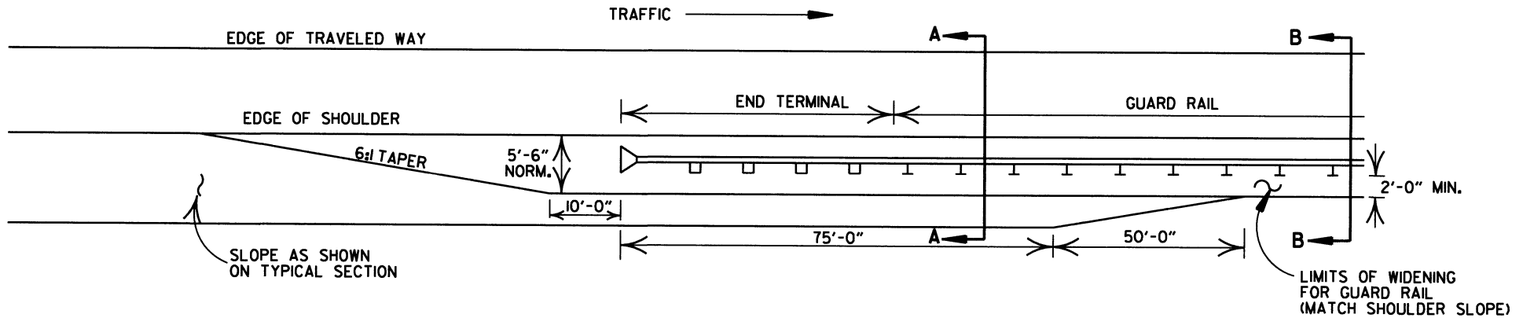
- • THRIE BEAM GUARD RAIL TERMINAL
- •• GUARD RAIL TERMINAL (TYPE 2)

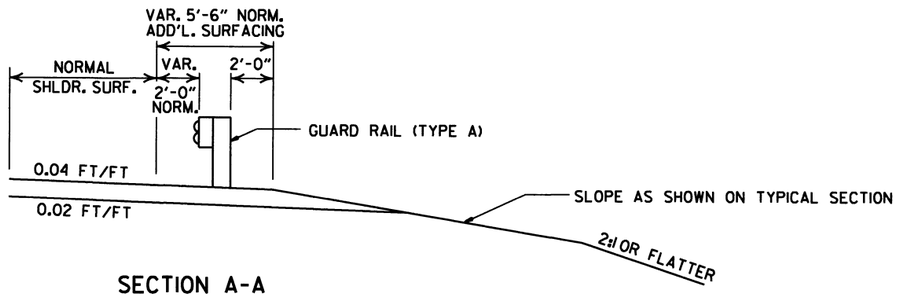
| DATE | REVISION | DATE FILM |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| 4-17-08 | REVISED LAYOUTS | |
| 11-10-05 | REMOVED GUARD RAIL NOTES AND DETAILS | |
| 11-16-01 | DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I) | |
| 1-12-00 | ADDED CONSTRUCTION NOTE | 1-12-00 |
| 6-26-97 | REVISED LAYOUT | |
| 10-1-92 | REDRAWN & REVISED | 10-1-92 |
| | ADDED NOTE | |
| 10-9-87 | REDRAWN & REVISED | |

ARKANSAS STATE HIGHWAY COMMISSION

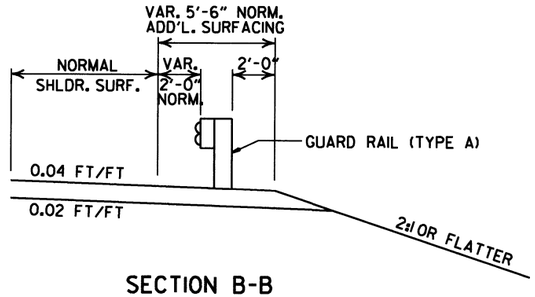
# GUARD RAIL DETAILS

STANDARD DRAWING GR-9



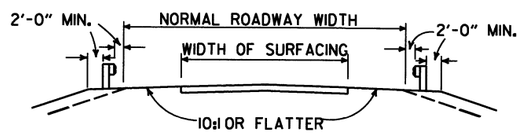

SECTION A-A



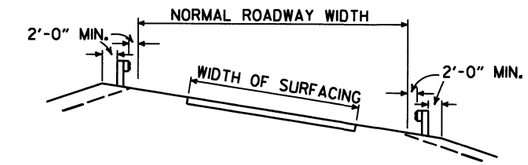

SECTION B-B

## DETAILS OF WIDENING FOR GUARD RAIL

NOTE: NORMAL SECTION TO BE WIDENED APPROX. 5'-6" EACH SIDE TO SUPPORT GUARD RAIL.

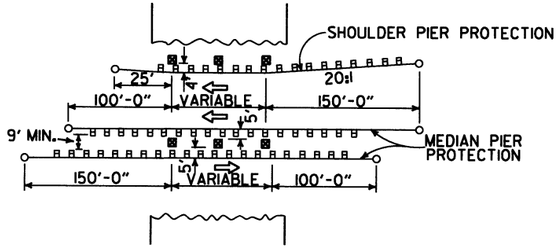



SECTION ON TANGENT




SECTION ON CURVE

## DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



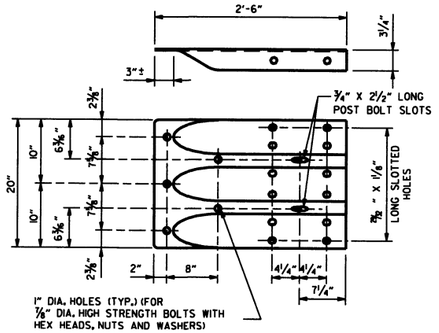

## METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

| DATE | REVISION | DATE FILM |
|---|---|---|
| 4-17-08 | MINOR REVISION | |
| 11-10-05 | DRAWN | |

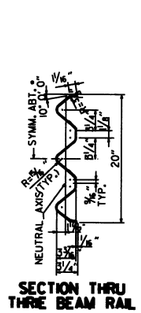
ARKANSAS STATE HIGHWAY COMMISSION

# GUARD RAIL DETAILS

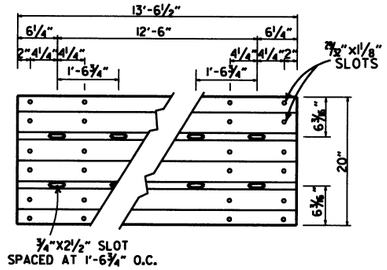
STANDARD DRAWING GR-9A



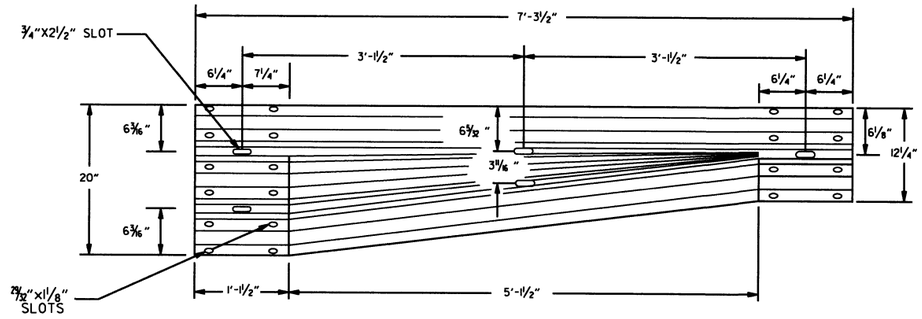

## SPECIAL END SHOE



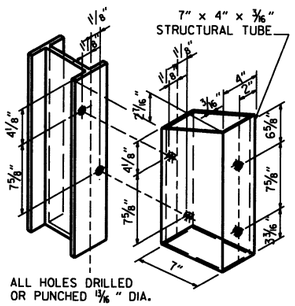

SECTION THRU THRIE BEAM RAIL




## THRIE BEAM RAIL

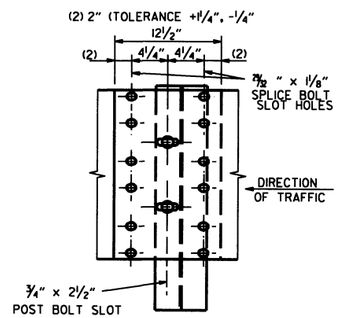



## TRANSITION SECTION

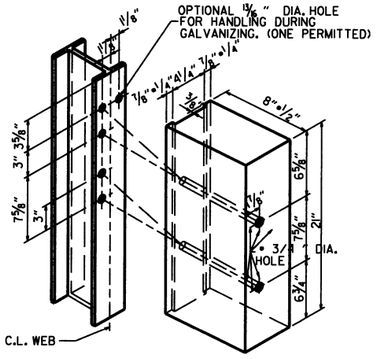



ATTACH BLOCKOUT TO POST USING 5/8" DIA. HEX HEAD BOLTS WITH 1 1/2" O.D. CUT STEEL WASHERS AND NUT.

## STRUCTURAL STEEL TUBING BLOCKOUT DETAIL



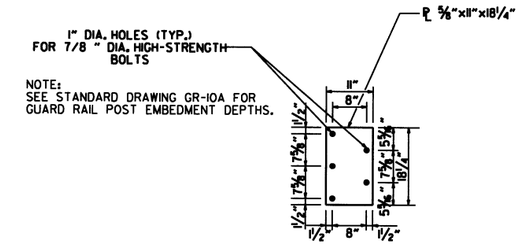

## THRIE BEAM RAIL SPLICE AT POST




ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

## HOLE PUNCHING DETAIL FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.




## CONNECTOR PLATE

CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING 7/8" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.

GENERAL NOTES:

THE THRIE BEAM RAIL, SPECIAL END SHOE, AND THE TRANSITION SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAGE. ZINC COATING SHALL BE TYPE I.

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3"4" BEYOND IT.

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-13.

REFER TO STD. DRWG. GR-11 FOR POST DETAILS.

USE THRIE BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.

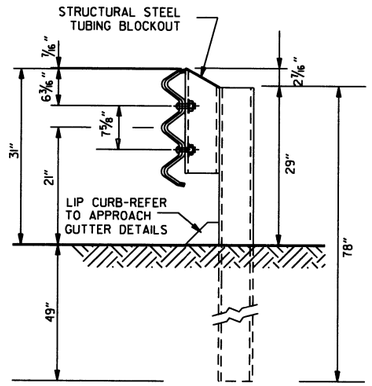
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

| DATE | REVISION | FILMED |
|---|---|---|
| 11-16-17 | REVISED TRANSITION SECTION, GUARD RAIL HEIGHT, AND GENERAL NOTES; MOVED THRIE BEAM GUARD RAIL CONNECTIONS AT BRIDGES ENDS TO STD. DRWG. GR-12 | |
| 07-14-10 | RAISED HEIGHT OF W-BEAM 1" | |
| 11-29-07 | ADDED PLASTIC BLOCKOUTS | |
| 11-10-05 | ADDED NOTE FOR ATTACHING STEEL BLOCKOUT | |
| 11-18-04 | REVISED GENERAL NOTES | |
| 10-9-03 | REVISED GENERAL NOTES | |
| 04-10-03 | REVISED GENERAL NOTES | |
| 08-22-02 | REVISED NOTE (2) | |
| 06-29-00 | MOVED DIMENSION LINES | |
| 05-18-00 | ADDED NOTE | |
| 03-30-00 | DRAWN & ISSUED | |

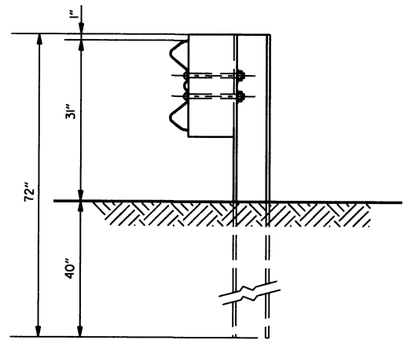
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

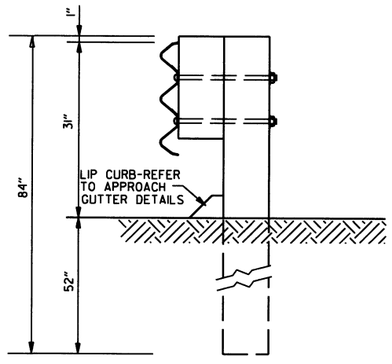
STANDARD DRAWING GR-10



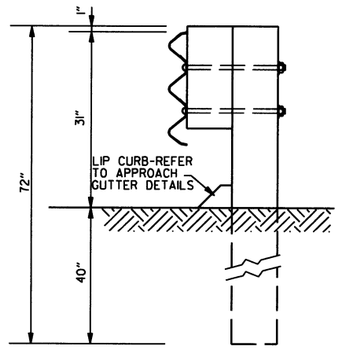

THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7



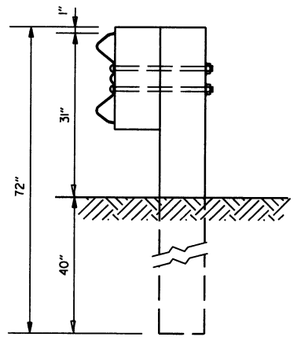

W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8




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




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




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

GENERAL NOTES:

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

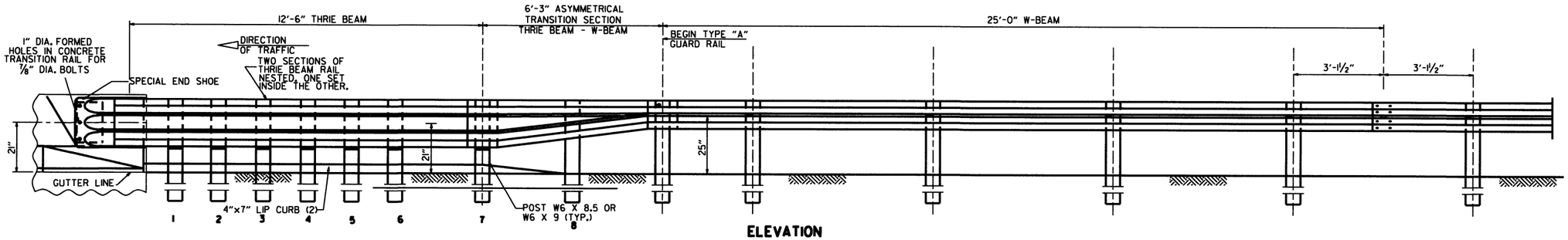
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

| DATE | REVISION | FILMED |
|---|---|---|
| 11-16-17 | REVISED GUARD RAIL HEIGHT, CHANGED STD. DWG. NUMBER FROM GR-10A TO GR-11 | |
| 07-14-10 | REVISED POST 8 DIMENSIONS | |
| 11-29-07 | ADDED PLASTIC BLOCKOUTS | |
| 08-22-02 | REVISED LIP CURB NOTE | |
| 05-30-00 | DRAWN & ISSUED | |

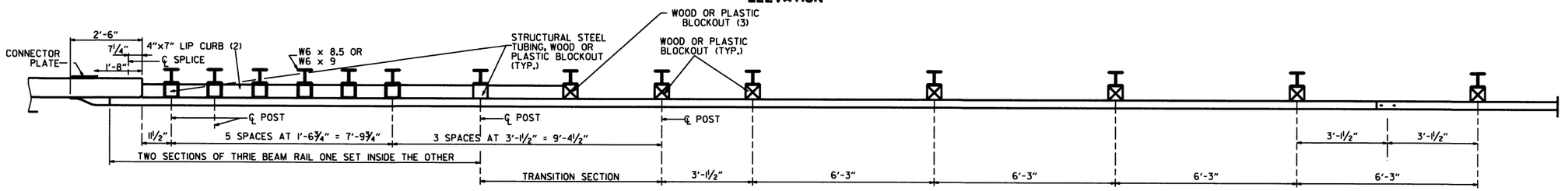
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

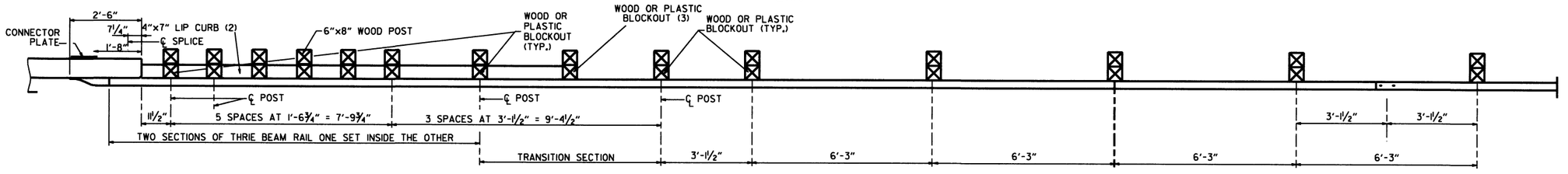
STANDARD DRAWING GR-11




ELEVATION




PLAN




PLAN

(1) VERIFY BOLT SPACING FROM RAIL TRANSITION PRODUCER.
(2) REFER TO APPROACH GUTTER DETAILS.
(3) LENGTH OF BLOCKOUT ON POST 8 TO BE MODIFIED TO FIT RAIL WIDTH.

# THRIE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS

GENERAL NOTES:

THE THRIE BEAM RAIL, SPECIAL END SHOE, AND THE TRANSITION SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAGE. ZINC COATING SHALL BE TYPE 1.

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3*4" BEYOND IT.

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-13.

REFER TO STD. DRWG. GR-11 FOR POST DETAILS.

USE THRIE BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.

POSTS SHALL BE PLACED AT THE MID-SPAN OF THE W-BEAM.

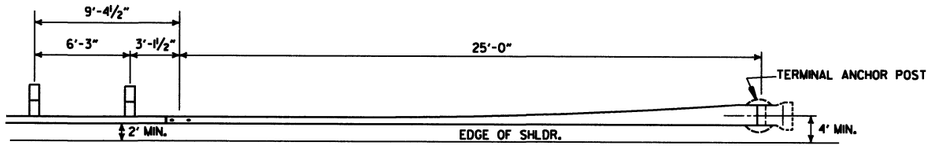
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

| DATE | REVISION | FILMED |
|---|---|---|
| 11-16-17 | RE-DRAWN FROM STD. DWG. GR-10 & ISSUED | |

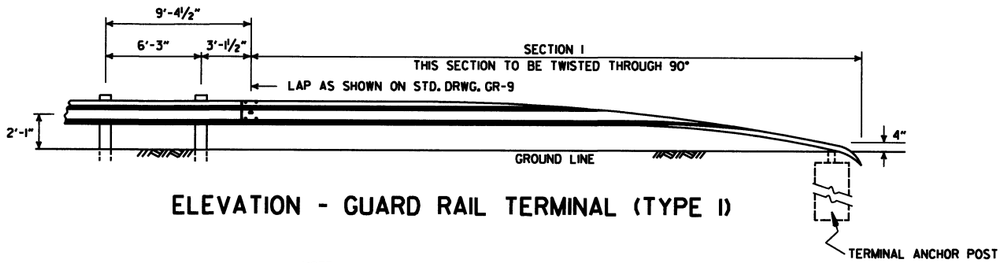
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-12

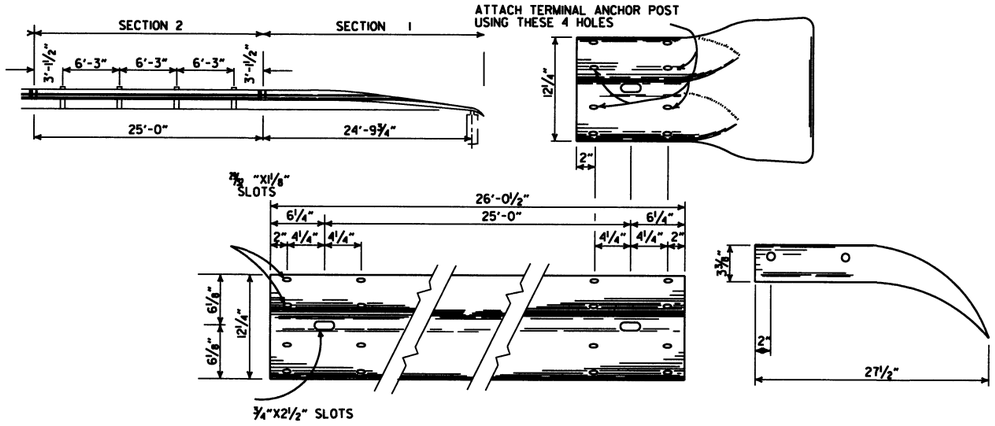



PLAN - GUARD RAIL TERMINAL (TYPE I)



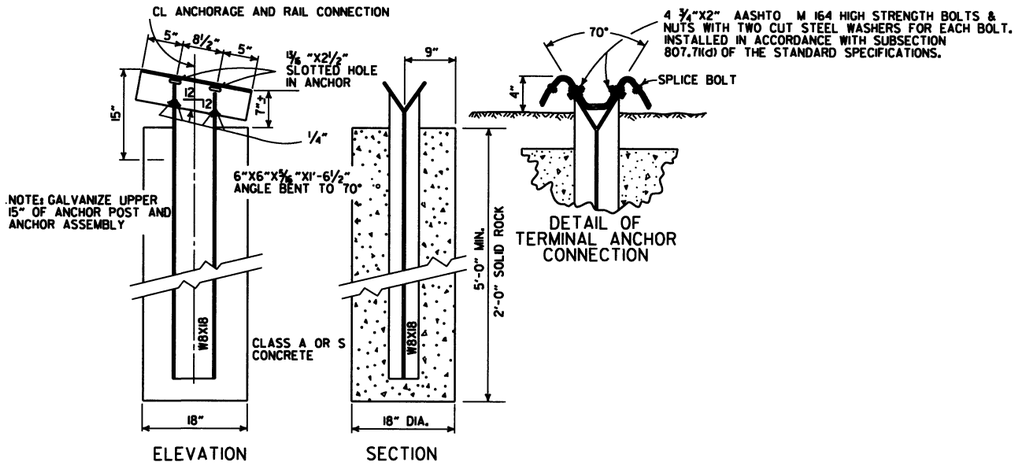

ELEVATION - GUARD RAIL TERMINAL (TYPE I)

NOTE:
SECTIONS I AND 2 OF GUARD RAIL TERMINAL SHALL BE PAID FOR AT THE PRICE BID PER LINEAR FOOT OF THE TYPE OF GUARD RAIL SPECIFIED.




SECTION I

TERMINAL SECTION




NOTE: RAIL MEMBERS MAY BE BOLTED TO ANGLE AT TERMINAL ANCHOR AND THE TWO ASSEMBLIES POSITIONED TO PROPER ALIGNMENT PRIOR TO PLACING CONCRETE AROUND 8 WF 17 POST IF CONTRACTOR SO DESIRES.

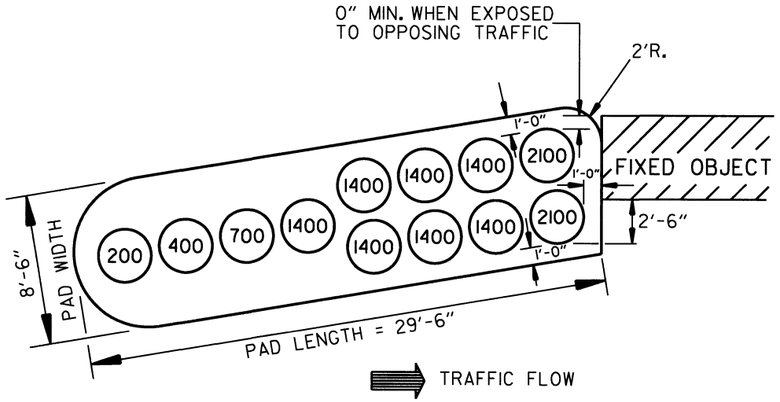
DETAIL OF TERMINAL ANCHOR POST (TYPE I)

| DATE | REVISION | FILMED |
|---|---|---|
| | | |
| 11-16-17 | REVISED GUARD RAIL HEIGHT AND LOCATION OF POSTS | |
| 07-14-10 | RAISED HEIGHT OF GUARD RAIL 1" | |
| 06-26-97 | REVISED LAP NOTE | |
| 10-18-96 | REVISED ASTM REF. TO AASHTO | |
| 11-03-94 | DIMENSION TERMINAL DETAIL | |
| 11-11-92 | ADDED NOTE FOR PAYMENT | 11-11-92 |
| 10-01-92 | DRAWN & ISSUED | 10-1-92 |

ARKANSAS STATE HIGHWAY COMMISSION

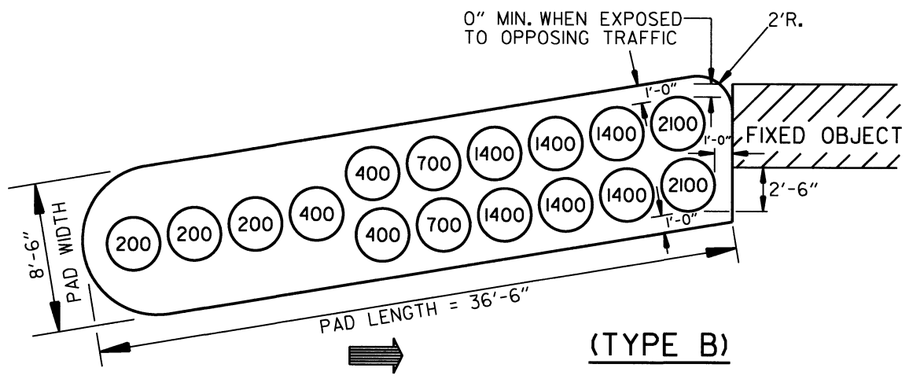
GUARD RAIL DETAILS

STANDARD DRAWING GRT-1



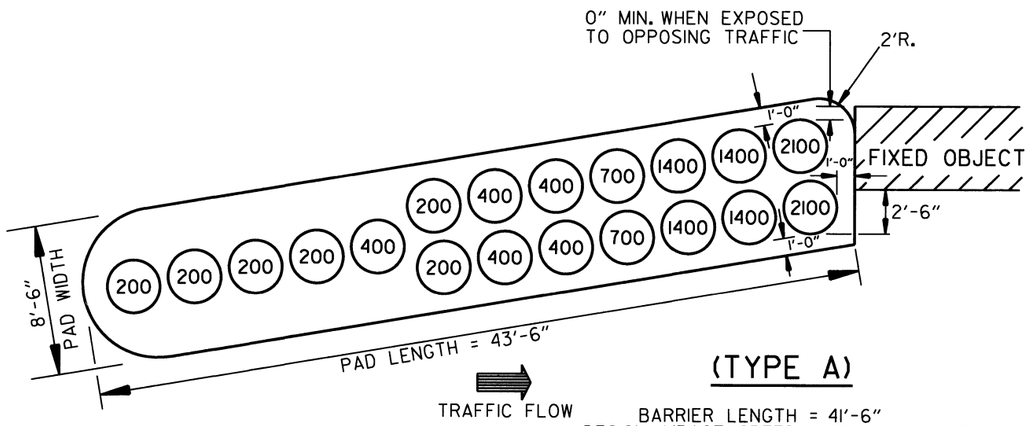

## (TYPE C)

BARRIER LENGTH = 27'-6"
DESIGN IMPACT SPEED = 50 M.P.H.= 73.3 fps



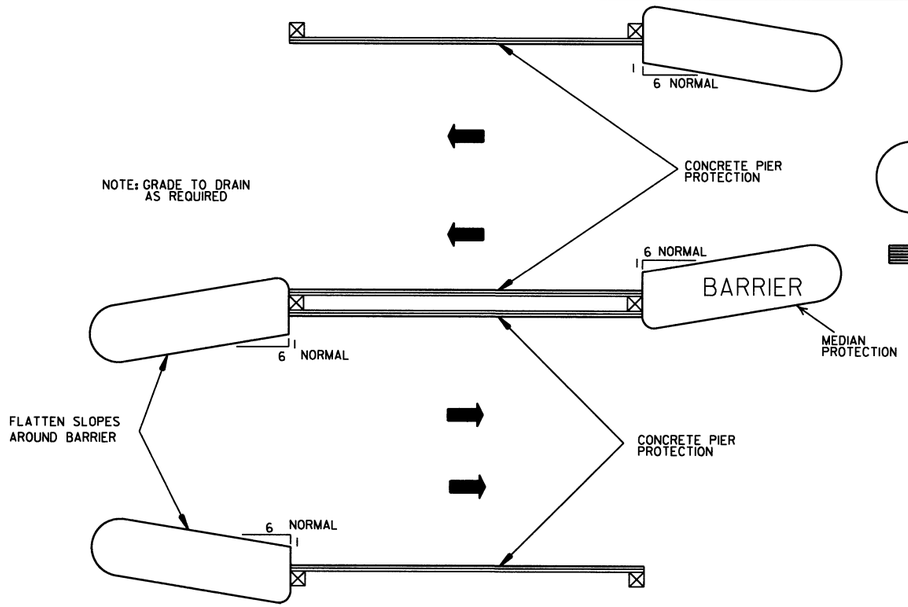

## (TYPE B)

BARRIER LENGTH = 34'-6"
DESIGN IMPACT SPEED = 60 M.P.H.= 88 fps

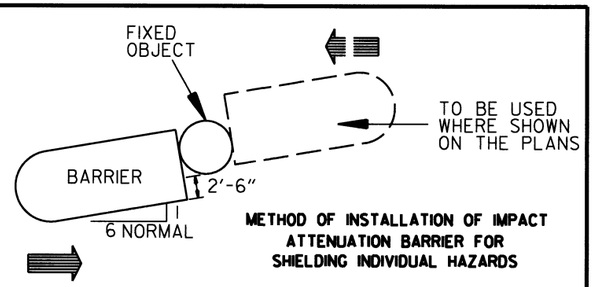



## (TYPE A)

BARRIER LENGTH = 41'-6"
DESIGN IMPACT SPEED = 70 M.P.H.= 103 fps




### METHOD OF INSTALLATION OF IMPACT ATTENUATION BARRIER FOR PIER PROTECTION




### METHOD OF INSTALLATION OF IMPACT ATTENUATION BARRIER FOR SHIELDING INDIVIDUAL HAZARDS

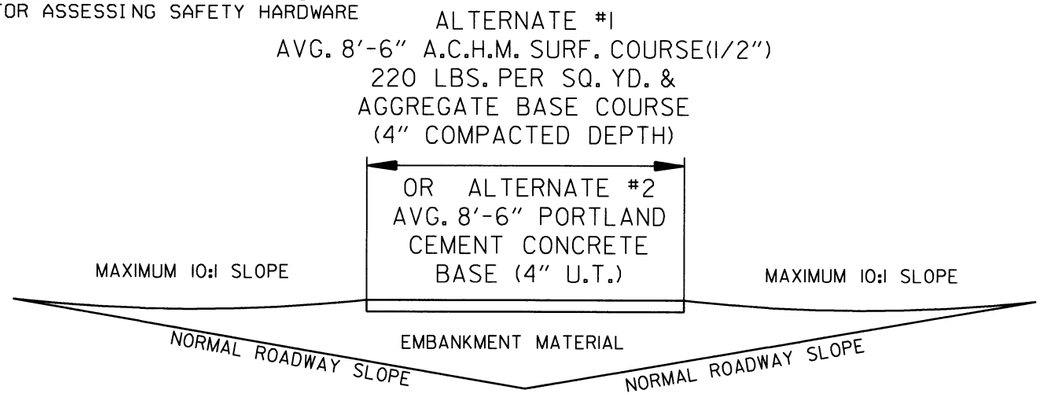
GENERAL NOTES

1. DIMENSIONS SHOWN ARE TO TOP OF PLASTIC MODULES.
2. SPACING BETWEEN PLASTIC MODULES SHALL NOT EXCEED 6" AT THE TOP.
3. PLASTIC MODULES SHALL MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).

### APPROXIMATE QUANTITIES PER PAD

| TYPE | ALTERNATE #1 AGGR. BASE COURSE TONS | ALTERNATE #1 A.C.H.M. SURFACE COURSE TONS | ALTERNATE #2 P.C.CONC. BASE (4"U.T.) SQ.YDS. |
|---|---|---|---|
| A | 9.7 | 4.6 | 41.6 |
| B | 8.1 | 3.8 | 34.9 |
| C | 6.6 | 3.1 | 28.3 |

NOTE: APPROXIMATE QUANTITIES SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY. PAYMENT TO BE INCLUDED IN UNIT PRICE BID FOR IMPACT ATTENUATION BARRIER.




### DETAIL OF BARRIER PAD

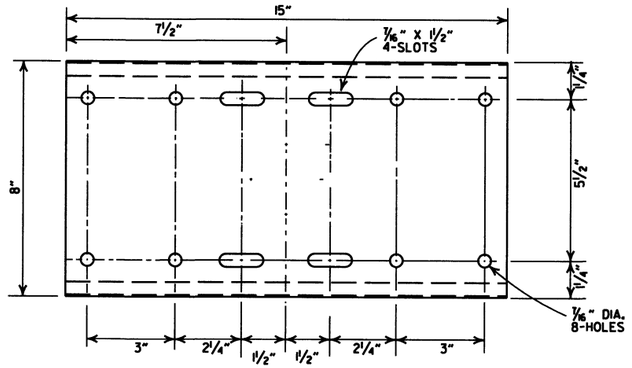
NOTE: BARRIER PAD TO BE SKEWED TOWARD ONCOMING TRAFFIC A MAXIMUM OF 6:1 WITH 6:1 BEING NORMAL

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 11-29-07 | REVISED TY. A & TY. C ARRAYS | |
| 11-19-98 | REVISED FIXED OBJECT | |
| 11-18-98 | REV. NOTES & TYPE A MOD. WTS. | |
| 10-18-96 | REDRAWN | |
| 7-15-88 | CONFORMED TO 1988 SPECS | |
| 7-29-87 | REDRAWN | |

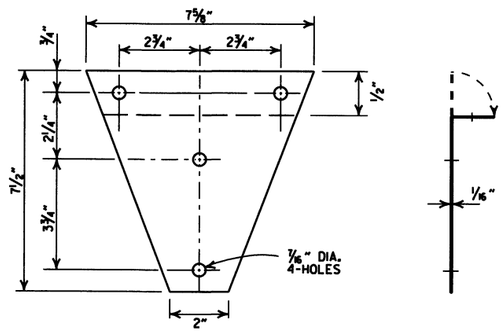
**ARKANSAS STATE HIGHWAY COMMISSION**

# IMPACT ATTENUATION BARRIER

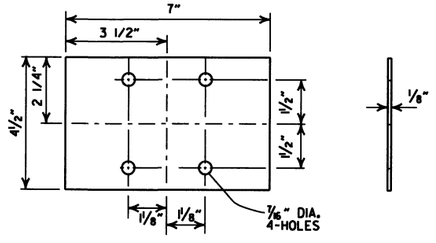
**STANDARD DRAWING IB-1**



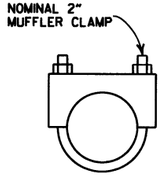

SHELF



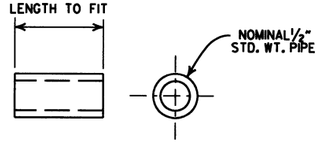

BRACKET



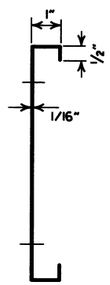

ANTI-TWIST PLATE

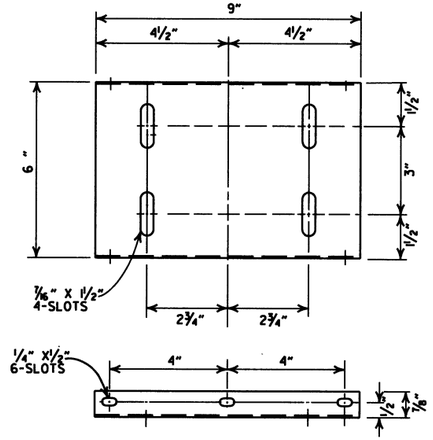



CLAMP

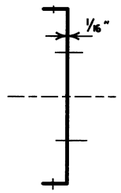


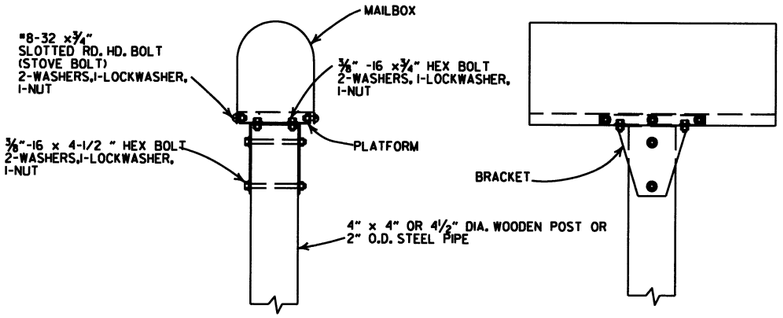

SPACER



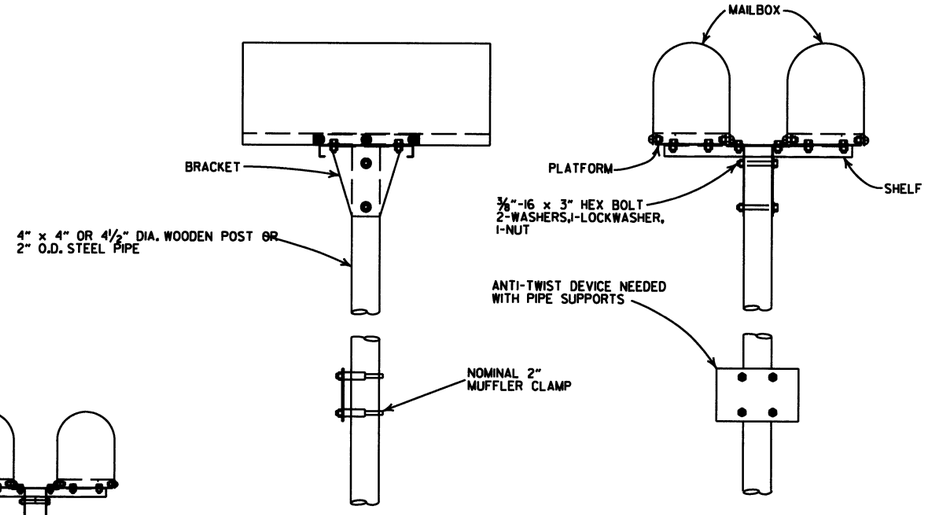




PLATFORM



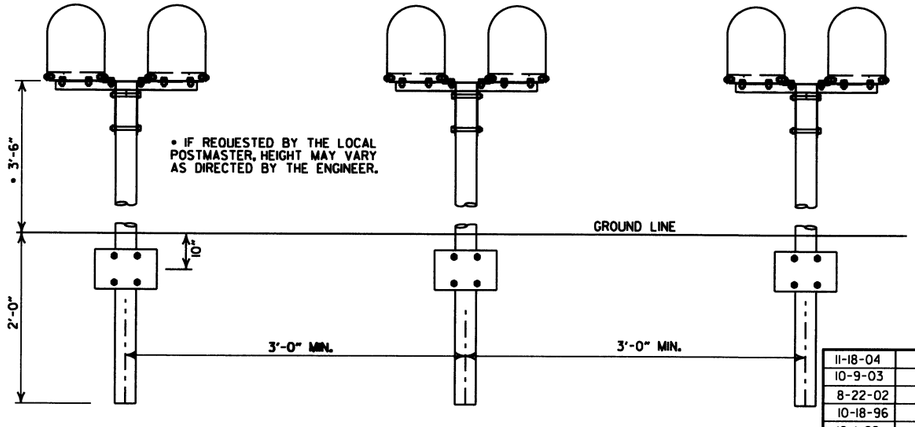

SINGLE INSTALLATION




DOUBLE INSTALLATION

**GENERAL NOTES**

1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF ¾" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X¾" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE AHTD QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



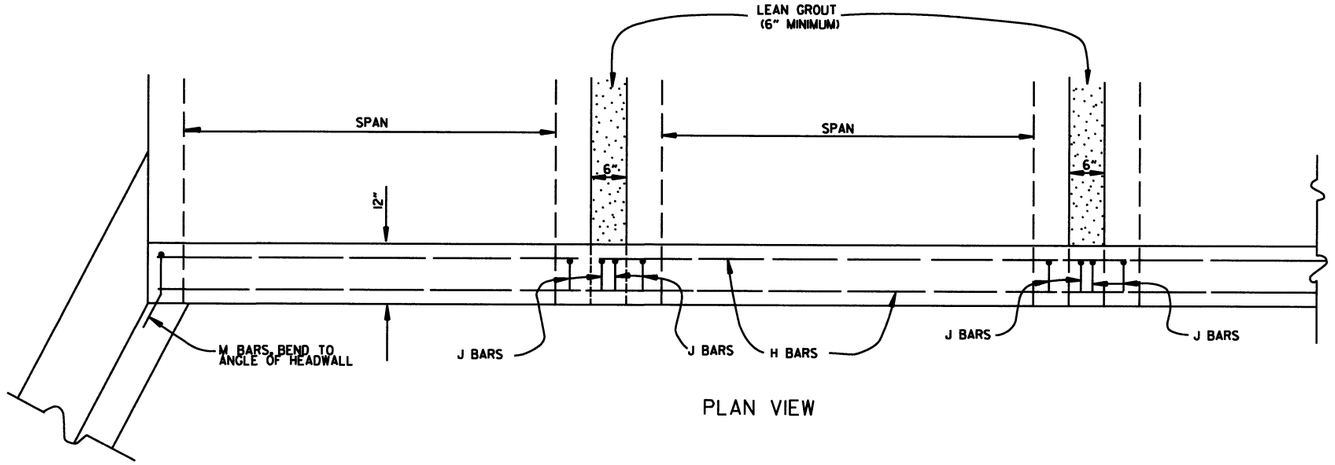

SPACING FOR MULTIPLE POST INSTALLATION

| DATE | FILMED | REVISION |
|---|---|---|
| 11-18-04 | | REVISED NOTES |
| 10-9-03 | | REVISED NOTE 6 |
| 8-22-02 | | REVISED NOTE 6 |
| 10-18-96 | | CORRECTED AASHTO |
| 10-1-92 | | CORRECTED SPELLING |
| 9-26-91 | | NEW PHONE NUMBER |
| 8-15-91 | | ADDED NOTE |
| 11-30-89 | | ADJUSTED HEIGHT & ADDED NOTE |
| 2-16-89 | | DELETED SLOTS FROM SHELF & PLTF |
| 11-17-88 | 10-1-92 | ADJUSTED DIMENSIONS OF STEEL POSTS |
| 7-15-88 | 20-7-15-88 | ISSUED |

ARKANSAS STATE HIGHWAY COMMISSION

# MAILBOX DETAILS

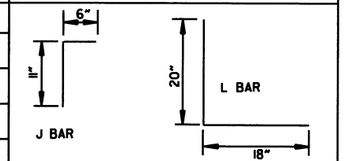
STANDARD DRAWING MB-1




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.

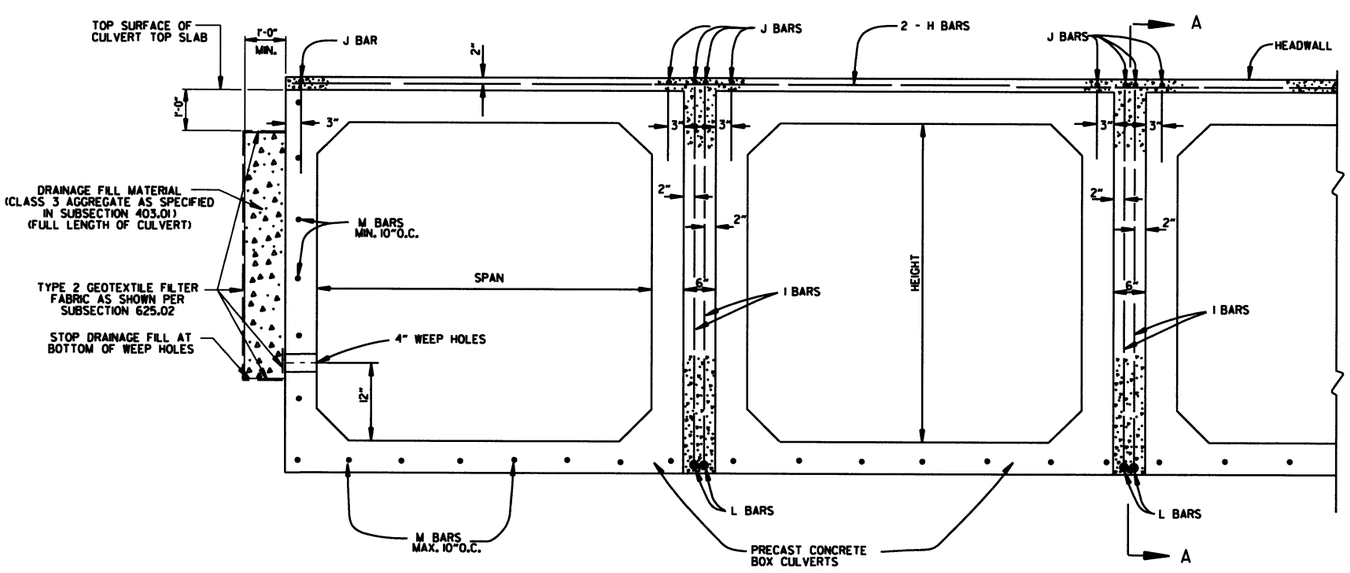
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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.

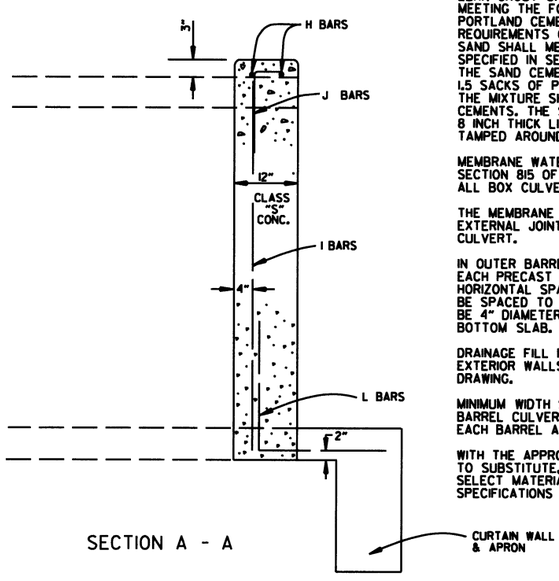
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT. SEE DETAILS ON THIS DRAWING.

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 | |
| 8-10-05 | 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 | |

ARKANSAS STATE HIGHWAY COMMISSION

# PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

## REINFORCED CONCRETE ARCH PIPE DIMENSIONS

| EQUIV. DIA. | SPAN | | RISE | |
|---|---|---|---|---|
| | AASHTO M 206 | AHTD NOMINAL | AASHTO M 206 | AHTD NOMINAL |
| INCHES | INCHES | | | |
| 15 | 18 | 18 | 11 | 11 |
| 18 | 22 | 22 | 13½ | 14 |
| 21 | 26 | 26 | 15½ | 16 |
| 24 | 28½ | 29 | 18 | 18 |
| 30 | 36¼ | 36 | 22½ | 23 |
| 36 | 43⅜ | 44 | 26⅝ | 27 |
| 42 | 51⅛ | 51 | 31⅝ | 31 |
| 48 | 58½ | 59 | 36 | 36 |
| 54 | 65 | 65 | 40 | 40 |
| 60 | 73 | 73 | 45 | 45 |
| 72 | 88 | 88 | 54 | 54 |
| 84 | 102 | 102 | 62 | 62 |
| 90 | 115 | 115 | 72 | 72 |
| 96 | 122 | 122 | 77½ | 77 |
| 108 | 138 | 138 | 87⅛ | 87 |
| 120 | 154 | 154 | 96⅞ | 97 |
| 132 | 168¾ | 169 | 106½ | 107 |

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M206.

## REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

| EQUIV. DIA. | AASHTO M 207 | |
|---|---|---|
| | SPAN | RISE |
| INCHES | INCHES | |
| 18 | 23 | 14 |
| 24 | 30 | 19 |
| 27 | 34 | 22 |
| 30 | 38 | 24 |
| 33 | 42 | 27 |
| 36 | 45 | 29 |
| 39 | 49 | 32 |
| 42 | 53 | 34 |
| 48 | 60 | 38 |
| 54 | 68 | 43 |
| 60 | 76 | 48 |
| 66 | 83 | 53 |
| 72 | 91 | 58 |
| 78 | 98 | 63 |
| 84 | 106 | 68 |

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M207.

## CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SUBSECTION 606.03.(f)(1).

**NOTE: HAUNCH AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF CONCRETE PIPE.**

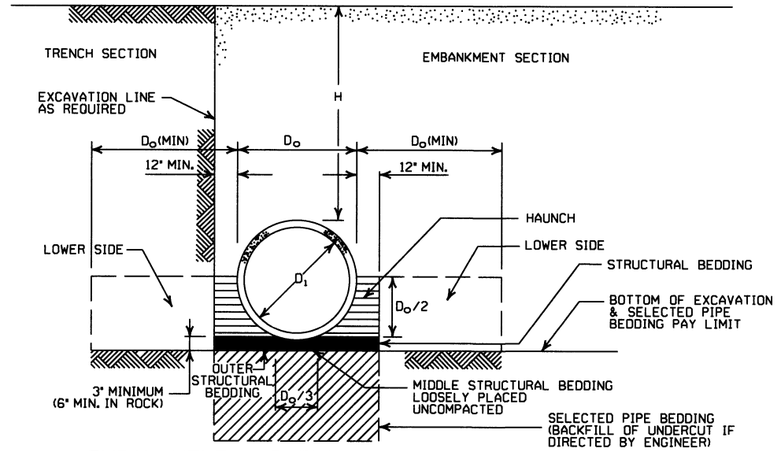
## - LEGEND -

$D_i$ = NORMAL INSIDE DIAMETER OF PIPE
$D_o$ = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
= UNDISTURBED SOIL

| INSTALLATION TYPE | MATERIAL REQUIREMENTS FOR HAUNCH AND STRUCTURAL BEDDING |
|---|---|
| TYPE 1 | AGGREGATE BASE COURSE (CLASS 5 OR CLASS 7) |
| TYPE 2 | SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL* |
| TYPE 3** | AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL |

*SM-3 WILL NOT BE ALLOWED.

**MATERIALS SHALL NOT INCLUDE ORGANIC MATERIALS OR STONES LARGER THAN 3 INCHES.




## EMBANKMENT AND TRENCH INSTALLATIONS

1. MATERIAL IN THE HAUNCH AND OUTER STRUCTURAL BEDDING SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. FOR TRENCHES WITH WALLS OF NATURAL SOIL, THE DENSITY OF THE SOIL IN THE LOWER SIDE ZONE SHALL BE AS FIRM AS THE 95% DENSITY REQUIRED FOR THE HAUNCH. IF THE EXISTING SOIL DOES NOT MEET THIS CRITERIA, IT SHALL BE REMOVED AND RECOMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OF MATERIAL USED.
3. FOR EMBANKMENTS, THE MATERIAL IN THE LOWER SIDE ZONE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

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

| | CLASS OF PIPE | | | |
|---|---|---|---|---|
| | CLASS III | | CLASS IV | CLASS V |
| INSTALLATION TYPE | TYPE 1 OR 2 | TYPE 3 | ALL | ALL |
| PIPE ID (IN.) | FEET | | | |
| 12-15 | 2 | 2.5 | 2 | 1 |
| 18-24 | 2.5 | 3 | 2 | 1 |
| 27-33 | 3 | 4 | 2 | 1 |
| 36-42 | 3.5 | 5 | 2 | 1 |
| 48 | 4.5 | 5.5 | 2 | 1 |
| 54-60 | 5 | 7 | 2 | 1 |
| 66-78 | 6 | 8 | 2 | 1 |
| 84-108 | 7.5 | 8 | 2 | 1 |

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

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

| INSTALLATION TYPE | CLASS OF PIPE | | |
|---|---|---|---|
| | CLASS III | CLASS IV | CLASS V |
| | FEET | | |
| TYPE 1 | 21 | 32 | 50 |
| TYPE 2 | 16 | 25 | 39 |
| TYPE 3 | 12 | 20 | 30 |

NOTE: IF FILL HEIGHT EXCEEDS 50 FEET, A SPECIAL DESIGN CONCRETE PIPE WILL BE REQUIRED USING TYPE 1 INSTALLATION.

## MINIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

| INSTALLATION TYPE | CLASS OF PIPE | |
|---|---|---|
| | CLASS III | CLASS IV |
| | FEET | |
| TYPE 2 OR TYPE 3 | 2.5 | 1.5 |

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

## MAXIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

| INSTALLATION TYPE | CLASS OF PIPE | |
|---|---|---|
| | CLASS III | CLASS IV |
| | FEET | |
| TYPE 2 | 13 | 21 |
| TYPE 3 | 10 | 16 |

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

## GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170. R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 2-27-14 | REVISED GENERAL NOTE 1. | |
| 12-15-11 | REVISED FOR LRFD DESIGN SPECIFICATIONS | |
| 5-18-00 | REVISED TYPE 3 BEDDING & ADDED NOTE | |
| 3-30-00 | REVISED INSTALLATIONS | |
| 11-06-97 | ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

# CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

## CORRUGATED STEEL PIPE (ROUND)

| PIPE DIAMETER (INCHES) | ① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET) | MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET) | | | | |
|---|---|---|---|---|---|---|
| | | METAL THICKNESS (INCHES) | | | | |
| | | 0.064 | 0.079 | 0.109 | 0.138 | 0.168 |
| 2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM | | | | | | |
| 12 | 1 | 84 | 91 | | | |
| 15 | 1 | 67 | 73 | | | |
| 18 | 1 | 56 | 61 | | | |
| 24 | 1 | 42 | 46 | 59 | | |
| 30 | 2 | 34 | 36 | 47 | | |
| 36 | 2 | | 30 | 39 | 41 | |
| 42 | 2 | | 43 | 67 | 70 | 73 |
| 48 | 2 | | 37 | 58 | 61 | 64 |
| ② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM | | | | | | |
| 36 | 1 | 48 | 60 | 88 | 111 | 118 |
| 42 | 1 | 41 | 51 | 72 | 90 | 102 |
| 48 | 1 | 36 | 45 | 64 | 77 | 85 |
| 54 | 2 | 32 | 40 | 59 | 71 | 79 |
| 60 | 2 | 29 | 36 | 53 | 64 | 71 |
| 66 | 2 | 26 | 33 | 47 | 58 | 64 |
| 72 | 2 | 24 | 30 | 44 | 53 | 59 |
| 78 | 2 | | 28 | 41 | 49 | 54 |
| 84 | 2 | | 26 | 38 | 45 | 51 |
| 90 | 2 | | 24 | 35 | 43 | 45 |
| 96 | 2 | | 22 | 33 | 40 | 44 |
| 102 | 2 | | | 31 | 38 | 42 |
| 108 | 2 | | | 30 | 35 | 39 |
| 114 | 2 | | | 28 | 34 | 37 |
| 120 | 2 | | | 27 | 32 | 35 |

## CORRUGATED ALUMINUM PIPE (ROUND)

| PIPE DIAMETER (INCHES) | ① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET) | MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET) | | | | |
|---|---|---|---|---|---|---|
| | | METAL THICKNESS IN INCHES | | | | |
| | | 0.060 | 0.075 | 0.105 | 0.135 | 0.164 |
| | | 2⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM | | | | |
| 12 | 1 | 45 | 45 | | | |
| 18 | 2 | 30 | 30 | 52 | | |
| 24 | 2 | 22 | 22 | 39 | 41 | |
| 30 | 2 | | 18 | 31 | 32 | 34 |
| 36 | 2.5 | | 15 | 26 | 27 | 28 |
| 42 | 2 | | | 43 | 43 | 44 |
| 48 | 2 | | | 40 | 41 | 43 |
| 54 | 2 | | | 35 | 37 | 38 |
| 60 | 2 | | | | 33 | 34 |
| 66 | 2 | | | | | 31 |
| 72 | 2 | | | | | 29 |

## CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE. THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT EXCEED 24 INCHES OR 1/3 THE SIZE OF THE PIPE, WHICHEVER IS LESS.

NOTE: STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF METAL PIPE.

| INSTALLATION TYPE | MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING |
|---|---|
| TYPE 1 | AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) |
| TYPE 2 | SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL ③ |

③ SM-3 WILL NOT BE ALLOWED.

## EQUIVALENT METAL THICKNESSES AND GAUGES

| METAL THICKNESS IN INCHES | | | GAUGE NUMBER |
|---|---|---|---|
| STEEL | | | |
| ZINC COATED | UNCOATED | ALUMINUM | |
| 0.064 | 0.0598 | 0.060 | 16 |
| 0.079 | 0.0747 | 0.075 | 14 |
| 0.109 | 0.1046 | 0.105 | 12 |
| 0.138 | 0.1345 | 0.135 | 10 |
| 0.168 | 0.1644 | 0.164 | 8 |

## CORRUGATED METAL PIPE ARCHES

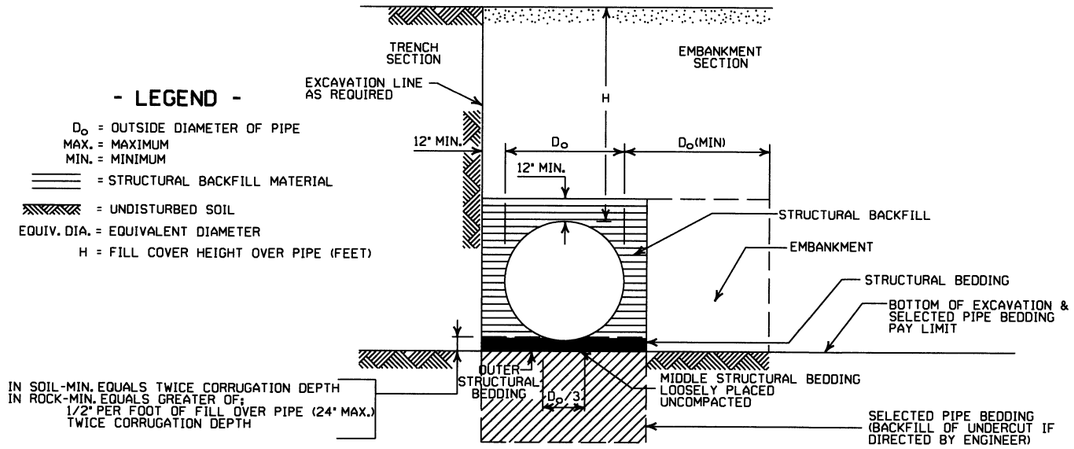
| EQUIV. DIA. (INCHES) | PIPE DIMENSION SPAN X RISE (INCHES) | MINUMUM CORNER RADIUS (INCHES) | STEEL | | | | | ALUMINUM | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | MIN. THICKNESS REQUIRED INCHES | ① MIN. HEIGHT OF FILL, "H" (FT.) | | MAX. HEIGHT OF FILL, "H" (FT.) | | MIN. THICKNESS REQUIRED INCHES | ① MIN. HEIGHT OF FILL, "H" (FT.) | | MAX. HEIGHT OF FILL, "H" (FT.) | |
| | | | | INSTALLATION | | INSTALLATION | | | INSTALLATION | | INSTALLATION | |
| | | | | TYPE 1 | | TYPE 1 | | | TYPE 1 | | TYPE 1 | |
| | | | 2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM | | | | | 2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM | | | | |
| 15 | 17x13 | 3 | 0.064 | 2 | | 15 | | 0.060 | 2 | | 15 | |
| 18 | 21x15 | 3 | 0.064 | 2 | | 15 | | 0.060 | 2 | | 15 | |
| 21 | 24x18 | 3 | 0.064 | 2.25 | | 15 | | 0.060 | 2.25 | | 15 | |
| 24 | 28x20 | 3 | 0.064 | 2.5 | | 15 | | 0.075 | 2.5 | | 15 | |
| 30 | 35x24 | 3 | 0.079 | 3 | | 12 | | 0.075 | 3 | | 12 | |
| 36 | 42x29 | 3½ | 0.079 | 3 | | 12 | | 0.105 | 3 | | 12 | |
| 42 | 49x33 | 4 | 0.079 | 3 | | 12 | | 0.105 | 3 | | 12 | |
| 48 | 57x38 | 5 | 0.109 | 3 | | 13 | | 0.135 | 3 | | 13 | |
| 54 | 64x43 | 6 | 0.109 | 3 | | 14 | | 0.135 | 3 | | 14 | |
| 60 | 71x47 | 7 | 0.138 | 3 | | 15 | | 0.164 | 3 | | 15 | |
| 66 | 77x52 | 8 | 0.168 | 3 | | 15 | | | | | | |
| 72 | 83x57 | 9 | 0.168 | 3 | | 15 | | | | | | |
| | | | ② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM | | | | | | | | | |
| | | | | INSTALLATION | | INSTALLATION | | | | | | |
| | | | | TYPE 2 | TYPE 1 | TYPE 2 | TYPE 1 | | | | | |
| 36 | 40x31 | 5 | 0.079 | 3 | 2 | 12 | 15 | | | | | |
| 42 | 46x36 | 6 | 0.079 | 3 | 2 | 13 | 15 | | | | | |
| 48 | 53x41 | 7 | 0.079 | 3 | 2 | 13 | 15 | | | | | |
| 54 | 60x46 | 8 | 0.079 | 3 | 2 | 13 | 15 | | | | | |
| 60 | 66x51 | 9 | 0.079 | 3 | 2 | 13 | 15 | | | | | |
| 66 | 73x55 | 12 | 0.079 | 3 | 2 | 15 | 15 | | | | | |
| 72 | 81x59 | 14 | 0.079 | 3 | 2 | 15 | 15 | | | | | |
| 78 | 87x63 | 14 | 0.079 | 3 | 2 | 15 | 15 | | | | | |
| 84 | 95x67 | 16 | 0.109 | 3 | 2 | 15 | 15 | | | | | |
| 90 | 103x71 | 16 | 0.109 | 3 | 2 | 15 | 15 | | | | | |
| 96 | 112x75 | 18 | 0.109 | 3 | 2 | 15 | 15 | | | | | |
| 102 | 117x79 | 18 | 0.109 | 3 | 2 | 15 | 15 | | | | | |
| 108 | 128x83 | 18 | 0.138 | 3 | 2 | 15 | 15 | | | | | |

① FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

② WHERE THE STANDARD 2 2/3"x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.

- LEGEND -

$D_o$ = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM
= STRUCTURAL BACKFILL MATERIAL
= UNDISTURBED SOIL
EQUIV. DIA. = EQUIVALENT DIAMETER
H = FILL COVER HEIGHT OVER PIPE (FEET)




## EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALALTION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2⅔" X ½" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

## GENERAL NOTES

1. METAL PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 2-27-14 | REVISED GENERAL NOTE 1. | |
| 12-15-11 | REVISED FOR LRFD DESIGN SPECS | |
| 3-30-00 | REVISED INSTALLATIONS | |
| 11-06-97 | ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

# METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

| INSTALLATION TYPE | •• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING |
|---|---|
| TYPE 2 | •SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-4) |

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF HDPE PIPE.

## MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

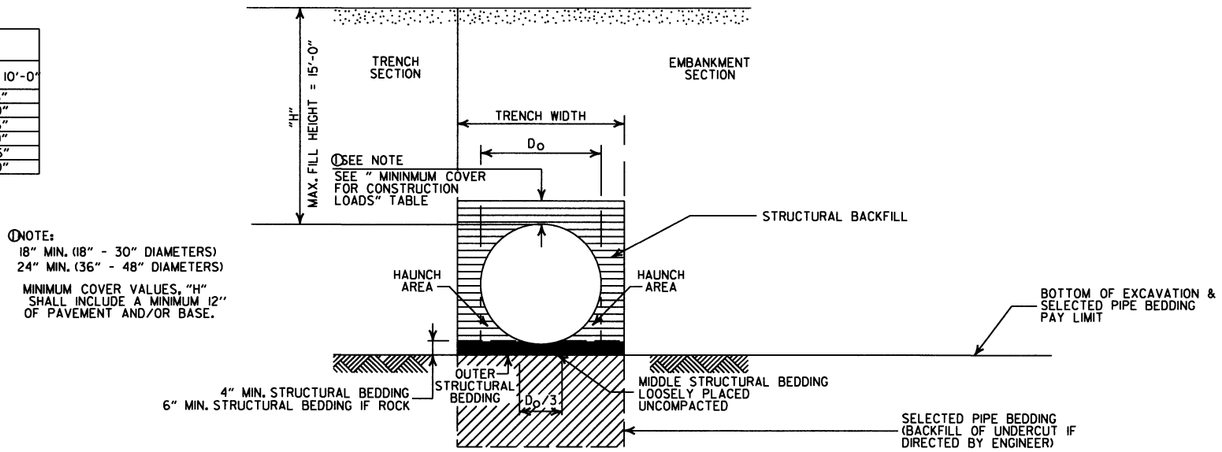
| PIPE DIAMETER | CLEAR DISTANCE BETWEEN PIPES |
|---|---|
| 18" | 1'-6" |
| 24" | 2'-0" |
| 30" | 2'-6" |
| 36" | 3'-0" |
| 42" | 3'-6" |
| 48" | 4'-0" |

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

| PIPE DIAMETER | TRENCH WIDTH (FEET) "H" < 10'-0" | TRENCH WIDTH (FEET) "H" >OR= 10'-0" |
|---|---|---|
| 18" | 4'-6" | 4'-6" |
| 24" | 5'-0" | 6'-0" |
| 30" | 5'-6" | 7'-6" |
| 36" | 6'-0" | 9'-0" |
| 42" | 7'-0" | 10'-6" |
| 48" | 8'-0" | 12'-0" |

①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)

MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.




## TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

## MINIMUM COVER FOR CONSTRUCTION LOADS

| PIPE DIAMETER | ② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS 18.0-50.0 (KIPS) | 50.0-75.0 (KIPS) | 75.0-110.0 (KIPS) | 110.0-175.0 (KIPS) |
|---|---|---|---|---|
| 36" OR LESS | 2'-0" | 2'-6" | 3'-0" | 3'-0" |
| 42" OR GREATER | 3'-0" | 3'-0" | 3'-6" | 4'-0" |

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.

## CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

## GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M294, TYPE S. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

## - LEGEND -

H = FILL HEIGHT (FT.)
Ø = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 2-27-14 | REVISED GENERAL NOTE 1. | |
| 12-15-11 | REVISED GENERAL NOTES & MINIMUM COVER NOTE | |
| 11-17-10 | ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

# PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

| INSTALLATION TYPE | •• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING |
|---|---|
| TYPE 2 | •SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) |

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF PVC PIPE.

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

| PIPE DIAMETER | TRENCH WIDTH (FEET) | |
|---|---|---|
| | "H" < 10'-0" | "H" >OR= 10'-0" |
| 18" | 4'-6" | 4'-6" |
| 24" | 5'-0" | 6'-0" |
| 30" | 5'-6" | 7'-6" |
| 36" | 6'-0" | 9'-0" |

## MULTIPLE INSTALLATION OF PVC PIPES

| PIPE DIAMETER | CLEAR DISTANCE BETWEEN PIPES |
|---|---|
| 18" | 1'-6" |
| 24" | 2'-0" |
| 30" | 2'-6" |
| 36" | 3'-0" |

## MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

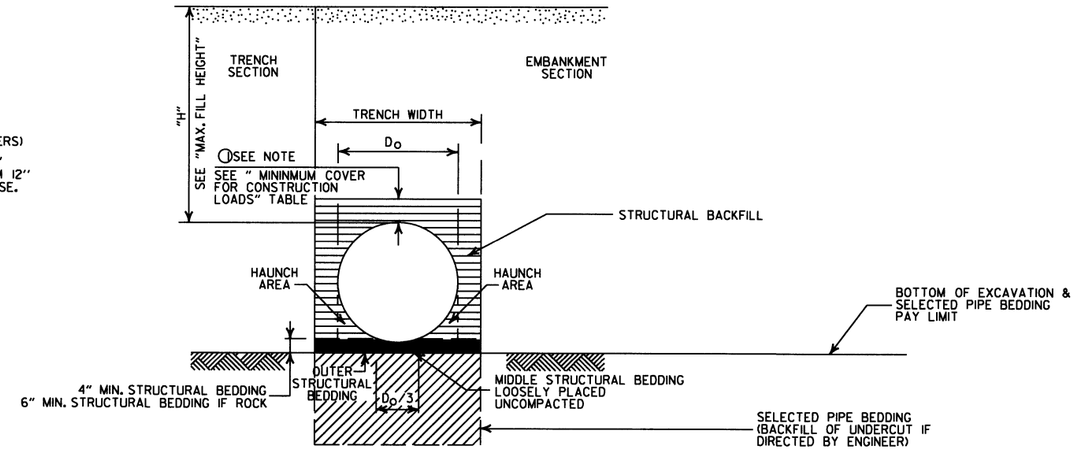
| PIPE DIAMETER | "H" |
|---|---|
| 18" | 45'-0" |
| 24" | 45'-0" |
| 30" | 40'-0" |
| 36" | 40'-0" |

① NOTE:
12" MIN. (18" - 36" DIAMETERS)
MINIMUM COVER VALUE, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

## MINIMUM COVER FOR CONSTRUCTION LOADS

| PIPE DIAMETER | ② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS | | | |
|---|---|---|---|---|
| | 18.0-50.0 (KIPS) | 50.0-75.0 (KIPS) | 75.0-110.0 (KIPS) | 110.0-175.0 (KIPS) |
| 18" THRU 36" | 2'-0" | 2'-6" | 3'-0" | 3'-0" |

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.




## TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

## CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

## GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

## - LEGEND -

H = FILL HEIGHT (FT.)
$D_O$ = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

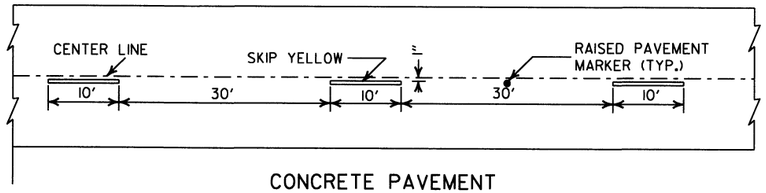
| DATE | REVISION | DATE FILMED |
|---|---|---|
| 2-27-14 | REVISED GENERAL NOTE 1. | |
| 12-15-11 | REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL | |
| 11-17-10 | ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

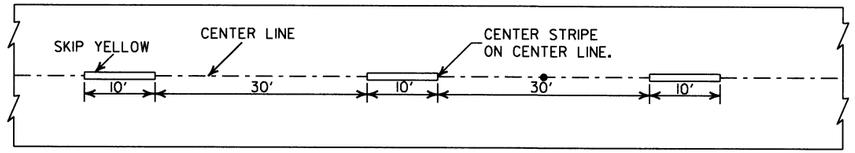
# PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

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

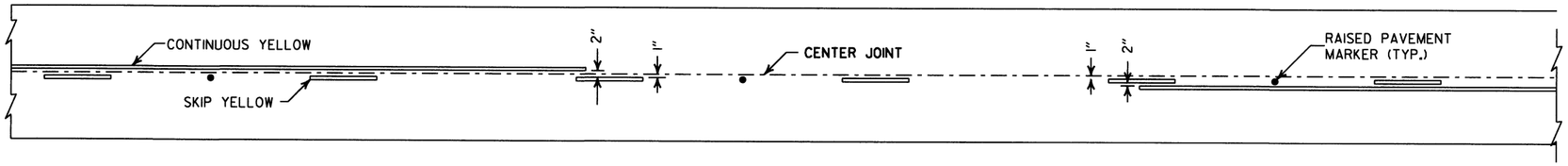



CONCRETE PAVEMENT

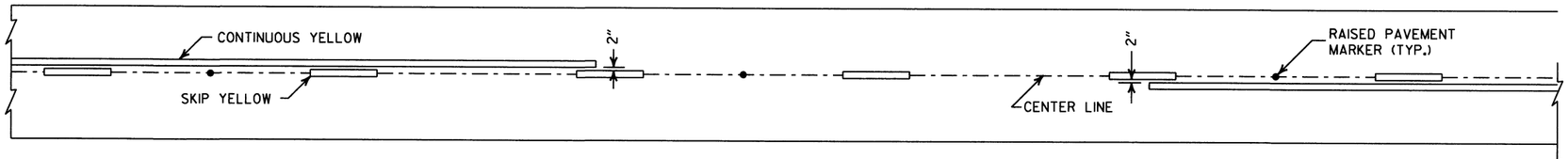



ASPHALT PAVEMENT

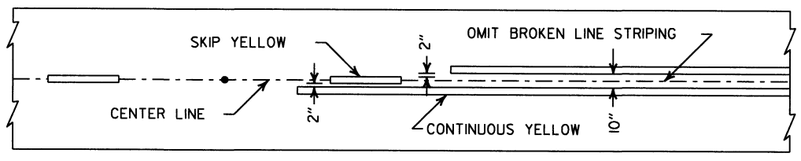
## BROKEN LINE STRIPING



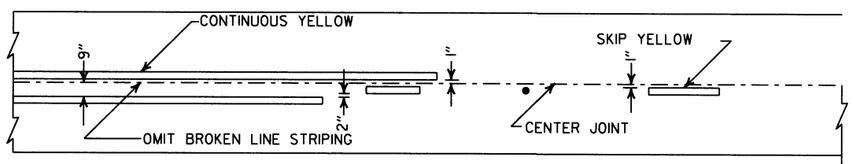

## SOLID LINE STRIPING ON CONCRETE PAVEMENT




## SOLID LINE STRIPING ON ASPHALT PAVEMENT

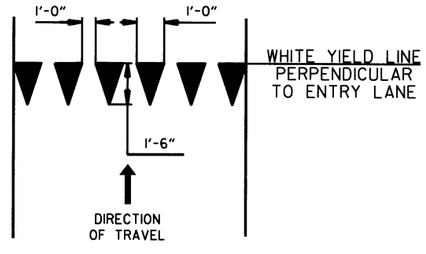



ASPHALT PAVEMENT

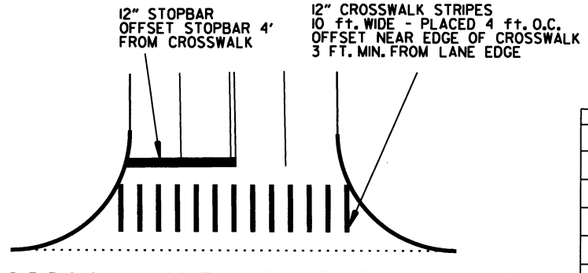



CONCRETE PAVEMENT

## STRIPING AT ADJACENT NO PASSING LANES

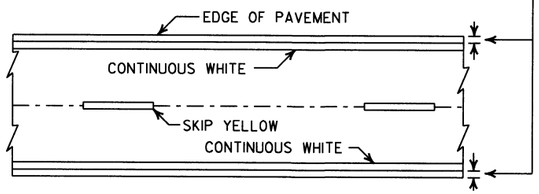



## YIELD LINE DETAIL




## CROSSWALK AND STOPBAR DETAILS

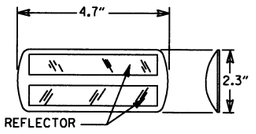
2" FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT




## 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 | FILMED |
|---|---|---|
| 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 |

ARKANSAS STATE HIGHWAY COMMISSION

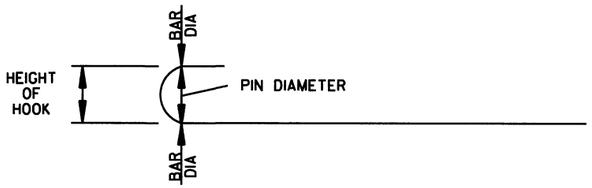
# PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-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

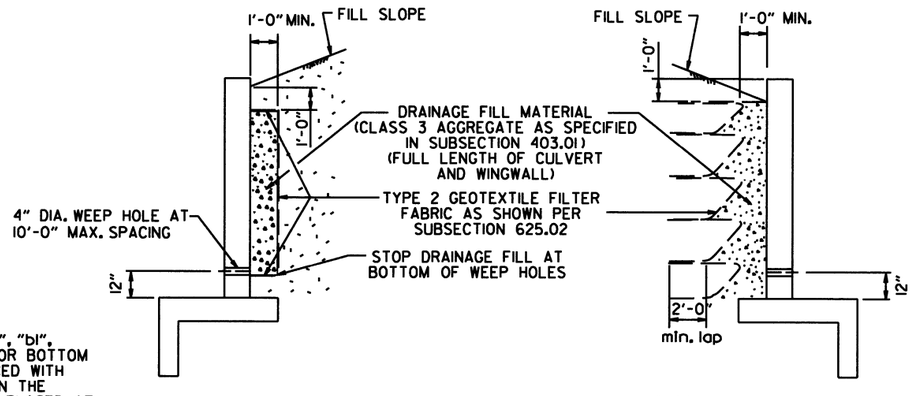
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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.

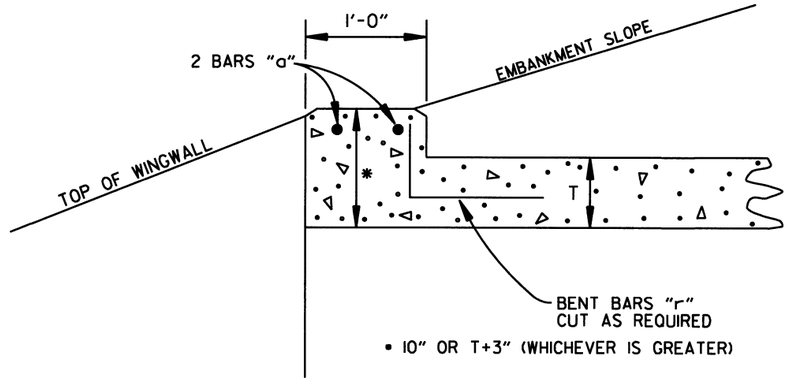
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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.

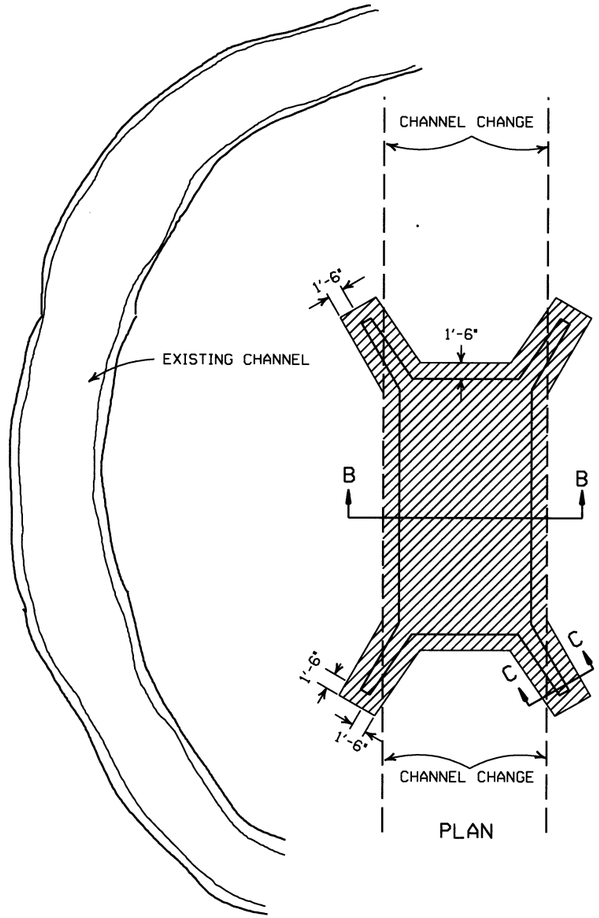
R.C. BOX CULVERT HEADWALL MODIFICATIONS

| 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

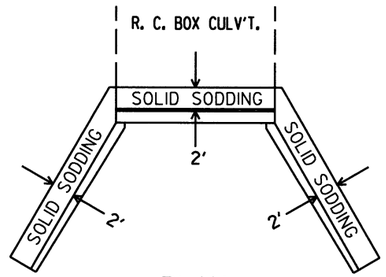
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1




PLAN

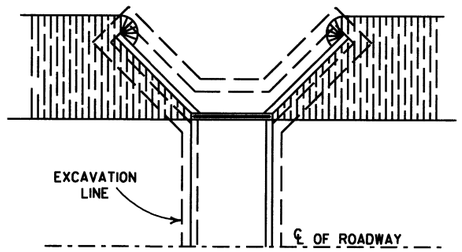
## SOLID SODDING



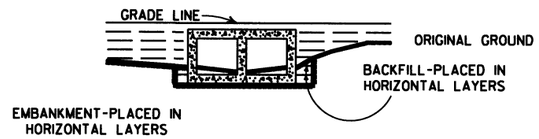

PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

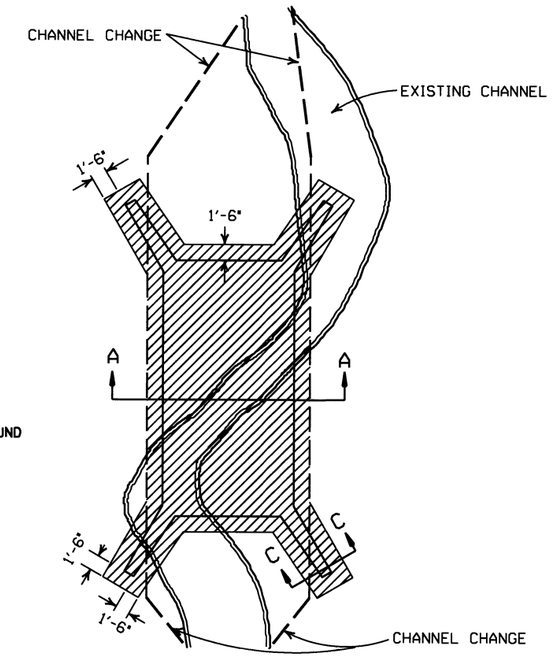



PLAN

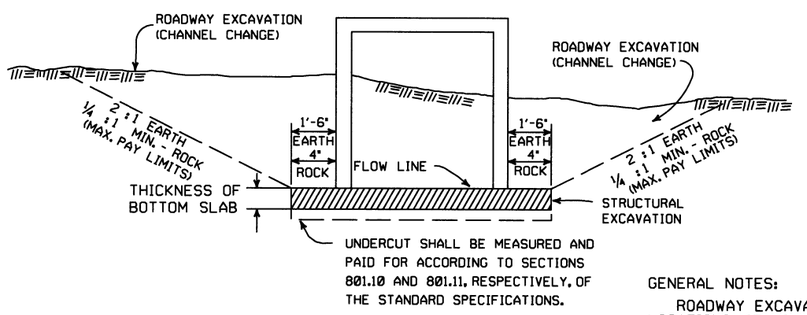



LONGITUDINAL SECTION

# BACKFILL DETAILS FOR BOX CULVERT

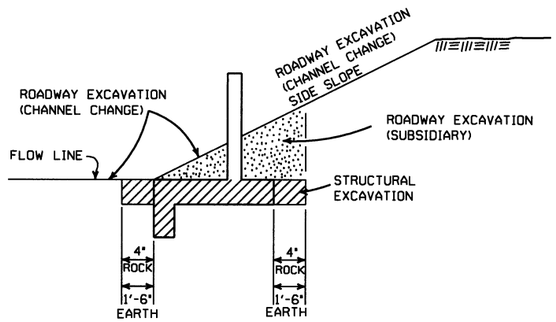



PLAN

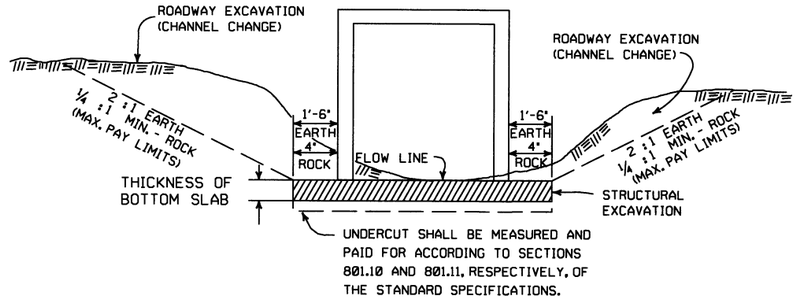



SECTION B-B

# 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.

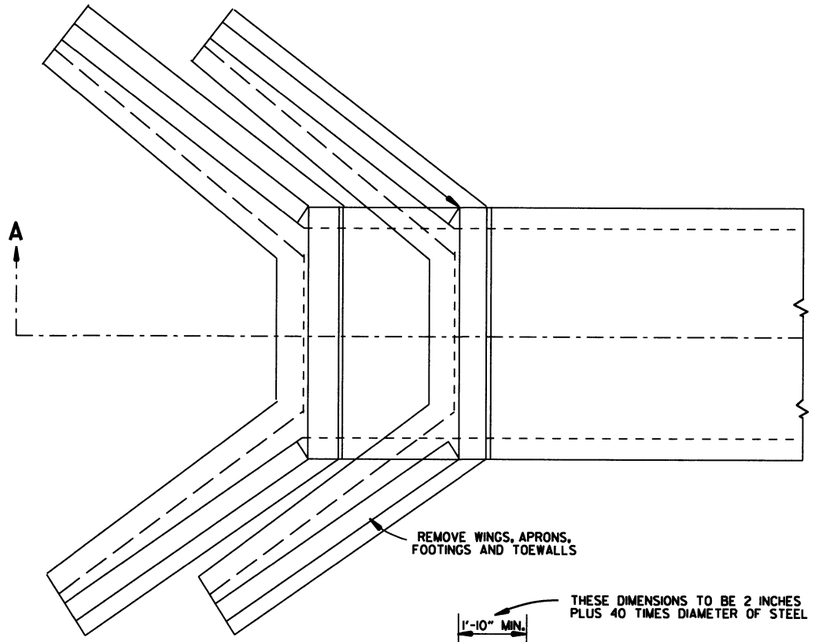
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

| 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

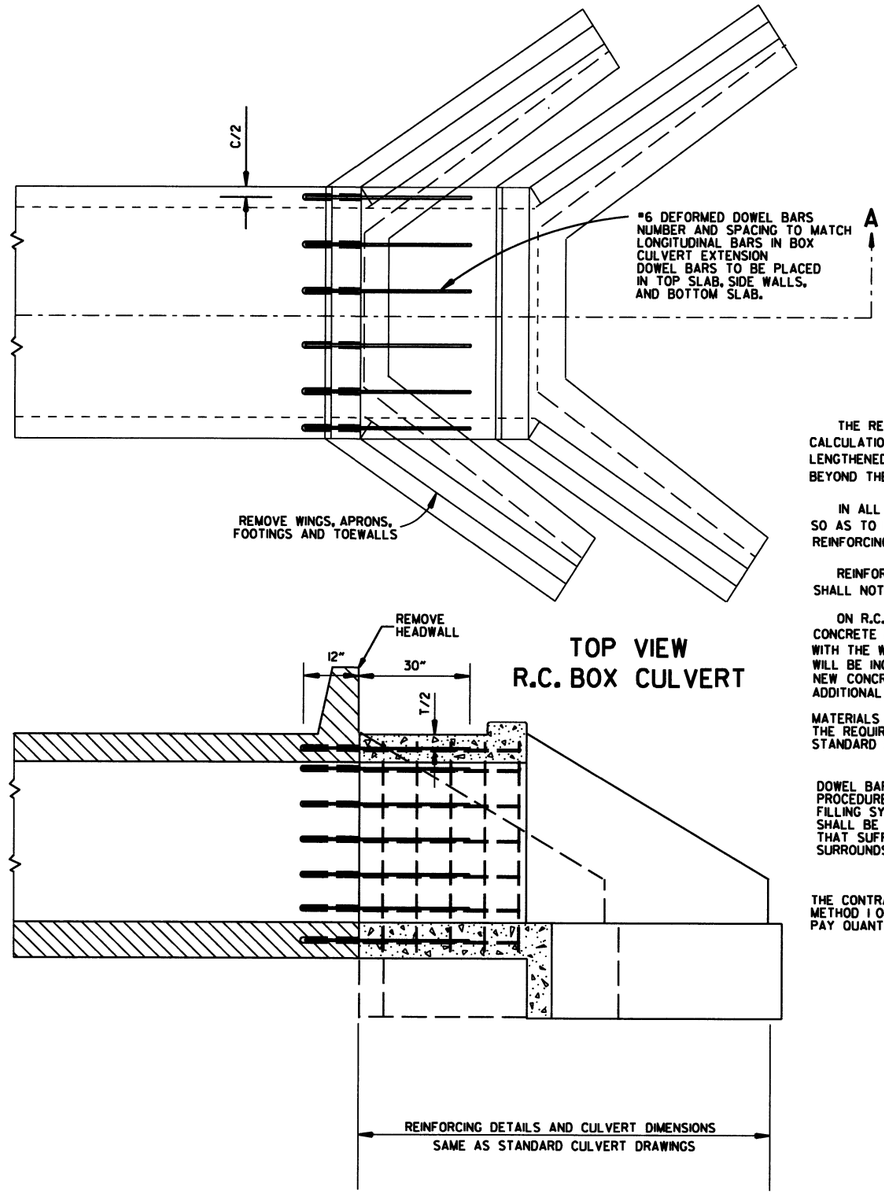
STANDARD DRAWING RCB-2




TOP VIEW
R.C. BOX CULVERT

SECTION A-A

METHOD 1




TOP VIEW
R.C. BOX CULVERT

SECTION A-A

METHOD 2

GENERAL NOTES

| | USE FOR METHOD |
|---|---|
| THE RESIDENT ENGINEER WILL MAKE INDIVIDUAL CALCULATIONS OF QUANTITIES FOR EACH STRUCTURE LENGTHENED, MAKING NO ALLOWANCE FOR OVERBREAKAGE BEYOND THE LINES INDICATED. | 1 |
| IN ALL INSTANCES CONCRETE SHALL BE REMOVED SO AS TO PERMIT FULL 40 DIAMETER SPLICE OF REINFORCING STEEL. | 1 |
| REINFORCING STEEL REMOVED FROM EXISTING STRUCTURE SHALL NOT BE REUSED IN CONSTRUCTING EXTENSION. | 1&2 |
| ON R.C. BOX CULVERTS THAT HAVE AN EXISTING CONCRETE APRON; THE CONCRETE APRON SHALL BE REMOVED WITH THE WINGS. THE COST OF REMOVING ALL OLD CONCRETE WILL BE INCLUDED IN THE PRICE BID PER CUBIC YARD FOR NEW CONCRETE OF THE CLASS SPECIFIED AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED. | 1&2 |
| MATERIALS FOR SECURING DOWEL BARS SHALL MEET THE REQUIREMENTS OF SECTION 507.02 OF THE STANDARD SPECIFICATIONS. | 2 |
| DOWEL BARS SHALL BE INSTALLED AS FOLLOWS: THE DRILLING PROCEDURE SHALL BE APPROVED BY THE ENGINEER. THE FILLING SYSTEM SHALL BE APPROVED BY THE ENGINEER, AND SHALL BE AN INJECTION-TYPE SYSTEM WHICH WILL INSURE THAT SUFFICIENT MATERIAL IS INJECTED SO IT COMPLETELY SURROUNDS THE BARS AND FILLS THE HOLES. | 2 |
| THE CONTRACTOR SHALL HAVE THE OPTION OF USING EITHER METHOD 1 OR METHOD 2, REGARDLESS OF WHICH METHOD IS USED, PAY QUANTITIES WILL BE CALCULATED BASED ON METHOD 1. | 1&2 |

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

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

| DATE | REVISION | DATE FILM |
|---|---|---|
| 10-12-95 | CHANGED DRAWING * FROM 144-A | |
| 4-1-93 | ADDED GENERAL NOTE | |
| 10-1-92 | ADDED ALT. METHOD OF EXTENSION | |
| 8-30-89 | REDRAWN | |
| 1-4-83 | ELIMINATED CONCRETE CLASS | |
| 12-20-56 | RETRACED | |

ARKANSAS STATE HIGHWAY COMMISSION

# METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS

# STANDARD DRAWING RCB-3

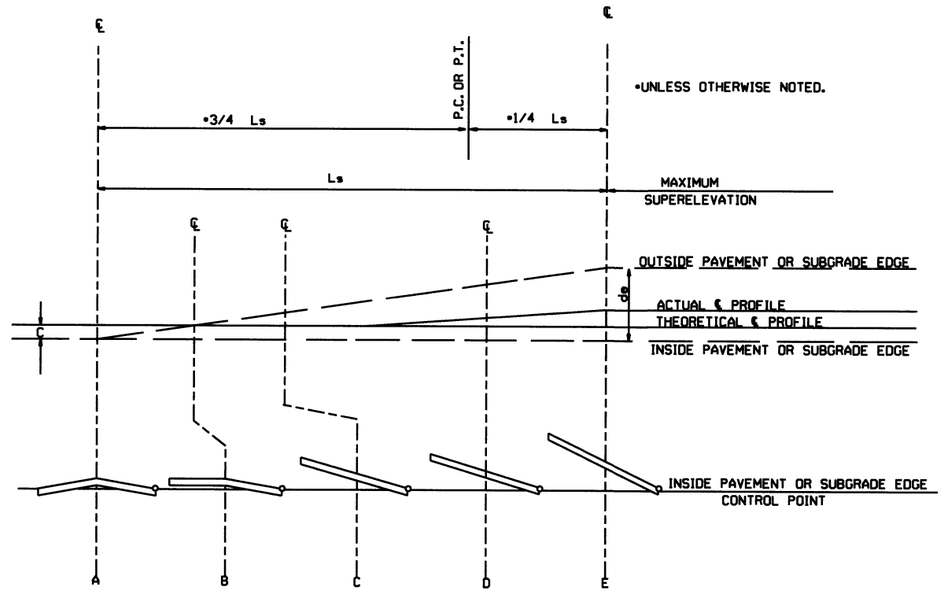
## SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

| 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.* | | | N.C.* | | | N.C.* | | |
| 1° 00' | N.C.* | | | N.C.* | | | 0.021 | | | 0.022 | | | 0.023 | | | 0.028 | | |
| 1° 15' | N.C.* | | | R.C.* | | | 0.026 | | | 0.026 | | | 0.030 | | | 0.037 | | |
| 1° 30' | N.C.* | | | 0.021 | | | 0.031 | | | 0.032 | | | 0.037 | | | 0.046 | | |
| 1° 45' | N.C.* | | | 0.025 | | | 0.036 | 200 | | 0.037 | 225 | | 0.043 | 250 | | 0.054 | 275 | |
| 2° 00' | R.C.* | | | 0.028 | 175 | | 0.040 | | | 0.043 | | | 0.049 | | | 0.062 | | 300 |
| 2° 15' | R.C.* | | | 0.031 | | | 0.045 | | | 0.048 | | | 0.055 | | | 0.070 | | |
| 2° 30' | 0.021 | | | 0.034 | | | 0.049 | | | 0.053 | | | 0.061 | | | 0.078 | 300 | |
| 2° 45' | 0.023 | | | 0.037 | | | 0.053 | | | 0.058 | | | 0.067 | | | 0.085 | 315 | 350 |
| 3° 00' | 0.025 | | | 0.040 | | | 0.057 | | | 0.063 | | | 0.072 | | | 0.091 | 335 | |
| 3° 15' | 0.027 | 150 | | 0.043 | | | 0.061 | | | 0.067 | 230 | | 0.077 | 260 | | 0.096 | 350 | |
| 3° 30' | 0.029 | | | 0.046 | | | 0.065 | 205 | | 0.072 | 245 | | 0.082 | 275 | | 0.098 | 360 | 400 |
| 3° 45' | 0.031 | | | 0.049 | | | 0.069 | 215 | | 0.076 | 255 | | 0.086 | 285 | | 0.100 | 360 | |
| 4° 00' | 0.033 | | | 0.051 | | | 0.072 | 225 | | 0.080 | 265 | | 0.090 | 295 | 350 | | | |
| 4° 30' | 0.037 | | | 0.056 | | | 0.078 | 240 | | 0.083 | 270 | | 0.093 | 305 | | | | |
| 5° 00' | 0.040 | | | 0.061 | | | 0.083 | 250 | | 0.087 | 280 | | 0.096 | 315 | | | | |
| 5° 30' | 0.043 | | | 0.066 | 185 | | 0.088 | 260 | | 0.091 | 295 | 350 | 0.098 | 320 | | | | |
| 6° 00' | 0.046 | | | 0.070 | 190 | | 0.092 | 270 | | 0.094 | 300 | | | | | | | |
| 6° 30' | 0.050 | | | 0.074 | 200 | | 0.095 | 280 | 300 | 0.096 | 305 | | | | | | | |
| 7° 00' | 0.053 | | | 0.078 | 210 | | 0.098 | 285 | | 0.100 | 315 | | | | | | | |
| 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.

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

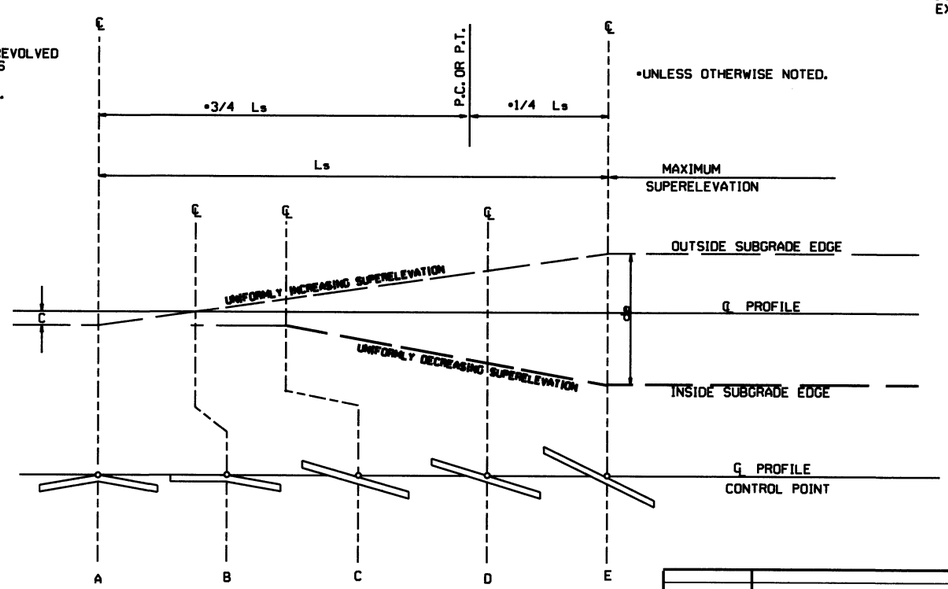
### GENERAL NOTES

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.



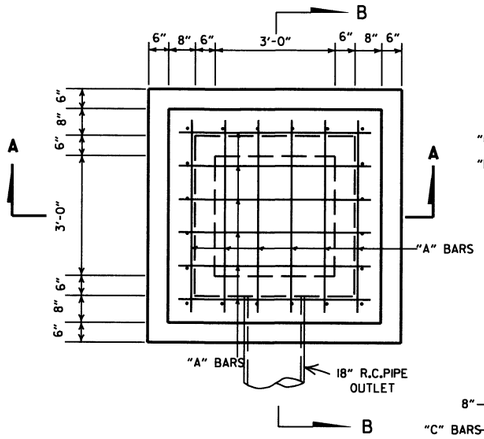

STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

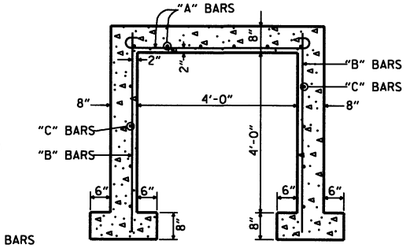
| DATE | REVISION | DATE FILMED |
|---|---|---|
| 10-18-96 | ADDED FORMULA | |
| 01-09-87 | ISSUED | 534-1-9-87 |

ARKANSAS STATE HIGHWAY COMMISSION

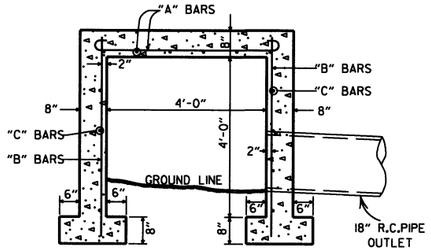
# TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2




SEC A-A



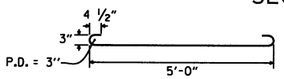

SEC B-B

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

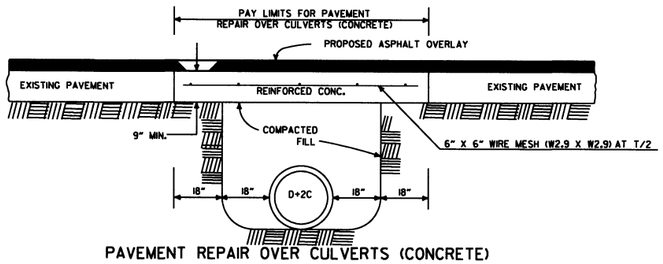
QUANTITIES

CONCRETE 3.31 CU. YDS.
REINFORCING STEEL 168 LB.

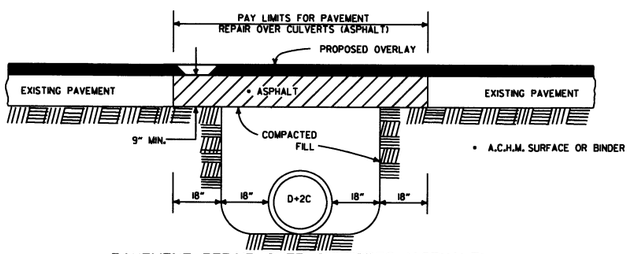
GENERAL NOTE:

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

## REINFORCED CONCRETE SPRING BOX



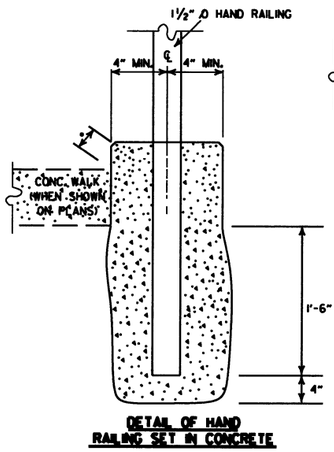

PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



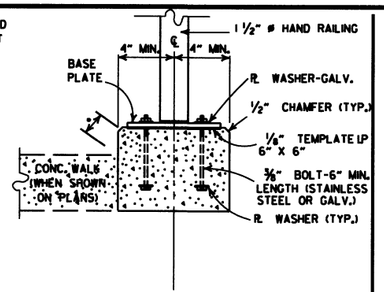

PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

## DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

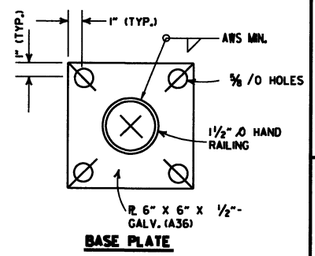
* A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.




DETAIL OF HAND RAILING SET IN CONCRETE

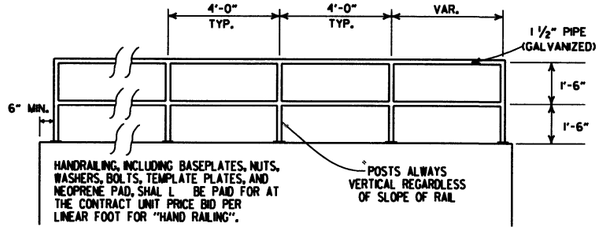



POST CONNECTION TO WALL

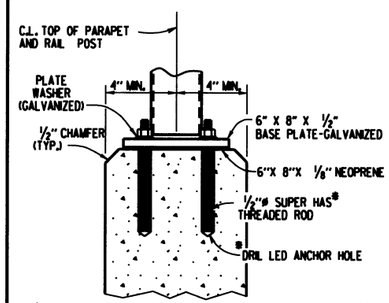



BASE PLATE

## POST CONNECTION DETAILS



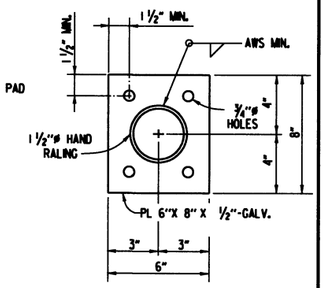

HAND RAILING SHALL CONFORM TO SECTION 633.




*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.

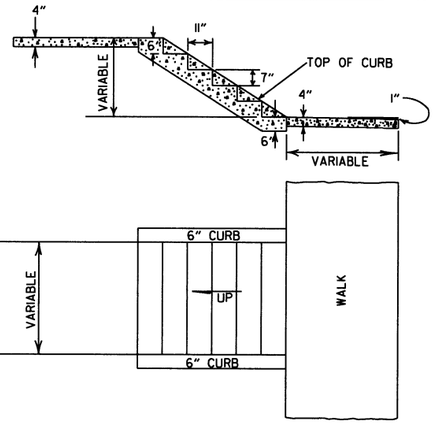
POST CONNECTION TO WALL




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.

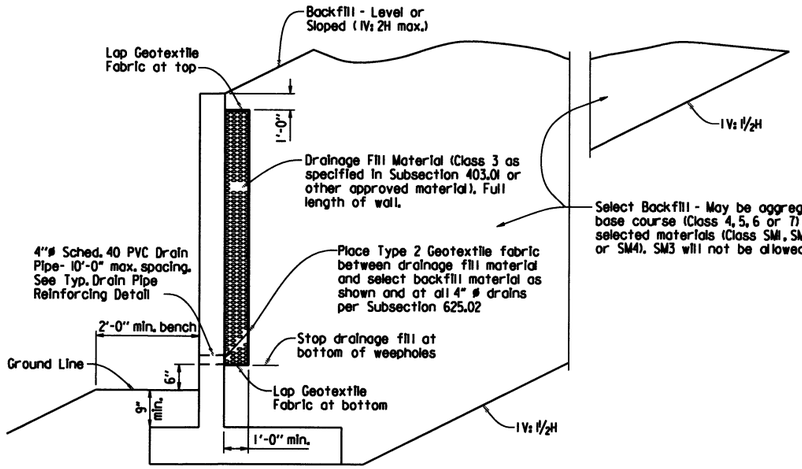
## DETAILS OF CONCRETE STEPS & WALKS

| 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

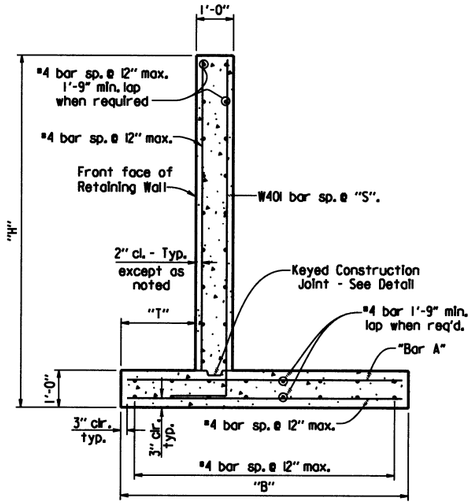
# DETAILS OF SPECIAL ITEMS

STANDARD DRAWING SI-1



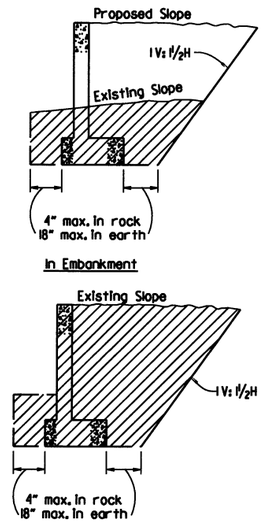

## TYPICAL DRAINAGE & BACKFILL DETAILS

N.T.S




## TYPICAL SECTION

N.T.S




NOTE: Hatched area denotes maximum limits of pay excavation.

## DETAILS OF EXCAVATION

N.T.S

### GENERAL NOTES

CONSTRUCTION SPECIFICATIONS: Arkansas state Highway and Transportation Department Standard Specifications for Highway Construction (Current Edition) with applicable supplemental specifications and special provisions. Unless otherwise noted in the plans, Section and Subsection refer to the Standard Construction Specifications.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Sixth Edition (2012).

LIVE LOAD: Live Load Surcharge is not included in the design of these walls. Vehicular Live Load shall not be allowed within a distance equal to one-half the height of the wall.

CONCRETE: Concrete shall be poured in the dry and all exposed corners to be chamfered 1/2". All concrete shall be Class S with a minimum 28 day compressive strength f'c = 3,500 psi. A Class 2 Surface finish shall be used on all surfaces of the concrete unless otherwise noted.

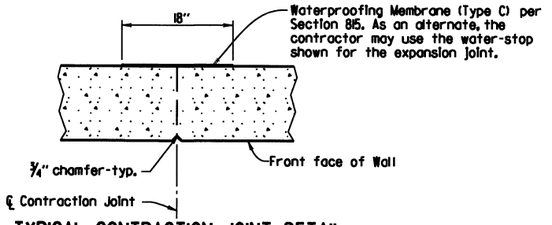
REINFORCING STEEL: All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.

Foundations for footings shall be prepared in accordance with subsection 801.04. Backfill for retaining walls shall be in accordance with subsection 801.08.

Waterproof Membrane (Type C), waterstops, preformed joints, weep holes & geotextile fabric shall not be paid for directly, but shall be considered subsidiary to Class S Concrete.

Drainage fill material (Class 3) and select backfill shall be measured and paid for as Compacted Embankment.

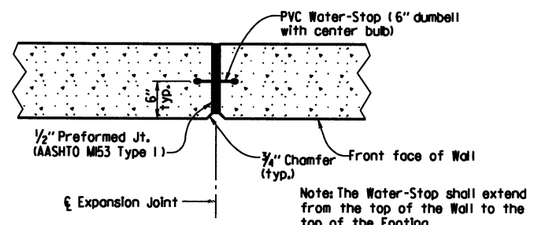
These details are not intended for use along streams or ditches without consideration for scour.




## TYPICAL CONTRACTION JOINT DETAIL

N.T.S.

Note: 20'-0" Max. Spacing between Contraction Joints. Horizontal reinforcement shall be continuous through Contraction Joints.

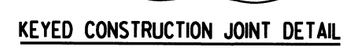



Note: The Water-Stop shall extend from the top of the Wall to the top of the Footing.

## TYPICAL EXPANSION JOINT DETAIL

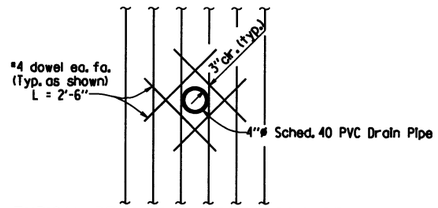
N.T.S.

Note: 60'-0" Max. Spacing between Expansion Joints. Horizontal reinforcing shall stop 2" from ℄ Expansion Joint.




## KEYED CONSTRUCTION JOINT DETAIL

N.T.S




## TYPICAL DRAIN PIPE REINFORCING DETAIL

N.T.S

SEISMIC ZONE: These walls have been designed for the following site adjusted peak ground accelerations ($A_S$):
Level Backfill - $A_S \leq .40g$
Sloped Backfill (1V: 2H max.) - $A_S \leq .30g$

## TABLE OF RETAINING WALL VARIABLES (LEVEL BACKFILL)

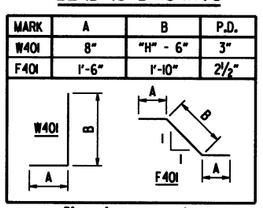
| "H" | "T" | "B" | "S" | "Bar A" Size @ Spacing |
|---|---|---|---|---|
| 3'-0" | 9" | 2'-6" | 12" | #4 @ 12" |
| 4'-0" | 9" | 3'-6" | 12" | #4 @ 12" |
| 5'-0" | 9" | 4'-0" | 12" | #4 @ 12" |
| 6'-0" | 9" | 4'-6" | 12" | #4 @ 12" |
| 7'-0" | 9" | 5'-6" | 12" | #4 @ 10" |
| 8'-0" | 9" | 6'-0" | 12" | #5 @ 10" |
| 9'-0" | 1'-0" | 7'-0" | 12" | #5 @ 6 1/2" |

## TABLE OF RETAINING WALL VARIABLES (SLOPED BACKFILL) (1V: 2H MAX.)

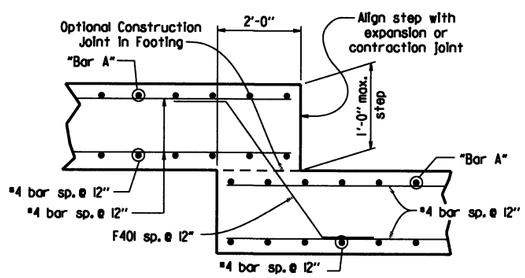
| "H" | "T" | "B" | "S" | "Bar A" Size @ Spacing |
|---|---|---|---|---|
| 3'-0" | 9" | 2'-6" | 12" | #4 @ 12" |
| 4'-0" | 9" | 3'-6" | 12" | #4 @ 12" |
| 5'-0" | 9" | 4'-6" | 12" | #4 @ 12" |
| 6'-0" | 9" | 5'-6" | 12" | #4 @ 6" |
| 7'-0" | 9" | 6'-6" | 12" | #5 @ 6 1/2" |
| 8'-0" | 1'-6" | 8'-0" | 7 1/2" | #6 @ 6" |
| 9'-0" | 1'-11" | 9'-6" | 5" | #8 @ 6" |

## BENDING DIAGRAMS

| MARK | A | B | P.D. |
|---|---|---|---|
| W40l | 8" | "H" - 6" | 3" |
| F40l | 1'-6" | 1'-10" | 2 1/2" |




Dimensions are out to out of bars.




## FOOTING STEP DETAIL

N.T.S.

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 5-12-16 | REVISED SLOPES FOR SELECT BACKFILL | |
| 2-27-14 | REVISED GENERAL NOTES | |
| 7-26-12 | DRAWING ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

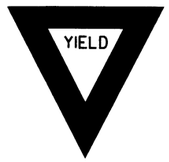
# REINFORCED CONCRETE RETAINING WALL (WITHOUT LIVE LOAD SURCHARGE)

STANDARD DRAWING SI - 2

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"

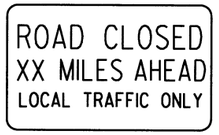
R5-1

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

RII-2

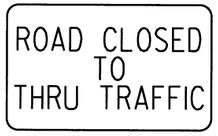
48"X30"

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"

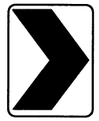
WI-4

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"

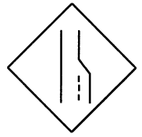
W3-1

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"

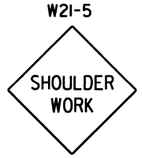
W20-7a

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"

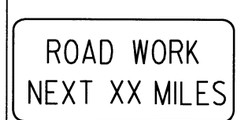
W8-11

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

W8-9

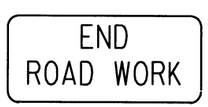
STD. 36"X36"
FWY. 48"X48"

G20-1



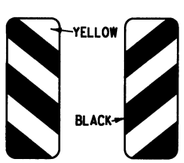

60"X24"

G20-2



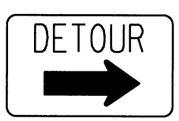

48"X24"

OM-3L OM-3R




12"X36"

M4-9

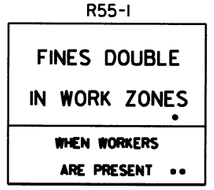



STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

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.

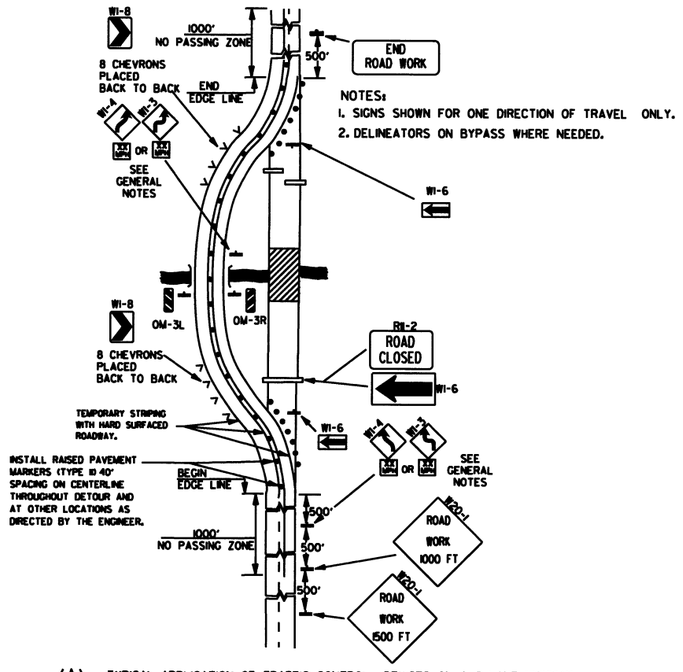
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY 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 | |
| 8-18-04 | REVISED NOTES | |
| 10-9-03 | REVISED NOTE 1 | |
| 8-16-01 | REVISED NOTE 7 | |
| 9-28-00 | REVISED NOTE | |
| 8-18-98 | 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 | |

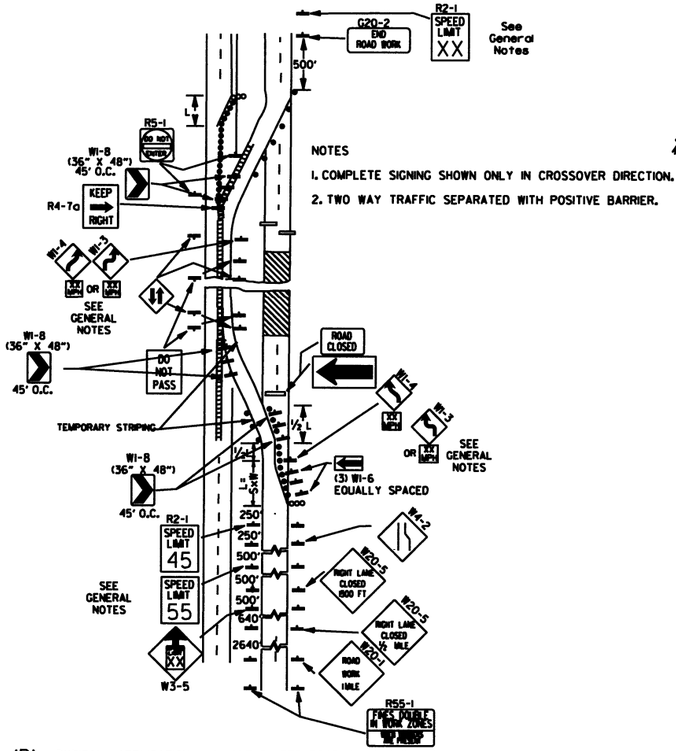
ARKANSAS STATE HIGHWAY COMMISSION

# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

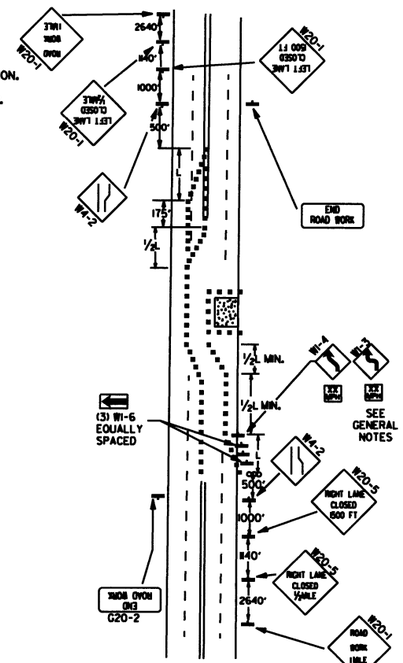
STANDARD DRAWING TC-1



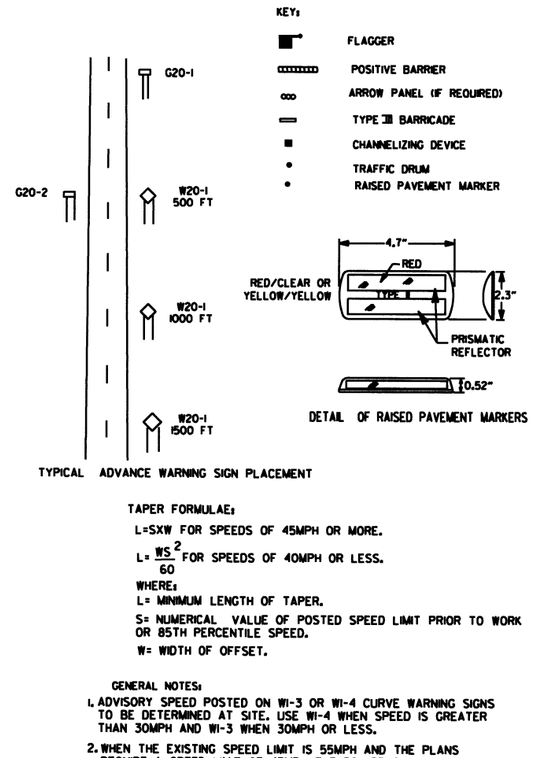

(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.




(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.




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:

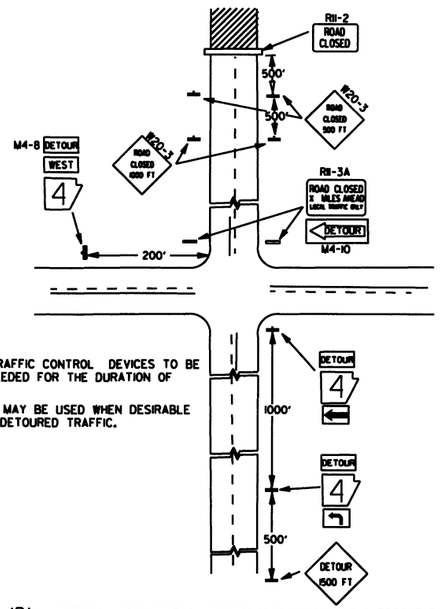
L= MINIMUM LENGTH OF TAPER.

S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.

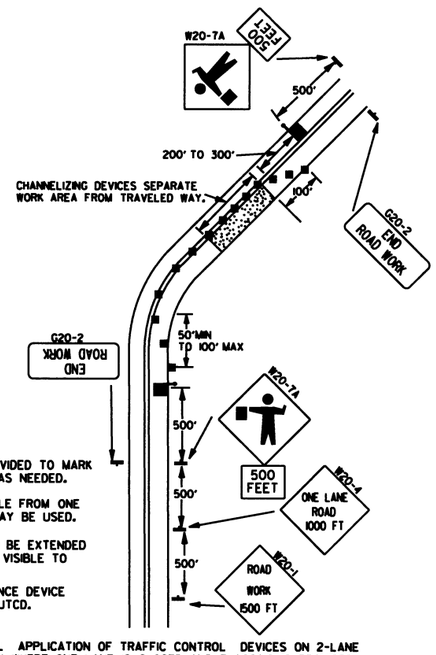
W= WIDTH OF OFFSET.

GENERAL NOTES:

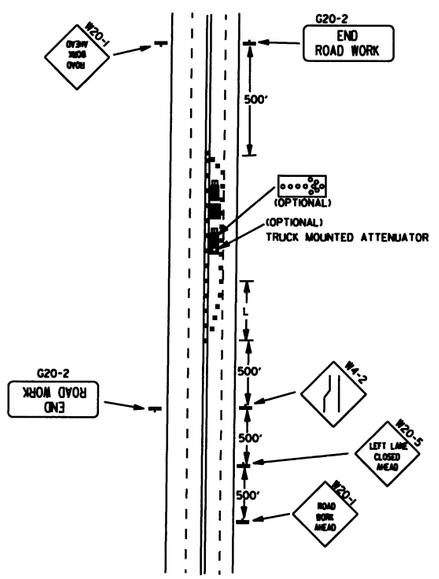
1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED 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.




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




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



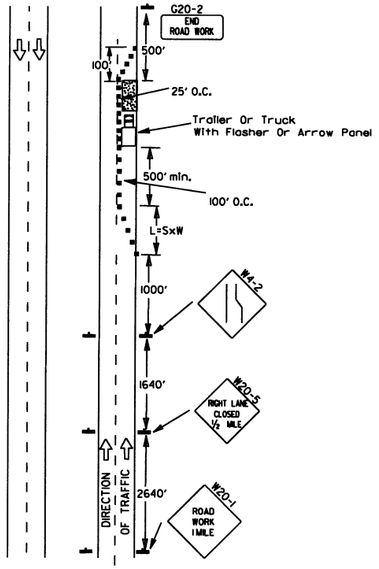

(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

| 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 | |

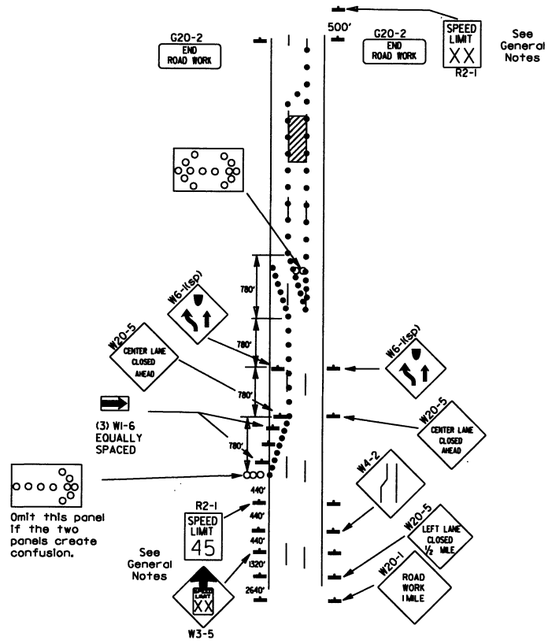
ARKANSAS STATE HIGHWAY COMMISSION

# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

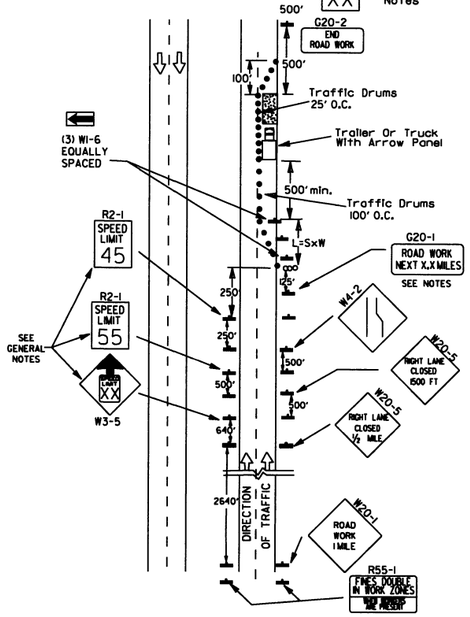
STANDARD DRAWING TC-2




(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)

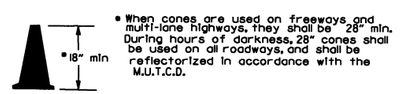
■ Channelizing Device

● 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.

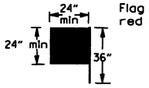
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

| 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.

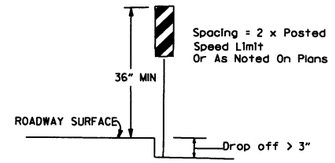
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

FLAG

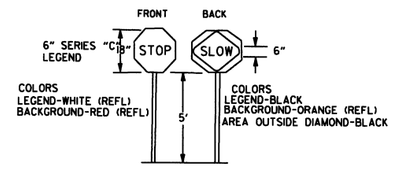


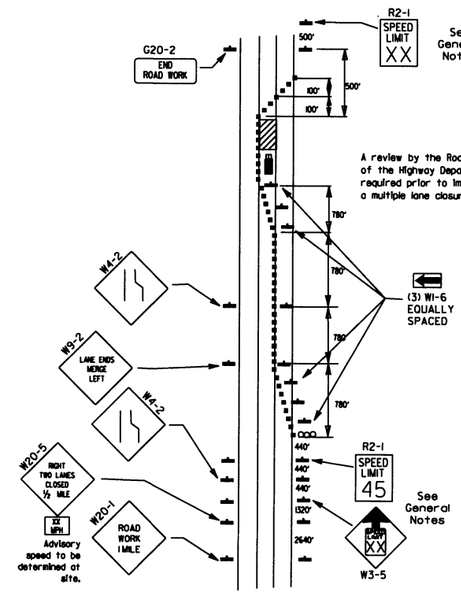

Flag shall be of good grade red material

VERTICAL PANEL PLACEMENT



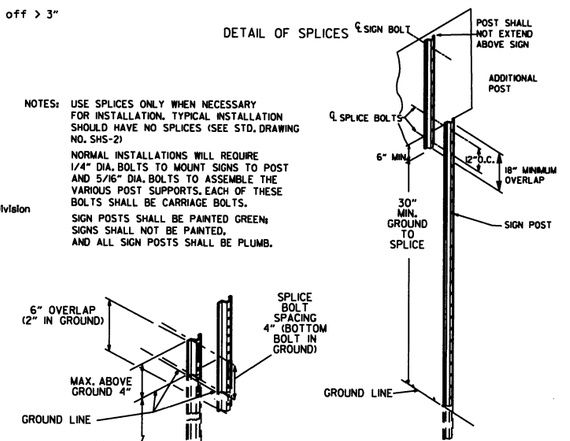

STOP SLOW PADDLE




(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.

| 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 | |

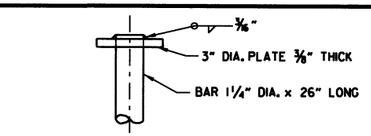
ARKANSAS STATE HIGHWAY COMMISSION

# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

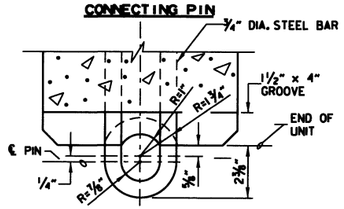
STANDARD DRAWING TC-3

## REINFORCING BAR TABLE PER BARRIER UNIT

| MARK | LOCATION | BAR SIZE | (NO. BARS) | SKETCH |
|---|---|---|---|---|
| H-1 | HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS | #5 | (6) | 19'-3" |
| H-2 | CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY | #5 | (6) | 6'-6" |
| H-3 | TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1 | #4 | (2) | 1'-6" |
| S-1 | OVER LIFT HOLES | #4 | (2) | 2'-5", LIFTING HOLE, 3 3/8" R, 90° |
| S-2 | HORIZ. AROUND SLOTS BETWEEN V-1'S @ DRAIN SLOTS | #4 | (2) | 1 1/2" R, SLOTS, 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP, 1'-6", 1" MIN. CLEAR TO BAR |
| V-1 | VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS | #5 | (16) | TOTAL LENGTH 4'-9", 2 3/16" R, 12°, 4 3/8", 2'-1 3/8" |

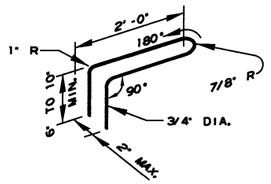



CONNECTING PIN

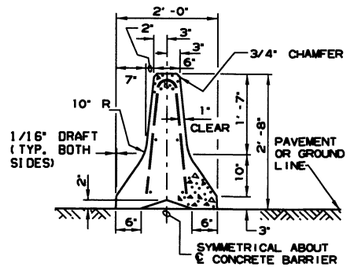



SECTION E-E

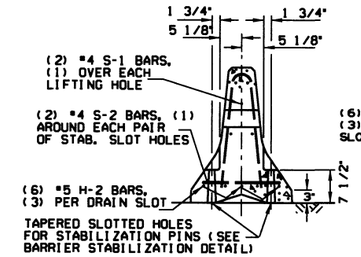
CONNECTION DETAILS



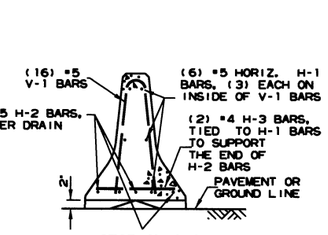

CONNECTION LOOP



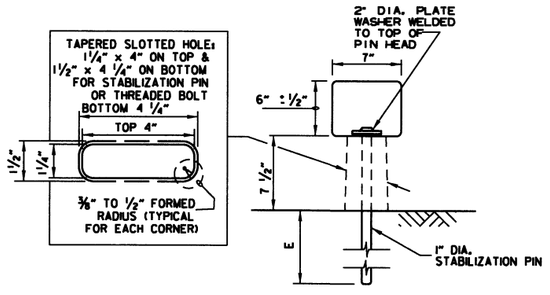

SECTION A-A




SECTION B-B



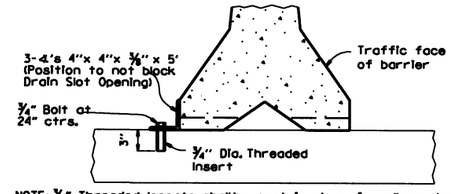

SECTION C-C




BARRIER STABILIZATION DETAIL

ROADWAY SECTION

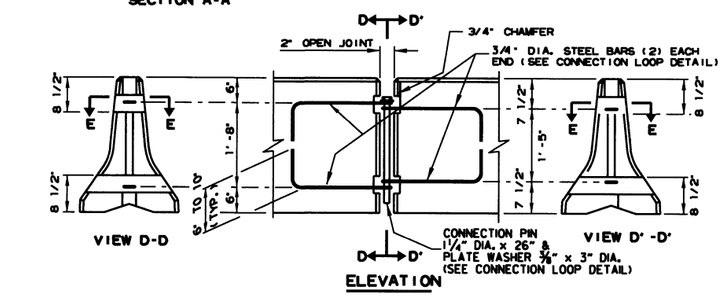
(E) 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas




NOTE: 3/4" Threaded Inserts shall be cast in place for all new bridge decks and drilled and grouted for existing bridge decks. Inserts shall have a minimum ultimate load capacity of 8000 lbs. in tension. After removal of barrier, bolts, and angles, the inserts shall be filled with approved non-shrink epoxy.

BARRIER STABILIZATION DETAIL

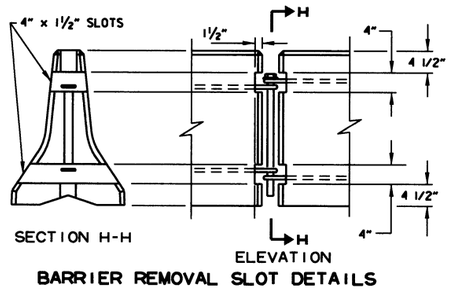
BRIDGE DECKS




VIEW D-D

VIEW D'-D'

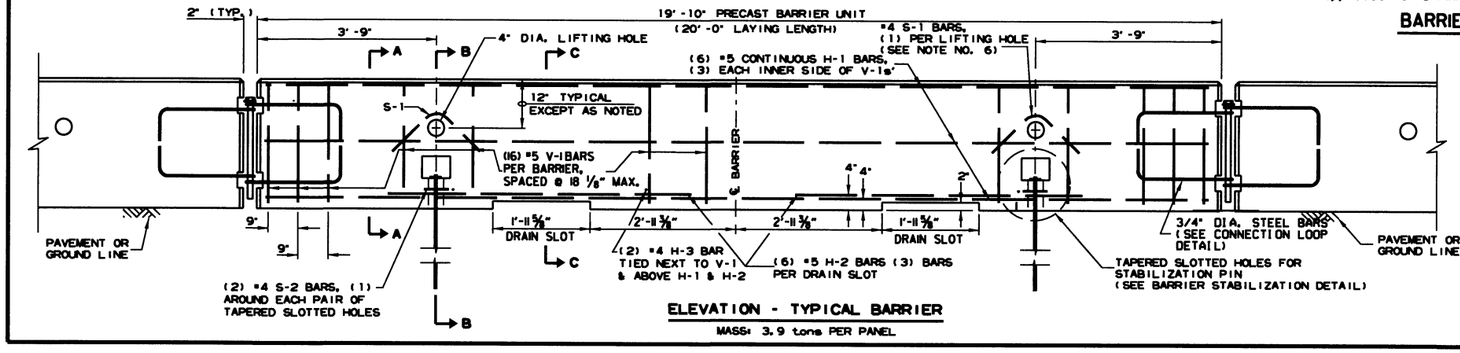
ELEVATION




SECTION H-H

ELEVATION

BARRIER REMOVAL SLOT DETAILS




ELEVATION - TYPICAL BARRIER

MASS: 3.9 tons PER PANEL

### General Notes

1. The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.
2. Materials shall meet the following minimum requirements:
   Concrete: 2500 psi compressive strength at 28 days.
   Reinforcing Steel: AASHTO M 31 or M 53, Grade 60
   Structural Steel: AASHTO-M270 Grade 36 shall be used for the Connection Pin, Connection Loops, and Stabilization Pins. A One Piece Pin with a 3" rounded top may be used in place of the detailed Connection Pin.
   Delineators: Delineators shall be mounted at 10' spacing on top of precast barrier.

   In applications where barrier wall is within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers.
   Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices.
   Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.
3. Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.
4. Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.
5. Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.
6. A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

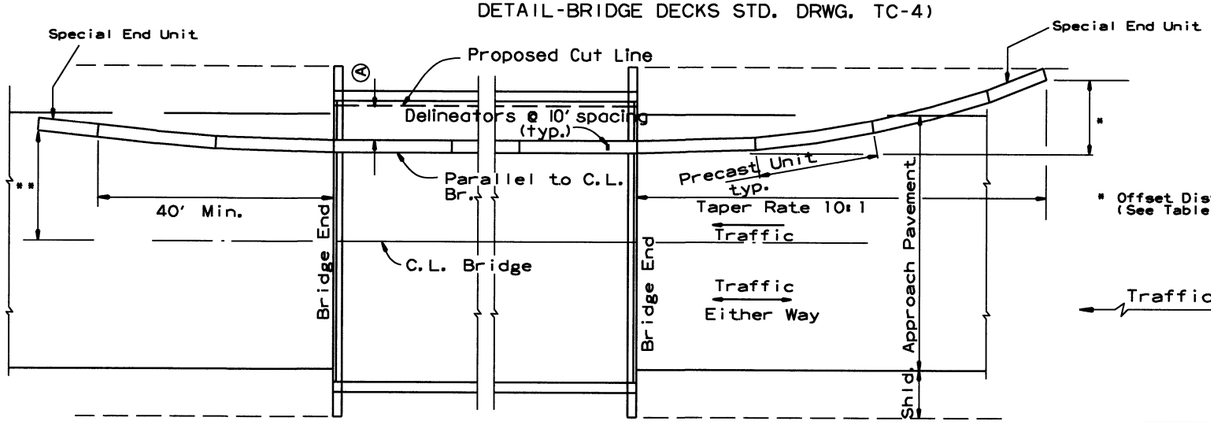
| DATE | REVISION | FILMED |
|---|---|---|
| 2-27-14 | REVISED BARRIER STABILIZATION DETAIL | |
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 8-5-09 | REV. NOTE 3 CONCERNING DRAIN SLOTS | |
| 11-29-07 | REVISED NOTE 3 | |
| 5-25-06 | DELETED GENERAL NOTE 7 | |
| 11-18-04 | REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS | |
| 4-10-03 | REVISED GENERAL NOTE 2 | |
| 8-22-02 | ISSUED NEW DRAWING | |

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-4

Ⓐ 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)

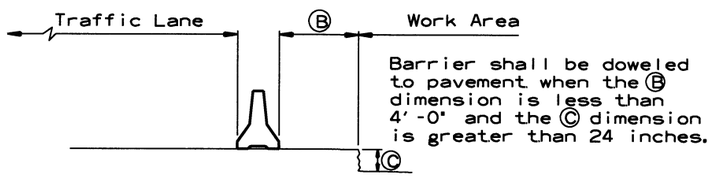



BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

** Offset Distance for Two Way Traffic Only

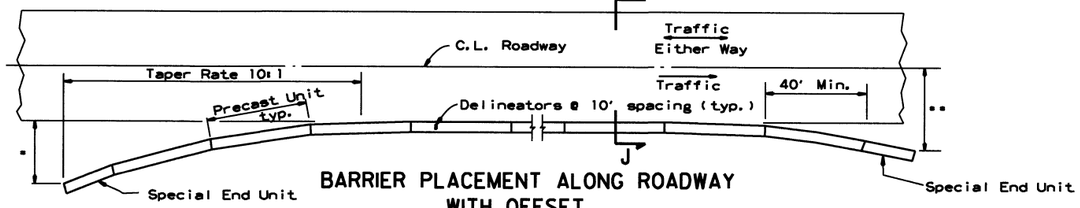
* Offset Distance (See Table)




Barrier shall be doweled to pavement when the Ⓑ dimension is less than 4'-0" and the Ⓒ dimension is greater than 24 inches.

SECTION J-J

No Scale




BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

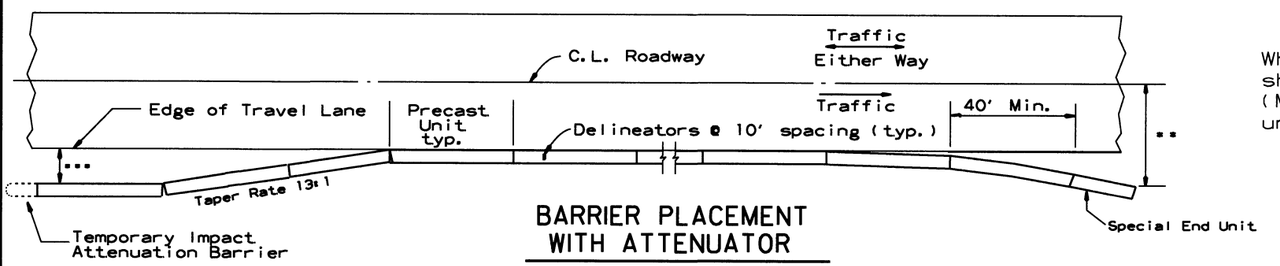
** Offset Distance For Two Way Traffic Only

* Offset Distance (See Table)

Offset Distance Table

| Speed (MPH) | Offset Distance (FT.) |
|---|---|
| ≤ 45 | 12 |
| > 45 | 18 |

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

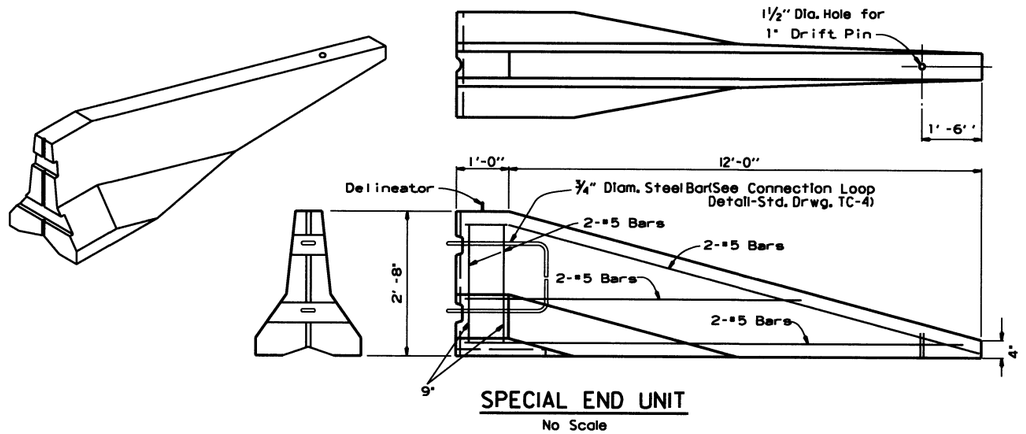



BARRIER PLACEMENT WITH ATTENUATOR

No Scale

*** Min. 3'-0" From Edge of Travel Lane to Nearest Edge of Attenuator

** Offset Distance For Two Way Traffic Only




SPECIAL END UNIT

No Scale

General Notes

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with an NCHRP-350 or Manual For Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of "Temporary Impact Attenuation Barrier."

| DATE | REVISION | FILMED |
|---|---|---|
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 5-25-06 | REVISED BARRIER PLACEMENT | |
| 8-22-02 | ISSUED NEW DRAWING | |

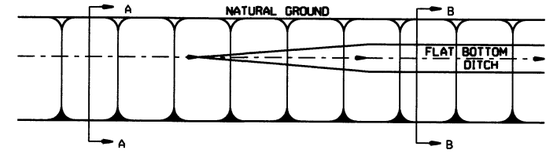
ARKANSAS STATE HIGHWAY COMMISSION

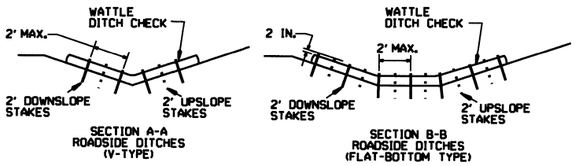
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-5

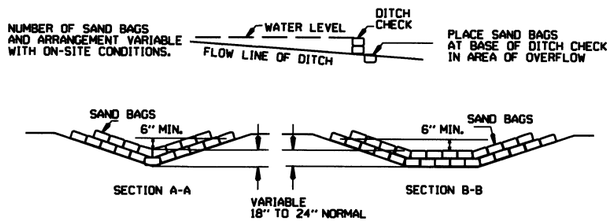
GENERAL NOTES

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

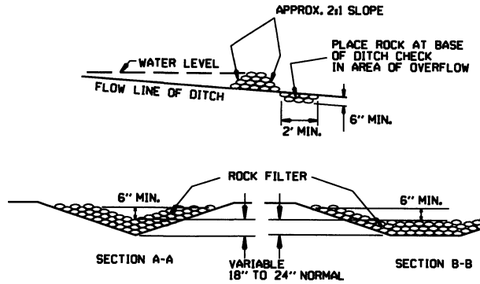



## WATTLE DITCH CHECK (E-1)




## SAND BAG DITCH CHECK (E-5)

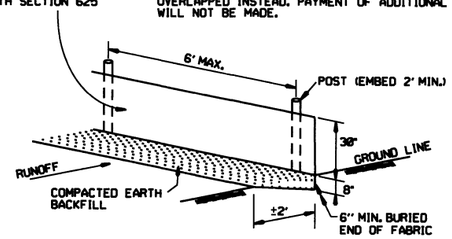



## ROCK DITCH CHECK (E-6)

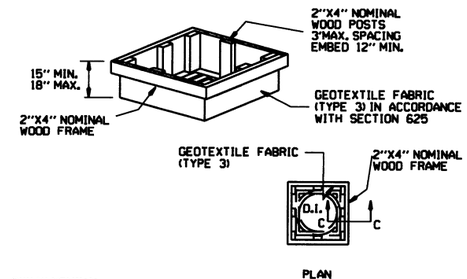
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

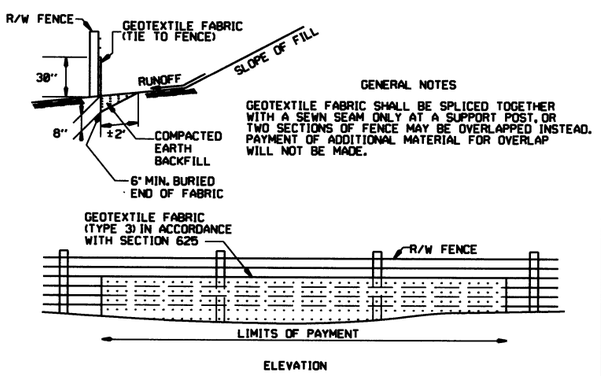
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.




## SILT FENCE (E-11)




## DROP INLET SILT FENCE (E-7)



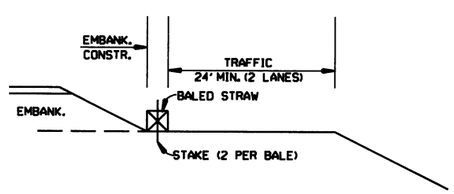

## SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

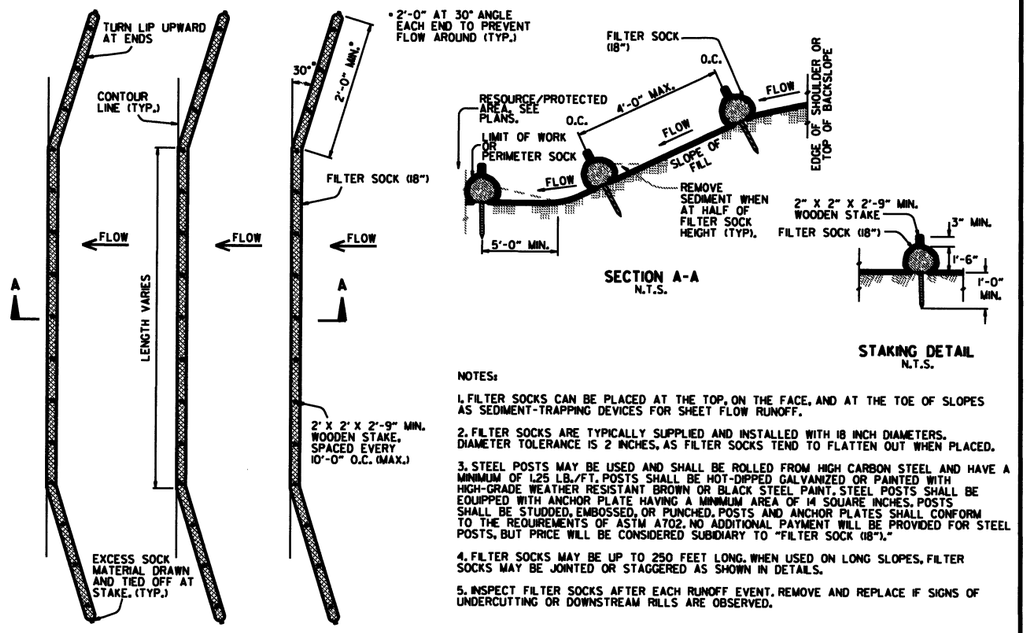
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

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.

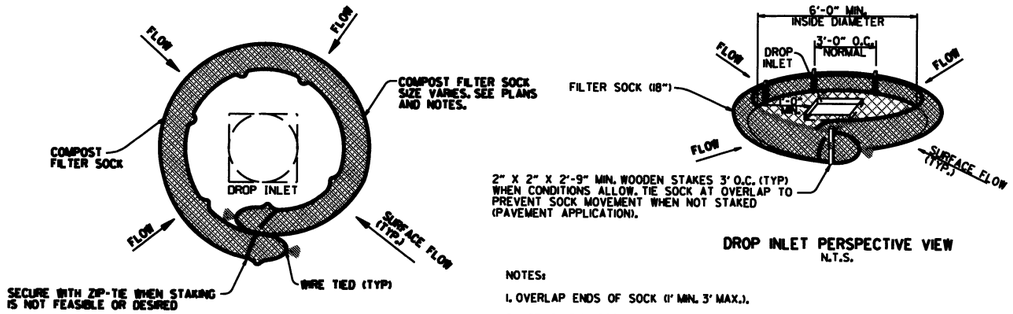
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

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 SUBSIDIARY 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)




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.

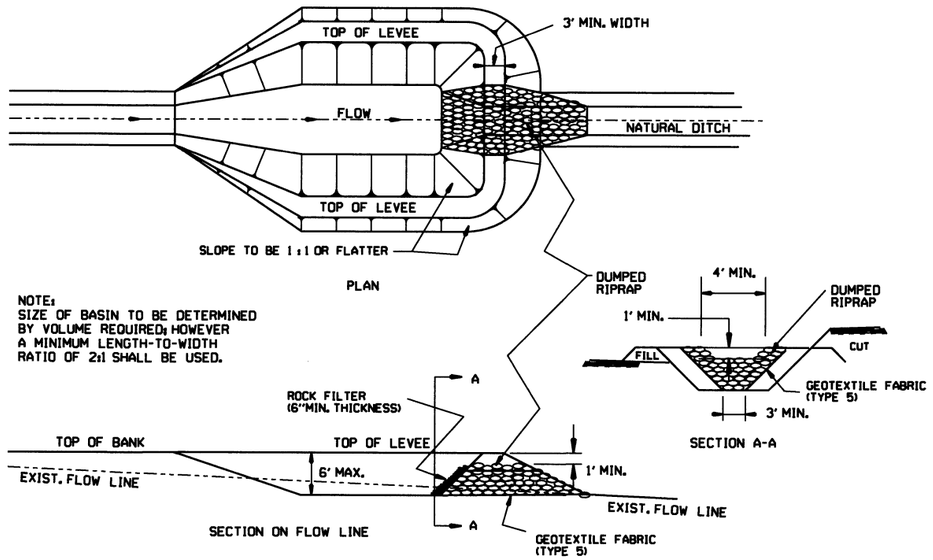
## COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

| 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. 15" 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 |

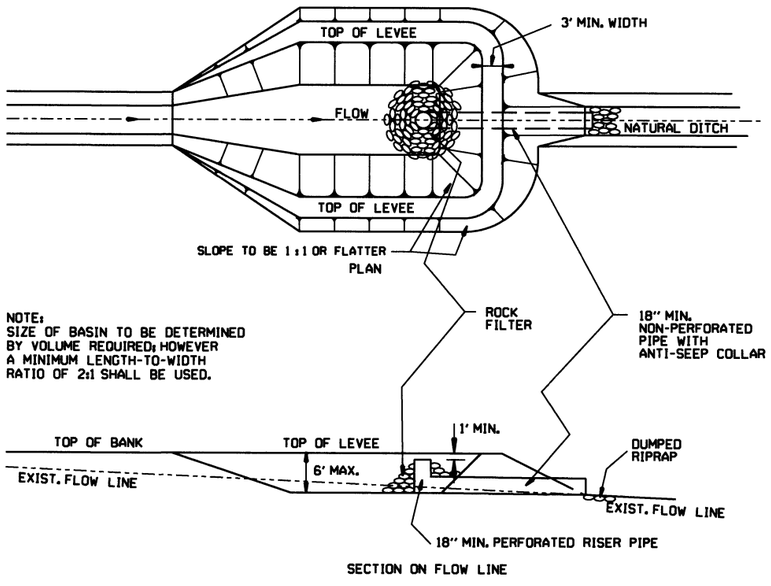
ARKANSAS STATE HIGHWAY COMMISSION

# TEMPORARY EROSION CONTROL DEVICES

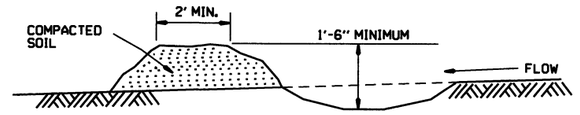
STANDARD DRAWING TEC-1



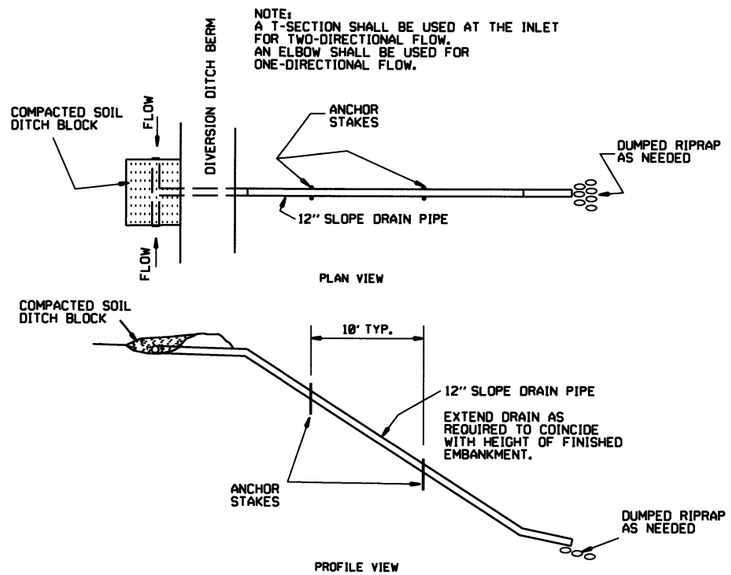

SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



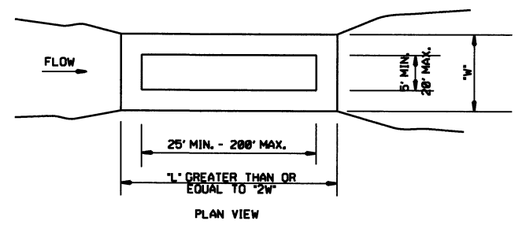

SEDIMENT BASIN WITH PIPE OUTLET (E-10)




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

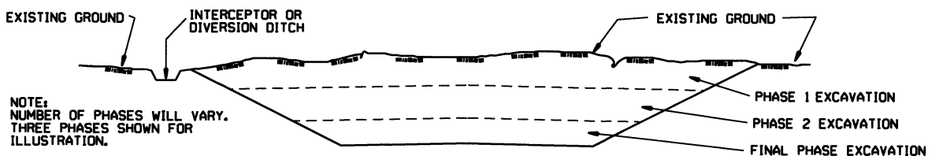
STANDARD DRAWING TEC-2

## 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



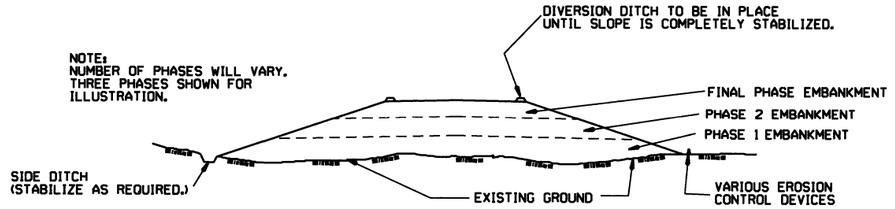

GENERAL NOTE

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

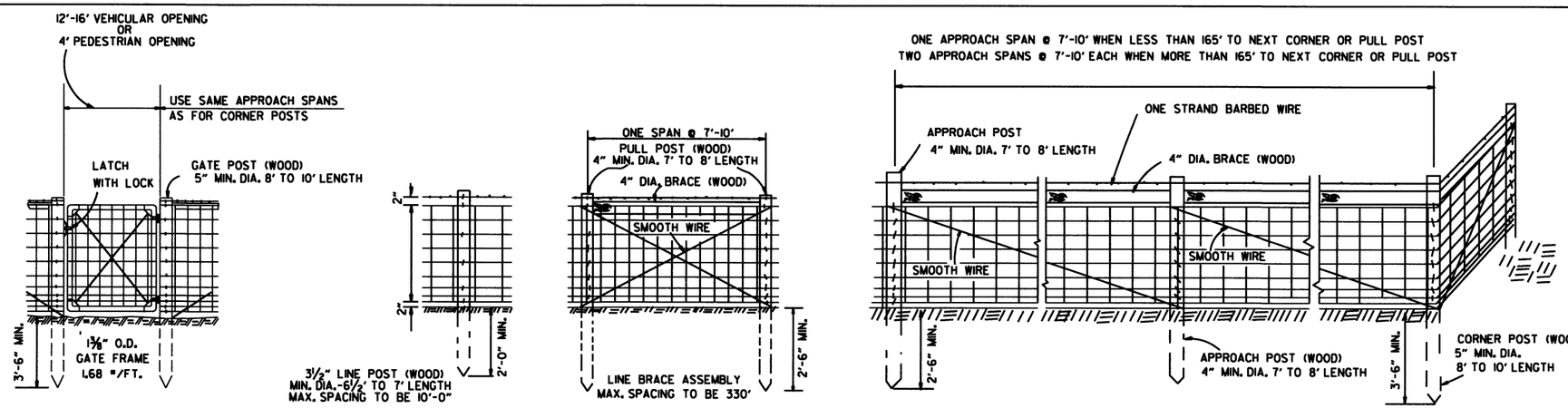
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD 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

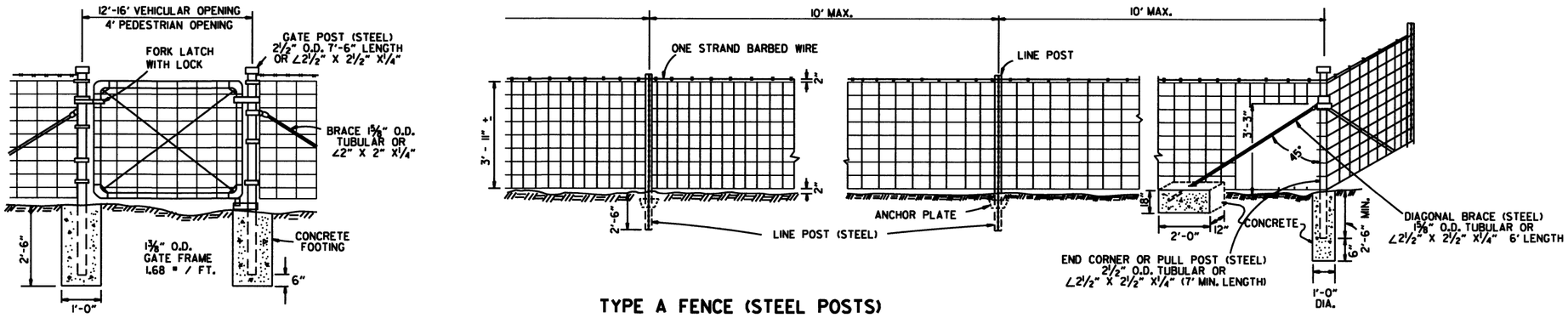
# TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3

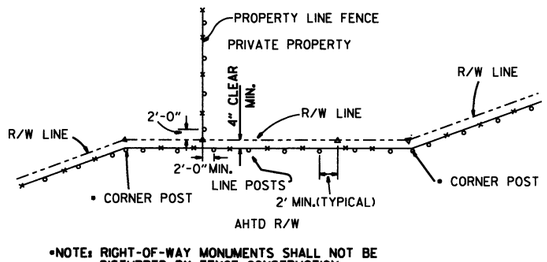



NOTE: STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

## TYPE A FENCE (WOOD POSTS)



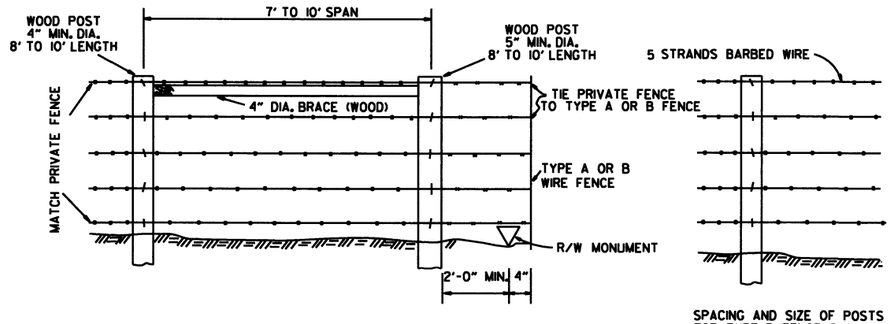

## TYPE A FENCE (STEEL POSTS)




•NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

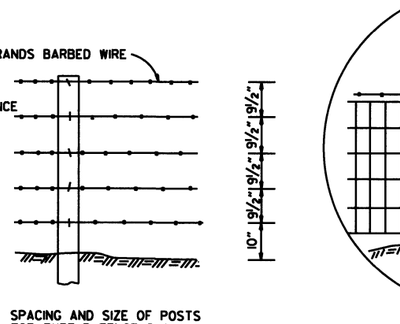
△ - R/W MONUMENTS
○ - FENCE POSTS

## RIGHT-OF-WAY FENCE LOCATION



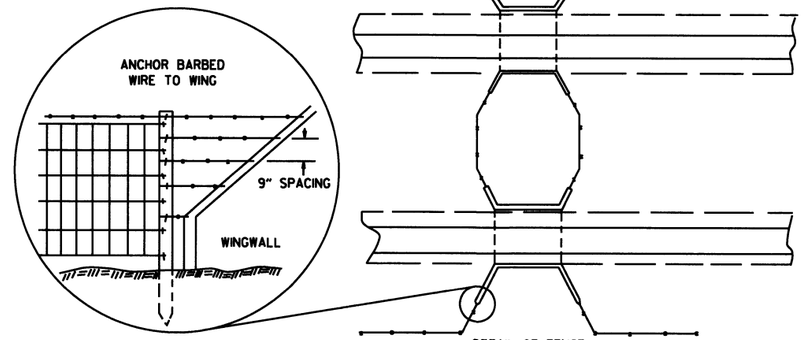

WHERE EXISTING PRIVATE FENCE CONSISTS OF STEEL POSTS, USE END POST ASSEMBLY AS SHOWN WITH TYPE A FENCE OR OTHER END POST ASSEMBLY AS APPROVED BY THE ENGINEER.

## PRIVATE FENCE TERMINAL INSTALLATION




SPACING AND SIZE OF POSTS FOR TYPE B FENCE SHALL BE THE SAME AS TYPE A FENCE.

## TYPE B FENCE






DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

GENERAL NOTES:

STEEL LINE POSTS SHALL BE GALVANIZED, 7 FT. IN LENGTH.

TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK).

THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF WOOD LINE POSTS OF 7' LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

GATE HINGES AND LATCHES WITH LOCKS TO BE OF A TYPE APPROVED BY THE ENGINEER. DRIVEWAY GATES, EITHER SINGLE 12' OR 16' OR DOUBLE 6' TO 8' OPENINGS OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE FOR USE BY MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON THE PLANS OR AS DESIGNATED BY THE ENGINEER.

AT STREAM CROSSINGS THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF BANK TO THE BRIDGE STRUCTURE, A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFIEICNT, THE FENCE SHALL BE TERMINATED WITH CROSS CONNECTIONS AND END POSTS ADJACENT TO THE BRIDGE ABUTMENTS OR CULVERT WINGWALLS.

SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE "WESTERN UNION METHOD" AS DESCRIBED AS FOLLOWS; THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

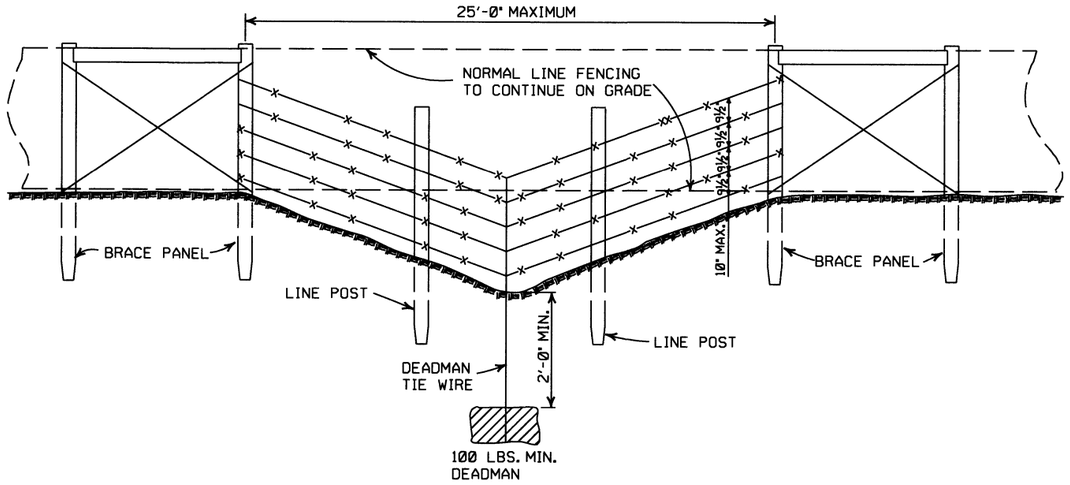
SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE "EYE METHOD"; AS DESCRIBED AS FOLLOWS; THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRE A MINIMUM OF 4 TIMES FOR EACH WIRE LOOP.

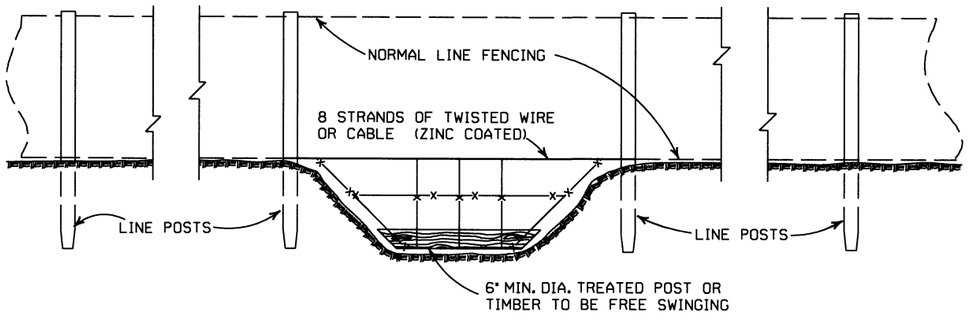
| DATE | REVISION | DATE FILMED |
|---|---|---|
| 8-22-02 | REVISED GENERAL NOTES | |
| 10-18-96 | REVISED ASTM REF. TO AASHTO | |
| 11-22-95 | REVISED R-O-W LOCATION DETAIL | |
| 6-2-94 | ADDED CORNER POST NOTE | 6-2-94 |
| 8-5-93 | REVISED R-O-W LOCATION DETAIL | 8-5-93 |
| 10-1-92 | ADDED STAPLE NOTE | |
| 8-2-90 | REV'D PULL POST LENGTH | |
| 11-30-89 | DELETED CLASS CONC. | |
| 7-15-88 | ADDED SPLICE NOTES | |
| 7-15-88 | ADDED HEIGHT DIMENSION | |
| 4-3-87 | REVISED VARIOUS NOTES | |
| | AND GENERAL NOTES | |
| 11-1-84 | MAX. POST SPACING | |
| 1-4-83 | MIN. DIA. LINE POST | |
| 10-2-72 | REVISED & REDRAWN | |

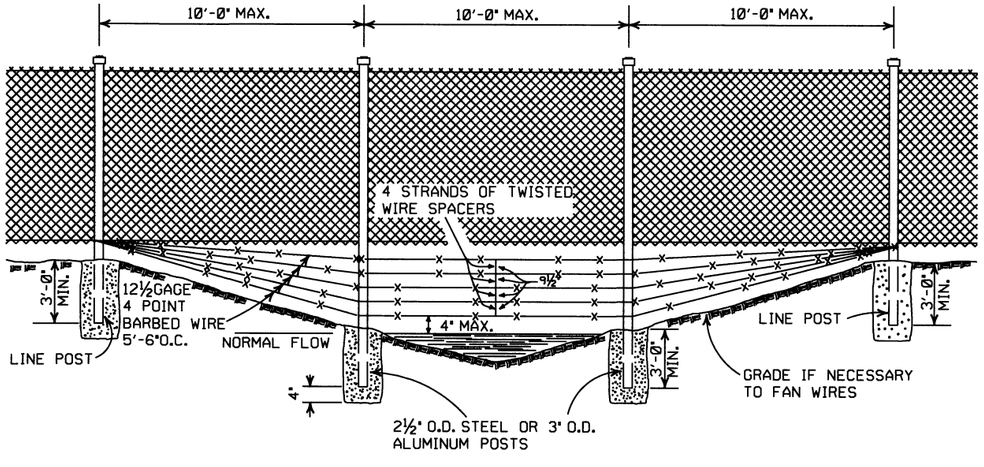
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE
TYPE A AND B

STANDARD DRAWING WF-1




GENERAL NOTES:

THESE INSTALLATIONS TO BE USED WHERE NORMAL FENCING INSTALLATION WOULD CAUSE THE COLLECTING OF DRIFT IN THE CHANNEL OR THE DEPRESSION WILL NOT PERMIT NORMAL INSTALLATION. INSTALLATIONS WILL BE MADE ONLY WHERE DIRECTED BY THE ENGINEER.

WHEN A FENCE LINE APPROACHES A DITCH, GULLY OR DEPRESSION, THE LAST POST ON LEVEL GROUND SHALL BE PLACED CLOSE ENOUGH TO THE EDGE OF THE DROP OFF THAT THE FENCE MAY BE STRUNG TO THE POST IN THE DEPRESSION WITHOUT TOUCHING THE GROUND.

IN TERRAIN OF SUCH EXTREME IRREGULARITY THAT MINOR GRADING WILL NOT BE FEASIBLE, THE NORMAL FENCE SHALL CONTINUE ON GRADE AND THE GULLIES OR DEPRESSIONS TREATED BY AUXILIARY FENCES AS SHOWN.

PAYMENT FOR THE TYPE INSTALLATION USED WILL NOT BE MADE DIRECTLY BUT WILL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR WIRE FENCE OR CHAIN LINK FENCE.

| DATE | REVISION | FILMED |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| 4-20-79 | REVISED TOP RAIL & TENSION WIRE | 696-4-20-79 |
| 10-2-72 | REVISED AND REDRAWN | 529-10-2-72 |

ARKANSAS STATE HIGHWAY COMMISSION

# WIRE FENCE WATER GAPS

STANDARD DRAWING WF-2

| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |

# BAR LIST FOR BARREL SECTION 60:0" IN LENGTH

| DEPTH OF COVER D | CLEAR SPAN S | CLEAR HEIGHT H | "a" bars STRAIGHT In Top and Bottom Slabs of Barrel. 2 Add'l In Apron and Headwall - Each. SIZE | SPACING | NUMBER REQ'D 3:1 | NUMBER REQ'D 4:1 | LENGTH | "b" bars BENT - See Diagram below. In Top and Bottom Slabs of Barrel. Alternate with "a" bars. SIZE | SPACING | NUMBER REQ'D 3:1 | NUMBER REQ'D 4:1 | LENGTH | X | "d" bars STRAIGHT Longitudinal in Top Slab of Barrel SIZE | SPACING | NO. REQ'D | LENGTH | "d1" bars STRAIGHT Longitudinal in Sidewalls SIZE | SPACING | NO. REQ'D | LENGTH | "e" bars. STRAIGHT Longitudinal in Bottom Slab of Barrel SIZE | SPACING | NO. REQ'D | LENGTH | "f" bars STRAIGHT Verticals in Sidewalls SIZE | SPACING | NUMBER REQ'D 3:1 | NUMBER REQ'D 4:1 | LENGTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | S | H | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0'-0" to 5'-0" Maximum | 1 @ 4' | 2' | #5 | 13" | 120 | 120 | 4'-9" | #6 | 13" | 110 | 110 | 5'-10" | 4'-8" | #5 | 10½" | 6 | #4 | 12" | 4 | #4 | 12" | 5 | #4 | 12" | 120 | 120 | 2'-11" |
| | | 3' | | | 120 | 120 | 4'-9" | | | 110 | 110 | 5'-10" | 4'-8" | | | 6 | | | 6 | | | 5 | | | 120 | 120 | 3'-11" |
| | | 4' | | | 120 | 120 | 4'-9" | | | 110 | 110 | 5'-10" | 4'-8" | | | 6 | | | 8 | | | 5 | | | 120 | 120 | 4'-11" |
| | | 5' | | | 120 | 120 | 4'-9" | | | 110 | 110 | 5'-10" | 4'-8" | | | 6 | | | 10 | | | 5 | | | 120 | 120 | 5'-11" |
| | | 6' | | | 120 | 120 | 4'-11" | | | 110 | 110 | 6'-0" | 4'-10" | | | 6 | | | 12 | | | 5 | | | 120 | 120 | 6'-11" |
| | 1 @ 5' | 8' | #6 | 13" | 120 | 120 | 5'-9" | #6 | 13" | 110 | 110 | 6'-10" | 5'-8" | #5 | 10½" | 7 | #4 | 12" | 6 | #4 | 12" | 6 | #4 | 12" | 120 | 120 | 4'-0" |
| | | 4' | | | 120 | 120 | 5'-9" | | | 110 | 110 | 6'-10" | 5'-8" | | | 7 | | | 8 | | | 6 | | | 120 | 120 | 5'-0" |
| | | 5' | | | 120 | 120 | 5'-9" | | | 110 | 110 | 6'-10" | 5'-8" | | | 7 | | | 10 | | | 6 | | | 120 | 120 | 6'-0" |
| | | 6' | | | 120 | 120 | 5'-11" | | | 110 | 110 | 7'-0" | 5'-10" | | | 7 | | | 12 | | | 6 | | | 120 | 120 | 7'-0" |
| | | 7' | | | 120 | 120 | 6'-0" | | | 110 | 110 | 7'-1" | 5'-11" | | | 7 | | | 14 | | | 6 | | | 120 | 120 | 8'-0" |
| | | 8' | | | 120 | 120 | 6'-2" | | | 110 | 110 | 7'-3" | 6'-1" | | | 7 | | | 16 | | | 6 | | | 120 | 120 | 9'-0" |
| | 1 @ 6' | 3' | #6 | 12" | 128 | 128 | 6'-9" | #6 | 12" | 118 | 118 | 7'-10" | 6'-6" | #5 | 10½" | 8 | #4 | 12" | 6 | #4 | 12" | 7 | #4 | 12" | 120 | 120 | 4'-1" |
| | | 4' | | | 128 | 128 | 6'-9" | | | 118 | 118 | 7'-10" | 6'-6" | | | 8 | | | 8 | | | 7 | | | 120 | 120 | 5'-1" |
| | | 5' | | | 128 | 128 | 6'-9" | | | 118 | 118 | 7'-10" | 6'-6" | | | 8 | | | 10 | | | 7 | | | 120 | 120 | 6'-1" |
| | | 6' | | | 128 | 128 | 6'-11" | | | 118 | 118 | 8'-1" | 6'-11" | | | 8 | | | 12 | | | 7 | | | 120 | 120 | 7'-1" |
| | | 7' | | | 128 | 128 | 7'-0" | | | 118 | 118 | 8'-1" | 6'-11" | | | 8 | | | 14 | | | 7 | | | 120 | 120 | 8'-1" |
| | | 8' | | | 128 | 128 | 7'-1" | | | 118 | 118 | 8'-2" | 7'-0" | | | 8 | | | 16 | | | 7 | | | 120 | 120 | 9'-1" |
| | 1 @ 7' | 4' | #6 | 11" | 140 | 140 | 7'-9" | #6 | 11" | 130 | 130 | 8'-10" | 7'-8" | #5 | 10½" | 9 | #4 | 12" | 8 | #4 | 12" | 8 | #4 | 12" | 120 | 120 | 5'-2" |
| | | 5' | | | 140 | 140 | 7'-9" | | | 130 | 130 | 8'-10" | 7'-8" | | | 9 | | | 10 | | | 8 | | | 120 | 120 | 6'-2" |
| | | 6' | | | 140 | 140 | 7'-11" | | | 130 | 130 | 9'-1" | 7'-10" | | | 9 | | | 12 | | | 8 | | | 120 | 120 | 7'-2" |
| | | 7' | | | 140 | 140 | 8'-0" | | | 130 | 130 | 9'-1" | 7'-10" | | | 9 | | | 14 | | | 8 | | | 120 | 120 | 8'-2" |
| | | 8' | | | 140 | 140 | 8'-1" | | | 130 | 130 | 9'-2" | 8'-0" | | | 9 | | | 16 | | | 8 | | | 120 | 120 | 9'-2" |
| | | 9' | | | 140 | 140 | 8'-3" | | | 130 | 130 | 9'-4" | 8'-2" | | | 9 | | | 18 | | | 8 | | | 120 | 120 | 10'-2" |
| | 1 @ 8' | 4' | #7 | 12" | 128 | 128 | 8'-9" | #6 | 12" | 118 | 118 | 9'-10" | 8'-8" | #5 | 10" | 11 | #4 | 12" | 8 | #4 | 12" | 9 | #4 | 12" | 120 | 120 | 5'-8" |
| | | 5' | | | 128 | 128 | 8'-11" | | | 118 | 118 | 10'-0" | 8'-10" | | | 11 | | | 10 | | | 9 | | | 120 | 120 | 6'-8" |
| | | 6' | | | 128 | 128 | 8'-11" | | | 118 | 118 | 10'-0" | 8'-10" | | | 11 | | | 12 | | | 9 | | | 120 | 120 | 7'-8" |
| | | 7' | | | 128 | 128 | 9'-0" | | | 118 | 118 | 10'-1" | 8'-11" | | | 11 | | | 14 | | | 9 | | | 120 | 120 | 8'-8" |
| | | 8' | | | 128 | 128 | 9'-1" | | | 118 | 118 | 10'-2" | 9'-0" | | | 11 | | | 16 | | | 9 | | | 10" | 144 | 9'-8" |
| | | 9' | | | 128 | 128 | 9'-3" | | | 118 | 118 | 10'-4" | 9'-2" | | | 11 | | | 18 | | | 9 | | | 10" | 144 | 10'-8" |
| | | 10' | | | 128 | 128 | 9'-5" | | | 118 | 118 | 10'-5" | 9'-3" | | | 11 | | | 20 | | | 9 | | | 10" | 144 | 11'-8" |
| | 1 @ 9' | 5' | #7 | 11" | 140 | 140 | 9'-11" | #6 | 11" | 130 | 130 | 11'-0" | 9'-10" | #5 | 10" | 12 | #4 | 12" | 10 | #4 | 12" | 10 | #4 | 12" | 120 | 120 | 6'-5" |
| | | 6' | | | 140 | 140 | 10'-0" | | | 130 | 130 | 11'-1" | 9'-11" | | | 12 | | | 12 | | | 10 | | | 120 | 120 | 7'-5" |
| | | 7' | | | 140 | 140 | 10'-0" | | | 130 | 130 | 11'-1" | 9'-11" | | | 12 | | | 14 | | | 10 | | | 120 | 120 | 8'-5" |
| | | 8' | | | 140 | 140 | 10'-1" | | | 130 | 130 | 11'-2" | 10'-0" | | | 12 | | | 16 | | | 10 | | | 10" | 144 | 9'-5" |
| | | 9' | | | 140 | 140 | 10'-3" | | | 130 | 130 | 11'-4" | 10'-2" | | | 12 | | | 18 | | | 10 | | | 10" | 144 | 10'-5" |
| | | 10' | | | 140 | 140 | 10'-5" | | | 130 | 130 | 11'-4" | 10'-2" | | | 12 | | | 20 | | | 10 | | | 11" | 132 | 11'-5" |
| | | 11' | | | 140 | 140 | 10'-7" | | | 130 | 130 | 11'-5" | 10'-3" | | | 12 | | | 22 | | | 10 | | | 11" | 132 | 12'-5" |
| | 1 @ 10' | 5' | #7 | 12" | 128 | 128 | 10'-11" | #7 | 12" | 118 | 118 | 12'-2" | 10'-10" | #5 | 10" | 13 | #4 | 12" | 10 | #4 | 12" | 11 | #4 | 12" | 120 | 120 | 6'-6" |
| | | 6' | | | 128 | 128 | 11'-0" | | | 118 | 118 | 12'-3" | 10'-11" | | | 13 | | | 12 | | | 11 | | | 120 | 120 | 7'-6" |
| | | 7' | | | 128 | 128 | 11'-0" | | | 118 | 118 | 12'-3" | 10'-11" | | | 13 | | | 14 | | | 11 | | | 120 | 120 | 8'-6" |
| | | 8' | | | 128 | 128 | 11'-1" | | | 118 | 118 | 12'-4" | 11'-0" | | | 13 | | | 16 | | | 11 | | | 10" | 144 | 9'-6" |
| | | 9' | | | 128 | 128 | 11'-3" | | | 118 | 118 | 12'-6" | 11'-2" | | | 13 | | | 18 | | | 11 | | | 10" | 144 | 10'-6" |
| | | 10' | | | 128 | 128 | 11'-5" | | | 118 | 118 | 12'-8" | 11'-4" | | | 13 | | | 20 | | | 11 | | | 10" | 144 | 11'-6" |
| | | 11' | | | 128 | 128 | 11'-7" | | | 118 | 118 | 12'-10" | 11'-6" | | | 13 | | | 22 | | | 11 | | | 10" | 144 | 12'-6" |
| | | 12' | | | 128 | 128 | 11'-9" | | | 118 | 118 | 13'-0" | 11'-8" | | | 13 | | | 24 | | | 11 | | | 10" | 144 | 13'-6" |
| | 1 @ 11' | 6' | #8 | 12" | 140 | 140 | 12'-1" | #7 | 12" | 130 | 130 | 13'-4" | 12'-0" | #5 | 9½" | 15 | #4 | 12" | 12 | #4 | 12" | 12 | #4 | 12" | 120 | 120 | 7'-7" |
| | | 7' | | | 140 | 140 | 12'-1" | | | 130 | 130 | 13'-4" | 12'-0" | | | 15 | | | 14 | | | 12 | | | 120 | 120 | 8'-7" |
| | | 8' | | | 140 | 140 | 12'-1" | | | 130 | 130 | 13'-4" | 12'-0" | | | 15 | | | 16 | | | 12 | | | 10" | 144 | 9'-7" |
| | | 9' | | | 140 | 140 | 12'-3" | | | 130 | 130 | 13'-6" | 12'-2" | | | 15 | | | 18 | | | 12 | | | 10" | 144 | 10'-7" |
| | | 10' | | | 140 | 140 | 12'-5" | | | 130 | 130 | 13'-8" | 12'-4" | | | 15 | | | 20 | | | 12 | | | 11" | 132 | 11'-7" |
| | | 11' | | | 140 | 140 | 12'-7" | | | 130 | 130 | 13'-10" | 12'-6" | | | 15 | | | 22 | | | 12 | | | 11" | 132 | 12'-7" |
| | | 12' | | | 140 | 140 | 12'-9" | | | 130 | 130 | 14'-0" | 12'-8" | | | 15 | | | 24 | | | 12 | | | 11" | 132 | 13'-7" |
| | 1 @ 12' | 6' | #8 | 12" | 128 | 128 | 13'-1" | #7 | 12" | 118 | 118 | 14'-4" | 13'-0" | #5 | 9½" | 16 | #4 | 12" | 12 | #4 | 12" | 13 | #4 | 12" | 120 | 120 | 7'-9" |
| | | 7' | | | 128 | 128 | 13'-1" | | | 118 | 118 | 14'-4" | 13'-0" | | | 16 | | | 14 | | | 13 | | | 120 | 120 | 8'-9" |
| | | 8' | | | 128 | 128 | 13'-1" | | | 118 | 118 | 14'-4" | 13'-0" | | | 16 | | | 16 | | | 13 | | | 10" | 144 | 9'-9" |
| | | 9' | | | 128 | 128 | 13'-3" | | | 118 | 118 | 14'-6" | 13'-2" | | | 16 | | | 18 | | | 13 | | | 10" | 144 | 10'-9" |
| | | 10' | | | 128 | 128 | 13'-5" | | | 118 | 118 | 14'-8" | 13'-4" | | | 16 | | | 20 | | | 13 | | | 11" | 132 | 11'-9" |
| | | 11' | | | 128 | 128 | 13'-7" | | | 118 | 118 | 14'-10" | 13'-6" | | | 16 | | | 22 | | | 13 | | | 11" | 132 | 12'-9" |
| | | 12' | | | 128 | 128 | 13'-9" | | | 118 | 118 | 15'-0" | 13'-8" | | | 16 | | | 24 | | | 13 | | | 11" | 132 | 13'-9" |

2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap)

2 @ 31'-6" for 60'-0" Length Barrel. (1'-3" Lap)

| BAR SIZE | PIN DIAM. | K | ADD FOR 2 HOOKS | BENDING DIAGRAM Bars "b". |
|---|---|---|---|---|
| #6 | 3" | 5" | 1'-2" | K, Pin Diam., X |
| #7 | 3½" | 5¾" | 1'-4" | |

NOTE:- Dimensions are to centers of bars.

## DOWEL BARS FOR TWO HEADWALLS

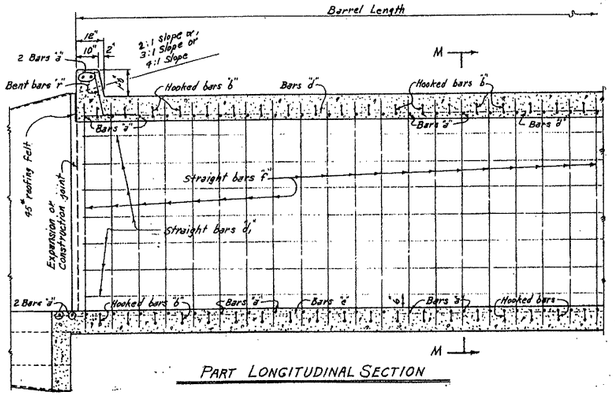
| SPAN | SIZE | SPACING | NO. REQ'D | LENGTH | X |
|---|---|---|---|---|---|
| 4' | #4 | 11¼" | 12 | 2'-6" | 1'-3" |
| 5' | #4 | 11¼" | 14 | 2'-7" | 1'-3⅜" |
| 6' | #4 | 11¼" | 16 | 2'-8" | 1'-4" |
| 7' | #4 | 11¼" | 18 | 2'-9" | 1'-4⅜" |
| 8' | #4 | 11¼" | 20 | 2'-11" | 1'-5⅜" |
| 9' | #4 | 11¼" | 22 | 3'-0" | 1'-6" |
| 10' | #4 | 11¼" | 24 | 3'-1" | 1'-6⅜" |
| 11' | #4 | 12" | 26 | 3'-2" | 1'-7" |
| 12' | #4 | 12" | 28 | 3'-3" | 1'-7½" |

Bars "r" Dowel bars in Headwalls. (E, 12, X)

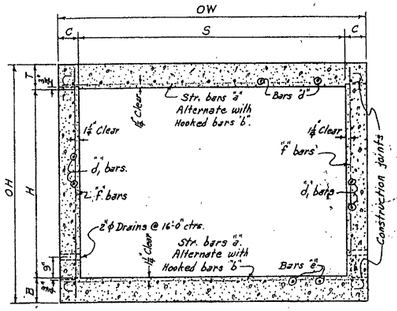
# DIMENSIONS AND QUANTITIES

| MARK. DESIGN DEPTH OF COVER D | CLEAR SPAN S | CLEAR HEIGHT H | BARREL DIMENSIONS Sq. Ft. OPENING A | OVERALL WIDTH OW | THICKNESS OF TOP SLAB T | THICKNESS OF SIDEWALLS C | THICKNESS OF BOTTOM SLAB B | OVERALL HEIGHT OH | UNIT QUANTITIES CLASS S CONC. PER LIN. FT. OF BARREL CU.YD. | REINFORCING STEEL PER LIN. FT. OF BARREL LB. | REINFORCING STEEL ADDITIONAL PER LAP LB. | REINFORCING STEEL ADDITIONAL TWO HEADWALLS & APRONS LB. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5'-0" | 1 @ 4' | 2' | 8 | 5'-0" | 7" | 6" | 6½" | 3'-1½" | 0.282 | 41.99 | 17.96 | 66.35 |
| | | 3' | 12 | 5'-0" | | 6" | | 4'-1½" | 0.319 | 44.16 | 19.62 | 66.35 |
| | | 4' | 16 | 5'-0" | | 6" | | 5'-1½" | 0.356 | 46.83 | 21.29 | 66.35 |
| | | 5' | 20 | 5'-0" | | 6" | | 6'-1½" | 0.394 | 49.50 | 22.96 | 66.35 |
| | | 6' | 24 | 5'-2" | | 7" | | 7'-1½" | 0.474 | 52.96 | 24.63 | 67.75 |
| | 1 @ 5' | 3' | 15 | 6'-0" | 7½" | 6" | 6½" | 4'-2½" | 0.380 | 55.55 | 22.19 | 101.27 |
| | | 4' | 20 | 6'-0" | | 6" | | 5'-2½" | 0.417 | 58.23 | 23.86 | 101.27 |
| | | 5' | 25 | 6'-0" | | 6" | | 6'-2½" | 0.454 | 60.90 | 25.53 | 101.27 |
| | | 6' | 30 | 6'-2" | | 7" | | 7'-2½" | 0.535 | 64.99 | 27.20 | 103.27 |
| | | 7' | 35 | 6'-3" | | 7½" | | 8'-2½" | 0.609 | 67.63 | 28.87 | 106.27 |
| | 1 @ 6' | 3' | 18 | 7'-0" | 8" | 6" | 7" | 4'-3½" | 0.496 | 66.29 | 29.76 | 118.96 |
| | | 4' | 24 | 7'-0" | | 6" | | 5'-3½" | 0.983 | 68.96 | 26.93 | 118.96 |
| | | 5' | 30 | 7'-0" | | 6" | | 6'-3½" | 0.520 | 71.64 | 28.10 | 118.96 |
| | | 6' | 36 | 7'-2" | | 7" | | 7'-3½" | 0.602 | 75.31 | 29.77 | 120.96 |
| | | 7' | 42 | 7'-3" | | 7½" | | 8'-3½" | 0.671 | 78.98 | 31.44 | 121.97 |
| | | 8' | 48 | 7'-4" | | 8" | | 9'-3½" | 0.746 | 88.47 | 33.11 | 122.97 |
| | 1 @ 7' | 4' | 28 | 8'-0" | 9" | 6" | 8" | 5'-5" | 0.568 | 81.32 | 29.01 | 136.88 |
| | | 5' | 35 | 8'-1" | | 6" | | 6'-5" | 0.605 | 84.00 | 30.68 | 136.88 |
| | | 6' | 42 | 8'-2" | | 7" | | 7'-5" | 0.698 | 87.74 | 32.35 | 138.88 |
| | | 7' | 49 | 8'-3" | 9½" | 7½" | 8½" | 8'-5" | 0.757 | 90.98 | 39.02 | 139.88 |
| | | 8' | 56 | 8'-4" | | 8" | | 9'-5" | 0.832 | 96.65 | 35.69 | 140.88 |
| | | 9' | 63 | 8'-6" | | 9" | | 10'-5" | 0.946 | 105.59 | 37.36 | 142.89 |
| | 1 @ 8' | 4' | 32 | 9'-0" | 10" | 6" | 9" | 5'-7" | 0.676 | 95.26 | 33.32 | 196.07 |
| | | 5' | 40 | 9'-2" | | 7" | | 6'-7" | 0.754 | 98.12 | 34.99 | 196.80 |
| | | 6' | 48 | 9'-2" | | 7" | | 7'-7" | 0.797 | 101.79 | 36.66 | 196.80 |
| | | 7' | 56 | 9'-3" | 9½" | 7½" | 9½" | 8'-7" | 0.867 | 105.05 | 38.33 | 198.16 |
| | | 8' | 64 | 9'-4" | | 8" | | 9'-7" | 0.942 | 110.81 | 40.00 | 199.52 |
| | | 9' | 72 | 9'-6" | | 9" | | 10'-7" | 1.057 | 119.92 | 41.67 | 202.25 |
| | | 10' | 80 | 9'-8" | | 10" | | 11'-7" | 1.184 | 126.67 | 43.34 | 204.97 |
| | 1 @ 9' | 5' | 45 | 10'-2" | 10" | 7" | 10" | 6'-8" | 0.844 | 114.72 | 37.56 | 219.61 |
| | | 6' | 54 | 10'-3" | | 7½" | | 7'-8" | 0.910 | 118.04 | 39.23 | 220.97 |
| | | 7' | 63 | 10'-3" | | 7½" | | 8'-8" | 0.957 | 120.71 | 40.90 | 220.97 |
| | | 8' | 72 | 10'-4" | | 8" | | 9'-8" | 1.033 | 126.54 | 42.57 | 222.33 |
| | | 9' | 81 | 10'-6" | | 9" | | 10'-8" | 1.198 | 135.80 | 44.24 | 225.06 |
| | | 10' | 90 | 10'-8" | | 10" | | 11'-8" | 1.276 | 142.68 | 45.91 | 227.78 |
| | | 11' | 99 | 10'-10" | | 11" | | 12'-8" | 1.916 | 150.90 | 47.58 | 230.51 |
| | 1 @ 10' | 5' | 50 | 11'-2" | 10½" | 7" | 11" | 6'-9½" | 0.957 | 130.64 | 40.13 | 292.69 |
| | | 6' | 60 | 11'-3" | | 7½" | | 7'-9½" | 1.024 | 133.99 | 41.80 | 294.00 |
| | | 7' | 70 | 11'-3" | | 7½" | | 8'-9½" | 1.071 | 136.66 | 43.47 | 294.00 |
| | | 8' | 80 | 11'-4" | | 8" | | 9'-9½" | 1.147 | 142.55 | 45.14 | 295.36 |
| | | 9' | 90 | 11'-6" | | 9" | | 10'-9½" | 1.263 | 151.92 | 96.81 | 248.09 |
| | | 10' | 100 | 11'-8" | | 10" | | 11'-9½" | 1.391 | 158.89 | 48.98 | 250.81 |
| | | 11' | 110 | 11'-10" | | 11" | | 12'-9½" | 1.532 | 164.71 | 50.15 | 253.54 |
| | | 12' | 120 | 12'-0" | | 12" | | 13'-9½" | 1.685 | 178.67 | 51.82 | 256.26 |
| | 1 @ 11' | 6' | 66 | 12'-9" | 11" | 8" | 11½" | 7'-10⅝" | 1.153 | 155.16 | 96.12 | 268.62 |
| | | 7' | 77 | 12'-9" | | 8" | | 8'-10⅝" | 1.202 | 157.83 | 47.79 | 268.62 |
| | | 8' | 88 | 12'-9" | | 8" | | 9'-10⅝" | 1.252 | 163.06 | 49.96 | 268.62 |
| | | 9' | 99 | 12'-9" | | 9" | | 10'-10⅝" | 1.368 | 172.60 | 51.13 | 271.34 |
| | | 10' | 110 | 12'-9" | | 10" | | 11'-10⅝" | 1.497 | 179.70 | 52.80 | 274.07 |
| | | 11' | 121 | 12'-10" | | 11" | | 12'-10⅝" | 1.688 | 187.67 | 54.97 | 276.79 |
| | | 12' | 132 | 13'-0" | | 12" | | 13'-10⅝" | 1.792 | 199.79 | 56.14 | 279.52 |
| | 1 @ 12' | 6' | 72 | 13'-9" | 12" | 8" | 12" | 8'-0" | 1.284 | 172.20 | 98.69 | 357.62 |
| | | 7' | 84 | 13'-9" | | 8" | | 9'-0" | 1.333 | 174.87 | 50.36 | 357.62 |
| | | 8' | 96 | 13'-9" | | 8" | | 10'-0" | 1.383 | 180.15 | 52.03 | 357.62 |
| | | 9' | 108 | 13'-9" | | 9" | | 11'-0" | 1.500 | 183.85 | 58.70 | 361.18 |
| | | 10' | 120 | 13'-9" | | 10" | | 12'-0" | 1.630 | 197.07 | 55.37 | 364.74 |
| | | 11' | 132 | 13'-10" | | 11" | | 13'-0" | 1.772 | 205.16 | 57.04 | 368.30 |
| | | 12' | 144 | 14'-0" | | 12" | | 14'-0" | 1.926 | 217.45 | 58.71 | 371.86 |

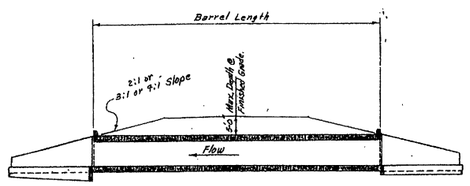
W-X002-1, W-X003-2, or W-X004-2.
W-X002-1 or W-X003-1 or W-X004-1




PART LONGITUDINAL SECTION




TYPICAL SECTION M-M




LONGITUDINAL SECTION

NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X003-2 and W-X004-2.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 35'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

## DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961

AND

SPECIAL MILITARY LOADING

Two 24,000 Lb. Axles @ 9'-0" ctrs.

## UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/in²

Reinforcing Steel 20,000 #/in²

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

CLASS S CONCRETE

# ARKANSAS STATE HIGHWAY COMMISSION

## DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

4,5,6,7,8,9,10,11&12' SPANS — 3:1 OR 4:1 SLOPES

SINGLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-100X-0

Designed By:- W.C.H. 1-23-63. Checked By:- [illegible] 5-8-63.
Drawn By:- W.C.H. 2-8-63. Checked By:- [illegible] 5-24-63.
Quantities By:- W.C.H. 2-12-63. Checked By:- [illegible] 5-24-63.

| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |

## BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

"a" bars: STRAIGHT — In Top and Bottom Slab of Barrel. 2 Add'l. in Apron and Headwall - Each.
"b" bars: BENT - See Diagram below. — In Bottom of Top Slab bent up over Division Wall - hooked. Alternate with "a" and "c" bars.

| DEPTH OF COVER D | CLEAR SPAN S | CLEAR HEIGHT H | "a" SIZE | "a" SPACING | "a" NUMBER REQ'D 3:1 | "a" NUMBER REQ'D 4:1 | "a" LENGTH | "b" SIZE | "b" SPACING | "b" NUMBER REQ'D 3:1 | "b" NUMBER REQ'D 4:1 | "b" LENGTH | "b" X | "b" Y | "b" Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0'-0" TO 5'-0" MAXIMUM | 2 @ 4' | 2' | #5 | 12" | 128 | 128 | 9'-5" | #5 | 12" | 59 | 59 | 10'-6" | 0'-3" | 2'-2½" | 3'-4" |
| | | 3' | | | 128 | 128 | 9'-5" | | | 59 | 59 | 10'-6" | 0'-3" | 2'-2½" | 3'-4" |
| | | 4' | | | 128 | 128 | 9'-5" | | | 59 | 59 | 10'-6" | 0'-3" | 2'-2½" | 3'-4" |
| | | 5' | | | 128 | 128 | 9'-5" | | | 59 | 59 | 10'-6" | 0'-3" | 2'-2½" | 3'-4" |
| | | 6' | | | 128 | 128 | 9'-8" | | | 59 | 59 | 10'-9" | 0'-3" | 2'-3½" | 3'-5" |
| | 2 @ 5' | 3' | #6 | 12" | 128 | 128 | 11'-5" | #5 | 12" | 59 | 59 | 12'-7" | 0'-3⅛" | 2'-7⅛" | 4'-1" |
| | | 4' | | | 128 | 128 | 11'-5" | | | 59 | 59 | 12'-7" | 0'-3⅛" | 2'-7⅛" | 4'-1" |
| | | 5' | | | 128 | 128 | 11'-5" | | | 59 | 59 | 12'-7" | 0'-3⅛" | 2'-7⅛" | 4'-1" |
| | | 6' | | | 128 | 128 | 11'-8" | | | 59 | 59 | 12'-10" | 0'-3⅛" | 2'-8⅛" | 4'-2" |
| | | 7' | | | 128 | 128 | 11'-10" | | | 59 | 59 | 13'-0" | 0'-3⅛" | 2'-9⅛" | 4'-2½" |
| | 2 @ 6' | 3' | #6 | 11" | 140 | 140 | 13'-5" | #5 | 11" | 65 | 65 | 14'-7" | 0'-4" | 3'-0⅛" | 4'-10" |
| | | 4' | | | 140 | 140 | 13'-5" | | | 65 | 65 | 14'-7" | 0'-4" | 3'-0⅛" | 4'-10" |
| | | 5' | | | 140 | 140 | 13'-5" | | | 65 | 65 | 14'-7" | 0'-4" | 3'-0⅛" | 4'-10" |
| | | 6' | | | 140 | 140 | 13'-8" | | | 65 | 65 | 14'-10" | 0'-4" | 3'-1⅛" | 4'-11" |
| | | 7' | | | 140 | 140 | 13'-10" | | | 65 | 65 | 15'-0" | 0'-4" | 3'-2⅛" | 4'-11½" |
| | | 8' | | | 140 | 140 | 13'-11" | | | 65 | 65 | 15'-1" | 0'-4" | 3'-2⅛" | 5'-0" |
| | 2 @ 7' | 4' | #6 | 12" | 128 | 128 | 15'-5" | #6 | 12" | 59 | 59 | 16'-9" | 0'-4½" | 3'-5" | 5'-7" |
| | | 5' | | | 128 | 128 | 15'-5" | | | 59 | 59 | 16'-9" | 0'-4½" | 3'-5" | 5'-7" |
| | | 6' | | | 128 | 128 | 15'-8" | | | 59 | 59 | 17'-0" | 0'-4½" | 3'-6" | 5'-8" |
| | | 7' | | | 128 | 128 | 15'-10" | | | 59 | 59 | 17'-2" | 0'-4½" | 3'-7" | 5'-8½" |
| | | 8' | | | 128 | 128 | 15'-11" | | | 59 | 59 | 17'-3" | 0'-4½" | 3'-7" | 5'-9" |
| | | 9' | | | 128 | 128 | 16'-2" | | | 59 | 59 | 17'-6" | 0'-4½" | 3'-8" | 5'-10" |
| | 2 @ 8' | 4' | #6 | 11" | 140 | 140 | 17'-5" | #6 | 11" | 65 | 65 | 18'-10" | 0'-5" | 3'-10" | 6'-4" |
| | | 5' | | | 140 | 140 | 17'-8" | | | 65 | 65 | 19'-1" | 0'-5" | 3'-11" | 6'-5" |
| | | 6' | | | 140 | 140 | 17'-8" | | | 65 | 65 | 19'-1" | 0'-5" | 3'-11" | 6'-5" |
| | | 7' | | | 140 | 140 | 17'-10" | | | 65 | 65 | 19'-3" | 0'-5" | 4'-0" | 6'-5½" |
| | | 8' | | | 140 | 140 | 17'-11" | | | 65 | 65 | 19'-4" | 0'-5" | 4'-0" | 6'-6" |
| | | 9' | | | 140 | 140 | 18'-2" | | | 65 | 65 | 19'-7" | 0'-5" | 4'-1" | 6'-7" |
| | | 10' | | | 140 | 140 | 18'-5" | | | 65 | 65 | 19'-10" | 0'-5" | 4'-2" | 6'-8" |
| | 2 @ 9' | 5' | #6 | 11" | 140 | 140 | 19'-8" | #6 | 11" | 65 | 65 | 21'-1" | 0'-5½" | 4'-4" | 7'-2" |
| | | 6' | | | 140 | 140 | 19'-10" | | | 65 | 65 | 21'-3" | 0'-5½" | 4'-5" | 7'-2½" |
| | | 7' | | | 140 | 140 | 19'-10" | | | 65 | 65 | 21'-3" | 0'-5½" | 4'-5" | 7'-2½" |
| | | 8' | | | 140 | 140 | 19'-11" | | | 65 | 65 | 21'-4" | 0'-5½" | 4'-5" | 7'-3" |
| | | 9' | | | 140 | 140 | 20'-2" | | | 65 | 65 | 21'-7" | 0'-5½" | 4'-6" | 7'-4" |
| | | 10' | | | 140 | 140 | 20'-5" | | | 65 | 65 | 21'-10" | 0'-5½" | 4'-7" | 7'-5" |
| | | 11' | | | 140 | 140 | 20'-7" | | | 65 | 65 | 22'-0" | 0'-5½" | 4'-7" | 7'-6" |
| | 2 @ 10' | 5' | #7 | 12" | 128 | 128 | 21'-8" | #6 | 12" | 59 | 59 | 23'-2" | 0'-6" | 4'-9" | 7'-11" |
| | | 6' | | | 128 | 128 | 21'-10" | | | 59 | 59 | 23'-4" | 0'-6" | 4'-10" | 7'-11½" |
| | | 7' | | | 128 | 128 | 21'-10" | | | 59 | 59 | 23'-4" | 0'-6" | 4'-10" | 7'-11½" |
| | | 8' | | | 128 | 128 | 21'-11" | | | 59 | 59 | 23'-5" | 0'-6" | 4'-10" | 8'-0" |
| | | 9' | | | 128 | 128 | 22'-2" | | | 59 | 59 | 23'-8" | 0'-6" | 4'-11" | 8'-1" |
| | | 10' | | | 128 | 128 | 22'-5" | | | 59 | 59 | 23'-11" | 0'-6" | 5'-0" | 8'-2" |
| | | 11' | | | 128 | 128 | 22'-7" | | | 59 | 59 | 24'-1" | 0'-6" | 5'-0" | 8'-3" |
| | | 12' | | | 128 | 128 | 22'-9" | | | 59 | 59 | 24'-3" | 0'-6" | 5'-0" | 8'-4" |
| | 2 @ 11' | 6' | #7 | 12" | 128 | 128 | 23'-11" | #6 | 12" | 59 | 59 | 25'-5" | 0'-6½" | 5'-3" | 8'-9" |
| | | 7' | | | 128 | 128 | 23'-11" | | | 59 | 59 | 25'-5" | 0'-6½" | 5'-3" | 8'-9" |
| | | 8' | | | 128 | 128 | 23'-11" | | | 59 | 59 | 25'-5" | 0'-6½" | 5'-3" | 8'-9" |
| | | 9' | | | 128 | 128 | 24'-2" | | | 59 | 59 | 25'-8" | 0'-6½" | 5'-4" | 8'-10" |
| | | 10' | | | 128 | 128 | 24'-5" | | | 59 | 59 | 25'-11" | 0'-6½" | 5'-5" | 8'-11" |
| | | 11' | | | 128 | 128 | 24'-7" | | | 59 | 59 | 26'-1" | 0'-6½" | 5'-5" | 9'-0" |
| | | 12' | | | 128 | 128 | 24'-9" | | | 59 | 59 | 26'-3" | 0'-6½" | 5'-5" | 9'-1" |
| | 2 @ 12' | 6' | #7 | 11" | 140 | 140 | 25'-11" | #6 | 11" | 65 | 65 | 27'-5" | 0'-7" | 5'-8" | 9'-6" |
| | | 7' | | | 140 | 140 | 25'-11" | | | 65 | 65 | 27'-5" | 0'-7" | 5'-8" | 9'-6" |
| | | 8' | | | 140 | 140 | 25'-11" | | | 65 | 65 | 27'-5" | 0'-7" | 5'-8" | 9'-6" |
| | | 9' | | | 140 | 140 | 26'-2" | | | 65 | 65 | 27'-8" | 0'-7" | 5'-9" | 9'-7" |
| | | 10' | | | 140 | 140 | 26'-5" | | | 65 | 65 | 27'-11" | 0'-7" | 5'-10" | 9'-8" |
| | | 11' | | | 140 | 140 | 26'-7" | | | 65 | 65 | 28'-1" | 0'-7" | 5'-10" | 9'-9" |
| | | 12 | | | 140 | 140 | 26'-9" | | | 65 | 65 | 28'-3" | 0'-7" | 5'-10" | 9'-10" |

"$b_2$" bars: BENT - See Diagram below. — In Top of Bottom Slab bent down under Division Wall - hooked. Alternate with "a" and "c" bars.
"c" bars: STRAIGHT — In Top and Bottom Slab of Barrel. Alternate with "b" and "$b_2$" bars.

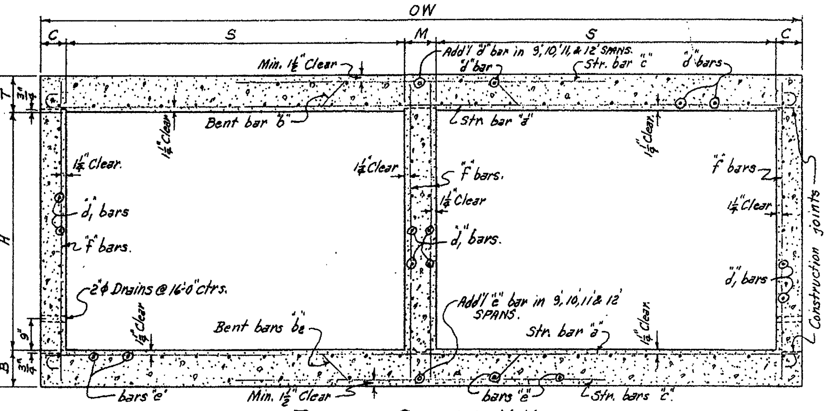
| S | H | "$b_2$" SIZE | "$b_2$" SPACING | "$b_2$" NUMBER REQ'D 3:1 | "$b_2$" NUMBER REQ'D 4:1 | "$b_2$" LENGTH | "$b_2$" X | "$b_2$" Y | "$b_2$" Z | "c" SIZE | "c" SPACING | "c" NUMBER REQ'D 3:1 | "c" NUMBER REQ'D 4:1 | "c" LENGTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 @ 4' | 2' | #5 | 12" | 59 | 59 | 10'-6" | 0'-2½" | 2'-3½" | 3'-4" | #5 | 12" | 120 | 120 | 4'-8" |
| | 3' | | | 59 | 59 | 10'-6" | 0'-2½" | 2'-3½" | 3'-4" | | | 120 | 120 | 4'-8" |
| | 4' | | | 59 | 59 | 10'-6" | 0'-2½" | 2'-3½" | 3'-4" | | | 120 | 120 | 4'-8" |
| | 5' | | | 59 | 59 | 10'-6" | 0'-2½" | 2'-3½" | 3'-4" | | | 120 | 120 | 4'-8" |
| | 6' | | | 59 | 59 | 10'-9" | 0'-2½" | 2'-4½" | 3'-5" | | | 120 | 120 | 4'-9" |
| 2 @ 5' | 3' | #5 | 12" | 59 | 59 | 12'-6" | 0'-3" | 2'-8½" | 4'-1" | #6 | 12" | 120 | 120 | 5'-8" |
| | 4' | | | 59 | 59 | 12'-6" | 0'-3" | 2'-8½" | 4'-1" | | | 120 | 120 | 5'-8" |
| | 5' | | | 59 | 59 | 12'-6" | 0'-3" | 2'-8½" | 4'-1" | | | 120 | 120 | 5'-8" |
| | 6' | | | 59 | 59 | 12'-9" | 0'-3" | 2'-9½" | 4'-2" | | | 120 | 120 | 5'-9" |
| | 7' | | | 59 | 59 | 12'-11" | 0'-3" | 2'-10½" | 4'-2½" | | | 120 | 120 | 5'-10" |
| 2 @ 6' | 3' | #5 | 11" | 65 | 65 | 14'-7" | 0'-4" | 3'-0⅛" | 4'-10" | #6 | 11" | 132 | 132 | 6'-8" |
| | 4' | | | 65 | 65 | 14'-7" | 0'-4" | 3'-0⅛" | 4'-10" | | | 132 | 132 | 6'-8" |
| | 5' | | | 65 | 65 | 14'-7" | 0'-4" | 3'-0⅛" | 4'-10" | | | 132 | 132 | 6'-8" |
| | 6' | | | 65 | 65 | 14'-10" | 0'-4" | 3'-1⅛" | 4'-11" | | | 132 | 132 | 6'-9" |
| | 7' | | | 65 | 65 | 15'-0" | 0'-4" | 3'-2⅛" | 4'-11½" | | | 132 | 132 | 6'-10" |
| | 8' | | | 65 | 65 | 15'-1" | 0'-4" | 3'-2⅛" | 5'-0" | | | 132 | 132 | 6'-10" |
| 2 @ 7' | 4' | #6 | 12" | 59 | 59 | 16'-9" | 0'-4½" | 3'-5" | 5'-7" | #6 | 12" | 120 | 120 | 7'-8" |
| | 5' | | | 59 | 59 | 16'-9" | 0'-4½" | 3'-5" | 5'-7" | | | 120 | 120 | 7'-8" |
| | 6' | | | 59 | 59 | 17'-0" | 0'-4½" | 3'-6" | 5'-8" | | | 120 | 120 | 7'-9" |
| | 7' | | | 59 | 59 | 17'-2" | 0'-4½" | 3'-7" | 5'-8½" | | | 120 | 120 | 7'-10" |
| | 8' | | | 59 | 59 | 17'-3" | 0'-4½" | 3'-7" | 5'-9" | | | 120 | 120 | 7'-10" |
| | 9' | | | 59 | 59 | 17'-6" | 0'-4½" | 3'-8" | 5'-10" | | | 120 | 120 | 7'-11" |
| 2 @ 8' | 4' | #6 | 11" | 65 | 65 | 18'-10" | 0'-5" | 3'-10" | 6'-4" | #6 | 11" | 132 | 132 | 8'-8" |
| | 5' | | | 65 | 65 | 19'-1" | 0'-5" | 3'-11" | 6'-5" | | | 132 | 132 | 8'-9" |
| | 6' | | | 65 | 65 | 19'-1" | 0'-5" | 3'-11" | 6'-5" | | | 132 | 132 | 8'-9" |
| | 7' | | | 65 | 65 | 19'-3" | 0'-5" | 4'-0" | 6'-5½" | | | 132 | 132 | 8'-10" |
| | 8' | | | 65 | 65 | 19'-4" | 0'-5" | 4'-0" | 6'-6" | | | 132 | 132 | 8'-10" |
| | 9' | | | 65 | 65 | 19'-7" | 0'-5" | 4'-1" | 6'-7" | | | 132 | 132 | 8'-11" |
| | 10' | | | 65 | 65 | 19'-10" | 0'-5" | 4'-2" | 6'-8" | | | 132 | 132 | 9'-0" |
| 2 @ 9' | 5' | #6 | 11" | 65 | 65 | 21'-1" | 0'-5¾" | 4'-3½" | 7'-2" | #6 | 11" | 132 | 132 | 9'-9" |
| | 6' | | | 65 | 65 | 21'-3" | 0'-5¾" | 4'-4½" | 7'-2½" | | | 132 | 132 | 9'-10" |
| | 7' | | | 65 | 65 | 21'-3" | 0'-5¾" | 4'-4½" | 7'-2½" | | | 132 | 132 | 9'-10" |
| | 8' | | | 65 | 65 | 21'-4" | 0'-5¾" | 4'-4½" | 7'-3" | | | 132 | 132 | 9'-10" |
| | 9' | | | 65 | 65 | 21'-7" | 0'-5¾" | 4'-5½" | 7'-4" | | | 132 | 132 | 9'-11" |
| | 10' | | | 65 | 65 | 21'-10" | 0'-5¾" | 4'-6½" | 7'-5" | | | 132 | 132 | 10'-0" |
| | 11' | | | 65 | 65 | 22'-0" | 0'-5¾" | 4'-6½" | 7'-6" | | | 132 | 132 | 10'-0" |
| 2 @ 10' | 5' | #6 | 12" | 59 | 59 | 23'-2" | 0'-6½" | 4'-8" | 7'-11" | #7 | 12" | 120 | 120 | 10'-9" |
| | 6' | | | 59 | 59 | 23'-4" | 0'-6½" | 4'-9" | 7'-11½" | | | 120 | 120 | 10'-10" |
| | 7' | | | 59 | 59 | 23'-4" | 0'-6½" | 4'-9" | 7'-11½" | | | 120 | 120 | 10'-10" |
| | 8' | | | 59 | 59 | 23'-5" | 0'-6½" | 4'-9" | 8'-0" | | | 120 | 120 | 10'-10" |
| | 9' | | | 59 | 59 | 23'-8" | 0'-6½" | 4'-10" | 8'-1" | | | 120 | 120 | 10'-11" |
| | 10' | | | 59 | 59 | 23'-11" | 0'-6½" | 4'-11" | 8'-2" | | | 120 | 120 | 11'-0" |
| | 11' | | | 59 | 59 | 24'-1" | 0'-6½" | 4'-11" | 8'-3" | | | 120 | 120 | 11'-0" |
| | 12' | | | 59 | 59 | 24'-3" | 0'-6½" | 4'-11" | 8'-4" | | | 120 | 120 | 11'-0" |
| 2 @ 11' | 6' | #6 | 12" | 59 | 59 | 25'-6" | 0'-7½" | 5'-1" | 8'-9" | #7 | 12" | 120 | 120 | 11'-10" |
| | 7' | | | 59 | 59 | 25'-6" | 0'-7½" | 5'-1" | 8'-9" | | | 120 | 120 | 11'-10" |
| | 8' | | | 59 | 59 | 25'-6" | 0'-7½" | 5'-1" | 8'-9" | | | 120 | 120 | 11'-10" |
| | 9' | | | 59 | 59 | 25'-9" | 0'-7½" | 5'-2" | 8'-10" | | | 120 | 120 | 11'-11" |
| | 10' | | | 59 | 59 | 26'-0" | 0'-7½" | 5'-3" | 8'-11" | | | 120 | 120 | 12'-0" |
| | 11' | | | 59 | 59 | 26'-2" | 0'-7½" | 5'-3" | 9'-0" | | | 120 | 120 | 12'-0" |
| | 12' | | | 59 | 59 | 26'-4" | 0'-7½" | 5'-3" | 9'-1" | | | 120 | 120 | 12'-0" |
| 2 @ 12' | 6' | #6 | 11" | 65 | 65 | 27'-7" | 0'-8½" | 5'-5" | 9'-6" | #7 | 11" | 132 | 132 | 12'-10" |
| | 7' | | | 65 | 65 | 27'-7" | 0'-8½" | 5'-5" | 9'-6" | | | 132 | 132 | 12'-10" |
| | 8' | | | 65 | 65 | 27'-7" | 0'-8½" | 5'-5" | 9'-6" | | | 132 | 132 | 12'-10" |
| | 9' | | | 65 | 65 | 27'-10" | 0'-8½" | 5'-6" | 9'-7" | | | 132 | 132 | 12'-11" |
| | 10' | | | 65 | 65 | 28'-1" | 0'-8½" | 5'-7" | 9'-8" | | | 132 | 132 | 13'-0" |
| | 11' | | | 65 | 65 | 28'-3" | 0'-8½" | 5'-7" | 9'-9" | | | 132 | 132 | 13'-0" |
| | 12' | | | 65 | 65 | 28'-5" | 0'-8½" | 5'-7" | 9'-10" | | | 132 | 132 | 13'-0" |

"d" bars: STRAIGHT — Longitudinal in Top Slab of Barrel. Length: 2 @ 30'-0" for 60'-0" Length Barrel (1'-8" Lap)
"$d_1$" bars: STRAIGHT — Longitudinal in Sidewalls and Division Walls. Length: 2 @ 30'-6" for 60'-0" Length Barrel (1'-3" Lap)
"e" bars: STRAIGHT — Longitudinal in Bottom Slab of Barrel. Length: 2 @ 31'-6" for 60'-0" Length Barrel (1'-3" Lap)
"f" bars: STRAIGHT — Vertical in Sidewalls and Division Walls.

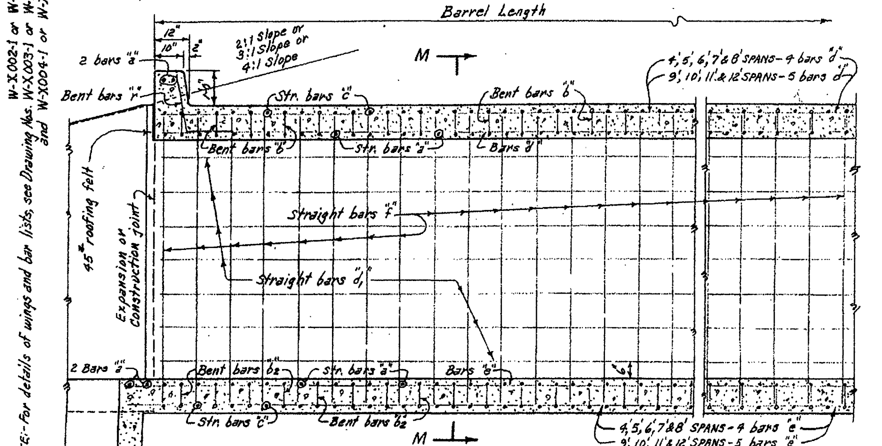
| S | H | "d" SIZE | "d" SPACING | "d" NO. REQ'D | "$d_1$" SIZE | "$d_1$" SPACING | "$d_1$" NO. REQ'D | "e" SIZE | "e" SPACING | "e" NO. REQ'D | "f" SIZE | "f" SPACING | "f" NUMBER REQ'D 3:1 | "f" NUMBER REQ'D 4:1 | "f" LENGTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 @ 4' | 2' | #5 | 12" | 14 | #4 | 12" | 8 | #4 | 12" | 14 | #4 | 12" | 240 | 240 | 2'-10" |
| | 3' | | | 14 | | | 12 | | | 14 | | | 240 | 240 | 3'-10" |
| | 4' | | | 14 | | | 16 | | | 14 | | | 240 | 240 | 4'-10" |
| | 5' | | | 14 | | | 20 | | | 14 | | | 240 | 240 | 5'-10" |
| | 6' | | | 14 | | | 24 | | | 14 | | | 240 | 240 | 6'-10" |
| 2 @ 5' | 3' | #5 | 11½" | 16 | #4 | 12" | 12 | #4 | 12" | 16 | #4 | 12" | 240 | 240 | 3'-11" |
| | 4' | | | 16 | | | 16 | | | 16 | | | 240 | 240 | 4'-11" |
| | 5' | | | 16 | | | 20 | | | 16 | | | 240 | 240 | 5'-11" |
| | 6' | | | 16 | | | 24 | | | 16 | | | 240 | 240 | 6'-11" |
| | 7' | | | 16 | | | 28 | | | 16 | | | 240 | 240 | 7'-11" |
| 2 @ 6' | 3' | #5 | 11½" | 18 | #4 | 12" | 12 | #4 | 12" | 18 | #4 | 12" | 240 | 240 | 4'-0" |
| | 4' | | | 18 | | | 16 | | | 18 | | | 240 | 240 | 5'-0" |
| | 5' | | | 18 | | | 20 | | | 18 | | | 240 | 240 | 6'-0" |
| | 6' | | | 18 | | | 24 | | | 18 | | | 240 | 240 | 7'-0" |
| | 7' | | | 18 | | | 28 | | | 18 | | | 240 | 240 | 8'-0" |
| | 8' | | | 18 | | | 32 | | | 18 | | 10" | 288 | 288 | 9'-0" |
| 2 @ 7' | 4' | #5 | 11½" | 20 | #4 | 12" | 16 | #4 | 12" | 20 | #4 | 12" | 240 | 240 | 5'-1" |
| | 5' | | | 20 | | | 20 | | | 20 | | | 240 | 240 | 6'-1" |
| | 6' | | | 20 | | | 24 | | | 20 | | | 240 | 240 | 7'-1" |
| | 7' | | | 20 | | | 28 | | | 20 | | | 240 | 240 | 8'-1" |
| | 8' | | | 20 | | | 32 | | | 20 | | 10" | 288 | 288 | 9'-1" |
| | 9' | | | 20 | | | 36 | | | 20 | #5 | 12" | 240 | 240 | 10'-1" |
| 2 @ 8' | 4' | #5 | 11½" | 23 | #4 | 12" | 16 | #4 | 12" | 22 | #4 | 12" | 240 | 240 | 5'-2" |
| | 5' | | | 23 | | | 20 | | | 22 | | | 240 | 240 | 6'-2" |
| | 6' | | | 23 | | | 24 | | | 22 | | | 240 | 240 | 7'-2" |
| | 7' | | | 23 | | | 28 | | | 22 | | | 240 | 240 | 8'-2" |
| | 8' | | | 23 | | | 32 | | | 22 | | 10" | 288 | 288 | 9'-2" |
| | 9' | | | 23 | | | 36 | | | 22 | #5 | 12" | 240 | 240 | 10'-2" |
| | 10' | | | 23 | | | 40 | | | 22 | | 11" | 264 | 264 | 11'-2" |
| 2 @ 9' | 5' | #5 | 11½" | 26 | #4 | 12" | 20 | #4 | 12" | 25 | #4 | 12" | 240 | 240 | 6'-3" |
| | 6' | | | 26 | | | 24 | | | 25 | | | 240 | 240 | 7'-3" |
| | 7' | | | 26 | | | 28 | | | 25 | | | 240 | 240 | 8'-3" |
| | 8' | | | 26 | | | 32 | | | 25 | | 10" | 288 | 288 | 9'-3" |
| | 9' | | | 26 | | | 36 | | | 25 | #5 | 12" | 240 | 240 | 10'-3" |
| | 10' | | | 26 | | | 40 | | | 25 | | 11" | 264 | 264 | 11'-3" |
| | 11' | | | 26 | | | 44 | | | 25 | | 10" | 288 | 288 | 12'-3" |
| 2 @ 10' | 5' | #5 | 11½" | 28 | #4 | 12" | 20 | #4 | 12" | 27 | #4 | 12" | 240 | 240 | 6'-4" |
| | 6' | | | 28 | | | 24 | | | 27 | | | 240 | 240 | 7'-4" |
| | 7' | | | 28 | | | 28 | | | 27 | | | 240 | 240 | 8'-4" |
| | 8' | | | 28 | | | 32 | | | 27 | | 10" | 288 | 288 | 9'-4" |
| | 9' | | | 28 | | | 36 | | | 27 | #5 | 12" | 240 | 240 | 10'-4" |
| | 10' | | | 28 | | | 40 | | | 27 | | 11" | 264 | 264 | 11'-4" |
| | 11' | | | 28 | | | 44 | | | 27 | | 10" | 288 | 288 | 12'-4" |
| | 12' | | | 28 | | | 48 | | | 27 | #6 | 12" | 240 | 240 | 13'-4" |
| 2 @ 11' | 6' | #5 | 11½" | 30 | #4 | 12" | 24 | #4 | 12" | 29 | #4 | 12" | 240 | 240 | 7'-6" |
| | 7' | | | 30 | | | 28 | | | 29 | | | 240 | 240 | 8'-6" |
| | 8' | | | 30 | | | 32 | | | 29 | | 10" | 288 | 288 | 9'-6" |
| | 9' | | | 30 | | | 36 | | | 29 | #5 | 12" | 240 | 240 | 10'-6" |
| | 10' | | | 30 | | | 40 | | | 29 | | 11" | 264 | 264 | 11'-6" |
| | 11' | | | 30 | | | 44 | | | 29 | | 10" | 288 | 288 | 12'-6" |
| | 12' | | | 30 | | | 48 | | | 29 | #6 | 12" | 240 | 240 | 13'-6" |
| 2 @ 12' | 6' | #5 | 11½" | 32 | #4 | 12" | 24 | #4 | 12" | 31 | #4 | 12" | 240 | 240 | 7'-7" |
| | 7' | | | 32 | | | 28 | | | 31 | | | 240 | 240 | 8'-7" |
| | 8' | | | 32 | | | 32 | | | 31 | | 10" | 288 | 288 | 9'-7" |
| | 9' | | | 32 | | | 36 | | | 31 | #5 | 12" | 240 | 240 | 10'-7" |
| | 10' | | | 32 | | | 40 | | | 31 | | 11" | 264 | 264 | 11'-7" |
| | 11' | | | 32 | | | 44 | | | 31 | | 10" | 288 | 288 | 12'-7" |
| | 12' | | | 32 | | | 48 | | | 31 | #6 | 12" | 240 | 240 | 13'-7" |

## DIMENSIONS / QUANTITIES

| MAX. DESIGN DEPTH OF COVER D | CLEAR SPANS S | CLEAR HEIGHT H | SQ. FT. OPENING A | OVERALL WIDTH OW | THICKNESS OF TOP SLAB T | THICKNESS OF SIDEWALLS C | THICKNESS OF DIVISION WALL M | THICKNESS OF BOTTOM SLAB B | OVERALL HEIGHT OH | CLASS S CONC. PER LIN. FT. OF BARREL CU.YD. | REINF. STEEL PER LIN. FT. OF BARREL LB. | ADDITIONAL PER LAP LB. | ADDITIONAL TWO HEADWALLS & APRONS LB. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5'-0" | 2 @ 4' | 2' | 16 | 9'-8" | 6½" | 6" | 8" | 6" | 3'-0½" | 0.496 | 88.15 | 42.71 | 129.56 |
| | | 3' | 24 | 9'-8" | | 6" | 8" | | 4'-0½" | 0.558 | 93.49 | 46.05 | 129.56 |
| | | 4' | 32 | 9'-8" | | 6" | 8" | | 5'-0½" | 0.620 | 98.84 | 49.39 | 129.56 |
| | | 5' | 40 | 9'-8" | | 6" | 8" | | 6'-0½" | 0.682 | 104.18 | 52.73 | 129.56 |
| | | 6' | 48 | 9'-11" | | 7" | 9" | | 7'-0½" | 0.809 | 110.74 | 56.07 | 131.65 |
| | 2 @ 5' | 3' | 30 | 11'-8" | 7" | 6" | 8" | 6½" | 4'-1½" | 0.671 | 123.34 | 51.19 | 198.64 |
| | | 4' | 40 | 11'-8" | | 6" | 8" | | 5'-1½" | 0.733 | 128.68 | 54.53 | 198.64 |
| | | 5' | 50 | 11'-8" | | 6" | 8" | | 6'-1½" | 0.795 | 134.03 | 57.87 | 198.64 |
| | | 6' | 60 | 11'-11" | | 7" | 9" | | 7'-1½" | 0.922 | 140.89 | 61.21 | 201.64 |
| | | 7' | 70 | 12'-1" | | 7½" | 10" | | 8'-1½" | 1.044 | 147.34 | 64.55 | 203.65 |
| | 2 @ 6' | 3' | 36 | 13'-8" | 7½" | 6" | 8" | 7½" | 4'-3" | 0.818 | 148.50 | 56.34 | 233.58 |
| | | 4' | 48 | 13'-8" | | 6" | 8" | | 5'-3" | 0.880 | 153.85 | 59.68 | 233.58 |
| | | 5' | 60 | 13'-8" | | 6" | 8" | | 6'-3" | 0.941 | 159.19 | 63.02 | 233.58 |
| | | 6' | 72 | 13'-11" | | 7" | 9" | | 7'-3" | 1.070 | 166.20 | 66.36 | 236.59 |
| | | 7' | 84 | 14'-1" | | 7½" | 10" | | 8'-3" | 1.192 | 172.74 | 69.70 | 238.59 |
| | | 8' | 96 | 14'-2" | | 8" | 10" | | 9'-3" | 1.298 | 183.36 | 73.04 | 239.59 |
| | 2 @ 7' | 4' | 56 | 15'-8" | 8" | 6" | 8" | 8" | 5'-4" | 1.021 | 178.15 | 64.83 | 268.97 |
| | | 5' | 70 | 15'-8" | | 6" | 8" | | 6'-4" | 1.082 | 183.49 | 68.17 | 268.97 |
| | | 6' | 84 | 15'-11" | | 7" | 9" | | 7'-4" | 1.212 | 190.59 | 71.51 | 271.97 |
| | | 7' | 98 | 16'-1" | | 7½" | 10" | | 8'-4" | 1.339 | 197.19 | 74.85 | 273.98 |
| | | 8' | 112 | 16'-2" | | 8" | 10" | | 9'-4" | 1.440 | 207.89 | 78.19 | 274.98 |
| | | 9' | 126 | 16'-5" | | 9" | 11" | | 10'-4" | 1.616 | 225.25 | 81.53 | 277.98 |
| | 2 @ 8' | 4' | 64 | 17'-8" | 8½" | 6" | 8" | 8½" | 5'-5" | 1.174 | 210.37 | 71.71 | 304.80 |
| | | 5' | 80 | 17'-11" | | 7" | 9" | | 6'-5" | 1.295 | 217.63 | 75.05 | 307.81 |
| | | 6' | 96 | 17'-11" | | 7" | 9" | | 7'-5" | 1.366 | 222.97 | 78.39 | 307.81 |
| | | 7' | 112 | 18'-1" | | 7½" | 10" | | 8'-5" | 1.489 | 229.68 | 81.73 | 309.81 |
| | | 8' | 128 | 18'-2" | | 8" | 10" | | 9'-5" | 1.595 | 240.47 | 85.07 | 310.81 |
| | | 9' | 144 | 18'-5" | | 9" | 11" | | 10'-5" | 1.772 | 258.08 | 88.41 | 313.82 |
| | | 10' | 160 | 18'-8" | | 10" | 12" | | 11'-5" | 1.967 | 271.07 | 91.75 | 316.82 |
| | 2 @ 9' | 5' | 90 | 19'-11" | 9" | 7" | 9" | 9¾" | 6'-6¾" | 1.477 | 239.37 | 82.77 | 345.92 |
| | | 6' | 108 | 20'-1" | | 7½" | 10" | | 7'-6¾" | 1.594 | 246.08 | 86.11 | 347.43 |
| | | 7' | 126 | 20'-1" | | 7½" | 10" | | 8'-6¾" | 1.671 | 251.43 | 89.45 | 347.43 |
| | | 8' | 144 | 20'-2" | | 8" | 10" | | 9'-6¾" | 1.778 | 262.26 | 92.79 | 348.43 |
| | | 9' | 162 | 20'-5" | | 9" | 11" | | 10'-6¾" | 1.956 | 279.95 | 96.13 | 351.43 |
| | | 10' | 180 | 20'-8" | | 10" | 12" | | 11'-6¾" | 2.152 | 292.97 | 99.47 | 354.43 |
| | | 11' | 198 | 20'-10" | | 11" | 12" | | 12'-6¾" | 2.328 | 306.86 | 102.81 | 356.44 |
| | 2 @ 10' | 5' | 100 | 21'-11" | 9½" | 7" | 9" | 10" | 6'-7½" | 1.674 | 279.64 | 87.92 | 479.99 |
| | | 6' | 120 | 22'-1" | | 7½" | 10" | | 7'-7½" | 1.792 | 286.50 | 91.26 | 482.71 |
| | | 7' | 140 | 22'-1" | | 7½" | 10" | | 8'-7½" | 1.869 | 291.85 | 94.60 | 482.71 |
| | | 8' | 160 | 22'-2" | | 8" | 10" | | 9'-7½" | 1.976 | 302.77 | 97.94 | 484.08 |
| | | 9' | 180 | 22'-5" | | 9" | 11" | | 10'-7½" | 2.155 | 320.74 | 101.28 | 488.16 |
| | | 10' | 200 | 22'-8" | | 10" | 12" | | 11'-7½" | 2.352 | 333.99 | 104.62 | 492.25 |
| | | 11' | 220 | 22'-10" | | 11" | 12" | | 12'-7½" | 2.529 | 348.01 | 107.96 | 494.98 |
| | | 12' | 240 | 23'-0" | | 12" | 12" | | 13'-7½" | 2.718 | 370.23 | 111.30 | 497.70 |
| | 2 @ 11' | 6' | 132 | 24'-2" | 10" | 8" | 10" | 11" | 7'-9" | 2.048 | 309.36 | 96.41 | 530.03 |
| | | 7' | 154 | 24'-2" | | 8" | 10" | | 8'-9" | 2.128 | 314.70 | 99.75 | 530.03 |
| | | 8' | 176 | 24'-2" | | 8" | 10" | | 9'-9" | 2.208 | 325.12 | 103.09 | 530.03 |
| | | 9' | 198 | 24'-5" | | 9" | 11" | | 10'-9" | 2.388 | 343.25 | 106.43 | 534.12 |
| | | 10' | 220 | 24'-8" | | 10" | 12" | | 11'-9" | 2.586 | 356.57 | 109.77 | 538.21 |
| | | 11' | 242 | 24'-10" | | 11" | 12" | | 12'-9" | 2.764 | 370.67 | 113.11 | 540.93 |
| | | 12' | 264 | 25'-0" | | 12" | 12" | | 13'-9" | 2.954 | 393.05 | 116.45 | 543.66 |
| | 2 @ 12' | 6' | 144 | 26'-2" | 10½" | 8" | 10" | 12" | 7'-10½" | 2.299 | 353.31 | 101.55 | 576.93 |
| | | 7' | 168 | 26'-2" | | 8" | 10" | | 8'-10½" | 2.379 | 358.65 | 104.89 | 576.93 |
| | | 8' | 192 | 26'-2" | | 8" | 10" | | 9'-10½" | 2.459 | 369.12 | 108.23 | 576.93 |
| | | 9' | 216 | 26'-5" | | 9" | 11" | | 10'-10½" | 2.640 | 387.52 | 111.57 | 580.52 |
| | | 10' | 240 | 26'-8" | | 10" | 12" | | 11'-10½" | 2.840 | 401.07 | 114.91 | 584.60 |
| | | 11' | 264 | 26'-10" | | 11" | 12" | | 12'-10½" | 3.018 | 415.31 | 118.25 | 587.33 |
| | | 12' | 288 | 27'-0" | | 12" | 12" | | 13'-10½" | 3.208 | 437.88 | 121.59 | 590.05 |

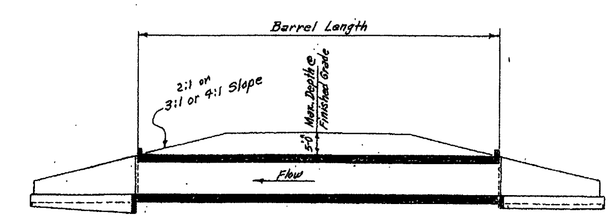



TYPICAL SECTION M-M




PART LONGITUDINAL SECTION

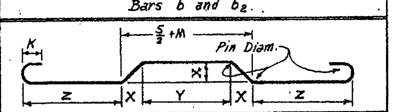
NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X002-2, W-X003-1 or W-X003-2, and W-X004-1 or W-X004-2.




LONGITUDINAL SECTION

| BAR SIZE | PIN DIAM. | K | ADD FOR 2 HOOKS |
|---|---|---|---|
| #5 | 2½" | 4¼" | 0'-11½" |
| #6 | 3" | 5" | 1'-2" |

BENDING DIAGRAM FOR Bars "b" and "$b_2$".

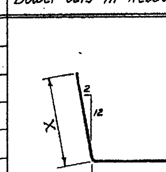



NOTE:- Dimensions are to centers of bars. (Bars "b" and "$b_2$")

### DOWEL BARS FOR TWO HEADWALLS

Bars "r" — Dowel bars in Headwalls.

| 2 SPANS @ | SIZE | SPACING | NO. REQ'D | LENGTH | X |
|---|---|---|---|---|---|
| 4' | #4 | 12"± | 20 | 2'-5" | 1'-2½" |
| 5' | #4 | 12"± | 24 | 2'-6" | 1'-3" |
| 6' | #4 | 12"± | 28 | 2'-7" | 1'-3½" |
| 7' | #4 | 12"± | 32 | 2'-8" | 1'-4" |
| 8' | #4 | 12"± | 36 | 2'-9" | 1'-4½" |
| 9' | #4 | 12"± | 40 | 2'-10" | 1'-5" |
| 10' | #4 | 12"± | 46 | 2'-11" | 1'-5½" |
| 11' | #4 | 12"± | 50 | 3'-0" | 1'-6" |
| 12' | #4 | 12"± | 54 | 3'-1" | 1'-6½" |




Designed by:- W.C.H. 1-17-63. Checked by:- RHS 5-14-63
Drawn by:- W.C.H. 2-15-63. Checked by:- RHS 5-24-63
Quantities by:- W.C.H. 2-19-63. Checked by:- RHS 5-24-63

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, division walls and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

### DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

CLASS S CONCRETE

# ARKANSAS STATE HIGHWAY COMMISSION
## DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 OR 4:1 SLOPES
DOUBLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-200X-0.

| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |

## BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

Depth of Cover D: 0'-0" TO 5'-0" MAXIMUM

"a" bars — STRAIGHT — In Top and Bottom Slab of Barrel. 2 Add'l in Apron and Headwall - Each.
"b" bars — BENT - See Diagram below. In Bottom of Top Slab bent up over Division Walls - hooked. Alternate with "a" and "c" bars.

| S | H | a Size | a Spacing | a No. Req'd 3:1 | a No. Req'd 4:1 | a Length | b Size | b Spacing | b No. Req'd 3:1 | b No. Req'd 4:1 | b Length | b X | b Y | b Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 @ 4' | 2' | #5 | 12" | 128 | 128 | 14'-1" | #5 | 12" | 59 | 59 | 15'-4" | 0'-3" | 2'-2" | 3'-4⅝" |
| | 3' | | | 128 | 128 | 14'-1" | | | 59 | 59 | 15'-4" | 0'-3" | 2'-2" | 3'-4⅝" |
| | 4' | | | 128 | 128 | 14'-1" | | | 59 | 59 | 15'-4" | 0'-3" | 2'-2" | 3'-4⅝" |
| | 5' | | | 128 | 128 | 14'-1" | | | 59 | 59 | 15'-4" | 0'-3" | 2'-2" | 3'-4⅝" |
| | 6' | | | 128 | 128 | 14'-5" | | | 59 | 59 | 15'-6" | 0'-3" | 2'-3" | 3'-5⅝" |
| 3 @ 5' | 3' | #6 | 12" | 128 | 128 | 17'-1" | #5 | 12" | 59 | 59 | 18'-5" | 0'-3½" | 2'-7" | 4'-1⅛" |
| | 4' | | | 128 | 128 | 17'-1" | | | 59 | 59 | 18'-5" | 0'-3½" | 2'-7" | 4'-1⅛" |
| | 5' | | | 128 | 128 | 17'-1" | | | 59 | 59 | 18'-5" | 0'-3½" | 2'-7" | 4'-1⅛" |
| | 6' | | | 128 | 128 | 17'-5" | | | 59 | 59 | 18'-9" | 0'-3½" | 2'-8" | 4'-2⅛" |
| | 7' | | | 128 | 128 | 17'-8" | | | 59 | 59 | 19'-0" | 0'-3½" | 2'-9" | 4'-2⅝" |
| 3 @ 6' | 3' | #6 | 11" | 140 | 140 | 20'-1" | #5 | 11" | 65 | 65 | 21'-6" | 0'-4" | 3'-0" | 4'-10⅛" |
| | 4' | | | 140 | 140 | 20'-1" | | | 65 | 65 | 21'-6" | 0'-4" | 3'-0" | 4'-10⅛" |
| | 5' | | | 140 | 140 | 20'-1" | | | 65 | 65 | 21'-6" | 0'-4" | 3'-0" | 4'-10⅛" |
| | 6' | | | 140 | 140 | 20'-5" | | | 65 | 65 | 21'-10" | 0'-4" | 3'-1" | 4'-11⅛" |
| | 7' | | | 140 | 140 | 20'-8" | | | 65 | 65 | 22'-1" | 0'-4" | 3'-2" | 4'-11⅝" |
| | 8' | | | 140 | 140 | 20'-9" | | | 65 | 65 | 22'-2" | 0'-4" | 3'-2" | 5'-0⅛" |
| 3 @ 7' | 4' | #6 | 12" | 128 | 128 | 23'-1" | #6 | 12" | 59 | 59 | 24'-8" | 0'-4½" | 3'-5" | 5'-7" |
| | 5' | | | 128 | 128 | 23'-1" | | | 59 | 59 | 24'-8" | 0'-4½" | 3'-5" | 5'-7" |
| | 6' | | | 128 | 128 | 23'-5" | | | 59 | 59 | 25'-0" | 0'-4½" | 3'-6" | 5'-8" |
| | 7' | | | 128 | 128 | 23'-8" | | | 59 | 59 | 25'-3" | 0'-4½" | 3'-7" | 5'-8½" |
| | 8' | | | 128 | 128 | 23'-9" | | | 59 | 59 | 25'-4" | 0'-4½" | 3'-7" | 5'-9" |
| | 9' | | | 128 | 128 | 24'-1" | | | 59 | 59 | 25'-8" | 0'-4½" | 3'-8" | 5'-10" |
| 3 @ 8' | 4' | #6 | 11" | 140 | 140 | 26'-1" | #6 | 11" | 65 | 65 | 27'-9" | 0'-5" | 3'-10" | 6'-4" |
| | 5' | | | 140 | 140 | 26'-5" | | | 65 | 65 | 28'-1" | 0'-5" | 3'-11" | 6'-5" |
| | 6' | | | 140 | 140 | 26'-5" | | | 65 | 65 | 28'-1" | 0'-5" | 3'-11" | 6'-5" |
| | 7' | | | 140 | 140 | 26'-8" | | | 65 | 65 | 28'-4" | 0'-5" | 4'-0" | 6'-5½" |
| | 8' | | | 140 | 140 | 26'-9" | | | 65 | 65 | 28'-5" | 0'-5" | 4'-0" | 6'-6" |
| | 9' | | | 140 | 140 | 27'-1" | | | 65 | 65 | 28'-9" | 0'-5" | 4'-1" | 6'-7" |
| | 10' | | | 140 | 140 | 27'-5" | | | 65 | 65 | 29'-1" | 0'-5" | 4'-2" | 6'-8" |
| 3 @ 9' | 5' | #6 | 11" | 140 | 140 | 29'-5" | #6 | 11" | 65 | 65 | 31'-2" | 0'-5½" | 4'-4" | 7'-2" |
| | 6' | | | 140 | 140 | 29'-8" | | | 65 | 65 | 31'-5" | 0'-5½" | 4'-5" | 7'-2½" |
| | 7' | | | 140 | 140 | 29'-8" | | | 65 | 65 | 31'-5" | 0'-5½" | 4'-5" | 7'-2½" |
| | 8' | | | 140 | 140 | 29'-9" | | | 65 | 65 | 31'-6" | 0'-5½" | 4'-5" | 7'-3" |
| | 9' | | | 140 | 140 | 30'-1" | | | 65 | 65 | 31'-10" | 0'-5½" | 4'-6" | 7'-4" |
| | 10' | | | 140 | 140 | 30'-5" | | | 65 | 65 | 32'-2" | 0'-5½" | 4'-7" | 7'-5" |
| | 11' | | | 140 | 140 | 30'-7" | | | 65 | 65 | 32'-4" | 0'-5½" | 4'-7" | 7'-6" |
| 3 @ 10' | 5' | #7 | 12" | 128 | 128 | 32'-5" | #6 | 12" | 59 | 59 | 34'-3" | 0'-6" | 4'-9" | 7'-11" |
| | 6' | | | 128 | 128 | 32'-8" | | | 59 | 59 | 34'-6" | 0'-6" | 4'-10" | 7'-11½" |
| | 7' | | | 128 | 128 | 32'-8" | | | 59 | 59 | 34'-6" | 0'-6" | 4'-10" | 7'-11½" |
| | 8' | | | 128 | 128 | 32'-9" | | | 59 | 59 | 34'-7" | 0'-6" | 4'-10" | 8'-0" |
| | 9' | | | 128 | 128 | 33'-1" | | | 59 | 59 | 34'-11" | 0'-6" | 4'-11" | 8'-1" |
| | 10' | | | 128 | 128 | 33'-5" | | | 59 | 59 | 35'-3" | 0'-6" | 5'-0" | 8'-2" |
| | 11' | | | 128 | 128 | 33'-7" | | | 59 | 59 | 35'-5" | 0'-6" | 5'-0" | 8'-3" |
| | 12' | | | 128 | 128 | 33'-9" | | | 59 | 59 | 35'-7" | 0'-6" | 5'-0" | 8'-4" |
| 3 @ 11' | 6' | #7 | 11" | 140 | 140 | 35'-9" | #6 | 11" | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" |
| | 7' | | | 140 | 140 | 35'-9" | | | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" |
| | 8' | | | 140 | 140 | 35'-9" | | | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" |
| | 9' | | | 140 | 140 | 36'-1" | | | 65 | 65 | 38'-0" | 0'-6½" | 5'-4" | 8'-10" |
| | 10' | | | 140 | 140 | 36'-5" | | | 65 | 65 | 38'-4" | 0'-6½" | 5'-5" | 8'-11" |
| | 11' | | | 140 | 140 | 36'-7" | | | 65 | 65 | 38'-6" | 0'-6½" | 5'-5" | 9'-0" |
| | 12' | | | 140 | 140 | 36'-9" | | | 65 | 65 | 38'-8" | 0'-6½" | 5'-5" | 9'-1" |
| 3 @ 12' | 6' | #7 | 11" | 140 | 140 | 38'-9" | #6 | 11" | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" |
| | 7' | | | 140 | 140 | 38'-9" | | | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" |
| | 8' | | | 140 | 140 | 38'-9" | | | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" |
| | 9' | | | 140 | 140 | 39'-1" | | | 65 | 65 | 41'-1" | 0'-7" | 5'-9" | 9'-7" |
| | 10' | | | 140 | 140 | 39'-5" | | | 65 | 65 | 41'-5" | 0'-7" | 5'-10" | 9'-8" |
| | 11' | | | 140 | 140 | 39'-7" | | | 65 | 65 | 41'-7" | 0'-7" | 5'-10" | 9'-9" |
| | 12' | | | 140 | 140 | 39'-9" | | | 65 | 65 | 41'-9" | 0'-7" | 5'-10" | 9'-10" |

"b₂" bars — BENT - See Diagram below. In Top of Bottom Slab bent down under Division Walls - hooked. Alternate with "a" and "c" bars.
"c" bars — STRAIGHT — In Top and Bottom Slab of Barrel. Alternate with "b" and "b₂" bars.

| S | H | b₂ Size | b₂ Spacing | b₂ No. Req'd 3:1 | b₂ No. Req'd 4:1 | b₂ Length | b₂ X | b₂ Y | b₂ Z | c Size | c Spacing | c No. Req'd 3:1 | c No. Req'd 4:1 | c Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 @ 4' | 2' | #5 | 12" | 59 | 59 | 15'-3" | 0'-2½" | 2'-3" | 3'-4⅝" | #5 | 12" | 120 | 120 | 9'-4" |
| | 3' | | | 59 | 59 | 15'-3" | 0'-2½" | 2'-3" | 3'-4⅝" | | | 120 | 120 | 9'-4" |
| | 4' | | | 59 | 59 | 15'-3" | 0'-2½" | 2'-3" | 3'-4⅝" | | | 120 | 120 | 9'-4" |
| | 5' | | | 59 | 59 | 15'-3" | 0'-2½" | 2'-3" | 3'-4⅝" | | | 120 | 120 | 9'-4" |
| | 6' | | | 59 | 59 | 15'-7" | 0'-2½" | 2'-4" | 3'-5⅝" | | | 120 | 120 | 9'-6" |
| 3 @ 5' | 3' | #5 | 12" | 59 | 59 | 18'-4" | 0'-3" | 2'-8" | 4'-1⅛" | #6 | 12" | 120 | 120 | 11'-4" |
| | 4' | | | 59 | 59 | 18'-4" | 0'-3" | 2'-8" | 4'-1⅛" | | | 120 | 120 | 11'-4" |
| | 5' | | | 59 | 59 | 18'-4" | 0'-3" | 2'-8" | 4'-1⅛" | | | 120 | 120 | 11'-4" |
| | 6' | | | 59 | 59 | 18'-8" | 0'-3" | 2'-9" | 4'-2⅛" | | | 120 | 120 | 11'-6" |
| | 7' | | | 59 | 59 | 18'-11" | 0'-3" | 2'-10" | 4'-2⅝" | | | 120 | 120 | 11'-8" |
| 3 @ 6' | 3' | #5 | 11" | 65 | 65 | 21'-5" | 0'-3½" | 3'-1" | 4'-10⅛" | #6 | 11" | 132 | 132 | 13'-4" |
| | 4' | | | 65 | 65 | 21'-5" | 0'-3½" | 3'-1" | 4'-10⅛" | | | 132 | 132 | 13'-4" |
| | 5' | | | 65 | 65 | 21'-5" | 0'-3½" | 3'-1" | 4'-10⅛" | | | 132 | 132 | 13'-4" |
| | 6' | | | 65 | 65 | 21'-9" | 0'-3½" | 3'-2" | 4'-11⅛" | | | 132 | 132 | 13'-6" |
| | 7' | | | 65 | 65 | 22'-0" | 0'-3½" | 3'-3" | 4'-11⅝" | | | 132 | 132 | 13'-8" |
| | 8' | | | 65 | 65 | 22'-1" | 0'-3½" | 3'-3" | 5'-0⅛" | | | 132 | 132 | 13'-8" |
| 3 @ 7' | 4' | #6 | 12" | 59 | 59 | 24'-8" | 0'-4½" | 3'-5½" | 5'-7" | #6 | 12" | 120 | 120 | 15'-4" |
| | 5' | | | 59 | 59 | 24'-8" | 0'-4½" | 3'-5½" | 5'-7" | | | 120 | 120 | 15'-4" |
| | 6' | | | 59 | 59 | 25'-0" | 0'-4½" | 3'-6½" | 5'-8" | | | 120 | 120 | 15'-6" |
| | 7' | | | 59 | 59 | 25'-3" | 0'-4½" | 3'-7½" | 5'-8½" | | | 120 | 120 | 15'-8" |
| | 8' | | | 59 | 59 | 25'-4" | 0'-4½" | 3'-7½" | 5'-9" | | | 120 | 120 | 15'-8" |
| | 9' | | | 59 | 59 | 25'-8" | 0'-4½" | 3'-8½" | 5'-10" | | | 120 | 120 | 15'-10" |
| 3 @ 8' | 4' | #6 | 11" | 65 | 65 | 27'-9" | 0'-5" | 3'-10" | 6'-4" | #6 | 11" | 132 | 132 | 17'-4" |
| | 5' | | | 65 | 65 | 28'-1" | 0'-5" | 3'-11" | 6'-5" | | | 132 | 132 | 17'-6" |
| | 6' | | | 65 | 65 | 28'-1" | 0'-5" | 3'-11" | 6'-5" | | | 132 | 132 | 17'-6" |
| | 7' | | | 65 | 65 | 28'-4" | 0'-5" | 4'-0" | 6'-5½" | | | 132 | 132 | 17'-8" |
| | 8' | | | 65 | 65 | 28'-5" | 0'-5" | 4'-0" | 6'-6" | | | 132 | 132 | 17'-8" |
| | 9' | | | 65 | 65 | 28'-9" | 0'-5" | 4'-1" | 6'-7" | | | 132 | 132 | 17'-10" |
| | 10' | | | 65 | 65 | 29'-1" | 0'-5" | 4'-2" | 6'-8" | | | 132 | 132 | 18'-0" |
| 3 @ 9' | 5' | #6 | 11" | 65 | 65 | 31'-2" | 0'-5½" | 4'-4" | 7'-2" | #6 | 11" | 132 | 132 | 19'-6" |
| | 6' | | | 65 | 65 | 31'-5" | 0'-5½" | 4'-5" | 7'-2½" | | | 132 | 132 | 19'-8" |
| | 7' | | | 65 | 65 | 31'-5" | 0'-5½" | 4'-5" | 7'-2½" | | | 132 | 132 | 19'-8" |
| | 8' | | | 65 | 65 | 31'-6" | 0'-5½" | 4'-5" | 7'-3" | | | 132 | 132 | 19'-8" |
| | 9' | | | 65 | 65 | 31'-10" | 0'-5½" | 4'-6" | 7'-4" | | | 132 | 132 | 19'-10" |
| | 10' | | | 65 | 65 | 32'-2" | 0'-5½" | 4'-7" | 7'-5" | | | 132 | 132 | 20'-0" |
| | 11' | | | 65 | 65 | 32'-4" | 0'-5½" | 4'-7" | 7'-6" | | | 132 | 132 | 20'-0" |
| 3 @ 10' | 5' | #6 | 12" | 59 | 59 | 34'-3" | 0'-6" | 4'-9" | 7'-11" | #7 | 12" | 120 | 120 | 21'-6" |
| | 6' | | | 59 | 59 | 34'-6" | 0'-6" | 4'-10" | 7'-11½" | | | 120 | 120 | 21'-8" |
| | 7' | | | 59 | 59 | 34'-6" | 0'-6" | 4'-10" | 7'-11½" | | | 120 | 120 | 21'-8" |
| | 8' | | | 59 | 59 | 34'-7" | 0'-6" | 4'-10" | 8'-0" | | | 120 | 120 | 21'-8" |
| | 9' | | | 59 | 59 | 34'-11" | 0'-6" | 4'-11" | 8'-1" | | | 120 | 120 | 21'-10" |
| | 10' | | | 59 | 59 | 35'-3" | 0'-6" | 5'-0" | 8'-2" | | | 120 | 120 | 22'-0" |
| | 11' | | | 59 | 59 | 35'-5" | 0'-6" | 5'-0" | 8'-3" | | | 120 | 120 | 22'-0" |
| | 12' | | | 59 | 59 | 35'-7" | 0'-6" | 5'-0" | 8'-4" | | | 120 | 120 | 22'-0" |
| 3 @ 11' | 6' | #6 | 11" | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" | #7 | 11" | 132 | 132 | 23'-8" |
| | 7' | | | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" | | | 132 | 132 | 23'-8" |
| | 8' | | | 65 | 65 | 37'-8" | 0'-6½" | 5'-3" | 8'-9" | | | 132 | 132 | 23'-8" |
| | 9' | | | 65 | 65 | 38'-0" | 0'-6½" | 5'-4" | 8'-10" | | | 132 | 132 | 23'-10" |
| | 10' | | | 65 | 65 | 38'-4" | 0'-6½" | 5'-5" | 8'-11" | | | 132 | 132 | 24'-0" |
| | 11' | | | 65 | 65 | 38'-6" | 0'-6½" | 5'-5" | 9'-0" | | | 132 | 132 | 24'-0" |
| | 12' | | | 65 | 65 | 38'-8" | 0'-6½" | 5'-5" | 9'-1" | | | 132 | 132 | 24'-0" |
| 3 @ 12' | 6' | #6 | 11" | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" | #7 | 11" | 132 | 132 | 25'-8" |
| | 7' | | | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" | | | 132 | 132 | 25'-8" |
| | 8' | | | 65 | 65 | 40'-9" | 0'-7" | 5'-8" | 9'-6" | | | 132 | 132 | 25'-8" |
| | 9' | | | 65 | 65 | 41'-1" | 0'-7" | 5'-9" | 9'-7" | | | 132 | 132 | 25'-10" |
| | 10' | | | 65 | 65 | 41'-5" | 0'-7" | 5'-10" | 9'-8" | | | 132 | 132 | 26'-0" |
| | 11' | | | 65 | 65 | 41'-7" | 0'-7" | 5'-10" | 9'-9" | | | 132 | 132 | 26'-0" |
| | 12' | | | 65 | 65 | 41'-9" | 0'-7" | 5'-10" | 9'-10" | | | 132 | 132 | 26'-0" |

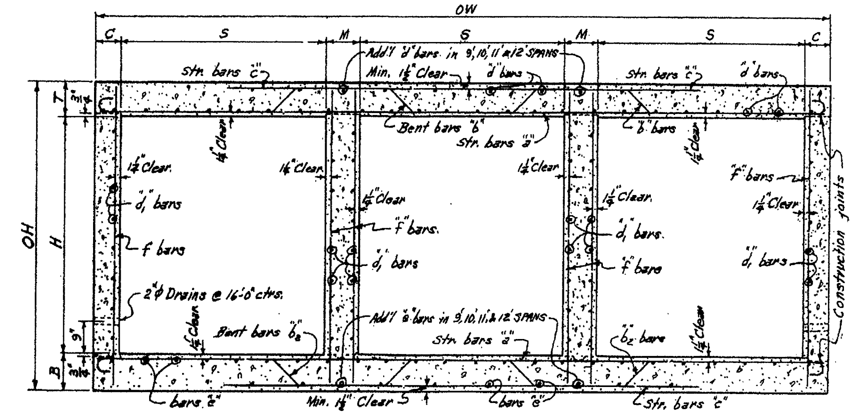
"d" bars — STRAIGHT — Longitudinal in Top Slab of Barrel. Length: 2 @ 30'-8" for 60'-0" Length Barrel. (1'-8" Lap.)
"d₁" bars — STRAIGHT — Longitudinal in Sidewalls and Division Walls. Length: 2 @ 30'-6" for 60'-0" Length Barrel. (1'-5" Lap.)
"e" bars — STRAIGHT — Longitudinal in Bottom Slab of Barrel. Length: 2 @ 31'-6" for 60'-0" Length Barrel. (1'-5" Lap.)
"f" bars — STRAIGHT — Vertical in Sidewalls and Division Walls.

| S | H | d Size | d Spacing | d No. Req'd | d₁ Size | d₁ Spacing | d₁ No. Req'd | e Size | e Spacing | e No. Req'd | f Size | f Spacing | f No. Req'd 3:1 | f No. Req'd 4:1 | f Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 @ 4' | 2' | #5 | 12" | 22 | #4 | 12" | 12 | #4 | 12" | 22 | #4 | 12" | 360 | 360 | 2'-10" |
| | 3' | | | 22 | | | 18 | | | 22 | | | 360 | 360 | 3'-10" |
| | 4' | | | 22 | | | 24 | | | 22 | | | 360 | 360 | 4'-10" |
| | 5' | | | 22 | | | 30 | | | 22 | | | 360 | 360 | 5'-10" |
| | 6' | | | 22 | | | 36 | | | 22 | | | 360 | 360 | 6'-10" |
| 3 @ 5' | 3' | #5 | 11½" | 26 | #4 | 12" | 18 | #4 | 12" | 25 | #4 | 12" | 360 | 360 | 3'-11" |
| | 4' | | | 26 | | | 24 | | | 25 | | | 360 | 360 | 4'-11" |
| | 5' | | | 26 | | | 30 | | | 25 | | | 360 | 360 | 5'-11" |
| | 6' | | | 26 | | | 36 | | | 25 | | | 360 | 360 | 6'-11" |
| | 7' | | | 26 | | | 42 | | | 25 | | | 360 | 360 | 7'-11" |
| 3 @ 6' | 3' | #5 | 11½" | 30 | #4 | 12" | 18 | #4 | 12" | 28 | #4 | 12" | 360 | 360 | 4'-0" |
| | 4' | | | 30 | | | 24 | | | 28 | | | 360 | 360 | 5'-0" |
| | 5' | | | 30 | | | 30 | | | 28 | | | 360 | 360 | 6'-0" |
| | 6' | | | 30 | | | 36 | | | 28 | | | 360 | 360 | 7'-0" |
| | 7' | | | 30 | | | 42 | | | 28 | | | 360 | 360 | 8'-0" |
| | 8' | | | 30 | | | 48 | | | 28 | | 10" | 432 | 432 | 9'-0" |
| 3 @ 7' | 4' | #5 | 11½" | 32 | #4 | 12" | 24 | #4 | 12" | 31 | #4 | 12" | 360 | 360 | 5'-1" |
| | 5' | | | 32 | | | 30 | | | 31 | | | 360 | 360 | 6'-1" |
| | 6' | | | 32 | | | 36 | | | 31 | | | 360 | 360 | 7'-1" |
| | 7' | | | 32 | | | 42 | | | 31 | | | 360 | 360 | 8'-1" |
| | 8' | | | 32 | | | 48 | | | 31 | | 10" | 432 | 432 | 9'-1" |
| | 9' | | | 32 | | | 54 | | | 31 | #5 | 12" | 360 | 360 | 10'-1" |
| 3 @ 8' | 4' | #5 | 11½" | 36 | #4 | 12" | 24 | #4 | 12" | 35 | #4 | 12" | 360 | 360 | 5'-2" |
| | 5' | | | 36 | | | 30 | | | 35 | | | 360 | 360 | 6'-2" |
| | 6' | | | 36 | | | 36 | | | 35 | | | 360 | 360 | 7'-2" |
| | 7' | | | 36 | | | 42 | | | 35 | | | 360 | 360 | 8'-2" |
| | 8' | | | 36 | | | 48 | | | 35 | | 10" | 432 | 432 | 9'-2" |
| | 9' | | | 36 | | | 54 | | | 35 | #5 | 12" | 360 | 360 | 10'-2" |
| | 10' | | | 36 | | | 60 | | | 35 | | 11" | 396 | 396 | 11'-2" |
| 3 @ 9' | 5' | #5 | 11½" | 41 | #4 | 12" | 30 | #4 | 12" | 40 | #4 | 12" | 360 | 360 | 6'-3" |
| | 6' | | | 41 | | | 36 | | | 40 | | | 360 | 360 | 7'-3" |
| | 7' | | | 41 | | | 42 | | | 40 | | | 360 | 360 | 8'-3" |
| | 8' | | | 41 | | | 48 | | | 40 | | 10" | 432 | 432 | 9'-3" |
| | 9' | | | 41 | | | 54 | | | 40 | #5 | 12" | 360 | 360 | 10'-3" |
| | 10' | | | 41 | | | 60 | | | 40 | | 11" | 396 | 396 | 11'-3" |
| | 11' | | | 41 | | | 66 | | | 40 | | 10" | 432 | 432 | 12'-3" |
| 3 @ 10' | 5' | #5 | 11½" | 44 | #4 | 12" | 30 | #4 | 12" | 43 | #4 | 12" | 360 | 360 | 6'-4" |
| | 6' | | | 44 | | | 36 | | | 43 | | | 360 | 360 | 7'-4" |
| | 7' | | | 44 | | | 42 | | | 43 | | | 360 | 360 | 8'-4" |
| | 8' | | | 44 | | | 48 | | | 43 | | 10" | 432 | 432 | 9'-4" |
| | 9' | | | 44 | | | 54 | | | 43 | #5 | 12" | 360 | 360 | 10'-4" |
| | 10' | | | 44 | | | 60 | | | 43 | | 11" | 396 | 396 | 11'-4" |
| | 11' | | | 44 | | | 66 | | | 43 | | 10" | 432 | 432 | 12'-4" |
| | 12' | | | 44 | | | 72 | | | 43 | #6 | 12" | 360 | 360 | 13'-4" |
| 3 @ 11' | 6' | #5 | 11½" | 48 | #4 | 12" | 36 | #4 | 12" | 46 | #4 | 12" | 360 | 360 | 7'-5" |
| | 7' | | | 48 | | | 42 | | | 46 | | | 360 | 360 | 8'-5" |
| | 8' | | | 48 | | | 48 | | | 46 | | 10" | 432 | 432 | 9'-5" |
| | 9' | | | 48 | | | 54 | | | 46 | #5 | 12" | 360 | 360 | 10'-5" |
| | 10' | | | 48 | | | 60 | | | 46 | | 11" | 396 | 396 | 11'-5" |
| | 11' | | | 48 | | | 66 | | | 46 | | 10" | 432 | 432 | 12'-5" |
| | 12' | | | 48 | | | 72 | | | 46 | #6 | 12" | 360 | 360 | 13'-5" |
| 3 @ 12' | 6' | #5 | 11½" | 51 | #4 | 12" | 36 | #4 | 12" | 49 | #4 | 12" | 360 | 360 | 7'-6" |
| | 7' | | | 51 | | | 42 | | | 49 | | | 360 | 360 | 8'-6" |
| | 8' | | | 51 | | | 48 | | | 49 | | 10" | 432 | 432 | 9'-6" |
| | 9' | | | 51 | | | 54 | | | 49 | #5 | 12" | 360 | 360 | 10'-6" |
| | 10' | | | 51 | | | 60 | | | 49 | | 11" | 396 | 396 | 11'-6" |
| | 11' | | | 51 | | | 66 | | | 49 | | 10" | 432 | 432 | 12'-6" |
| | 12' | | | 51 | | | 72 | | | 49 | #6 | 12" | 360 | 360 | 13'-6" |

## DIMENSIONS — QUANTITIES

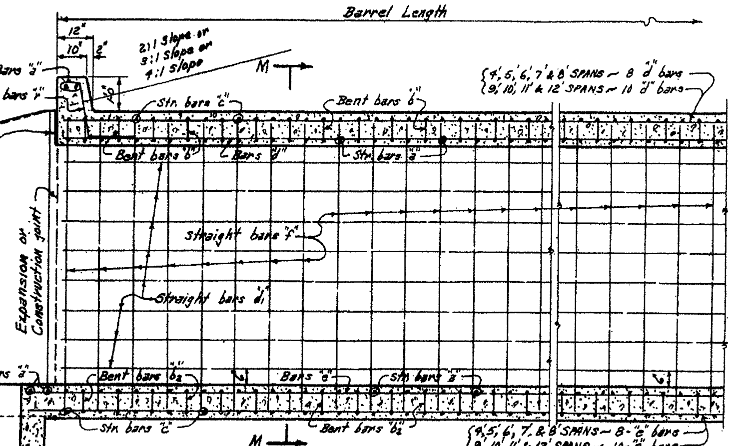
Max. Design Depth of Cover D: 5'-0"

| Clear Spans S | Clear Height H | Sq. Ft. Opening A | Overall Width OW | Thickness of Top Slab T | Thickness of Sidewalls C | Thickness of Division Walls M | Thickness of Bottom Slab B | Overall Height OH | Class S Conc. per Lin. Ft. of Barrel CU.YD. | Reinforcing Steel per Lin. Ft. of Barrel LB. | Additional per Lap LB. | Additional Two Headwalls & Aprons LB. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 @ 4' | 2' | 24 | 14'-4" | 6½" | 6" | 8" | 6" | 3'-0½" | 0.726 | 137.76 | 66.63 | 195.33 |
| | 3' | 36 | 14'-4" | | 6" | 8" | | 4'-0½" | 0.812 | 145.78 | 71.64 | 195.33 |
| | 4' | 48 | 14'-4" | | 6" | 8" | | 5'-0½" | 0.899 | 153.79 | 76.65 | 195.33 |
| | 5' | 60 | 14'-4" | | 6" | 8" | | 6'-0½" | 0.985 | 161.81 | 81.66 | 195.33 |
| | 6' | 72 | 14'-8" | | 7" | 9" | | 7'-0½" | 1.158 | 171.56 | 86.67 | 198.11 |
| 3 @ 5' | 3' | 45 | 17'-4" | 7" | 6" | 8" | 6½" | 4'-1½" | 0.981 | 195.23 | 81.10 | 298.79 |
| | 4' | 60 | 17'-4" | | 6" | 8" | | 5'-1½" | 1.068 | 203.25 | 86.11 | 298.79 |
| | 5' | 75 | 17'-4" | | 6" | 8" | | 6'-1½" | 1.154 | 211.27 | 91.12 | 298.79 |
| | 6' | 90 | 17'-8" | | 7" | 9" | | 7'-1½" | 1.329 | 221.98 | 96.13 | 302.80 |
| | 7' | 105 | 17'-11" | | 7½" | 10" | | 8'-1½" | 1.503 | 231.27 | 101.14 | 305.80 |
| 3 @ 6' | 3' | 54 | 20'-4" | 7½" | 6" | 8" | 7" | 4'-2½" | 1.169 | 236.39 | 90.56 | 351.21 |
| | 4' | 72 | 20'-4" | | 6" | 8" | | 5'-2½" | 1.266 | 244.41 | 95.57 | 351.21 |
| | 5' | 90 | 20'-4" | | 6" | 8" | | 6'-2½" | 1.342 | 252.42 | 100.58 | 351.21 |
| | 6' | 108 | 20'-8" | | 7" | 9" | | 7'-2½" | 1.517 | 262.84 | 105.59 | 355.21 |
| | 7' | 126 | 20'-11" | | 7½" | 10" | | 8'-2½" | 1.692 | 272.79 | 110.60 | 358.22 |
| | 8' | 144 | 21'-0" | | 8" | 10" | | 9'-2½" | 1.829 | 288.48 | 115.61 | 359.22 |
| 3 @ 7' | 4' | 84 | 23'-4" | 8" | 6" | 8" | 7¾" | 5'-3¾" | 1.480 | 279.99 | 101.55 | 404.29 |
| | 5' | 105 | 23'-4" | | 6" | 8" | | 6'-3¾" | 1.566 | 288.01 | 106.56 | 404.29 |
| | 6' | 126 | 23'-8" | | 7" | 9" | | 7'-3¾" | 1.743 | 298.53 | 111.57 | 408.29 |
| | 7' | 147 | 23'-11" | | 7½" | 10" | | 8'-3¾" | 1.919 | 308.56 | 116.58 | 411.30 |
| | 8' | 168 | 24'-0" | | 8" | 10" | | 9'-3¾" | 2.056 | 324.34 | 121.59 | 412.30 |
| | 9' | 189 | 24'-4" | | 9" | 11" | | 10'-3¾" | 2.294 | 350.27 | 126.60 | 416.30 |
| 3 @ 8' | 4' | 96 | 26'-4" | 8½" | 6" | 8" | 8½" | 5'-5" | 1.727 | 330.89 | 111.85 | 459.38 |
| | 5' | 120 | 26'-8" | | 7" | 9" | | 6'-5" | 1.893 | 341.69 | 116.86 | 463.38 |
| | 6' | 144 | 26'-8" | | 7" | 9" | | 7'-5" | 1.992 | 349.65 | 121.87 | 463.38 |
| | 7' | 168 | 26'-11" | | 7½" | 10" | | 8'-5" | 2.168 | 359.85 | 126.88 | 466.38 |
| | 8' | 192 | 27'-0" | | 8" | 10" | | 9'-5" | 2.306 | 375.76 | 131.89 | 467.39 |
| | 9' | 216 | 27'-4" | | 9" | 11" | | 10'-5" | 2.645 | 402.04 | 136.90 | 471.39 |
| | 10' | 240 | 27'-8" | | 10" | 12" | | 11'-5" | 2.810 | 421.39 | 141.91 | 475.40 |
| 3 @ 9' | 5' | 135 | 29'-8" | 9" | 7" | 9" | 9" | 6'-6" | 2.142 | 377.01 | 129.72 | 520.47 |
| | 6' | 162 | 29'-11" | | 7½" | 10" | | 7'-6" | 2.310 | 387.21 | 134.73 | 523.48 |
| | 7' | 189 | 29'-11" | | 7½" | 10" | | 8'-6" | 2.418 | 396.23 | 139.74 | 523.48 |
| | 8' | 216 | 30'-0" | | 8" | 10" | | 9'-6" | 2.656 | 411.21 | 144.75 | 524.48 |
| | 9' | 243 | 30'-4" | | 9" | 11" | | 10'-6" | 2.796 | 437.60 | 149.76 | 528.48 |
| | 10' | 270 | 30'-8" | | 10" | 12" | | 11'-6" | 3.062 | 457.00 | 154.77 | 532.49 |
| | 11' | 297 | 30'-10" | | 11" | 12" | | 12'-6" | 3.275 | 477.29 | 159.78 | 534.49 |
| 3 @ 10' | 5' | 150 | 32'-8" | 9½" | 7" | 9" | 9½" | 6'-7" | 2.409 | 443.34 | 137.44 | 716.12 |
| | 6' | 180 | 32'-11" | | 7½" | 10" | | 7'-7" | 2.578 | 453.81 | 142.95 | 720.20 |
| | 7' | 210 | 32'-11" | | 7½" | 10" | | 8'-7" | 2.686 | 461.88 | 147.46 | 720.20 |
| | 8' | 240 | 33'-0" | | 8" | 10" | | 9'-7" | 2.824 | 477.91 | 152.47 | 721.57 |
| | 9' | 270 | 33'-4" | | 9" | 11" | | 10'-7" | 3.066 | 509.74 | 157.48 | 727.02 |
| | 10' | 300 | 33'-8" | | 10" | 12" | | 11'-7" | 3.332 | 524.50 | 162.49 | 732.97 |
| | 11' | 330 | 33'-10" | | 11" | 12" | | 12'-7" | 3.546 | 544.94 | 167.50 | 735.19 |
| | 12' | 360 | 34'-0" | | 12" | 12" | | 13'-7" | 3.772 | 577.47 | 172.51 | 737.92 |
| 3 @ 11' | 6' | 198 | 36'-0" | 10" | 8" | 10" | 10" | 7'-8" | 2.889 | 522.98 | 151.91 | 790.33 |
| | 7' | 231 | 36'-0" | | 8" | 10" | | 8'-8" | 3.000 | 531.00 | 156.92 | 790.33 |
| | 8' | 264 | 36'-0" | | 8" | 10" | | 9'-8" | 3.111 | 546.56 | 161.93 | 790.33 |
| | 9' | 297 | 36'-4" | | 9" | 11" | | 10'-8" | 3.354 | 573.79 | 166.94 | 795.78 |
| | 10' | 330 | 36'-8" | | 10" | 12" | | 11'-8" | 3.621 | 593.87 | 171.95 | 801.23 |
| | 11' | 363 | 36'-10" | | 11" | 12" | | 12'-8" | 3.835 | 614.97 | 176.96 | 803.96 |
| | 12' | 396 | 37'-0" | | 12" | 12" | | 13'-8" | 4.062 | 647.44 | 181.97 | 806.68 |
| 3 @ 12' | 6' | 216 | 39'-0" | 10½" | 8" | 10" | 10½" | 7'-9" | 3.194 | 560.85 | 159.63 | 859.76 |
| | 7' | 252 | 39'-0" | | 8" | 10" | | 8'-9" | 3.306 | 568.87 | 164.64 | 859.76 |
| | 8' | 288 | 39'-0" | | 8" | 10" | | 9'-9" | 3.417 | 584.50 | 169.65 | 859.76 |
| | 9' | 324 | 39'-4" | | 9" | 11" | | 10'-9" | 3.660 | 611.85 | 174.66 | 865.21 |
| | 10' | 360 | 39'-8" | | 10" | 12" | | 11'-9" | 3.929 | 631.98 | 179.67 | 870.66 |
| | 11' | 396 | 39'-10" | | 11" | 12" | | 12'-9" | 4.144 | 652.63 | 184.68 | 873.39 |
| | 12' | 432 | 40'-0" | | 12" | 12" | | 13'-9" | 4.370 | 685.72 | 189.69 | 876.10 |

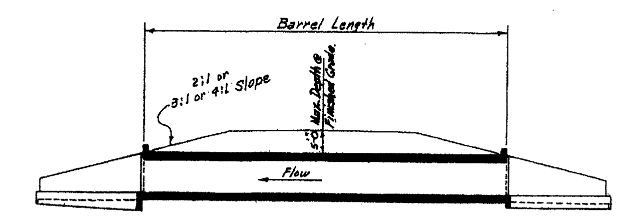



TYPICAL SECTION M-M

NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X002-2, W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2.



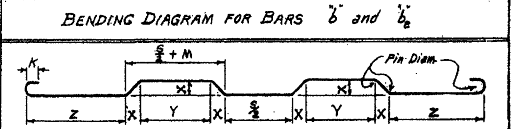

PART LONGITUDINAL SECTION




LONGITUDINAL SECTION

| BAR SIZE | PIN DIAM. | K | ADD FOR 2 HOOKS |
|---|---|---|---|
| #5 | 2½" | 4⅝" | 0'-11½" |
| #6 | 3" | 5" | 1'-2" |

BENDING DIAGRAM FOR BARS "b" and "b₂"

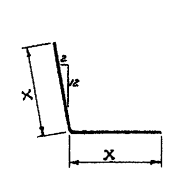



NOTE:- Dimensions are to centers of bars ("b" and "b₂")

### DOWEL BARS FOR TWO HEADWALLS

| 3 SPANS @ | SIZE | SPACING | NO. REQ'D | LENGTH | X |
|---|---|---|---|---|---|
| 4' | #4 | 12"± | 30 | 2'-5" | 1'-2½" |
| 5' | #4 | 12"± | 36 | 2'-6" | 1'-3" |
| 6' | #4 | 12"± | 42 | 2'-7" | 1'-3½" |
| 7' | #4 | 12"± | 48 | 2'-8" | 1'-4" |
| 8' | #4 | 12"± | 54 | 2'-9" | 1'-4½" |
| 9 | #4 | 12"± | 60 | 2'-10" | 1'-5" |
| 10' | #4 | 12"± | 66 | 2'-11" | 1'-5½" |
| 11' | #4 | 12"± | 72 | 3'-0" | 1'-6" |
| 12' | #4 | 12"± | 78 | 3'-1" | 1'-6½" |

Bars "r" — Dowel bars in Headwalls




GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 35'-0" length of barrel over 38'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, division walls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

### DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING.
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/"
Reinforcing Steel 20,000#/"

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — TRIPLES
3:1 OR 4:1 SLOPES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-300X-0

Designed By:- W.C.H. 1-22-63. Checked By:- B.H.S. 5-17-63
Drawn By:- W.C.H. 2-28-63. Checked By:- B.H.S. 5-24-63
Quantities By:- W.C.H. 3-4-63. Checked By:- B.H.S. 5-24-63

# BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH - TWO 45° SKEWED ENDS.

| DEPTH OF COVER D | CLEAR SPANS S | CLEAR HEIGHT H | "a" bars STRAIGHT In Top and Bottom Slabs of Barrel. SIZE | SPACING | NO. REQ'D | LENGTH | "a1" bars STRAIGHT In Top and Bottom Slab of Barrel- (Four of each Length) SIZE | SPACING | NO. REQ'D | LENGTH | "b" bars BENT - See Diagrams below In Top and Bottom Slabs of Barrel- hooked. Alternate with "a" bars SIZE | SPACING | NO. REQ'D | LENGTH | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | MAX. / MIN. |
| 0'-0" TO 5'-0" MAXIMUM | 1 @ 4' | 2' | #5 | 13" | 104 | 4'-9" | #5 | 13" | 8 | 3'-8" | #6 | 13" | 104 | 5'-10" | 4'-8" |
| | | 3' | | | 104 | 4'-9" | | | 8 | " " | | | 104 | 5'-10" | " |
| | | 4' | | | 104 | 4'-9" | | | 8 | " " | | | 104 | 5'-10" | " |
| | | 5' | | | 104 | 4'-9" | | | 8 | " " | | | 104 | 5'-10" | " |
| | | 6' | | | 106 | 4'-11" | | | 8 | 3'-10" | 2'-9" | | 106 | 6'-0" | 4'-10" |
| | 1 @ 5' | 3' | #6 | 18" | 102 | 5'-9" | #6 | 15" | 12 | 4'-8" | 2'-6" | #6 | 102 | 6'-10" | 5'-8" |
| | | 4' | | | 102 | 5'-9" | | | 12 | " " | " " | | 102 | 6'-10" | " |
| | | 5' | | | 102 | 5'-9" | | | 12 | " " | " " | | 102 | 6'-10" | " |
| | | 6' | | | 102 | 5'-11" | | | 12 | 4'-10" | 2'-8" | | 102 | 7'-0" | 5'-10" |
| | | 7' | | | 102 | 6'-0" | | | 12 | 4'-11" | 2'-9" | | 102 | 7'-1" | 5'-11" |
| | 1 @ 6' | 3' | #6 | 12" | 110 | 6'-3" | #6 | 12" | 16 | 5'-9" | 2'-9" | #6 | 108 | 7'-1" | 6'-8" |
| | | 4' | | | 110 | 6'-3" | | | 16 | " " | " " | | 108 | 7'-10" | " |
| | | 5' | | | 110 | 6'-3" | | | 16 | " " | " " | | 108 | 7'-10" | " |
| | | 6' | | | 108 | 6'-11" | | | 16 | 5'-11" | 2'-11" | | 108 | 8'-5" | 6'-6" |
| | | 7' | | | 108 | 7'-0" | | | 16 | 6'-0" | 3'-0" | | 108 | 8'-11" | 6'-11" |
| | | 8' | | | 108 | 7'-1" | | | 16 | 6'-1" | 3'-1" | | 108 | 8'-2" | 7'-0" |
| | 1 @ 7' | 9' | #6 | 11" | 116 | 7'-9" | #6 | 11" | 24 | 6'-10" | 2'-8" | #6 | 116 | 8'-10" | 7'-8" |
| | | 5' | | | 116 | 7'-9" | | | 24 | " " | " " | | 116 | 8'-10" | " |
| | | 6' | | | 116 | 7'-11" | | | 24 | 7'-0" | 2'-9" | | 116 | 9'-0" | 7'-10" |
| | | 7' | | | 116 | 8'-0" | | | 24 | 7'-1" | 2'-10" | | 116 | 9'-1" | 7'-11" |
| | | 8' | | | 116 | 8'-1" | | | 24 | 7'-2" | 2'-11" | | 114 | 9'-2" | 8'-0" |
| | | 9' | | | 116 | 8'-2" | | | 24 | 7'-3" | 2'-11" | | 116 | 9'-3" | 8'-2" |
| | 1 @ 8' | 4' | #7 | 12" | 106 | 8'-9" | #7 | 12" | 24 | 7'-9" | 2'-9" | #7 | 104 | 9'-0" | 8'-8" |
| | | 5' | | | 104 | 8'-11" | | | 24 | 7'-11" | 2'-11" | | 104 | 10'-0" | 8'-10" |
| | | 6' | | | 104 | 9'-0" | | | 24 | 8'-0" | 3'-0" | | 104 | 10'-1" | 8'-11" |
| | | 7' | | | 104 | 9'-1" | | | 24 | " " | " " | | 104 | 10'-2" | 9'-0" |
| | | 8' | | | 104 | 9'-2" | | | 24 | 8'-1" | 3'-1" | | 104 | 10'-3" | 9'-1" |
| | | 9' | | | 104 | 9'-3" | | | 24 | 8'-2" | 3'-1" | | 104 | 10'-4" | 9'-2" |
| | | 10' | | | 104 | 9'-5" | | | 28 | 8'-3" | 2'-5" | | 102 | 10'-4" | 9'-4" |
| | 1 @ 9' | 5' | #7 | 12" | 112 | 9'-11" | #7 | 12" | 28 | 9'-0" | 2'-7" | #7 | 110 | 11'-0" | 9'-10" |
| | | 6' | | | 112 | 10'-0" | | | 28 | 9'-1" | 2'-8" | | 110 | 11'-1" | 9'-11" |
| | | 7' | | | 112 | 10'-0" | | | 28 | " " | " " | | 110 | 11'-1" | 9'-11" |
| | | 8' | | | 112 | 10'-1" | | | 28 | 9'-2" | 2'-9" | | 110 | 11'-2" | 10'-0" |
| | | 9' | | | 112 | 10'-2" | | | 28 | 9'-3" | 2'-10" | | 110 | 11'-3" | 10'-1" |
| | | 10' | | | 112 | 10'-3" | | | 28 | 9'-4" | 2'-10" | | 110 | 11'-4" | 10'-2" |
| | | 11' | | | 112 | 10'-4" | | | 28 | 9'-5" | 2'-11" | | 110 | 11'-5" | 10'-3" |
| | 1 @ 10' | 5' | #7 | 12" | 100 | 10'-11" | #7 | 12" | 32 | 10'-0" | 3'-7" | #7 | 100 | 12'-2" | 10'-6" |
| | | 6' | | | 100 | 11'-0" | | | 32 | 10'-0" | 3'-0" | | 100 | 12'-3" | 10'-7" |
| | | 7' | | | 100 | 11'-0" | | | 32 | " " | " " | | 100 | 12'-3" | " |
| | | 8' | | | 100 | 11'-1" | | | 32 | 10'-1" | 3'-1" | | 100 | 12'-4" | 10'-8" |
| | | 9' | | | 100 | 11'-2" | | | 32 | 10'-3" | 3'-3" | | 100 | 12'-5" | 10'-9" |
| | | 10' | | | 100 | 11'-3" | | | 32 | 10'-4" | 3'-4" | | 98 | 12'-3" | 11'-0" |
| | | 11' | | | 100 | 11'-4" | | | 32 | 10'-5" | 3'-5" | | 98 | 12'-4" | 11'-1" |
| | | 12' | | | 100 | 11'-5" | | | 32 | 10'-6" | 3'-6" | | 98 | 12'-5" | 11'-2" |
| | 1 @ 11' | 6' | #7 | 12" | 108 | 12'-1" | #7 | 12" | 40 | 11'-2" | 2'-11" | #7 | 106 | 13'-1" | 12'-0" |
| | | 7' | | | 106 | 12'-1" | | | 40 | " " | " " | | 106 | 13'-1" | " |
| | | 8' | | | 106 | 12'-1" | | | 40 | " " | " " | | 106 | 13'-2" | " |
| | | 9' | | | 106 | 12'-3" | | | 40 | 11'-3" | 3'-1" | | 106 | 13'-3" | 12'-2" |
| | | 10' | | | 106 | 12'-5" | | | 40 | 11'-4" | 3'-2" | | 106 | 13'-4" | 12'-3" |
| | | 11' | | | 106 | 12'-7" | | | 40 | 11'-5" | 3'-3" | | 106 | 13'-5" | 12'-4" |
| | | 12' | | | 106 | 12'-9" | | | 40 | 11'-6" | 3'-4" | | 104 | 13'-3" | 12'-5" |
| | 1 @ 12' | 6' | #7 | 12" | 96 | 13'-1" | #7 | 12" | 40 | 12'-3" | 3'-1" | #7 | 96 | 14'-2" | 13'-0" |
| | | 7' | | | 96 | 13'-1" | | | 40 | " " | " " | | 96 | 14'-2" | " |
| | | 8' | | | 96 | 13'-1" | | | 40 | " " | " " | | 96 | 14'-3" | " |
| | | 9' | | | 96 | 13'-3" | | | 40 | 12'-3" | 3'-2" | | 96 | 14'-5" | 13'-2" |
| | | 10' | | | 96 | 13'-5" | | | 44 | 12'-5" | 2'-5" | | 94 | 14'-3" | 13'-5" |
| | | 11' | | | 96 | 13'-7" | | | 44 | 12'-7" | 2'-7" | | 94 | 14'-10" | 13'-6" |
| | | 12' | | | 96 | 13'-9" | | | 44 | 12'-9" | 2'-9" | | 94 | 15'-0" | 13'-8" |

| DEPTH OF COVER D | CLEAR SPANS S | CLEAR HEIGHT H | "b" bars BENT - See Diagrams below In Top and Bottom Slabs of Barrel- one end hooked. (Four of each Length) Alternate with "a1" bars. SIZE | SPACING | NO. REQ'D | LENGTH MAX. | LENGTH MIN. | X MAX. | X MIN. | "d" bars STRAIGHT Longitudinal in Top Slab of Barrel. SIZE | SPACING | NO. REQ'D | LENGTH | "d1" bars STRAIGHT Longitudinal in Sidewalls. SIZE | SPACING | NO. REQ'D | LENGTH | "e" bars STRAIGHT Longitudinal in Bottom Slab of Barrel. SIZE | SPACING | NO. REQ'D | LENGTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0'-0" TO 5'-0" MAXIMUM | 1 @ 4' | 2' | #5 | 13" | 8 | 4'-9" | 3'-8" | 4'-2" | 3'-1" | #5 | 10½" | 6 | | #4 | 12" | 9 | | #4 | 12" | 5 | |
| | | 3' | | | 8 | " | " | " | " | | | 6 | | | | 6 | | | | 5 | |
| | | 4' | | | 8 | " | " | " | " | | | 6 | | | | 6 | | | | 5 | |
| | | 5' | | | 8 | " | " | " | " | | | 6 | | | | 6 | | | | 5 | |
| | | 6' | | | 8 | 4'-11" | 3'-10" | 4'-8" | 3'-8" | | | 6 | | | | 6 | | | | 5 | |
| | 1 @ 5' | 3' | #6 | 18" | 12 | 5'-9" | 3'-7" | 5'-2" | 3'-0" | #5 | 10½" | 7 | | #4 | 12" | 6 | | #4 | 12" | 6 | |
| | | 4' | | | 12 | " | " | " | " | | | 7 | | | | 8 | | | | 6 | |
| | | 5' | | | 12 | " | " | " | " | | | 7 | | | | 10 | | | | 6 | |
| | | 6' | | | 12 | 5'-11" | 3'-10" | 5'-5" | 3'-3" | | | 7 | | | | 12 | | | | 6 | |
| | | 7' | | | 12 | 6'-0" | 3'-10" | 5'-5" | 3'-3" | | | 7 | | | | 14 | | | | 6 | |
| | 1 @ 6' | 3' | #6 | 12" | 16 | 5'-9" | 3'-9" | 6'-2" | 3'-2" | #5 | 10½" | 8 | | #4 | 12" | 6 | | #4 | 12" | 7 | |
| | | 4' | | | 16 | " | " | " | " | | | 8 | | | | 8 | | | | 7 | |
| | | 5' | | | 16 | " | " | " | " | | | 8 | | | | 10 | | | | 7 | |
| | | 6' | | | 16 | 5'-11" | 2'-11" | 6'-8" | 3'-2" | | | 8 | | | | 12 | | | | 7 | |
| | | 7' | | | 16 | 6'-0" | 3'-0" | 6'-5" | 3'-2" | | | 8 | | | | 14 | | | | 7 | |
| | | 8' | | | 16 | 6'-1" | 3'-1" | 6'-6" | 3'-3" | | | 8 | | | | 16 | | | | 7 | |
| | 1 @ 7' | 9' | #6 | 12" | 24 | 6'-10" | 2'-8" | 7'-3" | 2'-8" | #5 | 10½" | 9 | | #4 | 12" | 8 | | #4 | 12" | 8 | |
| | | 5' | | | 24 | 7'-10" | 3'-8" | 7'-3" | 2'-8" | | | 9 | | | | 8 | | | | 8 | |
| | | 6' | | | 24 | " | " | " | " | | | 9 | | | | 8 | | | | 8 | |
| | | 7' | | | 24 | 8'-0" | 3'-5" | 7'-5" | 2'-10" | #5 | 10½" | 9 | | #4 | 12" | 8 | | #4 | 12" | 8 | |
| | | 8' | | | 24 | 8'-1" | 3'-6" | 7'-6" | 2'-11" | | | 9 | | | | 8 | | | | 8 | |
| | | 9' | | | 24 | 8'-2" | 3'-9" | 7'-7" | 3'-0" | | | 9 | | | | 8 | | | | 8 | |
| | | 10' | | | 24 | 8'-3" | 3'-9" | 7'-8" | 3'-0" | #5 | 10½" | 9 | | #4 | 12" | 8 | | #4 | 12" | 8 | |
| | | 11' | | | 24 | 8'-4" | 3'-10" | 7'-9" | 3'-1" | | | 9 | | | | 8 | | | | 8 | |
| | | 12' | | | 24 | 8'-5" | 3'-10" | 7'-10" | 3'-1" | | | 9 | | | | 8 | | | | 8 | |
| | 1 @ 8' | 4' | #7 | 12" | 24 | 8'-9" | 3'-9" | 8'-2" | 3'-2" | #5 | 10½" | 11 | | #4 | 12" | 8 | | #4 | 12" | 9 | |
| | | 5' | | | 24 | 8'-10" | 3'-10" | 8'-3" | 3'-3" | | | 11 | | | | 8 | | | | 9 | |
| | | 6' | | | 24 | 9'-0" | 3'-10" | 8'-4" | 3'-3" | | | 11 | | | | 8 | | | | 9 | |
| | | 7' | | | 24 | 9'-1" | 3'-11" | 8'-5" | 3'-4" | | | 11 | | | | 8 | | | | 9 | |
| | | 8' | | | 24 | 9'-2" | 4'-0" | 8'-6" | 3'-5" | | | 11 | | | | 8 | | | | 9 | |
| | | 9' | | | 24 | 9'-3" | 3'-11" | 8'-6" | 3'-5" | | | 11 | | | | 8 | | | | 9 | |
| | | 10' | | | 24 | 9'-4" | 4'-0" | 8'-7" | 3'-6" | | | 11 | | | | 8 | | | | 9 | |
| | | 11' | | | 24 | 9'-5" | 4'-0" | 8'-8" | 3'-6" | | | 11 | | | | 8 | | | | 9 | |
| | 1 @ 9' | 5' | #7 | 12" | 28 | 9'-10" | 3'-10" | 8'-11" | 3'-5" | #5 | 10" | 11 | | #4 | 12" | 9 | | #4 | 12" | 9 | |
| | | 6' | | | 28 | 9'-11" | 3'-11" | 9'-0" | 3'-6" | | | 11 | | | | 9 | | | | 9 | |
| | | 7' | | | 28 | 9'-11" | 3'-11" | 9'-0" | 3'-6" | | | 11 | | | | 9 | | | | 9 | |
| | | 8' | | | 28 | 9'-12" | 4'-0" | 9'-1" | 3'-7" | | | 11 | | | | 9 | | | | 9 | |
| | | 9' | | | 28 | 9'-13" | 3'-11" | 8'-11" | 3'-6" | | | 11 | | | | 9 | | | | 9 | |
| | | 10' | | | 28 | 9'-14" | 4'-0" | 9'-2" | 3'-7" | | | 11 | | | | 9 | | | | 9 | |
| | | 11' | | | 28 | 9'-15" | 3'-11" | 8'-11" | 3'-6" | | | 11 | | | | 9 | | | | 9 | |
| | | 12' | | | 28 | 9'-16" | 4'-0" | 9'-3" | 3'-8" | | | 11 | | | | 9 | | | | 9 | |
| | 1 @ 10' | 5' | #7 | 12" | 32 | 10'-0" | 3'-7" | 9'-5" | 3'-0" | #5 | 10" | 12 | | #4 | 12" | 10 | | #4 | 12" | 10 | |
| | | 6' | | | 32 | 10'-1" | 3'-8" | 9'-6" | 3'-1" | | | 12 | | | | 10 | | | | 10 | |
| | | 7' | | | 32 | " | " | " | " | | | 12 | | | | 10 | | | | 10 | |
| | | 8' | | | 32 | 10'-2" | 3'-9" | 9'-7" | 3'-2" | | | 12 | | | | 10 | | | | 10 | |
| | | 9' | | | 32 | 10'-3" | 3'-10" | 9'-8" | 3'-3" | | | 12 | | | | 10 | | | | 10 | |
| | | 10' | | | 32 | 10'-4" | 3'-10" | 9'-9" | 3'-3" | | | 12 | | | | 10 | | | | 10 | |
| | | 11' | | | 32 | 10'-5" | 3'-11" | 9'-10" | 3'-4" | | | 12 | | | | 10 | | | | 10 | |
| | | 12' | | | 32 | 10'-6" | 3'-11" | 9'-11" | 3'-4" | | | 12 | | | | 10 | | | | 10 | |
| | 1 @ 11' | 6' | #7 | 12" | 36 | 10'-9" | 3'-10" | 9'-10" | 3'-5" | #5 | 10" | 13 | | #4 | 12" | 11 | | #4 | 12" | 11 | |
| | | 7' | | | 36 | 10'-10" | 3'-11" | 9'-11" | 3'-5" | | | 13 | | | | 11 | | | | 11 | |
| | | 8' | | | 36 | 10'-11" | 3'-11" | 9'-11" | 3'-5" | | | 13 | | | | 11 | | | | 11 | |
| | | 9' | | | 36 | 10'-11" | 4'-0" | 10'-0" | 3'-6" | | | 13 | | | | 11 | | | | 11 | |
| | | 10' | | | 36 | 10'-12" | 4'-0" | 10'-1" | 3'-7" | | | 13 | | | | 11 | | | | 11 | |
| | | 11' | | | 36 | 10'-13" | 4'-0" | 10'-2" | 3'-7" | | | 13 | | | | 11 | | | | 11 | |
| | | 12' | | | 36 | 10'-14" | 4'-0" | 10'-3" | 3'-8" | | | 13 | | | | 11 | | | | 11 | |
| | 1 @ 12' | 6' | #7 | 12" | 40 | 11'-2" | 3'-11" | 10'-11" | 3'-6" | #5 | 9½" | 15 | | #4 | 12" | 12 | | #4 | 12" | 12 | |
| | | 7' | | | 40 | " | " | " | " | | | 15 | | | | 14 | | | | 12 | |
| | | 8' | | | 40 | " | " | " | " | | | 15 | | | | 16 | | | | 12 | |
| | | 9' | | | 40 | 11'-3" | 4'-0" | 11'-0" | 3'-7" | | | 15 | | | | 18 | | | | 12 | |
| | | 10' | | | 44 | 12'-5" | 2'-5" | 12'-0" | 2'-10" | | | 15 | | | | 20 | | | | 12 | |
| | | 11' | | | 44 | 12'-7" | 2'-7" | 12'-2" | 2'-11" | | | 15 | | | | 22 | | | | 12 | |
| | | 12' | | | 44 | 12'-9" | 2'-9" | 12'-3" | 2'-11" | | | 15 | | | | 24 | | | | 12 | |
| | 1 @ 13' | 6' | #7 | 12" | 44 | 13'-2" | 3'-2" | 12'-8" | 2'-8" | #5 | 9" | 16 | | #4 | 12" | 12 | | #4 | 12" | 13 | |
| | | 7' | | | 44 | 13'-2" | 3'-3" | 12'-8" | 2'-8" | | | 16 | | | | 14 | | | | 13 | |
| | | 8' | | | 44 | 13'-3" | 3'-4" | 12'-9" | 2'-9" | | | 16 | | | | 16 | | | | 13 | |
| | | 9' | | | 44 | 13'-4" | 3'-4" | 12'-10" | 2'-10" | | | 16 | | | | 18 | | | | 13 | |
| | | 10' | | | 44 | 13'-5" | 3'-5" | 12'-11" | 2'-10" | | | 16 | | | | 20 | | | | 13 | |
| | | 11' | | | 44 | 13'-6" | 3'-5" | 12'-11" | 2'-11" | | | 16 | | | | 22 | | | | 13 | |
| | | 12' | | | 44 | 13'-7" | 3'-6" | 13'-0" | 2'-11" | | | 16 | | | | 24 | | | | 13 | |

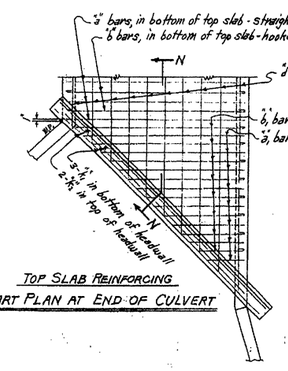
These bars are in the skewed portion of barrel only. The length of "a1" bars and overall length X of "b" bars vary by 1'-1" for 13" spacing, 1'-0" for 12" spacing and 0'-11" for 11" spacing.

| BAR SIZE | PIN DIAM | K | ADD FOR HOOKS | BENDING DIAGRAMS FOR BARS "b" & "b1" |
|---|---|---|---|---|
| #4 | 3" | 5" | 1'-2" | 2 HOOKS — "b" bars: K, Pin diam., X |
| #7 | 3½" | 5⅝" | 1'-4" | |
| #6 | 3" | 5" | 0'-7" | 1 HOOK — "b1" bars: K, Pin diam., X |
| #7 | 3½" | 5⅝" | 0'-8" | |

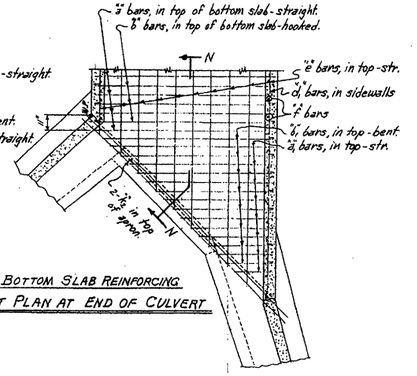
NOTE:- Dimensions are to centers of bars. ("b" and "b1")

DOWEL BARS FOR TWO HEADWALLS

| SPAN | SIZE | SPACING | NO. REQ'D | LENGTH | X | Dowel bars "i" in Two Headwalls |
|---|---|---|---|---|---|---|
| 4' | #4 | 12" | 16 | 2'-6" | 1'-3" | |
| 5' | #4 | 12" | 18 | 2'-7" | 1'-3½" | |
| 6' | #4 | 12" | 22 | 2'-8" | 1'-4" | |
| 7' | #4 | 12" | 24 | 2'-9" | 1'-4½" | |
| 8' | #4 | 12" | 28 | 2'-11" | 1'-5½" | |
| 9' | #4 | 12" | 30 | 3'-0" | 1'-6" | |
| 10' | #4 | 12" | 34 | 3'-1" | 1'-6½" | |
| 11' | #4 | 12" | 36 | 3'-2" | 1'-7" | |
| 12' | #4 | 12" | 40 | 3'-3" | 1'-7½" | |



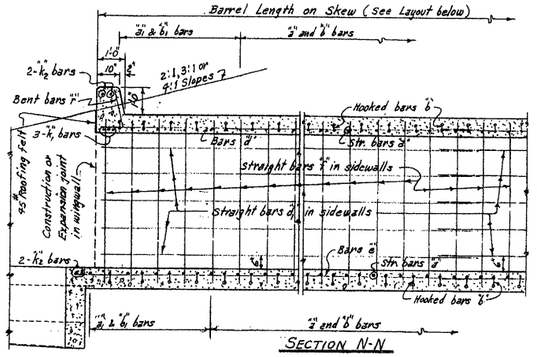

TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT



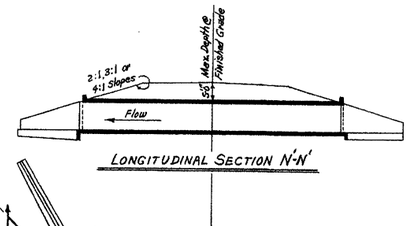

BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT

Designed by:- W.C.H. 1-23-63.
Drawn by:- W.C.H. 7-10-64.
Quantities by:- W.C.H. 9-30-64.
Checked by:- R.H.S. 5-8-63
Checked by:- Checked by:-

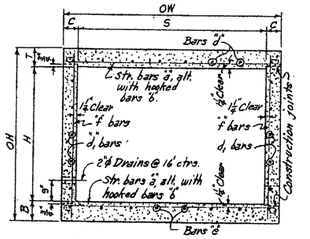
NOTE:- For Details of Standard Wings and bar lists, see Drawing No. W-X452-1 or W-X452-2; W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.



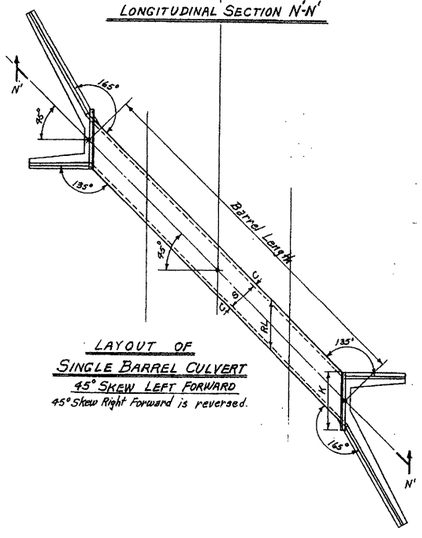

SECTION N-N




LONGITUDINAL SECTION N'-N'




TYPICAL SECTION M-M




LAYOUT OF
SINGLE BARREL CULVERT
45° SKEW LEFT FORWARD
45° Skew Right Forward is reversed.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 20,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X452-1 or W-X452-2, W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.

GENERAL NOTES

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾ chamfers.
REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters min.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEET |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |

| MAX. DESIGN DEPTH OF COVER D | BARREL DIMENSIONS CLEAR SPANS S | CLEAR HEIGHT H | SQ. FT. OPENING A | OVERALL WIDTH OW | THICKNESS OF TOP SLAB T | THICKNESS OF SIDEWALLS C | THICKNESS OF BOTTOM SLAB B | OVERALL HEIGHT OH | ROADWAY WIDTH RL | LENGTH OF HEADWALL K | * QUANTITIES CLASS S CONC. PER LIN. FT. OF BARREL TOTAL FOR 60'-0" LENGTH OF BARREL | REINFORCING STEEL PER LIN. FT. OF BARREL | ADDITIONAL PER LAP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | CU.YD. | LB. | LB. |
| 5'-0" | 1 @ 4' | 2' | 8 | 5'-0" | 7" | 6" | 6½" | 3'-1⅛" | 7'-0⅝" | 9'-0⅝" | 0.282 | 2635 | 41.99 | 17.95 |
| | | 3' | 12 | 6'-0" | | 6" | | 4'-1⅛" | " | " | 0.319 | 2797 | 44.16 | 19.62 |
| | | 4' | 16 | 6'-0" | | 6" | | 5'-1⅛" | " | " | 0.356 | 2958 | 46.83 | 21.29 |
| | | 5' | 20 | 6'-0" | | 6" | | 6'-1⅛" | " | " | 0.394 | 3120 | 49.50 | 22.96 |
| | | 6' | 24 | 6'-2" | | 7" | | 7'-1⅛" | 7'-3⅝" | 9'-3⅝" | 0.494 | 3336 | 52.96 | 24.63 |
| | 1 @ 5' | 3' | 15 | 6'-0" | | 6" | | 4'-2¼" | 8'-5⅛" | 10'-5⅛" | 0.380 | 3572 | 55.55 | 22.19 |
| | | 4' | 20 | 6'-0" | | 6" | | 5'-2¼" | " | " | 0.417 | 3733 | 58.23 | 23.86 |
| | | 5' | 25 | 6'-0" | | 6" | | 6'-2¼" | " | " | 0.459 | 3895 | 60.90 | 25.53 |
| | | 6' | 30 | 6'-2" | | 7" | | 7'-2¼" | 8'-10⅝" | 10'-10⅝" | 0.535 | 4115 | 64.99 | 27.20 |
| | | 7' | 35 | 6'-3" | | 7½" | | 8'-2¼" | 8'-10⅝" | 10'-10⅝" | 0.604 | 4308 | 67.63 | 28.87 |
| | 1 @ 6' | 3' | 18 | 7'-0" | 8" | 6" | 7½" | 4'-3⅜" | 9'-10⅝" | 11'-10⅝" | 0.496 | 4260 | 66.29 | 29.76 |
| | | 4' | 24 | 7'-0" | | 6" | | 5'-3⅜" | " | " | 0.983 | 4921 | 68.96 | 26.43 |
| | | 5' | 30 | 7'-0" | | 6" | | 6'-3⅜" | " | " | 0.520 | 4583 | 71.64 | 28.10 |
| | | 6' | 36 | 7'-2" | | 7" | | 7'-3⅜" | 10'-1⅝" | 12'-1⅝" | 0.602 | 4813 | 75.31 | 29.77 |
| | | 7' | 42 | 7'-3" | | 7½" | | 8'-3⅜" | 10'-3" | 12'-3" | 0.671 | 5008 | 78.96 | 31.44 |
| | | 8' | 48 | 7'-4" | | 8" | | 9'-3⅜" | 10'-4⅝" | 12'-4⅝" | 0.746 | 5410 | 88.97 | 33.11 |
| | 1 @ 7' | 4' | 28 | 8'-0" | 8½" | 6" | 7½" | 5'-5" | 11'-3⅝" | 13'-3⅝" | 0.568 | 5303 | 81.32 | 29.01 |
| | | 5' | 35 | 8'-0" | | 6" | | 6'-5" | " | " | 0.605 | 5464 | 84.00 | 30.68 |
| | | 6' | 42 | 8'-2" | | 7" | | 7'-5" | 11'-6⅝" | 13'-6⅝" | 0.688 | 5700 | 87.76 | 32.35 |
| | | 7' | 49 | 8'-3" | | 7½" | | 8'-5" | 11'-8" | 13'-8" | 0.767 | 5901 | 90.88 | 34.02 |
| | | 8' | 56 | 8'-4" | | 8" | | 9'-5" | 11'-9⅜" | 13'-9⅜" | 0.832 | 6219 | 96.65 | 35.69 |
| | | 9' | 63 | 8'-6" | | 9" | | 10'-5" | 12'-0⅛" | 14'-0⅛" | 0.944 | 6976 | 105.59 | 37.36 |
| | 1 @ 8' | 4' | 32 | 9'-0" | 9½" | 6" | 8½" | 5'-7" | 12'-8⅝" | 14'-8⅝" | 0.676 | 6196 | 95.24 | 33.32 |
| | | 5' | 40 | 9'-2" | | 7" | | 6'-7" | 12'-11⅝" | 14'-11⅝" | 0.756 | 6423 | 99.12 | 34.99 |
| | | 6' | 48 | 9'-2" | | 7" | | 7'-7" | " | " | 0.797 | 6584 | 101.79 | 36.66 |
| | | 7' | 56 | 9'-3" | | 7½" | | 8'-7" | 13'-1⅛" | 15'-1⅛" | 0.867 | 6788 | 105.05 | 38.33 |
| | | 8' | 64 | 9'-4" | | 8" | | 9'-7" | 13'-2⅝" | 15'-2⅝" | 0.962 | 7141 | 110.81 | 40.00 |
| | | 9' | 72 | 9'-6" | | 9" | | 10'-7" | 13'-5⅛" | 15'-5⅛" | 1.057 | 7701 | 119.92 | 41.67 |
| | | 10' | 80 | 9'-8" | | 10" | | 11'-7" | 13'-8" | 15'-8" | 1.184 | 8121 | 126.67 | 43.34 |
| | 1 @ 9' | 5' | 50 | 11'-2" | 9½" | 7" | 9½" | 6'-9½" | 15'-3½" | 17'-3½" | 0.957 | 8572 | 130.64 | 40.13 |
| | | 6' | 60 | 11'-3" | | 7½" | | 7'-9½" | 15'-11" | 17'-11" | 1.026 | 8784 | 133.99 | 41.80 |
| | | 7' | 70 | 11'-3" | | 7½" | | 8'-3½" | " | " | 1.071 | 8996 | 136.66 | 43.47 |
| | | 8' | 80 | 11'-4" | | 8" | | 9'-3½" | 16'-0⅜" | 18'-0⅜" | 1.197 | 9308 | 142.55 | 45.14 |
| | | 9' | 90 | 11'-6" | | 9" | | 10'-3½" | 16'-3½" | 18'-3½" | 1.263 | 9891 | 151.32 | 96.81 |
| | | 10' | 100 | 11'-8" | | 10" | | 11'-3½" | 16'-6" | 18'-6" | 1.391 | 10,310 | 158.83 | 48.98 |
| | | 11' | 110 | 11'-10" | | 11" | | 12'-3½" | 16'-8⅝" | 18'-8⅝" | 1.532 | 10,785 | 166.71 | 50.15 |
| | | 12' | 120 | 12'-0" | | 12" | | 13'-3½" | 16'-11⅝" | 18'-11⅝" | 1.685 | 11,529 | 178.47 | 51.82 |
| | 1 @ 10' | 6' | 66 | 12'-4" | 10½" | 8" | 11" | 7'-10⅝" | 17'-5⅛" | 19'-5⅛" | 1.153 | 10,378 | 155.16 | 96.12 |
| | | 7' | 77 | 12'-4" | | 8" | | 8'-10⅝" | " | " | 1.202 | 10,539 | 158.83 | 97.79 |
| | | 8' | 88 | 12'-4" | | 8" | | 9'-10⅝" | " | " | 1.252 | 10,855 | 163.06 | 99.46 |
| | | 9' | 99 | 12'-4" | | 9" | | 10'-10⅝" | 17'-8⅝" | 19'-8⅝" | 1.368 | 11,493 | 172.60 | 51.13 |
| | | 10' | 110 | 12'-8" | | 10" | | 11'-10⅝" | 17'-11" | 19'-11" | 1.997 | 11,886 | 179.70 | 52.80 |
| | | 11' | 121 | 12'-10" | | 11" | | 12'-10⅝" | 18'-1⅜" | 20'-1⅜" | 1.438 | 12,274 | 187.67 | 54.47 |
| | | 12' | 132 | 13'-0" | | 12" | | 13'-10⅝" | 18'-2⅝" | 20'-2⅝" | 1.792 | 13,071 | 199.79 | 56.14 |
| | 1 @ 11' | 6' | 72 | 13'-4" | 10½" | 8" | 11" | 8'-0" | 18'-10⅝" | 20'-10⅝" | 1.284 | 11,920 | 172.20 | 98.69 |
| | | 7' | 84 | 13'-4" | | 8" | | 9'-0" | " | " | 1.333 | 11,581 | 174.87 | 50.36 |
| | | 8' | 96 | 13'-4" | | 8" | | 10'-0" | " | " | 1.383 | 11,899 | 180.15 | 52.03 |
| | | 9' | 108 | 13'-6" | | 9" | | 11'-0" | 18'-11⅝" | 21'-1" | 1.500 | 12,500 | 189.85 | 53.70 |
| | | 10' | 120 | 13'-8" | | 10" | | 12'-0" | 19'-3⅝" | 21'-3⅝" | 1.630 | 12,948 | 197.07 | 55.37 |
| | | 11' | 132 | 13'-10" | | 11" | | 13'-0" | 19'-6⅝" | 21'-6⅝" | 1.772 | 13,996 | 205.16 | 57.04 |
| | | 12' | 144 | 14'-0" | | 12" | | 14'-0" | 19'-9⅝" | 21'-9⅝" | 1.926 | 15,212 | 217.45 | 58.71 |

* For remainder of quantities see Std. Wing Drawings listed at left. Total steel quantities listed above include one lap of longitudinal bars.

CLASS S CONCRETE

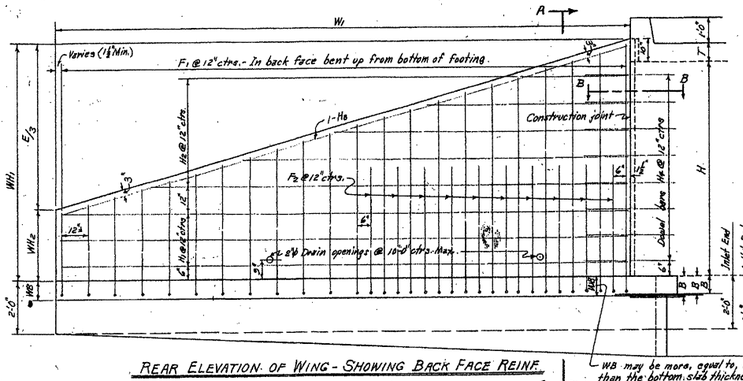
ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
45° SKEW

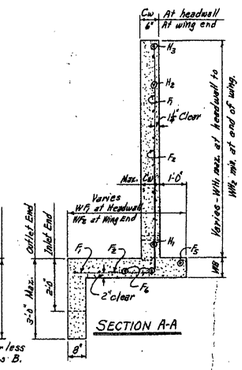
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 2:1, 3:1 OR 4:1 SLOPES
SINGLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-145X-0

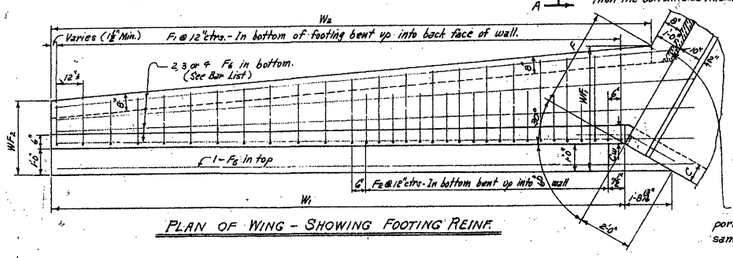
| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |




REAR ELEVATION OF WING - SHOWING BACK FACE REINF.

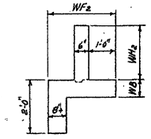



SECTION A-A



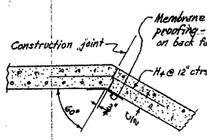

PLAN OF WING - SHOWING FOOTING REINF.

W5 may be more, equal to, or less than the bottom slab thickness B.

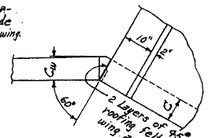



END VIEW OF WING

When B is more than W3, the shaded portion of the apron shall be made the same thickness as the barrel base B.




SECTION B-B THRU CONSTRUCTION JOINT




DETAIL AT TOP OF WING

Note:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.

## WING DIMENSIONS

| CLEAR HEIGHT OF BOX | THICKNESS OF WING FOOTING | THICKNESS OF WING AT HEADWALL = C | WINGWALL HEIGHTS AT HEADWALL | WINGWALL HEIGHTS AT END OF WING | WIDTHS OF WING FOOTINGS AT HEADWALL | WIDTHS OF WING FOOTINGS AT END OF WING | PERPENDICULAR FOOTING DIMENSION | PERPENDICULAR DIST. FROM H3&H2 TO END OF WING | LENGTH OF WING WALLS | INSIDE FOOTING DIMENSION | * QUANTITY PER WING CLASS S CONCRETE INLET END | * QUANTITY PER WING CLASS S CONCRETE OUTLET END |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | WB | $C_W$ | $WH_1$ | $WH_2$ | $Wf_1$ | $Wf_2$ | F | E | $W_1$ | $W_2$ | CU.YD. | CU.YD. |
| 2' | 7" | 6" | 2'-10" | 0'-8" | 2'-9" | 2'-0" | 0'-11⅞" | 6'-6" | 7'-6" | 7'-1½" | 0.889 | 0.986 |
| 3' | 7" | 6" | 3'-10" | 1'-0" | 2'-8" | 2'-1½" | 1'-4⅜" | 8'-6" | 9'-3⅜" | 9'-2⅝" | 1.338 | 1.966 |
| 4' | 7" | 6" | 4'-10" | 1'-2" | 3'-0" | 2'-3" | 1'-9" | 10'-6" | 12'-1⅛" | 12'-1⅛" | 1.868 | 2.027 |
| 5' | 7' | 6" | 5'-10" | 1'-4" | 3'-4" | 2'-4⅝" | 2'-1⅝" | 12'-6" | 14'-5⅛" | 14'-7⅛" | 2.578 | 2.648 |
| | | 7" | 5'-10" | 1'-3" | 3'-4" | 2'-4⅝" | 2'-1⅝" | 12'-6" | 14'-5⅛" | 14'-7⅛" | 2.582 | 2.772 |
| 6' | 8" | 7" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-4⅝" | 14'-6" | 16'-9" | 17'-1⅝" | 3.440 | 3.661 |
| | | 7½" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-4⅝" | 14'-6" | 16'-9" | 17'-1⅝" | 3.811 | 3.732 |
| | | 8" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-4⅝" | 14'-6" | 16'-9" | 17'-1⅝" | 3.588 | 3.803 |
| 7' | 8½" | 7½" | 7'-10" | 2'-8" | 4'-2" | 2'-7½" | 3'-1⅛" | 16'-6" | 19'-0⅝" | 19'-0⅝" | 4.505 | 4.758 |
| | | 8" | 7'-10" | 2'-8" | 4'-2" | 2'-7½" | 3'-1⅛" | 16'-6" | 19'-0⅝" | 19'-0⅝" | 4.597 | 4.851 |
| 8' | 9" | 8" | 8'-10" | 2'-8" | 4'-8" | 2'-9" | 3'-5" | 18'-6" | 21'-2⅝" | 22'-0" | 5.761 | 6.097 |

* Quantity per wing does not include headwall or that portion of apron or toewall for the length $W_3$.

## APRON DIMENSION $W_3$

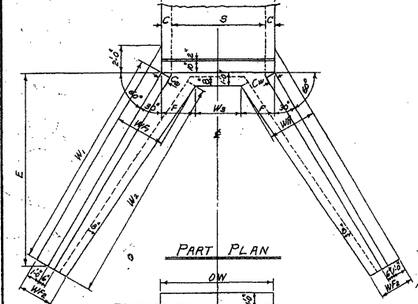
$W_3 = (OW - 2F)$

| CLEAR SPAN S | CLEAR HEIGHT H | 2 × FOOTING DIMENSION 2F | SINGLE BARREL CULVERT OW | SINGLE BARREL CULVERT $W_3$ | DOUBLE BARREL CULVERT OW | DOUBLE BARREL CULVERT $W_3$ | TRIPLE BARREL CULVERT OW | TRIPLE BARREL CULVERT $W_3$ | QUADRUPLE BARREL CULVERT OW | QUADRUPLE BARREL CULVERT $W_3$ | QUINTUPLE BARREL CULVERT OW | QUINTUPLE BARREL CULVERT $W_3$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4' | 2' | 1'-11⅝" | 5'-0" | 3'-0⅛" | 9'-8" | 7'-8⅛" | 14'-4" | 12'-4⅛" | 19'-0" | 17'-0⅛" | 23'-8" | 21'-8⅛" |
| | 3' | 2'-8⅜" | 5'-0" | 2'-3¼" | 9'-8" | 6'-11¼" | 14'-4" | 11'-7¼" | 19'-0" | 16'-3¼" | 23'-8" | 20'-11⅛" |
| | 4' | 3'-6" | 5'-0" | 1'-6" | 9'-8" | 6'-2" | 14'-4" | 10'-10" | 19'-0" | 15'-6" | 23'-8" | 20'-2" |
| | 5' | 4'-3⅜" | 5'-0" | 0'-8⅝" | 9'-8" | 5'-4⅜" | 14'-4" | 10'-0⅜" | 19'-0" | 14'-8⅜" | 23'-8" | 19'-4⅝" |
| | 6' | 5'-0⅜" | 5'-2" | 0'-1¼" | 9'-11" | 4'-10⅛" | 14'-8" | 9'-7⅛" | 19'-5" | 14'-2⅛" | 24'-2" | 19'-1⅛" |
| 5' | 3' | 2'-8⅜" | 6'-0" | 3'-3¼" | 11'-8" | 8'-11¼" | 17'-4" | 14'-7¼" | 23'-0" | 20'-3¼" | 28'-8" | 25'-11⅛" |
| | 4' | 3'-6" | 6'-0" | 2'-6" | 11'-8" | 8'-2" | 17'-4" | 13'-10" | 23'-0" | 19'-6" | 28'-8" | 25'-2" |
| | 5' | 4'-3⅜" | 6'-0" | 1'-8⅝" | 11'-8" | 7'-4⅜" | 17'-4" | 13'-0⅜" | 23'-0" | 18'-8⅜" | 28'-8" | 24'-4⅝" |
| | 6' | 5'-0⅜" | 6'-2" | 1'-1¼" | 11'-11" | 6'-10⅛" | 17'-8" | 12'-7⅛" | 23'-5" | 18'-2⅛" | 29'-2" | 24'-1⅛" |
| | 7' | 6'-2⅝" | 6'-5" | 0'-0¾" | 12'-1" | 5'-10⅝" | 17'-11" | 11'-8⅝" | 23'-9" | 17'-6⅝" | 29'-7" | 23'-6⅝" |
| 6' | 3' | 2'-8⅜" | 7'-0" | 4'-3¼" | 13'-8" | 10'-11¼" | 20'-4" | 17'-7¼" | 27'-0" | 24'-3¼" | 33'-8" | 30'-11⅛" |
| | 4' | 3'-6" | 7'-0" | 3'-6" | 13'-8" | 10'-2" | 20'-4" | 16'-10" | 27'-0" | 23'-6" | 33'-8" | 30'-2" |
| | 5' | 4'-3⅜" | 7'-0" | 2'-8⅜" | 13'-8" | 9'-4⅜" | 20'-4" | 16'-0⅜" | 27'-0" | 22'-8⅜" | 33'-8" | 29'-4⅝" |
| | 6' | 5'-0⅜" | 7'-2" | 2'-1¼" | 13'-11" | 8'-10⅛" | 20'-8" | 15'-7⅛" | 27'-5" | 22'-2⅛" | 34'-2" | 29'-1⅛" |
| | 7' | 6'-2⅝" | 7'-5" | 1'-0¾" | 14'-1" | 7'-10⅝" | 20'-11" | 14'-8⅝" | 27'-9" | 21'-6⅝" | 34'-7" | 28'-6⅝" |
| | 8' | 7'-1" | 7'-8" | 0'-10" | 14'-5" | 6'-10" | 21'-2" | 13'-8" | 27'-10" | 20'-6" | 34'-8" | 27'-8" |
| 7' | 4' | 3'-6" | 8'-0" | 4'-6" | 15'-8" | 12'-2" | 23'-4" | 19'-10" | 31'-0" | 27'-6" | 38'-8" | 35'-2" |
| | 5' | 4'-3⅜" | 8'-0" | 3'-8⅜" | 15'-8" | 11'-4⅜" | 23'-4" | 19'-0⅜" | 31'-0" | 26'-8⅜" | 38'-8" | 34'-4⅝" |
| | 6' | 5'-0⅜" | 8'-2" | 3'-1¼" | 15'-11" | 10'-10⅛" | 23'-8" | 18'-7⅛" | 31'-5" | 26'-2⅛" | 39'-2" | 34'-1⅛" |
| | 7' | 6'-2⅝" | 8'-5" | 2'-0¾" | 16'-1" | 9'-10⅝" | 23'-11" | 17'-8⅝" | 31'-9" | 25'-6⅝" | 39'-7" | 33'-6⅝" |
| | 8' | 7'-1" | 8'-8" | 1'-10" | 16'-5" | 8'-10" | 24'-2" | 16'-8" | 31'-10" | 24'-6" | 39'-8" | 32'-8" |
| 8' | 4' | 3'-6" | 9'-0" | 5'-6" | 17'-8" | 14'-2" | 26'-4" | 22'-10" | 35'-0" | 31'-6" | 43'-8" | 40'-2" |
| | 5' | 4'-3⅜" | 9'-2" | 4'-10⅜" | 17'-11" | 13'-7⅜" | 26'-8" | 22'-0⅜" | 35'-5" | 31'-1⅜" | 44'-2" | 39'-10⅝" |
| | 6' | 5'-0⅜" | 9'-2" | 4'-1¼" | 17'-11" | 12'-10⅛" | 26'-8" | 21'-7⅛" | 35'-5" | 30'-5⅛" | 44'-2" | 39'-1⅛" |
| | 7' | 6'-2⅝" | 9'-5" | 3'-0¾" | 18'-1" | 11'-10⅝" | 26'-11" | 20'-8⅝" | 35'-9" | 29'-6⅝" | 44'-7" | 38'-6⅝" |
| | 8' | 7'-1" | 9'-8" | 2'-10" | 18'-5" | 10'-10" | 27'-0" | 19'-8" | 35'-10" | 28'-6" | 44'-8" | 37'-8" |
| 9' | 5' | 4'-3⅜" | 10'-2" | 5'-10⅜" | 19'-11" | 15'-7⅜" | 29'-8" | 25'-4⅜" | 39'-5" | 35'-1⅜" | 49'-2" | 44'-10⅝" |
| | 6' | 5'-0⅜" | 10'-3" | 5'-2¼" | 20'-1" | 15'-0⅛" | 29'-11" | 24'-10⅛" | 39'-9" | 34'-5⅛" | 49'-7" | 44'-1⅛" |
| | 7' | 6'-2⅝" | 10'-5" | 4'-1⅝" | 20'-1" | 13'-10⅝" | 29'-11" | 23'-8⅝" | 39'-9" | 33'-6⅝" | 49'-7" | 43'-6⅝" |
| | 8' | 7'-1" | 10'-8" | 3'-10" | 20'-5" | 12'-10" | 30'-0" | 22'-8" | 39'-10" | 32'-6" | 49'-8" | 42'-8" |
| 10' | 5' | 4'-3⅜" | 11'-2" | 6'-10⅜" | 21'-11" | 17'-7⅜" | 32'-8" | 28'-4⅜" | 43'-5" | 39'-1⅜" | 54'-2" | 49'-10⅝" |
| | 6' | 5'-0⅜" | 11'-3" | 6'-2¼" | 22'-1" | 17'-0⅛" | 32'-11" | 27'-10⅛" | 43'-9" | 38'-5⅛" | 54'-7" | 49'-1⅛" |
| | 7' | 6'-2⅝" | 11'-5" | 5'-1⅝" | 22'-1" | 15'-10⅝" | 32'-11" | 26'-8⅝" | 43'-9" | 37'-6⅝" | 54'-7" | 48'-6⅝" |
| | 8' | 7'-1" | 11'-8" | 4'-10" | 22'-5" | 14'-10" | 33'-0" | 25'-8" | 43'-10" | 36'-6" | 54'-8" | 47'-8" |
| 11' | 6' | 5'-0⅜" | 12'-3" | 7'-3¼" | 24'-2" | 19'-1⅛" | 36'-0" | 30'-11⅛" | 47'-10" | 42'-9⅛" | | |
| | 7' | 6'-2⅝" | 12'-5" | 6'-1⅝" | 24'-2" | 17'-11⅝" | 36'-0" | 29'-9⅝" | 47'-10" | 41'-7⅝" | | |
| | 8' | 7'-1" | 12'-8" | 5'-10" | 24'-5" | 16'-10" | 36'-0" | 28'-8" | 47'-10" | 40'-6" | | |
| 12' | 6' | 5'-0⅜" | 13'-4" | 8'-3¼" | 26'-5" | 21'-1⅛" | 39'-0" | 33'-11⅛" | 51'-10" | 46'-9⅛" | | |
| | 7' | 6'-2⅝" | 13'-6" | 7'-1⅝" | 26'-5" | 19'-11⅝" | 39'-0" | 32'-9⅝" | 51'-10" | 45'-7⅝" | | |
| | 8' | 7'-1" | 13'-9" | 6'-10" | 26'-8" | 18'-10" | 39'-0" | 31'-8" | 51'-10" | 44'-6" | | |

## QUANTITIES

| CLEAR SPAN S | CLEAR HEIGHT H | THICKNESS OF WING AT HEADWALL C | THICKNESS OF WING FOOTING $C_W$ | REINFORCING STEEL - FOR 4 WINGS ⊛ LB. | CLASS S CONCRETE - 4 WINGS HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS SINGLE BARREL CULVERT CU.YD. | DOUBLE BARREL CULVERT CU.YD. | TRIPLE BARREL CULVERT CU.YD. | QUADRUPLE BARREL CULVERT CU.YD. | QUINTUPLE BARREL CULVERT CU.YD. |
|---|---|---|---|---|---|---|---|---|---|
| 4' | 2' | 6" | 7" | 108.0 | 4.50 | 5.96 | 6.92 | 7.38 | 8.34 |
| | 3' | 6" | 7" | 169.8 | 6.26 | 7.27 | 8.17 | 9.18 | 10.09 |
| | 4' | 6" | 7" | 259.6 | 8.33 | 9.28 | 10.24 | 11.20 | 12.16 |
| | 5' | 6" | 7" | 357.8 | 10.72 | 11.68 | 12.64 | 13.60 | 14.56 |
| | 6' | 7" | 8" | 583.1 | 14.55 | 15.53 | 16.52 | 17.51 | 18.49 |
| 5' | 3' | 6" | 7" | 169.4 | 6.97 | 7.68 | 8.79 | 9.96 | 11.12 |
| | 4' | 6" | 7" | 259.6 | 8.56 | 9.70 | 10.87 | 12.03 | 13.20 |
| | 5' | 6" | 7" | 357.8 | 10.94 | 12.10 | 13.26 | 14.43 | 15.59 |
| | 6' | 7" | 8" | 583.1 | 14.77 | 15.96 | 17.16 | 18.34 | 19.54 |
| | 7' | 7½" | 8½" | 1139.6 | 18.94 | 20.15 | 21.37 | 22.59 | 23.80 |
| 6' | 3' | 6" | 7" | 169.4 | 6.68 | 8.06 | 9.42 | 10.80 | 12.18 |
| | 4' | 6" | 7" | 259.6 | 8.75 | 10.14 | 11.49 | 12.87 | 14.25 |
| | 5' | 6" | 7" | 357.8 | 11.15 | 12.53 | 13.89 | 15.27 | 16.65 |
| | 6' | 7" | 8" | 583.1 | 14.98 | 16.39 | 17.78 | 19.18 | 20.59 |
| | 7' | 7½" | 8½" | 1139.6 | 19.16 | 20.58 | 22.00 | 23.43 | 24.86 |
| | 8' | 8" | 9" | 1925.6 | 24.09 | 25.63 | 26.96 | 28.39 | 29.83 |
| 7' | 4' | 6" | 7" | 259.6 | 8.97 | 10.58 | 12.15 | 13.76 | 15.35 |
| | 5' | 6" | 7" | 357.8 | 11.36 | 12.97 | 14.58 | 16.15 | 17.75 |
| | 6' | 7" | 8" | 583.1 | 15.20 | 16.82 | 18.42 | 20.04 | 21.66 |
| | 7' | 7½" | 8½" | 1139.6 | 19.38 | 21.02 | 22.69 | 24.28 | 25.92 |
| | 8' | 8" | 9" | 1925.6 | 24.32 | 25.97 | 27.60 | 29.25 | 30.89 |
| 8' | 4' | 6" | 7" | 259.6 | 9.19 | 11.03 | 12.82 | 14.65 | 16.45 |
| | 5' | 7" | 7" | 357.8 | 12.03 | 13.89 | 15.70 | 17.55 | 19.34 |
| | 6' | 7" | 8" | 583.1 | 15.92 | 17.27 | 19.09 | 20.93 | 22.75 |
| | 7' | 7½" | 8½" | 1139.6 | 19.59 | 21.46 | 23.30 | 25.16 | 26.99 |
| | 8' | 8" | 9" | 1925.6 | 24.54 | 26.97 | 28.84 | 30.11 | 31.96 |
| 9' | 5' | 7" | 7" | 357.8 | 12.26 | 14.39 | 16.87 | 18.95 | 20.97 |
| | 6' | 7½" | 8" | 583.1 | 15.94 | 18.04 | 20.09 | 22.19 | 24.23 |
| | 7' | 7½" | 8½" | 1139.6 | 19.81 | 21.91 | 23.96 | 26.06 | 28.10 |
| | 8' | 8" | 9" | 1925.6 | 24.76 | 26.86 | 28.91 | 31.00 | 33.05 |
| 10' | 5' | 7" | 7" | 357.8 | 12.49 | 14.80 | 17.05 | 19.26 | 21.52 |
| | 6' | 7½" | 8" | 583.1 | 16.17 | 18.50 | 20.77 | 22.99 | 25.28 |
| | 7' | 7½" | 8½" | 1139.6 | 20.09 | 22.37 | 24.64 | 26.87 | 29.15 |
| | 8' | 8" | 9" | 1925.6 | 24.98 | 27.31 | 29.58 | 31.81 | 34.10 |
| 11' | 6' | 8" | 8" | 583.1 | 16.69 | 19.27 | 21.76 | 24.23 | |
| | 7' | 8" | 8½" | 1139.6 | 20.64 | 23.22 | 25.71 | 28.18 | |
| | 8' | 8" | 9" | 1925.6 | 25.19 | 27.77 | 30.27 | 32.74 | |
| 12' | 6' | 8" | 8" | 583.1 | 16.92 | 19.75 | 22.95 | 25.18 | |
| | 7' | 8" | 8½" | 1139.6 | 20.87 | 23.69 | 26.90 | 29.13 | |
| | 8' | 8" | 9" | 1925.6 | 25.92 | 28.25 | 30.96 | 33.69 | |

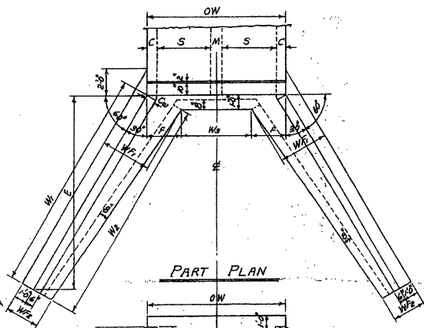
⊛ For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.




PART PLAN

END ELEVATION

SINGLE BARREL CULVERT

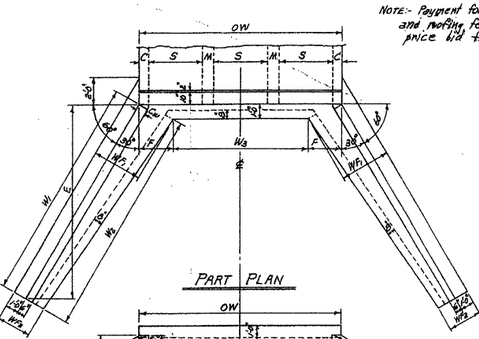



PART PLAN

END ELEVATION

DOUBLE BARREL CULVERT

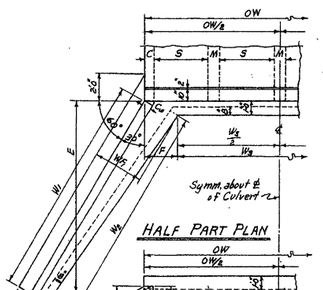
NOTE:- Plans and Elevations are not to scale.




PART PLAN

END ELEVATION

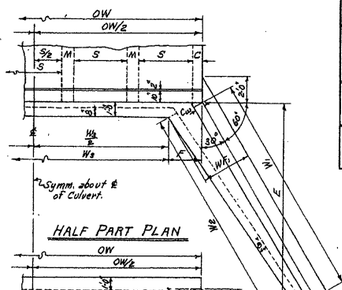
TRIPLE BARREL CULVERT




HALF PART PLAN

HALF END ELEVATION

QUADRUPLE BARREL CULVERT




HALF PART PLAN

HALF END ELEVATION

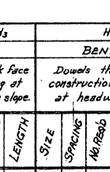
QUINTUPLE BARREL CULVERT

MEMBRANE:- A membrane waterproofing 18" wide, consisting of three mopings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

## BAR LIST FOR ONE WING - 4 REQUIRED

| CLEAR HEIGHT H | $F_1$ Bent: In bottom of footing, bent up into back face of wing. One bar of each length. SIZE | SPACING | NO. REQD | LENGTHS VARY MIN. | LENGTHS VARY MAX. | X MIN. | X MAX. | Y MIN. | Y MAX. | $F_2$ Bent: In bottom of footing, bent up into back face of wing. Alt. with $F_1$ bars. SIZE | SPACING | NO. REQD | LENGTH | X | Y | $F_5$ Straight: Longitudinal in top of wing footing heel. SIZE | NO. REQD | LENGTH | $F_4$ Straight: Longitudinal in bottom of wing footing toe. SIZE | NO. REQD | LENGTH | $H_1$ Straight: Horizontal in back face of wing. SIZE | SPACING | NO. REQD | LENGTH | $H_2$ Straight: Horizontal in back face of wing. One bar of each length. SIZE | SPACING | NO. REQD | LENGTHS VARY MAX. | LENGTHS VARY MIN. | $H_3$ Straight: In back face of wing at top on slope. SIZE | NO. REQD | LENGTH | $H_4$ Bent: Dowels thru construction joint at headwall. SIZE | SPACING | NO. REQD | LENGTH | X | QUANTITY REINFORCING STEEL PER WING LB. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2' | #3 | 12" | 8 | 1'-6" | 3'-10" | 0'-8" | 1'-0" | 0'-11" | 2'-1" | — | — | — | — | — | — | #3 | 1 | 9'-8" | #3 | 2 | 8'-6" | #3 | 12" | 1 | 7'-2" | #3 | 12" | 1 | — | 9'-0" | #8 | 1 | 9'-9" | #3 | 12" | 2 | 2'-8" | 1'-9" | 27.0 |
| 3' | #3 | 12" | 10 | 2'-2" | 5'-2" | 0'-10" | 1'-3" | 1'-5" | 4'-0" | — | — | — | — | — | — | #3 | 1 | 12'-0" | #3 | 2 | 11'-0" | #3 | 12" | 1 | 9'-4" | #3 | 12" | 2 | 7'-6" | 9'-0" | #8 | 1 | 9'-9" | #8 | 12" | 3 | 2'-8" | 1'-9" | 41.1 |
| 4' | #3 | 12" | 13 | 2'-9" | 6'-6" | 0'-11" | 1'-3" | 1'-6" | 5'-0" | — | — | — | — | — | — | #3 | 1 | 14'-6" | #3 | 3 | 13'-6" | #3 | 12" | 1 | 11'-10" | #3 | 12" | 3 | 10'-11" | 9'-0" | #3 | 1 | 12'-2" | #3 | 12" | 4 | 2'-8" | 1'-9" | 63.7 |
| 5' | #3 | 12" | 15 | 2'-11" | 7'-10" | 1'-1" | 1'-11" | 1'-11" | 6'-0" | #3 | 12" | 4 | 3'-6" | 1'-1" | 8'-6" | #3 | 1 | 16'-8" | #3 | 3 | 16'-0" | #8 | 12" | 2 | 14'-2" | #3 | 12" | 3 | 10'-11" | 9'-0" | #3 | 1 | 14'-7" | #3 | 12" | 5 | 2'-8" | 1'-9" | 89.5 |
| 6' | #4 | 12" | 17 | 3'-6" | 9'-3" | 1'-8" | 2'-8" | 2'-5" | 7'-1" | #3 | 12" | 4 | 4'-6" | 1'-4" | 3'-3" | #3 | 1 | 19'-0" | #3 | 3 | 18'-6" | #3 | 12" | 2 | 16'-6" | #3 | 12" | 4 | 14'-6" | 9'-0" | #3 | 1 | 17'-0" | #3 | 12" | 6 | 2'-8" | 1'-9" | 145.8 |
| 7' | #4 | 12" | 20 | 3'-9" | 10'-9" | 1'-3" | 2'-9" | 2'-7" | 8'-1" | #4 | 12" | 7 | 5'-6" | 1'-7" | 4'-0" | #4 | 1 | 21'-4" | #4 | 4 | 21'-0" | #4 | 12" | 2 | 18'-9" | #4 | 12" | 5 | 17'-9" | 9'-0" | #4 | 1 | 19'-5" | #4 | 12" | 7 | 3'-6" | 1'-9" | 283.7 |
| 8' | #4 | 12" | 22 | 4'-4" | 12'-3" | 1'-5" | 3'-2" | 3'-0" | 9'-2" | #4 | 12" | 10 | 6'-6" | 1'-10" | 4'-9" | #4 | 1 | 23'-8" | #4 | 4 | 23'-6" | #4 | 12" | 3 | 21'-1" | #4 | 12" | 5 | 17'-9" | 9'-0" | #4 | 1 | 21'-10" | #4 | 12" | 8 | 3'-6" | 1'-9" | 356.4 |

BAR BENDING DIAGRAMS




NOTE:- Dimensions are to bar centers.

REVISIONS:- Membrane added. 5-10-66 W.C.H.

Designed By:- W.C.H. 8-20-62. Checked By:- RMS 1-9-63
Drawn By:- W.C.H. 12-4-62. Checked By:- RMS 1-31-63
Quantities By:- W.C.H. 12-14-62. Rechecked By:- RMS 3-29-63

## GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾ chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos. as listed below.

| SINGLES | DOUBLES | TRIPLES | QUADRUPLES | QUINTUPLES |
|---|---|---|---|---|
| R-100X-0 | R-200X-0 | R-300X-0 | R-400X-0 | R-500X-0 |
| R-100X-X1 | R-200X-X1 | R-300X-X1 | R-400X-X1 | R-500X-X1 |
| R-100X-X2 | R-200X-X2 | R-300X-X2 | R-400X-X2 | |
| | R-200X-X3 | R-300X-X3 | | |

CLASS S CONCRETE

# ARKANSAS STATE HIGHWAY COMMISSION

## DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

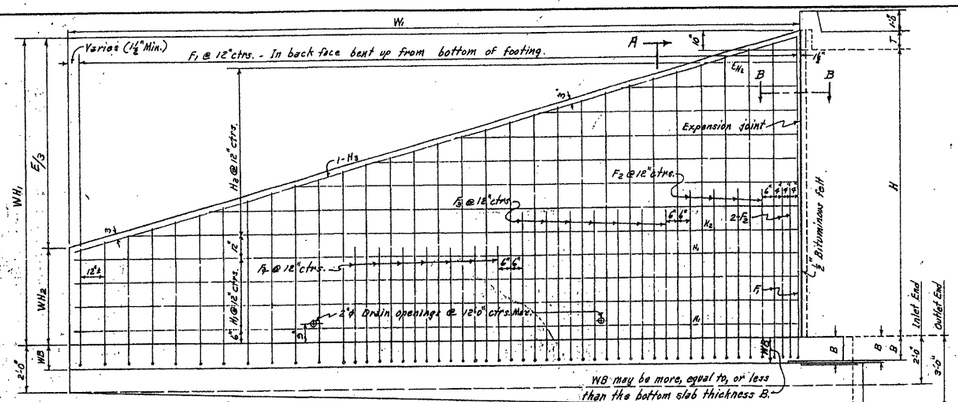
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

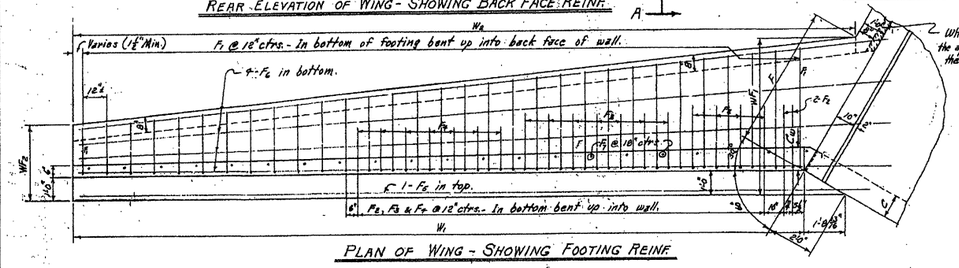
STANDARD DRAWING NO. W-X003-1

MYLAR

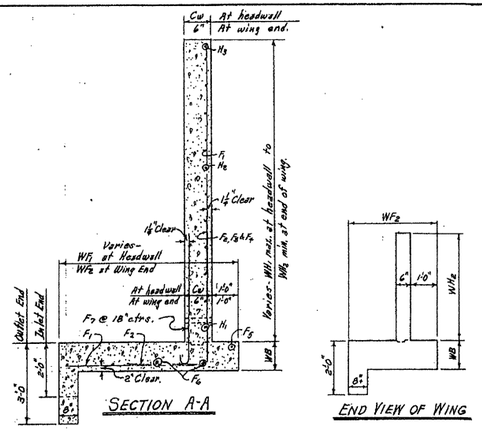
| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No: | | | | | |



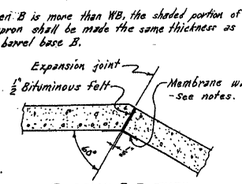

REAR ELEVATION OF WING - SHOWING BACK FACE REINF.



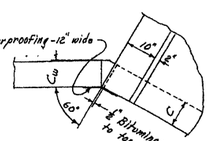

PLAN OF WING - SHOWING FOOTING REINF.




SECTION A-A




SECTION B-B THRU EXPANSION JOINT




DETAIL AT TOP OF WING



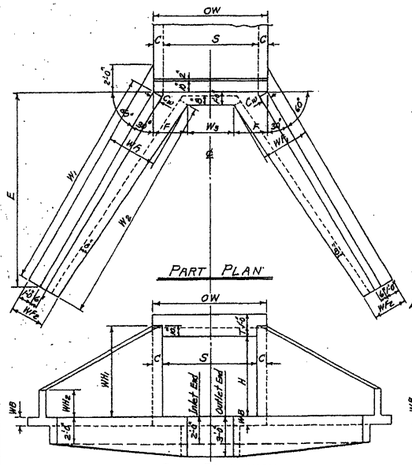

END VIEW OF WING

## WING DIMENSIONS

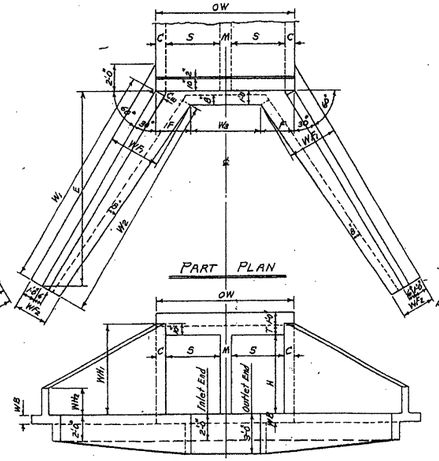
| CLEAR HEIGHT OF BOX | THICKNESS OF WING FOOTING | THICKNESS OF WING AT HEADWALL = C | WINGWALL HEIGHTS | | WIDTHS OF WING FOOTINGS | | PERPENDICULAR FOOTING DIMENSION | PERPENDICULAR DIST. FROM H2WL TO END OF WING | LENGTH OF WINGWALLS | INSIDE FOOTING DIMENSION | * QUANTITY PER WING CLASS S CONCRETE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AT HEADWALL | AT END OF WING | AT HEADWALL | AT END OF WING | PERPENDICULAR | | | | INLET END | OUTLET END |
| H | WB | Cw | WH1 | WH2 | WF1 | WF2 | F | E | W1 | W2 | Cu.Yd. | Cu.Yd. |
| 9' | 10" | 9" | 9'-10" | 3'-0" | 5'-8" | 2'-10½" | 4'-9" | 20'-6" | 23'-8" | 24'-1" | 7.492 | 7.810 |
| 10' | 11" | 10" | 10'-10" | 3'-9" | 5'-8" | 3'-0" | 4'-10" | 22'-6" | 25'-11½" | 27'-6" | 9.584 | 9.905 |
| 11' | 12" | 11" | 11'-10" | 5'-8" | 6'-2" | 3'-1½" | 5'-5" | 24'-6" | 28'-3" | 30'-1½" | 11.977 | 12.361 |
| 12' | 13" | 12" | 12'-10" | 4'-0" | 6'-8" | 3'-3" | 6'-0" | 26'-6" | 30'-7" | 32'-8½" | 14.791 | 15.206 |

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W2.

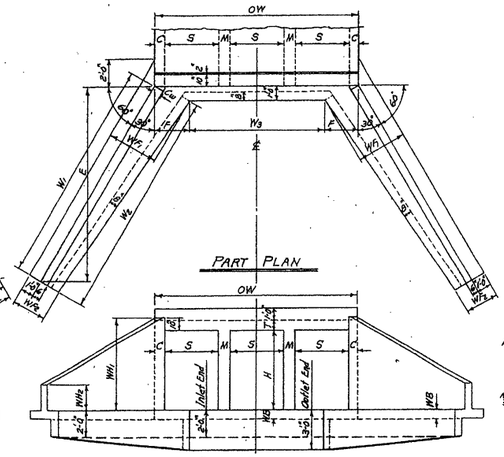
| CLEAR SPAN | CLEAR HEIGHT | 2" FOOTING EXTENSION | W2 = (OW - 2F) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SINGLE BARREL CULVERT | | DOUBLE BARREL CULVERT | | TRIPLE BARREL CULVERT | | QUADRUPLE BARREL CULVERT | | QUINTUPLE BARREL CULVERT | |
| S | H | 2F | OW | W2 | OW | W2 | OW | W2 | OW | W2 | OW | W2 |
| 7' | | | | | | | | | | | | |
| | 9' | 8'-6" | 8'-6" | 0'-0" | 16'-5" | 7'-11" | 24'-4" | 15'-10" | 32'-3" | 23'-9" | 40'-2" | 31'-8" |
| 8' | 9' | 8'-6" | 9'-6" | 1'-0" | 18'-5" | 9'-11" | 27'-4" | 18'-10" | 36'-3" | 27'-9" | 45'-2" | 36'-8" |
| | 10' | 9'-8" | 9'-8" | 0'-0" | 18'-8" | 9'-10" | 27'-8" | 18'-0" | 36'-8" | 27'-0" | 45'-8" | 36'-0" |
| 9' | 9' | 8'-6" | 10'-6" | 2'-0" | 20'-5" | 11'-11" | 30'-4" | 21'-10" | 40'-3" | 31'-9" | 50'-2" | 41'-8" |
| | 10' | 9'-8" | 10'-8" | 1'-0" | 20'-8" | 11'-0" | 30'-8" | 21'-0" | 40'-8" | 31'-0" | 50'-8" | 41'-0" |
| | 11' | 10'-10" | 10'-10" | 0'-0" | 20'-10" | 10'-0" | 30'-10" | 20'-0" | 40'-10" | 30'-0" | 50'-10" | 40'-0" |
| 10' | 9' | 8'-6" | 11'-6" | 3'-0" | 22'-5" | 13'-11" | 33'-4" | 24'-10" | 44'-3" | 35'-9" | 55'-2" | 46'-8" |
| | 10' | 9'-8" | 11'-8" | 2'-0" | 22'-8" | 13'-0" | 33'-8" | 24'-0" | 44'-8" | 35'-0" | 55'-8" | 46'-0" |
| | 11' | 10'-10" | 11'-10" | 1'-0" | 22'-10" | 12'-0" | 33'-10" | 23'-0" | 44'-10" | 34'-0" | 55'-10" | 45'-0" |
| | 12' | 12'-0" | 12'-0" | 0'-0" | 23'-0" | 11'-0" | 34'-0" | 22'-0" | 45'-0" | 33'-0" | 56'-0" | 44'-0" |
| 11' | 9' | 8'-6" | 12'-6" | 4'-0" | 24'-5" | 15'-11" | 36'-4" | 27'-10" | 48'-3" | 39'-9" | | |
| | 10' | 9'-8" | 12'-8" | 3'-0" | 24'-8" | 15'-0" | 36'-8" | 27'-0" | 48'-8" | 39'-0" | | |
| | 11' | 10'-10" | 12'-10" | 2'-0" | 24'-10" | 14'-0" | 36'-10" | 26'-0" | 48'-10" | 38'-0" | | |
| | 12' | 12'-0" | 13'-0" | 1'-0" | 25'-0" | 13'-0" | 37'-0" | 25'-0" | 49'-0" | 37'-0" | | |
| 12' | 9' | 8'-6" | 13'-6" | 5'-0" | 26'-5" | 17'-11" | 39'-4" | 30'-10" | 52'-3" | 43'-9" | | |
| | 10' | 9'-8" | 13'-8" | 4'-0" | 26'-8" | 17'-0" | 39'-8" | 30'-0" | 52'-8" | 43'-0" | | |
| | 11' | 10'-10" | 13'-10" | 3'-0" | 26'-10" | 16'-0" | 39'-10" | 29'-0" | 52'-10" | 42'-0" | | |
| | 12' | 12'-0" | 14'-0" | 2'-0" | 27'-0" | 15'-0" | 40'-0" | 28'-0" | 53'-0" | 41'-0" | | |




SINGLE BARREL CULVERT

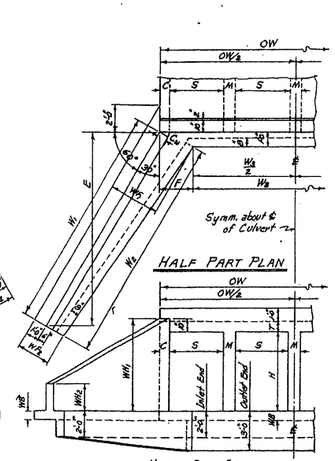



DOUBLE BARREL CULVERT

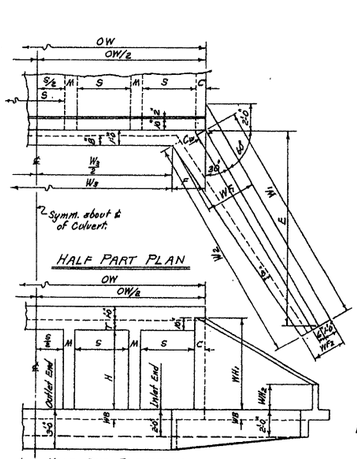



TRIPLE BARREL CULVERT

NOTE:- Plans and Elevations are not to scale.




QUADRUPLE BARREL CULVERT




QUINTUPLE BARREL CULVERT

## QUANTITIES

| CLEAR SPAN | CLEAR HEIGHT | THICKNESS OF WING AT HEADWALL | THICKNESS OF WING FOOTING | REINFORCING STEEL FOR 4 WINGS * | CLASS S CONCRETE - 4 WINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS | | | | |
| | | | | | SINGLE BARREL CULVERT | DOUBLE BARREL CULVERT | TRIPLE BARREL CULVERT | QUADRUPLE BARREL CULVERT | QUINTUPLE BARREL CULVERT |
| S | H | Cw | WB | LB. | CU.YD. | CU.YD. | CU.YD. | CU.YD. | CU.YD. |
| 7' | | | | | | | | | |
| | 9' | 9" | 10" | 2133.2 | 31.16 | 32.84 | 34.51 | 36.19 | 37.87 |
| 8' | 9' | 9" | 10" | 2133.2 | 31.39 | 33.28 | 35.16 | 37.05 | 38.94 |
| | 10' | 10" | 11" | 2651.5 | 39.56 | 41.98 | 43.90 | 45.33 | 47.25 |
| 9' | 9' | 9" | 10" | 2133.2 | 31.61 | 33.73 | 35.81 | 37.91 | 40.01 |
| | 10' | 10" | 11" | 2651.6 | 39.78 | 41.93 | 44.05 | 46.20 | 48.33 |
| | 11' | 11" | 12" | 3249.1 | 49.39 | 51.55 | 53.70 | 55.87 | 58.02 |
| 10' | 9' | 9" | 10" | 2133.2 | 31.83 | 34.17 | 36.47 | 38.73 | 41.12 |
| | 10' | 10" | 11" | 2651.5 | 40.01 | 42.37 | 44.70 | 47.05 | 49.41 |
| | 11' | 11" | 12" | 3249.1 | 49.62 | 52.00 | 54.36 | 56.73 | 59.11 |
| | 12' | 12" | 13" | 4049.2 | 60.79 | 63.19 | 65.57 | 67.97 | 70.37 |
| 11' | 9' | 9" | 10" | 2133.2 | 32.04 | 34.64 | 37.15 | 39.68 | |
| | 10' | 10" | 11" | 2651.5 | 40.22 | 42.83 | 45.37 | 47.99 | |
| | 11' | 11" | 12" | 3249.1 | 49.86 | 52.45 | 55.02 | 57.61 | |
| | 12' | 12" | 13" | 4049.2 | 61.01 | 63.64 | 66.24 | 68.85 | |
| 12' | 9' | 9" | 10" | 2133.2 | 32.27 | 35.11 | 37.84 | 40.69 | |
| | 10' | 10" | 11" | 2651.5 | 40.44 | 43.30 | 46.06 | 48.82 | |
| | 11' | 11" | 12" | 3249.1 | 50.06 | 52.92 | 55.68 | 58.48 | |
| | 12' | 12" | 13" | 4049.2 | 61.24 | 64.10 | 66.90 | 69.73 | |

* For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.

### GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, footings and sidewalls shall be only where shown on plans.

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three mopppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the expansion joints.

Payment for the membrane waterproofing and bituminous felt shall be included in unit price bid for Class S Concrete.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-

Class S Concrete (n=10) 1200#/□"

Reinforcing Steel 20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos. as listed below.

| SINGLES | DOUBLES | TRIPLES | QUADRUPLES | QUINTUPLES |
|---|---|---|---|---|
| R-100X-0 | R-200X-0 | R-300X-0 | R-400X-0 | R-500X-0 |
| R-100X-X2 | R-200X-X2 | R-300X-X2 | R-400X-X2 | |
| | R-200X-X3 | R-300X-X3 | | |

### BAR LIST FOR ONE WING - 4 REQUIRED

| CLEAR HEIGHT | F1 Bent: In bottom of footing, bent up into back face of wing. One bar of each length. | | | | | | | | F2 Bent: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. | | | | | F3 Bent: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. | | | | | F4 Bent: In bottom of footing, bent up into back face of wing ⊥ Alt. with F1 bars. | | | | | F5 Straight: Longitudinal in top of wing footing haul. | | F6 Straight: Longitudinal in bottom of wing footing rod. | | H1 Straight: Horizontal in back face of wing. | | | H2 Straight: Horizontal in back face of wing. One bar of each length | | | | | H3 Straight: In back face of wing at top - on slope | | | F7 Bent: Footing dowels extending up into front face of wing. | | | | | QUANTITY REINFORCING STEEL PER WING | BAR BENDING DIAGRAMS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Size | Spacing | No. Reqd | Lengths Vary Min. | Lengths Vary Max. | X Min. | X Max. | Y Min. | Y Max. | Size | Spacing | No. Reqd | Length | X | Y | Size | Spacing | No. Reqd | Length | X | Y | Size | Spacing | No. Reqd | Length | X | Y | Size | No. Reqd | Length | Size | No. Reqd | Length | Size | Spacing | No. Reqd | Length | Size | No. Reqd | Length | Size | Spacing | No. Reqd | Length | Lengths Vary Max. | Lengths Vary Min. | Size | No. Reqd | Length | Size | Spacing | No. Reqd | Length | X | | |
| H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | LB. | |
| 9' | #5 | 12" | 24 | 5'-0" | 13'-10" | 1'-6" | 3'-8" | 3'-7" | 10'-3" | #5 | 12" | 3 | 7'-6" | 2'-1" | 5'-6" | #4 | 12" | 7 | 6'-6" | 1'-10" | 4'-9" | — | — | — | — | — | — | #4 | 1 | 26'-0" | #4 | 4 | 26'-3" | #4 | 12" | 3 | 23'-5" | #4 | 12" | 6 | 21'-5" | 4'-0" | #4 | 1 | 24'-1" | #4 | 18" | 16 | 4'-0" | 3'-6" | 538.3 | |
| 10' | #5 | 12" | 27 | 5'-6" | 15'-5" | 1'-7" | 4'-2" | 3'-10" | 11'-4" | #6 | 12" | 2 | 8'-6" | 2'-9" | 6'-3" | #5 | 12" | 4 | 7'-6" | 2'-1" | 5'-6" | #4 | 12" | 7 | 6'-6" | 1'-10" | 4'-9" | #4 | 1 | 28'-0" | #4 | 4 | 29'-0" | #4 | 12" | 3 | 25'-8" | #4 | 12" | 7 | 24'-7" | 4'-0" | #4 | 1 | 26'-6" | #4 | 18" | 18 | 4'-3" | 3'-9" | 662.9 | |
| 11' | #5 | 12" | 29 | 6'-0" | 16'-11" | 1'-9" | 4'-7" | 4'-1" | 12'-5" | #6 | 12" | 6 | 8'-6" | 2'-9" | 6'-3" | #5 | 12" | 9 | 7'-6" | 2'-1" | 5'-6" | #4 | 12" | 9 | 7'-6" | 1'-10" | 4'-9" | #4 | 1 | 30'-8" | #4 | 4 | 31'-6" | #4 | 12" | 4 | 28'-0" | #4 | 12" | 7 | 29'-7" | 4'-0" | #4 | 1 | 28'-11" | #4 | 18" | 19 | 4'-9" | 4'-3" | 810.8 | |
| 12' | #5 | 12" | 31 | 6'-6" | 18'-5" | 1'-11" | 5'-0" | 4'-10" | 13'-6" | #7 | 12" | 6 | 9'-6" | 2'-7" | 7'-0" | #6 | 12" | 7 | 8'-6" | 2'-9" | 6'-3" | #4 | 12" | 11 | 8'-6" | 2'-1" | 5'-6" | #4 | 1 | 33'-8" | #4 | 4 | 33'-9" | #5 | 12" | 4 | 30'-8" | #4 | 12" | 8 | 28'-0" | 4'-0" | #4 | 1 | 31'-9" | #4 | 18" | 21 | 5'-0" | 4'-6" | 1012.3 | |

* Except as shown at headwall.

Note:- Dimensions are to bar centers.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

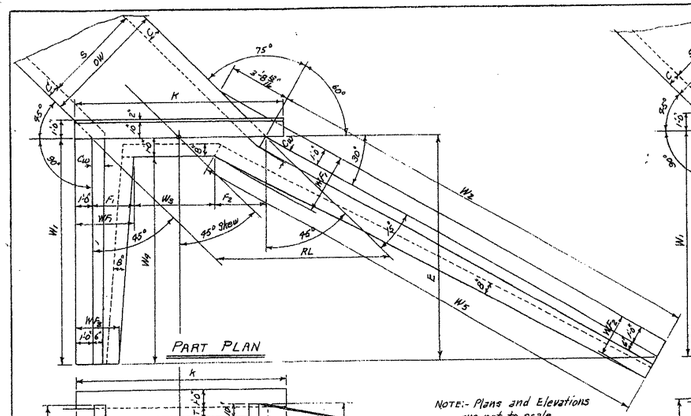
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER FOR H = 9'-0" & OVER.

STANDARD DRAWING NO. W-X003-2

4

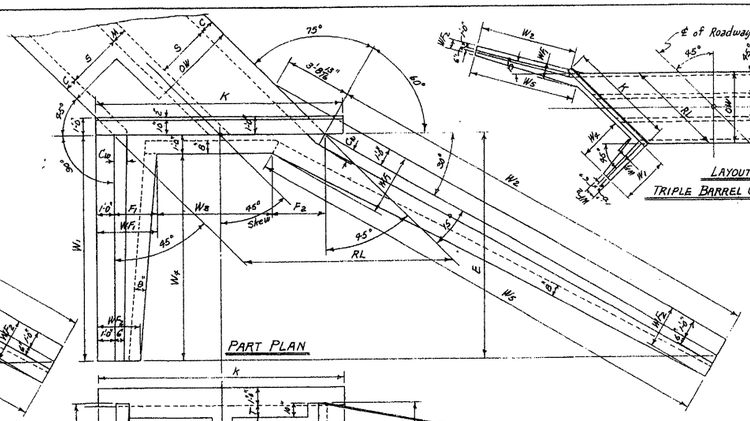
Designed By:- W.C.H. 7-25-62 Checked By:- RHS 1-31-63
Drawn By:- W.C.H. 12-31-62 Checked By:- RHS 1-31-63
Quantities By:- W.C.H. 1-11-63 Checked By:- RHS 1-31-63 Rechecked By:-

| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |




SINGLE BARREL CULVERT- 45° SKEW RIGHT FORWARD

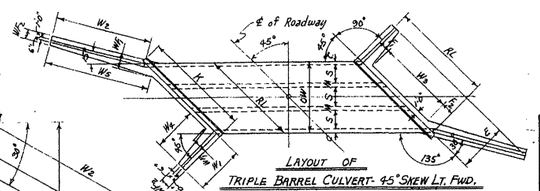
Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.

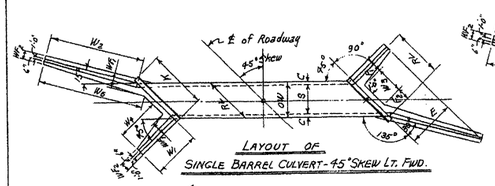


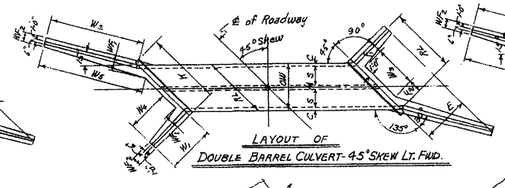

DOUBLE BARREL CULVERT- 45° SKEW RIGHT FORWARD

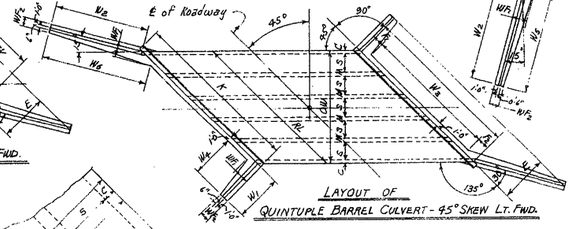
Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.

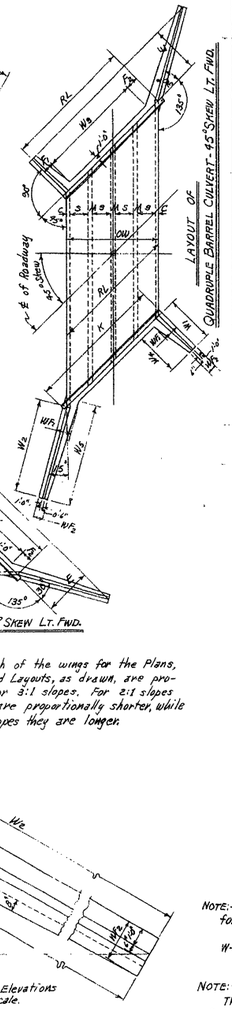
NOTE:- Plans and Elevations are not to scale.

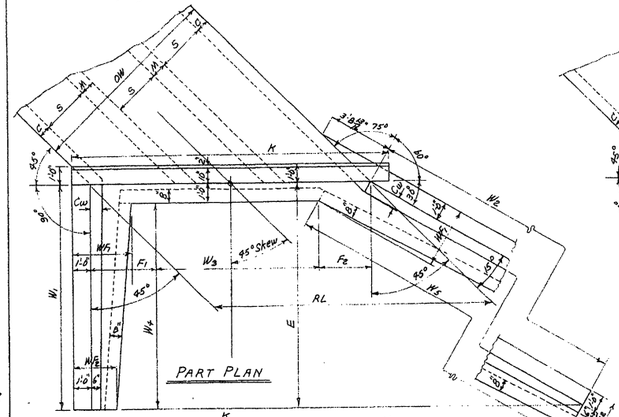


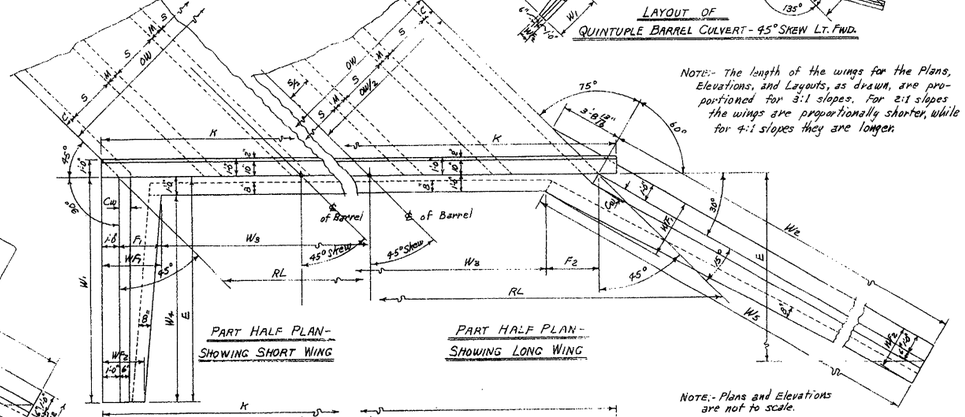

TRIPLE BARREL CULVERT- 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Layout at top center of sheet.




QUADRUPLE BARREL CULVERT- 45° SKEW Rt. Fwd.

Details of Culvert with 45° Skew Left Forward is reversed, see Layout at above center.




QUINTUPLE BARREL CULVERT- 45° SKEW Rt. Fwd.

Details of Culvert with 45° Skew Left Forward is reversed, see Layout above.

Note:- Plans and Elevations are not to scale.

ROADWAY LENGTH RL — HEADWALL LENGTH K — APRON DIMENSION $W_3$

RL = OW × 1.414 + 21 — K = RL + (2'0") — $W_3 = RL - (F_1 + F_2)$

| USE WITH DRAWING NO. | CLEAR SPAN S | CLEAR HEIGHT H | SUM OF FILLET DIMENSIONS $F_1 + F_2$ | SINGLE BARREL CULVERT OW | SINGLE BARREL CULVERT RL | SINGLE BARREL CULVERT K | SINGLE BARREL CULVERT $W_3$ | DOUBLE BARREL CULVERT OW | DOUBLE BARREL CULVERT RL | DOUBLE BARREL CULVERT K | DOUBLE BARREL CULVERT $W_3$ | TRIPLE BARREL CULVERT OW | TRIPLE BARREL CULVERT RL | TRIPLE BARREL CULVERT K | TRIPLE BARREL CULVERT $W_3$ | QUADRUPLE BARREL CULVERT OW | QUADRUPLE BARREL CULVERT RL | QUADRUPLE BARREL CULVERT K | QUADRUPLE BARREL CULVERT $W_3$ | QUINTUPLE BARREL CULVERT OW | QUINTUPLE BARREL CULVERT RL | QUINTUPLE BARREL CULVERT K | QUINTUPLE BARREL CULVERT $W_3$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W-X452-1, W-X453-1 OR W-X454-1. (FOR H=8'0" OR LESS) | 4' | 2' | 2'3½" | 5'-0" | 7'-0⅞" | 9'-0⅛" | 4'-3⅝" | 9'-8" | 13'-8" | 15'-8" | 11'-4⅝" | 14'-4" | 20'-3½" | 22'-3½" | 18'-0" | 19'-0" | 26'-10½" | 28'-10½" | 24'-7½" | 23'-8" | 33'-5⅛" | 35'-5⅛" | 31'-2⅛" |
| | | 3' | 3'-3½" | 5'-0" | " | " | 3'-9⅝" | 9'-8" | " | " | 10'-4⅝" | 14'-4" | " | " | 17'-0" | 19'-0" | " | " | 23'-7½" | 23'-8" | " | " | 30'-2½" |
| | | 4' | 4'-3½" | 5'-0" | " | " | 2'-9⅝" | 9'-8" | " | " | 9'-4⅝" | 14'-4" | " | " | 16'-0" | 19'-0" | " | " | 22'-7½" | 23'-8" | " | " | 29'-2½" |
| | | 5' | 5'-3½" | 5'-0" | 7'-0⅞" | 9'-0⅛" | 1'-9⅝" | 9'-8" | 13'-8" | 15'-8" | 8'-4⅝" | 14'-4" | 20'-3½" | 22'-3½" | 15'-0" | 19'-0" | 26'-10½" | 28'-10½" | 21'-7½" | 23'-8" | 33'-5⅛" | 35'-5⅛" | 28'-2½" |
| | | 6' | 6'-3½" | 5'-2" | 7'-3⅝" | 9'-3⅜" | 1'-0½" | 9'-11" | 14'-0⅝" | 16'-0⅝" | 7'-10⅝" | 14'-8" | 20'-8⅜" | 22'-9" | 14'-5½" | 19'-5" | 27'-5⅝" | 29'-5⅝" | 21'-2½" | 24'-2" | 34'-2⅜" | 36'-2" | 27'-10⅜" |
| | 5' | 3' | 3'-3½" | 6'-0" | 8'-5⅜" | 10'-8⅝" | 5'-2⅝" | 11'-8" | 16'-6" | 18'-6" | 13'-2⅜" | 17'-4" | 24'-4⅝" | 26'-4⅝" | 21'-3" | 23'-0" | 32'-6⅜" | 34'-6⅜" | 29'-1" | 28'-8" | 40'-6½" | 42'-6½" | 37'-3⅜" |
| | | 4' | 4'-3½" | 6'-0" | " | " | 4'-2⅝" | 11'-8" | " | " | 12'-2⅜" | 17'-4" | " | " | 26'-3" | 23'-0" | " | " | 28'-3" | 28'-8" | " | " | 36'-3⅜" |
| | | 5' | 5'-3½" | 6'-0" | 8'-5⅜" | 10'-5⅝" | 3'-2⅝" | 11'-8" | 16'-6" | 18'-6" | 11'-2⅜" | 17'-4" | 24'-4⅝" | 26'-4⅝" | 19'-3" | 23'-0" | 32'-6⅜" | 34'-6⅜" | 27'-1" | 28'-8" | 40'-6½" | 42'-6½" | 35'-3⅜" |
| | | 6' | 6'-3½" | 6'-2" | 8'-8⅜" | 10'-8⅝" | 2'-5⅝" | 11'-11" | 16'-10⅝" | 18'-10⅝" | 10'-1" | 17'-8" | 24'-8⅜" | 26'-8⅜" | 17'-6" | 23'-5" | 32'-10⅜" | 34'-10⅜" | 25'-3" | 29'-2" | 41'-0" | 43'-3" | 34'-11⅜" |
| | | 7' | 7'-3½" | 6'-3" | 8'-10⅜" | 10'-10⅝" | 1'-8⅝" | 12'-1" | 17'-1" | 19'-1" | 9'-3⅜" | 17'-11" | 25'-0" | 27'-0" | 17'-4⅜" | 23'-8" | 33'-3" | 35'-3" | 25'-6" | 29'-6" | 41'-6" | 43'-10" | 34'-10⅜" |
| | 6' | 3' | 3'-3½" | 7'-0" | 9'-10⅜" | 11'-10⅝" | 6'-7⅝" | 13'-8" | 19'-3⅝" | 21'-4" | 16'-0⅜" | 20'-4" | 28'-5⅜" | 30'-9" | 25'-5⅜" | 27'-0" | 38'-2⅝" | 40'-2⅝" | 34'-11" | 33'-8" | 47'-7⅞" | 49'-7⅞" | 44'-4" |
| | | 4' | 4'-3½" | 7'-0" | " | " | 5'-7⅝" | 13'-8" | " | " | 15'-0⅜" | 20'-4" | " | " | 33'-11" | 33'-8" | " | " | 43'-4" | | | | |
| | | 5' | 5'-3½" | 7'-0" | 9'-10⅜" | 11'-10⅝" | 4'-7⅝" | 13'-8" | 19'-3⅝" | 21'-4" | 14'-0⅜" | 20'-4" | 28'-5⅜" | 30'-9" | 23'-5⅜" | 27'-0" | 38'-2⅝" | 40'-2⅝" | 32'-11" | 33'-8" | 47'-7⅞" | 49'-7⅞" | 42'-4" |
| | | 6' | 6'-3½" | 7'-2" | 10'-1⅜" | 12'-1⅝" | 3'-10⅝" | 13'-11" | 19'-5⅞" | 21'-8⅛" | 13'-5" | 20'-5" | 29'-2⅝" | 31'-2⅝" | 21'-11⅛" | 27'-5" | 38'-9½" | 40'-9½" | 32'-6" | 34'-2" | 48'-5⅛" | 50'-3⅝" | 42'-0⅛" |
| | | 7' | 7'-3½" | 7'-3" | 10'-3⅜" | 12'-3⅝" | 2'-5⅝" | 14'-1" | 19'-11" | 21'-11" | 12'-1⅝" | 20'-11" | 29'-7" | 31'-7" | 21'-5⅝" | 27'-9" | 39'-3" | 41'-3" | 31'-5⅝" | 34'-7" | 48'-10" | 50'-11" | 41'-7⅝" |
| | | 8' | 8'-3½" | 7'-4" | 10'-4½" | 12'-4½" | 1'-1½" | 14'-2" | 20'-0⅝" | 22'-0⅝" | 10'-9⅛" | 21'-0" | 29'-8⅝" | 31'-10⅝" | 20'-5⅝" | 27'-10" | 39'-4⅝" | 41'-4⅝" | 30'-1" | 34'-8" | 49'-0⅝" | 51'-0⅝" | 39'-9" |
| | 7' | 4' | 4'-3½" | 8'-0" | 11'-3⅜" | 13'-3⅝" | 7'-0⅛" | 15'-8" | 22'-1⅛" | 24'-1⅛" | 17'-0⅛" | 23'-4" | 33'-0" | 35'-0" | 28'-0⅜" | 31'-0" | 43'-10⅛" | 45'-10" | 38'-6⅜" | 38'-8" | 54'-8½" | 56'-8½" | 50'-5" |
| | | 5' | 5'-3½" | 8'-0" | 11'-3⅜" | 13'-3⅝" | 6'-0⅛" | 15'-9" | 22'-1⅛" | 24'-1⅛" | 17'-0⅛" | 23'-4" | 33'-0" | 35'-0" | 27'-0⅜" | 31'-0" | 43'-10⅛" | 45'-10" | 38'-6⅜" | 38'-8" | 54'-8½" | 56'-8½" | 50'-5" |
| | | 6' | 6'-3½" | 8'-2" | 11'-5⅜" | 13'-5⅝" | 5'-3⅛" | 15'-11" | 22'-4⅛" | 24'-4⅛" | 16'-2⅛" | 23'-8" | 33'-5⅜" | 35'-5⅜" | 27'-2⅜" | 31'-5" | 44'-3⅛" | 46'-3" | 38'-11⅜" | 39'-2" | 55'-2⅛" | 57'-2⅛" | 50'-11⅜" |
| | | 7' | 7'-3½" | 8'-3" | 11'-8" | 13'-8" | 5'-0⅜" | 16'-1" | 22'-6" | 24'-7" | 16'-4⅜" | 23'-11" | 33'-9⅜" | 35'-11" | 26'-10⅜" | 31'-9" | 44'-8⅜" | 46'-8" | 39'-3⅜" | 39'-8" | 55'-8⅜" | 57'-8⅜" | 51'-6" |
| | | 8' | 8'-3½" | 8'-4" | 11'-9⅜" | 13'-9⅝" | 3'-10⅝" | 16'-2" | 22'-7⅛" | 24'-7⅛" | 15'-7" | 24'-0" | 33'-11⅛" | 35'-11⅛" | 24'-8" | 31'-10" | 45'-0⅛" | 47'-0⅛" | 35'-9" | 39'-8" | 56'-1⅛" | 58'-1⅛" | 46'-10" |
| | 8' | 4' | 4'-3½" | 9'-0" | 12'-0⅜" | 14'-0⅝" | 8'-1⅝" | 17'-8" | 24'-1⅛" | 26'-1⅛" | 20'-0⅛" | 26'-4" | 37'-2⅜" | 39'-2⅜" | 32'-1⅛" | 35'-0" | 49'-6" | 51'-6" | 44'-3⅛" | 43'-8" | 61'-7" | 63'-7" | 57'-5⅛" |
| | | 5' | 5'-3½" | 9'-2" | 12'-1⅜" | 14'-1⅝" | 7'-0⅛" | 17'-9" | 24'-1⅛" | 26'-1⅛" | 20'-0⅛" | 26'-8" | 37'-2⅜" | 39'-2⅜" | 32'-1⅛" | 35'-5" | 50'-1" | 52'-1" | 44'-3⅛" | 44'-0" | 62'-5⅛" | 64'-5⅛" | 57'-2⅛" |
| | | 6' | 6'-3½" | 9'-2" | 12'-1⅜" | 14'-1⅝" | 6'-0⅛" | 17'-11" | 25'-1" | 27'-1" | 19'-0⅛" | 26'-8" | 37'-6⅜" | 39'-6⅜" | 31'-5⅛" | 35'-5" | 50'-1" | 52'-1" | 43'-9⅜" | 44'-2" | 62'-5⅛" | 64'-5⅛" | 57'-0⅛" |
| | | 7' | 7'-3½" | 9'-3" | 13'-1" | 15'-1" | 5'-1⅜" | 18'-1" | 25'-4⅛" | 27'-7" | 17'-9⅛" | 26'-11" | 38'-0⅛" | 40'-0⅛" | 30'-8⅜" | 35'-6" | 50'-6⅛" | 52'-6⅛" | 42'-9⅛" | 44'-7" | 63'-0⅛" | 65'-0⅛" | 55'-3⅛" |
| | | 8' | 8'-3½" | 9'-4" | 13'-2⅜" | 15'-2⅝" | 3'-11⅛" | 18'-2" | 25'-8⅛" | 27'-8⅛" | 16'-5" | 27'-0" | 38'-2⅝" | 40'-2⅝" | 28'-11" | 35'-10" | 50'-10⅝" | 52'-8" | 41'-5" | 44'-8" | 63'-2⅝" | 65'-2⅝" | 53'-10⅝" |
| | 9' | 5' | 5'-3½" | 10'-2" | 14'-3⅝" | 16'-3⅞" | 9'-1⅞" | 19'-11" | 28'-2" | 30'-2" | 22'-10⅝" | 29'-8" | 41'-1⅝" | 43'-1⅝" | 36'-0⅝" | 39'-5" | 55'-10⅝" | 57'-9" | 50'-5⅝" | 49'-2" | 69'-2⅝" | 71'-1⅝" | 64'-3⅝" |
| | | 6' | 6'-3½" | 10'-3" | 14'-6" | 16'-6" | 8'-2⅝" | 20'-1" | 28'-4⅛" | 30'-4⅛" | 22'-1⅛" | 29'-11" | 42'-3⅜" | 44'-3⅜" | 36'-2⅛" | 39'-9" | 56'-2⅝" | 58'-2⅝" | 49'-11⅛" | 49'-7" | 70'-1⅛" | 72'-1⅛" | 63'-10⅛" |
| | | 7' | 7'-3½" | 10'-3" | 14'-6" | 16'-6" | 6'-3⅜" | 20'-1" | 28'-4⅛" | 30'-4⅛" | 20'-7⅝" | 29'-11" | 42'-3⅜" | 44'-3⅜" | 34'-6⅛" | 39'-9" | 56'-2⅝" | 58'-2⅝" | 48'-5⅝" | 49'-7" | 70'-1⅛" | 72'-1⅛" | 62'-9⅛" |
| | | 8' | 8'-3½" | 10'-4" | 14'-7⅜" | 16'-7⅝" | 5'-1⅜" | 20'-2" | 28'-4⅝" | 30'-4⅝" | 19'-3" | 30'-0" | 42'-5⅜" | 44'-5⅜" | 33'-2" | 39'-10" | 56'-6" | 58'-6" | 47'-10⅜" | 49'-8" | 70'-2⅜" | 72'-2" | 60'-11⅜" |
| | 10' | 5' | 5'-3½" | 11'-2" | 15'-9⅜" | 17'-9⅝" | 10'-2⅞" | 21'-11" | 31'-0" | 33'-0" | 24'-9⅝" | 32'-8" | 46'-2⅜" | 48'-2⅜" | 40'-1" | 43'-5" | 61'-7⅝" | 63'-7⅝" | 56'-1⅜" | 54'-6" | 76'-7⅛" | 78'-7⅛" | 71'-4" |
| | | 6' | 6'-3½" | 11'-3" | 15'-11" | 17'-11" | 9'-1⅞" | 22'-1" | 31'-2⅝" | 33'-2⅝" | 23'-5⅝" | 32'-11" | 46'-6⅜" | 48'-6⅜" | 38'-9⅝" | 43'-9" | 61'-10⅝" | 63'-10⅝" | 54'-1⅝" | 54'-9" | 77'-0⅛" | 79'-0⅛" | 69'-5" |
| | | 7' | 7'-3½" | 11'-3" | 15'-11" | 17'-11" | 8'-1⅜" | 22'-1" | 31'-2⅝" | 33'-2⅝" | 23'-5⅝" | 32'-11" | 46'-6⅜" | 48'-6⅜" | 38'-9⅝" | 43'-9" | 61'-10⅝" | 63'-10⅝" | 54'-1⅝" | 54'-9" | 77'-0⅛" | 79'-0⅛" | 69'-5" |
| | | 8' | 8'-3½" | 11'-4" | 16'-0⅜" | 18'-0⅝" | 6'-11⅜" | 22'-2" | 31'-4⅝" | 33'-4⅝" | 22'-1" | 33'-0" | 46'-8" | 48'-8" | 37'-6⅜" | 43'-10" | 61'-11⅝" | 63'-11⅝" | 52'-8⅜" | 54'-8" | 77'-1⅛" | 79'-1⅛" | 68'-6½" |
| | 11' | 6' | 6'-3½" | 12'-0" | 17'-0⅛" | 19'-0⅜" | 11'-2⅝" | 24'-2" | 34'-2⅛" | 36'-2" | 27'-11" | 36'-0" | 50'-4" | 52'-11" | 44'-2⅜" | 47'-9" | 67'-0⅛" | 69'-0⅛" | 60'-4" | — | — | — | — |
| | | 7' | 7'-3½" | 12'-4" | " | " | 9'-8⅜" | 24'-2" | " | " | 26'-5" | 36'-0" | " | " | 43'-7⅛" | 47'-10" | " | " | 59'-10⅛" | — | — | — | — |
| | | 8' | 8'-3½" | 12'-5" | " | " | 8'-2⅜" | 24'-2" | " | " | 24'-11" | 36'-0" | " | " | 41'-7⅛" | 47'-10" | " | " | 58'-10⅛" | — | — | — | — |
| | 12' | 6' | 6'-3½" | 13'-1" | 18'-5⅝" | 20'-5⅞" | 12'-7⅛" | 26'-2" | 37'-0⅝" | 39'-0" | 30'-8⅝" | 39'-0" | 53'-11⅛" | 57'-1⅛" | 48'-6⅝" | 51'-10" | 73'-3⅝" | 75'-3⅝" | 67'-0⅝" | — | — | — | — |
| | | 7' | 7'-3½" | 13'-1" | " | " | 11'-1⅞" | 26'-2" | " | " | 29'-2⅝" | 39'-0" | " | " | 47'-6⅝" | 51'-10" | " | " | 65'-5⅛" | — | — | — | — |
| | | 8' | 8'-3½" | 13'-1" | " | " | 9'-7⅞" | 26'-2" | " | " | 27'-10⅝" | 39'-0" | " | " | 46'-10⅝" | 51'-10" | " | " | 64'-10⅛" | — | — | — | — |
| W-X452-2, W-X453-2 OR W-X454-2. (FOR H=9'-0" & OVER) | 7' | 9' | 10'-9⅛" | 8'-6" | 12'-0⅝" | 14'-0⅝" | 1'-3" | 16'-5" | 23'-2⅝" | 25'-2⅝" | 12'-5⅜" | 24'-4" | 36'-5" | 36'-5" | 23'-7⅞" | 32'-3" | 45'-7⅛" | 47'-7⅛" | 34'-10" | 40'-2" | 56'-9⅜" | 58'-9⅜" | 46'-0⅝" |
| | 8' | 9' | 10'-9⅛" | 9'-6" | 13'-5⅛" | 15'-5⅜" | 2'-8" | 18'-5" | 26'-0⅝" | 28'-0⅝" | 15'-3⅛" | 27'-4" | 38'-7⅜" | 40'-5" | 27'-10⅝" | 36'-3" | 51'-3⅛" | 53'-3⅛" | 39'-10" | 45'-2" | 63'-10⅝" | 65'-10⅝" | 53'-1⅛" |
| | | 10' | 12'-3⅛" | 9'-8" | 13'-8" | 15'-8" | 1'-6⅜" | 18'-8" | 26'-4⅝" | 28'-4⅝" | 14'-1⅛" | 27'-10" | 39'-1⅛" | 41'-1⅛" | 27'-6" | 36'-8" | 51'-10⅝" | 53'-10⅝" | 39'-7" | 45'-8" | 64'-7" | 66'-7" | 52'-3⅝" |
| | 9' | 9' | 10'-9⅛" | 10'-6" | 14'-10⅝" | 16'-10⅞" | 4'-1" | 20'-5" | 28'-10⅝" | 30'-10⅝" | 18'-1⅜" | 30'-8" | 43'-2⅝" | 44'-10⅝" | 32'-1⅞" | 40'-3" | 56'-11⅜" | 58'-11" | 44'-7⅜" | 50'-2" | 70'-11⅜" | 72'-11⅜" | 60'-2⅝" |
| | | 10' | 12'-3⅛" | 10'-8" | 15'-1" | 17'-1" | 2'-9⅜" | 20'-8" | 29'-2⅝" | 31'-2⅝" | 18'-11⅝" | 30'-8" | 43'-10⅜" | 45'-10⅜" | 31'-1⅜" | 40'-8" | 57'-4⅝" | 59'-4⅝" | 45'-3" | 50'-8" | 71'-7⅜" | 73'-7⅜" | 59'-4⅝" |
| | | 11' | 13'-3⅛" | 10'-10" | 15'-3⅜" | 17'-3⅝" | 1'-4⅝" | 20'-10" | 29'-5⅛" | 31'-5⅛" | 15'-10⅝" | 30'-10" | 43'-7⅛" | 45'-7⅛" | 29'-10" | 40'-10" | 57'-1" | 59'-1" | 43'-10⅝" | 50'-10" | 71'-10⅝" | 73'-10⅝" | 58'-1⅛" |
| | 10' | 9' | 10'-9⅛" | 11'-6" | 16'-3⅝" | 18'-3⅞" | 5'-1" | 22'-5" | 31'-8⅜" | 33'-8⅜" | 20'-11⅝" | 33'-4" | 47'-1⅜" | 49'-1⅜" | 34'-6⅜" | 44'-3" | 62'-7" | 64'-7" | 49'-11⅜" | 55'-2" | 78'-1⅝" | 80'-1⅝" | 63'-0" |
| | | 10' | 12'-3⅛" | 11'-8" | 16'-6" | 18'-6" | 4'-2⅝" | 22'-8" | 32'-0⅝" | 34'-0⅝" | 19'-9⅛" | 33'-8" | 47'-5⅜" | 49'-5⅜" | 35'-4⅛" | 44'-8" | 63'-2" | 65'-2" | 50'-10⅜" | 55'-8" | 78'-8⅝" | 80'-8⅝" | 66'-5⅛" |
| | | 11' | 13'-3⅛" | 11'-10" | 16'-8⅜" | 18'-8⅝" | 3'-3⅛" | 22'-10" | 32'-3⅜" | 34'-3⅜" | 18'-6⅝" | 33'-10" | 47'-10⅝" | 49'-10⅝" | 36'-1" | 44'-10" | 63'-4⅝" | 65'-5" | 51'-3⅛" | 55'-10" | 78'-11⅝" | 80'-11⅝" | 65'-11⅛" |
| | | 12' | 14'-3⅛" | 12'-0" | 16'-11⅜" | 18'-11⅝" | 2'-1⅝" | 23'-1" | 32'-6⅛" | 34'-6⅛" | 17'-3" | 34'-0" | 48'-1⅛" | 50'-1" | 32'-9⅜" | 45'-0" | 63'-7⅜" | 65'-7⅜" | 51'-8⅛" | 56'-0" | 79'-2⅜" | 81'-2⅜" | 63'-11⅛" |
| | 11' | 9' | 10'-9⅛" | 12'-4" | 17'-0⅝" | 19'-0⅞" | 6'-10⅝" | 24'-5" | 34'-6⅜" | 36'-6⅜" | 28'-9⅜" | 36'-4" | 51'-0⅝" | 53'-0⅝" | 40'-0⅛" | 48'-3" | 67'-5⅝" | 69'-5⅝" | 55'-0⅛" | — | — | — | — |
| | | 10' | 12'-3⅛" | 12'-8" | 17'-11" | 19'-11" | 5'-7⅜" | 24'-8" | 34'-10⅝" | 36'-10⅝" | 22'-7⅛" | 36'-8" | 51'-10⅝" | 53'-10⅝" | 39'-7" | 48'-8" | 68'-3⅛" | 70'-3⅛" | 55'-4⅝" | — | — | — | — |
| | | 11' | 13'-3⅛" | 12'-10" | 18'-1⅜" | 20'-1⅝" | 4'-4⅝" | 24'-10" | 35'-1⅜" | 37'-1⅜" | 21'-4⅝" | 36'-11" | 52'-1⅛" | 54'-1" | 38'-3⅛" | 48'-10" | 68'-6⅛" | 70'-6⅛" | 55'-10⅜" | — | — | — | — |
| | | 12' | 14'-3⅛" | 13'-0" | 18'-3⅝" | 20'-3⅞" | 3'-1⅞" | 25'-1" | 35'-4⅝" | 37'-4⅝" | 20'-1" | 37'-1" | 52'-3⅝" | 54'-3⅝" | 37'-0⅝" | 49'-3" | 68'-10⅝" | 70'-10⅝" | 56'-3⅜" | — | — | — | — |
| | 12' | 9' | 10'-9⅛" | 13'-1" | 18'-1⅞" | 20'-1⅞" | 8'-5⅝" | 24'-5" | 37'-6⅜" | 39'-6⅜" | 26'-7" | 39'-4" | 55'-7⅝" | 57'-7⅝" | 44'-0⅝" | 52'-3" | 73'-10⅝" | 75'-10⅝" | 61'-7⅛" | — | — | — | — |
| | | 10' | 12'-3⅛" | 13'-8" | 19'-2⅜" | 21'-2⅝" | 7'-10⅝" | 24'-8" | 37'-10⅝" | 39'-10⅝" | 25'-5⅝" | 39'-8" | 56'-1⅛" | 58'-1" | 43'-8" | 52'-8" | 74'-5⅝" | 76'-5⅝" | 62'-2⅝" | — | — | — | — |
| | | 11' | 13'-3⅛" | 13'-10" | 19'-4⅝" | 21'-4⅝" | 6'-9⅛" | 24'-10" | 38'-1⅜" | 40'-1⅜" | 24'-2⅝" | 39'-10" | 56'-6" | 58'-6" | 42'-1⅝" | 52'-10" | 74'-10⅝" | 76'-10⅝" | 62'-8⅛" | — | — | — | — |
| | | 12' | 14'-3⅛" | 14'-0" | 19'-6⅜" | 21'-6⅝" | 5'-7⅛" | 25'-1" | 38'-4⅝" | 40'-4⅝" | 22'-11" | 40'-0" | 56'-10⅝" | 58'-10⅝" | 41'-3⅛" | 53'-0" | 75'-3⅝" | 77'-3⅝" | 62'-11⅛" | — | — | — | — |

NOTE:- This drawing to be used in conjunction with Standard Wing Drawings for 45° Skews for each slope as listed below.

| 2:1 Slopes | 3:1 Slopes | 4:1 Slopes |
|---|---|---|
| W-X452-1 or W-X452-2 | W-X453-1 or W-X453-2 | W-X454-1 or W-X454-2. |

NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.-

| SINGLES | DOUBLES | TRIPLES | QUADRUPLES | QUINTUPLES |
|---|---|---|---|---|
| R-145X-0 | R-245X-01 | R-345X-01 | R-445X-01 | R-545X-01 |
| | R-245X-02 | R-345X-02 | R-445X-02 | R-545X-02 |
| R-145X-1 | R-245X-1 | R-345X-1 | R-445X-1 | |
| | R-245X-2 | R-345X-2 | | |

CLASS S CONCRETE

# ARKANSAS STATE HIGHWAY COMMISSION

## DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 45° SKEW

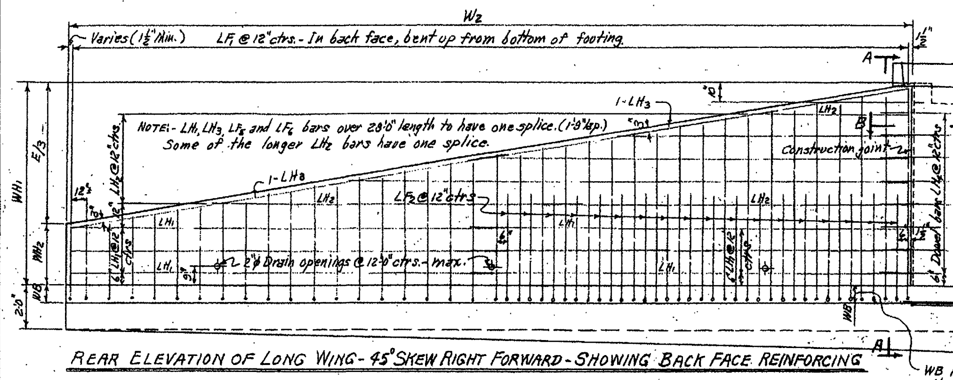
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 2:1, 3:1 & 4:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER H= 2', 3', 4', 5', 6', 7', 8', 9', 10', 11' & 12'

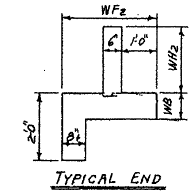
STANDARD DRAWING No. W-X45

Designed by:- W.C.H. 5-16-49
Drawn by:- W.C.H. 6-15-49
Quantities by:-
Checked by:-
Checked by:- JEM. 6-23-49
Checked by:-

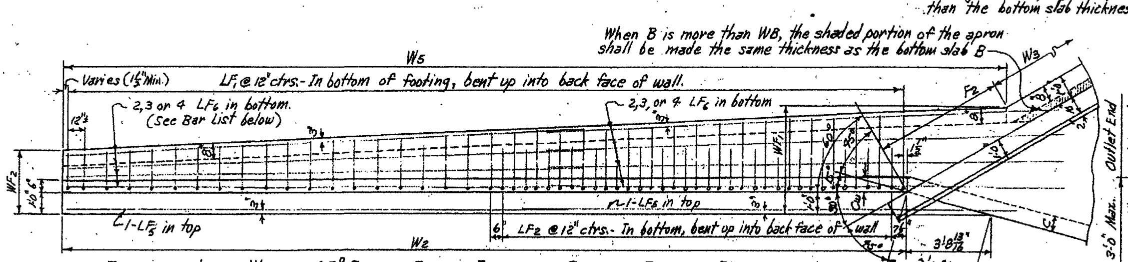
| FED. ROAD No. | STATE | FED. AID PROJECT | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 6 | ARK. | | | | |
| JOB No. | | | | | |



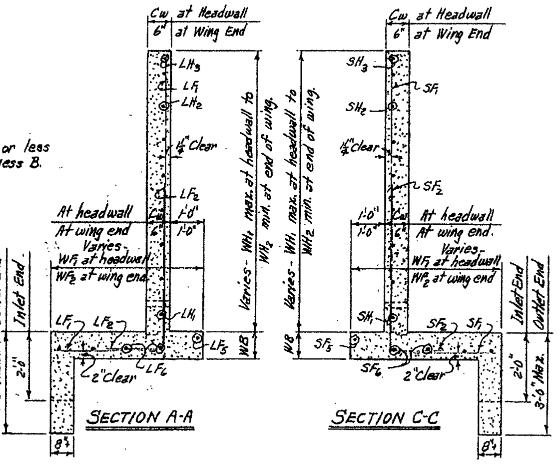

REAR ELEVATION OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING

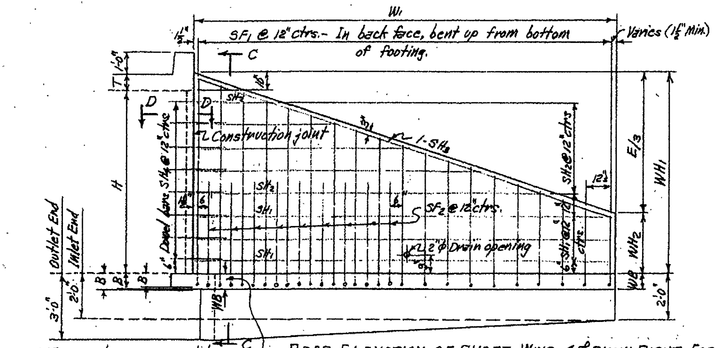



TYPICAL END VIEW OF WING

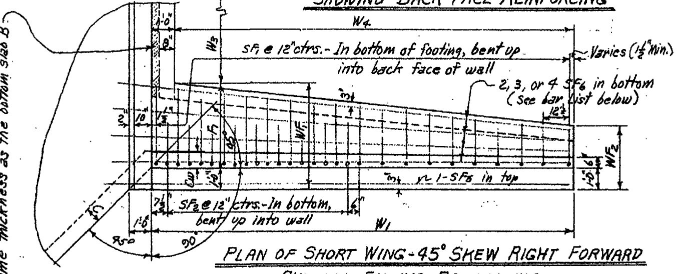



PLAN OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING FOOTING REINFORCING



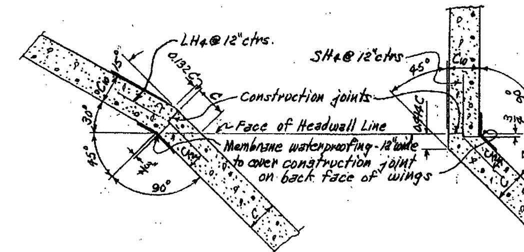




REAR ELEVATION OF SHORT WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING

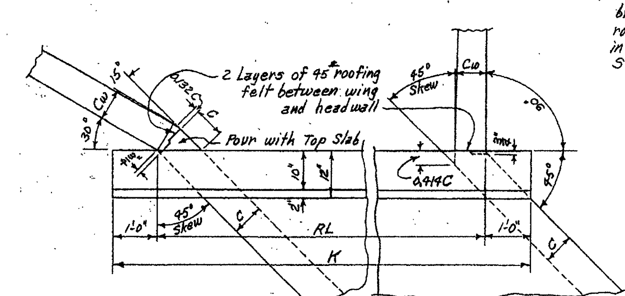



When B is more than WB, the shaded portion of the apron shall be made the same thickness as the bottom slab B.

PLAN OF SHORT WING - 45° SKEW RIGHT FORWARD SHOWING FOOTING REINFORCING

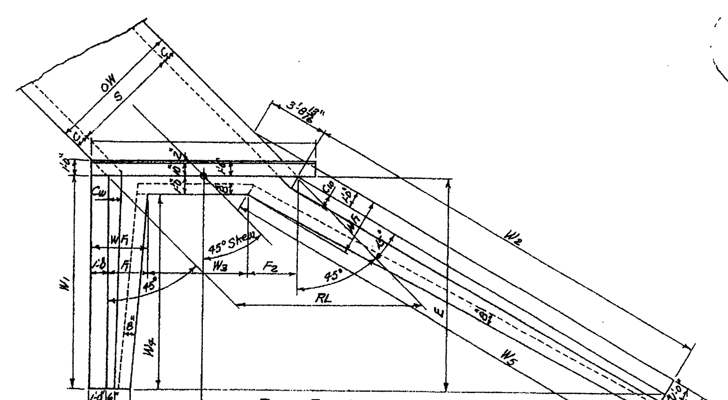



SECTIONS THRU CONSTRUCTION JOINTS



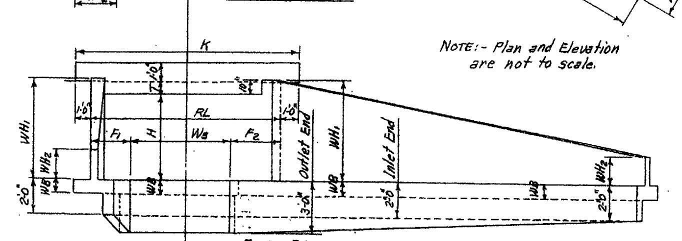

DETAILS AT TOP OF WINGS - 45° SKEW RIGHT FORWARD

NOTE:- Payment for the membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.




PART PLAN

NOTE:- Plan and Elevation are not to scale.




END ELEVATION

SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Drawing No. W-X45.

TYPICAL WING DETAILS

NOTE:-
For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X45.
For values of RL, K and $W_3$ for each box, see above Std. also.

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

REVISIONS:- Membrane Added. 5-10-66 W.C.H.

### REGULAR WING DIMENSIONS - 3:1 SLOPES

| Clear Height of Box | Thickness of Wing Footing | Thickness of Wing at Hdwl.=C | Wingwall Heights: At Headwall | Wingwall Heights: At End of Wing | Widths of Wing Footings: At Headwall | Widths of Wing Footings: At End of Wing | Footing Dimension Parallel with Headwall: Short Wing | Footing Dimension Parallel with Headwall: Long Wing | Perpendicular Dist. from Hdwl. to End of Wing | Lengths of Wingwalls: Short Wing | Lengths of Wingwalls: Long Wing | Inside Footing Dimension: Short Wing | Inside Footing Dimension: Long Wing | * Quantity per Wing, Class S Concrete: Inlet End Short Wing | Inlet End Long Wing | Outlet End Short Wing | Outlet End Long Wing |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | WB | Cw | WH1 | WH2 | WF1 | WF2 | F1 | F2 | E | W1 | W2 | W4 | W5 | Cu.Yd. | Cu.Yd. | Cu.Yd. | Cu.Yd. |
| 2' | 7" | 6" | 2'-10" | 0'-8" | 2'-4" | 2'-0" | 1'-4" | 0'-11 5/8" | 6'-6" | 6'-6" | 13'-0" | 5'-6" | 13'-3 3/8" | 0.743 | 1.572 | 0.827 | 1.741 |
| 3' | 7" | 6" | 3'-10" | 1'-0" | 2'-8" | 2'-1 1/2" | 1'-8" | 1'-7 5/8" | 8'-6" | 8'-6" | 17'-0" | 7'-6" | 17'-10 3/4" | 1.120 | 2.364 | 1.229 | 2.590 |
| 4' | 7" | 6" | 4'-10" | 1'-4" | 3'-0" | 2'-3" | 2'-0" | 2'-3 1/4" | 10'-6" | 10'-6" | 21'-0" | 9'-6" | 22'-5 1/2" | 1.567 | 3.295 | 1.700 | 3.577 |
| 5' | 7" | 6" | 5'-10" | 1'-8" | 3'-4" | 2'-4 1/2" | 2'-4" | 2'-11 1/8" | 12'-6" | 12'-6" | 25'-0" | 11'-6" | 27'-0 1/2" | 2.082 | 4.367 | 2.241 | 4.705 |
| | | 7" | 5'-10" | 1'-8" | 3'-4" | 2'-4 1/2" | 2'-4" | 2'-11 1/8" | 12'-6" | 12'-6" | 25'-0" | 11'-6" | 27'-0 1/2" | 2.166 | 4.551 | 2.325 | 4.889 |
| 6' | 8" | 7" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-8" | 3'-7 3/4" | 14'-6" | 14'-6" | 29'-0" | 13'-6" | 31'-7 1/2" | 2.894 | 6.055 | 3.078 | 6.450 |
| | | 7 1/2" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-8" | 3'-7 3/4" | 14'-6" | 14'-6" | 29'-0" | 13'-6" | 31'-7 1/2" | 2.952 | 6.180 | 3.135 | 6.575 |
| | | 8" | 6'-10" | 2'-0" | 3'-8" | 2'-6" | 2'-8" | 3'-7 3/4" | 14'-6" | 14'-6" | 29'-0" | 13'-6" | 31'-7 1/2" | 3.009 | 6.305 | 3.192 | 6.700 |
| 7' | 8 1/2" | 7 1/2" | 7'-10" | 2'-4" | 4'-2" | 2'-7 1/2" | 3'-2" | 4'-7 3/4" | 16'-6" | 16'-6" | 33'-0" | 15'-6" | 36'-5 3/4" | 3.794 | 7.930 | 4.003 | 8.385 |
| | | 8" | 7'-10" | 2'-4" | 4'-2" | 2'-7 1/2" | 3'-2" | 4'-7 3/4" | 16'-6" | 16'-6" | 33'-0" | 15'-6" | 36'-5 3/4" | 3.870 | 8.093 | 4.078 | 8.548 |
| 8' | 9" | 8" | 8'-10" | 2'-8" | 4'-8" | 2'-9" | 3'-8" | 5'-7 1/2" | 18'-6" | 18'-6" | 37'-0" | 17'-6" | 41'-4 1/4" | 4.855 | 10.136 | 5.088 | 10.651 |

* Quantity per wing does not include headwall or that portion of apron or toewall for the length $W_3$.

### QUANTITIES

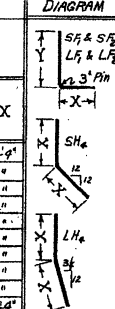
| Clear Span | Clear Height | Thickness of Wing at Headwall | Thickness of Wing Footing | ⊕ Reinforcing Steel for 4 Wings | Class S Concrete - 4 Wings (Headwalls, Wingwalls, Footings, Toewalls and Aprons): Single Barrel Culvert | Double Barrel Culvert | Triple Barrel Culvert | Quadruple Barrel Culvert | Quintuple Barrel Culvert |
|---|---|---|---|---|---|---|---|---|---|
| S | H | Cw | WB | LB. | Cu.Yd. | Cu.Yd. | Cu.Yd. | Cu.Yd. | Cu.Yd. |
| 4' | 2' | 6" | 7" | 142 | 6.15 | 7.50 | 8.86 | 10.22 | 11.58 |
| | 3' | 6" | 7" | 214 | 8.44 | 9.79 | 11.14 | 12.50 | 13.86 |
| | 4' | 6" | 7" | 328 | 11.13 | 12.48 | 13.84 | 15.20 | 16.56 |
| | 5' | 6" | 7" | 463 | 14.25 | 15.60 | 16.96 | 18.32 | 19.68 |
| | 6' | 7" | 8" | 763 | 19.23 | 20.62 | 22.02 | 23.41 | 24.81 |
| 5' | 3' | 6" | 7" | 214 | 8.74 | 10.38 | 12.03 | 13.67 | 15.32 |
| | 4' | 6" | 7" | 328 | 11.43 | 13.07 | 14.72 | 16.37 | 18.02 |
| | 5' | 6" | 7" | 463 | 14.55 | 16.19 | 17.84 | 19.49 | 21.14 |
| | 6' | 7" | 8" | 763 | 19.53 | 21.21 | 22.90 | 24.59 | 26.28 |
| | 7' | 7½" | 8½" | 1475 | 24.98 | 26.69 | 28.41 | 30.14 | 31.86 |
| 6' | 3' | 6" | 7" | 214 | 9.03 | 10.99 | 12.91 | 14.86 | 16.79 |
| | 4' | 6" | 7" | 328 | 11.73 | 13.69 | 15.60 | 17.56 | 19.48 |
| | 5' | 6" | 7" | 463 | 14.85 | 16.80 | 18.72 | 20.68 | 22.60 |
| | 6' | 7" | 8" | 763 | 19.83 | 21.82 | 23.79 | 25.78 | 27.76 |
| | 7' | 7½" | 8½" | 1475 | 25.28 | 27.30 | 29.31 | 31.33 | 33.35 |
| | 8' | 8" | 9" | 1872 | 31.70 | 33.74 | 35.75 | 37.79 | 39.81 |
| 7' | 4' | 6" | 7" | 328 | 12.04 | 14.31 | 16.54 | 18.81 | 21.02 |
| | 5' | 6" | 7" | 463 | 15.15 | 17.43 | 19.65 | 21.93 | 24.13 |
| | 6' | 7" | 8" | 763 | 20.14 | 22.44 | 24.69 | 26.99 | 29.24 |
| | 7' | 7½" | 8½" | 1475 | 25.59 | 27.91 | 30.21 | 32.53 | 34.83 |
| | 8' | 8" | 9" | 1872 | 32.02 | 34.35 | 36.66 | 38.99 | 41.31 |
| 8' | 4' | 6" | 7" | 328 | 12.35 | 14.95 | 17.49 | 20.08 | 22.57 |
| | 5' | 7" | 7" | 463 | 16.05 | 18.67 | 21.24 | 23.86 | 26.37 |
| | 6' | 7" | 8" | 763 | 20.45 | 23.07 | 25.64 | 28.26 | 30.77 |
| | 7' | 7½" | 8½" | 1475 | 25.90 | 28.54 | 31.13 | 33.78 | 36.32 |
| | 8' | 8" | 9" | 1872 | 32.33 | 34.97 | 37.56 | 40.21 | 42.80 |
| 9' | 5' | 7" | 7" | 463 | 16.37 | 19.32 | 22.18 | 25.02 | 27.91 |
| | 6' | 7½" | 8" | 763 | 21.16 | 24.13 | 27.02 | 29.89 | 32.81 |
| | 7' | 7½" | 8½" | 1475 | 26.21 | 29.18 | 32.08 | 34.97 | 37.86 |
| | 8' | 8" | 9" | 1872 | 32.63 | 35.61 | 38.51 | 41.37 | 44.29 |
| 10' | 5' | 7" | 7" | 463 | 16.69 | 19.96 | 23.14 | 26.27 | 29.47 |
| | 6' | 7½" | 8" | 763 | 21.48 | 24.77 | 27.99 | 31.13 | 34.36 |
| | 7' | 7½" | 8½" | 1475 | 26.53 | 29.82 | 33.04 | 36.19 | 39.42 |
| | 8' | 8" | 9" | 1872 | 32.95 | 36.25 | 39.46 | 42.62 | 45.85 |
| 11' | 6' | 8" | 8" | 763 | 22.18 | 25.83 | 29.35 | 32.84 | — |
| | 7' | 8" | 8½" | 1475 | 27.39 | 30.99 | 34.51 | 38.01 | — |
| | 8' | 8" | 9" | 1872 | 33.26 | 36.91 | 40.43 | 43.93 | — |
| 12' | 6' | 8" | 8" | 763 | 22.50 | 26.51 | 30.33 | 34.19 | — |
| | 7' | 8" | 8½" | 1475 | 27.66 | 31.66 | 35.49 | 39.35 | — |
| | 8' | 8" | 9" | 1872 | 33.58 | 37.58 | 41.41 | 45.27 | — |

⊕ For reinforcing steel in Headwalls and Aprons, see Drawing Nos. of Barrel Sections listed below.

### BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

| Clear Height | Wing Location | SF1 & LF1 Bent (In bottom of footing, bent up into back face of wing. One bar (or two bars) of each length.) Size | Spacing | No. Req'd | Lengths Vary Min. | Lengths Vary Max. | X Min. | X Max. | Y Min. | Y Max. | SF2 & LF2 Bent (In bottom of footing, bent up into back face of wing. Alt. with F1 bars) Size | Spacing | No. Req'd | Length | X | Y | SF5 & LF5 Straight (Longitudinal in top of wing footing heel.) Size | No. Req'd | Length | SF6 & LF6 Straight (Longitudinal in bottom of wing footing toe.) Size | No. Req'd | Length | SH1 & LH1 Straight (Horizontal in back face of wing.) Size | Spacing | No. Req'd | Length | SH2 & LH2 Straight (Horizontal in back face of wing. One bar of each length.*) Size | Spacing | No. Req'd | Lengths Vary Max. | Lengths Vary Min. | SH3 & LH3 Straight (In back face of wing at top - on slope) Size | No. Req'd | Length | SH4 & LH4 Bent (Dowels thru construction joint at headwall.) Size | Spacing | No. Req'd | Length | X | Quantity: Reinforcing Steel per Wing - Lbs. Short Wing | Long Wing |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | Short or Long | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2' | Short | #3 | 12" | 7 | 1'-7" | 3'-11" | 0'-8" | 1'-0" | 1'-0" | 3'-0" | — | — | — | — | — | — | #3 | 1 | 8'-4" | #3 | 2 | 8'-0" | #3 | 12" | 1 | 6'-3" | #3 | 12" | 1 | — | 3'-3" | #3 | 1 | 6'-7" | #3 | 12" | 2 | 2'-8" | 1'-4" | 24.4 | 46.3 |
| | Long | #3 | 12" | 14 | 1'-5" | 3'-11" | 0'-8" | 1'-0" | 0'-10" | 3'-0" | — | — | — | — | — | — | #3 | 1 | 17'-6" | #3 | 2 | 15'-6" | #3 | 12" | 1 | 12'-8" | #3 | 12" | 1 | — | 6'-6" | #3 | 1 | 12'-11" | #3 | 12" | 2 | " | " | | |
| 3' | Short | #3 | 12" | 9 | 2'-1" | 5'-3" | 0'-10" | 1'-4" | 1'-4" | 4'-0" | — | — | — | — | — | — | #3 | 1 | 10'-4" | #3 | 2 | 10'-0" | #3 | 12" | 1 | 8'-3" | #3 | 12" | 2 | 6'-3" | 3'-3" | #3 | 1 | 8'-8" | #3 | 12" | 3 | " | " | 36.8 | 70.3 |
| | Long | #3 | 12" | 18 | 1'-11" | 5'-3" | 0'-10" | 1'-4" | 1'-2" | 4'-0" | — | — | — | — | — | — | #3 | 1 | 21'-6" | #3 | 2 | 20'-2" | #3 | 12" | 1 | 16'-8" | #3 | 12" | 2 | 12'-6" | 6'-6" | #3 | 1 | 16'-11" | #3 | 12" | 3 | " | " | | |
| 4' | Short | #3 | 12" | 11 | 2'-6" | 6'-7" | 0'-11" | 1'-8" | 1'-8" | 5'-0" | — | — | — | — | — | — | #3 | 1 | 12'-4" | #3 | 3 | 12'-0" | #3 | 12" | 1 | 10'-3" | #3 | 12" | 3 | 9'-3" | 3'-3" | #3 | 1 | 10'-9" | #3 | 12" | 4 | " | " | 55.9 | 107.9 |
| | Long | #3 | 12" | 22 | 2'-4" | 6'-6" | 0'-11" | 1'-7" | 1'-6" | 5'-0" | — | — | — | — | — | — | #3 | 1 | 25'-6" | #3 | 3 | 24'-10" | #3 | 12" | 1 | 20'-8" | #3 | 12" | 3 | 18'-6" | 6'-6" | #3 | 1 | 21'-0" | #3 | 12" | 4 | " | " | | |
| 5' | Short | #3 | 12" | 13 | 2'-11" | 7'-11" | 1'-0" | 2'-0" | 2'-0" | 6'-0" | #3 | 12" | 3 | 3'-6" | 1'-1" | 2'-6" | #3 | 1 | 14'-4" | #3 | 3 | 14'-0" | #3 | 12" | 2 | 12'-3" | #3 | 12" | 3 | 9'-3" | 3'-3" | #3 | 1 | 12'-11" | #3 | 12" | 5 | " | " | 77.7 | 153.7 |
| | Long | #3 | 12" | 26 | 2'-9" | 7'-10" | 1'-0" | 1'-11" | 1'-10" | 6'-0" | #3 | 12" | 6 | 3'-6" | 1'-1" | 2'-6" | #3 | 2 | 15'-8" | #3 | 6 | 15'-7" | #3 | 12" | 2 | 24'-8" | #3 | 12" | 3 | 18'-6" | 6'-6" | #3 | 1 | 25'-1" | #3 | 12" | 5 | " | " | | |
| 6' | Short | #4 | 12" | 15 | 3'-6" | 9'-4" | 1'-2" | 2'-4" | 2'-5" | 7'-1" | #3 | 12" | 3 | 4'-6" | 1'-4" | 3'-3" | #3 | 1 | 16'-4" | #3 | 3 | 16'-0" | #3 | 12" | 2 | 14'-3" | #3 | 12" | 4 | 12'-3" | 3'-3" | #3 | 1 | 15'-0" | #3 | 12" | 6 | " | " | 127.6 | 253.9 |
| | Long | #4 | 12" | 30 | 3'-4" | 9'-3" | 1'-2" | 2'-3" | 2'-3" | 7'-1" | #3 | 12" | 6 | 4'-6" | 1'-4" | 3'-3" | #3 | 2 | 17'-8" | #3 | 6 | 18'-0" | #3 | 12" | 4 | 15'-2" | #3 | 12" | 4 | 24'-6" | 6'-6" | #3 | 2 | 15'-5" | #3 | 12" | 6 | 2'-8" | 1'-4" | | |
| 7' | Short | #4 | 12" | 17 | 3'-11" | 10'-10" | 1'-3" | 2'-10" | 2'-9" | 8'-1" | #4 | 12" | 6 | 5'-6" | 1'-7" | 4'-0" | #4 | 1 | 18'-4" | #4 | 4 | 18'-0" | #4 | 12" | 2 | 16'-3" | #4 | 12" | 5 | 15'-3" | 3'-3" | #4 | 1 | 17'-1" | #4 | 12" | 7 | 3'-6" | 1'-9" | 246.5 | 491.1 |
| | Long | #4 | 12" | 34 | 3'-9" | 10'-8" | 1'-3" | 2'-8" | 2'-7" | 8'-1" | #4 | 12" | 12 | 5'-6" | 1'-7" | 4'-0" | #4 | 2 | 19'-8" | #4 | 8 | 20'-4" | #4 | 12" | 4 | 17'-2" | #4 | 12" | 5 | *30'-6" | 6'-6" | #4 | 2 | 17'-5" | #4 | 12" | 7 | " | " | | |
| 8' | Short | #4 | 12" | 19 | 4'-6" | 12'-5" | 1'-5" | 3'-4" | 3'-2" | 9'-2" | #4 | 12" | 9 | 6'-6" | 1'-10" | 4'-9" | #4 | 1 | 20'-4" | #4 | 4 | 20'-0" | #4 | 12" | 3 | 18'-3" | #4 | 12" | 5 | 15'-3" | 3'-3" | #4 | 1 | 19'-3" | #4 | 12" | 8 | " | " | 312.5 | 623.6 |
| | Long | #4 | 12" | 38 | 4'-4" | 12'-3" | 1'-5" | 3'-2" | 3'-0" | 9'-2" | #4 | 12" | 18 | 6'-6" | 1'-10" | 4'-9" | #4 | 2 | 21'-8" | #4 | 8 | 22'-9" | #4 | 12" | 6 | 19'-2" | #4 | 12" | 5 | *30'-6" | 6'-6" | #4 | 2 | 19'-6" | #4 | 12" | 8 | 3'-6" | 1'-9" | | |

BAR BENDING DIAGRAM




NOTE:- Dimensions are to bar centers.

NOTE:- Bars for short wing shall be marked with prefix letter "S", while those for long wing shall be marked with letter "L". * Length without splice. Bars over 28'-0" length may be spliced. (1'-8" lap)

### GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 20,000 #/□"

NOTE:-
This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.-

| SINGLES | DOUBLES | TRIPLES | QUADRUPLES | QUINTUPLES |
|---|---|---|---|---|
| R-145X-0 | R-245X-01 | R-345X-01 | R-445X-01 | R-545X-01 |
| | R-245X-02 | R-345X-02 | R-445X-02 | R-545X-02 |
| R-145X-1 | R-245X-1 | R-345X-1 | R-445X-1 | |
| | R-245X-2 | R-345X-2 | | |

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 45° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES

3:1 SLOPES
ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING No. W-X453-1

Designed By:- W.C.H. 5-13-63 Checked By:-
Drawn By:- W.C.H. 6-5-64 Checked By:- J&M 7-21-64
Quantities By:- W.C.H. 7-2-64 Checked By:- J&M 7-21-64