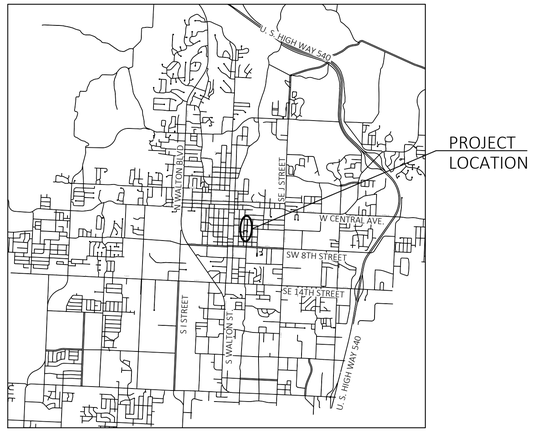
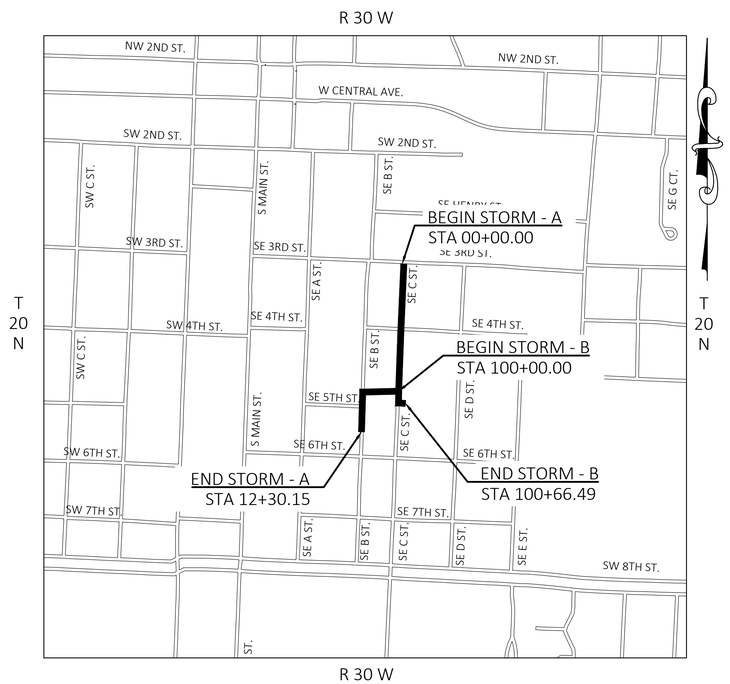



VICINITY MAP

# CITY OF BENTONVILLE, ARKANSAS

## CONSTRUCTION PLANS FOR SE C LATERALS CEI PROJECT NO.32252 (MUNIS #21EN0017) FEBRUARY 2022




TOTAL LENGTH OF PROJECT = 1,297 LF (0.25 MILES)

PROJECT CONTACTS

CITY OF BENTONVILLE
TRANSPORTATION DEPARTMENT
CONTACT: DENNIS BIRGE
3200 SW. MUNICIPAL DRIVE
BENTONVILLE, AR 72712
PHONE: 479-271-6840
EMAIL: DBIRGE@BENTONVILLEAR.COM

CITY OF BENTONVILLE
CITY ENGINEER
CONTACT: DAN WEESE
3200 SW. MUNICIPAL DRIVE
BENTONVILLE, AR 72712
PHONE: 479-271-6840
EMAIL: DWEESE@BENTONVILLEAR.COM

TELEPHONE
AT&T
CONTACT: BRENT BALDWIN
1133 HAROLD STREET
FAYETTEVILLE, AR 72744
PHONE: 479-220-9022
EMAIL: BB6585@ATT.COM

WATER/SEWER
CITY OF BENTONVILLE
CONTACT: BEAU THOMPSON, AICP
3200 SW MUNICIPAL DRIVE
BENTONVILLE, AR 72712
PHONE: 479-271-3140
EMAIL: BTHOMPSON@BENTONVILLEAR.COM

ELECTRIC
CITY OF BENTONVILLE
CONTACT: TRAVIS MATLOCK
3200 SW MUNICIPAL DRIVE
BENTONVILLE, AR 72712
PHONE: 479-271-3135
EMAIL: TMATLOCK@BENTONVILLEAR.COM

CABLE
COX
CONTACT: MICHAEL MOORE
4901 S. 48TH STREET
SPRINGDALE, AR 72762
PHONE: 479-717-3730
EMAIL: MICHAEL.MOORE3@COX.COM

NAUTRAL GAS
BLACK HILLS ENERGY
CONTACT: JOSH KNIGHT
1301 FEDERAL WAY
P.O. BOX 2129
LOWELL, AR 72745
PHONE: 479-320-5091 / 479-721-4543
EMAIL:
JOSH.KNIGHT@BLACKHILLSCORP.COM

TELECOMMUNICATION
RITTER COMMUNICATIONS
CONTACT: KYLE GRAHAM
5078 W NORTHGATE ROAD, STE 220
ROGERS, AR 72758
PHONE: (479) 567-9370
EMAIL: KYLE.GRAHAM@
RITTERCOMMUNICATIONS.COM

CERTIFICATE OF AUTHORIZATION
CEI Engineering Associates, Inc.
No. 118
ARKANSAS ENGINEER

CEI ENGINEERING ASSOCIATES, INC.
3108 SW REGENCY PKWY
BENTONVILLE, AR 72712
PHONE: (479) 273-9472
FAX: (479) 273-0844

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CITY OF BENTONVILLE
SE C LATERALS
BENTONVILLE, AR

PRELIMINARY
NOT FOR
CONSTRUCTION

| | |
|---|---|
| PROFESSIONAL OF RECORD | BLM |
| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

TITLE SHEET
SHEET TITLE
SHEET NUMBER
1

DRAWING LOCATION: P:\32000\32252.01\DRAWINGS\DESIGN\WORKING\32252-COVER.DWG - SAVED BY - CECHOLS

## INDEX OF SHEETS



## ARDOT ROADWAY STANDARD DRAWINGS

| DRWG. NO. | TITLE | DATE |
|---|---|---|
| CG-1 | CURBING DETAILS | 11/29/2007 |
| FES-1 | FLARED END SECTION | 10/18/1996 |
| FES-2 | FLARED END SECTION | 10/18/1996 |
| FPC-9 | DETAILS OF DROP INLETS & JUNCTION BOXES | 11/16/2001 |
| FPC-9E | DETAILS OF DROP INLETS (TYPE C) | 08/22/2002 |
| FPC-9M | DETAILS OF DROP INLETS (TYPE MO) | 08/22/2002 |
| PM-1 | PAVEMENT MARKING DETAILS | 02/27/2020 |
| SHS-2 | U-CHANNEL POST ASSEMBLIES | 07/25/2019 |
| SHS-3 | DETAIL OF BREAKAWAY SIGN SUPPORTS FOR GUIDE SIGNS | 09/12/2013 |
| SHS-4 | DETAIL OF BREAKAWAY SIGN SUPPORTS FOR STANDARD SIGNS | 09/12/2013 |
| TC-1 | STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION | 11/07/2019 |
| TC-2 | STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION | 11/07/2019 |
| TC-3 | STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION | 02/27/2020 |
| TC-4 | STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER | 11/07/2019 |
| TC-5 | STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER | 11/07/2019 |
| TEC-1 | TEMPORARY EROSION CONTROL DEVICES | 11/16/2017 |
| TEC-2 | TEMPORARY EROSION CONTROL DEVICES | 06/02/1994 |
| TEC-3 | TEMPORARY EROSION CONTROL DEVICES | 11/03/1994 |
| WR-1 | WHEELCHAIR RAMPS NEW CONSTRUCTION AND ALTERATIONS | 11/10/2005 |
| WR-2 | WHEELCHAIR RAMPS ALTERATIONS ONLY | 10/09/2003 |


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| PROFESSIONAL OF RECORD | BLM |
| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

INDEX OF SHEETS
SHEET TITLE

SHEET NUMBER
2

DRAWING LOCATION: P:\32000\32252.01\DRAWINGS\DESIGN\WORKING\32252-COVER.DWG - SAVED BY - CECHOLS

GENERAL NOTES

1. TOPOGRAPHIC SURVEY, INCLUDING PROPERTY LINES, LEGAL DESCRIPTION, EXISTING UTILITIES, SITE TOPOGRAPHY WITH SPOT ELEVATIONS, OUTSTANDING PHYSICAL FEATURES AND EXISTING STRUCTURE LOCATIONS WAS PROVIDED BY THE FOLLOWING COMPANY, AS A CONTRACTOR TO THE SELLER/OWNER:

   CEI ENGINEERING ASSOCIATES INC.
   3108 S.W. REGENCY PARKWAY
   BENTONVILLE, AR 72712
   (479) 273-9241

2. ALL MATERIALS DEEMED ACCEPTABLE FOR CITY USE SHALL BE PRESERVED, SAVED, AND DELIVERED TO A LOCATION DEEMED BY THE CITY FOR FUTURE USE. CONTRACTOR IS TO REMOVE AND DISPOSE OF ALL OTHER MATERIALS RESULTING FROM PREVIOUS AND CURRENT DEMOLITION OPERATIONS. DISPOSAL WILL BE IN ACCORDANCE WITH ALL LOCAL STATE . AND/OR FEDERAL REGULATIONS GOVERNING SUCH OPERATIONS. CONTRACTOR SHALL TAKE PRECAUTION TO PROTECT EXISTING PIPE CULVERTS FROM DAMAGE DURING THEIR REMOVAL AND SHALL RETURN THE UNDAMAGED PIPE CULVERTS TO THE OWNER.

3. UNLESS NOTED IN THE PLANS, ALL RCP PIPE PLACED SHALL BE CLASS III OR BETTER.

4. STORM SEWER RINGS AND LIDS SHALL BE INSTALLED TO MATCH THE CROSS SLOPE OF THE FINISHED PAVEMENT.

5. ALL STORM SEWER BOX LIDS WITHIN THE SIDEWALK SHALL HAVE A MAXIMUM CROSS SLOPE OF 2% AND MUST MEET THE MINIMUM ADA REQUIREMENTS AND GUIDELINES.

6. THE GENERAL CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR AND SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT.

7. WARRANTY/DISCLAIMER: THE DESIGNS REPRESENTED IN THESE PLANS ARE IN ACCORDANCE WITH ESTABLISHED PRACTICES OF CIVIL ENGINEERING FOR THE DESIGN FUNCTIONS AND USES INTENDED BY THE OWNER AT THIS TIME. HOWEVER, NEITHER THE ENGINEER NOR ITS PERSONNEL CAN OR DO WARRANT THESE DESIGNS OR PLANS AS CONSTRUCTED EXCEPT IN THE SPECIFIC CASES WHERE THE ENGINEER INSPECTS AND CONTROLS THE PHYSICAL CONSTRUCTION ON A CONTEMPORARY BASIS AT THE SITE.

8. SAFETY NOTICE TO CONTRACTOR IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. ANY CONSTRUCTION OBSERVATION BY THE ENGINEER OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, IN, ON OR NEAR THE CONSTRUCTION SITE.

9. WETLANDS NOTE: ANY DEVELOPMENT, EXCAVATION, CONSTRUCTION, OR FILLING IN A U.S. CORPS OF ENGINEERS DESIGNATED WETLAND IS SUBJECT TO LOCAL, STATE AND FEDERAL APPROVALS. THE CONTRACTOR SHALL COMPLY WITH ALL PERMIT REQUIREMENTS AND/OR RESTRICTIONS AND ANY VIOLATION WILL BE SUBJECT TO FEDERAL PENALTY. THE CONTRACTOR SHALL HOLD THE OWNER/DEVELOPER, THE ENGINEER AND THE LOCAL GOVERNING AGENCIES HARMLESS AGAINST SUCH VIOLATION.

10. ALL CONSTRUCTION WITHIN CITY RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH CITY STANDARDS AND PROCEDURES, INCLUDING TRAFFIC CONTROL, WHICH WILL CONFORM TO THE MUTCD LATEST EDITION.

11. THE CONTRACTOR SHALL PROVIDE ALL PAVEMENT MARKINGS AND SIGNS IN ACCORDANCE WITH THE MUTCD LATEST EDITION.

12. CONTRACTOR TO PROVIDE CONSTRUCTION STAKING.

13. ANY PLAN DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR RAZING AND REMOVAL OF THE EXISTING STRUCTURES, RELATED UTILITIES, PAVING, UNDERGROUND STORAGE TANKS AND ANY OTHER EXISTING IMPROVEMENTS AS NOTED.

15. PRIOR TO INSTALLATION OF STORM OR SANITARY SEWER, THE CONTRACTOR SHALL EXCAVATE, VERIFY, AND CALCULATE ALL CROSSINGS AND INFORM THE OWNER AND THE ENGINEER
    OF ANY CONFLICTS PRIOR TO CONSTRUCTION. THE ENGINEER WILL BE HELD HARMLESS IN THE EVENT THE ENGINEER IS NOT NOTIFIED OF DESIGN CONFLICTS.

16. ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH AND 4" OF TOPSOIL APPLIED. IF ADEQUATE TOPSOIL IS NOT AVAILABLE ON SITE, THE CONTRACTOR SHALL PROVIDE TOPSOIL, APPROVED BY THE OWNER, AS NEEDED. THE AREA SHALL THEN BE SEEDED OR SODDED, FERTILIZED, MULCHED, WATERED, AND MAINTAINED UNTIL HARDY GRASS GROWTH IS ESTABLISHED IN ALL AREAS. ANY AREAS DISTURBED FOR ANY REASON PRIOR TO FINAL ACCEPTANCE OF THE PROJECT SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL BE REQUIRED TO MOW ALL SEEDED AND/OR SODDED AREAS A MINIMUM OF TWO TIMES PRIOR TO ACCEPTANCE BY CITY. CONTRACTOR SHALL CONTINUE TO MOW AND MAINTAIN THE PROJECT UNTIL THE PROJECT HAS REACHED FINAL COMPLETION.

17. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FILED LOCATION OF UTILITIES.

18. ALL STORM DRAIN PIPE SHALL BE BACKFILLED TO FINISH SUB-GRADE OR PLAN FINISH GRADE IMMEDIATELY AFTER INSTALLATION AND PRIOR TO ALLOWING CONSTRUCTION TRAFFIC TO DRIVE OVER.

19. GENERAL CONTRACTOR SHALL LOCATE THEIR OWN LAY DOWN YARD. CONTRACTOR TO PROVIDE PERIMETER BMP ON THE DOWNSTREAM SIDE OF THE LAYDOWN AREA.

20. CONTRACTOR IS ADVISED THAT ALL SECTIONS OF PAVED SIDEWALK AND STAGING AREA SHALL MEET MINIMUM ADA STANDARDS FOR MINIMUM/MAXIMUM GRADES ALLOWED. THE MAXIMUM GRADE ALLOWED IS 4.99%, UNLESS STATED ON PLANS, WITH A MAXIMUM CROSS SLOPE OF 2%.

21. PRINTED DRAWINGS PROVIDED BY ENGINEER ARE PART OF THE CONTRACT DOCUMENTS; HOWEVER, ELECTRONIC DATA IS NOT. ELECTRONIC DATA PROVIDED IS FOR CONTRACTOR'S CONVENIENCE ONLY. IT IS CONTRACTOR'S RESPONSIBILITY TO VERIFY ELECTRONIC DATA AGAINST PRINTED DRAWINGS. USE OF ELECTRONIC DATA IS AT CONTRACTORS RISK.

22. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND OWNER PRIOR TO DISTURBING ANY AREAS OF VEGETATION AND LANDSCAPING WITHIN TEMPORARY CONSTRUCTION EASEMENTS. CONSTRUCTION ACTIVITIES WITHIN TEMPORARY CONSTRUCTION EASEMENTS SHALL BE KEPT TO A MINIMUM.

23. ALL DRIVES TO BE RECONSTRUCTED TO EXISTING ROW UTILIZING CONCRETE. CURB TO BE REPLACED IN KIND.

24. TAPER CURB HEIGHTS FROM 6" TO 0" OVER 2' AT ALL CURB ENDS. WHEN APPROACHING THE SIDEWALK EDGE, TAPER CURB TO 0" 2' BEFORE SIDEWALK EDGE AND CONTINUE FLAT INTO SIDEWALK EDGE.

25. CONTRACTOR SHALL NOTIFY THE CITY OF BENTONVILLE OR THE ENGINEER PRIOR TO THE REMOVAL OF ANY TREES.

26. ALL PIPE LINES, POWER, TELEPHONE AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.

27. 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.

28. 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.

29. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.

30. 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.

31. ONCE INSTALLED, LANDSCAPING SHALL BE MAINTAINED IN HEALTHY LIVING CONDITION AND ALL PLANT MATERIAL THAT DIES SHALL BE REPLACED. (SEC 1400.5.C-10)

32. HEALTHY TREES SHALL NOT BE REMOVED AT ANY TIME AND PROPER TREE PRUNING TECHNIQUES AS ESTABLISHED BY THE LATEST EDITION OF THE ANSI A300 "STANDARDS FOR TREE CARE" SHALL BE UTILIZED FOR MAINTENANCE PURPOSES.

33. THE GENERAL CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING PAVEMENT STRIPING THAT IS TO TIE INTO PROPOSED STRIPING. IN THE EVENT OF DAMAGE, THE GENERAL CONTRACTOR SHALL REPLACE ANY OF SAID STRIPING AT NO COST TO THE OWNER.

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CEI ENGINEERING ASSOCIATES, INC.
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|---|---|
| PROFESSIONAL OF RECORD | BLM |
| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

GENERAL NOTES
SHEET TITLE

SHEET NUMBER
3

DRAWING LOCATION - P:\32000\32252.00\DRAWINGS\DESIGN\WORKING\32252-COVER.DWG - SAVED BY - CEEHOLS


N

0 20' 30' 40'
SCALE IN FEET

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BENTONVILLE, AR

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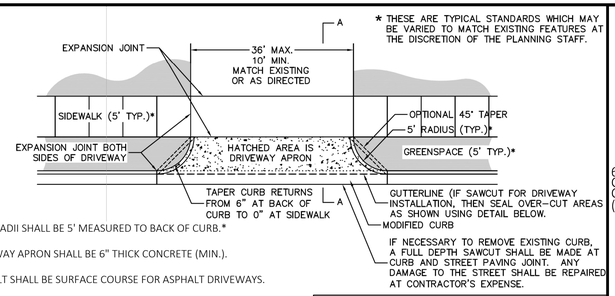
| | |
|---|---|
| PROFESSIONAL OF RECORD | BLM |
| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

OVERALL PLAN
SHEET TITLE

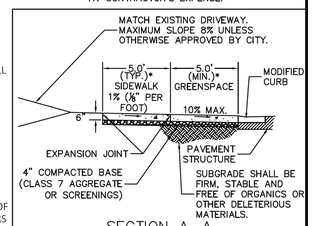
SHEET NUMBER
4

DRAWING LOCATION - P:\32000\32252.00\DRAWINGS\DESIGN\WORKING\32252-PNP.DWG - SAVED BY - CEICHOLS

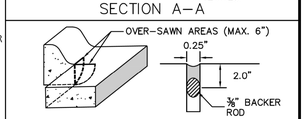



★ THESE ARE TYPICAL STANDARDS WHICH MAY BE VARIED TO MATCH EXISTING FEATURES AT THE DISCRETION OF THE PLANNING STAFF.

1. CURB RADII SHALL BE 5' MEASURED TO BACK OF CURB.*
2. DRIVEWAY APRON SHALL BE 6" THICK CONCRETE (MIN.).
3. ASPHALT SHALL BE SURFACE COURSE FOR ASPHALT DRIVEWAYS.
4. IF THERE IS NOT SIDEWALK, THE DRIVEWAY APRON SHALL BE 6' AS MEASURED PERPENDICULAR FROM BACK OF CURB OR EDGE OF PAVEMENT.
5. EXPANSION JOINS SHALL BE A MINIMUM OF ½" AND EXTENDED THE FULL DEPTH OF THE CONCRETE. EXPANSION JOINT MATERIAL SHALL MEET AASHTO M213 FOR AN ASPHALTIC FIBER EXPANSION JOINT MATERIAL AND INSTALLED WITH A ZIP STRIP WHICH IS REMOVED AFTER THE CONCRETE HAS CURED AND SEALED WITH A MASTIC SEALER.
6. CONTRACTION JOINTS TO BE PLACED IN CONCRETE DRIVEWAY SO THAT NO SLAB DIMENSION IS MORE THAN 15'.
7. ALL SIDEWALKS AND DRIVEWAY TO RECEIVE A BROOM FINISH.
8. CITY SHALL INSPECT ALL SIDEWALKS AND DRIVEWAYS IN PUBLIC RIGHT OF WAY PRIOR TO CONCRETE OR ASPHALT PLACEMENT. PROVIDE 24 HOURS NOTICE PRIOR TO PLACEMENT.
9. REFER TO CITY OF BENTONVILLE STREET SPECIFICATIONS ARTICLE 500 FOR CONCRETE SPECIFICATIONS.
10. REFER TO APPROVED PLANS FOR ACTUAL SIDEWALK AND GREENSPACE WIDTHS OR CONTACT CITY.
11. APRON SHALL BE GRADED SO THAT SIDEWALK CONTINUES WITHOUT GRADE BREAKS ALONG ROADWAY.
12. DRIVEWAY SHALL BE HARD SURFACE FOR ANY SLOPES OVER 8%.




SECTION A–A




CONCRETE JOINT SEALANT SHALL BE SONNEBORN "SONOLASTIC SLI" OR AN APPROVED EQUAL.

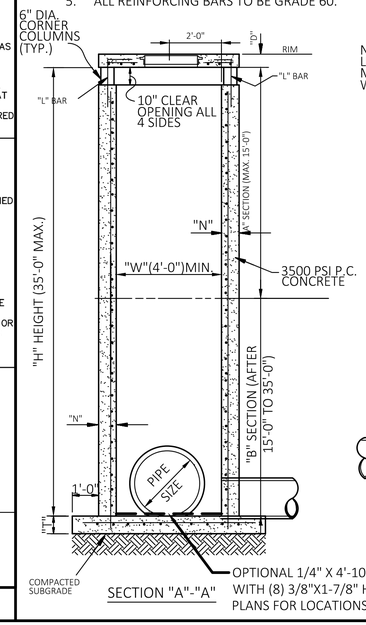
JOINT SEALANT DETAIL

RESIDENTIAL DRIVEWAY DETAIL

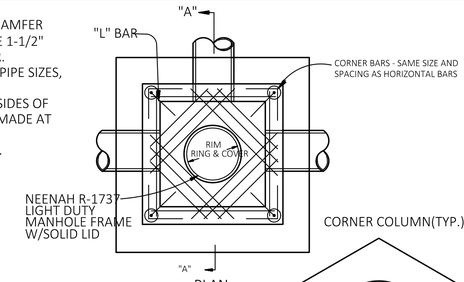
N.T.S.

GENERAL NOTES:

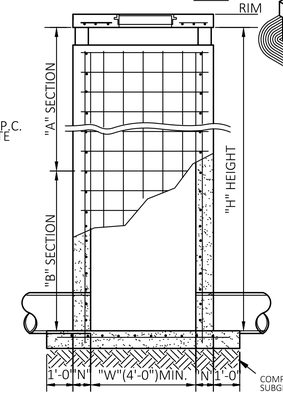
1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER
2. ALL #4 & #5 REINFORCING BARS TO HAVE 1-1/2" COVER, LARGER SIZES TO HAVE 2" COVER.
3. SEE GRADING AND DRAINAGE PLAN FOR PIPE SIZES, LOCATIONS, AND FLOW LINES.
4. PIPES SHALL CONNECT TO THE ENDS OR SIDES OF THE INLET. CONNECTION SHALL NOT BE MADE AT THE CORNERS OF THE INLET.
5. ALL REINFORCING BARS TO BE GRADE 60.




SECTION "A"-"A"



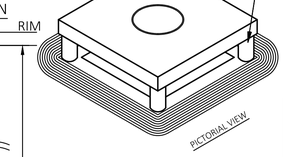

PLAN

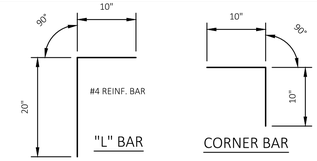



ELEVATION

AREA INLET

N.T.S.



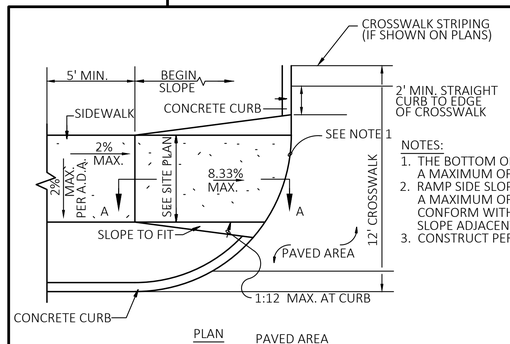

| REINFORCEMENT SCHEDULE, BASE | |
|---|---|
| SECTION | |
| "A" | #4's @ 6" E.W. |
| "B" | #6's @ 6" E.W. |

| TABLE OF 'W' DIMENSIONS | | | |
|---|---|---|---|
| PIPE SIZE | SKEW OF CROSS DRAIN | | |
| SINGLE | STRAIGHT | 30° | 45° |
| ≤24" | 4'-0" | 4'-0" | 4'-10" |
| 30" | 4'-0" | 4'-7" | 5'-8" |
| 36" | 4'-0" | 5'-3" | 6'-5" |
| 42" | 5'-3" | 5'-11" | 7'-3" |
| 48" | 5'-10" | 6'-7" | 8'-0" |
| 60" | 7'-0" | 7'-10" | 9'-8" |

| REINFORCEMENT SCHEDULE, WALLS | | | |
|---|---|---|---|
| SECTION | WIDTH ("W") | HOR. | VERT. |
| "A" | 4' | #4's @ 9" | #4's @ 10" |
| | BETWEEN 4' & 7' | #6's @ 9" | #4's @ 10" |
| | GREATER THAN 7' | #5's @ 4 1/2" | #4's @ 10" |
| "B" | 4' | #4's @ 6" | #4's @ 10" |
| | BETWEEN 4' & 7' | #6's @ 6" | #4's @ 10" |

| TABLE OF "T" & "N" DIMENSIONS | | | | |
|---|---|---|---|---|
| SECTION | WIDTH ("W") | "T" | "N" | "T" |
| "A" | BETWEEN 4' & 7' | 6" + PIPE THICKNESS | 8" | 6" |
| | GREATER THAN 7' | 6" + PIPE THICKNESS | 8" | 8" |
| "B" | 4' | 6" + PIPE THICKNESS | 8" | 8" |
| | BETWEEN 4' & 7' | 6" + PIPE THICKNESS | 10" | 8" |

| REINFORCEMENT SCHEDULE, TOP | | |
|---|---|---|
| DIMENSIONS | STEEL | SPECIAL PATTERN |
| W1 = 7' OR LESS<br>W2 = 7' OR LESS | #4's @ 8" E.W.<br>#4's @ 8" E.W. | DIAGONAL @ COVER<br>DIAGONAL @ COVER |
| W1 = 7' OR LESS<br>W2 = 7' OR GREATER | #4's @ 8" E.W.<br>#4'S @ 6" E.W. | DIAGONAL @ COVER<br>DIAGONAL @ COVER |
| W1 = 7' OR GREATER<br>W2 = 7' OR GREATER | #4's @ 6" E.W.<br>#4's @ 6" E.W. | DIAGONAL @ COVER<br>DIAGONAL @ COVER |

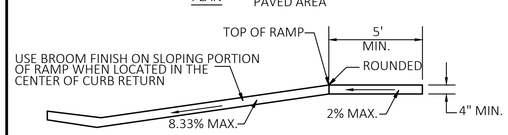



PLAN

PAVED AREA

NOTES:

1. THE BOTTOM OF THE RAMP SHALL HAVE A MAXIMUM OF A 1/4" LIP.
2. RAMP SIDE SLOPE VARIES UNIFORMLY FROM A MAXIMUM OF UP TO 8.33 % AT CURB TO CONFORM WITH LONGITUDINAL SIDEWALK SLOPE ADJACENT TO TOP OF THE RAMP.
3. CONSTRUCT PER A.D.A. STANDARDS.



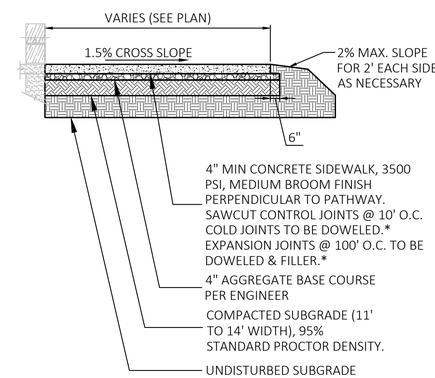

SECTION A-A

WHEELCHAIR RAMP IN SIDEWALK

N.T.S.

NOTES:

1. IF COMPACTED SUBGRADE DOES NOT PASS DENSITY TESTING, UNDERCUT USING A MINIMUM OF 8" STRUCTURAL FILL AS REQUIRED BY ENGINEER.
2. VERTICAL CLEARANCE TYP. 8' MIN.
3. SLOPES BEYOND 36" MIN. CLEAR AREA SHALL NOT EXCEED 3:1
4. MAXIMUM RUNNING SLOPE SHALL BE 5% UNLESS NOTED ON PLANS.
5. DOWELS ARE TO BE 1/2" X 16" DOWEL W/ EXPANSION CAP OR SLEEVE AT ONE END @ 18" O.C.
6. FILLER SHALL CONFORM TO AASHTO M213-81 AND BE 1/2" X 6" & HAVE A FILLER CAP.
7. EXPANSION JOINTS SHALL HAVE TOOLED EDGE BY USING CARPET JOINTER.




*CONTROL JOINT SPACING SHALL MATCH SIDEWALK WIDTH, EXPANSION JOINTS SHALL BE SPACED TO MATCH

CONCRETE SIDEWALK

N.T.S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PRELIMINARY NOT FOR CONSTRUCTION

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|---|---|
| PROFESSIONAL OF RECORD | BLM |
| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

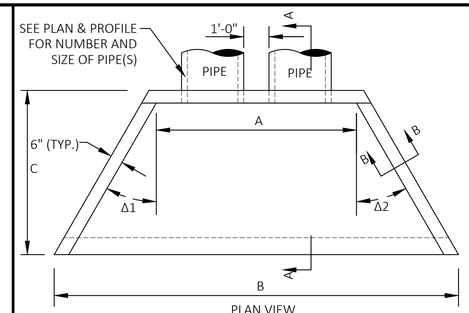
SPECIAL DETAILS (1)

SHEET TITLE

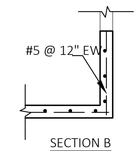
SHEET NUMBER

5

DRAWING LOCATION - P:\32000\32252.00\DRAWINGS\DESIGN\WORKING\32252-DET.DWG - SAVED BY - CEEHOLS




PLAN VIEW

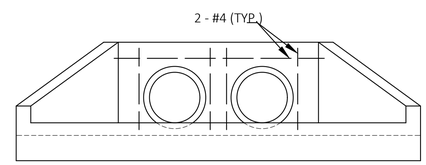



SECTION B

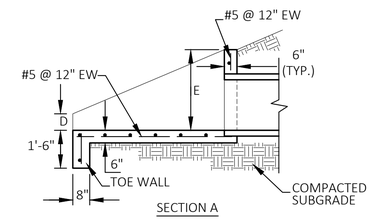
| STRUCTURE | A | B | C | D | E | Δ1 | Δ2 |
|---|---|---|---|---|---|---|---|
| HW-1 | 4'-0" | 11'-0" | 5'-6" | 1'-0" | 3'-0" | 30° | 30° |
| HW-2 | 8'-6" | 13'-2" | 5'-6" | 1'-0" | 2'-6" | 45° | N/A |

NOTES:

1. STRUCTURE TO BE SYMMETRICAL AROUND AXIS OF PIPE(S), UNLESS OTHERWISE SHOWN ON THE PLANS, INSTRUCTED BY ENGINEERS, OR REQUIRED BY PROPOSED FINISHED GRADING.
2. GRADING PLAN INDICATES ELEVATION AT DOWNSTREAM END OF STRUCTURE. SLOPE OF APRON TO BE THE SAME AS THE PIPE SLOPE UNLESS OTHERWISE INDICATED.
3. ALL DETAILING, FABRICATION AND PLACING OF REINFORCING STEEL SHALL CONFORM TO THE ACI STANDARD "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT" (ACI 318).
4. CHAMFER ALL EXPOSED EXTERNAL CORNERS OF CONCRETE WITH 3/4" x 45 DEGREE CHAMFER UNLESS OTHERWISE NOTED.
5. UNLESS OTHERWISE SPECIFIED, CONCRETE SHALL BE 3500 PSI AND REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A 615, GRADE 60.




FRONT ELEVATION




SECTION A

CONCRETE HEAD WALL

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| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

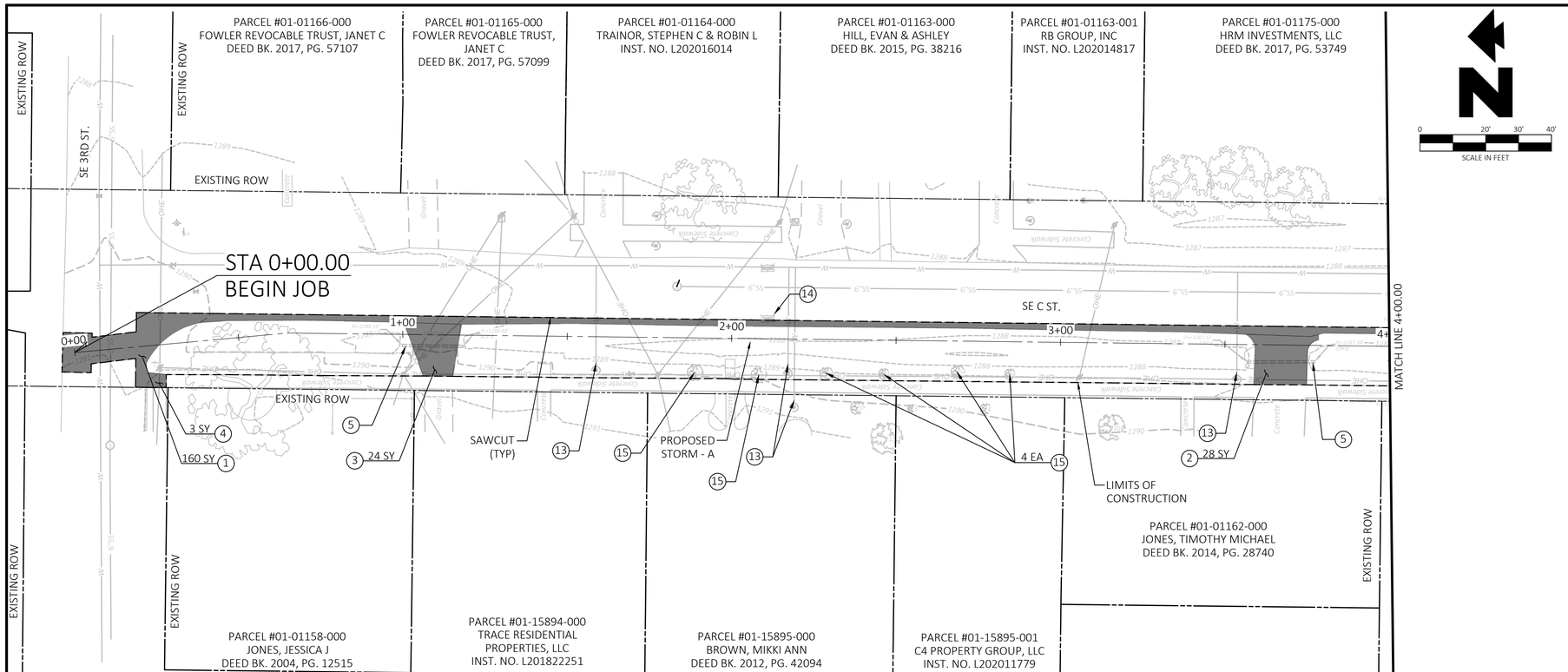
SPECIAL DETAILS (2)

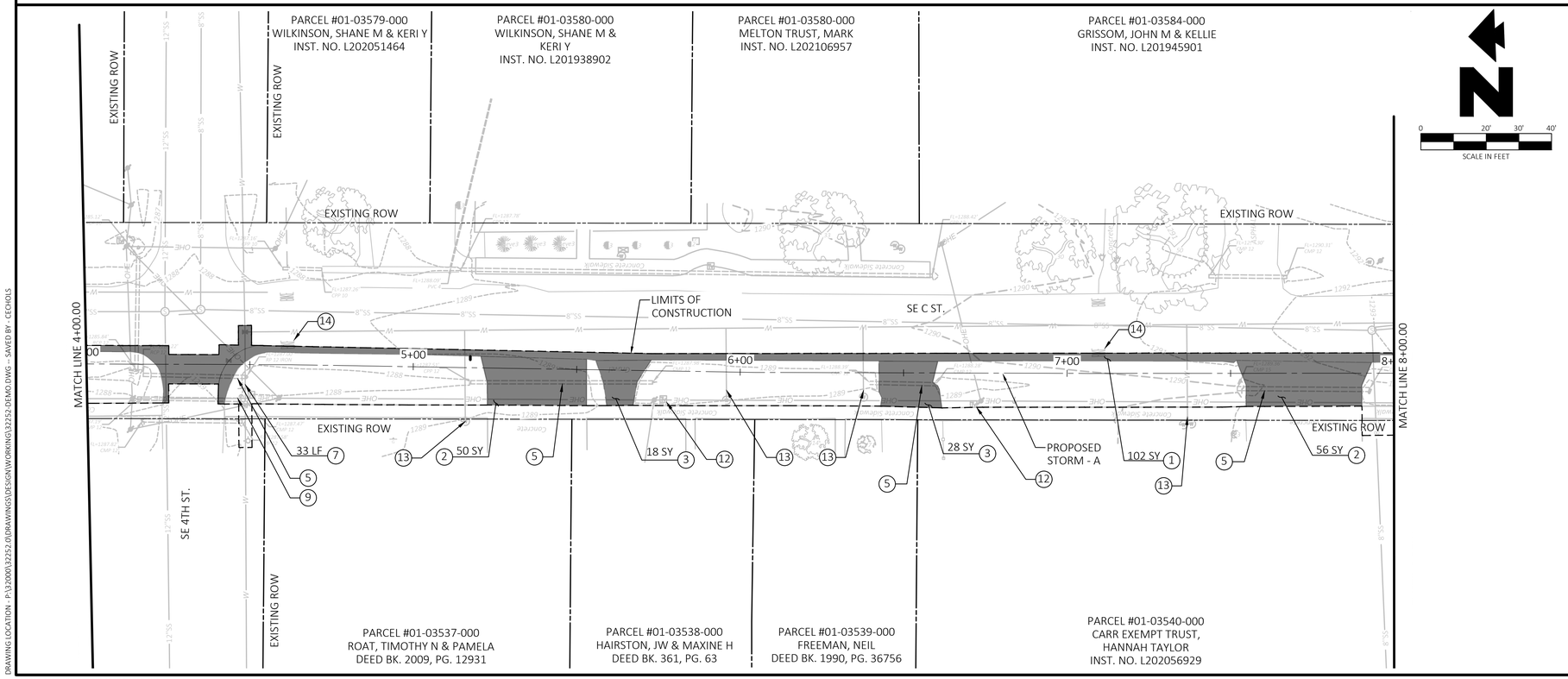
SHEET TITLE

SHEET NUMBER

6

DRAWING LOCATION: P:\32000\32252.00\DRAWINGS\DESIGN\WORKING\32252-DET.DWG - SAVED BY: CECHOLS




1. REMOVE AND DISPOSE OF ASPHALT PAVEMENT
2. REMOVE AND DISPOSE OF CONCRETE DRIVEWAY
3. REMOVE AND DISPOSE OF GRAVEL DRIVEWAY
4. REMOVE AND DISPOSE OF CONCRETE WALKS
5. REMOVE AND DISPOSE OF PIPE CULVERTS
6. ABANDON EXISTING PIPE CULVERT IN PLACE
7. REMOVE AND DISPOSE OF WATER LINE
8. REMOVE AND DISPOSE OF SANITARY SEWER LINE
9. REMOVE AND SALVAGE SIGN
10. REMOVE AND SALVAGE FIRE HYDRANT
11. REMOVE AND DISPOSE OF DRAINAGE STRUCTURE
12. COMMUNICATIONS APPURTENANCE TO BE RELOCATED BY AT&T
13. REMOVE AND DISPOSE OF WATER SERVICE LINE
14. REMOVE AND DISPOSE OF PERMANENT PAVEMENT STRIPING
15. REMOVE AND DISPOSE OF TREE(S)

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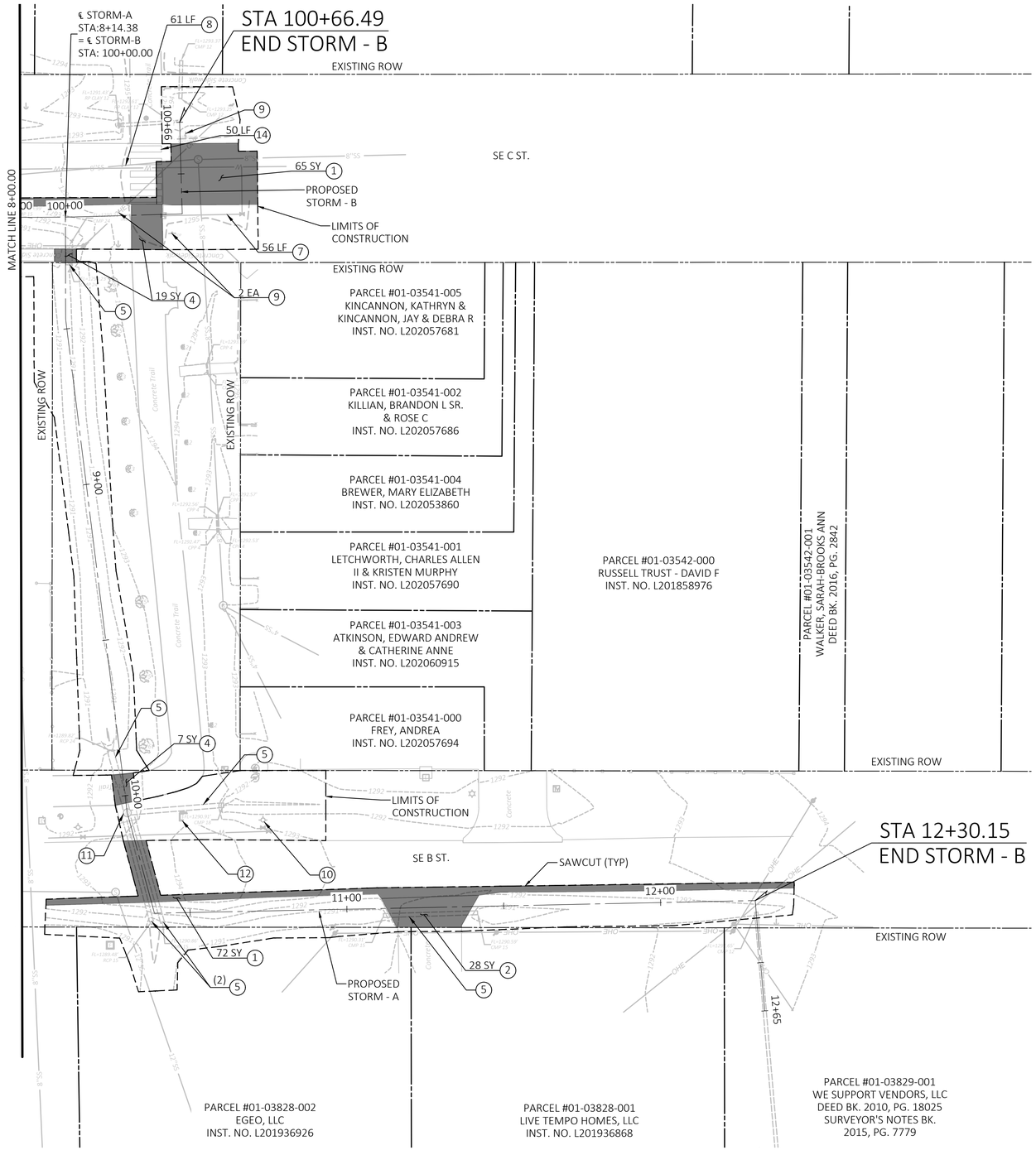
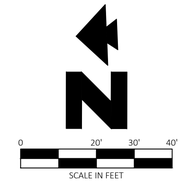
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

DEMOLITION PLAN (1)
SHEET TITLE

SHEET NUMBER
7

DRAWING LOCATION - P:\32000\32252.00\DRAWINGS\DESIGN\WORKING\32252-DEMO.DWG - SAVED BY - CEOHOLS

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DEMOLITION PLAN (2)
SHEET TITLE

SHEET NUMBER
8

DRAWING LOCATION - P:\32000\32252-01\DRAWINGS\DESIGN\WORKING\32252-DEMO.DWG - SAVED BY - CECHOLS

## A. GENERAL SITE DATA

PROJECT LIMITS:

BEGIN CONSTRUCTION OF STORM SEWER - A AT STA 0+00.00 - END CONSTRUCTION AT STA 12+30.15
BEGIN CONSTRUCTION OF STORM SEWER - B AT STA 100+00.00 - END CONSTRUCTION AT STA 100+66.49
(ROADWAY LENGTH = 1,298 FT = APPROX. 0.25 MILE)

PROJECT SITE MAPS:

- PROJECT LOCATION MAP: TITLE SHEET (SHEET 1)

PROJECT DESCRIPTION:

STORM SEWER IMPROVEMENTS THAT INCLUDES CURB AND GUTTER; CONSTRUCTION OF UNDERGROUND UTILITIES; UNDERGROUND DRAINAGE PIPES AND STRUCTURES; UNDERCUT; STRUCTURAL SUBGRADE FILL PLACEMENT; BASE COURSE; HOT MIXED ASPHALTIC CONCRETE BINDER AND SURFACE COURSES, PORTLAND CONCRETE PAVEMENT COURSE, PERMANENT PAVEMENT MARKINGS; AND SIDEWALKS.

MAJOR SOIL DISTURBING ACTIVITIES:

- ASPHALT REMOVAL
- FULL DEPTH REMOVAL
- INSTALLATION OF STORM SEWER
- UTILITIES RELOCATION

EXISTING CONDITION OF SOIL & VEGETATIVE COVER & % OF EXISTING VEGETATIVE COVER:

THE PROJECT SITE IS COMPRISED OF PERIDGE GRAVELLY SILT LOAM . PERIDGE GRAVELLY SILT LOAM IS CHARACTERIZED AS HYDROLOGIC SOIL GROUP B. VEGETATIVE COVER IS MOSTLY BERMUDA GRASS WITH ESTIMATED 100% VEGETATIVE COVER.

TOTAL PROJECT AREA:

0.54 ACRES

TOTAL AREA TO BE DISTURBED:

0.54 ACRES

WEIGHTED RUNOFF COEFFICIENT:

BEFORE CONSTRUCTION: 0.65
AFTER CONSTRUCTION: 0.65

PROJECT LATITUDE & LONGITUDE:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| STORM SEWER - A | | | | | | | |
| PROJECT BEGINS - | LATITUDE: | 36° | 22' 10.41" N | ENDS - LATITUDE: | 36° | 22' 00.33" N |
| | LONGITUDE: | -94° | 12' 20.37"W | LONGITUDE: | -94° | 12' 23.32" W |
| STORM SEWER - B | | | | | | | |
| PROJECT BEGINS - | LATITUDE: | 36° | 22' 02.43" N | ENDS - LATITUDE: | 36° | 22' 02.42" N |
| | LONGITUDE: | -94° | 12' 20.64"W | LONGITUDE: | -94° | 12' 20.30" W |

NAME OF RECEIVING WATERS:

THE ULTIMATE RECEIVING WATER OF THE STORM RUNOFF IS BLACK APPLE CREEK WHICH EMPTIES INTO MCKISIC CREEK.

ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORY PROPERTY:

1. US FISH AND WILDLIFE SERVICE HAS SUBMITTED COMMENTS IN ACCORDANCE WITH THE ENDANGERED SPECIES ACT (87 STAT. 884, AS AMENDED 16 U.S.C. 1531 ET SEQ.). THE FOLLOWING ENDANGERED SPECIES ARE KNOWN TO OCCUR IN BENTON COUNTY: GRAY BAT; INDIANA BAT; OZARK BIG-EARED BAT; AND THE BENTON CAVE CRAYFISH. THE OZARK CAVEFISH IS A SPECIES LISTED AS THREATENED THAT ALSO OCCURS IN BENTON COUNTY.

## B. EROSION AND SEDIMENT CONTROLS

1. SOIL STABILIZATION PRACTICES: (SELECT "T" - TEMPORARY OR "P" - PERMANENT, AS APPLICABLE)

| | | | |
|---|---|---|---|
| T | TEMPORARY SEEDING | | PRESERVATION OF NATURAL RESOURCES |
| | MULCHING (HAY OR STRAW) | | FLEXIBLE CHANNEL LINER |
| T | BUFFER ZONES | | RIGID CHANNEL LINER |
| T, P | PLANTING | | SOIL RETENTION BLANKET |
| T, P | SEEDING | | COMPOST MANUFACTURED TOPSOIL |
| P | SODDING | | OTHER: RIPRAP |

2. WHERE WORK IN AN AREA WILL CEASE FOR MORE THAN 14 DAYS, THE AREA MUST BE TEMPORALITY STABILIZED IMMEDIATELY.

3. WHERE WORK IN AN AREA HAS PERMANENTLY CEASED, THE AREA MUST BE PERMANENTLY STABILIZED IMMEDIATELY, BUT NO MORE THAN 14 DAYS AFTER LAST CONSTRUCTION ACTIVITY.

4. STRUCTURAL PRACTICES: (SELECT "T" - TEMPORARY OR "P" - PERMANENT, AS APPLICABLE)

T SILT FENCES
T WATTLES OR EROSION CONTROL LOG
T ROCK CHECK DAMS
DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
DIVERSION, DIKE AND SWALE COMBINATIONS
PIPE SLOPE DRAINS
PAVED FLUMES
ROCK BEDDING AT CONSTRUCTION EXIT
TIMBER MATTING AT CONSTRUCTION EXIT
CHANNEL LINERS
SEDIMENT TRAPS
SEDIMENT BASINS
T CURB INLET SEDIMENT FILTER
STONE OUTLET STRUCTURES
P CURBS AND GUTTERS
P STORM SEWERS
VELOCITY CONTROL DEVICES
OTHER:
T CONCRETE WASH OUT

5. STORM WATER MANAGEMENT:

1. STORM WATER DRAINAGE WILL BE PROVIDED BY THE INLETS WHICH WILL CARRY DRAINAGE WITHIN THE ROW TO THE LOW POINTS WITHIN THE ROADWAY AND PROJECT SITE WHICH DRAIN TO NATURAL FACILITIES.

2. OTHER PERMANENT EROSION CONTROLS INCLUDE HYDRAULIC DESIGN TO LIMIT STRUCTURE OUTLET VELOCITIES AND GRADING DESIGN GENERALLY CONSISTING OF 4:1 (TYPICAL ROADWAY SECTIONS) OR FLATTER SLOPES WITH PERMANENT VEGETATIVE COVER.

6. STORM WATER MANAGEMENT ACTIVITIES: (SEQUENCE OF CONSTRUCTION)

1. INSTALL TEMPORARY EROSION CONTROL DEVICES FOR TEMPORARY CONSTRUCTION OF THE EXISTING PAVEMENT.

2. PERFORM CLEARING, GRUBBING, AND DEMO FOR PHASE OF CONSTRUCTION

3. CONSTRUCT UTILITIES AND DRAINAGE SYSTEM. PROVIDE TEMPORARY SILT FENCE BOX PROTECTION AFTER INSTALLING INLET BOXES.

4. CONSTRUCT THE UTILITIES, PAVEMENT STRUCTURE, INLETS, PIPES AND SIDEWALKS. REMOVE TEMPORARY EROSION CONTROL MEASURES FROM THE INLETS AFTER THE SITE IS STABILIZED.

5. PERFORM PERMANENT SEEDING AND SOD.

6. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES ONCE PROJECT HAS BEEN STABILIZED.

7. NON-STORM WATER DISCHARGES:

NON-STORM WATER DISCHARGES SHOULD BE FILTERED, OR HELD IN RETENTION BASINS, BEFORE BEING ALLOWED TO MIX WITH STORM WATER.

THESE DISCHARGES CONSIST OF NON-POLLUTED GROUND WATER, SPRING WATER, FOUNDATION AND/OR FOOTING DRAIN WATER; AND WATER USED FOR DUST CONTROL, PAVEMENT WASHING AND VEHICLE WASHWATER CONTAINING NO DETERGENTS.

## C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:

ALL EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 72 HOURS OF DISCOVERY WITHOUT FURTHER DAMAGE TO THE SITE FROM HEAVY EQUIPMENT. DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED, TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED IMMEDIATELY UNLESS THEY ARE SCHEDULED TO AND DO RESUME WITHIN 14 CALENDAR DAYS. THE AREAS ADJACENT TO CREEKS AND DRAINAGE WAYS SHALL HAVE PRIORITY FOLLOWED BY DEVICES PROTECTING STORM SEWER INLETS.

2. INSPECTION:

AN INSPECTION SHALL BE PERFORMED BY AN INSPECTOR EVERY 14 CALENDAR DAYS AS WELL AS WITHIN 24 HOURS OF EVERY 0.25" OR MORE RAIN AS RECORDED ON A RAIN GAUGE TO BE LOCATED AT THE PROJECT SITE. AN INSPECTION AND MAINTENANCE REPORT SHALL BE FILED FOR EACH INSPECTION. BASED ON THE INSPECTION RESULTS, THE CONTROLS SHALL BE REVISED AS PER THE INSPECTION REPORT.

3. WASTE MATERIALS:

ALL WASTE MATERIALS SHALL BE COLLECTED IN A METAL DUMPSTER HAVING A SECURE COVER. THE DUMPSTER SHALL MEET ALL STATE AND LOCAL CITY SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND DEBRIS FROM CONSTRUCTION SHALL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER SHALL BE EMPTIED, AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION, AND HAULED TO A LOCAL APPROVED LANDFILL SITE. THE BURYING OF CONSTRUCTION WASTE ON THE PROJECT SITE SHALL NOT BE PERMITTED.

CONCRETE WASHOUT LOCATION WILL BE AT THE DISCRETION OF THE CONTRACTOR. CONTAMINATED WATER OF CONCRETE SHALL NOT BE DRAINED IN TO THE STORM SEWER SYSTEM. ONCE THE SURPLUS CONCRETE HAS DRIED THEN IT CAN BE DISPOSED OF AS REQUIRED BY STATE OR LOCAL REGULATION.

4. HAZARDOUS WASTE (INCLUDING SPILL REPORTING):

AS A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS, SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION AND CONCRETE CURING COMPOUNDS OR ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR SHALL BE CONTACTED IMMEDIATELY.

5. SANITARY WASTE:

ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS, AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION, BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

6. OFFSITE VEHICLE TRACKING:

THE CONTRACTOR SHALL BE REQUIRED, ON A REGULAR BASIS OR AS MAY BE DIRECTED BY THE ENGINEER, TO DAMPEN HAUL ROADS FOR DUST CONTROL, STABILIZE CONSTRUCTION ENTRANCES AND TO REMOVE EXCESS DIRT FROM THE ROADWAY.

7. MANAGEMENT PRACTICES:

1. DISPOSAL AREAS, STOCKPILES AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT MAY ENTER RECEIVING WATERS. THE LENGTH OF SITE ENTRANCE SHALL BE AT LEAST FOUR TIMES THE LARGEST TIRE SIZE AT THE SITE. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, WATER BODY OR STREAM BED.

2. CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS AND SHOULD BE AT LEAST 300 FEET AWAY FROM STREAMS, WETLANDS AND KARST FEATURES. OFFSITE VEHICLE TRACKING SHALL BE CONTROLLED BY TEMPORARY CONSTRUCTION ENTRANCES THAT ARE EQUAL OR BETTER THAN SPECIFIED.

3. ALL WATERWAYS SHALL BE CLEARED AS SOON AS PRACTICABLE OF TEMPORARY EMBANKMENT, TEMPORARY BRIDGES, MATTING, FALSE WORK, PILING, DEBRIS OR OTHER OBSTRUCTIONS PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT A PART OF THE FINISHED WORK.

8. OTHER:

1. A LIST OF CONSTRUCTION MATERIALS STORED ON SITE, INCLUDING PROTECTIVE CONTROLS, WILL BE MAINTAINED BY THE CONTRACTOR.

2. DUST CONTROL MUST BE PROVIDED IN ACCORDANCE WITH ANY LOCAL, STATE, AND FEDERAL REGULATIONS.

3. ANY EXCAVATIONS MUST BE DEWATERED THROUGH A PUMPED FILTER BAG ON A STABILIZED SURFACE AND PROTECTED WITH A DOWNSTREAM BMP SUCH AS A BIG RED, EROSION EEL, OR OTHER RELATED BMP.

9. SPECIFICATIONS:

REFER TO THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS, INCLUDING BEST MANAGEMENT PRACTICES REQUIRED BY THE UNITED STATES FISH AND WILDLIFE SERVICE.

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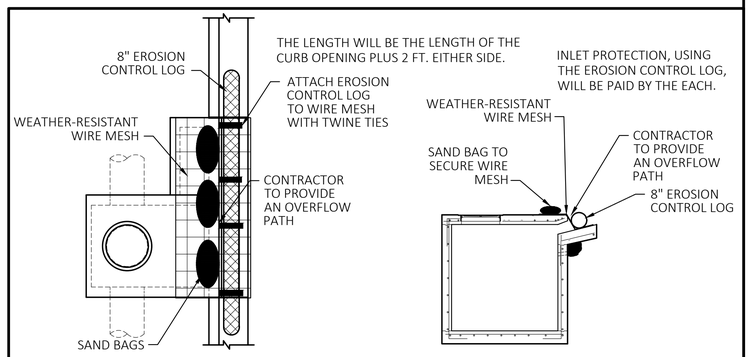
| PROFESSIONAL OF RECORD | BLM |
| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

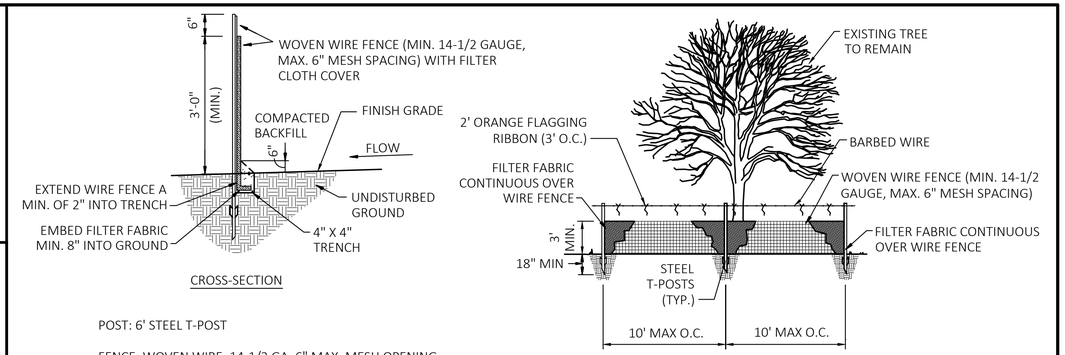
EROSION CONTROL NOTES
SHEET TITLE

SHEET NUMBER
9

DRAWING LOCATION - P:\32000\32252.01\DRAWINGS\DESIGN\WORKING\32252-COVER.DWG - SAVED BY - CECHOLS




INLET PROTECTION
N.T.S.




POST: 6' STEEL T-POST

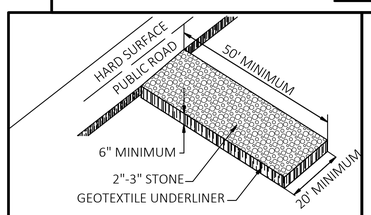
FENCE: WOVEN WIRE, 14-1/2 GA. 6" MAX. MESH OPENING

FILTER FABRIC: SEE SPECIFICATIONS

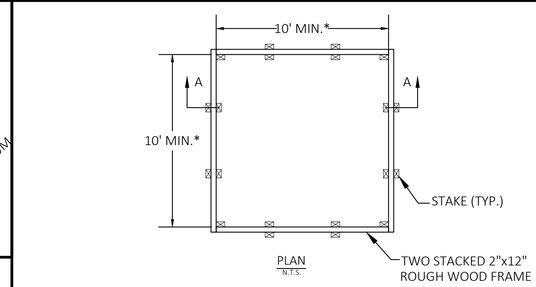
PREFABRICATED UNIT: SEE SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NOTED IN THE EROSION CONTROL PLAN. COLLECTED MATERIAL SHALL BE REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

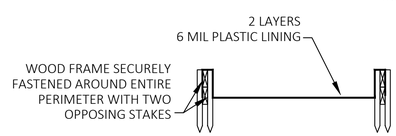
TREE PROTECTION FENCE
WITH SILT FENCE
N.T.S.




TEMPORARY STONE
CONSTRUCTION ENTRANCE
N.T.S.

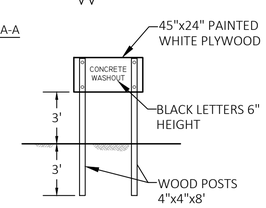



PLAN
N.T.S.



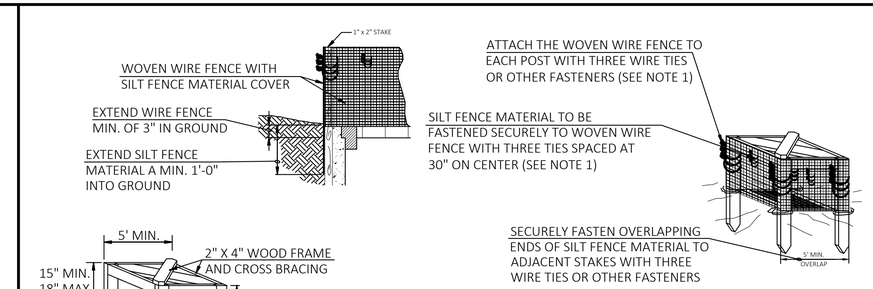

SECTION A-A
N.T.S.

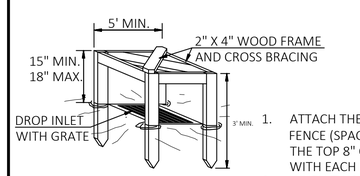
NOTES:
1. *DENOTES THE INTERIOR DIMENSION.
2. CONCRETE WASHOUT SHALL BE AT LEAST 50 FT. FROM ANY STORM SEWER INLET.
3. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.




CONCRETE WASHOUT
SIGN DETAIL
(OR EQUIVALENT)

TEMPORARY CONCRETE WASHOUT
(ABOVE GRADE)
N.T.S.




1. ATTACH THE WOVEN WIRE FENCE TO EACH POST AND THE GEOTEXTILE TO THE WOVEN WIRE FENCE (SPACED EVERY 30") WITH THREE WIRE TIES OR OTHER FASTENERS, ALL SPACED WITHIN THE TOP 8" OF THE FABRIC. ATTACH EACH TIE DIAGONALLY 45 DEGREES THROUGH THE FABRIC, WITH EACH PUNCTURE AT LEAST 1" VERTICALLY APART.
2. WHEN TWO SECTIONS OF SILT FENCE MATERIAL ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED ACROSS TWO POSTS.
3. MAINTENANCE SHALL BE PERFORMED AS NOTED IN THE SWPPP. DEPTH OF ACCUMULATED SEDIMENTS MAY NOT EXCEED ONE-HALF THE HEIGHT OF THE FABRIC. MAINTENANCE CLEANOUT MUST BE CONDUCTED REGULARLY TO PREVENT ACCUMULATED SEDIMENTS FROM REACHING ONE-HALF THE HEIGHT OF THE SIFT FENCE MATERIAL BEING ABOVE GRADE.
4. ALL SILT FENCE INLETS SHALL INCLUDE WIRE SUPPORT.

POSTS: 2 x 4
WOODEN STAKE FENCE:
WOVEN WIRE, 14-1/2 Ga.,
6" MAX. MESH OPENING FABRIC:
IN ACCORDANCE WITH ASTM D 6461, LATEST EDITION

SILT FENCE
INLET PROTECTION
N.T.S.

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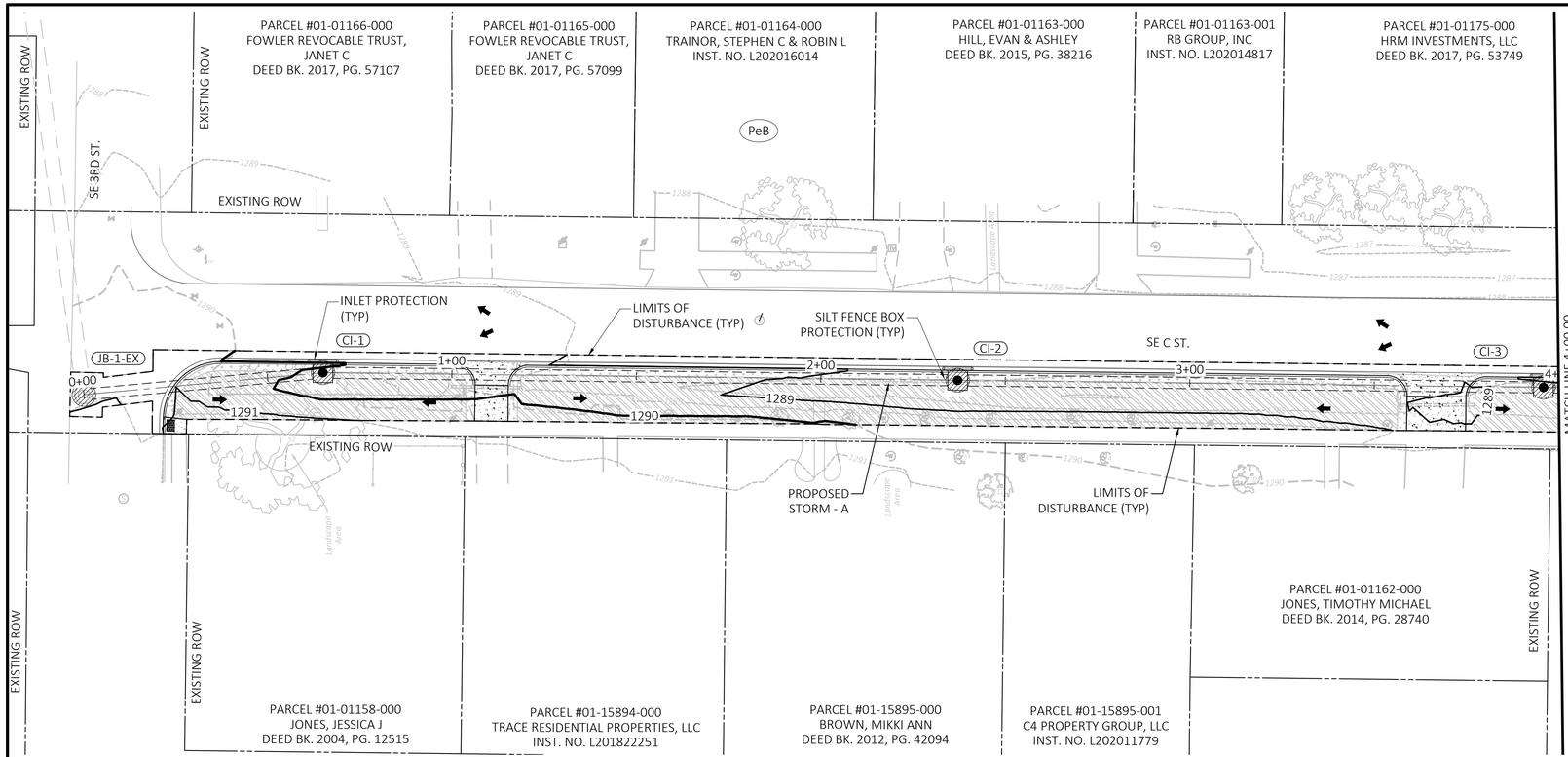
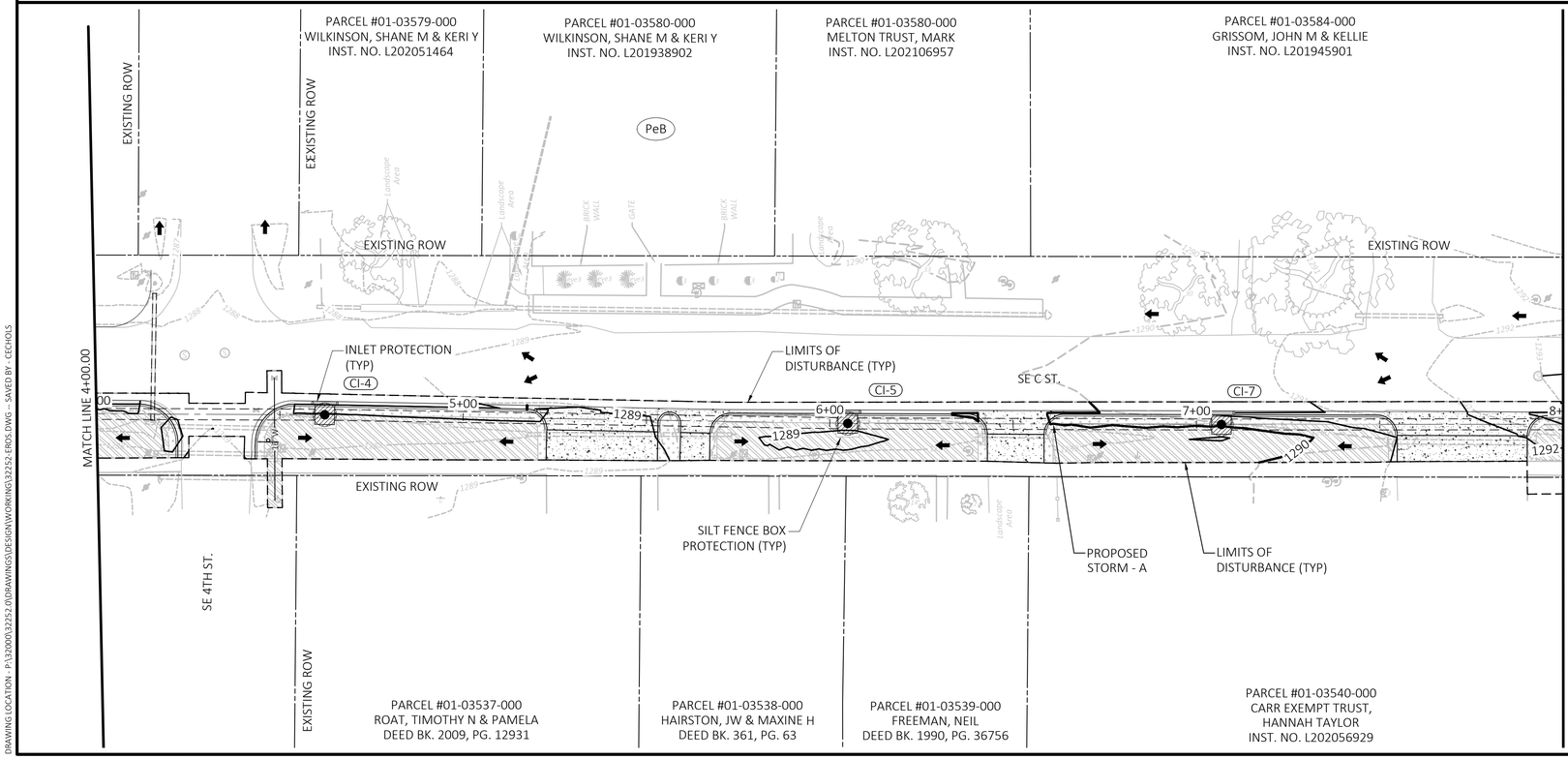
| | |
|---|---|
| PROFESSIONAL OF RECORD | BLM |
| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

EROSION CONTROL DETAILS
SHEET TITLE

SHEET NUMBER
10

DRAWING LOCATION - P:\32000\32252.00\DRAWINGS\DESIGN\WORKING\32252-DET.DWG - SAVED BY - CECHOLS




LEGEND

- LIMITS OF DISTURBANCE
- INLET PROTECTION
- SILT FENCE BOX PROTECTION
- STRAW WATTLE
- SURFACE FLOW DIRECTION
- SEED
- SOD
- E-6 ROCK CHECK DAM

| PROJECT AREA | DISTURBED AREA |
|---|---|
| 0.54 ACRES | 0.54 ACRES |

NOTE

CONTRACTOR TO PLACE SILT FENCE BOX PROTECTION AFTER INSTALLING INLET BOXES
CONTRACTOR TO REMOVE SILT FENCE BOX PROTECTION AND PLACE INLET PROTECTION ONCE RIM HAS BEEN CONSTRUCTED.

SOIL TYPE LEGEND

PeB — PERIDGE GRAVELLY SILT LOAM 1 TO 3% SLOPES

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| | |
|---|---|
| PROFESSIONAL OF RECORD | BLM |
| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

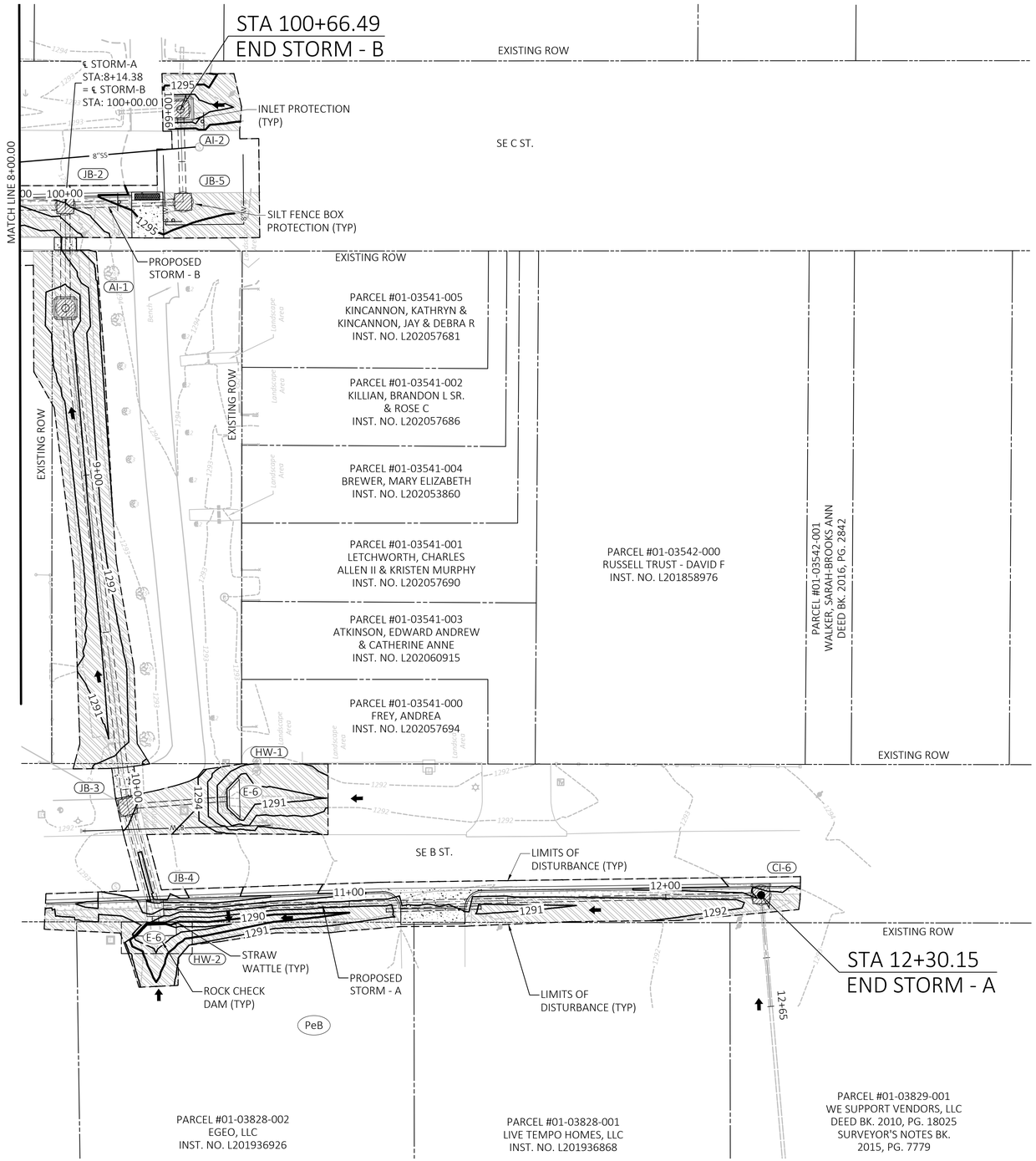
EROSION CONTROL PLAN (1)

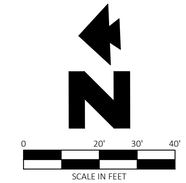
SHEET TITLE

SHEET NUMBER

11

DRAWING LOCATION: P:\32000\32252.01\DRAWINGS\DESIGN\WORKING\32252-EROS.DWG - SAVED BY: CEEHOLS




LEGEND

- LIMITS OF DISTURBANCE
- INLET PROTECTION
- SILT FENCE BOX PROTECTION
- STRAW WATTLE
- SURFACE FLOW DIRECTION
- SEED
- SOD
- E-6 ROCK CHECK DAM

| PROJECT AREA | DISTURBED AREA |
|---|---|
| 0.54 ACRES | 0.54 ACRES |

NOTE

CONTRACTOR TO PLACE SILT FENCE BOX PROTECTION AFTER INSTALLING INLET BOXES
CONTRACTOR TO REMOVE SILT FENCE BOX PROTECTION AND PLACE INLET PROTECTION ONCE RIM HAS BEEN CONSTRUCTED.

SOIL TYPE LEGEND

PeB — PERIDGE GRAVELLY SILT LOAM 1 TO 3% SLOPES

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|---|---|
| PROFESSIONAL OF RECORD | BLM |
| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

EROSION CONTROL PLAN (2)

SHEET TITLE

SHEET NUMBER

12

DRAWING LOCATION - P:\32000\32252.0\DRAWINGS\DESIGN\WORKING\32252-EROS.DWG - SAVED BY - CECHOLS

## SELECTED PIPE BEDDING

| LOCATION | SELECTED PIPE BEDDING |
|---|---|
| | CU. YD. |
| ENTIRE PROJECT TO BE USED IF | 50 |
| AND WHERE DIRECTED BY THE | |
| ENGINEER | |
| | |
| **TOTAL:** | **50** |

NOTE: QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.

## EARTHWORK

| STATION | STATION | UNCLASSIFIED EXCAVATION | COMPACTED EMBANKMENT |
|---|---|---|---|
| | | CU. YD. | |
| ENTIRE | PROJECT | 65 | 310 |
| | | | |
| **TOTALS:** | | **65** | **310** |

SEE SECTION 104.03 OF THE STD. SPECS.
NOTE: EARTHWORK QUANTITIES SHOWN ABOVE SHALL BE PAID AS PLAN QUANTITY
* QUANTITY ESTIMATED AND TO BE MEASURED AND PAID AS DIRECTED BY THE ENGINEER.

## CLEARING AND GRUBBING

| STATION | STATION | LOCATION | CLEARING | GRUBBING |
|---|---|---|---|---|
| | | | STATION | |
| 00+00.00 | 12+30.03 | SE C ST. TO SE B ST. | 12 | 12 |
| 100+00.00 | 100+68.05 | SE C ST. | 1 | 1 |
| | | | | |
| **TOTALS:** | | | **13** | **13** |

## STRUCTURES

| STATION | DESCRIPTION | REIN. CONC. PIPE CULVERT (CLASS III) 18" | 24" | 36" | (CLASS IV) 12" | 18" | DROP INLETS TYPE C CURB 4'x4' | AREA INLET 4'X4' | JUNCTION BOX TYPE E 4'X4' | CONCRETE HEADWALL | CONNECT TO EXISTING DRAINAGE STRUCTURE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LF | | | | | EA. | | | | |
| 00+64.96 | DROP INLET | | | 65 | | | 1 | | | | 1 |
| 02+37.00 | DROP INLET | | | 72 | | | 1 | | | | |
| 03+95.79 | DROP INLET | | | 159 | | | 1 | | | | |
| 04+62.14 | DROP INLET | | | 66 | | | 1 | | | | |
| 06+04.82 | DROP INLET | | | 143 | | | 1 | | | | |
| 07+06.72 | DROP INLET | | | 102 | | | 1 | | | | |
| 08+14.29 | JUNCTION BOX | | | 108 | | | | | 1 | | |
| 08+46.27 | AREA INLET | | | 32 | | | 1 | 1 | | | |
| 10+04.89 | JUNCTION BOX | | | 159 | | | | | 1 | | |
| 10+38.54 | JUNCTION BOX | | | 34 | | | | | 1 | | |
| 11+26+60 | 12" DRIVEWAY CULVERT | | | | 30 | | | | | | |
| 13+30.03 | DROP INLET | | | | | 191 | 1 | | | | |
| 100+37.28 | JUNCTION BOX | | 37 | | | | | | 1 | | |
| 100+68.05 | AREA INLET | | 31 | | | | 1 | 1 | | | |
| 10+10.59 | HEADWALL-1 | 34 | | | | | | | | 1 | |
| 10+38.56 | HEADWALL-2 | | 4 | | | | | | | 1 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY ENGINEER | | | | | | | | | | | |
| | | | | | | | | | | | |
| **TOTALS:** | | **34** | **72** | **940** | **30** | **191** | **9** | **2** | **4** | **2** | **1** |

NOTE: FOR R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE SPECIFIED.

## REMOVAL AND DISPOSAL OF ITEMS

| STATION | STATION | LOCATION | ASPHALT PAVEMENT | CONCRETE DRIVEWAY | GRAVEL DRIVEWAY | CONCRETE WALKS | SEWER LINE | WATER LINE | PAVEMENT MARKING (STRIPING) | PAVEMENT MARKING (WORD) | TREES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SY | | | | LF | | | EA. | |
| 00+00.00 | 12+30.03 | SE C ST. TO SE B ST. | 340 | 162 | 70 | 26 | | 33 | | 3 | 6 |
| 100+00.00 | 100+68.05 | SE C ST. | 65 | | | | 61 | 56 | 50 | | |
| | | | | | | | | | | | |
| **TOTALS:** | | | **405** | **162** | **70** | **26** | **61** | **89** | **50** | **3** | **6** |

## EROSION CONTROL

| STATION | STATION | PERMANENT EROSION CONTROL SEEDING | LIME | MULCH COVER | WATER | SECOND SEEDING APPLICATION | SOLID SODDING | TEMPORARY EROSION CONTROL TEMPORARY SEEDING | MULCH COVER | WATER | INLET PROTECTION | SILT FENCE BOX PROTECTION | ROCK CHECK DAM | *SEDIMENT REMOVAL & DISPOSAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ACRE | TON | ACRE | M. GAL. | ACRE | SY | ACRE | TON | M. GAL. | LF | EA. | | CU.YD. |
| ENTIRE | PROJECT | 0.30 | 0.60 | 0.30 | 30.60 | 0.30 | 224 | 0.30 | 0.60 | 6.12 | 75 | 13 | 6 | 26 |
| | | | | | | | | | | | | | | |
| **TOTALS:** | | **0.30** | **0.60** | **0.30** | **30.60** | **0.30** | **224** | **0.30** | **0.60** | **6.12** | **75** | **13** | **6** | **26** |

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
WATER..... 20.4 M.G. / ACRE OF SOLID SODDING
ROCK DITCH CHECKS..... 3 CU. YD. / LOCATION
NOTE: THE TEMPOARARY EROSION CONTROL DEVICES SHOWN ABOVE AND ON THE PLANS SHALL BE INSTALLED IN SUCH A SEQUENCE AS TO DETER EROSION AND SEDIMENTATION ON U.S. WATERWAYS AS EXPLAINED BY THE NATIONAL POLLUTANT DISCHARGE ELIMINATION
*QUANTITIES ESTIMATED
SEE SECTION 104.03 OF THE STD. SPECS.

## DRIVEWAYS AND TURNOUTS

| STATION | SIDE | LOCATION | WIDTH | P.C. CONCRETE DRIVEWAY APRON | P.C. CONCRETE DRIVEWAY |
|---|---|---|---|---|---|
| | | | FEET | SY | |
| 01+10.72 | LT | SE C ST. | 9 | 9 | 10 |
| 03+66.80 | LT | SE C ST. | 16 | 14 | 16 |
| 05+37.93 | LT | SE C ST. | 30 | 24 | 27 |
| 05+63.27 | LT | SE C ST. | 8 | 8 | 7 |
| 06+50.60 | LT | SE C ST. | 15 | 14 | 13 |
| 07+72.40 | LT | SE C ST. | 35 | 28 | 28 |
| 11+26.21 | LT | SE B ST. | 20 | 17 | 11 |
| | | | | | |
| **TOTALS:** | | | | **114** | **112** |

## CONCRETE COMBINATION CURB AND GUTTER

| STATION | STATION | LOCATION | TYPE A |
|---|---|---|---|
| | | | LF |
| 00+00.00 | 12+30.03 | SE C ST. TO SE B ST. | 975 |
| | | | |
| **TOTALS:** | | | **975** |

## WHEELCHAIR RAMPS

| STATION | STATION | LOCATION | RAMPS |
|---|---|---|---|
| | | | EA |
| 00+00.00 | 12+30.03 | SE C ST. TO SE B ST. | 1 |
| | | | |
| **TOTAL:** | | | **1** |

## PERMANENT PAVEMENT REPAIR

| STATION | STATION | LOCATION | ASPHALT PAVEMENT |
|---|---|---|---|
| | | | SY |
| 00+00.00 | 12+30.03 | SE C ST. TO SE B ST. | 366 |
| 100+00.00 | 100+68.05 | SE C ST. | 65 |
| | | | |
| **TOTAL:** | | | **431** |

## CONCRETE

| STATION | STATION | DESCRIPTION | CONCRETE SIDEWALK AVG. WIDTH | CONCRETE SIDEWALKS | TRUNCATED DOME WARNING DEVICES |
|---|---|---|---|---|---|
| | | | FEET | SY | EA |
| 00+00.00 | 12+30.03 | SE C ST. TO SE B ST. | 10 | 23 | 2 |
| | | | | | |
| **TOTALS:** | | | | **23** | **2** |

## REMOVE AND SALVAGE / RELOCATE ITEMS

| STATION | STATION | LOCATION | SIGN | WATER METER | FIRE HYDRANT |
|---|---|---|---|---|---|
| | | | EA. | | |
| 00+00.00 | 12+30.03 | SE C ST. TO SE B ST. | 1 | 8 | 1 |
| 100+00.00 | 100+68.05 | SE C ST. | 3 | | |
| | | | | | |
| **TOTALS:** | | | **4** | **8** | **1** |

## REMOVAL AND DISPOSAL OF CULVERTS AND INLETS

| STATION | DESCRIPTION | PIPE CULVERTS | INLETS |
|---|---|---|---|
| | | EA. | |
| 01+09.04 | 8" RCP | 1 | |
| 03+66.92 | 8" RCP | 1 | |
| 04+33.07 | 12" RCP | 1 | |
| 05+45.37 | 12" CMP | 1 | |
| 06+49.51 | 12" CMP | 1 | |
| 07+72.16 | 15" CMP | 1 | |
| 08+25.90 | 24" CMP | 1 | |
| 09+93.79 | 24" RCP | 1 | |
| 10+04.89 | 18" CMP | 1 | 1 |
| 10+24.24 | 15" RCP | 1 | |
| 10+24.24 | 15" CMP | 1 | |
| 11+26.49 | 15" CMP | 1 | |
| | | | |
| **TOTALS:** | | **12** | **1** |

NOTE: QUANTITIES SHOWN ABOVE SHALL INCLUDE FLARED END SECTIONS IF APPLICABLE.
CONTRACTOR SHALL REMOVE, PROTECT, AND RETURN CONDITION.

## PERMANENT PAVEMENT MARKINGS

| DESCRIPTION | PAINT PAVEMENT MARKINGS REFLECTIVE WHITE "SHARROW" | THERMOPLASTIC PAVEMENT MARKINGS 12" WHITE |
|---|---|---|
| | EA | LF |
| PAINT PAVEMENT MARKING - REFLECTIVE WHITE "SHARROW" | 3 | |
| THERMOPLASTIC PAVEMENT MARKING - WHITE (12") | | 50 |
| | | |
| **TOTALS:** | **3** | **50** |

NOTE: NO PERMANENT PAVEMENT MARKINGS SHALL BE PLACED UNTIL A MINIMUM OF 3 DAYS AFTER ALL MAIN LANE PAVING HAS BEEN COMPLETED. IN ADDITION, NO PERMANENT PAVEMENT MARKINGS SHALL BE PLACED DURING THE TIME PERIOD FROM DECEMBER 21 TO MARCH 15, INCLUSIVE.


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| | |
|---|---|
| PROFESSIONAL OF RECORD | BLM |
| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/25/2022 |
| REVISION | REV-30% |

QUANTITIES (1)
SHEET TITLE
SHEET NUMBER
13

DRAWING LOCATION: P:\32000\32252.00\DRAWINGS\DESIGN\WORKING\32252-QNTY.DWG - SAVED BY: CECHOLS

| SUMMARY OF QUANTITIES | | | |
|---|---|---|---|
| ITEM NO. | ITEM | UNIT | TOTAL QUANTITY |
| | ROADWAY | | |
| 1 | MOBILIZATION | LS | 1 |
| 2 | TRENCHING AND EXCAVATION SAFETY SYSTEMS | LS | 1 |
| 3 | CLEARING | STA | 13 |
| 4 | GRUBBING | STA | 13 |
| 5 | REMOVAL AND DISPOSAL OF ASPHALT PAVEMENT | SY | 405 |
| 6 | REMOVAL AND DISPOSAL OF CONCRETE DRIVEWAY | SY | 162 |
| 7 | REMOVAL AND DISPOSAL OF GRAVEL DRIVEWAY | SY | 70 |
| 8 | REMOVAL AND DISPOSAL OF CONCRETE WALKS | SY | 26 |
| 9 | REMOVAL AND DISPOSAL OF SEWER LINE | LF | 61 |
| 10 | REMOVAL AND DISPOSAL OF WATER LINE | LF | 89 |
| 11 | REMOVAL AND DISPOSAL OF PAVEMENT MARKINGS | LF | 50 |
| 12 | REMOVAL AND DISPOSAL OF PAVEMENT MARKING - WORD | EA | 3 |
| 13 | REMOVAL AND DISPOSAL OF TREES | EA | 6 |
| 14 | REMOVAL AND DISPOSAL OF PIPE CULVERTS | EA | 12 |
| 15 | REMOVAL AND DISPOSAL OF INLETS | EA | 1 |
| 16 | REMOVE AND RELOCATE SIGN | EA | 4 |
| 17 | REMOVE AND RELOCATE WATER METER | EA | 8 |
| 18 | REMOVE AND RELOCATE FIRE HYDRANT | EA | 1 |
| 19 | UNCLASSIFIED EXCAVATION | CY | 65 |
| 20 | COMPACTED EMBANKMENT | CY | 310 |
| 21 | P.C. CONCRETE DRIVEWAY APRON | SY | 114 |
| 22 | P.C. CONCRETE DRIVEWAY | SY | 112 |
| 23 | MAINTENANCE OF TRAFFIC | LS | 1 |
| 24 | 18" REINFORCED CONCRETE PIPE, CLASS III | LF | 34 |
| 25 | 24" REINFORCED CONCRETE PIPE, CLASS III | LF | 72 |
| 26 | 36" REINFORCED CONCRETE PIPE, CLASS III | LF | 940 |
| 27 | 12" REINFORCED CONCRETE PIPE, CLASS IV | LF | 30 |
| 28 | 18" REINFORCED CONCRETE PIPE, CLASS IV | LF | 191 |
| 29 | TYPE C RECTANGULAR CURB INLETS (4'x4') | EA | 9 |
| 30 | AREA INLETS (4'x4') | EA | 2 |
| 31 | TYPE E JUNCTION BOX (4'x4') | EA | 4 |
| 32 | CONCRETE HEADWALL | EA | 2 |
| 33 | CONNECT TO EXISTING DRAINAGE STRUCTURE | EA | 1 |
| 34 | FLOWABLE FILL | CY | 50 |
| 35 | SELECTED PIPE BEDDING | CY | 50 |
| 36 | SEEDING | ACRE | 0.30 |
| 37 | TEMPORARY SEEDING | ACRE | 0.30 |
| 38 | LIME | TON | 0.60 |
| 39 | MULCH COVER | ACRE | 0.90 |
| 40 | WATER | M. GAL | 36.72 |
| 41 | SECOND SEEDING | ACRE | 0.30 |
| 42 | SOLID SODDING | SY | 224 |
| 43 | INLET PROTECTION | LF | 75 |
| 44 | SILT FENCE BOX PROTECTION | EA | 13 |
| 45 | ROCK CHECK DAM | CY | 6 |
| 46 | SEDIMENT REMOVAL & DISPOSAL | CY | 26 |
| 47 | CONCRETE COMBINATION CURB AND GUTTER (TYPE A 1'-6") | LF | 975 |
| 48 | CONCRETE SIDEWALK | SY | 23 |
| 49 | TRUNCATED DOME WARNING DEVICE | EA | 2 |
| 50 | WHEELCHAIR RAMPS | EA | 1 |
| 51 | PAINT PAVEMENT MARKING - REFLECTIVE WHITE "SHARROW" | EA | 3 |
| 52 | THERMOPLASTIC PAVEMENT MARKING - WHITE (12") | LF | 50 |
| 53 | ASPHALT PAVEMENT REPAIR | SY | 431 |

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CONSTRUCTION

| | |
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| PROFESSIONAL OF RECORD | BLM |
| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/25/2022 |
| REVISION | REV-30% |

SUMMARY OF QUANTITIES
SHEET TITLE

SHEET NUMBER
14

DRAWING LOCATION - P:\32000\32252.00\DRAWINGS\DESIGN\WORKING\32252-QNTY.DWG - SAVED BY - CECHOLS

SURVEY CONTROL COORDINATES

PROJECT NAME: POPLAR STREET IMPROVEMENTS
DATE:
COORDINATE SYSTEM: ARKANSAS STATE PLANE GRID COORDINATES, NORTH ZONE, NAD 83,
UNITS: U.S. SURVEY FOOT

SURVEY POINT TABLE

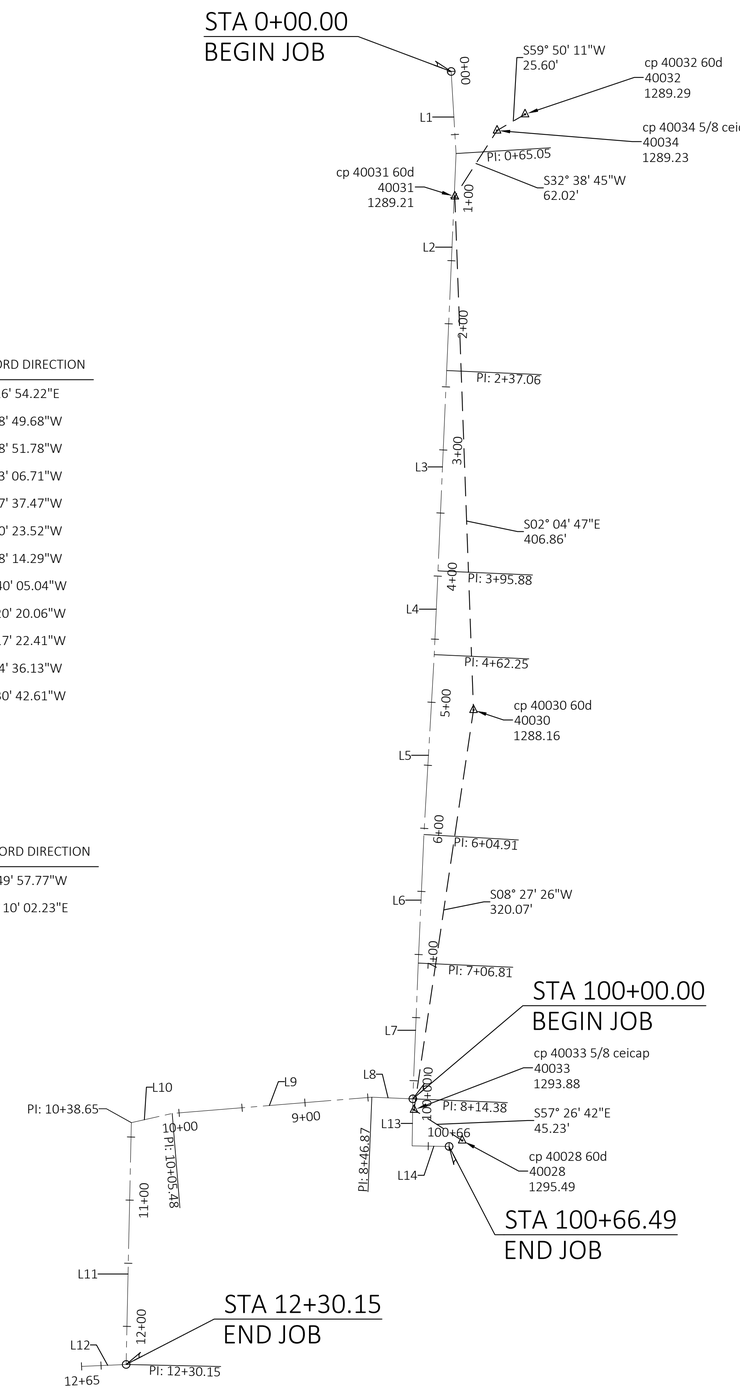
| POINT NAME | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---|---|---|---|---|
| 40028 | 747614.87 | 662964.11 | 1295.49 | CP 40028 60D |
| 40030 | 747955.79 | 662973.06 | 1288.16 | CP 40030 60D |
| 40031 | 748362.39 | 662958.29 | 1289.21 | CP 40031 60D |
| 40032 | 748427.47 | 663013.88 | 1289.29 | CP 40032 60D |
| 40033 | 747639.21 | 662925.98 | 1293.88 | CP 40033 5/8 CEICAP |
| 40034 | 748414.61 | 662991.75 | 1289.23 | CP 40034 5/8 CEICAP |

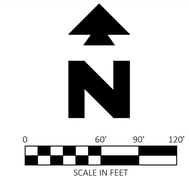
STORM-A

| NUMBER | RADIUS | LENGTH | LINE/CHORD DIRECTION |
|---|---|---|---|
| L1 | | 65.05' | S3° 26' 54.22"E |
| L2 | | 172.01' | S2° 28' 49.68"W |
| L3 | | 158.82' | S2° 28' 51.78"W |
| L4 | | 66.37' | S2° 33' 06.71"W |
| L5 | | 142.66' | S3° 17' 37.47"W |
| L6 | | 101.90' | S2° 30' 23.52"W |
| L7 | | 107.57' | S2° 18' 14.29"W |
| L8 | | 32.49' | N87° 40' 05.04"W |
| L9 | | 158.62' | S85° 20' 20.06"W |
| L10 | | 33.16' | S77° 17' 22.41"W |
| L11 | | 191.50' | S1° 14' 36.13"W |
| L12 | | 35.28' | S87° 30' 42.61"W |

STORM-B

| NUMBER | RADIUS | LENGTH | LINE/CHORD DIRECTION |
|---|---|---|---|
| L13 | | 37.25' | S0° 49' 57.77"W |
| L14 | | 29.23' | S89° 10' 02.23"E |





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| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
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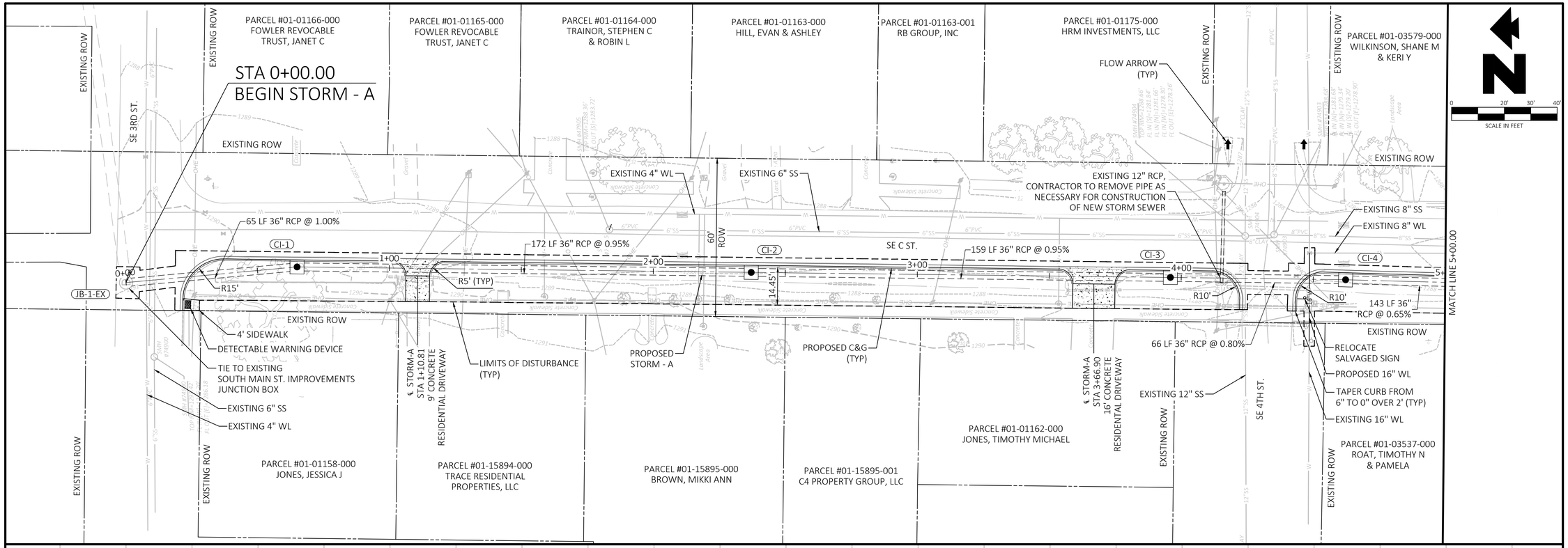
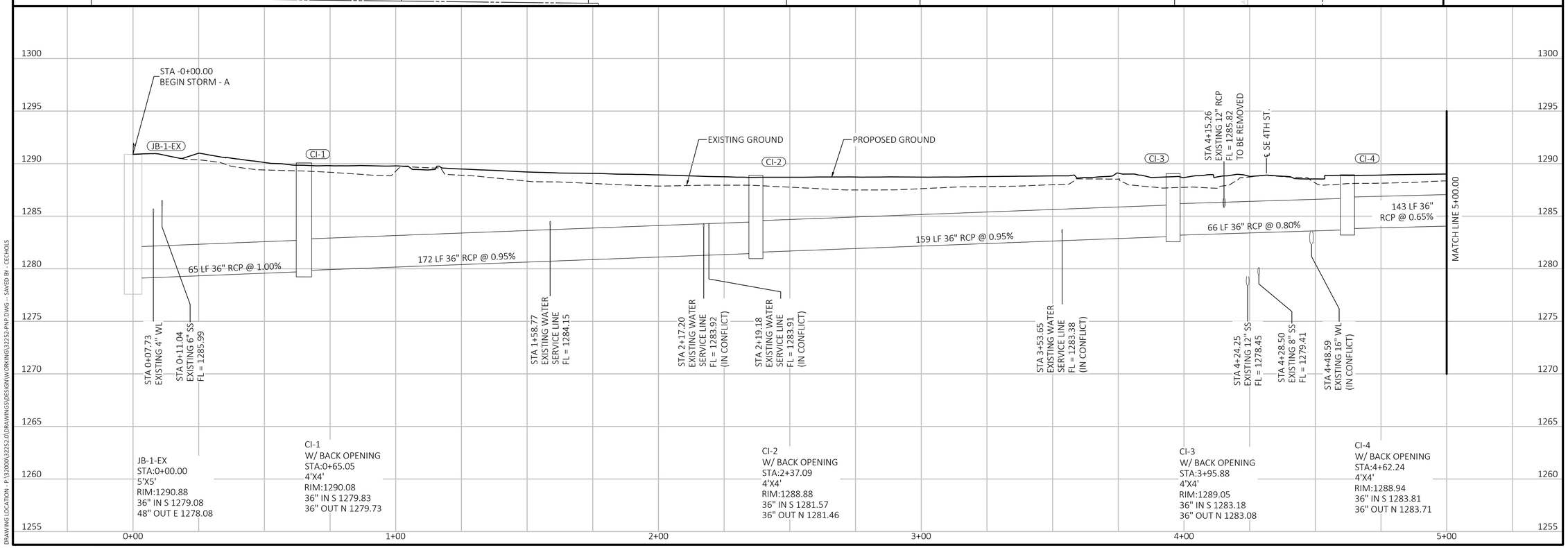
SURVEY CONTROL DETAILS
SHEET TITLE

SHEET NUMBER
15

DRAWING LOCATION - P:\32000\32252.00\DRAWINGS\DESIGN\WORKING\32252-CTRL.DWG - SAVED BY - CEEHOLS

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| CEI PROJECT NUMBER | 32252 |
| DATE | 2/25/2022 |
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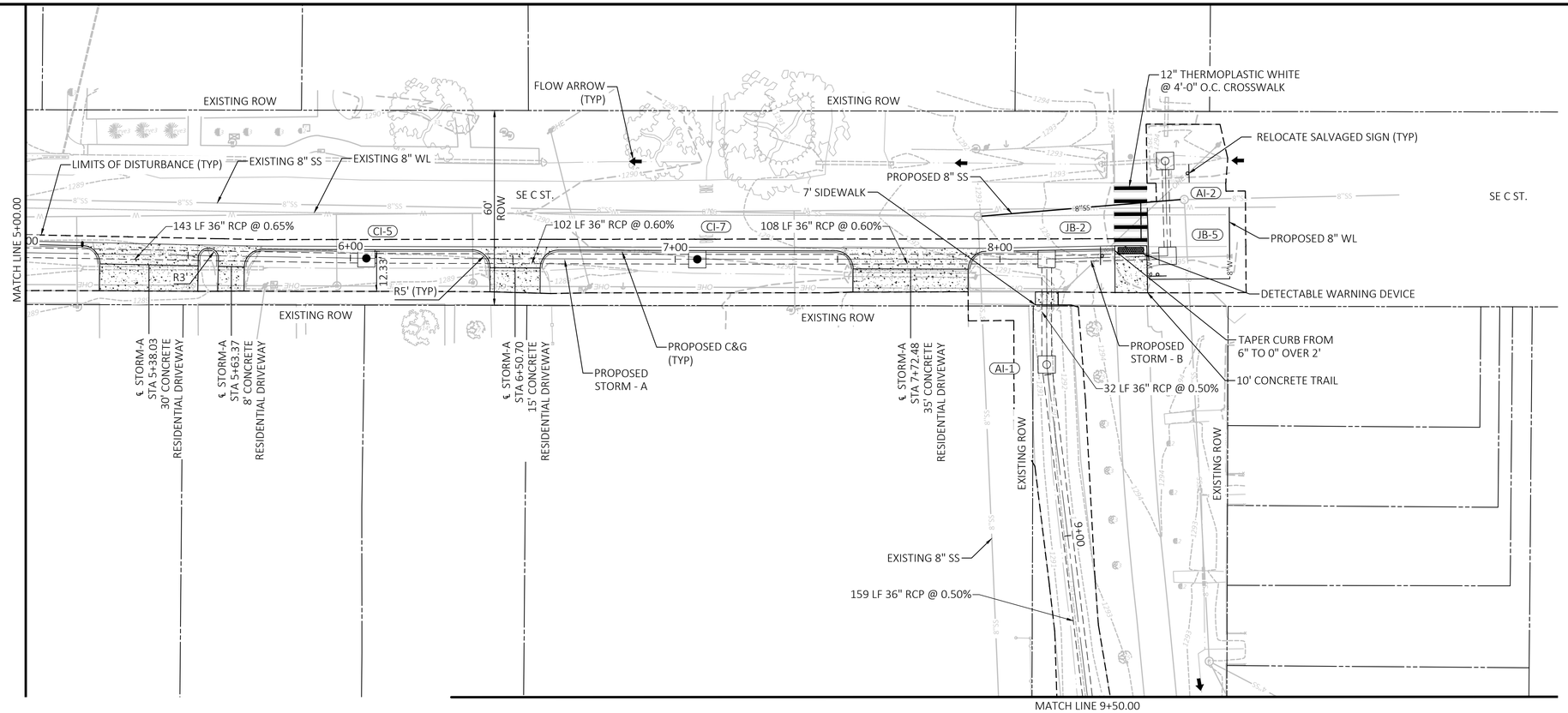
STORM SEWER PLAN
& PROFILE (1)

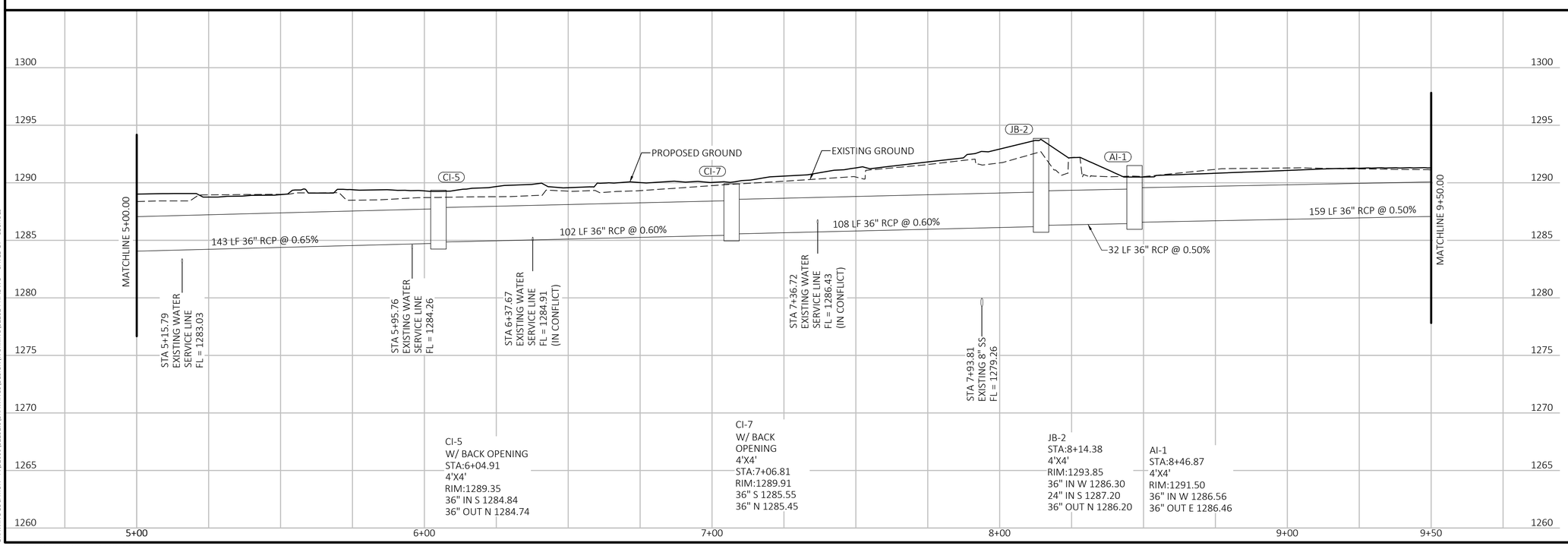
SHEET TITLE

SHEET NUMBER

16

DRAWING LOCATION: P:\32000\32252.01\DRAWINGS\DESIGN\WORKING\32252-PNP.DWG - SAVED BY: CEICHOLS

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| PROJECT MANAGER | AN |
| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
| REVISION | REV-30% |

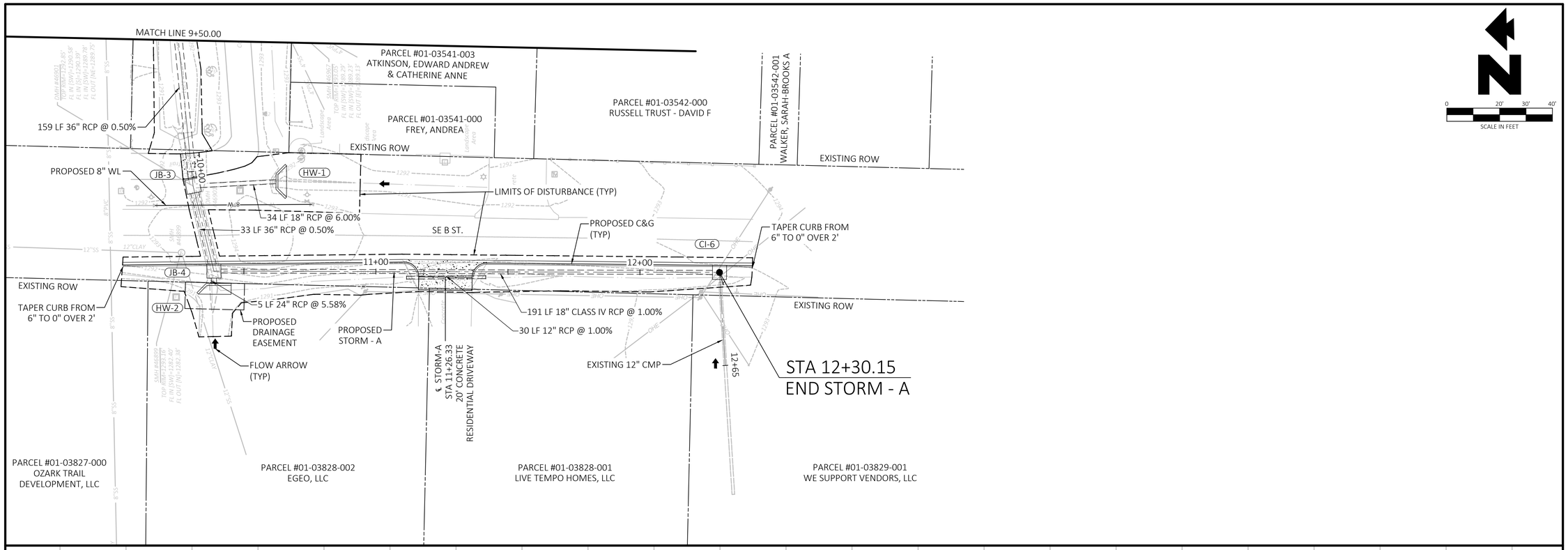
STORM SEWER PLAN & PROFILE (2)

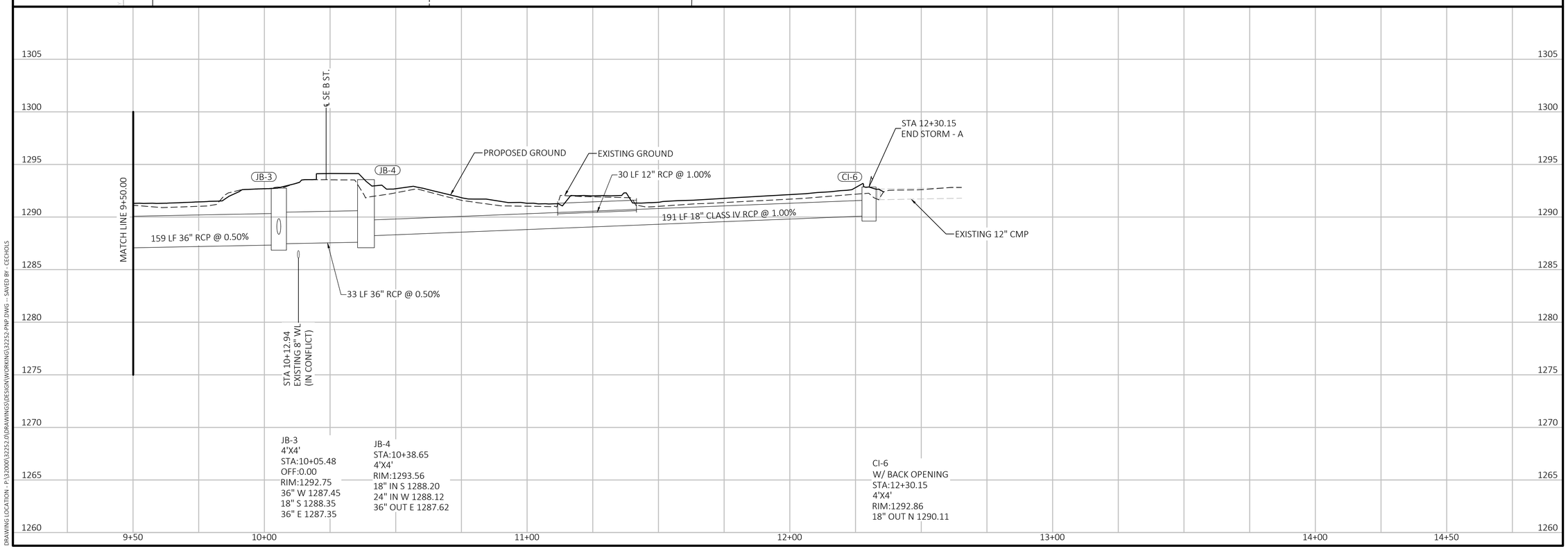
SHEET TITLE

SHEET NUMBER

17

DRAWING LOCATION: P:\32000\32252.00\DRAWINGS\DESIGN\WORKING\32252-PNP.DWG - SAVED BY: CECHOLS

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| DESIGNER | CLE |
| CEI PROJECT NUMBER | 32252 |
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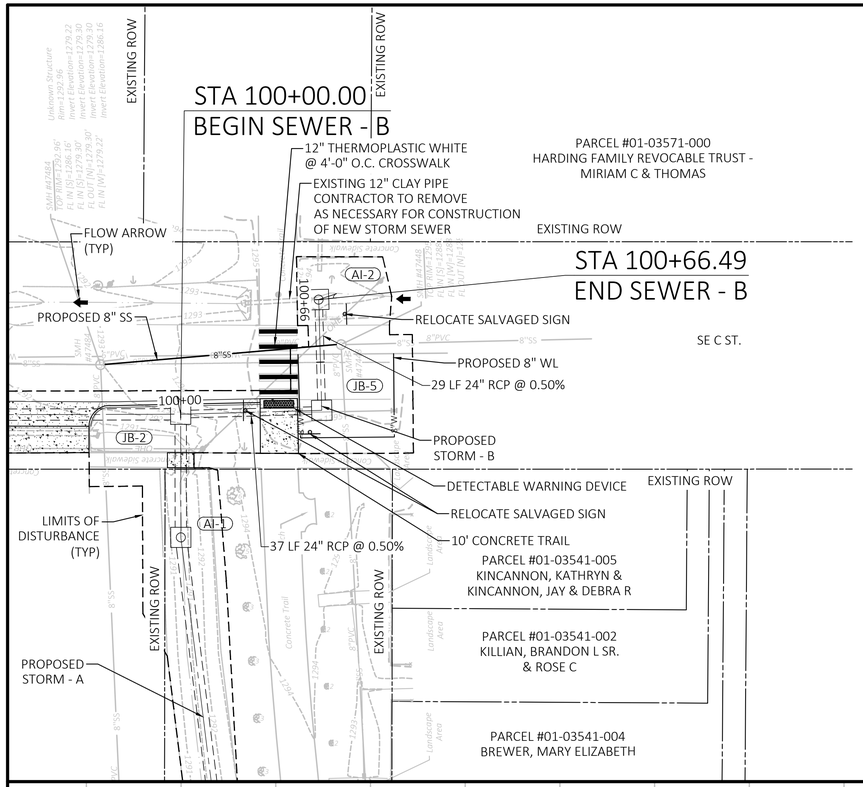
STORM SEWER PLAN & PROFILE (3)

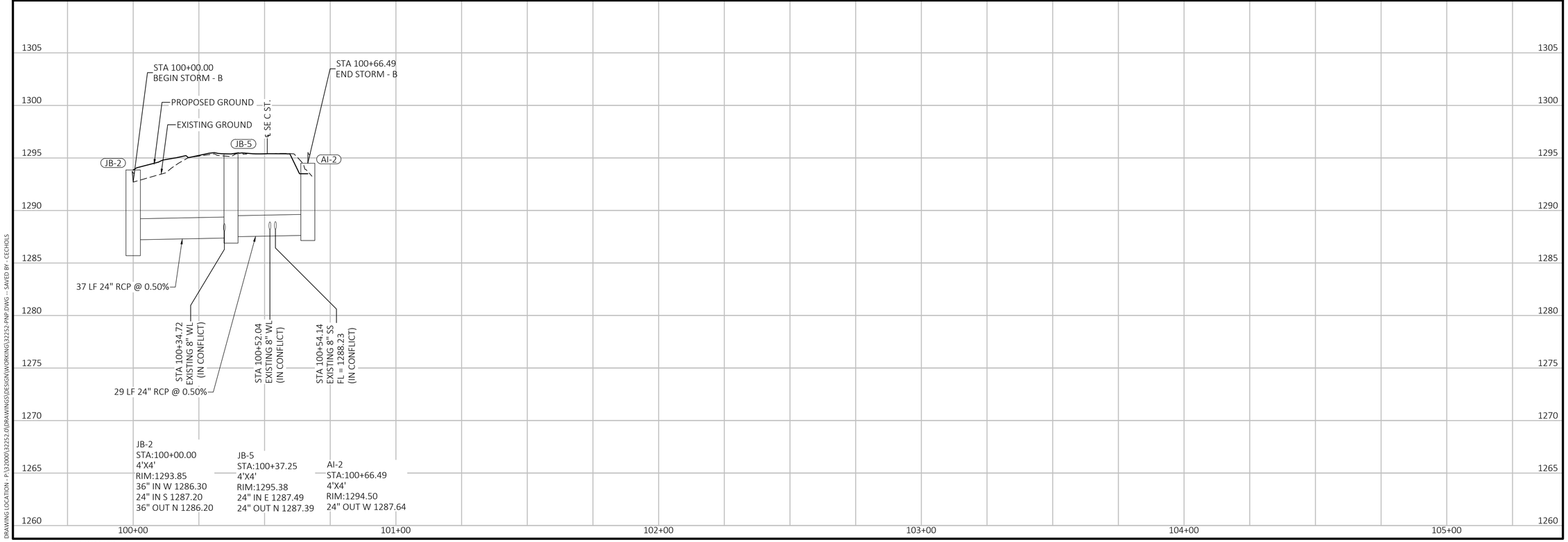
SHEET TITLE

SHEET NUMBER

18

DRAWING LOCATION: P:\32000\32252.01\DRAWINGS\DESIGN\WORKING\32252.PNP.DWG - SAVED BY: CECHOLS




N

0 20' 30' 40'
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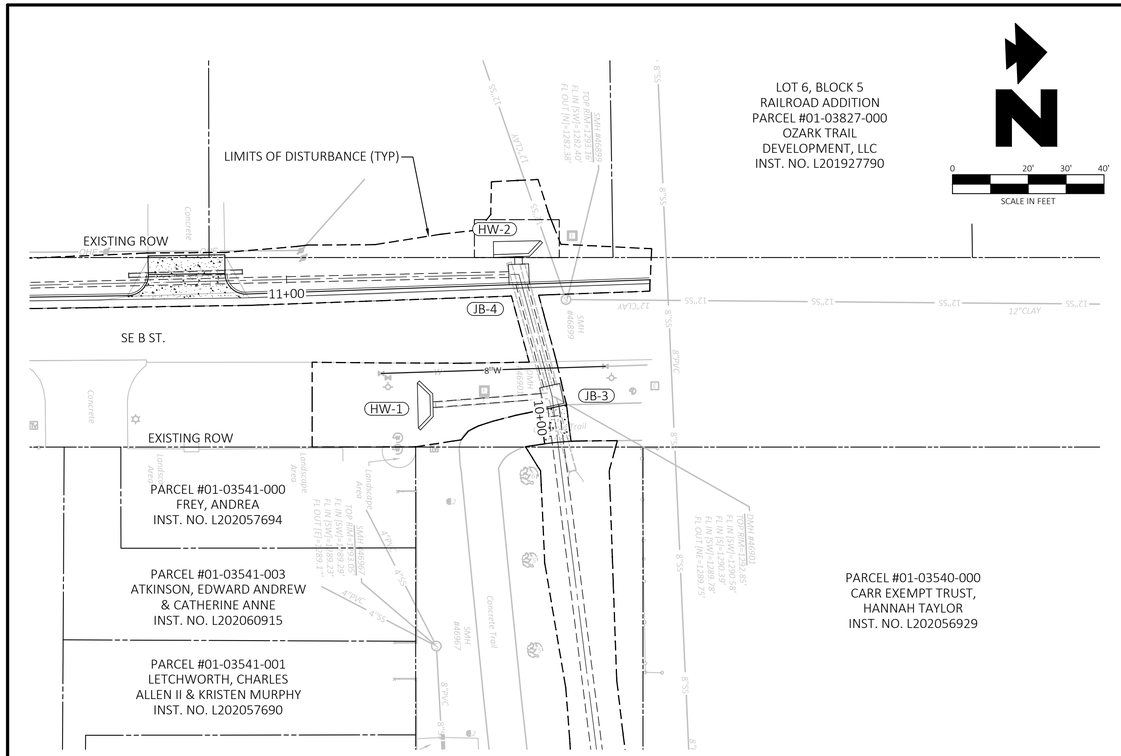
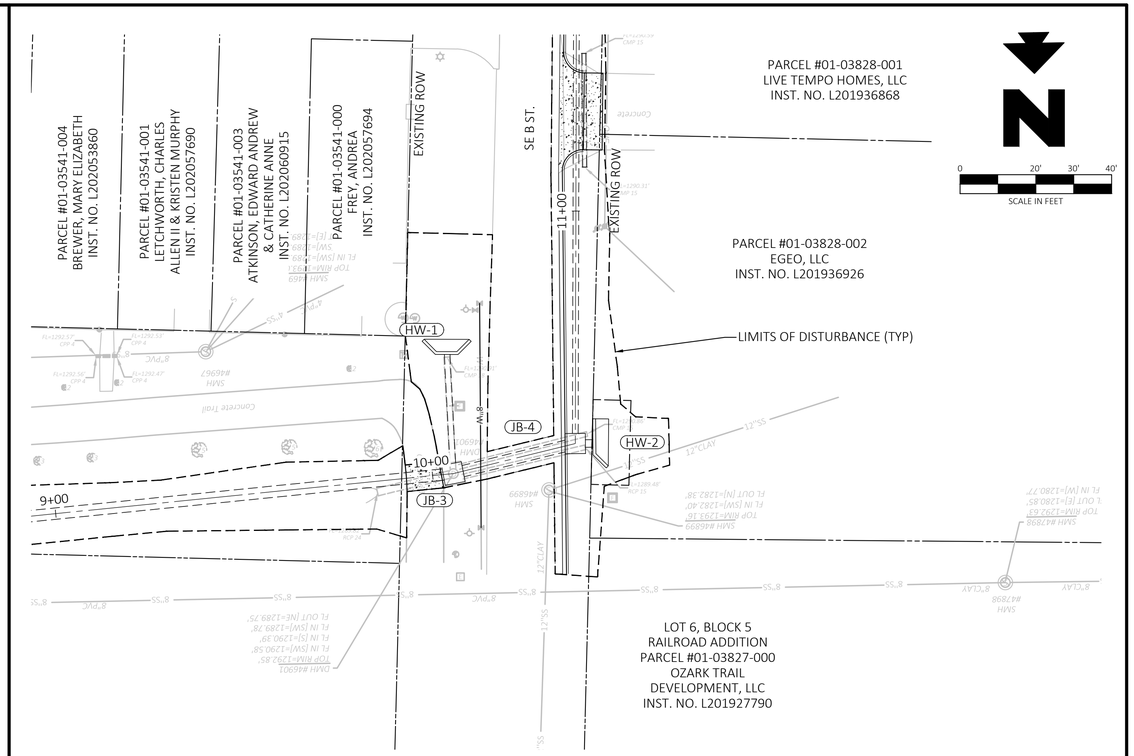
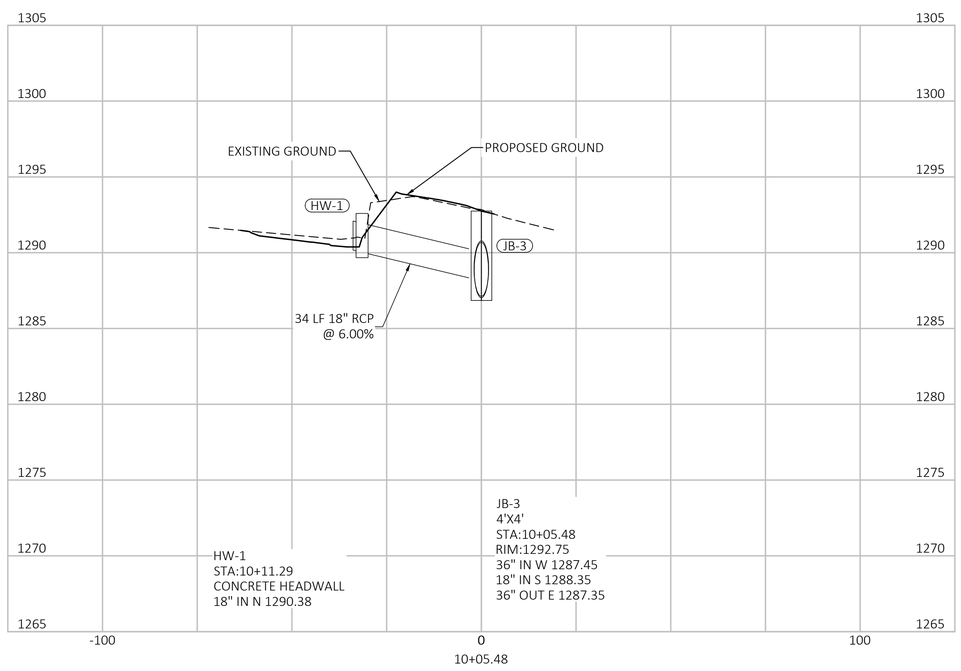
STORM SEWER PLAN
& PROFILE (4)
SHEET TITLE

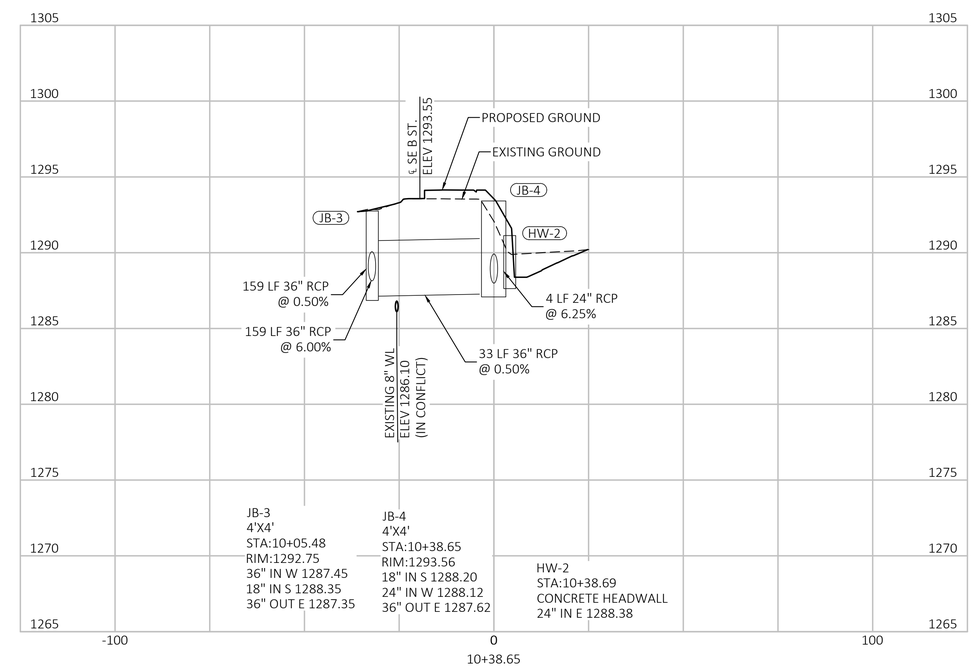
SHEET NUMBER
19

DRAWING LOCATION: P:\32000\32252.01\DRAWINGS\DESIGN\WORKING\32252-PNP.DWG - SAVED BY: CEECHOLS

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STORM PIPE CROSS SECTIONS
SHEET TITLE

SHEET NUMBER
20

DRAWING LOCATION - P:\32000\32252.00\DRAWINGS\DESIGN\WORKING\32252-STRM-SECT.DWG - SAVED BY - CECHOLS


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| CEI PROJECT NUMBER | 32252 |
| DATE | 2/24/2022 |
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DRAINAGE AREA MAP
SHEET TITLE

SHEET NUMBER
21

DRAWING LOCATION - P:\32000\32252.0\DRAWINGS\DESIGN\WORKING\32252-DRAIN.DWG - SAVED BY - CECHOLS

*Civil Engineering, Landscape Architecture,*
*Survey, Planning & Program Management*

3108 SW Regency Parkway
Bentonville, AR 72712
Office: 479.273.9472
Toll-free: 1.800.433.4173
ceieng.com

February 25, 2021

Dan Weese
City of Bentonville
3200 SW Municipal Drive
Bentonville, AR 72712
Phone: (479) 271-6840

**RE: SE C Street Laterals – Executive Drainage Summary**

Dear Mr. Weese,

Below is a summary of the drainage improvements for the SE C Street Laterals project.

**Introduction:**
It is the intent of this report to show that the stormwater management facilities designed for the SE C Street Laterals project area described within meets or exceeds the requirements of the City of Bentonville Stormwater Management and Drainage Manual and general engineering practices for the control of peak runoff and safe conveyance of stormwater within and/or from the site without damage to downstream property and life. The proposed improvements to the project area will consist of a new drainage trunk extending from SE B Street to the corner of SE C Street and SE 3rd Street. This project is not located within any established 100-year floodplain, as shown by the Federal Emergency Management Agency (FEMA) Flood Rate Insurance Map (FIRM) for the City of Bentonville, Community Panels #05007C0255K (effective date 06/05/2012) and #05007C0090J (effective date 09/28/2007).

**Hydrology Methods:**
Stormwater runoff for the project area generally flows from south to north. The existing drainage system is primarily open ditch flow in a northernly direction towards SE 3rd Street.

In accordance with the City of Bentonville Stormwater Management and Drainage Manual, the Rational Method was utilized for each drainage area due to their respective sizes being less than 200 acres each. The proposed drainage system was designed to convey full flow capacity for the 100-year storm event.

**Hydrology Parameters:**
The drainage areas for inlets were delineated using survey data along the proposed trunk and branch line locations and USGS Quad map contours.

The times of concentration ($T_c$) were calculated using the Technical Release 55 (TR-55) methodology. However, in drainage areas where the calculated $T_c$ fell below the 5-minute minimum dictated by TR-55, a $T_c$ of 5 minutes was assumed.

Peak flow rates for each drainage area were calculated using the Rational Method with composite runoff coefficients based on the following: 0.9 for pavement, roofs, and other impervious areas; 0.55 for properties zoned R-1 with an average size of 1/3 acre; 0.75 for properties zoned R-3; 0.8 for properties zoned R-4 and RC-2; and 0.92 for properties zoned RC-3. These runoff coefficients were obtained from Table 2.1 of the City of Bentonville Stormwater Management and Drainage Manual. Rainfall intensities (used in the Rational Method) were also obtained from the City of Bentonville Stormwater Management and Drainage Manual.

**Conclusion:**
The proposed drainage system was analyzed and sized to adequately convey the stormwater runoff that the existing system experienced.

The project area is located outside of the floodway and the 100-year floodplain limits. Improvements as outlined in this report and depicted on the design drawings shall not increase the risk of endangerment to life or have negative impact on adjacent or downstream property or watersheds.

This report has been prepared in accordance with the design requirements for this project. In addition, storm events/frequencies, runoff calculations, discharge criteria, pipe hydraulics, evaluation methods (including computer software applications), etc., have been based on the guidelines/requirements of this project and reflect the application of generally accepted standards of engineering practice.

Respectfully Submitted,

Colton Echols E.I.
Project Designer

# Structure Report

10-Year

| Structure Number | Line ID | Junction Type | Rim Elevation (ft) | Structure | | | Line Out | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Shape | Length (ft) | Width (ft) | Size (in) | Shape | Invert (ft) |
| 1 | JB-1-EX | MH | 1290.89 | Rect | 6 | 6 | 48 | Cir | 1278.08 |
| 2 | CI-1 | Curb | 1289.99 | Rect | 5 | 5 | 36 | Cir | 1279.73 |
| 3 | CI-2 | Curb | 1288.88 | Rect | 5 | 5 | 36 | Cir | 1281.46 |
| 4 | CI-3 | Curb | 1288.60 | Rect | 5 | 5 | 36 | Cir | 1283.08 |
| 5 | CI-4 | Curb | 1288.87 | Rect | 5 | 5 | 36 | Cir | 1283.71 |
| 6 | CI-5 | Curb | 1289.26 | Rect | 5 | 5 | 36 | Cir | 1284.74 |
| 7 | CI-7 | Curb | 1289.83 | Rect | 5 | 5 | 36 | Cir | 1285.45 |
| 8 | JB-2 | MH | 1293.77 | Rect | 5 | 5 | 36 | Cir | 1286.20 |
| 9 | AI-1 | Dp-Curb | 1291.50 | Rect | 5 | 5 | 36 | Cir | 1286.46 |
| 10 | JB-3 | MH | 1292.75 | Rect | 5 | 5 | 36 | Cir | 1287.35 |
| 11 | JB-4 | MH | 1293.42 | Rect | 5 | 5 | 36 | Cir | 1287.62 |
| 12 | CI-6 | Curb | 1292.86 | Rect | 4 | 4 | 18 | Cir | 1290.11 |
| 13 | HW-2 | Hdwall | 1290.65 | … | … | … | 24 | Cir | 1288.38 |
| 14 | HW-1 | Hdwall | 1290.57 | … | … | … | 18 | Cir | 1290.38 |
| 15 | JB-5 | MH | 1295.31 | Rect | 5 | 5 | 24 | Cir | 1287.39 |
| 16 | AI-2 | Dp-Curb | 1294.50 | Rect | 5 | 5 | 24 | Cir | 1287.65 |

# Storm Sewer Summary Report

10-Year

| Line Number | Line ID | Flow Rate (cfs) | Pipe Capacity (cfs) | Pipe Capacity (%) | Line Size (in) | Line Shape | Line Length (ft) | Invert El. Down (ft) | Invert El. Up (ft) | Line Slope (%) | Pipe Velocity (fps) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | JB-1-EX | 50.25 | 150.72 | 33% | 48 | Cir | 108 | 1277.07 | 1278.08 | 0.94 | 9.10 |
| 2 | CI-1 | 50.46 | 72.28 | 70% | 36 | Cir | 65 | 1279.08 | 1279.73 | 1.00 | 9.85 |
| 3 | CI-2 | 48.32 | 70.33 | 69% | 36 | Cir | 172 | 1279.83 | 1281.46 | 0.95 | 8.56 |
| 4 | CI-3 | 44.91 | 70.46 | 64% | 36 | Cir | 159 | 1281.57 | 1283.08 | 0.95 | 8.22 |
| 5 | CI-4 | 42.79 | 64.57 | 66% | 36 | Cir | 66 | 1283.18 | 1283.71 | 0.80 | 8.08 |
| 6 | CI-5 | 40.84 | 58.33 | 70% | 36 | Cir | 143 | 1283.81 | 1284.74 | 0.65 | 7.92 |
| 7 | CI-7 | 37.18 | 55.87 | 67% | 36 | Cir | 102 | 1284.84 | 1285.45 | 0.60 | 7.51 |
| 8 | JB-2 | 35.17 | 56.16 | 63% | 36 | Cir | 108 | 1285.55 | 1286.20 | 0.60 | 7.44 |
| 9 | AI-1 | 24.75 | 51.09 | 48% | 36 | Cir | 32 | 1286.30 | 1286.46 | 0.50 | 5.97 |
| 10 | JB-3 | 23.82 | 50.99 | 47% | 36 | Cir | 159 | 1286.56 | 1287.35 | 0.50 | 6.54 |
| 11 | JB-4 | 18.99 | 51.10 | 37% | 36 | Cir | 34 | 1287.45 | 1287.62 | 0.50 | 5.70 |
| 12 | CI-6 | 7.47 | 11.36 | 66% | 18 | Cir | 191 | 1288.20 | 1290.11 | 1.00 | 6.23 |
| 13 | HW-2 | 11.70 | 61.21 | 19% | 24 | Cir | 4 | 1288.12 | 1288.38 | 6.25 | 7.19 |
| 14 | HW-1 | 5.76 | 27.90 | 21% | 18 | Cir | 34 | 1288.35 | 1290.38 | 6.00 | 7.18 |
| 15 | JB-5 | 12.54 | 17.33 | 72% | 24 | Cir | 38 | 1287.20 | 1287.39 | 0.50 | 5.98 |
| 16 | AI-2 | 12.60 | 17.33 | 73% | 24 | Cir | 32 | 1287.49 | 1287.65 | 0.50 | 5.99 |

## Inlet Report

10-Year

| Line Number | Inlet ID | Drainage Area (ac) | Q = CIA (cfs) | Q Carryover (cfs) | Q Captured (cfs) | Q Bypass (cfs) | Junction Type | Height (in) | Grate Area (sf) | Curb Inlet Length (ft) | Spread (ft) | Depth (ft) | Depression (in) | Bypass Line Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | JB-1-EX | 0.00 | 0.00 | Rect | 6.00 | .... | MH | .... | .... | .... | .... | .... | .... | n/a |
| 2 | CI-1 | 0.88 | 1289.99 | 0.00 | 5.00 | 0.00 | Curb | 6.00 | .... | 5.80 | 2.44 | 0.34 | 0 | Sag |
| 3 | CI-2 | 1.25 | 4.71 | 0.00 | 5.00 | 0.00 | Curb | 6.00 | .... | 5.80 | 3.17 | 0.42 | 0 | Sag |
| 4 | CI-3 | 0.70 | 2.79 | 0.00 | 5.00 | 0.00 | Curb | 6.00 | .... | 4.00 | 4.27 | 0.38 | 0 | Sag |
| 5 | CI-4 | 0.78 | 2.85 | 0.00 | 5.00 | 0.00 | Curb | 6.00 | .... | 4.00 | 7.66 | 0.38 | 0 | Sag |
| 6 | CI-5 | 1.28 | 4.54 | 0.00 | 4.54 | 0.00 | Curb | 6.00 | .... | 4.00 | 5.73 | 0.52 | 0 | Sag |
| 7 | CI-7 | 0.59 | 2.80 | 0.00 | 2.80 | 0.00 | Curb | 6.00 | .... | 4.00 | 3.53 | 0.38 | 0 | Sag |
| 8 | JB-2 | 0.00 | 0.00 | .... | .... | .... | MH | .... | .... | .... | .... | .... | .... | n/a |
| 9 | AI-1 | 0.42 | 1.77 | 0.00 | 1.77 | 0.00 | Dp-Curb | 6.00 | .... | 16.00 | 0.74 | 0.11 | .... | Sag |
| 10 | JB-3 | 0.00 | 0.00 | .... | .... | .... | MH | .... | .... | .... | .... | .... | .... | n/a |
| 11 | JB-4 | 0.00 | 0.00 | .... | .... | .... | MH | .... | .... | .... | .... | .... | .... | n/a |
| 12 | CI-6 | 1.73 | 7.47 | 0.00 | 0.81 | 6.66 | Curb | 6.00 | .... | 3.20 | 12.35 | 0.28 | 0 | 13 |
| 13 | HW-2 | 2.84 | 11.70 | 6.66 | 18.36 | 0.00 | Hdwall | .... | .... | .... | .... | .... | .... | n/a |
| 14 | HW-1 | 1.44 | 5.76 | 0.00 | 5.76 | 0.00 | Hdwall | .... | .... | .... | .... | .... | .... | n/a |
| 15 | JB-5 | 0.00 | 0.00 | .... | .... | .... | MH | .... | .... | .... | .... | .... | .... | n/a |
| 16 | AI-2 | 2.96 | 12.60 | 0.00 | 12.60 | 0.00 | Dp-Curb | 6.00 | .... | 16.36 | 1.35 | 0.40 | .... | Sag |

# Structure Report

100-Year

| Structure Number | Line ID | Junction Type | Rim Elevation (ft) | Structure | | | Line Out | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Shape | Length (ft) | Width (ft) | Size (in) | Shape | Invert (ft) |
| 1 | JB-1-EX | MH | 1290.89 | Rect | 6 | 6 | 48 | Cir | 1278.08 |
| 2 | CI-1 | Curb | 1289.99 | Rect | 5 | 5 | 36 | Cir | 1279.73 |
| 3 | CI-2 | Curb | 1288.88 | Rect | 5 | 5 | 36 | Cir | 1281.46 |
| 4 | CI-3 | Curb | 1288.6 | Rect | 5 | 5 | 36 | Cir | 1283.08 |
| 5 | CI-4 | Curb | 1288.87 | Rect | 5 | 5 | 36 | Cir | 1283.71 |
| 6 | CI-5 | Curb | 1289.26 | Rect | 5 | 5 | 36 | Cir | 1284.74 |
| 7 | CI-7 | Curb | 1289.83 | Rect | 5 | 5 | 36 | Cir | 1285.45 |
| 8 | JB-2 | MH | 1293.77 | Rect | 5 | 5 | 36 | Cir | 1286.2 |
| 9 | AI-1 | Dp-Curb | 1291.5 | Rect | 5 | 5 | 36 | Cir | 1286.46 |
| 10 | JB-3 | MH | 1292.75 | Rect | 5 | 5 | 36 | Cir | 1287.35 |
| 11 | JB-4 | MH | 1293.42 | Rect | 5 | 5 | 36 | Cir | 1287.62 |
| 12 | CI-6 | Curb | 1292.86 | Rect | 4 | 4 | 18 | Cir | 1290.11 |
| 13 | HW-2 | Hdwall | 1290.65 | … | … | … | 24 | Cir | 1288.38 |
| 14 | HW-1 | Hdwall | 1290.57 | … | … | … | 18 | Cir | 1290.38 |
| 15 | JB-5 | MH | 1295.31 | Rect | 5 | 5 | 24 | Cir | 1287.39 |
| 16 | AI-2 | Dp-Curb | 1294.5 | Rect | 5 | 5 | 24 | Cir | 1287.65 |

# Storm Sewer Summary Report

100-Year

| Line Number | Line ID | Flow Rate (cfs) | Pipe Capacity (cfs) | Pipe Capacity (%) | Line Size (in) | Line Shape | Line Length (ft) | Invert El. Down (ft) | Invert El. Up (ft) | Line Slope (%) | Pipe Velocity (fps) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | JB-1-EX | 72.48 | 150.72 | 48% | 48.00 | Cir | 107.67 | 1277.07 | 1278.08 | 0.94 | 10.18 |
| 2 | CI-1 | 72.68 | 72.28 | 101% | 36.00 | Cir | 64.96 | 1279.08 | 1279.73 | 1.00 | 11.26 |
| 3 | CI-2 | 69.34 | 70.33 | 99% | 36.00 | Cir | 172.05 | 1279.83 | 1281.46 | 0.95 | 10.60 |
| 4 | CI-3 | 64.20 | 70.46 | 91% | 36.00 | Cir | 158.78 | 1281.57 | 1283.08 | 0.95 | 10.01 |
| 5 | CI-4 | 61.07 | 64.57 | 95% | 36.00 | Cir | 66.36 | 1283.18 | 1283.71 | 0.80 | 9.72 |
| 6 | CI-5 | 58.07 | 58.33 | 100% | 36.00 | Cir | 142.68 | 1283.81 | 1284.74 | 0.65 | 9.38 |
| 7 | CI-7 | 52.70 | 55.87 | 94% | 36.00 | Cir | 102.00 | 1284.84 | 1285.45 | 0.60 | 8.83 |
| 8 | JB-2 | 49.69 | 56.16 | 88% | 36.00 | Cir | 107.57 | 1285.55 | 1286.20 | 0.60 | 8.64 |
| 9 | AI-1 | 34.91 | 51.09 | 68% | 36.00 | Cir | 31.99 | 1286.30 | 1286.46 | 0.50 | 6.81 |
| 10 | JB-3 | 33.35 | 50.99 | 65% | 36.00 | Cir | 158.62 | 1286.56 | 1287.35 | 0.50 | 7.31 |
| 11 | JB-4 | 26.53 | 51.10 | 52% | 36.00 | Cir | 34.00 | 1287.45 | 1287.62 | 0.50 | 6.35 |
| 12 | CI-6 | 10.41 | 11.36 | 92% | 18.00 | Cir | 191.49 | 1288.20 | 1290.11 | 1.00 | 6.98 |
| 13 | HW-2 | 16.33 | 61.21 | 27% | 24.00 | Cir | 4.17 | 1288.12 | 1288.38 | 6.25 | 7.64 |
| 14 | HW-1 | 7.94 | 27.90 | 28% | 18.00 | Cir | 33.75 | 1288.35 | 1290.38 | 6.00 | 6.60 |
| 15 | JB-5 | 17.30 | 17.33 | 100% | 24.00 | Cir | 38.00 | 1287.20 | 1287.39 | 0.50 | 6.29 |
| 16 | AI-2 | 17.35 | 17.33 | 100% | 24.00 | Cir | 32.00 | 1287.49 | 1287.65 | 0.50 | 5.52 |

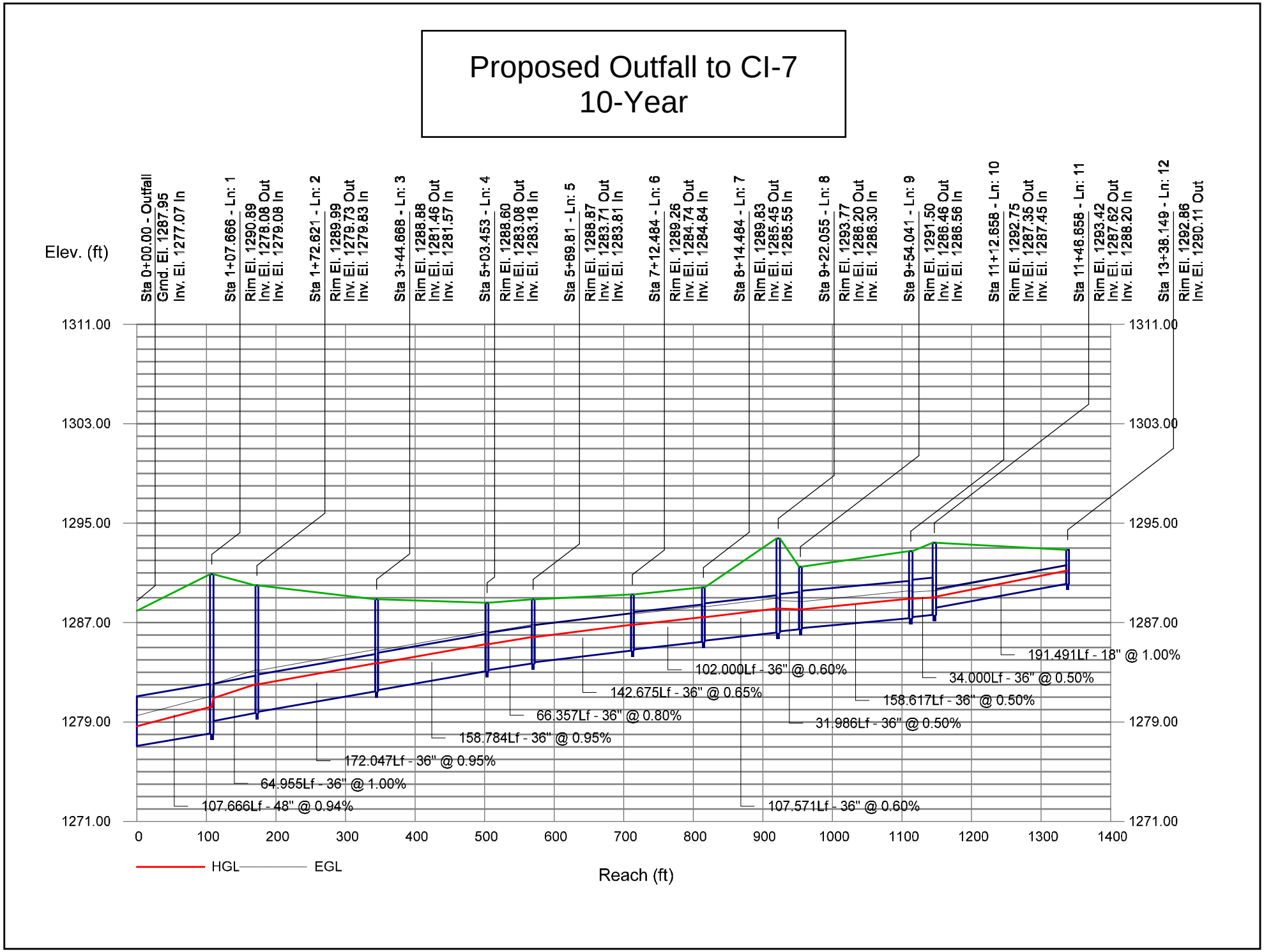
# Inlet Report

100-Year

| Line Number | Inlet ID | Drainage Area (ac) | Q = CIA (cfs) | Q Carryover (cfs) | Q Captured (cfs) | Q Bypass (cfs) | Junction Type | Height (in) | Grate Area (sf) | Curb Inlet Length (ft) | Spread (ft) | Depth (ft) | Depression (in) | Bypass Line Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | JB-1-EX | 0.00 | 0.00 | .... | 6.00 | .... | MH | .... | .... | .... | .... | .... | .... | n/a |
| 2 | CI-1 | 0.88 | 4.71 | 0.00 | 5.00 | 0.00 | Curb | 6.00 | .... | 5.80 | 2.84 | 0.42 | 0 | Sag |
| 3 | CI-2 | 1.25 | 6.52 | 0.00 | 5.00 | 0.00 | Curb | 6.00 | .... | 5.80 | 3.76 | 0.52 | 0 | Sag |
| 4 | CI-3 | 0.70 | 3.85 | 0.00 | 5.00 | 0.00 | Curb | 6.00 | .... | 4.00 | 5.18 | 0.47 | 0 | Sag |
| 5 | CI-4 | 0.78 | 3.94 | 0.00 | 5.00 | 0.00 | Curb | 6.00 | .... | 4.00 | 9.51 | 0.48 | 0 | Sag |
| 6 | CI-5 | 1.28 | 6.29 | 0.00 | 6.29 | 0.00 | Curb | 6.00 | .... | 4.00 | 6.98 | 0.65 | 0 | Sag |
| 7 | CI-7 | 0.59 | 3.86 | 0.00 | 3.86 | 0.00 | Curb | 6.00 | .... | 4.00 | 4.23 | 0.47 | 0 | Sag |
| 8 | JB-2 | 0.00 | 0.00 | .... | .... | .... | MH | .... | .... | .... | .... | .... | .... | n/a |
| 9 | AI-1 | 0.42 | 2.43 | 0.00 | 2.43 | 0.00 | Dp-Curb | 6.00 | .... | 16.00 | 0.91 | 0.14 | .... | Sag |
| 10 | JB-3 | 0.00 | 0.00 | .... | .... | .... | MH | .... | .... | .... | .... | .... | .... | n/a |
| 11 | JB-4 | 0.00 | 0.00 | .... | .... | .... | MH | .... | .... | .... | .... | .... | .... | n/a |
| 12 | CI-6 | 1.73 | 10.41 | 0.00 | 0.97 | 9.43 | Curb | 6.00 | .... | 3.20 | 14.01 | 0.31 | 0 | 13 |
| 13 | HW-2 | 2.84 | 16.33 | 9.43 | 25.76 | 0.00 | Hdwall | .... | .... | .... | .... | .... | .... | n/a |
| 14 | HW-1 | 1.44 | 7.94 | 0.00 | 7.94 | 0.00 | Hdwall | .... | .... | .... | .... | .... | .... | n/a |
| 15 | JB-5 | 0.00 | 0.00 | .... | .... | .... | MH | .... | .... | .... | .... | .... | .... | n/a |
| 16 | AI-2 | 2.96 | 17.35 | 0.00 | 17.35 | 0.00 | Dp-Curb | 6.00 | .... | 16.36 | 1.67 | 0.50 | .... | Sag |

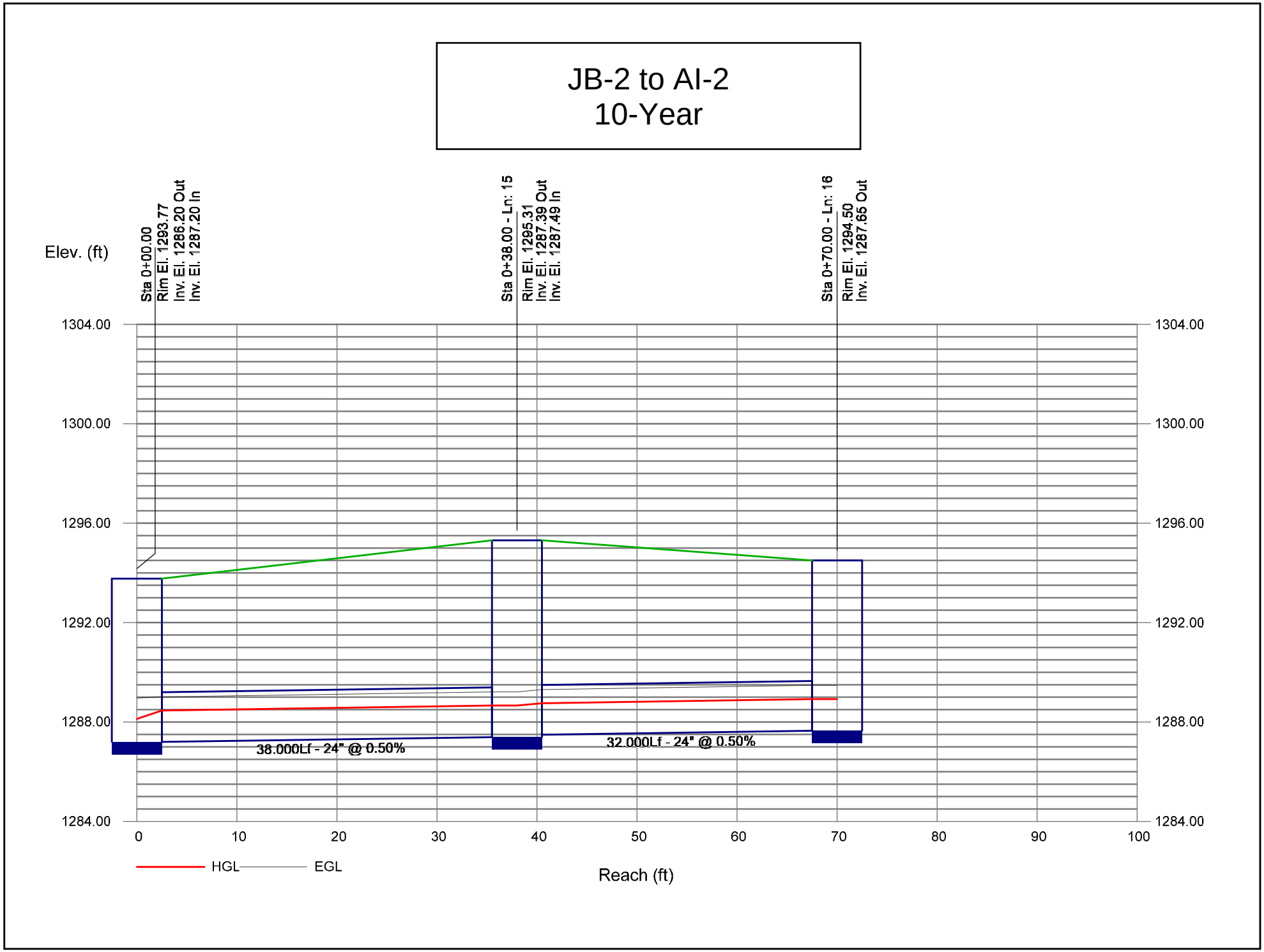
# Storm Sewer Profile

Proj. file: 32252 - 60% Working (2).stm



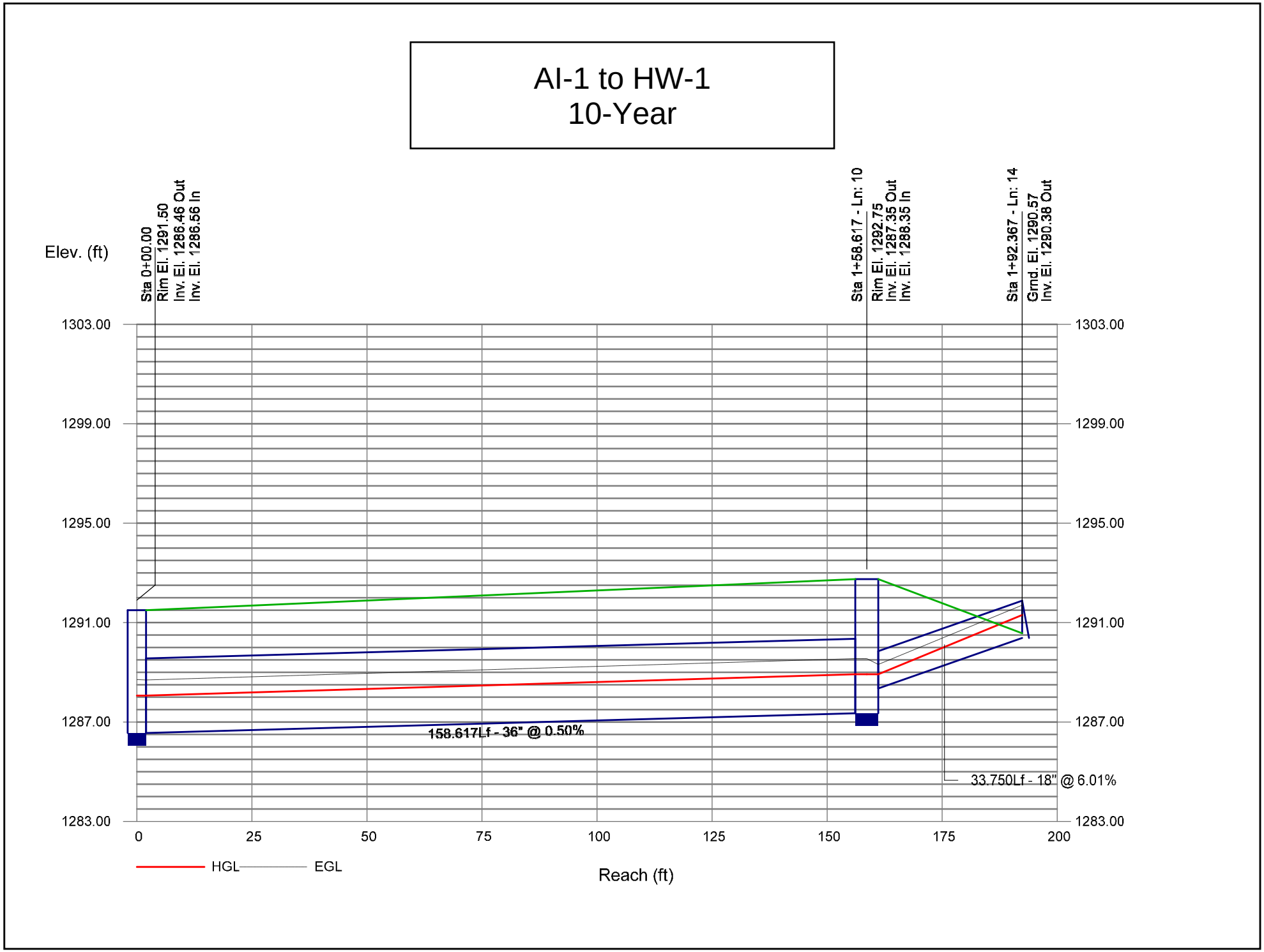
# Storm Sewer Profile

Proj. file: 32252 - 60% Working (2).stm



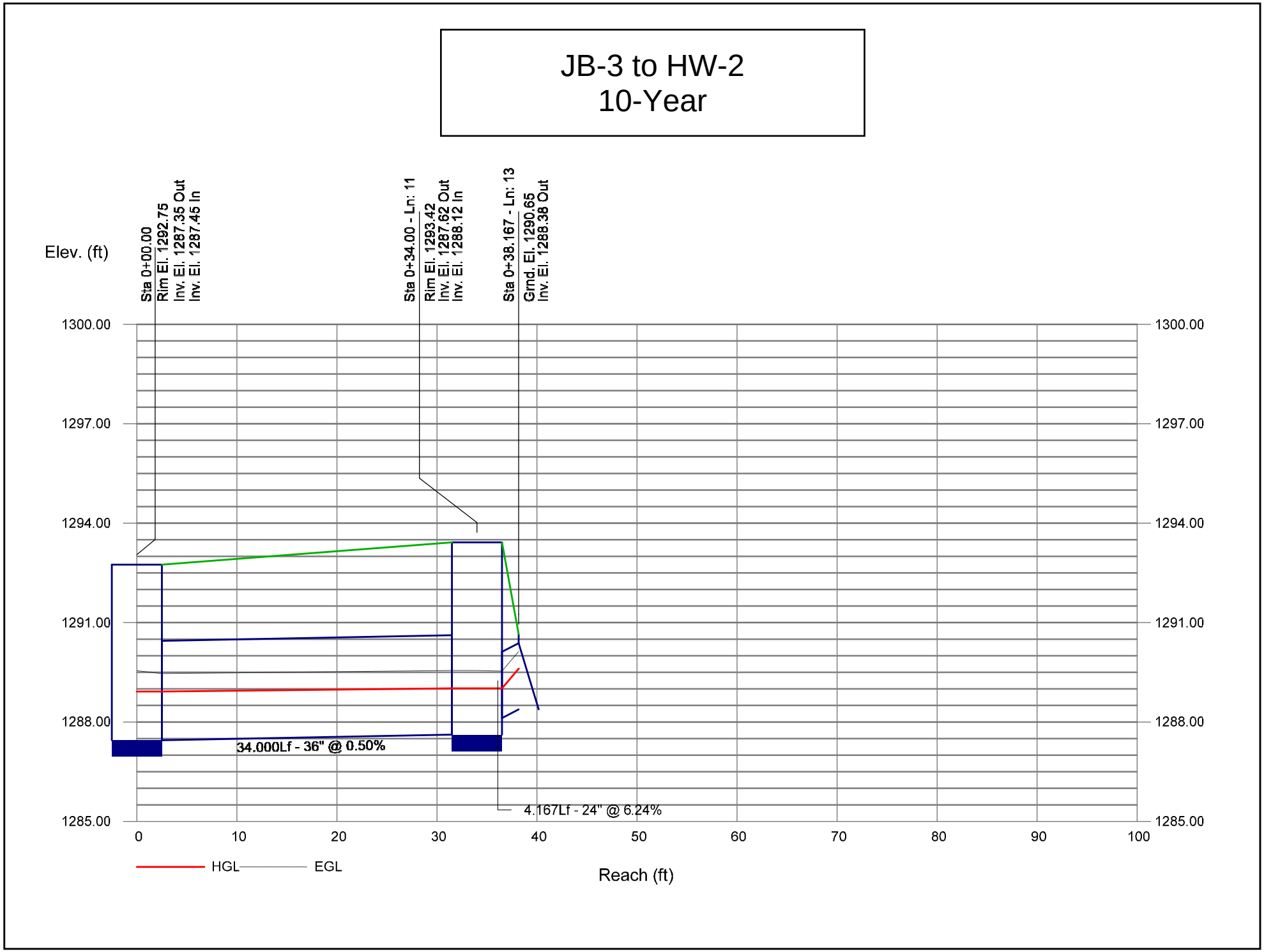
# Storm Sewer Profile

Proj. file: 32252 - 60% Working (2).stm



# Storm Sewer Profile

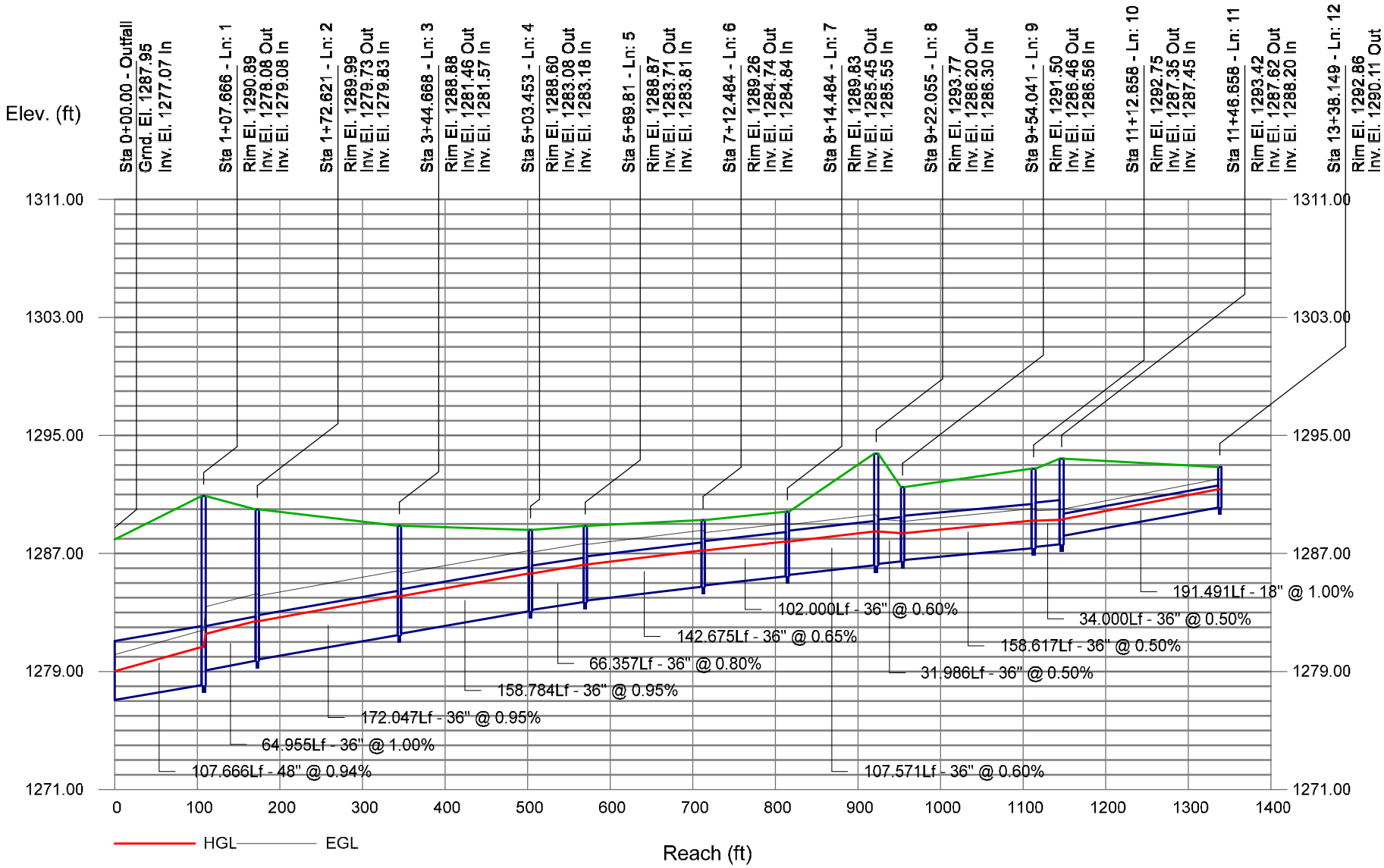
Proj. file: 32252 - 60% Working (2).stm



# Storm Sewer Profile

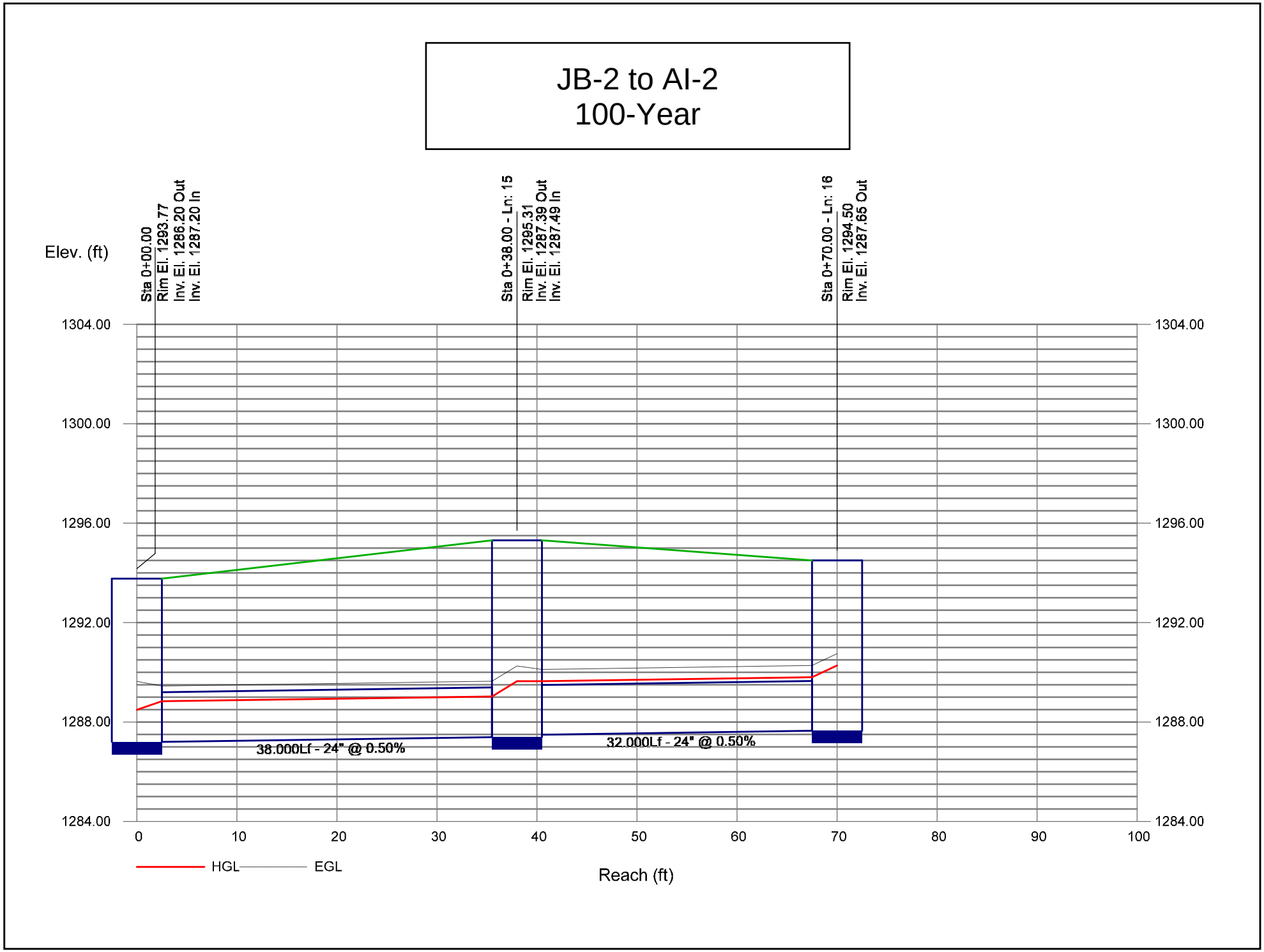
Proj. file: 32252 - 60% Working (2).stm

## Proposed Outfall to CI-7
## 100-Year



# Storm Sewer Profile

Proj. file: 32252 - 60% Working (2).stm



# Storm Sewer Profile

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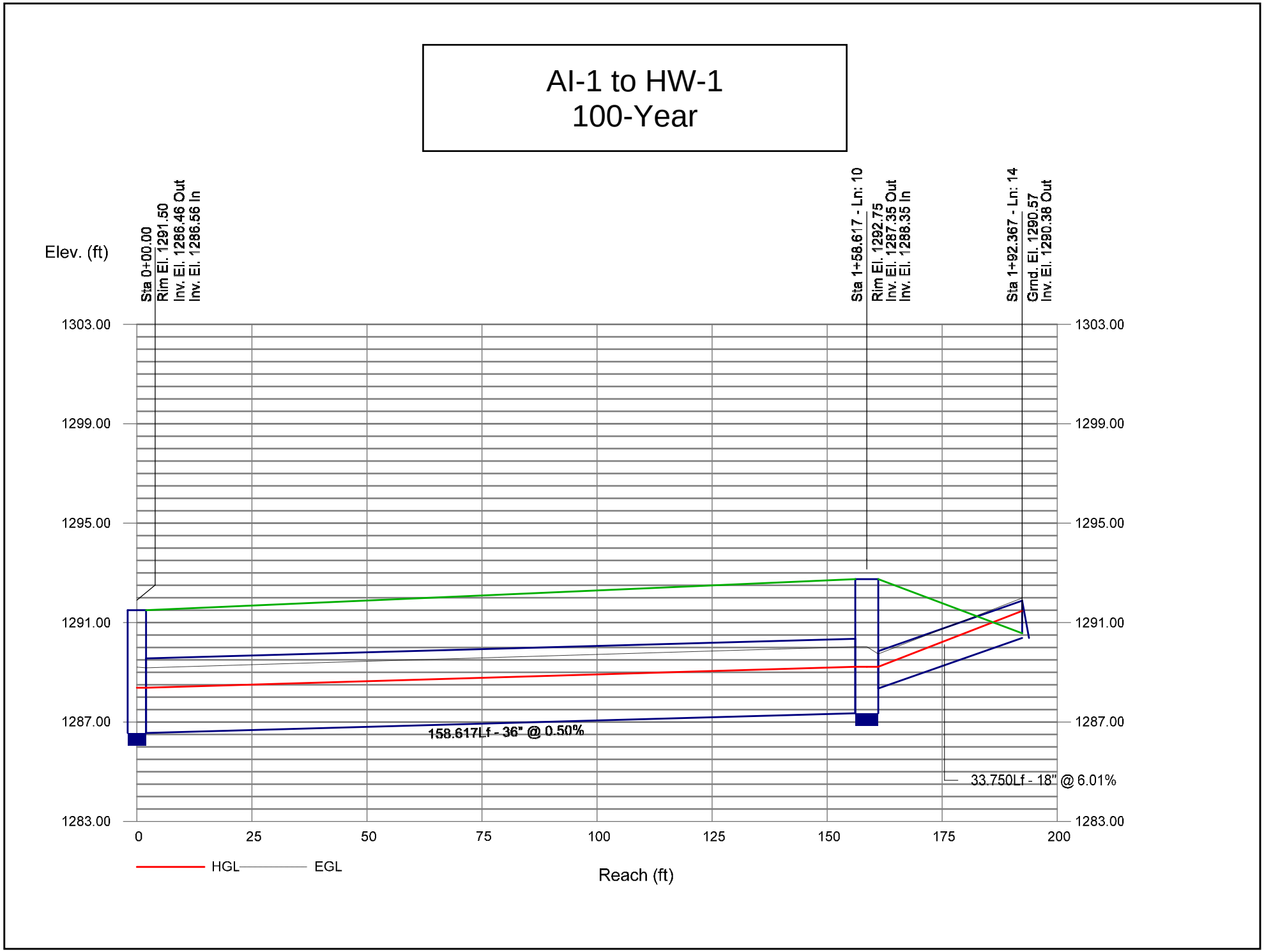
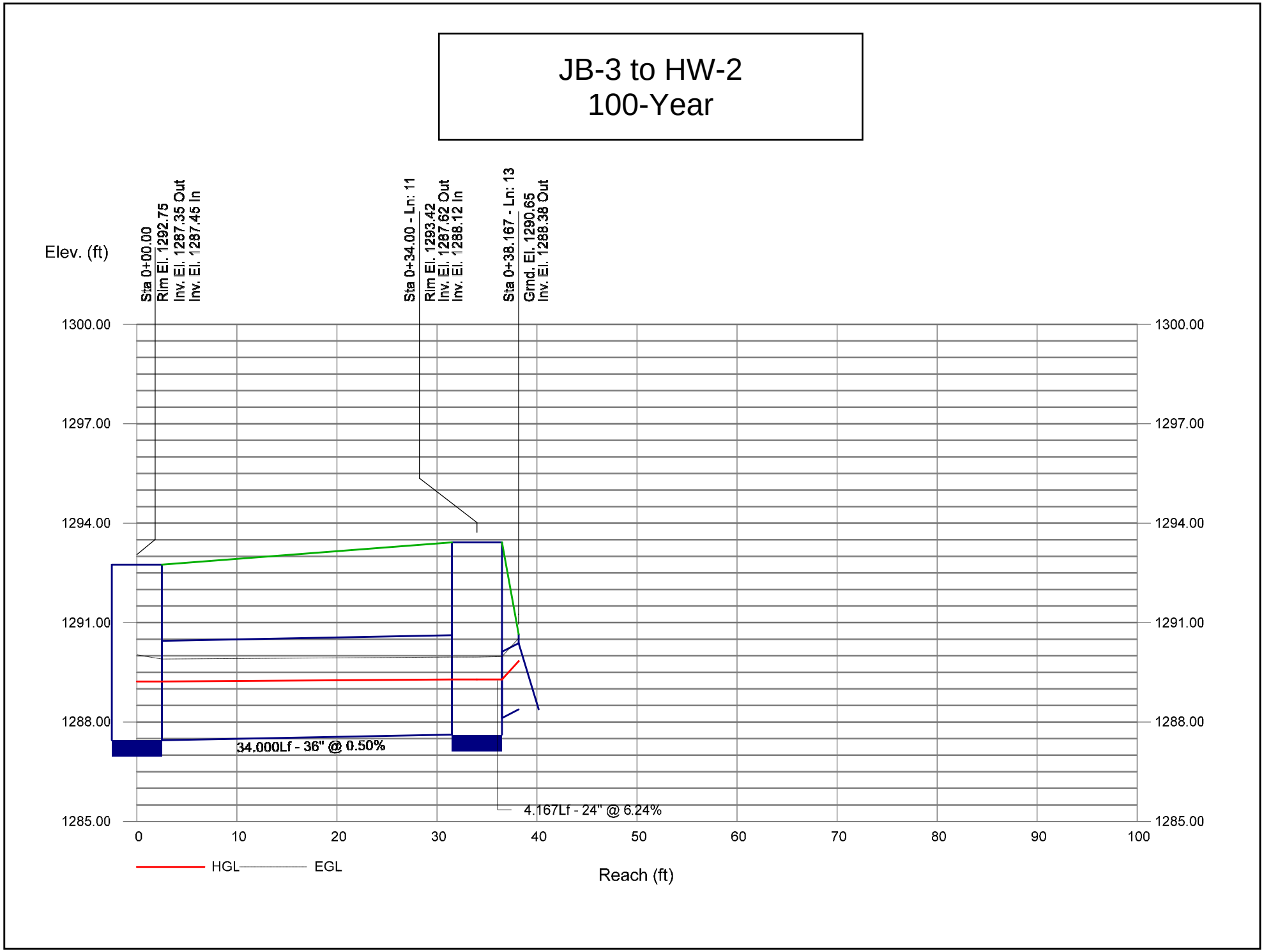
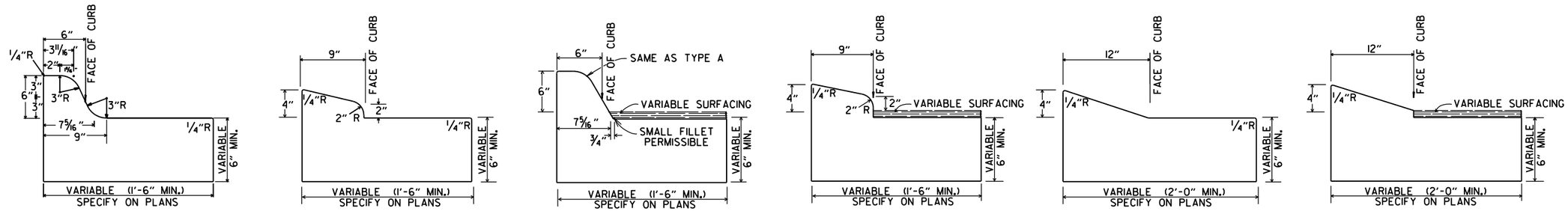


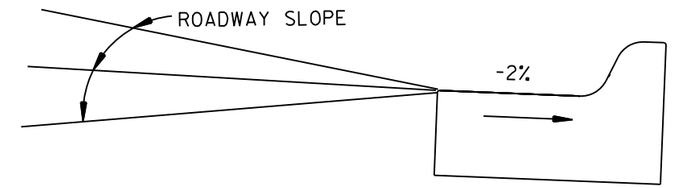
# Storm Sewer Profile

Proj. file: 32252 - 60% Working (2).stm



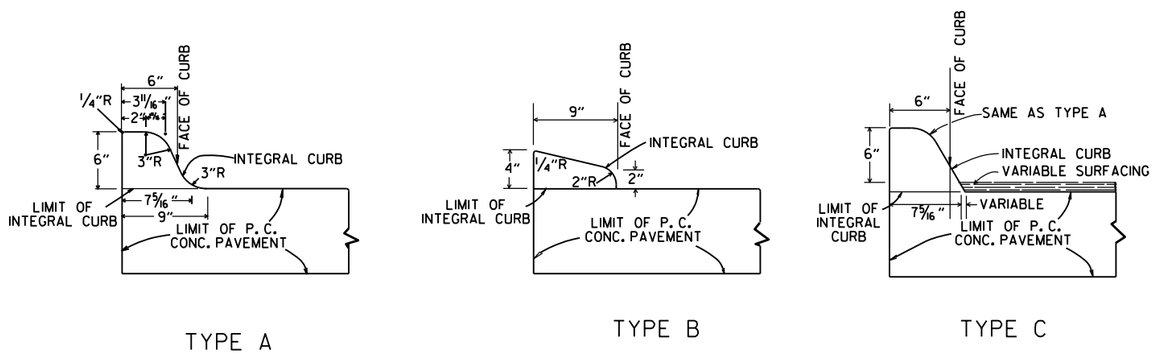



# CONCRETE COMBINATION CURB AND GUTTER

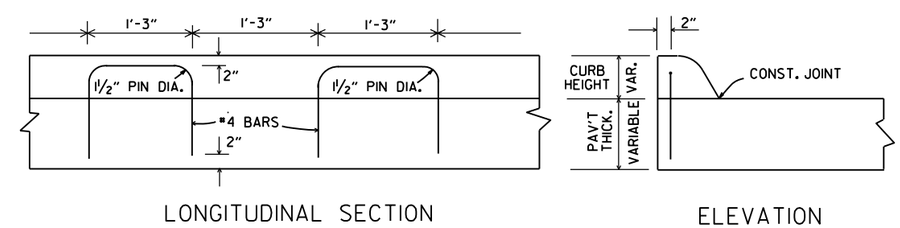



# DETAIL OF GUTTER SLOPE

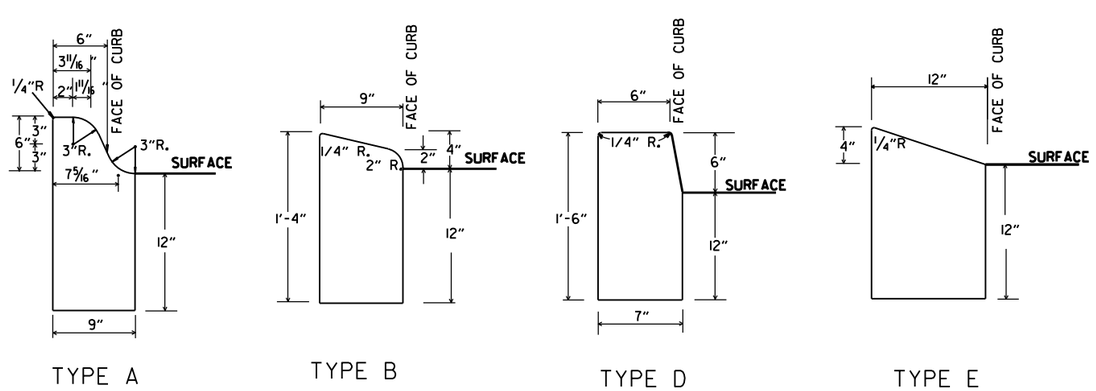
GUTTER SHALL BE CONSTRUCTED ON 2% SLOPE AWAY FROM ROADWAY, REGARDLESS OF ROADWAY SLOPE.



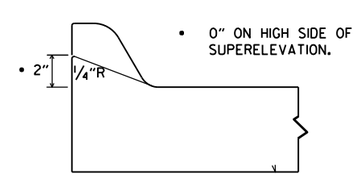

# INTEGRAL CURB




# ALTERNATE CONSTRUCTION METHOD FOR INTEGRAL CURB




# CONCRETE CURB




NOTE: USE MODIFIED CURB AS SPECIFIED ON STD. DR-1. COMPENSATION FOR MODIFIED CURB WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE TYPE OF CURB OR CURB AND GUTTER SPECIFIED.

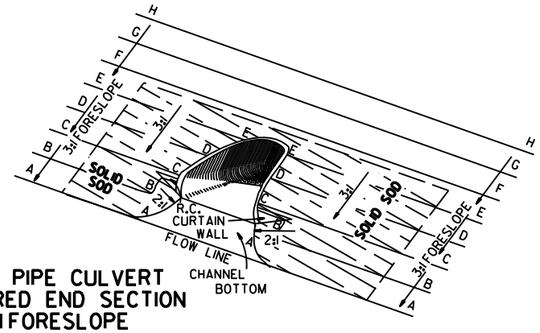
# DETAILS OF MODIFIED CURB

| DATE | REVISION | DATE FILMED |
|---|---|---|
| 11-29-07 | REVISED GUTTER SLOPE & MODIFIED CURB DETAILS | |
| 11-10-05 | ADDED DETAILS OF TYPE E CURBS | |
| 11-16-01 | REVISED CONCRETE CURB TYPE B | |
| 11-18-98 | REVISED MODIFIED CURB | |
| 6-2-94 | ADDED NOTE TO SPECIAL MODIFIED CURB | |
| 8-5-93 | CORRECTED GUTTER SLOPE | 8-5-93 |
| 10-1-92 | ADDED DETAILS OF GUTTER SLOPE | 10-1-92 |
| 5-24-90 | ADDED DETAILS OF MODIFIED CURB | 5-24-90 |
| 11-30-89 | VARIBLE DEPTH TYPE A & B I | 11-30-89 |
| 7-15-88 | REVISED MODIFIED CURB | 630-7-15-88 |
| 11-1-73 | REVISED MODIFIED CURB | 500-11-1-73 |
| 10-2-72 | REVISED AND REDRAWN | 512-10-2-72 |

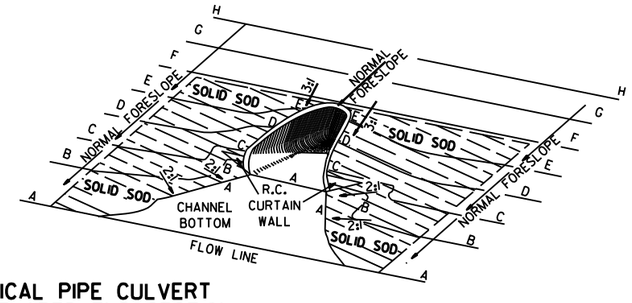
ARKANSAS STATE HIGHWAY COMMISSION

# CURBING DETAILS

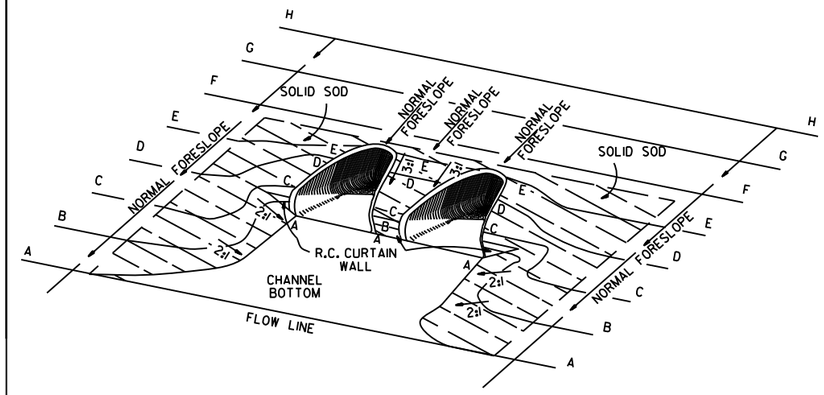
STANDARD DRAWING CG-1



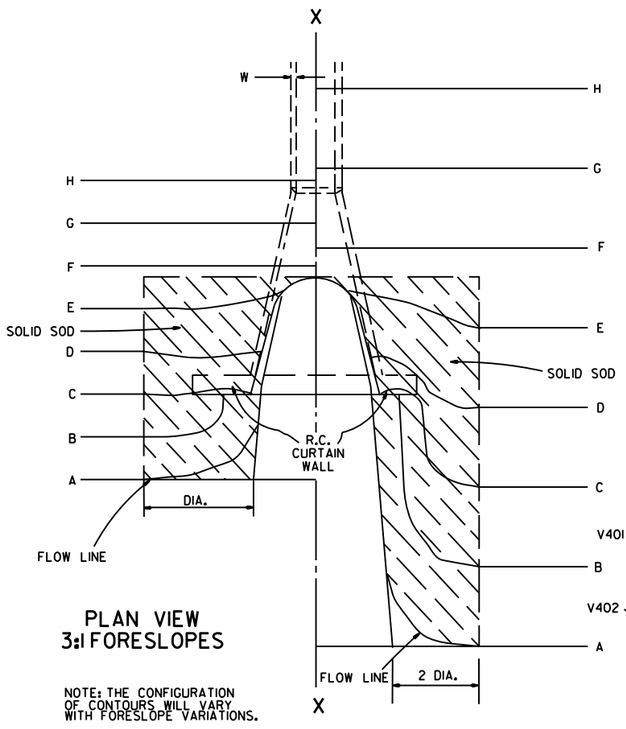

TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE




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

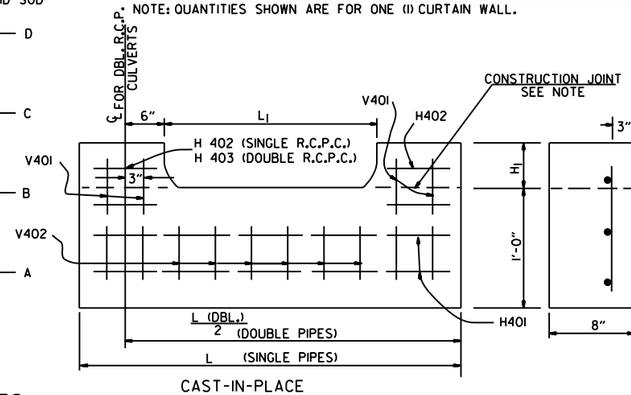
| PIPE DIA. | $H_1$ | $L_1$ | L | L (DBL.)/2 | SINGLE R.C.P.C. CONC. | SINGLE R.C.P.C. REINF. STEEL | DOUBLE R.C.P.C. CONC. | DOUBLE R.C.P.C. REINF. STEEL |
|---|---|---|---|---|---|---|---|---|
| | | | | | CU. YDS. | LBS. | CU. YDS. | LBS. |
| 18" | 11½" | 3'-5" | 8'-0" | 6'-3" | 0.31 | 27.7 | 0.45 | 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.

## REINFORCING STEEL SCHEDULE

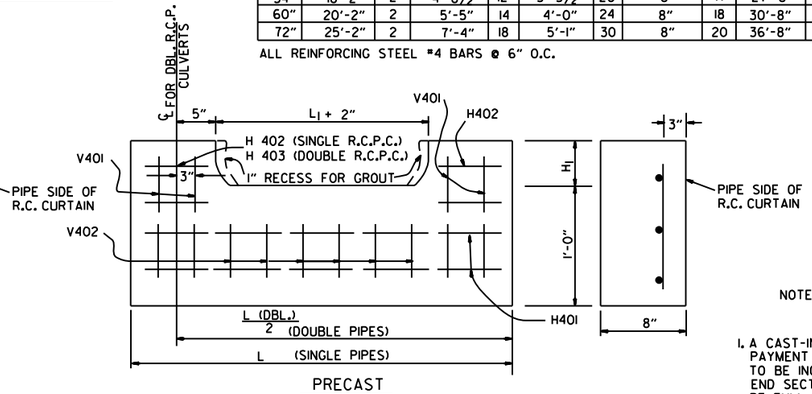
| PIPE DIA. | SINGLE R.C. PIPE CULVERT H401 L | H401 NO. | H402 L | H402 NO. | V401 L | V401 NO. | V402 L | V402 NO. | DOUBLE R.C. PIPE CULVERT H401 L | H401 NO. | H402 L | H402 NO. | H403 L | H403 NO. | V401 L | V401 NO. | V402 L | V402 NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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.




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

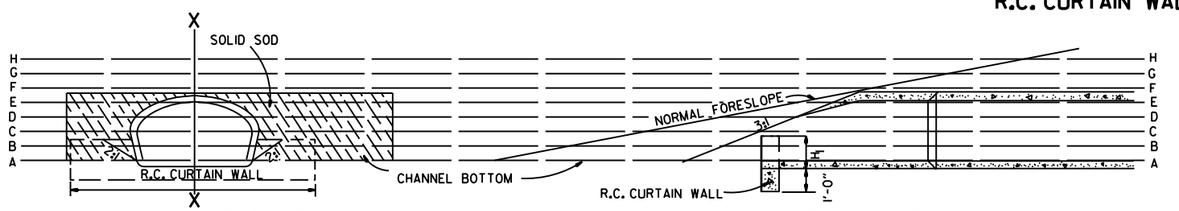
## SOLID SODDING

| PIPE DIA. | SINGLE R.C.P.C. 3:1 | SINGLE R.C.P.C. 4:1 | SINGLE R.C.P.C. 6:1 | DOUBLE R.C.P.C. 3:1 | DOUBLE R.C.P.C. 4:1 | DOUBLE R.C.P.C. 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 | 62 | 104 | 48 | 65 | 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 x 3 W/10 x W10 MAY BE USED IN LIEU OF REINFORCING BARS.




END VIEW

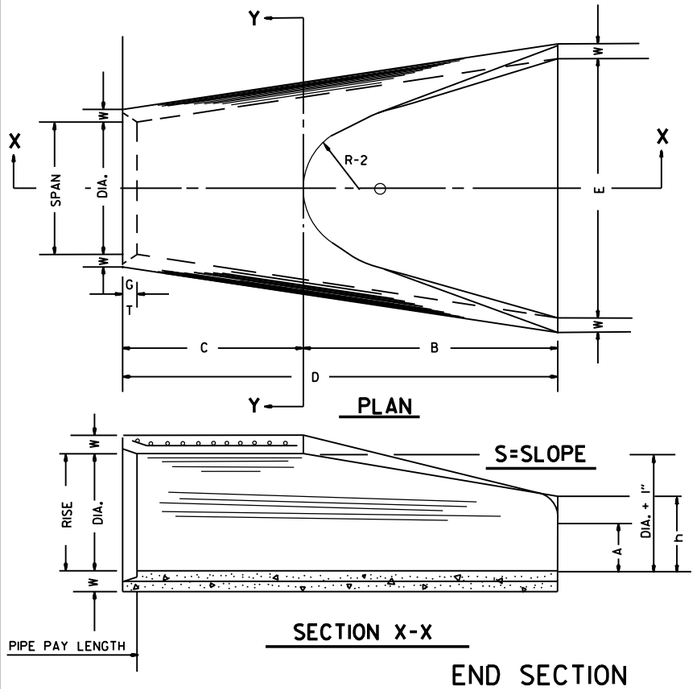
SECTIONAL VIEW "X-X"

| 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



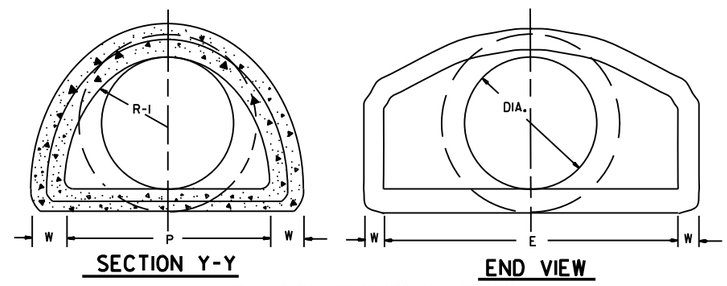

## TABLE OF DIMENSIONS

| DIA. | WALL | A | B | C | D | E | S | DIA. + 1" | P | R-1 | 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'-1½" | 4'-0" | 3:1 | 25" | 33 3/16" | 16 15/16" | 14" | 2½" | 1600 | 1'-1½" |
| 30" | 3½" | 1'-0" | 4'-6" | 1'-7¾" | 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" | 47 13/16" | 24 5/16" | 20" | 3½" | 4100 | 1'-8" |
| 42" | 4½" | 1'-9" | 5'-3" | 2'-11" | 8'-2" | 6'-6" | 3:1 | 43" | 53⅞" | 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" | 36 11/16" | 24" | 4" | 9270 | 3'-5" |
| 72" | 7" | 3'-10" | 6'-6" | 1'-10" | 8'-4" | 9'-0" | 3:1 | 73" | 77 13/16" | 38 15/16" | 24" | 5" | 13250 | 4'-6" |

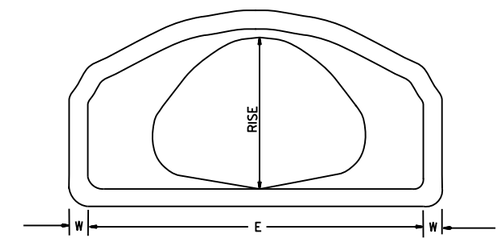
## ARCH PIPE

| EQUIV. DIA. | • SPAN AASHTO M 206 | • SPAN AHD NOMINAL | • RISE AASHTO M 206 | • RISE AHD NOMINAL | W | A | B | C | D | E | P | R2 | G-T | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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" | 36 11/16" | 15" | 2½" | 2½:1 |
| 30 | 36¼ | 36 | 22½ | 23 | 3½" | 10" | 3'-1" | 3'-0½" | 6'-1½" | 6'-0" | 47 11/16" | 20" | 3" | 2½:1 |
| 36 | 43¾ | 44 | 26⅝ | 27 | 4" | 10½" | 4'-0" | 2'-11½" | 6'-1½" | 6'-6" | 54 5/16" | 22" | 3½" | 2½:1 |
| 42 | 51⅛ | 51 | 31 5/16 | 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" | 70 5/16" | 24" | 4¼" | 2½:1 |
| 54 | 65 | 65 | 40 | 40 | 5½" | 1'-7" | 5'-3" | 2'-11" | 8'-2" | 8'-6" | 72 1/16" | 24" | 4¾" | 2¼:1 |
| 60 | 73 | 73 | 45 | 45 | 6" | 1'-10" | 5'-6" | 2'-8" | 8'-2" | 9'-0" | 77 13/16" | 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.

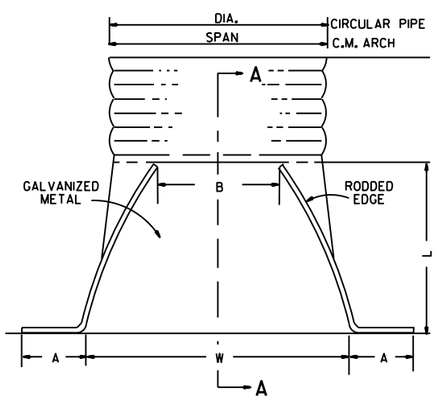


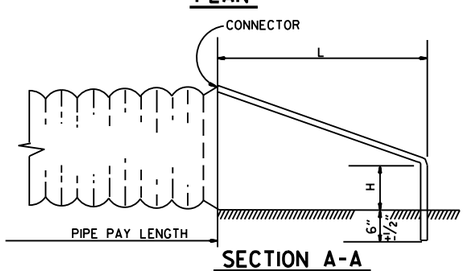

NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

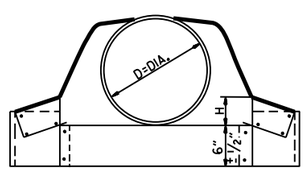



END VIEW
CONCRETE ARCH PIPE

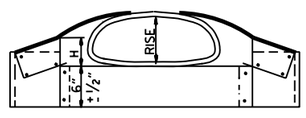
# END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS




CIRCULAR PIPE




C.M. ARCH PIPE

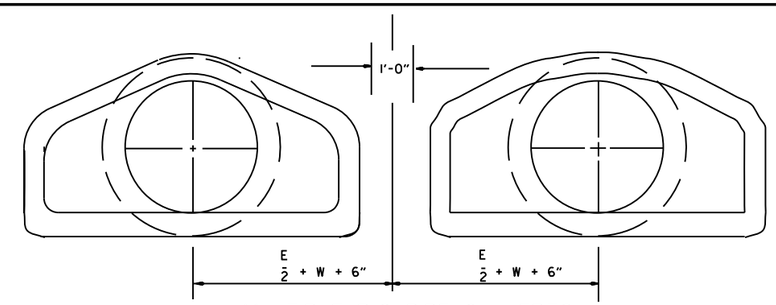
## CIRCULAR PIPE

| D. DIA. | GAUGE | A 1" ± | B. MAX. | H 1" ± | 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 |

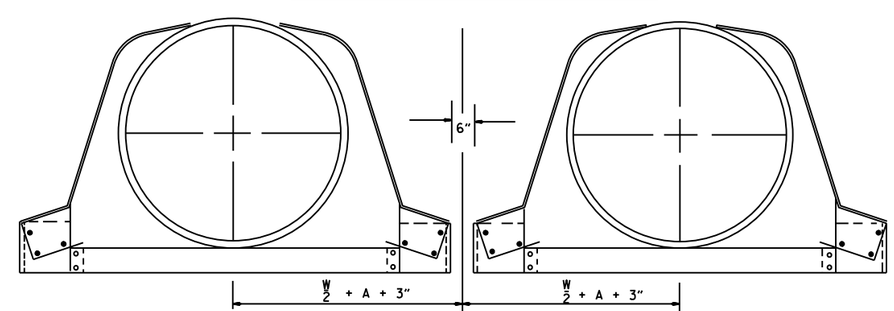
## C.M. ARCH PIPE

| EQUIV. DIA. | SPAN | RISE | A 1" ± | B MAX. | H 1" ± | 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 | 13 | 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 |

NOTE: ALTERNATE CONNECTIONS TO THE PIPE CULVERTS, IN ACCORDANCE WITH MANUFACTURER'S STANDARD PRACTICES, MAY BE MADE SUBJECT TO THE APPROVAL OF THE ENGINEER.




MULTIPLE R.C. PIPE CULVERTS




MULTIPLE C.M. PIPE CULVERTS

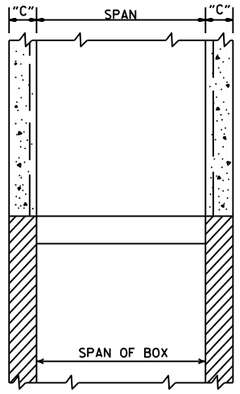
# END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS

| 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 |

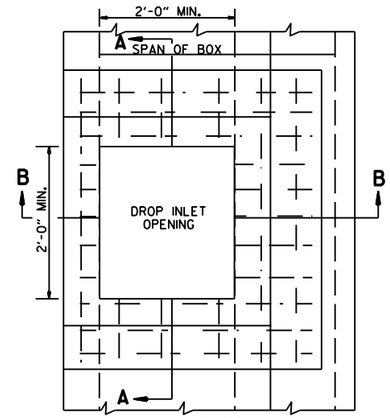
ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

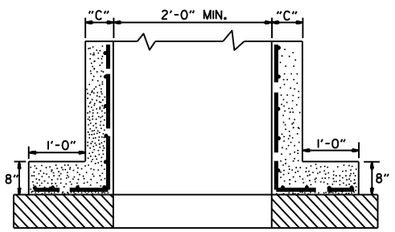
STANDARD DRAWING FES-2



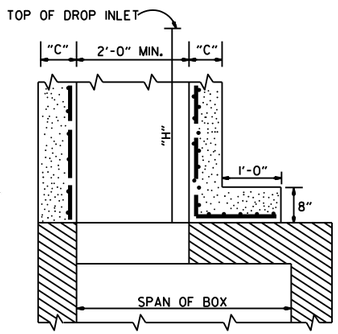

SECTION B-B




PLAN

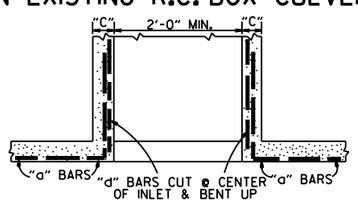



SECTION A-A

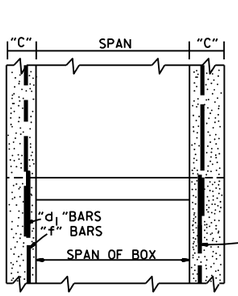



SECTION B-B

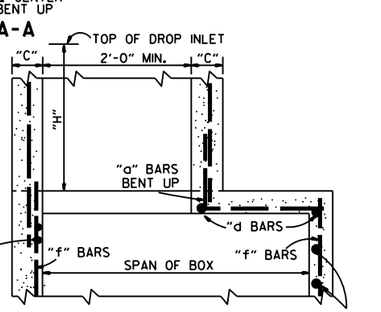
## METHOD OF CONSTRUCTING DROP INLET ON EXISTING R.C. BOX CULVERT




SECTION A-A



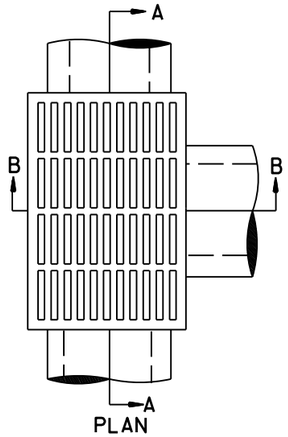

SECTION B-B



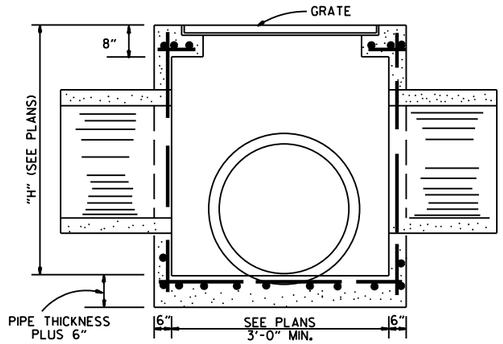

SECTION B-B

## METHOD OF CONSTRUCTING DROP INLET ON NEW R.C. BOX CULVERT

NOTE: "C" DIMENSIONS AND REINFORCING BAR SIZES, SHALL CONFORM TO THOSE SHOWN ON STANDARD DRAWING FOR DROP INLET.

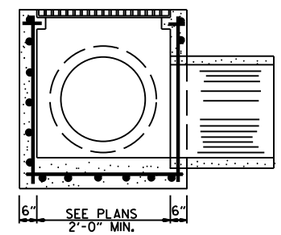



PLAN



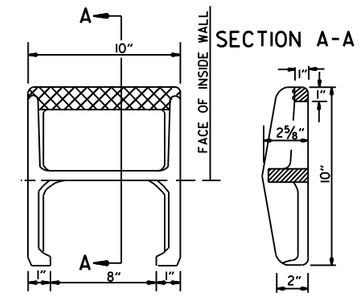

SECTION A-A

NOTE: REINF. BARS TO BE #4 BARS ON 6" CTRS. WITH 1½" MIN. COVER. THIS TYPE DROP INLET TO BE USED WHERE NOT SUBJECTED TO TRAFFIC.




SECTION B-B

## DROP INLET (TYPE E)



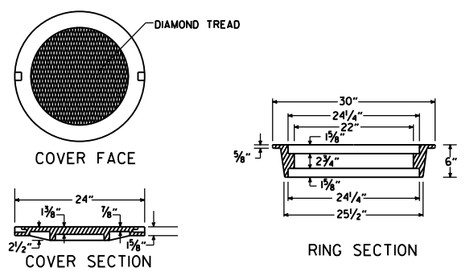

SECTION A-A

APPROX. WEIGHT = 11 LBS. (CAST IRON)

PLAN

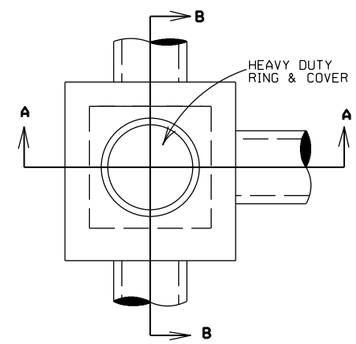
NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.

## DETAIL OF STEP FOR DROP INLET

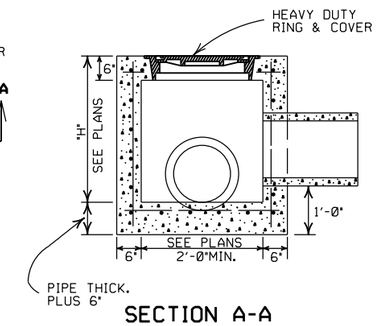



APPROXIMATE TOTAL WEIGHT = 333 LBS.

## HEAVY DUTY RING & COVER

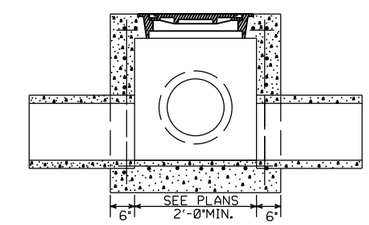



PLAN



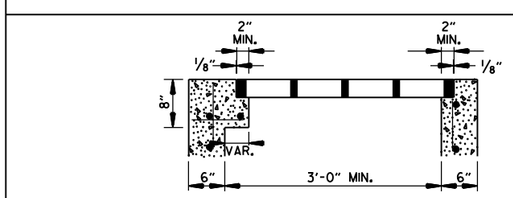

SECTION A-A

NOTE: REINF. BARS TO BE #4 BARS ON 6" CTRS. WITH 1½" MIN. COVER. THIS TYPE JUNCTION BOX TO BE USED WHERE NOT SUBJECTED TO TRAFFIC.

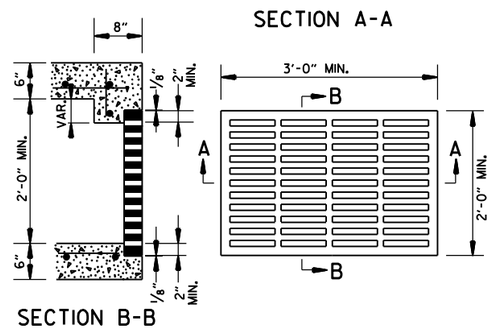



SECTION B-B

## JUNCTION BOX (TYPE E)



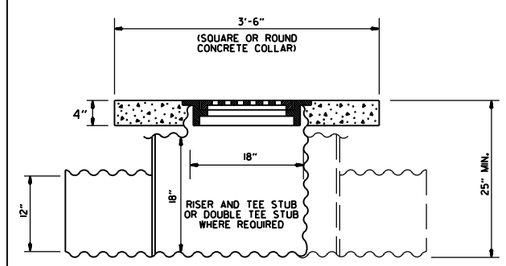

SECTION A-A



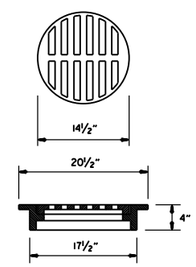

SECTION B-B

APPROXIMATE MINIMUM WATERWAY OPENING = 260 SQ. IN.

## GRATE FOR TYPE E DROP INLET




NOTE: CONCRETE COLLAR TO BE CAST IN PLACE. 12" PIPE CULVERTS TO BE MEASURED AND PAID FOR AS " 12" SIDE DRAIN ".




USE NEENAH R-5901-C OR EQUIVALENT BICYCLE SAFE FRAME AND GRATE

## DETAIL OF YARD DRAIN

GENERAL NOTES:

1. ALL EXPOSED CORNERS SHALL BE ¾" CHAMFERED.
2. STEPS SHALL BE INSTALLED ON 16" CENTERS ON ALL INLETS 4'-0" HIGH OR OVER, OR AS APPROVED BY THE ENGINEER.
3. EXPANSION JOINT MATERIAL SHALL BE ¾" PREFORMED FIBER.
4. GRATE OR GRATE AND FRAME SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105 CLASS 35B. GRATE MAY BE USED WITHOUT FRAME.
5. GRATE AND FRAME SHALL NOT BE PAINTED.
6. GRATE SHALL BE BICYCLE SAFE.
7. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.
8. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
9. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
10. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.

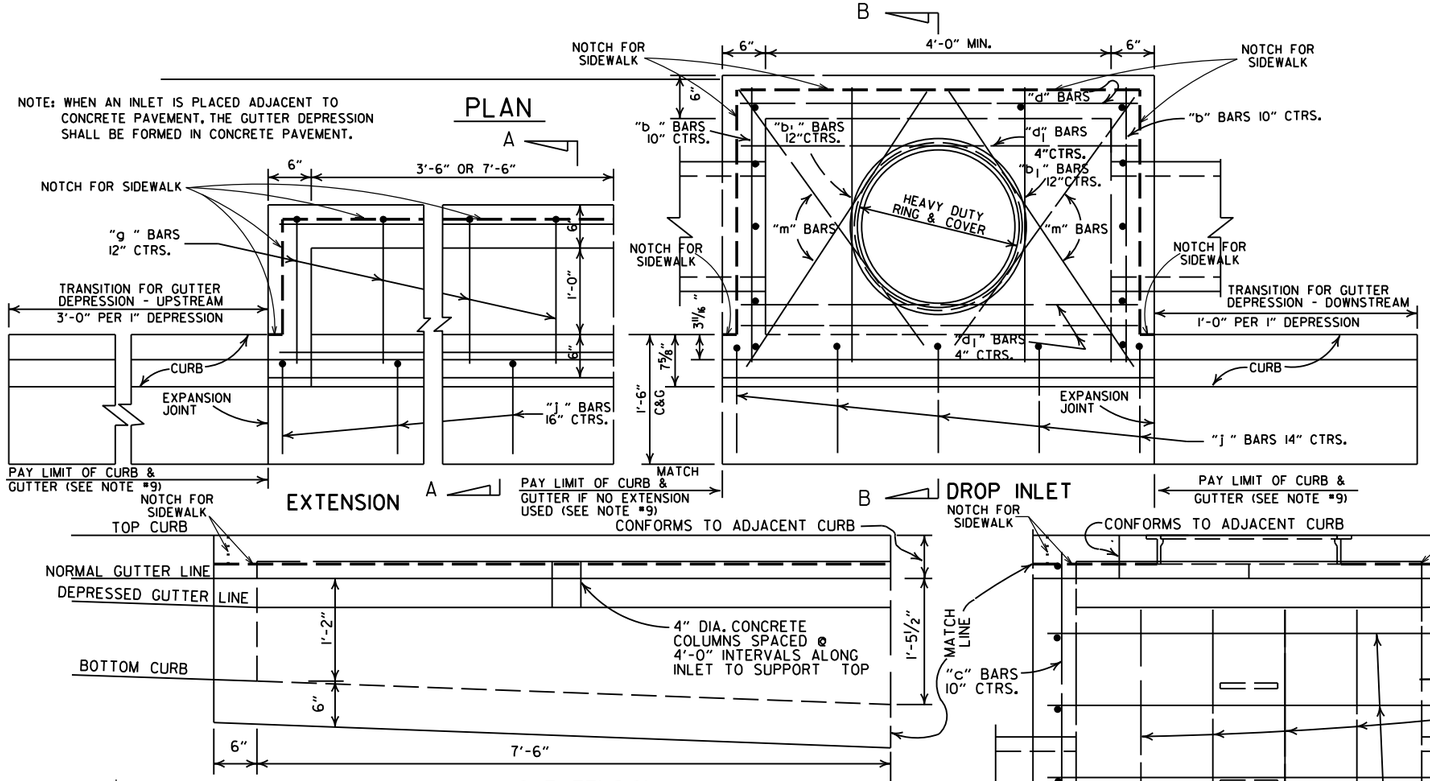
| DATE REV. | REVISION | DATE FILMED |
|---|---|---|
| 11-16-01 | ADDED NOTE 10 | |
| 1-12-00 | REVISED HEAVY DUTY RING & COVER | |
| 7-02-98 | CHANGED GRATE DETAIL. DELETED DI(TYPE D), REPLACED RING & COVER W/HEAVY DUTY RING & COVER, ADDED JUNCTION BOX (TYPE E) | |
| 6-26-97 | ADDED DIMENSION TO TYPE IV-A | |
| 10-18-96 | ADDED DETAIL OF YARD DRAIN | |
| 8-15-91 | DELETE TYPE IV GRATE | |
| 7-15-88 | REVISED STEP DETAIL | |
| 5-20-83 | REVISED DETAILS OF GRATES (TYPE IV & IV-A) | |
| 2-4-83 | ADDED GENERAL NOTE NO. 4 | |
| 3-2-81 | ADDED TYPE IV-A GRATE | |
| 5-22-74 | DELETED INLET (TYPE F) & GRATE (TYPE III) | |
| 10-2-72 | REVISED AND REDRAWN | |

ARKANSAS STATE HIGHWAY COMMISSION

# DETAILS OF DROP INLETS & JUNCTION BOXES

STANDARD DRAWING FPC-9

NOTE: WHEN AN INLET IS PLACED ADJACENT TO CONCRETE PAVEMENT, THE GUTTER DEPRESSION SHALL BE FORMED IN CONCRETE PAVEMENT.




## 4'-0" LENGTH DROP INLET / DROP INLET EXTENSION

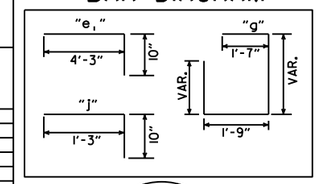
| PIPE SIZE | MIN. WIDTH | HEIGHT 5'-0" CLASS A CONC. | HEIGHT 5'-0" REINF. STEEL | PLUS OR MINUS PER LIN. FT. OF HEIGHT CLASS A CONC. | PLUS OR MINUS PER LIN. FT. OF HEIGHT REINF. STEEL | 4'-0" CLASS A CONC. | 4'-0" REINF. STEEL | 8'-0" CLASS A CONC. | 8'-0" REINF. STEEL |
|---|---|---|---|---|---|---|---|---|---|
| | | CU. YDS. | POUNDS | CU. YDS. | POUNDS | CU. YDS. | POUNDS | CU. YDS. | POUNDS |
| 18" | 2'-6" | 1.77 | 156 | 0.28 | 22 | 0.58 | 38 | 0.87 | 72 |
| 24" | 2'-6" | 1.79 | 156 | 0.28 | 22 | | | | |
| 30" | 3'-2" | 2.39 | 205 | 0.30 | 26 | | | | |
| 36" | 3'-8" | 2.63 | 236 | 0.32 | 28 | DEDUCT FROM QUANTITY COMPUTED FOR EACH EXTENSION ADDED. | | | |
| 42" | 4'-4" | 2.95 | 250 | 0.34 | 30 | | | | |
| 48" | 4'-10" | 3.21 | 265 | 0.36 | 32 | | | | |
| | | | | | | 0.04 | 3 | | |

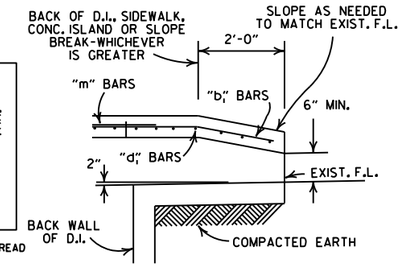
NOTE: QUANTITIES ARE APPROXIMATE AND ARE SHOWN FOR BIDDER INFORMATION ONLY.

**DEDUCT FROM QUANTITY COMPUTED FOR EACH PIPE ENTERING INLET**

| INSIDE DIA. PIPE | CLASS A CONC. | REINF. STEEL |
|---|---|---|
| INCHES | CU. YDS. | POUNDS |
| 18 | 0.05 | 2 |
| 24 | 0.09 | 3 |
| 30 | 0.13 | 4 |
| 42 | 0.24 | 8 |

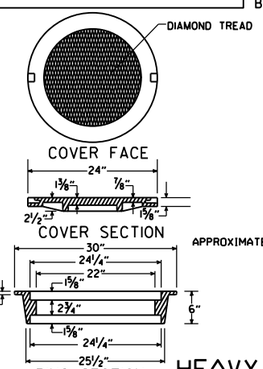
## BAR DIAGRAM



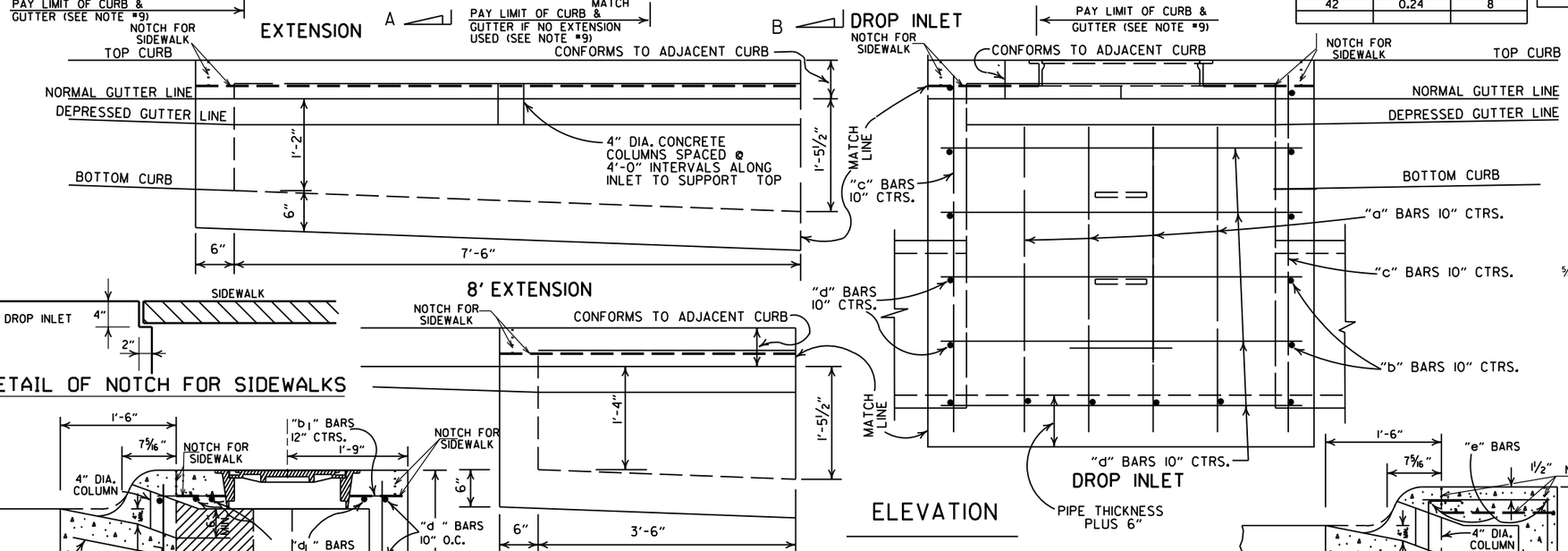

## BACK OPENING

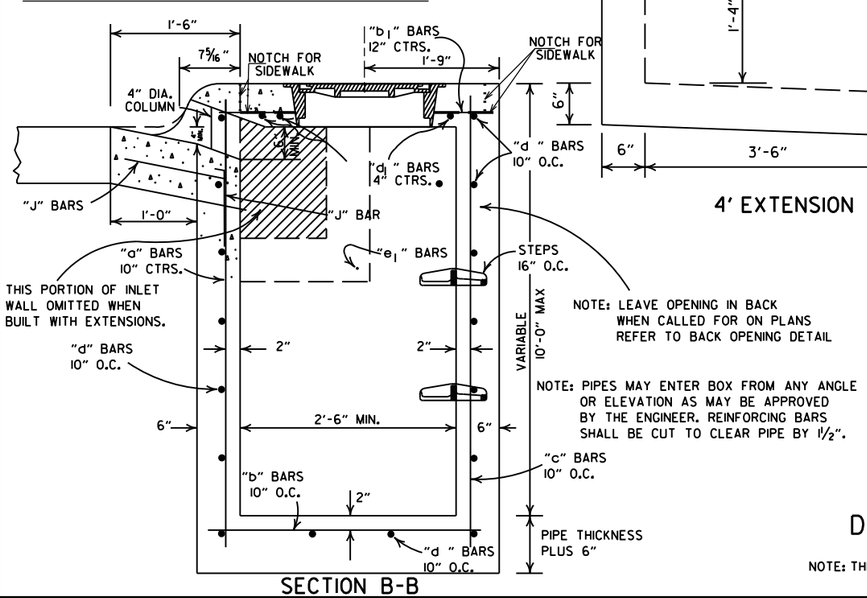
WHEN OPENING IN BACK IS CALLED FOR ON PLANS EXTEND OPENING AS SHOWN IN DETAIL. PAYMENT TO BE INCLUDED IN PRICE BID FOR DROP INLET (TYPE C).




APPROXIMATE TOTAL WEIGHT = 333 LBS.

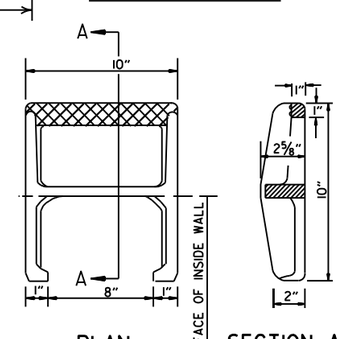
## HEAVY DUTY RING & COVER




NOTE: LEAVE OPENING IN BACK WHEN CALLED FOR ON PLANS REFER TO BACK OPENING DETAIL

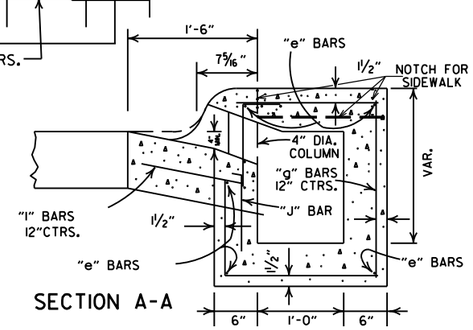
NOTE: PIPES MAY ENTER BOX FROM ANY ANGLE OR ELEVATION AS MAY BE APPROVED BY THE ENGINEER. REINFORCING BARS SHALL BE CUT TO CLEAR PIPE BY 1½".




## DETAIL OF STEP FOR DROP INLET

APPROX. WEIGHT = 11 LBS. (CAST IRON)

NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.




GENERAL NOTES:

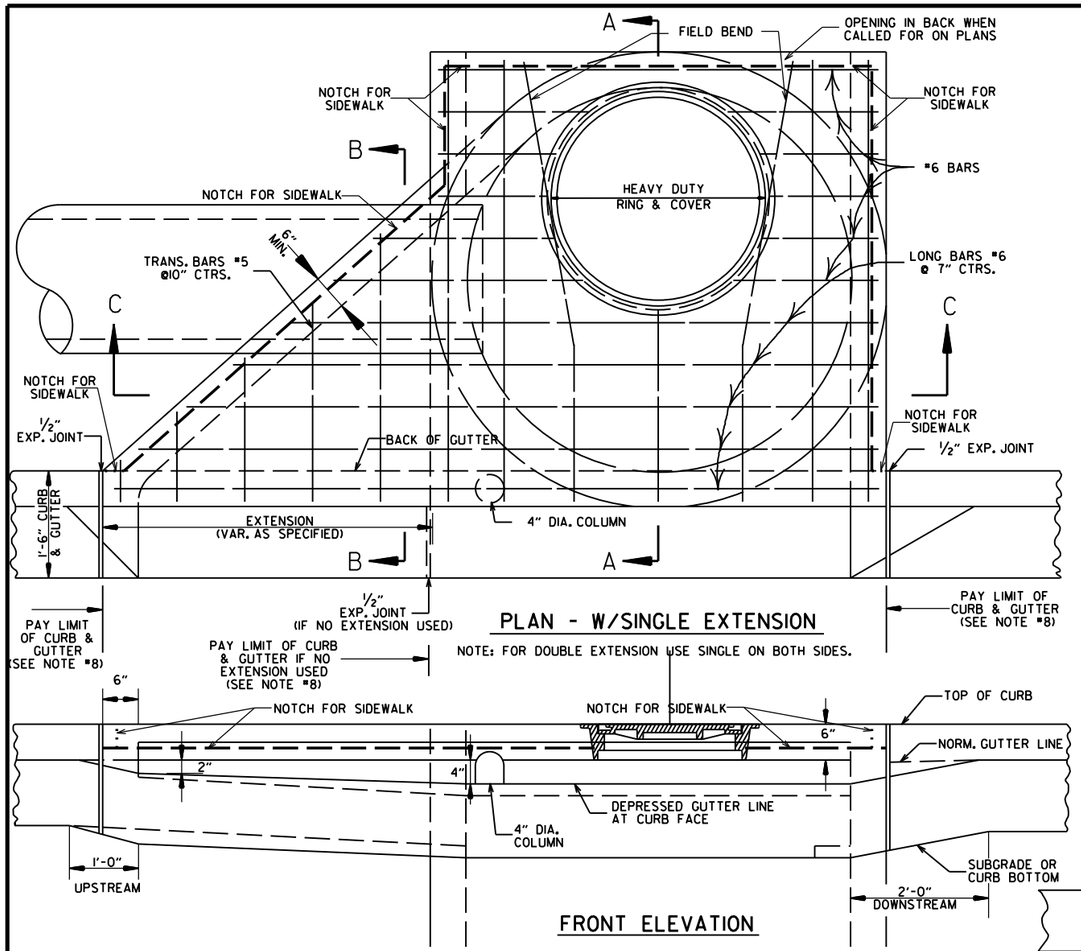
1. ALL EXPOSED CORNERS TO HAVE ¾" CHAMFER.
2. STEPS SHALL BE INSTALLED IN ALL INLETS 4'-0" HIGH AND OVER OF AS APPROVED BY THE ENGINEER.
3. ALL REINF. BARS SHALL BE #4 AND HAVE 1½" COVER.
4. DROP INLETS AND EXTENSION ON CURVED SECTIONS SHALL CONFORM TO THE CURVATURE OF THE CURB.
5. THIS DROP INLET MAY BE CONSTRUCTED ON NEW OR EXISTING R.C. BOX CULVERT AS SHOWN ON F.P.C.-9.
6. WHEN PLANS CALL FOR DROP INLET OVER 10'-0" HIGH, FLOOR AND WALLS SHALL BE CONSTRUCTED AS SHOWN FOR TYPE "RM" DROP INLET (FPC-9D).
7. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.
8. DURING CONSTRUCTION OF THE ROADWAY THE CONTRACTOR SHALL MAINTAIN DRAINAGE INTO OR AROUND THE DROP INLET AS APPROVED BY THE ENGINEER.
9. PAYMENT FOR CURB AND/OR CURB AND GUTTER WITHIN THE LIMITS OF DROP INLETS AND DROP INLET EXTENSIONS SHALL BE CONSIDERED INCLUDED IN PAYMENT MADE FOR DROP INLETS AND/OR DROP INLET EXTENSIONS.
10. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
11. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
12. 4"×2" NOTCH SHALL BE FORMED IN ALL DROP INLETS TO SUPPORT SIDEWALK CONSTRUCTION. REFER TO DETAIL OF NOTCH FOR SIDEWALKS.
13. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.

| DATE REV. | REVISION | DATE FILMED |
|---|---|---|
| 8-22-02 | ADDED PAY LIMIT CURB NOTES TO SECTIONS A-A & B-B | |
| 11-16-01 | ADDED NOTE 13; REVISED SECTION B-B | |
| 1-12-00 | CORRECTED DIMENSION ON SECTION B-B & REVISED RING & COVER | |
| 5-13-99 | ADDED DETAIL OF NOTCH FOR SIDEWALKS | |
| 7-02-98 | REPLACED RING & COVER W/HEAVY DUTY RING & COVER ADDED NOTES 9,10,&11 | |
| 10-18-96 | CORRECTED SPELLING | |
| 4-26-96 | ADDED NOTE 8 & REVISED (4')(8') EXTENSION TITLES | 10-18-96 |
| 4-1-93 | REVISED BACK OPENING & NOTE | |
| 8-15-91 | DELETE TYPE IV GRATE | |
| 7-15-88 | REVISED STEP DETAIL | |
| 5-20-83 | REVISED DETAILS OF GRATES (TYPE IV & IV-A) | |
| 2-4-83 | ADDED GENERAL NOTE NO. 4 | |
| 3-2-81 | ADDED TYPE IV-A GRATE | |
| 5-22-74 | DELETED INLET (TYPE F) & GRATE (TYPE III) | |
| 10-2-72 | REVISED AND REDRAWN | |

ARKANSAS STATE HIGHWAY COMMISSION

# DETAILS OF DROP INLETS (TYPE C)

STANDARD DRAWING FPC-9E

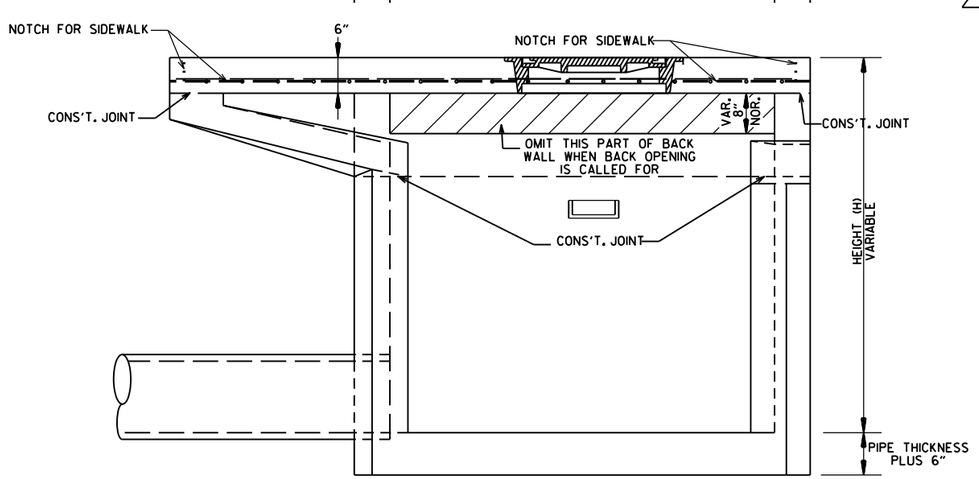



## PLAN - W/SINGLE EXTENSION

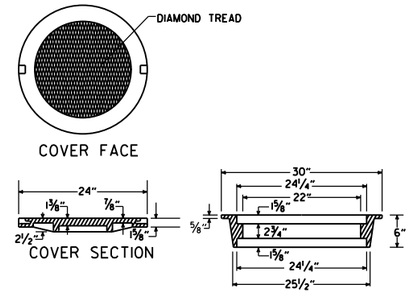
NOTE: FOR DOUBLE EXTENSION USE SINGLE ON BOTH SIDES.




## FRONT ELEVATION



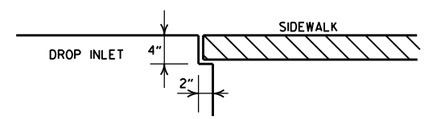

## SECTION C-C



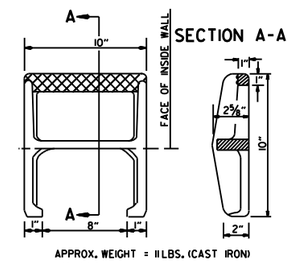

APPROXIMATE TOTAL WEIGHT = 333 LBS.

## HEAVY DUTY RING & COVER

1. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
2. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
3. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.




## DETAIL OF NOTCH FOR SIDEWALKS

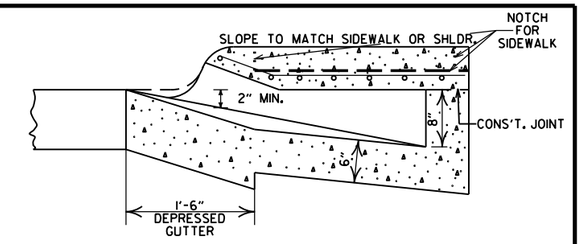



APPROX. WEIGHT = 11 LBS. (CAST IRON)

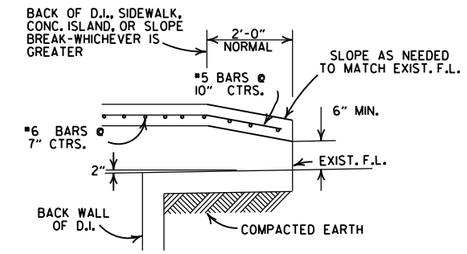
PLAN

NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.

## DETAIL OF STEP FOR DROP INLET




## SECTION B-B

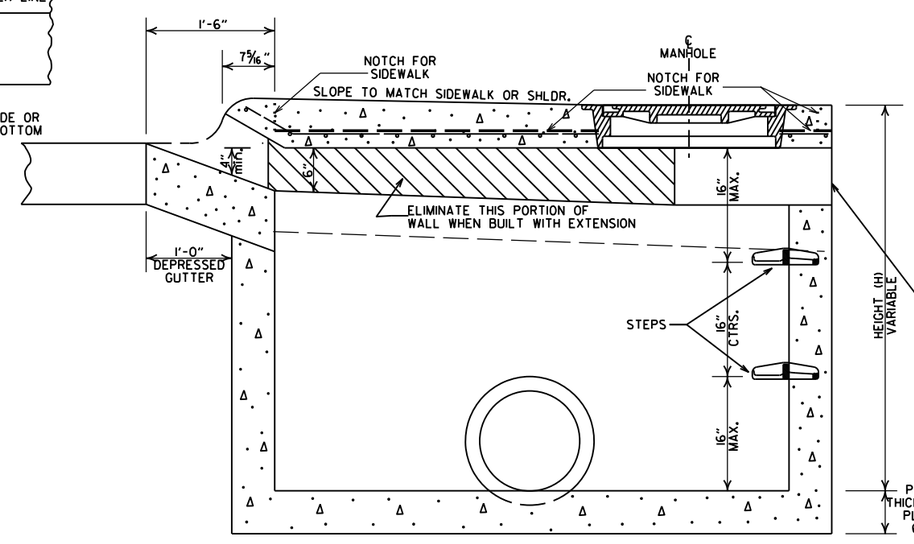



## BACK OPENING

WHEN OPENING IN BACK IS CALLED FOR ON PLANS EXTEND OPENING AS SHOWN IN DETAIL. PAYMENT TO BE INCLUDED IN PRICE BID FOR DROP INLET (TYPE MO).

GENERAL NOTES:

1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER.
2. STEPS SHALL BE INSTALLED IN ALL INLETS 4'-0" HIGH AND OVER OR AS DIRECTED BY THE ENGINEER.
3. ALL REINFORCING BARS SHALL BE GRADE 60 AND HAVE MIN. 1 1/2" COVER.
4. DROP INLETS AND EXTENSION ON CURVED SECTIONS SHALL CONFORM TO THE CURVATURE OF THE CURB.
5. 4" DIA. COLUMNS SPACED AT MAX. 4'-0" INTERVALS SHALL BE INSTALLED ALONG INLET AND EXTENSION TO SUPPORT TOP.
6. BASE AND INLET WALLS SHALL BE CAST MONOLITHICALLY.
7. THE THROAT SHALL BE CAST INTEGRALLY WITH THE GUTTER.
8. PAYMENT FOR CURB AND/OR CURB AND GUTTER WITHIN THE LIMITS OF DROP INLETS AND DROP INLET EXTENSIONS SHALL BE CONSIDERED INCLUDED IN PAYMENT MADE FOR DROP INLETS AND/OR DROP INLET EXTENSIONS.
9. PIPES MAY ENTER DROP INLET FROM ANY ANGLE OR ELEVATION AS MAY BE APPROVED BY THE ENGINEER.
10. APPROPRIATE SIZE TYPE C DROP INLETS MAY BE SUBSTITUTED FOR TYPE MO DROP INLETS AS APPROVED BY THE ENGINEER. PAYMENT TO BE AS DROP INLET (TYPE MO).
11. DURING CONSTRUCTION OF THE ROADWAY THE CONTRACTOR SHALL MAINTAIN DRAINAGE INTO OR AROUND THE DROP INLET AS APPROVED BY THE ENGINEER.
12. 4"x2" NOTCH SHALL BE FORMED IN ALL DROP INLETS TO SUPPORT SIDEWALK CONSTRUCTION. REFER TO DETAIL OF NOTCH FOR SIDEWALKS.
13. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.




## SECTION A-A

| DIA. OF D.I. | DIA. OF OUTLET PIPE | MINIMUM WALL THICKNESS CAST IN PLACE | MINIMUM WALL THICKNESS PRECAST |
|---|---|---|---|
| 4' I.D. | 12" THRU 27" | 6" | 5" |
| 5' I.D. | 30" THRU 42" | 8" | 6" |
| 6' I.D. | 48" THRU 54" | 8" | 7" |

| DATE | REVISIONS | DATE FILMED |
|---|---|---|
| 8-22-02 | ADDED PAY LIMIT CURB NOTES TO SECTIONS A-A & B-B | |
| 11-16-01 | ADDED NOTE 13 | |
| 1-12-00 | REVISED HEAVY DUTY RING & COVER | |
| 5-13-99 | ADDED NOTCH DETAIL FOR SIDEWALKS | |
| 7-02-98 | REP. NOTE 8, REM. PLAN DET., REV. PICTURE FOR NEW RING & COVER, ADDED HEAVY DUTY RING & COVER AND DETAIL OF STEP FOR DROP INLET | |
| 4-26-96 | ADDED NOTE 11, ADJ. OPENING DIMENSION | |
| 10-12-95 | CORRECTED #6 BAR SPACING | |
| 7-20-95 | CORRECTED DIAMETER OF D.I. IN BOX | |
| 2-2-95 | TYPE C TO MO (OPEN. BACK DETAIL) | |
| 11-3-94 | REVISED GENERAL NOTES | 11-3-94 |
| 4-1-93 | REV. BACK OPEN. DETAIL & NOTE | 4-1-93 |
| 8-16-91 | REVISED NOTES 1,12 & ADDED BK.OPEN DETAIL | 8-15-91 |
| 11-30-89 | ADDED NOTE NO. 12 | 11-30-89 |
| 3-23-89 | ADDED NOTE & MINIMUM WALL THICKNESS | 513-3-23-89 |
| 7-15-88 | ADDED EXTEND NOTE TO SECTION A-A | 629-7-15-88 |
| 1-14-87 | MODIFIED WALL THICKNESS | 783-1-14-87 |
| 6-12-87 | ISSUED | 4-6-12-87 |

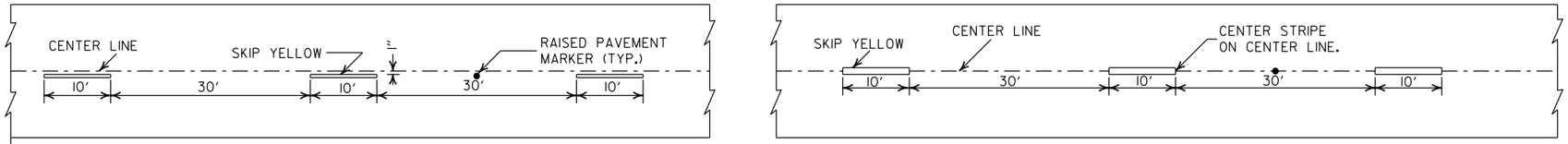
ARKANSAS STATE HIGHWAY COMMISSION

# DETAILS OF DROP INLET (TYPE MO)

STANDARD DRAWING FPC-9M

NOTES:

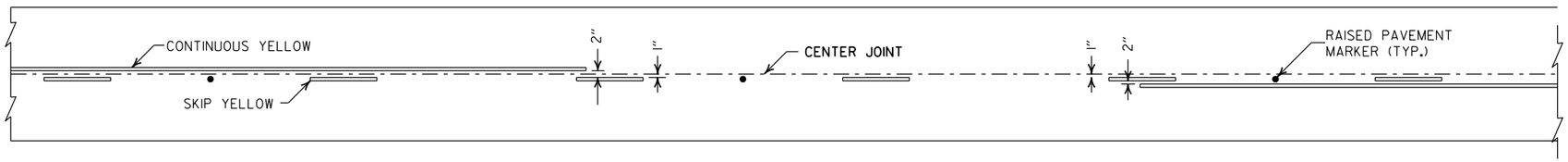
1. REFER TO THE STRIPING DETAILS FOR PAVEMENT MARKING LINE WIDTHS.
2. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
3. RAISED PAVEMENT MARKERS SHALL BE PLACED ON AN 80 FEET SPACING UNLESS OTHERWISE SHOWN IN THE PLANS.



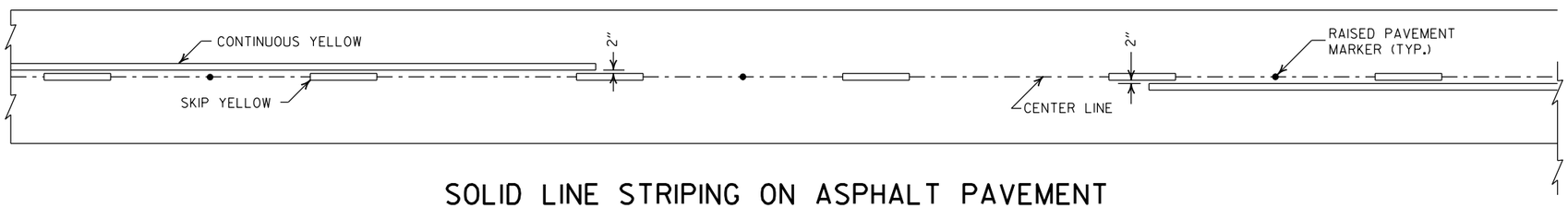

CONCRETE PAVEMENT

ASPHALT PAVEMENT

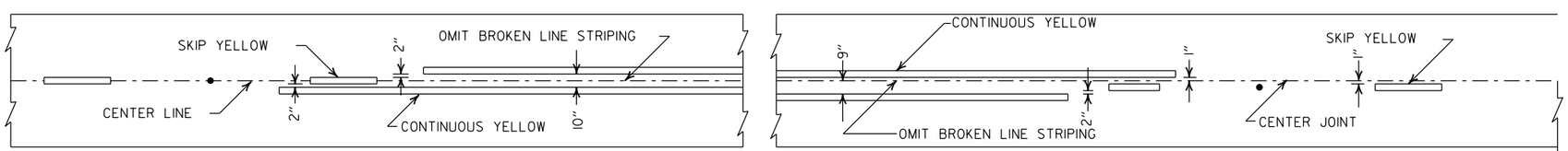
## BROKEN LINE STRIPING




## SOLID LINE STRIPING ON CONCRETE PAVEMENT



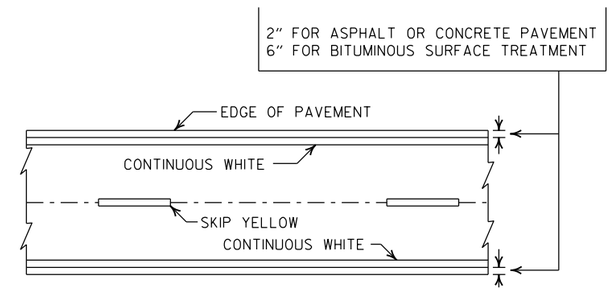

## SOLID LINE STRIPING ON ASPHALT PAVEMENT




ASPHALT PAVEMENT

CONCRETE PAVEMENT

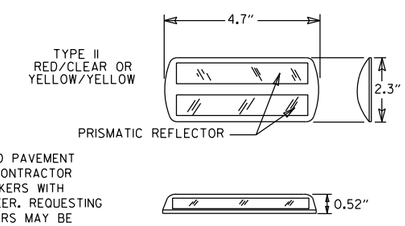
## STRIPING AT ADJACENT NO PASSING LANES



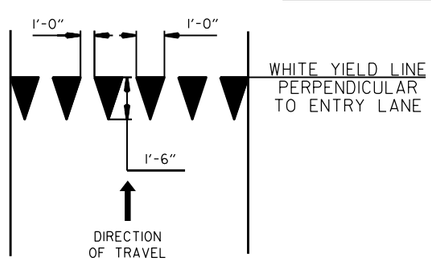

## PAVEMENT EDGE LINE MARKING

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

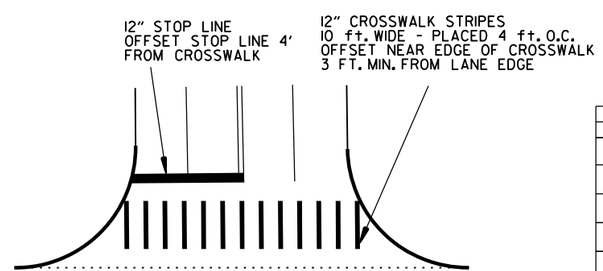
NOTE:
DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE ARDOT QUALIFIED PRODUCTS LIST.




## DETAIL OF STANDARD RAISED PAVEMENT MARKERS




## YIELD LINE DETAIL



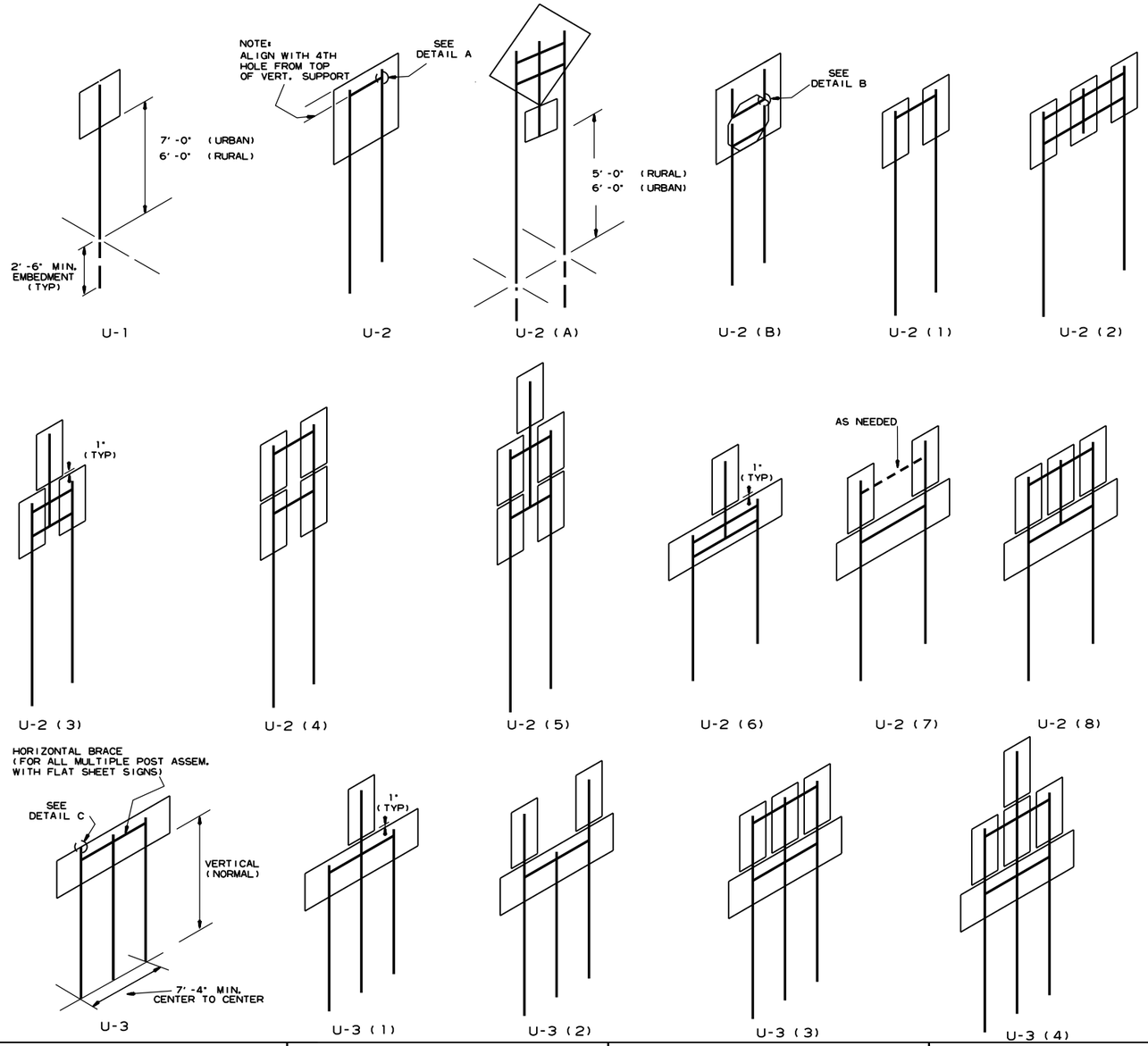

## CROSSWALK AND STOP LINE DETAILS

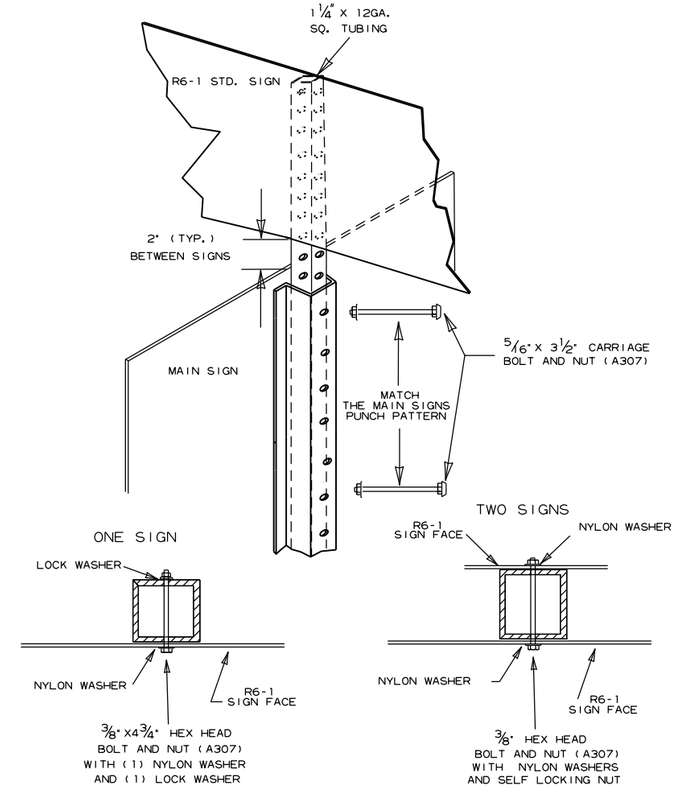
| DATE | REVISION | FILMED |
|---|---|---|
| 2-27-20 | REVISED STOP LINE DETAILS | |
| 6-1-17 | ADDED YIELD LINE DETAIL | |
| 5-12-16 | REVISED LINE WIDTHS, SPACING, & NOTES | |
| 9-12-13 | REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS | |
| 11-17-10 | REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT 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

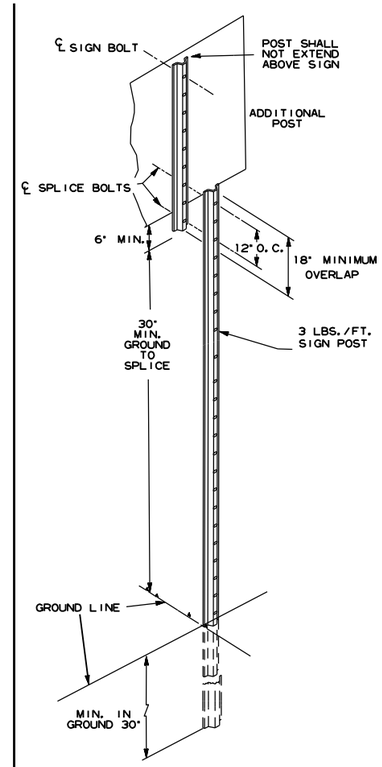
# PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1




DETAIL E
R6-1 EXTENSION FOR U-CHANNEL POST




DETAIL F
DETAIL OF SPLICES

NOTES:

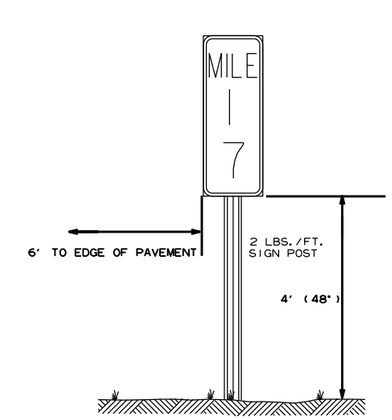
SIGNS AT LEAST 8' IN LENGTH MAY BE INSTALLED ON THREE 3 LB. POST. IN NO CASE SHALL THERE BE MORE THAN TWO 3 LB. POSTS WITHIN A 7' PATH.

SPLICES NECESSARY TO ATTAIN PROPER MOUNTING HEIGHT SHALL BE AS SHOWN IN DETAIL ( F ).

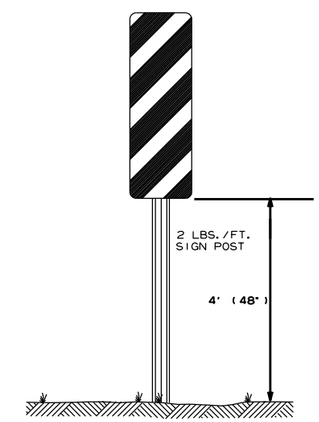
NORMAL INSTALLATIONS WILL REQUIRE 5/16" DIA. CARRIAGE BOLTS TO MOUNT SIGNS TO POST AND TO ASSEMBLE THE VARIOUS POST SUPPORTS.

ALL SIGN POSTS SHALL BE PLUMB.

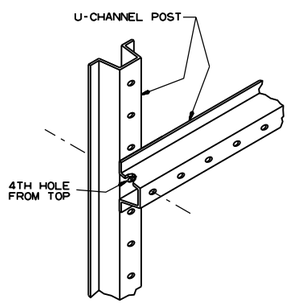
THE POST FOR "TYPE U" SUPPORTS SHALL BE HOT DIP GALVANIZED.



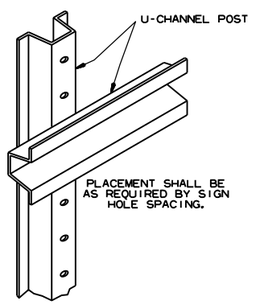

TYPICAL MILE MARKER INSTALLATION



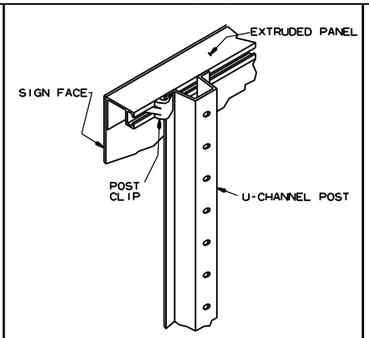

TYPICAL OM-3 INSTALLATION AT EDGE OF OBSTRUCTION



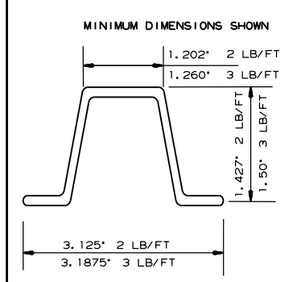

DETAIL A
SHOWING HORIZONTAL BRACE




DETAIL B
SHOWING BACK-TO-BACK INSTALLATION




DETAIL C
SHOWING GUIDE SIGN MOUNTING WITH EXTRUDED PANELS




DETAIL C
U-CHANNEL POST

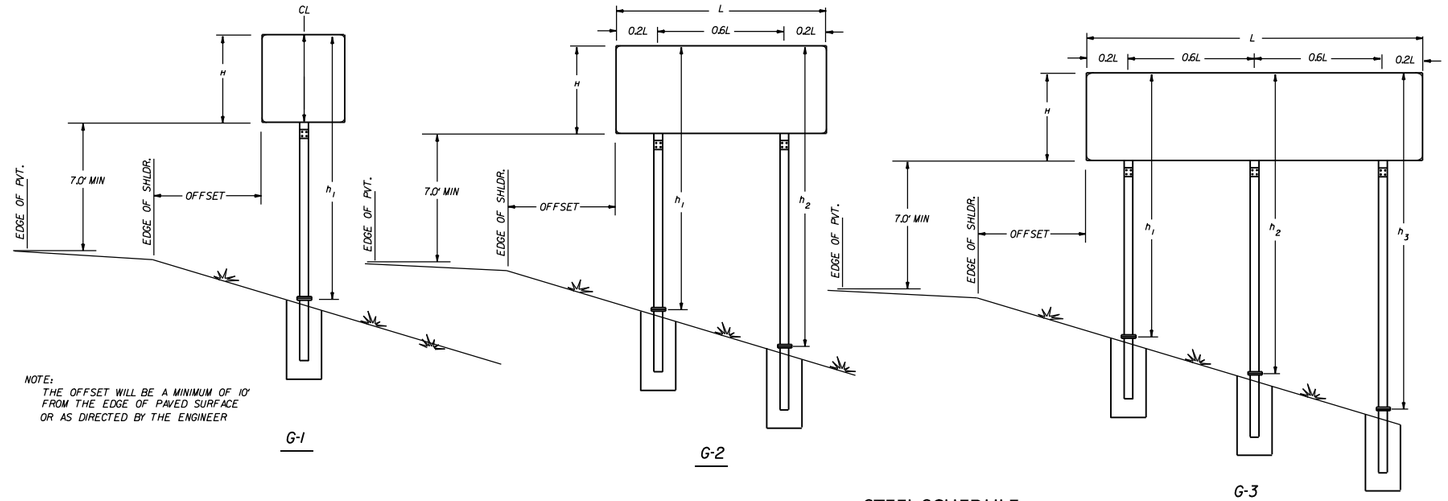
| DATE | REVISION | FILMED |
|---|---|---|
| 7-25-19 | REVISED CARRIAGE BOLT WITH MATERIAL REQUIREMENT | |
| 2-27-14 | REVISED NOTES. | |
| 9-12-13 | REVISED U-2(3), U-2(6), U-3(1), DETAIL D; ADDED DETAILS E & F; ADDED TYPICAL MARKERS | |
| 10-9-03 | REMOVED ROUND POST & REVISED SPACING | |
| 10-12-95 | MOVED UPPER SPLICE | |
| 6-8-95 | REVISED SPLICE DETAIL | 6-8-95 |
| 2-2-95 | REDRAWN | 2-2-95 |

ARKANSAS STATE HIGHWAY COMMISSION

# U-CHANNEL POST ASSEMBLIES

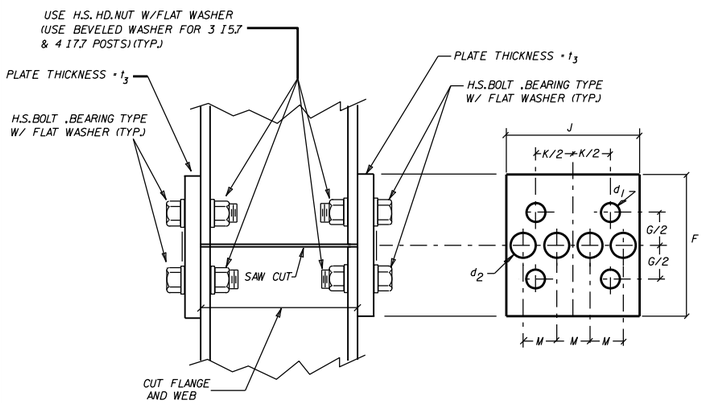
STANDARD DRAWING SHS-2

| POST SIZE | BASE CONNECTION DATA | | | | | | | | | | | FUSE PLATE DATA | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BOLT SIZE | BOLT TORQUE (INCH/LBS) | A | B | C | D | E | $t_1$ | $t_2$ | W | R | F | G | | J | K | M | $d_1$ | $d_2$ | $t_3$ | BOLT SIZE | WT. OF EACH FUSE PLATE LBS. |
| W 6X9 | 5/8" x 2 3/4" | 450"-680" | 5" | 2" | 1 1/4" | 2 3/4" | 1 1/8" | 3/4" | 1/2" | 1/4" | 11/32" | 4 1/4" | 2" | | 4" | 2 1/4" | 1" | 9/16" | 3/4" | 1/4" | 1/2" x 1 1/2" | 1.01 |
| W 6X12 | | | | | | | | | | | | | | | | | | | | | | |
| W 6X15 | | | | | | | | | | | | 5" | 2 1/2" | | 6" | 3 1/2" | 1 1/2" | 11/16" | 1 1/4" | 3/8" | 5/8" x 2 1/4" | 2.51 |
| W 8X18 | 3/4" x 3 1/2" | 750"-1050" | 6" | 2 1/4" | 1 3/8" | 3 1/2" | 1 1/4" | 1" | 3/4" | 5/16" | 11/32" | 5" | 2 1/2" | | 5 1/4" | 2 3/4" | 1 1/4" | 13/16" | 1 1/16" | 3/8" | 3/4" x 2 1/4" | 2.26 |
| W 8X21 | | | | | | | | | | | | 5 1/2" | 2 1/2" | | 5 1/4" | 2 3/4" | 1 1/4" | 13/16" | 1" | 1/2" | 3/4" x 2 1/4" | 3.35 |
| W 10X22 | | | | | | | | | | | | 6" | 3" | | 5 3/4" | 2 3/4" | 1 3/8" | 13/16" | 1 1/8" | 1/2" | 3/4" x 2 1/4" | 4.03 |
| W 10X26 | | | | | | | | | | | | | | | | | | | | | | |
| W 12X26 | | | | | | | | | | | | 6" | 3" | | 6 1/2" | 3 1/2" | 1 5/8" | 13/16" | 1 3/16" | 1/2" | 3/4" x 2 1/4" | 4.47 |




NOTE:
THE OFFSET WILL BE A MINIMUM OF 10' FROM THE EDGE OF PAVED SURFACE OR AS DIRECTED BY THE ENGINEER

G-1 G-2 G-3



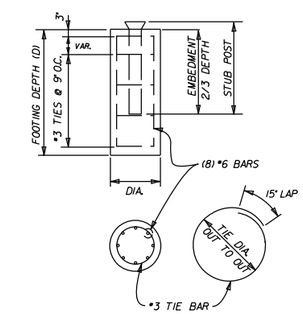

NOTE: USE H.S.HEX HEAD BOLTS.HEX HEAD NUTS AND BEVEL OR FLAT WASHERS (WHERE REQ.) UNDER NUTS. ALL HOLES SHALL BE DRILLED.ALL PLATE CUTS SHALL PREFERABLY BE SAW CUTS.HOWEVER FLAME CUTTING WILL BE PERMITTED PROVIDED ALL EDGES ARE GROUND. METAL PROJECTING BEYOND THE PLANE OF THE PLATE FACE WILL NOT BE PERMITTED. STEEL FUSE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM-A36,ASTM-A441,ASTM-572 GRADE 50,OR ASTM-A588 MAY BE SUBSTITUTED FOR A36 AT THE OPTION OF THE FABRICATOR. STEEL USED SHALL HAVE AN ULTIMATE TENSILE STRENGTH NOT TO EXCEED 80 KSI.

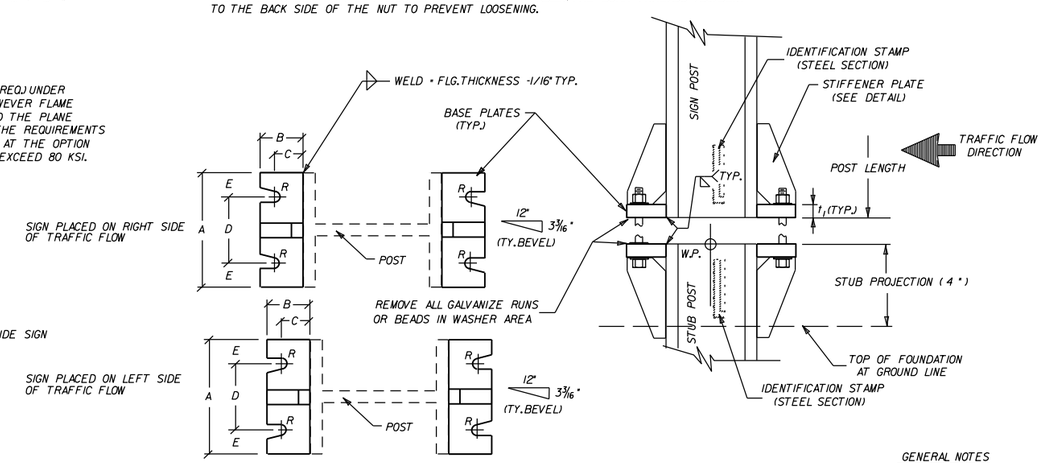
NOTE: SECTIONS SHOWN ARE FOR INSTALLATION ON THE RIGHT SHOULDER AND IN THE GORE. BOLT HOLES IN BASE PLATE ARE SLOTTED AND BEVELED AS SHOWN. USE H.S.BOLTS WITH HEX HD.,HEX NUT AND THREE FLAT WASHERS FOR EACH BOLT.SEE TABLE FOR BOLT DIA. AND TORQUE.
NOTE: ASSEMBLE SIGN POST TO STUB POST USING THE BOLTS SPEC.IN THE TABLE AND AS SHOWN IN THE ELEVATION DETAILS.THERE SHALL BE THREE FLAT WASHERS ON EACH BOLT LOCATED AS SHOWN IN THE ELEVATIONS. USE A SHIM TO PLUMB THE SIGN POST.THEN TIGHTEN THE BOLTS USING A 12" TO 15" WRENCH UNTIL THE WASHERS AND SHIMS ARE SEATED AND THE BOLT THREADS ARE CLEAR ,THEN LOOSEN EACH BOLT IN TURN AND RETIGHTEN IN A SYSTEMATIC ORDER TO THE PRESCRIBED TORQUE (SEE TABLE).THE BURR THREADS ADJACENT TO THE BACK SIDE OF THE NUT TO PREVENT LOOSENING.

## STEEL SCHEDULE

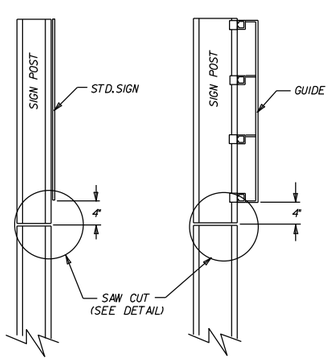
| FOOTING DIAMETER | #3 TIE BARS | | |
|---|---|---|---|
| | DIAMETER | BAR LENGTH | POUNDS |
| INCHES | INCHES | FEET | |
| 18 | 12 | 4.39 | 1.65 |
| 24 | 18 | 5.96 | 2.24 |
| 30 | 24 | 7.53 | 2.83 |
| 36 | 30 | 9.1 | 3.42 |

| FOOTINIG DEPTH | #6 STRAIGHT BARS | | |
|---|---|---|---|
| | BAR LENGTH | NUMBER REQ'D. | POUNDS |
| FEET | FEET | | |
| 2.50 | 2.00 | 8 | 24.03 |
| 3.00 | 2.50 | 8 | 30.04 |
| 3.50 | 3.00 | 8 | 36.05 |
| 4.00 | 3.50 | 8 | 42.06 |
| 4.50 | 4.00 | 8 | 48.06 |
| 5.00 | 4.50 | 8 | 54.07 |
| 5.50 | 5.00 | 8 | 60.08 |
| 6.00 | 5.50 | 8 | 66.09 |
| 6.50 | 6.00 | 8 | 72.10 |
| 7.00 | 6.50 | 8 | 78.10 |
| 7.50 | 7.00 | 8 | 84.11 |
| 8.00 | 7.50 | 8 | 90.12 |



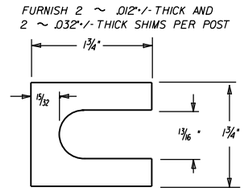

NOTE: BOLT HOLES.USED IN THE MOUNTING OF STANDARD SIGNS SHALL BE LOCATED IN THE FLANGE ADJACENT TO THE NEAR EDGE OF PAVEMENT FOR SINGLE POST ASSEMBLIES AND IN THE OUTSIDE FLANGES FOR MULTIPLE POST ASSEMBLIES.



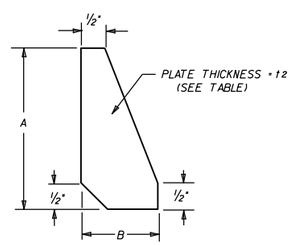

NOTE: POST SHALL BE SAW CUT AFTER GALVANIZING AND THE CUT SURFACE TREATED.AFTER PLATE IS INSTALLED AND ALL BOLTS FULLY TIGHTENED.WITH AN APPROVED ZINC SOLDER MEETING THE FEDERAL SPEC.O-G-93 (STICK ONLY).

STANDARD SIGNS GUIDE SIGNS

FUSE PLATE DETAILS




SHIM DETAIL




STIFFENER PLATE DETAIL

GENERAL NOTES

TIGHTEN THE HIGH STRENGTH BOLTS IN THE BASE CONNECTION ONLY TO THE TORQUE SHOWN. DO NOT OVERTIGHTEN.

BASE PLATES AND STIFFENER PLATES SHALL BE OF THE SAME MATERIAL AS THE PRIMARY SUPPORT POSTS WHICH THEY ARE WELDED.

REFER TO THE PLANS FOR FOOTING DIMENSIONS.

EACH STUB POST AND SIGN POST SHALL HAVE A PERMANENT IDENTIFYING STAMP WHICH SPECIFIES THE STEEL SECTION USED. IF THE CONTRACTOR ELECTS TO SHIP THE STUB POST SEPARATE FROM THE SIGN POST A MATCH MARK SYSTEM WILL BE REQUIRED.

## FOOTING QUANTITIES

| FOOTINIG DEPTH | NUMBER TIE BARS REQ'D | 18" DIAMETER | | 24" DIAMETER | | 30" DIAMETER | | 36" DIAMETER | |
|---|---|---|---|---|---|---|---|---|---|
| | | CLASS S CONCRETE | REINF STEEL | CLASS S CONCRETE | REINF STEEL | CLASS S CONCRETE | REINF STEEL | CLASS S CONCRETE | REINF STEEL |
| FEET | | CU. YD. | (GRADE 60) | CU. YD. | (GRADE 60) | CU. YD. | (GRADE 60) | CU. YD. | (GRADE 60) |
| 2.50 | 4 | 0.16 | 31 | | | | | | |
| 3.00 | 4 | 0.20 | 37 | | | | | | |
| 3.50 | 5 | 0.23 | 44 | | | | | | |
| 4.00 | 6 | 0.26 | 52 | 0.47 | 56 | | | | |
| 4.50 | 6 | 0.29 | 58 | 0.52 | 62 | | | | |
| 5.00 | 7 | 0.33 | 66 | 0.58 | 70 | 0.91 | 74 | | |
| 5.50 | 8 | | | 0.64 | 78 | 1.00 | 83 | | |
| 6.00 | 8 | | | 0.70 | 84 | 1.09 | 89 | 1.57 | 93 |
| 6.50 | 9 | | | | | 1.18 | 98 | 1.70 | 103 |
| 7.00 | 10 | | | | | 1.27 | 106 | 1.83 | 112 |
| 7.50 | 10 | | | | | | | 1.96 | 118 |
| 8.00 | 11 | | | | | | | 2.09 | 128 |

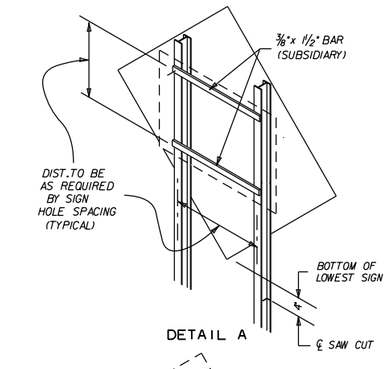
SIGN POST AND STUB POST

| DATE | REVISION | FILMED |
|---|---|---|
| 9-12-13 | ISSUED | |

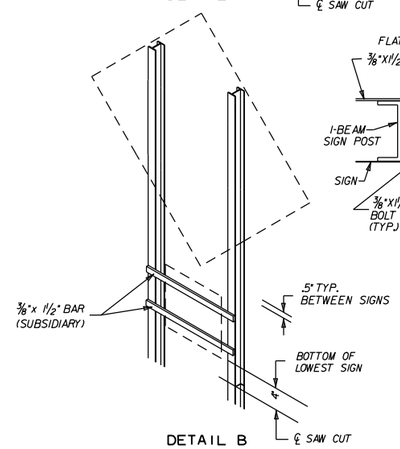
ARKANSAS STATE HIGHWAY COMMISSION

DETAIL OF BREAKAWAY SIGN SUPPORTS FOR GUIDE SIGNS

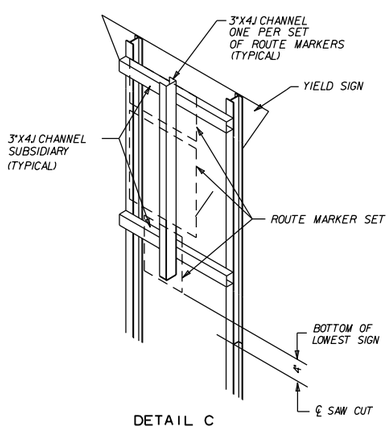
STANDARD DRAWING SHS-3



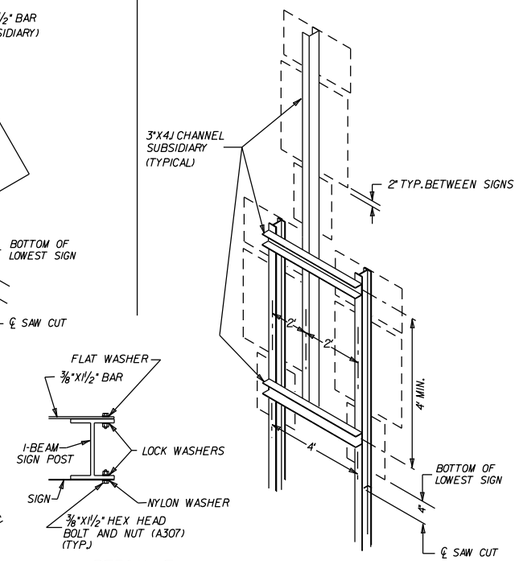

DETAIL A




DETAIL B



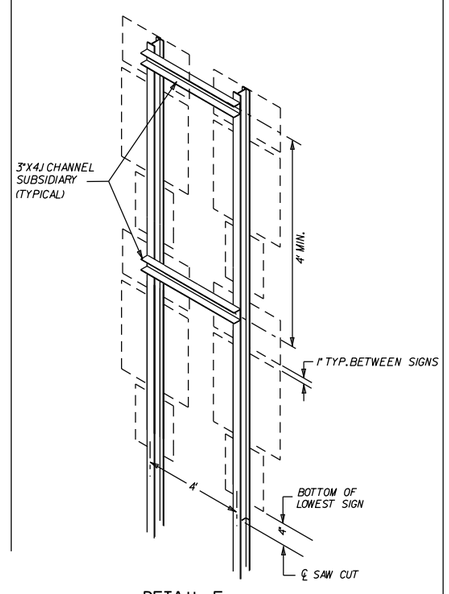

DETAIL C




DETAIL F




DETAIL D




DETAIL E

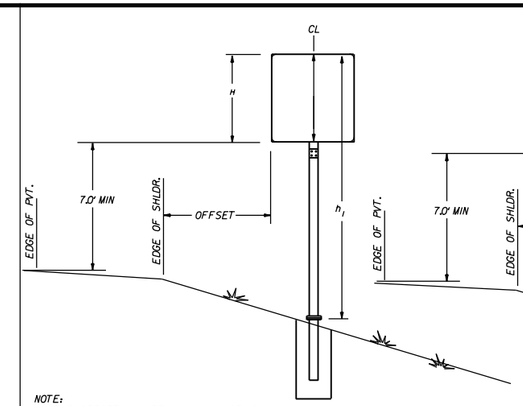
NOTE

ALL ADDITIONAL MOUNTING HARDWARE, BOLTS, NUTS, CHANNELS AND BAR STRAPS REQUIRED TO MOUNT SECONDARY SIGNS WILL BE CONSIDERED TO BE SUPPLEMENTAL TO THE MAIN SIGN SUPPORT SPECIFIED. PAYMENT WILL BE CONSIDERED SUBSIDIARY TO THE MAIN SUPPORT.

THE GALVANIZED STEEL CHANNEL AND BAR SUPPORTS MAY BE ASTM A-36.

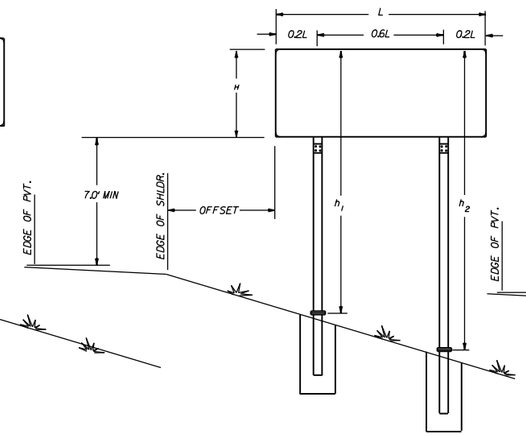
REFER TO THE P.C. RUTLEDGE FORMULA ON PAGE 58 OF THE AASHTO PUBLICATION "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS.

ALL BOLT HOLES SHALL BE 1/8" DIA. UNLESS OTHERWISE SHOWN.

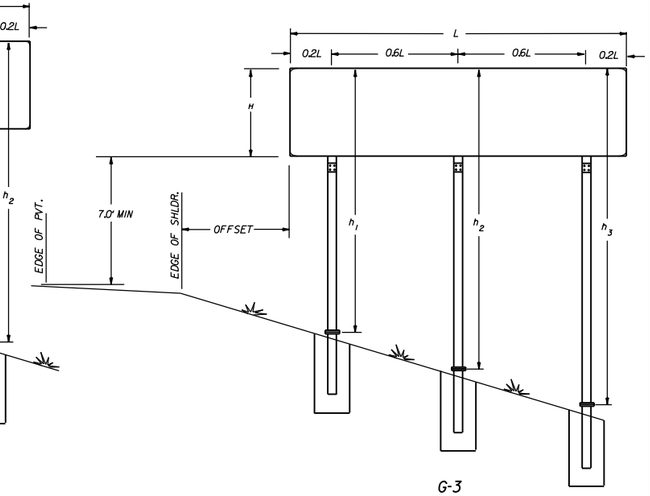



NOTE:
THE OFFSET WILL BE A MINIMUM OF 10' FROM THE EDGE OF PAVED SURFACE OR AS DIRECTED BY THE ENGINEER.

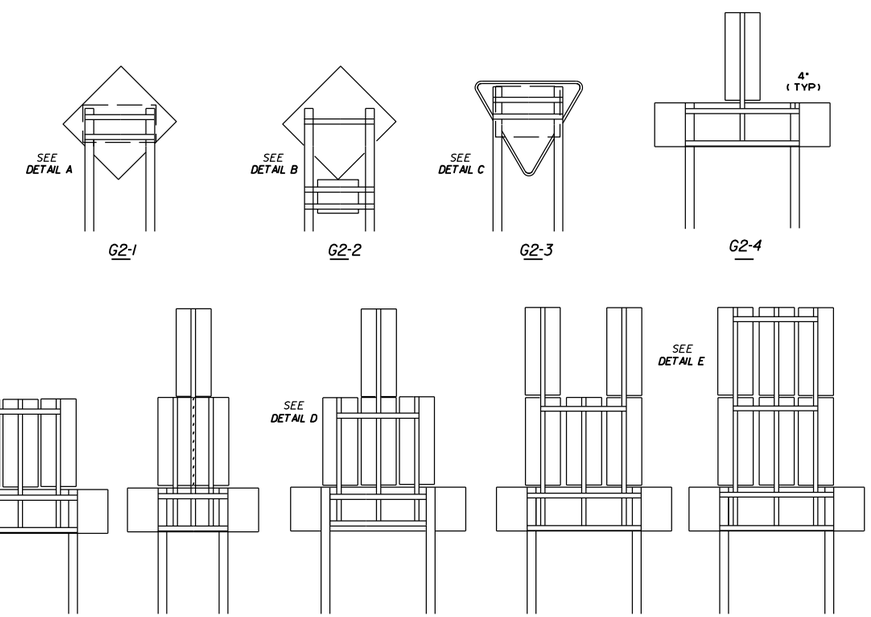
G-1




G-2




G-3




G2-1 G2-2 G2-3 G2-4 G2-5 G2-6 G2-7 G2-8 G2-9 G2-10

| | | |
|---|---|---|
| 9-12-13 | ISSUED | |
| DATE | REVISION | FILMED |

ARKANSAS STATE HIGHWAY COMMISSION

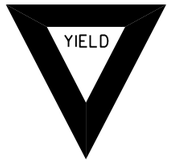
# DETAIL OF BREAKAWAY SIGN SUPPORTS FOR STANDARD SIGNS

STANDARD DRAWING SHS-4

R1-1


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

R1-2




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

R2-1


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

W3-5


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

W3-5a


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

R4-1


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

R4-2


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

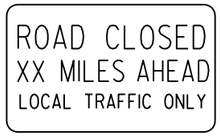
R5-1


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

R11-2


48"X30"

R11-3A




60"X30"

R11-4


60"X30"

W21-5a


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

W1-1

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

W1-2

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

W1-3

STD. 48"X48"

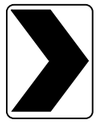
W1-4

STD. 48"X48"

W1-6

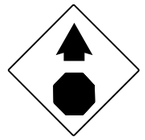
STD. 48"X24"
SPECIAL 60"X30"

W1-8



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

W3-1

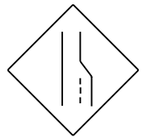


STD. 36"X36"
SPECIAL 48"X48"

W3-2

STD. 36"X36"
SPECIAL 48"X48"

W4-2



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

W5-1


STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7


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

W9-2


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

W13-1


STD. 24"X24"

W20-1


STD. 48"X48"

W20-2


STD. 48"X48"

W20-3


STD. 48"X48"

W20-4


STD. 48"X48"

W20-5


STD. 48"X48"

W20-7a


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

W21-2


STD. 30"X30"
SPECIAL 36"X36"

W21-5


STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

W1-4b

STD. 48"X48"

R56-1


STD. 18"X18"

W8-11


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

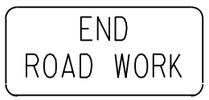
W8-9


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

G20-1

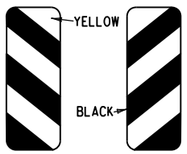

60"X24"

G20-2




48"X24"

OM-3L OM-3R




12"X36"

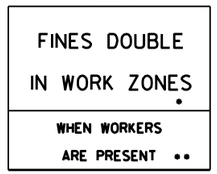
M4-9


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

M4-10


48"X18"

R55-1




36"X60"

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

ADVANCE DISTANCES
(XXXX)

| | |
|---|---|
| 500 FT | 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.

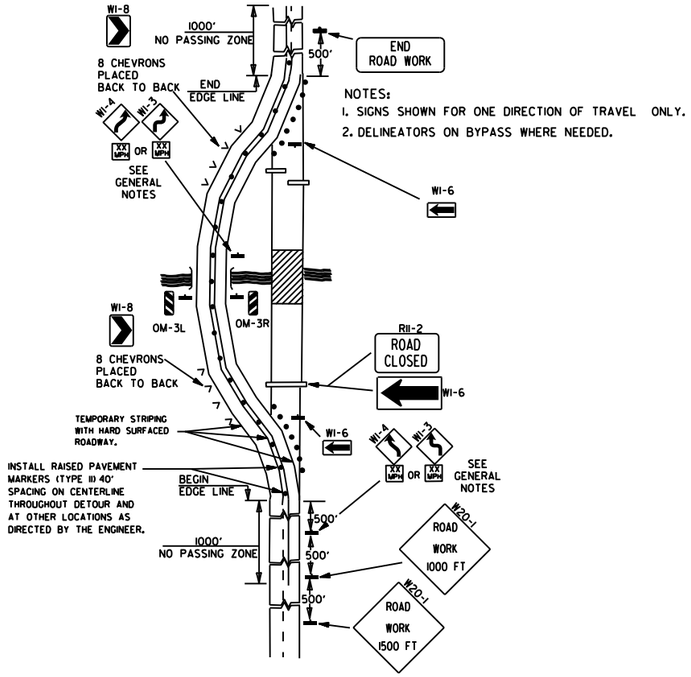
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED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

| DATE | REVISION | FILMED |
|---|---|---|
| 11-07-19 | REVISED FOR MASH | |
| 4-13-17 | DELETED RSP-1 & ADDED W21-5a | |
| 9-2-15 | REVISED REDUCED SPEED LIMIT AHEAD SIGNS<br>REVISED ROAD WORK NEXT XX MILES | |
| 12-15-11 | REVISED W24-1 | |
| 11-17-10 | DELETED W8-9a & ADDED W8-9 | |
| 10-15-09 | ADDED REFERENCE TO MASH & ADDED SIGN W24-1 | |
| 4-17-08 | REVISED SIGN DESIGNATIONS | |
| 11-18-04 | REVISED NOTES | |
| 10-9-03 | REVISED NOTE 1 | |
| 11-16-01 | REVISED NOTE 7 | |
| 9-28-00 | REVISED NOTE | |
| 11-18-98 | ADDED NOTE | |
| 6-26-97 | REVISED NOTE 5 | |
| 4-03-97 | REVISED NOTE 5 | |
| 10-18-96 | ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7 | |
| 10-12-95 | ADDED R55-1 | |
| 6-8-95 | REVISED TO CORRECT SIGN ILLUSTRATIONS | 6-8-95 |
| 2-2-95 | REVISED PER PART VI, MUTCD SEPT. 3, 1993 | |
| 8-15-91 | DRAWN AND PLACED IN USE | |

ARKANSAS STATE HIGHWAY COMMISSION

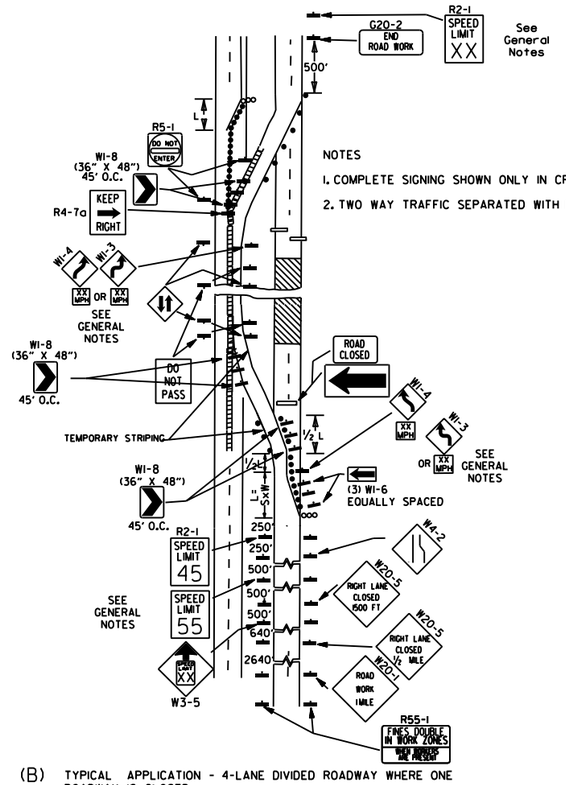
# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



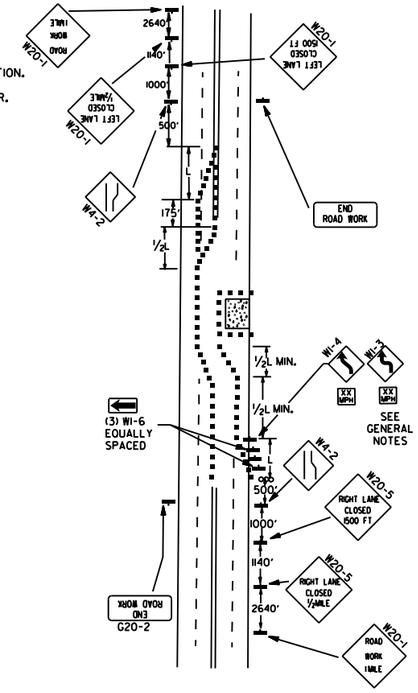

NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

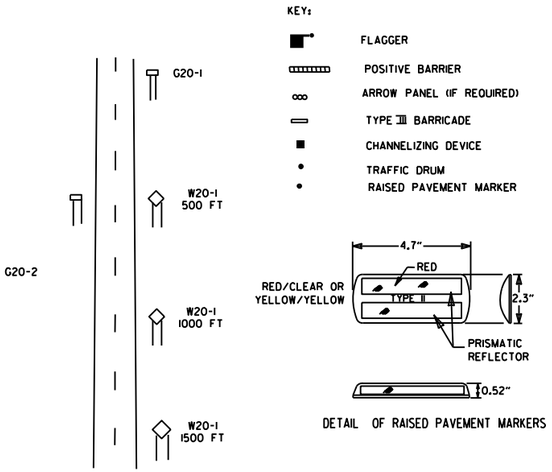



NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

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




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




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:

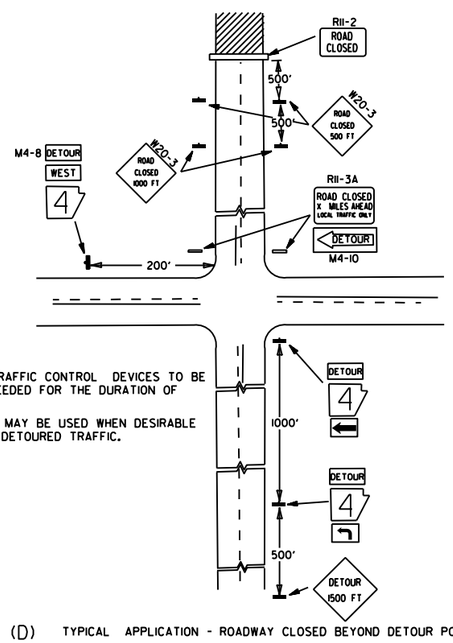
L= MINIMUM LENGTH OF TAPER.

S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.

W= WIDTH OF OFFSET.

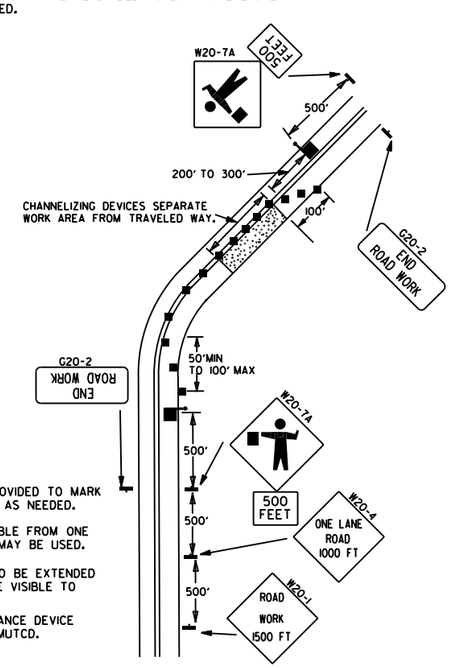
GENERAL NOTES:

1. THE MAINTENANCE DIVISION SHALL CONDUCT A BALL BANK STUDY TO DETERMINE THE ADVISORY SPEED LIMIT PRIOR TO OPENING TO TRAFFIC. THE ADVISORY SPEED WILL BE POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS. 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. PAYMENT FOR TRAFFIC DRUMS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR VARIOUS TRAILER MOUNTED DEVICES.
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 ARDOT QUALIFIED PRODUCTS LIST.
9. ALL TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).



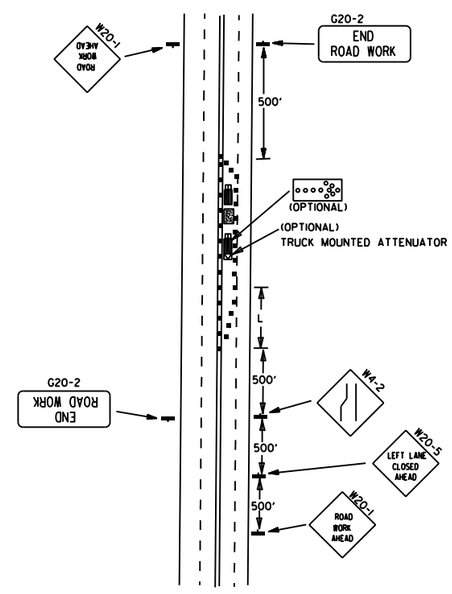

NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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




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

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



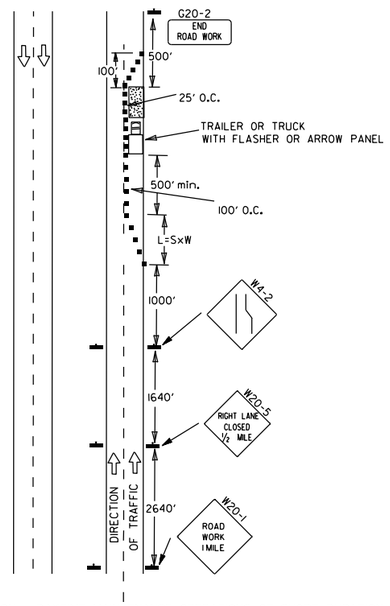

(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

| DATE | REVISION | FILMED |
|---|---|---|
| 05-20-21 | REVISED NOTE 7 | |
| 11-07-19 | REVISED NOTE 1, ADDED NOTE 9 | |
| 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 (c) 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 | |

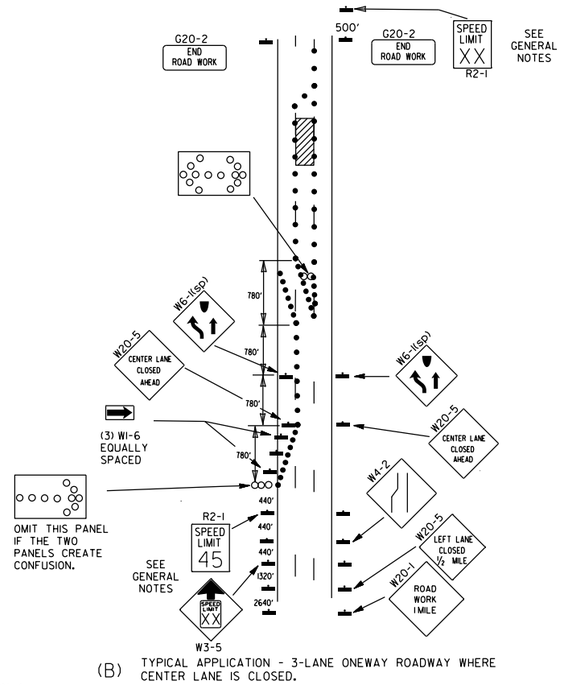
ARKANSAS STATE HIGHWAY COMMISSION

# 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.



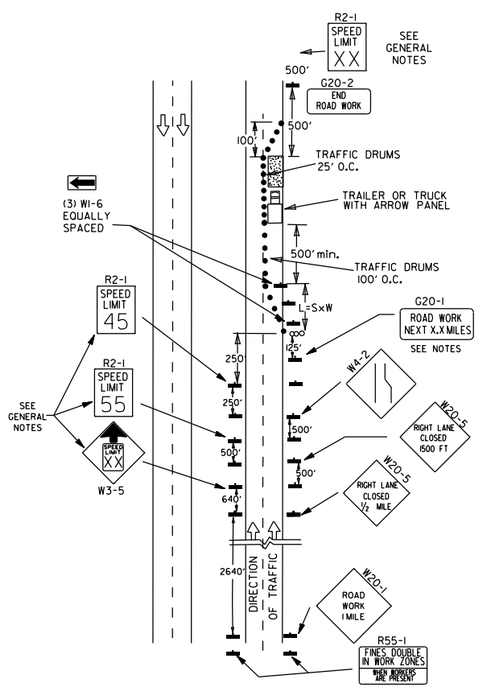

(B) TYPICAL APPLICATION - 3-LANE ONEWAY ROADWAY WHERE CENTER LANE IS CLOSED.

KEY:

- ARROW PANEL (IF REQUIRED)
- ■ CHANNELIZING DEVICE
- ● TRAFFIC DRUM

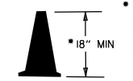
GENERAL NOTES:

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 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. PAYMENT FOR TRAFFIC DRUMS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR VARIOUS TRAILER MOUNTED DEVICES.
11. ALL TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).



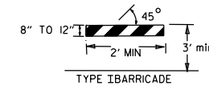

(C) TYPICAL APPLICATION - CONSTRUCTION OPERATIONS OF INTERMEDIATE TO LONG TERM DURATION ON A 4-LANE DIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.

## CHANNELIZING DEVICES



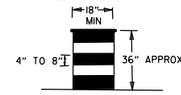

- WHEN CONES ARE USED ON FREEWAYS AND MULTI-LANE HIGHWAYS, THEY SHALL BE 28" MIN. DURING HOURS OF DARKNESS, 28" CONES SHALL BE USED ON ALL ROADWAYS, AND SHALL BE REFLECTORIZED IN ACCORDANCE WITH THE M.U.T.C.D.

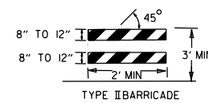
CONES



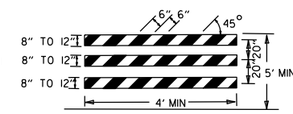

TYPE I BARRICADE

PLASTIC DRUM



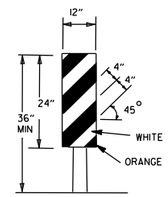




TYPE II BARRICADE



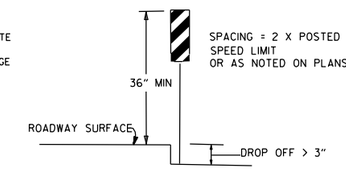

TYPE III BARRICADE

NOTE:
FOR ALL ROAD CLOSURES, THE TYPE III BARRICADES SHALL BE OF SUFFICIENT LENGTH TO EXTEND ACROSS ENTIRE ROADWAY.



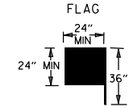

VERTICAL PANEL
VP-1R

VERTICAL PANEL PLACEMENT




SPACING = 2 X POSTED SPEED LIMIT OR AS NOTED ON PLANS

FLAG




FLAG SHALL BE OF GOOD GRADE RED MATERIAL

TRAFFIC CONTROL DEVICES

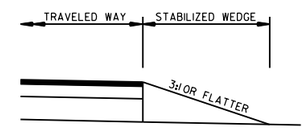
| NON-INTERSTATE | | | |
|---|---|---|---|
| VERTICAL DIFFERENTIAL | LOCATION | TRAFFIC CONTROL | |
| | | ≤ 45 MPH | > 45 MPH |
| ≤ 1" | CENTERLINE | W8-11 | W8-11 |
| > 1" ≤ 3" | CENTERLINE | W8-11 AND CENTERLINE LANE STRIPING | W8-11 AND CENTERLINE LANE STRIPING |
| > 3" | CENTERLINE | STANDARD LANE CLOSURE(6) | STANDARD LANE CLOSURE(6) |
| ≤ 3" | EDGE OF TRAVELED LANE OR EDGE OF SHOULDER | W8-9 AND TRAFFIC DRUMS(1) | W8-9 AND TRAFFIC DRUMS(1) |
| > 3" ≤ 6" | EDGE OF TRAVELED LANE OR EDGE OF SHOULDER | W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS(1) | W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS(1) |
| > 6" ≤ 18" | EDGE OF TRAVELED LANE OR EDGE OF SHOULDER | W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS(1) | W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS(2) |
| > 18" ≤ 24" | EDGE OF TRAVELED LANE OR EDGE OF SHOULDER | W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS(1) | A STABILIZED WEDGE, W8-17, EDGE LINE STRIPING AND TRAFFIC DRUMS(3) |
| > 24" | EDGE OF TRAVELED LANE OR EDGE OF SHOULDER | PRECAST CONCRETE BARRIER(4) & EDGE LINES | PRECAST CONCRETE BARRIER(4) & EDGE LINES |

| INTERSTATE | | |
|---|---|---|
| VERTICAL DIFFERENTIAL | LOCATION | TRAFFIC CONTROL |
| ≤ 3" | CENTERLINE | W8-11 AND LANE STRIPING |
| ≤ 3" | EDGE OF TRAVELED LANE OR EDGE OF SHOULDER | W8-9, EDGE LINE STRIPING, AND TRAFFIC DRUMS(2) |
| > 3" ≤ 6" | EDGE OF TRAVELED LANE OR EDGE OF SHOULDER | W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS(2) |
| > 6" | EDGE OF TRAVELED LANE OR EDGE OF SHOULDER | PRECAST CONCRETE BARRIER & EDGE LINES |

| INTERSTATE AND NON-INTERSTATE | | |
|---|---|---|
| FORESLOPE | HEIGHT | TRAFFIC CONTROL |
| 1:1 | > 2 FT | PRECAST CONCRETE BARRIER |
| 2:1 | ≤ 5 FT | TRAFFIC DRUMS |
| 2:1 | > 5 FT | PRECAST CONCRETE BARRIER |
| Flatter than 2:1 | N/A | TRAFFIC DRUMS |

GENERAL NOTES:

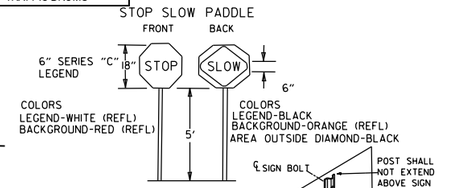
1. WHEN THE SHOULDER AREA IS USED AS PART OF THE TRAVELED LANE AND THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, THEN VERTICAL PANELS SHALL BE USED.
2. WHEN THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, A STABILIZED WEDGE SHALL BE USED.
3. PRECAST CONCRETE BARRIER WALL CAN BE USED IN LIEU OF A STABILIZED WEDGE, W8-17 SIGN, EDGE LINE STRIPING, AND TRAFFIC DRUMS, IF AND WHERE DIRECTED BY THE ENGINEER.
4. A STABILIZED WEDGE, W8-17 SIGN, EDGE LINE STRIPING, AND TRAFFIC DRUMS CAN BE USED IN LIEU OF PRECAST CONCRETE BARRIER WALL, IF AND WHERE DIRECTED BY THE ENGINEER.
5. W21-5, W21-5a, AND/OR W21-5b SIGNS SHALL BE USED WHERE THE ROADWAY IS UNOBSTRUCTED IF AND WHERE DIRECTED BY THE ENGINEER.
6. TIME LIMITATIONS MUST CONFORM TO SECTION 603 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).

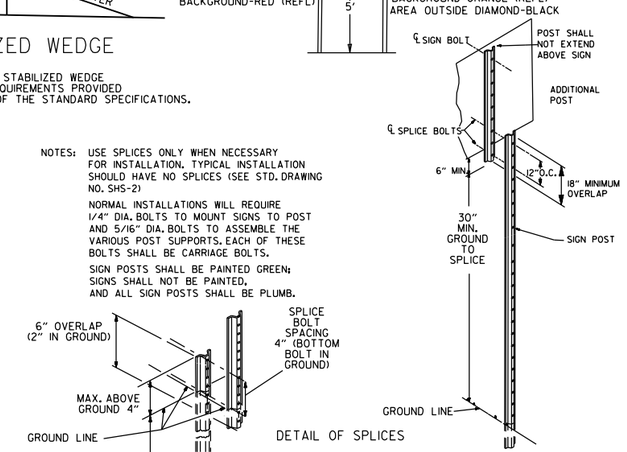



STABILIZED WEDGE

NOTE:
MATERIALS FOR THE STABILIZED WEDGE SHALL MEET THE REQUIREMENTS PROVIDED IN SECTION 603.02 OF THE STANDARD SPECIFICATIONS.

STOP SLOW PADDLE



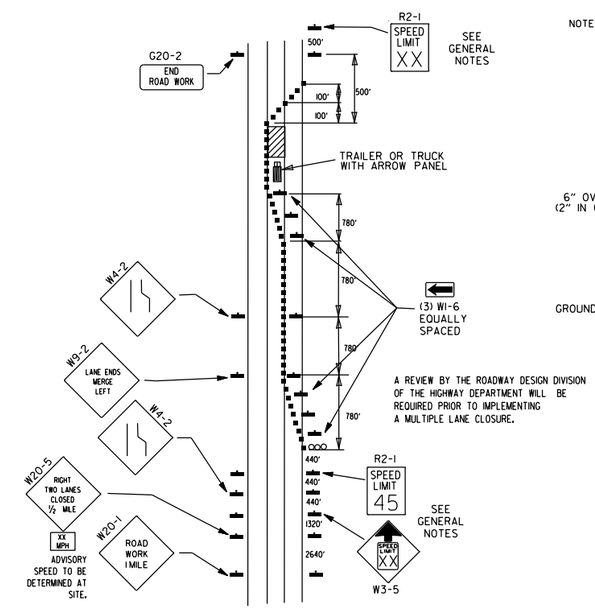




NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-21)

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.

DETAIL OF SPLICES




A REVIEW BY THE ROADWAY DESIGN DIVISION OF THE HIGHWAY DEPARTMENT WILL BE REQUIRED PRIOR TO IMPLEMENTING A MULTIPLE LANE CLOSURE.

(D) TYPICAL APPLICATION - CLOSING MULTIPLE LANES OF A MULTILANE HIGHWAY.

| DATE | REVISION | FILMED |
|---|---|---|
| 08-12-21 | REVISED TRAFFIC CONTROL DEVICES AND NOTES | |
| 05-20-21 | REVISED NOTE 10 | |
| 2-27-20 | REVISED TRAFFIC CONTROL DEVICES DETAILS | |
| 11-07-19 | REVISED NOTE 9, ADDED NOTE 11 | |
| 7-25-19 | REVISED TRAFFIC CONTROL DEVICES DETAILS | |
| 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 | |

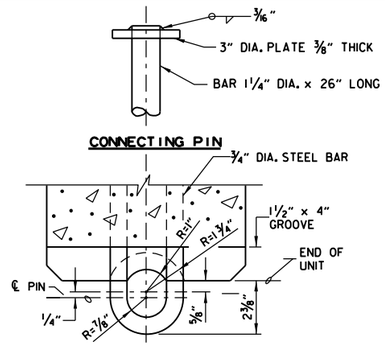
ARKANSAS STATE HIGHWAY COMMISSION

# STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

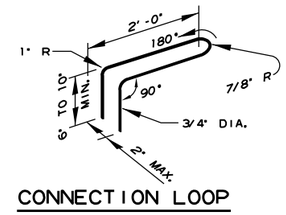
STANDARD DRAWING TC-3

## REINFORCING BAR TABLE PER BARRIER UNIT

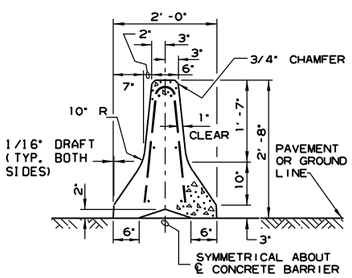
| MARK | LOCATION | BAR SIZE | (NO. BARS) | SKETCH |
|---|---|---|---|---|
| H-1 | HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS | #5 | (6) | 19'-3" |
| H-2 | CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY | #5 | (6) | 6'-6" |
| H-3 | TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1 | #4 | (2) | 1'-6" |
| S-1 | OVER LIFT HOLES | #4 | (2) | 2'-5", 90°, 3 3/8" R, LIFTING HOLE |
| 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°, 1 1/2", 9", 2'-1 3/8", 4 3/8" |



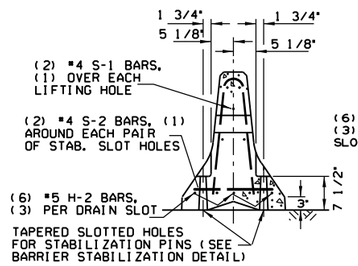

CONNECTION DETAILS



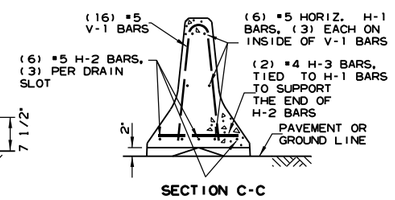

CONNECTION LOOP



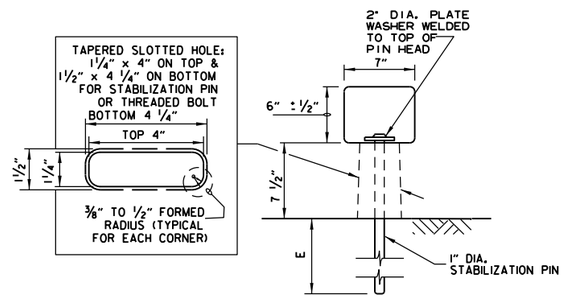

SECTION A-A




SECTION B-B



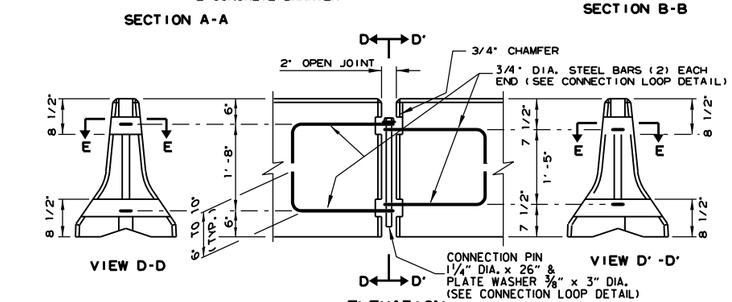

SECTION C-C



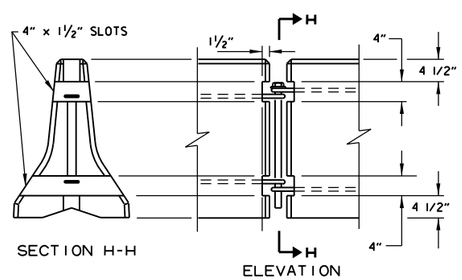

BARRIER STABILIZATION DETAIL

### ROADWAY SECTION

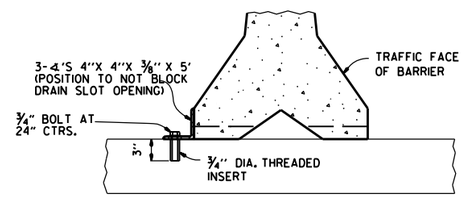
(E) 4" - CONCRETE PAVEMENT
8" - ASPHALT PAVEMENT
12" - SHOULDER AREAS




ELEVATION



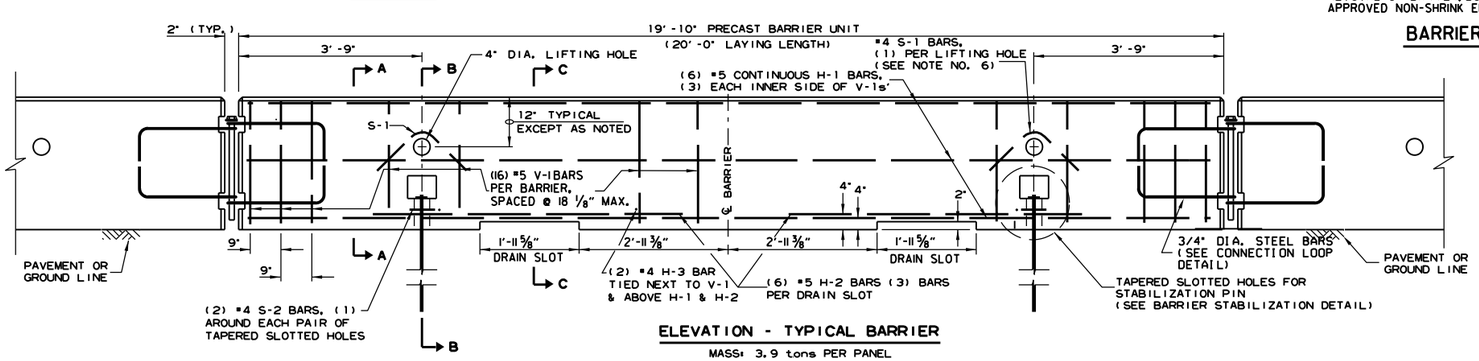

BARRIER REMOVAL SLOT DETAILS




NOTE: " 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




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 ARDOT 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 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 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 MANUAL FOR ASSESSING SAFETY HARDWARE (MASH). 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.

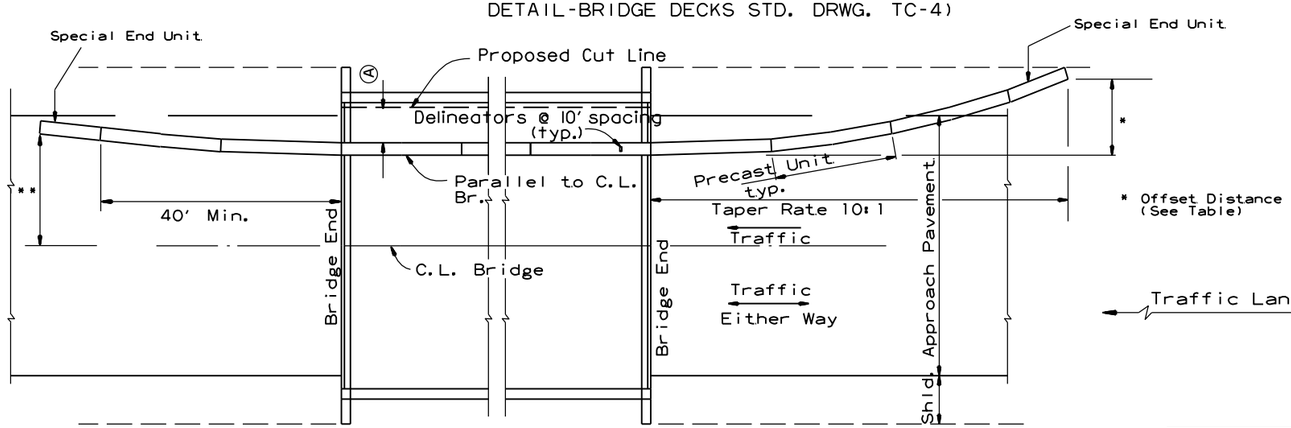
| DATE | REVISION | FILMED |
|---|---|---|
| 11-07-19 | REVISED NOTE 3 | |
| 2-27-14 | REVISED BARRIER STABILIZATION DETAIL | |
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 8-5-09 | REV. NOTE 3 CONCERNING DRAIN SLOTS | |
| 11-29-07 | REVISED NOTE 3 | |
| 5-25-06 | DELETED GENERAL NOTE 7 | |
| 11-18-04 | 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

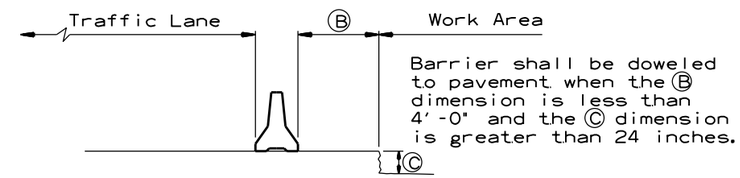
STANDARD DRAWING TC-4

Ⓐ 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

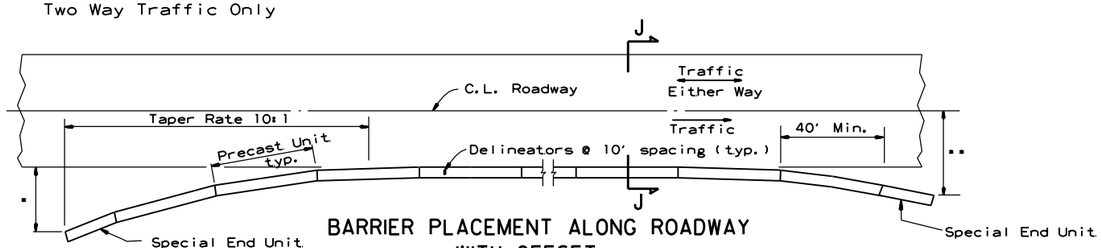
No Scale




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

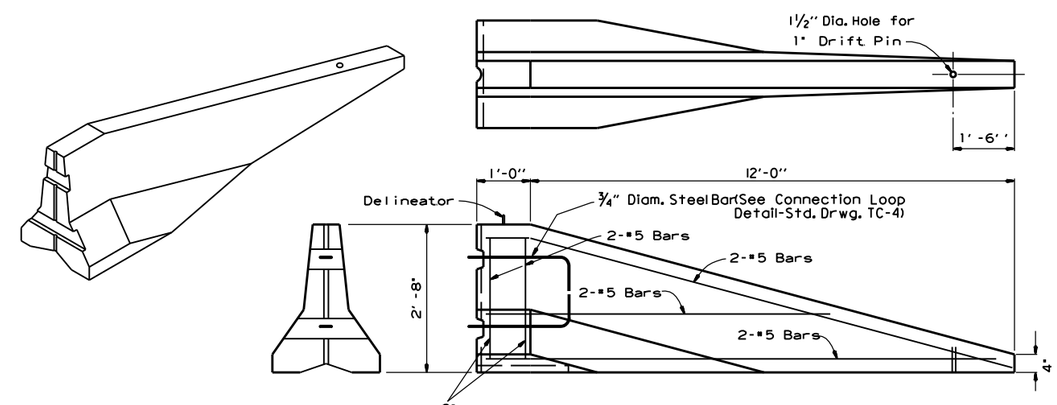
* Offset Distance (See Table)

** Offset Distance For Two Way Traffic Only

Offset Distance Table

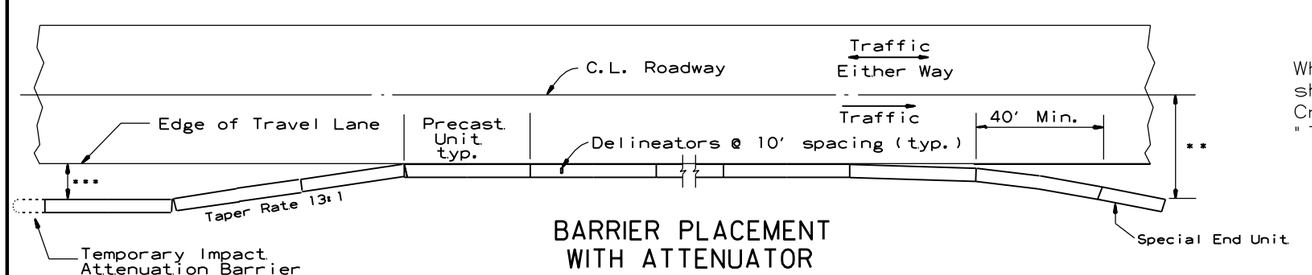
| Speed (MPH) | Offset Distance (FT.) |
|---|---|
| ≤ 45 | 12 |
| > 45 | 18 |

If offset distance is not attainable, then see "Barrier Placement With Attenuator" Detail shown below.




## SPECIAL END UNIT

No Scale




## 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

### General Notes

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with a 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 |
|---|---|---|
| 11-07-19 | REVISED NOTE | |
| 10-15-09 | ADDED REFERENCE TO MASH | |
| 5-25-06 | REVISED BARRIER PLACEMENT | |
| 8-22-02 | ISSUED NEW DRAWING | |

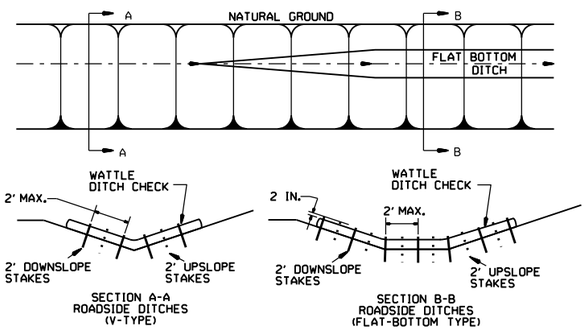
**ARKANSAS STATE HIGHWAY COMMISSION**

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

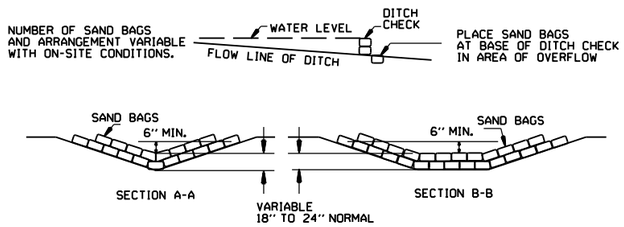
STANDARD DRAWING TC-5

GENERAL NOTES

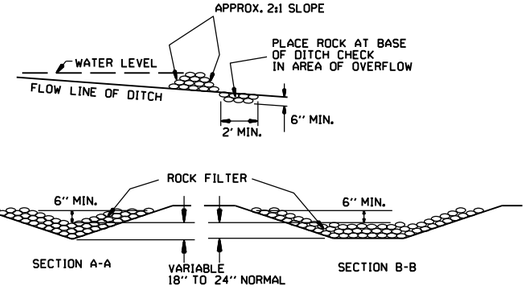
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.




## WATTLE DITCH CHECK (E-1)




## SAND BAG DITCH CHECK (E-5)

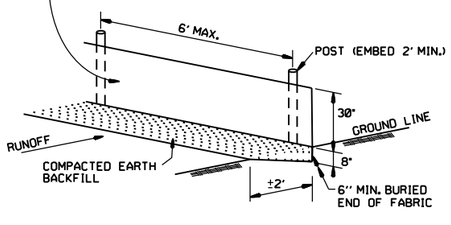



## ROCK DITCH CHECK (E-6)

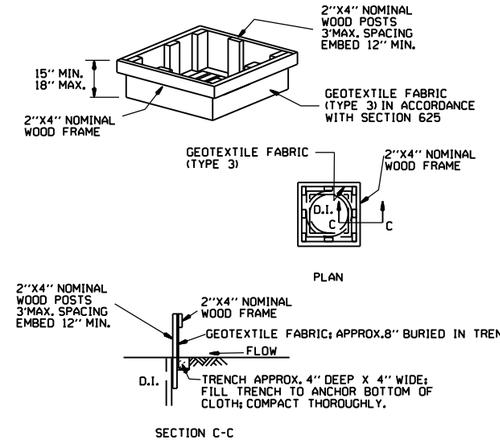
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

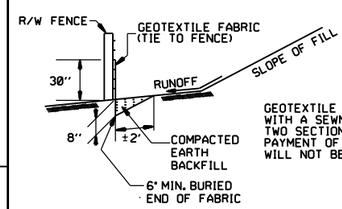
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.




## SILT FENCE (E-11)

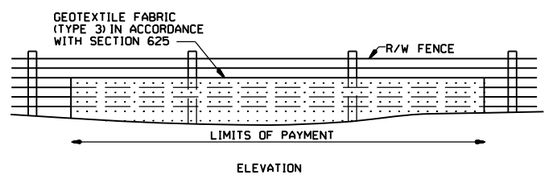



## DROP INLET SILT FENCE (E-7)




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.



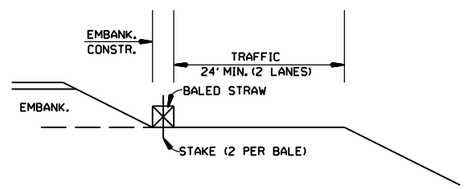

## SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

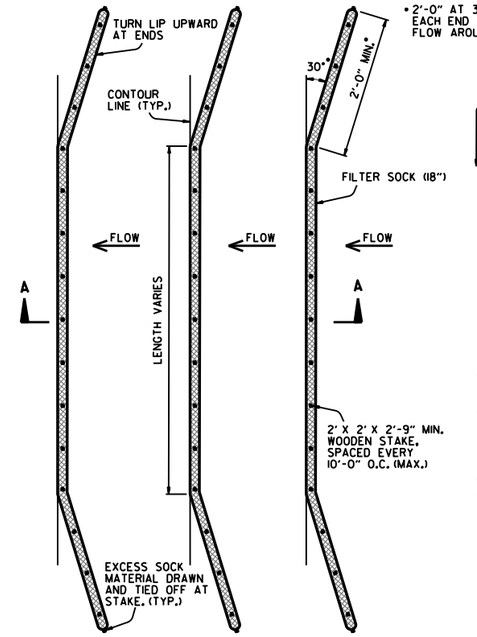
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

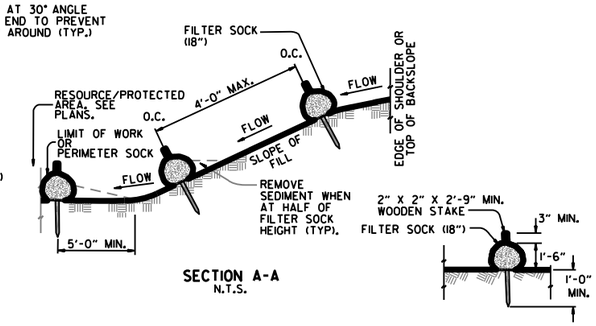
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.




## BALED STRAW FILTER BARRIER (E-2)




PLAN VIEW
N.T.S.




SECTION A-A
N.T.S.

STAKING DETAIL
N.T.S.

NOTES:

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

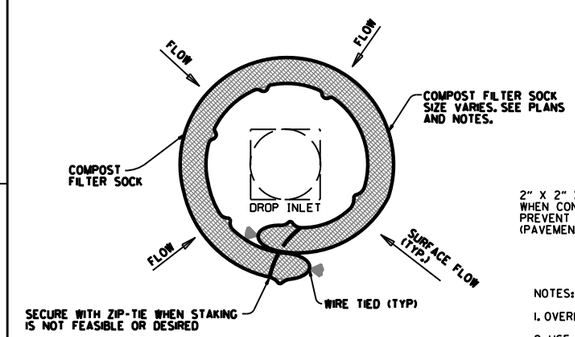
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

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

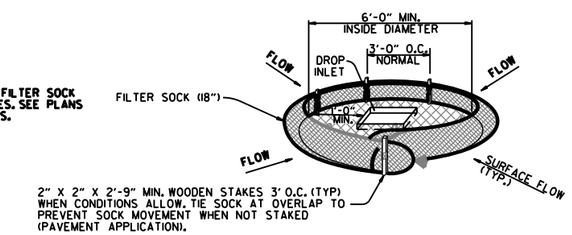
4. FILTER SOCKS MAY BE UP TO 250 FEET LONG. WHEN USED ON LONG SLOPES, FILTER SOCKS MAY BE JOINTED OR STAGGERED AS SHOWN IN DETAILS.

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

## FILTER SOCK ALONG SLOPE (E-3)




DROP INLET PLAN VIEW
N.T.S.




DROP INLET PERSPECTIVE VIEW
N.T.S.

NOTES:

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

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

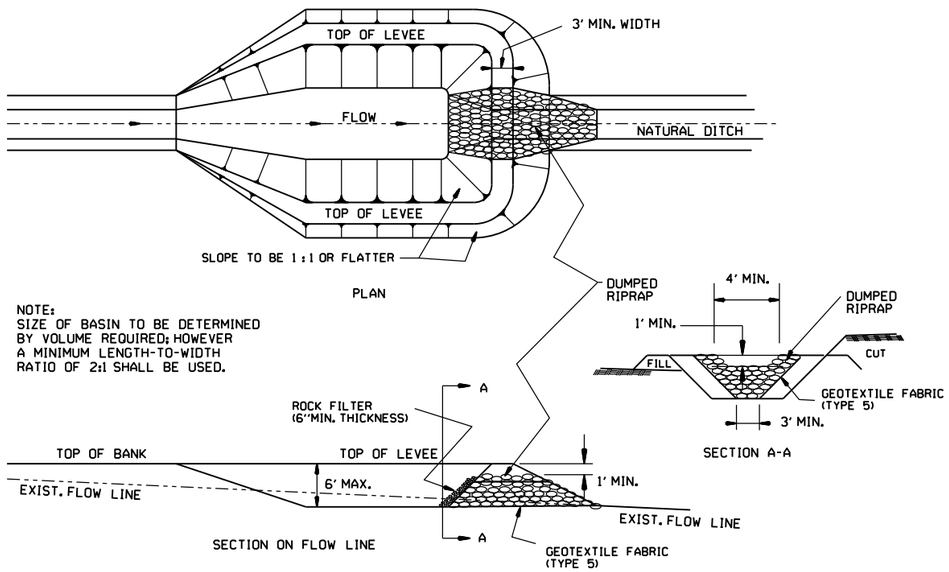
## COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

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

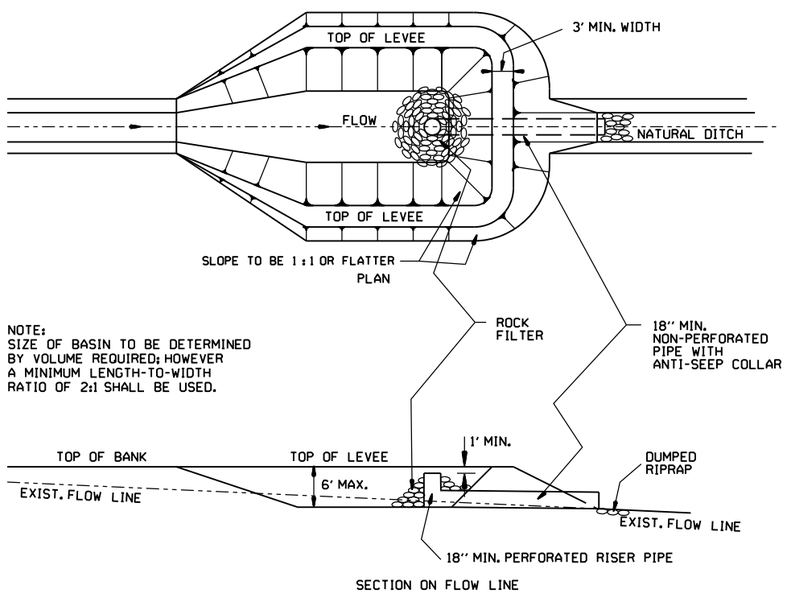
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

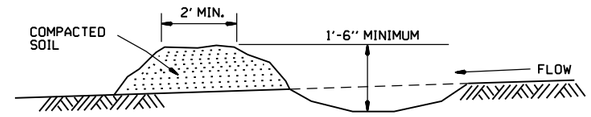
STANDARD DRAWING TEC-1



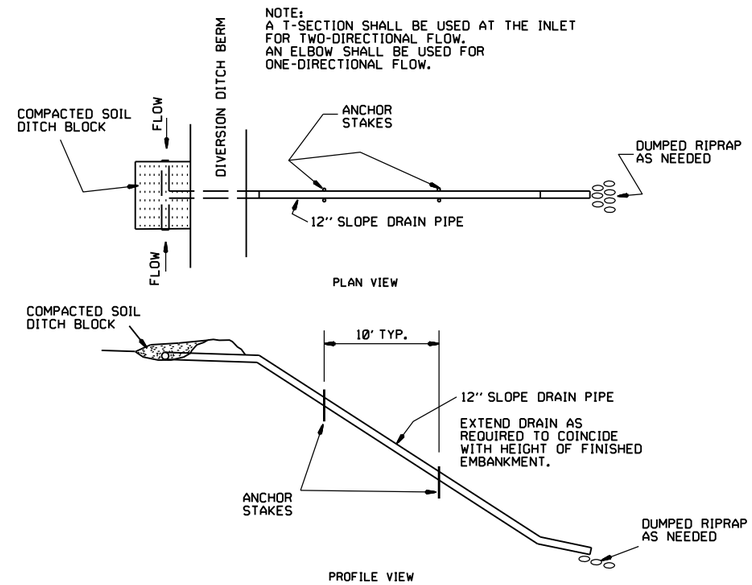

SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



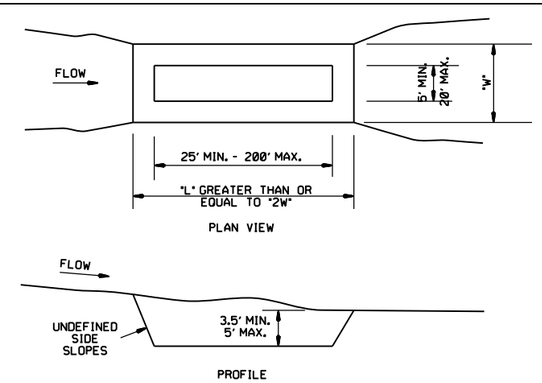

SEDIMENT BASIN WITH PIPE OUTLET (E-10)




DIVERSION DITCH (E-8)




SLOPE DRAIN (E-12)




SEDIMENT BASIN (E-14)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

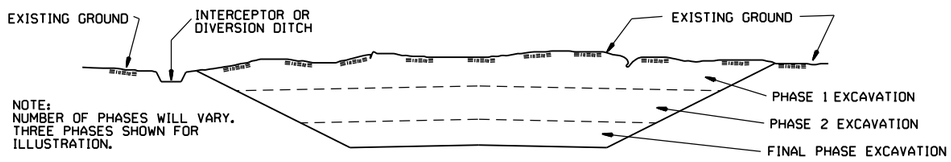
STANDARD DRAWING TEC-2

# CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

# EXCAVATION



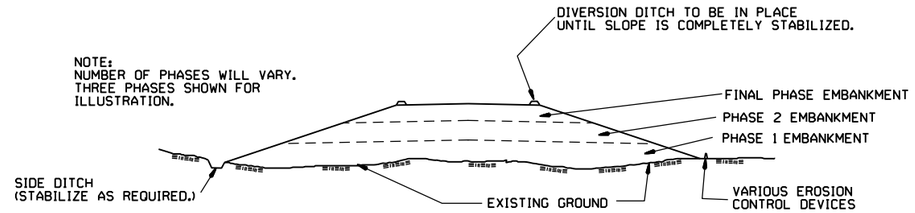

GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

# EMBANKMENT




GENERAL NOTE

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

CONSTRUCTION SEQUENCE

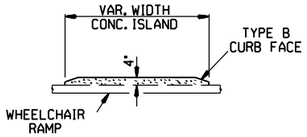
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD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

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

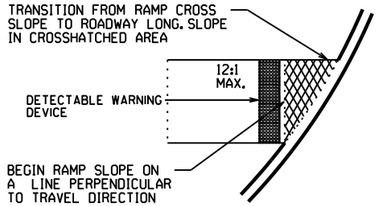
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3




CONCRETE ISLAND DETAIL



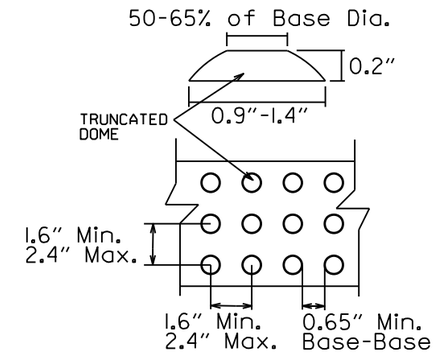

SLOPE TRANSITION DETAILS

TYPE 1 RAMP DIMENSIONS AND QUANTITIES

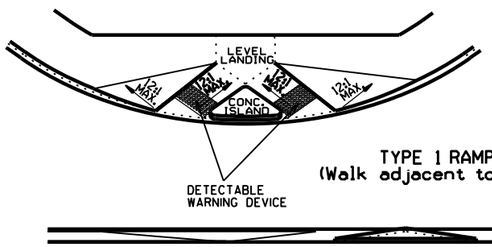
| RADIUS "R" | DISTANCE "X" | DISTANCE "Y" | LENGTH "L" | RAMP AREA "A" |
|---|---|---|---|---|
| FEET | FEET | FEET | FEET | SQ. YD. |
| 15 | 11.67 | 18.82 | 32.18 | 26.21 |
| 20 | 11.52 | 22.28 | 35.46 | 30.07 |
| 25 | 11.43 | 26.60 | 38.77 | 33.80 |
| 30 | 11.37 | 30.26 | 40.93 | 36.90 |
| 35 | 11.33 | 33.51 | 43.11 | 39.77 |
| 40 | 11.30 | 36.45 | 45.26 | 42.45 |
| 45 | 11.27 | 39.16 | 47.34 | 44.97 |
| 50 | 11.25 | 41.69 | 49.36 | 47.35 |
| 55 | 11.24 | 44.07 | 51.31 | 49.63 |
| 60 | 11.22 | 46.33 | 53.21 | 51.80 |

GENERAL NOTES FOR DETECTABLE WARNING DEVICES

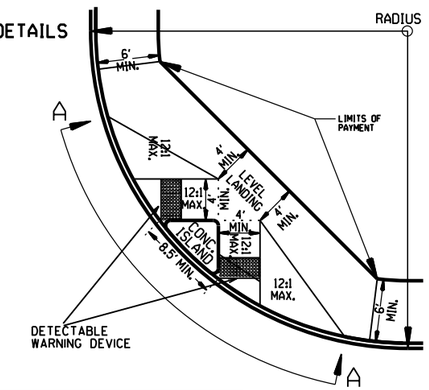
THE DETECTABLE WARNING DEVICE SHALL BE LOCATED SO THAT THE NEAREST EDGE OF THE DEVICE IS 6 TO 8 INCHES FROM THE FACE OF THE CURB.
TRUNCATED DOMES IN THE DETECTABLE WARNING SURFACE SHALL MEET THE REQUIREMENTS OF THE GEOMETRIC CONFIGURATION SHOWN.
DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES.
DETECTABLE WARNING DEVICE SHALL BE 24 INCHES IN THE DIRECTION OF TRAVEL AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR FLUSH SURFACE.
DETECTABLE WARNING DEVICE SHALL BE ON THE ARDOT QUALIFIED PRODUCTS LIST FOR CAST-IN-PLACE TACTILE PANELS (ADA DETECTABLE WARNING).

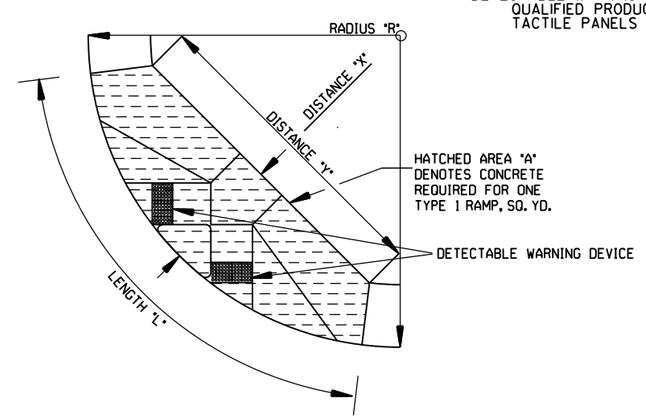


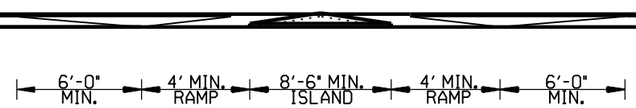

DETECTABLE WARNING DEVICE DETAIL




TYPE 1 RAMP
(Walk adjacent to curb)



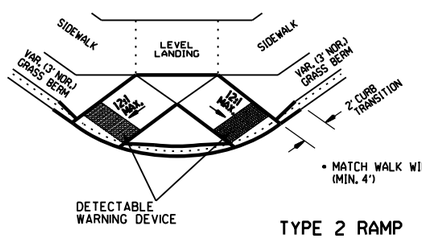



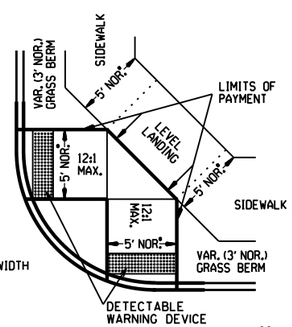

SECTION A-A

GENERAL NOTES:

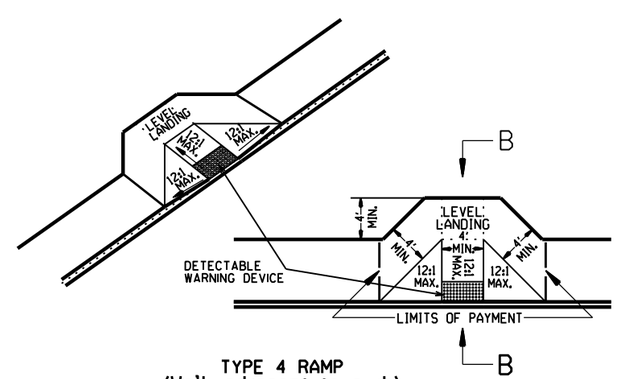
IN NEW CONSTRUCTION, UNLESS OTHERWISE INDICATED ON THE PLANS, WHEELCHAIR RAMPS ARE TO BE PROVIDED AT ALL CORNERS OF CURBED STREET INTERSECTIONS AND MID-BLOCK CROSSWALK LOCATIONS.
IN ALTERATIONS WHEELCHAIR RAMPS ARE TO BE PROVIDED AT CURBED STREET INTERSECTIONS WITH PEDESTRIAN TRAFFIC AND MID-BLOCK CROSSWALK LOCATIONS.
THE LENGTH OF THE RAMP SHALL BE SUCH THAT THE SLOPE DOES NOT EXCEED 12:1. THE SURFACE TEXTURE OF THE RAMP SHALL CONFORM TO A CLASS 6 FINISH ACCORDING TO SECTION 802.19.
THE NORMAL GUTTER GRADE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP.
ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
THE MINIMUM THICKNESS OF THE RAMP, WALK, & LANDING SHALL BE 4".
THE MINIMUM WIDTH OF THE RAMPS SHALL BE THE WALK WIDTH OR 36", WHICHEVER IS GREATER.
RAMPS SHALL BE MODIFIED AS NECESSARY TO INSURE THAT THEY ARE PARALLEL TO A LINE DRAWN FROM THE CENTER OF ONE RAMP TO THE CENTER OF THE RAMP ON THE OPPOSITE SIDE OF THE INTERSECTION.
THE DIMENSIONS AND QUANTITIES SHOWN ON THIS DRAWING ARE FOR A 90° INTERSECTION ONLY. DIMENSIONS AND QUANTITIES FOR SKEWED INTERSECTIONS WILL VARY, AND ARE TO BE DETERMINED BY THE ENGINEER.




TYPE 2 RAMP




NOTE:
THE CROSS SLOPE OF THE RAMPS, LEVEL LANDINGS, AND SIDEWALKS SHALL NOT EXCEED 2.0% UNLESS REQUIRED TO MATCH STREET LONGTITUDINAL GRADE.



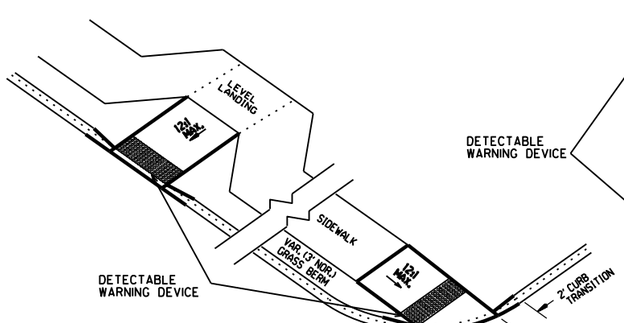

TYPE 4 RAMP
(Walk adjacent to curb)

RAMP SELECTION CRITERIA

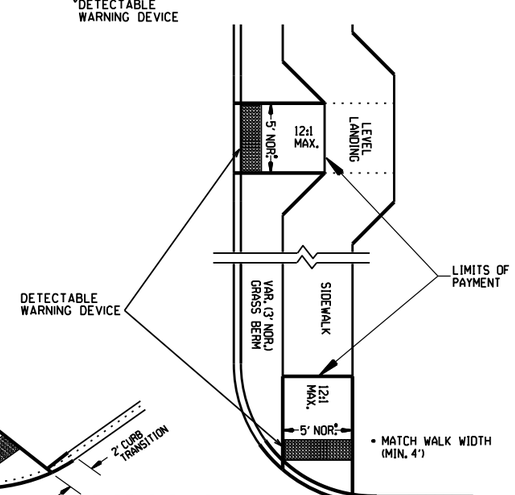
| | | |
|---|---|---|
| FIRST CHOICE | TYPE 1 | CORNER LOCATIONS WITH THE WALK ADJACENT TO THE CURB (BOTH NEW CONSTRUCTION AND ALTERATIONS). |
| | TYPE 2 | CORNER LOCATIONS WITH THE WALK OFFSET FROM THE CURB A DISTANCE INSUFFICIENT TO ALLOW THE REQUIRED RAMP SLOPE (BOTH NEW CONSTRUCTION AND ALTERATIONS). |
| | TYPE 3 | CORNER LOCATIONS WITH THE WALK OFFSET FROM THE CURB A DISTANCE SUFFICIENT TO ALLOW THE REQUIRED RAMP SLOPE (BOTH NEW CONSTRUCTION AND ALTERATIONS). |
| | TYPE 4 | TANGENT LOCATIONS (BOTH NEW CONSTRUCTION AND ALTERATIONS). |
| SECOND CHOICE | TYPE 5 | TANGENT LOCATIONS (ALTERATIONS ONLY). |
| THIRD CHOICE | TYPE 6 | CORNER LOCATIONS (ALTERATIONS ONLY). THIS RAMP MAY BE USED ONLY IF THE TYPE 5 RAMPS CANNOT BE PLACED AT THE ENDS OF THE RADIUS. |
| FOURTH CHOICE | | IF SITE CONSTRAINTS PREVENT THE CONSTRUCTION OF ANY OF THE TYPES LISTED, THEN AND ONLY THEN CAN THE 12:1 MAX. SLOPE ON THE RAMP BE EXCEEDED TO PROVIDE ACCESS TO THE STREET LEVEL (ALTERATIONS ONLY). THE SLOPE CAN BE STEEPENED TO A 10:1 MAX. FOR A MAX. LENGTH OF 5' OR A 8:1 MAX. FOR A MAX. LENGTH OF 2'. SLOPES STEEPER THAN 8:1 ARE NOT ALLOWED UNDER ANY CIRCUMSTANCES. |

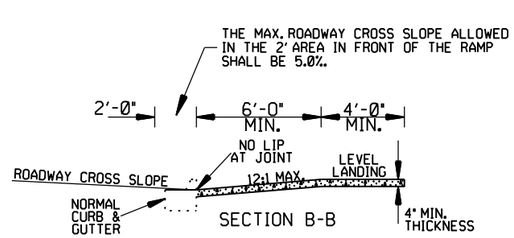
NOTE: IN ALTERATIONS, THE SELECTION OF THE TYPE OF WHEELCHAIR RAMP TO BE CONSTRUCTED SHALL BE BASED ON THE AMOUNT OF RIGHT-OF-WAY AVAILABLE, AND ON THE PRESENCE OF OTHER SITE CONSTRAINTS (UTILITIES, BUILDINGS, ETC.). THE TABLE ABOVE LISTS THE ORDER IN WHICH THE RAMPS ARE TO BE CONSIDERED.

AN ALTERATION IS DEFINED AS A PROJECT THAT CHANGES OR AFFECTS THE USE OF A PEDESTRIAN PATHWAY (OVERLAYS, SIGNALIZATION PROJECTS, ETC.) BUT DOES NOT REQUIRE THE PURCHASE OF ADDITIONAL RIGHT-OF-WAY. ALL PROJECTS THAT REQUIRE THE PURCHASE OF ADDITIONAL RIGHT-OF-WAY WILL USUALLY BE CONSIDERED NEW CONSTRUCTION FOR THE PURPOSES OF THE CHART ABOVE.




TYPE 3 RAMP



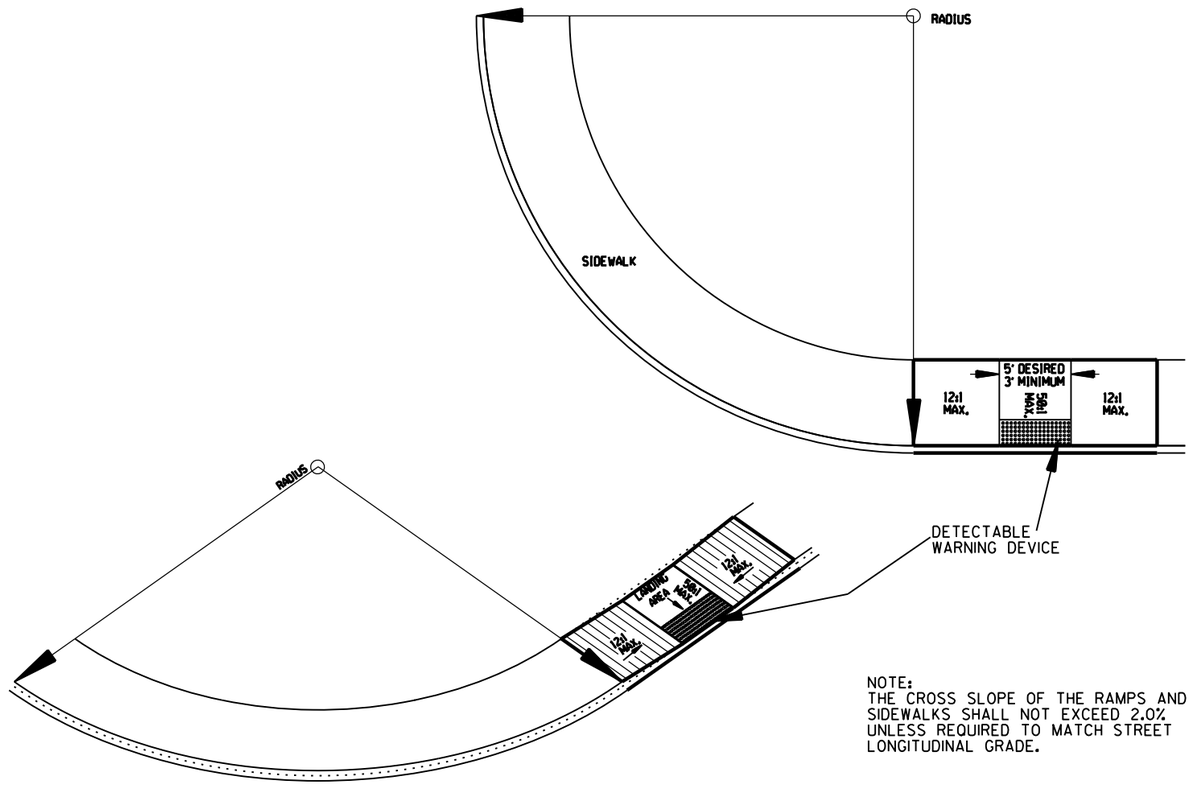

SECTION B-B

| DATE | REVISION | DATE FILM |
|---|---|---|
| | | |
| | | |
| | | |
| 11-10-05 | REVISED TO NEW SIDEWALK POLICY | |
| 10-9-03 | REVISED GEN. NOTES & ADDED NOTE | |
| 4-10-03 | REV. DETECTABLE WARNING DEVICES | |
| 8-22-02 | ADD DETECTABLE WARNING DEVICES | |
| 3-30-00 | ADD. SLOPE TRANS. & REV. ISL. DIMS. | |
| 11-18-98 | REVISED NOTES | |
| 8-12-98 | REVISED TEXTURE | |
| 7-02-98 | REDRAWN & REISSUED | |
| 10-18-96 | CORRECTED DIMENSIONS | 10-18-96 |
| 5-24-90 | FROM 8 TO 12 MAX. SLOPES | 5-24-90 |
| 7-15-88 | ADJUSTED MAX. SLOPE | 652-7-15-88 |
| 7-14-88 | INCLUD. "CONC. ISLD." IN PAY ITEM | ------ |
| 6-02-76 | ISSUED-P.H.D. | 299-7-28-76 |

ARKANSAS STATE HIGHWAY COMMISSION

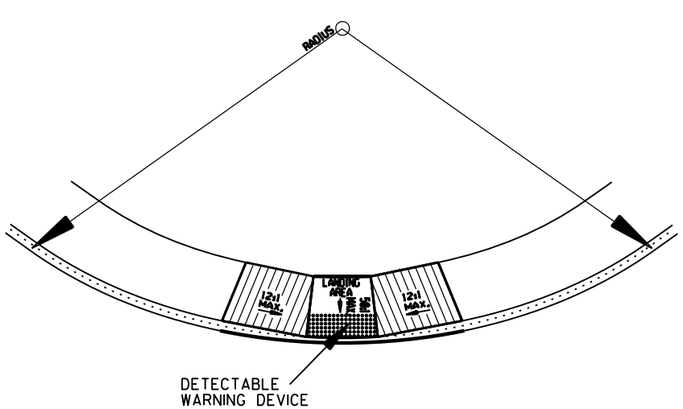
WHEELCHAIR RAMPS
NEW CONSTRUCTION
AND ALTERATIONS

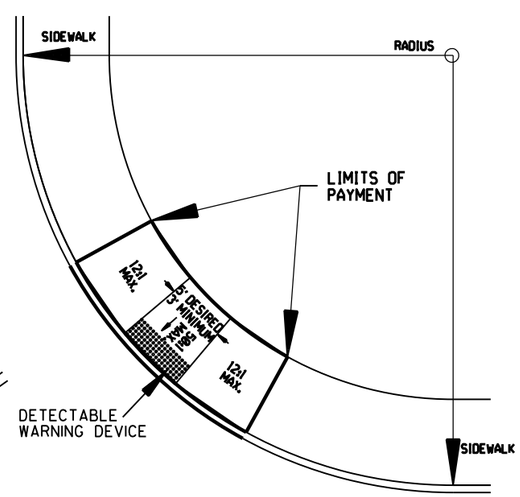
STANDARD DRAWING WR-1




NOTE:
THE CROSS SLOPE OF THE RAMPS AND SIDEWALKS SHALL NOT EXCEED 2.0% UNLESS REQUIRED TO MATCH STREET LONGITUDINAL GRADE.

TYPE 5 RAMP

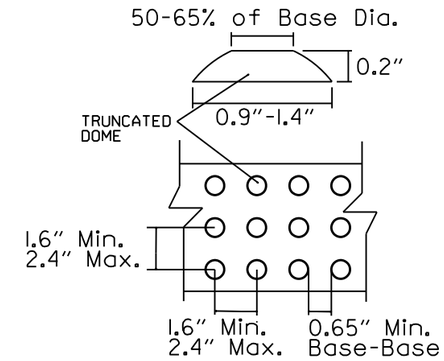



TYPE 6 RAMP

GENERAL NOTES FOR DETECTABLE WARNING DEVICES

THE DETECTABLE WARNING DEVICE SHALL BE LOCATED SO THAT THE NEAREST EDGE OF THE DEVICE IS 6 TO 8 INCHES FROM THE FACE OF THE CURB.
TRUNCATED DOMES IN THE DETECTABLE WARNING SURFACE SHALL MEET THE REQUIREMENTS OF THE GEOMETRIC CONFIGURATION SHOWN.
DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES.
DETECTABLE WARNING DEVICE SHALL BE 24 INCHES IN THE DIRECTION OF TRAVEL AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR FLUSH SURFACE.
DETECTABLE WARNING DEVICE SHALL BE ON THE ARDOT QUALIFIED PRODUCTS LIST FOR CAST-IN-PLACE TACTILE PANELS (ADA DETECTABLE WARNING).




DETECTABLE WARNING DEVICE DETAIL

GENERAL NOTES:

IN ALTERATIONS WHEELCHAIR RAMPS ARE TO BE PROVIDED AT CURBED STREET INTERSECTIONS WITH PEDESTRIAN TRAFFIC AND MID-BLOCK CROSSWALK LOCATIONS.

THE LENGTH OF THE RAMP SHALL BE SUCH THAT THE SLOPE DOES NOT EXCEED 12:1. THE SURFACE TEXTURE OF THE RAMP SHALL CONFORM TO A CLASS 6 FINISH ACCORDING TO SECTION 802.19.

THE NORMAL GUTTER GRADE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP.
ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
THE MINIMUM THICKNESS OF THE RAMP, WALK, & LANDING SHALL BE 4".
THE MINIMUM WIDTH OF THE RAMPS SHALL BE THE EXISTING WALK WIDTH OR 36", WHICHEVER IS GREATER.
MINOR MODIFICATIONS OF THESE DETAILS, AS APPPROVED BY THE ENGINEER, MAY BE MADE TO ADJUST TO LOCAL CONDITIONS.

RAMP SELECTION CRITERIA

| | | |
|---|---|---|
| FIRST CHOICE | TYPE 1 | CORNER LOCATIONS WITH THE WALK ADJACENT TO THE CURB (BOTH NEW CONSTRUCTION AND ALTERATIONS). |
| | TYPE 2 | CORNER LOCATIONS WITH THE WALK OFFSET FROM THE CURB A DISTANCE INSUFFICIENT TO ALLOW THE REQUIRED RAMP SLOPE (BOTH NEW CONSTRUCTION AND ALTERATIONS). |
| | TYPE 3 | CORNER LOCATIONS WITH THE WALK OFFSET FROM THE CURB A DISTANCE SUFFICIENT TO ALLOW THE REQUIRED RAMP SLOPE (BOTH NEW CONSTRUCTION AND ALTERATIONS). |
| | TYPE 4 | TANGENT LOCATIONS (BOTH NEW CONSTRUCTION AND ALTERATIONS). |
| SECOND CHOICE | TYPE 5 | TANGENT LOCATIONS (ALTERATIONS ONLY). |
| THIRD CHOICE | TYPE 6 | CORNER LOCATIONS (ALTERATIONS ONLY). THIS RAMP MAY BE USED ONLY IF THE TYPE 5 RAMPS CANNOT BE PLACED AT THE ENDS OF THE RADIUS. |
| FOURTH CHOICE | | IF SITE CONSTRAINTS PREVENT THE CONSTRUCTION OF ANY OF THE TYPES LISTED, THEN AND ONLY THEN CAN THE 12:1 MAX. SLOPE ON THE RAMP BE EXCEEDED TO PROVIDE ACCESS TO THE STREET LEVEL (ALTERATIONS ONLY). THE SLOPE CAN BE STEEPENED TO A 10:1 MAX. FOR A MAX. LENGTH OF 5' OR A 8:1 MAX. FOR A MAX. LENGTH OF 2'. SLOPES STEEPER THAN 8:1 ARE NOT ALLOWED UNDER ANY CIRCUMSTANCES. |

NOTE: IN ALTERATIONS, THE SELECTION OF THE TYPE OF WHEELCHAIR RAMP TO BE CONSTRUCTED SHALL BE BASED ON THE AMOUNT OF RIGHT-OF-WAY AVAILABLE, AND ON THE PRESENCE OF OTHER SITE CONSTRAINTS (UTILITIES, BUILDINGS, ETC.). THE TABLE ABOVE LISTS THE ORDER IN WHICH THE RAMPS ARE TO BE CONSIDERED.

AN ALTERATION IS DEFINED AS A PROJECT THAT CHANGES OR AFFECTS THE USE OF A PEDESTRIAN PATHWAY (OVERLAYS, SIGNALIZATION PROJECTS, ETC.) BUT DOES NOT REQUIRE THE PURCHASE OF ADDITIONAL RIGHT-OF-WAY. ALL PROJECTS THAT REQUIRE THE PURCHASE OF ADDITIONAL RIGHT-OF-WAY WILL USUALLY BE CONSIDERED NEW CONSTRUCTION FOR THE PURPOSES OF THE CHART ABOVE.

| DATE | REVISION | DATE FILM |
|---|---|---|
| 10-9-03 | REVISED GENERAL NOTES & ADDED NOTE. | |
| 4-10-03 | REVISED DETECTABLE WARNING DEVICE DETAIL | |
| 8-22-02 | ADDED DETECTABLE WARNING DEVICES DETAILS | |
| 11-18-98 | REV. FOURTH CHOICE NOTE | |
| 8-12-98 | REVISED TEXTURE | |
| 7-02-98 | ISSUED | |

ARKANSAS STATE HIGHWAY COMMISSION

WHEELCHAIR RAMPS
ALTERATIONS ONLY

STANDARD DRAWING WR-2