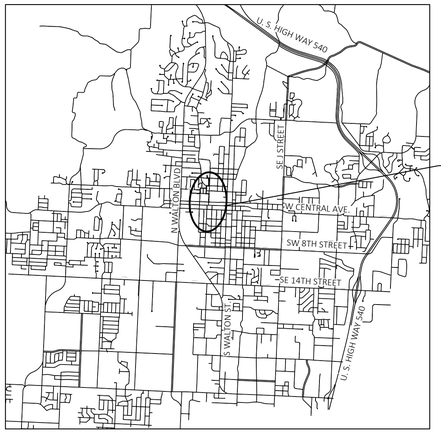


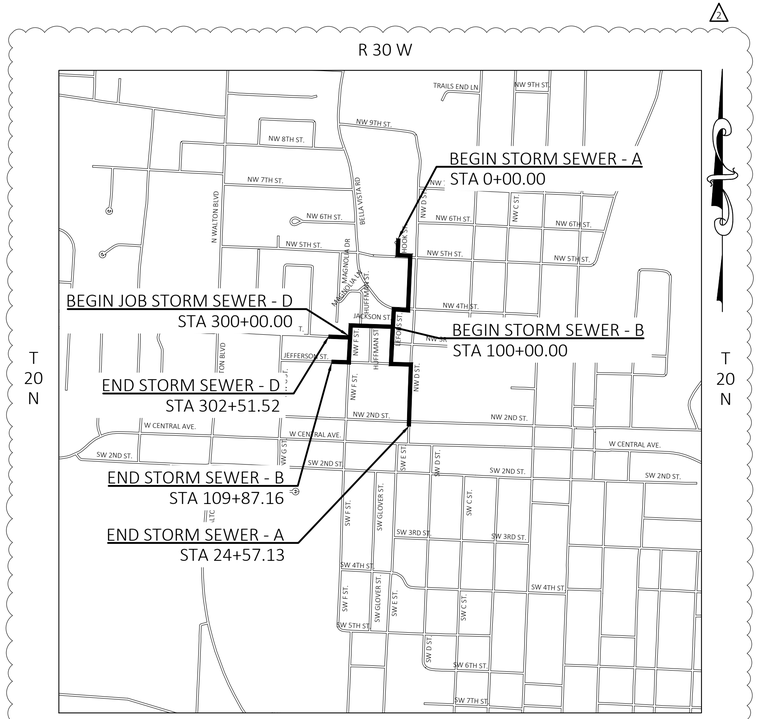
PROJECT LOCATION

VICINITY MAP

CITY OF BENTONVILLE, ARKANSAS

PUBLIC INFRASTRUCTURE IMPROVEMENT PLANS FOR

NW 9TH AND D STREET
CEI PROJECT NO.32245
MUNIS# 21EN0009
JULY 2023



TOTAL LENGTH OF STORM SEWER - A = 2,457 LF (0.47 MILE)
TOTAL LENGTH OF STORM SEWER - B = 987 LF (0.19 MILE)
~~TOTAL LENGTH OF STORM SEWER - C = 50 LF (0.01 MILE)~~
TOTAL LENGTH OF STORM SEWER - D = 252 LF (0.05 MILE)
TOTAL LENGTH OF ENTIRE PROJECT = 3,696 LF (APPROX. 0.70 MILE)

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: BRYAN WILLIAMS
700 W WALNUT STREET
ROGERS, AR 72756
PHONE: 479-249-5194
EMAIL: AW9156@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: BEN PLEDGER
4901 S. 48TH STREET
SPRINGDALE, AR 72762
PHONE: 479-717-3730
EMAIL: BEN.PLEDGER@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: BRIAN PARRISH
5078 W NORTHGATE ROAD, STE 220
ROGERS, AR 72758
PHONE: (479) 567-9370
EMAIL: BRIAN.PARRISH@
RITTERCOMMUNICATIONS.COM

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

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APPROVED FOR CONSTRUCTION
04/12/2024 8:50:40 AM

CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. KNIGHT
03/29/2024

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

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

TITLE SHEET
SHEET TITLE

SHEET NUMBER
1

DRAWING LOCATION: P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245-COVER.DWG - SAVED BY: JRENNICK

INDEX OF SHEETS

SHEET NO.		TITLE
1	____	TITLE SHEET
2	____	INDEX OF SHEETS
3	____	GENERAL NOTES
4	____	OVERALL PLAN LAYOUT
5 - 8	____	SPECIAL DETAILS
9 - 13	____	DEMOLITION PLANS
14	____	EROSION CONTROL NOTES
15	____	EROSION CONTROL SPECIAL DETAILS
16 - 20	____	EROSION CONTROL PLANS
21 - 25	____	MAINTENANCE OF TRAFFIC PLANS
26 - 27	____	QUANTITIES
28	____	SUMMARY OF QUANTITIES
29 - 36	____	STORM SEWER PLAN & PROFILES
37	____	STORM SEWER BRANCH CROSS SECTIONS
38	____	PRE-DEVELOPMENT DRAINAGE AREA MAP
39	____	POST-DEVELOPMENT DRAINAGE AREA MAP
40	____	INLET DRAINAGE AREA MAP
41	____	UTILITY NOTES
42 - 45	____	WATER PLAN AND PROFILES
46	____	SEWER PLAN AND PROFILE
		DETENTION OUTFALL STRUCTURE DETAILS
		CITY OF BENTONVILLE DETAILS
		ARDOT DETAILS
		DRAINAGE SUMMARY AND CALCULATIONS

ARDOT ROADWAY STANDARD DRAWINGS

DRWG. NO.	TITLE	DATE
CG-1	CURBING DETAILS	11/29/2007
DR-1	DETAILS OF DRIVEWAYS & ISLANDS	11/07/2019
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
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	02/27/2014
PM-1	PAVEMENT MARKING DETAILS	02/27/2020
RRS-1	PAVEMENT MARKING FOR RAILROAD CROSSING	12/08/2016
SHS-1	STANDARD HIGHWAY SIGNS AND SUPPORT ASSEMBLIES	09/12/2013
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
R-100X-0	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	02/08/1963
W-X002-1	DETAILS OF STANDARD WINGS FOR REINFORED CONCRETE BOX CULVERTS	05/10/1966

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

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04/12/2024 8:50:54 AM

CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. KNOX
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

INDEX OF SHEETS

SHEET TITLE

SHEET NUMBER

2

DRAWING LOCATION: P:\32000\32245\01DRAWINGS\DESIGN\WORKING\32245-COVER.DWG - SAVED BY: JRENNICK

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.

34. PROPOSED STORM SEWER PIPES AND STRUCTURES MUST MAINTAIN MINIMUM SEPARATIONS OF 5' HORIZONTAL AND 8" VERTICAL FROM ALL PUBLIC WATER AND SEWER INFRASTRUCTURE.

35. CONTRACTOR SHALL PHASE WORK SO THAT AT LEAST ONE ROAD LANE IS OPEN TO VEHICLE, PEDESTRIAN, AND BICYCLE TRAFFIC AT ALL TIMES DURING CONSTRUCTION. DRIVEWAY ACCESS SHALL BE MAINTAINED AT ALL TIMES.

CEI Solutions for Land and Life

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
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 17418
ANNA J. STAMPS
06/06/2023

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	5/31/2023
REVISION	IFC
PIIP22-0010	

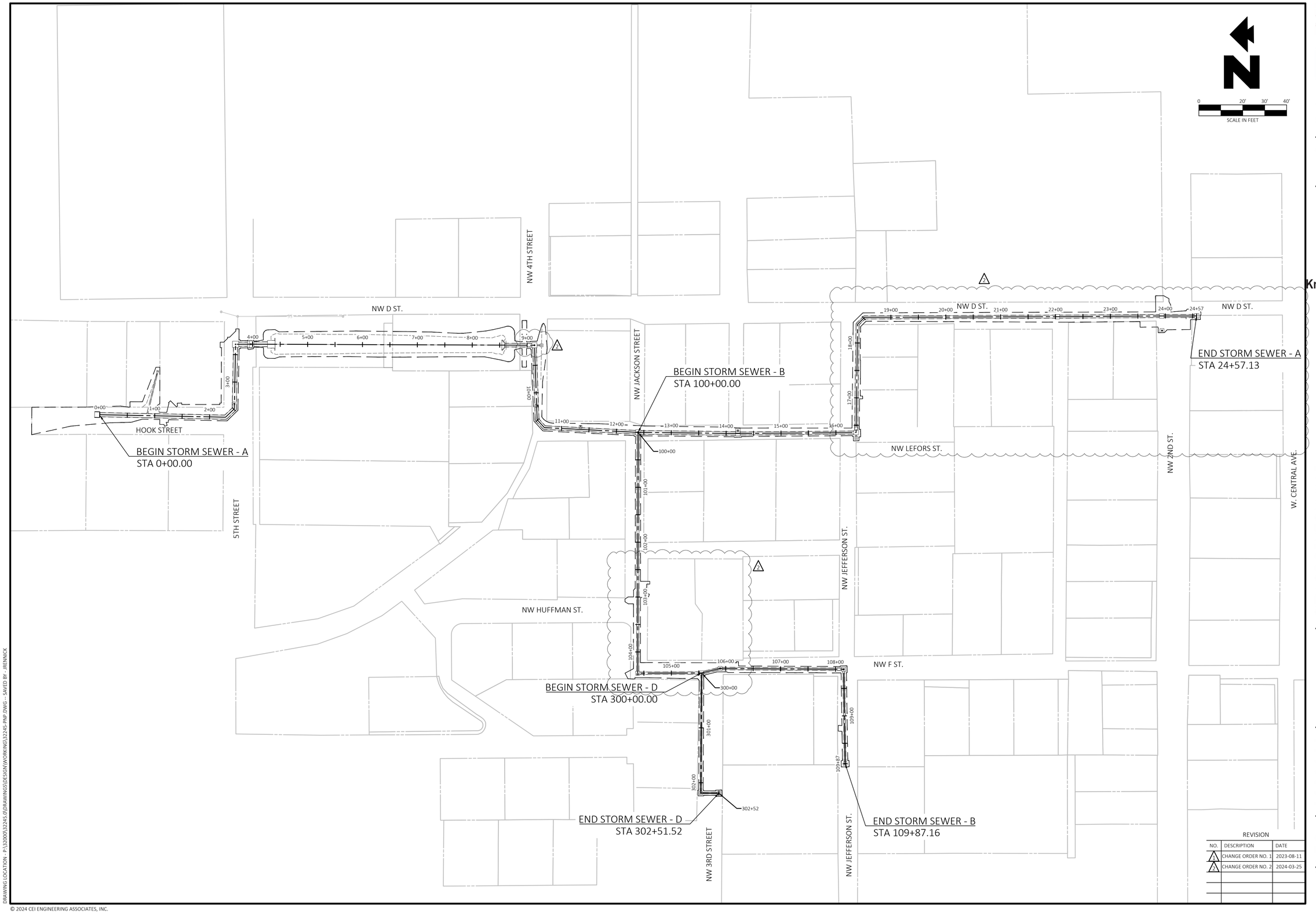
GENERAL NOTES

SHEET TITLE

SHEET NUMBER

3

DRAWING LOCATION P:\32000\32245.00\DRAWINGS\DESIGN\CONSTRUCTION SET\32245-COVER.DWG - SAVED BY JRENWICK



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3108 SW REGENCY PKWY
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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. NANCE
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
PIIP22-0010	

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

OVERALL PLAN LAYOUT

SHEET TITLE

SHEET NUMBER

4

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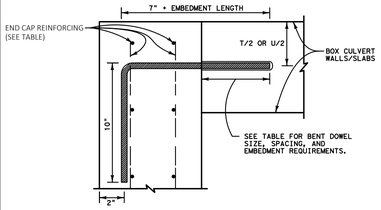


BENT DOWEL DETAIL
N.T.S.
(SEE TABLE FOR SIZES AND SPACING)

BENT DOWEL SIZE/SPACING/EMBEDMENT			
"T" OR "U" (IN)	SIZE	SPACING	EMBEDMENT
4"	#3	6"	4"
5"	#4	8"	5"
6"	#4	8"	6"
> 6"	#5	12"	6"

BOX CULVERT - END CAP REINFORCEMENT				
"S" OR "H" (MAX)	INSIDE MAT OF REINFORCING			
	MAX FILL ≤ 15'		15' < MAX FILL ≤ 30'	
	SIZE	SPACING	SIZE	SPACING
< 4'	4	12"	4	12"
5'	4	12"	4	10"
6'	4	12"	5	11"
7'	4	10"	5	9"
8'	5	12"	6	9"
9'	5	10"	6	8"
10'	5	9"	6	7"
11'	5	8"	6	6"
12'	5	8"	6	6"
OUTSIDE MAT OF REINFORCING: # 4 BARS @ 12" C-C EA WAY				

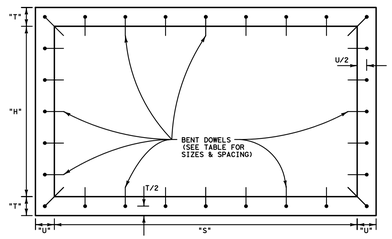
IN ALL INSTANCES CONCRETE SHALL BE REMOVED SO AS TO PERMIT FULL 40 DIAMETER SPLICE OF REINFORCING STEEL.

REINFORCING STEEL REMOVED FROM EXISTING STRUCTURE SHALL NOT BE REUSED IN ENDCAP.

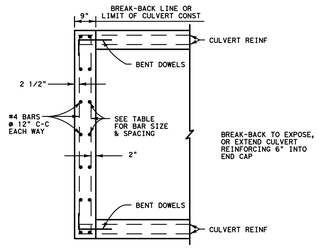
CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI.

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

DOWEL BARS SHALL BE INSTALLED AS FOLLOWS: THE DRILLING PROCEDURE SHALL BE APPROVED BY THE ENGINEER, THE FILLING SYSTEM SHALL BE APPROVED BY THE ENGINEER. AND SHALL BE AN INJECTION-TYPE SYSTEM WHICH WILL INSURE THAT SUFFICIENT MATERIAL IS INJECTED SO IT COMPLETELY SURROUNDS THE BARS AND FILLS THE HOLES.



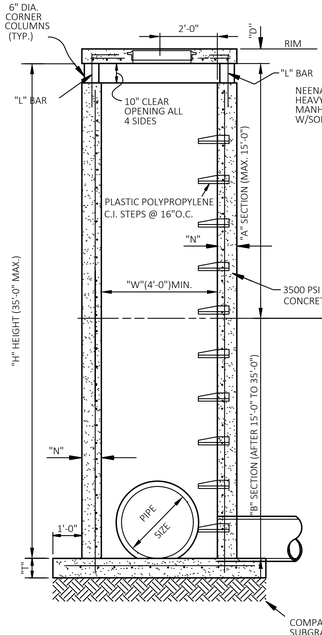
FRONT ELEVATION VIEW
N.T.S.



SIDE ELEVATION VIEW
N.T.S.

BOX CULVERT END CAP 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.



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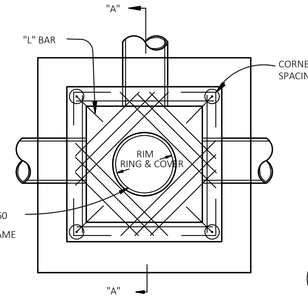
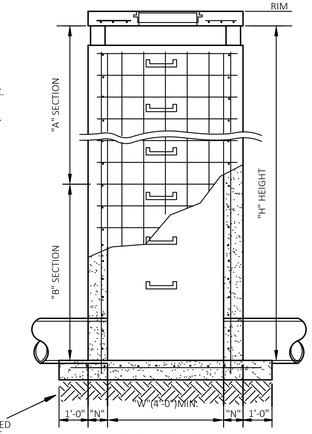
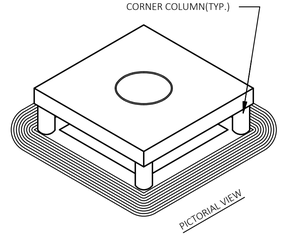
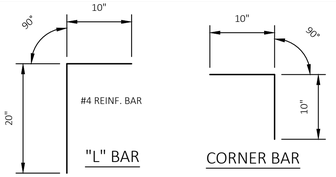


PLAN



ELEVATION





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

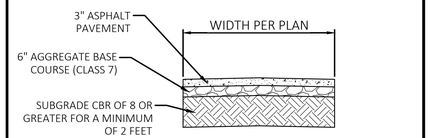
TABLE OF 'W' DIMENSIONS			
PIPE SIZE	SKEW OF CROSS DRAIN		
SINGLE	STRAIGHT	30°	45°
≤ 24"	4'-0"	4'-0"	4'-10"
30"	4'-0"	4'-7"	5'-8"
36"	4'-0"	5'-3"	6'-5"
42"	5'-3"	5'-11"	7'-3"
48"	5'-10"	6'-7"	8'-0"
60"	7'-0"	7'-10"	9'-8"
DOUBLE	FOR "A" SECTION ONLY		
24"	7'-0"	7'-10"	9'-5"
30"	8'-2"	9'-2"	11'-0"
36"	9'-4"	10'-6"	12'-6"
42"	10'-6"	11'-10"	14'-2"
48"	11'-8"	13'-2"	15'-10"

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"

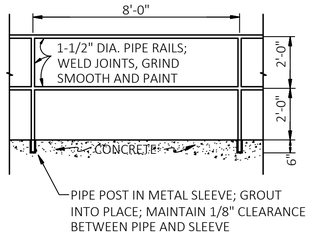
TABLE OF "T" & "N" DIMENSIONS				
SECTION	WIDTH ("W")	"T"	"N"	"D"
"A"	BETWEEN 4' & 7'	6" + PIPE THICKNESS	8"	6"
	GREATER THAN 7'	6" + PIPE THICKNESS	8"	8"
"B"	4'	6" + PIPE THICKNESS	8"	8"
	BETWEEN 4' & 7'	6" + PIPE THICKNESS	10"	8"

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

AREA INLET
N.T.S.

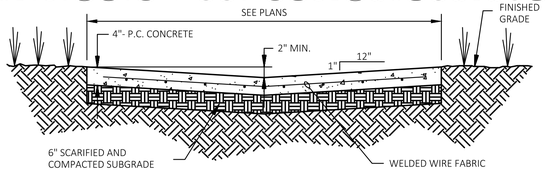


TYPICAL PAVEMENT SECTION FOR FULL DEPTH RECONSTRUCTION



NOTE: REFER TO STATE AND LOCAL SPECIFICATIONS FOR MATERIALS, CONSTRUCTION AND PAINTING

HAND RAIL
N.T.S.



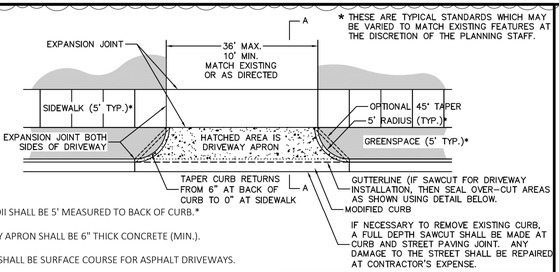
SUBGRADE NOTES

1. COMPACT TO 95% MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698 (STANDARD PROCTOR) AT ± 2% OF PROCTOR OPTIMUM MOISTURE CONTENT.

CONCRETE NOTES

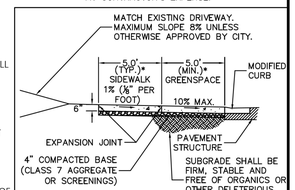
1. COMPRESSIVE STRENGTH: 3,500 P.S.I. MINIMUM AT 28 DAYS.
2. FLOAT OR SMOOTH FINISH.
3. REINFORCEMENT: WELDED WIRE FABRIC - 6"X6" - W 2.1 X W 2.1, 2" FROM BOTTOM.
4. WEAKENED-PLANE CONTROL JOINTS 15' O.C. AND FILLED/SEALED. SEE SPECIFICATIONS FOR APPROVED FILLER/SEALERS.

CONCRETE TRICKLE CHANNEL
N.T.S.

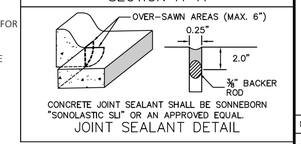


* THESE ARE TYPICAL STANDARDS WHICH MAY BE VARIED TO MATCH EXISTING FEATURES AT THE DISCRETION OF THE PLANNING STAFF.

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



JOINT SEALANT DETAIL

RESIDENTIAL DRIVEWAY DETAIL
N.T.S.

REVISION		
NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

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

Know what's below. Call before you dig.

APPROVED FOR B CONSTRUCTION
04/12/2024 8:50:55 AM

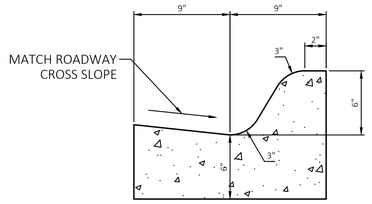
CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 21680
ANDREW SLITE
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/27/2024
REVISION	CO 3
PIIP22-0010	

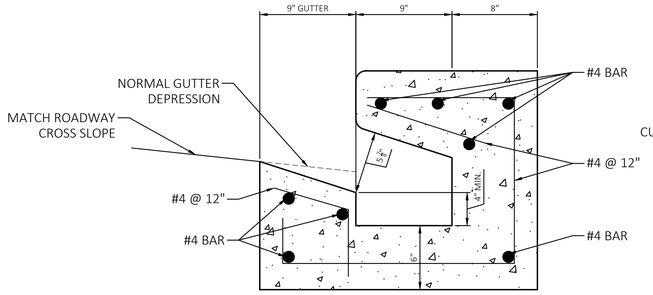
SPECIAL DETAILS - 1
SHEET TITLE
SHEET NUMBER
5

DRAWING LOCATION: P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245-DET1.DWG - SAVED BY: JRENNICK



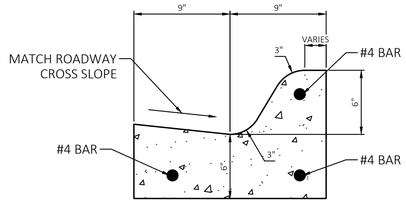
DIMENSIONS ARE APPROXIMATE.
REFER TO CURB AND GUTTER
DETAILS FOR EXACT DIMENSIONS.

SECTION "C"-"C"



MATCH DEPTH OF PAVEMENT STRUCTURE (BASE AND SURFACE).
ADJUST BAR LENGTHS AS DIRECTED BY THE ENGINEER.

SECTION "B"-"B"



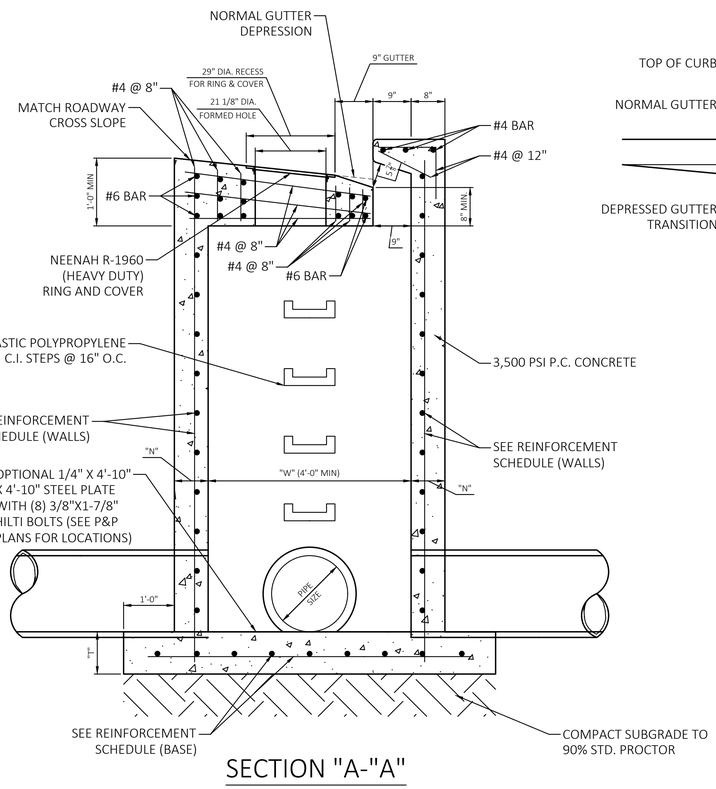
SECTION "D"-"D"

REINFORCEMENT SCHEDULE (WALLS)		
WIDTH	HORIZONTAL	VERTICAL
4'-0"	#4 @ 9"	#4 @ 10"
BETWEEN 4' & 7'	#6 @ 9"	#4 @ 10"
GREATER THAN 7'	#5 @ 4 1/2"	#4 @ 10"

REINFORCEMENT SCHEDULE (BASE)		
WIDTH	HORIZONTAL	VERTICAL
4'-0"	#4 @ 6"	#4 @ 6"
5' AND GREATER	#6 @ 6"	#6 @ 6"

TABLE OF "T" AND "N" DIMENSIONS		
WIDTH	"T"	"N"
4'-0"	6" + PIPE THICKNESS	8"
5' AND GREATER	6" + PIPE THICKNESS	8"

REINFORCEMENT SCHEDULE (TOP)		
WIDTH	STEEL	SPECIAL PATTERN
4'-0"	SEE SECTION "A"-"A"	DIAGONAL AT COVER
5'-0"	SEE SECTION "A"-"A"	DIAGONAL AT COVER

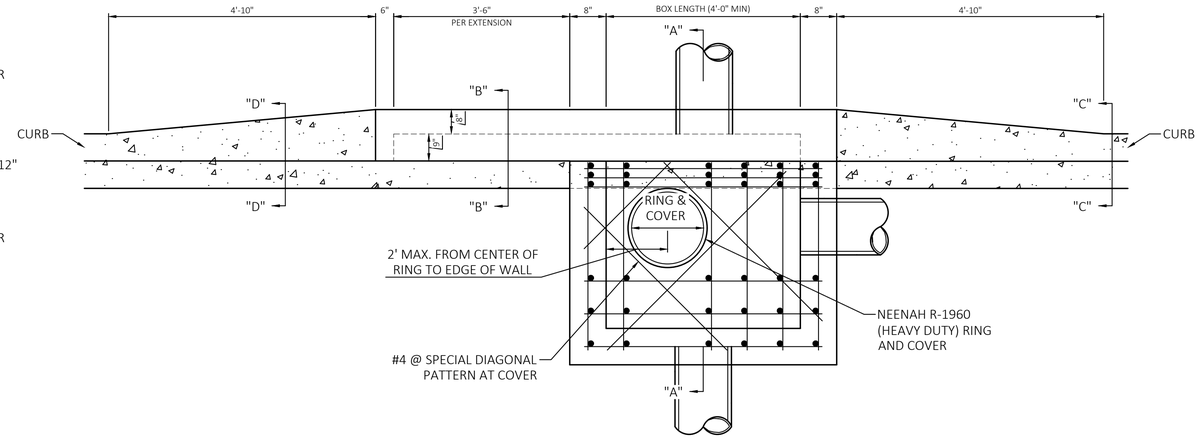


SECTION "A"-"A"

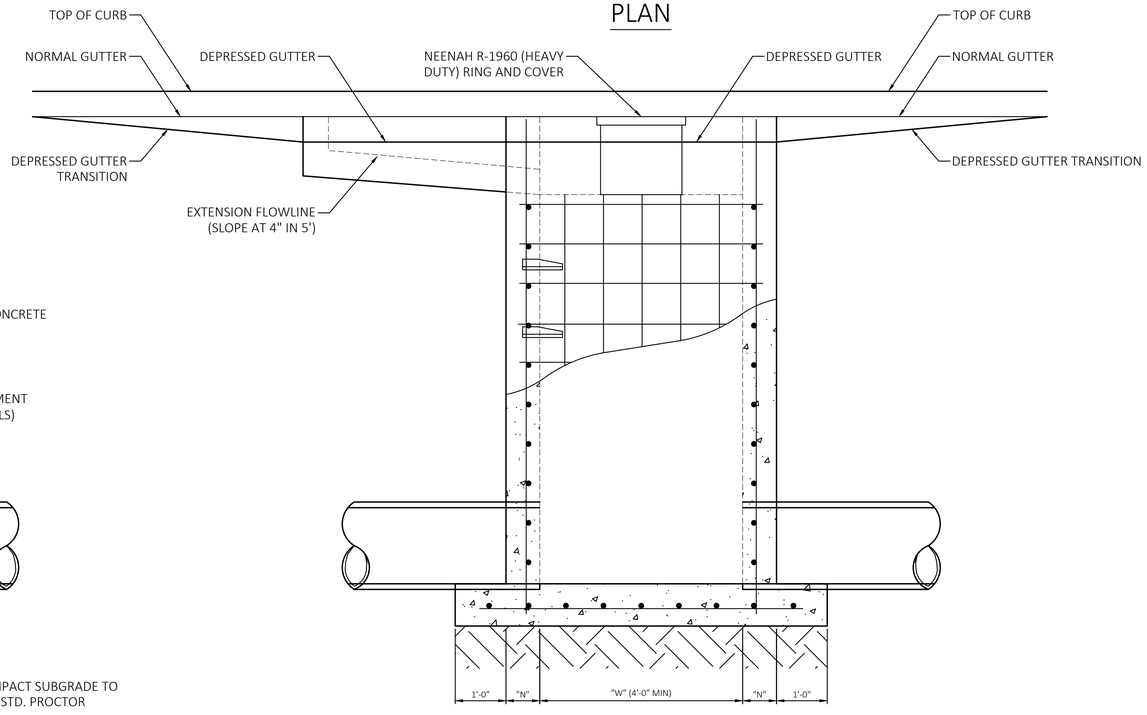
GENERAL NOTES:

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. SEE GRADING AND DRAINAGE PLAN FOR INLET SIZES AND LOCATIONS.
5. PIPES SHALL CONNECT TO THE ENDS OR SIDES OF THE INLET. CONNECTION SHALL NOT BE MADE AT CORNERS OF INLET.
6. ALL REINFORCING BARS TO BE GRADE 60.

REVERSE CURB INLET
N.T.S.



PLAN



FRONT ELEVATION VIEW

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

811 Know what's below. Call before you dig.

APPROVED FOR B CONSTRUCTION
04/12/2024 8:50:55 AM

CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11880
ANDREW J. KUNZ
03/29/2024

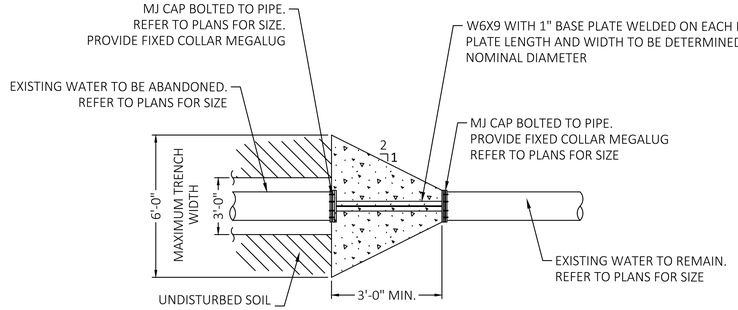
PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/27/2024
REVISION	CO 3
PIIP22-0010	

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 2	2024-03-25

SHEET TITLE: SPECIAL DETAILS - 2

SHEET NUMBER: 6

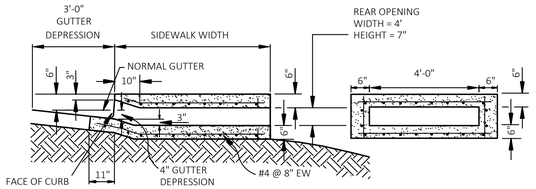


NOTES:

1. THRUST BLOCK END AREA MINIMUM 6'-0" WIDE X 2'-0" HIGH
2. LIMIT TRENCH WIDTH REMOVAL TO 3'-0" MAXIMUM.
3. ALL CONCRETE SHALL BE MINIMUM 4000 PSI AT 28 DAYS.

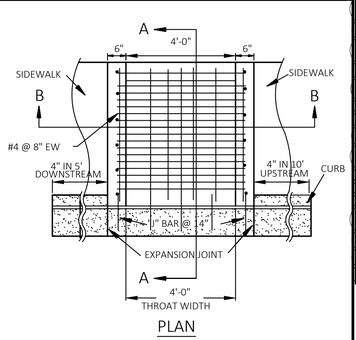
WATER MAIN CUT AND CAP DETAIL

N.T.S.



SECTION A - A

SECTION B - B



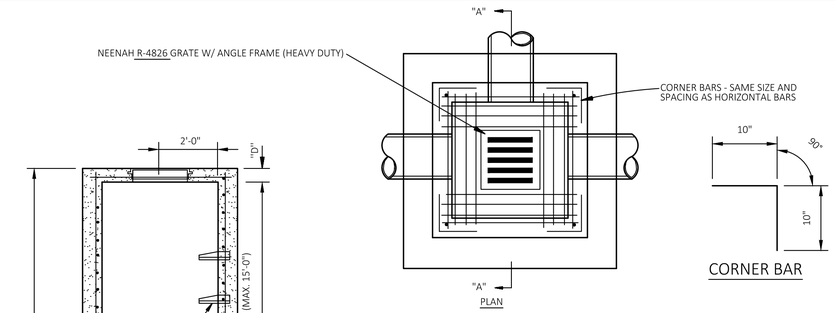
PLAN

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 LOCATION AND FLOW LINES.
4. ALL REINFORCING BARS TO BE GRADE 60.

CONCRETE FLUME W/ SIDEWALK

N.T.S.



PLAN

CORNER BAR

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 CORNERS OF INLET.
5. ALL REINFORCING BARS TO BE GRADE 60.

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"
DOUBLE	FOR "A" SECTION ONLY		
24"	7'-0"	7'-10"	9'-5"
30"	8'-2"	9'-2"	11'-0"
36"	9'-4"	10'-6"	12'-6"
42"	10'-6"	11'-10"	14'-2"
48"	11'-8"	13'-2"	15'-10"

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"	"D"
"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"

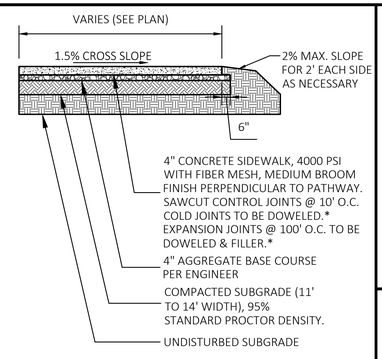
REINFORCEMENT SCHEDULE, TOP		
DIMENSIONS	STEEL	SPECIAL PATTERN
W1 = 7' OR LESS	#4's @ 8" E.W.	DIAGONAL @ COVER
W2 = 7' OR LESS	#4's @ 8" E.W.	DIAGONAL @ COVER
W1 = 7' OR LESS	#4's @ 8" E.W.	DIAGONAL @ COVER
W2 = 7' OR GREATER	#4'S @ 6" E.W.	DIAGONAL @ COVER
W1 = 7' OR GREATER	#4's @ 6" E.W.	DIAGONAL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

GRATE INLET

N.T.S.

NOTES:

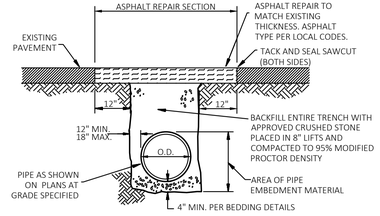
1. IF COMPACTED SUBGRADE DOES NOT PASS DENSITY TESTING, UNDERCUT USING A MINIMUM OF 8" STRUCTURAL FILL AS REQUIRED BY ENGINEER.
2. VERTICAL CLEARANCE TYP. 8' MIN.
3. SLOPES BEYOND 36" MIN. CLEAR AREA SHALL NOT EXCEED 3:1
4. MAXIMUM RUNNING SLOPE SHALL BE 5% UNLESS NOTED ON PLANS.
5. DOWELS ARE TO BE 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

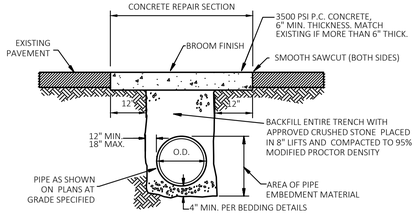
CONCRETE SIDEWALK

N.T.S



ASPHALT PATCH FOR STREET OR DRIVE

N.T.S.



CONCRETE PATCH FOR STREET OR DRIVE

N.T.S.

REVISION		
NO.	DESCRIPTION	DATE
2	CHANGE ORDER NO. 2	2024-03-25

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

Know what's below. Call before you dig.

APPROVED FOR B CONSTRUCTION
04/12/2024 8:50:55 AM

CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11650
JEREMY D. RENWICK
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/27/2024
REVISION	CO 3
PIIP22-0010	

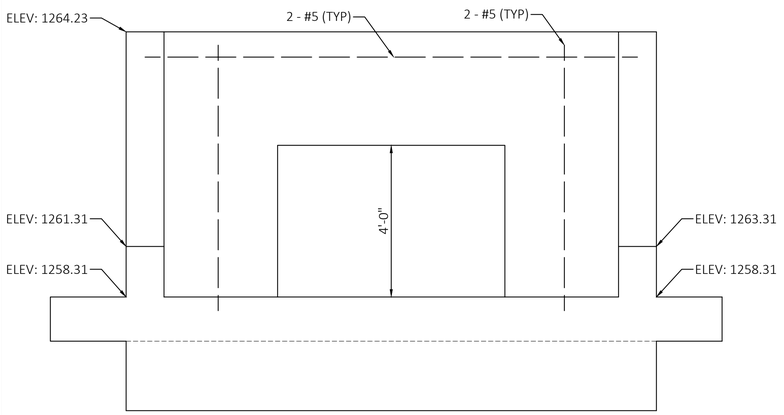
SPECIAL DETAILS - 3

SHEET TITLE

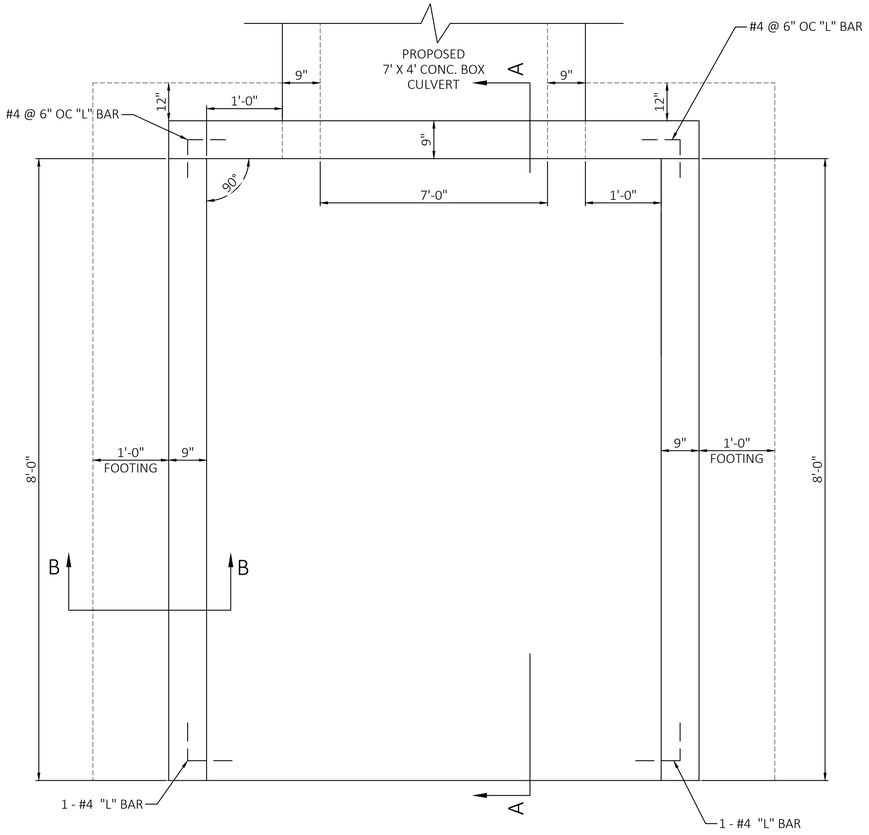
SHEET NUMBER

7

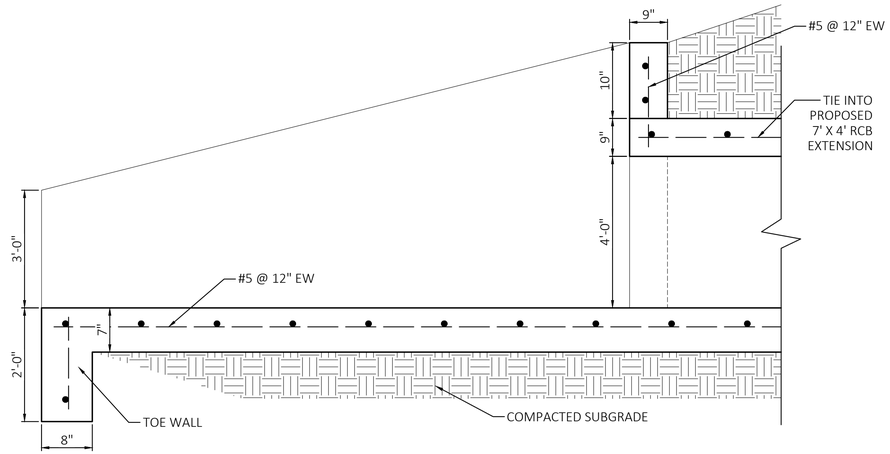
DRAWING LOCATION - P:\32000\32245.00\DRAWINGS\DESIGN\WORKING\32245-DETL.DWG - SAVED BY - JRENWICK



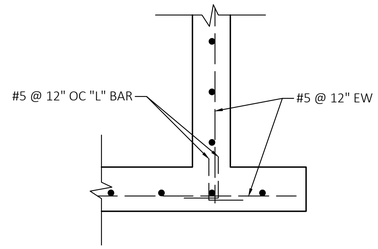
FRONT ELEVATION



PLAN VIEW



SECTION A



SECTION B

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.
6. ALL REINFORCING BARS SHALL BE #4 @ 6" EW, UNLESS OTHERWISE NOTED.

CONCRETE HEAD WALL
N.T.S.

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11

CEI
Solutions for Land and Life

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

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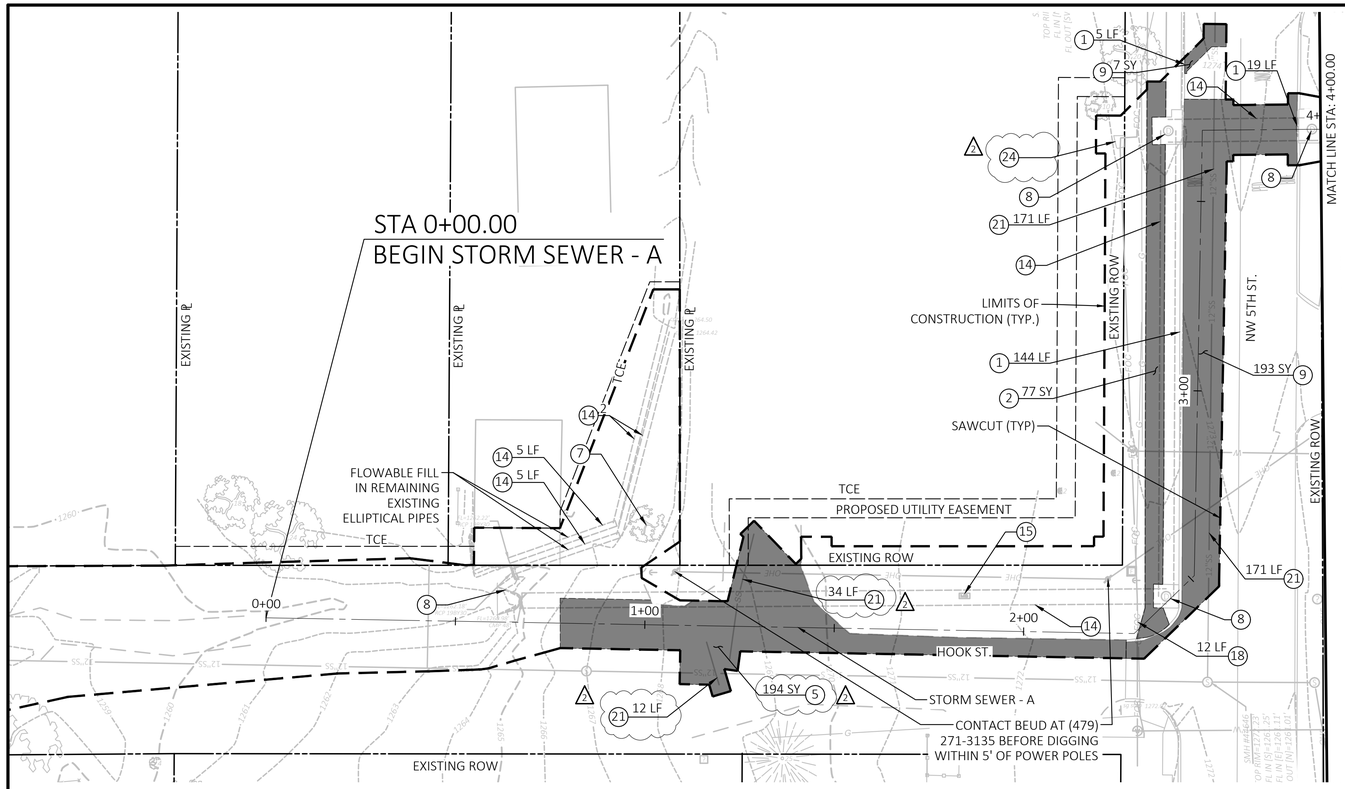
CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

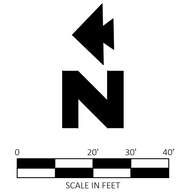
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 17418
ANNA J. STAMPS
09/11/2023

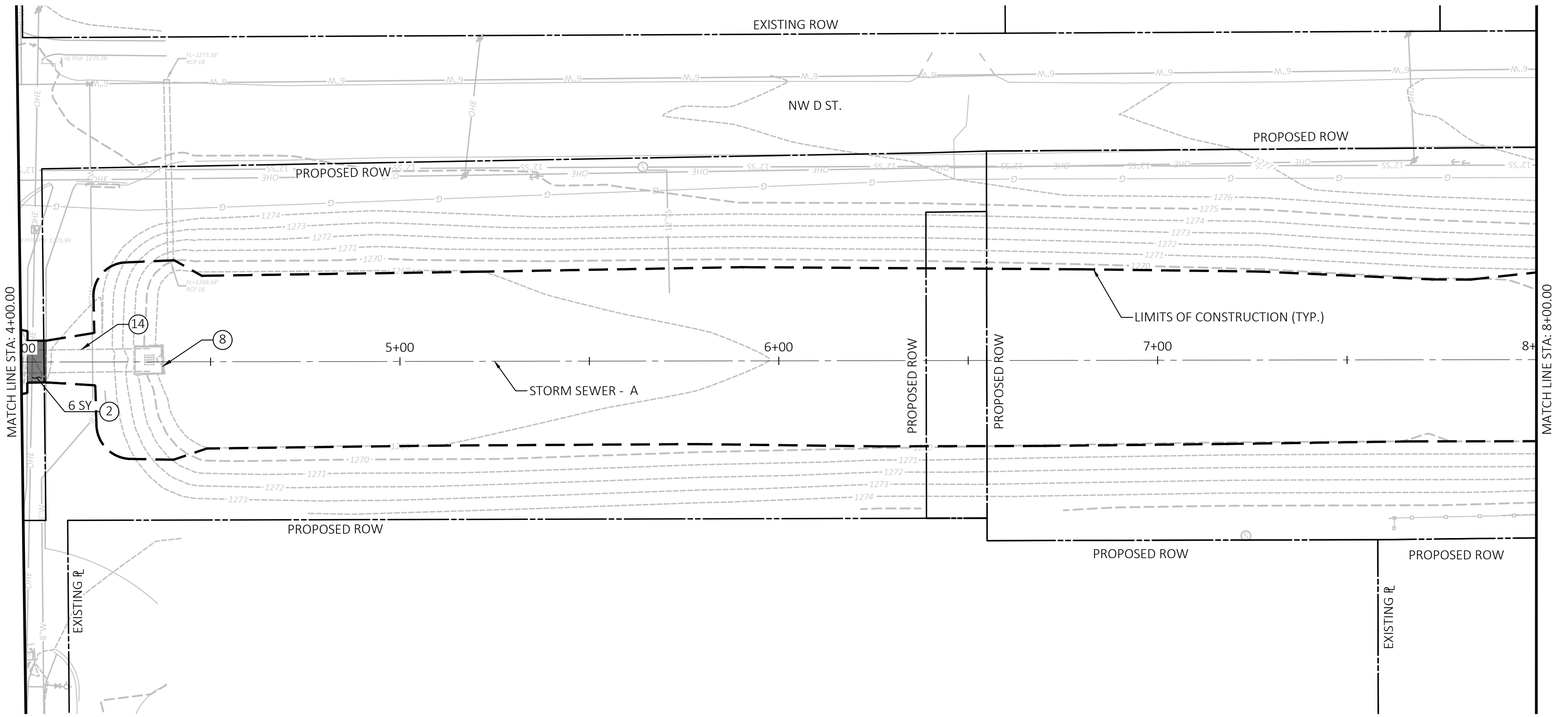
PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	8/10/2023
REVISION	CO 1
PIIP22-0010	

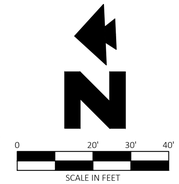
SPECIAL DETAILS - 4
SHEET TITLE

SHEET NUMBER
8









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1. REMOVE AND REPLACE CONCRETE CURB & GUTTER
2. REMOVE AND REPLACE CONCRETE SIDEWALK
3. REMOVE AND REPLACE CONCRETE DRIVEWAY
4. REMOVE AND REPLACE ASPHALT DRIVEWAY
5. REMOVE AND REPLACE OF GRAVEL DRIVEWAY
6. REMOVE AND DISPOSE OF FENCE
7. REMOVE AND DISPOSE OF TREE(S)
8. REMOVE AND DISPOSE OF DRAINAGE STRUCTURE
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10. REMOVE AND DISPOSE OF CONCRETE PAVEMENT
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12. REMOVE AND RELOCATE WATER METER
13. REMOVE AND RELOCATE FIRE HYDRANT
14. REMOVE AND DISPOSE OF PIPE CULVERTS
15. REMOVE AND RELOCATE MAILBOX & SUPPORT
16. ABANDON EXISTING WATER LINE IN PLACE
17. POWER POLE TO BE RELOCATED BY CITY OF BENTONVILLE
18. GAS LINE AND APPURTENANCE TO BE RELOCATED BY BLACKHILLS
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21. REMOVE AND DISPOSE OF SEWER LINE
22. REMOVE AND DISPOSE OF WATER LINE
23. MODIFY EXISTING DROP INLET
24. REMOVE AND DISPOSE OF CONCRETE STRUCTURE △1
25. REMOVE AND REPLACE MASONRY RETAINING WALL

REVISION

NO.	DESCRIPTION	DATE
△1	CHANGE ORDER NO. 1	2023-08-11
△2	CHANGE ORDER NO. 2	2024-03-25

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
NW 9TH AND D STREET
BENTONVILLE, AR

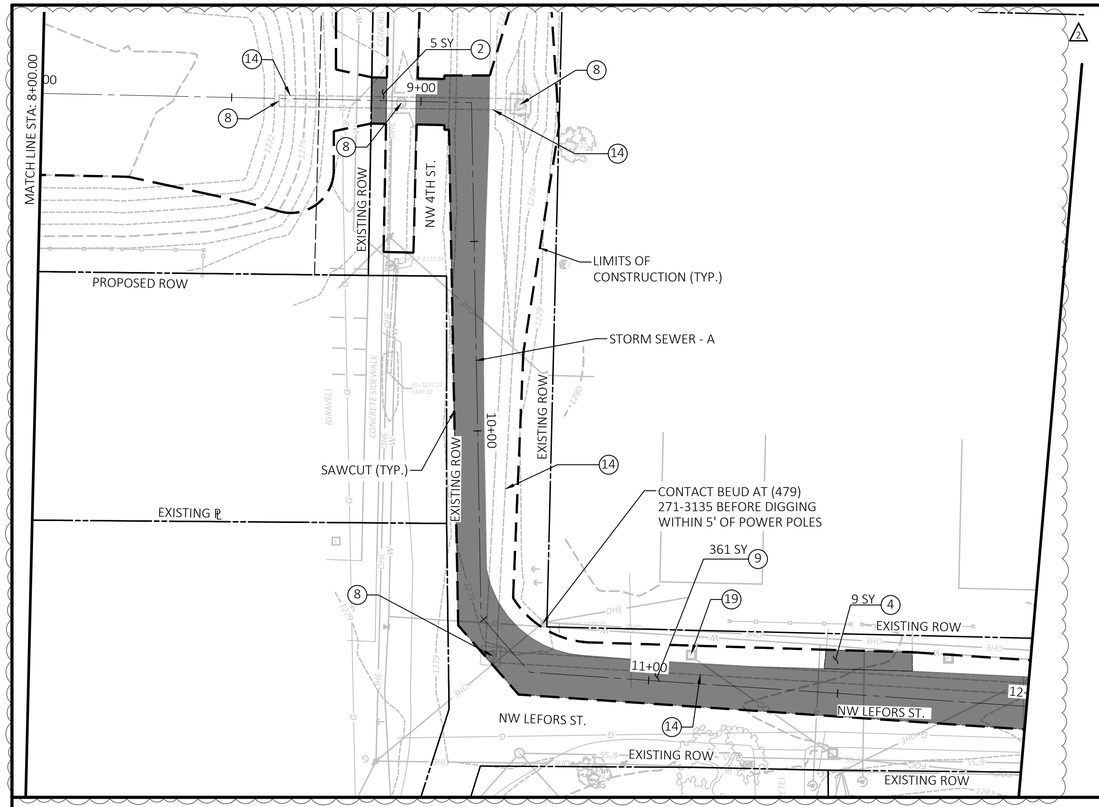
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
ANDREW D. KNEE
No. 19880
03/29/2024

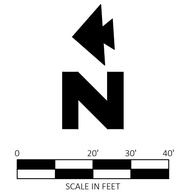
PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

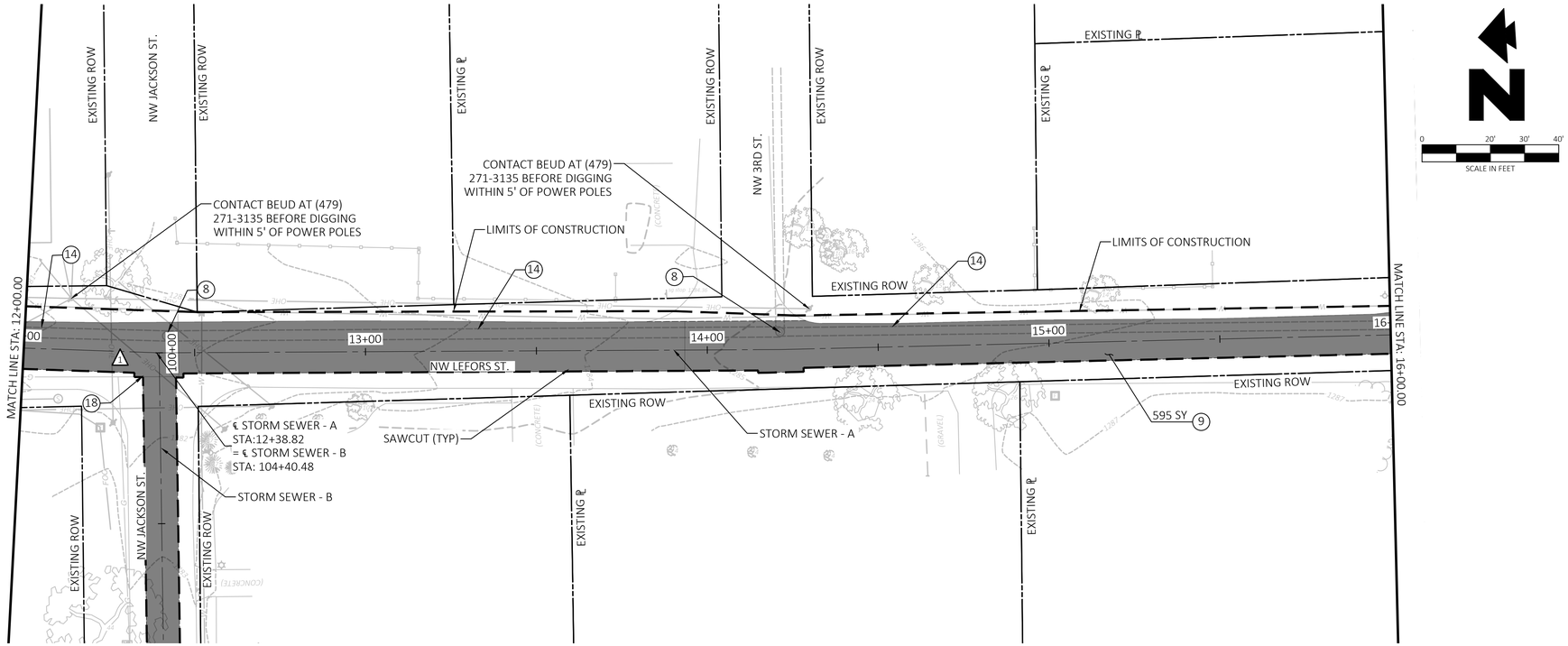
DEMOLITION PLAN - 1
SHEET TITLE

SHEET NUMBER
9

DRAWING LOCATION - P:\32000\32245.0\DRAWINGS\DESIGN\WORKING\32245-DEMO.DWG - SAVED BY - JRENNICK







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24. REMOVE AND DISPOSE OF CONCRETE STRUCTURE (1)
25. REMOVE AND REPLACE MASONRY RETAINING WALL

REVISION

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2	CHANGE ORDER NO. 2	2024-03-25

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CITY OF BENTONVILLE
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BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11880
ANDREW D. KLEE
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

DEMOLITION PLAN - 2
SHEET TITLE

SHEET NUMBER
10

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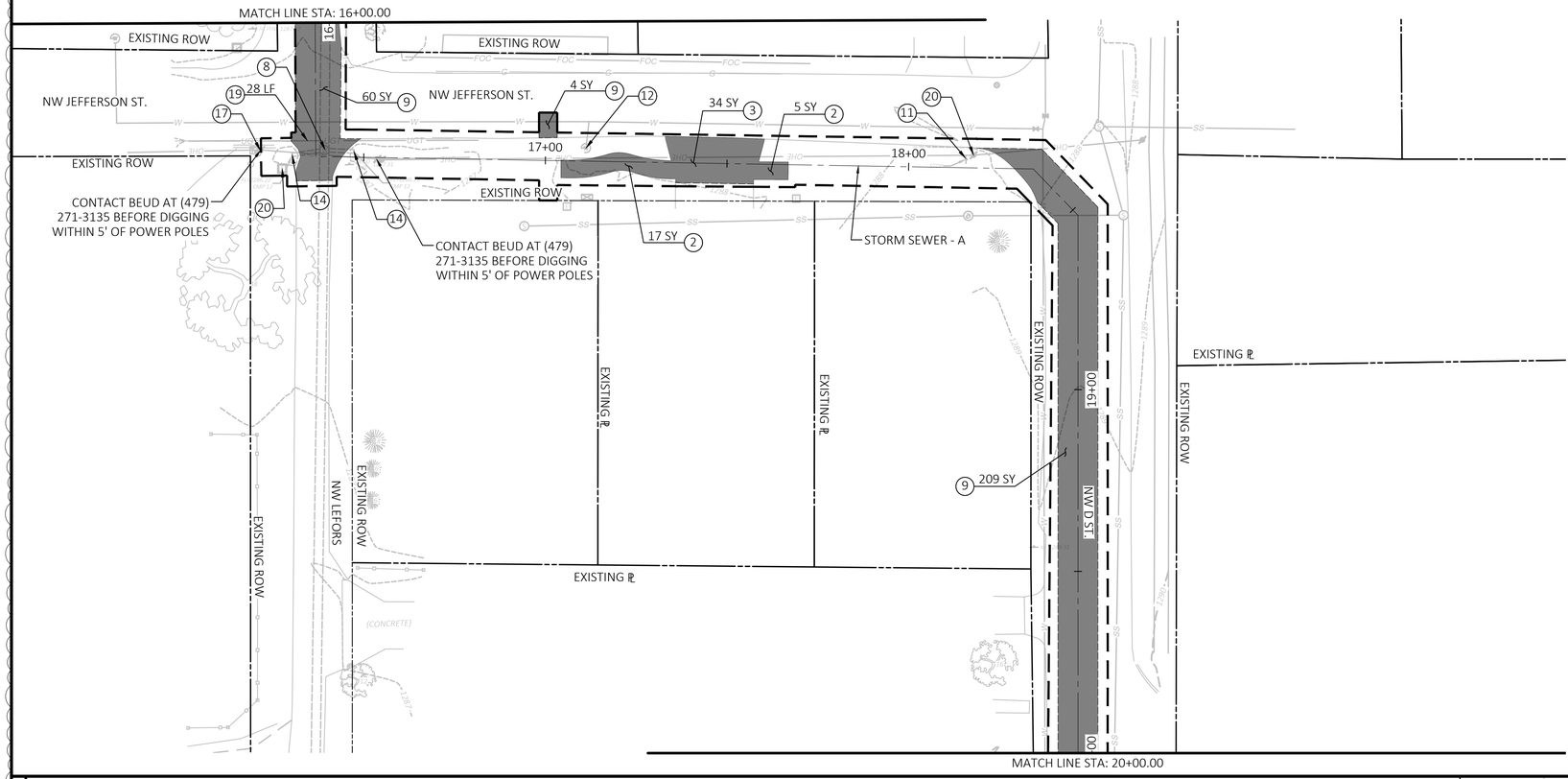

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CITY OF BENTONVILLE
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BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
JAMES W. D. NEWD. NEWCK
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
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REVISION

NO.	DESCRIPTION	DATE
△1	CHANGE ORDER NO. 1	2023-08-11
△2	CHANGE ORDER NO. 2	2024-03-25

DEMOLITION PLAN - 3
SHEET TITLE

SHEET NUMBER
11

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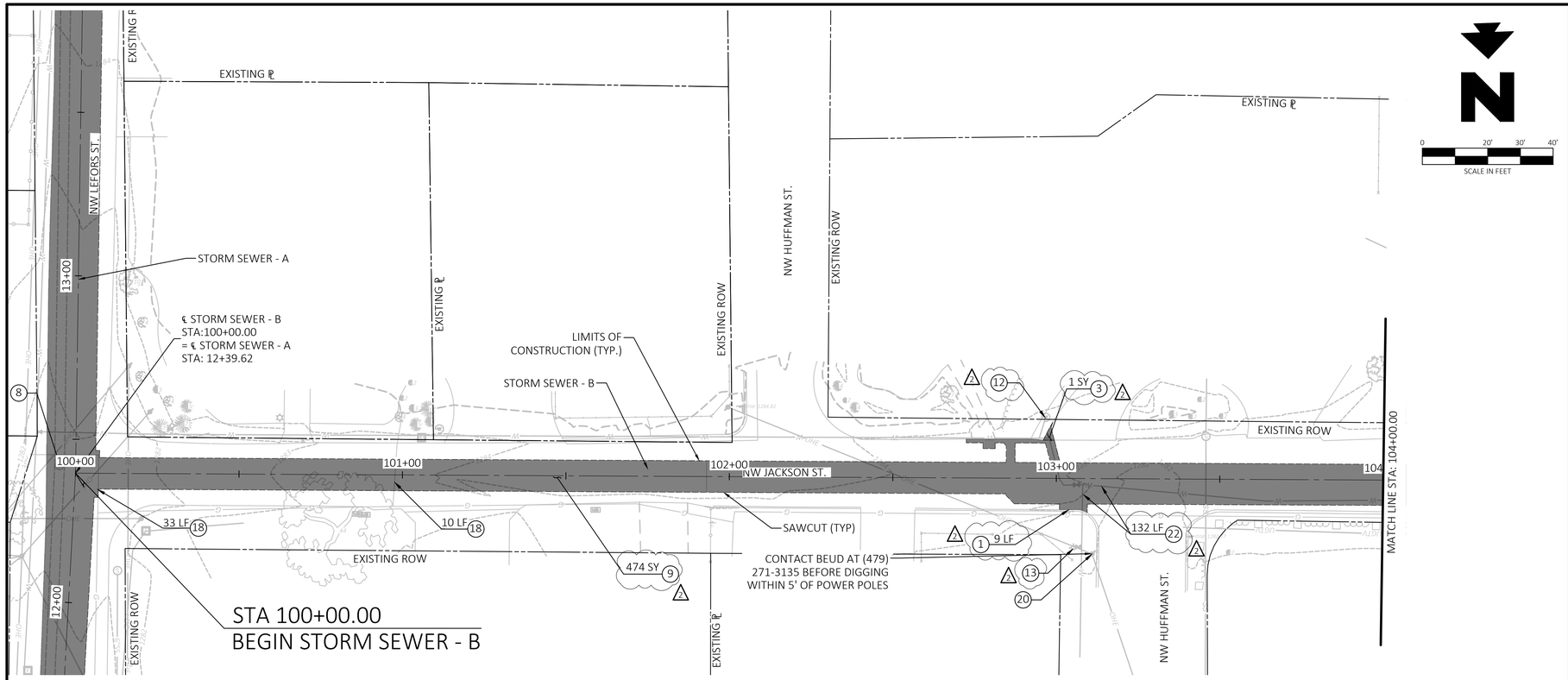

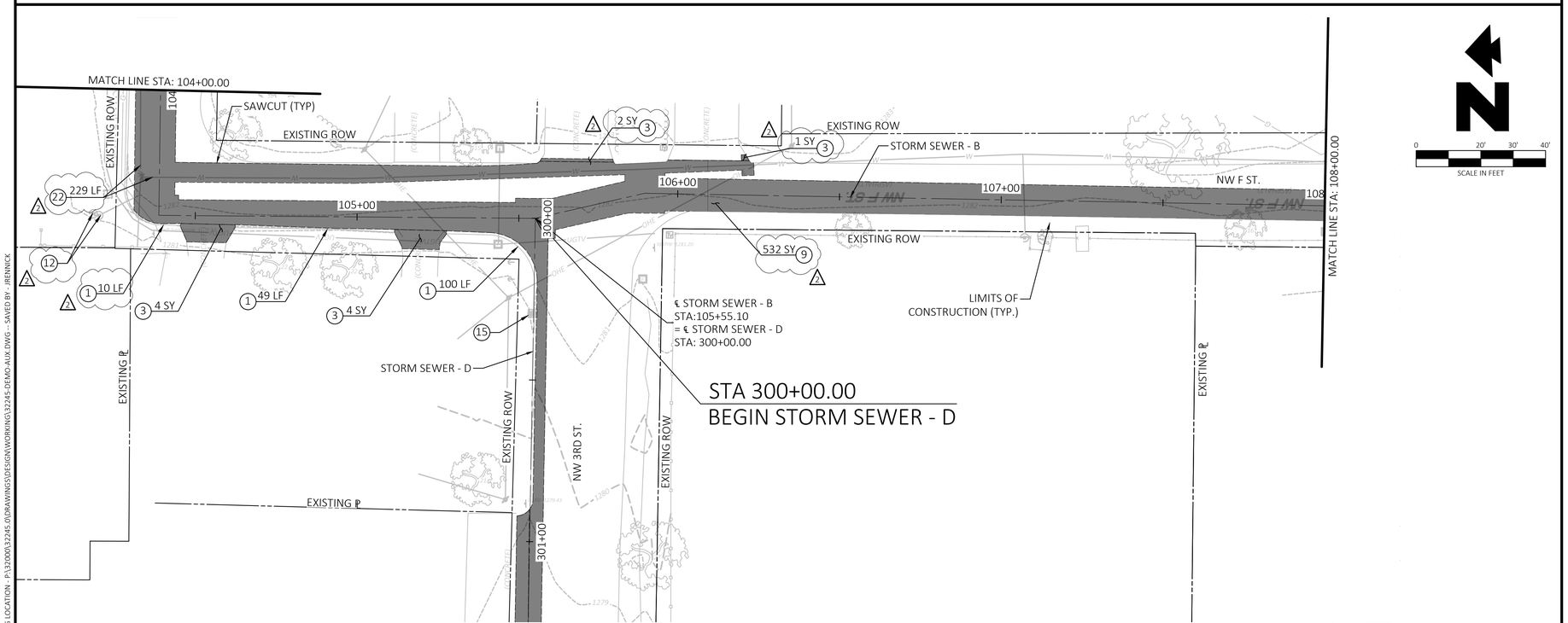

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25. REMOVE AND REPLACE MASONRY WALL

REVISION

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2	CHANGE ORDER NO. 2	2024-03-25

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FAX: (479) 273-0844

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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11880
ANDREW D. NANCE
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
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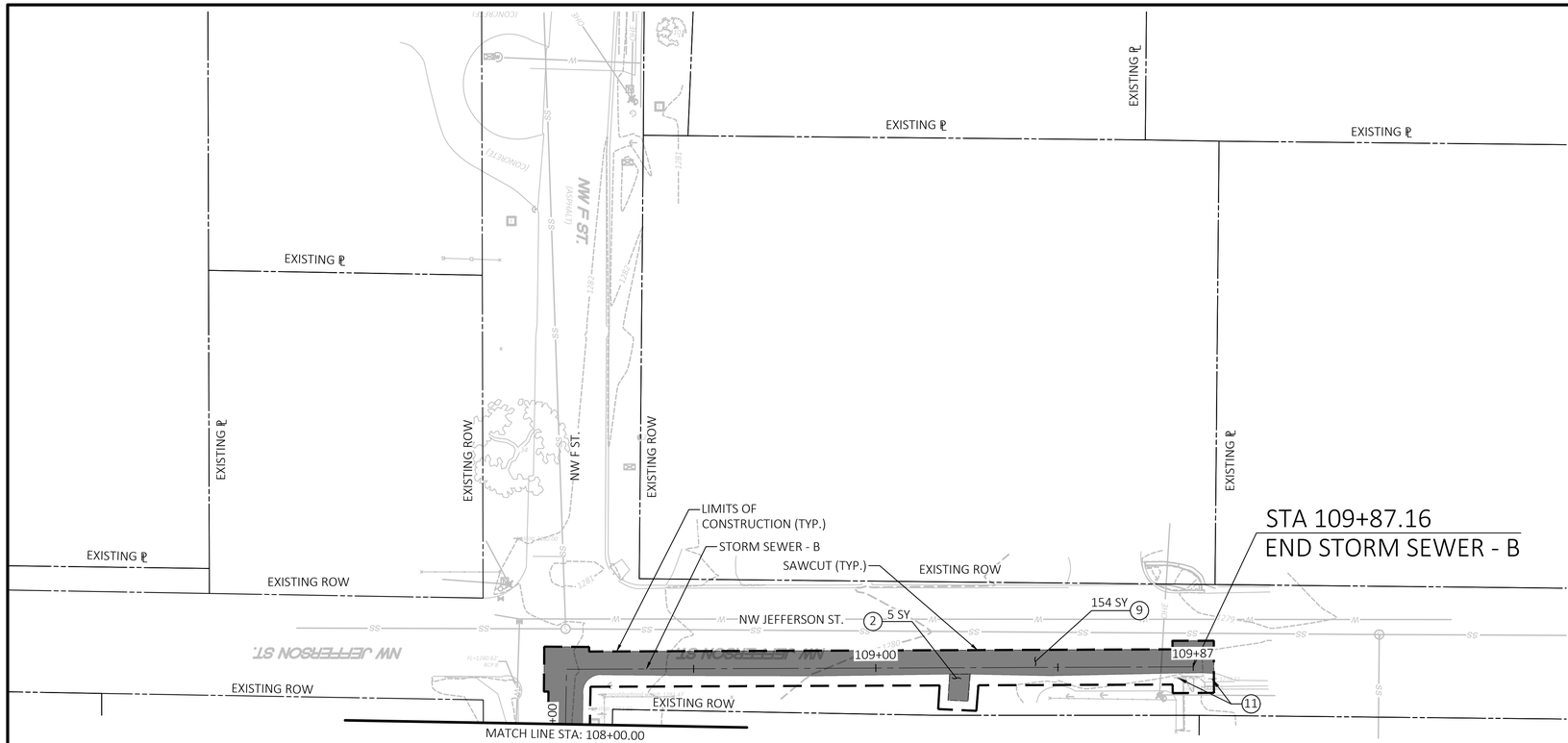
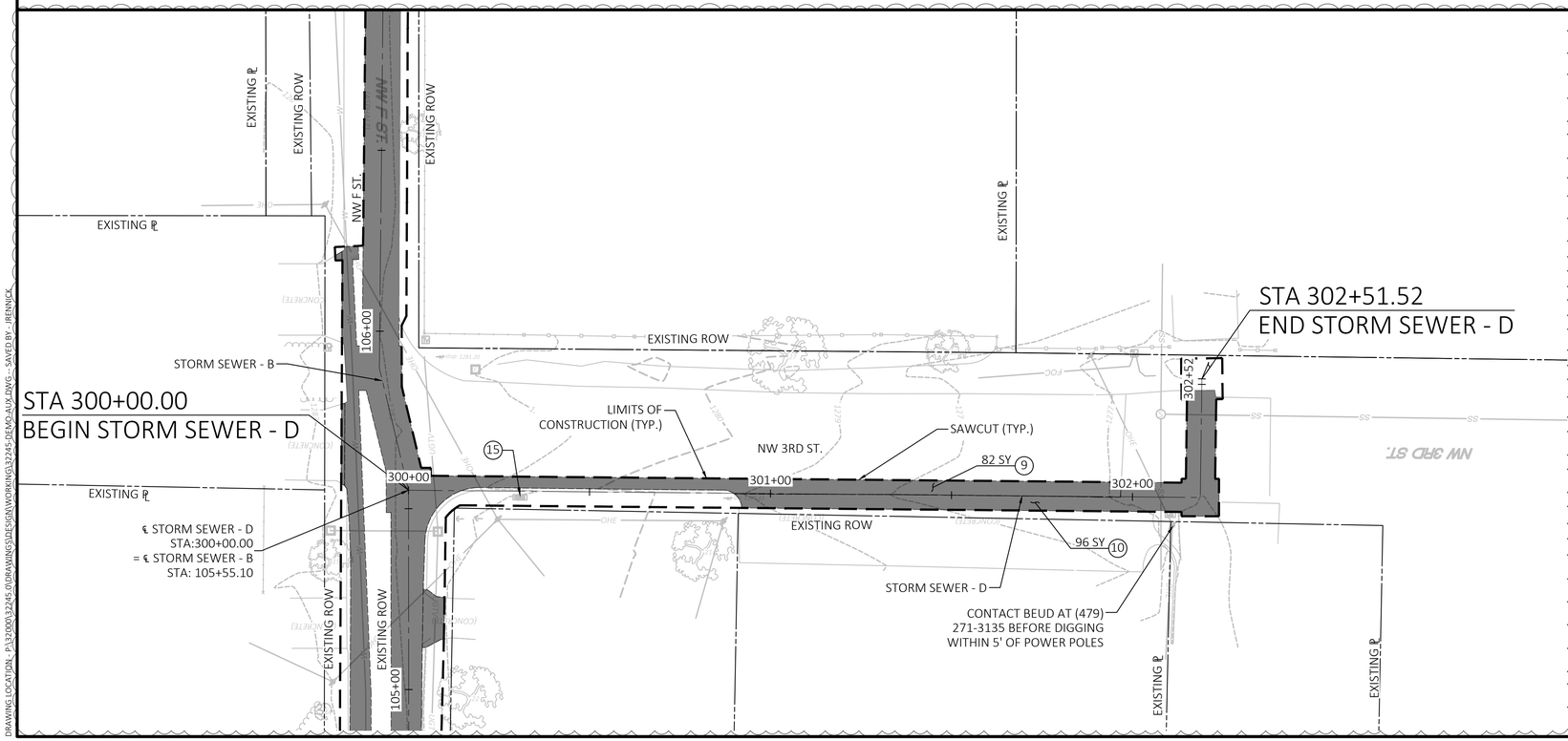
DEMOLITION PLAN - 4
SHEET TITLE

SHEET NUMBER
12

DRAWING LOCATION - P:\32000\32245.0\DRAWINGS\DESIGN\WORKING\32245-DEMO-AUX.DWG - SAVED BY - JRENNICK





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24 REMOVE AND DISPOSE OF CONCRETE STRUCTURE
25 REMOVE AND REPLACE MASONRY WALL

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3108 SW REGENCY PKWY
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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANTHONY D. SLOAN
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

DEMOLITION PLAN - 5
SHEET TITLE
SHEET NUMBER
13

DRAWING LOCATION: P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245-DEMO-ALIGNING - SAVED BY: JRENGCL

A. GENERAL SITE DATA

PROJECT LIMITS:

BEGIN CONSTRUCTION OF STORM SEWER - A AT STA 0+00.00 - END CONSTRUCTION AT 24+57.13
BEGIN CONSTRUCTION OF STORM SEWER - B AT STA 100+00.00 - END CONSTRUCTION AT STA 109+87.16
~~BEGIN CONSTRUCTION OF STORM SEWER - C AT STA 200+00.00 - END CONSTRUCTION AT STA 200+50.28~~
BEGIN CONSTRUCTION OF STORM SEWER - D AT STA 300+00.00 - END CONSTRUCTION AT STA 302+51.52
(PROJECT LENGTH = 3696 FT = APPROX. 0.70 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; SIDEWALKS; WATER MAIN RELOCATION; AND SANITARY SEWER MAIN RELOCATION.

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 WITH COMPONENTS OF NIXA AND NOARK GRAVELLY SILT LOAM SOILS. 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:

3.99 ACRES

TOTAL AREA TO BE DISTURBED: (2)

1.95 ACRES

WEIGHTED RUNOFF COEFFICIENT:

BEFORE CONSTRUCTION: 0.65
AFTER CONSTRUCTION: 0.65

PROJECT LATITUDE & LONGITUDE:

STORM SEWER - A
PROJECT BEGINS - LATITUDE: 36° 22' 42.17" N LONGITUDE: 94° 12' 54.31" W
ENDS - LATITUDE: 36° 22' 22.62" N LONGITUDE: 94° 12' 52.57" W

STORM SEWER - B
PROJECT BEGINS - LATITUDE: 36° 22' 32.46" N LONGITUDE: 94° 12' 54.91" W
ENDS - LATITUDE: 36° 22' 28.85" N LONGITUDE: 94° 13' 02.37" W

~~STORM SEWER - C~~
~~PROJECT BEGINS - LATITUDE: 36° 22' 32.48" N LONGITUDE: 94° 12' 58.77" W~~
~~ENDS - LATITUDE: 36° 22' 32.76" N LONGITUDE: 94° 12' 59.06" W~~

STORM SEWER - D
PROJECT BEGINS - LATITUDE: 36° 22' 31.41" N LONGITUDE: 94° 13' 00.29" W
ENDS - LATITUDE: 36° 22' 31.13" N LONGITUDE: 94° 13' 02.98" 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
	BUFFER ZONES		RIGID CHANNEL LINER
T, P	PLANTING		SOIL RETENTION BLANKET
T, P	SEEDING		COMPOST MANUFACTURED TOPSOIL
P	SODDING	P	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
	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.

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

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

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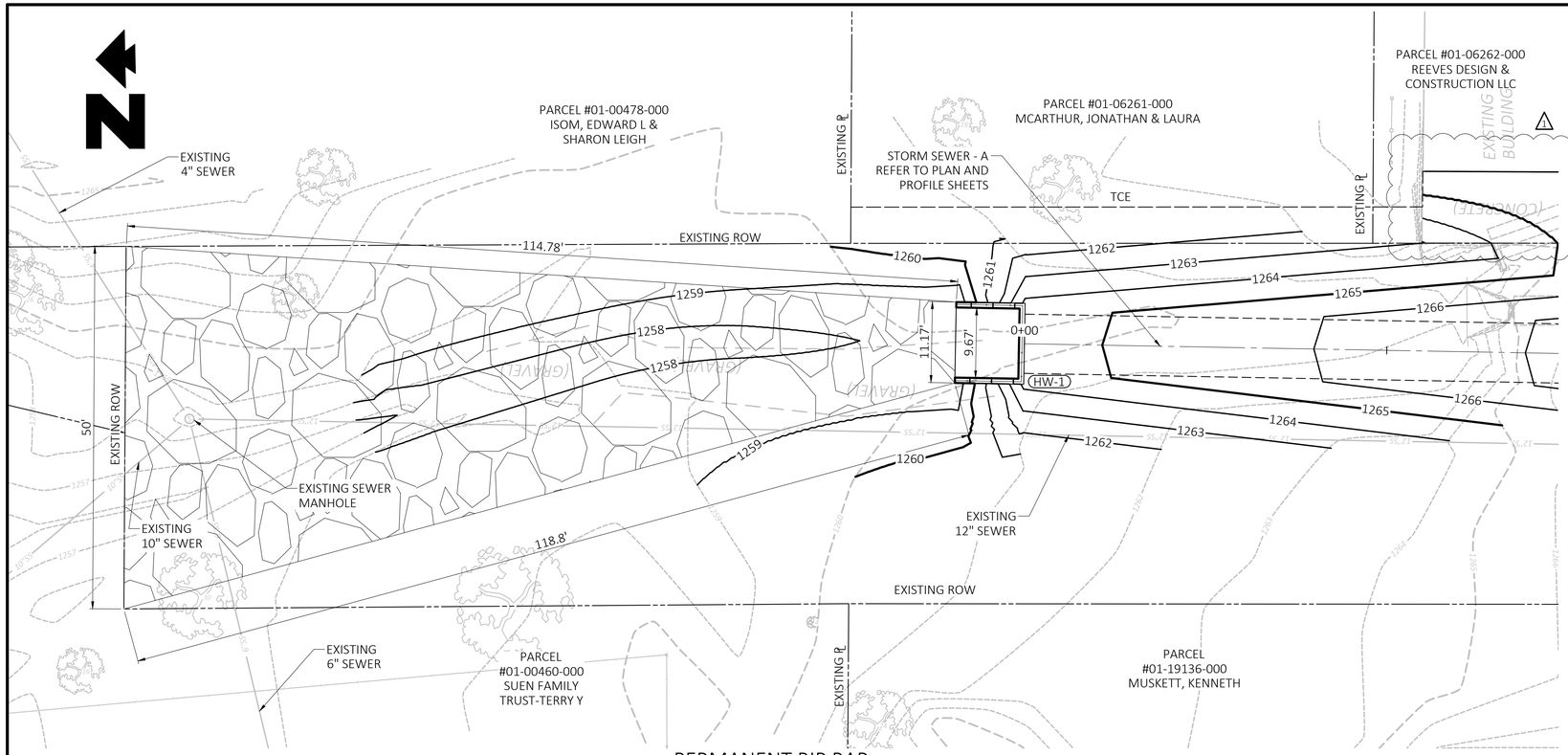
CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW J. KNOX
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

EROSION CONTROL NOTES
SHEET TITLE

SHEET NUMBER
14



PERMANENT RIP RAP

1" = 10'

NOTES:

1. MATERIALS
   - 1.1. IF REQUESTED BY ENGINEER, CONTRACTOR SHALL SUBMIT CERTIFICATION OR TEST RESULTS SHOWING THAT THE PROPOSED ROCK MEETS DENSITY AND ABSORPTION REQUIREMENTS SPECIFIED. TESTING SHALL BE IN ACCORDANCE WITH ASTM C97.
   - 1.2. RIP RAP SHALL BE HARD, SOUND, AND DURABLE FIELD STONE OR ROUGH UNHEWN QUARRY STONE. IT SHALL BE REASONABLY FREE OF FINES AND SHALL BE WELL GRADED BETWEEN THE MAXIMUM AND MINIMUM ROCK SIZES SO AS TO PRODUCE A MINIMUM OF VOIDS.
   - 1.3. MINIMUM DENSITY OF STONE SHALL BE 140 POUNDS PER CUBIC FOOT AND MAXIMUM ABSORPTION SHALL BE 6 PERCENT.
   - 1.4. UNLESS OTHERWISE SPECIFIED, MAXIMUM STONE SIZE SHALL NOT BE GREATER THAN 18 INCHES IN ANY DIMENSION AND APPROXIMATELY 50 PERCENT OF THE MATERIAL SHALL CONSIST OF PIECES WEIGHING 35 POUNDS OR MORE. THE STONES SHALL BE PREDOMINANTLY ANGULAR IN SHAPE WITH NOT MORE THAN 25 PERCENT HAVING A LENGTH MORE THAN 2.5 TIMES TS BREADTH OR THICKNESS AND NONE HAVING A LENGTH EXCEEDING 3 TIMES ITS BREADTH OR THICKNESS.
   - 1.5. ACCEPTABLE FILTER FABRICS:
     - 1.5.1. MIRAFI 140 NS
     - 1.5.2. PHILLIPS 66 SUPAC 4 NP
     - 1.5.3. DUPONT TYPAR 3341
2. EXECUTION
   - 2.1. GRADE AREA TO RECEIVE RIP RAP TO THE LINES AND GRADES INDICATED ON THE DRAWINGS AND AS REQUIRED FOR THE THICKNESS OF RIP RAP PAD INDICATED.
   - 2.2. INSTALL FILTER FABRIC IN AREA WHERE RIP RAP WILL BE INSTALLED, FOLLOWING INSTALLATION PROCEDURES OF THE MANUFACTURER.
   - 2.3. SMALLER STONES SHALL BE WELL DISTRIBUTED THROUGHOUT THE RIP RAP LAYER. HAND PLACING MAY BE REQUIRED TO OBTAIN THE RESULTS SPECIFIED.
   - 2.4. AREAS TO BE PROTECTED WITH RIP RAP SHALL BE DRESSED TO THE LINES AND GRADES INDICATED ON THE DRAWINGS.
   - 2.5. RIP RAP SHALL BE PLACED STARTING AT THE TOE OF THE SLOPE WITH A MAXIMUM VERTICAL DROP ON TO PREPARED SUB OF 3 FEET. TAKE CARE TO AVOID HAVING STONES ROLL ON THE SLOPE.

REVISION

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1	CHANGE ORDER NO. 1	2023-08-11

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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 17418
ANNA J. STAMPS
09/11/2023

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	8/10/2023
REVISION	CO 1
PIIP22-0010	

EROSION CONTROL
SPECIAL DETAILS
SHEET TITLE

SHEET NUMBER
15

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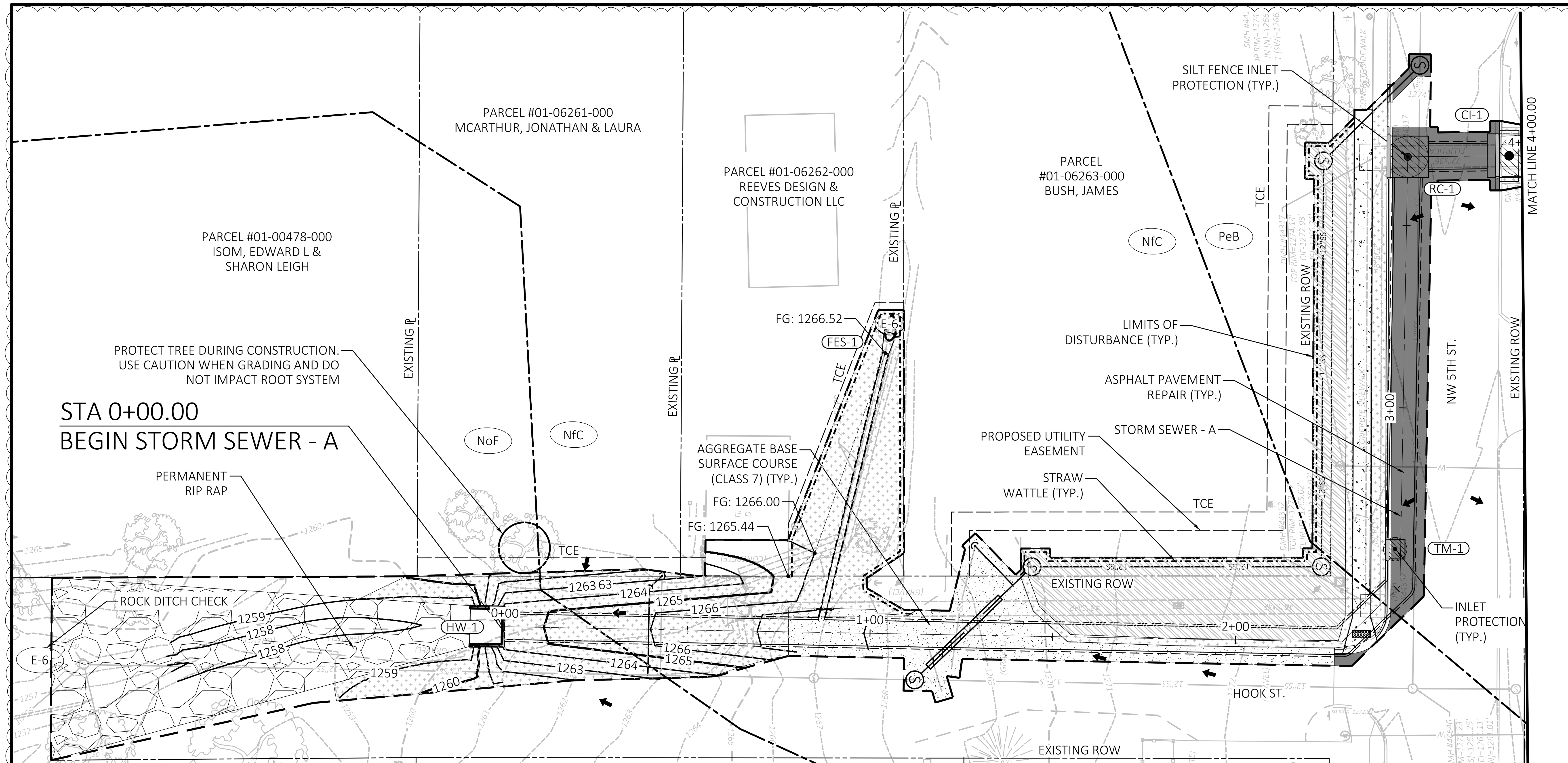

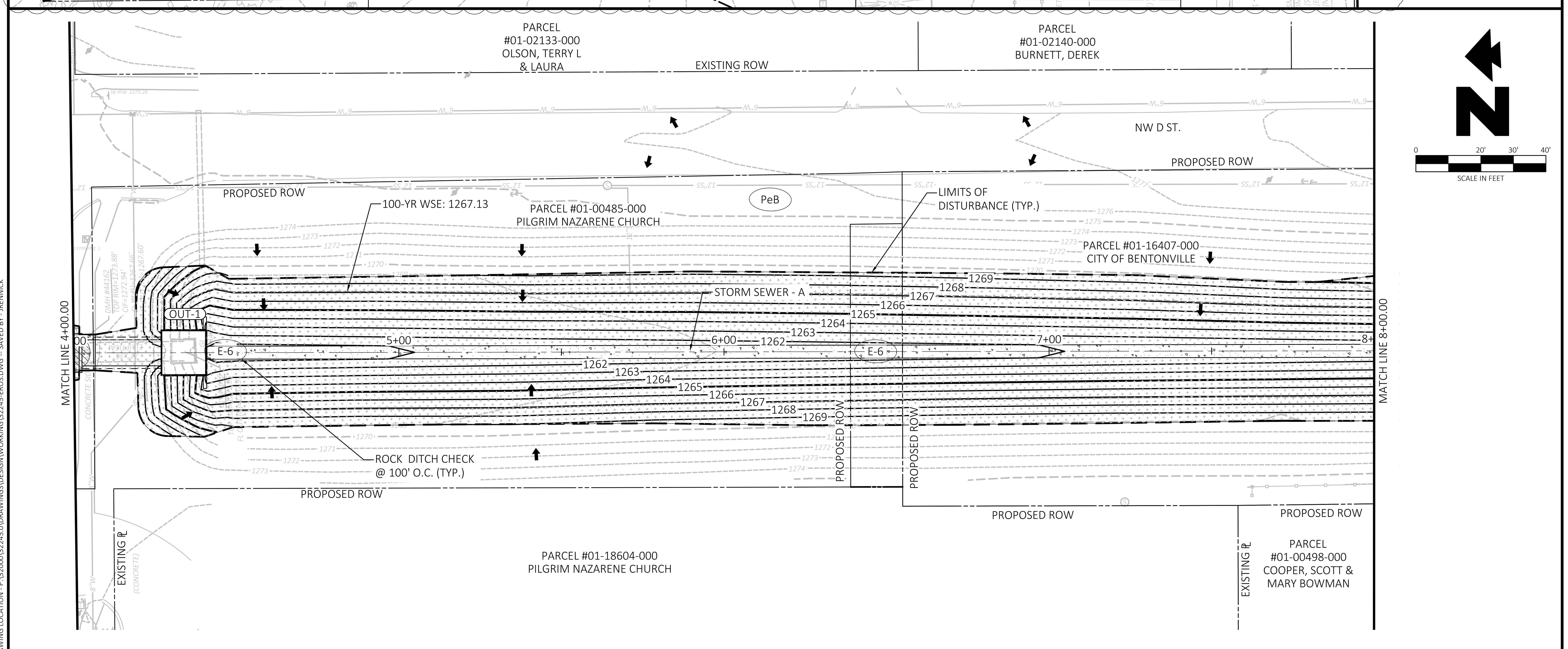

SCALE IN FEET: 0, 20', 30', 40'

LEGEND

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

PROJECT AREA	DISTURBED AREA
3.99 ACRES	1.95 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

- NfC — NIXA VERY GRAVELLY SILT LOAM 3 TO 8% SLOPES
- NoF — NOARK VERY GRAVELLY SILT LOAM 20 TO 40% SLOPES
- PeB — PERIDGE GRAVELLY SILT LOAM 1 TO 3% SLOPES
- PeC — PERIDGE SILT LOAM 3 TO 8% SLOPES
- APPROXIMATE LIMITS OF SOIL TYPE

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NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11850
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
PIIP22-0010	

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

EROSION CONTROL PLAN - 1
SHEET TITLE

SHEET NUMBER
16

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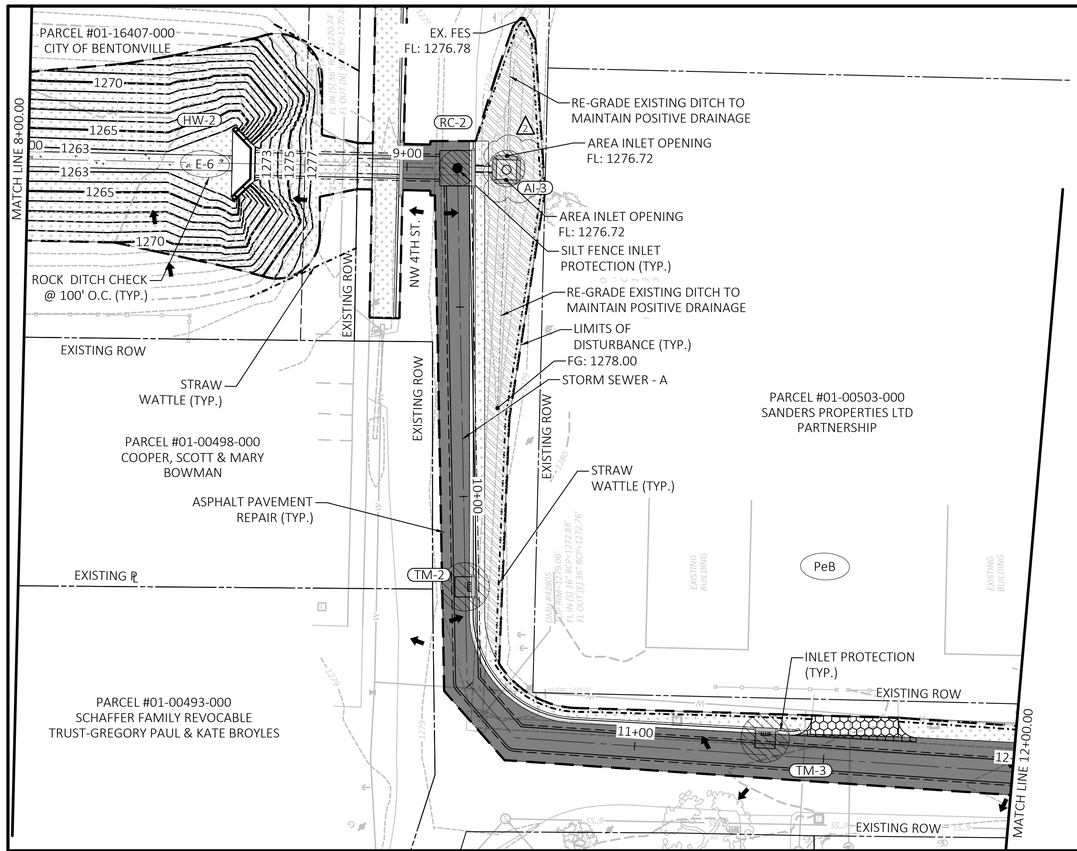

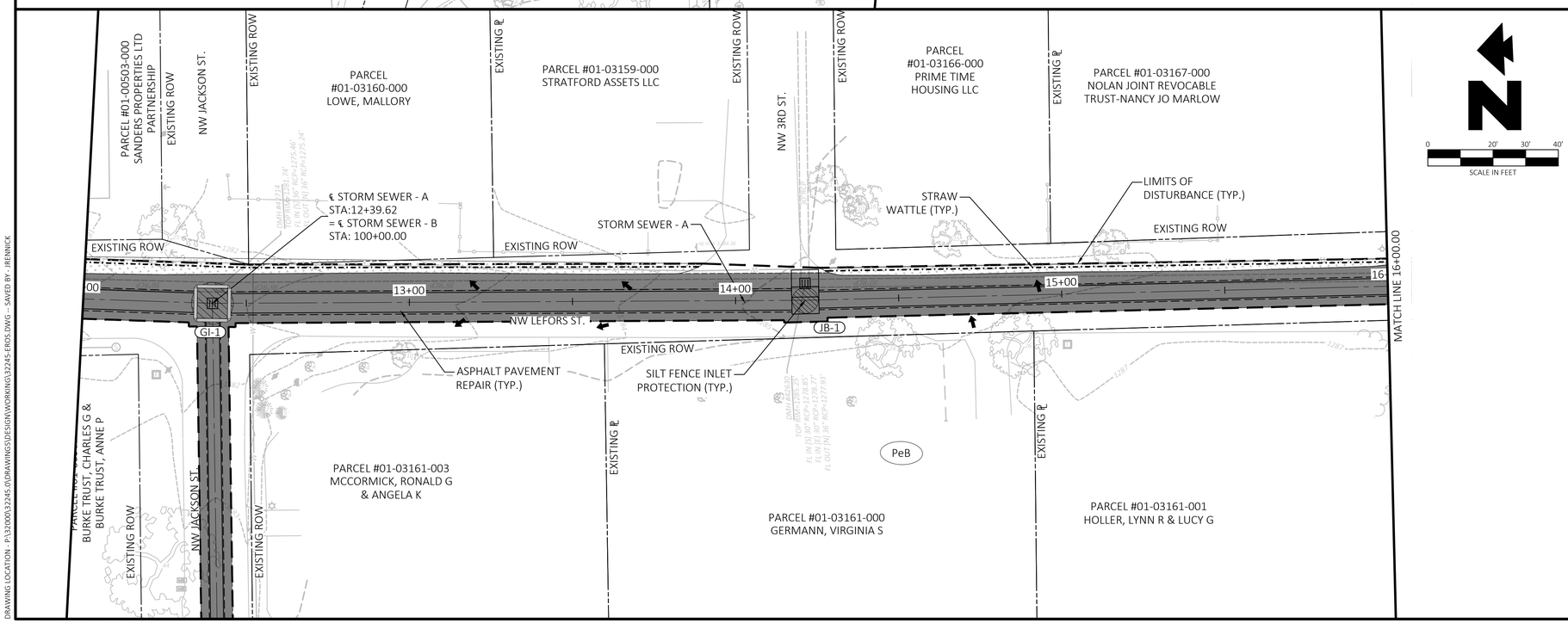

0 20' 30' 40'
SCALE IN FEET

LEGEND

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

PROJECT AREA	DISTURBED AREA
3.99 ACRES	1.95 ACRES

NOTE

CONTRACTOR TO PLACE SILT FENCE BOX PROTECTION AFTER INSTALLING INLET BOXES
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- APPROXIMATE LIMITS OF SOIL TYPE

REVISION

NO.	DESCRIPTION	DATE
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2	CHANGE ORDER NO. 2	2024-03-25

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FAX: (479) 273-0844

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NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11880
ANDREW D. KLINE
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
PIIP22-0010	

EROSION CONTROL PLAN - 2
SHEET TITLE

SHEET NUMBER
17

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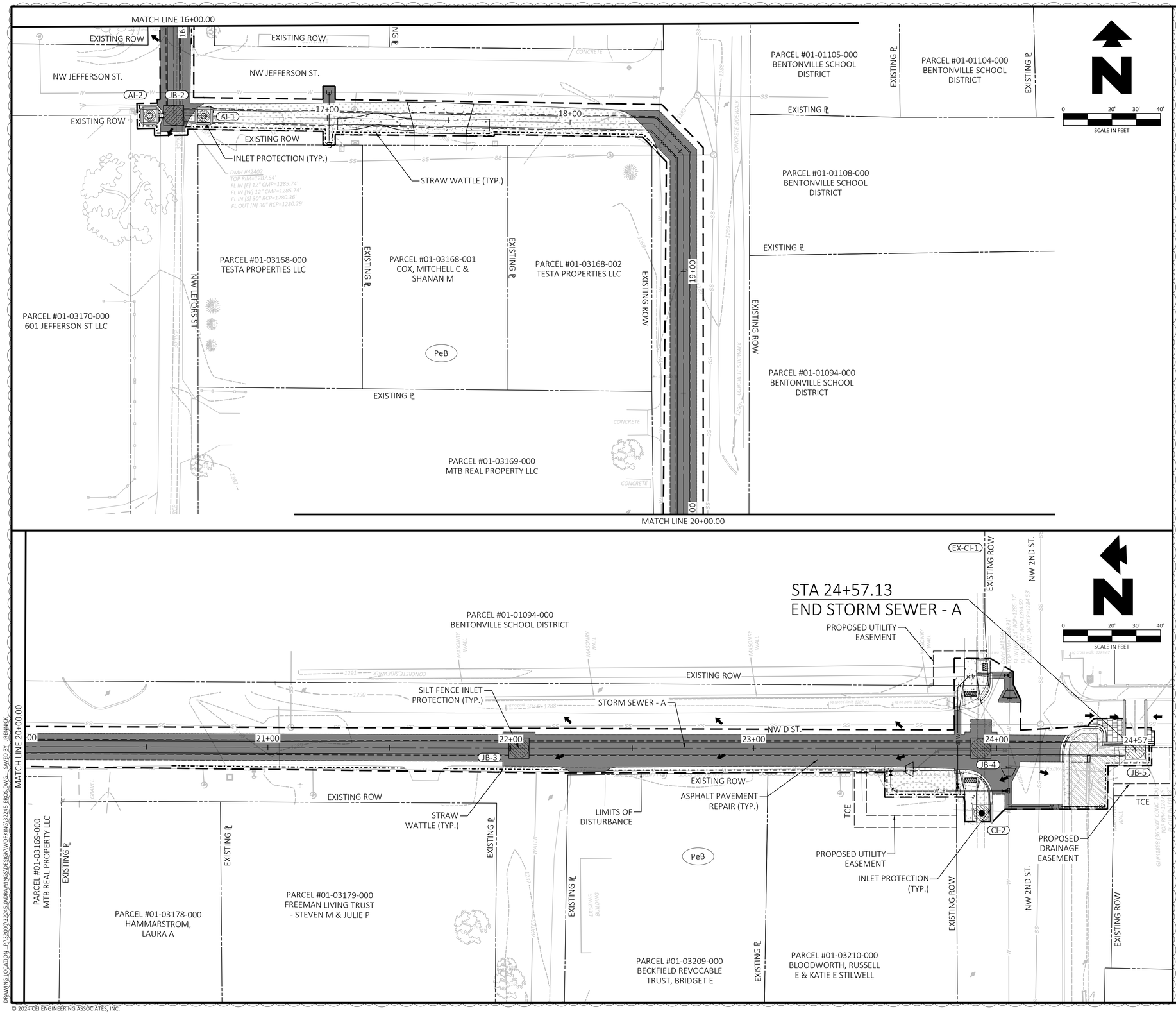

LEGEND

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

PROJECT AREA	DISTURBED AREA
3.99 ACRES	1.95 ACRES

NOTE

CONTRACTOR TO PLACE SILT FENCE BOX PROTECTION AFTER INSTALLING INLET BOXES
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PeC	PERIDGE SILT LOAM 3 TO 8% SLOPES
	APPROXIMATE LIMITS OF SOIL TYPE

REVISION

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STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
JAMES W. RITTER, JR.
NW D ST
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
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EROSION CONTROL PLAN - 3

SHEET TITLE

SHEET NUMBER

18

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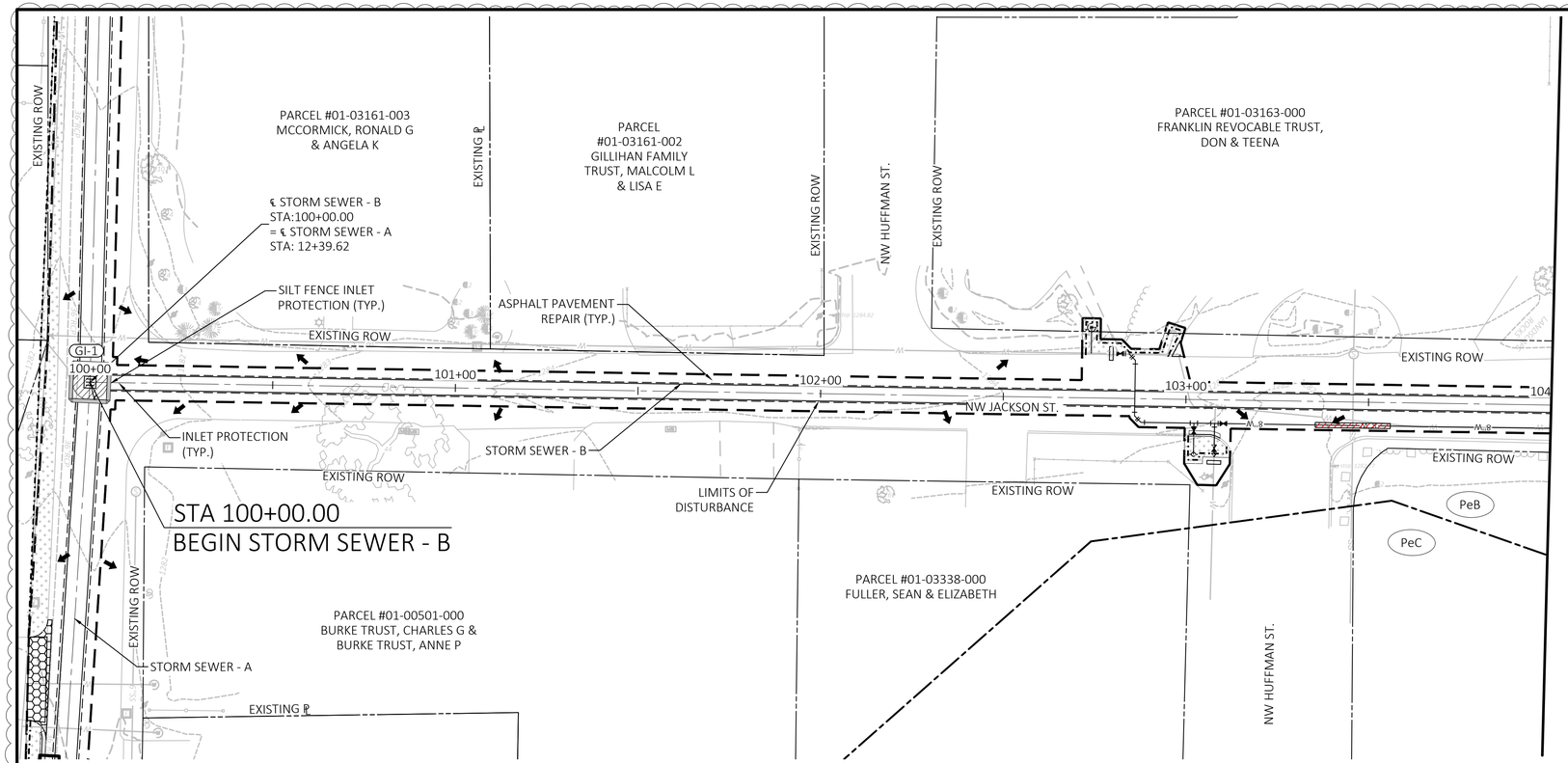

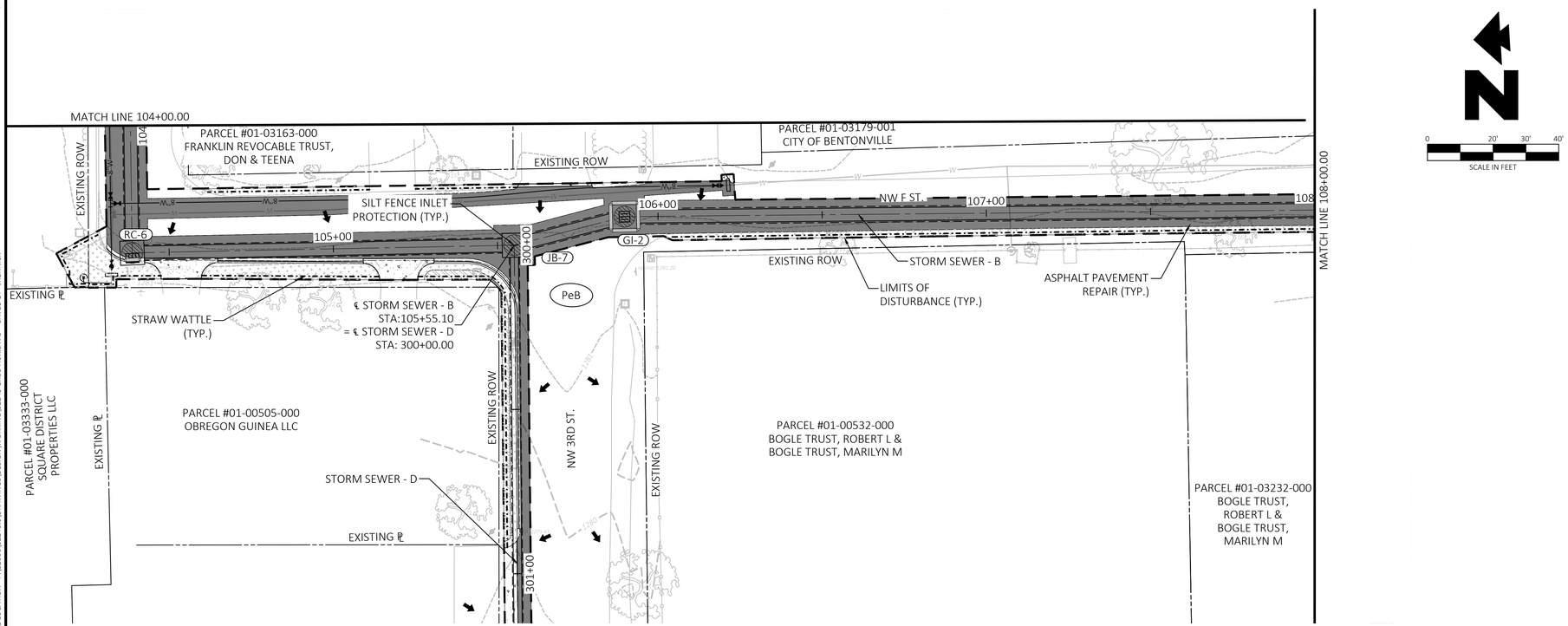

1

LEGEND

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

PROJECT AREA	DISTURBED AREA 1
3.99 ACRES	1.95 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

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- PeB — PERIDGE GRAVELLY SILT LOAM, 1 TO 3% SLOPES
- PeC — PERIDGE SILT LOAM, 3 TO 8% SLOPES
- APPROXIMATE LIMITS OF SOIL TYPE

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

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BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
JEREMY WADE NEWD 9TH
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

EROSION CONTROL PLAN - 4
SHEET TITLE

SHEET NUMBER
19

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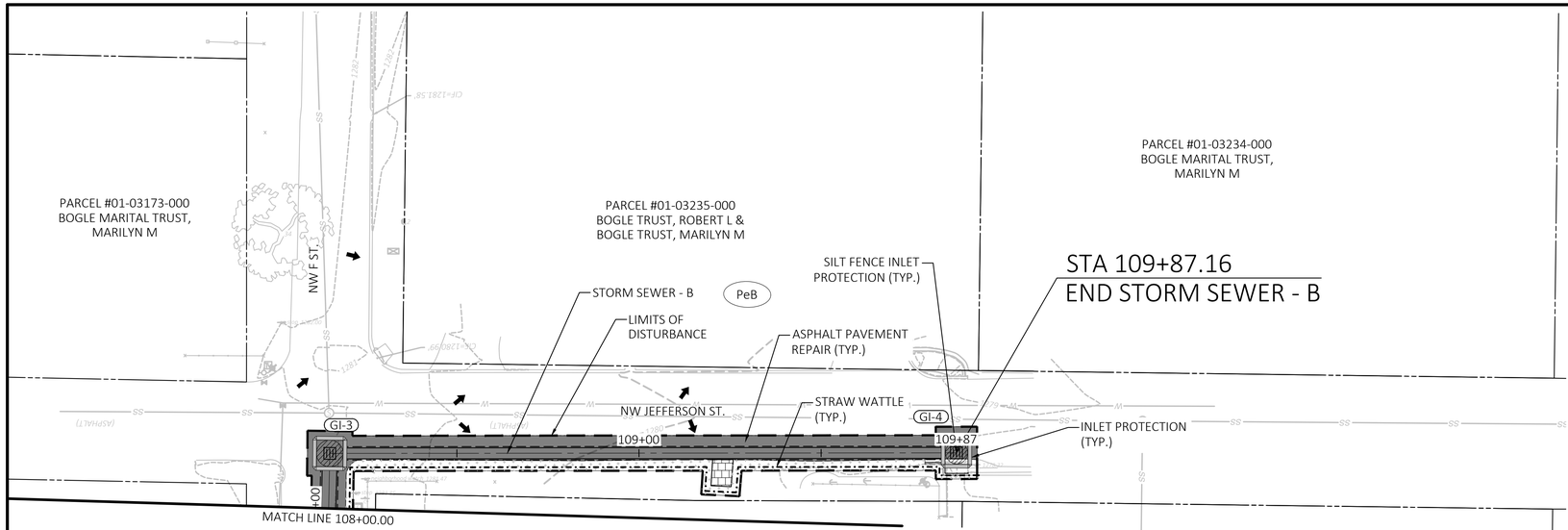

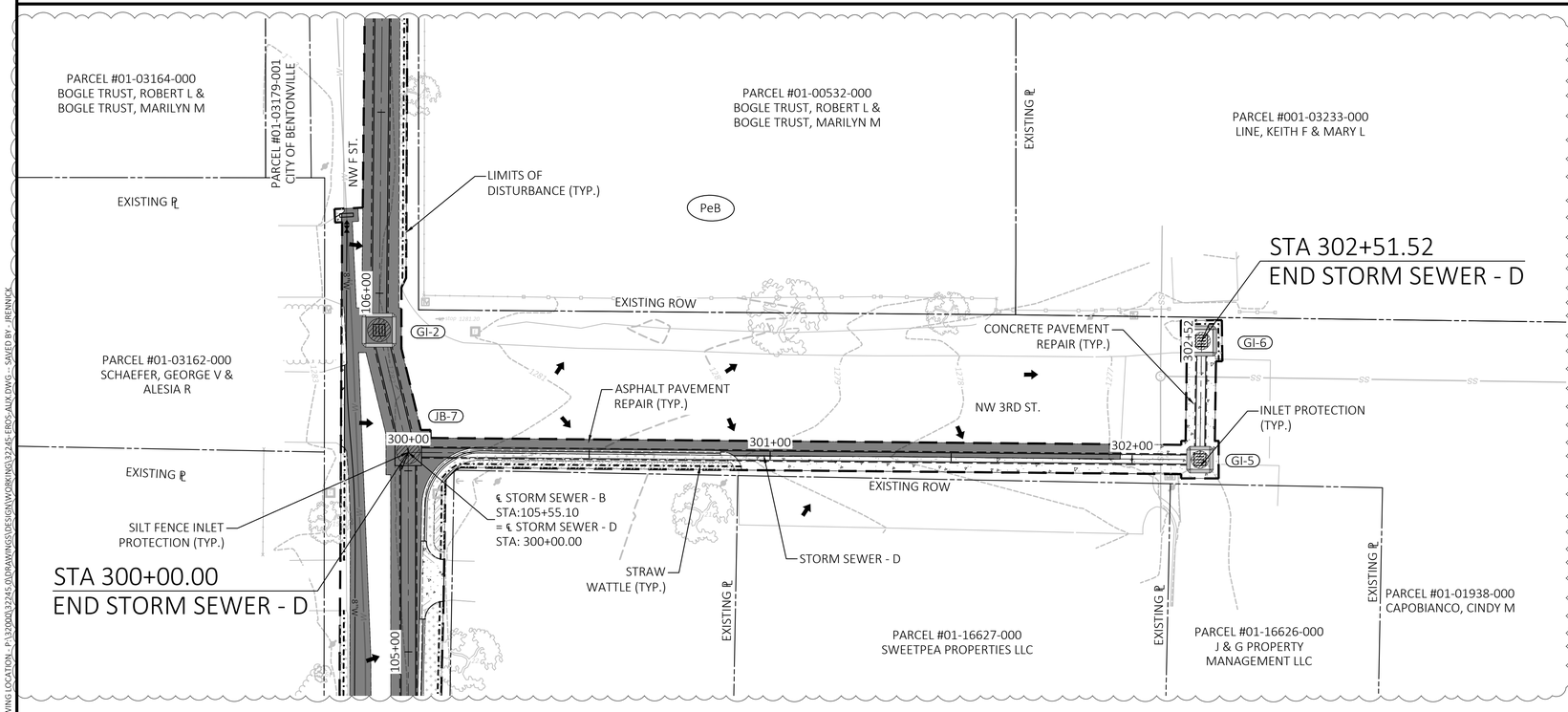

N

0 20' 30' 40'

SCALE IN FEET

LEGEND

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

PROJECT AREA	DISTURBED AREA
3.99 ACRES	1.95 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

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- APPROXIMATE LIMITS OF SOIL TYPE

REVISION

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2	CHANGE ORDER NO. 2	2024-03-25

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3108 SW REGENCY PKWY
BENTONVILLE, AR 72712
PHONE: (479) 273-9472
FAX: (479) 273-0844

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NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 17650
ANDREW D. NIX
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

EROSION CONTROL PLAN - 5

SHEET TITLE

SHEET NUMBER

20

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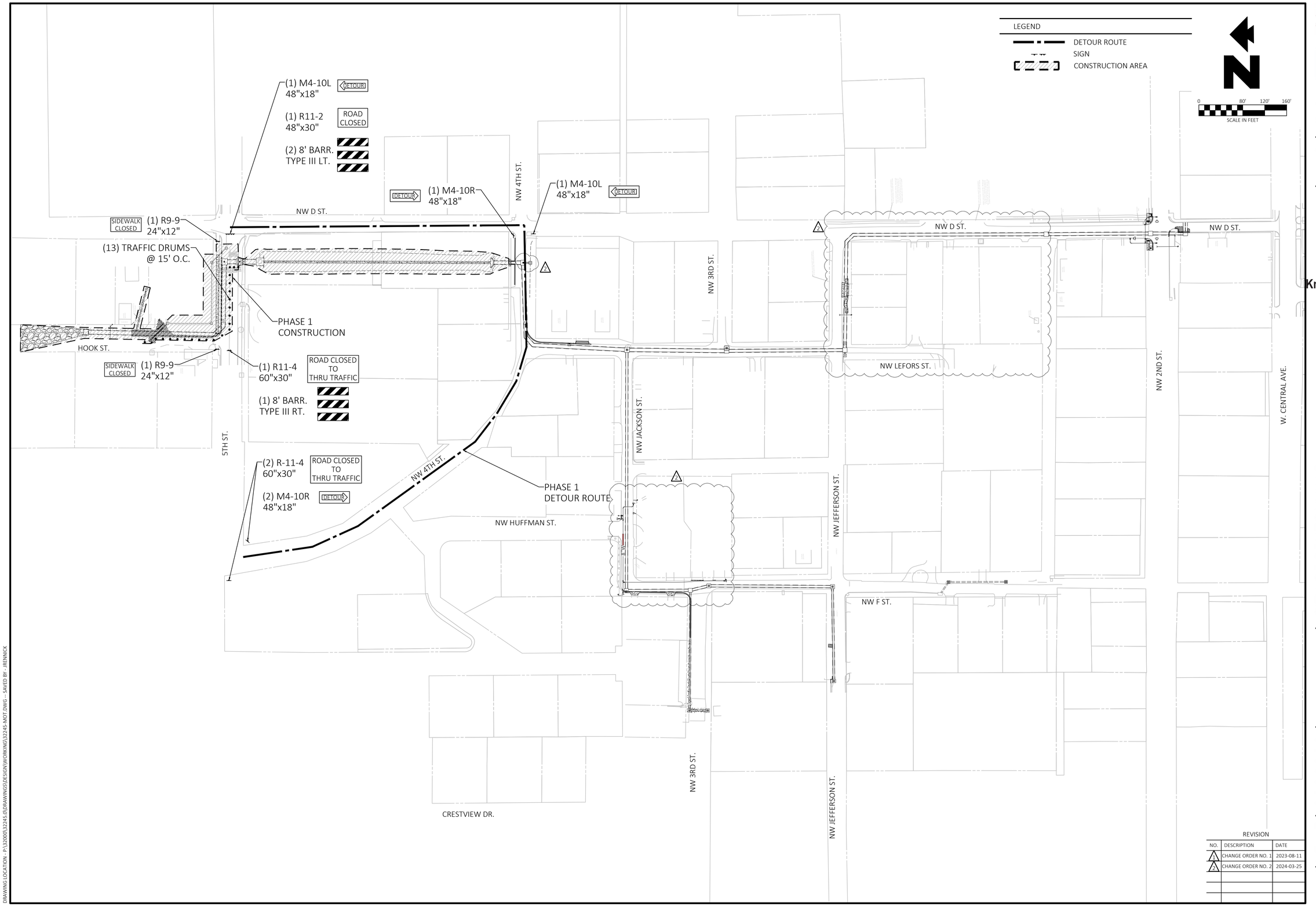

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REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

CEI Solutions for Land and Life

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

811 Know what's below. Call before you dig.

APPROVED FOR B CONSTRUCTION
04/12/2024 8:50:57 AM

CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. KNOX
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

MAINTENCE OF TRAFFIC PLAN - PHASE 1
SHEET TITLE

SHEET NUMBER
21

LEGEND

DETOUR ROUTE

SIGN

CONSTRUCTION AREA

N

0 80' 120' 160'

SCALE IN FEET

PHASE 2 DETOUR ROUTE

PHASE 2 CONSTRUCTION

DETOUR (1) M4-10L 48"x18"

ROAD CLOSED (1) R11-2 48"x30"

(2) 8' BARR. TYPE III

SIDEWALK CLOSED (2) R9-9 24"x12"

ROAD CLOSED TO THRU TRAFFIC (1) R11-4 60"x30"

(1) 8' BARR. TYPE III

(1) M4-10R 48"x18"

(2) R11-2 48"x30"

(2) M4-10L 48"x18"

(1) R11-2 48"x30"

(1) M4-10R 48"x18"

(1) M4-10L 48"x18"

(1) R11-2 48"x30"

(1) 8' BARR. TYPE III

(1) M4-10R 48"x18"

(1) M4-10L 48"x18"

(1) M4-10L 48"x18"

(1) M4-10R 48"x18"

(1) M4-10L 48"x18"

(1) M4-10R 48"x18"

(1) M4-10L 48"x18"

NW D ST.

NW 4TH ST.

NW 3RD ST.

NW JACKSON ST.

NW JEFFERSON ST.

NW LEFORS ST.

NW 2ND ST.

W. CENTRAL AVE.

HOOK ST.

5TH ST.

NW HUFFMAN ST.

NW F ST.

CRESTVIEW DR.

CEI ENGINEERING ASSOCIATES, INC.
3108 SW REGENCY PKWY
BENTONVILLE, AR 72712
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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11660
ANDREW D. KNICK

03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

MAINTENCE OF TRAFFIC PLAN - PHASE 2

SHEET TITLE

SHEET NUMBER

22

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

DRAWING LOCATION - P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245-MOT.DWG - SAVED BY: JRENNICK

LEGEND

DETOUR ROUTE

SIGN

CONSTRUCTION AREA

N

0 80' 120' 160'

SCALE IN FEET

NW D ST.

NW 4TH ST.

NW 3RD ST.

NW JACKSON ST.

NW JEFFERSON ST.

NW LEFORS ST.

NW 2ND ST.

W. CENTRAL AVE.

SW E ST.

SW 2ND ST.

NW HUFFMAN ST.

NW F ST.

CRESTVIEW DR.

NW 3RD ST.

NW JEFFERSON ST.

DETOUR

ROAD CLOSED TO THRU TRAFFIC

ROAD CLOSED

SIDEWALK CLOSED

(1) M4-10R 48"x18"

(1) R11-4 60"x30"

(1) 8' BARR. TYPE III

(2) R11-2 48"x30"

(2) 8' BARR. TYPE III

(2) M10-4L 48"x18"

(1) M4-10L 48"x18"

(2) R9-9 24"x12"

(6) R11-2 48"x30"

(6) 8' BARR. TYPE III

(4) R11-2 48"x30"

(4) 8' BARR. TYPE III

PHASE 3 CONSTRUCTION

PHASE 3 DETOUR ROUTE

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

CEI ENGINEERING ASSOCIATES, INC.
3108 SW REGENCY PKWY
BENTONVILLE, AR 72712
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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. KNIGHT
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

MAINTENCE OF TRAFFIC PLAN - PHASE 3

SHEET TITLE

SHEET NUMBER

23

DRAWING LOCATION: P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245-MOT DWG - SAVED BY: JRENNICK

LEGEND

DETOUR ROUTE

SIGN

CONSTRUCTION AREA

0 80' 120' 160'

SCALE IN FEET

NW D ST.

NW 4TH ST.

NW 3RD ST.

NW LEFORS ST.

NW JACKSON ST.

NW JEFFERSON ST.

NW 2ND ST.

W. CENTRAL AVE.

SW E ST.

SW 2ND ST.

NW F ST.

NW G ST.

NW HUFFMAN ST.

CRESTVIEW DR.

DETOUR

ROAD CLOSED TO THRU TRAFFIC

(1) M4-10L 48"x18"

(1) R11-4 60"x30"

(1) 8' BARR. TYPE III

(1) M4-10R 48"x18"

(27) TRAFFIC DRUMS @ 15' O.C.

PHASE 4 CONSTRUCTION

ROAD CLOSED

(4) R11-2 48"x30"

(4) 8' BARR. TYPE III

PHASE 4 DETOUR ROUTE

DRAWING LOCATION - P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245-MOT.DWG - SAVED BY - JRENNICK

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
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CEI Solutions for Land and Life

CEI ENGINEERING ASSOCIATES, INC.
3108 SW REGENCY PKWY
BENTONVILLE, AR 72712
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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. KNOTT
03/29/2024

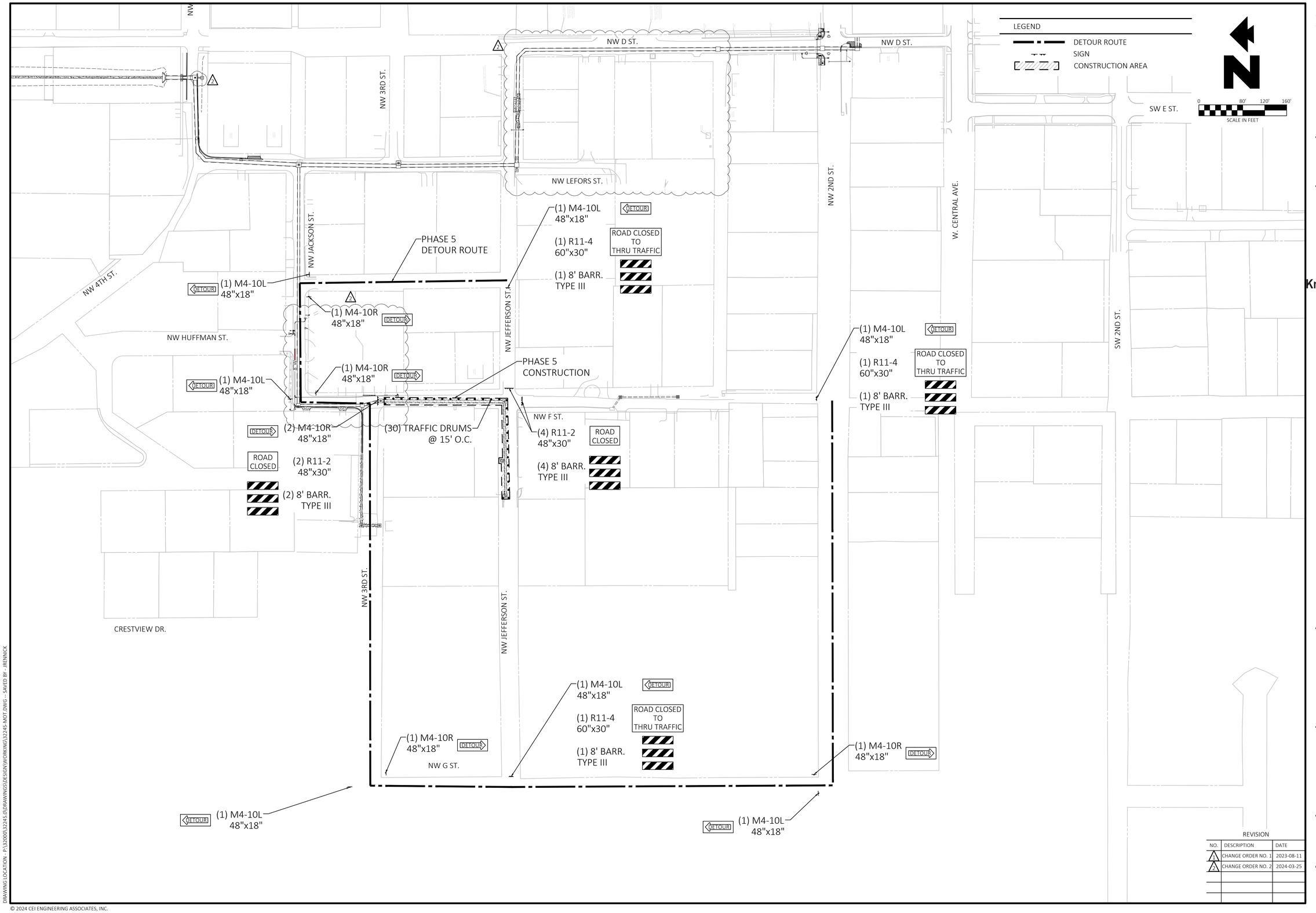
PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

MAINTENCE OF TRAFFIC PLAN - PHASE 4

SHEET TITLE

SHEET NUMBER

24



REVISION

NO.	DESCRIPTION	DATE
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2	CHANGE ORDER NO. 2	2024-03-25

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NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. KNOX
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

MAINTENCE OF TRAFFIC PLAN - PHASE 5

SHEET TITLE

SHEET NUMBER

25

STRUCTURES

STATION	DESCRIPTION	REIN. CONC. PIPE CULVERT (CLASS III) 18"	30"	48"	REIN. CONC. PIPE CULVERT (CLASS IV) 30"	36"	REIN. CONC. BOX CULVERT (CLASS III) 4'x4'	5'x4'	6'x4'	7'x4'	8'x3'	DROP INLETS: DETENTION POND OUTFALL 12'x12'	TYPE C RECTANGULAR CURB INLET 6'x6'	10'x4'	AREA INLET 4'x4'	7'x7'	REVERSE CURB INLET 6'x6'	8'x8'	10'x10'	TYPE TM 4'x4'	GRATE 5'x5'	6'x6'	8'x8'	JUNCTION BOX TYPE E 5'x5'	6'x6'	7'x7'	FLARED END SECTION 18"	CONCRETE HEADWALL	FLOWABLE FILL	CRUSHED STONE (ARDOT CLASS 7) BACKFILL FOR STORM SEWER	GRANULAR BACKFILL FOR STORM SEWER
		LF										EA																	CY	TON	
00+00.00	HEADWALL																										1			
01+04.29	FLARED END SECTION	82																								1				
02+29.20	45° DEFLECTION									229																				
02+51.25	45° DEFLECTION									22																				
02+61.29	TYPE TM INLET																		1											
03+68.78	REVERSE CURB INLET									118								1												
03+96.52	DROP INLET									28			1																	
04+33.85	POND OUTLET										37	1																		
08+59.83	HEADWALL																										1			
09+13.34	REVERSE CURB INLET								54									1												
09+13.99	AREA INLET	13													1															
10+23.85	TYPE TM INLET																		1											
10+49.00	40° DEFLECTION								136																					
10+68.50	45° DEFLECTION								19																					
11+34.27	TYPE TM INLET																		1											
12+38.62	GRATE INLET								171													1								
14+21.38	JUNCTION BOX		5						179																1					
16+36.78	JUNCTION BOX							214																	1					
16+36.78	AREA INLET	10													1															
16+49.21	TYPE TM INLET																		1											
18+34.31	45° DEFLECTION							198																						
18+52.05	44° DEFLECTION							18																						
22+03.37	JUNCTION BOX							351																	1					
23+93.53	JUNCTION BOX							190																	1					
23+94.02	DROP INLET												1																	
24+57.13	JUNCTION BOX							64																	1					
104+38.73	REVERSE CURB INLET						439										1													
105+55.10	JUNCTION BOX						116																	1						
105+89.79	GRATE INLET			35																	1									
108+15.10	GRATE INLET			225																	1									
109+87.16	GRATE INLET					172														1										
302+18.73	GRATE INLET				219															1										
302+51.52	GRATE INLET				33															1										
ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY ENGINEER																												56		
ENTIRE PROJECT																													1333	11145
TOTALS:		**105**	**5**	**260**	**252**	**172**	**555**	**1035**	**559**	**397**	**37**	**1**	**1**	**1**	**2**	**0**	**1**	**1**	**1**	**4**	**3**	**2**	**1**	**0**	**1**	**5**	**1**	**2**	**56**	**1333**	**11145**

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

PERMANENT PAVEMENT MARKINGS

DESCRIPTION	THERMOPLASTIC PAVEMENT MARKINGS: BIKE SYMBOL	4" YELLOW	12" WHITE	24" WHITE
	EA	LF		
THERMOPLASTIC PAVEMENT MARKING - REFLECTIVE WHITE "BIKE" SYMBOL	2			
THERMOPLASTIC PAVEMENT MARKING - YELLOW (4")		32		
THERMOPLASTIC PAVEMENT MARKING - WHITE (12")			12	
THERMOPLASTIC PAVEMENT MARKING - WHITE (24")				36
TOTALS:	**2**	**32**	**12**	**36**

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.

REMOVE AND SALVAGE/RELOCATE ITEMS

STATION	STATION	LOCATION	SIGN	WATER METER	FIRE HYDRANT	MAILBOX & SUPPORT
			EA			
00+00.00	24+57.13	HOOK ST. TO NW D ST.	1	2		1
100+00.00	109+87.16	JACKSON ST. TO JEFFERSON ST.	2	3	1	
300+00.00	302+51.52	NW 3RD ST.				1
TOTALS:			**3**	**5**	**1**	**2**

PERMANENT PAVEMENT REPAIR

STATION	STATION	LOCATION	AGGREGATE BASE SURFACE COURSE (CLASS 7) (6")	ASPHALT PAVEMENT	P.C. CONCRETE PAVEMENT	STAMPED AND COLORED CONCRETE PAVEMENT
			TON	SY		
00+00.00	24+57.13	HOOK ST. TO NW D ST.	194	2022		13
100+00.00	109+87.16	JACKSON ST. TO JEFFERSON ST.		1145	3	
300+00.00	302+51.52	NW 3RD ST.		76	96	
TOTALS:			**194**	**3243**	**99**	**13**

REMOVAL AND DISPOSAL OF CULVERTS AND INLETS

STATION	DESCRIPTION	PIPE CULVERTS	INLETS
		EA	
00+78.36	30"x19" ELLEPTICAL RCP	2	
00+98.61	18" CPP	2	
01+52.51	48" CMP	1	1
03+07.09	48" RCP	1	1
03+78.75	72"x26" ELLEPTICAL RCP	1	1
04+15.75	72"x26" ELLEPTICAL RCP	1	1
08+78.68	36" RCP	1	1
09+10.52	36" RCP	1	1
09+85.45	36" RCP	1	1
11+49.04	36" RCP	1	1
13+30.83	36" RCP	1	1
15+27.44	30" RCP	1	1
16+33.99	12" CMP	1	
13+64.50	12" RCP	1	
17+44.89	30" RCP	1	
23+93.56	36" RCP	1	
24+32.73	7'X3' BOX CULVERT	1	
TOTALS:		**19**	**10**

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

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL: SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	SOLID SODDING	CLASS 2 RIPRAP	TEMPORARY EROSION CONTROL: TEMPORARY SEEDING	MULCH COVER	WATER	WATTLE (20") (E-1)	INLET PROTECTION	SILT FENCE BOX PROTECTION	ROCK DITCH CHECKS (E-6)	*SEDIMENT REMOVAL & DISPOSAL	CONCRETE WASHOUT
			ACRE	TON	ACRE	M. GAL.	ACRE	SY		ACRE	TON	M. GAL.	LF		EA		CU. YD.	LS
00+00.00	24+57.13	HOOK ST. TO NW D ST.	0.11	0.22	0.11	22.97	0.11	3403	389	0.11	0.11	2.29	1709	148	16	11	32	1
100+00.00	109+87.16	JACKSON ST. TO JEFFERSON ST.	0.01	0.02	0.01	2.04	0.01	211		0.01	0.01	0.20	684	91	5		10	
300+00.00	302+51.52	NW 3RD ST.	0.01	0.02	0.01	2.04	0.01	26		0.01	0.01	0.20	108	40	2		4	
TOTALS:			**0.13**	**0.26**	**0.13**	**27.05**	**0.13**	**3640**	**389**	**0.13**	**0.13**	**2.70**	**2500**	**279**	**23**	**11**	**46**	**1**

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..... 12.6 GALS / SQ. YARD OF SOLID SODDING
WATTLE DITCH CHECKS..... 9 LIN. FT. / LOCATION
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 SYSTEM PERMIT.
*QUANTITIES ESTIMATED
SEE SECTION 104.03 OF THE STD. SPECS.

EARTHWORK

LOCATION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT
	CU. YD.	
ENTIRE PROJECT	2715	285
TOTALS:	**2715**	**285**

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	24+57.13	HOOK ST. TO NW D ST.	25	25
100+00.00	109+87.16	JACKSON ST. TO JEFFERSON ST.	10	10
300+00.00	302+51.52	NW 3RD ST.	3	3
TOTALS:			**38**	**38**

DRIVEWAYS AND TURNOUTS

STATION	SIDE	LOCATION	WIDTH	ASPHALT DRIVEWAY	P.C. CONCRETE DRIVEWAY
			FEET	SY	
11+57.64	LT	NW LEFORS ST.	23	16	
17+46.65	LT	NW JEFFERSON ST.	21		34
102+97.65	LT	NW JACKSON ST.	2		1
104+52.42	RT	NW F ST.	12		12
105+19.71	RT	NW F ST.	11.5		11
105+71.49	LT	NW F ST.	19.5		2
106+20.73	LT	NW F ST.	2		1
TOTALS:				**16**	**61**

REVISION

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NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11650
ANDREW J. KOTT
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
PIIP22-0010	

QUANTITIES - 1
SHEET TITLE

SHEET NUMBER
26

DRAWING LOCATION - P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245-QNTY.DWG - SAVED BY - JRENNICK

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	ASPHALT PAVEMENT	CONCRETE PAVEMENT	ASPHALT DRIVEWAY	CONCRETE DRIVEWAY	GRAVEL DRIVEWAY	CONCRETE SIDEWALK	CONCRETE CURB AND GUTTER	SEWER LINE	WATER LINE	MASONRY RETAINING WALL	TREES	CONCRETE STRUCTURE
			SY						LF					EA
00+00.00	24+57.13	HOOK ST. TO NW D ST.	2053	16	9	34	194	138	211	205	243	3	1	1
100+00.00	109+87.16	JACKSON ST. TO JEFFERSON ST.	1160			15		5	168		361			
300+00.00	302+51.52	NW 3RD ST.	82	96										
TOTALS:			3295	112	9	49	194	143	379	205	604	3	1	1

FENCE

STATION	STATION	LOCATION	HANDRAIL
			LF
0+00.00	0+00.00	HOOK ST.	29
TOTALS:			29

CONCRETE

STATION	STATION	DESCRIPTION	CONCRETE SIDEWALK AVG. WIDTH	CONCRETE SIDEWALK CONCRETE SIDEWALK	CONCRETE TRICKLE CHANNEL	STAMPED AND COLORED CONCRETE SIDEWALK	CONCRETE FLUME (4')
			FEET	SY			EA
00+00.00	24+57.13	HOOK ST. TO NW D ST.	5	149	184		1
100+00.00	109+87.16	JACKSON ST. TO JEFFERSON ST.				5	
TOTALS:				149	184	5	1

ADVANCE WARNING SIGNS

SIGN NUMBER	DESCRIPTION	SIGN SIZE	OVERALL DETOUR PLAN PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED NO.	SQ. FT.	TRAFFIC DRUMS	BARRICADES (TYPE III) RIGHT	LEFT
			EA.									LIN. FT.	
R9-9	SIDEWALK CLOSED	24"X12"	2	2	2			2	2	4			
R11-2	ROAD CLOSED	48"X30"	1	9	16	4	6	16	16	160			
R11-4	ROAD CLOSED TO THRU TRAFFIC	60"X30"	3	3	6	3	3	6	6	75			
M4-10R	DETOUR	48"X18"	3	5	5	2	6	6	6	36			
M4-10L	DETOUR	48"X18"	1	8	7	5	7	8	8	48			
	TRAFFIC DRUMS		13			27	30	30			30		
	BARRICADES TYPE III (8')		3	11	22	7	9	22				88	88
TOTALS:										323	30	88	88

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

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU. YD.
ENTIRE PROJECT TO BE USED IF	150
AND WHERE DIRECTED BY THE	
ENGINEER	
TOTAL:	150

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

WHEELCHAIR RAMPS

STATION	STATION	LOCATION	RAMPS
			EA
00+00.00	24+57.13	HOOK ST. TO NW D ST.	4
TOTAL:			4

CONCRETE COMBINATION CURB AND GUTTER

STATION	STATION	LOCATION	TYPE A (1'-6")
			LF
00+00.00	24+57.13	HOOK ST. TO NW D ST.	592
100+00.00	109+87.26	JACKSON ST. TO JEFFERSON ST.	100
300+00.00	302+51.52	NW 3RD ST.	78
TOTAL:			770

CONCRETE END CAP

STATION	LOCATION	CAST-IN-PLACE CONCRETE END CAP
		EA
24+32.73	NW D ST.	1
TOTALS:		1

RETAINING WALL

STATION	LOCATION	MASONRY RETAINING WALL
		SFF
24+37.93	NW D ST.	6
TOTALS:		6

REVISION

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NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11880
ANDREW D. KLINE
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
PIIP22-0010	

QUANTITIES - 2
SHEET TITLE

SHEET NUMBER
27

DRAWING LOCATION - P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245-QNTY.DWG - SAVED BY - JRENNICK

SUMMARY OF QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL QUANTITY
	WATER LINE RELOCATION		
1	TRENCHING AND EXCAVATION SAFETY SYSTEMS (WATER)	LS	1
2	REMOVAL AND DISPOSAL OF WATER LINE	LF	604
3	REMOVE AND SALVAGE WATER METER	EA	5
4	8" DUCTILE IRON PIPE	LF	123
5	8" TAPPING SLEEVE & VALVE	EA	3
6	8" GATE VALVE	EA	7
7	8" CUT, CAP AND ANCHOR COLLAR BLOCK	EA	3
8	DUCTILE IRON MJ FITTINGS	LB	1189
9	1" SERVICE LINE W/ SINGLE 5/8" METER SET (SHORT SIDE OF STREET)	EA	3
10	1" SERVICE LINE W/ SINGLE 5/8" METER SET (LONG SIDE OF STREET)	EA	UNUSED
11	CRUSHED STONE (ARDOT CLASS 7) BACKFILL (WATER)	TON	553
	SANITARY SEWER RELOCATION		
12	TRENCHING AND EXCAVATION SAFETY SYSTEMS (SEWER)	LS	1
13	REMOVAL AND DISPOSAL OF SEWER LINE	LF	217
14	12" SDR26 PVC SANITARY SEWER PIPE	LF	272
15	20" PIPE ENCASEMENT	LF	30
16	4' DIA. CAST-IN-PLACE MANHOLE, 6' DEPTH	EA	5
17	4' DIA. MANHOLE EXTRA DEPTH	VF	33
18	4" SEWER SERVICE CONNECTION (SHORT SIDE OF STREET)	EA	2
19	CRUSHED STONE (ARDOT CLASS 7) BACKFILL (SEWER)	TON	31
	ROADWAY		
20	MOBILIZATION	LS	1
21	CLEARING	STA	38
22	GRUBBING	STA	38
23	TRENCHING AND EXCAVATION SAFETY SYSTEMS (STORM)	LS	1
24	REMOVAL AND DISPOSAL OF ASPHALT PAVEMENT	SY	3295
25	REMOVAL AND DISPOSAL OF CONCRETE PAVEMENT	SY	112
26	REMOVAL AND DISPOSAL OF ASPHALT DRIVEWAY	SY	9
27	REMOVAL AND DISPOSAL OF CONCRETE DRIVEWAY	SY	49
28	REMOVAL AND DISPOSAL OF GRAVEL DRIVEWAY	SY	194
29	REMOVAL AND DISPOSAL OF CONCRETE SIDEWALK	SY	143
30	REMOVAL AND DISPOSAL OF CONCRETE CURB AND GUTTER	LF	379
31	REMOVAL AND DISPOSAL OF TREES	EA	1
32	REMOVAL AND DISPOSAL OF PIPE CULVERTS	EA	19
33	REMOVAL AND DISPOSAL OF INLETS	EA	10
34	REMOVE AND RELOCATE SIGN	EA	3
35	REMOVE AND RELOCATE MAILBOXES	EA	2
36	UNCLASSIFIED EXCAVATION	CY	2715
37	COMPACTED EMBANKMENT	CY	285
38	ASPHALT DRIVEWAY	SY	16
39	P.C. CONCRETE DRIVEWAY	SY	61
40	MAINTENANCE OF TRAFFIC	LS	1
41	SIGNS	SF	323
42	TRAFFIC DRUMS	EA	30
43	TYPE III BARRICADES	LF	176
44	18" REINFORCED CONCRETE PIPE, CLASS III	LF	105
45	30" REINFORCED CONCRETE PIPE, CLASS III	LF	5
46	48" REINFORCED CONCRETE PIPE, CLASS III	LF	260
47	30" REINFORCED CONCRETE PIPE, CLASS IV	LF	252
48	36" REINFORCED CONCRETE PIPE, CLASS IV	LF	172
49	4'x4' REINFORCED CONCRETE BOX CULVERT, CLASS III	LF	555
50	5'x4' REINFORCED CONCRETE BOX CULVERT, CLASS III	LF	1035
51	6'x4' REINFORCED CONCRETE BOX CULVERT, CLASS III	LF	559
52	7'x4' REINFORCED CONCRETE BOX CULVERT, CLASS III	LF	397
53	8'x3' REINFORCED CONCRETE BOX CULVERT, CLASS III	LF	37
54	DETENTION POND OUTFALL STRUCTURE (12'x12')	EA	1
55	TYPE C RECTANGULAR CURB INLETS (6'x6')	EA	1
56	TYPE C RECTANGULAR CURB INLETS (10'x4')	EA	1
57	AREA INLETS (4'x4')	EA	2
58	AREA INLETS (7'x7')	EA	UNUSED
59	REVERSE CURB INLETS (6'x6')	EA	1
60	REVERSE CURB INLETS (8'x8')	EA	1
61	REVERSE CURB INLETS (10'x10')	EA	1
62	TYPE TM INLETS (4'X4')	EA	4
63	GRATE INLETS (5'X5')	EA	3
64	GRATE INLETS (6'X6')	EA	2
65	GRATE INLETS (8'X8')	EA	1
66	TYPE E JUNCTION BOXES (6'x6')	EA	1
67	TYPE E JUNCTION BOXES (7'x7')	EA	5
68	FLOWABLE FILL	CY	56
69	CRUSHED STONE (ARDOT CLASS 7) BACKFILL FOR STORM SEWER	TON	1333
70	CONCRETE HEADWALL	EA	2
71	SELECTED PIPE BEDDING	CY	150
72	SEEDING	ACRE	0.13
73	TEMPORARY SEEDING	ACRE	0.13
74	LIME	TON	0.26
75	MULCH COVER	ACRE	0.26
76	WATER	M. GAL	30
77	SECOND SEEDING APPLICATION	ACRE	0.13
78	SOLID SODDING	SY	3640
79	RIPRAP (CLASS 2)	SY	389
80	WATTLE (20")	LF	2500
81	INLET PROTECTION	LF	279
82	SILT FENCE BOX PROTECTION	EA	23
83	ROCK DITCH CHECK	EA	11
84	SEDIMENT REMOVAL & DISPOSAL	CY	46
85	CONCRETE WASHOUT	LS	1
86	CONCRETE COMBINATION CURB AND GUTTER (TYPE A 1'-6")	LF	770
87	CONCRETE SIDEWALK	SY	149
88	CONCRETE TRICKLE CHANNEL	SY	184
89	STAMPED AND COLORED CONCRETE SIDEWALK	SY	5
90	CONCRETE FLUME (4')	EA	1
91	WHEELCHAIR RAMPS	EA	4
92	THERMOPLASTIC PAVEMENT MARKING - REFLECTIVE WHITE "BIKE" SYMBOL	EA	2
93	THERMOPLASTIC PAVEMENT MARKING - YELLOW (4")	LF	32
94	THERMOPLASTIC PAVEMENT MARKING - WHITE (12")	LF	12
95	THERMOPLASTIC PAVEMENT MARKING - WHITE (24")	LF	36
96	AGGREGATE BASE SURFACE COURSE (CLASS 7) (6")	TON	194
97	ASPHALT PAVEMENT REPAIR	SY	3243
98	P.C. CONCRETE PAVEMENT REPAIR	SY	99
99	STAMPED AND COLORED CONCRETE PAVEMENT REPAIR	SY	13
100	OWNER'S CONTINGENCY ALLOWANCE	LS	1
	CHANGE ORDER 1 ITEMS		
101	FLARED END SECTION (18")	EA	1
102	HANDRAIL	LF	29
	CHANGE ORDER 2 ITEMS		
103	REMOVAL AND DISPOSAL OF CONCRETE STRUCTURE	EA	1
104	REMOVAL AND DISPOSAL OF MASONRY RETAINING WALL	LF	3
105	REMOVE AND SALVAGE FIRE HYDRANT	EA	1
106	MASONRY RETAINING WALL	LF	6
107	ADJUST MANHOLE TO GRADE	EA	1
108	LOWER SEWER SERVICE LINE	EA	1
109	CAST-IN-PLACE CONCRETE END CAP	EA	1
110	6" PVC PIPE	LF	9
111	8" PVC PIPE	LF	370
112	16" PIPE ENCASEMENT	LF	21
113	6" GATE VALVE	EA	1
114	FIRE HYDRANT ASSEMBLY	EA	1
115	1" SERVICE LINE W/ DOUBLE 5/8" METER SET (SHORT SIDE OF STREET)	EA	1
116	8"X6" HYMAX COUPLING	EA	2
117	CONCRETE ANCHOR COLLAR BLOCK	EA	4
118	GRANULAR BACKFILL FOR STORM SEWER	TON	11145
119	EXPLORATORY EXCAVATION	LS	1

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

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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11880
ANDREW D. NUTT
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
PIIP22-0010	

REVISION

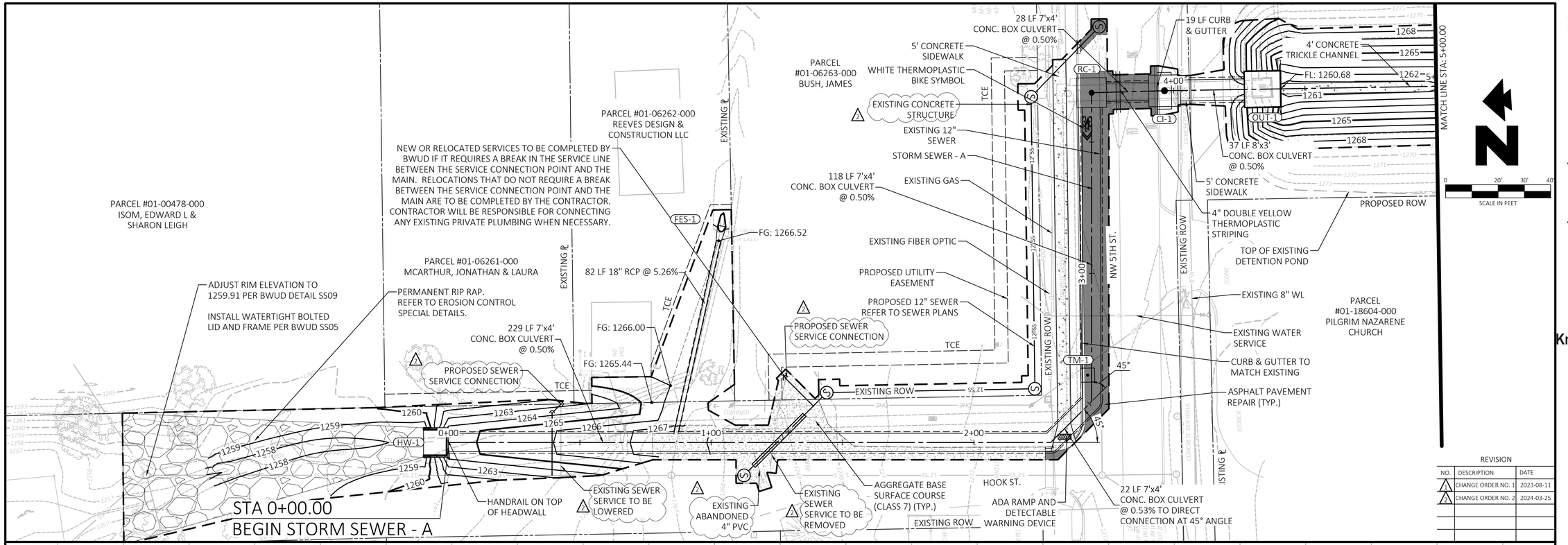
NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

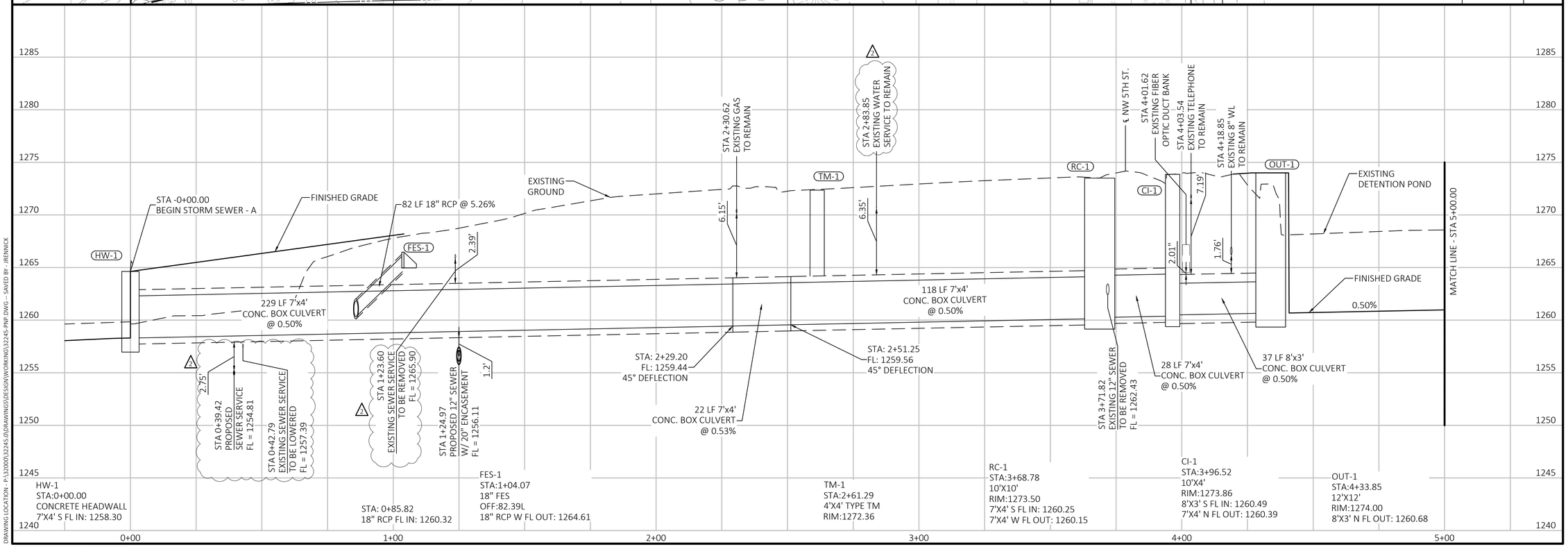
SUMMARY OF QUANTITIES

SHEET TITLE

SHEET NUMBER

28





REVISION

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BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
JAMES WILLIAM REEVES IV, P.E.
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
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STORM SEWER PLAN & PROFILE - 1
SHEET TITLE

SHEET NUMBER
29

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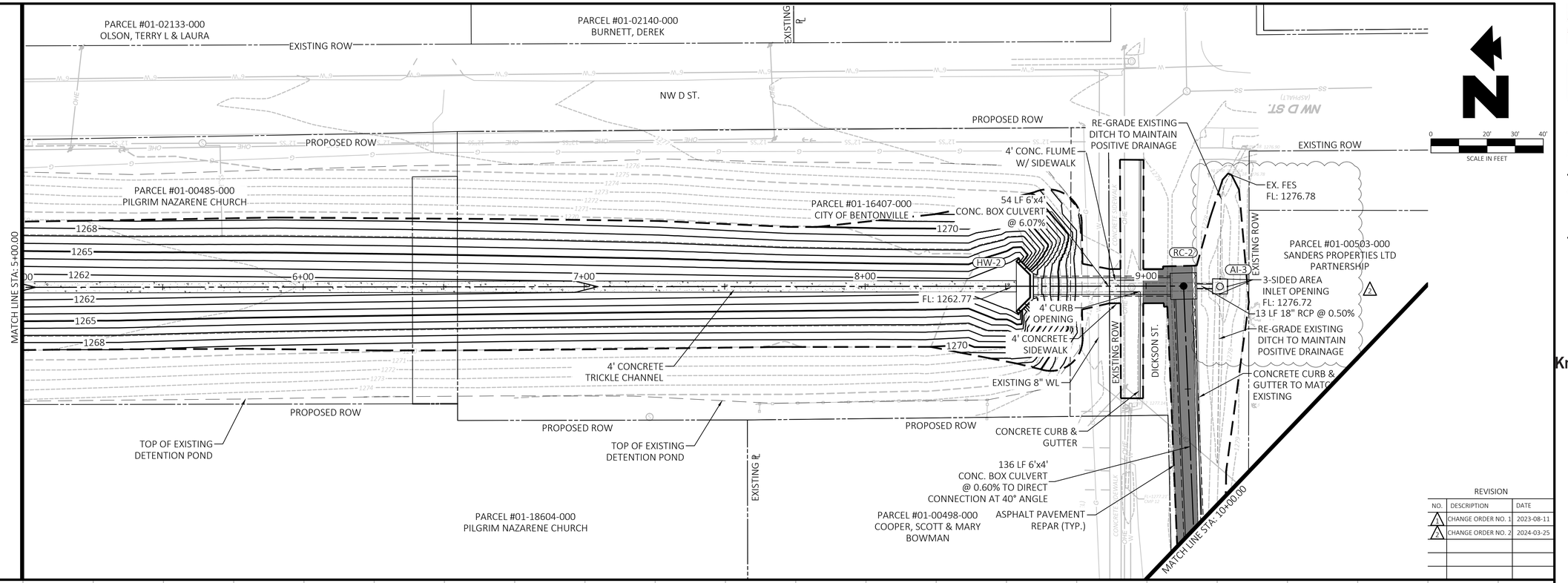

REVISION		
NO.	DESCRIPTION	DATE
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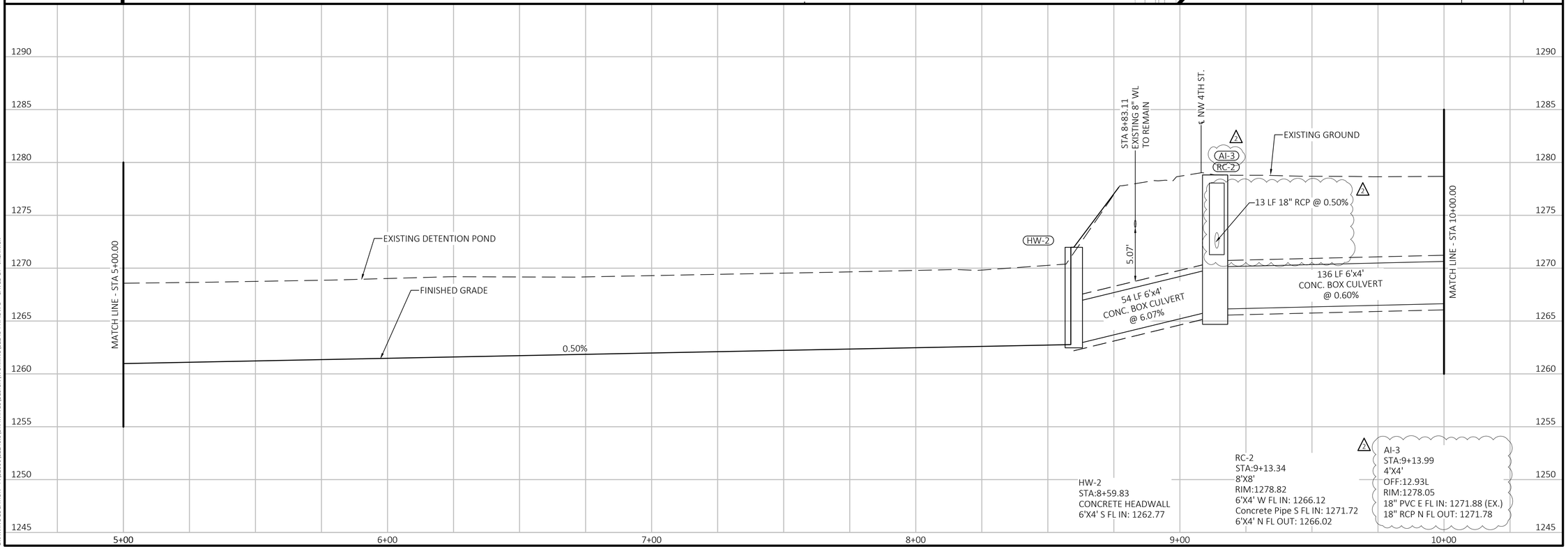

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NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. KLUTTZ
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
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STORM SEWER PLAN
& PROFILE - 2
SHEET TITLE

SHEET NUMBER
30

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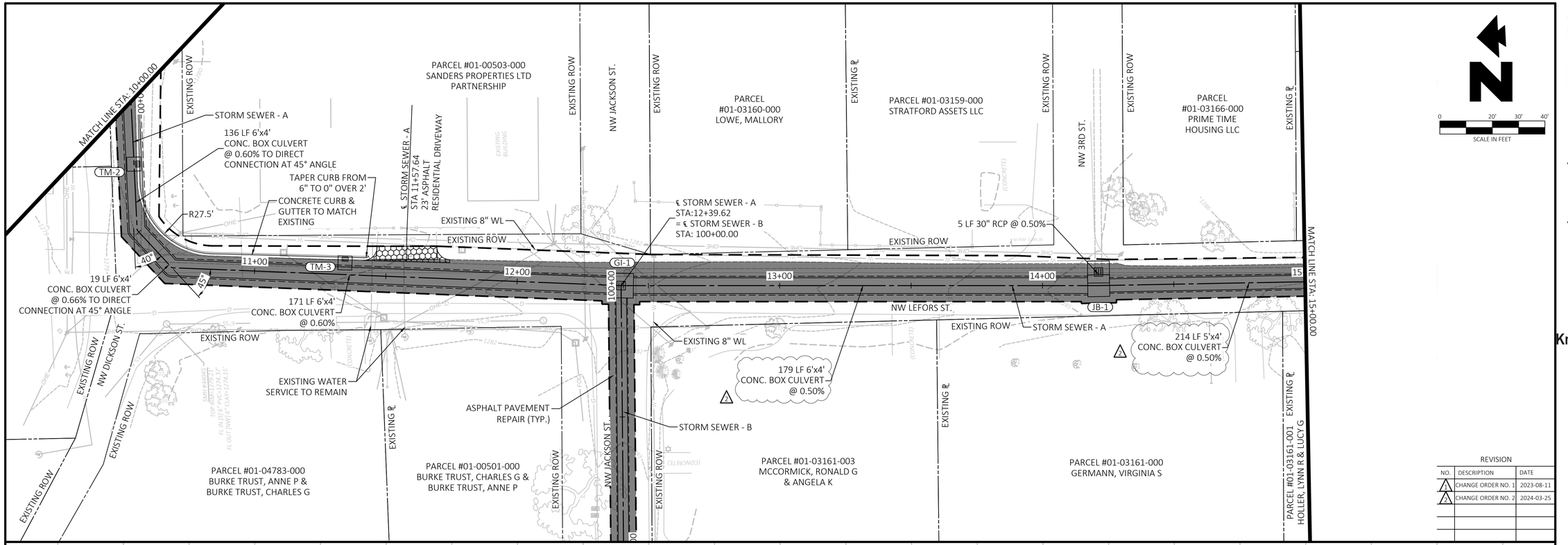

REVISION

NO.	DESCRIPTION	DATE
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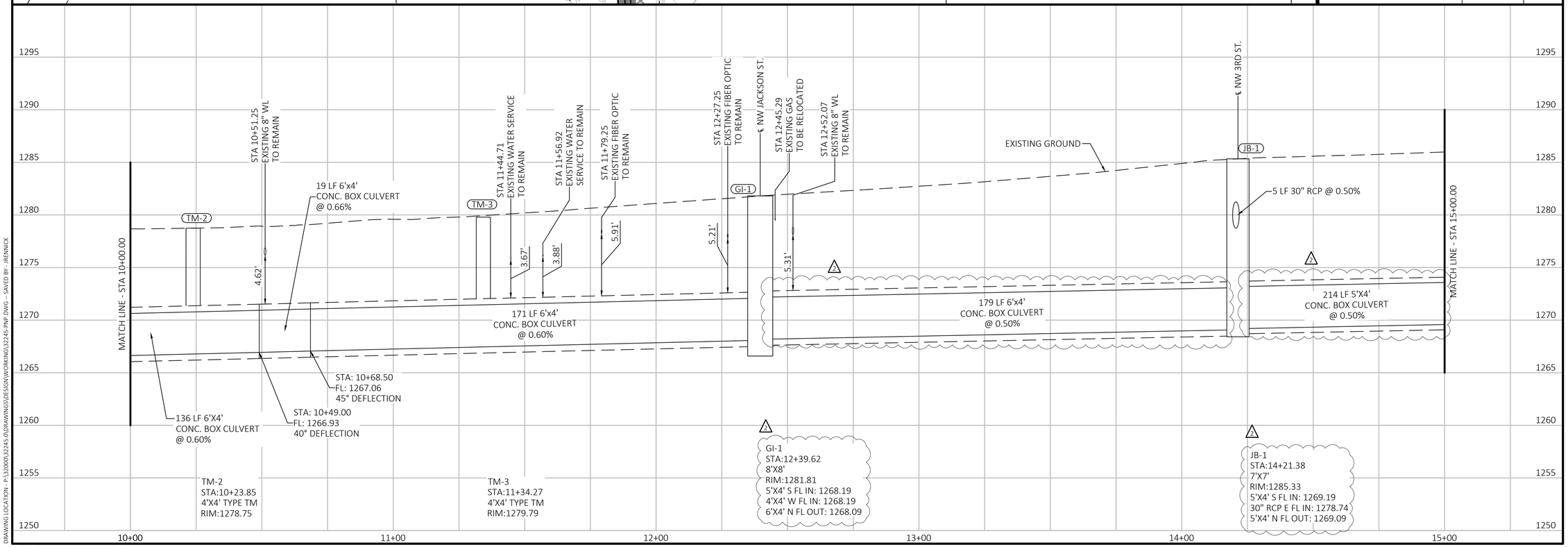

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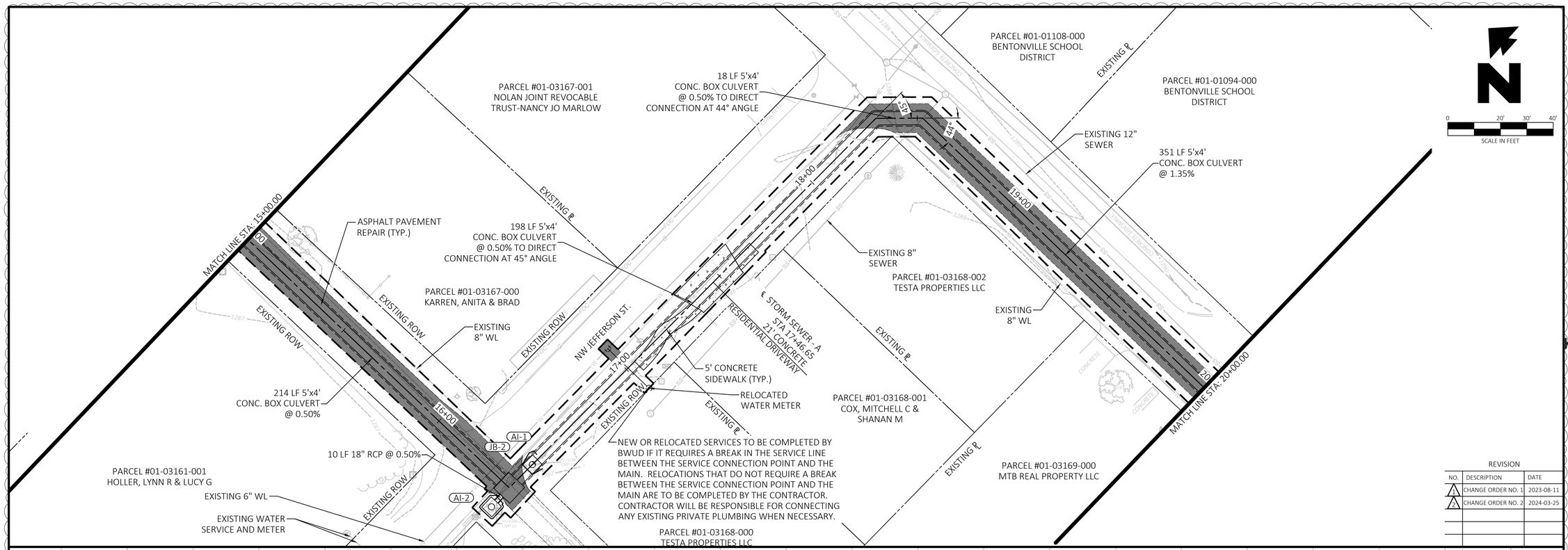
BENTONVILLE, AR

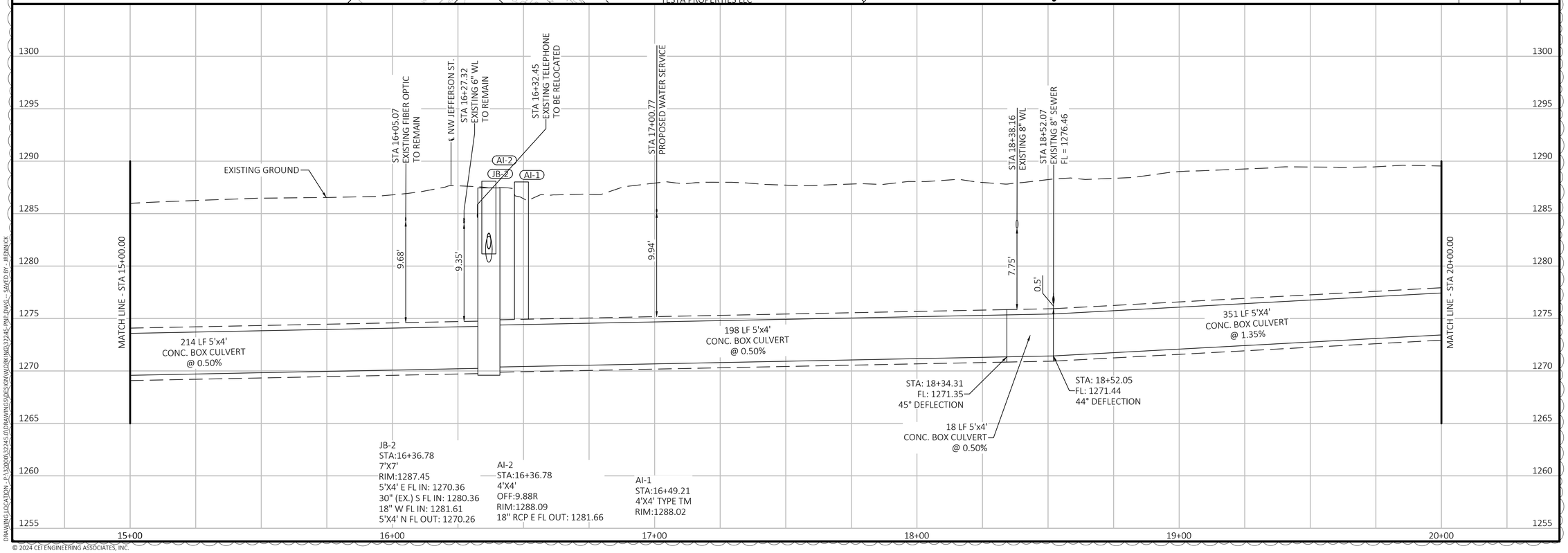
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
JAMES WD. RENNICK
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
PIIP22-0010	

STORM SEWER PLAN & PROFILE - 3
SHEET TITLE

SHEET NUMBER
31





REVISION		
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STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. NANCE
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
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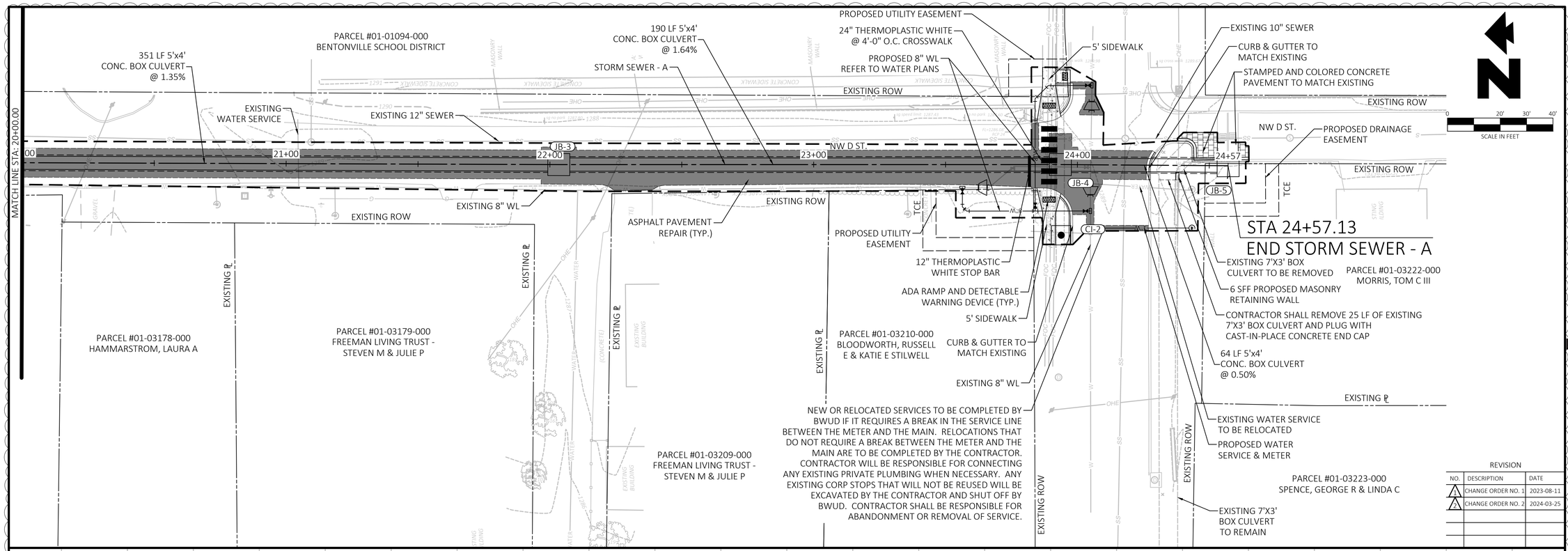
CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STORM SEWER PLAN & PROFILE - 4
SHEET TITLE

SHEET NUMBER
32



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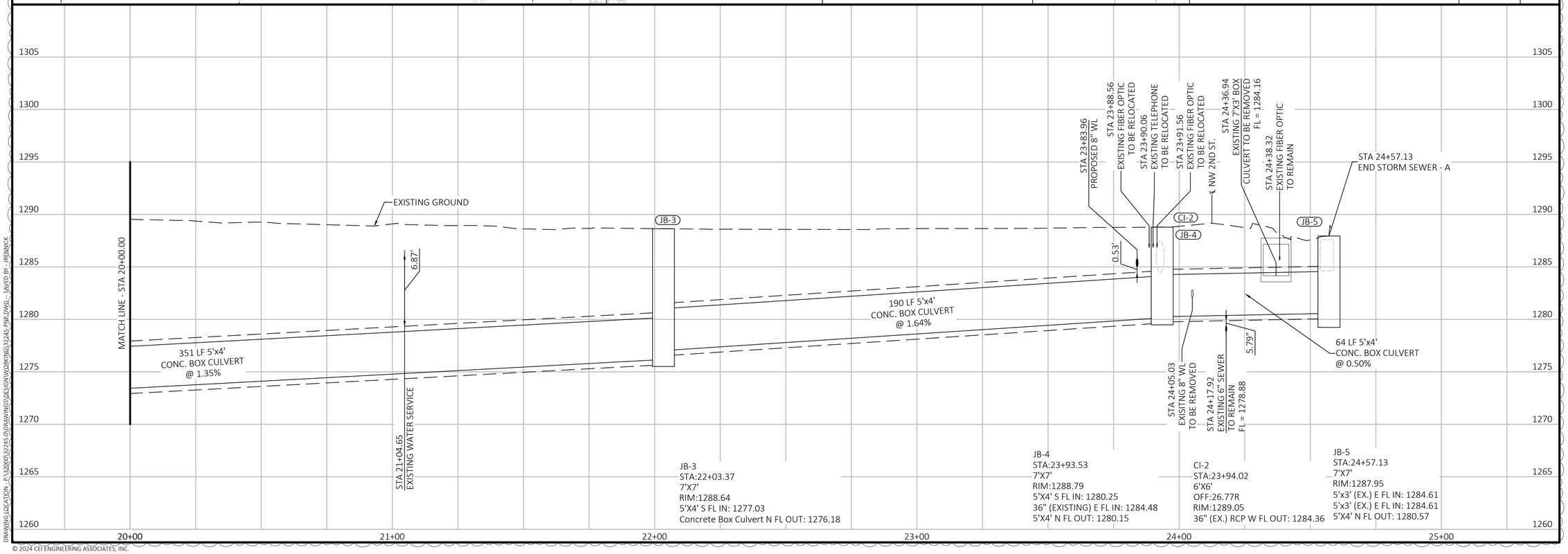

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NW 9TH AND D STREET
BENTONVILLE, AR

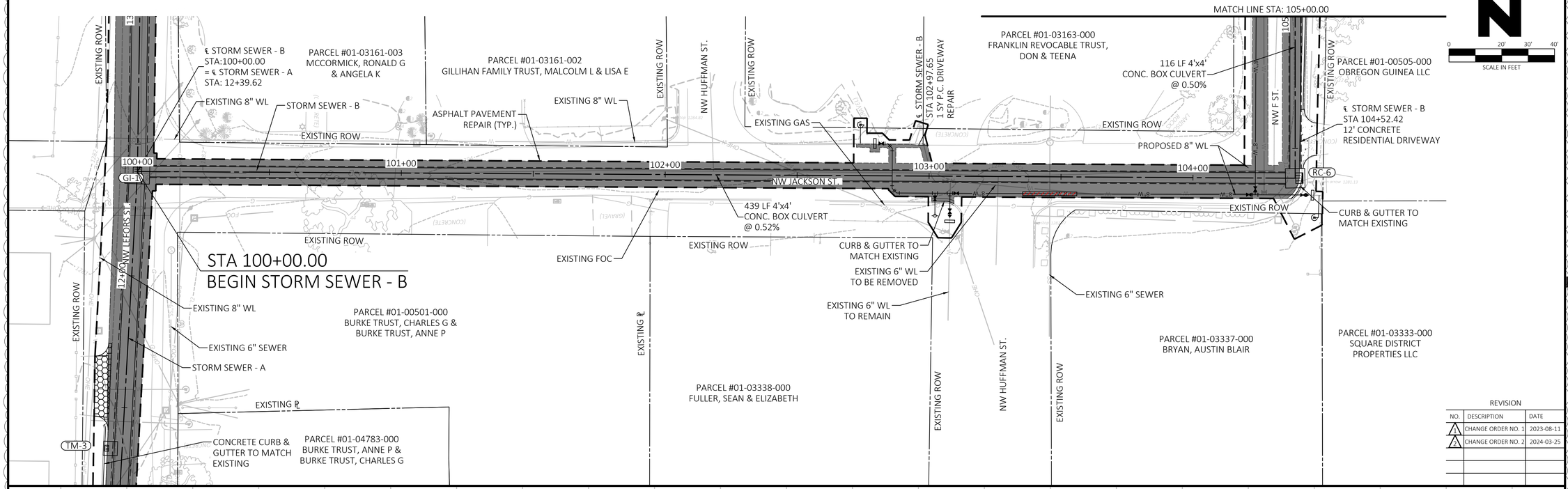
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
JAMES W. RUNNELS
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
PIIP22-0010	

STORM SEWER PLAN
& PROFILE - 5
SHEET TITLE

SHEET NUMBER
33

DRAWING LOCATION: P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245_PIIP.DWG - SAVED BY: JRENNICK



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NO.	DESCRIPTION	DATE
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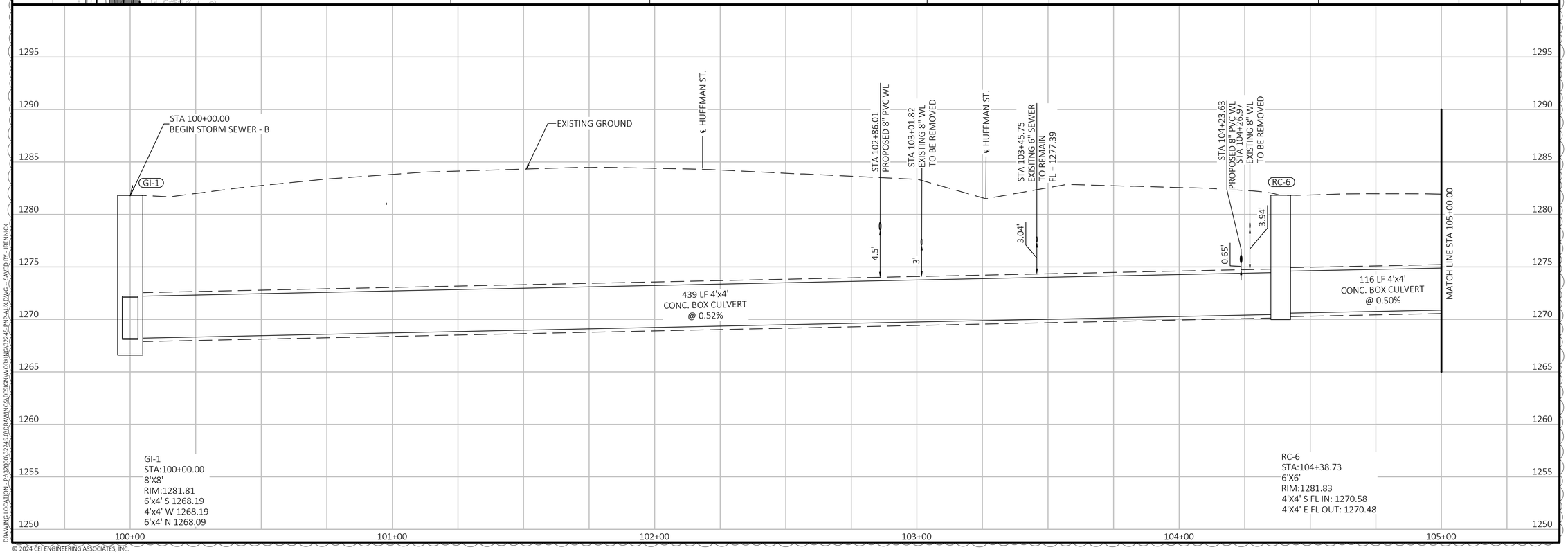

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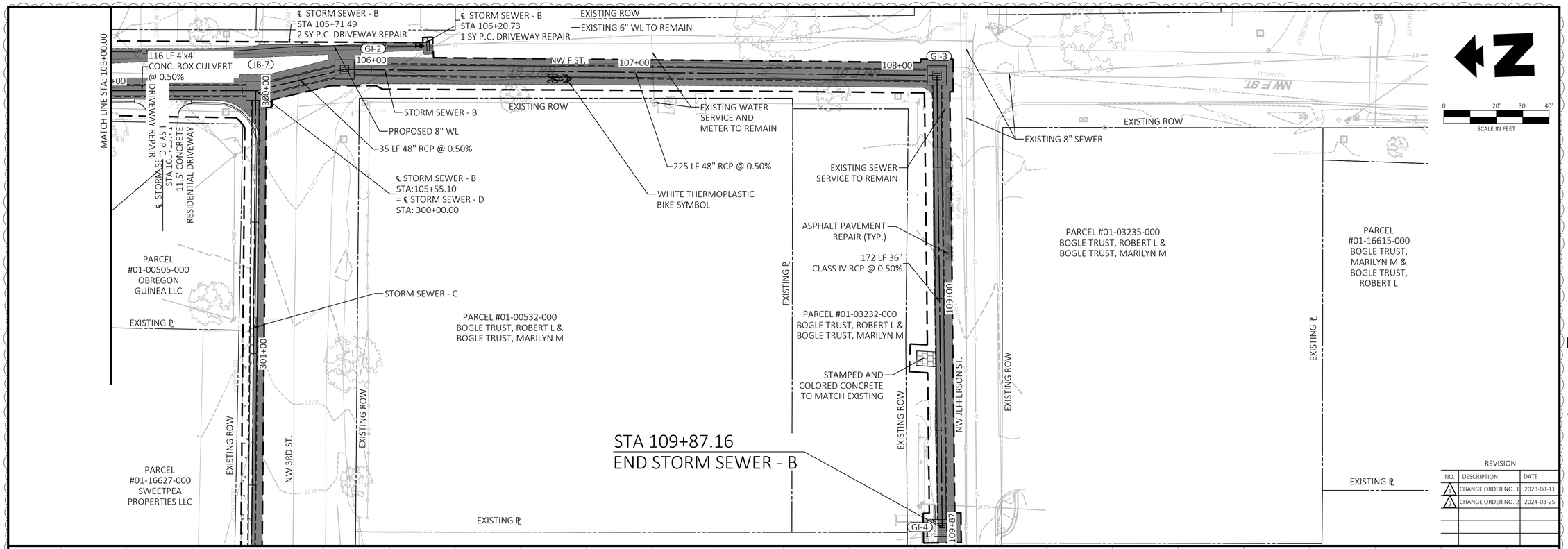
CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
JAMES WILLIAM KEENUM
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

STORM SEWER PLAN & PROFILE - 6
SHEET TITLE
SHEET NUMBER
34



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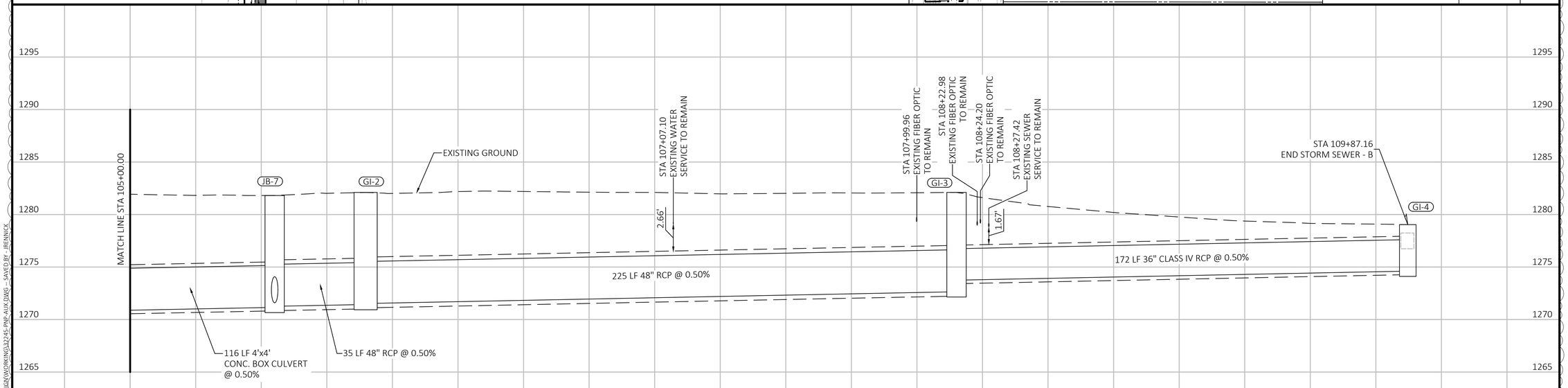

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3108 SW REGENCY PKWY
BENTONVILLE, AR 72712
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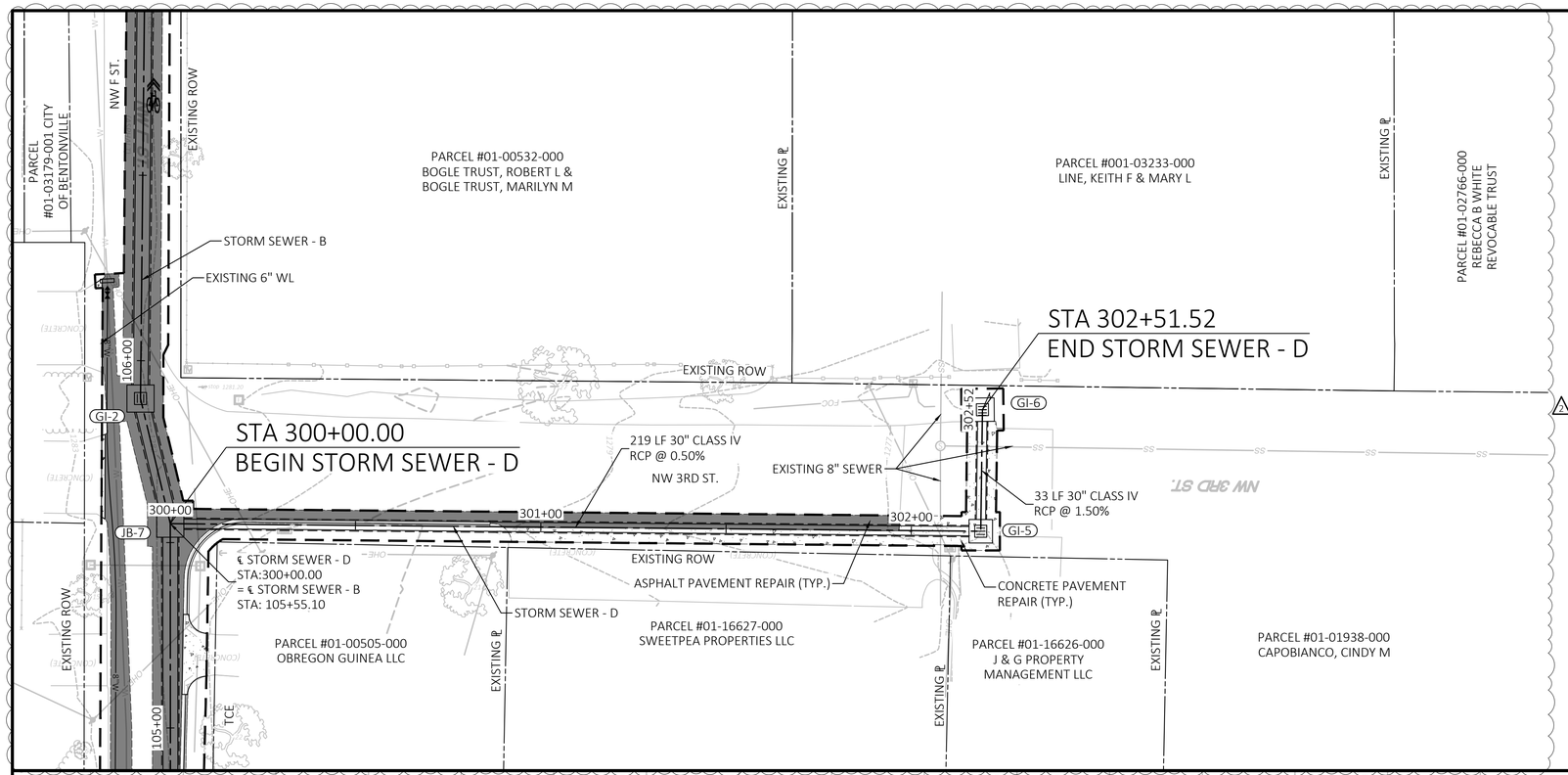
CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

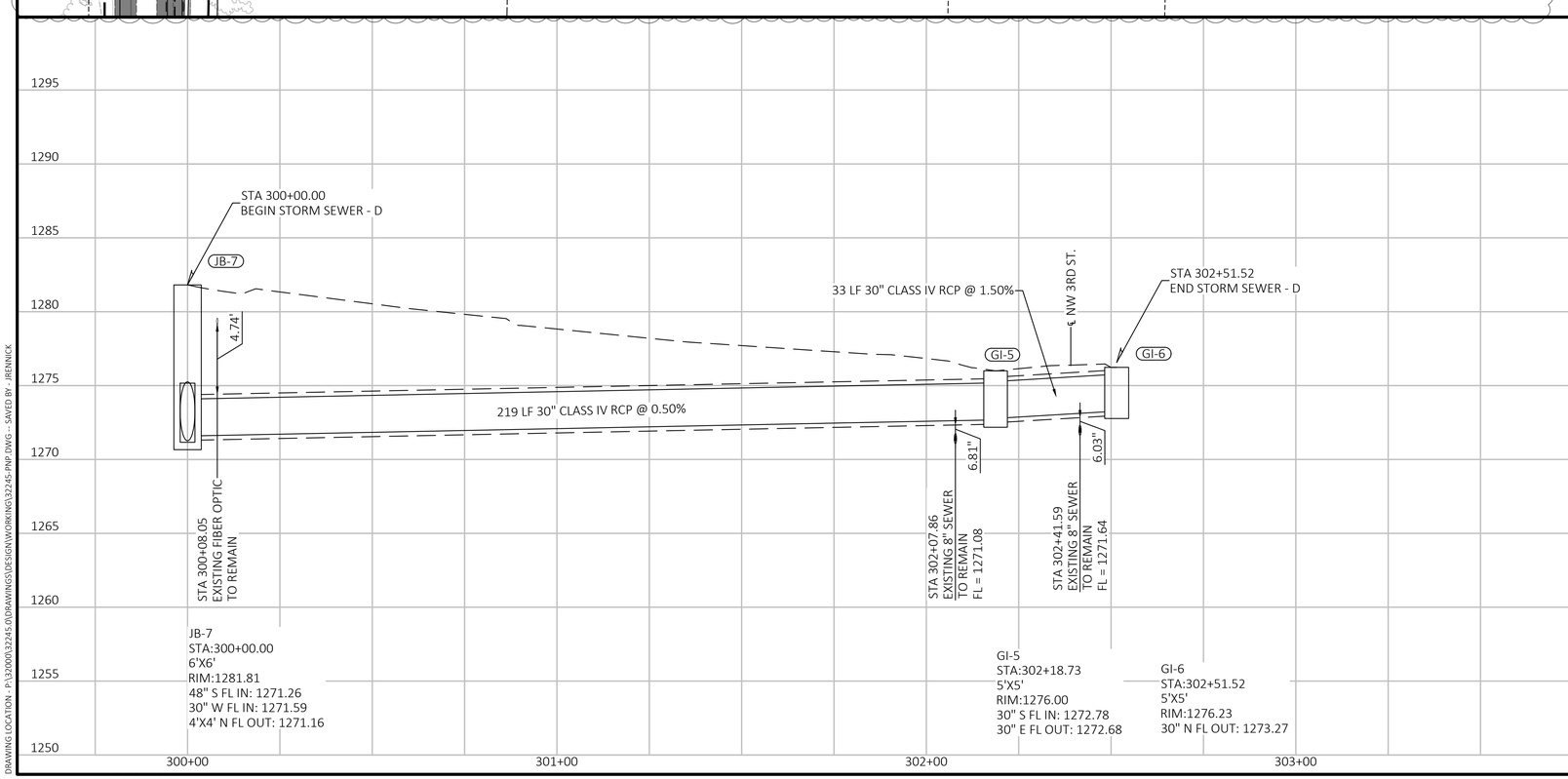
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. KOTT
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

STORM SEWER PLAN & PROFILE - 7
SHEET TITLE

SHEET NUMBER
35





0 20' 30' 40'
SCALE IN FEET

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

CEI ENGINEERING ASSOCIATES, INC.
3108 SW REGENCY PKWY
BENTONVILLE, AR 72712
PHONE: (479) 273-9472
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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. KNOX
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/26/2024
REVISION	CO 3
PIIP22-0010	

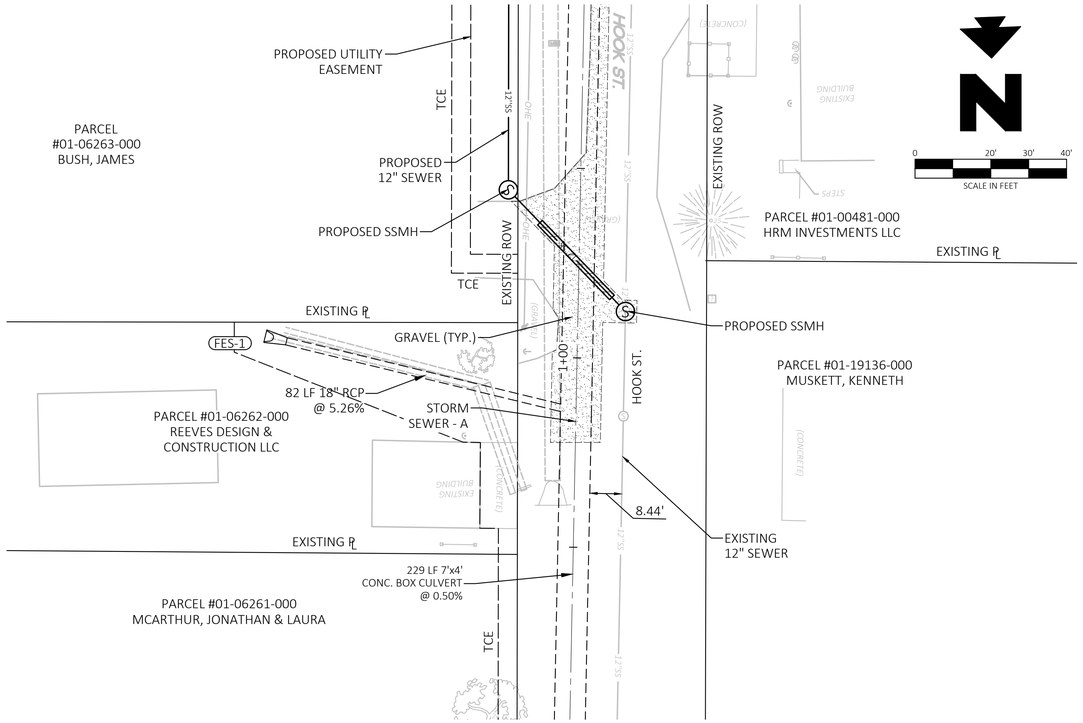
STORM SEWER PLAN & PROFILE - 9

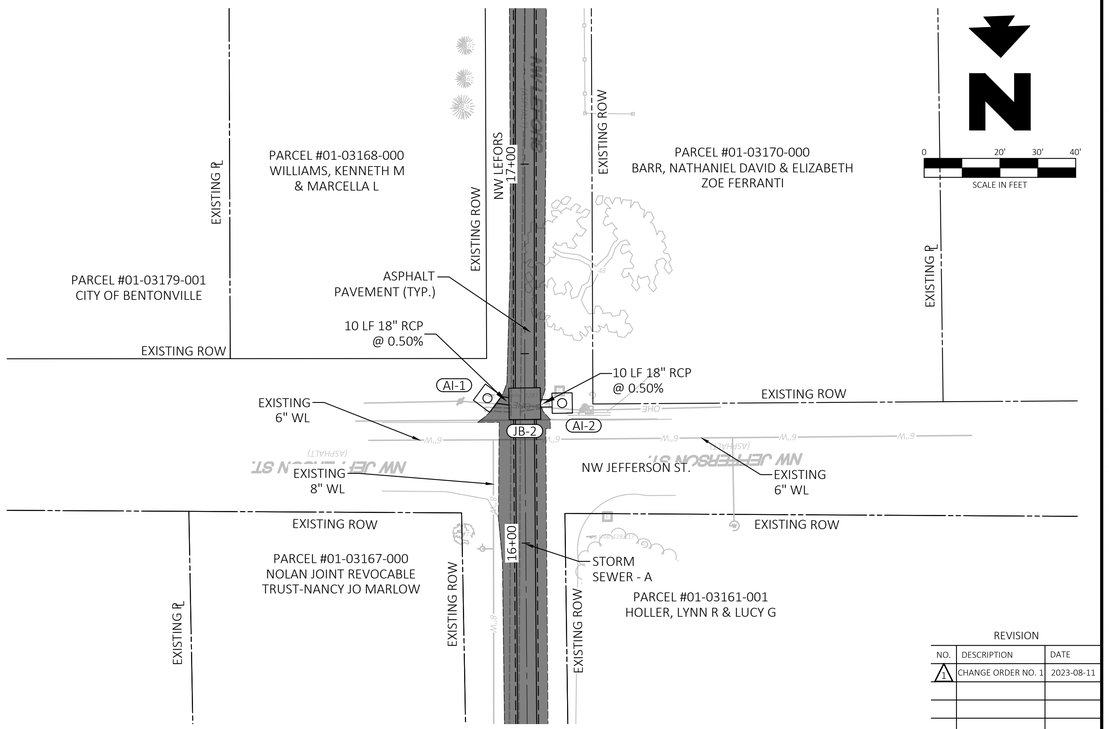
SHEET TITLE

SHEET NUMBER

36

DRAWING LOCATION - P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245-PNP.DWG - SAVED BY - JRENNICK





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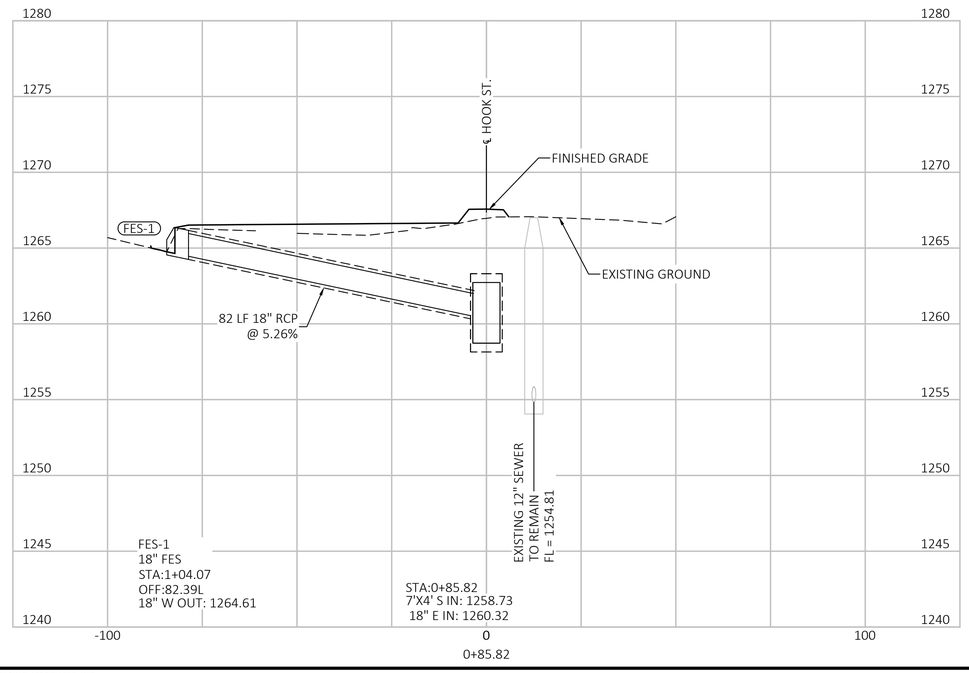
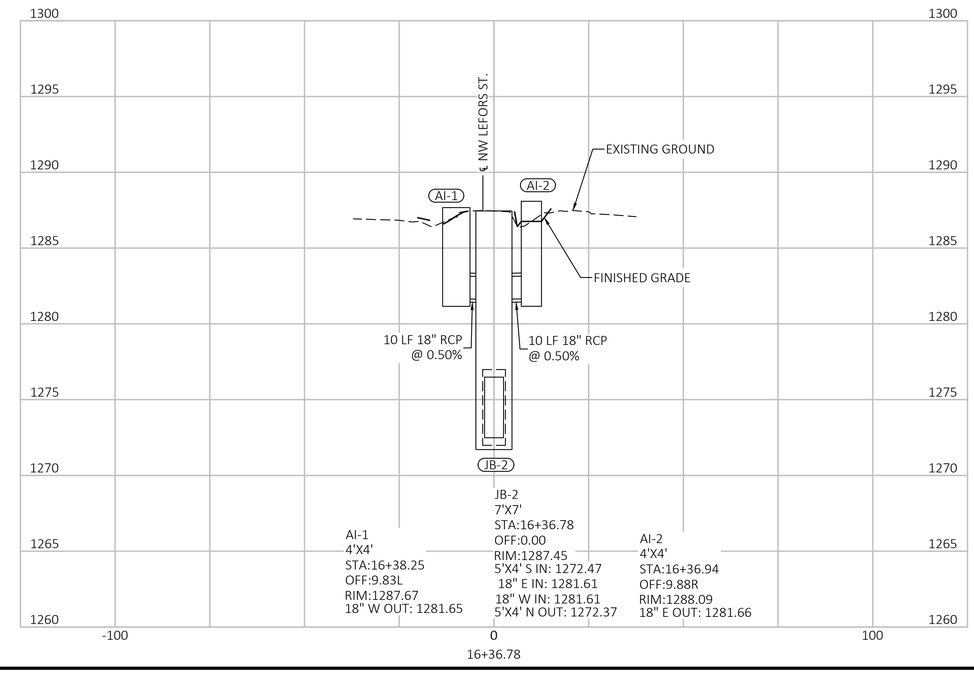
NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11





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

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APPROVED FOR B CONSTRUCTION
04/12/2024 8:50:59 AM

CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 17418
ANNA J. STAMPS
09/11/2023

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	8/10/2023
REVISION	CO 1
PIIP22-0010	

STORM SEWER BRANCH CROSS SECTIONS - 1
SHEET TITLE

SHEET NUMBER
37

N

0 200' 300' 400'

SCALE IN FEET

LEGEND

LIMITS OF PRE-DEVELOPED CONTRIBUTING DRAINAGE AREA
TIME OF CONCENTRATION PATH

CEI
Solutions for Land and Life

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
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 17418
ANNA J. STAMPS
09/11/2023

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	8/10/2023
REVISION	CO 1
PIIP22-0010	

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11

PRE-DEVELOPMENT DRAINAGE MAP

SHEET TITLE

SHEET NUMBER 1

38

DRAWING LOCATION - P:\2020\32245\DRAINAGE\WORKING\32245 PRE-POST.DWG - SAVED BY - JRENNICK

N

0 200' 300' 400'

SCALE IN FEET

LEGEND

LIMITS OF POST-DEVELOPED CONTRIBUTING DRAINAGE AREA

TIME OF CONCENTRATION PATH

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

CEI ENGINEERING ASSOCIATES, INC.
3108 SW REGENCY PKWY
BENTONVILLE, AR 72712
PHONE: (479) 273-9472
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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11880
ANDREW D. KLEE
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

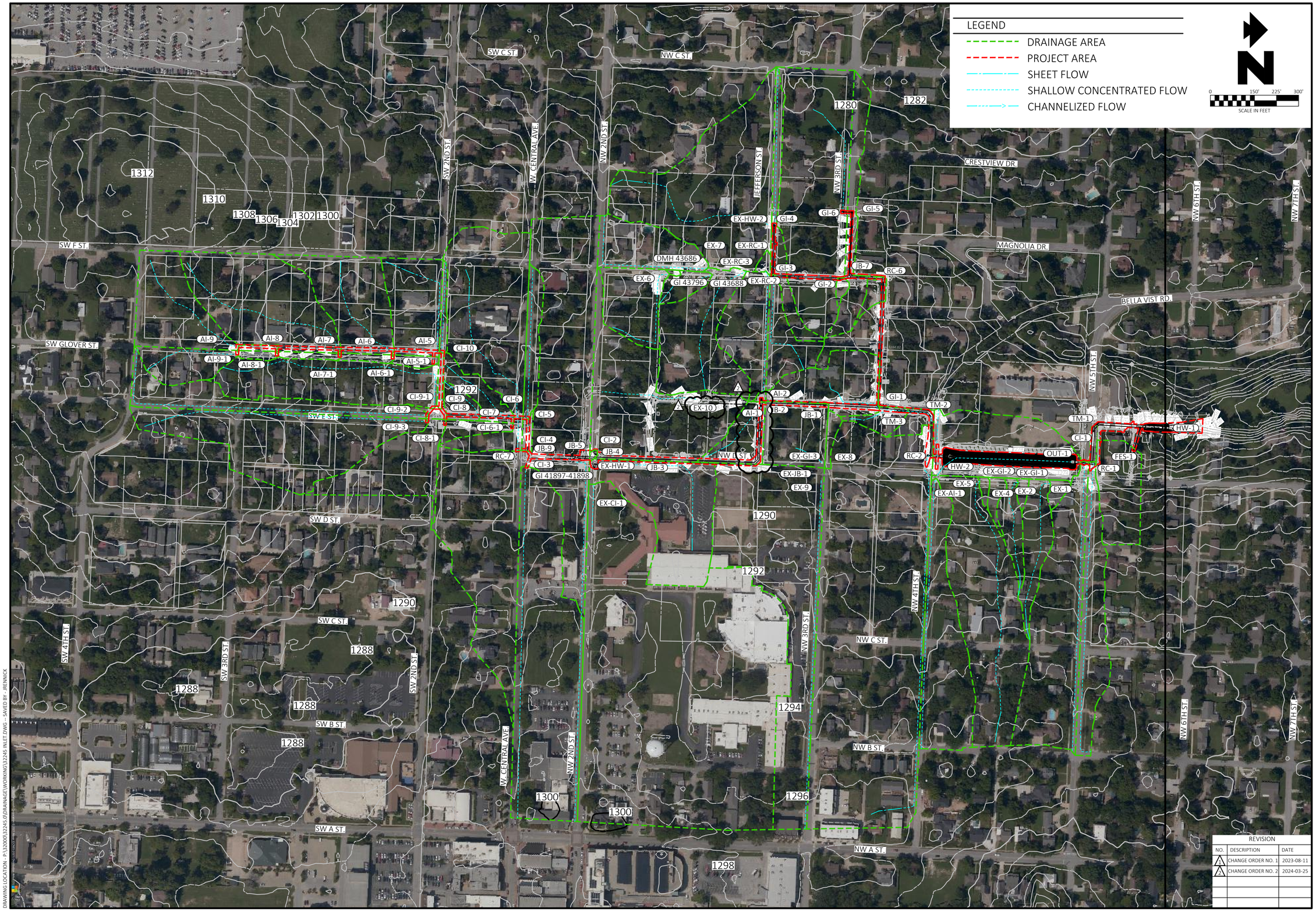
POST-DEVELOPMENT DRAINAGE MAP

SHEET TITLE

SHEET NUMBER

39

DRAWING LOCATION - P:\32000\32245.01\DRAINAGE\WORKING\32245 PRE-POST.DWG - SAVED BY - JRENNICK



REVISION		
NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11
2	CHANGE ORDER NO. 2	2024-03-25

CEI ENGINEERING ASSOCIATES, INC.
3108 SW REGENCY PKWY
BENTONVILLE, AR 72712
PHONE: (479) 273-9472
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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
ANDREW D. KLEIN
No. 21880
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3

INLET DRAINAGE MAP
SHEET TITLE

SHEET NUMBER
40

DRAWING LOCATION - P:\32000\32245.01\DRAINAGE\WORKING\32245 INLET.DWG - SAVED BY - JRENNICK

BWU GENERAL NOTES:

ALL MATERIALS AND METHODS USED TO CONSTRUCT, MODIFY, OR TAP ANY PUBLIC WATER OR SEWER MAIN SHALL CONFORM TO BENTONVILLE WATER UTILITIES DEPARTMENT STANDARD SPECIFICATIONS AND DETAILS DATED 2021.

VERTICAL SEPARATION SHALL BE 18" MIN. BETWEEN WATER AND SANITARY SEWER AND 6" BETWEEN WATER AND ALL OTHER UTILITIES AND STORM SEWER.

PROPOSED STORM SEWER PIPES AND STRUCTURES MUST MAINTAIN MINIMUM SEPARATIONS OF 5' HORIZONTAL AND 8" VERTICAL FROM ALL PUBLIC WATER AND SEWER INFRASTRUCTURE.

CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITIES PRIOR TO CONSTRUCTION.

BWU WATER NOTES:

ALL WATER MAINS SHALL BE DUCTILE IRON PIPE WITH 4 FEET MIN. COVER BELOW POINT OF BURY, MEASURED FROM THE GROUND SURFACE OR THE SURFACE OF PERMANENT IMPROVEMENT TO THE TOP OF THE BARREL OF THE PIPE, WHICHEVER IS GREATER, UNLESS OTHERWISE APPROVED BY BWUD. ALL DEPTHS OF WATER MAINS SHALL BE APPROVED BY BWUD.

MINIMUM COVER OVER WATER SERVICES SHALL BE 24" OR AS APPROVED BY BWUD.

WATER SERVICES CROSSING ROADWAY SHALL BE INSTALLED IN 4" SCH. 40 PVC CONDUIT.

PROVIDE FULL LENGTH OF PIPE FOR WATER MAINS CROSSING UNDER STORM SEWERS.

NEW OR RELOCATED SERVICES TO BE COMPLETED BY BWUD IF IT REQUIRES A BREAK IN THE SERVICE LINE BETWEEN THE METER AND THE MAIN. RELOCATIONS THAT DO NOT REQUIRE A BREAK BETWEEN THE METER AND THE MAIN ARE TO BE COMPLETED BY THE CONTRACTOR. CONTRACTOR WILL BE RESPONSIBLE FOR CONNECTING ANY EXISTING PRIVATE PLUMBING WHEN NECESSARY.

ANY EXISTING CORP STOPS THAT WILL BE NOT BE REUSED WILL BE EXCAVATED BY THE CONTRACTOR AND SHUT OFF BY BWUD. CONTRACTOR SHALL BE RESPONSIBLE FOR ABANDONMENT OR REMOVAL OF SERVICE.

CONTRACTOR SHALL VERIFY DEPTH OF EXISTING WATER LINES IN FIELD.

CONTRACTOR SHALL ENSURE CUT AND CAP IS PLACED TO PROVIDE ADEQUATE BACKING WHEN STORM TRENCH IS DUG.

BWU SEWER NOTES:

ALL SANITARY SEWER MAINS SHALL BE SDR 26 PVC WITH 3 FEET MIN. COVER BELOW POINT OF BURY, MEASURED FROM THE GROUND SURFACE OR THE SURFACE OF PERMANENT IMPROVEMENT TO THE TOP OF THE BARREL OF THE PIPE, WHICHEVER IS GREATER, UNLESS OTHERWISE APPROVED BY BWUD. ALL DEPTHS OF SEWER MAINS SHALL BE APPROVED BY BWUD.

SANITARY SEWER MANHOLES LOCATED IN ROADWAYS OR IN AREAS EXPOSED TO VEHICULAR TRAFFIC SHALL HAVE HEAVY DUTY FRAMES AND COVERS INSTALLED.

SANITARY SEWER MANHOLES LOCATED IN AREAS SUBJECT TO FLOODING OR POOLING SHALL HAVE WATER TIGHT COVERS INSTALLED.

UNLESS STATED IN THE PLANS, ALL SANITARY SEWER MANHOLES SHALL BE 4-FOOT DIAMETER AND SHALL BE PROXY-LINED WITH A GMI 24" COMPOSITE RING AND LID PER BWUD STANDARD DETAILS.

NEW OR RELOCATED SERVICES TO BE COMPLETED BY BWUD IF IT REQUIRES A BREAK IN THE SERVICE LINE BETWEEN THE SERVICE CONNECTION POINT AND THE MAIN. RELOCATIONS THAT DO NOT REQUIRE A BREAK BETWEEN THE SERVICE CONNECTION POINT AND THE MAIN ARE TO BE COMPLETED BY THE CONTRACTOR. CONTRACTOR WILL BE RESPONSIBLE FOR CONNECTING ANY EXISTING PRIVATE PLUMBING WHEN NECESSARY.

PROPOSED LEGEND

X"SS	SANITARY SEWER LINE
X"W	WATER MAIN
WATER	WATER SERVICE
	BEND (SEE PLANS FOR SIZE AND ANGLE)
	TEE (SEE PLANS FOR SIZE)
	CROSS (SEE PLANS FOR SIZE)
	TAPPING SLEEVE (SEE PLANS FOR SIZE)
	CAP OR PLUG W/ THRUST BLOCKING (SEE PLANS FOR SIZE)
	REDUCER (SEE PLANS FOR SIZE)
	WATER METER
	FIRE HYDRANT
	VALVE (SEE PLANS FOR SIZE AND TYPE)
	REDUCED PRESSURE ZONE (RPZ)

EXISTING LEGEND

X"SS	SANITARY SEWER
X"W	WATER MAIN
WATER	WATER SERVICE TO REMAIN
WATER	WATER SERVICE TO BE RELOCATED

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11

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
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 17418
ANNA J. STAMPS
09/11/2023

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	8/10/2023
REVISION	CO 1
PIIP22-0010	

UTILITY NOTES
SHEET TITLE

SHEET NUMBER
41

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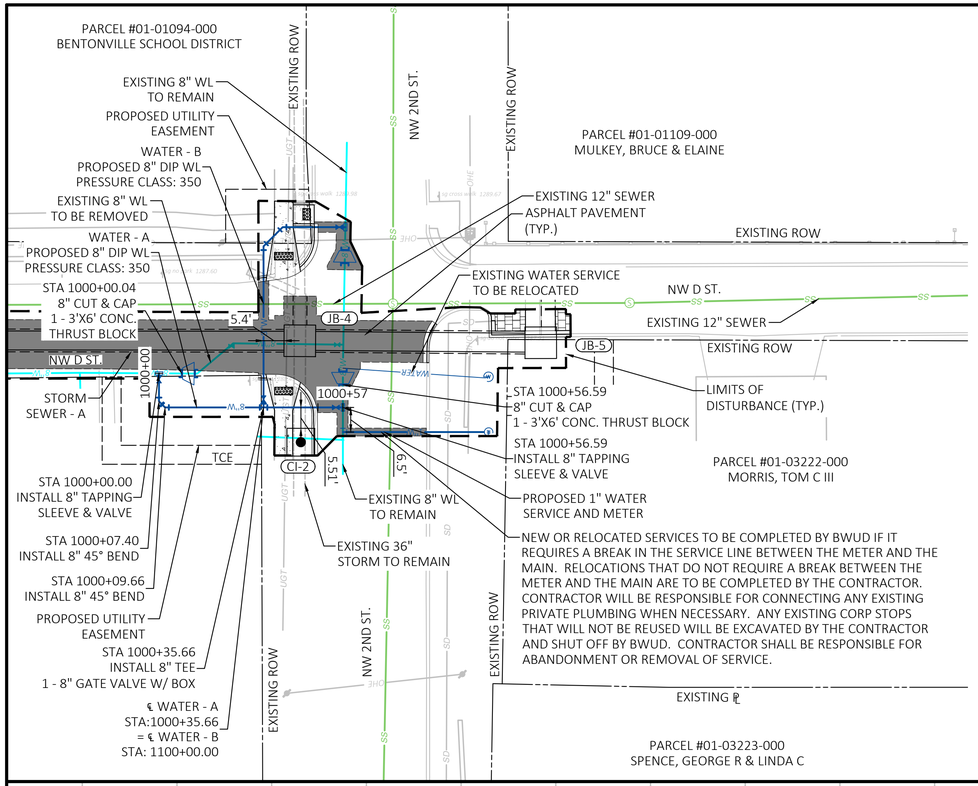

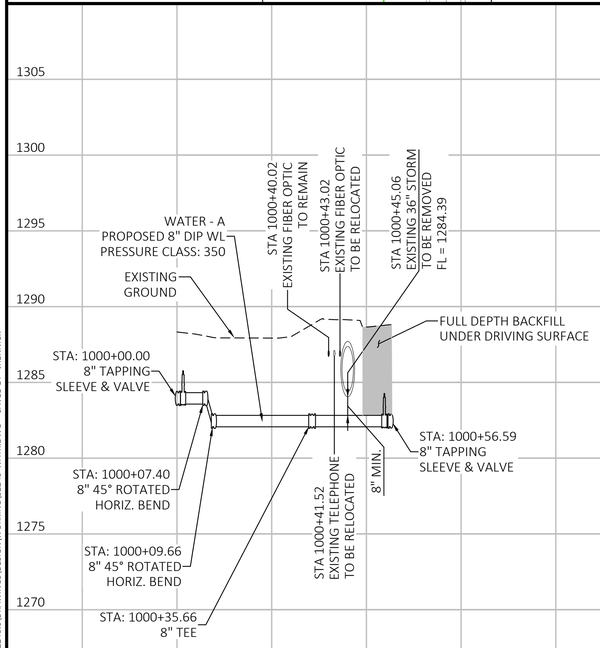

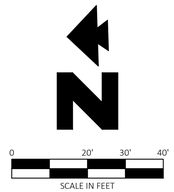

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11

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BENTONVILLE, AR 72712
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CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 17418
ANNA J. STAMPS
09/11/2023

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	8/10/2023
REVISION	CO 1
PIIP22-0010	

WATER PLAN &
PROFILE - 1

SHEET TITLE

SHEET NUMBER
42 ⚠

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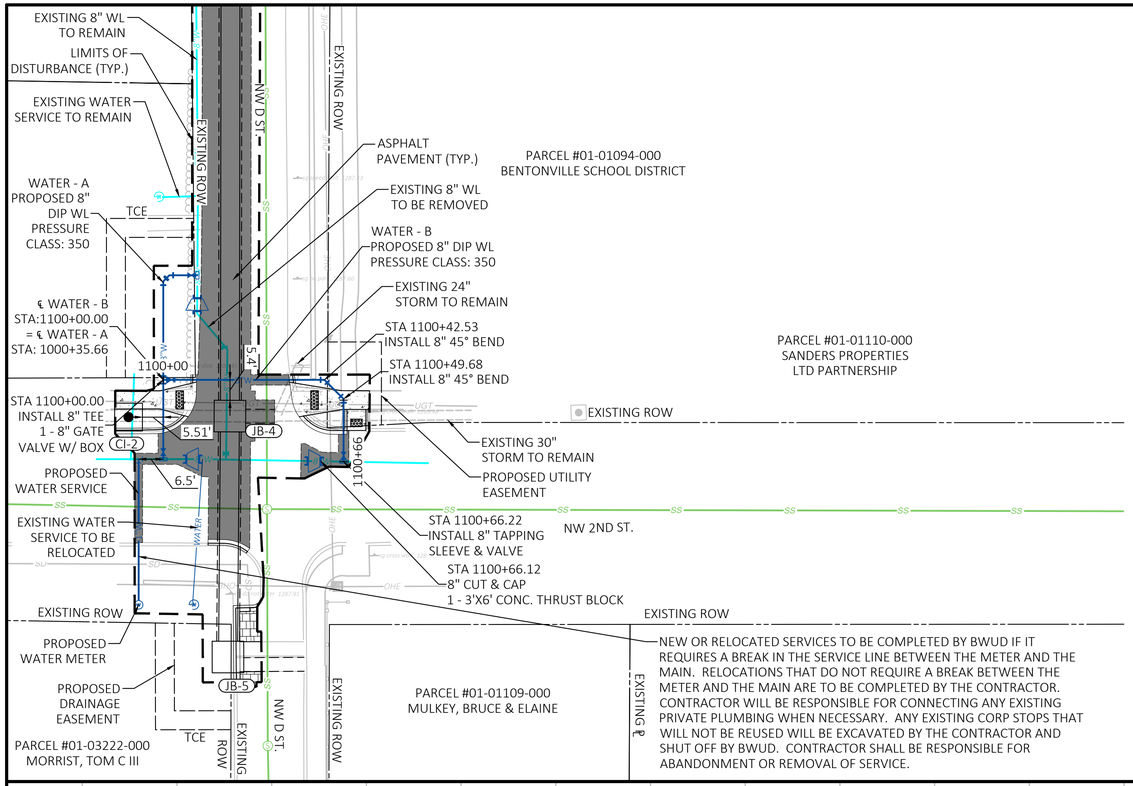


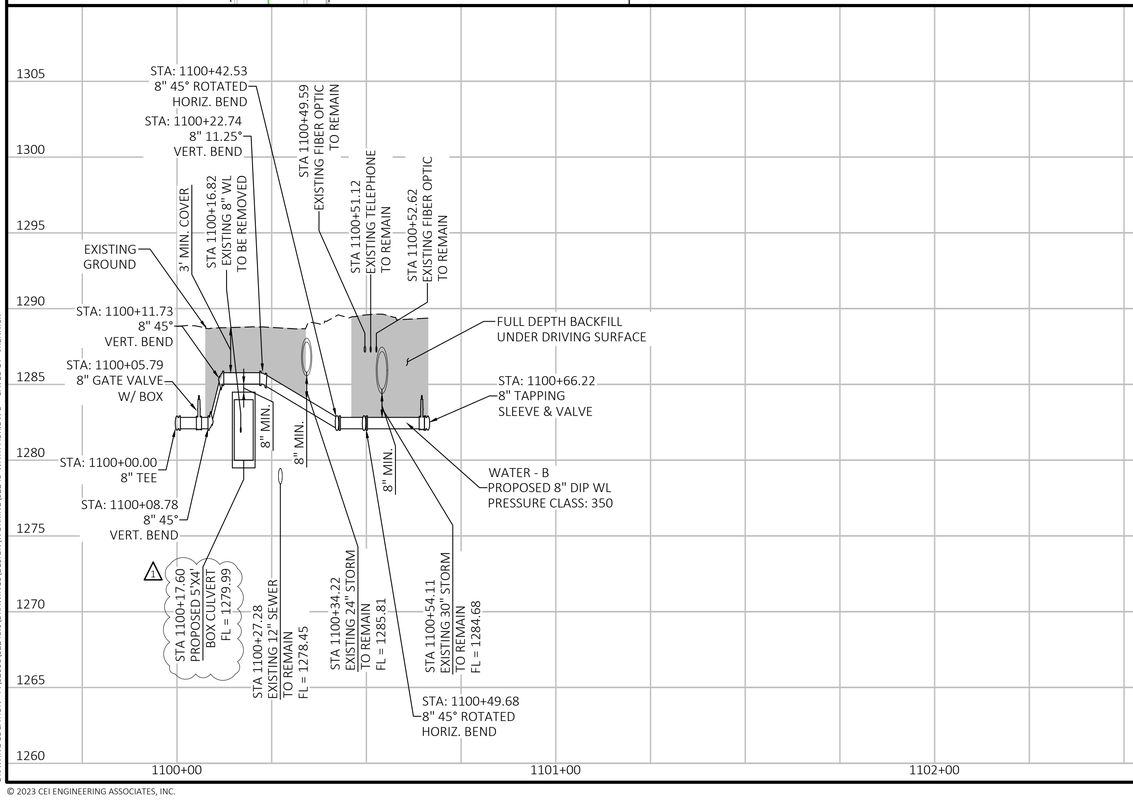
N

0 20' 30' 40'

SCALE IN FEET

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 1	2023-08-11



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CITY OF BENTONVILLE NW 9TH AND D STREET

BENTONVILLE, AR

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 17418
ANNA J. STAMPS
09/11/2023

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	8/10/2023
REVISION	CO 1
PIIP22-0010	

WATER PLAN & PROFILE - 2

SHEET TITLE

SHEET NUMBER

43

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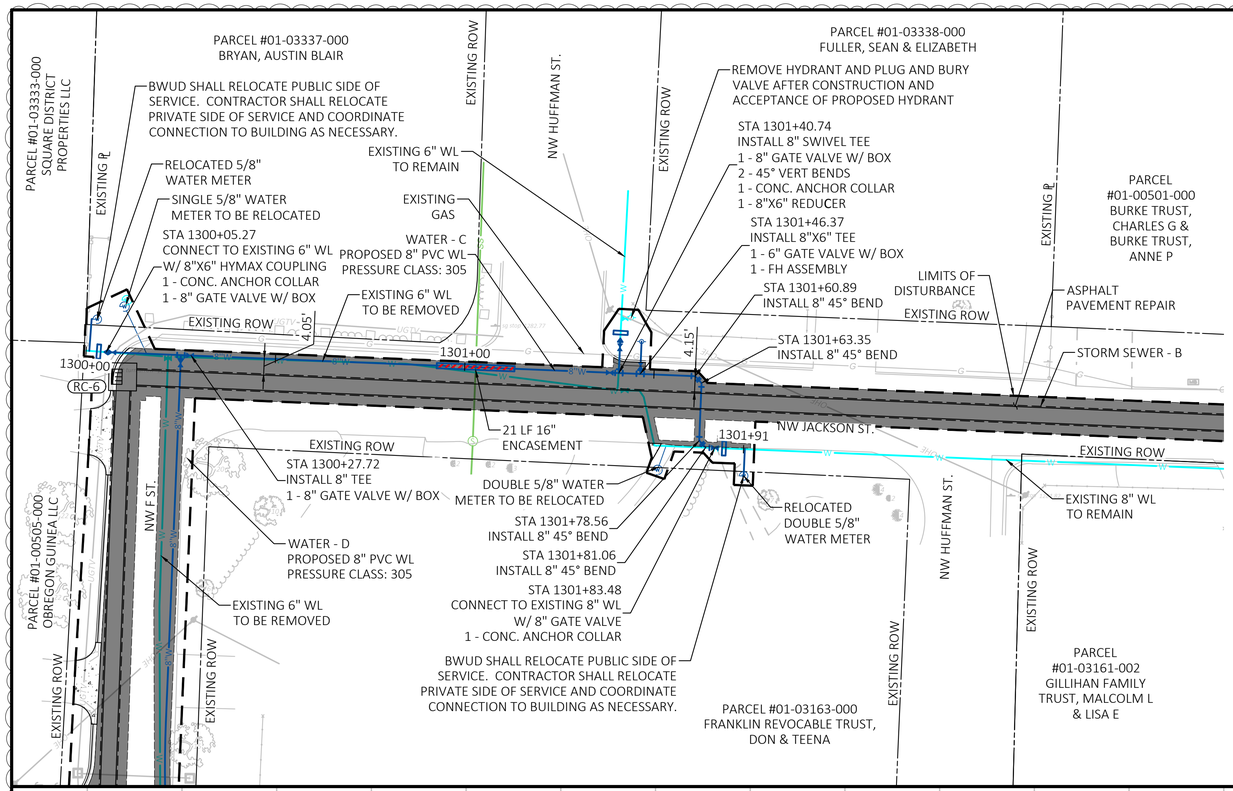

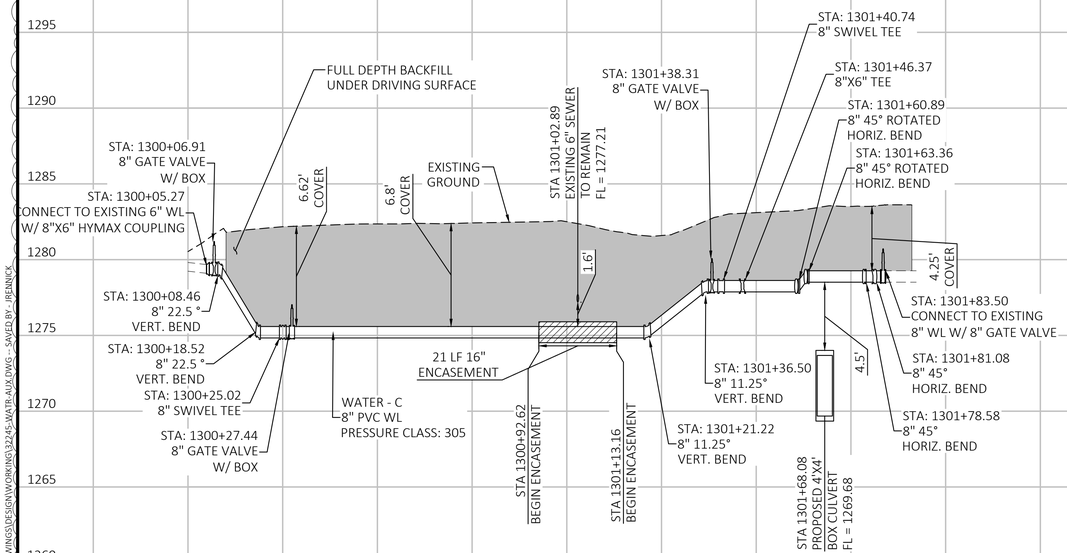

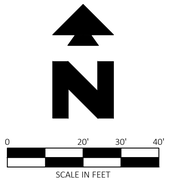

REVISION

NO.	DESCRIPTION	DATE
3	CHANGE ORDER NO. 2	2024-03-25

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3108 SW REGENCY PKWY
BENTONVILLE, AR 72712
PHONE: (479) 273-9472
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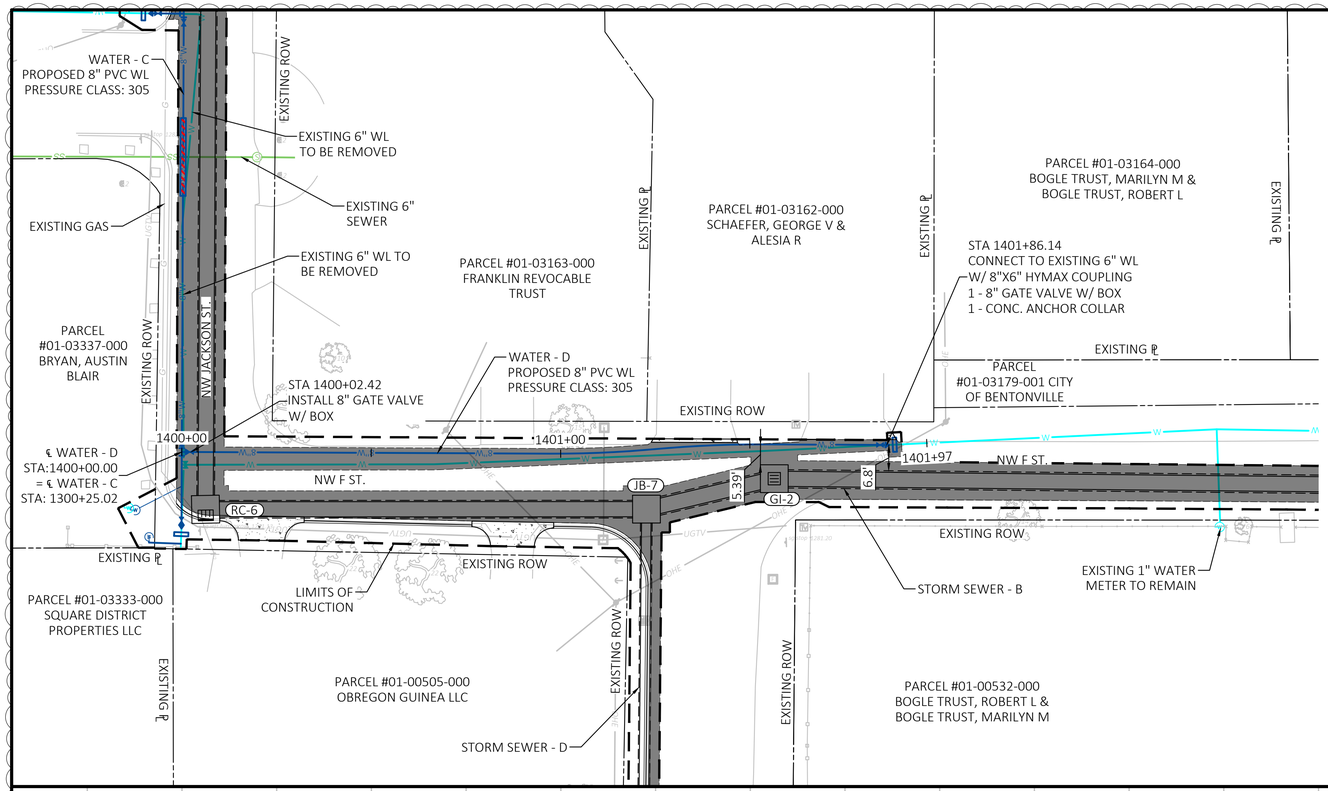
CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

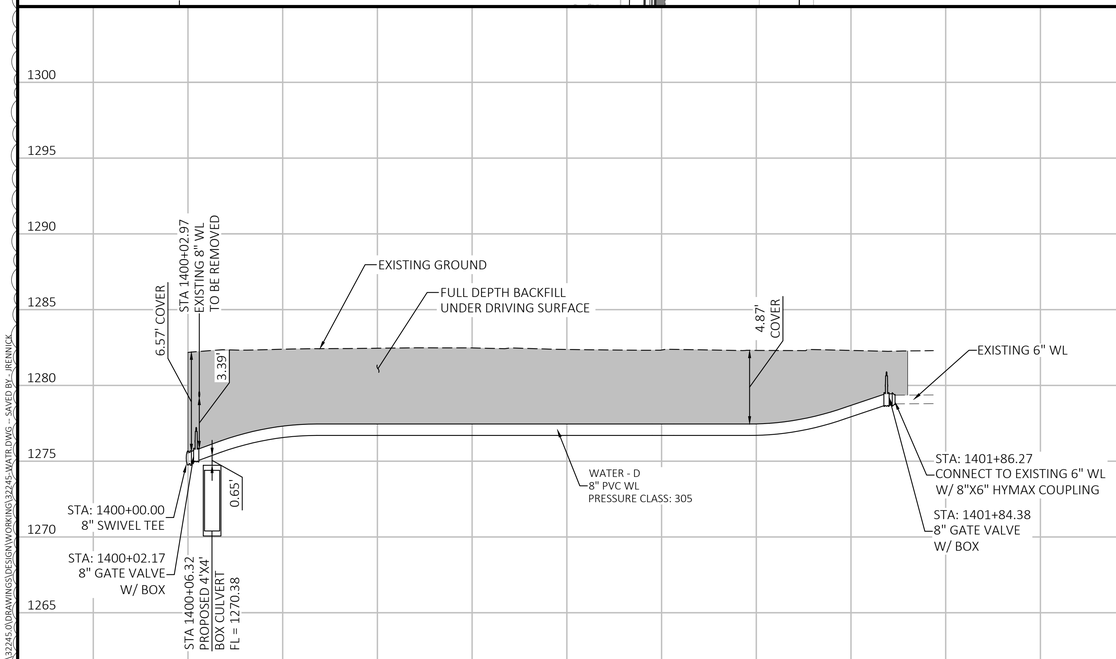
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
WESLEY D. SLATER
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

WATER PLAN & PROFILE - 3
SHEET TITLE
SHEET NUMBER
44

DRAWING LOCATION: P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245-SWTR-ALIGN.DWG - SAVED BY: JBEANCK





0 20' 30' 40'
SCALE IN FEET

REVISION

NO.	DESCRIPTION	DATE
1	CHANGE ORDER NO. 2	2024-03-25

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
NW 9TH AND D STREET
BENTONVILLE, AR

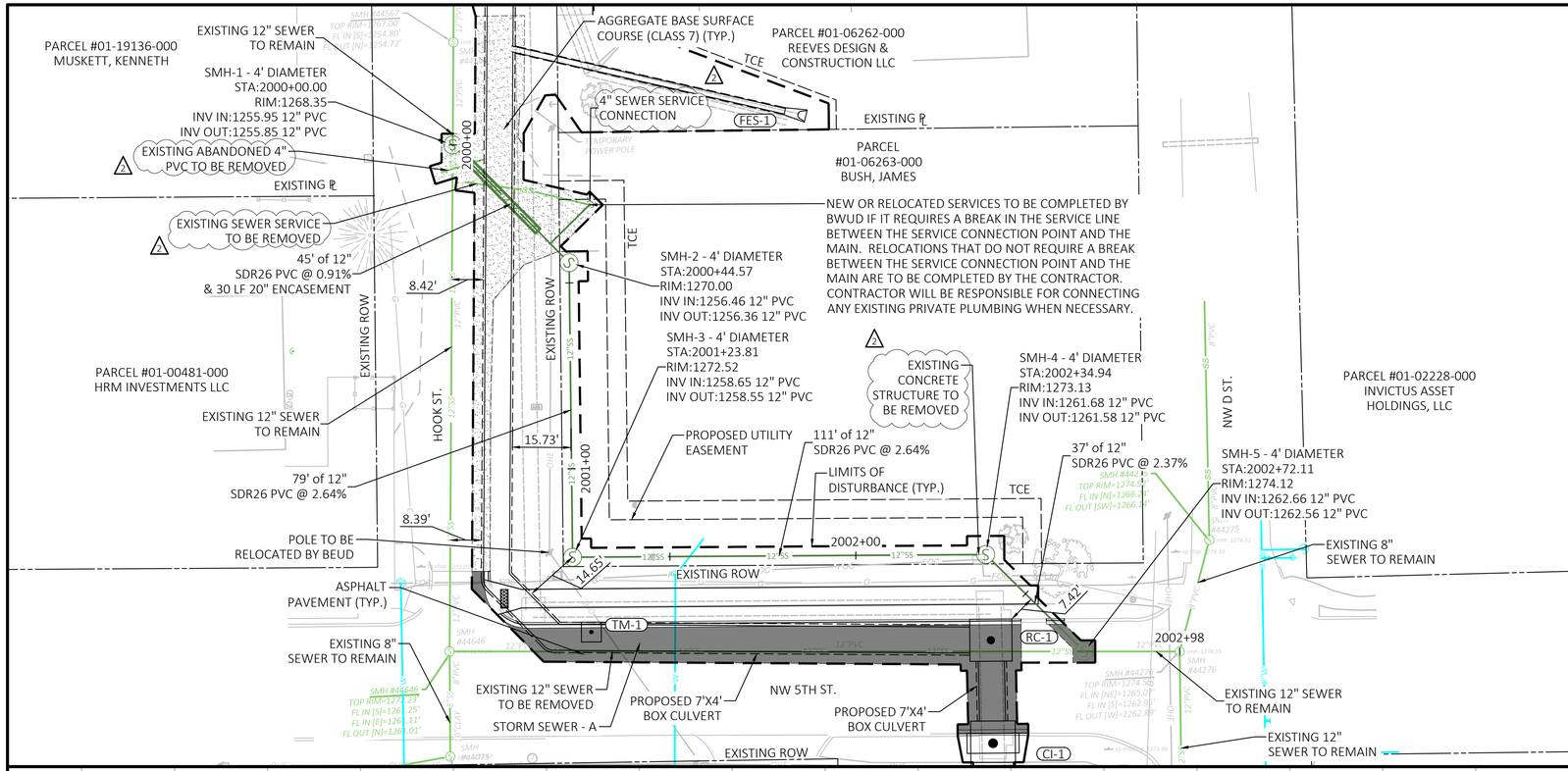
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
ANDREW D. NUTTER
03/29/2024

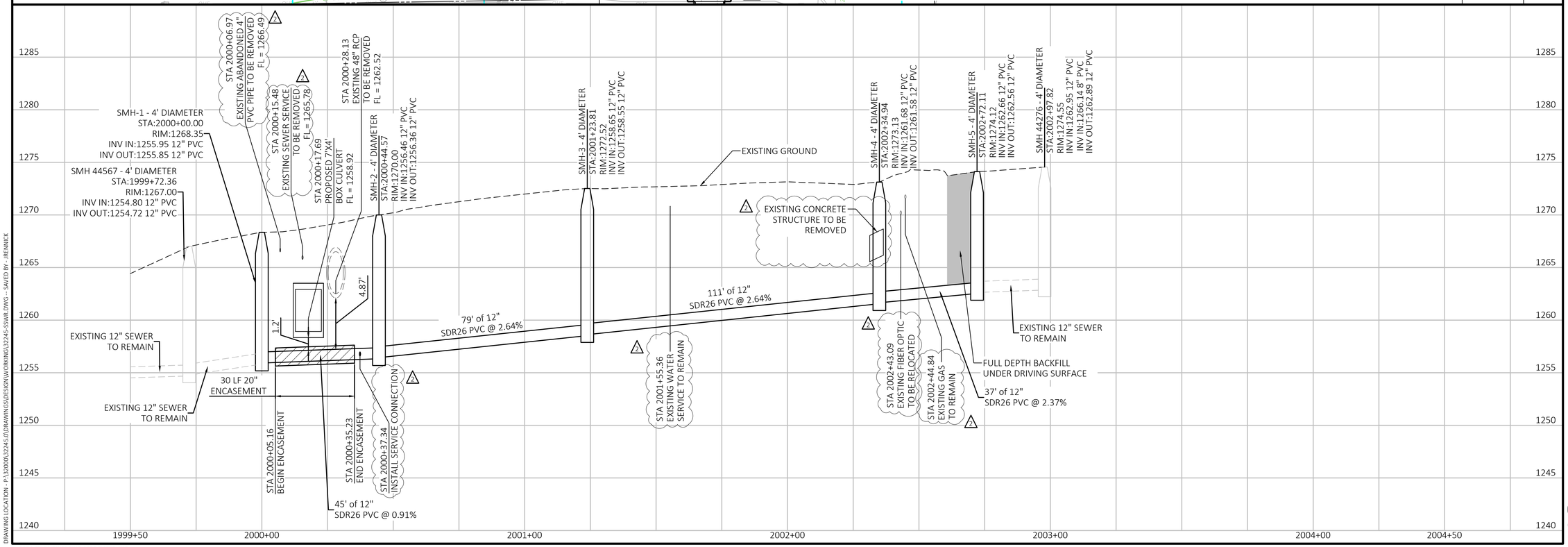
PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

WATER PLAN & PROFILE - 4
SHEET TITLE

SHEET NUMBER
45

DRAWING LOCATION: P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245 WATR.DWG - SAVED BY: JRENNICK





REVISION

NO.	DESCRIPTION	DATE
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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 NW 9TH AND D STREET
BENTONVILLE, AR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11680
JAMES WILLIAM REED
03/29/2024

PROFESSIONAL OF RECORD	AJK
PROJECT MANAGER	AN
DESIGNER	JR
CEI PROJECT NUMBER	32245
DATE	3/25/2024
REVISION	CO 3
PIIP22-0010	

SANITARY SEWER PLAN & PROFILE - 1

SHEET TITLE

SHEET NUMBER 46 (3)

DRAWING LOCATION: P:\32000\32245.01\DRAWINGS\DESIGN\WORKING\32245-SSWR.DWG - SAVED BY: JREINICK

PLAN NOTES

1. OVERALL NOTES

1.1. GENERAL NOTES ARE AN INTEGRAL PART OF THE CONSTRUCTION DOCUMENTS AND DESCRIBE CONDITIONS THAT APPLY GENERALLY THROUGHOUT THE DRAWINGS.

1.2. PLANS, SECTIONS, AND DETAILS ARE NOT TO BE SCALED FOR DETERMINATION OF QUANTITIES, LENGTHS, OR FIT OF MATERIALS.

1.3. SHOP DRAWING SUBMITTALS SHALL CONTAIN ONE PDF OF EACH SHEET.

1.4. SHOP DRAWINGS SHALL BE ORIGINAL DRAWINGS PREPARED BY THE CONTRACTOR, SUBCONTRACTOR, SUPPLIER OR DISTRIBUTOR. REPRODUCTION OF STRUCTURAL CONTRACT DOCUMENTS AS SHOP DRAWINGS, ERECTION PLANS, FABRICATION PLANS OR DETAILS IS NOT AUTHORIZED AND, IF SUBMITTED, WILL BE REJECTED WITHOUT CHECKING.

1.5. SHOP DRAWINGS SHALL CONTAIN THE CONTRACTOR'S STAMP CERTIFYING: (A) HIS REVIEW PRIOR TO SUBMITTAL AND (B) VERIFICATION OF PRODUCTS, FIELD MEASUREMENTS, FIELD CONSTRUCTION COORDINATION AND COORDINATION WITH ASSOCIATED AREAS OF WORK. IN ADDITION, SHOP DRAWINGS SHALL CONTAIN THE INITIALS AND DATE OF BOTH THE ORIGINATOR AND CHECKER. IF SHOP DRAWINGS ARE SUBMITTED PRIOR TO BEING CHECKED, THEY WILL BE REJECTED.

1.6. PROVIDE TEMPORARY BRACING AND SHORING AS REQUIRED FOR STABILITY DURING CONSTRUCTION.

1.7. SHEETS S1 THROUGH S3 DISPLAY CONSTRUCTION FOR ONE OUTFLOW STRUCTURE.

2. FOUNDATION NOTES

2.1. THE OWNER'S ENGINEER OR ANOTHER ENGINEER LICENSED IN THE STATE OF ARKANSAS SHALL VERIFY THAT THE BEARING MATERIALS ARE ADEQUATE DURING CONSTRUCTION.

2.2. FOUNDING SOILS FOR THE SLABS-ON-GRADE SHALL BE PLACED ON EXISTING NON-EXPANSIVE SOIL. IF EXPANSIVE SOIL IS ENCOUNTERED, THE SLABS-ON-GRADE SHALL BE PLACED ON SELECT FILL.

2.3. AFTER REMOVAL OF ALL SURFACE VEGETATION, TOPSOIL, UNSUITABLE BEARING MATERIALS, AND IN-SITU MATERIALS TO BE REPLACED WITH SELECT FILL, SCARIFY THE EXPOSED SUB GRADE TO A MINIMUM OF 8". COMPACT THIS SCARIFIED MATERIAL TO 95% OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY (ASTM D-698), ADJUSTING THE MATERIAL'S MOISTURE CONTENT TO -1% TO +3% OF THE MATERIAL'S OPTIMUM MOISTURE CONTENT PRIOR TO BEING COMPACTED.

2.4. SELECT FILL MATERIAL SHALL BE NON-EXPANSIVE, NON-GRANULAR SANDY CLAY OR CLAYEY SAND MATERIAL HAVING A LIQUID LIMIT LESS THAN 35 AND PLASTICITY BETWEEN 5 AND 18.

2.5. COMPACT ALL SELECT FILL TO 95% OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY (ASTM D698) WITH MOISTURE CONTENT AT A MINIMUM OF 1% BELOW TO 3% ABOVE OPTIMUM. LIFTS SHALL NOT EXCEED 8" MAXIMUM.

2.6. MOISTURE CONTENTS DEVELOPED DURING COMPACTION SHALL BE MAINTAINED UNTIL THE FOUNDATION SLABS ARE PLACED.

2.7. ALL FILL MATERIALS, MOISTURE CONTROL, AND COMPACTION PROCEDURES SHALL BE APPROVED BY THE ENGINEER. CONTRACTOR SHALL SUBMIT PROPOSED FILL MATERIALS AND COMPACTION EQUIPMENT/PROCEDURES FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION.

3. CONCRETE NOTES

3.1. ALL REINFORCED CONCRETE MATERIALS SHALL BE PROPORTIONED, FABRICATED, DELIVERED, AND PLACED IN ACCORDANCE WITH ACI STANDARD 318-14, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE," INCLUDING LATEST SUPPLEMENT.

3.2. TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH ACI STANDARD SPECIFICATION 117.

3.3. DETAILING OF CONCRETE REINFORCEMENT AND ACCESSORIES SHALL BE IN ACCORDANCE WITH ACI PUBLICATION 315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES."

3.4. U.N.O., CONCRETE IN THE FOLLOWING AREAS SHALL HAVE SAND AND GRAVEL OR CRUSHED STONE AGGREGATE, TYPE I PORTLAND CEMENT, THE DESIGNATED COMPRESSIVE STRENGTH IN 28 DAYS AND A MINIMUM MODULUS OF RUPTURE OF 570 PSI. NORMAL WEIGHT AGGREGATE SHALL CONFORM TO ASTM C33.

3.5.

COMPRESSIVE STRENGTH	(F'c)	W/C
SLABS AND WALLS	4000 PSI	0.48

3.6. CONCRETE FOUNDATION SLAB CONCRETE SHALL MEET REQUIRED COMPRESSIVE STRENGTH BEFORE PLACEMENT OF WALL CONCRETE.

3.6. SLUMP OF THE CONCRETE SHALL BE BETWEEN 4" AND 6" AT THE END OF PUMP HOSE OR AT END OF CHUTE, IF CONCRETE IS NOT PUMPED. CONCRETE MIX DESIGN SHALL ACCOMMODATE SLUMP LOSS DUE TO PUMPING, IF PUMPING IS USED. IF A SUPER PLASTICIZER ADMIXTURE IS INCLUDED IN THE MIX DESIGN, THE SLUMP SHALL NOT EXCEED 6" BEFORE THE ADDITION OF THE ADMIXTURE AND SHALL NOT EXCEED 8" AFTER THE ADDITION OF THE ADMIXTURE.

3.7. PROPORTIONS OF MATERIALS USED FOR CONCRETE SHALL BE SELECTED TO PRODUCE CONCRETE WITH AN AVERAGE COMPRESSIVE STRENGTH F'cr IN ACCORDANCE WITH ACI STANDARD 318-14, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", INCLUDING LATEST SUPPLEMENT.

3.8. CONTRACTOR SHALL SUBMIT PROPOSED CONCRETE PROPORTIONS, ALONG WITH SUPPORTING DOCUMENTATION, INDICATING SUFFICIENT TEST RESULTS TO ESTABLISH STANDARD DEVIATION AND/OR TEST RESULTS FROM APPROPRIATE TRIAL MIXTURES.

3.9. U.N.O., ALL CONCRETE REINFORCING BARS SHALL BE OF DOMESTIC MANUFACTURE AND SHALL CONFORM TO ASTM A615, GRADE 60. WELDING OF REINFORCING OTHER THAN SPECIFIED IS PROHIBITED.

3.10. ALL REINFORCING SHALL BE SUPPORTED FROM ABOVE OR WITH APPROVED SUPPORT FROM THE BOTTOM AT A SPACING THAT WILL NOT ALLOW THE BARS TO DEFLECT MORE THAN 1/4" FROM SUPPORT TO SUPPORT.

3.11. U.N.O. CONCRETE COVER OVER STEEL REINFORCEMENT SHALL CONFORM TO THE MINIMUM REQUIRED BY TABLE 20.6.1.3.1 OF ACI 318-14.

3.12. U.N.O. LAP SPLICES AND EMBEDMENT LENGTHS SHALL BE CLASS B SPLICES. LAP SPLICES OF CONTINUOUS REINFORCEMENT IN BEAMS SHALL BE MADE OVER THE SUPPORT FOR BOTTOM BARS AND AT MIDSPAN FOR TOP BARS. REINFORCEMENT DESIGNATED AS "CONTINUOUS REINFORCEMENT" MAY BE LAP SPLICED 42 DIAMETERS.

3.13. REINFORCING SHALL BE SUPPORTED AND SECURED IN ITS CORRECT LOCATION TO PREVENT DISPLACEMENT DURING PLACEMENT OF CONCRETE.

3.14. PROVIDE CORNER BARS, MATCHING SPECIFIED REINFORCEMENT, IN OUTSIDE FACES OF ALL EXTERIOR CORNERS FORMED BY INTERSECTING WALLS AND FOOTINGS. NUMBER AND SPACING OF CORNER BARS SHALL BE EQUAL TO NUMBER AND SPACING OF HORIZONTAL REINFORCING BARS WITH WHICH THEY LAP.

3.15. PROVIDE A ¾" CHAMFER AT ALL EXPOSED CONCRETE EDGES. ALL CHAMFER STRIPS SHALL BE SIZED LUMBER.

INDEX OF SHEETS

GENERAL NOTES

LOADING
DEAD LOADS

DESIGN
2015 INTERNATIONAL BUILDING CODE
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH ED.

FOUNDATION DESIGN DATA
FOUNDATION DESIGN BASED ON PRESUMPTIVE VALUES FROM IBC.
ALLOWABLE VERTICAL FOUNDATION PRESSURE = 1500 PSF

APPROVED FOR CONSTRUCTION
04/12/2024 8:51:00 AM

COLLINS
Structural Design
6608 N. WESTERN AVE
#542
OKLA. CITY, OK 73116
405.430.9279
tcollins@csd-ok.com

LICENSED PROFESSIONAL ENGINEER
No. 18257
TRAVIS A. COLLINS
5-9-2023

COA NO. 3431

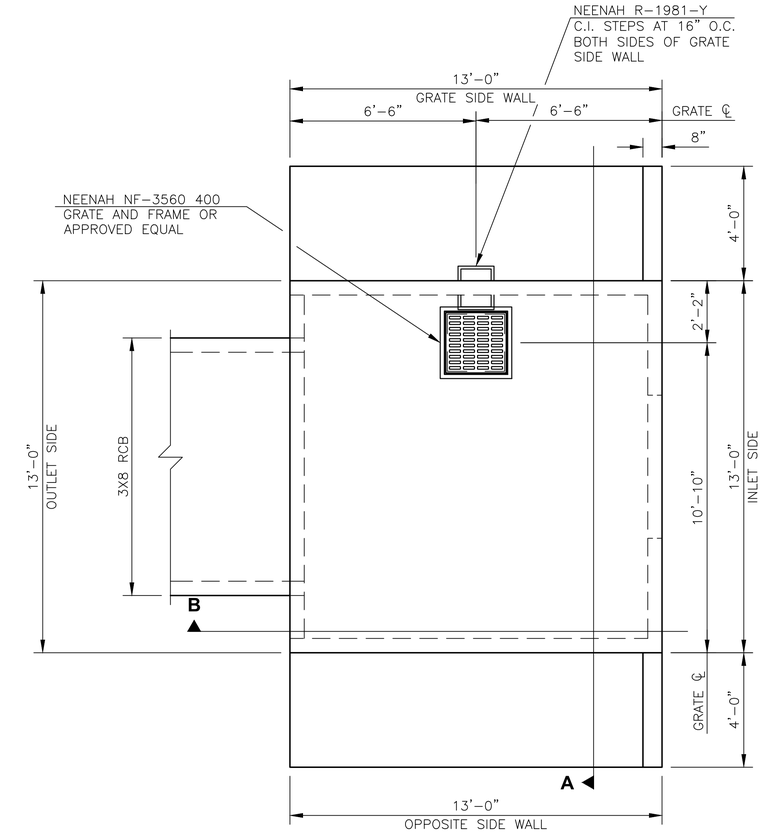
CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

OUT-1
OUTFLOW STRUCTURE
NOTES

SHEET TITLE

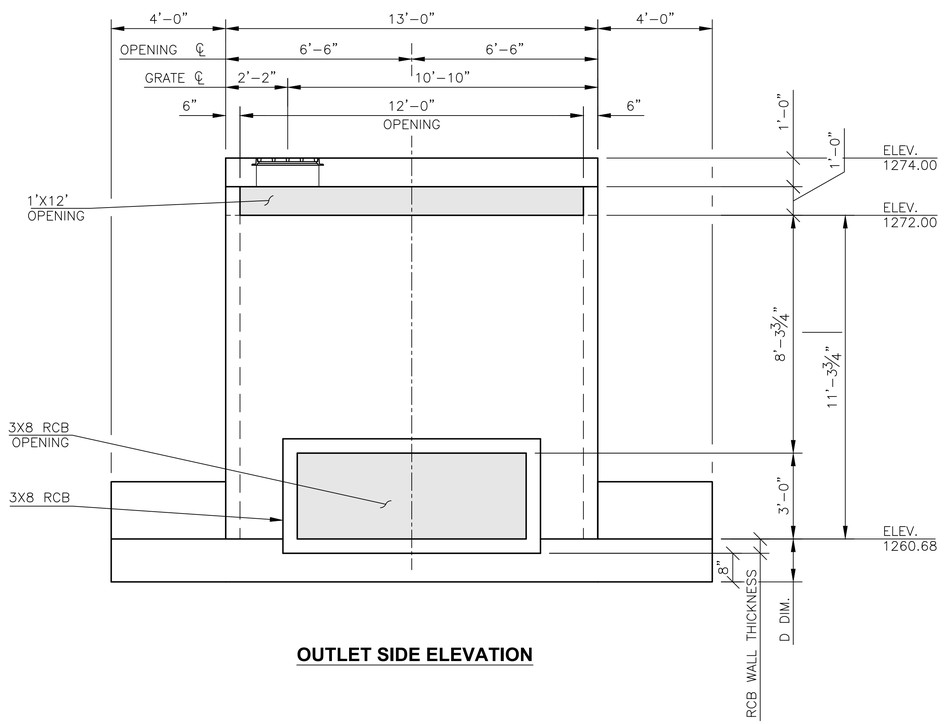
SHEET NUMBER

S1

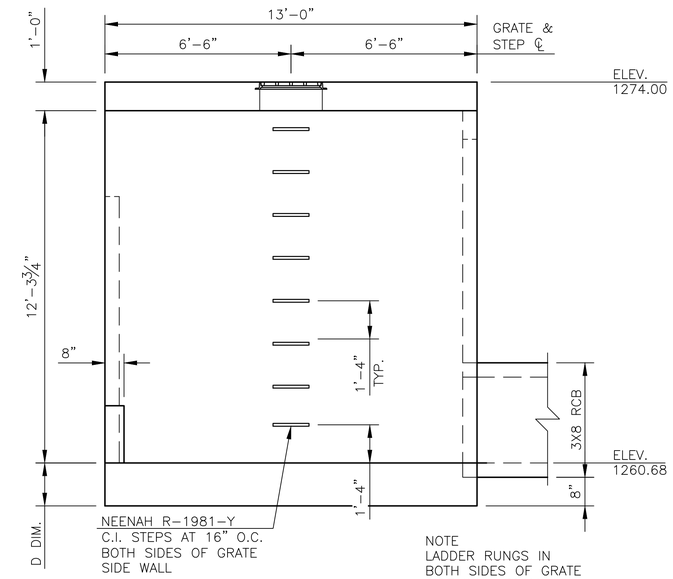


OUT-1 OUTFLOW STRUCTURE PLAN

NOTE
FOR SECTIONS A AND B, SEE SHEET S4.
FOR THE INLET SIDE ELEVATION, SEE SHEET S3.



OUTLET SIDE ELEVATION



D DIM. = RCB WALL THICKNESS + 8"

SIDE WALL ELEVATION
(GRATE SIDE WALL SHOWN, OPPOSITE SIDE WALL SIMILAR)

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5-9-2023

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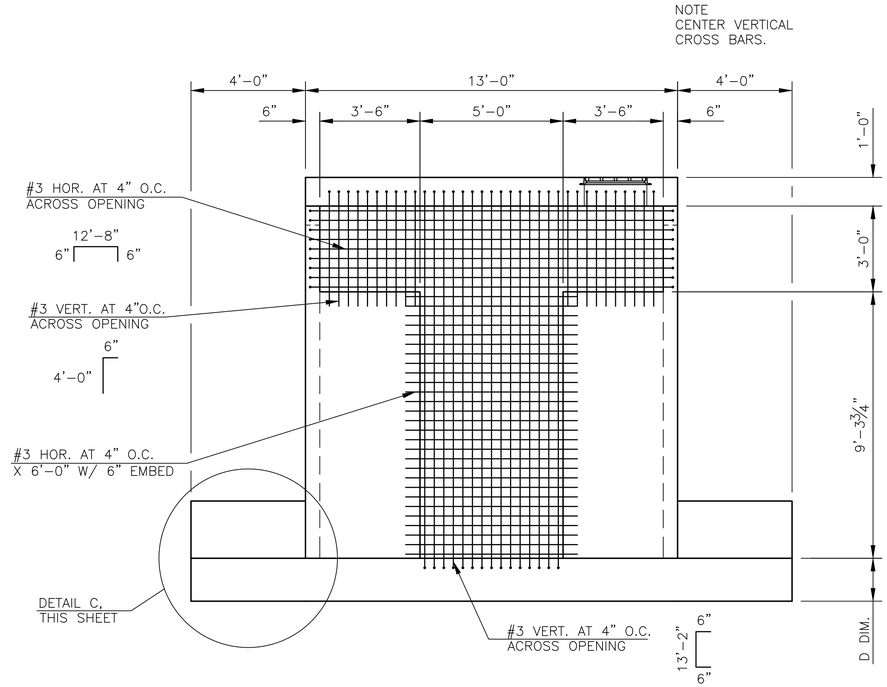
CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

OUT-1
OUTFLOW STRUCTURE
DETAILS (1 OF 2)

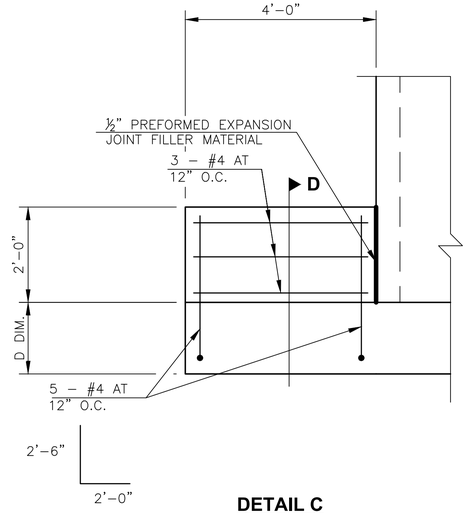
SHEET TITLE

SHEET NUMBER
S2

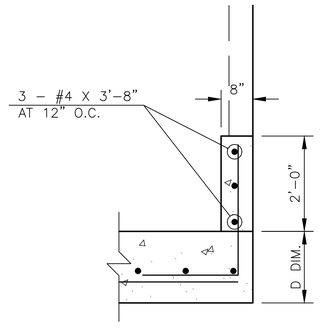


CROSS BAR DETAIL

NOTE
VERTICAL BARS
CENTERED IN WALL.

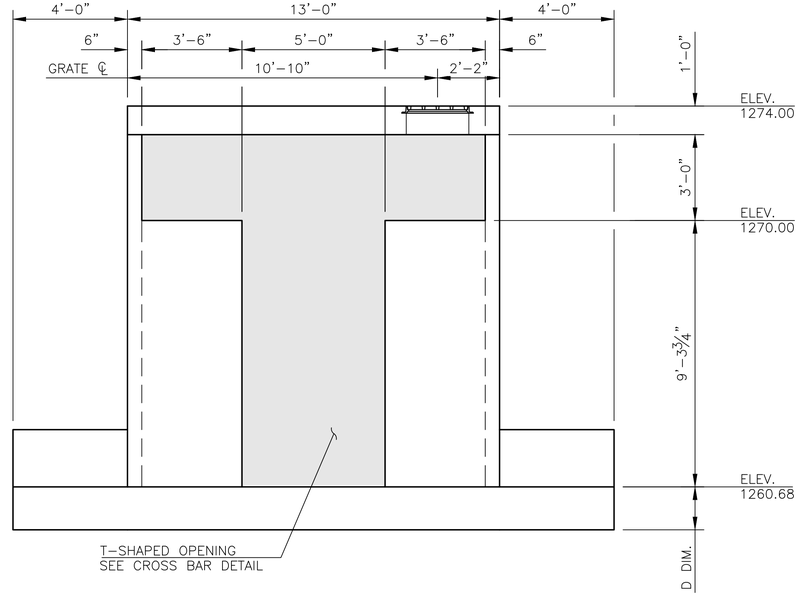


DETAIL C



SECTION D

NOTE
VERTICAL BARS
CENTERED IN WALL.



INLET SIDE ELEVATION

D DIM. = RCB WALL THICKNESS + 8"

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5–9–2023

COA NO. 3431

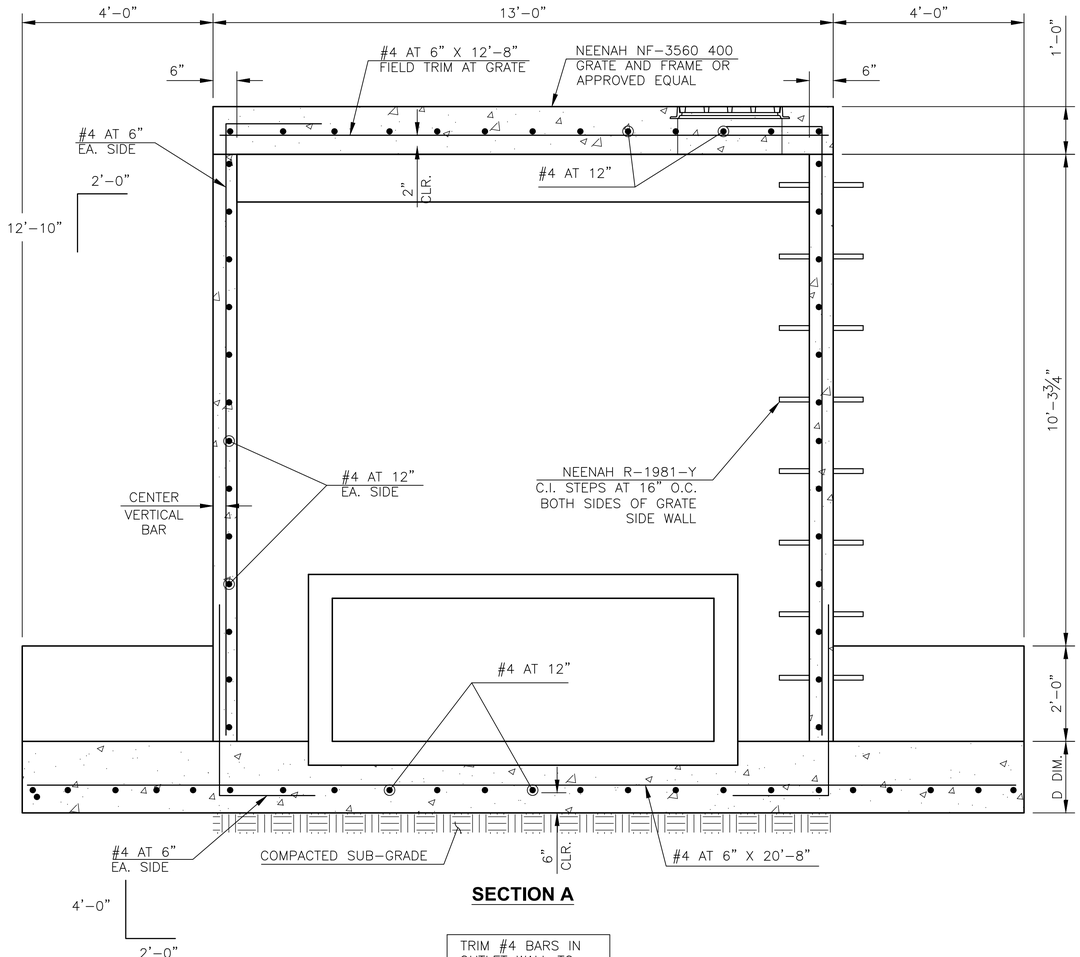
CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

OUT-1
OUTFLOW STRUCTURE
DETAILS (2 OF 2)

SHEET TITLE

SHEET NUMBER

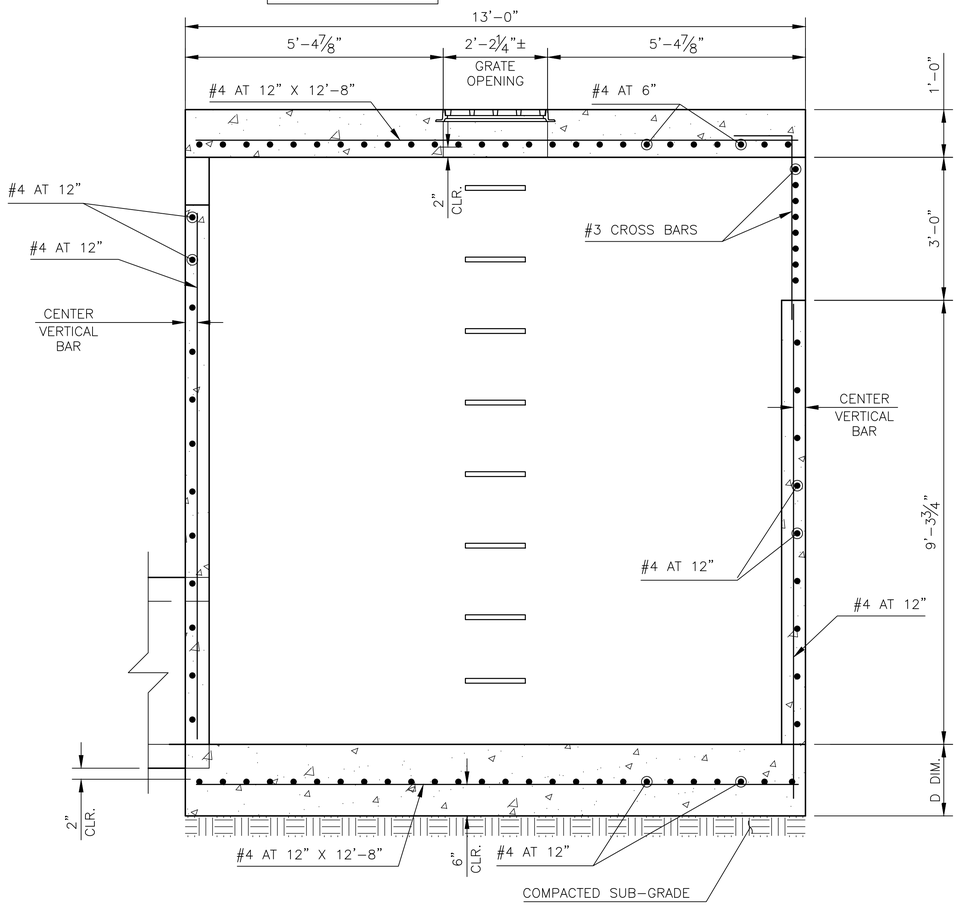
S3



SECTION A

TRIM #4 BARS IN OUTLET WALL TO PROVIDE 2" CLR. TO PIPE AND RCB.

TRIM #4 BARS IN TOP SLAB TO PROVIDE 2" CLR. GRATE OPENING.



SECTION B

D DIM. = RCB WALL THICKNESS + 8"

COLLINS
Structural Design

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LICENSED PROFESSIONAL ENGINEER
No. 18257
TRAVIS A. COLLINS
5–9–2023

COA NO. 3431

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04/12/2024 8:51:03 AM

CITY OF BENTONVILLE
NW 9TH AND D STREET
BENTONVILLE, AR

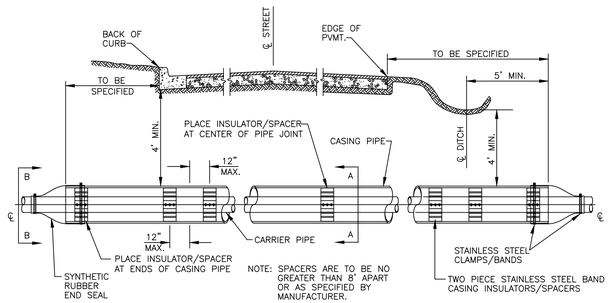
OUT-1
OUTFLOW STRUCTURE
SECTIONS

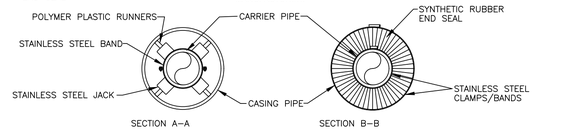
SHEET TITLE

SHEET NUMBER

S4

ENCASEMENT DETAIL





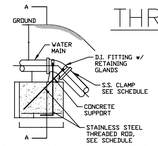
CARRIER & CASING SIZES									
CARRIER	4"	6"	8"	10"	12"	14"	16"	18"	20"
CASING	16"	16"	16"	18"	20"	24"	30"	30"	36"
CASING/WALL THICKNESS	.219	.219	.219	.250	.281	.344	.406	.406	.500

NOTE: DUCTILE IRON, OR PVC PIPE REQUIRED FOR WATER, OR SEWER.

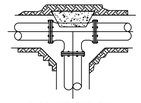
*ALL BELLS SHALL BE RESTRAINED INSIDE ENCASEMENT BY APPROVED METHOD.

GENERAL WATER/SEWER DETAIL: GWS01

THRUST BLOCKING

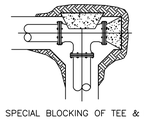


BLOCKING FOR VERTICAL TIE DOWN

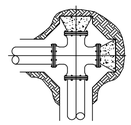


BLOCKING FOR TEE

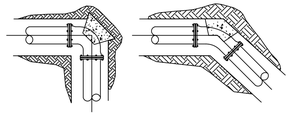
TYPICAL BLOCKING FOR VERTICAL BENDS



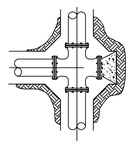
SPECIAL BLOCKING OF TEE & PLUG (WHEN DIRECTED BY WATER DEPT.)



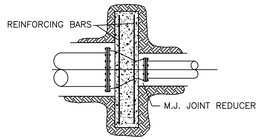
TYPICAL SECTION OF CROSS & 2 PLUG BLOCKING (WHEN DIRECTED BY WATER DEPT.)



TYPICAL BLOCKING FOR HORIZONTAL BENDS



TYPICAL SECTION OF CROSS & PLUG BLOCKING (WHEN DIRECTED BY WATER DEPT.)



THRUST SUPPORT FOR REDUCER (SIZE TO BE DETERMINED BY WATER DEPT.)

NOTES
1. ALL BLOCKING SHALL BE AGAINST UNDISTURBED SOIL USING 4,000 PSI CONCRETE.
2. WHERE SOIL CONDITIONS MAKE IT NECESSARY TO POUR CONCRETE OVER JOINTS, THE ENDS OF THE ADJACENT PIPES MUST HAVE A THRUST BLOCK TO RESIST MOVEMENT OF THESE JOINTS.
3. WEIGHT CALCULATIONS TO BE BASED ON REACTION BACKING TABLE (SEE GWS03).
4. WHEN BLOCKING AGAINST FITTINGS, FITTINGS SHALL BE COVERED WITH POLYETHYLENE WRAP TO PREVENT BONDING OF CONCRETE
5. WHERE SHEAR BECOMES A PROBLEM PROPER REINFORCING MUST BE INSTALLED INTO THE BLOCKING.
6. CLEARANCE SHALL BE A MINIMUM OF 6" BETWEEN PIPE AND OBSTRUCTIONS.
7. CLEARANCE ON PIPES BELONGING TO OIL/GAS COMPANIES SHALL BE 18" UNLESS SPECIAL PERMISSION IS GIVEN BY THESE COMPANIES AND THE DEPARTMENT.
8. 12" OF ALL THREAD EMBEDDED IN CONCRETE
9. MIN. 5/8" ALL THREAD FOR SECTIONS 10FT OR UNDER

GENERAL WATER/SEWER DETAIL: GWS02

REACTION BACKING TABLE

BLOCKING SCHEDULE					
PIPE SIZE		BENDS 45°	BENDS 22 1/2°	BENDS 11 1/4°	ROD DIA.
8"	VOLUME REQ'D (CU. FT.)	98.5	50.2	25.2	3/4 IN.
	A (FT.)	5.00'	4.00'	3.00'	
	B (FT.)	4.00'	3.20'	2.80'	
	C (FT.)	5.00'	4.00'	3.00'	
	MIN. CLAMP (2 EA.)	3/8 IN. x 2 IN.			
12"	VOLUME REQ'D (CU. FT.)	209.5	106.8	53.7	3/4 IN.
	A (FT.)	6.00'	5.00'	4.00'	
	B (FT.)	6.00'	4.25'	3.50'	
	C (FT.)	6.00'	5.00'	4.00'	
	MIN. CLAMP (2 EA.)	1/2 IN. x 2 IN.			
18"	VOLUME REQ'D (CU. FT.)	457.2	233.1	117.1	1 IN.
	A (FT.)	8.00'	6.50'	5.00'	
	B (FT.)	7.25'	5.50'	4.75'	
	C (FT.)	8.00'	6.50'	5.00'	
	MIN. CLAMP (2 EA.)	5/8 IN. x 3 IN.			
24"	VOLUME REQ'D (CU. FT.)	800.3	408.0	205.0	1 1/4 IN.
	A (FT.)	9.50'	7.50'	6.00'	
	B (FT.)	9.00'	7.25'	5.75'	
	C (FT.)	9.50'	7.50'	6.00'	
	MIN. CLAMP (2 EA.)	5/8 IN. x 3 IN.			

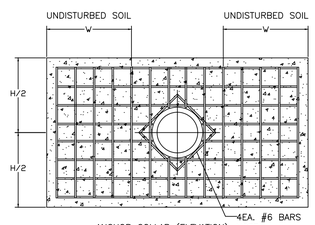
VOLUME CALCULATED ON THE BASIS OF CONCRETE REACTING THRUST ON THE RESPECTIVE BENDS UNDER AN INTERNAL PRESSURE OF 250 PSI, 50 PSI SURGE AND THE WEIGHT OF CONCRETE IS 150 POUNDS PER CU. FT.

NOTES:
1. ALL FITTINGS SHALL BE MECHANICAL JOINTS.
2. DO NOT COVER BELLS OR FLANGES WITH CONCRETE.
3. WRAP ALL FITTINGS WITH POLY WRAP.
4. BACK ALL TEES ACCORDING TO SIZE OF BRANCH.
5. BACKING FUTURE LINE EXTENSIONS SHALL BE SUCH THAT LATER REMOVAL IS POSSIBLE.
6. ALL BENDS WHERE FITTINGS ARE USED, BOTH HORIZONTAL OR VERTICAL, SHALL BE BACKED WITH CONCRETE.
7. REACTION BACKING TABLE IS BASED ON 150 PSI AND SOIL BEARING PRESSURE OF 2,000 LB/SQ. FT. ADDITIONAL BACKING MAY BE REQUIRED IN SOME AREAS AS REQUIRED BY CITY WATER DEPARTMENT.

GENERAL WATER/SEWER DETAIL: GWS03

ANCHOR COLLAR SPECIFICATIONS

ANCHOR COLLAR SCHEDULE						
PIPE SIZE	DIMENSIONS W	H	T	M	REINFORCING BARS "A" BARS	"B" BARS
6"	1.5'	2.0'	1.0'	M.J. RETAINER GLAND	#6@6"	#6@6"
8"	1.5'	2.5'	1.0'	M.J. RETAINER GLAND	#6@6"	#6@6"
12"	2.0'	4.0'	1.5'	M.J. RETAINER GLAND	#6@6"	#6@6"
16"	3.0'	4.5'	1.5'	M.J. RETAINER GLAND	#6@6"	#6@6"
20"	3.0'	5.0'	2.0'	M.J. RETAINER GLAND	#6@6"	#6@6"
24"	3.5'	5.5'	2.0'	M.J. RETAINER GLAND	#7@6"	#6@10"
30"	6.5'	6.0'	2.5'	4"	#8@6"	#7@10"
36"	7.0'	7.0'	2.5'	4"	#8@6"	#7@10"



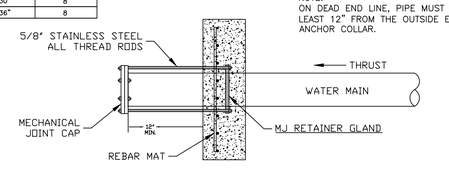
ANCHOR COLLAR (ELEVATION)

NOTE:
USE M.J. RETAINER GLANDS FOR PIPE 24" AND SMALLER.

NOTE:
PIPE SURFACES SHALL BE CLEANED OF ALL FOREIGN MATERIAL BEFORE 4000 PSI CONCRETE COLLAR IS POURED.

NOTE:
ON DEAD END LINE, PIPE MUST EXTEND AT LEAST 12" FROM THE OUTSIDE EDGE OF ANCHOR COLLAR.

ROD REQUIREMENTS	
MAIN SIZE	NO. OF RODS
6"	2
8"	4
12"	4
16"	6
24"	6
30"	8
36"	8

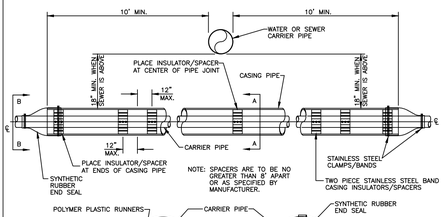


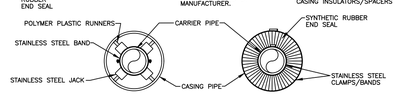
ANCHOR COLLAR (SIDE)

NOTE:
ALL–THREAD STEEL RODS SHALL BE 5/8" STAINLESS STEEL WITH STAINLESS STEEL HARDWARE.

GENERAL WATER/SEWER DETAIL: GWS04

ENCASEMENT CROSSING DETAIL





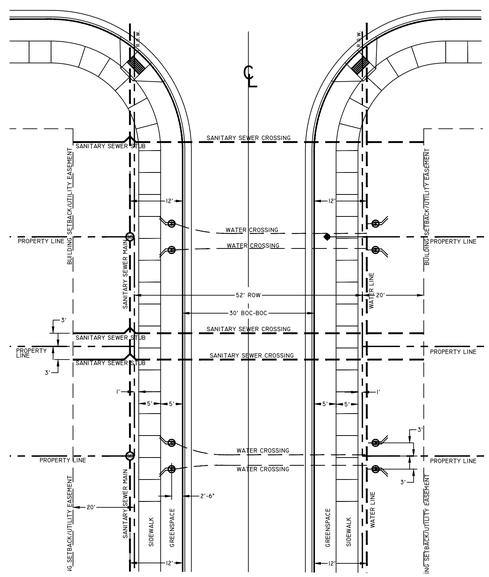
CARRIER & CASING SIZES									
CARRIER	4"	6"	8"	10"	12"	14"	16"	18"	20"
CASING	16"	16"	16"	18"	20"	24"	30"	30"	36"
CASING/WALL THICKNESS	.219	.219	.219	.250	.281	.344	.406	.406	.500

NOTE: DUCTILE IRON, OR PVC PIPE REQUIRED FOR WATER, OR SEWER.

*ALL BELLS SHALL BE RESTRAINED BY APPROVED METHOD.

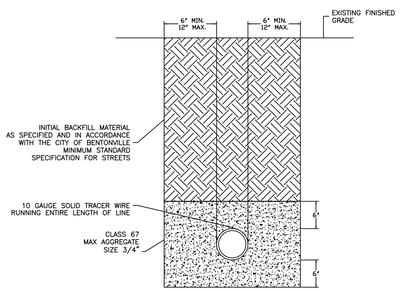
GENERAL WATER/SEWER DETAIL: GWS05

SUBDIVISION UTILITY PLACEMENT



GENERAL WATER/SEWER DETAIL: GWS06

TYPICAL BEDDING DETAIL



* REFER TO STREET SPECIFICATIONS FOR STREET REPAIR INFORMATION

GENERAL WATER/SEWER DETAIL: GWS07

THE CITY OF WASTEWATER WATER BENTONVILLE
3200 SW MUNICIPAL DR.
Bentonville, AR 72712
Ph: (479) 271-3140
www.bentonvillear.com

WATER/SEWER DETAILS

APPROVED FOR CONSTRUCTION
04/12/2024 8:51:01 AM

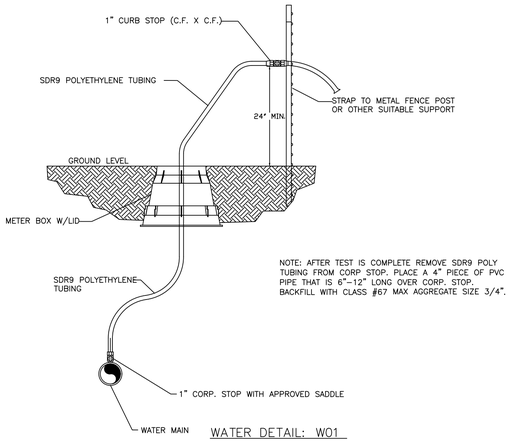
811 Know what's **below.** **Call** before you dig.

REVISIONS:
Adopted by City Council 06/22/2021
Ordinance Number: 2021-135

DRAWN BY:	DATE:
JI	03/16/2021
APPROVED BY: PN	DATE: 03/16/2021

SHEET NUMBER: 1 OF 1

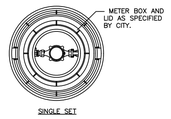
TEMPORARY 1" BLOW OFF ASSEMBLY SAMPLE POINTS



NOTE: AFTER TEST IS COMPLETE REMOVE SDR9 POLY TUBING FROM CORP STOP. PLACE A 4" PIECE OF PVC PIPE THAT IS 6"–12" LONG OVER CORP. STOP. BACKFILL WITH CLASS #67 MAX AGGREGATE SIZE 3/4".

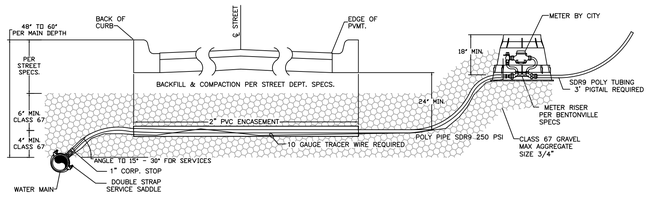
WATER DETAIL: W01

WATER SERVICE DETAIL 1"



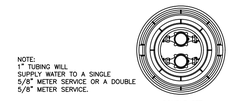
SINGLE SET

NOTE:
1" SDR9 POLY TUBING WILL SUPPLY WATER ONLY TO A SINGLE 1" METER SERVICE.



WATER DETAIL: W02

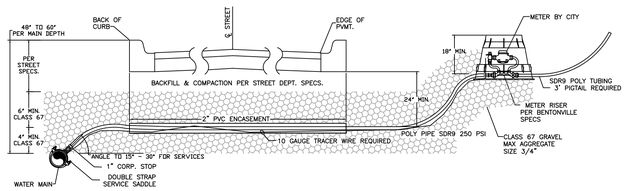
WATER SERVICE DETAIL 5/8"



NOTE:
1" TUBING WILL SUPPLY WATER TO A SINGLE 5/8" METER SERVICE OR A DOUBLE 5/8" METER SERVICE.

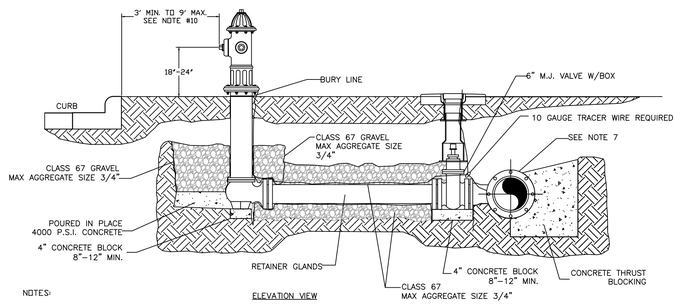
DOUBLE SET

SINGLE SET



WATER DETAIL: W03

FIRE HYDRANT DETAIL W/ RETAINER GLANDS

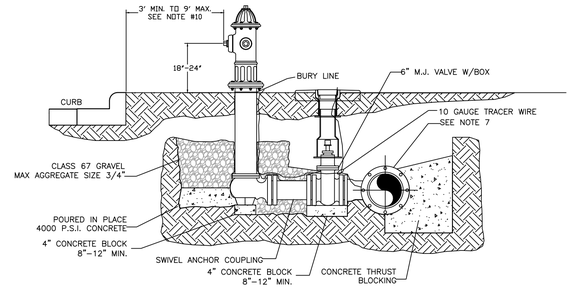


ELEVATION VIEW

NOTES:
1. DRAINAGE BED SHALL CONSIST OF CLASS 67 GRAVEL WITH A MAX AGGREGATE SIZE OF 3/4".
2. USE 6" NIPPLE WITH M.J. RETAINER GLANDS IF DISTANCE BETWEEN VALVE AND HYDRANT MUST BE GREATER THAN 13" SWIVEL ADAPTER.
3. FIRE HYDRANT TO BE BLOCKED AGAINST FIRM SOIL AS SHOWN.
4. ALL HYDRANTS SHALL BE INSTALLED PLUMB.
5. LARGE NOZZLE SHALL FACE CURB UNLESS OTHERWISE NOTED. ROTATE BARREL AS REQUIRED.
6. HYDRANT SHOULD NOT BE SET CLOSER THAN 4.0' TO OBSTRUCTIONS THAT ARE IN LINE WITH NOZZLE.
7. M.J. ANCHOR TEE, TAPPING SLEEVE OR TAPPING SADDLE MAY BE USED (SEE MATERIAL SPECIFICATIONS)
8. HYDRANTS TO BE SET AT DEPTHS GREATER THAN 6.0' SHALL BE SET WITH A MODIFIED FIRE HYDRANT SETTING.
9. POLYWRAP ENTIRE HYDRANT ASSEMBLY. DO NOT COVER WEEP HOLE DRAIN.
10. HYDRANTS WILL BE SET AT A MINIMUM OF 3' TO A MAXIMUM OF 9' BACK OF CURB OR EDGE OF DRAINING SURFACE, NOT IN SIDEWALK, FIRE LANE, OR RADIUS OR AS DIRECTED BY BENTONVILLE WATER DEPARTMENT.

WATER DETAIL: W04

FIRE HYDRANT DETAIL W/SWIVEL ANCHOR COUPLING



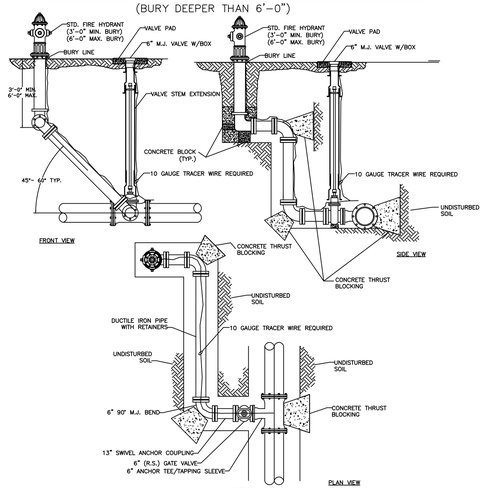
ELEVATION VIEW

NOTES:
1. DRAINAGE BED SHALL CONSIST OF CLASS 67 GRAVEL WITH A MAX AGGREGATE SIZE OF 3/4".
2. M.J. RETAINER GLANDS IF DISTANCE BETWEEN VALVE AND HYDRANT MUST BE GREATER THAN 13" SWIVEL ADAPTER.
3. FIRE HYDRANT TO BE BLOCKED AGAINST FIRM SOIL AS SHOWN.
4. ALL HYDRANTS SHALL BE INSTALLED PLUMB.
5. LARGE NOZZLE SHALL FACE CURB UNLESS OTHERWISE NOTED. ROTATE BARREL AS REQUIRED.
6. HYDRANT SHOULD NOT BE SET CLOSER THAN 4.0' TO OBSTRUCTIONS THAT ARE IN LINE WITH NOZZLE.
7. M.J. ANCHOR TEE, TAPPING SLEEVE OR TAPPING SADDLE MAY BE USED (SEE MATERIAL SPECIFICATIONS)
8. HYDRANTS TO BE SET AT DEPTHS GREATER THAN 6.0' SHALL BE SET WITH A MODIFIED FIRE HYDRANT SETTING.
9. POLYWRAP ENTIRE HYDRANT ASSEMBLY. DO NOT COVER WEEP HOLE DRAIN.
10. HYDRANTS WILL BE SET AT A MINIMUM OF 3' TO A MAXIMUM OF 9' BACK OF CURB, NOT IN SIDEWALK, FIRE LANE, OR RADIUS OR AS DIRECTED BY BENTONVILLE WATER DEPARTMENT.

WATER DETAIL: W05

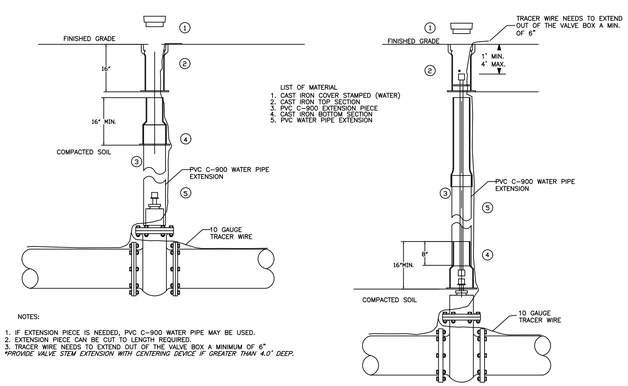
DEEP BURY FIRE HYDRANTS

(BURY DEEPER THAN 6'–0")



WATER DETAIL: W06

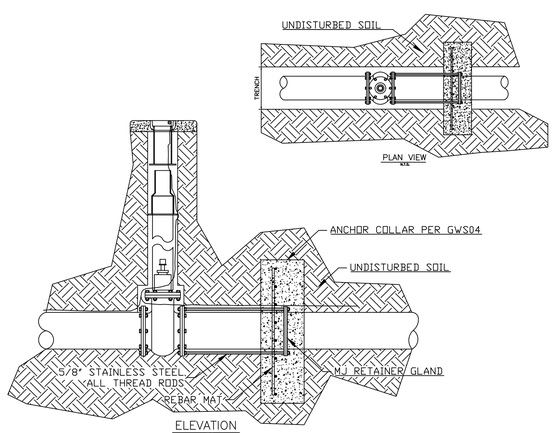
VALVE BOX VALVE STEM & TRACER WIRE INSTALLATION



NOTES:
1. IF EXTENSION PIECE IS NEEDED, PVC C-900 WATER PIPE MAY BE USED.
2. EXTENSION PIECE CAN BE CUT TO LENGTH REQUIRED.
3. TRACER WIRE NEEDS TO EXTEND OUT OF THE VALVE BOX A MINIMUM OF 6"
*PROVIDE VALVE STEM EXTENSION WITH CENTERING DEVICE IF GREATER THAN 4.0' DEEP.

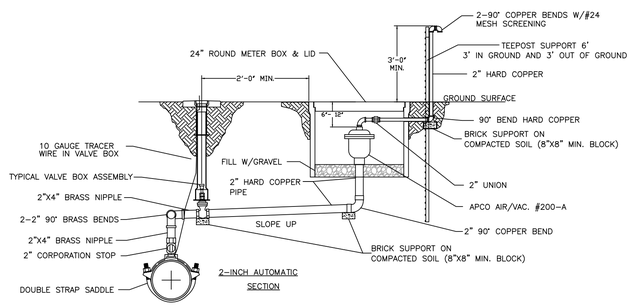
WATER DETAIL: W07

RESTRAINED GATE VALVE



WATER DETAIL: W08

2" COMBINATION AIR/VACUUM VALVE DETAIL



NOTES:
1. ALL THREADED CONNECTIONS SHALL HAVE A DOUBLE WRAP OF TEFLON TAPE ON THREADS.
2. DRILL HOLE IN SIDE OF METER BOX FOR OUTLET PIPING.
3. VALVES WILL BE PIPED TO POINT BEYOND PAVEMENT AND SHOULDER.

WATER DETAIL: W09

THE CITY OF WASTEWATER WATER BENTONVILLE
3200 SW MUNICIPAL DR.
Bentonville, AR 72712
Ph: (479) 271-3140
www.bentonvillear.com

WATER DETAILS

APPROVED FOR CONSTRUCTION
04/12/2024 8:51:01 AM

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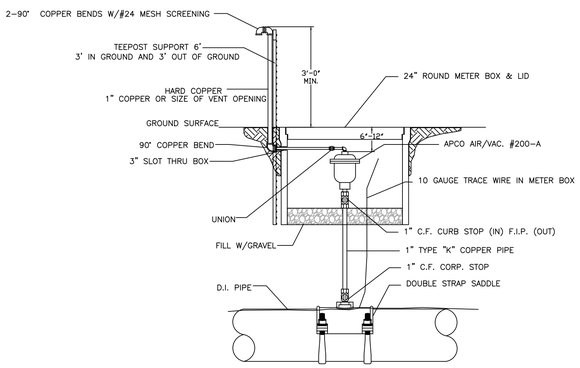
REVISIONS:
Adopted by City Council 06/22/2021
Ordinance Number: 2021-135

Approved by Dept. of Health
04/01/2021

NOTES:

DRAWN BY:	JI	DATE:	03/16/2021
APPROVED BY:	PN	DATE:	03/16/2021
SHEET NUMBER:	1	OF	2

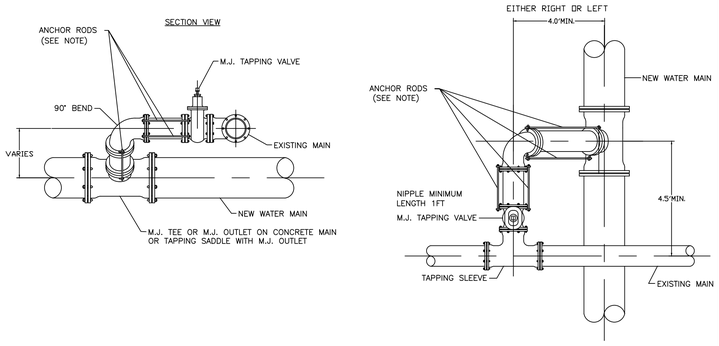
1" COMBINATION AIR/VACUUM VALVE DETAIL



NOTES:
1. ALL THREADED CONNECTIONS SHALL HAVE A DOUBLE WRAP OF TEFLON TAPE ON THREADS.
2. DRILL HOLE IN SIDE OF METER BOX FOR OUTLET PIPING.
3. VALVES WILL BE PIPED TO POINT BEYOND PAVEMENT AND SHOULDER.

WATER DETAIL: W10

SWING CONNECTION - NEW MAIN TO EXISTING MAIN



THRUST BLOCKING REQUIRED AT TEES AND ELBOWS.

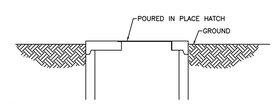
PIPE SIZE	6"	8"	12"
RODS PER NIPPLE	2	2	4

NOTES:
1. CONTRACTOR SHALL LOCATE EXISTING MAIN IN ADVANCE OF LAYING NEW LINE IN ORDER TO ASSURE ADEQUATE LENGTH TO ADJUST DEPTH OF NEW MAIN.
2. DIMENSIONS SHOWN ARE RECOMENDED MINIMUMS TO PROVIDE ADEQUATE ROOM FOR TIGHTENING BOLTS ON JOINTS. (OTHER DIMENSIONS MAY BE USED)
3. PROVIDE STAINLESS STEEL "ALL THREAD(MIN 5/8")" TIE RODS WITH EYE BOLTS FOR ANCHORING ALL JOINTS.
4. RODS SHALL BE FIELD CUT TO FIT & SHALL BE PROTECTED WITH POLYWRAP.
5. ROTATE TEE UP & ELBOW DOWN AS REQUIRED TO MATCH.
6. USE TYPICAL CONCRETE BLOCKING REQUIRED.

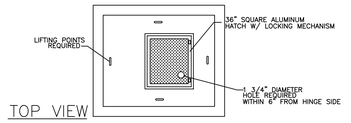
WATER DETAIL: W11

METER VAULT DETAIL FOR 4" - 8" METERS (TYPICAL)

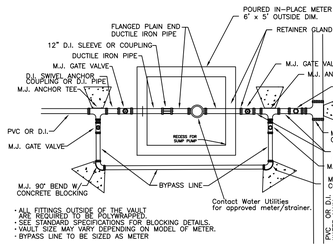
(DIMENSIONS MAY VARY FOR METER SIZES)



SIDE VIEW



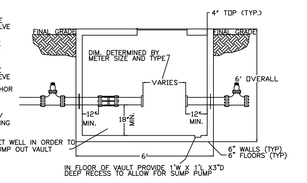
TOP VIEW



- ALL FITTINGS OUTSIDE OF THE VAULT ARE REQUIRED TO BE POLYWRAPPED.
- SEE STANDARD SPECIFICATIONS FOR BLOCKING DETAILS.
- VAULT SIZE MAY VARY DEPENDING ON MODEL OF METER.
- BYPASS LINE TO BE SIZED AS METER

PLAN VIEW
N.T.S.

- NOTE: IF VAULT IS SQUARE REBAR IS REQUIRED
#4 BAR ON 12" ON CENTER EACH WAY FOR THE BOTTOM
#4 BAR ON 8" ON CENTER EACH WAY FOR THE WALLS
#4 BAR ON 8" ON CENTER EACH WAY FOR THE LID

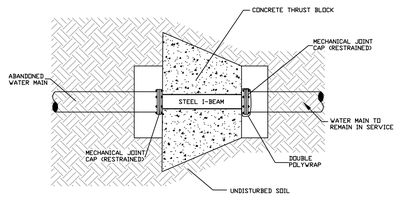


IN FLOOR OF VAULT PROVIDE 1'W x 1'L x 3'D DEEP RECESS TO ALLOW FOR SUMP PUMP

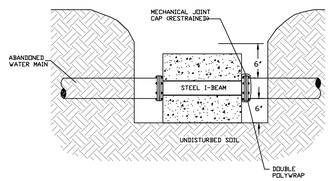
ELEVATION
N.T.S.

WATER DETAIL: W12

CUT/CAP DETAIL



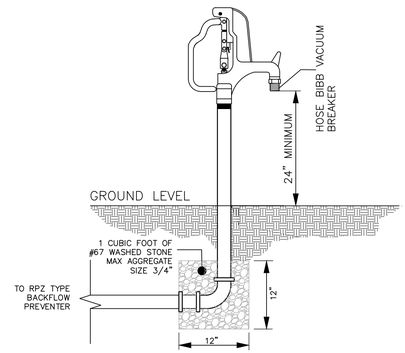
PLAN VIEW



PROFILE VIEW

WATER DETAIL: W13

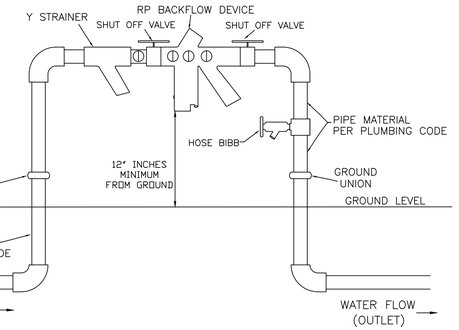
FROST FREE HOSE BIBB WITH VACUUM BREAKER



ELEVATION
N.T.S.

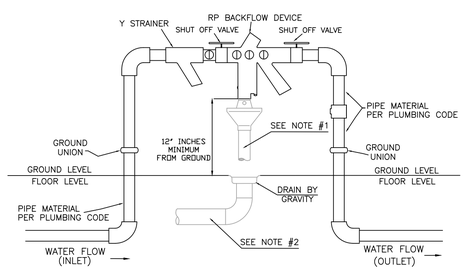
WATER DETAIL: W14

REDUCED PRESSURE (RP) IRRIGATION ONLY



WATER DETAIL: W15

REDUCED PRESSURE (RP) IRRIGATION ONLY



INDOOR APPLICATION ONLY NOTES:

1. AN AIR GAP DRAIN IS REQUIRED TO REDUCE SPLASHING OF MINOR DISCHARGES FROM THE RELIEF VALVE DRAIN PORT.
2. INDOOR INSTALLATION OF RP'S SHOULD PROVIDE FOR DRAINAGE CAPABLE OF HANDLING IN EXCESS OF THE MAXIMUM DISCHARGE RATE EXPECTED BY THE BACKFLOW ASSEMBLY MANUFACTURER.

WATER DETAIL: W16

THE CITY OF WASTEWATER WATER BENTONVILLE
3200 SW MUNICIPAL DR.
Bentonville, AR 72712
Ph: (479) 271-3140
www.bentonvillear.com

WATER DETAILS

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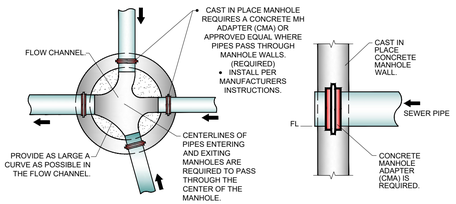
NOTES:

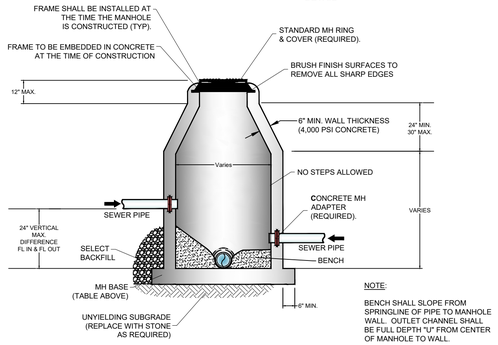
DRAWN BY: JI	DATE: 03/16/2021
APPROVED BY: PN	DATE: 03/16/2021
SHEET NUMBER: 2	OF 2

SANITARY SEWER
CAST IN PLACE MANHOLE



MANHOLE FLOW CHANNEL

CONCRETE MANHOLE ADAPTER (CMA) DETAIL



NOTE:

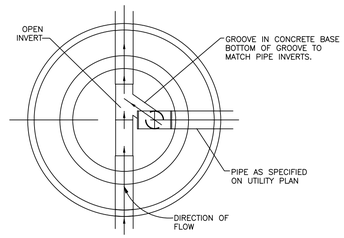
BENCH SHALL SLOPE FROM SPRINGLINE OF PIPE TO MANHOLE WALL. OUTLET CHANNEL SHALL BE FULL DEPTH "U" FROM CENTER OF MANHOLE TO WALL.

Inside Diameter of Manhole	Minimum Wall Thickness	Base Thickness	Minimum Ring & Cover Size
4' DIA	6"	8"	24" (< or Equal to 24" Pipes)
5' DIA	8"	10"	
6' DIA	8"	12"	36" (> 24" Pipes)

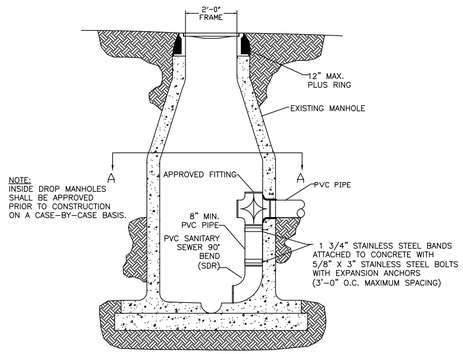
MANHOLE INFORMATION TABLE

SANITARY SEWER DETAIL: SS01

SANITARY SEWER
INTERIOR DROP MANHOLE



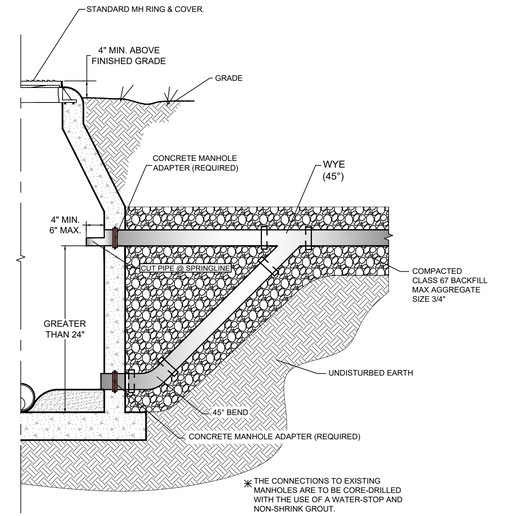
SECTION A-A



NOTE:
INSIDE DROP MANHOLES SHALL BE APPROVED PRIOR TO CONSTRUCTION ON A CASE-BY-CASE BASIS.

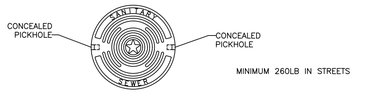
SANITARY SEWER DETAIL: SS02

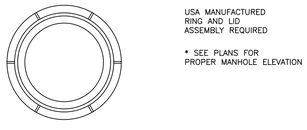
SANITARY SEWER
EXTERIOR DROP MANHOLE

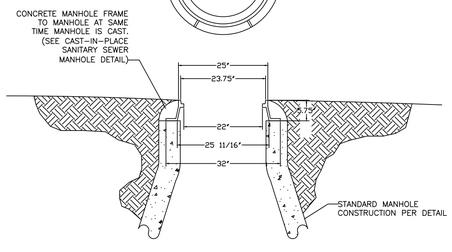


SANITARY SEWER DETAIL: SS03

HEAVY DUTY MANHOLE
LID & FRAME

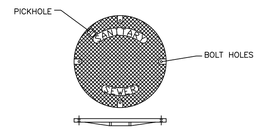


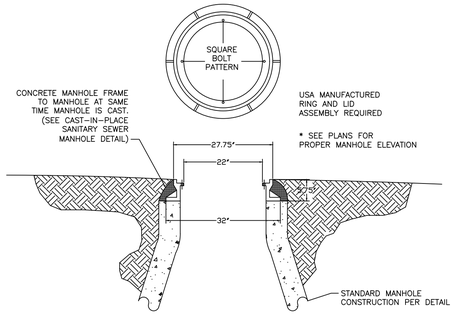




SANITARY SEWER DETAIL: SS04

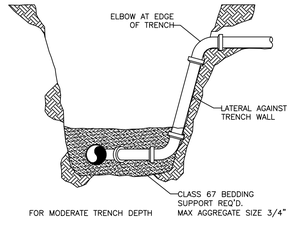
WATER TIGHT BOLTED MANHOLE
LID & FRAME



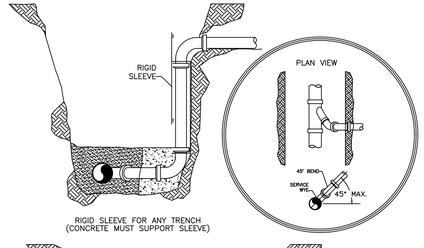


SANITARY SEWER DETAIL: SS05

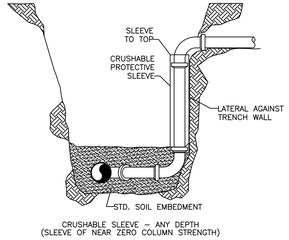
SANITARY SEWER
SERVICE WYE



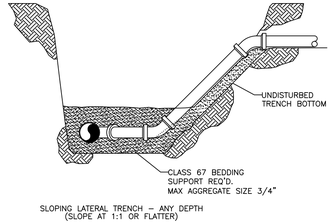
FOR MODERATE TRENCH DEPTH



RIGID SLEEVE FOR ANY TRENCH (CONCRETE MUST SUPPORT SLEEVE)



CRUSHABLE SLEEVE – ANY DEPTH
(SLEEVE OF NEAR ZERO COLUMN STRENGTH)



SLOPING LATERAL TRENCH – ANY DEPTH
(SLOPE AT 1:1 OR FLATTER)

SANITARY SEWER DETAIL: SS06

THE CITY OF WASTEWATER WATER BENTONVILLE
3200 SW MUNICIPAL DR.
Bentonville, AR 72712
Ph: (479) 271-3140
www.bentonvillear.com

SAN.SEWER DETAILS

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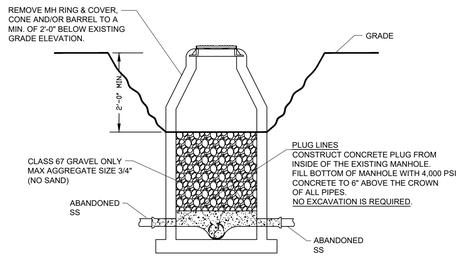
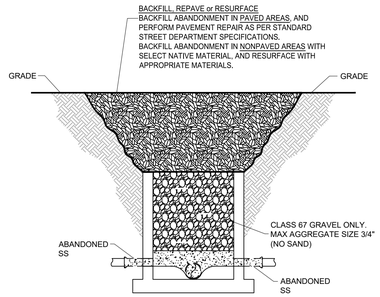
NOTES:

DRAWN BY: JI	DATE: 03/16/2021
APPROVED BY: PN	DATE: 03/16/2021
SHEET NUMBER: 1	OF 2

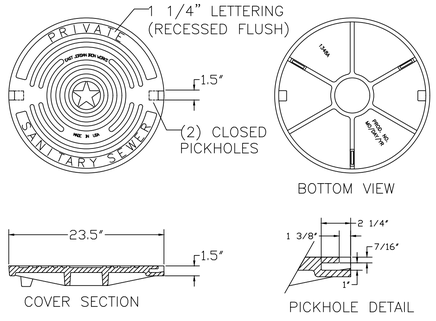
SANITARY SEWER MANHOLE ABANDONMENT





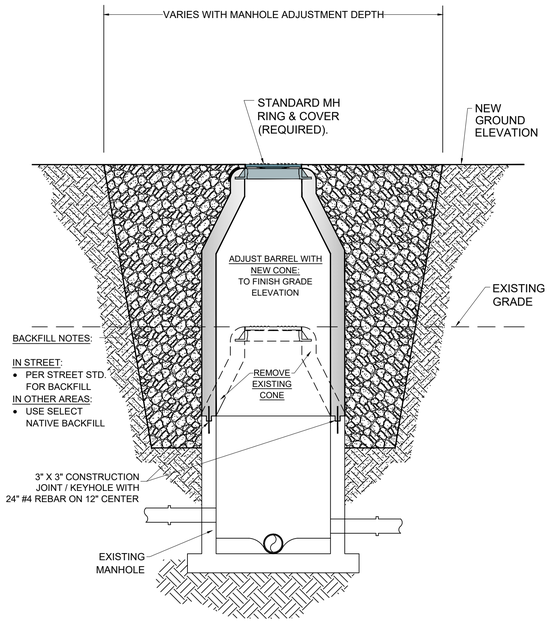
SANITARY SEWER DETAILS: SS07

PRIVATE MANHOLE RING AND LID



SANITARY SEWER DETAILS: SS08

TYPICAL MANHOLE ADJUST TO GRADE



SANITARY SEWER DETAILS: SS09

THE CITY OF WASTEWATER WATER BENTONVILLE
3200 SW MUNICIPAL DR.
Bentonville, AR 72712
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REVISIONS:
Adopted by City Council 06/22/2021
Ordinance Number: 2021-135

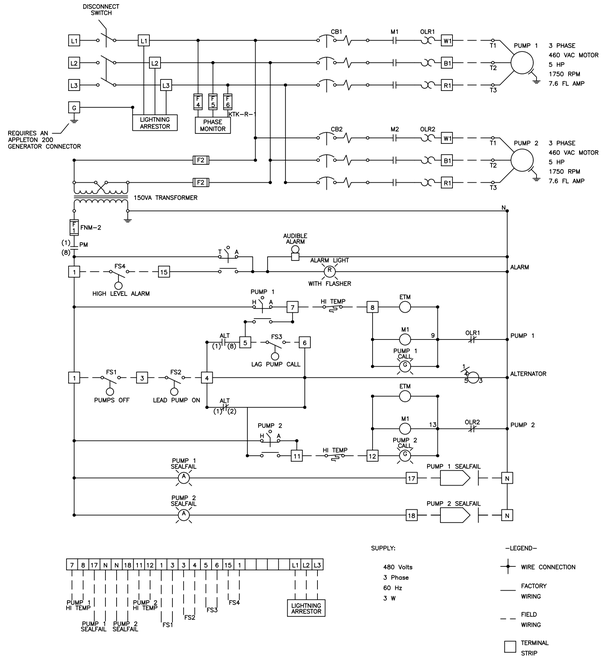
Approved by Dept. of Health
04/01/2021

NOTES:

DRAWN BY: JI	DATE: 03/16/2021
APPROVED BY: PN	DATE: 03/16/2021
SHEET NUMBER: 2	OF 2

DUPLEX PUMP CONTROL PANEL

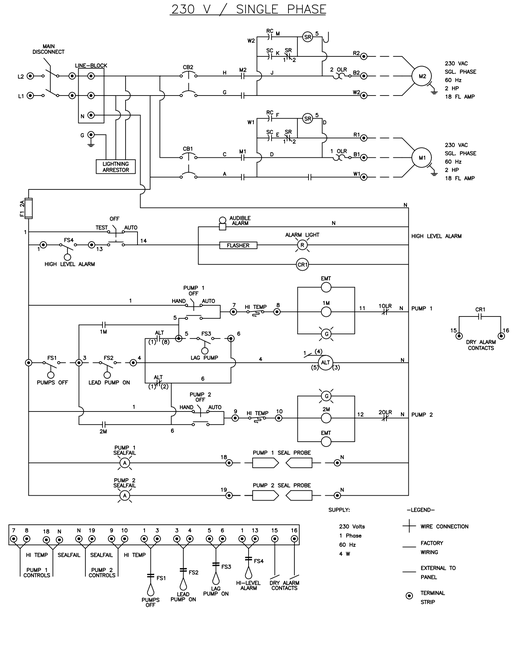
480 V / 3 PHASE



LIFT STATION DETAILS: LS01

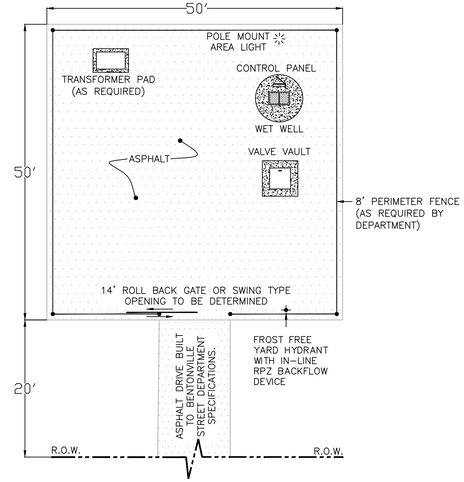
DUPLEX PUMP CONTROL PANEL

230 V / SINGLE PHASE



LIFT STATION DETAILS: LS02

LIFT STATION SITE DETAIL



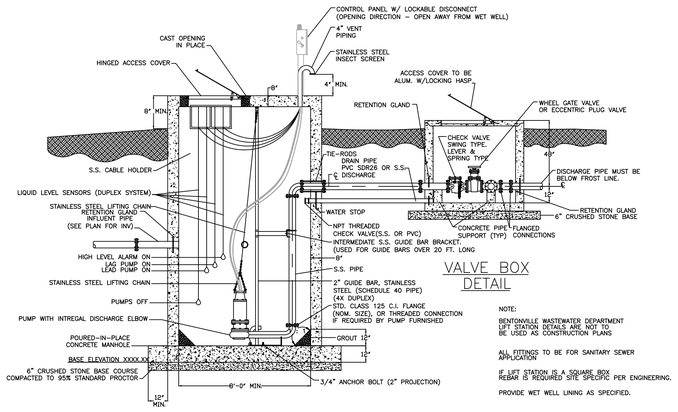
*ACTUAL SITE LAYOUT MAY VARY

BENTONVILLE WASTEWATER DEPARTMENT
LIFT STATION DETAILS ARE NOT TO
BE USED AS CONSTRUCTION PLANS

LIFT STATION DETAILS: LS03

LIFT STATION DETAIL

NON-CLOG PUMPS 5 HP AND UP



VALVE BOX DETAIL

NOTE:
BENTONVILLE WASTEWATER DEPARTMENT LIFT STATION DETAILS ARE NOT TO BE USED AS CONSTRUCTION PLANS

ALL FITTINGS TO BE FOR SANITARY SEWER APPLICATION

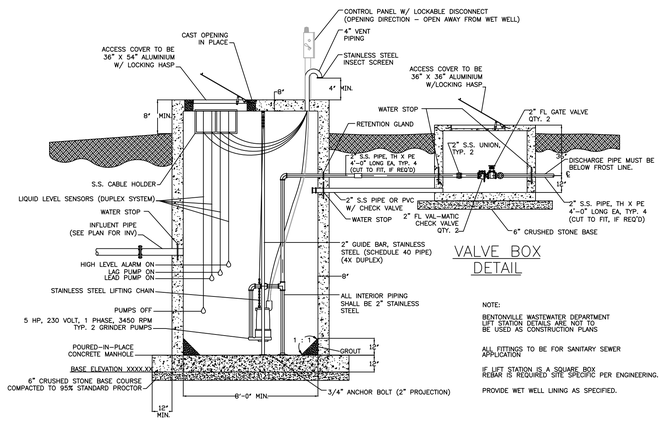
IF LIFT STATION IS A SQUARE BOX REBAR IS REQUIRED SITE SPECIFIC PER ENGINEERING.

PROVIDE WET WELL LINING AS SPECIFIED.

LIFT STATION DETAILS: LS04

LIFT STATION DETAIL

GRINDER PUMPS 5 HP AND LESS



VALVE BOX DETAIL

NOTE:
BENTONVILLE WASTEWATER DEPARTMENT LIFT STATION DETAILS ARE NOT TO BE USED AS CONSTRUCTION PLANS

ALL FITTINGS TO BE FOR SANITARY SEWER APPLICATION

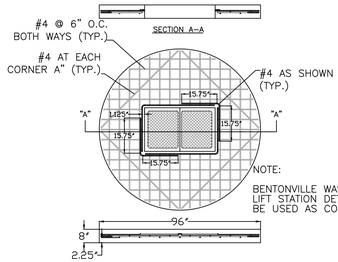
IF LIFT STATION IS A SQUARE BOX REBAR IS REQUIRED SITE SPECIFIC PER ENGINEERING.

PROVIDE WET WELL LINING AS SPECIFIED.

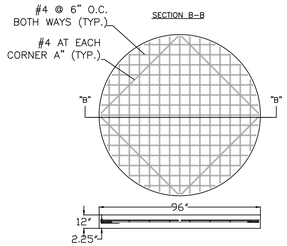
LIFT STATION DETAILS: LS05

WET WELL AND VALVE VAULT

TOP SLAB REINFORCEMENT DETAIL



BOTTOM SLAB REINFORCEMENT DETAIL



LIFT STATION DETAILS: LS06

3200 SW MUNICIPAL DR.
Bentonville, AR 72712
Ph: (479) 271-3140
www.bentonvillear.com

LIFT STATION DETAILS

APPROVED FOR CONSTRUCTION
04/12/2024 8:51:02 AM

Know what's **below.**
Call before you dig.

REVISIONS:
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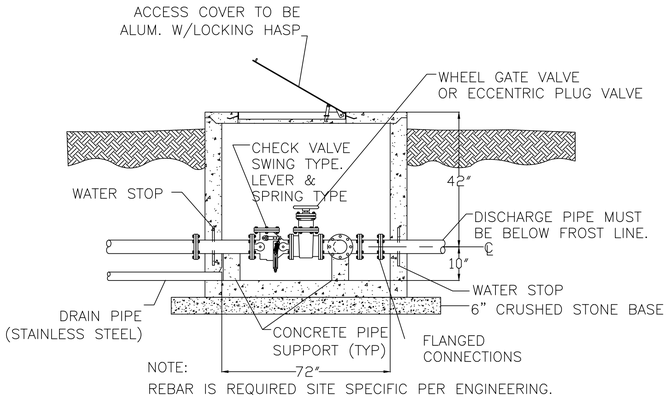
04/01/2021

NOTES:

DRAWN BY:	JI	DATE:	03/16/2021
APPROVED BY:	PN	DATE:	03/16/2021
SHEET NUMBER:	1	OF	2

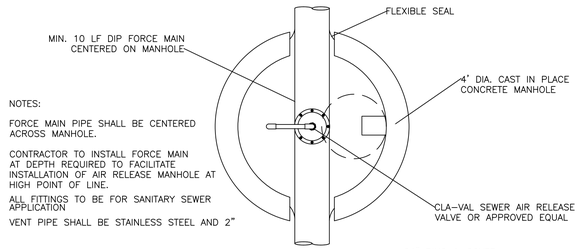
LIFT STATION VALVE VAULT DETAIL



NOTE:
REBAR IS REQUIRED SITE SPECIFIC PER ENGINEERING.

LIFT STATION DETAILS: LS07

AIR VACUUM/RELEASE MANHOLE FOR FORCE MAIN



NOTES:

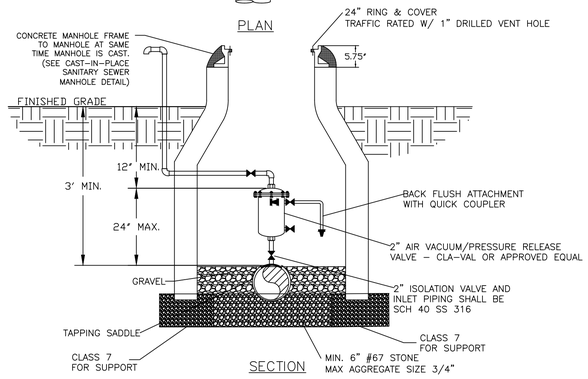
FORCE MAIN PIPE SHALL BE CENTERED ACROSS MANHOLE.

CONTRACTOR TO INSTALL FORCE MAIN AT DEPTH REQUIRED TO FACILITATE INSTALLATION OF AIR RELEASE MANHOLE AT HIGH POINT OF LINE.

ALL FITTINGS TO BE FOR SANITARY SEWER APPLICATION

VENT PIPE SHALL BE STAINLESS STEEL AND 2"

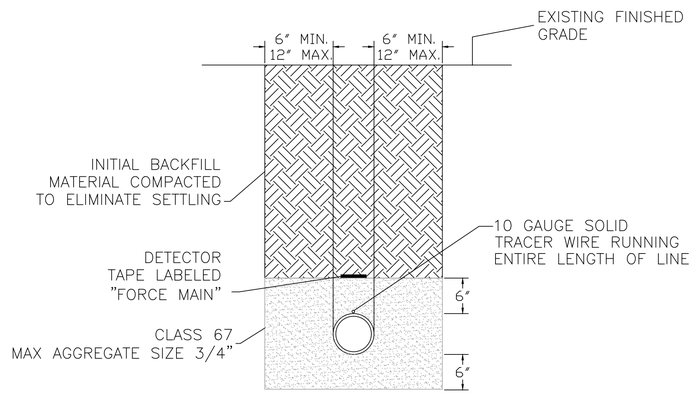
PLAN



SECTION

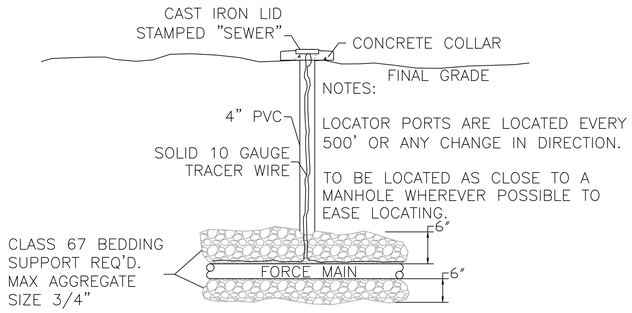
LIFT STATION DETAILS: LS08

TYPICAL BEDDING DETAIL FOR FORCE MAIN



LIFT STATION DETAILS: LS09

TRACER WIRE PORT



NOTES:

LOCATOR PORTS ARE LOCATED EVERY 500' OR ANY CHANGE IN DIRECTION.

TO BE LOCATED AS CLOSE TO A MANHOLE WHEREVER POSSIBLE TO EASE LOCATING.

LIFT STATION DETAILS: LS10

THE CITY OF WASTEWATER WATER BENTONVILLE

3200 SW MUNICIPAL DR.
Bentonville, AR 72712
Ph: (479) 271-3140
www.bentonvillear.com

LIFT STATION DETAILS

APPROVED FOR CONSTRUCTION
04/12/2024 8:51:02 AM

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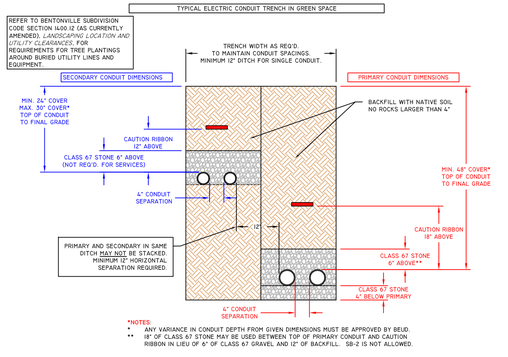
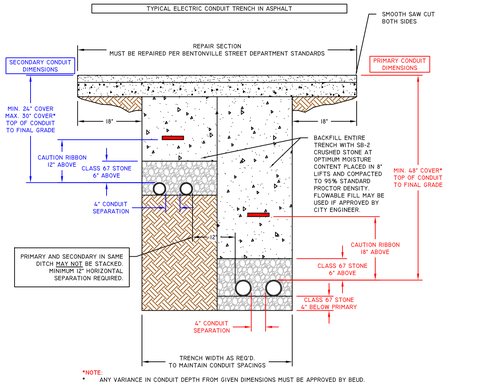
NOTES:

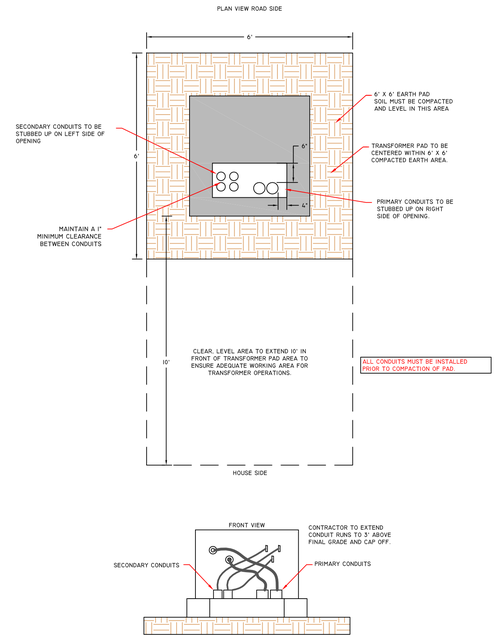
DRAWN BY: JI	DATE: 03/16/2021
APPROVED BY: PN	DATE: 03/16/2021
SHEET NUMBER: 2	OF 2



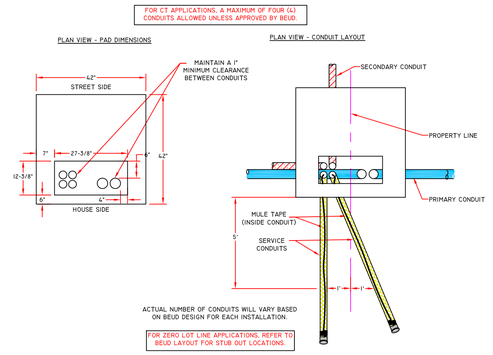
DS-1403 ELECTRIC TRENCH DETAILS SHEET 1



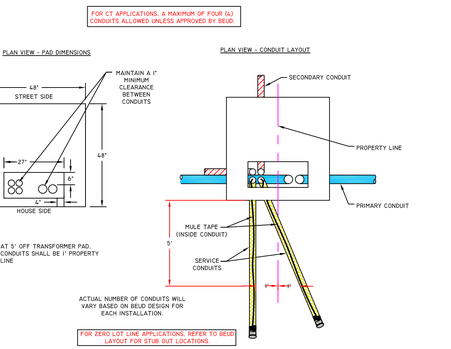
DS-1404 ELECTRIC TRENCH DETAILS SHEET 2



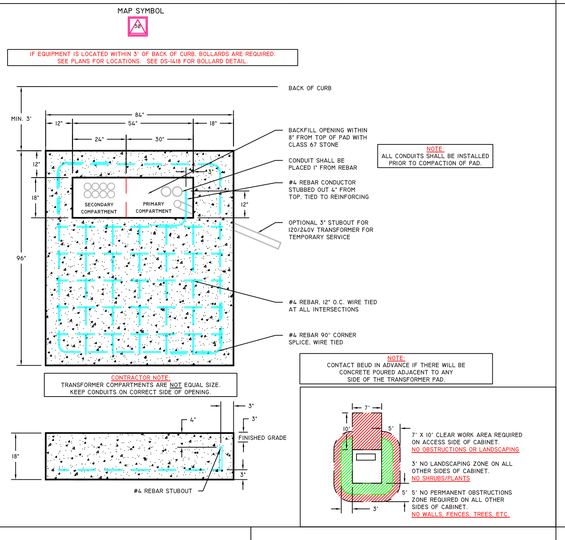
DS-1405 SINGLE PHASE TRANSFORMER SITE REQUIREMENTS



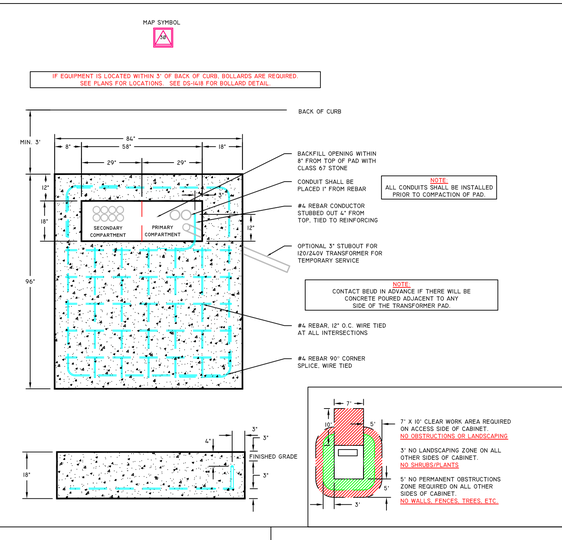
DS-1406 SINGLE PHASE TRANSFORMER PAD SMALLER THAN 100 kVA



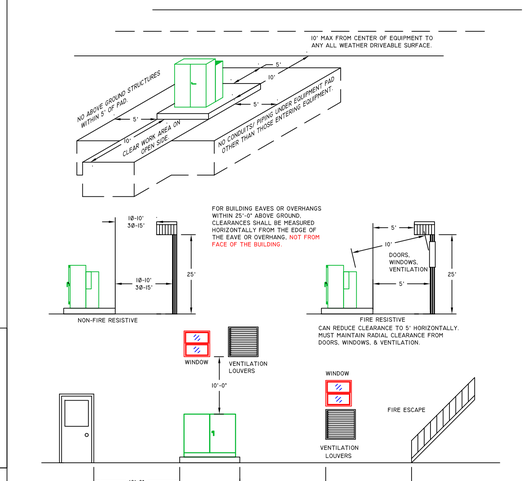
DS-1407 SINGLE PHASE TRANSFORMER PAD 100 kVA AND LARGER



DS-1408 THREE PHASE TRANSFORMER PAD 45-1000 kVA



DS-1409 THREE PHASE TRANSFORMER PAD 1500-2500 kVA



DS-1410 CLEARANCE SPECIFICATIONS FOR PADMOUNTED EQUIPMENT

THE CITY OF BENTONVILLE
608 SE 3rd Street
Bentonville, AR 72712
Ph: (479) 271-3135
www.bentonvillear.com

ELECTRIC LAYOUT

APPROVED FOR CONSTRUCTION
04/12/2024 8:51:02 AM

REVISION	DATE
1 BEUD REVISION	05/05/2014
2 BEUD REVISION	07/27/2015
3 BEUD REVISION	12/2016
3.1 BEUD CLARIFICATIONS	1/2017
4 BEUD REVISION	04/2019

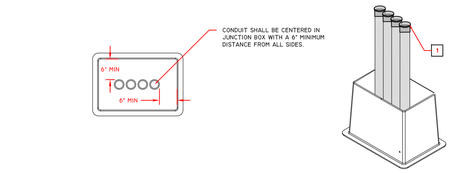
SCAN FOR LATEST REVISION OF BEUD SPECS
www.tinyurl.com/BEUDspecs

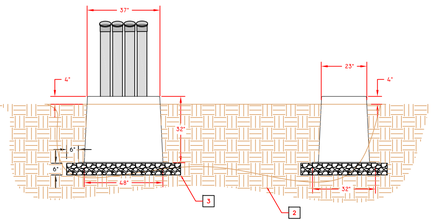
Know what's below. Call before you dig.

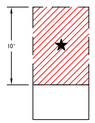
DRAWN: AJH 04/2019
CHECKED: WDT REV 4.
SHEET NUMBER:

DS-1411 SINGLE PHASE PRIMARY JUNCTION BOX SLEEVE

MAP SYMBOL





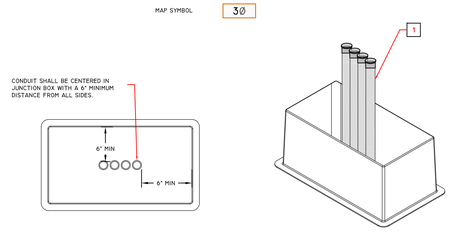


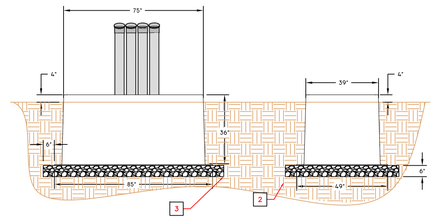
NOTES:

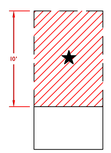
1. CONDUITS SHALL BE STUBBED UP AND CAPPED 3' ABOVE TOP OF SLEEVE.
2. SOIL BELOW SLEEVE SHALL BE COMPACTED AND LEVEL.
3. 6" OF CLASS 67 GRAVEL SHALL BE PLACED IN THE BOTTOM OF THE EARTH BOX, EXTENDING 6" BEYOND EDGE OF SLEEVE.
4. MARK GROUND ROD PLACEMENT IN BOTTOM OF SLEEVE WITH WOODEN STAKE TO MISS BURIED CONDUIT RUNS.
5. 10' CLEAR WORK AREA REQUIRED ON ACCESS SIDE OF CABINET. NO OBSTRUCTIONS.

DS-1412 THREE PHASE 200A PRIMARY JUNCTION BOX SLEEVE

MAP SYMBOL 3Ø





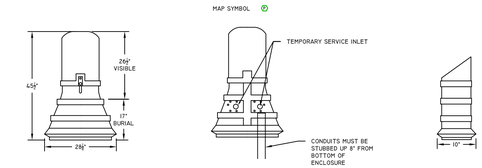


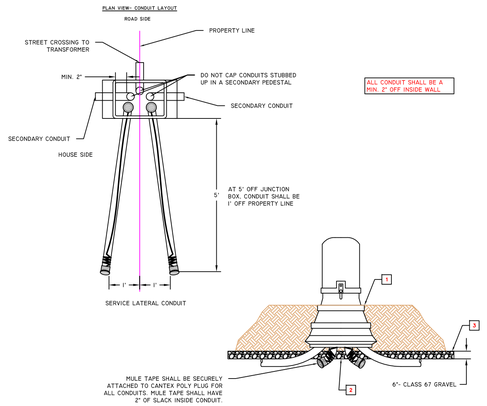
NOTES:

1. CONDUITS SHALL BE STUBBED UP AND CAPPED 3' ABOVE TOP OF SLEEVE.
2. SOIL BELOW SLEEVE SHALL BE COMPACTED AND LEVEL.
3. 6" OF CLASS 67 GRAVEL SHALL BE PLACED IN THE BOTTOM OF THE EARTH BOX, EXTENDING 6" BEYOND EDGE OF SLEEVE.
4. MARK GROUND ROD PLACEMENT IN BOTTOM OF SLEEVE WITH WOODEN STAKE TO MISS BURIED CONDUIT RUNS.
5. 10' CLEAR WORK AREA REQUIRED ON ACCESS SIDE OF CABINET. NO OBSTRUCTIONS.

DS-1414 SECONDARY JUNCTION BOX

MAP SYMBOL





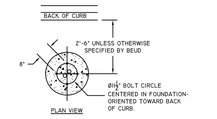
NOTES:

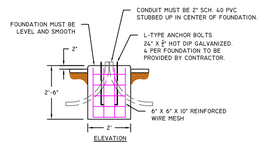
1. EXCAVATE A 30" W X 24" H X 17" D PIT CENTERED IN A 5' X 5' CLEAR, LEVEL AREA. PEDESTAL SHALL NOT BE SITUATED IN A LOW AREA OR SWALE THAT WOULD CAUSE WATER TO COLLECT IN PIT.
2. CONTRACTOR TO USE ONLY SHORT SWEEP ELBOWS.
3. 6" OF CLASS 67 GRAVEL SHALL BE PLACED IN THE BOTTOM OF THE EARTH BOX. EXTENDING 6" BEYOND EDGE OF SLEEVE.

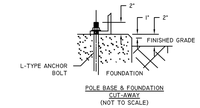
DS-1415 STREET LIGHT FOUNDATION FOR 12' RESIDENTIAL LIGHTS

MAP SYMBOL

DS-1415A - STANDARD FOUNDATION

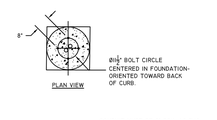


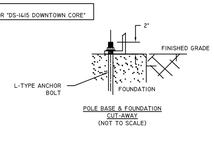


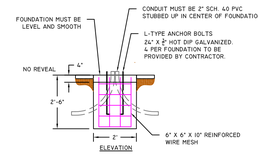


DS-1415B DOWNTOWN CORE

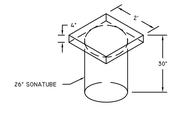
CONTRACTOR NOTE
ONLY USE THIS DETAIL WHEN BEUD DESIGN CALLS FOR "DS-1415 DOWNTOWN CORE"





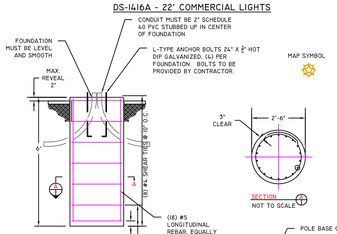


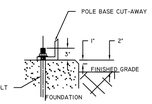
INSTALL ROUND SONATUBE FORM TO WITHIN 4" OF TOP ELEVATION. FORM A 24" SQUARE TOP ON THE SONATUBE TO MATCH THE ELEVATION OF SIDEWALK. SET SONATUBE, FORM SQUARE TOP, AND POUR FOUNDATION WITH ONE POUR FOR STRENGTH & STABILITY.



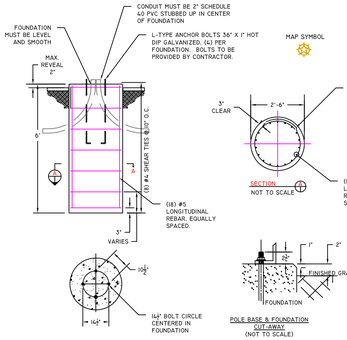
DS-1416 STREET LIGHT FOUNDATION FOR 22' AND 30' COMMERCIAL LIGHTS

DS-1416A - 22' COMMERCIAL LIGHTS

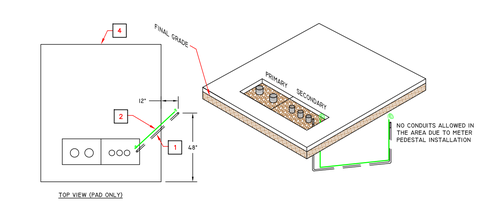


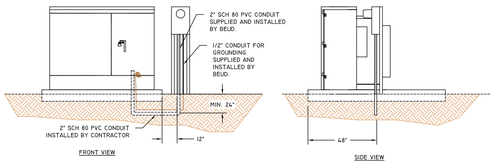


DS-1416B - 30' COMMERCIAL LIGHTS

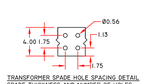


DS-1417 TRANSFORMER PAD AND METER CONFIGURATION FOR CT'S ON SPADES





1. 2" SCHEDULE 80 PVC CONDUIT FOR METERING TO BE INSTALLED BY CONTRACTOR. MUST BE STUBBED UP 12" FROM SIDE OF CONCRETE PAD AND 4.8" FROM FRONT EDGE OF CONCRETE PAD.
2. #6 BARE SOLID COPPER FOR GROUNDING TO BE INSTALLED BY CONTRACTOR. MUST BE DIRECT BURIED OUTSIDE 2" SCH 80 PVC CONDUIT IN THE SAME DITCH WITH MIN. 6 FT LENGTH COILED AT EACH END.
3. ELECTRICAL CONTRACTOR REQUIRED TO LAND SECONDARY CONDUCTORS IN TRANSFORMER WITH TWO HOLE TERMINAL LUGS USING (2) 1/2" SILICON BRONZE HEX BOLTS AND NUTS. (4) SILICON BRONZE FLAT WASHERS. (2) SILICON BRONZE LOCK WASHERS PER LUG. (BOLT LENGTH AS REQUIRED)
4. CONTRACTOR TO OBTAIN CORRECT MEASUREMENTS FOR CONCRETE PAD FROM CITY OF BENTONVILLE ELECTRIC UTILITIES DEPARTMENT.
5. COORDINATE WITH BEUD IF CONCRETE WILL BE POURED ANYWHERE ADJACENT TO THE TRANSFORMER PAD.



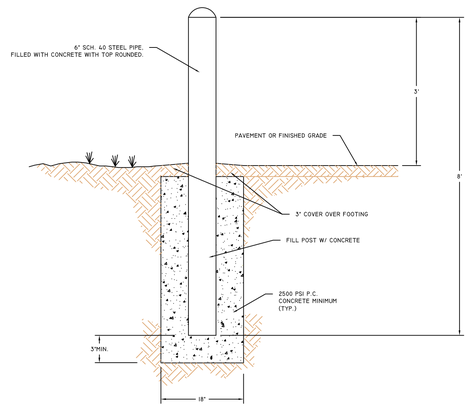
TRANSFORMER SPADE HOLE SPACING DETAIL
SPADE THICKNESS AND NUMBER OF HOLES VARIES BY TRANSFORMER SIZE.

TRANSFORMER SIZE (kVA)	USEABLE POSITIONS	SPADE THICKNESS
45	5	0.38"
75	7	0.5"
150-1000	11	0.5"
1500-2000	13	0.5"
2500	13	0.75"

DS-1418 PIPE BOLLARD DETAIL

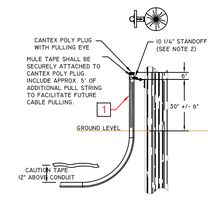
NOTE: IF EQUIPMENT IS 3' OR LESS FROM BACK OF CURB, BOLLARDS ARE REQUIRED. (SEE PLANS FOR LOCATIONS)

ALL PIPES SHALL BE PAINTED TRAFFIC YELLOW



DS-1419 CONDUIT INSTALLATION DETAILS

DS-1419A - CONDUIT STANDOFF



	ELBOW SIZE		
CONDUIT SIZE	PRIMARY	SECONDARY	SERVICE
2"	N/A	9.5"	9.5"
3"	48"	13"	13"
4"	48"	16"	16"
5"	60"	N/A	N/A
6"	60"	N/A	N/A

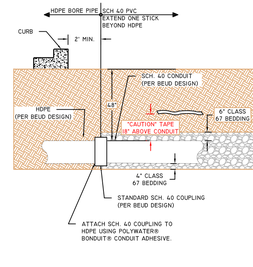
NOTES:

1. FOR 200A SERVICE. MIN. 3" CONDUIT REQUIRED. FOR 400A SERVICE MIN. 4" CONDUIT REQUIRED.
2. STAND-OFF WILL BE SUPPLIED AND INSTALLED BY CITY OF BENTONVILLE ELECTRIC DEPARTMENT. CALL 479-271-3135 PRIOR TO DIGGING TO CONFIRM CORRECT POLE AND STAND-OFF LOCATION.

DS-1419B - HDPE BORE PIPE TO PVC SCHEDULE 40 CONDUIT

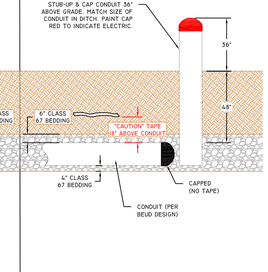
CONTRACTOR TO INSTALL ONE STICK SCH 40 PVC WHEN INSTALLING HDPE BORE PIPE.

18" OF CLASS 67 GRAVEL MAY BE USED BETWEEN TOP OF CONDUIT AND CAUTION RIBBON IN LIEU OF 4" OF CLASS 67 GRAVEL AND 12" OF BACKFILL.



DS-1419C - CONDUIT STUB-UP

18" OF CLASS 67 GRAVEL MAY BE USED BETWEEN TOP OF CONDUIT AND CAUTION RIBBON IN LIEU OF 6" OF CLASS 67 GRAVEL AND 12" OF BACKFILL.



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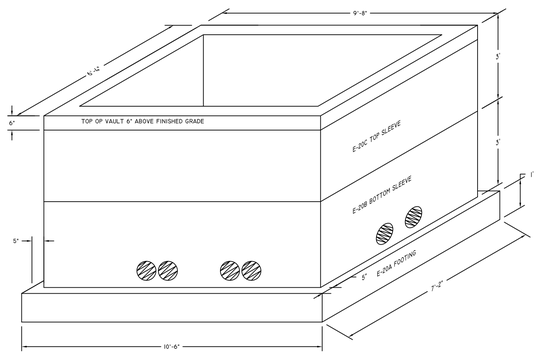
REVISION			
1	BEUD REVISION	05/09/2014	
2	BEUD REVISION	07/27/2015	
3	BEUD REVISION	12/2016	
3A	BEUD CLARIFICATIONS	1/2017	
4	BEUD REVISION	04/2019	

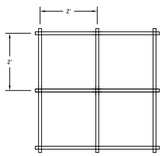
SCAN FOR LATEST REVISION OF BEUD SPECS
www.tinyurl.com/BEUDspecs

Know what's below. Call before you dig.

DRAWN:	AJH	04/2019
CHECKED:	WDT	REV 4

SHEET NUMBER: 2

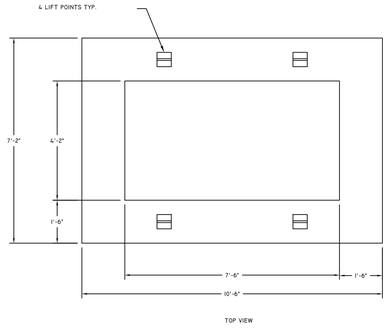




STEEL REINFORCING GRID REQUIRED USING #4 REBAR AT 12" O.C. THROUGHOUT

CONTRACTOR SHALL COVER EACH UNUSED HOLES INDIVIDUALLY. NO GLUE SHALL BE USED.

DS-I420 PADMOUNT SWITCHGEAR VAULT ASSEMBLY



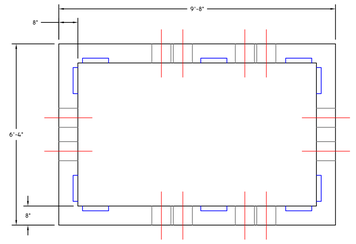
TOP VIEW

FRONT VIEW

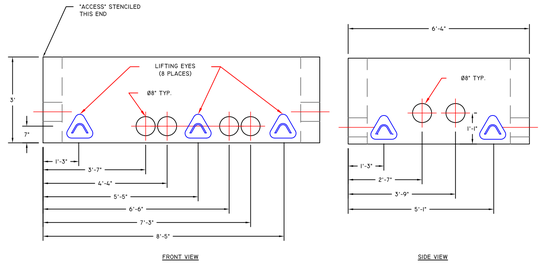
NOTE: CLASS 67 STONE MUST NOT BE INSTALLED ANY HIGHER THAN 2" FROM TOP OF FOOTING.

FOOTER WEIGHT: 3,200 LBS

DS-I420A PADMOUNT SWITCHGEAR VAULT FOOTER



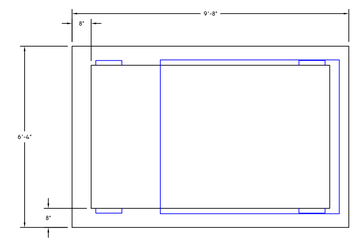
TOP VIEW



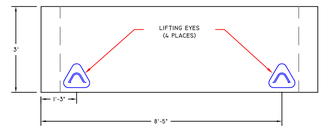
FRONT VIEW SIDE VIEW

BOTTOM SLEEVE WEIGHT: 8,900 LBS

DS-I420B PADMOUNT SWITCHGEAR BOTTOM SLEEVE



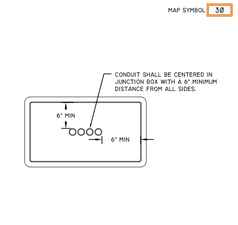
TOP VIEW

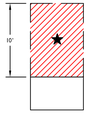


FRONT VIEW

TOP SLEEVE WEIGHT: 9,200 LBS

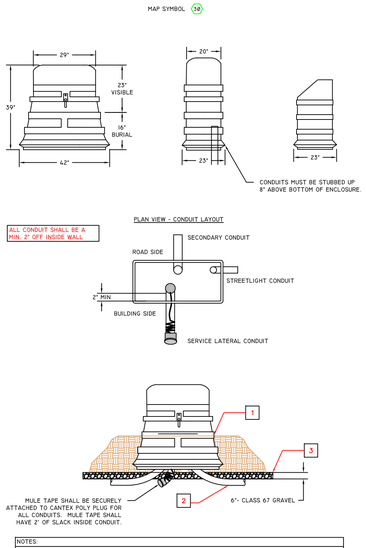
DS-I420C PADMOUNT SWITCHGEAR TOP SLEEVE





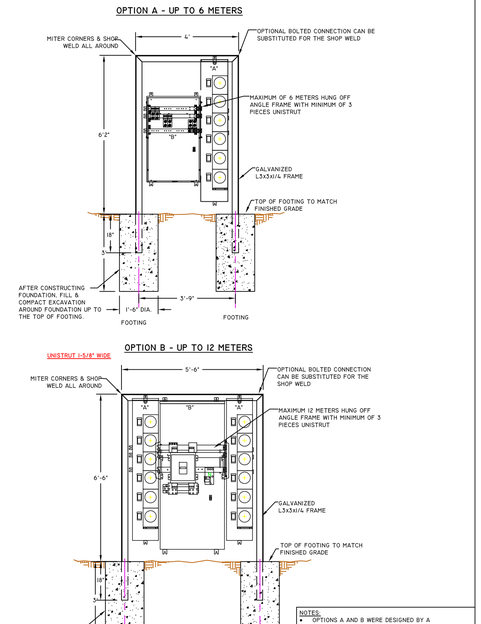
NOTES:
1. CONDUITS SHALL BE STUBBED UP AND CAPPED 3" TOP OF SLEEVE.
2. SOIL BELOW SLEEVE SHALL BE COMPACTED AND LEVEL.
3. 6" OF CLASS 67 GRAVEL SHALL BE PLACED IN THE BOTTOM OF THE EARTH BOX, EXTENDING 6" BEYOND EDGE OF SLEEVE.
4. MARK GROUND ROD PLACEMENT IN BOTTOM OF SLEEVE WITH WOODEN STAKE TO MISS BURIED CONDUIT RUNS.
5. 10' CLEAR WORK AREA REQUIRED ON ACCESS SIDE OF CABINET. NO OBSTRUCTIONS.

DS-I413 THREE PHASE 600A PRIMARY JUNCTION BOX SLEEVE



NOTES:
1. EXCAVATE A 44" W X 48" H X 17" D PIT CENTERED IN A 7' X 7' CLEAR, LEVEL AREA. PEDESTAL SHALL NOT BE SITUATED IN A LOW AREA OR SWALE THAT WOULD CAUSE WATER TO COLLECT IN PIT.
2. CONTRACTOR TO USE ONLY SHORT SWEEP ELBOWS.
3. 6" OF CLASS 67 GRAVEL SHALL BE PLACED IN THE BOTTOM OF THE EARTH BOX, EXTENDING 6" BEYOND EDGE OF SLEEVE.

DS-I414-1 THREE PHASE SECONDARY JUNCTION BOX



NOTES:
- OPTIONS A AND B WERE DESIGNED BY A PROFESSIONAL STRUCTURAL ENGINEER.
- IF THIS METER RACK CANNOT ACCOMODATE THE REQUIRED EQUIPMENT, THE DEVELOPER MUST HAVE AN APPROPRIATE METER RACK DESIGNED BY A PROFESSIONAL STRUCTURAL ENGINEER. DESIGN DRAWINGS STAMPED BY THE ENGINEER MUST BE SUBMITTED TO BEUD FOR REVIEW PRIOR TO INSTALLATION.
- FOR BOTH OPTIONS, GROUNDING SHALL BE PER NEC TABLE 250.122

DS-I024 SINGLE PHASE FREE STANDING METER RACK

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REVISION		DATE
BEUD REVISION	1	05/05/2014
BEUD REVISION	2	01/27/2015
BEUD REVISION	3	07/27/2016
BEUD CLARIFICATIONS	3C	07/2017
BEUD REVISION	4	04/2019

SCAN FOR LATEST REVISION OF BEUD SPECS
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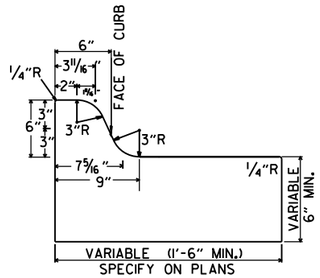
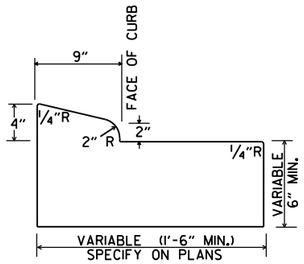
Know what's below. Call before you dig.

DRAWN: AJH 04/2019
CHECKED: WDT REV 4

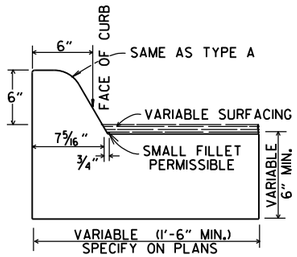
SHEET NUMBER: 3



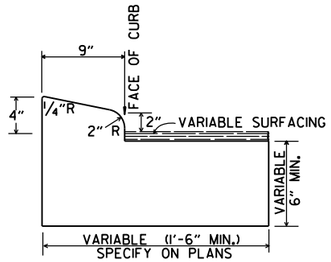
TYPE A



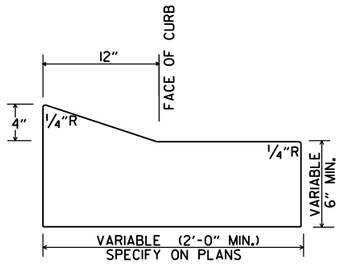
TYPE B-1



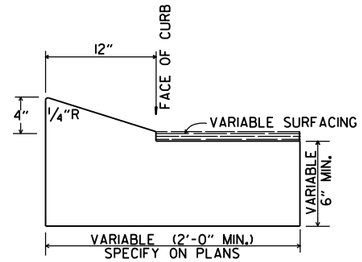
TYPE C



TYPE B-2

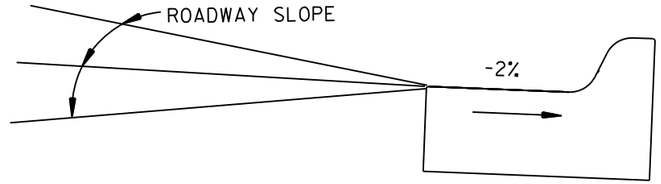


TYPE E-1



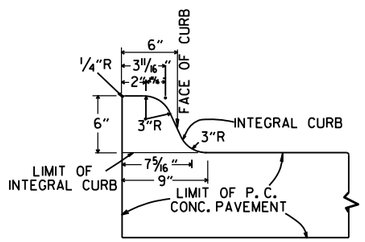
TYPE E-2

CONCRETE COMBINATION CURB AND GUTTER

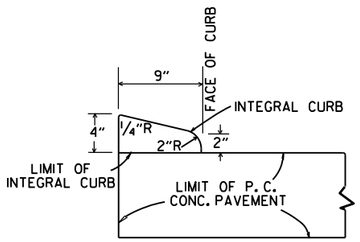


DETAIL OF GUTTER SLOPE

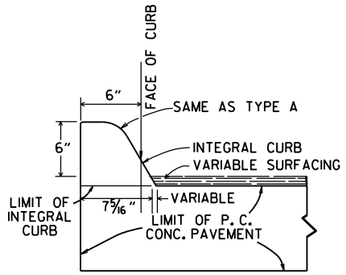
GUTTER SHALL BE CONSTRUCTED ON 2% SLOPE AWAY FROM ROADWAY, REGARDLESS OF ROADWAY SLOPE.



TYPE A

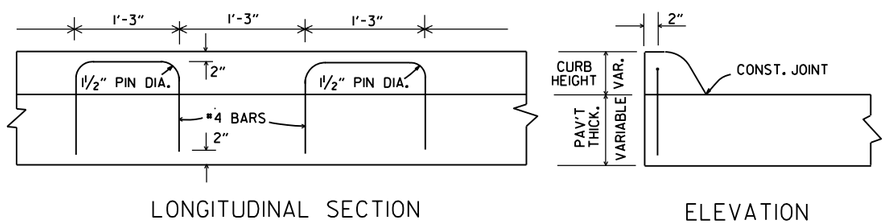


TYPE B



TYPE C

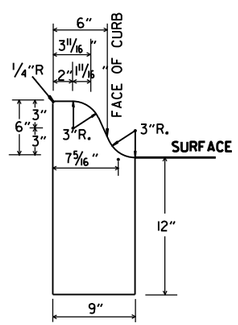
INTEGRAL CURB



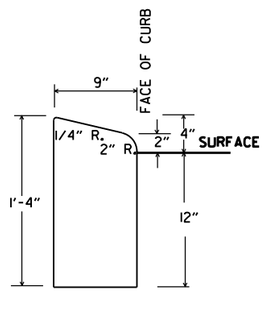
LONGITUDINAL SECTION

ELEVATION

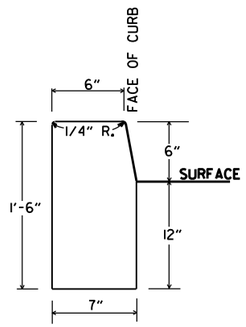
ALTERNATE CONSTRUCTION METHOD FOR INTEGRAL CURB



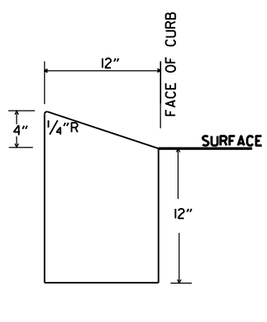
TYPE A



TYPE B

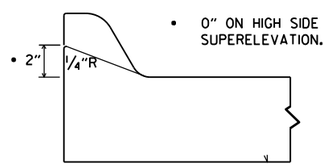


TYPE D



TYPE E

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.

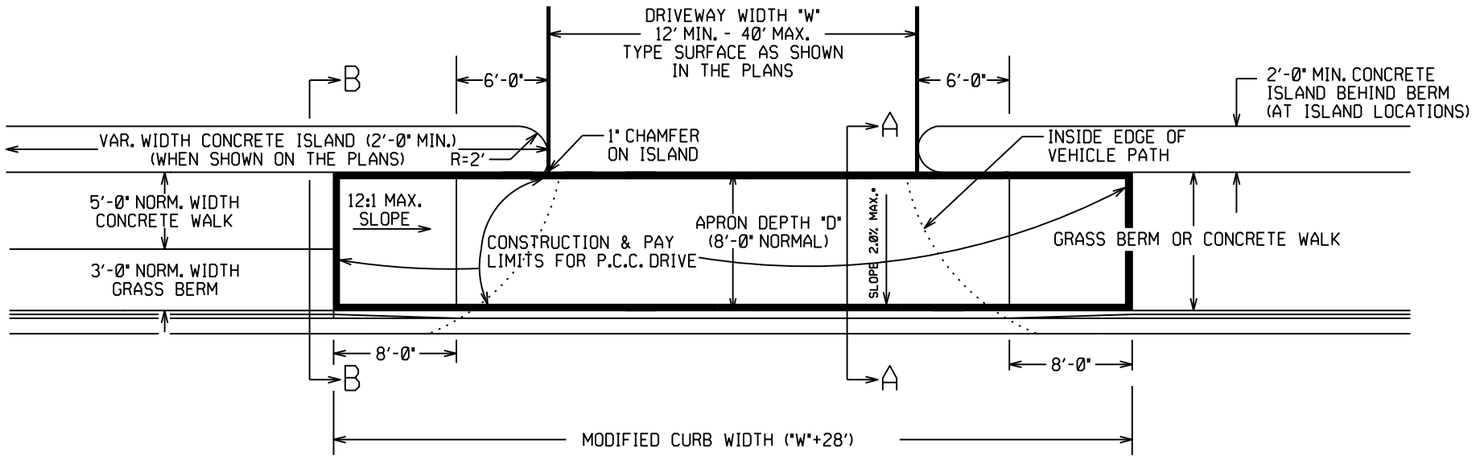
DETAILS OF MODIFIED CURB

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

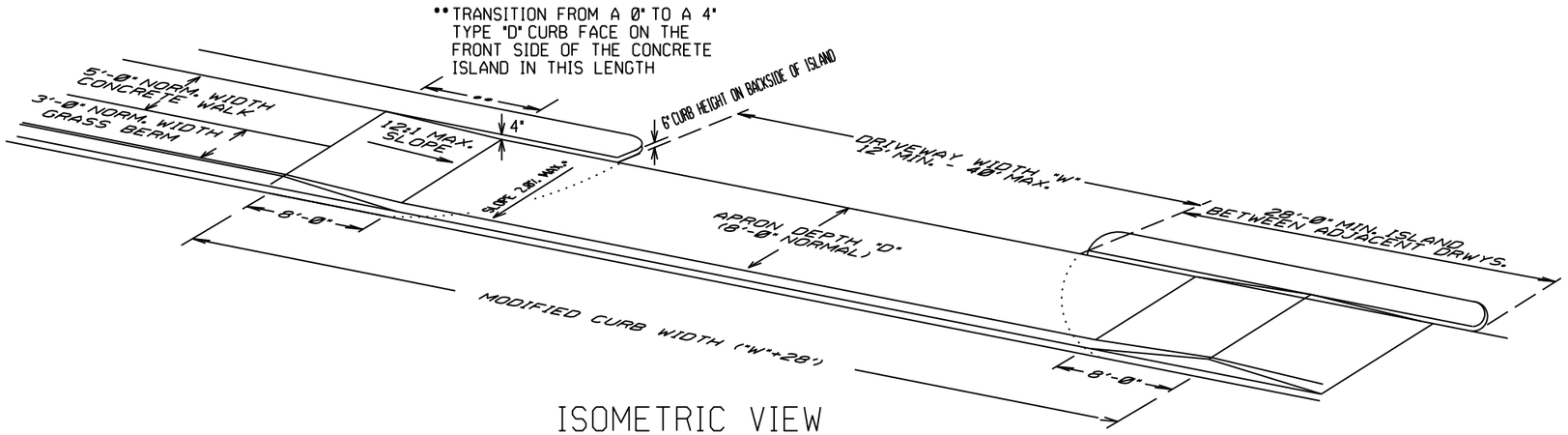
ARKANSAS STATE HIGHWAY COMMISSION

CURBING DETAILS

STANDARD DRAWING CG-1

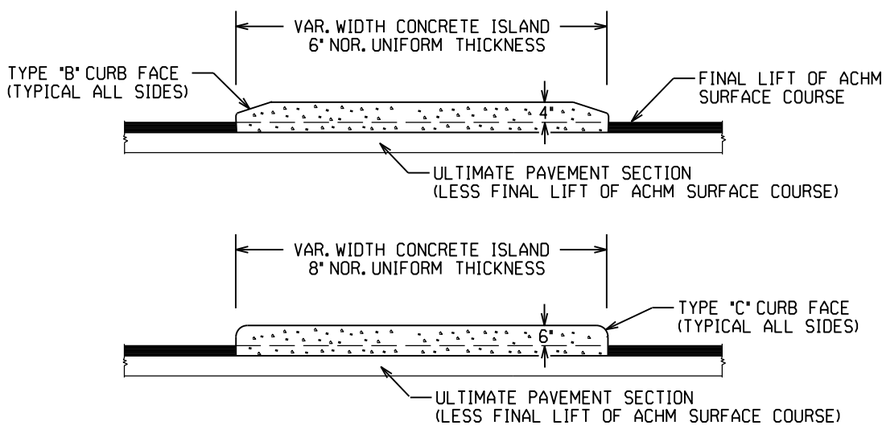


PLAN VIEW

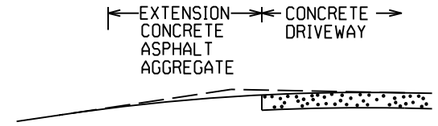


ISOMETRIC VIEW

REFER TO PLANS FOR TYPE OF CURB FACE TO BE USED. NO DIRECT PAYMENT WILL BE MADE FOR THE CURB FACES SHOWN ON THE ISLAND DETAILS. PAYMENT FOR THE CURB FACE WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM "CONCRETE ISLAND".



CURBED ISLANDS FOR CHANNELIZATION



EXTENSION TYPICAL SECTIONS

1: CONCRETE - 6" P.C. CONCRETE DRIVEWAY

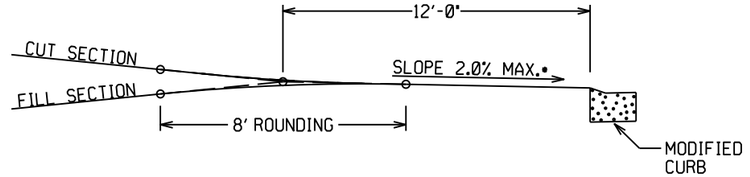
2: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
4" ACHM BINDER COURSE (1") OR
4" ACHM BASE COURSE (1-1/2")

3: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
7" AGGREGATE BASE COURSE

4: AGGREGATE - 6" AGGREGATE BASE COURSE

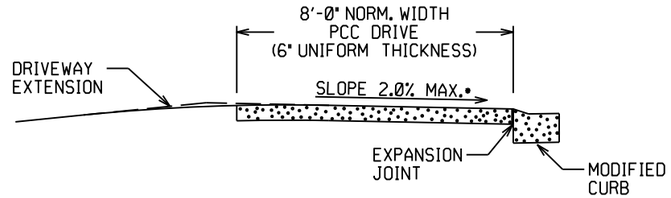
THE TYPE OF EXTENSION SHALL BE AS SHOWN IN THE PLANS. THE CONTRACTOR MAY, WITH THE APPROVAL OF THE ENGINEER, SUBSTITUTE A LOWER NUMBERED TYPE OF EXTENSION IN LIEU OF THE TYPE SPECIFIED IN THE PLANS, BUT AT NO ADDITIONAL COST TO THE DEPARTMENT.

DRIVEWAY EXTENSION DETAILS

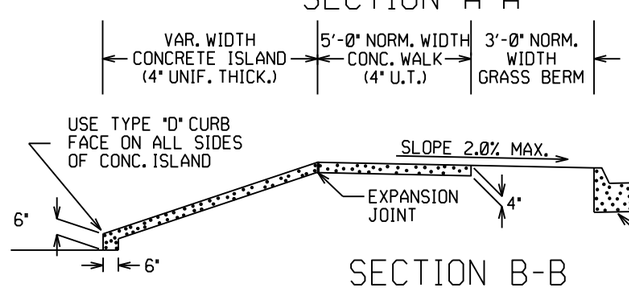


DRIVEWAY VERTICAL ALIGNMENT DETAILS

• NOTE: DRIVEWAYS MAY NOT BE SLOPED AWAY FROM THE ROADWAY UNLESS APPROVED BY THE ENGINEER.



SECTION A-A



SECTION B-B
CURBED ISLAND BEHIND WALK

DATE REV	DATE FILMED	DESCRIPTION
11-07-19		REVISED WALK DETAILS
2-27-14		REVISED PLAN & ISOMETRIC VIEW
11-29-07		ADDED CHANNELIZATION ISLAND WITH TYPE C CURB FACE & REVISED DRIVEWAY SLOPE NOTE & VERTICAL ALIGNMENT DETAIL
11-10-05		REV. APRON SLOPE & DEPTH OF AGG. BASE.
8-22-02		ADDED ISLAND DETAILS & NOTES
3-30-00		REV. MOD. CURB WIDTH & TRANS. NOTE
11-19-98		REVISED NOTES
11-18-98		REDRAWN AND REISSUED

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DRIVEWAYS & ISLANDS

STANDARD DRAWING DR-1

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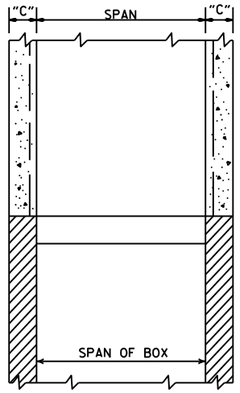
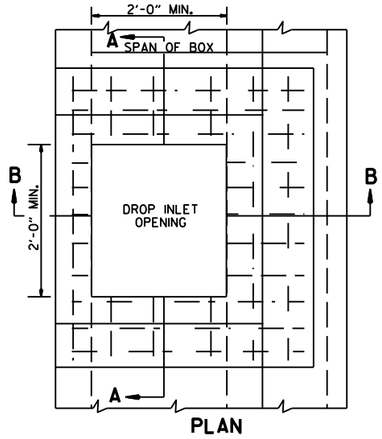
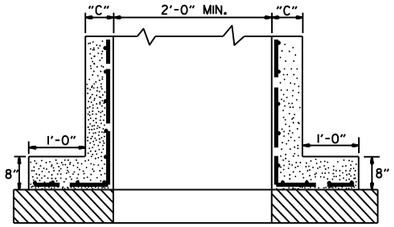


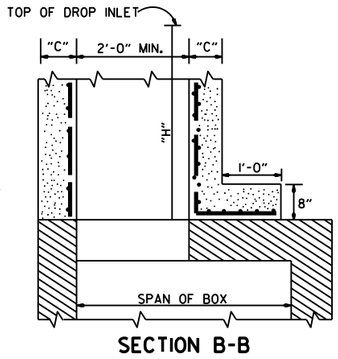
SECTION B-B



PLAN

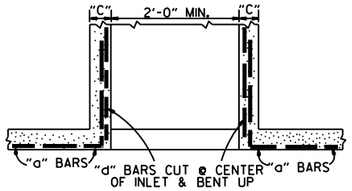


SECTION A-A

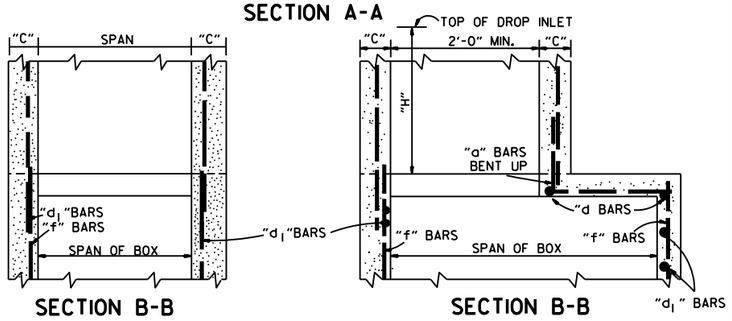


SECTION B-B

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



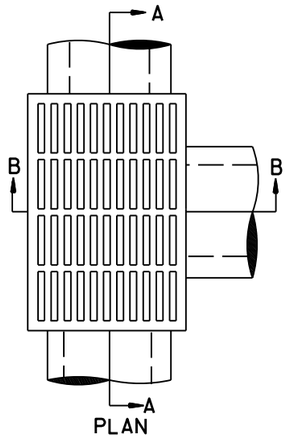
SECTION A-A



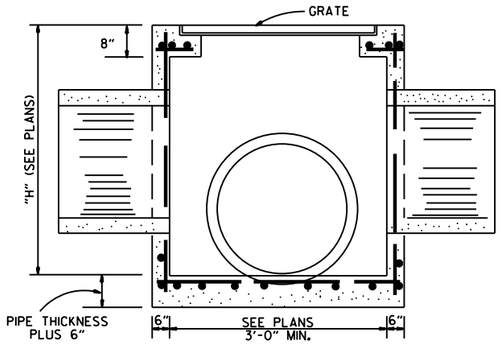
SECTION B-B SECTION B-B

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

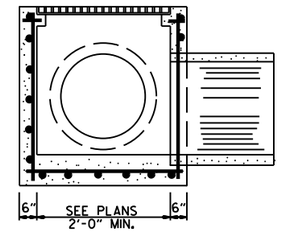
NOTE: "C" DIMENSIONS AND REINFORCING BAR SIZES, SHALL CONFORM TO THOSE SHOWN ON STANDARD DRAWING FOR DROP INLET.



PLAN



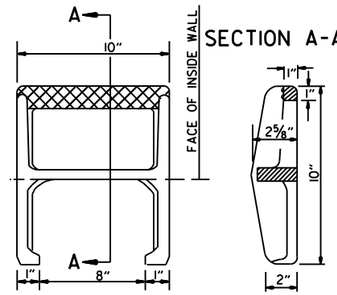
SECTION A-A



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)

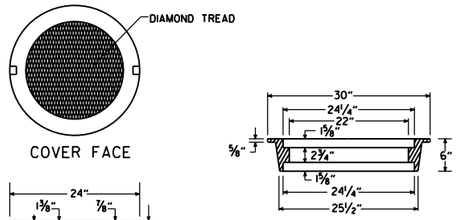


APPROX. WEIGHT = 11 LBS. (CAST IRON)

PLAN

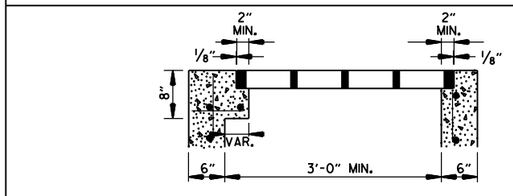
NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.

DETAIL OF STEP FOR DROP INLET

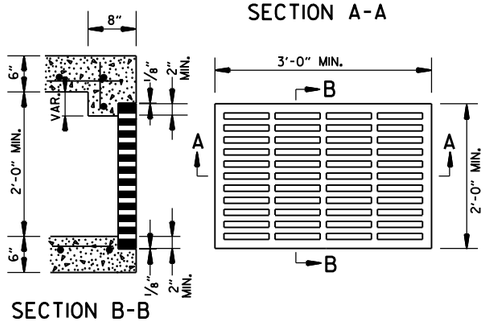


APPROXIMATE TOTAL WEIGHT = 333 LBS.

HEAVY DUTY RING & COVER



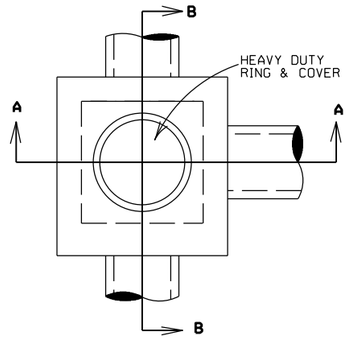
SECTION A-A



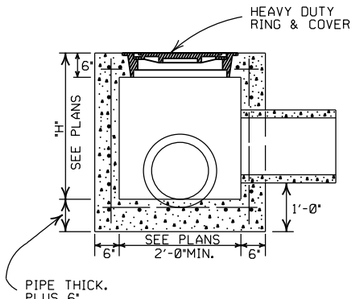
SECTION B-B

APPROXIMATE MINIMUM WATERWAY OPENING = 260 SQ. IN.

GRATE FOR TYPE E DROP INLET

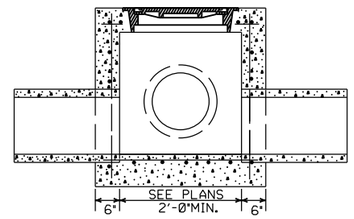


PLAN



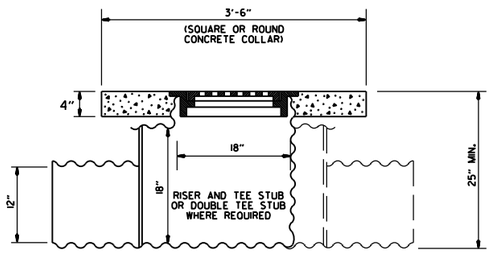
SECTION A-A

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.

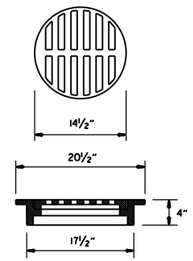


SECTION B-B

JUNCTION BOX (TYPE E)



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

APPROVED FOR CONSTRUCTION
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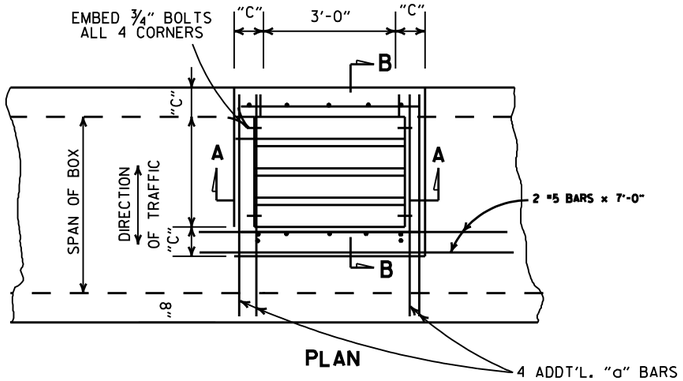
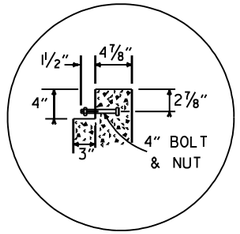
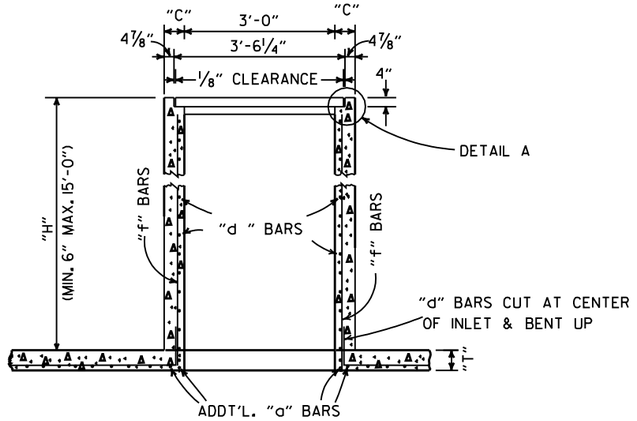


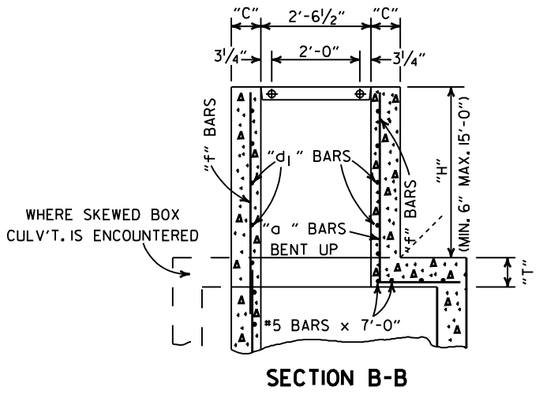
PLAN



DETAIL A



SECTION A-A

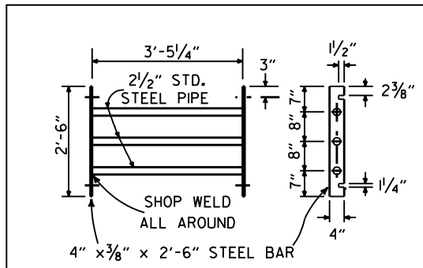


SECTION B-B

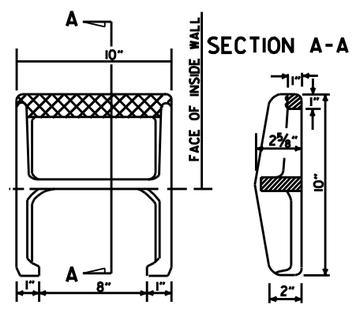
NOTE: ADDT'L.REINF. STEEL TO BE INCLUDED IN UNIT PRICE BID PER TYPE "TM" D.I.

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

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



GRATE DETAIL



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

APPROVED FOR CONSTRUCTION
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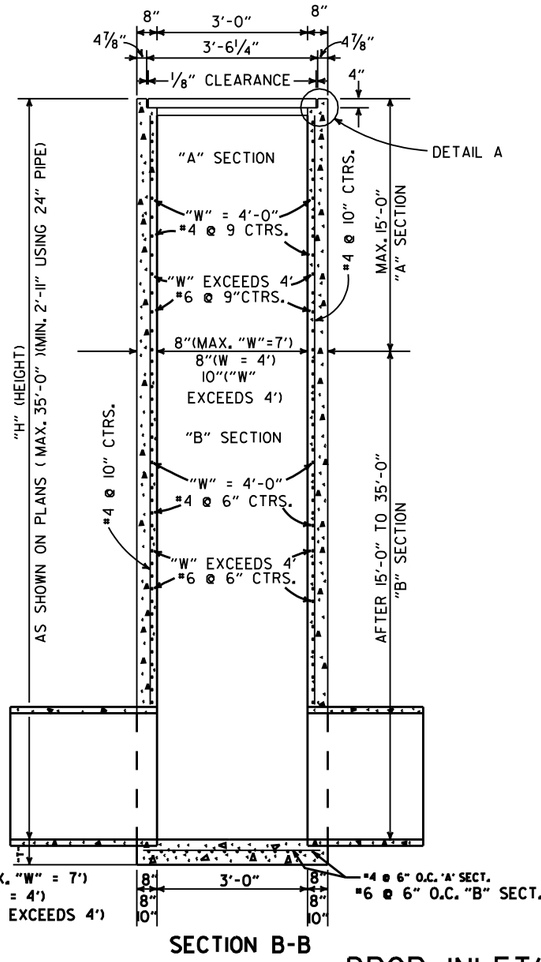
GENERAL NOTES:

1. STEEL PIPE FOR GRATES AND BOLTS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 807. BOLTS SHALL CONFORM TO ONE OF THE FOLLOWING: ASTM A193, GRADE B8 CLASS 1 OR 2, ASTM A307 OR AASHTO M 164.
2. STEEL PIPE FOR GRATES SHALL BE "STANDARD WEIGHT" PIPE CONFORMING TO ASTM A53 NATIONAL STANDARD PIPE.
3. BOLTS, NUTS, WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 232 OR AASHTO M 298, CLASS 40 OR 50.
4. ALL EXPOSED CORNERS TO HAVE ¾" CHAMFER.
5. ALL #4 AND #5 REINFORCING BARS TO HAVE 1½" COVER. LARGER SIZES TO HAVE 2" COVER.
6. THE COMPLETE PIPE GRATE SHALL BE PAINTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

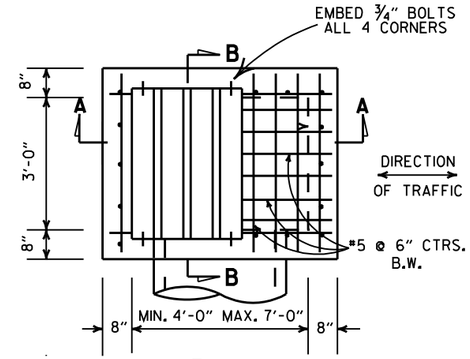


SECTION B-B

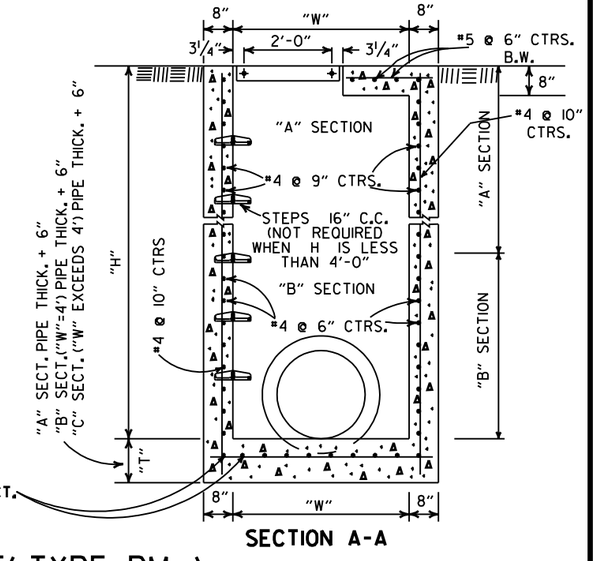
TABLE OF "W" DIMENSIONS

I.D. PIPE	SKEW OF CROSS DRAIN		
	STRAIGHT	30°	45°
	"W"	"W"	"W"
24"	4'-0"	4'-0"	4'-0"
30"	4'-0"	4'-0"	4'-5"
36"	4'-0"	4'-3"	5'-3"
42"	4'-3"	4'-11"	6'-1"
48"	4'-10"	5'-7"	6'-11"

NOTE: DIMENSIONS SHOWN ABOVE ARE FOR PIPES INTERSECTING DROP INLET ON ONE SIDE ONLY. FOR SKEWED PIPES INTERSECTING BOTH SIDES OF DROP INLET, "W" WILL NEED TO BE INCREASED OR AXIS OF INTERSECTING PIPES WILL NEED TO BE SHIFTED.



PLAN



SECTION A-A

DROP INLET(TYPE RM)

REVISED		DATE FILMED
8-22-02	ADDED & REVISED DIMENSION TO SECTION A-A	
1-12-00	CORRECTED DIMENSION ON SECTION B-B	
11-06-97	ADDED DIMENSION TO SECTION A-A	
10-18-96	REVISED ASTM REF. TO AASHTO AND ADDED NOTE TO TABLE OF "W" DIMENSIONS	
10-1-92	ADDED DIRECTION OF TRAFFIC	10-1-92
8-15-91	ADDED NOTE ABOUT PAINTING OF GRATE	8-15-91
11-30-89	ALTERED DETAIL A	11-30-89
7-15-88	REVISED STEP DETAIL,TM & RM D.I. & GRATE DETAIL	719-7-15-88
10-2-72	REVISED AND REDRAWN	542-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS

STANDARD DRAWING FPC-9D

4'-0" LENGTH DROP INLET

PIPE SIZE	MIN. WIDTH	HEIGHT 5'-0" CLASS A CONC. CU. YDS.	HEIGHT 5'-0" REINF. STEEL POUNDS	PLUS OR MINUS PER LIN. FT. OF HEIGHT CLASS A CONC. CU. YDS.	PLUS OR MINUS PER LIN. FT. OF HEIGHT REINF. STEEL POUNDS
18"	2'-6"	1.77	156	0.28	22
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
42"	4'-4"	2.95	250	0.34	30
48"	4'-10"	3.21	265	0.36	32

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

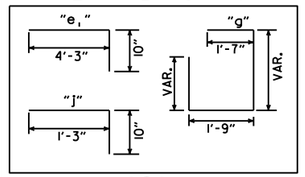
DROP INLET EXTENSION

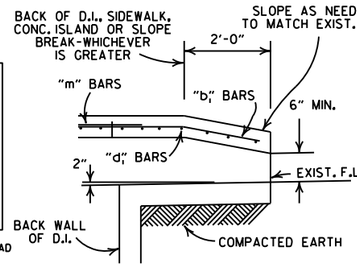
4'-0" CLASS A CONC. CU. YDS.	4'-0" REINF. STEEL POUNDS	8'-0" CLASS A CONC. CU. YDS.	8'-0" REINF. STEEL POUNDS
0.58	38	0.87	72
DEDUCT FROM QUANTITY COMPUTED FOR EACH EXTENSION ADDED.			
0.04	3		

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

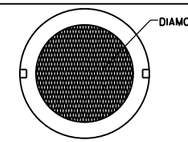
BAR DIAGRAM

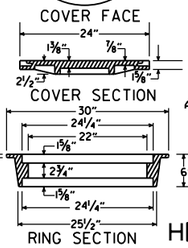




BACK OPENING

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).

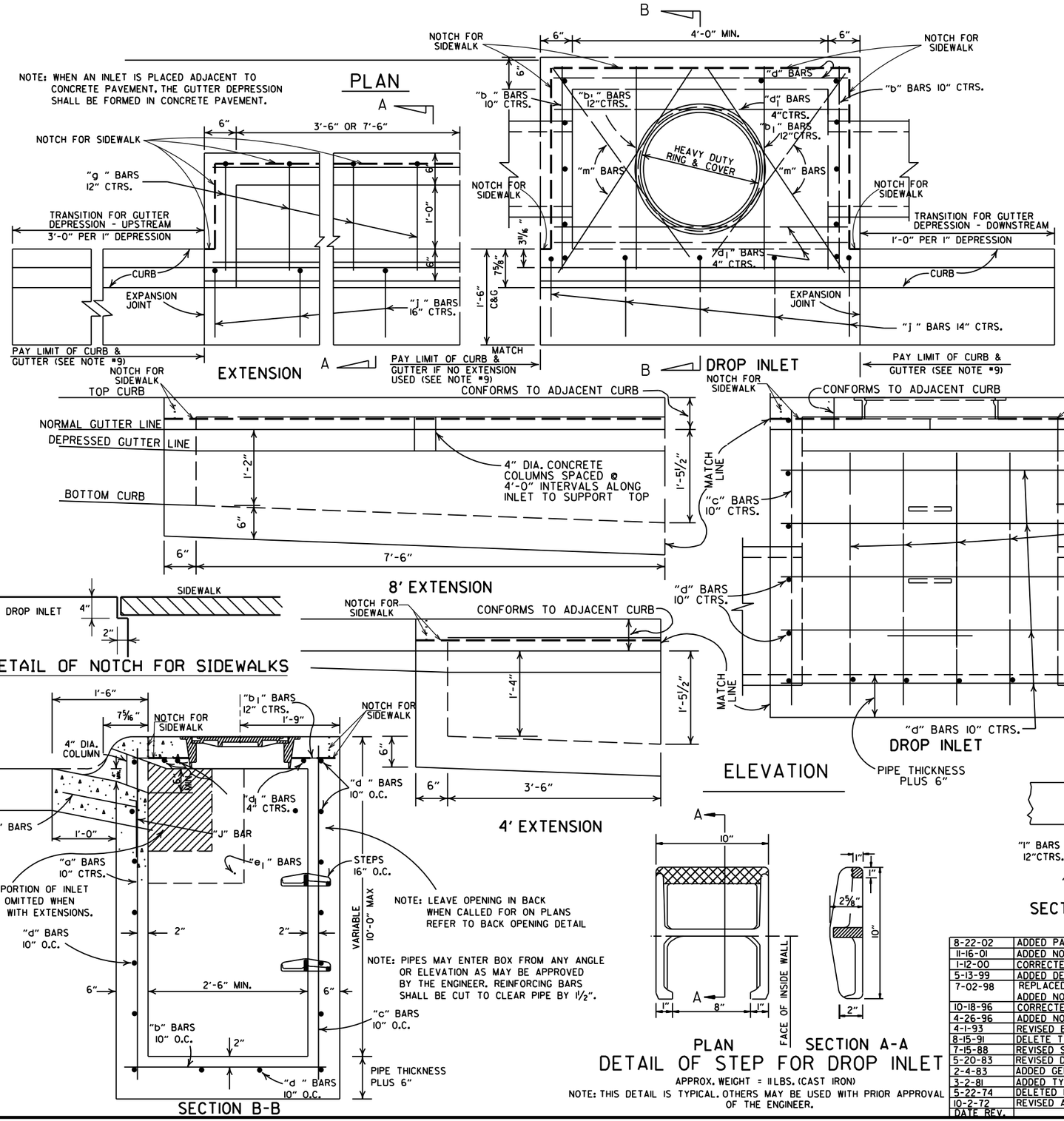




APPROXIMATE TOTAL WEIGHT = 333 LBS.

HEAVY DUTY RING & COVER

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"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.



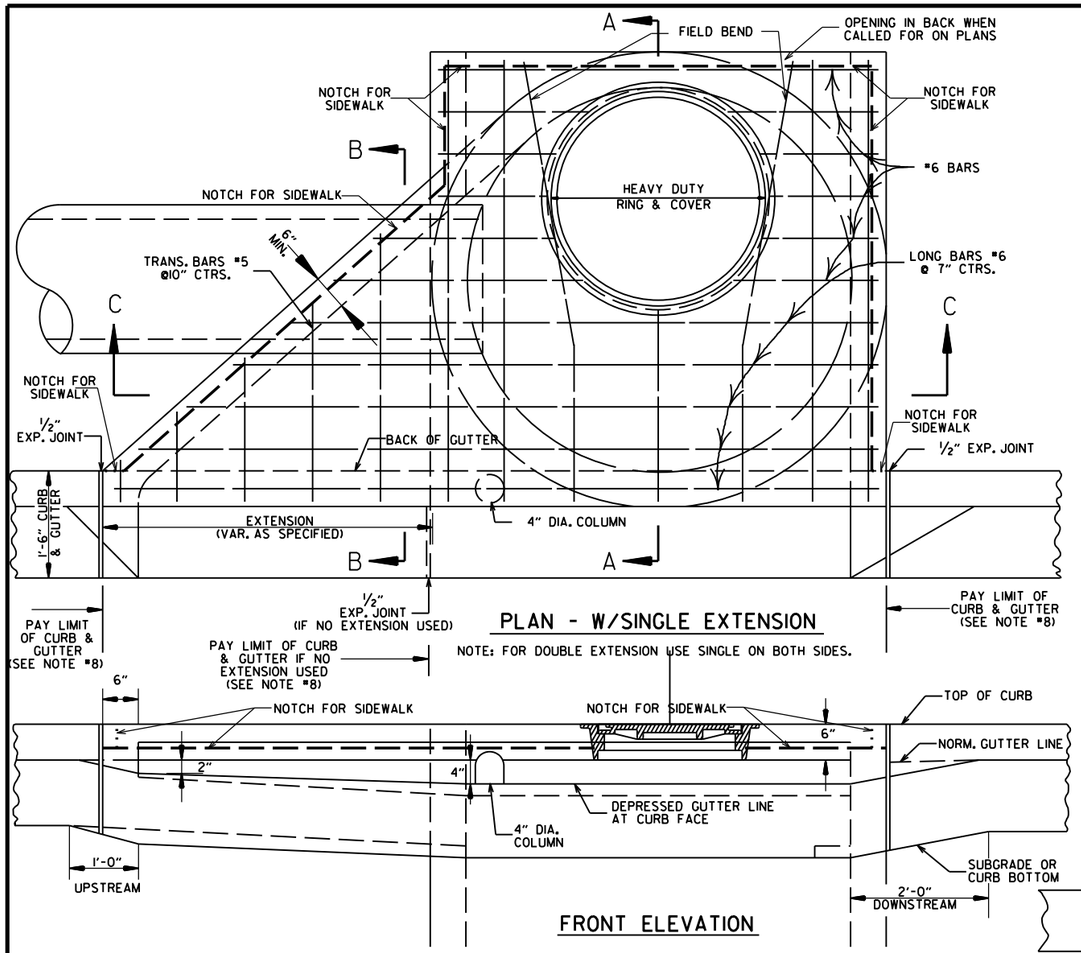
DATE REV.	REVISION	DATE FILMED
8-22-02	ADDED PAY LIMIT CURB NOTES TO SECTIONS A-A & B-B	
11-16-01	ADDED NOTE 13; REVISED SECTION B-B	
1-12-00	CORRECTED DIMENSION ON SECTION B-B & REVISED RING & COVER	
5-13-99	ADDED DETAIL OF NOTCH FOR SIDEWALKS	
7-02-98	REPLACED RING & COVER W/HEAVY DUTY RING & COVER 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

APPROVED FOR CONSTRUCTION
04/12/2024 8:54:15 AM

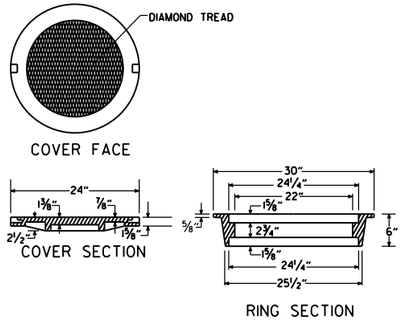


PLAN - W/SINGLE EXTENSION

NOTE: FOR DOUBLE EXTENSION USE SINGLE ON BOTH SIDES.

FRONT ELEVATION

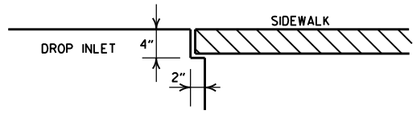
SECTION C-C



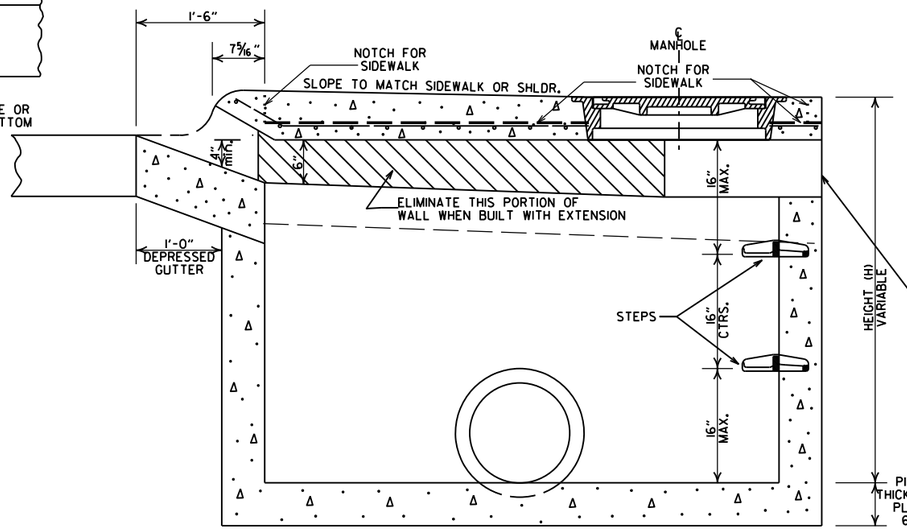
APPROXIMATE TOTAL WEIGHT = 333 LBS.

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



SECTION A-A

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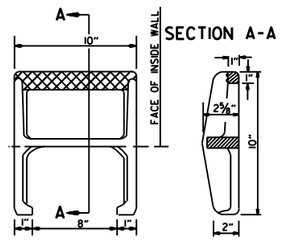
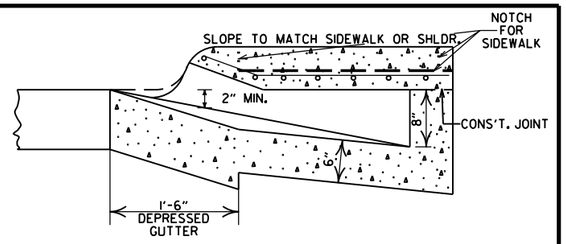


APPROX. WEIGHT = 11LBS. (CAST IRON)

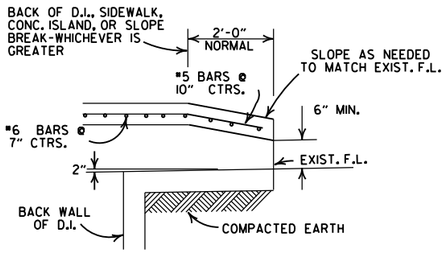
PLAN

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 ¾" 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. 1½" 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.

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 11,12 & ADDED BK.OPEN DETAIL	8-15-91
11-30-89	ADDED NOTE NO. 12	11-30-89
5-23-89	ADDED NOTE & MINIMUM WALL THICKNESS	513-5-23-89
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

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	ARDOT NOMINAL	AASHTO M 206	ARDOT NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31⅜	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M206.

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

EQUIV. DIA.	AASHTO M 207	
	SPAN	RISE
INCHES	INCHES	
18	23	14
24	30	19
27	34	22
30	38	24
33	42	27
36	45	29
39	49	32
42	53	34
48	60	38
54	68	43
60	76	48
66	83	53
72	91	58
78	98	63
84	106	68

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M207.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SUBSECTION 606.03.(f)(1).

NOTE: HAUNCH AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF CONCRETE PIPE.

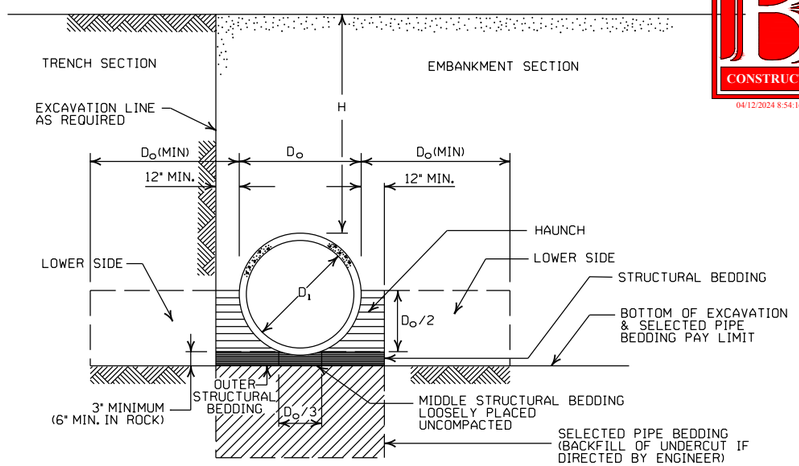
- LEGEND -

D_1 = NORMAL INSIDE DIAMETER OF PIPE
D_O = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
= UNDISTURBED SOIL

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR HAUNCH AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 5 OR CLASS 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL*
TYPE 3**	AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL

* SM-3 WILL NOT BE ALLOWED.

** MATERIALS SHALL NOT INCLUDE ORGANIC MATERIALS OR STONES LARGER THAN 3 INCHES.



EMBANKMENT AND TRENCH INSTALLATIONS

1. MATERIAL IN THE HAUNCH AND OUTER STRUCTURAL BEDDING SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. FOR TRENCHES WITH WALLS OF NATURAL SOIL, THE DENSITY OF THE SOIL IN THE LOWER SIDE ZONE SHALL BE AS FIRM AS THE 95% DENSITY REQUIRED FOR THE HAUNCH. IF THE EXISTING SOIL DOES NOT MEET THIS CRITERIA, IT SHALL BE REMOVED AND RECOMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OF MATERIAL USED.
3. FOR EMBANKMENTS, THE MATERIAL IN THE LOWER SIDE ZONE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170, R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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

	CLASS OF PIPE			
	CLASS III		CLASS IV	CLASS V
INSTALLATION TYPE	TYPE 1 OR 2	TYPE 3	ALL	ALL
PIPE ID (IN.)	FEET			
12-15	2	2.5	2	1
18-24	2.5	3	2	1
27-33	3	4	2	1
36-42	3.5	5	2	1
48	4.5	5.5	2	1
54-60	5	7	2	1
66-78	6	8	2	1
84-108	7.5	8	2	1

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

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

INSTALLATION TYPE	CLASS OF PIPE		
	CLASS III	CLASS IV	CLASS V
	FEET		
TYPE 1	21	32	50
TYPE 2	16	25	39
TYPE 3	12	20	30

NOTE: IF FILL HEIGHT EXCEEDS 50 FEET, A SPECIAL DESIGN CONCRETE PIPE WILL BE REQUIRED USING TYPE 1 INSTALLATION.

MINIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
	FEET	
TYPE 2 OR TYPE 3	2.5	1.5

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

MAXIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
	FEET	
TYPE 2	13	21
TYPE 3	10	16

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED FOR LRFD DESIGN SPECIFICATIONS	
5-18-00	REVISED TYPE 3 BEDDING & ADDED NOTE	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

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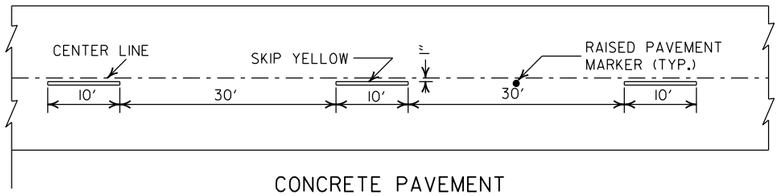
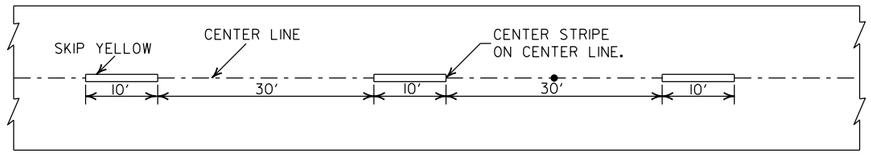
NOTES:
1. REFER TO THE STRIPING DETAILS FOR PAVEMENT MARKING LINE WIDTHS.
2. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
3. RAISED PAVEMENT MARKERS SHALL BE PLACED ON AN 80 FEET SPACING UNLESS OTHERWISE SHOWN IN THE PLANS.

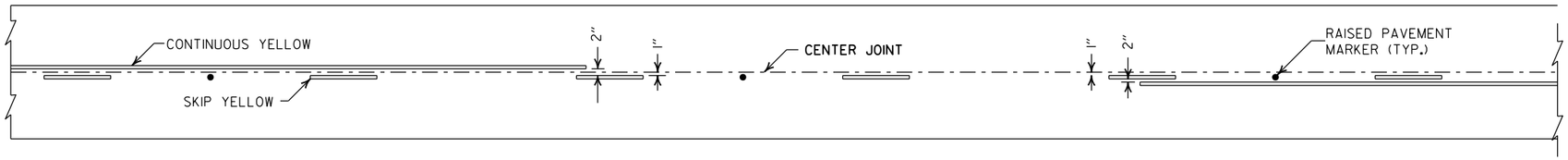


CONCRETE PAVEMENT

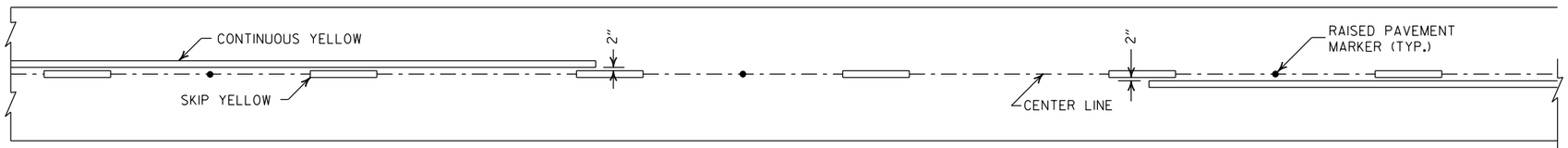


ASPHALT PAVEMENT

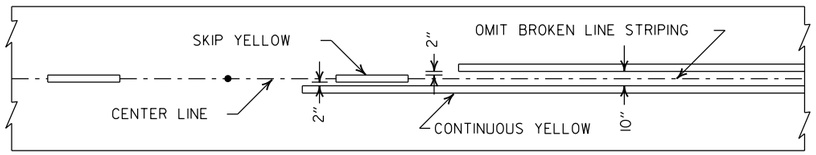
BROKEN LINE STRIPING



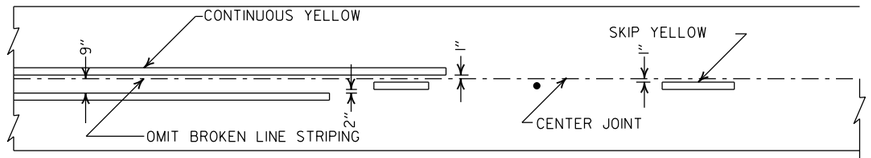
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

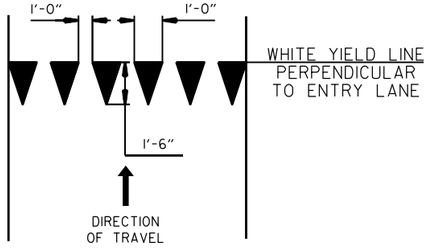


ASPHALT PAVEMENT

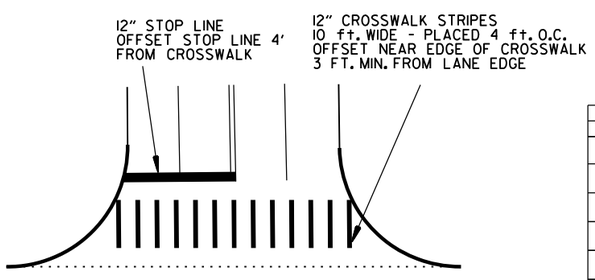


CONCRETE PAVEMENT

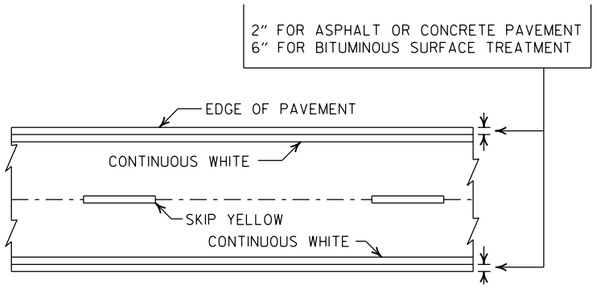
STRIPING AT ADJACENT NO PASSING LANES



YIELD LINE DETAIL



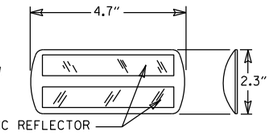
CROSSWALK AND STOP LINE DETAILS



PAVEMENT EDGE LINE MARKING

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

TYPE II RED/CLEAR OR YELLOW/YELLOW



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

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

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

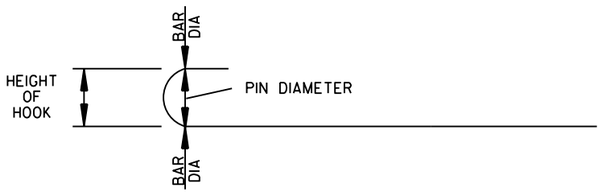
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

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

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

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2¾ INCHES, EACH BENT BAR SHALL BE REPLACED WITH ONE HOOKED BAR AND ONE STRAIGHT BAR, USING LENGTHS AS SHOWN IN THE TABLE BELOW. THE TWO BARS SHALL BE THE SAME DIAMETER AS, AND PLACED AT THE SAME SPACING AS, THE "b", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.



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

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

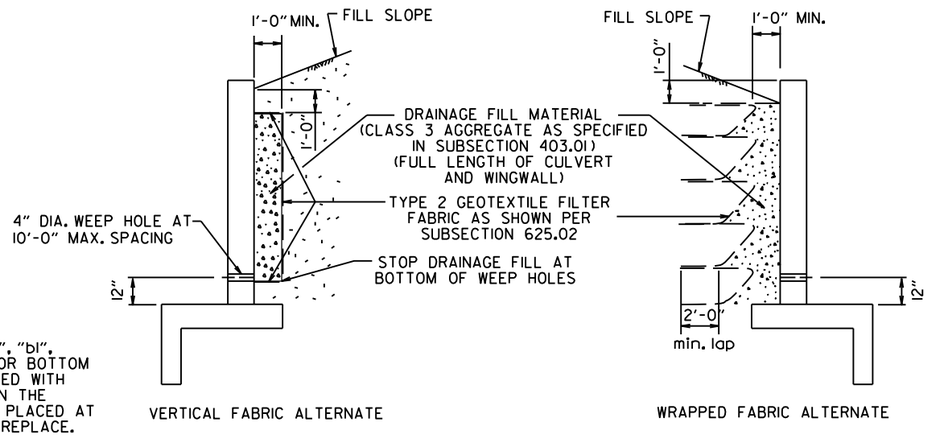
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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

REPLACEMENT BAR LENGTHS TABLE

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

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

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

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

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

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

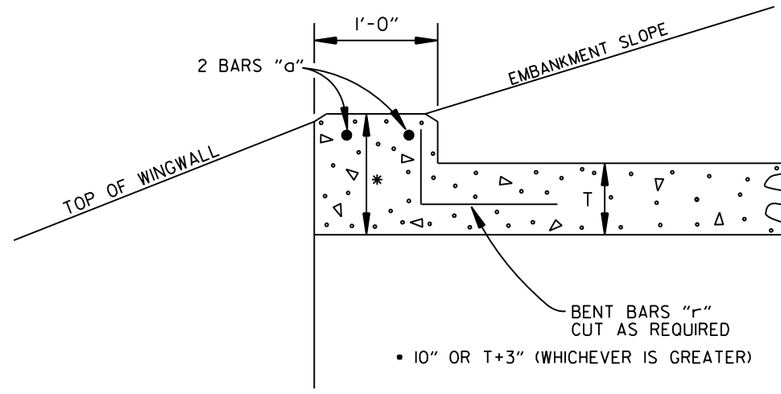
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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

WEEP HOLES IN BOX CULVERT WALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

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

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



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

R.C. BOX CULVERT HEADWALL MODIFICATIONS

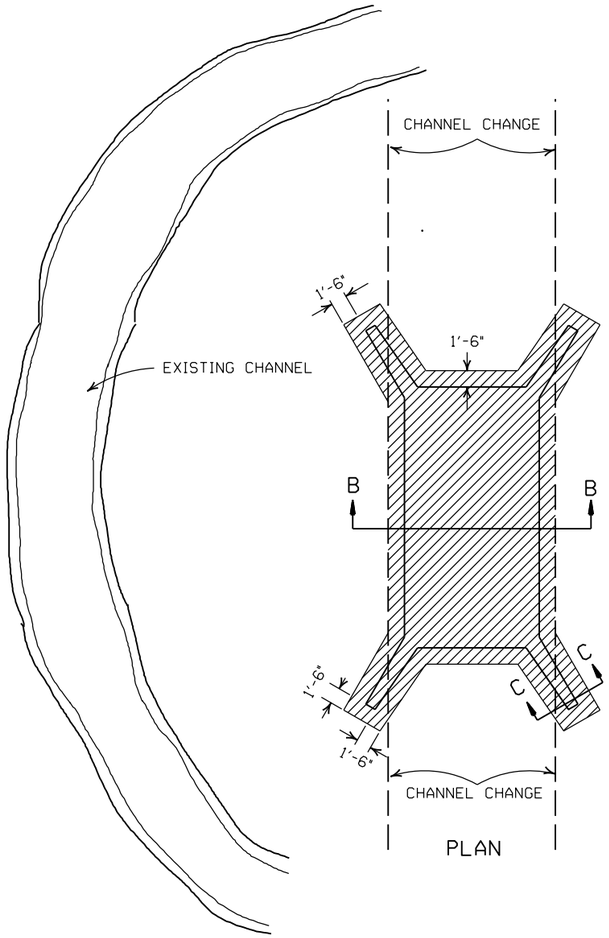
DATE	REVISION	DATE FILMED
7/26/12	REV. DRAINAGE FILL MATERIAL & DETAIL	
12/15/11	REQUIRE WEEP HOLES IN BOX CULVERT WALLS	
5-25-06	REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM	
11-16-01	ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES	
10-18-96	REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM	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

ARKANSAS STATE HIGHWAY COMMISSION

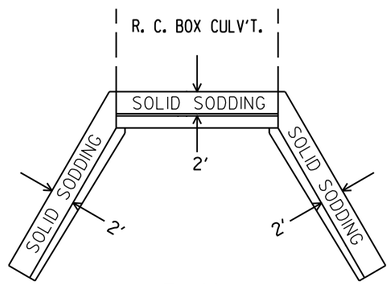
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1

APPROVED FOR CONSTRUCTION
04/12/2024 8:54:16 AM



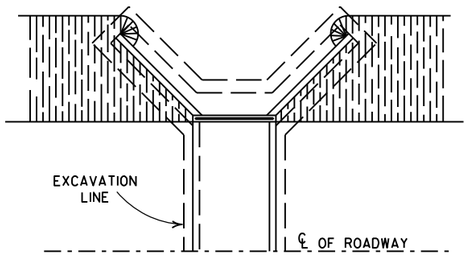
PLAN



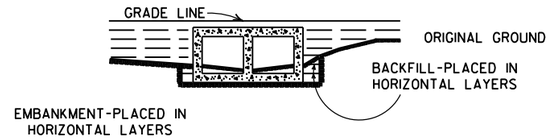
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

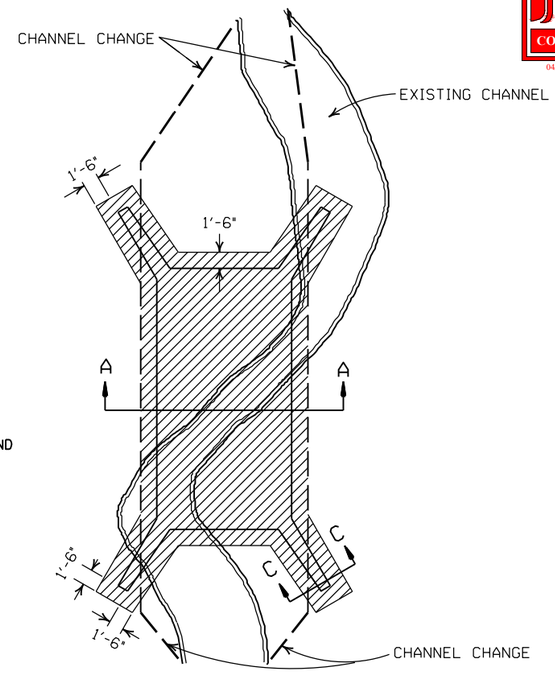


PLAN

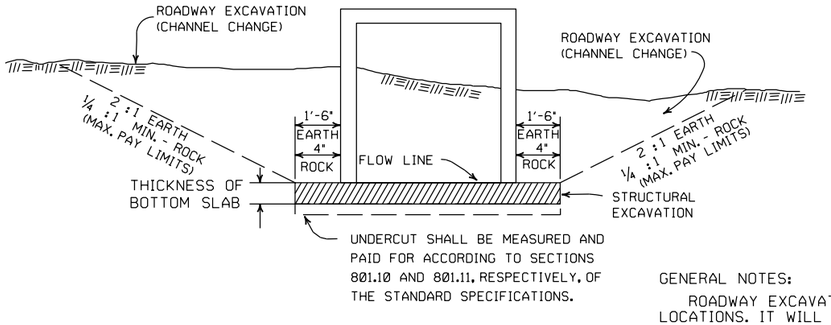


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

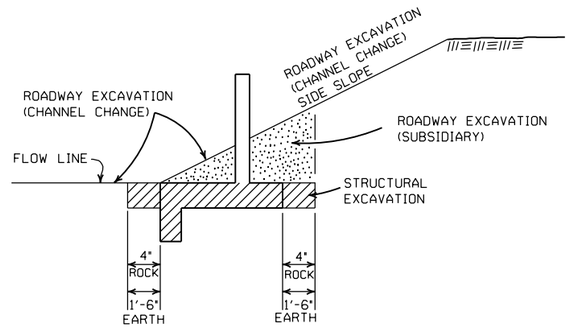


PLAN

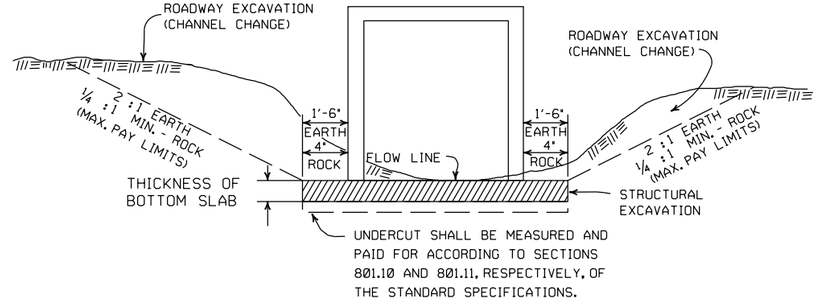


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

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

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

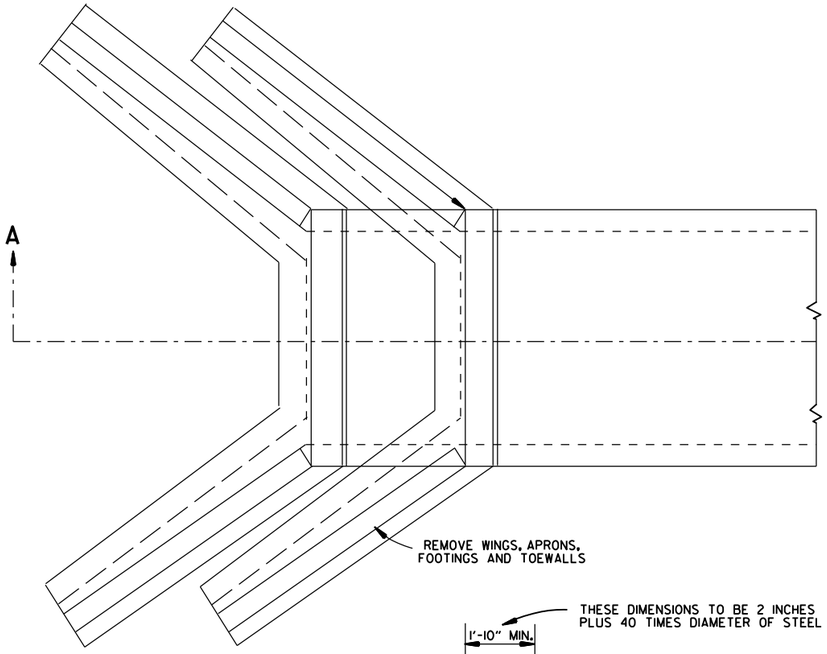
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

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

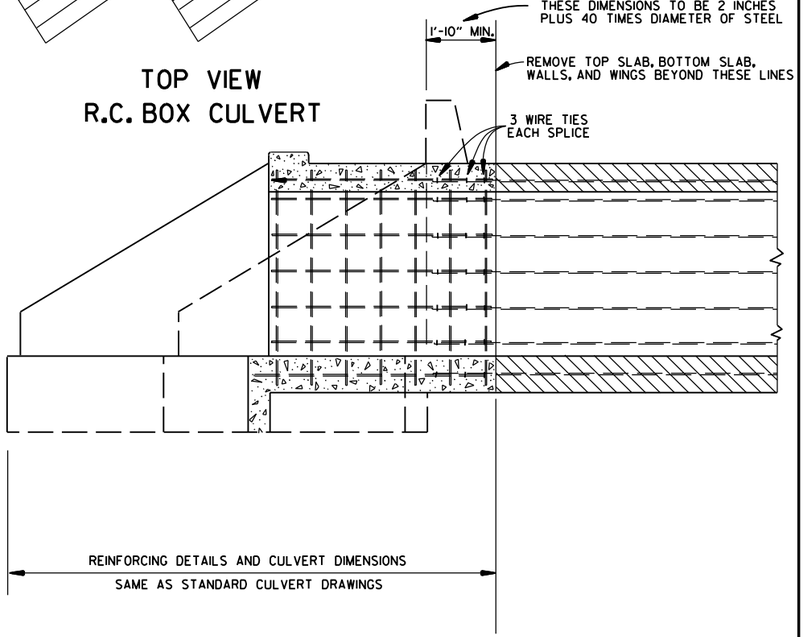
ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

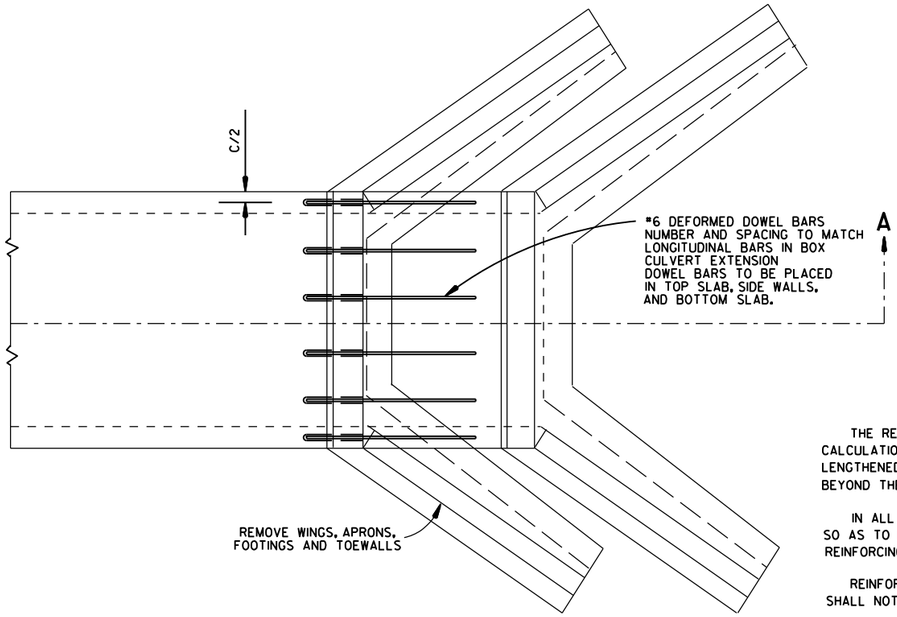


TOP VIEW
R.C. BOX CULVERT

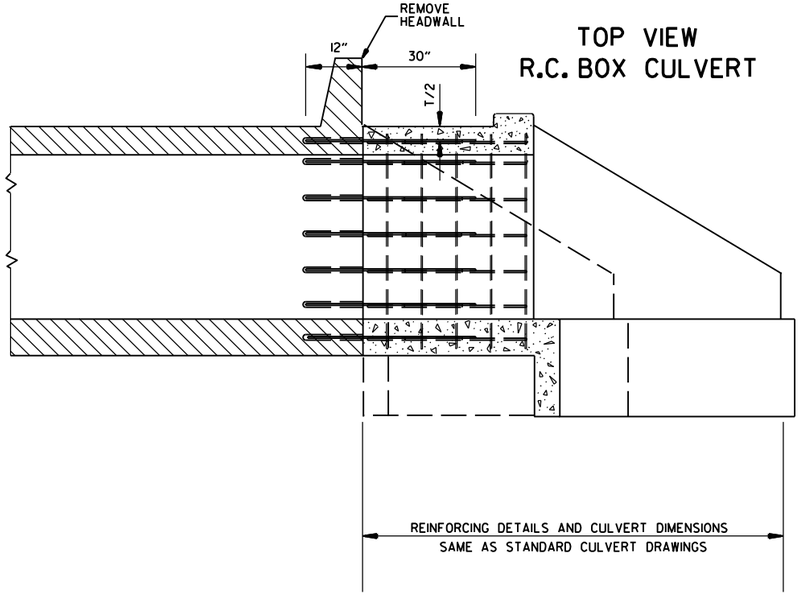


SECTION A-A

METHOD 1



TOP VIEW
R.C. BOX CULVERT



SECTION A-A

METHOD 2

GENERAL NOTES

	USE FOR METHOD
THE RESIDENT ENGINEER WILL MAKE INDIVIDUAL CALCULATIONS OF QUANTITIES FOR EACH STRUCTURE LENGTHENED, MAKING NO ALLOWANCE FOR OVERBREAKAGE BEYOND THE LINES INDICATED.	1
IN ALL INSTANCES CONCRETE SHALL BE REMOVED SO AS TO PERMIT FULL 40 DIAMETER SPLICE OF REINFORCING STEEL.	1
REINFORCING STEEL REMOVED FROM EXISTING STRUCTURE SHALL NOT BE REUSED IN CONSTRUCTING EXTENSION.	1&2
ON R.C. BOX CULVERTS THAT HAVE AN EXISTING CONCRETE APRON; THE CONCRETE APRON SHALL BE REMOVED WITH THE WINGS. THE COST OF REMOVING ALL OLD CONCRETE WILL BE INCLUDED IN THE PRICE BID PER CUBIC YARD FOR NEW CONCRETE OF THE CLASS SPECIFIED AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.	1&2
MATERIALS FOR SECURING DOWEL BARS SHALL MEET THE REQUIREMENTS OF SECTION 507.02 OF THE STANDARD SPECIFICATIONS.	2
DOWEL BARS SHALL BE INSTALLED AS FOLLOWS: THE DRILLING PROCEDURE SHALL BE APPROVED BY THE ENGINEER, THE FILLING SYSTEM SHALL BE APPROVED BY THE ENGINEER, AND SHALL BE AN INJECTION-TYPE SYSTEM WHICH WILL INSURE THAT SUFFICIENT MATERIAL IS INJECTED SO IT COMPLETELY SURROUNDS THE BARS AND FILLS THE HOLES.	2
THE CONTRACTOR SHALL HAVE THE OPTION OF USING EITHER METHOD 1 OR METHOD 2. REGARDLESS OF WHICH METHOD IS USED, PAY QUANTITIES WILL BE CALCULATED BASED ON METHOD 1.	1&2

NOTE:
NO PART OF THIS STANDARD IS TO BE USED FOR ANY DETAILS RELATIVE TO NEW CONSTRUCTION.

SEE STANDARD DRAWING LISTED IN TABULATION OF STRUCTURES FOR ALL NEW CONSTRUCTION DETAILS.

DATE	REVISION	DATE FILM
10-12-95	CHANGED DRAWING # FROM 144-A	
4-1-93	ADDED GENERAL NOTE	
10-1-92	ADDED ALT. METHOD OF EXTENSION	
11-30-89	REDRAWN	
1-4-83	ELIMINATED CONCRETE CLASS	
12-20-56	RETRACED	

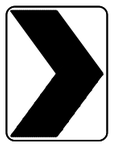
ARKANSAS STATE HIGHWAY COMMISSION

METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS

STANDARD DRAWING RCB-3

R1-1
30"X30"

W1-3
30"X30"
(LT. OR RT.)



W1-8
18"X24"

W2-5
30"X30"

W3-1
36"X36"

W5-1
36"X36"

M6-3
21"X15"

R1-2
36"X36"X36"

W1-4
30"X30"
(LT. or RT.)

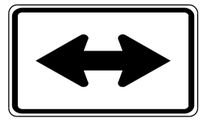
W2-1
30"X30"

S1-1
36"X36"

W3-2
36"X36"

County
Route Marker
M1-6
24"X24"

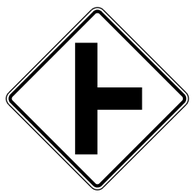
NOTE: REFLECTORIZED YELLOW LEGEND (COUNTY NAME, ROUTE LETTER & NUMBER) & BORDER ON A BLUE BACKGROUND.



M6-4
21"X15"

R2-1
24"X30"

W1-5
30"X30"
(LT. or RT.)

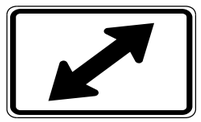


W2-2
30"X30"

W5-2
36"X36"

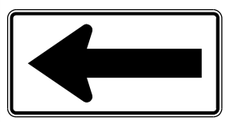
W8-3
36"X36"

R1-3P
18"X6"

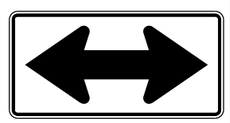


M6-5
21"X15"

W1-1
30"X30"
(LT. or RT.)



W1-6
48"X24"

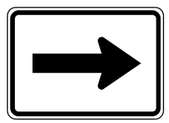


W1-7
48"X24"

W2-3
30"X30"
(LT. or RT.)

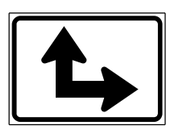
W5-3
36"X36"

W13-1P
18"X18"



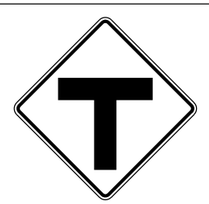
M6-1
21"X15"

NOTE: ALL M6 SIGNS TO BE MADE WITH REFLECTORIZED YELLOW ARROW & BORDER WITH BLUE BACKGROUND.



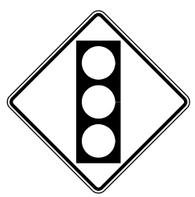
M6-6
21"X15"

W1-2
30"X30"
(LT. or RT.)

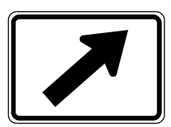


W2-4
30"X30"

W10-1
36" DIAMETER



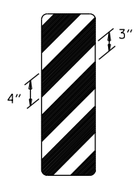
W3-3
36"X36"



M6-2
21"X15"

S4-3P
24"X8"

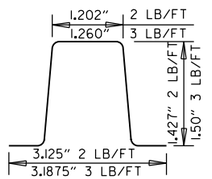
S4-2P
24"X10"



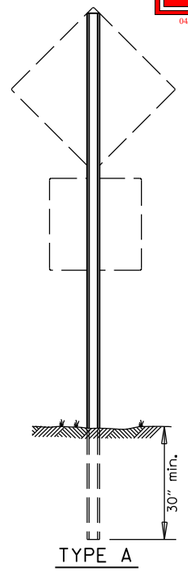
OM-3
12"X36"
(LT. or RT.)

MINIMUM DIMENSIONS SHOWN

SUPPORT SECTION

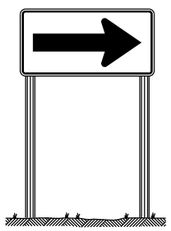


(U-CHANNEL)
STANDARD SUPPORT
ASSEMBLIES



TYPE A

NOTE: LENGTH OF SIGN POSTS SHALL BE DETERMINED SO AS TO PROVIDE FOR MINIMUM VERTICAL CLEARANCES AS CALLED FOR IN THE SPECIFICATIONS PLUS A MINIMUM VERTICAL PENETRATION OF 30" IN THE SOIL.



TYPE B

TYPE C

MINIMUM WEIGHT

TYPE A & B = 3 LBS./FT.
TYPE C = 2 LBS./FT.

STANDARD HIGHWAY SIGNS

DATE	REVISION	DATE FILMED
9-12-13	DELETED JOB NO. BLOCK; REVISED RI-3 TO RI-3P	
4-17-08	REVISED SIGN DESIGNATION - W3-1 & W3-2	
4-10-03	REVISED W5-2, W8-3, OM-3; ADDED WI-8	
1-5-81	REDRAWN	960-1-15-81
9-15-78	ADDED WI4-3	877-9-15-78
9-2-76	POST WT.	623-9-3-76
5-3-76	STEEL POST WT. FROM 2"-3"; ADDED S4-2 & S4-3	504-5-3-76
8-12-74	REV. HT. TYPE "C" ASSEMBLY	500-8-21-74
12-21-72	ADDED M6-2,3,4,5,6	500-12-21-72
12-1-72	ISSUED	562-12-1-72

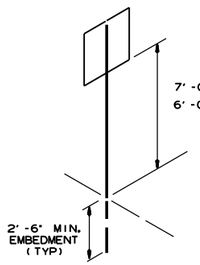
SUPPORT ASSEMBLIES

ARKANSAS STATE HIGHWAY COMMISSION

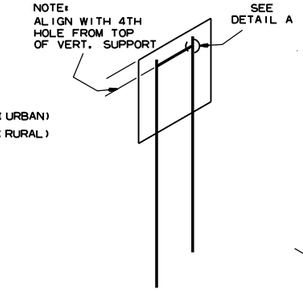
STANDARD HIGHWAY SIGNS
AND SUPPORT ASSEMBLIES

STANDARD DRAWING SHS-1

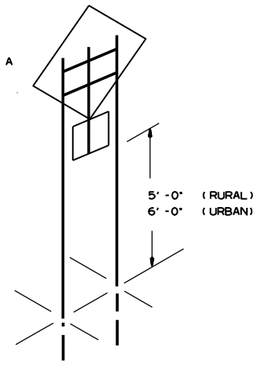
APPROVED FOR CONSTRUCTION
04/12/2024 8:54:16 AM



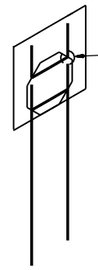
U-1



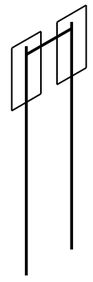
U-2



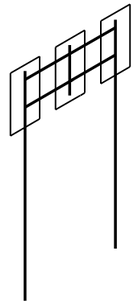
U-2 (A)



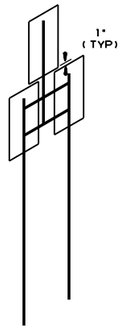
U-2 (B)



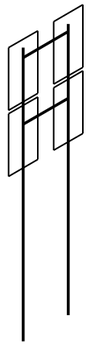
U-2 (1)



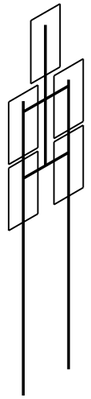
U-2 (2)



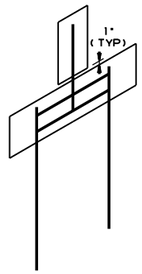
U-2 (3)



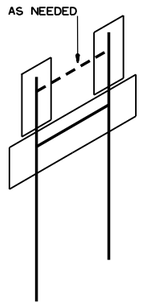
U-2 (4)



U-2 (5)



U-2 (6)



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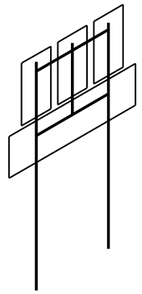

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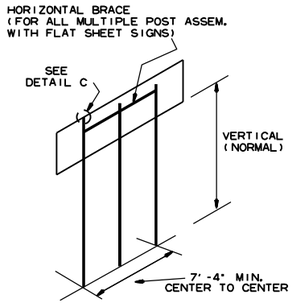
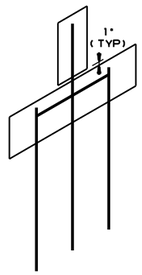
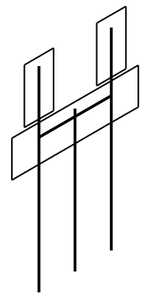


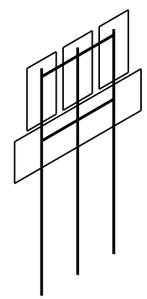
U-3



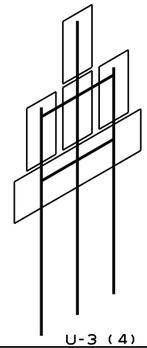
U-3 (1)



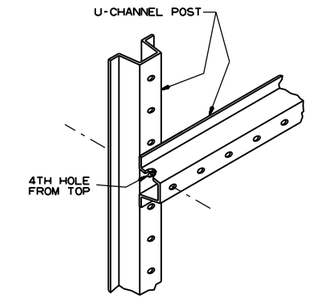
U-3 (2)



U-3 (3)

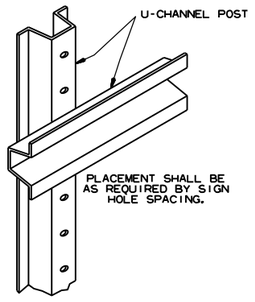


U-3 (4)



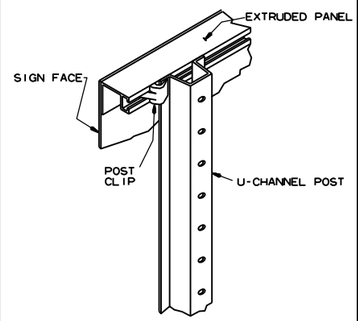
DETAIL A

SHOWING HORIZONTAL BRACE



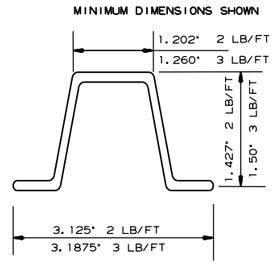
DETAIL B

SHOWING BACK-TO-BACK INSTALLATION



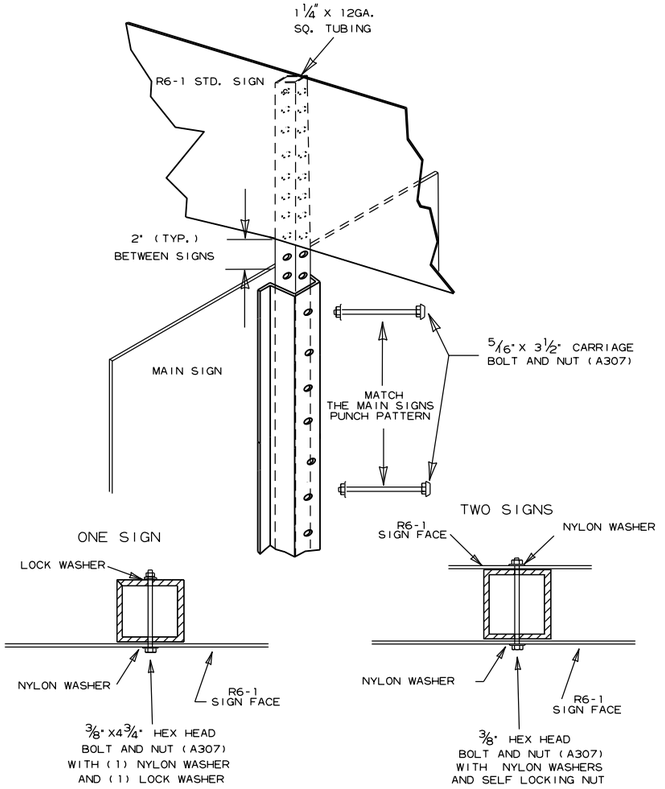
DETAIL C

SHOWING GUIDE SIGN MOUNTING WITH EXTRUDED PANELS



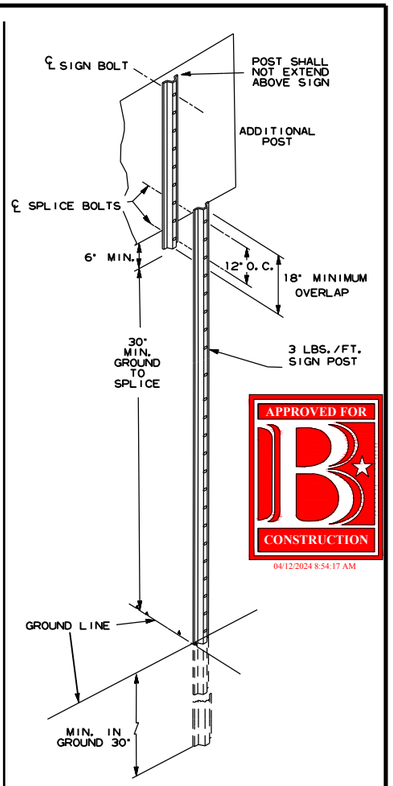
DETAIL C

U-CHANNEL POST



DETAIL E

R6-1 EXTENSION FOR U-CHANNEL POST



DETAIL F

DETAIL OF SPLICES

NOTES:

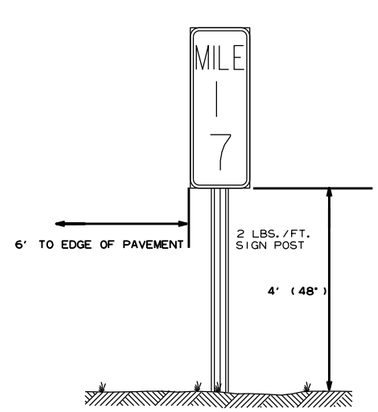
SIGNS AT LEAST 8' IN LENGTH MAY BE INSTALLED ON THREE 3 LB. POST. IN NO CASE SHALL THERE BE MORE THAN TWO 3 LB. POSTS WITHIN A 7' PATH.

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

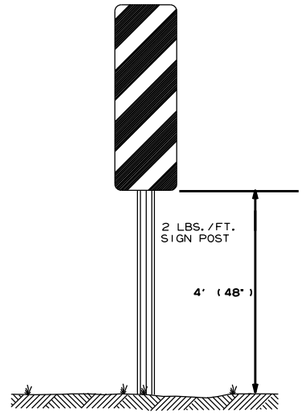
NORMAL INSTALLATIONS WILL REQUIRE 5/16" DIA. CARRIAGE BOLTS TO MOUNT SIGNS TO POST AND TO ASSEMBLE THE VARIOUS POST SUPPORTS.

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

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

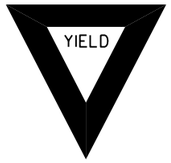
APPROVED FOR B CONSTRUCTION

04/12/2024 8:54:17 AM

RI-1

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

RI-2



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

R2-1

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

W3-5

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

W3-5a

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

R4-1

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

R4-2

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

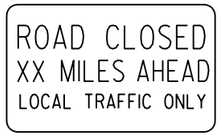
R5-1

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

RII-2

48"X30"

RII-3A



60"X30"

RII-4

60"X30"

W21-5a

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

WI-1

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

WI-2

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

WI-3

STD. 48"X48"

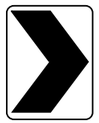
WI-4

STD. 48"X48"

WI-6

STD. 48"X24"
SPECIAL 60"X30"

WI-8



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

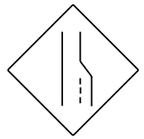
W3-1

STD. 36"X36"
SPECIAL 48"X48"

W3-2

STD. 36"X36"
SPECIAL 48"X48"

W4-2



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

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

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

W9-2

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

WI3-1

STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

W20-7a

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

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

WI-4b

STD. 48"X48"

R56-1

STD. 18"X18"

W8-11

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

W8-9

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

G20-1

60"X24"

G20-2

48"X24"

OM-3L OM-3R

12"X36"

M4-9

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

M4-10

48"X18"

R55-1

36"X60"

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

ADVANCE DISTANCES
(XXXX)

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

APPROVED FOR B CONSTRUCTION
04/12/2024 8:54:17 AM

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 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.

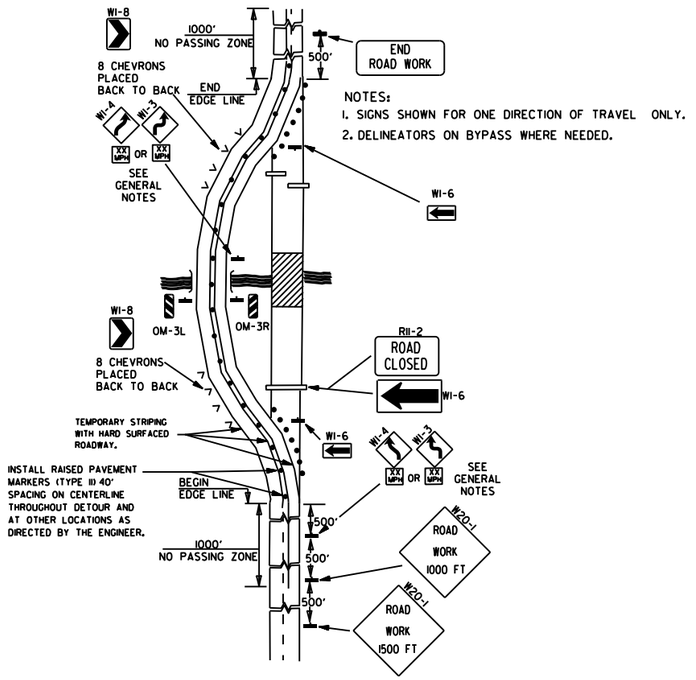
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED 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 REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
11-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
11-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION

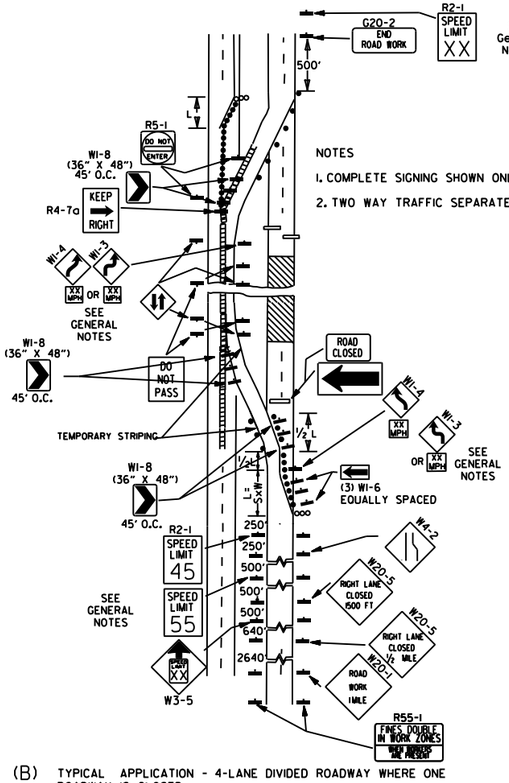
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



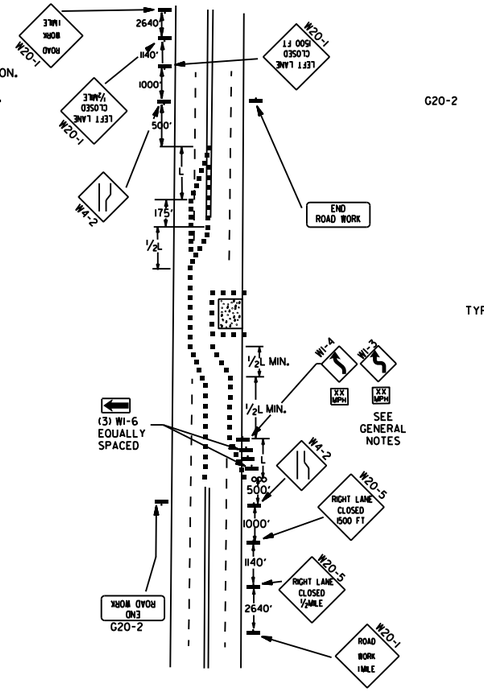
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.

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



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

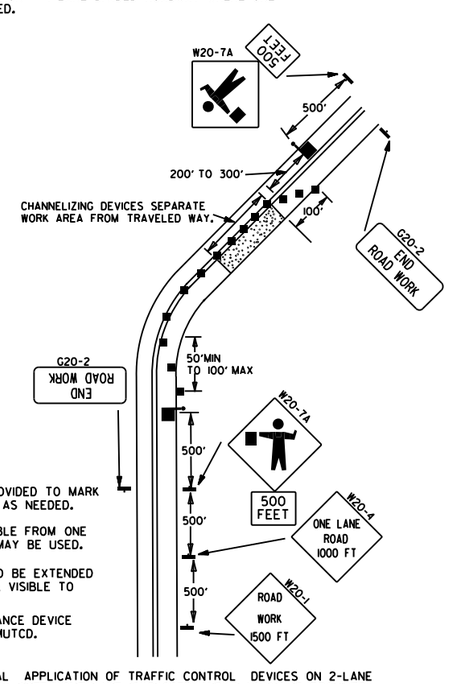
(B) TYPICAL APPLICATION - 4-LANE DIVIDED ROADWAY WHERE ONE ROADWAY IS CLOSED.



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

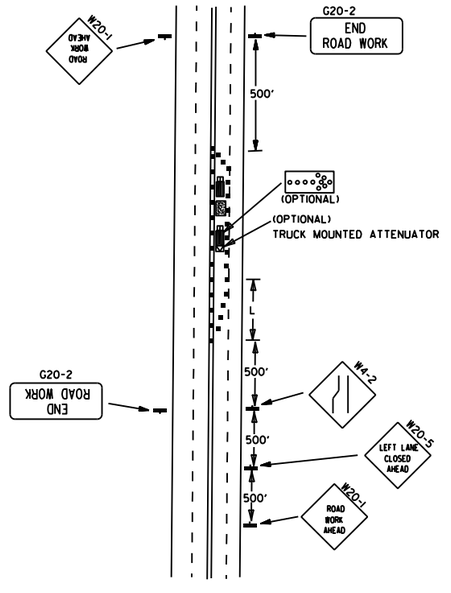
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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



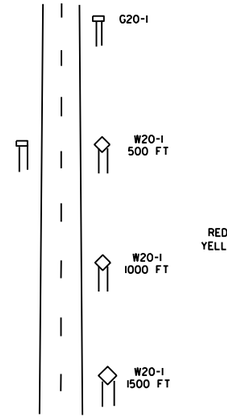
NOTES:
1. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
2. IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.
3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
4. AUTOMATED FLAGGER ASSISTANCE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

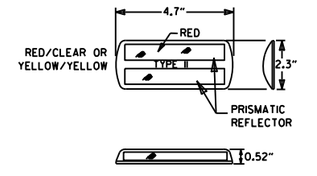
(E) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON 2-LANE HIGHWAY WHERE ONE LANE IS CLOSED AND FLAGGING IS PROVIDED.



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

KEY:
- FLAGGER
- POSITIVE BARRIER
- ARROW PANEL (IF REQUIRED)
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TRAFFIC DRUM
- RAISED PAVEMENT MARKER





DETAIL OF RAISED PAVEMENT MARKERS

TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

L=SXW FOR SPEEDS OF 45MPH OR MORE.

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

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

GENERAL NOTES:

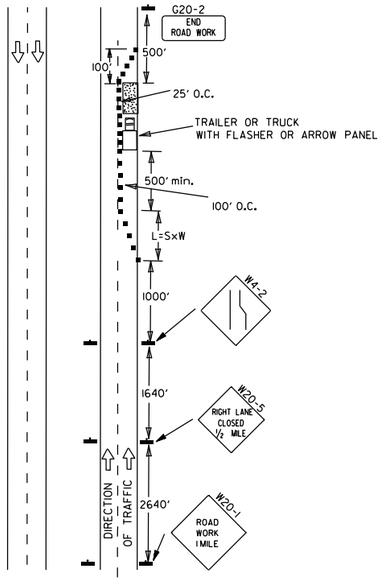
1. THE MAINTENANCE DIVISION SHALL CONDUCT A BALL BANK STUDY TO DETERMINE THE ADVISORY SPEED LIMIT PRIOR TO OPENING TO TRAFFIC. THE ADVISORY SPEED WILL BE POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS
2. WHEN THE EXISTING SPEED LIMIT 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).

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 (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

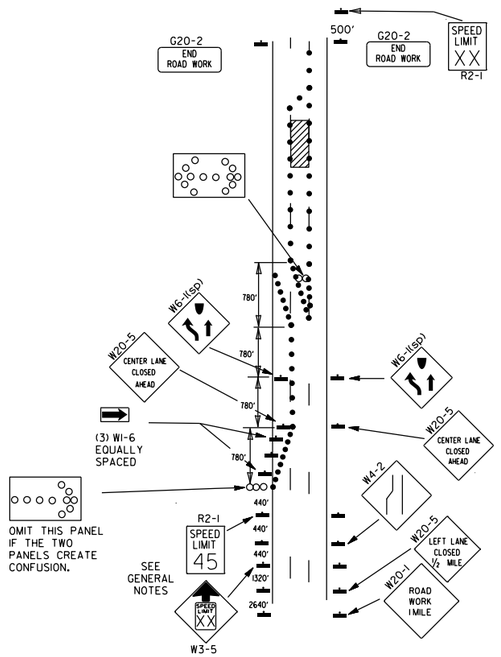
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-2



(A) TYPICAL APPLICATION - DAYTIME MAINTENANCE OPERATIONS OF SHORT DURATION ON A 4-LANE DIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



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

KEY:

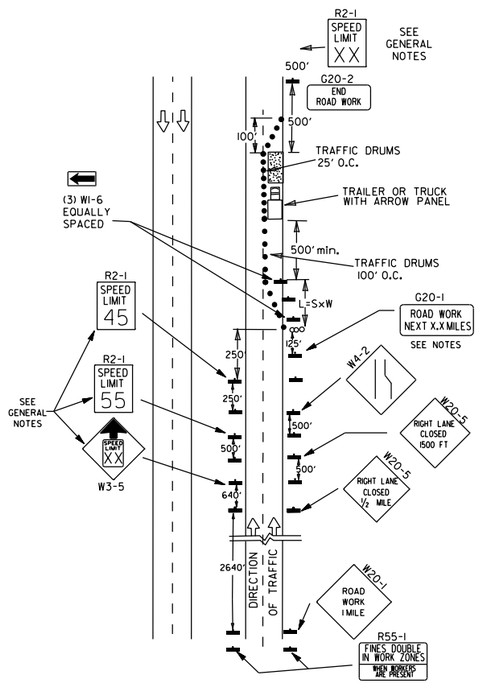
ARROW PANEL (IF REQUIRED)

■ CHANNELIZING DEVICE

● TRAFFIC DRUM

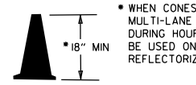
GENERAL NOTES:

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 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. 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).



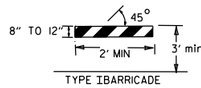
(C) TYPICAL APPLICATION - CONSTRUCTION OPERATIONS OF INTERMEDIATE TO LONG TERM DURATION ON A 4-LANE DIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.

CHANNELIZING DEVICES



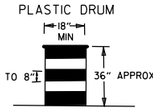
* WHEN CONES ARE USED ON FREEWAYS AND MULTI-LANE HIGHWAYS, THEY SHALL BE 28" MIN. DURING HOURS OF DARKNESS, 28" CONES SHALL BE USED ON ALL ROADWAYS, AND SHALL BE REFLECTORIZED IN ACCORDANCE WITH THE M.U.T.C.D.

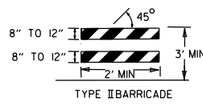
CONES



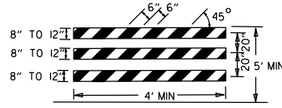
TYPE I BARRICADE

PLASTIC DRUM



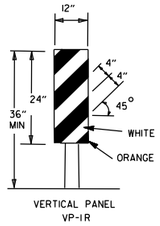


TYPE II BARRICADE



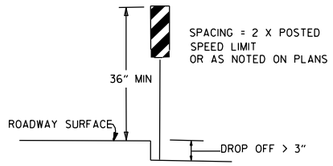
TYPE III BARRICADE

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

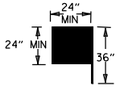


VERTICAL PANEL
VP-1R

VERTICAL PANEL PLACEMENT



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

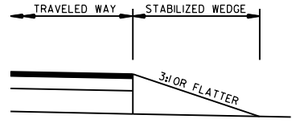
VERTICAL DIFFERENTIAL	LOCATION	TRAFFIC CONTROL
≤ 3"	CENTERLINE	W8-11 AND LANE STRIPING
≤ 3"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-9, EDGE LINE STRIPING, AND TRAFFIC DRUMS[2]
> 3" ≤ 6"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[2]
> 6"	EDGE OF TRAVELED 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:

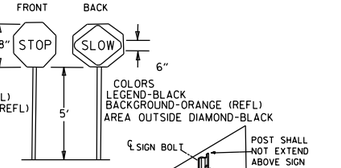
1. WHEN THE SHOULDER AREA IS USED AS PART OF THE TRAVELED LANE AND THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, THEN VERTICAL PANELS SHALL BE USED.
2. WHEN THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, A STABILIZED WEDGE SHALL 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).

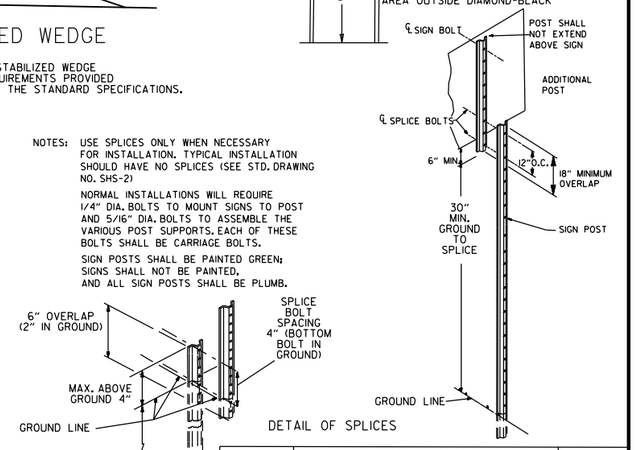


STABILIZED WEDGE

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

STOP SLOW PADDLE



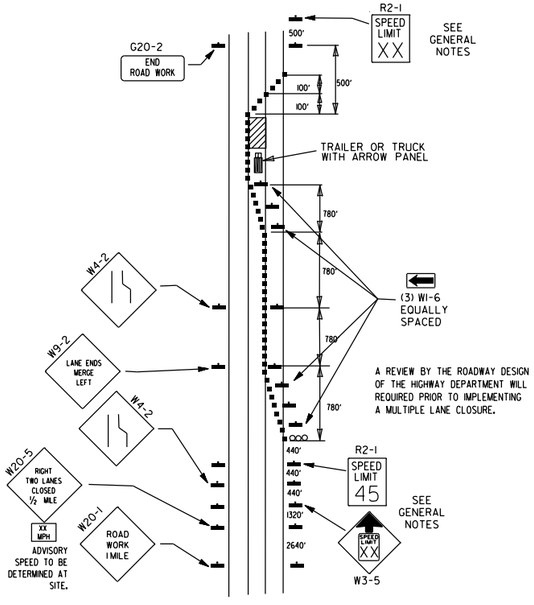


NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-21)

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

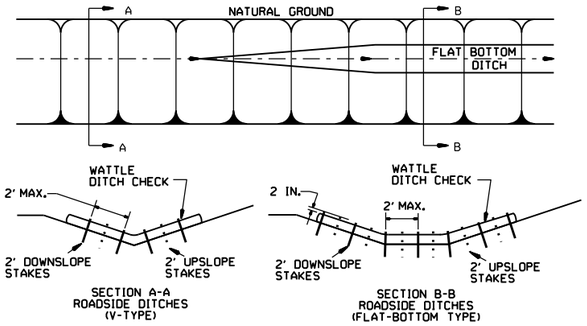
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-3

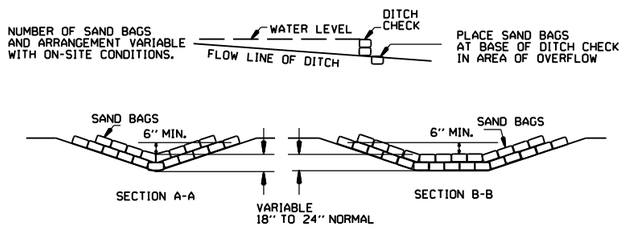
APPROVED FOR CONSTRUCTION
04/12/2024 8:54:17 AM

GENERAL NOTES

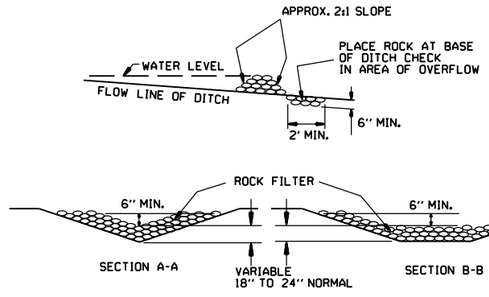
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



SAND BAG DITCH CHECK (E-5)

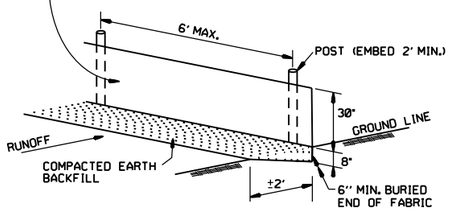


ROCK DITCH CHECK (E-6)

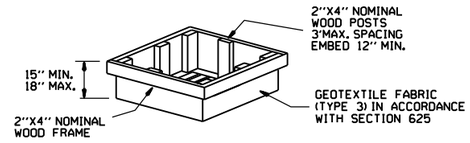
GENERAL NOTES

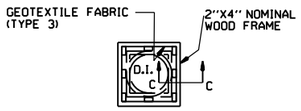
GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

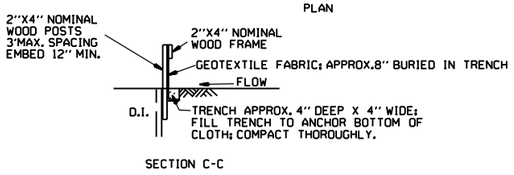
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



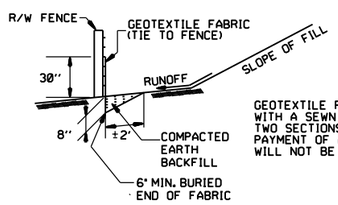
SILT FENCE (E-11)





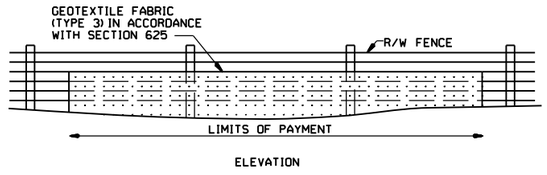


DROP INLET SILT FENCE (E-7)



GENERAL NOTES

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



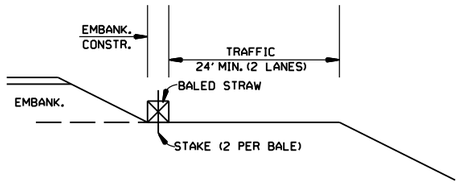
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

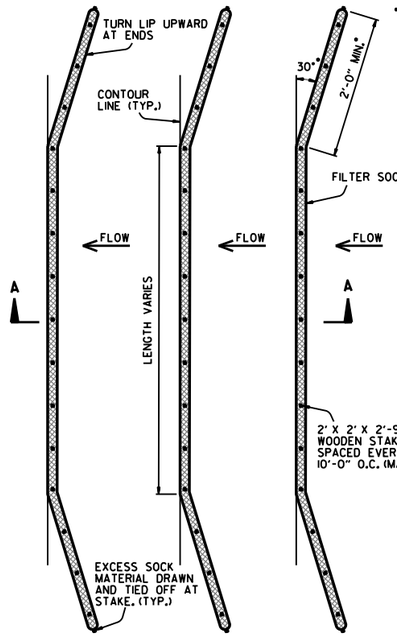
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

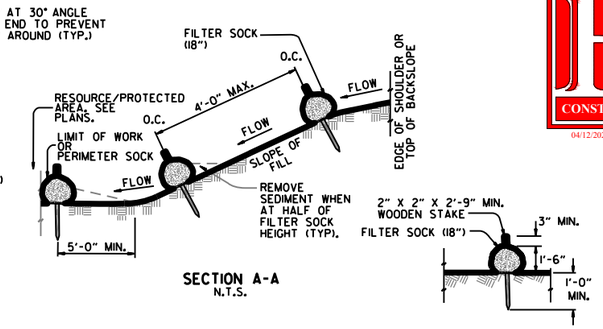
2. NO GAPS SHALL BE LEFT BETWEEN BALES.

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



BALED STRAW FILTER BARRIER (E-2)





NOTES:

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

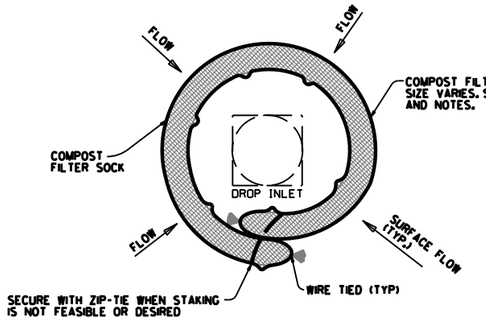
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

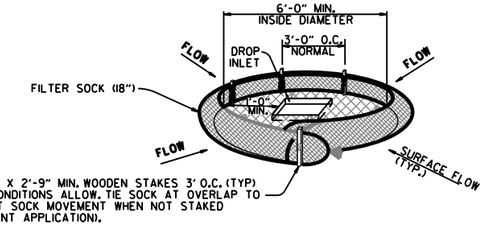
3. STEEL POSTS MAY BE USED AND SHALL BE ROLLED FROM HIGH CARBON STEEL AND HAVE A MINIMUM OF 1.25 LB./FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH-GRADE WEATHER RESISTANT BROWN OR BLACK STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES.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

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

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

FILTER SOCK ALONG SLOPE (E-3)





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)

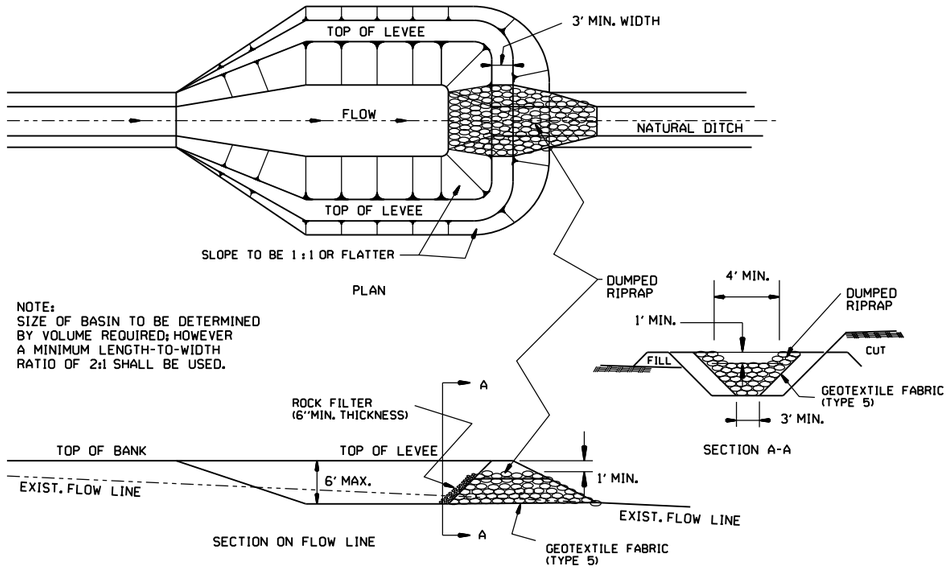
DATE	REVISION	FILMED
11-16-17	ADDED FILTER SOCK E-3 AND E-13	
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
11-18-98	ADDED NOTES	
07-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
07-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95
07-15-94	REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC	
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

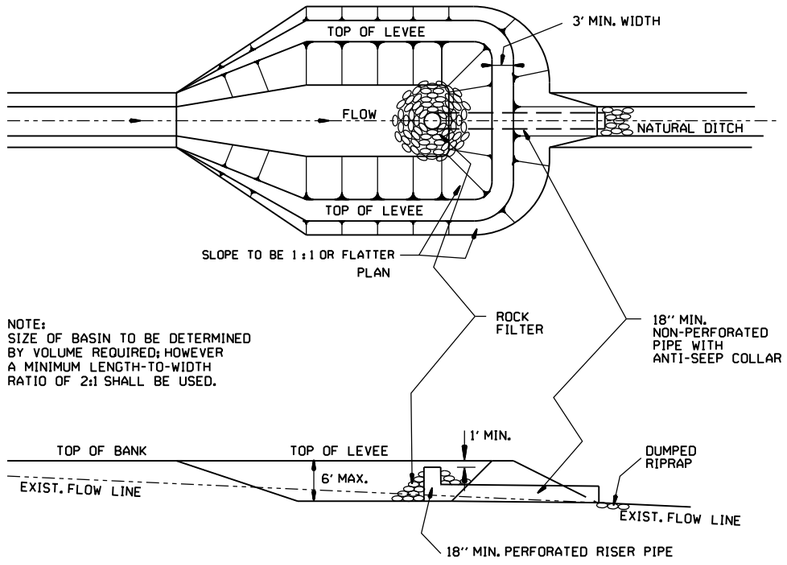
TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-1

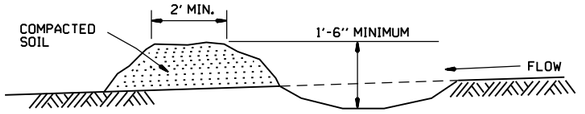
APPROVED FOR CONSTRUCTION
04/12/2022 8:54:17 AM



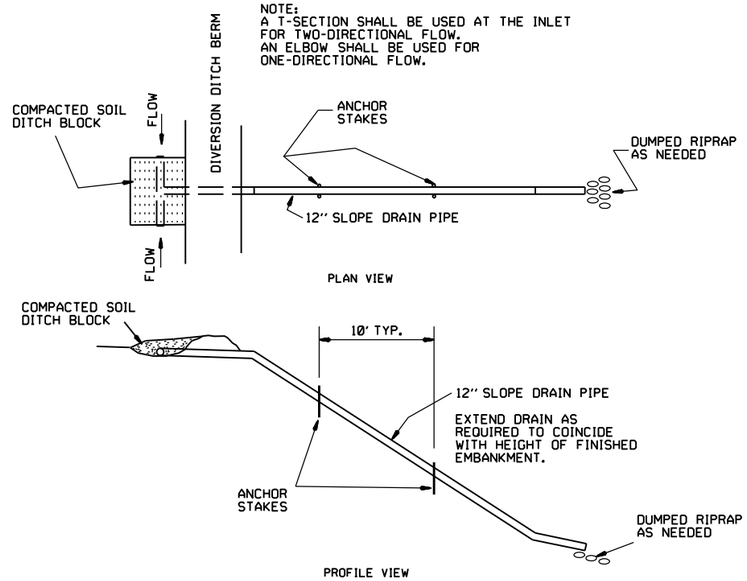
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



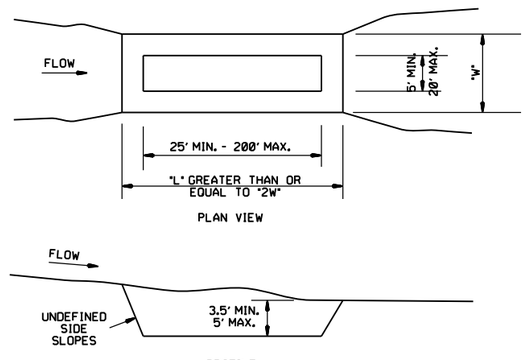
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

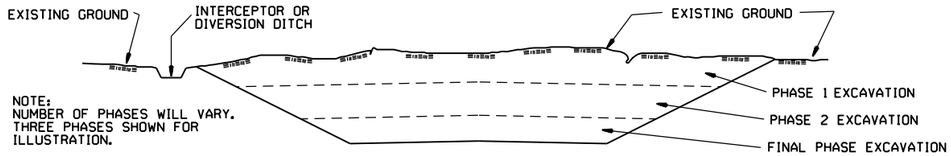
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

EXCAVATION



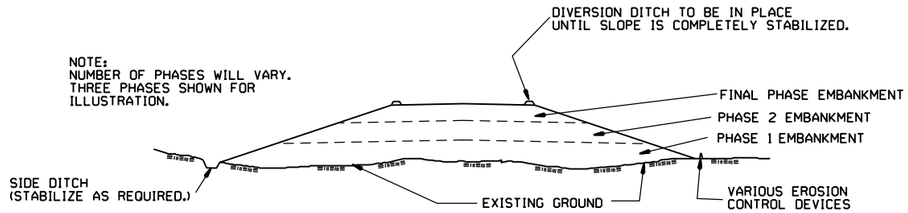
GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

EMBANKMENT



GENERAL NOTE

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

CONSTRUCTION SEQUENCE

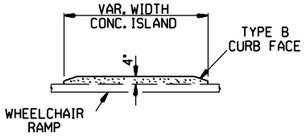
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD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

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

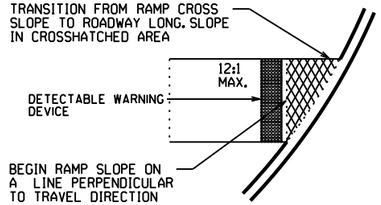
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

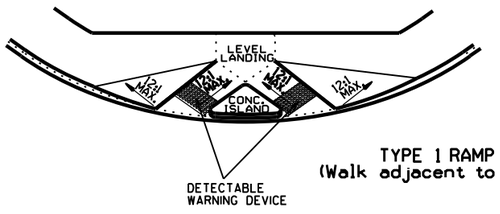
STANDARD DRAWING TEC-3



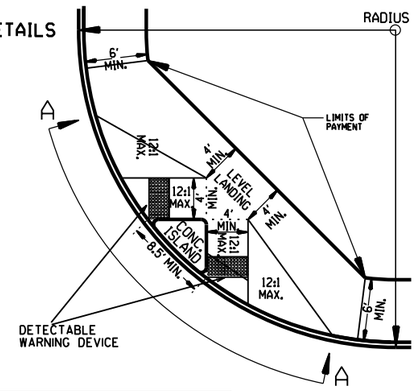
CONCRETE ISLAND DETAIL



SLOPE TRANSITION DETAILS



TYPE 1 RAMP
(Walk adjacent to curb)

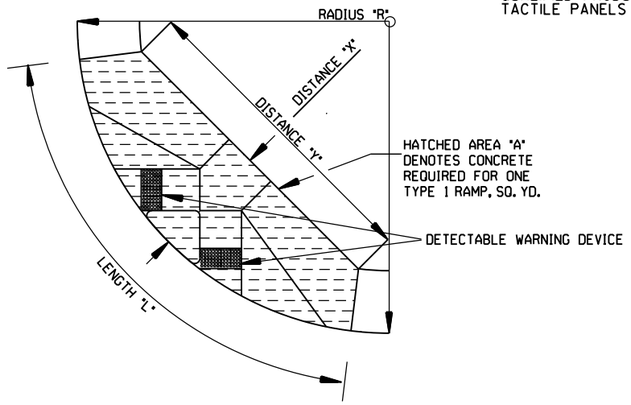


6'-0" MIN. | 4' MIN. RAMP | 8'-6" MIN. ISLAND | 4' MIN. RAMP | 6'-0" MIN.

SECTION A-A

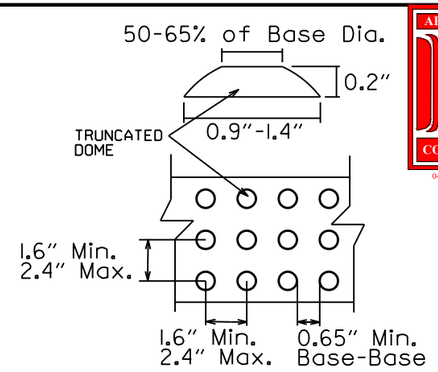
TYPE 1 RAMP DIMENSIONS AND QUANTITIES

RADIUS "R" FEET	DISTANCE "X" FEET	DISTANCE "Y" FEET	LENGTH "L" FEET	RAMP AREA "A" 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

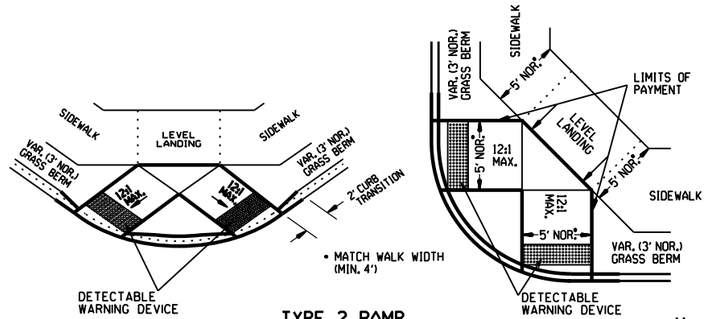
THE DETECTABLE WARNING DEVICE SHALL BE LOCATED SO THAT THE NEAREST EDGE OF THE DEVICE IS 6 TO 8 INCHES FROM THE FACE OF THE CURB.
TRUNCATED DOMES IN THE DETECTABLE WARNING SURFACE SHALL MEET THE REQUIREMENTS OF THE GEOMETRIC CONFIGURATION SHOWN.
DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT 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).



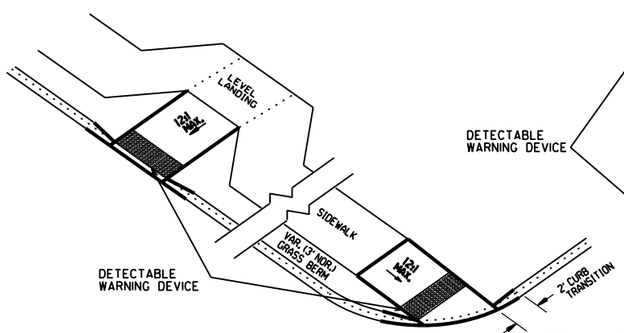
DETECTABLE WARNING DEVICE DETAIL

GENERAL NOTES:

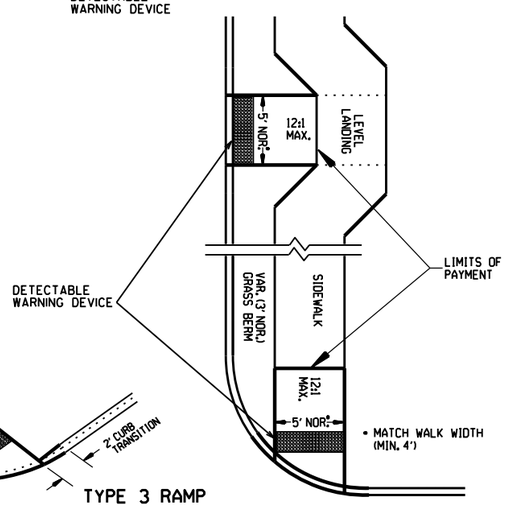
IN NEW CONSTRUCTION, UNLESS OTHERWISE INDICATED ON THE PLANS, WHEELCHAIR RAMPS ARE TO BE PROVIDED AT ALL CORNERS OF CURBED STREET INTERSECTIONS AND MID-BLOCK CROSSWALK LOCATIONS.
IN ALTERATIONS WHEELCHAIR RAMPS ARE TO BE PROVIDED AT CURBED STREET INTERSECTIONS WITH PEDESTRIAN TRAFFIC AND MID-BLOCK CROSSWALK 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.



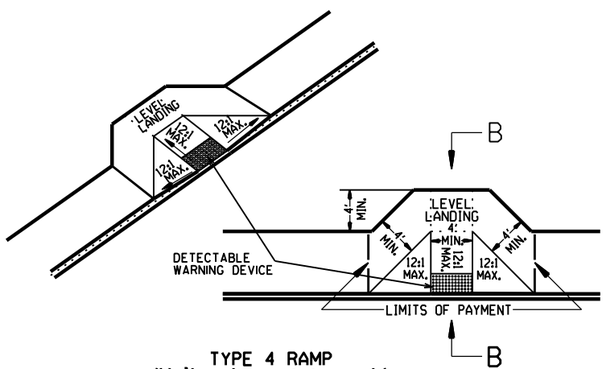
TYPE 2 RAMP



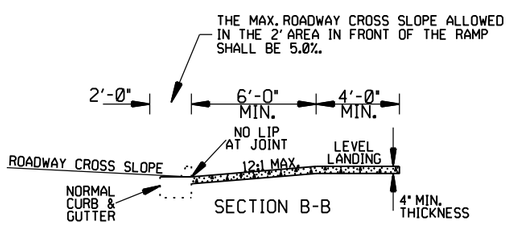
TYPE 3 RAMP



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)



SECTION B-B

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
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	FROM8#TO12#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

APPROVED FOR CONSTRUCTION
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APPROVED FOR B CONSTRUCTION
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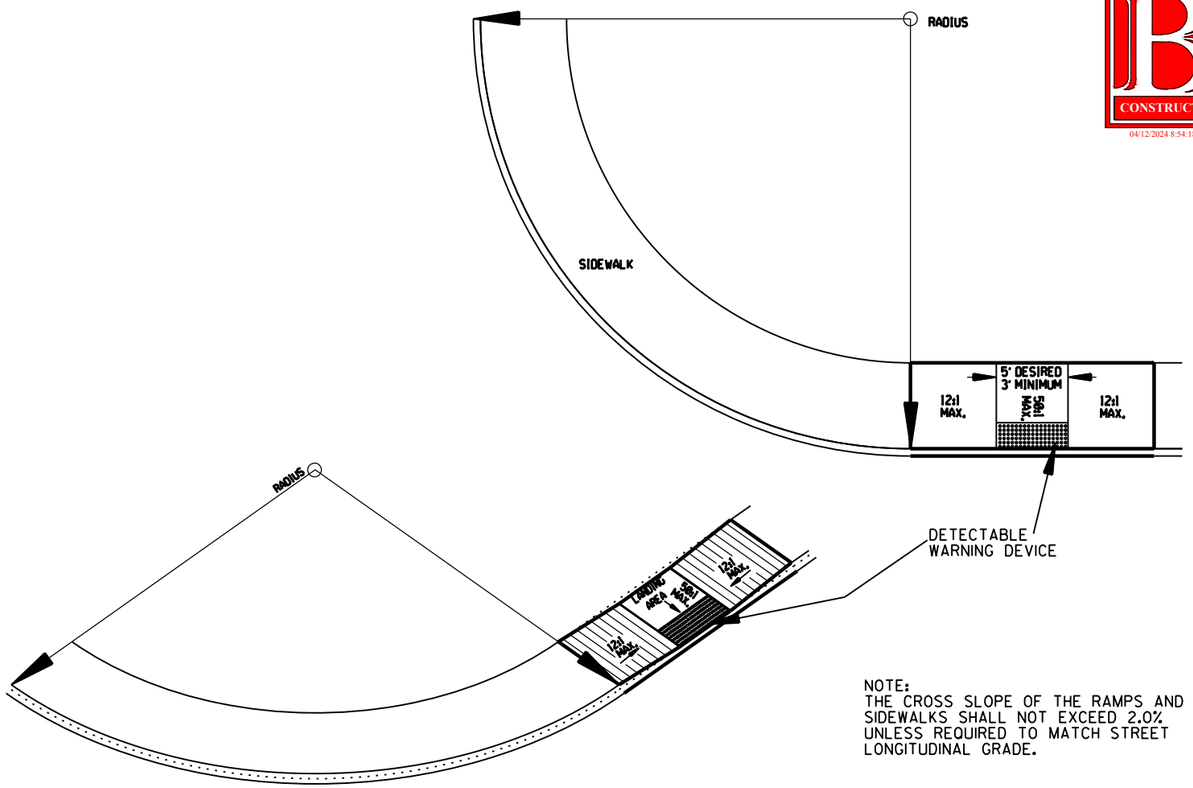
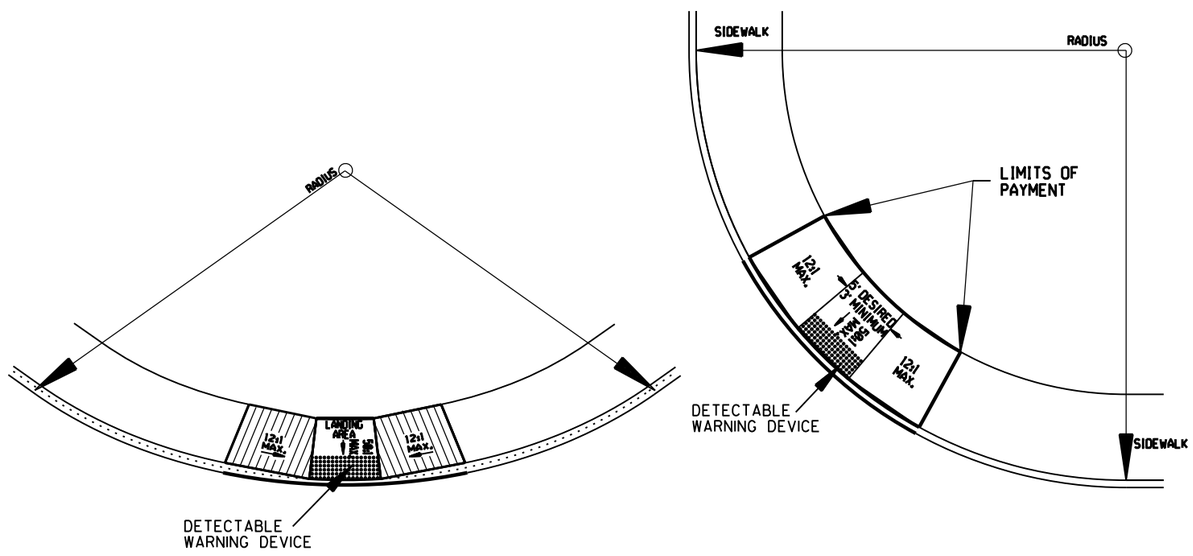


NOTE:
THE CROSS SLOPE OF THE RAMPS AND SIDEWALKS SHALL NOT EXCEED 2.0% UNLESS REQUIRED TO MATCH STREET LONGITUDINAL GRADE.

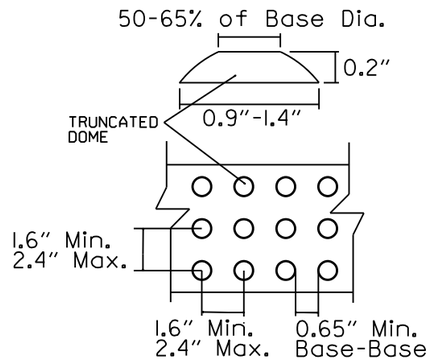
TYPE 5 RAMP



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

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					

APPROVED FOR CONSTRUCTION
04/12/2024 8:54:18 AM

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

0'-0" TO 5'-0" MAXIMUM

DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"a" bars STRAIGHT In Top and Bottom Slabs of Barrel. 2 Add'l in Apron and Headwall- Each. SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	"b" bars BENT - See Diagram below. In Top and Bottom Slabs of Barrel. Alternate with "a" bars. SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	X	"d" bars STRAIGHT. Longitudinal in Top Slab of Barrel SIZE	SPACING	NUMBER REQ'D	LENGTH	"d1" bars STRAIGHT. Longitudinal in Sidewalls SIZE	SPACING	NUMBER REQ'D	LENGTH	"e" bars. STRAIGHT Longitudinal in Bottom Slab of Barrel SIZE	SPACING	NUMBER REQ'D	LENGTH	"f" bars STRAIGHT Verticals in Sidewalls SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH
D	S	H																												
1 @ 4'		2'			120	120	4'-9"			110	110	5'-10"	4'-8"	#5	10½"	6	#4	16"	4	#4	12"	5	#4	12"	120	120	2'-11"
		3'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			6			5			120	120	3'-11"
		4'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			8			5			120	120	4'-11"
		5'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			10			5			120	120	5'-11"
		6'			120	120	4'-11"			110	110	6'-0"	4'-10"			6			12			5			120	120	6'-11"
1 @ 5'		3'			120	120	5'-9"			110	110	6'-10"	5'-8"			6			6			6			120	120	4'-0"
		4'			120	120	5'-9"			110	110	6'-10"	5'-8"			7			8			6			120	120	5'-0"
		5'	#6	13"	120	120	5'-9"	#6	13"	110	110	6'-10"	5'-8"	#5	10½"	7	#4	12"	10	#4	12"	6	#4	12"	120	120	6'-0"
		6'			120	120	5'-11"			110	110	7'-0"	5'-10"			7			12			6			120	120	7'-0"
		7'			120	120	6'-0"			110	110	7'-1"	5'-11"			7			14			6			120	120	8'-0"
1 @ 6'		3'			128	128	6'-9"			118	118	7'-10"	6'-8"			6			6			7			120	120	4'-1"
		4'			128	128	6'-9"			118	118	7'-10"	6'-8"			6			8			7			120	120	5'-1"
		5'			128	128	6'-9"			118	118	7'-10"	6'-8"			6			10			7			120	120	6'-1"
		6'	#6	12"	128	128	6'-11"	#6	12"	118	118	8'-0"	6'-10"	#5	10½"	8	#4	12"	12	#4	12"	7	#4	12"	120	120	7'-1"
		7'			128	128	7'-0"			118	118	8'-1"	6'-11"			8			14			7			120	120	8'-1"
		8'			128	128	7'-1"			118	118	8'-2"	7'-0"			8			16			7			120	120	9'-1"
1 @ 7'		4'			140	140	7'-9"			130	130	8'-10"	7'-8"			9			8			8			120	120	5'-2"
		5'			140	140	7'-9"			130	130	8'-10"	7'-8"			9			10			8			120	120	6'-2"
		6'			140	140	7'-11"			130	130	9'-0"	7'-10"			9			12			8			120	120	7'-2"
		7'	#6	11"	140	140	8'-0"	#6	11"	130	130	9'-1"	7'-11"	#5	10"	9	#4	12"	14	#4	12"	8	#4	12"	120	120	8'-2"
		8'			140	140	8'-1"			130	130	9'-2"	8'-0"			9			16			8			10"	144	9'-2"
		9'			140	140	8'-3"			130	130	9'-4"	8'-2"			9			18			8			#5	12"	10'-2"
1 @ 8'		4'			128	128	8'-9"			118	118	9'-10"	8'-8"			11			8			9			120	120	5'-6"
		5'			128	128	8'-11"			118	118	10'-0"	8'-10"			11			10			9			120	120	6'-6"
		6'			128	128	8'-11"			118	118	10'-0"	8'-10"			11			12			9			120	120	7'-8"
		7'			128	128	9'-0"			118	118	10'-1"	8'-11"			11			14			9			120	120	8'-10"
		8'	#7	12"	128	128	9'-4"	#6	12"	118	118	10'-2"	9'-0"	#5	10"	11	#4	12"	16	#4	12"	9	#4	12"	10"	149	9'-10"
		9'			128	128	9'-3"			118	118	10'-4"	9'-2"			11			18			9			11"	132	11'-0"
		10'			128	128	9'-5"			118	118	10'-6"	9'-4"			11			20			9					
1 @ 9'		5'			140	140	9'-11"			130	130	11'-0"	9'-10"			12			10			10			120	120	6'-5"
		6'			140	140	10'-0"			130	130	11'-1"	9'-11"			12			12			10			120	120	7'-5"
		7'			140	140	10'-0"			130	130	11'-1"	9'-11"			12			14			10			120	120	8'-5"
		8'	#7	11"	140	140	10'-1"	#6	11"	130	130	11'-2"	10'-0"	#5	10"	12	#4	12"	16	#4	12"	10	#4	12"	10"	149	9'-5"
		9'			140	140	10'-3"			130	130	11'-4"	10'-2"			12			18			10			11"	132	11'-5"
		10'			140	140	10'-5"			130	130	11'-6"	10'-4"			12			20			10					
		11'			140	140	10'-7"			130	130	11'-8"	10'-6"			12			22			10					
1 @ 10'		5'			128	128	10'-11"			118	118	12'-2"	10'-10"			13			10			11			120	120	6'-6"
		6'			128	128	11'-0"			118	118	12'-3"	10'-11"			13			12			11			120	120	8'-6"
		7'			128	128	11'-0"			118	118	12'-3"	10'-11"			13			14			11			10"	149	9'-6"
		8'	#7	12"	128	128	11'-1"	#7	12"	118	118	12'-4"	11'-0"	#5	10"	13	#4	12"	16	#4	12"	11	#4	12"	12"	182	11'-6"
		9'			128	128	11'-3"			118	118	12'-6"	11'-2"			13			18			11			10"	149	10'-6"
		10'			128	128	11'-5"			118	118	12'-8"	11'-4"			13			20			11			#6	12"	13'-6"
		11'			128	128	11'-7"			118	118	12'-10"	11'-6"			13			22			11					
		12'			128	128	11'-9"			118	118	13'-0"	11'-8"			13			24			11					
1 @ 11'		6'			140	140	12'-1"			130	130	13'-4"	12'-0"			15			12			12			120	120	7'-7"
		7'			140	140	12'-1"			130	130	13'-4"	12'-0"			15			14			12			120	120	8'-7"
		8'			140	140	12'-1"			130	130	13'-4"	12'-0"			15			16			12			10"	149	9'-7"
		9'	#7	11"	140	140	12'-3"	#7	11"	130	130	13'-6"	12'-2"	#5	9½"	15	#4	12"	18	#4	12"	12	#4	12"	12"	182	11'-7"
		10'			140	140	12'-5"			130	130	13'-8"	12'-4"			15			20			12			10"	149	10'-7"
		11'			140	140	12'-7"			130	130	13'-10"	12'-6"			15			22			12			#6	12"	13'-7"
		12'			140	140	12'-9"			130	130	14'-0"	12'-8"			15			24			12					
1 @ 12'		6'			128	128	13'-1"			118	118	14'-4"	13'-0"			16			12			13			120	120	7'-9"
		7'			128	128	13'-1"			118	118	14'-4"	13'-0"			16			14			13			120	120	8'-9"
		8'			128	128	13'-1"			118	118	14'-4"	13'-0"			16			16			13			10"	149	9'-9"
		9'	#8	12"	128	128	13'-3"	#7	12"	118	118	14'-6"	13'-2"	#5	9½"	16	#4	12"	18	#4	12"	13	#4	12"	12"	182	11'-9"
		10'			128	128	13'-5"			118	118	14'-8"	13'-4"			16			20			13			10"	149	10'-9"
		11'			128	128	13'-7"			118	118	14'-10"	13'-6"			16			22			13			#6	12"	13'-9"
		12'			128	128	13'-9"			118	118	15'-0"	13'-8"			16			24			13					

(1'-3" Lap) 2 @ 30'-6" for 60'-0" Length Barrel.
(1'-3" Lap) 2 @ 30'-6" for 60'-0" Length Barrel.
(1'-3" Lap) 2 @ 31'-6" for 60'-0" Length Barrel.

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM Bars "b"
#6	3"	5"	1'-2"	K, Pin Diam., X
#7	3½"	5⅜"	1'-4"	

NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

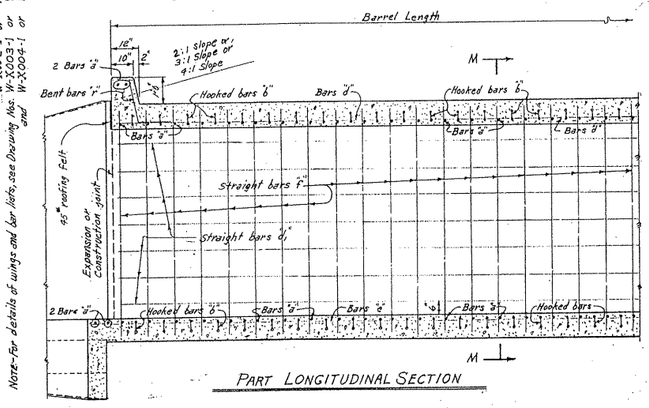
SPAN	SIZE	SPACING	NO. REQD	LENGTH	X
4'	#4	11"±	12	2'-6"	1'-3"
5'	#4	11"±	14	2'-7"	1'-3⅛"
6'	#4	11"±	16	2'-8"	1'-4"
7'	#4	11"±	18	2'-9"	1'-4⅛"
8'	#4	11⅛"±	20	2'-11"	1'-5⅛"
9'	#4	11⅛"±	22	3'-0"	1'-6"
10'	#4	11⅛"±	24	3'-1"	1'-6⅛"
11'	#4	12"±	26	3'-2"	1'-7"
12'	#4	12"±	28	3'-3"	1'-7⅛"

Bars "r" Dowel bars in Headwalls. (X, 2, 12)

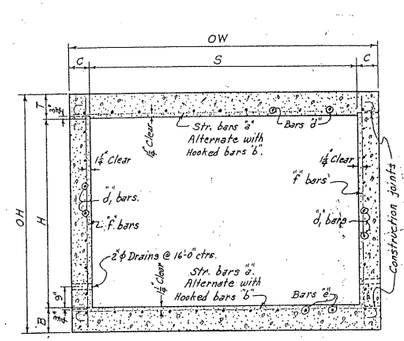
DIMENSIONS AND QUANTITIES

MAX. DESIGN DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	CLASS S CONC. PER LIN. FT. OF BARREL	REINFORCING STEEL PER LIN. FT. OF BARREL	REINFORCING STEEL ADDITIONAL PER LAP	REINFORCING STEEL ADDITIONAL TWO HEADWALLS & APRONS
D	S	H	A	OW	T	C	B	OH	CU.YD.	LB.	LB.	LB.
5'-0"	1 @ 4'	2'	8	5'-0"	7"	6"	6½"	3'-1½"	0.282	41.99	17.95	66.35
		3'	12	5'-0"		6"		4'-1⅝"	0.319	44.16	19.62	66.35
		4'	16	5'-0"		6"		5'-1⅞"	0.356	46.83	21.29	66.35
		5'	20	5'-0"		6"		6'-1⅞"	0.394	49.50	22.96	66.35
		6'	24	5'-2"		7"		7'-1⅞"	0.474	52.96	24.63	67.75
	1 @ 5'	3'	15	6'-0"	7"	6"	6½"	4'-2⅝"	0.380	55.55	22.19	101.27
		4'	20	6'-0"		6"		5'-2⅝"	0.417	58.23	23.86	101.27
		5'	25	6'-0"		6"		6'-2⅝"	0.454	60.90	25.53	101.27
		6'	30	6'-2"		7"		7'-2⅝"	0.535	64.99	27.20	103.27
		7'	35	6'-3"		7½"		8'-2⅝"	0.609	67.63	28.87	104.27
	1 @ 6'	3'	18	7'-0"	7½"	6"	7"	4'-3½"	0.496	66.29	29.76	118.96
		4'	24	7'-0"		6"		5'-3½"	0.483	68.96	26.93	118.96
		5'	30	7'-0"		6"		6'-3½"	0.520	71.64	28.10	118.96
		6'	36	7'-2"		7"		7'-3½"	0.602	75.31	29.77	120.96
		7'	42	7'-3"		7½"		8'-3½"	0.671	78.98	31.44	121.97
		8'	48	7'-4"		8"		9'-3½"	0.746	88.47	33.11	122.97
	1 @ 7'	4'	28	8'-0"	8"	6"	8½"	5'-5"	0.568	81.32	29.01	136.88
		5'	35	8'-0"		6"		6'-5"	0.605	84.00	30.68	136.88
		6'	42	8'-2"		7"		7'-5"	0.688	87.76	32.35	138.88
		7'	49	8'-3"		7½"		8'-5"	0.757	90.98	34.02	139.88
		8'	56	8'-4"		8"		9'-5"	0.832	96.65	35.69	140.88
		9'	63	8'-6"		9"		10'-5"	0.996	105.59	37.36	142.89
	1 @ 8'	4'	32	9'-0"	9½"	7"	9½"	5'-7"	0.676	95.26	33.32	198.07
		5'	40	9'-2"		7"		6'-7"	0.758	99.12	34.99	196.80
		6'	48	9'-2"		7½"		7'-7"	0.797	101.79	36.66	196.80
		7'	56	9'-3"		7½"		8'-7"	0.867	105.05	38.33	198.16
		8'	64	9'-4"		8"		9'-7"	0.942	110.81	40.00	199.52
		9'	72	9'-6"		9"		10'-7"	1.057	119.92	41.67	202.25
		10'	80	9'-8"		10"		11'-7"	1.184	126.67	43.34	204.97
	1 @ 9'	5'	45	10'-2"	10"	7"	10"	6'-8"	0.849	119.72	37.56	213.61
		6'	54	10'-3"		7½"		7'-8"	0.910	118.04	39.23	220.97
		7'	63	10'-3"		7½"		8'-8"	0.957	120.71	40.90	220.97
		8'	72	10'-4"		8"		9'-8"	1.033	126.54	42.57	222.33
		9'	81	10'-6"		9"		10'-8"	1.148	135.80	44.24	225.06
		10'	90	10'-8"		10"		11'-8"	1.276	142.68	45.91	227.78
		11'	99	10'-10"		11"		12'-8"	1.416	150.90	47.58	230.51
	1 @ 10'	5'	50	11'-2"	10½"	7"	11"	6'-9½"	0.957	130.64	40.13	242.64
		6'	60	11'-3"		7½"		7'-9½"	1.024	133.99	41.80	244.00
		7'	70	11'-3"		7½"		8'-9½"	1.071	136.66	43.47	244.00
		8'	80	11'-4"		8"		9'-9½"	1.147	142.55	45.14	245.36
		9'	90	11'-6"		9"		10'-9½"	1.263	151.92	96.81	248.09
		10'	100	11'-8"		10"		11'-9½"	1.391	158.89	98.98	250.81
		11'	110	11'-10"		11"		12'-9½"	1.532	166.71	50.15	253.54
		12'	120	12'-0"		12"		13'-9½"	1.685	178.67	51.82	256.26
	1 @ 11'	6'	66	12'-3"	11"	8"	11½"	7'-10⅝"	1.153	155.16	96.12	268.62
		7'	77	12'-3"		8"		8'-10⅝"	1.202	157.83	97.79	268.62
		8'	88	12'-4"		8"		9'-10⅝"	1.252	163.06	99.46	268.62
		9'	99	12'-6"		9"		10'-10⅝"	1.368	172.60	51.13	271.34
		10'	110	12'-8"		10"		11'-10⅝"	1.497	179.70	52.80	274.07
		11'	121	12'-10"		11"		12'-10⅝"	1.638	187.67	54.97	276.79
		12'	132	13'-0"		12"		13'-10⅝"	1.792	199.79	56.14	279.52
	1 @ 12'	6'	72	13'-3"	12"	8"	12½"	8'-0"	1.284	172.20	98.69	357.62
		7'	84	13'-3"		8"		9'-0"	1.333	174.87	50.36	357.62
		8'	96	13'-4"		8"		10'-0"	1.383	180.15	52.03	357.62
		9'	108	13'-6"		9"		11'-0"	1.500	189.85	58.70	361.18
		10'	120	13'-8"		10"		12'-0"	1.630	197.07	55.37	364.74
		11'	132	13'-10"		11"		13'-0"	1.772	205.16	57.04	368.30
		12'	144	14'-0"		12"		14'-0"	1.926	217.95	58.71	371.86

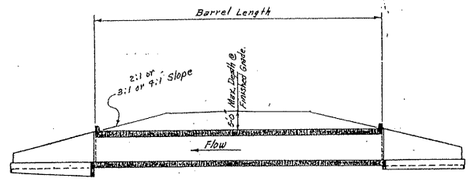
W-X002-1, W-X003-2, or W-X004-2.
W-X002-1 or W-X004-1 or W-X004-2.



PART LONGITUDINAL SECTION



TYPICAL SECTION M-M



LONGITUDINAL SECTION

NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X002-2 and W-X004-1 or W-X004-2.

GENERAL NOTES:-
- CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
- REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
- BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.
- CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.
- SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 20,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

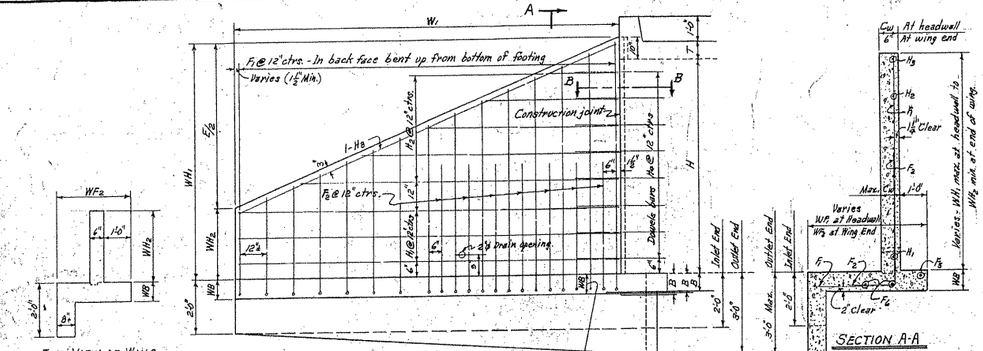
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 OR 4:1 SLOPES
SINGLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-100X-0

Designed By:- W.C.H. 1-23-63. Checked By:- RBG. 5-8-63
Drawn By:- W.C.H. 2-8-63. Checked By:- RBG. 5-8-63
Quantities By:- W.C.H. 2-12-63. Checked By:- RBG. 5-24-63

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					

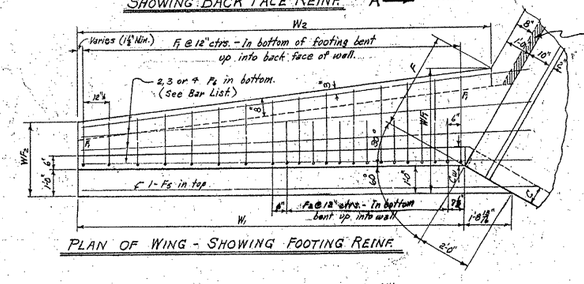
APPROVED FOR B CONSTRUCTION



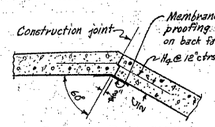
END VIEW OF WING

REAR ELEVATION OF WING - SHOWING BACK FACE REINF.

SECTION A-A

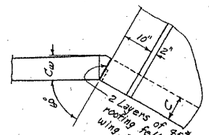


PLAN OF WING - SHOWING FOOTING REINF.



SECTION B-B THRU CONSTRUCTION JOINT

NOTE:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.



DETAIL AT TOP OF WING

WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WING & FOOTING		WINGWALL HEIGHTS		WIDTHS OF WING FOOTINGS		PERPENDICULAR FOOTING DIMENSION	PERPENDICULAR DIST. FROM HDWL. TO END OF WING	LENGTH OF WINGWALLS	INSIDE FOOTING DIMENSION	* QUANTITY PER WING CLASS S CONCRETE	
			AT HEADWALL	AT END OF WING	AT HEADWALL	AT END OF WING					INLET END	OUTLET END
H	WB	Cw	WH1	WH2	W1	W2	F	E	W1	W2	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	0'-11"	4'-4"	5'-0"	4'-7½"	0.604	0.670
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-4½"	1'-0"	5'-8"	6'-6½"	6'-2½"	0.908	0.996
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-8"	1'-2"	7'-0"	8'-1"	8'-1"	1.267	1.376
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-11½"	2'-1½"	8'-4"	9'-7½"	9'-9⅜"	1.679	1.810
		7"	5'-10"	1'-8"	3'-4"	2'-9½"	2'-1½"	8'-4"	9'-7½"	9'-9⅜"	1.750	1.881
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6½"	9'-8"	11'-2"	11'-6½"	2.330	2.483
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6⅝"	9'-8"	11'-2"	11'-6½"	2.379	2.531
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6⅝"	9'-8"	11'-2"	11'-6½"	2.427	2.580
7'	8½"	7½"	7'-10"	2'-0"	4'-2"	2'-7½"	3'-1⅛"	11'-0"	12'-8½"	13'-2½"	3.054	3.230
		8"	7'-10"	2'-0"	4'-2"	2'-7½"	3'-1⅛"	11'-0"	12'-8½"	13'-2½"	3.117	3.293
8'	9"	8"	8'-10"	2'-0"	4'-8"	2'-9"	3'-3"	12'-9"	14'-3"	15'-2½"	3.905	4.104

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W3.

APRON DIMENSION W3 = (OW - 2F)

CLEAR SPAN	CLEAR HEIGHT	2 X FOOTING DIMENSION	SINGLE BARREL CULVERT		DOUBLE BARREL CULVERT		TRIPLE BARREL CULVERT		QUADRUPLE BARREL CULVERT		QUINTUPLE BARREL CULVERT	
			OW	W3	OW	W3	OW	W3	OW	W3	OW	W3
S	H	2F										
4'	2'	1'-11⅛"	5'-0"	3'-0⅛"	9'-5⅛"	7'-0⅛"	14'-4⅛"	12'-0⅛"	19'-0"	17'-0⅛"	23'-8"	21'-8⅛"
	3'	2'-8⅛"	5'-0"	2'-3⅛"	9'-5⅛"	6'-11⅛"	14'-4"	11'-7⅛"	19'-0"	16'-7⅛"	23'-8"	20'-11⅛"
	4'	3'-5"	5'-0"	1'-6"	9'-5⅛"	6'-2"	14'-4"	11'-0"	19'-0"	15'-10"	23'-8"	20'-2"
	5'	4'-3⅛"	5'-0"	0'-8⅛"	9'-5⅛"	5'-4⅛"	14'-4"	10'-0⅛"	19'-0"	14'-10⅛"	23'-8"	19'-4⅛"
	6'	5'-0⅛"	5'-8"	0'-1⅛"	9'-11⅛"	4'-10⅛"	14'-8"	9'-7⅛"	19'-5"	14'-4⅛"	24'-2"	19'-1⅛"
5'	3'	2'-8⅛"	6'-0"	3'-3⅛"	11'-8"	8'-11⅛"	17'-4"	14'-7⅛"	23'-0"	20'-3⅛"	28'-8"	25'-11⅛"
	4'	3'-5"	6'-0"	2'-6"	11'-8"	8'-2"	17'-4"	13'-10"	23'-0"	19'-6"	28'-8"	25'-2"
	5'	4'-3⅛"	6'-0"	1'-8⅛"	11'-8"	7'-4⅛"	17'-4"	13'-0⅛"	23'-0"	18'-10⅛"	28'-8"	24'-4⅛"
	6'	5'-0⅛"	6'-0"	1'-1⅛"	11'-11"	6'-10⅛"	17'-8"	12'-7½"	23'-5"	18'-4½"	29'-2"	24'-1⅛"
	7'	6'-2⅛"	6'-3"	0'-0⅛"	12'-1"	5'-10⅛"	17'-11"	11'-8⅛"	23'-9"	17'-4½"	29'-7"	23'-0⅛"
6'	3'	2'-8⅛"	7'-0"	4'-3⅛"	13'-8"	10'-11⅛"	20'-0"	17'-7⅛"	27'-0"	24'-3⅛"	33'-8"	30'-11⅛"
	4'	3'-5"	7'-0"	3'-6"	13'-8"	10'-2"	20'-0"	16'-10"	27'-0"	23'-6"	33'-8"	30'-2"
	5'	4'-3⅛"	7'-0"	2'-8⅛"	13'-8"	9'-4⅛"	20'-0"	16'-0⅛"	27'-0"	22'-8⅛"	33'-8"	29'-4⅛"
	6'	5'-0⅛"	7'-2"	2'-1⅛"	13'-11"	8'-10⅛"	20'-5"	15'-7½"	27'-5"	22'-2½"	34'-2"	29'-1⅛"
	7'	6'-2⅛"	7'-3"	1'-0⅛"	14'-1"	7'-10⅛"	20'-11"	14'-8½"	27'-9"	21'-1½"	34'-7"	28'-0⅛"
	8'	7'-1⅛"	7'-8"	0'-0"	14'-2"	6'-10"	21'-0"	13'-8"	27'-10"	20'-1"	34'-8"	27'-0"
7'	4'	3'-5"	8'-0"	4'-6"	15'-8"	11'-2"	23'-5"	18'-10"	31'-0"	26'-4"	38'-10"	33'-2"
	5'	4'-3⅛"	8'-0"	3'-8⅛"	15'-8"	11'-4⅛"	23'-5"	19'-0⅛"	31'-0"	26'-4⅛"	38'-10"	33'-2⅛"
	6'	5'-0⅛"	8'-2"	3'-1⅛"	15'-11"	10'-10⅝"	23'-8"	18'-7⅛"	31'-5"	25'-10⅛"	39'-3"	33'-1⅛"
	7'	6'-2⅛"	8'-3"	2'-0⅛"	16'-1"	9'-10⅝"	23'-11"	17'-8⅛"	31'-9"	24'-9⅛"	39'-7"	32'-0⅛"
	8'	7'-1⅛"	8'-8"	1'-0"	16'-2"	8'-10"	24'-0"	16'-8"	31'-10"	23'-8"	39'-8"	30'-10"
8'	4'	3'-5"	9'-0"	5'-6"	17'-8"	14'-2"	26'-5"	22'-10"	35'-10"	31'-4"	43'-8"	40'-2"
	5'	4'-3⅛"	9'-2"	4'-10⅛"	17'-11"	13'-7⅛"	26'-8"	21'-11⅛"	35'-5"	30'-1⅛"	44'-1"	39'-1⅛"
	6'	5'-0⅛"	9'-2"	4'-1⅛"	17'-11"	12'-10⅛"	26'-8"	21'-1⅛"	35'-5"	30'-0⅛"	44'-1"	39'-1⅛"
	7'	6'-2⅛"	9'-3"	3'-0⅛"	18'-1"	11'-10⅝"	26'-11"	20'-0⅝"	35'-9"	28'-11⅛"	44'-5"	38'-0⅛"
	8'	7'-1⅛"	9'-8"	2'-0"	18'-2"	10'-10"	27'-0"	19'-0"	35'-10"	27'-10"	44'-8"	37'-0"
9'	5'	4'-3⅛"	10'-2"	5'-10⅛"	19'-11"	15'-7⅛"	29'-8"	25'-0⅛"	39'-5"	35'-1⅛"	49'-2"	44'-10⅛"
	6'	5'-0⅛"	10'-3"	5'-2⅛"	20'-1"	15'-0⅛"	29'-11"	24'-1⅛"	39'-9"	34'-0⅛"	49'-7"	43'-11⅛"
	7'	6'-2⅛"	10'-3"	4'-0⅛"	20'-1"	13'-10⅛"	29'-11"	23'-0⅛"	39'-9"	32'-6⅛"	49'-7"	42'-4⅛"
	8'	7'-1⅛"	10'-8"	3'-0"	20'-2"	12'-10"	30'-0"	22'-8"	39'-10"	32'-6"	49'-8"	42'-0"
10'	5'	4'-3⅛"	11'-2"	6'-10⅛"	21'-11"	17'-7⅛"	32'-8"	28'-0⅛"	43'-5"	39'-1⅛"	54'-2"	49'-10⅛"
	6'	5'-0⅛"	11'-3"	6'-2⅛"	22'-1"	17'-0⅛"	32'-11"	27'-1⅛"	43'-9"	38'-0⅛"	54'-7"	48'-11⅛"
	7'	6'-2⅛"	11'-3"	5'-0⅛"	22'-1"	15'-10⅛"	32'-11"	26'-0⅛"	43'-9"	37'-6⅛"	54'-7"	47'-4⅛"
	8'	7'-1⅛"	11'-8"	4'-0"	22'-2"	14'-10"	33'-0"	25'-8"	43'-10"	36'-6"	54'-8"	47'-0"
11'	6'	5'-0⅛"	12'-4"	7'-3⅛"	24'-2"	19'-1⅛"	36'-0"	30'-1⅛"	47'-10"	42'-5⅛"		
	7'	6'-2⅛"	12'-4"	6'-1⅛"	24'-2"	17'-11⅛"	36'-0"	29'-0⅛"	47'-10"	41'-2⅛"		
	8'	7'-1⅛"	12'-9"	5'-0"	24'-2"	16'-10"	36'-0"	28'-8"	47'-10"	40'-6"		
12'	6'	5'-0⅛"	13'-8"	8'-3⅛"	26'-2"	21'-1⅛"	39'-0"	33'-1⅛"	51'-10"	46'-5⅛"		
	7'	6'-2⅛"	13'-8"	7'-1⅛"	26'-2"	19'-11⅛"	39'-0"	32'-0⅛"	51'-10"	45'-1⅛"		
	8'	7'-1⅛"	13'-8"	6'-0"	26'-2"	18'-10"	39'-0"	31'-8"	51'-10"	44'-6"		

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	REINFORCING STEEL @	CLASS S CONCRETE - 4 WINGS HEADWALLS, WINGWALLS, FOOTINGS, TOE WALLS AND APRONS					
				FOR 4 WINGS	SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT	
S	H	Cw	WB	LB.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	
4'	2'	6"	7"	81.0	3.30	4.25	5.21	6.17	7.13	
	3'	6"	7"	119.8	4.45	5.41	6.37	7.33	8.29	
	4'	6"	7"	183.3	5.83	6.78	7.74	8.70	9.66	
	5'	6"	7"	253.2	7.41	8.37	9.33	10.29	11.25	
	6'	7"	8"	415.4	9.97	10.95	11.94	12.93	13.92	
5'	3'	6'	7"	119.8	4.67	5.83	6.99	8.16	9.33	
	4'	6"	7"	183.3	6.04	7.20	8.36	9.53	10.70	
	5'	6"	7"	253.2	7.63	8.78	9.95	11.12	12.28	
	6'	7"	8"	415.4	10.19	11.38	12.57	13.77	14.96	
	7'	7½	8½	797.6	12.98	14.19	15.41	16.63	17.85	
6'	3'	6"	7"	119.8	4.88	6.26	7.62	9.00	10.38	
	4'	6"	7"	183.3	6.25	7.63	8.99	10.37	11.75	
	5'	6"	7"	253.2	7.83	9.22	10.57	11.96	13.33	
	6'	7"	8"	415.4	10.40	11.81	13.20	14.61	16.01	
	7'	7½	8½	797.6	13.19	14.63	16.04	17.47	18.90	
	8'	8	9"	1004.9	16.50	17.93	19.36	20.79	22.23	
7'	4'	6"	7"	183.3	6.47	8.07	9.66	11.26	12.85	
	5'	6"	7"	253.2	8.05	9.66	11.28	12.84	14.44	
	6'	7"	8"	415.4	10.62	12.25	13.88	15.46	17.08	
	7'	7½	8½	797.6	13.42	15.06	16.68	18.32	19.96	
	8'	8	9"	1004.9	16.72	18.37	20.00	21.65	23.29	
8'	4'	6"	7"	183.3	6.69	8.52	10.32	12.15	13.95	
	5'	7"	7"	253.2	8.59	10.44	12.26	14.11	15.92	
	6'	7"	8"	415.4	10.86	12.69	14.51	16.36	18.17	
	7'	7½	8½	797.6	13.68	15.50	17.34	19.21	21.08	
	8'	8	9"	1004.9	16.96	18.81	20.65	22.51	24.36	
9'	5'	7"	7"	253.2	8.81	10.90	12.92	15.00	17.02	
	6'	7½	8"	415.4	11.27	13.38	15.42	17.52	19.56	
	7'	7½	8½	797.6	13.85	15.96	18.00	20.10	22.14	
	8'	8	9"	1004.9	17.16	19.26	21.31	23.41	25.45	
10'	5'	7"	7"	253.2	9.04	11.35	13.60	15.81	18.08	
	6'	7½	8"	415.4	11.50	13.83	16.10	18.33	20.61	
	7'	7½	8½	797.6	14.08	16.41	18.68	20.91	23.20	
	8'	8	9"	1004.9	17.38	19.71	21.98	24.22	26.50	
11'	6'	6"	8"	415.4	11.93	14.51	17.00	19.47		
	7'	8"	8½	797.6	14.56	17.15	19.64	22.11		
	8'	8"	9"	1004.9	17.53	20.18	22.67	25.14		
12'	6'	8"	9"	415.4	12.16	14.99	17.70	20.42		
	7'	8"	8½	797.6	14.79	17.62	20.33	23.06		
	8'	8"	9"	1004.9	17.82	20.65	23.36	26.08		

* For reinforcing steel in Headwalls and Aprons, see Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾ chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-

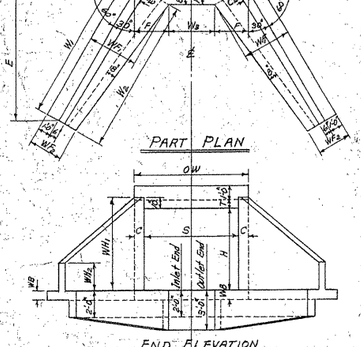
Class S Concrete (n=10) 1200 #/in²

Reinforcing Steel 20,000 #/in²

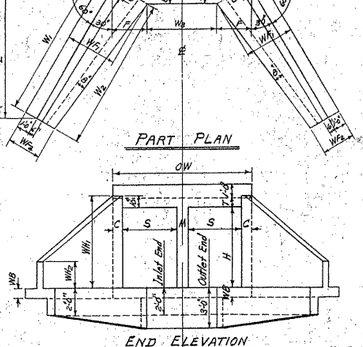
NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos. as listed below.

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-100X-0	R-200X-0	R-300X-0	R-400X-0	R-500X-0
R-100X-X1	R-200X-X1	R-300X-X1	R-400X-X1	R-500X-X1
R-100X-X2	R-200X-X2	R-300X-X2	R-400X-X2	
	R-200X-X3	R-300X-X3		

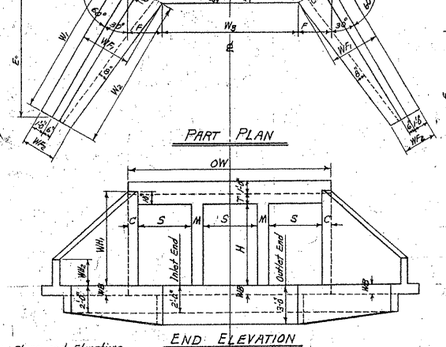
CLASS S CONCRETE



END ELEVATION
SINGLE BARREL CULVERT

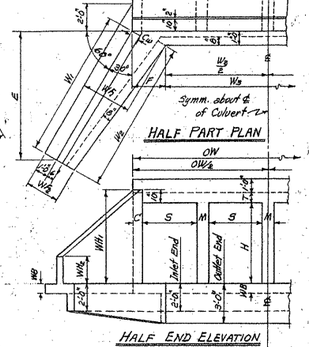


END ELEVATION
DOUBLE BARREL CULVERT

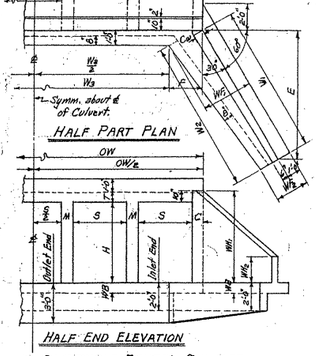


END ELEVATION
TRIPLE BARREL CULVERT

NOTE:- Plans and Elevations are not to scale.



HALF PART PLAN
HALF END ELEVATION
QUADRUPLE BARREL CULVERT



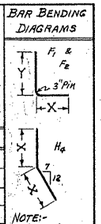
HALF PART PLAN
HALF END ELEVATION
QUINTUPLE BARREL CULVERT

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three mopplings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

BAR LIST FOR ONE WING. - 4 REQUIRED

CLEAR HEIGHT	F1 BENT: In bottom of footing, bent up into back face of wing. One bar of each length. SIZE	SPACING	NO. REQD	LENGTHS VARY MIN.	MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.	F2 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE	SPACING	NO. REQD	LENGTH	X	Y	F5 STRAIGHT: Longitudinal in top of wing footing heel. SIZE	NO. REQD	LENGTH	F4 STRAIGHT: Longitudinal in bottom of wing footing toe. SIZE	NO. REQD	LENGTH	H1 Horizontal in back face of wing. SIZE	SPACING	NO. REQD	LENGTH	H2 STRAIGHT: Horizontal in back face of wing. One bar of each length. SIZE	SPACING	NO. REQD	LENGTHS VARY MAX.	MIN.	H3 In back face of wing at top - on slope. SIZE	NO. REQD	LENGTH	H4 BENT: Dowels thru construction joint at headwall. SIZE	SPACING	NO. REQD	LENGTH	X	QUANTITY REINFORCING STEEL PER WING
H																																									LB.
2'	#3	12"	6	1'-6"	3'-10"	0'-8"	1'-0"	0'-11"	2'-11"	—	—	—	—	—	—	#3	1	7'-6"	#3	2	6'-3"	#3	12"	1	4'-9"	#3	12"	1	—	2'-8"	#3	1	5'-1"	#3	12"	2	2'-8"	1'-4"		20.2
3'	#3	12"	7	2'-2"	5'-3"	0'-10"	1'-4"	1'-5"	4'-0"	—	—	—	—	—	—	#3	1	9'-0"	#3	2	8'-0"	#3	12"	1	6'-3"	#3	12"	2	5'-0"	2'-8"	#3	1	6'-8"	#3	12"	3	2'-8"	1'-4"		29.9
4'	#3	12"	9	2'-10"	6'-7"	0'-11"	1'-8"	1'-6"	5'-0"	—	—	—	—	—	—	#3	1	10'-7"	#3	3	9'-9"	#3	12"	1	7'-10"	#3	12"	3	7'-4"	2'-8"	#3	1	8'-6"	#3	12"	4	2'-8"	1'-4"		45.8
5'	#3	12"	10	3'-6"	7'-10"	1'-1"	1'-11"	2'-0"	6'-0"	#3	12"	3	3'-6"	1'-1"	2'-8"	#3	1	12'-1"	#3	3	11'-6"	#3	12"	2	9'-4"	#3	12"	3	7'-4"	2'-8"	#3	1	10'-1"	#3	12"	5	2'-8"	1'-4"		68.3
6'	#4	12"	12	3'-5"	9'-3"	1'-2"	2'-3"	2'-9"	7'-1"	#3	12"	3	4'-6"	1'-4"	3'-3"	#3	1	13'-8"	#3	3	13'-3"	#4	12"	2	10'-11"	#3	12"	4	9'-8"	2'-8"	#3	1	11'-9"	#3	12"	6	2'-8"	1'-5"	103.8
7'	#4	12"	13	4'-1"	10'-9"	1'-4"	2'-9"	2'-10"	8'-1"	#4	12"	5	5'-6"	1'-7"	4'-0"	#4	1	15'-2"	#4	4	15'-0"	#4	12"	2	12'-5"	#4	12"	5	12'-0"	2'-8"	#4	1	13'-5"	#4	12"	7	3'-6"	1'-9"		199.4
8'	#4	12"	15	4'-5"	12'-3"	1'-5"	3'-2"	3'-1"	9'-2"	#4	12"	7	6'-6"	1'-10"	4'-9"	#4	1	16'-9"	#4	4	16'-9"	#4	12"	3	14'-0"	#4	12"	5	12'-0"	2'-8"	#4	1	15'-2"	#4	12"	8	3'-6"	1'-9"		251.2

BAR BENDING DIAGRAMS



REVISIONS:- Membrane added: 5-10-66 W.C.H.

Designed by - W.C.H. 7-25-62 Checked by - J.S.M. - 5-7-63
Drawn by - W.C.H. 4-16-63 Checked by - J.S.M. - 5-7-63
Quantities by - W.C.H. Checked by - J.S.M. - 5-7-63

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 2:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X002-1