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CONSTRUCTION PLANS FOR THE CITY OF CALLAWAY SOUTH BERTHE AVENUE DITCH PIPING

PREPARED FOR:
CITY OF CALLAWAY

MAY 2021



CITY OF CALLAWAY
CITY COMMISSION

- | | |
|----------------------|-----------------------|
| PAMN HENDERSON | MAYOR |
| SCOTT DAVIS | WARD I COMMISSIONER |
| DAVID GRIGGS | WARD II COMMISSIONER |
| BOB PELLETIER | WARD III COMMISSIONER |
| KENNETH L. AYERS JR. | WARD IV COMMISSIONER |
| EDDIE COOK | CITY MANAGER |
| BILL FRYE | PUBLIC WORKS DIRECTOR |

PREPARED BY:

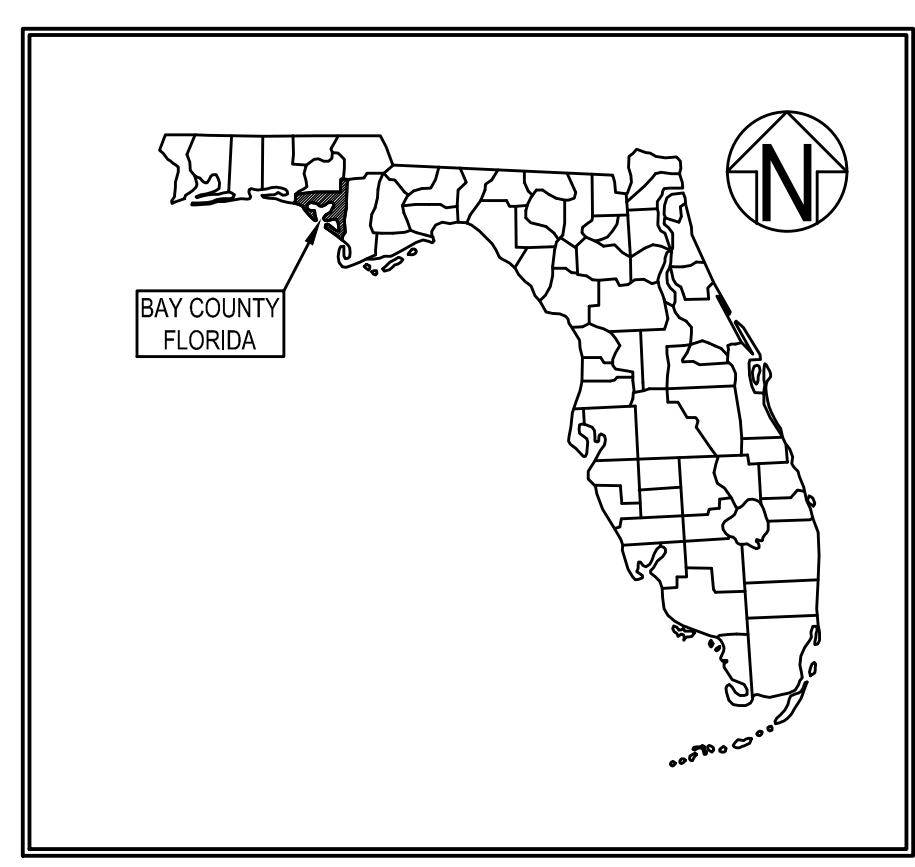
BASKERVILLE-DONOVAN, INC.
ENGINEERING THE SOUTH SINCE 1927

14101 PANAMA CITY BEACH PARKWAY, SUITE 110
PANAMA CITY BEACH, FLORIDA 32413 (850) 230-6150
PENSACOLA - PANAMA CITY BEACH - TALLAHASSEE - MOBILE

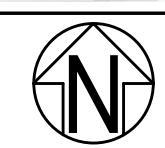
ENGINEERING BUSINESS: EB-0000340
ENGINEER'S PROJECT NO.: 27657.01

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LOCATION MAP
NOT TO SCALE



48 HOURS BEFORE YOU DIG
CALL SUNSHINE
1-800-432-4770
IT'S THE LAW IN FLORIDA
FL STATUTE 553.851 (1979) REQUIRES
MIN. OF 2 DAYS AND MAX. OF 5 DAYS
NOTICE BEFORE YOU EXCAVATE.

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RELEASED FOR CONSTRUCTION MARCH 20, 2023

UTILITY CONTACT INFORMATION	
UTILITY	CONTACT
WATER - CITY OF CALLAWAY	ZACH MILLER 850-871-1033
SEWER - CITY OF CALLAWAY	JOHN FRANKLIN 850-215-7232
	JEFFREY SMITH 850-770-8056
COMCAST	4001 W. 23RD ST, SUITE A, PANAMA CITY, FL 32405
	SANDRA PERRY 850-872-3315
GULF POWER	12425 HUTCHINSON BLVD, PANAMA CITY BEACH, FL 32407
AT&T DISTRIBUTION	AL RUDOLPH 850-436-1488
	MIKE MCQUIRE 850-914-6104
TECO	3706 W. 23RD ST., PANAMA CITY, FL 32405

LEGEND	
	CHAINLINK FENCE
	ALUMINUM HAND RAIL
	GUARD RAIL
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	RIGHT-OF-WAY
	OVERHEAD ELECTRIC
	FORCE MAIN
	WATER MAIN
	SANITARY SEWER MAIN
	TO BE REMOVED
	PROPOSED SPOT GRADE
	TO BE REMOVED
	BENCH MARK
	POWER POLE
	WATER METER
	SILT FENCE

GENERAL NOTES:

1. THE CONTRACTOR IS CAUTIONED TO VISIT THE SITE AND FAMILIARIZE HIMSELF WITH THE PROJECT PRIOR TO BIDDING.
2. B.M. DATUM IS 1988 NAVD.
3. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE EXACT LOCATIONS AND DEPTHS OF ALL UTILITIES INCLUDING, BUT NOT LIMITED TO, WATER LINES, FORCEMAINS, BURIED TELEPHONE LINES, BURIED ELECTRICAL LINES AND GAS MAINS PRIOR TO COMMENCEMENT OF CONSTRUCTION. CONTRACTOR IS TO COORDINATE WITH UTILITY COMPANIES FOR REMOVAL AND/OR RELOCATION OF EXISTING UTILITY POLES, AERIAL LINES, BURIED CABLE AND OTHER UTILITIES.
4. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONFLICTS BETWEEN CONTRACT DOCUMENTS AND EXISTING CONDITIONS. THESE DRAWINGS REPRESENT KNOWN STRUCTURES AND UTILITIES LOCATED IN THE PROJECT AREA. THE CONTRACTOR IS CAUTIONED THAT OTHER STRUCTURES AND UTILITIES, ABOVE OR BELOW GROUND, MAY BE ENCOUNTERED DURING THE COURSE OF THE PROJECT. THE CONTRACTOR SHOULD NOTIFY THE UTILITY, THEN THE ENGINEER, IMMEDIATELY UPON ENCOUNTERING ANY UNEXPECTED STRUCTURE, UTILITY LINE, OR OTHER UNUSUAL CONDITION.
5. CONTRACTOR SHALL SAFETY-BARRICADE ALL EXCAVATIONS AND OTHER HAZARDS.
6. CONTRACTOR SHALL PROVIDE ACCESS TO PROPERTIES ADJACENT TO THE CONSTRUCTION AREAS. ADEQUATE BARRICADES, CONSTRUCTION SIGNAGE AND OTHER TRAFFIC CONTROL DEVICES SHALL BE PROVIDED IN ACCORDANCE WITH FDOT CONSTRUCTION STANDARDS.
7. THE CONTRACTOR SHALL EMPLOY THE USE OF SILT FENCES, HAY BALES, DITCHES OR WHATEVER MEANS NECESSARY TO CONTROL EROSION AND SEDIMENTATION AT ALL TIMES. WATERS OF THE STATE, ADJACENT PROPERTIES, AND ANY NEW DRAINAGE CONSTRUCTION SHALL BE PROTECTED DURING THE CONSTRUCTION PERIOD. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND SHALL REMAIN UNTIL THE COMPLETION OF CONSTRUCTION AND ACCEPTANCE BY THE OWNER.
8. ADEQUATE PROVISIONS SHALL BE MADE FOR THE FLOW OF SEWERS, DRAINS, WATER COURSES AND OTHER UTILITIES ENCOUNTERED DURING CONSTRUCTION.
9. ALL PAVEMENT CUTS SHALL BE SAW CUT.
10. ALL NEW CONCRETE FOR SITE WORK SHALL ACHIEVE A 28 DAY STRENGTH OF 3000 PSI (MIN.), UNLESS OTHERWISE SPECIFIED.
11. ALL ON-SITE GRADING, DRAINAGE AND PAVEMENT WORK SHALL BE IN ACCORDANCE WITH FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DUST CONTROL.
13. THE CONTRACTOR SHALL RESTORE ALL DISTURBED RIGHTS-OF-WAY IN ACCORDANCE WITH THE EDITION OF THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.
14. THE CONTRACTOR SHALL HIRE A SURVEYOR LICENSED IN THE STATE OF FLORIDA IN ACCORDANCE WITH SECTION 12.0 OF THE GENERAL CONDITIONS.
15. THE CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL LAWS.
16. CONTRACTOR SHALL COMPLY FULLY WITH ALL PERMIT REQUIREMENTS IMPOSED BY THE REGULATORY AUTHORITIES.
17. NOTIFY SUNSHINE UTILITIES TWO FULL BUSINESS DAYS IN ADVANCE PRIOR TO DIGGING WITHIN THE RIGHT-OF-WAY; 1-800-432-4770. CONTRACTOR SHALL VERIFY DEPTH AND LOCATION AND IMMEDIATELY NOTIFY ENGINEER OF CONFLICTS.
18. THE CONTRACTOR SHALL NOTIFY THE CITY OF CALLAWAY 48 HOURS PRIOR TO INITIATING ANY WORK IN THE CITY OF CALLAWAY RIGHTS-OF-WAY.
19. TYPE B STABILIZATION IS INCIDENTAL TO EARTHWORK.
20. ALL PIPE JOINTS, INCLUDING CONNECTIONS TO STRUCTURES, SHALL BE WRAPPED WITH FILTER FABRIC IN ACCORDANCE WITH FDOT DESIGN STANDARDS AND THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

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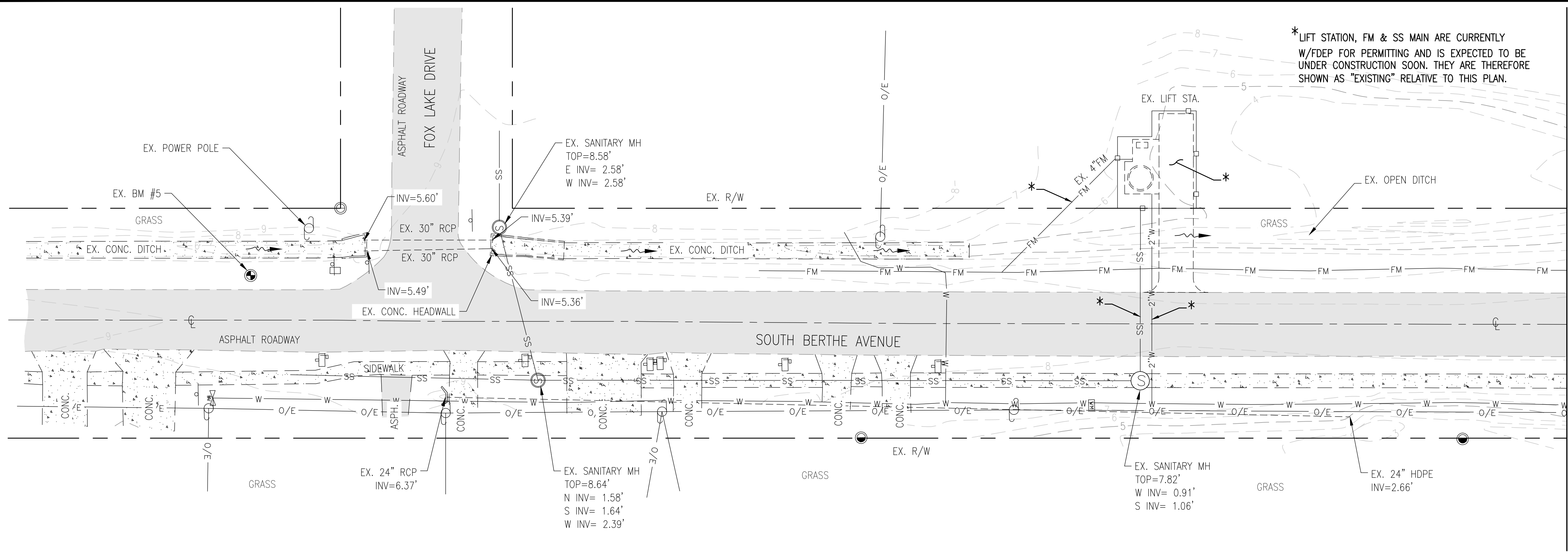
**SOUTH BERTHE AVENUE
 DITCH PIPING**

PROJECT NO.	DESIGNED BY	DRAWN BY	CHK'D BY	PROJ. MGR.	DATE	NO.	DATE	APPR.	REVISION/ACTION TAKEN
27657.01	JCP	RCG	GDM	JCP	MAY 2021				

**GENERAL NOTES
 AND LEGEND**

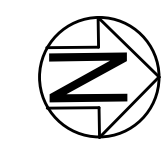
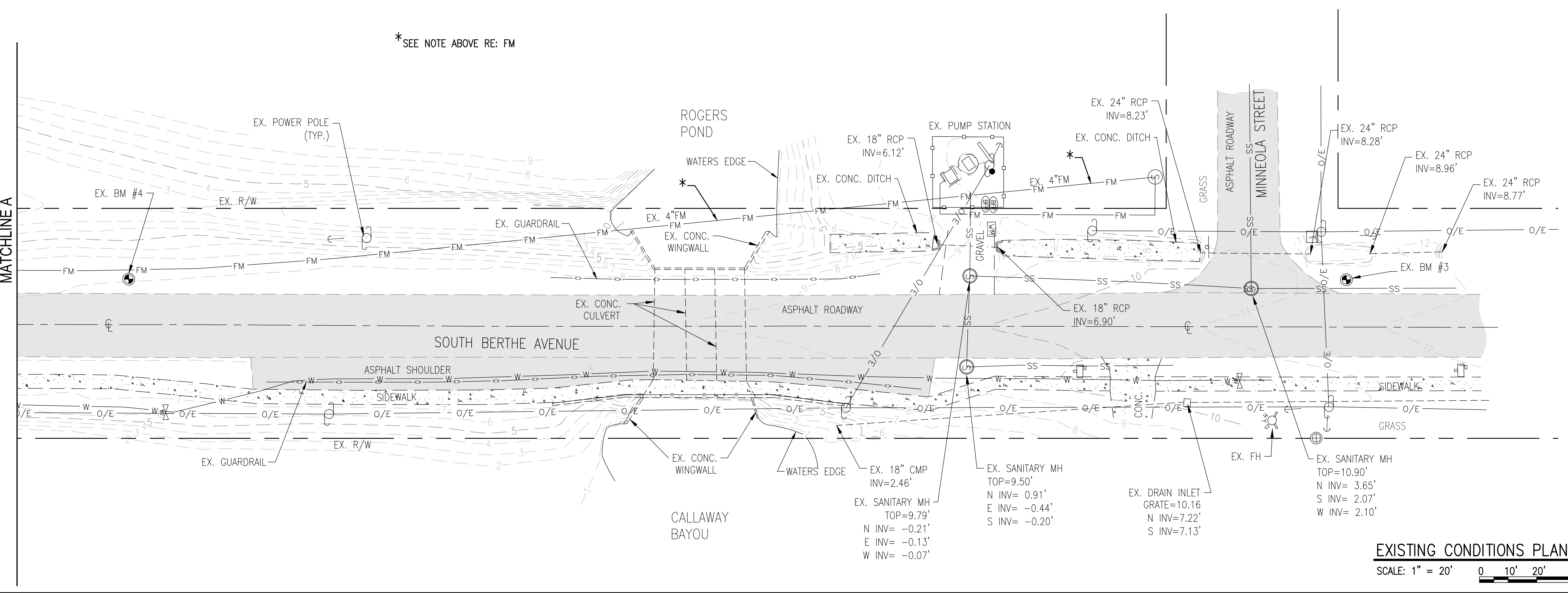
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MATCHLINE A

*LIFT STATION, FM & SS MAIN ARE CURRENTLY W/FDEP FOR PERMITTING AND IS EXPECTED TO BE UNDER CONSTRUCTION SOON. THEY ARE THEREFORE SHOWN AS "EXISTING" RELATIVE TO THIS PLAN.



*SEE NOTE ABOVE RE: FM

EXISTING CONDITIONS PLAN

SCALE: 1" = 20' 0 10' 20' 40'

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LETTY C. PETERMAN, P.E.
 FL Reg. Engineer #77540

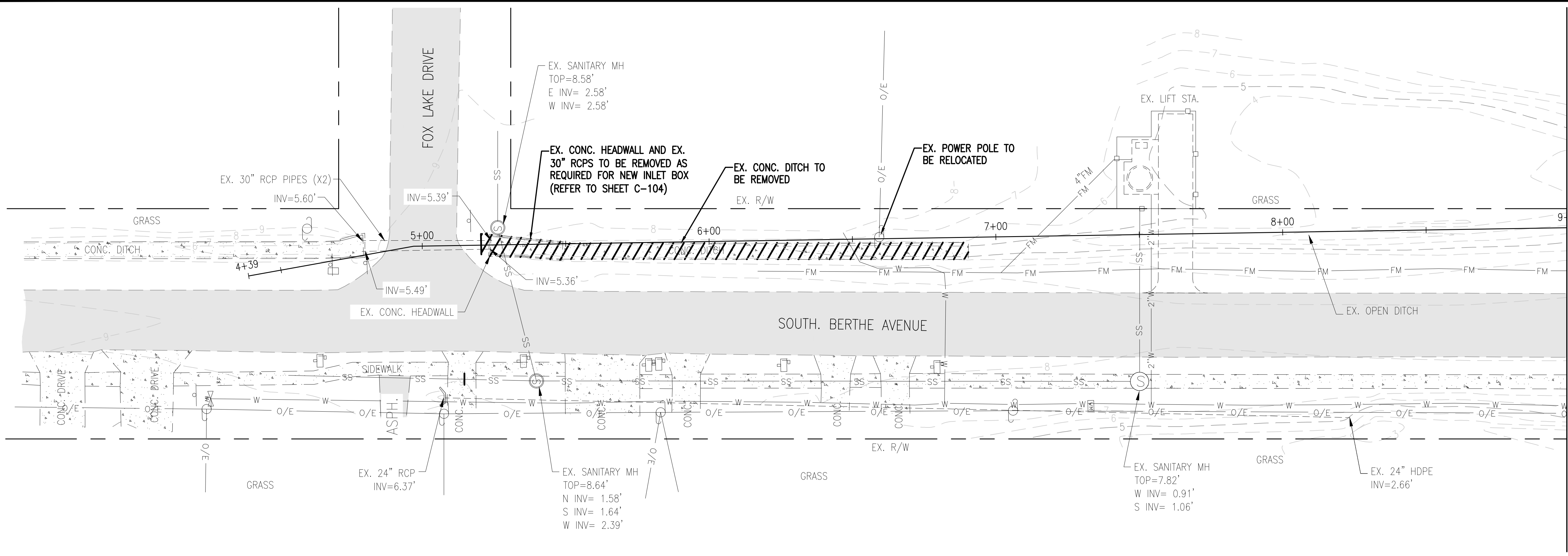
**SOUTH BERTHE AVENUE
 DITCH PIPING**

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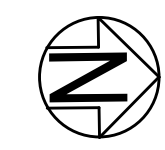
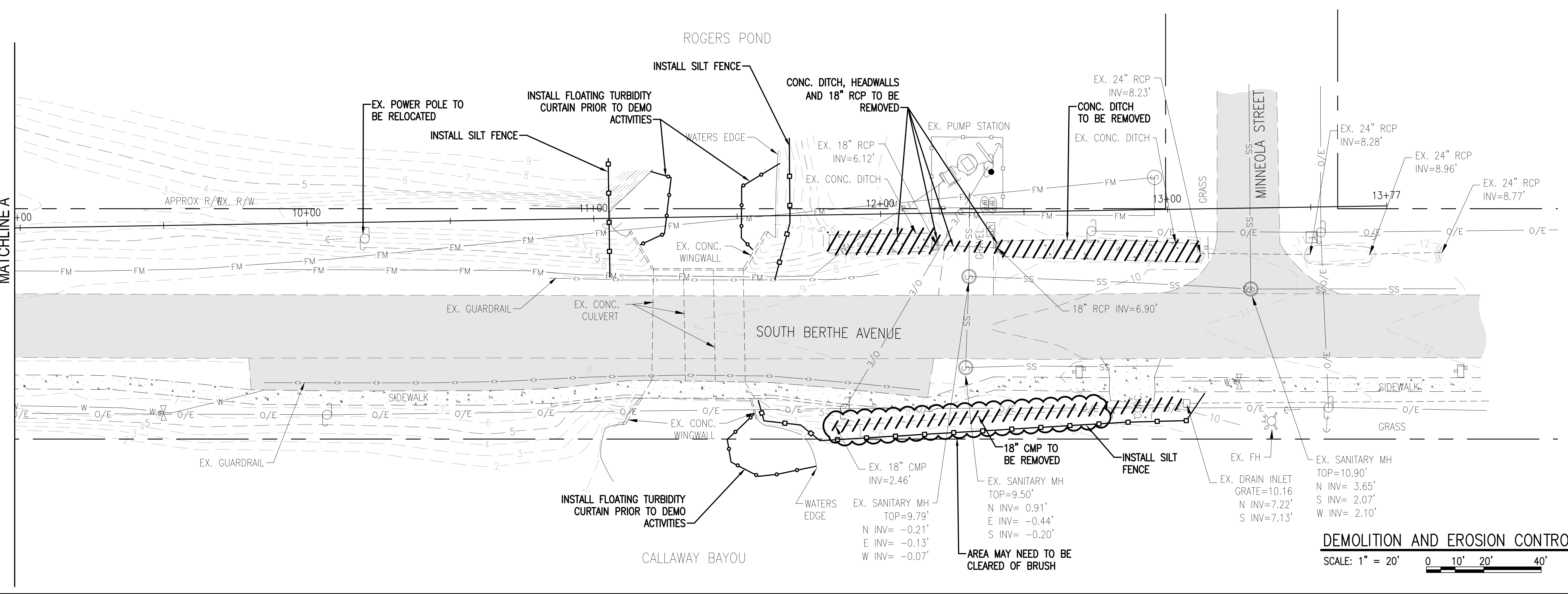
PROJECT NO: 27657.01
 DESIGNED BY: JCP
 DRAWN BY: RCG
 CHK'D BY: GDM
 PROJ. MGR: JCP
 DATE: MAY 2021
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**EXISTING CONDITIONS
 PLAN**

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MATCHLINE A



DEMOLITION AND EROSION CONTROL PLAN

SCALE: 1" = 20' 0 10' 20' 40'

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**SOUTH BERTHE AVENUE
 DITCH PIPING**

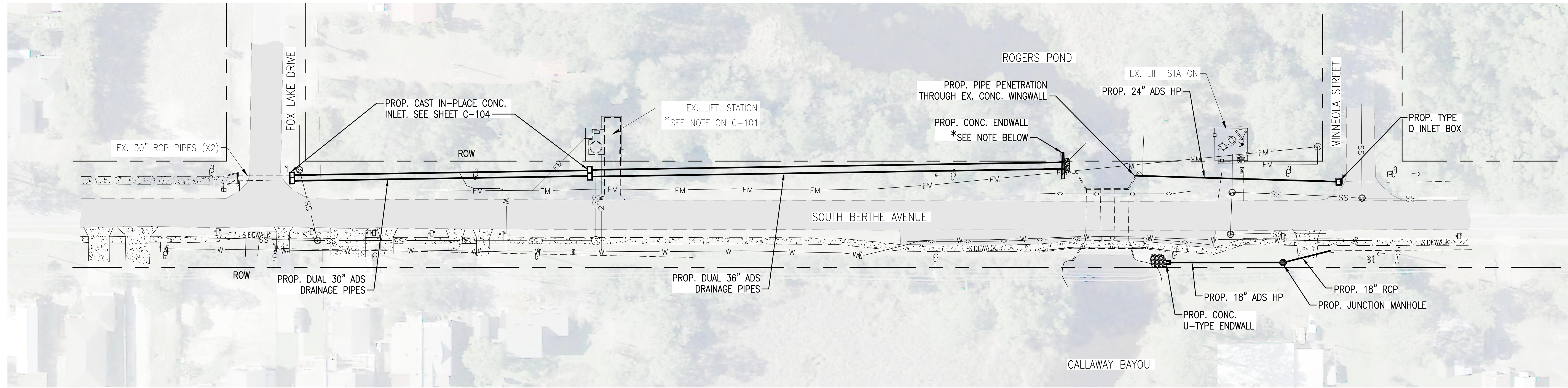
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**DEMOLITION AND
 EROSION CONTROL PLAN**

C-101

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OVERALL PLAN

SCALE: 1" = 40' 0 20' 40' 80'



***NOTE:**

THE CITY OF CALLAWAY IS CURRENTLY IN NEGOTIATIONS W/THE STATE TO OBTAIN OWNERSHIP OF THE LAND SURROUNDING ROGERS POND (WEST OF ESTABLISHED R.O.W. SHOWN). THE CITY HAS ALSO RECEIVED A LETTER FROM FDEP STATING THAT THE CITY HAS APPROVAL TO CONSTRUCT IMPROVEMENTS TO THE WATERLINE OF ROGERS POND (PERMITTING REGULATIONS STILL APPLY).

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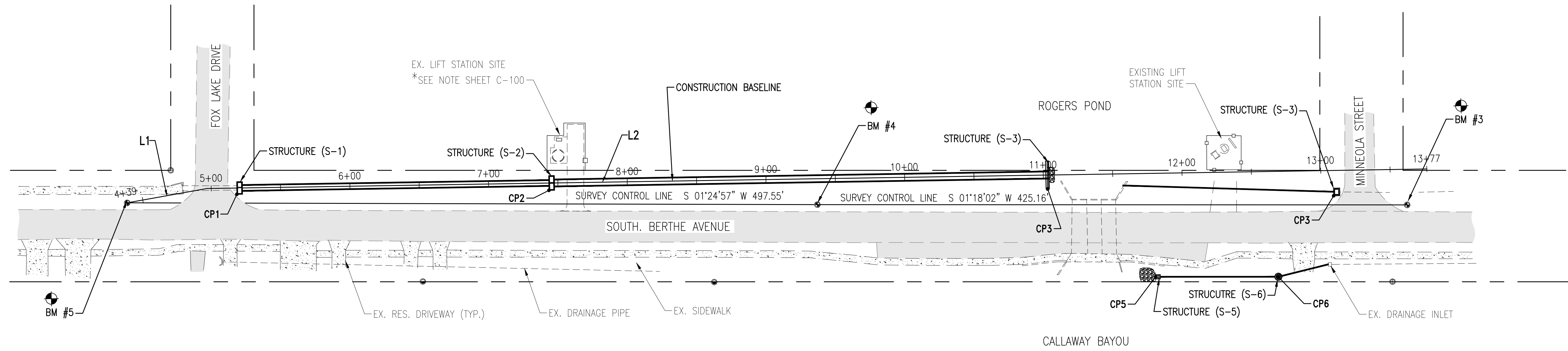
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PROJ. MGR: JCP				
DATE: MAY 2021				

**OVERALL PROJECT
 LAYOUT**

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CONTROL PLAN
 SCALE: 1" = 40' 0 20' 40' 80'

CONTROL COORDINATE TABLE			
CONTROL POINT	DESCRIPTION	STATION	OFFSET
CP1	SOUTH EAST CORNER OF STRUCTURE (S-1)	5+18.52	4.50' RT
CP2	SOUTH EAST CORNER OF STRUCTURE (S-2)	7+43.49	5.25' RT
CP3	SOUTH EAST CORNER OF STRUCTURE (S-3)	11+02.99	10.0' RT
CP4	SOUTH EAST CORNER OF STRUCTURE (S-4)	13+09.059	18.23' RT
CP5	END INV. OF STRUCTURE (S-5)	11+79.80	74.52' RT
CP6	CENTER OF MH STRUCTURE (S-6)	12+68.18	75.985' RT

LINE TABLE		
LINE #	DISTANCE	BEARING
L1	58.45'	N8° 56' 03.69"W
L2	879.51'	N0° 21' 07.26"E

BENCH MARK DATA

BM #3
 STA 13+61.88, OFF 25.71' RT
 SET CAPPED IRON ROD No. 0304
 ELEVATION = 11.42

BM #4
 STA 9+36.78, OFF 18+67' RT
 SET CAPPED IRON ROD No. 0304
 ELEVATION = 7.83

BM #5
 STA 4+39.00, OFF 0.00
 SET CAPPED IRON ROD NO. 0304
 ELEVATION = 8.85

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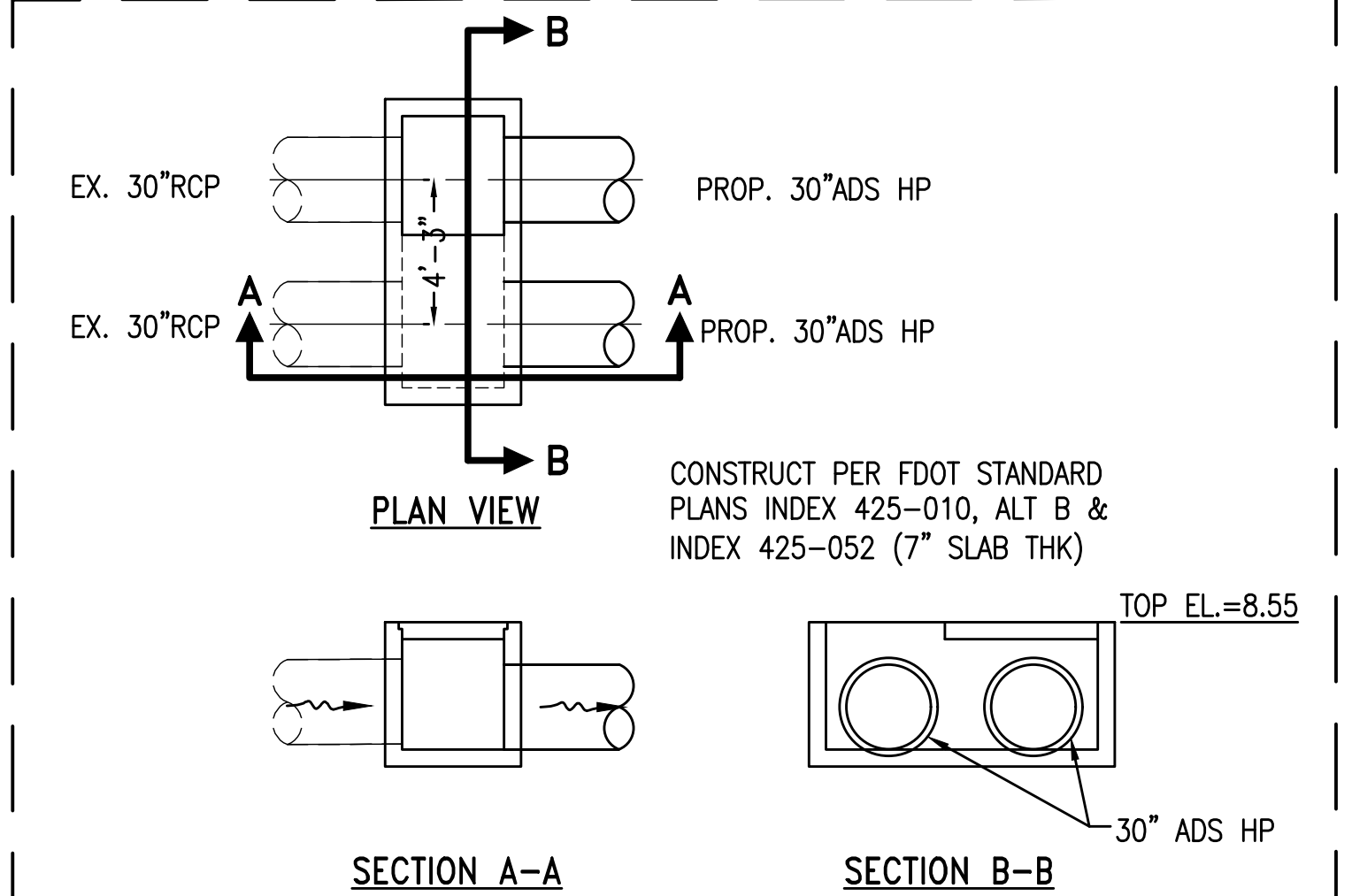
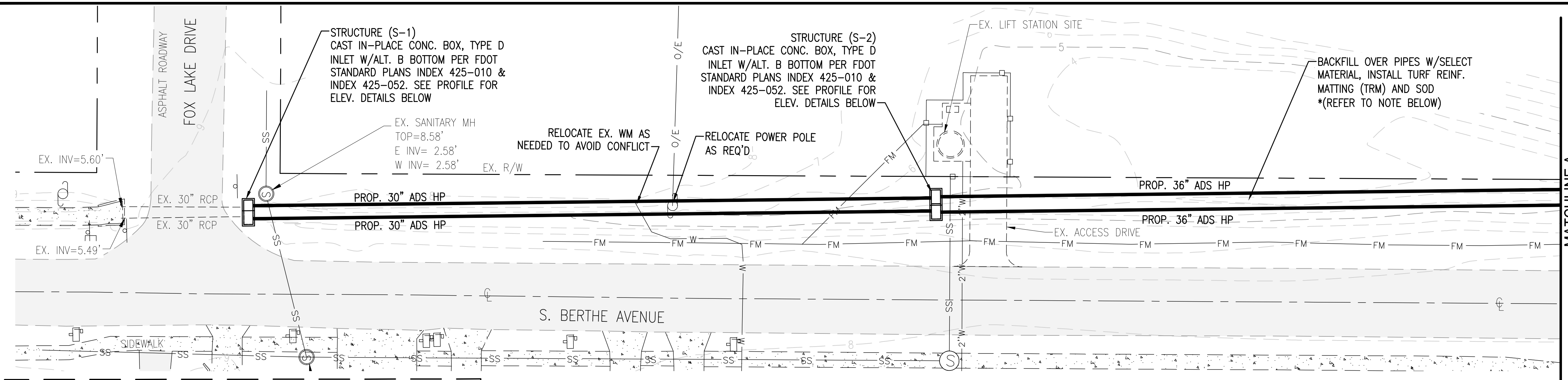
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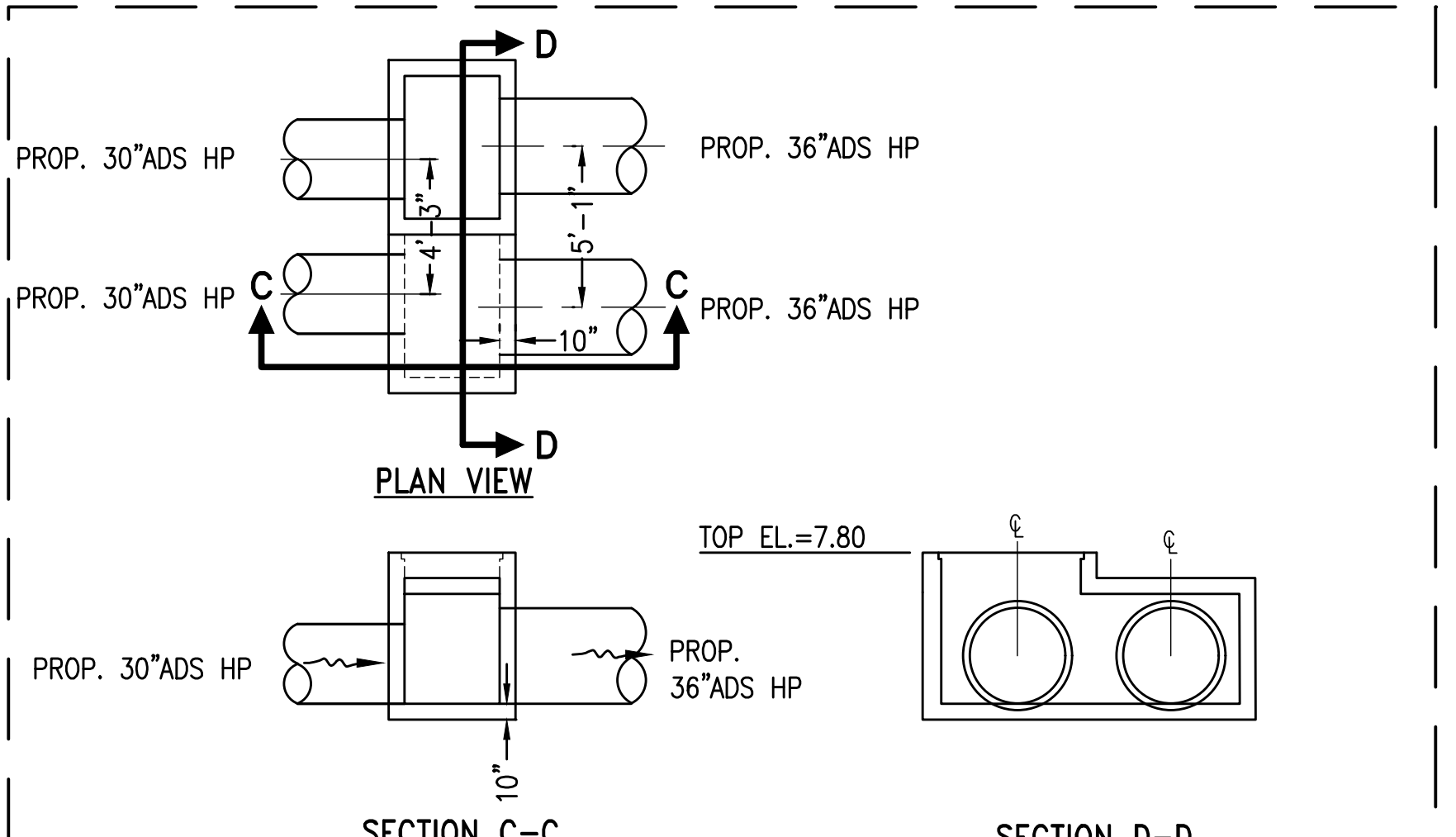
**HORIZONTAL
 CONTROL PLAN**

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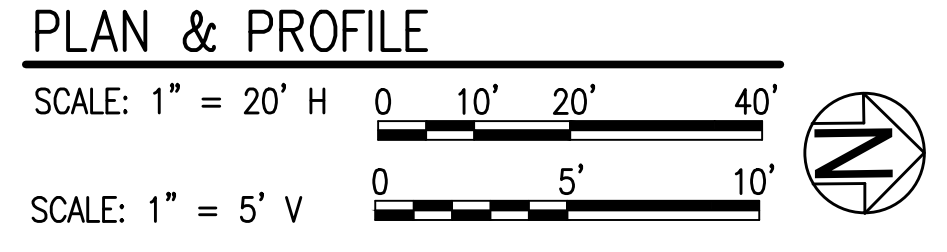
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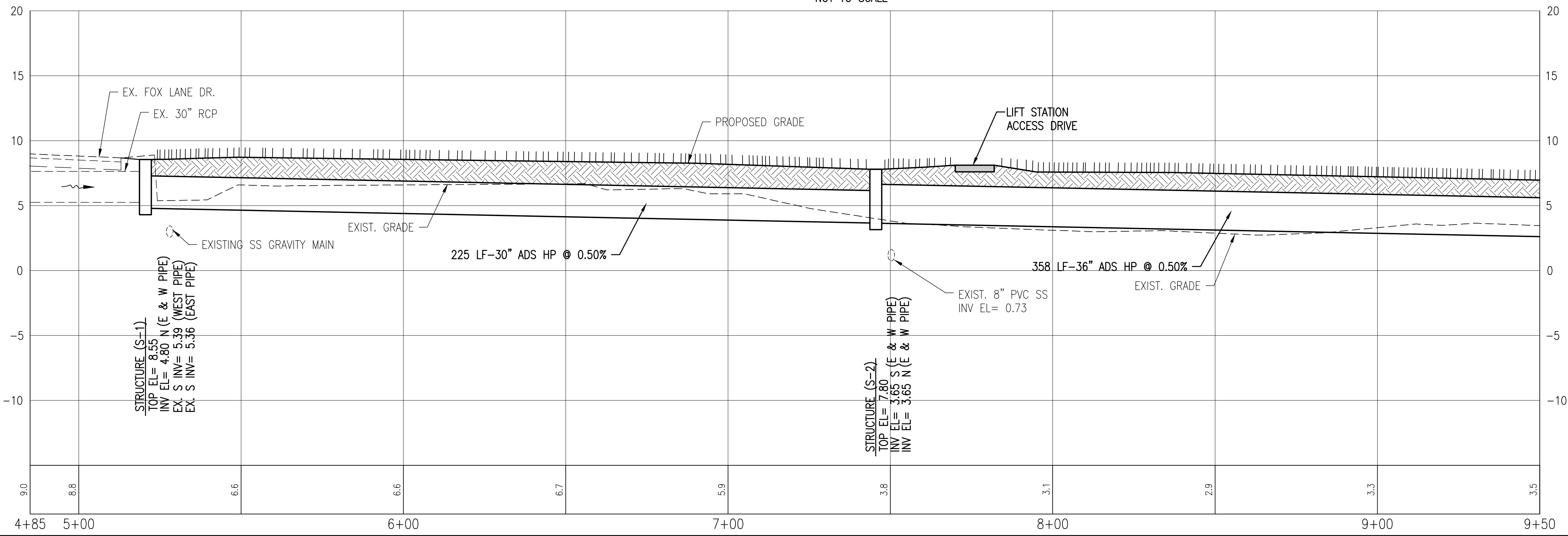
STRUCTURE (S-1) DETAILS
NOT TO SCALE



STRUCTURE (S-2) DETAILS
NOT TO SCALE



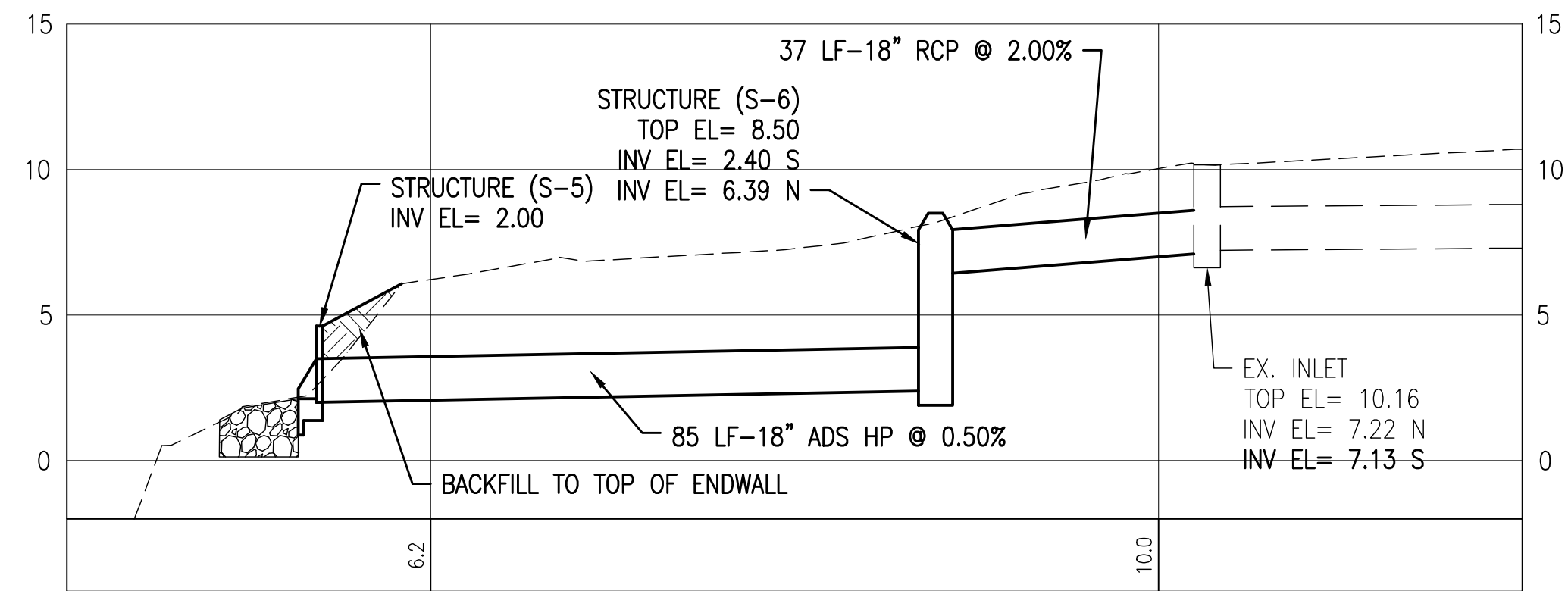
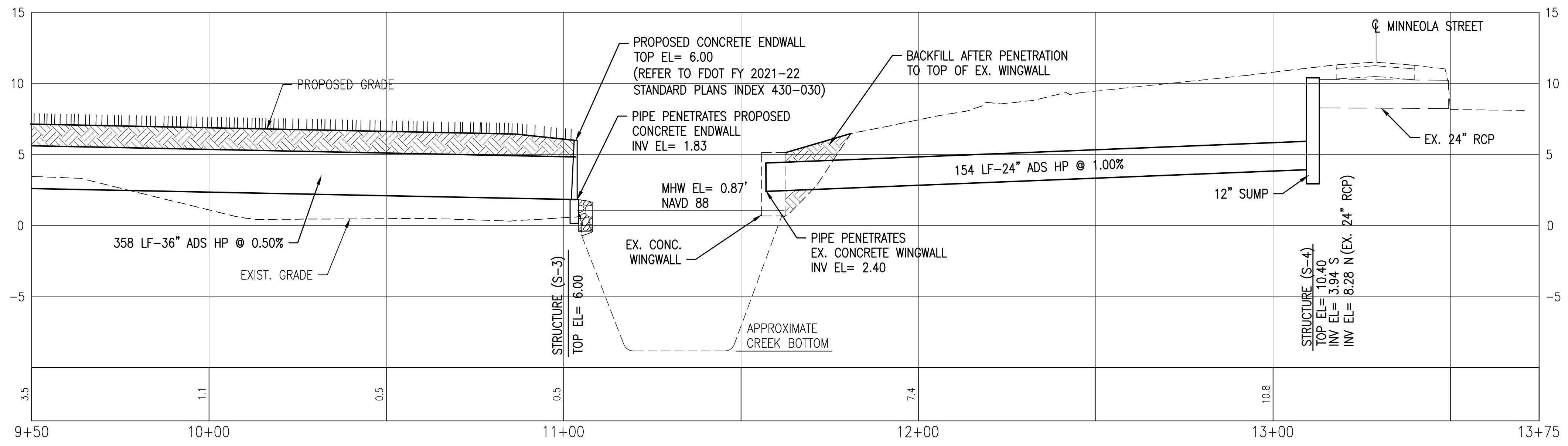
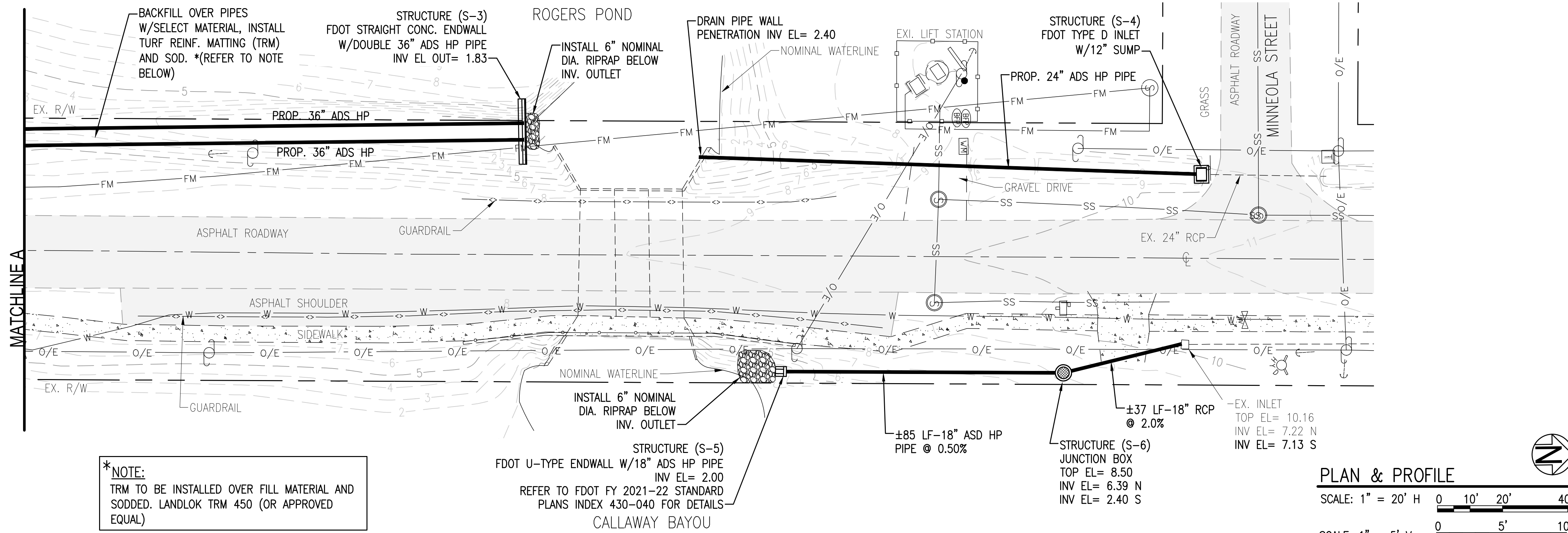
*NOTE:
TRM TO BE INSTALLED OVER FILL MATERIAL AND
SODDED. LANDLOK TRM 450 (OR APPROVED
EQUAL)



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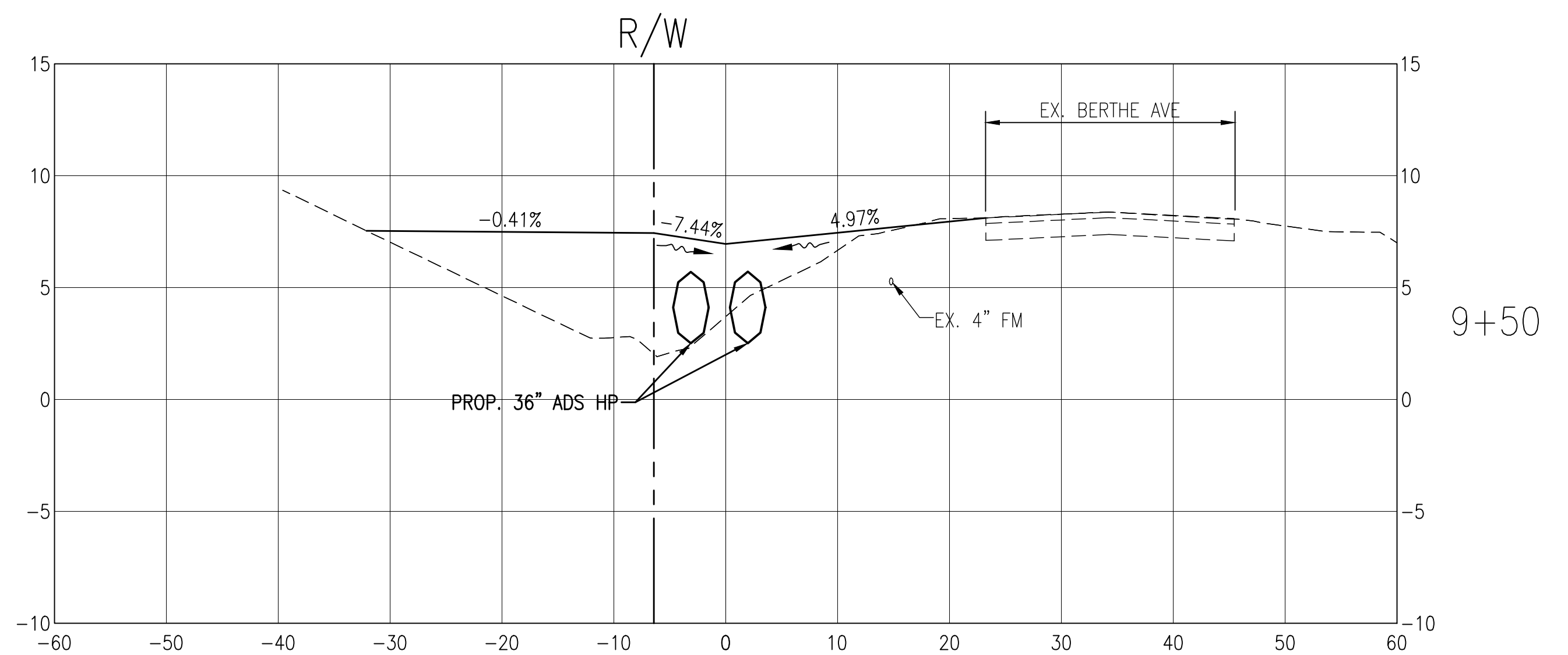
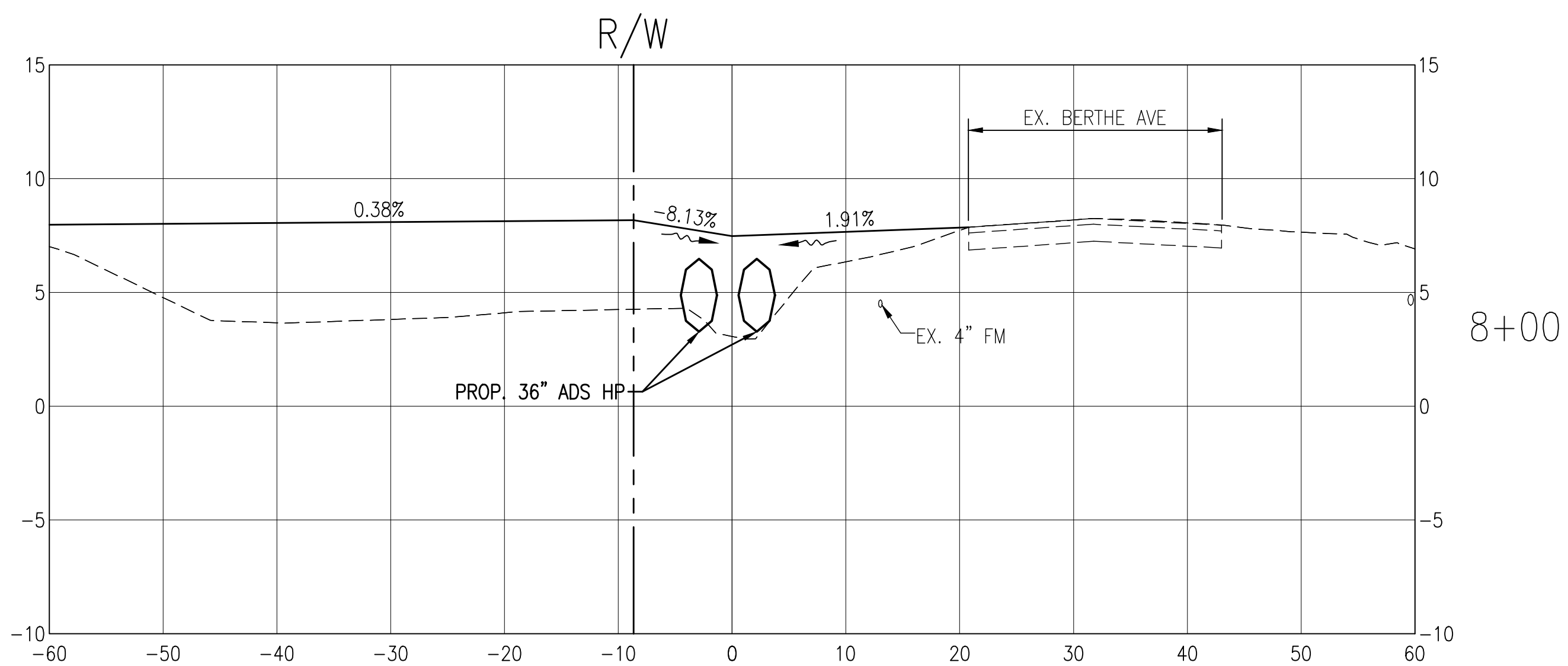
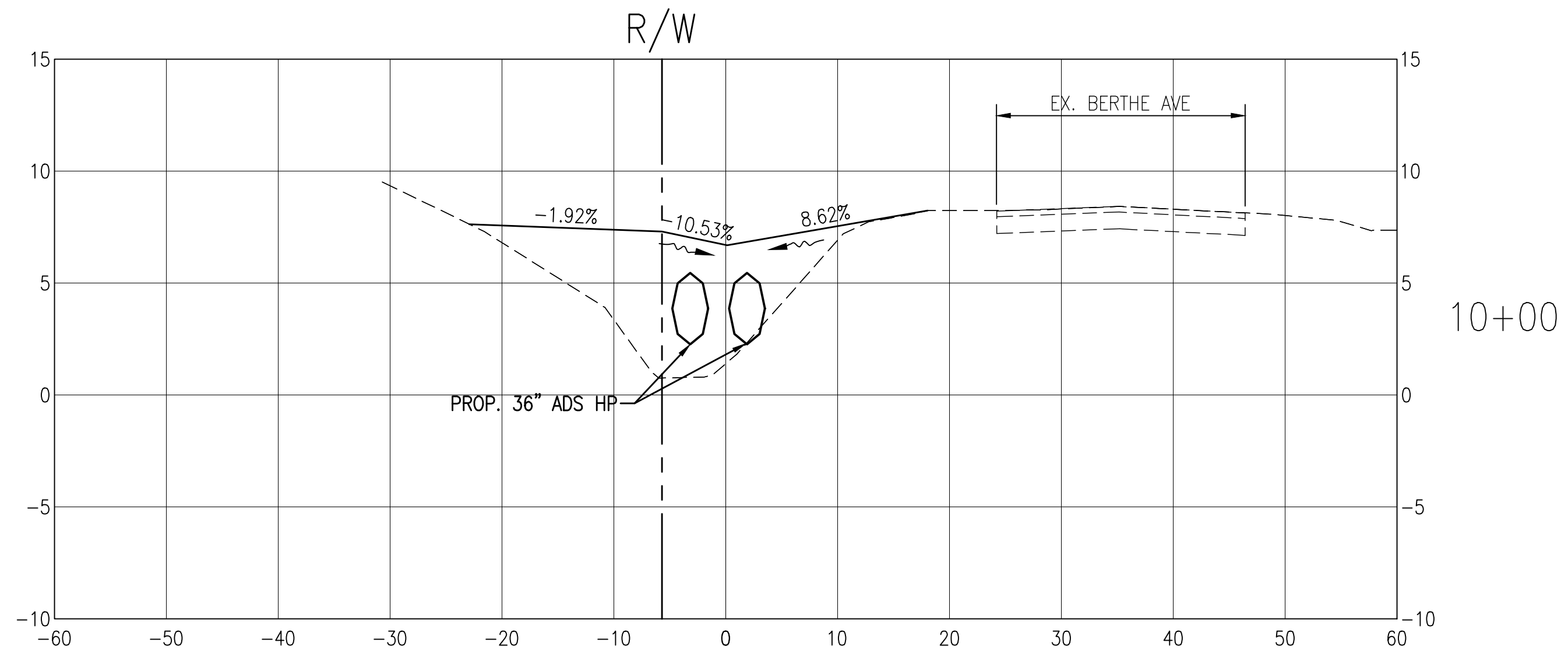
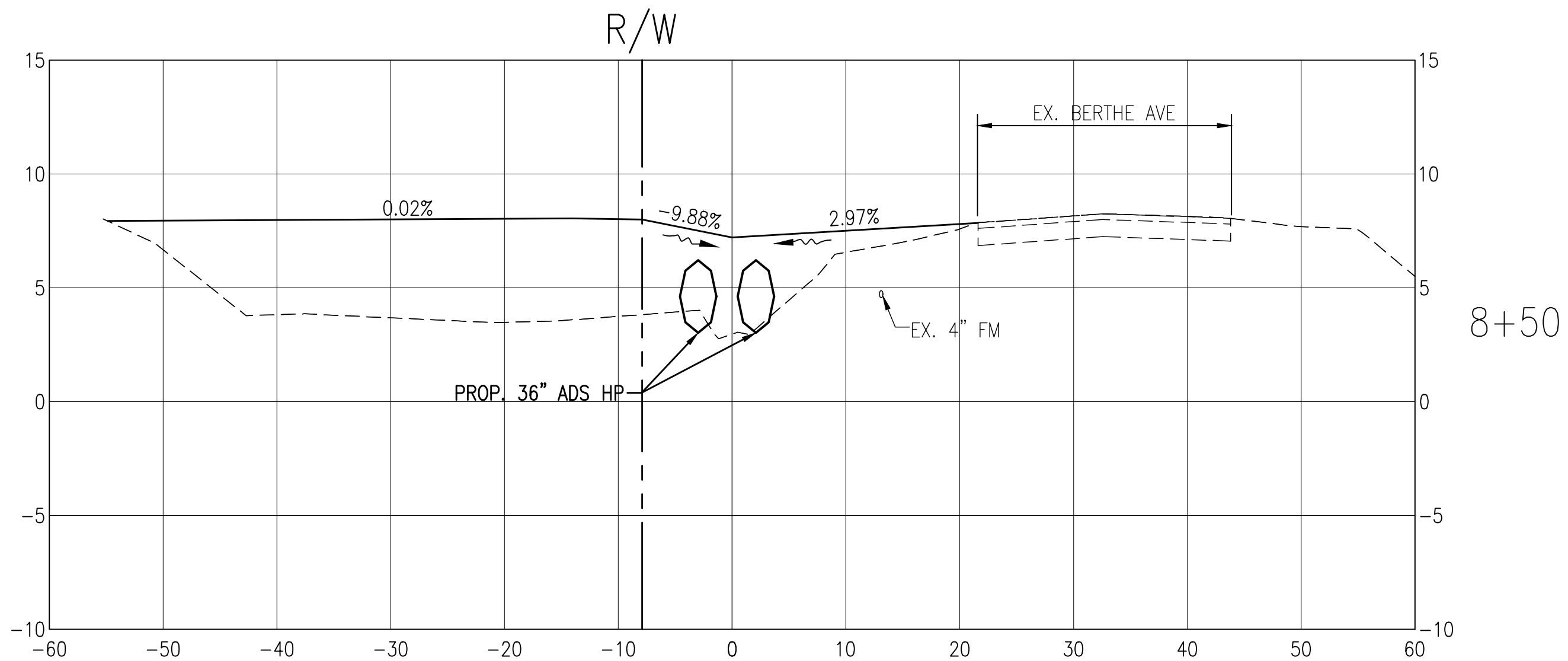
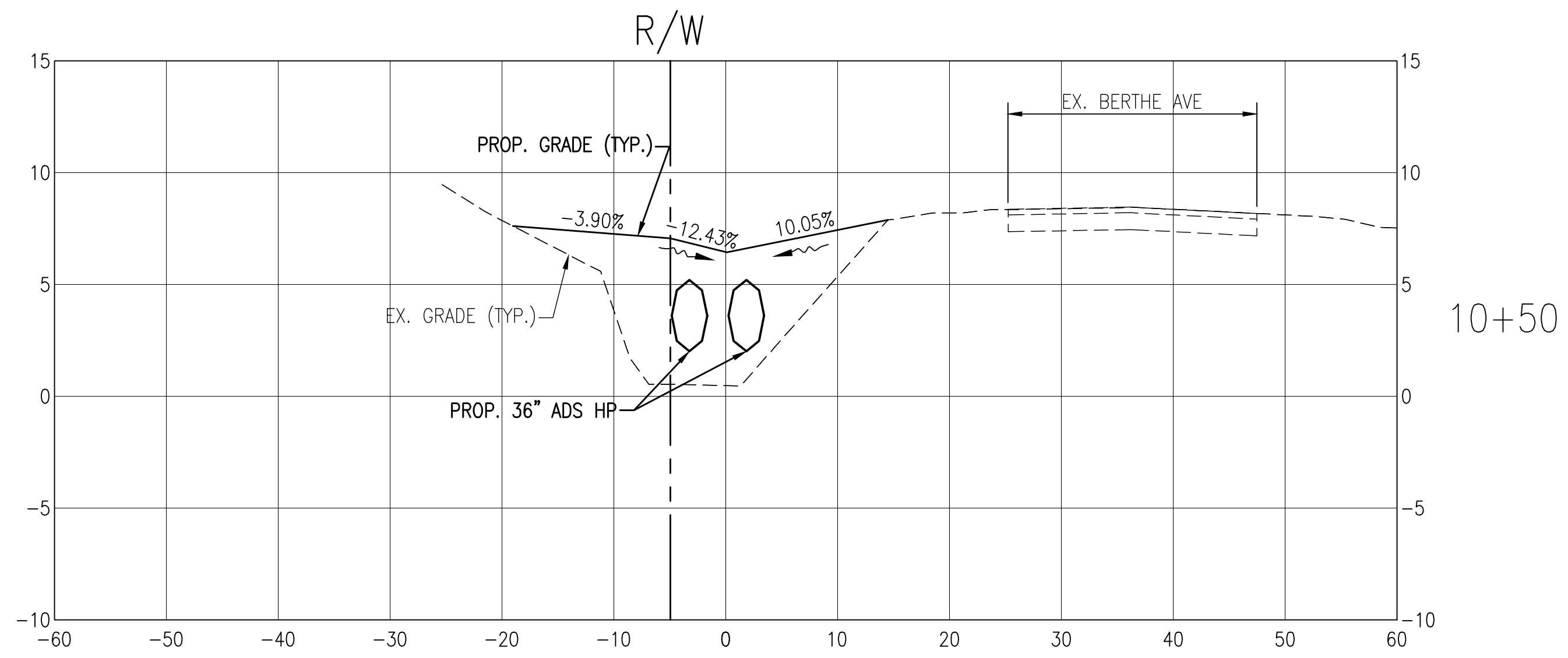
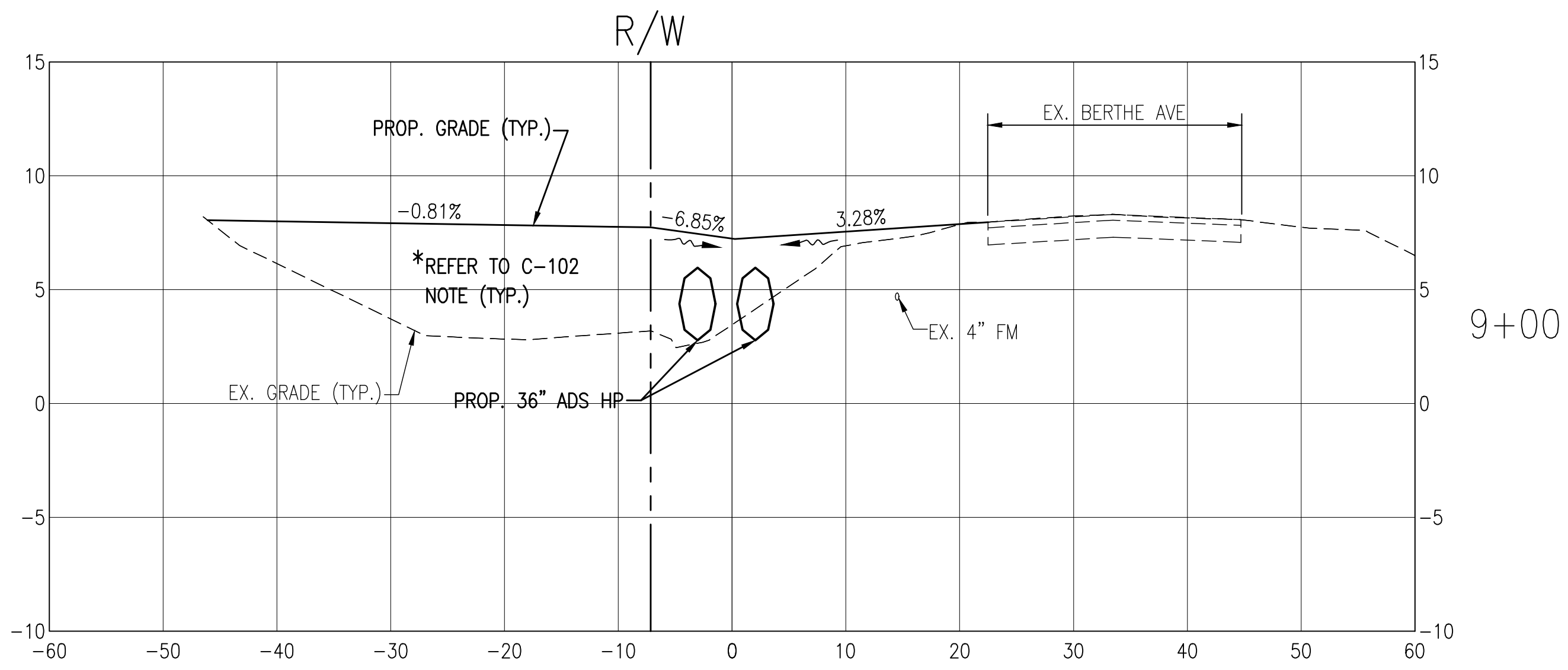
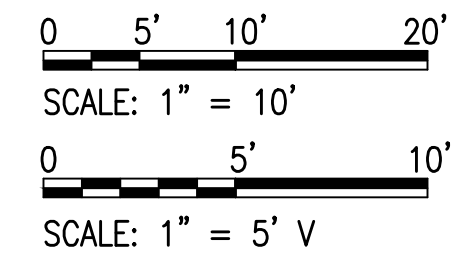
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**SOUTH BERTHE AVENUE
DITCH PIPING**

**DITCH PIPING
PLAN & PROFILE**

C-105

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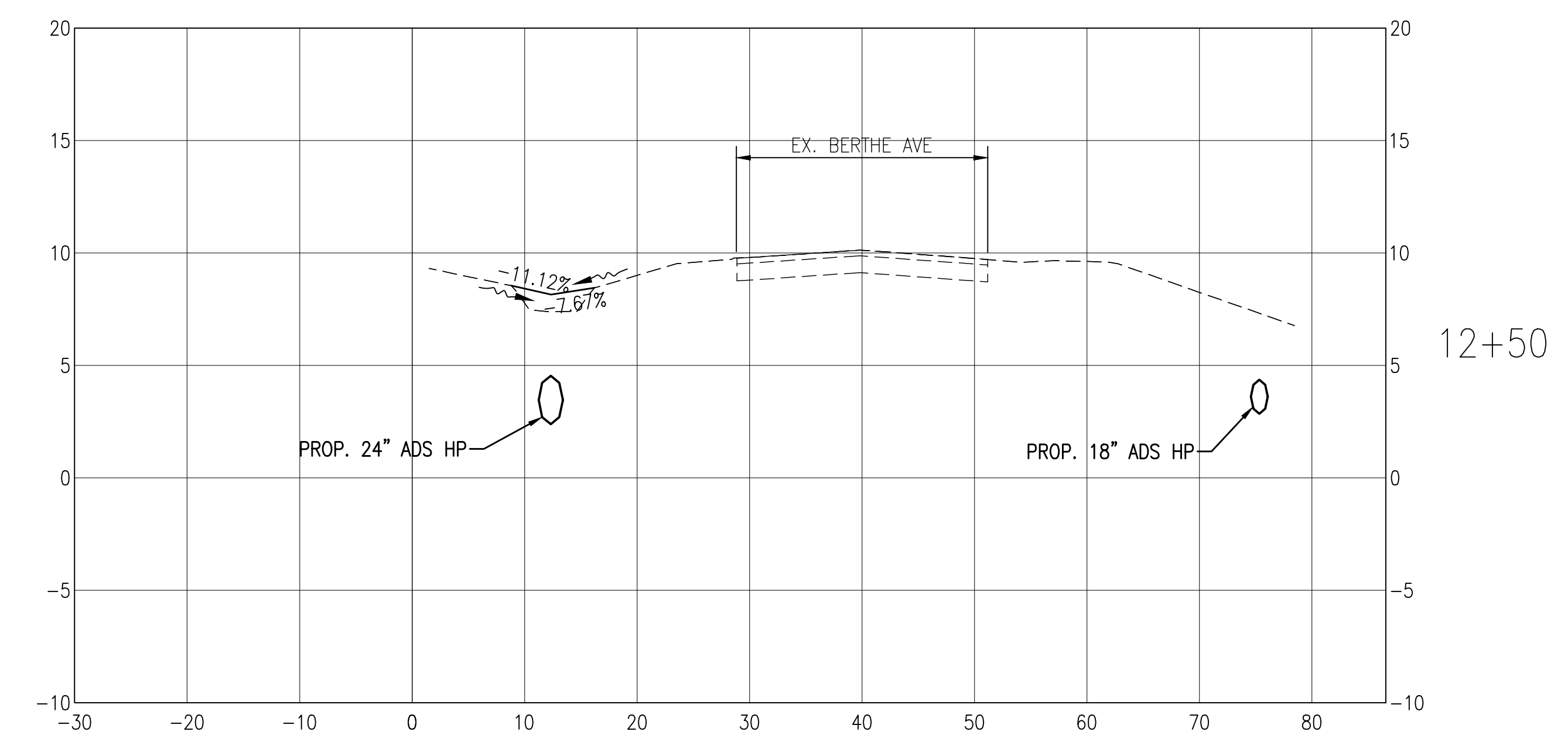
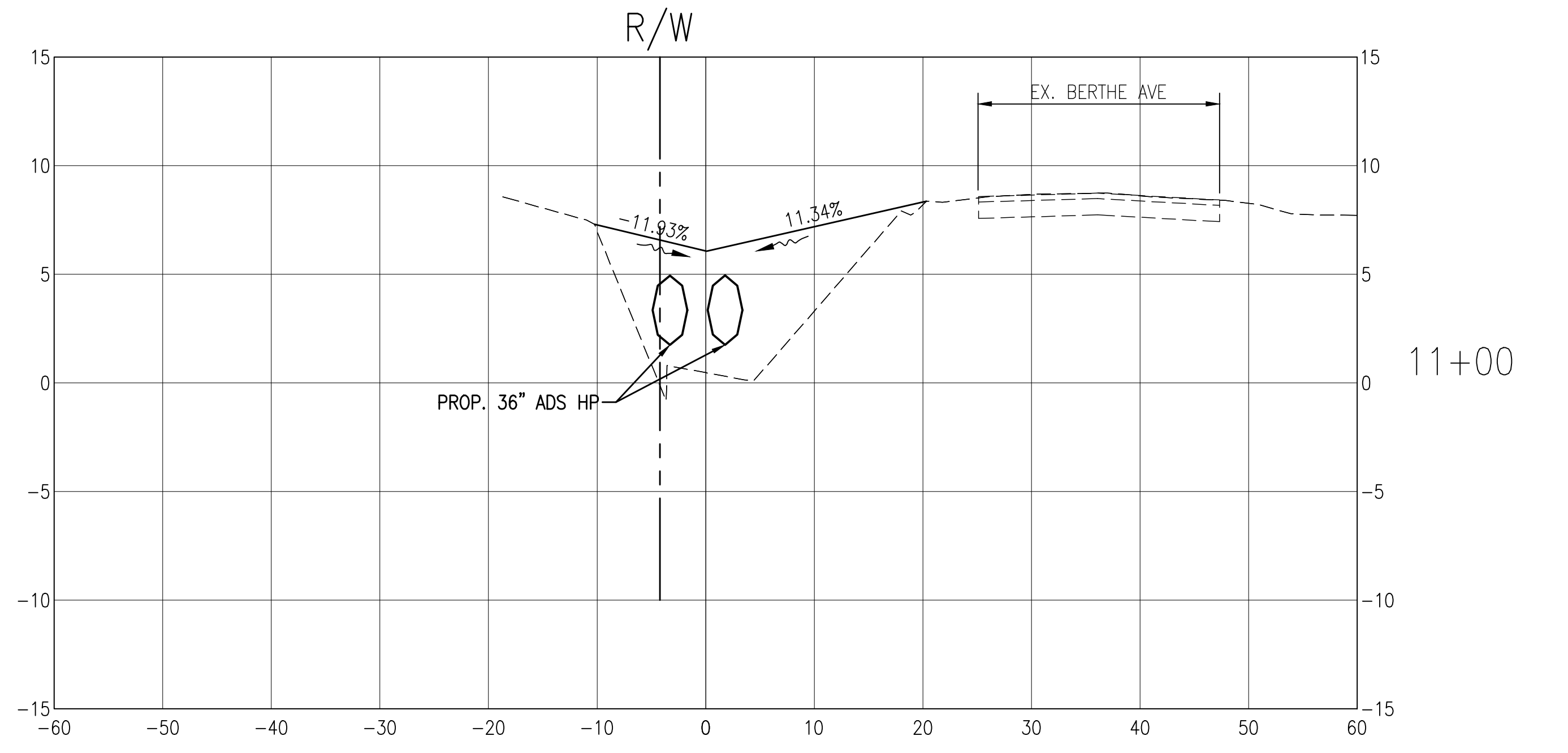
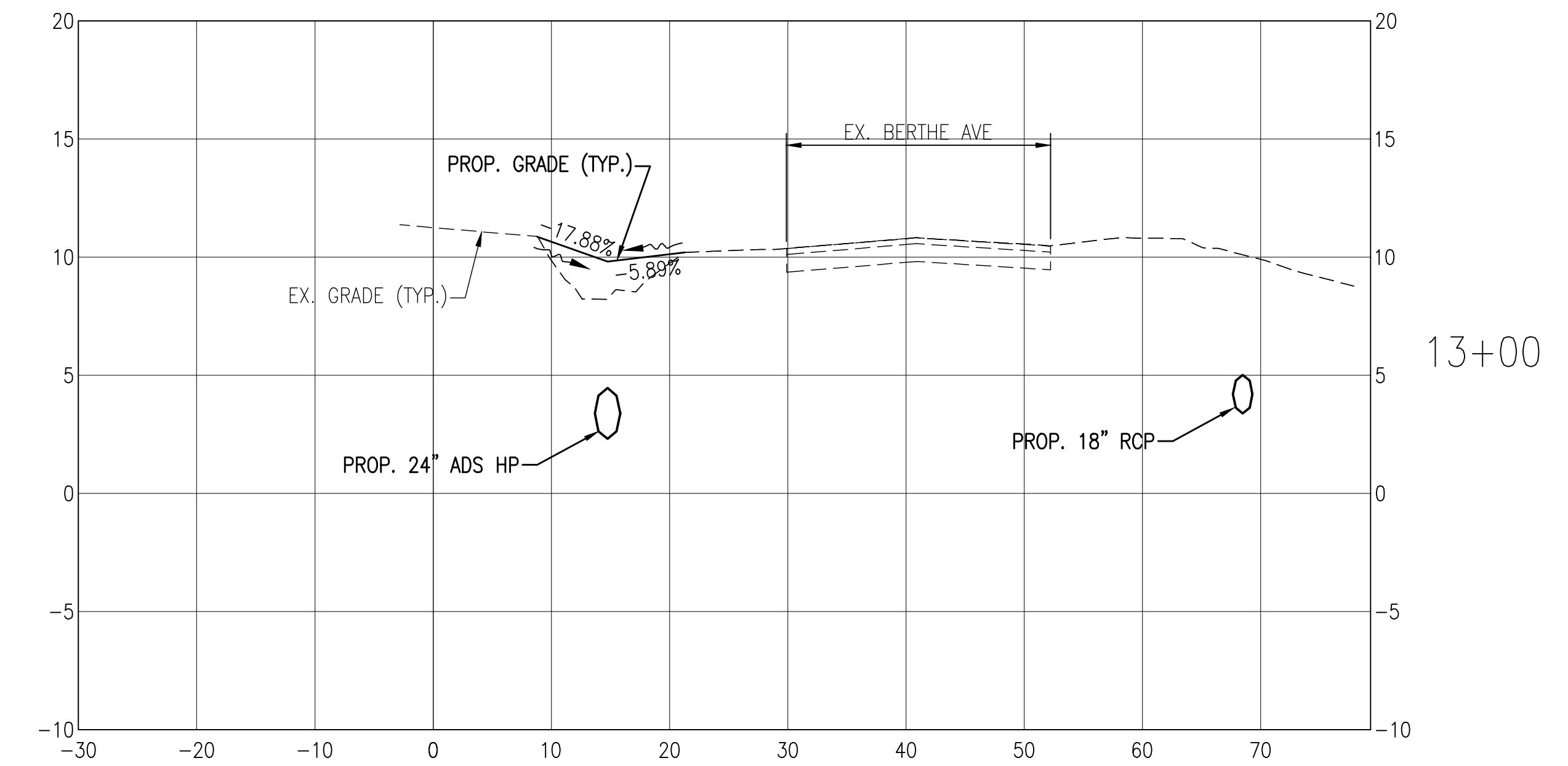
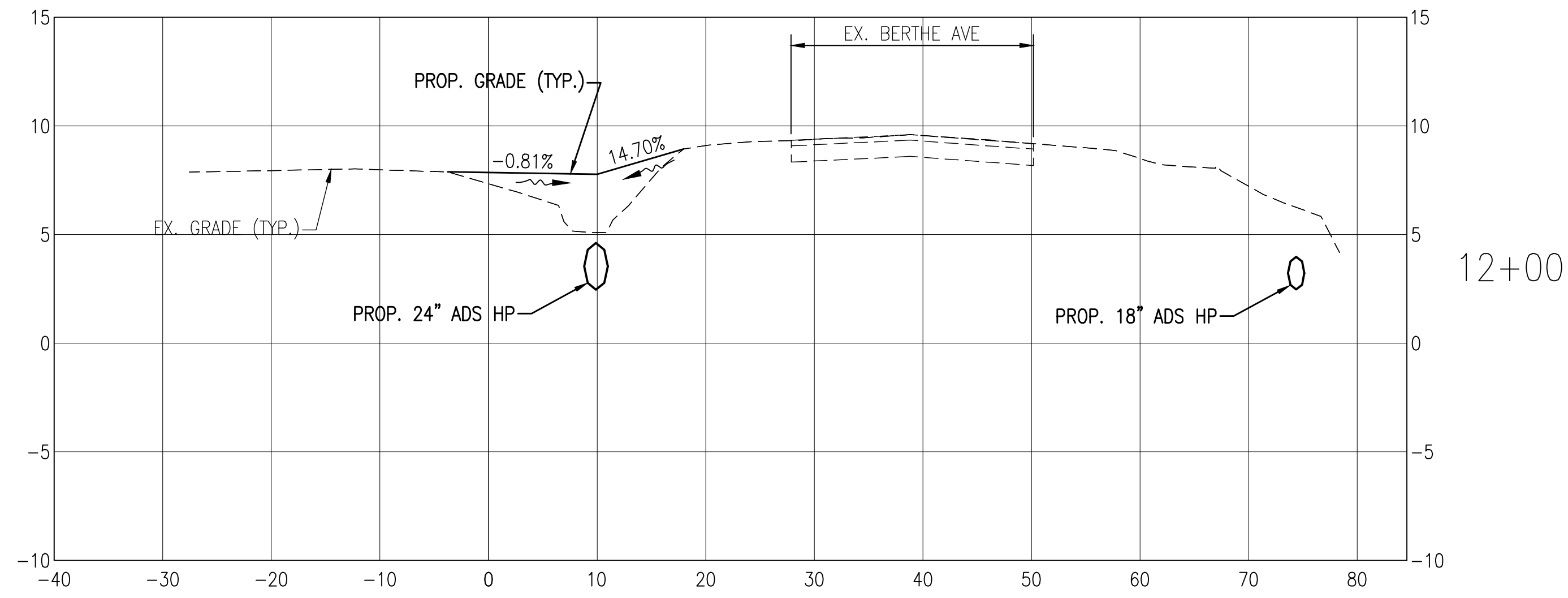
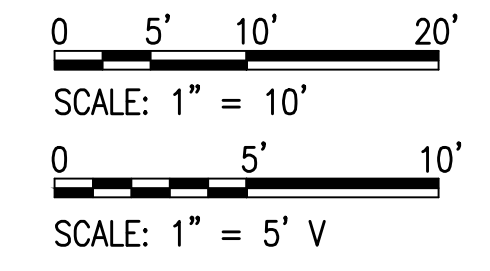
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CROSS-SECTIONS

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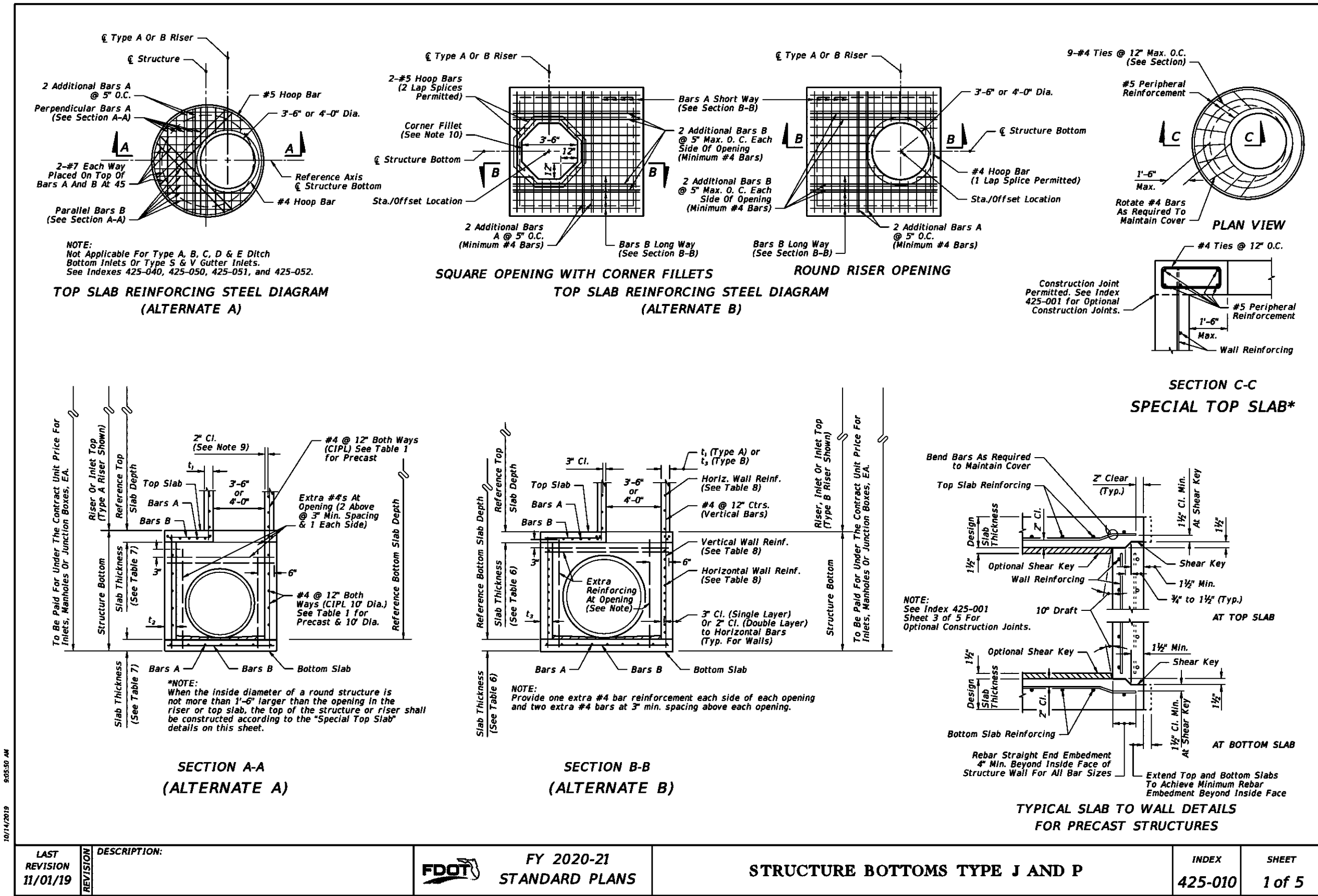
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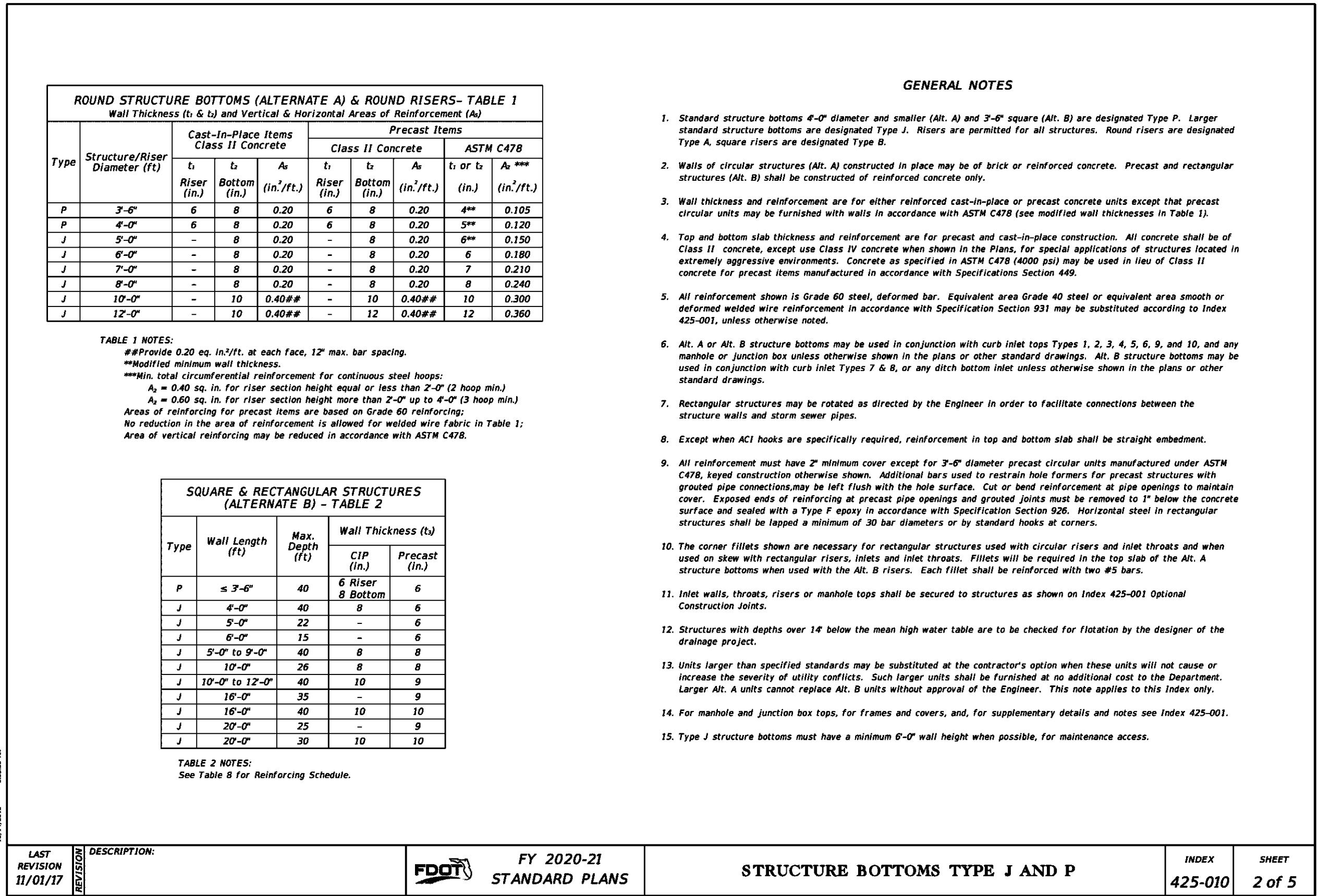
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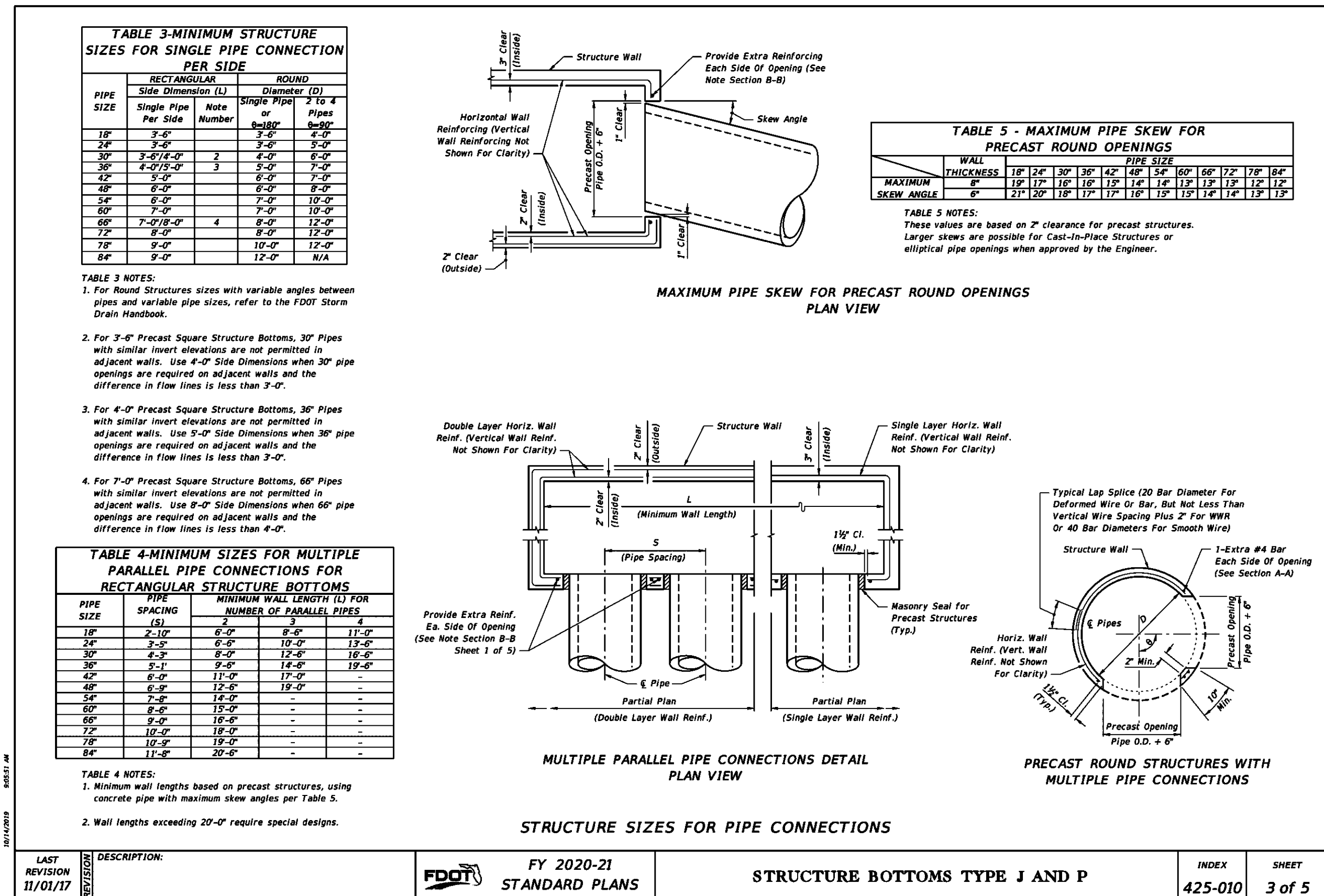
CROSS-SECTIONS



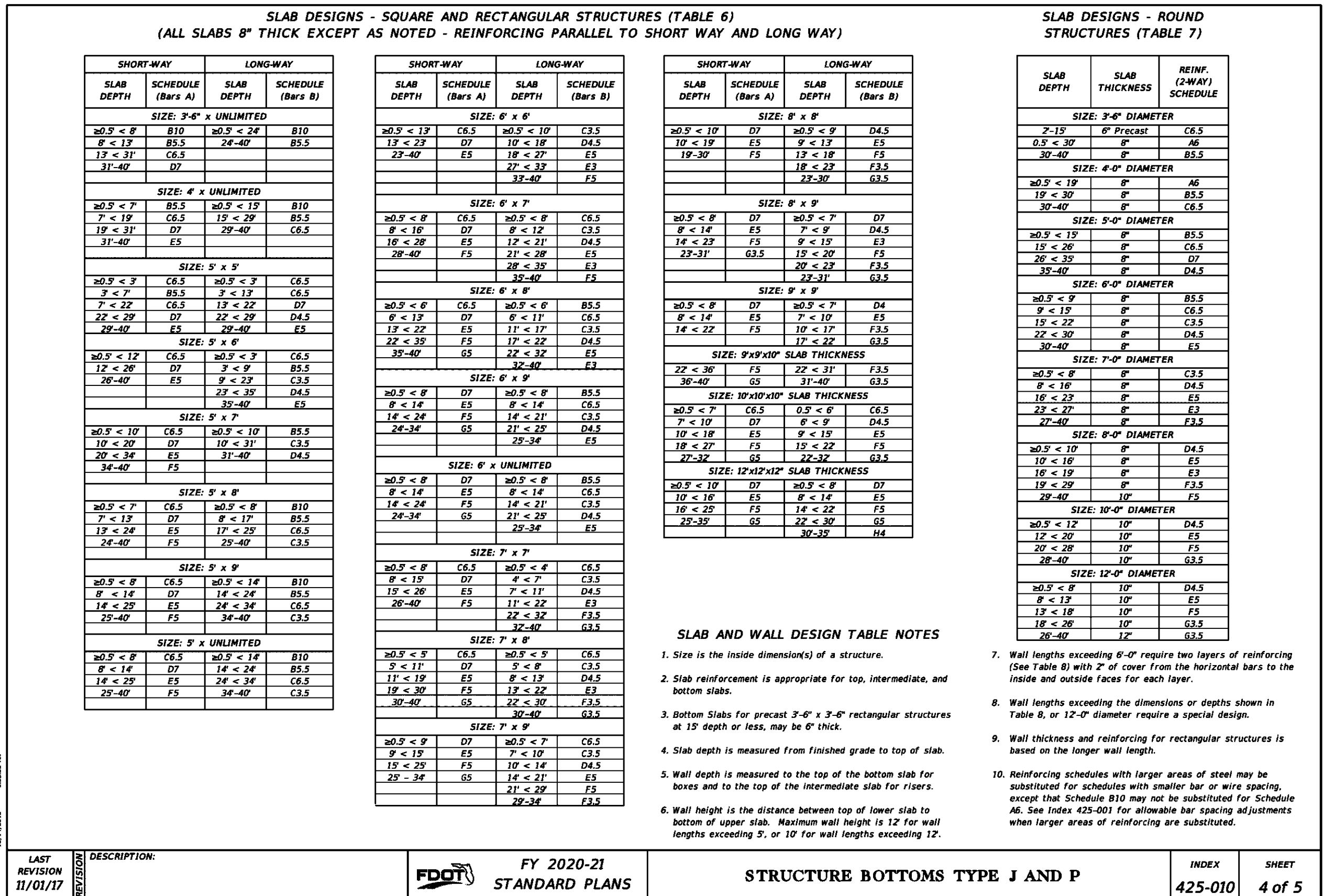
LAST REVISION 11/01/17	DESCRIPTION:	FY 2020-21 STANDARD PLANS	STRUCTURE BOTTOMS TYPE J AND P	INDEX 425-010	SHEET 1 of 5
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LAST REVISION 11/01/17	DESCRIPTION:	FY 2020-21 STANDARD PLANS	STRUCTURE BOTTOMS TYPE J AND P	INDEX 425-010	SHEET 2 of 5
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LAST REVISION 11/01/17	DESCRIPTION:	FY 2020-21 STANDARD PLANS	STRUCTURE BOTTOMS TYPE J AND P	INDEX 425-010	SHEET 3 of 5
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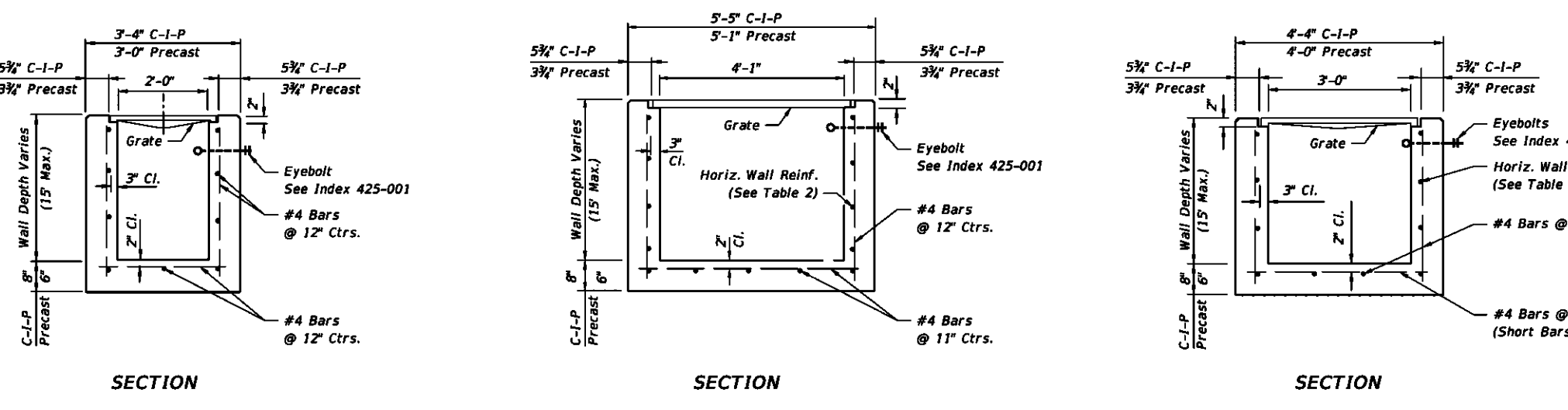
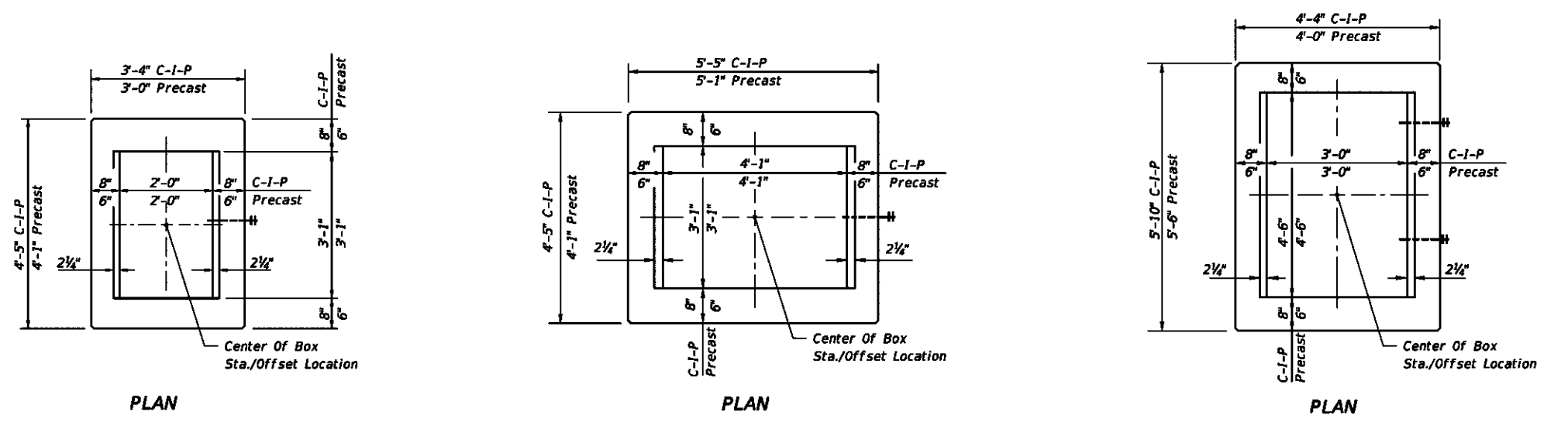
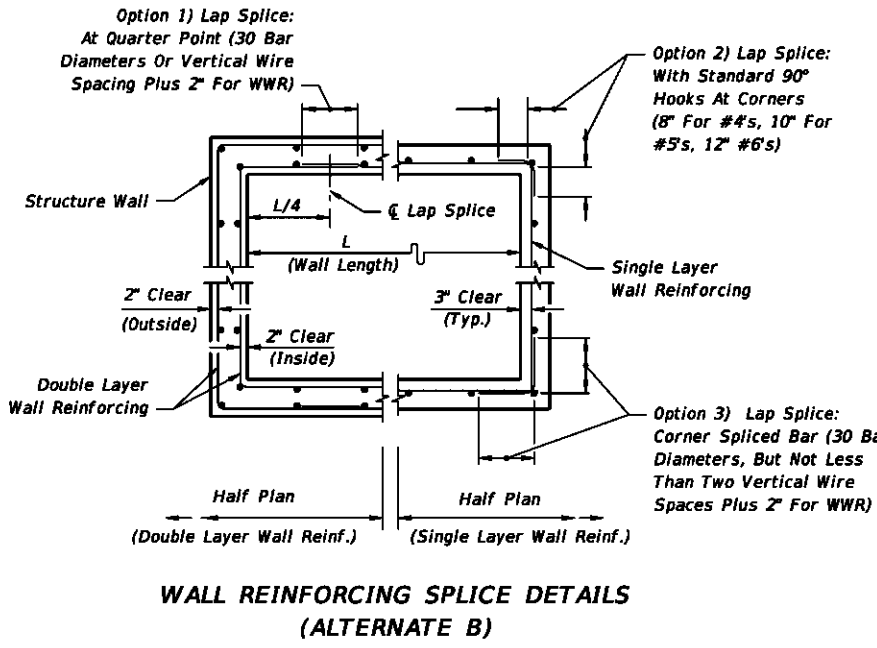
WALL DESIGNS - RECTANGULAR STRUCTURES (TABLE B)

VERTICAL REINFORCING		HORIZONTAL REINFORCING		WALL THICKNESS	
WALL DEPTH	SCHEDULE	WALL DEPTH	SCHEDULE		
SIZE: 3'-6" & RISERS					
≥1.17' < 4'	A12	≥1.17' < 10'	B10	6"Ø	
		10' < 15'	B5.5	6"Ø	
		15' < 20'	C6.5	6"Ø	
		20' < 25'	C3.5	6"Ø	
SIZE: 4'-0"					
≥1.17' < 4'	A12	≥1.17' < 6'	B10	6"Ø	
		6' < 10'	B5.5	6"Ø	
		10' < 20'	C6.5	6"Ø	
		20' < 28'	C3.5	6"Ø	
		28' < 40'	D4.5	6"Ø	
SIZE: 5'-0"					
≥1.17' < 4'	A12	≥1.17' < 3'	B5.5	6"Ø	
		3' < 9'	C6.5	6"Ø	
		9' < 15'	C3.5	6"Ø	
		15' < 22'	D4.5	6"Ø	
		22' < 40'	E3	8"	
SIZE: 6'-0"					
≥1.17' < 20'	A12	≥1.17' < 9'	C3.5	6"Ø	
		9' < 15'	D4.5	6"Ø	
		15' < 20'	E3	8"	
SIZE: 7'-0"					
≥1.17' < 25'	A12	≥1.17' < 7'	B10	B10	8"
		7' < 10'	B5.5	B5.5	8"
		10' < 20'	C6.5	C6.5	8"
		20' < 30'	D7	D7	8"
		30' < 40'	E5	E5	8"
SIZE: 8'-0"					
≥1.17' < 20'	A12	≥1.17' < 6'	B5.5	B5.5	8"
		6' < 13'	C6.5	C6.5	8"
		13' < 20'	D7	D7	8"
		22' < 31'	E5	E5	8"
		31' < 40'	F5	F5	8"
SIZE: 9'-0"					
≥1.17' < 12'	A12	≥1.17' < 6'	C6.5	C6.5	8"
		6' < 15'	D7	D7	8"
		15' < 25'	E5	E5	8"
		25' < 40'	F5	F5	8"
SIZE: 10'-0"					
≥1.17' < 10'	B10	≥1.17' < 10'	D7	D7	8"
		10' < 21'	C6.5	C6.5	10'
		21' < 26'	D7	D7	10'
		26' < 40'	C6.5	C6.5	10'

VERTICAL REINFORCING		HORIZONTAL REINFORCING		WALL THICKNESS	
WALL DEPTH	SCHEDULE	WALL DEPTH	SCHEDULE		
SIZE: 10'-0" (Precast Only)					
≥1.17' < 20'	D7	≥1.17' < 40'	F5	F5	9"
SIZE: 12'-0"					
≥1.17' < 14'	B10	≥1.17' < 10'	C6.5	C6.5	10'
		10' < 17'	D7	D7	10'
		17' < 23'	E5	E5	10'
		23' < 32'	F5	F5	10'
SIZE: 12'-0" (Precast Only)					
≥1.17' < 12'	B10	≥1.17' < 10'	D7	D7	9"
		12' < 24'	C6.5	C6.5	9"
		24' < 40'	D7	D7	9"
SIZE: 12'-0" (Precast Only)					
≥1.17' < 11'	C6.5	≥1.17' < 13'	D7	D7	10"
		13' < 20'	E5	E5	10"
		20' < 28'	E5	E5	10"
		28' < 40'	F5	F5	10"
SIZE: 16'-0" (Precast Only)					
≥1.17' < 10'	C6.5	≥1.17' < 9'	D7	D7	9"
		10' < 18'	D7	D7	9"
		18' < 25'	E5	E5	9"
		25' < 35'	F5	F5	9"
		35' < 40'	G5	G5	9"
SIZE: 20'-0" (Precast Only)					
≥1.17' < 8'	C6.5	≥1.17' < 8'	D4.5	D4.5	9"
		8' < 13'	E5	E5	9"
		13' < 20'	F5	F5	9"
		20' < 30'	G5	G5	10"

SCHEDULE	REINFORCING SCHEDULE			
	GRADE 60 AREA (In. Yr.)	MAXIMUM SPACING	GRADE 60 BARS (In.)	WWR EQUIV. AREA*
A12	0.20	12"	8"	8"
A6	0.20	6"	5"	46%
B10	0.24	10"	8"	7 1/2"
B5.5	0.24	5 1/2"	5"	4"
C6.5	0.37	6 1/2"	6"	5"
C3.5	0.37	3 1/2"	3"	2 1/2"
D7	0.53	7"	6"	5"
D4.5	0.53	4 1/2"	4"	3 1/2"
E3	0.73	3"	3"	3"
F5	1.06	5"	4"	4"
F3.5	1.06	3 1/2"	3"	3"
G5	1.45	5"	4"	4"
G3.5	1.45	3 1/2"	3"	3"
H4	1.75	4"	3"	3"

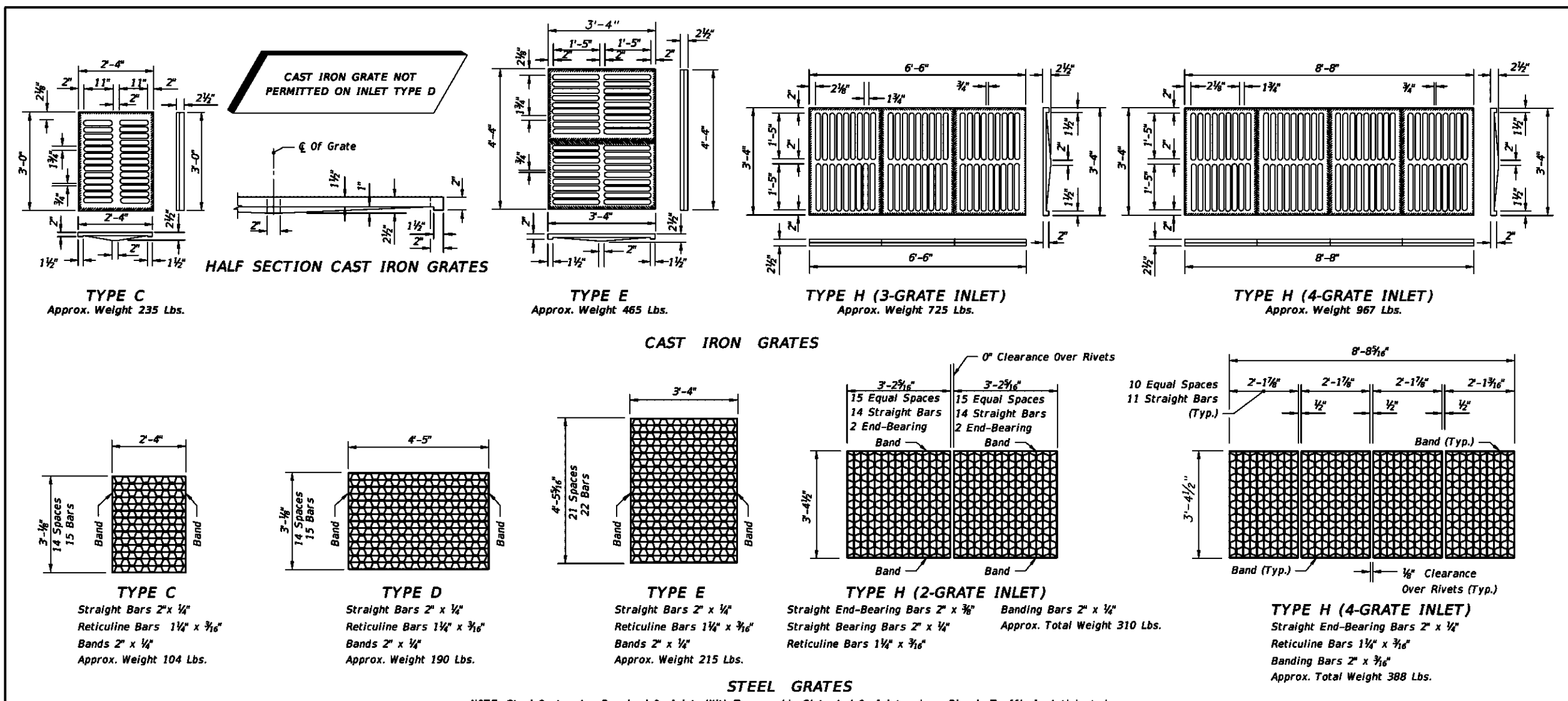
*Equivalent Area Welded Wire Reinforcing may be substituted in accordance with Index 425-001.



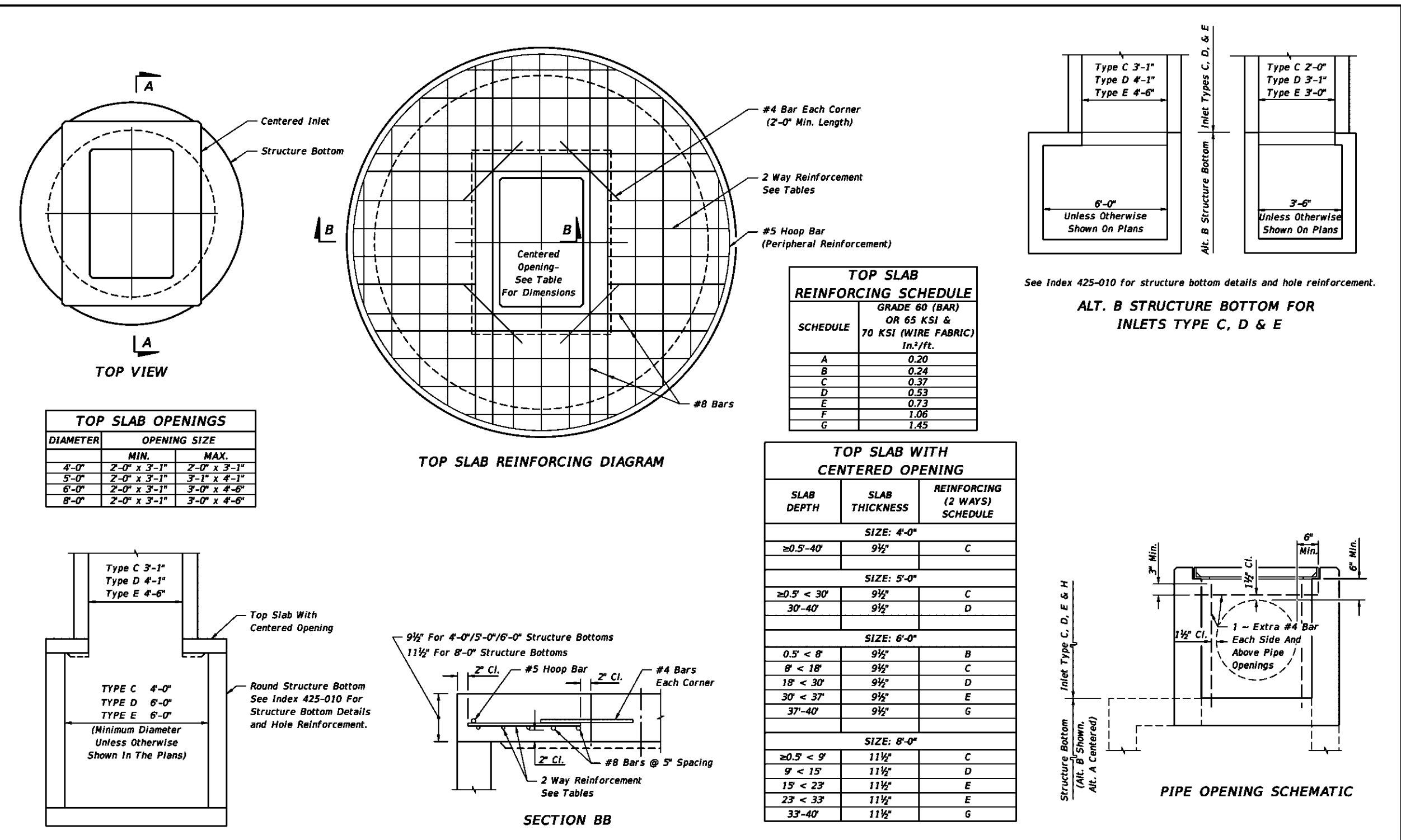
HORIZONTAL WALL REINFORCING SCHEDULES (TABLE 1)			
WALL DEPTH	SCHEDULE	AREA (In. ² /Yr.)	MAX. SPACING
0'-15"	A12	0.20	12" 8"

HORIZONTAL WALL REINFORCING SCHEDULES (TABLE 2)			
WALL DEPTH	SCHEDULE	AREA (In. ² /Yr.)	MAX. SPACING
0'-6"	A12	0.20	12" 8"
6'-10"	A6	0.20	6" 5"
10'-13"	A4	0.20	4" 3"
10'-15"	B5.5	0.24	5 1/2" 5"

HORIZONTAL WALL REINFORCING SCHEDULES (TABLE 3)			
WALL DEPTH	SCHEDULE	AREA (In. ² /Yr.)	MAX. SPACING
0'-3"	A12	0.20	12" 8"
0'-7.5"	A6	0.20	6" 5"
7.5'-10"	B5.5	0.24	5 1/2" 5"
10'-15"	C6.5	0.37	6 1/2" 6"

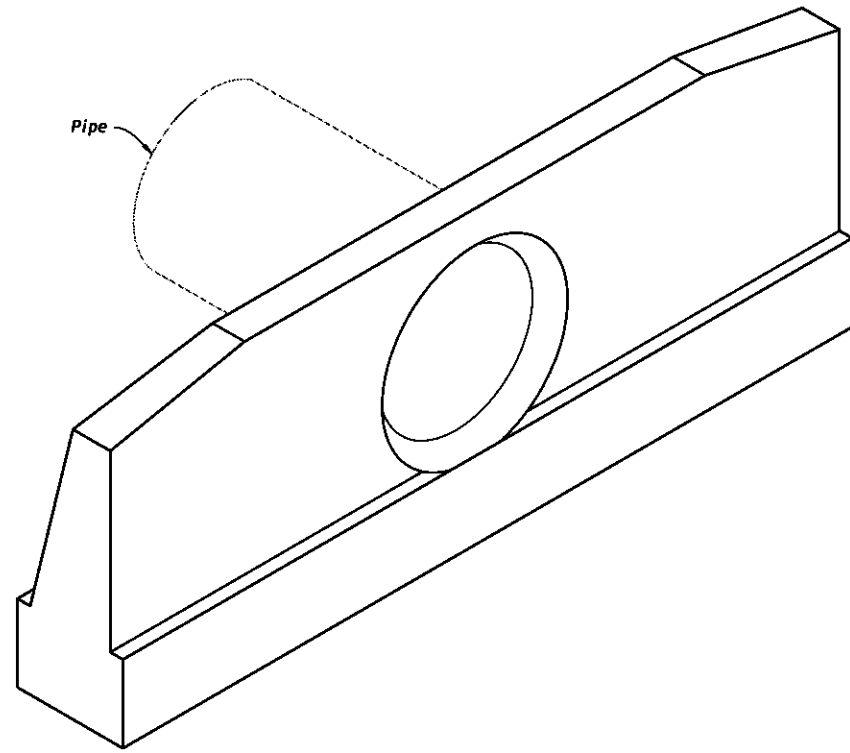


- NOTE: Steel Grates Are Required On Inlets With Traversable Slots And On Inlets Where Bicycle Traffic Is Anticipated.
- GENERAL NOTES**
- These inlets are suitable for bicycle traffic and are to be used in ditches, medians and other areas subject to infrequent traffic loadings but are not to be placed in areas subject to any heavy wheel loads. These inlets may be placed in areas subject to occasional pedestrian traffic such as landscaped areas and pavement areas where pedestrians can walk around the inlet.
 - Inlets subject to minimal debris should be constructed without slots. Where debris is a problem inlets should be constructed with slots. Slotted inlets located within roadway clear zones and areas subject to pedestrians shall have traversable slots. The traversable slot modification is not adaptable to inlet Type H. Slots may be constructed at either or both ends as shown on plans. Traversable slots shall not be used in areas subject to occasional bicycle traffic.
 - Steel grates are to be used on all inlets where bicycle traffic is anticipated. Steel grates are to be used on all inlets with traversable slots. Either cast iron or steel grates may be used on inlets without slots where bicycle traffic is not anticipated. Either cast iron or steel grates may be used on all inlets with non-traversable slots. Subject to the selection described above, when Alternate G grate is specified in the plans, either the steel grate, hot dip galvanized after fabrication, or the cast iron grate may be used, unless the plans stipulate the particular type.
 - Recommended maximum pipe sizes shown are for concrete pipe. Size for other types of pipe must be checked for fit.
 - All exposed edges and corners shall be 1/2" chamfer or tool to 1/2" radius.
 - Concrete inlet pavement to be used on inlets without slots and inlets with non-traversable slots only when called for in the plans; but required on all traversable slot inlets. Cost to be included in contract unit price for inlets. Quantities shown are for information only.
 - Traversable slots constructed in existing inlets shall be paid for as inlets partial. For conversion work and method of payment see TRAVERSABLE SLOT INLETS (PARTIAL) FOR EXISTING INLETS.
 - Sodding to be used on all inlets not located in paved areas and paid for under contract unit price for Performance Turf, 5".
 - For supplementary details see Index 425-001.
 - All reinforcing is Grade 60 bars with 2" min. cover unless otherwise noted. Bars to be cut or bent for 1 1/2" clearance around pipe opening. Provide one additional #4 bar above and at each side of pipe opening.



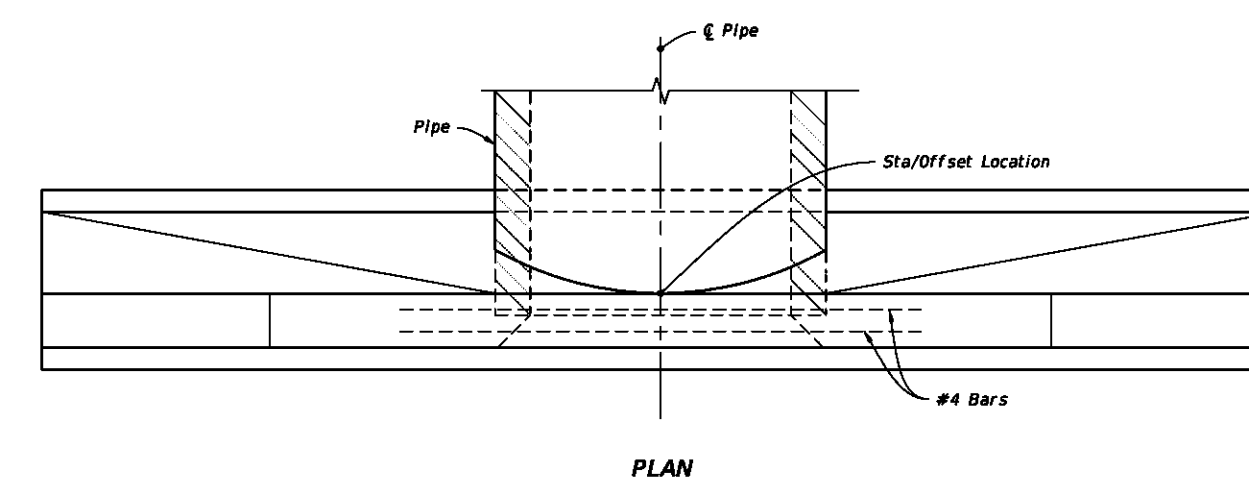
GENERAL NOTES:

1. Use Class I concrete.
2. Reinforcing steel is either Grade 40 or 60.
3. Endwalls may be cast in place or precast concrete. (Additional reinforcement necessary for handling precast units will be determined by the Contractor or the supplier).
4. Chamfer all exposed edges and corners to 1/4".
5. Endwall dimensions, locations and positions are for round and elliptical concrete pipe and for round and pipe-arch corrugated metal pipe. Round concrete pipe shown.
6. On outfall ditches with side slopes flatter than 1:1.5 provide 20' transitions from the endwall to the flatter side slopes, right of way permitting.
7. Construct front slope and ditch transitions in accordance with Index 430-001.
8. Quantities shown are for estimating purposes only.

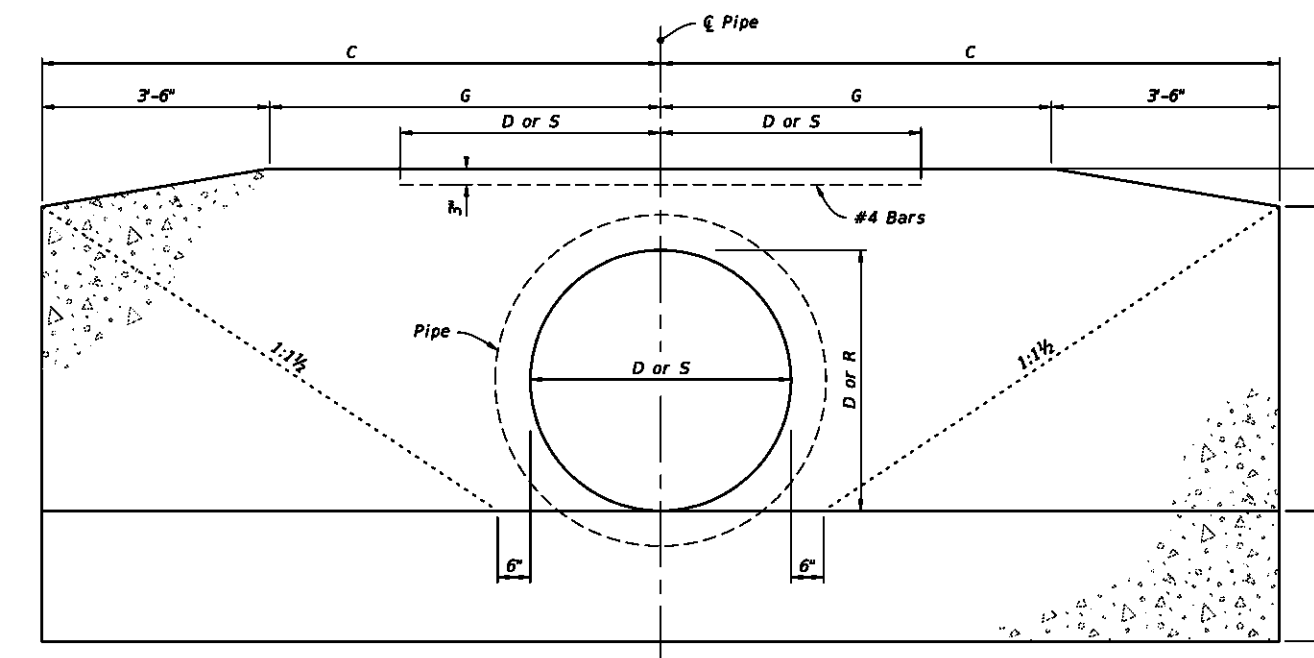


STRAIGHT CONCRETE ENDWALL

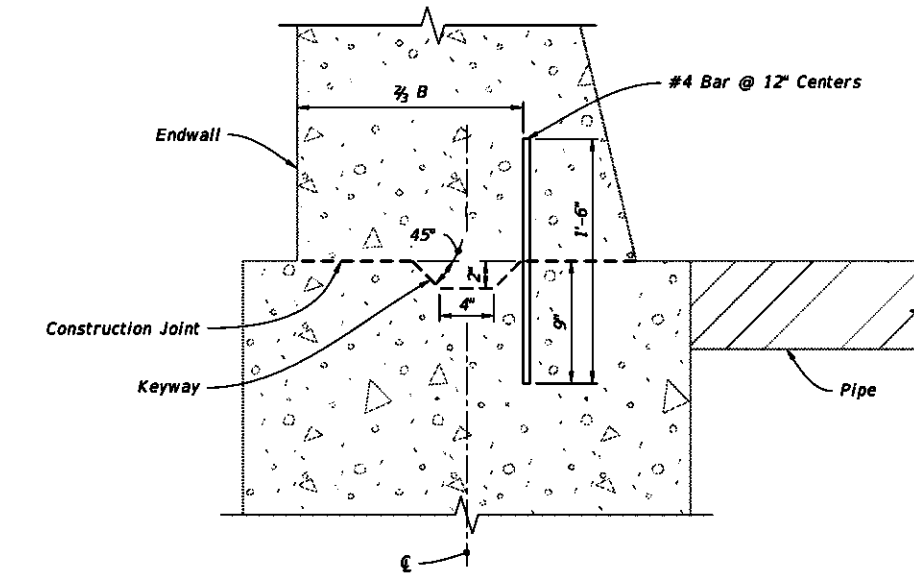
TABLE OF CONTENTS:	
Sheet	Description
1	General Notes and Contents
2	Concrete Endwall Details
3	Concrete and Metal Pipe Tables
4	Spacing For Multiple Pipes



PLAN

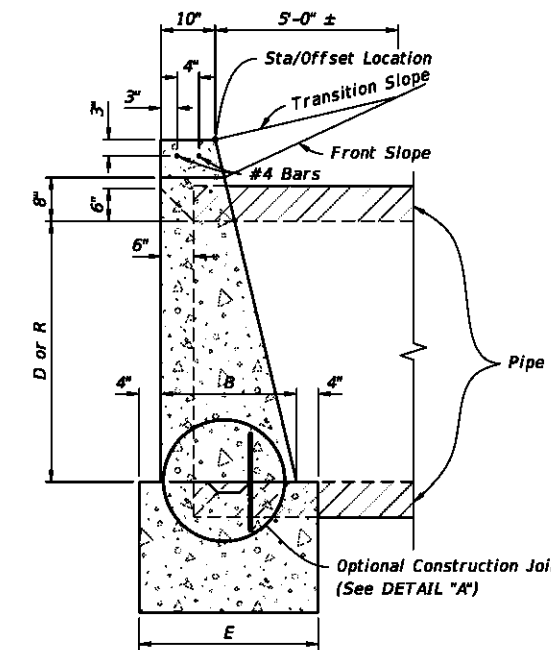


FRONT ELEVATION



DETAIL "A"

NOTE: Keyway and Dowels are required for optional construction joint.



SIDE ELEVATION

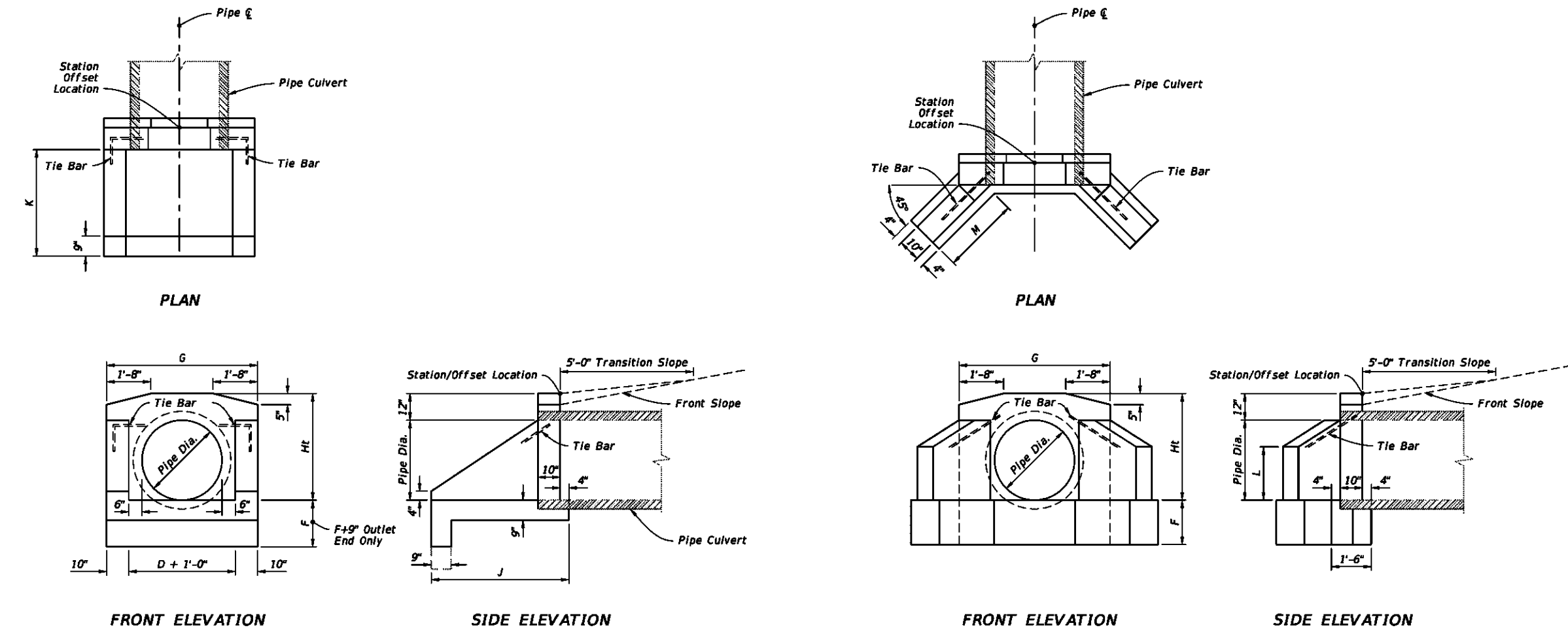
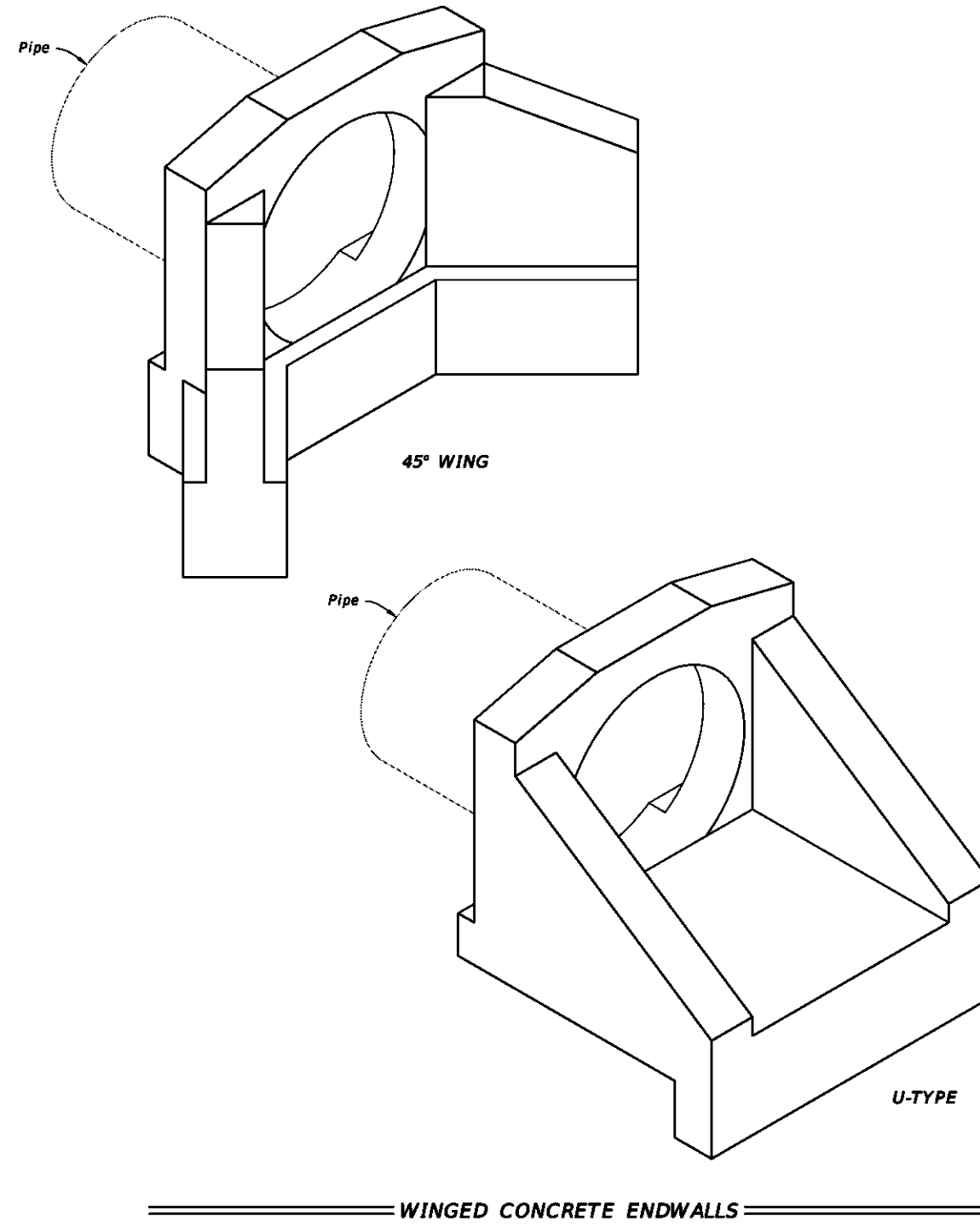
CONCRETE ENDWALL DETAILS

Dia. D	Rise R	Span S	Opening Area (SF)		Dimensions												Class I Concrete (CY)												Dia. D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
			Number Of Pipes		Number Of Pipe And Skew Angle Of Pipe (a)												Number Of Pipe And Skew Angle Of Pipe (a)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
			1	2	Single				Double				Triple				Quadruple																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
15"	1.3	2.6	3.69	4.52	1'-11"	1'-2"	1'-4"	1'-6"	1'-8"	1'-10"	2'-0"	2'-2"	2'-4"	2'-6"	2'-8"	2'-10"	3'-0"	3'-2"	3'-4"	3'-6"	3'-8"	3'-10"	4'-0"	4'-2"	4'-4"	4'-6"	4'-8"	4'-10"	5'-0"	5'-2"	5'-4"	5'-6"	5'-8"	5'-10"	6'-0"	6'-2"	6'-4"	6'-6"	6'-8"	6'-10"	7'-0"	7'-2"	7'-4"	7'-6"	7'-8"	7'-10"	8'-0"	8'-2"	8'-4"	8'-6"	8'-8"	8'-10"	9'-0"	9'-2"	9'-4"	9'-6"	9'-8"	9'-10"	10'-0"	10'-2"	10'-4"	10'-6"	10'-8"	10'-10"	11'-0"	11'-2"	11'-4"	11'-6"	11'-8"	11'-10"	12'-0"	12'-2"	12'-4"	12'-6"	12'-8"	12'-10"	13'-0"	13'-2"	13'-4"	13'-6"	13'-8"	13'-10"	14'-0"	14'-2"	14'-4"	14'-6"	14'-8"	14'-10"	15'-0"	15'-2"	15'-4"	15'-6"	15'-8"	15'-10"	16'-0"	16'-2"	16'-4"	16'-6"	16'-8"	16'-10"	17'-0"	17'-2"	17'-4"	17'-6"	17'-8"	17'-10"	18'-0"	18'-2"	18'-4"	18'-6"	18'-8"	18'-10"	19'-0"	19'-2"	19'-4"	19'-6"	19'-8"	19'-10"	20'-0"	20'-2"	20'-4"	20'-6"	20'-8"	20'-10"	21'-0"	21'-2"	21'-4"	21'-6"	21'-8"	21'-10"	22'-0"	22'-2"	22'-4"	22'-6"	22'-8"	22'-10"	23'-0"	23'-2"	23'-4"	23'-6"	23'-8"	23'-10"	24'-0"	24'-2"	24'-4"	24'-6"	24'-8"	24'-10"	25'-0"	25'-2"	25'-4"	25'-6"	25'-8"	25'-10"	26'-0"	26'-2"	26'-4"	26'-6"	26'-8"	26'-10"	27'-0"	27'-2"	27'-4"	27'-6"	27'-8"	27'-10"	28'-0"	28'-2"	28'-4"	28'-6"	28'-8"	28'-10"	29'-0"	29'-2"	29'-4"	29'-6"	29'-8"	29'-10"	30'-0"	30'-2"	30'-4"	30'-6"	30'-8"	30'-10"	31'-0"	31'-2"	31'-4"	31'-6"	31'-8"	31'-10"	32'-0"	32'-2"	32'-4"	32'-6"	32'-8"	32'-10"	33'-0"	33'-2"	33'-4"	33'-6"	33'-8"	33'-10"	34'-0"	34'-2"	34'-4"	34'-6"	34'-8"	34'-10"	35'-0"	35'-2"	35'-4"	35'-6"	35'-8"	35'-10"	36'-0"	36'-2"	36'-4"	36'-6"	36'-8"	36'-10"	37'-0"	37'-2"	37'-4"	37'-6"	37'-8"	37'-10"	38'-0"	38'-2"	38'-4"	38'-6"	38'-8"	38'-10"	39'-0"	39'-2"	39'-4"	39'-6"	39'-8"	39'-10"	40'-0"	40'-2"	40'-4"	40'-6"	40'-8"	40'-10"	41'-0"	41'-2"	41'-4"	41'-6"	41'-8"	41'-10"	42'-0"	42'-2"	42'-4"	42'-6"	42'-8"	42'-10"	43'-0"	43'-2"	43'-4"	43'-6"	43'-8"	43'-10"	44'-0"	44'-2"	44'-4"	44'-6"	44'-8"	44'-10"	45'-0"	45'-2"	45'-4"	45'-6"	45'-8"	45'-10"	46'-0"	46'-2"	46'-4"	46'-6"	46'-8"	46'-10"	47'-0"	47'-2"	47'-4"	47'-6"	47'-8"	47'-10"	48'-0"	48'-2"	48'-4"	48'-6"	48'-8"	48'-10"	49'-0"	49'-2"	49'-4"	49'-6"	49'-8"	49'-10"	50'-0"	50'-2"	50'-4"	50'-6"	50'-8"	50'-10"	51'-0"	51'-2"	51'-4"	51'-6"	51'-8"	51'-10"	52'-0"	52'-2"	52'-4"	52'-6"	52'-8"	52'-10"	53'-0"	53'-2"	53'-4"	53'-6"	53'-8"	53'-10"	54'-0"	54'-2"	54'-4"	54'-6"	54'-8"	54'-10"	55'-0"	55'-2"	55'-4"	55'-6"	55'-8"	55'-10"	56'-0"	56'-2"	56'-4"	56'-6"	56'-8"	56'-10"	57'-0"	57'-2"	57'-4"	57'-6"	57'-8"	57'-10"	58'-0"	58'-2"	58'-4"	58'-6"	58'-8"	58'-10"	59'-0"	59'-2"	59'-4"	59'-6"	59'-8"	59'-10"	60'-0"	60'-2"	60'-4"	60'-6"	60'-8"	60'-10"	61'-0"	61'-2"	61'-4"	61'-6"	61'-8"	61'-10"	62'-0"	62'-2"	62'-4"	62'-6"	62'-8"	62'-10"	63'-0"	63'-2"	63'-4"	63'-6"	63'-8"	63'-10"	64'-0"	64'-2"	64'-4"	64'-6"	64'-8"	64'-10"	65'-0"	65'-2"	65'-4"	65'-6"	65'-8"	65'-10"	66'-0"	66'-2"	66'-4"	66'-6"	66'-8"	66'-10"	67'-0"	67'-2"	67'-4"	67'-6"	67'-8"	67'-10"	68'-0"	68'-2"	68'-4"	68'-6"	68'-8"	68'-10"	69'-0"	69'-2"	69'-4"	69'-6"	69'-8"	69'-10"	70'-0"	70'-2"	70'-4"	70'-6"	70'-8"	70'-10"	71'-0"	71'-2"	71'-4"	71'-6"	71'-8"	71'-10"	72'-0"	72'-2"	72'-4"	72'-6"	72'-8"	72'-10"	73'-0"	73'-2"	73'-4"	73'-6"	73'-8"	73'-10"	74'-0"	74'-2"	74'-4"	74'-6"	74'-8"	74'-10"	75'-0"	75'-2"	75'-4"	75'-6"	75'-8"	75'-10"	76'-0"	76'-2"	76'-4"	76'-6"	76'-8"	76'-10"	77'-0"	77'-2"	77'-4"	77'-6"	77'-8"	77'-10"	78'-0"	78'-2"	78'-4"	78'-6"	78'-8"	78'-10"	79'-0"	79'-2"	79'-4"	79'-6"	79'-8"	79'-10"	80'-0"	80'-2"	80'-4"	80'-6"	80'-8"	80'-10"	81'-0"	81'-2"	81'-4"	81'-6"	81'-8"	81'-10"	82'-0"	82'-2"	82'-4"	82'-6"	82'-8"	82'-10"	83'-0"	83'-2"	83'-4"	83'-6"	83'-8"	83'-10"	84'-0"	84'-2"	84'-4"	84'-6"	84'-8"	84'-10"	85'-0"	85'-2"	85'-4"	85'-6"	85'-8"	85'-10"	86'-0"	86'-2"	86'-4"	86'-6"	86'-8"	86'-10"	87'-0"	87'-2"	87'-4"	87'-6"	87'-8"	87'-10"	88'-0"	88'-2"	88'-4"	88'-6"	88'-8"	88'-10"	89'-0"	89'-2"	89'-4"	89'-6"	89'-8"	89'-10"	90'-0"	90'-2"	90'-4"	90'-6"	90'-8"	90'-10"	91'-0"	91'-2"	91'-4"	91'-6"	91'-8"	91'-10"	92'-0"	92'-2"	92'-4"	92'-6"	92'-8"	92'-10"	93'-0"	93'-2"	93'-4"	93'-6"	93'-8"	93'-10"	94'-0"	94'-2"	94'-4"	94'-6"	94'-8"	94'-10"	95'-0"	95'-2"	95'-4"	95'-6"	95'-8"	95'-10"	96'-0"	96'-2"	96'-4"	96'-6"	96'-8"	96'-10"	97'-0"	97'-2"	97'-4"	97'-6"	97'-8"	97'-10"	98'-0"	98'-2"	98'-4"	98'-6"	98'-8"	98'-10"	99'-0"	99'-2"	99'-4"	99'-6"	99'-8"	99'-10"	100'-0"	100'-2"	100'-4"	100'-6"	100'-8"	100'-10"	101'-0"	101'-2"	101'-4"	101'-6"	101'-8"	101'-10"	102'-0"	102'-2"	102'-4"	102'-6"	102'-8"	102'-10"	103'-0"	103'-2"	103'-4"	103'-6"	103'-8"	103'-10"	104'-0"	104'-2"	104'-4"	104'-6"	104'-8"	104'-10"	105'-0"	105'-2"	105'-4"	105'-6"	105'-8"	105'-10"	106'-0"	106'-2"	106'-4"	106'-6"	106'-8"	106'-10"	107'-0"	107'-2"	107'-4"	107'-6"	107'-8"	107'-10"	108'-0"	108'-2"	108'-4"	108'-6"	108'-8"	108'-10"	109'-0"	109'-2"	109'-4"	109'-6"	109'-8"	109'-10"	110'-0"	110'-2"	110'-4"	110'-6"	110'-8"	110'-10"	111'-0"	111'-2"	111'-4"	111'-6"	111'-8"	111'-10"	112'-0"	112'-2"	112'-4"	112'-6"	112'-8"	112'-10"	113'-0"	113'-2"	113'-4"	113'-6"	113'-8"	113'-10"	114'-0"	114'-2"	114'-4"	114'-6"	114'-8"	114'-10"	115'-0"	115'-2"	115'-4"	115'-6"	115'-8"	115'-10"	116'-0"	116'-2"	116'-4"	116'-6"	116'-8"	116'-10"	117'-0"	117'-2"	117'-4"	117'-6"	117'-8"	117'-10"	118'-0"	118'-2"	118'-4"	118'-6"	118'-8"	118'-10"	119'-0"	119'-2"	119'-4"	119'-6"	119'-8"	119'-10"	120'-0"	120'-2"	120'-4"	120'-6"	120'-8"	120'-10"	121'-0"	121'-2"	121'-4"	121'-6"	121'-8"	121'-10"	122'-0"	122'-2"	122'-4"	122'-6"	122'-8"	122'-10"	123'-0"	123'-2"	123'-4"	123'-6"	123'-8"	123'-10"	124'-0"	124'-2"	124'-4"	124'-6"	124'-8"	124'-10"	125'-0"	125'-2"	125'-4"	125'-6"	125'-8"	125'-10"	126'-0"	126'-2"	126'-4"	126'-6"	126'-8"	126'-10"	127'-0"	127'-2"	127'-4"	127'-6"	127'-8"	127'-10"	128'-0"	128'-2"	128'-4"	128'-6"	128'-8"	128'-10"	129'-0"	129'-2"	129'-4"	129'-6"	129'-8"	129'-10"	130'-0"	130'-2"	130'-4"	130'-6"	130'-8"	130'-10"	131'-0"	131'-2"	131'-4"	131'-6"	131'-8"	131'-10"	132'-0"	132'-2"	132'-4"	132'-6"	132'-8"	132'-10"	133'-0"	133'-2"	133'-4"	133'-6"	133'-8"	133'-10"	134'-0"	134'-2"	134'-4"	134'-6"	134'-8"	134'-10"	135'-0"	135'-2"	135'-4"	135'-6"	135'-8"	135'-10"	136'-0"	136'-2"	136'-4"	136'-6"	136'-8"	136'-10"	137'-0"	137'-2"	137'-4"	137'-6"	137'-8"	137'-10"	138'-0"	138'-2"	138'-4"	138'-6"	138'-8"	138'-10"	139'-0"	139'-2"	139'-4"	139'-6"	139'-8"	139'-10"	140'-0"	140'-2"	140'-4"	140'-6"	140'-8"	140'-10"	141'-0"	141'-2"	141'-4"	141'-6"	141'-8"	141'-10"	142'-0"	142'-2"	142'-4"	142'-6"	142'-8"	142'-10"	143'-0"	143'-2"	143'-4"	143'-6"	143'-8"	143'-10"	144'-0"	144'-2"	144'-4"	144'-6"	144'-8"	144'-10"	145'-0"	145'-2"	145'-4"	145'-6"	145'-8"	145'-10"	146'-0"	146'-2"	146'-4"	146'-6"	146'-8"	146'-10"	147'-0"	147'-2"	147'-4"	147'-6"	147'-8"	147'-10"	148'-0"	148'-2"	148'-4"	148'-6"	148'-8"	148'-10"	149'-0"	149'-2"	149'-4"	149'-6"	149'-8"	149'-10"	150'-0"	150'-2"	150'-4"	150'-6"	150'-8"	150'-10"	151'-0"	151'-2"	151'-4"	151'-6"	151'-8"	151'-10"	152'-0"	152'-2"	152'-4"	152'-6"	152'-8"	152'-10"	153'-0"	153'-2"	153'-4"	153'-6"	153'-8"	153'-10"	154'-0"	154'-2"	154'-4"	154'-6"	154'-8"	154'-10"	155'-0"	155'-2"	155'-4"	155'-6"	155'-8"	155'-10"	156'-0"	156'-2"	156'-4"	156'-6"	156'-8"	156'-10"	157'-0"	157'-2"	157'-4"	157'-6"	157'-8"	157'-10"	158'-0"	158'-2"	158'-4"	158'-6"	158'-8"	158'-10"	159'-0"	159'-2"	159'-4"	159'-6"	159'-8"	159'-10"	160'-0"	160'-2"	160'-4"	160'-6"	160'-8"	160'-10"	161'-0"	161'-2"	161'-4"	161'-6"	161'-8"	161'-10"	162'-0"	162'-2"	162'-4"	162'-6"	162'-8"	162'-10"	163'-0"	163'-2"	163'-4"	163'-6"	163'-8"	163'-10"	164'-0"	164'-2"	164'-4"	164'-6"	164'-8"	164'-10"	165'-0"	165'-2"	165'-4"	165'-6"	165'-8"	165'-10"	166'-0"	166'-2"	166'-4"	166'-6"	166'-8"	166'-10"	167'-0"	167'-2"	167'-4"	167'-6"	167'-8"	167'-10"	168'-0"	168'-2"	168'-4"	168'-6"	168'-8"	168'-10"	169'-0"	169'-2"	169'-4"	169'-6"	169'-8"	169'-10"	170'-0"	170'-2"	170'-4"	170'-6"	170'-8"	170'-10"	171'-0"	171'-2"	171'-4"

GENERAL NOTES:

1. Use Class I concrete.
2. Chamfer all exposed edges and corners $\frac{3}{4}$ " unless otherwise shown.
3. Quantities shown are for estimating purposes only.

TABLE OF CONTENTS:	
Sheet	Description
1	General Notes and Contents
2	U-Type and 45° Endwalls



DIMENSIONS AND ESTIMATED QUANTITIES PIPE CULVERT ENDWALLS WITH U-TYPE WINGS													
Pipe Dia. (ft)	Area (ft ²)	Wall				Footings						Steel Tie Bars	
		G	H	K	F	RCP		CMP		CIP			
						Inlet	Outlet	Inlet	Outlet	Inlet	Outlet		
15"	1.2	3'-11"	2'-3"	1'-5"	1'-2"	2'-7"	0.59	0.67	0.62	0.70	0.61	0.70	none
18"	1.8	4'-2"	2'-4"	1'-5"	1'-2"	2'-11"	0.70	0.79	0.74	0.82	0.74	0.82	none
24"	3.1	4'-8"	3'-0"	2'-5"	1'-6"	3'-8"	1.01	1.11	1.06	1.16	1.06	1.16	2-#6 Bars x 2'-0"
30"	4.9	5'-2"	3'-6"	3'-3"	1'-6"	4'-5"	1.33	1.44	1.41	1.51	1.40	1.51	2-#6 Bars x 2'-0"
36"	7.1	5'-8"	4'-0"	4'-0"	1'-9"	5'-2"	1.73	1.85	1.84	1.96	1.82	1.94	2-#6 Bars x 2'-6"
42"	9.6	6'-2"	4'-6"	4'-6"	2'-0"	5'-11"	2.19	2.32	2.32	2.45			2-#6 Bars x 2'-6"
48"	12.6	6'-8"	5'-0"	5'-0"	2'-0"	6'-8"	2.64	2.78	2.61	2.95			2-#6 Bars x 3'-0"

DIMENSIONS AND ESTIMATED QUANTITIES PIPE CULVERT ENDWALLS WITH 45° WINGS													
Pipe Dia. (ft)	Area (ft ²)	Wall				Footings						Steel Tie Bars	
		G	H	L	M	F	RCP		CMP		CIP		
							Inlet	Outlet	Inlet	Outlet	Inlet		Outlet
15"	1.2	2'-3"	3'-7"	1'-0"	1'-3"	1'-3"	0.56	0.59	0.59	0.59	0.59	0.59	none
18"	1.8	2'-6"	3'-10"	1'-2"	1'-3"	1'-3"	0.74	0.77	0.77	0.77	0.77	0.77	none
24"	3.1	3'-0"	4'-4"	1'-5"	2'-1"	1'-6"	1.01	1.06	1.06	1.06	1.06	1.06	2-#6 Bars x 2'-0"
30"	4.9	3'-6"	4'-10"	1'-9"	2'-5"	1'-6"	1.32	1.40	1.39	1.39	1.39	1.39	2-#6 Bars x 2'-0"
36"	7.1	4'-0"	5'-4"	2'-0"	2'-11"	1'-8"	1.72	1.83	1.82	1.82	1.82	1.82	2-#6 Bars x 2'-6"
42"	9.6	4'-6"	5'-10"	2'-3"	3'-6"	2'-0"	2.34	2.47	2.47	2.47	2.47	2.47	2-#6 Bars x 2'-6"
48"	12.6	5'-0"	6'-4"	2'-6"	4'-0"	2'-0"	2.74	2.90	2.90	2.90	2.90	2.90	2-#6 Bars x 2'-6"