

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
PLAN OF PROPOSED IMPROVEMENT

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
1181-11-70		

Section No.	Title
1	Typical Sections and Details
2	Estimate of Quantities
3	Miscellaneous Quantities
4	Right of Way Plat
5	Plan and Profile
6	Standard Detail Drawings
7	Sign Plates
8	Structure Plans
9	Computer Earthwork Data
9	Cross Sections

TOTAL SHEETS = 100

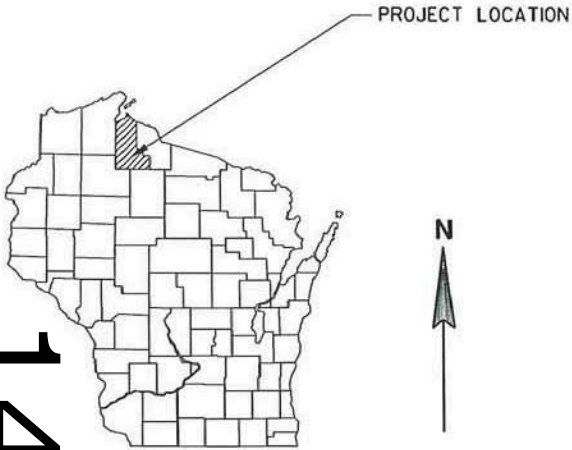
CITY OF ASHLAND, LAKE SHORE DRIVE

29TH AVENUE - 36TH AVENUE
USH 2
ASHLAND COUNTY

STATE PROJECT NUMBER
1181-11-70

AS-BUILT PLAN

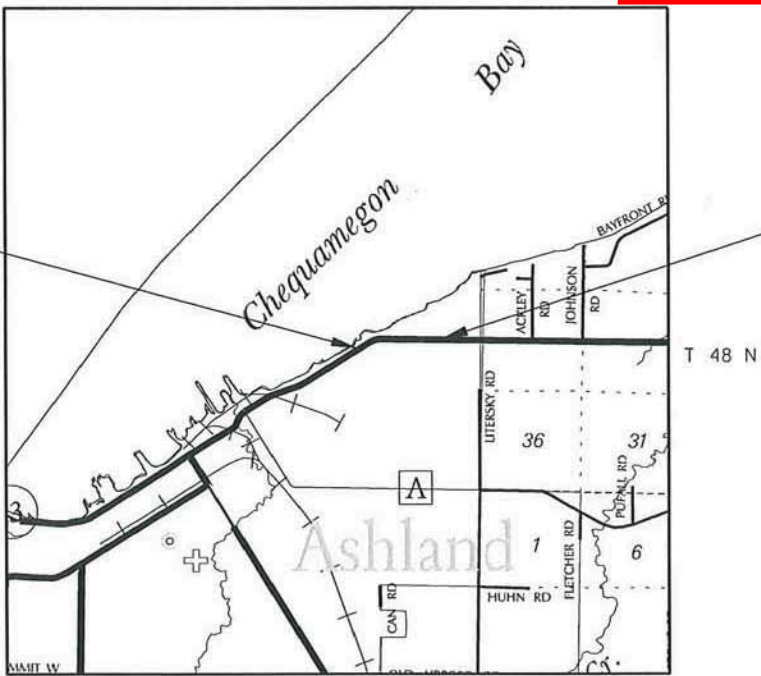
PROJECT LEADER: David Thaler - Coleman Engineering Co.
PRIME CONTRACTOR - Integrity Grading and Excavating, Inc.
Begin Construction 04/20/15 End Construction 09/03/15
FINAL CONSTRUCTION COST: \$1,294,352.66
CONTRACT MODS; (1) \$15,373.40 (2) \$32,376.24 (3) \$18,115.32
(4) \$117,344.42 (NET) = \$183,209.38
CONTRACT I.D. - 20141111014



DESIGN DESIGNATION	
A.A.D.T. (2013)	= 7200
A.A.D.T. (2033)	= 7500
D.H.V.	= 653
D.D.	= 50%
T.	= 13.2
DESIGN SPEED	= 35 MPH
ESALS	= 4,022,300

BEGIN PROJECT
STA 5+00
Y = 329245.6988
X = 510567.2561

END PROJECT
STA 40+00



CONVENTIONAL SYMBOLS

COUNTY LINE	COMBUSTIBLE FLUIDS	CAUTION
CORPORATE LIMITS	UNDERGROUND UTILITIES	
PROPERTY LINE	GAS	G
LOT LINE	ELECTRIC	E
LIMITED EASEMENT	TELEPHONE OR TELEGRAPH	T
EARTHWORK BALANCE POINT	TV/CABLE	TV
EXISTING RIGHT OF WAY	SERVICE PEDESTAL	
PROPOSED OR NEW R/W LINE	POWER POLE	
SURVEY LINE	TELEPHONE POLE	
SLOPE INTERCEPT	RAILROAD	
ORIGINAL GROUND	SANITARY SEWER	SAN
MARSH OR ROCK PROFILE (To be noted as such)	STORM SEWER	SS
MARSH AREA	WATER	W
WOODED OR SHRUB AREA	EXISTING CULVERT	
	PROPOSED CULVERT (Box or Pipe)	
	CULVERT (Profile View)	



TOTAL NET LENGTH OF CENTERLINE = 0.663 MI

Replace Sheet 28 with 28-A
Replace Sheet 86 with 86-A
Replace Sheet 87 with 87-A
Replace Sheet 88 with 88-A
Replace Sheet 89 with 89-A
Replace Sheet 90 with 90-A
Replace Sheet 91 with 91-A
Replace Sheet 92 with 92-A
Replace Sheet 93 with 93-A/94-A
Replace Sheet 94 with 93-A/94-A
Replace Sheet 95 with 95-A
Replace Sheet 96 with 96-A
Replace Sheet 97 with 97-A
Replace Sheet 98 with 98-A

ACCEPTED FOR
City of Ashland
02/03/2014
DATE: [Signature]

ORIGINAL PLANS PREPARED BY:
[Signature]
SEH

WISCONSIN
JARROD S. STARREN
38465
EAU CLAIRE
PROFESSIONAL ENGINEER
01/31/2014

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY
Surveyor: SEH
Designer: SEH
Project Manager: PHILIP KEPPERS
Regional Examiner: DANIEL OJIBWAY
Regional Supervisor: DAVID OSTROWSKI
C.O. Examiner:

APPROVED FOR THE DEPARTMENT
DATE: 02/03/14 [Signature]
(Signature)

STANDARD ABBREVIATIONS

ABUT	ABUTMENT	HYD	HYDRANT
AC	ACRE	ID	INSIDE DIAMETER
AGG	AGGREGATE	INV	INVERT
AECPRC	APRON ENDWALL FOR CULVERT PIPE REINFORCED CONCRETE	IP	IRON PIPE ON PIN
	ASPHALTIC	LHF	LEFT-HAND FORWARD
ASPH	AVERAGE	L	LENGTH OF CURVE
AVG	AVERAGE DAILY TRAFFIC	LF	LINEAR FOOT
ADT	BACK FACE	LC	LONG CHORD OF CURVE
BF	BENCH MARK	LS	LUMP SUM
BM	BRIDGE	MH	MANHOLE
BR	COMMERCIAL ENTRANCE	MOR	MID POINT OF RADIUS
CE	CENTER LINE	NC	NORMAL CROWN
CL OR C/L OR C	CENTRAL ANGLE OR DELTA	NO	NUMBER
Δ	CONCRETE	OBLIT	OBLITERATE
CONC	CULVERT PIPE REINFORCED CONCRETE	PAVT	PAVEMENT
CPRC	CULVERT PIPE REINFORCED CONCRETE	PE	PRIVATE ENTRANCE
CPRCHE	HORIZONTAL ELLIPTICAL	PVRC	POINT OF VERTICAL REVERSE CURVE
	CREEK	QOR	QUARTER POINT OF RADIUS
CR	CUBIC YARD	R	RADIUS
CY	CURB AND GUTTER	REQ'D	REQUIRED
C & G	DEGREE OF CURVE	RES	RESIDENCE OR RESIDENTIAL
D	DESIGN HOUR VOLUME	RHF	RIGHT-HAND FORWARD
DHV	DISCHARGE	R/W	RIGHT-OF-WAY
DISCH	DITCH GRADE	R	RIVER
DG	DRIVEWAY	RDWY	ROADWAY
DWY	EAST GRID COORDINATE	R/L OR R	REFERENCE LINE
X	STEEL PLATE BEAM GUARD	SALV	SALVAGED
EAT	ENERGY ABSORBING TERMINAL	SAN	SANITARY SEWER
	END POINT OF RADIUS	SF	SQUARE FEET
EOR	ELEVATION	SY	SQUARE YARD
EL	ENTRANCE	SDD	STANDARD DETAIL DRAWINGS
ENT	EQUIVALENT SINGLE AXLE LOADS	STA	STATION
ESALS	EXCAVATION	SS	STORM SEWER
EXC	EXCAVATION BELOW SUBGRADE	SSPRC	STORM SEWER PIPE REINFORCED CONCRETE
EBS	EXISTING	SE	SUPERELEVATION RATE
EXIST	FACE OF CURB	TC	TOP OF CURB
FC	FACE TO FACE	T OR TN	TOWN
FF	FERTILIZE	T	TRUCKS (PERCENT OF)
FERT	FIELD ENTRANCE	TYP	TYPICAL
FE	FLOW LINE	VAR	VARIABLE
FL	FIBER OPTIC	VC	VERTICAL CURVE
FO	HUNDREDWEIGHT	Y	NORTH GRID COORDINATE
CWT		YD	YARD

GENERAL NOTES

ELEVATIONS SHOWN ON THE PLAN ARE REFERENCED TO THE APPROXIMATE USGS DATUM.

WHEN THE QUANTITY OF BASE AGGREGATE OR ASPHALTIC SURFACE IS MEASURED FOR PAYMENT BY THE TON OR CUBIC YARD, THE DEPTH OR THICKNESS OF THE LAYER SHOWN ON THE PLANS IS APROXIMATE AND THE ACTUAL THICKNESS WILL DEPEND ON THE DISTRIBUTION OF THE MATERIAL AS DIRECTED BY THE ENGINEER.

THE LOCATION OF EXISTING AND PROPOSED UTILITY INSTALLATIONS AS SHOWN ON THE PLANS IS APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.

NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT THE APPROVAL OF THE ENGINEER.

CURVE DATA IS BASED ON THE ARC DEFINITION.

THE EXACT LOCATION OF THE EROSION CONTROL DEVICES SHALL BE DETERMINED IN THE FIELD.

4-IN ASPHALTIC SURFACE SHALL BE CONSTRUCTED IN TWO LAYERS.

DISTURBED AREAS WITHIN THE RIGHT-OF-WAY, EXCEPT THE AREAS WITHIN THE FINISHED SHOULDER POINTS, ARE TO BE 4-INCH SALVAGED TOPSOILED, FERTILIZED, SEEDED AND MULCHED.

BEARINGS SHOWN ON THE PLANS ARE GROUND BEARINGS TO THE NEAREST SECOND.

A VERTICAL SAWCUT SHALL BE MADE THROUGH EXISTING DRIVEWAYS AND PAVEMENTS AT REMOVAL LIMITS.

WETLANDS ARE PRESENT ALONG THE PROJECT. DO NOT OPERATE MACHINERY OUTSIDE THE LIMITS OF THE SLOPE INTERCEPTS.

UTILITY CONTACTS

RAY HYDE
ASHLAND WATER UTILITY-WATER
2020 6TH ST E
ASHLAND, WI 54803
715.682.7580 OFFICE
715.209.7580 CELL
RHYDE@COAWI.ORG

ALAN NICKELL
CENTURYLINK-COMMUNICATION LINE
PO BOX 369
MINONG, WI 54859
715.378.2131 OFFICE
715.566.3879 CELL
ALAN.NICKELL@CENTURYLINK.COM

THOMAS HASSE
CHARTER COMMUNICATIONS-COMMUNICATION LINE
2304 S MAIN ST
RICE LAKE, WI 54868
715.730.1601
THOMAS.HASSE@CHARTERCOM.COM

MURRAY SMERER
XCEL ENERGY-ELECTRIC & GAS
2400 FARM ROAD
ASHLAND, WI 54806
715.682.6928
MURRAY.J.SMERER@XCELENERGY.COM

GUY FOLSOM
NORVADO-COMMUNICATION LINE
43750 USH 63
P.O. BOX 67
CABLE, WI 54821
715.798.7123
GFOLSOM@NORVADO.COM

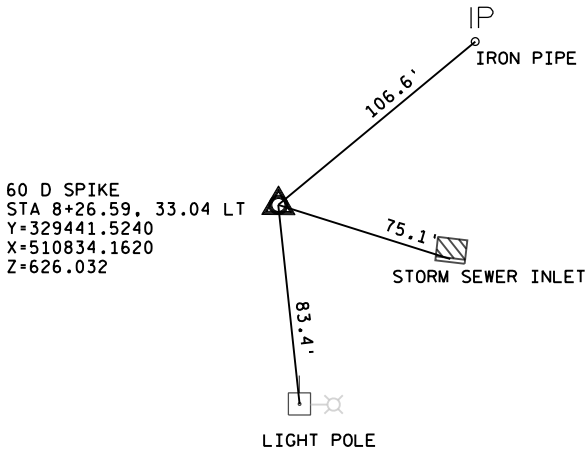
PETE EMPIE
MERIT NETWORK INC-COMMUNICATION LINE
1000 OAKBROOK DRIVE, SUITE 200
ANN ARBOR, MI 48104-5700
517.527.5790.
PEMPIE@MERIT.EDU

DESIGN CONTACT

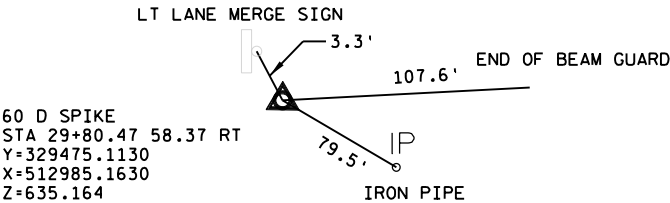
SEH INC.
421 FRENETTE DRIVE
CHIPPEWA FALLS, WI 54729
TELEPHONE: 715.720.6200
ATTENTION: JARROD STARREN
EMAIL:JSTARREN@SEHINC.COM

W.D.N.R. CONTACT

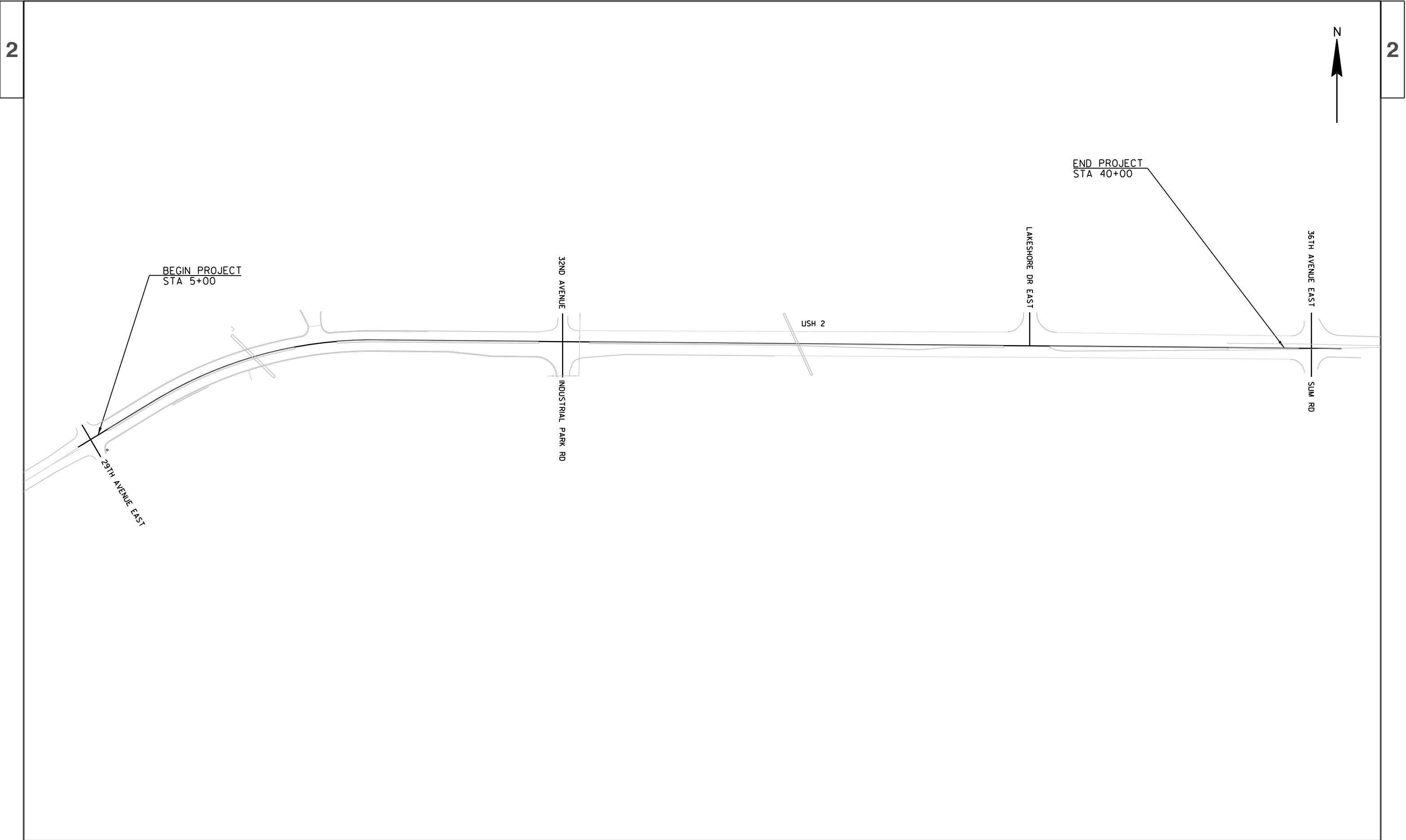
WI DEPT. OF NATURAL RESOURCES
801 W MAPLE STREET
SPOONER, WI 54801
TELEPHONE: 715.635.4228
ATTENTION: SHAWN HASELEU
EMAIL: SHAWN.HASELEU@WISCONSIN.GOV



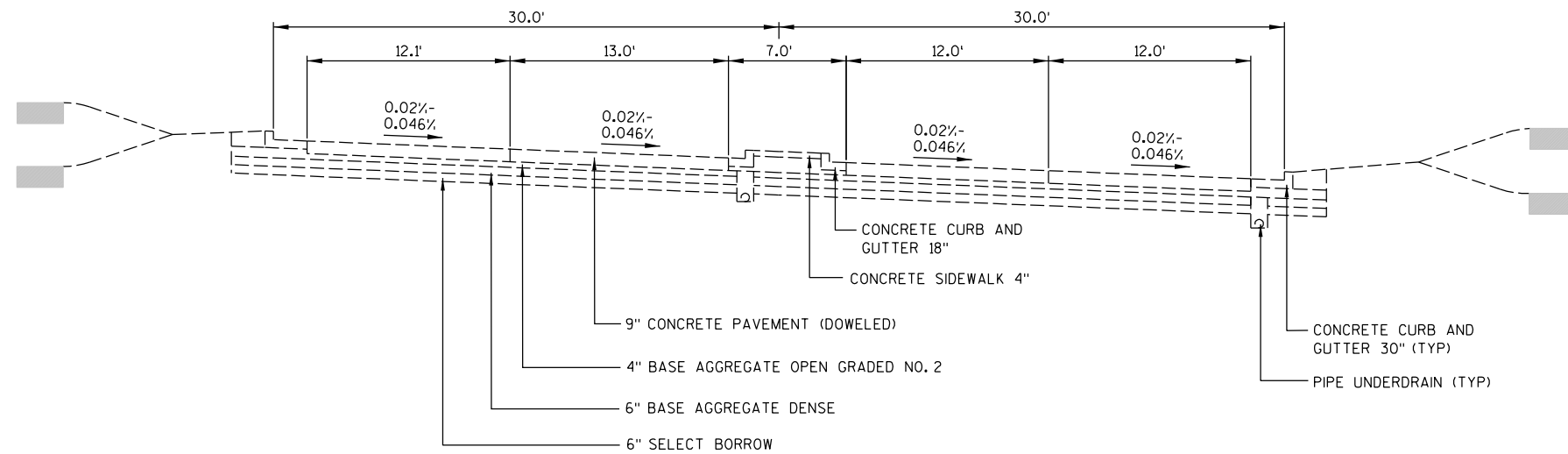
ALIGNMENT TIES



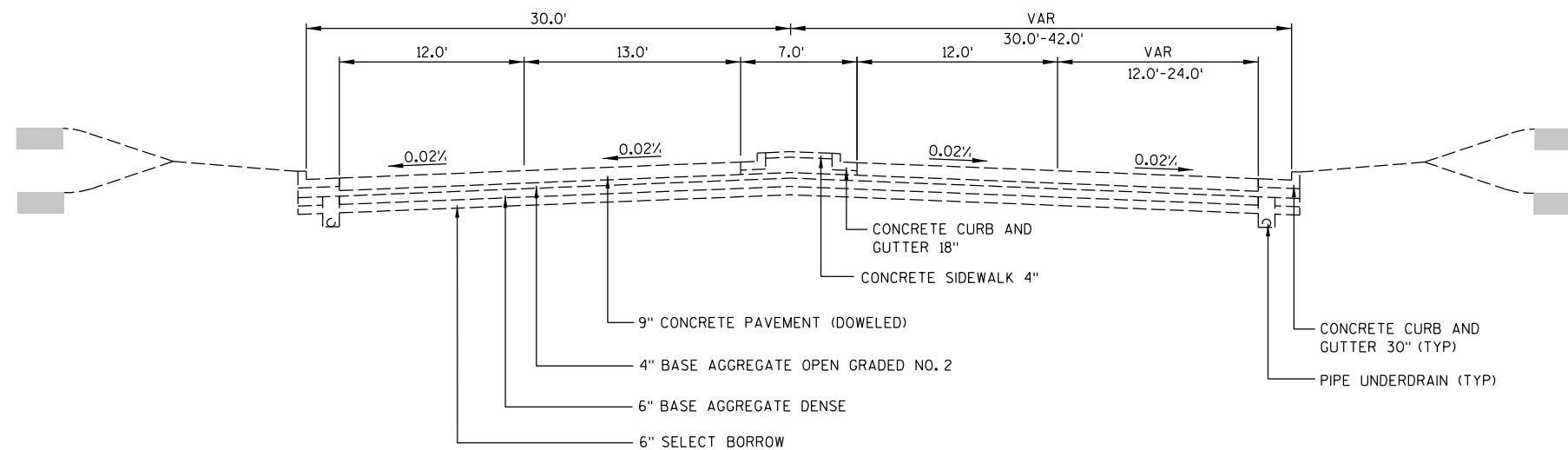
Dial 811 or (800)242-8511
www.DiggersHotline.com



PROJECT NO: 1181-11-70	HWY: USH 2	COUNTY: ASHLAND	PROJECT OVERVIEW	SHEET	E
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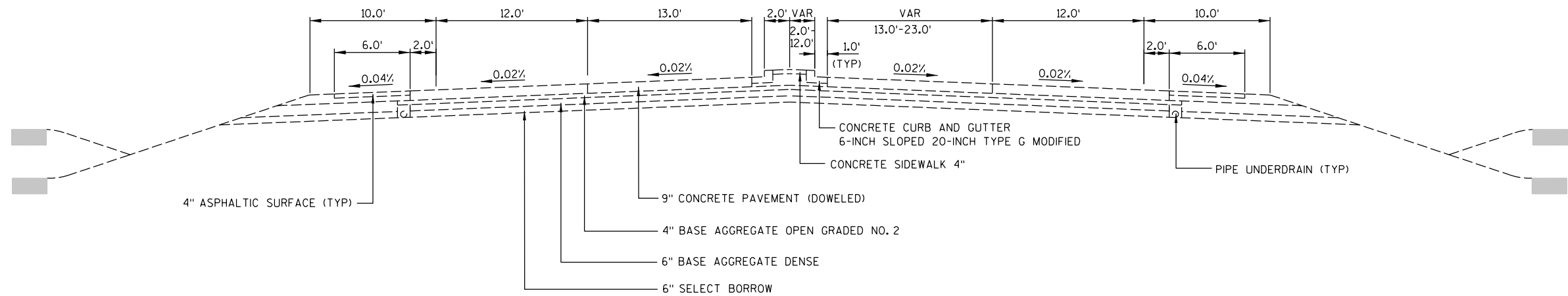
**TYPICAL EXISTING SECTION**

USH 2
STA 5+32 TO STA 15+10 *

**TYPICAL EXISTING SECTION**

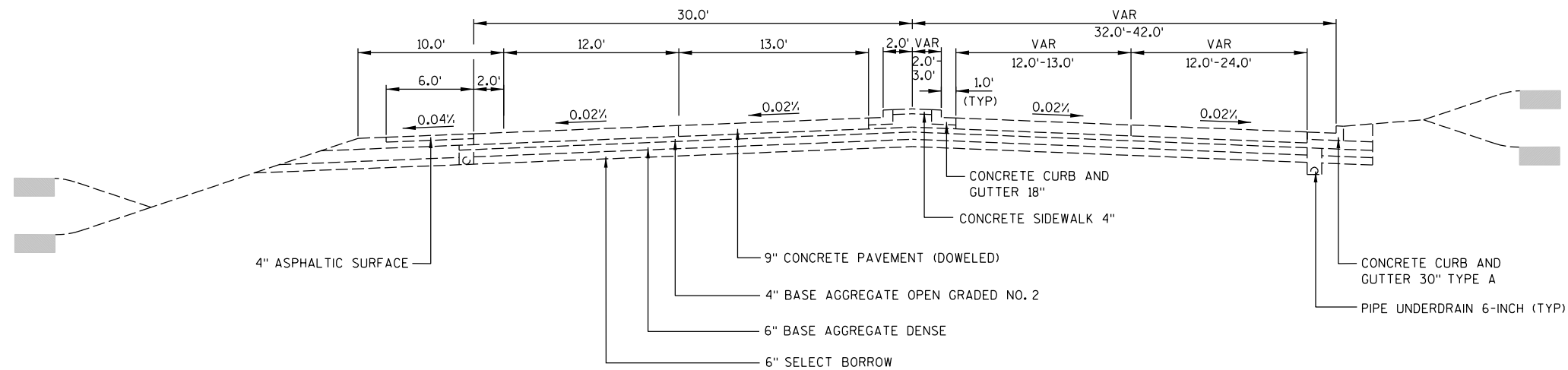
USH 2
STA 5+00 TO STA 5+32 *
STA 15+10 TO STA 18+10

*WORK ASSOCIATED WITH THE PIPE REPLACEMENTS FROM
STA 9+35 TO 10+75 AND STA 23+88 TO 31+45.
EXISTING TYPICALS AT OTHER LOCATIONS SHOWN FOR
INFORMATION ONLY FOR CONCRETE PAVEMENT REPAIR
DOWELED SPECIAL AND CONCRETE PAVEMENT REPLACEMENT
DOWELED SPECIAL AREAS.



TYPICAL EXISTING SECTION

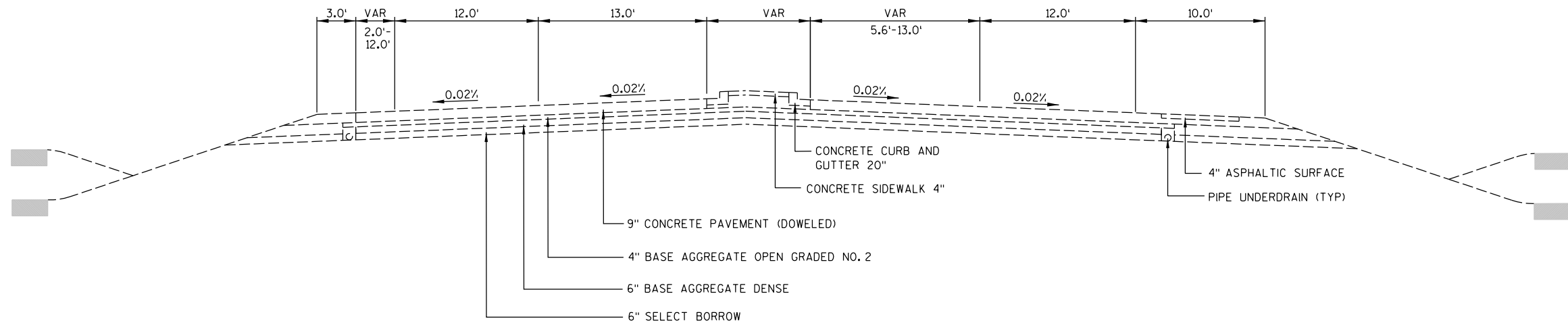
USH 2
STA 25+00 TO STA 33+03 *



TYPICAL EXISTING SECTION

USH 2
STA 18+10 TO STA 25+00 *

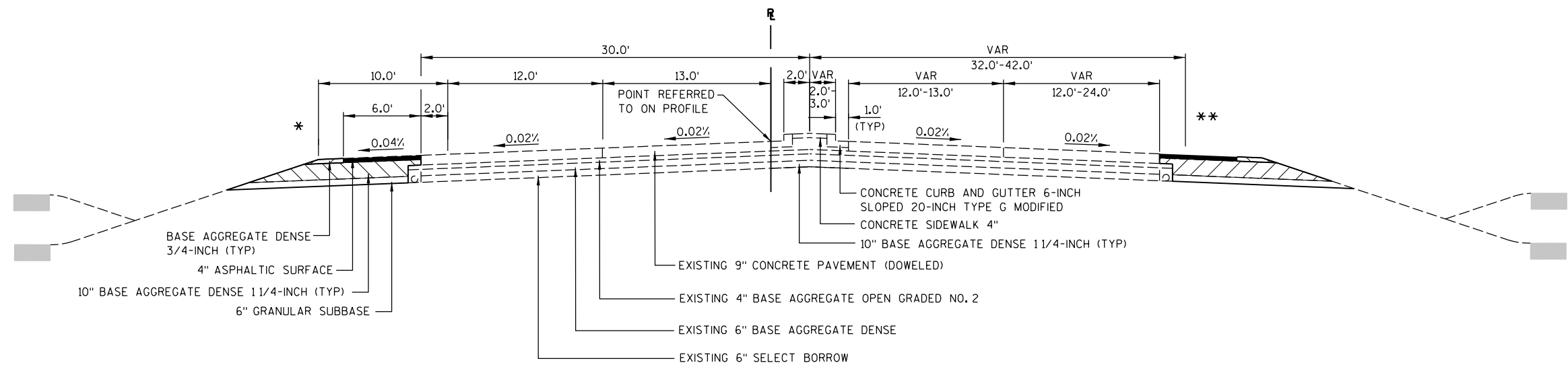
*WORK ASSOCIATED WITH THE PIPE REPLACEMENTS FROM
STA 9+35 TO 10+75 AND STA 23+88 TO 31+45.
EXISTING TYPICALS AT OTHER LOCATIONS SHOWN FOR
INFORMATION ONLY FOR CONCRETE PAVEMENT REPAIR
DOWELED SPECIAL AND CONCRETE PAVEMENT REPLACEMENT
DOWELED SPECIAL AREAS.



TYPICAL EXISTING SECTION

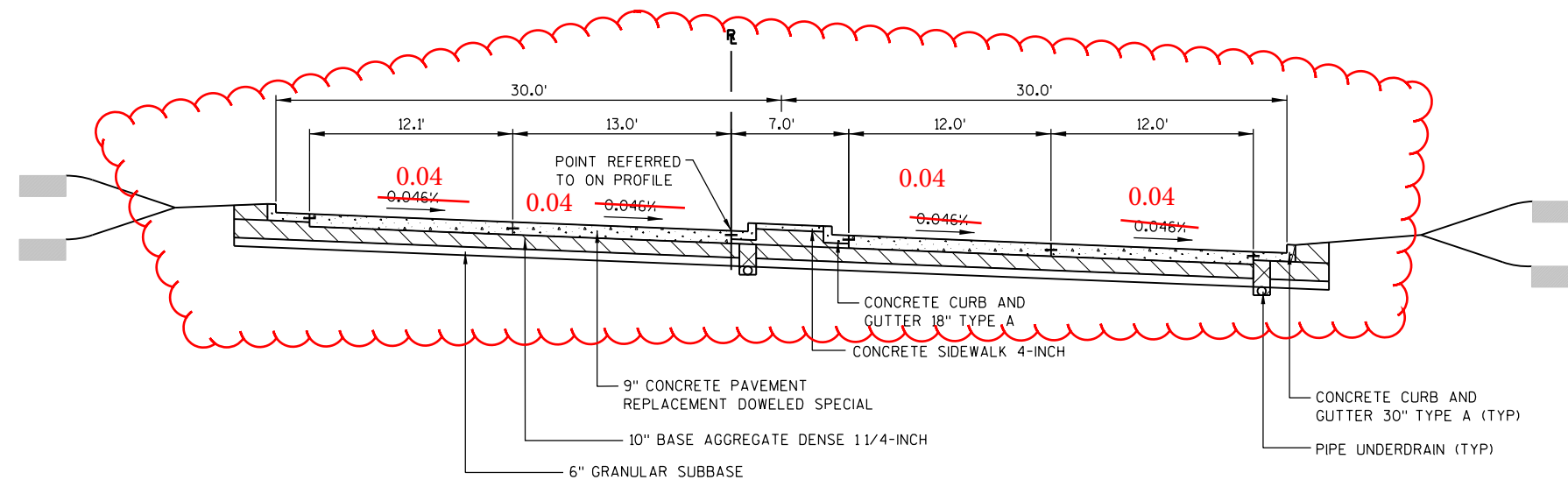
USH 2
STA 33+03 TO STA 40+00 *

*WORK ASSOCIATED WITH THE PIPE REPLACEMENTS FROM
STA 9+35 TO 10+75 AND STA 23+88 TO 31+45.
EXISTING TYPICALS AT OTHER LOCATIONS SHOWN FOR
INFORMATION ONLY FOR CONCRETE PAVEMENT REPAIR
DOWELED SPECIAL AND CONCRETE PAVEMENT REPLACEMENT
DOWELED SPECIAL AREAS.



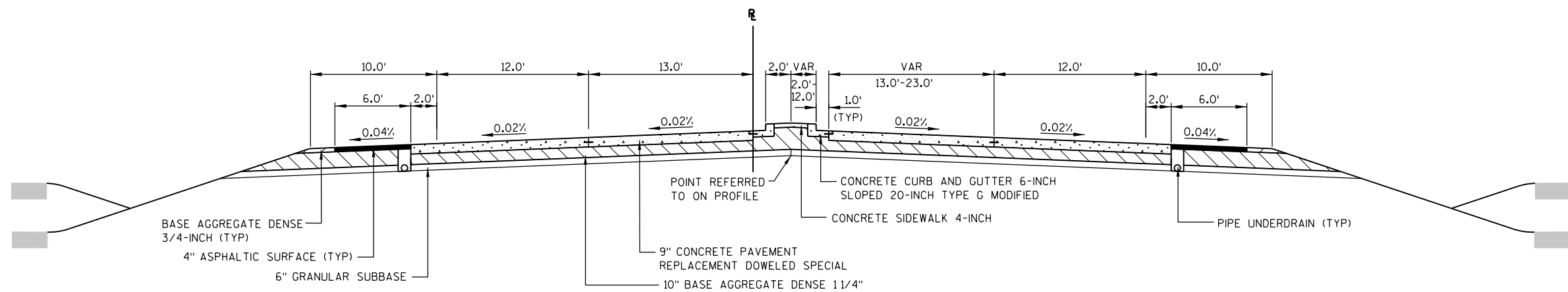
TYPICAL FINISHED SECTION

USH 2
* STA 23+87.62 TO STA 25+10, STA 26+65 TO STA 29+50
** STA 25+15.47 TO STA 25+10, STA 26+65 TO STA 31+45.10



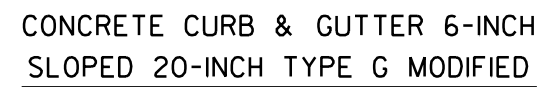
TYPICAL FINISHED SECTION

USH 2
STA 9+35 TO STA 10+75



TYPICAL FINISHED SECTION

USH 2
STA 25+10 TO STA 26+65



EAST & WEST INLET WINGWALL ANGLE DETAILS

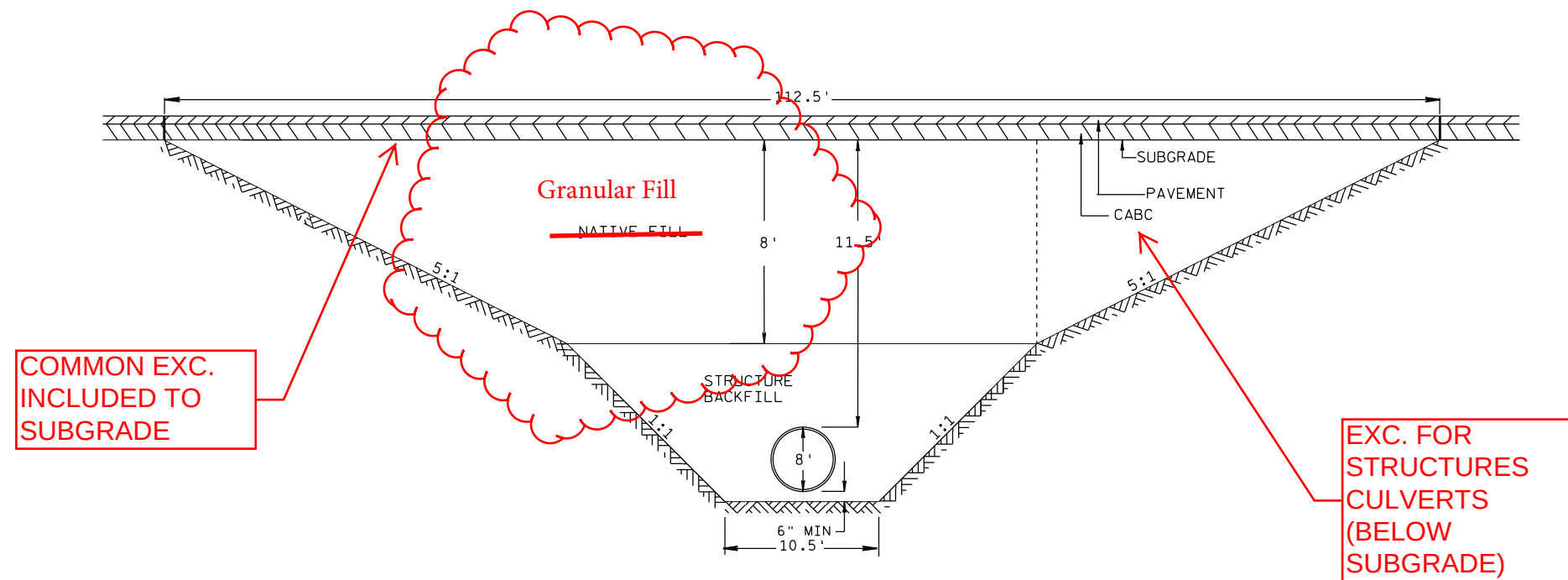
Side	Horizontal Distance (ft)
WEST	16.0'
EAST	19.0'



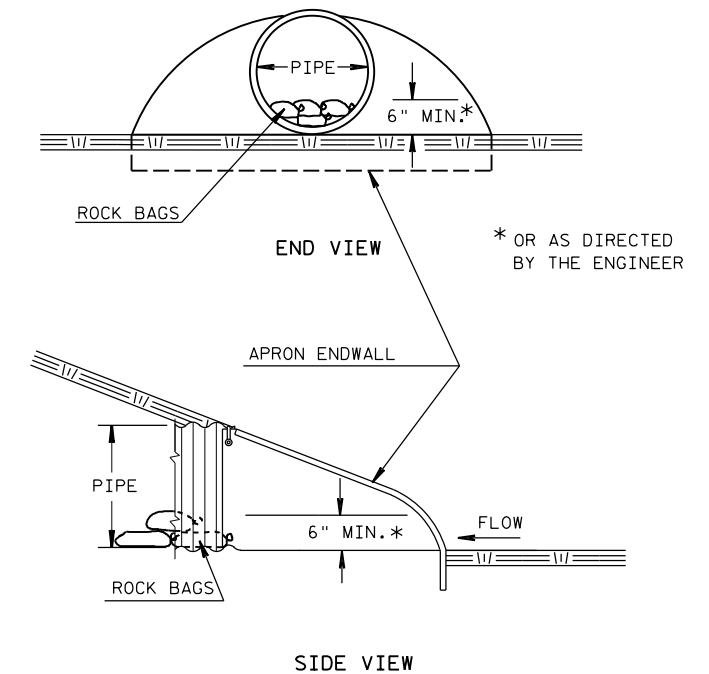
Diagram illustrating the exterior side of a culvert pipe. The diagram shows a cross-section of the pipe with a width of 8" +/- 1" (TYPICAL). The height of the pipe is 1 1/2" (+/- 1/4"). The diagram also shows the reinforcement details, including the exterior side of the culvert pipe.

CULVERT INTERIOR SURFACE RAKE DETAIL

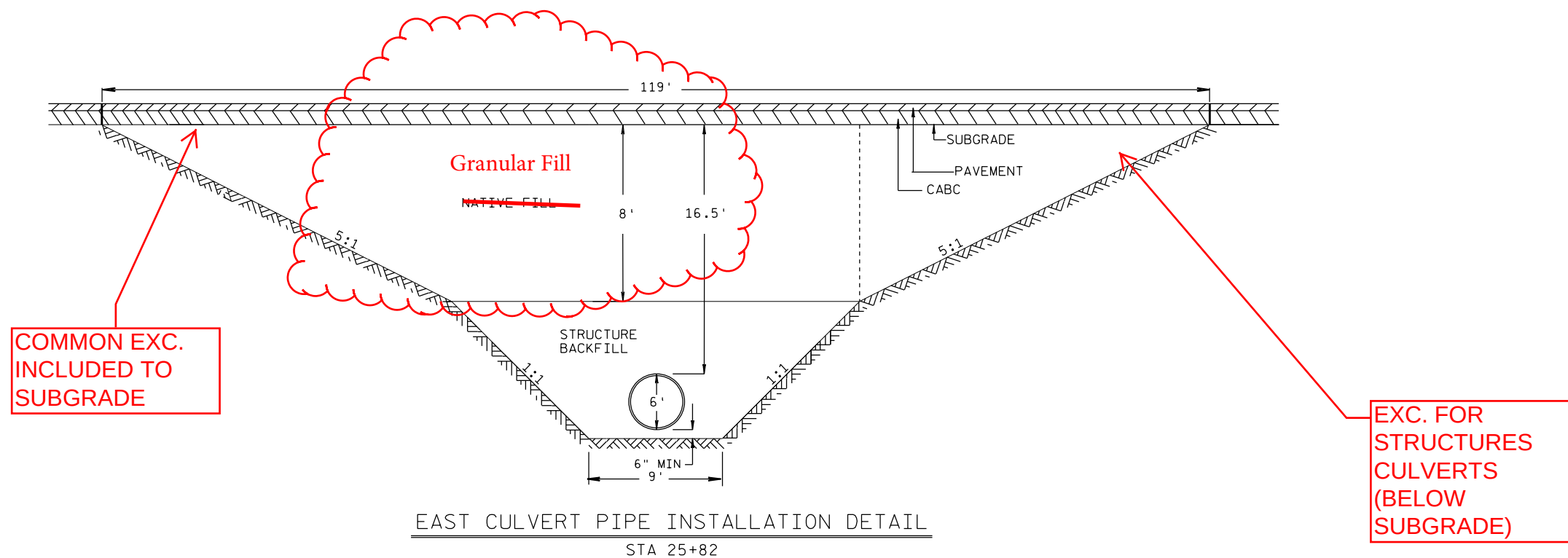
TO BE DONE TO INTERIOR SURFACE OF PIPE UPON MANUFACTURE



WEST CULVERT PIPE INSTALLATION DETAIL
STA 10+00



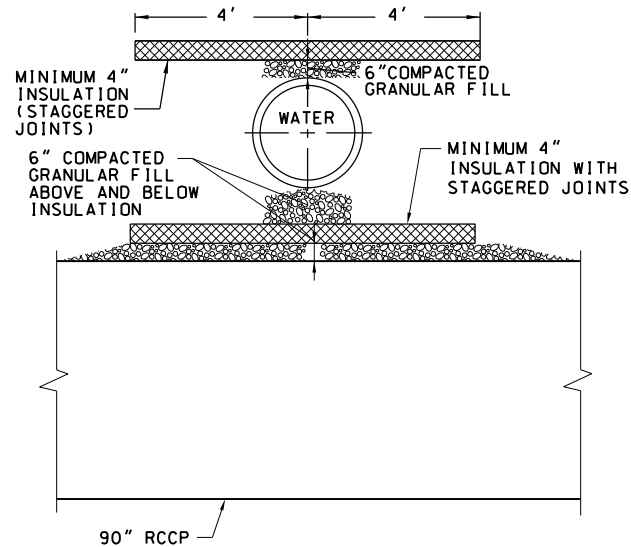
CULVERT PIPE CHECKS



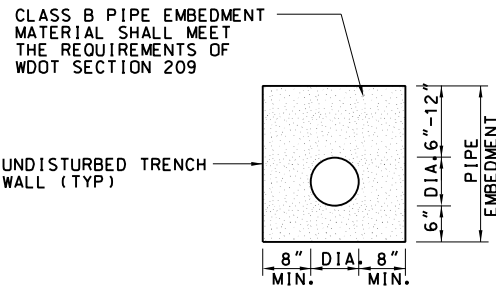
EAST CULVERT PIPE INSTALLATION DETAIL
STA 25+82

2

NOTES:
DIMENSIONS OF
INSULATION REQUIRED
SHOWN ON PLANS.
INSTALL INSULATION ABOVE
WATER MAIN WHERE BURY
DEPTH IS LESS THAN
8.0' FINISHED GRADE
TO TOP OF WATER MAIN.

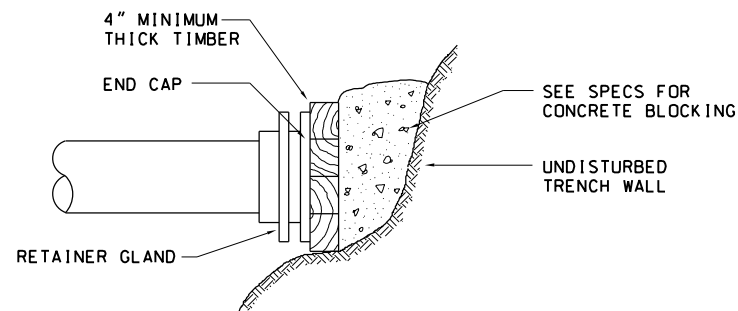


INSULATE WATER MAIN AT CULVERT CROSSING

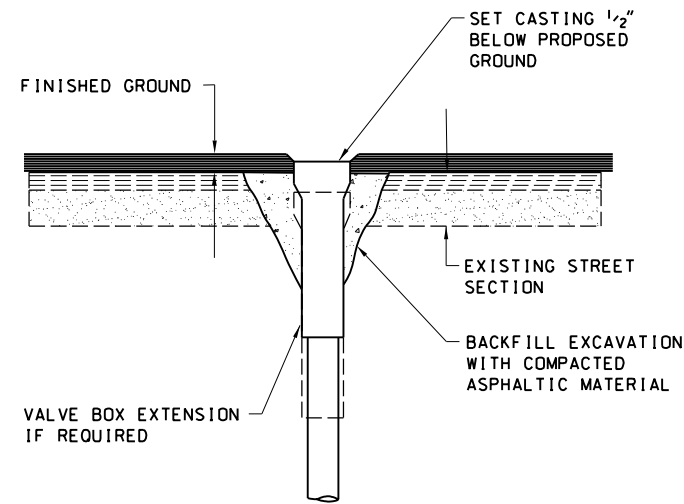


NOTE: CLASS B PIPE EMBEDMENT SHALL BE INCIDENTAL TO ALL PIPE INSTALLATION

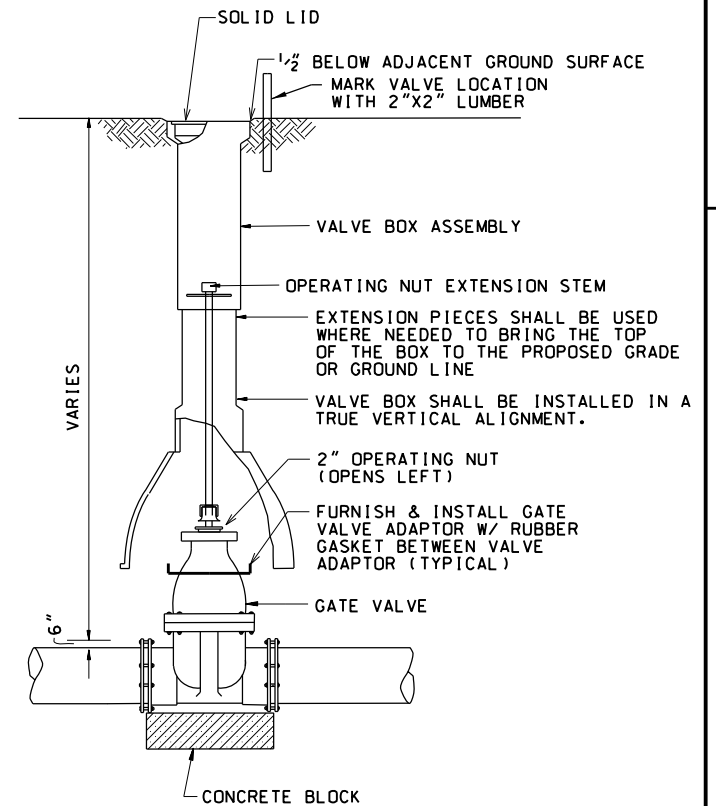
CLASS B PIPE EMBEDMENT



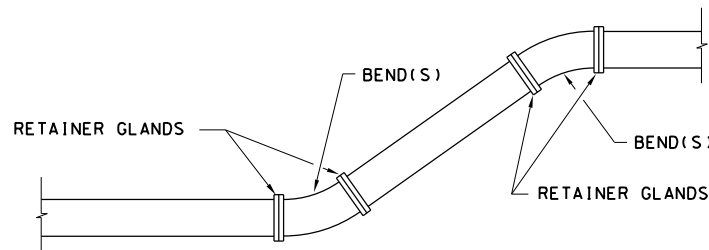
DEAD END BLOCKING



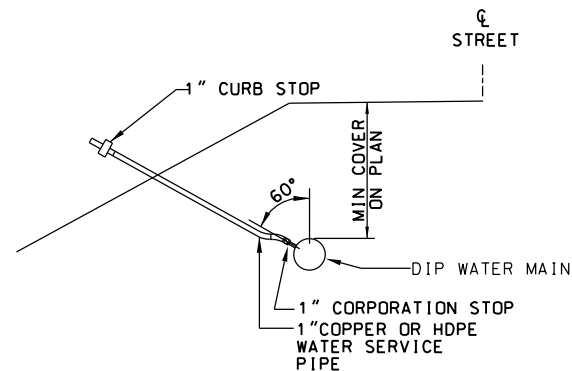
VALVE BOX ADJUSTMENT



GATE VALVE & BOX



JOINT RESTRAINT DETAIL



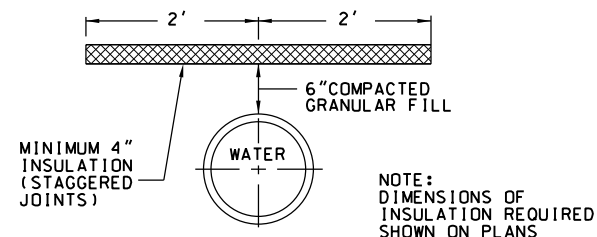
TEMPORARY WATER SERVICE CONNECTION

PROVIDE ALL REQUIRED WATER SERVICE MATERIALS FOR TESTING AND FLUSHING OF WATER MAIN. FILL MAIN FROM OPPOSITE END.

ONCE ALL TESTING AND FLUSHING IS COMPLETE REMOVE 1" WATER SERVICE PIPE TO CORPORATION AND TURN CORPORATION OFF.

ALL REQUIRED MATERIALS, REMOVALS, AND LABOR TO COMPLETE REQUIRED TESTS ARE CONSIDERED INCIDENTAL TO FLUSHING AND TESTING MAIN.

FLUSHING AND TESTING MAIN



INSULATE WATER MAIN

TEMPORARY PAVEMENT MARKING

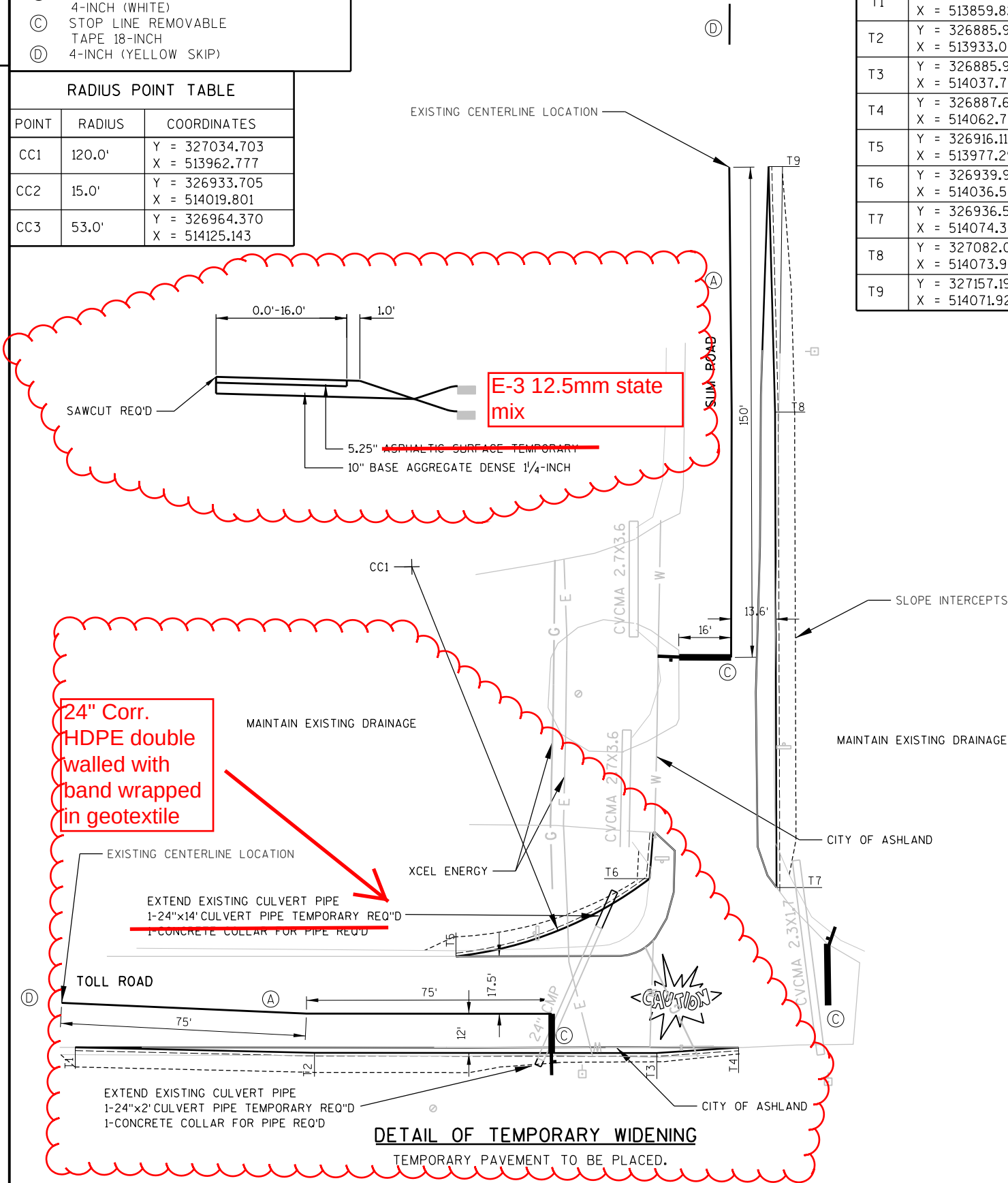
- (A) REMOVABLE TAPE 4-INCH (DOUBLE YELLOW)
- (B) REMOVABLE TAPE 4-INCH (WHITE)
- (C) STOP LINE REMOVABLE TAPE 18-INCH
- (D) 4-INCH (YELLOW SKIP)

RADIUS POINT TABLE

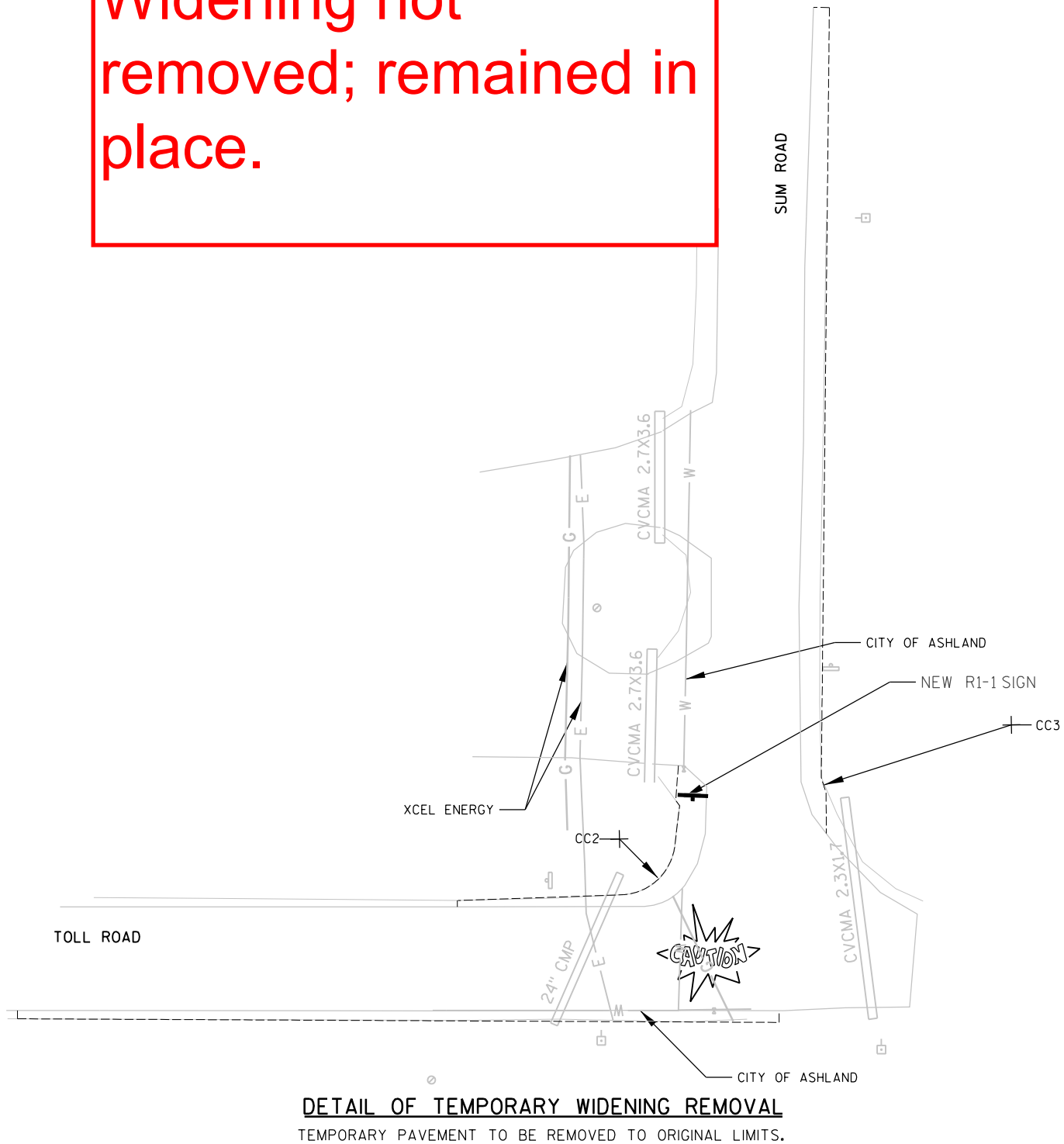
POINT	RADIUS	COORDINATES
CC1	120.0'	Y = 327034.703 X = 513962.777
CC2	15.0'	Y = 326933.705 X = 514019.801
CC3	53.0'	Y = 326964.370 X = 514125.143

TAPER POINT TABLE

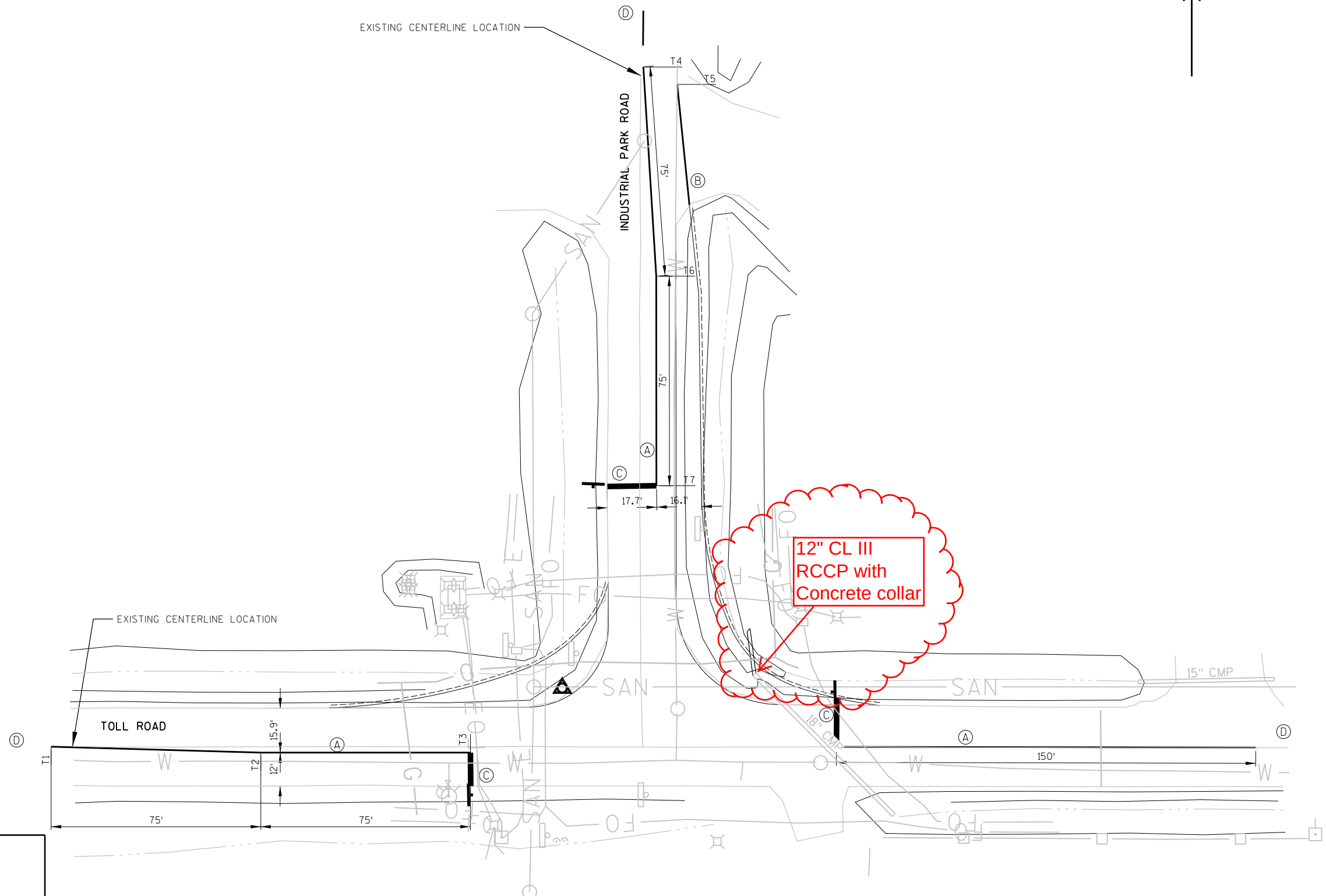
POINT	COORDINATES
T1	Y = 326887.645 X = 513859.822
T2	Y = 326885.992 X = 513933.008
T3	Y = 326885.902 X = 514037.727
T4	Y = 326887.610 X = 514062.736
T5	Y = 326916.117 X = 513977.296
T6	Y = 326939.945 X = 514036.583
T7	Y = 326936.528 X = 514074.387
T8	Y = 327082.014 X = 514073.909
T9	Y = 327157.191 X = 514071.926



Widening not removed; remained in place.



TAPER POINT TABLE	
POINT	COORDINATES
T1	Y = 326903.477 X = 512530.149
T2	Y = 326901.376 X = 512605.149
T3	Y = 326901.350 X = 512680.149
T4	Y = 327146.639 X = 512741.993
T5	Y = 327140.391 X = 512754.083
T6	Y = 327071.828 X = 512746.584
T7	Y = 326996.828 X = 512746.681



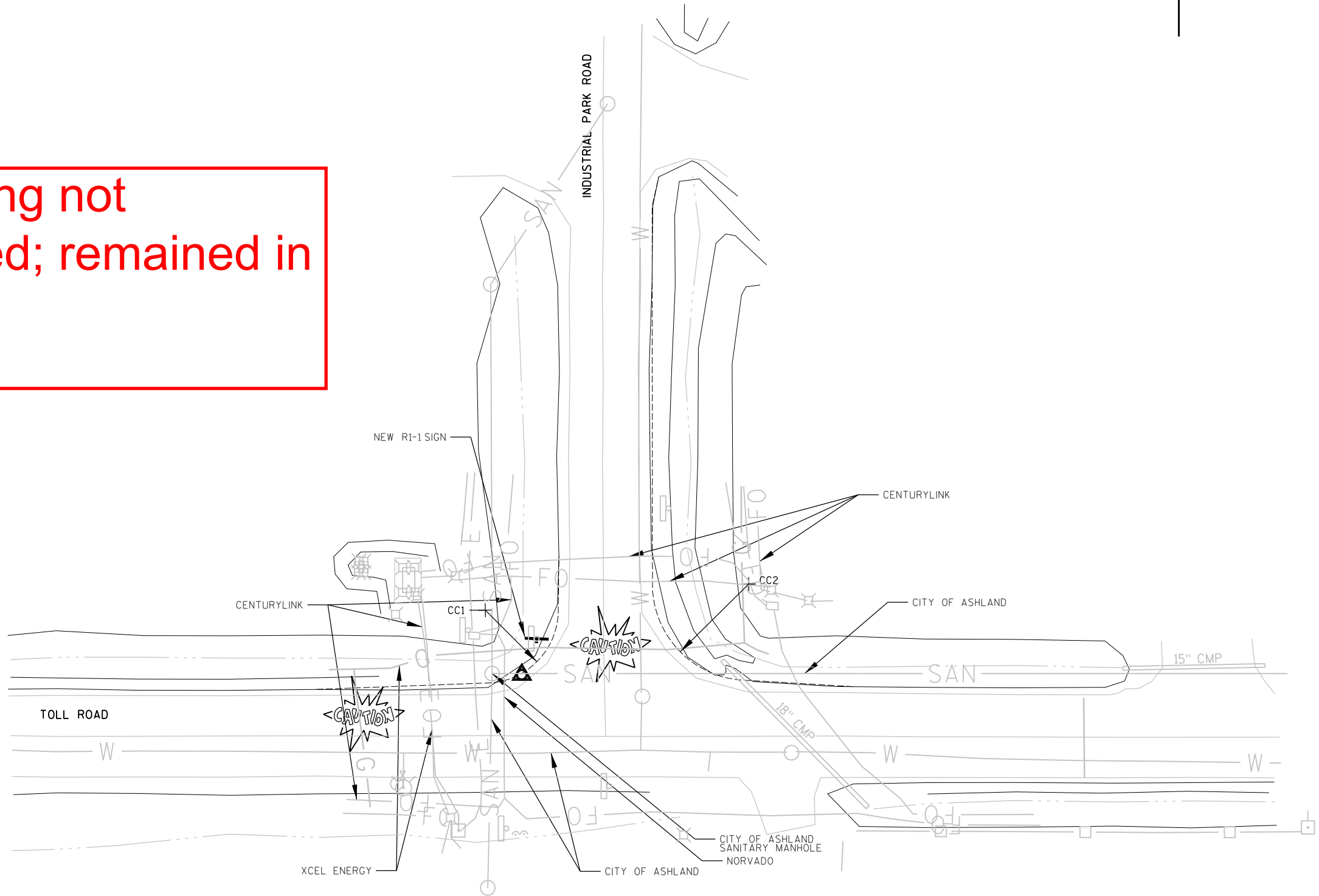
TEMPORARY PAVEMENT MARKING

- (A) REMOVABLE TAPE 4-INCH (DOUBLE YELLOW)
- (B) REMOVABLE TAPE 4-INCH (WHITE)
- (C) STOP LINE REMOVABLE TAPE 18-INCH
- (D) 4-INCH (YELLOW SKIP)

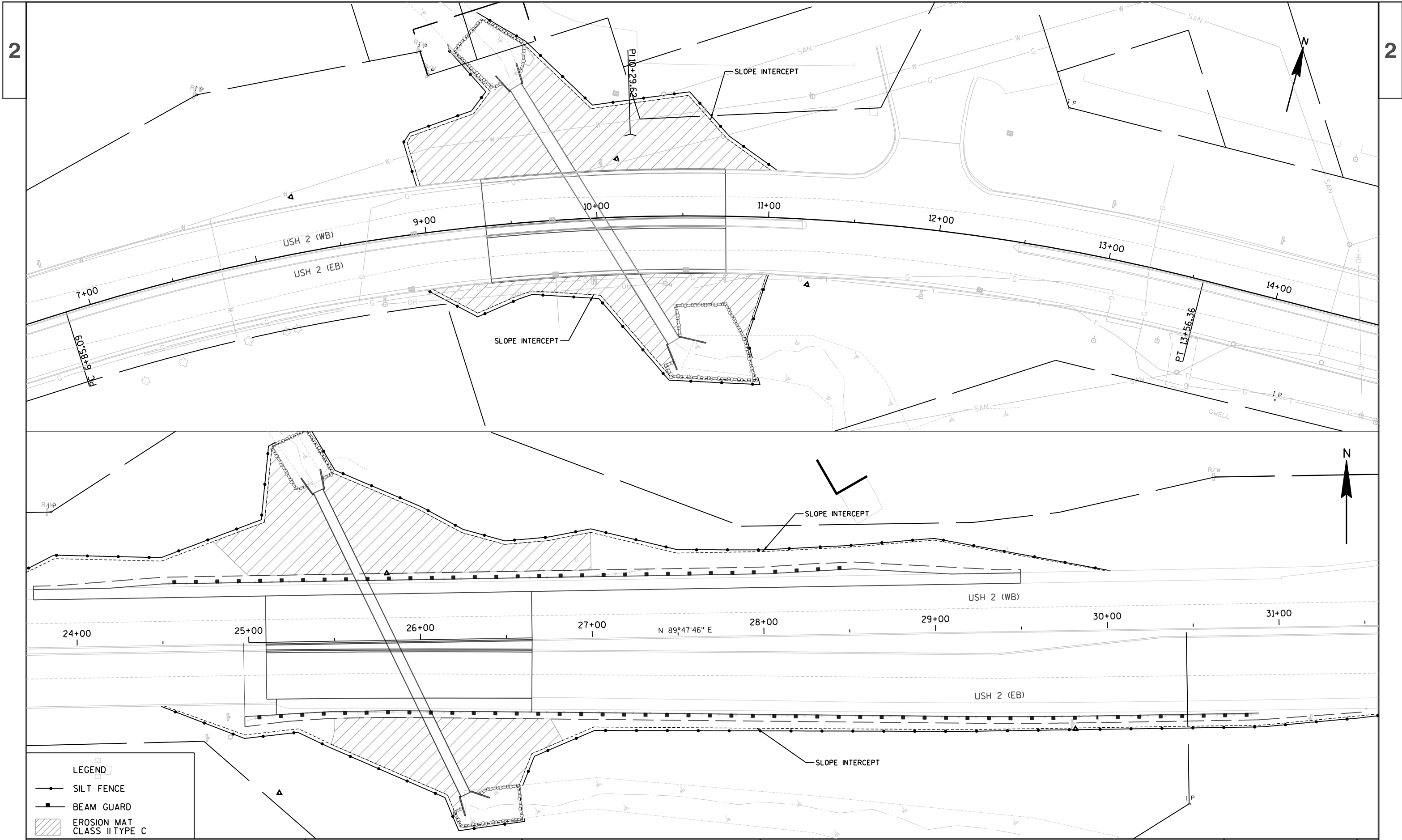
DETAIL OF TEMPORARY WIDENING
TEMPORARY PAVEMENT MARKING TO BE MODIFIED.

RADIUS POINT TABLE		
POINT	RADIUS	COORDINATES
CC1	25.0'	Y = 326946.612 X = 512700.477
CC2	33.0'	Y = 326955.541 X = 512790.753

Widening not removed; remained in place.



DETAIL OF TEMPORARY WIDENING REMOVAL
TEMPORARY PAVEMENT TO BE REMOVED TO ORIGINAL LIMITS.



BENCHMARK TABLE				
NO	STATION		DESCRIPTION	ELEV
BM 1	4+92.80	50.62' RT	TOP NUT OF HYDRANT SOUTHEAST QUADRANT OF USH 2 AND 29TH AVE	630.146

UNNAMED TRIBUTARY

NOTE: FIELD VERIFY WATER MAIN VERTICAL AND HORIZONTAL LOCATION.
FIELD VERIFY WATER SERVICE LOCATIONS.

CUT INTO & CONNECT TO EXISTING WATER MAIN, INSTALL 8-INCH GATE VALVES, AND AN ADEQUATE LENGTH OF PIPE, PLUG, AND THRUST BLOCK AGAINST NATIVE SOIL TO PERMIT WATER TO BE TURNED ON ONCE VALVE AND PIPE ARE BACKFILLED. MAINTAIN WATER SERVICE AT ALL TIMES DURING CULVERT CONSTRUCTION.

ONCE CULVERT INSTALLATION IS COMPLETE INSTALL REMAINING 8-INCH
WATER MAIN AND PERFORM REQUIRED TESTS PRIOR TO PLACING
WATER MAIN INTO SERVICE.

STA 10+50.00, 59.6' LT
1-CUT INTO & CONNECT TO
EXISTING WATER MAIN
1-8" GV & BOX
FIELD VERIFY EXISTING WATER
MAIN ELEVATION AT CONNECTION
TO INSURE WATER MAIN
INSTALLATION WILL NOT RESULT
IN A HIGH POINT

~~INSTALL TEMPORARY WATER SERVICE FOR FLUSHING AND TESTING~~

— SLOPE INTERCEPTS

BEGIN RECONSTRUCTION

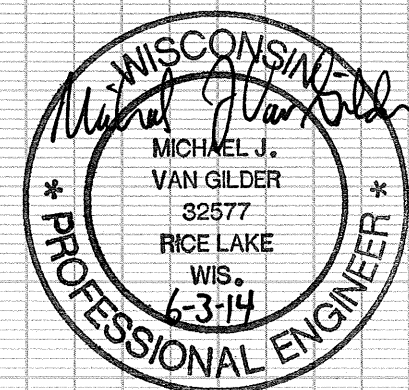
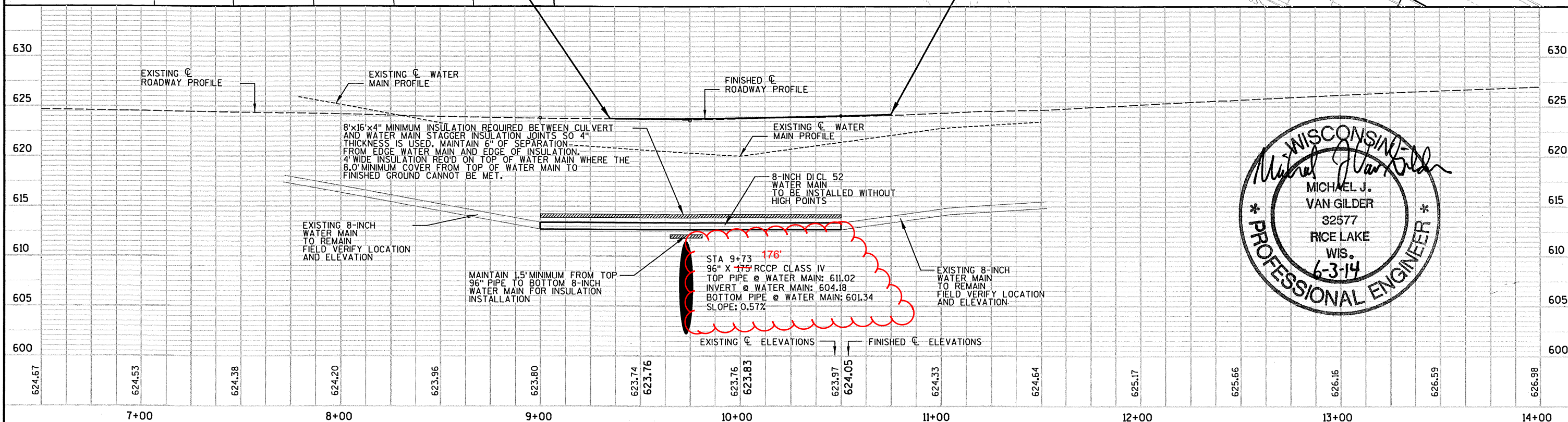
~~STA 9+35.00~~
MATCH EXISTING
SAWCUT REQ'D

STA 9+23

~~END RECONSTRUCTION~~

~~STA 10+75.00~~
MATCH EXISTING
SAWCUT REQ'D

STA 10+00



PROJECT NO: 1181-11-70

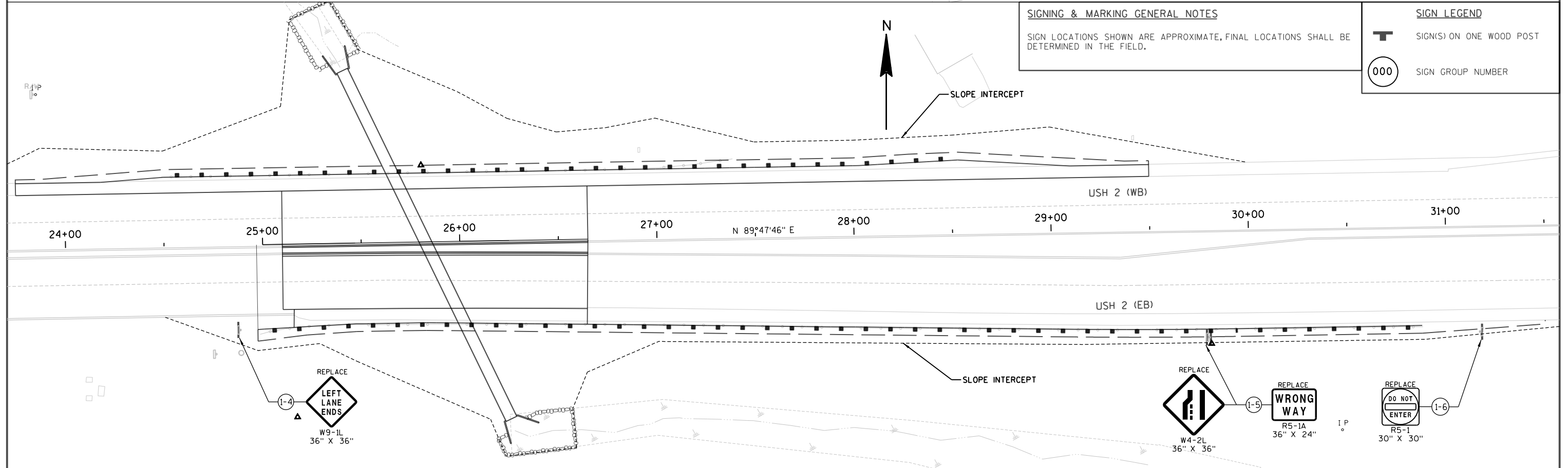
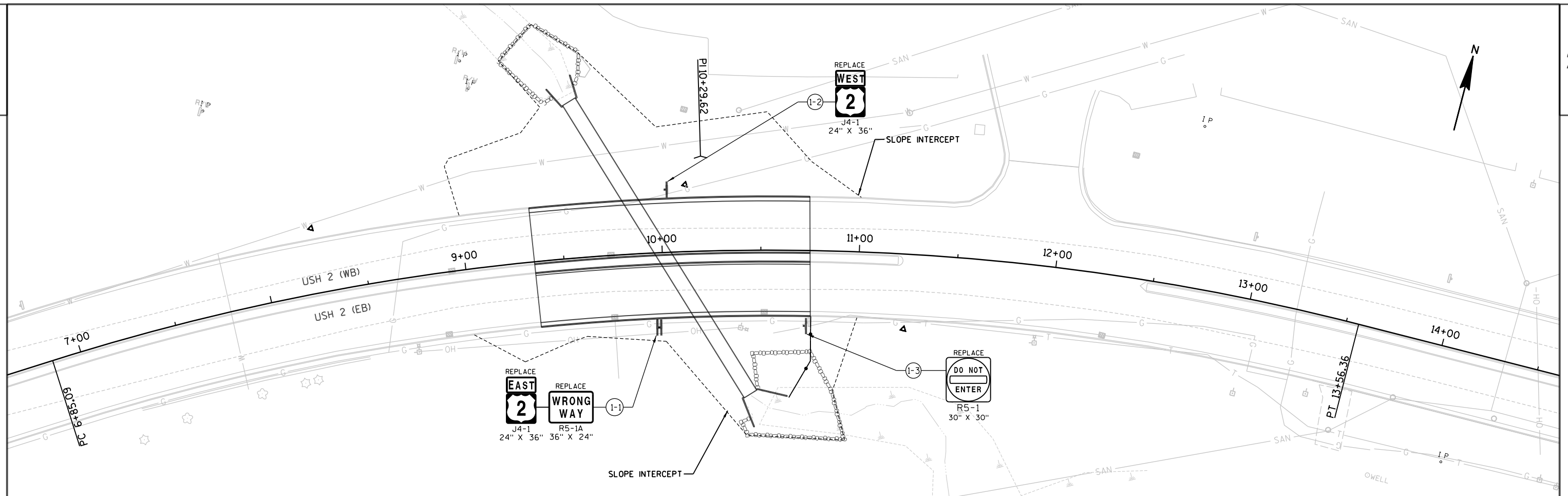
HWY: USH 2

COUNTY: ASHLAND

WATER MAIN PLAN

SHEET

IF



PROJECT NO: 1181-11-70

HWY: USH 2

COUNTY: ASHLAND

PERMANENT SIGNING

SHEET

E

FILE NAME : P:\UZ\W\W1\tnw\121895\5-final-dsgn\51-drawings\40-TransHwy\023201-ps.dgn

PLOT TIME : 11:19:09 AM

PLOT DATE : 1/30/2014

PLOT BY : SEH

PLOT NAME :

PLOT SCALE : N/A

WISDOT/CADDs SHEET 42

NO	STATION	DESCRIPTION	ELEV
BM 1	4+92.80 50.62'RT	TOP NUT. OF HYDRANT SOUTHEAST QUADRANT OF USH 2 AND 29TH AVE	630.146



E

NOTE

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS ARE APPROXIMATE AND SHALL BE ADJUSTED TO FIT FIELD CONDITIONS

DURING HOURS OF DARKNESS ALL BARRICADES USED TO SHIELD A HAZARD SHALL BE EQUIPPED WITH WARNING LIGHTS, TYPE A.

ALL SIGNS ARE TYPE 2 UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AT ALL TIMES DURING CONSTRUCTION.

ALL SIGNS OR PAVEMENT MARKINGS, TEMPORARY OR EXISTING, THAT MAY CONFLICT WITH THE CONSTRUCTION TRAFFIC PATTERN SHALL BE REMOVED OR COVERED.

ALL SIGNS SHALL BE FURNISHED BY THE CONTRACTOR

ALL TRAFFIC CONTROL DEVICES SHALL BE CONFORMANCE WITH THE "WISCONSIN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES"(WMTCD) AND STANDARD DETAIL DRAWINGS.

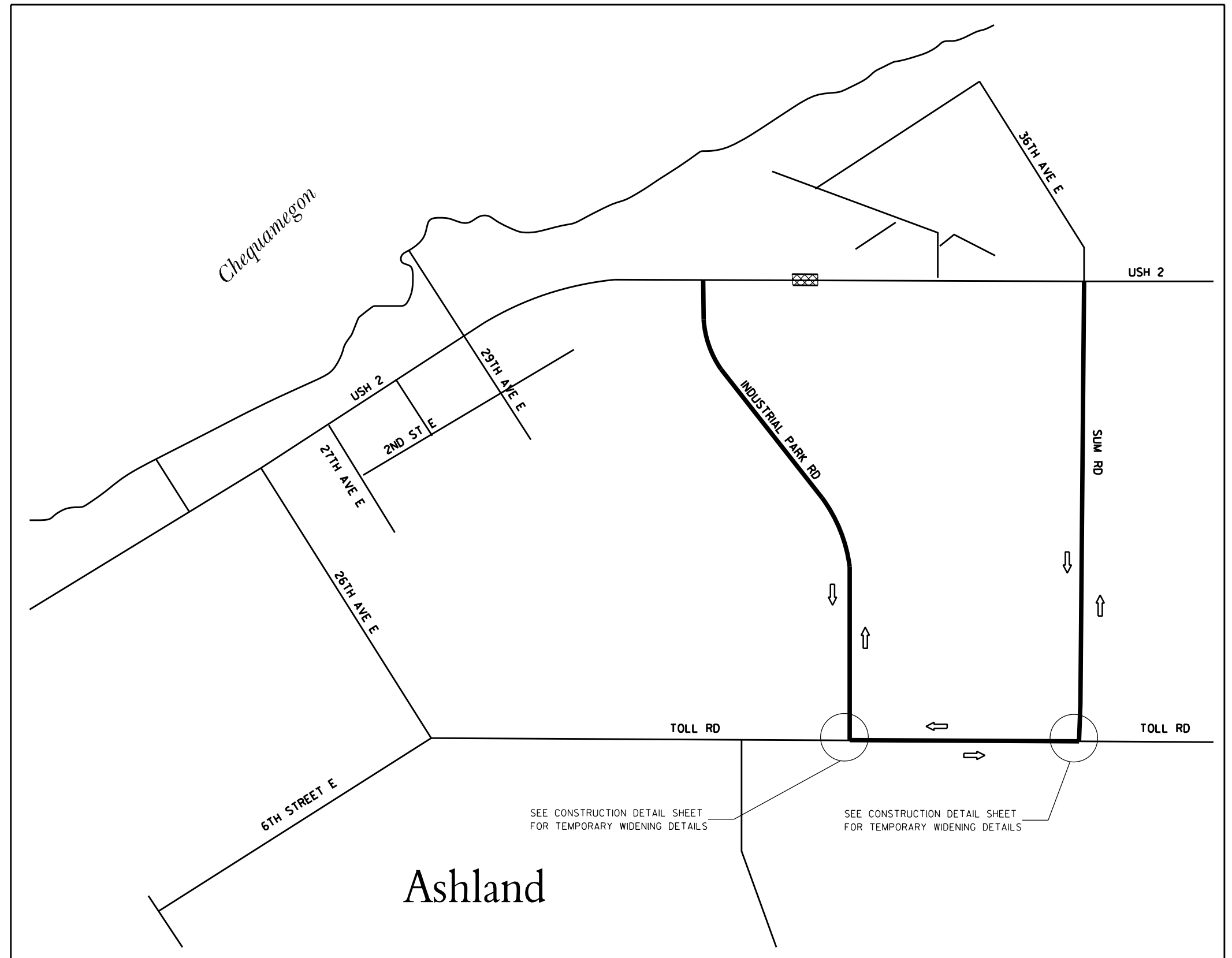
ALL SIDEROAD INTERSECTIONS WITHIN THE PROJECT LIMITS SHALL BE CLOSED AND SIGNED IN ACCORDANCE WITH DETAIL 4 OF THE SDD "BARRICADES AND SIGNS FOR SIDEROAD CLOSURE"

TYPICAL SIGN SPACING, SIGN CODES, SIGN SIZES AND ADDITIONAL GENERAL NOTES SHALL BE IN ACCORDANCE WITH SDD'S "BARRICADES AND SIGNS FOR MAINLINE CLOSURES" AND BARRICADES AND SIGNS FOR SIDEROAD CLOSURES".

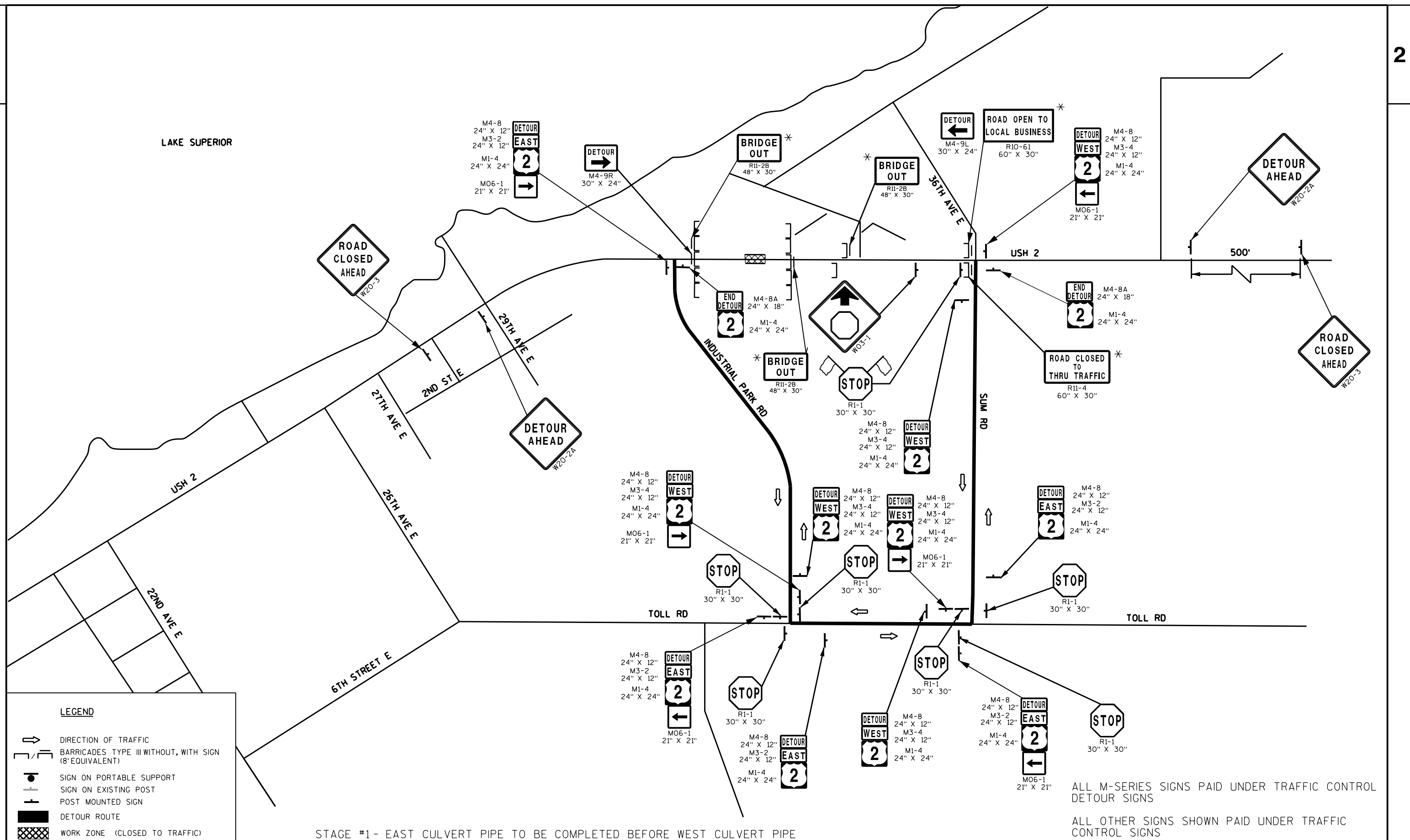
A 200' SPACING BETWEEN SIGN LOCATIONS SHALL BE MAINTAINED WHEREVER CONDITIONS ALLOW.

LEGEND

-  DIRECTION OF TRAFFIC
-  BARRICADES TYPE III WITHOUT, WITH SIGN (8' EQUIVALENT)
-  SIGN ON PORTABLE SUPPORT
-  SIGN ON EXISTING POST
-  POST MOUNTED SIGN
-  DETOUR ROUTE
-  WORK ZONE (CLOSED TO TRAFFIC)



STAGE #1 - EAST CULVERT PIPE TO BE COMPLETED BEFORE WEST CULVERT PIPE



NOTE

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS ARE APPROXIMATE AND SHALL BE ADJUSTED TO FIT FIELD CONDITIONS

DURING HOURS OF DARKNESS ALL BARRICADES USED TO SHIELD A HAZARD SHALL BE EQUIPPED WITH WARNING LIGHTS, TYPE A.

ALL SIGNS ARE TYPE 2 UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AT ALL TIMES DURING CONSTRUCTION.

ALL SIGNS OR PAVEMENT MARKINGS, TEMPORARY OR EXISTING, THAT MAY CONFLICT WITH THE CONSTRUCTION TRAFFIC PATTERN SHALL BE REMOVED OR COVERED.

ALL SIGNS SHALL BE FURNISHED BY THE CONTRACTOR

ALL TRAFFIC CONTROL DEVICES SHALL BE CONFORMANCE WITH THE "WISCONSIN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES"(WMTCD) AND STANDARD DETAIL DRAWINGS.

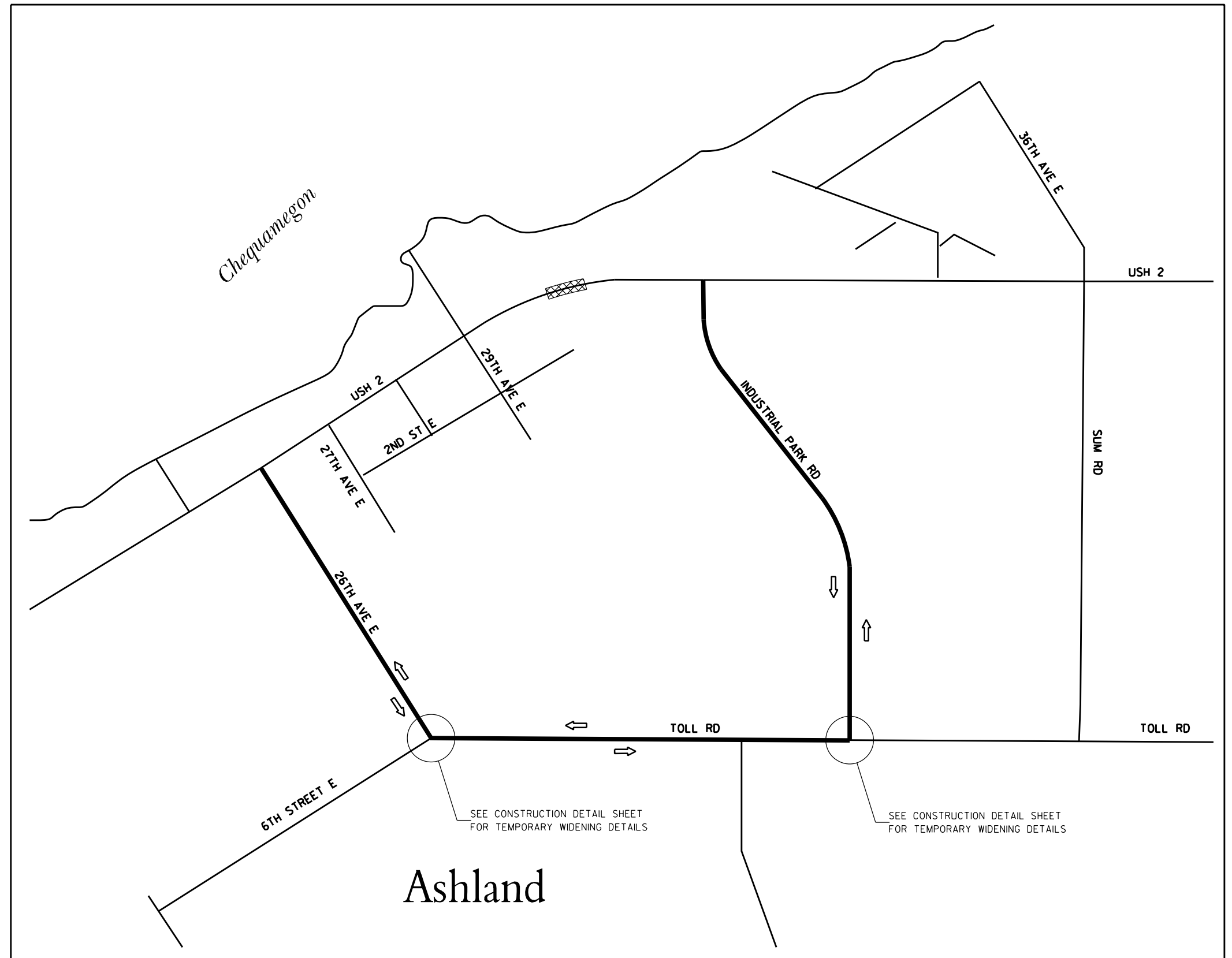
ALL SIDEROAD INTERSECTIONS WITHIN THE PROJECT LIMITS SHALL BE CLOSED AND SIGNED IN ACCORDANCE WITH DETAIL 4 OF THE SDD "BARRICADES AND SIGNS FOR SIDEROAD CLOSURE"

TYPICAL SIGN SPACING, SIGN CODES, SIGN SIZES AND ADDITIONAL GENERAL NOTES SHALL BE IN ACCORDANCE WITH SDD'S "BARRICADES AND SIGNS FOR MAINLINE CLOSURES" AND BARRICADES AND SIGNS FOR SIDEROAD CLOSURES".

A 200' SPACING BETWEEN SIGN LOCATIONS SHALL BE MAINTAINED WHEREVER CONDITIONS ALLOW.

LEGEND

-  DIRECTION OF TRAFFIC
-  BARRICADES TYPE III WITHOUT, WITH SIGN (8' EQUIVALENT)
-  SIGN ON PORTABLE SUPPORT
-  SIGN ON EXISTING POST
-  POST MOUNTED SIGN
-  DETOUR ROUTE
-  WORK ZONE (CLOSED TO TRAFFIC)



STAGE #2 - WEST CULVERT PIPE TO BE CONSTRUCTED AFTER EAST CULVERT PIPE IS COMPLETED

DATE 18AUG14		E S T I M A T E O F Q U A N T I T I E S			
LINE		1181-11-70			
NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	QUANTITY
0010	201.0105	CLEARING	STA	4.000	4.000
0020	201.0205	GRUBBING	STA	4.000	4.000
0030	203.0100	REMOVING SMALL PIPE CULVERTS	EACH	1.000	1.000
0040	203.0200	REMOVING OLD STRUCTURE (STATION) 01. STA 10+00	LS	1.000	1.000
0050	203.0200	REMOVING OLD STRUCTURE (STATION) 02. STA 25+82	LS	1.000	1.000
0060	204.0150	REMOVING CURB & GUTTER	LF	75.000	75.000
0070	204.0155	REMOVING CONCRETE SIDEWALK	SY	130.000	130.000
0080	204.0180	REMOVING DELINEATORS AND MARKERS	EACH	4.000	4.000
0090	204.0210	REMOVING MANHOLES	EACH	1.000	1.000
0100	205.0100	EXCAVATION COMMON	CY	3,700.000	3,700.000
0110	206.2000	EXCAVATION FOR STRUCTURES CULVERTS (STRUCTURE) 01. STA 10+00	LS	1.000	1.000
0120	206.2000	EXCAVATION FOR STRUCTURES CULVERTS (STRUCTURE) 02. STA 25+82	LS	1.000	1.000
0130	208.0100	BORROW	CY	145.000	145.000
0140	210.0100	BACKFILL STRUCTURE	CY	2,140.000	2,140.000
0150	211.0200	PREPARE FOUNDATION FOR CONCRETE PAVEMENT (PROJECT) 01. 1181-11-70	LS	1.000	1.000
0160	213.0100	FINISHING ROADWAY (PROJECT) 01. 1181-11-70	EACH	1.000	1.000
0170	305.0110	BASE AGGREGATE DENSE 3/4-INCH	TON	130.000	130.000
0180	305.0120	BASE AGGREGATE DENSE 1 1/4-INCH	TON	2,030.000	2,030.000
0190	350.0102	SUBBASE	CY	440.000	440.000
0200	416.0610	DRILLED TIE BARS	EACH	275.000	275.000
0210	416.0620	DRILLED DOWEL BARS	EACH	1,490.000	1,490.000
0220	440.4410.S	INCENTIVE IRI RIDE	DOL	450.000	450.000
0230	455.0605	TACK COAT	GAL	31.000	31.000
0240	465.0105	ASPHALTIC SURFACE	TON	145.000	145.000
0250	465.0110	ASPHALTIC SURFACE PATCHING	TON	10.000	10.000
0260	465.0125	ASPHALTIC SURFACE TEMPORARY	TON	167.000	167.000
0270	504.0900	CONCRETE MASONRY ENDWALLS	CY	25.000	25.000
0280	520.4018	CULVERT PIPE TEMPORARY 18-INCH	LF	16.000	16.000
0290	520.4024	CULVERT PIPE TEMPORARY 24-INCH	LF	16.000	16.000
0300	520.8000	CONCRETE COLLARS FOR PIPE	EACH	3.000	3.000
0310	522.0115	CULVERT PIPE REINFORCED CONCRETE CLASS III 15-INCH	LF	20.000	20.000
0320	522.0372	CULVERT PIPE REINFORCED CONCRETE CLASS IV 72-INCH	LF	196.000	196.000
0330	522.1015	APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 15-INCH	EACH	1.000	1.000
0340	524.0618	APRON ENDWALLS FOR CULVERT PIPE SALVAGED 18-INCH	EACH	1.000	1.000
0350	601.0405	CONCRETE CURB & GUTTER 18-INCH TYPE A	LF	280.000	280.000
0360	601.0409	CONCRETE CURB & GUTTER 30-INCH TYPE A	LF	280.000	280.000
0370	601.0411	CONCRETE CURB & GUTTER 30-INCH TYPE D	LF	72.000	72.000
0380	602.0405	CONCRETE SIDEWALK 4-INCH	SF	1,120.000	1,120.000
0390	606.0300	RIPRAP HEAVY	CY	390.000	390.000
0400	608.0318	STORM SEWER PIPE REINFORCED CONCRETE CLASS III 18-INCH	LF	34.000	34.000
0410	611.0430	RECONSTRUCTING INLETS	EACH	8.000	8.000
0420	611.3230	INLETS 2X3-FT	EACH	2.000	2.000
0430	611.9710	SALVAGED INLET COVERS	EACH	2.000	2.000
0440	612.0106	PIPE UNDERDRAIN 6-INCH	LF	240.000	240.000

DATE 18AUG14		E S T I M A T E O F Q U A N T I T I E S			
LINE					1181-11-70
NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	QUANTITY
0450	612.0902.S	INSULATION BOARD POLYSTYRENE (INCH) 01. 4-INCH	SY	85.000	85.000
0460	614.0920	SALVAGED RAIL	LF	860.000	860.000
0470	614.2300	MGS GUARDRAIL 3	LF	887.500	887.500
0480	614.2610	MGS GUARDRAIL TERMINAL EAT	EACH	2.000	2.000
0490	614.2620	MGS GUARDRAIL TERMINAL TYPE 2	EACH	2.000	2.000
0500	618.0100	MAINTENANCE AND REPAIR OF HAUL ROADS (PROJECT) 01. 1181-11-70	EACH	1.000	1.000
0510	619.1000	MOBILIZATION	EACH	1.000	1.000
0520	625.0500	SALVAGED TOPSOIL	SY	3,785.000	3,785.000
0530	627.0200	MULCHING	SY	3,785.000	3,785.000
0540	628.1504	SILT FENCE	LF	3,130.000	3,130.000
0550	628.1520	SILT FENCE MAINTENANCE	LF	5,280.000	5,280.000
0560	628.1905	MOBILIZATIONS EROSION CONTROL	EACH	2.000	2.000
0570	628.1910	MOBILIZATIONS EMERGENCY EROSION CONTROL	EACH	2.000	2.000
0580	628.2027	EROSION MAT CLASS II TYPE C	SY	2,675.000	2,675.000
0590	628.7005	INLET PROTECTION TYPE A	EACH	10.000	10.000
0600	628.7015	INLET PROTECTION TYPE C	EACH	10.000	10.000
0610	628.7555	CULVERT PIPE CHECKS	EACH	8.000	8.000
0620	629.0210	FERTILIZER TYPE B	CWT	2.400	2.400
0630	630.0120	SEEDING MIXTURE NO. 20	LB	103.000	103.000
0640	630.0200	SEEDING TEMPORARY	LB	103.000	103.000
0650	633.5200	MARKERS CULVERT END	EACH	6.000	6.000
0660	634.0616	POSTS WOOD 4X6-INCH X 16-FT	EACH	8.000	8.000
0670	637.2210	SIGNS TYPE II REFLECTIVE H	SF	46.860	46.860
0680	637.2230	SIGNS TYPE II REFLECTIVE F	SF	18.000	18.000
0690	638.2602	REMOVING SIGNS TYPE II	EACH	12.000	12.000
0700	638.3000	REMOVING SMALL SIGN SUPPORTS	EACH	8.000	8.000
0710	642.5001	FIELD OFFICE TYPE B	EACH	1.000	1.000
0720	643.0100	TRAFFIC CONTROL (PROJECT) 01. 1181-11-70	EACH	1.000	1.000
0730	643.0300	TRAFFIC CONTROL DRUMS	DAY	1,640.000	1,640.000
0740	643.0420	TRAFFIC CONTROL BARRICADES TYPE III	DAY	1,272.000	1,272.000
0750	643.0705	TRAFFIC CONTROL WARNING LIGHTS TYPE A	DAY	2,544.000	2,544.000
0760	643.0715	TRAFFIC CONTROL WARNING LIGHTS TYPE C	DAY	656.000	656.000
0770	643.0900	TRAFFIC CONTROL SIGNS	DAY	1,456.000	1,456.000
0780	643.1050	TRAFFIC CONTROL SIGNS PCMS	DAY	164.000	164.000
0790	643.2000	TRAFFIC CONTROL DETOUR (PROJECT) 01. 1181-11-70	EACH	1.000	1.000
0800	643.3000	TRAFFIC CONTROL DETOUR SIGNS	DAY	3,690.000	3,690.000
0810	645.0120	GEOTEXTILE FABRIC TYPE HR	SY	470.000	470.000
0820	646.0106	PAVEMENT MARKING EPOXY 4-INCH	LF	1,566.000	1,566.000
0830	646.0600	REMOVING PAVEMENT MARKINGS	LF	2,012.000	2,012.000
0840	647.0166	PAVEMENT MARKING ARROWS EPOXY TYPE 2	EACH	6.000	6.000
0850	647.0566	PAVEMENT MARKING STOP LINE EPOXY 18-INCH	LF	16.000	16.000
0860	647.0955	REMOVING PAVEMENT MARKINGS ARROWS	EACH	6.000	6.000
0870	649.0100	TEMPORARY PAVEMENT MARKING 4-INCH	LF	1,958.000	1,958.000
0880	649.0400	TEMPORARY PAVEMENT MARKING REMOVABLE TAPE 4-INCH	LF	3,056.000	3,056.000
0890	649.1200	TEMPORARY PAVEMENT MARKING STOP LINE REMOVABLE TAPE 18-INCH	LF	166.000	166.000
0900	650.4000	CONSTRUCTION STAKING STORM SEWER	EACH	11.000	11.000
0910	650.4500	CONSTRUCTION STAKING SUBGRADE	LF	295.000	295.000
0920	650.5000	CONSTRUCTION STAKING BASE	LF	945.000	945.000

DATE 18AUG14		E S T I M A T E O F Q U A N T I T I E S			
LINE					1181-11-70
NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	QUANTITY
0930	650.5500	CONSTRUCTION STAKING CURB GUTTER AND CURB & GUTTER	LF	72.000	72.000
0940	650.6000	CONSTRUCTION STAKING PIPE CULVERTS	EACH	4.000	4.000
0950	650.7000	CONSTRUCTION STAKING CONCRETE PAVEMENT	LF	295.000	295.000
0960	650.8000	CONSTRUCTION STAKING RESURFACING REFERENCE	LF	663.000	663.000
0970	650.9910	CONSTRUCTION STAKING SUPPLEMENTAL CONTROL (PROJECT) 01. 1181-11-70	LS	1.000	1.000
0980	650.9920	CONSTRUCTION STAKING SLOPE STAKES	LF	295.000	295.000
0990	690.0150	SAWING ASPHALT	LF	980.000	980.000
1000	690.0250	SAWING CONCRETE	LF	1,530.000	1,530.000
1010	715.0415	INCENTIVE STRENGTH CONCRETE PAVEMENT	DOL	500.000	500.000
1020	SPV.0060	SPECIAL 01. GATE VALVE AND BOX 8-INCH	EACH	2.000	2.000
1030	SPV.0060	SPECIAL 02. CUT INTO AND CONNECT TO EXISTING WATER MAIN	EACH	2.000	2.000
1040	SPV.0060	SPECIAL 03. INSTALL AND REMOVE TEMPORARY SERVICE FOR TESTING	EACH	2.000	2.000
1050	SPV.0060	SPECIAL 04. CONSTRUCTION STAKING DETOUR WIDENING STAKING	EACH	3.000	3.000
1060	SPV.0085	SPECIAL 01. WATER MAIN FITTINGS	LB	142.000	142.000
1070	SPV.0090	SPECIAL 01. CONCRETE CURB & GUTTER 6-INCH SLOPED 20-INCH TYPE G MODIFIED	LF	310.000	310.000
1080	SPV.0090	SPECIAL 02. CULVERT PIPE REINFORCED CONCRETE CLASS IV 96-INCH	LF	175.000	175.000
1090	SPV.0090	SPECIAL 03. WATER MAIN 8-INCH	LF	160.000	160.000
1100	SPV.0090	SPECIAL 04. CONCRETE CURB & GUTTER CURE AND SEAL TREATMENT	LF	942.000	942.000
1110	SPV.0105	SPECIAL 01. SPECIAL STORM SEWER PROTECTION	LS	1.000	1.000
1120	SPV.0165	SPECIAL 01. CONCRETE SIDEWALK CURE & SEAL TREATMENT	SF	1,120.000	1,120.000
1130	SPV.0180	SPECIAL 01. CONCRETE PAVEMENT REPAIR DOWELED SPECIAL	SY	225.000	225.000
1140	SPV.0180	SPECIAL 02. CONCRETE PAVEMENT REPLACEMENT DOWELED SPECIAL	SY	2,635.000	2,635.000

3

CLEARING/GRUBBING			
		201.0105	201.0205
		CLEARING	GRUBBING
STATION	LOCATION	STA	STA
USH 2			
9+00 - 11+00	LT & RT	2	2
25+00 -27+00	LT & RT	2	2
ITEM TOTALS		4	4

REMOVING SMALL CULVERT PIPES		
STATION	LOCATION	203.0100 EACH
USH 2		
25+82	LT & RT	1
ITEM TOTAL		1
* 48-INCH DUAL WALL PIPE LINER, INSIDE OF EXISTING 66-INCH CULVERT PIPE, HAS NOT BEEN GROUTED IN. REMOVE AND STOCKPILE FOR PICK-UP BY ASHLAND COUNTY		

BASE COURSE DENSE			
		305.0110	305.0120
		3/4-INCH	1 1/4-INCH
STATION	LOCATION	TON	TON
USH 2			
9+35 - 10+75	LT & RT	-	530
23+75 - 25+10	LT	15	60
25+10 - 26+65	LT & RT	35	730
26+65 - 29+50	LT	30	140
UNDISTRIBUTED		-	90
USH 2 DETOUR			
26TH AVE		5	40
SUM RD		35	260
INDUSTRIAL PARK ROAD		10	180
ITEM TOTALS		130	2030

ASPHALTIC PAVEMENT ITEMS					
		455.0605	465.0105	465.0110	465.0125
		TACK	ASPHALTIC	ASPHALTIC	ASPHALTIC
		COAT	SURFACE	SURFACE	SURFACE
		GAL	TON	PATCHING	TEMPORARY
STATION	LOCATION			TON	TON
USH 2					
23+75 - 29+50	LT	13	115	-	-
25+15.47 - 26+75	RT	4	30	-	-
UNDISTRIBUTED	LT & RT	-	-	10	-
USH 2 DETOUR					
26TH AVE		1	-	-	12
SUM RD		5	-	-	61
INDUSTRIAL PARK RD	LT & RT	9	-	-	94
ITEM TOTALS		31	145	10	167

3

REMOVALS							
		203.0200.01	203.0200.02	204.0150	204.0115	204.0180	614.0920
		REMOVING	REMOVING	REMOVING	REMOVING	REMOVING	REMOVING
		OLD	OLD	CURB &	CONCRETE	DELINEATORS	RAIL
		STRUCTURE	STRUCTURE	GUTTER	SIDEWALK	AND	SALVAGED
		(STA 10+00)	(STA 25+82)	LF	SY	MARKERS	LF
STATION	LOCATION	LS	LS			LF	
USH 2							
9+35 - 10+75	MEDIAN RT	-	-	-	65	-	-
9+35 - 10+75	LT & RT	1	-	-	-	2	-
9+74	LT	-	-	-	-	-	1
10+51	RT	-	-	-	-	-	-
24+49.19 - 27+17.87	LT	-	-	-	-	-	269
24+97.98 - 30+87.37	RT	-	-	-	-	-	591
25+10 - 26+65	LT & RT	-	1	-	65	2	-
USH 2 DETOUR							
26TH AVE		-	-	75	-	-	-
ITEM TOTALS		1	1	75	130	4	860

SUBBASE		
STATION	LOCATION	350.0102 CY
USH 2		
9+35 - 10+75	LT & RT	165
23+75 - 25+10	LT	10
25+10 - 26+65	LT & RT	220
26+65 - 29+50	LT	45
ITEM TOTAL		440

PIPE CULVERTS									
		520.4018	520.4024	520.8000	522.0115	522.0372	522.1015	524.0618	SPV.0090.02
		CULVERT	CULVERT	CONCRETE	CULVERT	CULVERT	APRON	APRON	CULVERT
		PIPE	PIPE	COLLARS	CONCRETE	CONCRETE	ENDWALLS	ENDWALLS	PIPE
		TEMPORARY	TEMPORARY	FOR PIPE	CLASS III	CLASS IV	FOR CULVERT	FOR CULVERT	REINFORCED
		18-INCH	24-INCH	EACH	15-INCH	72-INCH	REINFORCED	PIPE	CONCRETE
		LF	LF		LF	LF	CONCRETE	SALVAGED	CLASS IV
							15-INCH	18-INCH	96-INCH
STATION	LOCATION						LF	EACH	LF
USH 2									
10+00	LT & RT	-	-	-	-	-	-	-	175
10+51	RT	-	-	-	20	-	1	-	-
25+82	LT & RT	-	-	-	-	196	-	-	-
USH 2 DETOUR									
SUM RD	LT & RT	-	16	2	-	-	-	-	-
INDUSTRIAL PARK RD	RT	16	-	1	-	-	-	1	-
ITEM TOTALS		16	16	3	20	196	1	1	175

EXCAVATION							
FOR INFORMATION ONLY						206.2000.01	206.2000.02
						FOR STRUCTURES	FOR STRUCTURES
						CULVERTS	CULVERTS
						(STA 10+00)	(STA 25+82)
						LS	LS
STATION	LOCATION	205.0100	*AIR	**EXPANDED	WASTE		
		COMMON	FILL	FILL	CY		
		CY	CY	CY			
USH 2							
9+25 - 11+00	LT & RT	2040	2207	2869	-829	1	-
25+00 - 26+75	LT & RT	1170	2926	3804	-2634	-	1
USH 2 DETOUR							
26TH AVE	LT	40	-	-	40	-	-
SUM RD	LT & RT	150	25	32	118	-	-
INDUSTRIAL PARK RD	LT & RT	300	-	-	300	-	-
ITEM TOTALS		3700	5158	6705	-3005	1	1
NOTES: *FILL USED AT PIPE LOCATIONS CAN COME FROM STRUCTURE EXCAVATION **EXPANSION FACTOR = 1.3							

CONCRETE PAVEMENT					
		416.0610	416.0620	SPV.0180.01	SPV.0180.02
		DRILLED	DRILLED	REPAIR	REPLACEMENT
		TIE	DOWEL	DOWELED	DOWELED
		BARS	BARS	SPECIAL	SPECIAL
		EACH	EACH	SY	SY
USH 2					
5+00 - 9+25					
9+25	LT & RT	65	345	95	220
9+25 - 10+75		-	65	-	-
10+75	LT & RT	-	-	-	760
10+75 - 25+00		-	65	-	-
25+00	LT & RT	40	235	80	130
25+00 - 26+75		-	65	-	-
26+75	LT & RT	-	-	-	930
26+75 - 40+00		-	65	-	-
LT & RT		170	650	50	595
ITEM TOTALS		275	1490	225	2635
** INCLUDES REMOVING PAVEMENT					

CONCRETE CURB & GUTTER					
		601.0405	601.0409	601.0411	SPV.0090.01
		18-INCH	30-INCH	30-INCH	6-INCH SLOPED
		TYPE A	TYPE A	TYPE D	20-INCH
		LF	LF	LF	TYPE G
					MODIFIED
STATION	LOCATION				LF
USH 2					
9+35 - 10+75	MEDIAN	280	-	-	-
9+25 - 10+75	LT & RT	-	280	-	-
25+10 - 26+65	MEDIAN	-	-	-	310
USH 2 DETOUR					
26TH AVE	LT	-	-	72	-
ITEM TOTALS		280	280	72	310

BORROW		
STA	LOCATION	208.0100 CY
DETOUR ROUTE		
INDUSTRIAL PARK RD	LT & RT	145
ITEM TOTAL		145

BACKFILL STRUCTURE			
STA	LOCATION	210.0100 CY	
USH 2			
9+25 - 10+75	LT & RT	675	
25+00 - 26+75	LT & RT	1465	
ITEM TOTAL		2140	

PREPARE FOUNDATION FOR CONCRETE PAVEMENT (1181-11-70)		
STATION	LOCATION	211.0200 LS
USH 2		
USH 2	LT & RT	1
ITEM TOTAL		1

CONCRETE MASONRY ENDWALLS		
STATION	LOCATION	504.0900 CY
USH 2		
10+00	LT & RT	15
25+82	LT & RT	10
ITEM TOTAL		25

CONCRETE SIDEWALK 4-INCH				
		602.0405	SPV.0165.01	
		SF	CURE & SEAL TREATMENT	
			SF	
STATION	LOCATION			
USH 2				
9+35 - 10+75	MEDIAN	560	560	
25+10 - 26+65	MEDIAN	560	560	
ITEM TOTALS		1120	1120	

3

CLEARING/GRUBBING			
STATION	LOCATION	201.0105 CLEARING STA	201.0205 GRUBBING STA
USH 2			
9+00 - 11+00	LT & RT	2	2
25+00 -27+00	LT & RT	2	2
ITEM TOTALS		4	4

REMOVING SMALL CULVERT PIPES		
STATION	LOCATION	203.0100 EACH
USH 2		
25+82	LT & RT	1
ITEM TOTAL		1
* 48-INCH DUAL WALL PIPE LINER, INSIDE OF EXISTING 66-INCH CULVERT PIPE, HAS NOT BEEN GROUTED IN. REMOVE AND STOCKPILE FOR PICK-UP BY ASHLAND COUNTY		

BASE COURSE DENSE			
STATION	LOCATION	305.0110 3/4-INCH TON	305.0120 1 1/4-INCH TON
USH 2			
9+35 - 10+75	LT & RT	-	530
23+75 - 25+10	LT	15	60
25+10 - 26+65	LT & RT	35	730
26+65 - 29+50	LT	30	140
UNDISTRIBUTED		-	90
USH 2 DETOUR			
26TH AVE		5	40
SUM RD		35	260
INDUSTRIAL PARK ROAD		10	180
ITEM TOTALS		130	2030

ASPHALTIC PAVEMENT ITEMS					
STATION	LOCATION	455.0605 TACK COAT GAL	465.0105 ASPHALTIC SURFACE TON	465.0110 ASPHALTIC SURFACE PATCHING TON	465.0125 ASPHALTIC SURFACE TEMPORARY TON
USH 2					
23+75 - 29+50	LT	13	115	-	-
25+15.47 - 26+75	RT	4	30	-	-
UNDISTRIBUTED	LT & RT	-	-	10	-
USH 2 DETOUR					
26TH AVE		1	-	-	12
SUM RD		5	-	-	61
INDUSTRIAL PARK RD	LT & RT	8	-	-	94
ITEM TOTALS		31	145	10	167

3

REMOVALS								
		203.0200.01 REMOVING OLD STRUCTURE (STA 10+00) LS	203.0200.02 REMOVING OLD STRUCTURE (STA 25+82) LS	204.0150 REMOVING CURB & GUTTER LF	204.0115 REMOVING CONCRETE SIDEWALK SY	204.0180 REMOVING DELINEATORS AND MARKERS LF	204.0210 REMOVING MANHOLES EACH	614.0920 SALVAGED RAIL LF
STATION	LOCATION							
USH 2								
9+35 - 10+75	MEDIAN RT	-	-	-	65	-	-	-
9+35 - 10+75	LT & RT	1	-	-	-	2	-	-
9+74	LT	-	-	-	-	-	1	-
10+51	RT	-	-	-	-	-	-	-
24+49.19 - 27+17.87	LT	-	-	-	-	-	-	269
24+97.98 - 30+87.37	RT	-	-	-	-	-	-	591
25+10 - 26+65	LT & RT	-	1	-	65	2	-	-
USH 2 DETOUR 26TH AVE		-	-	75	-	-	-	-
ITEM TOTALS		1	1	75	130	4	1	860

SUBBASE		
STATION	LOCATION	350.0102 CY
USH 2		
9+35 - 10+75	LT & RT	165
23+75 - 25+10	LT	10
25+10 - 26+65	LT & RT	220
26+65 - 29+50	LT	45
ITEM TOTAL		440

PIPE CULVERTS									
		520.4018 CULVERT PIPE TEMPORARY 18-INCH LF	520.4024 CULVERT PIPE TEMPORARY 24-INCH LF	520.8000 CONCRETE COLLARS FOR PIPE EACH	522.0115 CULVERT PIPE REINFORCED CONCRETE CLASS III 15-INCH LF	522.0372 CULVERT PIPE REINFORCED CONCRETE CLASS IV 72-INCH LF	522.1015 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 15-INCH LF	524.0618 APRON ENDWALLS FOR CULVERT PIPE SALVAGED 18-INCH EACH	SPV.0090.02 CULVERT PIPE REINFORCED CONCRETE CLASS IV 96-INCH LF
STATION	LOCATION	LF	LF	EACH	LF	LF	LF	EACH	LF
USH 2									
10+00	LT & RT	-	-	-	-	-	-	-	175
10+51	RT	-	-	-	20	-	1	-	-
25+82	LT & RT	-	-	-	-	196	-	-	-
USH 2 DETOUR									
SUM RD	LT & RT	-	16	2	-	-	-	-	-
INDUSTRIAL PARK RD	RT	16	-	1	-	-	-	1	-
ITEM TOTALS		16	16	3	20	196	1	1	175

EXCAVATION							
STATION	LOCATION	205.0100 COMMON CY	*AIR FILL CY	**EXPANDED FILL CY	*BORROW CY	206.2000.01 FOR STRUCTURES CULVERTS (STA 10+00) LS	206.2000.02 FOR STRUCTURES CULVERTS (STA 25+82) LS
USH 2							
9+25 - 11+00	LT & RT	934	2207	2869	-1935	1	-
25+00 - 26+75	LT & RT	1849	2926	3804	-1955	-	1
USH 2 DETOUR							
26TH AVE	LT	40	-	-	40	-	-
SUM RD	LT & RT	150	25	32	118	-	-
INDUSTRIAL PARK RD	LT & RT	300	-	-	300	-	-
ITEM TOTALS		3273	5158	6705	-3432	1	1
NOTES: *FILL USED AT PIPE LOCATIONS CAN COME FROM STRUCTURE EXCAVATION **EXPANSION FACTOR = 1.3							

<u>CONCRETE PAVEMENT</u>					
				**	**
		416.0610	416.0620	SPV.0180.01	SPV.0180.02
		DRILLED	DRILLED	REPAIR	REPLACEMENT
		TIE	DOWEL	DOWELED	DOWELED
		BARS	BARS	SPECIAL	SPECIAL
STATION	LOCATION	EACH	EACH	SY	SY
USH 2					
5+00 - 9+25					
9+25	LT & RT	65	345	95	220
9+25 - 10+75		-	65	-	-
10+75	LT & RT	-	-	-	760
10+75 - 25+00		-	65	-	-
25+00	LT & RT	40	235	80	130
25+00 - 26+75		-	65	-	-
26+75	LT & RT	-	-	-	930
26+75 - 40+00		-	65	-	-
	LT & RT	170	650	50	595
ITEM TOTALS		275	1490	225	2635
** INCLUDES REMOVING PAVEMENT					

<u>CONCRETE CURB & GUTTER</u>						
		601.0405 18-INCH TYPE A LF	601.0409 30-INCH TYPE A LF	601.0411 30-INCH TYPE D LF	SPV.0090.01 6-INCH SLOPED 20-INCH TYPE G MODIFIED LF	SPV.0090.04 CURE & SEAL TREATMENT LF
STATION	LOCATION					
USH 2						
9+35 - 10+75	MEDIAN	280	-	-	-	280
9+25 - 10+75	LT & RT	-	280	-	-	280
25+10 - 26+65	MEDIAN	-	-	-	310	310
USH 2 DETOUR						
26TH AVE	LT	-	-	72	-	72
ITEM TOTALS		280	280	72	310	942

BORROW		
STA	LOCATION	208.0100 CY
DETOUR ROUTE		
INDUSTRIAL PARK RD	LT & RT	145
ITEM TOTAL		145

BACKFILL STRUCTURE			
STA	LOCATION	210.0100 CY	
USH 2			
9+25 - 10+75	LT & RT	1160	
25+00 - 26+75	LT & RT	1862	
ITEM TOTAL		3022	

PREPARE FOUNDATION FOR CONCRETE PAVEMENT (1181-11-70)		
STATION	LOCATION	211.0200 LS
USH 2	LT & RT	1
ITEM TOTAL		1

CONCRETE MASONRY ENDWALLS		
STATION	LOCATION	504.0900 CY
USH 2		
10+00	LT & RT	15
25+82	LT & RT	10
ITEM TOTAL		25

CONCRETE SIDEWALK 4-INCH				
STATION	LOCATION	602.0405 SF	SPV.0165.01 CURE & SEAL TREATMENT SF	
USH 2				
9+35 - 10+75	MEDIAN	560	560	
25+10 - 26+65	MEDIAN	560	560	
ITEM TOTALS		1120	1120	

3

STORM SEWER STRUCTURE ITEMS										
608.0318 STORM SEWER PIPE REINFORCED CONCRETE CLASS III 18-INCH LF										
611.0430 RECONSTRUCTING INLET EACH										
611.3230 INLETS 2X3-FT EACH										
611.9710 SALVAGED INLET COVERS EACH										
612.0106 PIPE UNDERDRAIN 6-INCH LF										
650.4000 CONSTRUCTION STAKING STORM SEWER EACH										
628.7005 INLET PROTECTION TYPE A EACH										
628.7015 INLET PROTECTION TYPE C EACH										
SPV.0105.01 SPECIAL STORM SEWER PROTECTION LS										
STATION	LOCATION									
USH 2										
8+87.2	31.5' RT	-	1	-	-	-	1	1	1	-
8+92.9	0.5' LT	-	1	-	-	-	1	1	1	-
9+35 - 10+75	LT & RT	-	-	-	-	240	1	-	-	1
9+73.9	0.5' LT	4	-	1	1	-	1	1	1	-
9+73.9	32.5' RT	30	1	-	-	-	1	1	1	-
10+51.0	32.5' RT	-	-	1	1	-	1	1	1	-
12+28.0	31.0' RT	-	1	-	-	-	1	1	1	-
15+11.4	32' RT	-	1	-	-	-	1	1	1	-
16+28.3	36.4' RT	-	1	-	-	-	1	1	1	-
16+96.2	42.9' RT	-	1	-	-	-	1	1	1	-
18+22.0	43' RT	-	1	-	-	-	1	1	1	-
ITEM TOTALS		34	8	2	2	240	11	10	10	1

SALVAGED TOPSOIL, MULCHING AND SEEDING						
625.0500 SALVAGED TOPSOIL SY						
627.0200 MULCHING SY						
629.0210 FERTILIZER TYPE B CWT						
630.0120 SEEDING MIXTURE NO. 20 LB						
630.0200 TEMPORARY SEEDING LB						
STATION	LOCATION					
USH 2						
9+25 - 10+75	LT&RT	1579	1579	1.0	43	43
25+00 - 26+75	LT&RT	1491	1491	0.9	40	40
USH 2 DETOUR						
26TH AVE	LT	36	36	0.1	1	1
SUM RD	LT & RT	209	209	0.1	6	6
INDUSTRIAL PARK RD	LT & RT	470	470	0.3	13	13
ITEM TOTALS		3785	3785	2.4	103	103

3

GUARDRAIL ITEMS					EROSION CONTROL ITEMS				
614.2300 MGS GUARDRAIL 3 LF					628.1504 SILT FENCE LF				
614.2610 MGS GUARDRAIL TERMINAL EAT EACH					628.1520 SILT FENCE MAINTENANCE LF				
614.2620 MGS GUARDRAIL TERMINAL TYPE 2 EACH					628.2027 EROSION MAT CLASS II TYPE C SY				
628.7555 CULVERT PIPE CHECKS EACH									
STATION	LOCATION				STATION	LOCATION			
USH 2					USH 2				
24+50.00	LT	-	-	1	9+25 - 10+75	LT & RT	650	1300	1375
24+50 - 28+00	LT	350	-	-	25+00 - 26+75	LT & RT	1500	3000	1300
28+00 - 28+53.13	LT	-	1	-					
24+96.88 - 25+50.00	RT	-	1	-	USH 2 DETOUR				
25+50.00 - 30+87.37	RT	537.5	-	-	26TH AVE	LT	80	80	-
30+87.37	RT	-	-	1	SUM RD	LT & RT	500	500	-
ITEM TOTALS		887.5	2	2	INDUSTRIAL PARK RD	LT & RT	400	400	-
					ITEM TOTALS		3130	5280	2675
									8

MARKERS CULVERT END			RIPRAP HEAVY	
633.5200 EACH			606.0300 CY	
STATION	LOCATION		STATION	LOCATION
USH 2			USH 2	
10+00	LT & RT	2	9+50	LT
25+82	LT & RT	2	10+50	RT
USH 2 DETOUR			25+50	LT
SUM RD	LT & RT	2	26+25	RT
ITEM TOTAL		6	ITEM TOTALS	
				390
				470

PAVEMENT MARKING									
646.0106 EPOXY 4-INCH LF									
646.0600 REMOVING PAVEMENT MARKING LF									
647.0166 ARROWS EPOXY TYPE 2 EACH									
647.0566 STOP LINE EPOXY 18-INCH LF									
647.0955 REMOVING PAVEMENT MARKING ARROWS EACH									
649.0100 TEMPORARY 4-INCH LF									
649.0400 TEMPORARY REMOVABLE TAPE 4-INCH LF									
649.1200 TEMPORARY STOP LINE REMOVABLE TAPE 18-INCH LF									
STATION	LOCATION								REMARKS
9+35 - 10+75	LT & RT	280	-	-	-	-	-	-	
9+35 - 10+75	LT & RT	280	-	-	-	-	-	-	
9+35 - 10+75	LT & RT	70	-	-	-	-	-	-	
25+10 - 26+65	LT & RT	310	-	-	-	-	-	-	
25+10 - 26+65	LT & RT	310	-	-	-	-	-	-	
25+10 - 26+65	LT & RT	78	-	-	-	-	-	-	
UNDISTRIBUTED		200	-	-	-	-	-	-	CONCRETE REPAIR AREA
USH 2 DETOUR									
26TH AVE	LT & RT	38	54	6	16	6	-	300	13
TOLL RD	LT & RT	-	733	-	-	-	733	1800	56
SUM RD	LT & RT	-	583	-	-	-	583	300	16
INDUSTRIAL PARK RD	LT & RT	-	642	-	-	-	642	656	81
ITEM TOTALS		1566	2012	6	16	6	1958	3056	166

SAWING				
690.0150 ASPHALT LF				
690.0250 CONCRETE LF				
STATION	LOCATION			REMARKS
USH 2				
9+25	LT & RT	-	62	
10+75	LT & RT	-	62	
23+75	LT	6	-	
25+00	LT & RT	-	63	
26+75	LT & RT	-	63	
29+50	LT	6	-	
UNDISTRIBUTED		-	1275	FOR REPAIR & REPLACEMENT
USH 2 DETOUR				
26TH AVE	LT	73	5	
SUM RD	LT & RT	525	-	
INDUSTRIAL PARK RD	LT & RT	370	-	
ITEM TOTALS		980	1530	

PROJECT NO: 1181-11-70	HWY: USH 2	COUNTY: ASHLAND	MISCELLANEOUS QUANTITIES	SHEET	E
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PERMANENT SIGNING

SIGN GROUP CODE	SIGN CODE	MESSAGE	SIZE	634.0616	637.2210	637.2230	638.2602	638.3000
				POSTS WOOD 4X6-INCH 16-FT EACH	SIGNS TYPE II REFLECTIVE H SF	SIGNS TYPE II REFLECTIVE F SF	REMOVING SIGNS TYPE II EACH	REMOVING SMALL SIGN SUPPORTS EACH
1-1	J4-1	EAST USH 2	24 X 36	1	6.00	-	1	1
				-	-	-	1	-
1-2	R5-1A	WRONG WAY	36 X 24	-	6.00	-	1	-
	J4-1	WEST USH 2	24 X 36	1	6.00	-	1	1
				-	-	-	1	-
1-3	R5-1	DO NOT ENTER	30 X 30	1	6.25	-	1	1
1-4	W9-1L	LEFT LANE ENDS	36 X 36	1	-	9	1	1
1-5	W4-2L	LANE REDUCTION	36 X 36	1	-	9	1	1
	R5-1A	WRONG WAY	36 X 24	-	6.00	-	1	-
1-6	R5-1	DO NOT ENTER	30 X 30	1	6.25	-	1	1
USH 2 DETOUR SUM RD				1	5.18	-	1	1
INDUSTRIAL PARK RD				1	5.18	-	1	1
ITEM TOTALS				8	46.86	18	12	8

3

TRAFFIC CONTROL

STATION	LOCATION	643.0100	643.0300	643.0420	643.0705	643.0715	643.0900	643.1050	643.2000	643.3000	REMARKS
		(1181-11-70) EACH	DRUMS DAY	BARRICADES TYPE III DAY	WARNING LIGHTS TYPE A DAY	WARNING LIGHTS TYPE C DAY			DETOUR (1181-11-70) EACH	DETOUR SIGNS DAY	
USH 2 DETOUR											
EAST CULVERT	LT & RT	0.5	-	714	1428	408	867	102	0.5	2295	
WEST CULVERT	LT & RT	0.5	-	558	1116	248	589	62	0.5	1395	
UNDISTRIBUTED		-	1640	-	-	-	-	-	-	-	FOR REPAIR & REPLACEMENT
ITEM TOTALS		1	1640	1272	2544	656	1456	164	1	3690	

CONSTRUCTION STAKING

STATION	LOCATION	650.4500	650.5000	650.5500	650.6000	650.7000	650.8000	650.9910	650.9920	SPV.0060.04
		SUBGRADE LF	BASE LF	CURB AND GUTTER LF	PIPE CULVERTS EACH	CONCRETE PAVEMENT LF	RESURFACING REFERENCE LF	SUPPLEMENTAL CONTROL (1181-11-70) LS	SLOPE STAKES LF	DETOUR WIDENING STAKING EACH
USH 2								1		
9+35 - 10+75	LT & RT	140	-	-	1	140	-	-	140	-
23+75 - 31+50	LT & RT	-	-	-	-	-	663	-	-	-
25+10 - 26+65	LT & RT	155	-	-	1	155	-	-	155	-
USH 2 DETOUR										
26TH AVE	LT	-	72	72	-	-	-	-	-	1
SUM RD	LT & RT	-	503	-	2	-	-	-	-	1
INDUSTRIAL PARK RD	LT & RT	-	370	-	-	-	-	-	-	1
ITEM TOTALS		295	945	72	4	295	663	1	295	3

3

INSULATION BOARD POLYSTYRENE		
STATION	LOCATION	612.0902.S 4-INCH SY
USH 2 9+00 - 10+50	LT	85
ITEM TOTALS		85

GATE VALVE AND BOX 8-INCH		
STATION	LOCATION	SPV.0060.01 EACH
USH 2 9+00	47.1' LT	1
10+50	59.6' LT	1
ITEM TOTAL		2

WATER MAIN FITTINGS			
STATION	LOCATION	SPV.0085.01 LB	REMARKS
USH 2 9+25	LT	26	8" PLUG
10+25	LT	71	8" SLEEVE & PLUG
UNDISTRIBUTED	LT	45	
ITEM TOTAL		142	

3

CUT INTO AND CONNECT TO EXISTING WATER MAIN		
STATION	LOCATION	SPV.0060.02 EACH
USH 2 9+00	47.1' LT	1
10+50	59.6' LT	1
ITEM TOTAL		2

INSTALL AND REMOVE TEMPORARY SERVICE FOR TESTING		
STATION	LOCATION	SPV.0060.03 EACH
USH 2 9+05	LT	1
10+45	LT	1
ITEM TOTAL		2

WATER MAIN 8-INCH		
STATION	LOCATION	SPV.0090.03 LF
USH 2 9+00 - 10+50	LT	160
ITEM TOTAL		160

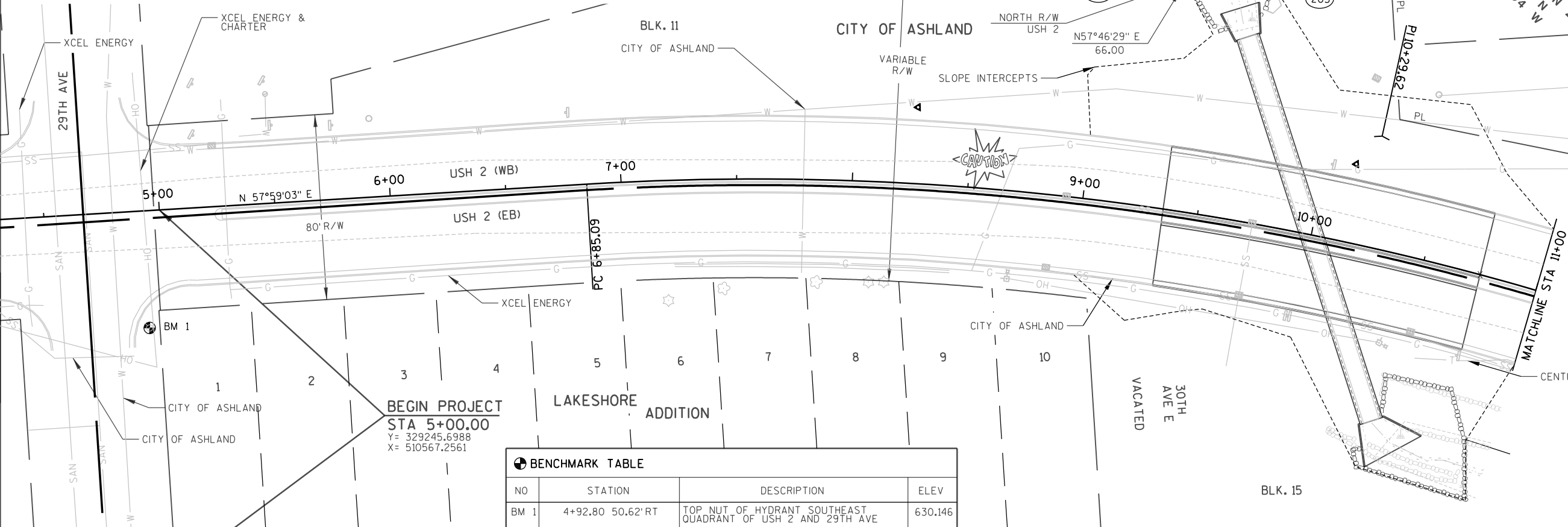
NOTE: ALL ITEMS AND QUANTITIES ON THIS SHEET ARE FOR
ENGINEER ESTIMATE CATEGORY 0020, UNLESS OTHERWISE NOTED.

SCHEDULE OF LANDS & INTERESTS REQUIRED

AREAS SHOWN IN THE TOTAL ACRES COLUMN MAY BE APPROXIMATE AND ARE DERIVED FROM TAX ROLLS OR OTHER AVAILABLE SOURCES AND MAY NOT INCLUDE LANDS OF THE OWNER WHICH ARE NOT CONTIGUOUS TO THE AREA TO BE ACQUIRED.

PARCEL NUMBER	OWNER (S)	INTEREST REQUIRED	TOTAL ACRES	R&W ACRES REQUIRED			PLE AC.
				NEW	EXISTING	TOTAL	
1	GOLDIN VACATIONLAND LLC A/K/A GOLDIN VACATIONLAND L.L.C.	PLE	4.50	---	---	---	0.04

OWNER'S NAMES ARE SHOWN FOR REFERENCE PURPOSES ONLY AND ARE SUBJECT TO CHANGE PRIOR TO THE TRANSFER OF LAND INTERESTS TO THE CITY.

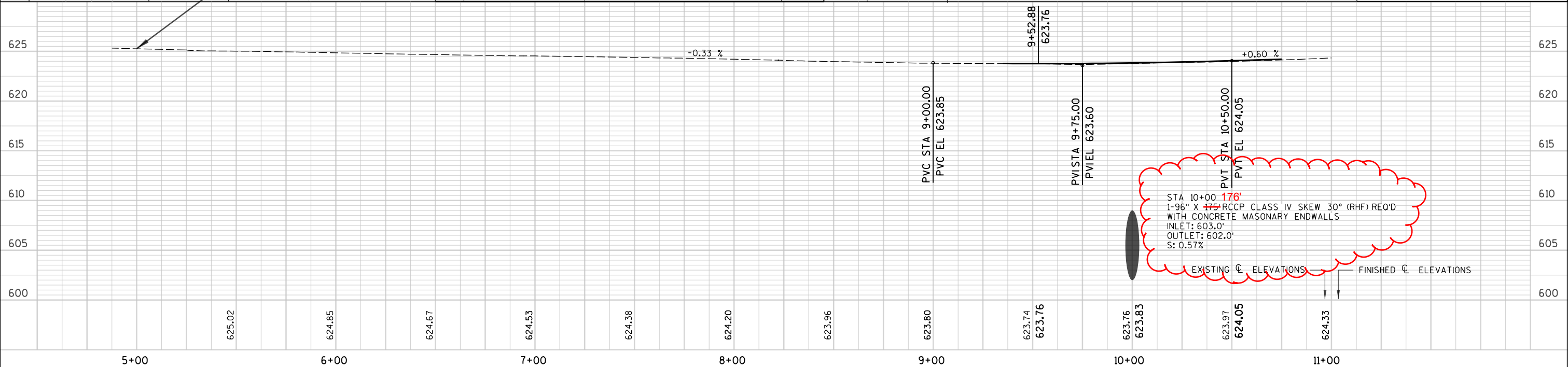


CURVE DATA
DELTA = 31°48'44" (RT)
D = 4°44'21"
T = 344.53
L = 671.27
E = 48.13
R = 1209.00
DB = N 57°59'03" E
DA = N 89°47'46" E
PC STA 6+85.09
PC Y = 329343.826
PC X = 510724.196
PI STA 10+29.62
PI Y = 329526.481
PI X = 511016.324
PT STA 13+56.36
PT Y = 329527.707
PT X = 511360.853
SE = 4.6%



BENCHMARK TABLE			
NO	STATION	DESCRIPTION	ELEV
BM 1	4+92.80 50.62' RT	TOP NUT OF HYDRANT SOUTHEAST QUADRANT OF USH 2 AND 29TH AVE	630.146

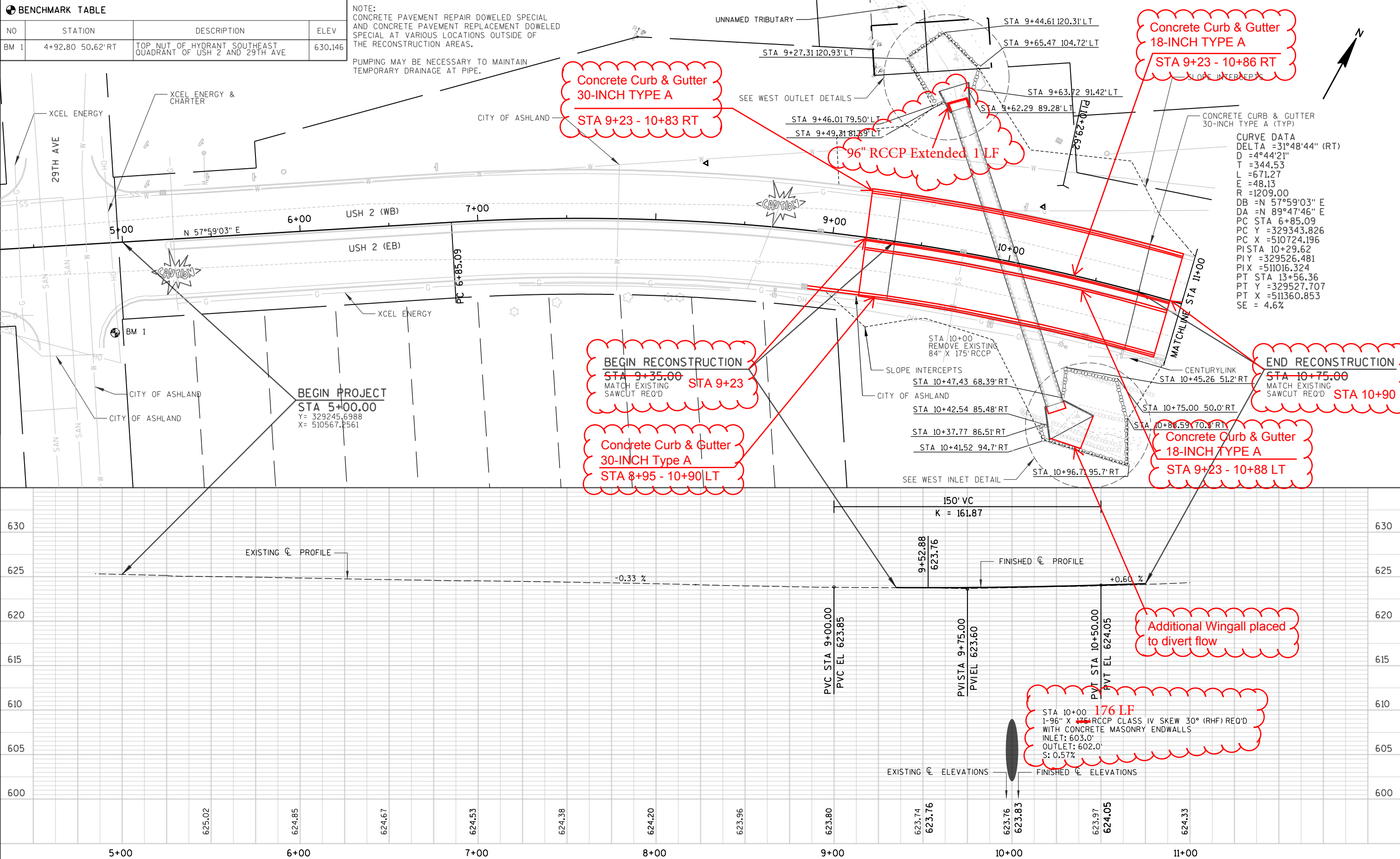
PLE STATION OUT TABLE		
200	9+06.98	118.3' LT
201	9+11.83	90.8' LT
202	9+65.46	132.2' LT
203	9+71.48	104.9' LT

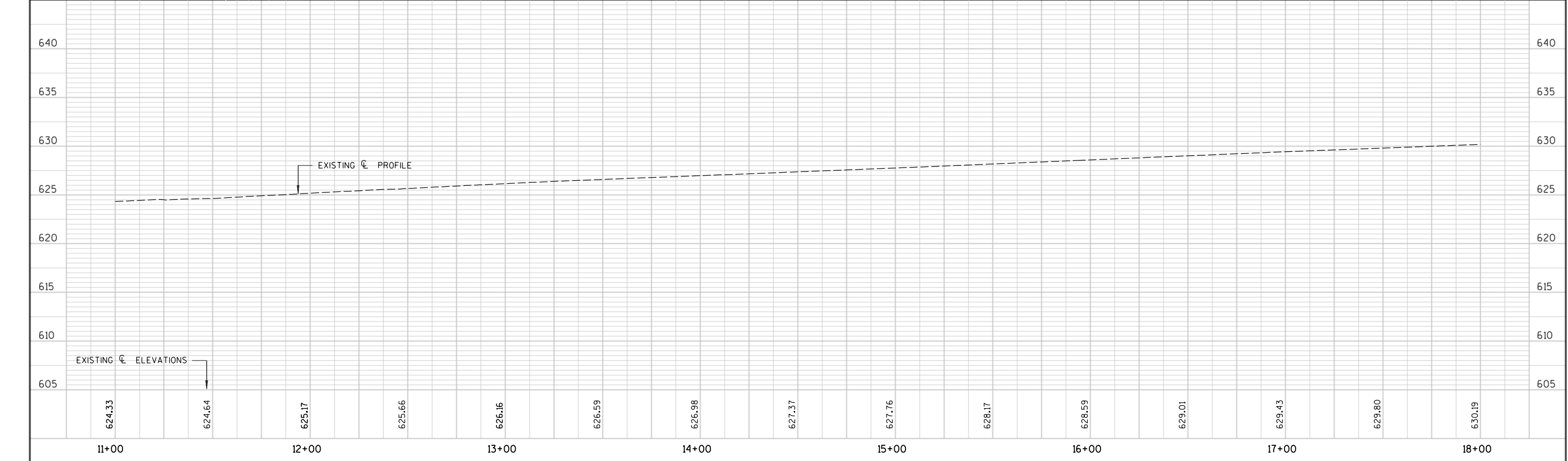
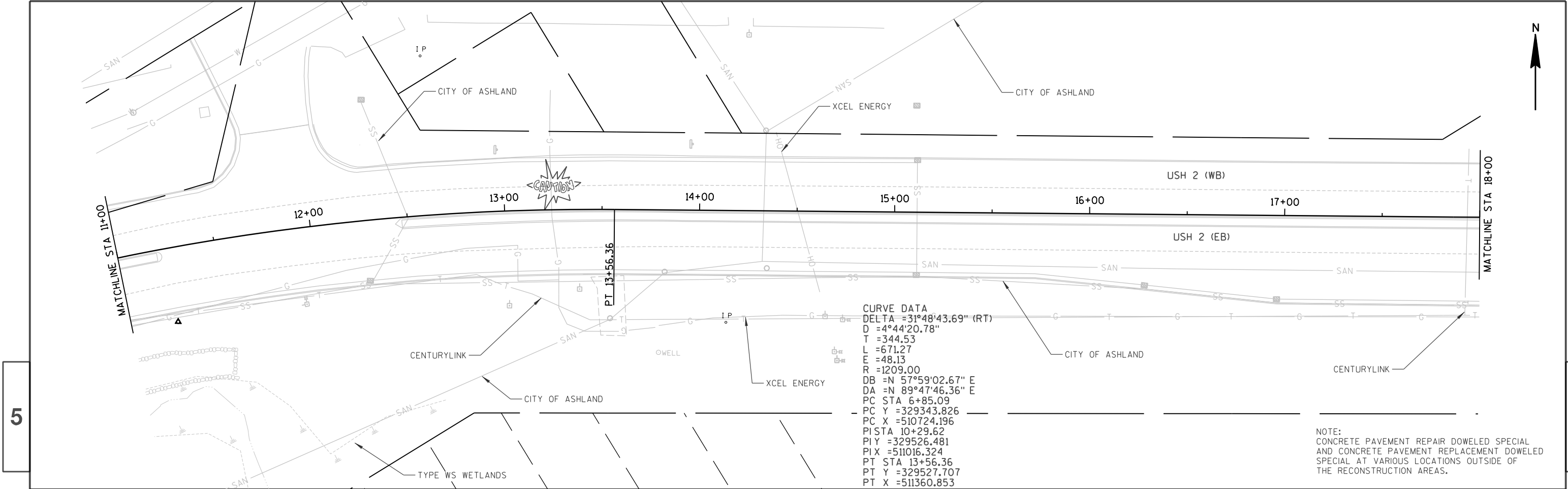


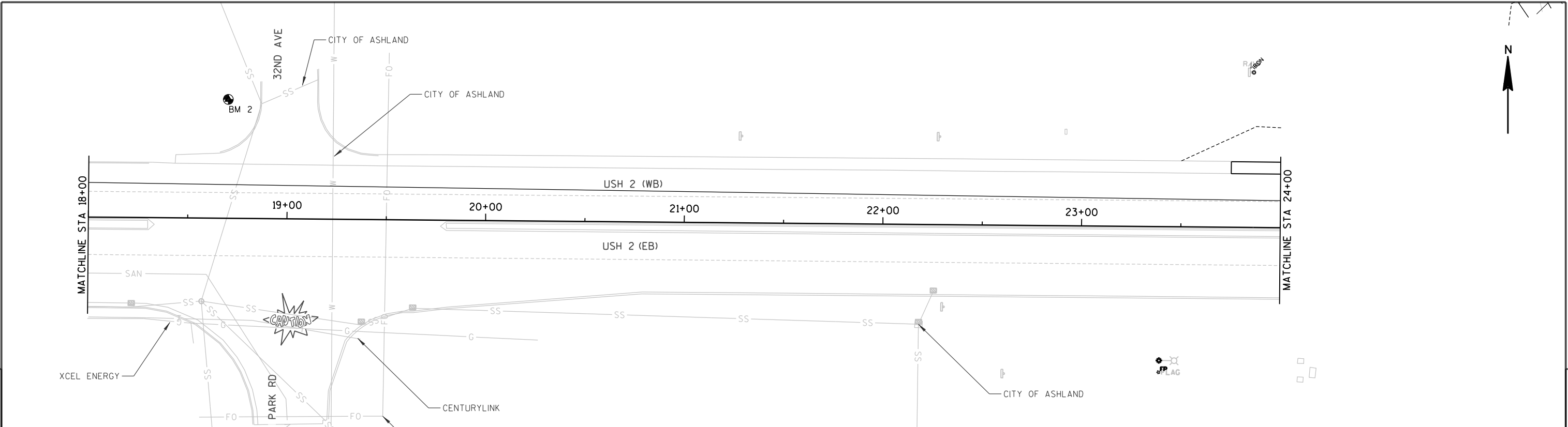
BENCHMARK TABLE			
NO	STATION	DESCRIPTION	ELEV
BM 1	4+92.80 50.62' RT	TOP NUT OF HYDRANT SOUTHEAST QUADRANT OF USH 2 AND 29TH AVE	630.146

NOTE:
CONCRETE PAVEMENT REPAIR DOWELED SPECIAL
AND CONCRETE PAVEMENT REPLACEMENT DOWELED
SPECIAL AT VARIOUS LOCATIONS OUTSIDE OF
THE RECONSTRUCTION AREAS.

PUMPING MAY BE NECESSARY TO MAINTAIN
TEMPORARY DRAINAGE AT PIPE.

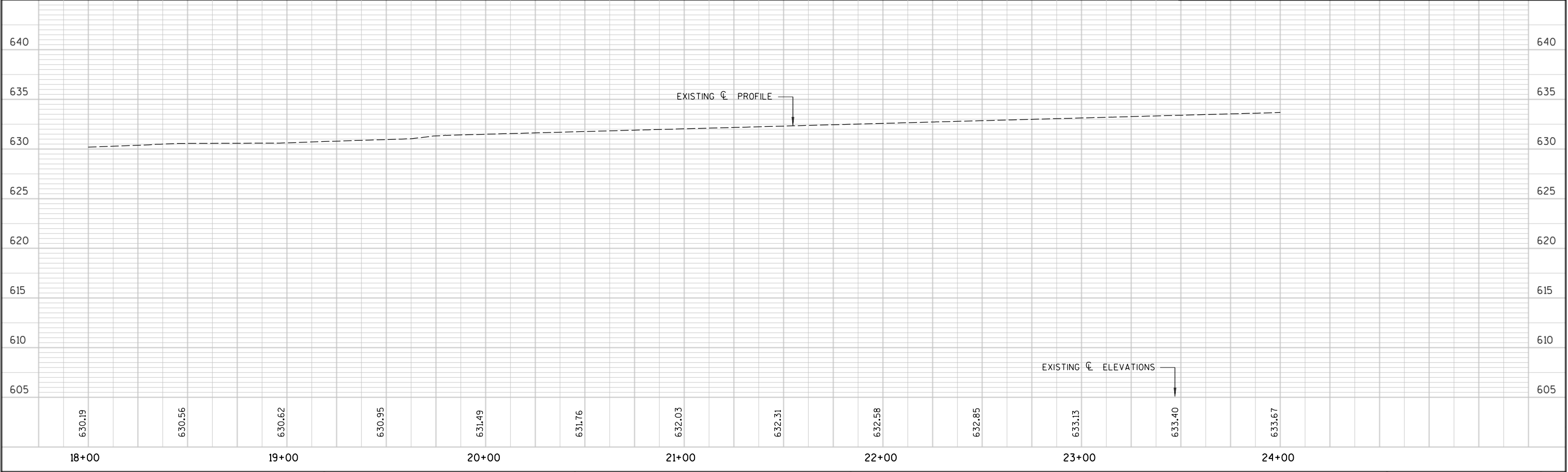


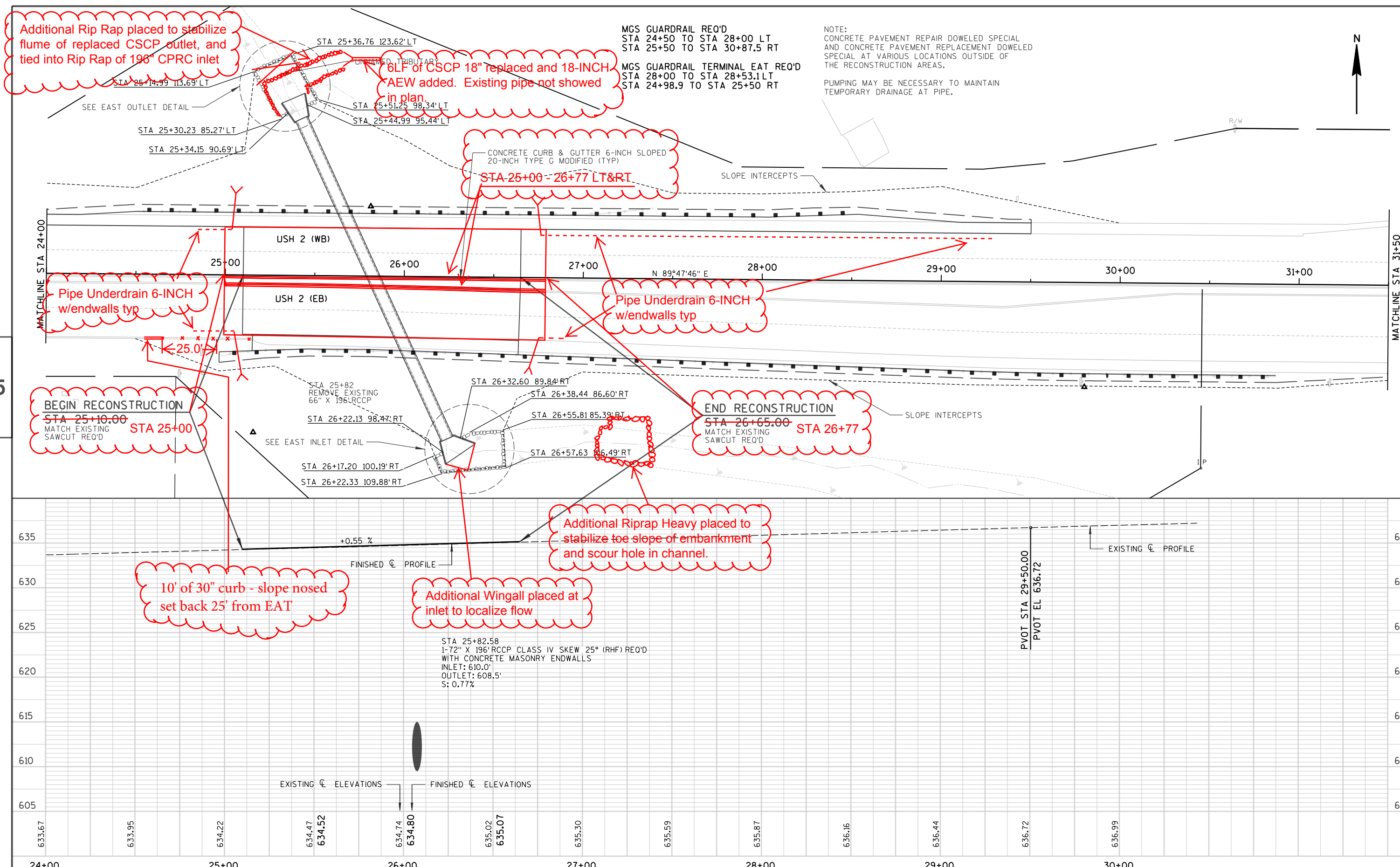


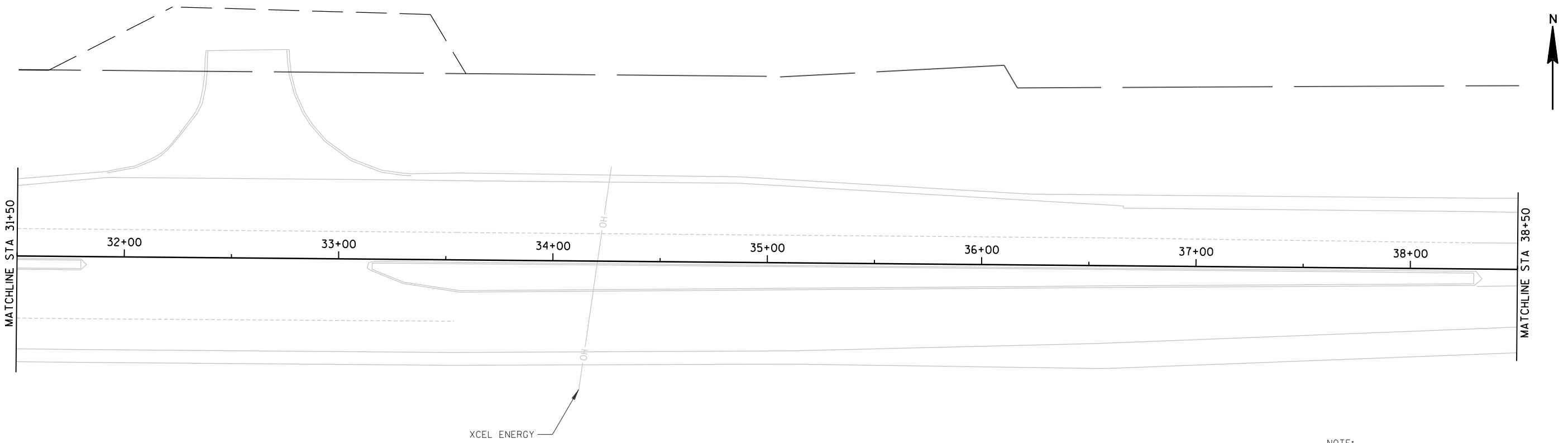


NOTE:
CONCRETE PAVEMENT REPAIR DOWELED SPECIAL
AND CONCRETE PAVEMENT REPLACEMENT DOWELED
SPECIAL AT VARIOUS LOCATIONS OUTSIDE OF
THE RECONSTRUCTION AREAS.

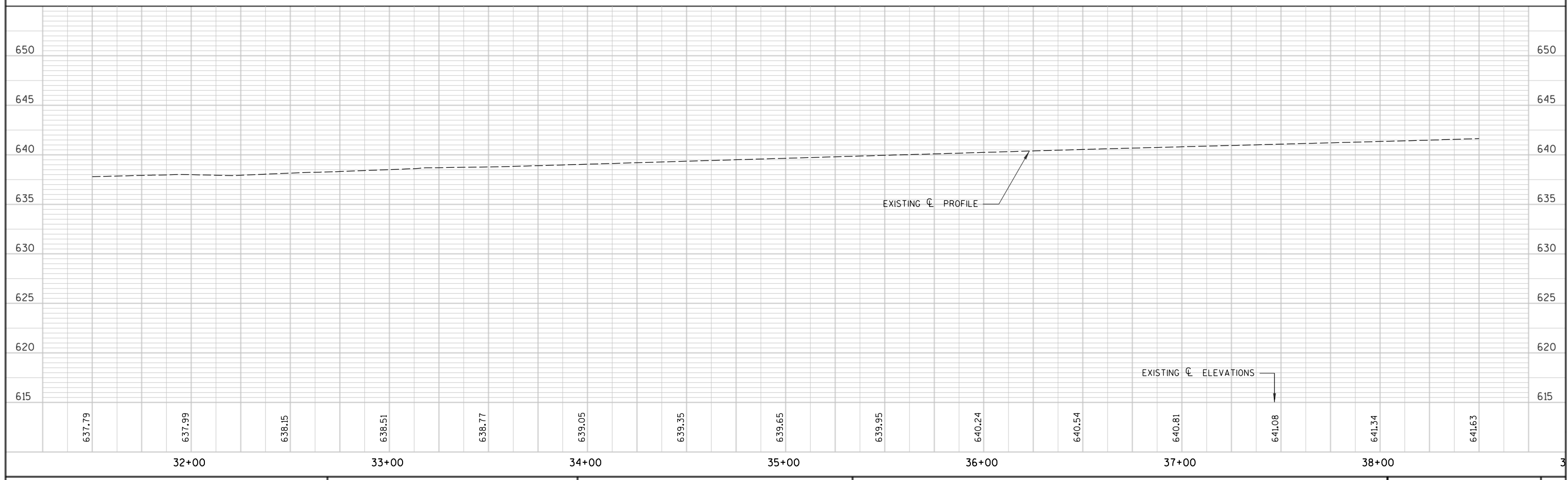
BENCHMARK TABLE			
NO	STATION	DESCRIPTION	ELEV
BM 2	STA 18+69.94 59.93' LT	CONCRETE DOT MONUMENT WITH BRASS CAP	629.8

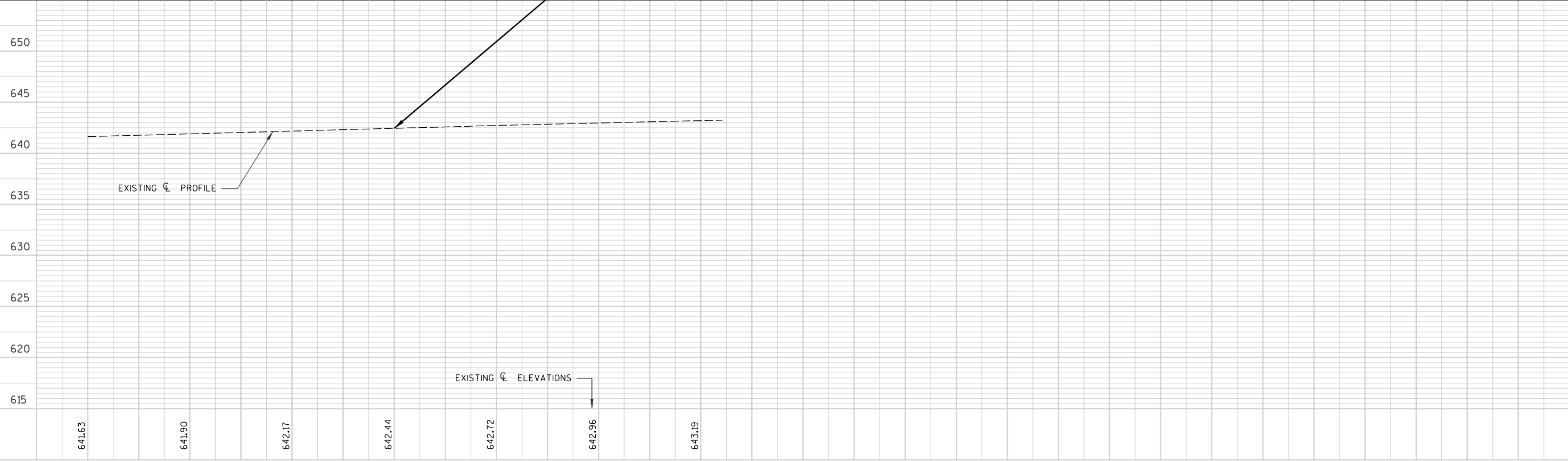
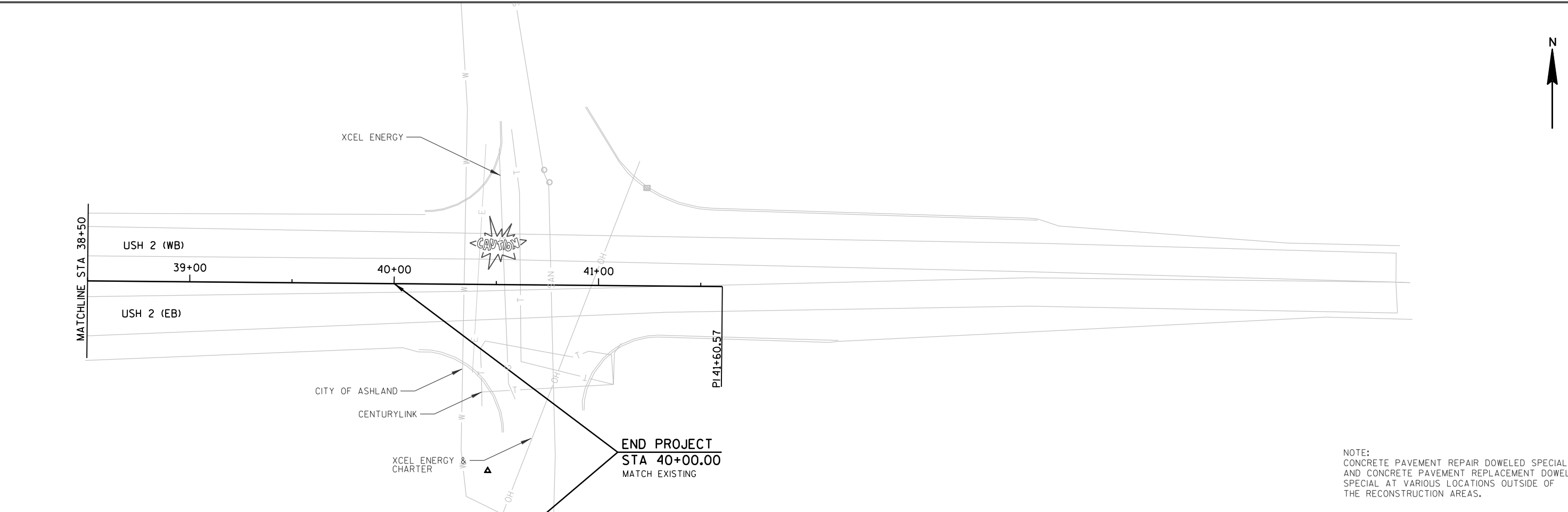






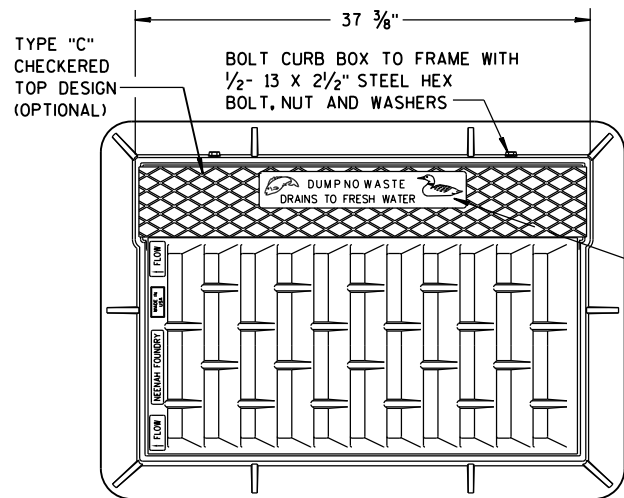
NOTE:
CONCRETE PAVEMENT REPAIR DOWELED SPECIAL
AND CONCRETE PAVEMENT REPLACEMENT DOWELED
SPECIAL AT VARIOUS LOCATIONS OUTSIDE OF
THE RECONSTRUCTION AREAS.



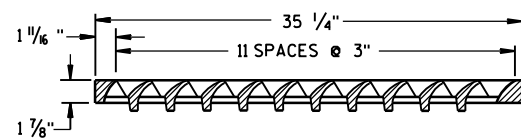
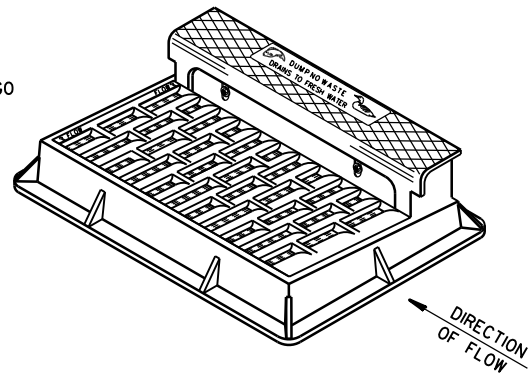


Standard Detail Drawing List

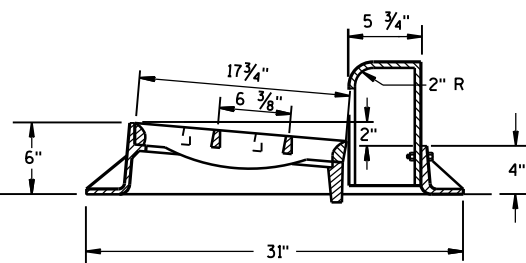
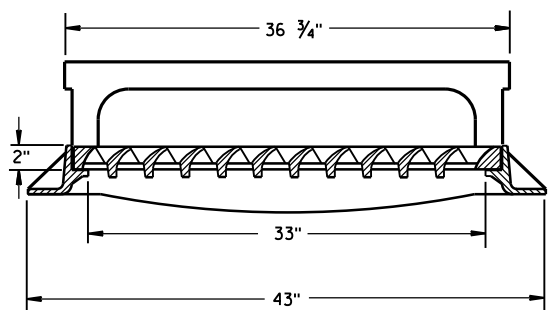
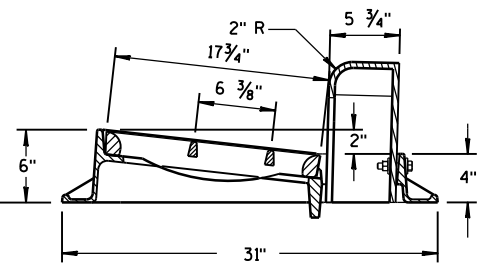
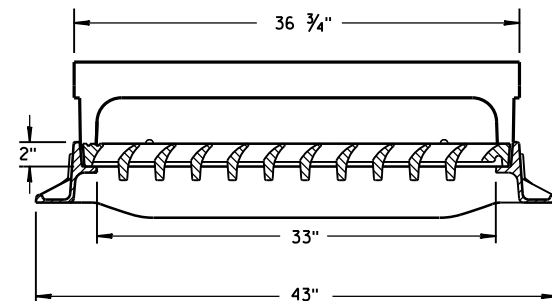
08A05-19A	INLET COVERS TYPE A, H, A-S, H-S & Z
08B10-01	MANHOLES 3X3-FT, 4X4-FT, 5X5-FT AND 6X6-FT
08C07-01	INLETS 2X2-FT, 2X2.5-FT, 2X3-FT AND 2.5X3-FT
08D01-17	CONCRETE CURB, CONCRETE CURB AND GUTTER AND TIES
08E09-06	SILT FENCE
08E10-02	INLET PROTECTION TYPE A, B, C AND D
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
08F04-07	JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL
08F10-01	CONCRETE MASONRY ENDWALLS FOR CULVERT PIPE AND PIPE ARCH
13C09-11A	CONCRETE PAVEMENT REPAIR AND REPLACEMENT
13C09-11B	CONCRETE PAVEMENT REPAIR AND REPLACEMENT
13C09-11C	CONCRETE PAVEMENT REPAIR AND REPLACEMENT
14B42-03A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-03B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-03C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B44-02A	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-02B	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-02C	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B47-01A	MIDWEST GUARDRAIL SYSTEM (MGS) TYPE 2 TERMINAL
14B47-01B	MIDWEST GUARDRAIL SYSTEM (MGS) TYPE 2 TERMINAL
14B47-01C	MIDWEST GUARDRAIL SYSTEM (MGS) TYPE 2 TERMINAL
15A03-02A	FLEXIBLE MARKER POST FOR CULVERT END
15A03-02B	FLEXIBLE MARKER POST FOR CULVERT END
15C02-05A	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C02-05B	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C02-05C	DETOUR SIGNING FOR MAINLINE CLOSURES
15C03-02	BARRICADES AND SIGNS FOR SIDEROAD CLOSURES
15C07-12C	PAVEMENT MARKING ARROWS
15C08-16A	PAVEMENT MARKING (MAINLINE)
15C08-16B	PAVEMENT MARKING (INTERSECTIONS)
15C08-16E	PAVEMENT MARKING (LEFT TURN LANE)
15C33-01	STOP LINE AND CROSSWALK PAVEMENT MARKING
15D20-02	TRAFFIC CONTROL, SINGLE LANE CLOSURE, NON-FREEWAY/EXPRESSWAY



NOTE:
GRATE IS REVERSIBLE.

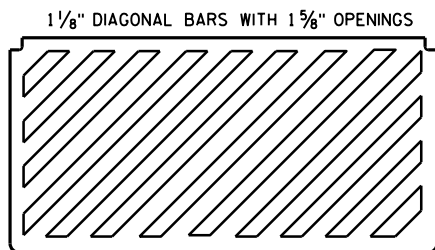


NOTE: CURB BOX HEIGHT ADJUSTABLE 6" TO 9"

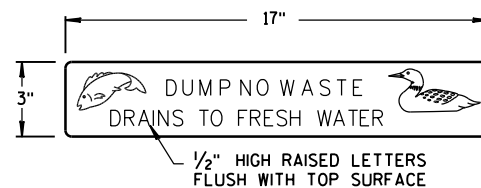


TYPE "H"

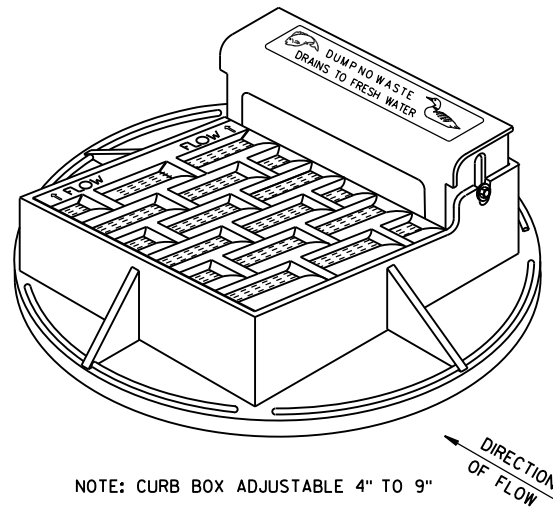
NOTE: EITHER CASTING IS ACCEPTABLE



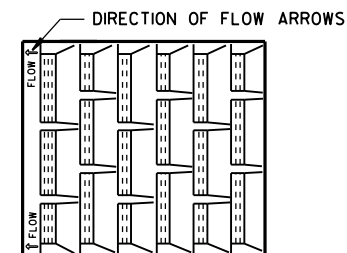
SPECIAL GRATE FOR
TYPE "H" COVER
(MEASURES 35 1/4" X 17 3/4" X 2")
(NOTED AS TYPE H-S ON DRAINAGE TABLE)



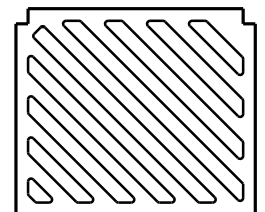
LOGO DETAIL



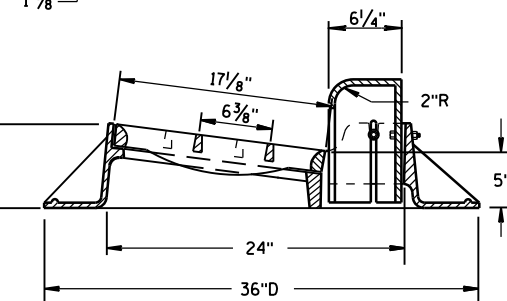
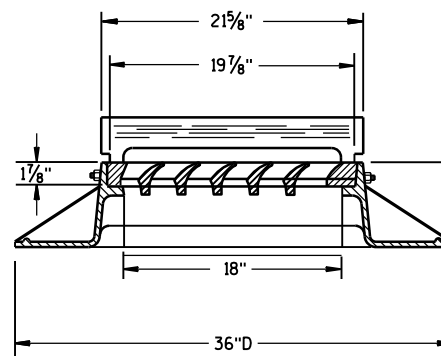
NOTE:
GRATE IS REVERSIBLE.



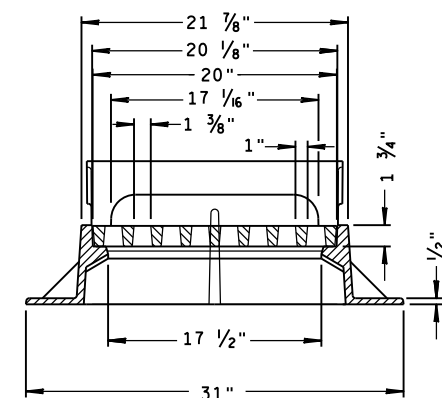
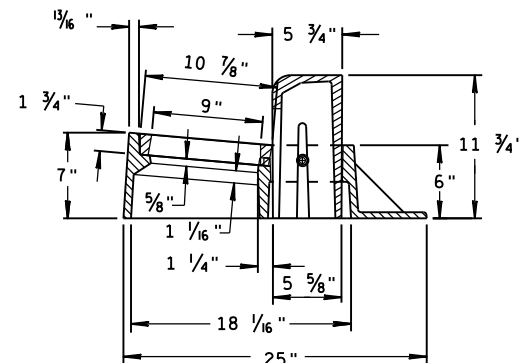
1" DIAGONAL BARS
WITH 1 1/2" OPENINGS



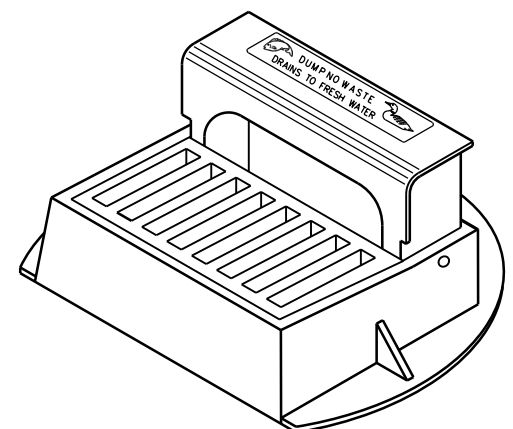
SPECIAL GRATE FOR
TYPE "A" COVER
(MEASURES 19 3/4" X 17" X 1 1/8")
(NOTED AS TYPE A-S ON DRAINAGE TABLE)



TYPE "A"



TYPE "Z"

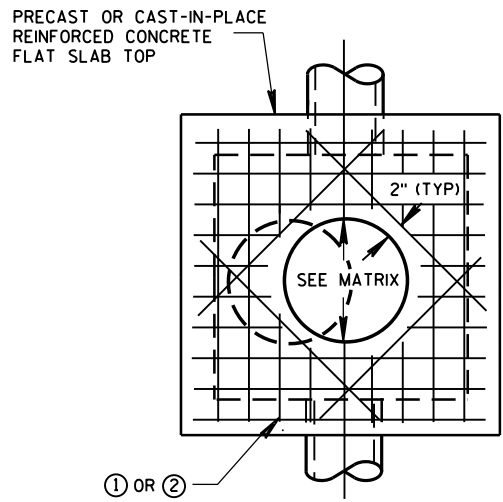


INLET COVERS
TYPE A, H, A-S, H-S & Z

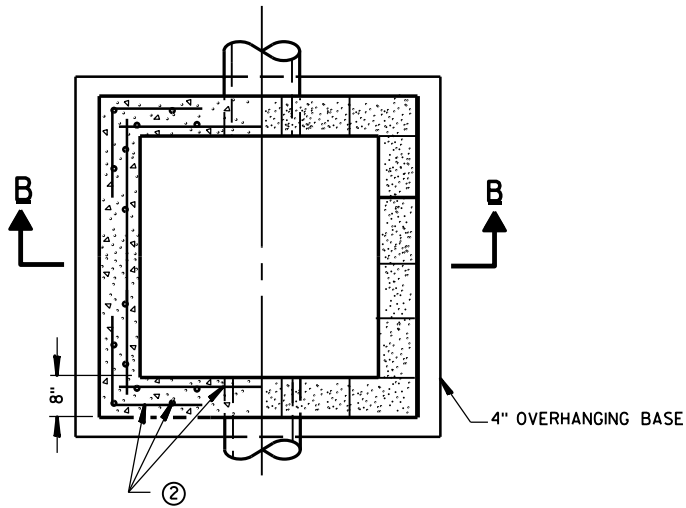
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
II-27-13
DATE
FHWA

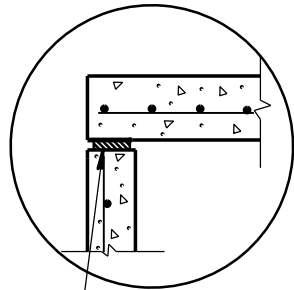
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER



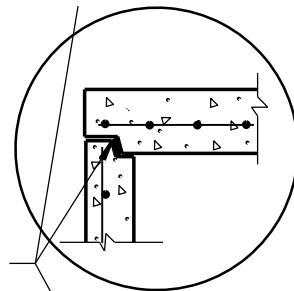
PLAN VIEW
CIRCULAR OPENING



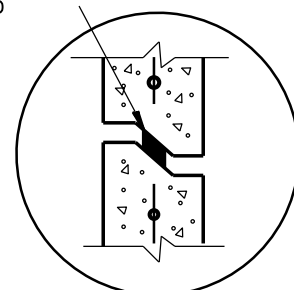
SECTION A-A
PLAN VIEW



TOP WITH PLAIN END JOINT

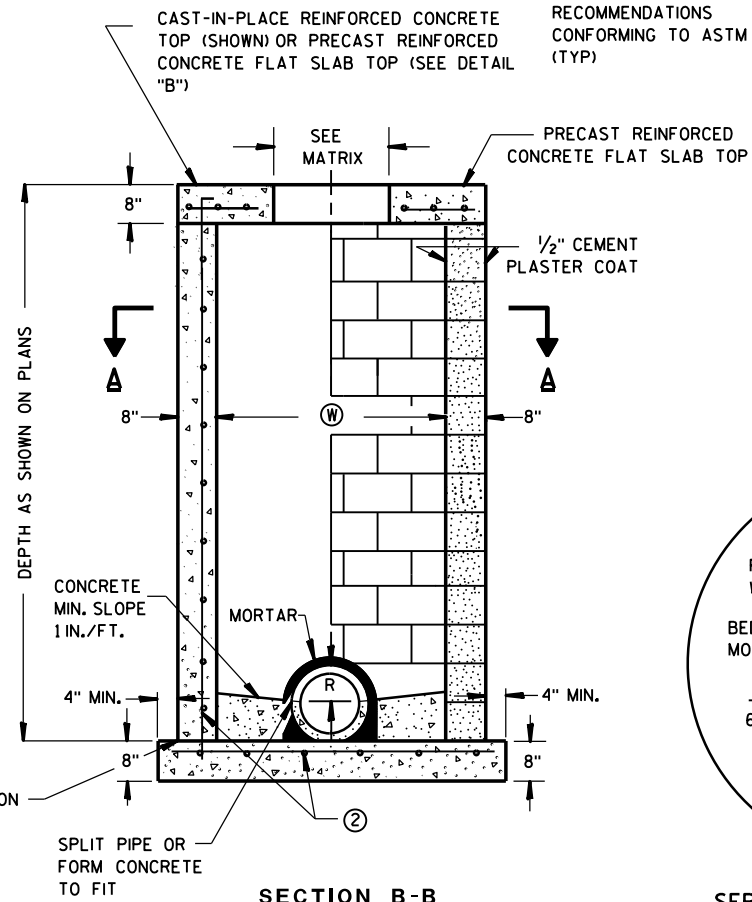
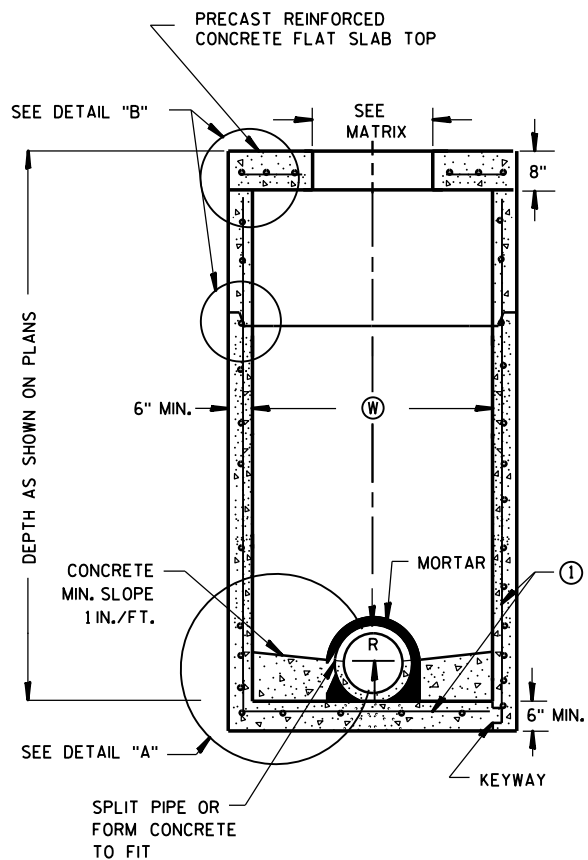


TOP WITH TONGUE AND GROOVE JOINT

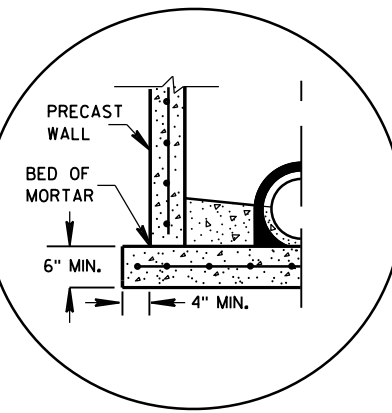


DETAIL "B"

JOINTS TO BE SEALED WITH A BUTYL RUBBER SEAL PER SEALANT MANUFACTURERS RECOMMENDATIONS CONFORMING TO ASTM C 990 (TYP)



SECTION B-B



SEPARATE PRECAST REINFORCED
CONCRETE BASE OPTION

DETAIL "A"

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE ENGINEER, THE CONTRACTOR SHALL NOT ORDER AND DELIVER PRECAST MANHOLE UNITS REQUIRED FOR THE PROJECT UNTIL A LIST OF SIZES IS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ALL DRAINAGE STRUCTURES ARE DESIGNATED ON THE PLANS AS "MANHOLES 3X3-L", "CATCH BASINS 4-B", "INLETS 2X3-H", ETC. THE FIRST NUMBERS DESIGNATE THE SIZE OF THE STRUCTURE, AND THE FOLLOWING LETTER DESIGNATES THE TYPE OF COVER TO BE USED TO COMPRISE THE COMPLETE UNIT.

BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS OF GRANULAR BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

PRECAST REINFORCED FLAT SLAB TOPS MAY BE USED ON CONCRETE BLOCK STRUCTURES. THE TOPS SHALL BE INSTALLED ON A BED OF MORTAR.

STEPS MEETING AASHTO M199 AND THE FOLLOWING REQUIREMENTS SHALL BE INSTALLED IN ALL STRUCTURES OVER 5 FEET IN DEPTH: 16 INCH C-C MAXIMUM SPACING; PROJECT A MINIMUM CLEAR DISTANCE OF 4 INCHES FROM THE WALL AT THE POINT OF EMBEDMENT; MINIMUM LENGTH OF 10 INCHES; MINIMUM WALL EMBEDMENT OF 3 INCHES. FERROUS METAL STEPS NOT PAINTED OR TREATED TO RESIST CORROSION SHALL HAVE A MINIMUM CROSS SECTIONAL DIMENSION OF 1 INCH.

STEPS OF APPROVED POLYPROPYLENE PLASTIC COATED REINFORCEMENT BAR ARE ACCEPTABLE. REINFORCING BAR MUST BE A MINIMUM OF 1/2 INCH AND MEET THE REQUIREMENTS OF ASTM A615.

CERTIFICATION SHALL BE PROVIDED THAT INSTALLED STEPS WHEN TESTED IN ACCORDANCE WITH SECTION 10 OF AASHTO T280 CAN WITHSTAND A VERTICAL LOAD OF 800 LBS. AND A HORIZONTAL LOAD OF 400 LBS.

ALL BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

CONCRETE BLOCK WILL NOT BE PERMITTED FOR STRUCTURES GREATER THAN 4 FEET IN WIDTH.

PRECAST REINFORCED RISERS SHALL HAVE A TONGUE AND GROOVE JOINT WITH TONGUE UP OR DOWN.

ALL PRECAST MANHOLE UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF ASTM C 913.

4" OVERHANGING BASES ARE REQUIRED FOR ALL CONCRETE BLOCK INSTALLATIONS. 4" OVERHANG IS REQUIRED WHEN SEPARATE PRECAST BASE IS PROVIDED. OVERHANG IS NOT REQUIRED ON PRECAST STRUCTURES WITH AN INTEGRAL OR MONOLITHIC BASE.

MAXIMUM PIPE DIAMETER DETERMINED BY 3 INCH CLEARANCE ON EACH SIDE OF THE OUTSIDE WALL OF THE PIPE. SEE DETAIL "C". ASSUMES PIPE ENTERS PERPENDICULAR TO THE STRUCTURE.

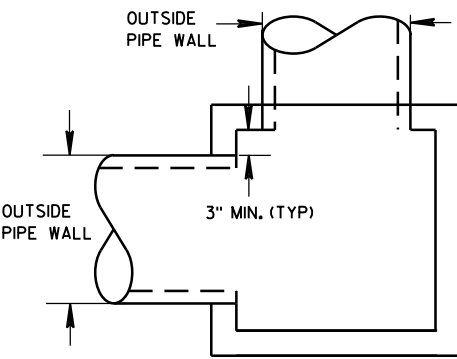
- ① FOR PRECAST MANHOLES PROVIDE REINFORCING STEEL IN ACCORDANCE TO ASTM C 913.
- ② CONTRACTOR TO PROVIDE DRAWING(S) STAMPED BY A PROFESSIONAL ENGINEER FOR STEEL REINFORCING DESIGN FOR CAST-IN-PLACE STRUCTURES.

MANHOLE COVER OPENING MATRIX

MANHOLE COVER TYPE	C	ALL J'S	K	L	M
OPENING SIZE (FT)					
2 DIA.	X	X		X	
3 DIA.			X		X

PIPE MATRIX

MANHOLE SIZE	MAXIMUM INSIDE PIPE DIAMETER	
	WIDTH (W) (IN)	LENGTH (L) (IN)
3X3-FT	24	24
4X4-FT	30	30
5X5-FT	42	42
6X6-FT	54	54



DETAIL "C"

PRECAST REINFORCED
CONCRETE WITH
MONOLITHIC BASE

PRECAST REINFORCED
CONCRETE WITH
INTEGRAL BASE

CAST-IN-PLACE
REINFORCED
CONCRETE

CONCRETE BLOCK WITH
CAST-IN-PLACE OR
PRECAST REINFORCED
CONCRETE BASE

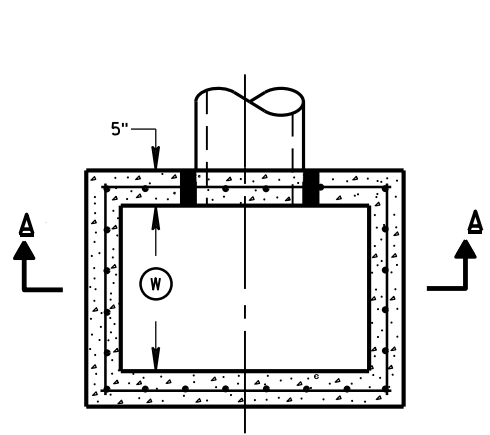
SQUARE MANHOLES W/ FLAT TOP

MANHOLES 3X3-FT, 4X4-FT, 5X5-FT AND 6X6-FT

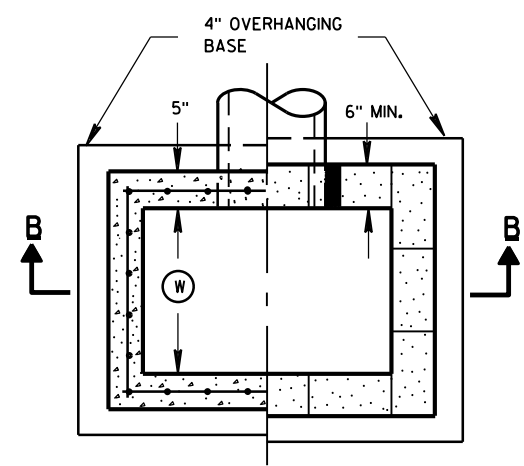
MANHOLES 3X3-FT, 4X4-FT
5X5-FT AND 6X6-FT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

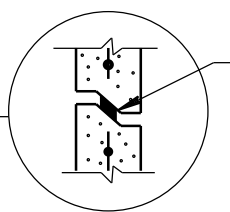
APPROVED
6/5/2012 /S/ Jerry H. Zogg
DATE ROADWAY STANDARDS DEVELOPMENT
FHWA ENGINEER



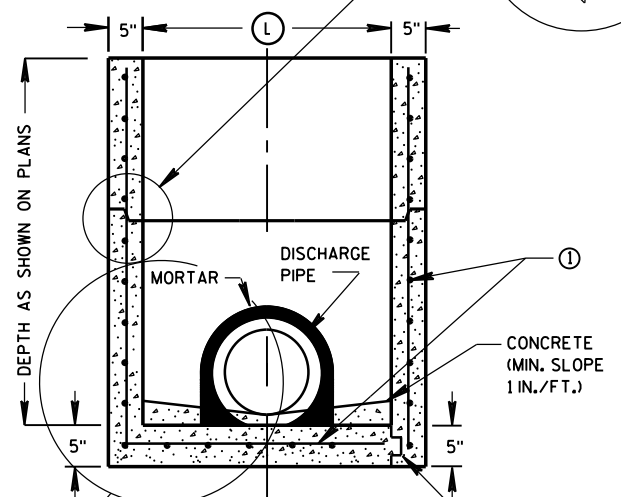
PLAN VIEW



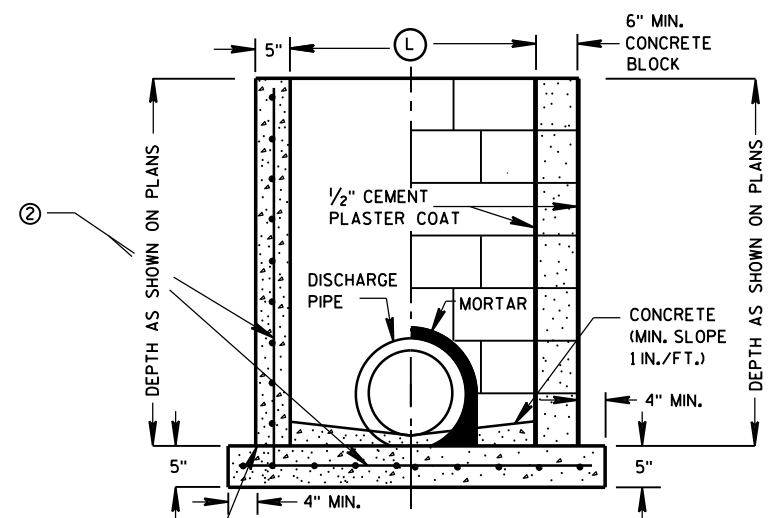
PLAN VIEW



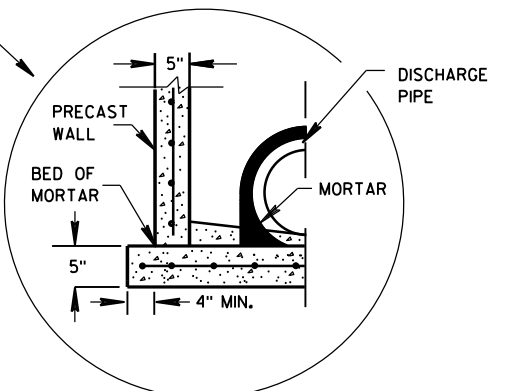
RISER JOINTS TO BE SEALED WITH A BUTYL RUBBER SEAL PER SEALANT MANUFACTURERS RECOMMENDATIONS CONFORMING TO ASTM C 990 (TYP)



SECTION A-A



SECTION B-B



SEPARATE PRECAST REINFORCED CONCRETE BASE OPTION

INLETS 2X2-FT, 2X2.5-FT, 2X3-FT AND 2.5X3-FT

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE ENGINEER, THE CONTRACTOR SHALL NOT ORDER AND DELIVER PRECAST INLET UNITS REQUIRED FOR THE PROJECT UNTIL A LIST OF SIZES IS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ALL PRECAST INLET UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF ASTM C 913.

ALL DRAINAGE STRUCTURES ARE DESIGNATED ON THE PLANS AS "MANHOLES 3X3-L", "CATCH BASINS 4-B", "INLETS 2X3-H", ETC. THE FIRST NUMBERS DESIGNATES THE SIZE OF THE STRUCTURE, AND THE FOLLOWING LETTER DESIGNATES THE TYPE OF COVER TO BE USED TO COMPRISE THE COMPLETE UNIT.

BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS OF GRANULAR BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

ALL BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

PRECAST REINFORCED RISERS SHALL HAVE A TONGUE AND GROOVE JOINT WITH TONGUE UP OR DOWN.

4" OVERHANGING BASES ARE REQUIRED FOR CAST-IN-PLACE REINFORCED CONCRETE AND CONCRETE BLOCK INSTALLATIONS. 4" OVERHANG IS REQUIRED WHEN SEPARATE PRECAST BASE IS PROVIDED. OVERHANG IS NOT REQUIRED ON PRECAST STRUCTURES WITH AN INTEGRAL OR MONOLITHIC BASE.

MAXIMUM INSIDE PIPE DIAMETER DETERMINED BY 3 INCH CLEARANCE ON EACH SIDE OF THE OUTSIDE WALL OF THE PIPE. SEE DETAIL "A". ASSUMES PIPE ENTERS PERPENDICULAR TO THE STRUCTURE.

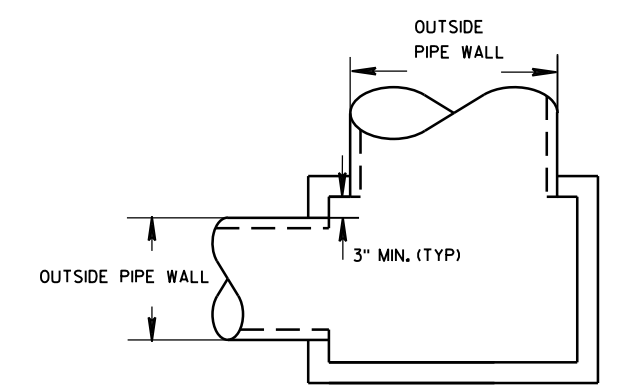
- ① FOR PRECAST INLETS PROVIDE REINFORCING STEEL IN ACCORDANCE TO ASTM C 913.
- ② CONTRACTOR TO PROVIDE DRAWING(S) STAMPED BY A PROFESSIONAL ENGINEER FOR STEEL REINFORCING DESIGN FOR CAST-IN-PLACE STRUCTURES.

INLET COVER MATRIX

INLET SIZE		INLET COVER TYPE	ALL A'S	ALL B'S	BW	F	ALL H'S	S	T	V	WM
	WIDTH ① (FT)	LENGTH ② (FT)									
2X2-FT	2	2	X	X				X		X	
2X2.5-FT	2	2.5			X			X	X	X	X
2X3-FT	2	3					X				
2.5X3-FT	2.5	3				X					

PIPE MATRIX

INLET SIZE	MAXIMUM INSIDE PIPE DIAMETER	
	WIDTH (IN)	LENGTH (IN)
2X2-FT	12	12
2X2.5-FT	12	18
2X3-FT	12	24
2.5X3-FT	18	24

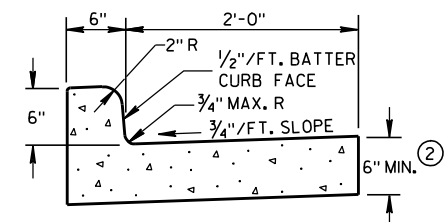


DETAIL "A"

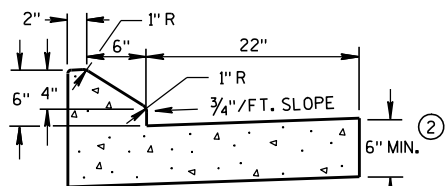
INLETS 2X2-FT, 2X2.5-FT, 2X3-FT AND 2.5X3-FT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

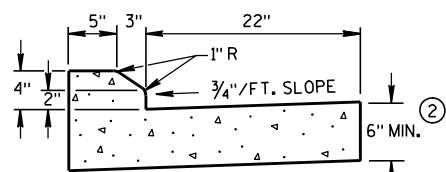
APPROVED
6/5/2012 /S/ Jerry H. Zogg
DATE ROADWAY STANDARDS DEVELOPMENT
FHWA ENGINEER



TYPES A & D ①



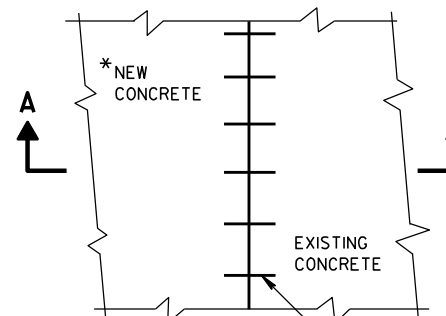
6" SLOPED CURB TYPES G & J ①



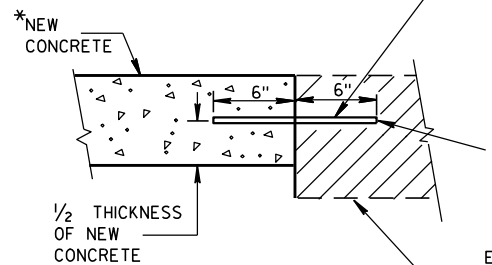
4" SLOPED CURB TYPES G & J ①

CONCRETE CURB & GUTTER 30"

* NEW CURB & GUTTER,
SURFACE DRAINS,
CONCRETE PAVEMENT
OR OTHER NEW CONCRETE.



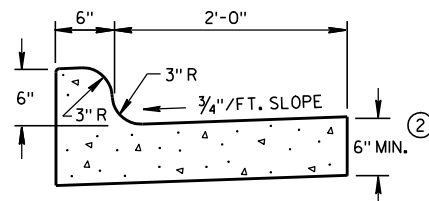
PLAN VIEW

SECTION A-A
TIE BARS DRILLED
INTO EXISTING PAVEMENT

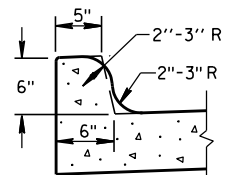
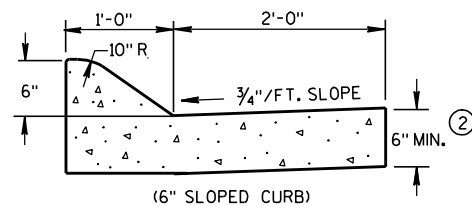
NO. 6 TIE BARS SPACED 2'-6" C-C,
INSTALLED PERPENDICULAR
TO THE LONGITUDINAL JOINT.

MAXIMUM DRILL HOLE
SIZE IS 1/8" GREATER
THAN TIE BAR DIAMETER

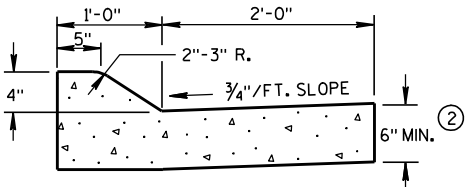
EXISTING
CONCRETE



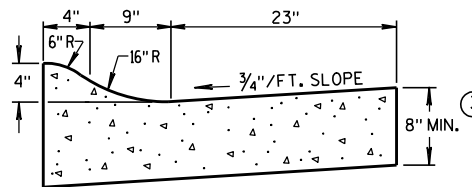
TYPES K & L ①

OPTIONAL CURB SHAPE
FOR TYPES K & L ①

(6" SLOPED CURB)

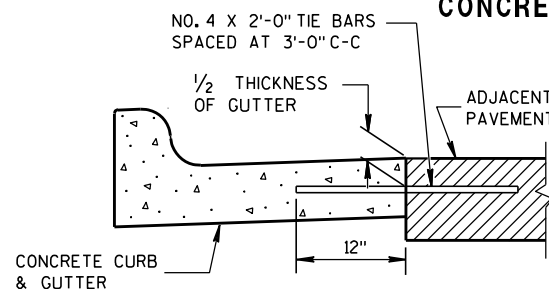


TYPES A & D ①

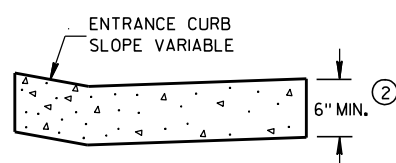


4" SLOPED CURB TYPES R & T ① ④

CONCRETE CURB & GUTTER 36"

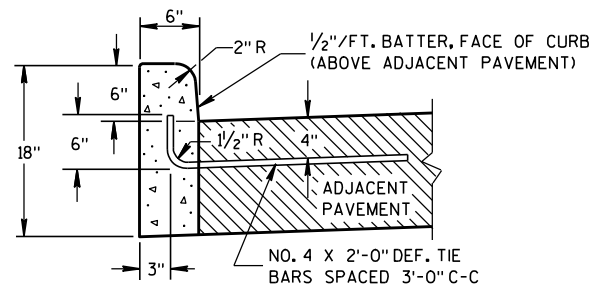


TYPICAL TIE BAR LOCATION ①



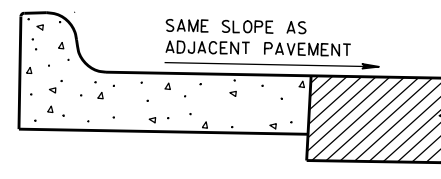
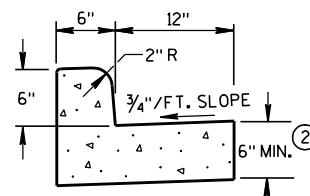
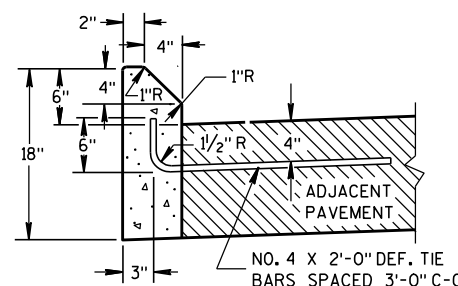
DRIVEWAY ENTRANCE CURB

(WHEN DIRECTED BY THE ENGINEER)



TYPES A & D ①

CONCRETE CURB

REVERSE SLOPE GUTTER ⑤
(TYPICAL FOR ALL CURB & GUTTER TYPES)TYPES A & D
CONCRETE CURB & GUTTER 18"

TYPES G & J ①

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

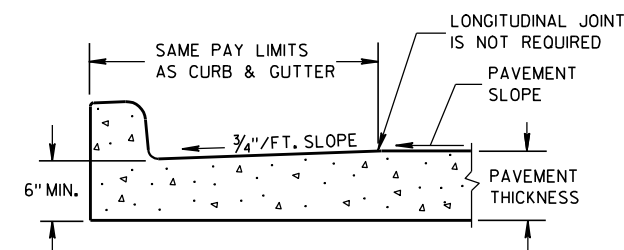
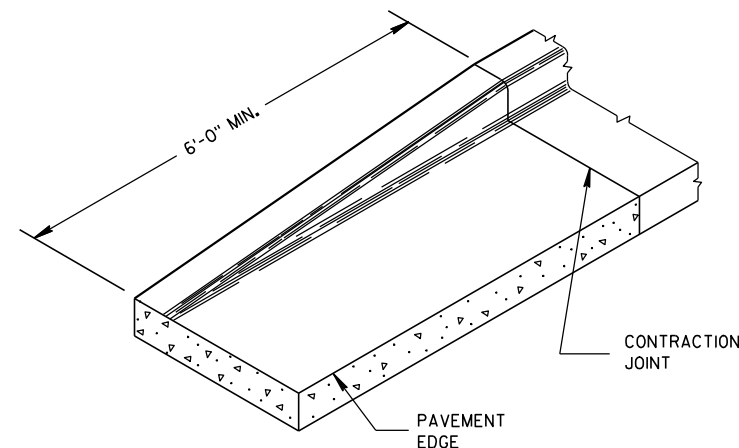
PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

INTEGRAL CURB & GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB & GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE. A LONGITUDINAL CONSTRUCTION JOINT IS NOT REQUIRED WITH INTEGRAL CURB AND GUTTER.

WHERE THE TRANSVERSE JOINTS IN THE PAVEMENT ARE REQUIRED TO BE SEALED, THE JOINTS IN THE INTEGRAL CURB AND GUTTER SHALL BE SEALED TO THE FACE OF CURB WITH THE SAME TYPE OF SEALANT. THE COST OF FURNISHING AND INSTALLING THIS SEALANT SHALL BE INCIDENTAL TO THE ITEM CONCRETE CURB AND GUTTER.

UNLESS OTHERWISE SHOWN ON THE TYPICAL CROSS SECTIONS, THE BASE AGGREGATE AND COMMON EXCAVATION LIMITS ARE 2'-0" BEHIND THE BACK OF CURBS.

- ① TIE BARS ARE REQUIRED FOR CURB AND GUTTER TYPES A, G, K AND R.
- ② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ③ THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 8" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ④ THE FACE OF CURB IS 6" FROM THE BACK OF CURB.
- ⑤ WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATION(S) WILL BE SHOWN ELSEWHERE IN THE PLAN.

PARTIAL SECTION OF PAVEMENT
WITH INTEGRAL CURB & GUTTER

END SECTION CURB & GUTTER

CONCRETE CURB, CONCRETE
CURB & GUTTER AND TIES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

9/4/08

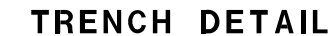
DATE

FHWA

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER



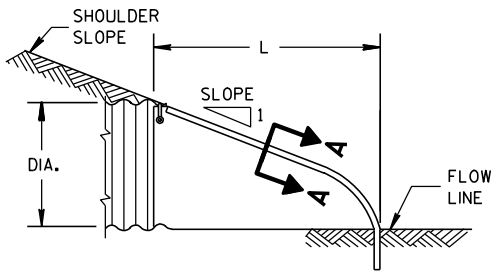
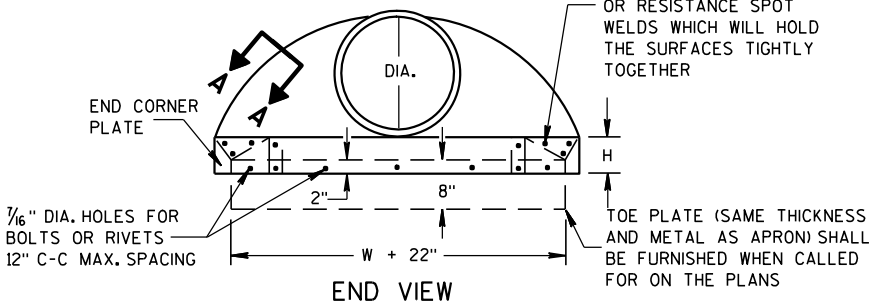
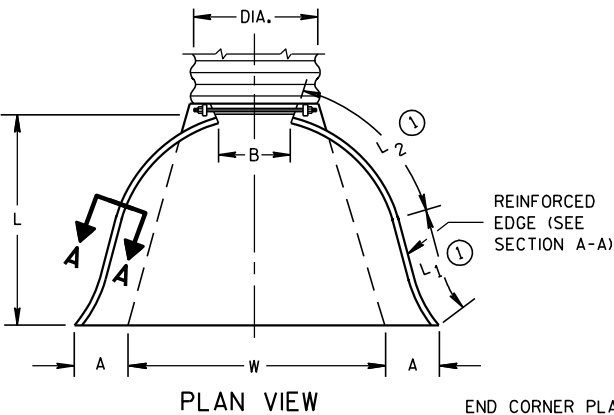
- ① HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
- ② FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
- ③ WOOD POSTS SHALL BE A MINIMUM SIZE OF 1½" X 1½" OF OAK OR HICKORY.
- ④ SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.
- ⑤ CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.



SILT FENCE	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED <u>4-29-05</u> DATE	<u>/S/ Beth Cannestra</u> CHIEF ROADWAY DEVELOPMENT ENGINEER

METAL APRON ENDWALLS											
PIPE DIA. (IN.)	MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 ①	L2 ①	W (±2")		
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	36	2 1/2 to 1	1 Pc.
21	.064	.060	9	12	6	36	18	29 5/8	42	2 1/2 to 1	1 Pc.
24	.064	.075	10	13	6	41	18	37 1/4	48	2 1/2 to 1	1 Pc.
30	.079	.075	12	16	8	51	18	52 1/4	60	2 1/2 to 1	1 Pc.
36	.079	.105	14	19	9	60	24	59 3/4	72	2 1/2 to 1	2 Pc.
42	.109	.105	16	22	11	69	24	75 5/8	84	2 1/2 to 1	2 Pc.
48	.109	.105	18	27	12	78	24	81	90	2 1/4 to 1	3 Pc.
54	.109	.105	18	30	12	84	30	85 1/2	102	2 1/4 to 1	3 Pc.
60	.109x	.105x	18	33	12	87	—	—	114	2 to 1	3 Pc.
66	.109x	.105x	18	36	12	87	—	—	120	2 to 1	3 Pc.
72	.109x	.105x	18	39	12	87	—	—	126	2 to 1	3 Pc.
78	.109x	.105x	18	42	12	87	—	—	132	1 1/2 to 1	3 Pc.
84	.109x	.105x	18	45	12	87	—	—	138	1 1/2 to 1	3 Pc.
90	.109x	.105x	18	37	12	87	—	—	144	1 1/2 to 1	3 Pc.
96	.109x	.105x	18	35	12	87	—	—	150	1 1/2 to 1	3 Pc.

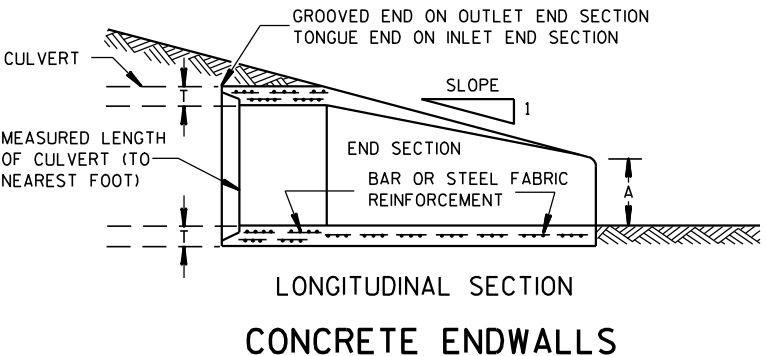
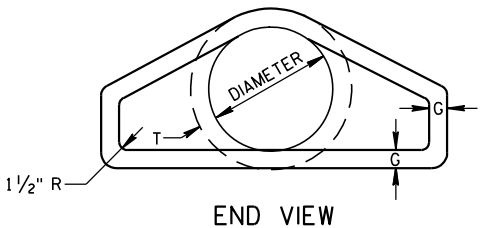
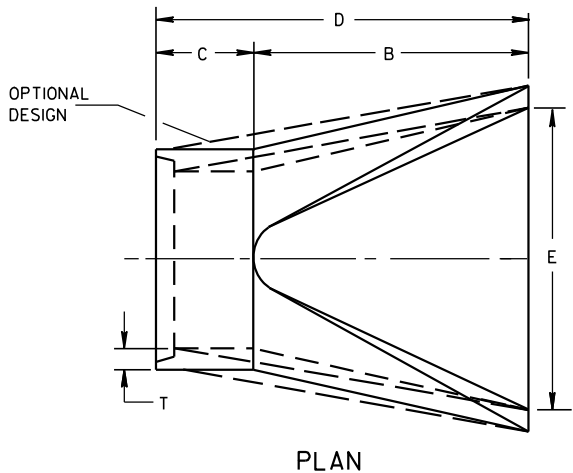
* EXCEPT CENTER PANEL
SEE GENERAL NOTES



SIDE ELEVATION
METAL ENDWALLS

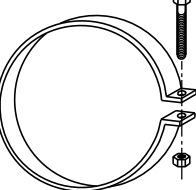
REINFORCED CONCRETE APRON ENDWALLS											
PIPE DIA. (IN.)	DIMENSIONS (Inches)							APPROX. SLOPE			
	T	A	B	C	D	E	G				
12	2	4	24	48 7/8	72 7/8	24	2	3 to 1			
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1			
18	2 1/2	9	27	46	73	36	2 1/2	3 to 1			
21	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	3 to 1			
24	3	9 1/2	43 1/2	30	73 1/2	48	3	3 to 1			
27	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	3 to 1			
30	3 1/2	12	54	19 3/4	73 1/2	60	3 1/2	3 to 1			
36	4	15	63	34 3/4	97 3/4	72	4	3 to 1			
42	4 1/2	21	63	35	98	78	4 1/2	3 to 1			
48	5	24	72	26	98	84	5	3 to 1			
54	5 1/2	27	65	33 1/4-35	98 1/4-100	90	5 1/2	2 2/5 to 1			
60	6	30-35	60	39	99	96	5	2 to 1			
66	6 1/2	24-30	72-78	21-27	99	102	5 1/2	2 to 1			
72	7	24-36	78	21	99	108	6	2 to 1			
78	7 1/2	24-36	78	21	99	114	6 1/2	2 to 1			
84	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1			
90	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	1 1/2 to 1			

* MINIMUM
** MAXIMUM

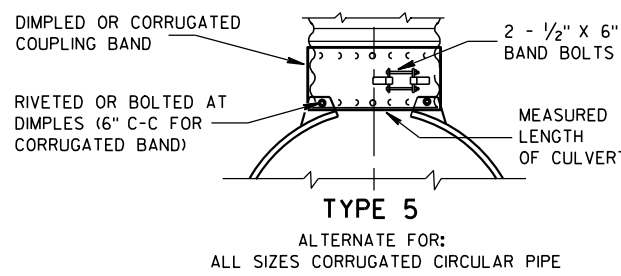
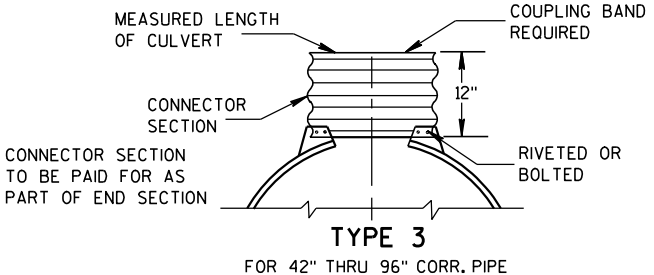
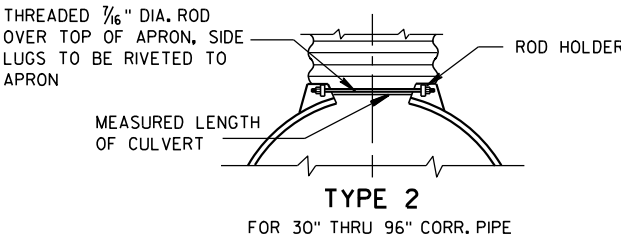
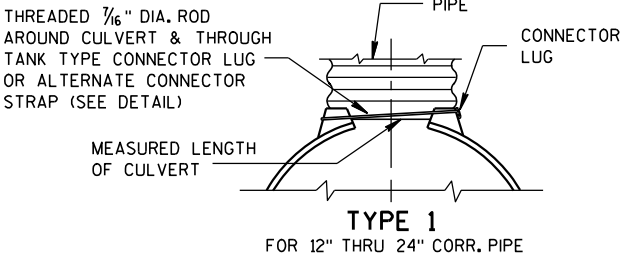


LONGITUDINAL SECTION
CONCRETE ENDWALLS

1" WIDE, 12 GA. (0.109" THICK) GALVANIZED STRAP WITH STANDARD 6" X 1/2" BAND BOLT AND NUT



ALTERNATE FOR TYPE 1 CONNECTION
END SECTION CONNECTOR STRAP



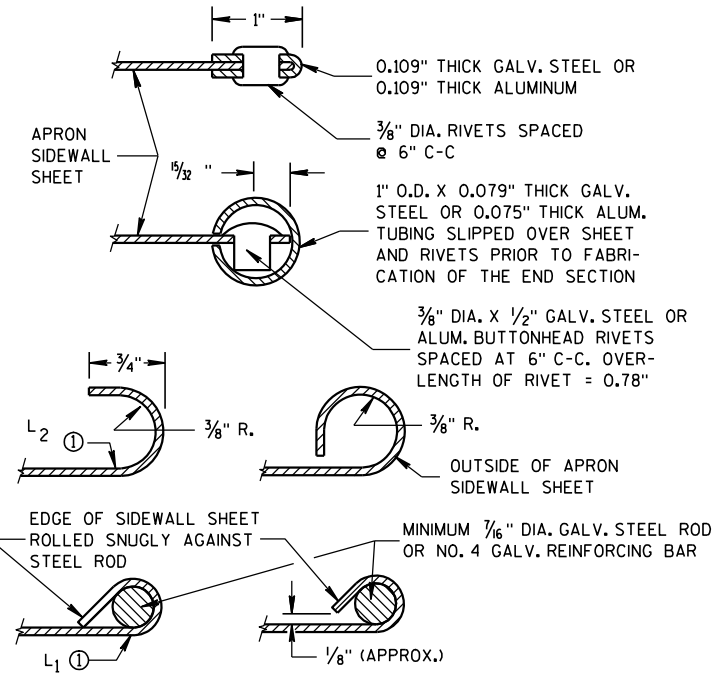
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

FOR CIRCUMFERENTIALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2, 3 OR 5 AS APPLICABLE.

FOR HELICALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2 OR 5.

FOR HELICALLY CORRUGATED PIPES WITH TWO CIRCUMFERENTIAL CORRUGATIONS AT EACH END USE ENDWALL CONNECTION DETAILS 1, 2 OR 3.

CONNECTION DETAILS



GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

CONCRETE CULVERT ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VISE VERSA. GALVANIZED STEEL OR ALUMINUM ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL.

ALL THREE PIECE STEEL APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.105" SIDES AND 0.134" CENTER PANELS. THE WIDTH OF CENTER PANELS SHALL BE GREATER THAN 20 PERCENT OF THE PIPE PERIMETER.

LAP SEAMS SHALL BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM RIVETS AND BOLTS FOR ALUMINUM UNITS. FOR THE 60" THROUGH 96" DIAMETER APRON ENDWALL SIZES, THE REINFORCED EDGES AND CENTER PANEL SEAMS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER ANGLES. THE ANGLES SHALL BE ATTACHED BY GALVANIZED NUTS AND BOLTS FOR STEEL UNITS AND ALUMINUM NUTS AND BOLTS FOR ALUMINUM UNITS.

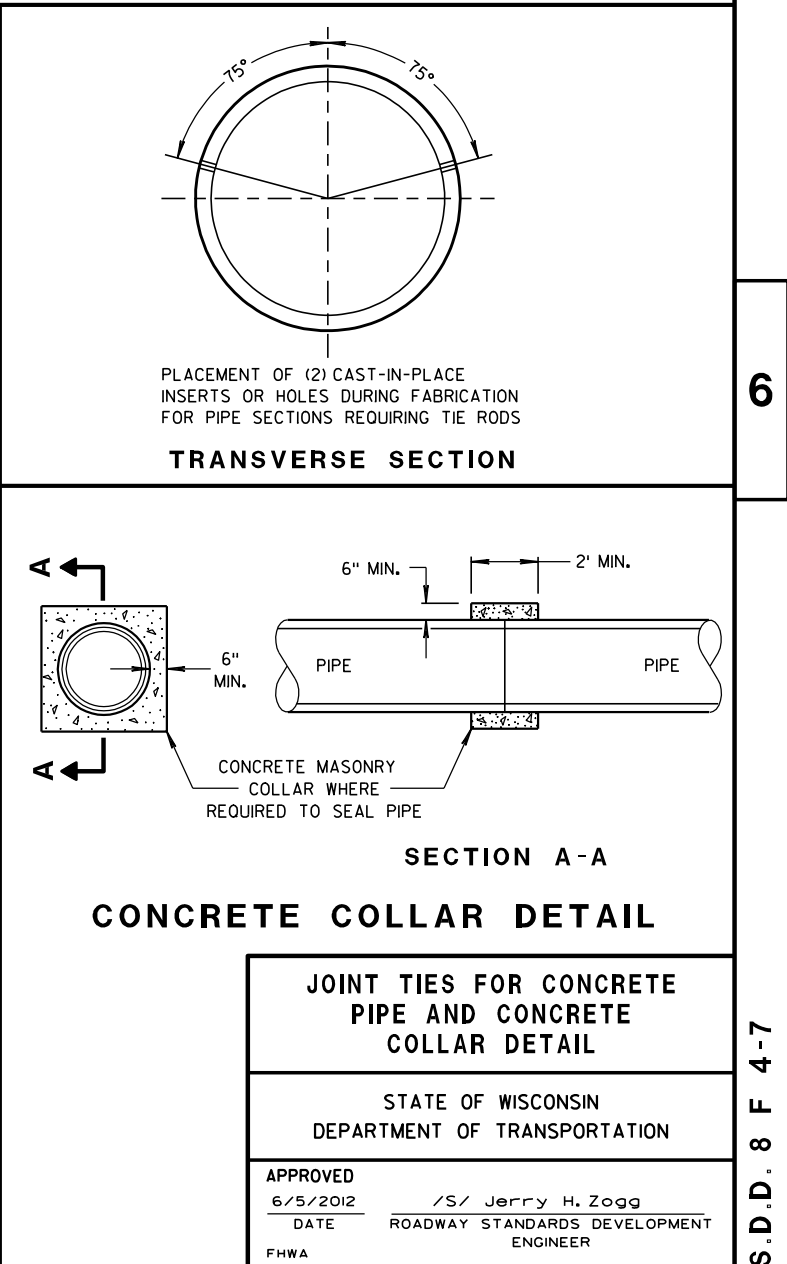
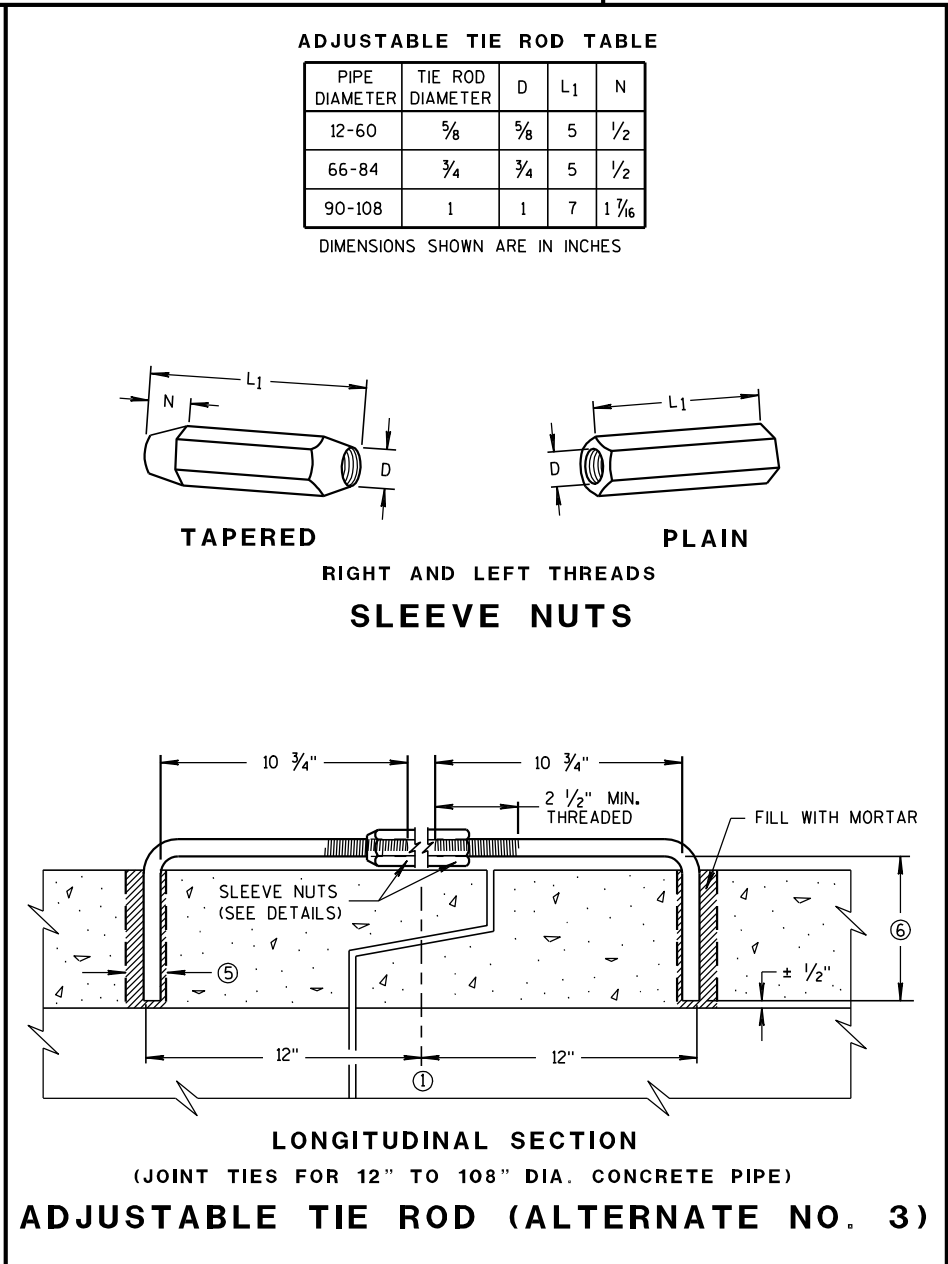
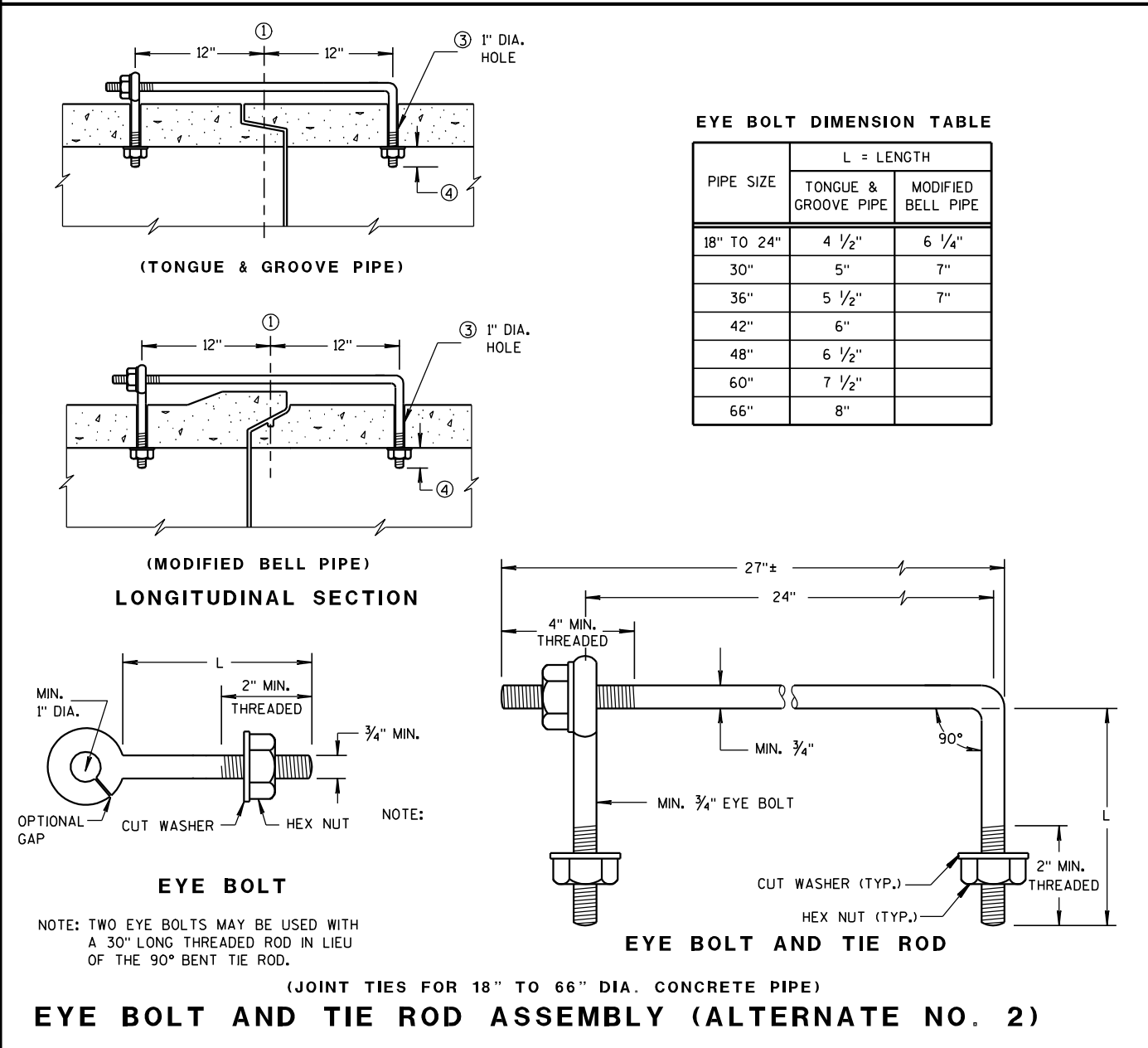
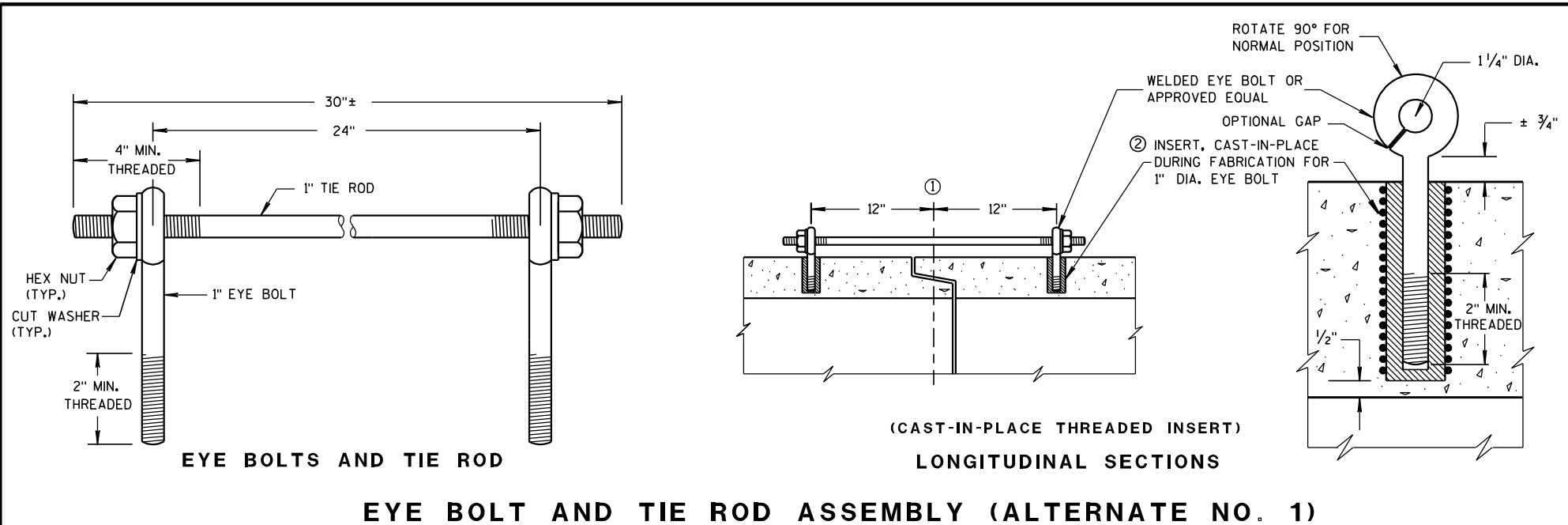
WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

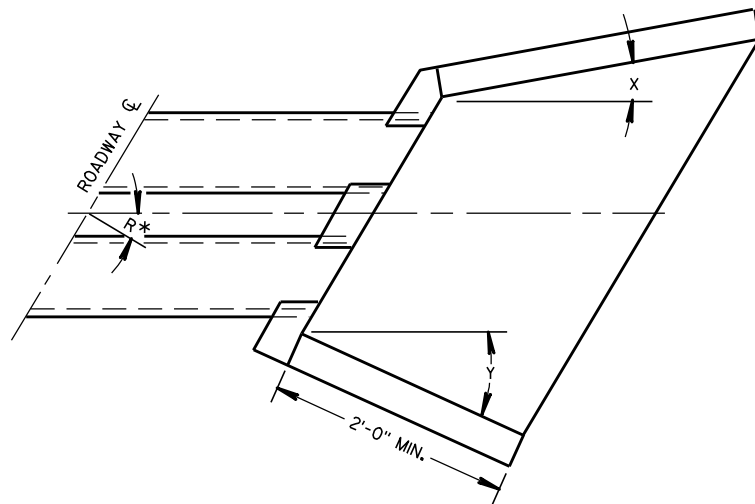
① FOR PIPE SIZES UP TO 60" DIAMETER, A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.

APRON ENDWALLS FOR
CULVERT PIPE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
11/30/94
DATE
/S/ Rory L. Rhinesmith
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA





WINGWALL ANGLE DETAILS

INLET			OUTLET		
R*	X	Y	R*	X	Y
0 - 7°	30°	30°	0 - 15°	15°	15°
8 - 22°	25°	"	16 - 45°	10°	"
23 - 37°	20°	"	46 - 75°	5°	"
38 - 52°	15°	"	OVER 75°	0°	"
53 - 67°	10°	"			
68 - 82°	5°	"			
OVER 82°	0°	"			

*R = NUMBER OF DEGREES RIGHT OR LEFT HAND FORWARD

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

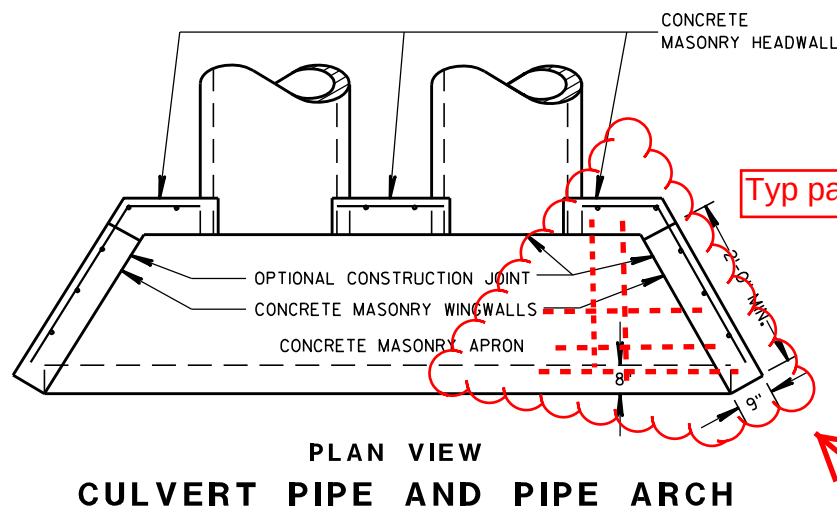
FILL SLOPES FLATTER THAN 2 1/2:1 SHALL BE WARPED TO MEET THE TOP OF THE WINGWALLS.

ALL STEEL REINFORCEMENT AND WELDED STEEL WIRE FABRIC SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE NOTED.

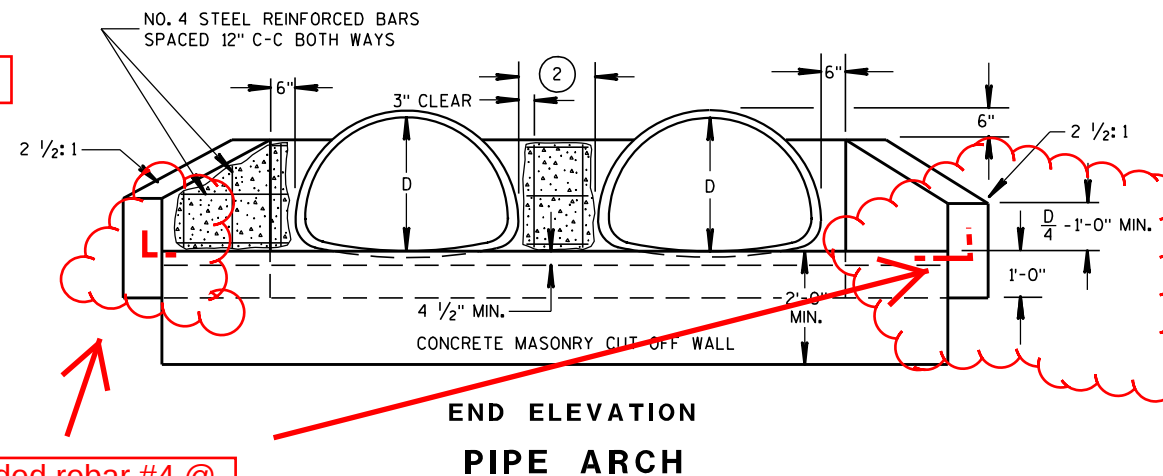
① MINIMUM REINFORCEMENT SHALL BE 6" X 6" - W4.0 X W4.0 OR NO. 3 BARS SPACED 12" C-C IN BOTH DIRECTIONS.

② THE SPACE BETWEEN PIPES SHALL BE AS FOLLOWS:

DIAMETER OR SPAN	SPACE
UP TO AND INCLUDING 48"	2'-0"
OVER 48" TO 72"	1/2 DIA. OR SPAN
OVER 72"	3'-0"

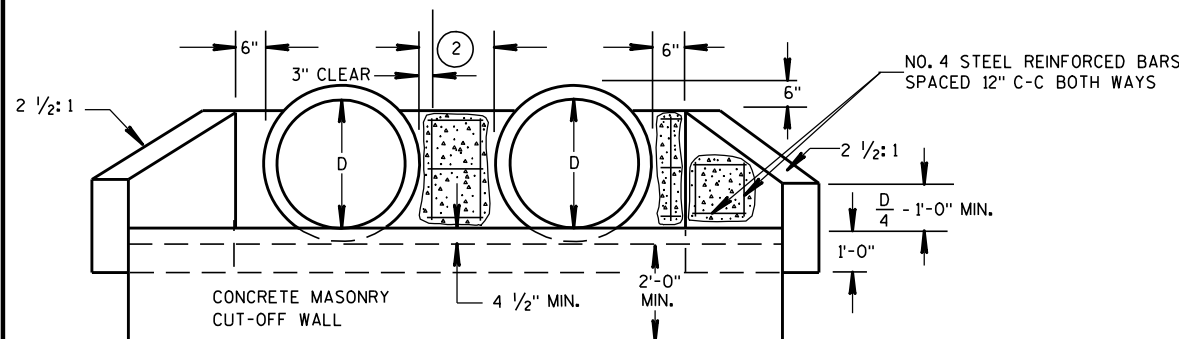


PLAN VIEW
CULVERT PIPE AND PIPE ARCH

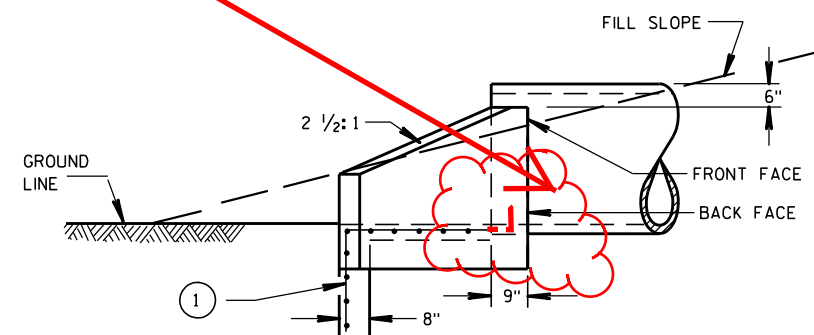


END ELEVATION
PIPE ARCH

Added rebar #4 @ 6"X 6"



END ELEVATION
CULVERT PIPE



SIDE ELEVATION
CULVERT PIPE AND PIPE ARCH

CONCRETE MASONRY ENDWALLS FOR CULVERT PIPE AND PIPE ARCH

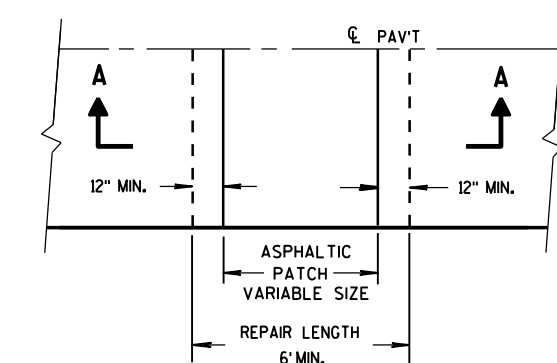
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

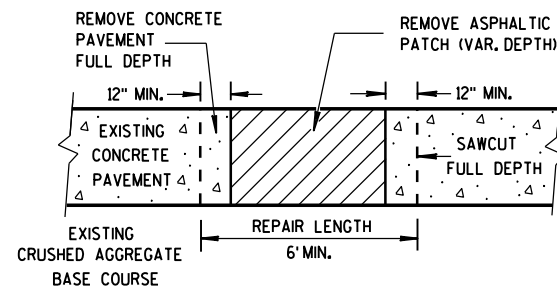
9/14/98
DATE

FHWA

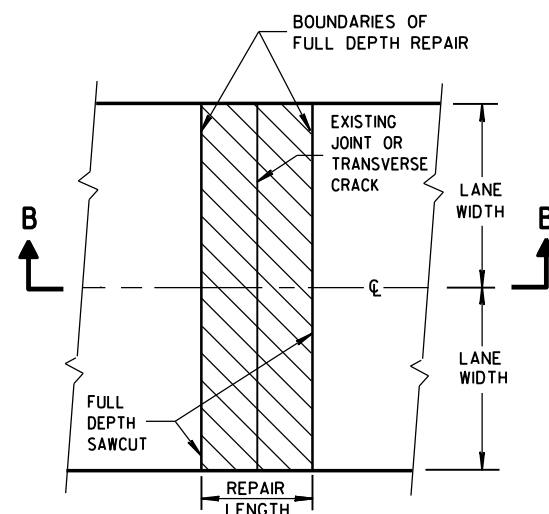
/S/ Rory L. Rhinesmith
CHIEF ROADWAY DEVELOPMENT ENGINEER



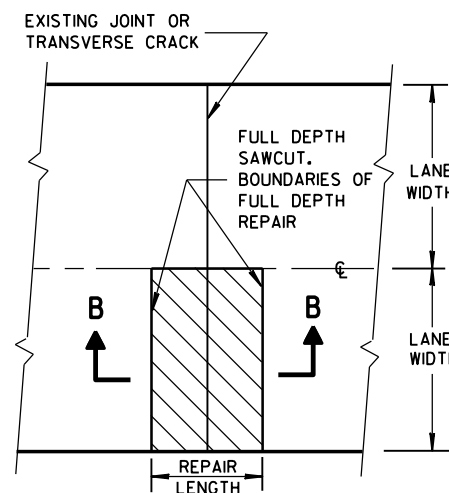
PLAN VIEW



SECTION A-A
HMA PATCH REMOVAL



PLAN VIEW
(DOUBLE LANE REPAIR)



PLAN VIEW
(SINGLE LANE REPAIR)

FULL DEPTH CONCRETE PAVEMENT REMOVAL

(SEE NOTE)

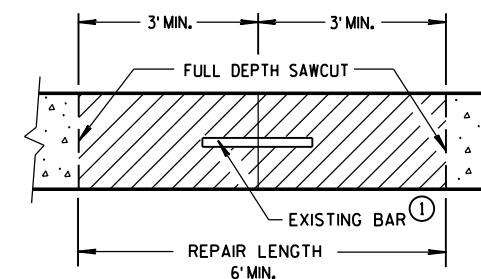
GENERAL NOTES

SAW CUT, DRILL, AND LIFT OUT EXISTING CONCRETE PAVEMENT WITHIN THE BOUNDARIES OF CONCRETE REPAIR AREAS. THE CONTRACTOR MAY MAKE ADDITIONAL SAW CUTS INSIDE THE REPAIR LIMITS TO REDUCE WEIGHT AND SIZE OF CONCRETE PIECES. ADDITIONAL SAW CUTS ARE NOT PAID FOR BY THE DEPARTMENT.

PROVIDE A 6-FOOT MINIMUM DISTANCE FROM BOUNDARIES OF CONCRETE REPAIR AREAS TO ADJACENT TRANSVERSE JOINT OR CRACK IN THE SAME LANE.

THE LENGTH OF THE REPAIRS MAY VARY FROM THE DIMENSIONS SHOWN IF THE EXISTING CONCRETE PAVEMENT IS NONDOWELED AND THE PAVEMENT IS TO BE OVERLAID AFTER REPAIRING.

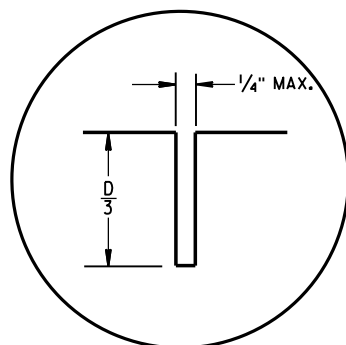
① DOWEL BARS MIGHT NOT EXIST.



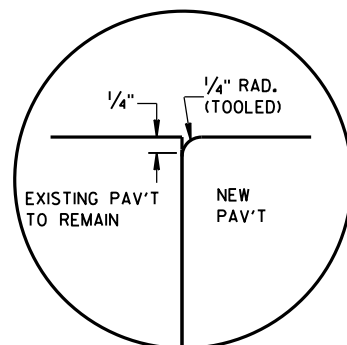
SECTION B-B
CONCRETE REMOVAL

TIE BAR TABLE

PAVEMENT DEPTH "D"	CLEAR COVER "C"	MAXIMUM TIE BAR SPACING "S"	
		PAVEMENT WIDTH 24' OR 26'	≥ 30'
6, 6 1/2"	3" ± 1/2"	48"	42"
7, 7 1/2"	3 1/4" ± 1"	45"	36"
8, 8 1/2"	3 3/4" ± 1"	39"	30"
9, 9 1/2"	4 1/4" ± 1"	33"	27"
10, 10 1/2"	4 3/4" ± 1"	30"	24"
11, 11 1/2"	5 1/4" ± 1"	27"	21"
12"	5 3/4" ± 1"	24"	21"

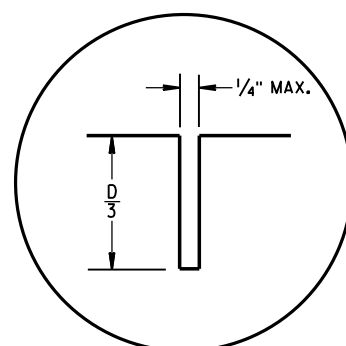


C1

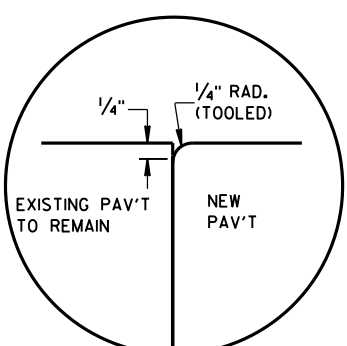


C2

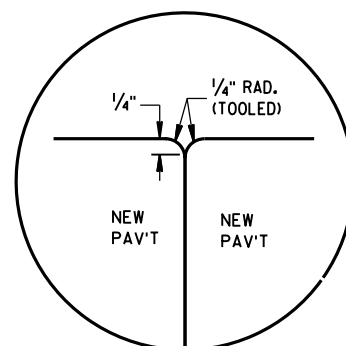
TRANSVERSE JOINTS



L1

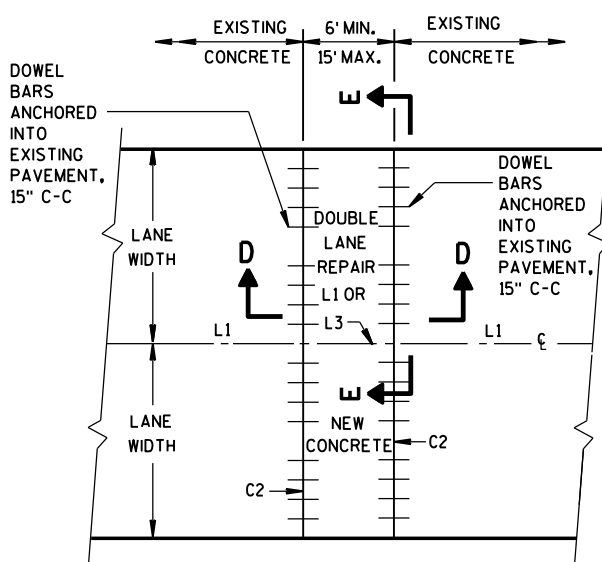


L2



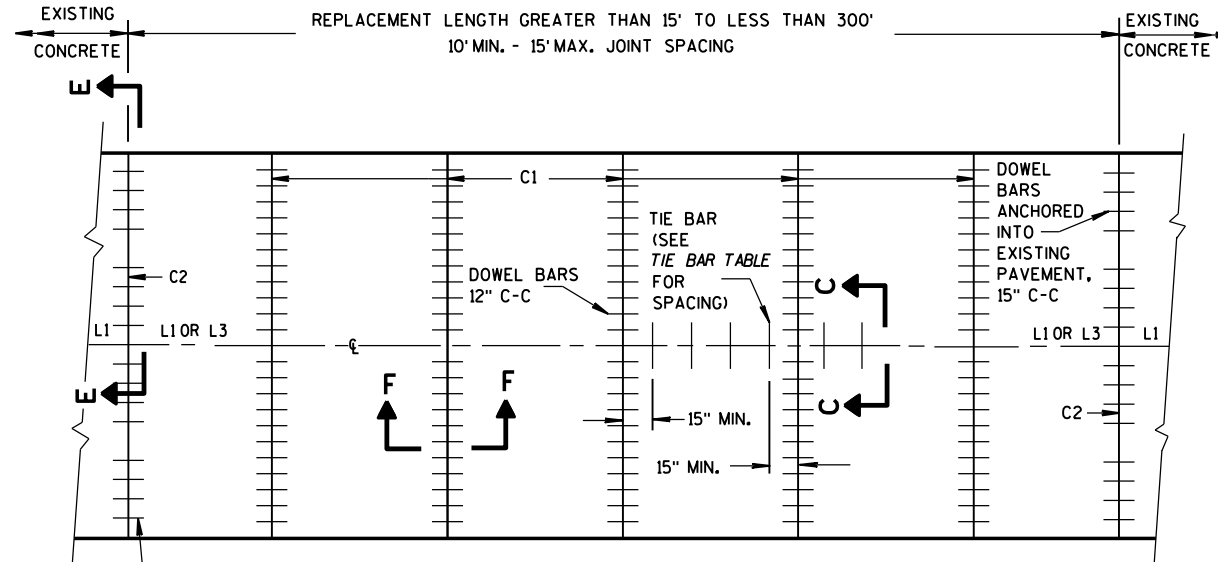
L3

LONGITUDINAL JOINTS



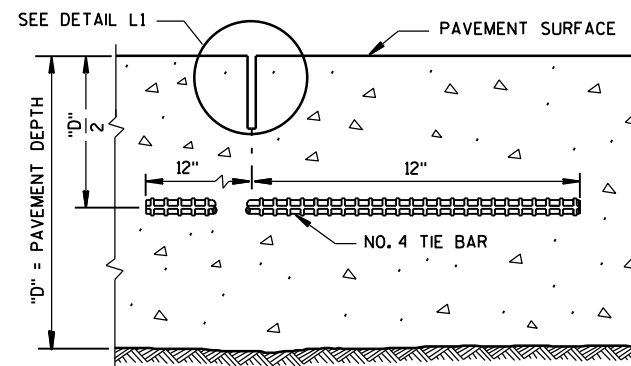
PLAN VIEW

MULTI-LANE CONCRETE PAVEMENT REPAIR



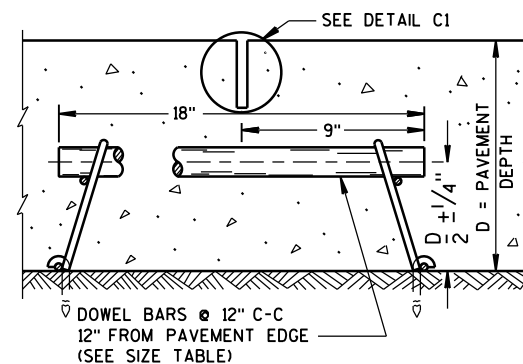
PLAN VIEW

MULTI-LANE CONCRETE PAVEMENT REPLACEMENT



SECTION C-C

SAWED LONGITUDINAL JOINT

SECTION F-F
CONTRACTION JOINT

GENERAL NOTES

INSTALL DOWEL BARS PARALLEL TO THE PAVEMENT CENTERLINE AND PAVEMENT SURFACE.

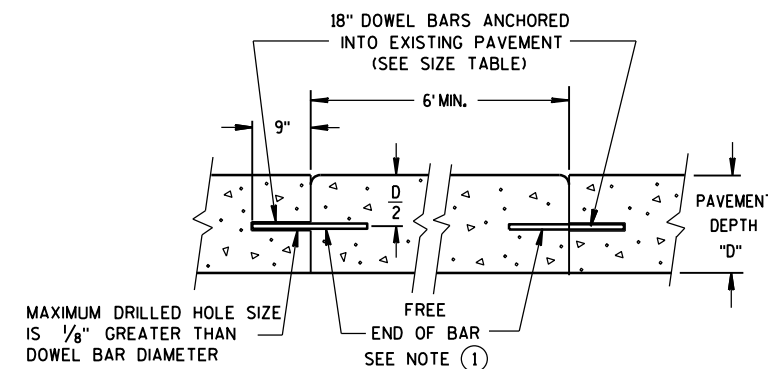
CONCRETE PAVEMENT REPAIRS OF EXISTING NONDOWELED CONCRETE PAVEMENTS DO NOT NEED TO BE DOWELED.

DO NOT SEAL OR FILL JOINTS.

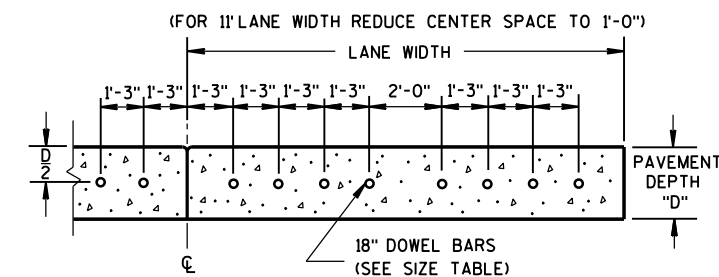
ANCHOR DOWEL BARS AND TIE BARS INTO DRILLED HOLES WITH AN EPOXY.

FOR MULTI-LANE CONCRETE PAVEMENT REPLACEMENTS, PROVIDE A MINIMUM DISTANCE OF 15 INCHES FROM ALL TRANSVERSE JOINTS OR EDGES OF REPLACEMENT TO THE CENTER OF THE TIE BAR NEAREST THAT JOINT OR EDGE.

- ① APPLY A THIN UNIFORM COATING OF SURFACE TREATMENT TO THE FREE END OF DOWEL BARS TO PREVENT BONDING.



SECTION D-D



SECTION E-E

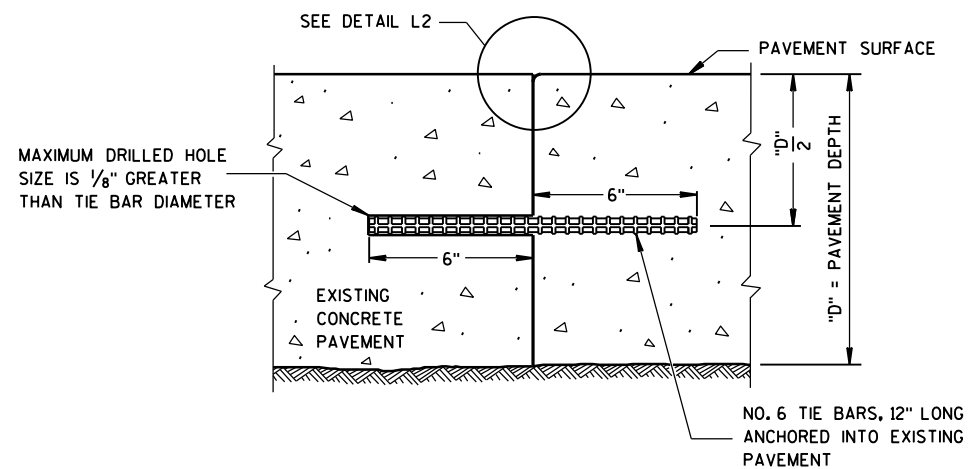
DRILLED DOWEL BAR CONSTRUCTION JOINT

PAVEMENT DEPTH, DOWEL BAR SIZE
AND JOINT SPACING TABLE

PAVEMENT DEPTH (D)	DOWEL BAR DIAMETER	CONTRACTION JOINT SPACING
5 1/2", 6, 6 1/2"	NONE	12'
7", 7 1/2"	1"	14'
8", 8 1/2"	1 1/4"	15'
9", 9 1/2"	1 1/4"	15'
10" & ABOVE	1 1/2"	15'

CONCRETE PAVEMENT
REPAIR AND REPLACEMENT

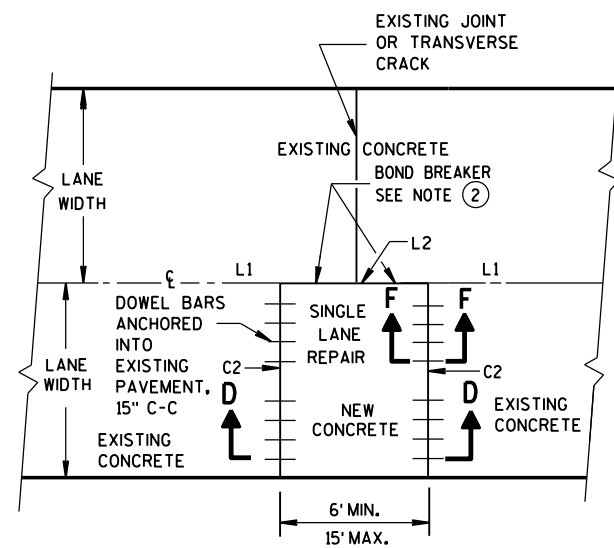
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



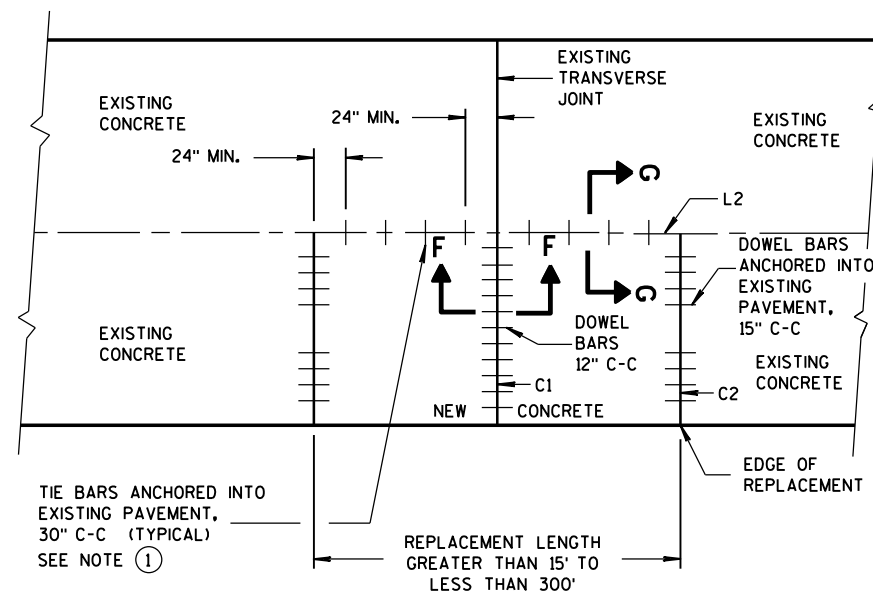
SECTION G-G
TIE BARS ANCHORED
INTO EXISTING PAVEMENT

GENERAL NOTES

- ① WITH THE APPROVAL OF THE ENGINEER, FOR SINGLE LANE PAVEMENT REPLACEMENTS LESS THAN 30 FEET IN LENGTH, THE CONTRACTOR MAY INSTALL DRILLED TIE BARS ON 6:1 SKEW HORIZONTALLY, DIRECTION OF SKEW ALTERNATING WITH EACH SUCCESSIVE BAR. DRIVE SKEWED TIE BARS TO A DEPTH OF 6 INCHES AND TO SUCH A DIAMETER AS TO PROVIDE A TIGHT DRIVEN FIT.
- ② USE AN ENGINEER-APPROVED BOND BREAKER (E.G. RELEASE AGENT, CURING COMPOUND) FOR SINGLE LANE REPAIRS UP TO 15 FEET IN LENGTH.



PLAN VIEW
SINGLE LANE
CONCRETE PAVEMENT REPAIR



PLAN VIEW
SINGLE LANE
CONCRETE PAVEMENT REPLACEMENT

CONCRETE PAVEMENT REPAIR AND REPLACEMENT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

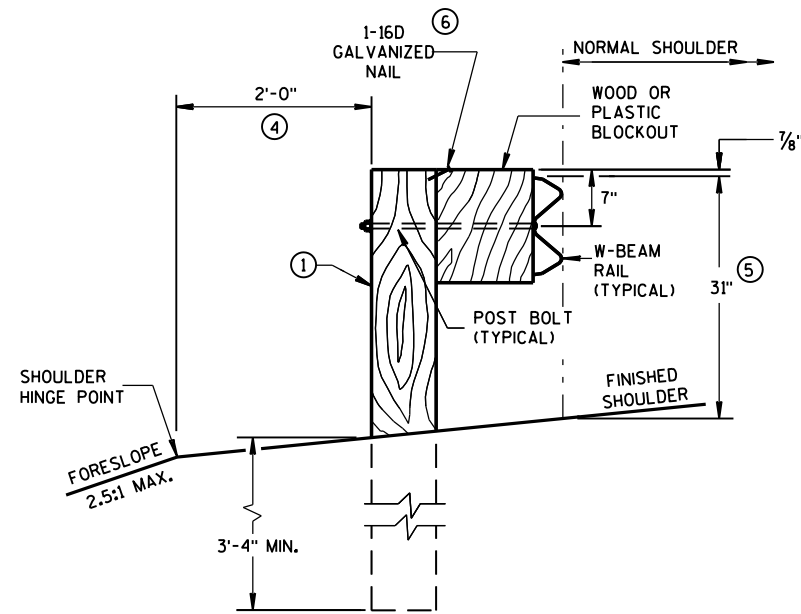
12-2013
DATE

FHWA

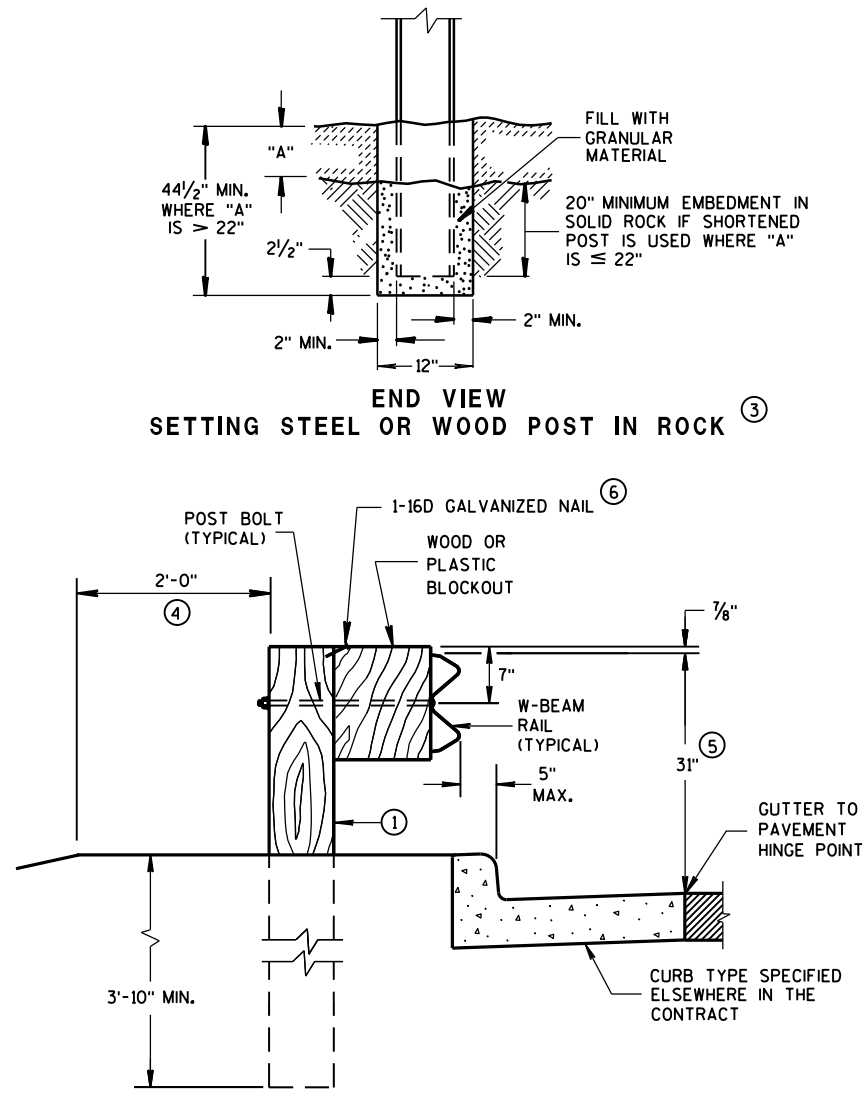
/S/ Deb Bischoff
PAVEMENT POLICY & DESIGN ENGINEER

GENERAL NOTES

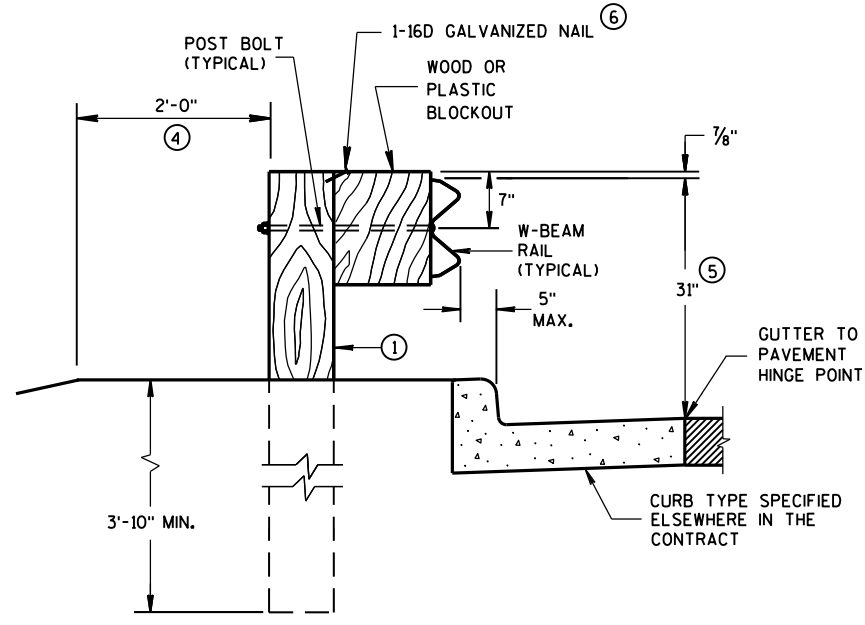
- ① WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- ② USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.
- ③ IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2 1/2 INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AND INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.
- ④ WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).
- ⑤ FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS ± 1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27 3/4" TO 32".
- ⑥ WHEN USING STEEL POST AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.



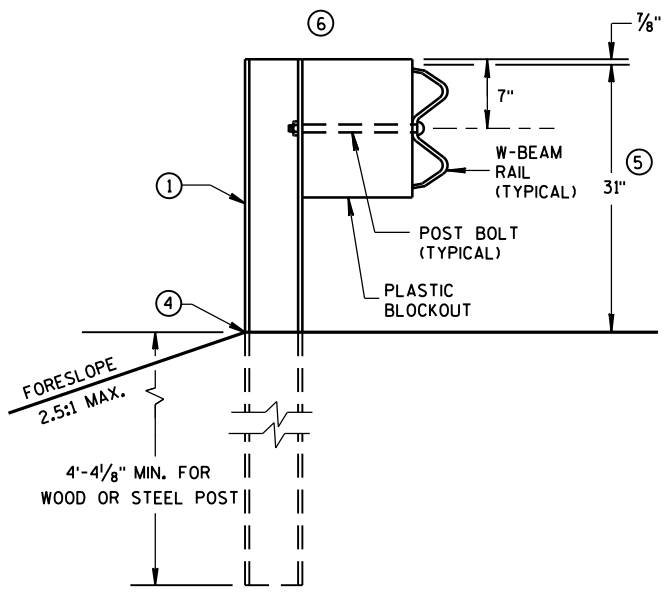
END VIEW
LOCATED ALONG A ROADWAY SHOULDER
STANDARD INSTALLATION



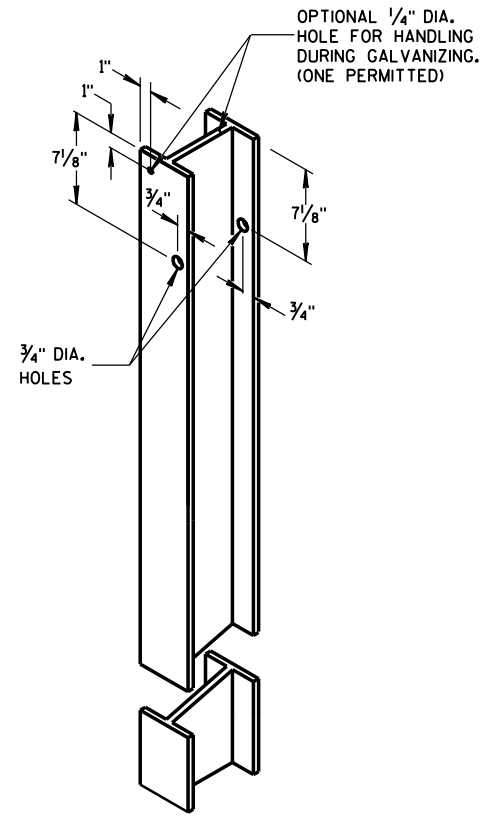
END VIEW
SETTING STEEL OR WOOD POST IN ROCK ③



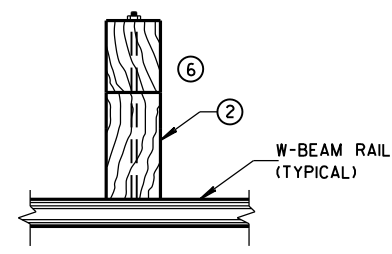
END VIEW
LOCATED ALONG A CURBED ROADWAY



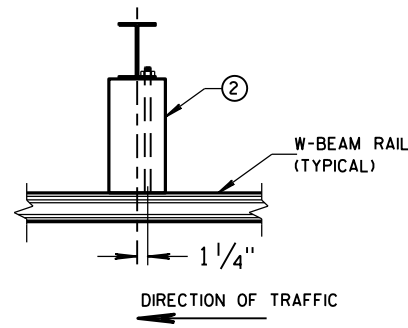
END VIEW
MGS LONGER POST AT HALFPST SPACING W BEAM (K)



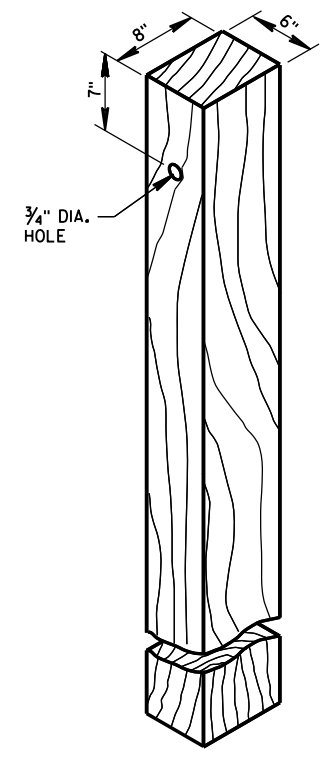
STEEL POST &
HOLE PUNCHING DETAIL
(w6X9) ①



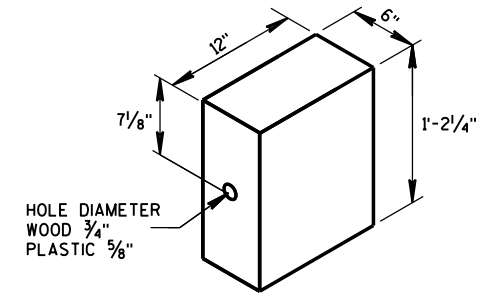
PLAN VIEW
WOOD POST,
BLOCKOUT & BEAM



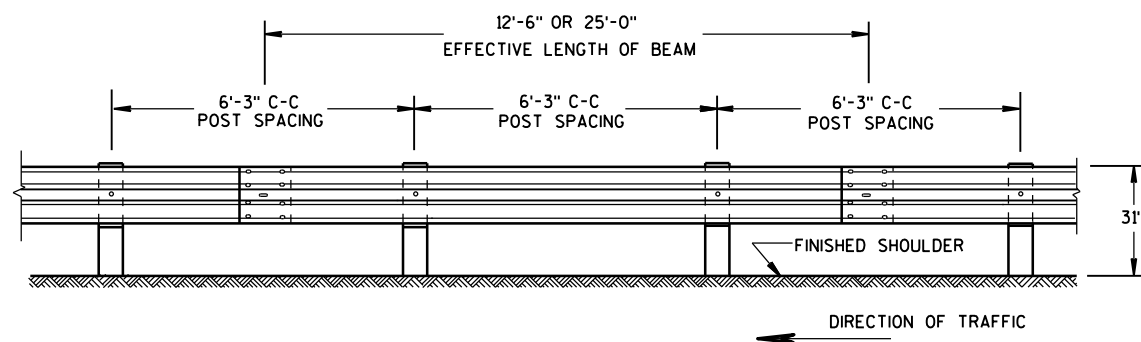
PLAN VIEW
STEEL POST,
PLASTIC BLOCKOUT & BEAM



WOOD POST
(6" X 8") NOMINAL ①

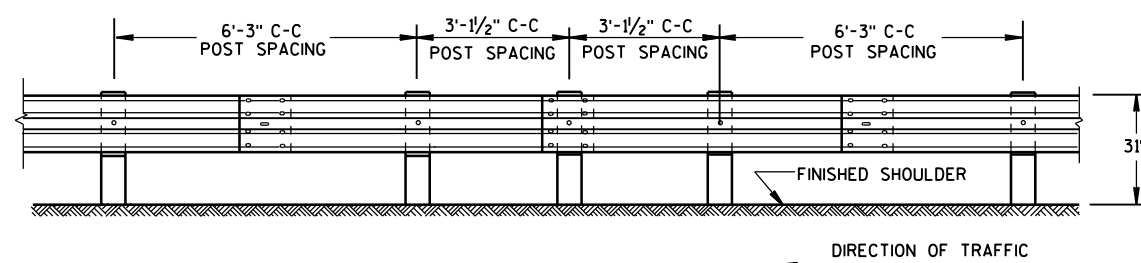


WOOD OR
PLASTIC BLOCKOUT ②



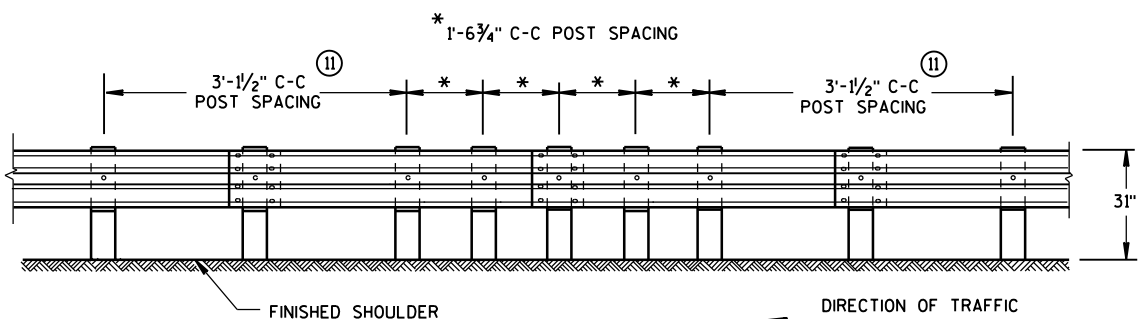
FRONT VIEW

POST SPACING STANDARD INSTALLATION



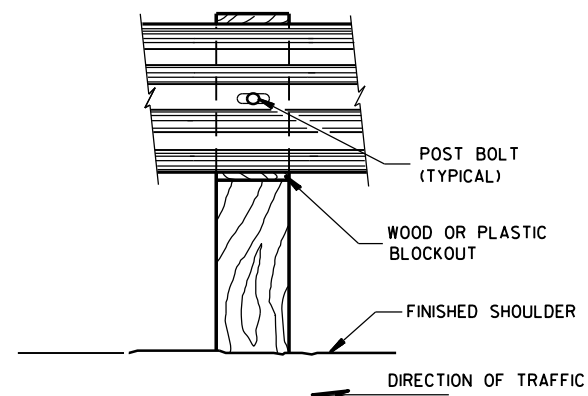
FRONT VIEW

HALF POST SPACING (HS) AND
HALF POST SPACING WITH LONGER POSTS (K)

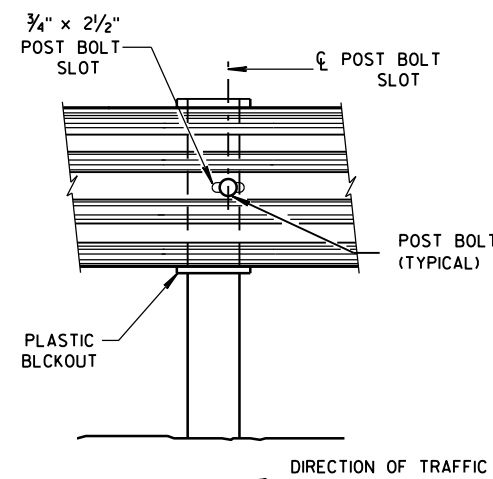


FRONT VIEW

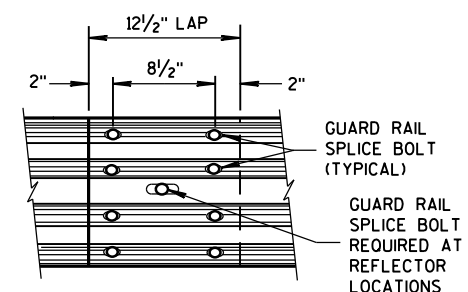
QUARTER POST SPACING (QS)



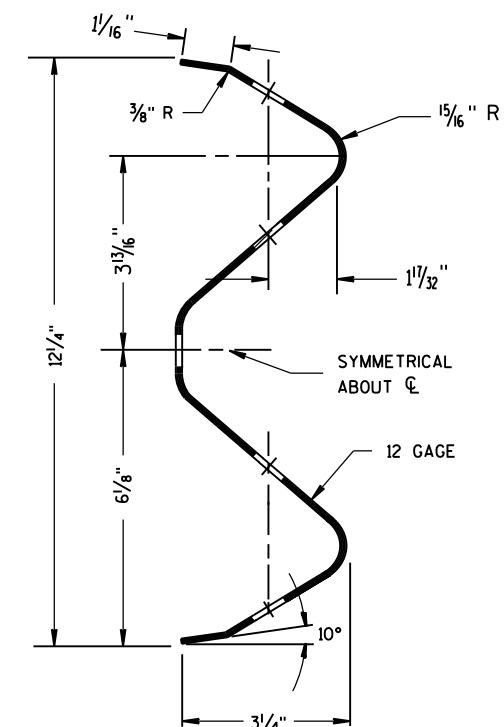
FRONT VIEW AT WOOD POST



FRONT VIEW AT STEEL POST



FRONT VIEW
MID-SPAN BEAM SPLICE



SECTION THRU W-BEAM RAIL

REFLECTOR SPACING ⁽⁸⁾				
	BEAM GUARD LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTOR
ONE WAY TRAFFIC	< 200' > 200'	50' C-C 100' C-C	1 1	3
TWO WAY TRAFFIC	< 200' > 200'	25' C-C 50' C-C	1 ⁽⁹⁾ 1	6
TWO WAY TRAFFIC	< 200' > 200'	50' C-C 100' C-C	2 ⁽¹⁰⁾ 2	3

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

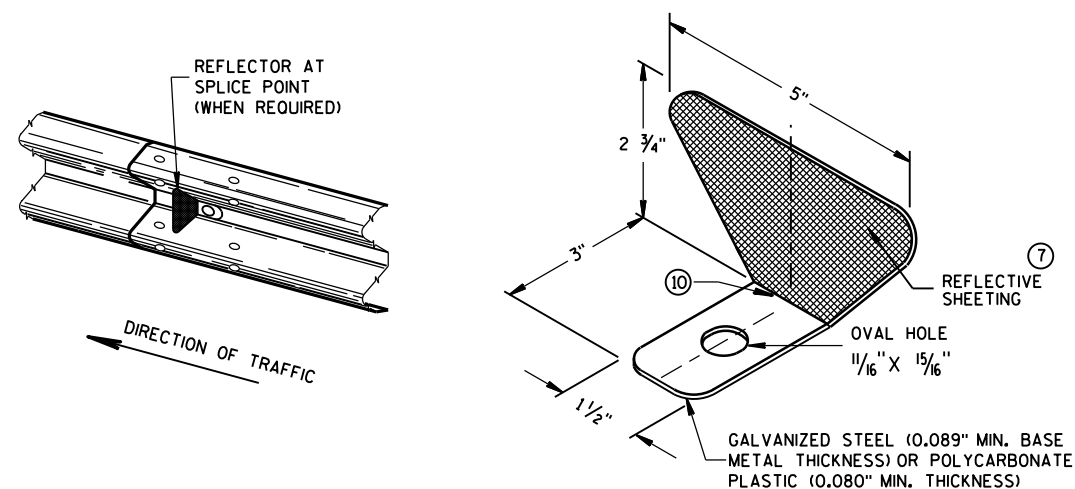
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

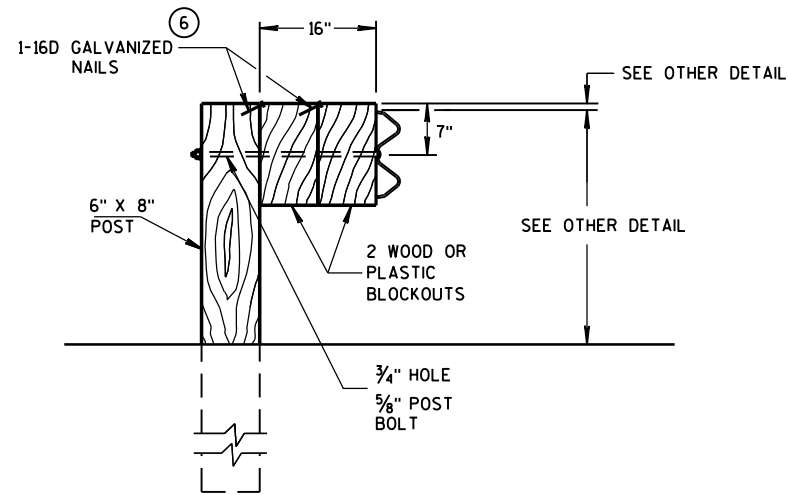
- ⑦ PROVIDE SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH YELLOW REFLECTIVE SHEETING. SHEETING IS TYPE H, SEE STANDARD SPECIFICATION 637.
- ⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPLICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.
- ⑨ REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.
- ⑩ PROVIDE AN ANGLE OF BEND OF $90^\circ \pm 1^\circ$ FOR TWO-SIDED REFLECTORS.
- ⑪ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.

POST BOLTS ARE A 3/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 3/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 3/8" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.

GUARD RAIL SPLICE BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.

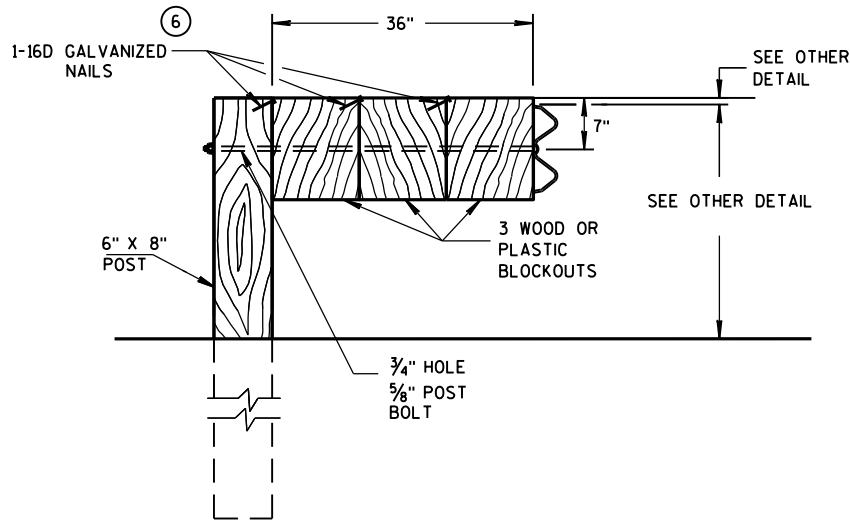


ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION



DETAIL FOR 16" BLOCKOUT DEPTH

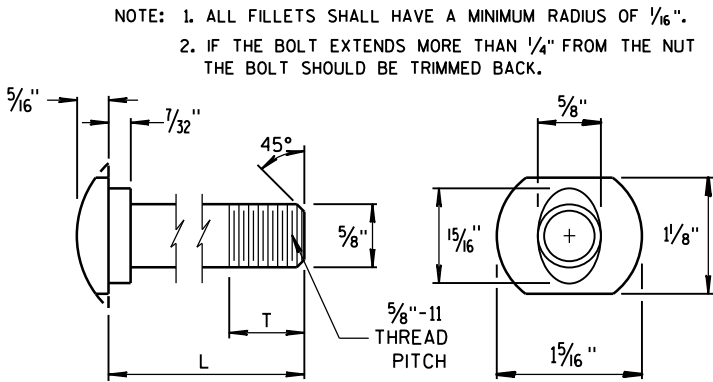
IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.



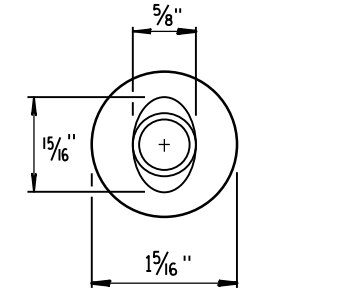
DETAIL FOR 36" BLOCKOUT DEPTH

NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.

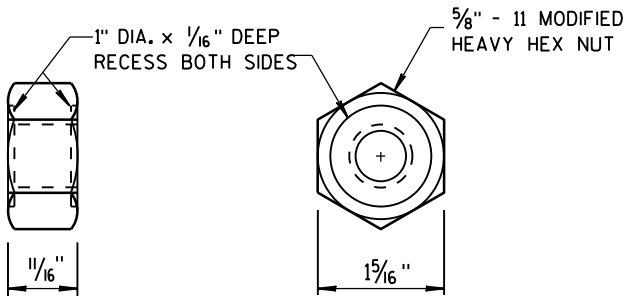
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.



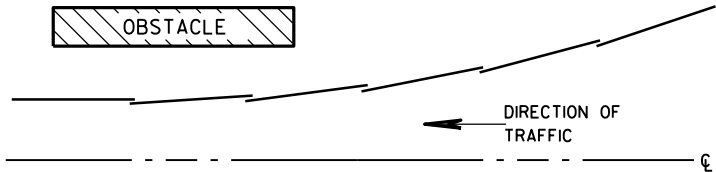
POST BOLT TABLE



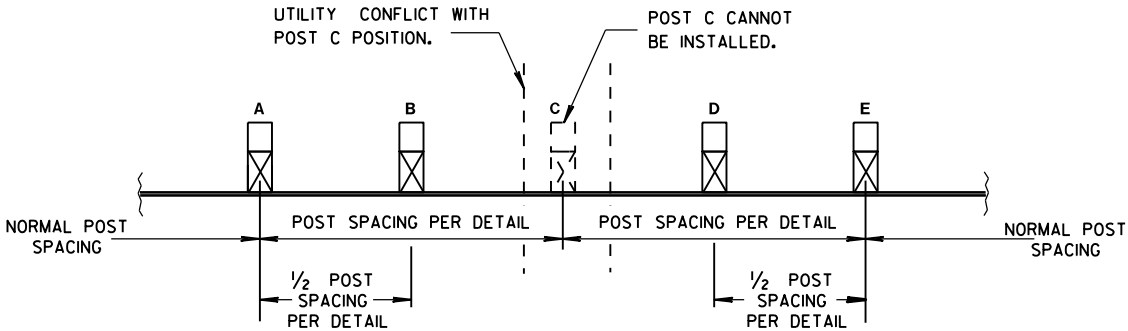
ALTERNATE BOLT HEAD



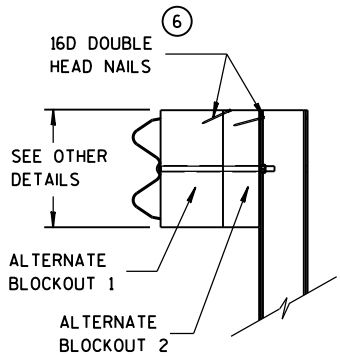
POST BOLT AND RECESS NUT



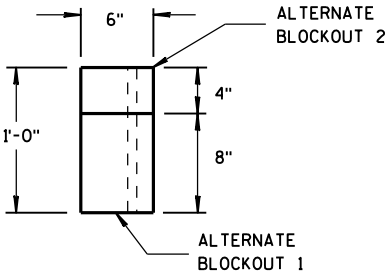
PLAN VIEW
BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS
UNDERGROUND OBSTRUCTION



SIDE VIEW



TOP VIEW

ALTERNATE WOOD
BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2014
DATE /S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER
FHWA

GENERAL NOTES

- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL), AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
- (B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED.
- (C) DIFFERENT MANUFACTURES REQUIRE DIFFERENT PERFORATED W-BEAM RAIL END PANELS. SEE MANUFACTURES INFORMATION.
- (D) THE TOP OF THE STEEL TUBE ON POST 1 AND POST 2 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.
- (E) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS, ONE SCREW PER CORNER.
- (G) 1/2" DIAMETER X 3" LONG LAG BOLT AND WASHER.
- (H) HARDWARE VARIES BETWEEN DIFFERENT MANUFACTURES. SEE MANUFACTURE'S DRAWING FOR INFORMATION.
- (I) DIMENSIONS MAY VARY. SEE MANUFACTURE'S INFORMATION.

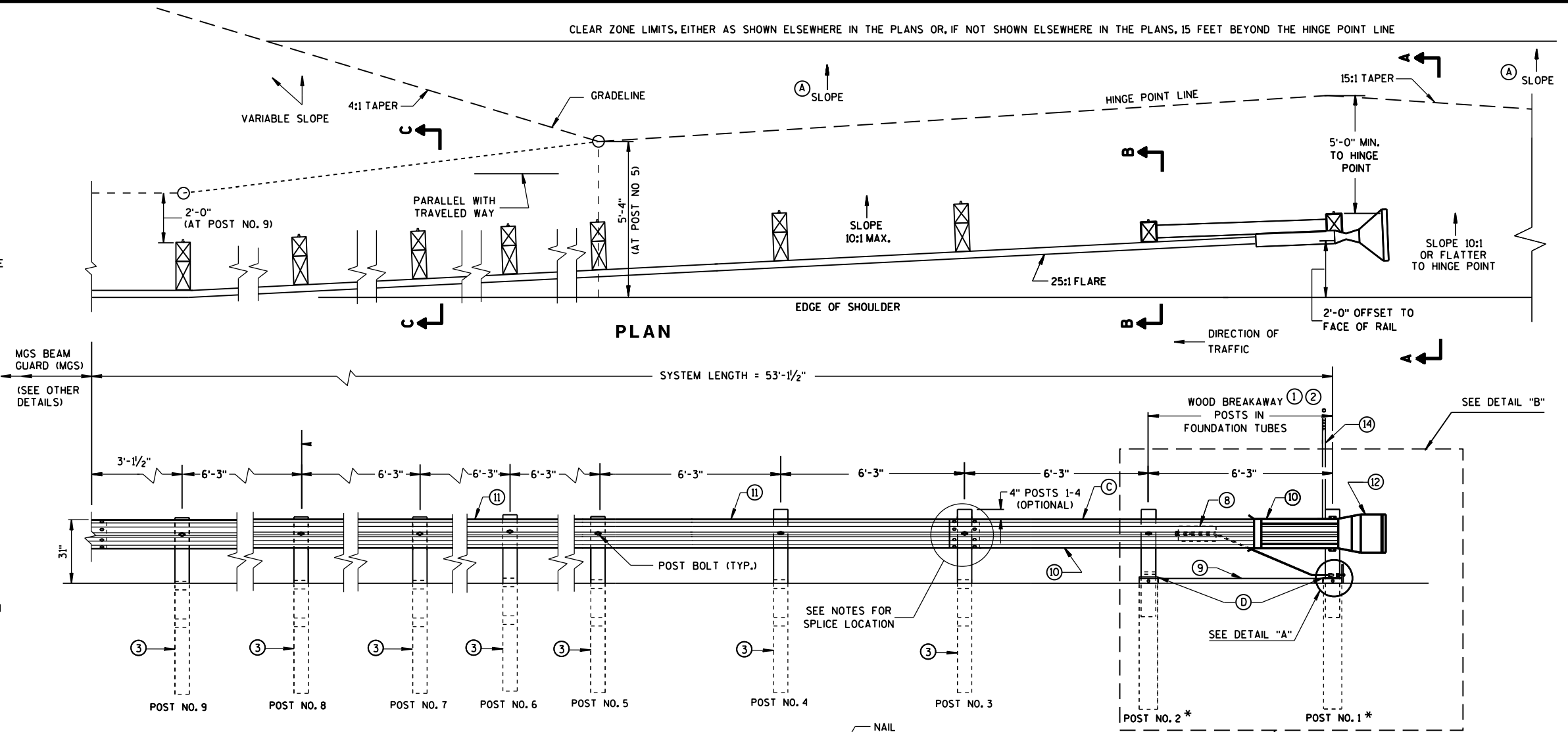
SEE SDD 14B42 FOR MORE INFORMATION.

* DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.

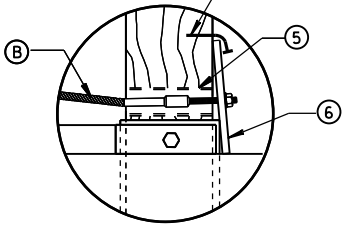
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

W-BEAM RAIL SPLICES ARE LOCATED AT POST NUMBER 3, AND BETWEEN POST 5 AND 6, BETWEEN POSTS 7 AND 8, AND MIDDLE OF THE SPAN AFTER POST 9.

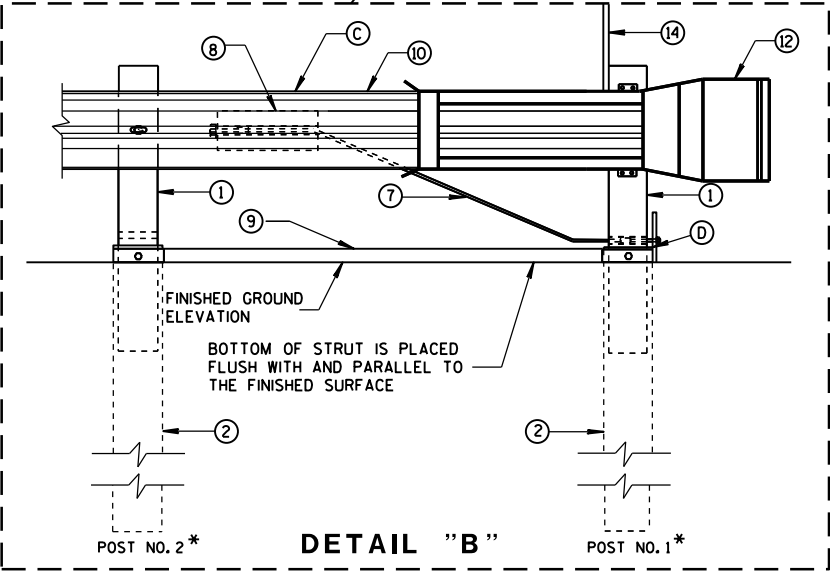
THE CENTER OF THE UPPER 3/2" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE.



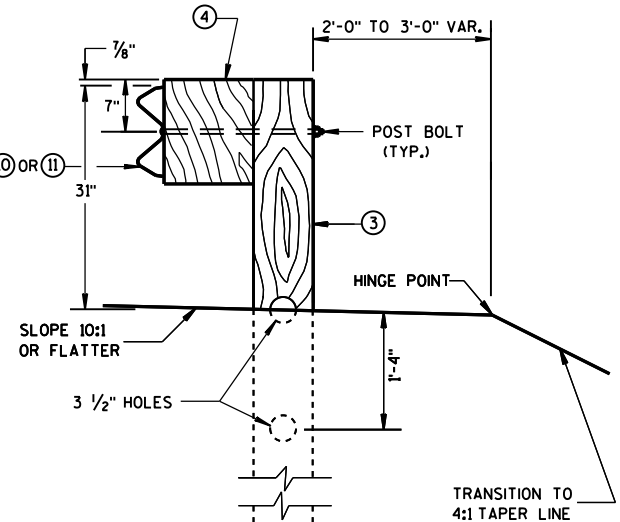
ELEVATION



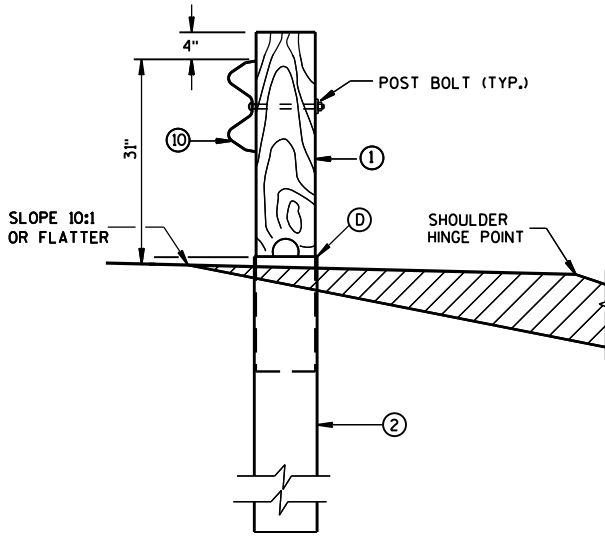
DETAIL "A"



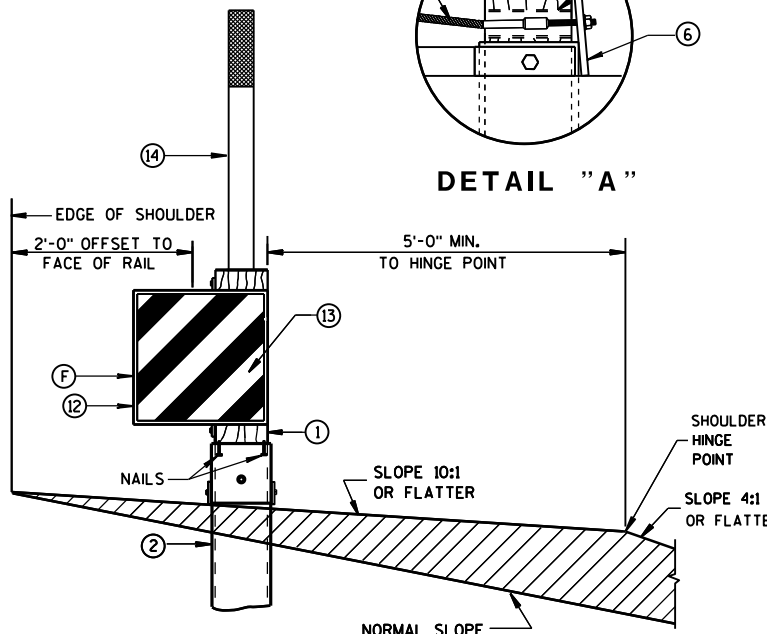
DETAIL "B"



SECTION C-C
TYPICAL AT POST NOS. 3-9



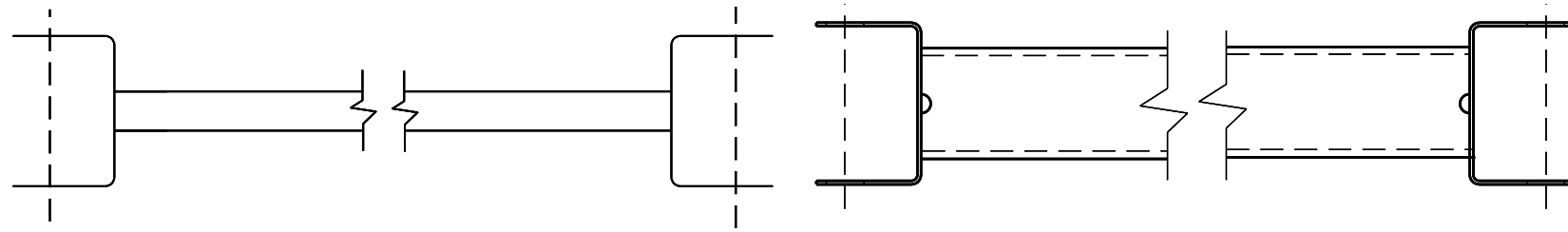
SECTION B-B
TYPICAL AT POST NO. 2*



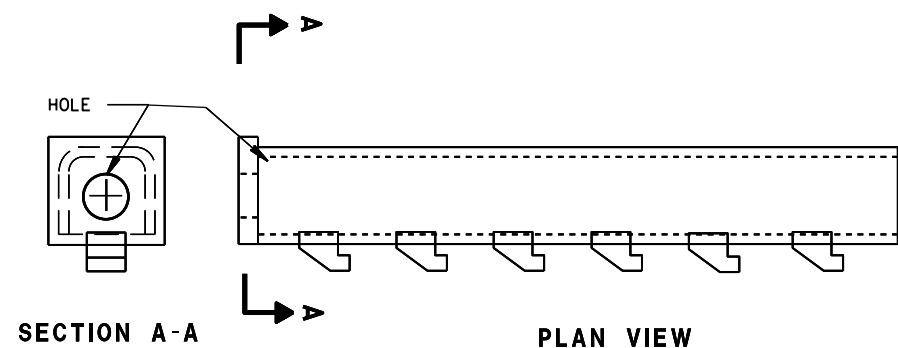
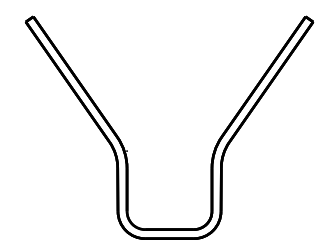
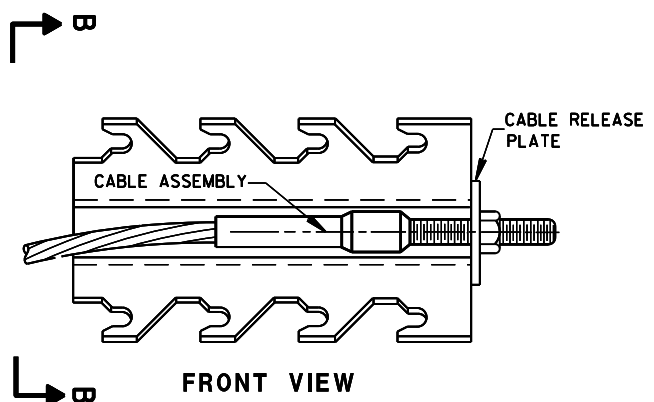
SECTION A-A
TYPICAL AT POST NO. 1*

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



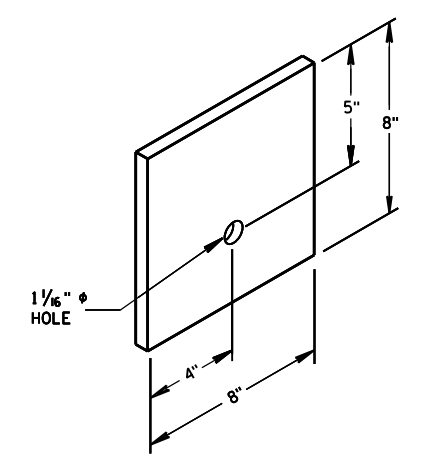
9 H
GENERIC GROUND STRUT



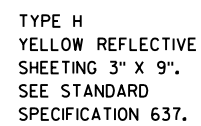
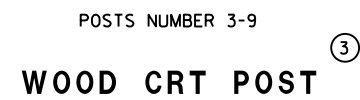
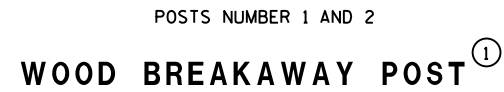
8 H
GENERIC ANCHOR CABLE BOX

BILL OF MATERIALS

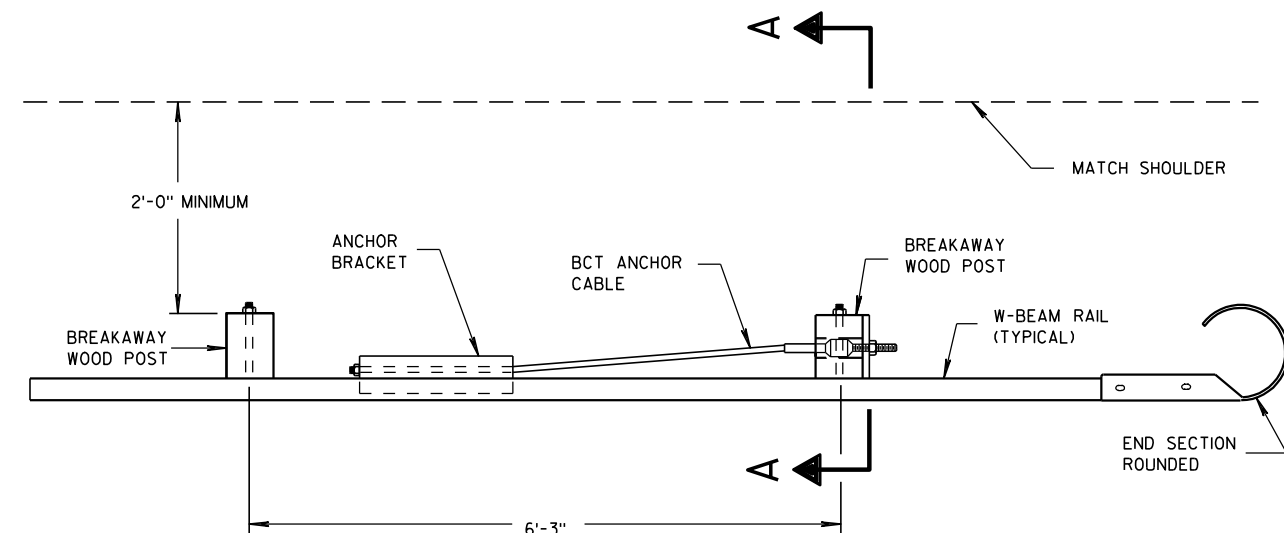
PART NO.	DESCRIPTION
MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.	
①	WOOD BREAKAWAY POST
②	6" X 8" X 0.188", 6'-0" LONG FOUNDATION TUBE AT POSTS 1 AND 2
③	WOOD CRT
④	WOOD BLOCKOUT
⑤	PIPE SLEEVE
⑥	BEARING PLATE
⑦	BCT CABLE ASSEMBLY
⑧	ANCHOR CABLE BOX
⑨	GROUND STRUT
⑩	PERFORATED W-BEAM RAIL END PANEL, 12'-6" LONG.
⑪	STANDARD W-BEAM RAIL. MULTIPLE SECTIONS REQUIRED. SECTIONS VARY IN LENGTH.
⑫	END SECTION EAT
⑬	0.040" ALUMINUM SHEET WITH REFLECTIVE SHEETING TYPE F PER SECTION 637 OF THE STANDARD SPECIFICATIONS
⑭	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)



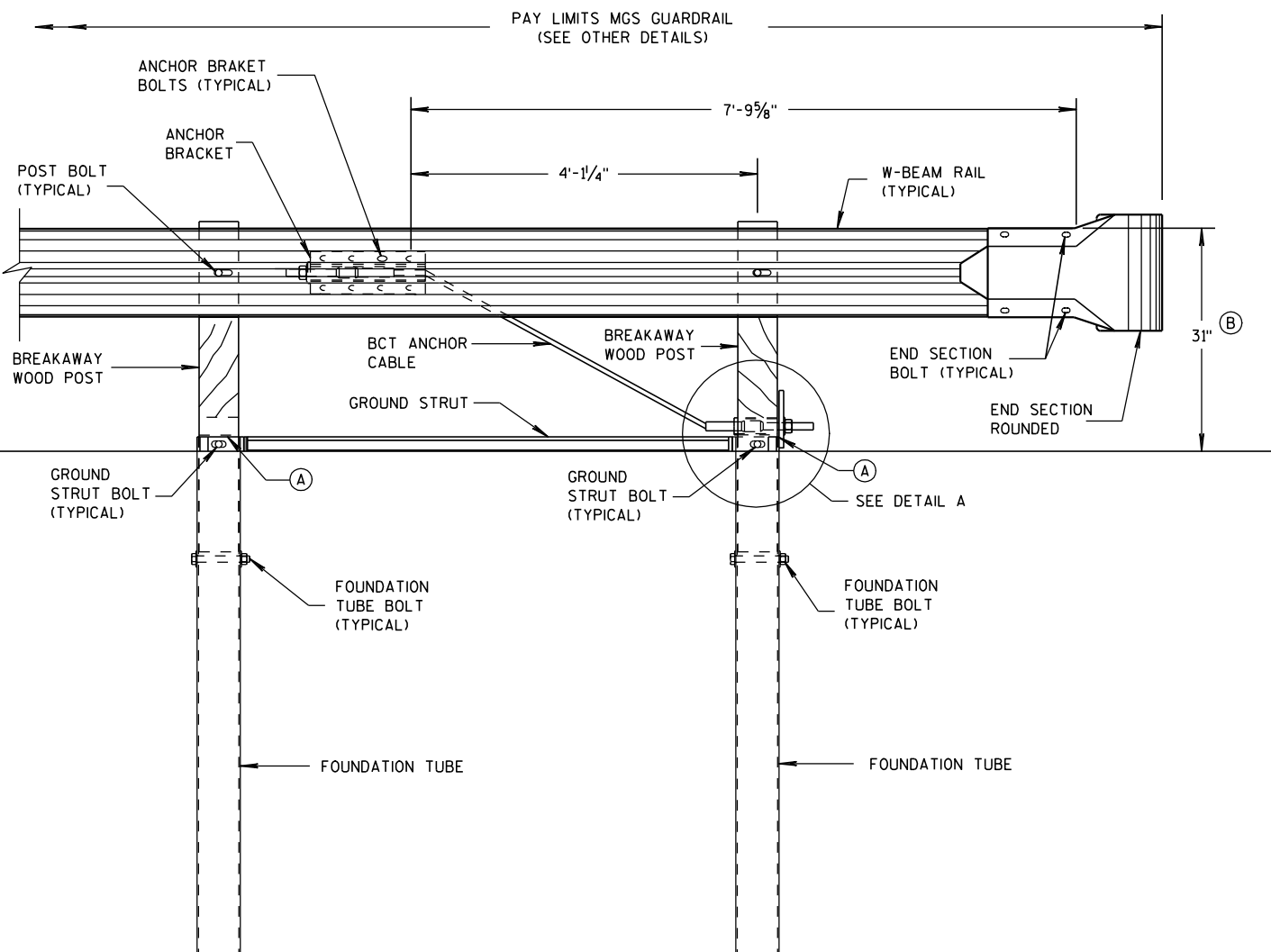
⑥
BEARING PLATE



MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June 2014	<i>/S/ Jerry H. Zogg</i>
DATE	ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA	

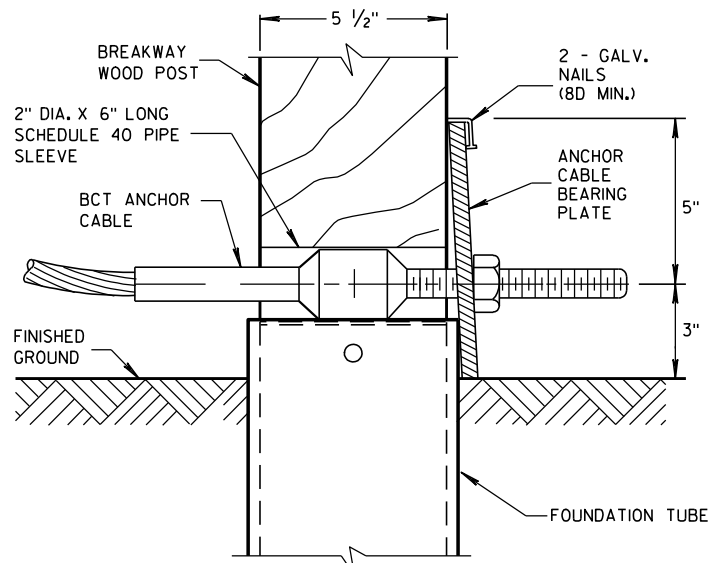


PLAN VIEW



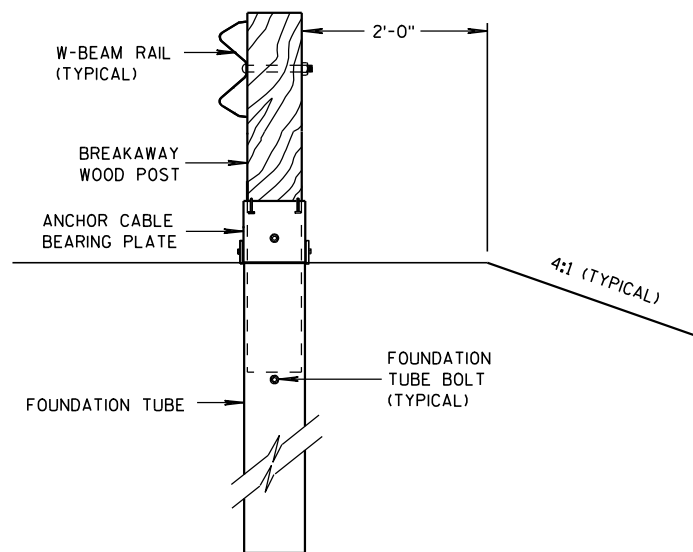
FRONT VIEW

END RAIL DETAIL



DETAIL A

POST NO. 1
GROUND STRUT NOT SHOWN FOR CLARITY.



SECTION A-A

GENERAL NOTES

SEE SDD 14 B 42 FOR MORE INFORMATION.

POST BOLTS ARE A $\frac{5}{8}$ " DIAMETER X 10" LONG GUARDRAIL BOLT. A POST BOLT REQUIRES A $\frac{5}{8}$ " DIAMETER DH MODIFIED (RECESSED) HEAVY HEX NUT AND $\frac{5}{8}$ " DIAMETER FLAT WASHER.

FOUNDATION TUBE BOLTS ARE A $\frac{7}{8}$ " DIAMETER X $7\frac{1}{2}$ " LONG HEAVY HEX HEAD BOLT. A FOUNDATION TUBE BOLT REQUIRES A $\frac{7}{8}$ " DIAMETER DH HEAVY HEX NUT AND A $\frac{5}{8}$ " DIAMETER FLAT WASHER.

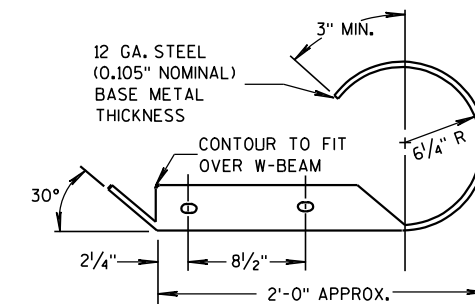
GROUND STRUT BOLTS ARE A $\frac{5}{8}$ " DIAMETER X 10" LONG HEAVY HEX HEAD BOLT. A GROUND STRUT BOLT REQUIRES A $\frac{5}{8}$ " DIAMETER DH HEAVY HEX NUT AND A $\frac{5}{8}$ " DIAMETER FLAT WASHER.

ANCHOR BRACKET BOLTS ARE A $\frac{5}{8}$ " DIAMETER X $1\frac{1}{2}$ " LONG HEAVY HEX HEAD BOLT. AN ANCHOR BRACKET BOLT REQUIRES A $\frac{5}{8}$ " DIAMETER DH HEAVY HEX NUT AND A FLAT WASHER.

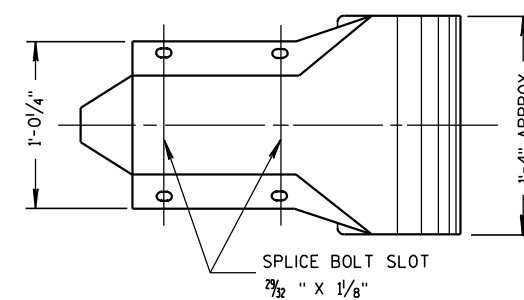
END SECTION BOLTS ARE A $\frac{5}{8}$ " DIAMETER X $1\frac{1}{2}$ " HEAVY HEX HEAD BOLT. AN END SECTION BOLT REQUIRES $\frac{5}{8}$ " DIAMETER DH HEAVY HEX NUT AND A $\frac{5}{8}$ " DIAMETER FLAT WASHER.

W-BEAM END SECTION ROUNDED HAS THE SAME MATERIAL PROPERTIES AS STANDARD STEEL RAIL.

- (A) TOP OF FOUNDATION TUBE SHALL BE NO MORE THAN 3" ABOVE FINISHED GROUND.
- (B) FOR NEW CONSTRUCTION TOP OF RAIL IS $31" \pm 1"$.
FOR EXISTING INSTALLATIONS TOP OF RAIL IS BETWEEN $27\frac{3}{4}"$ TO $32" \pm 1"$.



PLAN VIEW

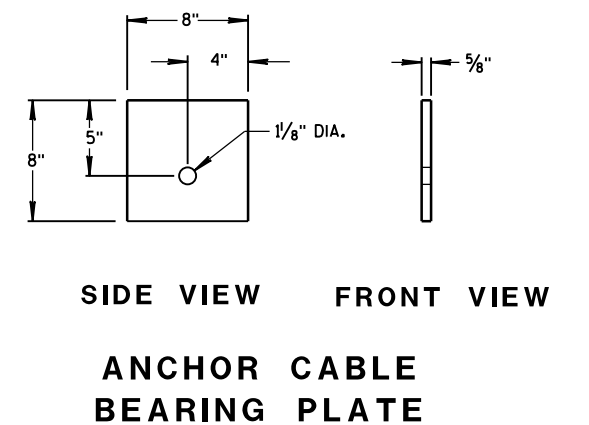
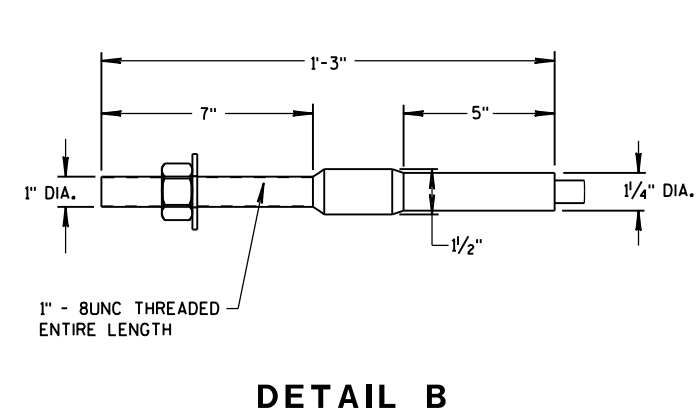
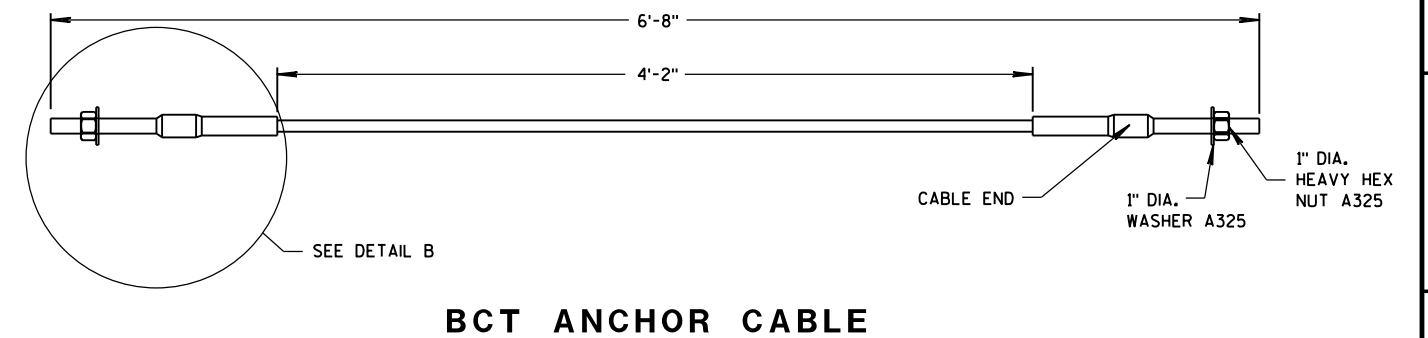
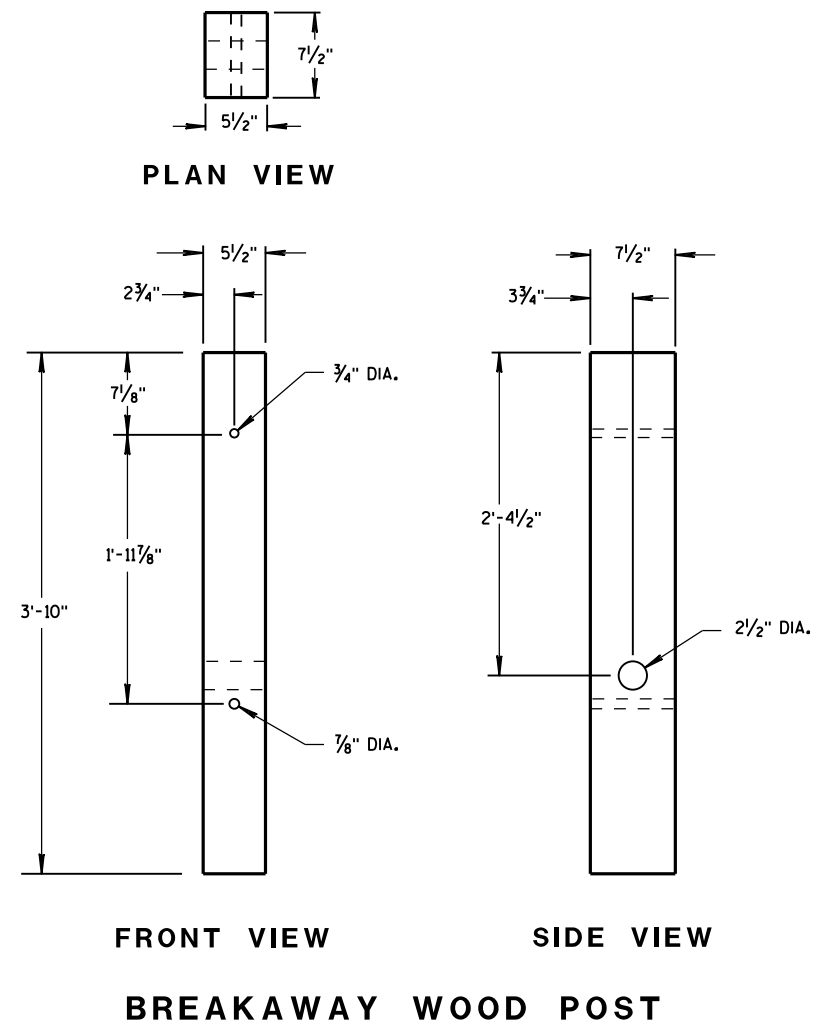
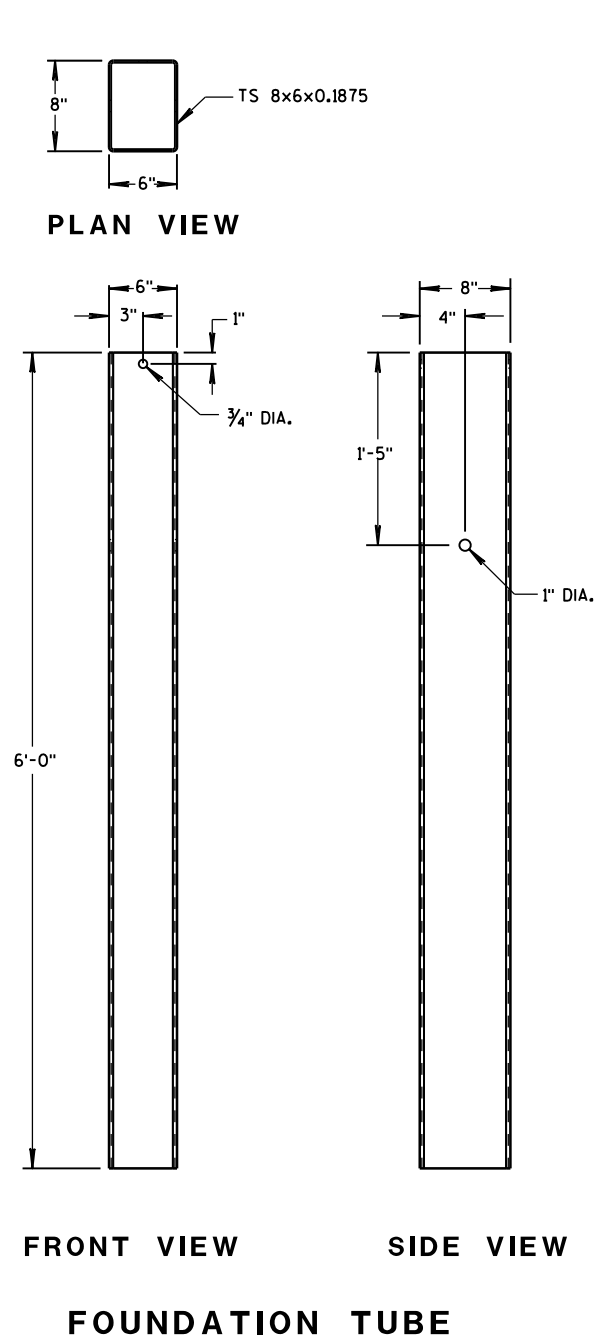


FRONT VIEW

W BEAM END
SECTION ROUNDED

MIDWEST GUARDRAIL
SYSTEM (MGS) TYPE 2 TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

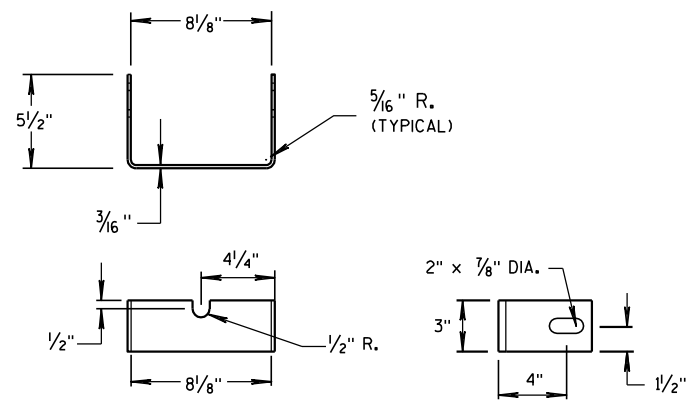


MIDWEST GUARDRAIL
SYSTEM (MGS) TYPE 2 TERMINAL

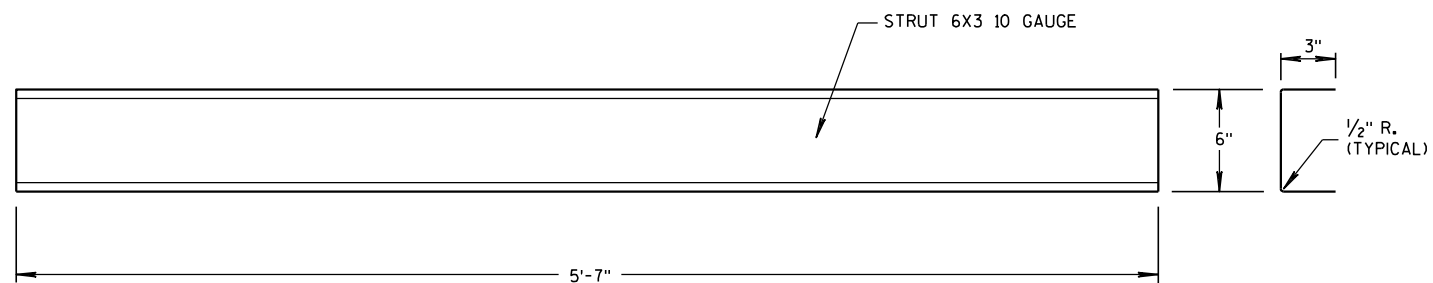
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

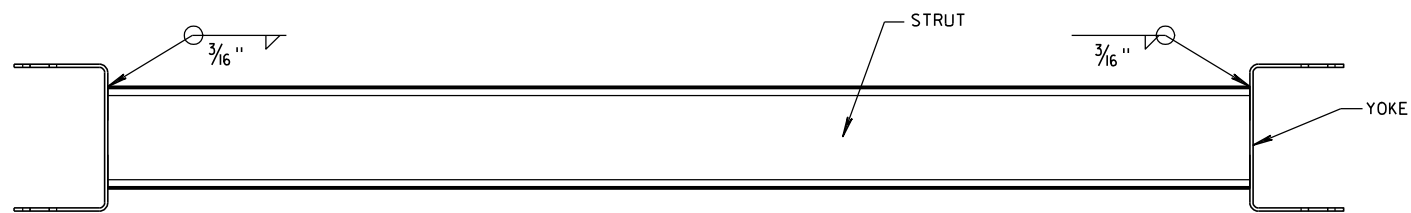
BCT ANCHOR CABLE IS A 3/8" DIAMETER 6X19 IWRC IPS GALVANIZED WIRE ROPE. THE SWAGED FITTINGS AND STUD ARE REQUIRED. THE END FITTING SHALL BE MACHINED FROM HOT-ROLLED CARBON STEEL CONFORMING TO ASTM A576 GRADE 1035 AND GALVANIZED ACCORDING TO ASTM A123. THE TREADED STUD SHOULD CONFORM TO ASTM A325 OR SAE GRADE 5. MINIMUM BREAKING STRENGTH OF WIRE ROPE IS 43,000 LB. WIRE ROPE IS TO BE TAUT.



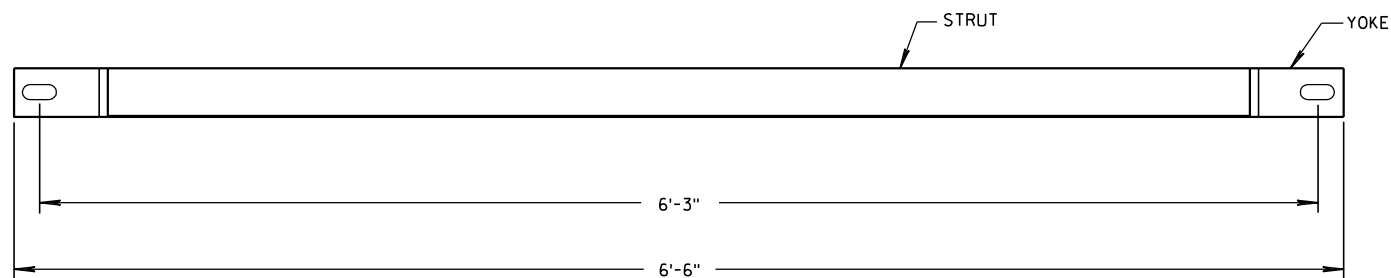
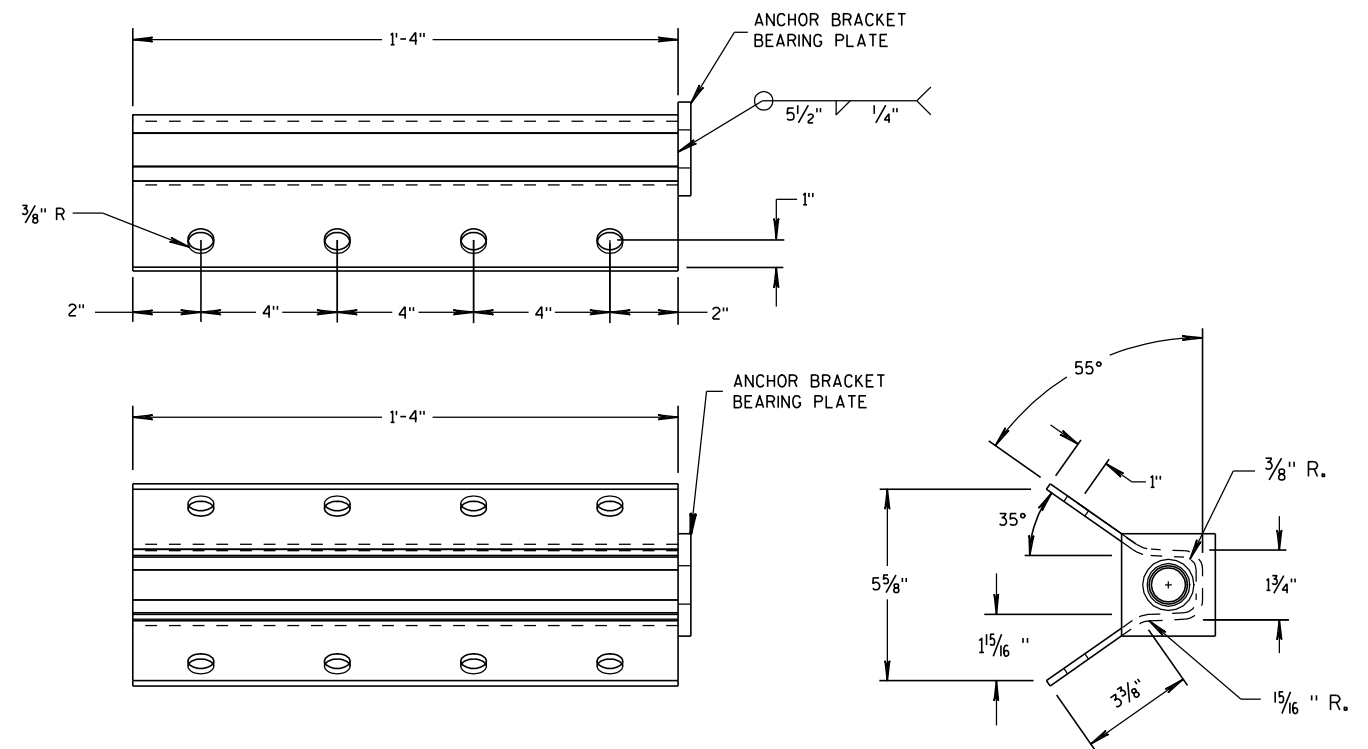
YOKE DETAIL



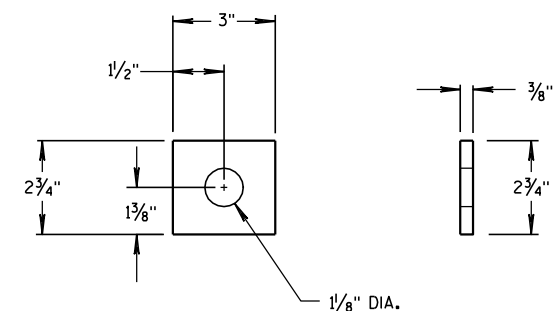
STRUT DETAIL



PLAN VIEW

FRONT VIEW
GROUND STRUT DETAIL

ANCHOR BRACKET

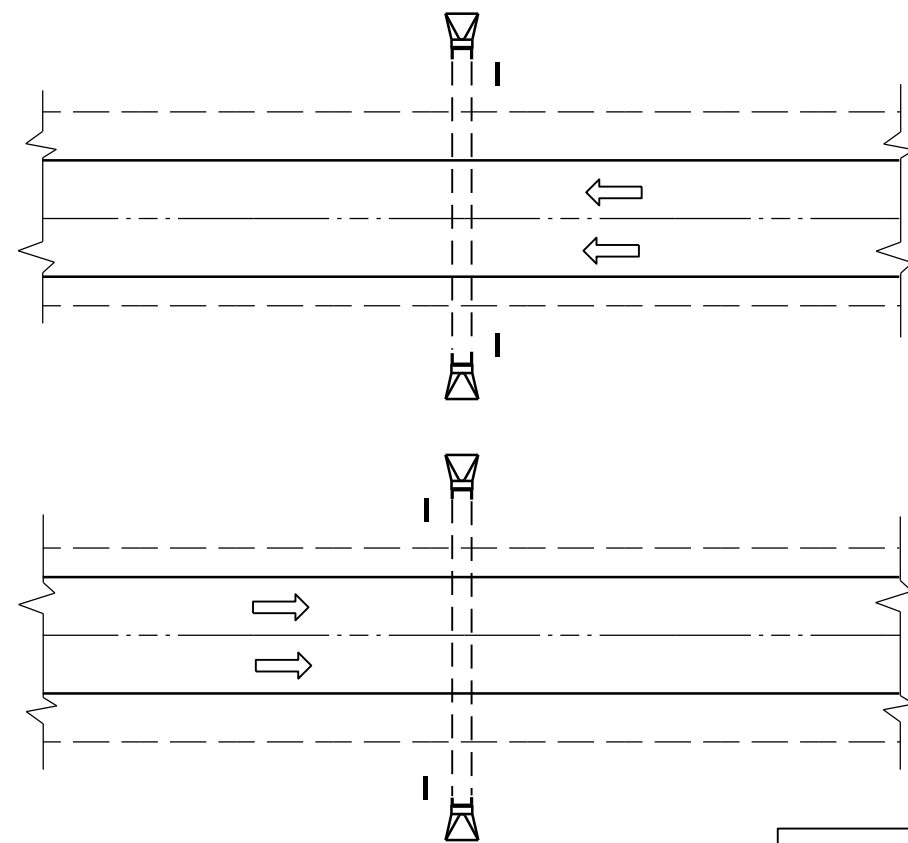
ANCHOR BRACKET
BEARING PLATEMIDWEST GUARDRAIL
SYSTEM (MGS) TYPE 2 TERMINALSTATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

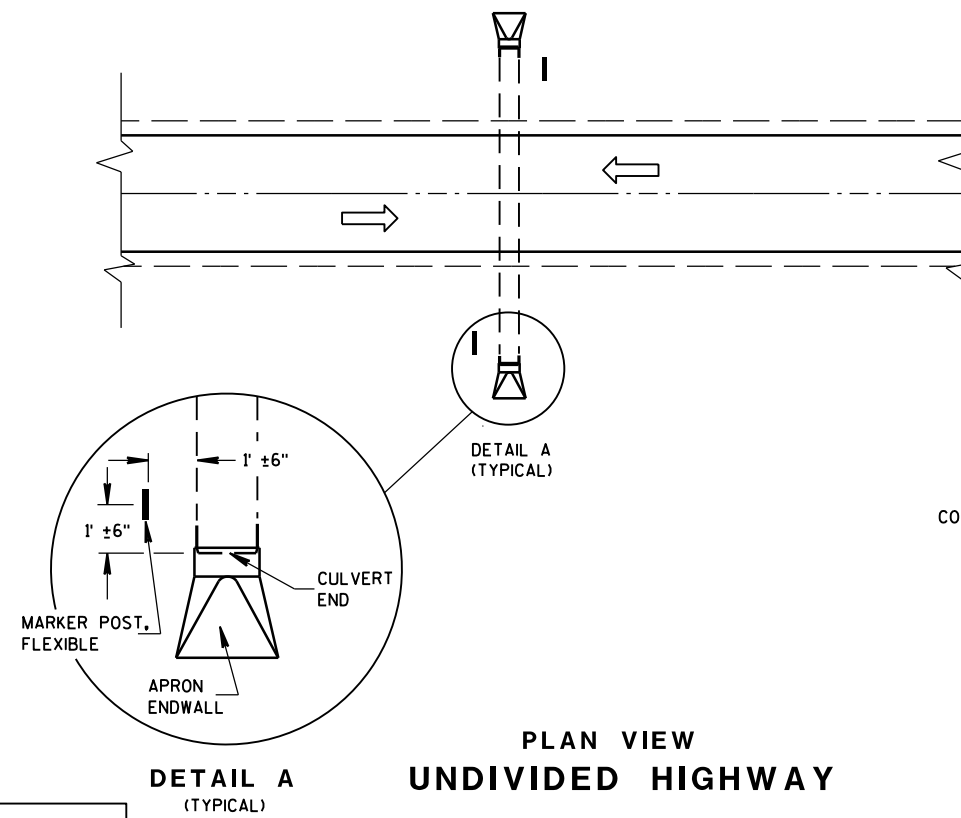
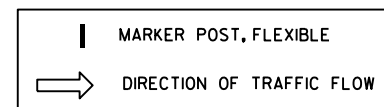
5/23/2011
DATE

FHWA

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER



PLAN VIEW
DIVIDED HIGHWAY

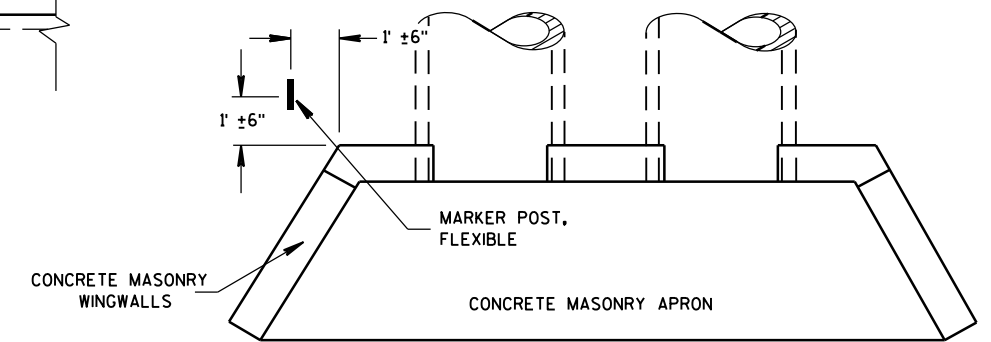


PLAN VIEW
UNDIVIDED HIGHWAY

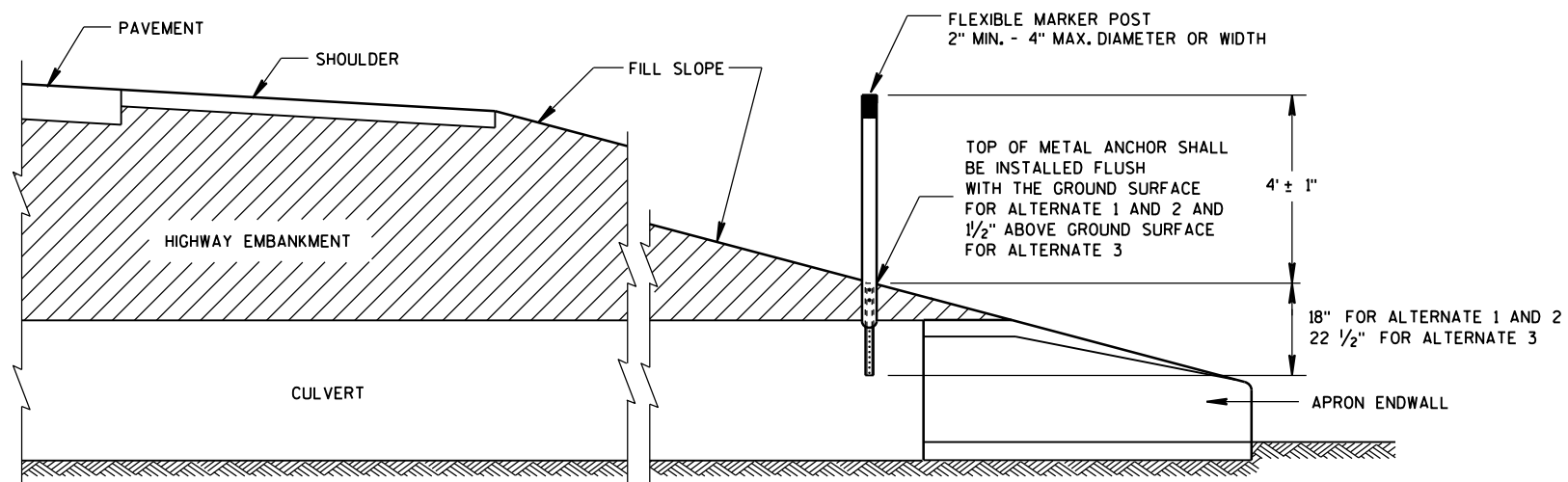
FLEXIBLE MARKER POST LOCATION

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.



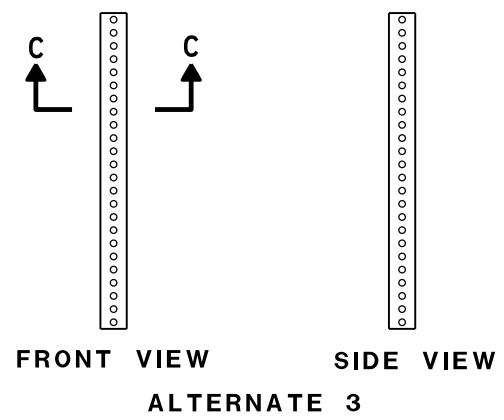
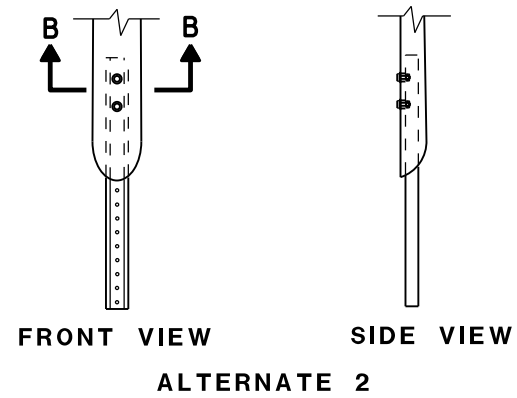
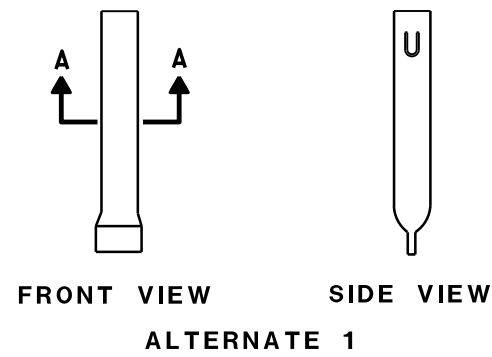
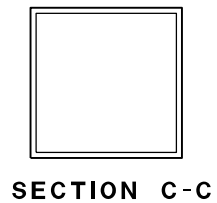
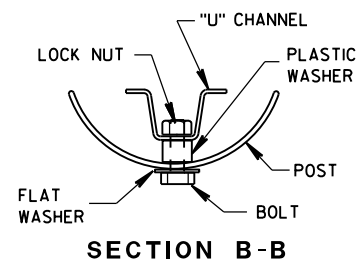
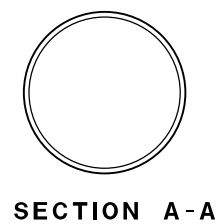
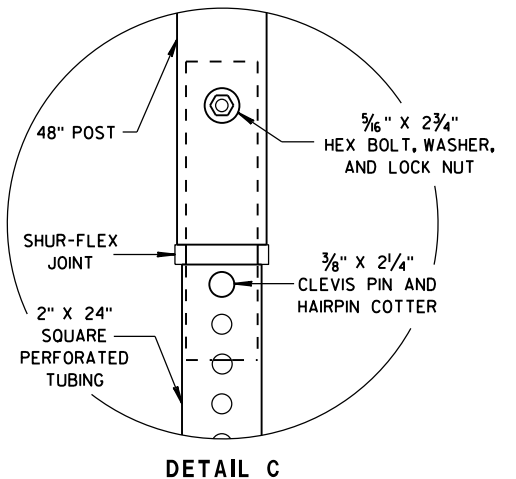
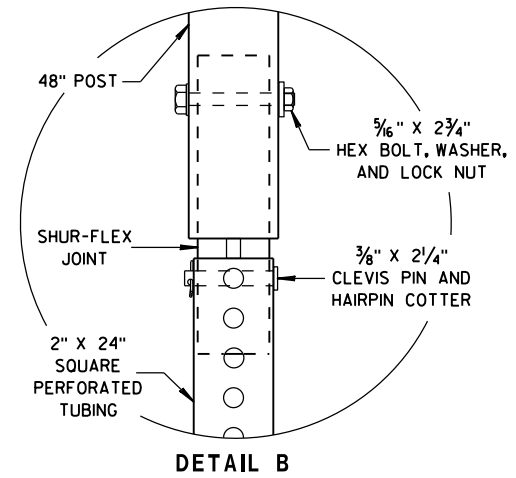
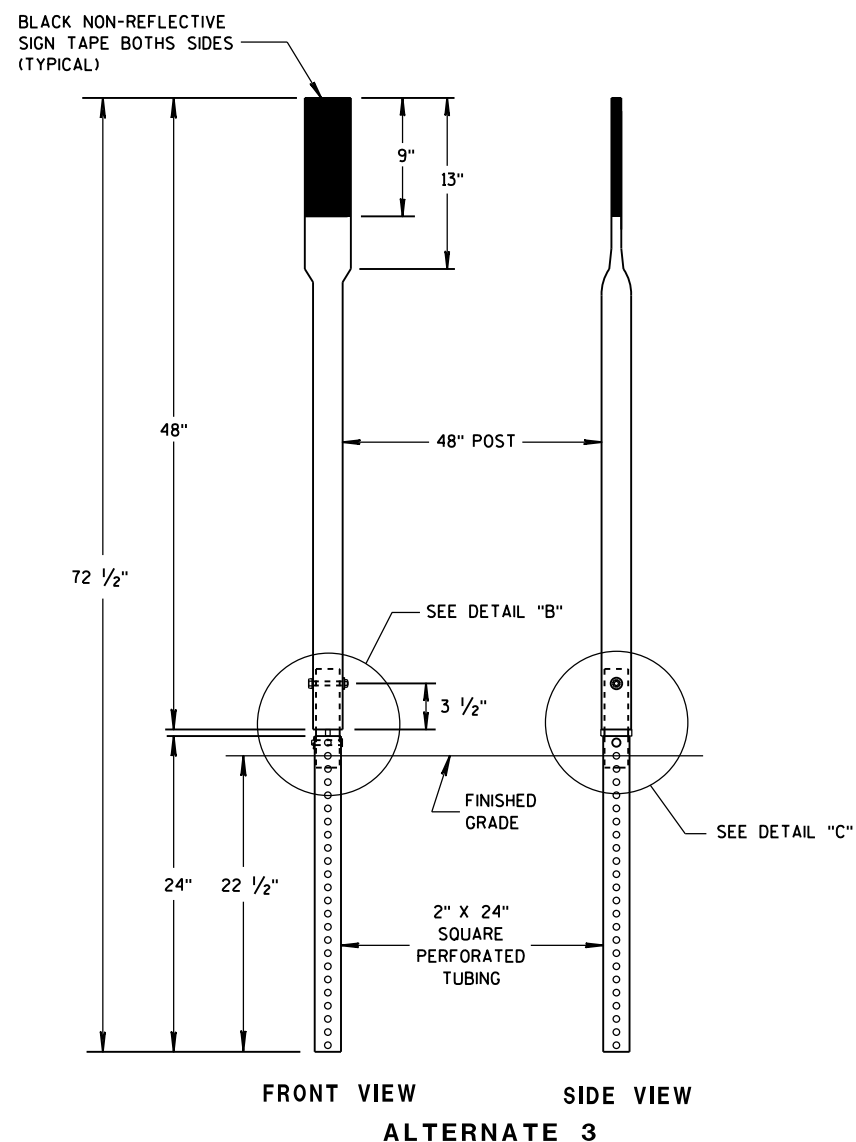
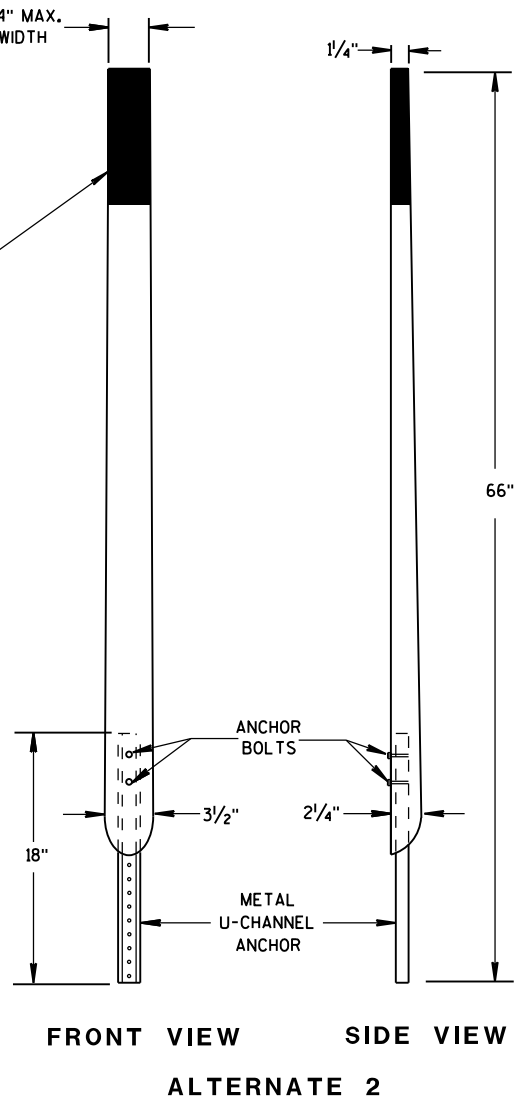
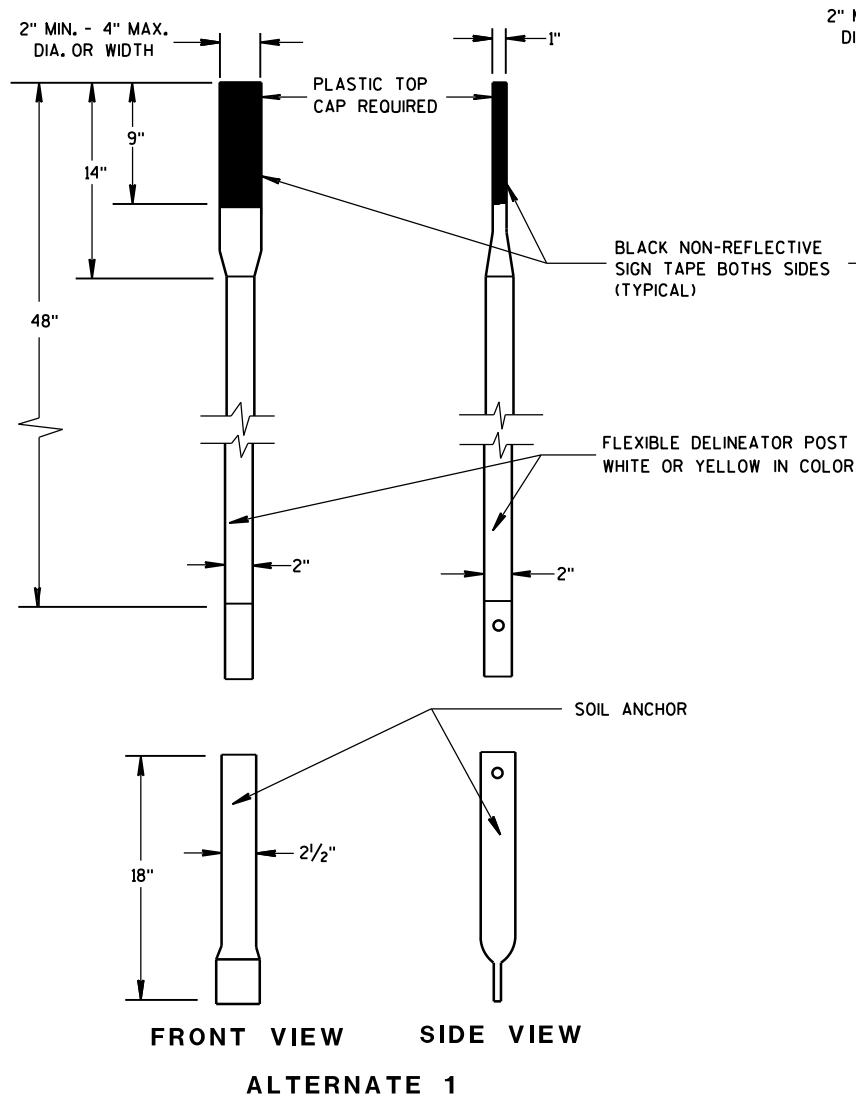
PLAN VIEW
CONCRETE MASONRY ENDWALLS FOR
CULVERT PIPE AND PIPE ARCH



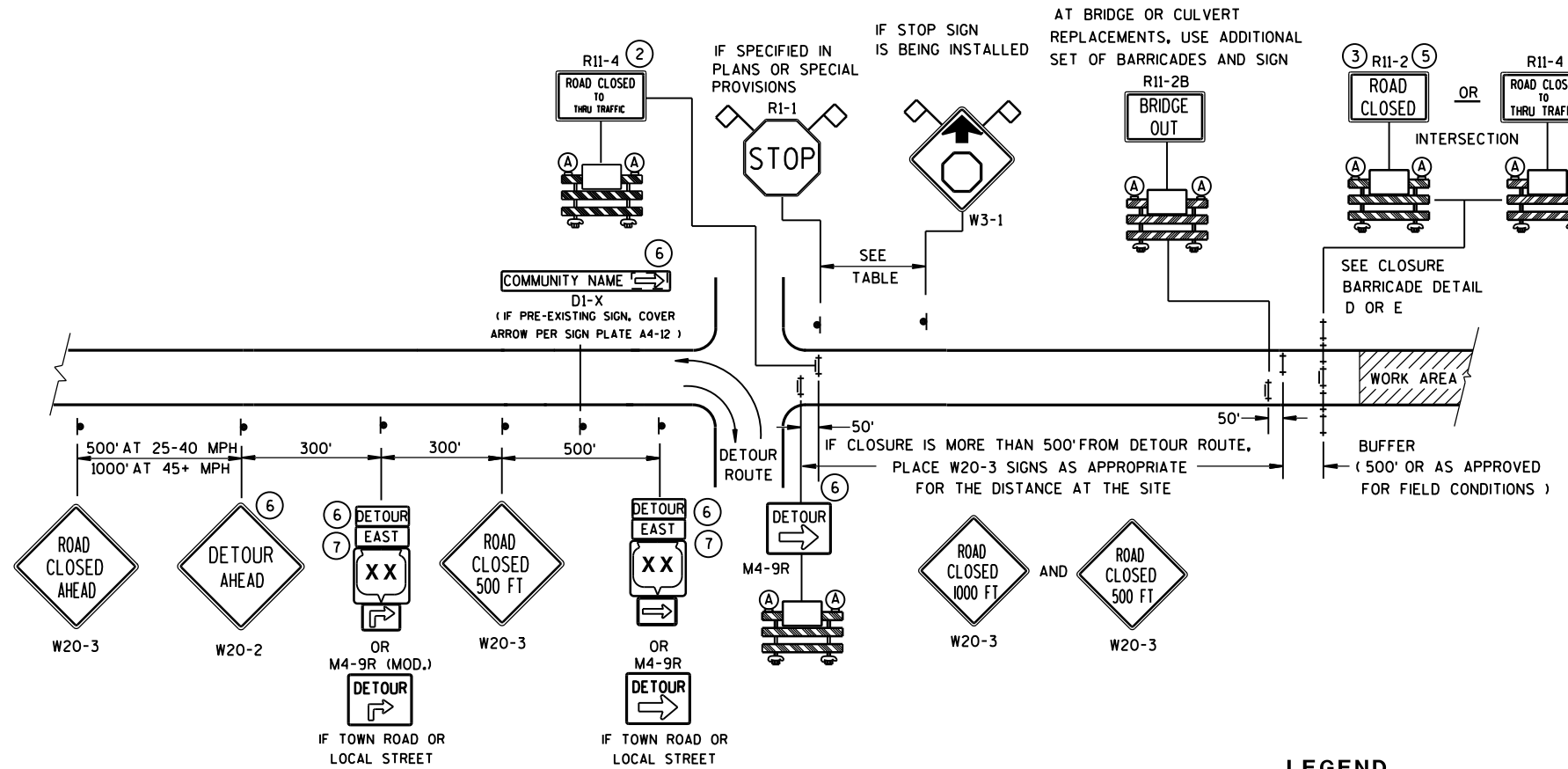
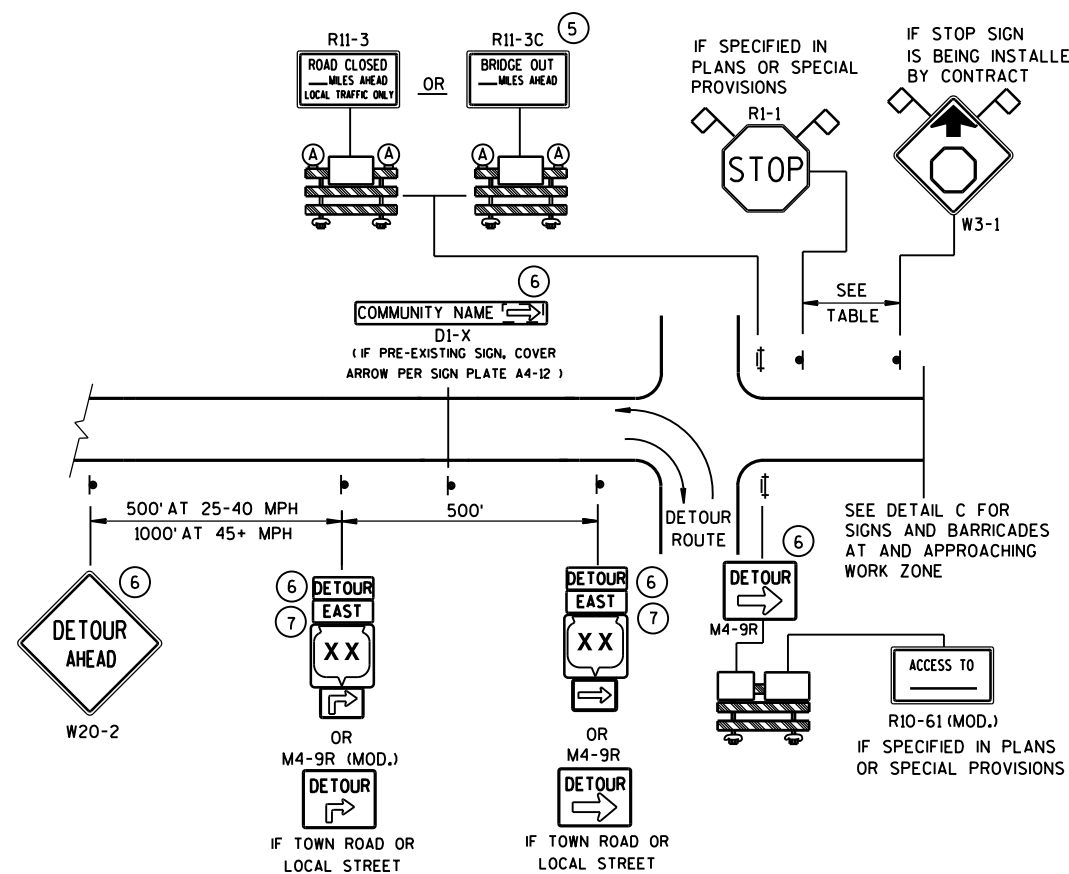
CROSS SECTION
FLEXIBLE MARKER POST

FLEXIBLE MARKER POST
FOR CULVERT END

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



FLEXIBLE MARKER POST FOR CULVERT END	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 10/1/2012 DATE	/S/ Travis Feltes STATE TRAFFIC ENGINEER OF DESIGN
FHWA	



LEGEND

- SIGN ON PERMANENT SUPPORT
- ⊥ TYPE III BARRICADE
- ⊥ TYPE III BARRICADE WITH ATTACHED SIGN
- Ⓐ TYPE "A" WARNING LIGHT (FLASHING)

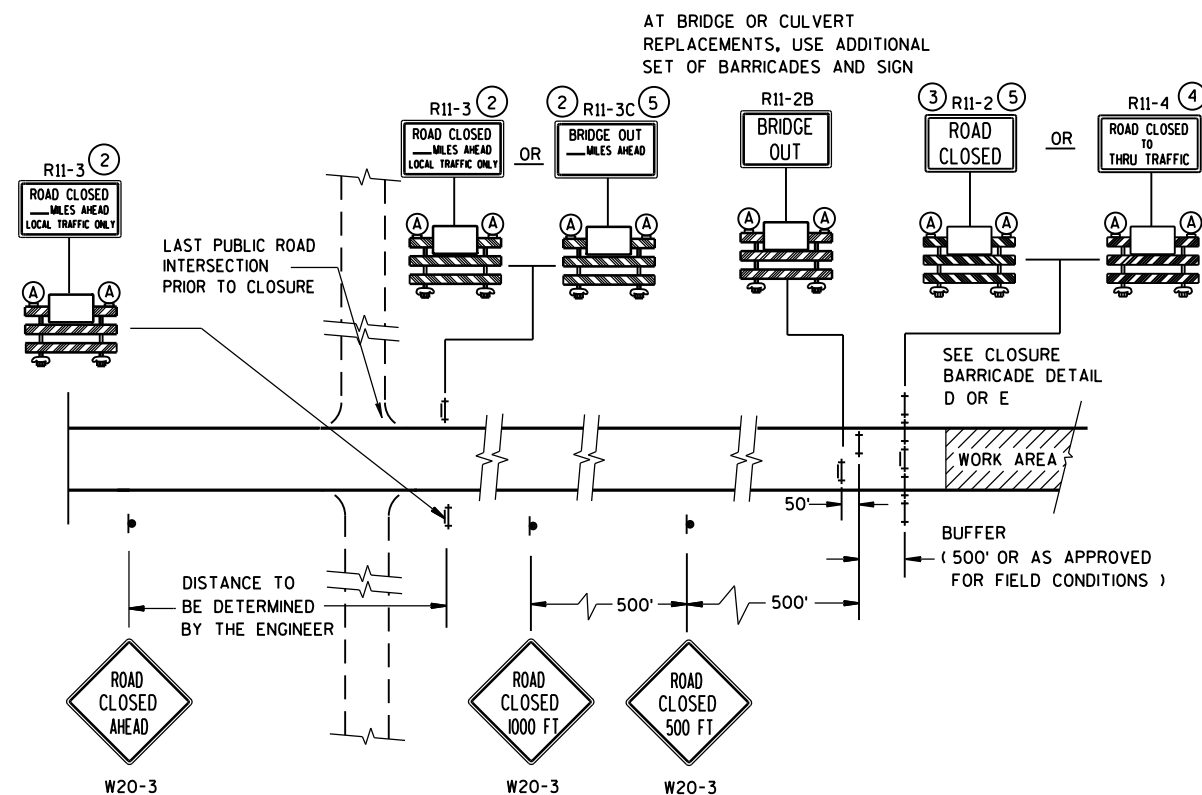
WORK AREA

DETOUR EAST M4-8
M3-X
XX OR COUNTY XX OR XX
M1-4 M1-5A M1-6

M05-1 OR M06-1

FLAGS, 16" X 16" MIN., (ORANGE)

SPEED LIMIT (MPH)	"STOP AHEAD" ADVANCE WARNING DISTANCE (FT)
25	200
30	200
35	350
40	350
45	500
50	550
55	750

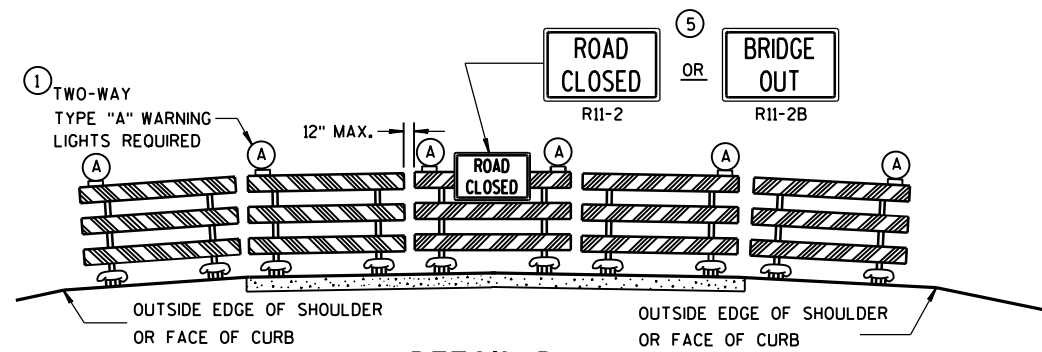


SEE SDD 15C2-SHEET "b"
FOR GENERAL NOTES
AND FOOTNOTES ① THROUGH ⑦

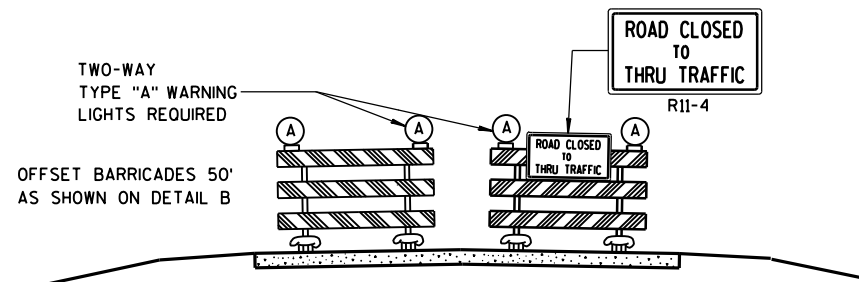
**BARRICADES AND SIGNS
FOR
MAINLINE CLOSURES**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

8/2013 /S/ Travis Feltes
DATE STATE TRAFFIC ENGINEER OF DESIGN
FHWA



DETAIL D
ROAD CLOSURE BARRICADE DETAIL
APPROACH VIEW



DETAIL E
LANE CLOSURE BARRICADE DETAIL
APPROACH VIEW

SEE SDD 15C2-SHEET "a" FOR LEGEND

GENERAL NOTES

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND BARRICADES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

BARRICADES THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY RE-ESTABLISHED UPON COMPLETION OF THE OPERATION OR, FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

ALL TYPE III BARRICADES SHALL HAVE RAILS REFLECTORIZED ON BOTH FACES. STRIPES SHALL BE PROPERLY SLOPED DOWN TOWARD THE TRAFFIC SIDE OR AS SHOWN IN THE ROAD CLOSURE BARRICADE DETAIL D FOR FULL ROAD CLOSURES.

TYPE "A" LOW-INTENSITY FLASHING WARNING LIGHTS SHALL BE VISIBLE ON BOTH SIDES OF THE BARRICADE.

THE R11-2, R11-3, M4-9, R11-4 AND R10-61 SIGNS PLACED ON BARRICADES SHALL COVER NO MORE THAN THE TOP RAIL. THE SIGNS SHALL NOT COVER ANY PORTION OF THE MIDDLE OR BOTTOM RAILS.

"WO AND "MO" SIGNS ARE THE SAME AS "W" AND "M" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:

R11-2 SHALL BE 48" X 30".

R11-3, R11-4 AND R10-61 SHALL BE 60" X 30".

M4-9 SHALL BE 30" X 24".

M3-X SHALL BE 24" X 12". (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS.)

M4-8 SHALL BE 24" X 12". (30" X 15" IF NEEDED TO MATCH EXISTING SIGNS.)

M1-4, M1-5A, AND M1-6 SHALL BE 24" X 24". (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS.)

M05-1 AND M06-1 SHALL BE 21" X 21". (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS.)

D1-X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.

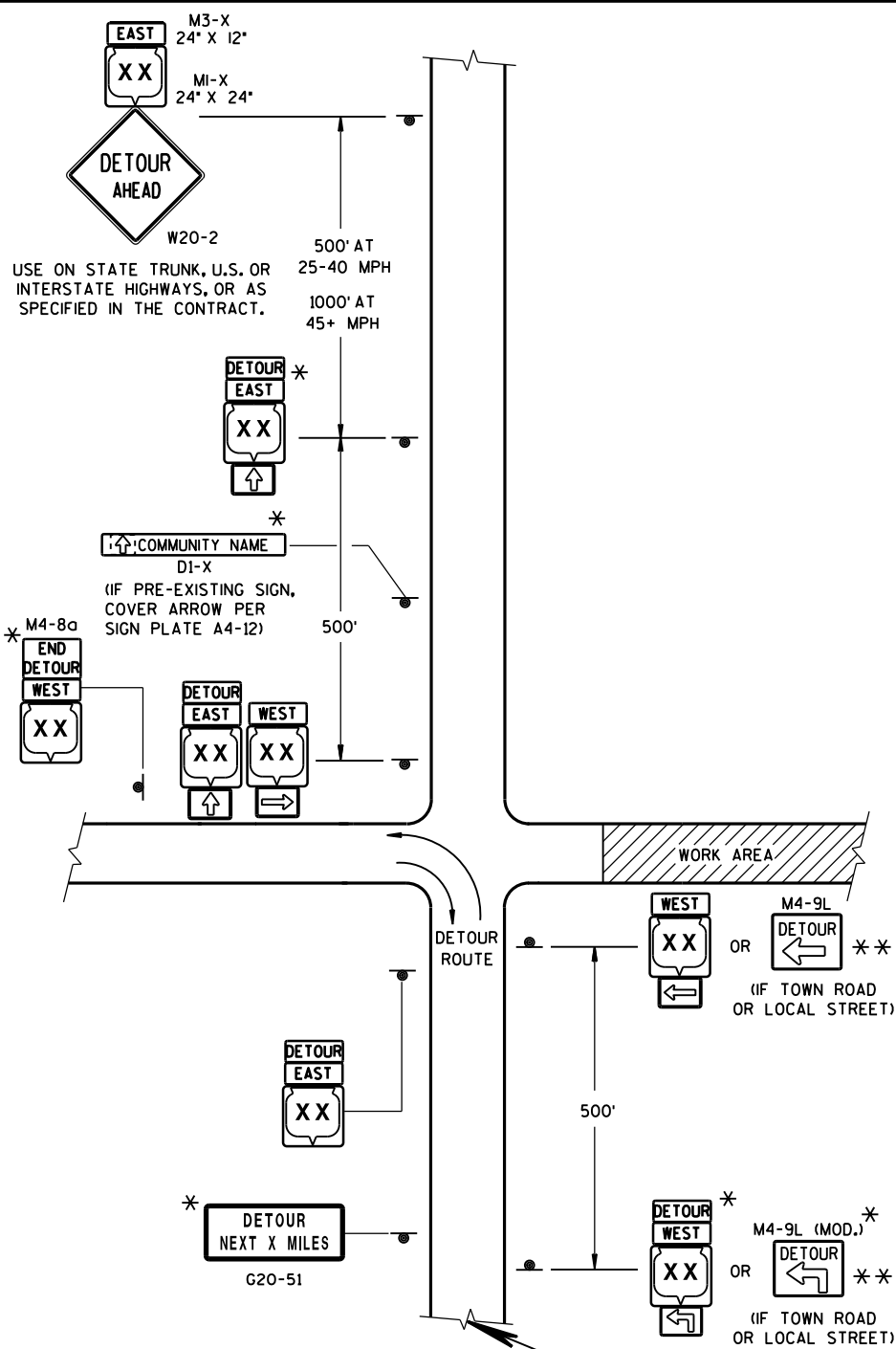
R1-1 SHALL BE 36" X 36".

- ① TWO WARNING LIGHTS SHALL BE PROVIDED ON THE CENTER BARRICADE AND A MINIMUM OF ONE WARNING LIGHT SHALL BE PROVIDED ON EACH OF THE OTHER BARRICADES WITHIN THE ROADWAY LIMITS. SPACING OF THE WARNING LIGHTS SHALL BE UNIFORM TO THE EDGE OF ROADWAY AS SHOWN (APPROX. 8-FOOT LIGHT SPACING).
- ② THESE SIGNS AND BARRICADES ARE NOT REQUIRED IF ROAD CLOSURE BEGINS AT INTERSECTION.
- ③ FOR ROAD CLOSURE WITHOUT LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL D.
- ④ FOR ROAD CLOSURE WITH LOCAL ACCESS TO PROJECT, SEE LANE CLOSURE BARRICADE DETAIL E.
- ⑤ FOR BRIDGE OR CULVERT REPLACEMENTS, SUBSTITUTE "BRIDGE OUT" INSTEAD OF "ROAD CLOSED" ON R11-2 AND R11-3 SIGNS.
- ⑥ INSTALL DETOUR AND COMMUNITY GUIDE SIGNS AND ARROWS ONLY IF SPECIFIED IN THE CONTRACT. IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. MODIFY EXISTING SIGNS WHERE POSSIBLE. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. IF DETOUR SIGNS ARE BEING INSTALLED BY OTHERS, PLACE THE CONTRACTED TRAFFIC CONTROL SIGNS TO ALLOW FOR PLACEMENT OF ALL WARNING, DETOUR AND GUIDE SIGNS AS SHOWN.
- ⑦ "EAST" CARDINAL DIRECTION MARKERS AND RIGHT TURN ARROWS ARE SHOWN. USE OTHER CARDINAL DIRECTIONS AND ARROWS AS APPROPRIATE.

**BARRICADES AND SIGNS
FOR
MAINLINE CLOSURES**

**STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION**

8/2013 /S/ Travis Feltes
DATE STATE TRAFFIC ENGINEER OF DESIGN
FHWA



LEGEND

SIGN ON PERMANENT SUPPORT

WORK AREA

M4-8
M3-X

OR OR
MI-4 MI-5A MI-6

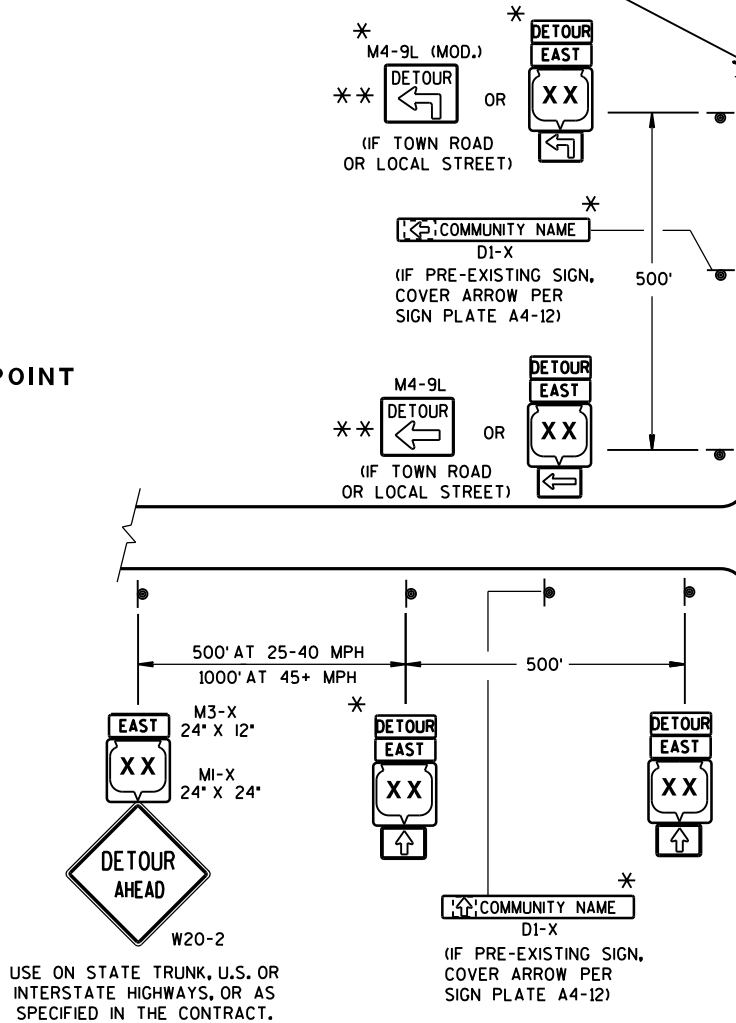
OR OR
M05-1 M06-1 M06-1

SEE SPECIFIC PROJECT DETOUR
SIGNING DETAIL SHEETS AND
DETAIL A OR B ON SDD 15C2-SHEET "a"

THIS DRAWING PROVIDES GENERAL GUIDANCE
ON TYPICAL DETOUR SIGN LAYOUT AND SPACING.
SEE PROJECT DETOUR SIGNING SHEETS FOR
SPECIFIC DETAILS FOR EACH PROJECT.

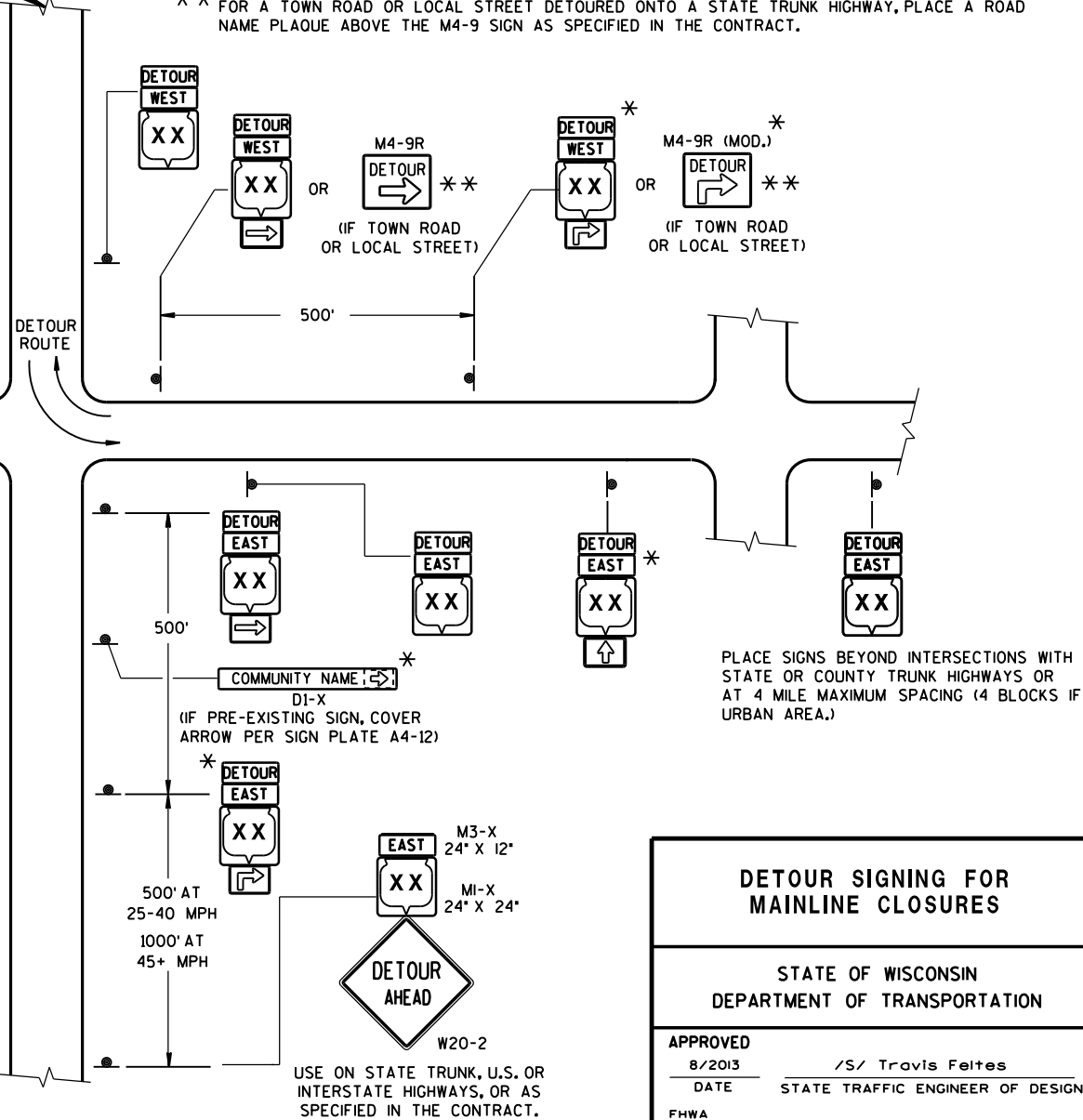
MATCH POINT

DETAIL F
DETOUR SIGNING



GENERAL NOTES

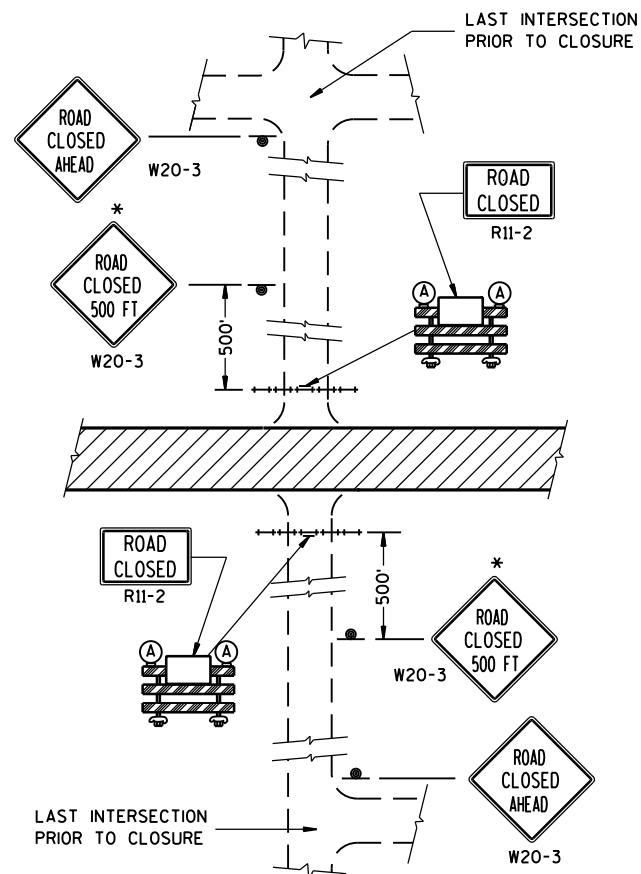
- THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.
- IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS, MODIFY EXISTING SIGNS WHERE POSSIBLE.
- THE SPACING BETWEEN TRAFFIC CONTROL AND DETOUR SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.
- ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE", SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.
- SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.
- "MO" SIGNS ARE THE SAME AS "M" SIGNS EXCEPT THE BACKGROUND IS ORANGE.
- SIGN SIZES SHALL BE AS FOLLOWS:
- M3-X SHALL BE 24" X 12". (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS.)
 - M4-8 SHALL BE 24" X 12". (30" X 15" IF NEEDED TO MATCH EXISTING SIGNS.)
 - MI-4, MI-5A, AND MI-6 SHALL BE 24" X 24". (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS.)
 - M05-1 AND M06-1 SHALL BE 21" X 21". (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS.)
 - M4-9 SHALL BE 30" X 24".
 - M4-8a SHALL BE 24" X 18".
 - G20-51 SHALL BE 60" X 24".
 - W20-2 SHALL BE 48" X 48".
 - D1-X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.
- * OPTIONAL SIGNS. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS.
- ** FOR A TOWN ROAD OR LOCAL STREET DETOURED ONTO A STATE TRUNK HIGHWAY, PLACE A ROAD NAME PLAQUE ABOVE THE M4-9 SIGN AS SPECIFIED IN THE CONTRACT.



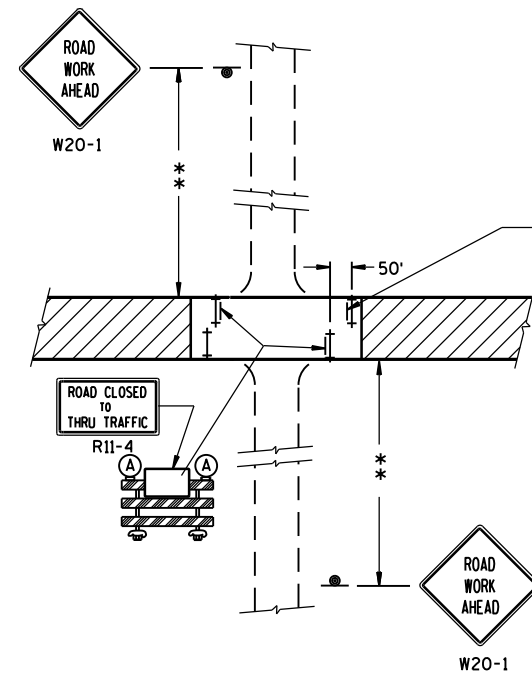
**DETOUR SIGNING FOR
MAINLINE CLOSURES**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

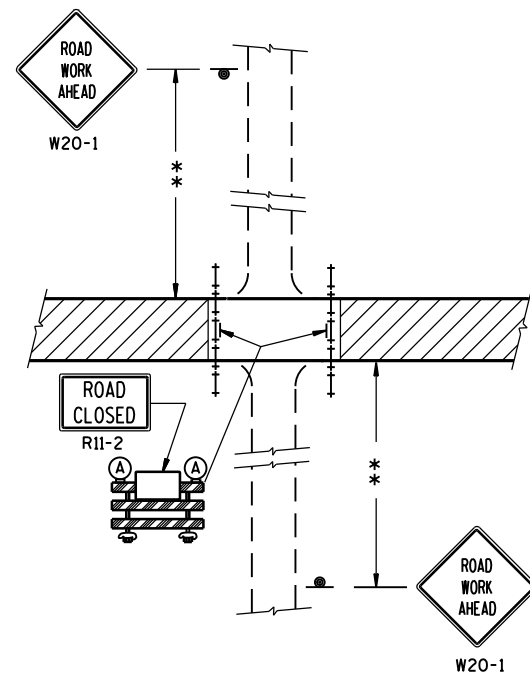
APPROVED
8/2013 /S/ Travis Feltes
DATE STATE TRAFFIC ENGINEER OF DESIGN
FHWA



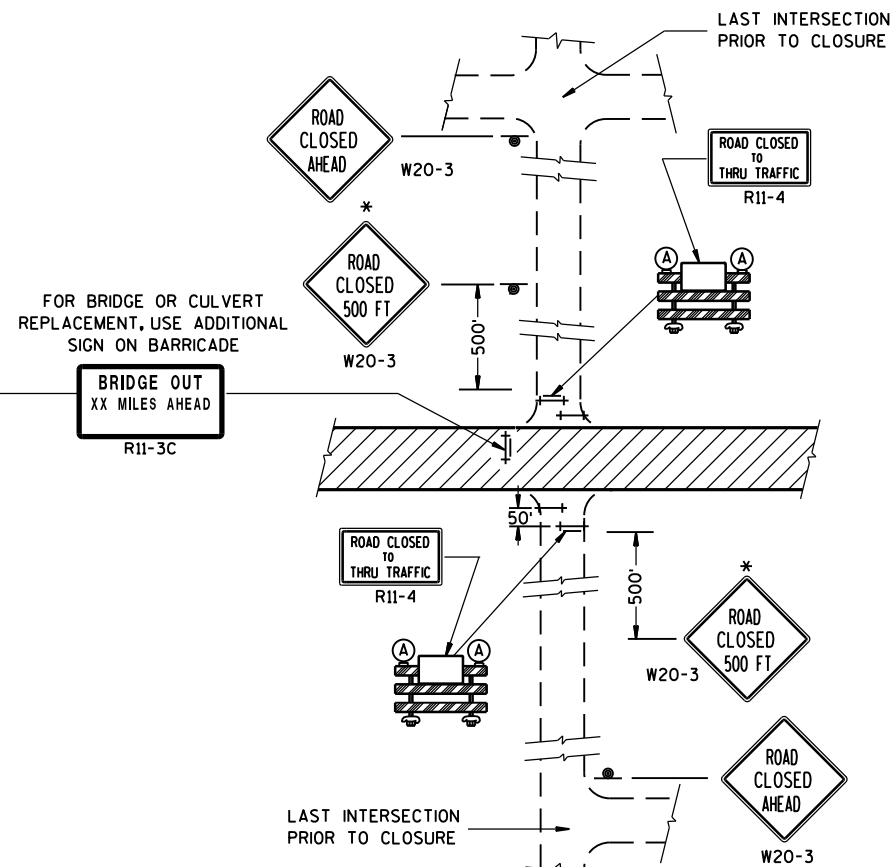
DETAIL 1
(NO ACCESS TO PROJECT)



DETAIL 3
(PUBLIC CROSS-TRAFFIC MAINTAINED. CONTRACTOR, LOCAL BUSINESS AND RESIDENT ACCESS).



DETAIL 2
(PUBLIC CROSS-TRAFFIC MAINTAINED.
NO ACCESS TO PROJECT).



DETAIL 4
(CONTRACTOR, LOCAL BUSINESS AND
RESIDENT ACCESS TO PROJECT)

GENERAL NOTES

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND BARRICADES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

IF A "STOP" SIGN MUST BE REMOVED FOR A WORK OPERATION, A TEMPORARY "STOP" SIGN SHALL BE PLACED PRIOR TO THE SIGN REMOVAL, OR A FLAGGER SHALL BE PROVIDED UNTIL THE SIGN IS RE-ESTABLISHED.

BARRICADES THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY RE-ESTABLISHED UPON COMPLETION OF THE OPERATION OR, FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

ALL TYPE III BARRICADES SHALL HAVE RAILS REFLECTORIZED ON BOTH FACES. STRIPES SHALL BE PROPERLY SLOPED DOWN TOWARD THE TRAFFIC SIDE OR AS SHOWN IN THE ROAD CLOSURE BARRICADE DETAIL D FOR FULL ROAD CLOSURES.

TYPE "A" LOW-INTENSITY FLASHING WARNING LIGHTS SHALL BE VISIBLE ON BOTH SIDES OF THE BARRICADE.

THE R11-2, R11-3 AND R11-4 SIGNS PLACED ON BARRICADES SHALL COVER NO MORE THAN THE TOP RAIL. THE SIGNS SHALL NOT COVER ANY PORTION OF THE MIDDLE OR BOTTOM RAILS.

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:

R11-2 SHALL BE 48" X 30".

R11-4 AND R11-3 SHALL BE 60" X 30".

*OMIT THE "ROAD CLOSED 500 FT." SIGN IF THE LAST INTERSECTION IS 500 FT. OR LESS FROM THE WORK ZONE.

**500' MAX. OR AT LAST INTERSECTION WHICHEVER IS CLOSER.

LEGEND

- ⊙ SIGN ON PERMANENT SUPPORT
- ⊥ TYPE III BARRICADE
- ⊥ TYPE III BARRICADE WITH ATTACHED SIGN
- (A) TYPE "A" WARNING LIGHT (FLASHING)
- ▨ WORK AREA

BARRICADES AND SIGNS FOR SIDEROAD CLOSURES

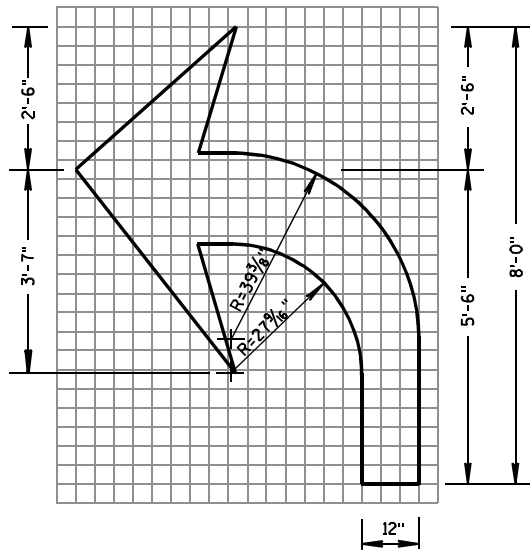
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

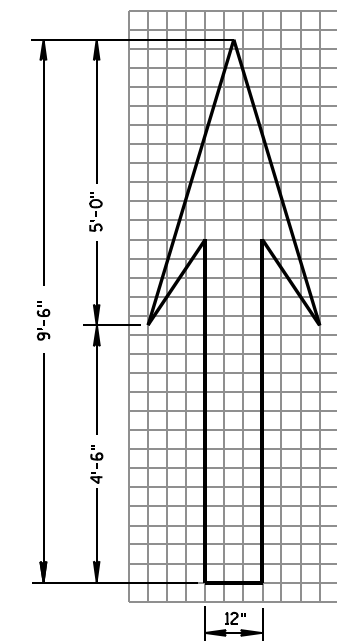
8/2013 /S/ Travis Feltes

DATE STATE TRAFFIC ENGINEER OF DESIGN

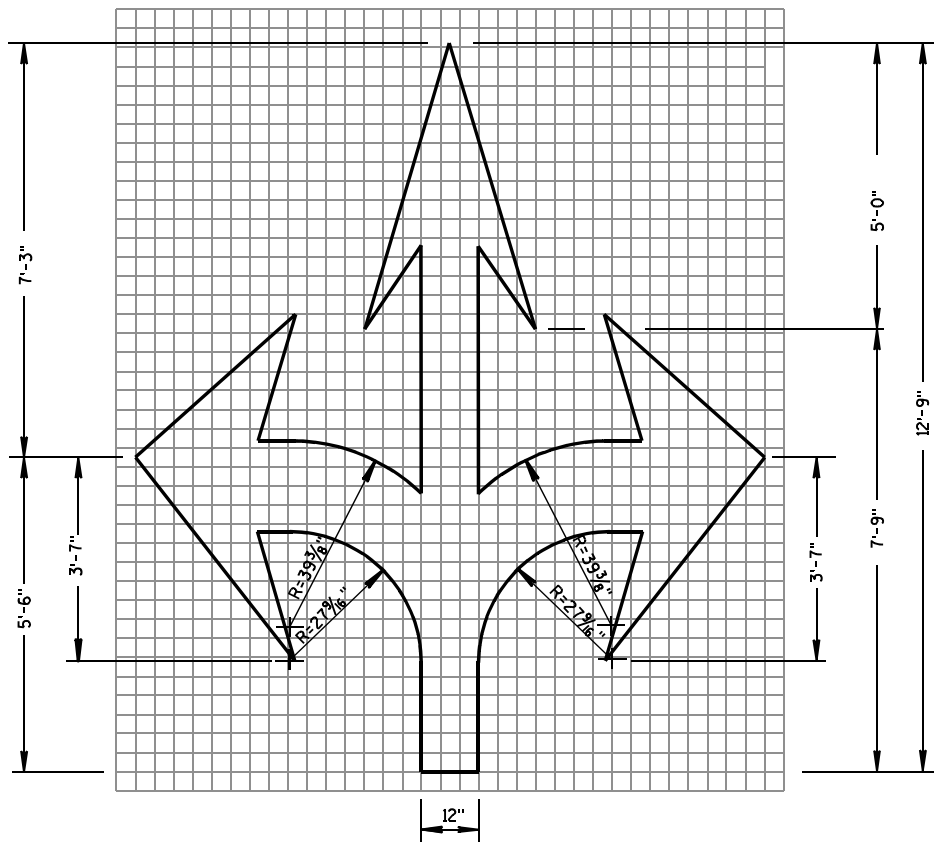
FHWA



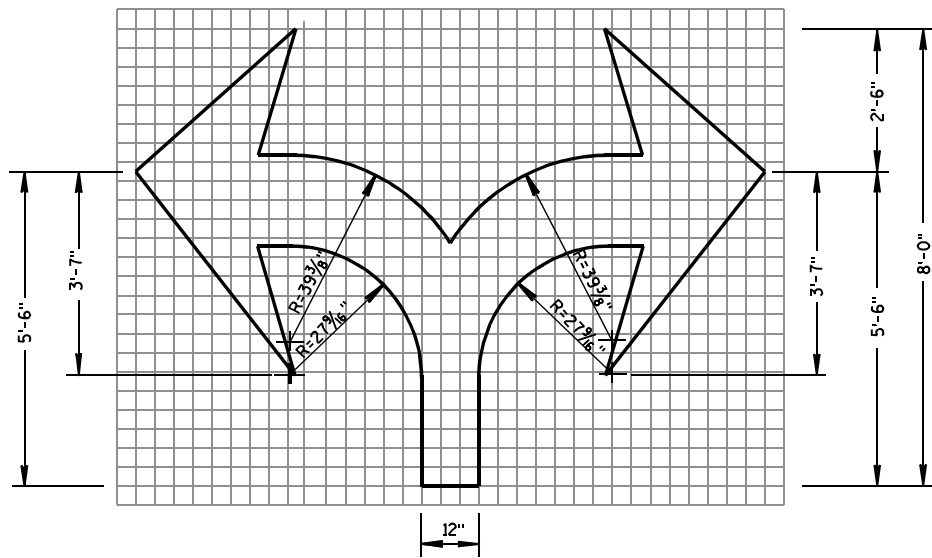
TYPE 2



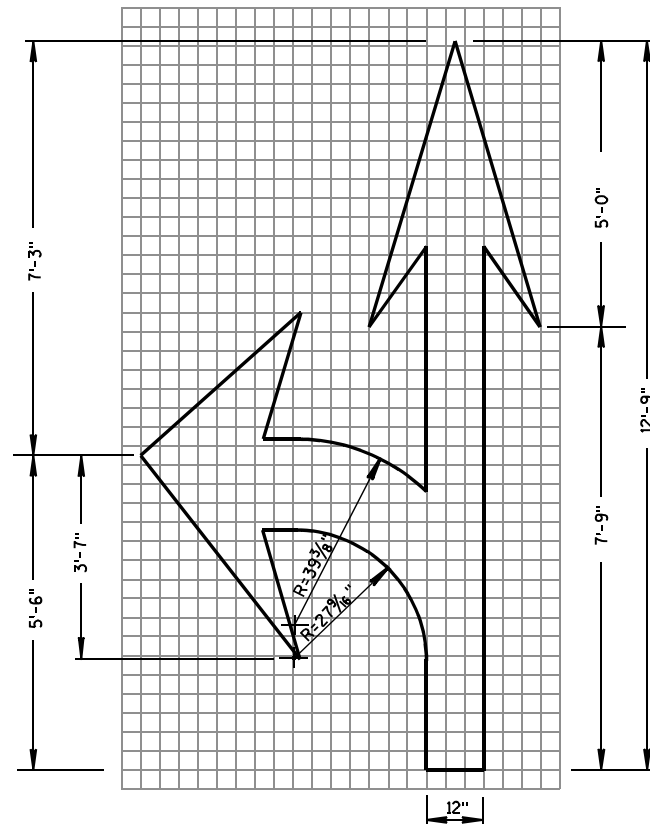
TYPE 1



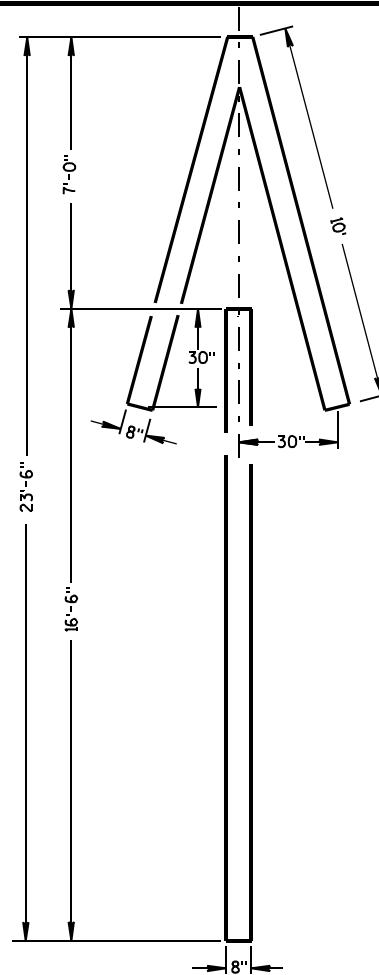
TYPE 6



TYPE 7



TYPE 3

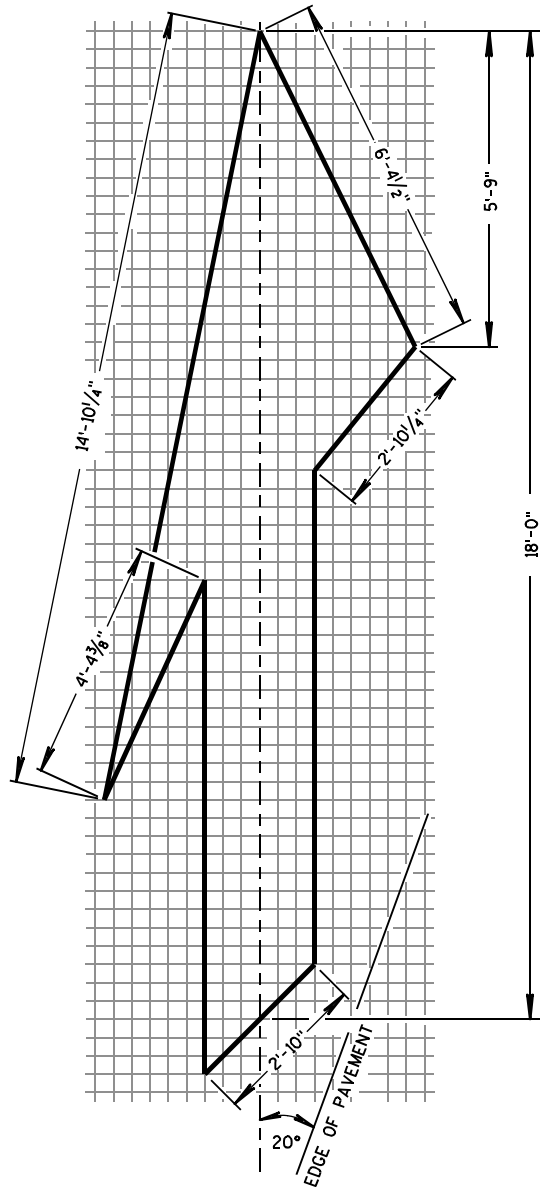


TYPE 4

GENERAL NOTES

DETAILS OF INSTALLATION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

ALL LETTERS, ARROWS AND SYMBOLS SHALL BE IN CONFORMANCE WITH REQUIREMENTS INCLUDED IN "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKING" BOOK BY THE FEDERAL HIGHWAY ADMINISTRATION. ALL LETTERS, ARROWS AND SYMBOLS SHALL BE WHITE AND REFLECTORIZED. SMALL DIFFERENCES IN DIMENSIONS WITHIN THE TOLERANCES OF THAT BOOK ARE ACCEPTABLE.



TYPE 5 LANE DROP ARROW

PAVEMENT MARKING ARROWS

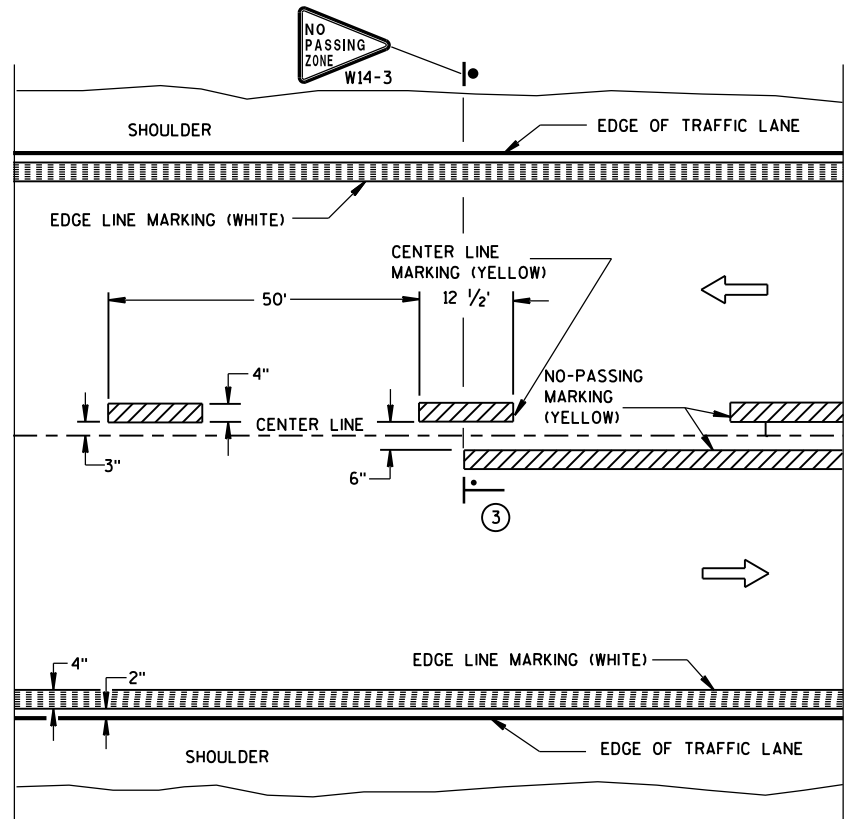
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

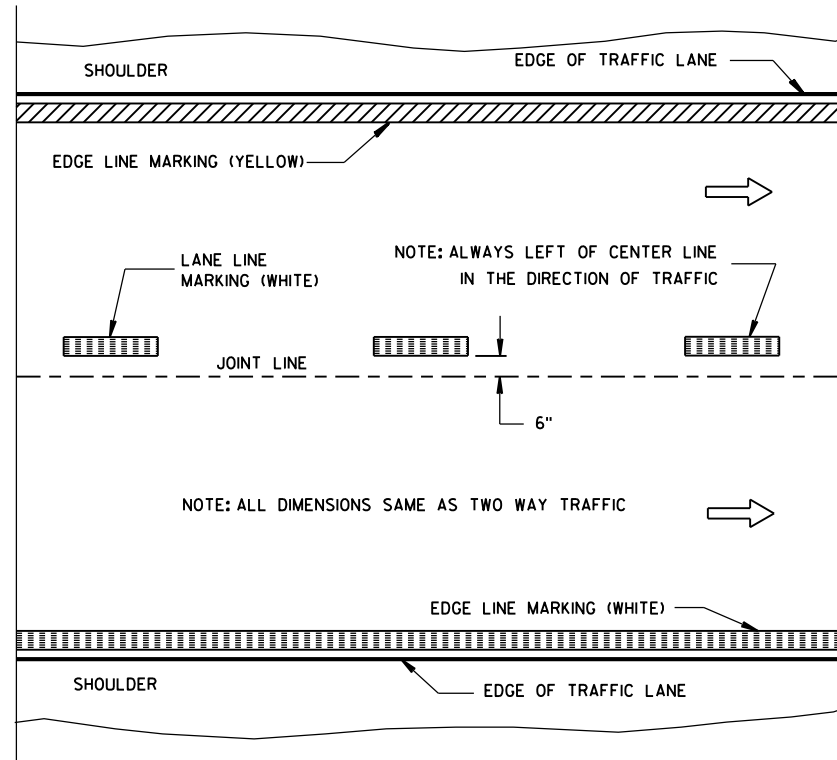
7/1/11
DATE

/S/ Thomas N. Notbohm
STATE TRAFFIC ENGINEER OF DESIGN

FHWA

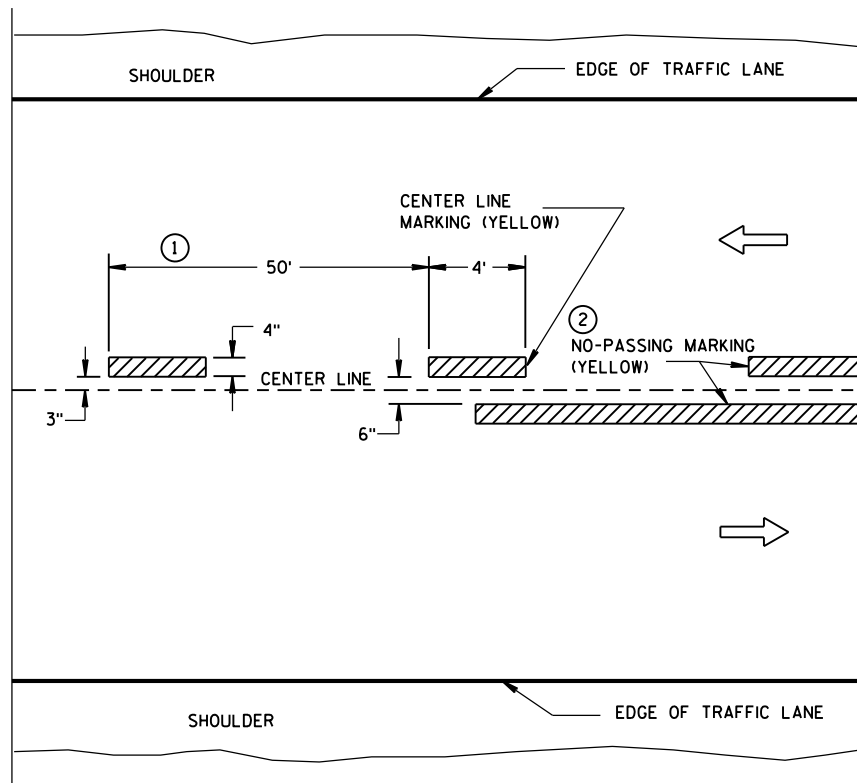


TWO WAY TRAFFIC

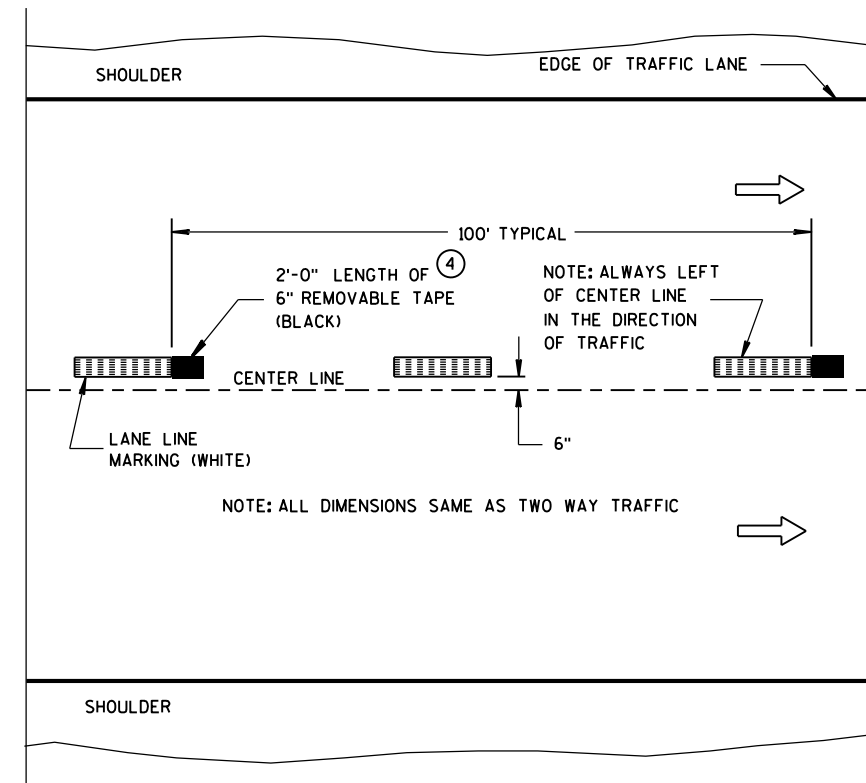


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY (INTERMEDIATE) PAVEMENT MARKING
(SHOWS CYCLE FOR TEMPORARY CENTER LINE OR TEMPORARY LANE LINE MARKING)

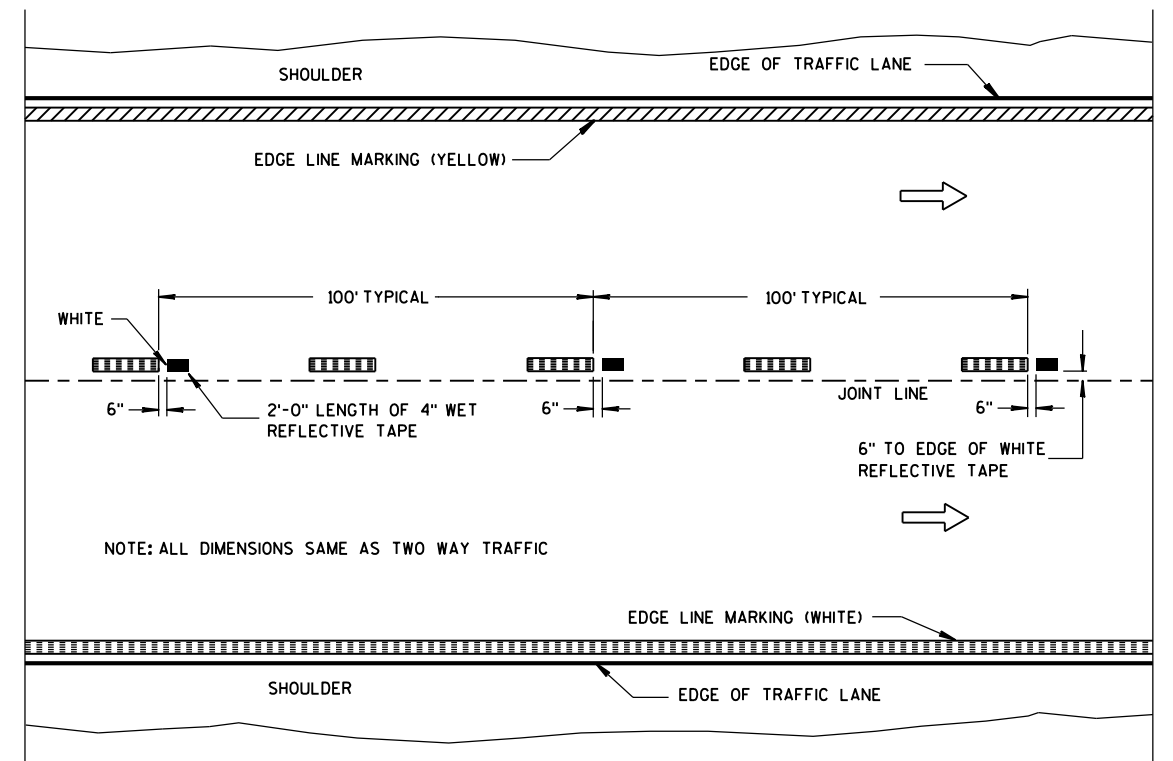
GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

- 1 HALF CYCLE LENGTHS (25'±) WITH 2' MINIMUM STRIPE LENGTHS SHALL BE PROVIDED ON ROADWAYS (INCLUDING TEMPORARY TRAVELED WAYS) WITH REVERSE CURVATURE, CURVATURE OF OVER 5 DEGREES OR WHEN DIRECTED BY THE ENGINEER TO MARK UNUSUAL ALIGNMENT OF THE TRAVELED WAY.
- 2 NO PASSING ZONE TEMPORARY PAVEMENT MARKING IS REQUIRED TO BE PLACED, WHERE APPROPRIATE, ALONG WITH CENTERLINE TEMPORARY PAVEMENT MARKING WHEN A SAME DAY PERMANENT PAVEMENT MARKING ITEM IS INCLUDED IN THE CONTRACT.
- 3 NO PASSING ZONE MARKINGS ARE PLACED ACCORDING TO "T" MARKINGS. IF EXISTING NO PASSING ZONE W14-3 SIGNS ARE BEYOND 50 FEET IN EITHER DIRECTION, THE SIGNS SHALL BE MOVED TO THE "T" MARKINGS.
- 4 CONCRETE ONLY.

NOTE

ARROW SYMBOL (→) SHOWS DIRECTION OF TRAVEL



WET REFLECTIVE TAPE SUPPLEMENT TO
SPRAYED OR NON WET REFLECTIVE TAPE LANE LINE

LEGEND

- "T" MARKING
- POST MOUNTED SIGN

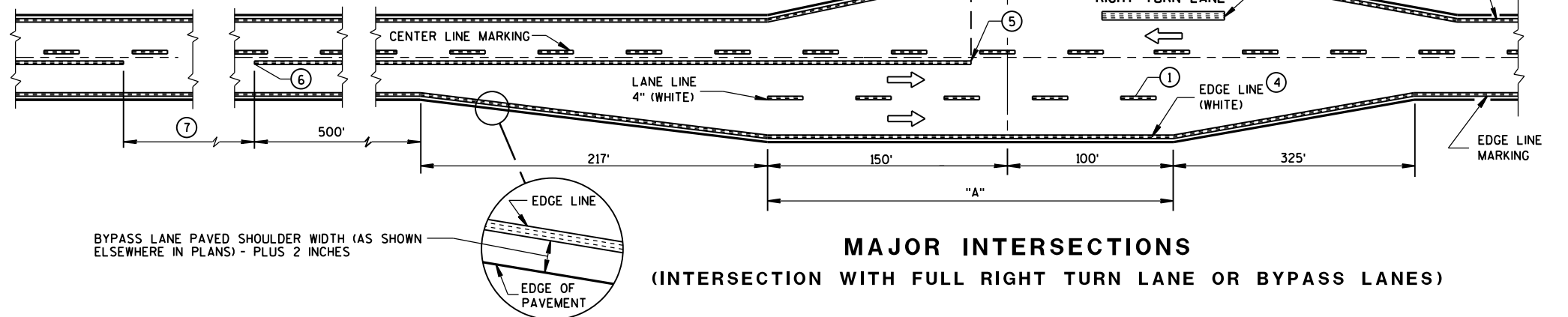
PAVEMENT MARKING
(MAINLINE)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
5-13-2013 /S/ Travis Feltes
DATE STATE TRAFFIC ENGINEER
FHWA

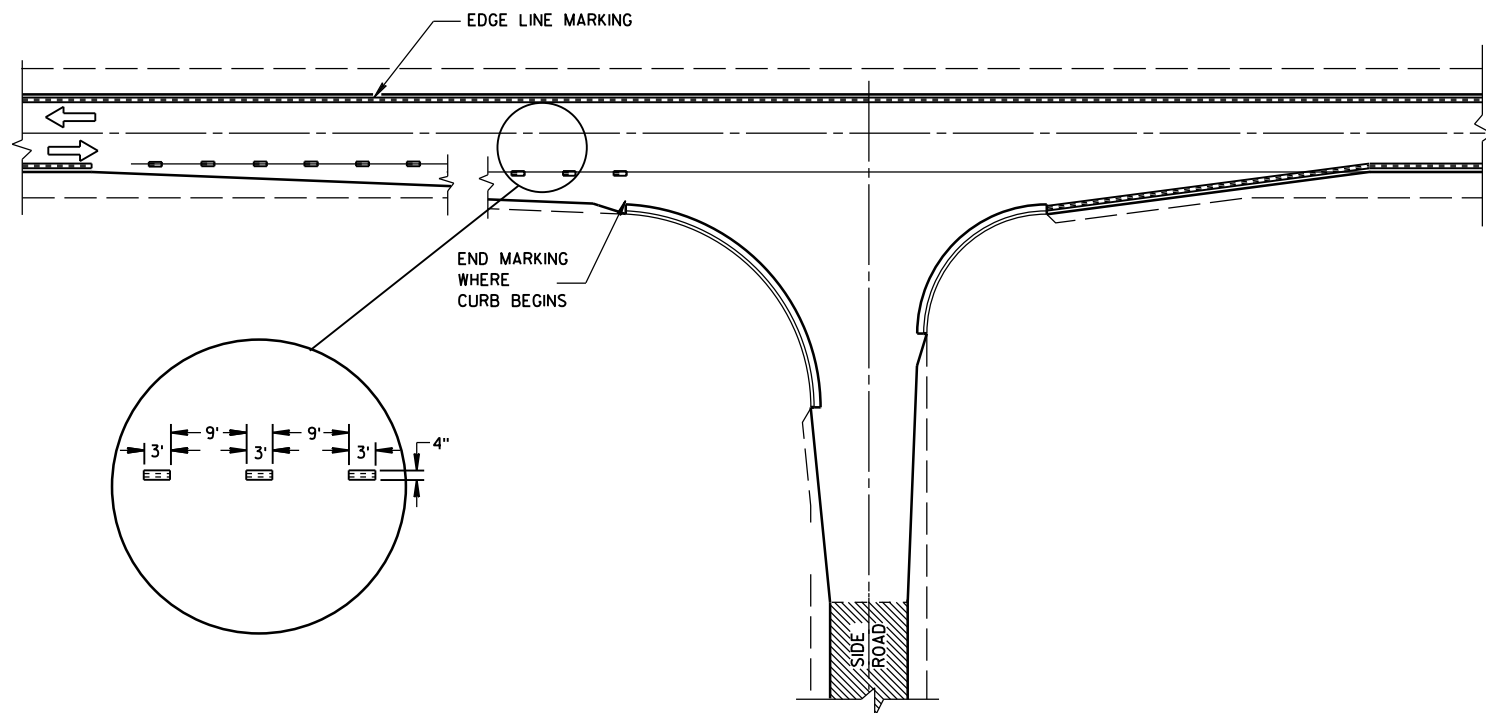


7	
POSTED SPEED (MPH)	MINIMUM DISTANCE BETWEEN ZONES (FEET)
25 - 30	528
35 - 40	528
45 - 50	686
55	792

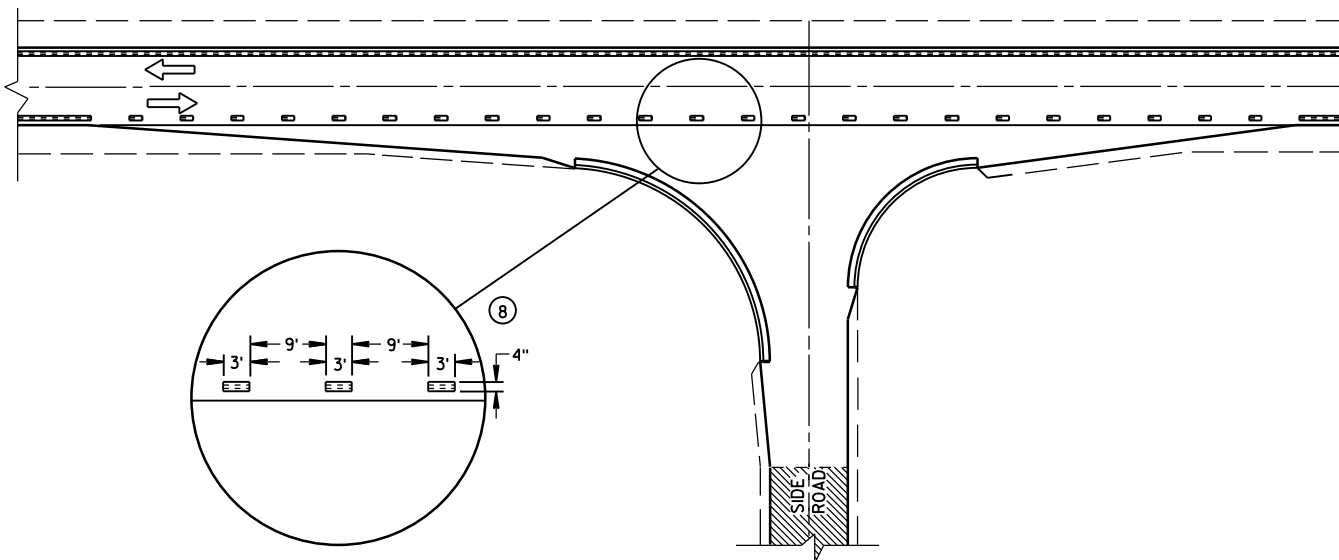


MAJOR INTERSECTIONS

(INTERSECTION WITH FULL RIGHT TURN LANE OR BYPASS LANES)



MINOR INTERSECTION WITH CURBS (TYPICAL MARKING)



MINOR INTERSECTION WITH CURBS

PAVEMENT MARKING (INTERSECTIONS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

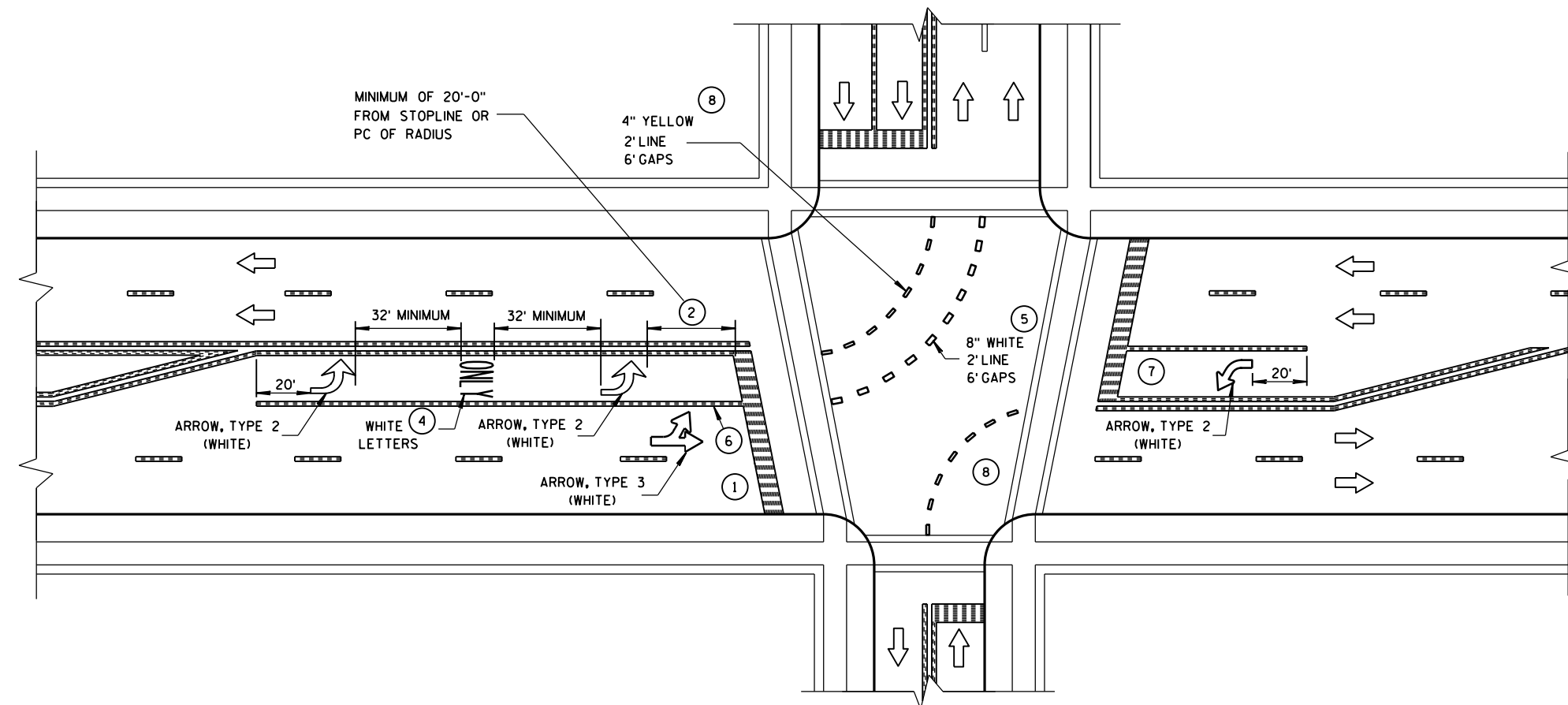
GENERAL NOTES

EDGE LINES SHALL BE OMITTED THROUGH INTERSECTIONS. EDGE LINES SHALL BE CONTINUED THROUGH DRIVEWAYS.

- ① WHEN DISTANCE "A" IS LESS THAN 250 FEET, OMIT LANE LINE.
- ② WHEN DISTANCE "B" IS LESS THAN 100 FEET, OMIT CHANNELIZING LANE LINE.
- ③ ALTERNATIVE MARKING SHALL BE PROVIDED WHEN SPECIFIED IN THE CONTRACT. TYPICAL SITUATIONS WHERE THIS MARKING MAY BE REQUIRED ARE WHERE THE INTERSECTION IS ON A SHARP HORIZONTAL CURVE OR CREST VERTICAL CURVE IN AN UNLIGHTED AREA SUCH THAT THE EDGE LINE MAY BE MISLEADING TO THE MOTORIST OR DISAPPEAR FROM SIGHT.
- ④ THE EDGE LINE IN THE TAPER AREAS OF THE BYPASS LANE AND THE BYPASS LANE SHALL BE LOCATED 1-FOOT FROM EDGE OF PAVEMENT TO THE OUTSIDE EDGE OF EDGE LINE.

- ⑤ BARRIER LINE ENDS AT SIDE ROAD PAVEMENT/SURFACE EDGE EXTENSION.
- ⑥ BARRIER LINE STARTS 500 FEET PRIOR TO THE BYPASS TAPER.
- ⑦ IF THE DISTANCE BETWEEN 2 SUCCESSIVE NO-PASSING ZONES IS LESS THAN THE MINIMUM DISTANCE BETWEEN ZONES, CONNECT THE 2 ZONES.
- ⑧ 3' LINE 9' GAP, EXCEPT RETRACE THE EXISTING LINE - GAP PATTERN WHERE EXISTING MARKINGS ARE IN PLACE.

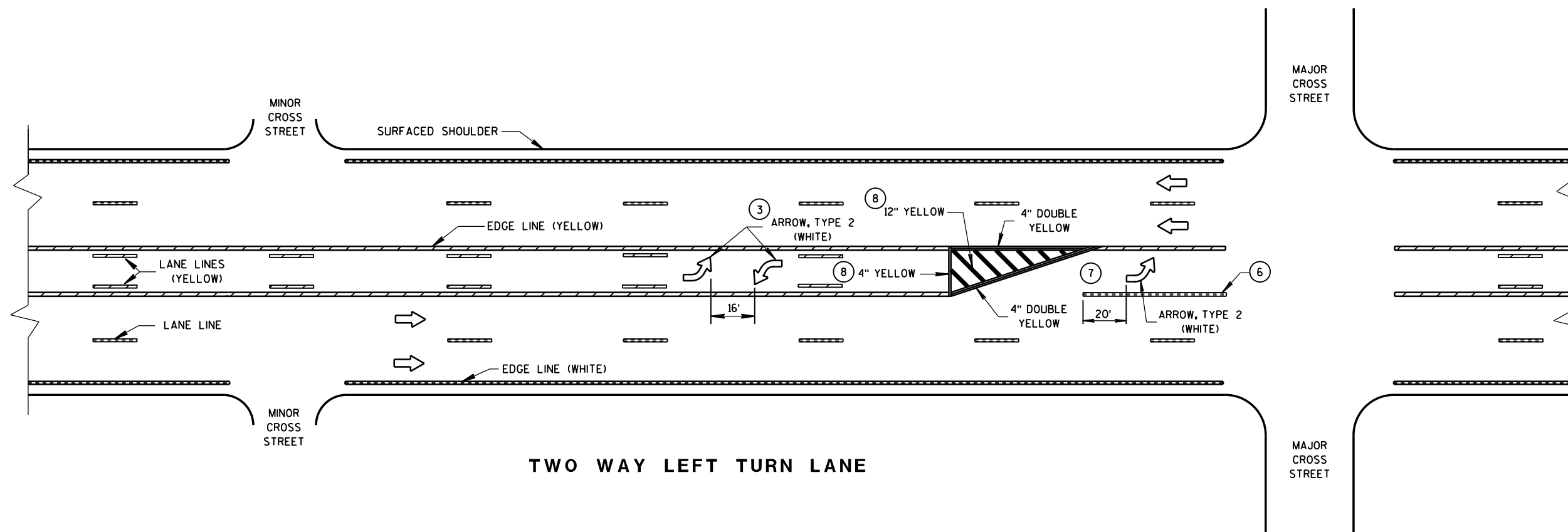
ARROW SYMBOL () SHOWS DIRECTION OF TRAVEL



GENERAL NOTES

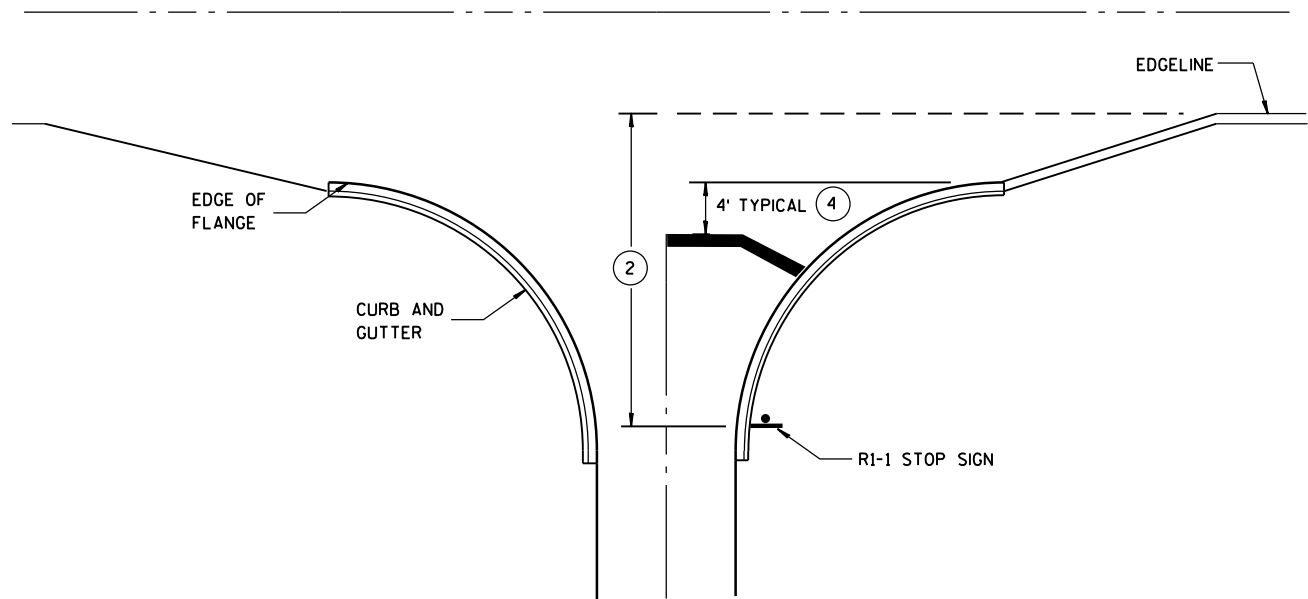
- ① STOP BAR IS REQUIRED ONLY WHEN SPECIFIED IN THE CONTRACT.
- ② DISTANCE MAY BE ADJUSTED TO ACCOMMODATE SHORT LEFT TURN LANES, AS APPROVED BY THE ENGINEER.
- ③ A SET OF ARROWS IS REQUIRED EVERY 400 FEET OR NEAR INTERSECTIONS OR DRIVEWAYS WITH TURNING TRAFFIC.
- ④ ADD EXTRA SETS OF ONE ARROW AND ONE ONLY PER 160 FEET OR WHEN ON A CURVE.
- ⑤ 8" WHITE WITH 2' LINE 6' GAPS FOR DUAL TURN LANE.
- ⑥ 8" WHITE
- ⑦ ADD SECOND ARROW WHEN TURN BAY IS GREATER THAN OR EQUAL TO 108 FEET.
- ⑧ REQUIRED ONLY WHEN SPECIFIED IN THE CONTRACT.

NOTE:
ARROW SYMBOL (➡)
SHOWS DIRECTION OF TRAVEL

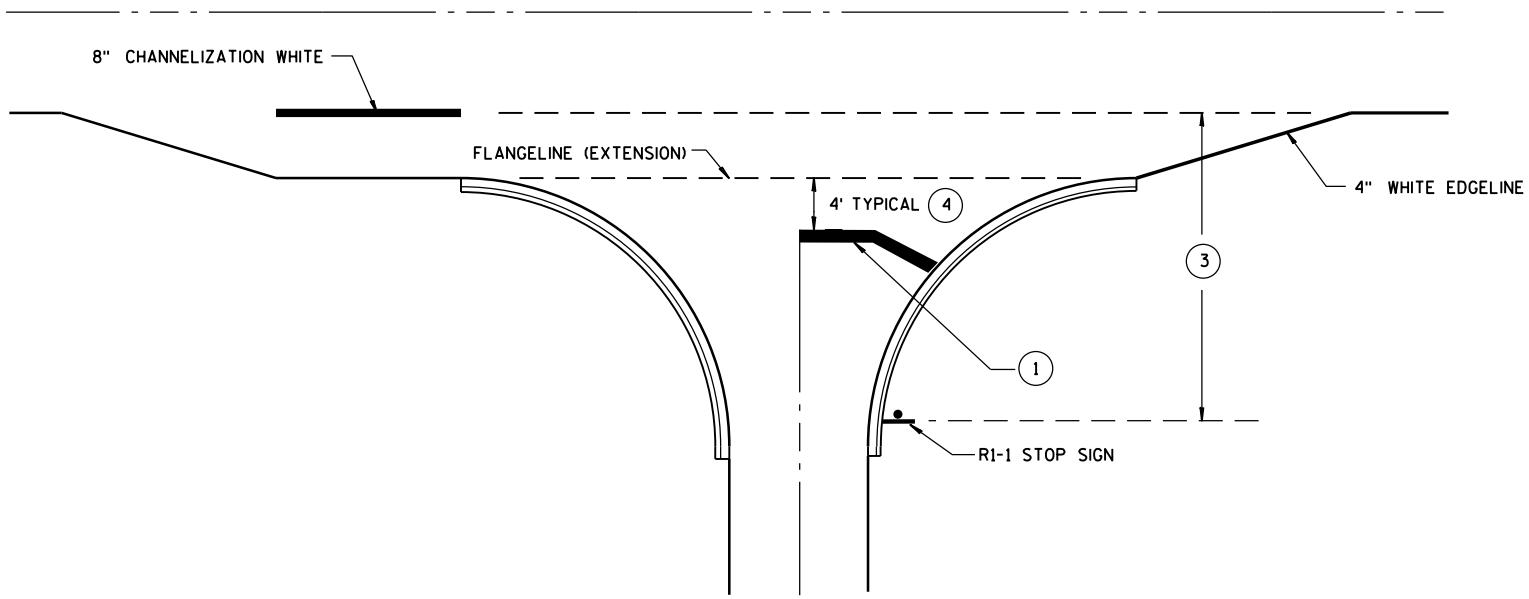


PAVEMENT MARKING
(LEFT TURN LANE)

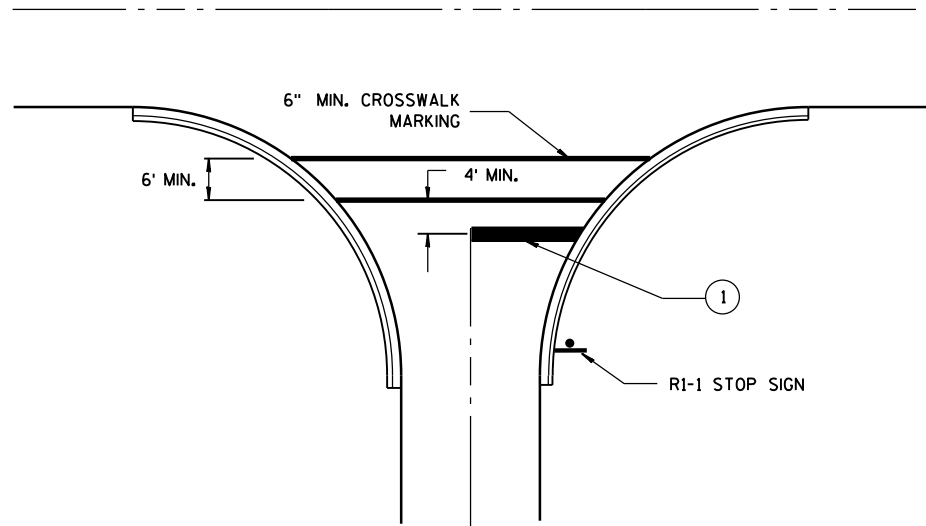
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



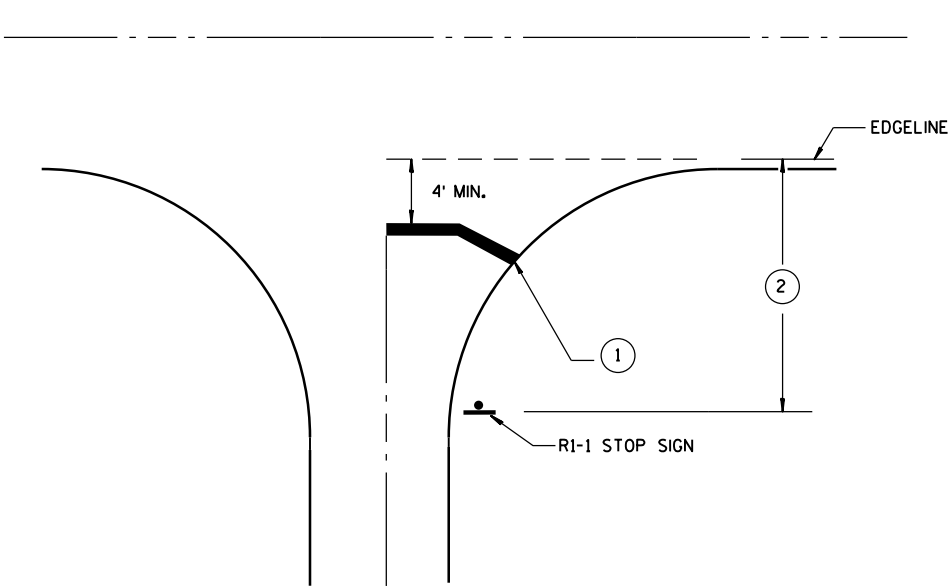
TYPICAL STOP LINE PAVEMENT MARKING
WITH CURB AND GUTTER



TYPICAL STOP LINE PAVEMENT MARKING
FOR SIDEROADS WITH RIGHT TURN LANE



TYPICAL STOP LINE PAVEMENT MARKING
FOR SIDEROADS WITH CROSSWALK MARKING



TYPICAL STOP LINE PAVEMENT MARKING
WITHOUT CURB AND GUTTER

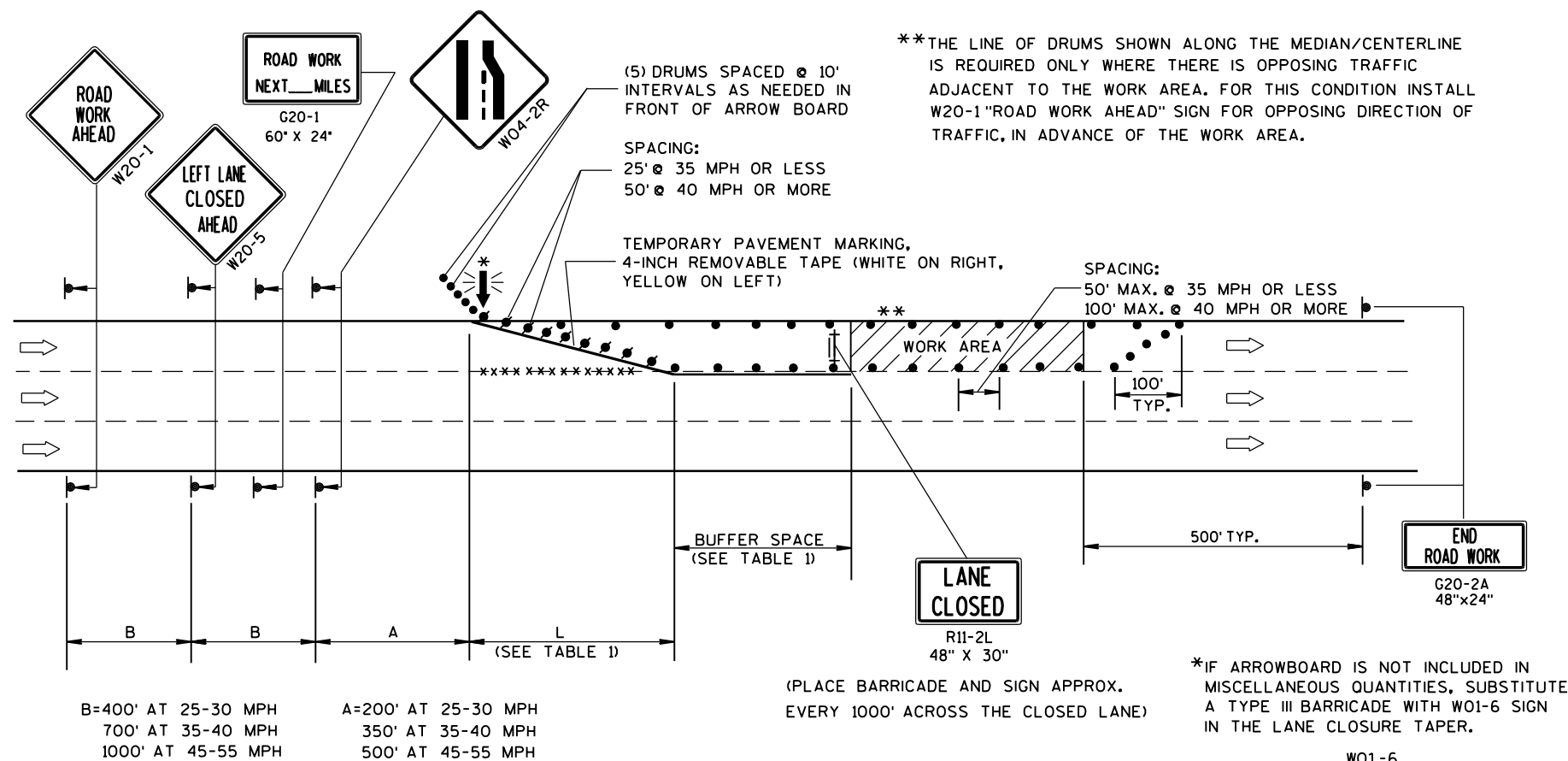
GENERAL NOTES

- ① 18-INCH STOP LINES MAY BE DELETED OR ADDED BY THE PROJECT ENGINEER BASED ON VISIBILITY AND SIGHT LINES.
- ② IF STOP SIGN IS LESS THAN OR EQUAL TO 40 FEET FROM THE EDGE LINE THAN NO STOP LINE IS REQUIRED.
- ③ IF STOP SIGN IS LESS THAN OR EQUAL TO 30 FEET FROM THE FLANGELINE EXTENSION THAN NO STOP LINE IS REQUIRED.
- ④ MOVE CLOSER TO EDGE OF TRAVEL LANE AS NEEDED FOR VISIBILITY AND SIGHT LINES.

STOP LINE AND CROSSWALK
PAVEMENT MARKING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
4/30/2013 DATE /S/ Travis Feltz
STATE TRAFFIC ENGINEER
FHWA



LEGEND

- TYPE III BARRICADE WITH ATTACHED SIGN
- SIGN ON PERMANENT SUPPORT
- TRAFFIC CONTROL DRUM WITH TYPE "C" STEADY BURN LIGHT
- TRAFFIC CONTROL DRUM
- FLASHING ARROW BOARD
- DIRECTION OF TRAFFIC
- REMOVING PAVEMENT MARKING (SEE GENERAL NOTES)
- WORK AREA

GENERAL NOTES

THIS LANE CLOSURE DETAIL IS TYPICAL FOR CLOSING THE LEFT LANE. FOR A RIGHT LANE CLOSURE, REVERSE THE TRAFFIC CONTROL.

THIS DETAIL MAY BE USED FOR ROADWAYS WITH EITHER TWO OR THREE LANES IN EACH DIRECTION.

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND DEVICES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY DISTRICT TRAFFIC UNIT.

"WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS, OR THAT WILL BE PLACED IN A CLOSED LANE, MAY BE MOUNTED ON PORTABLE SUPPORTS.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

REMOVE PAVEMENT MARKINGS AND PLACE TEMPORARY PAVEMENT MARKING, REMOVABLE TAPE IF LANE CLOSURE IS TO BE IN PLACE FOR 4 OR MORE CONTINUOUS DAYS AND NIGHTS.

ON UNDIVIDED ROADWAYS, OMIT THE SIGNS SHOWN ON LEFT SIDE OF ROAD.

W20-1, G20-1 AND G20-2A SIGNS ARE NOT REQUIRED IF THE LANE CLOSURE IS WITHIN A LARGER WORK ZONE WHERE THESE SIGNS ARE ALREADY PRESENT.

OMIT G20-1 SIGNS IF LENGTH OF WORK AREA IS 2 MILES OR LESS.

CONSIDER GEOMETRICS WHEN LOCATING SIGNS AND ARROWBOARDS SO THE APPROACHING DRIVER HAS A CLEAR VIEW OF THE ARROWBOARDS AND LANE CLOSURE DRUMS.

PLACE THE ARROWBOARD AS CLOSE AS POSSIBLE TO THE BEGINNING OF THE LANE CLOSURE TAPER, PREFERABLY ON THE SHOULDER OR TERRACE.

CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

BARRICADES IN A CLOSED LANE THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY RE-ESTABLISHED UPON COMPLETION OF THE OPERATION OR, FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

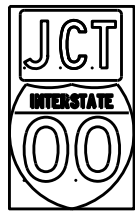
WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.

TRAFFIC CONTROL,
SINGLE LANE CLOSURE,
NON-FREEWAY/EXPRESSWAY

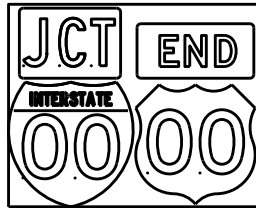
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/2013 /S/ Travis Feltes
DATE STATE TRAFFIC ENGINEER OF DESIGN
FHWA

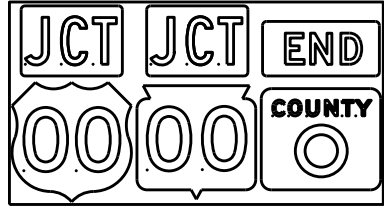
TYPICAL ASSEMBLIES



J1-1



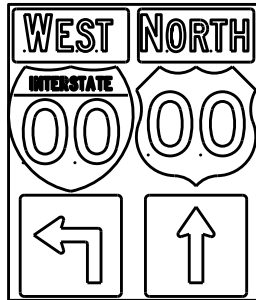
J1-2



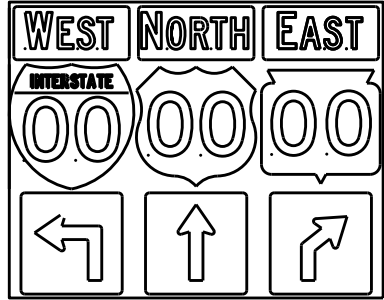
J1-3



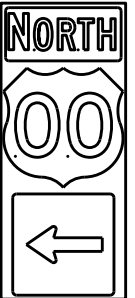
J2-1



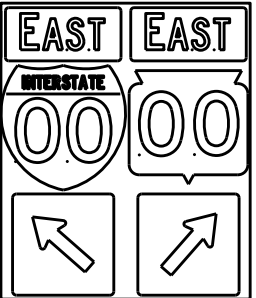
J2-2



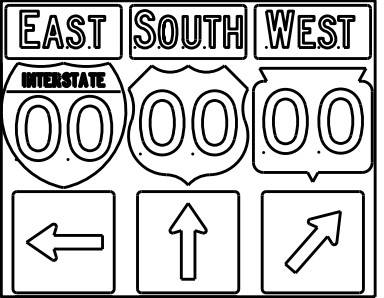
J2-3



J3-1



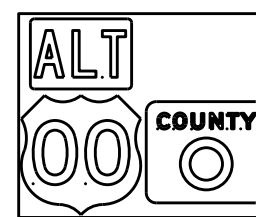
J3-2



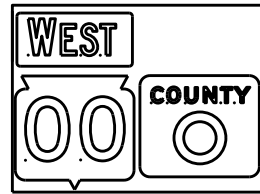
J3-3



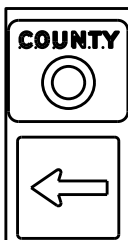
J4-1



J4-2



J4-2



J13-1



J12-1



J32-1



J33-1



J23-1

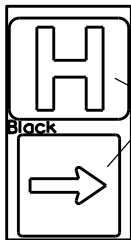


J22-1



JV

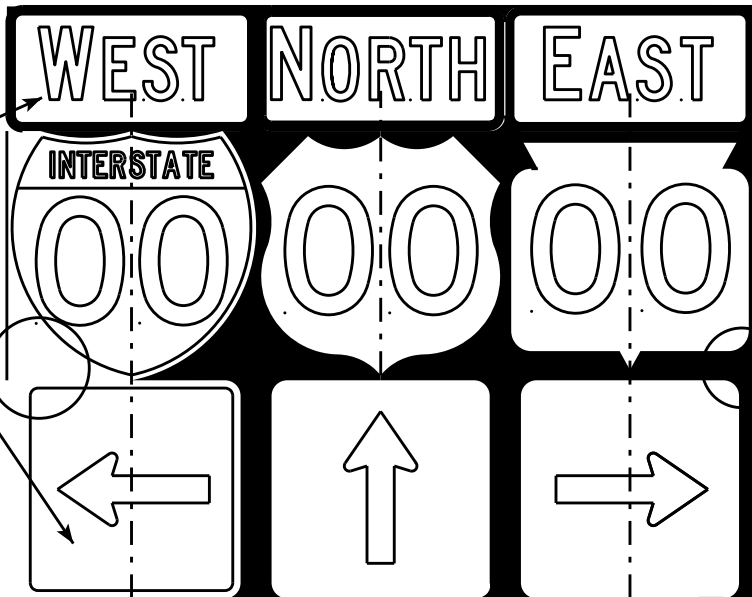
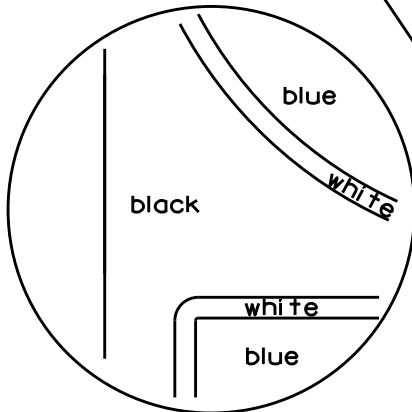
(Typical Vertical J-Assembly
See Note 10 and 11)



JH-1

Blue Background

[blue background
with interstate]



[black background]

ROUTE MARKERS & COMPONENTS
IN TYPICAL ASSEMBLIES

WISCONSIN DEPT OF TRANSPORTATION

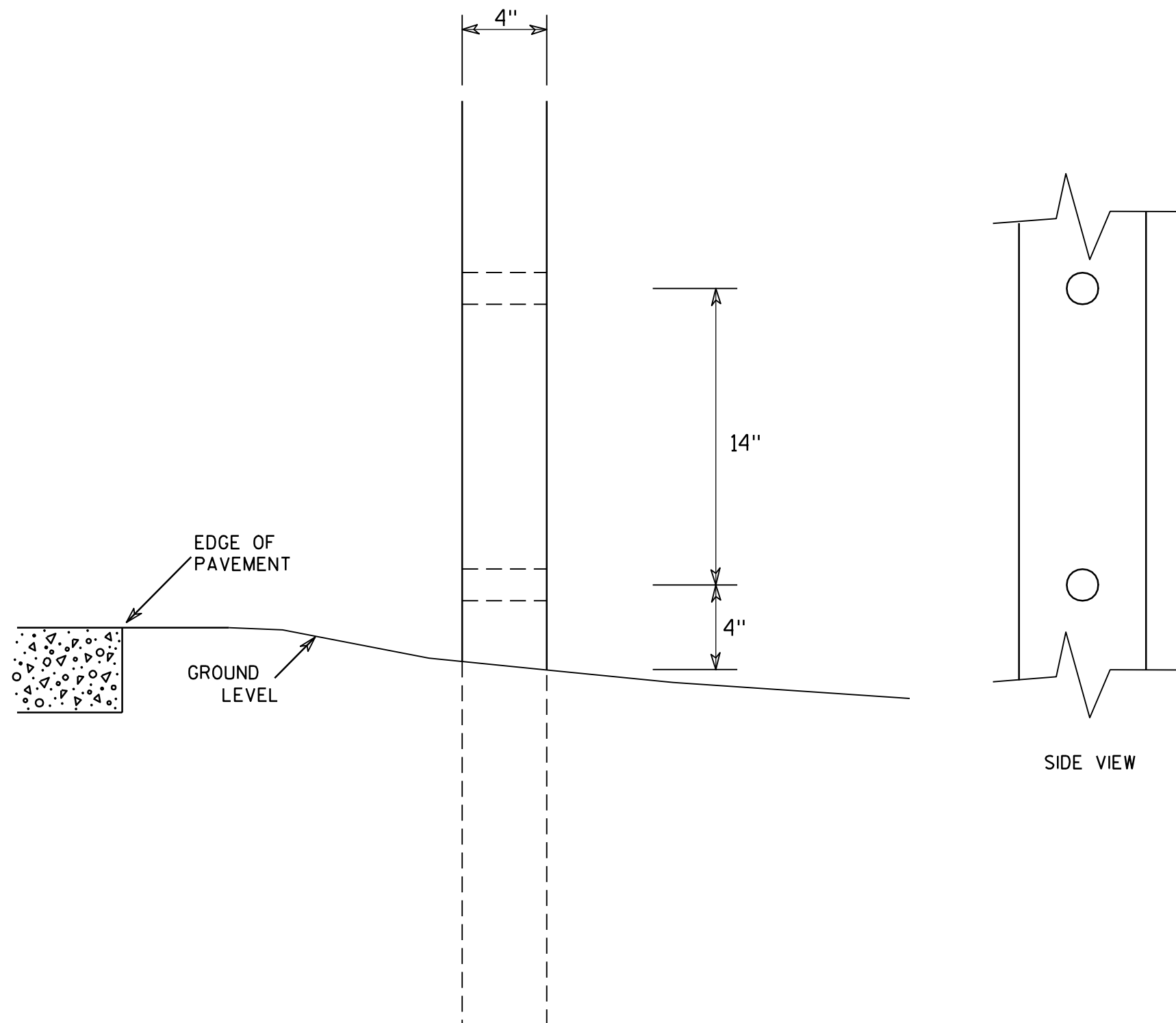
APPROVED *Matthew R. Rauch*
For State Traffic Engineer

DATE 2/06/14 PLATE NO. A2-1S.8

NOTES

1. Signs are Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - Black Non-reflective
Message - see Note 5
3. Message Series - See Note 5
4. Corners shall be square or rounded if base material is plywood. If base material is metal the corners shall be rounded.
5. The colors and message spacing on each marker shall be according to the applicable route marker panel specifications.
6. Certain marker heads require the component pieces to be the same color. As an example, all the components used with an M1-1 Interstate marker shall be blue.
7. Single panel j-assemblies shall only be used with route marker shields that are same size. If the route marker shields are different size use multiple piece component.
8. Route assemblies that have 24 inch route shields and have dimensions greater than 48 inches (both vertical and horizontal) shall have one horizontal splice between the arrows and route shields. Vertical splices shall not be used on route assemblies with a horizontal dimension of 144 inches or less. The contractor shall not use more than one vertical joint per sign and the joint shall be between route shields.
9. Route assemblies that have 36 inch shields and have dimensions greater than 48 inches (both vertical and horizontal) shall have two horizontal splices. One horizontal splice shall be between the cardinal direction and route shields and the other horizontal splice shall be between the arrows and route shields. Vertical splices shall not be used on route assemblies with a horizontal dimension of 144 or less. The contractor shall not use more than one vertical joint per sign and the joint shall be between route shields.
10. All Vertical J Assemblies are given a Sign Code of JV
11. For JV Assemblies that have a mixture of Interstate and non Interstate shields, arrows and cardinals shall be white on blue.

7



GENERAL NOTES

1. All 4 x 6 Wood Posts shall be modified by having two 1½" diameter holes drilled perpendicular to the roadway centerline.

7

4 X 6 WOOD POST MODIFICATIONS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED

Chester J. Spang
for State Traffic Engineer

DATE 3/27/97

PLATE NO. A4-11.2

PROJECT NO:

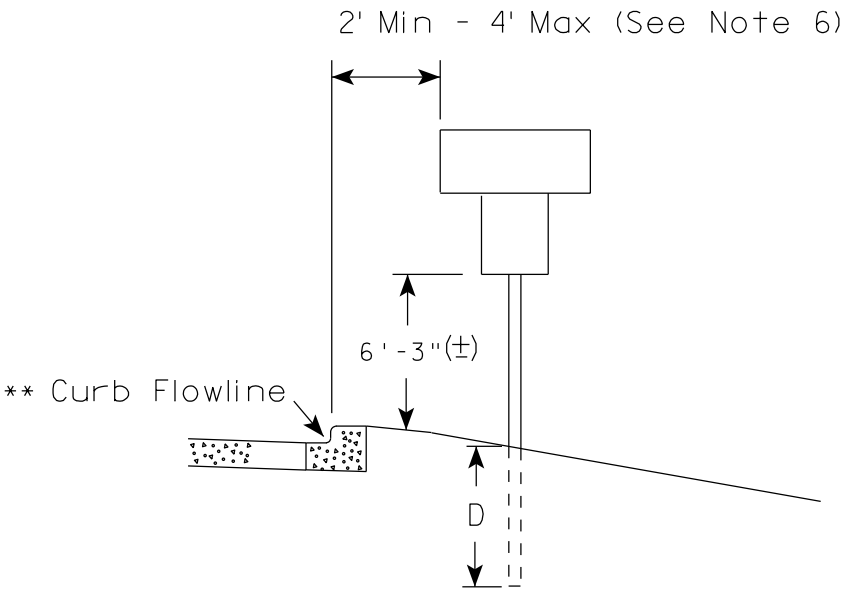
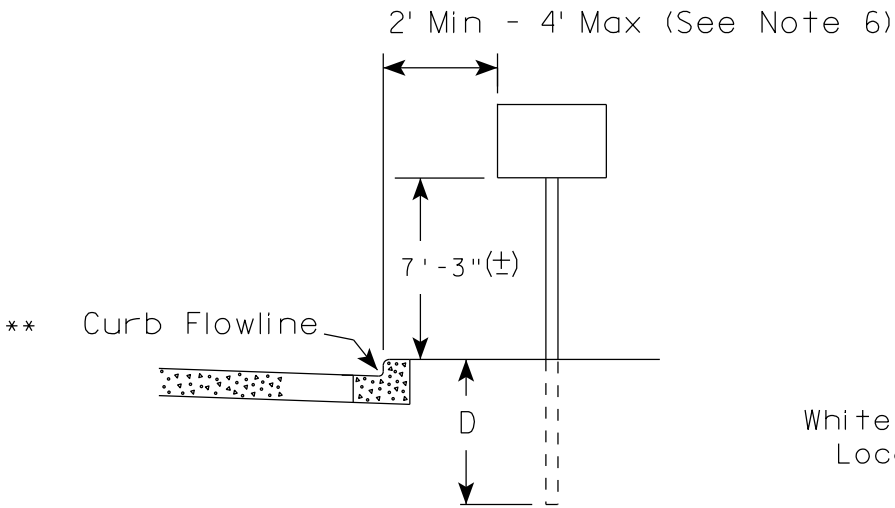
HWY:

COUNTY:

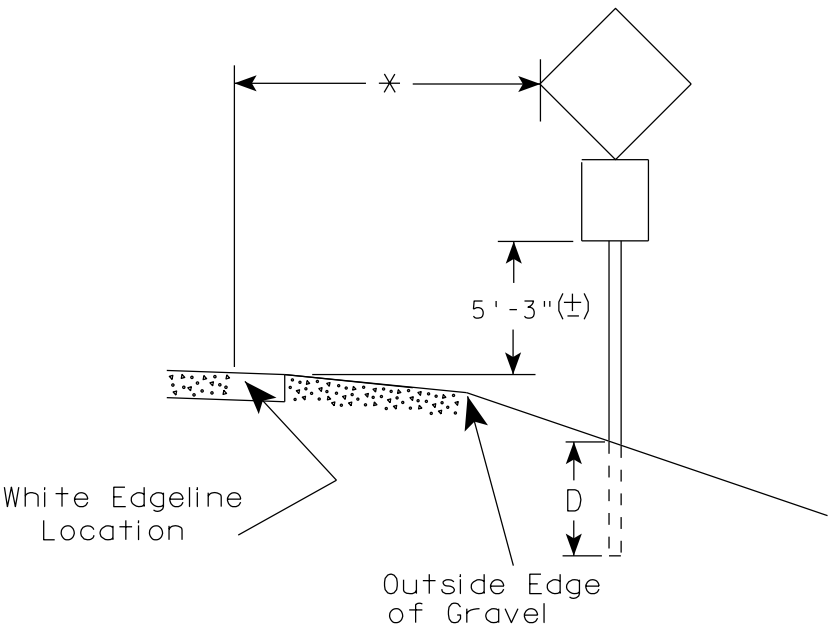
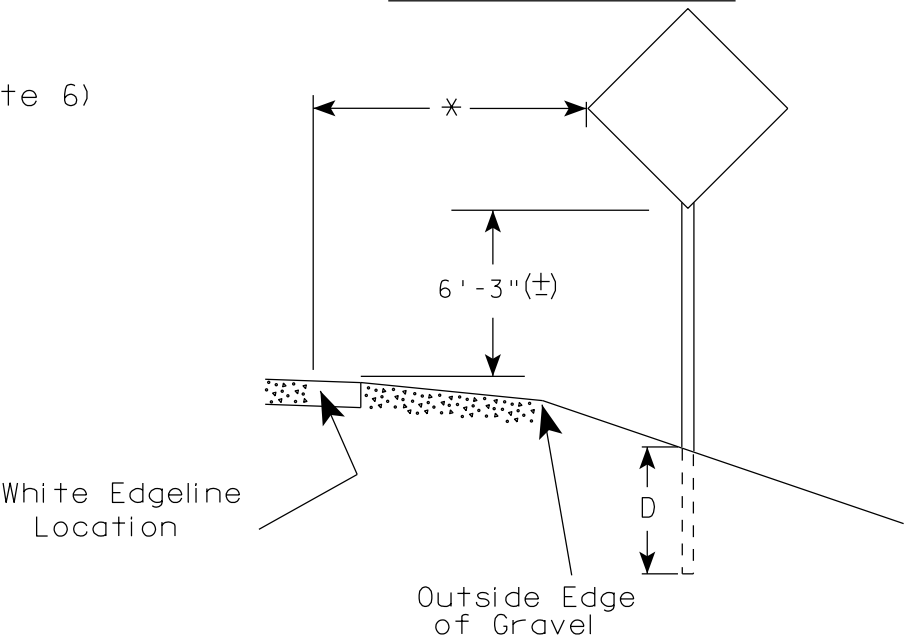
SHEET NO:

E

URBAN AREA



RURAL AREA (See Note 2)



GENERAL NOTES

1. Signs wider than 4 feet, 20 sq.ft or larger, shall be mounted on multiple posts. Refer to plate A4-4.
2. If signs are mounted on barrier wall, see A4-10 sign plate.
3. For expressways and freeways, mounting height is 7'- 3" (±) or 6'-3" (±) depending upon existence of a sub-sign.
4. Minimum mounting height for J assemblies (A4-5) is 7'-3" (±) or 6'-3" (±) per urban or rural detail respectively.
5. Minimum mounting height for signs mounted on traffic signal poles is 5'- 3" (±).
6. Offset distance shall be consistent with existing signs or consistent throughout length of project.
7. The (±) tolerance for mounting height is 3 inches.
8. Folding stop signs (R1-1F) shall be mounted at a height of 5'-3" (±) or as directed by the Engineer.
9. The Double Arrow sign (W12-1) shall be mounted at a height of 2'-3" (±). The Chevron sign (W1-8), Roundabout Chevron panel (R6-4B), Enhanced Reference Markers, Clearance Markers (W5-52), Mile Markers (D10 series) & End of Rod Markers (W5-56 & W5-56A) shall be mounted at a height of 4'-3" (+).

POST EMBEDMENT DEPTH

Area of Sign Installation (Sq.Ft.)	D (Min)
20 or Less	4'
Greater than 20	5'

×× The existence of curb and gutter does not in itself mandate the vertical clearance illustrated. That height is typically measured where there is sidewalk adjacent to the roadway or parking is permitted. In the absence of sidewalk vertical clearance is measured from the top of the curb. Offset of signs is measured from the flow line.

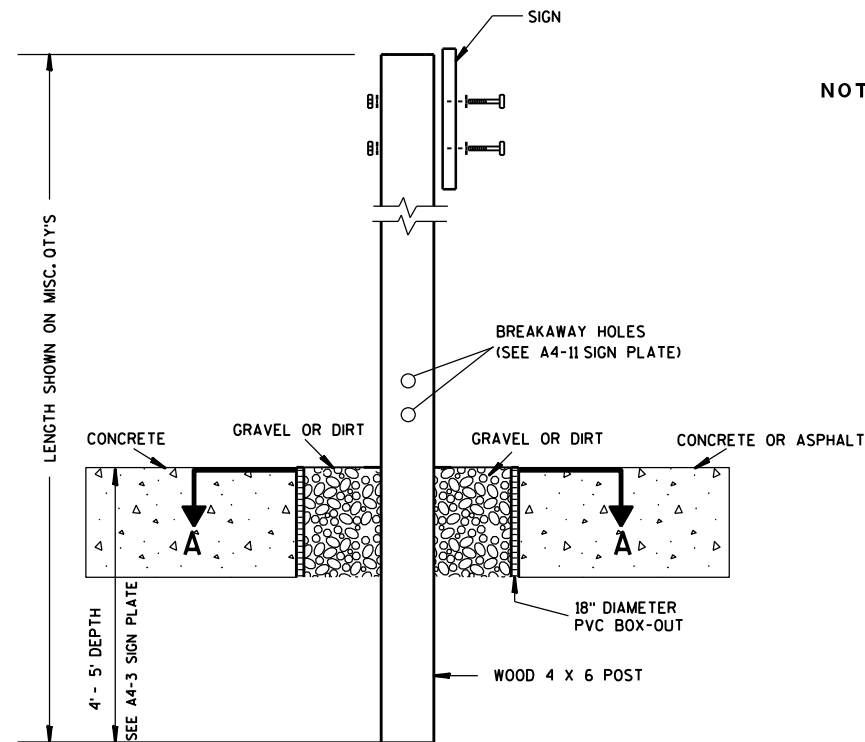
* 6 feet from edge of a paved shoulder or 12 feet from the edge of pavement (edge line location) or 2 feet from outside edge of gravel, whichever is greater unless directed by project engineer.

TYPICAL INSTALLATION
OF PERMANENT TYPE II
SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED
Matthew R. Rauch
for State Traffic Engineer

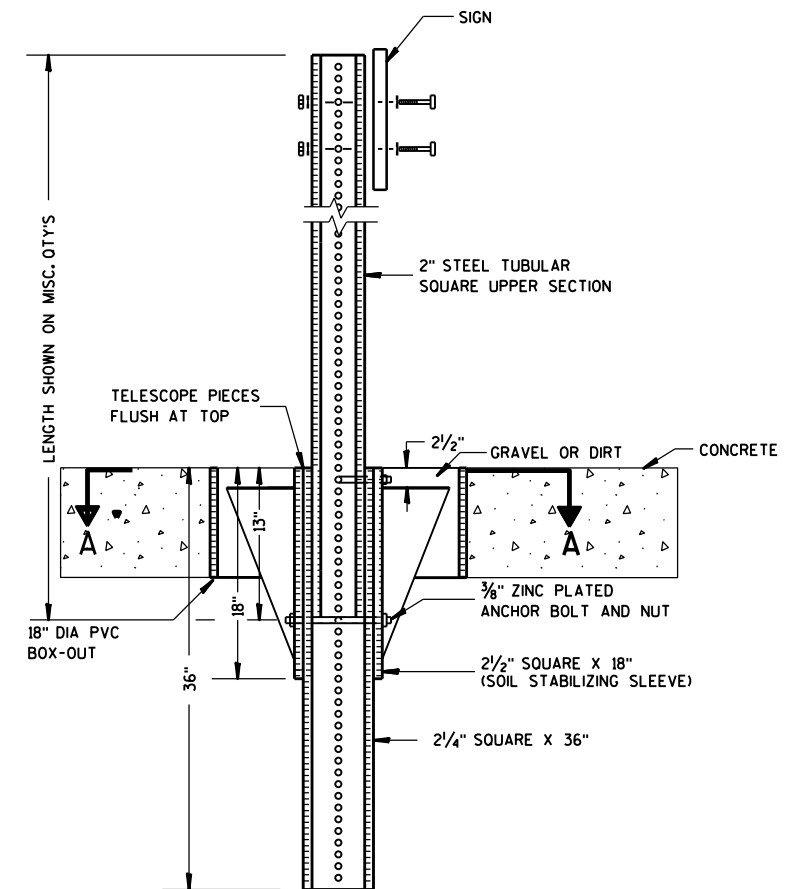
DATE 9/30/13 PLATE NO. A4-3.18



ELEVATION VIEW

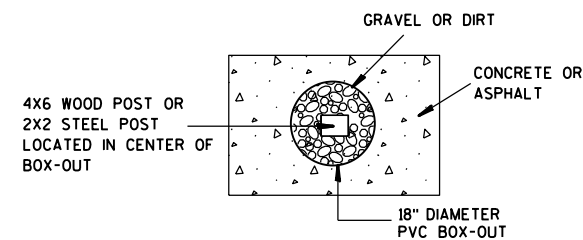
DETAIL OF WOOD 4 X 6 SIGN POST IN BOX-OUT

- NOTES: 1. ALL MATERIAL TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION
2. SEE SIGN PLATE A4-8 FOR SIGN HARDWARE REQUIREMENTS
3. 18 INCH X 18 INCH SQUARE BOX-OUTS MAY BE USED FOR INSTALLATIONS IN EXISTING CONCRETE OR ASPHALT LOCATIONS.



ELEVATION VIEW

DETAIL OF STEEL 2 X 2 SIGN POST IN BOX-OUT



PLAN VIEW

FOR NEW CONCRETE/ASPHALT INSTALLATIONS

SIGN POST
BOX-OUTS
A4-3B

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 1/27/14 PLATE NO. A4-3B.1

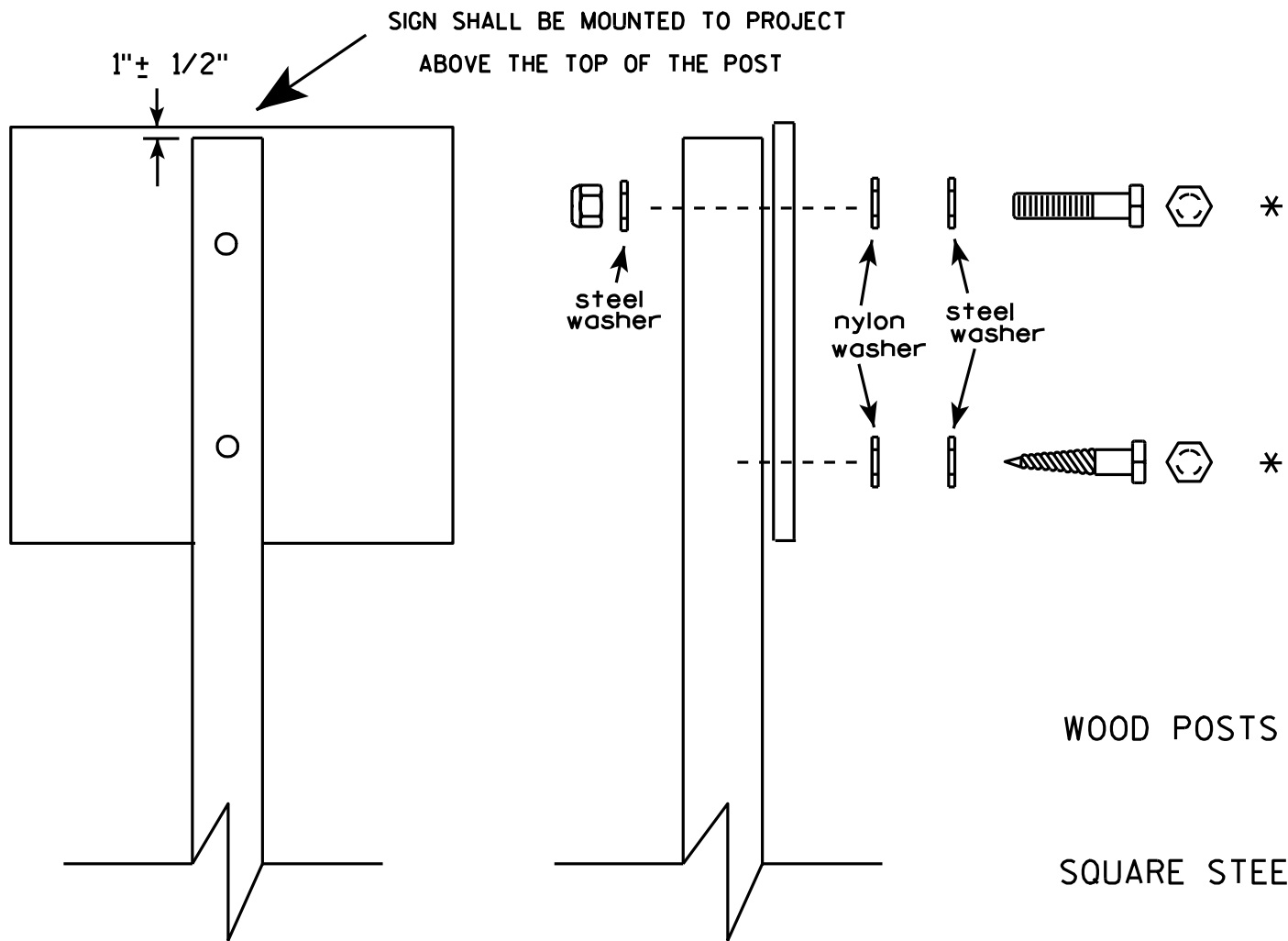
PROJECT NO:

HWY:

COUNTY:

SHEET NO:

E

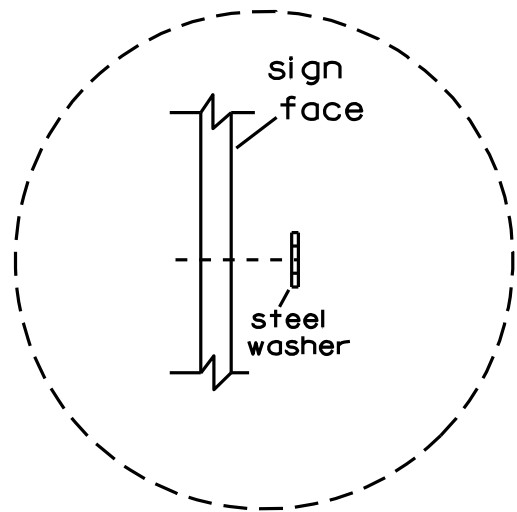


Nuts, bolts and lags used for mounting signs shall have hexagonal heads and shall be either :

- a. Hot dip galvanized in accordance with ASTM Designation: A 153, Class D, or SC 3
- b. Electro-galvanized in accordance with ASTM Designation : B 633, TYPE III, SC 3.

Threads on bolts and nuts shall be manufactured with sufficient allowance for the cadmium plate or galvanized coating to permit the nuts to run freely on the bolts.

- WOOD POSTS (4" x 4" or 4" x 6")
LAG SCREWS - 3/8" X 3"
MACHINE BOLTS - 5/16" X 6-1/2" or 7" Length w/ nuts
- SQUARE STEEL POSTS (2" x 2")
MACHINE BOLTS - 3/8" X 3-1/4" Length w/ nuts
RIVETS - 9/32" (6605-9-6) BULB-TITE, TRI-FOLD, ALUMINUM BODY/MANDREL
O.D. FLANGE .720-.765 INCH, GRIP RANGE .042-.375 INCH
- WASHERS (ALL POSTS) -
1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL
1-1/4" O.D. X 3/8" I.D. X .080 NYLON for all Type H signs.



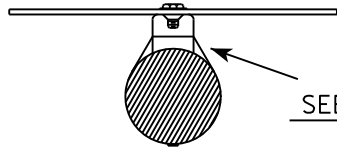
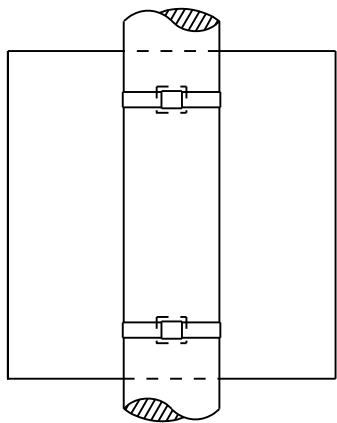
Washer Placement when Sign Has Other Than Type H or Type F Face

* Two different fastening systems are shown for illustration purposes. On any individual sign, either one or the other system shall be used. Actual number of fasteners per sign varies with the sign area, but normally there are two. For a single post installation, all signs greater than 9 sq. ft. require the use of 3 fasteners.

ATTACHMENT OF SIGNS TO POSTS	
WISCONSIN DEPT OF TRANSPORTATION	
APPROVED	<i>Matthew R. Rauch</i> For State Traffic Engineer
DATE 3/23/10	PLATE NO. A4-8.7

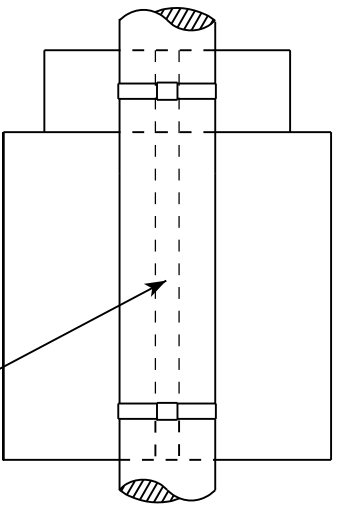
BANDING

SINGLE SIGN

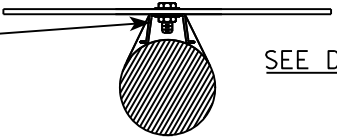


SEE DETAIL A

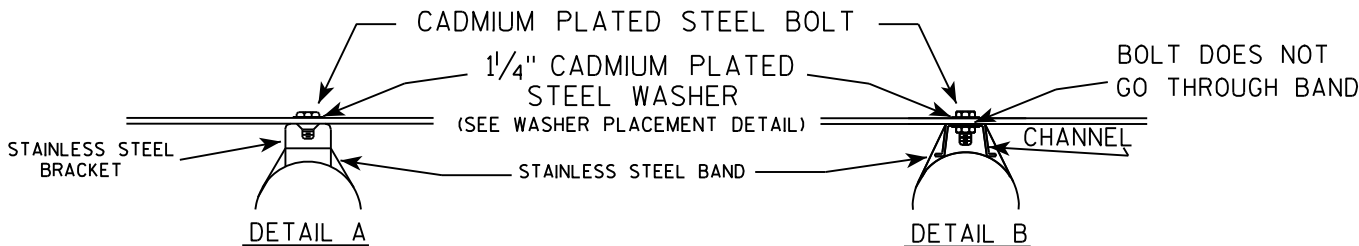
"J" ASSEMBLY



CHANNEL
SEE TYPICAL PANEL
INSTALLATION SHEET



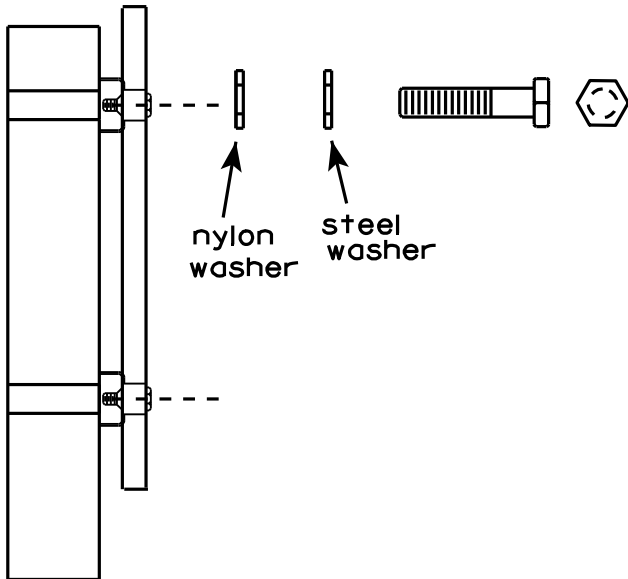
SEE DETAIL B



GENERAL NOTES

1. Any sign over 3 feet in width shall use the V-Block banding method. See A5-10 standard plate.
2. Signs 3 feet or greater in height shall have three bracket bands installed. Signs less than 3 feet in height shall have two bracket bands installed.
3. Banding and assembly bracket shall be stainless steel. All bands shall be $\frac{3}{4}$ " in width and 0.025" thickness.

WASHER PLACEMENT



WASHERS (ALL POSTS) -
1-1/4" O.D. X $\frac{3}{8}$ " I.D. X $\frac{1}{16}$ " STEEL
1-1/4" O.D. X $\frac{3}{8}$ " I.D. X .080 NYLON
FOR ALL TYPE H SIGNS

STANDARD SIGN
SIGN BANDING DETAILS

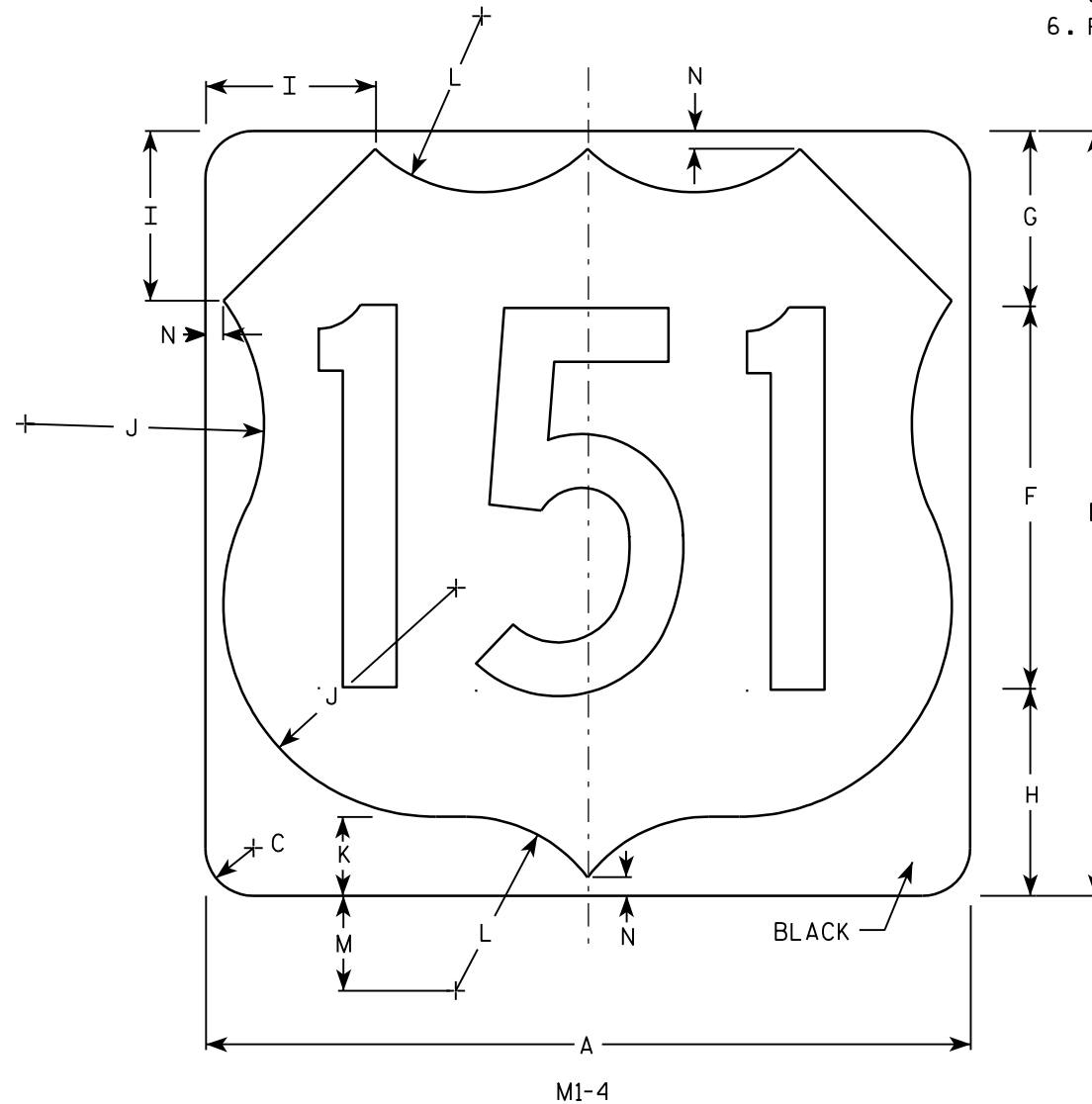
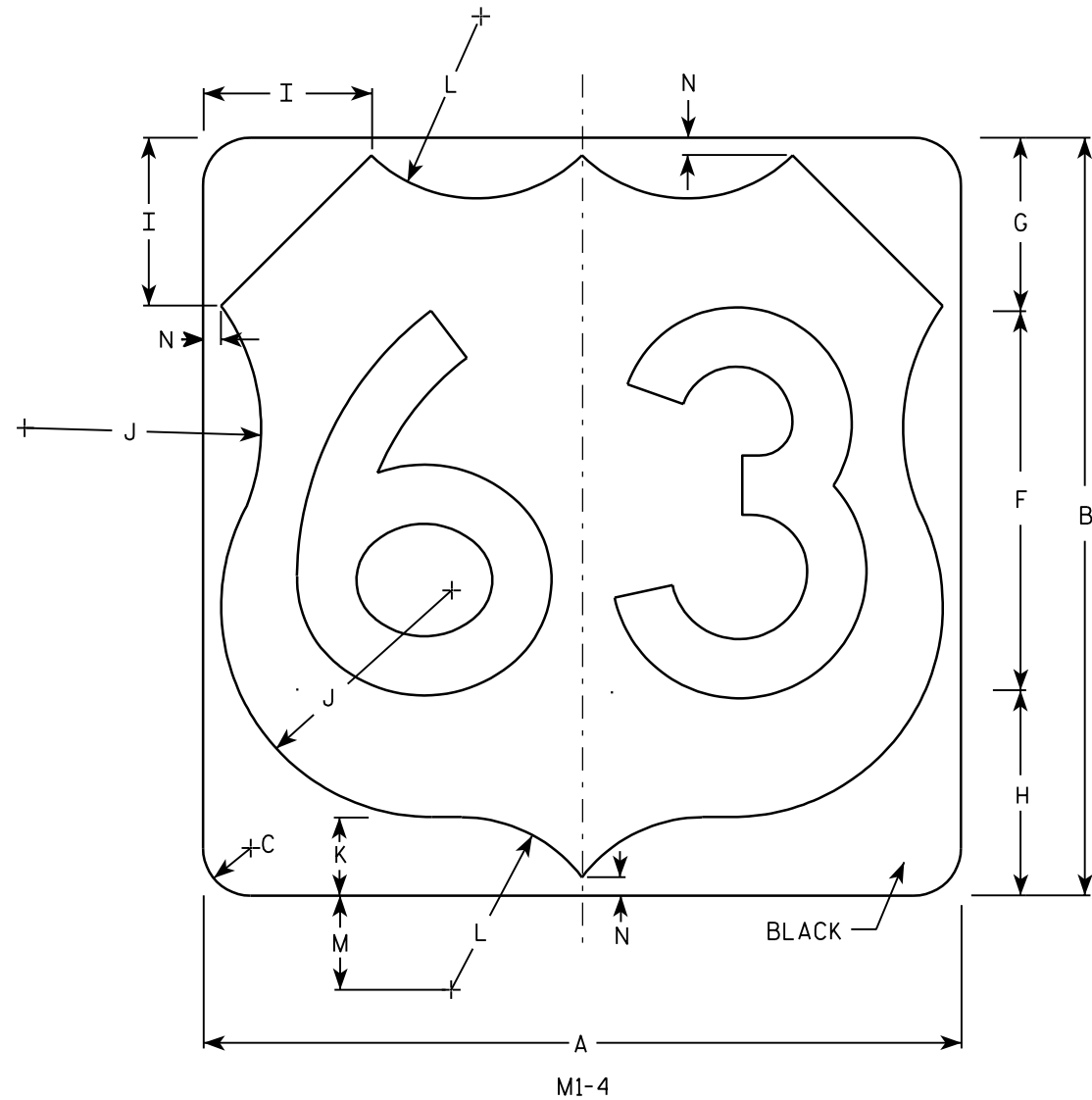
WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 8/16/13 PLATE NO. A5-9.3

NOTES

1. Sign is Type II - See Note 6 - reference
WIS DOT Standard Specification for HIGHWAY
and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - White & Black - See Note 6
Message - Black
3. Message Series - See note 5
4. Corners may be square or rounded when base
material is plywood but borders shall be rounded
as shown. When base material is metal, the
corners and borders shall be rounded.
5. Substitute appropriate numerals and adjust
spacing as per Plate A10-1.
6. Permanent Signs
Background - Type H Reflective
Detour or other temporary signs
Background - Reflective

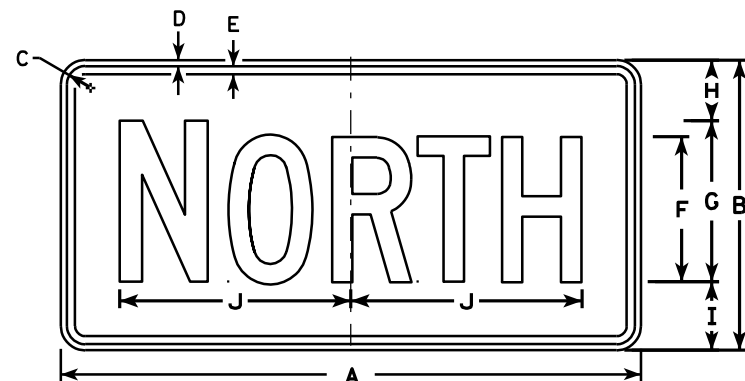


Metric equivalent
for this sign is:

SIZE	
1	
2	600 mm X 600 mm
3	900 mm X 900 mm
4	900 mm X 900 mm
5	900 mm X 900 mm

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Areq sq. ft.	Areq m ²
1																												
2	24	24	1 1/2			12	5 1/2	6 1/2	5	7 1/2	2 1/2	5 1/2	3	1/2													4.0	.36
3	36	36	2 1/4			18	8 1/4	9 1/4	7 1/4	11 1/4	3 3/4	8 1/4	4 1/2	3/4													9.0	.81
4	36	36	2 1/4			18	8 1/4	9 1/4	7 1/4	11 1/4	3 3/4	8 1/4	4 1/2	3/4													9.0	.81
5	36	36	2 1/4			18	8 1/4	9 1/4	7 1/4	11 1/4	3 3/4	8 1/4	4 1/2	3/4													9.0	.81

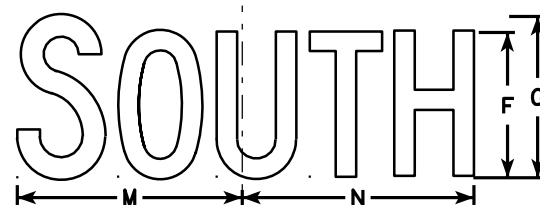
PROJECT NO: HWY: COUNTY: SHEET NO: E



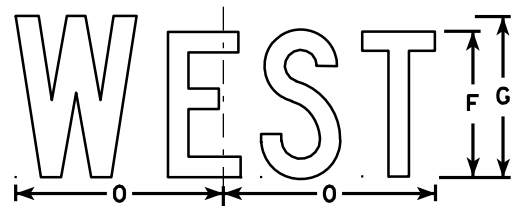
M3-1
MK3-1
M03-1



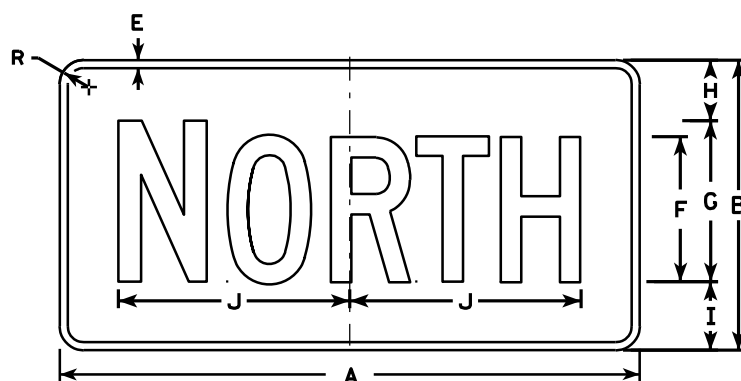
M3-2
MK3-2
M03-2



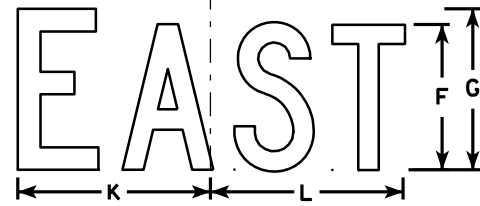
M3-3
MK3-3
M03-3



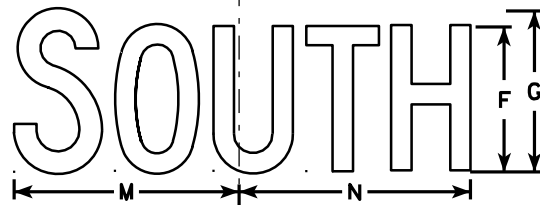
M3-4
MK3-4
M03-4



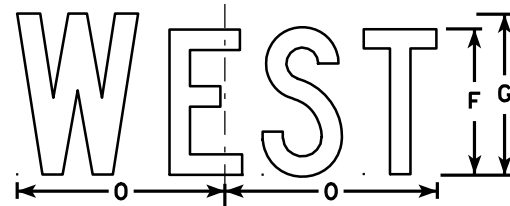
MB3-1
MG3-1
MM3-1
MN3-1



MB3-2
MG3-2
MM3-2
MN3-2



MB3-3
MG3-3
MM3-3
MN3-3



MB3-4
MG3-4
MM3-4
MN3-4

NOTES

1. All Signs Type II - See Note 5 - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - See note 5
Message - See note 5
3. Message Series - C
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
5. M3-1 thru M3-4 Background - White - Type H Reflective (Detour or temporary signs - Reflective)
Message - Black
MB3-1 thru MB3-4 Background - Blue
Message - White - Type H Reflective (Detour or temporary signs - Reflective)
MG3-1 thru MG3-4 Background - Green
Message - White - Type H Reflective
MK3-1 thru MK3-4 Background - Green
Message - White - Type H Reflective
MM3-1 thru MM3-4 Background - White - Type H Reflective
Message - Green
MN3-1 thru MN3-4 Background - Brown
Message - White - Type H Reflective
M03-1 thru M03-4 Background - Orange - Reflective
Message - Black
6. Note the first letter of each direction is larger than the remainder of the message.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2	24	12	1 1/8	3/8	3/8	6	7	2 1/4	2 3/4	10 1/4	7 7/8	8 3/8	10 1/4	9 3/4	8 3/4			1 1/2									2.00
3	36	18	1 1/8	3/8	1/2	9	10	3 3/4	4 1/4	14 3/8	12	12 1/8	14	14 1/8	13			1 1/2									4.5
4	36	18	1 1/8	3/8	1/2	9	10	3 3/4	4 1/4	14 3/8	12	12 1/8	14	14 1/8	13			1 1/2									4.5
5	36	18	1 1/8	3/8	1/2	9	10	3 3/4	4 1/4	14 3/8	12	12 1/8	14	14 1/8	13			1 1/2									4.5

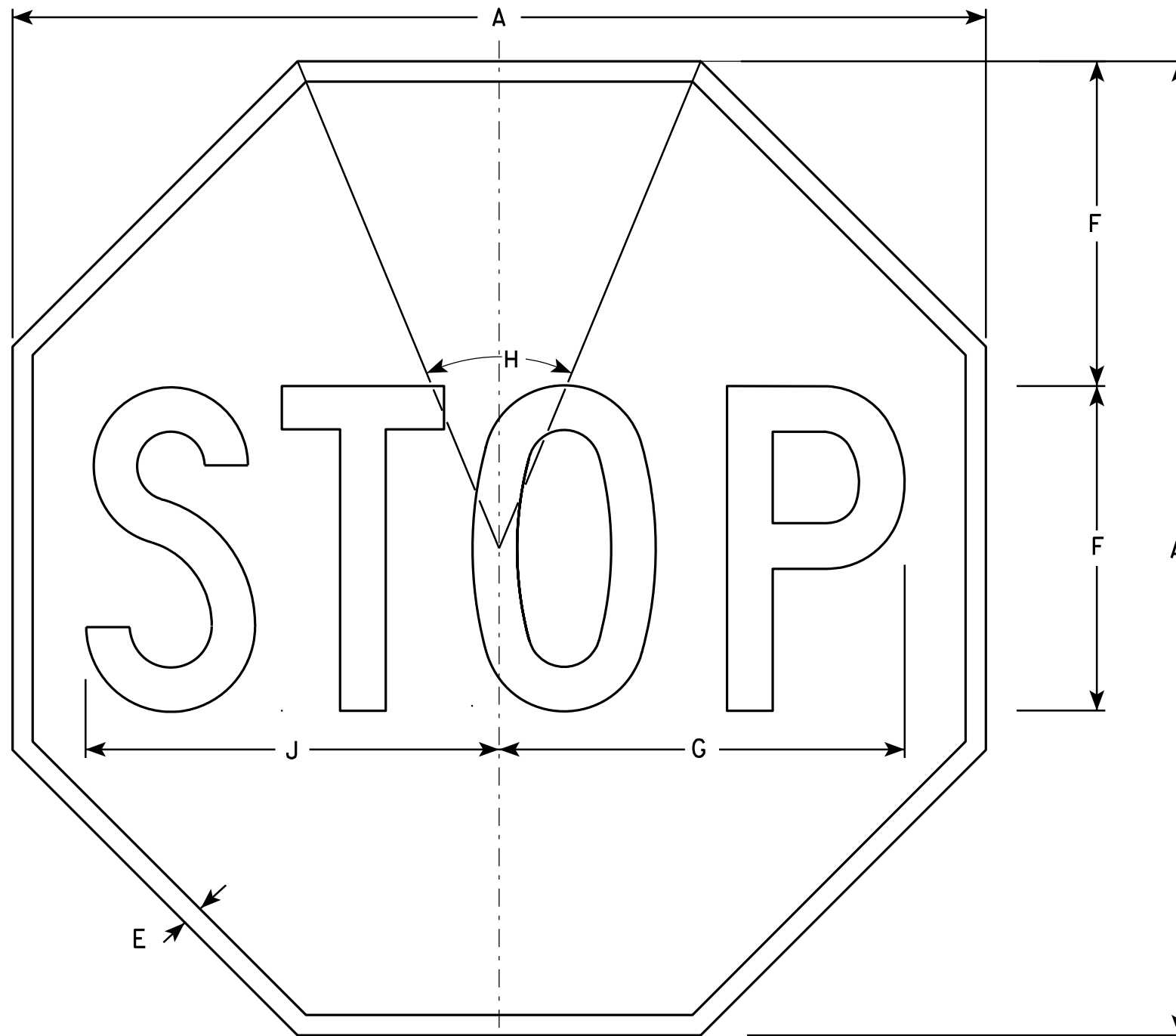
PROJECT NO: HWY: COUNTY: SHEET NO: E

STANDARD SIGNS
M3-1 thru M3-4
SERIES

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 11/10/10 PLATE NO. M3-1.12



NOTES

1. Sign is Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - Red
Message - White
3. Message Series - C

R1-1

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	24				3/8	8	10	45°		10 1/4																	3.31
2S	30				5/8	10	12 1/2	45°		12 3/4																	5.18
2M	36				3/4	12	15	45°		15 3/8																	7.46
3	36				3/4	12	15	45°		15 3/8																	7.46
4	48				1	16	20	45°		20 1/2																	13.25
5	48				1	16	20	45°		20 1/2																	13.25
6	18				3/8	6	7 3/4	45°		7 3/4																	1.86
7	12				1/4	4	5	45°		5 1/8																	0.78

STANDARD SIGN
R1-1

WISCONSIN DEPT OF TRANSPORTATION

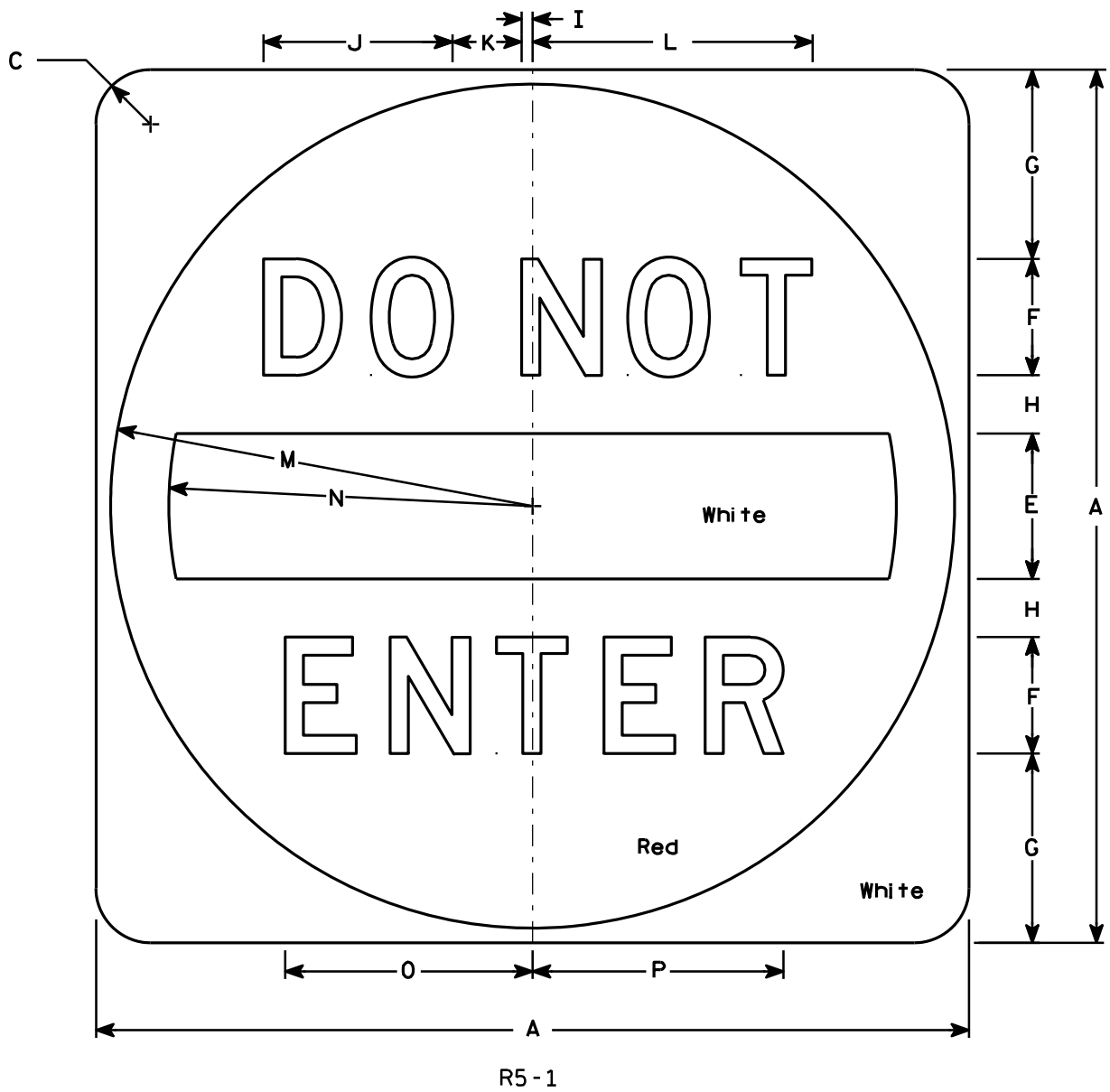
APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 12/03/10 PLATE NO. R1-1.12

PROJECT NO:	HWY:	COUNTY:	SHEET NO:	E
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NOTES

- 1. Sign is Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
- 2. Color:
 - Background - See detail
 - Message - White - Type H Reflective
- 3. Message Series - D
- 4. Corners may be square or rounded when base material is plywood but when base material is metal, the corners shall be rounded.



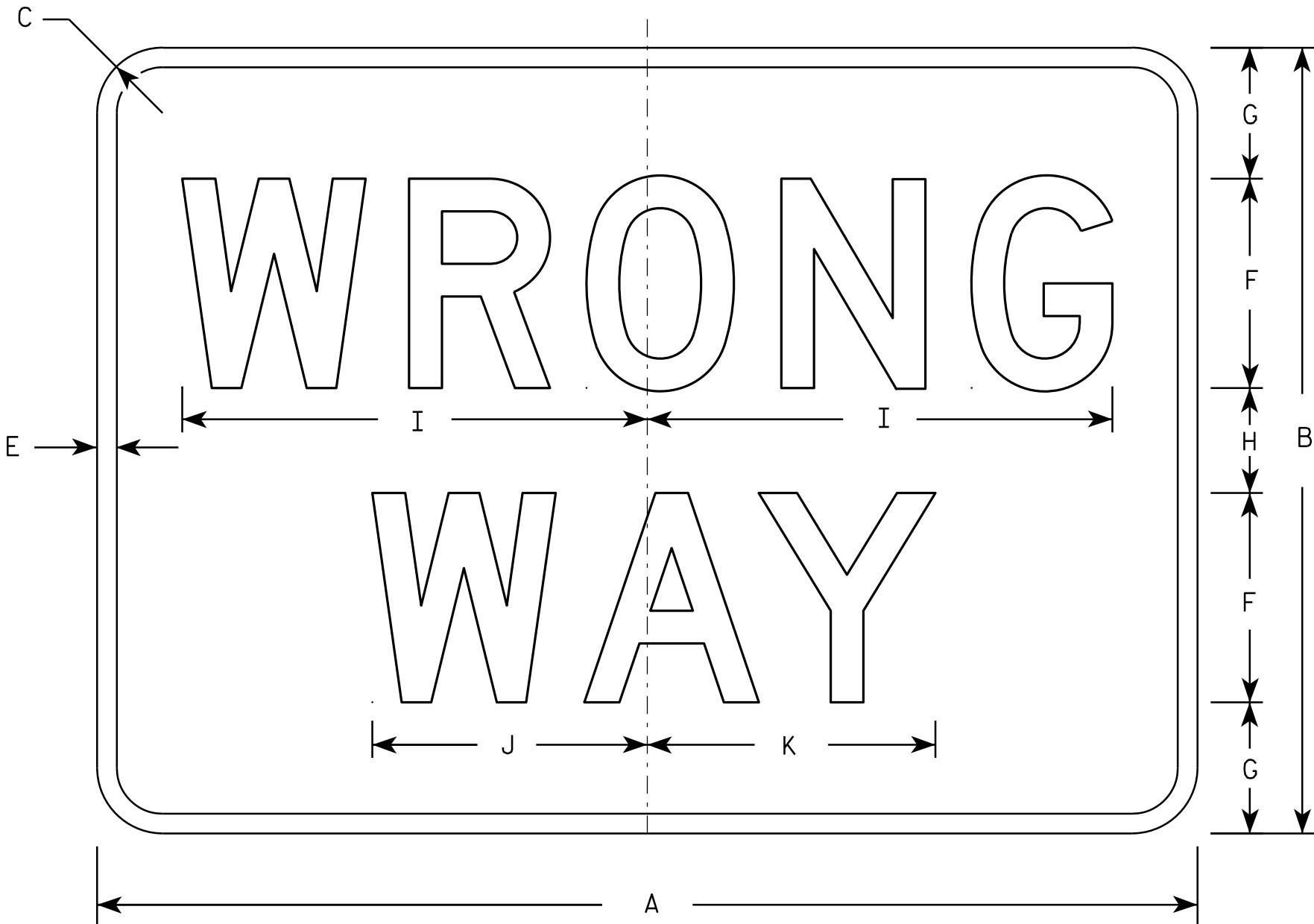
SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2S	30		1 7⁄8		5	4	6 1⁄2	2	3⁄8	6 1⁄2	2 3⁄8	9 5⁄8	14 1⁄2	12 1⁄2	8 1⁄2	8 5⁄8											6.26
2M	36		2 1⁄4		6	5	7 1⁄2	2 1⁄2	1⁄2	8 1⁄8	3	12 1⁄8	17 1⁄2	15	10 5⁄8	10 3⁄4											9.0
3	36		2 1⁄4		6	5	7 1⁄2	2 1⁄2	1⁄2	8 1⁄8	3	12 1⁄8	17 1⁄2	15	10 5⁄8	10 3⁄4											9.0
4	36		2 1⁄4		6	5	7 1⁄2	2 1⁄2	1⁄2	8 1⁄8	3	12 1⁄8	17 1⁄2	15	10 5⁄8	10 3⁄4											9.0
5	48		3		8	6	11	3	5⁄8	9 3⁄4	3 5⁄8	14 1⁄2	23 1⁄2	20	12 3⁄4	12 7⁄8											16.0

STANDARD SIGN
R5 - 1

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 12/17/10 PLATE NO. R5-1.15



R5-1A

NOTES

1. Sign is Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - Red
Message - White
3. Message Series - D
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	30	18	1 1/2		1/2	5	3	2	11	6 1/2	6 7/8																3.75
2S	36	24	2		5/8	6	4 1/2	3	13 1/4	7 7/8	8 1/4																6.00
2M	42	30	2 1/2		3/4	8	5	4	17 3/4	10 1/2	11																8.75
3	42	30	2 1/2		3/4	8	5	4	17 3/4	10 1/2	11																8.75
4	42	30	2 1/2		3/4	8	5	4	17 3/4	10 1/2	11																8.75
5	42	30	2 1/2		3/4	8	5	4	17 3/4	10 1/2	11																8.75

STANDARD SIGN
R5-1A

WISCONSIN DEPT OF TRANSPORTATION

APPROVED

Matthew R. Rauch
for State Traffic Engineer

DATE 12/17/10

PLATE NO. R5-1A.2

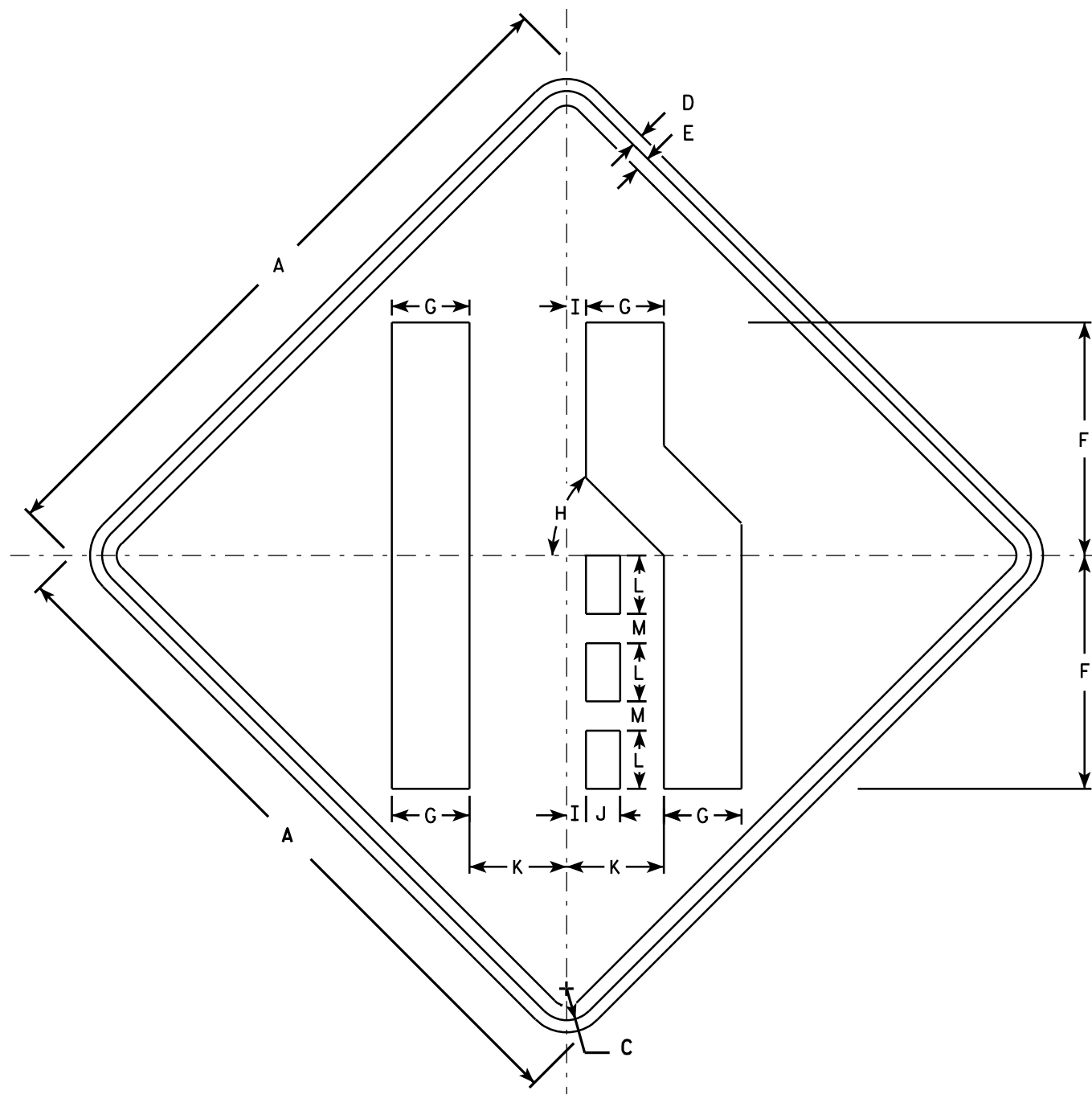
PROJECT NO:

HWY:

COUNTY:

SHEET NO:

E



W4-2R

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - Yellow
Message - Black
3. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
4. W4-2L is the same as W4-2R except the symbols is reversed along the vertical centerline.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	30		1 3⁄8	1⁄2	5⁄8	10	3 3⁄8	45°	7⁄8	1 1⁄2	4 1⁄4	2 1⁄2	1 1⁄4														6.25
2S	36		1 5⁄8	5⁄8	3⁄4	12	4	45°	1	1 3⁄4	5	3	1 1⁄2														9.0
2M	36		1 5⁄8	5⁄8	3⁄4	12	4	45°	1	1 3⁄4	5	3	1 1⁄2														9.0
3	36		1 5⁄8	5⁄8	3⁄4	12	4	45°	1	1 3⁄4	5	3	1 1⁄2														9.0
4	48		2 1⁄4	3⁄4	1	16	5 3⁄8	45°	1 1⁄4	2 3⁄8	6 3⁄4	4	2														16.0
5	48		2 1⁄4	3⁄4	1	16	5 3⁄8	45°	1 1⁄4	2 3⁄8	6 3⁄4	4	2														16.0

STANDARD SIGN W4-2

WISCONSIN DEPT OF TRANSPORTATION

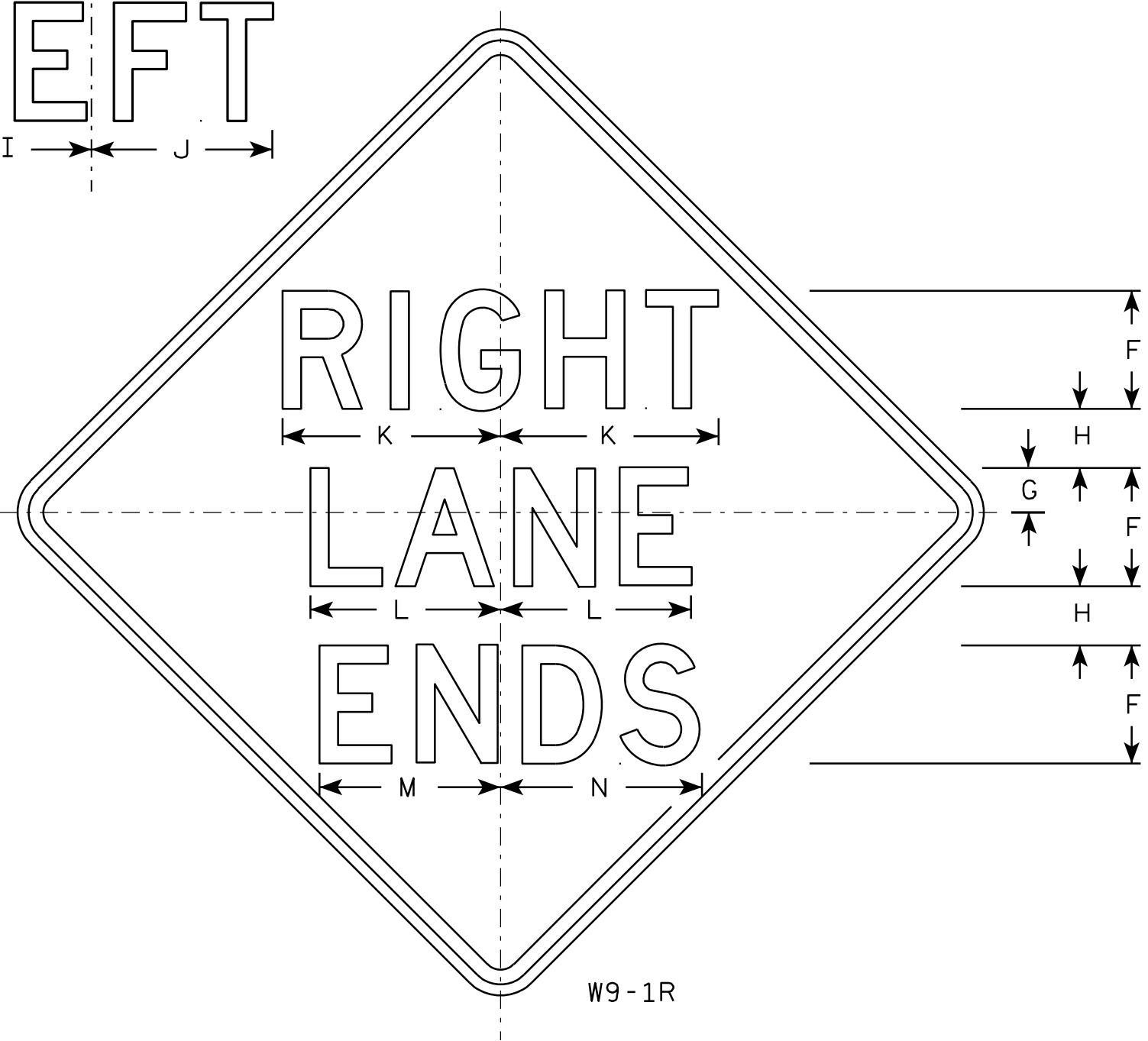
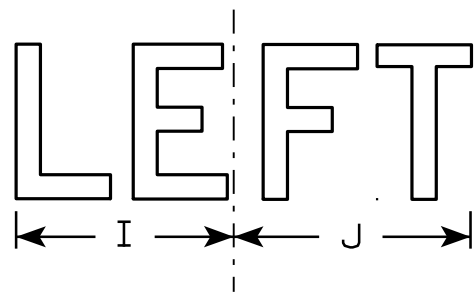
APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 3/12/13 PLATE NO. W4-2.14

PROJECT NO:

SHEET NO:

E



NOTES

- 1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
- 2. Color:
Background - Yellow
Message - Black
- 3. Message Series - D
- 4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
- 5. W9-1L same as W9-1R except the word Left replaces Right.

7

7

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	30		1 3/8	1/2	5/8	5	1 1/2	2 1/2	7 1/8	7 5/8	9 1/4	8 1/8	7 5/8	8 5/8													6.25
2S	36		1 5/8	5/8	3/4	6	2	3	8 1/2	9 1/8	11	9 3/4	9	10 3/8													9.0
2M	36		1 5/8	5/8	3/4	6	2	3	8 1/2	9 1/8	11	9 3/4	9	10 3/8													9.0
3	36		1 5/8	5/8	3/4	6	2	3	8 1/2	9 1/8	11	9 3/4	9	10 3/8													9.0
4	36		1 5/8	5/8	3/4	6	2	3	8 1/2	9 1/8	11	9 3/4	9	10 3/8													9.0
5	48		2 1/4	3/4	1	8	3	4	11 1/4	12 1/4	14 3/4	12 7/8	12 1/4	13 5/8													16.0

STANDARD SIGN
W9-1

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

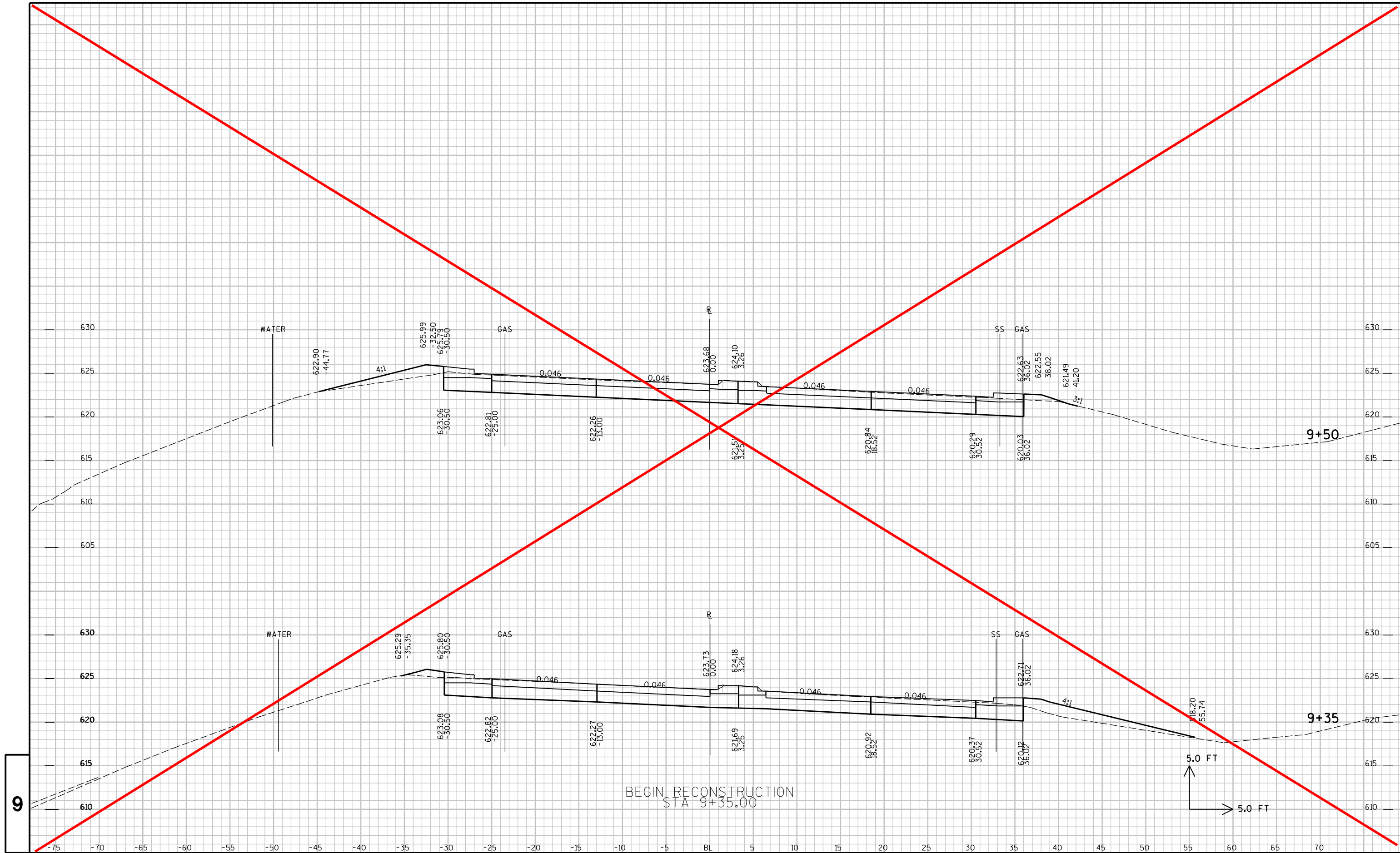
DATE 03/18/13 PLATE NO. W9-1.8

EARTHWORK							
USH 2 West Culvert				* EXPANDED 30%			
		0.9					
STATION	END AREA CUT (SF)	FILL (SF)	VOLUME CUT (CY)	*FILL (CY)	CUM VOLUME CUT (CY)	FILL (CY)	MASS HAUL (CY)
5+50	0	0	0	0	0	0	0
6+00	0	0	0	0	0	0	0
6+50	0	0	0	0	0	0	0
6+75	15.5	0	7	0	7	0	7
7+00	15.2	0	14	0	21	0	21
7+50	29.3	4.3	41	5	63	5	57
8+00	29.6	6.1	55	13	117	18	99
8+25	29.8	4	28	6	145	24	121
8+50	12.6	2.4	20	4	164	28	137
9+00	13	1.9	24	5	188	33	155
9+25	138.2	9.4	70	7	258	40	218
9+50	137.3	12.1	128	13	386	53	333
9+59	163	9.2	49	5	434	57	377
10+00	140.3	17.7	231	27	666	84	582
10+44	141.9	2.2	231	21	896	105	792
10+75	145.4	13.5	164	12	1061	117	944
11+00	12.4	3.4	73	10	1134	127	1007
11+50	12.9	0.5	23	5	1157	131	1026
12+00	0	0	12	1	1169	132	1037
				1170	130	1040 Waste	
					100	100 Fill	
						130 Fill @1.3	
						1170 Cut	

EARTHWORK							
USH 2 East Culvert				* EXPANDED 30%			
STATION	END AREA CUT (SF)	FILL (SF)	VOLUME CUT (CY)	*FILL (CY)	CUM VOLUME CUT (CY)	FILL (CY)	MASS HAUL (CY)
21+50	0	0	0	0	0	0	0
22+00	14.8	0	14	0	14	0	14
22+50	14.8	0	27	0	41	0	41
23+00	44.8	0	55	0	96	0	96
23+50	43.4	0	82	0	178	0	178
24+00	28.3	0.2	66	0	244	0	244
24+50	28.4	0.2	53	0	297	1	296
25+00	168.3	3.9	182	5	479	6	473
25+42	178.2	1.8	269	6	748	11	736
25+50	178.4	0.8	54	1	801	12	789
26+00	170.8	1.7	323	3	1125	15	1110
26+25	182.1	3.3	161	3	1286	18	1268
26+75	181	2.1	338	7	1624	24	1600
27+00	29	3.8	97	4	1722	28	1694
27+50	26.6	0	51	5	1773	33	1740
28+00	31	0	53	0	1826	33	1794
28+50	33.9	0	60	0	1886	33	1854
29+00	35.4	0	64	0	1951	33	1918
29+50	30.8	0	61	0	2012	33	1979
30+00	0	0	29	0	2040	33	2008
30+50	0	0	0	0	2040	33	2008
105+50	0	0	0	0	2040	33	2008
				2040	35	2005 Waste	
					26.92307692	27 Fill	
						35 Fill @1.3	
						2040 Cut	

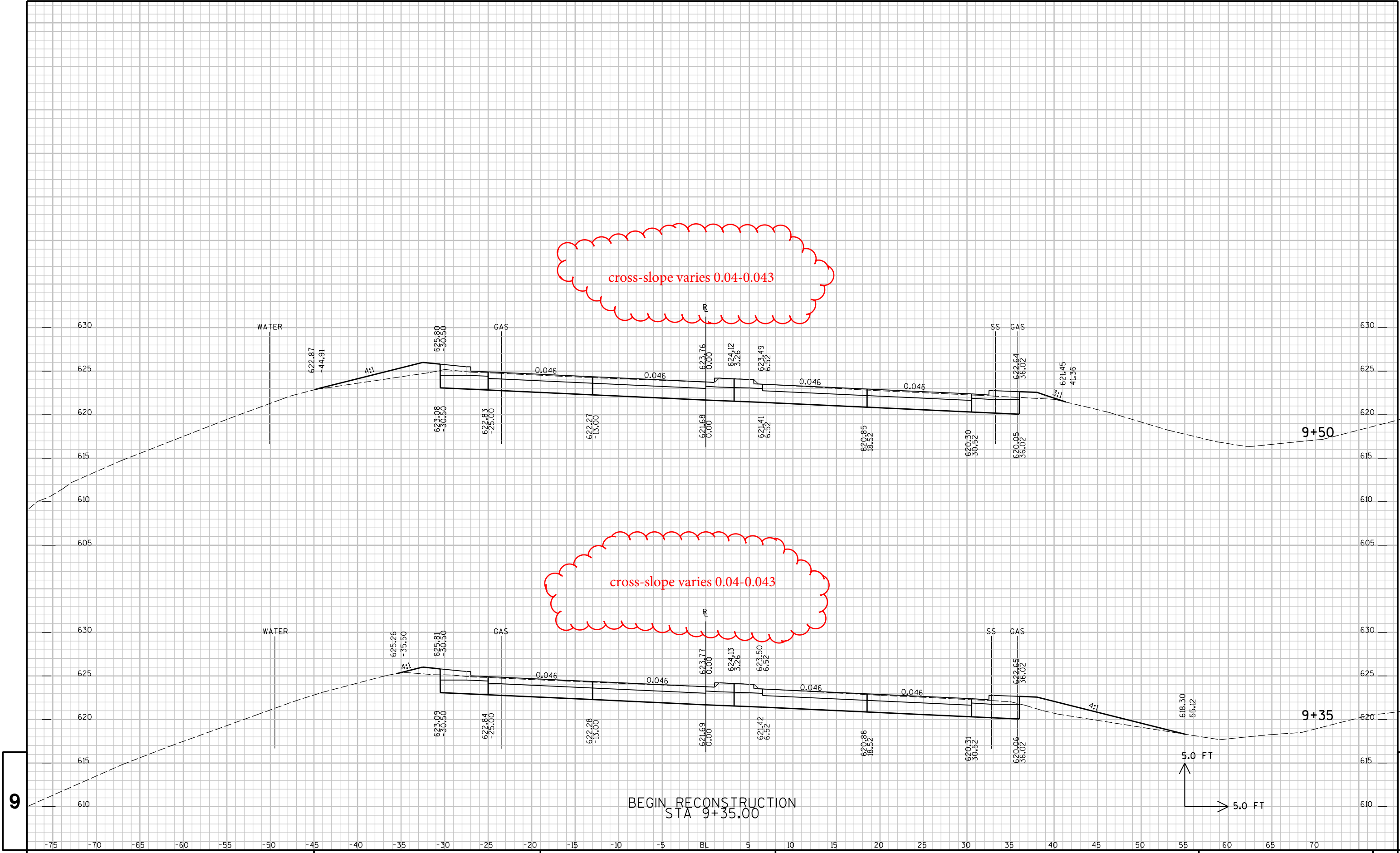
EARTHWORK							
USH 2 West Culvert				* EXPANDED 30%			
STATION	END AREA CUT (SF)	FILL (SF)	VOLUME CUT (CY)	*FILL (CY)	CUM VOLUME CUT (CY)	FILL (CY)	MASS HAUL (CY)
9+00	0		0	0	0	0	0
9+25	138.2	9.4	64	6	64	6	58
9+50	137.3	12.1	128	13	192	19	173
9+59	163	9.2	49	5	240	23	217
10+00	140.3	17.7	231	27	472	50	422
10+44	141.9	2.2	231	21	702	71	631
10+75	145.4	13.5	164	12	867	83	784
11+00	0	0	67	8	934	91	843

EARTHWORK							
USH 2 East Culvert				* EXPANDED 30%			
STATION	END AREA CUT (SF)	FILL (SF)	VOLUME CUT (CY)	*FILL (CY)	CUM VOLUME CUT (CY)	FILL (CY)	MASS HAUL (CY)
23+50	0	0	0	0	0	0	0
23+75	43.4	0	20	0	20	0	20
24+00	28.3	0.2	33	0	53	0	53
24+50	28.4	0.2	53	0	106	1	105
25+00	168.3	3.9	182	5	288	6	282
25+42	178.2	1.8	269	6	557	11	545
25+50	178.4	0.8	54	1	610	12	598
26+00	170.8	1.7	323	3	934	15	919
26+25	182.1	3.3	161	3	1095	18	1077
26+75	181	2.1	338	7	1433	24	1409
27+00	29	3.8	97	4	1530	28	1503
27+50	26.6	0	51	5	1582	32	1550
28+00	31	0	53	0	1635	32	1603
28+50	33.9	0	60	0	1695	32	1663
29+00	35.4	0	64	0	1760	32	1727
29+50	30.8	0	61	0	1821	32	1788
30+00	0	0	29	0	1849	32	1817



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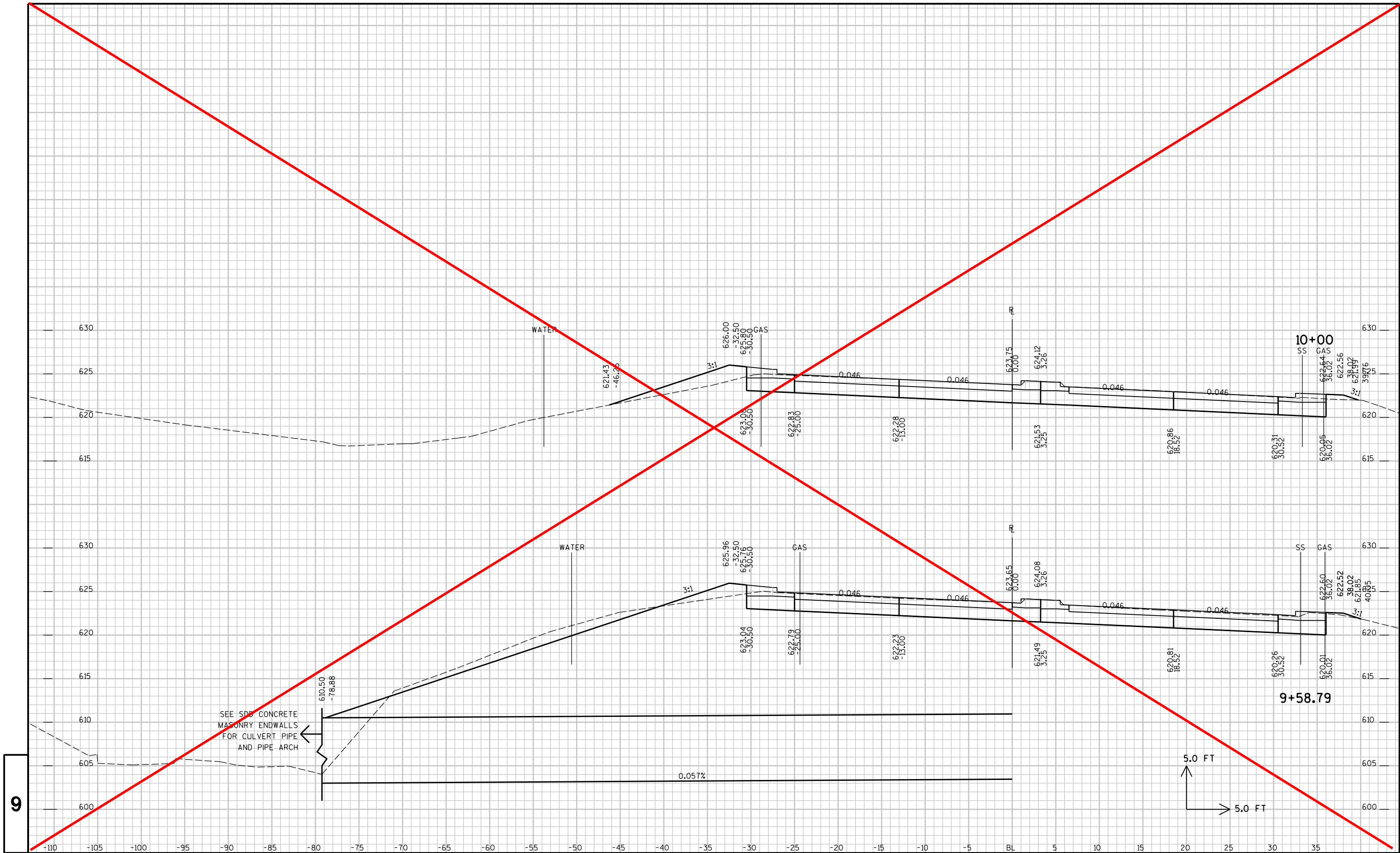


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PROJECT NO: 1181-11-70	HWY: USH 2	COUNTY: ASHLAND	CROSS SECTIONS - USH 2	SHEET NO: 87-A	E
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FILE NAME : P:\02\N\W\1\121895\5-Final-dsgn\MetaData Submittal\USH 2 MetaData Files\Files to Transfer\Microsoft\Plot Files\09020013\3500CAM PLOT DATE : 3/10/2015 PLOT BY : SEH PLOT NAME : PLOT SCALE : N/A



PROJECT NO : 1181-11-70

HWY : USH 2

COUNTY : ASHLAND

CROSS SECTIONS - USH 2

SHEET NO:

E

FILE NAME : P:\UZ\W\Witnw\121895\5-final-dsgn\51-drawings\40-TransHwy\XBUSH2FINAL.DGN

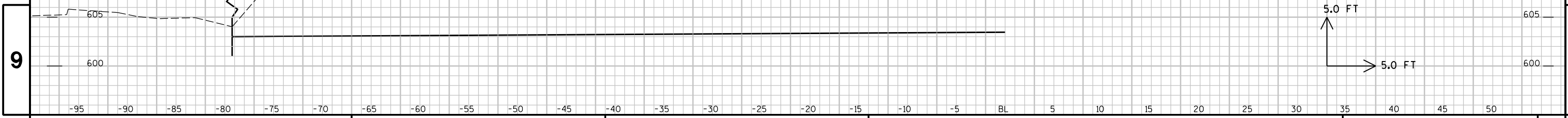
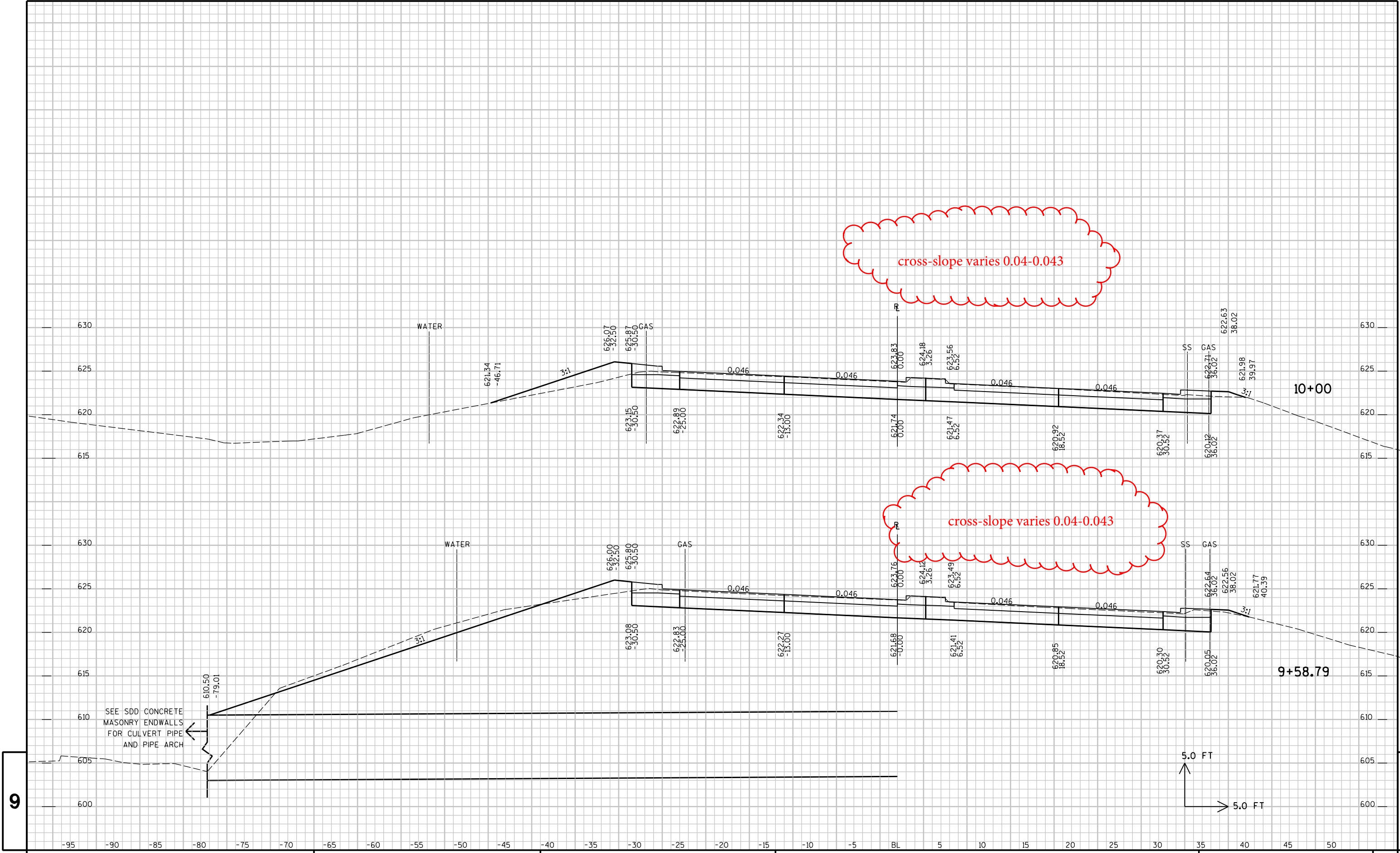
PLOT TIME : 2:43:04 PM

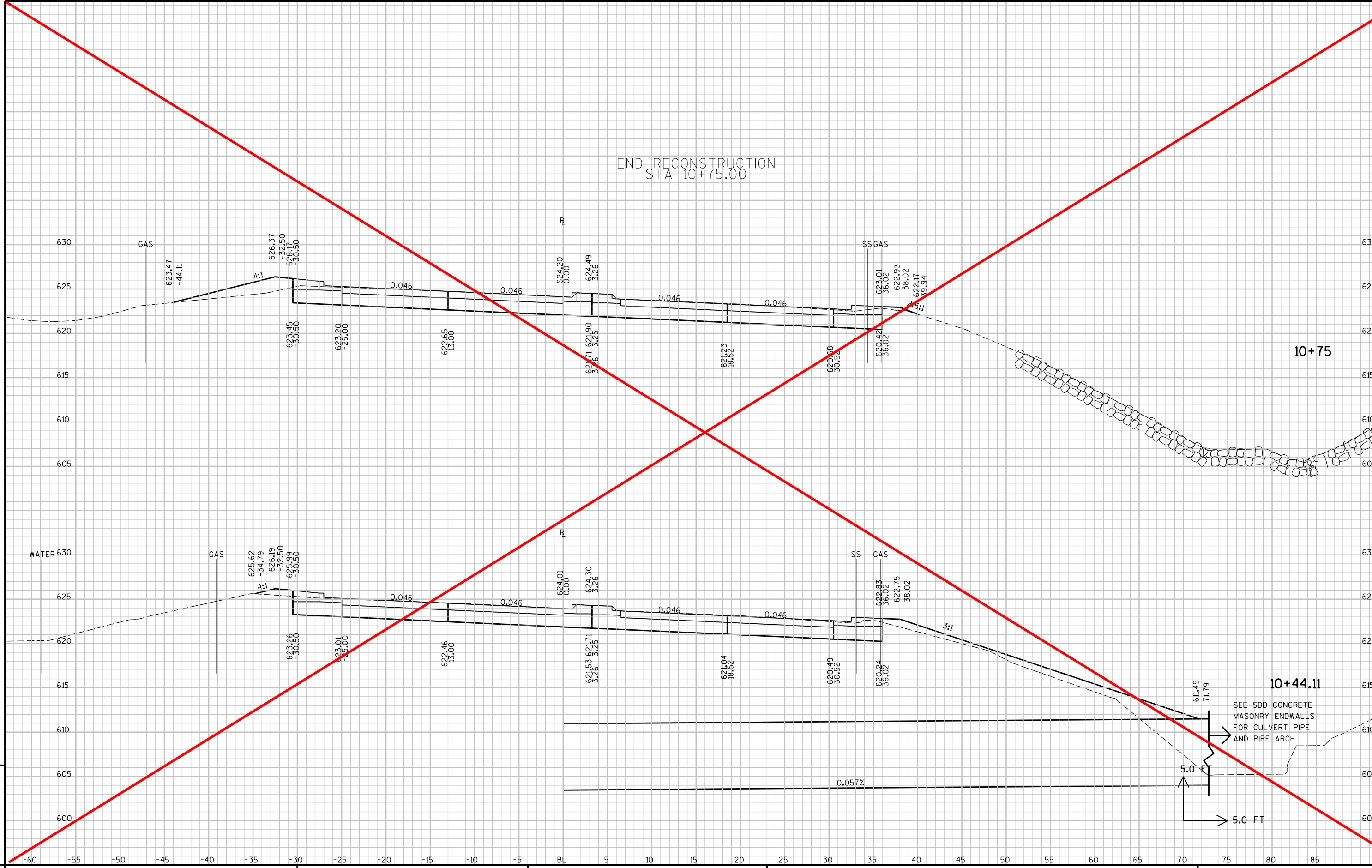
PLOT DATE : 1/27/2014

PLOT BY : SEH

PLOT NAME :

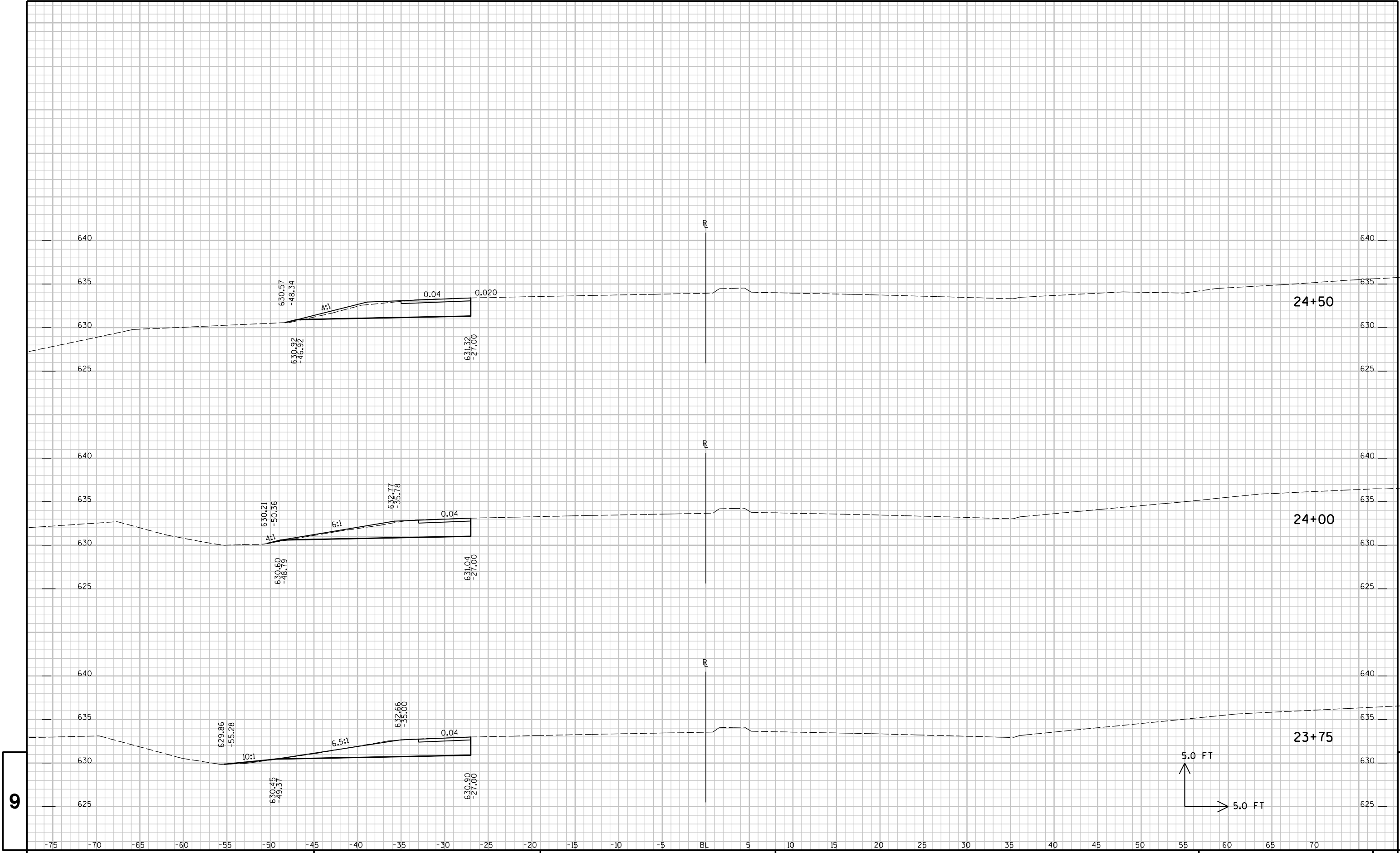
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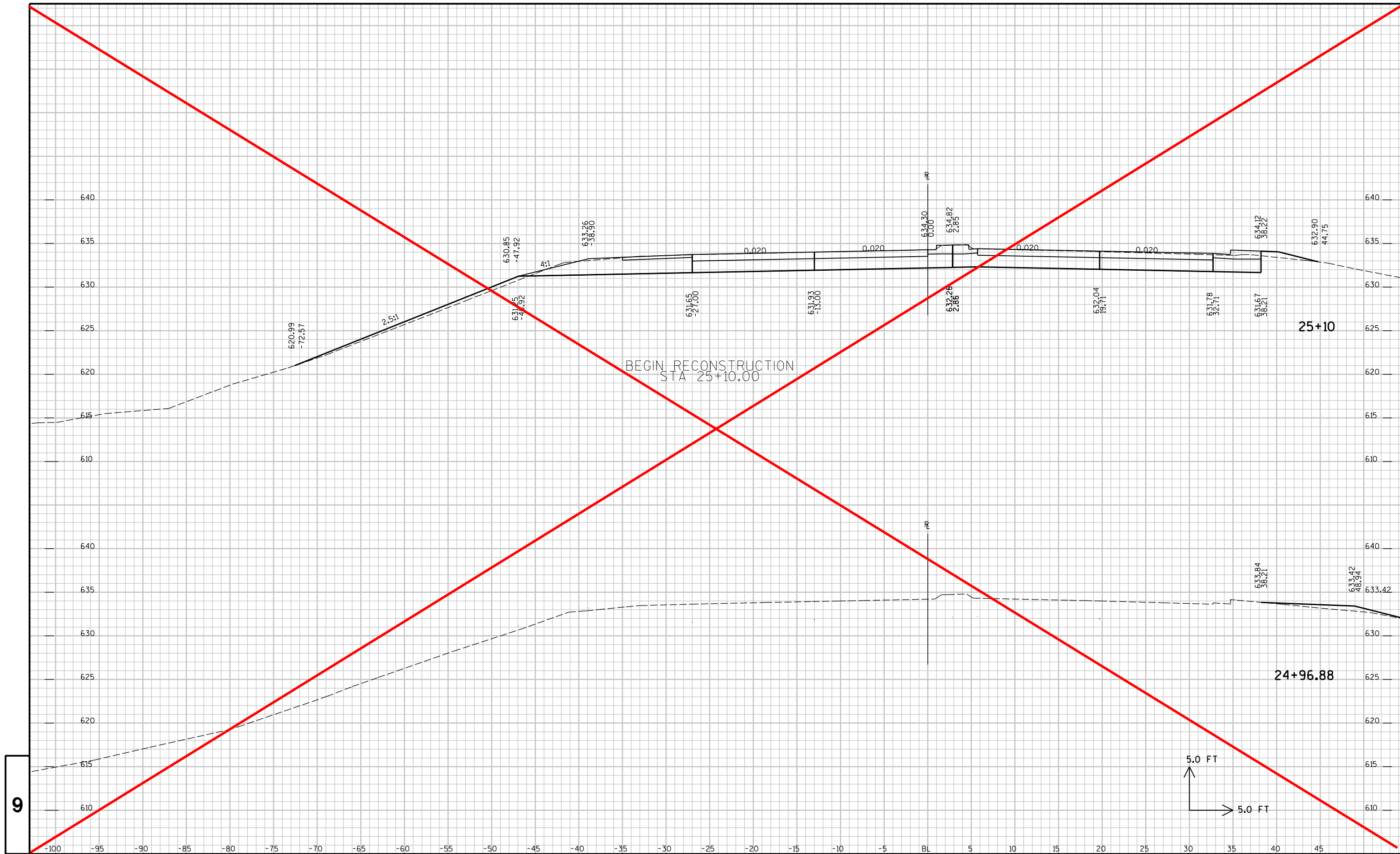
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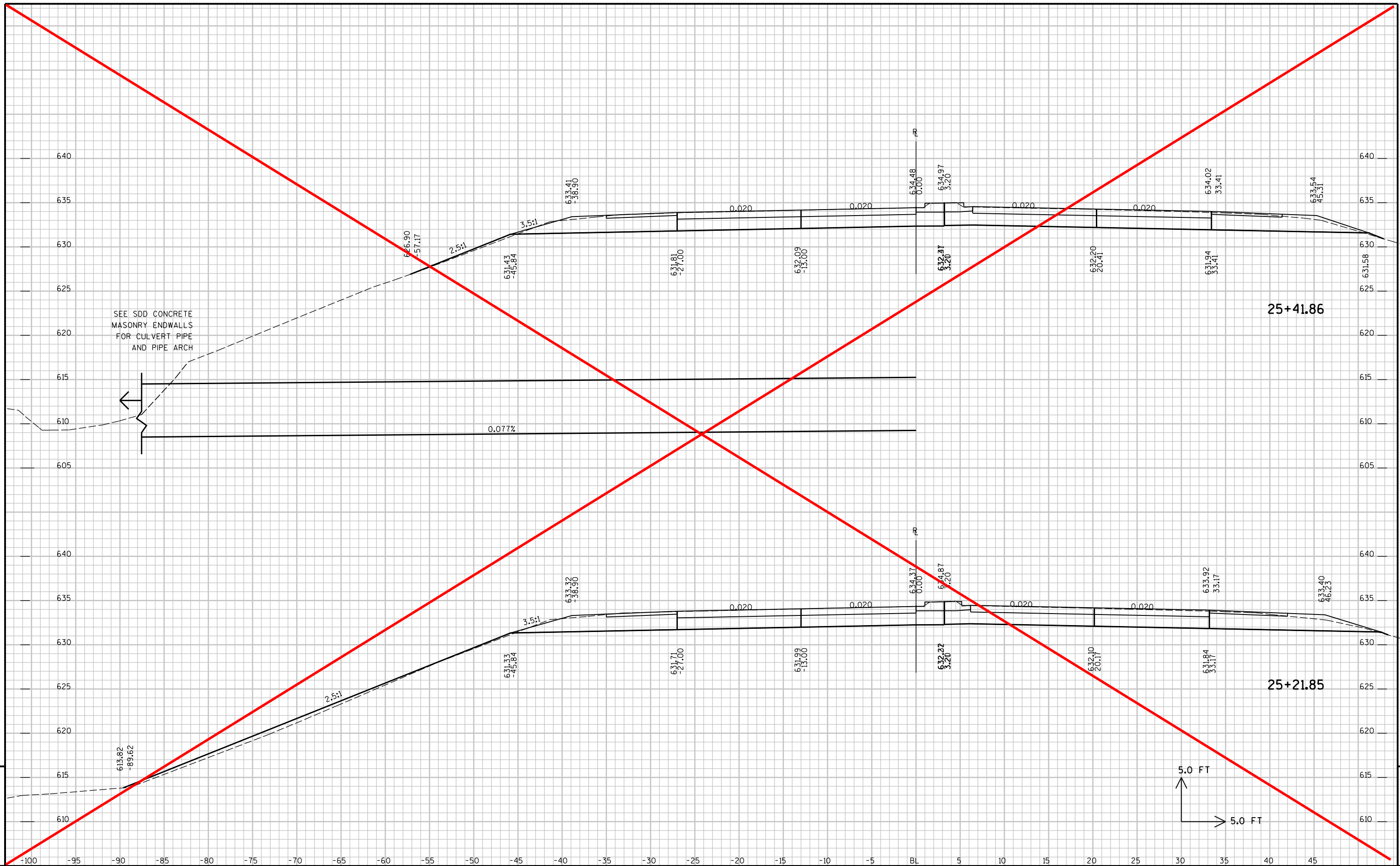
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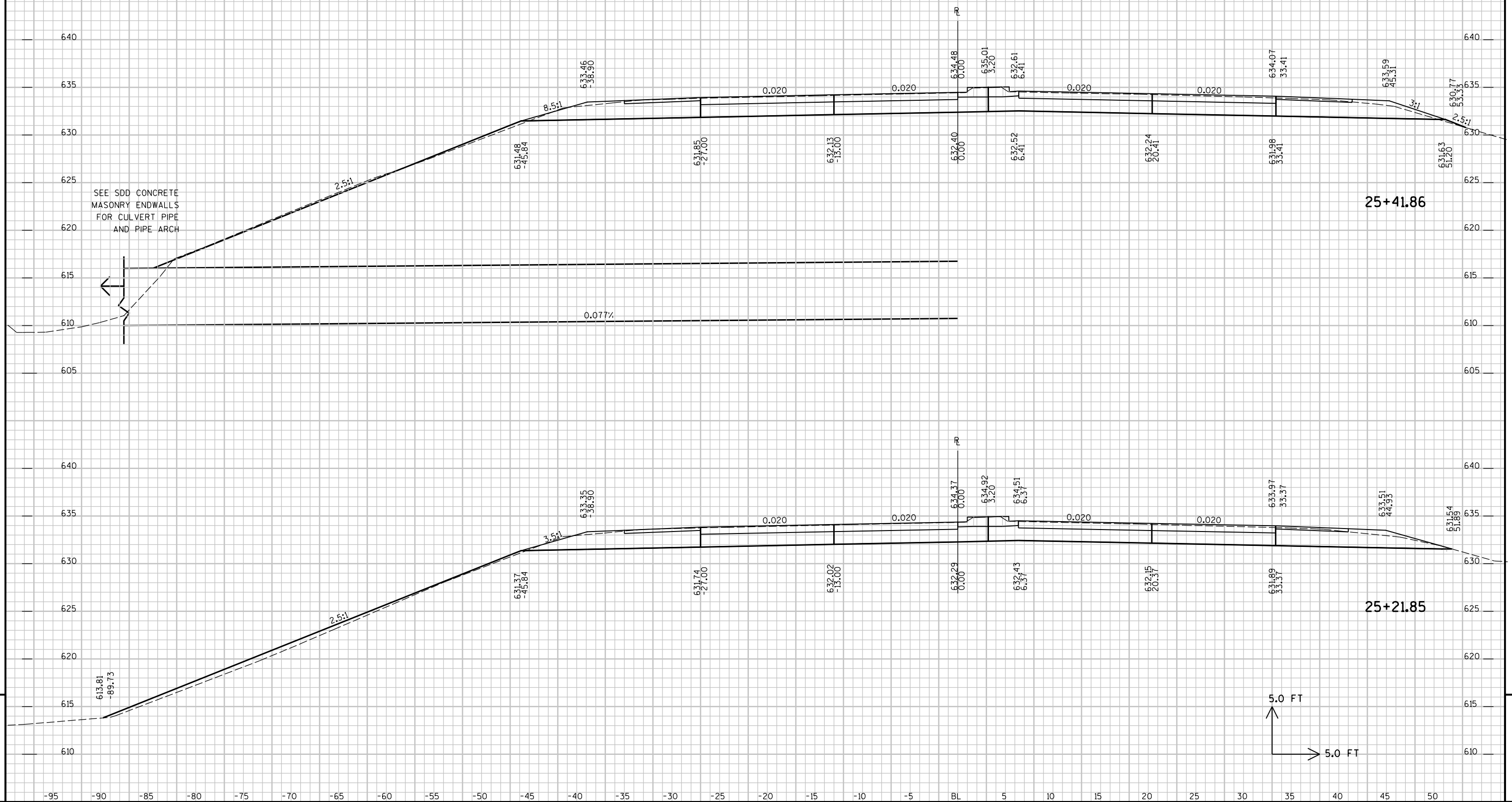


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PROJECT NO : 1181-11-70	HWY : USH 2	COUNTY : ASHLAND	CROSS SECTIONS - USH 2	SHEET NO:	E
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FILE NAME : P:\UZ\W\Witnw\121895\5-final-dsgn\51-drawings\40-TransHwy\XBUSH2FINAL.DGN PLOT TIME : 2:43:03 PM PLOT DATE : 1/27/2014 PLOT BY : SEH PLOT NAME : PLOT SCALE : N/A



PROJECT NO : 1181-11-70

HWY : USH 2

COUNTY : ASHLAND

CROS SECTIONS - USH 2

SHEET NO:

92-A

E

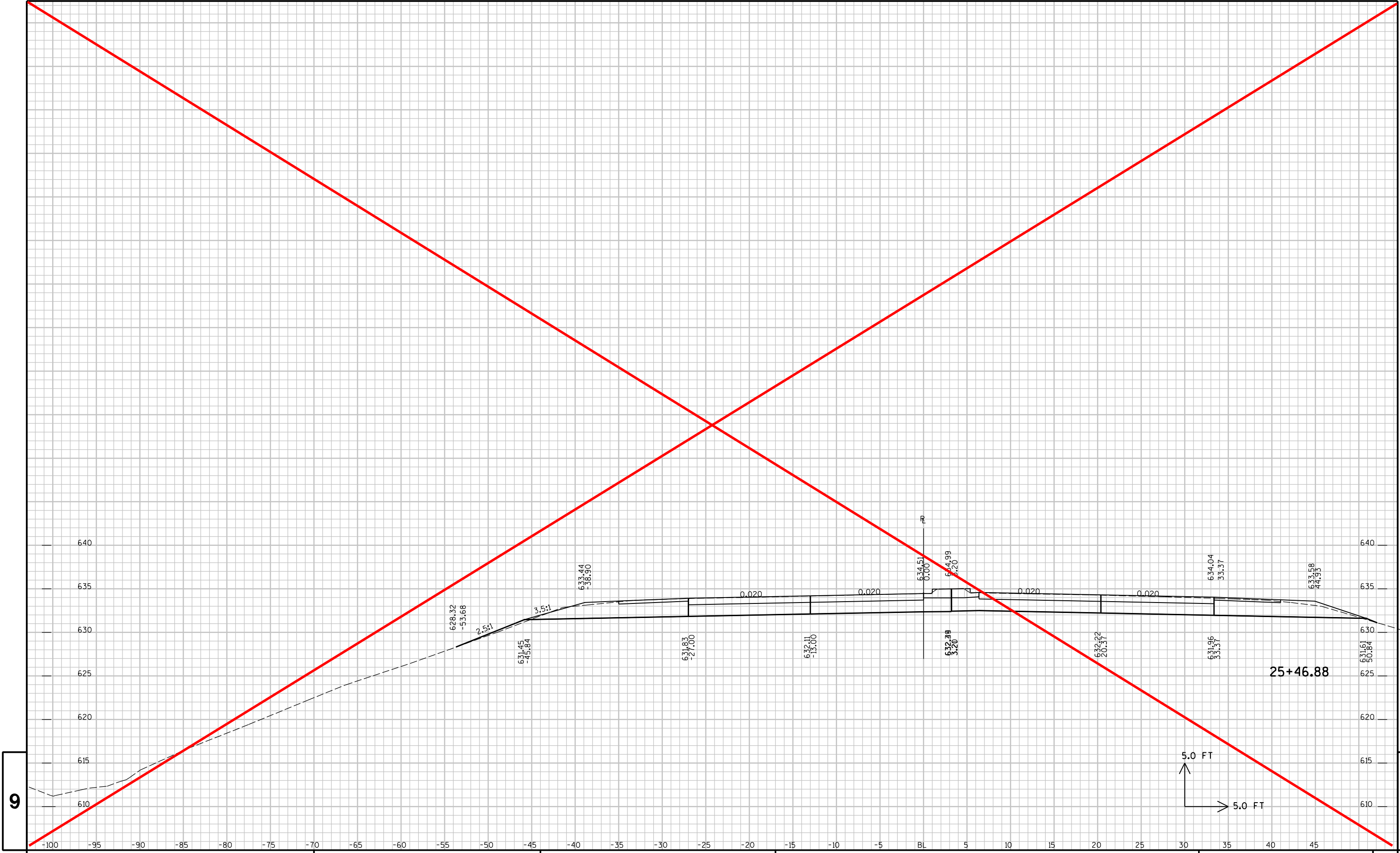
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PLOT DATE : 3/10/2015

PLOT BY : SEH

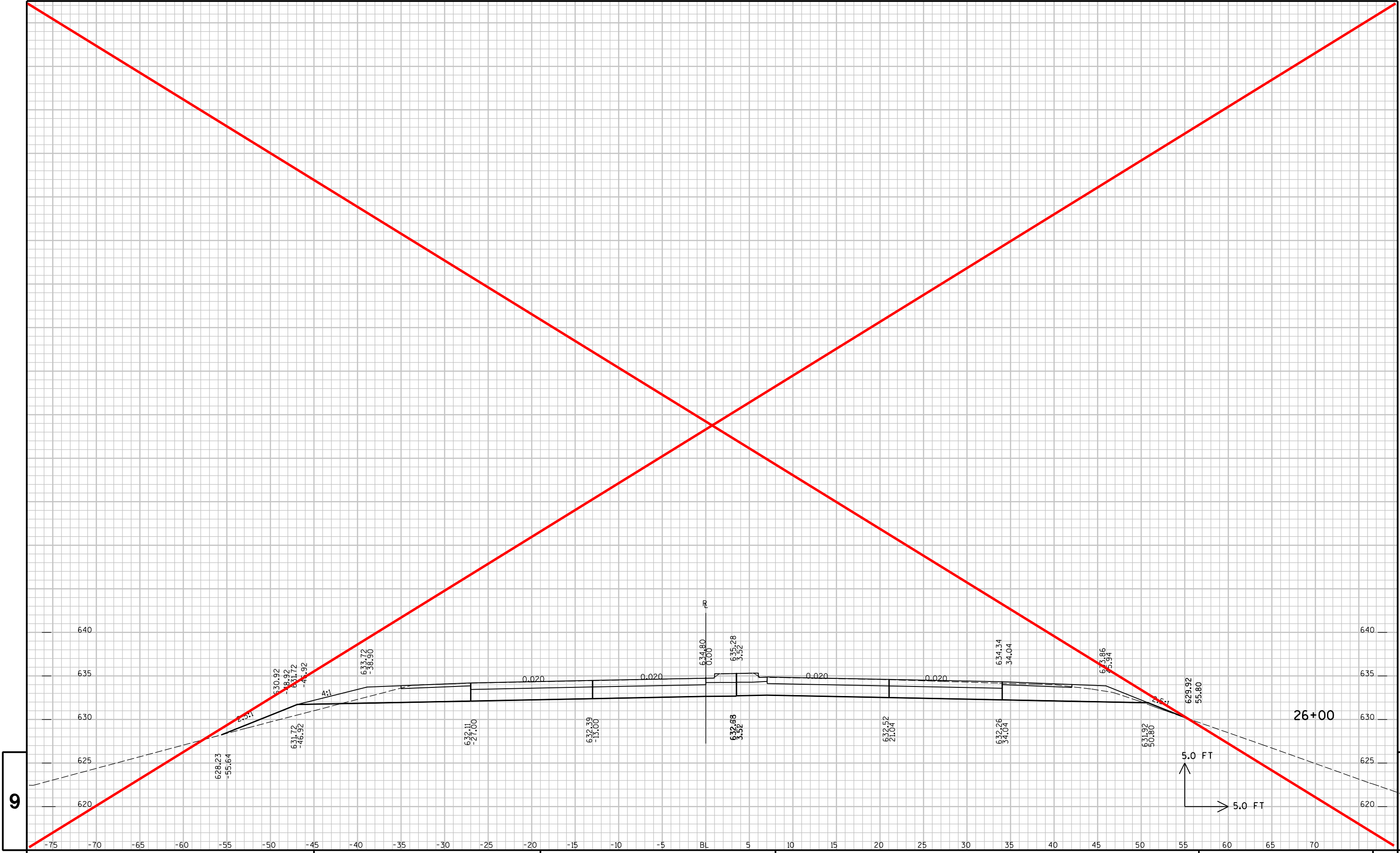
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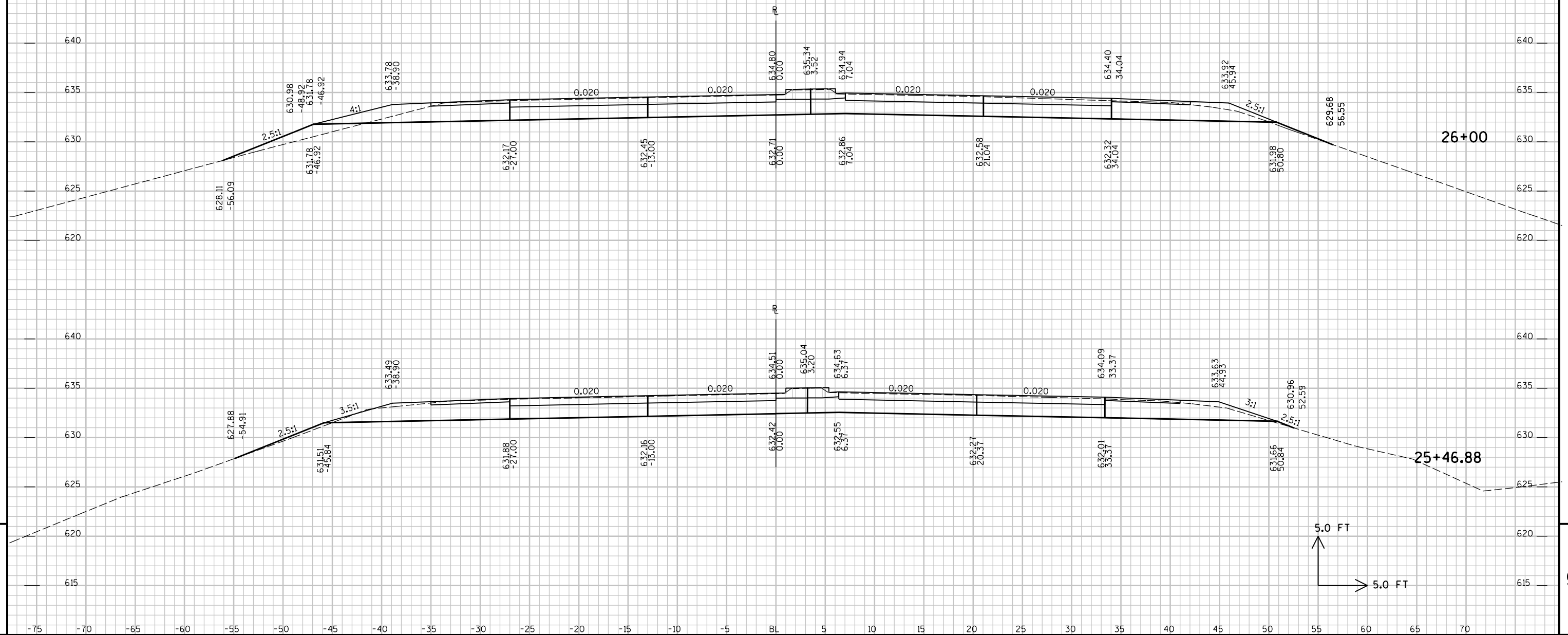
PLOT SCALE : N/A



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PROJECT NO: 1181-11-70

HWY: USH 2

COUNTY: ASHLAND

CROSS SECTIONS - USH 2

SHEET NO: **93-A / 94-A**

1

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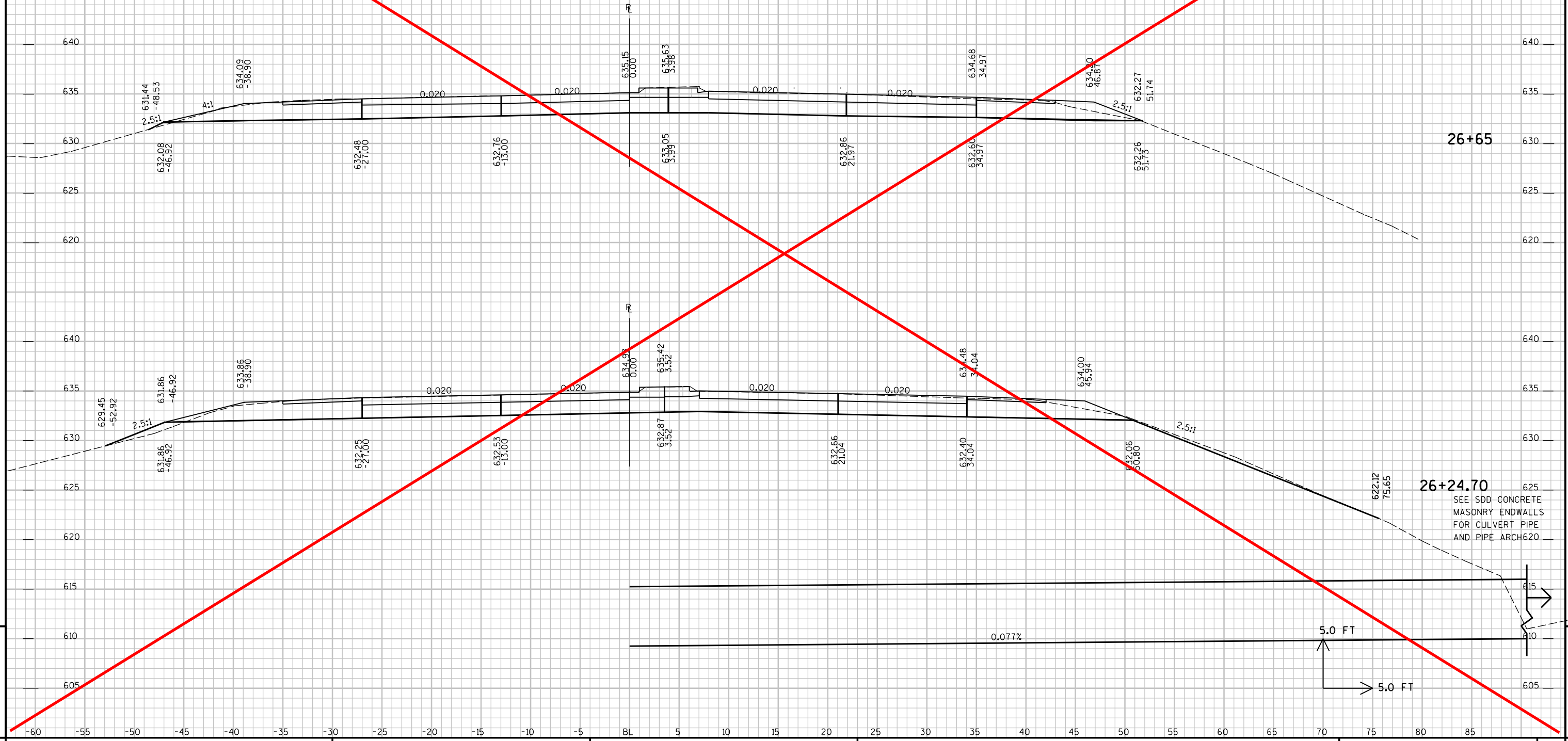
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PLOT BY : SEH

PLOT NAME :

PLOT SCALE : N/A

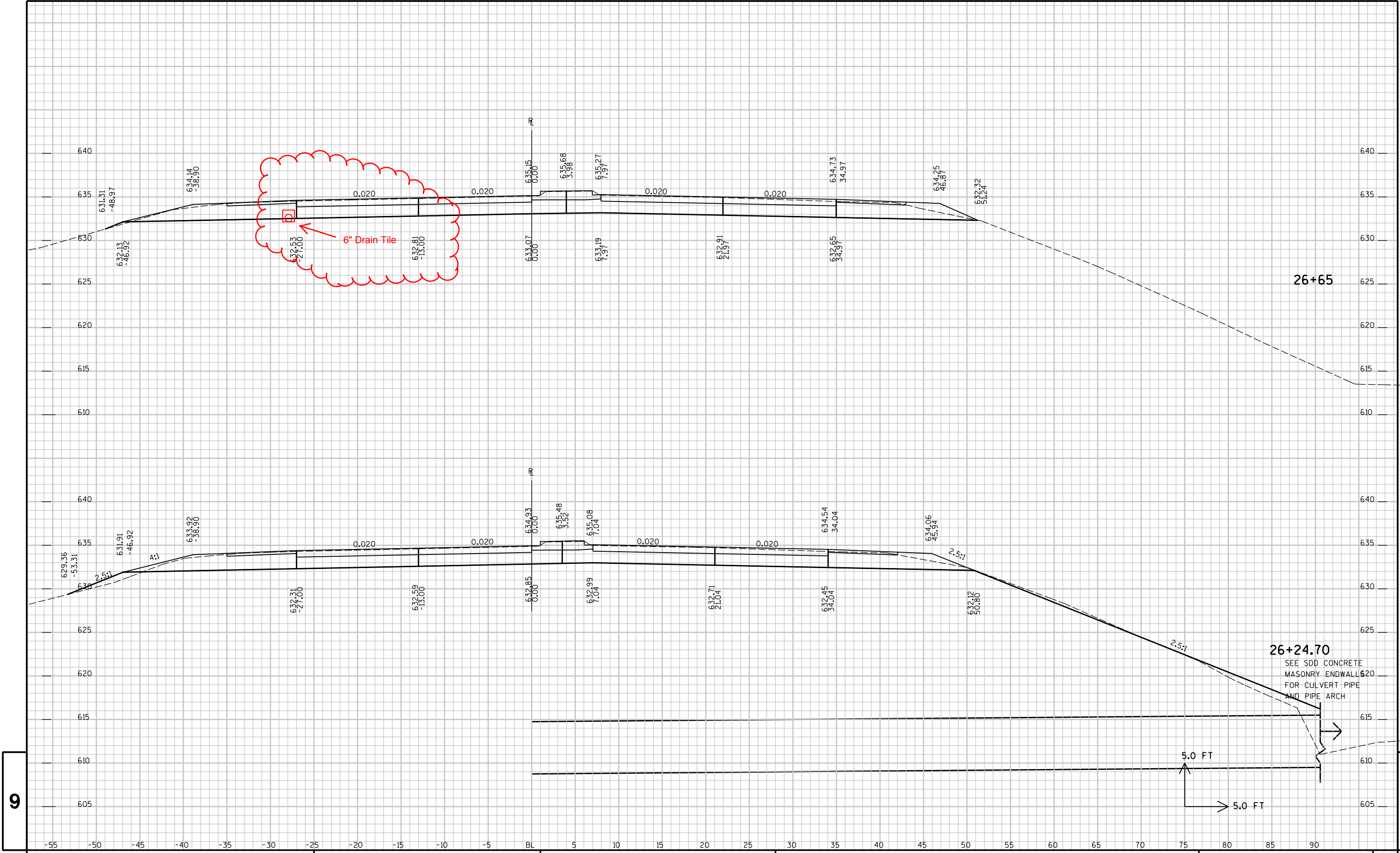
END RECONSTRUCTION
STA 26+65.00



26+65

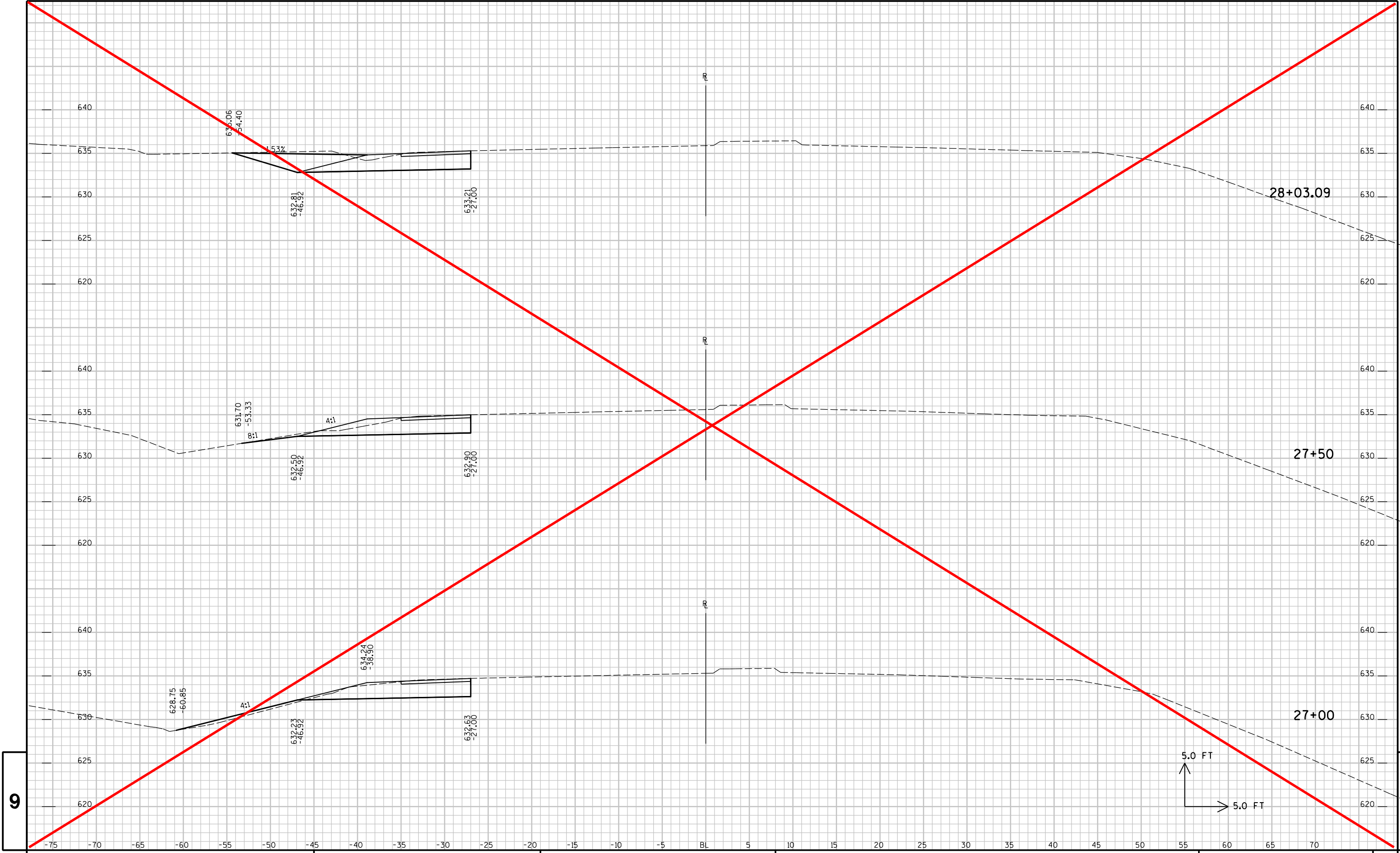
26+24.70

SEE SDD CONCRETE
MASONRY ENDWALLS
FOR CULVERT PIPE
AND PIPE ARCH



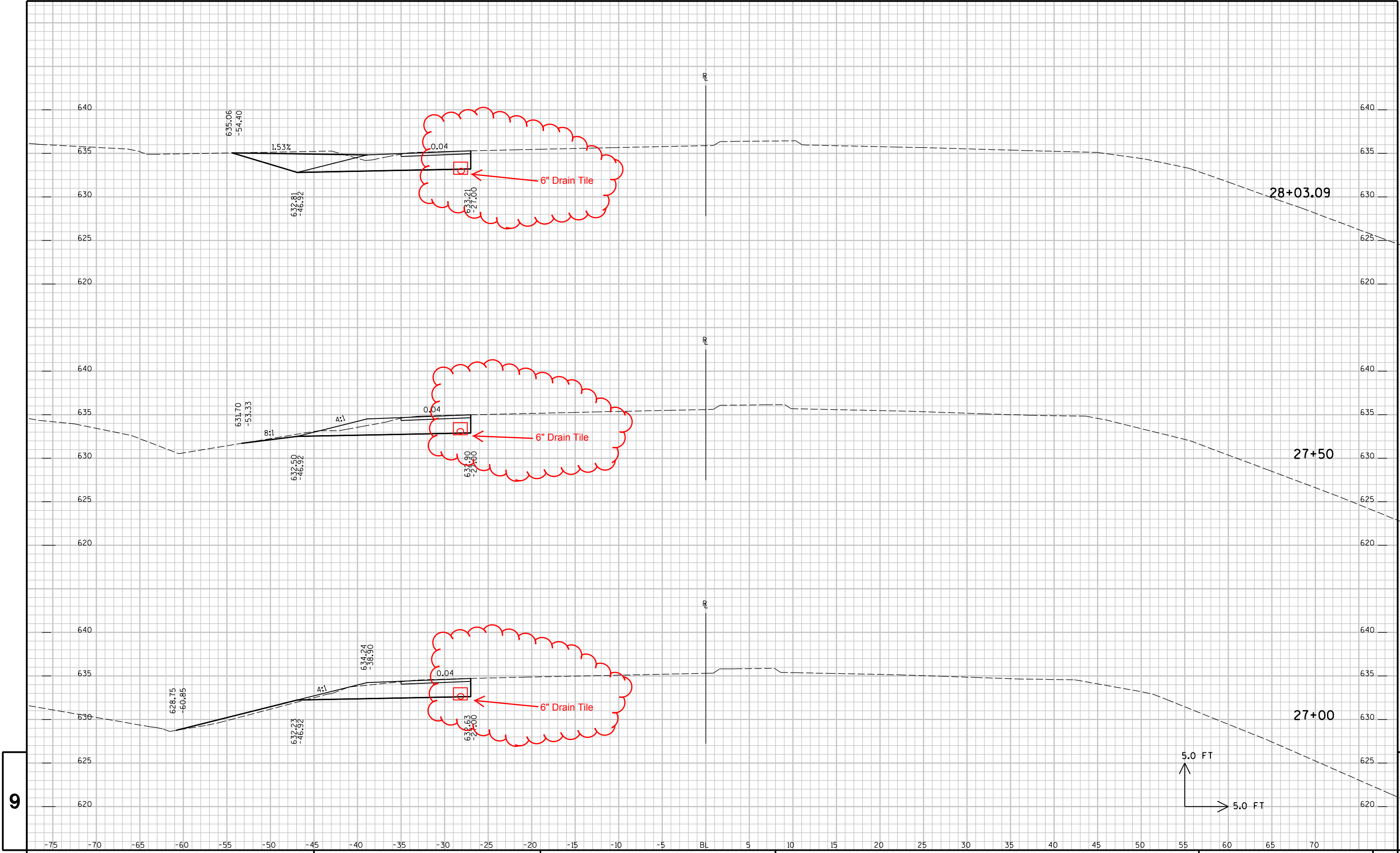
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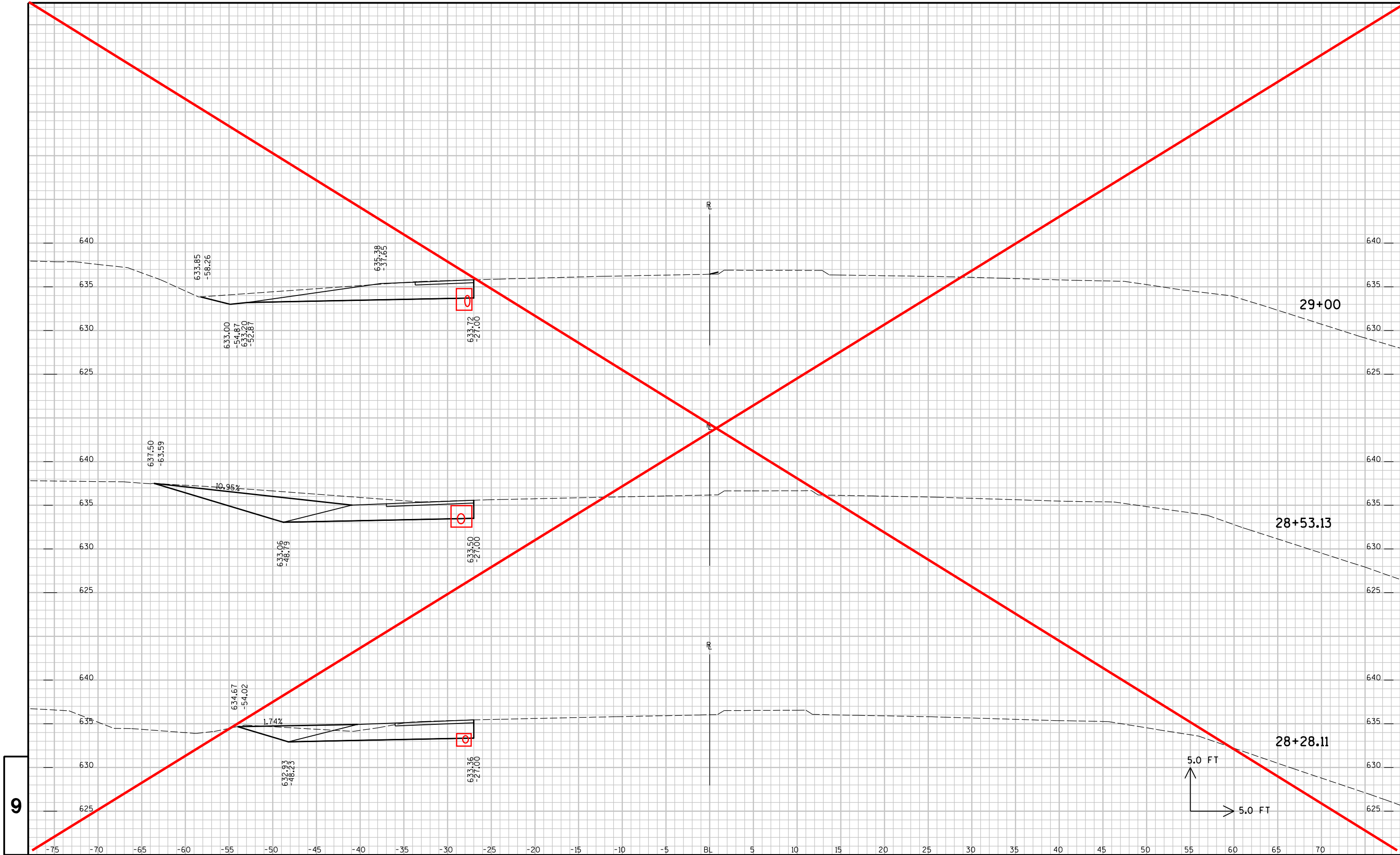
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PROJECT NO : 1181-11-70

HWY : USH 2

COUNTY : ASHLAND

CROSS SECTIONS - USH 2

SHEET NO:

E

FILE NAME : P:\UZ\W\Witnw\121895\5-final-dsgn\51-drawings\40-TransHwy\XBUSH2FINAL.DGN

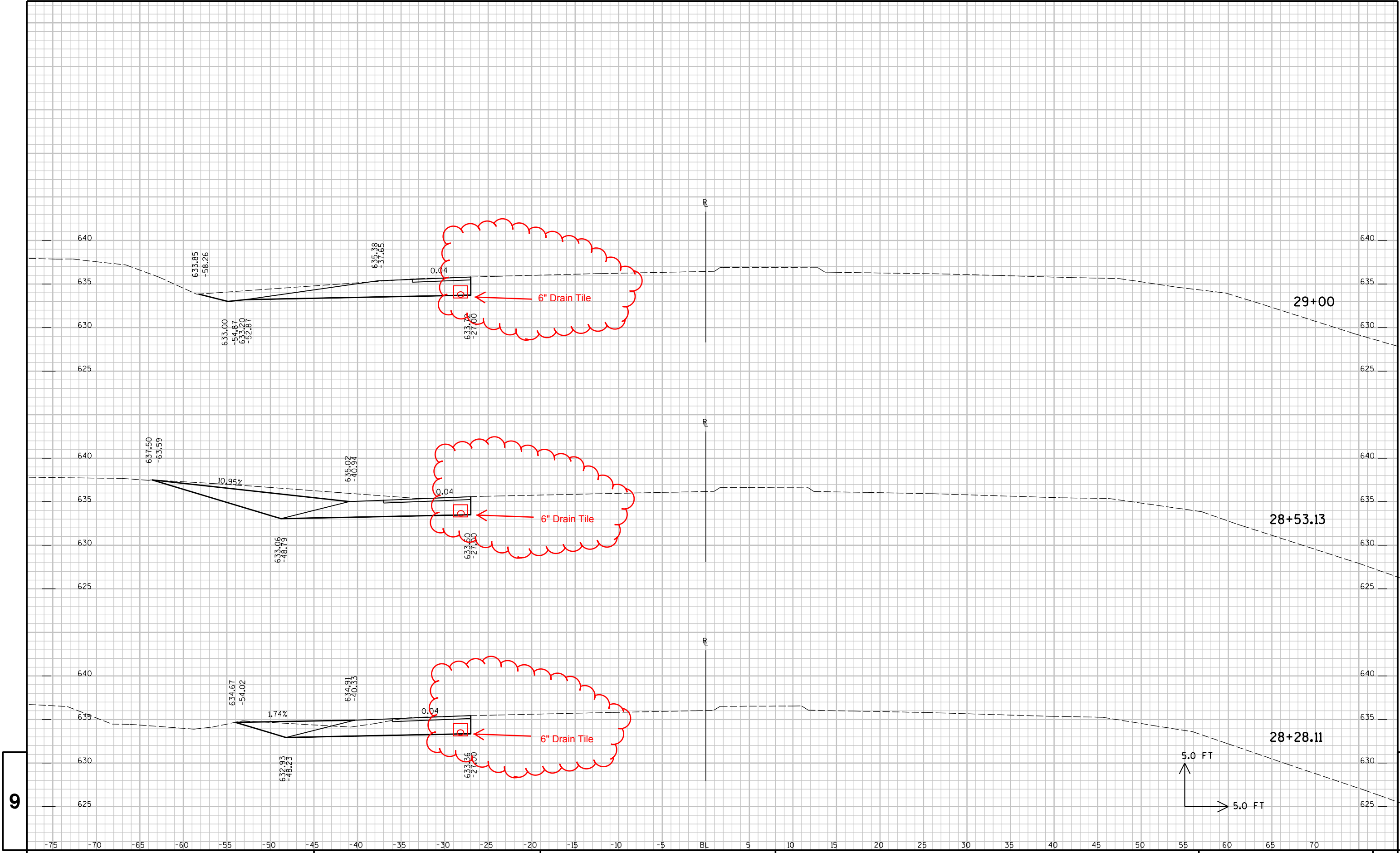
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PLOT DATE : 1/27/2014

PLOT BY : SEH

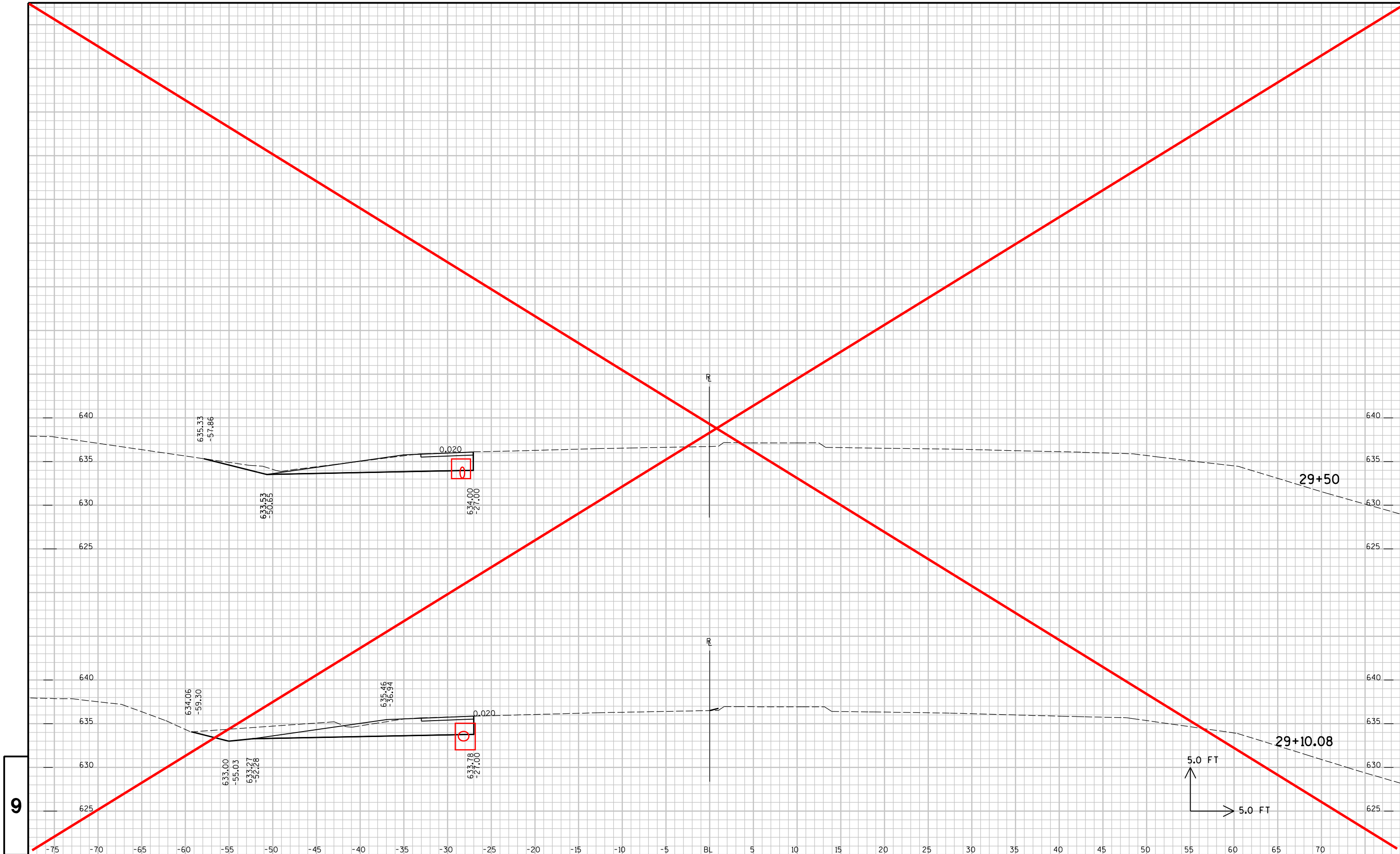
PLOT NAME :

PLOT SCALE : N/A



9

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PROJECT NO : 1181-11-70

HWY : USH 2

COUNTY : ASHLAND

CROSS SECTIONS - USH 2

SHEET NO:

E

FILE NAME : P:\UZ\W\Witnw\121895\5-final-dsgn\51-drawings\40-TransHwy\XBUSH2FINAL.DGN

PLOT TIME : 2:43:04 PM

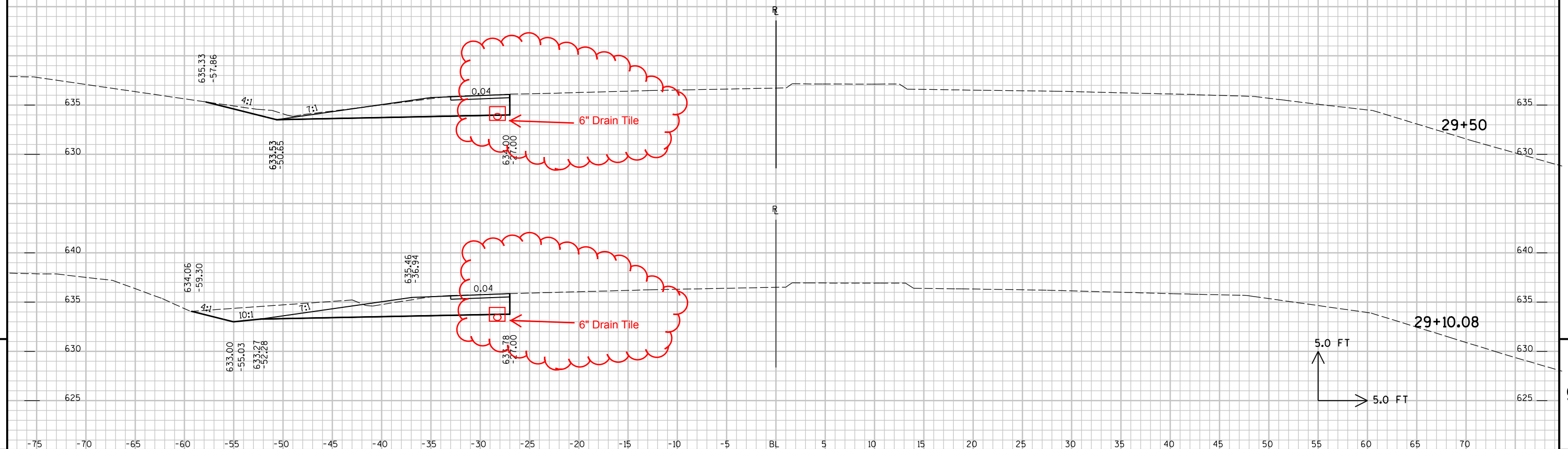
PLOT DATE : 1/27/2014

PLOT BY : SEH

PLOT NAME :

PLOT SCALE : N/A

END RECONSTRUCTION
STA 26+65.00



PROJECT NO: 1181-11-70

HWY: USH 2

COUNTY: ASHLAND

CROSS SECTIONS - USH 2

SHEET NO: **98-A**

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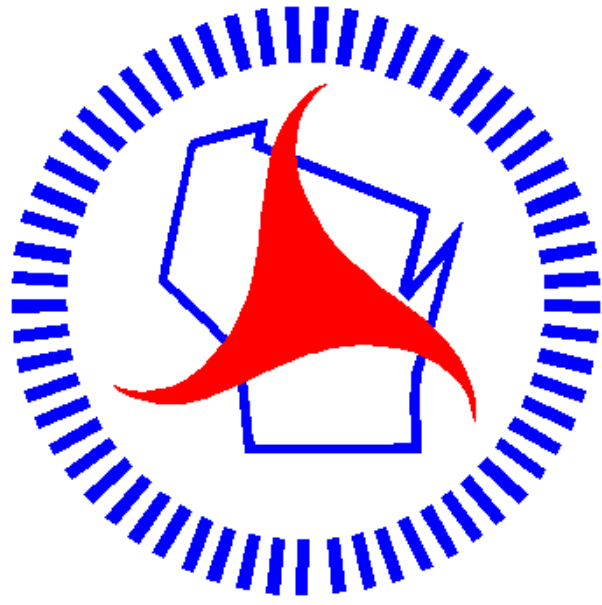
PLOT DATE : 3/10/2015

PLOT BY : SEH

PLOT NAME :

PLOT SCALE : N/A

Notes



Wisconsin Department of Transportation

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