

LIST OF STANDARD ABBREVIATIONS

ABUT	Abutment	INV	Invert	SALV	Salvaged
AC	Acre	IP	Iron Pipe or Pin	SAN S	Sanitary Sewer
AGG	Aggregate	IRS	Iron Rod Set	SEC	Section
AH	Ahead	JT	Joint	SHLDR	Shoulder
<	Angle	JCT	Junction	SHR	Shrinkage
ASPH	Asphaltic	LHF	Left-Hand Forward	SW	Sidewalk
AVG	Average	L	Length of Curve	S	South
ADT	Average Daily Traffic	LIN	Linear Foot	SQ	Square
BAD	Base Aggregate Dense	LC	Long Chord of Curve	SF or SQ FT	Square Feet
BK	Back	MH	Manhole	SF or SQ YD	Square Yard
BF	Back Face	MB	Mailbox	STD	Standard
BM	Bench Mark	ML or M/L	Match Line	SDD	Standard Detail Drawings
BR	Bridge	N	North	STH	State Trunk Highways
C or C/L	Center Line	Y	North Grid Coordinate	STA	Station
CC	Center to Center	OD	Outside Diameter	SS	Storm Sewer
CTH	County Trunk Highway	PLE	Permanent Limited Easement	SG	Subgrade
CR	Creek			SE	Superelevation
CR	Crushed	PT	Point	SL or S/L	Survey Line
CY or CU YD	Cubic Yard	PC	Point of Curvature	SV	Septic Vent
CP	Culvert Pipe	PI	Point of Intersection	T	Tangent
C & G	Curb and Gutter	PRC	Point of Reverse Curvature	TEL	Telephone
D	Degree of Curve	PT	Point of Tangency	TEMP	Temporary
DHV	Design Hour Volume	POC	Point On Curve	TI	Temporary Interest
DIA	Diameter	POT	Point on Tangent	TLE	Temporary Limited Easement
E	East	PVC	Polyvinyl Chloride	t	Ton
X	East Grid Coordinate	PCC	Portland Cement Concrete	T or TN	Town
ELEC	Electric (al)	LB	Pound	TRANS	Transition
EL or ELEV	Elevation	PSI	Pounds Per Square Inch	TL or T/L	Transit Line
ESALS	Equivalent Single Axle Loads	PE	Private Entrance	T	Trucks (percent of)
		R	Radius	TYP	Typical
EBS	Excavation Below Subgrade	RR	Railroad	UNCL	Unclassified
FF	Face to Face	R	Range	UG	Underground Cable
FE	Field Entrance	RL or R/L	Reference Line	USH	United States Highway
F	Fill	RP	Reference Point	VAR	Variable
FG	Finished Grade	RCCP	Reinforced Concrete	V	Velocity or Design Speed
FL or F/L	Flow Line		Culvert Pipe	VERT	Vertical
FT	Foot	REQ'D	Required	VC	Vertical Curve
FTG	Footing	RES	Residence or Residential	VOL	Volume
GN	Grid North	RW	Retaining Wall	WM	Water Main
HT	Height	RT	Right	WV	Water Valve
CWT	Hundredweight	RHF	Right-Hand Forward	W	West
HYD	Hydrant	R/W	Right-of-Way	WB	Westbound
INL	Inlet	R	River	YD	Yard
ID	Inside Diameter	RD	Road		
		RDWY	Roadway		

GENERAL NOTES

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

NO TREES OR SHRUBS ARE TO BE REMOVED UNLESS SUCH TREES OR SHRUBS HAVE FIRST BEEN INDICATED FOR REMOVAL BY THE ENGINEER IN THE FIELD.

EXCAVATION BELOW SUBGRADE (EBS) IS NOT USED TO BALANCE YARDAGE, AND IS NOT SHOWN ON THE CROSS SECTIONS BUT IS MEASURED AND PAID FOR AS COMMON EXCAVATION. EXACT LOCATIONS OF EBS WILL BE DETERMINED BY THE ENGINEER.

DISTURBED AREAS SHOWN WITHIN THE RIGHT-OF-WAY, EXCEPT THE AREAS WITHIN THE FINISHED SHOULDER POINTS ARE TO BE FERTILIZED (TYPE B), SEEDED (USE SEED MIX NO. 40) AND EROSION MATTED AS DIRECTED BY THE ENGINEER.

WHEN THE QUANTITY OF THE ITEM OF BASE AGGREGATE DENSE OR HMA PAVEMENT IS MEASURED FOR PAYMENT BY THE TON, THE DEPTH OR THICKNESS OF THE COURSE SHOWN ON THE PLANS IS APPROXIMATE, AND THE ACTUAL THICKNESS WILL DEPEND ON THE DISTRIBUTION OF THE MATERIAL AS DIRECTED BY THE ENGINEER IN THE FIELD.

SILT FENCE AND TEMPORARY DITCH CHECKS SHALL BE PLACED AS SHOWN ON THE PLAN OR AS DIRECTED BY THE ENGINEER IN THE FIELD. SILT FENCE SHALL BE PLACED PRIOR TO CONSTRUCTION.

EMAT ALL SLOPES AS DIRECTED BY THE ENGINEER IN THE FIELD.

FILL EXPANSION IS VARIABLE AND IS ESTIMATED AT 25%.

ADJUST DITCH GRADING AS NECESSARY TO FIT FIELD CONDITIONS AND AS DIRECTED BY THE ENGINEER IN THE FIELD.

REMOVAL OF ASPHALTIC SURFACES WHERE AN ABUTTING ASPHALTIC SURFACE IS TO REMAIN IN PLACE SHALL REQUIRE A SAWCUT MEETING THE APPROVAL OF THE ENGINEER IN THE FIELD.

THE LOCATION OF ALL PERMANENT SIGNING SHALL BE VERIFIED BY THE ENGINEER IN THE FIELD PRIOR TO PLACEMENT.

CURVE DATA IS BASED ON THE ARC DEFINITION.

THE EXACT LOCATION OF COMMERCIAL AND FIELD ENTRANCES ARE TO BE DETERMINED BY THE ENGINEER IN THE FIELD.

HMA PAVEMENT 4LT58-28S QUANTITIES WERE CALCULATED USING 112 LB/SY/IN.

ACCURACY OF INLET AND DISCHARGE ELEVATIONS FOR DRAINAGE STRUCTURES SHOULD BE VERIFIED BY THE ENGINEER IN THE FIELD.

CURB AND GUTTER ELEVATIONS ARE GIVEN ON THE FLANGE LINE UNLESS OTHERWISE NOTED.

STORM SEWER ELEVATIONS, LENGTHS, AND LOCATIONS AS SHOWN ON THE PLAN AND CROSS SECTIONS MAY BE ADJUSTED TO FIT FIELD CONDITIONS.

ORDER OF SECTION 2 SHEETS

- WRITTEN MATERIAL
- PROJECT OVERVIEW
- TYPICAL SECTIONS
- CONSTRUCTION DETAILS
- DRIVEWAY GRADING PLAN
- STORM SEWER PLAN
- PAVEMENT MARKING & SIGNING
- TRAFFIC CONTROL
- CONTROL TIES

NOTE: ALIGNMENT INFORMATION SHOWN ON PLAN & PROFILE SHEETS.

CONTACTS

WISDOT:

WISCONSIN DEPARTMENT OF TRANSPORTATION
3550 MORMON COULEE ROAD
LA CROSSE, WI 54601
ATTN: ROBERT WINTERTON, P.E.
PH: (608) 789-7879
E-MAIL: robert.winterton@dot.wi.gov
CELL: (608) 487-3562

DESIGN CONSULTANT:

JEWELL ASSOCIATES ENGINEERS, INC.
560 SUNRISE DRIVE
SPRING GREEN, WI 53588
ATTN: ELLERY SCHAFFER, P.E..
PH: (608) 459-6027
E-MAIL: ellery.schaffer@jewellassoc.com

DNR LIAISON:

STATE OF WISCONSIN
DNR SERVICE CENTER
3550 MORMON COULEE ROAD
LA CROSSE, WI 54601
ATTN: KAREN KALVELAGE
PH: (608) 406-7880
E-MAIL: Karen.Kalvelage@wisconsin.gov

U.S. FISH & WILDLIFE SERVICE:

DIVISION OF ENGINEERING
8600 WEST AMERICAN BOULEVARD
BLOOMINGTON, MN 55437
ATTN: ERIN MCFADDEN
PH: (612) 713-5262
E-MAIL: erin_mcfadden@fws.gov

UTILITIES

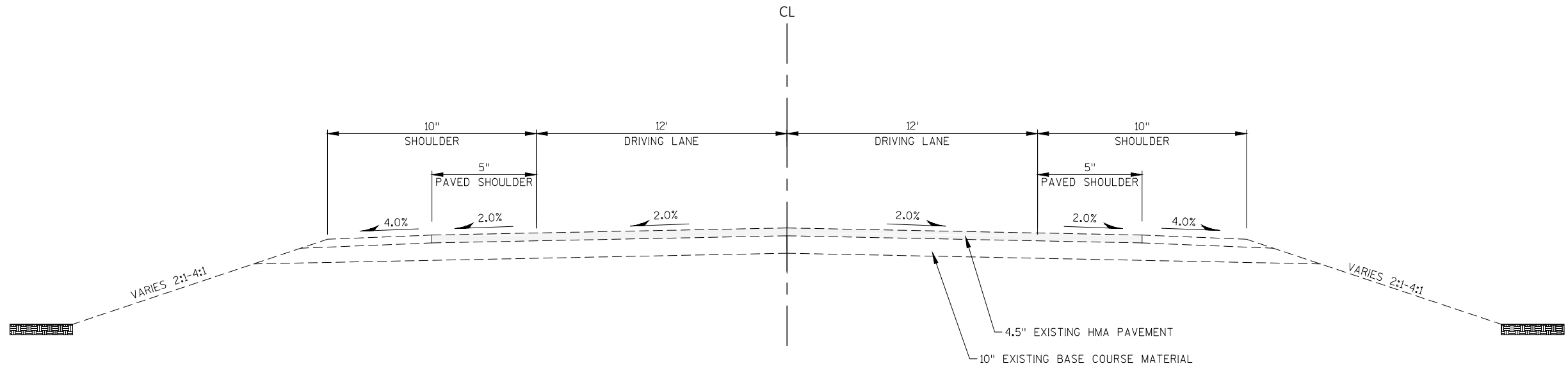
ELECTRICITY:

VERNON ELECTRIC COOPERATIVE
110 SAUGSTAD ROAD
WESTBY, WI 54667
ATTN: CRAIG BUROS
PH: (608) 634-3121
CELL: (608) 632-0660
E-MAIL: cburos@vernonelectric.org

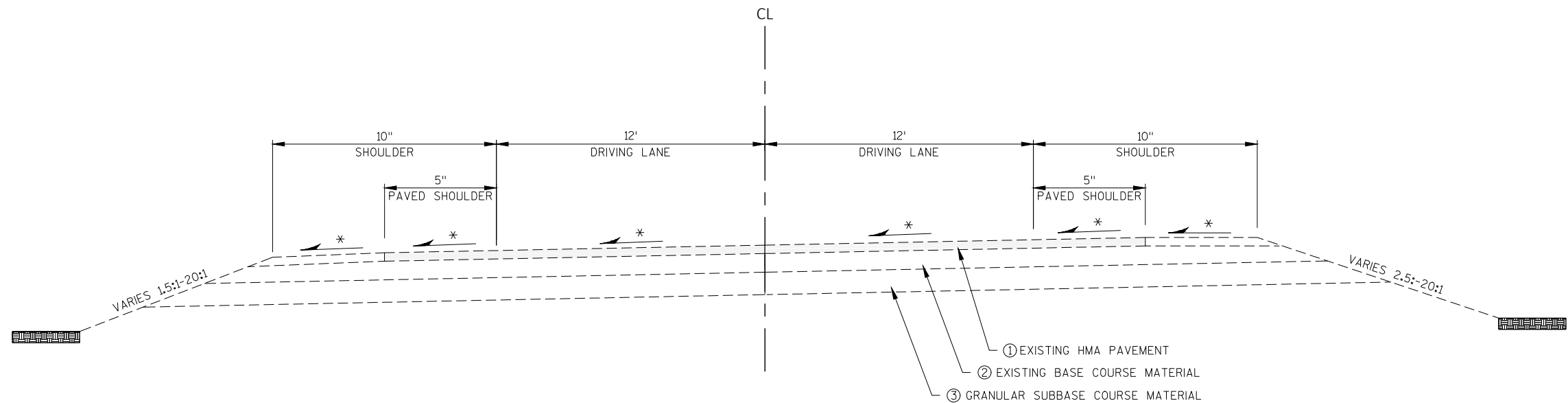
COMMUNICATION LINE:

VERNON COMMUNICATIONS COOPERATIVE
103 N MAIN STREET
WESTBY, WI 54667
ATTN: SCOTT FREDERICK
PH: (608) 634-3136 EXT. 234
CELL: (608) 632-0607
E-MAIL: sfrederick@vernoncom.coop



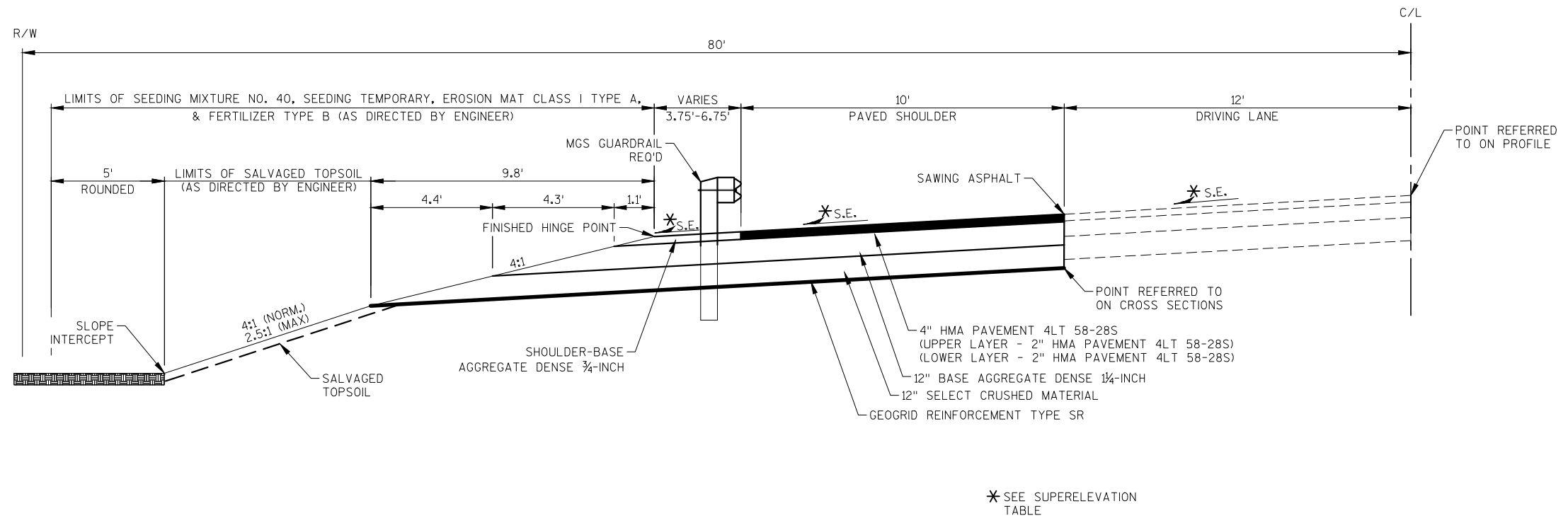
**TYPICAL EXISTING SECTION**

STA. 10+00 - STA. 11+25

**TYPICAL EXISTING SUPERELEVATED SECTION**

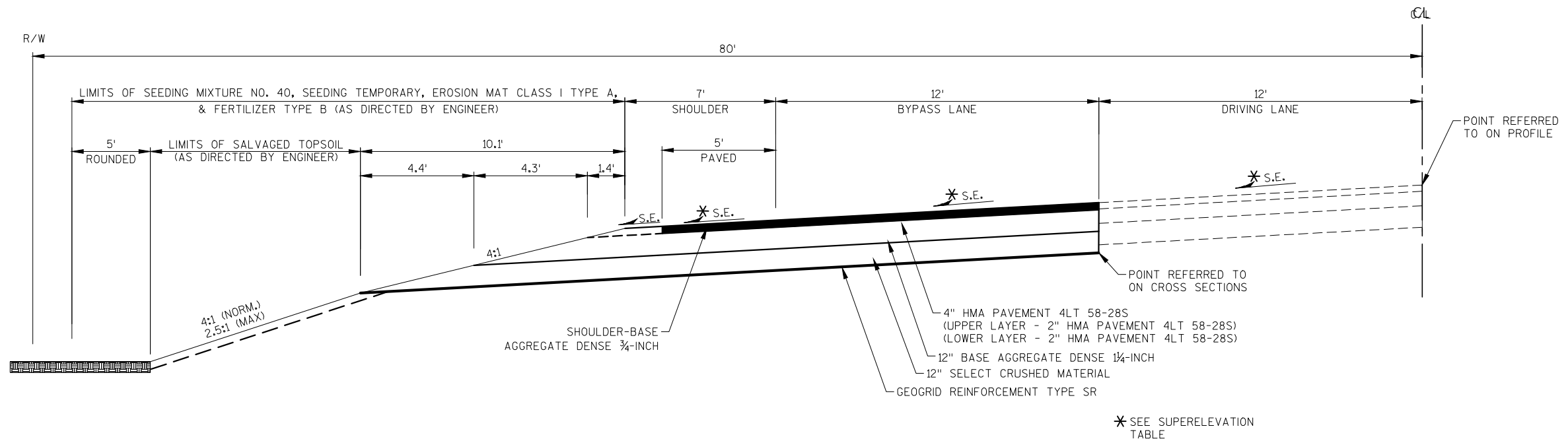
	① (IN)	② (IN)	③ (IN)
STA. 11+25 - STA. 19+00	4.5	10	0
STA. 19+00 - STA. 22+00	3.5	8	12

* VARIES 2.0% - 6.7%



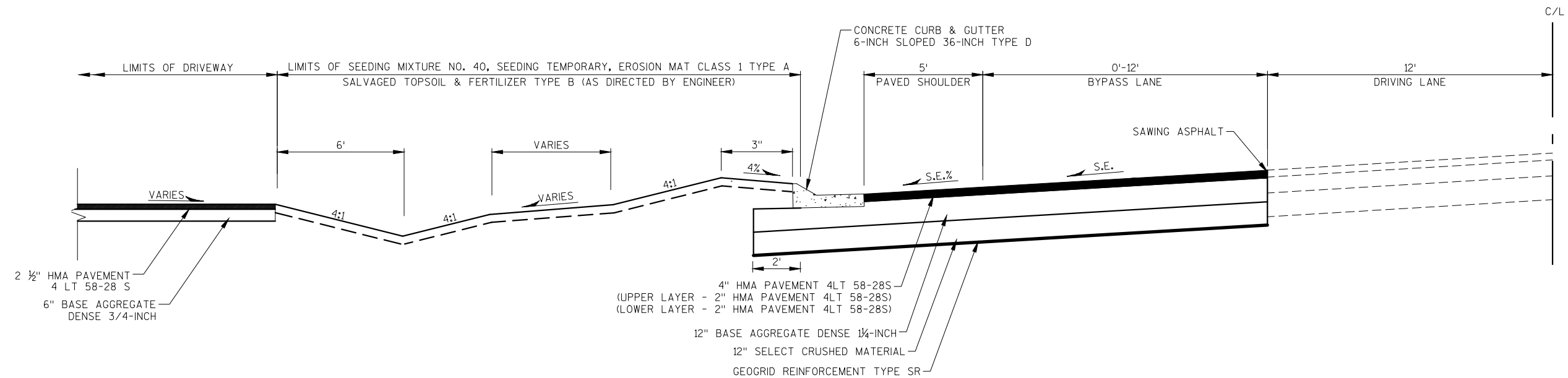
TYPICAL FINISHED SUPERELEVATED HALF SECTION

(STA. 10+08 - STA. 13+20, LT)
(STA. 10+08 - STA. 15+10, RT)



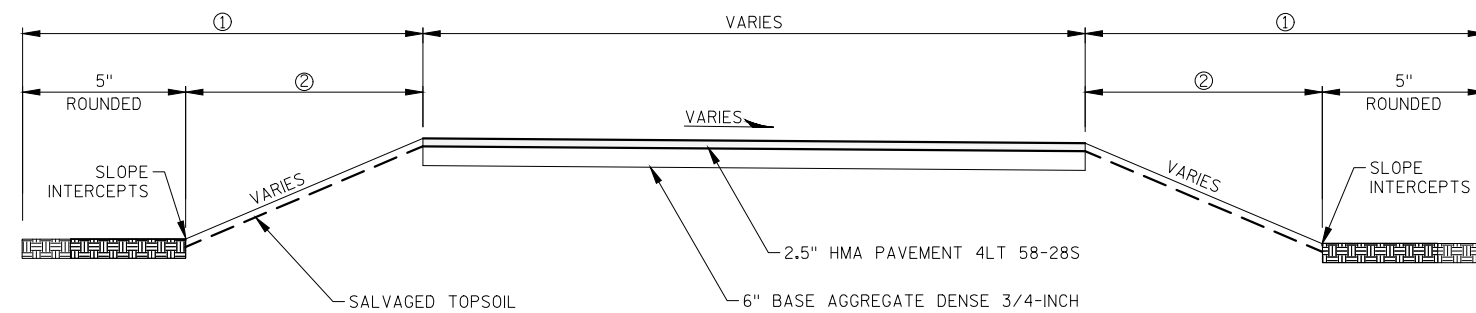
TYPICAL FINISHED SUPERELEVATED HALF SECTION

(STA. 13+20 - STA. 18+50, LT)



TYPICAL FINISHED SUPERELEVATED URBAN HALF SECTION

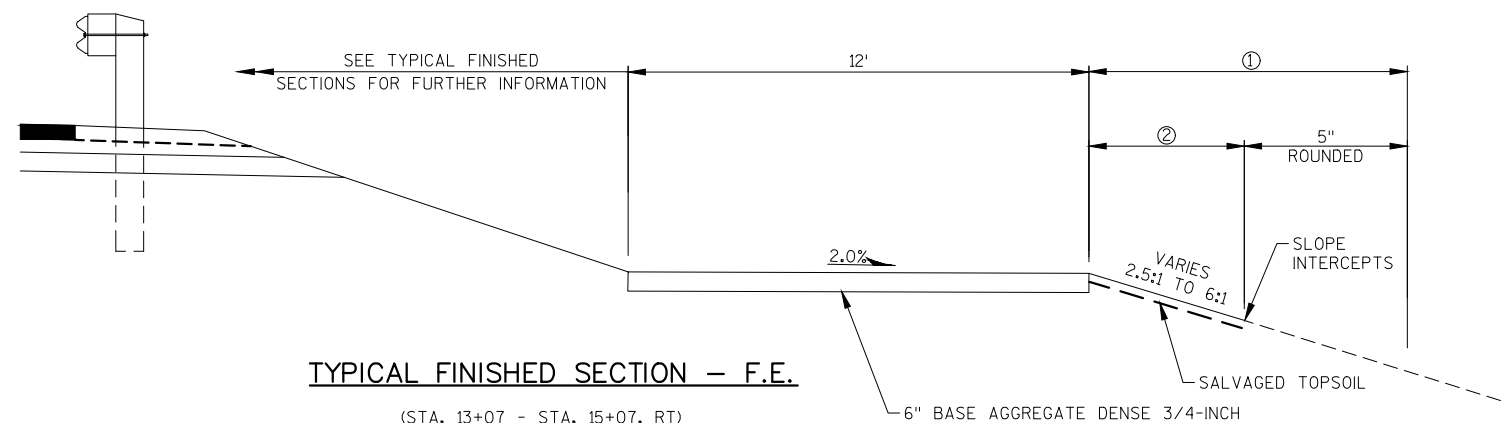
(STA. 18+50 - STA. 22+00, LT)



TYPICAL FINISHED SECTION - C.E.

(STA. 21+49, LT)

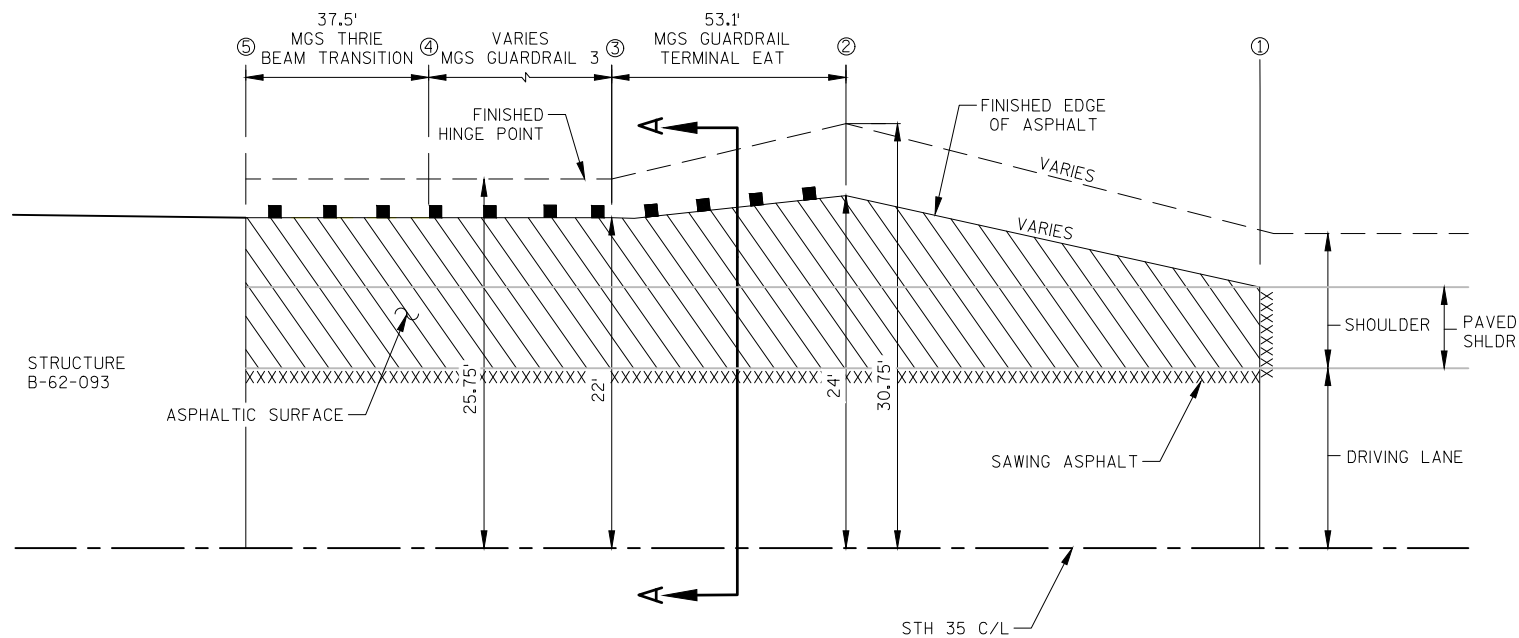
- ① LIMITS OF SEEDING MIXTURE NO. 40, SEEDING TEMPORARY, EROSION MAT CLASS 1 TYPE A, & FERTILIZER TYPE B (AS DIRECTED BY THE ENGINEER).
- ② LIMITS OF SALVAGED TOPSOIL (AS DIRECTED BY THE ENGINEER)



TYPICAL FINISHED SECTION - F.E.

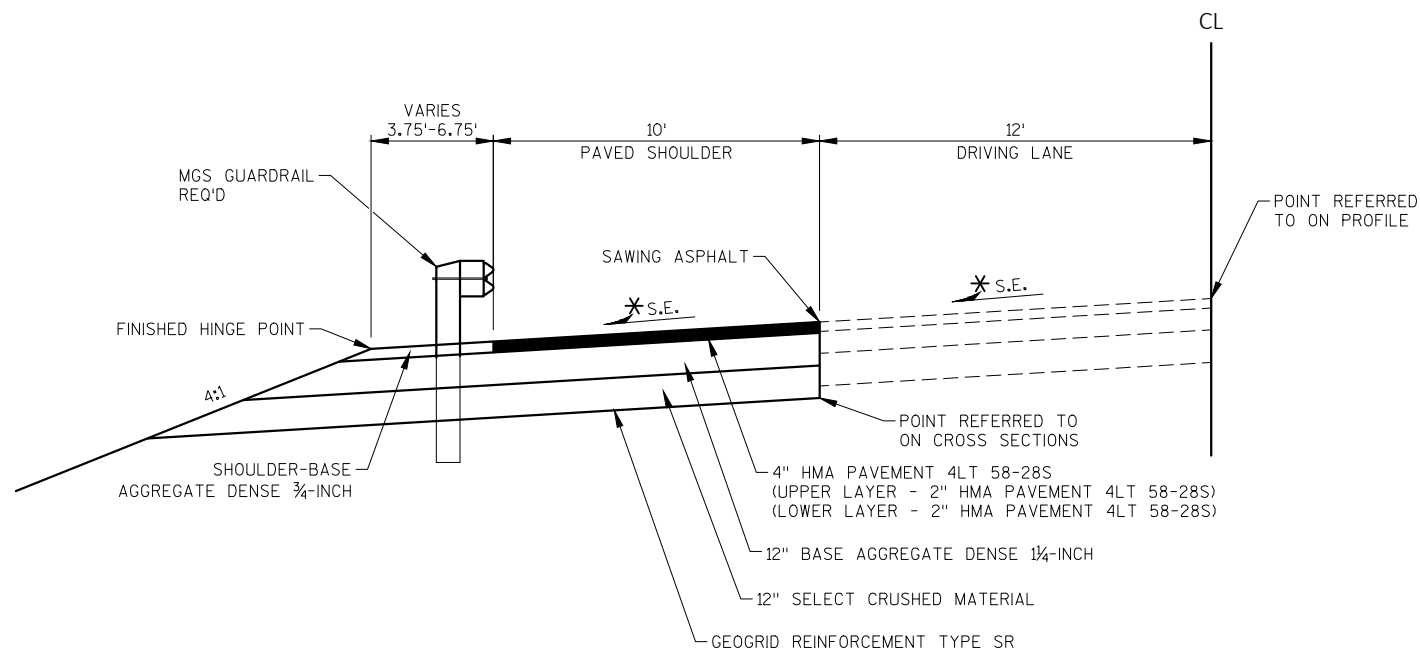
(STA. 13+07 - STA. 15+07, RT)

- ① LIMITS OF SEEDING MIXTURE NO. 40, SEEDING TEMPORARY, EROSION MAT CLASS 1 TYPE A, & FERTILIZER TYPE B (AS DIRECTED BY THE ENGINEER).
- ② LIMITS OF SALVAGED TOPSOIL (AS DIRECTED BY THE ENGINEER)

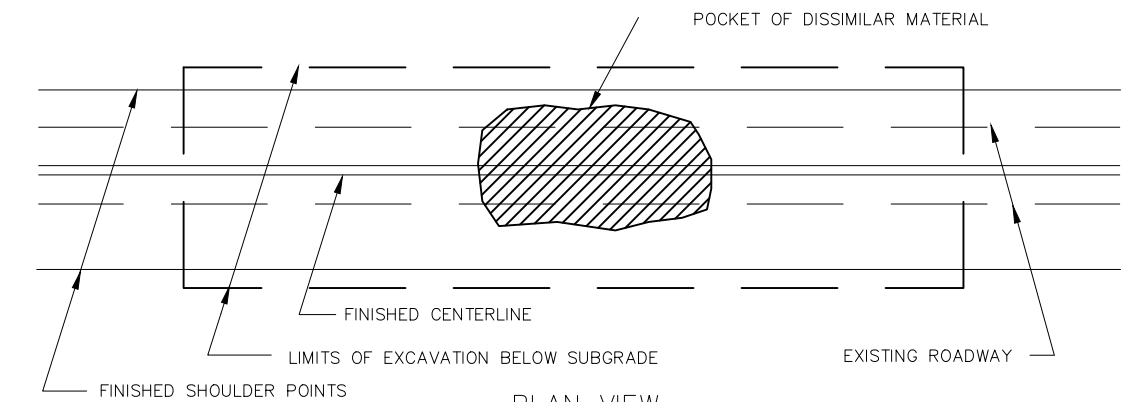


		BEAMGUARD LAYOUT TABLE				
		STATION				
QUADRANT	LOCATION	①	②	③	④	⑤
NORTHWEST	MAINLINE, LT.	13+20	12+37	11+84	10+46	10+08
NORTHEAST	MAINLINE, RT.	15+10	14+10	13+57	10+46	10+08

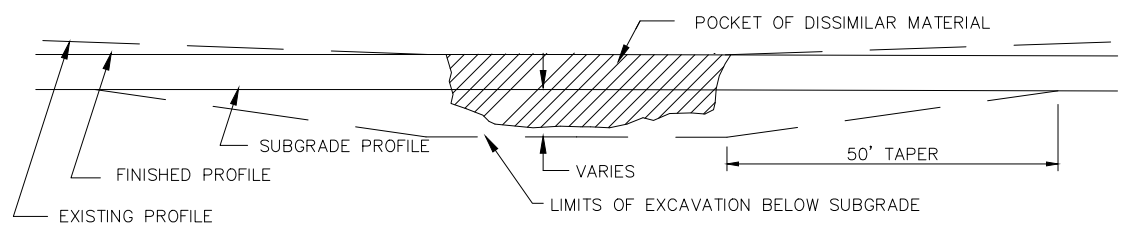
BEAMGUARD LAYOUT DETAIL



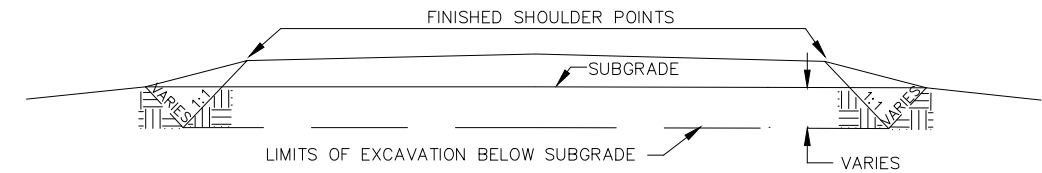
SECTION A-A



PLAN VIEW



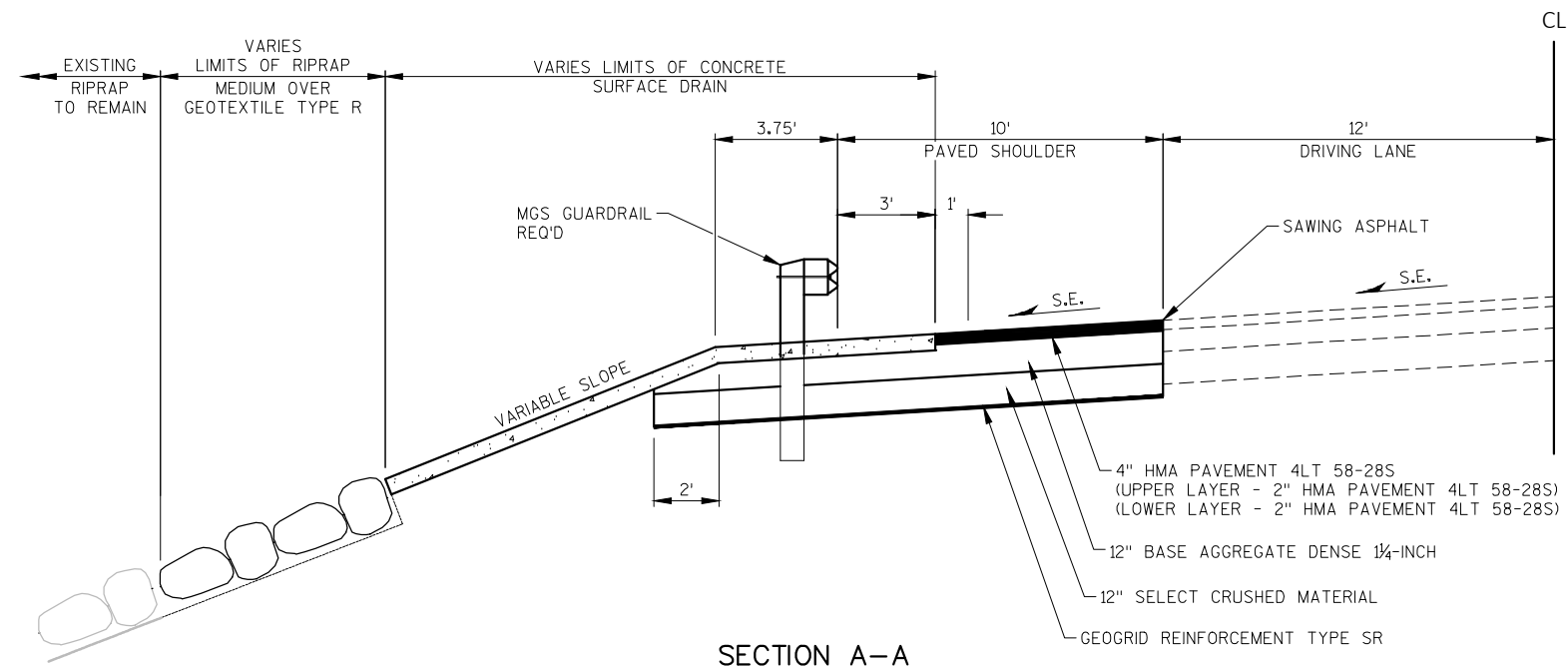
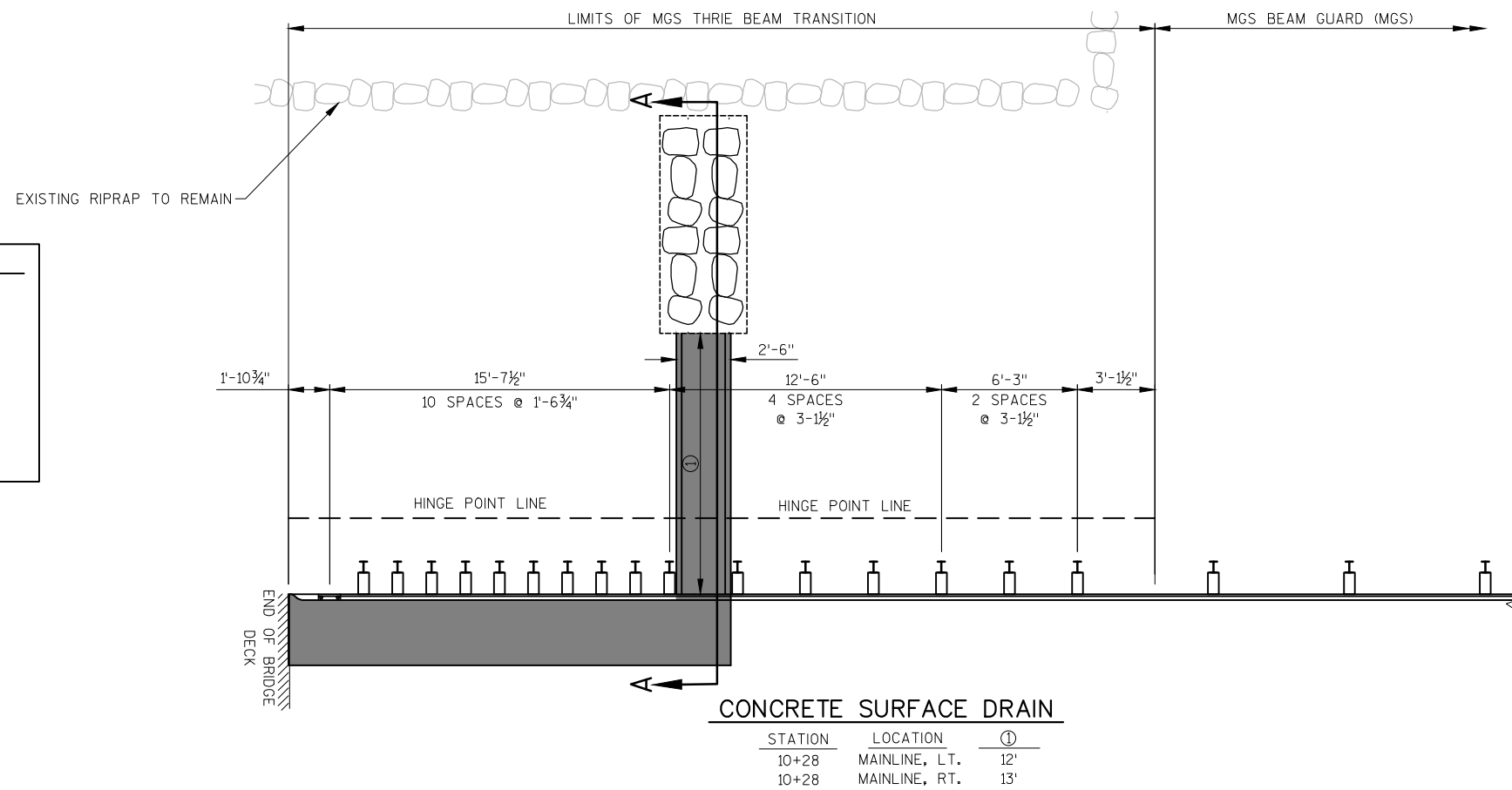
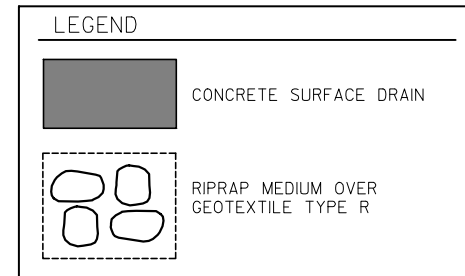
PROFILE VIEW

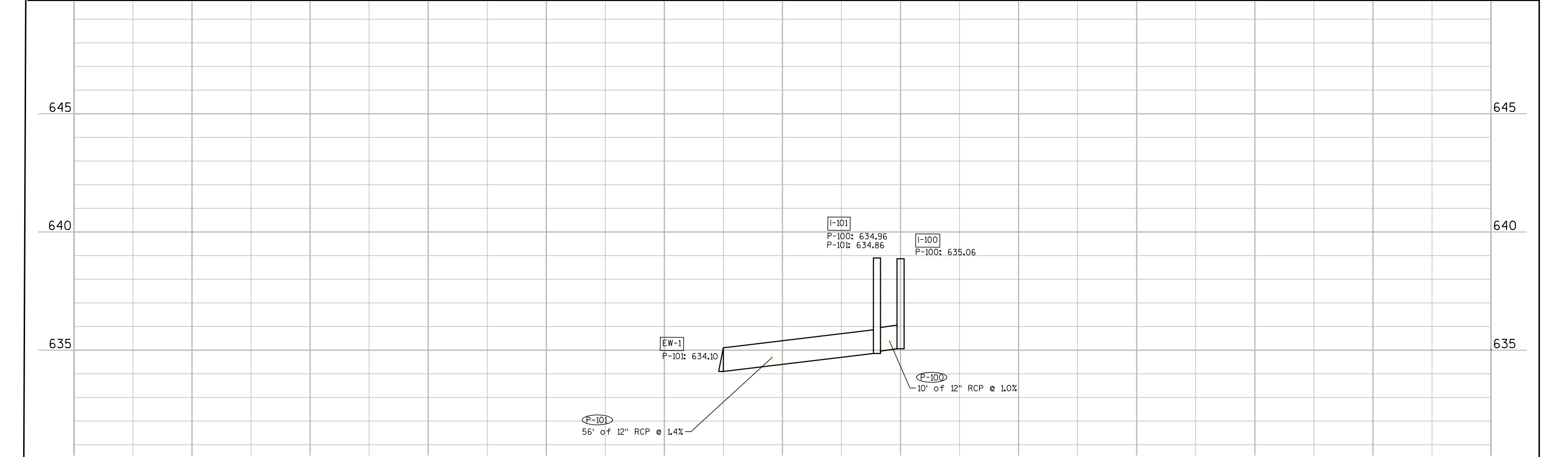
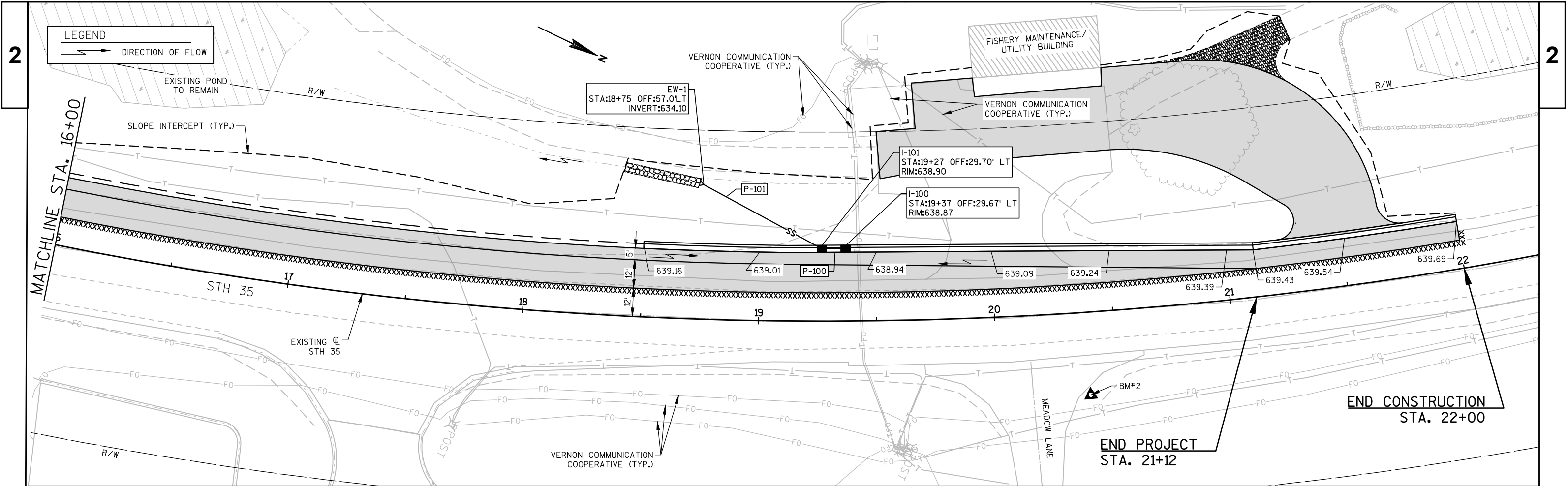


CROSS SECTION VIEW

1. EXACT LOCATION OF E.B.S. (EXCAVATION BELOW SUBGRADE) SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.
2. E.B.S. AREA TO BE BACKFILLED WITH MATERIAL ACCEPTABLE TO THE ENGINEER. BACKFILL MUST BE HOMOGENEOUS WITH ADJOINING FILL MATERIAL.
3. THE FILL SECTION WITHIN 100' OF THE MOUTH OF THE CUT MUST BE KEPT 2' BELOW SUBGRADE UNTIL E.B.S. IS COMPLETED. LATERAL LIMITS OF EXCAVATION SHALL BE THE SUBGRADE SHOULDER POINTS.

EXCAVATION BELOW SUBGRADE (E.B.S.)





PROJECT NO: 5160-01-70

HWY: STH 35

COUNTY: VERNON

STORM SEWER PLAN

SHEET

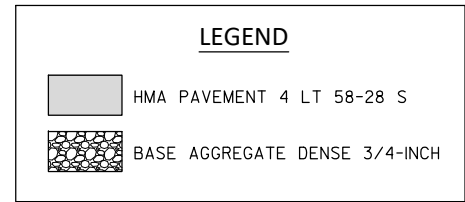
E

FILE NAME : S:\PROJECTS\U18060-U18061 USFWS GENOA NFH GUARDRAIL\SHEETSPLAN\DETAILS\U18060_STORM SEWER.DWG
LAYOUT :

PLOT DATE : 3/18/2019
PLOT TIME : 9:36:15 AM

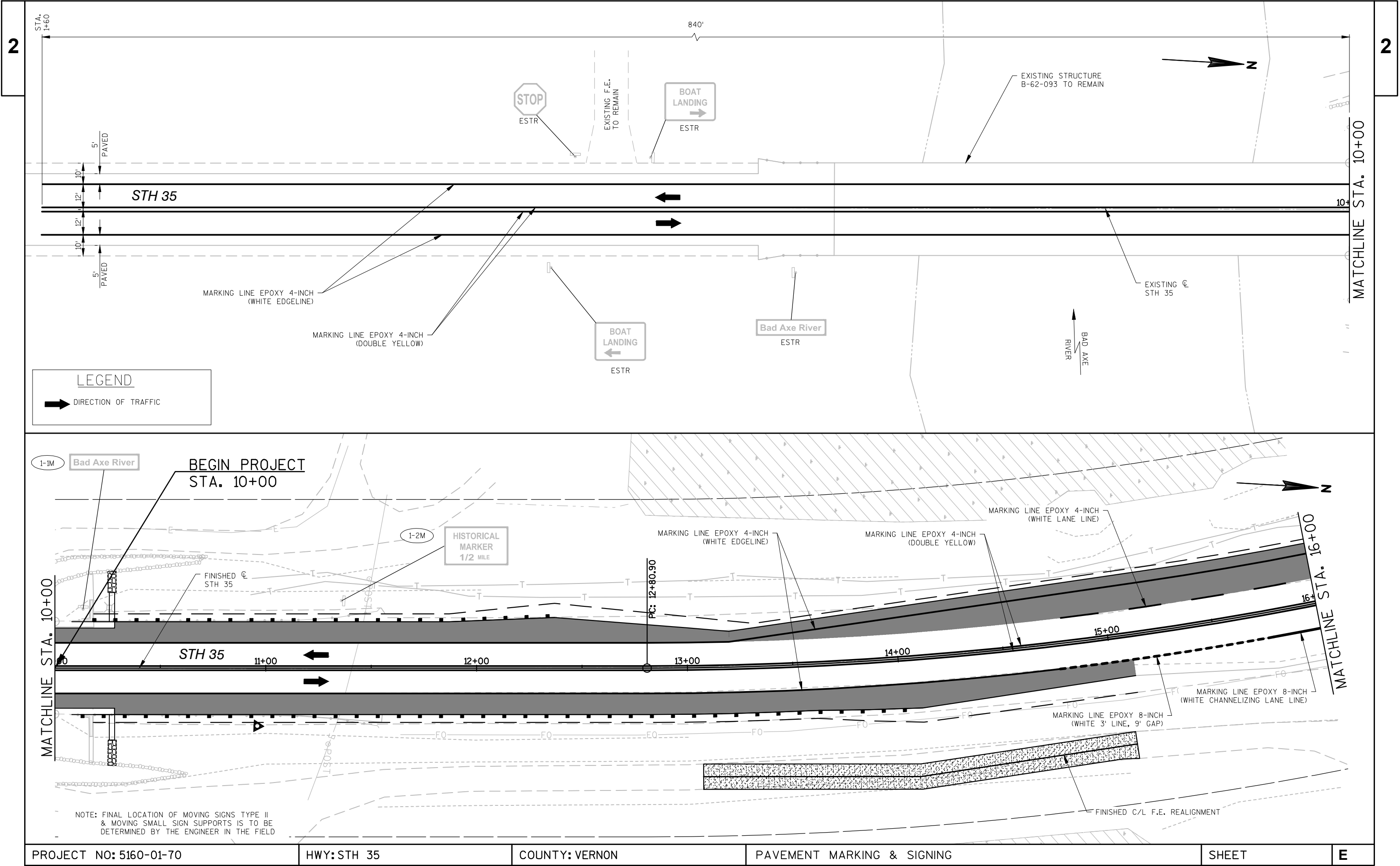
PLOT BY : JONAH DRAKE

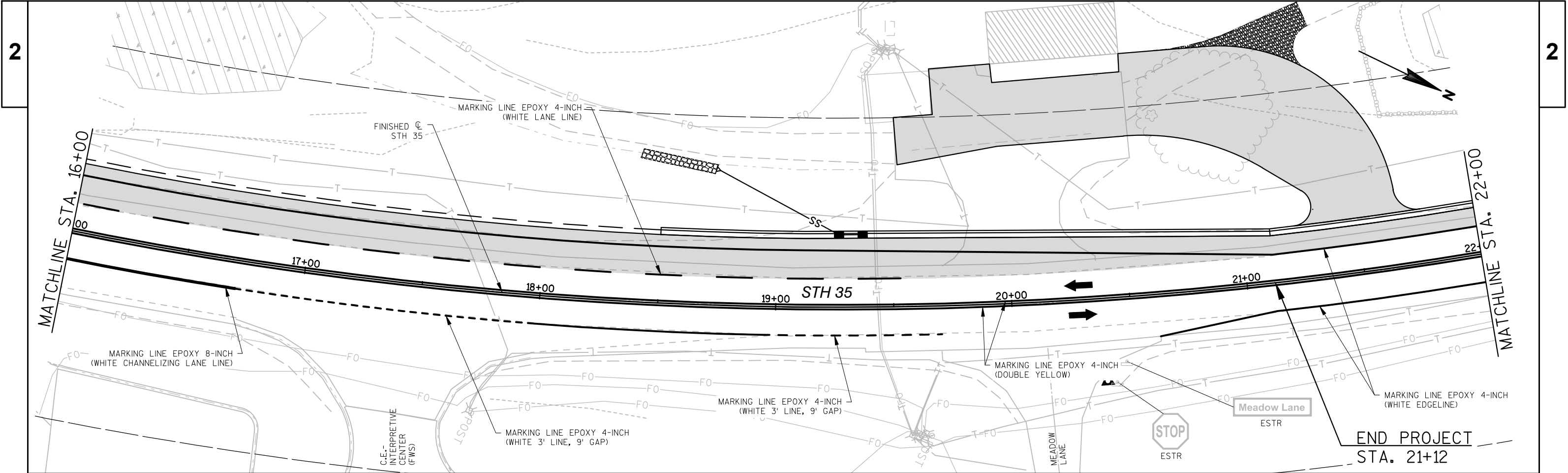
PLOT SCALE : 1" = 1'



POINT LAYOUT TABLE			
NO.	Y	X	ELEV.
30	137,568.30	615,129.71	--
31	137,557.52	615,109.80	--
32	137,571.49	615,101.61	--
33	137,561.25	615,084.02	--
34	137,585.41	615,068.84	--
35	137,634.09	615,043.98	--
36	137,655.31	615,029.81	--
37	137,665.43	615,021.24	--
38	137,668.26	615,011.30	--
39	137,680.13	614,996.55	--
40	137,703.06	615,009.72	--
41	137,718.72	615,007.04	--
42	137,753.04	615,027.25	--
43	137,771.35	615,048.57	--

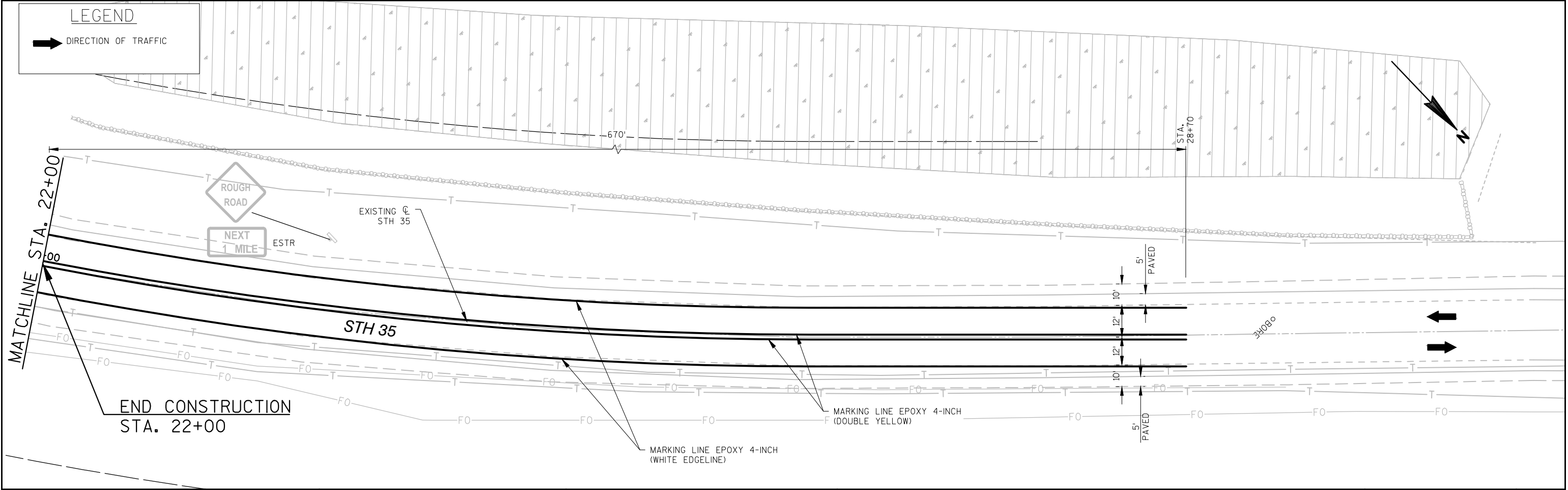




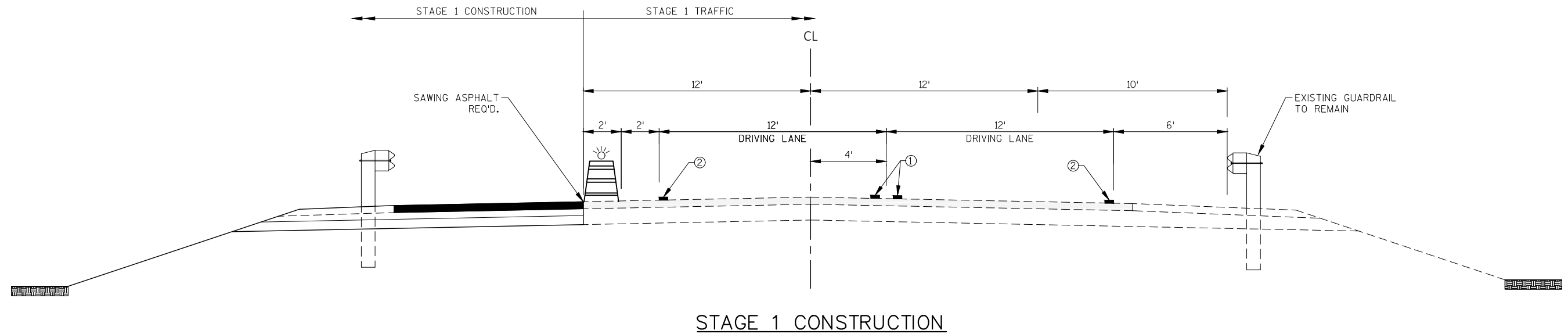


LEGEND

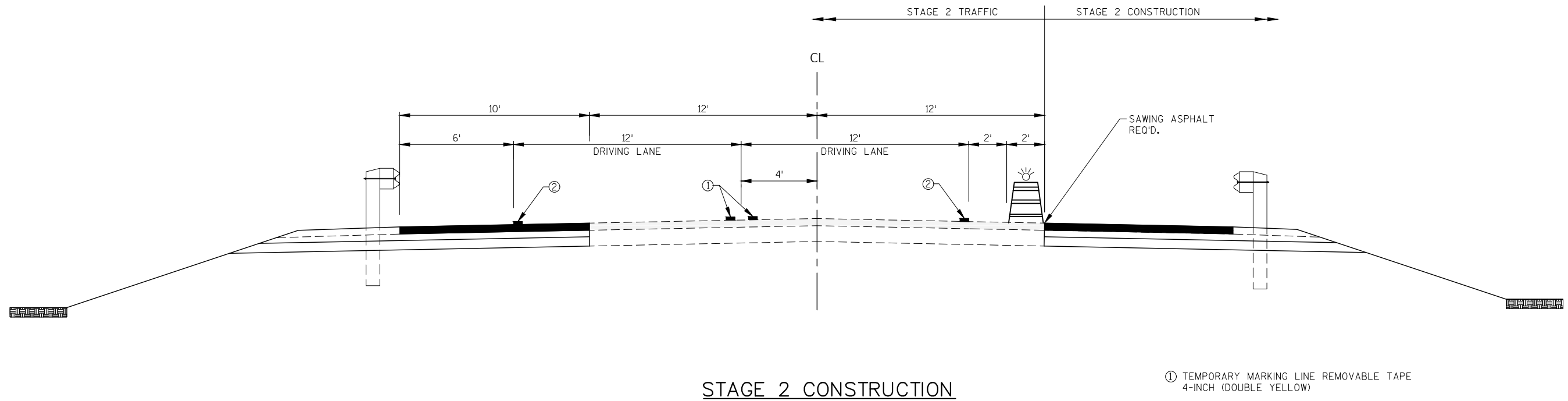
➔ DIRECTION OF TRAFFIC



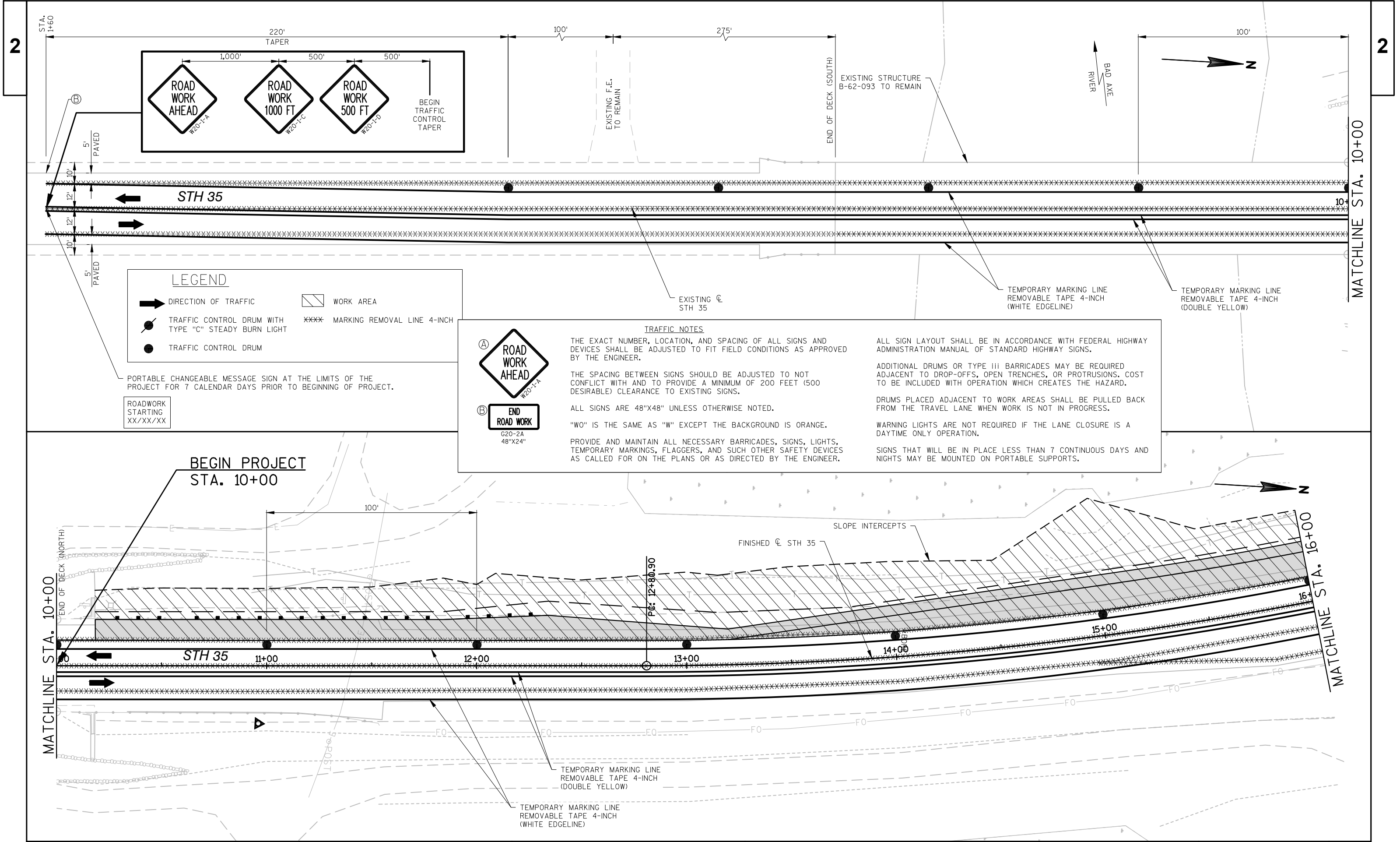
PROJECT NO: 5160-01-70	HWY: STH 35	COUNTY: VERNON	PAVEMENT MARKING & SIGNING	SHEET	E
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- ① TEMPORARY MARKING LINE REMOVABLE TAPE
4-INCH (DOUBLE YELLOW)
- ② TEMPORARY MARKING LINE REMOVABLE TAPE
4-INCH (WHITE EDGE LINE)



- ① TEMPORARY MARKING LINE REMOVABLE TAPE
4-INCH (DOUBLE YELLOW)
- ② TEMPORARY MARKING LINE REMOVABLE TAPE
4-INCH (WHITE EDGE LINE)



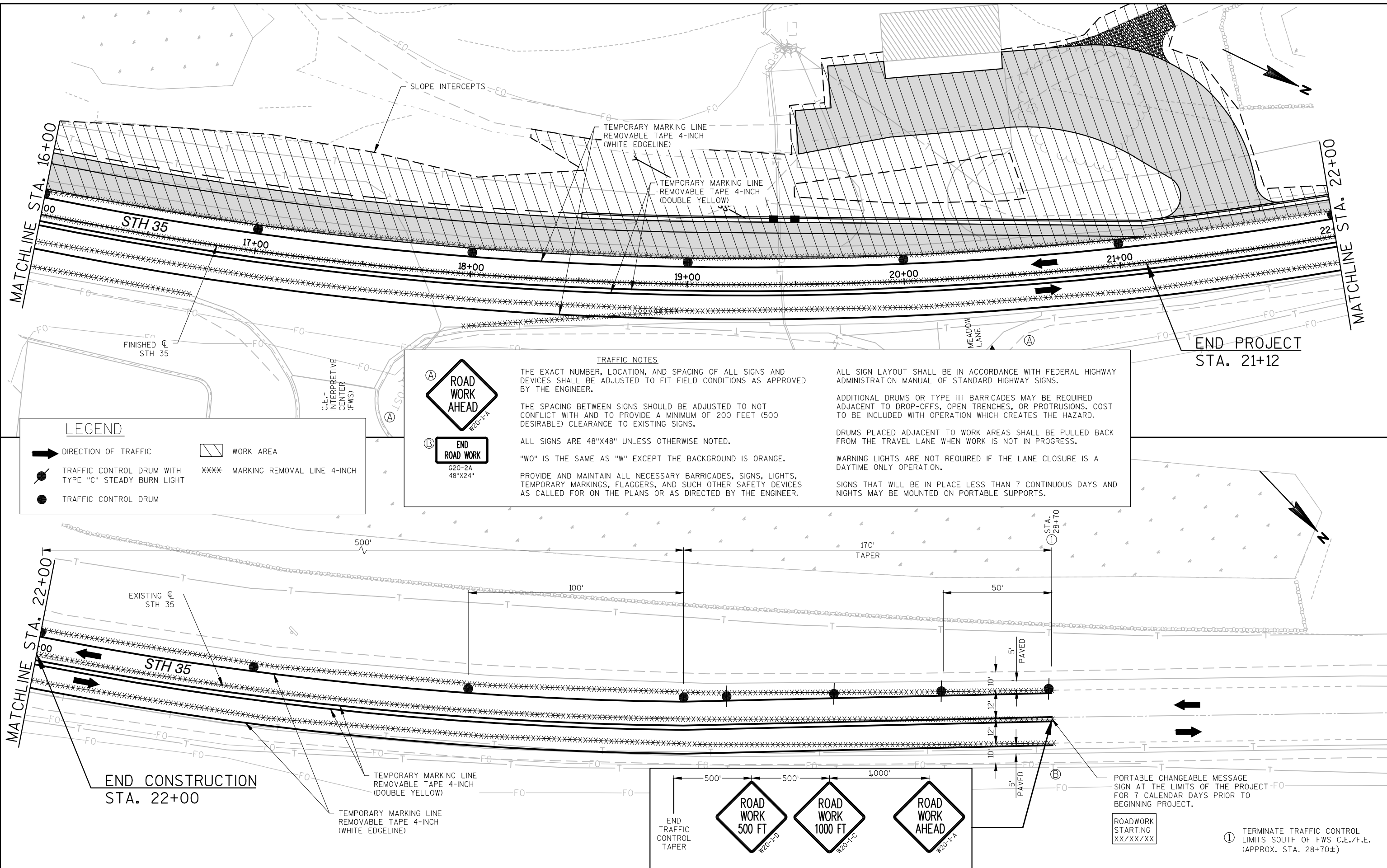
PROJECT NO: 5160-01-70	HWY: STH 35	COUNTY: VERNON	TRAFFIC CONTROL - STAGE 1	SHEET	E
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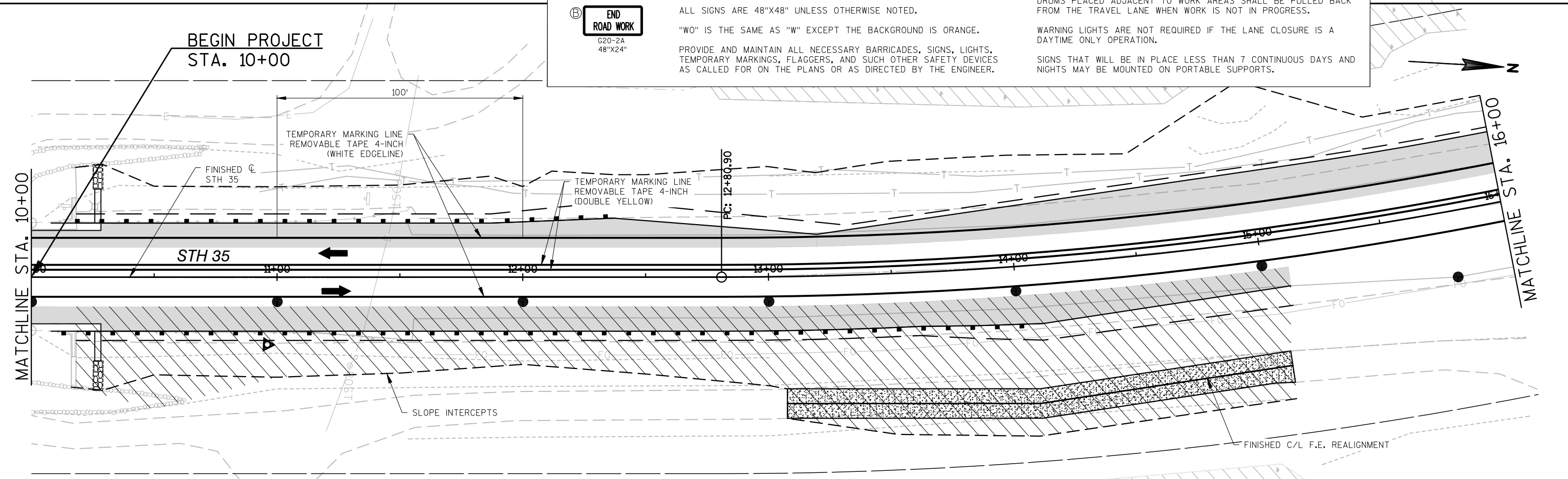
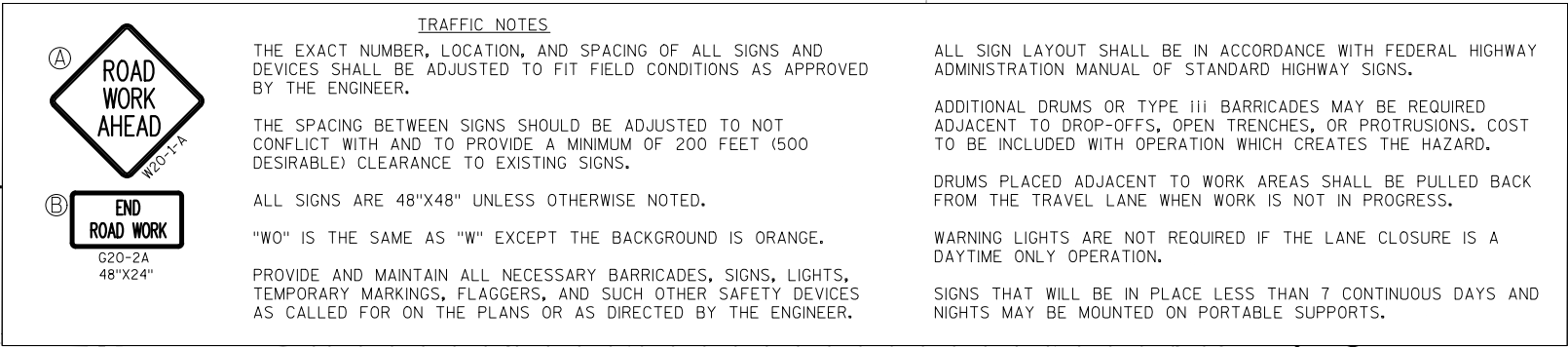
FILE NAME : S:\PROJECTS\U18060-U18061 USFWS GENOA NFH GUARDRAIL\SHEETSPLAN\DETAILS\TRAFFIC CONTROL - STAGE 1.DWG
LAYOUT : LAYOUT

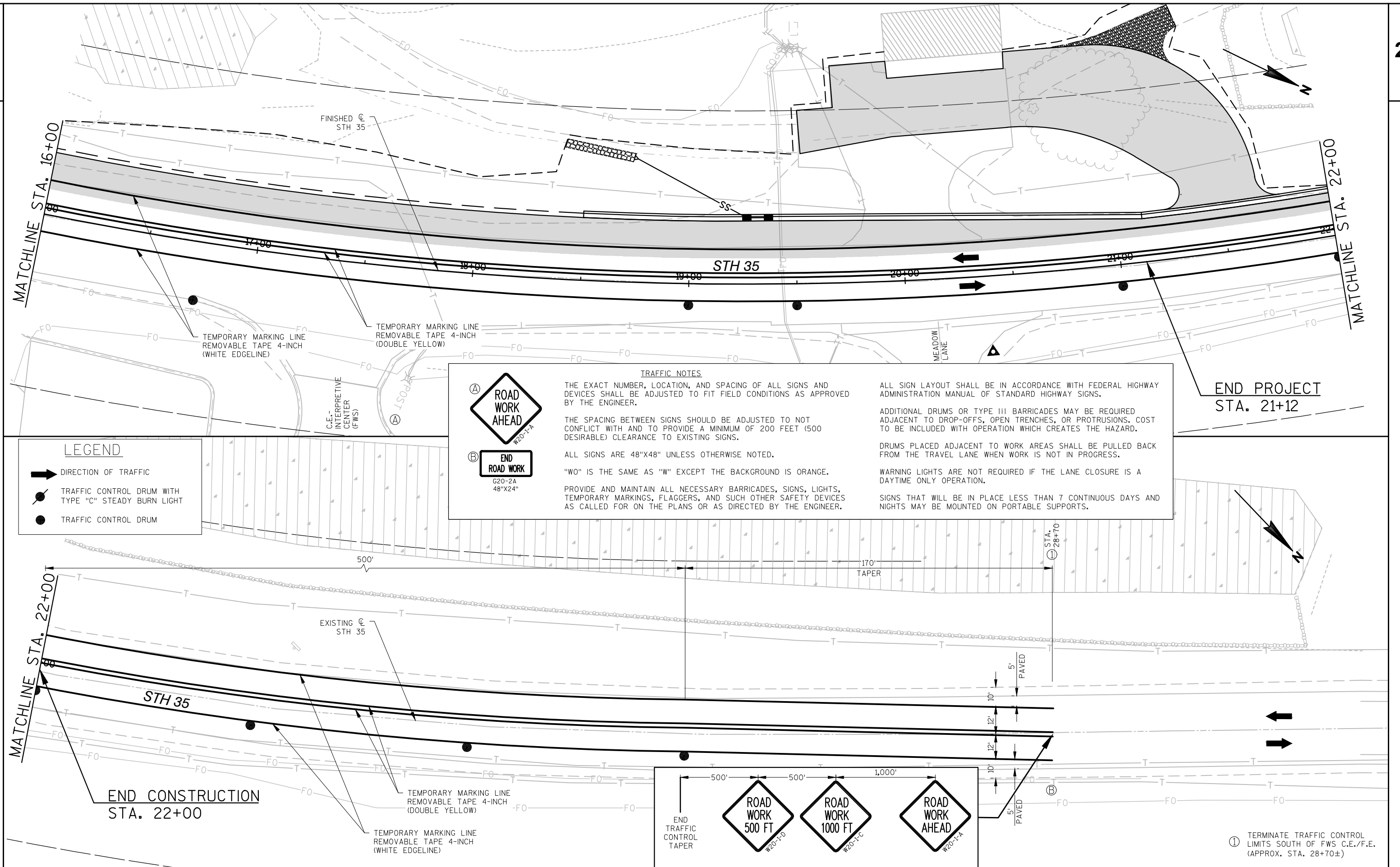
PLOT DATE : 1/24/2019
PLOT TIME : 3:09:55 PM

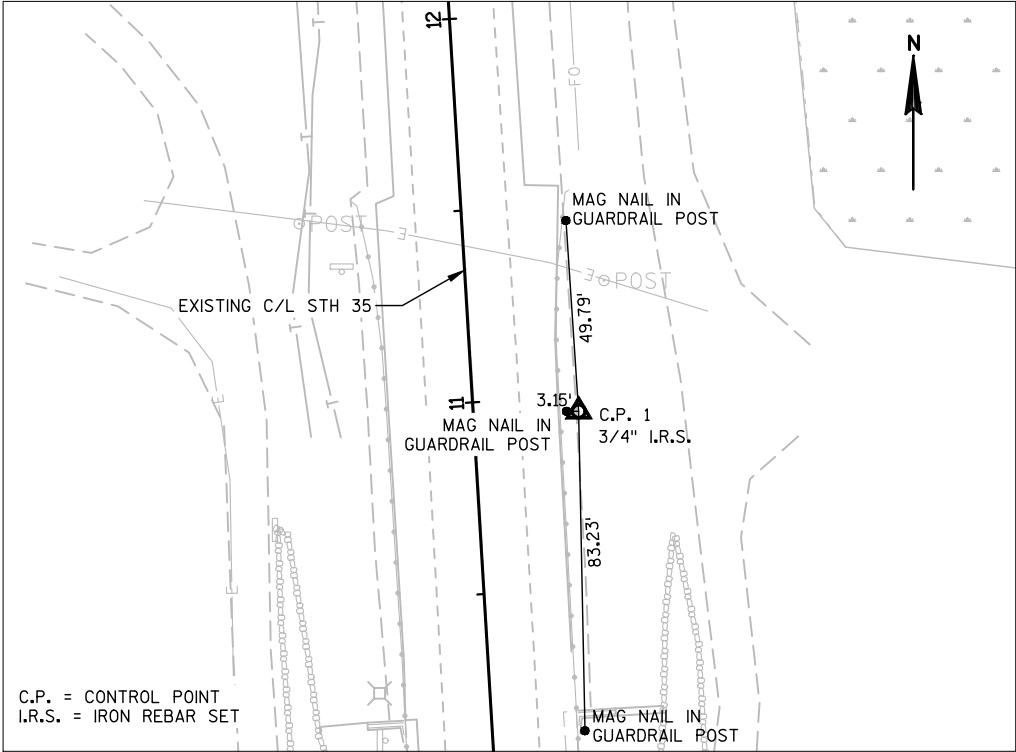
PLOT BY : JONAH DRAKE

PLOT SCALE : 1" = 1'

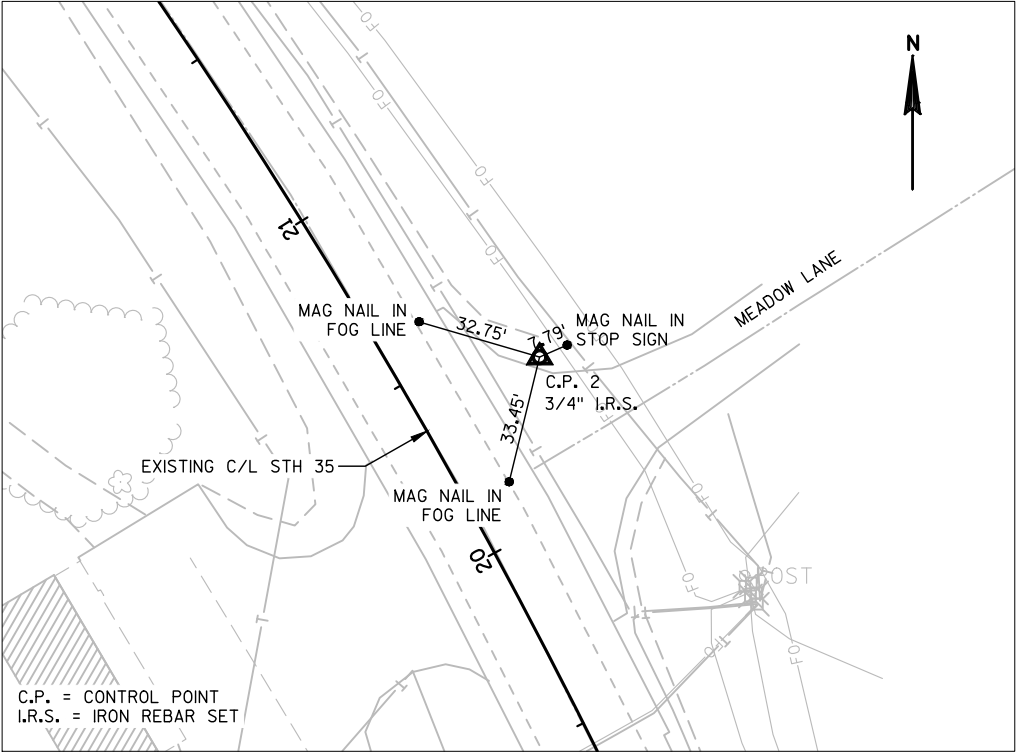




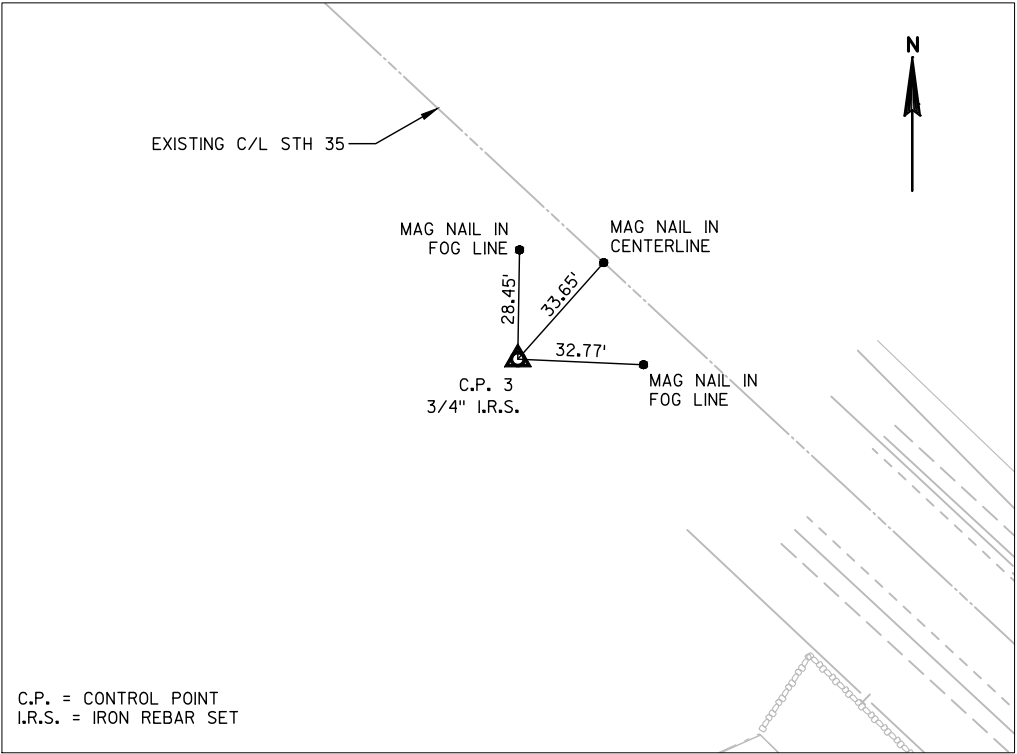




TIES TO C.P.#1
STA. 10+96.02; 27.43' RT.
Y = 136,771.44
X = 615,393.91



TIES TO C.P.#2
STA. 20+38.46; 35.0' RT.
Y = 137,691.38
X = 615,171.41



TIES TO C.P.#3
STA. 28+95.18; 33.6' LT.
Y = 138,283.44
X = 614,547.54

Estimate Of Quantities

5160-01-70

Line	Item	Item Description	Unit	Total	Qty
0002	201.0120	Clearing	ID	26.000	26.000
0004	201.0220	Grubbing	ID	26.000	26.000
0006	204.0165	Removing Guardrail	LF	294.000	294.000
0008	204.0190	Removing Surface Drains	EACH	2.000	2.000
0010	205.0100	Excavation Common	CY	2,900.000	2,900.000
0012	213.0100	Finishing Roadway (project) 01. 5160-01-70	EACH	1.000	1.000
0014	305.0110	Base Aggregate Dense 3/4-Inch	TON	610.000	610.000
0016	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	2,470.000	2,470.000
0018	312.0110	Select Crushed Material	TON	2,780.000	2,780.000
0020	416.1010	Concrete Surface Drains	CY	6.000	6.000
0022	455.0605	Tack Coat	GAL	125.000	125.000
0024	460.2000	Incentive Density HMA Pavement	DOL	450.000	450.000
0026	460.5224	HMA Pavement 4 LT 58-28 S	TON	690.000	690.000
0028	522.1012	Apron Endwalls for Culvert Pipe Reinforced Concrete 12-Inch	EACH	1.000	1.000
0030	601.0557	Concrete Curb & Gutter 6-Inch Sloped 36-Inch Type D	LF	345.000	345.000
0032	606.0200	Riprap Medium	CY	16.000	16.000
0034	608.0312	Storm Sewer Pipe Reinforced Concrete Class III 12-Inch	LF	66.000	66.000
0036	611.0636	Inlet Covers Type HM-S	EACH	2.000	2.000
0038	611.3230	Inlets 2x3-FT	EACH	2.000	2.000
0040	614.2300	MGS Guardrail 3	LF	451.000	451.000
0042	614.2500	MGS Thrie Beam Transition	LF	80.000	80.000
0044	614.2610	MGS Guardrail Terminal EAT	EACH	2.000	2.000
0046	618.0100	Maintenance And Repair of Haul Roads (project) 01. 5160-01-70	EACH	1.000	1.000
0048	619.1000	Mobilization	EACH	1.000	1.000
0050	624.0100	Water	MGAL	45.000	45.000
0052	625.0500	Salvaged Topsoil	SY	2,350.000	2,350.000
0054	628.1504	Silt Fence	LF	2,330.000	2,330.000
0056	628.1520	Silt Fence Maintenance	LF	4,660.000	4,660.000
0058	628.1905	Mobilizations Erosion Control	EACH	4.000	4.000
0060	628.1910	Mobilizations Emergency Erosion Control	EACH	2.000	2.000
0062	628.2002	Erosion Mat Class I Type A	SY	5,580.000	5,580.000
0064	628.7005	Inlet Protection Type A	EACH	2.000	2.000
0066	628.7015	Inlet Protection Type C	EACH	2.000	2.000
0068	628.7504	Temporary Ditch Checks	LF	30.000	30.000
0070	629.0210	Fertilizer Type B	CWT	4.000	4.000
0072	630.0140	Seeding Mixture No. 40	LB	100.000	100.000
0074	630.0200	Seeding Temporary	LB	50.000	50.000

Estimate Of Quantities

5160-01-70

Line	Item	Item Description	Unit	Total	Qty
0076	633.5200	Markers Culvert End	EACH	1.000	1.000
0078	638.2102	Moving Signs Type II	EACH	2.000	2.000
0080	638.4000	Moving Small Sign Supports	EACH	2.000	2.000
0082	642.5001	Field Office Type B	EACH	1.000	1.000
0084	643.0300	Traffic Control Drums	DAY	1,250.000	1,250.000
0086	643.0715	Traffic Control Warning Lights Type C	DAY	210.000	210.000
0088	643.0900	Traffic Control Signs	DAY	430.000	430.000
0090	643.1050	Traffic Control Signs PCMS	DAY	14.000	14.000
0092	643.5000	Traffic Control	EACH	1.000	1.000
0094	645.0130	Geotextile Type R	SY	54.000	54.000
0096	645.0220	Geogrid Type SR	SY	4,740.000	4,740.000
0098	646.1020	Marking Line Epoxy 4-Inch	LF	13,085.000	13,085.000
0100	646.3020	Marking Line Epoxy 8-Inch	LF	126.000	126.000
0102	646.9000	Marking Removal Line 4-Inch	LF	9,450.000	9,450.000
0104	648.0100	Locating No-Passing Zones	MI	0.230	0.230
0106	649.0150	Temporary Marking Line Removable Tape 4-Inch	LF	21,680.000	21,680.000
0108	650.4000	Construction Staking Storm Sewer	EACH	3.000	3.000
0110	650.4500	Construction Staking Subgrade	LF	1,200.000	1,200.000
0112	650.5000	Construction Staking Base	LF	1,200.000	1,200.000
0114	650.5500	Construction Staking Curb Gutter and Curb & Gutter	LF	345.000	345.000
0116	650.9910	Construction Staking Supplemental Control (project) 01. 5160-01-70	LS	1.000	1.000
0118	650.9920	Construction Staking Slope Stakes	LF	1,200.000	1,200.000
0120	690.0150	Sawing Asphalt	LF	1,720.000	1,720.000
0122	SPV.0105	Special 01. Construction Staking Driveway Layout	LS	1.000	1.000

CLEARING & GRUBBING				REMOVING GUARDRAIL					
STATION	LOCATION	201.0120	201.0220	STATION - STATION	LOCATION	204.0165		SUBTOTALS =	TOTAL =
		(ID)	(ID)			STAGE 1	STAGE 2		
20+91	MAINLINE, LT.	STAGE 1	STAGE 1	10+08 - 11+54	MAINLINE, LT.	147	-	147	
		26	26	10+08 - 11+54	MAINLINE, RT.	-	147		
TOTAL =		26	26			147	147		
						147	147		
						294			

REMOVING SURFACE DRAINS						204.0190	
STATION - STATION	LOCATION	204.0190		STATION - STATION	LOCATION	(EACH)	
		STAGE 1	STAGE 2			STAGE 1	STAGE 2
10+00 - 10+18	MAINLINE, LT.	1	-	10+00 - 10+18	MAINLINE, LT.	-	1
10+00 - 10+18	MAINLINE, RT.	-	1				
SUBTOTALS =		1	1				
TOTAL =		2					

EARTHWORK SUMMARY													
STATION - STATION	LOCATION	205.0100 COMMON EXCAVATION		AVAILABLE MATERIAL (CY) (1)		UNEXPANDED FILL (CY)		EXPANDED FILL (CY) FACTOR 1.25 (2)		MASS ORDINATE +/- (CY) (3)		WASTE (CY)	
		CUT (CY)								STAGE 1	STAGE 2		
		STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2
10+08 - 22+00	MAINLINE, LT.	1920	-	1920	-	233	-	293	-	1627	-	1627	-
10+08 - 15+10	MAINLINE, RT.	-	740	-	740	-	137	-	170	-	570	-	570
21+49	MAINLINE, LT. - C.E.	240	-	240	-	15	-	20	-	220	-	220	-
SUBTOTALS =		2160	740	2160	740	248	137	313	170	1847	570	1847	570
TOTALS =		2900		2900		385		483		2417		2417	
NOTES:													
1.) AVAILABLE MATERIAL = CUT													
2.) EXPANDED FILL FACTOR 1.25: EXPANDED FILL = (UNEXPANDED FILL)*1.25													
3.) THE MASS ORDINATE+ OR - QTY CALCULATED FOR THE DIVISION. PLUS QUANTITY INDICATES AN EXCESS OF MATERIAL WITHIN THE CATEGORY. MINUS INDICATES A SHORTAGE OF MATERIAL WITHIN THE CATEGORY.													

BASE AGGREGATE DENSE / SELECT CRUSHED MATERIAL									
STATION - STATION	LOCATION	305.0110		305.0120		312.0110		645.0220	
		BASE AGGREGATE DENSE 3/4-INCH		BASE AGGREGATE DENSE 1 1/4-INCH		SELECT CRUSHED MATERIAL		GEOGRID TYPE SR	
		STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2
10+08 - 18+50	MAINLINE, LT.	81	-	-	-	-	-	-	-
10+00 - 22+00	MAINLINE, RT.	-	-	1679	-	1853	-	3143	-
10+00 - 15+10	MAINLINE, RT.	-	68	-	658	-	779	-	1336
13+07 - 15+07	MAINLINE, RT. - FE	-	97	-	-	-	-	-	-
21+49	MAINLINE, LT. - CE	329	-	-	-	-	-	-	-
-	UNDISTRIBUTED	25	10	91	42	107	41	187	74
SUBTOTALS =		435	175	1770	700	1960	820	3330	1410
TOTALS =		610		2470		2780		4740	

CONCRETE SURFACE DRAINS					
STATION - STATION	LOCATION	416.1010		SUBTOTALS =	TOTAL =
		STAGE 1	STAGE 2		
10+00 - 10+28	MAINLINE, LT.	3	-		
10+00 - 10+28	MAINLINE, RT.	-	3		
		3	3		
		6			

HMA PAVEMENT					
STATION - STATION	LOCATION	455.0605		460.5224	
		TACK COAT		HMA PAVEMENT	
		STAGE 1	STAGE 2	STAGE 1	STAGE 2
10+00 - 22+00	MAINLINE, LT.	88	-	401	-
10+00 - 15+10	MAINLINE, RT.	-	28	-	126
21+49	MAINLINE, LT. - C.E.	-	-	127	-
-	UNDISTRIBUTED	7	2	28	8
SUBTOTALS =		95	30	556	134
TOTALS =		125		690	

STORM SEWER STRUCTURES											
STRUCTURE NUMBER	STATION	LOCATION	RIM ELEVATION (FT)	522.1012	611.0636	611.3230	STRUCTURE DEPTH (FT)	628.7005	628.7015	650.4000	633.5200
				APRON ENDWALLS FOR	INLET	INLETS		INLET	INLET	CONSTRUCTION	CULVERT
				CULVERT PIPE REINFORCED	COVERS			PROTECTION	PROTECTION	STAKING	MARKERS
				CONCRETE 12-INCH	TYPE HM-S	2X3-FT		TYPE A	TYPE C	STORM SEWER	END
				(EACH)	(EACH)	(EACH)					(EACH)
				STAGE 1	STAGE 1	STAGE 1					STAGE 1
I-100	19+37	29.67' LT.	638.87	-	1	1	2.81	1	1	1	-
I-101	19+27	29.70' LT.	638.90	-	1	1	3.04	1	1	1	-
EW-1	18+75	57.0' LT.	-	1	-	-	-	-	-	1	1
TOTALS =				1	2	2		2	2	3	1
NOTES: STATION AND OFFSET OF STORM SEWER STRUCTURES WITH INLET COVERS TYPE HM-S ARE MEASURED TO THE FLANGE OF INLET. ALL RIM ELEVATIONS FOR STORM SEWER STRUCTURES WITH INLET COVERS TYPE HM-S ARE MEASURED TO THE FLANGE OF INLET STRUCTURE DEPTH (INLETS 2X3-FT) = RIM ELEVATION - INVERT LOWEST PIPE- 6 INCHES (RINGS) - 6 INCHES (CASTING HEIGHT).											

CONCRETE CURB & GUTTER			
STATION-STATION	LOCATION	601.0557	
		CONCRETE CURB & GUTTER 6-INCH SLOPED 36-INCH TYPE D	
		STAGE 1	STAGE 1
18+50 - 22+00	MAINLINE, LT.	345	345
TOTALS =		345	345

3

3

RIPRAP MEDIUM & GEOTEXTILE TYPE R										STORM SEWER PIPE									
606.0200 RIPRAP MEDIUM (CY) 645.0130 GEOTEXTILE TYPE R (SY)										608.0312 12-INCH (LF) STAGE 1 INFORMATIONAL PURPOSES ONLY JOINT TIES (EACH)									
STATION - STATION	LOCATION	STAGE 1	STAGE 2	STAGE 1	STAGE 2					PIPE NUMBER	FROM STRUCTURE	TO STRUCTURE	INLET ELEVATION (FT)	DISCHARGE ELEVATION (FT)	% SLOPE				
10+18	MAINLINE, LT.	3	-	10	-					P-100	I-100	I-101	635.06	634.96	1.0				
10+18	MAINLINE, RT.	-	3	-	12					P-101	I-101	EW-1	634.86	634.10	1.4				
18+75	MAINLINE, LT.	8	-	28	-														
-	UNDISTRIBUTED	1	1	2	2														
SUBTOTALS =		12	4	40	14					TOTALS = 66									
TOTALS=		16		54						NOTES: PIPE LENGTHS ARE MEASURED FROM CENTER OF STRUCTURES.									

MGS GUARDRAIL										WATER									
614.2300 MGS GUARDRAIL 3 (LF) 614.2500 MGS THRIE BREAM TRANSITION (LF) 614.2610 MGS GUARDRAIL TERMINAL EAT (EACH)										624.0100 (MGAL) LOCATION PROJECT STAGE 1 32 STAGE 2 13									
STATION - STATION	LOCATION	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2										
10+08 - 12+37	MAINLINE, LT.	138	-	40	-	1	-												
10+08 - 14+11	MAINLINE, RT.	-	313	-	40	-	1												
SUBTOTALS =		138	313	40	40	1	1												
TOTALS=		451		80		2													

FINISHING ITEMS												SILT FENCE				MOBILIZATION EROSION CONTROL				
625.0500 SALVAGED TOPSOIL (SY) 628.2002 EROSION MAT CLASS I TYPE A (SY) 629.0210 FERTILIZER TYPE B (CWT) 630.0140 SEEDING MIXTURE NO. 40 (LB) 630.0200 SEEDING TEMPORARY (LB)												628.1504 SILT FENCE (LF) 628.1520 SILT FENCE MAINTENANCE (LF)				628.1905 MOBILIZATION EROSION CONTROL (EACH) 628.1910 MOBILIZATION EROSION CONTROL (EACH)				
STATION - STATION	LOCATION	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STATION - STATION	LOCATION	STAGE 1	STAGE 2	STAGE 1	STAGE 2	PROJECT		
10+08 - 22+00	MAINLINE, LT.	1267	-	2945	-	1.8	-	53	-	27	-	10+00 - 18+50	MAINLINE, LT.	865	-	1730	-	5160-01-70	4	2
10+08 - 15+10	MAINLINE, RT.	-	508	-	1256	-	0.8	-	23	-	12	10+00 - 15+10	MAINLINE, RT.	-	510	-	1020			
21+49	MAINLINE, LT. - C.E.	110	-	263	-	0.2	-	5	-	2	-	13+07 - 15+07	MAINLINE, RT.	-	200	-	400			
-	UNDISTRIBUTED	343	122	802	314	0.8	0.4	14	5	7	2	21+49	MAINLINE, LT.	290	-	580	-			
SUBTOTALS=		1720	630	4010	1570	2.8	1.2	72	28	36	14	SUBTOTALS =		1440	890	2880	1780	TOTALS = 4 2		
TOTALS=		2350		5580		4.0		100		50		TOTALS=		2330		4660				

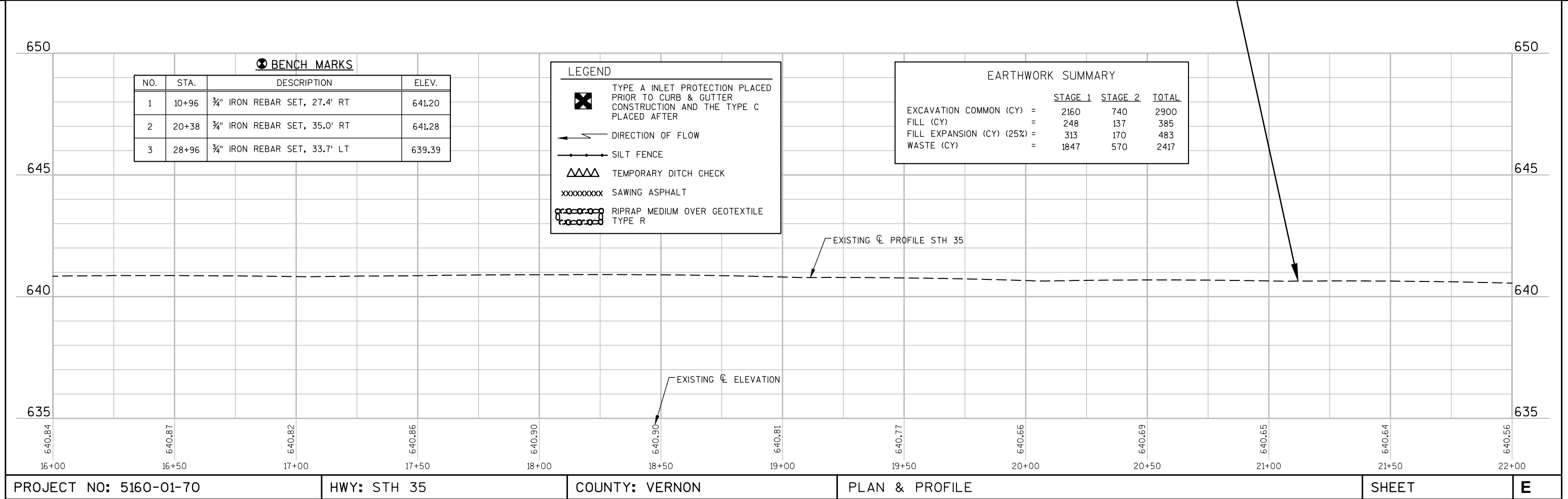
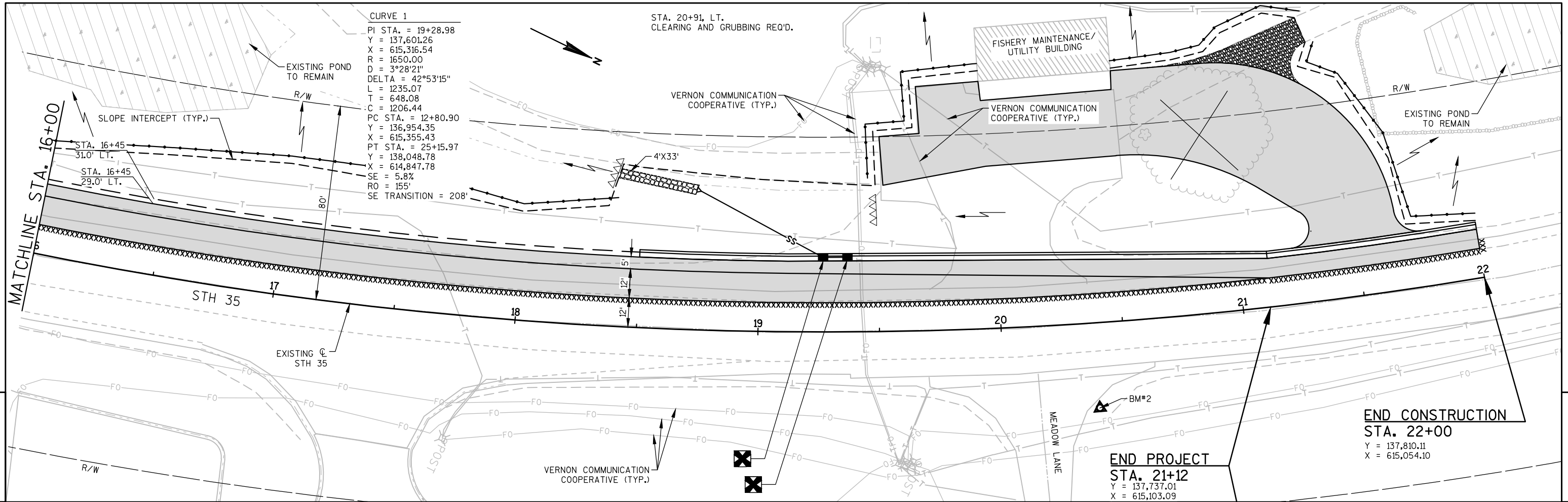
TEMPORARY DITCH CHECKS			MOVING SIGNS & SMALL SIGN SUPPORTS						TRAFFIC CONTROL									
628.7504 (LF)			638.2102 MOVING SIGNS TYPE II (EACH) 638.4000 MOVING SMALL SIGN SUPPORTS (EACH)						643.0715 WARNING LIGHTS TYPE C (DAY) 643.0900 SIGNS (DAY) 643.1050 SIGNS PCMS (DAY) 643.5000 TRAFFIC CONTROL (EACH)									
STATION	LOCATION	STAGE 1	STATION - STATION	LOCATION	SIGN NO.	DESCRIPTION	STAGE 1	STAGE 1	LOCATION	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	
18+25	MAINLINE, LT.	10	10+13	MAINLINE, LT.	1-1M	BAD AXE RIVER	1	1	MAINLINE	697	553	96	114	240	190	-	-	
19+50	MAINLINE, LT.	10	11+36	MAINLINE, LT.	1-2M	ROAD TO HISTORICAL MARKER 1/2 MILE	1	1	PROJECT	-	-	-	-	-	-	14	1	
-	UNDISTRIBUTED	10							SUBTOTALS =		697	553	96	114	240	190	14	1
TOTAL =		30	TOTALS = 2 2						TOTALS=		1250		210		430		14	1

PROJECT NO: 5160–01–70			HWY: STH 35			COUNTY: VERNON			MISCELLANEOUS QUANTITIES			SHEET		E
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PAVEMENT MARKING										TEMPORARY PAVEMENT MARKING										
			MARKING LINE																	
			646.1020	646.3020																
			EPOXY	EPOXY																
			4-INCH	8-INCH																
			(LF)	(LF)																
STATION - STATION	LOCATION	DESCRIPTION	STAGE 2	STAGE 2				STATION - STATION	LOCATION	DESCRIPTION	646.9000 MARKING REMOVAL LINE 4-INCH (LF)	STAGE 1	649.0150 TEMPORARY MARKING LINE REMOVABLE TAPE 4-INCH (LF)	STAGE 1	STAGE 2					
1+60 - 28+70	MAINLINE, LT.	WHITE EDGE LINE	2610	-				1+60 - 28+70	MAINLINE, LT.	WHITE EDGE LINE	2710	-	-							
1+60 - 14+75	MAINLINE	SB PASSING ONLY	1644	-				1+60 - 14+70	MAINLINE	SB PASSING ONLY (YELLOW)	1644	-	-							
1+60 - 14+75	MAINLINE, RT.	WHITE EDGE LINE	1315	-				1+60 - 28+70	MAINLINE, LT. & RT.	WHITE EDGE LINE	-	5420	5420							
14+75 - 15+77	MAINLINE, RT.	8" WHITE - 3' LINE, 9' GAP	-	26				1+60 - 28+70	MAINLINE, LT. & RT.	NO PASSING - DOUBLE YELLOW	-	5420	5420							
14+75 - 19+00	MAINLINE	NO PASSING - DOUBLE YELLOW	850	-				14+75 - 19+00	MAINLINE	NO PASSING - DOUBLE YELLOW	850	-	-							
15+77 - 16+77	MAINLINE, RT.	WHITE CHANNELIZING LANE	-	100				19+00 - 28+70	MAINLINE	NB PASSING ONLY (YELLOW)	1213	-	-							
16+45 - 18+95	MAINLINE, LT.	BYPASS LANE - 4" WHITE - 12.5 LINE, 37.5' GAP	63	-				1+60 - 28+70	MAINLINE, RT.	WHITE EDGE LINE	2710	-	-							
19+00 - 28+70	MAINLINE	NB PASSING ONLY	1213	-				14+95 - 16+70	MAINLINE, RT.	WHITE EDGE LINE - SKIP DASH	44	-	-							
16+77 - 17+95	MAINLINE, RT.	4" WHITE - 3' LINE, 9' GAP	30	-				14+95 - 16+70	MAINLINE, RT.	WHITE EDGE LINE - INTERSECTION	279	-	-							
17+95 - 18+95	MAINLINE, RT.	WHITE EDGE LINE	100	-				SUBTOTALS =			9450	10840	10840							
18+95 - 19+70	MAINLINE, RT.	4" WHITE - 3' LINE, 9' GAP	19	-				TOTALS=			9450	21680								
20+61 - 28+70	MAINLINE, RT.	WHITE EDGE LINE	809	-																
-	UNDISTRIBUTED*	LOCATING NO PASSING ZONE	4432	-																
TOTALS =			13085	126																
* ADDITIONAL QUANTITY FOR POSSIBLE CLOSING OF EXISTING PASSING ZONES LOCATED OUTSIDE OF PROJECT LIMITS (USE ONLY IF REQUIRED)																				

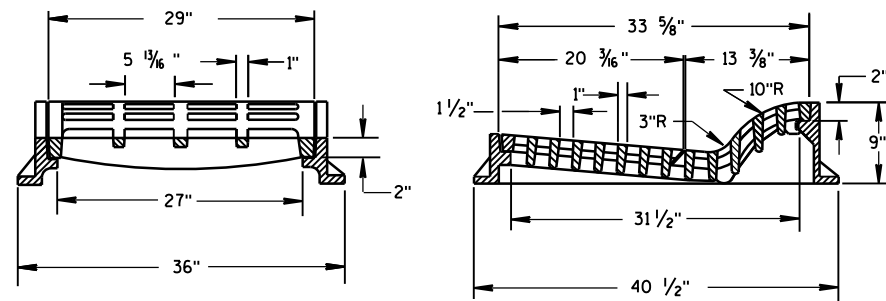
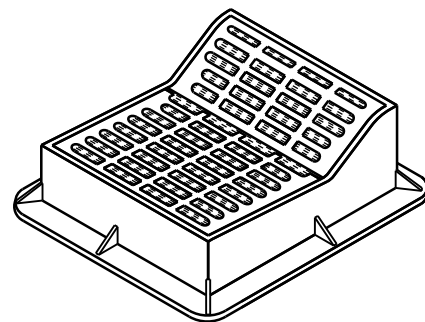
CONSTRUCTION STAKING										SAWING ASPHALT										
						650.9910														
			650.4500	650.5000	SUPPLEMENTAL	650.9920	SPV.0105.01													
			SUBGRADE	BASE	CONTROL	SLOPE	DRIVEWAY													
			(LF)	(LF)	(01. 5160-01-70)	STAKES	LAYOUT													
STATION - STATION	LOCATION									STATION - STATION	LOCATION	690.0150								
10+00 - 22+00	MAINLINE		1200	1200	1	1200	-			10+00 - 22+00	MAINLINE, LT.	1205								
21+49	MAINLINE, LT. - C.E.		-	-	-	-	1			10+00 - 15+10	MAINLINE, RT.	515								
TOTALS=			1200	1200	1	1200	1				TOTAL=			1720						
NOTE: CONSTRUCTION STAKING SUBGRADE REQUIRED FOR F.E. - DRIVEWAY REALIGNMENT FROM STA. 13+07 - STA. 15+07, RT. IS INCLUDED IN MAINLINE QUANTITY.																				

PROJECT NO: 5160-01-70	HWY: STH 35	COUNTY: VERNON	MISCELLANEOUS QUANTITIES	SHEET	E
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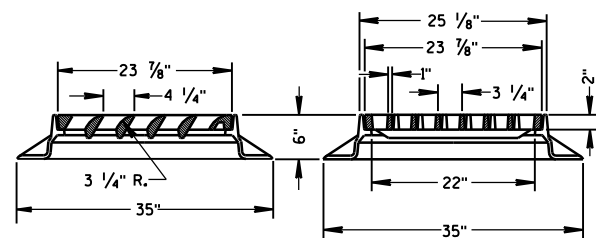
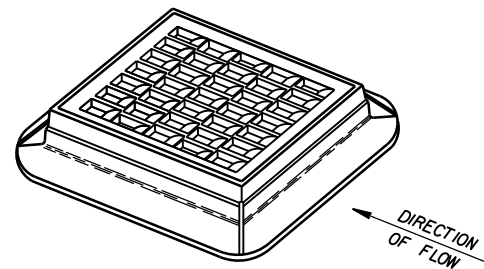
Standard Detail Drawing List

08A05-19C	INLET COVERS TYPE F, HM, HM-S, S, T, V, HM-GJ, & HM-GJ-S
08C07-02	INLETS 2X2-FT, 2X2.5-FT, 2X3-FT AND 2.5X3-FT
08D01-20A	CONCRETE CURB & GUTTER
08D02-06	CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES
08D20-01	DRIVEWAYS WITH CURB & GUTTER RETURNS
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E10-02	INLET PROTECTION TYPE A, B, C AND D
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
09A01-13A	AT-GRADE SIDE ROAD INTERSECTION, TYPES "B1", "B2", "C" AND D AND TEE INTERSECTION BYPASS LANE
14B42-06A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06D	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B44-04A	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-04B	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-04C	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B45-05A	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05B	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05C	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05D	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05E	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05F	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05G	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05H	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05I	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05J	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05K	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05L	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
15A03-02A	FLEXIBLE MARKER POST FOR CULVERT END
15A03-02B	FLEXIBLE MARKER POST FOR CULVERT END
15C04-05	TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45 M.P.H. OR GREATER TWO-WAY UNDIVIDED ROAD OPEN TO TRAFFIC
15C08-19A	LONGITUDINAL MARKING (MAINLINE)
15C12-06	TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION
15C19-05A	MOVING PAVEMENT MARKING OPERATION TWO-LANE TWO-WAY ROADWAY
15C35-03A	PAVEMENT MARKING (INTERSECTIONS)
15D06-03	TRAFFIC CONTROL, TWO LANE TWO WAY OPERATION
15D28-03	TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY
15D38-02A	TEMPORARY TRAFFIC CONTROL SIGN MOUNTING
15D38-02B	ATTACHMENT OF SIGNS TO POSTS

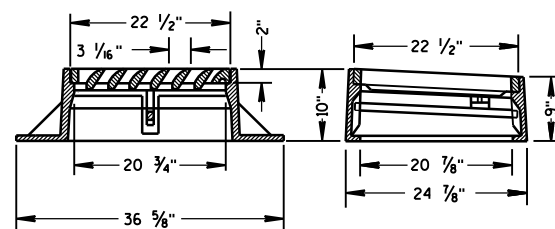
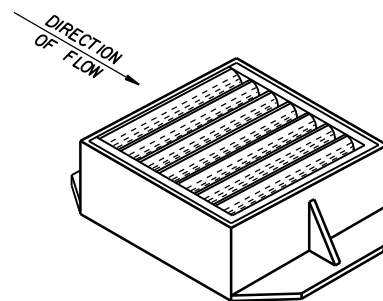


TYPE "F"

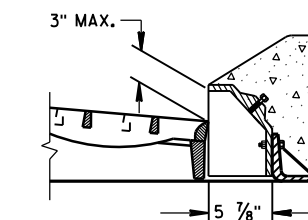
USE WITH TYPES A & D CONCRETE CURB & GUTTER, 36 INCH.



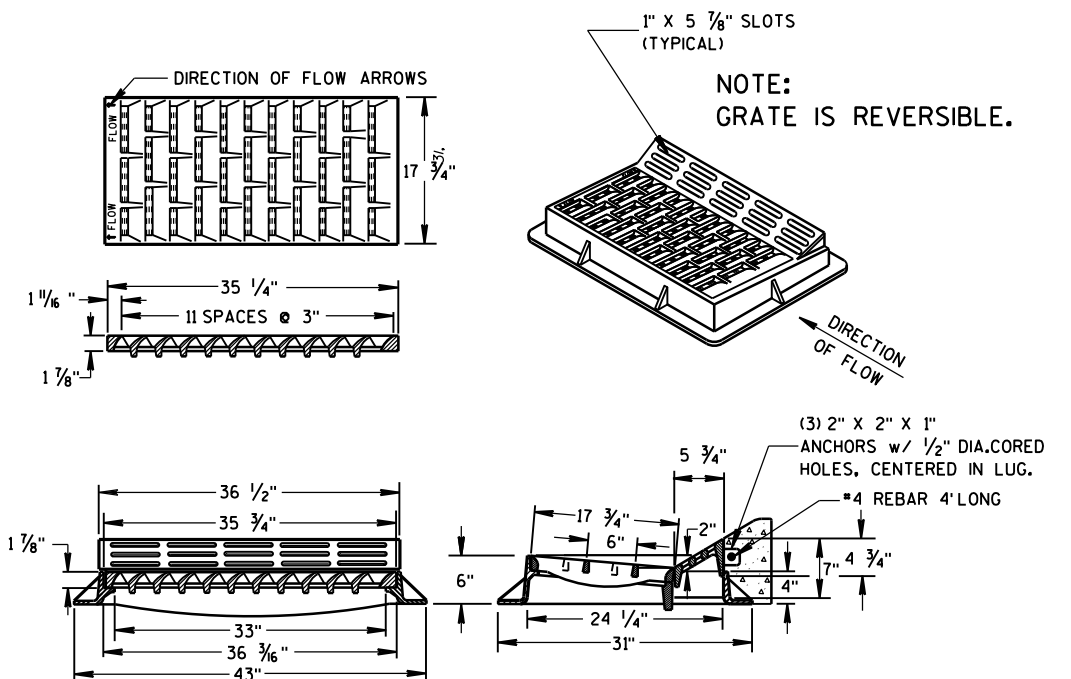
TYPE "S"



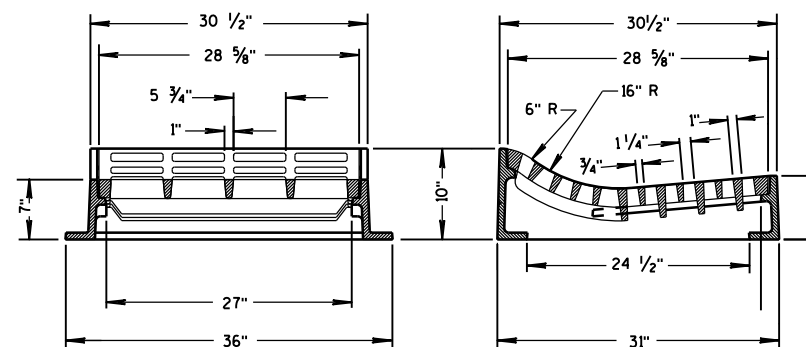
TYPE "V"

ALTERNATIVE CURB BOX
FOR TYPE "HM" COVERUSE WITH TYPES G & J CONCRETE CURB & GUTTER, 30 INCH
NOTED AS TYPE HM-GJ ON DRAINAGE TABLENOTE:
SPECIAL GRATE FOR THE
TYPE "H" COVER MAY ALSO BE
USED FOR THE TYPE "HM-GJ" COVER
NOTED AS TYPE HM-GJ-S ON DRAINAGE TABLE

GENERAL NOTES

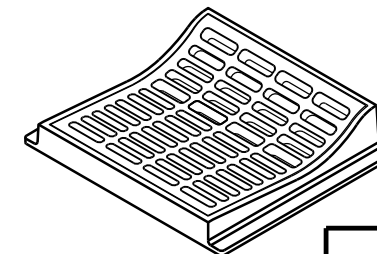
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING
SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND
THE APPLICABLE SPECIAL PROVISIONS.DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR INLET COVERS SHALL BE SUBMITTED
TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION
FOR EQUIVALENT CAPACITY AND STRENGTH.

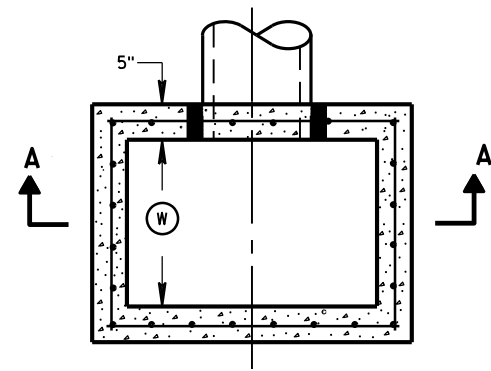
TYPE "HM"

USE WITH TYPES A & D CONCRETE
CURB & GUTTER, 36 INCH.NOTE:
SPECIAL GRATE FOR THE
TYPE "H" COVER MAY ALSO BE
USED FOR THE TYPE "HM" COVER
NOTED AS TYPE HM-S ON DRAINAGE TABLE

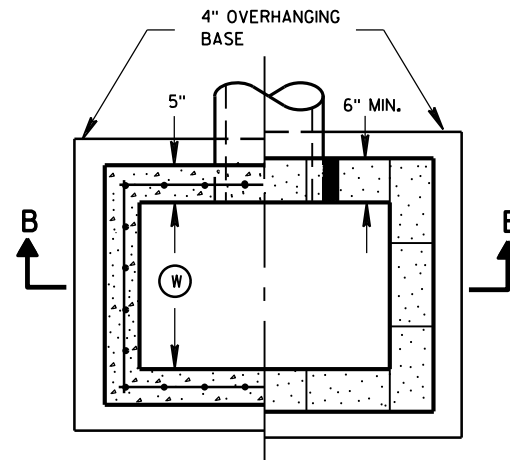
TYPE "T"

USE WITH TYPES R & T CONCRETE CURB & GUTTER, 36 INCH.

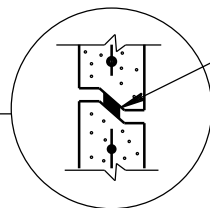
INLET COVERS
TYPE F, HM, HM-S, S, T, V,
HM-GJ, & HM-GJ-SSTATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATIONAPPROVED
11/27/2013
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER
FHWA



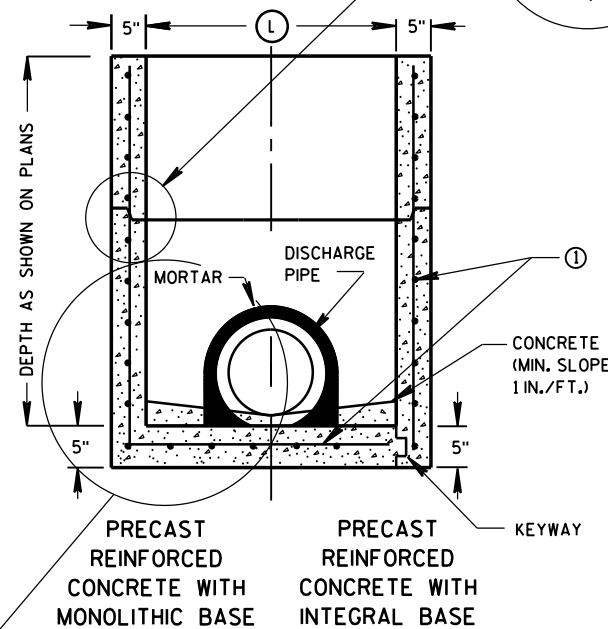
PLAN VIEW



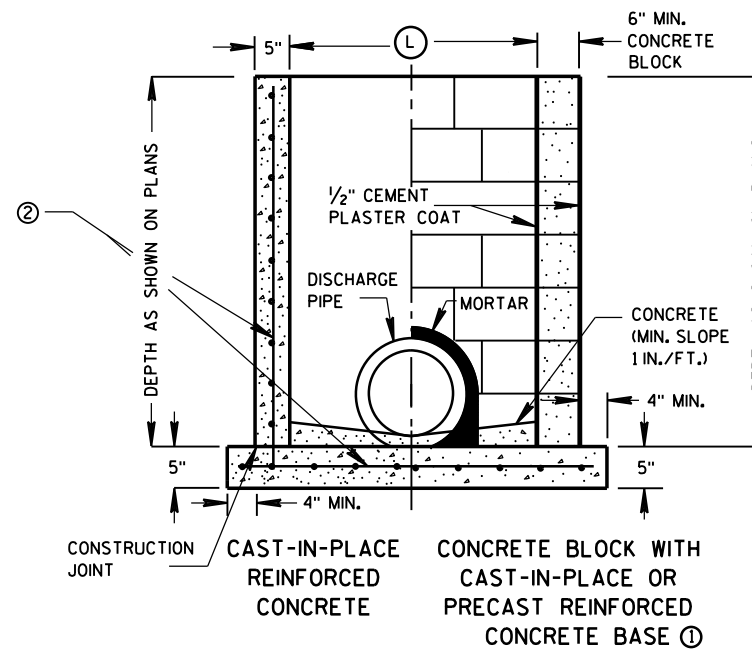
PLAN VIEW



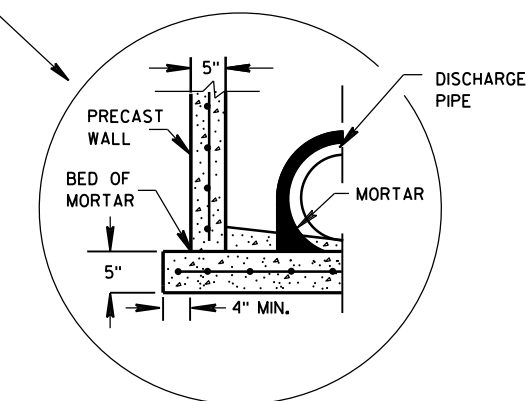
RISER JOINTS TO BE SEALED WITH A BUTYL RUBBER SEAL PER SEALANT MANUFACTURERS RECOMMENDATIONS CONFORMING TO ASTM C 990 (TYP)



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 FOUNDATION 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.

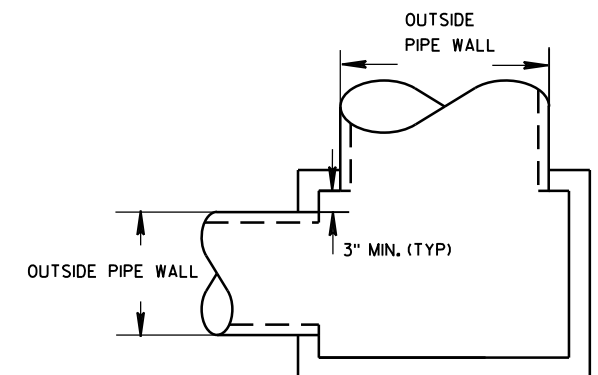
② CONTRACTOR TO PROVIDE DRAWING(S) STAMPED BY A PROFESSIONAL ENGINEER FOR STEEL REINFORCING DESIGN FOR CAST-IN-PLACE STRUCTURES.

INLET COVER MATRIX

INLET SIZE	WIDTH ① (FT)	INLET COVER TYPE	ALL A'S	ALL B'S	BW	F	ALL H'S	S	T	V	WM
		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

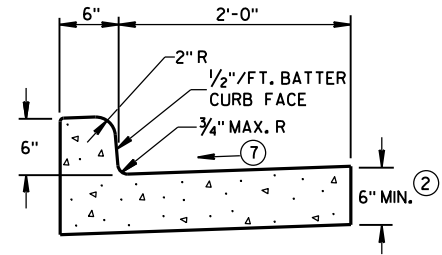


DETAIL "A"

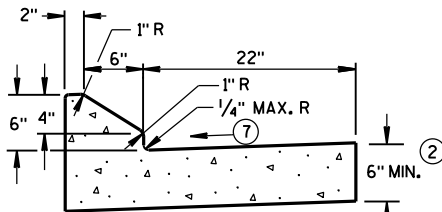
INLETS 2X2-FT, 2X2.5-FT,
2X3-FT AND 2.5X3-FT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

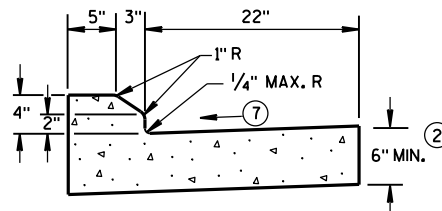
APPROVED
Sept., 2016 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT
FHWA UNIT SUPERVISOR



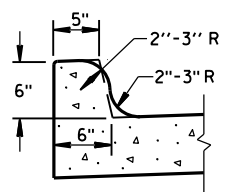
TYPES A^① & D



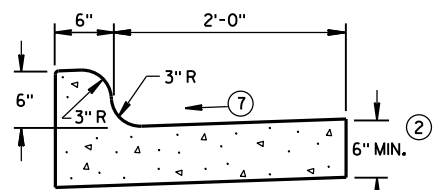
6" SLOPED CURB TYPES G^① & J



4" SLOPED CURB TYPES G^① & J

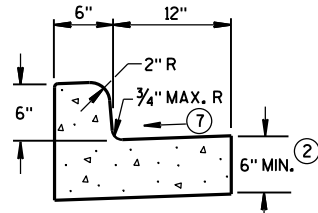


TYPES K^① & L
(OPTIONAL CURB SHAPE)



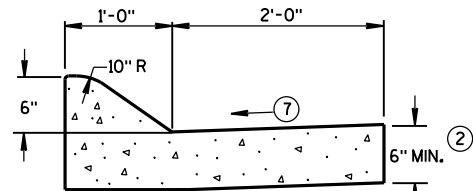
TYPES K^① & L

CONCRETE CURB & GUTTER 30"

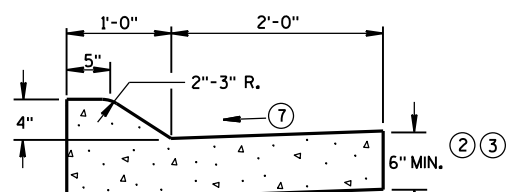


TYPES A^① & D

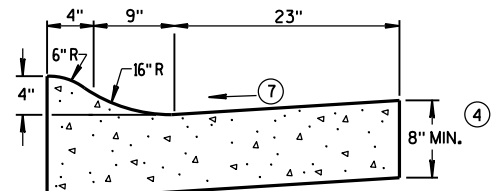
CONCRETE CURB & GUTTER 18"



6" SLOPED CURB TYPES A^① & D

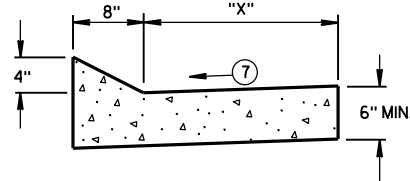


4" SLOPED CURB TYPES A^① & D



4" SLOPED CURB TYPES R^① & T^⑤

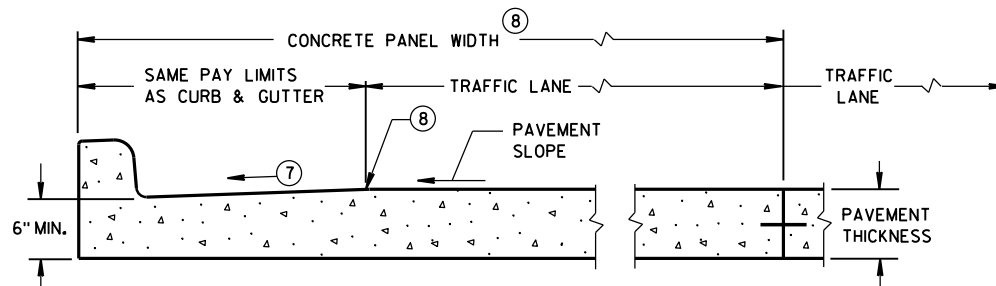
CONCRETE CURB & GUTTER 36"



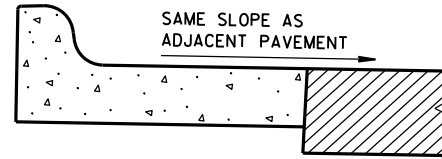
TYPES TBT & TBTT^①

CONCRETE CURB & GUTTER

TBT & TBTT	"X"
30"	22"
36"	28"



PARTIAL SECTION OF PAVEMENT
WITH INTEGRAL CURB & GUTTER



REVERSE SLOPE GUTTER^⑥
(TYPICAL FOR ALL CURB & GUTTER TYPES)

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.

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, R AND TBTT.
- 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 USE 8" MINIMUM GUTTER THICKNESS WHEN USED WITH AN ADJACENT CONCRETE TRUCK APRON PLACED BEHIND BACK OF CURB.
- ④ 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.
- ⑤ THE FACE OF CURB IS 6" FROM THE BACK OF CURB.
- ⑥ WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATION(S) WILL BE SHOWN ELSEWHERE IN THE PLAN.
- ⑦ USE 4% GUTTER CROSS SLOPE UNLESS OTHERWISE NOTED IN THE PLANS.
- ⑧ INCLUDE LONGITUDINAL JOINT AND TIE BARS ALONG LANE EDGE WHEN CONCRETE PANEL WIDTH EXCEEDS THE MAXIMUM WIDTH PER TABLE BELOW. LONGITUDINAL JOINT(S) ARE NOT ALLOWED WITHIN TRAFFIC LANES AND BIKE LANES. LONGITUDINAL JOINT MAY BE SAWED.

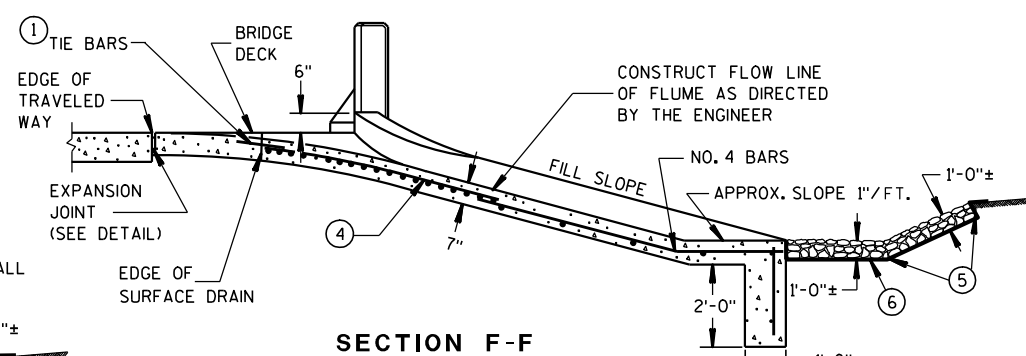
PAVEMENT THICKNESS
AND MAXIMUM CONCRETE
PANEL WIDTH TABLE

PAVEMENT THICKNESS	MAXIMUM PANEL WIDTH
LESS THAN 10"	12'
10" & ABOVE	15'

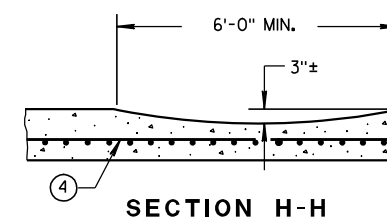
* BIKE LANE IS NOT SHOWN.

CONCRETE CURB & GUTTER

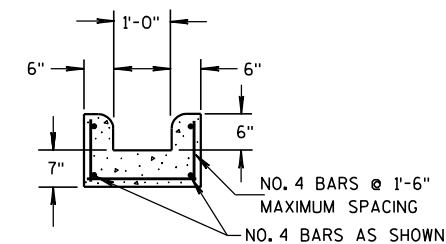
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



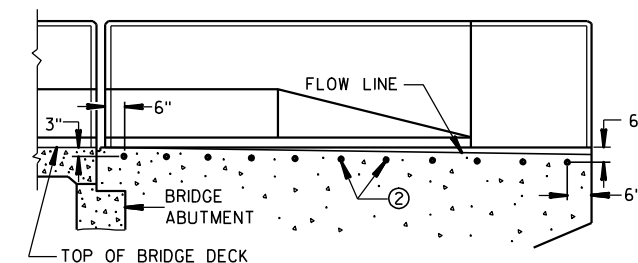
SECTION F-F



SECTION H-H



SECTION E-E



LOCATION OF TIE BARS IN WINGWALL



* PARTIAL PLAN VIEW
SURFACE DRAIN WITHOUT PIPE
TYPE "B"

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.

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

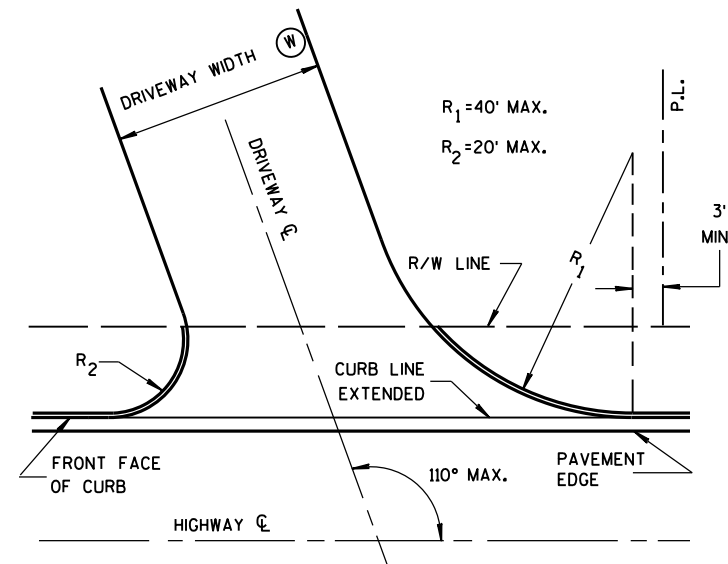
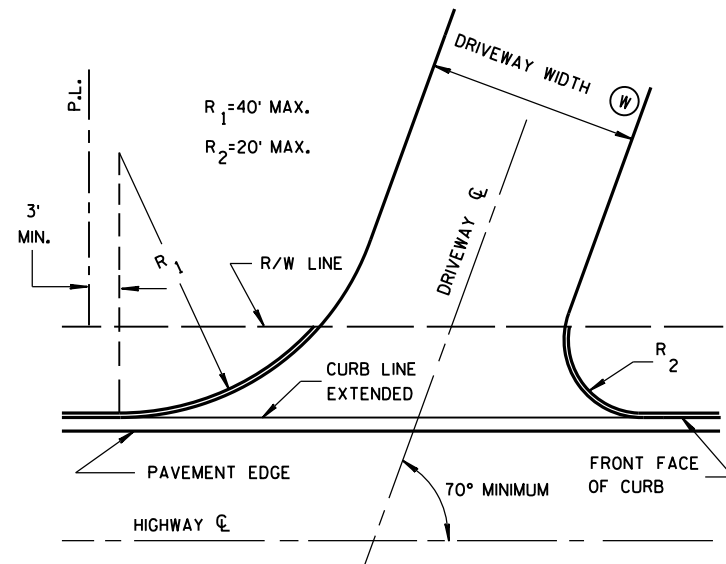
- ① NO. 4 X 2'-0" TIE BARS SPACED AT 3'-0" CENTERS TO BE USED ONLY WHEN ADJACENT TO P.C. CONCRETE.
- ② NO. 4 X 2'-0" TIE BARS SPACED AT 12" CENTERS TO BE PLACED BY BRIDGE CONTRACTOR, OR DRILLED TIE BARS PLACED AS DIRECTED BY THE ENGINEER.
- ③ PIPE UNDERDRAIN MAY BE ANY OF THE MATERIALS LISTED IN SECTION 612.2 OF THE STANDARD SPECIFICATIONS EXCEPT DRAIN TILE.
- ④ MINIMUM REINFORCEMENT SHALL BE 6" X 6" - W4.0 X W4.0 OR NO. 3 BARS LONGITUDINAL AND TRANSVERSE SPACING 12" C-C.
- ⑤ LIMITS OF ADDITIONAL RIPRAP WHEN SPECIAL DITCH IS REQUIRED.
- ⑥ GEOTEXTILE FABRIC, TYPE "R"
- ⑦ HOT POURED SEALANT UNLESS OTHERWISE SPECIFIED.
- ⑧ THIS DIMENSION MAY VARY DEPENDING ON THE SPACING OF POSTS FOR THE STEEL PLATE BEAM GUARD, THE TYPICAL LOCATION FOR THE SURFACE DRAIN IS WHERE THE POST SPACING WIDENS TO 3'-1/2".

CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES

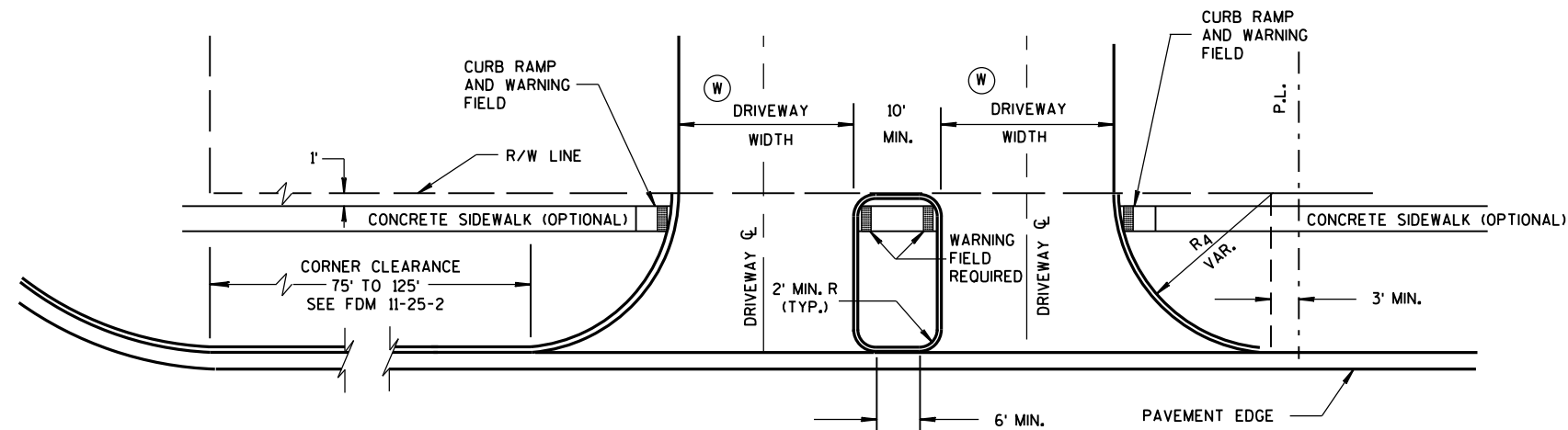
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
9/4/08
DATE
FHWA

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER



**SKewed DRIVEWAY DETAILS
(COMMERCIAL AND NON-COMMERCIAL)
SIDEWALK NOT SHOWN**



**DRIVEWAY LOCATION AND SPACING DETAILS
SIDEWALK SHOWN**

NOTES

A MAXIMUM RADIUS OF 10 FEET SHALL BE USED FOR NON-COMMERCIAL PRIVATE ENTRANCES. RADII FOR COMMERCIAL DRIVEWAYS SHALL BE DETERMINED BY THE ENGINEER BASED ON TRAFFIC AND DRIVEWAY PERMIT RESTRICTIONS.

THE MINIMUM ANGLE OF INTERSECTION BETWEEN THE DRIVEWAY AND HIGHWAY CENTERLINES SHALL BE 70°.

ALL CURVILINEAR PRIVATE ENTRANCE OUTLINES SHALL BE CONTAINED WITHIN THE HIGHWAY R/W.

NO DRIVEWAY SHALL BE BUILT WITHIN 3 FEET OF THE PROPERTY LINE EXCEPT FOR EXISTING JOINT DRIVEWAY SHARED BY TWO OWNERS.

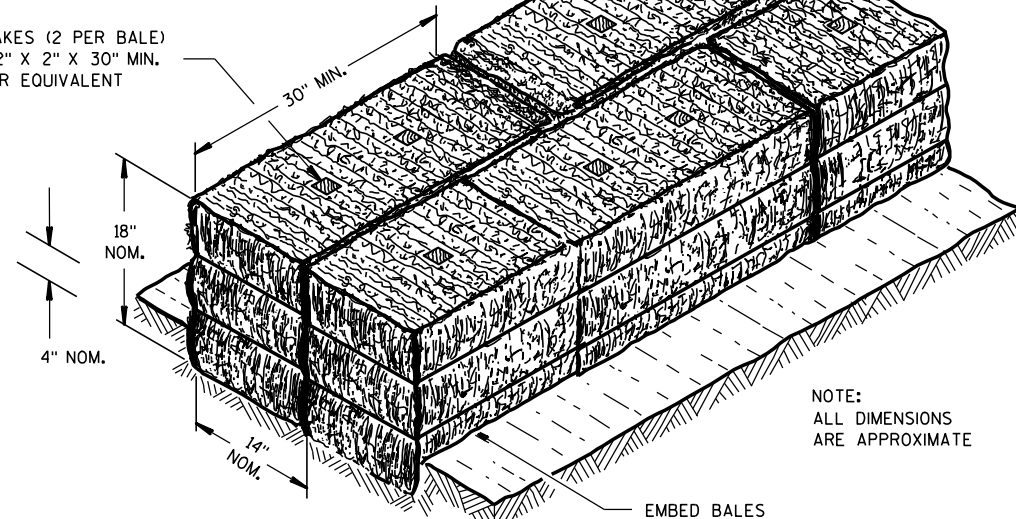
- Ⓢ DRIVEWAY WIDTHS:
- COMMERCIAL - 35' MAX., 16' MIN.
 - RESIDENTIAL AND NON-COMMERCIAL - 24' MAX., 12' MIN.

**DRIVEWAYS WITH
CURB & GUTTER RETURNS**

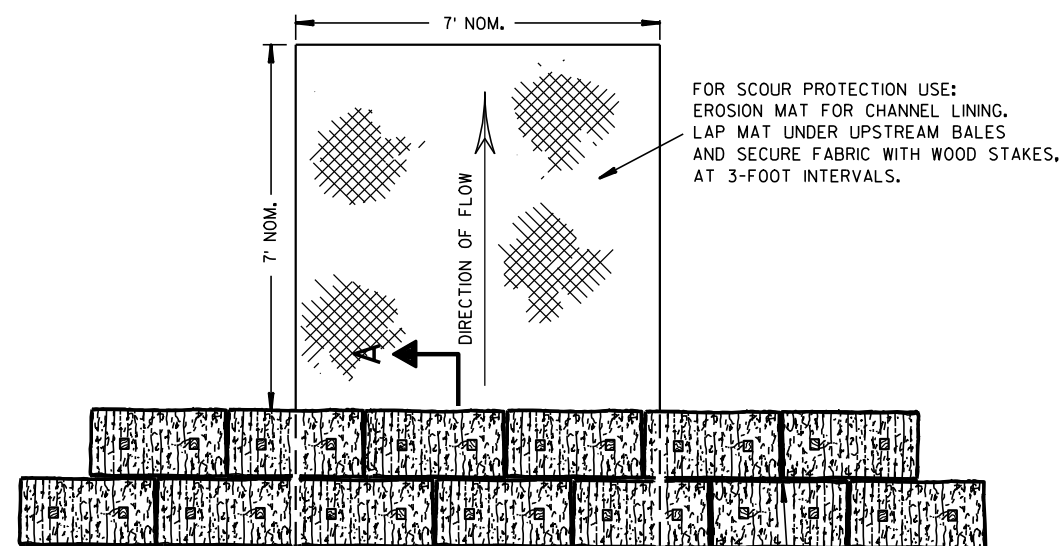
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
December, 2016 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT
FHWA UNIT SUPERVISOR

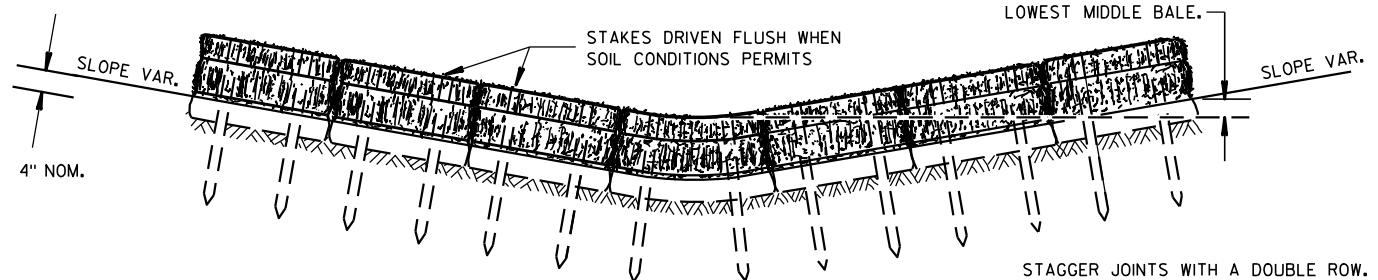
WOOD STAKES (2 PER BALE)
NOMINAL 2" X 2" X 30" MIN.
LENGTH OR EQUIVALENT



SECTION A-A



PLAN VIEW



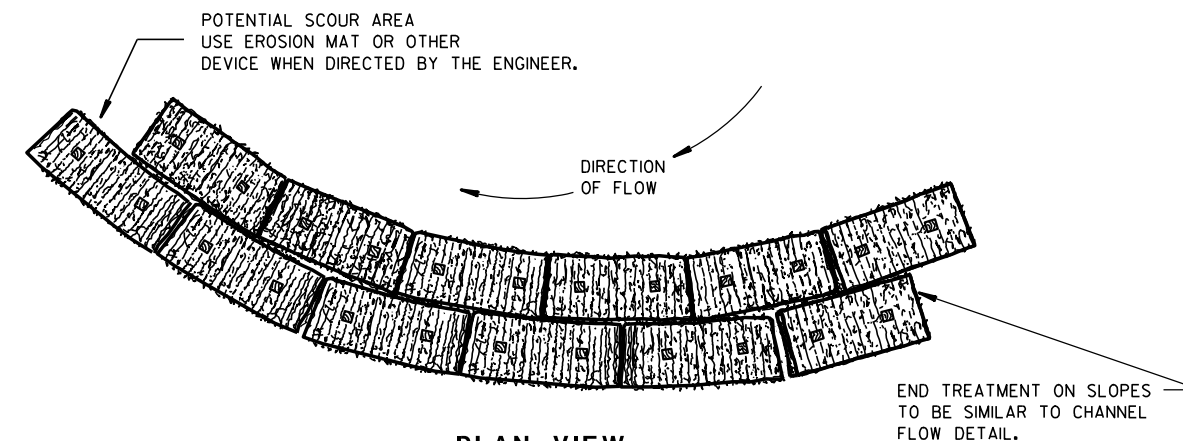
FRONT ELEVATION

TEMPORARY DITCH CHECK USING EROSION BALES ①

GENERAL NOTES

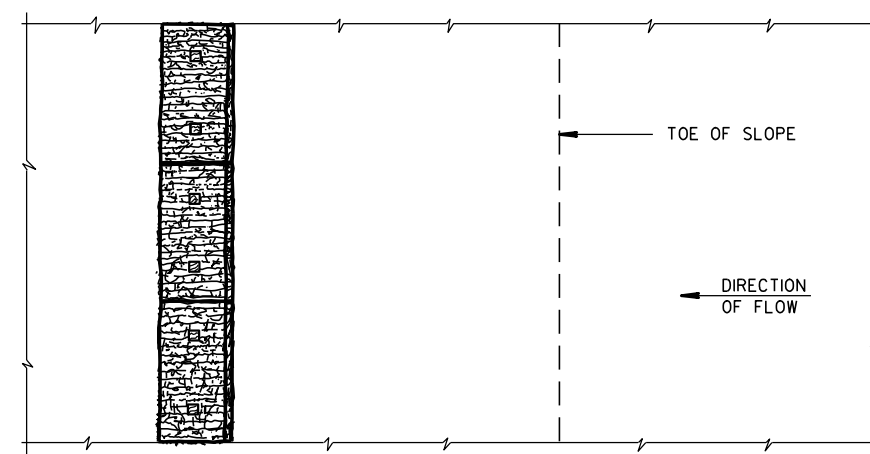
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- ① TEMPORARY DITCH CHECKS EITHER EROSION BALES OR MANUFACTURED SHALL BE PAID FOR UNDER THE BID ITEM OF TEMPORARY DITCH CHECK. THE DEPARTMENT WILL NOT PAY FOR TEMPORARY DITCH CHECKS CONSTRUCTED OF A SINGLE ROW OF EROSION BALES.

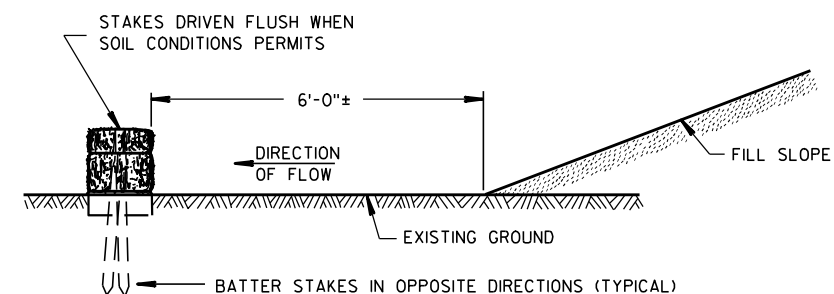


PLAN VIEW

WHEN ALTERING THE DIRECTION OF FLOW



PLAN VIEW



FRONT ELEVATION

WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE

EROSION BALES FOR SHEET FLOW

TYPICAL INSTALLATIONS OF
EROSION BALES / TEMPORARY
DITCH CHECKS

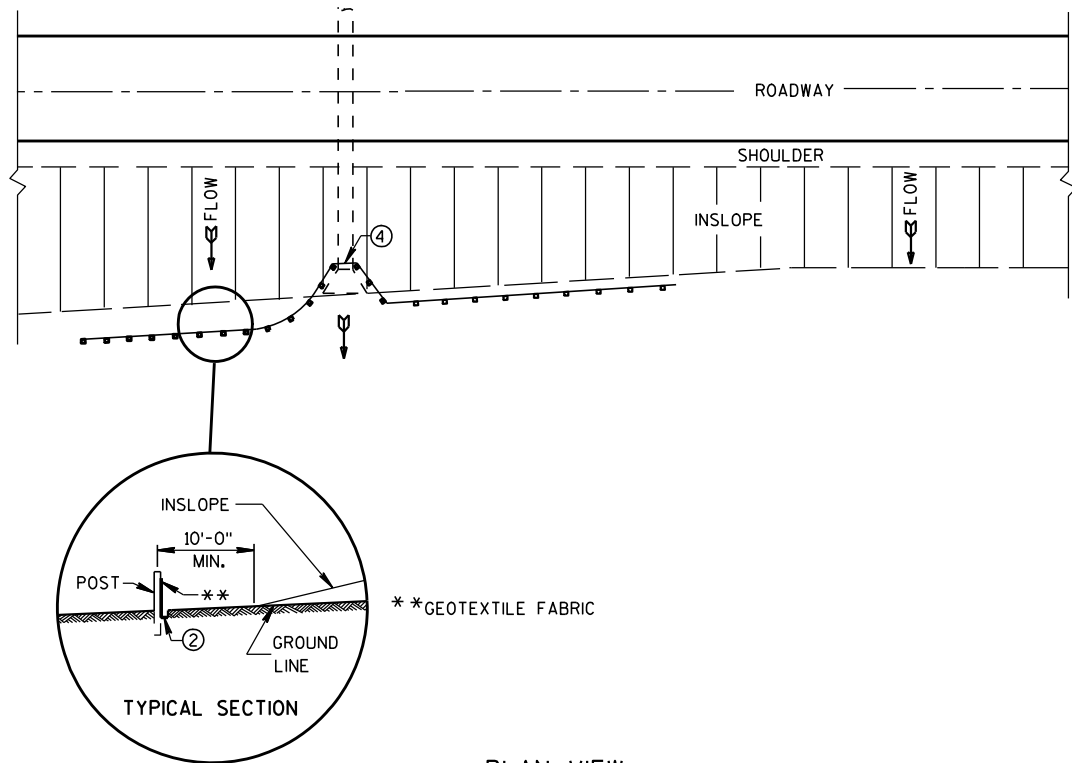
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

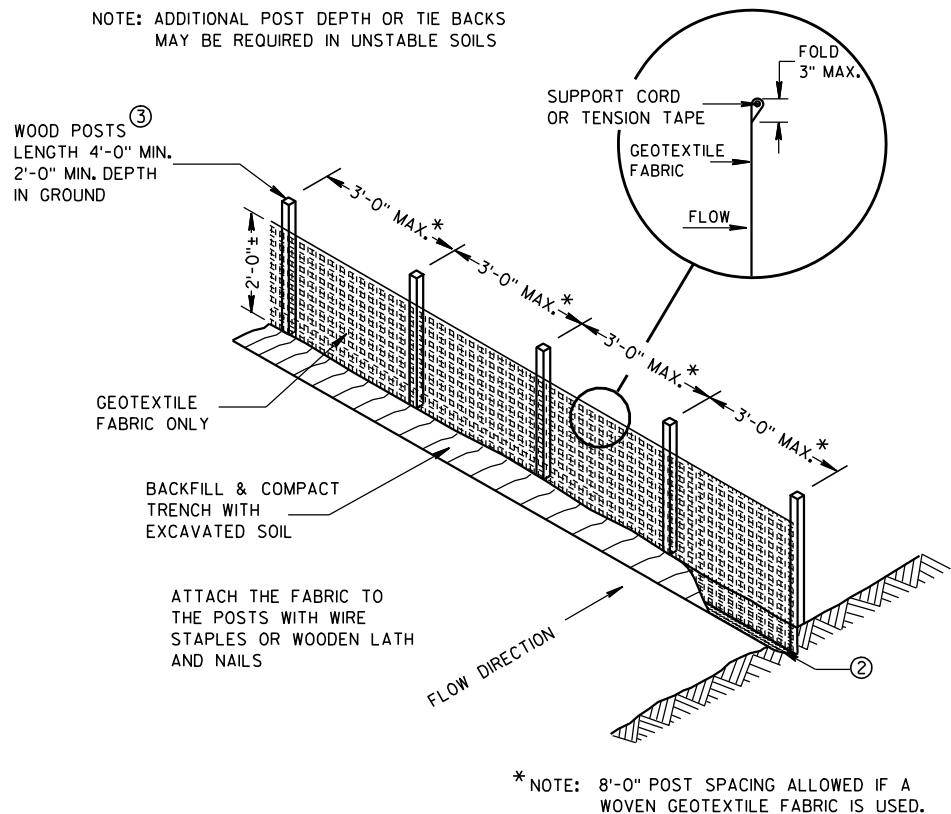
6/04/02
DATE

FHWA

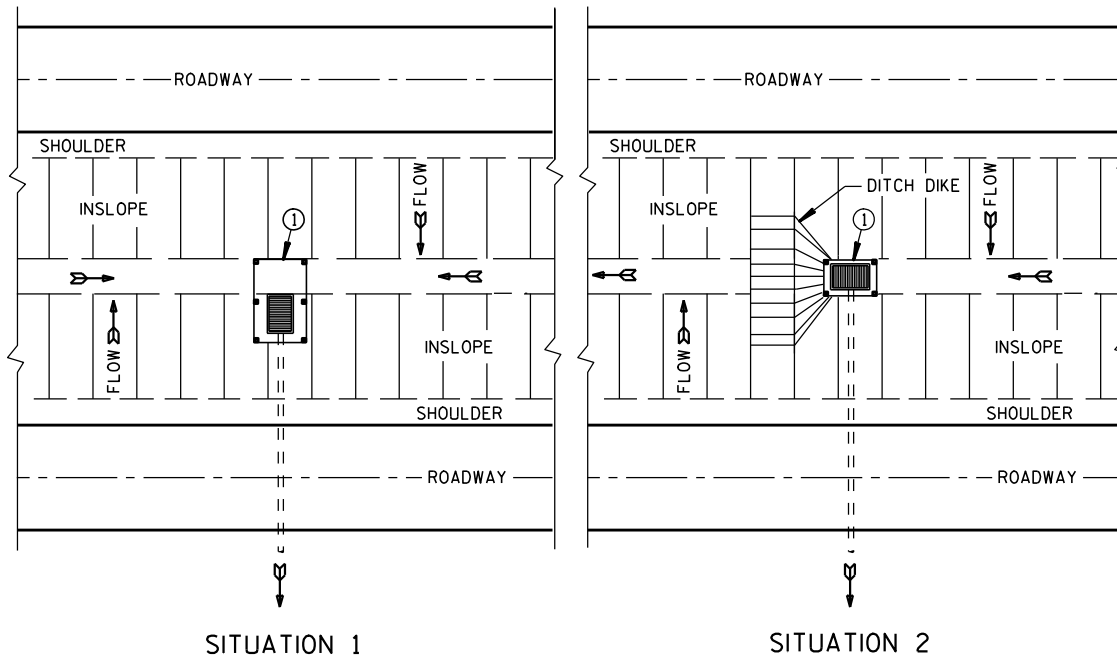
/S/ Beth Canestra
CHIEF ROADWAY DEVELOPMENT ENGINEER



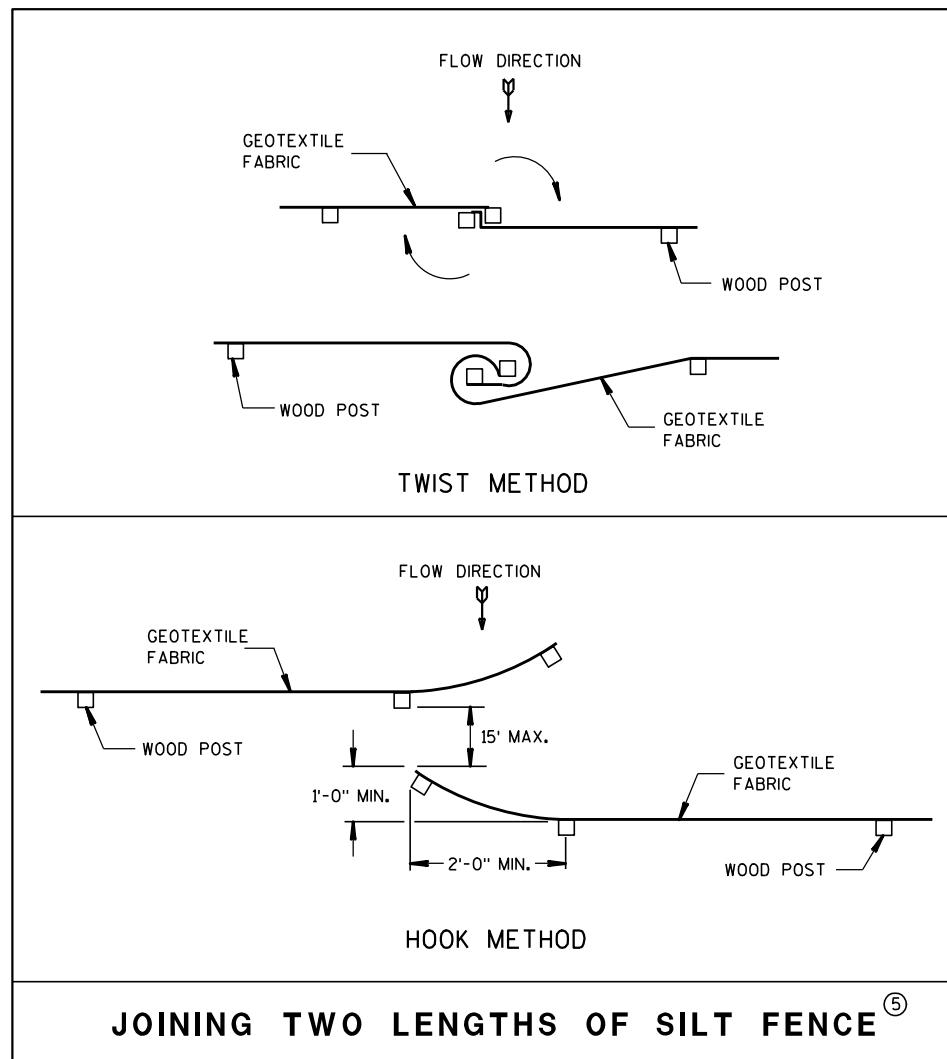
PLAN VIEW
TYPICAL APPLICATION OF SILT FENCE



SILT FENCE



PLAN VIEW
SILT FENCE AT MEDIAN SURFACE DRAINS

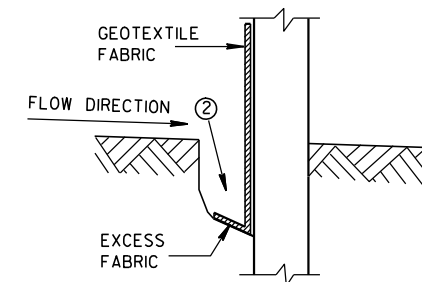


JOINING TWO LENGTHS OF SILT FENCE⁵

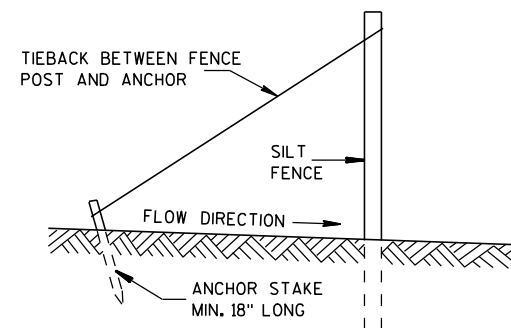
GENERAL NOTES

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

- 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 1 1/8" X 1 1/8" 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.

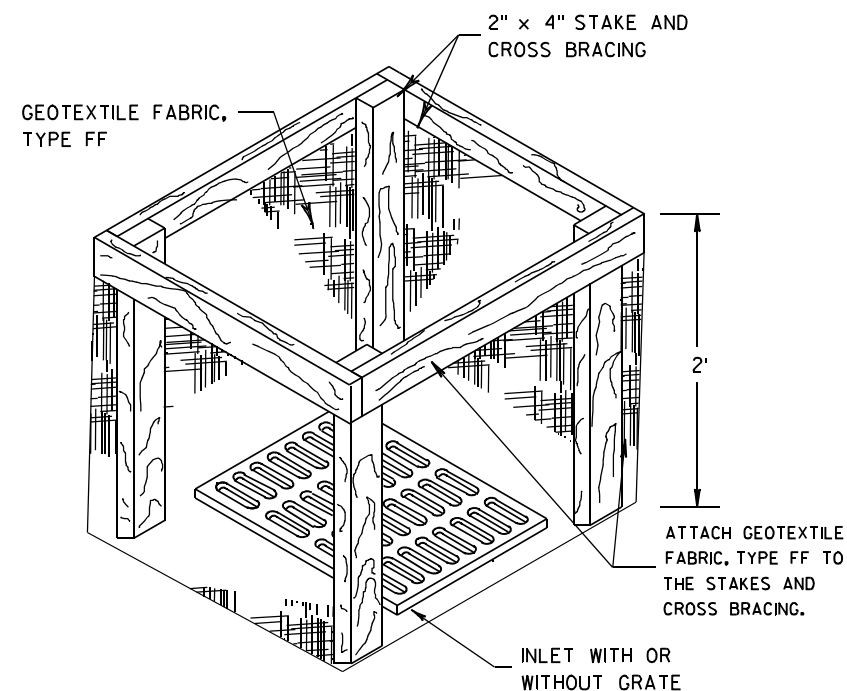
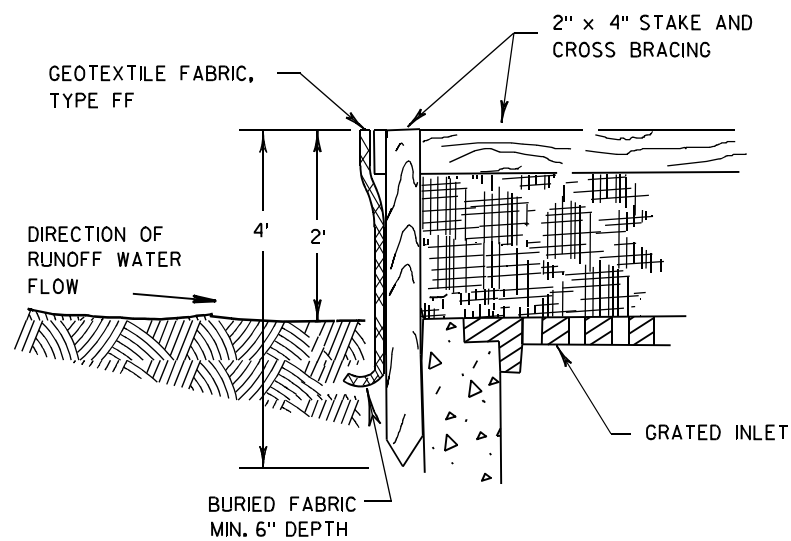


TRENCH DETAIL



SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)

SILT FENCE	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 4-29-05 DATE	/S/ Beth Canestra CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA	



INLET PROTECTION, TYPE A

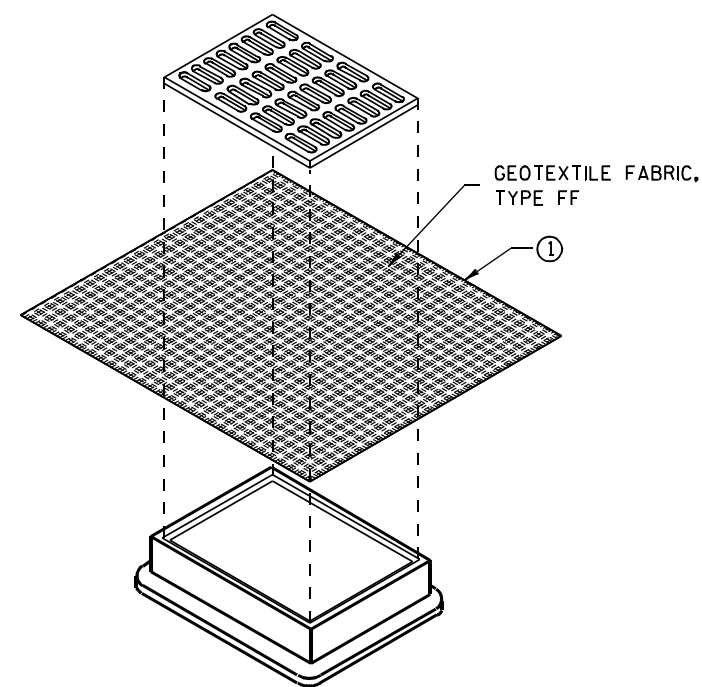
GENERAL NOTES

INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.

MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.

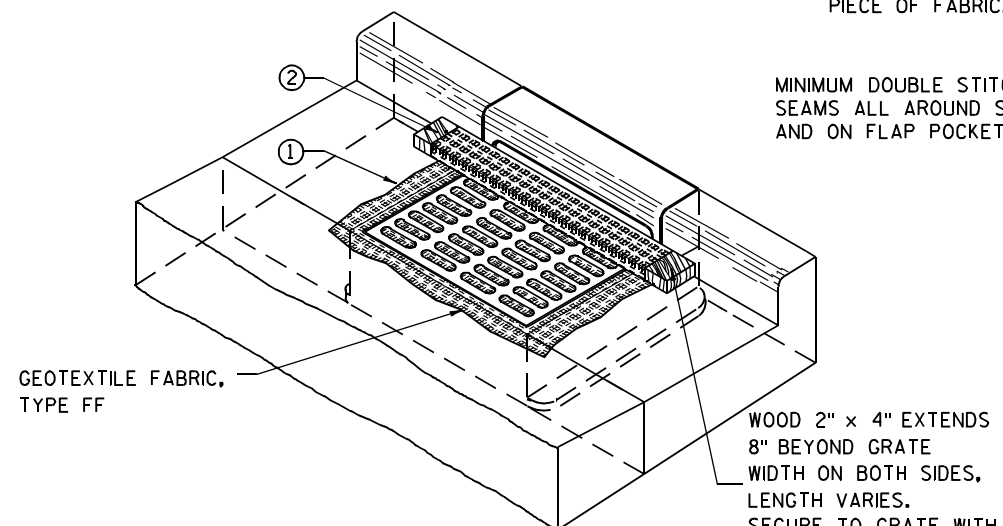
WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

- ① FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
- ② FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.
- ③ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.



**INLET PROTECTION, TYPE B
(WITHOUT CURB BOX)**

(CAN BE INSTALLED IN ANY INLET WITHOUT A CURB BOX)



INLET PROTECTION, TYPE C (WITH CURB BOX)

INSTALLATION NOTES

TYPE B & C

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

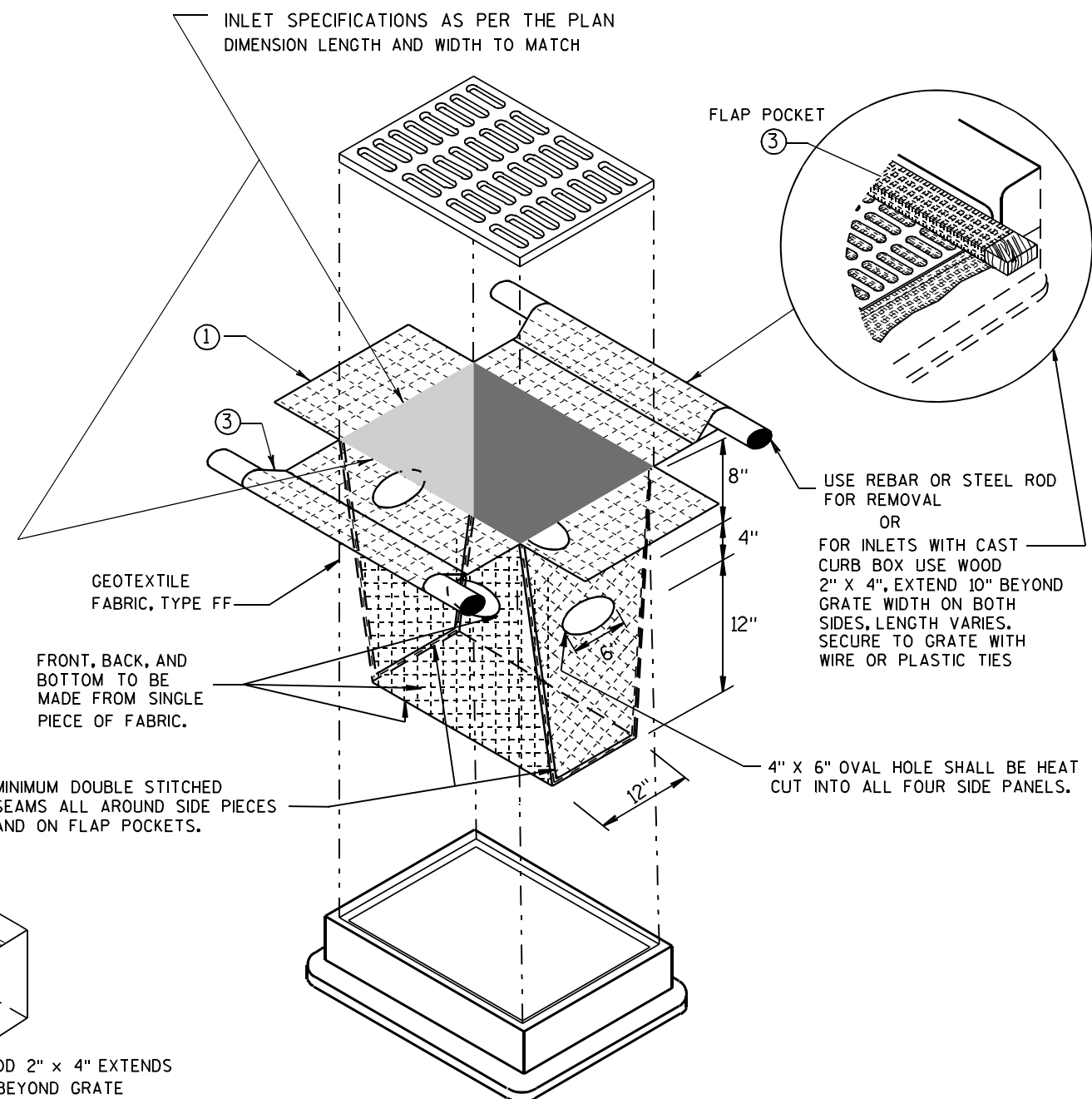
THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

TYPE D

DO NOT INSTALL INLET PROTECTION TYPE D IN INLETS SHALLower THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE.

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.



INLET PROTECTION, TYPE D

(CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX AS PER NOTE ②)

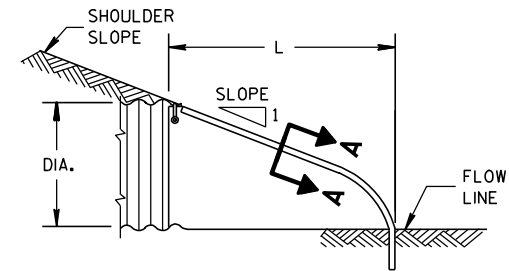
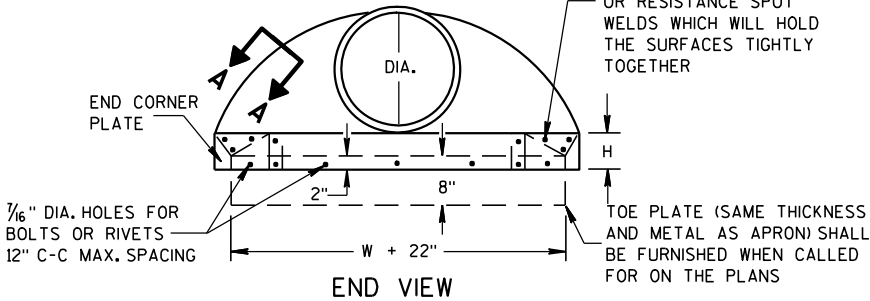
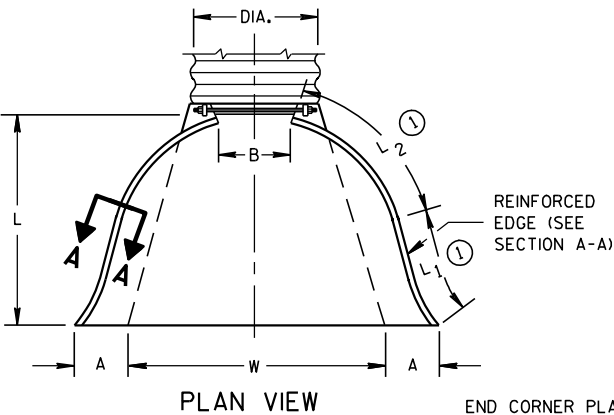
**INLET PROTECTION
TYPE A, B, C, AND D**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
10/16/02 /S/ Beth Cannestra
DATE
FHWA 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.

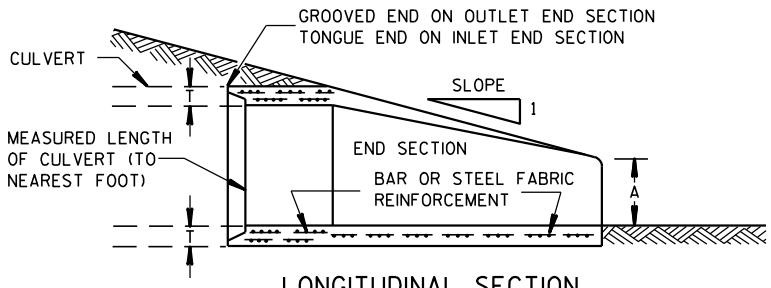
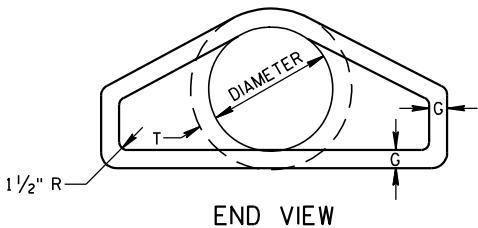
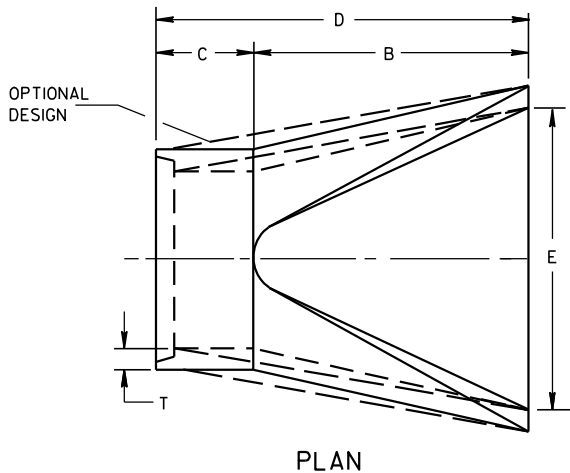
* EXCEPT CENTER PANEL
SEE GENERAL NOTES



METAL ENDWALLS

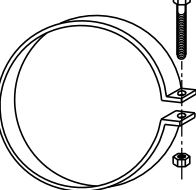
REINFORCED CONCRETE APRON ENDWALLS												
PIPE DIA. (IN.)	DIMENSIONS (Inches)							APPROX. SLOPE				
	T	A	B	C	D	E	G					
12	2	4	24	48 1/8	72 1/8	24	2	3 to 1				
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1				
18	2 1/2	9	27	46	73	36	2 1/2	3 to 1				
21	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	3 to 1				
24	3	9 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 1/2 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

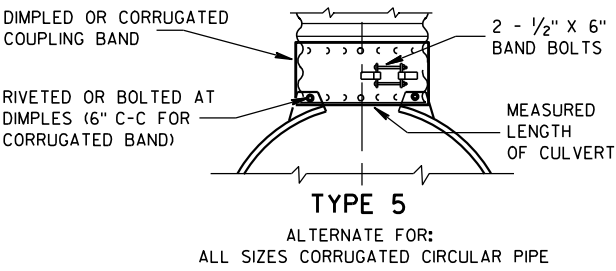
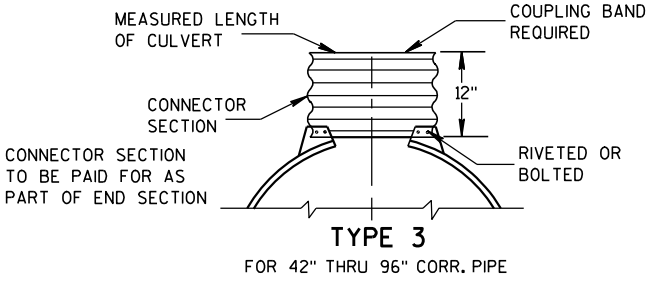
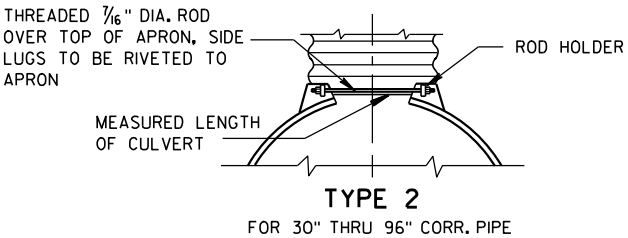
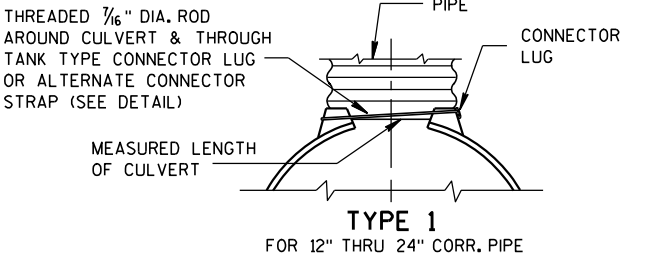


CONCRETE ENDWALLS

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



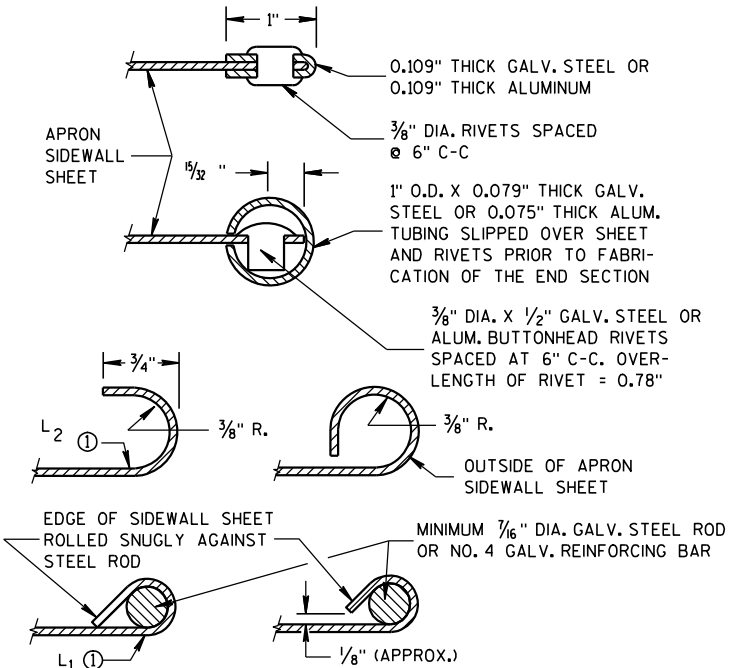
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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



SECTION A-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.

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.

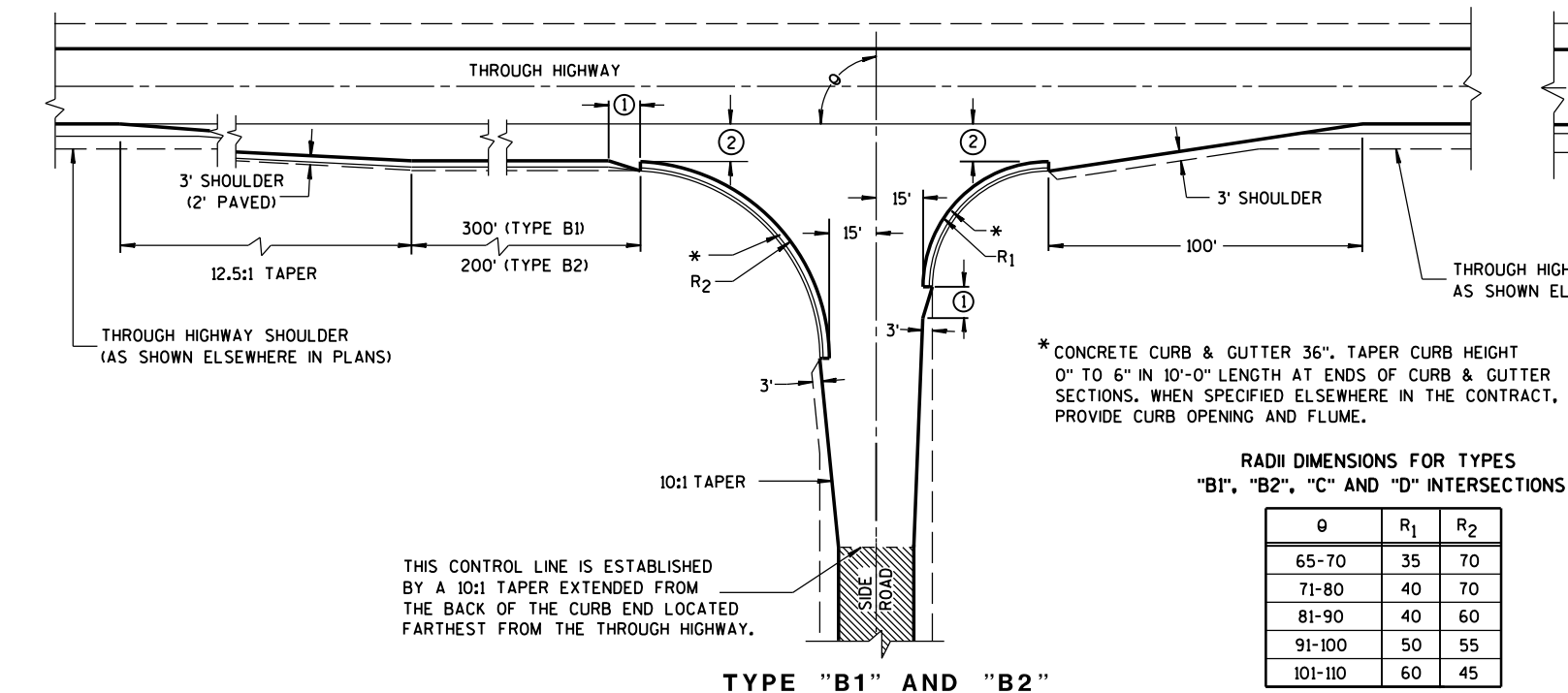
ALL THREE PIECE STEEL APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.105" SIDES AND 0.134" CENTER PANELS. THE WIDTH OF CENTER PANELS SHALL BE GREATER THAN 20 PERCENT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



GENERAL NOTES

DESIGNS MAY BE USED INTERCHANGEABLY IN COMBINATION OR SEPARATELY FOR ANY ONE COMPLETE INTERSECTION DEPENDING UPON INTERSECTION ANGLE AND SURFACING OF EACH APPROACH ROADWAY.

SIDE ROAD SURFACING NOTE

WHEN THE SIDE ROAD IS NOT PRESENTLY PAVED, PAVEMENT SHALL BE PLACED TO THE LIMITS SHOWN UNLESS OTHERWISE PROVIDED IN THE CONTRACT. WHERE THE CONSTRUCTION LIMITS ARE BEYOND THE PAVING LIMITS, CRUSHED AGGREGATE SURFACING SHALL BE PLACED BETWEEN THE PAVING LIMITS AND CONSTRUCTION LIMITS.

WHEN THE SIDE ROAD IS PRESENTLY PAVED, NEW PAVEMENT SHALL BE PLACED TO THE LIMITS OF DESIGN AS SHOWN AND BEYOND, IF NECESSARY, TO MEET EXISTING PAVEMENT.

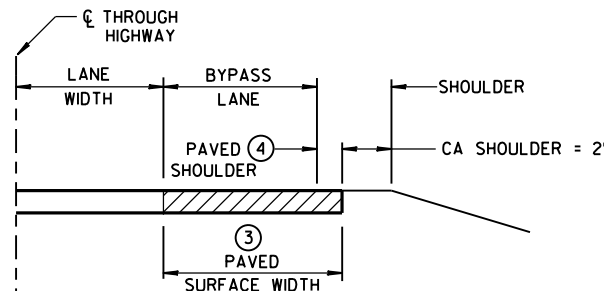
WHEN THE SIDE ROAD IS THE CONSTRUCTION PROJECT, THE INTERSECTION SURFACING SHALL BE THE SAME AS FOR THE PROJECT.

EXISTING PAVED SURFACE

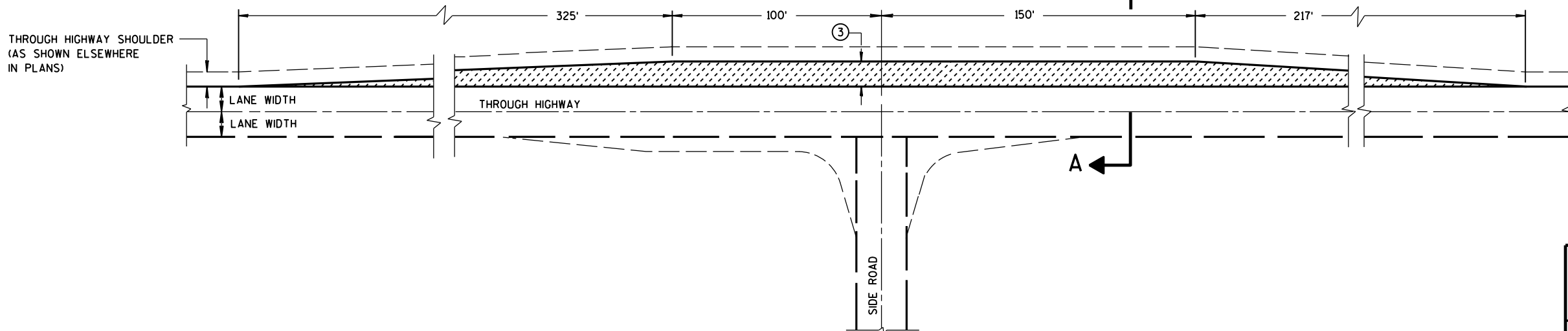
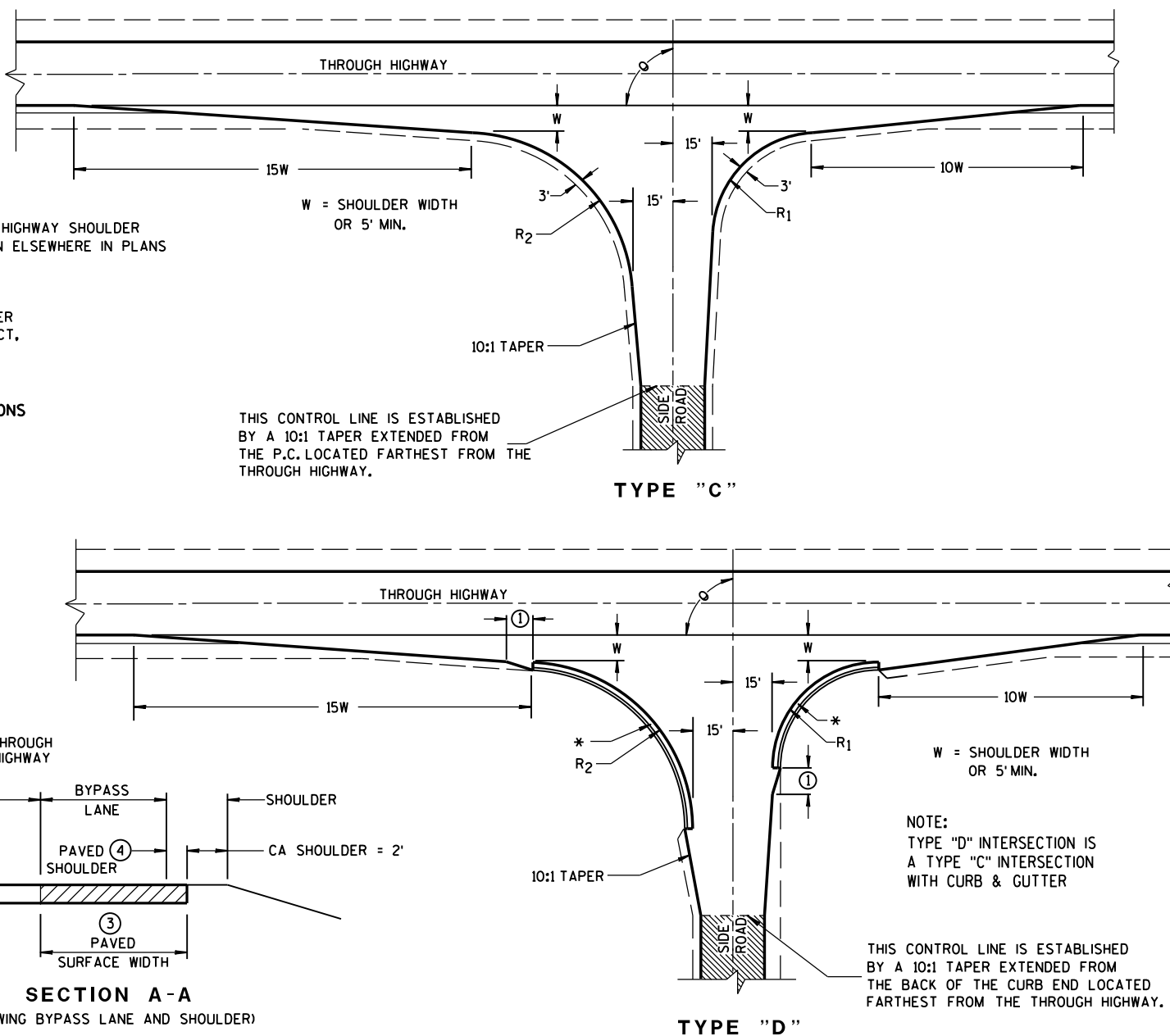
BYPASS LANE

- 10-FT TYPICAL.
- 12-FT** PLUS ADDITIONAL WIDTH FOR BIKE LANE IF SHOWN ELSEWHERE IN THE PLAN.

**10-FT MAY BE USED ON TYPE B2 ON RESURFACING PROJECTS IF SPECIFIED IN THE CONTRACT.
- BYPASS LANE PAVED SURFACE WIDTH OUTSIDE OF TRAVEL LANE
-ASPHALT = 12-FT PLUS PAVED SHOULDER WIDTH.
-PC CPNCRETE = 13-FT PLUS PAVED SHOULDER WIDTH.
- BYPASS LANE PAVED SHOULDER WIDTH = THE GREATER OF 1-FT OR THE PAVED SHOULDER WIDTH OF THE THROUGH HIGHWAY.



SECTION A-A
(SHOWING BYPASS LANE AND SHOULDER)

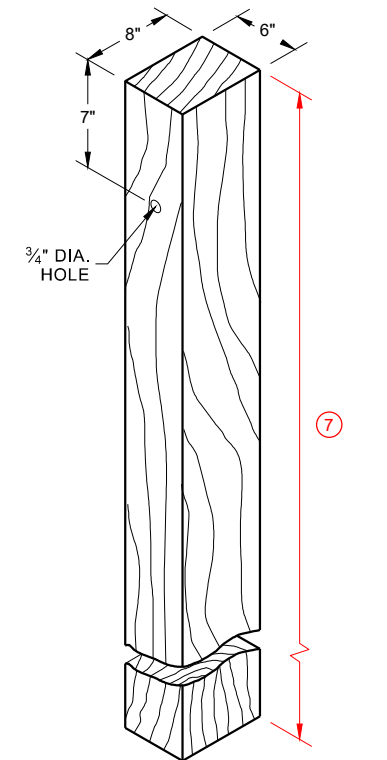
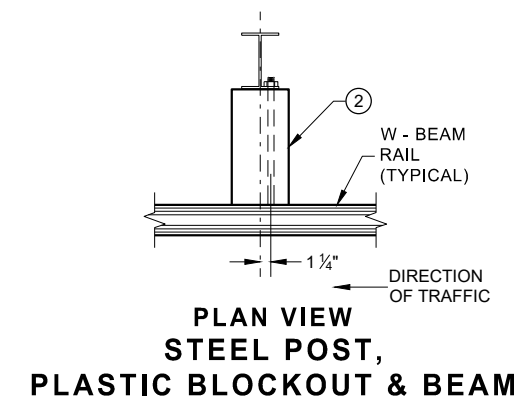
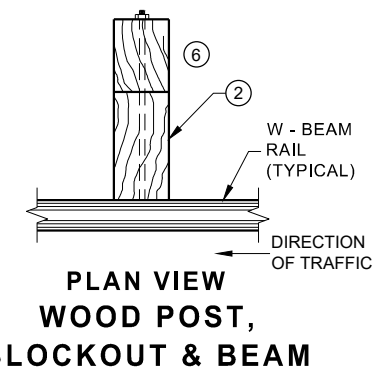
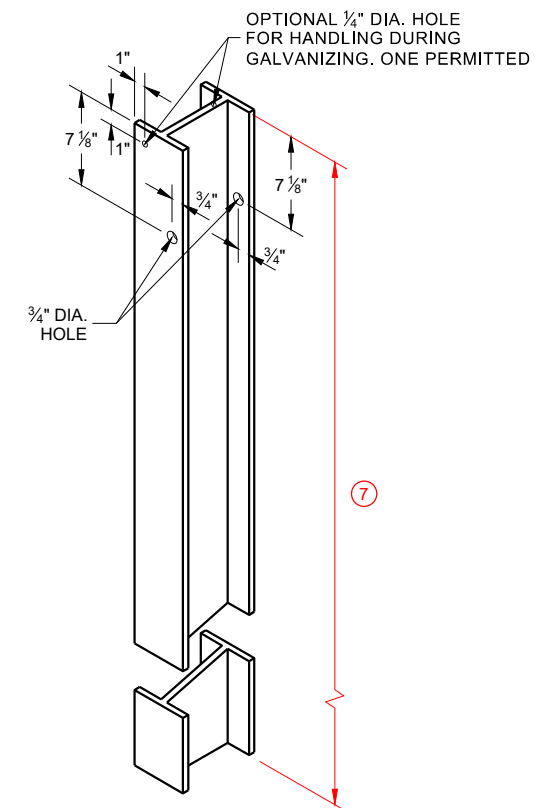
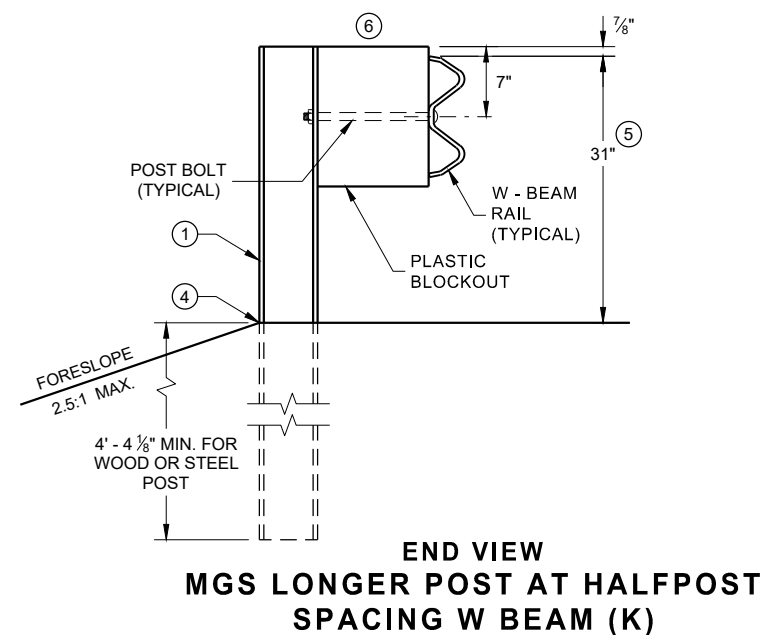
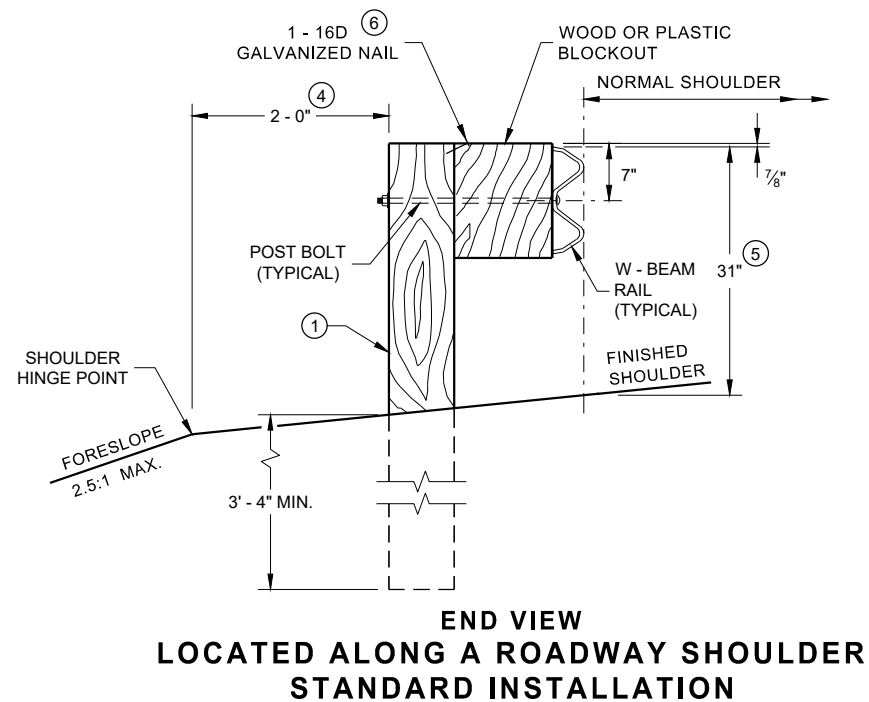
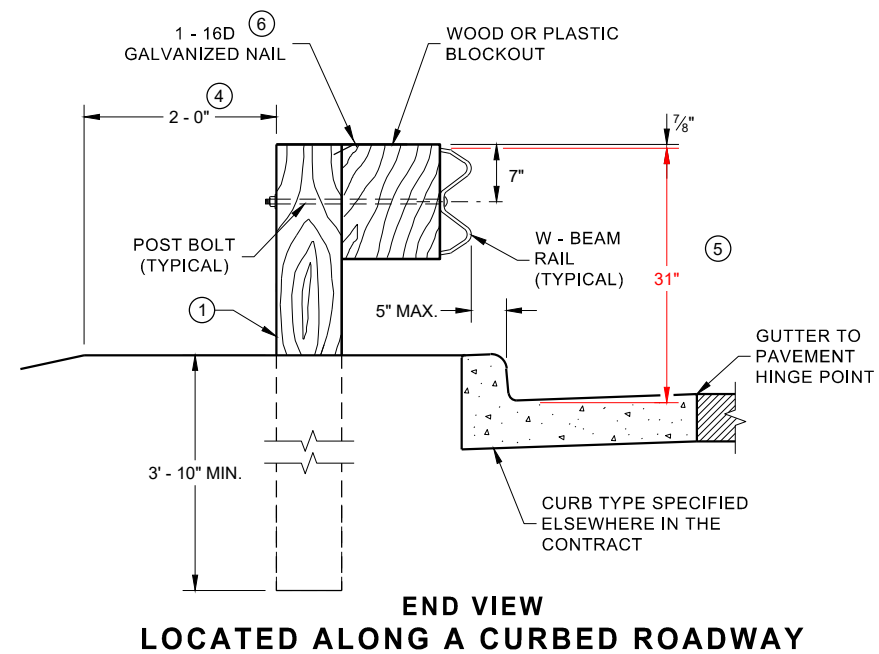
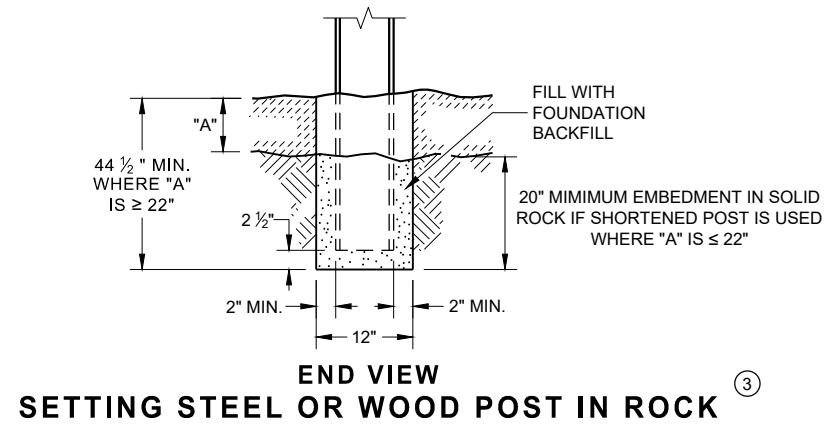


TEE INTERSECTION BYPASS LANE DETAIL

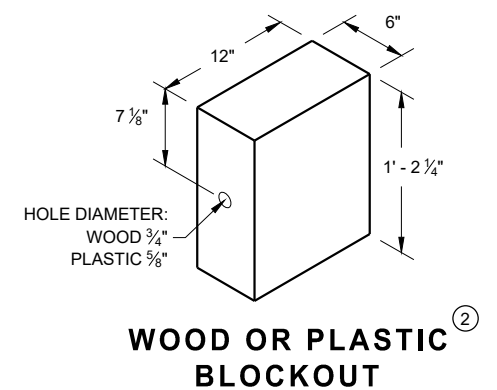
AT-GRADE SIDE ROAD
INTERSECTION, TYPES "B1", "B2",
"C" AND "D" AND TEE
INTERSECTION BYPASS LANE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

- 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 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 $\pm 1"$. 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.
- ⑦ TOTAL POST LENGTH FOR TYPE K IS 7' - 0".
TOTAL POST LENGTH FOR OTHER MGS TYPES IS 6' - 0".

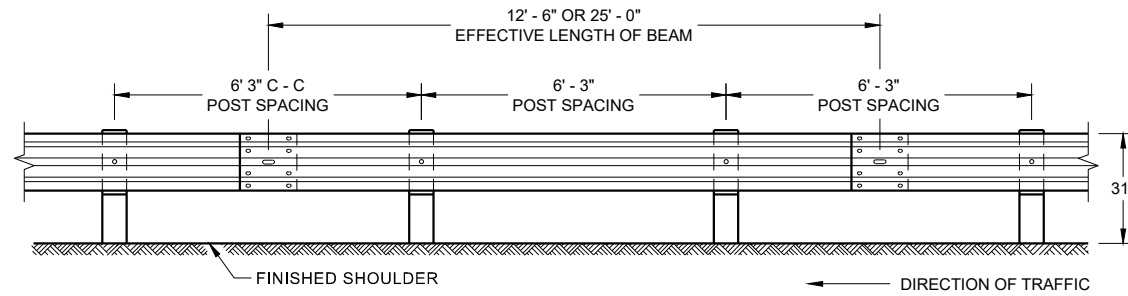


WOOD POST (6" X 8") NOMINAL ⁽¹⁾

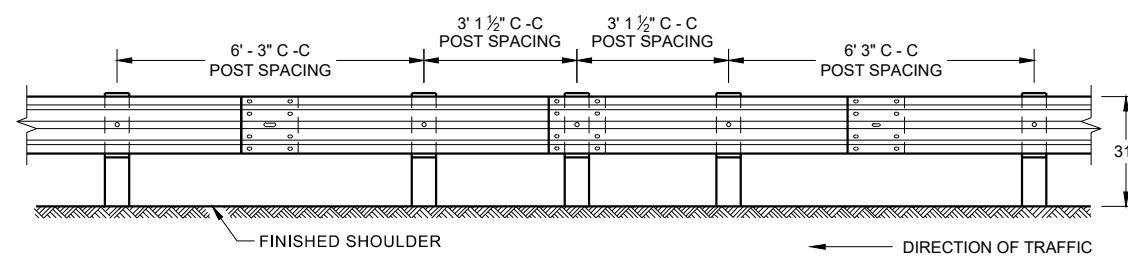


MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

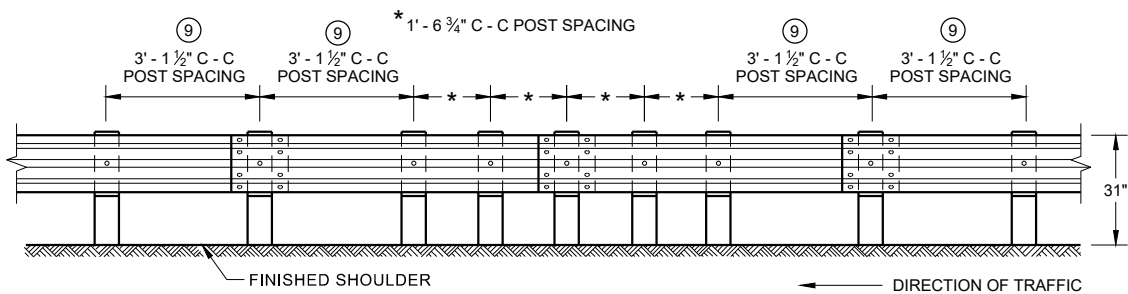
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



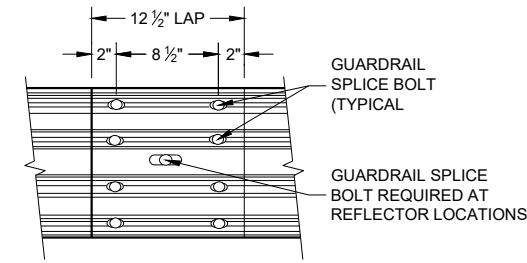
**FRONT VIEW
POST SPACING STANDARD INSTALLATION**



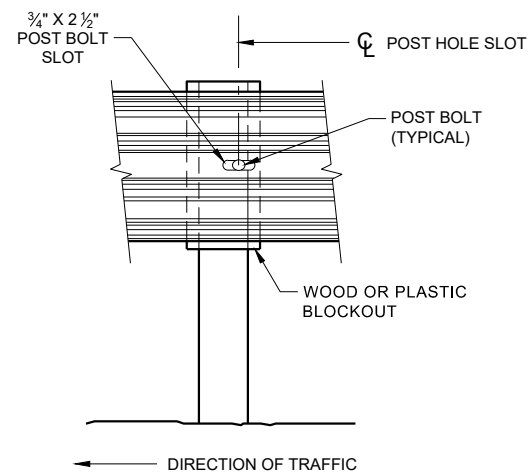
**FRONT VIEW
HALF POST SPACING (HS) AND
HALF POST SPACING WITH LONGER POSTS (K)**



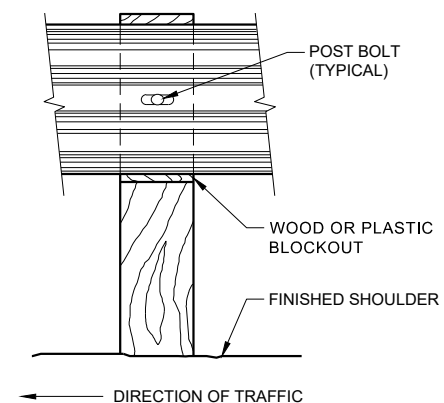
**FRONT VIEW
QUARTER POST SPACING (QS)**



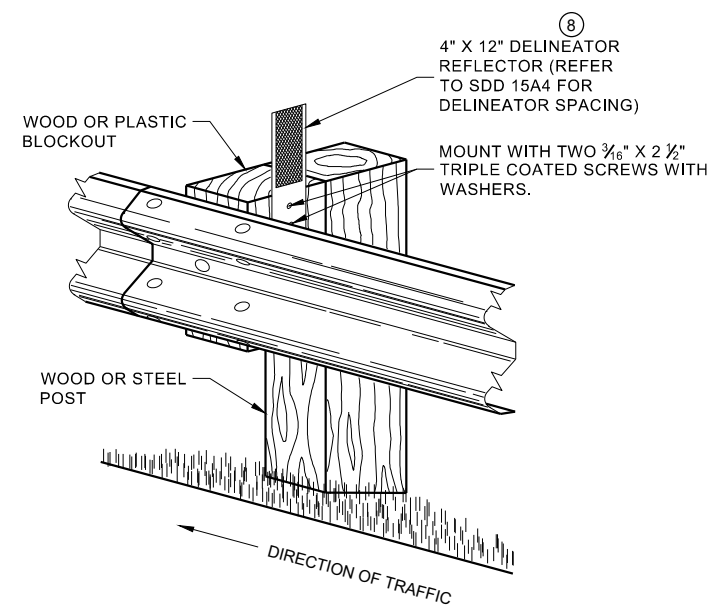
**FRONT VIEW
MID-SPAN BEAM SPLICE**



FRONT VIEW AT STEEL POST



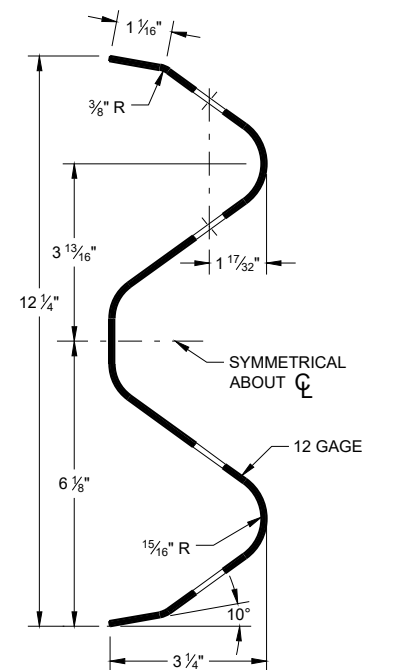
FRONT VIEW AT WOOD POST



**ONE SIDED REFLECTOR DETAIL
AND TYPICAL INSTALLATION**

GENERAL NOTES

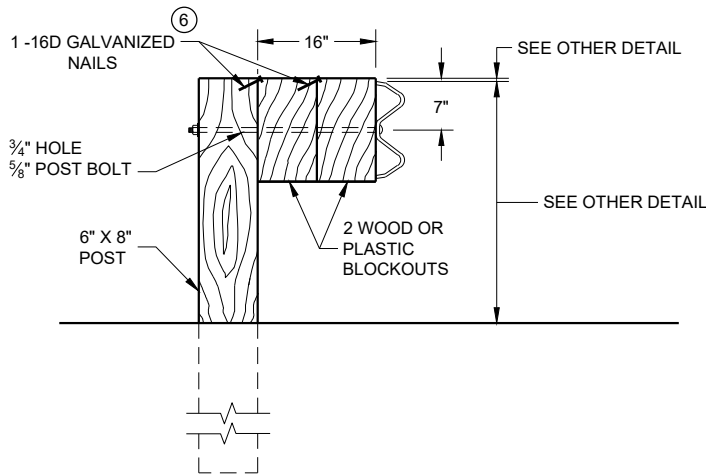
- 8 DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPLICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.
 - 9 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.
- POST BOLTS ARE A 3/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 3/4" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.
- GUARD RAIL SPLICE BOLTS ARE A 3/8" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.



SECTION THRU W-BEAM RAIL

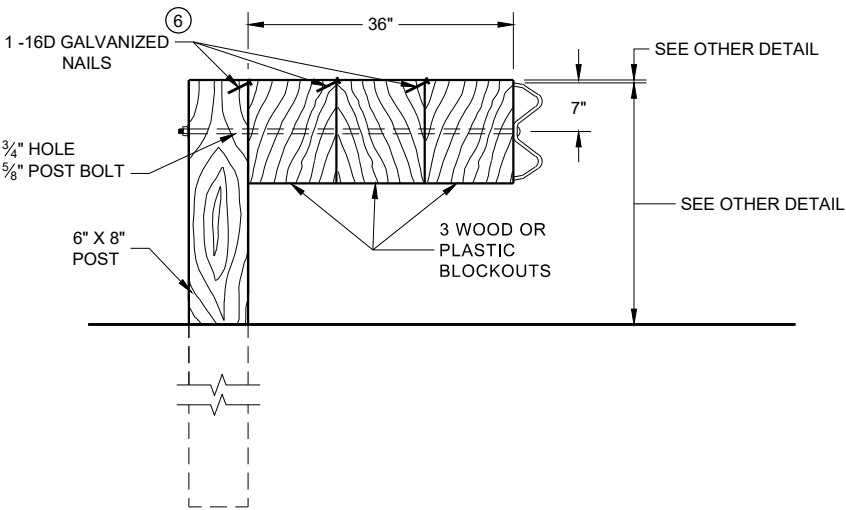
**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



DETAIL FOR 16" BLOCKOUT DEPTH

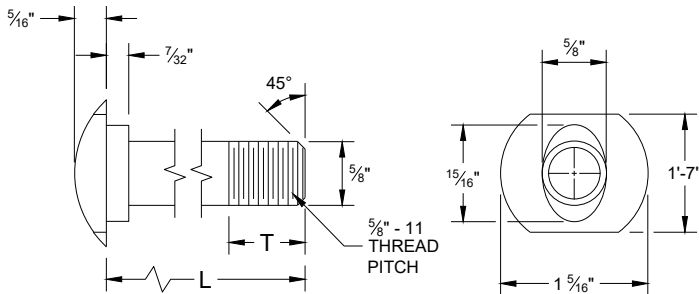
IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.



DETAIL FOR 36" BLOCKOUT DEPTH

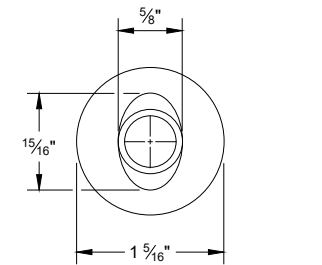
NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.

- NOTE:
- 1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 3/16".
 - 2. IF THE BOLT EXTENDS MORE THAN 1/4" FROM THE NUT THE BOLT SHOULD BE TRIMMED BACK.

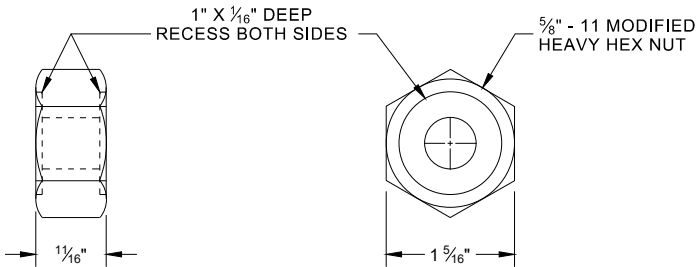


POST BOLT TABLE

L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"

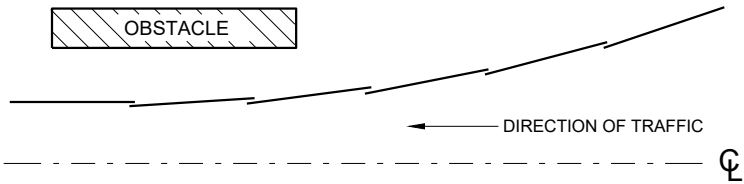


ALTERNATE BOLT HEAD

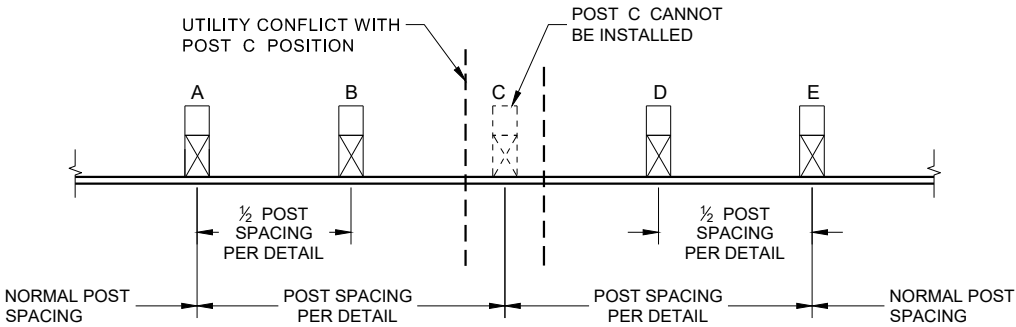


POST BOLT, SPLICE BOLT AND RECESS NUT

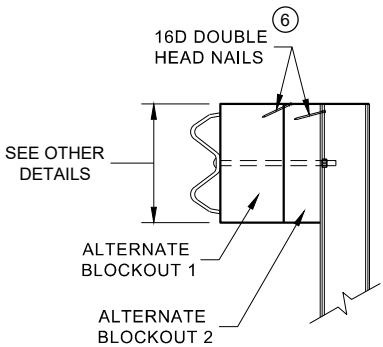
- 6 WHEN USING STEEL POST AD WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.



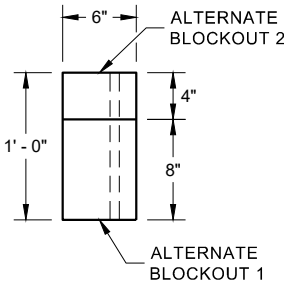
PLAN VIEW
BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS
UNDERGROUND OBSTRUCTION



SIDE VIEW

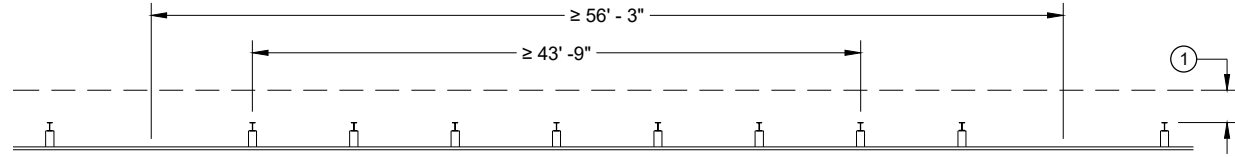


PLAN VIEW

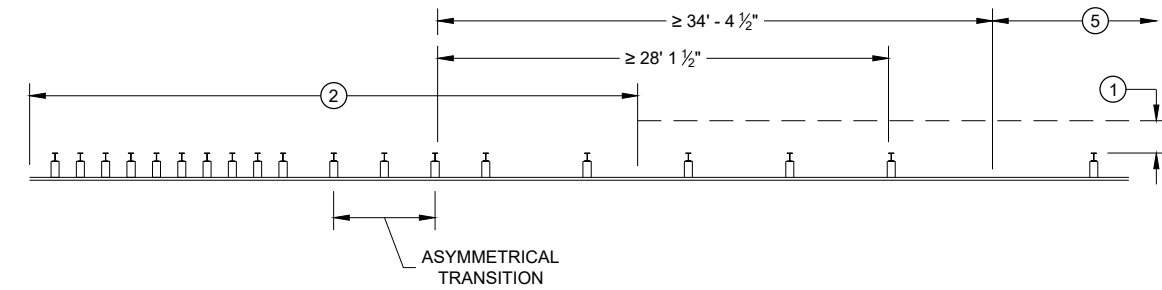
ALTERNATE WOOD
BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

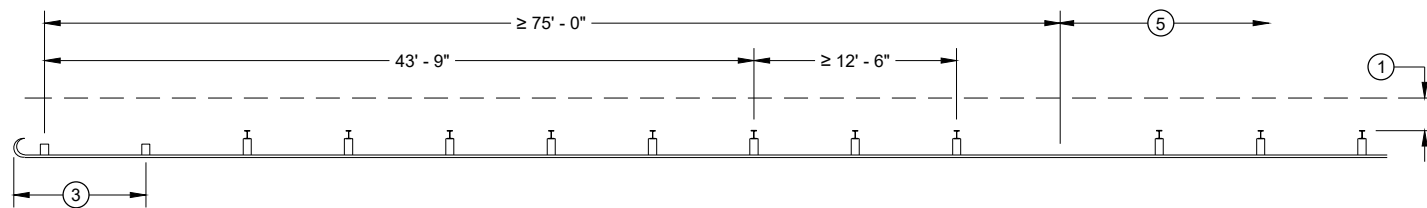
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



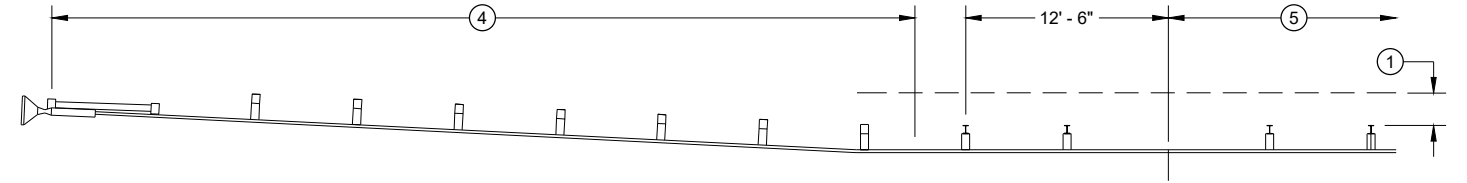
MISSING POST IN NORMAL BEAM GUARD RUN



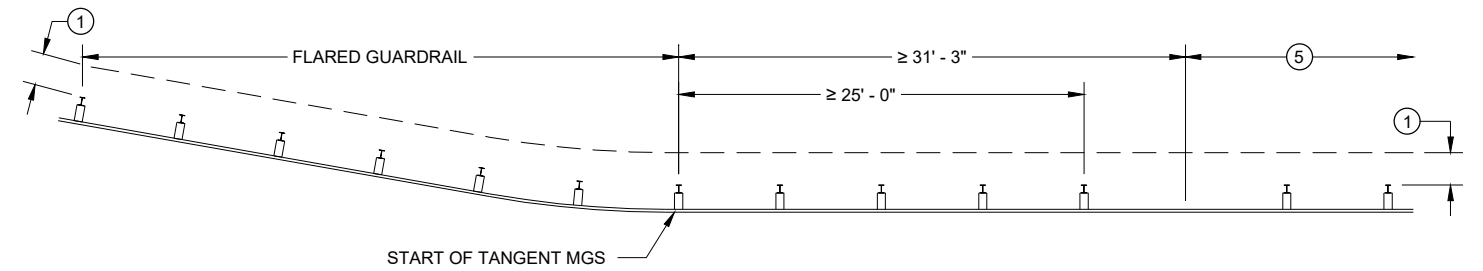
MISSING POST NEAR APPROACH THRIE BEAM TRANSITION



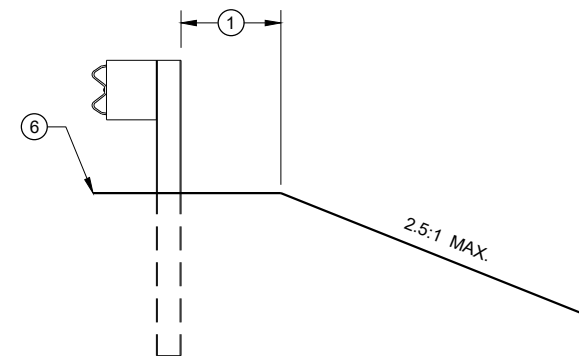
MISSING POST IN NORMAL BEAM GUARD RUN
NEAR TYPE 2 TERMINAL



MISSING POST IN NORMAL BEAM GUARD RUN NEAR EAT



MISSING POST IN NORMAL BEAM GUARD RUN
NEAR FLARED BEAM GUARD



CROSS SECTION VIEW

- (1) MINIMUM OF 2 FEET OF GRADING BEHIND POST.
- (2) SEE SDD 14B45 FOR MORE DETAILS.
- (3) SEE SDD 14B47 FOR MORE DETAILS.
- (4) SEE SDD 14B44 FOR MORE DETAILS.
- (5) SEE MISSING POST IN NORMAL BEAM GUARD RUN FOR DISTANCE TO NEXT MISSING POST AND AREA FOR WELL DRAINED, COMPACTED SOILS.
- (6) SEE PLAN FOR SHOULDER DESIGN.

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
7/2018
DATE
/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR
FHWA

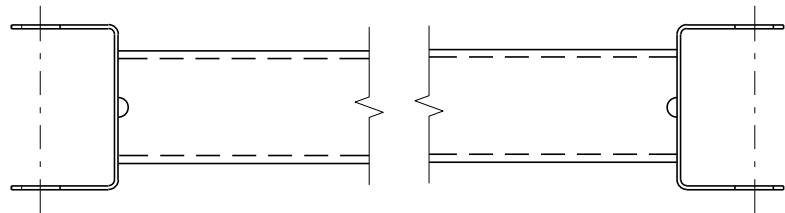
- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL) AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
- (B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED
- (C) DIFFERENT MANUFACTURERS REQUIRE DIFFERENT PERFORATED W - BEAM RAIL END PANELS. SEE MANUFACTURER'S INFORMATION.
- (D) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF - TAPPING SCREWS, ONE SCREW PER CORNER.
- (E) HARDWARE MAY VARY BETWEEN MANUFACTURER. SEE MANUFACTURER'S DRAWING FOR INFORMATION.

DIMENSIONS MAY VARY, MANUFACTURER'S INFORMATION.

THE CENTER OF THE UPPER 3 1/2" 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. WOOD BLOCKS ON POSTS NUMBERED 3 THROUGH 9 MAY BE ADJUSTED UP TO 3" ABOVE THE TOP OF POST.

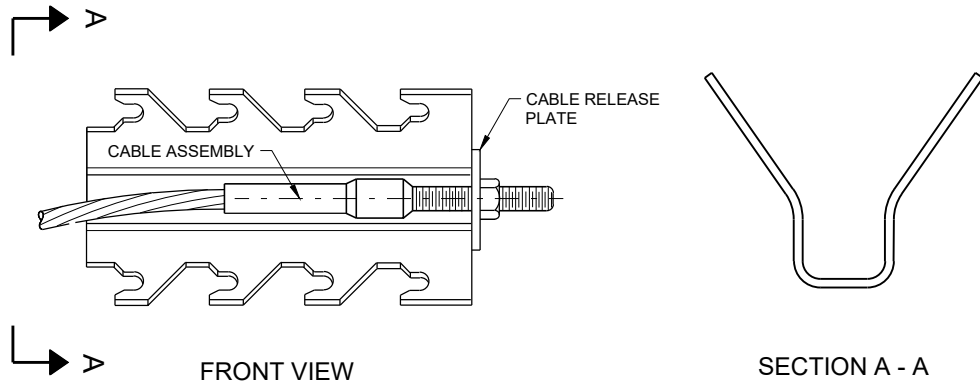


STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

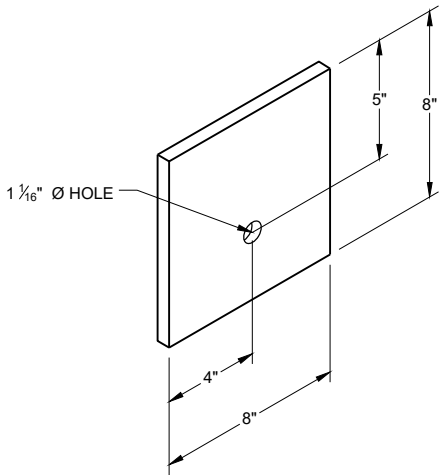


GENERIC GROUND STRUT⁹ E

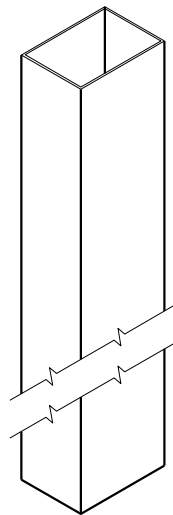
BILL OF MATERIALS	
PART NO.	DESCRIPTION MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
①	UPPER POST NO. 1 6" X 6" TUBE
②	LOWER POST NO. 1
③	WOOD CRT
④	WOOD BLOCKOUT
⑤	PIPE SLEEVE
⑥	BEARING PLATE
⑦	BCT CABLE ASSEMBLY
⑧	ANCHOR CABLE BOX
⑨	GROUND STRUT
⑩	PERFORATED W-BEAM RAIL END PANEL, 12'-6" LONG.
⑪	STANDARD W-BEAM RAIL. MULTIPLE SECTIONS REQUIRED. SECTIONS VARY IN LENGTH.
⑫	IMPACT HEAD
⑬	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)
⑭	SOIL PLATE
⑮	UPPER POST NO. 2
⑯	LOWER POST NO. 2



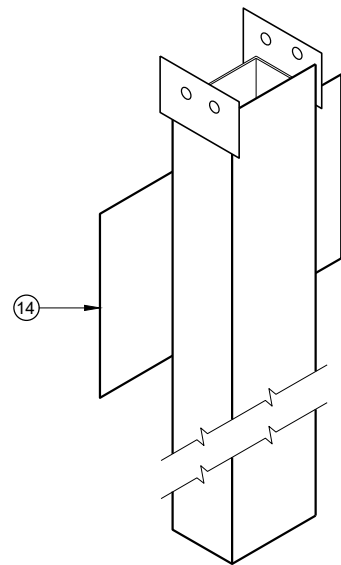
GENERIC ANCHOR CABLE BOX⁹ E



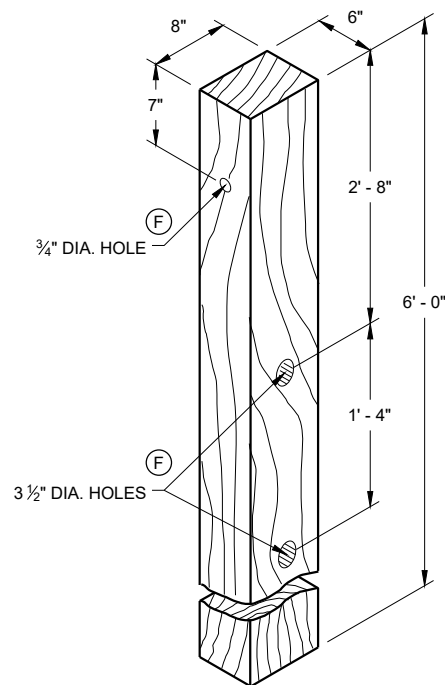
BEARING PLATE⁶ E



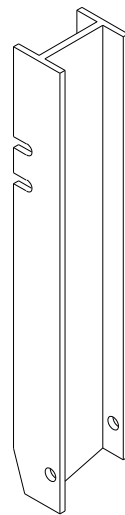
UPPER POST NO. 1^{(1) (E)}



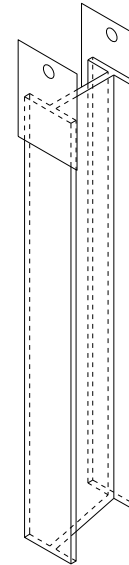
LOWER POST NO. 1^{(2) (E)}



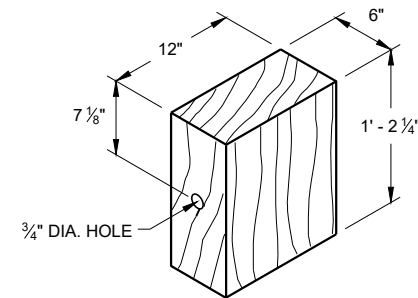
WOOD CRT POST^{(3) (E)}
POSTS NUMBER 3-9



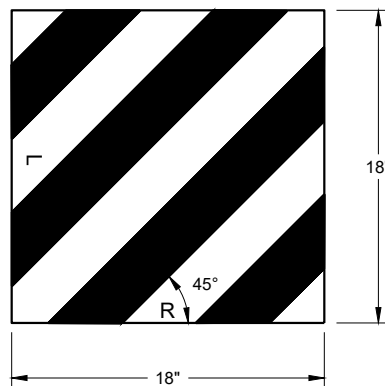
UPPER POST NO. 2^{(15) (E)}



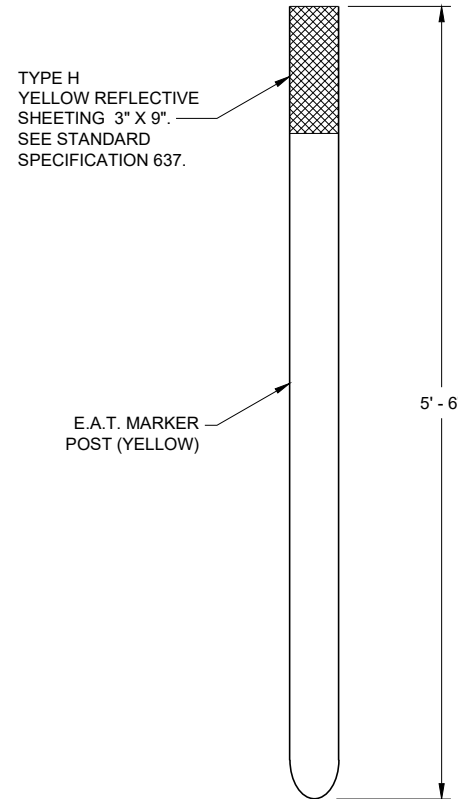
LOWER POST NO. 2^{(16) (E)}



WOOD BLOCKOUT⁽⁴⁾
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2



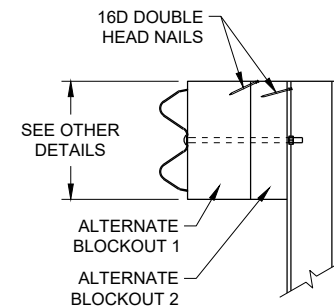
REFLECTIVE SHEETING DETAIL^(E)



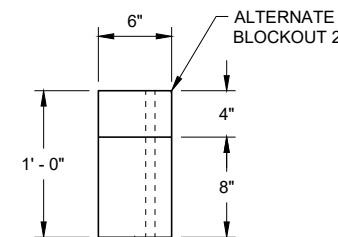
FRONT VIEW

SIDE VIEW

E.A.T. MARKER POST⁽¹³⁾



SIDE VIEW



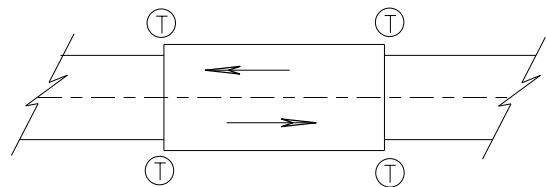
TOP VIEW

ALTERNATE WOOD
BLOCKOUT DETAIL

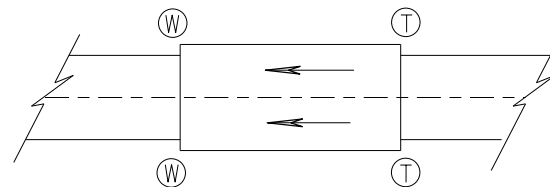
**MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
7/2018 DATE /S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR
FHWA



TWO WAY TRAFFIC



ONE WAY TRAFFIC

(T) THRIE BEAM CONNECTION

(W) W-BEAM CONNECTION WHEN REQUIRED

TYPICAL LOCATIONS OF THRIE BEAM AND W-BEAM CONNECTIONS TO BRIDGE

GENERAL NOTES

IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2", AND 12" DIAMETER AROUND POST. SEE 14B42 FOR MORE DETAILS.

TRANSITION USES STEEL POSTS ONLY.

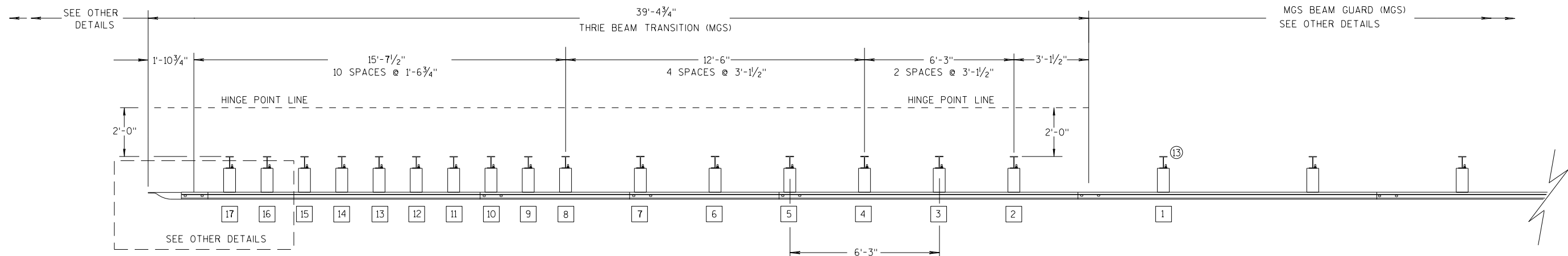
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

POST 2 THROUGH 17 USES STEEL POST ONLY

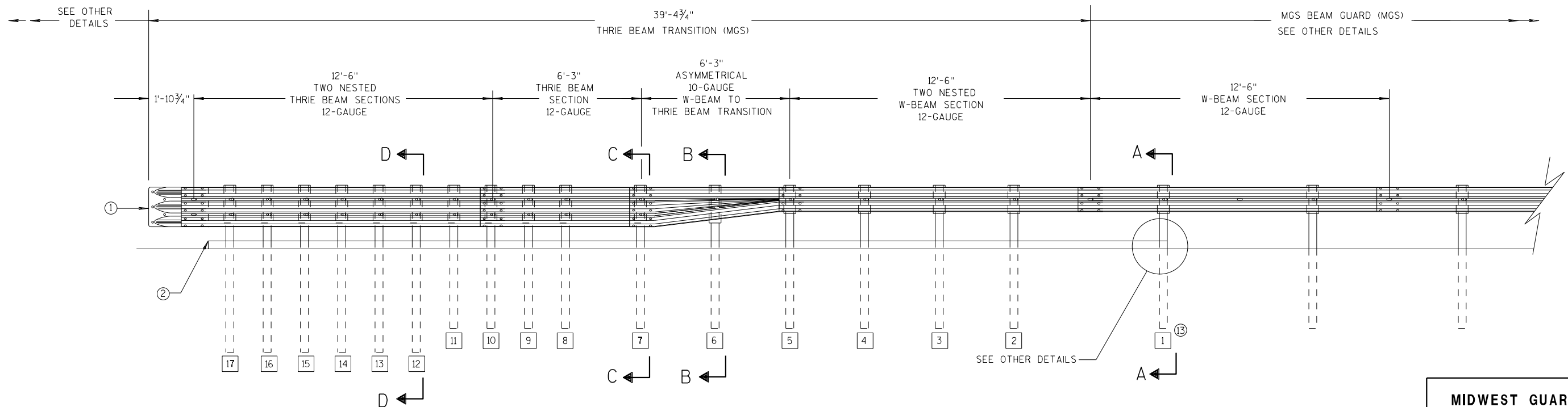
① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.

② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.

⑬ STEEL OR WOOD POST IS ACCEPTABLE AT POST 1. SEE SDD14B42



PLAN VIEW



ELEVATION VIEW

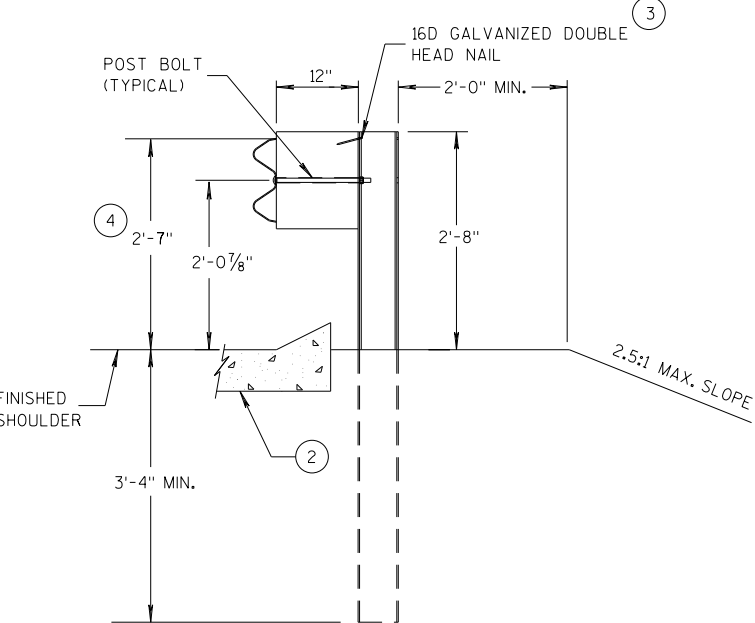
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

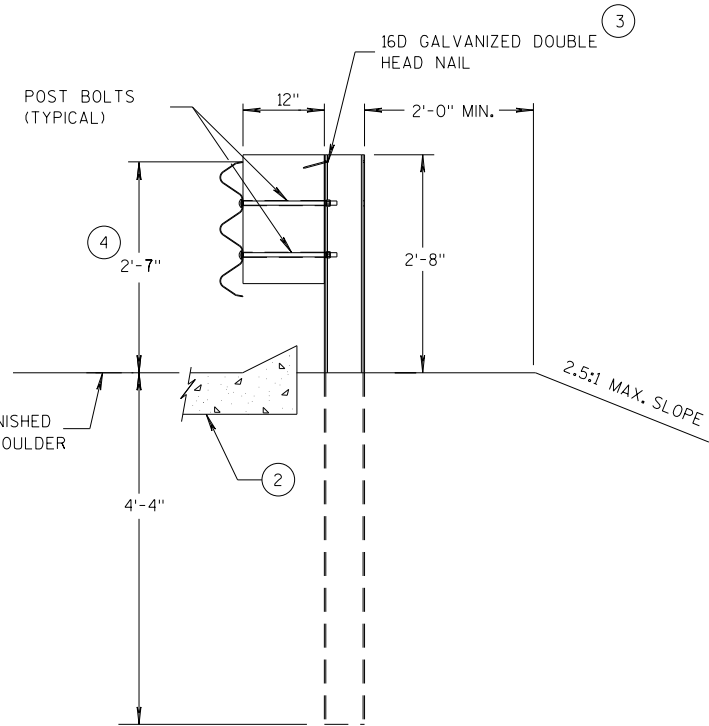
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

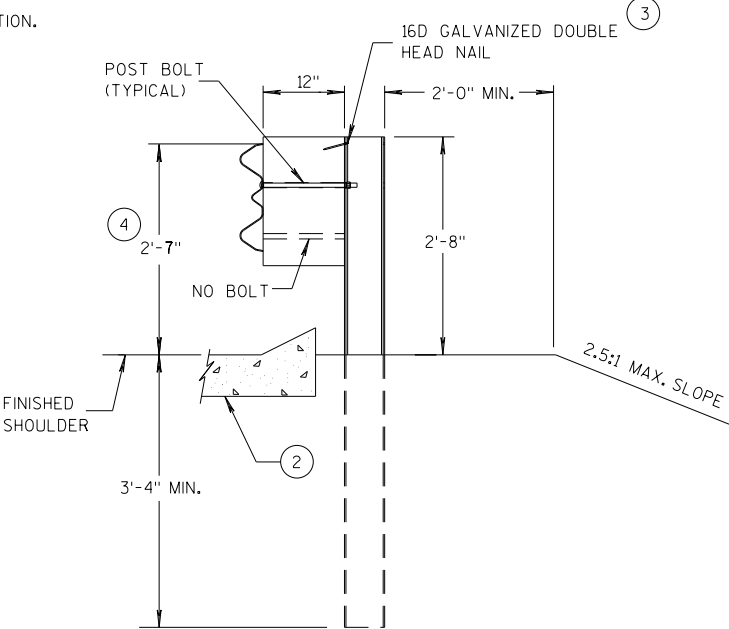
- 2 OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- 3 WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 10D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- 4 TOLERANCE FOR TOP OF W-BEAM RAIL IS $\pm 1"$.
- 13 STEEL OR WOOD POST IS ACCEPTABLE AT POST 1. SEE SDD 14B42



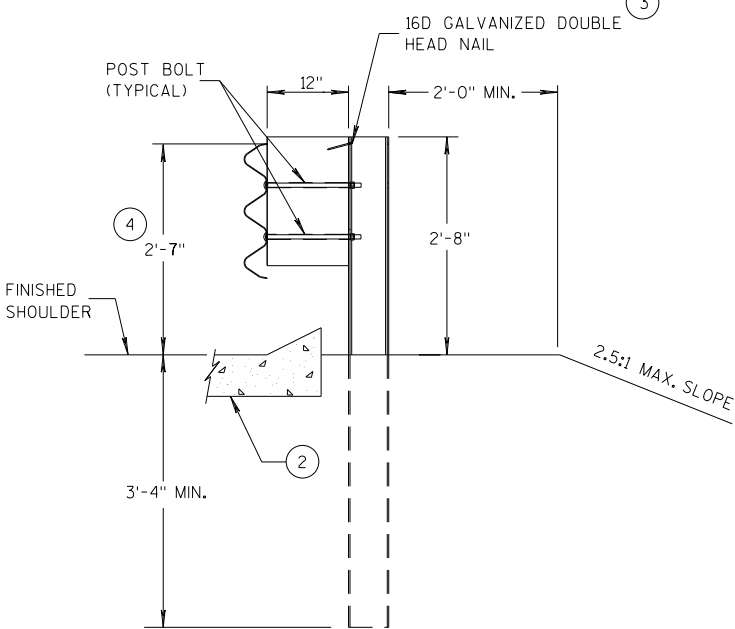
SECTION A-A
POSTS 1-5



SECTION D-D
POSTS 12-17



SECTION B-B
POST 6



SECTION C-C
POSTS 7-11

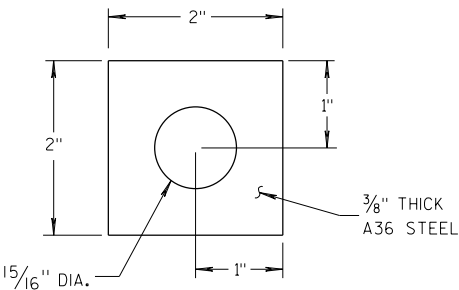
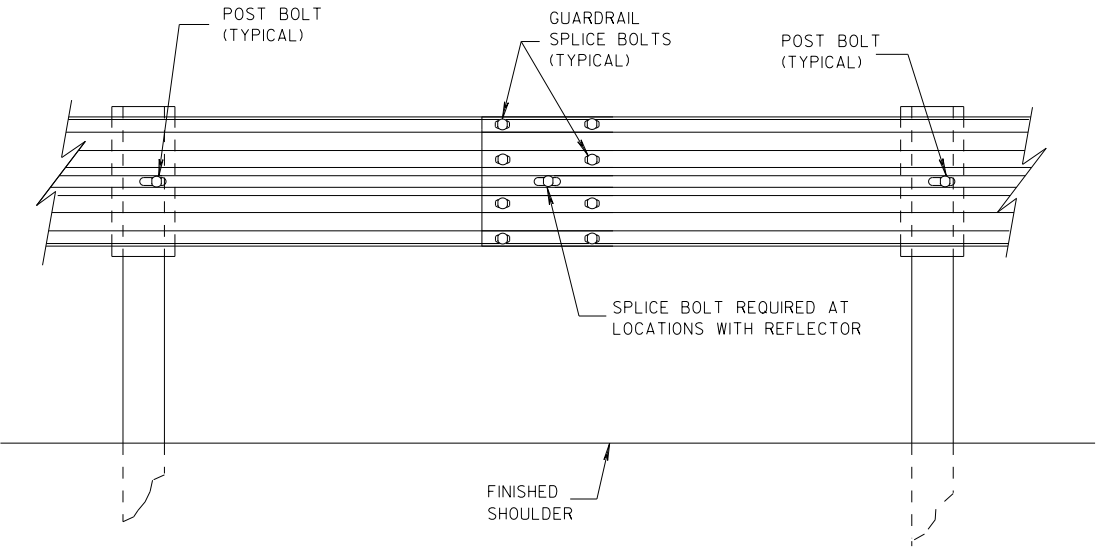
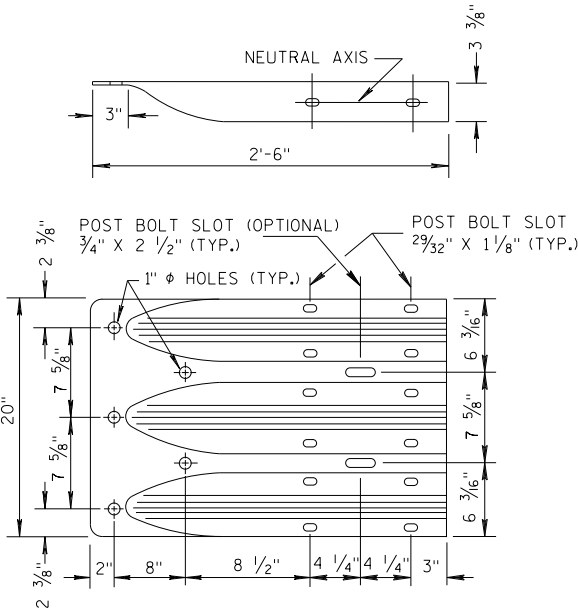


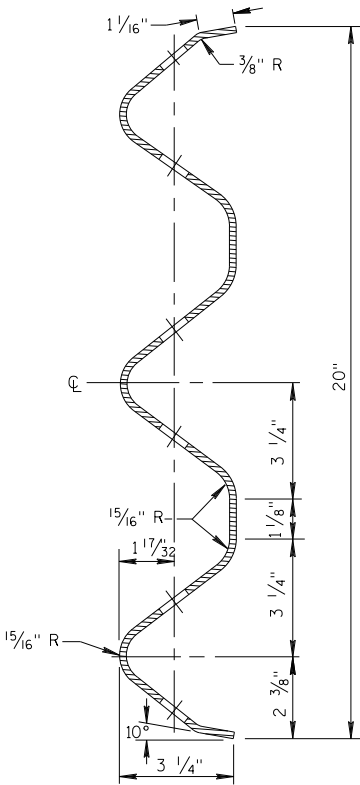
PLATE WASHER DETAIL



SPLICE DETAIL



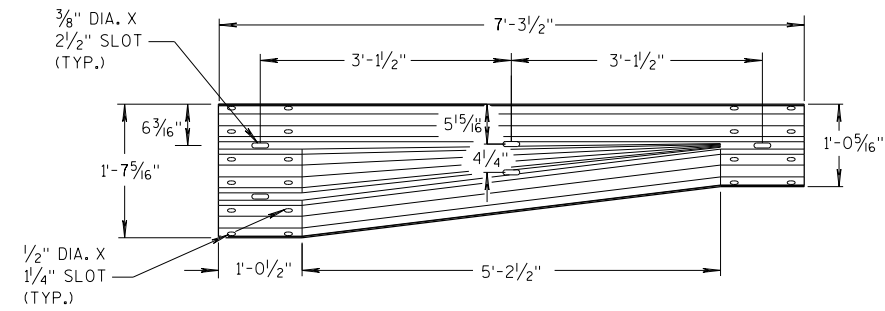
THRIE BEAM
TERMINAL CONNECTOR



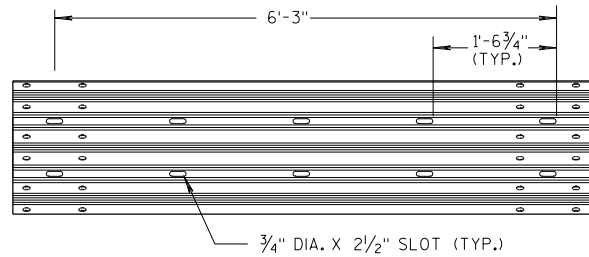
SECTION THRU THRIE
BEAM RAIL ELEMENT

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

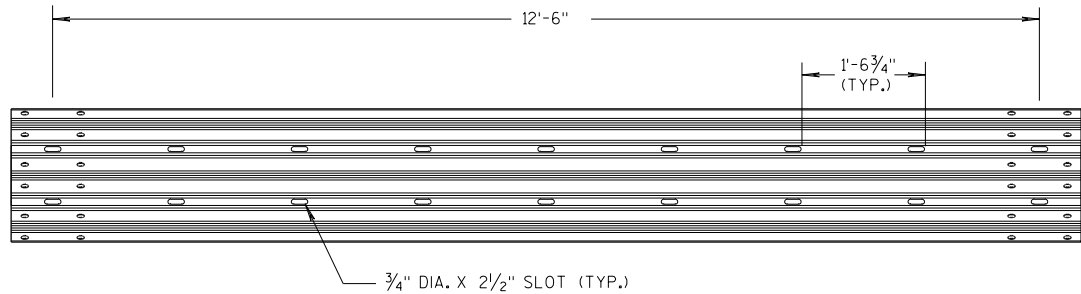
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



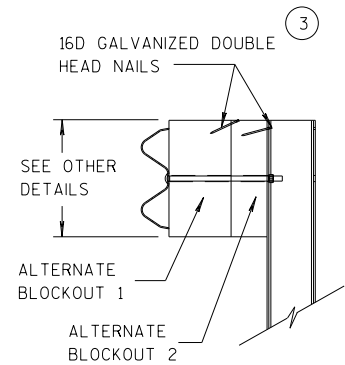
W-BEAM TO THRIE BEAM TRANSITION SECTION



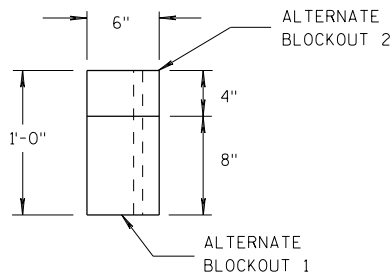
6'-3" THRIE BEAM SECTION



12'-6" THRIE BEAM SECTION

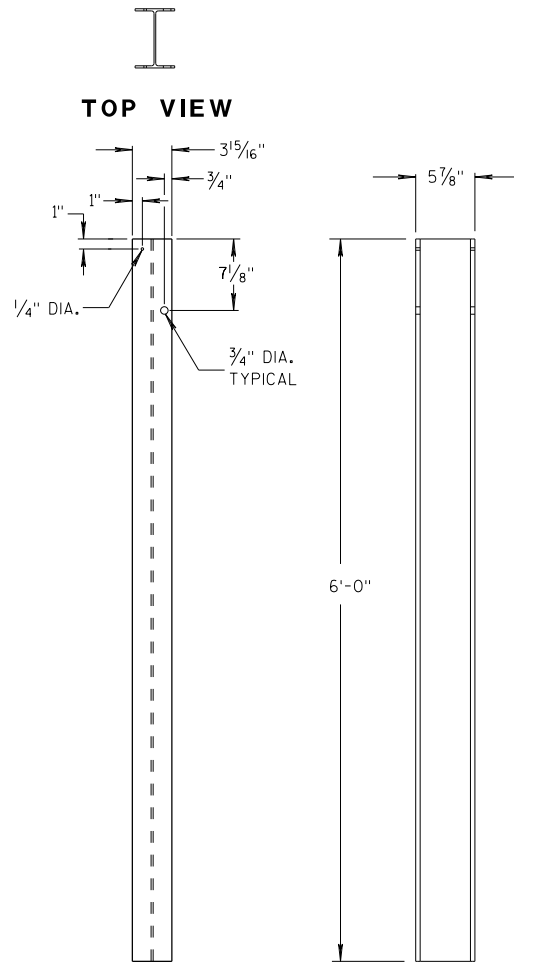


SIDE VIEW



TOP VIEW

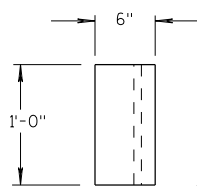
ALTERNATE WOOD BLOCKOUT DETAIL



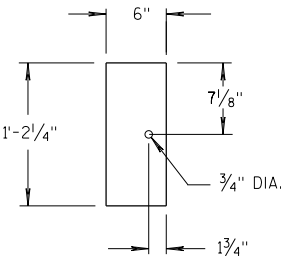
FRONT VIEW

SIDE VIEW

STEEL POSTS 1-5

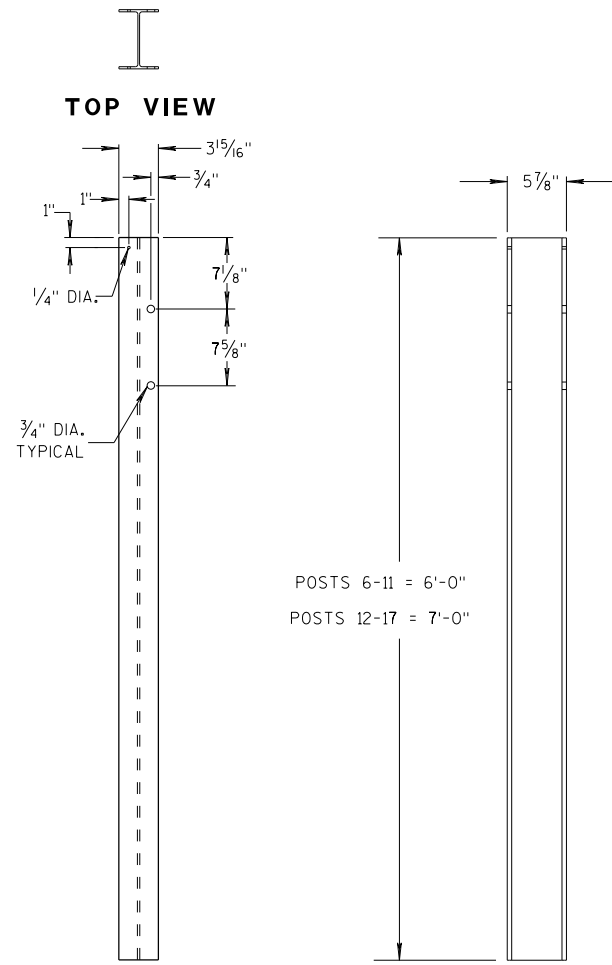


TOP VIEW



FRONT VIEW

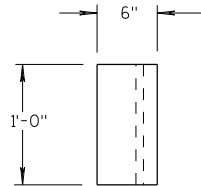
BLOCKOUT POSTS 1-5



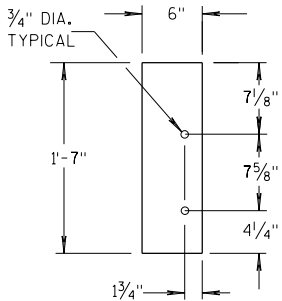
FRONT VIEW

SIDE VIEW

STEEL POSTS 6-17



TOP VIEW



FRONT VIEW

BLOCKOUT POSTS 6-17

GENERAL NOTES

STEEL POSTS ARE W6X9 OR W6X8.5.

BOLT HOLES FOR POST ARE ON FRONT AND OF SIDE OF POST.

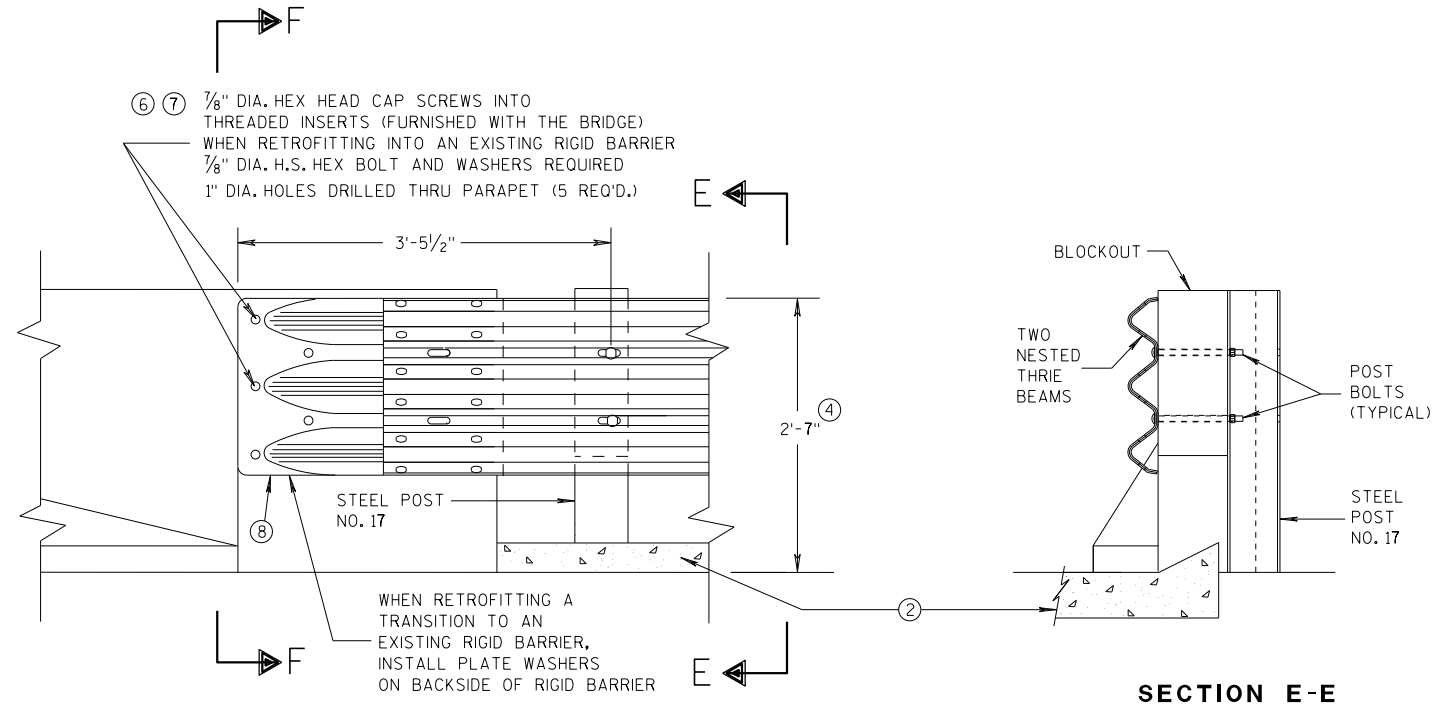
③ WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

⑤ WOOD BLOCKS MAY BE CONSTRUCTED OUT OF 2 WOOD BLOCKS. SEE ALTERNATE WOOD BLOCK DETAIL.

⑬ STEEL OR WOOD POST IS ACCEPTABLE AT POST 1. SEE SDD 14B42.

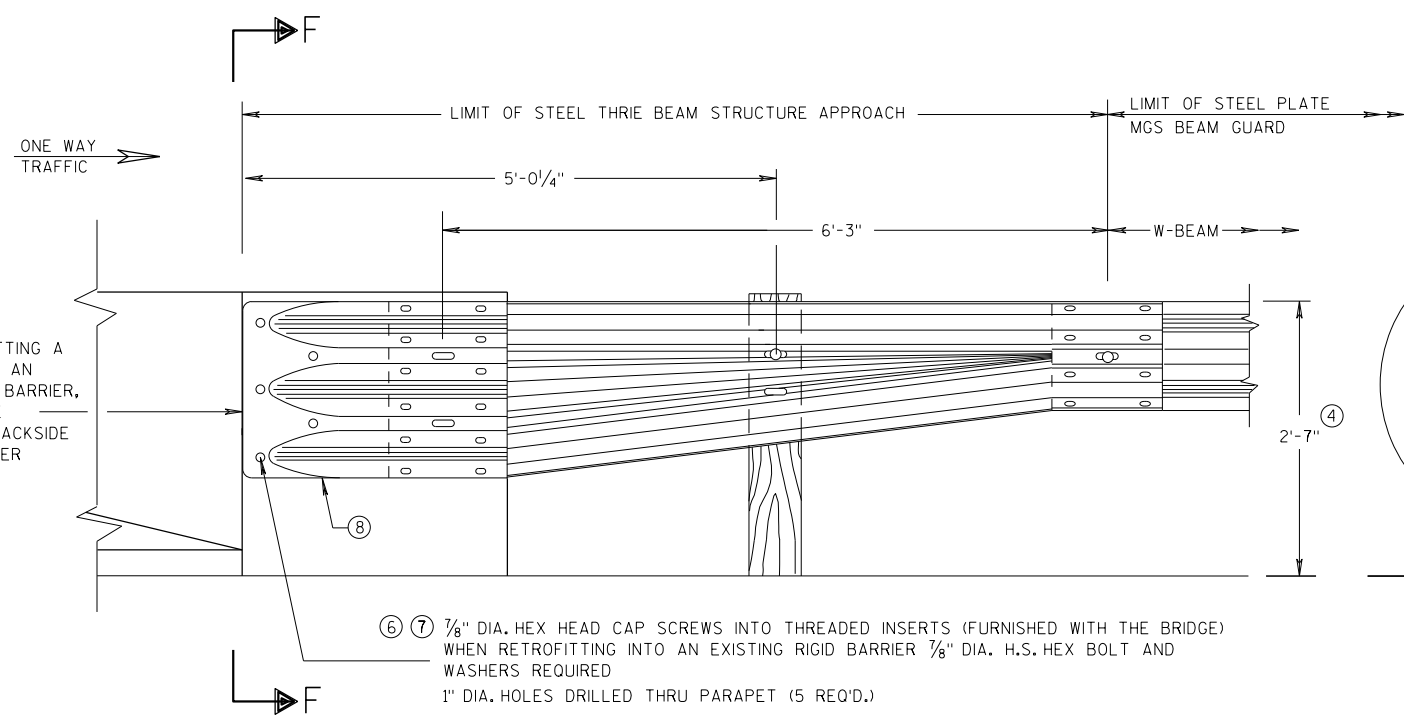
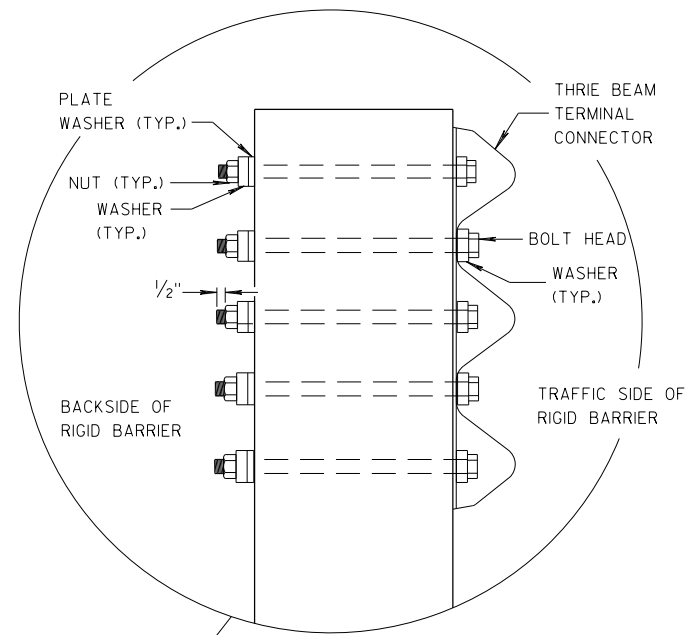
**MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

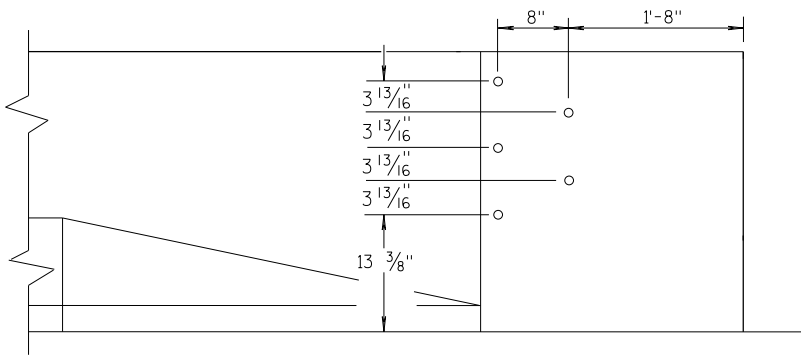


GENERAL NOTES

- THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSTION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ⑧ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".



SECTION F-F

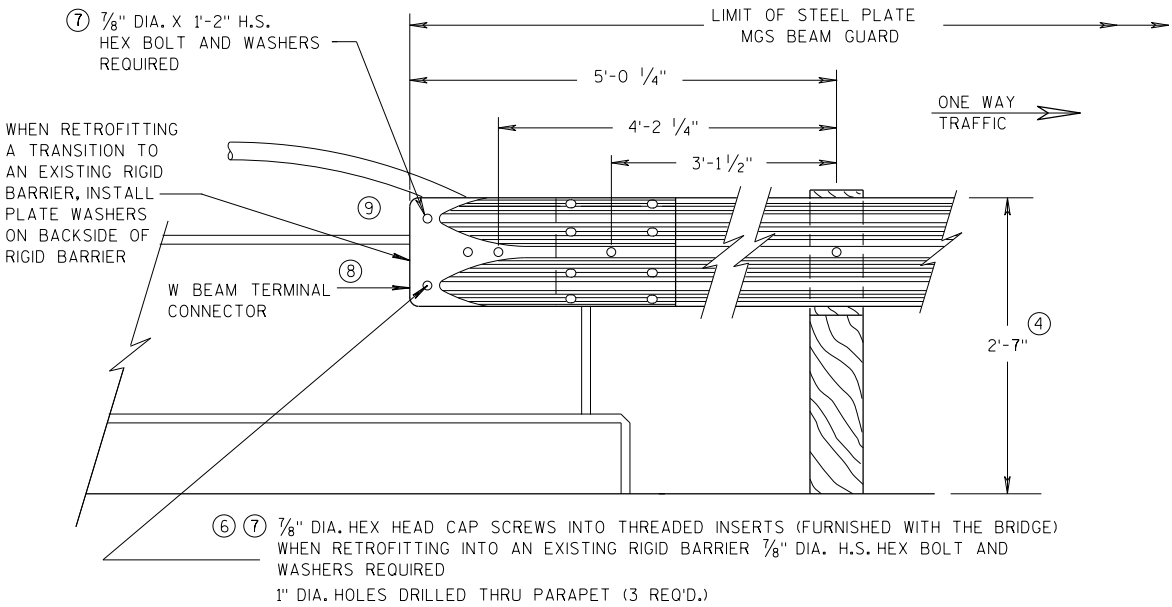


MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 07/2018 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
FHWA	

GENERAL NOTES

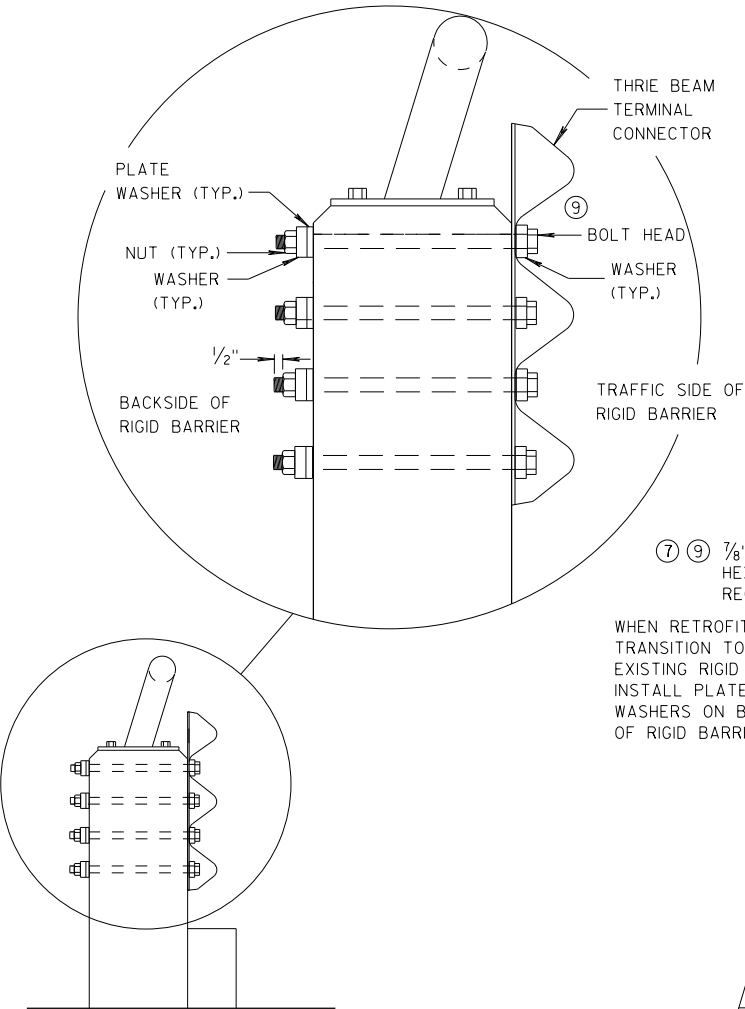
THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSTION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.

- OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X $\frac{5}{8}"$ THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 $\frac{1}{2}"$.
- BOLT, NUT AND WASHERS NOT REQUIRED FOR THIS LOCATION WHEN RETROFITTING AN EXISTING PAPAPET AND THE HOLE IS EITHER ABOVE PARAPET OR WITHIN 4 INCHES OF THE EDGE OF PARAPET.

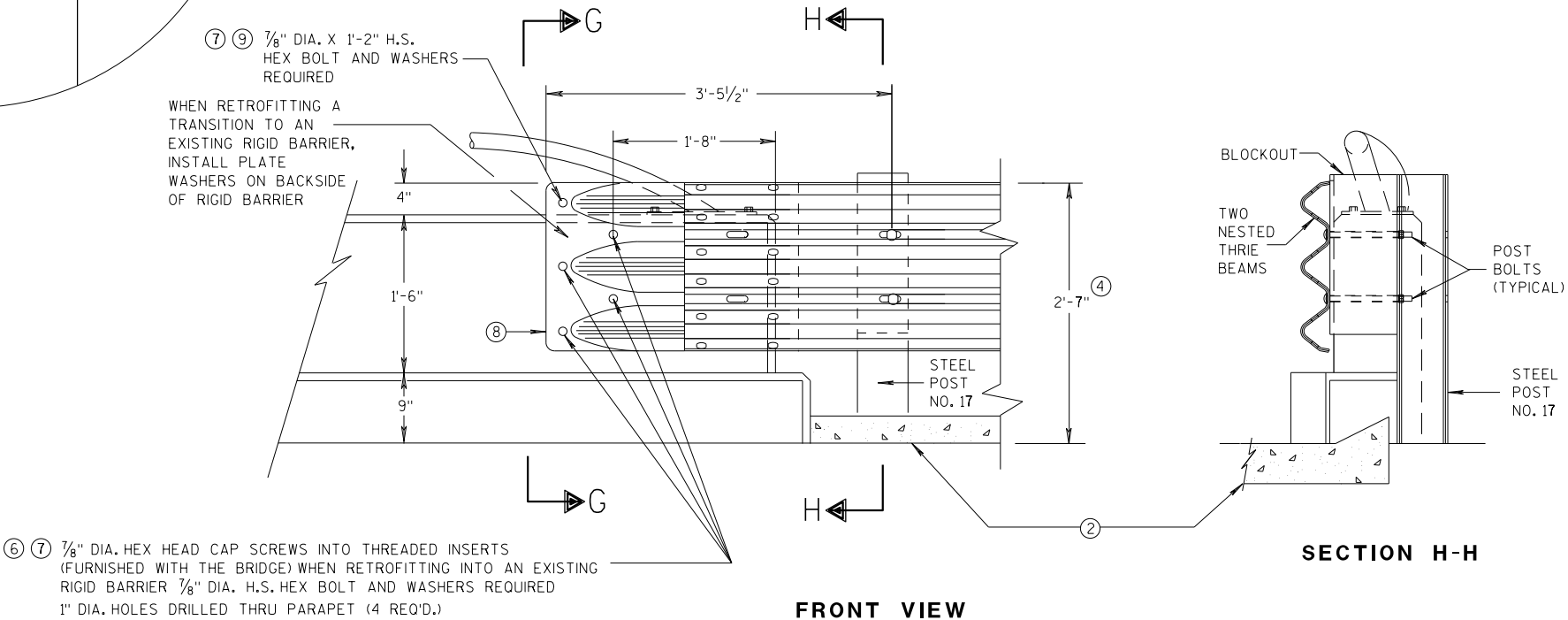


FRONT VIEW

W BEAM CONNECTION TO VERTICAL FACE PARAPET
(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

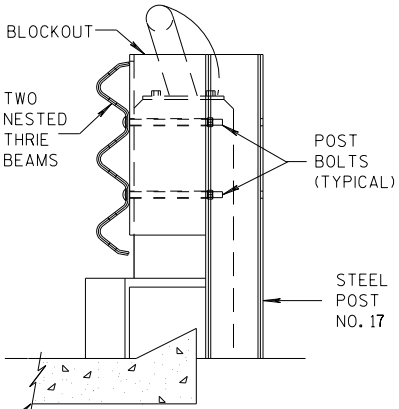


SECTION G-G



FRONT VIEW

THRIE BEAM CONNECTION TO VERTICAL FACED PARAPETS

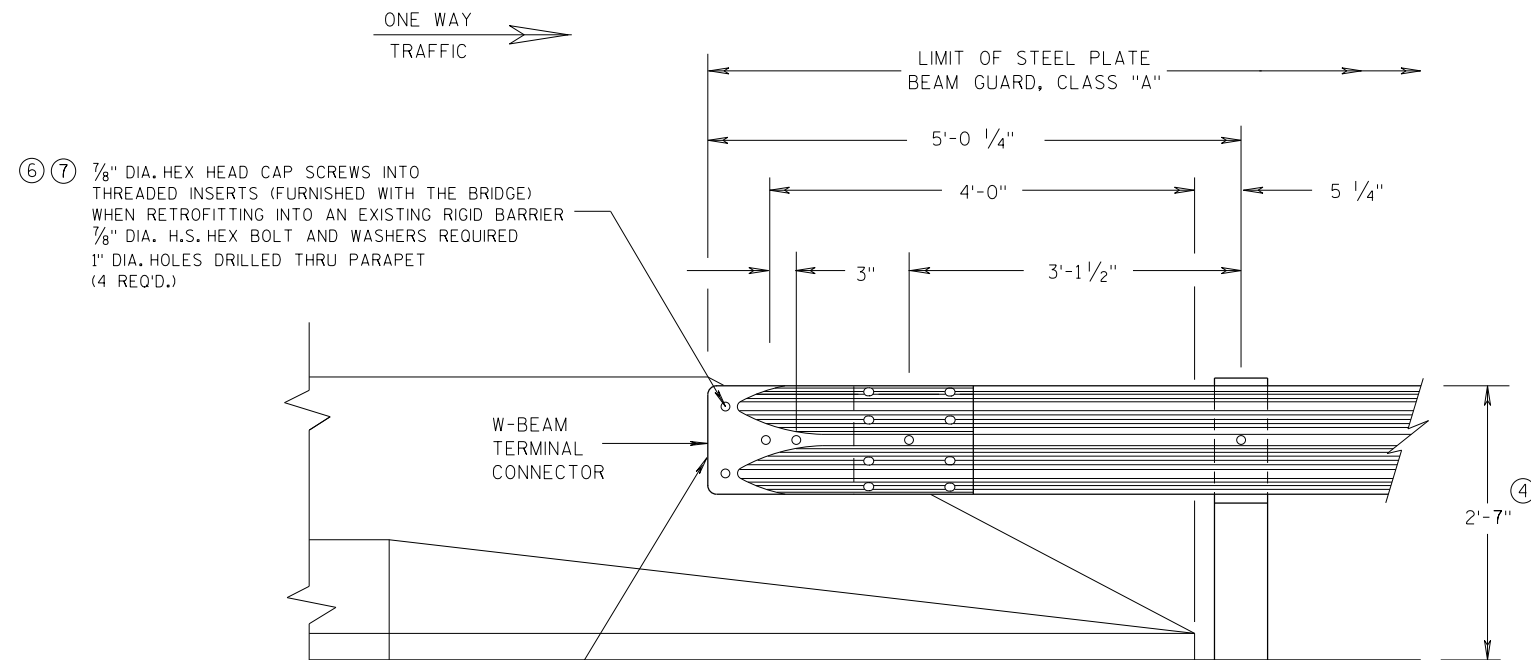


SECTION H-H

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

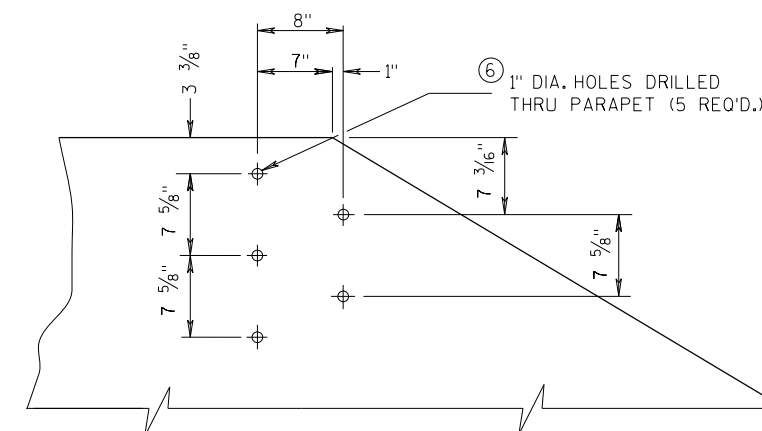
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
07/2018
DATE
FHWA
/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR

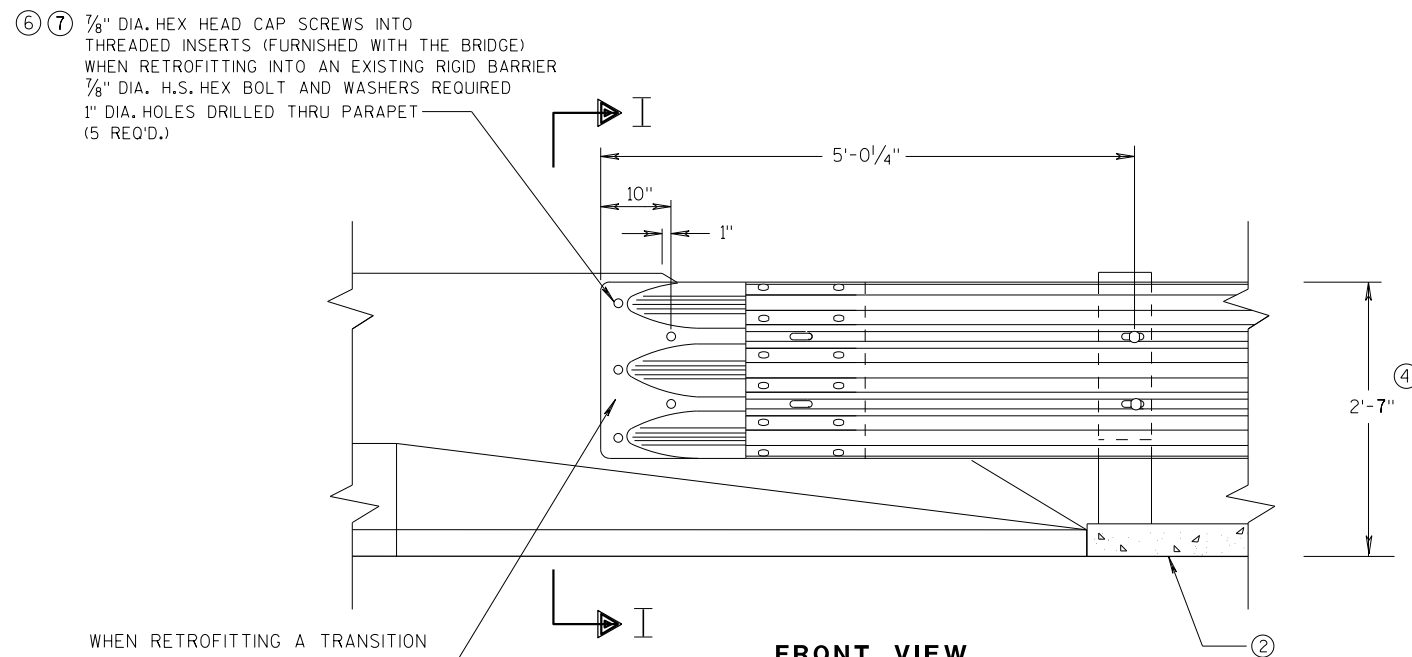


FRONT VIEW

**W BEAM CONNECTION TO
PARAPETS WITH SLOPED ENDS
(USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)**

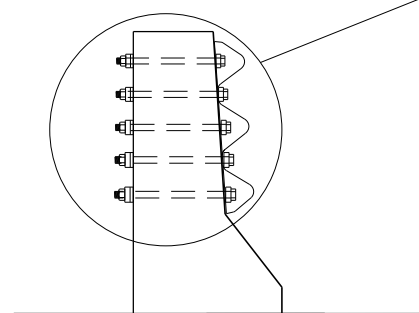


**DRILL HOLE LOCATION AND PATTERN
FOR THRIE BEAM CONNECTION**

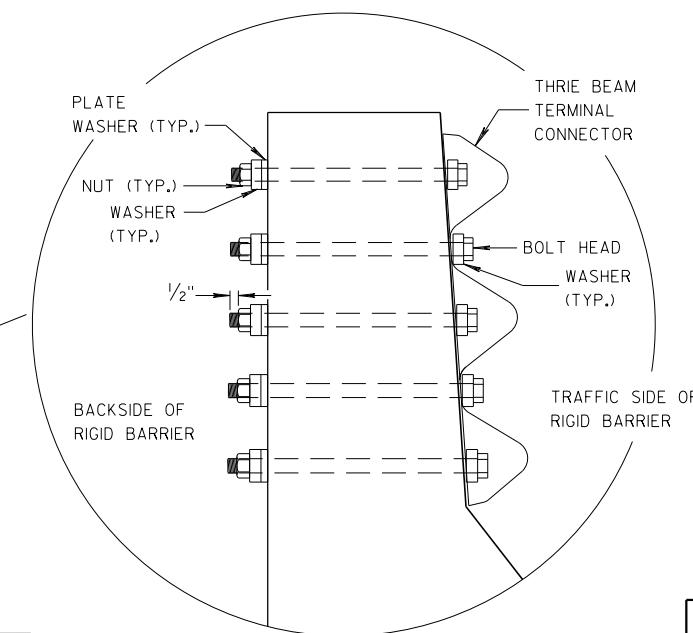


FRONT VIEW

**THRIE BEAM CONNECTION TO BRIDGE
PARAPETS WITH SLOPED ENDS**



SECTION I-I

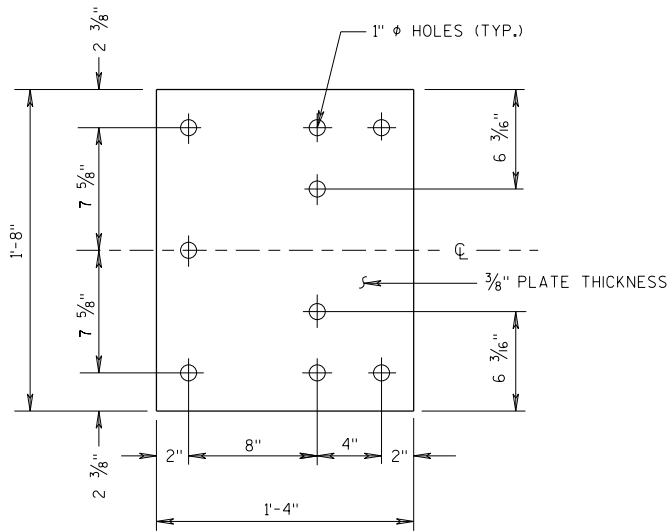
**GENERAL NOTES**

- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X $\frac{5}{8}"$ THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.

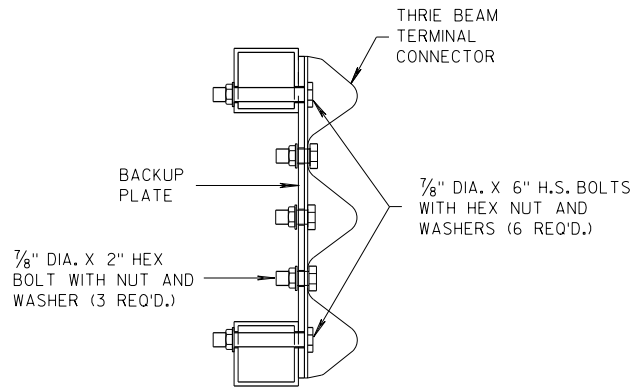
**MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

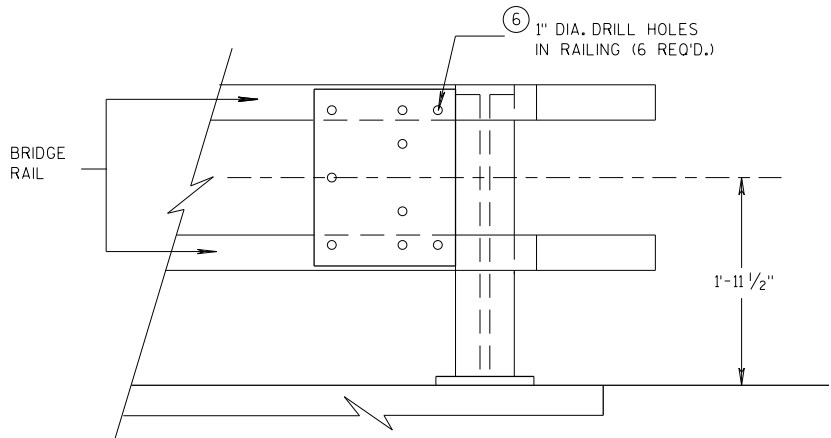
APPROVED	/S/ Rodney Taylor
DATE	ROADWAY STANDARDS DEVELOPMENT
FHWA	UNIT SUPERVISOR



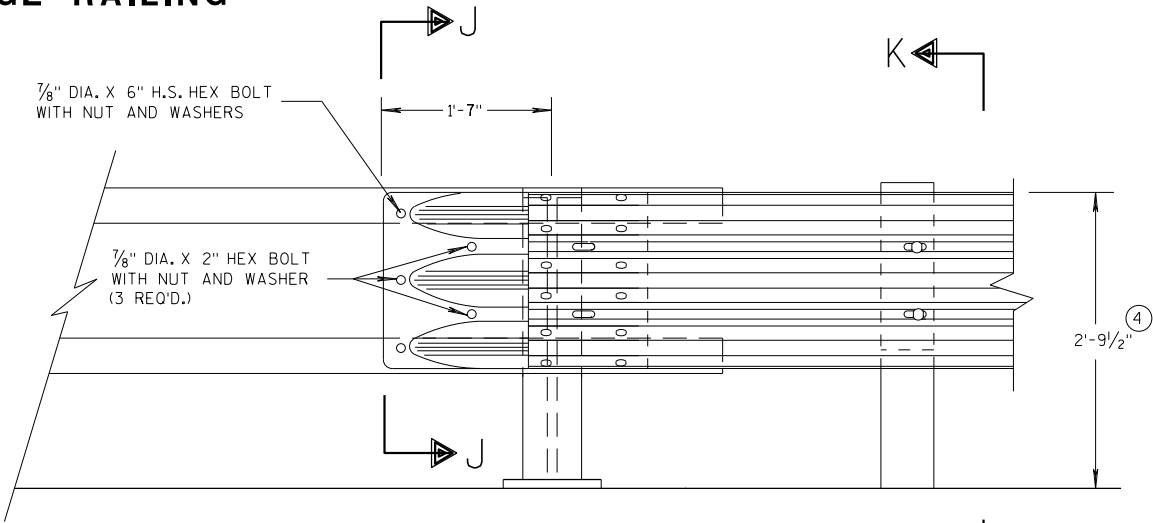
BACK-UP PLATE DETAIL



SECTION J-J

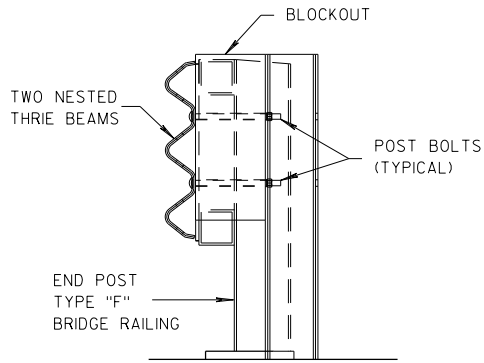


BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING



FRONT VIEW

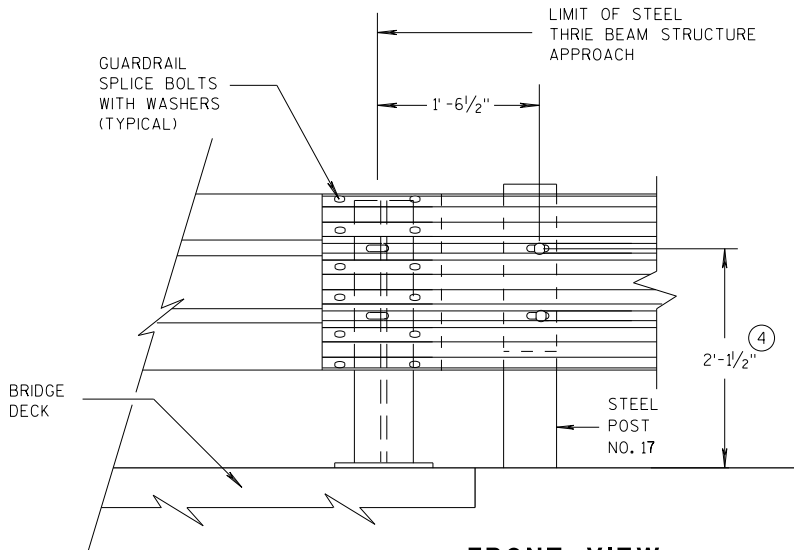
THRIE BEAM CONNECTION TO TUBULAR RAILING TYPE "F"



SECTION K-K

GENERAL NOTES

- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑥ DRILLING HOLES THROUGH THE PAPER, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.



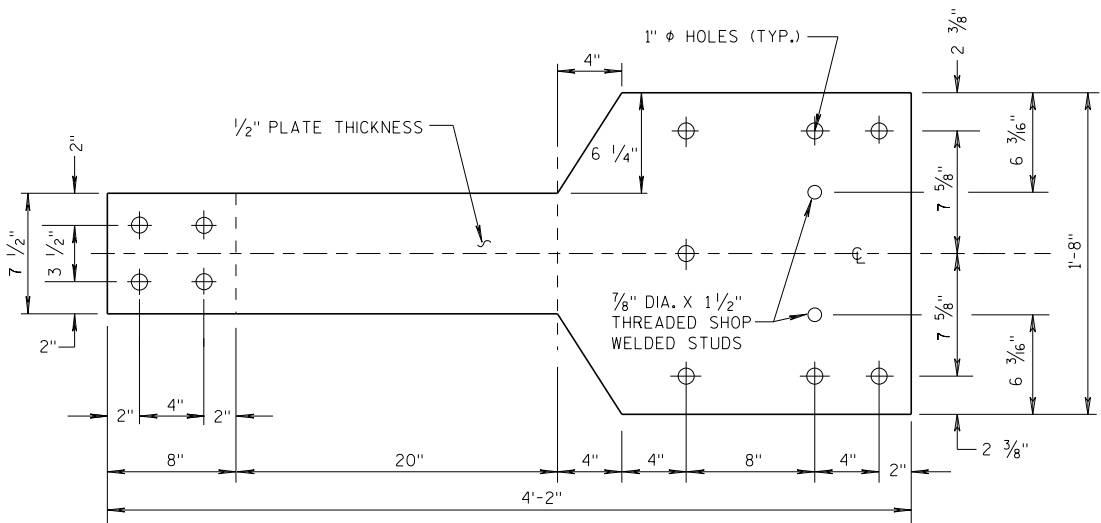
FRONT VIEW

THRIE BEAM CONNECTION TO STEEL RAILING TYPE "W"

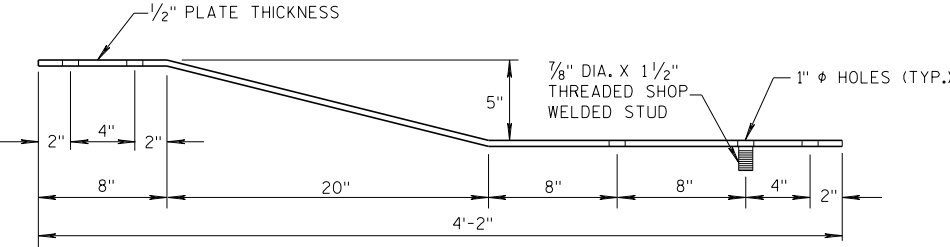
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 07/2018	/S/ Rodney Taylor
DATE	ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
FHWA	

GENERAL NOTES

④ TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".

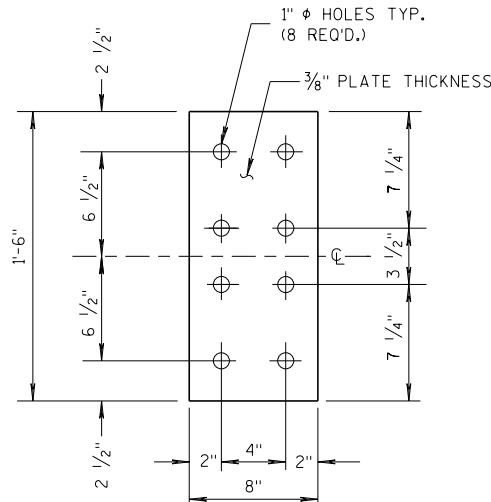


FRONT VIEW



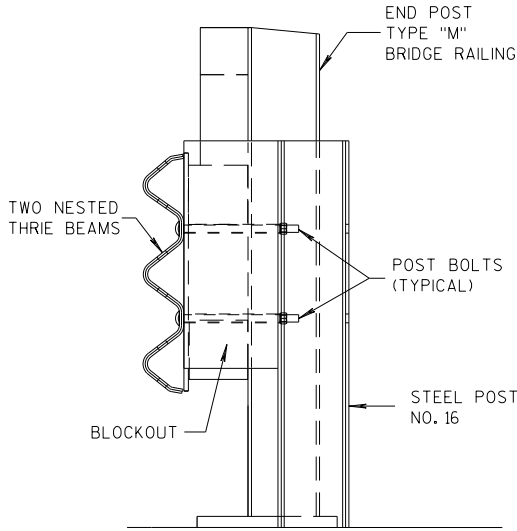
PLAN VIEW

BACK-UP PLATE DETAIL, TYPE "M"

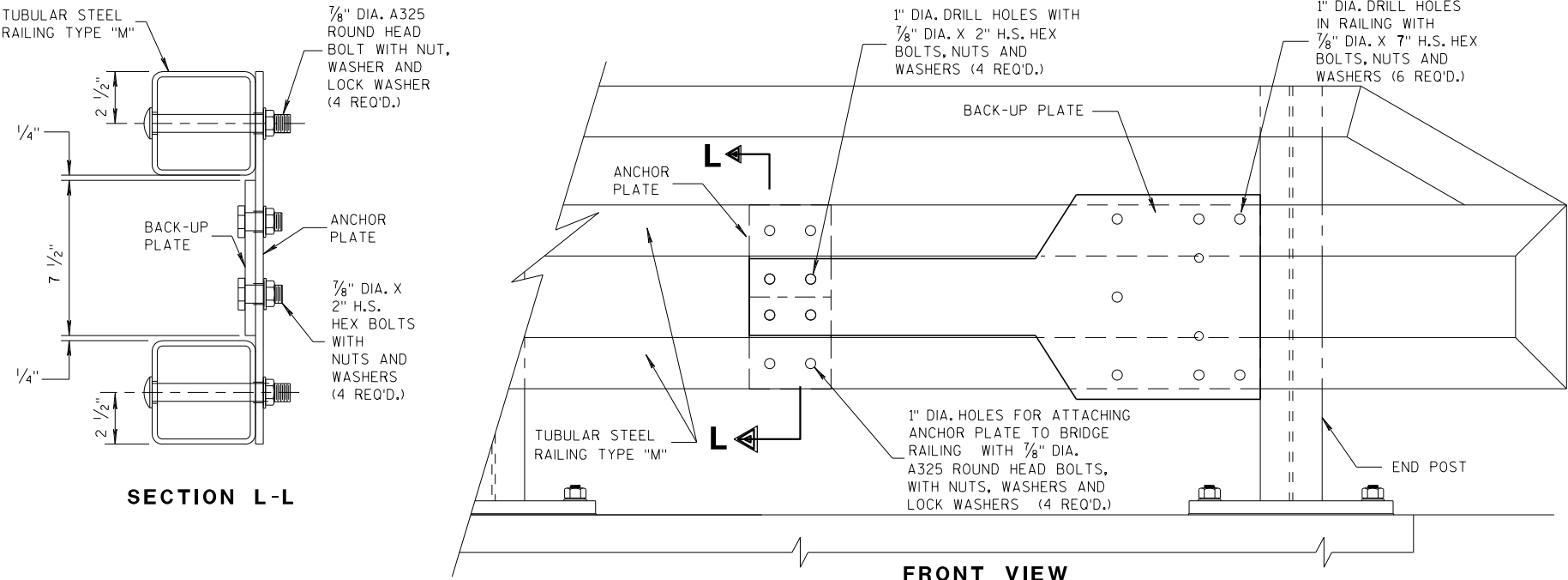


FRONT VIEW

ANCHOR PLATE DETAIL, TYPE "M"



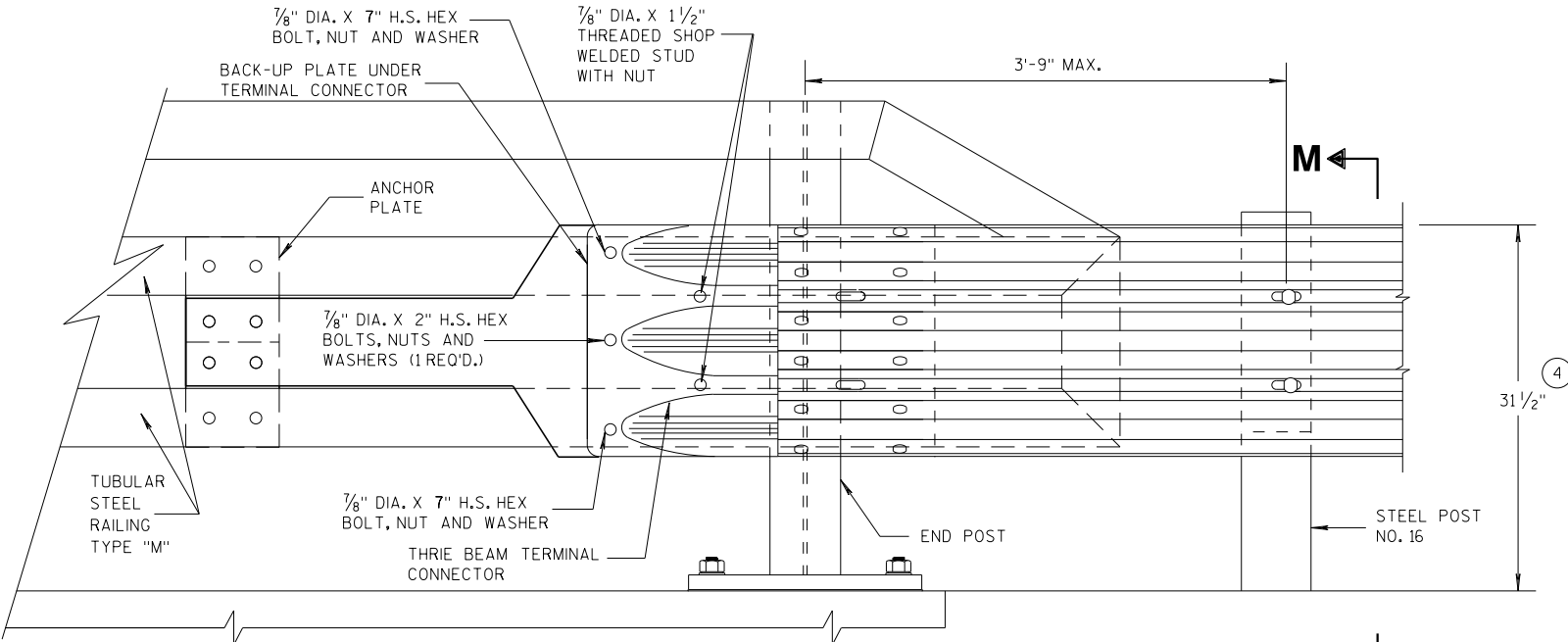
SECTION M-M



SECTION L-L

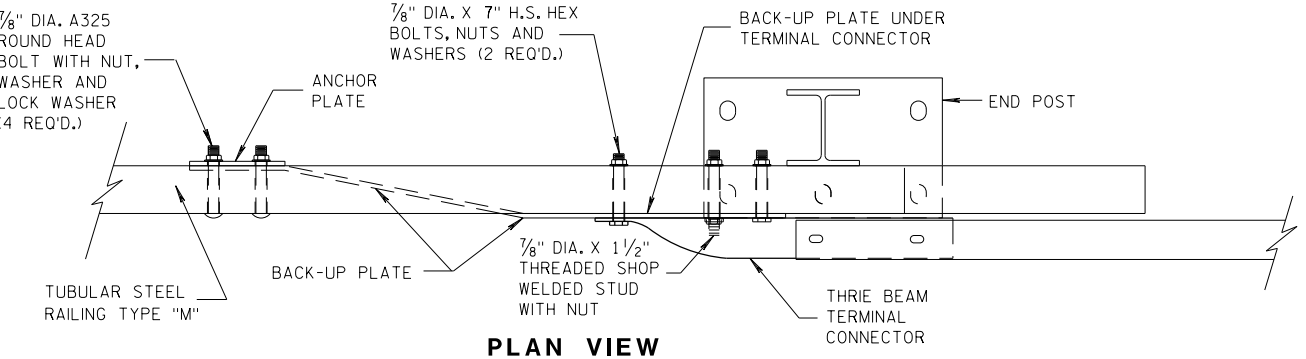
FRONT VIEW

ANCHOR AND BACK-UP PLATE MOUNTING TO BRIDGE RAILING, TYPE "M"



FRONT VIEW

M



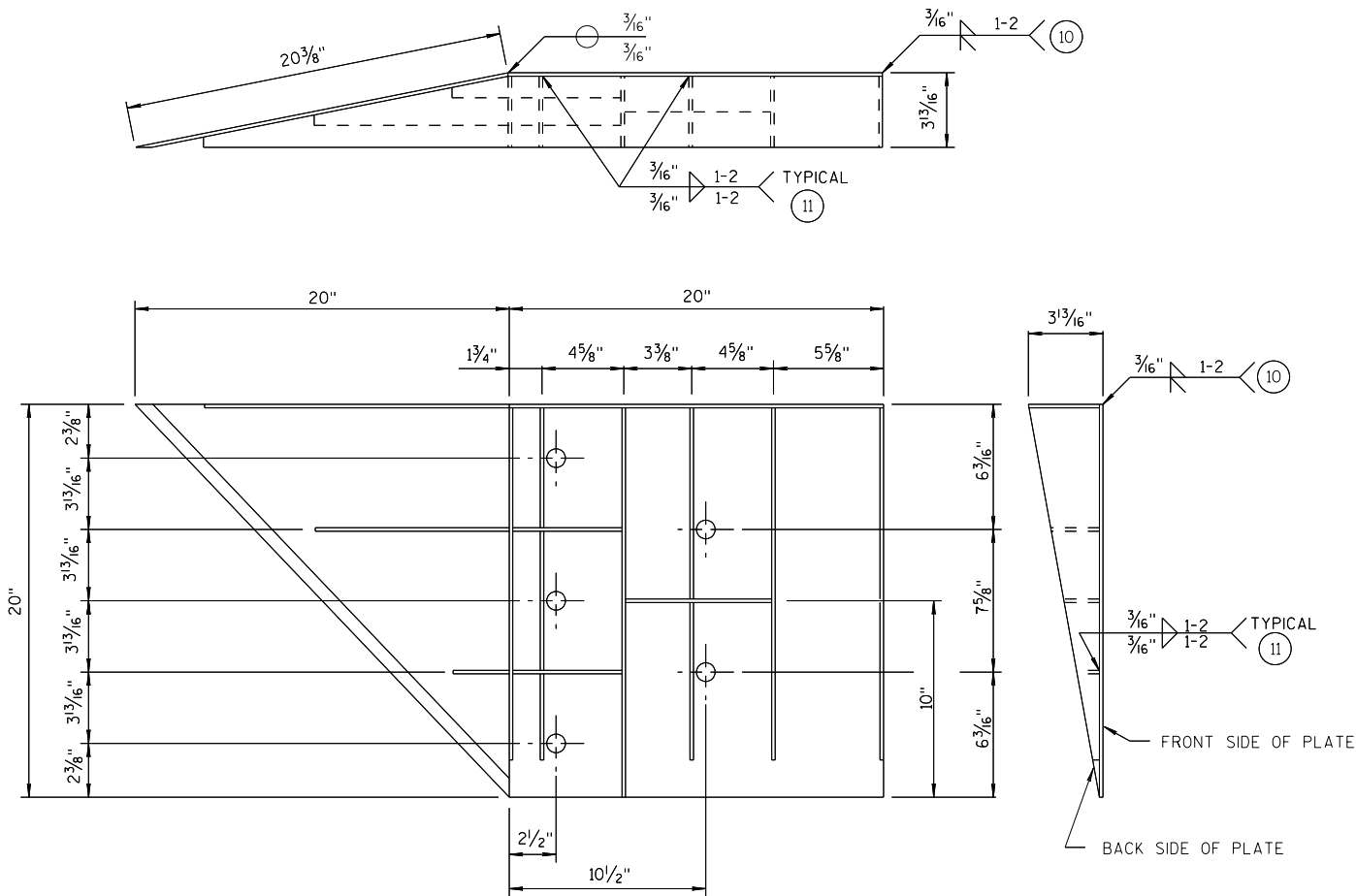
PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
07/2018
DATE /S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR
FHWA

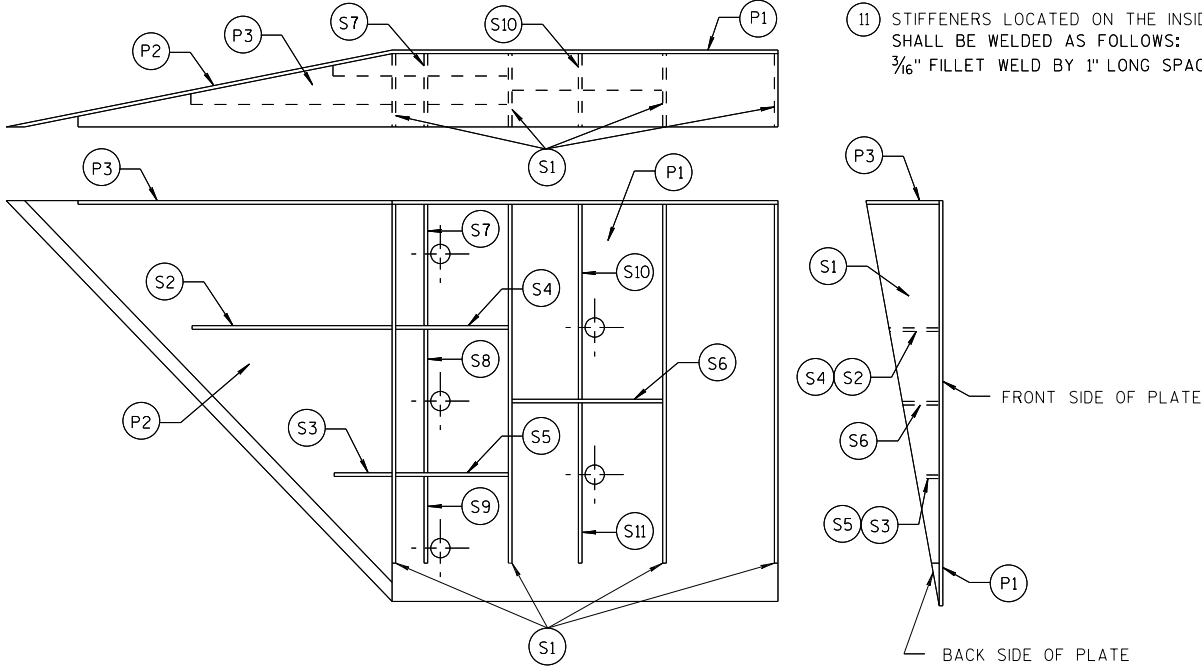


WELDING INSTRUCTION
(VIEWED FROM BACK SIDE OF PLATE)

SINGLE SLOPE CONNECTION PLATE

CONNECTOR PLATE DIMENSION (PER ASSEMBLY)				
PLATE	QUANTITY	SHAPE	SIZE (A x B x C x D)	THICKNESS
P1	1		20" x 20"	3/16"
P2	1		20" x 20" x 28 3/16"	3/16"
P3	1		39" x 3 5/8" x 20" x 19 5/16"	3/16"
S1	4		18 7/16" x 3 5/8" x 18 3/4"	1/4"
S2	1		10 1/4" x 2 1/16" x 10 3/8" x 1/2"	1/4"
S3	1		3" x 1 1/16" x 3 3/8" x 1/2"	1/4"
S4	1		6 1/8" x 2 7/16"	1/4"
S5	1		6 1/8" x 1 1/16"	1/4"
S6	1		7 3/4" x 1 3/4"	1/4"
S7	1		2 3/16" x 6" x 3 5/8" x 5 7/8"	1/4"
S8	1		1 5/32" x 7 1/2" x 2 1/2" x 7 3/8"	1/4"
S9	1		6 1/16" x 6 3/16" x 1 3/32"	1/4"
S10	1		1 7/8" x 9 7/8" x 3 5/8" x 9 11/16"	1/4"
S11	1		8 1/2" x 8 3/4" x 1 3/16"	1/4"

PLATE AND STIFFENER IDENTIFICATION
(VIEWED FROM BACK SIDE OF PLATE)



GENERAL NOTES

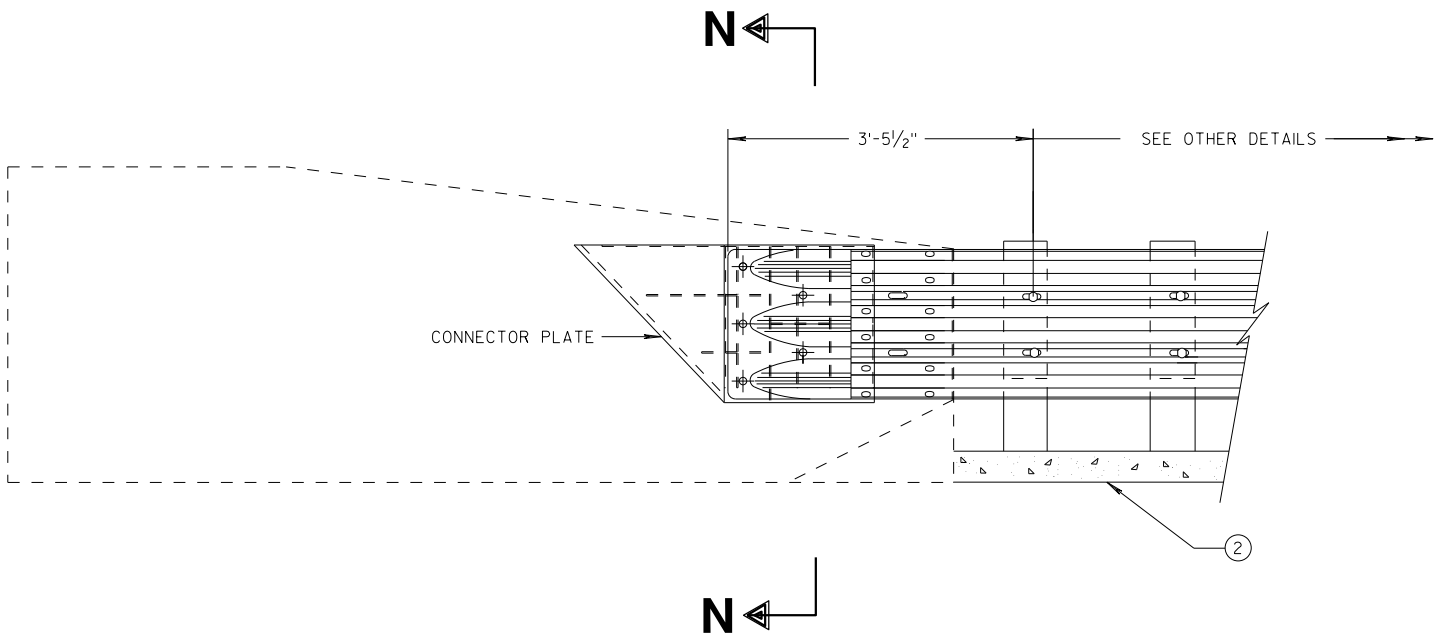
- COVER PLATE PANELS ARE 3/16" THICK.
- ALL STIFFENERS ARE 1/4" THICK.
- CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.
- FOR GALVANIZED REQUIREMENTS, SEE SECTION 614 OF THE STANDARD SPECIFICATIONS.
- ALL HOLE DIAMETERS SHALL BE 1".
- FOR OPPOSITE SIDE INSTALLATION MIRROR DRAWINGS.

- STIFFENERS LOCATED AT THE OUTSIDE EDGES OF THE COVER PLATES SHALL BE WELDED AS FOLLOWS:
SINGLE BEVEL GROOVE WELD ON EXTERNAL SIDES AND 3/16" FILLET WELD BY 1" LONG SPACED AT 2" ON INTERNAL SIDES.
- STIFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:
3/16" FILLET WELD BY 1" LONG SPACED AT 2".

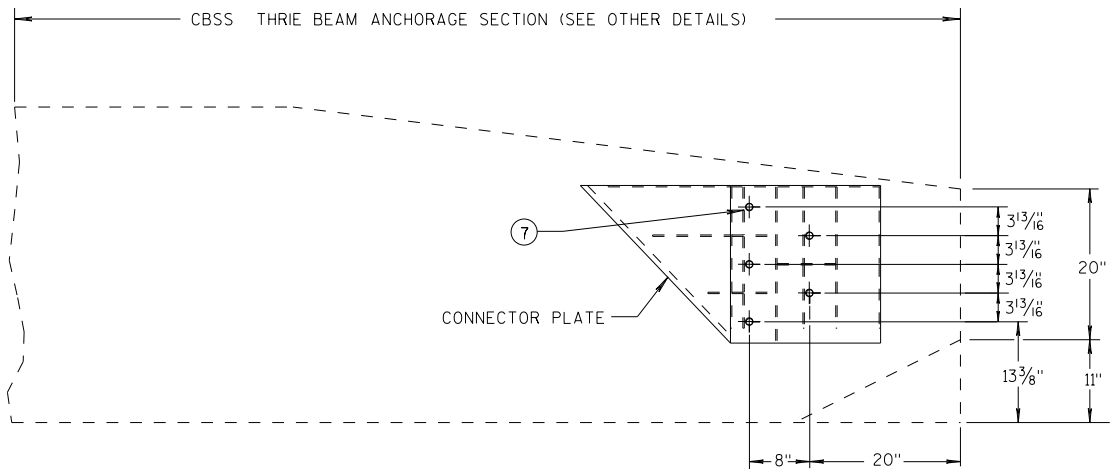
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
7/2018
DATE
/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR
FHWA



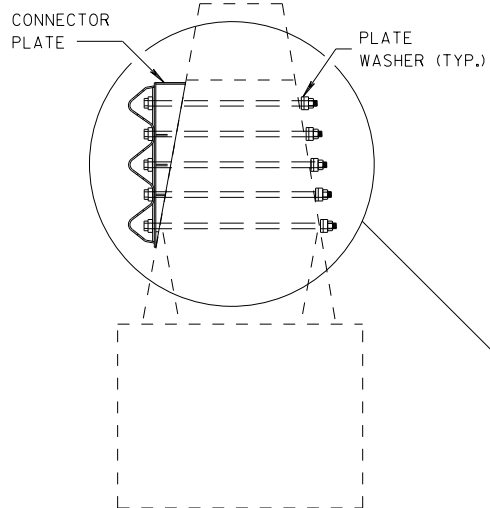
THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER



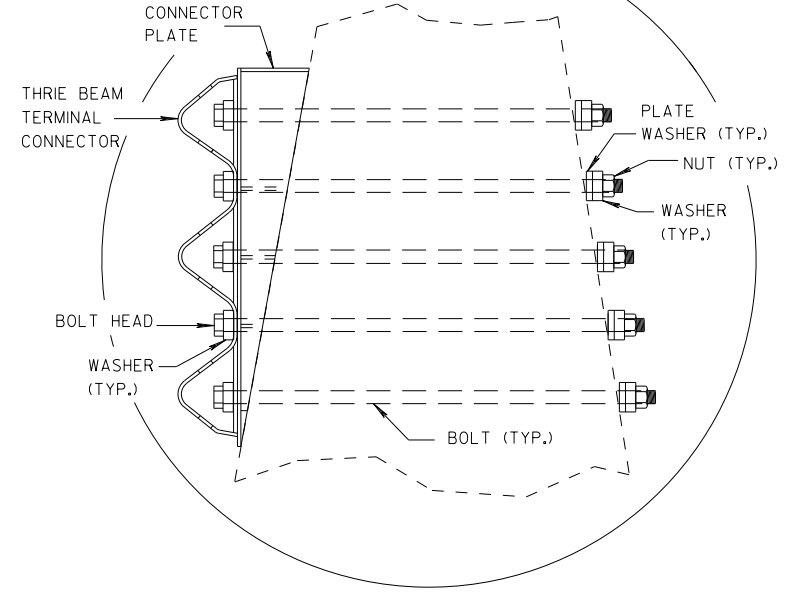
SINGLE SLOPE CONNECTION PLATE PLACEMENT

GENERAL NOTES

- CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- (2) OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- (7) BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTION PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.



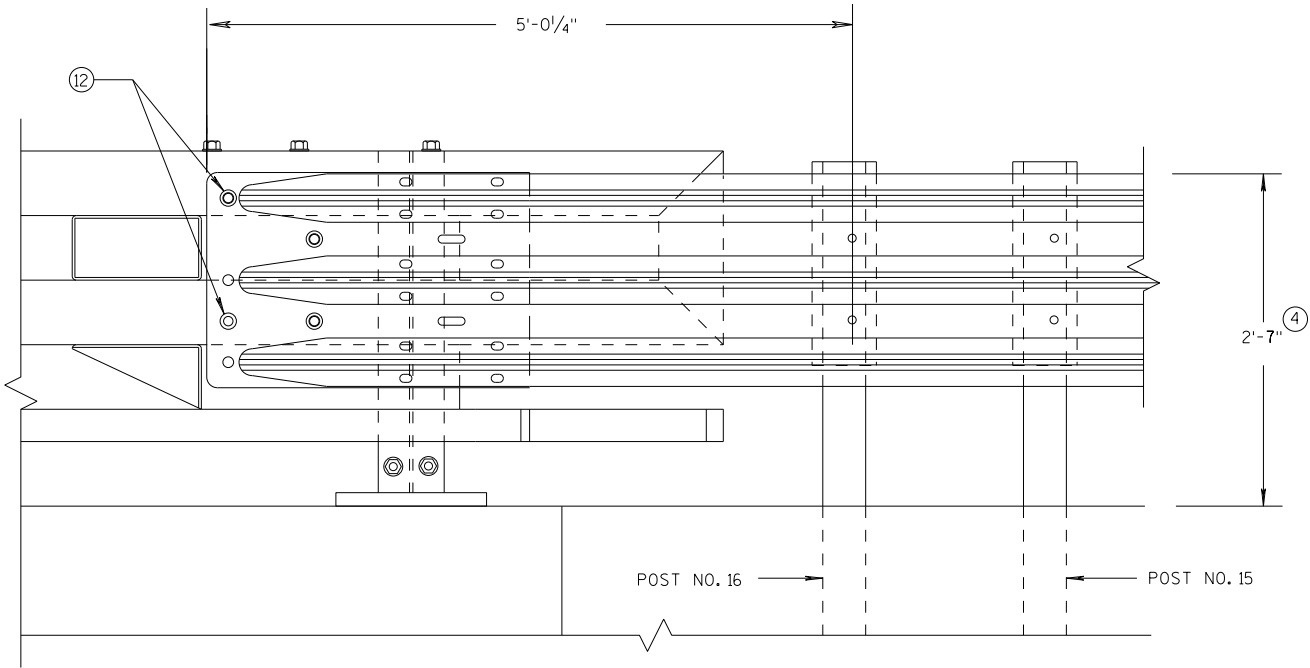
SECTION N-N



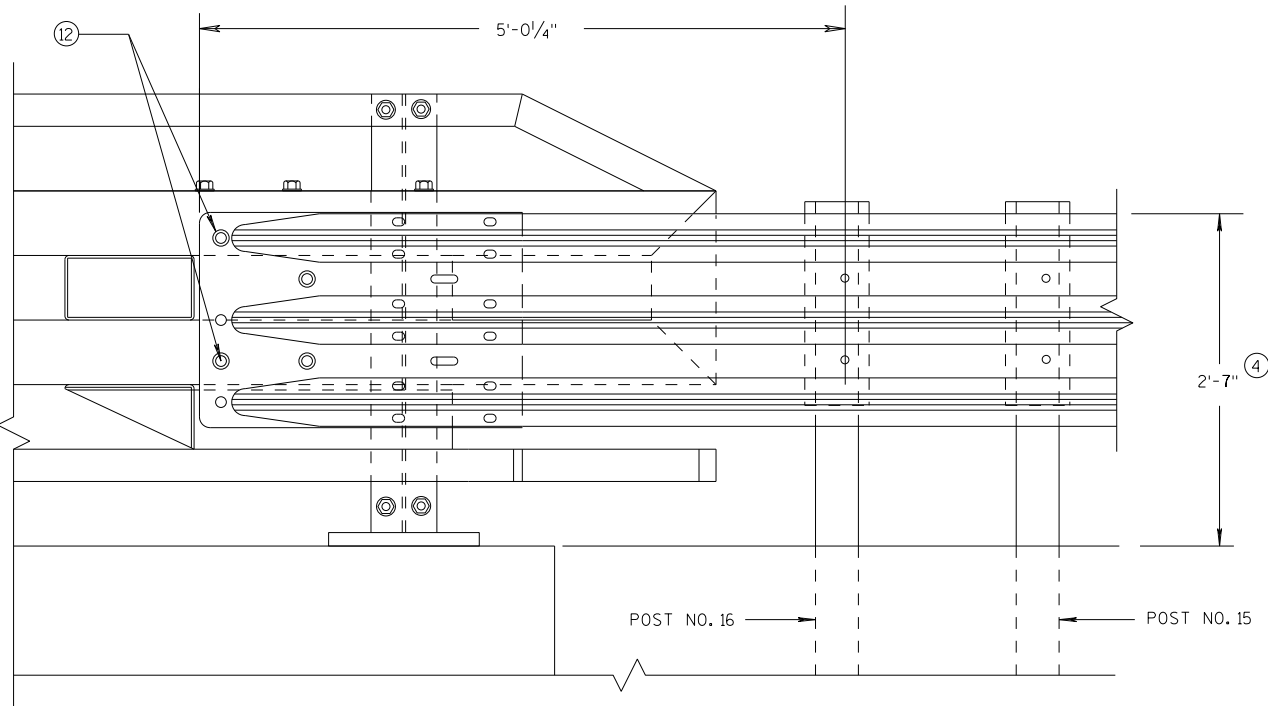
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 7/2018 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
FHWA	

GENERAL NOTES

- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑫ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND $\frac{1}{2}$ -INCH BEYOND NUT.



ELEVATION OF DETAIL AT NY3 END POST
THRIE BEAM RAIL ATTACHMENT

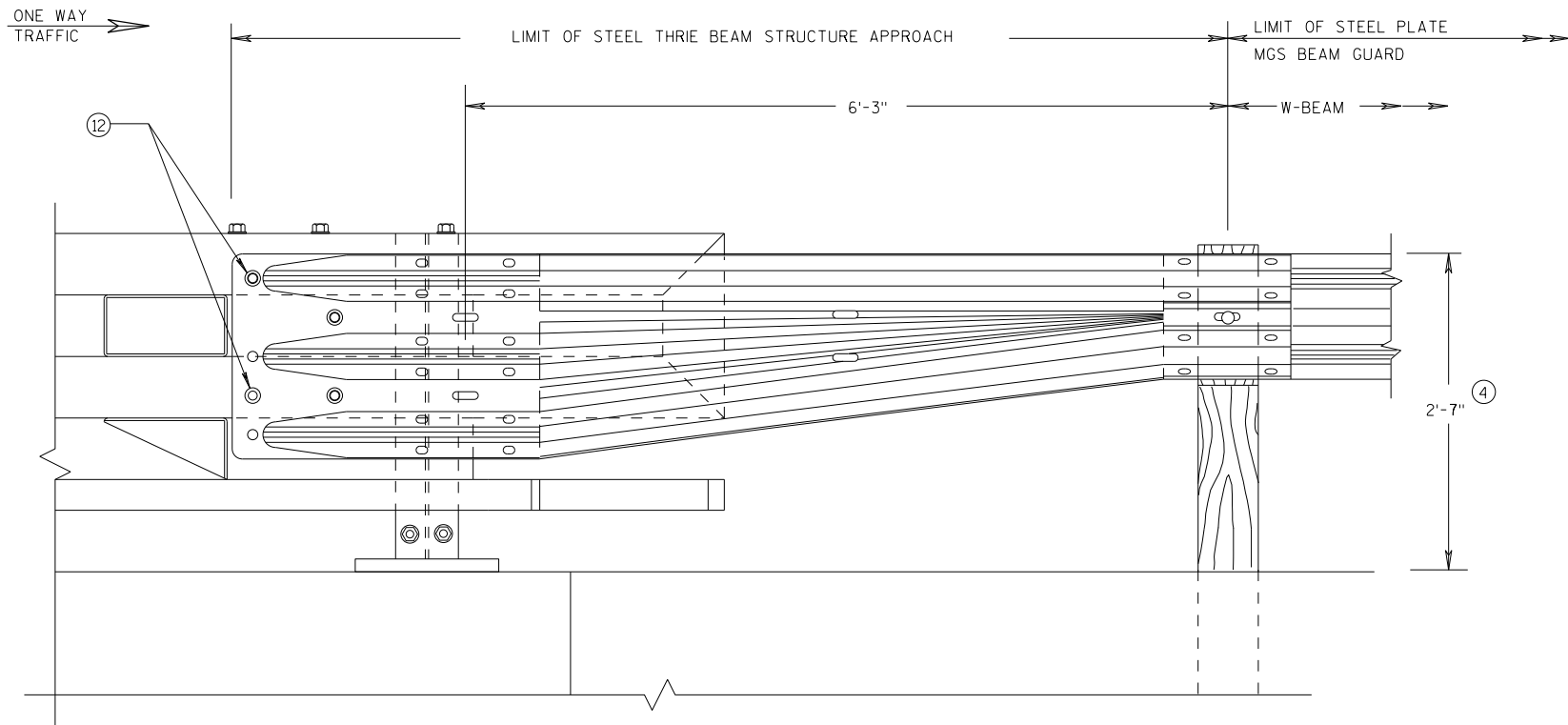


ELEVATION OF DETAIL AT NY4 END POST
THRIE BEAM RAIL ATTACHMENT

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

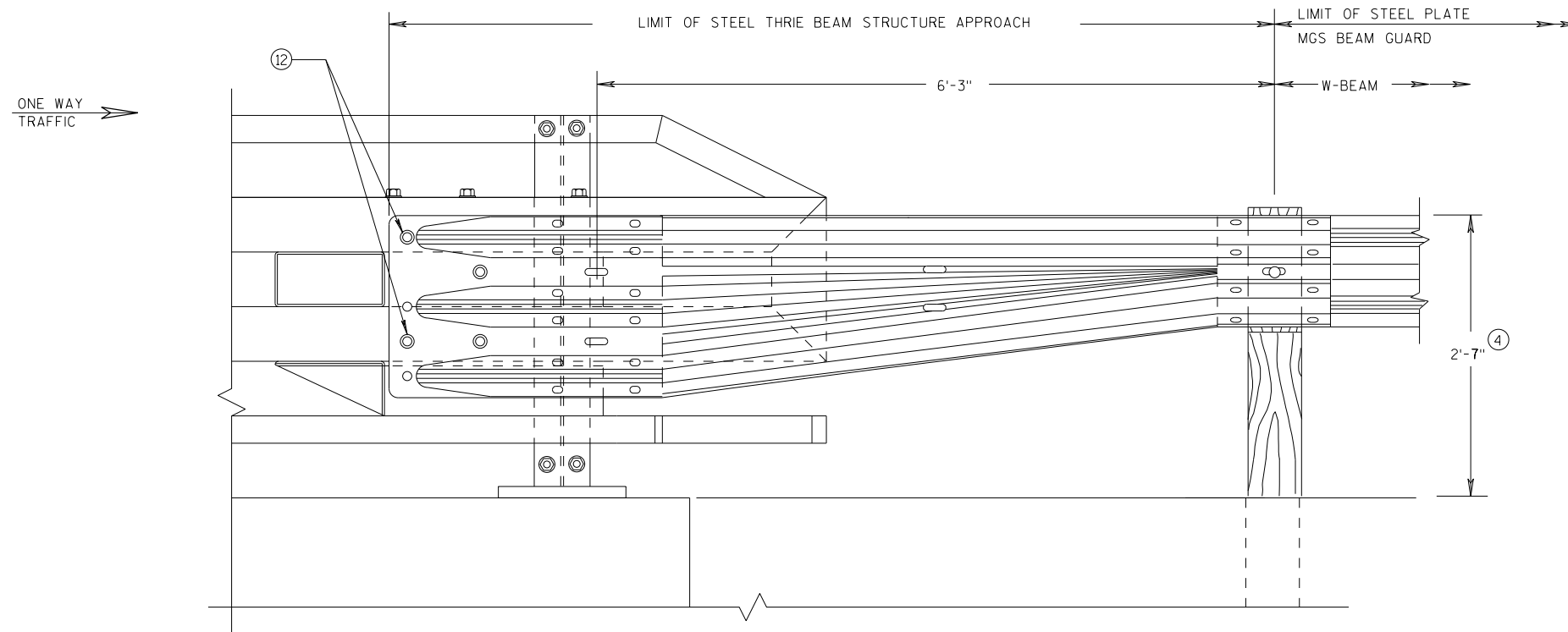
APPROVED	/S/ Rodney Taylor
DATE	ROADWAY STANDARDS DEVELOPMENT
FHWA	UNIT SUPERVISOR



FRONT VIEW
W BEAM TRANSITION AND
CONNECTION TO BRIDGE RAILING TYPE "NY3"
 (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

GENERAL NOTES

- (4) TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- (12) BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND $\frac{1}{2}$ -INCH BEYOND NUT.

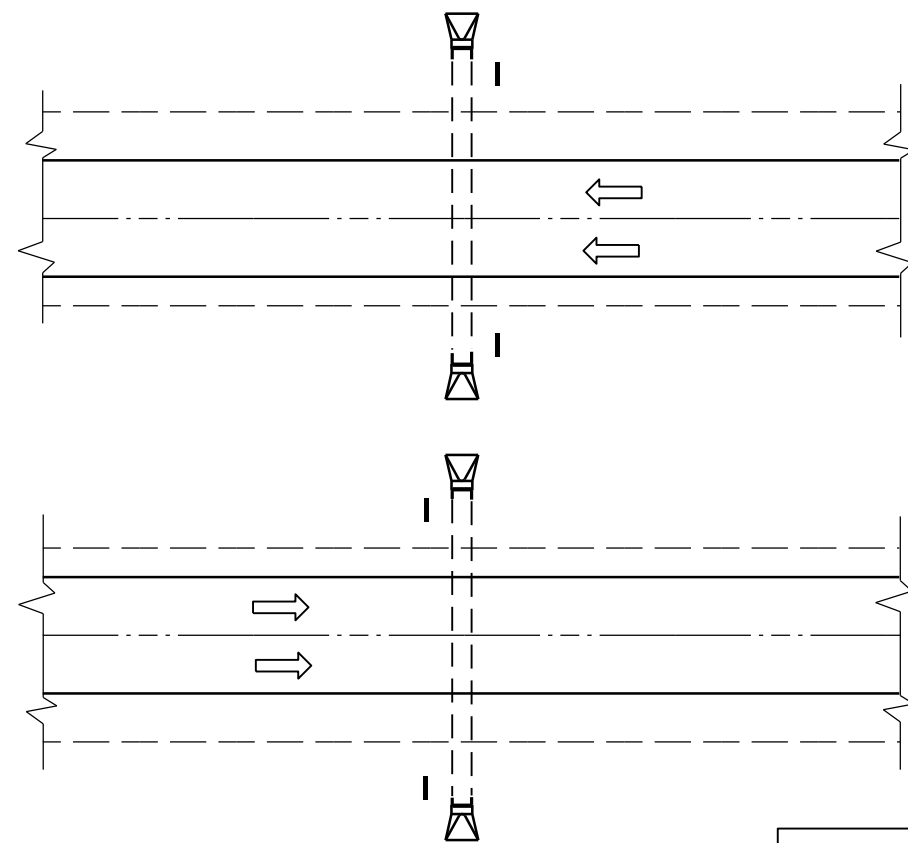


FRONT VIEW
W BEAM TRANSITION AND
CONNECTION TO BRIDGE RAILING TYPE "NY4"
 (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

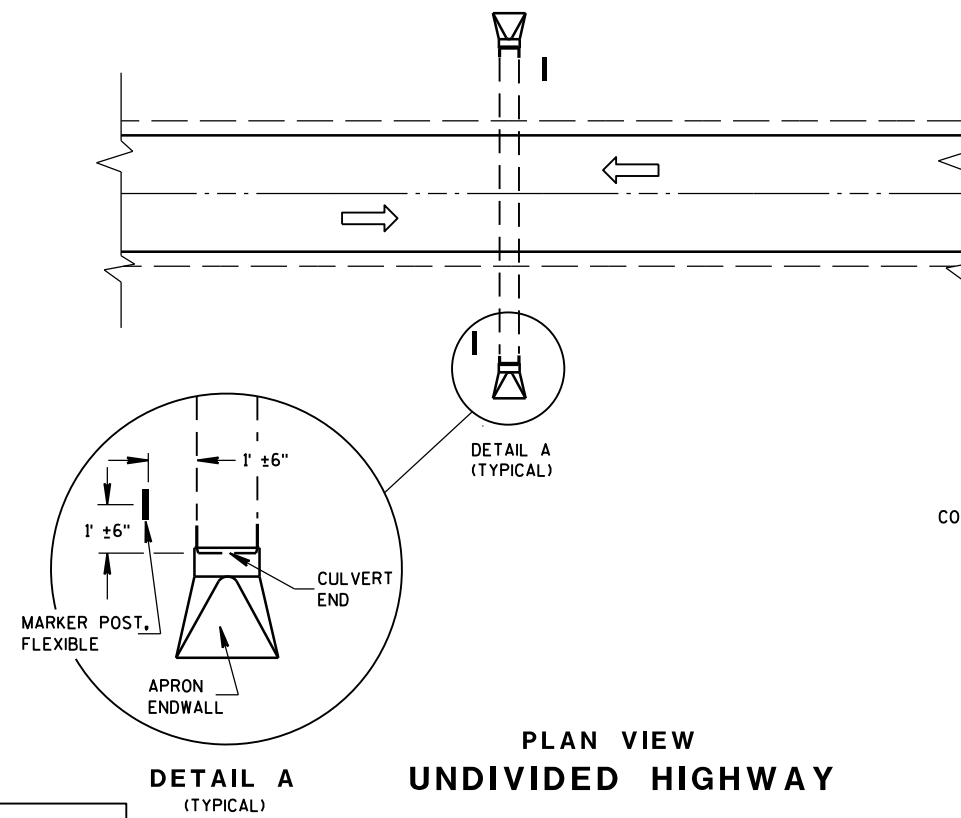
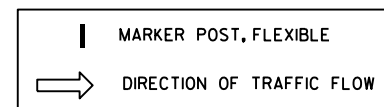
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

APPROVED
 7/2018
 DATE
 /S/ Rodney Taylor
 ROADWAY STANDARDS DEVELOPMENT
 UNIT SUPERVISOR
 FHWA



PLAN VIEW
DIVIDED HIGHWAY

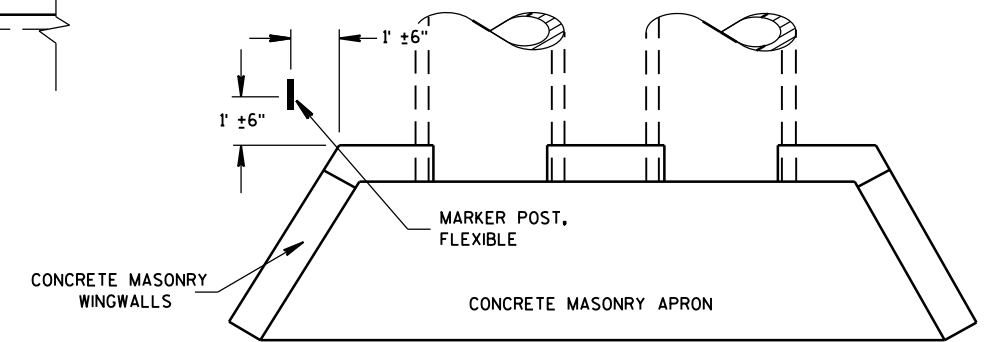


PLAN VIEW
UNDIVIDED HIGHWAY

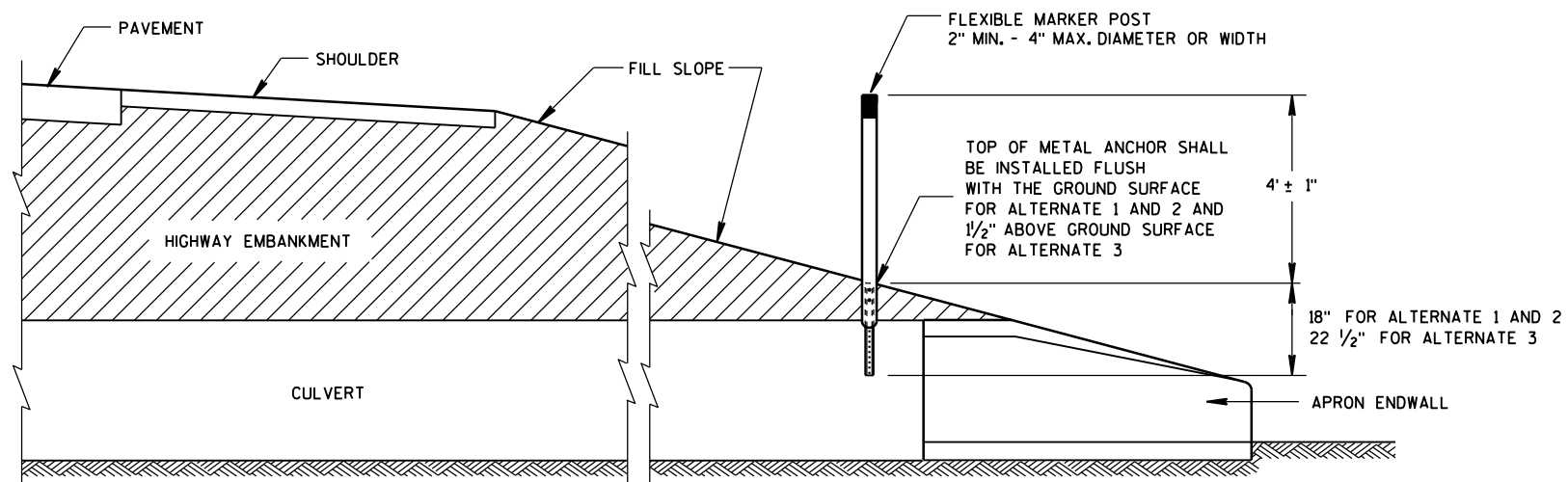
FLEXIBLE MARKER POST LOCATION

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.



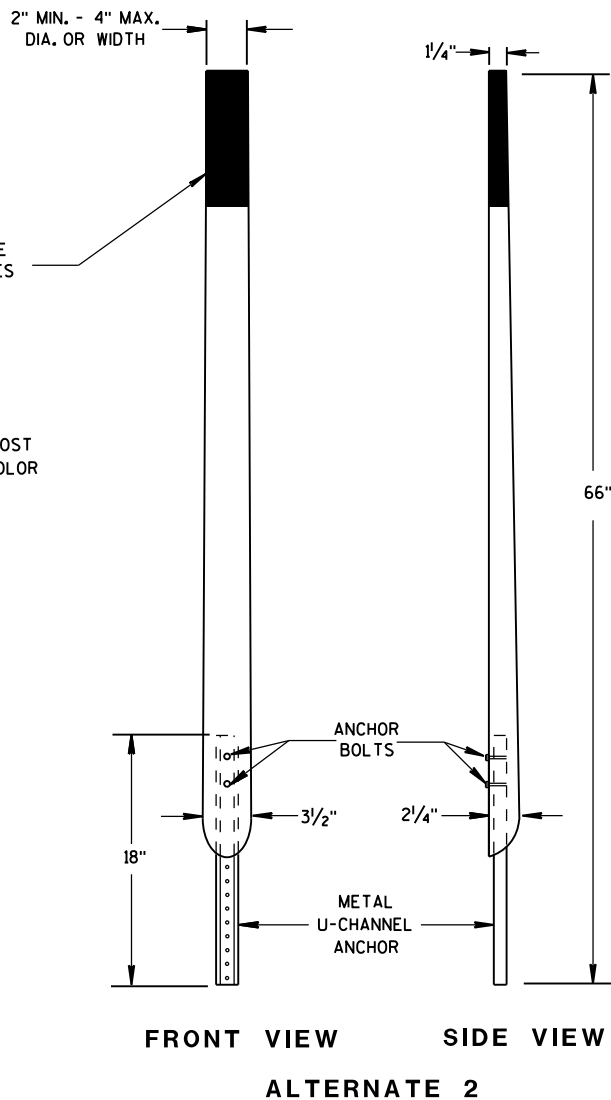
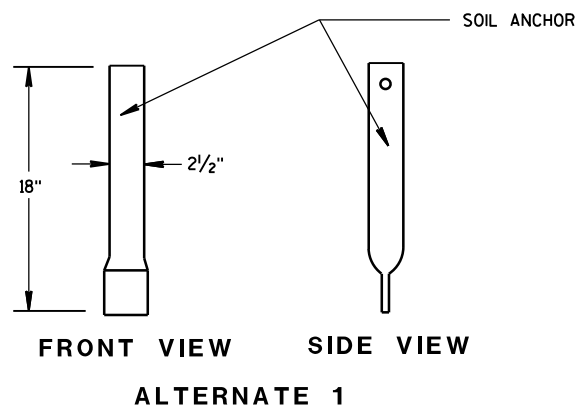
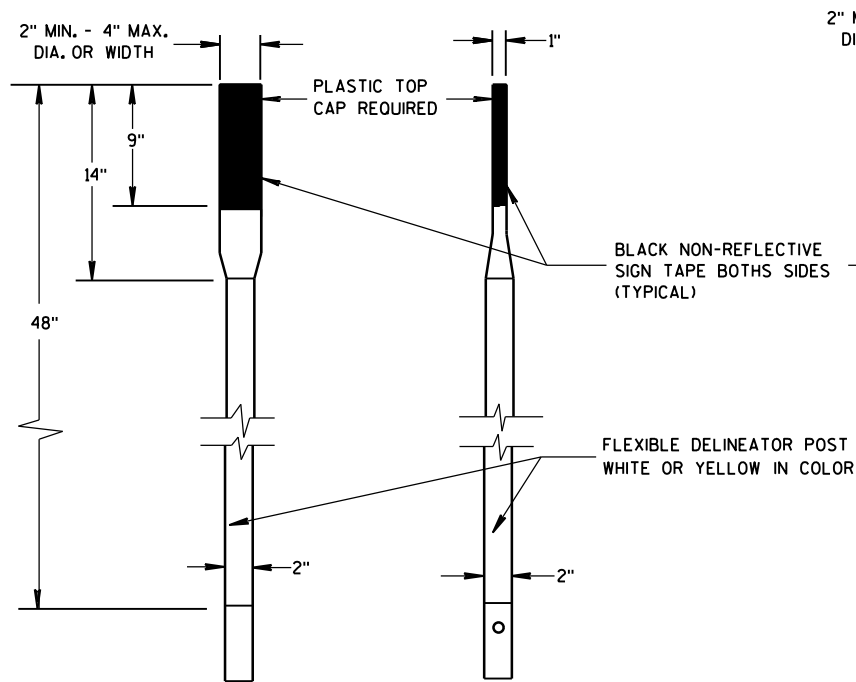
PLAN VIEW
CONCRETE MASONRY ENDWALLS FOR
CULVERT PIPE AND PIPE ARCH



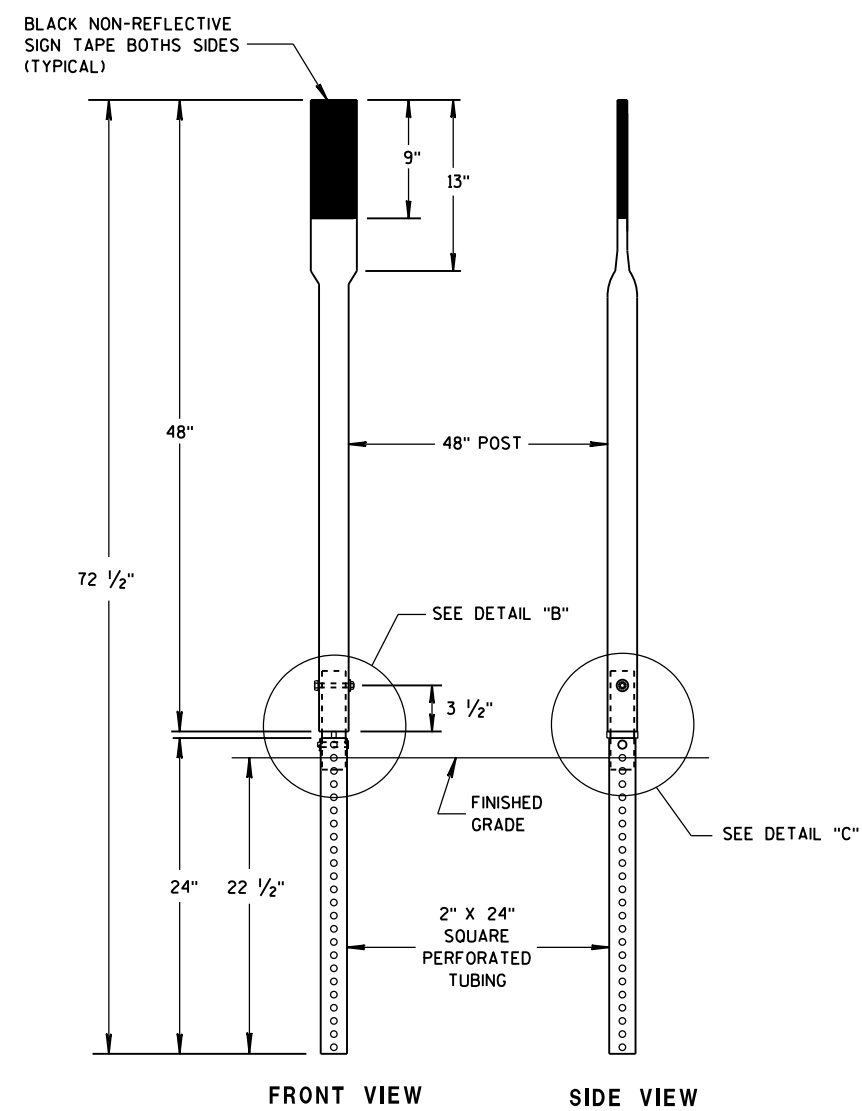
CROSS SECTION
FLEXIBLE MARKER POST

FLEXIBLE MARKER POST
FOR CULVERT END

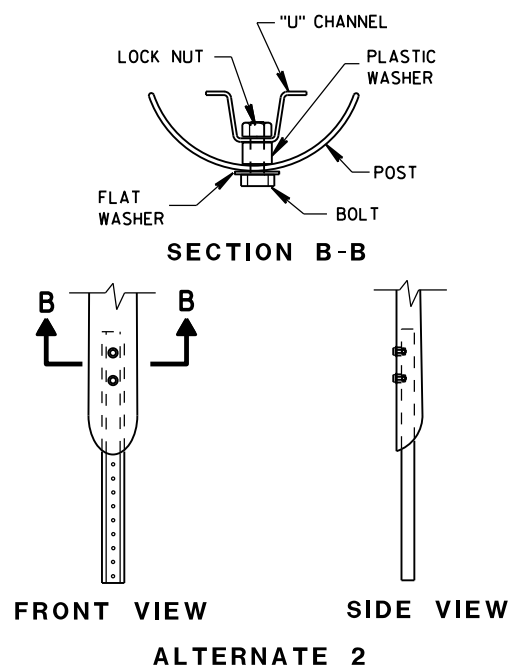
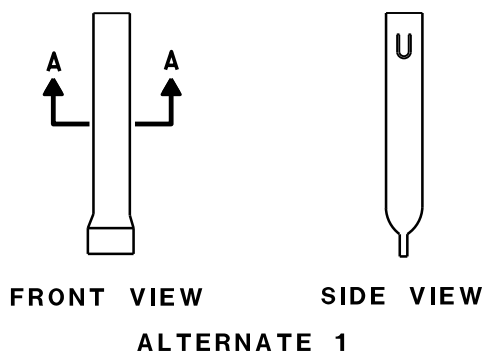
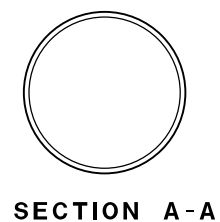
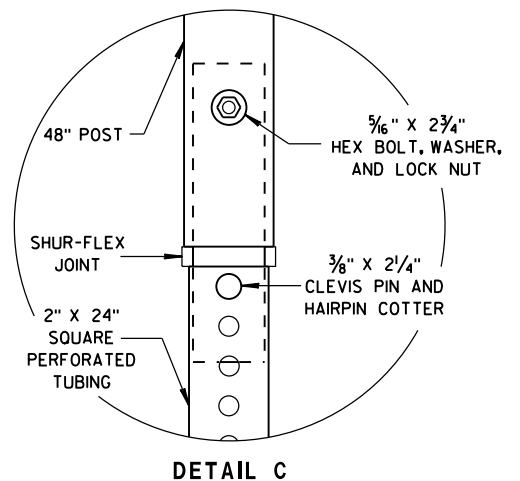
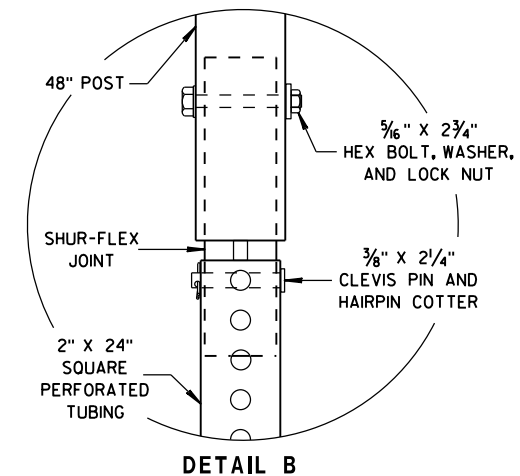
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



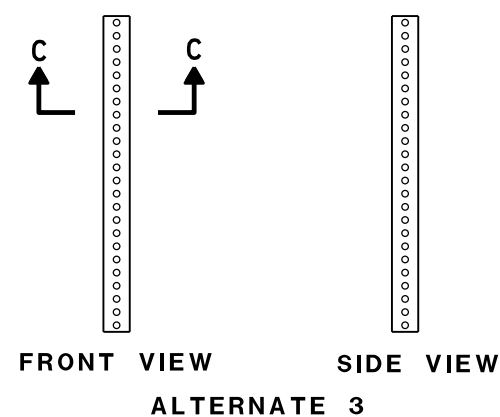
FLEXIBLE MARKER POSTS

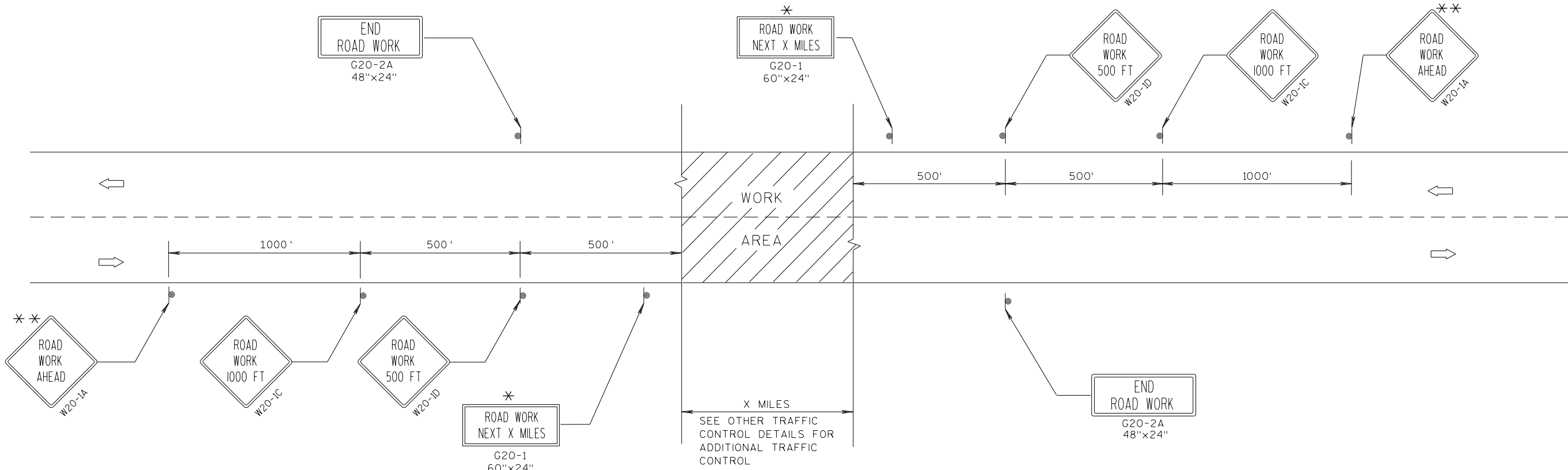


SECTION C-C



FLEXIBLE MARKER POST ANCHORS

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



TYPICAL SIDEROAD APPROACH WARNING SIGN DETAIL

GENERAL NOTES

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

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A MINIMUM OF 200 FEET (500 FEET DESIRABLE) CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

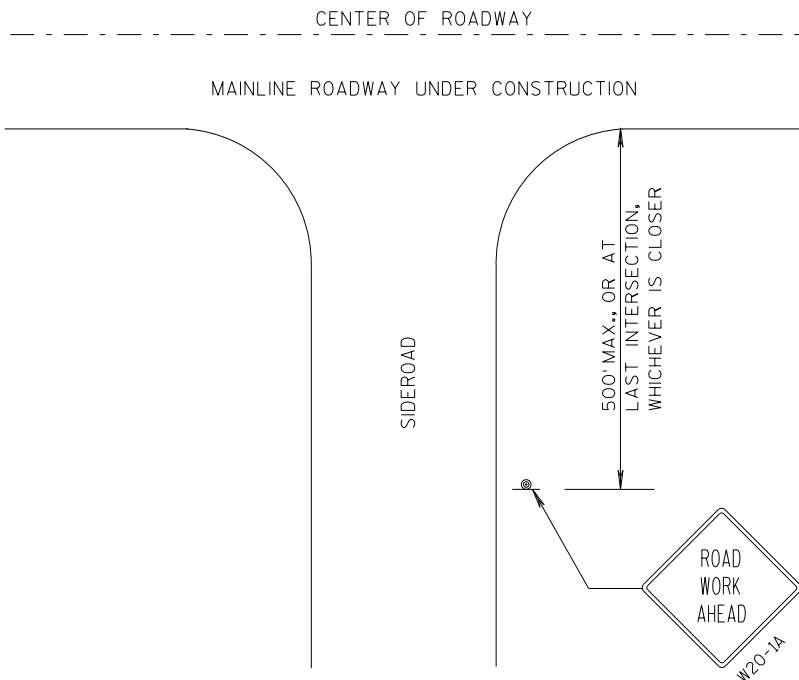
ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED.

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

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.

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

* * PLACE ADDITIONAL W20-1A "ROAD WORK AHEAD" SIGN IF WORK AREA WITHIN THE PROJECT IS SEPARATED BY MORE THAN 2 MILES FROM PREVIOUS WORK AREA.



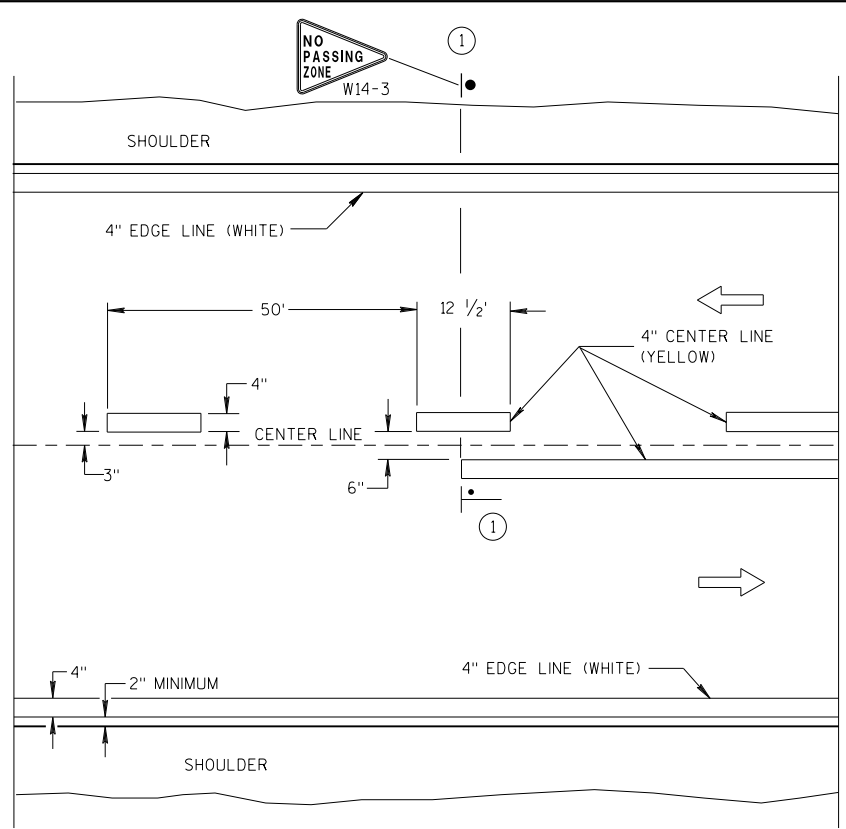
LEGEND

- ⦿ SIGN ON PERMANENT SUPPORT
- ➡ DIRECTION OF TRAFFIC
- ▨ WORK AREA

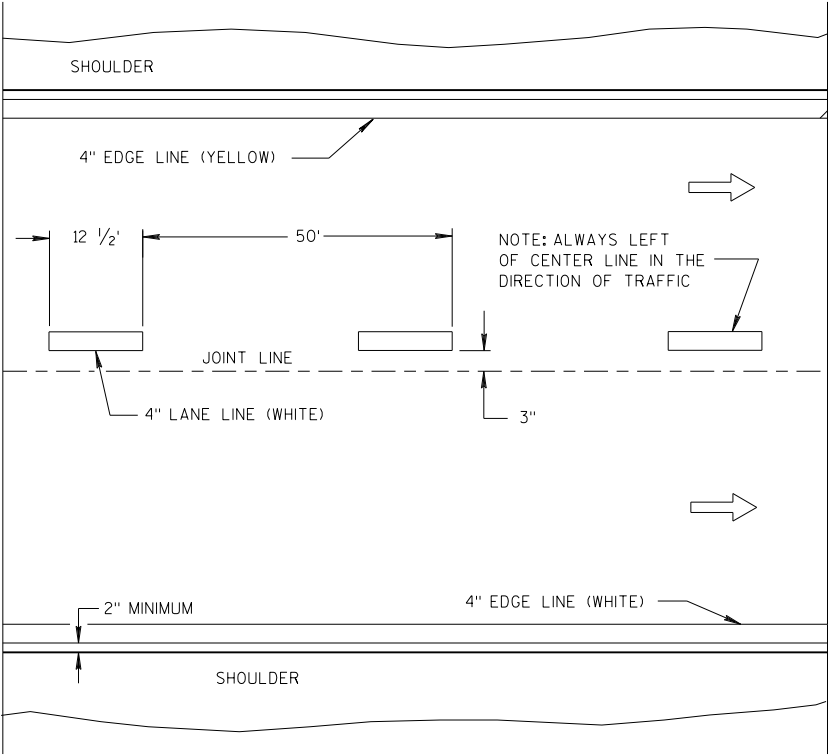
TRAFFIC CONTROL, ADVANCE
WARNING SIGNS 45 M.P.H.
OR GREATER TWO-WAY
UNDIVIDED ROAD OPEN TO TRAFFIC

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
7/2018 /S/ Andrew Heidtke
DATE WORK ZONE ENGINEER
FHWA

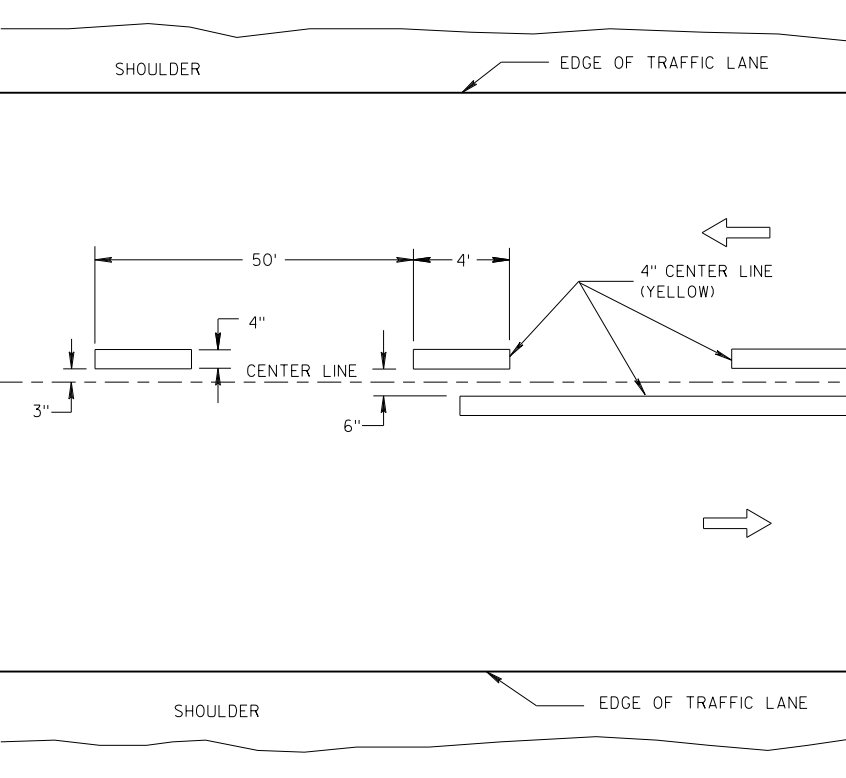


TWO WAY TRAFFIC

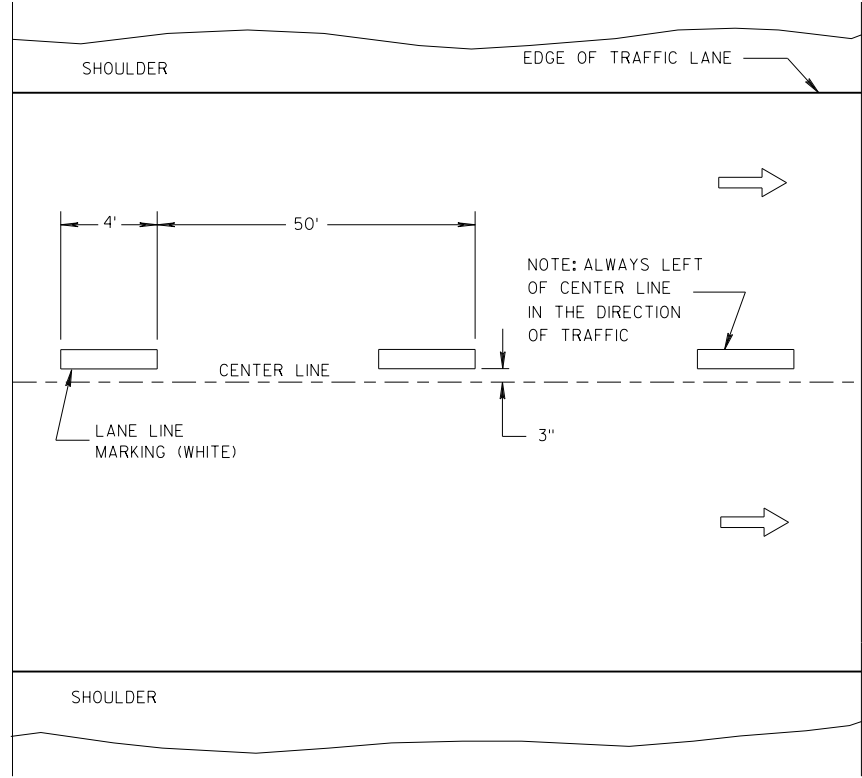


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY PAVEMENT MARKING

GENERAL NOTES

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

① LOCATE THE NO PASSING ZONE W14-3 SIGN WITHIN 50 FEET OF THE "T" MARKING.

NOTE

ARROW SYMBOL (➡) SHOWS DIRECTION OF TRAVEL

LEGEND

- "T" MARKING
- POST MOUNTED SIGN

LONGITUDINAL MARKING (MAINLINE)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
7/2018 /S/ Matthew R. Rauch
DATE STATE SIGNING AND MARKING ENGINEER
FHWA

LEGEND

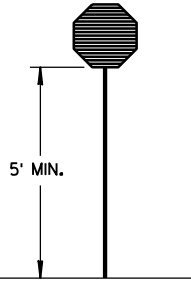
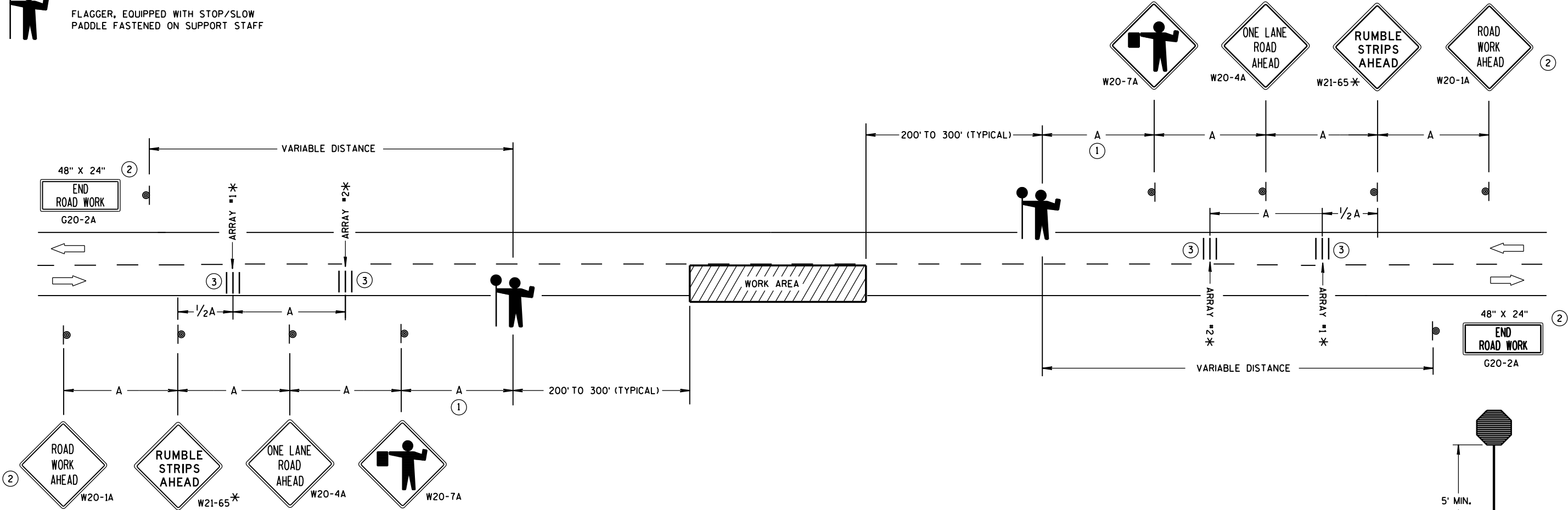
- SIGN ON PORTABLE OR PERMANENT SUPPORT
- DIRECTION OF TRAFFIC
- WORK AREA
- FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF

SIGN AND TEMPORARY RUMBLE STRIP ARRAY SPACING TABLE

SPEED LIMIT	SPACING A
25-35 MPH	200'
35-40 MPH	350'
45-55 MPH	500'



USE OF THE "BE PREPARED TO STOP" SIGN IS OPTIONAL. WHEN USED, THIS SIGN SHALL BE LOCATED BETWEEN THE W20-7A AND W20-4A SIGNS, USING SPACING A.



STOP/SLOW PADDLE ON SUPPORT STAFF

TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION

GENERAL NOTES

DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

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

THE FIRST ADVANCE WARNING SIGN SHOULD TYPICALLY BE LOCATED IN ADVANCE OF THE ANTICIPATED TRAFFIC BACKUP OR QUEUE.

"W0" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

WHEN A SIDE ROAD OR RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROLS SHALL BE PROVIDED AS SPECIFIED IN THE PLANS AND/OR THE SPECIAL PROVISIONS OR AS APPROVED BY THE ENGINEER.

INSTALL TEMPORARY RUMBLE STRIPS PER MANUFACTURER'S RECOMMENDATIONS. PLACE ADVANCE SIGNING PRIOR TO INSTALLING TEMPORARY RUMBLE STRIPS.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

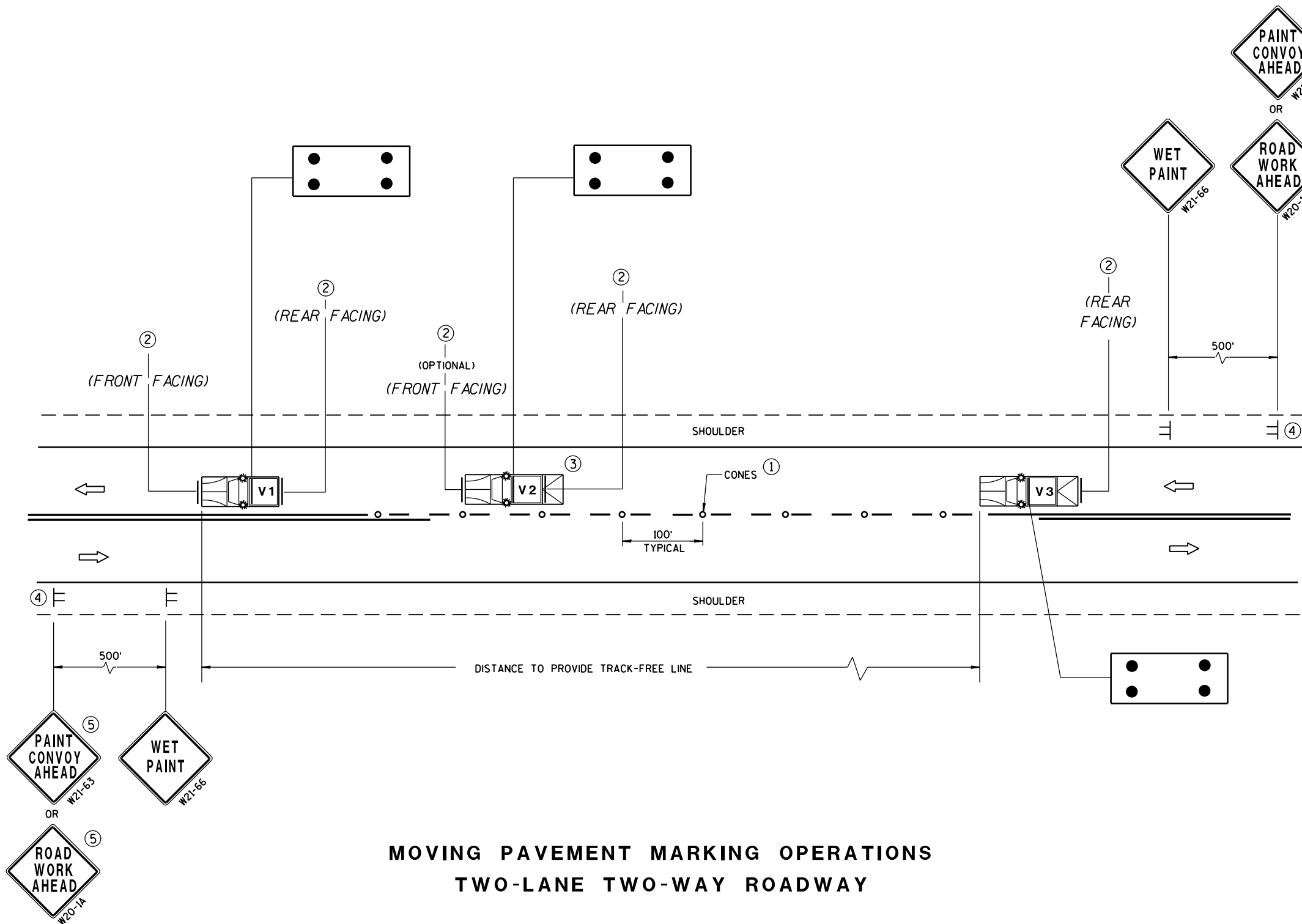
FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT, REMOVE TEMPORARY RUMBLE STRIPS PRIOR TO COVERING OR REMOVING ALL ADVANCE SIGNING.

- * UTILIZE TEMPORARY RUMBLE STRIPS WHEN FLAGGING OPERATION IS ANTICIPATED TO BE STATIONARY IN EXCESS OF TWO HOURS.
- ① FOR A MOVING WORK OPERATION, SIGNING AND TEMPORARY RUMBLE STRIPS (IF USED) SHALL BE REESTABLISHED (AS SIMULTANEOUSLY AS PRACTICAL) AT APPROXIMATELY 3,500 FOOT INTERVALS IN THE MOVING WORK OPERATION OR AS APPROVED BY THE ENGINEER.
- ② SIGN NOT REQUIRED IF FLAGGING OPERATION OCCURS WITHIN A SIGNED ROAD WORK ZONE AREA.
- ③ EACH TEMPORARY RUMBLE STRIP ARRAY CONSISTS OF THREE RUMBLE STRIPS SPACED ACCORDING TO MANUFACTURER'S RECOMMENDATION, PLACED TRANSVERSE ACROSS THE LANE AT LOCATIONS SHOWN.

TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

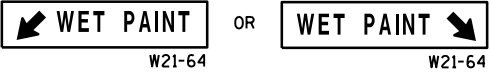
APPROVED
June 2017 /S/ Andrew Heldtke
DATE WORK ZONE ENGINEER
FHWA



MOVING PAVEMENT MARKING OPERATIONS
TWO-LANE TWO-WAY ROADWAY

GENERAL NOTES

- ALL VEHICLES SHALL BE EQUIPPED WITH TWO 360 DEGREE HIGH INTENSITY YELLOW FLASHING LIGHTS OR STROBE LIGHTS AND OPERATED WITH HEADLIGHTS TURNED ON.
- VEHICLES SHALL BE EQUIPPED WITH REAR FACING TYPE B OR C FLASHING ARROW PANEL OPERATING IN CAUTION MODE. SIGNS PLACED ON VEHICLES MUST NOT OBSCURE THE ARROW PANEL.
- ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE SPECIFIED.
- IF SPEED LIMIT IS 40 MPH OR LESS STATIONARY SIGNS MAY BE OMITTED IF CONES ARE USED.
- ALTERNATE SIGN MESSAGES, SUCH AS "PAINT CREW AHEAD" OR "ROAD PAINTING AHEAD" MAY BE USED.
- DISTANCE BETWEEN VEHICLES MAY VARY ACCORDING TO TERRAIN, SIGHT DISTANCE, PAINT DRYING TIME, AND OTHER FACTORS. WHENEVER ADEQUATE STOPPING SIGHT DISTANCE EXISTS TO THE REAR, SHADOW VEHICLES SHOULD MAINTAIN THE MINIMUM DISTANCE FROM THE WORK VEHICLE AND PROCEED AT THE SAME SPEED AS THE WORK VEHICLE. SHADOW VEHICLES SHOULD SLOW DOWN IN ADVANCE OF VERTICAL OR HORIZONTAL CURVES THAT RESTRICT SIGHT DISTANCE.
- THE WORK AND SHADOW VEHICLES SHOULD PULL OVER PERIODICALLY TO ALLOW TRAFFIC TO PASS.
- THIS DRAWING SHALL BE USED FOR CENTERLINE OR EDGELINE MARKING.
- WHEN NO WORK ACTIVITY IS TAKING PLACE, REMOVE OR TURN THE STATIONARY WARNING SIGNS AWAY FROM TRAFFIC.
- ① CONES MAY BE OMITTED ON PAINTED LINE IF APPROVED BY THE ENGINEER. CONSIDER PAVEMENT MARKING DRY OR CURE TIMES AND TRAFFIC VOLUME.
- ② USE STANDARD SIGN W21-64 WITH APPROPRIATE ARROW.
- ③ OPTIONAL TRUCK-MOUNTED ATTENUATOR.
- ④ SIGNS SHALL BE REPEATED APPROXIMATELY EVERY THREE MILES.
- ⑤ IF CONSTRUCTION WORK ZONE SIGNS ARE IN PLACE, W20-1 OR W21-63 ARE NOT REQUIRED.



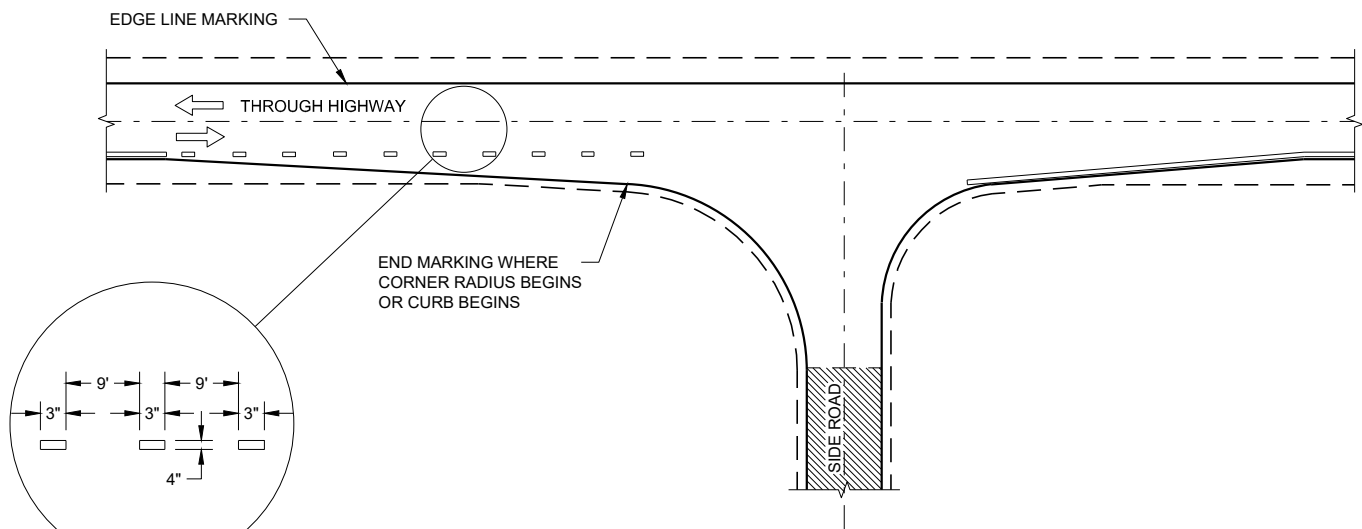
LEGEND

- V1** LEAD VEHICLE
- V2** SHADOW VEHICLE
- V3** TRAIL VEHICLE WITH TMA
- TMA** TRUCK-MOUNTED ATTENUATOR
- SIGN ON TEMPORARY SUPPORT
- DIRECTION OF TRAFFIC
- CONES
- FLASHING ARROW PANEL (CAUTION)

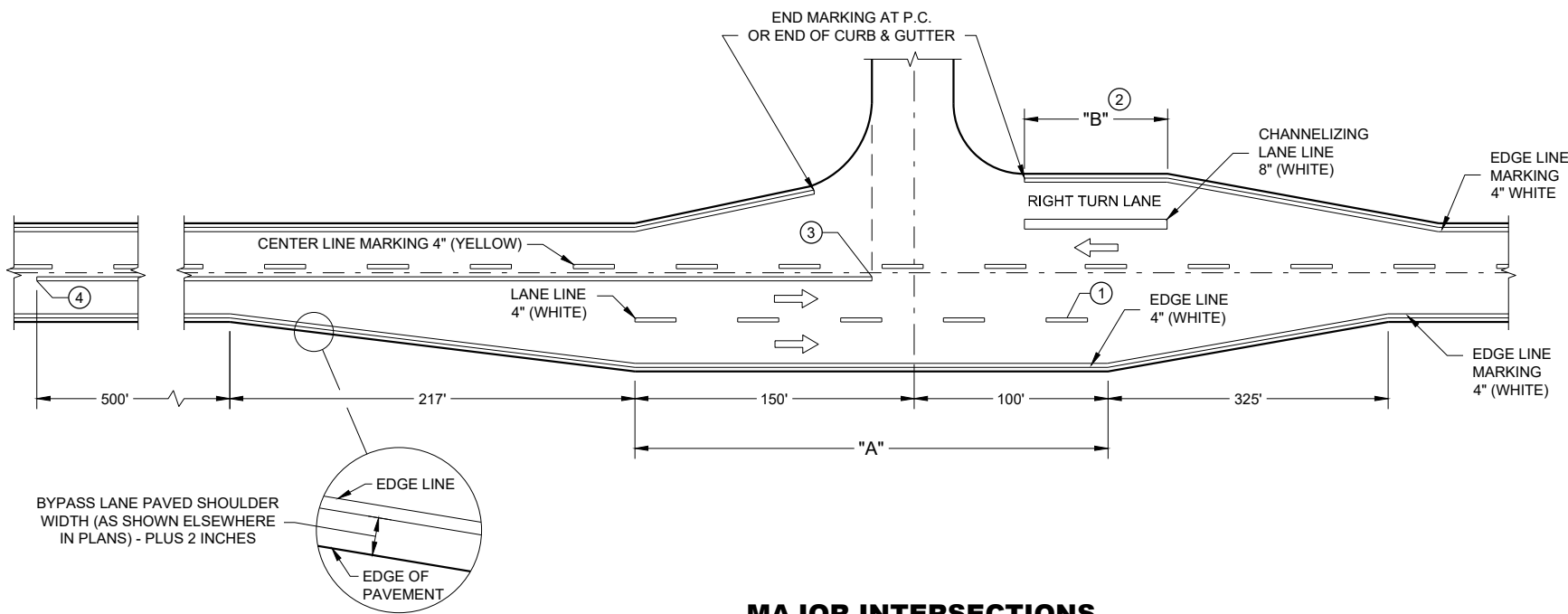
MOVING PAVEMENT MARKING
OPERATION
TWO-LANE TWO-WAY ROADWAY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE Sept., 2017 /S/ Andrew Heidtke
WORK ZONE ENGINEER
FHWA



MINOR INTERSECTION



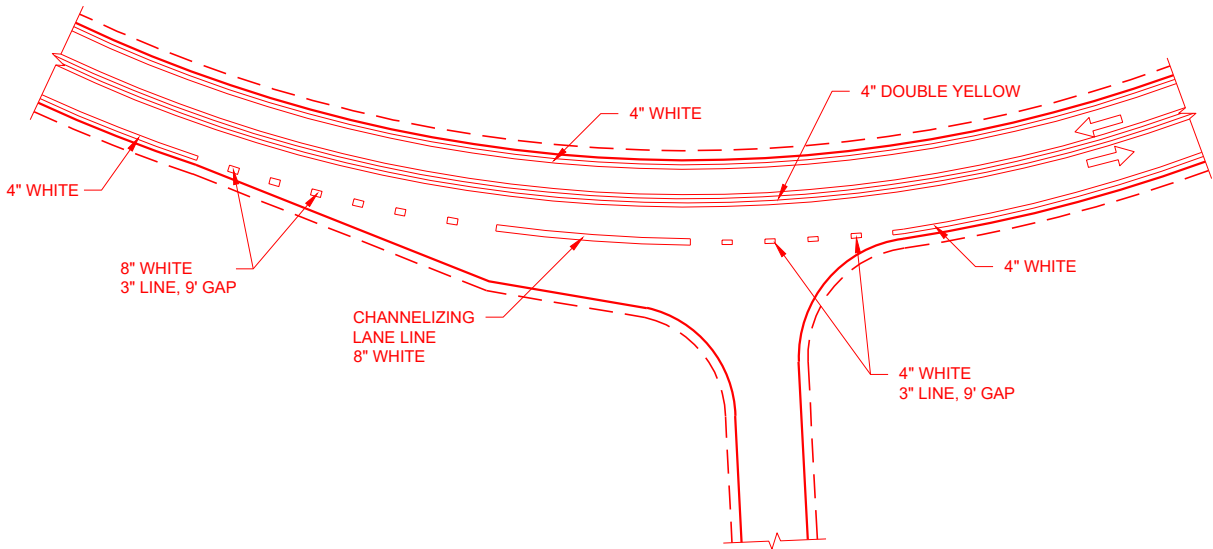
MAJOR INTERSECTIONS
(INTERSECTION WITH FULL RIGHT TURN LANE OR BYPASS LANE)

GENERAL NOTES

OMIT EDGE LINES THROUGH INTERSECTIONS. CONTINUE EDGE LINES 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 BARRIER LINE ENDS AT SIDE ROAD PAVEMENT / SURFACE EDGE EXTENSION.
- ④ BARRIER LINE STARTS 500 FEET PRIOR TO THE BYPASS TAPER

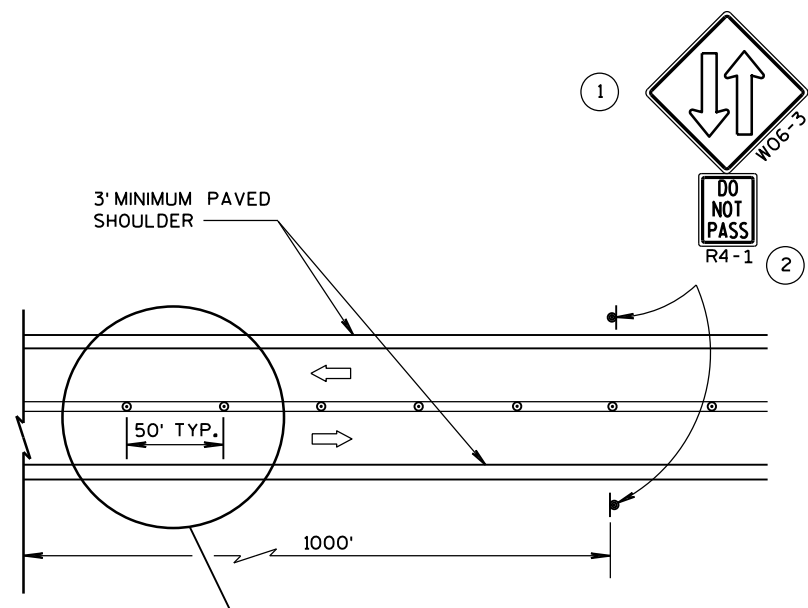
ARROW SYMBOL (➡) SHOWS DIRECTION OF TRAVEL



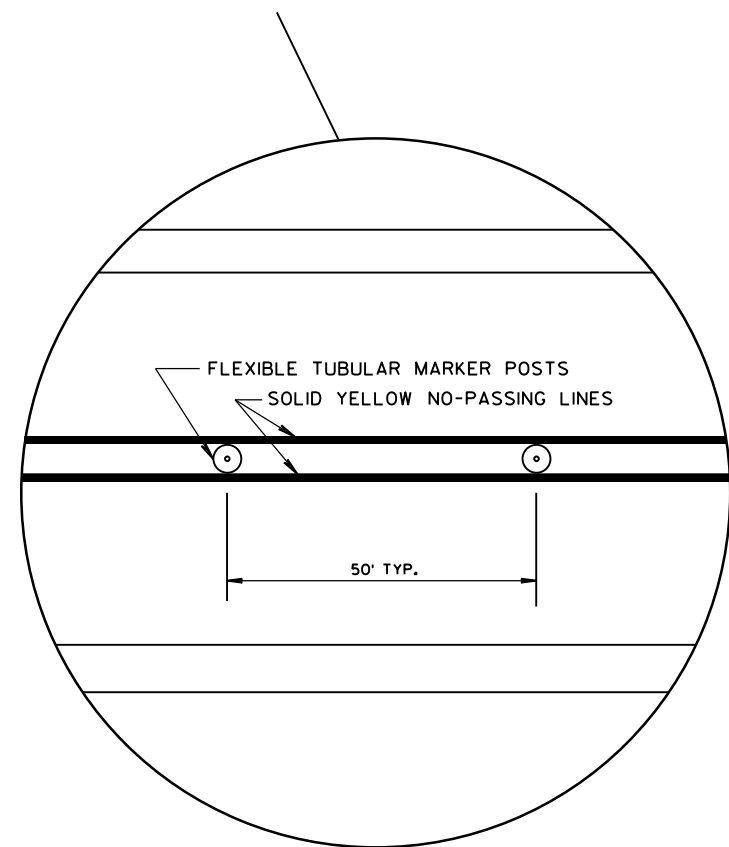
INTERSECTION ON OUTSIDE OF CURVE

PAVEMENT MARKING
(INTERSECTIONS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



TWO LANE, TWO WAY OPERATION



LEGEND

- ⊙ SIGN ON PERMANENT SUPPORT
- ⊙ DELINEATOR FLEXIBLE/TUBULAR MARKER
- ➡ DIRECTION OF TRAFFIC

GENERAL NOTES

ALL SIGNS ARE 48"x48" UNLESS OTHERS NOTED.

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

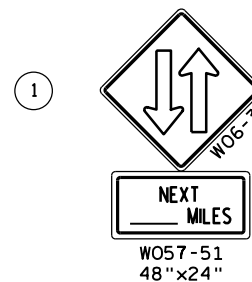
ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH THE TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER. NO WARNING LIGHTS SHALL BE WORKING ON "COVERED" OR "DOWNED" SIGNS.

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 SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 200 FEET, (500 FEET DESIRABLE) DISTANCE TO EXISTING SIGNS.

A SINGLE ROW OF FLEXIBLE TUBULAR MARKERS ON CENTERLINE EXTEND FOR THE ENTIRE LENGTH OF TWO-WAY TRAFFIC AT 50-FOOT SPACING.

COVER EXISTING CENTERLINE STRIPE WITH TEMPORARY PAVEMENT MARKING, 4-INCH DOUBLE YELLOW.



THE WO6-3 WITH THE W057-51 SHALL BE LOCATED 200 FEET BEYOND THE END OF THE ACCELERATION LANE OF EACH ENTRANCE RAMP AND/OR 500 FEET BEYOND ANY SIDEROAD. THE WO6-3 WITH THE R4-1 SHALL BE LOCATED 1000 FEET BEYOND THE WO6-3 AND THE W057-51 AND THE SIGNS SHALL BE ALTERNATED WITH ONE MILE INTERVALS BETWEEN WO6-3 SIGNS.

CONVENTIONAL: 24"x30"
FREEWAY AND EXPRESSWAY: 36"x48"

TRAFFIC CONTROL,
TWO LANE TWO
WAY OPERATION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

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

GENERAL NOTES

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

ALL SIGNS ARE 48" X 48" 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 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.

W20-1A AND G20-2A SIGNS ARE NOT REQUIRED IF THE WORK AREA IS WITHIN A LARGER WORK ZONE WHERE THESE SIGNS ARE ALREADY PRESENT. G20-2A SIGNS MAY ALSO BE OMITTED IF DURATION OF WORK IS LESS THAN 7 CONTINUOUS DAYS AND NIGHTS.

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

TABLE A

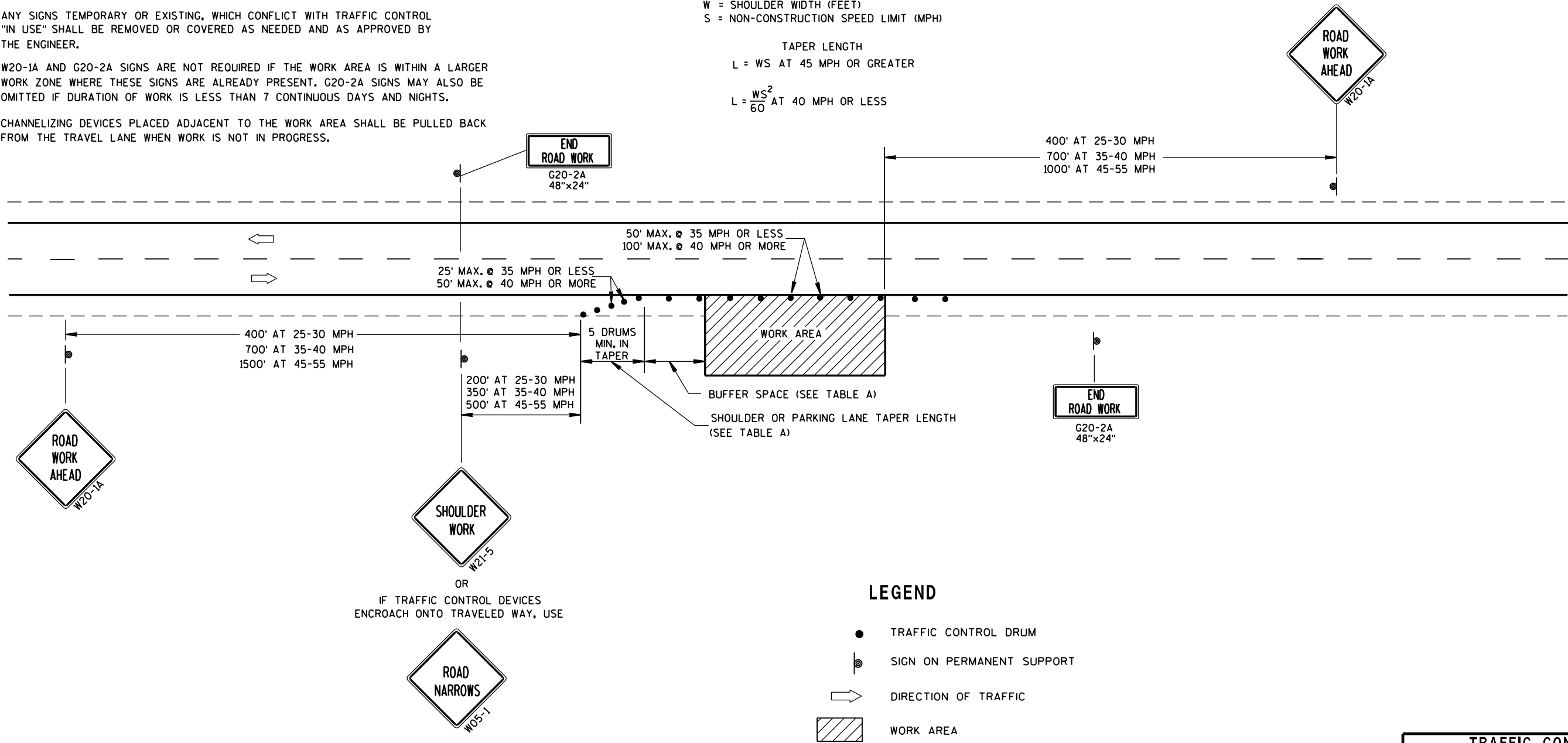
SHOULDER TAPER LENGTH (FEET)					BUFFER SPACE (FEET)
S \ W	4	6	8	10	
30	20	30	40	50	200
35	30	45	55	70	250
40	40	55	75	90	305
45	60	90	120	150	360
50	70	100	135	170	425
55	75	110	150	185	495

W = SHOULDER WIDTH (FEET)
S = NON-CONSTRUCTION SPEED LIMIT (MPH)

TAPER LENGTH
L = WS AT 45 MPH OR GREATER

$L = \frac{WS^2}{60}$ AT 40 MPH OR LESS

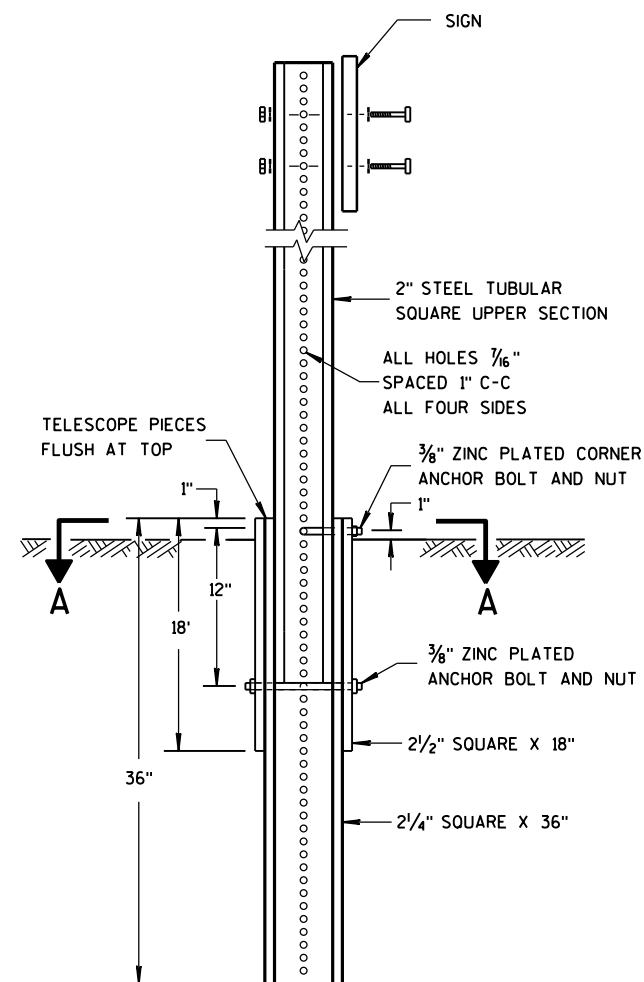
SHOULDER TAPER LENGTH = $\frac{1}{3}L$



LEGEND

- TRAFFIC CONTROL DRUM
- ⦿ SIGN ON PERMANENT SUPPORT
- ➡ DIRECTION OF TRAFFIC
- ▨ WORK AREA

TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED July 14, 2015 DATE	/S/ Peter Amakobe Atepe STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER
FHWA	

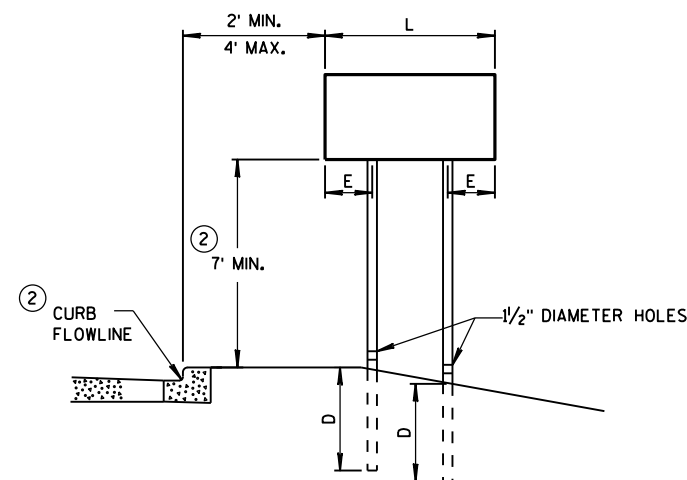
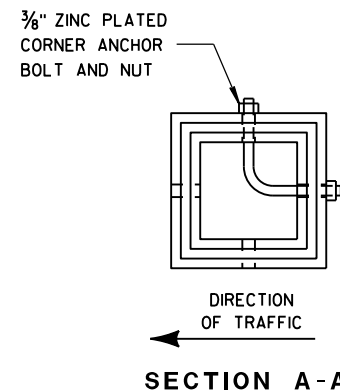


DETAIL OF TUBULAR
STEEL SIGN POST

TUBULAR STEEL POSTS

AREA OF SIGN INSTALLATION (SQ. FT.)	NUMBER OF REQUIRED TUBULAR STEEL POSTS
9 OR LESS	1
GREATER THAN 9 LESS THAN OR EQUAL TO 18	2
GREATER THAN 18 LESS THAN OR EQUAL TO 27	3

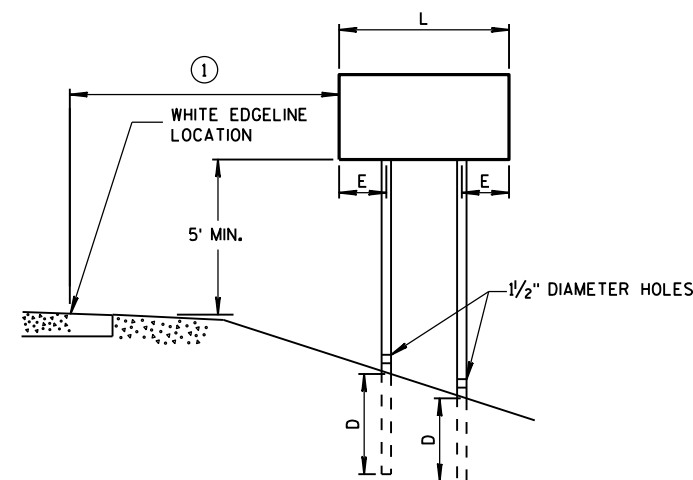
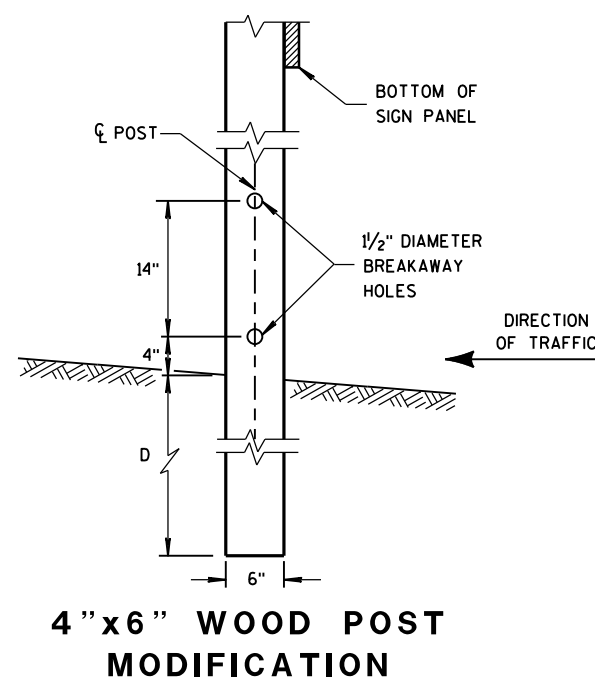
SIGNS WIDER THAN 3 FEET OR LARGER THAN 9 SQ. FT. SHALL
BE MOUNTED ON MULTIPLE POSTS (SEE ABOVE TABLE).
SIGNS LARGER THAN 27 SQ. FT. SHALL NOT BE MOUNTED
ON TUBULAR STEEL POSTS.



URBAN AREA

POST MOUNTING DETAIL FOR TEMPORARY TRAFFIC CONTROL FIXED MESSAGE SIGNS

WOOD POST EMBEDMENT DEPTH	
AREA OF SIGN INSTALLATION (SQ. FT.)	D (MIN)
20 OR LESS	4'
GREATER THAN 20	5'



RURAL AREA

POST SPACING REQUIREMENTS		NUMBER OF WOOD POSTS REQUIRED
L	E	
48" OR LESS AND LESS THAN 20 SQ. FT.	-	1
LESS THAN 60"	12"	2
60" TO 120"	L/5	2
GREATER THAN 120" LESS THAN 168"	12"	3
168" AND GREATER	12"	4

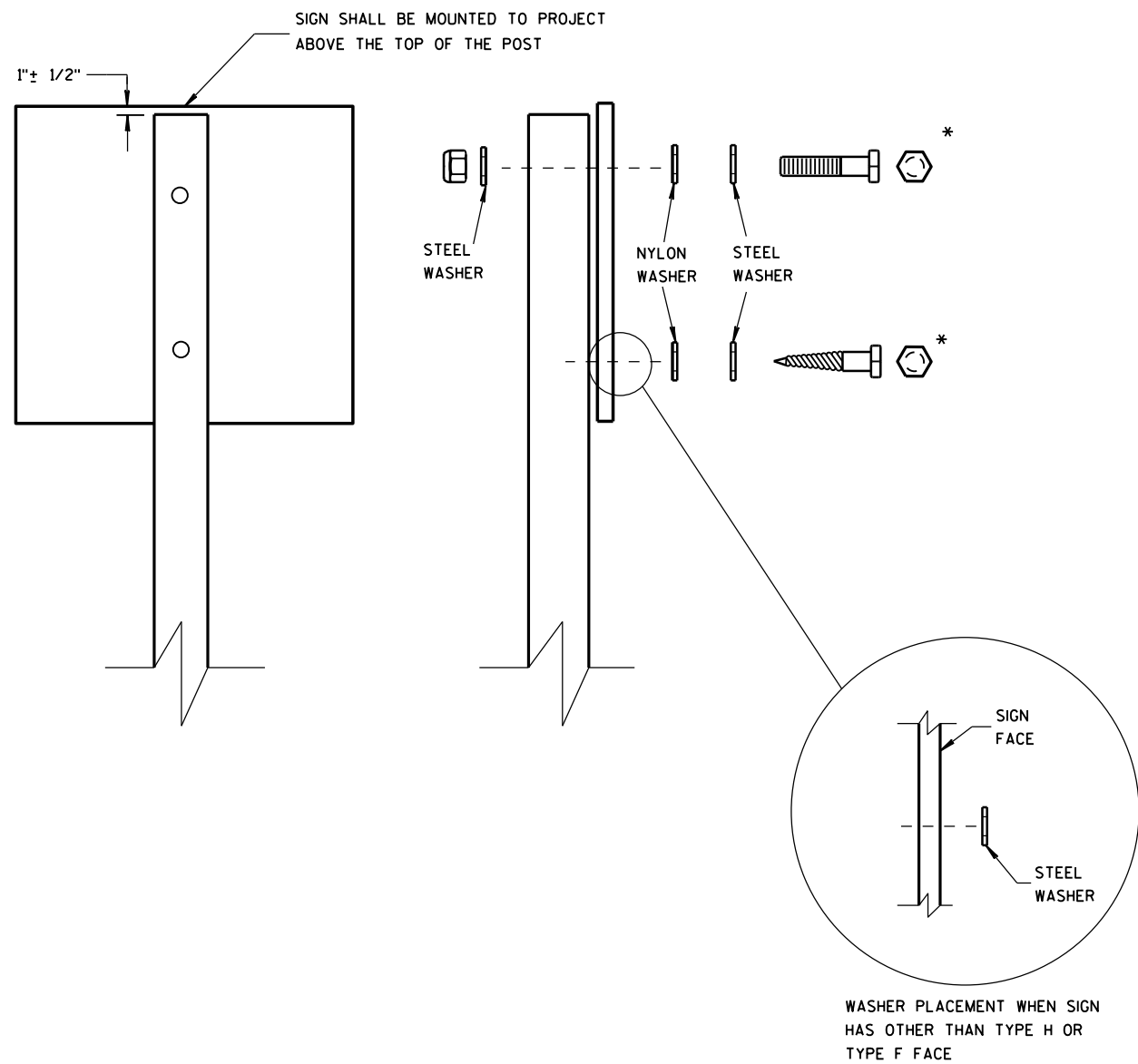
SEE NOTE ③

GENERAL NOTES

- ① 6 FEET FROM THE EDGE OF PAVEMENT (EDGE LINE LOCATION) UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER. LATERAL OFFSET SHOULD BE ADJUSTED TO AVOID THE DITCH FLOWLINE.
- ② 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. IF NO SIDEWALK AND NO PARKING, VERTICAL CLEARANCE MAY BE REDUCED TO 5 FOOT MINIMUM. OFFSET OF SIGNS IS MEASURED FROM THE CURB FLOWLINE.
- ③ FOR SIGNS REQUIRING 4 POSTS, SPACE INTERMEDIATE POSTS EVENLY.

TEMPORARY TRAFFIC CONTROL
SIGN MOUNTING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



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

* 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. FOR A SINGLE POST INSTALLATION, ALL SIGNS GREATER THAN 9 SQ. FT. REQUIRE THE USE OF 3 FASTENERS.

ATTACHMENT OF SIGNS TO POSTS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June 2017 DATE	/S/ Andrew Heidtke WORK ZONE ENGINEER
FHWA	

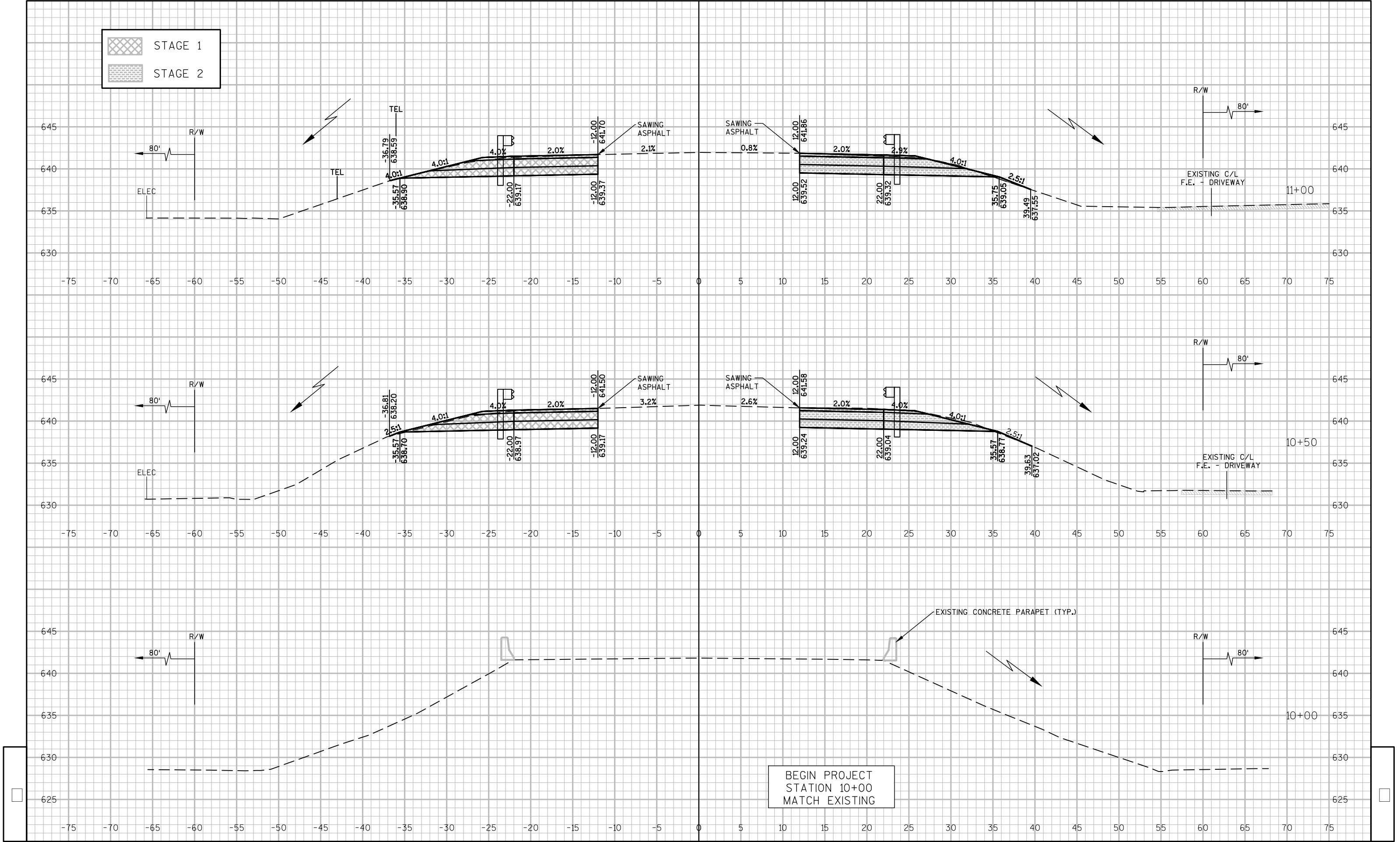
STAGE 1 EARTHWORK - MAINLINE

AREA (SF)		INCREMENTAL VOL (CY)			CUMMULATIVE VOLUME (CY)				
STATION	CUT	FILL	CUT NOTE 1	FILL NOTE 2	EXPANDED FILL (CY)	CUT 1.00 NOTE 1	FILL NOTE 2	EXPANDED FILL (CY)	MASS ORDINATE NOTE 4
					FACTOR 1.25 NOTE 3			FACTOR 1.25 NOTE 3	
10+08	20	0	0	0	0	0	0	0	0
10+50	40	0	56	1	1	56	1	1	55
11+00	41	0	75	1	1	131	2	2	129
11+50	45	0	79	0	0	210	2	2	208
12+00	39	0	77	0	0	287	2	2	285
12+50	39	0	72	0	0	359	2	2	357
13+00	47	0	80	0	0	439	2	2	437
13+50	58	0	97	0	0	536	2	2	534
14+00	51	0	101	0	0	637	2	2	635
14+50	47	0	91	0	0	728	2	2	726
15+00	43	58	83	54	68	811	56	70	741
15+50	49	0	85	54	68	896	110	138	758
16+00	49	0	91	0	0	987	110	138	849
16+50	53	0	95	0	0	1082	110	138	944
17+00	58	0	102	0	0	1184	110	138	1046
17+50	60	0	109	0	0	1293	110	138	1155
18+00	47	0	98	0	0	1391	110	138	1253
18+50	41	22	81	21	26	1472	131	164	1308
19+00	41	15	76	34	44	1548	165	208	1340
19+50	46	7	80	20	25	1628	185	233	1395
20+00	44	3	83	10	12	1711	195	245	1466
20+50	34	7	72	10	12	1783	205	257	1526
21+00	24	6	54	12	15	1837	217	272	1555
21+50	22	0	43	6	8	1880	223	280	1600
22+00	21	10	40	10	13	1920	233	293	1627
COLUMN SLBTOTALS =			1920	233	293	1920	233	293	1627
21+49, LT. - C.E.=			240	15	20	240	15	20	220
STAGE 1 SUBTOTALS =			2160	248	313	2160	248	313	1847

NOTES: 1 - CUT 2 - FILL 3 -EXPANDED FILL 4 - MASS ORDINATE	CUT INCLUDEDS SALVAGED/UNUSABLE MATERIAL DOES NOT INCLUDE UNUSUABLE PAVEMENT EXC VOLUME EXPANDED FILL FACTOR IS 1.25: EXPANDED FILL = (UNEXPANDED FILL*1.25) MASS ORDINATE = CUT-EXPANDED FILL
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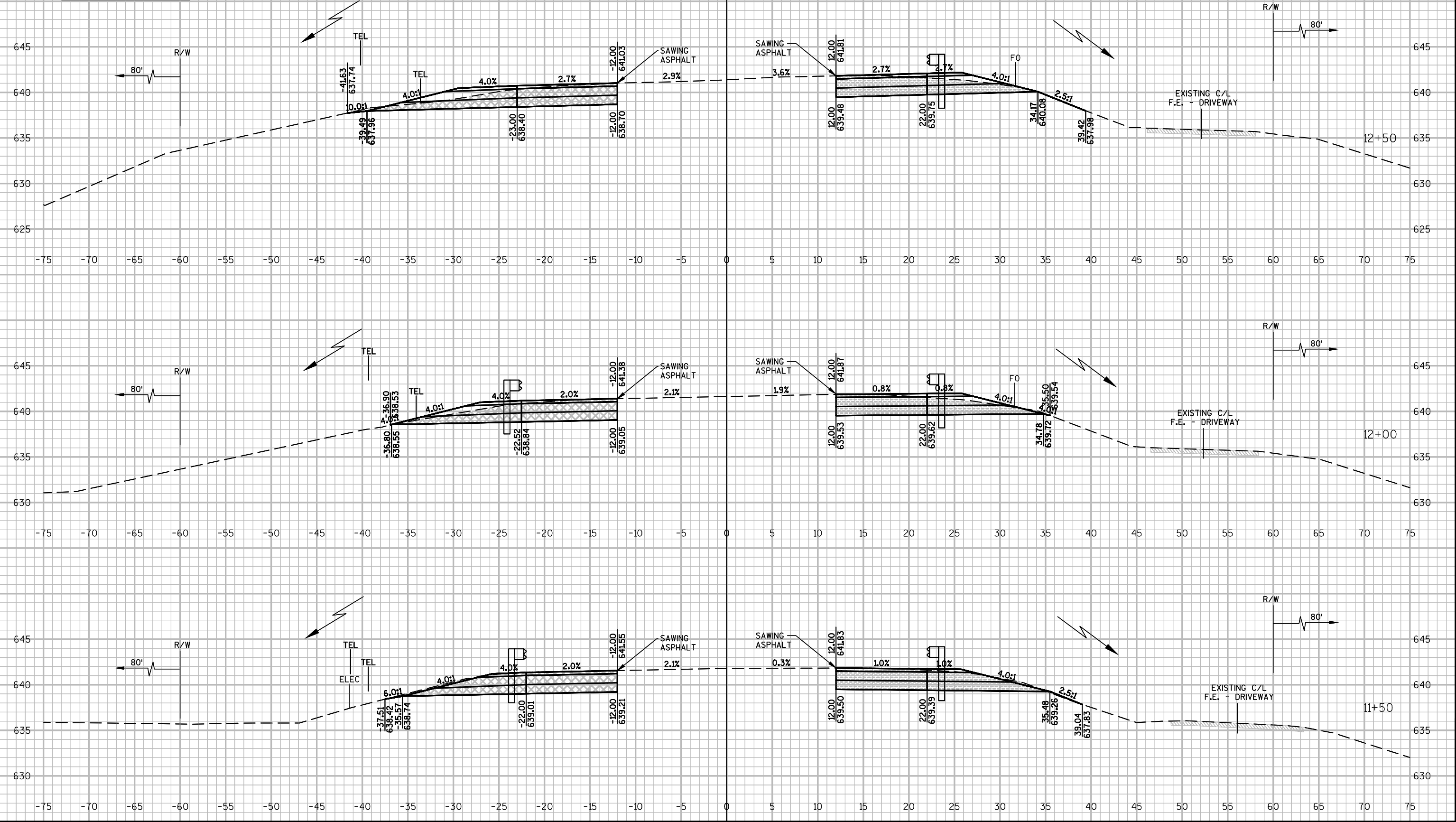
STAGE 2 EARTHWORK - MAINLINE

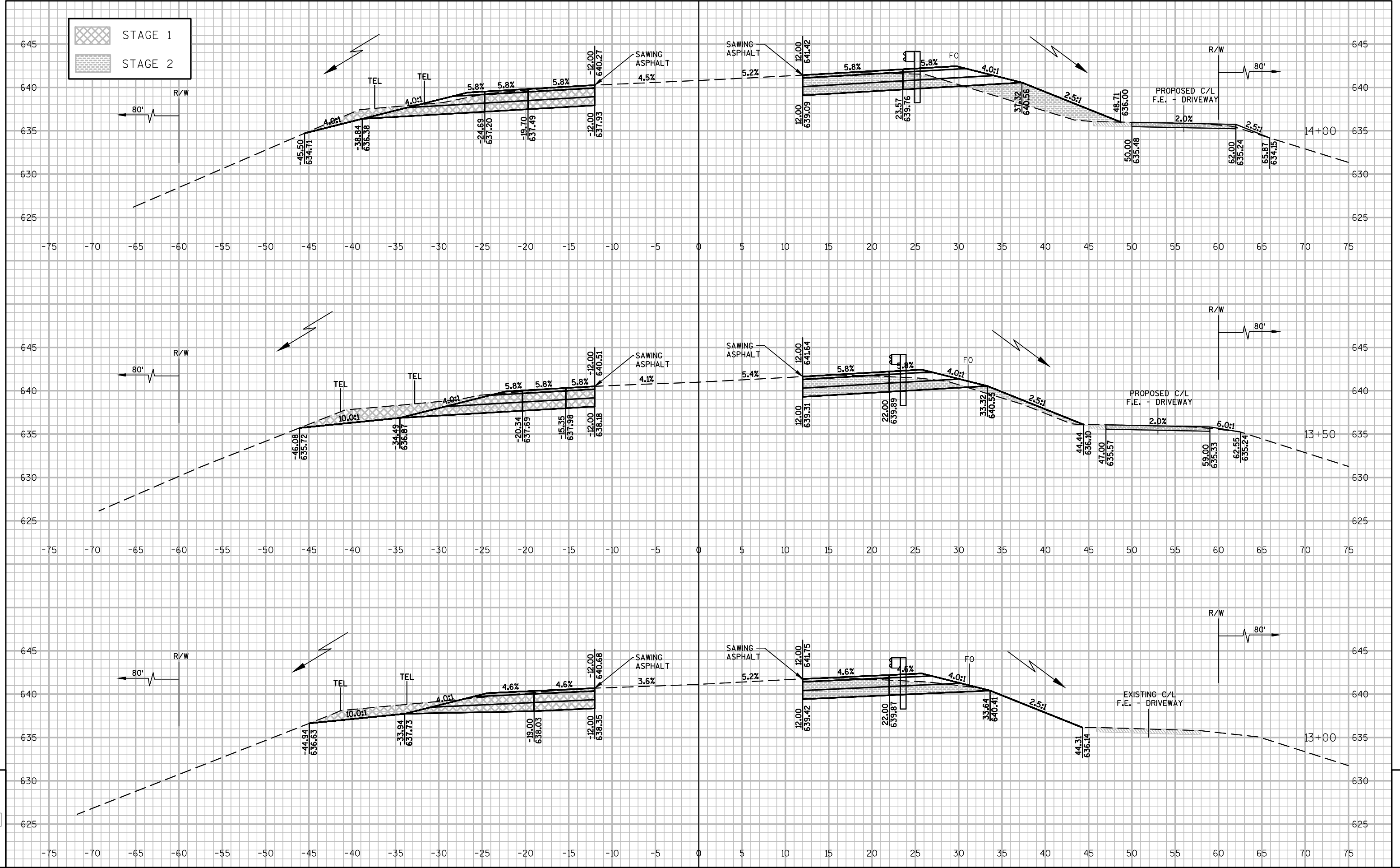
AREA (SF)		INCREMENTAL VOL (CY)			CUMMULATIVE VOLUME (CY)				
STATION	CUT	FILL	CUT NOTE 1	FILL NOTE 2	EXPANDED FILL (CY)	CUT 1.00 NOTE 1	FILL NOTE 2	EXPANDED FILL (CY)	MASS ORDINATE NOTE 4
					FACTOR 1.25 NOTE 3			FACTOR 1.25 NOTE 3	
10+08	48	4	0	0	0	0	0	0	0
10+50	48	9	74	11	12	74	11	12	62
11+00	43	1	84	10	11	158	21	23	135
11+50	44	0	81	1	1	239	22	24	215
12+00	37	0	74	0	0	313	22	24	289
12+50	35	0	67	0	0	380	22	24	356
13+00	33	0	63	0	0	443	22	24	419
13+07	33	0	9	0	0	452	22	24	428
13+07	37	7	0	0	0	452	22	24	428
13+50	37	7	59	11	14	511	33	38	473
14+00	39	28	71	32	40	582	65	78	504
14+50	38	20	72	44	56	654	109	134	520
15+00	39	8	72	26	33	726	135	167	559
15+07	39	8	10	2	3	736	137	170	566
15+07	33	0	0	0	0	736	137	170	566
15+10	33	0	4	0	0	740	137	170	570
STAGE 2 SUBTOTALS =			740	137	170	740	137	170	570
STAGE 1 SUBTOTAL =			1920	233	293	1920	233	293	1627
STAGE 2 SUBTOTAL =			740	137	170	740	137	170	570
21+49, LT. - C.E. =			240	15	20	240	15	20	220
TOTALS=			2900	385	483	2900	385	483	2417

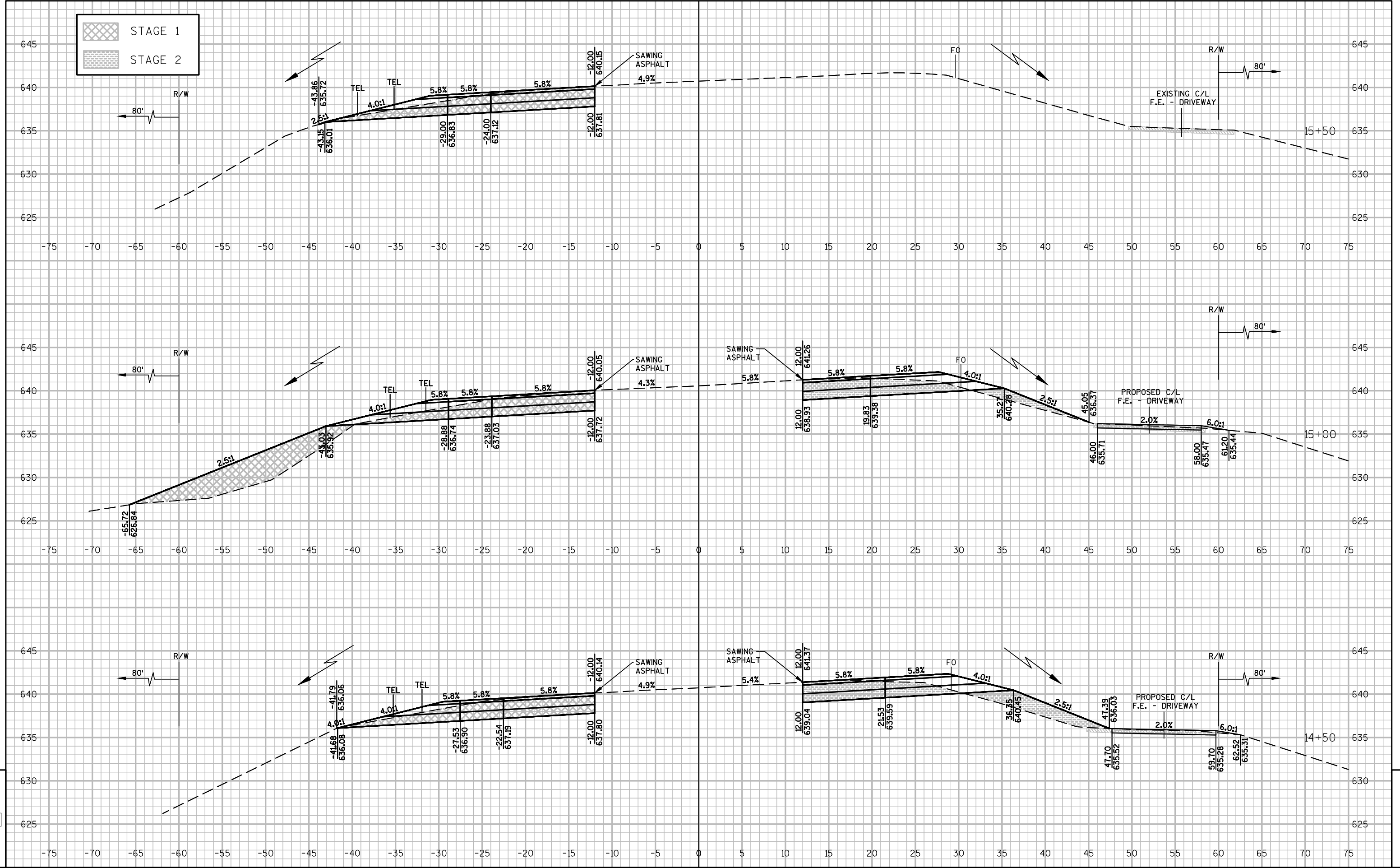


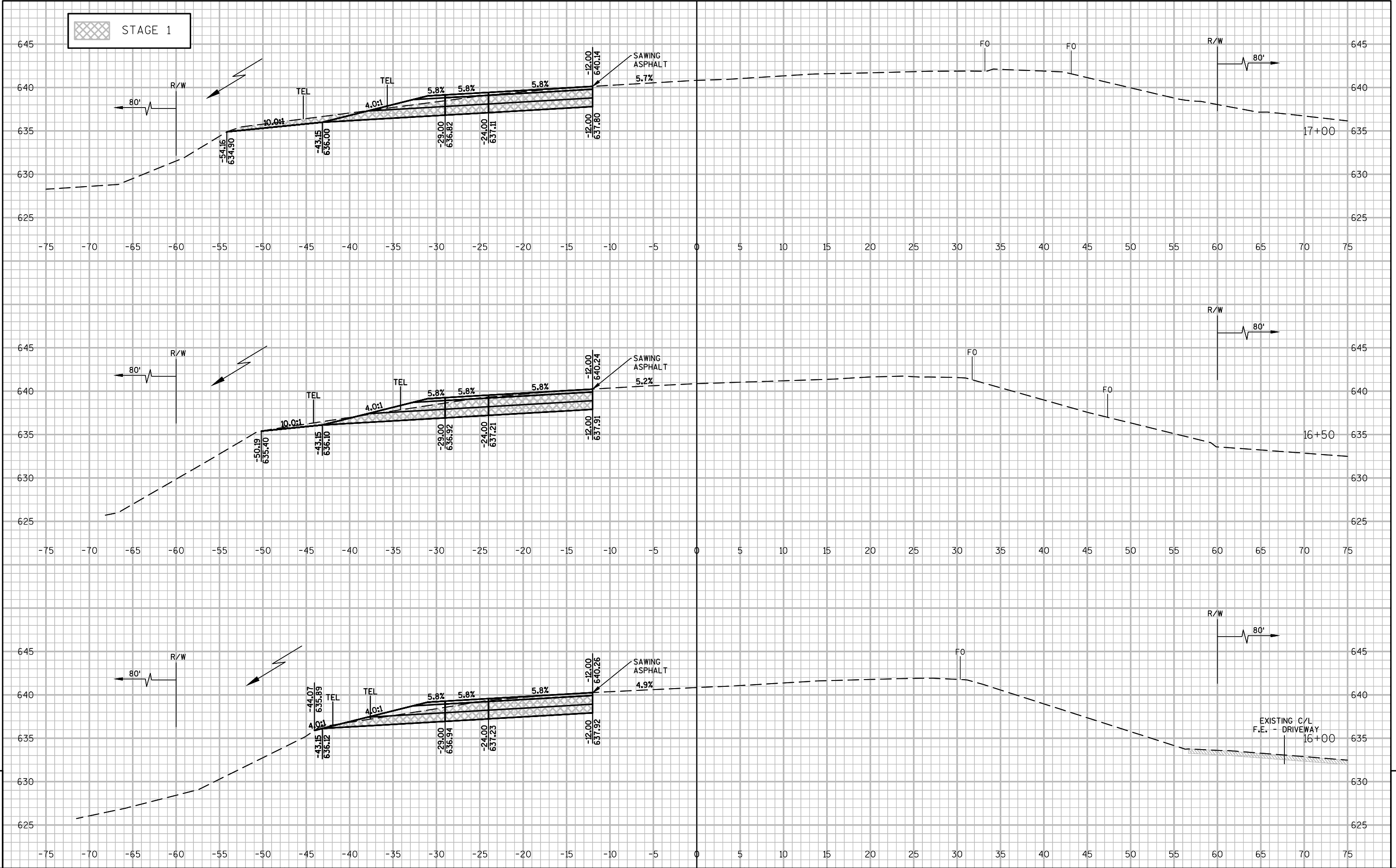

 STAGE 1


 STAGE 2

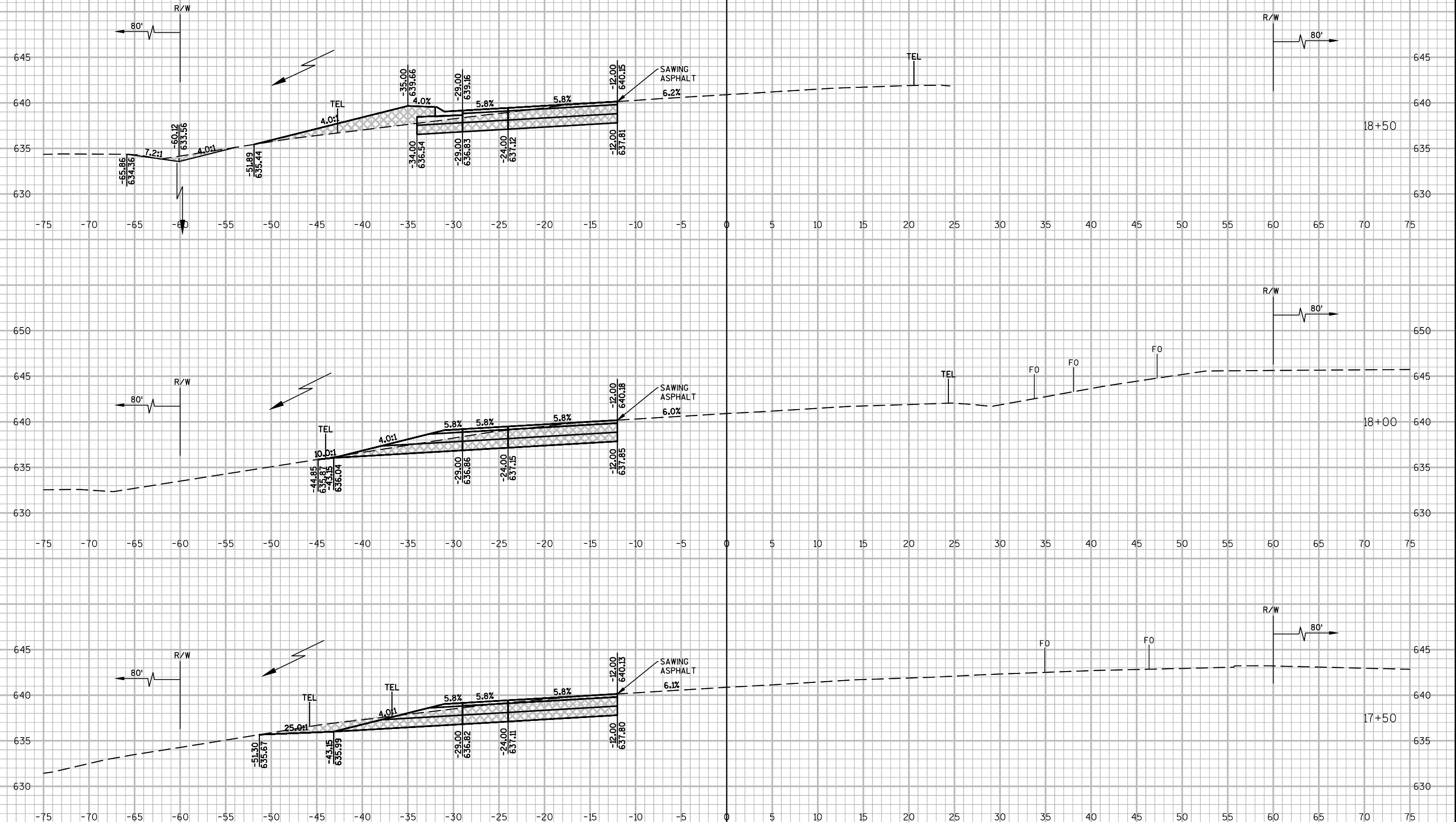


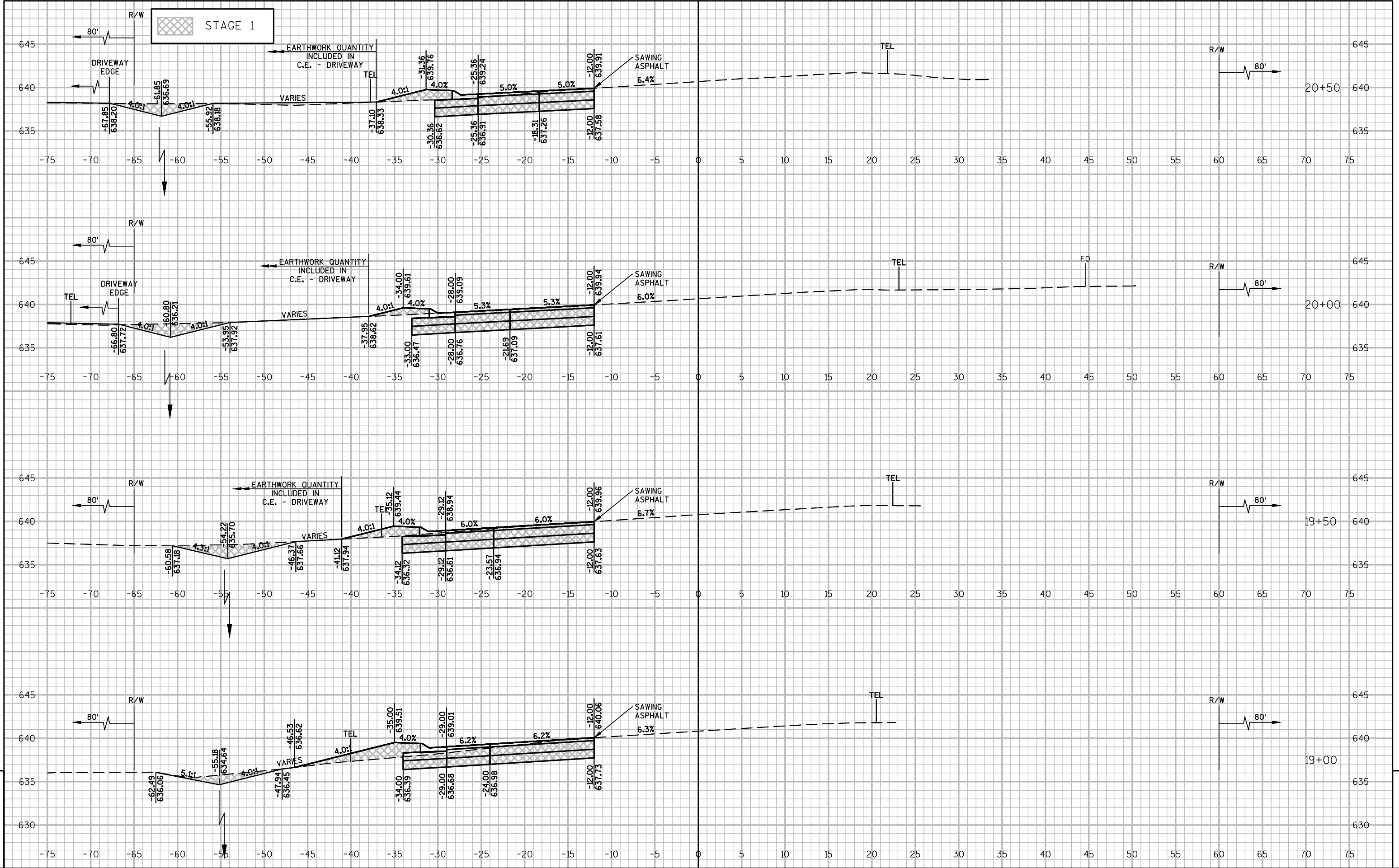






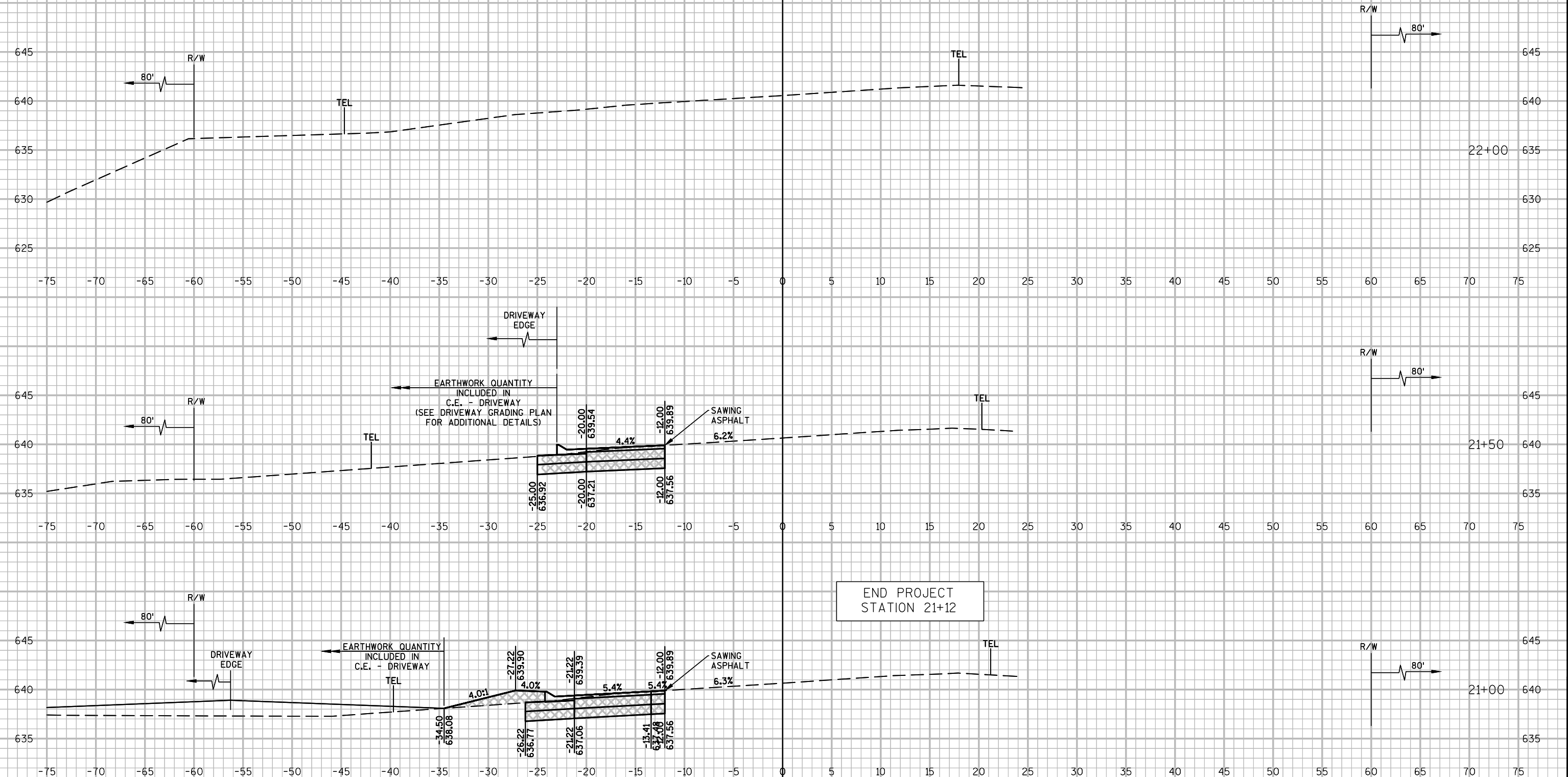
STAGE 1

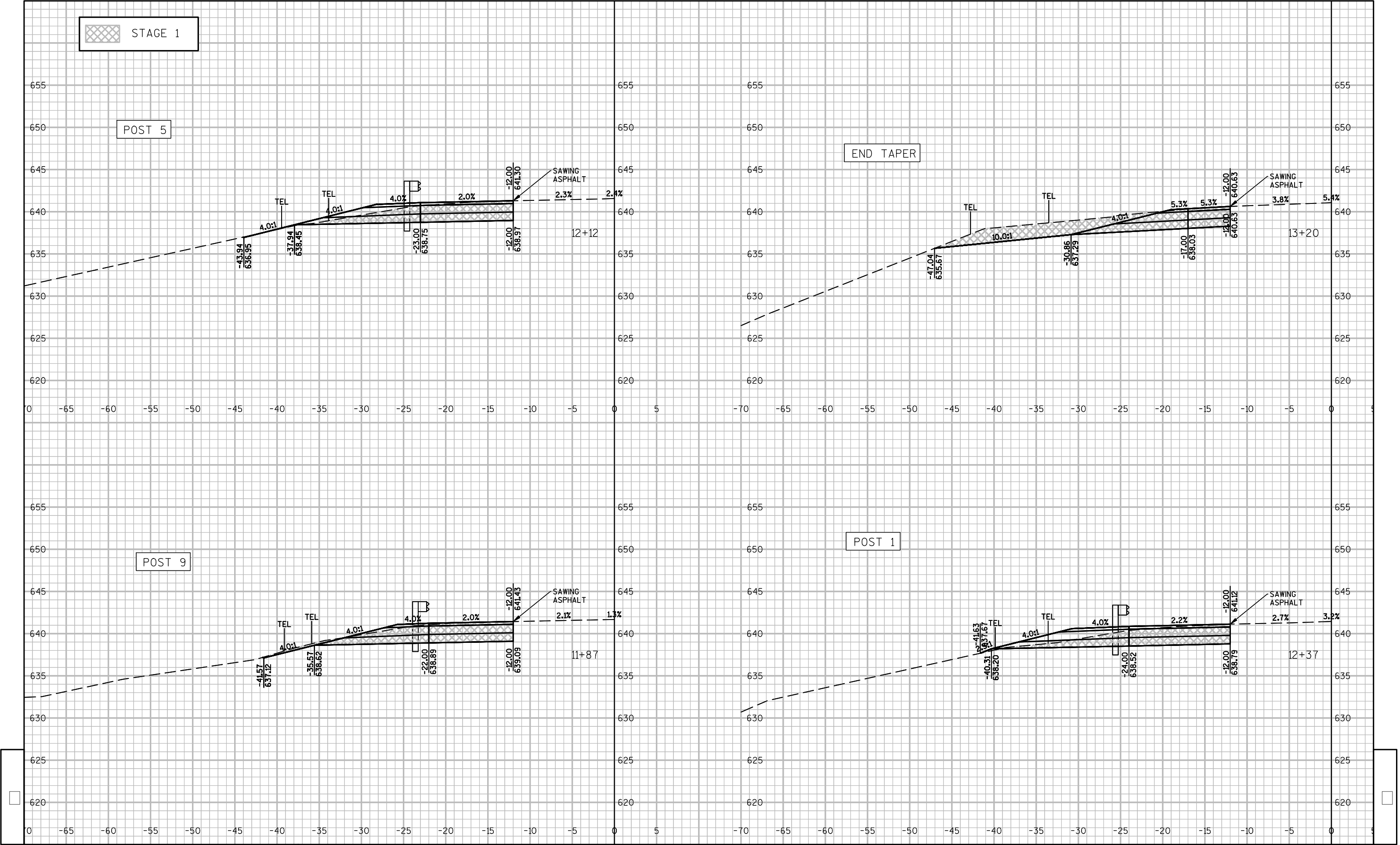




STAGE 1

END CONSTRUCTION
STATION 22+00
MATCH EXISTING





PROJECT NO: 5160-01-70

HWY: STH 35

COUNTY: VERNON

CROSS SECTIONS: MAINLINE (ENERGY ABSORBING TERMINAL)

SHEET

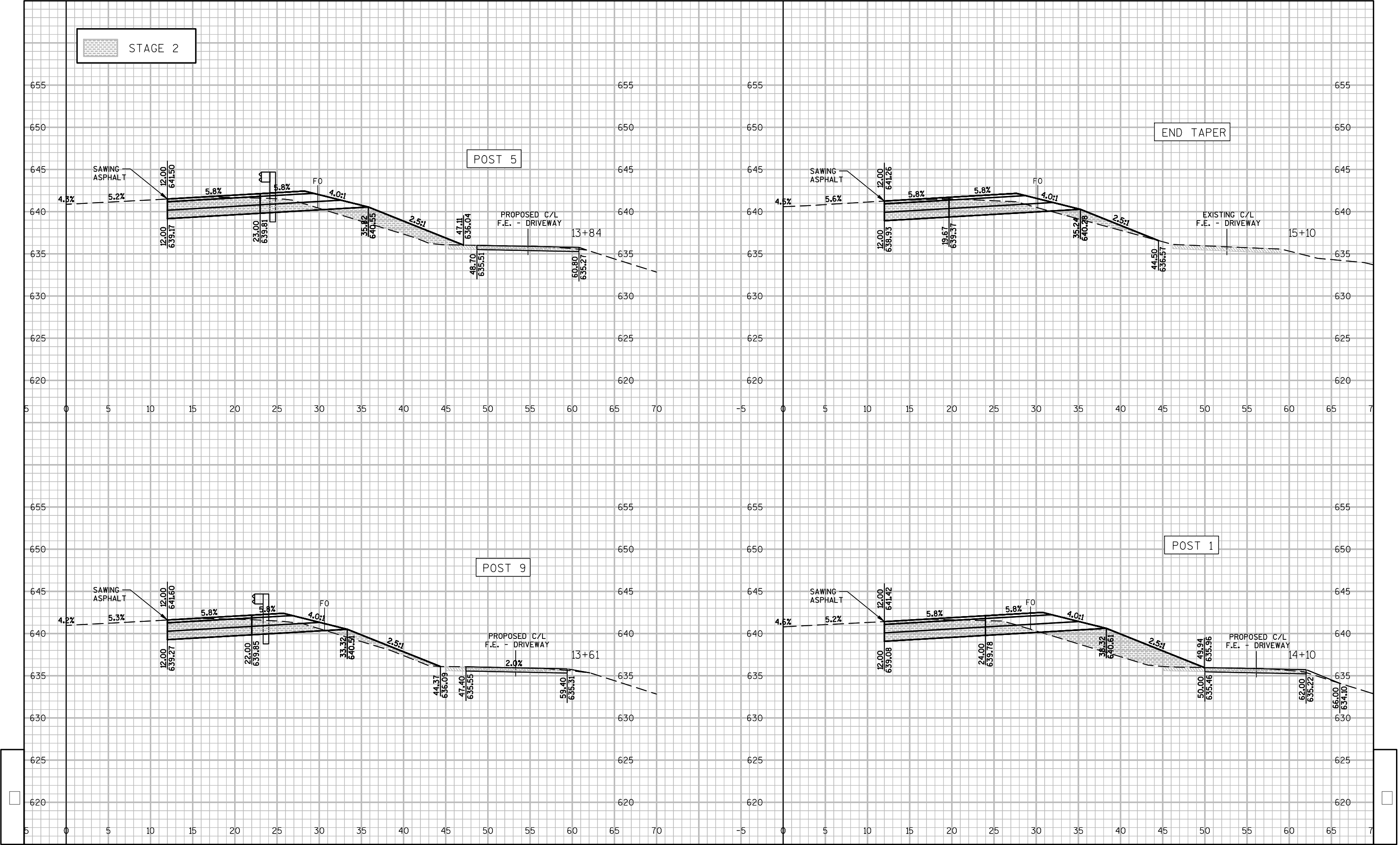
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LAYOUT : BEAMGUARD WEST- (1)

PLOT DATE : 1/23/2019
PLOT TIME : 11:30:11 AM

PLOT BY : JULIA ZEHNER

PLOT SCALE : 1" = 1'



PROJECT NO: 5160-01-70

HWY: STH 35

COUNTY: VERNON

CROSS SECTIONS: MAINLINE (ENERGY ABSORBING TERMINAL)

SHEET

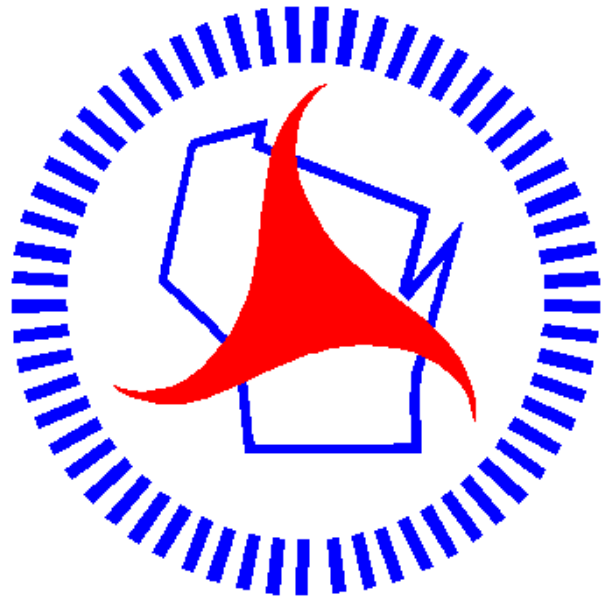
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FILE NAME : S:\PROJECTS\U18060-U18061 USFWS GENOA NFH GUARDRAIL\DESIGN\U18060_DESIGN.DWG
LAYOUT : BEAMGUARD EAST- (1)

PLOT DATE : 1/23/2019
PLOT TIME : 11:30:16 AM

PLOT BY : JULIA ZEHNER

PLOT SCALE : 1" = 1'



Wisconsin Department of Transportation

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