

GENERAL NOTES:

RESTORE SIDEROAD INTERSECTIONS AND PRIVATE ENTRANCES TO EXISTING CONDITIONS UNLESS SHOWN OTHERWISE.

THE EXACT CONSTRUCTION LIMITS OF PRIVATE ENTRANCES SHALL BE COORDINATED WITH THE ENGINEER IN THE FIELD.

WHEN THE QUANTITY OF BASE AGGREGATE OR HMA PAVEMENT IS MEASURED BY THE TON, THE THICKNESS OF THE LAYER SHOWN ON THE PLAN IS APPROXIMATE, AND THE ACTUAL THICKNESS WILL DEPEND ON THE DISTRIBUTION OF MATERIAL AS DIRECTED BY THE ENGINEER.

PRIOR TO THE PLACEMENT OF GUARDRAIL, THE SHOULDERS SHALL BE IN PLACE, SHAPED, AND COMPACTED UNLESS SHOWN OTHERWISE.

IN GUARDRAIL AREAS, EXTEND PAVED SHOULDER OUT TO GUARDRAIL FACE.

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

DISTURBED AREAS WITHIN THE RIGHT-OF-WAY, EXCEPT THE AREAS WITHIN THE FINISHED SHOULDER POINTS, SHALL BE FERTILIZED, SEEDED AND COVERED WITH EROSION MAT.

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

NO EQUIPMENT OR MATERIALS SHALL BE STORED IN WETLAND AREAS.

THE LOCATIONS OF EXISTING AND PROPOSED UTILITY FACILITIES AS SHOWN ON THE PLAN ARE APPROXIMATE. THERE MAY BE OTHER UTILITY FACILITIES WITHIN THE PROJECT AREA THAT ARE NOT SHOWN. THE CONTRACTOR SHALL NOTIFY DIGGERS HOTLINE PRIOR TO THE START OF WORK. ANY UTILITY WHICH IS NOT A MEMBER OF DIGGERS HOTLINE MUST BE CONTACTED SEPARATELY.

PAVEMENT QUANTITIES ARE BASED ON 112 LBS/SY COMPACTED 1" THICK.

UTILITIES:

COMMUNICATION LINE

CENTURYLINK
 BEN BAKER
 425 ELLINGSON AVE
 HAWKINS, WI 54530
 PHONE: 715-567-0725 (O)
 EMAIL: ben.baker@centurylink.com

CHARTER COMMUNICATIONS
 JAMEY OLDEEN
 2304 S MAIN ST
 RICE LAKE, WI 54868
 PHONE: 715-719-0561 (O) 715-651-7488 (M)
 EMAIL: Jamey.Oldeen@charter.net

S&K TV SYSTEM
 DAVID SCOTT
 508 W MINER AVE
 LADYSMITH, WI 54848
 PHONE: 715-532-7321
 EMAIL: dave.skable@gmail.com

ELECTRICITY

NORTH CENTRAL POWER COMPANY INC
 MICHAEL HEATH
 3661 N CLARK ST, P.O. BOX 68
 RADISSON, WI 54867
 PHONE: 715-945-2630 (O) 715-266-3411 (M)
 EMAIL: ncp@bevcomm.net

SEWER AND WATER

VILLAGE OF WINTER, WATER UTILITY*
 LANCE ARMSTRONG
 PO BOX 277
 WINTER, WI 54896-0277
 PHONE: 715-266-3006 (O) 715-609-9876 (M)
 EMAIL: villageofwinter@outlook.com

* DENOTES NOT A MEMBER OF DIGGERS HOTLINE

STANDARD ABBREVIATIONS

ABUT	ABUTMENT	CWT	HUNDREDWEIGHT
AC	ACRE	INL	INLET
AGG	AGGREGATE	LT	LEFT
AH	AHEAD	LHF	LEFT-HAND FORWARD
APPROX	APPROXIMATE	LIN	LINEAR
AEW	APRON ENDWALL	LIN FT	LINEAR FOOT
ASPH	ASPHALTIC	LS	LUMP SUM
ADT	AVERAGE DAILY TRAFFIC	MAX	MAXIMUM
AVG	AVERAGE	MI	MILE
AZ	AZIMUTH	MIN	MINIMUM
BK	BACK	MISC	MISCELLANEOUS
BEG	BEGIN	NE	NORTH EAST
BM	BENCH MARK	NW	NORTH WEST
C/L	CENTER LINE	PAV'T	PAVEMENT
CL	CLASS	PC	POINT OF CURVATURE
CE	COMMERCIAL ENTRANCE	PI	POINT OF INTERSECTION
CONC	CONCRETE	PT	POINT OF TANGENCY
CONST	CONSTRUCTION	POT	POINT ON TANGENT
CACP	CORRUGATED ALUMINUM CULVERT PIPE	LB	POUND
CO	COUNTY	PE	PRIVATE ENTRANCE
CTH	COUNTY TRUNK HIGHWAY	PROJ	PROJECT
X-SEC	CROSS SECTION	R	RANGE
CR	CRUSHED	RCCP	REINFORCED CONCRETE CULVERT PIPE
CFS	CUBIC FEET/SECOND	REQ'D	REQUIRED
CY OR CU YD	CUBIC YARD	RT	RIGHT
CULV	CULVERT	RHF	RIGHT-HAND FORWARD
CP	CULVERT PIPE	RW OR R/W	RIGHT OF WAY
CPRC	CULVERT PIPE REINFORCED CONCRETE	RD	ROAD
DOT	DEPARTMENT OF TRANSPORTATION	SHR	SHRINKAGE
DHV	DESIGN HOUR VOLUME	SL	SLOPE
DIA	DIAMETER	SI	SLOPE INTERCEPT
DD	DIRECTIONAL DISTRIBUTION	SE	SOUTH EAST
DISCH OR DIS	DISCHARGE	SW	SOUTH WEST
EA	EACH	STD	STANDARD
ELECT	ELECTRIC	SDD	STANDARD DETAIL DRAWINGS
EL OR ELEV	ELEVATION	STH	STATE TRUNK HIGHWAY
EMB	EMBANKMENT	STA	STATION
EBS	EXCAVATION BELOW SUBGRADE	SPPA	STRUCTURAL PLATE PIPE ARCH
EXIST	EXISTING	STRUCT	STRUCTURE
FERT	FERTILIZE	SURF	SURFACE
FE	FIELD ENTRANCE	TEL	TELEPHONE
FIN	FINISHED	TN	TOWN
FT	FOOT	T	TRUCKS (PERCENT OF)
FL	FLOW LINE	UNCL	UNCLASSIFIED
GA	GAUGE	UG	UNDERGROUND
HORIZ	HORIZONTAL	V	VELOCITY OR DESIGN SPEED
HMA	HOT MIX ASPHALT	VC	VERTICAL CURVE

RUNOFF COEFFICIENT TABLE

LAND USE:	HYDROLOGIC SOIL GROUP											
	A			B			C			D		
	SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)		
	0-2	2-6	6 & OVER									
ROW CROPS	.08	.16	.22	.12	.20	.27	.15	.24	.33	.19	.28	.38
	.22	.30	.38	.26	.34	.44	.30	.37	.50	.34	.41	.56
MEDIAN STRIP-TURF	.19	.20	.24	.19	.22	.26	.20	.23	.30	.20	.25	.30
	.24	.26	.30	.25	.28	.33	.26	.30	.37	.27	.32	.40
SIDE SLOPE-TURF			.25			.27			.28			.30
			.32			.34			.36			.38
PAVEMENT:												
ASPHALT	.70 - .95											
CONCRETE	.80 - .95											
BRICK	.70 - .80											
DRIVES, WALKS	.75 - .85											
ROOFS	.75 - .95											
GRAVEL ROADS, SHOULDERS	.40 - .60											

TOTAL PROJECT AREA = 56 ACRES
 TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 0.48 ACRES

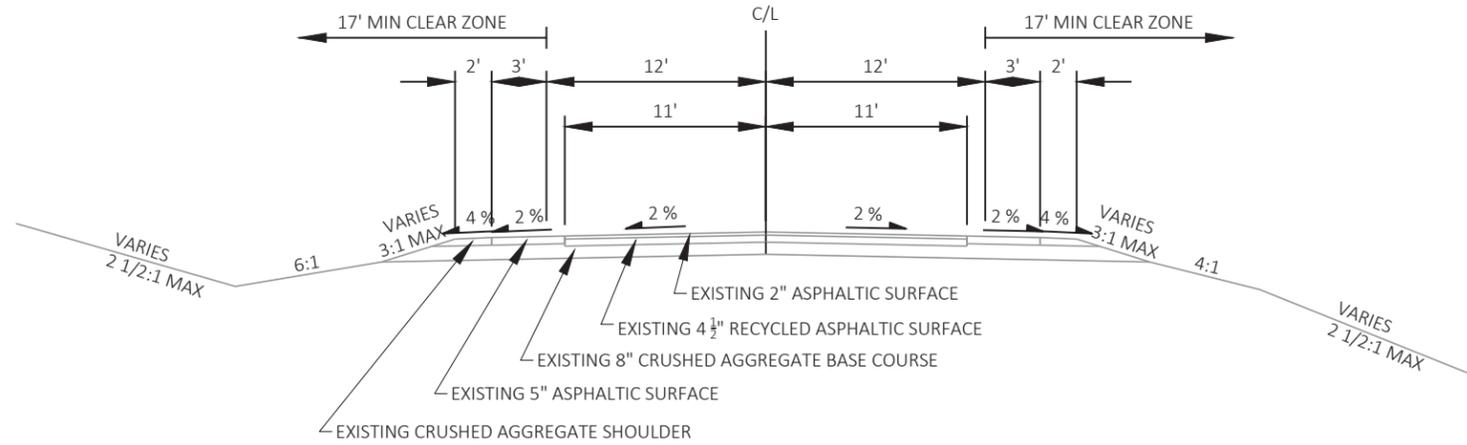


Dial **811** or (800)242-8511

www.DiggersHotline.com

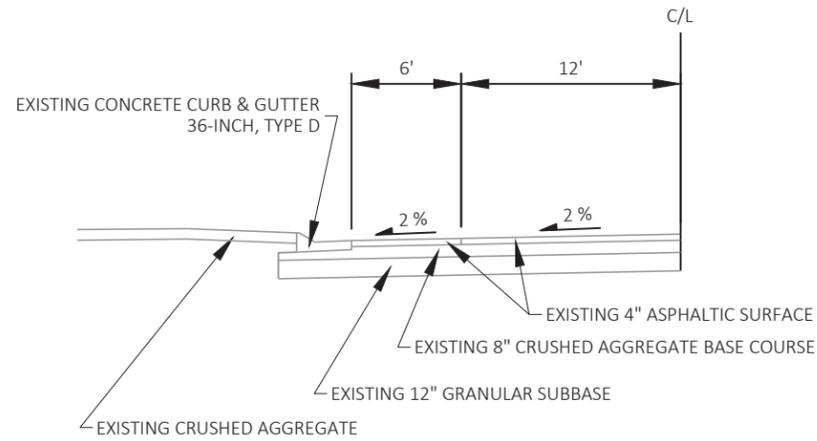
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

WDNR - NORTHWEST DISTRICT HEADQUARTERS
 SHAWN HASELEU
 810 WEST MAPLE STREET
 SPOONER, WI 54801
 PHONE: (715)635-4228
 EMAIL: Shawn.Haseleu@wisconsin.gov



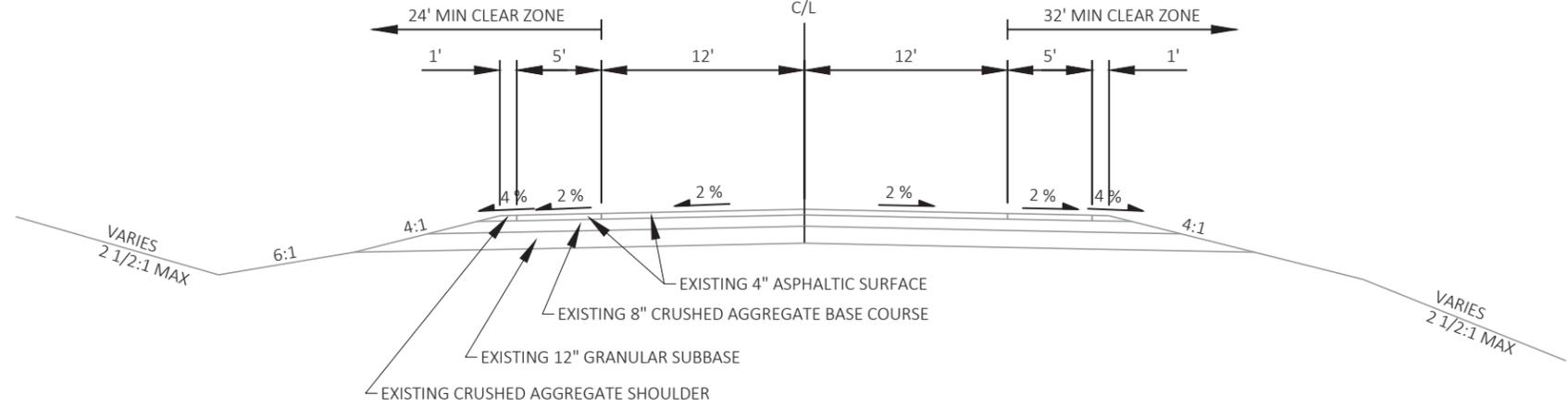
TYPICAL EXISTING SECTION

STA 11+33 TO STA 314+00



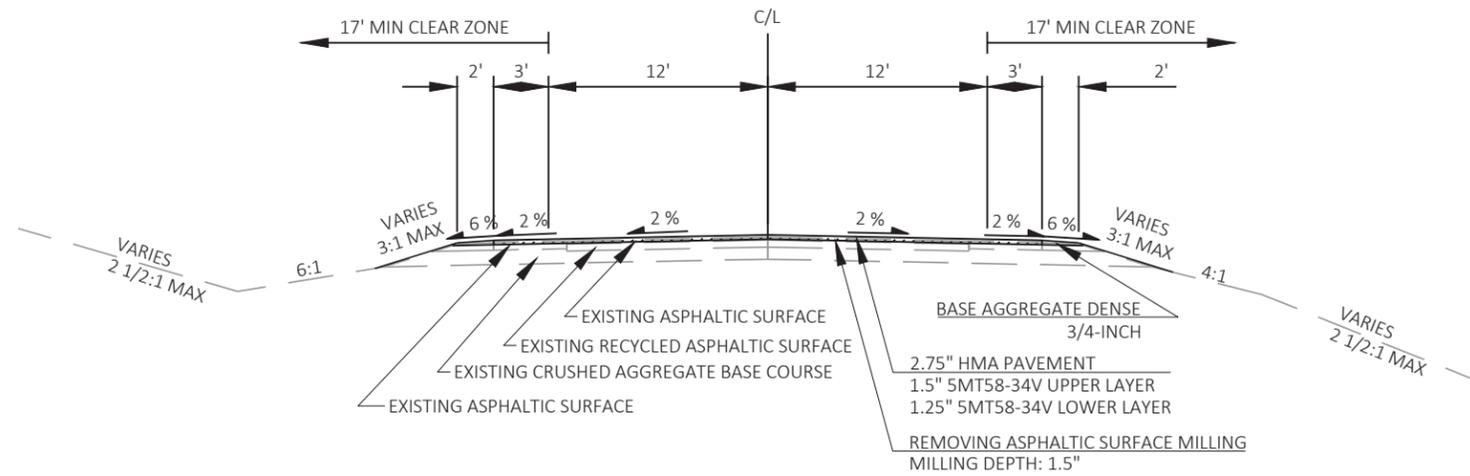
TYPICAL EXISTING SECTION

STA 550+81 TO STA 552+46 LT

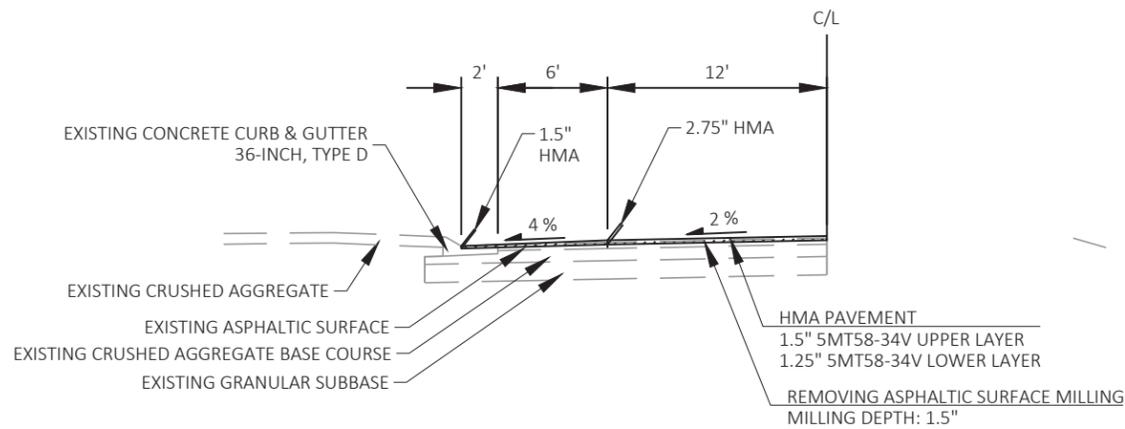


TYPICAL EXISTING SECTION

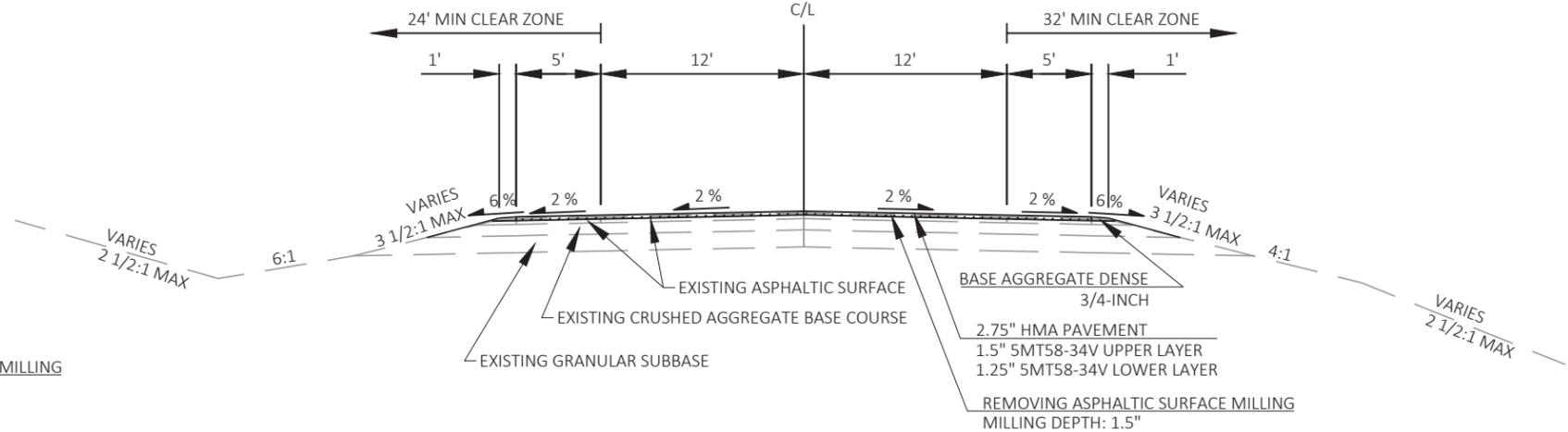
STA 314+00 TO STA 457+91
STA 458+39 TO STA 550+81
STA 550+81 TO STA 552+46 RT
STA 552+46 TO STA 559+55



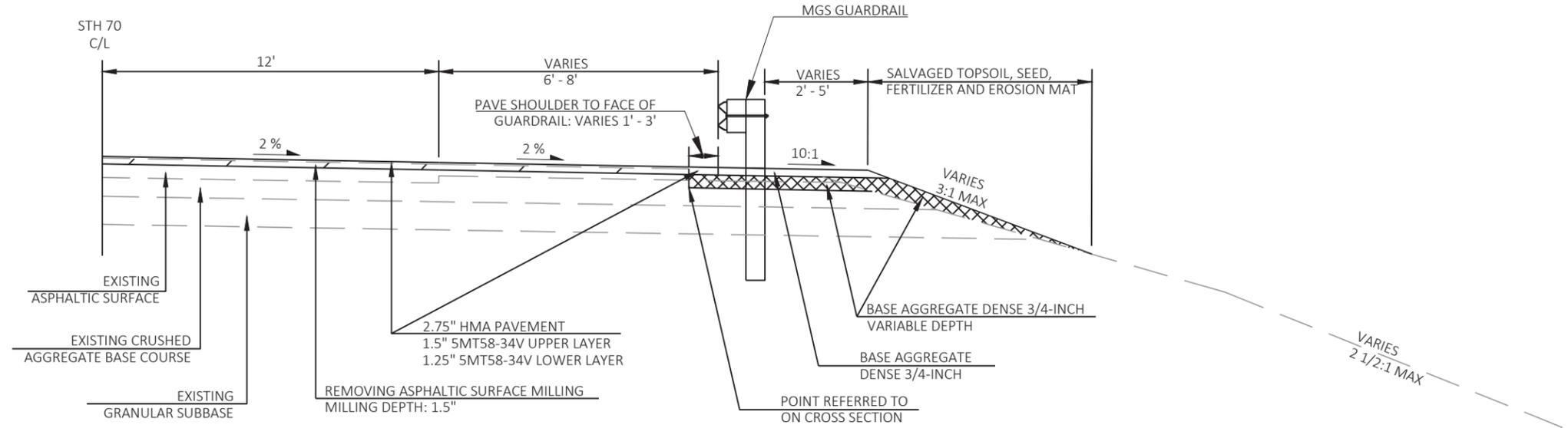
TYPICAL FINISHED SECTION
STA 11+33 TO STA 314+00



TYPICAL FINISHED SECTION
STA 550+81 TO STA 552+46 LT

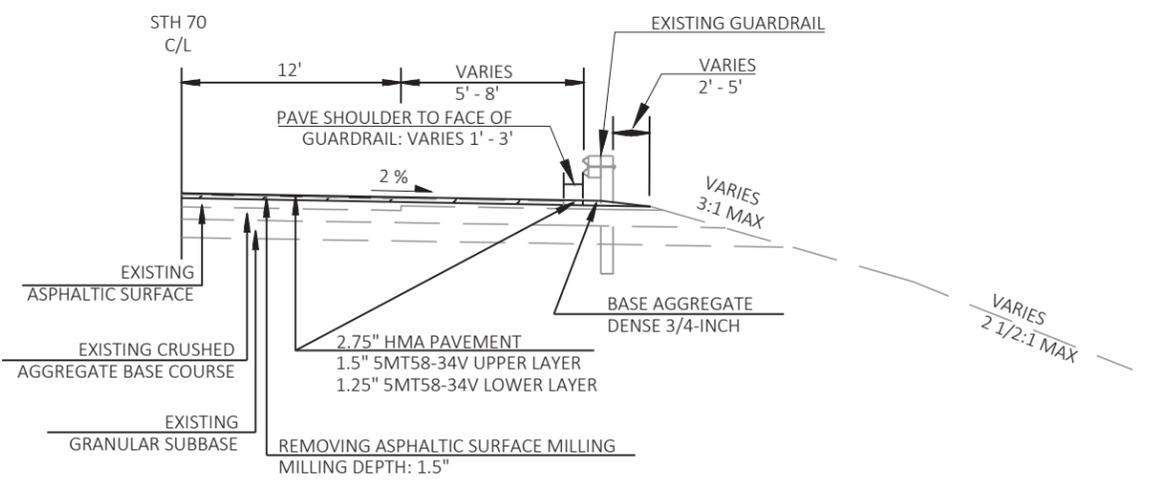


TYPICAL FINISHED SECTION
STA 314+00 TO STA 457+91
STA 458+39 TO STA 550+81
STA 550+81 TO STA 552+46 RT
STA 552+46 TO STA 559+55



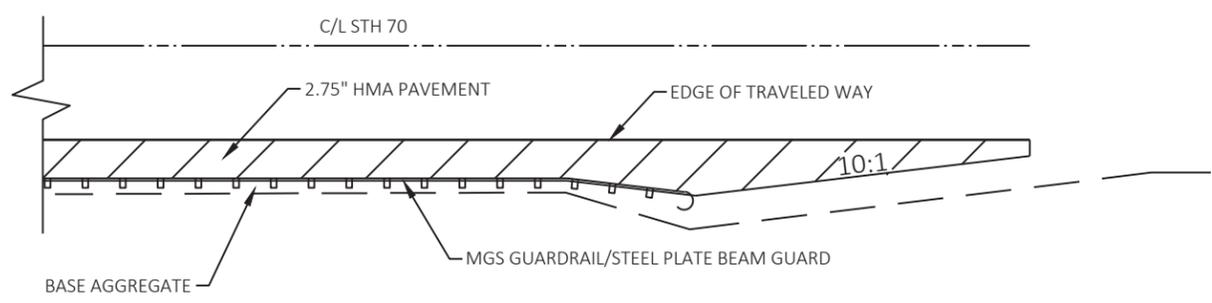
TYPICAL FINISHED SECTION FOR GUARDRAIL

STA 458+37 - STA 460+29 LT
STA 458+37 - STA 461+29 RT

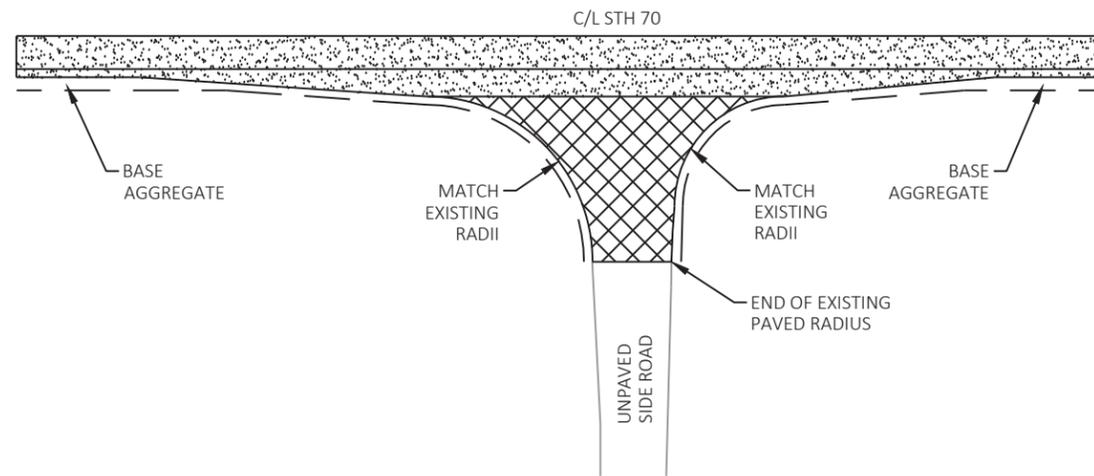


TYPICAL FINISHED SECTION FOR GUARDRAIL

STA 129+07 - STA 132+34 RT
STA 457+40 - STA 457+91 LT & RT

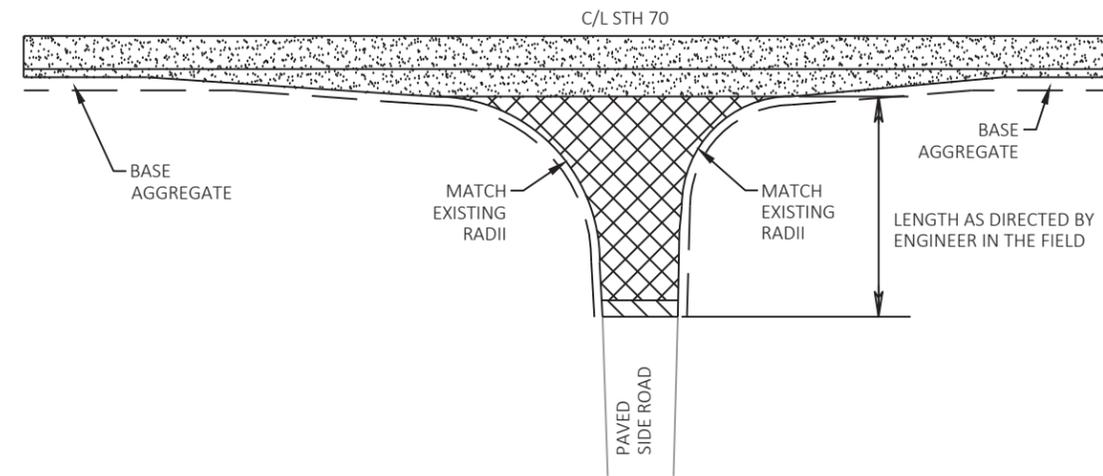


TYPICAL SHOULDER PAVING FOR GUARDRAIL



MILLING AND PAVING DETAIL FOR EXISTING UNPAVED SIDE ROADS

- | | |
|------------|-------------|
| OLSON RD | SUNDLING RD |
| LARSON RD | KADIN RD |
| TICE RD | GOLOB RD |
| KNOWLES RD | |

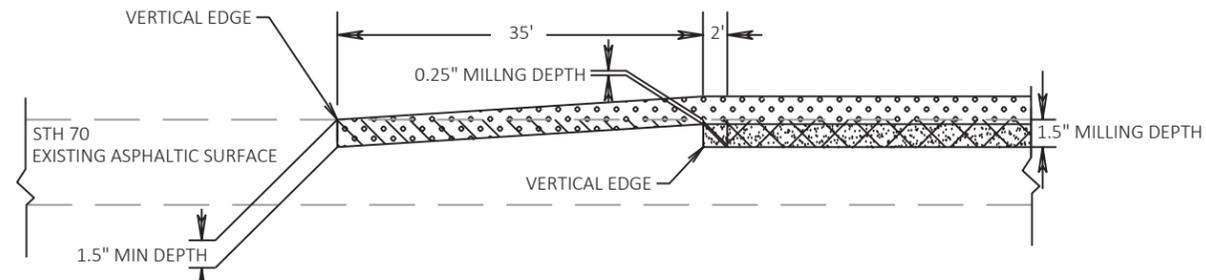


MILLING AND PAVING DETAIL FOR EXISTING PAVED SIDE ROADS

- | | |
|----------------|---------------|
| CRAWFORD ST | CEMETERY RD |
| LAKE WINTER RD | CLOVER RD |
| BURLUM RD | SIMPSON RD |
| LEE RD | PIKE HAVEN RD |
| CTH B | BUMBLEBEE RD |
| BROWNS RD | TURNER RD |
| UNCLE TOMS RD | DAM RD |
| LUDS LN | |

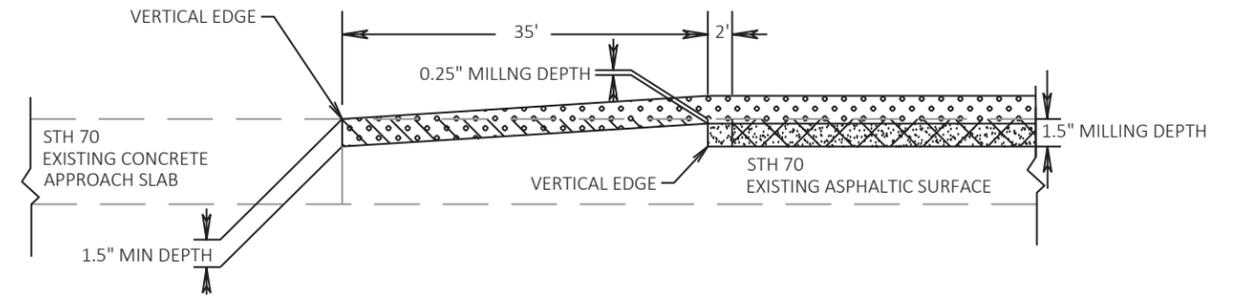
LEGEND

-  REMOVING ASPHALTIC SURFACE MILLING, 1.5" DEPTH
 2.75" HMA PAVEMENT
 1.5"-5 MT 58-34 V, UPPER LAYER
 1.25"-5 MT 58-34 V, LOWER LAYER
-  REMOVING ASPHALTIC SURFACE MILLING, 0.25 - 1.5" DEPTH, SEE SIDE ROAD CONSTRUCTION JOINT DETAIL
 1.5" HMA PAVEMENT 5 MT 58-34 V
-  REMOVING ASPHALTIC SURFACE BUTT JOINT, 1.5" DEPTH, SEE SIDE ROAD CONSTRUCTION JOINT DETAIL
 1.5" HMA PAVEMENT 5 MT 58-34 V



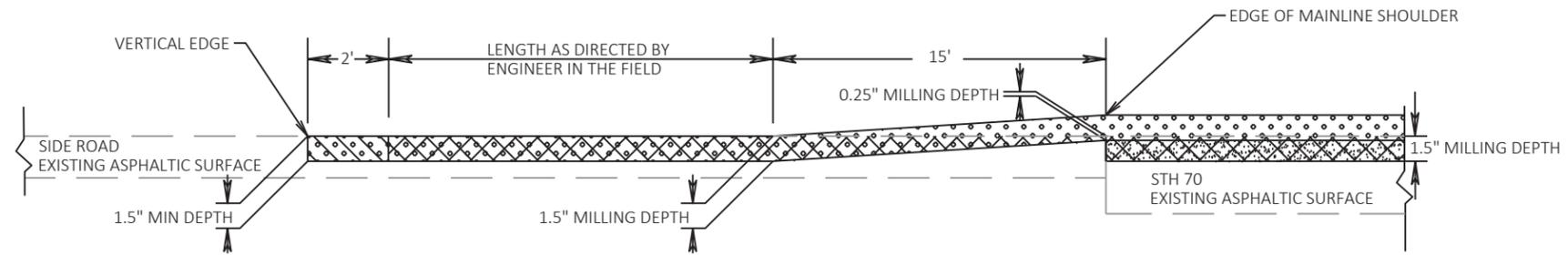
DETAIL FOR MAINLINE CONSTRUCTION JOINT

STA 11+33
STA 559+55



DETAIL FOR MAINLINE CONSTRUCTION JOINT

STA 457+71
STA 458+60

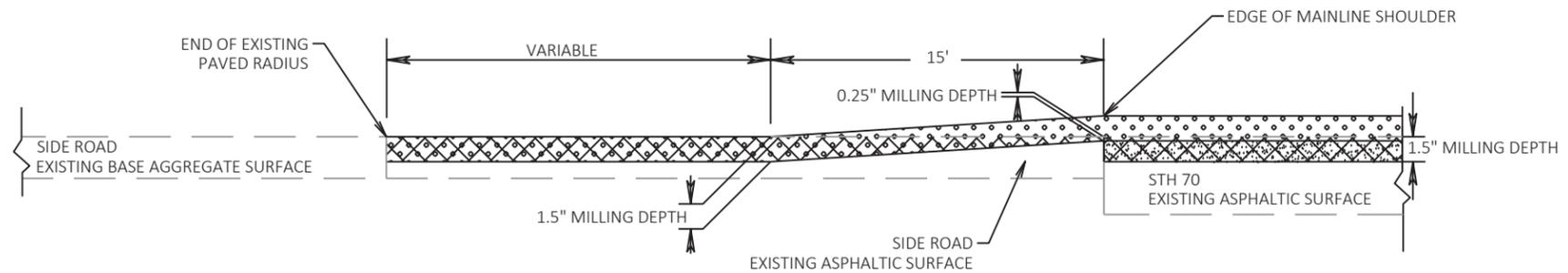


DETAIL FOR PAVED SIDE ROAD CONSTRUCTION JOINT

- | | |
|----------------|---------------|
| CRAWFORD ST | CEMETERY RD |
| LAKE WINTER RD | CLOVER RD |
| BURLUM RD | SIMPSON RD |
| LEE RD | PIKE HAVEN RD |
| CTH B | BUMBLEBEE RD |
| BROWNS RD | TURNER RD |
| UNCLE TOMS RD | DAM RD |
| LUDS LN | |

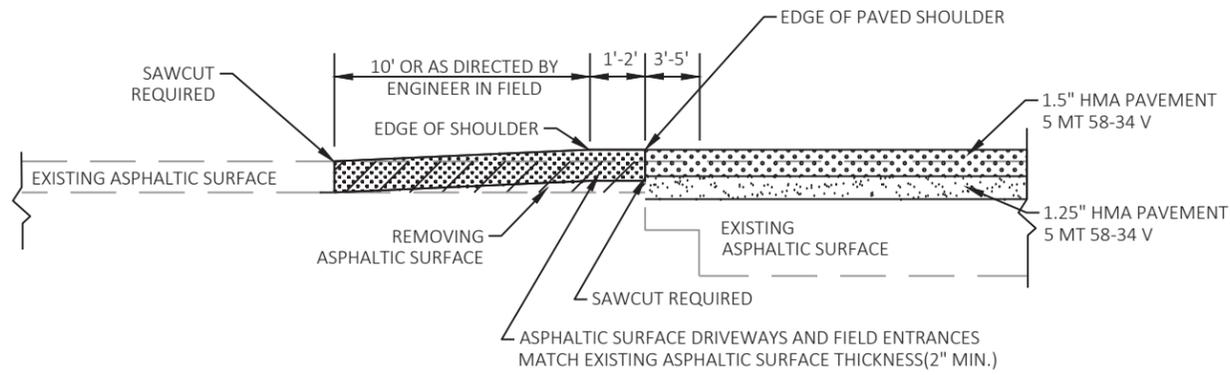
LEGEND

-  REMOVING ASPHALTIC SURFACE MILLING
-  REMOVING ASPHALTIC SURFACE BUTT JOINTS
-  1.5" HMA PAVEMENT 5 MT 58-34 V
-  1.25" HMA PAVEMENT 5 MT 58-34 V

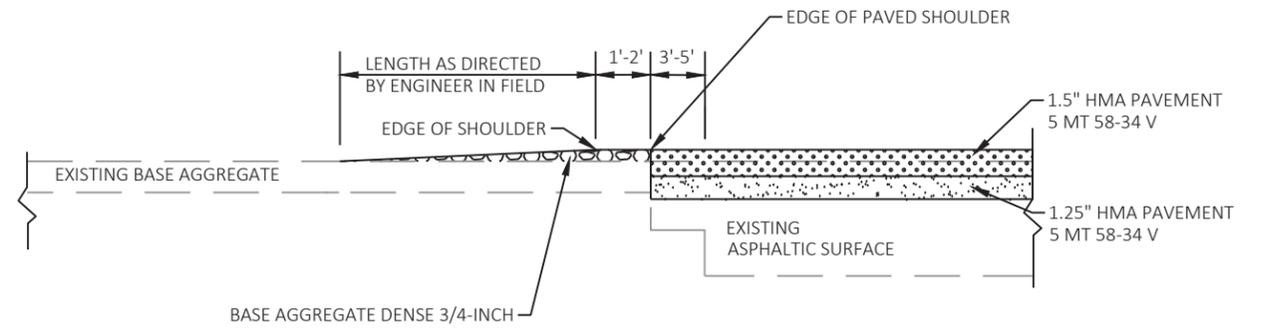


DETAIL FOR UNPAVED SIDE ROAD CONSTRUCTION JOINT

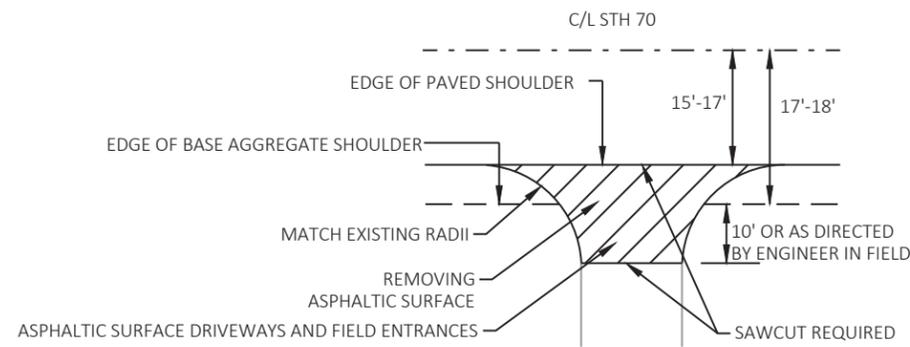
- | | |
|------------|-------------|
| OLSON RD | SUNDLING RD |
| LARSON RD | KADIN RD |
| TICE RD | GOLOB RD |
| KNOWLES RD | |



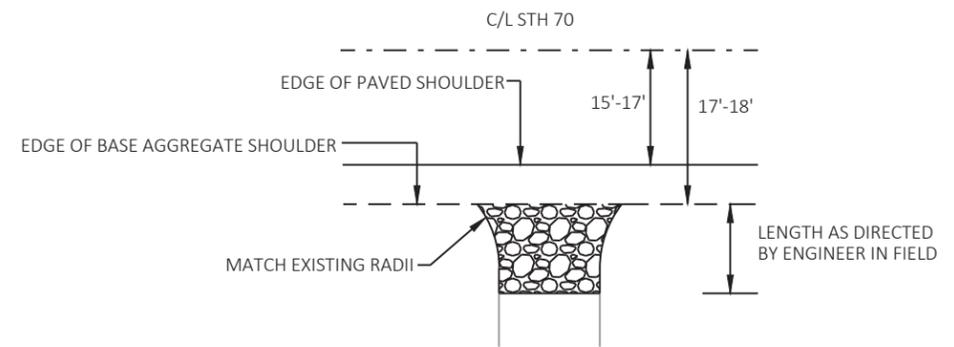
PAVED ENTRANCE DETAIL
PROFILE VIEW



BASE AGGREGATE ENTRANCE DETAIL
PROFILE VIEW



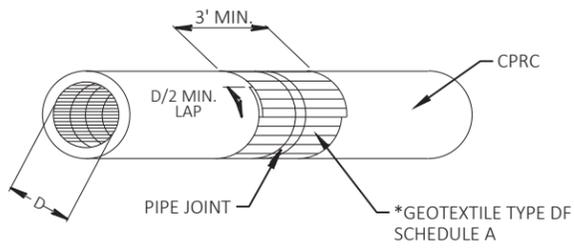
PAVED ENTRANCE DETAIL
PLAN VIEW



BASE AGGREGATE ENTRANCE DETAIL
PLAN VIEW

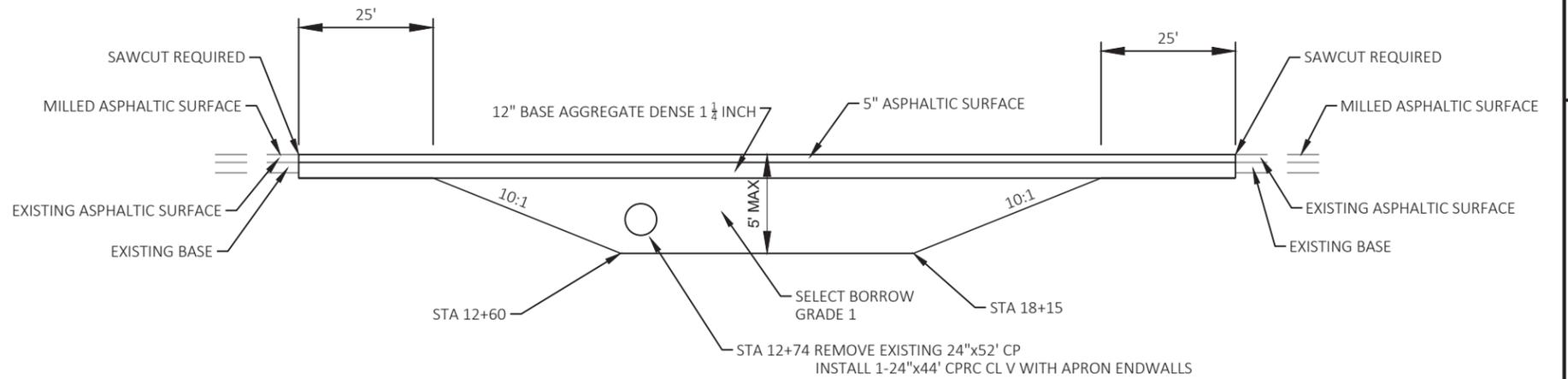
GEOTEXTILE REQUIRED FOR PIPE JOINTS

PIPE DIA. (IN.)	PIPE O.D. (IN.)	GEOTEXTILE/JOINT (S.Y.)
18	23	2.3
21	26.5	2.6
24	30	3.0
27	33.5	3.3
30	37	3.6
36	44	4.3
42	51	5.0
48	58	5.7
54	65	6.4
60	72	7.1
66	79	7.8
72	86	8.5

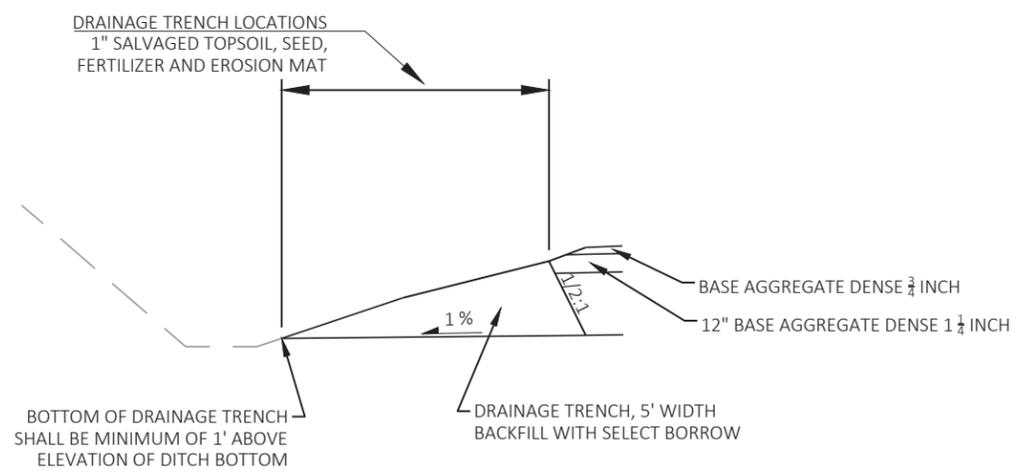


*INCIDENTAL TO ITEM 522.0524 CULVERT PIPE REINFORCED CONCRETE CLASS V 24-INCH

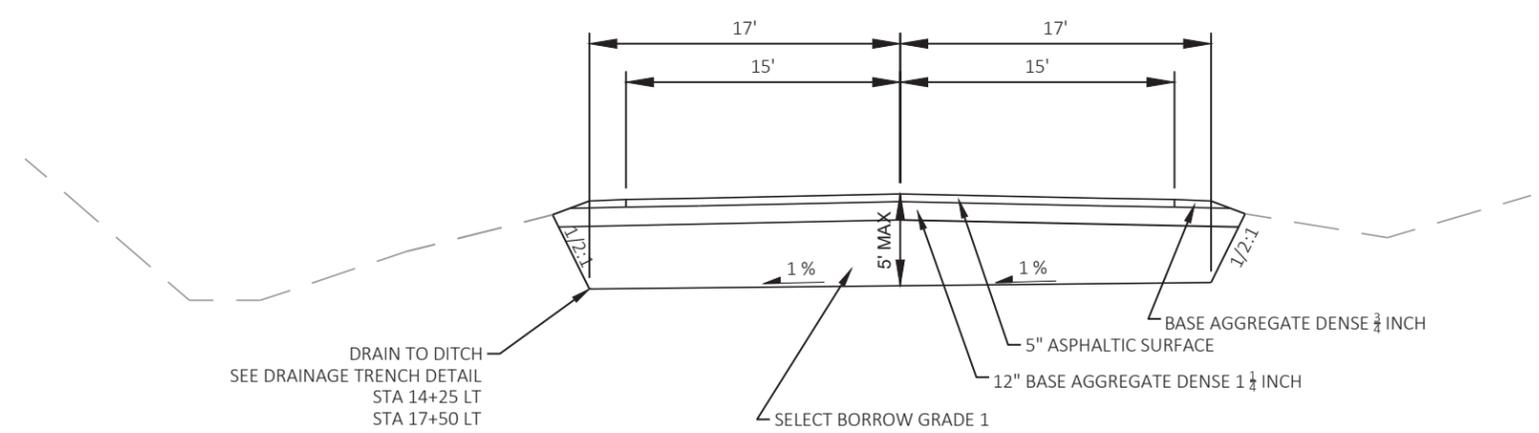
DETAIL FOR WRAPPED PIPE JOINT
WRAP ALL JOINTS
STA 12+74



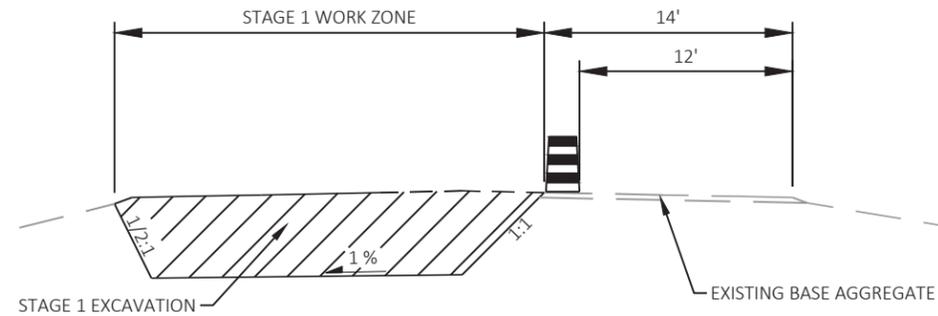
FROST HEAVE REPAIR DETAIL
TRANSITIONS



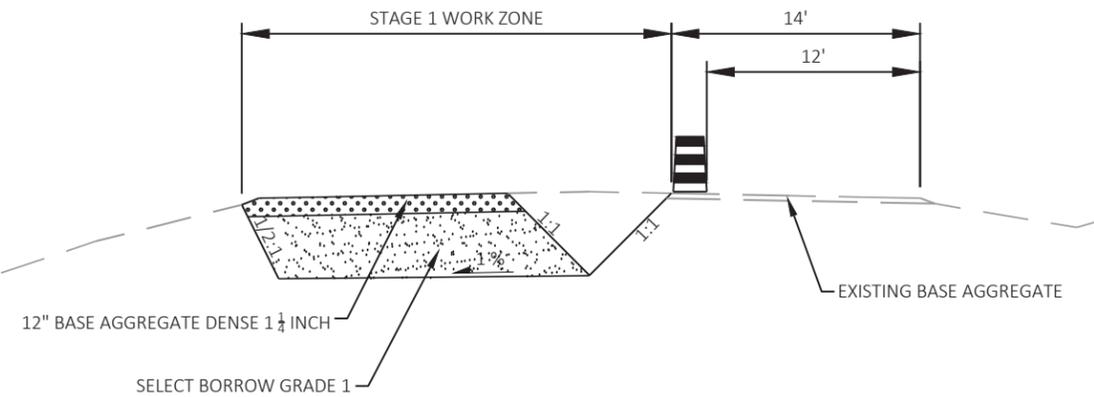
FROST HEAVE REPAIR DRAINAGE TRENCH DETAIL
STA 14+25 LT
STA 17+50 LT



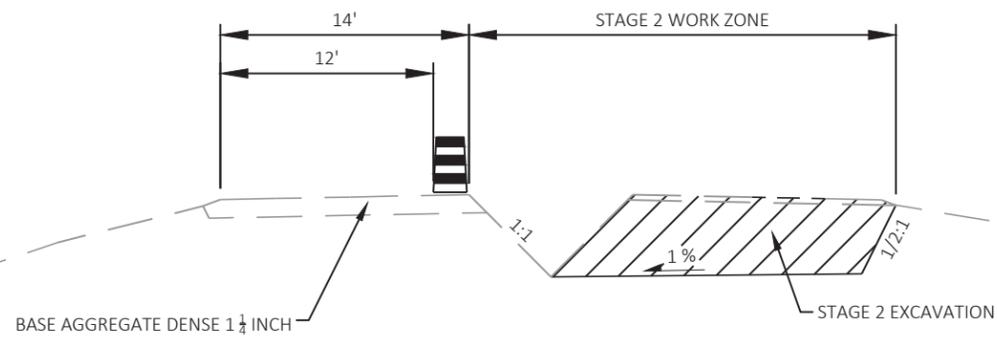
FROST HEAVE REPAIR DETAIL
TYPICAL FINISHED SECTION



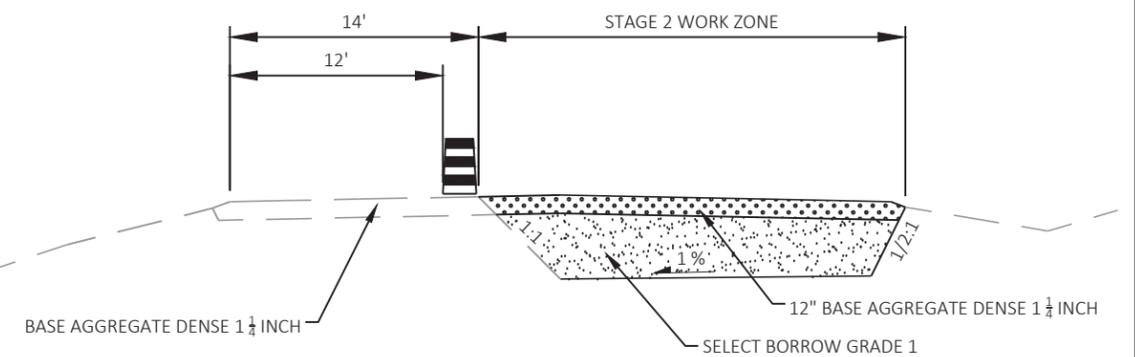
FROST HEAVE REPAIR STAGE 1 EXCAVATION DETAIL



FROST HEAVE REPAIR STAGE 1 BACKFILL DETAIL



FROST HEAVE REPAIR STAGE 2 EXCAVATION DETAIL



FROST HEAVE REPAIR STAGE 2 BACKFILL DETAIL

FROST HEAVE REPAIR STAGING GENERAL NOTES

UTILIZE LANE CLOSURES AND SINGLE LANE TRAFFIC UNDER FLAGGER CONTROL. INSTALL TRAFFIC CONTROL DEVICES IN ACCORDANCE TO STANDARD DETAIL DRAWING "TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION".

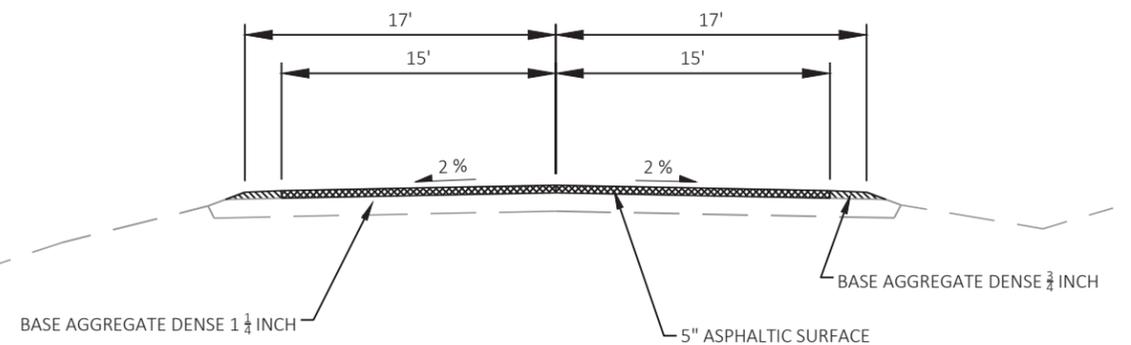
LANE CLOSURES ARE PERMITTED DURING DAYLIGHT HOURS WHILE WORK IS BEING PERFORMED, WITH THE EXCEPTION OF THE HOLIDAY WORK RESTRICTIONS LISTED IN THE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL LIMIT THE LENGTH EACH DAY'S WORK ZONE SO THAT STAGE 1 & 2 EXCAVATION AND BACKFILL ARE COMPLETED ON THE SAME DAY. OPEN STH 70 TO TWO LANES OF TRAFFIC ON THE BASE AGGREGATE DRIVING SURFACE AT THE COMPLETION OF EACH DAY'S WORK.

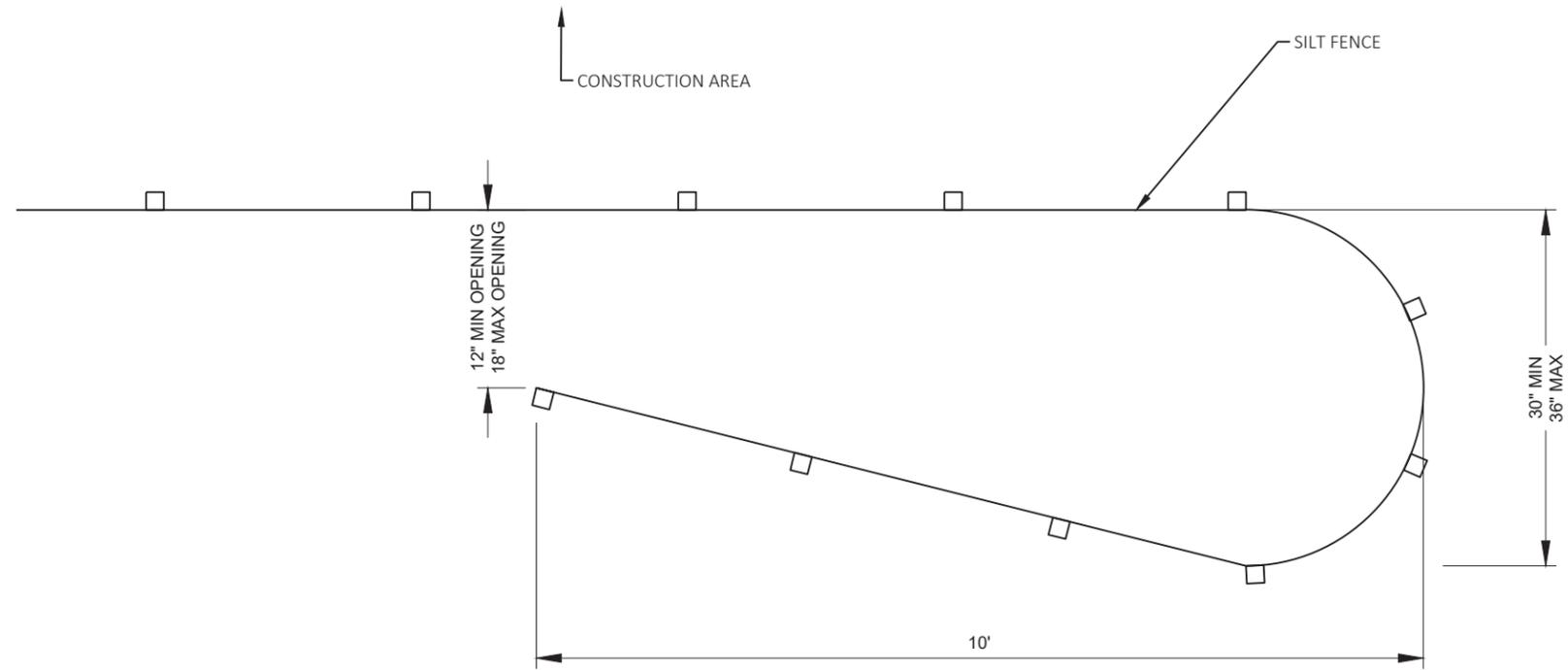
THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES SO THAT TRAFFIC DOES NOT TRAVEL ON BASE AGGREGATE LONGER THAN TEN CALENDAR DAYS OR OVER ANY PERIODS OF TIME COVERED BY THE HOLIDAY WORK RESTRICTIONS.

MAXIMUM WIDTH SIGNING FOR EASTBOUND AND WESTBOUND TRAFFIC IS REQUIRED WHEN CLOSURES LIMIT THE AVAILABLE LANE PLUS CLEAR SHOULDER WIDTH TO LESS THAN 16'. INSTALL TRAFFIC CONTROL SIGNING IN ACCORDANCE TO STANDARD DETAIL DRAWING "ADVANCED WIDTH RESTRICTION SIGNING". WHEN OPERATING UNDER FLAGGED, SINGLE LANE OF TRAFFIC CONDITIONS, MAXIMUM WIDTH SIGNING IS NOT REQUIRED WHEN A MINIMUM OF 16' WIDTH IS AVAILABLE.

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



FROST HEAVE REPAIR STAGE 3 PAVING DETAIL



**AMPHIBIAN AND REPTILE EXCLUSION FENCING
TURN-AROUND DETAIL**

AMPHIBIAN AND REPTILE EXCLUSION FENCING GENERAL NOTES

AMPHIBIAN AND REPTILE EXCLUSION FENCING IS STANDARD SILT FENCE THAT IS INSTALLED ACCORDING TO THIS DETAIL.

FENCING MUST BE AT LEAST 24 INCHES HIGH WITH AT LEAST 4 INCHES TRENCHED INTO THE SOIL AND AT LEAST 20 INCHES EXPOSED ABOVE GROUND. SOILS MUST BE CAREFULLY COMPACTED AGAINST BOTH SIDES OF THE FENCE FOR ITS ENTIRE LENGTH TO PREVENT ANIMALS FROM PASSING UNDER THE FENCE.

FENCING SHOULD BE INSTALLED WITH TURN-AROUNDS AT THE ENDS AND AT ANY ACCESS OPENINGS NEEDED IN THE FENCING, IN ORDER TO REDIRECT ANIMALS AWAY FROM OPENINGS.

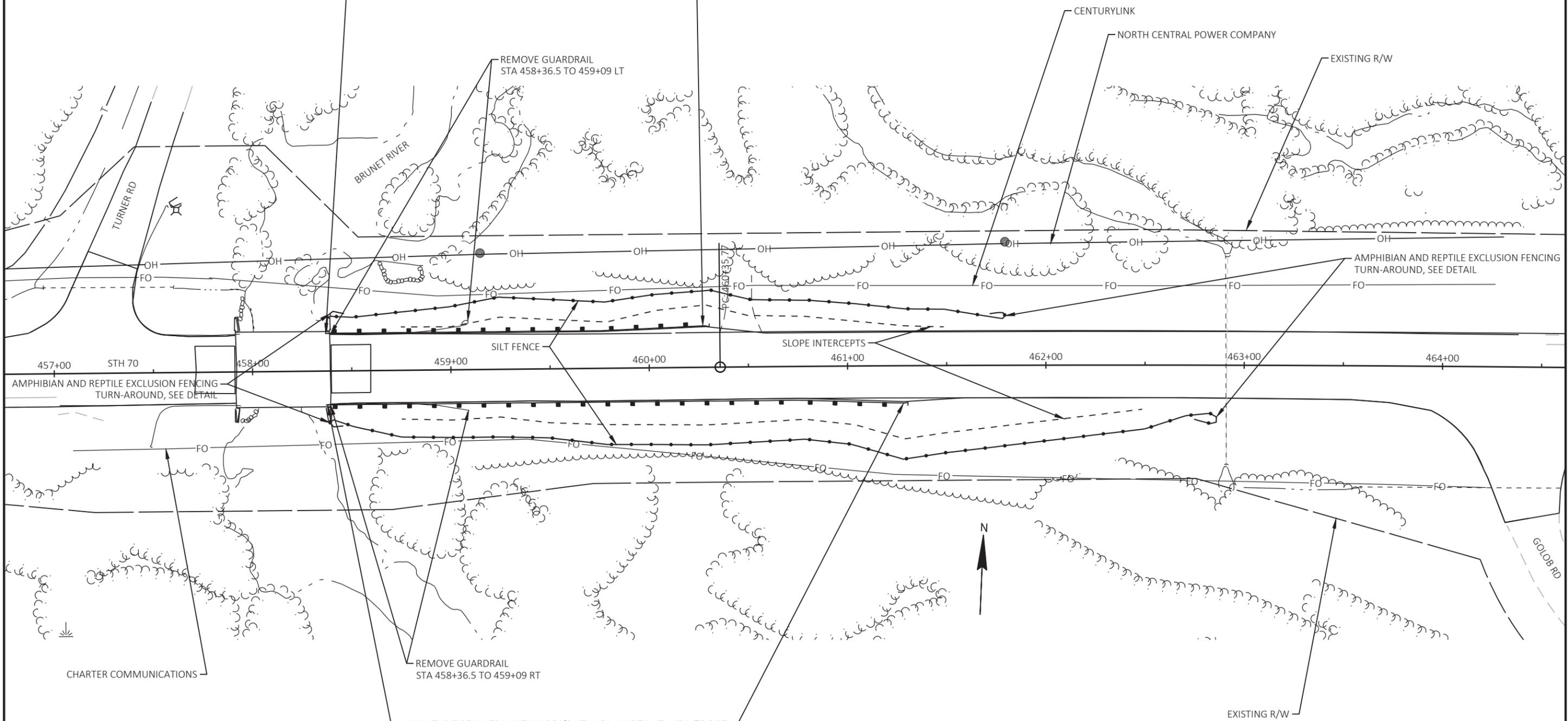
FENCE STAKES FOR THE TURN-AROUND SHOULD BE PLACED ON THE OUTSIDE OF THE TURN-AROUND.

THE NON-CONSTRUCTION SIDE OF THE FENCE SHOULD BE KEPT CLEAR OF TALL VEGETATION THAT COULD ALLOW ANIMALS TO MANEUVER OVER THE FENCING.

MGS THRIE BEAM TRANSITION REQ'D STA 458+36.5 TO STA 458+75.5 LT
 MGS GUARDRAIL 3 REQ'D STA 458+75.5 TO 459+75.5 LT
 MGS GUARDRAIL TERMINAL EAT REQ'D STA 459+75.5 TO STA 460+28.6 LT
 MGS GUARDRAIL TERMINAL: POST 9, STA 459+78.6 LT;
 POST 5, STA 460+03.6 LT;
 POST 1, STA 460+28.6 LT

REMOVE GUARDRAIL
 STA 458+36.5 TO 459+09 LT

MGS THRIE BEAM TRANSITION REQ'D STA 458+36.5 TO STA 458+75.5 RT
 MGS GUARDRAIL 3 REQ'D STA 458+75.5 TO 460+75.5 RT
 MGS GUARDRAIL TERMINAL EAT REQ'D STA 460+75.5 TO STA 461+28.6 RT
 MGS GUARDRAIL TERMINAL: POST 9, STA 460+78.6 RT;
 POST 5, STA 461+03.6 RT;
 POST 1, STA 461+28.6 RT



Estimate Of Quantities

8170-01-75

Line	Item	Item Description	Unit	Total	Qty
0002	203.0100	Removing Small Pipe Culverts	EACH	1.000	1.000
0004	204.0110	Removing Asphaltic Surface	SY	344.000	344.000
0006	204.0115	Removing Asphaltic Surface Butt Joints	SY	646.000	646.000
0008	204.0120	Removing Asphaltic Surface Milling	SY	199,960.000	199,960.000
0010	204.0165	Removing Guardrail	LF	146.000	146.000
0012	205.0100	Excavation Common	CY	3,969.000	3,969.000
0014	208.1100	Select Borrow	CY	3,310.000	3,310.000
0016	211.0100	Prepare Foundation for Asphaltic Paving (project) 01. 8170-01-75	LS	1.000	1.000
0018	213.0100	Finishing Roadway (project) 01. 8170-01-75	EACH	1.000	1.000
0020	305.0110	Base Aggregate Dense 3/4-Inch	TON	4,889.000	4,889.000
0022	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	1,857.000	1,857.000
0024	305.0500	Shaping Shoulders	STA	1,096.000	1,096.000
0026	455.0605	Tack Coat	GAL	23,797.000	23,797.000
0028	460.0105.S	HMA Percent Within Limits (PWL) Test Strip Volumetrics	EACH	1.000	1.000
0030	460.0110.S	HMA Percent Within Limits (PWL) Test Strip Density	EACH	3.000	3.000
0032	460.2005	Incentive Density PWL HMA Pavement	DOL	22,455.000	22,455.000
0034	460.2007	Incentive Density HMA Pavement Longitudinal Joints	DOL	54,780.000	54,780.000
0036	460.2010	Incentive Air Voids HMA Pavement	DOL	30,893.000	30,893.000
0038	460.6645	HMA Pavement 5 MT 58-34 V	TON	30,893.000	30,893.000
0040	460.9000.S	Material Transfer Vehicle	EACH	1.000	1.000
0042	465.0105	Asphaltic Surface	TON	630.000	630.000
0044	465.0110	Asphaltic Surface Patching	TON	350.000	350.000
0046	465.0120	Asphaltic Surface Driveways and Field Entrances	TON	40.000	40.000
0048	465.0425	Asphaltic Shoulder Rumble Strips 2-Lane Rural	LF	41,350.000	41,350.000
0050	465.0475	Asphalt Centerline Rumble Strips 2-Lane Rural	LF	45,300.000	45,300.000
0052	522.0524	Culvert Pipe Reinforced Concrete Class V 24-Inch	LF	44.000	44.000
0054	522.1024	Apron Endwalls for Culvert Pipe Reinforced Concrete 24-Inch	EACH	2.000	2.000
0056	614.0400	Adjusting Steel Plate Beam Guard	LF	325.000	325.000
0058	614.2300	MGS Guardrail 3	LF	300.000	300.000
0060	614.2500	MGS Thrie Beam Transition	LF	78.800	78.800
0062	614.2610	MGS Guardrail Terminal EAT	EACH	2.000	2.000
0064	618.0100	Maintenance And Repair of Haul Roads (project) 01. 8170-01-75	EACH	1.000	1.000
0066	619.1000	Mobilization	EACH	1.000	1.000
0068	624.0100	Water	MGAL	108.000	108.000
0070	625.0500	Salvaged Topsoil	SY	479.000	479.000
0072	627.0200	Mulching	SY	1,600.000	1,600.000
0074	628.1504	Silt Fence	LF	1,350.000	1,350.000
0076	628.1520	Silt Fence Maintenance	LF	1,350.000	1,350.000
0078	628.1905	Mobilizations Erosion Control	EACH	2.000	2.000
0080	628.1910	Mobilizations Emergency Erosion Control	EACH	1.000	1.000
0082	628.2008	Erosion Mat Urban Class I Type B	SY	829.000	829.000
0084	628.7504	Temporary Ditch Checks	LF	35.000	35.000
0086	629.0210	Fertilizer Type B	CWT	0.520	0.520
0088	630.0110	Seeding Mixture No. 10	LB	22.000	22.000
0090	630.0130	Seeding Mixture No. 30	LB	15.000	15.000
0092	630.0200	Seeding Temporary	LB	43.000	43.000
0094	630.0500	Seed Water	MGAL	18.000	18.000
0096	633.5200	Markers Culvert End	EACH	2.000	2.000
0098	642.5201	Field Office Type C	EACH	1.000	1.000

Estimate Of Quantities

8170-01-75

Line	Item	Item Description	Unit	Total	Qty
0100	643.0300	Traffic Control Drums	DAY	323.000	323.000
0102	643.0900	Traffic Control Signs	DAY	5,434.000	5,434.000
0104	643.5000	Traffic Control	EACH	1.000	1.000
0106	646.1020	Marking Line Epoxy 4-Inch	LF	63,815.000	63,815.000
0108	646.1040	Marking Line Grooved Wet Ref Epoxy 4-Inch	LF	104,100.000	104,100.000
0110	646.4520	Marking Line Same Day Epoxy 4-Inch	LF	63,700.000	63,700.000
0112	648.0100	Locating No-Passing Zones	MI	10.370	10.370
0114	649.0105	Temporary Marking Line Paint 4-Inch	LF	114,200.000	114,200.000
0116	650.8000	Construction Staking Resurfacing Reference	LF	54,822.000	54,822.000
0118	650.9910	Construction Staking Supplemental Control (project) 01. 8170-01-75	LS	1.000	1.000
0120	690.0150	Sawing Asphalt	LF	506.000	506.000
0122	740.0440	Incentive IRI Ride	DOL	41,496.000	41,496.000
0124	ASP.1T0A	On-the-Job Training Apprentice at \$5.00/HR	HRS	1,500.000	1,500.000
0126	ASP.1T0G	On-the-Job Training Graduate at \$5.00/HR	HRS	990.000	990.000

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REMOVING SMALL PIPE CULVERTS

CATEGORY	STATION	LOCATION	203.0100 EACH
0020	12+74	MAINLINE	1
PROJECT TOTAL			1

REMOVING ASPHALTIC SURFACE

STATION	LOCATION	204.0110 SY
12+40	CE LT	61
17+12	CE LT	47
94+58	CE LT	54
124+31	PE LT	36
148+49	PE RT	30
207+37	PE LT	26
311+95	CE LT	45
347+42	PE LT	45
PROJECT TOTAL		344

REMOVING ASPHALTIC SURFACE BUTT JOINTS

STATION	TO	STATION	LOCATION	204.0115 SY
11+33	-	11+68	MAINLINE	117
11+68	-	11+70	MAINLINE	7
457+34	-	457+36	MAINLINE	8
457+36	-	457+71	MAINLINE	132
458+60	-	458+95	MAINLINE	134
458+95	-	458+97	MAINLINE	8
559+18	-	559+20	MAINLINE	8
559+20	-	559+55	MAINLINE	132
		CRAWFORD ST		6
		CEMETERY RD		5
		LAKE WINTER RD		7
		CLOVER RD		5
		BURLUM RD		5
		SIMPSON RD		4
		LEE RD		5
		PIKE HAVEN RD		8
		CTH B		6
		BUMBLEBEE RD		6
		CLOVER RD LT		6
		CLOVER RD RT		6
		BROWNS RD		7
		TURNER RD		6
		UNCLE TOMS RD		6
		DAM RD		6
		LUDS LN		6
PROJECT TOTAL				646

REMOVING ASPHALTIC SURFACE MILLING

STATION	TO	STATION	LOCATION	204.0120 SY
11+70	-	314+00	MAINLINE	100,767
314+00	-	457+34	MAINLINE	54,151
458+97	-	550+81	MAINLINE	34,695
550+81	-	552+53	MAINLINE	707
552+53	-	559+18	MAINLINE	2,512
		CRAWFORD ST		297
		CEMETERY RD		270
		OLSON RD LT		288
		OLSON RD RT		159
		LAKE WINTER RD		377
		SUNDLING RD		308
		KADIN RD		127
		LARSON RD		212
		CLOVER RD		190
		BURLUM RD		204
		SIMPSON RD		67
		LEE RD		169
		PIKE HAVEN RD		175
		TICE RD		228
		CTH B		345
		BUMBLEBEE RD		345
		CLOVER RD LT		334
		CLOVER RD RT		337
		BROWNS RD		362
		TURNER RD		167
		GOLOB RD		347
		GOLOB RD		360
		UNCLE TOMS RD		328
		KNOWLES RD		338
		DAM RD		323
		LUDS LN		471
PROJECT TOTAL				199,960

REMOVING GUARDRAIL

STATION	TO	STATION	LOCATION	204.0165 LF
458+36	-	459+09	MAINLINE LT	73
458+36	-	459+09	MAINLINE RT	73
PROJECT TOTAL				146

BASE AGGREGATE DENSE 3/4-INCH

CATEGORY	STATION	TO	STATION	LOCATION	305.0110 TON
0010	11+33	-	314+00	MAINLINE SHOULDER LT & RT	2,334
0010	314+00	-	559+55	MAINLINE SHOULDER LT & RT	1,124
0010	458+39	-	461+49	GUARDRAIL LT	35
0010	458+39	-	462+49	GUARDRAIL RT	165
0010				INTERSECTIONS	600
0010				DRIVEWAYS	500
TOTAL 0010					4,758
0020	12+00	-	18+75	FROST HEAVE REPAIR	131
TOTAL 0020					131
PROJECT TOTAL					4889

BASE AGGREGATE DENSE 1 1/4-INCH

CATEGORY	STATION	TO	STATION	LOCATION	305.0120 TON
0020	12+00	-	18+75	FROST HEAVE REPAIR	1,857
PROJECT TOTAL					1,857

SHAPING SHOULDERS

STATION	TO	STATION	LOCATION	305.0500 STA
11+33	-	559+55	MAINLINE LT	548
11+33	-	559+55	MAINLINE RT	548
PROJECT TOTAL				1,096

NOTE: ALL ITEMS AND QUANTITIES ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED

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DIVISION	FROM / TO STATION	LOCATION	205.0100 COMMON EXCAVATION (1)		AVAILABLE MATERIAL (4)	UNEXPANDED FILL	EXPANDED FILL (5)	WASTE	208.1100 SELECT BORROW	COMMENT
			CUT (2)	EBS EXCAVATION (3)			FACTOR 1.30			
Category 0010										
	458+39 - 461+49	Mainline LT	11	0	11	0	0	0	0	Cut material is the existing base aggregate and can be incorporated into the widened shoulder aggregate
	458+39 - 462+49	Mainline RT	27	0	27	0	0	0	0	
Category 0010 SUBTOTAL			38	0	38	0	0			
Category 0020										
	12+00 - 18+75	Frost Heave Repair	3,931	0	0	2,546	3,310	3,931	3,310	The material from this excavation will not be suitable for use as backfill or embankment widening and should be wasted
Category 0020 SUBTOTAL			3,931	0	0	2,546	3,310		3,310	
GRAND TOTAL			3,969	0	38	2,546	3,310	3,931	3,310	
			TOTAL COMMON EXC = 3,969				TOTAL SELECT BORROW = 3,310			
NOTES:										
(1) COMMON EXCAVATION IS THE SUM OF THE CUT AND EBS EXCAVATION COLUMNS. ITEM NUMBER 205.0100										
(2) EXISTING ASPHALTIC SURFACE PAVEMENT IS INCLUDED IN CUT.										
(3) EBS EXCAVATION TO BE BACKFILLED WITH SELECT BORROW MATERIAL.										
(4) AVAILABLE MATERIAL = CUT - SALVAGED/UNUSUABLE PAVEMENT MATERIAL										
(5) EXPANDED FILL FACTOR = 1.30										

NOTE: ALL ITEMS AND QUANTITIES ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED

HMA PAVEMENT AND TACK COAT

455.0605 TACK COAT GAL
460.6645 HMA PAVEMENT 5 MT 58-34 V TON

CATEGORY	STATION	TO	STATION	LOCATION	TACK COAT GAL	HMA PAVEMENT TON	REMARKS
0010	11+68	-	314+00	MAINLINE	7,056	7,061	LOWER LAYER
0010	11+33	-	314+00	MAINLINE	5,052	8,481	UPPER LAYER
0010	314+00	-	457+36	MAINLINE	3,793	3,796	LOWER LAYER
0010	314+00	-	457+71	MAINLINE	2,719	4,562	UPPER LAYER
0010	458+95	-	550+81	MAINLINE	2,431	2,440	LOWER LAYER
0010	458+60	-	550+81	MAINLINE	1,750	2,926	UPPER LAYER
0010	550+81	-	552+53	MAINLINE	50	50	LOWER LAYER
0010	550+81	-	552+53	MAINLINE	35	59	UPPER LAYER
0010	552+53	-	559+20	MAINLINE	178	178	LOWER LAYER
0010	552+53	-	559+55	MAINLINE	135	223	UPPER LAYER
0010				CRAWFORD ST	16	26	
0010				CEMETERY RD	15	24	
0010				OLSON RD LT	15	24	
0010				OLSON RD RT	8	14	
0010				LAKE WINTER RD	20	33	
0010				SUNDLING RD	15	26	
0010				KADIN RD	6	11	
0010				LARSON RD	11	18	
0010				CLOVER RD	11	17	
0010				BURLUM RD	11	18	
0010				SIMPSON RD	4	7	
0010				LEE RD	9	15	
0010				PIKE HAVEN RD	10	16	
0010				TICE RD	11	19	
0010				CTH B	18	30	
0010				BUMBLEBEE RD	18	30	
0010				CLOVER RD LT	18	29	
0010				CLOVER RD RT	18	29	
0010				BROWNS RD	19	31	
0010				TURNER RD	9	15	
0010				GOLOB RD	17	29	
0010				GOLOB RD	18	30	
0010				UNCLE TOMS RD	17	29	
0010				KNOWLES RD	17	28	
0010				DAM RD	17	28	
0010				LUDS LN	25	41	
0010				WEDGING AND LEVELING		500	
TOTALS 0010					23,572	30,893	
0020	12+00	-	18+75	FROST HEAVE REPAIR	225	0	
TOTALS 0020					225	0	
PROJECT TOTALS					23,797	30,893	

ASPHALTIC SURFACE

465.0105 TON

CATEGORY	STATION	TO	STATION	LOCATION	465.0105 TON
0020	12+00	-	18+75	FROST HEAVE REPAIR	630
PROJECT TOTAL					630

ASPHALTIC SURFACE PATCHING

465.0110 TON

STATION	TO	STATION	LOCATION	465.0110 TON	REMARKS
11+33	-	559+55	MAINLINE	350	PREPARE FOUNDATION FOR ASPHALTIC PAVING
PROJECT TOTAL				350	

ASPHALTIC SURFACE DRIVEWAYS AND FIELD ENTRANCES

465.0120 TON

STATION	LOCATION	465.0120 TON
12+40	CE LT	7
17+12	CE LT	6
94+58	CE LT	6
124+31	PE LT	4
148+49	PE RT	4
207+37	PE LT	3
311+95	CE LT	5
347+42	PE LT	5
PROJECT TOTAL		40

SAWING ASPHALT

690.0150 LF

CATEGORY	STATION	LOCATION	690.0150 LF
0010	12+40	CE LT	40
0010	17+12	CE LT	28
0010	94+58	CE LT	93
0010	124+31	PE LT	61
0010	148+49	PE RT	42
0010	207+37	PE LT	28
0010	311+95	CE LT	47
0010	347+42	PE LT	77
TOTAL 0010			416
0020	12+00	FROST HEAVE REPAIR	30
0020	18+75	FROST HEAVE REPAIR	60
TOTAL 0020			90
PROJECT TOTAL			506

ASPHALTIC SHOULDER RUMBLE STRIPS 2-LANE RURAL

465.0425 LF

STATION	TO	STATION	LOCATION	465.0425 LF	REMARKS
314+00	-	559+55	SHOULDERS LT & RT	41,350	TYPE 1
PROJECT TOTAL				41,350	

ASPHALT CENTERLINE RUMBLE STRIPS 2-LANE RURAL

465.0475 LF

STATION	TO	STATION	LOCATION	465.0475 LF
21+35	-	559+55	MAINLINE CENTERLINE	45,300
PROJECT TOTAL				45,300

NOTE: ALL ITEMS AND QUANTITIES ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED

PWL Mixture Use Table

The following acceptance criteria are applicable for this project:

Location	Station	Mixture Use	Underlying Surface	Bid Item	Tons	Thickness	Quality Management Program to be used for:	
							Mixture Acceptance	Density Acceptance
12' Driving Lanes	11+68 - 314+00	Lower Layer	Milled Existing Asphaltic Surface	5 MT 58-34 V	5644	1.25"	Incentive Air Voids HMA Pavement 460.2010	Incentive Density PWL HMA Pavement 460.2005
12' Driving Lanes	11+33 - 314+00	Upper Layer	5 MT 58-34 V	5 MT 58-34 V	6780	1.50"	Incentive Air Voids HMA Pavement 460.2010	Incentive Density PWL HMA Pavement 460.2005
3' Shoulders	11+68 - 314+00	Lower Layer	Milled Existing Asphaltic Surface	5 MT 58-34 V	1417	1.25"	Incentive Air Voids HMA Pavement 460.2010	Acceptance testing by department; Not eligible for incentive or disincentive
3' Shoulders	11+33 - 314+00	Upper Layer	5 MT 58-34 V	5 MT 58-34 V	1701	1.50"	Incentive Air Voids HMA Pavement 460.2010	Acceptance testing by department; Not eligible for incentive or disincentive
12' Driving Lanes	314+00 - 457+36	Lower Layer	Milled Existing Asphaltic Surface	5 MT 58-34 V	2677	1.25"	Incentive Air Voids HMA Pavement 460.2010	Incentive Density PWL HMA Pavement 460.2005
12' Driving Lanes	314+00 - 457+71	Upper Layer	5 MT 58-34 V	5 MT 58-34 V	3219	1.50"	Incentive Air Voids HMA Pavement 460.2010	Incentive Density PWL HMA Pavement 460.2005
5' Shoulders	314+00 - 457+36	Lower Layer	Milled Existing Asphaltic Surface	5 MT 58-34 V	1119	1.25"	Incentive Air Voids HMA Pavement 460.2010	Acceptance testing by department; Not eligible for incentive or disincentive
5' Shoulders	314+00 - 457+71	Upper Layer	5 MT 58-34 V	5 MT 58-34 V	1343	1.50"	Incentive Air Voids HMA Pavement 460.2010	Acceptance testing by department; Not eligible for incentive or disincentive
12' Driving Lanes	458+95 - 559+20	Lower Layer	Milled Existing Asphaltic Surface	5 MT 58-34 V	1873	1.25"	Incentive Air Voids HMA Pavement 460.2010	Incentive Density PWL HMA Pavement 460.2005
12' Driving Lanes	458+60 - 559+55	Upper Layer	5 MT 58-34 V	5 MT 58-34 V	2262	1.50"	Incentive Air Voids HMA Pavement 460.2010	Incentive Density PWL HMA Pavement 460.2005
5' Shoulders	458+95 - 559+20	Lower Layer	Milled Existing Asphaltic Surface	5 MT 58-34 V	795	1.25"	Incentive Air Voids HMA Pavement 460.2010	Acceptance testing by department; Not eligible for incentive or disincentive
5' Shoulders	458+60 - 559+55	Upper Layer	5 MT 58-34 V	5 MT 58-34 V	946	1.50"	Incentive Air Voids HMA Pavement 460.2010	Acceptance testing by department; Not eligible for incentive or disincentive
Side Roads		Upper Layer	Milled Existing Asphaltic Surface	5 MT 58-34 V	617	1.50"	Incentive Air Voids HMA Pavement 460.2010	Acceptance testing by department; Not eligible for incentive or disincentive
Mainline	11+33 - 559+55	Wedging and leveling	Milled Existing Asphaltic Surface	5 MT 58-34 V	500	Varies	Incentive Air Voids HMA Pavement 460.2010	Acceptance by ordinary compaction

NOTE: ALL ITEMS AND QUANTITIES ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED

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CULVERT PIPE AND MARKERS

CATEGORY	STATION	LOCATION	522.0524 CULVERT PIPE REINFORCED CONCRETE CLASS V 24-INCH LF	522.1024 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 24-INCH EACH	633.5200 MARKERS CULVERT END EACH
0020	12+74	MAINLINE	44	2	2
PROJECT TOTALS			44	2	2

NOTE: JOINT TIES ARE REQUIRED AT THE LAST THREE JOINTS ON THE UPSTREAM AND DOWNSTREAM ENDS OF THE CONCRETE CULVERT.

ADJUSTING STEEL PLATE BEAM GUARD

STATION	TO	STATION	LOCATION	614.0400 LF
129+07	-	132+34	MAINLINE RT	325
PROJECT TOTAL				325

MGS GUARDRAIL AND THRIE BEAM

STATION	TO	STATION	LOCATION	614.2300 MGS GUARDRAIL 3 LF	614.2500 MGS THRIE BEAM TRANSITION LF	614.2610 MGS GUARDRAIL TERMINAL EAT EACH
458+36.5	-	458+75.5	MAINLINE LT		39.4	
458+36.5	-	458+75.5	MAINLINE RT		39.4	
458+75.5	-	459+75.5	MAINLINE LT	100		
458+75.5	-	460+75.5	MAINLINE RT	200		
459+75.5	-	460+28.6	MAINLINE LT			1
460+75.5	-	461+28.6	MAINLINE RT			1
PROJECT TOTALS				300	78.8	2

WATER

CATEGORY	STATION	TO	STATION	LOCATION	624.0100 MGAL
0010	11+33	-	559+55	MAINLINE SHOULDERS LT & RT	48
TOTAL 0010					48
0020	12+00	-	18+75	FROST HEAVE REPAIR	60
TOTAL 0020					60
PROJECT TOTAL					108

SILT FENCE

CATEGORY	STATION	TO	STATION	LOCATION	628.1504 SILT FENCE LF	628.1520 SILT FENCE MAINTENANCE LF	REMARKS
0010	458+50	-	461+60	MAINLINE LT	310	310	GUARDRAIL
0010	458+50	-	462+70	MAINLINE RT	420	420	GUARDRAIL
0010			458+40	MAINLINE LT	30	30	AMPHIBIAN AND REPTILE EXCLUSION FENCING TURN-AROUND
0010			458+40	MAINLINE RT	30	30	AMPHIBIAN AND REPTILE EXCLUSION FENCING TURN-AROUND
0010			461+70	MAINLINE LT	30	30	AMPHIBIAN AND REPTILE EXCLUSION FENCING TURN-AROUND
0010			462+80	MAINLINE RT	30	30	AMPHIBIAN AND REPTILE EXCLUSION FENCING TURN-AROUND
TOTAL 0010					850	850	
0020				WASTE AREA	500	500	
TOTAL 0020					500	500	
PROJECT TOTALS					1350	1350	

TEMPORARY DITCH CHECKS

CATEGORY	STATION	LOCATION	628.7504 LF
0020	12+85	MAINLINE LT	15
0020	14+35	MAINLINE LT	10
0020	17+60	MAINLINE LT	10
PROJECT TOTAL			35

CONSTRUCTION STAKING RESURFACING REFERENCE

STATION	TO	STATION	LOCATION	650.8000 LF
11+33	-	559+55	MAINLINE	54,822
PROJECT TOTAL				54,822

NOTE: ALL ITEMS AND QUANTITIES ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED

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NOTE: ALL ITEMS AND QUANTITIES ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED

SALVAGED TOPSOIL, MULCHING, EROSION MAT, FERTILIZER, SEED AND SEED WATER

CATEGORY	STATION	TO	STATION	LOCATION	625.0500 SALVAGED TOPSOIL SY	627.0200 MULCHING SY	628.2008 EROSION MAT URBAN CLASS I TYPE B SY	629.0210 FERTILIZER TYPE B CWT	630.0110 SEEDING MIXTURE NO. 10 LB	630.0130 SEEDING MIXTURE NO. 30 LB	630.0200 SEEDING TEMPORARY LB	630.0500 SEED WATER MGAL
0010	458+75	-	461+50	GUARDRAIL LT	82		181	0.11		3.00		4.00
0010	458+75	-	462+50	GUARDRAIL RT	360		588	0.37		11.00		13.00
TOTAL 0010					442	0	769	0.48	0	14.00	0	17.00
0020			12+74	CULVERT LT	10		15	0.01		0.25		0.25
0020			12+74	CULVERT RT	10		15	0.01		0.25		0.25
0020			14+25	FROST HEAVE DRAINAGE TRENCH	8		13	0.01		0.25		0.25
0020			17+50	FROST HEAVE DRAINAGE TRENCH	9		17	0.01		0.25		0.25
0020				WASTE AREA		1,600			22		43	
TOTAL 0020					37	1,600	60	0.04	22	1.00	43	1.00
PROJECT TOTALS					479	1600	829	0.52	22	15.00	43	18.00

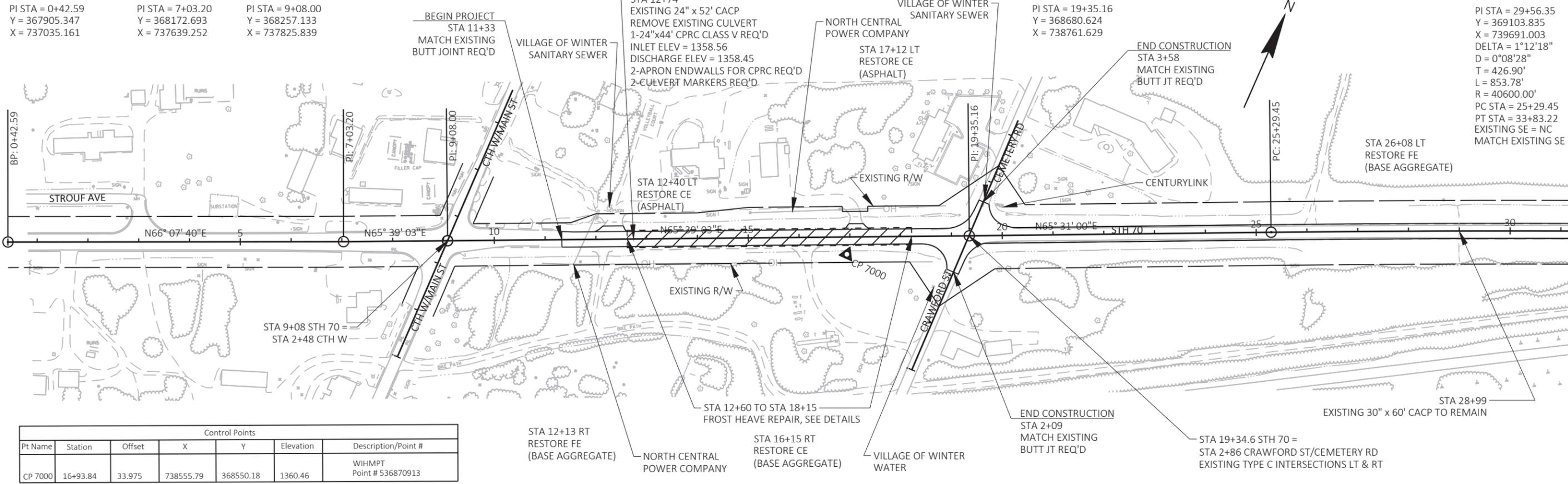
TRAFFIC CONTROL SIGNS

<u>TRAFFIC CONTROL DRUMS</u>								<u>TRAFFIC CONTROL SIGNS</u>								
CATEGORY	STATION	TO	STATION	NUMBER OF DRUMS REQUIRED	NUMBER OF DAYS REQUIRED	643.0300 DAY	REMARKS	CATEGORY	SIGN CODE	SIGN MESSAGE	SIZE	NUMBER OF SIGNS REQUIRED	NUMBER OF DAYS REQUIRED	643.0900 DAY		
0010	458+40	-	461+50	9	3	27	GUARDRAIL LT	0010	W20-1A	ROAD WORK AHEAD	48"x48"	28	93	2,604		
0010	458+40	-	462+50	10	3	30	GUARDRAIL RT	0010	W20-1C	ROAD WORK 1000 FT	48"x48"	2	93	186		
TOTAL 0010						57		0010	W20-1D	ROAD WORK 500 FT	48"x48"	2	93	186		
0020	12+00	-	18+75	38	7	266	FROST HEAVE REPAIR	0010	G20-2A	END ROAD WORK	48"x24"	2	93	186		
TOTAL 0020						266		0010	G20-1	ROAD WORK NEXT 10 MILES	60"x48"	2	93	186		
PROJECT TOTAL						323		0010	WO8-9	LOW SHOULDER	48"x48"	22	25	550		
													TOTAL 0010	5,218		
<u>PAVEMENT MARKING</u>								0020	W8-7	LOOSE GRAVEL	48"x48"	2	9	18		
STATION	TO	STATION	LOCATION	646.1020 MARKING LINE EPOXY 4-INCH LF	646.1040 MARKING LINE GROOVED WET REF EPOXY 4-INCH LF	646.4520 MARKING LINE SAME DAY EPOXY 4-INCH LF	649.0105 TEMPORARY MARKING LINE PAINT 4-INCH LF	REMARKS	0020	WO8-1	BUMP	48"x48"	4	9	36	
11+33	-	559+55	MAINLINE			63,700		CENTERLINE HMA UPPER LAYER	0020	WO16-7L	LEFT DOWN ARROW	30"x18"	4	9	36	
11+33	-	559+55	MAINLINE	63,700				CENTERLINE AFTER RUMBLE STRIP INSTALLATION	0020	M3-2	EAST	24"x12"	2	7	14	
11+33	-	559+55	MAINLINE				57,100	CENTERLINE MILLED SURFACE	0020	M1-6	70	24"x24"	4	7	28	
11+33	-	559+55	MAINLINE				57,100	CENTERLINE HMA LOWER LAYER	0020	W12-52	MAX XX WIDTH	48"x48"	8	7	56	
11+33	-	559+55	MAINLINE		104,100			EDGE LINE	0020	WO57-52	XX MILES AHEAD	36"x24"	2	7	14	
			CTH B	80				CENTERLINE	0020	M3-4	WEST	24"x12"	2	7	14	
			CTH B	35				EDGE LINE							TOTAL 0020	216
PROJECT TOTALS				63,815	104,100	63,700	114,200								PROJECT TOTAL	5434

LOCATING NO-PASSING ZONES

STATION	TO	STATION	LOCATION	648.0100 MI
11+33	-	559+55	MAINLINE	10.37
PROJECT TOTAL				10.37

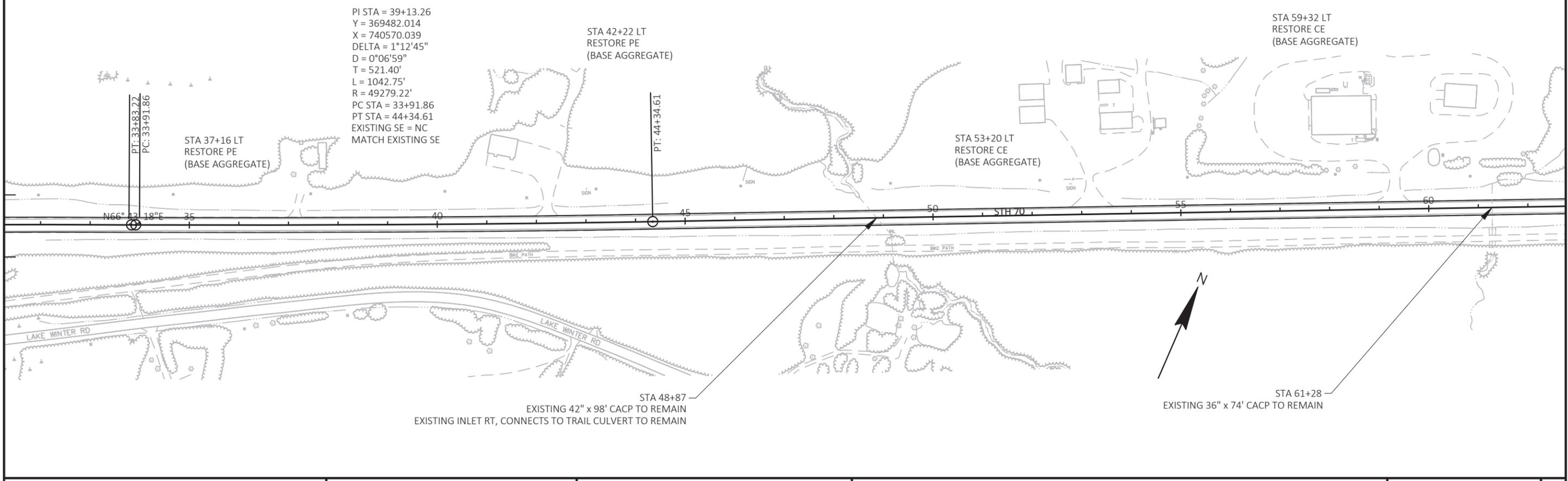
NOTE: IN AREAS OF CENTERLINE RUMBLE STRIPS, ONE APPLICATION OF MARKING LINE SAME DAY EPOXY IS INCLUDED FOR USE PRIOR TO INSTALLING RUMBLE STRIPS AND ONE APPLICATION OF MARKING LIKE EPOXY IS INCLUDED FOR USE AFTER INSTALLING RUMBLE STRIPS. MARKING LINE EPOXY SHALL BE APPLIED WITHIN 24 HOURS OF INSTALLATION OF CENTERLINE RUMBLE STRIPS.

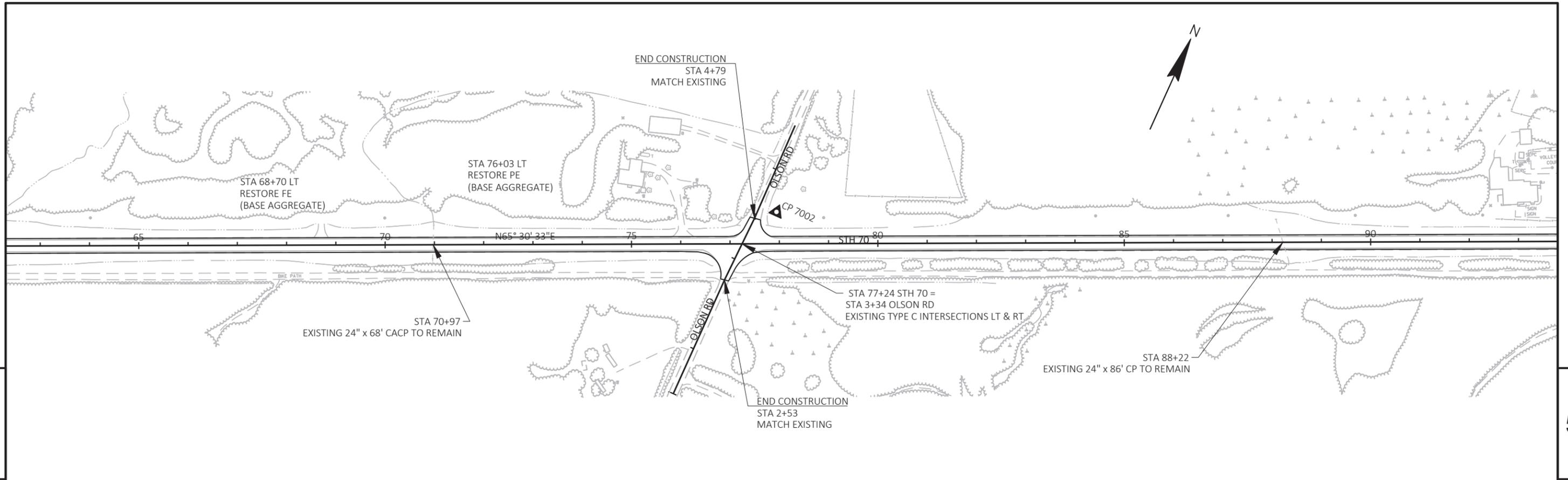


Control Points						
Pt Name	Station	Offset	X	Y	Elevation	Description/Point #
CP 7000	16+93.84	33.975	738555.79	368550.18	1360.46	WIHMPT Point # 536870913

5

5



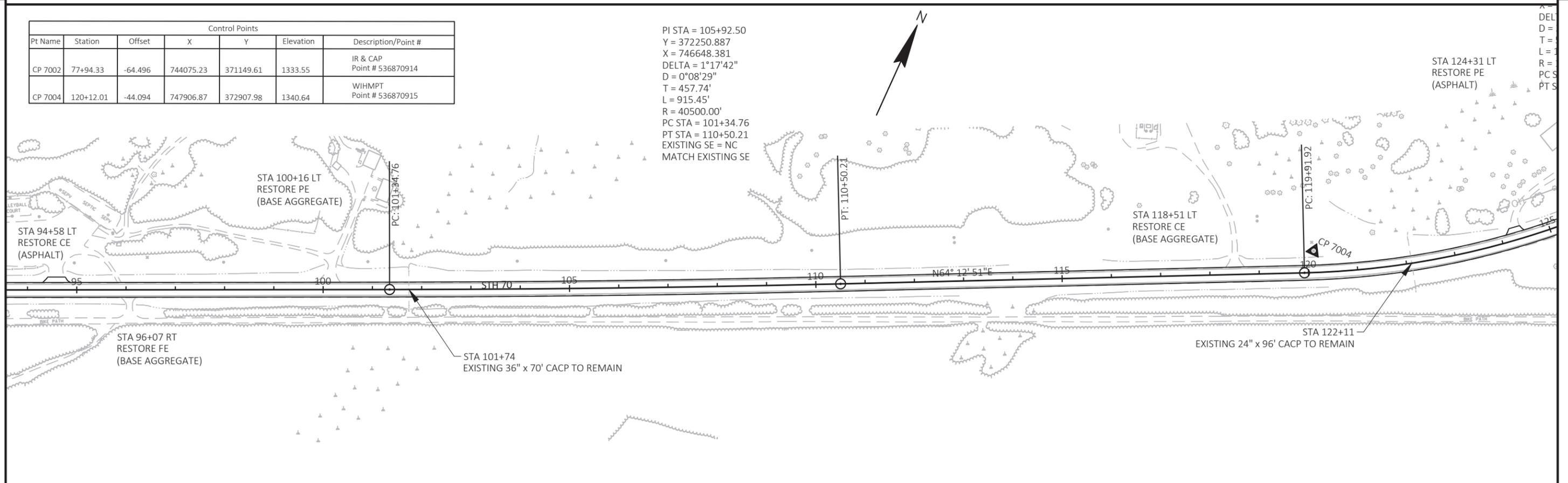


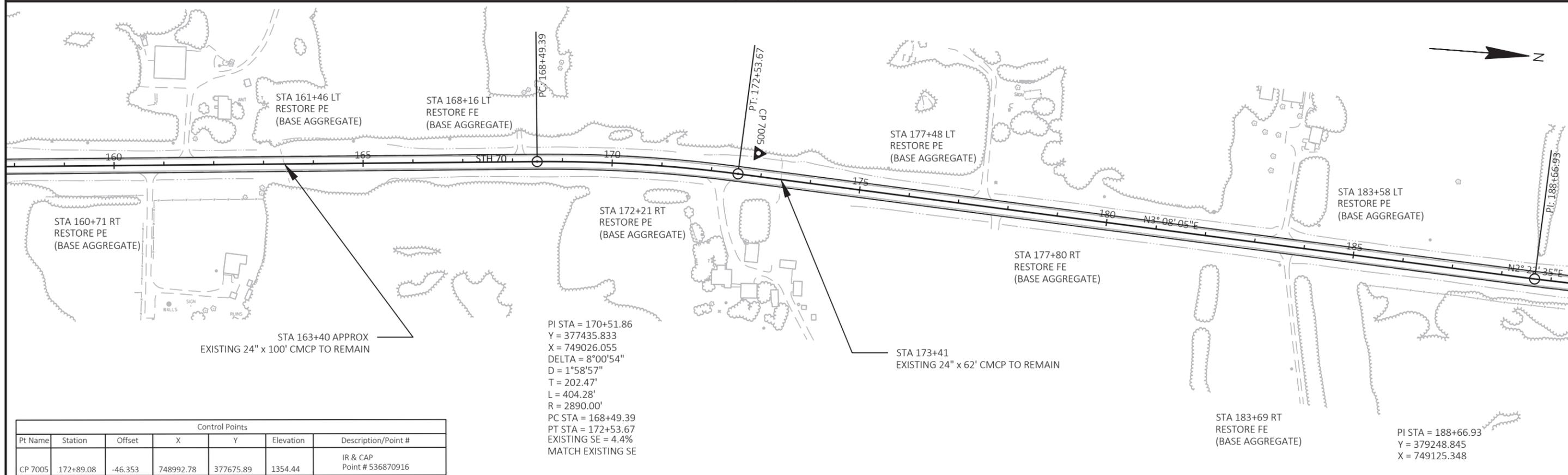
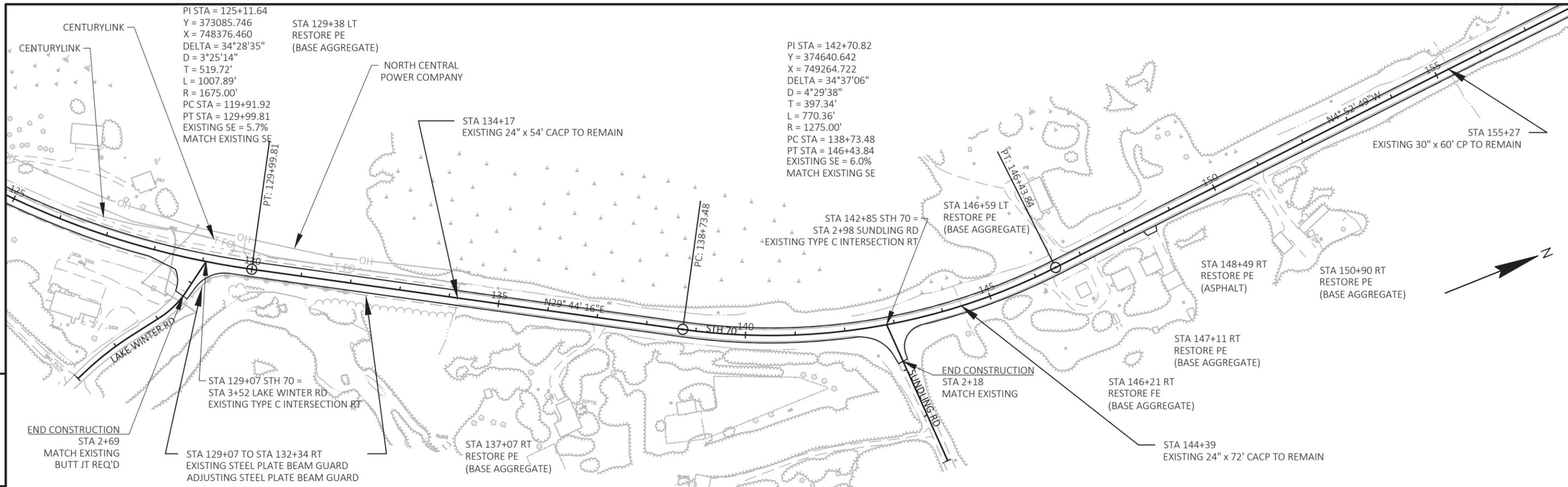
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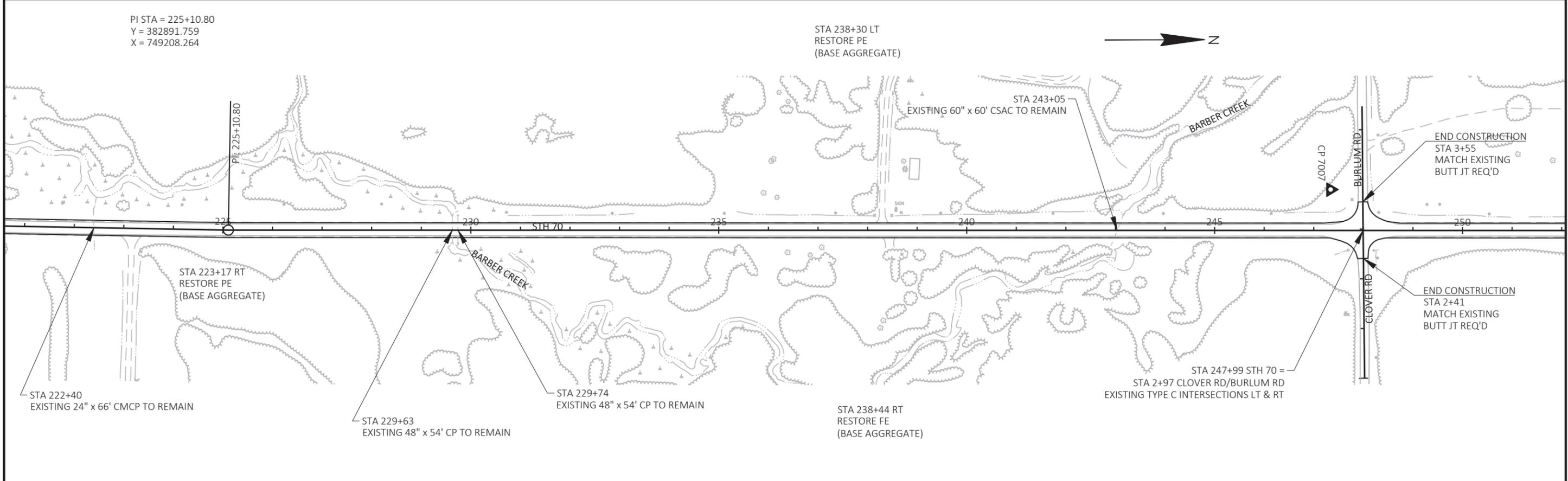
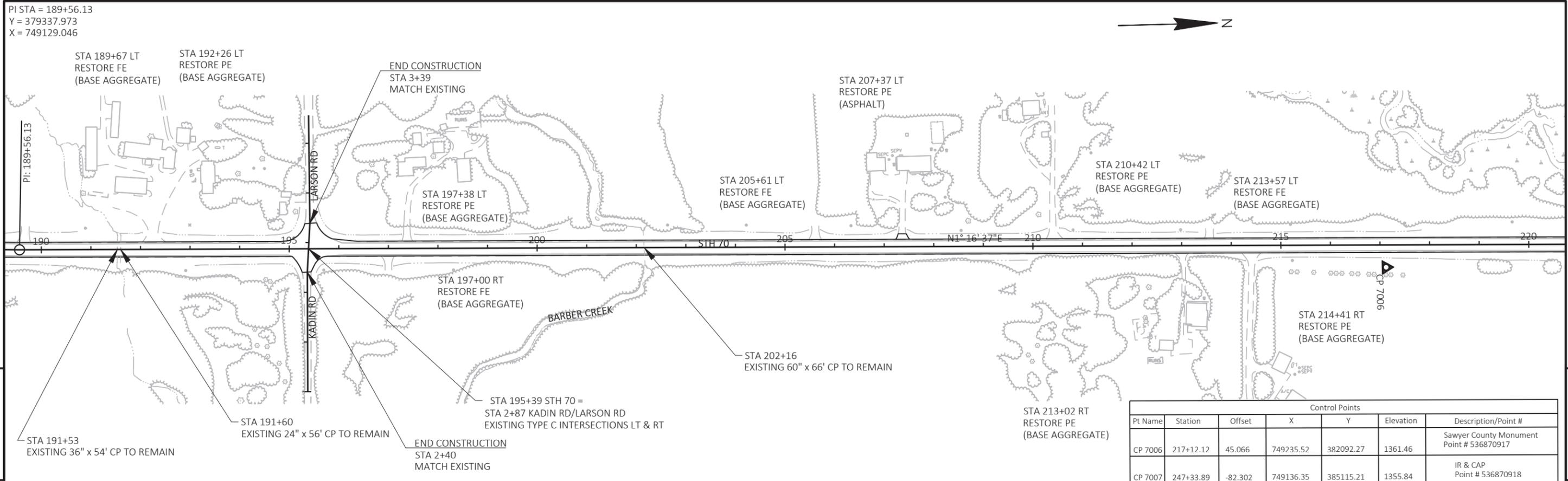
Control Points						
Pt Name	Station	Offset	X	Y	Elevation	Description/Point #
CP 7002	77+94.33	-64.496	744075.23	371149.61	1333.55	IR & CAP Point # 536870914
CP 7004	120+12.01	-44.094	747906.87	372907.98	1340.64	WIHMPT Point # 536870915

PI STA = 105+92.50
 Y = 372250.887
 X = 746648.381
 DELTA = 1°17'42"
 D = 0°08'29"
 T = 457.74'
 L = 915.45'
 R = 40500.00'
 PC STA = 101+34.76
 PT STA = 110+50.21
 EXISTING SE = NC
 MATCH EXISTING SE

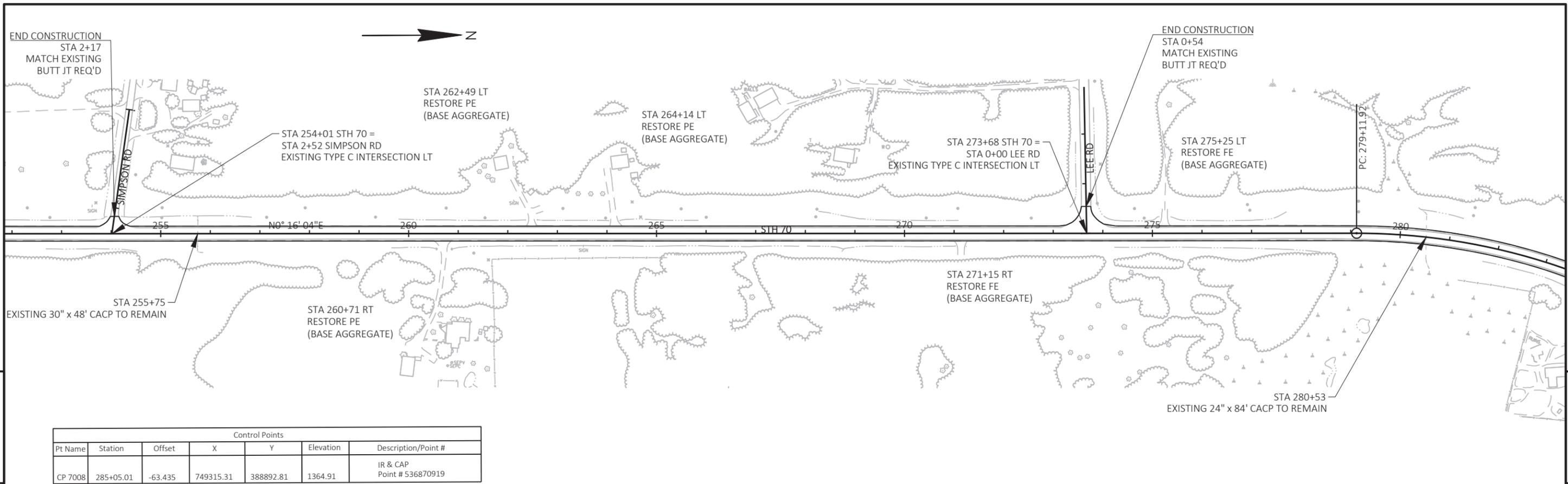




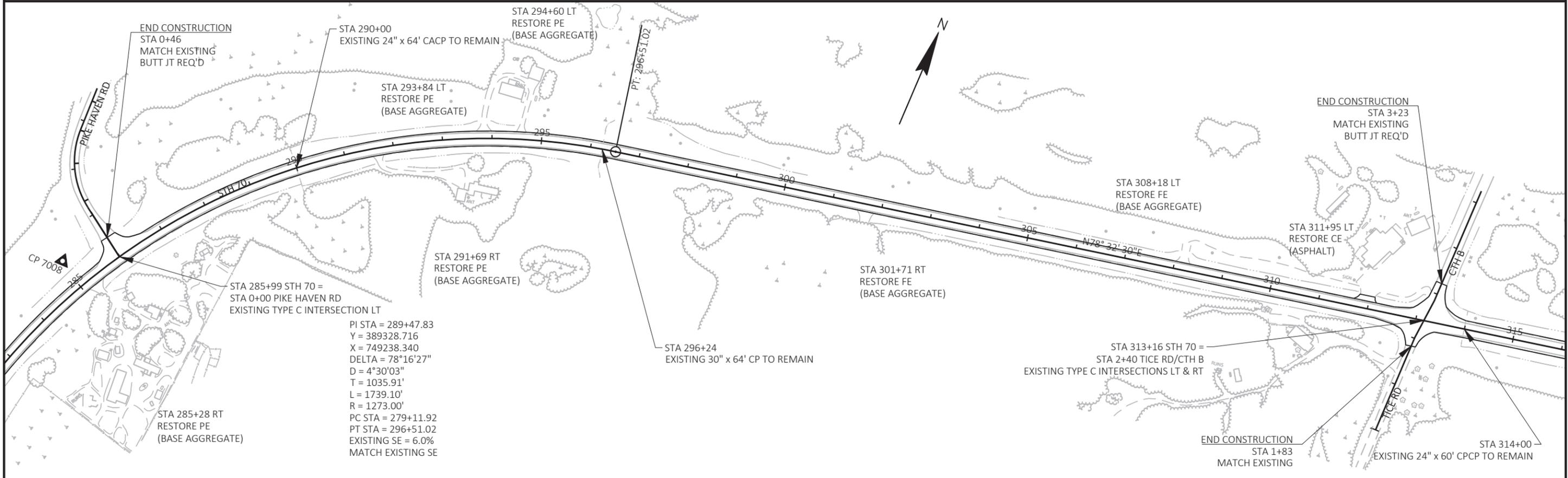
Control Points						
Pt Name	Station	Offset	X	Y	Elevation	Description/Point #
CP 7005	172+89.08	-46.353	748992.78	377675.89	1354.44	IR & CAP Point # 536870916



PROJECT NO: 8170-01-75	HWY: STH 70	COUNTY: SAWYER	PLAN	SHEET	E
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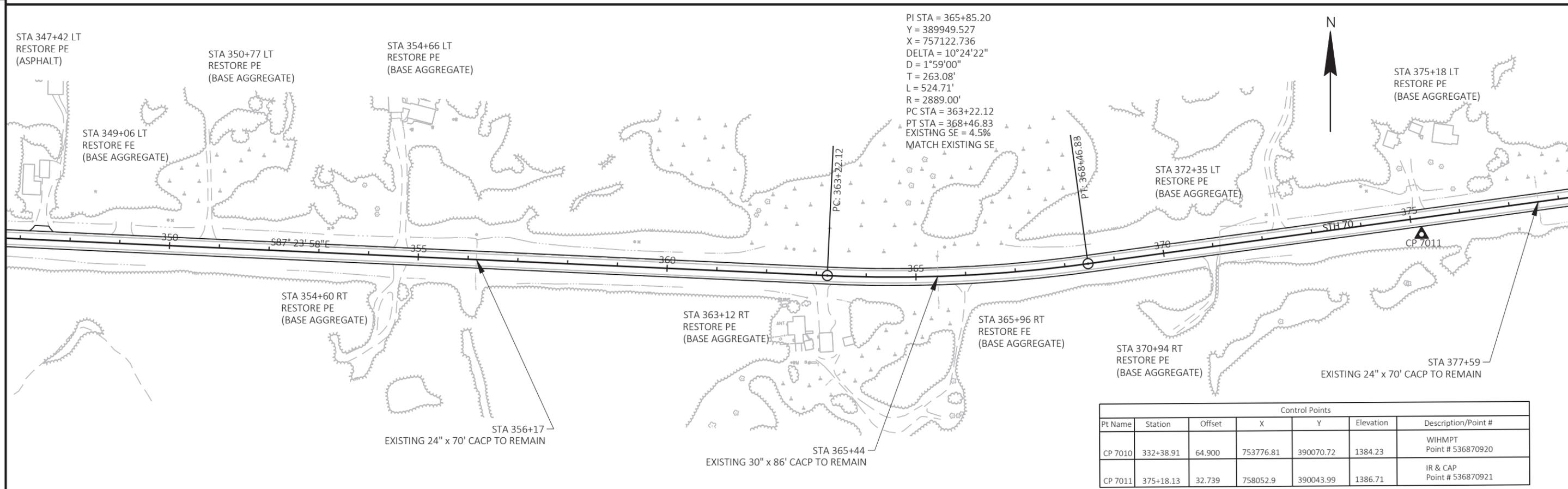
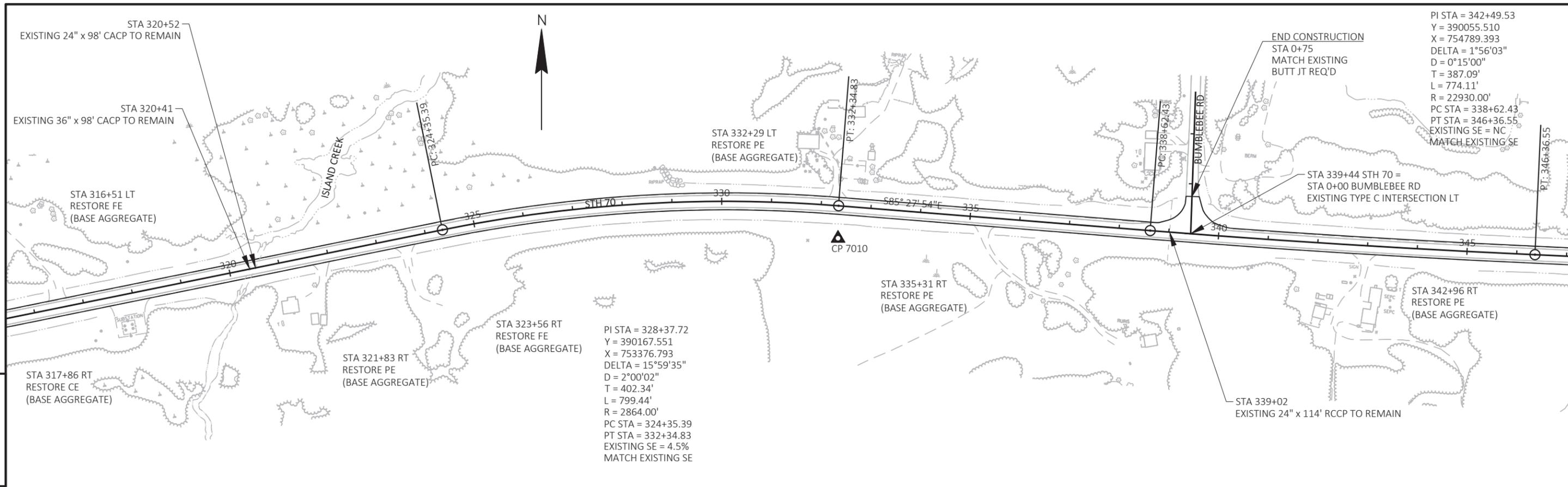


Control Points						
Pt Name	Station	Offset	X	Y	Elevation	Description/Point #
CP 7008	285+05.01	-63.435	749315.31	388892.81	1364.91	IR & CAP Point # 536870919



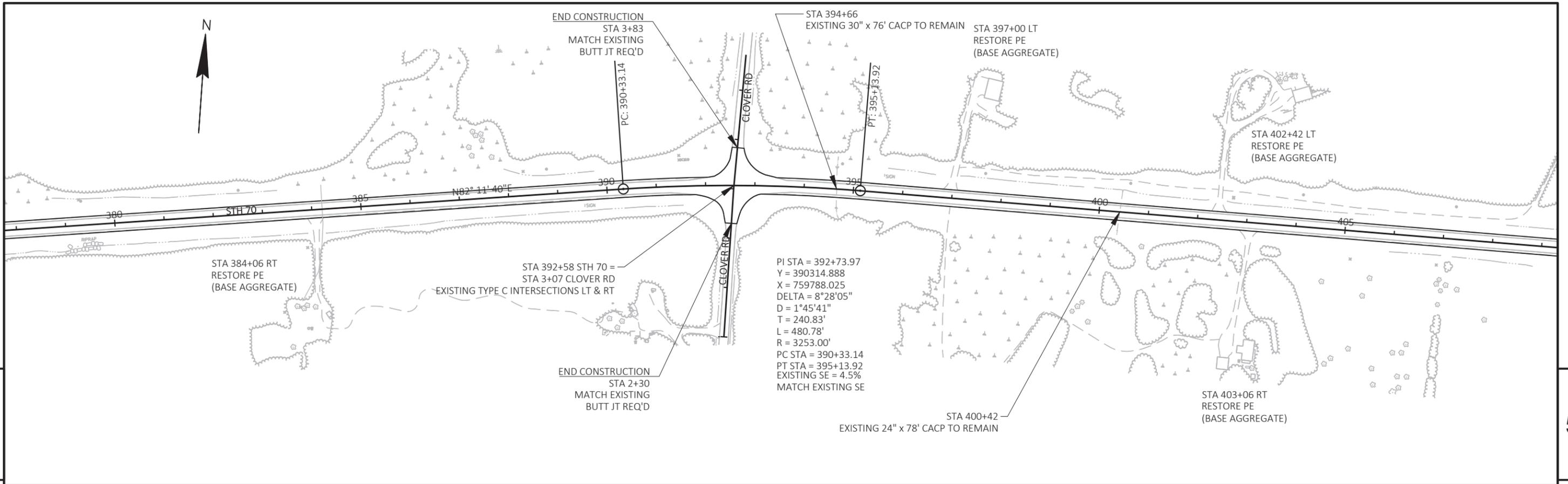
PI STA = 289+47.83
 Y = 389328.716
 X = 749238.340
 DELTA = 78° 16' 27"
 D = 4° 30' 03"
 T = 1035.91'
 L = 1739.10'
 R = 1273.00'
 PC STA = 279+11.92
 PT STA = 296+51.02
 EXISTING SE = 6.0%
 MATCH EXISTING SE

PROJECT NO: 8170-01-75	HWY: STH 70	COUNTY: SAWYER	PLAN	SHEET	E
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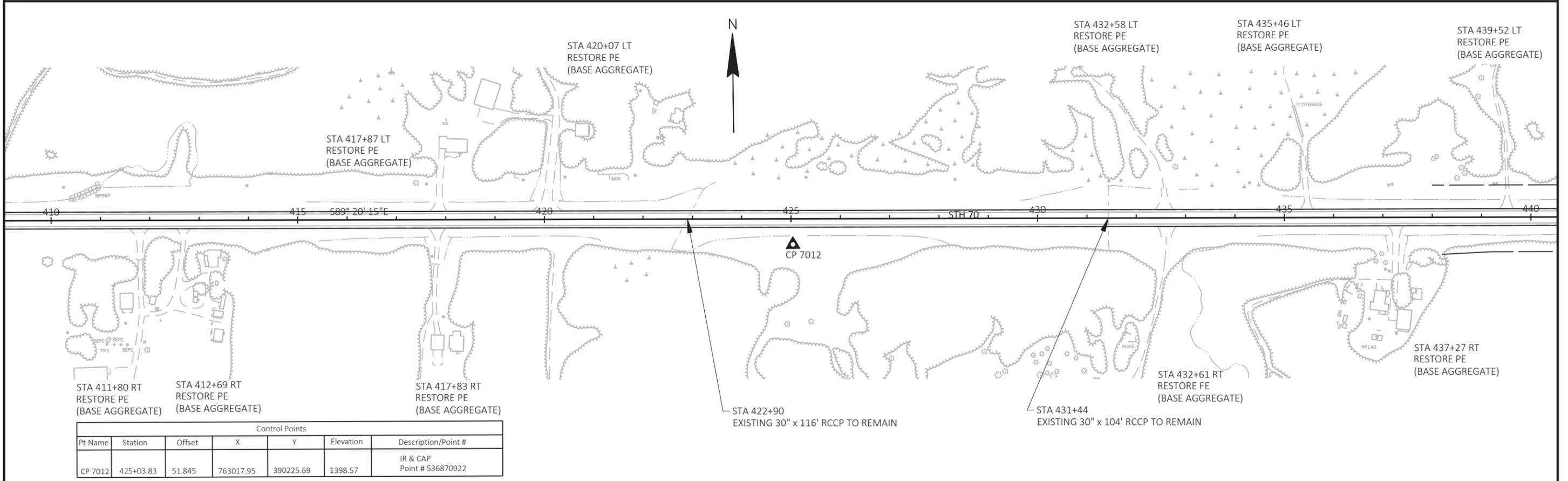
Control Points						
Pt Name	Station	Offset	X	Y	Elevation	Description/Point #
CP 7010	332+38.91	64.900	753776.81	390070.72	1384.23	WIHMPT Point # 536870920
CP 7011	375+18.13	32.739	758052.9	390043.99	1386.71	IR & CAP Point # 536870921

PROJECT NO: 8170-01-75 HWY: STH 70 COUNTY: SAWYER PLAN SHEET E



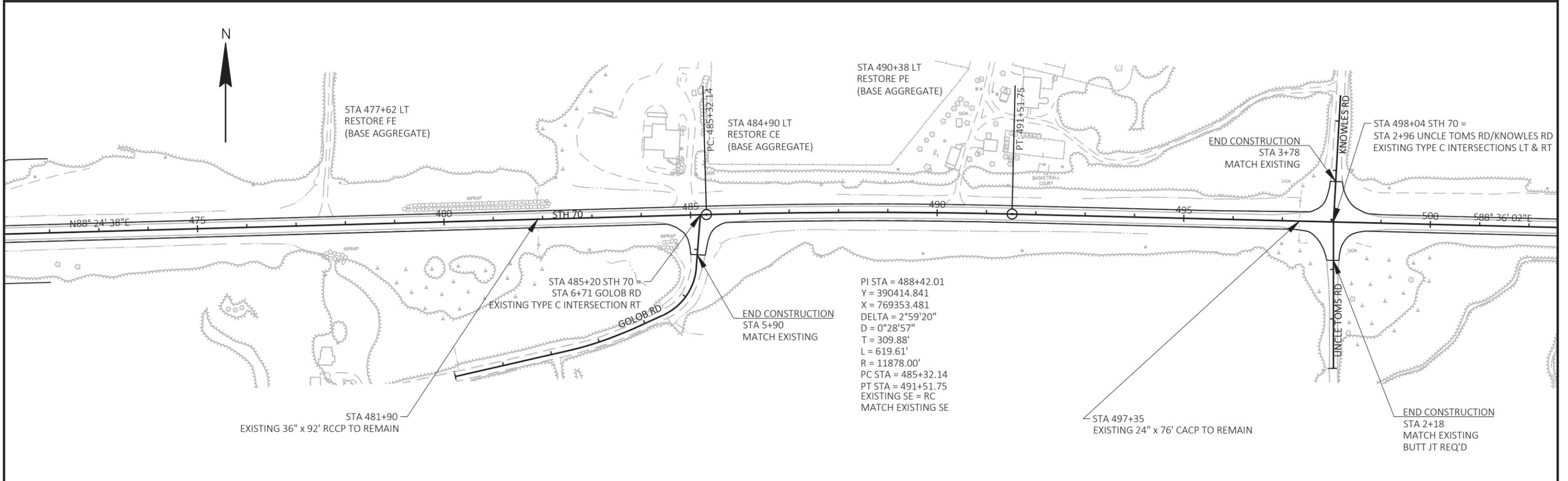
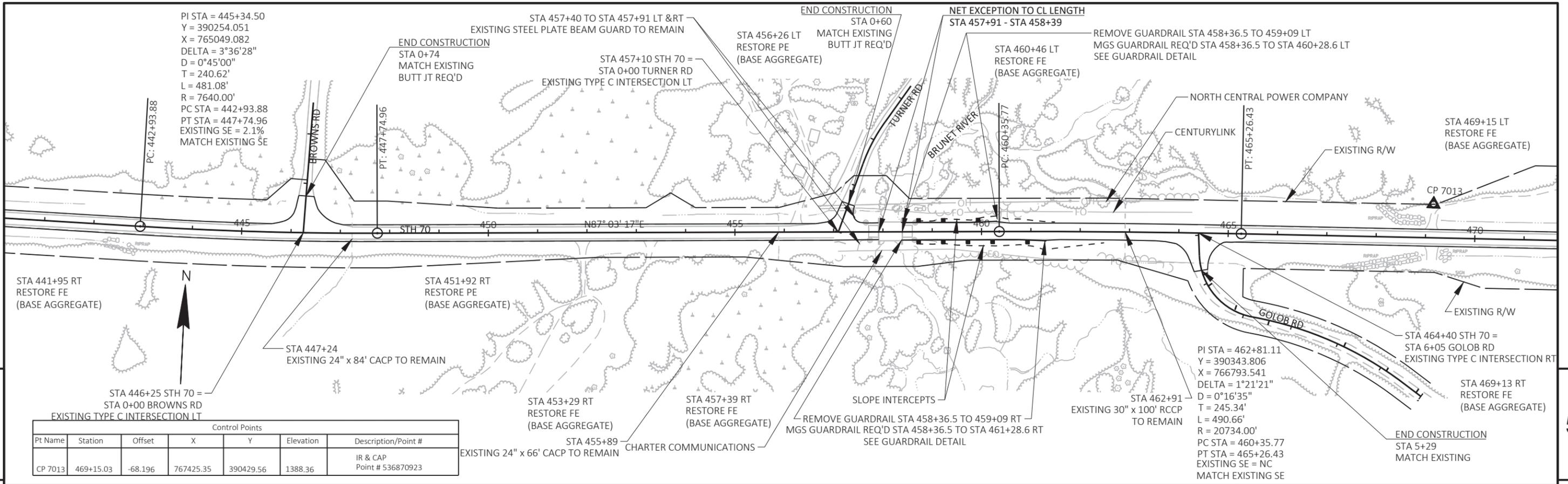
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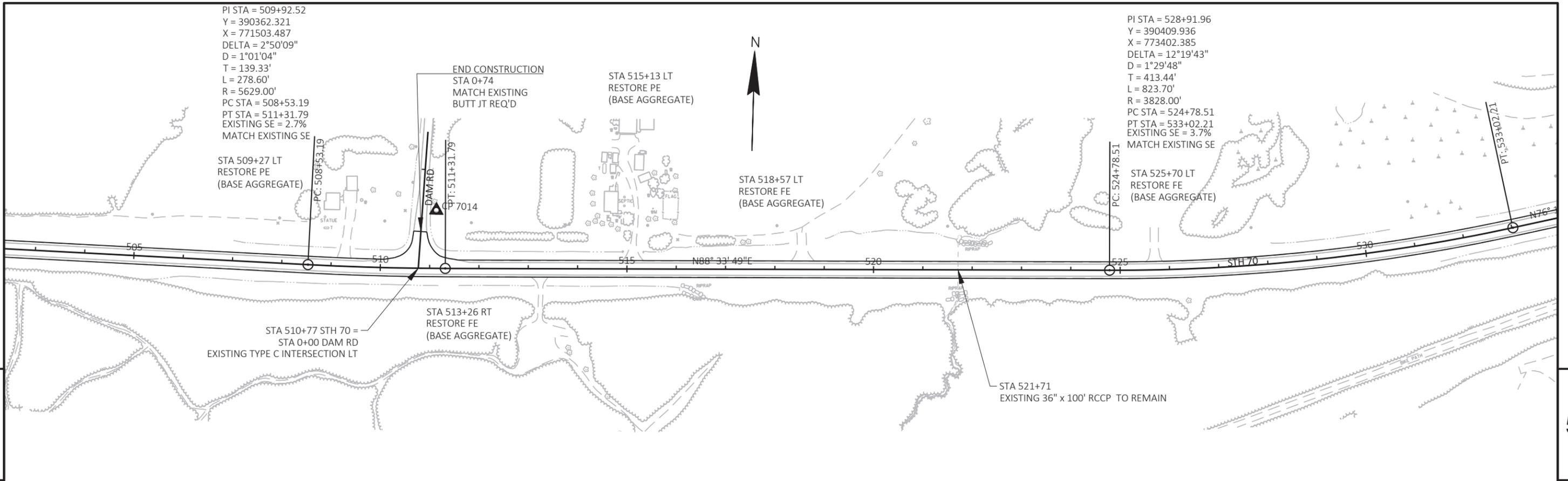
5



Control Points						
Pt Name	Station	Offset	X	Y	Elevation	Description/Point #
CP 7012	425+03.83	51.845	763017.95	390225.69	1398.57	IR & CAP Point # 536870922

PROJECT NO: 8170-01-75 HWY: STH 70 COUNTY: SAWYER PLAN SHEET E





PI STA = 509+92.52
 Y = 390362.321
 X = 771503.487
 DELTA = 2°50'09"
 D = 1°01'04"
 T = 139.33'
 L = 278.60'
 R = 5629.00'
 PC STA = 508+53.19
 PT STA = 511+31.79
 EXISTING SE = 2.7%
 MATCH EXISTING SE

PI STA = 528+91.96
 Y = 390409.936
 X = 773402.385
 DELTA = 12°19'43"
 D = 1°29'48"
 T = 413.44'
 L = 823.70'
 R = 3828.00'
 PC STA = 524+78.51
 PT STA = 533+02.21
 EXISTING SE = 3.7%
 MATCH EXISTING SE

STA 510+77 STH 70 =
 STA 0+00 DAM RD
 EXISTING TYPE C INTERSECTION LT

STA 513+26 RT
 RESTORE FE
 (BASE AGGREGATE)

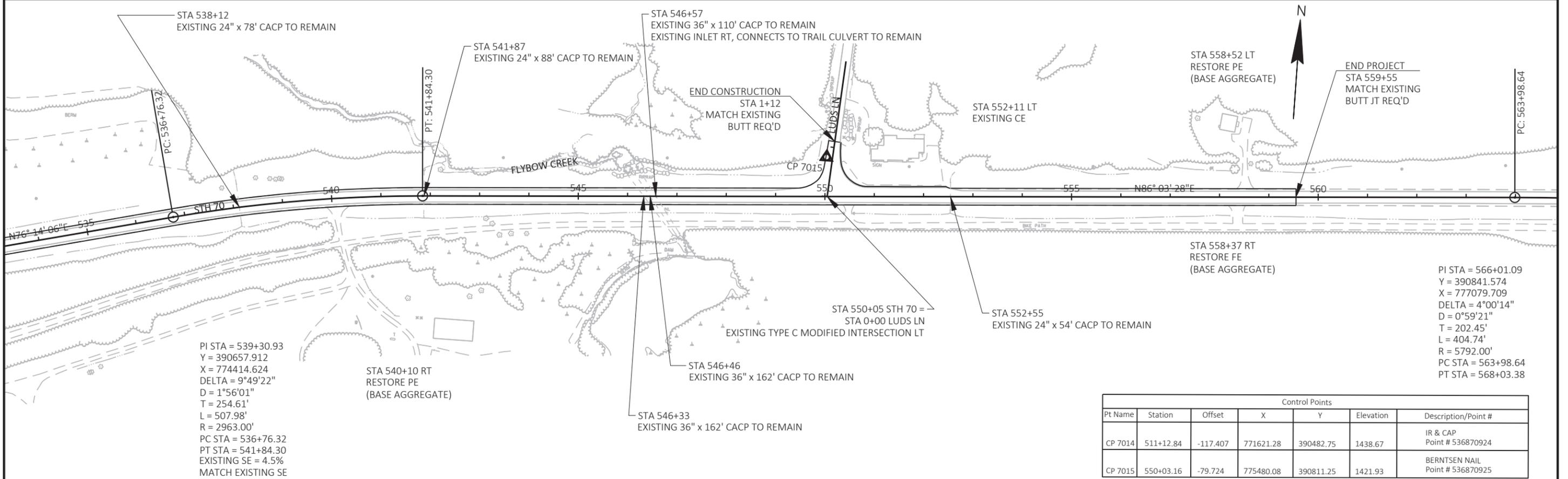
STA 518+57 LT
 RESTORE FE
 (BASE AGGREGATE)

STA 525+70 LT
 RESTORE FE
 (BASE AGGREGATE)

STA 521+71
 EXISTING 36" x 100' RCCP TO REMAIN

5

5



STA 538+12
 EXISTING 24" x 78' CACP TO REMAIN

STA 541+87
 EXISTING 24" x 88' CACP TO REMAIN

STA 546+57
 EXISTING 36" x 110' CACP TO REMAIN
 EXISTING INLET RT, CONNECTS TO TRAIL CULVERT TO REMAIN

END CONSTRUCTION
 STA 1+12
 MATCH EXISTING
 BUTT REQ'D

STA 552+11 LT
 EXISTING CE

STA 558+52 LT
 RESTORE PE
 (BASE AGGREGATE)

END PROJECT
 STA 559+55
 MATCH EXISTING
 BUTT JT REQ'D

PI STA = 539+30.93
 Y = 390657.912
 X = 774414.624
 DELTA = 9°49'22"
 D = 1°56'01"
 T = 254.61'
 L = 507.98'
 R = 2963.00'
 PC STA = 536+76.32
 PT STA = 541+84.30
 EXISTING SE = 4.5%
 MATCH EXISTING SE

PI STA = 566+01.09
 Y = 390841.574
 X = 777079.709
 DELTA = 4°00'14"
 D = 0°59'21"
 T = 202.45'
 L = 404.74'
 R = 5792.00'
 PC STA = 563+98.64
 PT STA = 568+03.38

STA 540+10 RT
 RESTORE PE
 (BASE AGGREGATE)

STA 546+33
 EXISTING 36" x 162' CACP TO REMAIN

STA 546+46
 EXISTING 36" x 162' CACP TO REMAIN

STA 550+05 STH 70 =
 STA 0+00 LUDS LN
 EXISTING TYPE C MODIFIED INTERSECTION LT

STA 552+55
 EXISTING 24" x 54' CACP TO REMAIN

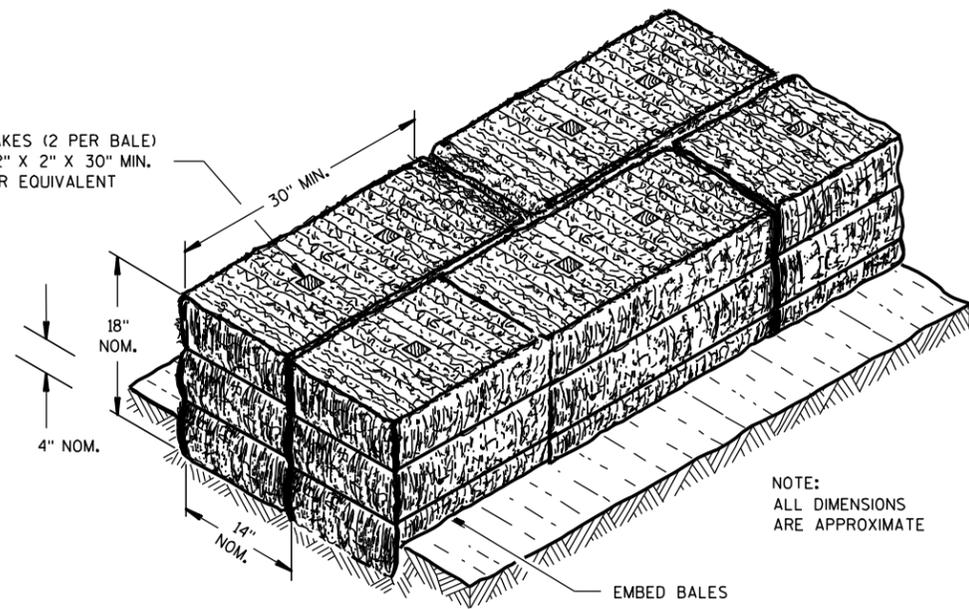
STA 558+37 RT
 RESTORE FE
 (BASE AGGREGATE)

Control Points						
Pt Name	Station	Offset	X	Y	Elevation	Description/Point #
CP 7014	511+12.84	-117.407	771621.28	390482.75	1438.67	IR & CAP Point # 536870924
CP 7015	550+03.16	-79.724	775480.08	390811.25	1421.93	BERNTSEN NAIL Point # 536870925

Standard Detail Drawing List

08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
08F04-07	JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL
13A10-02A	2-LANE RURAL SHOULDER RUMBLE STRIP, MILLING
13A10-02C	2-LANE RURAL SHOULDER RUMBLE STRIP, MILLING
13A11-03A	2-LANE RURAL CENTER LINE RUMBLE STRIP, MILLING
13A11-03B	2-LANE RURAL CENTER LINE RUMBLE STRIP, MILLING
13C19-03	HMA LONGITUDINAL JOINTS
14B15-11A	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-11B	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-11C	STEEL PLATE BEAM GUARD, CLASS "A", INSTALLATION & ELEMENTS
14B24-09A	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B24-09B	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B24-09C	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B27-01A	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B27-01B	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B27-01C	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B42-07A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-07B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-07C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-07D	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 THREE BEAM TRANSITION (MGS)
14B45-05B	MIDWEST GUARDRAIL SYSTEM THREE BEAM TRANSITION (MGS)
14B45-05C	MIDWEST GUARDRAIL SYSTEM THREE BEAM TRANSITION (MGS)
14B45-05G	MIDWEST GUARDRAIL SYSTEM THREE BEAM TRANSITION (MGS)
15A03-02A	FLEXIBLE MARKER POST FOR CULVERT END
15A03-02B	FLEXIBLE MARKER POST FOR CULVERT END
15C02-08F	ADVANCED WIDTH RESTRICTION SIGNING
15C04-05	TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45 M.P.H. OR GREATER TWO-WAY UNDIVIDED ROAD OPEN TO TRAFFIC
15C08-20A	LONGITUDINAL MARKING (MAINLINE)
15C11-08B	CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS
15C12-07	TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION
15C19-06A	MOVING PAVEMENT MARKING OPERATION TWO-LANE TWO-WAY ROADWAY
15C35-04A	PAVEMENT MARKING (INTERSECTIONS)
15D28-04	TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY
15D39-02	TRAFFIC CONTROL, DROP-OFF SIGNING
15D44-02	TRAFFIC CONTROL, SIGNING ON ROADWAYS WITH MILLED SURFACES
15D45-03	TRAFFIC CONTROL, SIGNING ON ROADWAYS WITH LOOSE GRAVEL
15D48-01	TRAFFIC CONTROL, LANE SHIFT IN FLAGGING OPERATION
15D51-01	TRAFFIC CONTROL, MOBILE OPERATIONS ON AN UNDIVIDED ROADWAY

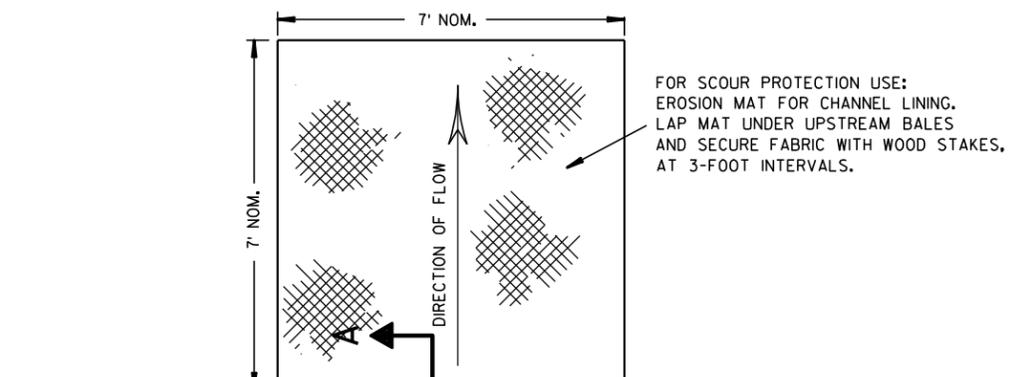
WOOD STAKES (2 PER BALE)
NOMINAL 2" X 2" X 30" MIN.
LENGTH OR EQUIVALENT



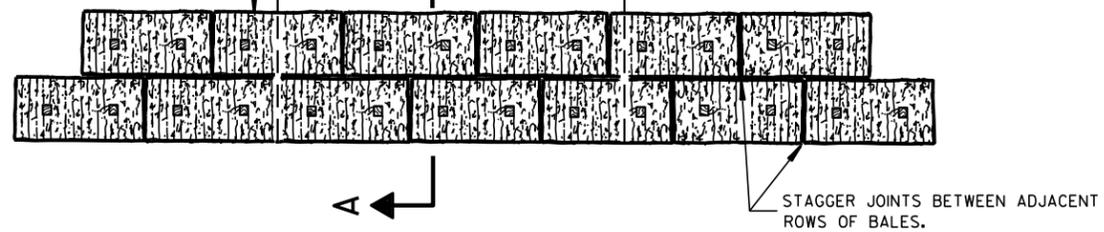
NOTE:
ALL DIMENSIONS
ARE APPROXIMATE

EMBED BALES

SECTION A-A



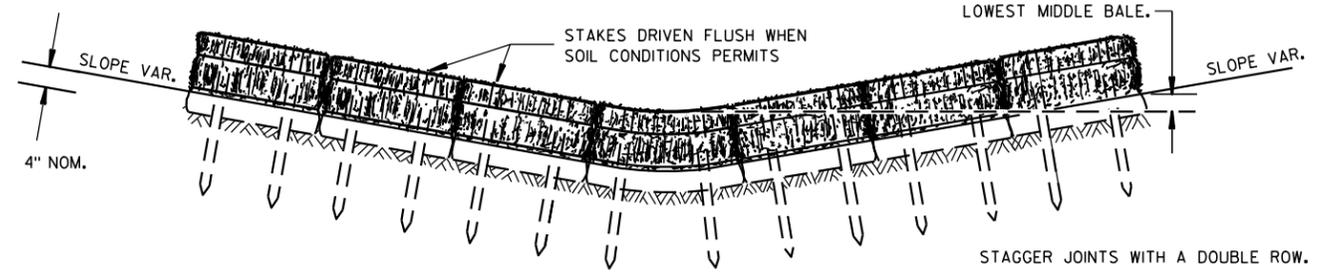
FOR SCOUR PROTECTION USE:
EROSION MAT FOR CHANNEL LINING.
LAP MAT UNDER UPSTREAM BALES
AND SECURE FABRIC WITH WOOD STAKES,
AT 3-FOOT INTERVALS.



STAGGER JOINTS BETWEEN ADJACENT
ROWS OF BALES.

PLAN VIEW

BOTTOM ELEVATION OF END BALE SHALL
BE EQUAL TO OR GREATER THAN TOP OF
LOWEST MIDDLE BALE.



FRONT ELEVATION

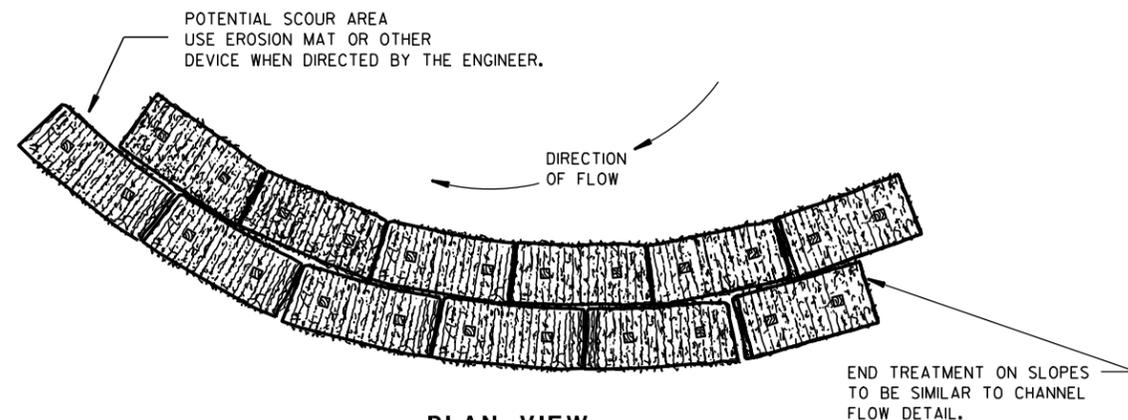
STAGGER JOINTS WITH A DOUBLE ROW.

TEMPORARY DITCH CHECK USING EROSION BALES ①

GENERAL NOTES

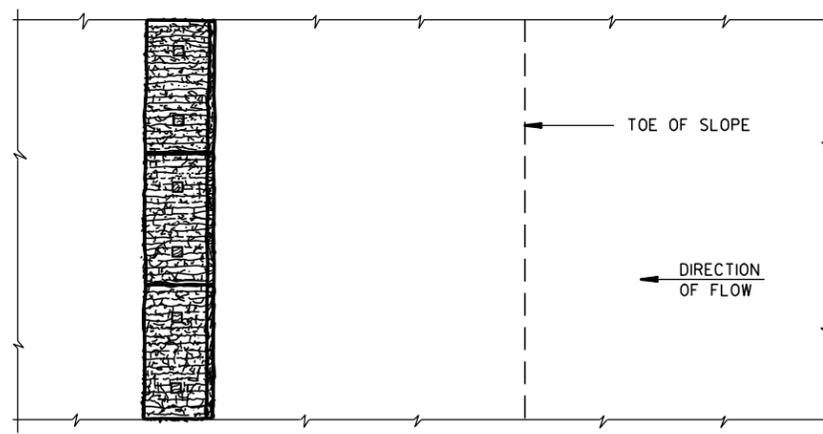
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- 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.

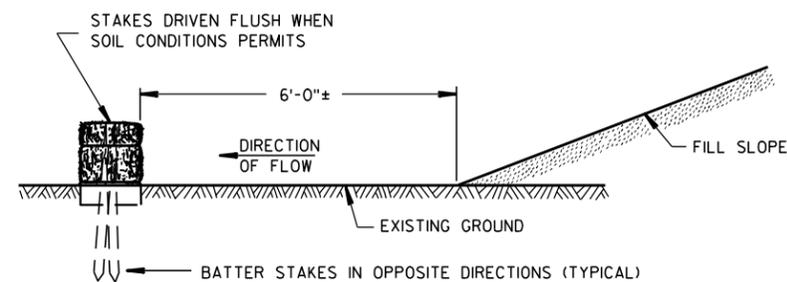


PLAN VIEW

WHEN ALTERING THE DIRECTION OF FLOW



PLAN VIEW



FRONT ELEVATION

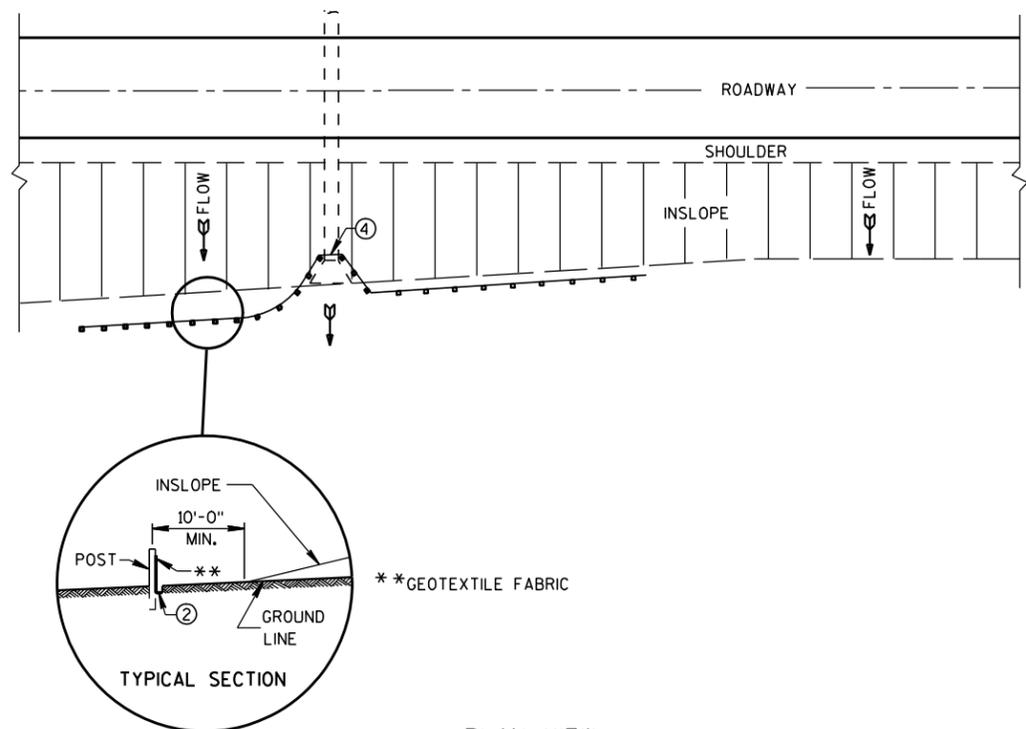
WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE

EROSION BALES FOR SHEET FLOW

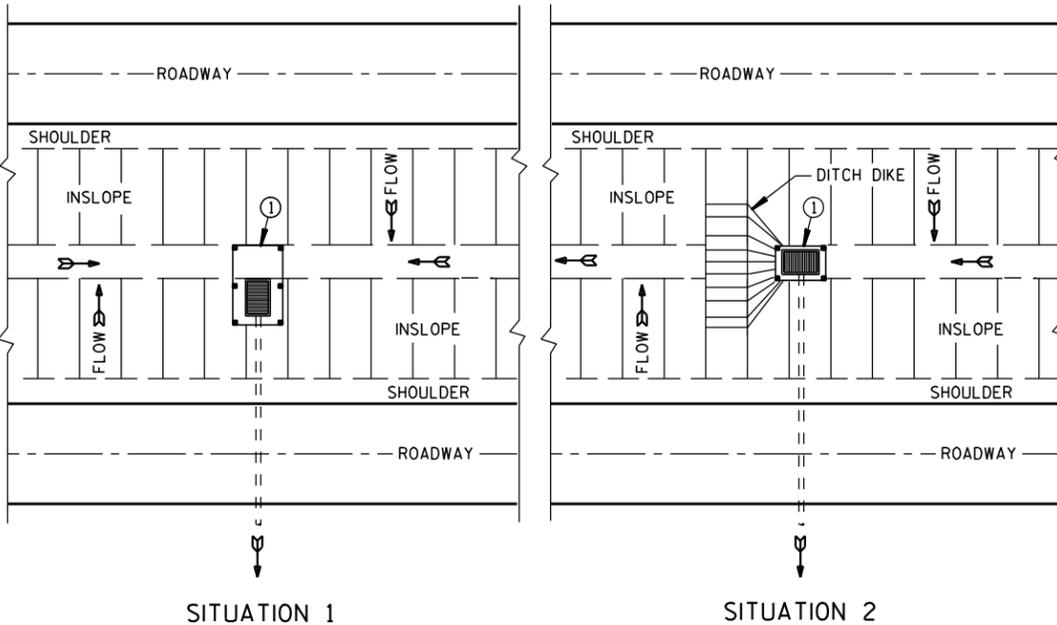
TYPICAL INSTALLATIONS OF
EROSION BALES / TEMPORARY
DITCH CHECKS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
 6/04/02 /S/ Beth Canestra
 DATE CHIEF ROADWAY DEVELOPMENT ENGINEER
 FHWA



PLAN VIEW
TYPICAL APPLICATION OF SILT FENCE

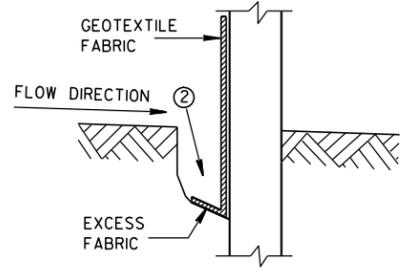


SITUATION 1 SITUATION 2
PLAN VIEW
SILT FENCE AT MEDIAN SURFACE DRAINS

GENERAL NOTES

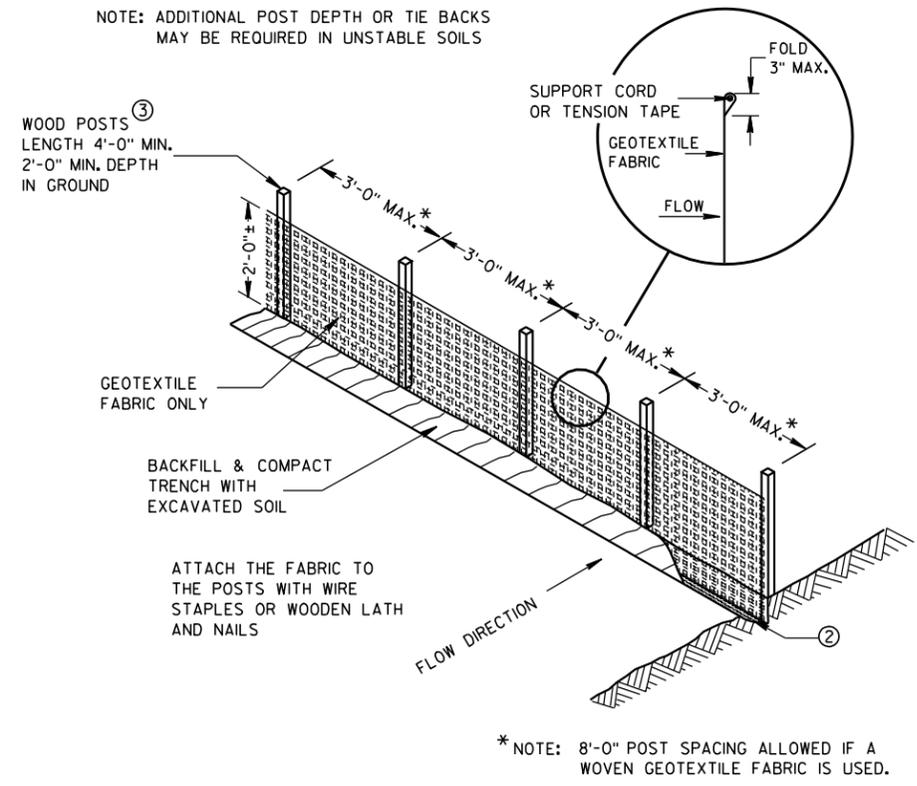
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

- 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.



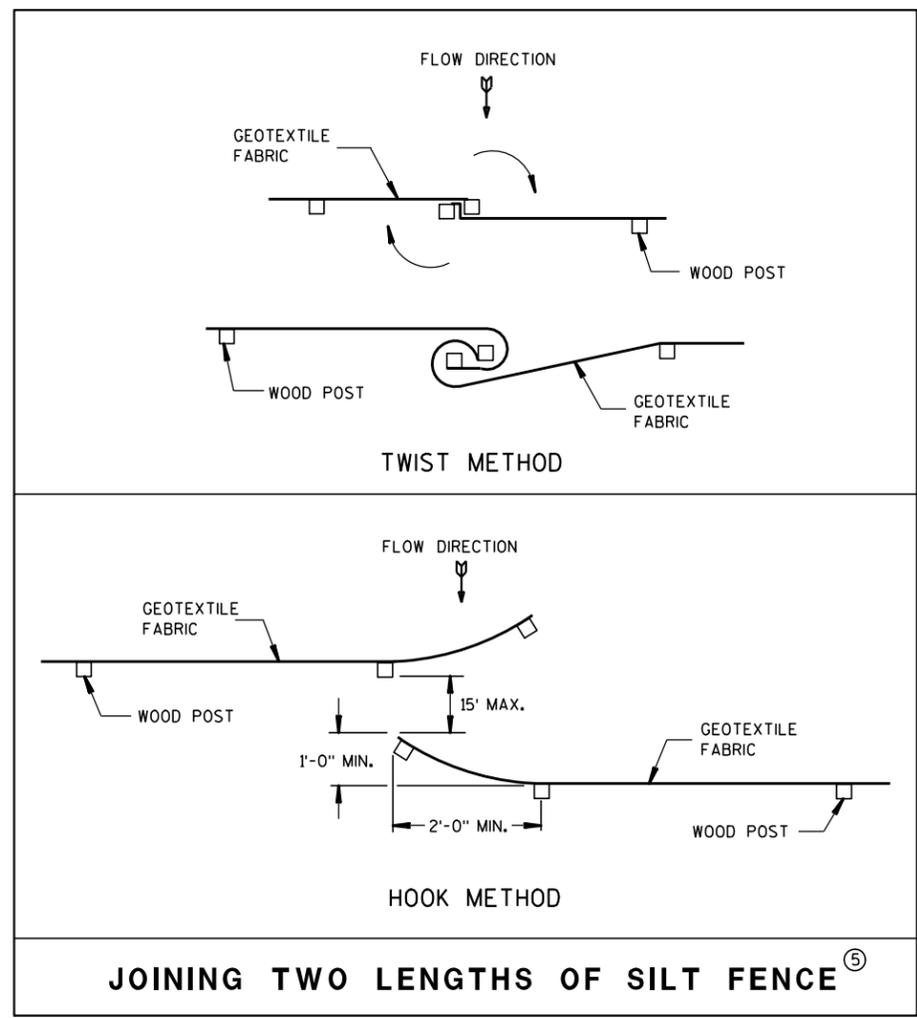
TRENCH DETAIL

6



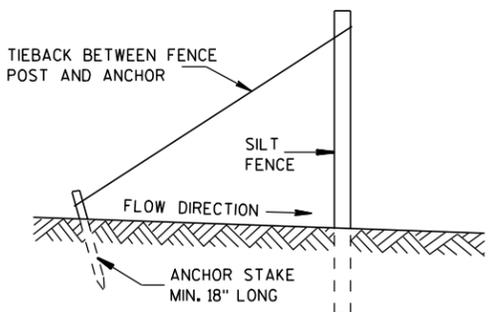
SILT FENCE

* NOTE: 8'-0" POST SPACING ALLOWED IF A WOVEN GEOTEXTILE FABRIC IS USED.



JOINING TWO LENGTHS OF SILT FENCE ⑤

6



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	

S.D.D. 8 E 9-6

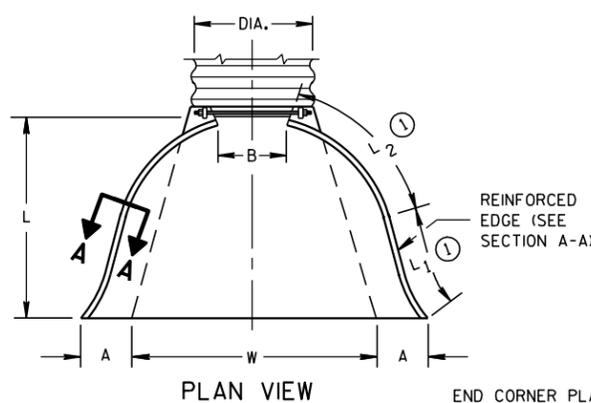
S.D.D. 8 E 9-6

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	L2	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.

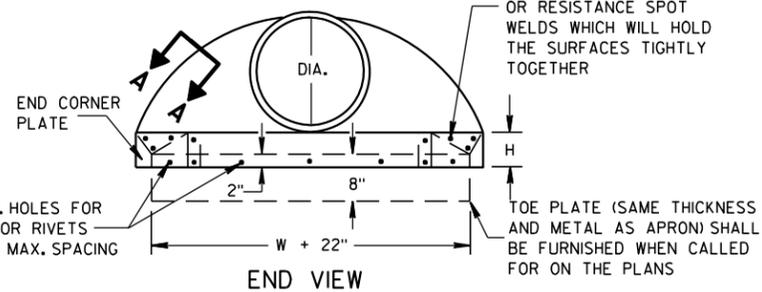
* EXCEPT CENTER PANEL SEE GENERAL NOTES

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	

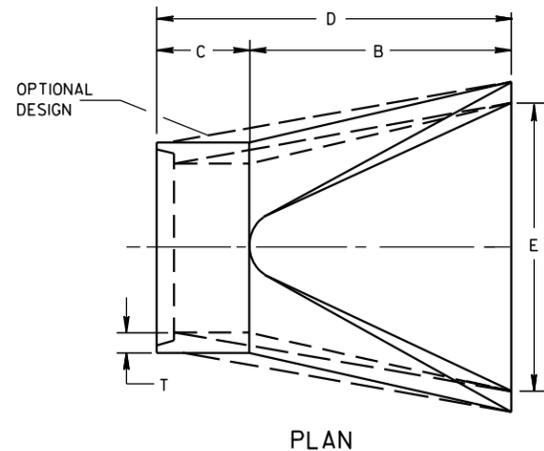
* MINIMUM
** MAXIMUM



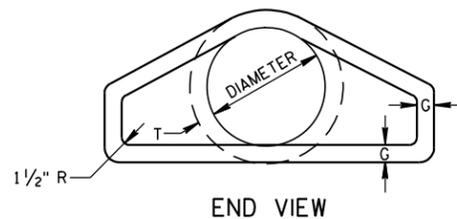
END CORNER PLATES MAY BE FASTENED TO APRON PROPER BY BOLTS, RIVETS, OR RESISTANCE SPOT WELDS WHICH WILL HOLD THE SURFACES TIGHTLY TOGETHER



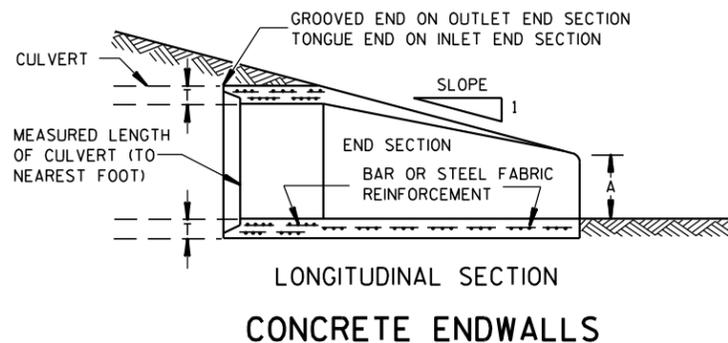
SIDE ELEVATION
METAL ENDWALLS



PLAN

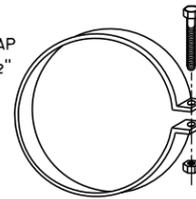


END VIEW

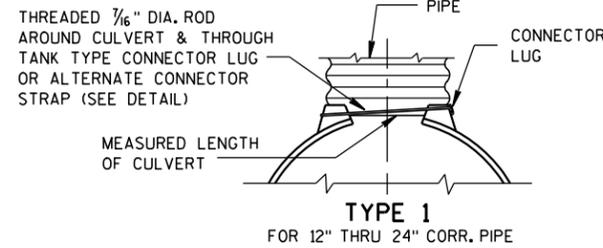


LONGITUDINAL SECTION
CONCRETE ENDWALLS

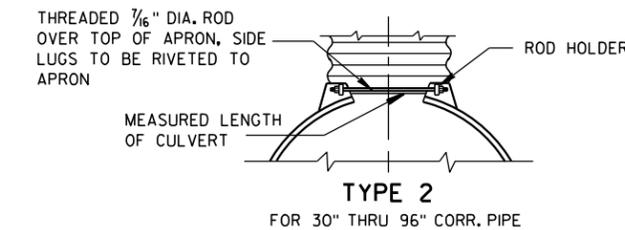
1" WIDE, 12 GA. (0.109" THICK) GALVANIZED STRAP WITH STANDARD 6" X 1/2" BAND BOLT AND NUT



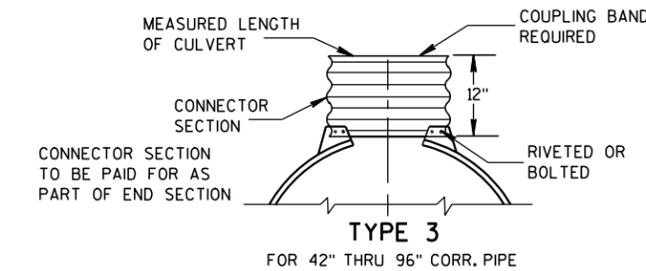
ALTERNATE FOR TYPE 1 CONNECTION
END SECTION CONNECTOR STRAP



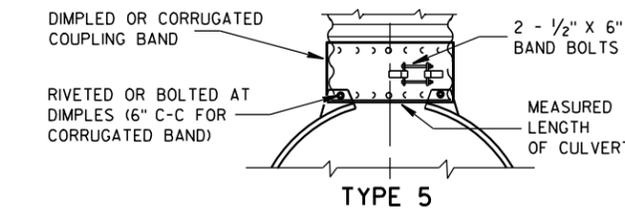
TYPE 1
FOR 12" THRU 24" CORR. PIPE



TYPE 2
FOR 30" THRU 96" CORR. PIPE



TYPE 3
FOR 42" THRU 96" CORR. PIPE



ALTERNATE FOR:
ALL SIZES CORRUGATED CIRCULAR PIPE

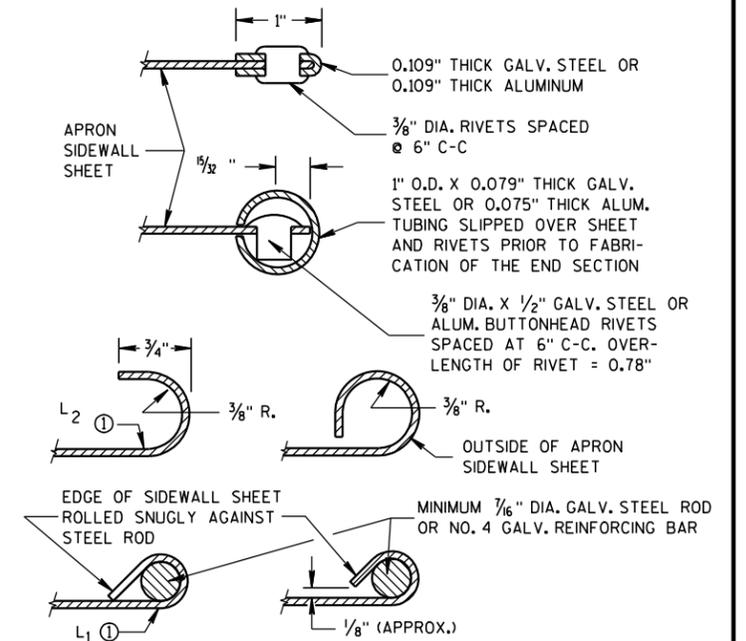
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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 VICE 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.

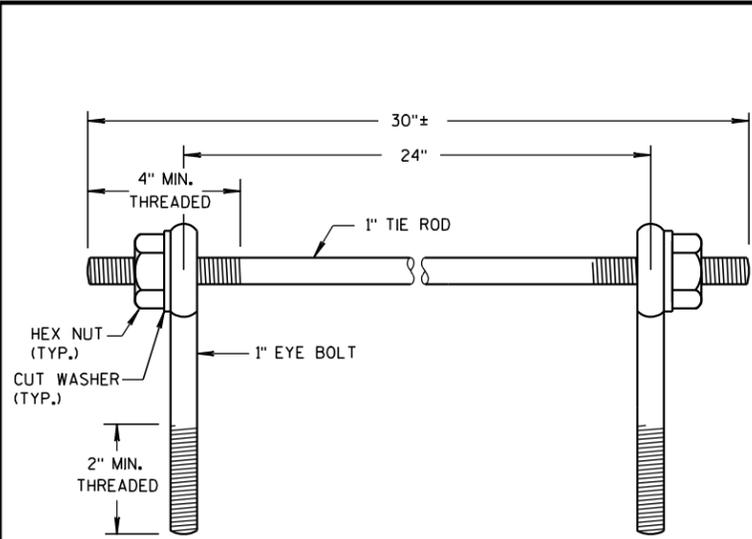
WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

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

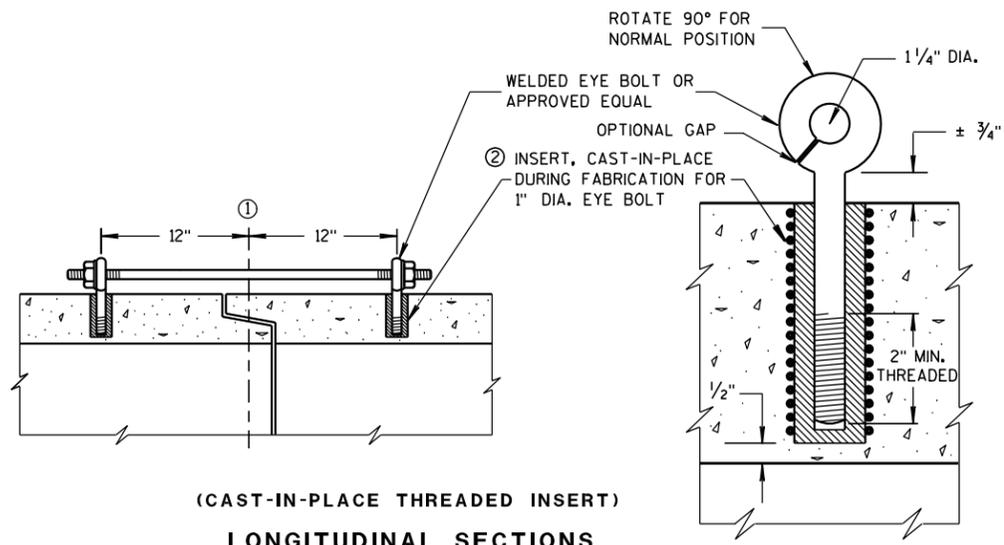
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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



EYE BOLTS AND TIE ROD

EYE BOLT AND TIE ROD ASSEMBLY (ALTERNATE NO. 1)



(CAST-IN-PLACE THREADED INSERT)
LONGITUDINAL SECTIONS

GENERAL NOTES

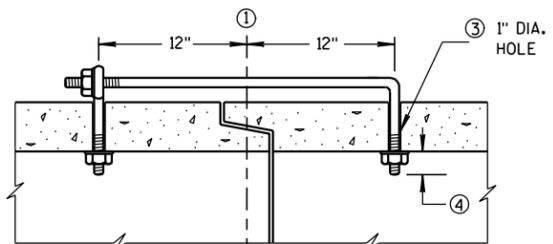
DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

CONCRETE CULVERT AND STORM SEWER PIPE SHALL BE TIED TOGETHER IN THE MANNER ILLUSTRATED BY THIS DETAIL AT LOCATIONS DESIGNATED IN THE STANDARD SPECIFICATIONS AND THE PLAN. THE CONTRACTOR MAY USE EITHER ALTERNATE 1, 2 OR 3 FOR DRAINAGE STRUCTURES. ONLY ALTERNATE 1 AND 3 MAY BE USED FOR CATTLE PASSES, UNLESS OTHERWISE STATED IN THE CONTRACT. THE MATERIALS, FABRICATION AND WORK NECESSARY TO TIE THE PIPE BY THIS DETAIL WILL BE CONSIDERED INCIDENTAL TO THE PIPE AND APRON ENDWALLS IF REQUIRED.

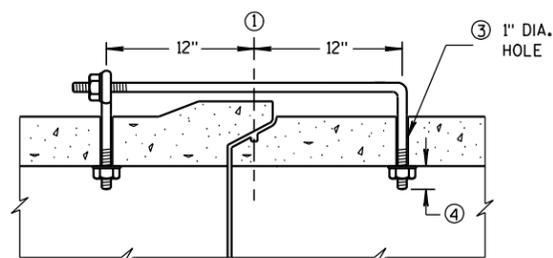
DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR JOINT TIES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

JOINT TIES TO BE HOT-DIP GALVANIZED PER ASTM A 153.

- ① ϕ OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS.
- ② THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS.
- ③ HOLES SHALL BE CAST-IN-PLACE OR DRILLED 12 INCHES FROM ϕ OF TONGUE AND GROOVE.
- ④ BOLT PROJECTION INSIDE OF PIPE SHALL NOT EXCEED 2 INCHES.
- ⑤ OPENING TO BE ROD DIAMETER PLUS 1 INCH.
- ⑥ LENGTH ADEQUATE TO EXTEND TO WITHIN $\frac{1}{2}$ INCH OF THE INNER SURFACE OF THE PIPE.



(TONGUE & GROOVE PIPE)



(MODIFIED BELL PIPE)
LONGITUDINAL SECTION

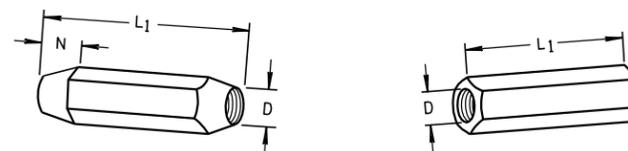
EYE BOLT DIMENSION TABLE

PIPE SIZE	L = LENGTH	
	TONGUE & GROOVE PIPE	MODIFIED BELL PIPE
18" TO 24"	4 1/2"	6 1/4"
30"	5"	7"
36"	5 1/2"	7"
42"	6"	
48"	6 1/2"	
60"	7 1/2"	
66"	8"	

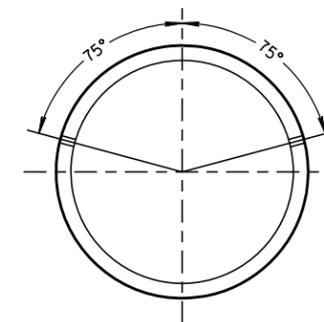
ADJUSTABLE TIE ROD TABLE

PIPE DIAMETER	TIE ROD DIAMETER	D	L ₁	N
12-60	5/8	5/8	5	1/2
66-84	3/4	3/4	5	1/2
90-108	1	1	7	1 1/6

DIMENSIONS SHOWN ARE IN INCHES

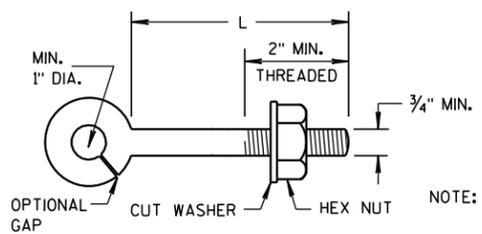


TAPERED PLAIN
RIGHT AND LEFT THREADS
SLEEVE NUTS



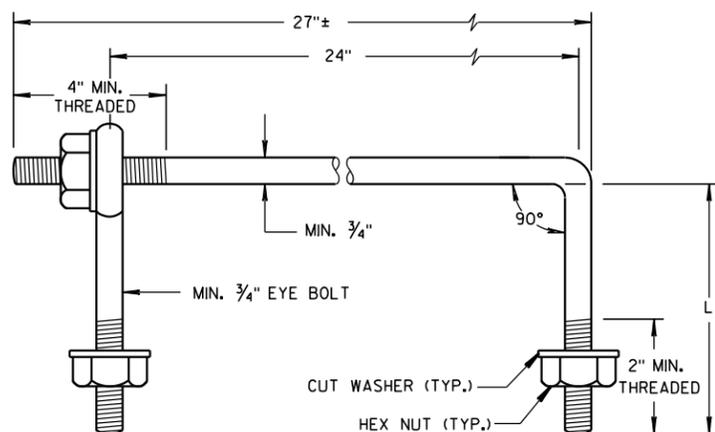
PLACEMENT OF (2) CAST-IN-PLACE
INSERTS OR HOLES DURING FABRICATION
FOR PIPE SECTIONS REQUIRING TIE RODS

TRANSVERSE SECTION



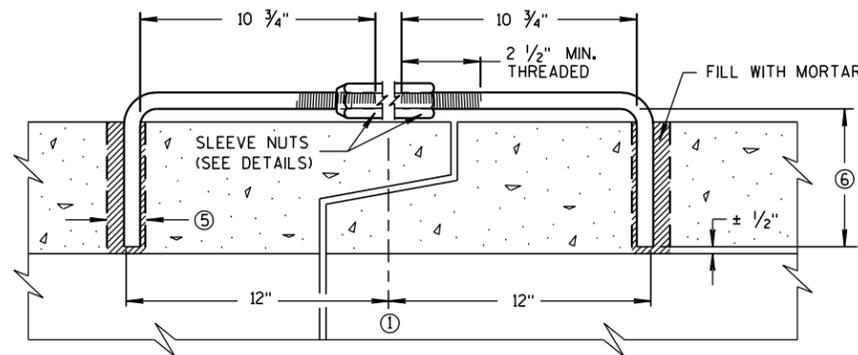
EYE BOLT

NOTE: TWO EYE BOLTS MAY BE USED WITH A 30" LONG THREADED ROD IN LIEU OF THE 90° BENT TIE ROD.



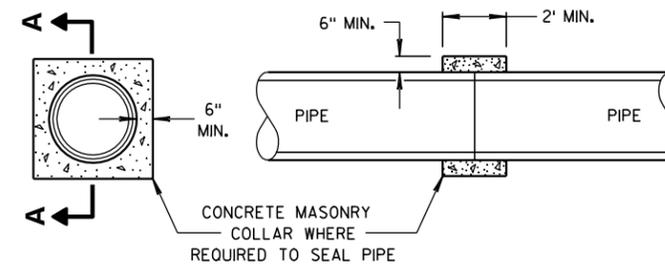
EYE BOLT AND TIE ROD

(JOINT TIES FOR 18" TO 66" DIA. CONCRETE PIPE)
EYE BOLT AND TIE ROD ASSEMBLY (ALTERNATE NO. 2)



LONGITUDINAL SECTION

(JOINT TIES FOR 12" TO 108" DIA. CONCRETE PIPE)
ADJUSTABLE TIE ROD (ALTERNATE NO. 3)



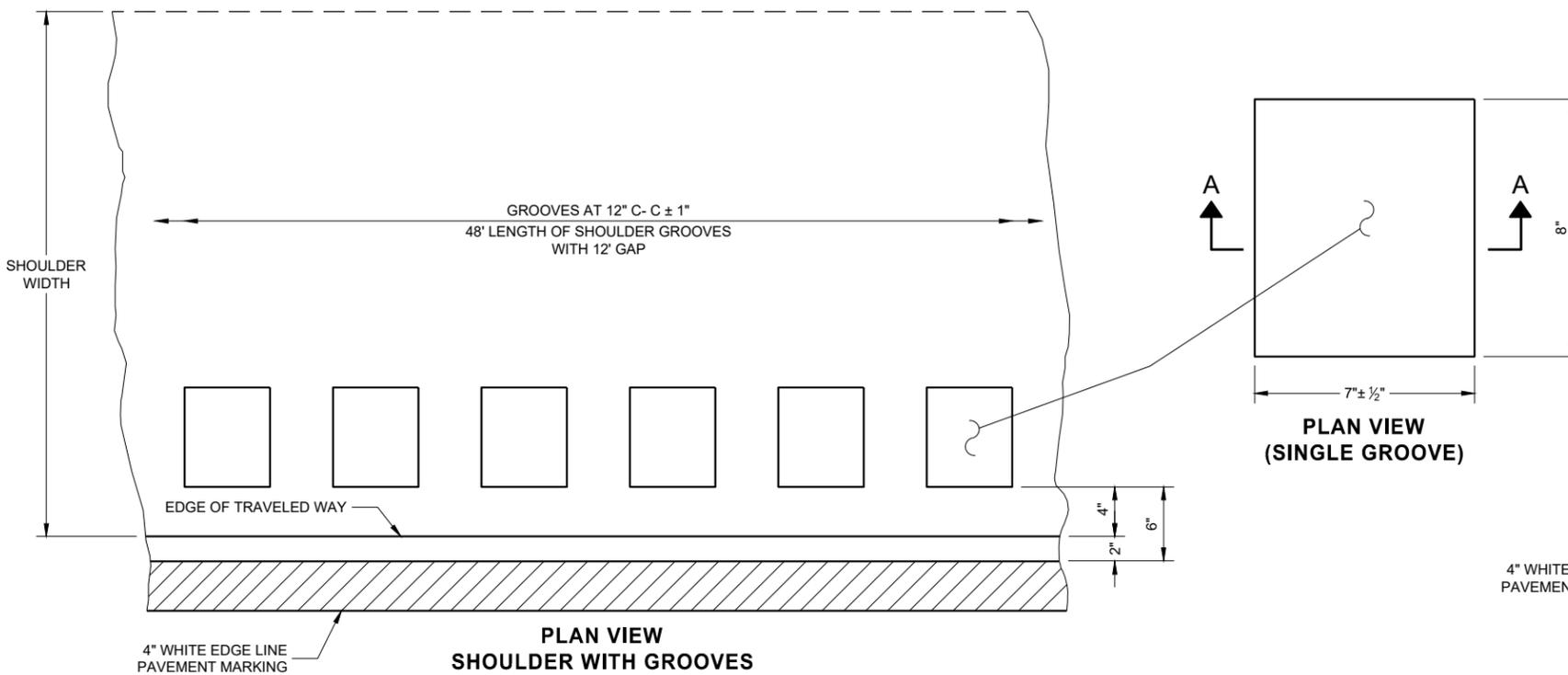
SECTION A-A

CONCRETE COLLAR DETAIL

JOINT TIES FOR CONCRETE
PIPE AND CONCRETE
COLLAR DETAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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



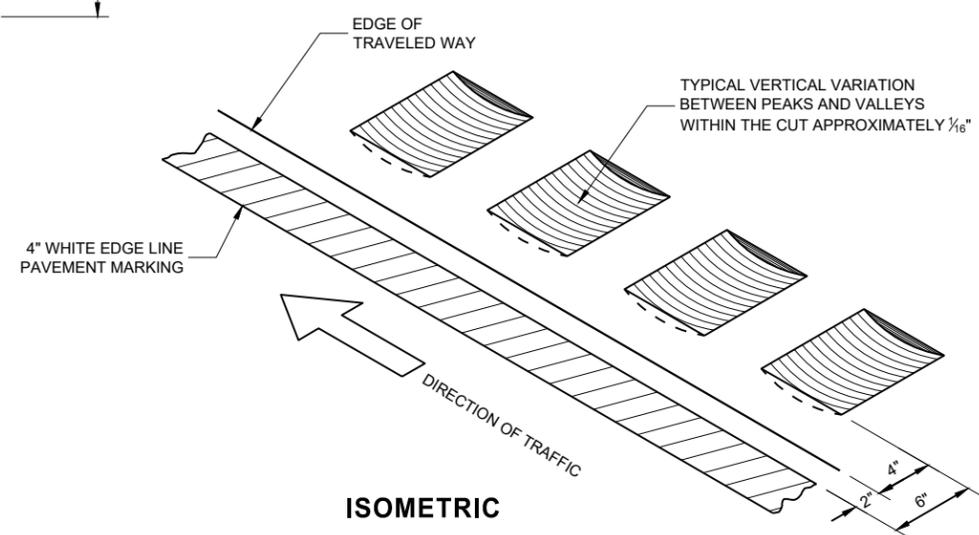
PLACEMENT DETAIL FOR TYPE 1 MILLED RUMBLE STRIP

GENERAL NOTES

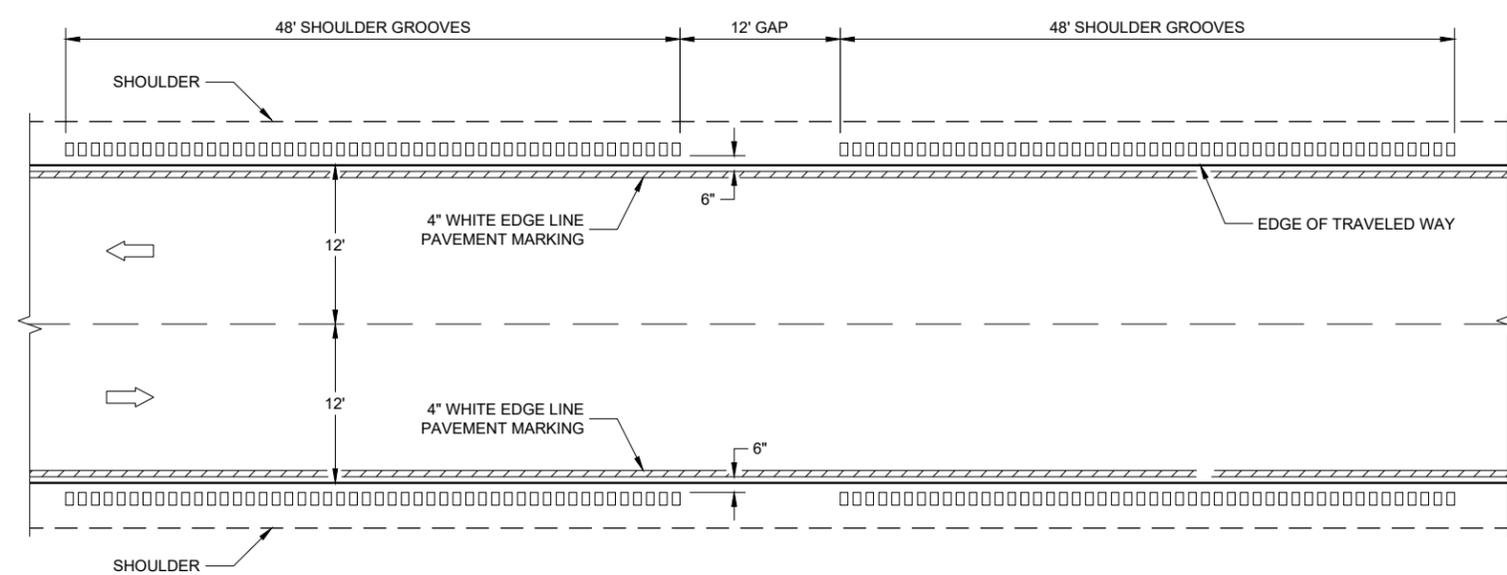
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

DO NOT MILL SHOULDER GROOVES THROUGH ANY INTERSECTION, MARKED CROSSWALK, NON-MOTORIZED PATH CROSSING, OR SNOWMOBILE CROSSING.

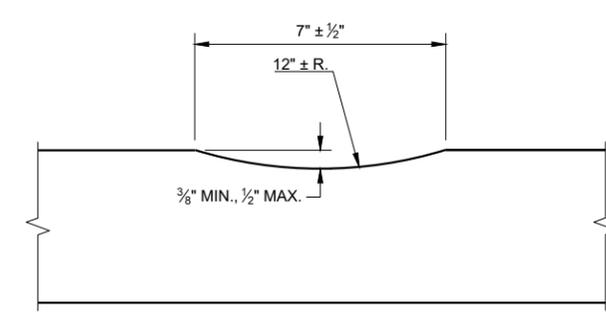
- ① SHOULDER GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS. WHEN DIRECTED BY THE ENGINEER.



ISOMETRIC



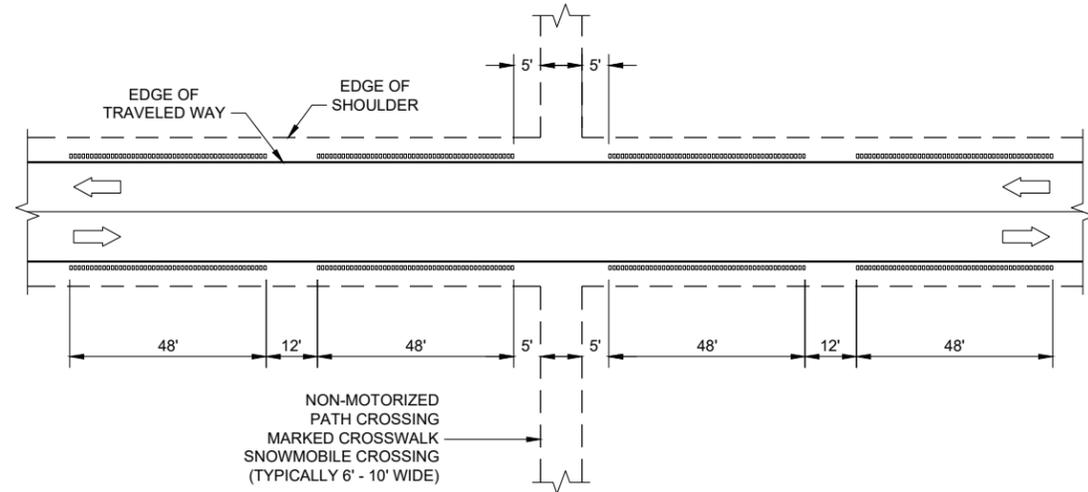
TYPE 1
2 - LANE SHOULDER RUMBLE STRIP



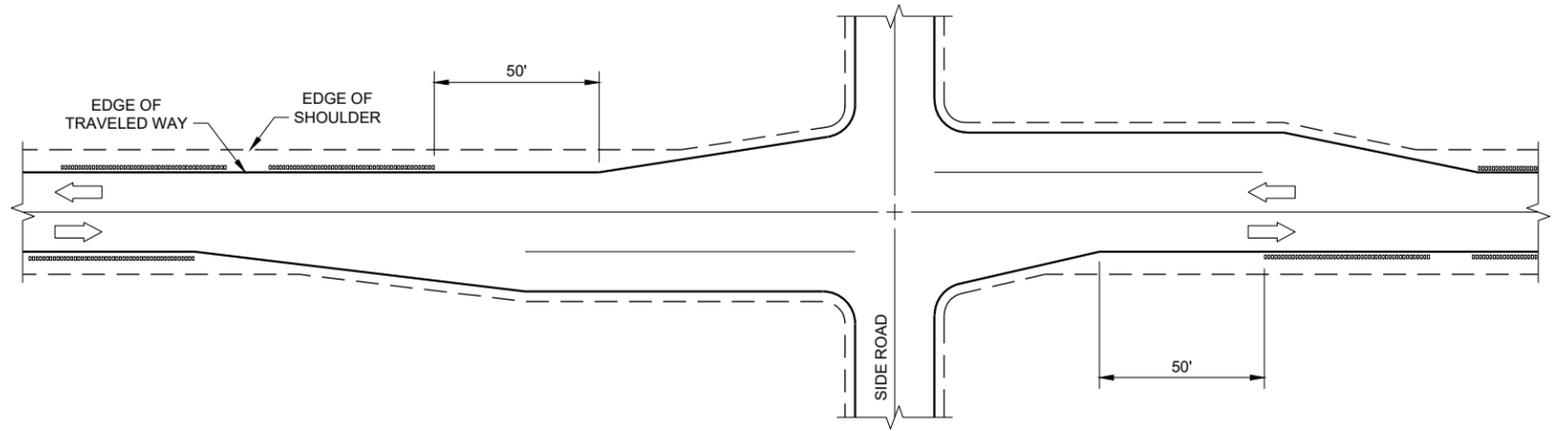
SECTION A - A

**2-LANE RURAL SHOULDER
RUMBLE STRIP, MILLING**

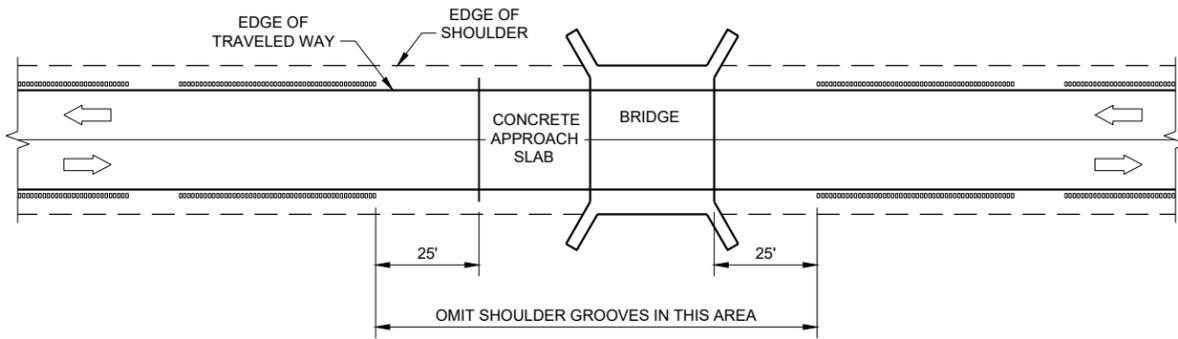
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



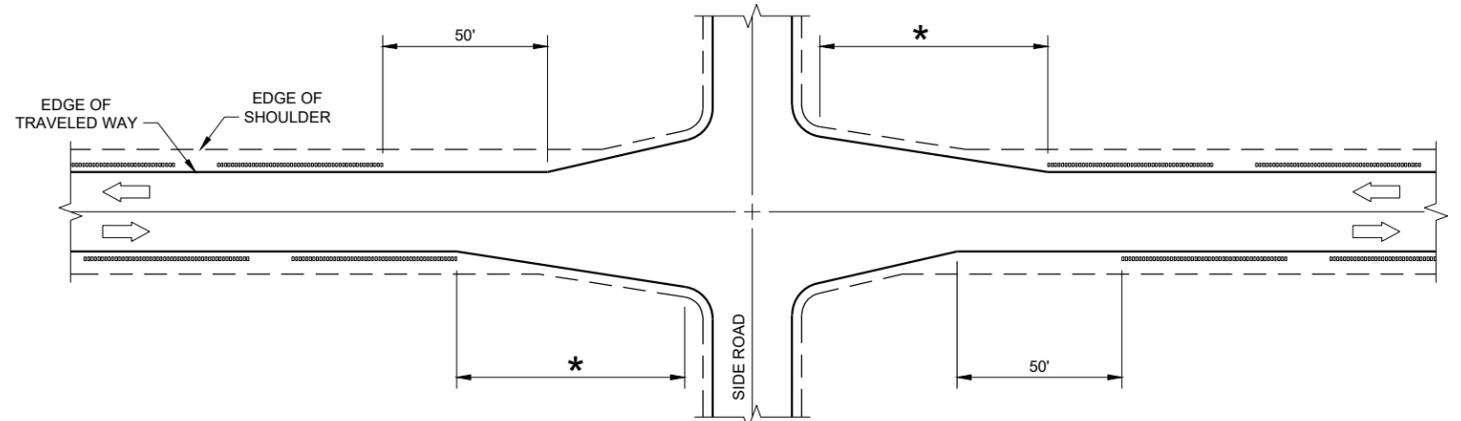
SHOULDER GROOVES AT MISCELLANEOUS CROSSINGS



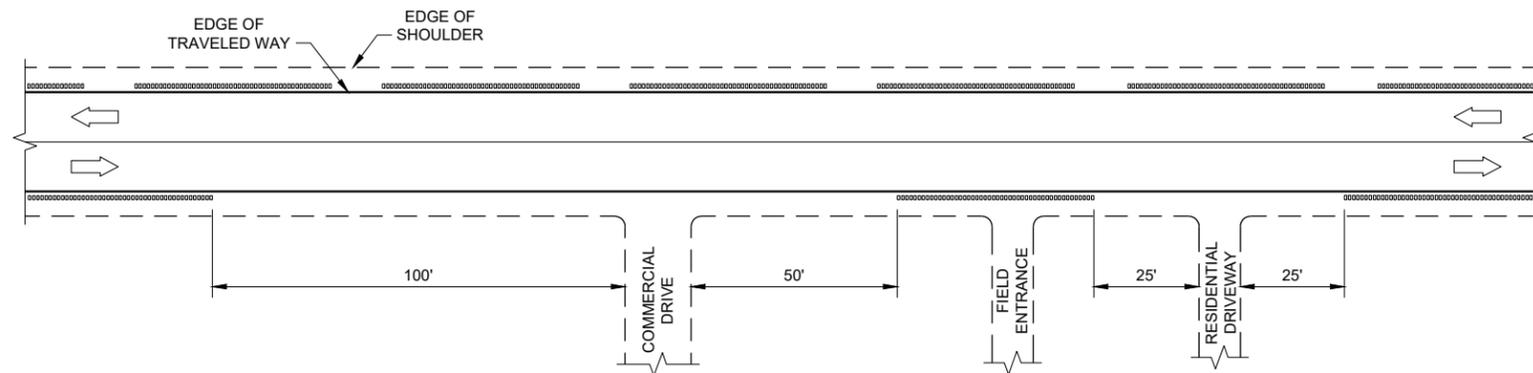
SHOULDER GROOVES AT RIGHT TURN LANE



SHOULDER GROOVES AT BRIDGES



SHOULDER GROOVES AT INTERSECTIONS WITH APPROACH TAPER



SHOULDER GROOVES AT DRIVEWAYS^①

GENERAL NOTES

- ① SHOULDER GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS. WHEN DIRECTED BY THE ENGINEER.

**2-LANE RURAL SHOULDER
RUMBLE STRIP, MILLING**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

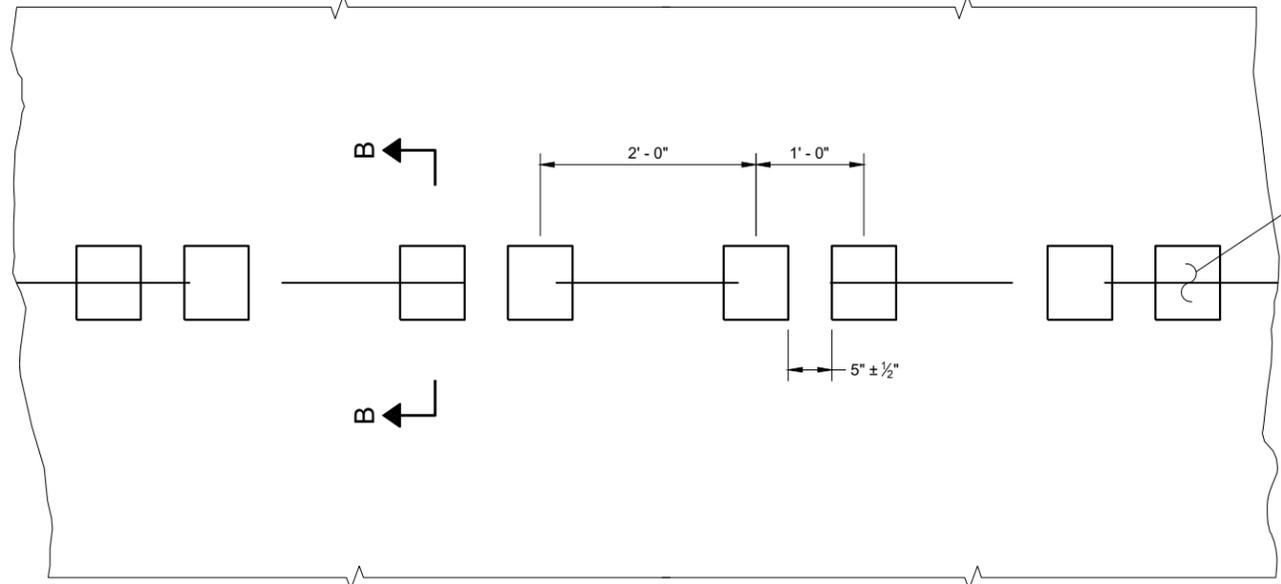
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

DO NOT MILL CENTERLINE GROOVES THROUGH ANY INTERSECTION, MARKED CROSSWALK, NON-MOTORIZED PATH CROSSING, OR SNOWMOBILE CROSSING.

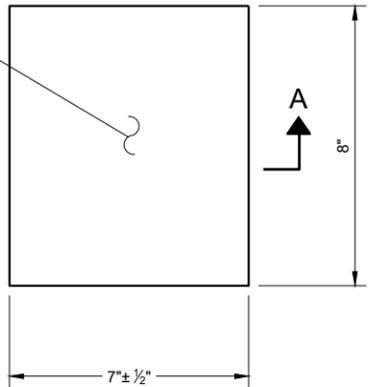
INSTALL PAVEMENT MARKING AFTER THE GROOVES ARE INSTALLED.

SEE SIGNING PLAN FOR SIGN REQUIREMENTS THAT MAY BE NEEDED.

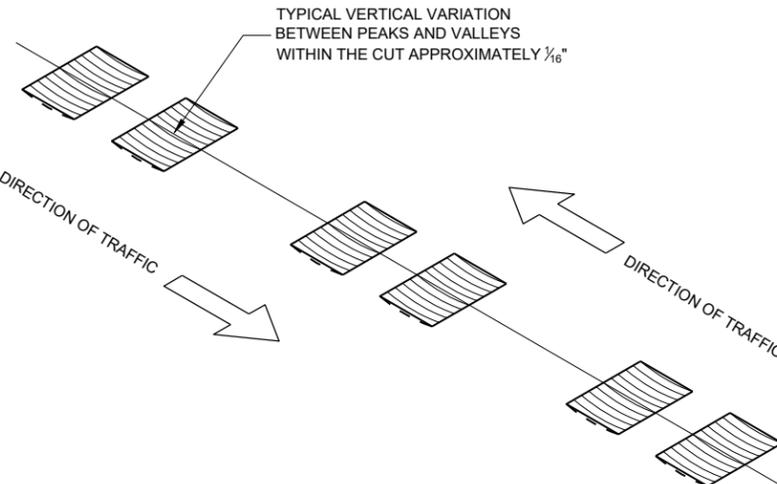
- ① CENTERLINE GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS, WHEN DIRECTED BY THE ENGINEER.



**PLAN VIEW
SHOULDER WITH GROOVES**

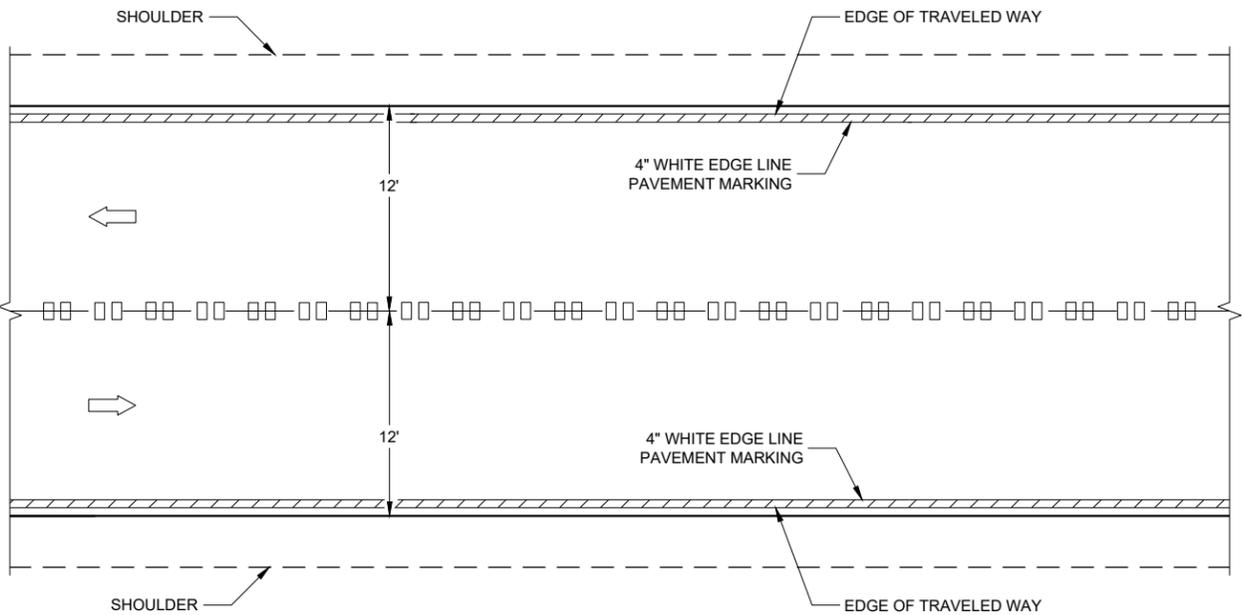


**PLAN VIEW
(SINGLE GROOVE)**

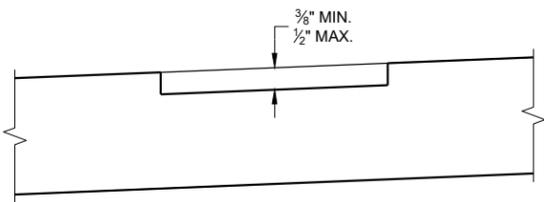


ISOMETRIC

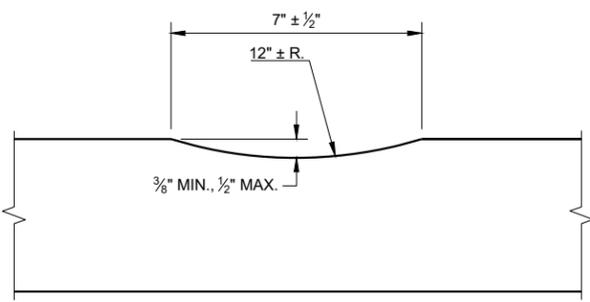
PLACEMENT DETAIL FOR TYPE 1 MILLED RUMBLE STRIP



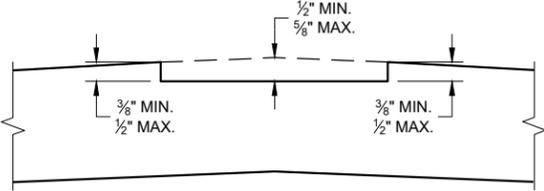
CENTERLINE GROOVES ON TWO-WAY ROADWAYS



**SECTION B - B
SUPERELEVATED ROADWAY**



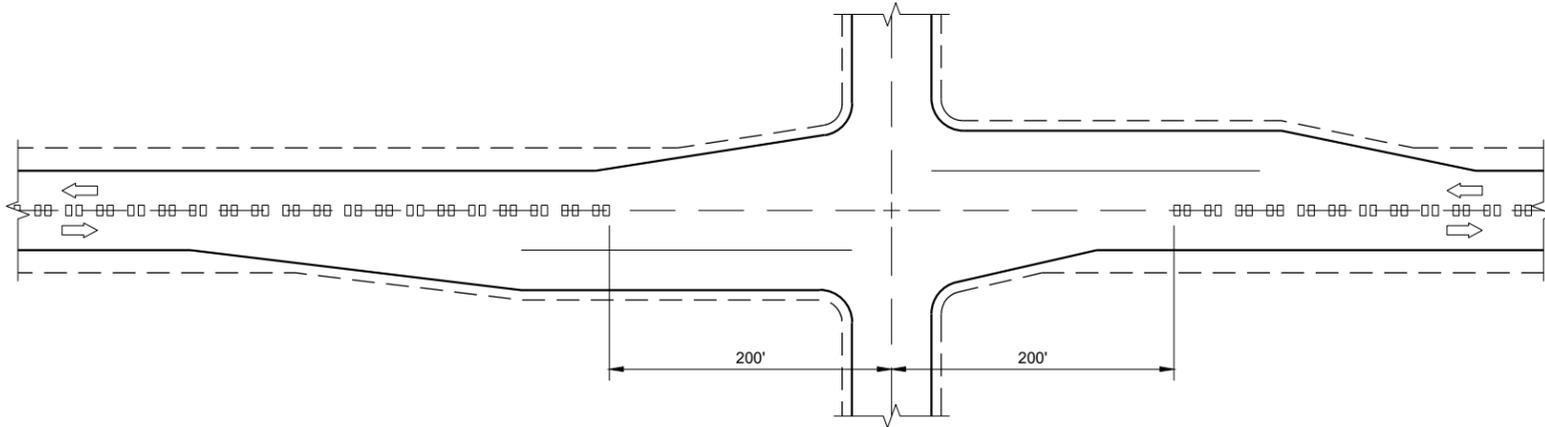
SECTION A - A



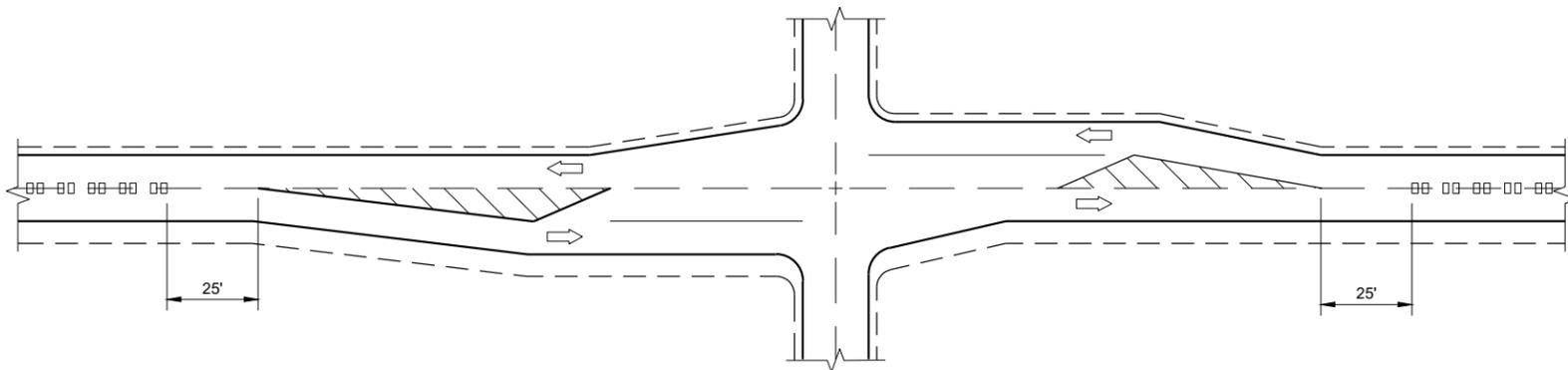
**SECTION B - B
CROWNED ROADWAY**

**2-LANE RURAL
CENTER LINE RUMBLE STRIP,
MILLING**

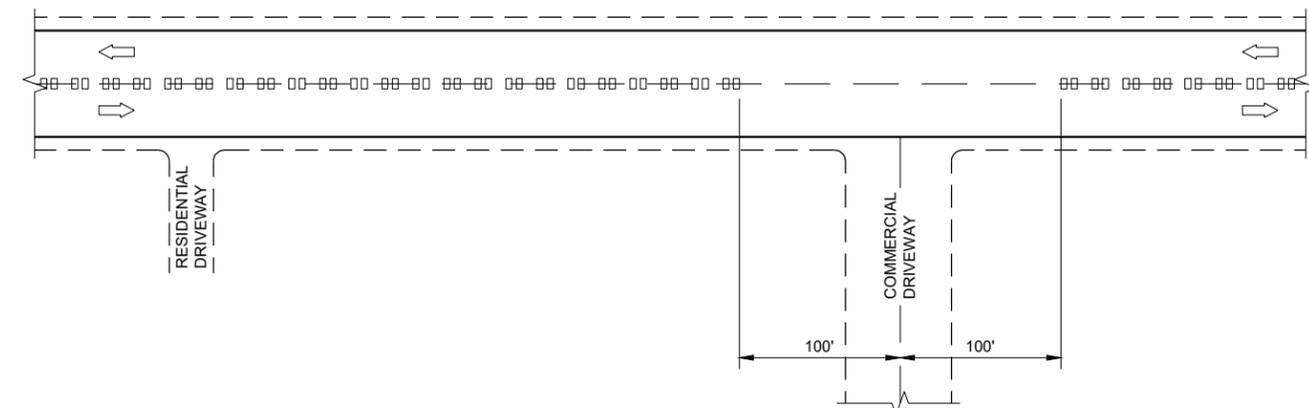
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



CENTERLINE GROOVES AT INTERSECTIONS



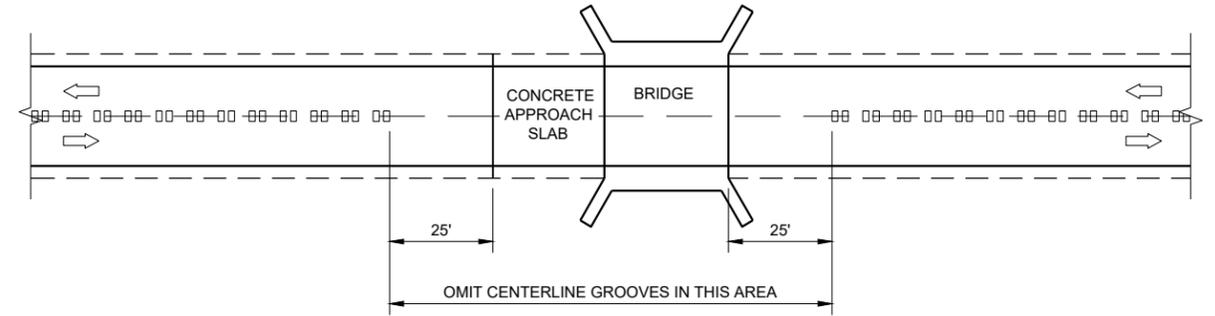
**CENTERLINE GROOVES AT INTERSECTIONS
(WITH LEFT TURN LANES)**



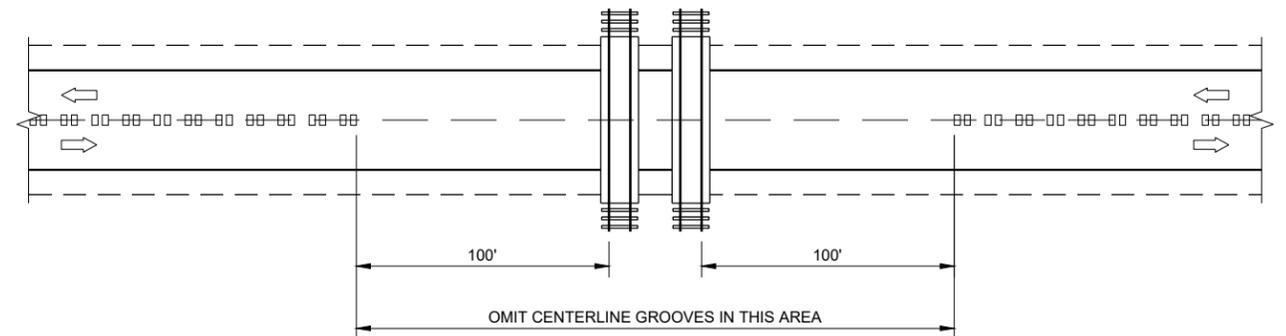
CENTERLINE GROOVES AT DRIVEWAYS^①

GENERAL NOTES

- ① CENTERLINE GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS. WHEN DIRECTED BY THE ENGINEER.



CENTERLINE GROOVES AT BRIDGES

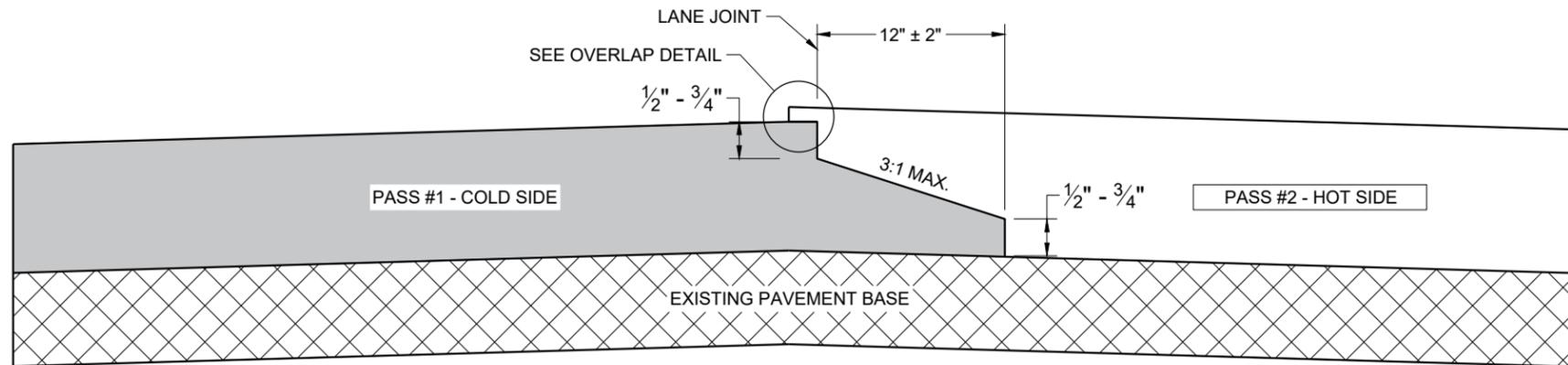


CENTERLINE GROOVES AT RAILROADS

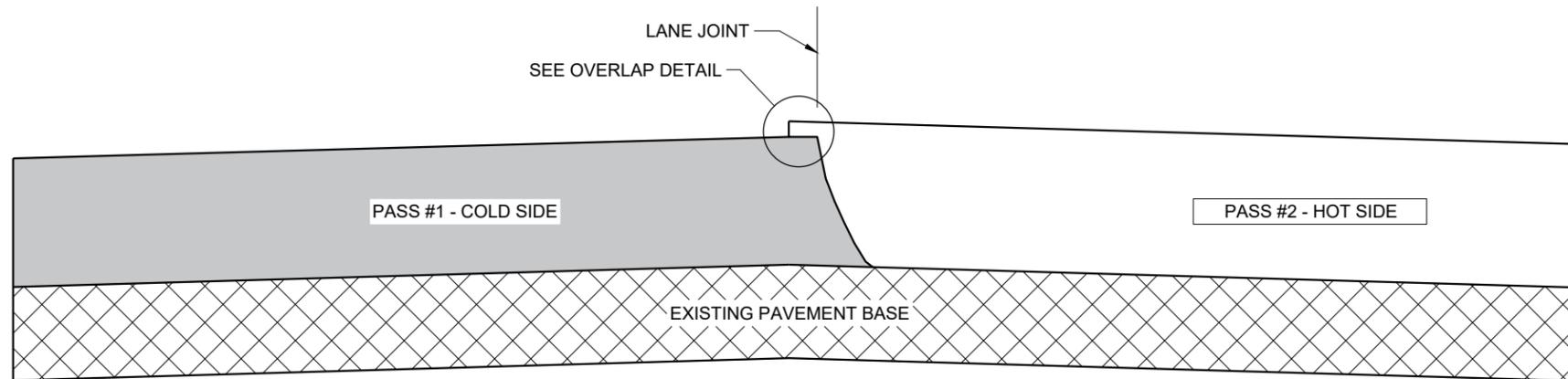
6

6

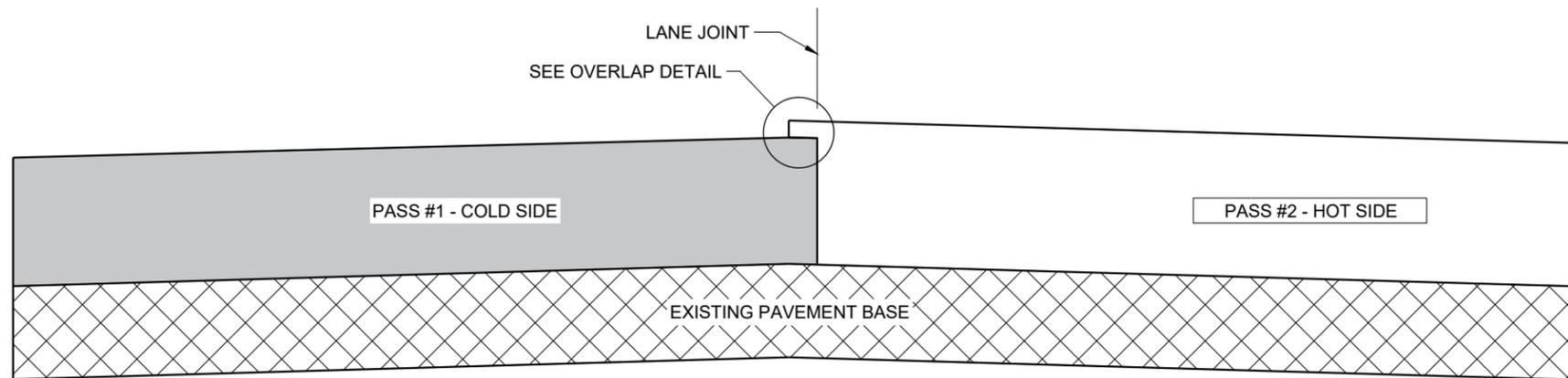
2-LANE RURAL CENTERLINE RUMBLE STRIP, MILLING	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 7/2018 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT ENGINEER
<small>FHWA</small>	



TYPICAL PAVEMENT CROSS SECTION NOTCHED WEDGE JOINT



TYPICAL PAVEMENT CROSS SECTION VERTICAL JOINT



TYPICAL PAVEMENT CROSS SECTION VERTICAL JOINT (MILLED)

GENERAL NOTES

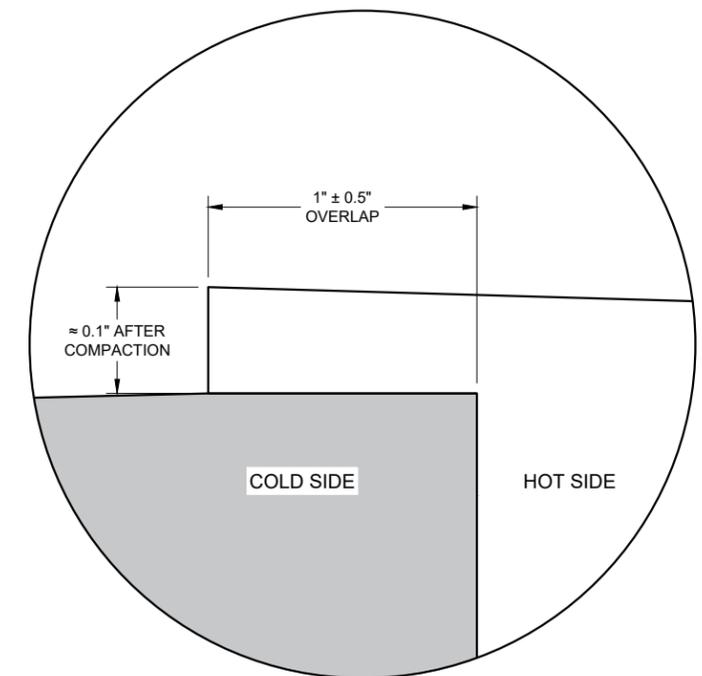
IN ADDITION TO THE DETAILS PROVIDED IN THIS DRAWING, CONFORM TO STANDARD SPECIFICATION 450.3.2.8 FOR WHEN A NOTCHED WEDGE JOINT IS REQUIRED AND FOR GENERAL JOINT CONSTRUCTION REQUIREMENTS.

FOR ALL LONGITUDINAL JOINTS, ENSURE THE PAVER SCREED OVERLAPS THE PREVIOUSLY PLACED PAVEMENT BY $1" \pm 0.5"$ AND THE HOT SIDE OF THE JOINT REMAINS HIGHER THAN THE COLD SIDE BY APPROXIMATELY 0.1" AFTER FINAL COMPACTION. (IT WILL BE FLUSH WHEN PAVING IN ECHELON.)

ONLY REMOVE THE LONGITUDINAL NOTCHED WEDGE JOINT FOR SMA PAVEMENT OR AS DIRECTED BY THE ENGINEER TO ADDRESS SPECIFIC LENGTHS OF JOINT DAMAGED BY TRAFFIC.

WHEN MILLING BACK OR REMOVING ANY LONGITUDINAL JOINT, LIMIT THE MATERIAL REMOVED TO 2" FROM THE TOP NOTCH OR FROM THE VERTICAL JOINT EDGE ON THE COLD SIDE OF THE JOINT.

USE LONGITUDINAL MILLED JOINT AS PLANS SHOW OR THE AS THE ENGINEER DIRECTS.



OVERLAP DETAIL (TYPICAL)

6

6

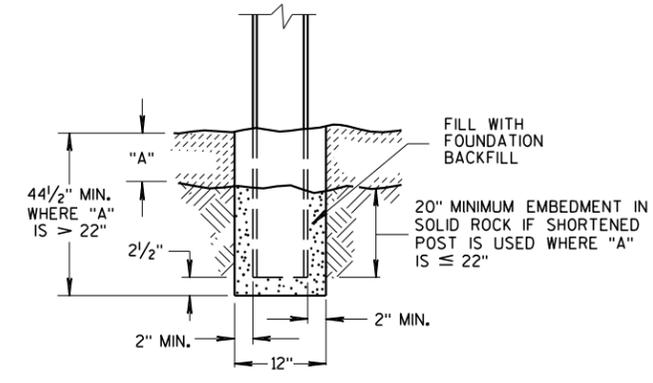
SDD 13C19 - 03

SDD 13C19 - 03

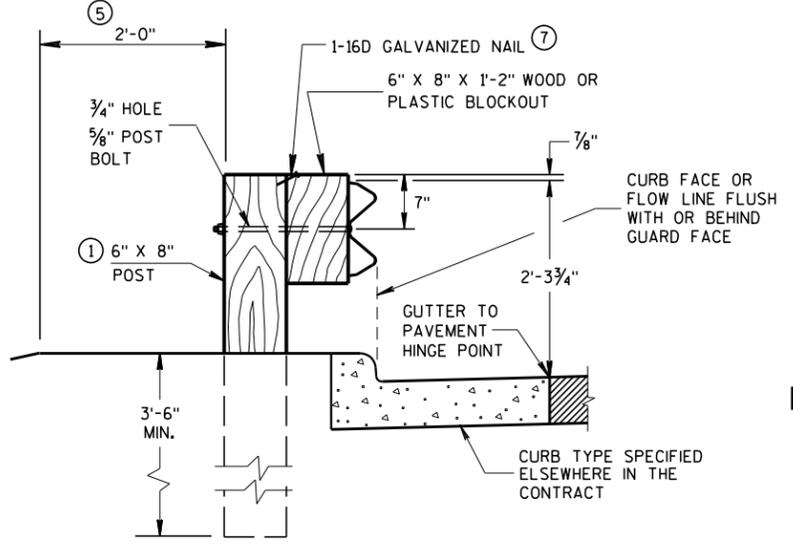
HMA LONGITUDINAL JOINTS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED November 2020 DATE	/S/ Steven Hefel HMA PAVEMENT ENGINEER
FHWA	

GENERAL NOTES

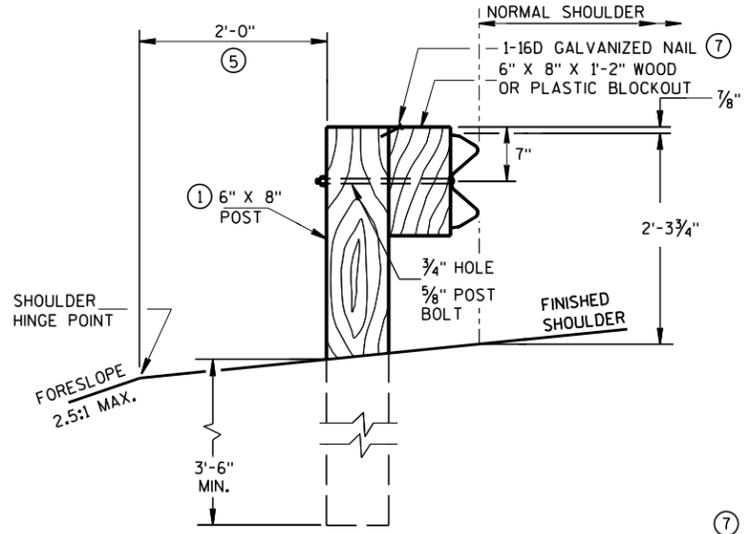
- ① W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POSTS WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS. APPROVED PLASTIC BLOCKOUT DESIGNS MAY VARY FROM THIS TYPICAL DETAIL WHEN USED IN CONJUNCTION WITH STEEL POSTS. DO NOT MIX STEEL POSTS AND WOOD POSTS IN A SINGLE INSTALLATION.
 - ② USE STRUCTURAL STEEL POSTS CONFORMING TO ASTM A 36. GALVANIZED POSTS ACCORDING TO AASHTO M 111. EITHER SET THE POSTS IN DRILLED HOLES OR DRIVE TO GRADE. REMOVE MUSHROOMING CAUSED BY DRIVING AND REPAIR DAMAGED SPELTER COATING ON GALVANIZED POSTS.
 - ③ INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
 - ④ USE EITHER WOOD OR APPROVED PLASTIC BLOCKOUTS ON WOOD POSTS.
 - ⑤ IF THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING, W BEAM (LHW).
 - ⑥ IF ROCK IS ENCOUNTERED DURING EXCAVATION, THE ENGINEER MAY APPROVE USING A 12 INCH DIAMETER POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 1/2 INCHES DEEP. CUT THE POSTS TO LENGTH AND PLACE IN THE HOLE. BACKFILL WITH MATERIAL EXCAVATED FROM THE HOLE AND COMPACT ADEQUATELY.
 - ⑦ 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.
- INSTALL BEAM GUARD SECTIONS AND ALL NECESSARY HARDWARE ACCORDING TO THE APPLICABLE PLAN AND CURRENT STANDARD AND SUPPLEMENTAL SPECIFICATIONS. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURER'S TOLERANCES EXCEPT WHERE ALLOWABLE TOLERANCES ARE SHOWN.



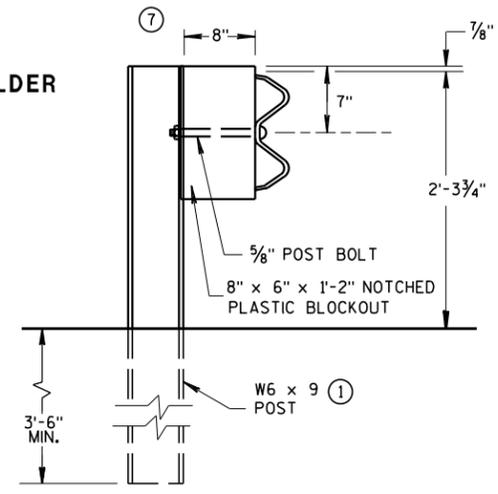
END VIEW SETTING STEEL OR WOOD POST IN ROCK ⑥



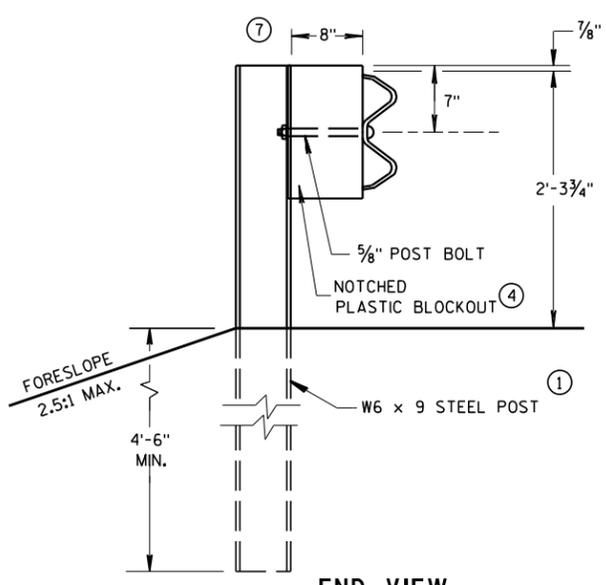
END VIEW LOCATED ALONG A CURBED ROADWAY



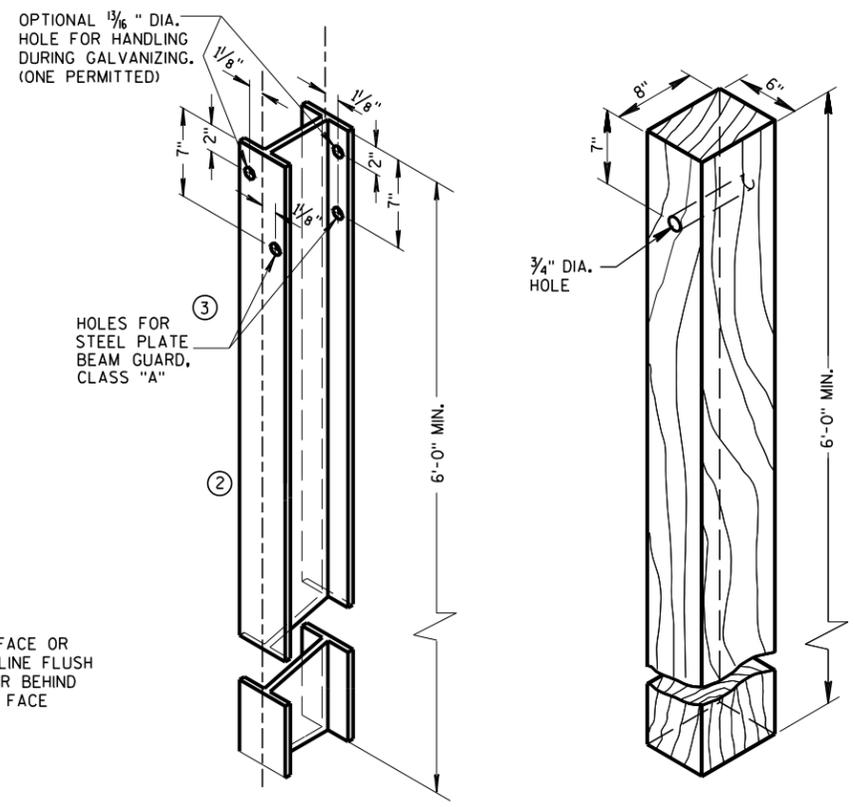
END VIEW LOCATED ALONG A ROADWAY SHOULDER STANDARD INSTALLATION



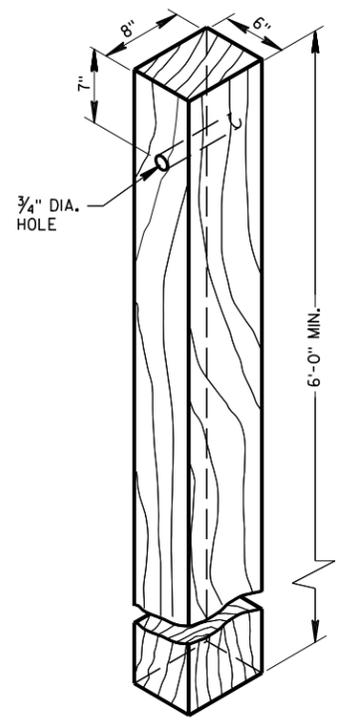
END VIEW STEEL POST & NOTCHED PLASTIC BLOCKOUT ALTERNATIVE STANDARD INSTALLATION



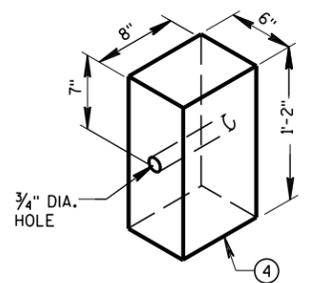
END VIEW LONGER POST AT HALF POST SPACING W BEAM (LHW)



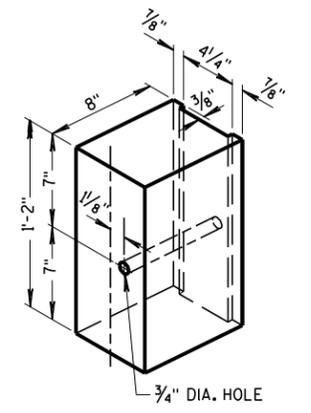
STEEL POST & HOLE PUNCHING DETAIL (W6 X 9) ①
ALL HOLES 1/8" DIAMETER EXCEPT AS NOTED



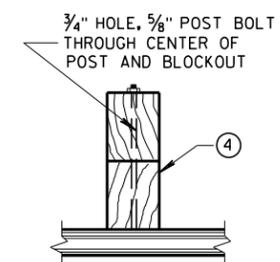
WOOD POST (6" X 8") NOMINAL



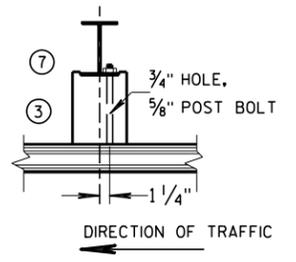
WOOD OR PLASTIC BLOCKOUT FOR WOOD POSTS



TYPICAL NOTCHED PLASTIC BLOCKOUT FOR STEEL POSTS ①



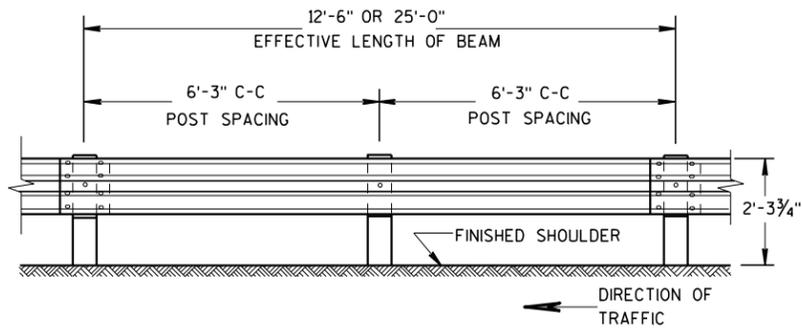
PLAN VIEW WOOD POST, BLOCKOUT & BEAM



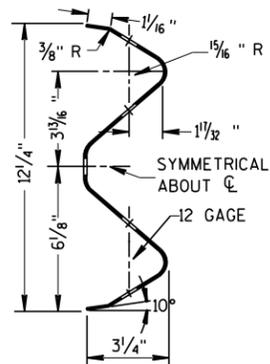
PLAN VIEW STEEL POST, NOTCHED PLASTIC BLOCKOUT & BEAM

STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS

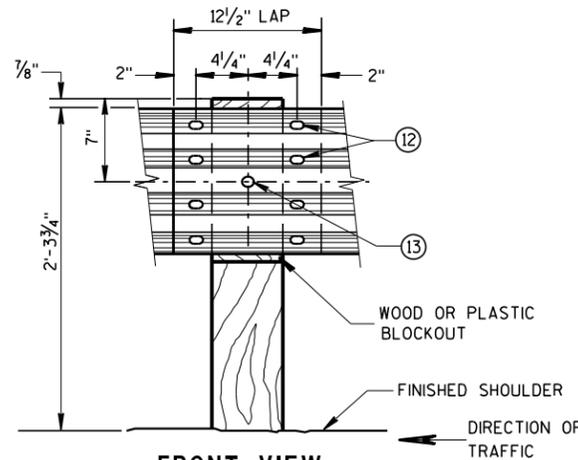
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



**FRONT VIEW
POST SPACING STANDARD INSTALLATION**



SECTION THRU W BEAM

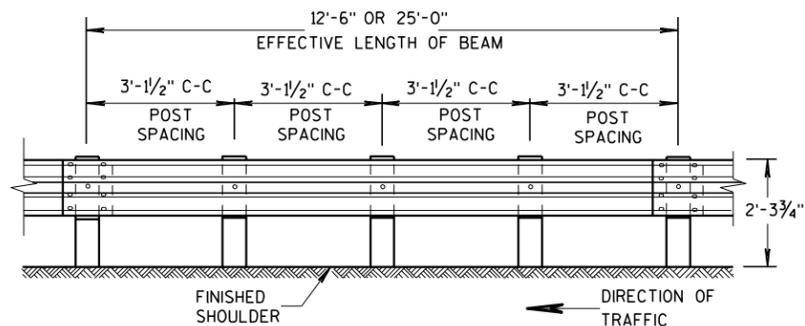


**FRONT VIEW
BEAM SPLICE AT WOOD POST
AND POST MOUNTING DETAIL**

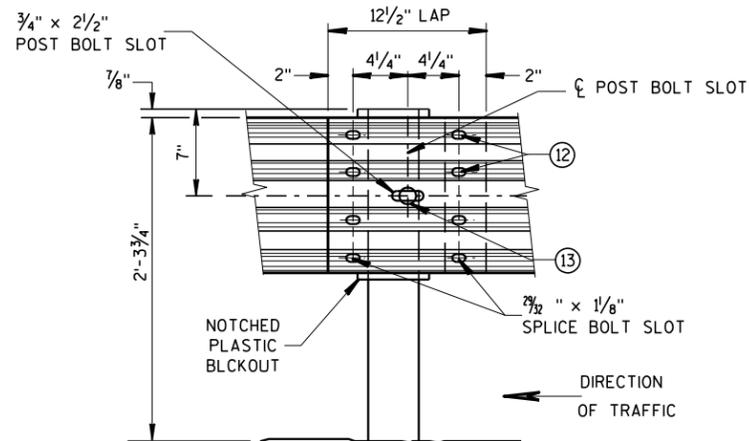
GENERAL NOTES

FURNISH GUARDRAIL DEFLECTORS FROM APPROVED PRODUCTS LIST.

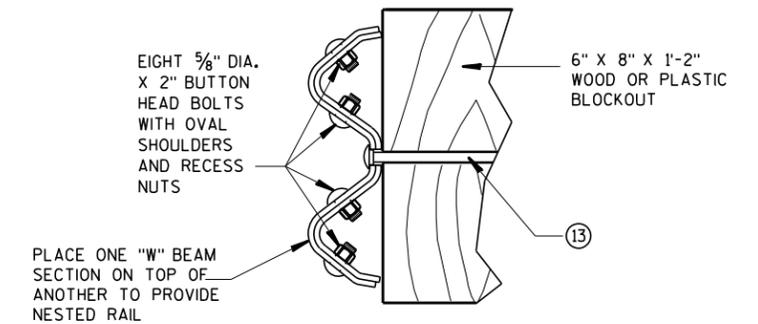
- ⑨ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINA. START REFLECTORS AT POST #9 AND SPACE EVENLY EVERY 100 FEET (MAX.) TO THE END OF GUARDRAIL RUN, USING A MINIMUM OF 3 REFLECTORS.
- ⑫ 8 - 5/8" ϕ X 2" BUTTON HEAD BOLTS WITH OVAL SHOULDERS & RECESS NUTS.
- ⑬ 5/8" DIA. BUTTON HEAD BOLT AND RECESS NUT WITH 5/8" DIA. F844 FLAT WASHER UNDER NUT.



**FRONT VIEW
POST SPACING FOR LONGER POST
AT HALF POST SPACING W BEAM (LHW)**



**FRONT VIEW
BEAM SPLICE AT STEEL POST
TYPICAL SPLICING DETAILS
OF STEEL PLATE BEAM GUARD**

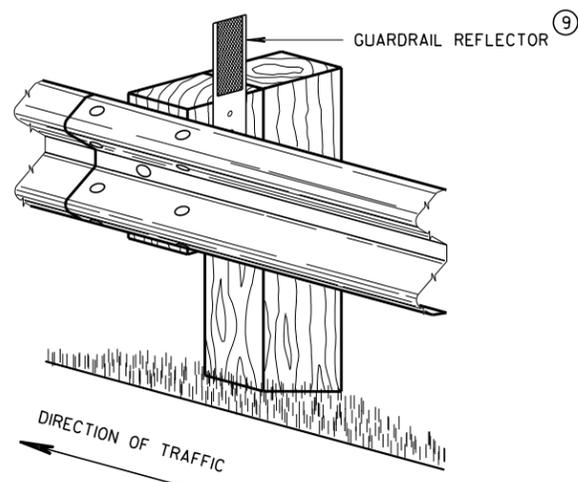


NESTED W BEAM (NW)
USE ALL OTHER STANDARD BEAM GUARD DETAILS FOR
CONSTRUCTING NESTED W BEAM (NW)

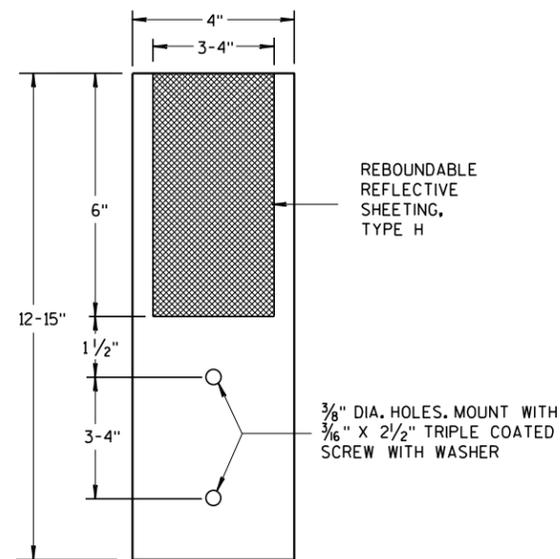
6

6

* USE DOUBLE SIDED WHITE GUARDRAIL REFLECTORS ON ROADWAYS WITH BI-DIRECTIONAL TRAFFIC (NO MEDIAN). USE SINGLE SIDED WHITE (RIGHT SIDE) AND SINGLE SIDED YELLOW (LEFT SIDE) ON ROADWAYS WITH MEDIAN SEPARATION.



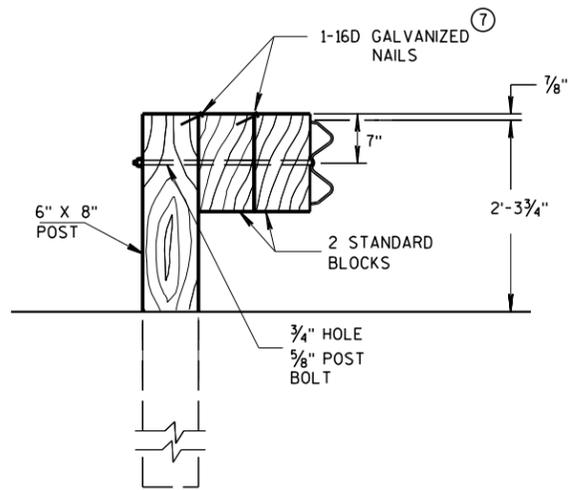
**4" X 12" GUARDRAIL REFLECTOR DETAIL
AND TYPICAL INSTALLATION ***



4" x 12" GUARDRAIL REFLECTOR

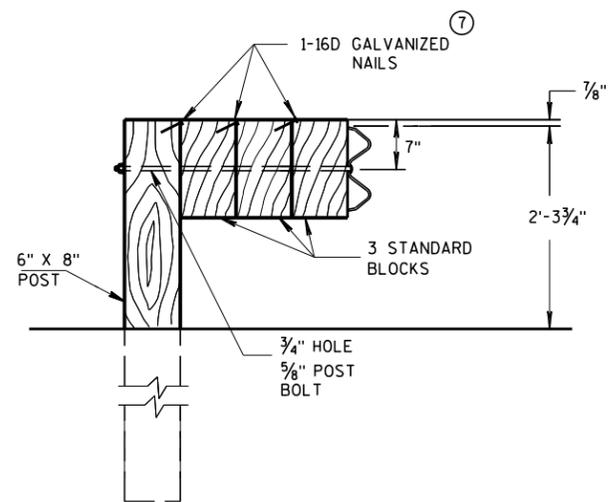
**STEEL PLATE BEAM GUARD,
CLASS "A",
INSTALLATION & ELEMENTS**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



DETAIL FOR DOUBLE BLOCKS

THE NUMBER OF DOUBLE BLOCK POSTS WITHIN A BARRIER RUN IS UNLIMITED

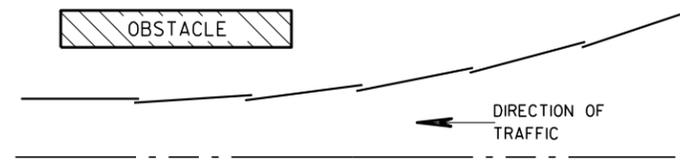


DETAIL FOR TRIPLE BLOCKS

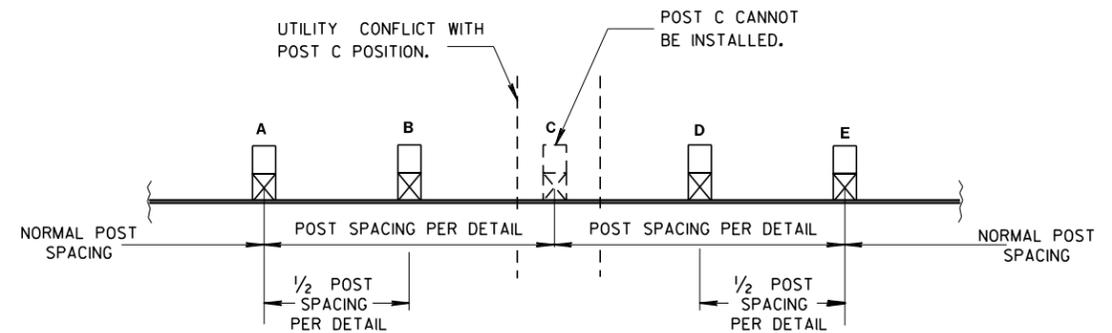
TRIPLE BLOCK DETAIL IS LIMITED TO ONE LOCATION WITHIN A BEAM GUARD RUN.

NOTES: USE DOUBLE OR TRIPLE BLOCKS WHEN UNDERGROUND OBSTACLES PREVENT THE POST FROM BEING INSTALLED.

DO NOT USE EXTRA 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.



**PLAN VIEW
BEAM LAPPING DETAIL**



**POST DRIVING FOR CONTINUOUS
UNDERGROUND OBSTRUCTION**

STEEL PLATE BEAM GUARD, CLASS "A", INSTALLATION & ELEMENTS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June 2017	/s/ Rodney Taylor
DATE	ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
FHWA	

BILL OF MATERIALS

NOTE NO.	DESCRIPTION
①	WOOD BREAKAWAY TERMINAL POST: 5 1/2" X 7 1/2" X 3'-9"
②	STEEL TUBE TS 8" X 6" X 0.188", 6'-0"
④	WOOD BREAKAWAY CRT POST: 6" X 8" X 6'-0"
⑤	WOOD OFFSET BLOCKS: 6' X 8" X 1'-2"
⑥	PIPE SLEEVE: 2" X 5 1/2" STANDARD PIPE
⑦	BEARING PLATE
⑧	BCT CABLE ASSEMBLY
⑨	CABLE ANCHOR BOX
⑩	STRUT & YOKE
⑪	STEEL PLATE BEAM, END PANEL 12 GA.
⑫	STEEL PLATE BEAM: 12 GA. 13'-6 1/2"
⑬	IMPACT HEAD
⑭	0.040" ALUMINUM SHEET WITH REFLECTIVE SHEETING TYPE F PER SECTION 637 OF THE STANDARD SPECIFICATIONS

GENERAL NOTES

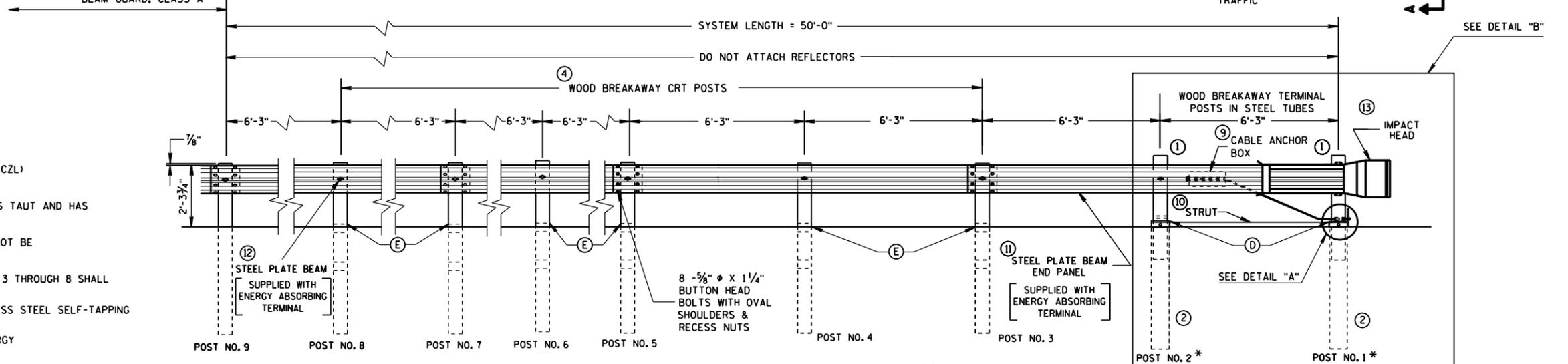
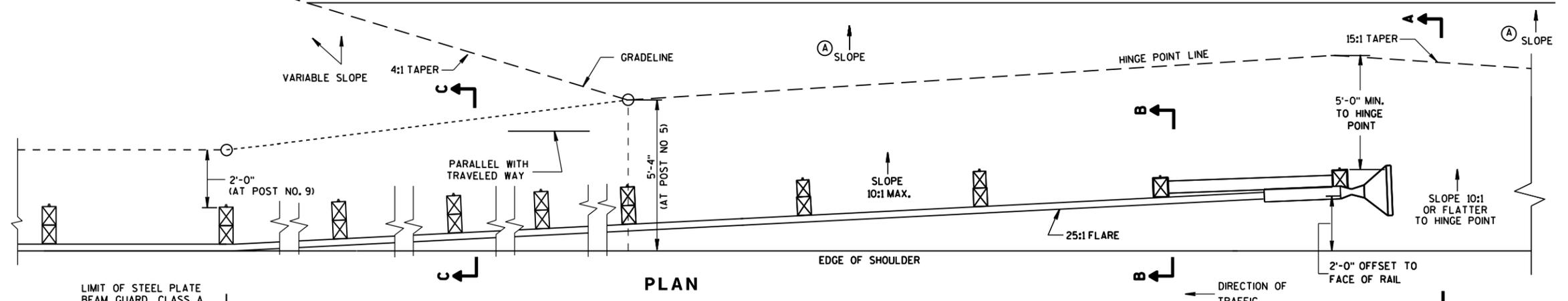
FOLLOW MANUFACTURE'S BOLTING RECOMMENDATIONS.

- (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.
- (D) THE TOP OF THE STEEL TUBE ON POSTS 1 AND 2 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.
- (E) THE CENTER OF THE UPPER 3 1/2" DIAMETER HOLE ON POST 3 THROUGH 8 SHALL BE 3/4" ABOVE THE FINISHED GROUND LINE.
- (F) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS, ONE SCREW PER CORNER.

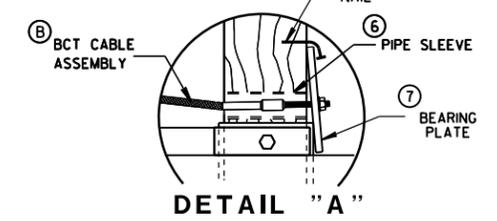
STEEL POSTS SHALL NOT BE ALLOWED FOR USE WITH ENERGY ABSORBING TERMINALS.
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

*DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.

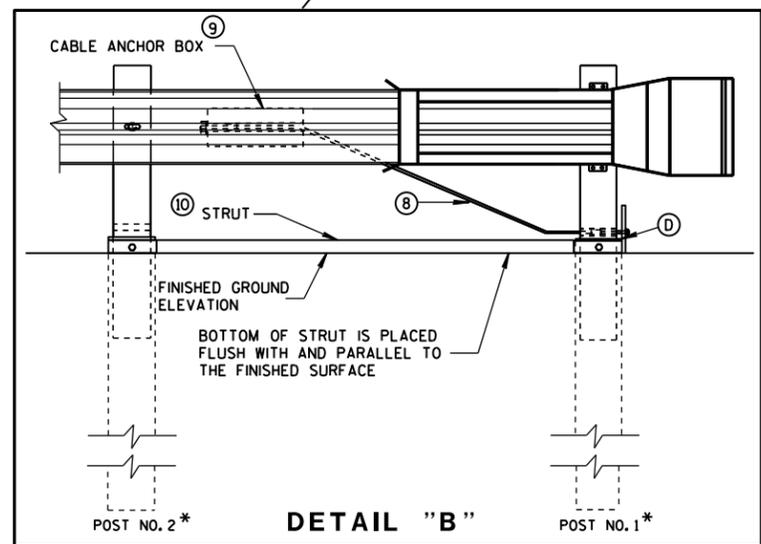
CLEAR ZONE LIMITS, EITHER AS SHOWN ELSEWHERE IN THE PLANS OR, IF NOT SHOWN ELSEWHERE IN THE PLANS, 15 FEET BEYOND THE HINGE POINT LINE



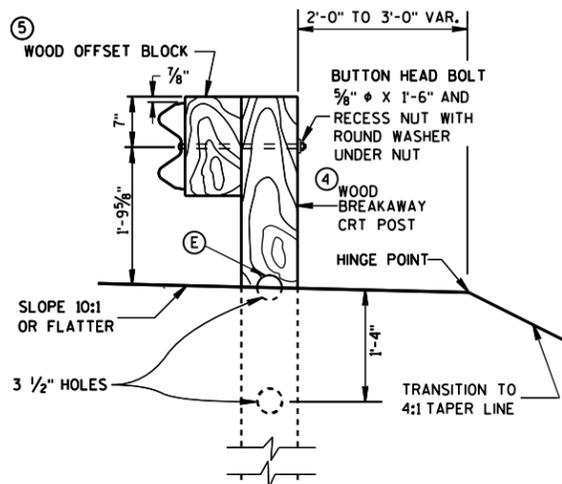
ELEVATION



DETAIL "A"

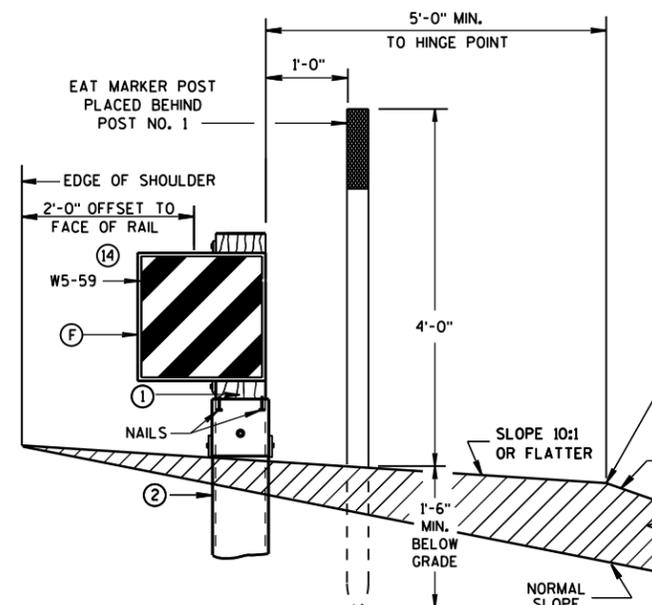


DETAIL "B"



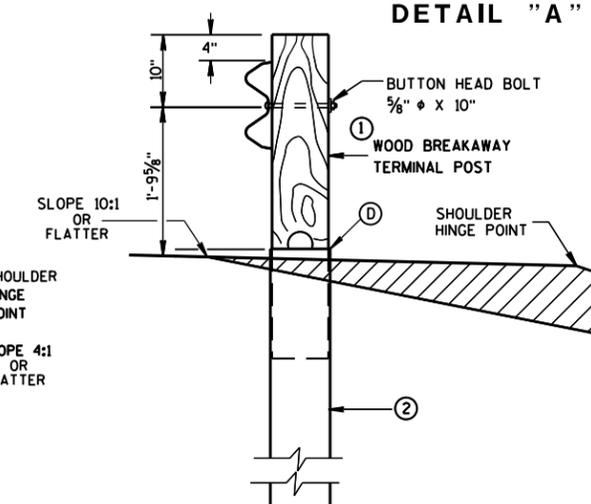
SECTION C-C

TYPICAL AT POST NOS. 6, 8



SECTION A-A

TYPICAL AT POST NO. 1*



SECTION B-B

TYPICAL AT POST NO. 2*

STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL

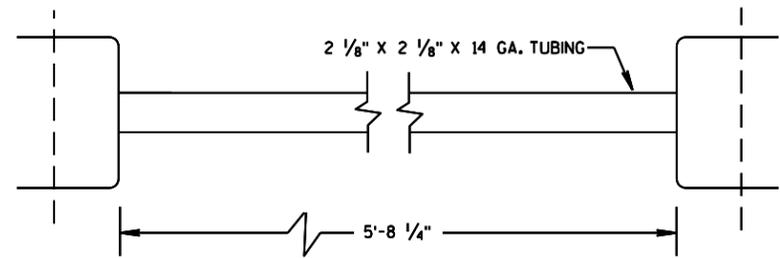
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

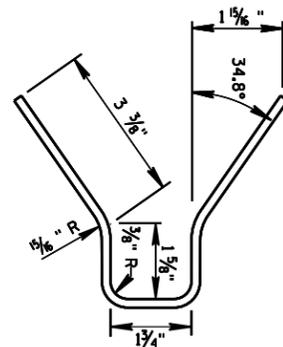
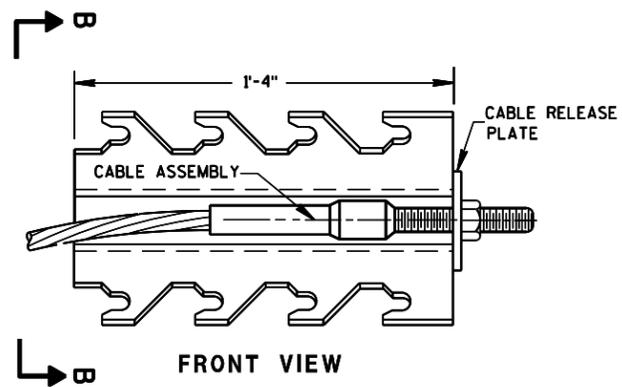
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S.D.D. 14 B 24-9a

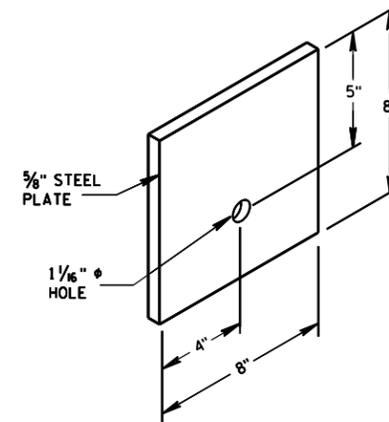
S.D.D. 14 B 24-9a



⑩ STRUT DETAIL



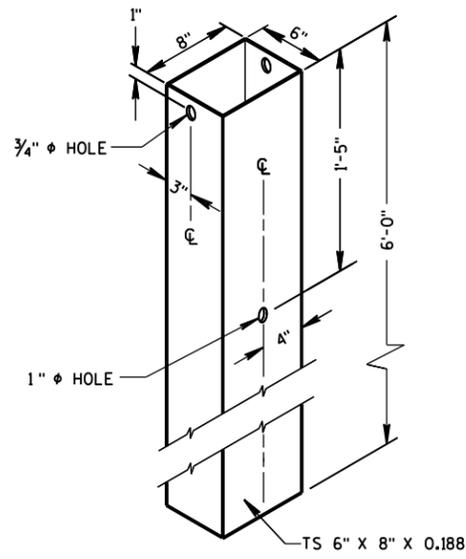
⑨ CABLE ANCHOR BOX



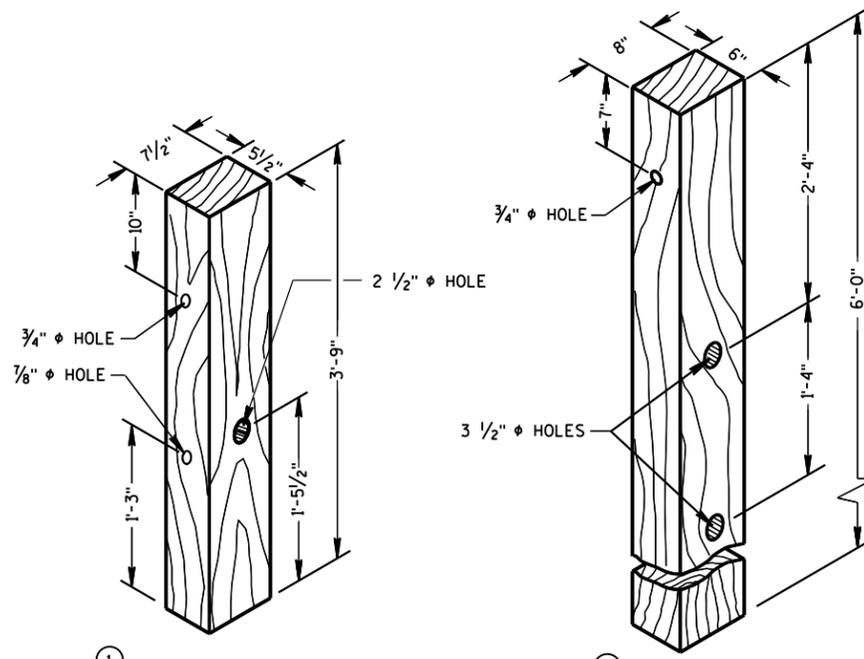
⑦ STEEL BEARING PLATE

6

6



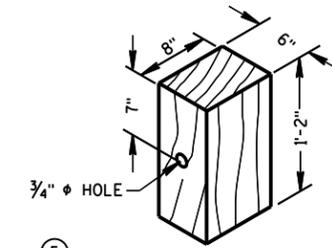
② **72" STEEL TUBE**
(POSTS NO. 1-2)



① **TERMINAL POST**

④ **CRT POST**
(POSTS NO'S 5-8)

WOOD BREAKAWAY POSTS



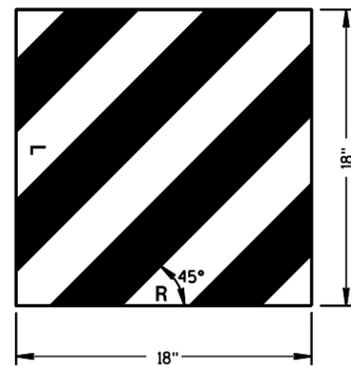
⑤ **WOOD OFFSET BLOCK**
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2

GENERAL NOTES

WHEN ROCK IS ENCOUNTERED DURING EXCAVATION, A 12 INCH DIA. POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK MAY BE USED IF APPROVED BY THE ENGINEER. GRANULAR MATERIAL SHALL BE PLACED IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 1/2" INCHES DEEP TO PROVIDE DRAINAGE. THE SOIL TUBES SHALL BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH ADEQUATELY COMPACTED MATERIAL EXCAVATED FROM THE HOLE.

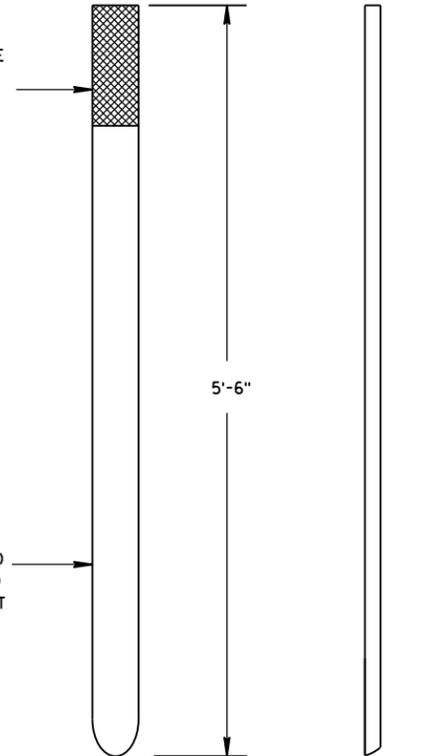
6

6



⑭ **REFLECTIVE SHEETING DETAILS**

TYPE H
YELLOW REFLECTIVE
SHEETING 3" X 9".
SEE STANDARD
SPECIFICATION 637.



E.A.T. MARKER
POST (YELLOW)
SEE APPROVED
PRODUCTS LIST

FRONT VIEW SIDE VIEW

E.A.T. MARKER POST

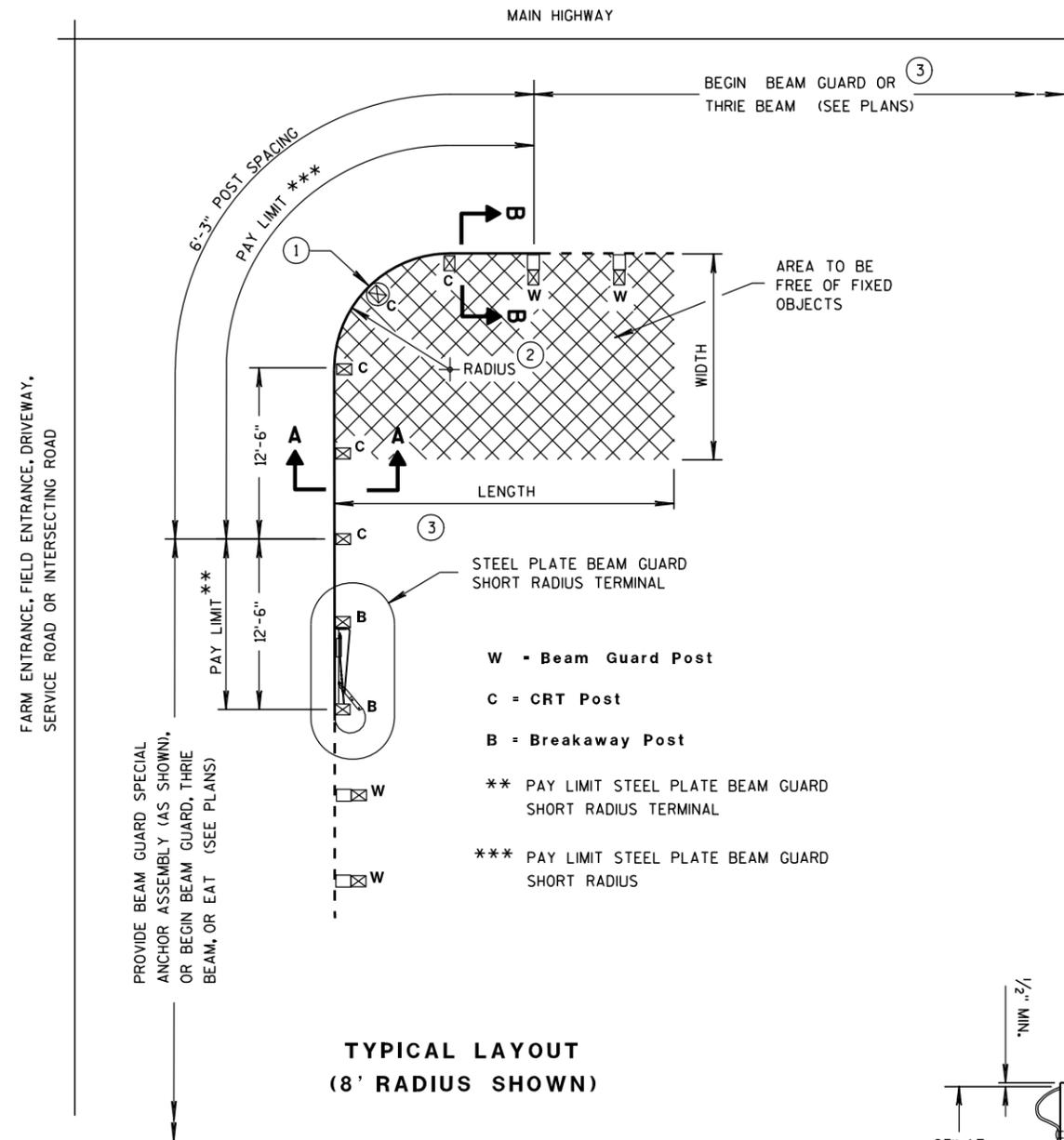
S.D.D. 14 B 24-9C

S.D.D. 14 B 24-9C

**STEEL PLATE BEAM GUARD
ENERGY ABSORBING TERMINAL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT
FHWA UNIT SUPERVISOR

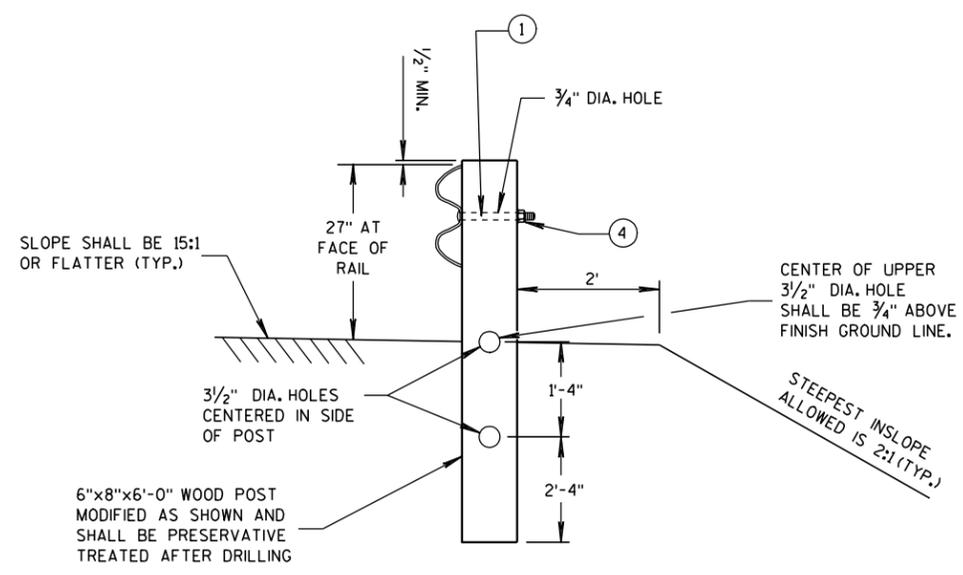


PROVIDE BEAM GUARD SPECIAL ANCHOR ASSEMBLY (AS SHOWN), OR BEGIN BEAM GUARD, THREE BEAM, OR EAT (SEE PLANS)

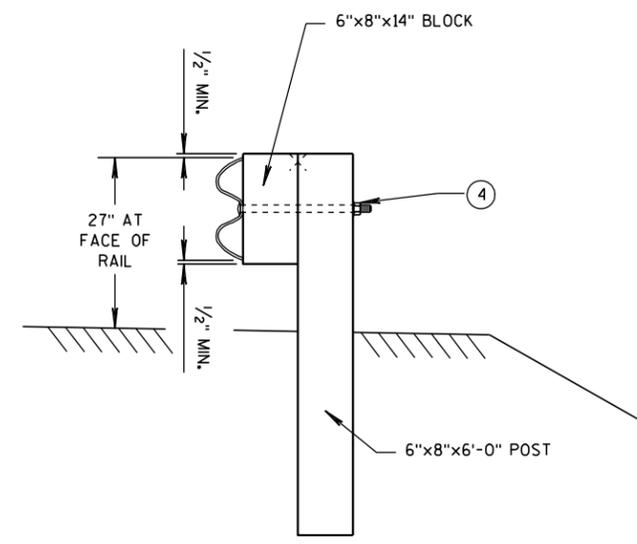
**TYPICAL LAYOUT
(8' RADIUS SHOWN)**

- W - Beam Guard Post
- C = CRT Post
- B = Breakaway Post
- ** PAY LIMIT STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
- *** PAY LIMIT STEEL PLATE BEAM GUARD SHORT RADIUS

**TYPICAL LAP SPLICES
(8' RADIUS SHOWN)**



**SECTION A-A
(CRT POST)**



**SECTION B-B
(BEAM GUARD POST)**

STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

GENERAL NOTES

ALL ANGLES, CHANNELS, AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36 AND THE STRUCTURAL TUBING SHALL CONFORM TO ASTM A 500. WELDING SHALL MEET THE CURRENT REQUIREMENTS OF THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE ANSI/AWS D1.1. ALL STRUCTURAL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123. PUNCHING, DRILLING, CUTTING, OR WELDING WILL NOT BE PERMITTED AFTER GALVANIZING. FURNISH AND INSTALL HARDWARE PER STANDARD SPECIFICATION 614.2. UNLESS NOTED OTHERWISE.

SHOP BEND CURVED RAIL SECTIONS.

SEE STANDARD DETAIL DRAWING 14 B 15 FOR OTHER DETAIL.

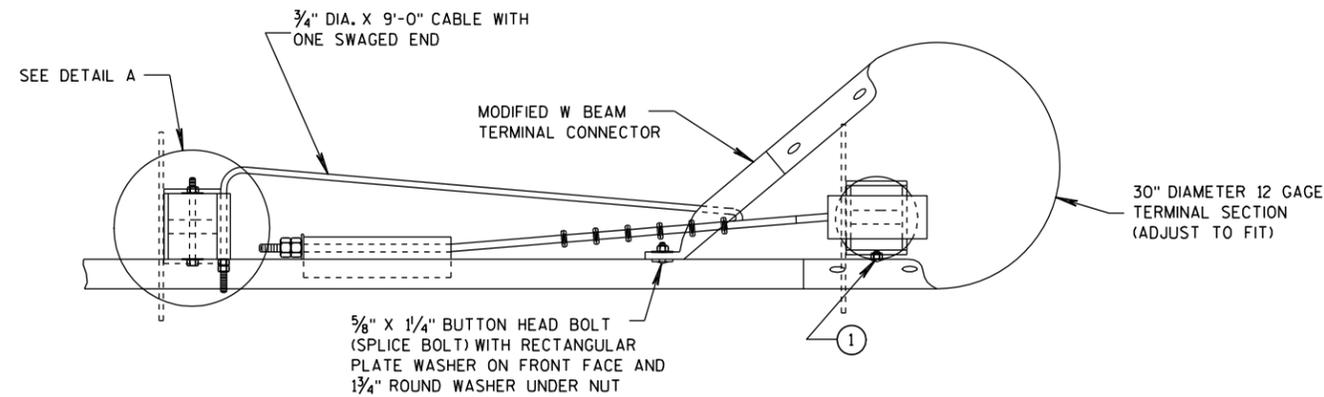
- ① ON THE 8 FOOT RADIUS INSTALLATION, DO NOT INSTALL BUTTON HEAD BOLT AT CENTER CRT POST.
- ② RADIUS FROM 8' - 36'. SEE PLAN.
- ③ HEIGHT TRANSITION MAY BE REQUIRED. SEE PLAN OR PROJECT ENGINEER.
- ④ 5/8" ϕ X 1'-6" BUTTON HEAD BOLT AND RECESS NUT WITH ROUND WASHER UNDER NUT.

RADIUS	NUMBER OF CRT POSTS	* NUMBER AND LENGTH OF CURVED RAILS	REQUIRED AREA FREE OF FIXED OBJECTS (LENGTH x WIDTH)
8'	5	1 at 12.5'	25' x 15'
16'	7	1 at 25'	30' x 15'
24'	9	1 at 25' and 1 at 12.5'	40' x 20'
32'	11	2 at 25'	50' x 20'

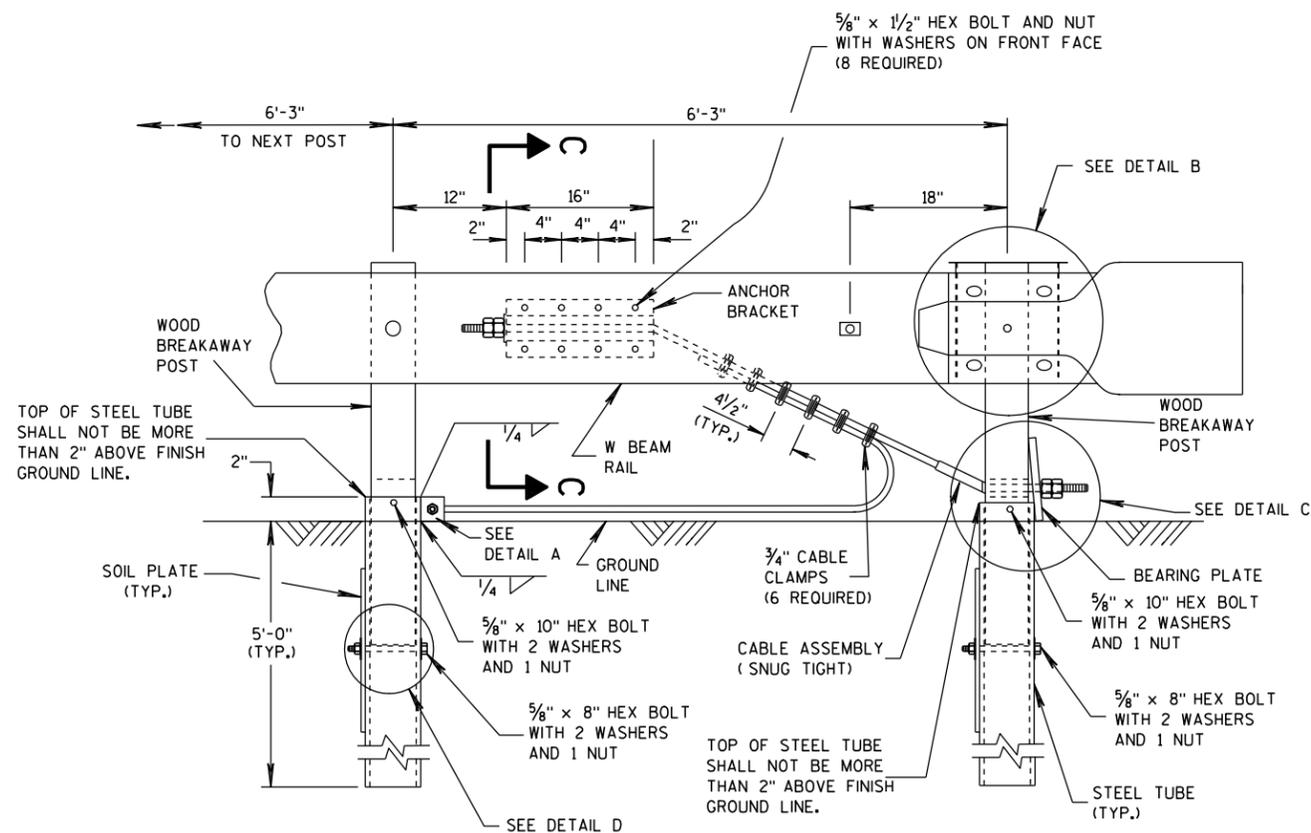
* THE NUMBER OF RAILS IS BASED ON A 90° INTERSECTION. SEE PLAN FOR NON 90° INSTALLATIONS.

**STEEL PLATE BEAM GUARD
SHORT RADIUS TERMINAL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



PLAN VIEW



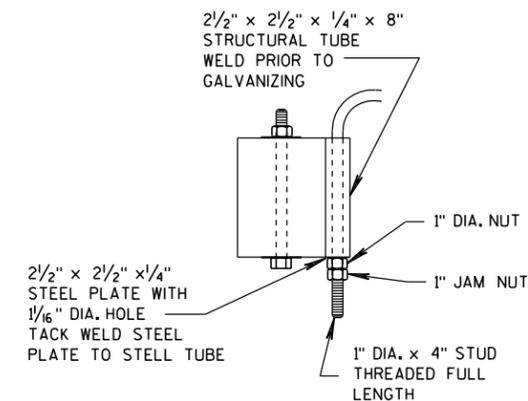
ELEVATION VIEW

STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

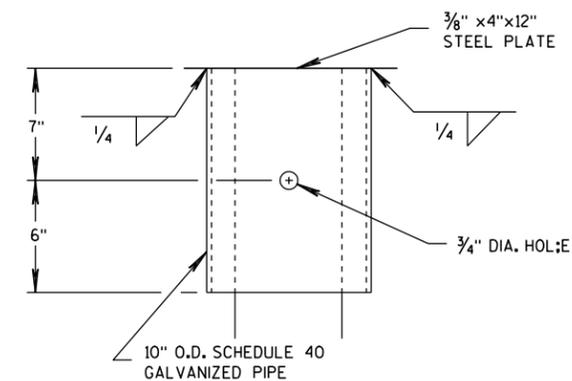
GENERAL NOTES

1 ATTACH W BEAM RAIL TO THE STEEL PIPE WITH A 5/8" X 2" BUTTON HEAD BOLT WITH NO WASHER. CONNECTION TO THE POST IS NOT REQUIRED.

INSTALL GALVANIZED 3/4" (6X19) PREFORMED WIRE OR INDEPENDENT WIRE ROPE CORE CONFORMING TO AASHTO M 30. MANUFACTURE WIRE ROPE OUT OF IMPROVED FLOW STEEL WITH A MINIMUM BREAKING STRENGTH OF 42,800 PSI.



DETAIL A



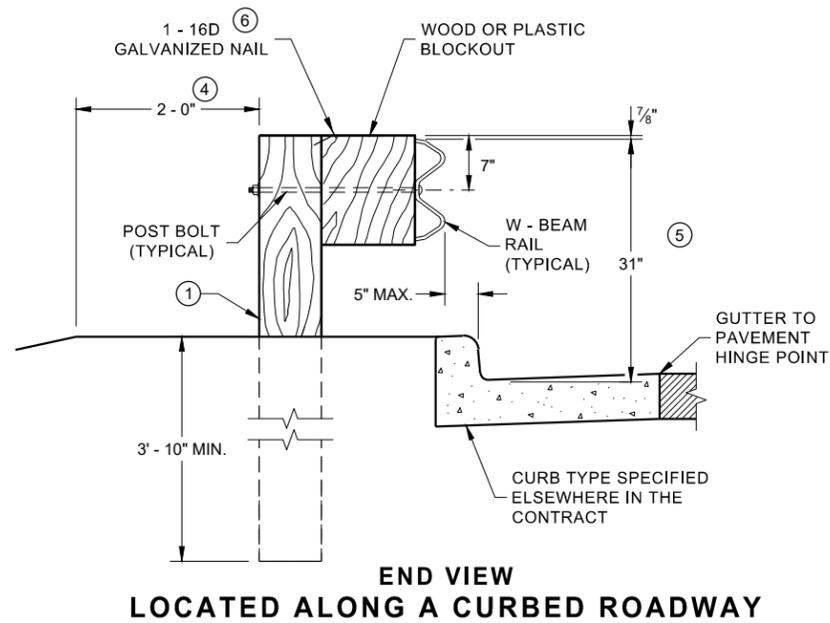
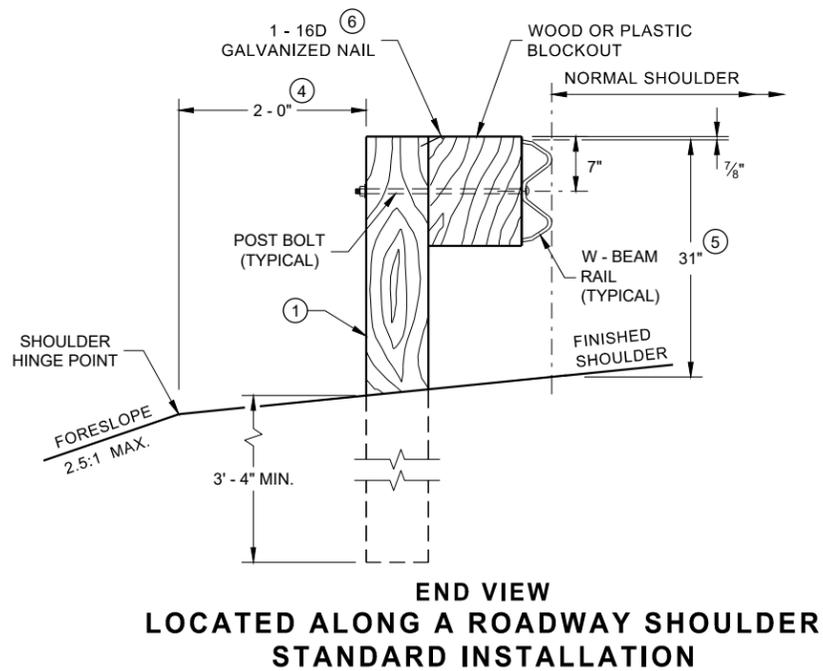
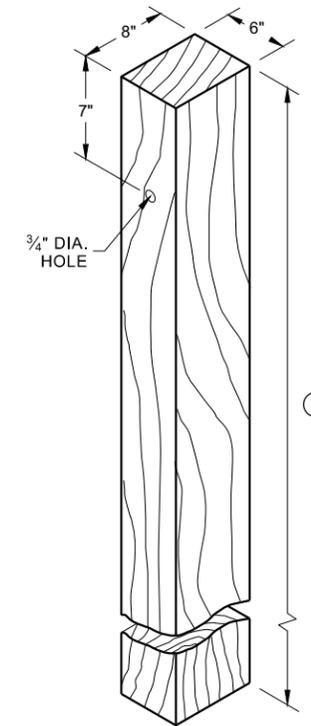
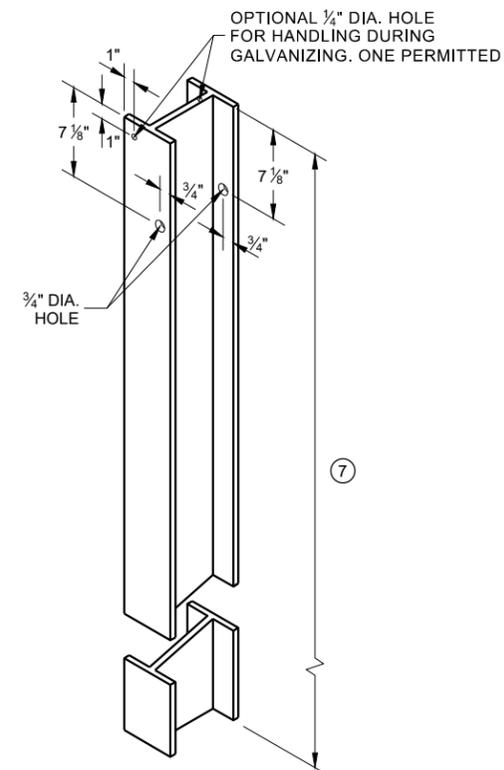
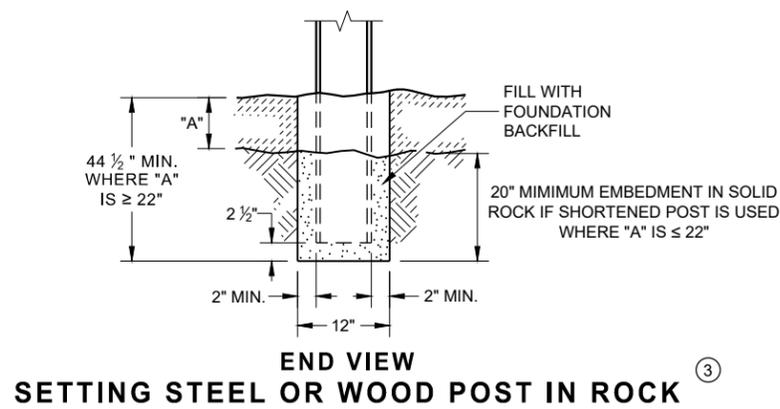
DETAIL B

(BEAM GUARD AND TERMINAL SECTION NOT SHOWN)

STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

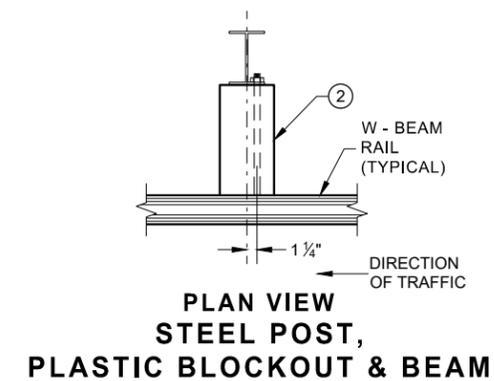
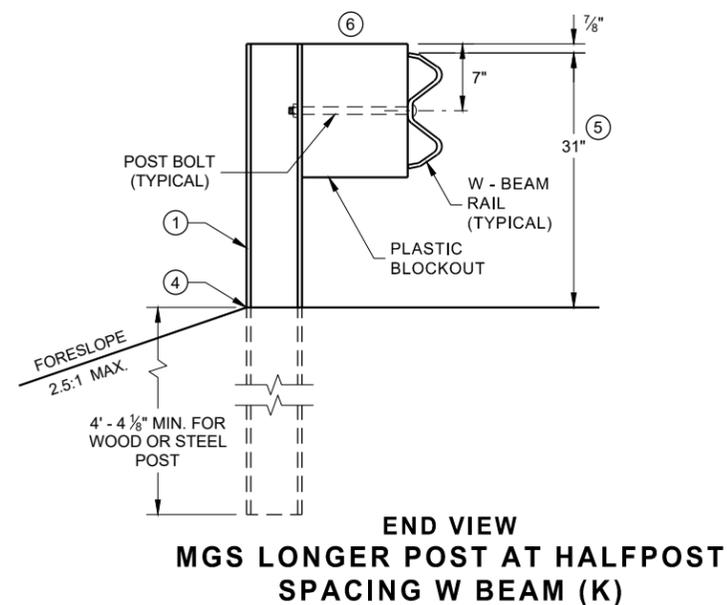
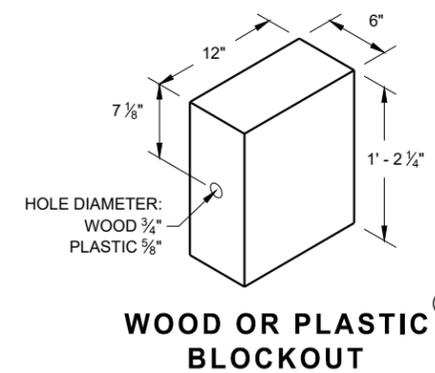
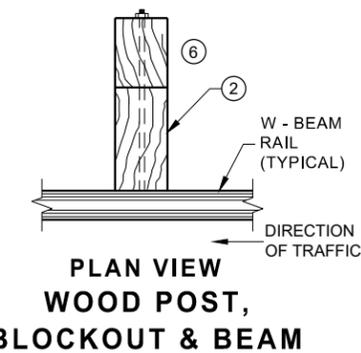
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

- 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 THE TO LENGTH AND INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.
- ④ WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).
- ⑤ FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS $\pm 1"$. 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".



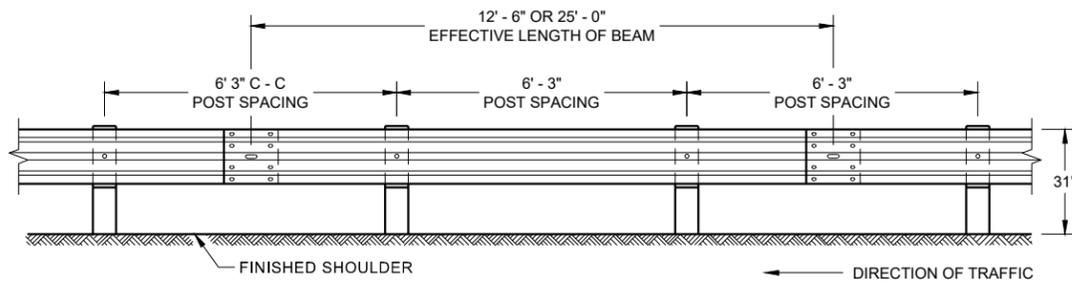
STEEL POST & HOLE PUNCHING DETAIL (W 6 X 9)

WOOD POST (6" X 8") NOMINAL

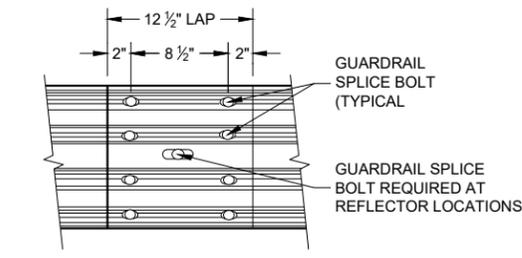


MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



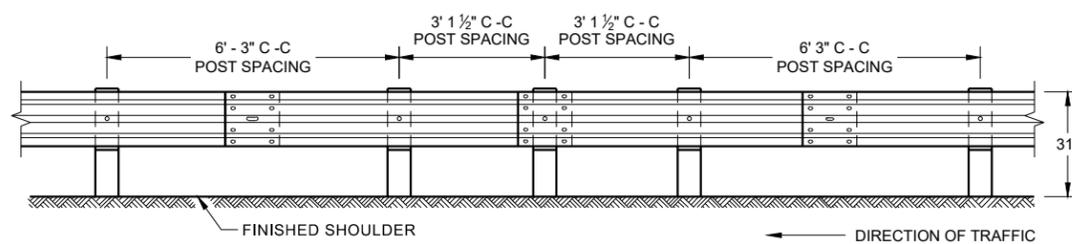
**FRONT VIEW
POST SPACING STANDARD INSTALLATION**



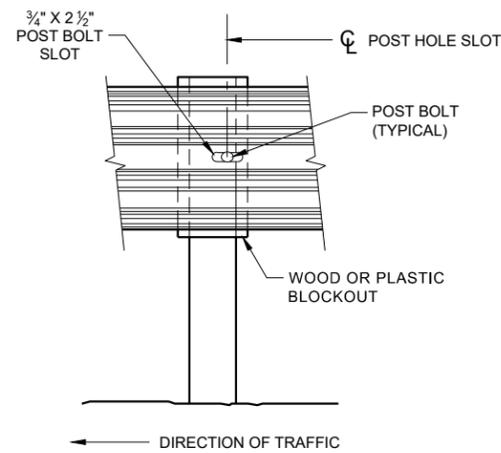
**FRONT VIEW
MID-SPAN BEAM SPLICE**

GENERAL NOTES

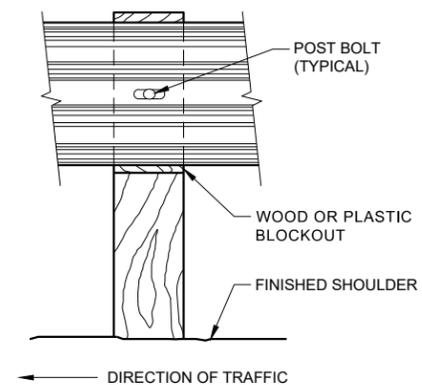
- ⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
 - ⑨ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.
- POST BOLTS ARE A 3/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 3/8" 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 3/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.



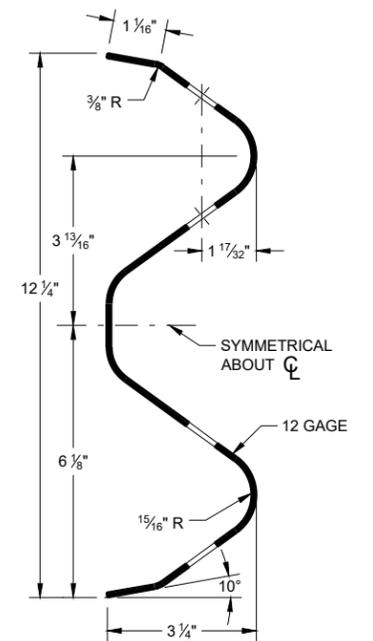
**FRONT VIEW
HALF POST SPACING (HS) AND
HALF POST SPACING WITH LONGER POSTS (K)**



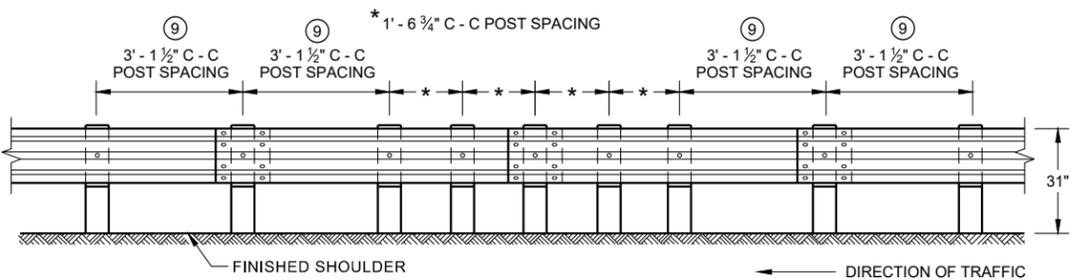
FRONT VIEW AT STEEL POST



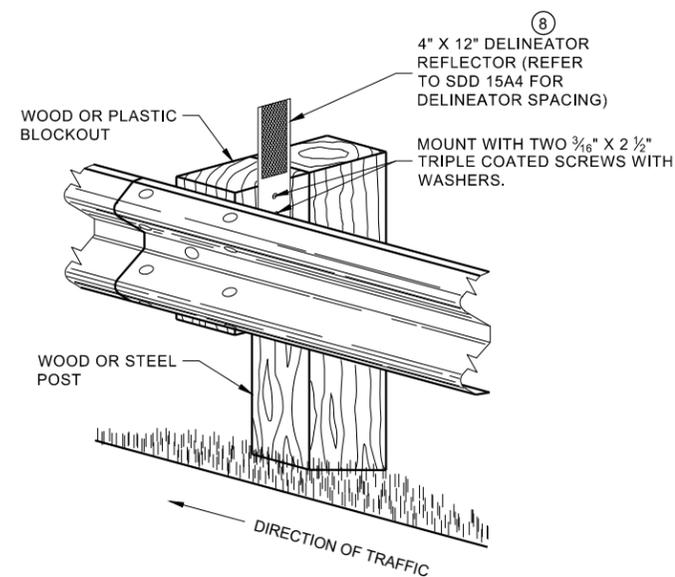
FRONT VIEW AT WOOD POST



SECTION THRU W-BEAM RAIL



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



**ONE SIDED REFLECTOR DETAIL
AND TYPICAL INSTALLATION**

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

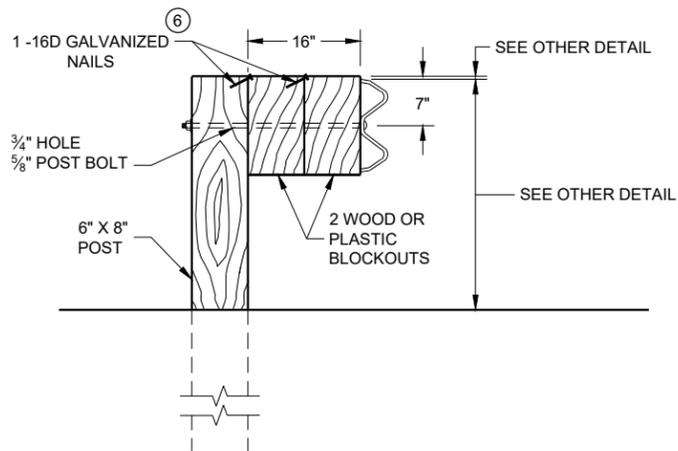
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

6

SDD 14B42 - 07b

SDD 14B42 - 07b

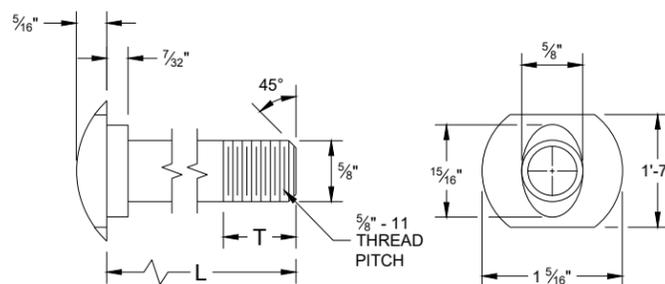


DETAIL FOR 16" BLOCKOUT DEPTH

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.

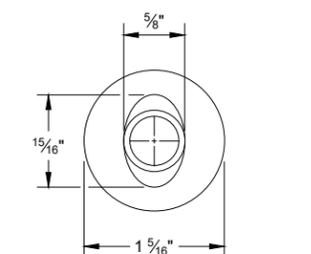
NOTE:

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.

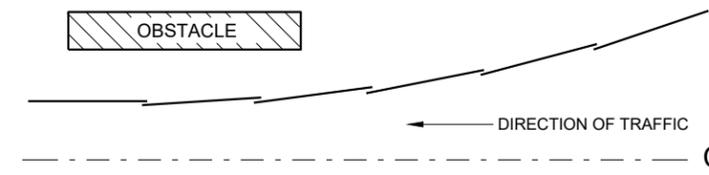


POST BOLT TABLE

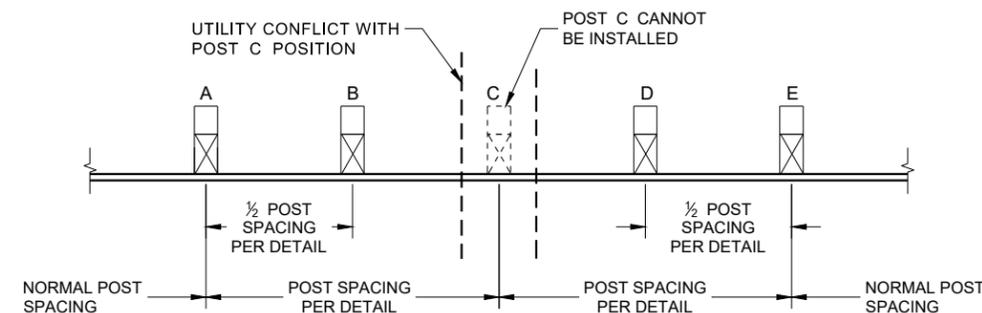
L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



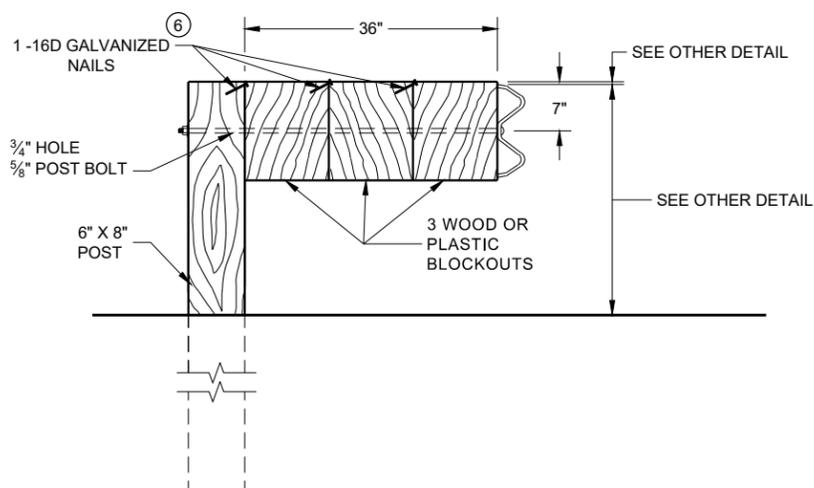
ALTERNATE BOLT HEAD



**PLAN VIEW
BEAM LAPPING DETAIL**

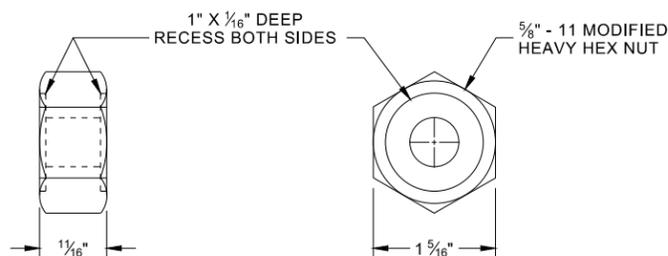


**POST DRIVING FOR CONTINUOUS
UNDERGROUND OBSTRUCTION**

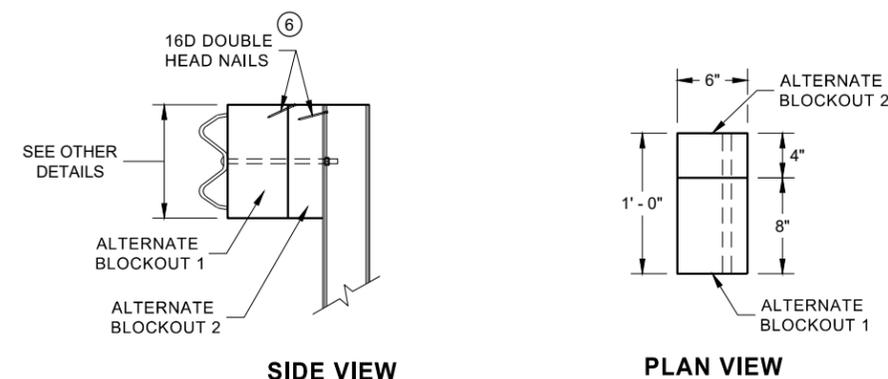


DETAIL FOR 36" BLOCKOUT DEPTH

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



**POST BOLT, SPLICE BOLT
AND RECESS NUT**

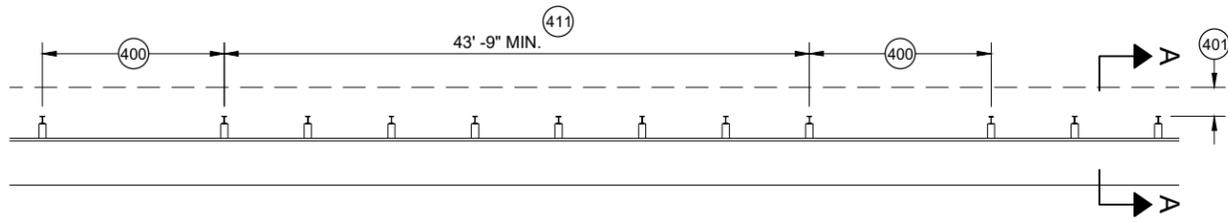


**ALTERNATE WOOD
BLOCKOUT DETAIL**

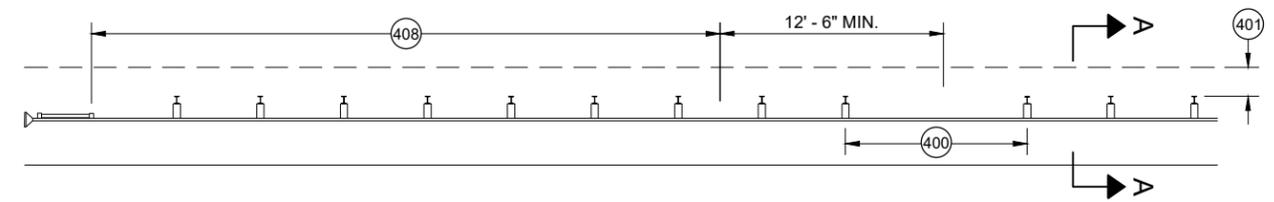
6 WHEN USING STEEL POST AND WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

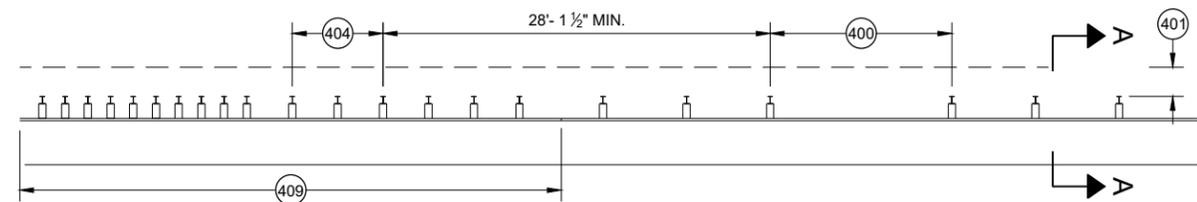
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



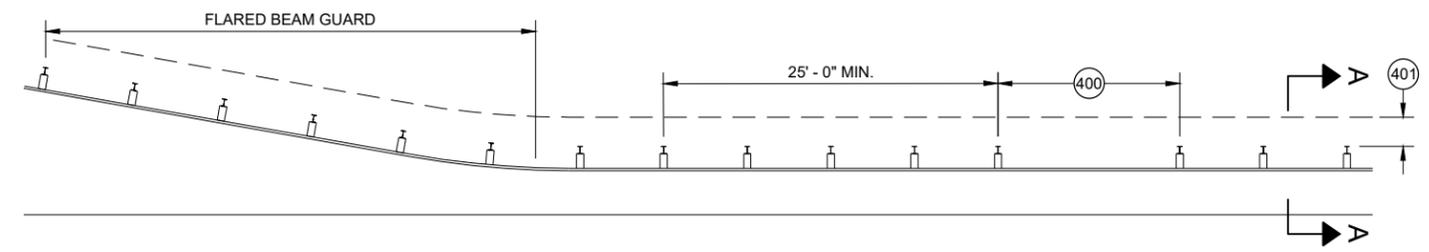
MISSING POST IN MGS GUARDRAIL



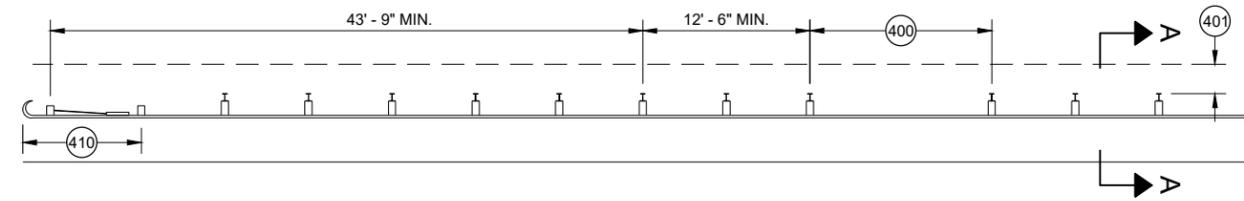
MISSING POST IN MGS GUARDRAIL NEAR EAT



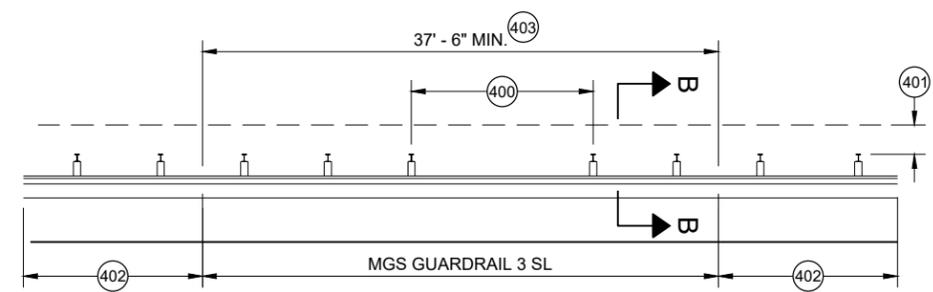
MISSING POST IN MGS GUARDRAIL NEAR AN APPROACH TRANSITION



MISSING POST IN MGS GUARDRAIL NEAR FLARED BEAM GUARD

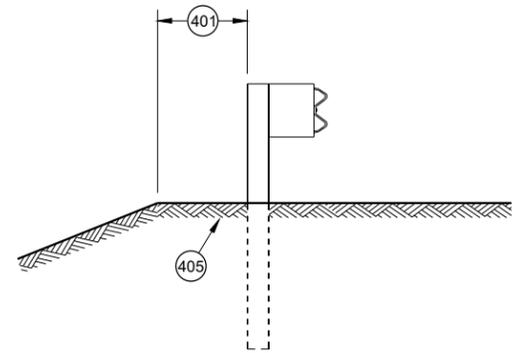


MISSING POST IN MGS GUARDRAIL NEAR A TYPE 2 END TERMINAL

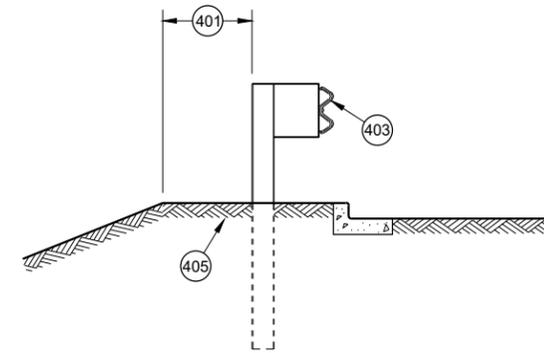


MISSING POST IN SHORT SPAN MGS GUARDRAIL NEAR CURB (SL)

- 400 MAX SPAN 12' - 6"
- 401 2' MIN.
- 402 MGS GUARDRAIL 3
- 403 NESTING BEAM GUARD
- 404 ASYMMETRIC TRANSITION
- 405 SOIL WELL DRAINED AND COMPACTED
- 406 SEE OTHER DRAWINGS IN THIS SDD
- 407 SEE OTHER DRAWINGS FOR MIN. SPACING BETWEEN SPANS
- 408 SEE SDD 14B44
- 409 SEE SDD 14B45
- 410 SEE SDD 14B47
- 411 MINIMUM DISTANCE BETWEEN MISSING POST SPANS.



SECTION A - A



SECTION B - B

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED May 2021 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
<small>FHWA</small>	

GENERAL NOTES

- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE 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.

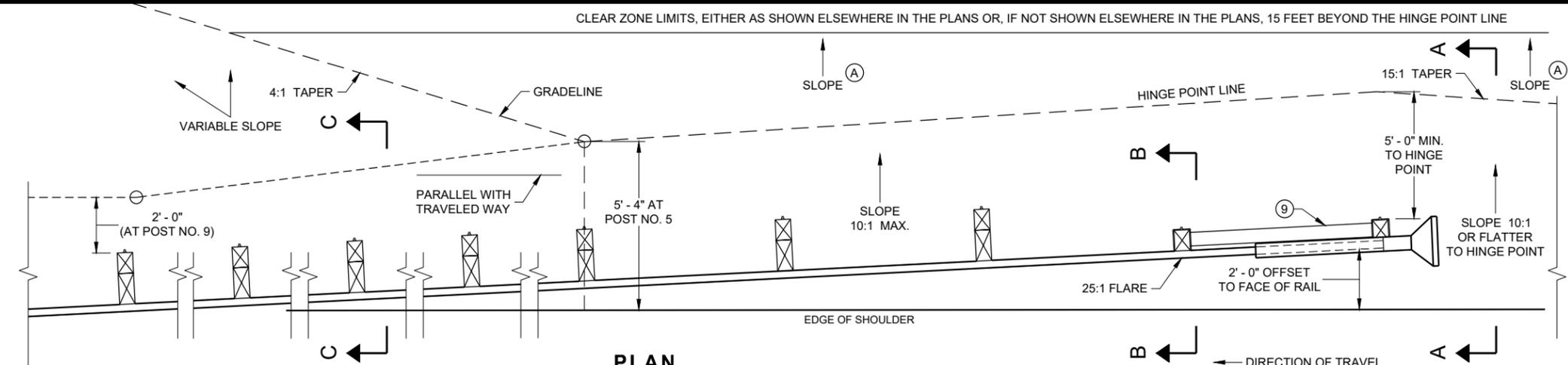
SEE SDD 14B42 FOR MORE INFORMATION.

* DO NOT ATTACH BLOCKOUTS TO POST 1 AND 2.

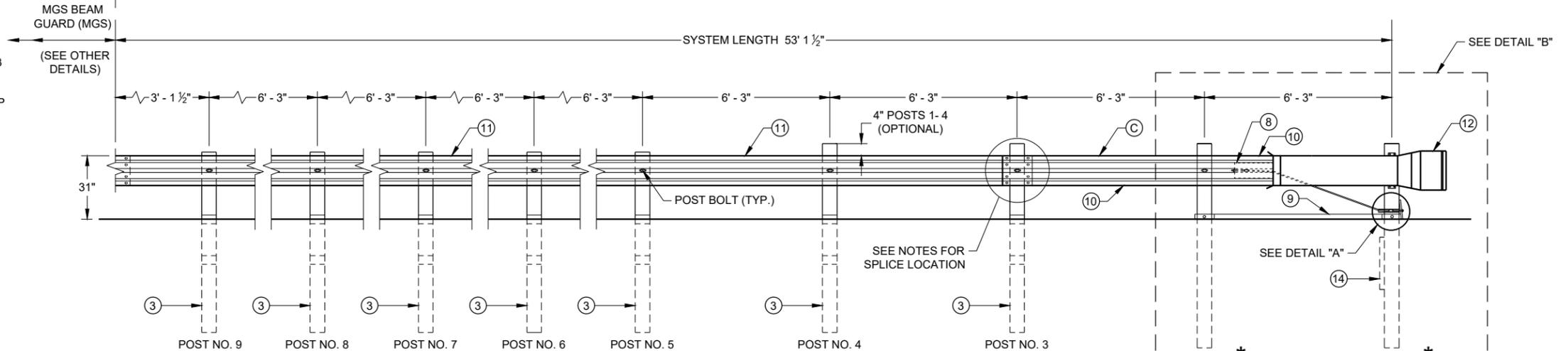
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

SEE MANUFACTURER'S DRAWING FOR SPLICE LOCATION, HARDWARE DIMENSIONS AND INSTALLATION INSTRUCTIONS.

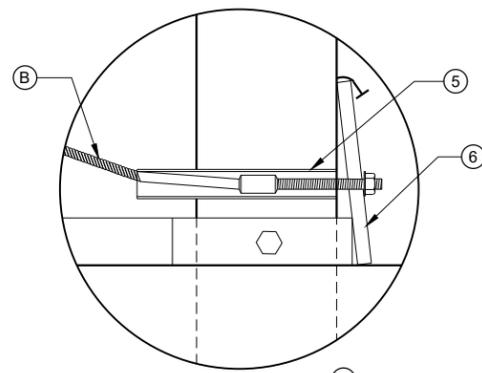
THE CENTER OF THE UPPER 3 1/2" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE. WOOD BLOCKS ON POSTS NUMBERED 3 THROUGH 9 MAY BE ADJUSTED UP TO 3" ABOVE THE TOP OF POST.



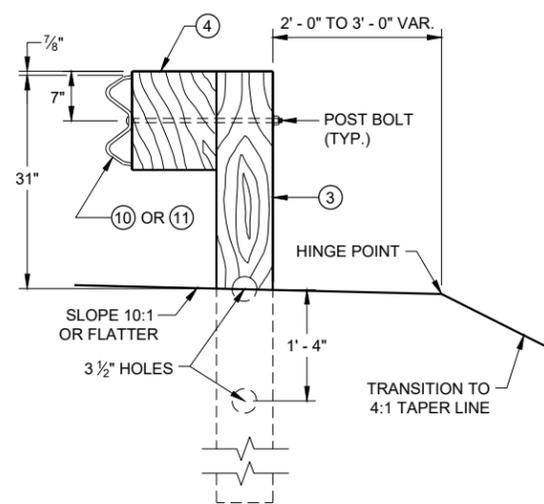
PLAN



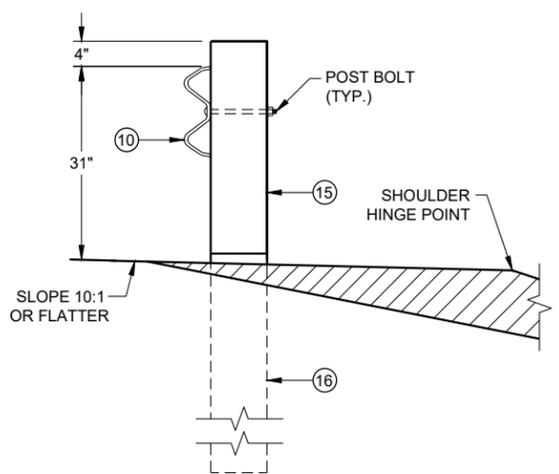
ELEVATION



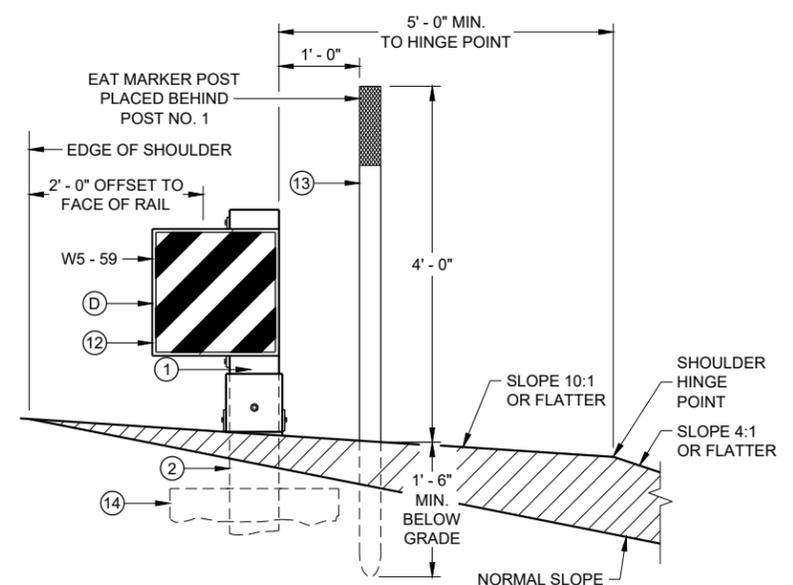
DETAIL "A"



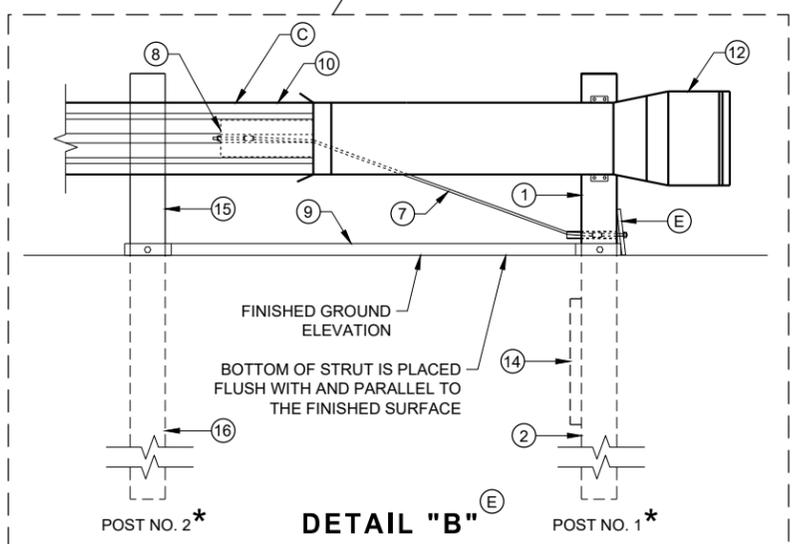
**SECTION C - C
TYPICAL AT POST NOS. 3 - 9**



**SECTION B - B
TYPICAL AT POST NO. 2***



**SECTION A - A
TYPICAL AT POST NO. 1***



DETAIL "B"

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

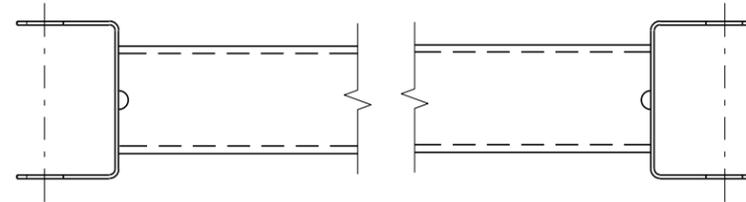
6

SDD 14B44 - 04a

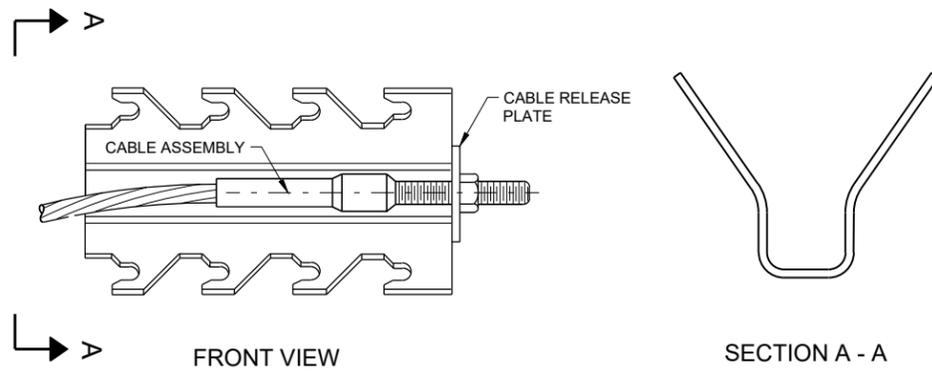
SDD 14B44 - 04a

BILL OF MATERIALS

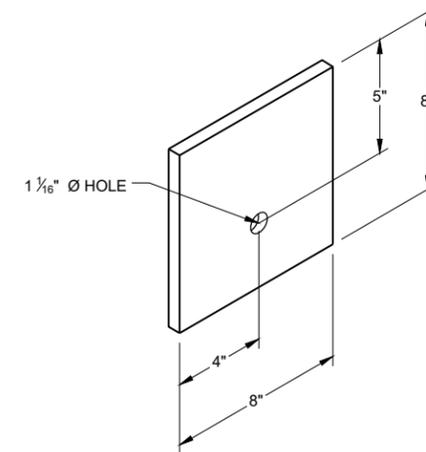
PART NO.	DESCRIPTION MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
①	UPPER POST NO. 1 6" X 6" TUBE
②	LOWER POST NO. 1
③	WOOD CRT
④	WOOD BLOCKOUT
⑤	PIPE SLEEVE
⑥	BEARING PLATE
⑦	BCT CABLE ASSEMBLY
⑧	ANCHOR CABLE BOX
⑨	GROUND STRUT
⑩	PERFORATED W-BEAM RAIL 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



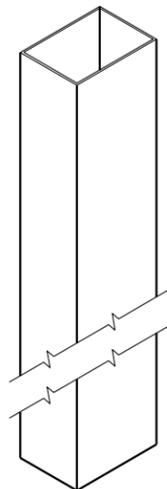
GENERIC GROUND STRUT ⑨ ⑤



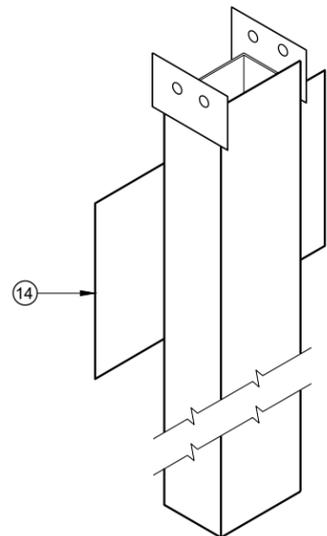
GENERIC ANCHOR CABLE BOX ⑨ ⑤



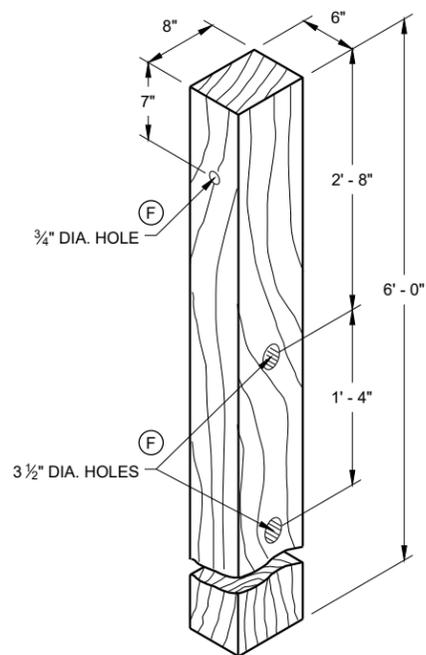
BEARING PLATE ⑥ ⑤



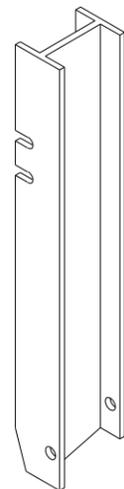
UPPER POST NO. 1 ⁽¹⁾ (E)



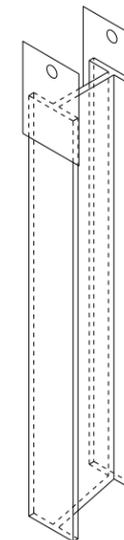
LOWER POST NO. 1 ⁽²⁾ (E)



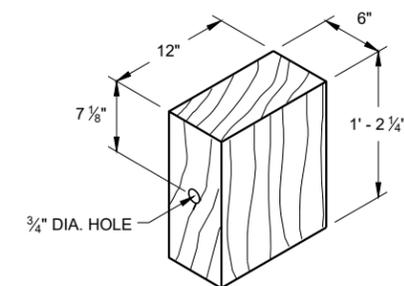
WOOD CRT POST ⁽³⁾ (E)
POSTS NUMBER 3-9



UPPER POST NO. 2 ⁽¹⁵⁾ (E)

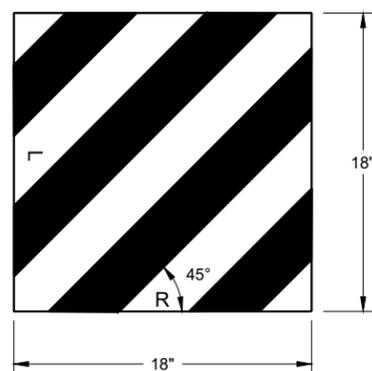


LOWER POST NO. 2 ⁽¹⁶⁾ (E)



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

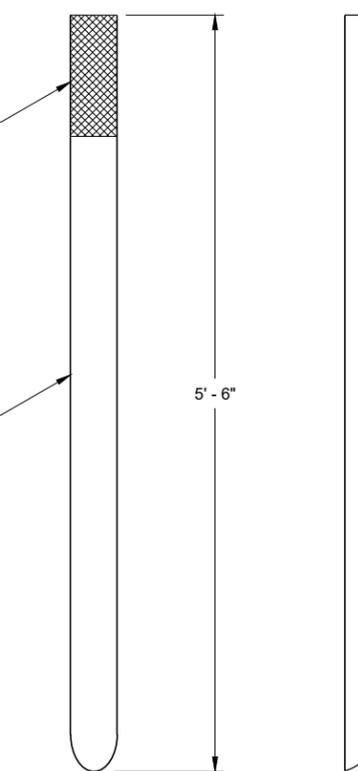
6



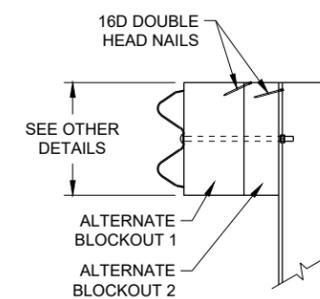
REFLECTIVE SHEETING DETAIL ^(E)

TYPE H
YELLOW REFLECTIVE
SHEETING 3" X 9".
SEE STANDARD
SPECIFICATION 637.

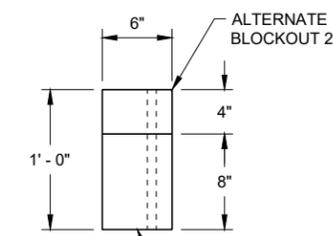
E.A.T. MARKER
POST (YELLOW)



FRONT VIEW SIDE VIEW
E.A.T. MARKER POST ⁽¹³⁾



SIDE VIEW



TOP VIEW

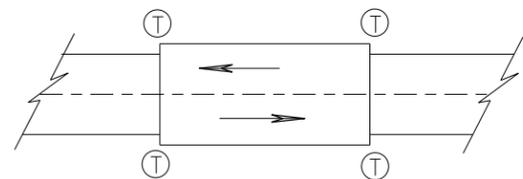
ALTERNATE WOOD
BLOCKOUT DETAIL

6

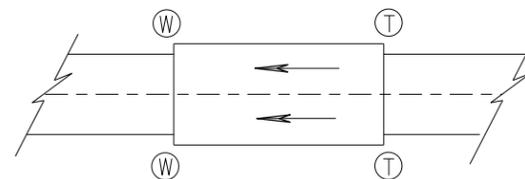
**MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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



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.

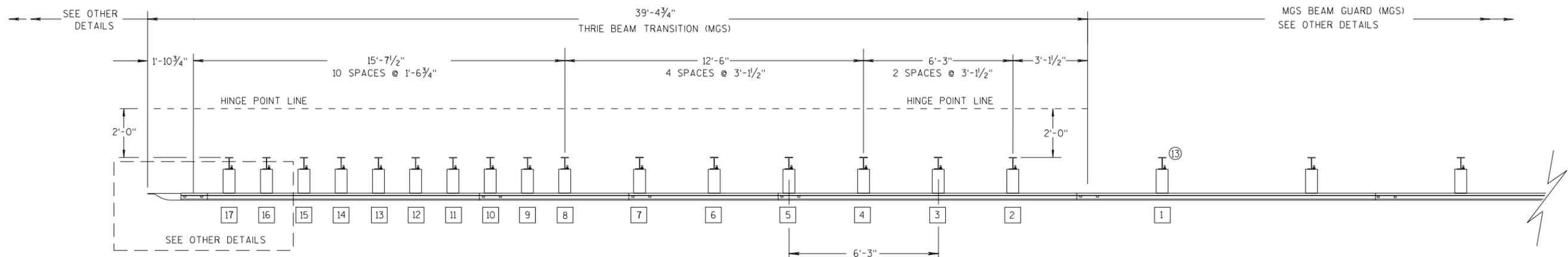
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

POST 2 THROUGH 17 USES STEEL POST ONLY

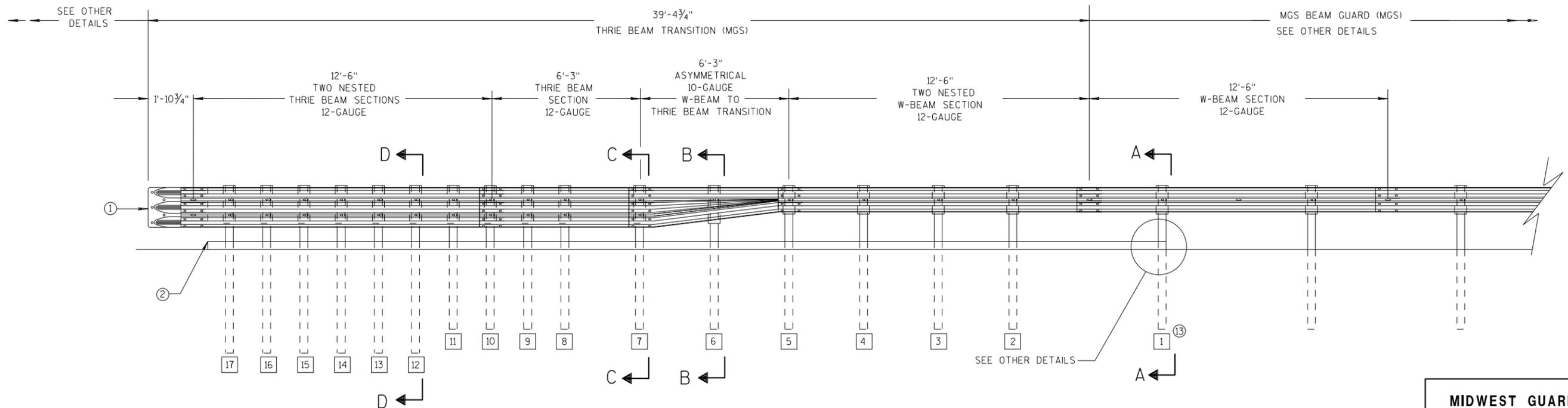
① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.

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

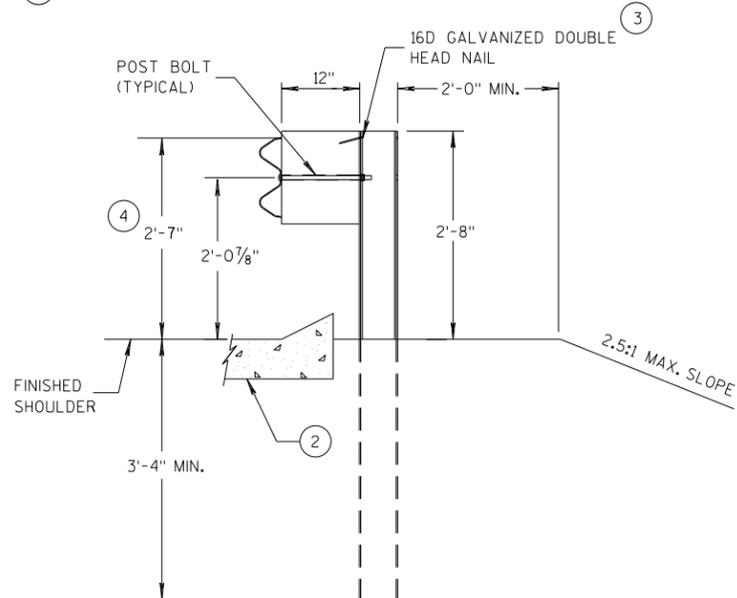
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

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

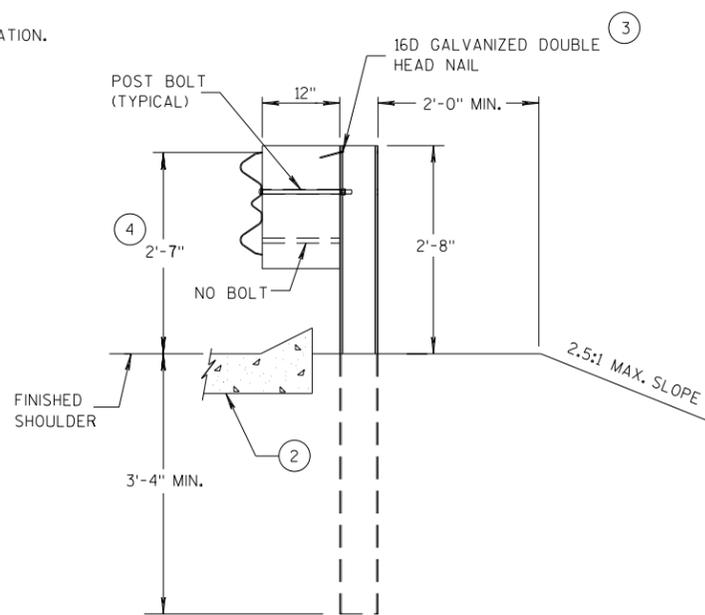
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

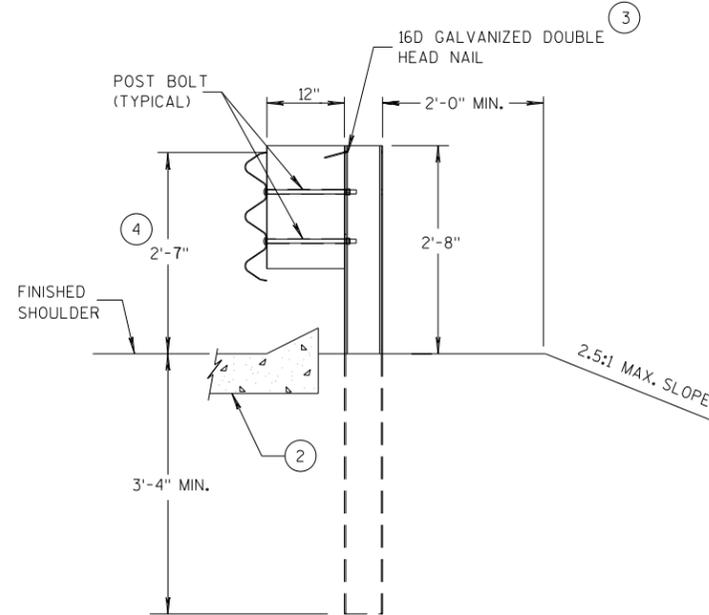
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ③ WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 10D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- ④ TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".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



**SECTION A-A
POSTS 1-5**



**SECTION B-B
POST 6**



**SECTION C-C
POSTS 7-11**

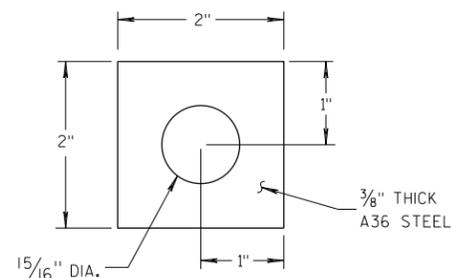
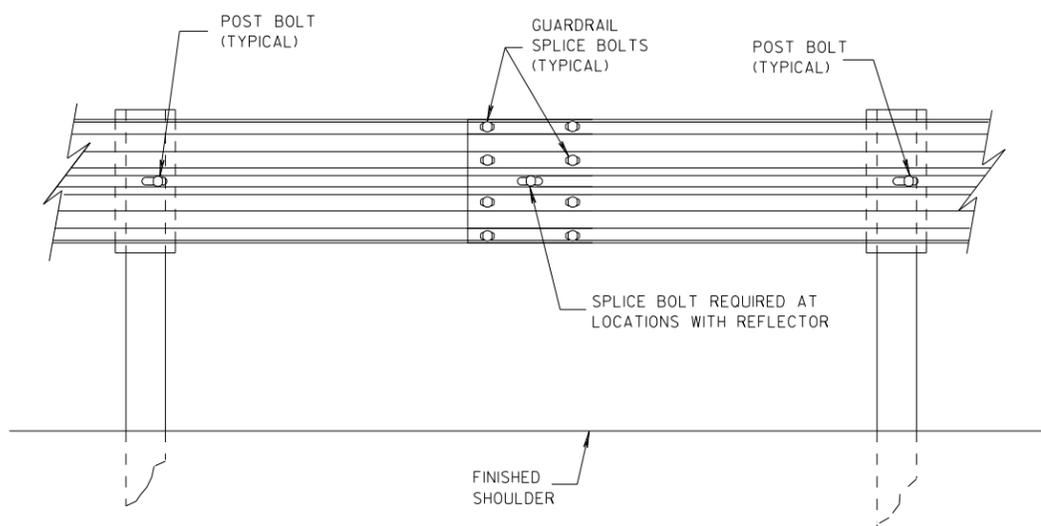
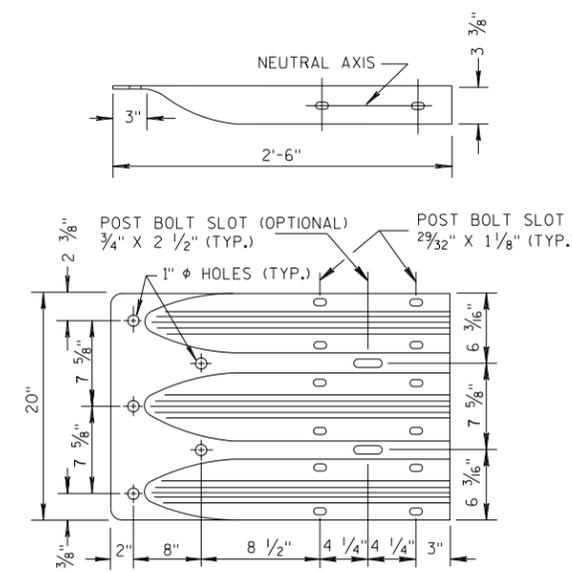


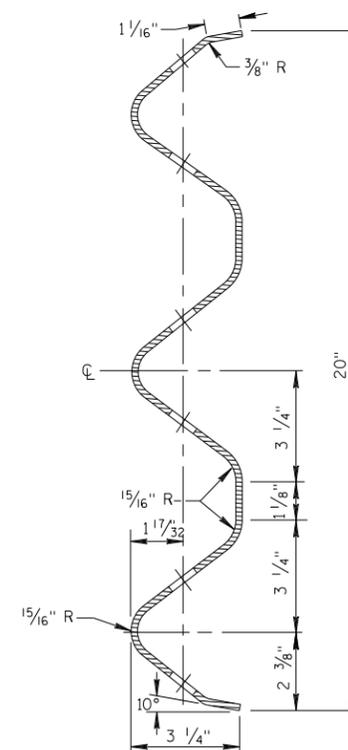
PLATE WASHER DETAIL



SPLICE DETAIL



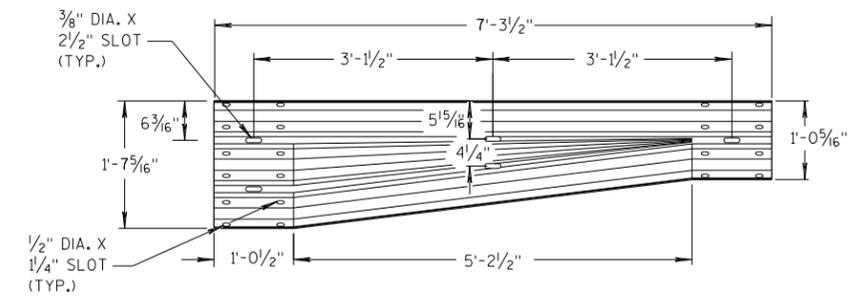
**THRIE BEAM
TERMINAL CONNECTOR**



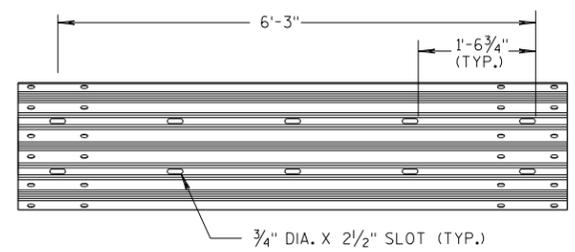
**SECTION THRU THRIE
BEAM RAIL ELEMENT**

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

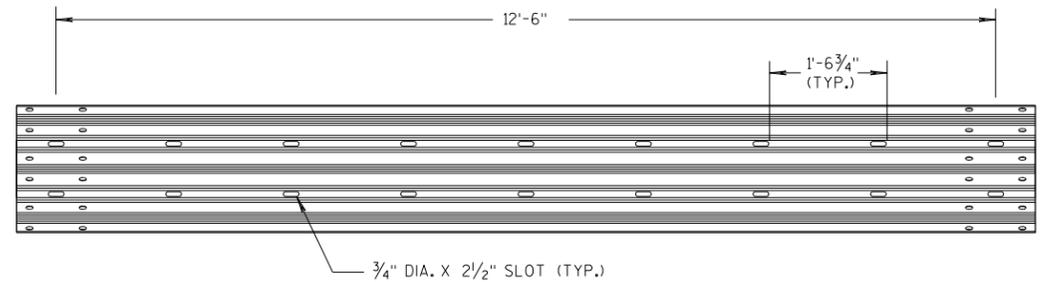
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



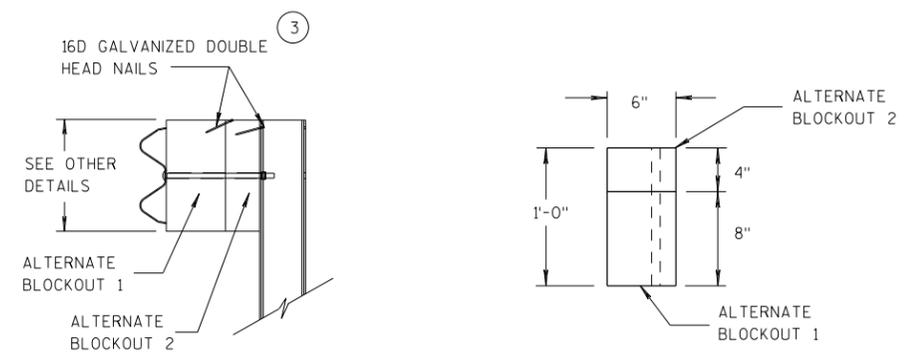
W-BEAM TO THRIE BEAM TRANSITION SECTION



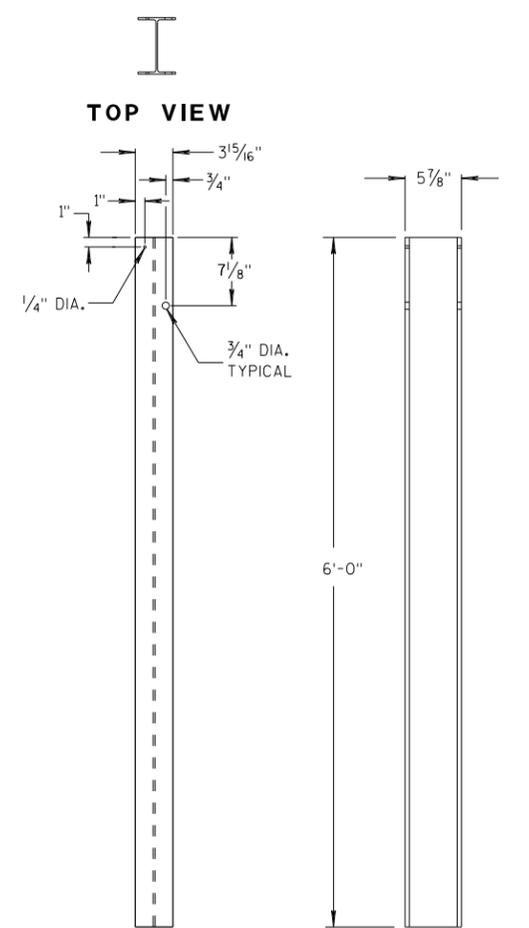
6'-3\"/>



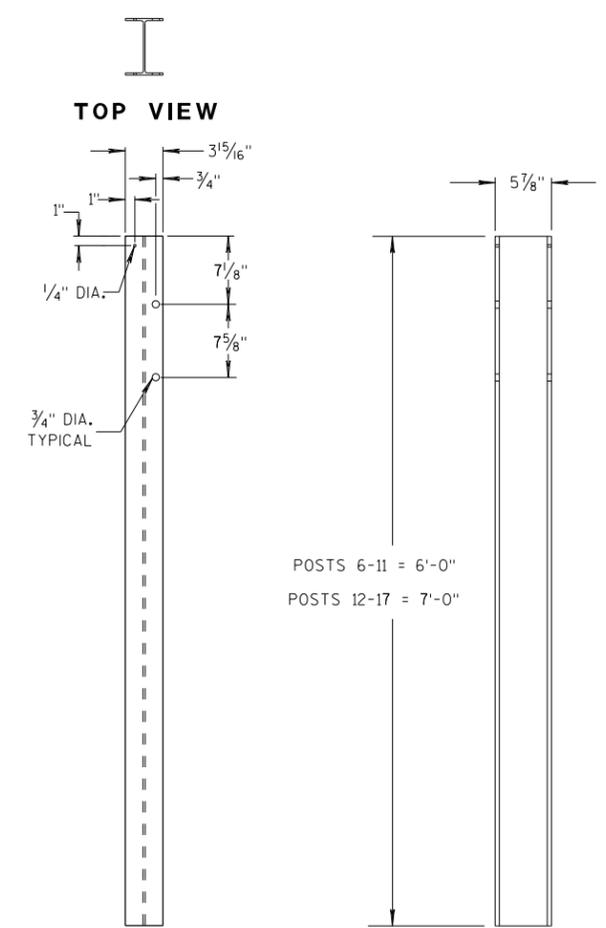
12'-6\"/>



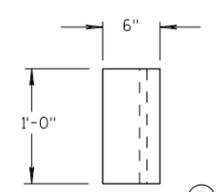
ALTERNATE WOOD BLOCKOUT DETAIL



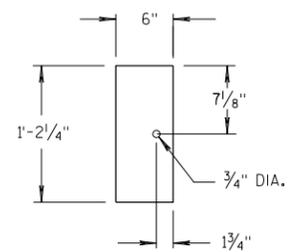
STEEL POSTS 1-5



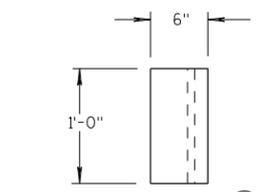
STEEL POSTS 6-17



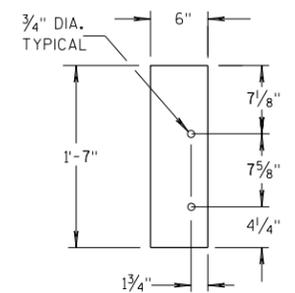
TOP VIEW



**FRONT VIEW
BLOCKOUT
POSTS 1-5**



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)**

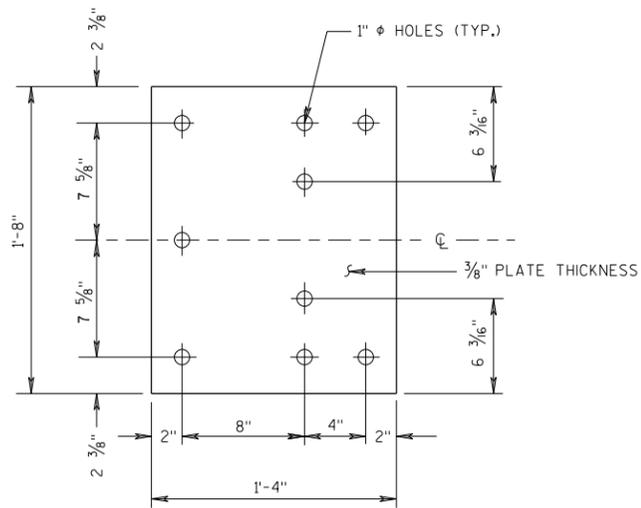
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

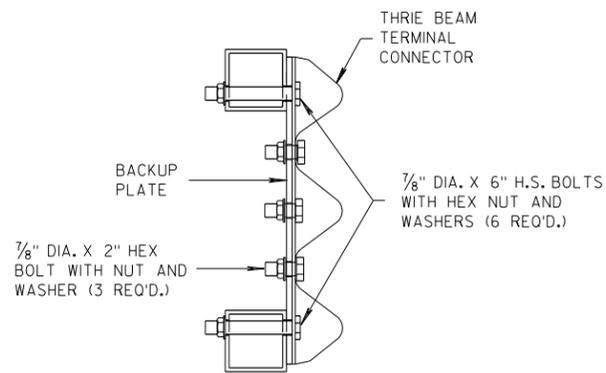
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S.D.D. 14 B 45-5c

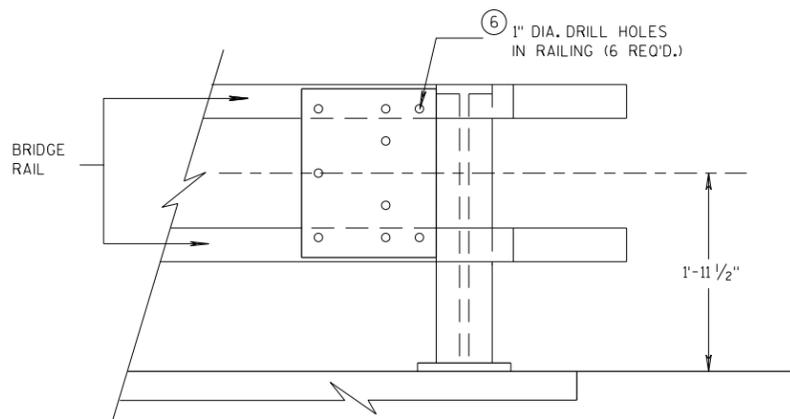
S.D.D. 14 B 45-5c



BACK-UP PLATE DETAIL



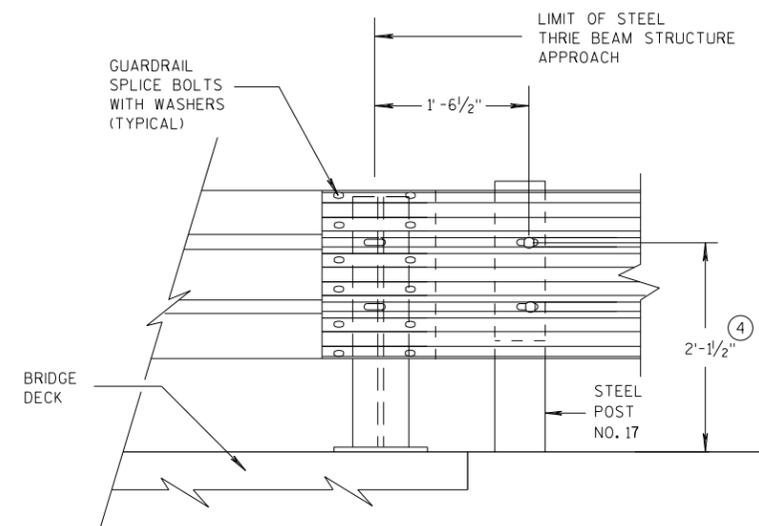
SECTION J-J



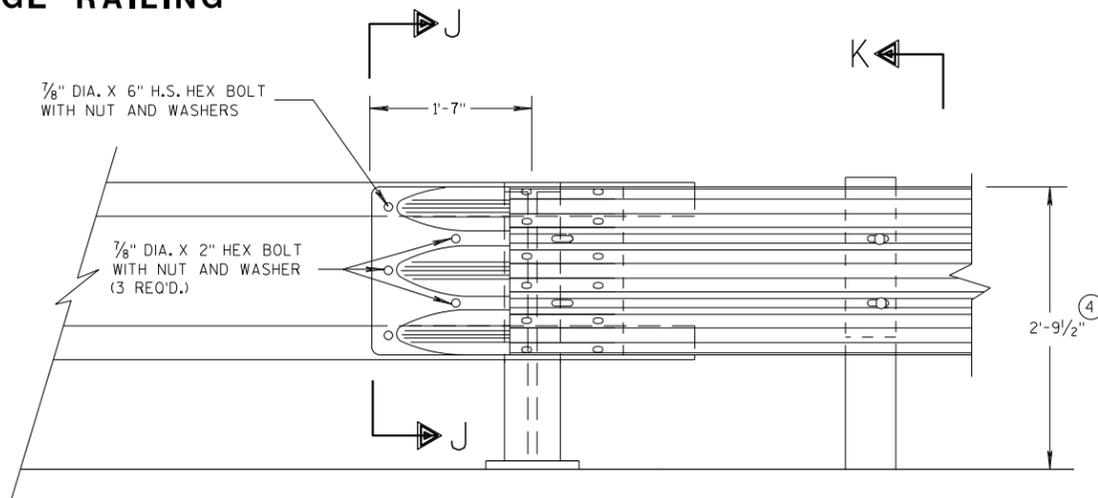
BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING

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.

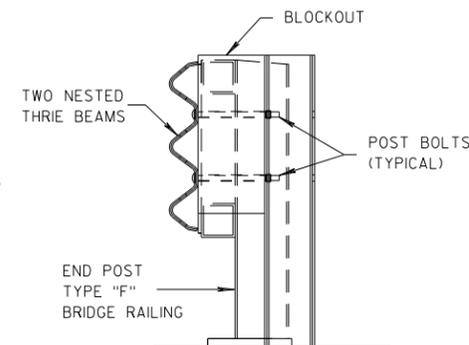


**FRONT VIEW
THRIE BEAM CONNECTION TO
STEEL RAILING TYPE "W"**



FRONT VIEW

**THRIE BEAM CONNECTION TO
TUBULAR RAILING TYPE "F"**



SECTION K-K

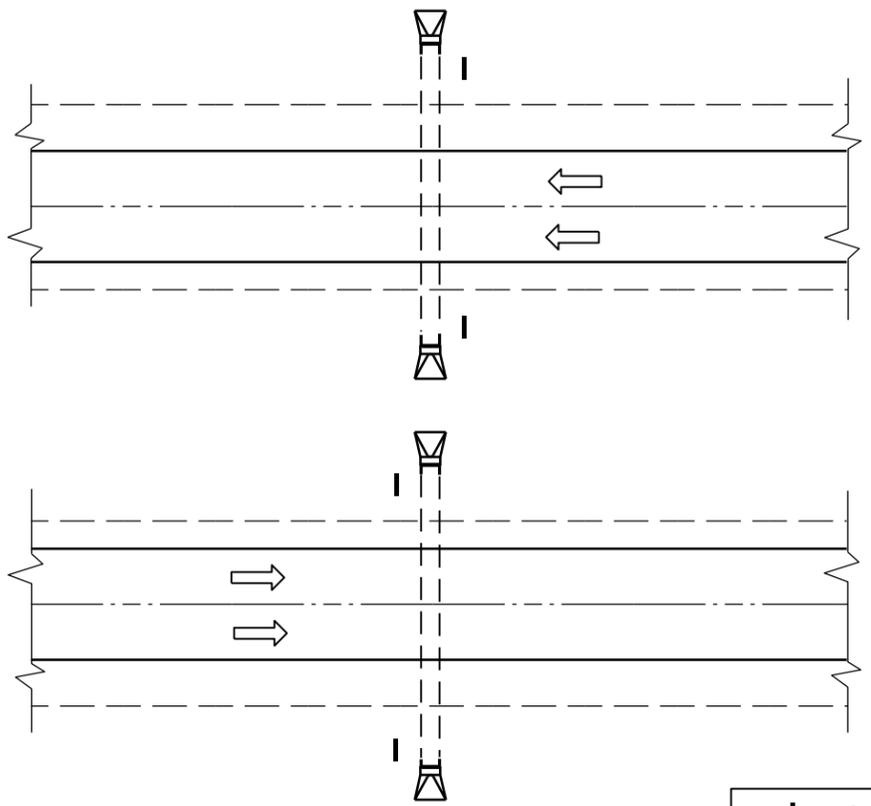
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 07/2018 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
FHWA	

6

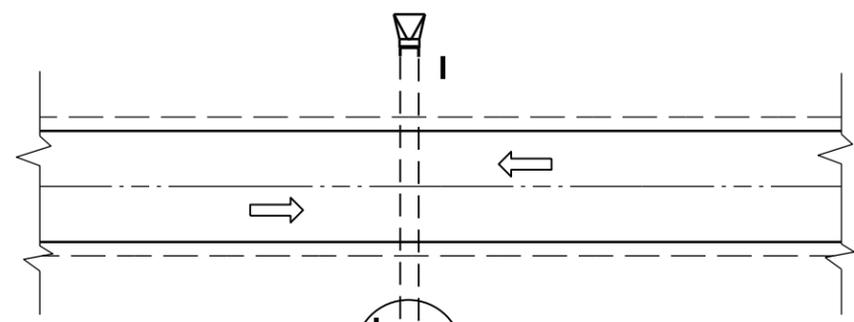
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S.D.D. 14 B 45-59

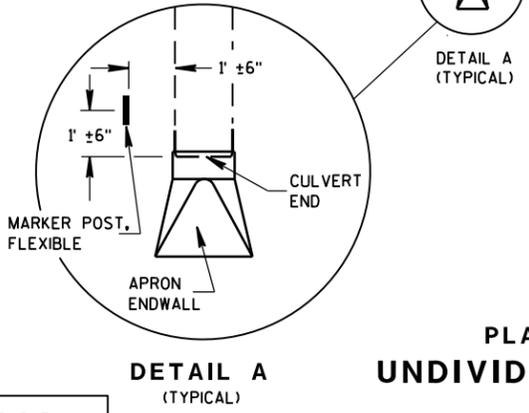
S.D.D. 14 B 45-59



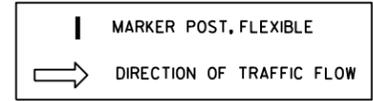
PLAN VIEW
DIVIDED HIGHWAY



PLAN VIEW
UNDIVIDED HIGHWAY

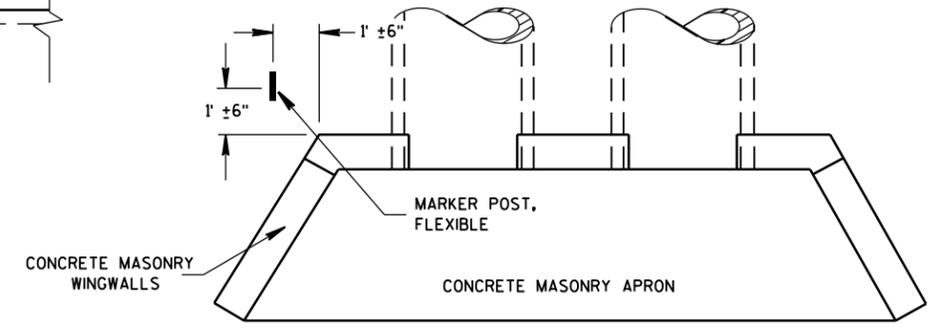


DETAIL A
(TYPICAL)



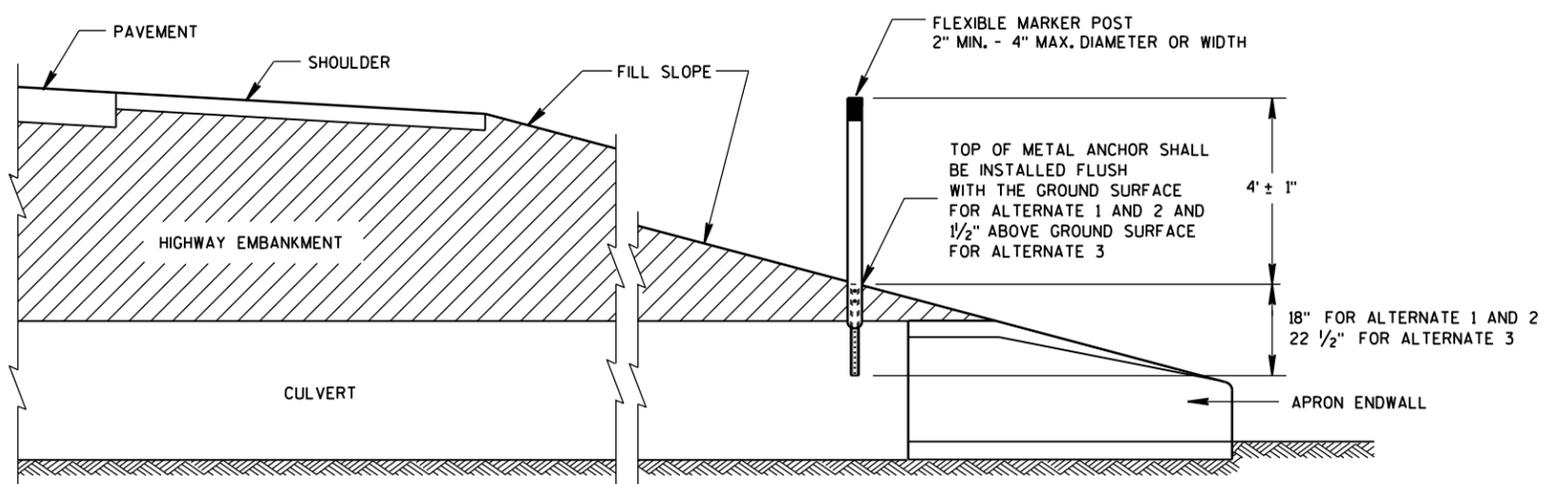
GENERAL NOTES

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

FLEXIBLE MARKER POST LOCATION



CROSS SECTION
FLEXIBLE MARKER POST

**FLEXIBLE MARKER POST
FOR CULVERT END**

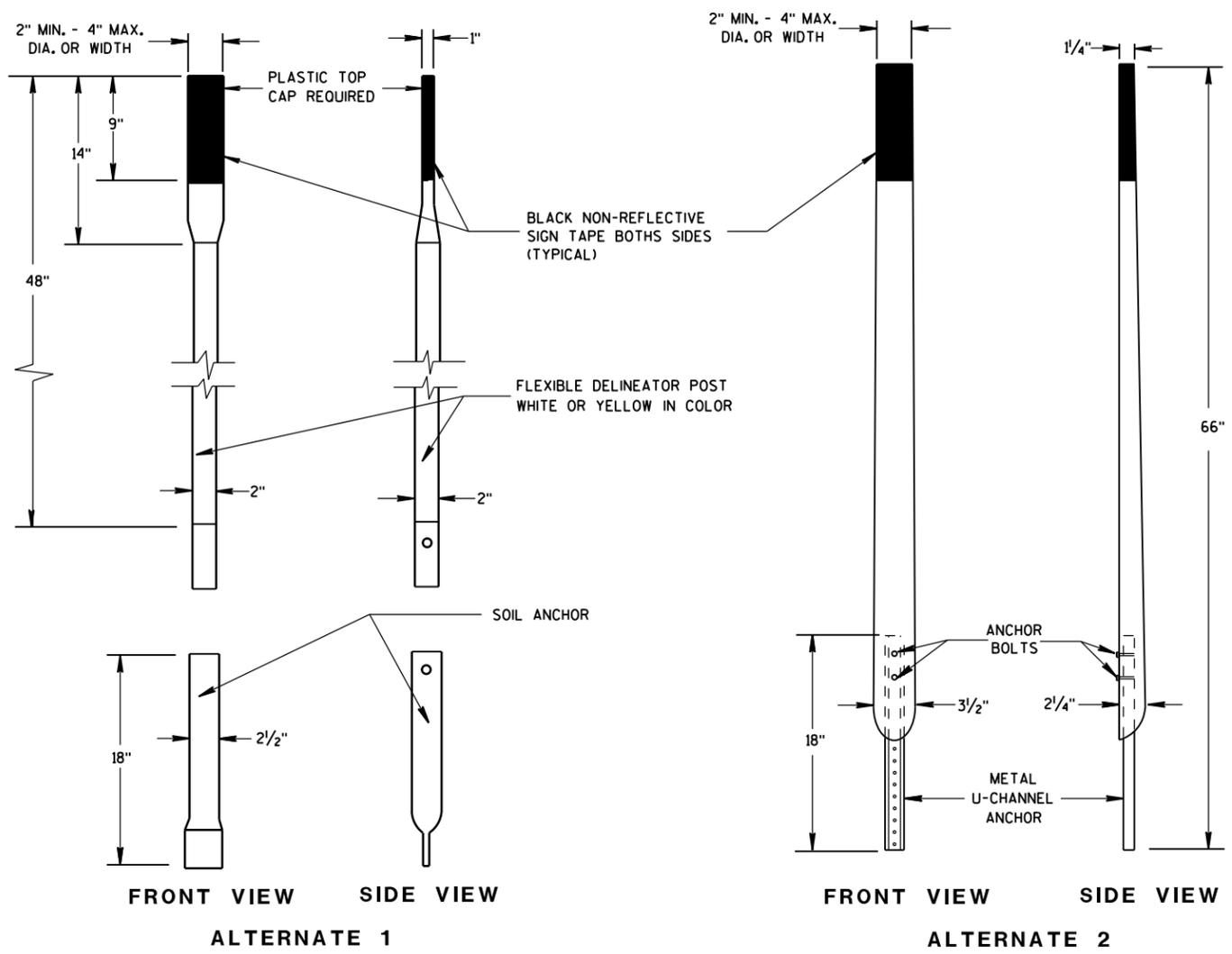
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

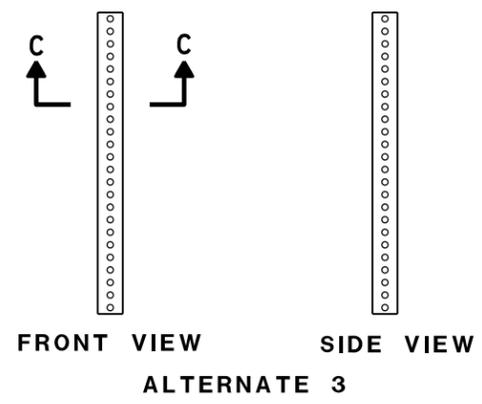
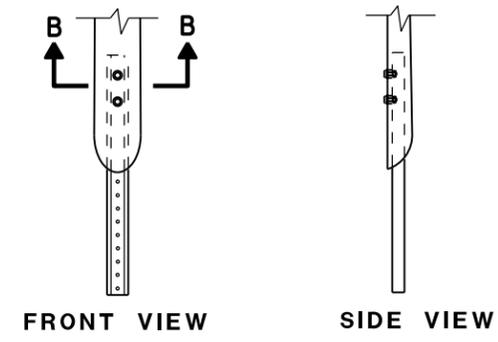
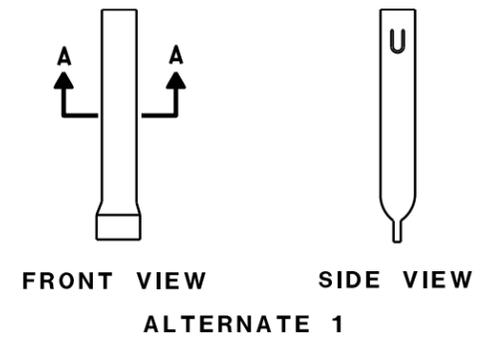
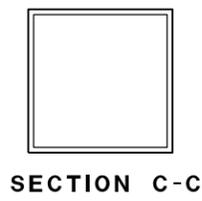
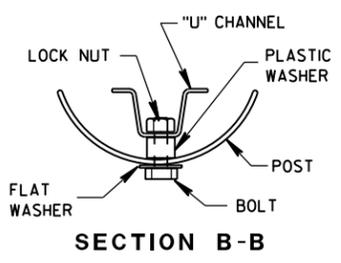
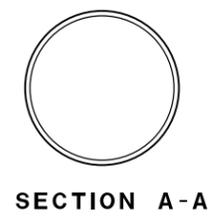
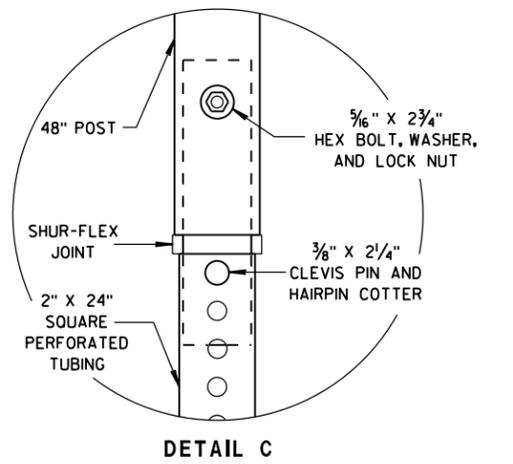
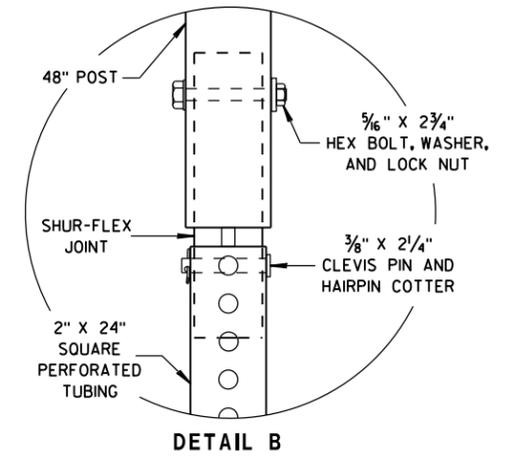
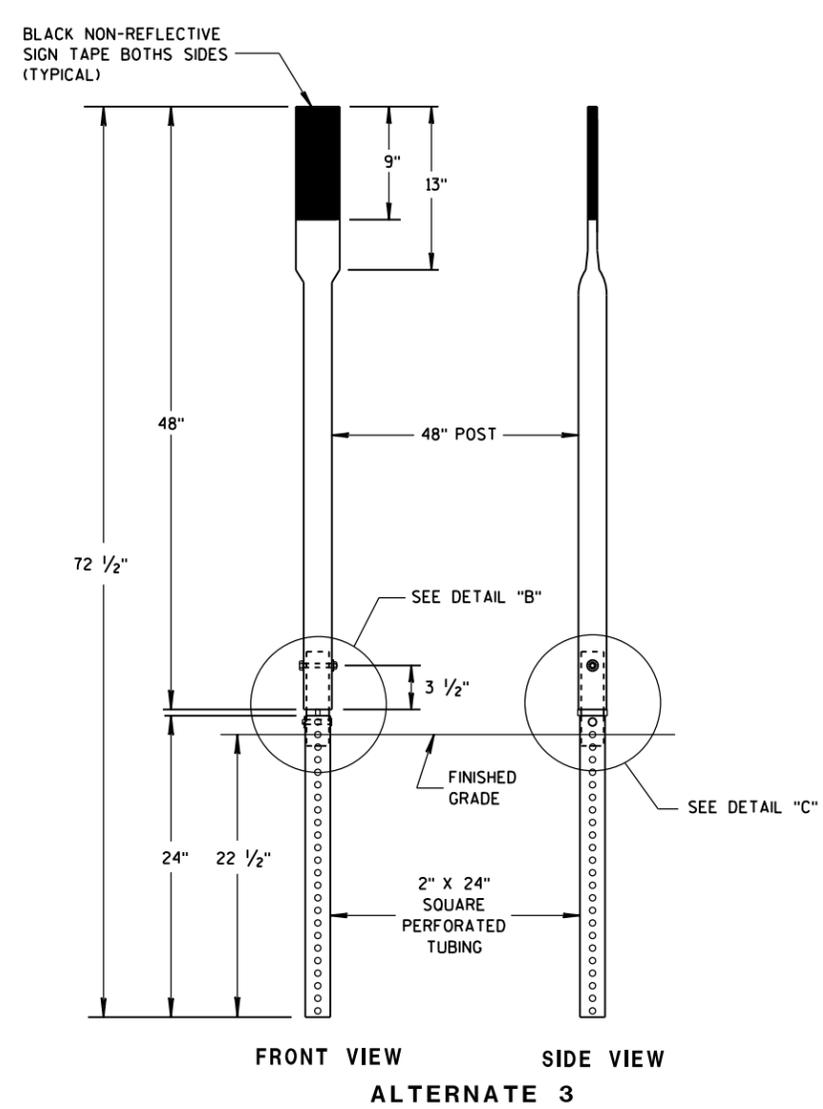
6

S.D.D. 15 A 3-2a

S.D.D. 15 A 3-2a

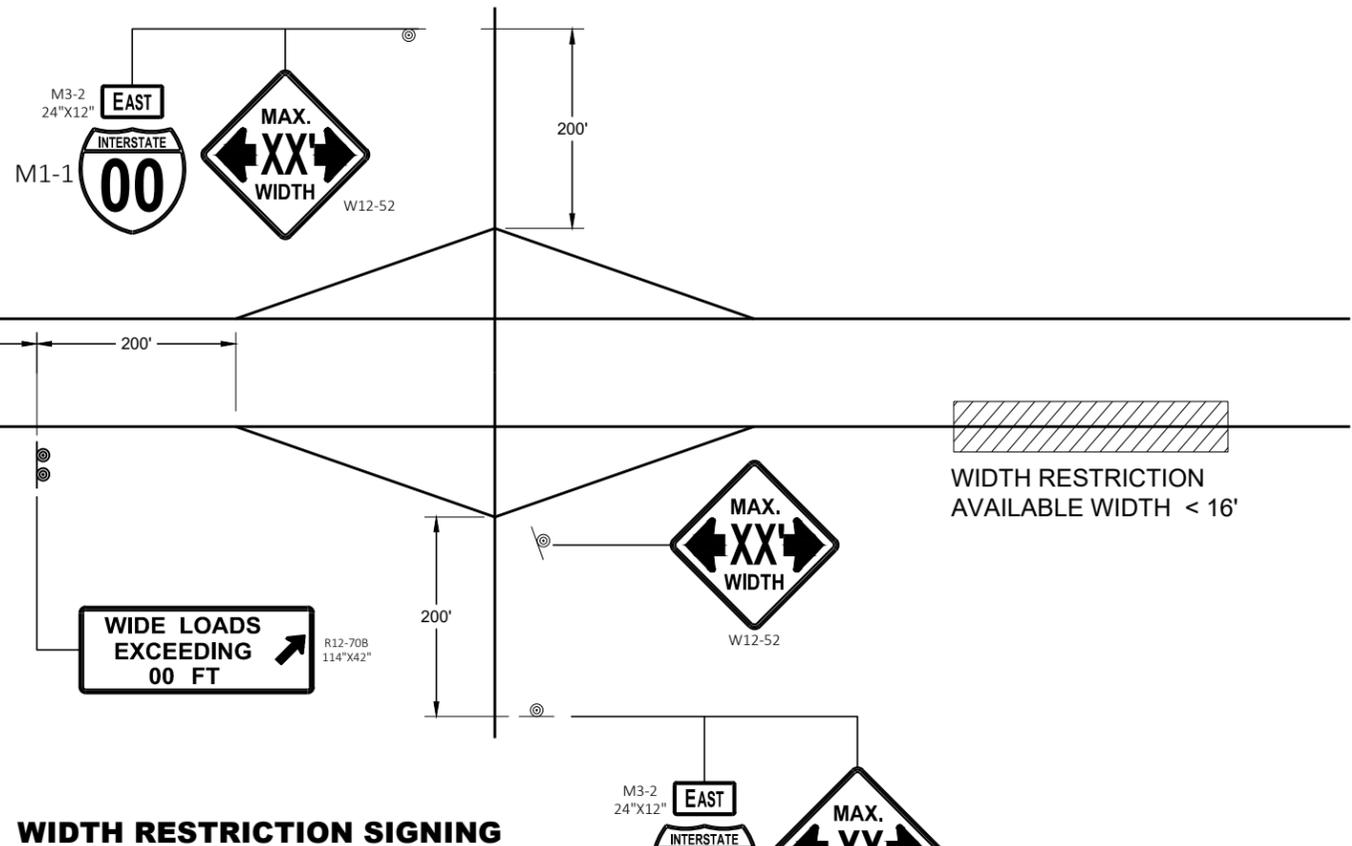


FLEXIBLE MARKER POSTS



FLEXIBLE MARKER POST ANCHORS

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



WIDTH RESTRICTION SIGNING

LEGEND

⊙ SIGN ON PERMANENT SUPPORT

GENERAL NOTES

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS 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 DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

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

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

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

WIDTH ON SIGN TO BE APPROXIMATELY ONE FOOT LESS THAN AVAILABLE WIDTH.

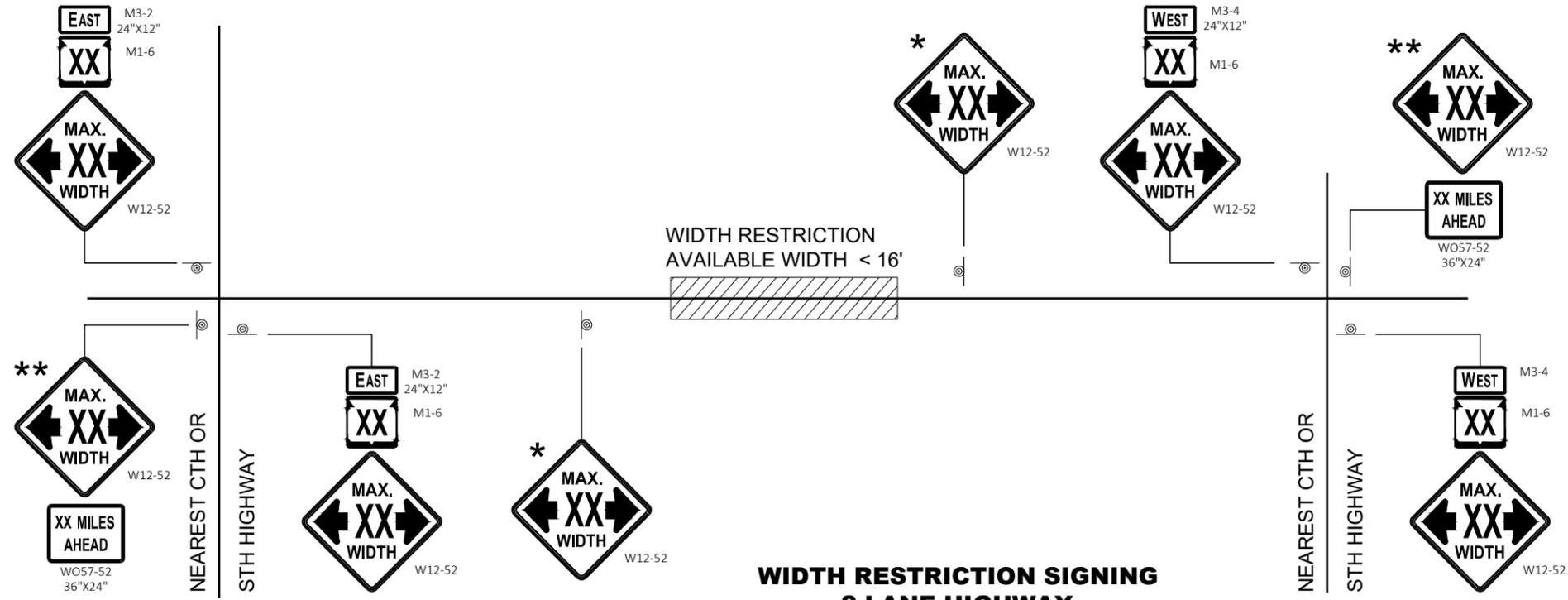
* PLACE 500 FEET AFTER THE W20 - 1A AND 500 FEET BEFORE ADDITIONAL SIGNS FOR ROADWAYS WITH A PRE - CONSTRUCTION SPEED LIMIT OF 45 MPH OR MORE. FOR 35-40 MPH, USE 350 FOOT TYPICAL SPACING. FOR 25-30 MPH, USE 200 FOOT TYPICAL SPACING.

** SIGN SHALL BE VISIBLE FROM ROADWAY.

*** ADDITIONAL SIGNS NEEDED IF THERE IS AN ON RAMP BETWEEN SIGNS.



WIDTH ON SIGN TO BE APPROX. 1 - FOOT LESS THAN AVAILABLE WIDTH



**WIDTH RESTRICTION SIGNING
2 LANE HIGHWAY**

**ADVANCED WIDTH
RESTRICTION SIGNING**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED	
February 2020	/S/ Andrew Heidtke
DATE	WORK ZONE ENGINEER
FHWA	

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" X 48" UNLESS OTHERWISE NOTED.

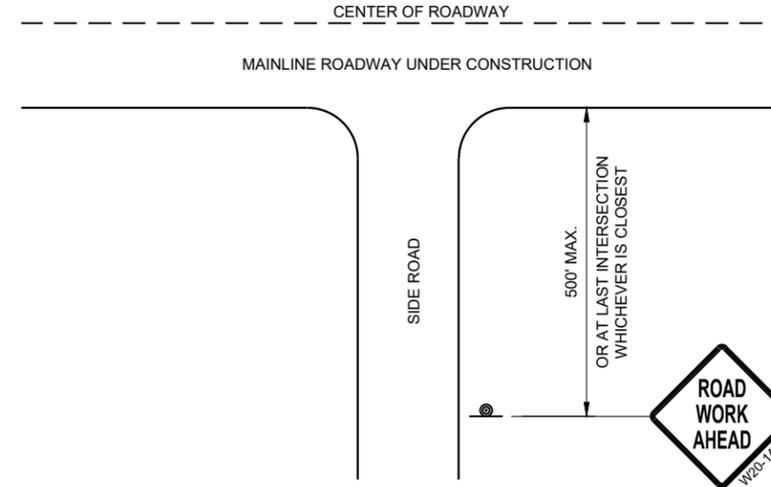
SIGNS THAT WILL BE IN PLACE LESS THAN SEVEN CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

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 REESTABLISHED.

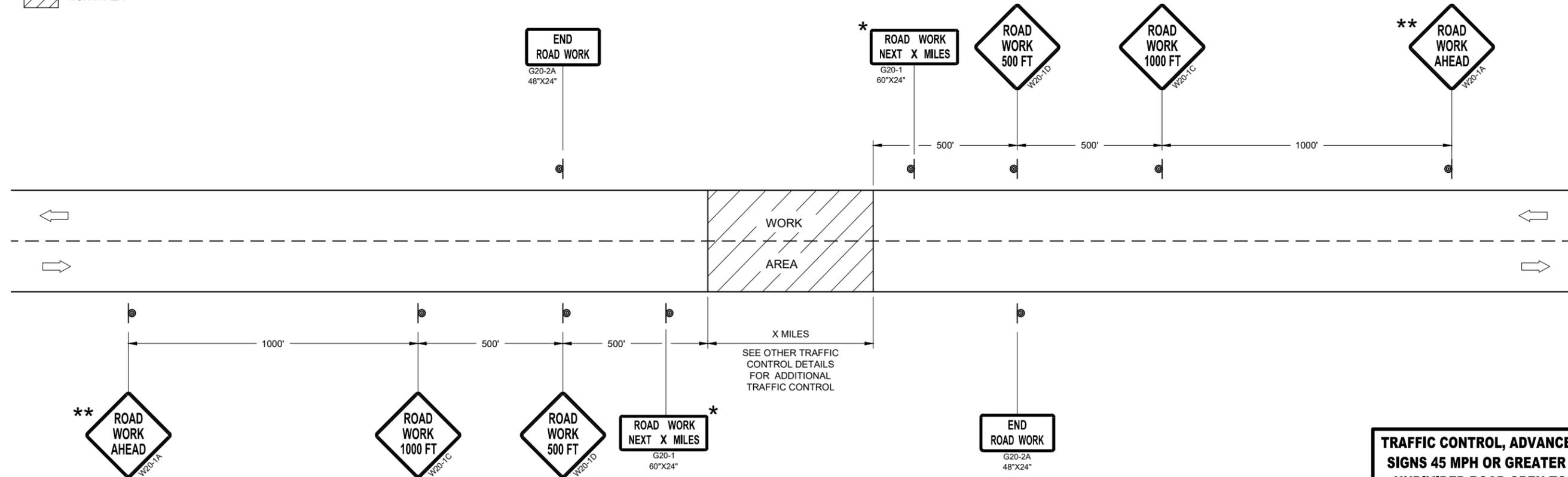
- * OMIT G20-1 SIGNS IF LENGTH OF WORK AREA IS 2 MILES OR LESS
- ** PLACE AN ADDITIONAL W20-1A "ROAD WORK AHEAD" SIGN IF WORK AREA WITHIN THE PROJECT IS SEPARATED BY MORE THAN 2 MILES FROM PREVIOUS WORK AREA.

LEGEND

-  SIGN ON PERMANENT SUPPORT
-  DIRECTION OF TRAFFIC
-  WORK AREA



**TYPICAL SIDE ROAD APPROACH
WARNING SIGN DETAIL**



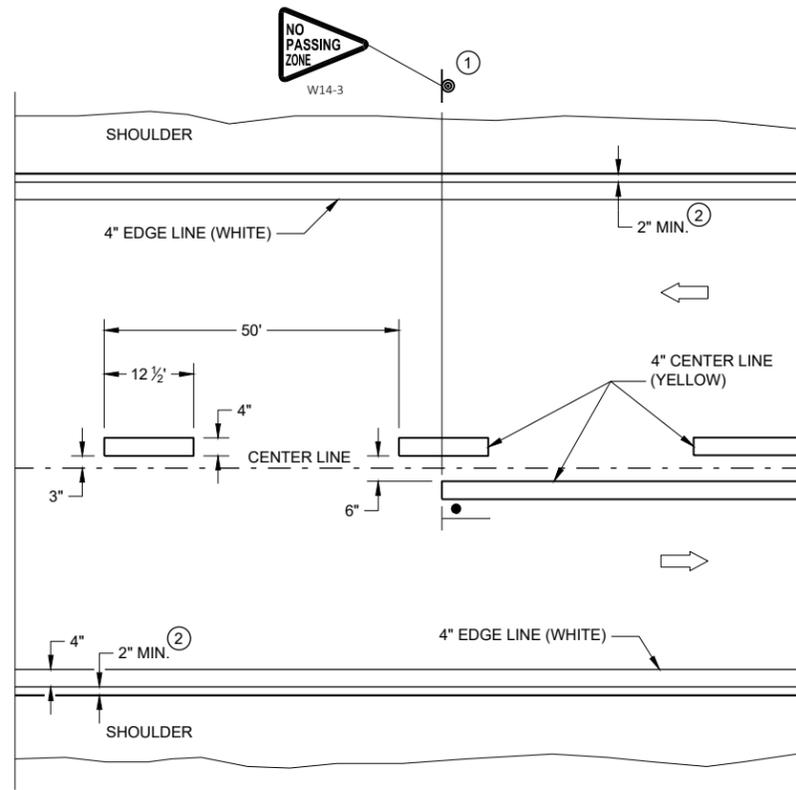
TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45MPH OR GREATER

**TRAFFIC CONTROL, ADVANCE WARNING
SIGNS 45 MPH OR GREATER TWO-WAY
UNDIVIDED ROAD OPEN TO TRAFFIC**

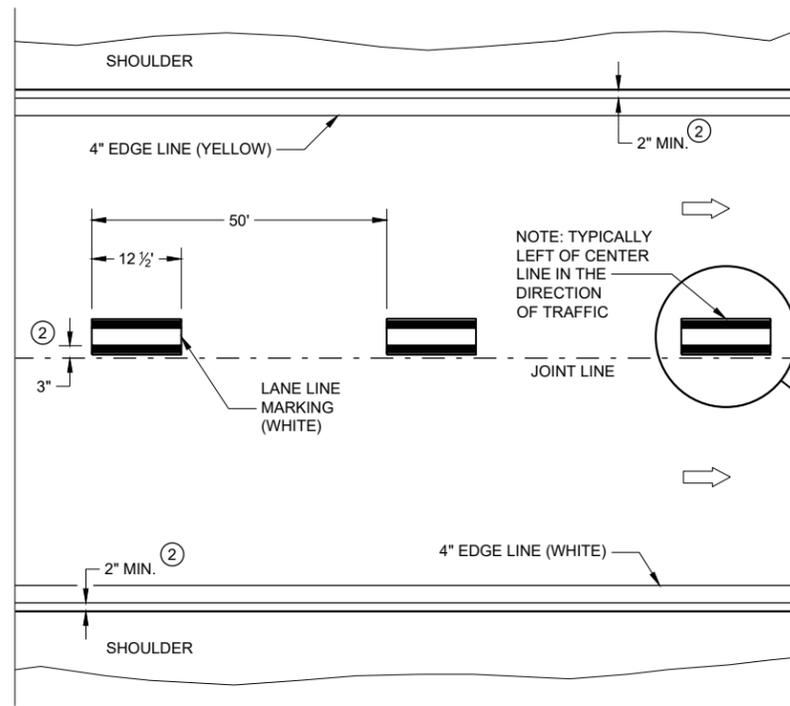
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED _____ /S/ Andrew Heidtke
DATE July 2018 WORK ZONE ENGINEER

FHWA

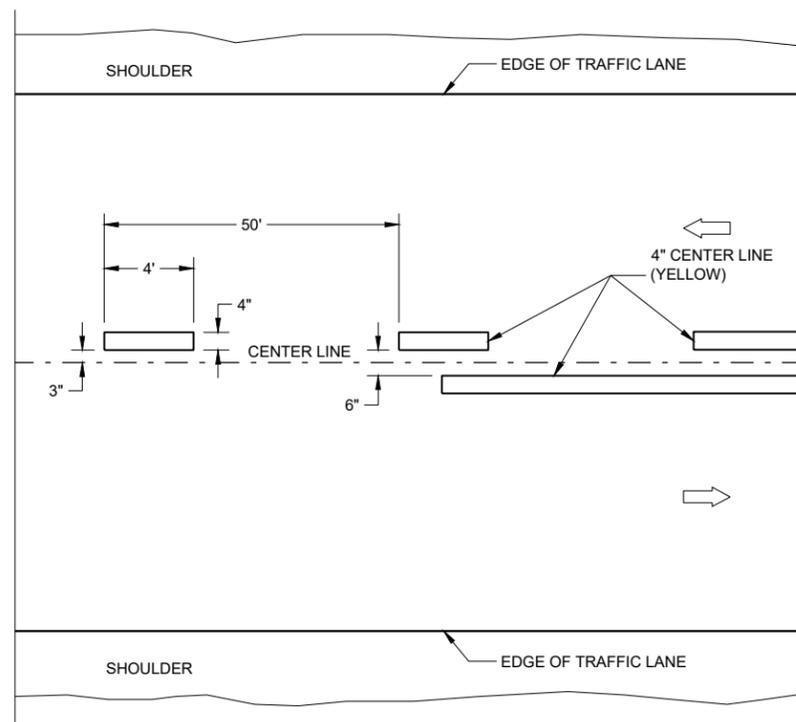


TWO WAY TRAFFIC

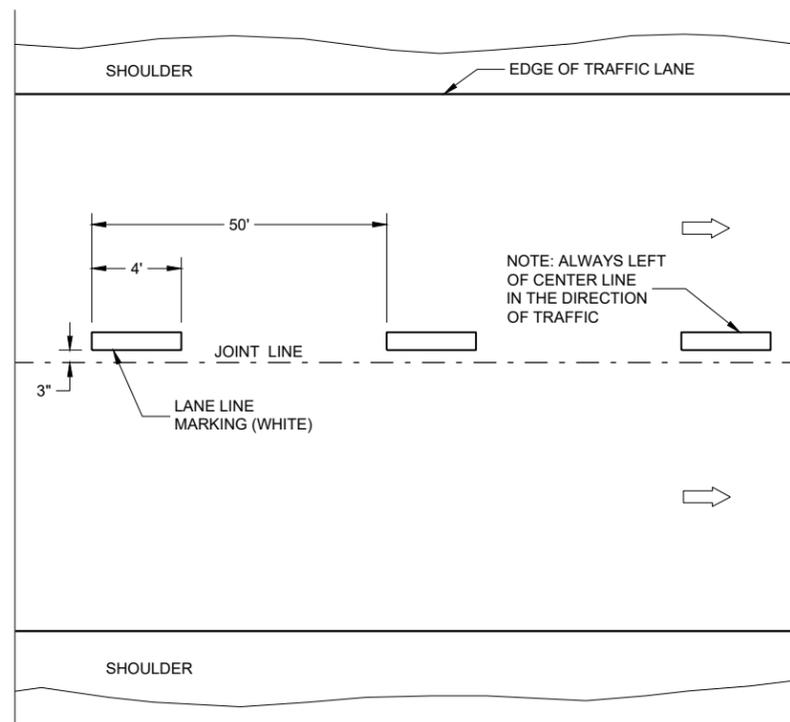


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY PAVEMENT MARKING

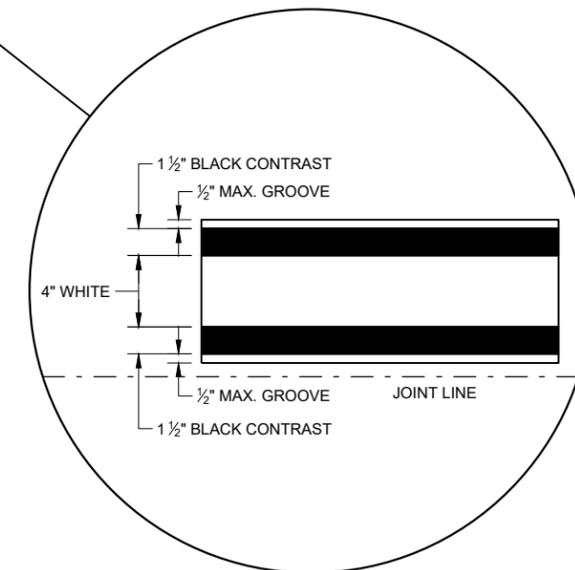
GENERAL NOTES

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
- ② MEASURE FROM EDGE OF MARKING TO JOINT LINE. THIS DOES NOT INCLUDE SPACE NEEDED FOR GROOVING OPERATIONS.

LEGEND

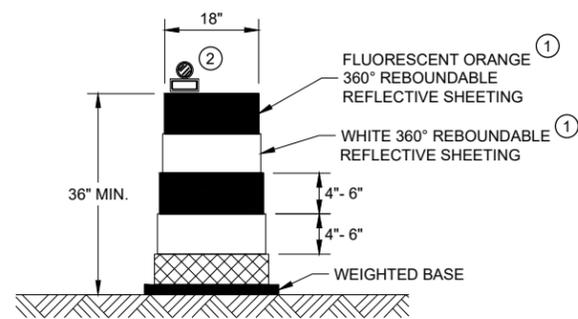
- |• "T" MARKING
- ⊙ SIGN ON PERMANENT SUPPORT
- DIRECTION OF TRAFFIC



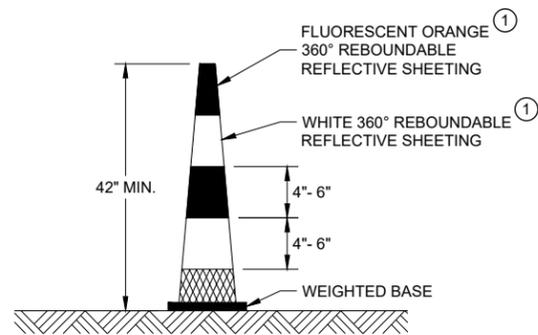
LONGITUDINAL MARKING (MAINLINE)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
February 2020 /S/ Matthew Rauch
DATE STATEWIDE SIGNING AND MARKING
ENGINEER

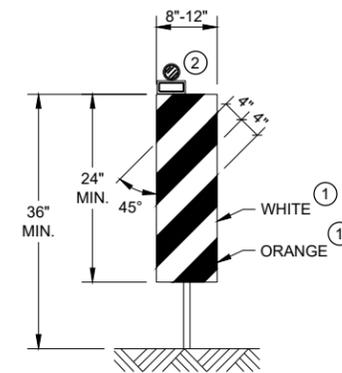


DRUM



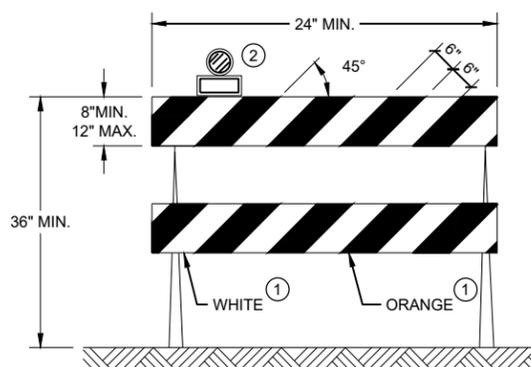
42" CONE

DO NOT USE IN TAPERS
½ SPACING OF DRUMS



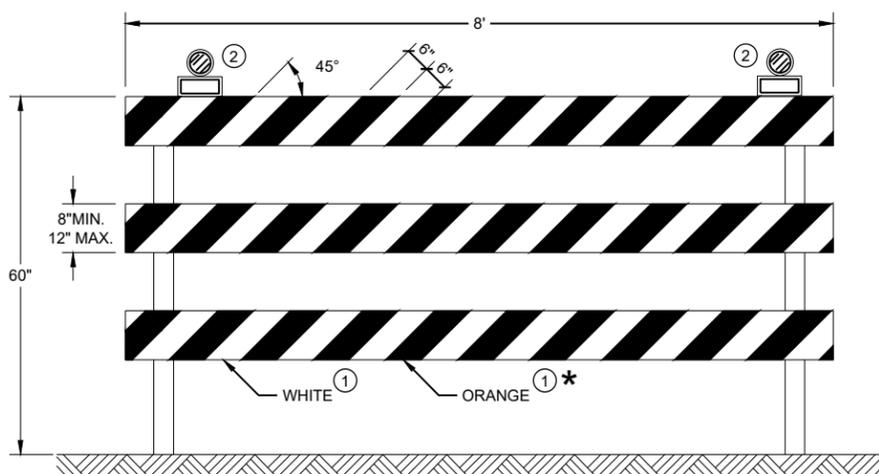
VERTICAL PANEL

THE STRIPES SHALL SLOPE DOWNWARD TO THE TRAFFIC SIDE FOR CHANNELIZATION.



TYPE II BARRICADE

FOR RAILS LESS THAN 36" LONG, 4" WIDE STRIPES MAY BE USED. ALL STRIPES SHALL SLOPE DOWNWARD TO THE TRAFFIC SIDE FOR CHANNELIZATION.



TYPE III BARRICADE

IF SIGN MOUNTED, DO NOT COVER MORE THAN 50% OF THE TOP TWO RAILS OR 33% OF THE TOTAL AREA OF THE THREE RAILS.

* IF USED FOR A PERMANENT APPLICATION USE RED SHEETING.

GENERAL NOTES

- ① REFLECTIVE SHEETING SHALL FOLLOW THE REQUIREMENTS IN THE APPROVED PRODUCTS LISTING FOR SIGN SHEETING.
- ② LOCATION OF WARNING LIGHTS WHEN SHOWN ON THE PLAN.

**CHANNELIZING DEVICES
DRUMS, CONES, BARRICADES
AND VERTICAL PANELS**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2020 /S/ Andrew Heidtke
DATE WORK ZONE ENGINEER

FHWA

LEGEND

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

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.

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

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

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS, DEVICES, AND 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.

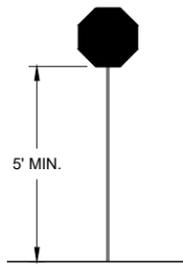
WHEN A SIDE ROAD OR RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROLS SHALL BE PROVIDED AS SPECIFIED IN THE PLANS AND/OR THE SPECIAL PROVISIONS OR AS APPROVED BY THE ENGINEER.

FLAGGING

- 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 PORTABLE RUMBLE STRIPS PRIOR TO COVERING OR REMOVING ALL ADVANCE SIGNING.
- ① FOR MOVING WORK OPERATIONS, POST ADDITIONAL W20-7A FLAGGER SIGNS AT APPROXIMATELY 3,500' 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.
- WHEN THE DISTANCE BETWEEN FLAGGERS EXCEEDS 2 MILES, A PILOT CAR IS REQUIRED. WHEN CURVES REDUCE SIGHT DISTANCE BELOW 400', A PILOT CAR IS REQUIRED.

TEMPORARY PORTABLE RUMBLE STRIPS

- UTILIZE TEMPORARY PORTABLE RUMBLE STRIPS ON ALL FLAGGING OPERATIONS.
- ③ EACH TEMPORARY PORTABLE RUMBLE STRIP ARRAY CONSISTS OF THREE RUMBLE STRIPS SPACED ACCORDING TO MANUFACTURER'S RECOMMENDATION, PLACED TRANSVERSE ACROSS THE LANE AT LOCATIONS SHOWN.
- ONLY USE TEMPORARY PORTABLE RUMBLE STRIPS FOR THE APPROVED PRODUCTS LIST.
- INSTALL TEMPORARY RUMBLE STRIPS PER MANUFACTURER'S RECOMMENDATIONS.
- PLACE ADVANCE SIGNING PRIOR TO INSTALLING TEMPORARY RUMBLE STRIPS.
- DO NOT INSTALL TEMPORARY PORTABLE RUMBLE STRIPS ON GRAVEL, MILLED SURFACES, OR ASPHALT THAT HAS BEEN PAVED LESS THAN 12 HOURS.



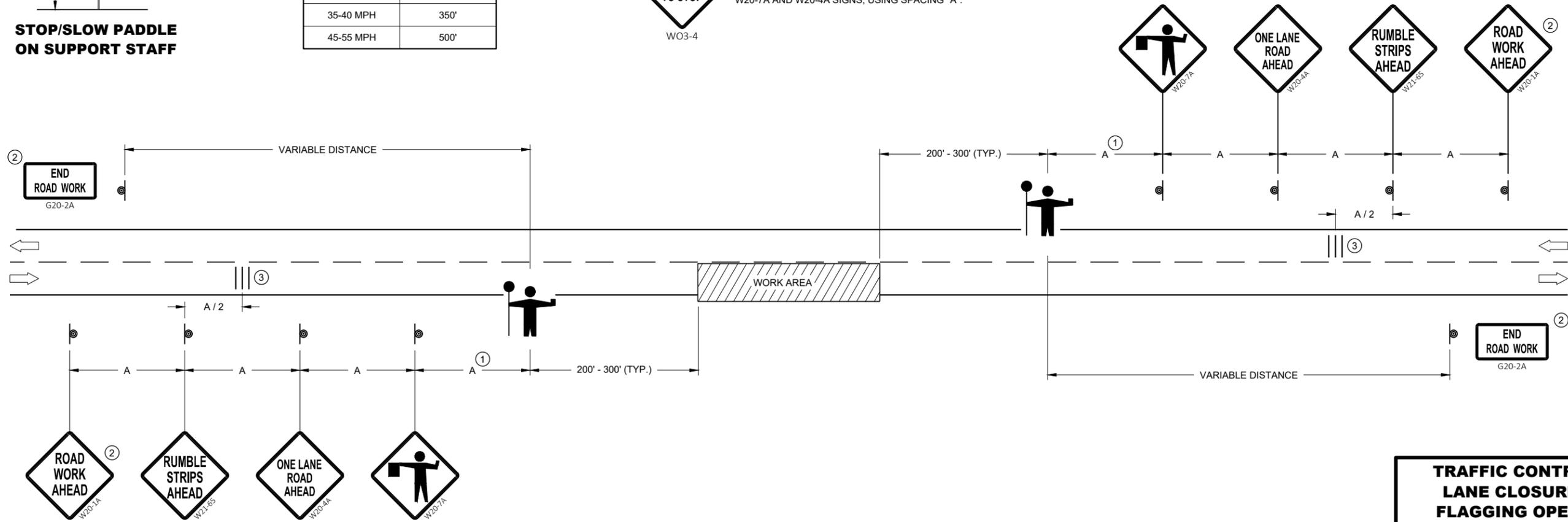
STOP/SLOW PADDLE ON SUPPORT STAFF

SIGN AND TEMPORARY RUMBLE STRIP ARRAY SPACING TABLE

SPEED LIMIT	SPACING "A"
25-30 MPH	200'
35-40 MPH	350'
45-55 MPH	500'



USE OF W03-4 SIGN IS OPTIONAL. WHEN USED, THIS SIGN SHALL BE LOCATED BETWEEN THE W20-7A AND W20-4A SIGNS, USING SPACING "A".



TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION

TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE: May 2019 /S/ Andrew Heidtke
WORK ZONE ENGINEER

FHWA

LEGEND

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

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.

ALL 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.

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 AND HORIZONTAL CURVES THAT RESTRICT SIGHT DISTANCE.

THE WORK AND SHADOW VEHICLES SHOULD PULL OVER PERIODICALLY TO ALLOW TRAFFIC TO PASS.

WHEN NO WORK ACTIVITY IS TAKING PLACE, REMOVE OR LAY STATIONARY SIGNS AND SUPPORTS FLAT ON THE GRADE WITH UPRIGHTS ORIENTED PARALLEL TO AND DOWNSTREAM FROM TRAFFIC.

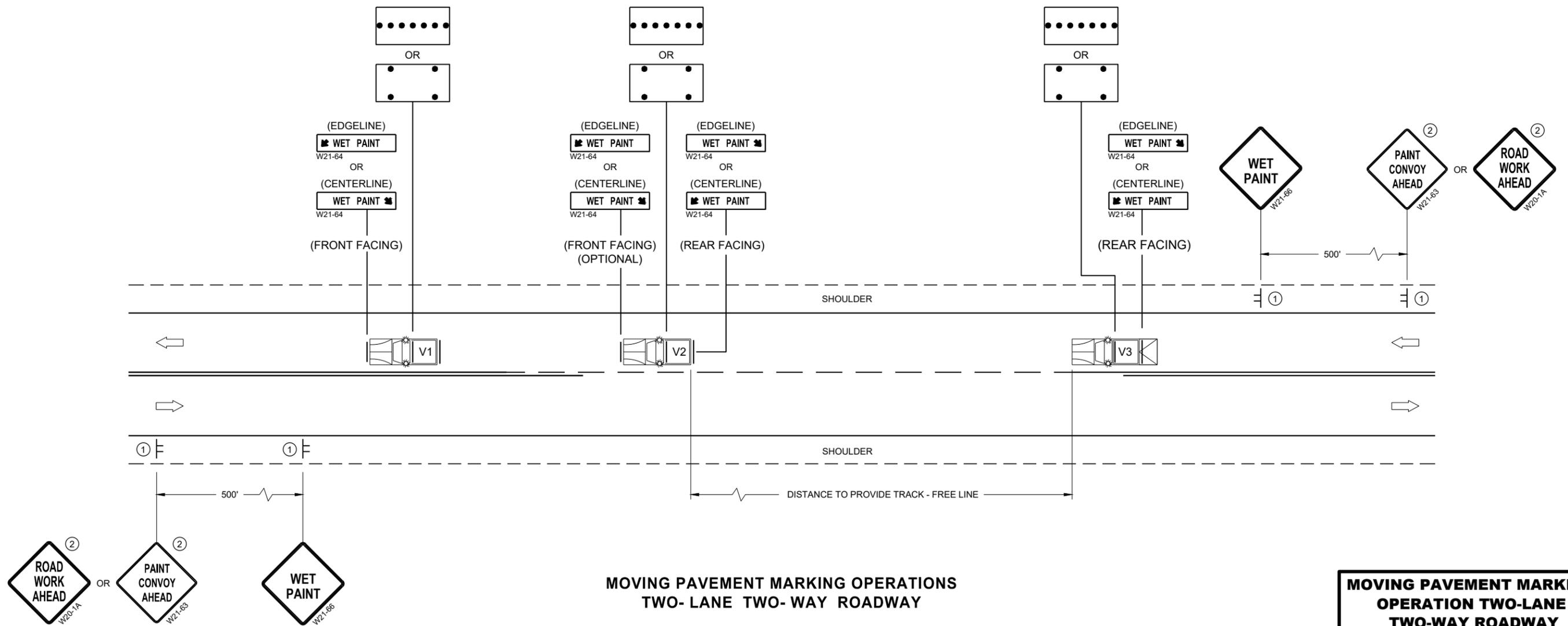
CONES SHOULD BE USED BETWEEN THE MARKING AND SHADOW VEHICLE AT 100 FOOT SPACING. CONES MAY BE OMITTED ON PAINTED LINE IF APPROVED BY THE ENGINEER. CONSIDER PAVEMENT MARKING DRY OR CURE TIMES AND TRAFFIC VOLUME.

CONES SHALL BE A MINIMUM OF 28" FOR WET PAVEMENT MARKING .

- ① SIGNS SHALL BE REPEATED APPROXIMATELY EVERY THREE MILES.
- ② IF CONSTRUCTION WORK ZONE SIGNS ARE IN PLACE, W20-1A OR W21-63 ARE NOT REQUIRED.

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**MOVING PAVEMENT MARKING OPERATIONS
TWO-LANE TWO-WAY ROADWAY**

SDD 15C19 - 06a

SDD 15C19 - 06a

MOVING PAVEMENT MARKING OPERATION TWO-LANE TWO-WAY ROADWAY	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED November 2019 DATE	/S/ Andrew Heidtke WORK ZONE ENGINEER
FHWA	

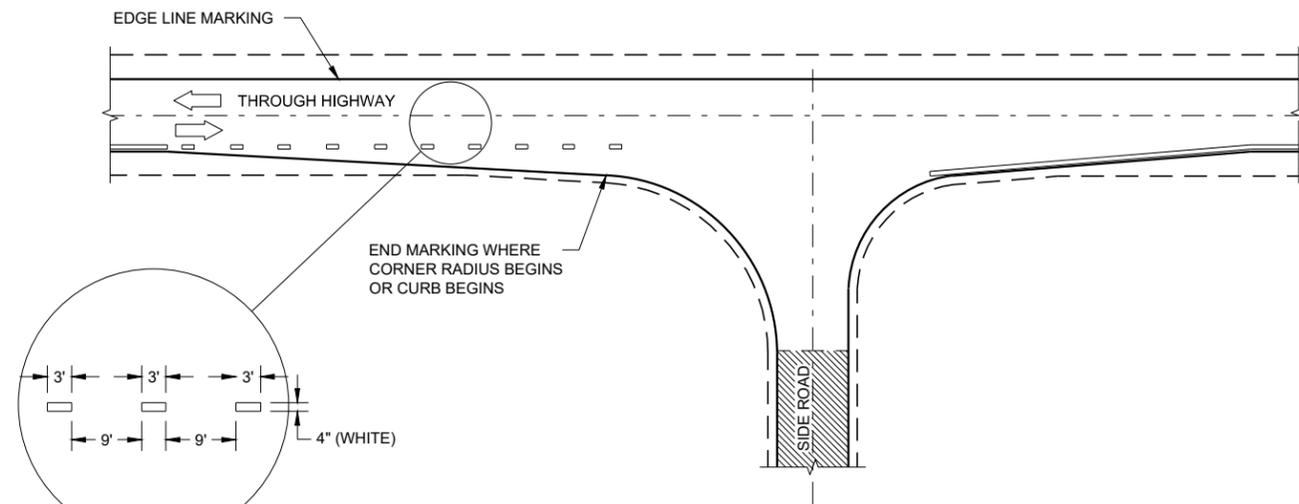
GENERAL NOTES

OMIT EDGE LINES THROUGH INTERSECTIONS. CONTINUE EDGE LINES THROUGH DRIVEWAYS.

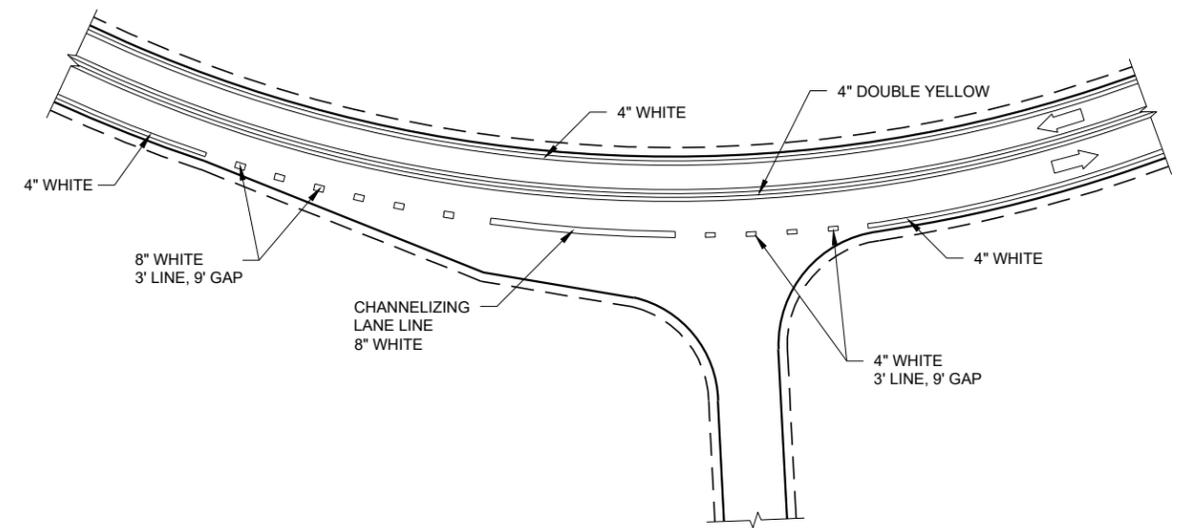
- ① WHEN DISTANCE "A" IS LESS THAN 250 FEET, OMIT LANE LINE.
- ② WHEN DISTANCE "B" IS LESS THAN 100 FEET, OMIT CHANNELIZING LANE LINE.
- ③ BARRIER LINE ENDS AT SIDE ROAD PAVEMENT / SURFACE EDGE EXTENSION.
- ④ BARRIER LINE STARTS 500 FEET PRIOR TO THE BYPASS TAPER.

LEGEND

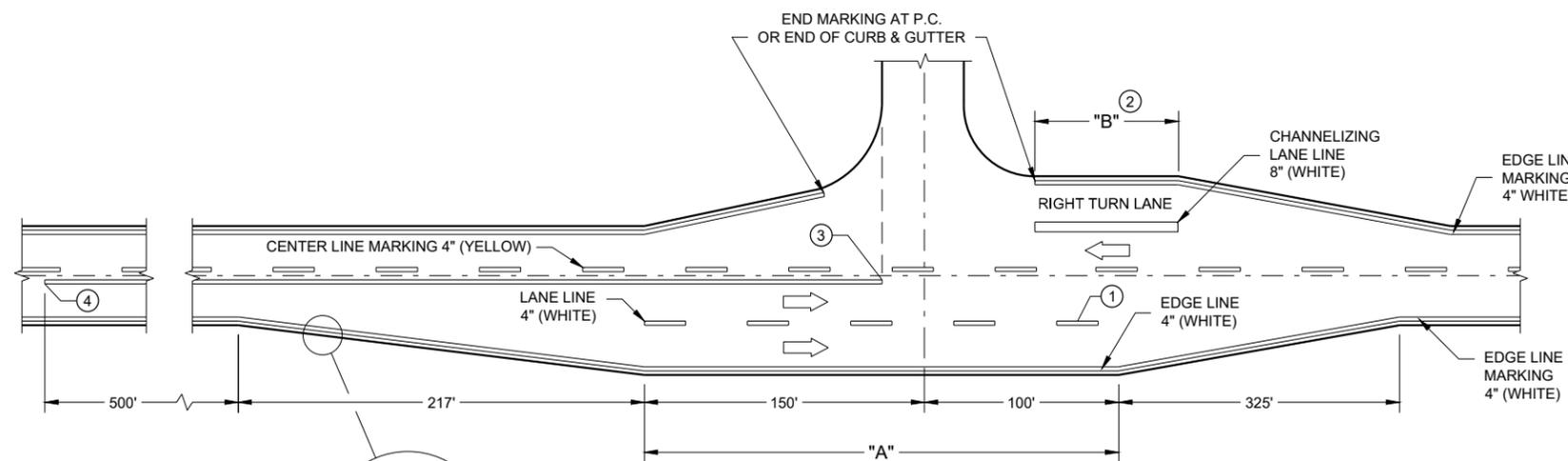
➡ DIRECTION OF TRAVEL



MINOR INTERSECTION



INTERSECTION ON OUTSIDE OF CURVE



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

**PAVEMENT MARKING
(INTERSECTIONS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

LEGEND

-  SIGN ON PERMANENT SUPPORT
-  TRAFFIC CONTROL DRUM
-  DIRECTION OF TRAFFIC
-  WORK ZONE

GENERAL NOTES

ALL SIGNS ARE 48"X48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY THE REGIONAL TRAFFIC UNIT.

"WO" SIGN IS THE SAME AS "W" SIGN 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.

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

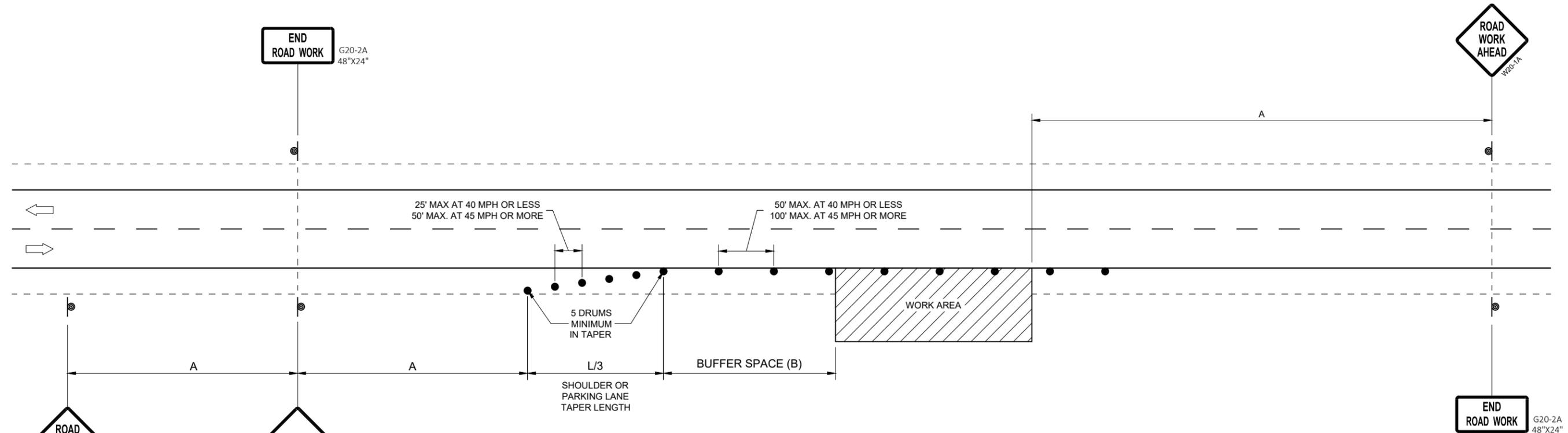
CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

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

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.

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OR
IF TRAFFIC CONTROL DEVICES
ENCROACH ONTO TRAVELED WAY, USE



POSTED SPEED LIMIT PRIOR TO WORK STARTING (MPH)	ADVANCE WARNING SIGN SPACING (A) FEET	SHOULDER TAPER L / 3 W, LATERAL OFFSET (FT)						BUFFER SPACE (B) FEET
		3	4	5	6	7	8	
25	200'	10	14	17	21	24	28	55
30	200'	15	20	25	30	35	40	85
35	350'	20	27	34	40	47	54	120
40	350'	26	35	44	53	62	70	170
45	500'	45	59	74	89	104	119	220
50	500'	50	66	83	99	116	132	280
55	500'	54	73	91	109	127	145	335'

**TRAFFIC CONTROL, WORK ON
SHOULDER OR PARKING LANE,
UNDIVIDED ROADWAY**

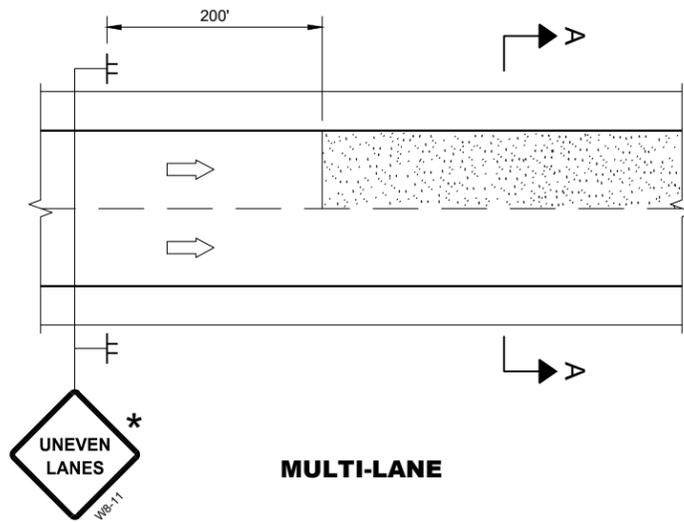
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
May 2020 /S/ Andrew Heidtke
DATE STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER

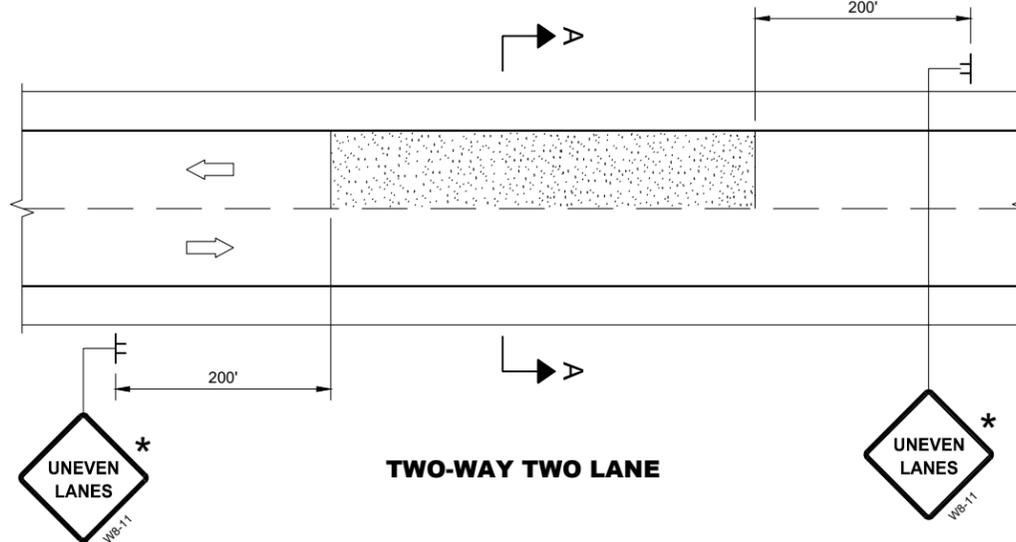
FHWA

SDD 15D28 - 04

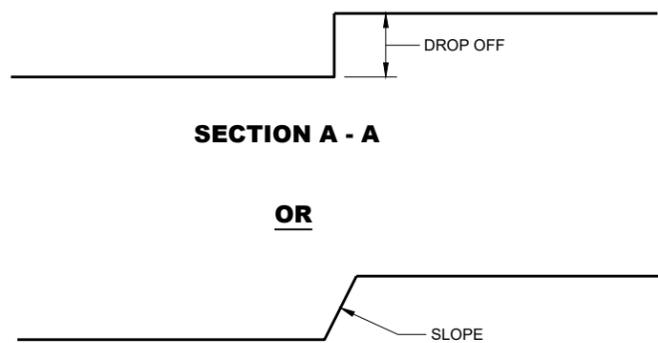
SDD 15D28 - 04



MULTI-LANE



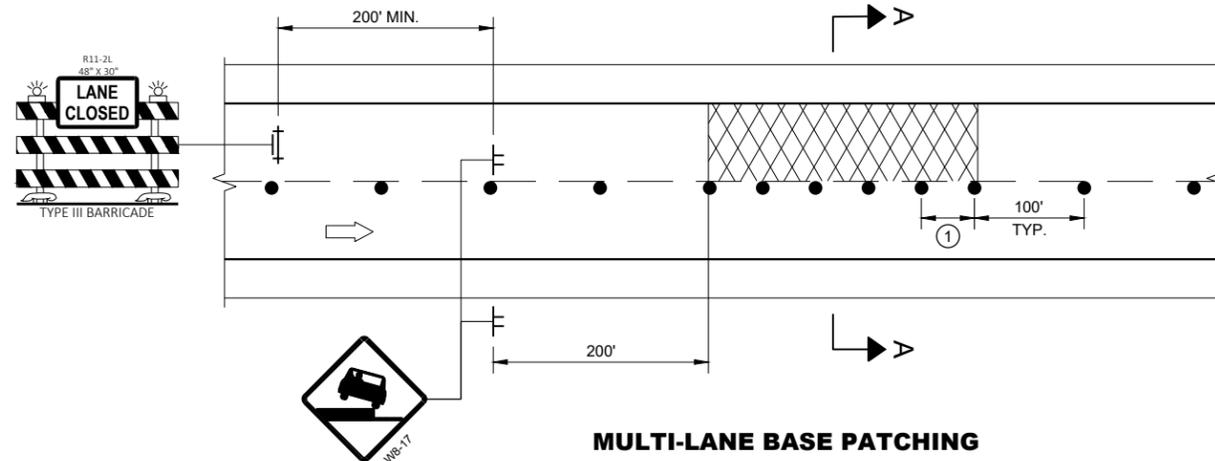
TWO-WAY TWO LANE



SECTION A - A

OR

SECTION A - A



MULTI-LANE BASE PATCHING

ADJACENT LANE DROP-OFFS

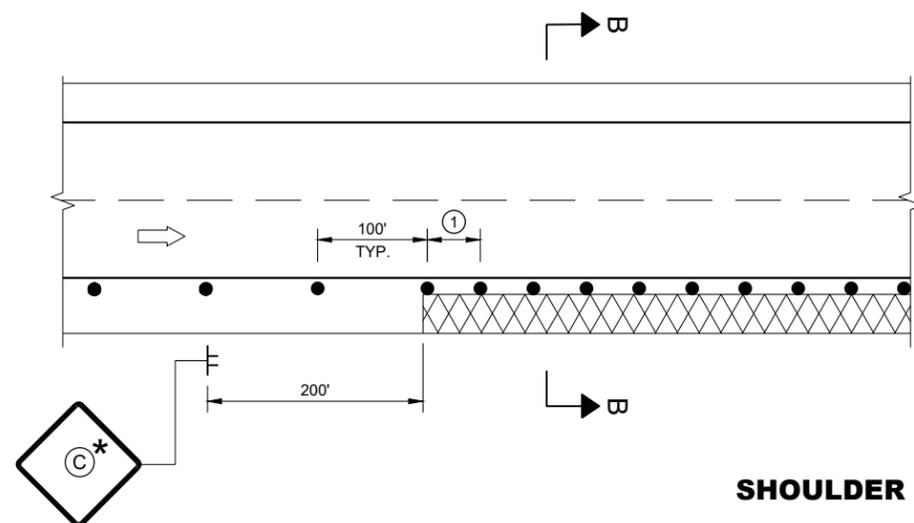
GENERAL NOTES

- FOR SPOT LOCATIONS USE ENGINEERING JUDGEMENT WHEN PLACING ADDITIONAL SIGNS.
- ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.
- "WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS ORANGE.
- WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.
- * IF THE DROP-OFF IS CONTINUOUS ALONG THE PROJECT, PLACE ADDITIONAL SIGNS EVERY 1 MILE AND AFTER EVERY ENTRANCE RAMP.
- ① USE CLOSER SPACING WHEN DELINEATING DROP-OFF.

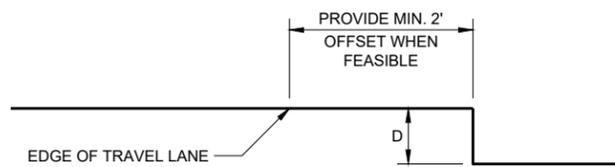
LEGEND

- SIGN ON TEMPORARY SUPPORT
- TRAFFIC CONTROL DRUM
- TYPE III BARRICADE WITH ATTACHED SIGN
- TYPE "A" WARNING LIGHT (FLASHING)
- DIRECTION OF TRAFFIC
- WORK AREA WITH DROP-OFF
- MILLED SURFACE

D	SIGN (C)
< 2" WITH A SLOPE STEEPER THAN 3:1	 W08-9
2" < 6" WITH A SLOPE STEEPER THAN 3:1	 W8-9A PROVIDE A 3:1 OR FLATTER SLOPE OF MATERIAL ADJACENT TO THE PAVEMENT



SHOULDER DROP-OFFS



SECTION B - B

TRAFFIC CONTROL, DROP-OFF SIGNING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
March 2018 /S/ Andrew Heidtke
DATE DATE WORK ZONE ENGINEER

FHWA

GENERAL NOTES

DRAWING NOT TO SCALE. ALL SIGNS AND POSTS ON THIS SHEET SHALL BE PAID FOR WITH 'TRAFFIC CONTROL SIGNS' BID ITEM. ALL SIDE ROADS WHICH ARE UNDER CONSTRUCTION OF CURB AND GUTTER AND/OR GRADING SHALL BE ADEQUATELY SIGNED.

ALL SIGNS AND DEVICES SHALL BE IN CONFORMANCE WITH THE WISCONSIN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (WMUTCD). SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE WISDOT STANDARD SIGN PLATES.

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

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

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

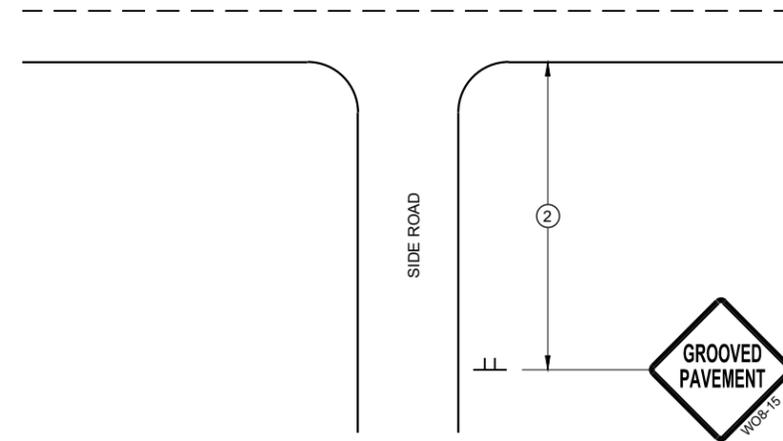
ALL SIGNS INAPPROPRIATE TO THE STATUS OF THE CONTROL ZONE, INCLUDING PRE-EXISTING SIGNS IN THE VICINITY, SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER.

SEE 15C34 FOR ADDITIONAL TRAFFIC CONTROL SIGNING WHEN CENTERLINE PAVEMENT MAKINGS ARE MISSING. 'DO NOT PASS' SIGNS MUST BE INSTALLED ON THE SAME DAY AS MILLING OPERATIONS.

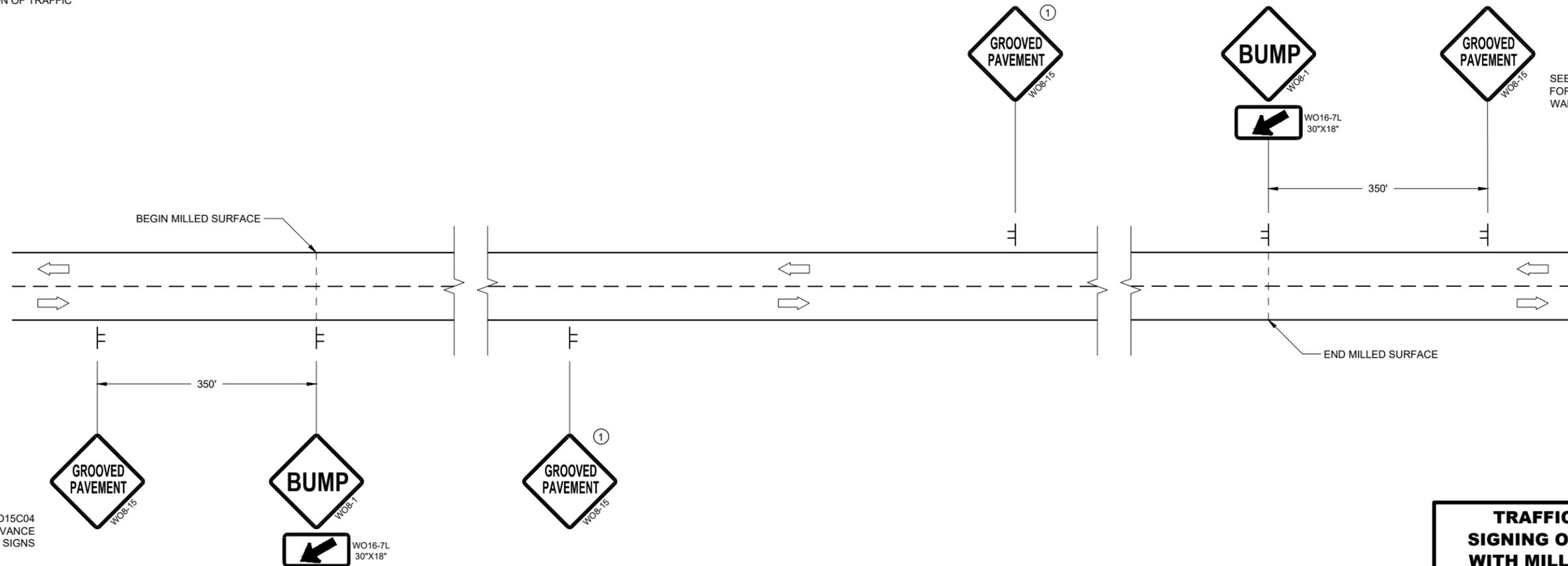
- ① PLACE SIGNS 350' IN ADVANCE OF MILLED SURFACES AND AT 1 MILE INTERVALS, OR AS DIRECTED BY THE ENGINEER.
- ② PLACE SIGN 200' MIN. FROM INTERSECTION AND 200' MIN. AFTER ADVANCE WARNING SIGN SHOWN IN SDD 15C04.

LEGEND

-  SIGN ON TEMPORARY SUPPORT
-  DIRECTION OF TRAFFIC



TYPICAL SIDE ROAD APPROACH SIGN DETAIL



DETAIL FOR SIGNING ON MILLED SURFACES

SEE SDD15C04 FOR ADVANCE WARNING SIGNS

SEE SDD15C04 FOR ADVANCE WARNING SIGNS

TRAFFIC CONTROL, SIGNING ON ROADWAYS WITH MILLED SURFACES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
February 2020 /S/ Andrew Heidtke
DATE WORK ZONE ENGINEER

FHWA

GENERAL NOTES

DRAWING NOT TO SCALE. ALL SIGNS AND POSTS ON THIS SHEET SHALL BE PAID FOR WITH 'TRAFFIC CONTROL SIGNS' BID ITEM. ALL SIDE ROADS WHICH ARE UNDER CONSTRUCTION OF CURB AND GUTTER AND/OR GRADING SHALL BE ADEQUATELY SIGNED.

ALL SIGNS AND DEVICES SHALL BE IN CONFORMANCE WITH THE WISCONSIN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (WMUTCD). SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE WISDOT STANDARD SIGN PLATES.

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

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

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

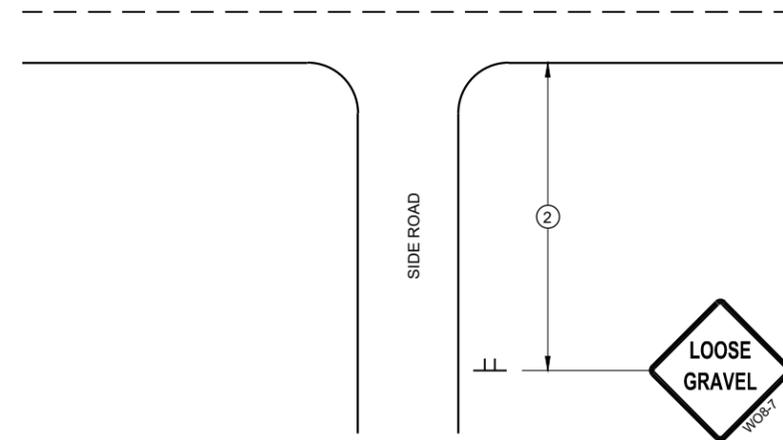
ALL SIGNS INAPPROPRIATE TO THE STATUS OF THE CONTROL ZONE, INCLUDING PRE-EXISTING SIGNS IN THE VICINITY, SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER.

SEE 15C34 FOR ADDITIONAL TRAFFIC CONTROL SIGNING WHEN CENTERLINE PAVEMENT MAKINGS ARE MISSING. 'DO NOT PASS' SIGNS MUST BE INSTALLED ON THE SAME DAY AS MILLING OPERATIONS.

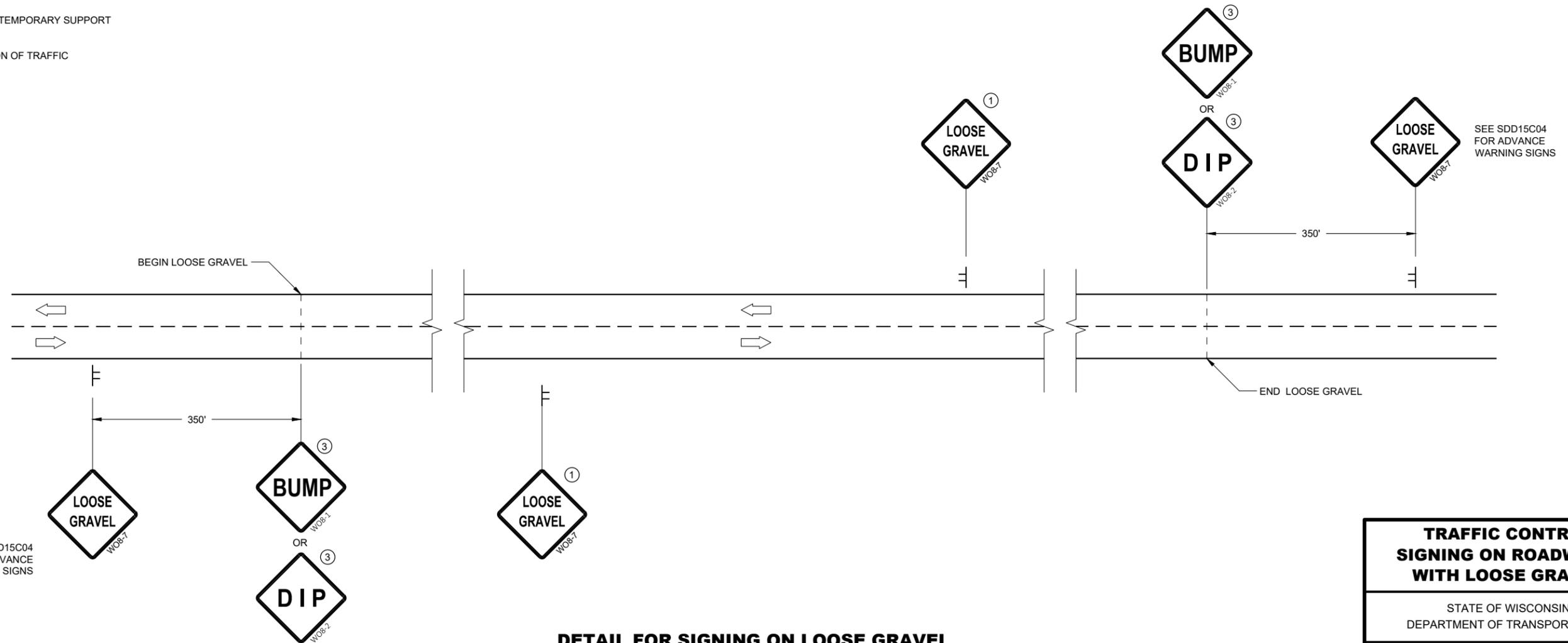
- ① PLACE SIGNS 350' IN ADVANCE OF CHIP SEALED OR LOOSE GRAVEL SURFACES AND AT 1 MILE INTERVALS, OR AS DIRECTED BY THE ENGINEER.
- ② PLACE SIGN 200' MIN. FROM INTERSECTION AND 200' MIN. AFTER ADVANCE WARNING SIGN SHOWN IN SDD 15C04.
- ③ ADD WO8-1 OR WO8-2 SIGN WHEN THE CONDITION IS PRESENT.

LEGEND

- ⊥ SIGN ON TEMPORARY SUPPORT
- ➡ DIRECTION OF TRAFFIC

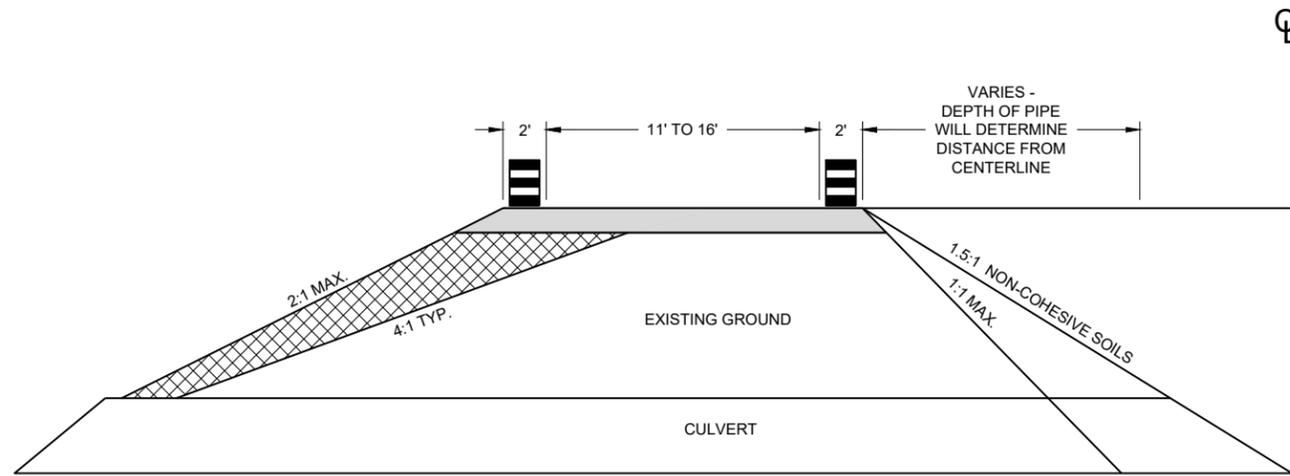


TYPICAL SIDE ROAD APPROACH SIGN DETAIL



DETAIL FOR SIGNING ON LOOSE GRAVEL OR CHIP SEALED SURFACES

TRAFFIC CONTROL SIGNING ON ROADWAYS WITH LOOSE GRAVEL	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED February 2021 DATE	/S/ Andrew Heidtke WORK ZONE ENGINEER
FHWA	



CROSS SECTION

GENERAL NOTES

USE 1:1 FOR COHESIVE CLAYS AND SILTS, LOAMS, SANDY CLAYS AND ANGULAR GRAVEL SOILS.
 USE 1.5:1 FOR NON-COHESIVE SOILS.

THE TAPER SHOULD EXTEND ACROSS THE SHOULDER UNLESS DOING SO WOULD GREATLY CONFLICT WITH THE WORK OPERATION.

ALL LANE CLOSURE SIGNS SHALL BE REMOVED OR COVERED AND ALL DEVICES REMOVED BEYOND THE SHOULDER WHEN WORK IS NOT IN PROGRESS AND THE LANE IS RESTORED TO A SAFE OPERATING CONDITION.

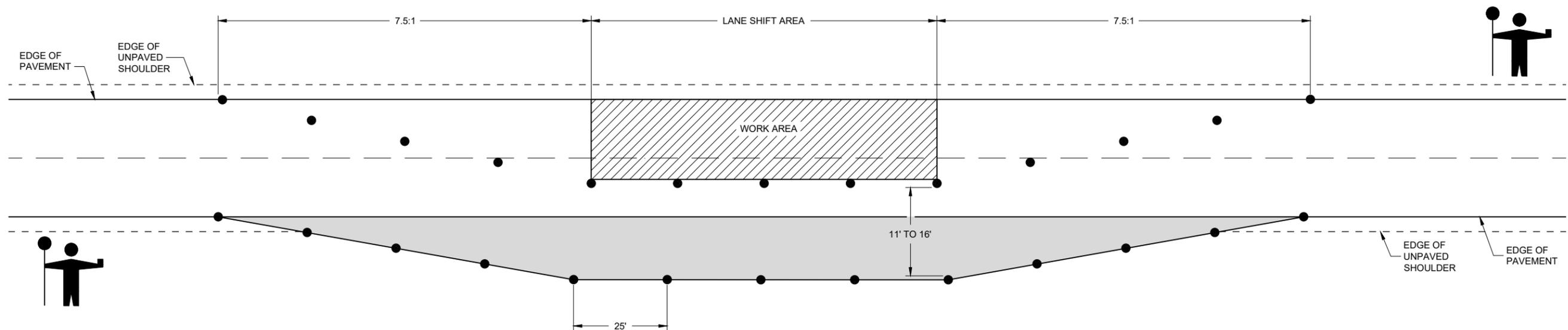
CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

USE WITH SDD 15C12 "TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATIONS"

USE WITH SDD 15D45 "SIGNING ON ROADWAYS WITH LOOSE GRAVEL"

LEGEND

- DRUM WITHOUT WARNING LIGHT
- 6" BASE AGGREGATE DENSE 1 1/2" - INCIDENTAL TO LANE SHIFT ITEM
- FILL - INCIDENTAL TO LANE SHIFT ITEM
- WORK AREA
- FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF



LANE SHIFT IN FLAGGING OPERATION

**TRAFFIC CONTROL,
 TEMPORARY LANE SHIFT
 DURING CULVERT WORK**

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

APPROVED
 February 2021 /S/ Andrew Heidtke
 DATE WORK ZONE ENGINEER

FHWA

LEGEND

- V1 WORK VEHICLE
- V2 SHADOW VEHICLE
-  TRUCK MOUNTED ATTENUATOR (TMA)
-  FLASHING ARROW PANEL (CAUTION)
-  WORK AREA
-  DIRECTION OF TRAFFIC

POSTED SPEED PRIOR TO WORK STARTING (MPH)	DECISION SIGHT DISTANCE (D)
0 - 25	550'
30	550'
35	700'
40	700'
45	900'
50	900'
55	1200'

GENERAL NOTES

ALL SIGNS ARE 48"X48" UNLESS OTHERWISE NOTED.

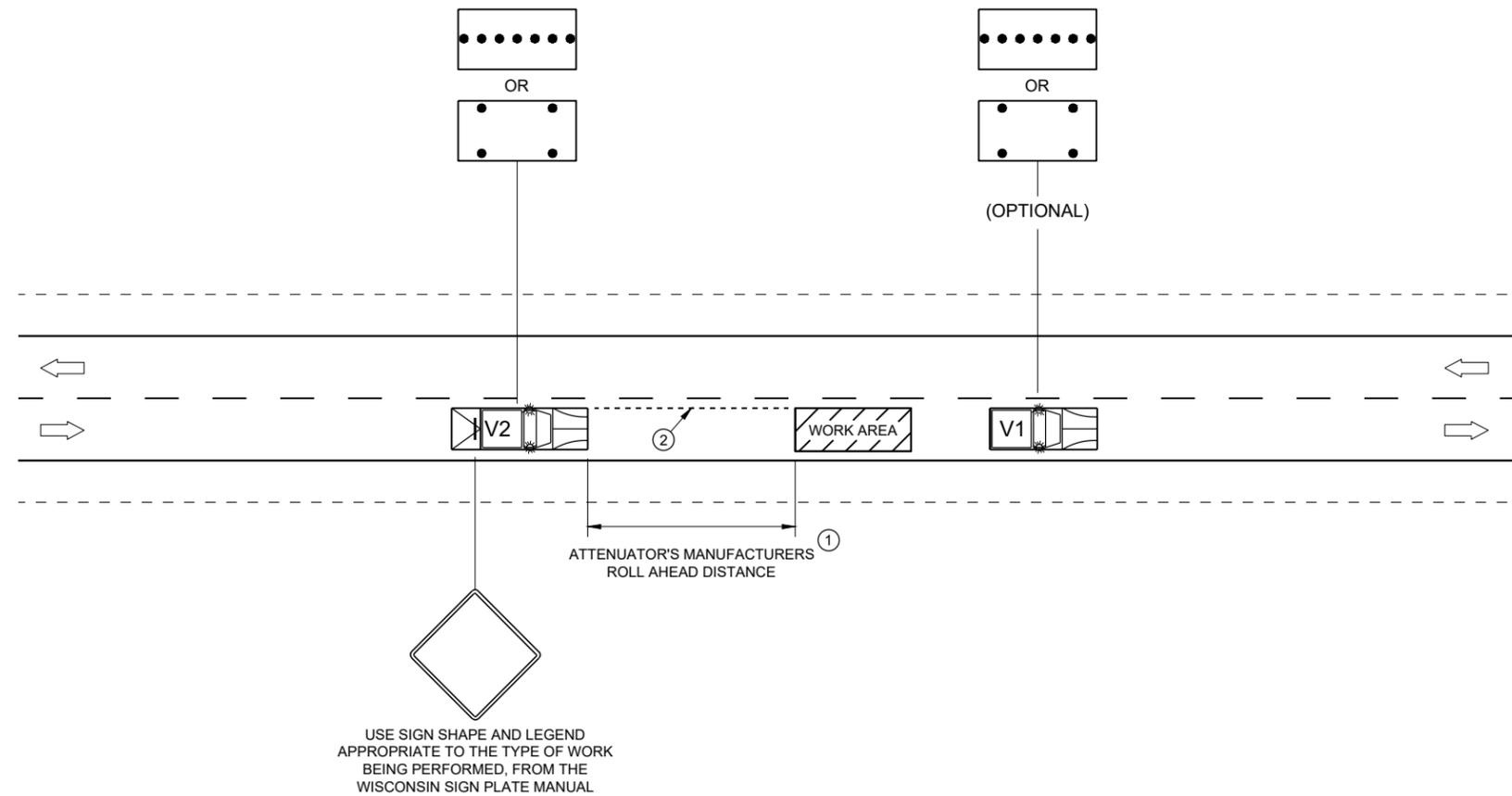
MOBILE IS WORK THAT MOVES CONTINUOUSLY OR MOVES AT LEAST THE DECISION SIGHT DISTANCE EVERY 15 MINUTES.

ALL VEHICLES SHALL BE EQUIPPED WITH TWO 360 DEGREE HIGH INTENSITY YELLOW FLASHING LIGHTS OR STROBE LIGHTS AND OPERATED WITH HEADLIGHTS TURNED ON.

ALL ARROW PANELS SHALL BE REAR FACING, TYPE "B" OR "C", AND DISPLAYING THE FLASHING CAUTION MODE. SIGNS PLACED ON VEHICLES MUST NOT OBSCURE THE ARROW PANEL.

USE AN ATTENUATOR ON THE REARMOST VEHICLE THAT BLOCKS ALL OR PART OF THE TRAFFIC LANE.

- ① DISTANCE BETWEEN VEHICLES MAY INCREASE FROM THE ATTENUATOR'S ROLL AHEAD BASED ON TERRAIN, SIGHT DISTANCE, 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.
- ② ALIGN LEFT SIDE OF SHADOW VEHICLE WITH EDGE OF WORK AREA.



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SDD 15D51 - 01

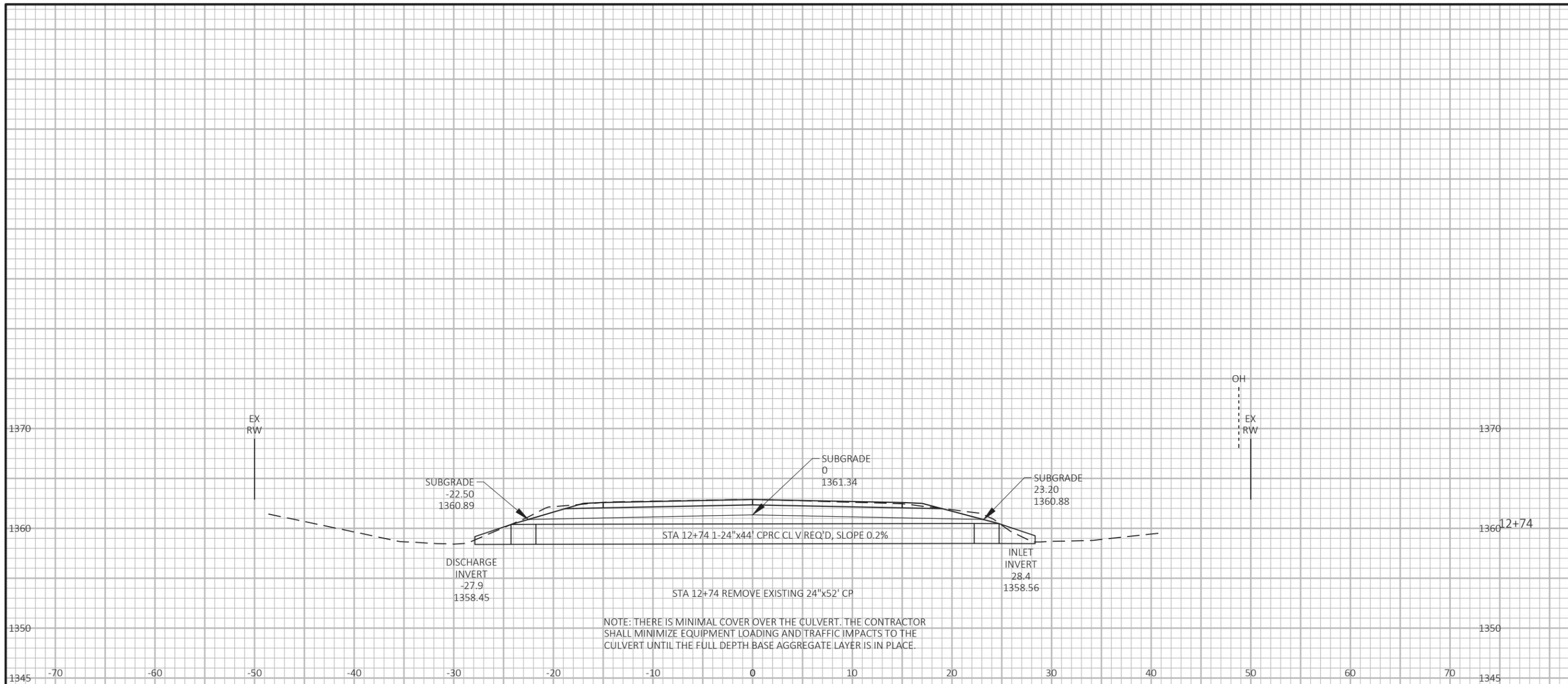
SDD 15D51 - 01

**TRAFFIC CONTROL,
MOBILE OPERATIONS ON
AN UNDIVIDED ROADWAY**

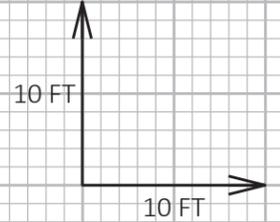
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
February 2021 DATE /S/ Andrew Heidtke
STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER

FHWA



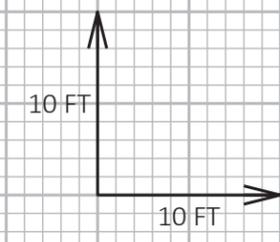
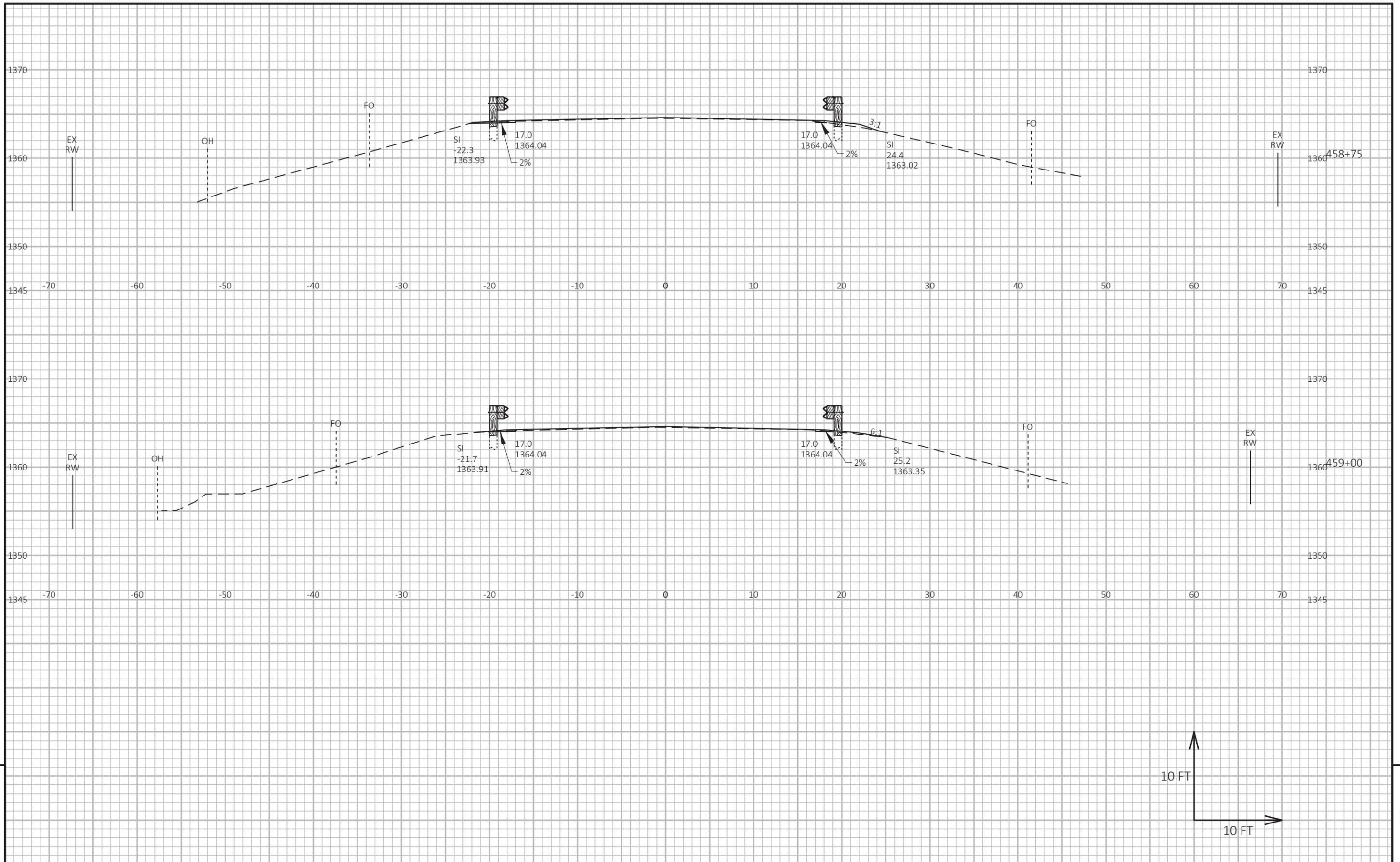
NOTE: THERE IS MINIMAL COVER OVER THE CULVERT. THE CONTRACTOR SHALL MINIMIZE EQUIPMENT LOADING AND TRAFFIC IMPACTS TO THE CULVERT UNTIL THE FULL DEPTH BASE AGGREGATE LAYER IS IN PLACE.

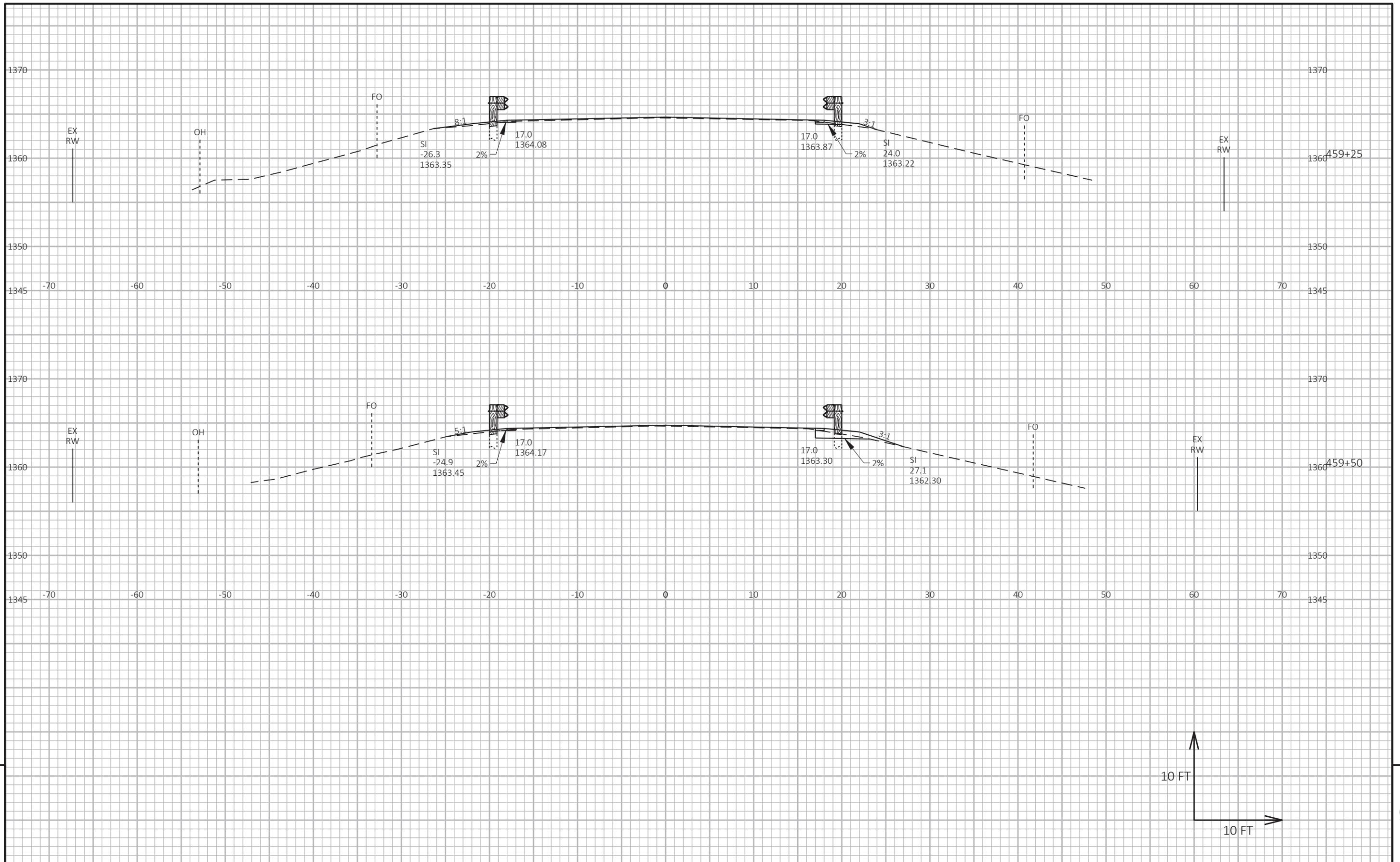


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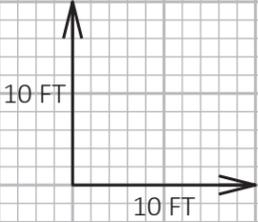
PROJECT NO: 8170-01-75	HWY: STH 70	COUNTY: SAWYER	CROSS SECTIONS: CULVERT REPLACEMENT, STATION 12+74	SHEET	E
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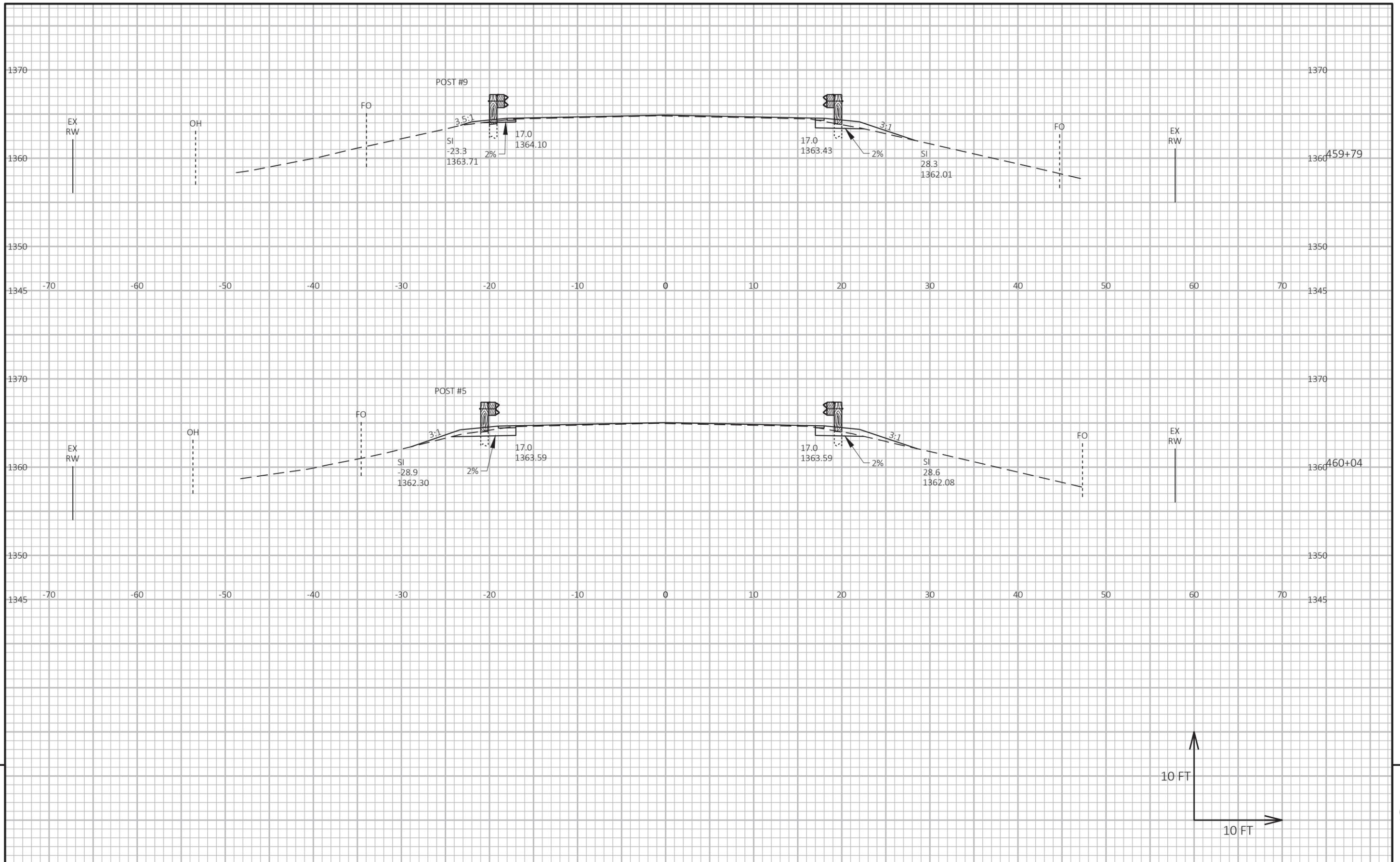
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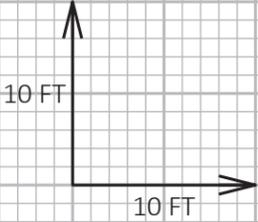
PROJECT NO: 8170-01-75 HWY: STH 70 COUNTY: SAWYER CROSS SECTIONS: BRUNET RIVER GUARDRAIL SHEET E

FILE NAME: N:\PDS\C3D\81700105\SHEETSPLAN\090202-XS.DWG PLOT DATE: 7/21/2021 11:26 AM PLOT BY: MEIR, RALPH L PLOT NAME: PLOT SCALE: 1 IN:10 FT HORZ. / 1 IN:10 FT VERT. WISDOT/CADD SHEET 49

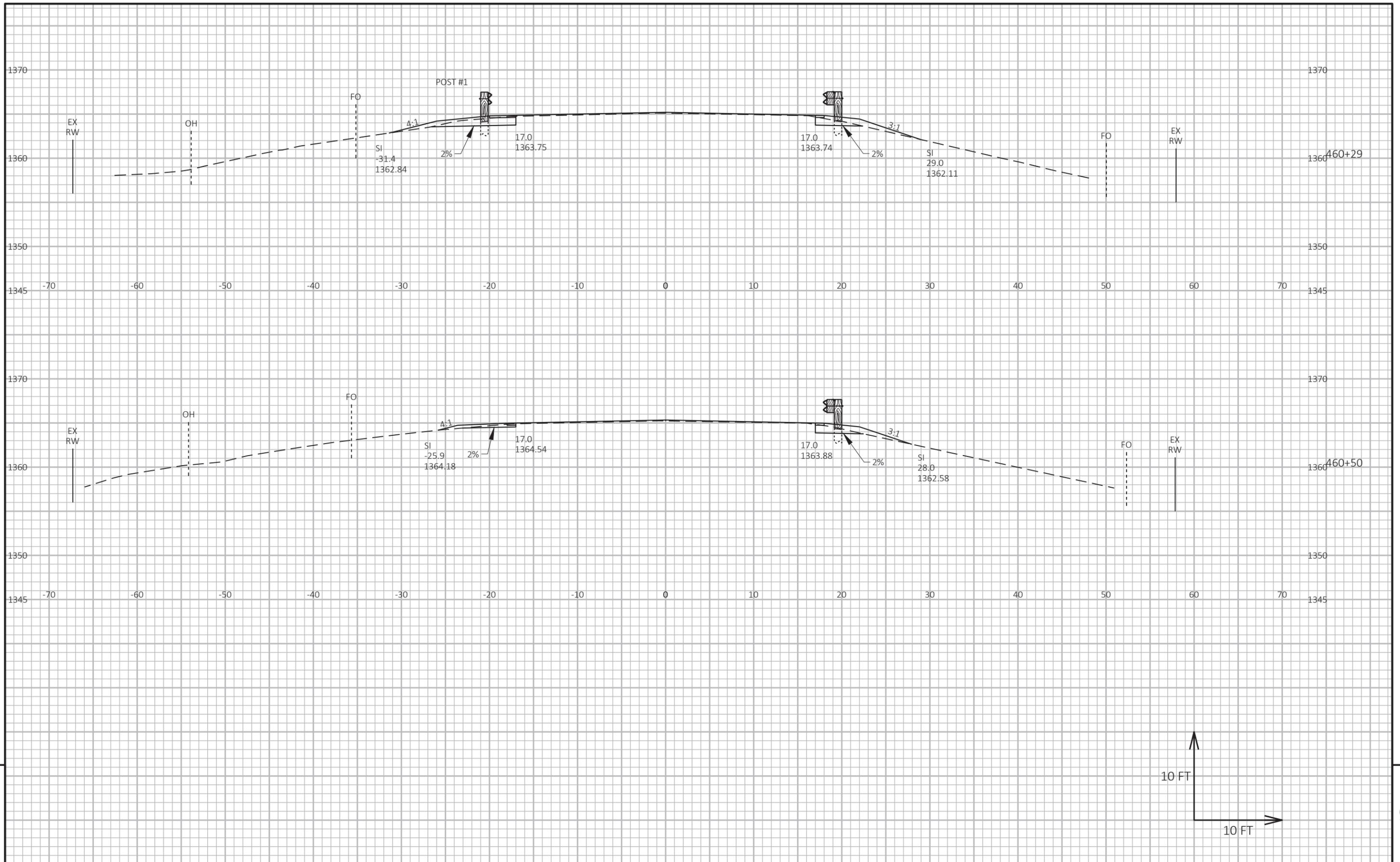


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PROJECT NO: 8170-01-75	HWY: STH 70	COUNTY: SAWYER	CROSS SECTIONS: BRUNET RIVER GUARDRAIL	SHEET	E
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PROJECT NO: 8170-01-75 HWY: STH 70 COUNTY: SAWYER CROSS SECTIONS: BRUNET RIVER GUARDRAIL SHEET E

FILE NAME: N:\PDS\C3D\81700105\SHEETSPLAN\090202-XS.DWG
LAYOUT NAME - 04

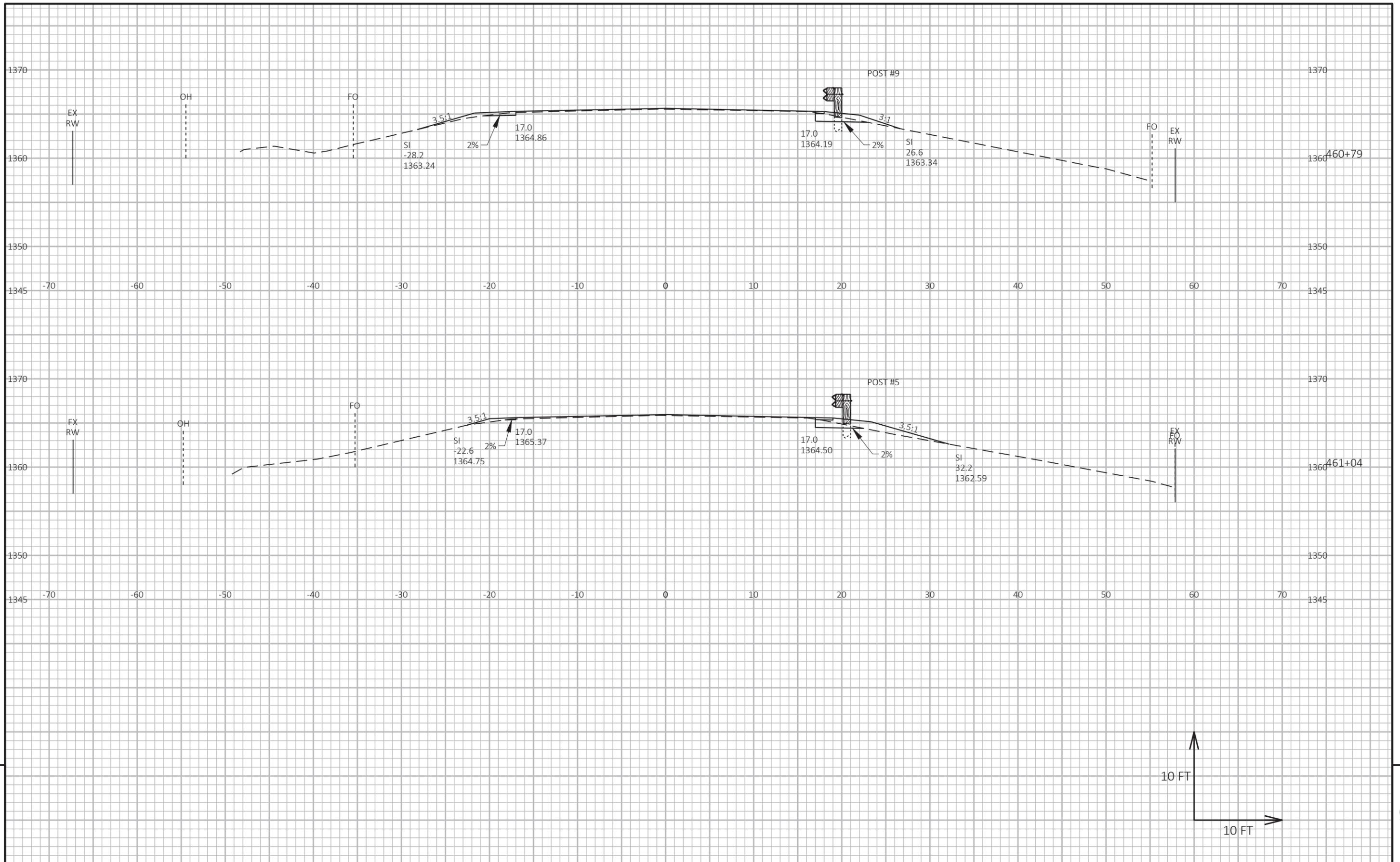
PLOT DATE: 7/21/2021 11:27 AM

PLOT BY: MEIR, RALPH L

PLOT NAME:

PLOT SCALE: 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

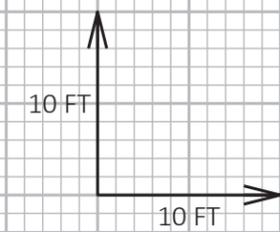
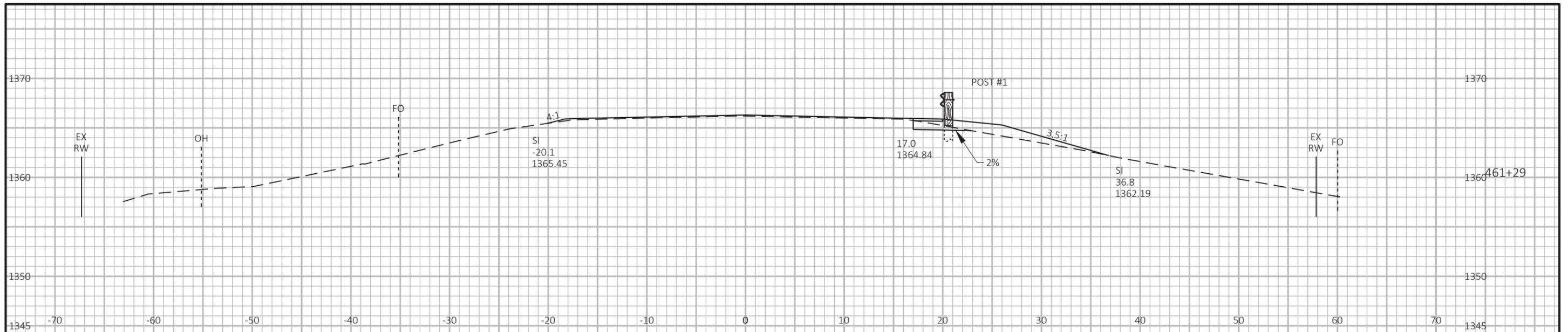
WISDOT/CADD SHEET 49



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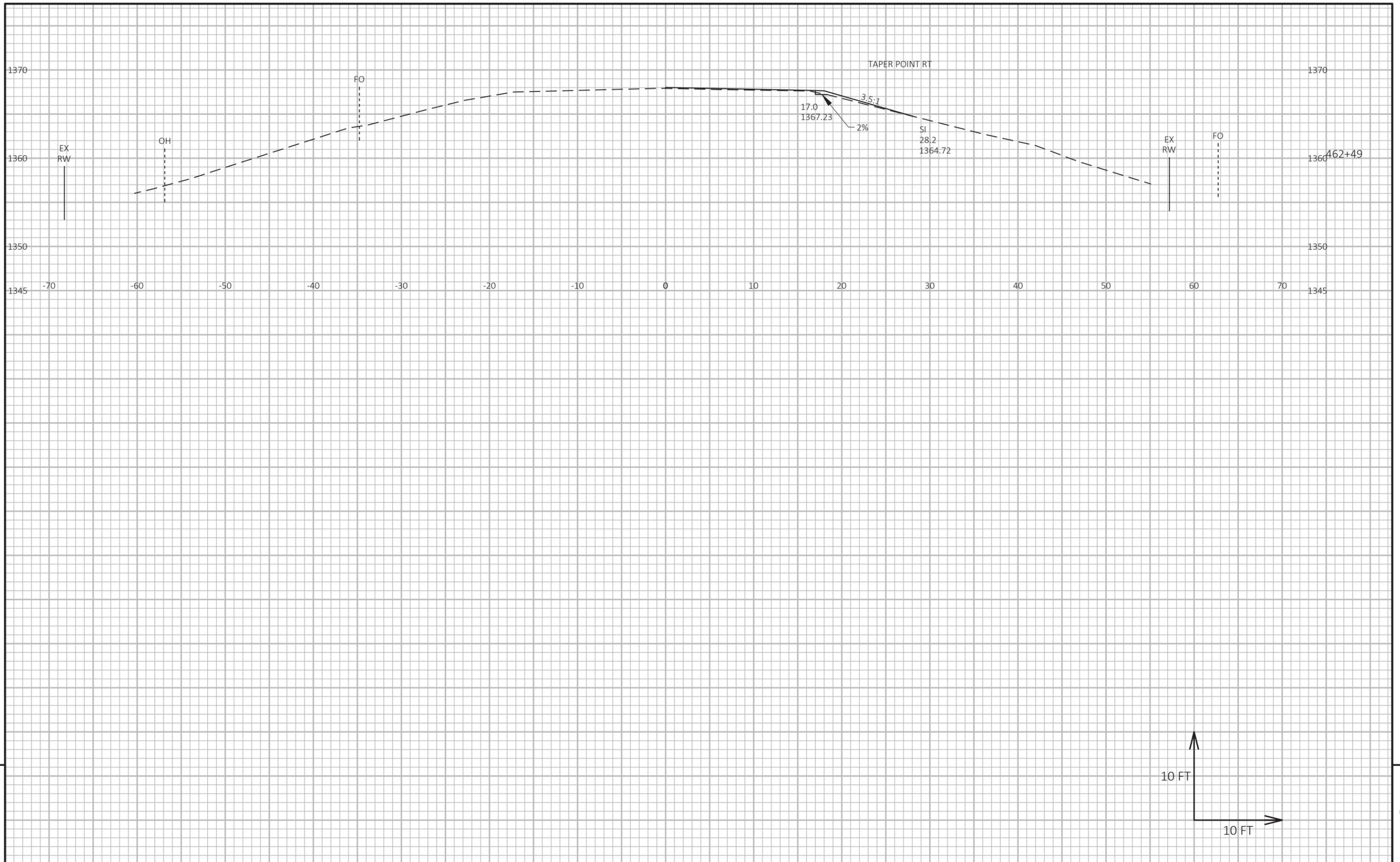
PROJECT NO: 8170-01-75	HWY: STH 70	COUNTY: SAWYER	CROSS SECTIONS: BRUNET RIVER GUARDRAIL	SHEET	E
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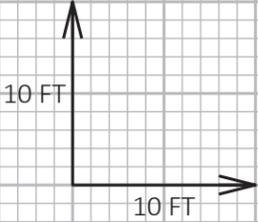
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PROJECT NO: 8170-01-75	HWY: STH 70	COUNTY: SAWYER	CROSS SECTIONS: BRUNET RIVER GUARDRAIL	SHEET	E
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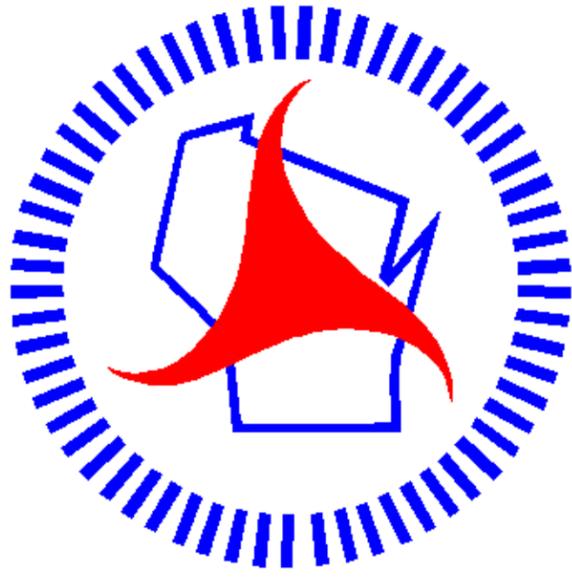
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PROJECT NO: 8170-01-75	HWY: STH 70	COUNTY: SAWYER	CROSS SECTIONS: BRUNET RIVER GUARDRAIL	SHEET	E
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Notes



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