

GRE

PROJECT ID: 4305-03-71

COUNTY: MANITOWOC

MAY 2022 ORDER OF SHEETS

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

TOTAL SHEETS = 80



DESIGN DESIGNATION 4305-03-00

A A D T	2023	=	155
A A D T	2043	=	190
D H V	2043	=	40
D D		=	60/40
T		=	6.0%
DESIGN SPEED		=	45 mph
ESALS		=	21,900

CONVENTIONAL SYMBOLS

CORPORATE LIMITS	
PROPERTY LINE	
LOT LINE	
LIMITED HIGHWAY EASEMENT	
EXISTING RIGHT OF WAY	
PROPOSED OR NEW R/W LINE	
SLOPE INTERCEPT	
REFERENCE LINE	
EXISTING CULVERT	
PROPOSED CULVERT (Box or Pipe)	
COMBUSTIBLE FLUIDS	
MARSH AREA	
WOODED OR SHRUB AREA	



GRADE LINE	
ORIGINAL GROUND	
MARSH OR ROCK PROFILE (To be noted as such)	
SPECIAL DITCH	
GRADE ELEVATION	
CULVERT (Profile View)	
UTILITIES	
ELECTRIC	
FIBER OPTIC	
GAS	
SANITARY SEWER	
STORM SEWER	
TELEPHONE	
WATER	
UTILITY PEDESTAL	
POWER POLE	
TELEPHONE POLE	

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

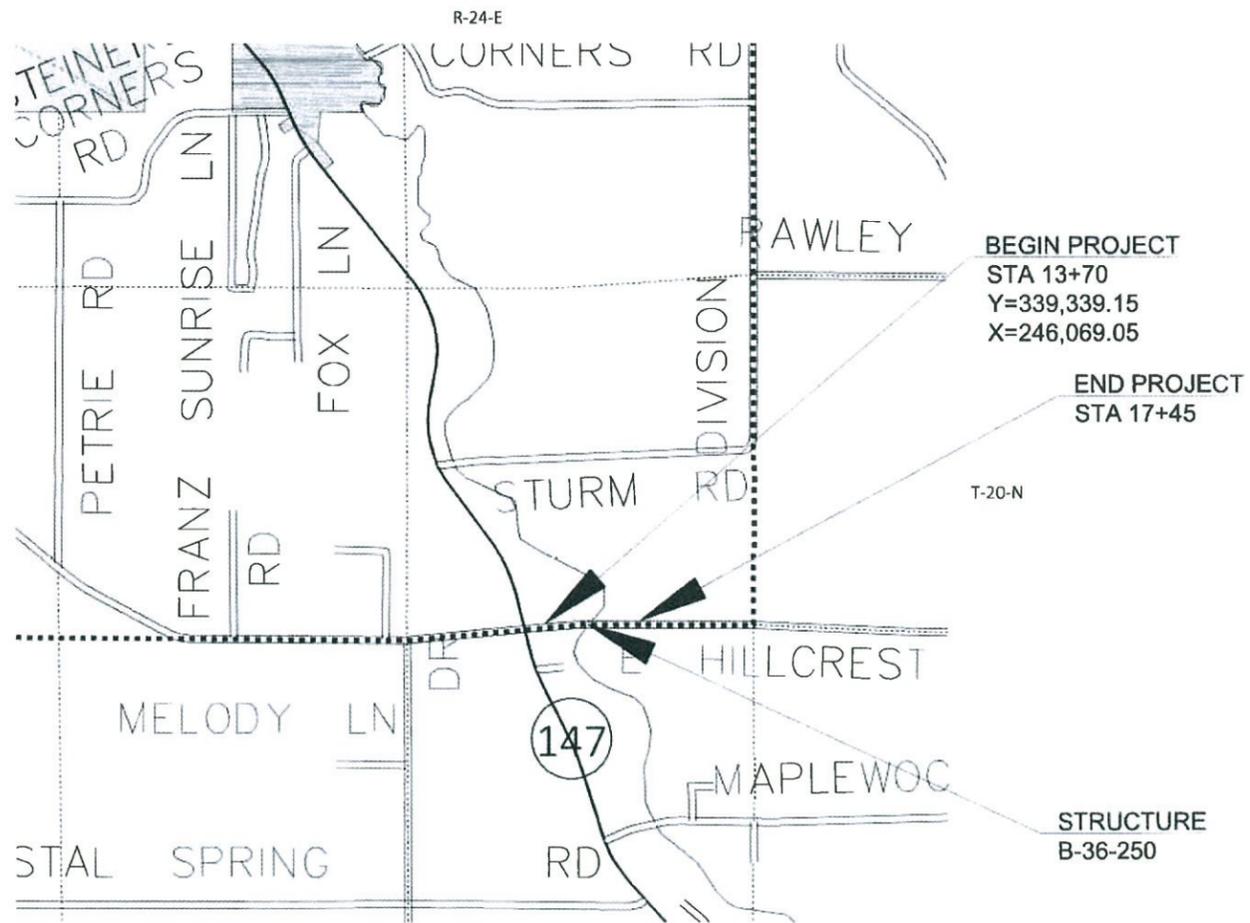
PLAN OF PROPOSED IMPROVEMENT

T TWO RIVERS, EAST HILLCREST ROAD

EAST TWIN RIVER BRIDGE & APPROACHES

LOCAL STREET
MANITOWOC

STATE PROJECT NUMBER
4305-03-71



LAYOUT
SCALE 0 0.5 MI

TOTAL NET LENGTH OF CENTERLINE = 0.071 Miles

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COORDINATE REFERENCE SYSTEM (WISCRS), MANITOWOC COUNTY, NAD83 (2011), IN U.S. SURVEY FEET. POSITIONS SHOWN ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES ARE THE SAME AS GROUND DISTANCES. ELEVATIONS ARE REFERENCED TO NAVD 88 (2012). GPS DERIVED ELEVATIONS ARE BASED ON GEOID 18.

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
4305-03-71	WISC 2022405	1

ACCEPTED FOR
MANITOWOC COUNTY

Date: 1/12/22 *[Signature]*
Commissioner (Signature and Title of Official)

ORIGINAL PLANS PREPARED BY

MURRAY R. GLEN
36246-006
GREEN BAY, WI

PROFESSIONAL ENGINEER

Date: 1/10/22 *[Signature]*
Professional Engineer Signature

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor: JT ENGINEERING
Designer: JT ENGINEERING
Project Manager: BRIAN EDWARDS, PE
Regional Examiner: REGIONAL EXAMINER
Regional Supervisor: JAMES THOMPSON, PE

APPROVED FOR THE DEPARTMENT

Date: 3/3/2022 *[Signature]*
(Signature)

E



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

UTILITY CONTACTS

FRONTIER COMMUNICATIONS
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 OAKFIELD, WI 53065
 TEL: (920) 563-3275
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WINDSTREAM
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 817 MAIN ST
 BROWNSVILLE, WI 53006
 TEL: (920) 579-7057
 EMAIL: MHORETZK@MICHELS.US

AT&T
 VICTORIA KASSAB
 205 S JEFFERSON STREET
 GREEN BAY, WI 54301
 TEL: (920) 401-7512
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AGENCY/PROJECT CONTACT

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 MR. MATT SCHAEVE
 NORTHEAST REGION
 2984 SHAWANO AVENUE
 GREEN BAY, WI 54313
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 EMAIL: MATTHEW.SCHAEVE@WISCONSIN.GOV

WISCONSIN DOT CONTACT
 MR. DOUG KIRST
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 GREEN BAY, WI 54304
 TEL: (920) 362-0389
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**SEQUENCE OF PLANS AND
 DETAILS IN SECTION 2**

- GENERAL NOTES
- TYPICAL SECTIONS
- CONSTRUCTION DETAILS
- EROSION CONTROL
- TRAFFIC CONTROL

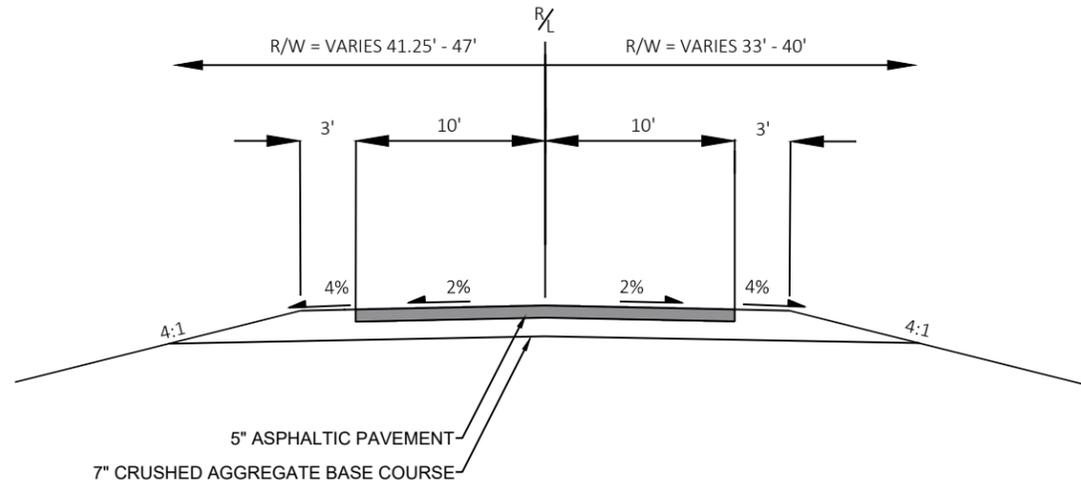
GENERAL NOTES

1. THE LOCATIONS OF EXISTING UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE. THERE MAY BE OTHER UTILITIES WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.
2. ANY LOCAL OR MUNICIPAL UTILITY WHICH IS NOT A MEMBER OF THE DIGGERS HOTLINE MUST BE CONTACTED SEPARATELY.

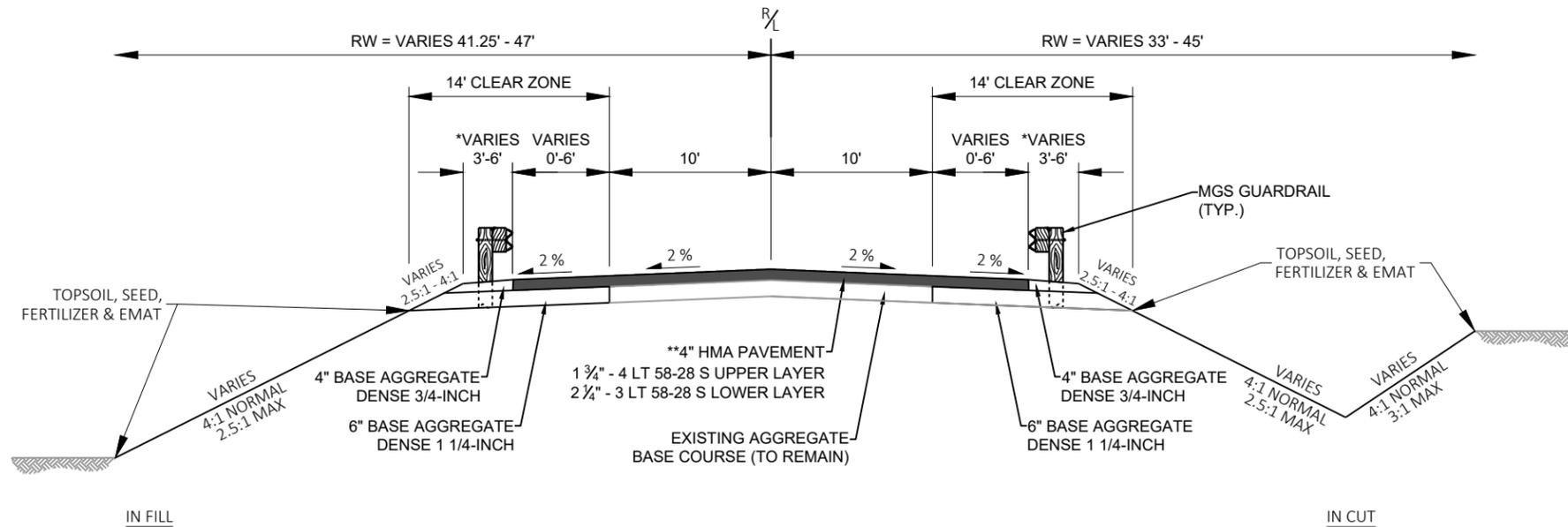
RUNOFF COEFFICIENT TABLE

	HYDROLOGIC SOIL GROUP											
	A			B			C			D		
	SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)		
LAND USE:	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 = 1.174 ACRES
 TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 1.035 ACRES



TYPICAL EXISTING SECTION
 HILLCREST ROAD
 STA 11+84 - STA 14+62
 STA 15+53 - STA 18+23

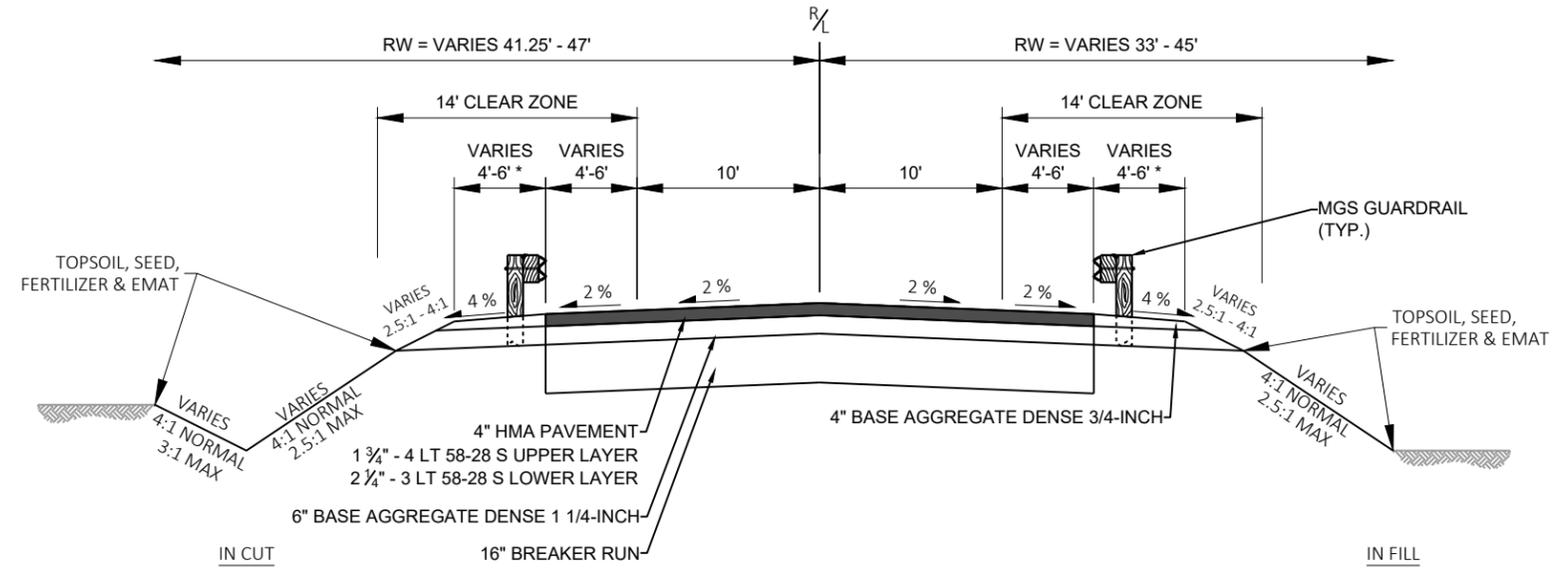


FINISHED TYPICAL SECTION

*STA 11+84.10 - 13+70 RT
 *STA 12+14.19 - 13+70 LT
 STA 17+45 - 17+93.92 RT
 STA 17+45 - 18+23 LT

* GUARDRAIL TO BE INSTALLED FROM
 13+19.10 TO 16+58.92 RT
 13+49.19 TO 16+88.27 LT

** REMOVE AND PLACE ASPHALTIC
 PAVEMENT FROM STATION 12+69.10 TO 13+70

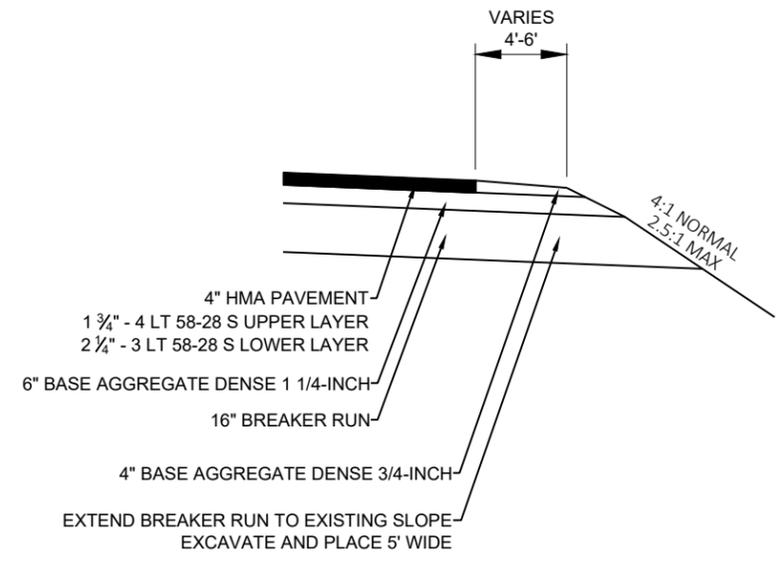


FINISHED TYPICAL SECTION

*STA 13+70 - 14+19
*STA 15+88 - 17+45

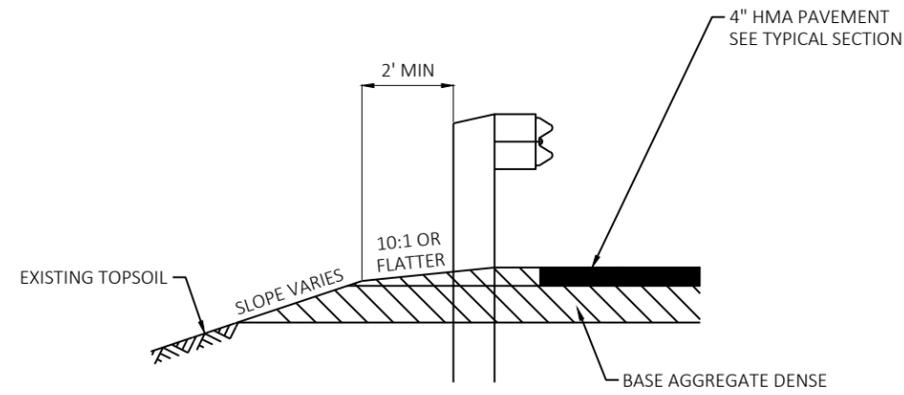
*GUARDRAIL TO BE INSTALLED FROM
13+19.10 TO 16+58.92 RT
13+49.19 TO 16+88.27 LT

NOTE:
CONSTRUCT CONCRETE APPROACH
SLABS FROM STATIONS 14+19 TO
14+43 & 15+64 TO 15+88 OVER 6"
BASE AGGREGATE DENSE 1-1/4" AND
8" BREAKER RUN

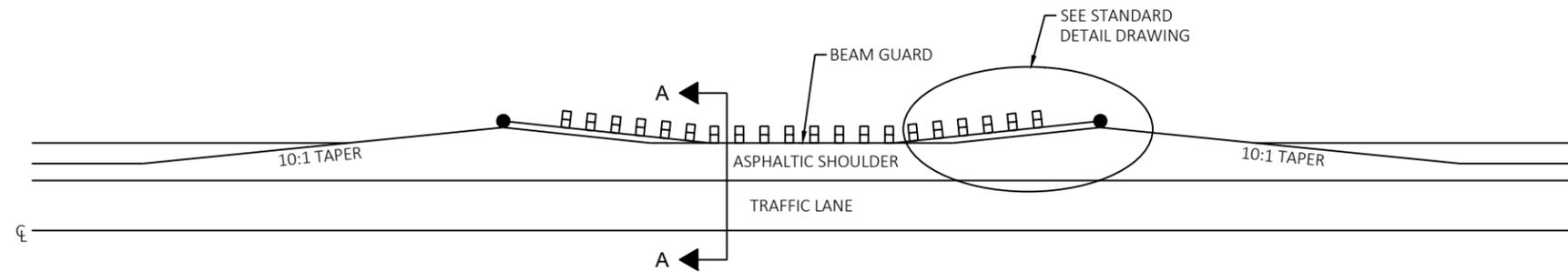


SUB BASE DRAIN-OUT DETAIL

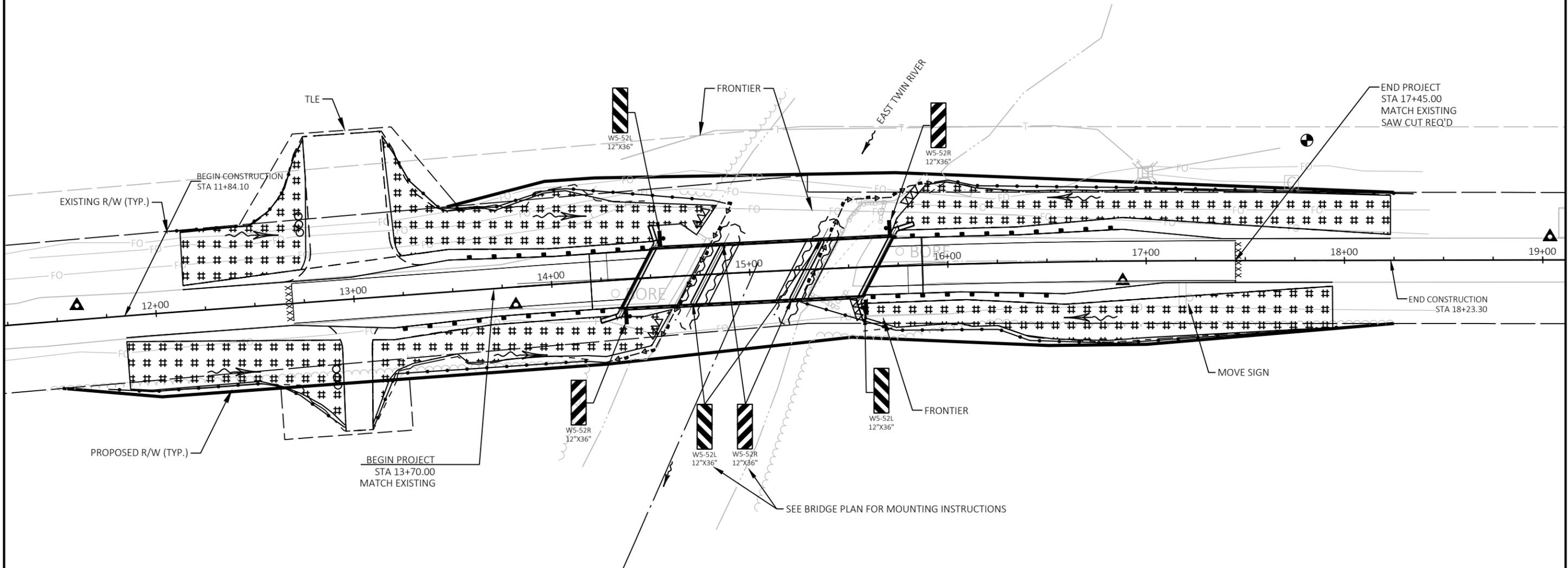
STA 14+18 RT
STA 14+40 LT
STA 16+27 LT & RT



SECTION A-A



DETAIL FOR ASPHALTIC SHOULDER AT BEAM GUARD



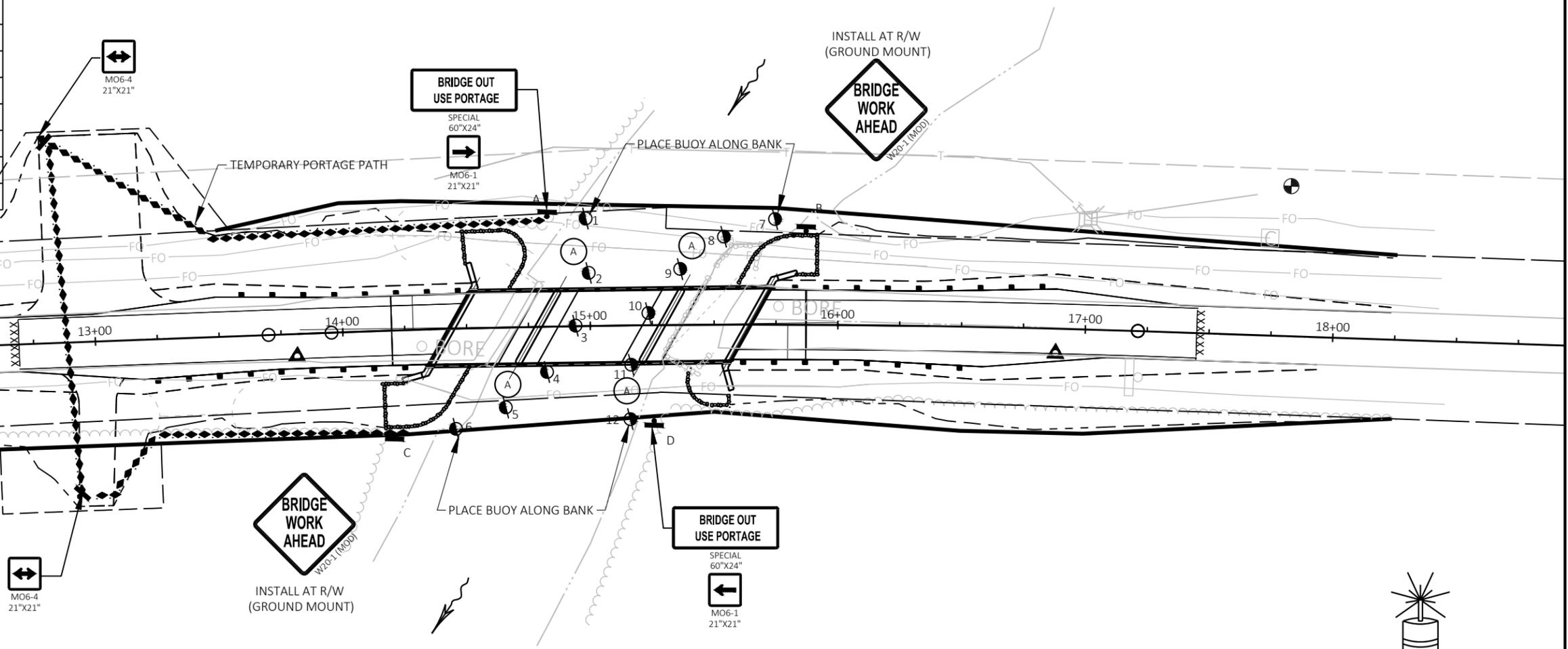
LEGEND	
	SILT FENCE
	TURBIDITY BARRIER
	EROSION MAT URBAN CLASS I, TYPE A
	TEMPORARY DITCH CHECK
	TEMPORARY CULVERT PIPE CHECK

HIGH WATER Q2 ELEVATION = 586.80

PROJECT NO: 4305-03-71	HWY: LOCAL STREET	COUNTY: MANITOWOC	EROSION CONTROL AND SIGNING PLAN	SHEET	E
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	Location Marker	Latitude	Longitude
Buoy	1	N 42.742542	W 96.535057
	2	N 42.742482	W 96.535043
	3	N 42.742422	W 96.535053
	4	N 42.742368	W 96.535088
	5	N 42.742324	W 96.535144
	6	N 42.742294	W 96.535215
	7	N 42.742565	W 96.534774
	8	N 42.742539	W 96.534847
	9	N 42.742498	W 96.534907
	10	N 42.742446	W 96.534947
	11	N 42.742387	W 96.534964
	12	N 42.742327	W 96.534956
Sign	A	N 42.742541	W 96.535114
	B	N 42.742558	W 96.534726
	C	N 42.742278	W 96.535305
	D	N 42.742326	W 96.534919



NOTES

ALL BUOYS TO BE LIGHTED FOR NIGHT TRAFFIC.

CLOSE RIVER FOR PIER CONSTRUCTION AND FORMING DECK.

CONTRACTOR TO PLACE SIGNS ALONG PORTAGE ROUTE TO GUIDE USERS ALONG THE ROUTE WHILE THE RIVER IS CLOSED. REMOVE WHEN OPEN TO NAVIGATIONAL TRAFFIC.

LEGEND

- NAVIGATIONAL BUOY
- SIGN ON PERMANENT SUPPORT
- PORTAGE ROUTE
- TYPE A WARNING LIGHT ATTACHED TO COFFERDAM



EXAMPLE BUOY

Estimate Of Quantities

4305-03-71

Line	Item	Item Description	Unit	Total	Qty
0002	201.0105	Clearing	STA	4.000	4.000
0004	201.0205	Grubbing	STA	4.000	4.000
0006	203.0100	Removing Small Pipe Culverts	EACH	1.000	1.000
0008	203.0260	Removing Structure Over Waterway Minimal Debris (structure) 01. P-36-250	EACH	1.000	1.000
0010	204.0110	Removing Asphaltic Surface	SY	224.000	224.000
0012	205.0100	Excavation Common	CY	528.000	528.000
0014	206.1000	Excavation for Structures Bridges (structure) 01. B-36-250	LS	1.000	1.000
0016	206.5000	Cofferdams (structure) 01. B-36-250	LS	1.000	1.000
0018	208.0100	Borrow	CY	1,539.000	1,539.000
0020	210.1500	Backfill Structure Type A	TON	244.000	244.000
0022	211.0100	Prepare Foundation for Asphaltic Paving (project) 01. 4305-03-71	LS	1.000	1.000
0024	213.0100	Finishing Roadway (project) 01. 4305-03-71	EACH	1.000	1.000
0026	305.0110	Base Aggregate Dense 3/4-Inch	TON	237.000	237.000
0028	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	550.000	550.000
0030	311.0110	Breaker Run	TON	655.000	655.000
0032	415.0060	Concrete Pavement 6-Inch	SY	41.000	41.000
0034	415.0410	Concrete Pavement Approach Slab	SY	102.000	102.000
0036	455.0605	Tack Coat	GAL	67.000	67.000
0038	460.2000	Incentive Density HMA Pavement	DOL	1.000	1.000
0040	460.5223	HMA Pavement 3 LT 58-28 S	TON	120.000	120.000
0042	460.5224	HMA Pavement 4 LT 58-28 S	TON	107.000	107.000
0044	502.0100	Concrete Masonry Bridges	CY	383.000	383.000
0046	502.1100	Concrete Masonry Seal	CY	128.000	128.000
0048	502.3200	Protective Surface Treatment	SY	482.000	482.000
0050	505.0400	Bar Steel Reinforcement HS Structures	LB	9,710.000	9,710.000
0052	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	65,050.000	65,050.000
0054	513.4061	Railing Tubular Type M	LF	250.000	250.000
0056	516.0500	Rubberized Membrane Waterproofing	SY	14.000	14.000
0058	520.1018	Apron Endwalls for Culvert Pipe 18-Inch	EACH	4.000	4.000
0060	520.3318	Culvert Pipe Class III-A 18-Inch	LF	116.000	116.000
0062	550.1100	Piling Steel HP 10-Inch X 42 Lb	LF	1,905.000	1,905.000
0064	606.0300	Riprap Heavy	CY	300.000	300.000
0066	612.0406	Pipe Underdrain Wrapped 6-Inch	LF	150.000	150.000
0068	614.2300	MGS Guardrail 3	LF	75.000	75.000
0070	614.2500	MGS Thrie Beam Transition	LF	158.000	158.000
0072	614.2610	MGS Guardrail Terminal EAT	EACH	4.000	4.000
0074	619.1000	Mobilization	EACH	1.000	1.000
0076	624.0100	Water	MGAL	16.000	16.000
0078	625.0100	Topsoil	SY	2,400.000	2,400.000
0080	628.1504	Silt Fence	LF	1,400.000	1,400.000
0082	628.1520	Silt Fence Maintenance	LF	2,800.000	2,800.000
0084	628.1905	Mobilizations Erosion Control	EACH	5.000	5.000
0086	628.1910	Mobilizations Emergency Erosion Control	EACH	3.000	3.000
0088	628.2006	Erosion Mat Urban Class I Type A	SY	2,400.000	2,400.000
0090	628.6005	Turbidity Barriers	SY	173.000	173.000
0092	628.7504	Temporary Ditch Checks	LF	60.000	60.000
0094	628.7555	Culvert Pipe Checks	EACH	6.000	6.000
0096	629.0210	Fertilizer Type B	CWT	2.000	2.000
0098	630.0170	Seeding Mixture No. 70	LB	9.000	9.000

Estimate Of Quantities

4305-03-71

Line	Item	Item Description	Unit	Total	Qty
0100	630.0200	Seeding Temporary	LB	65.000	65.000
0102	630.0500	Seed Water	MGAL	70.000	70.000
0104	634.0614	Posts Wood 4x6-Inch X 14-FT	EACH	4.000	4.000
0106	634.0616	Posts Wood 4x6-Inch X 16-FT	EACH	1.000	1.000
0108	637.2230	Signs Type II Reflective F	SF	24.000	24.000
0110	638.2102	Moving Signs Type II	EACH	1.000	1.000
0112	638.3000	Removing Small Sign Supports	EACH	1.000	1.000
0114	642.5001	Field Office Type B	EACH	1.000	1.000
0116	643.0420	Traffic Control Barricades Type III	DAY	1,440.000	1,440.000
0118	643.0705	Traffic Control Warning Lights Type A	DAY	1,640.000	1,640.000
0120	643.0900	Traffic Control Signs	DAY	2,080.000	2,080.000
0122	643.5000	Traffic Control	EACH	1.000	1.000
0124	645.0111	Geotextile Type DF Schedule A	SY	104.000	104.000
0126	645.0120	Geotextile Type HR	SY	550.000	550.000
0128	646.1020	Marking Line Epoxy 4-Inch	LF	700.000	700.000
0130	650.4500	Construction Staking Subgrade	LF	516.000	516.000
0132	650.5000	Construction Staking Base	LF	516.000	516.000
0134	650.6500	Construction Staking Structure Layout (structure) 01. B-36-250	LS	1.000	1.000
0136	650.9910	Construction Staking Supplemental Control (project) 01. 4305-03-71	LS	1.000	1.000
0138	650.9920	Construction Staking Slope Stakes	LF	516.000	516.000
0140	690.0150	Sawing Asphalt	LF	44.000	44.000
0142	715.0502	Incentive Strength Concrete Structures	DOL	2,298.000	2,298.000
0144	715.0720	Incentive Compressive Strength Concrete Pavement	DOL	500.000	500.000
0146	ASP.1T0A	On-the-Job Training Apprentice at \$5.00/HR	HRS	600.000	600.000
0148	ASP.1T0G	On-the-Job Training Graduate at \$5.00/HR	HRS	300.000	300.000
0150	SPV.0060	Special 01. Drop-In Concrete Anchors 1/2 Inch	EACH	8.000	8.000
0152	SPV.0090	Special 01. Flashing Stainless Steel	LF	235.000	235.000
0154	SPV.0195	Special 01. Select Crushed Material for Travel Corridor	TON	30.000	30.000

EARTHWORK SUMMARY

Division	From/To Station	LOCATION	Common Excavation (item #205.0100) Cut (1)	Unusable Pavement Material (2)	Available Material (3)	Unexpanded Fill	Expanded Fill (4) Factor 1.25	Mass Ordinate +/- (5)	BORROW 208.0100	Comment:
0010	11+84 TO 14+42	Hillcrest Rd	196	41	155	1,193	1491	-1,295	1,295	WEST APPROACH
0010	14+87 to 18+23	Hillcrest Rd	332	61	271	461	576	-244	244	EAST APPROACH
Total 0010			528	102	426	1,654	2,067	-1,539	1,539	

- 1) Unusable Pavement is included in Cut
- 2) Unusable Pavement Material = Existing Asphaltic Pavement
- 3) Available Material = Cut - Unusable Pavement Material
- 4) Expanded Fill Factor = 1.25 Expanded Fill = Unexpanded Fill * Fill Factor
- 5) The Mass Ordinate + or - Qty calculated for the Division. Plus quantity indicates an excess of material within the Division. Minus indicates a shortage of material within the Division.

CLEARING & GRUBBING

STATION	TO	STATION	LOCATION	201.0105 CLEARING STA	201.0205 GRUBBING STA
12+00	-	14+00	HILLCREST, RT	2	2
15+65	-	17+45	HILLCREST, RT	2	2
TOTALS				4	4

REMOVING SMALL PIPE CULVERTS

CATEGORY	STATION	LOCATION	EACH	NOTES
0010	14+06	Hillcrest Rd LT	1	CMCP 18-INCH
TOTAL 0010			1	

REMOVING ASPHALTIC SURFACE

CATEGORY	STATION	STATION	LOCATION	204.0110 REMOVING ASPHALTIC SURFACE SY
0010	12+69	- 13+70	HILLCREST RD	224
TOTAL 0010				224

BASE AGGREGATE SUMMARY

CATEGORY	STATION	STATION	LOCATION	305.0110 BASE AGGREGATE DENSE 3/4- INCH TON	305.0120 BASE AGGREGATE DENSE 1 1/4-INCH TON	311.0110 BREAKER RUN TON	624.0100 WATER MGAL
0010	11+84	- 14+42	Hillcrest Rd	33	200	168	5.0
0010	15+87	- 18+23	Hillcrest Rd	33	280	402	6.0
0010	DRIVEWAYS			141	---	---	3.0
0010	UNDISTRIBUTED			30	70	85	2.0
TOTAL 0010				237	550	655	16

CONCRETE SUMMARY

CATEGORY	STATION	STATION	LOCATION	415.0060 CONCRETE PAVEMENT 6- INCH SY	415.0410 CONCRETE PAVEMENT APPROACH SLAB SY
0010	11+84	- 14+42	Hillcrest Rd	21	52
0010	15+87	- 18+23	Hillcrest Rd	20	50
TOTAL 0010				41	102

3

3

ASPHALT PAVEMENT SUMMARY

455.0605 460.5223 460.5224

CATEGORY	STATION	STATION	LOCATION	AREA SY	LOWER LAYER	UPPER LAYER	TACK COAT GAL	HMA PAVEMENT 3	HMA PAVEMENT 4	
					DEPTH IN	DEPTH IN		LT 58-28 S TON	LT 58-28 S TON	
0010	11+84	-	14+42	Hillcrest Rd	466	2.25	1.75	33	59	46
0010	15+87	-	18+23	Hillcrest Rd	484	2.25	1.75	34	61	61
TOTAL								67	120	107

CULVERT PIPES

520.1018 520.3318

APRON ENDWALLS FOR
CULVERT PIPE 18-INCH

CULVERT PIPE CLASS
III-A 18-INCH

CATEGORY	STATION	LOCATION	EACH	LF	NOTES
0010	13+00	Hillcrest Rd RT	2	40	MIN STEEL THICKNESS .064
0010	13+00	Hillcrest Rd LT	2	76	MIN STEEL THICKNESS .064
TOTAL 0010			4	116	

EROSION CONTROL SUMMARY

628.1910 628.2006

628.1504 628.1520 628.1905 MOBILIZATION EROSION MAT 628.6005 628.7504 628.7555
 SILT FENCE SILT FENCE MOBILIZATION EMERGENCY URBAN CLASS I
 SILT FENCE MAINTENANCE EROSION CONTROL EROSION CONTROL TYPE A TURBIDITY TEMPORARY CULVERT PIPE
 BARRIERS DITCH CHECKS CHECKS

CATEGORY	STATION	STATION	LOCATION	LF	LF	EACH	EACH	SY	SY	LF	EACH	
0010	11+84	-	14+59	Hillcrest Rd RT	285	570	---	---	600	87	10	2
0010	12+15	-	14+75	Hillcrest Rd LT	325	650	---	---	638	---	10	2
0010	15+50	-	17+95	Hillcrest Rd RT	282	564	---	---	447	86	10	---
0010	15+75	-	18+25	Hillcrest Rd LT	235	470	---	---	481	---	10	---
0010	UNDISTRIBUTED			273	546	5	3	234	---	20	2	
TOTAL 0010				1,400	2,800	5	3	2,400	173	60	6	

3

3

GUARDRAIL SUMMARY

CATEGORY	STATION	STATION	LOCATION	614.2300 614.2500 614.2610			
				MGS GUARDRAIL 3	MGS THRIE BEAM TRANSITION	MGS GUARDRAIL TERMINAL EAT	
				LF	LF	EACH	
0010	11+84	-	14+59	Hillcrest Rd RT	25.0	39.4	1
0010	12+15	-	14+75	HillcrestRd LT	12.5	39.4	1
0010	15+50	-	17+95	Hillcrest Rd RT	12.5	39.4	1
0010	15+75	-	18+25	Hillcrest Rd LT	25.0	39.4	1
TOTAL					75	158	4

LANDSCAPING SUMMARY

CATEGORY	STATION	STATION	LOCATION	625.0100 629.0210 630.0170 630.0200 630.0500					
				TOPSOIL	FERTILIZER TYPE B	SEEDING MIXTURE NO. 70	SEEDING TEMPORARY	SEED WATER	
				SY	CWT	LB	LB	MGAL	
0010	11+84	-	14+59	Hillcrest Rd RT	600	0.38	2	16	18
0010	12+15	-	14+75	HillcrestRd LT	638	0.40	2	17	18
0010	15+50	-	17+95	Hillcrest Rd RT	447	0.28	2	12	13
0010	15+75	-	18+25	Hillcrest Rd LT	481	0.30	2	13	14
0010	UNDISTRIBUTED				234	0.15	1	6	7
TOTAL					2,400	2	9	65	70

PERMANENT SIGNING, TYPE II

CATEGORY	STATION	LOCATION	SIGN CODE	SIZE	DESCRIPTION	634.0614 634.0616 637.2230 638.2102 638.3000					NOTES
						POSTS WOOD 4X6 INCH X 14-FT	POSTS WOOD 4X6-INCH X 16-FT	SIGNS TYPE II REFLECTIVE F	MOVING SIGNS TYPE II	REMOVING SMALL SIGN SUPPORTS	
						EACH	EACH	SF	EACH	EACH	
0010	14+33	RT	W5-52R	12X36	BRIDGE HAZARD MARKER	1	---	3.0	---	---	
0010	14+50	LT	W5-52L	12X36	BRIDGE HAZARD MARKER	1	---	3.0	---	---	
0010	14+72	RT	W5-52L	12X36	BRIDGE HAZARD MARKER	---	---	3.0	---	---	ATTACH TO BRIDGE PIERS FOR NAVIGATOINAL TRAFFIC
0010	14+86	LT	W5-52R	12X36	BRIDGE HAZARD MARKER	---	---	3.0	---	---	ATTACH TO BRIDGE PIERS FOR NAVIGATOINAL TRAFFIC
0010	15+22	RT	W5-52R	12X36	BRIDGE HAZARD MARKER	---	---	3.0	---	---	ATTACH TO BRIDGE PIERS FOR NAVIGATOINAL TRAFFIC
0010	15+36	LT	W5-52L	12X36	BRIDGE HAZARD MARKER	---	---	3.0	---	---	ATTACH TO BRIDGE PIERS FOR NAVIGATOINAL TRAFFIC
0010	15+75	LT	W5-52L	12X36	BRIDGE HAZARD MARKER	1	---	3.0	---	---	
0010	15+60	RT	W5-52R	12X36	BRIDGE HAZARD MARKER	1	1	3.0	1	1	MOVE EXISTING "NO PARKING" . REPLACE WOOD POST
TOTAL 0010						4	1	24.0	1	1	

PROJECT NO: 4305-03-71

HWY: EAST HILLCREST ROAD

COUNTY: MANITOWOC

MISCELLANEOUS QUANTITIES

SHEET

E

TRAFFIC CONTROL SUMMARY

CATEGORY	STATION	TO	STATION	LOCATION	APPROXIMATE SERVICE								
					DAYS	643.5000 TRAFFIC CONTROL PROJECT		643.0420 BARRICADES TYPE III		643.0705 WARNING LIGHTS TYPE A		643.0900 SIGNS	
						EA	NO. IN SERVICE	DAYS	NO. IN SERVICE	DAYS	NO. IN SERVICE	DAYS	
0010	11+84	-	0+00	Hillcrest Rd	120	1	12	1,440	12	1,440	14	1,680	
0010	TEMPORARY PORTAGE PATH			Hillcrest Rd	50	---	---	---	4	200	8	400	
TOTAL 0010						1		1,440		1,640		2,080	

CONSTRUCTION STAKING SUMMARY

CATEGORY	STATION	TO	STATION	LOCATION	APPROXIMATE SERVICE						
					LF	650.4500 CONSTRUCTION STAKING SUBGRADE		650.5000 CONSTRUCTION STAKING BASE		650.6500.01 STAKING STRUCTURE B-36-250	
						LF	LF	LS	LS	LF	
0010	11+84	-	14+42	Hillcrest Rd	258	258	---	---	258		
0010	15+65	-	18+23	Hillcrest Rd	258	258	--	---	258		
PROJECT					---	---	1	1	--		
TOTAL 0010					516	516	1	1	516		

PAVEMENT MARKING

646.1020

MARKING LINE
EPOXY 4-INCH

CATEGORY	STATION	TO	STATION	LOCATION	LF	NOTES
0010	12+69	-	16+00	Hillcrest Rd	662	DOUBLE YELLOW CENTERLINE
0010	16+00	-	17+45	Hillcrest Rd	38	YELLOW SKIPS

TOTAL 0010 700

SAWING SUMMARY

690.0150
SAWING
ASPHALT

CATEGORY	STATION	LOCATION	LF
0010	11+84	Hillcrest Rd	22
0010	15+87	Hillcrest Rd	22

TOTAL 0010 44

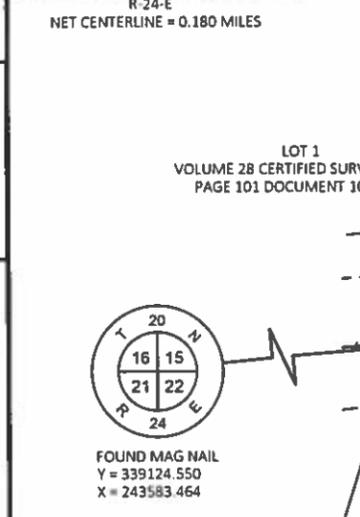
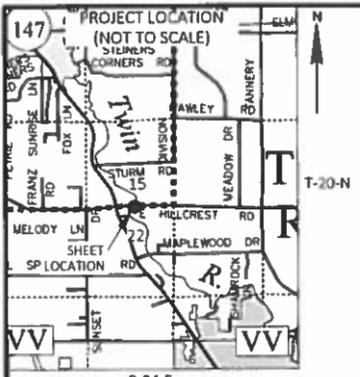


R/W PROJECT NUMBER	4305-03-00	NUMBER	4.01	SHEETS	1
FEDERAL PROJECT NUMBER					
PLAT OF RIGHT-OF-WAY REQUIRED FOR					
T TWO RIVERS, E HILLCREST RD					
EAST TWIN RIVER BRIDGE					
LOCAL STREET	MANITOWOC COUNTY				
CONSTRUCTION PROJECT NUMBER	4305-03-70				

SCHEDULE OF LANDS & INTERESTS REQUIRED

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

PARCEL NUMBER	OWNER (S)	INTEREST REQUIRED	FEE R/W ACRES, REQUIRED			TLE ACRES
			NEW	EXISTING	TOTAL	
1	PAMELA B. MAHLUM	FEE & TLE	0.020	0.361	0.381	0.079
2	PAUL W. FUNK AND DIANE M. FUNK REVOCABLE LIVING TRUST	FEE	0.038	0.224	0.262	---
3	GREGORY L. LINK	FEE & TLE	0.081	0.286	0.324	0.039
4	AUGUST W. ELLER III, SANDRA L. ELBE, AND CAROLE J. ELLER	FEE	0.052	0.224	0.276	---
50	FRONTIER COMMUNICATIONS	RELEASE OF RIGHTS	---	---	---	---



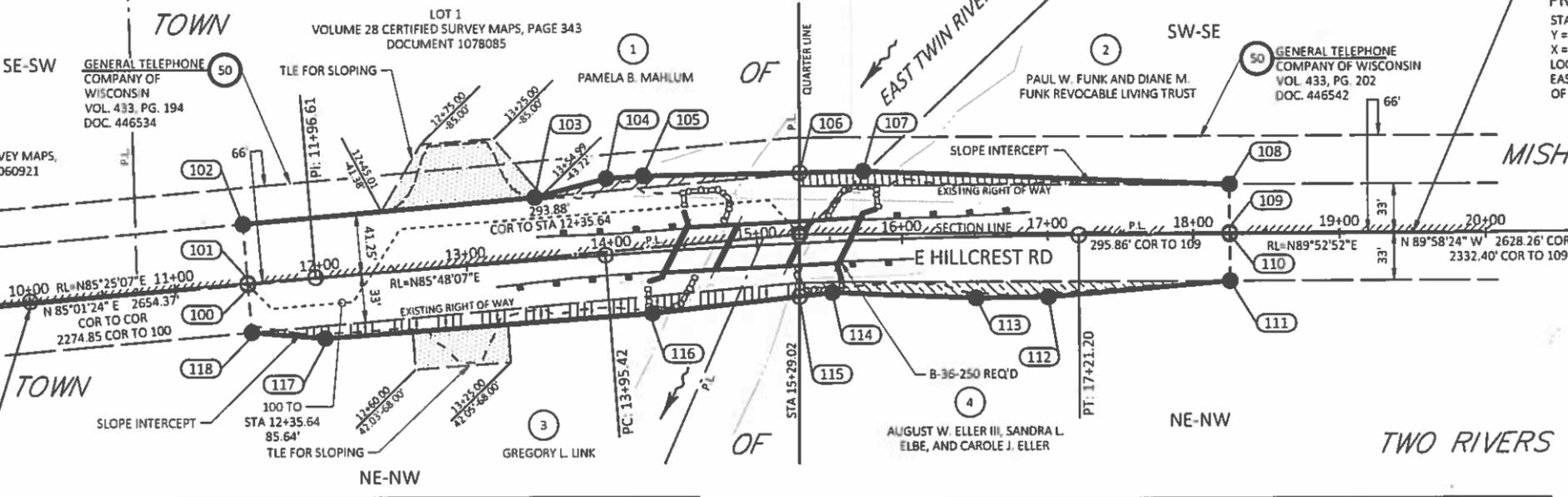
BEGIN RELOCATION ORDER
PROJECT 4305-03-00
STA 10+00
Y = 339318.744
X = 245799.836
LOCATED 36.07' SOUTH AND 428.00' WEST OF THE NORTH QUARTER CORNER OF SECTION 22, T 20 N, R 24 E.

CONVENTIONAL UTILITY SYMBOLS

WATER	—W—
GAS	—G—
TELEPHONE	—T—
OVERHEAD TRANSMISSION LINES	—OH—
ELECTRIC	—E—
CABLE TELEVISION	—TV—
FIBER OPTIC	—FO—
SANITARY SEWER	—SAN—
STORM SEWER	—SS—
NON COMPENSABLE	—NC—
COMPENSABLE	—C—
POWER POLE	—PP—
TELEPHONE POLE	—TP—
TELEPHONE PEDESTAL	—TPD—
ELECTRIC TOWER	—ET—

CONVENTIONAL ABBREVIATIONS

ACCESS POINT/ DRIVEWAY CONNECTION	AP
ACCESS RIGHTS	AR
ACRES	AC
AND OTHERS	ET AL.
CENTERLINE	CL
CERTIFIED SURVEY MAP CORNER	CSM COR.
DOCUMENT EASEMENT	DOC EASE.
HIGHWAY EASEMENT	H.E.
LAND CONTRACT	LC
MONUMENT	MON.
PAGE	P.
PERMANENT LIMITED EASEMENT	PLE
PROPERTY LINE	PL
RECORDED AS	(100)
REFERENCE LINE	RL
RELEASE OF RIGHTS	ROR
REMAINING	REM.
RIGHT-OF-WAY	R/W
SECTION	SEC.
STATION	STA.
TEMPORARY LIMITED EASEMENT VOLUME	TLE
FOUND IRON PIPE/PIN	FIP/PIN
R/W MONUMENT	R/W MON.
R/W STANDARD	R/W STD.
SECTION CORNER MONUMENT	SCM
SECTION CORNER SYMBOL	SCS
FEE (HATCH VARIES)	FEE
TEMPORARY LIMITED EASEMENT	TLE
PERMANENT LIMITED EASEMENT	PLE
R/W BOUNDARY POINT	R/W B.P.
PARCEL NUMBER	P.N.
UTILITY PARCEL NUMBER	UP.N.
SIGN NUMBER (OFF PREMISE)	S.N.
BUILDING	B.



ROW POINT TABLE

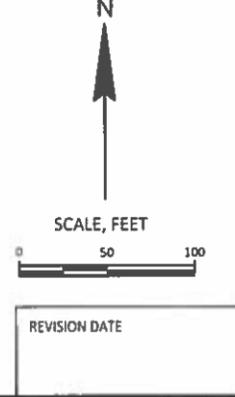
POINT	STATION	OFFSET	Y COORDS	X COORDS	POINT	STATION	OFFSET	Y COORDS	X COORDS
100	11+50.00	0.85' RT	339321.889	245849.744	110	18+25.00	0.00'	339353.496	246523.694
101	11+50.00	0.00'	339322.738	245849.676	111	18+25.00	31.82' RT	339321.673	246523.759
102	11+50.00	40.40' LT	339363.008	245846.449	112	17+00.00	42.00' RT	339311.189	246398.976
103	13+50.00	42.81' LT	339380.382	246045.982	113	16+50.00	42.00' RT	339310.586	246349.438
104	14+00.00	52.00' LT	339393.212	246095.232	114	15+50.00	35.00' RT	339314.751	246250.122
105	14+25.00	52.00' LT	339394.968	246120.444	115	15+27.26	36.53' RT	339312.279	246227.648
106	15+31.25	47.94' LT	339396.844	246227.916	116	14+25.00	42.00' RT	339301.178	246126.725
107	15+75.00	47.00' LT	339397.615	246272.125	117	12+00.00	42.00' RT	339284.822	245902.592
108	18+25.00	34.18' LT	339387.673	246523.623	118	11+50.00	33.85' RT	339288.993	245852.380
109	18+25.00	1.18' LT	339354.673	246523.691					

PI STA = 15+58.38
DELTA = 4°04'45" RT
D = 1°15'08"
T = 162.96'
L = 325.78'
R = 4575.87'
PC STA = 13+95.42
PT STA = 17+21.20

COURSE TABLE

COURSE	BEARING	DISTANCE	COURSE	BEARING	DISTANCE
100-101	N04° 34' 53"W	0.85'	110-111	S00° 07' 08"E	31.82'
101-102	N04° 34' 53"W	40.40'	111-112	S85° 11' 50"W	125.22'
102-103	N85° 01' 24"E	200.29'	112-113	S89° 18' 10"W	49.54'
103-104	N75° 23' 54"E	50.89'	113-114	N87° 35' 54"W	99.40'
104-105	N86° 00' 57"E	25.27'	114-115	S83° 43' 22"W	22.61'
105-106	N89° 00' 00"E	107.49'	115-116	S83° 43' 22"W	101.53'
106-107	N89° 00' 00"E	44.22'	116-117	S85° 49' 34"W	224.73'
107-108	S87° 44' 10"E	251.69'	117-118	N85° 15' 03"W	50.39'
108-109	S00° 07' 08"E	33.00'	118-100	N04° 34' 53"W	33.00'
109-110	S00° 07' 08"E	1.18'			

NOTES:
POSITIONS SHOWN ON THIS PLAT ARE WISCONSIN COORDINATE REFERENCE SYSTEM COORDINATES (WISCRS), MANITOWOC COUNTY, MAD31(2011) IN US SURVEY FEET. VALUES SHOWN ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES MAY BE USED AS GROUND DISTANCES.
ALL NEW RIGHT-OF-WAY MONUMENTS WILL BE TYPE 2 (TYPICALLY 3/4"x24" IRON REBARS) UNLESS OTHERWISE NOTED, AND WILL BE PLACED PRIOR TO THE COMPLETION OF THE PROJECT.
RIGHT-OF-WAY BOUNDARIES ARE DEFINED WITH COURSES OF THE PERIMETER OF THE HIGHWAY LANDS REFERENCED TO THE U.S. PUBLIC LAND SURVEY SYSTEM OR OTHER "SURVEYS" OF PUBLIC RECORD.
DIMENSIONING FOR THE NEW RIGHT-OF-WAY IS MEASURED ALONG AND PERPENDICULAR TO THE NEW REFERENCE LINES.
A TEMPORARY LIMITED EASEMENT (TLE) IS A RIGHT FOR CONSTRUCTION PURPOSES, AS DEFINED HEREIN, INCLUDING THE RIGHT TO OPERATE NECESSARY EQUIPMENT THEREON, THE RIGHT OF INGRESS AND EGRESS, AS LONG AS REQUIRED FOR SUCH PUBLIC PURPOSE, INCLUDING THE RIGHT TO PRESERVE, PROTECT, REMOVE, OR PLANT THEREON ANY VEGETATION THAT THE HIGHWAY AUTHORITIES MAY DEEM DESIRABLE. ALL (TLE)S ON THIS PLAT EXPIRE AT THE COMPLETION OF THE CONSTRUCTION PROJECT FOR WHICH THIS INSTRUMENT IS GIVEN.
PROPERTY LINES SHOWN ON THIS PLAT ARE DRAWN FROM DATA DERIVED FROM MAPS AND DOCUMENTS OF PUBLIC RECORD AND/OR EXISTING OCCUPATIONAL LINES. THIS PLAT MAY NOT BE A TRUE REPRESENTATION OF EXISTING PROPERTY LINES, EXCLUDING RIGHT-OF-WAY, AND SHOULD NOT BE USED AS A SUBSTITUTE FOR AN ACCURATE FIELD SURVEY.
FOR THE LATEST ACCESS/DRIVEWAY INFORMATION, CONTACT THE TOWN OF MISHICOT OR THE TOWN OF TWO RIVERS.
EXISTING RIGHT OF WAY FOR HILLCREST ROAD ESTABLISHED FROM DOCUMENTS 506259 AND 506250, CSM 28-343, AND THE NORTH LINE OF THE NORTHWEST 1/4 SECTION 22.



APPROVED FOR TOWN OF TWO RIVERS
DATE: 10-28-21
SIGNATURE: *William Wilfart*

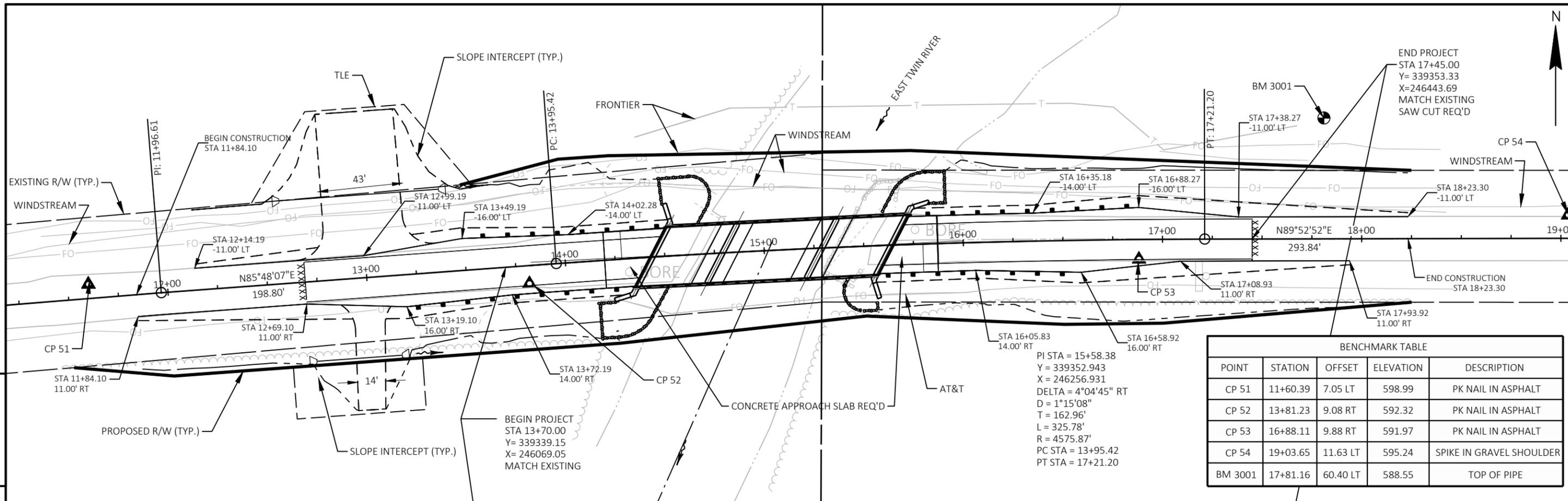
APPROVED FOR TOWN OF MISHICOT
DATE: 10-28-21
SIGNATURE: *Lee Stefanich*



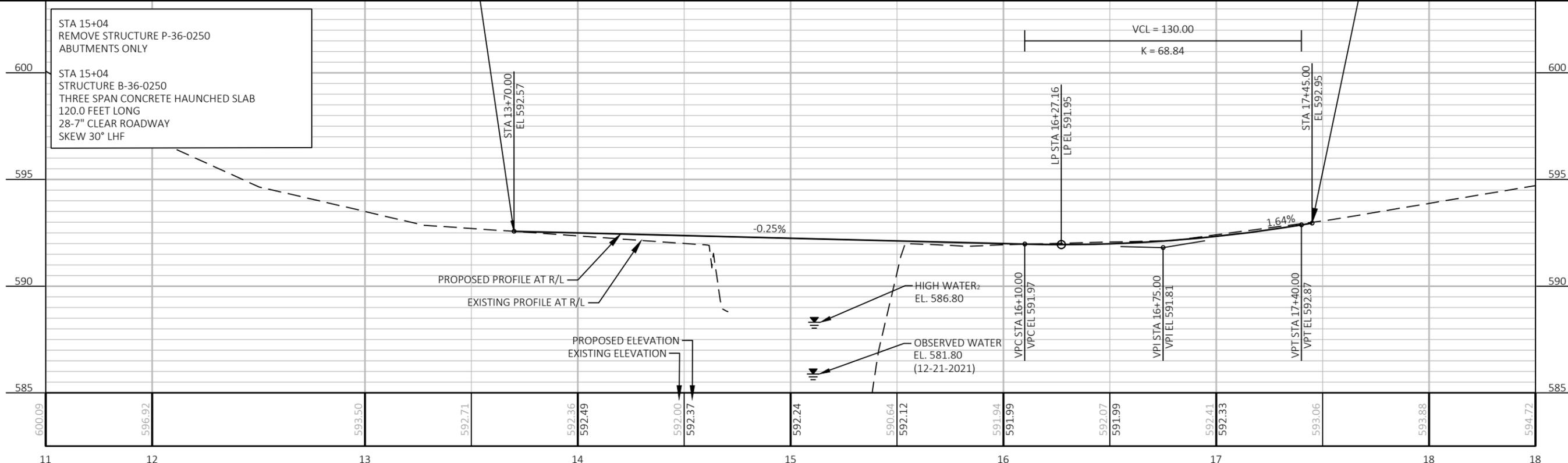
THIS SURVEY IS PREPARED AT THE REQUEST OF MANITOWOC COUNTY. THE TOPOGRAPHY AND UTILITY SURVEY WAS PERFORMED IN DECEMBER 2020. THIS SURVEY IS ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.



REVISION DATE: _____ DATE: 10/13/2021
JAMES CAPPART
REGISTRATION NUMBER: S-3044

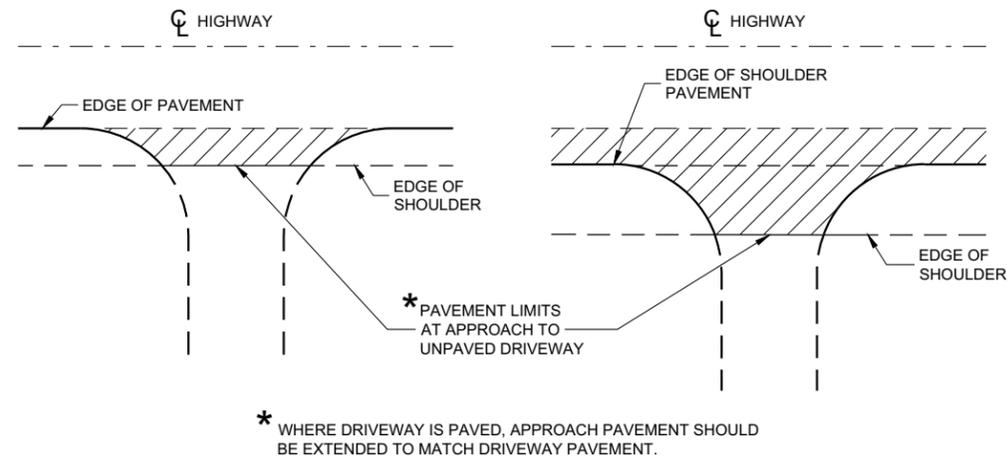


BENCHMARK TABLE				
POINT	STATION	OFFSET	ELEVATION	DESCRIPTION
CP 51	11+60.39	7.05 LT	598.99	PK NAIL IN ASPHALT
CP 52	13+81.23	9.08 RT	592.32	PK NAIL IN ASPHALT
CP 53	16+88.11	9.88 RT	591.97	PK NAIL IN ASPHALT
CP 54	19+03.65	11.63 LT	595.24	SPIKE IN GRAVEL SHOULDER
BM 3001	17+81.16	60.40 LT	588.55	TOP OF PIPE



Standard Detail Drawing List

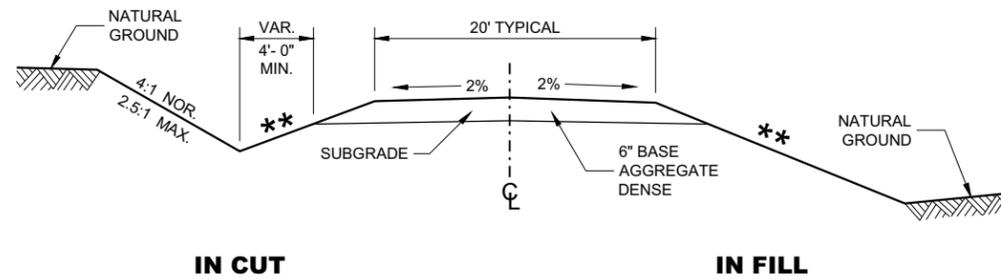
08D21-01	DRIVEWAYS WITHOUT CURB & GUTTER
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E11-02	TURBIDITY BARRIER
08E15-01	CULVERT PIPE CHECK
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
08F04-08	JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL
12A03-10	NAME PLATE (STRUCTURES)
13A03-06	CONCRETE PAVEMENT SHOULDERS
13B02-09A	CONCRETE PAVEMENT APPROACH SLAB
13C19-03	HMA LONGITUDINAL JOINTS
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 THRIE BEAM TRANSITION (MGS)
14B45-05B	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05C	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05H	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
15A04-07A	FLEXIBLE DELINEATOR POST
15A04-07E	DELINEATOR POST WITH REFLECTIVE SHEETING
15C02-08A	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C02-08B	BARRICADES AND SIGNS FOR VARIOUS CLOSURES
15C06-09	SIGNING & MARKING FOR TWO LANE BRIDGES
15C08-20A	LONGITUDINAL MARKING (MAINLINE)
15C11-09B	CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS



PLAN VIEW
(UNPAVED SHOULDER ON HIGHWAY)

PLAN VIEW
(PAVED SHOULDER ON HIGHWAY)

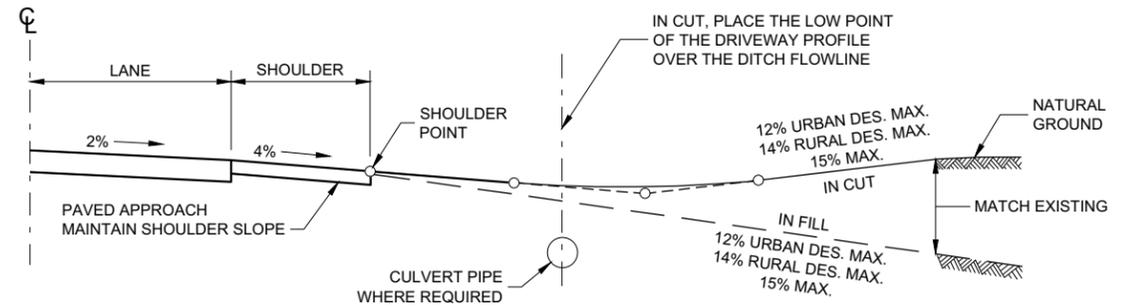
**RURAL DRIVEWAY INTERSECTION DETAIL
(NO CURB AND GUTTER OR SIDEWALK)**



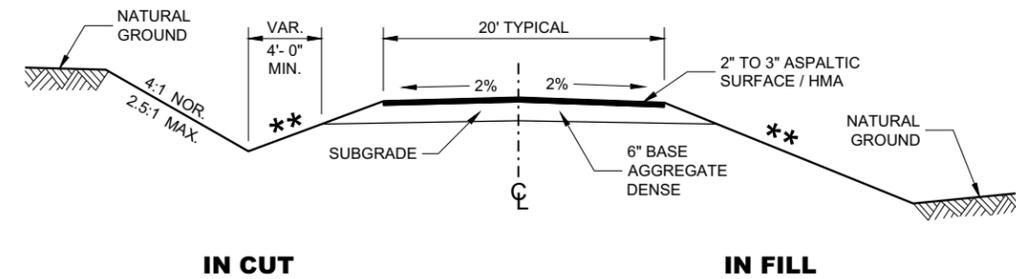
**TYPICAL CROSS SECTION FOR
PRIVATE DRIVE OR FIELD ENTRANCE
AGGREGATE SURFACE**

** SLOPE CAN VARY WITH SPEED. SEE 11-45-30.6.2

POSTED SPEED MPH	MAX. SLOPE
<35	4:1
≥ 35 TO < 60	6:1
≥60	10:1



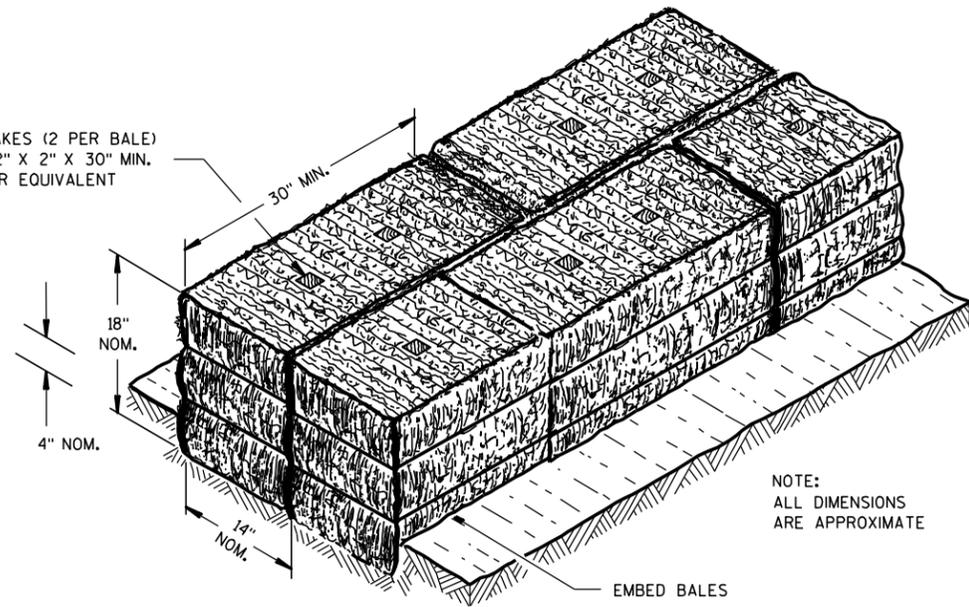
TYPICAL DRIVEWAY PROFILES



**TYPICAL CROSS SECTION FOR
PRIVATE DRIVE OR FIELD ENTRANCE
ASPHALTIC SURFACE**

DRIVEWAYS WITHOUT CURB AND GUTTER	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED December 2017 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
FHWA	

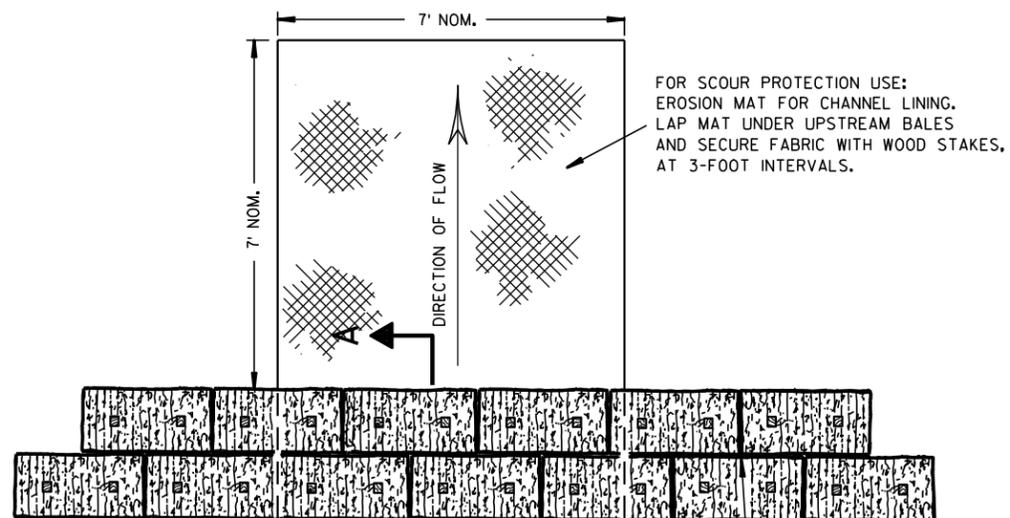
WOOD STAKES (2 PER BALE)
NOMINAL 2" X 2" X 30" MIN.
LENGTH OR EQUIVALENT



NOTE:
ALL DIMENSIONS
ARE APPROXIMATE

EMBED BALES

SECTION A-A

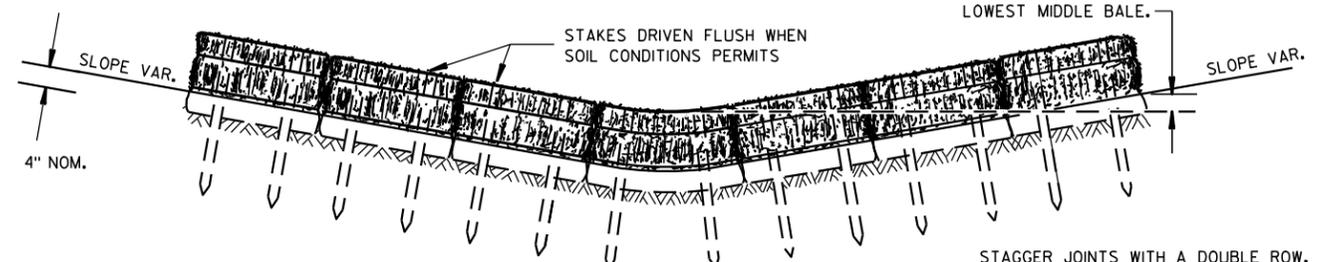


FOR SCOUR PROTECTION USE:
EROSION MAT FOR CHANNEL LINING.
LAP MAT UNDER UPSTREAM BALES
AND SECURE FABRIC WITH WOOD STAKES,
AT 3-FOOT INTERVALS.

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.



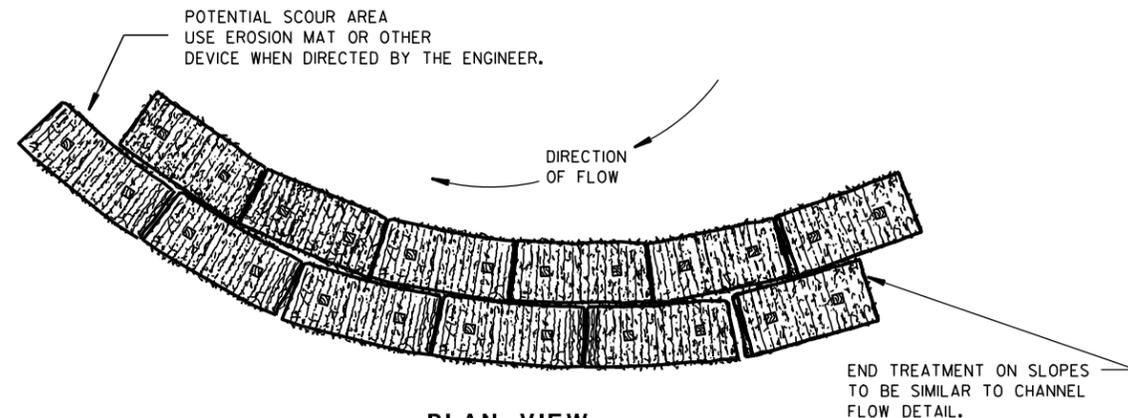
FRONT ELEVATION

TEMPORARY DITCH CHECK USING EROSION BALES ①

GENERAL NOTES

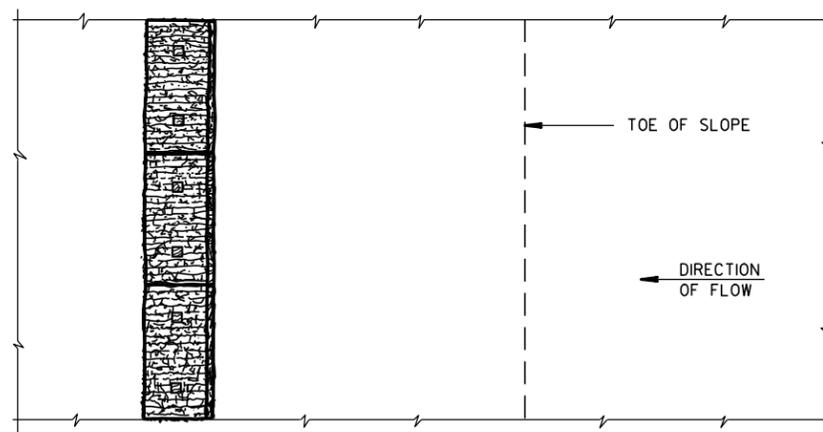
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- 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.

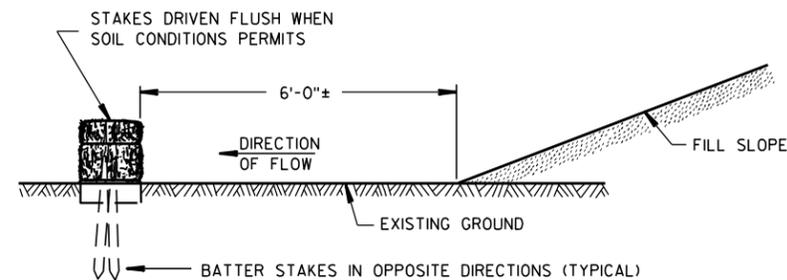


PLAN VIEW

WHEN ALTERING THE DIRECTION OF FLOW



PLAN VIEW



FRONT ELEVATION

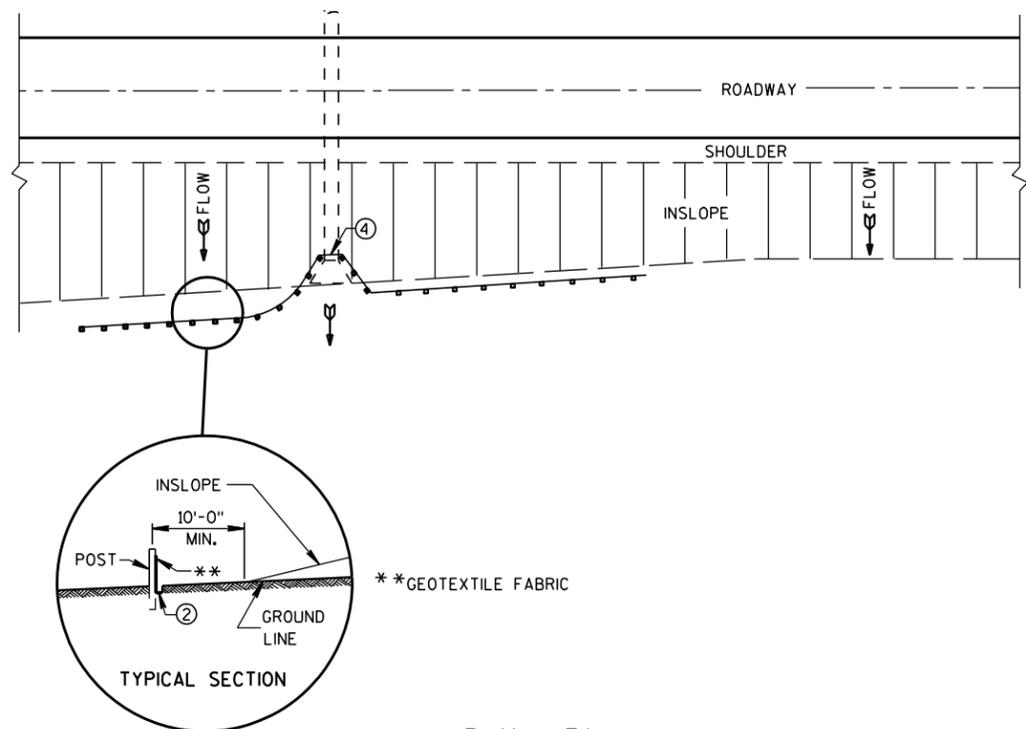
WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE

EROSION BALES FOR SHEET FLOW

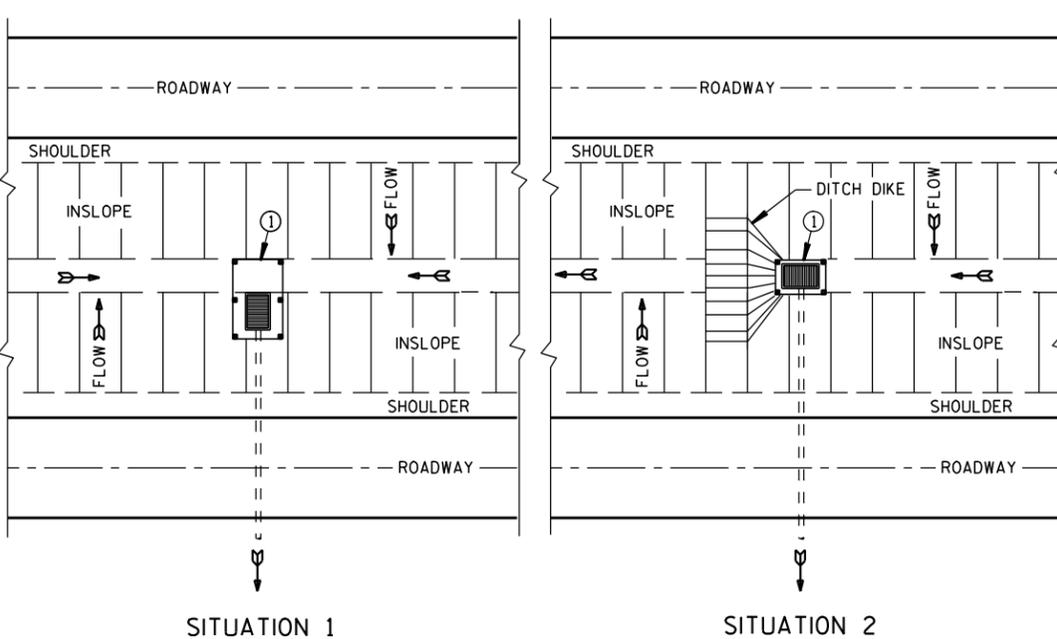
TYPICAL INSTALLATIONS OF
EROSION BALES / TEMPORARY
DITCH CHECKS

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

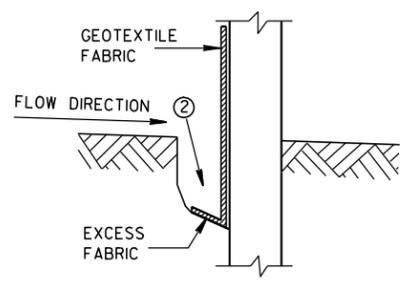


SITUATION 1 SITUATION 2
PLAN VIEW
SILT FENCE AT MEDIAN SURFACE DRAINS

GENERAL NOTES

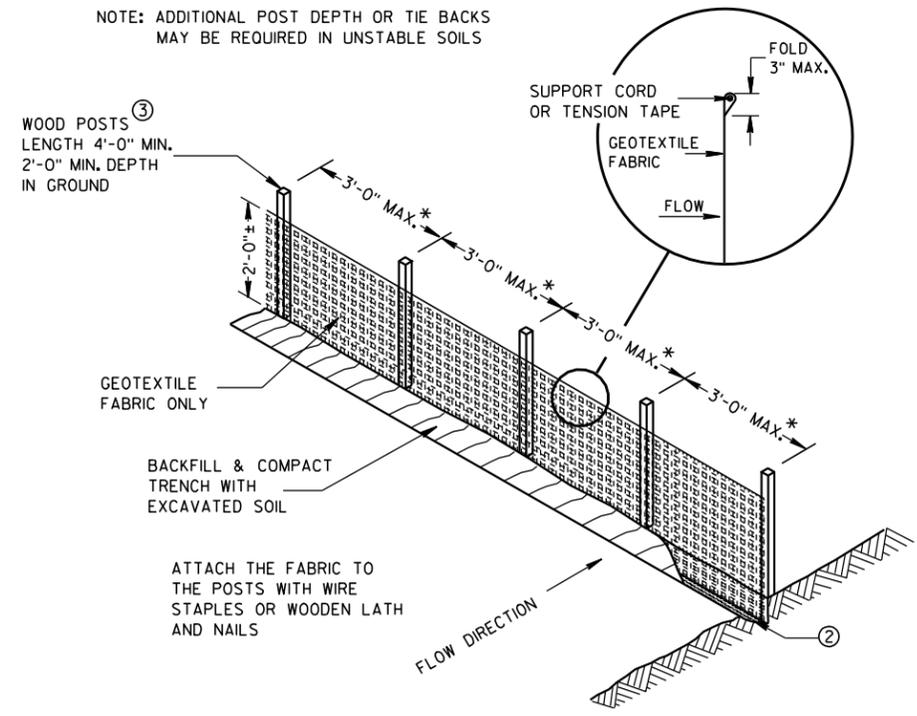
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

- 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.



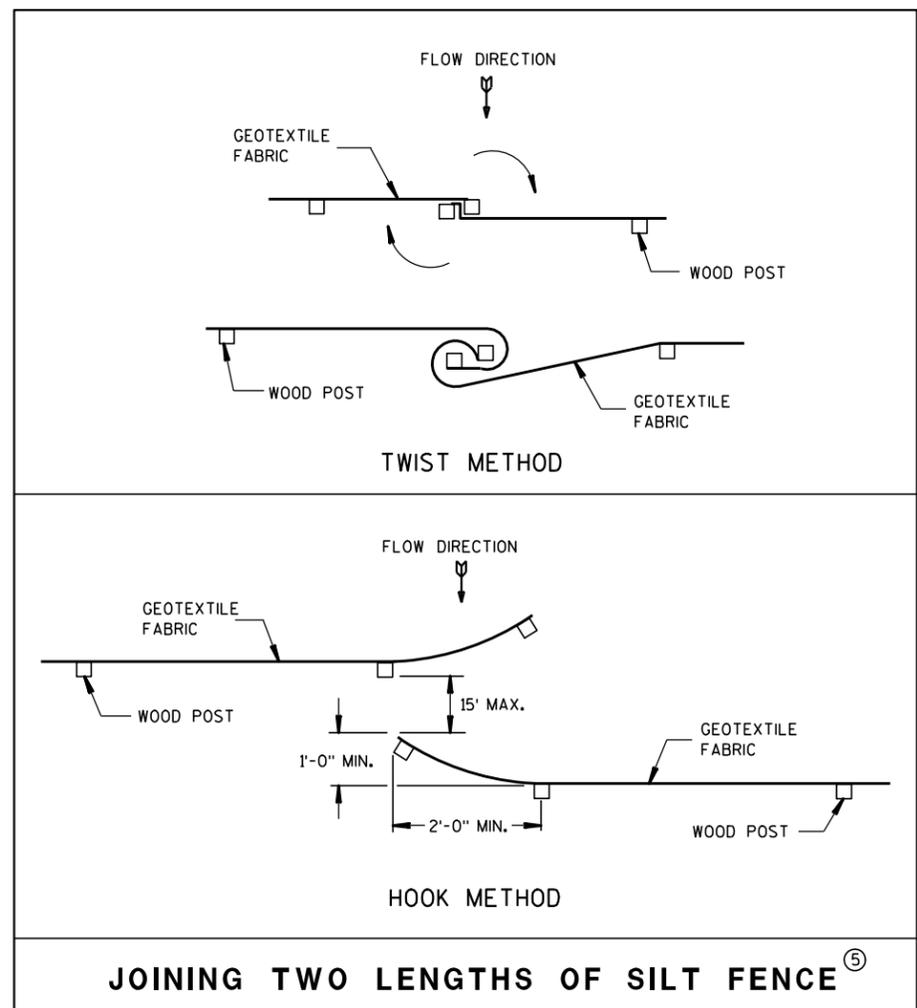
TRENCH DETAIL

NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS

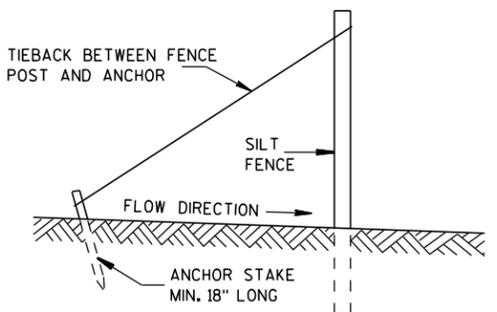


SILT FENCE

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

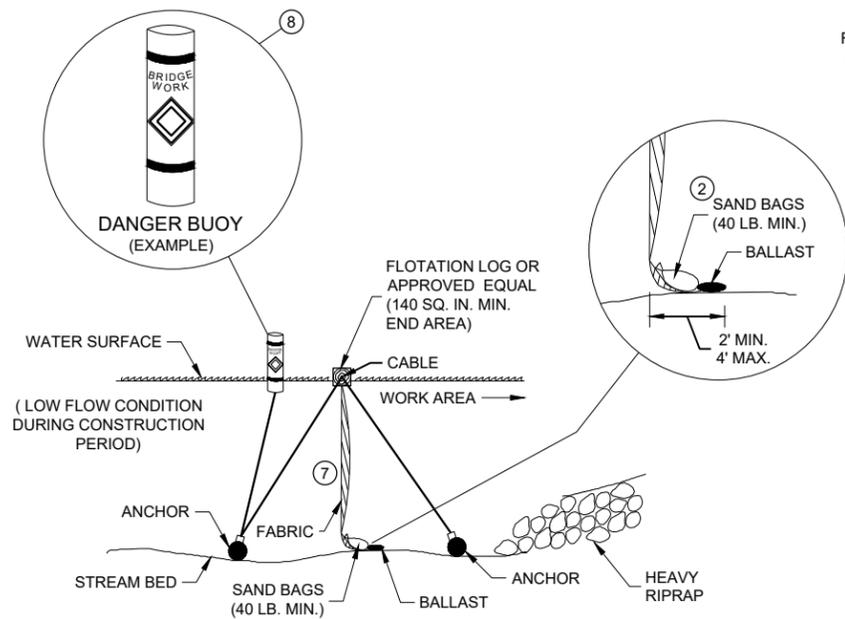


JOINING TWO LENGTHS OF SILT FENCE



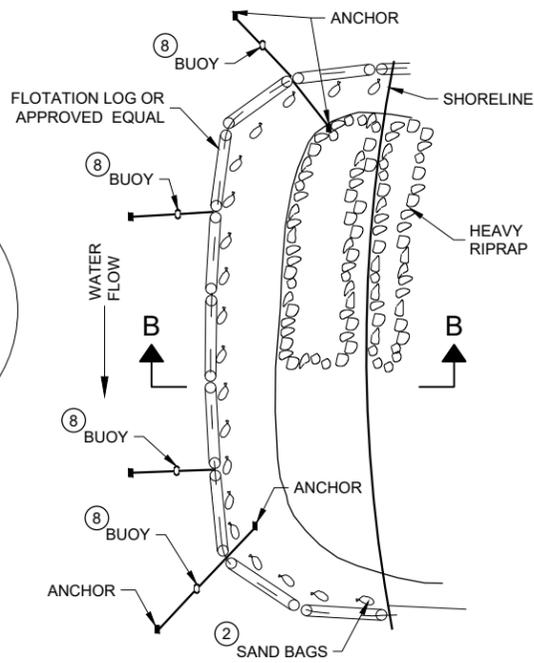
SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)

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

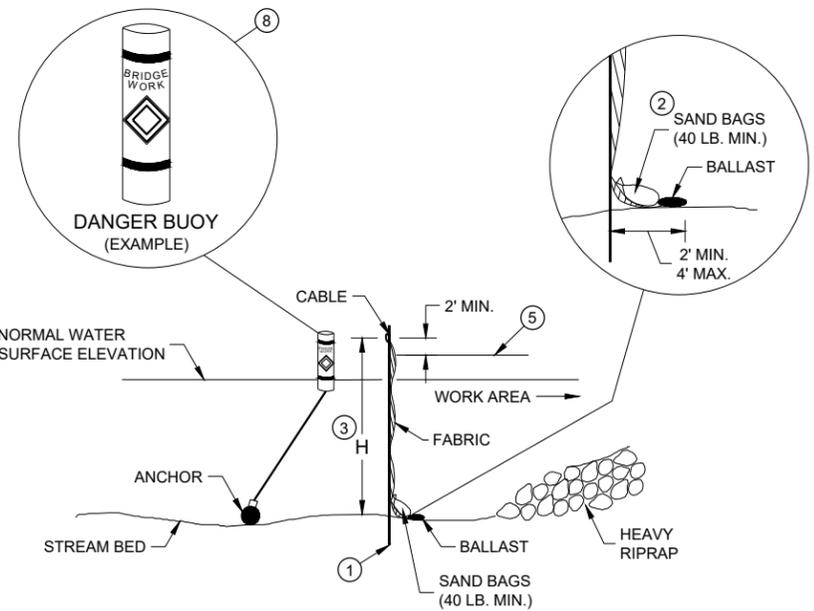


SECTION B - B

**TURBIDITY BARRIER - FLOAT ALTERNATIVE
CAUTION - SEE NOTE 6**

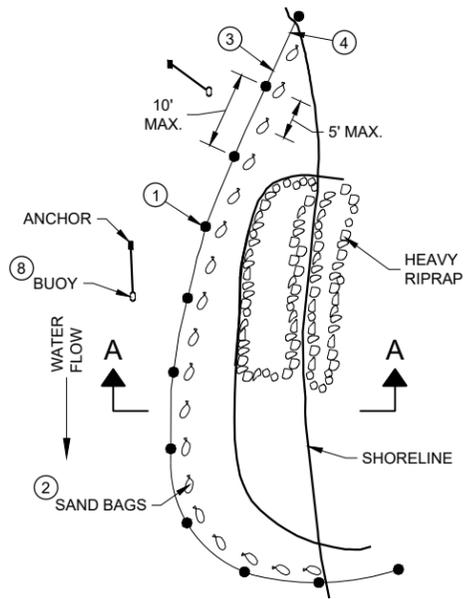


PLAN VIEW



SECTION A - A

TURBIDITY BARRIER - STANDARD POST INSTALLATION



PLAN VIEW

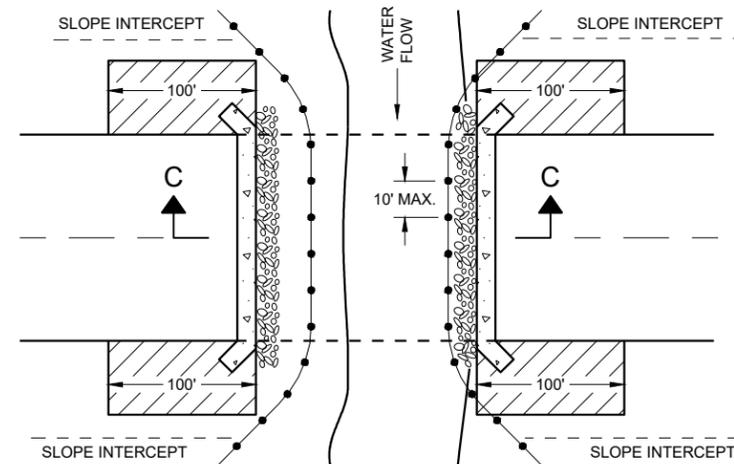
TURBIDITY BARRIER PLACEMENT DETAILS

GENERAL NOTES

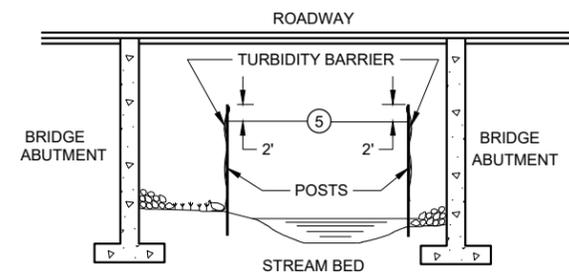
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

TURBIDITY BARRIER MAY BE REMOVED AT THE ENGINEERS DISCRETION, WHEN PERMANENT EROSION CONTROL MEASURES HAVE BEEN ESTABLISHED.

- ① DRIVEN STEEL POSTS, PIPES, OR CHANNELS. LENGTH SHALL BE SUFFICIENT TO SECURELY SUPPORT BARRIER AT HIGH WATER ELEVATIONS.
- ② SAND BAGS TO BE USED AS ADDITIONAL BALLAST WHEN ORDERED BY THE ENGINEER TO MEET ADVERSE FIELD CONDITIONS. SPACE AS APPROPRIATE FOR SITE CONDITIONS.
- ③ WHEN BARRIER HEIGHT "H" EXCEEDS 8 FEET, POST SPACING MAY NEED TO BE DECREASED.
- ④ IN WATERWAYS SUBJECT TO FLUCTUATING WATER ELEVATIONS, PROVISIONS SHOULD BE MADE TO ALLOW THE WATER TO EQUALIZE ON EACH SIDE OF THE BARRIER. THIS MAY BE ACCOMPLISHED BY LEAVING A PORTION OF THE BARRIER OPEN ON THE UPSTREAM END.
- ⑤ ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION PERIOD. MINIMUM BARRIER HEIGHT SHALL BE 2' GREATER THAN EITHER THE Q2 ELEVATION OR THE ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION, WHICHEVER IS GREATER.
- ⑥ FLOAT ALTERNATIVE WILL ONLY BE ALLOWED WITH WRITTEN APPROVAL OF THE ENGINEER, AND IS MEANT FOR LOCATIONS WHERE BEDROCK PREVENTS THE INSTALLATION OF POSTS.
- ⑦ ALLOW SUFFICIENT SLACK VERTICALLY AND HORIZONTALLY SO THAT SEDIMENT BUILD UP WILL NOT SEPARATE OR LOWER THE TURBIDITY BARRIER.
- ⑧ USE AS DIRECTED BY COAST GUARD OR DNR PERMIT WHEN WORKING IN NAVIGABLE WATERWAYS.



PLAN VIEW



SECTION C - C

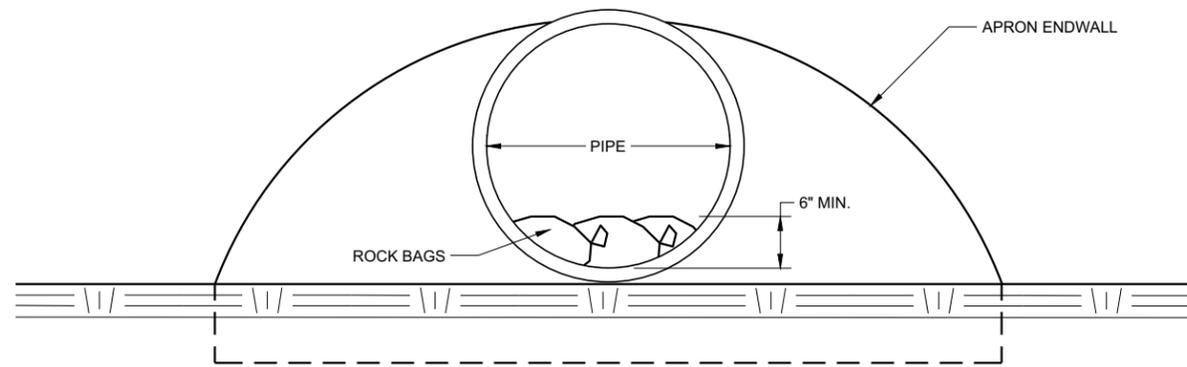
**TURBIDITY BARRIER DETAIL SHOWING
TYPICAL PLACEMENT AT STRUCTURES**

TURBIDITY BARRIER

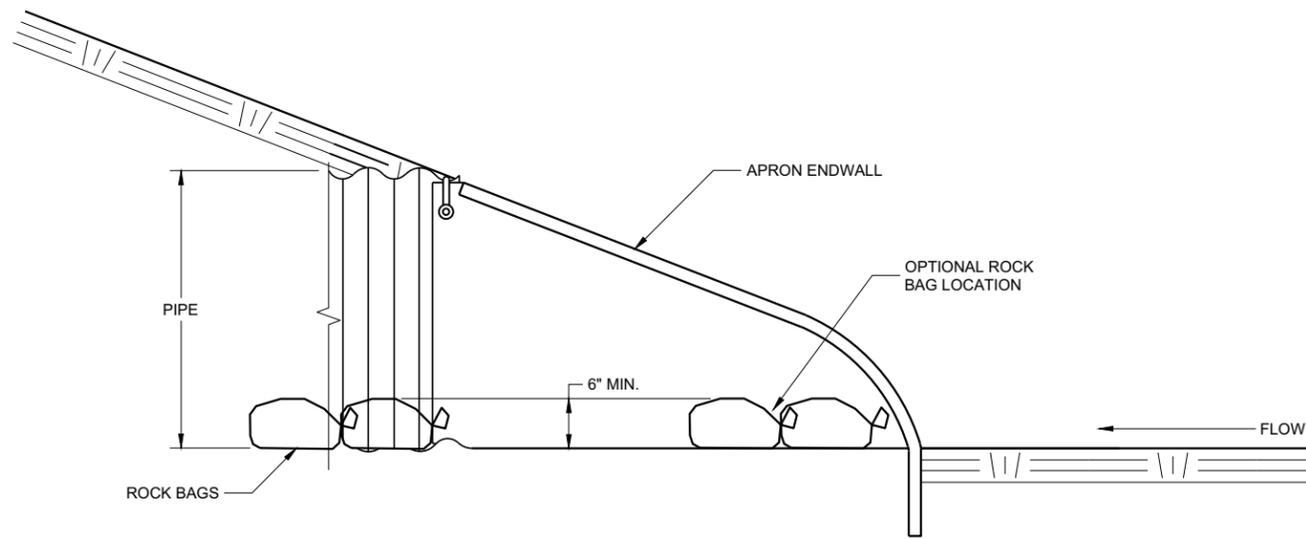
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
6/4/02 DATE /S/ Beth Cannestra
DATE CHIEF ROADWAY DEVELOPMENT
ENGINEER

FHWA



END VIEW



SIDE VIEW

CULVERT PIPE CHECK
 (INSTALL ON INLET END ONLY)

CULVERT PIPE CHECK

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
 May 2019 /S/ Daniel Schave
 DATE EROSION CONTROL ENGINEER

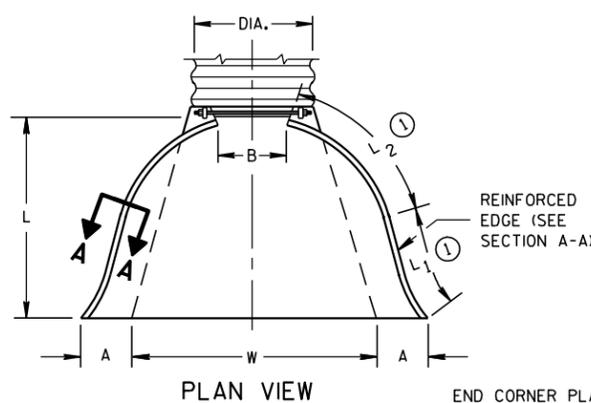
FHWA

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.

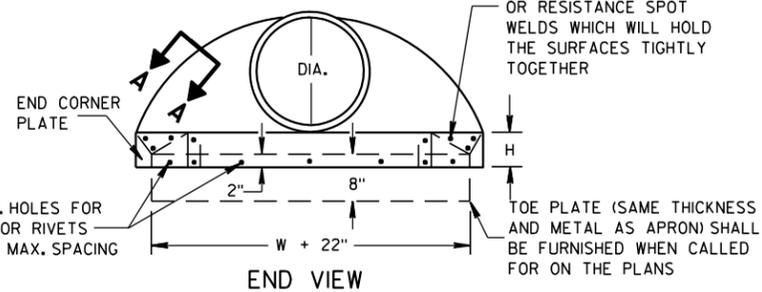
* EXCEPT CENTER PANEL SEE GENERAL NOTES

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	30-35	72-78	21-27	99	102	5 1/2	2 to 1	
72	7	30-35	78	21	99	108	6	2 to 1	
78	7 1/2	30-35	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	

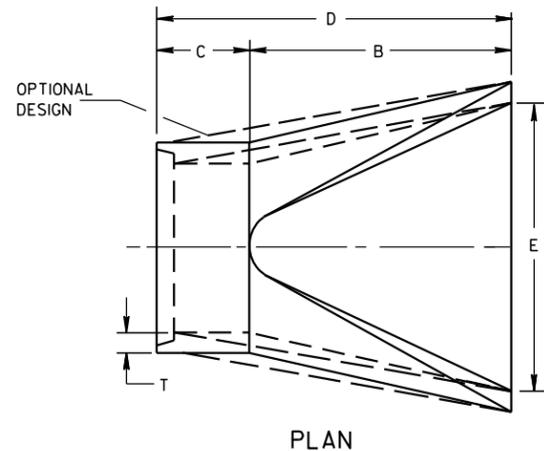
* MINIMUM
** MAXIMUM



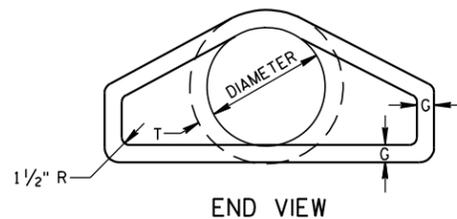
END CORNER PLATES MAY BE FASTENED TO APRON PROPER BY BOLTS, RIVETS, OR RESISTANCE SPOT WELDS WHICH WILL HOLD THE SURFACES TIGHTLY TOGETHER



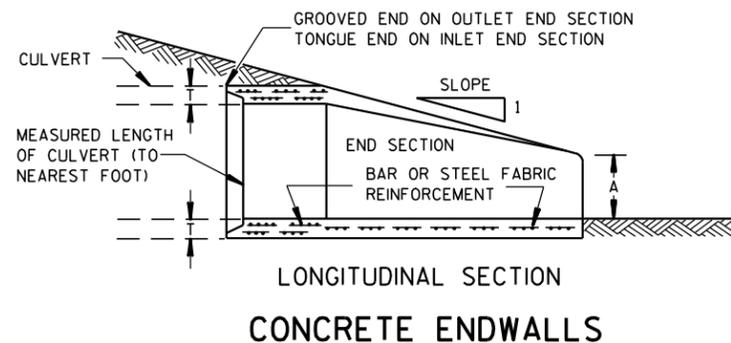
SIDE ELEVATION
METAL ENDWALLS



PLAN

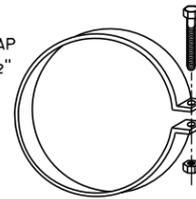


END VIEW

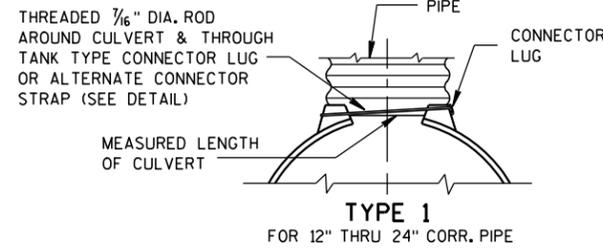


LONGITUDINAL SECTION
CONCRETE ENDWALLS

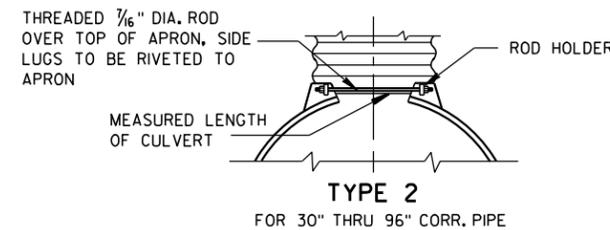
1" WIDE, 12 GA. (0.109" THICK) GALVANIZED STRAP WITH STANDARD 6" X 1/2" BAND BOLT AND NUT



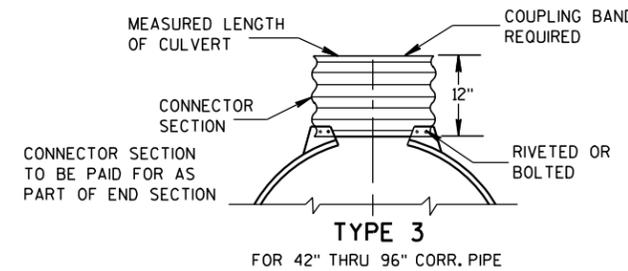
ALTERNATE FOR TYPE 1 CONNECTION
END SECTION CONNECTOR STRAP



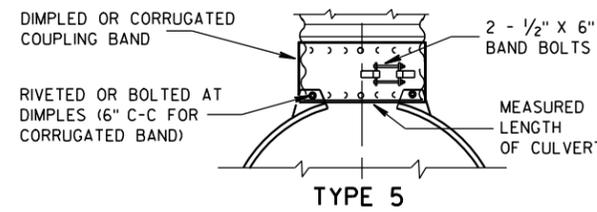
TYPE 1
FOR 12" THRU 24" CORR. PIPE



TYPE 2
FOR 30" THRU 96" CORR. PIPE



TYPE 3
FOR 42" THRU 96" CORR. PIPE



TYPE 5
ALTERNATE FOR:
ALL SIZES CORRUGATED CIRCULAR PIPE

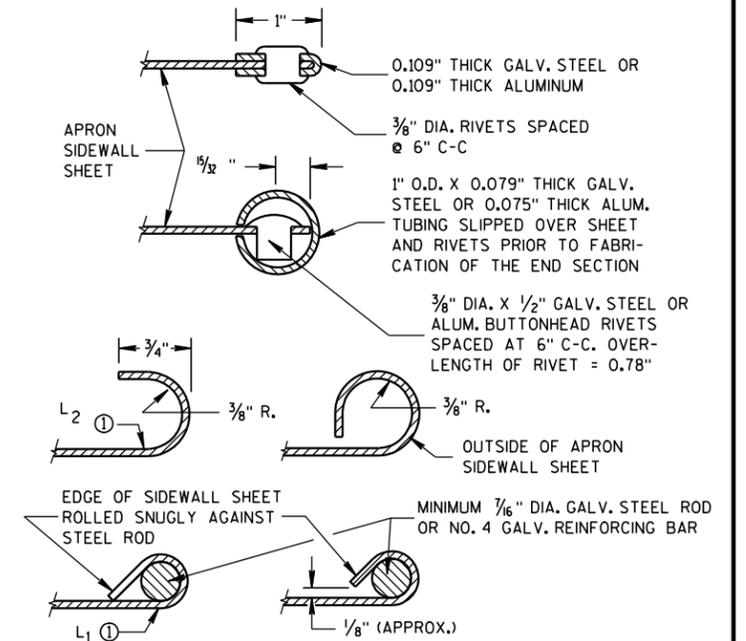
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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.

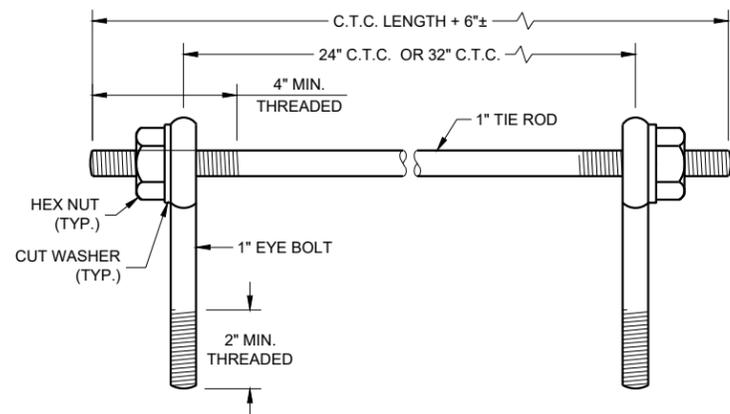
WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

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

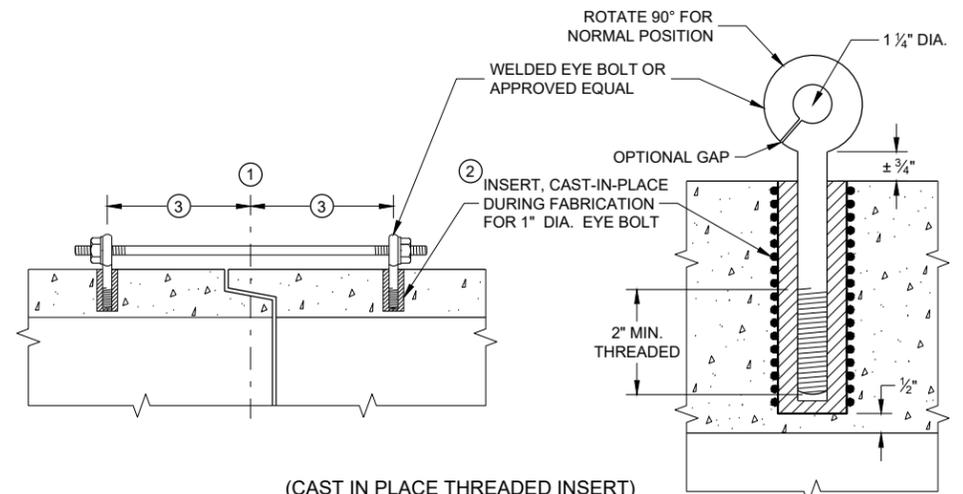
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
11/30/94 DATE /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

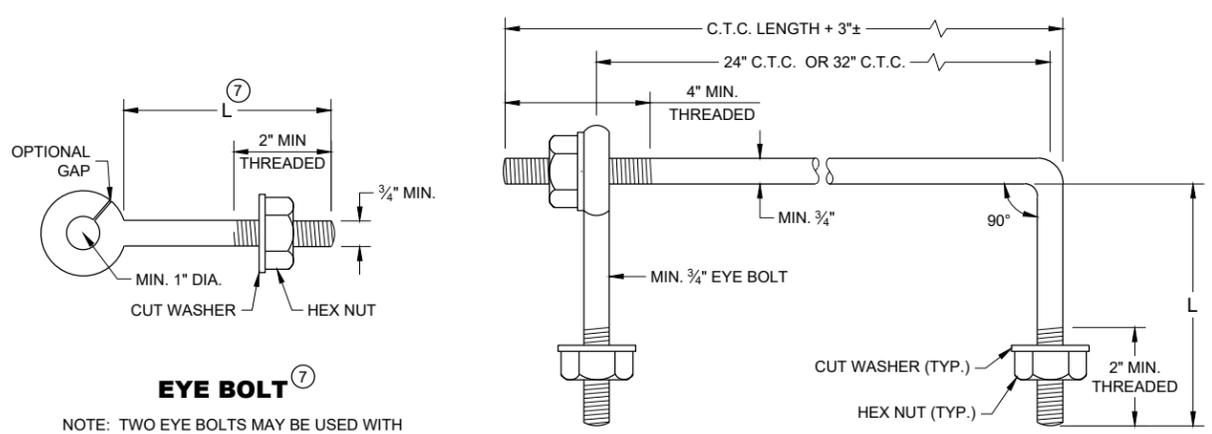
DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

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.

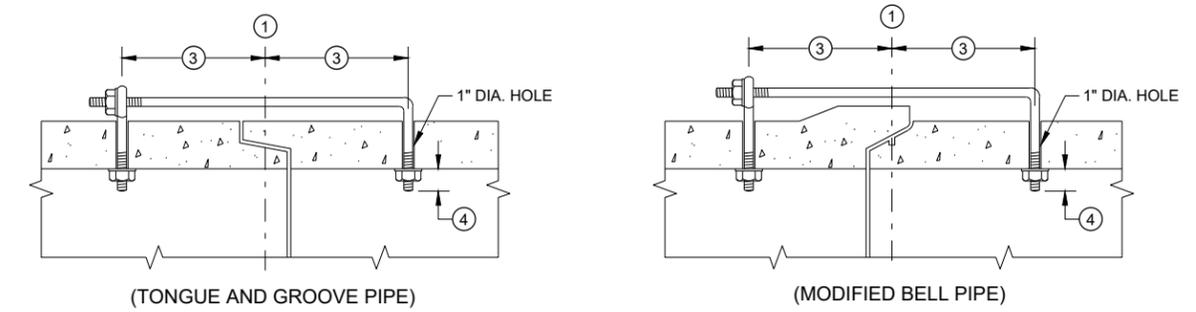
- ① CENTER LINE OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS.
- ② THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS.
- ③ HOLES SHALL BE CAST-IN-PLACE OR DRILLED PER THE APPLICABLE DETAIL, AND EQUAL DISTANCE FROM THE CENTERLINE OF THE JOINT.
- ④ BOLT PROJECTION INSIDE OF PIPE SHALL NOT EXCEED 2 INCHES.
- ⑤ OPENING TO BE ROD DIAMETER PLUS 1 INCH.
- ⑥ LENGTH ADEQUATE TO EXTEND TO WITHIN 1/2 INCH OF THE INNER SURFACE OF THE PIPE.
- ⑦ EYE BOLT LENGTH DETERMINED BY WALL THICKNESS, BELL THICKNESS AND BOLT PROJECTION INSIDE PIPE.



EYE BOLT ⑦

NOTE: TWO EYE BOLTS MAY BE USED WITH A 30" OR 38" LONG THREADED ROD IN LIEU OF THE 90° BENT TIE ROD.

EYE BOLT AND TIE ROD



LONGITUDINAL SECTION

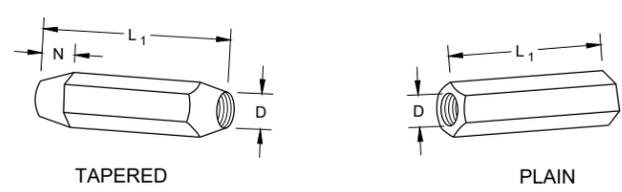
(JOINT TIES FOR 18" TO 66" DIA. CONCRETE PIPE)

EYE BOLT AND TIE ROD ASSEMBLY (ALTERNATE NO. 2)

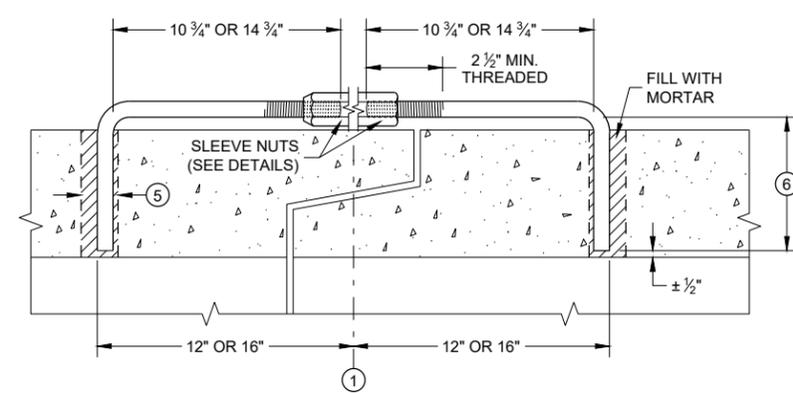
ADJUSTABLE TIE ROD TABLE

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 - 144	1	1	7	1 1/16

DIMENSIONS SHOWN ARE IN INCHES

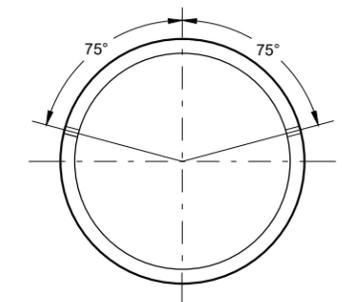


RIGHT AND LEFT THREADS SLEEVE NUTS



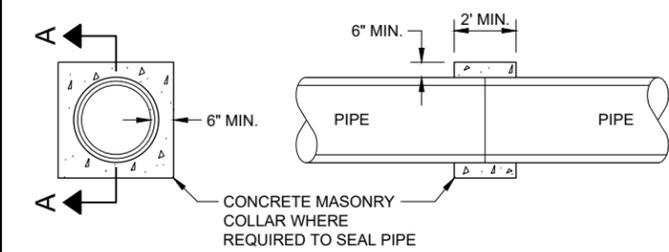
LONGITUDINAL SECTION

ADJUSTABLE TIE ROD (ALTERNATE NO. 3)



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

TRANSVERSE SECTION



SECTION A - A

CONCRETE COLLAR DETAIL

JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL

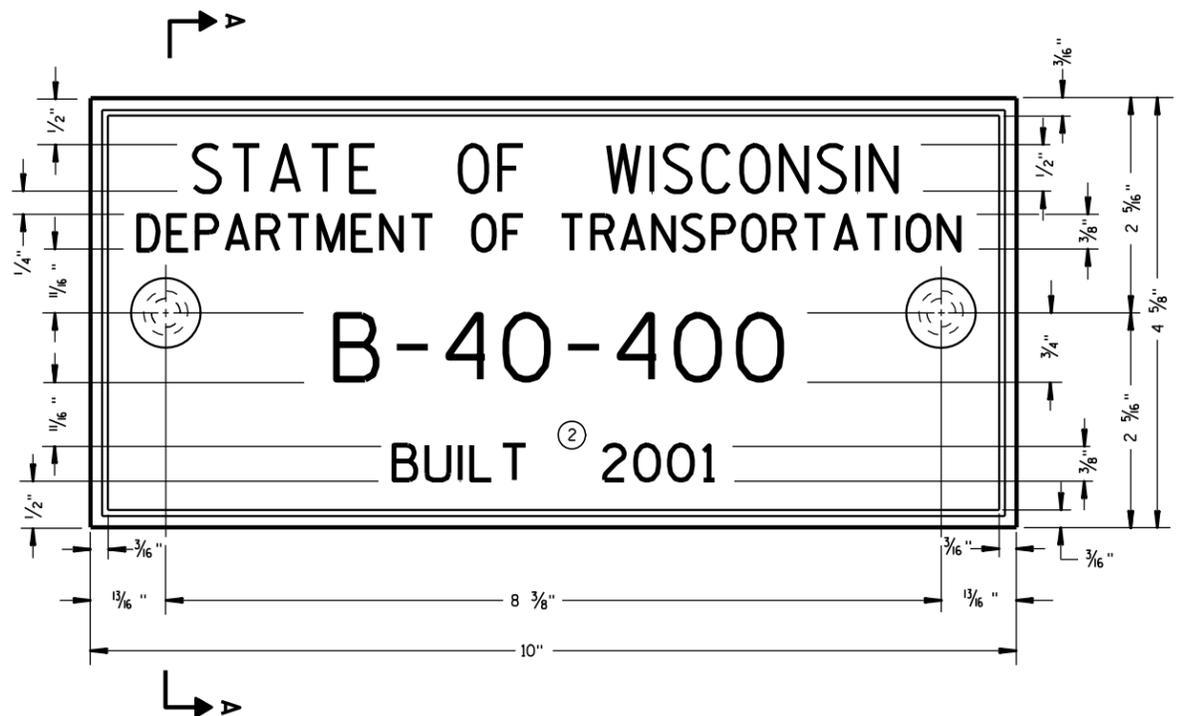
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2021 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT ENGINEER

FHWA

SDD 08F04 - 08

SDD 08F04 - 08



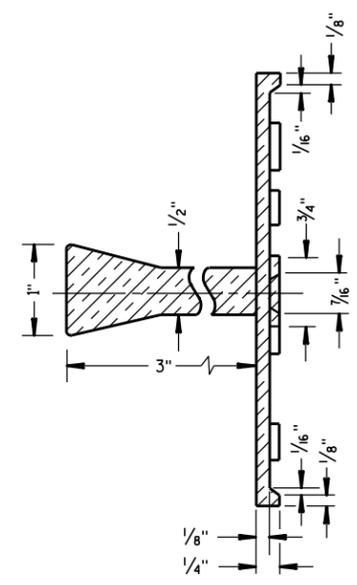
TYPICAL NAME PLATE
(BRIDGES, CULVERTS, AND RETAINING WALLS)

GENERAL NOTES

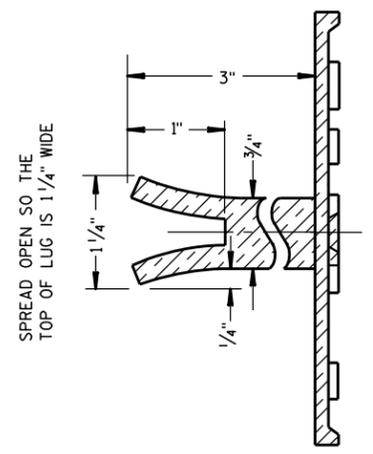
NAME PLATES TO BE INSTALLED ON BRIDGES, CULVERTS, AND RETAINING WALLS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS.

THE BRIDGE NUMBER AND YEAR BUILT SHOWN ON THIS DRAWING ARE EXAMPLES ONLY. SEE CONSTRUCTION PLANS FOR INDIVIDUAL NUMBERING AND YEAR BUILT.

- ① EPOXY RESIN SHALL BE FROM AN APPROVED MANUFACTURER AND USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ② REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.



SECTION A-A



ALTERNATE LUG

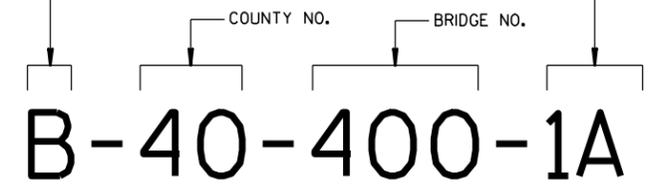
6

6

FOR MULTI-UNIT STRUCTURES
LINE 3 ABOVE SHALL READ

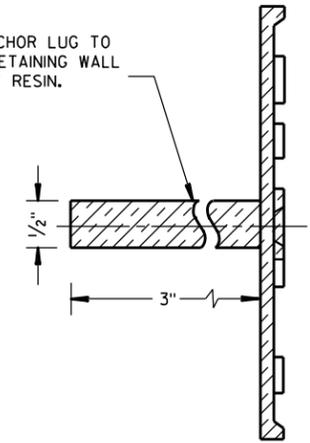
B = BRIDGE
C = CULVERT
R = RETAINING WALL

UNIT NO. FOR MULTIPLE
UNIT BRIDGE



**NUMBERING DESIGNATION
MULTI-UNIT STRUCTURES**

- ① ADHERE ANCHOR LUG TO PRECAST RETAINING WALL WITH EPOXY RESIN.

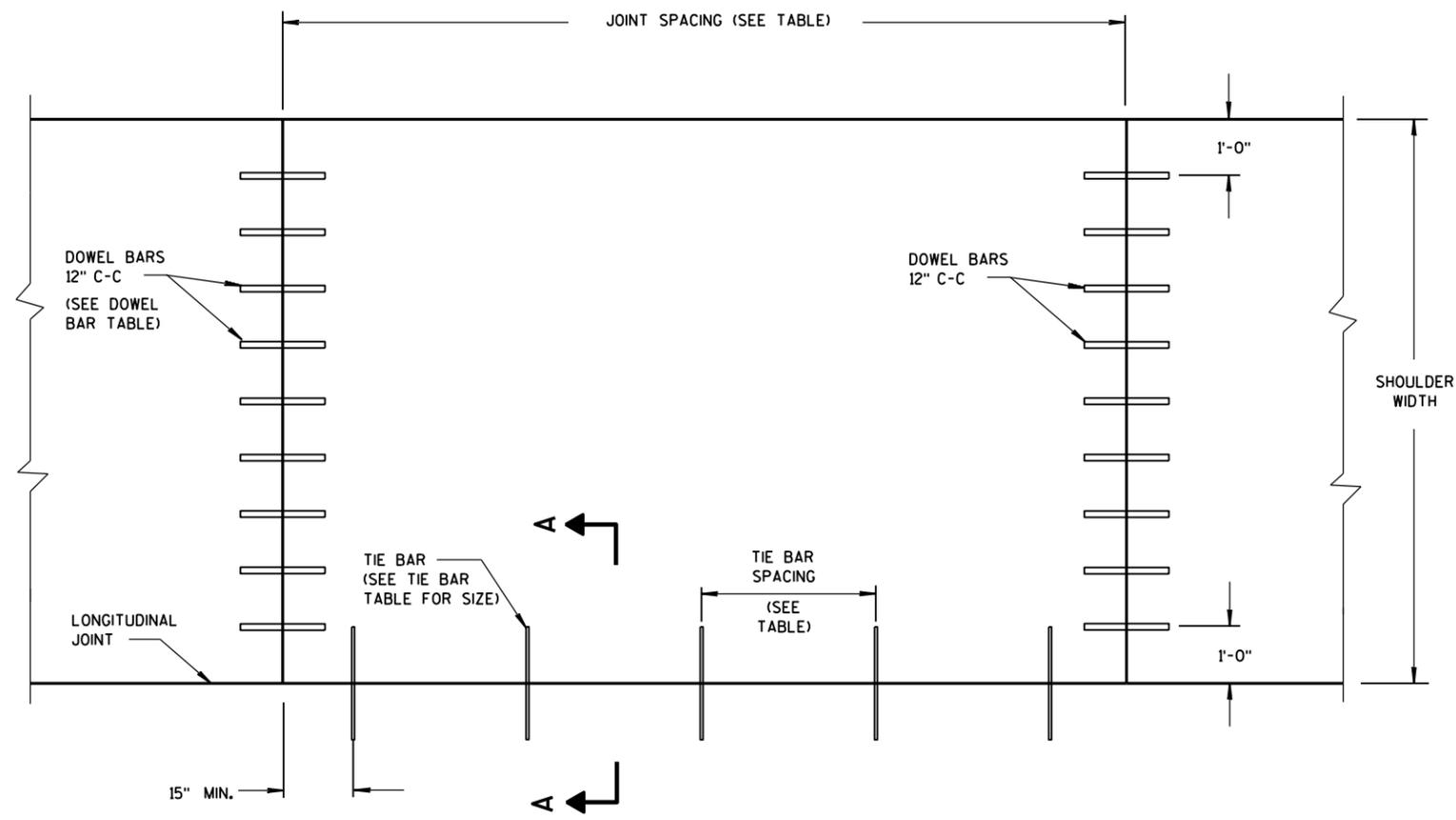


ALTERNATE LUG
(FOR ATTACHMENT TO PRECAST STRUCTURES)

S.D.D. 12 A 3-10

S.D.D. 12 A 3-10

NAME PLATE (STRUCTURES)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED DATE 3/26/10	/S/ Scot Becker CHIEF STRUCTURAL DEVELOPMENT ENGINEER
FHWA	



PLAN VIEW
CONCRETE PAVEMENT SHOULDER

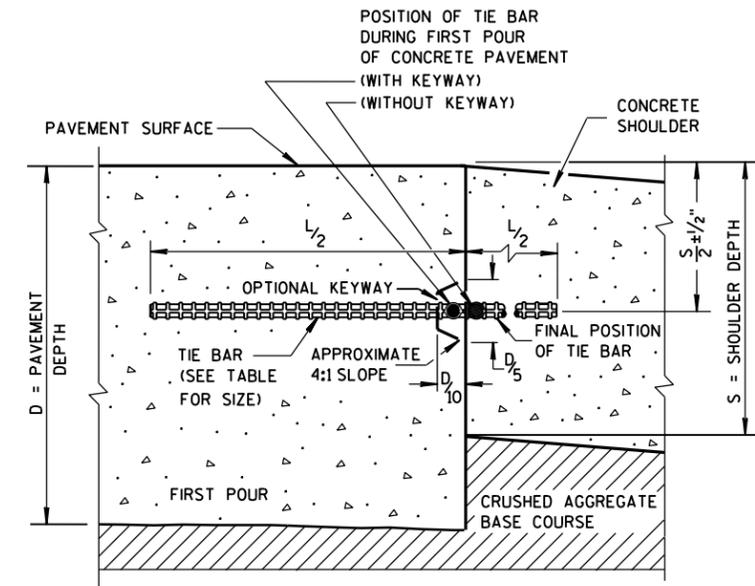
GENERAL NOTES

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.

TRANSVERSE JOINT DETAILS ARE SHOWN ELSEWHERE IN THE PLAN.

FINISH THE SHOULDER PAVEMENT CONFORMING TO SUBSECTION 415.3.8 OF THE STANDARD SPECIFICATIONS.

TIE BARS SHALL CONFORM TO SUBSECTION 505.2.4 OF THE STANDARD SPECIFICATIONS.



SECTION A-A
LONGITUDINAL CONSTRUCTION JOINT

TIE BAR TABLE

PAVEMENT DEPTH (D)	TIE BAR SIZE	TIE BAR LENGTH (L)	MAX. TIE BAR SPACING
< 10 1/2"	NO. 4	30"	36"
≥ 10 1/2"	NO. 5	36"	36"
	NO. 4*	30"	24" **

* SUBSTITUTE BENT BARS AT LONGITUDINAL JOINTS WHEN EQUIPMENT LIMITATIONS DURING CONSTRUCTION WARRANT (e.g. AUXILIARY LANES OR TURN LANES)

** CONFORM TO 15" MINIMUM SPACING FROM TRANSVERSE JOINTS; SPACING BETWEEN TIE BARS WILL BE 30" AT TRANSVERSE JOINTS.

PAVEMENT DEPTH, DOWEL BAR SIZE AND JOINT SPACING TABLE

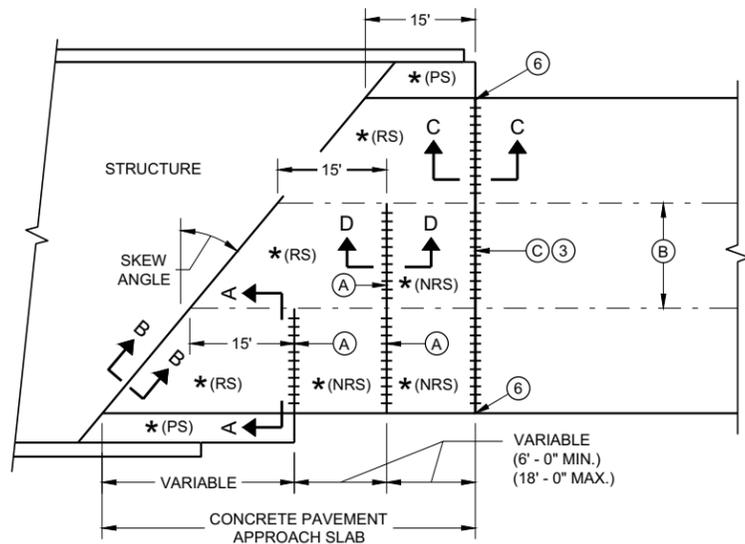
PAVEMENT DEPTH (D)	DOWEL BAR DIAMETER***	CONTRACTION JOINT SPACING
5 1/2", 6", 6 1/2"	NONE	12'
7", 7 1/2"	1"	14'
8", 8 1/2"	1 1/4"	15'
9", 9 1/2"	1 1/4"	15'
10" & ABOVE	1 1/2"	15'

*** FOR DOWELED CONCRETE SHOULDERS WITH TRAPEZOIDAL CROSS SECTIONS, CHOSE THE APPROPRIATE DOWEL BAR DIAMETER BASED ON THE SMALLER PAVEMENT DEPTH (LIKELY THE OUTSIDE EDGE OF THE SHOULDER). IF USING BASKETS, USE BASKETS FOR THE AVERAGE THICKNESS OF THE CROSS SECTION.

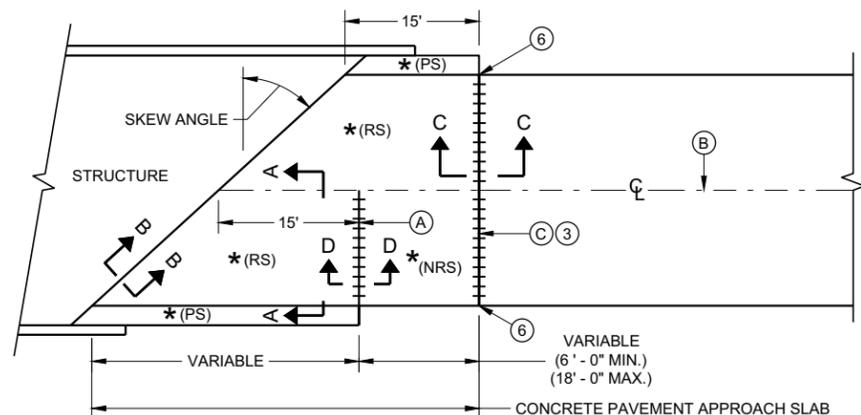
CONCRETE PAVEMENT SHOULDERS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

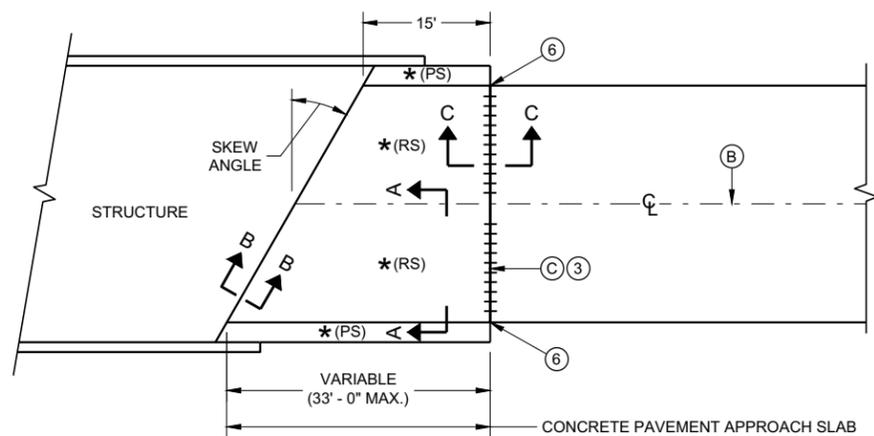
APPROVED
June, 2015 /S/ Peter Kemp, P.E.
DATE PAVEMENT SUPERVISOR
FHWA



**SKewed APPROACH
(PAVEMENT MORE THAN TWO LANES)**

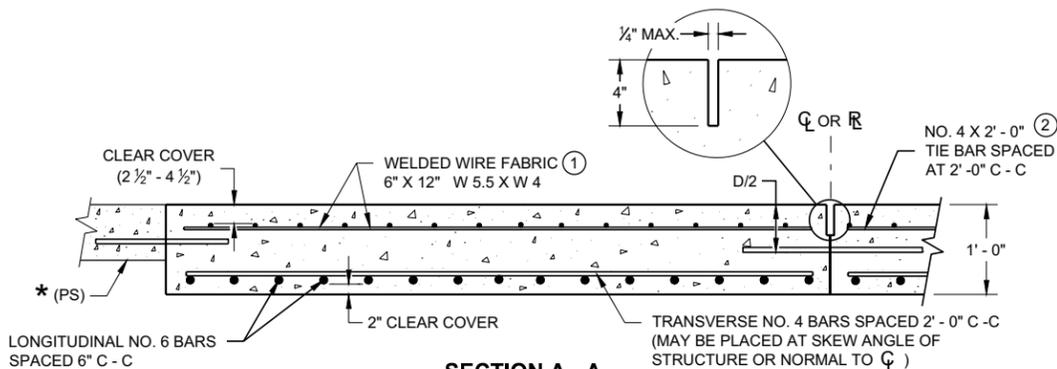


**SKews > 20°
(PAVEMENT WIDTH ≤ 30')**

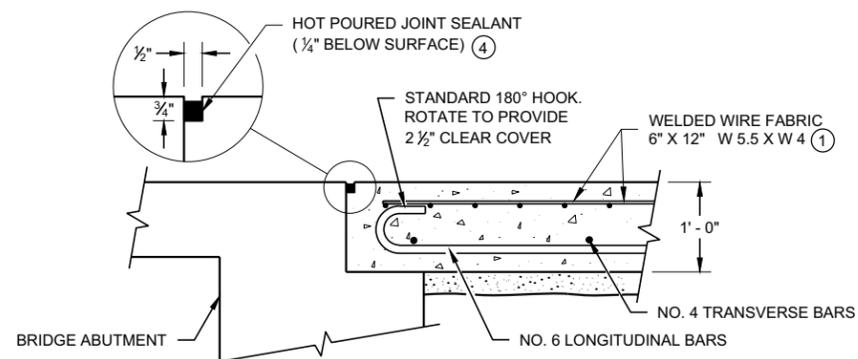


**SKews ≤ 20°
(PAVEMENT WIDTH ≤ 30')**
APPROACH SLAB AND ADJACENT PAVEMENT

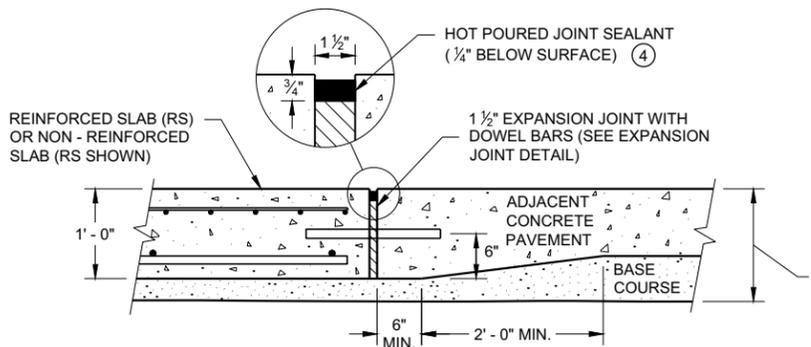
- * (RS) = REINFORCED CONCRETE SLAB
- * (PS) = PAVED CONCRETE SHOULDER OR CONCRETE DRAINAGE SLAB
- * (NRS) = NON - REINFORCED CONCRETE SLAB
- *** STANDARD DOWEL BAR DIAMETER (SEE SDD 13C11 AND SDD 13C13)



**SECTION A - A
REINFORCEMENT POSITIONING DETAIL**



**SECTION B - B
BEND DETAIL
BOTTOM REINFORCEMENT**



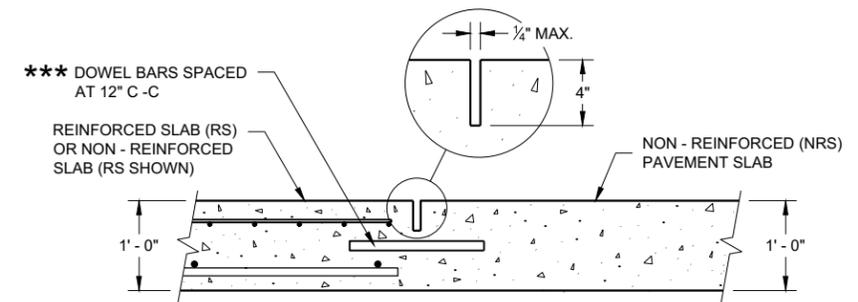
**SECTION C - C
TRANSITION DETAIL
APPROACH SLAB TO ADJACENT PAVEMENT**

GENERAL NOTES

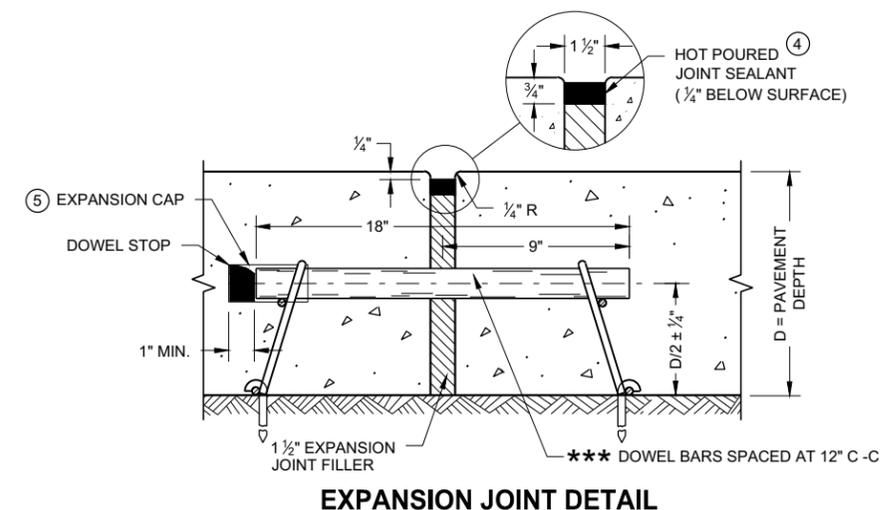
THE CONTRACTOR MAY SPLICE NO. 6 BARS IN THE APPROACH SLAB FOR SKEWED STRUCTURES ONLY. STAGGER SPLICES WITH A MAXIMUM OF ONE SPLICE PER BAR. THE LENGTH OF LAP IS 20 INCHES.

TACK WELD DOWEL BARS TO THE BASKETS ON ALTERNATE ENDS.

- ① THE CONTRACTOR MAY USE NO. 4 BARS SPACED AT 2' - 0" C - C IN BOTH THE LONGITUDINAL AND TRANSVERSE DIRECTIONS FOR TOP REINFORCEMENT AS AN ALTERNATIVE TO THE WELDED WIRE FABRIC.
- ② THE CONTRACTOR MAY OMIT THE BARS BETWEEN REINFORCED SLABS WHERE SLAB REINFORCEMENT BARS EXTEND ACROSS THE CENTERLINE OR REFERENCE LINE.
- ③ DO NOT CONSTRUCT AN EXPANSION JOINT OR INSTALL DOWEL BARS WHEN ABUTTING AN HMA PAVEMENT.
- ④ USE A JOINT SEALANT CONFORMING TO STANDARD SPECIFICATION 415.2.6.
- ⑤ PLACE EXPANSION CAP ON THE END OF THE DOWEL THAT IS NOT TACK WELDED TO THE BASKET. DO NOT FORCE DOWEL BAR PAST THE DOWEL STOP.
- ⑥ EXTEND EXPANSION JOINT THROUGH ANY ADJACENT TIED CONCRETE.
- (A) STANDARD CONTRACTION JOINT NORMAL TO C OR R.
- (B) STANDARD LONGITUDINAL JOINT WITH TIE BARS.
- (C) 1 1/2" EXPANSION JOINT WITH DOWEL BARS NORMAL TO C OR R.



**SECTION D - D
CONTRACTION JOINT**



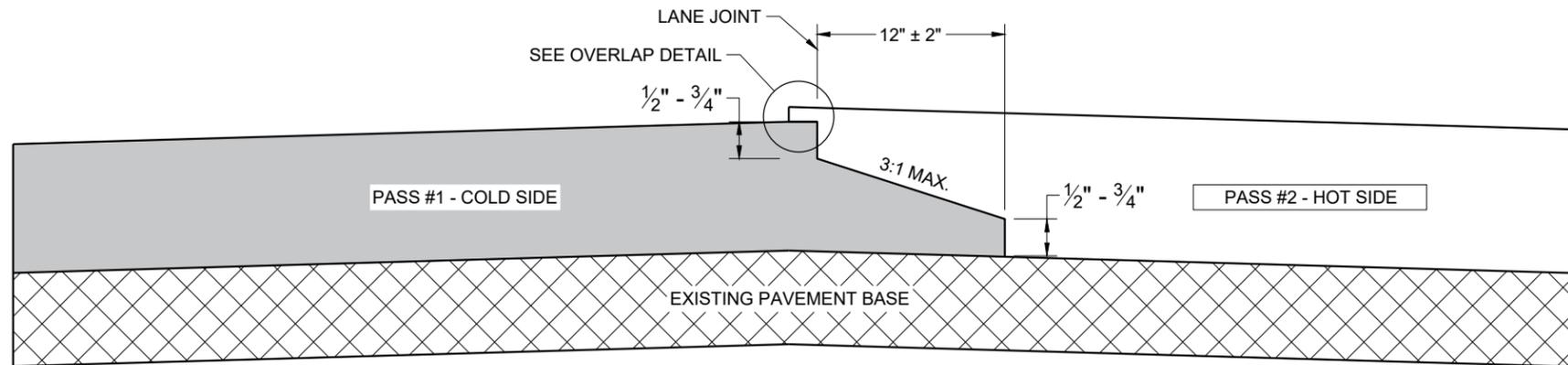
EXPANSION JOINT DETAIL

**CONCRETE PAVEMENT
APPROACH SLAB**

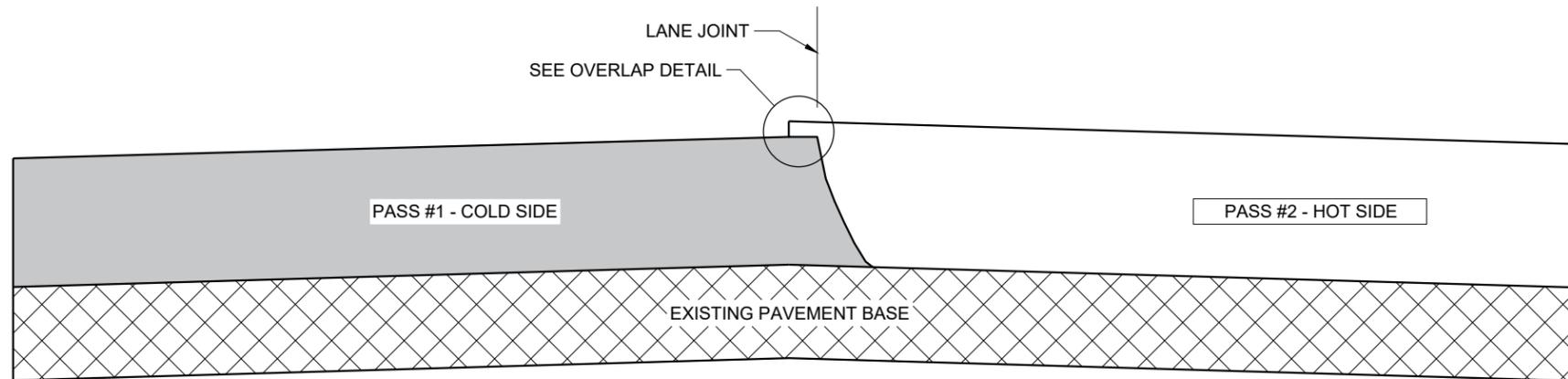
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2018 /S/ Peter Kemp, P.E.
DATE DATE PAVEMENT SUPERVISOR

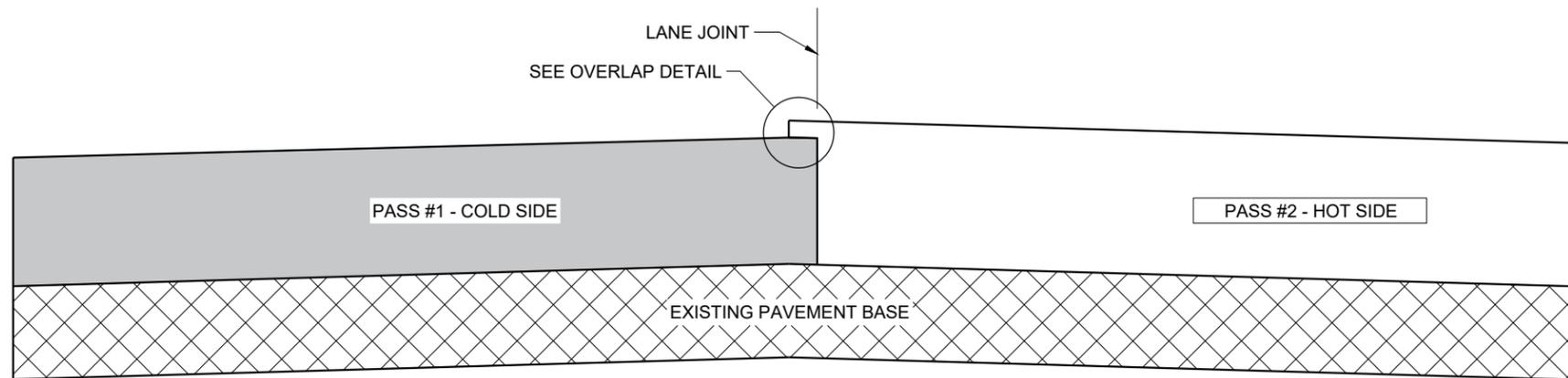
FHWA



**TYPICAL PAVEMENT CROSS SECTION
NOTCHED WEDGE JOINT**



**TYPICAL PAVEMENT CROSS SECTION
VERTICAL JOINT**



**TYPICAL PAVEMENT CROSS SECTION
VERTICAL JOINT (MILLED)**

GENERAL NOTES

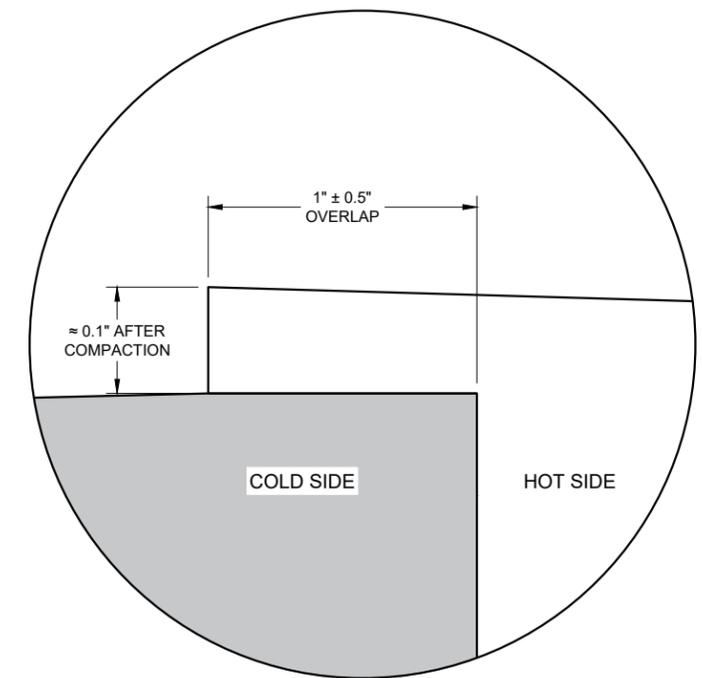
IN ADDITION TO THE DETAILS PROVIDED IN THIS DRAWING, CONFORM TO STANDARD SPECIFICATION 450.3.2.8 FOR WHEN A NOTCHED WEDGE JOINT IS REQUIRED AND FOR GENERAL JOINT CONSTRUCTION REQUIREMENTS.

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

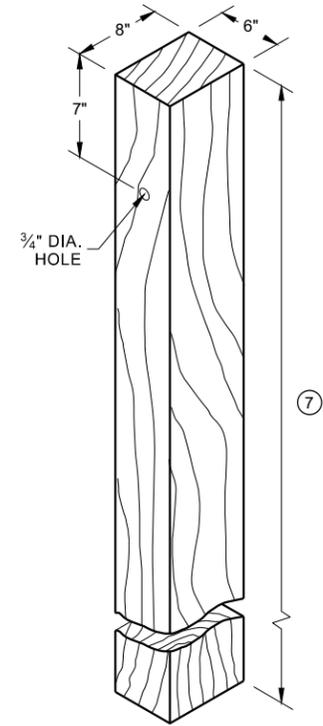
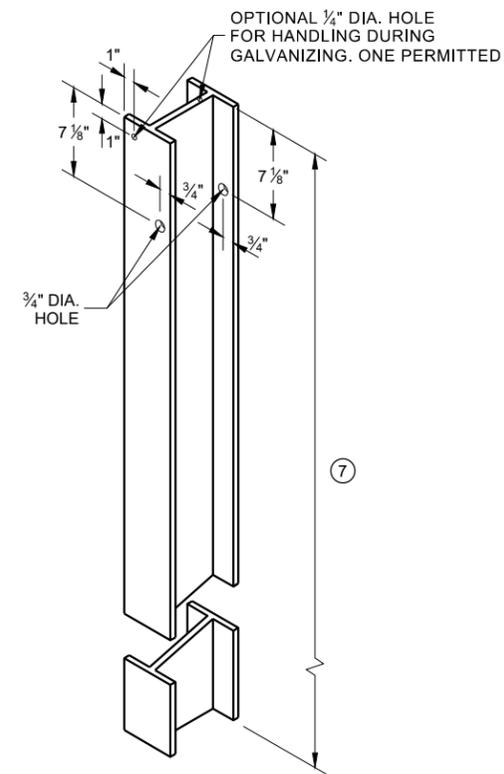
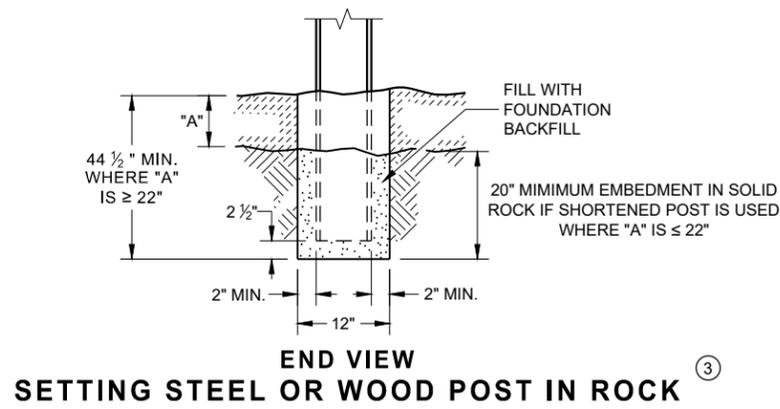
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SDD 13C19 - 03

SDD 13C19 - 03

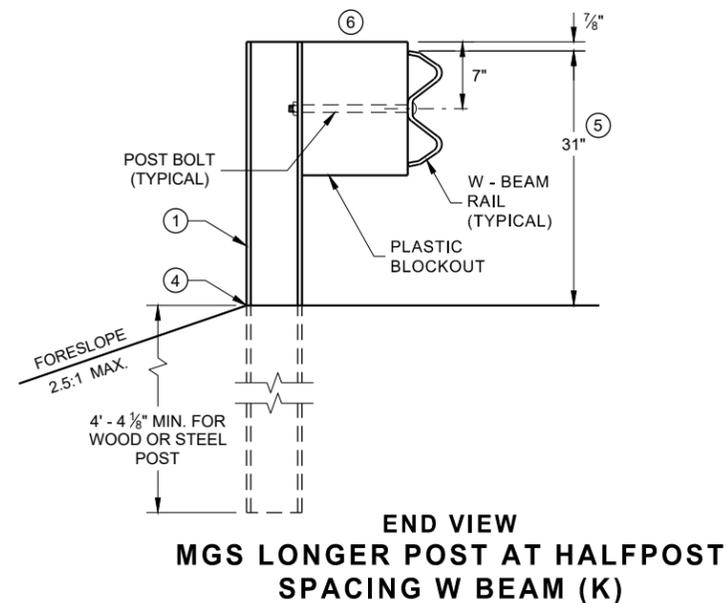
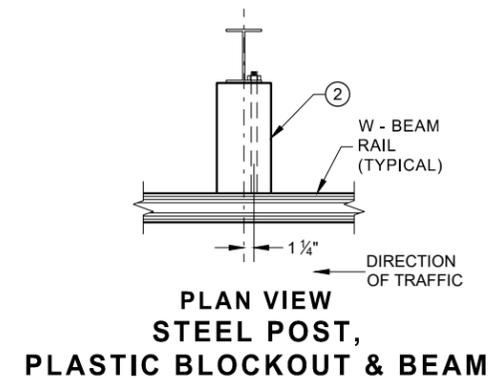
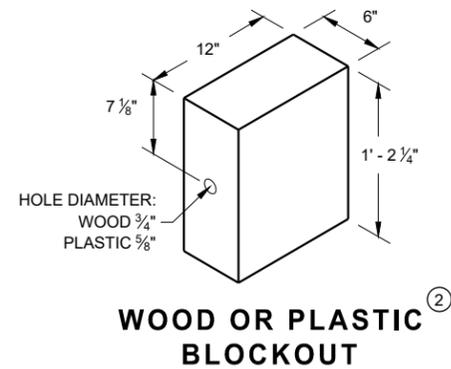
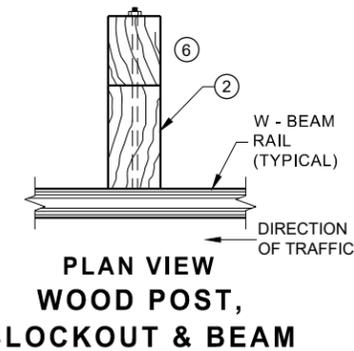
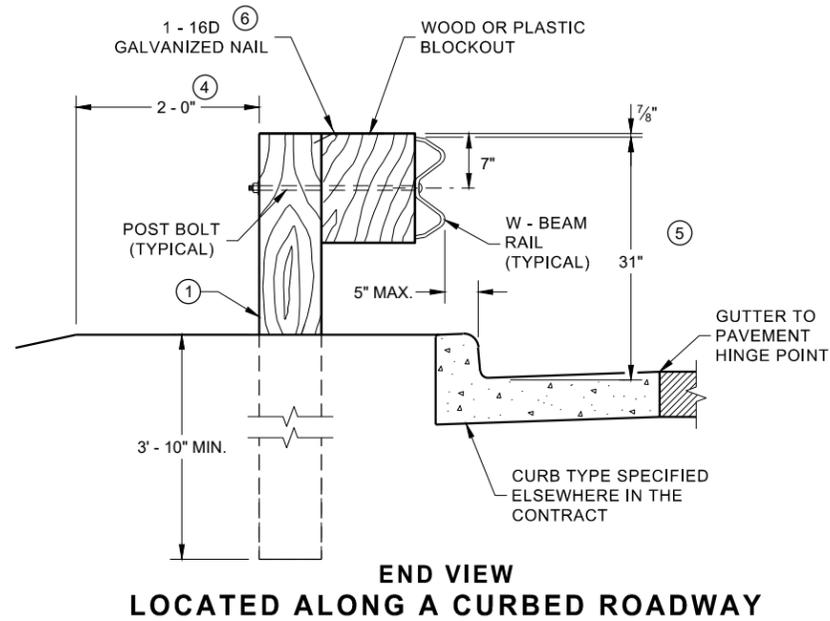
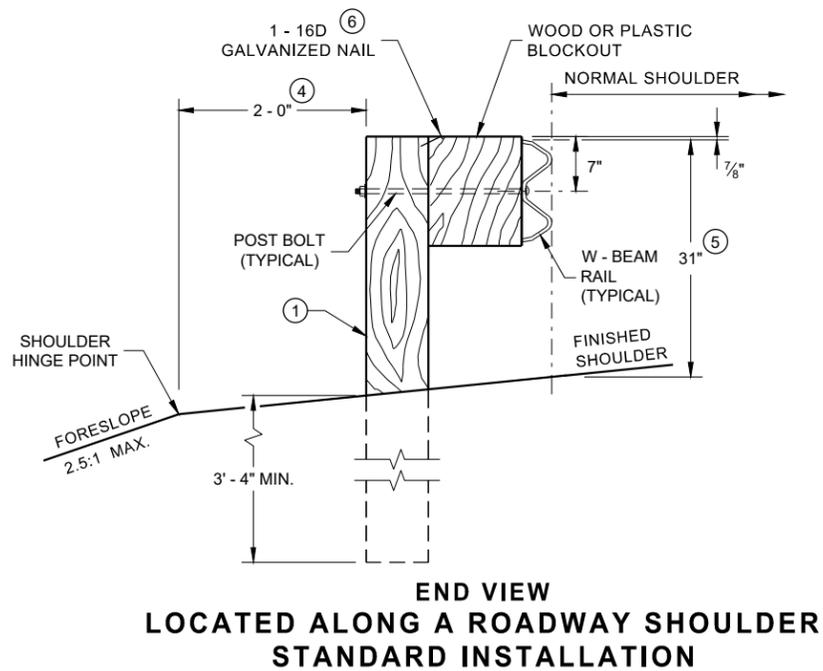
HMA LONGITUDINAL JOINTS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED November 2020 DATE	/S/ Steven Hefel HMA PAVEMENT ENGINEER
FHWA	

- 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".



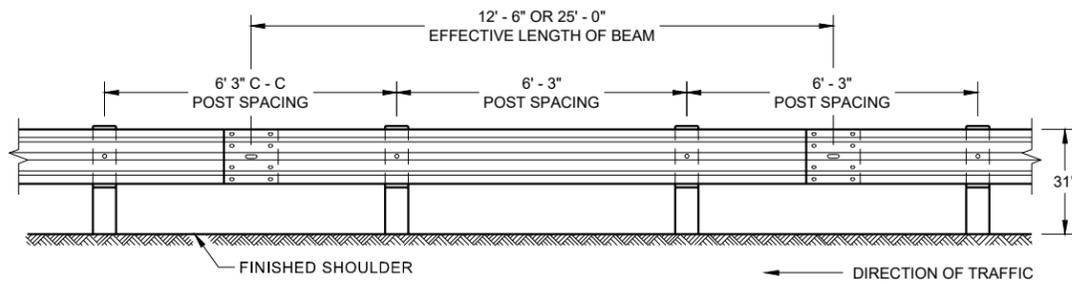
STEEL POST & HOLE PUNCHING DETAIL (W 6 X 9)

WOOD POST (6" X 8") NOMINAL

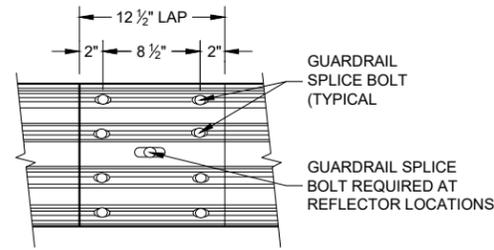


MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



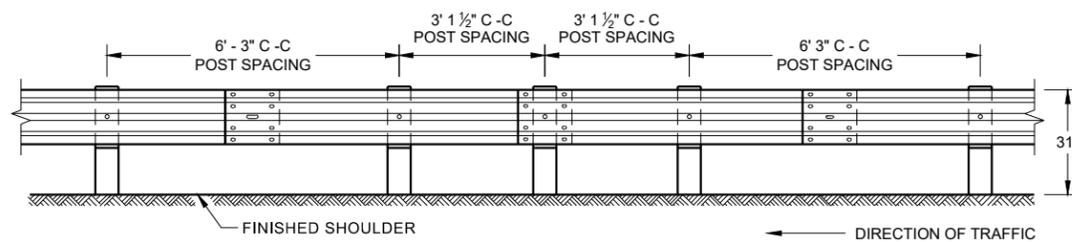
**FRONT VIEW
POST SPACING STANDARD INSTALLATION**



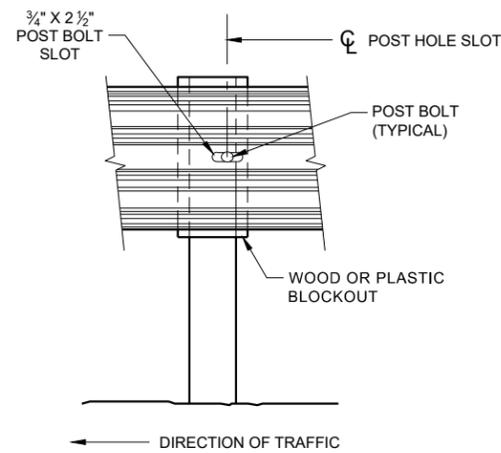
**FRONT VIEW
MID-SPAN BEAM SPLICE**

GENERAL NOTES

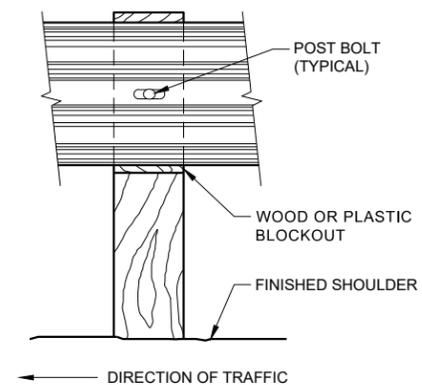
- ⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
 - ⑨ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.
- POST BOLTS ARE A 3/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 3/4" DIAMETER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



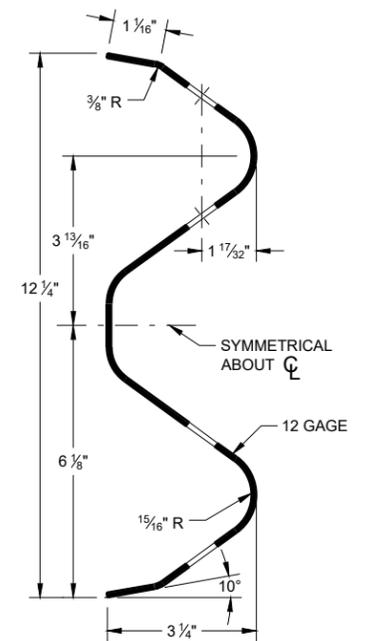
**FRONT VIEW
HALF POST SPACING (HS) AND
HALF POST SPACING WITH LONGER POSTS (K)**



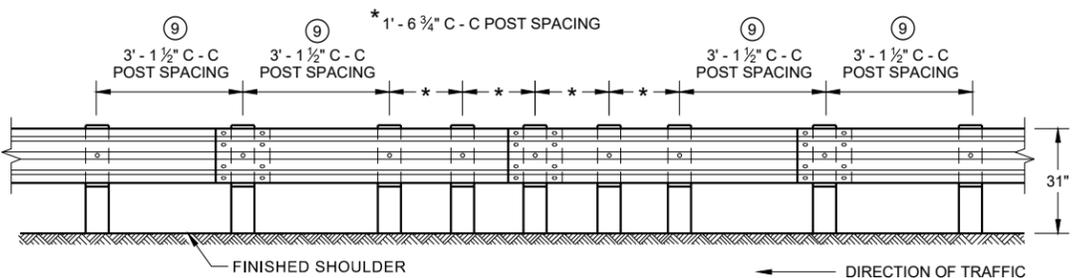
FRONT VIEW AT STEEL POST



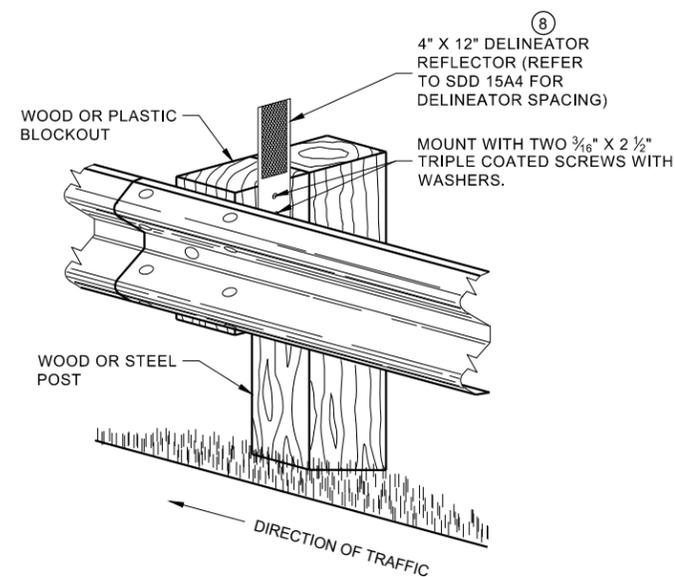
FRONT VIEW AT WOOD POST



SECTION THRU W-BEAM RAIL



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



**ONE SIDED REFLECTOR DETAIL
AND TYPICAL INSTALLATION**

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

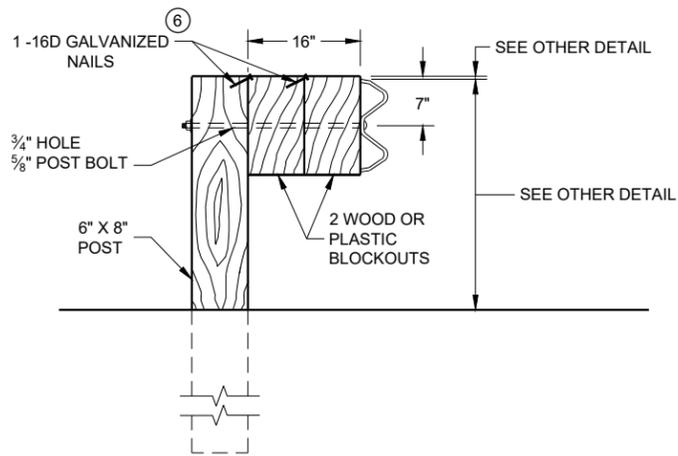
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

6

SDD 14B42 - 07b

SDD 14B42 - 07b

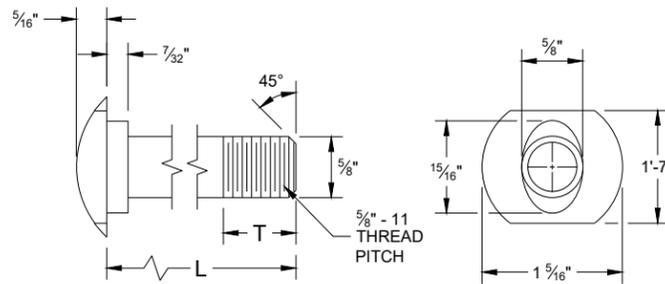


DETAIL FOR 16" BLOCKOUT DEPTH

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.

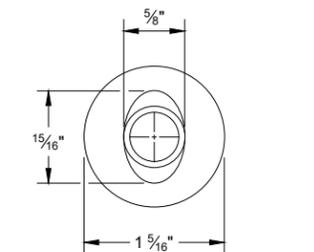
NOTE:

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.

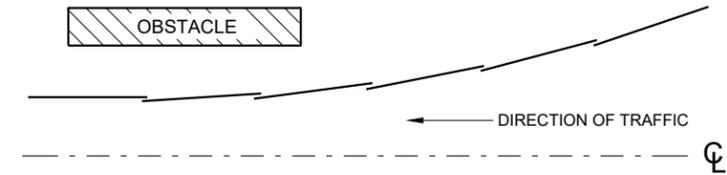


POST BOLT TABLE

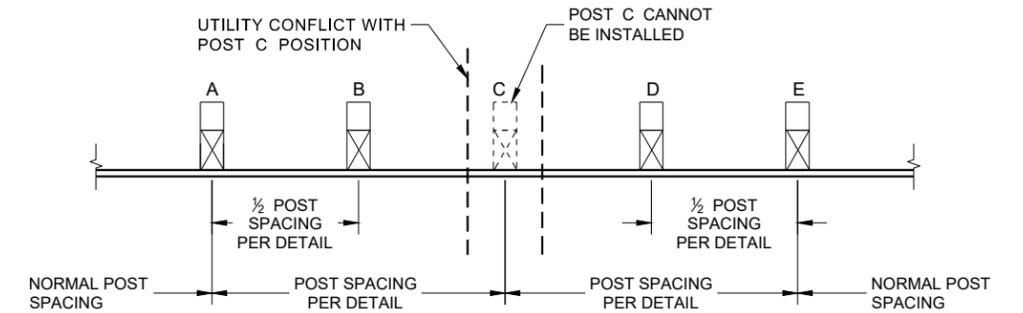
L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



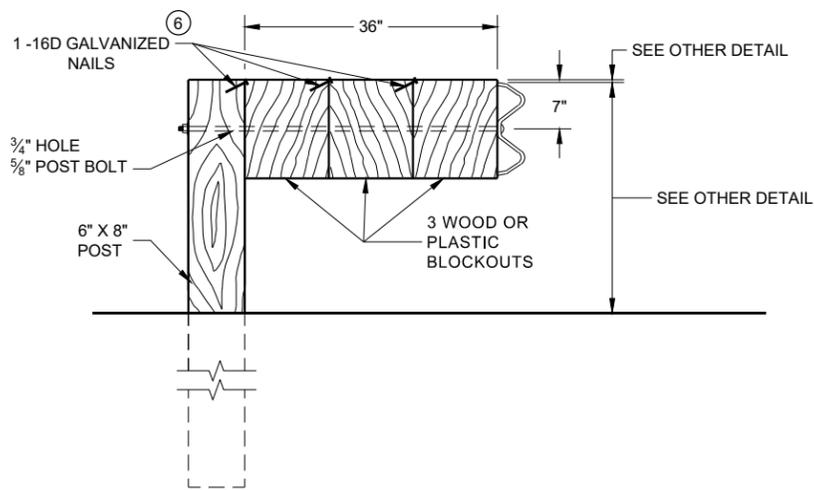
ALTERNATE BOLT HEAD



**PLAN VIEW
BEAM LAPPING DETAIL**

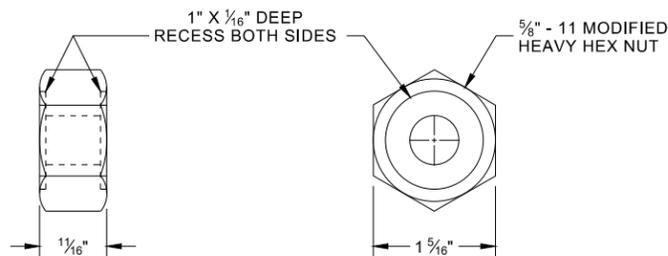


**POST DRIVING FOR CONTINUOUS
UNDERGROUND OBSTRUCTION**

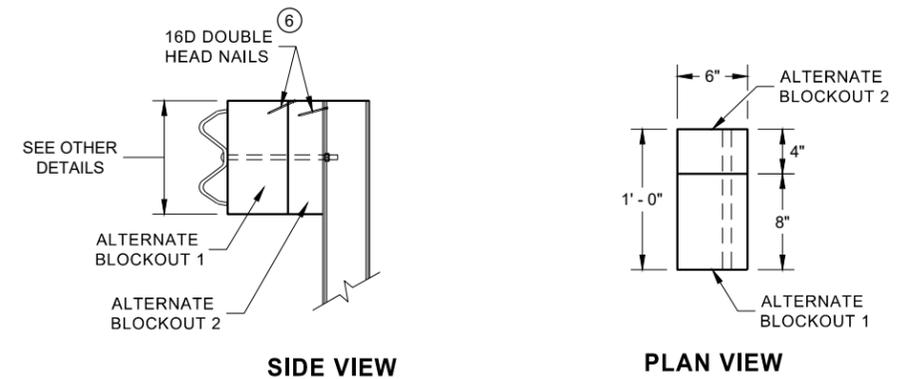


DETAIL FOR 36" BLOCKOUT DEPTH

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**

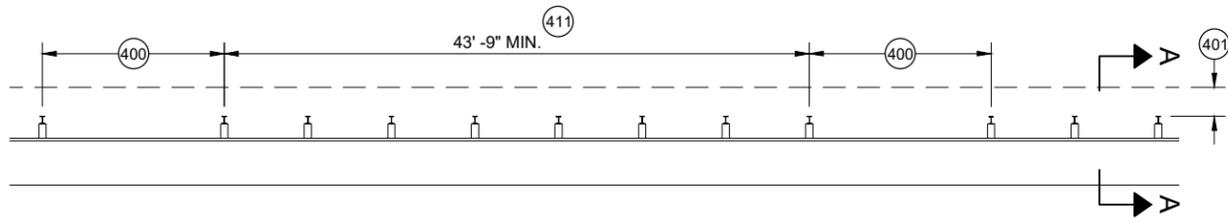


**ALTERNATE WOOD
BLOCKOUT DETAIL**

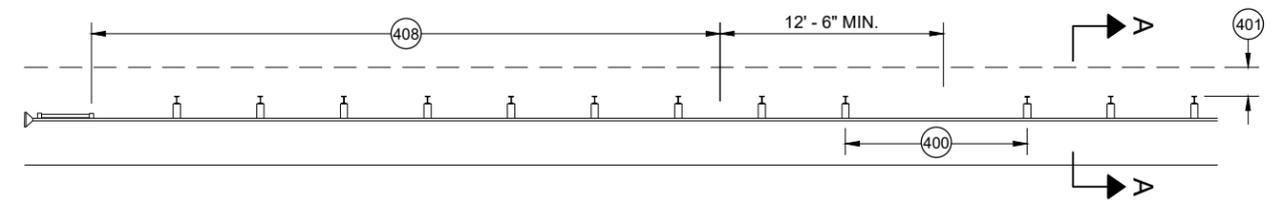
6 WHEN USING STEEL POST AND WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

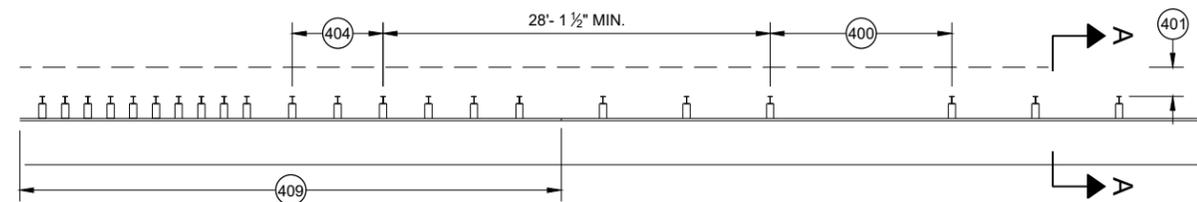
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



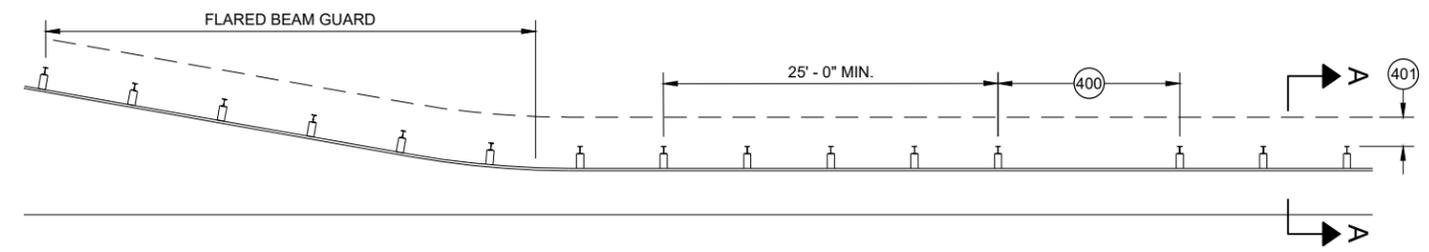
MISSING POST IN MGS GUARDRAIL



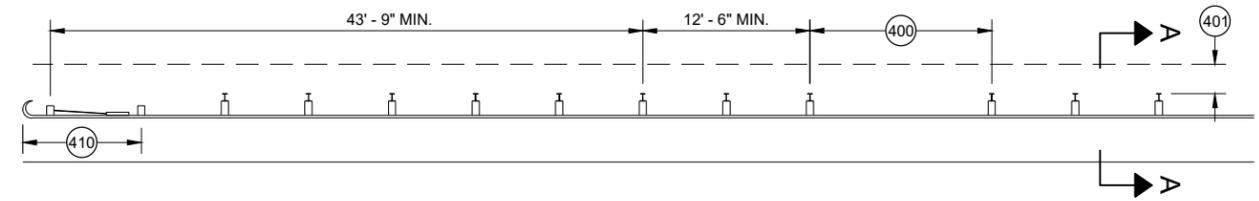
MISSING POST IN MGS GUARDRAIL NEAR EAT



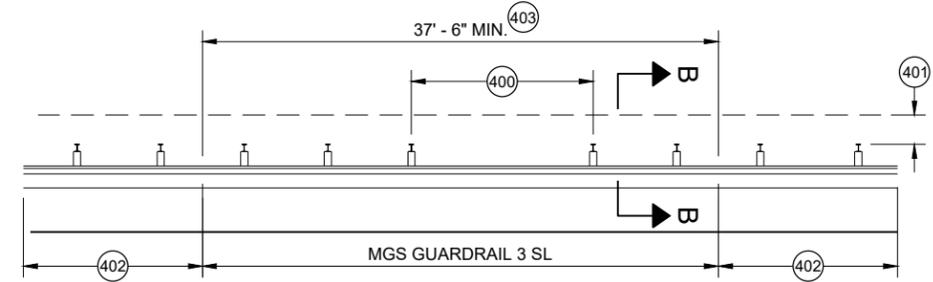
MISSING POST IN MGS GUARDRAIL NEAR AN APPROACH TRANSITION



MISSING POST IN MGS GUARDRAIL NEAR FLARED BEAM GUARD

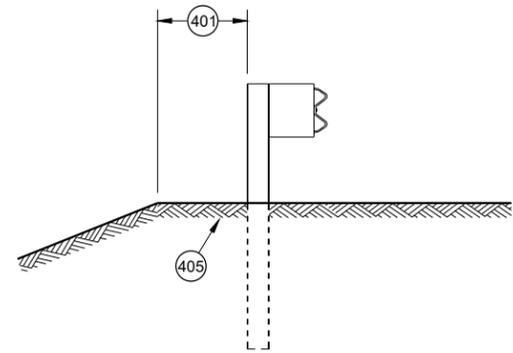


MISSING POST IN MGS GUARDRAIL NEAR A TYPE 2 END TERMINAL

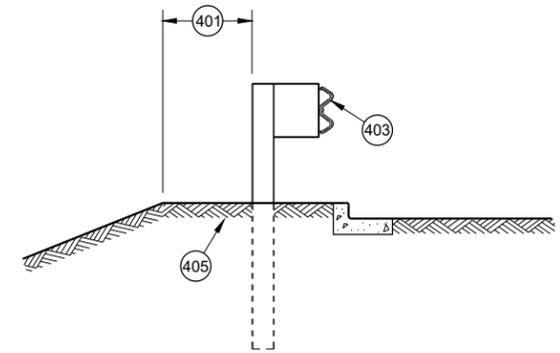


MISSING POST IN SHORT SPAN MGS GUARDRAIL NEAR CURB (SL)

- (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.

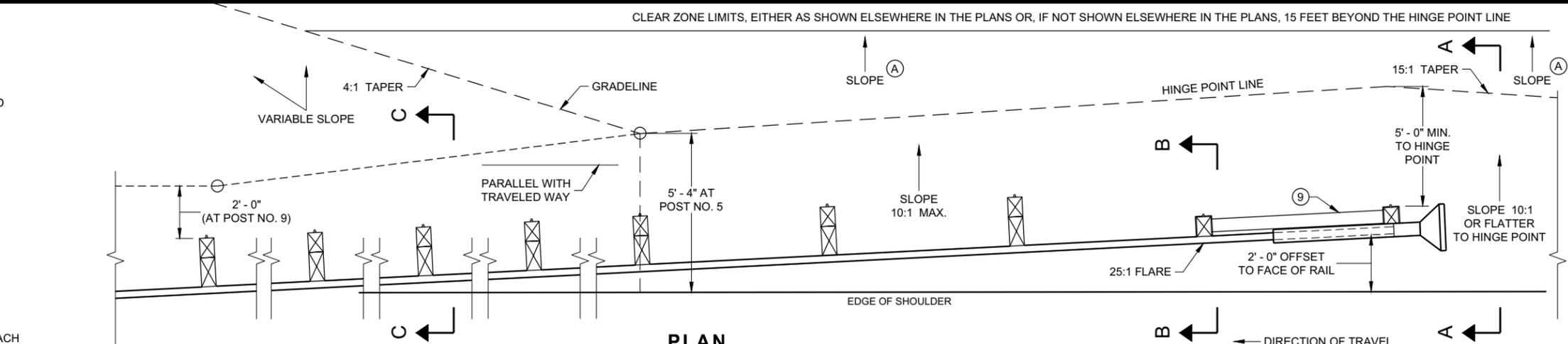
SEE SDD 14B42 FOR MORE INFORMATION.

* DO NOT ATTACH BLOCKOUTS TO POST 1 AND 2.

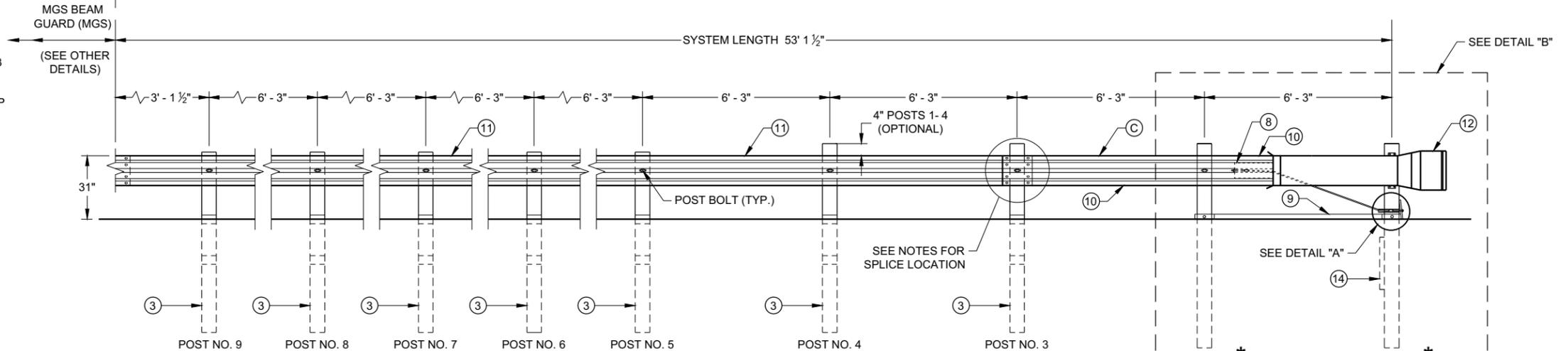
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

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

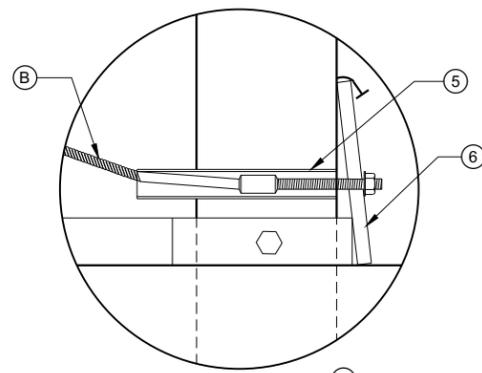
THE CENTER OF THE UPPER 3 1/2" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE. WOOD BLOCKS ON POSTS NUMBERED 3 THROUGH 9 MAY BE ADJUSTED UP TO 3" ABOVE THE TOP OF POST.



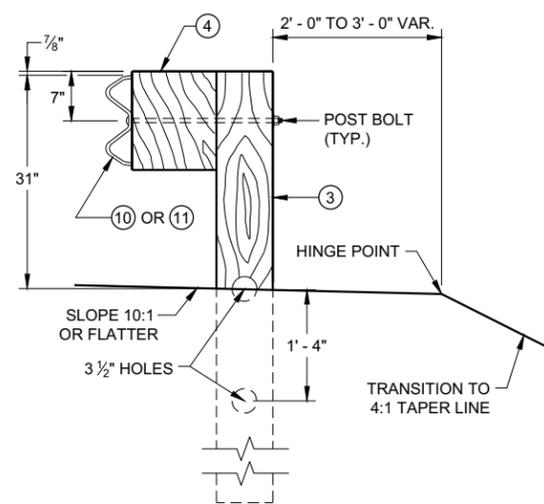
PLAN



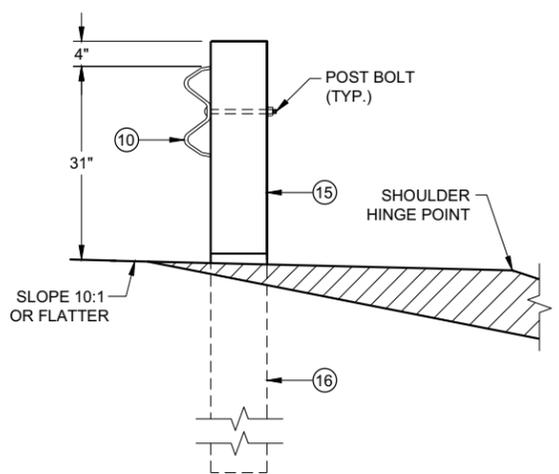
ELEVATION



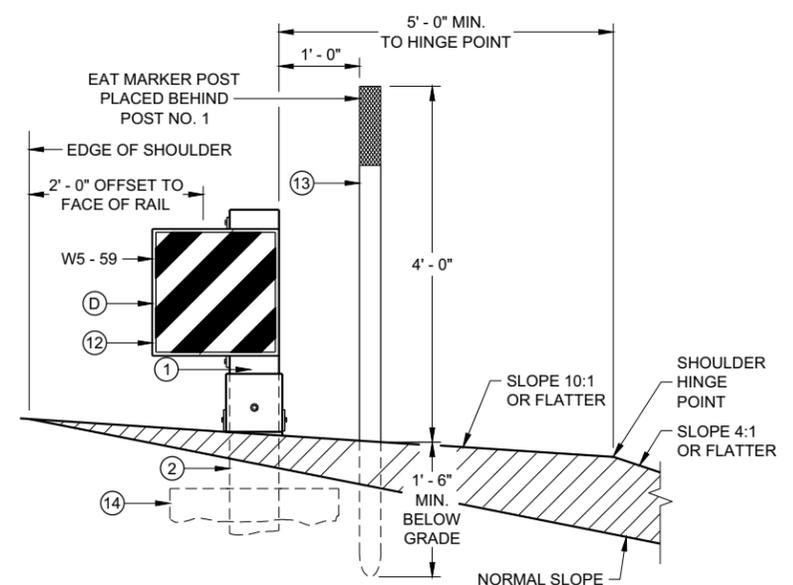
DETAIL "A"



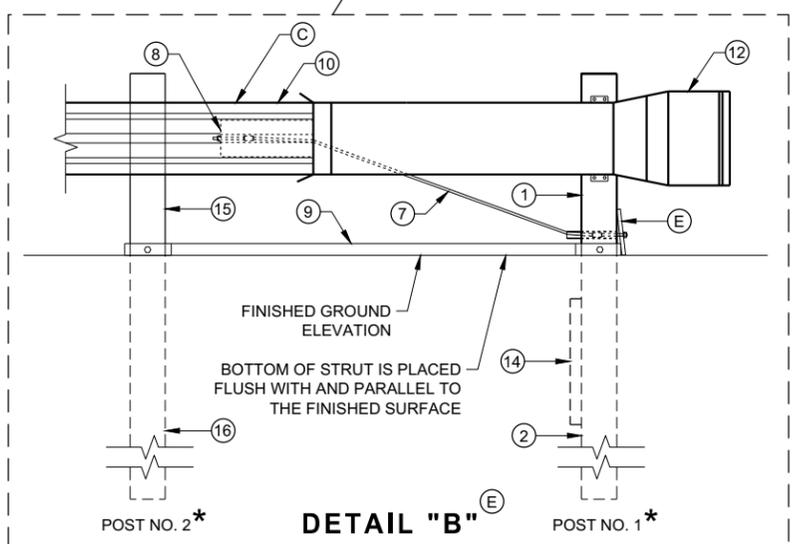
**SECTION C - C
TYPICAL AT POST NOS. 3 - 9**



**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

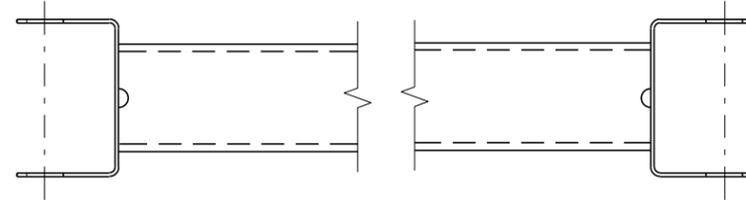
6

SDD 14B44 - 04a

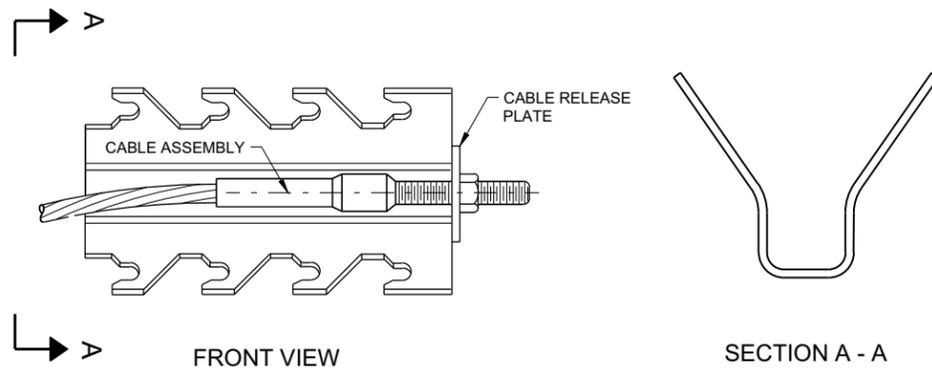
SDD 14B44 - 04a

BILL OF MATERIALS

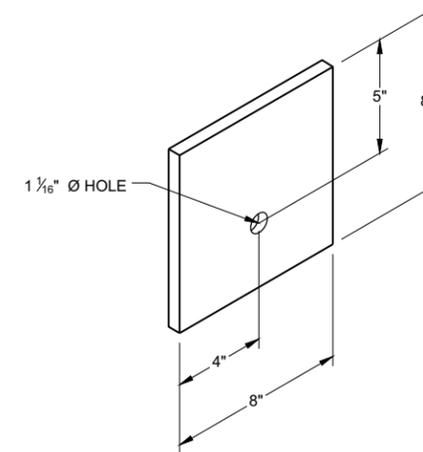
PART NO.	DESCRIPTION MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
①	UPPER POST NO. 1 6" X 6" TUBE
②	LOWER POST NO. 1
③	WOOD CRT
④	WOOD BLOCKOUT
⑤	PIPE SLEEVE
⑥	BEARING PLATE
⑦	BCT CABLE ASSEMBLY
⑧	ANCHOR CABLE BOX
⑨	GROUND STRUT
⑩	PERFORATED W-BEAM RAIL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

6

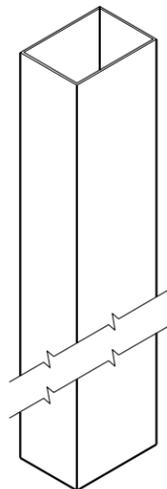
6

SDD 14B44 - 04b

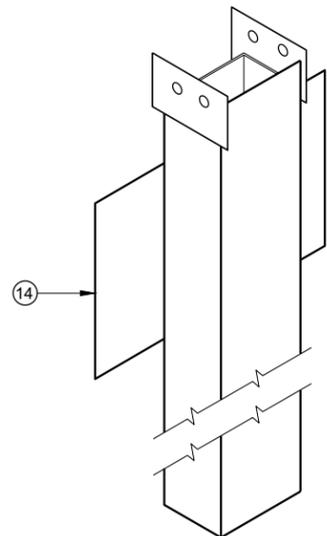
SDD 14B44 - 04b

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

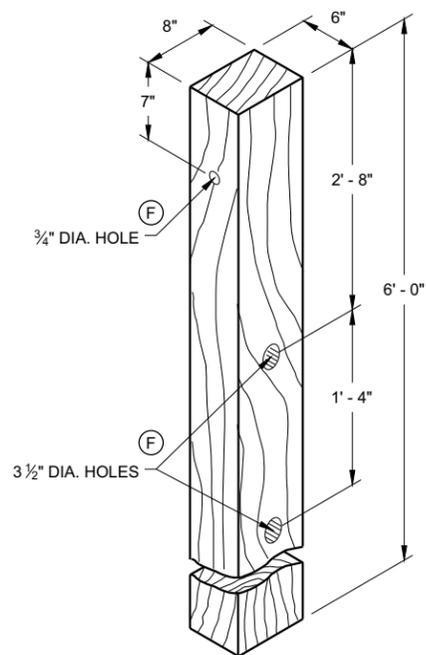
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



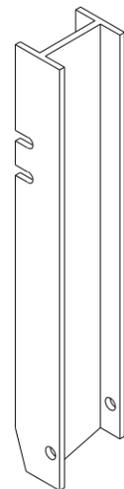
UPPER POST NO. 1 ⁽¹⁾ (E)



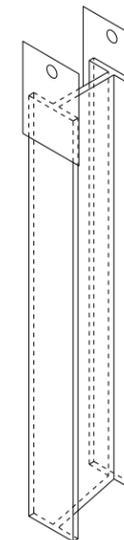
LOWER POST NO. 1 ⁽²⁾ (E)



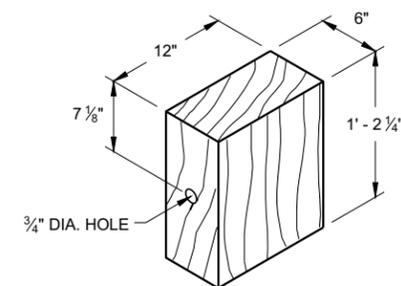
WOOD CRT POST ⁽³⁾ (E)
POSTS NUMBER 3-9



UPPER POST NO. 2 ⁽¹⁵⁾ (E)

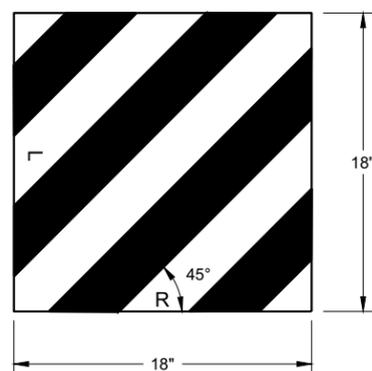


LOWER POST NO. 2 ⁽¹⁶⁾ (E)



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

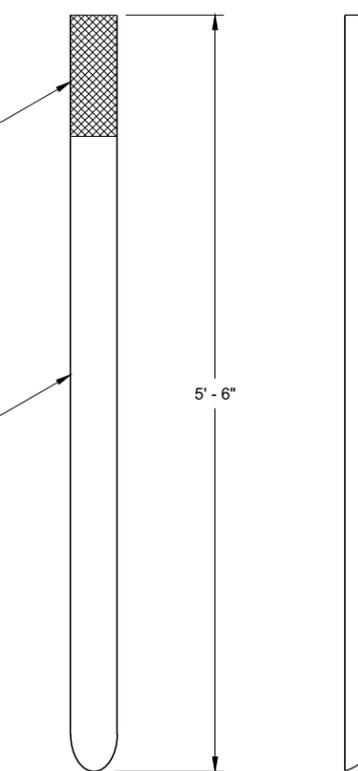
6



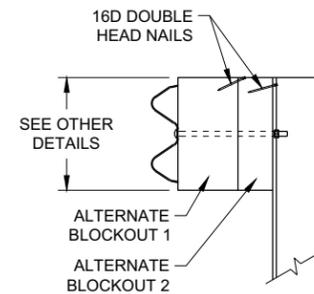
REFLECTIVE SHEETING DETAIL ^(E)

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

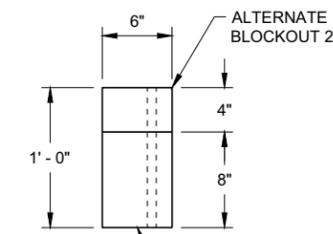
E.A.T. MARKER
POST (YELLOW)



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



SIDE VIEW



TOP VIEW

ALTERNATE WOOD
BLOCKOUT DETAIL

6

SDD 14B44 - 04c

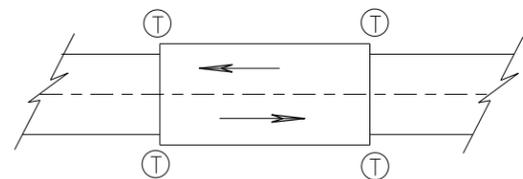
SDD 14B44 - 04c

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

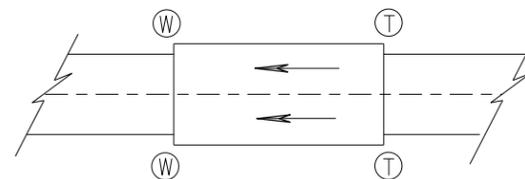
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

FHWA



TWO WAY TRAFFIC



ONE WAY TRAFFIC

(T) THRIE BEAM CONNECTION

(W) W-BEAM CONNECTION WHEN REQUIRED

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

GENERAL NOTES

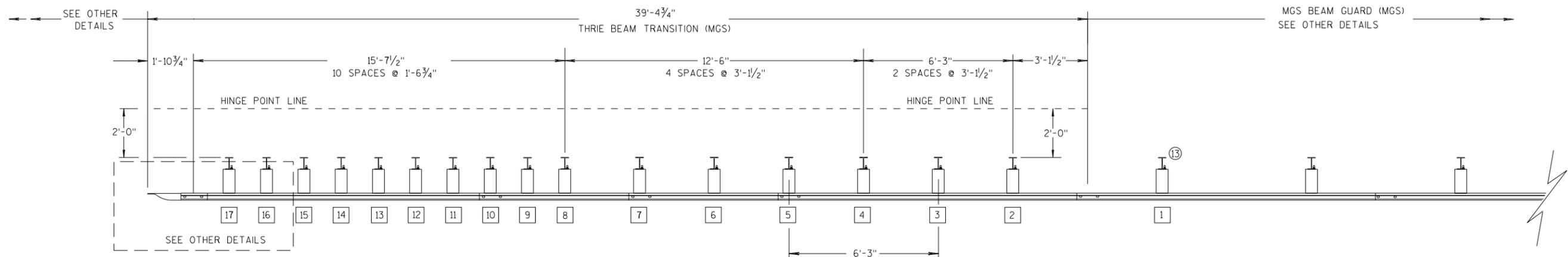
IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2", AND 12" DIAMETER AROUND POST. SEE 14B42 FOR MORE DETAILS.

TRANSITION USES STEEL POSTS ONLY.

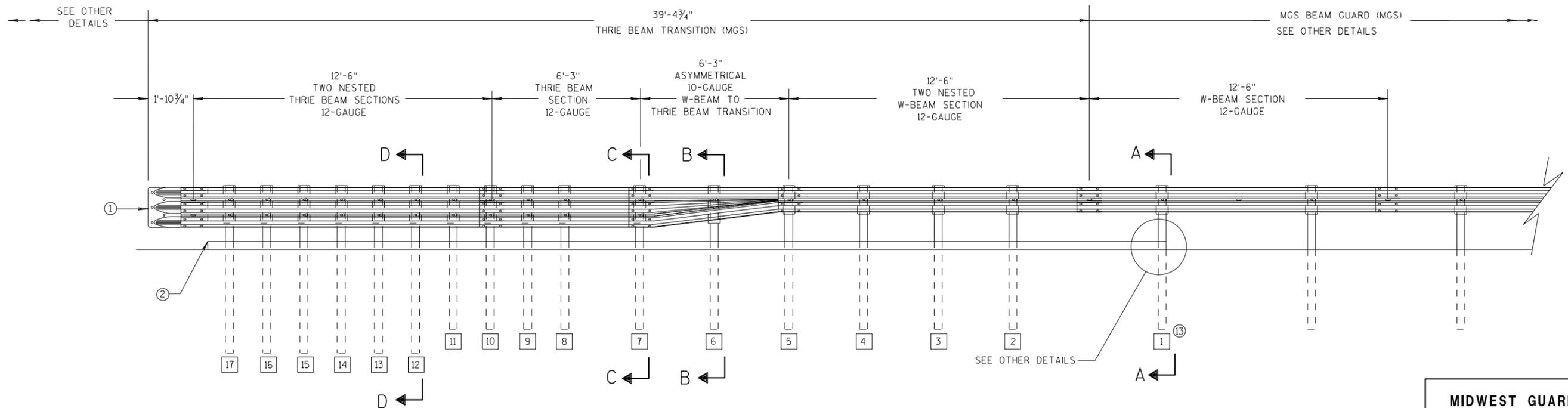
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

POST 2 THROUGH 17 USES STEEL POST ONLY

- ① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ⑬ STEEL OR WOOD POST IS ACCEPTABLE AT POST 1. SEE SDD14B42



PLAN VIEW



ELEVATION VIEW

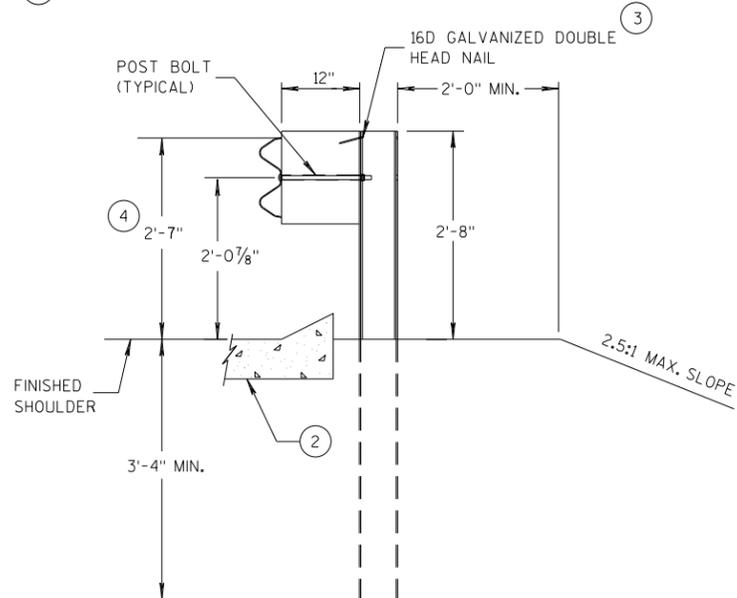
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

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

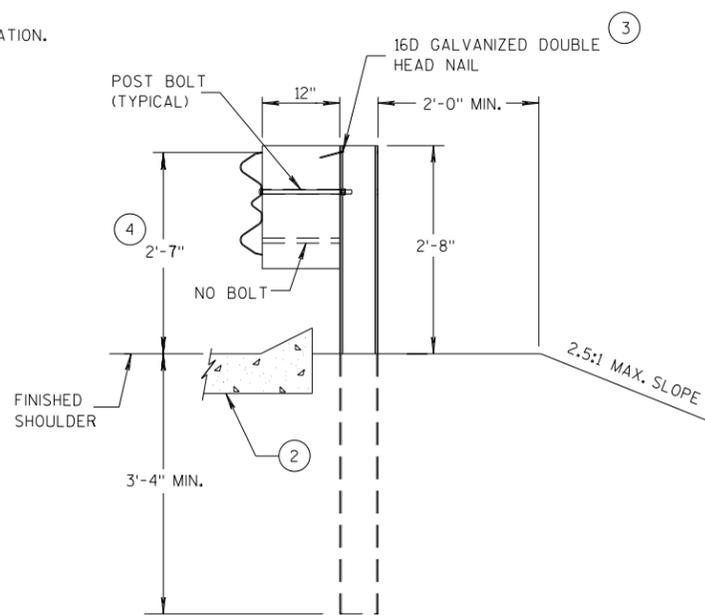
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

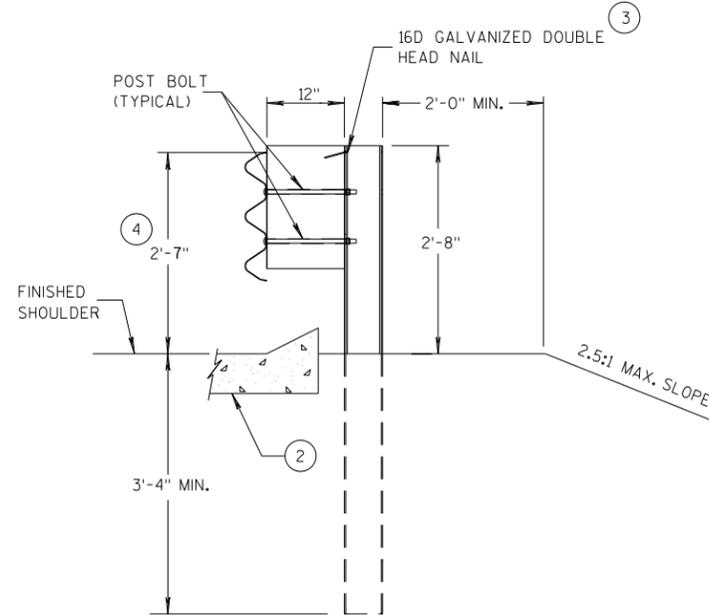
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ③ WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 10D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- ④ TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".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

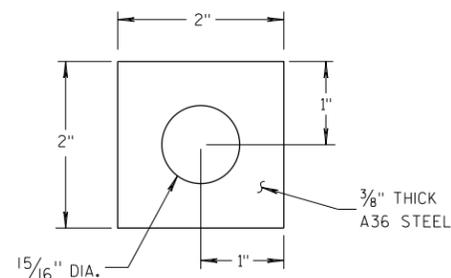
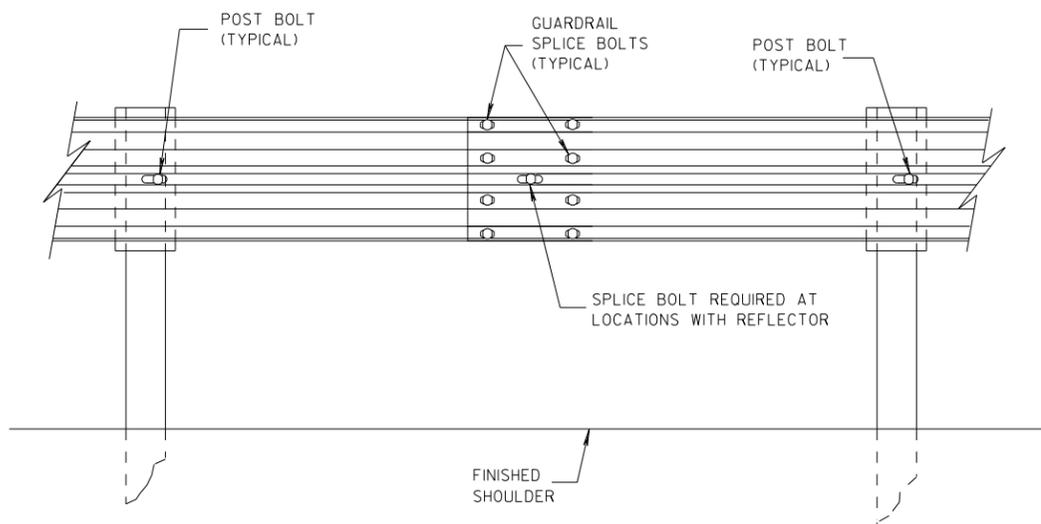
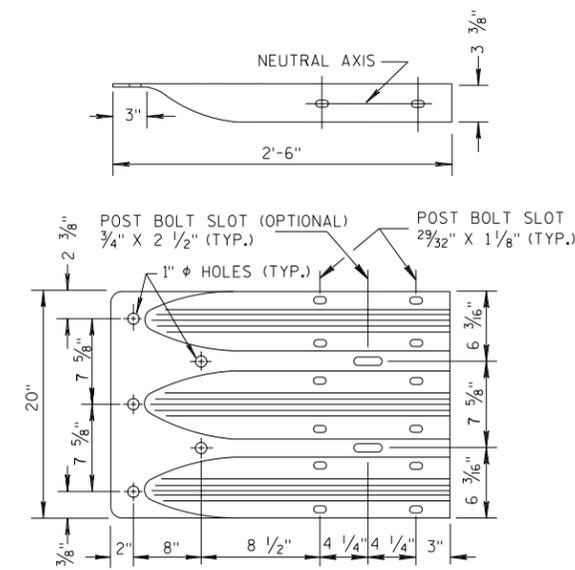


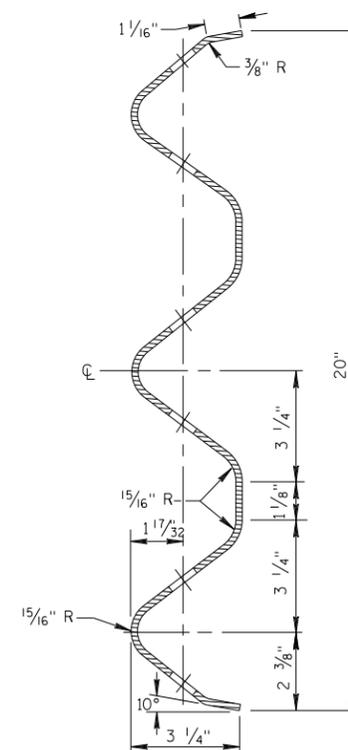
PLATE WASHER DETAIL



SPLICE DETAIL



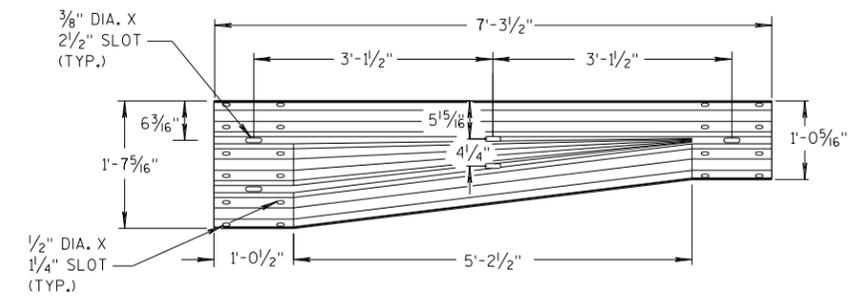
**THRIE BEAM
TERMINAL CONNECTOR**



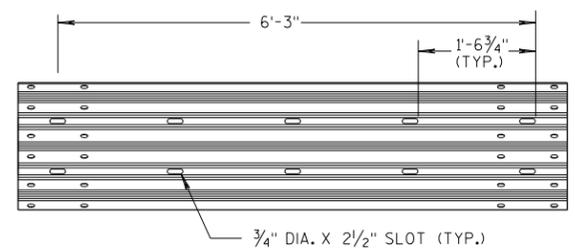
**SECTION THRU THRIE
BEAM RAIL ELEMENT**

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

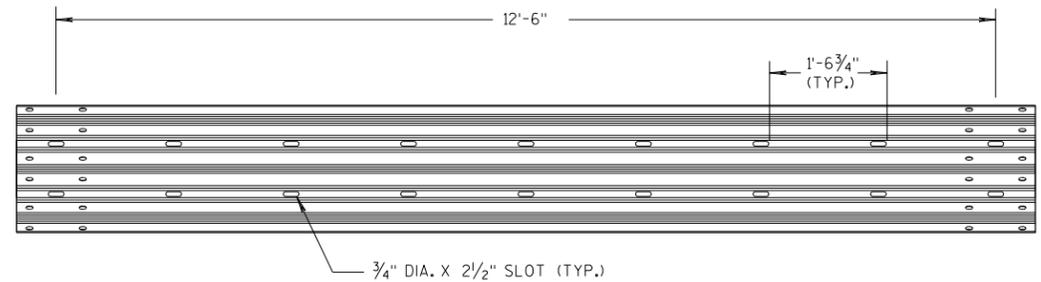
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



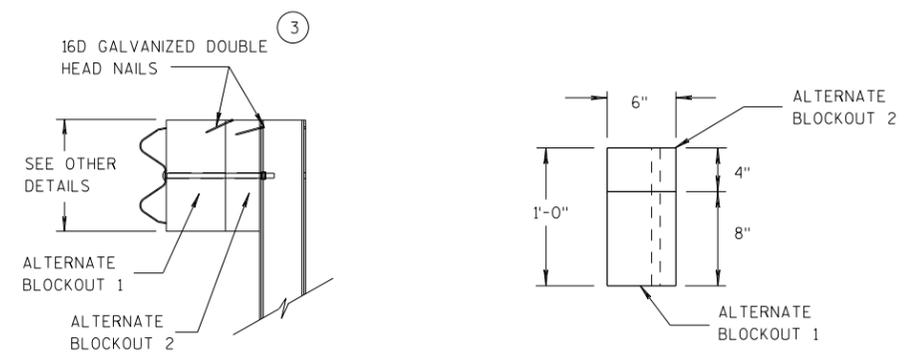
W-BEAM TO THRIE BEAM TRANSITION SECTION



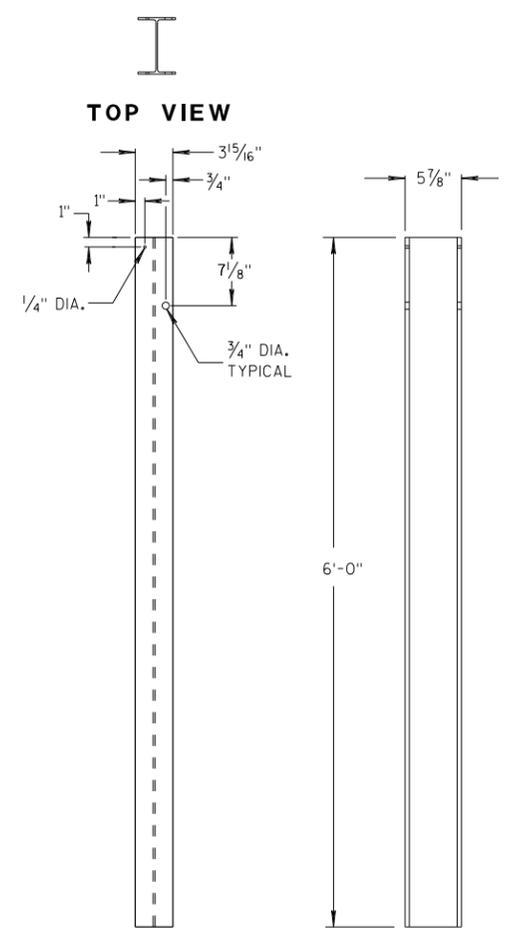
6'-3\"/>



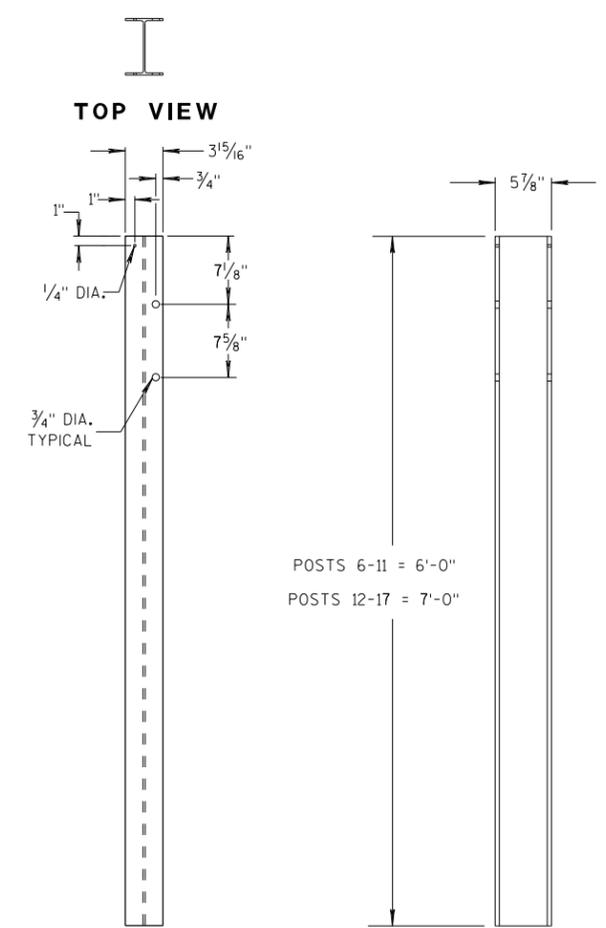
12'-6\"/>



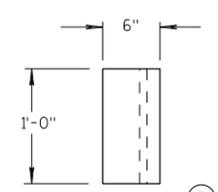
ALTERNATE WOOD BLOCKOUT DETAIL



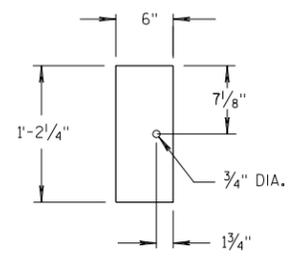
STEEL POSTS 1-5



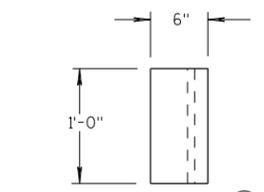
STEEL POSTS 6-17



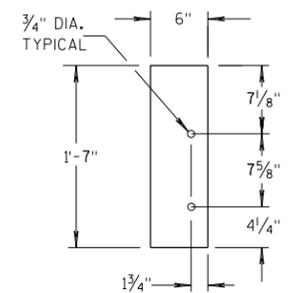
TOP VIEW



**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

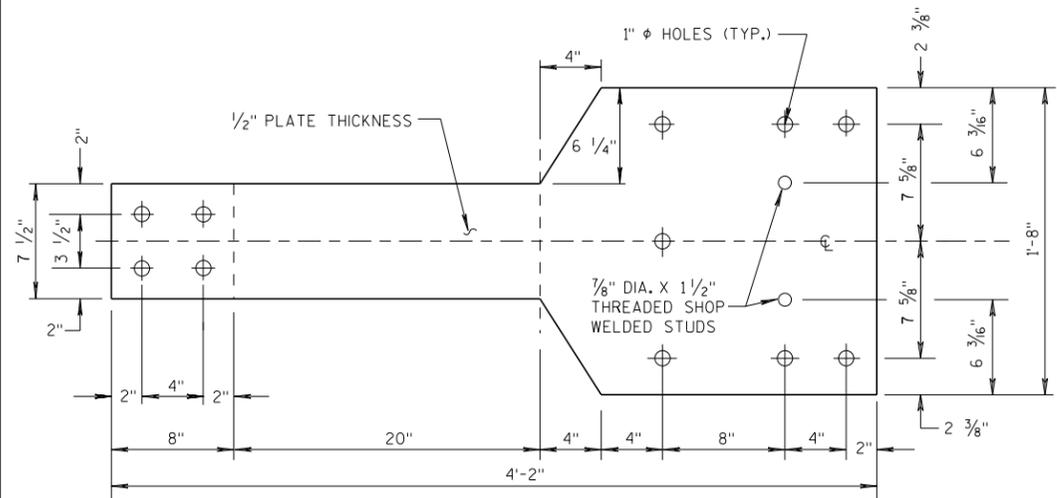
6

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

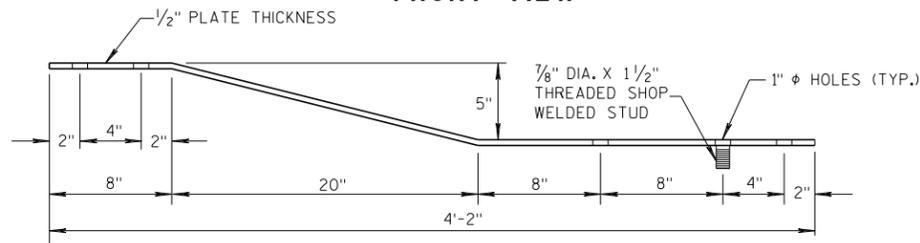
S.D.D. 14 B 45-5c

GENERAL NOTES

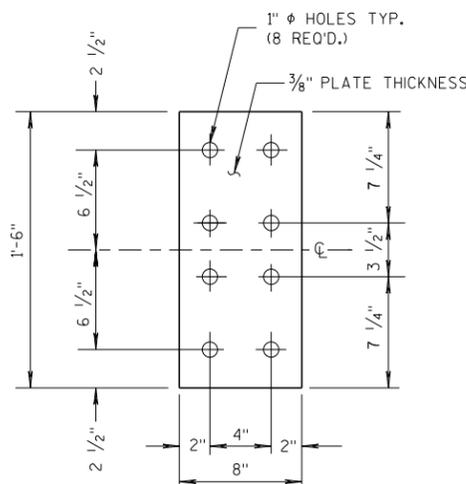
(4) TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".



FRONT VIEW

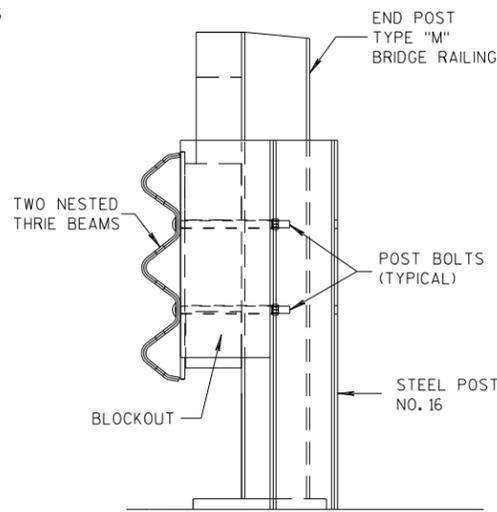


**PLAN VIEW
BACK-UP PLATE DETAIL, TYPE "M"**

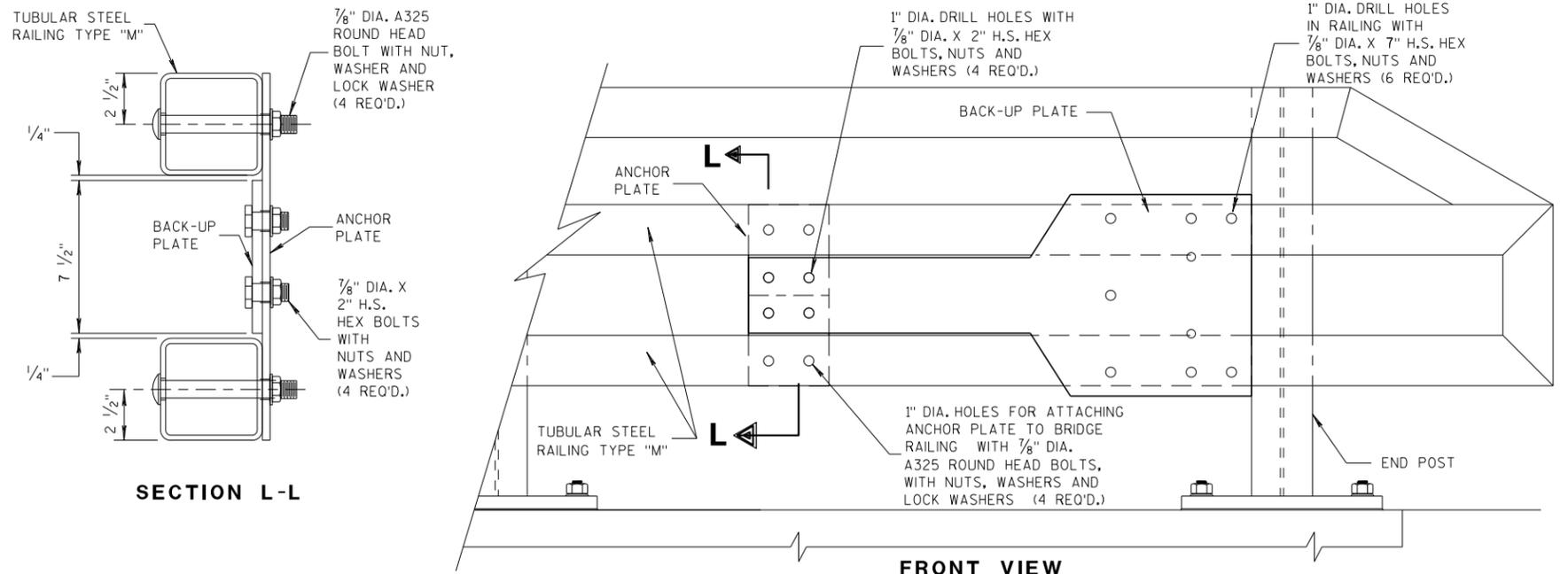


FRONT VIEW

**ANCHOR
PLATE DETAIL,
TYPE "M"**



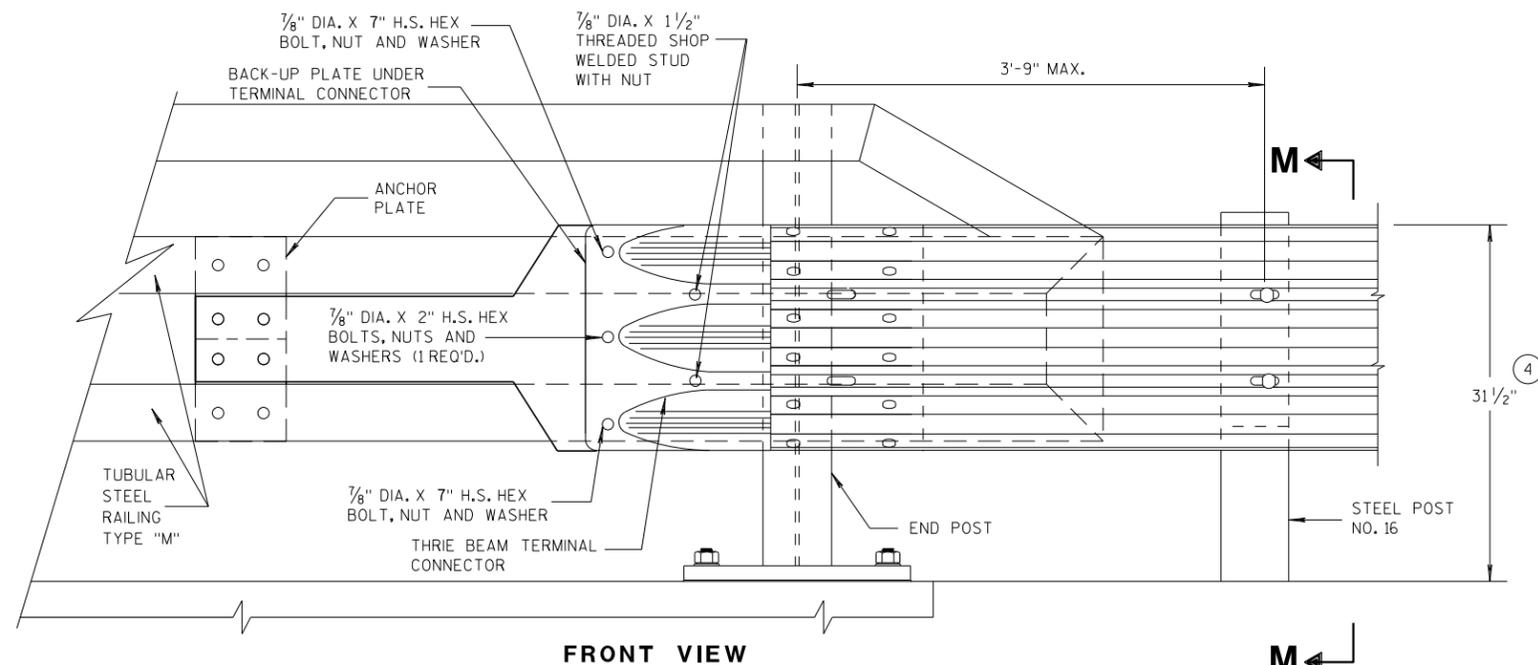
SECTION M-M



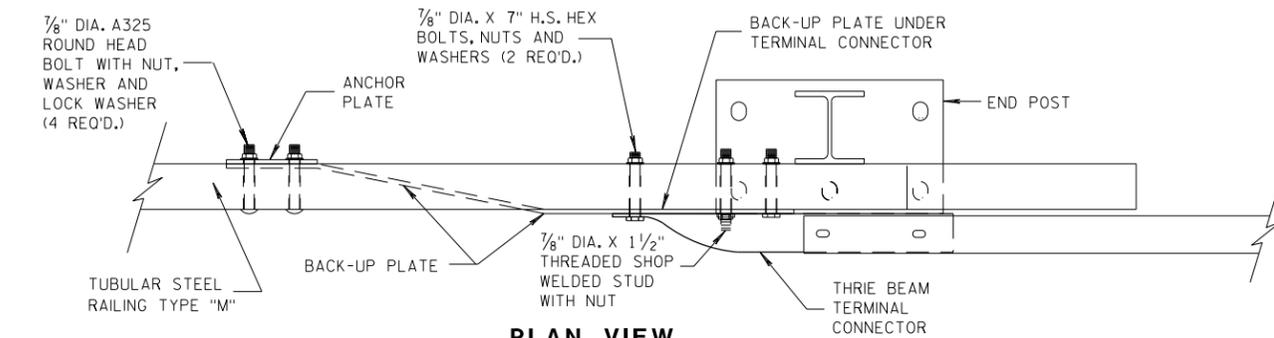
SECTION L-L

FRONT VIEW

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



FRONT VIEW



PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

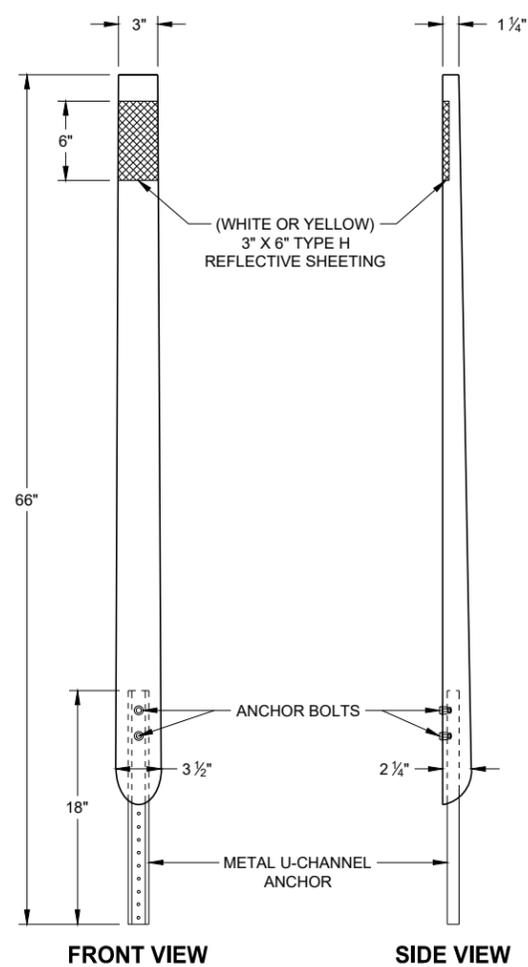
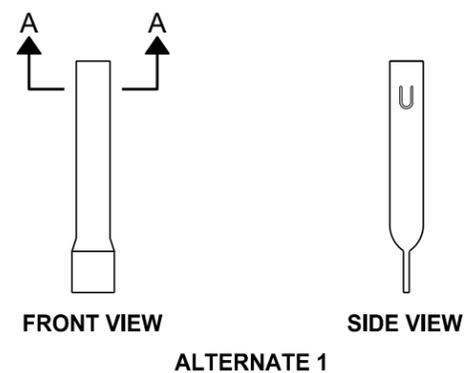
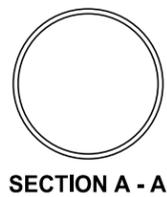
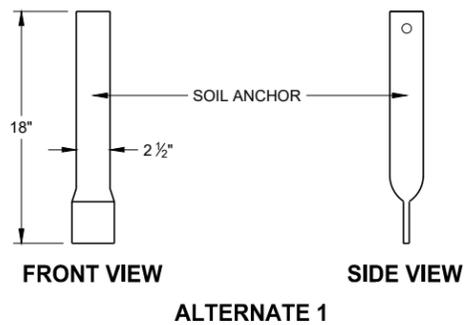
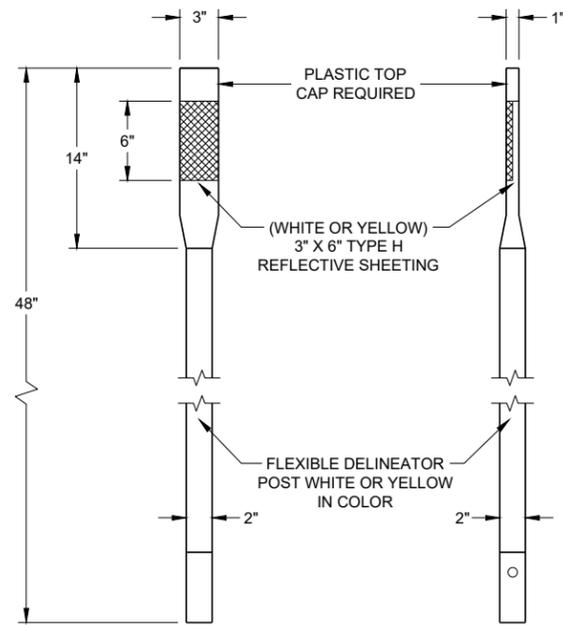
6

6

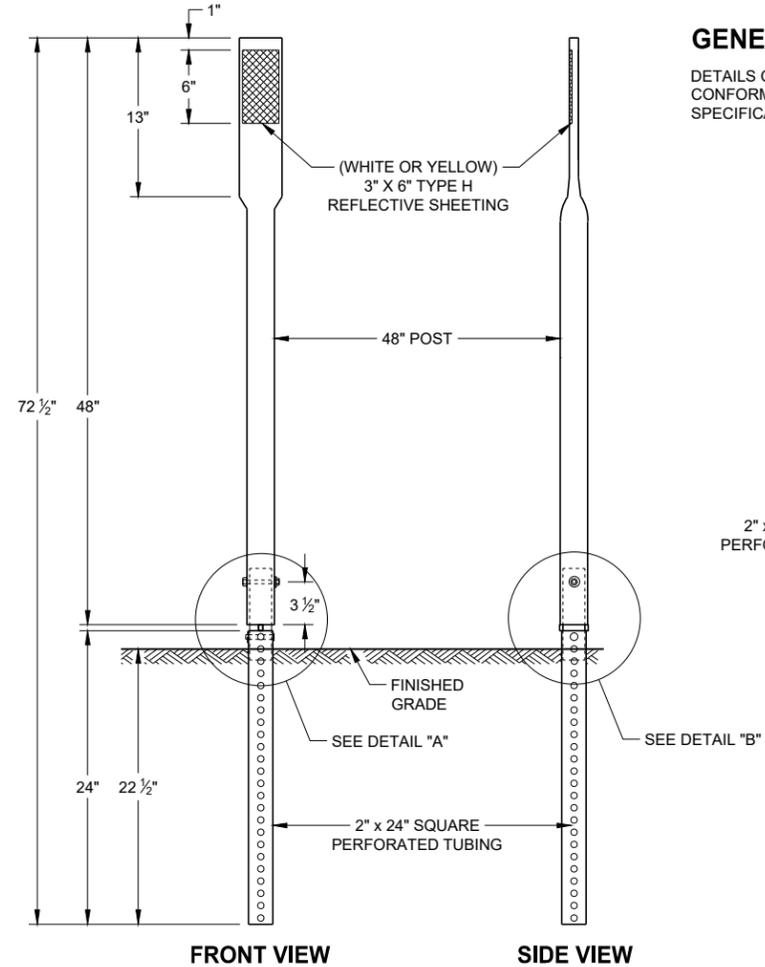
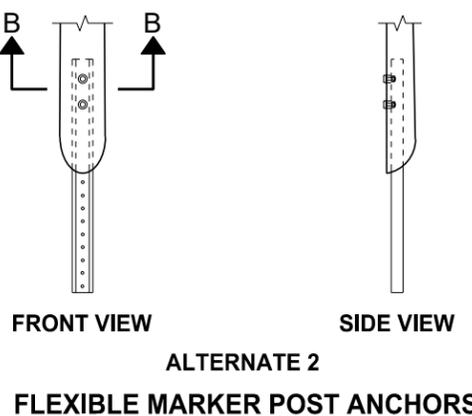
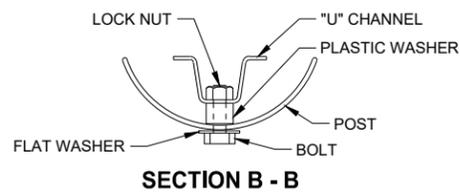
S.D.D. 14 B 45-5h

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

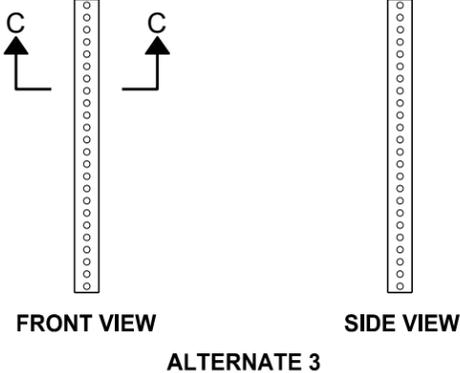
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED DATE FHWA	/s/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR



FRONT VIEW SIDE VIEW
ALTERNATE 2
FLEXIBLE DELINEATOR POSTS

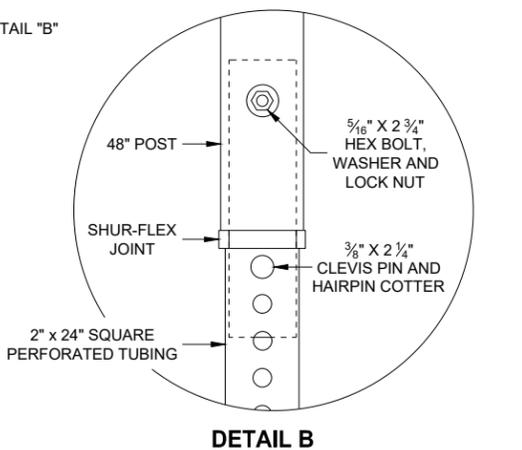
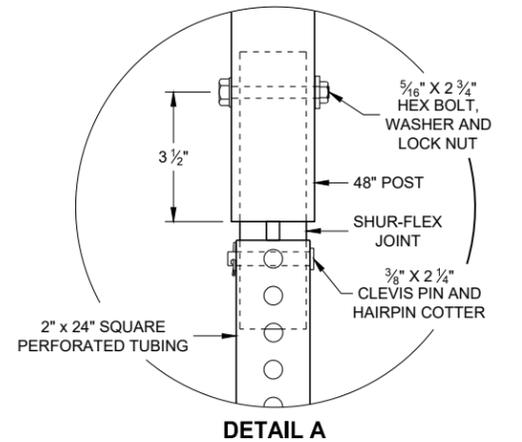


FRONT VIEW SIDE VIEW
ALTERNATE 3



GENERAL NOTES

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



REFLECTOR SPACING TABLE

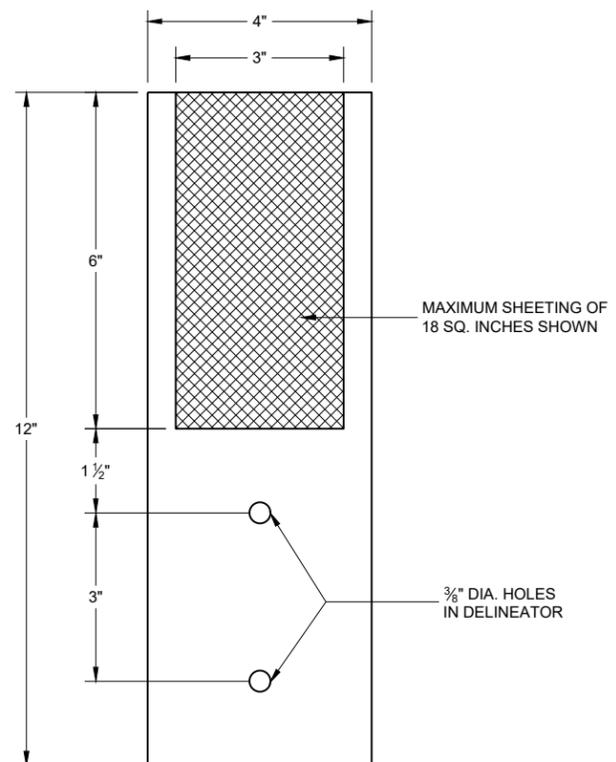
REFLECTOR SPACING	LOCATION
* 100' C-C	RAMPS
400' C-C	MAINLINE

* START AT BEGINNING OF RAMP TAPER AND END AT END OF RAMP TAPER

FLEXIBLE DELINEATOR POST

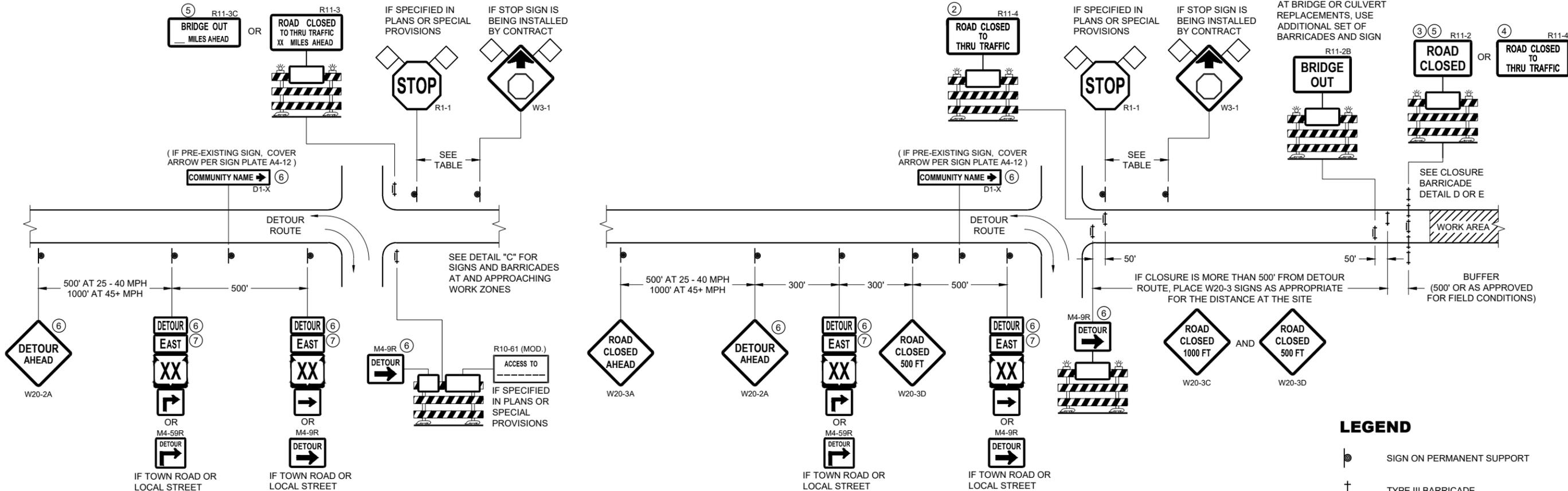
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2021 /S/ Matthew Rauch
DATE STATE SIGNING AND MARKING
ENGINEER
FHWA



**4" x 12" DELINEATOR
WITH REFLECTIVE SHEETING**

DELINEATOR WITH REFLECTIVE SHEETING	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED November 2021 DATE	/s/ Matthew Rauch STATE SIGNING AND MARKING ENGINEER
<small>FHWA</small>	



**DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR**

WORK ZONE GREATER THAN OR EQUAL TO 1/2 MILE FROM
DETOUR ROUTE (1000 FEET IF URBAN)

**DETAIL B
MAINLINE CLOSURE WITH POSTED DETOUR**

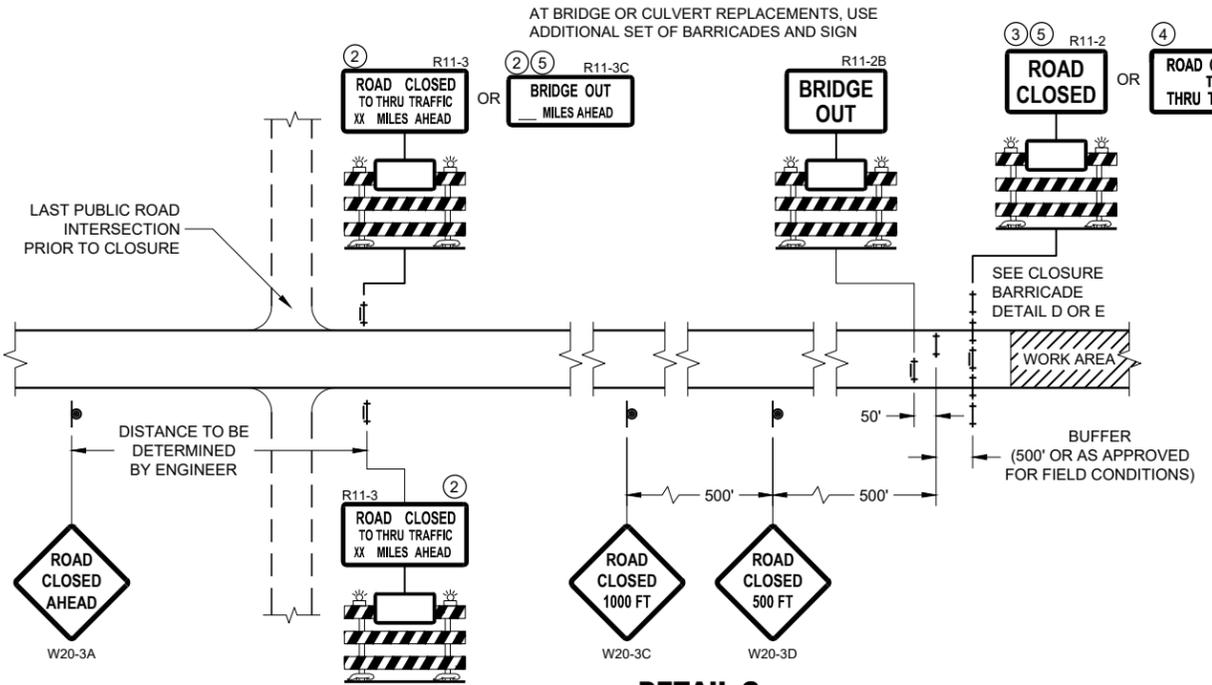
WORK ZONE LESS THAN 1/2 MILE FROM
DETOUR ROUTE (1000 FEET IF URBAN)

LEGEND

- SIGN ON PERMANENT SUPPORT
- TYPE III BARRICADE
- TYPE III BARRICADE WITH ATTACHED SIGN
- TYPE "A" WARNING LIGHT (FLASHING)
- WORK AREA
- FLAGS, 16" X 16" MIN. (ORANGE)

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

- M4 - 8
- M3 - X
- M1 - 4
- M1 - 6
- M1 - 5A
- M05 - 1
- M06 - 1



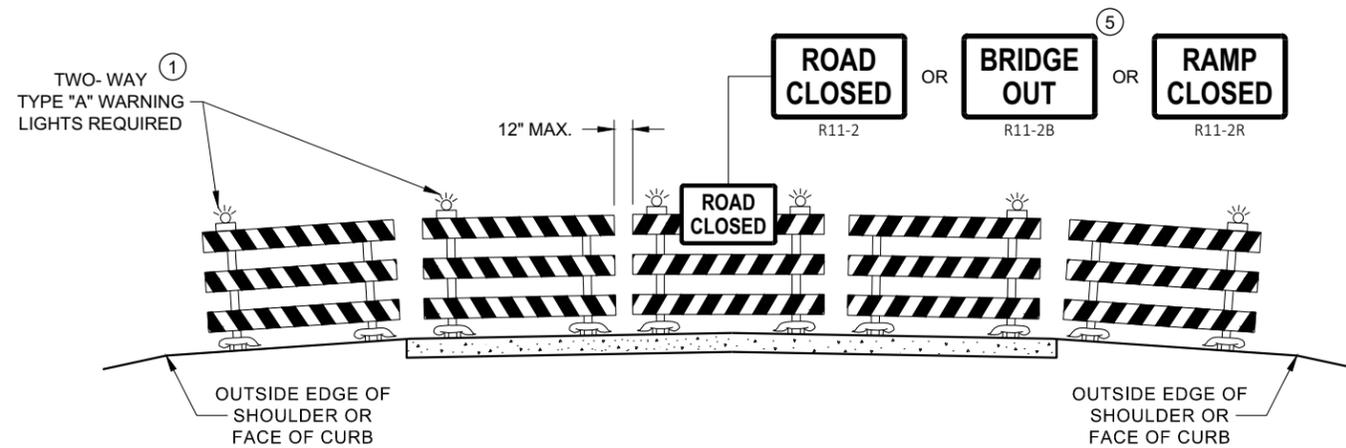
**DETAIL C
MAINLINE CLOSURE, NO POSTED DETOUR**

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

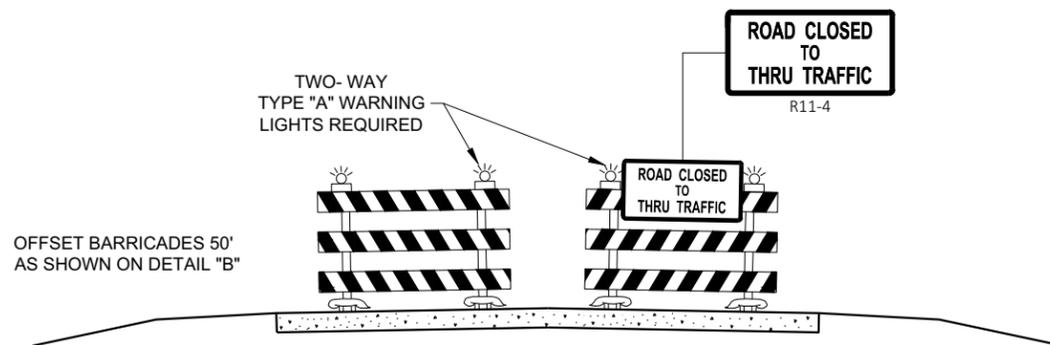
**BARRICADES AND SIGNS
FOR MAINLINE CLOSURES**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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



**DETAIL D
ROAD CLOSURE BARRICADE DETAIL
APPROACH VIEW**



**DETAIL E
LANE CLOSURE BARRICADE DETAIL
APPROACH VIEW**

SEE SDD 15C2 - SHEET "a" FOR LEGEND

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

- R11 - 2 SHALL BE 48" X 30"
- R11 - 3 SHALL, R11 - 4 AND R10 - 61 SHALL BE 60" X 30"
- M4 - 9 SHALL BE 30" X 24"
- M3 - X SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)
- M4 - 8 SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)
- M1 - 4, M1 - 5A AND M1 - 6 SHALL BE 24" X 24" (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS)
- MO5 - 1 AND MO6 - 1 SHALL BE 21" X 21" (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS)
- D1 - X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.
- R1 - 1 SHALL BE 36" X 36"

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

**BARRICADES AND SIGNS
FOR
VARIOUS CLOSURES**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

GENERAL NOTES

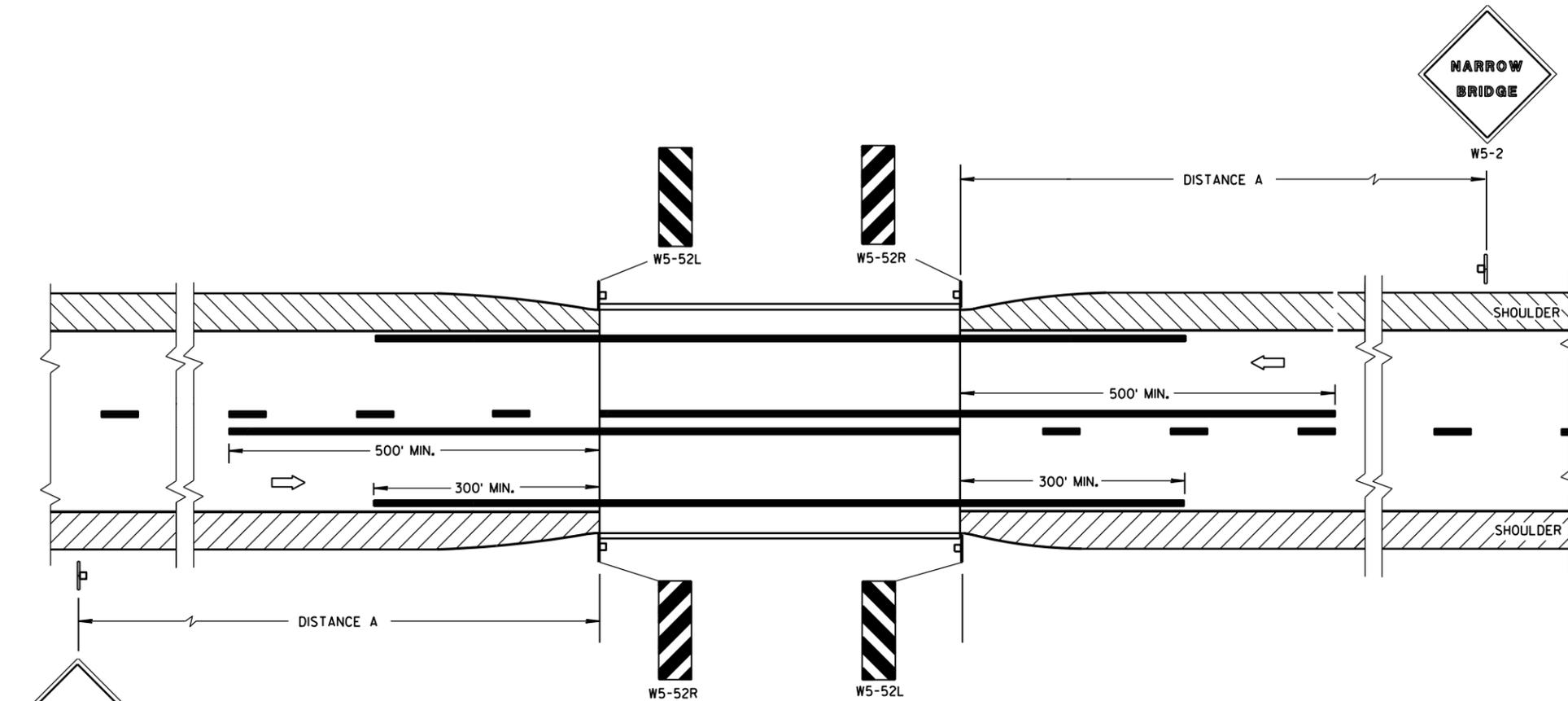
DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

LOCATE W5-52 SIGN POST(S) BEHIND GUARDRAIL WHEN PRESENT.

PLACE THE EDGE OF THE W5-52 SIGN IN LINE WITH FACE OF CURB OR PARAPET.

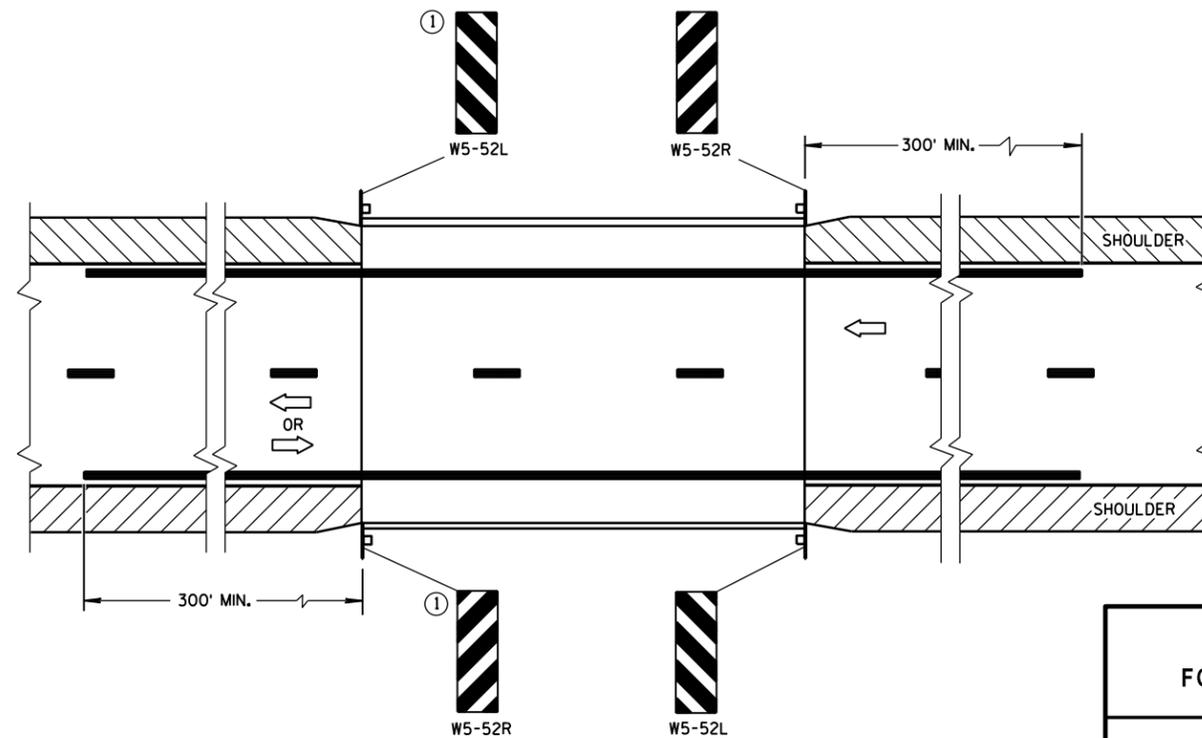
① OMIT ON ONE-WAY TRAVELLED WAYS.

➡ DIRECTION OF TRAFFIC



SITUATION 1

WARRANTING CRITERIA:
BRIDGE WIDTH IS AT LEAST 16 FEET BUT LESS THAN 24 FEET.



SITUATION 2

WARRANTING CRITERIA:
1. BRIDGE WIDTH IS AT LEAST 24 FEET AND
2. BRIDGE SHOULDER WIDTH IS LESS THAN 6 FEET.

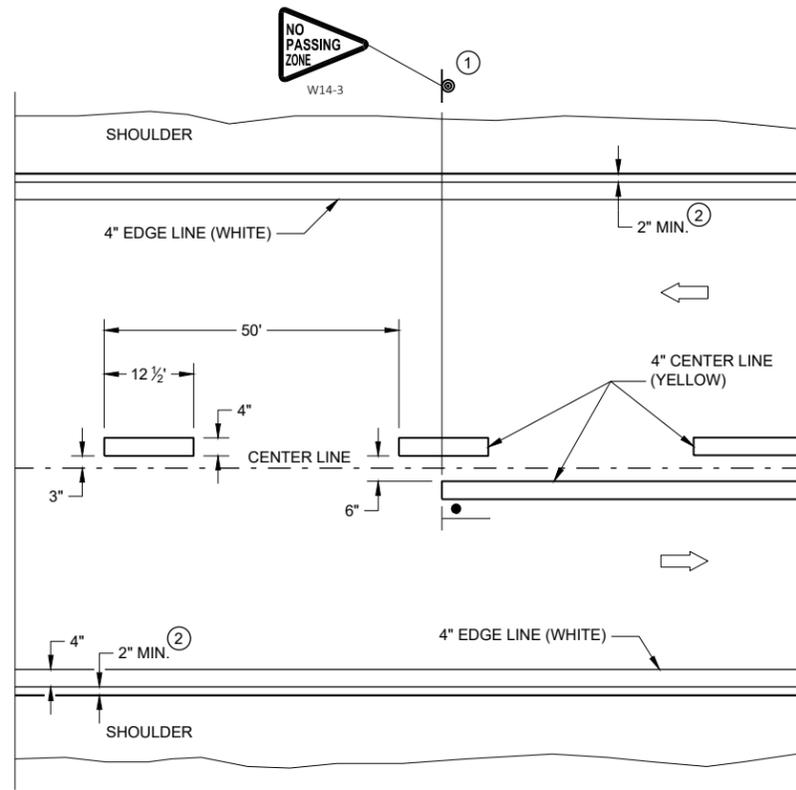
DISTANCE TABLE

POSTED OR 85th PERCENTILE SPEED	DISTANCE "A"
25	150'
30	200'
35	250'
40	300'
45	400'
50	550'
55	750'

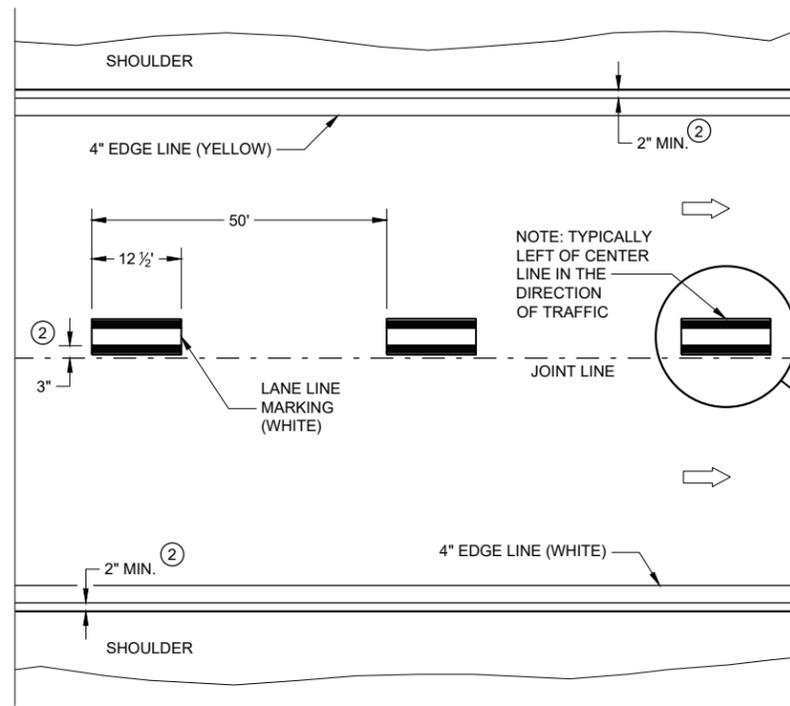
SIGNING & MARKING FOR TWO LANE BRIDGES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017 /S/ Matthew R. Rauch
DATE STATE SIGNING AND MARKING ENGINEER
FHWA

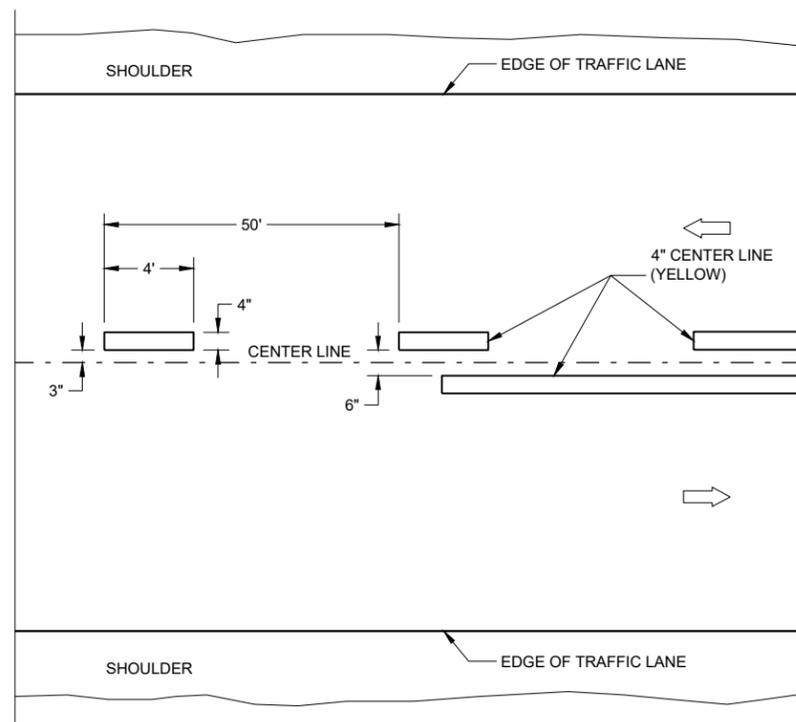


TWO WAY TRAFFIC

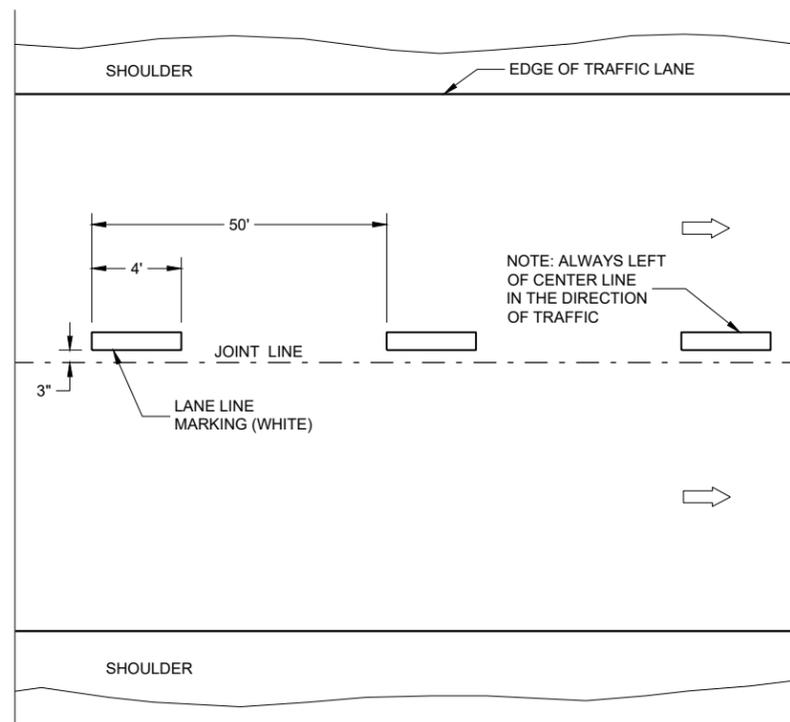


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY PAVEMENT MARKING

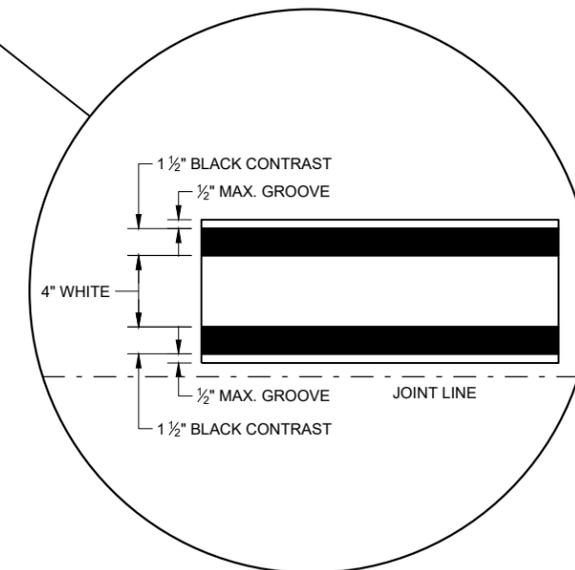
GENERAL NOTES

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

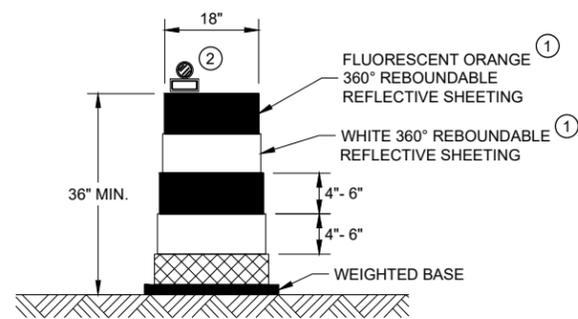
- |—"T" MARKING
- SIGN ON PERMANENT SUPPORT
- DIRECTION OF TRAFFIC



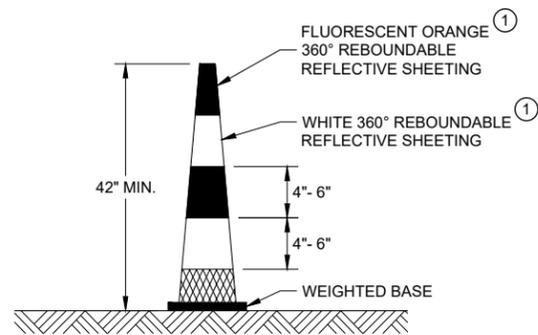
LONGITUDINAL MARKING (MAINLINE)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

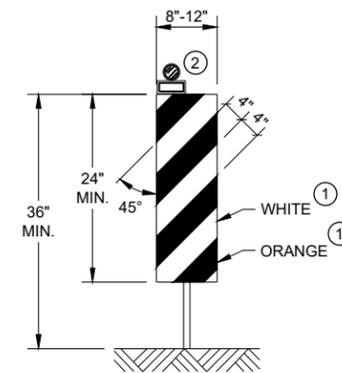


DRUM



42" CONE

DO NOT USE IN TAPERS
1/2 SPACING OF DRUMS

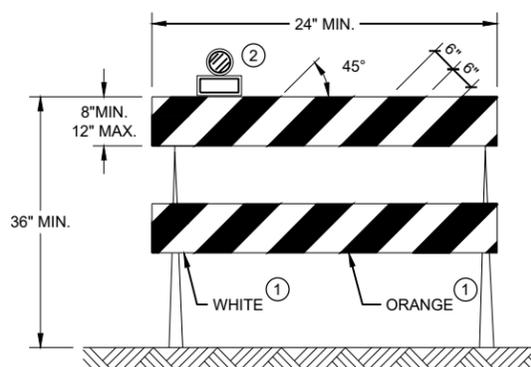


VERTICAL PANEL

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

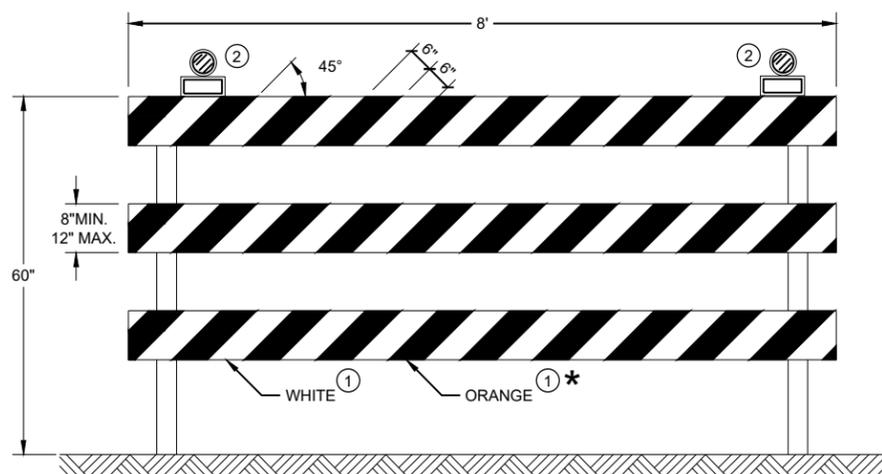
GENERAL NOTES

- 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.



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

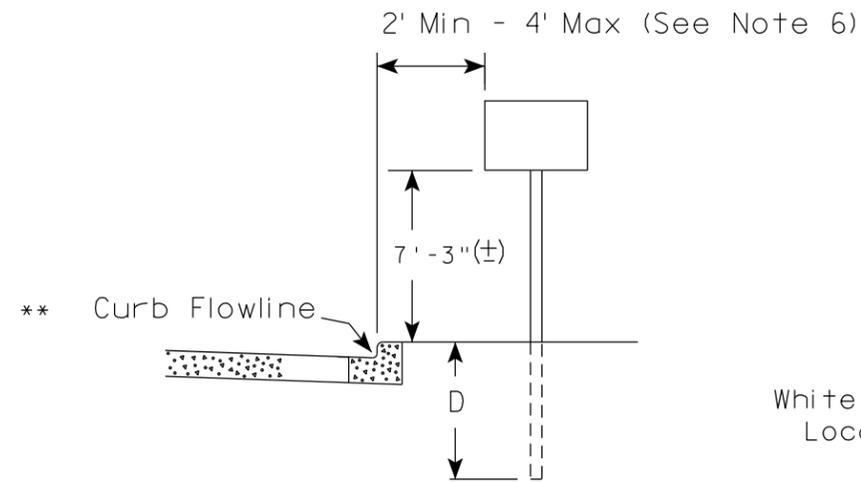
IF SIGN MOUNTED, DO NOT COVER MORE THAN 50% OF THE TOP
TWO RAILS OR 33% OF THE TOTAL AREA OF THE THREE RAILS.

* IF USED FOR A PERMANENT APPLICATION USE RED SHEETING.

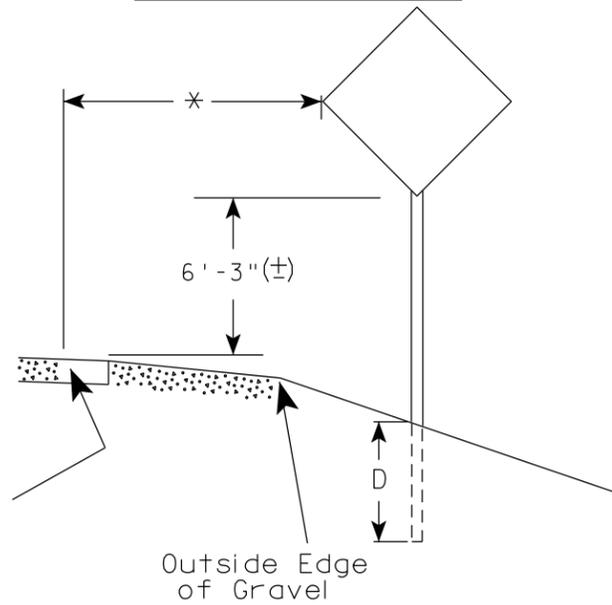
CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED May 2021 DATE	/S/ Andrew Heidtke WORK ZONE ENGINEER
<small>FHWA</small>	

URBAN AREA

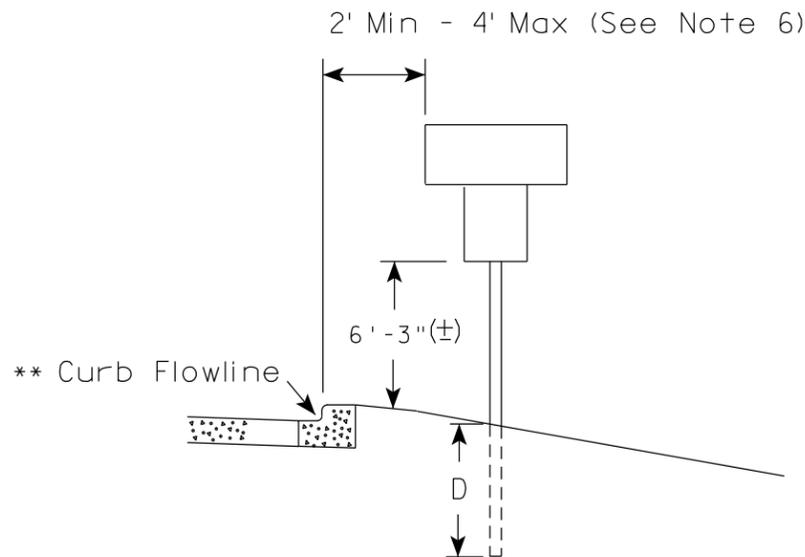
RURAL AREA (See Note 2)



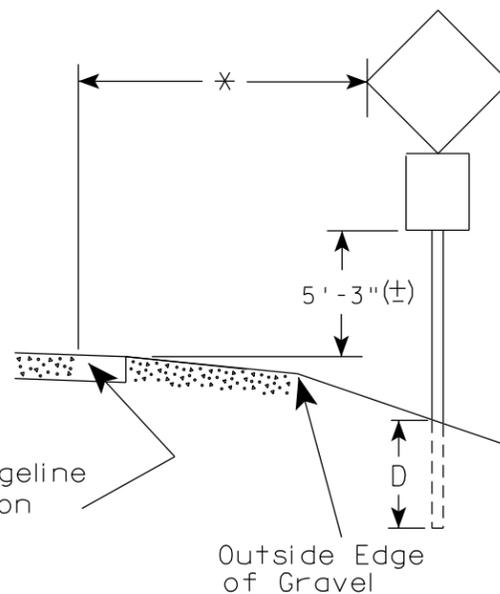
White Edgeline Location



Outside Edge of Gravel



White Edgeline Location



Outside Edge of Gravel

POST EMBEDMENT DEPTH

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

GENERAL NOTES

1. Signs wider than 4 feet or 20 sq.ft or larger, shall be mounted on multiple posts. Refer to plate A4-4.
2. If signs are mounted on or behind barrier wall, see A4-10 sign plate.
The Double Arrow sign (W12-1D) shall be mounted at a height of 2'-3" (±). The Chevron sign (W1-8), Roundabout Chevron panel (R6-4B), Enhanced Reference Markers, Clearance Markers (W5-52), Mile Markers (D10 series), In Road Object Markers (W5-54) & End of Road Markers (W5-56) shall be mounted at a height of 4'-3" (±).
3. For expressways and freeways, mounting height is 7'- 3" (±) or 6'-3" (±) depending upon existence of a sub-sign.
4. Minimum mounting height for signs mounted on traffic signal poles is 5'- 3" (±).
5. Offset distance shall be consistent with existing signs or consistent throughout length of project.
6. The (±) tolerance for mounting height is 3 inches.
7. Folding signs shall be mounted at a height of 5'-3" (±) or as directed by the Engineer.

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

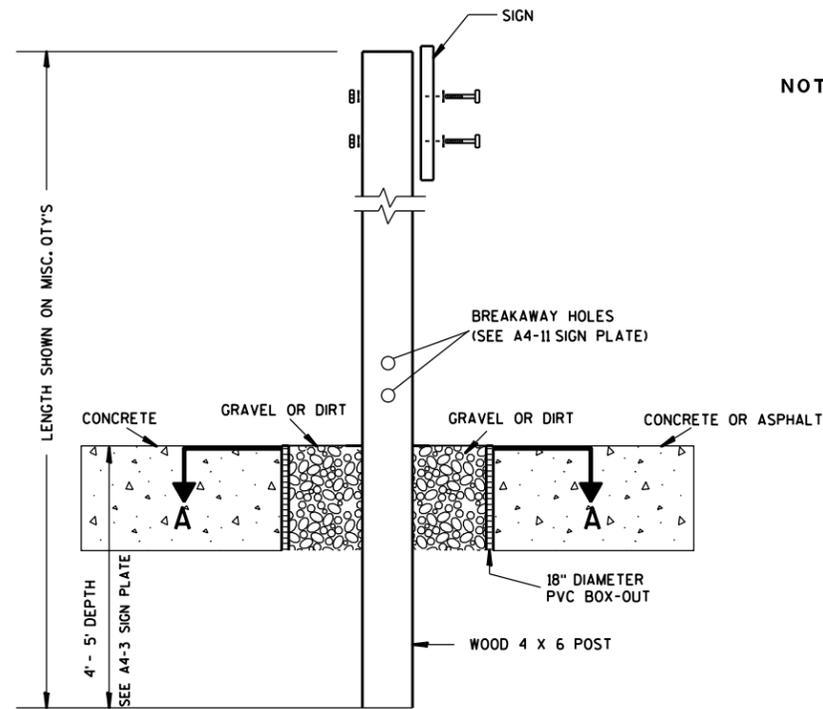
* 6 feet from edge of a paved shoulder or 12 feet from the edge of pavement (edge line location) or 2 feet from outside edge of gravel, whichever is greater unless directed by project engineer.

TYPICAL INSTALLATION OF PERMANENT TYPE II SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

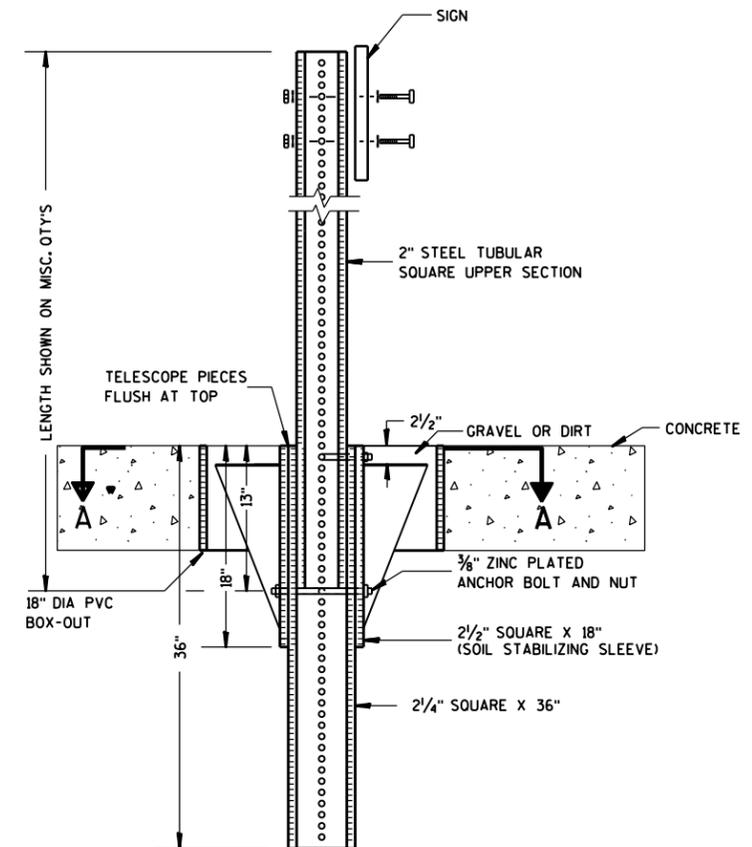
DATE 5/13/2020 PLATE NO. A4-3.22



ELEVATION VIEW

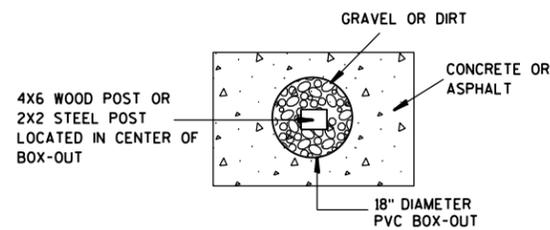
DETAIL OF WOOD 4 X 6 SIGN POST IN BOX-OUT

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



ELEVATION VIEW

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



PLAN VIEW

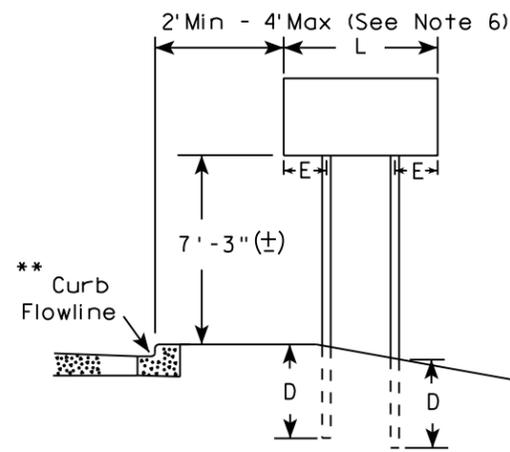
FOR NEW CONCRETE/ ASPHALT INSTALLATIONS

SIGN POST BOX-OUTS A4-3B	
<small>WISCONSIN DEPT OF TRANSPORTATION</small>	
APPROVED <i>Matthew R. Rauch</i> <small>for State Traffic Engineer</small>	
<small>DATE 1/27/14</small>	<small>PLATE NO. A4-3B.1</small>

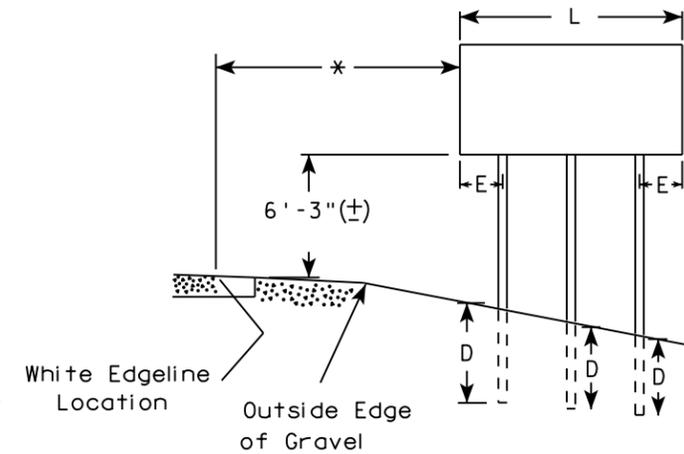
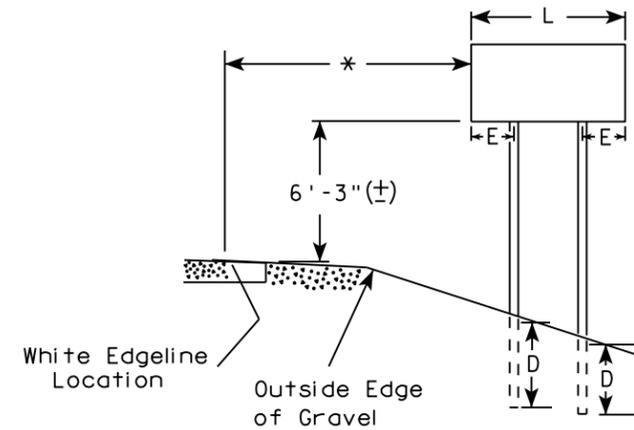
GENERAL NOTES

1. For 3 or 4 post installations, individual post spacing shall be greater than 3'-6".
2. See tables below for required number of posts.
3. For expressways and freeways, mounting height is 7'-3" (±) or 6'-3" (±) depending upon existence of sub-sign.
4. The (±) tolerance for mounting height is 3 inches.
5. J-Assemblies are considered to be one sign for mounting height.
6. Offset distance shall be consistent with existing signs or consistent throughout length of project.
7. Folding signs shall be mounted at a height of 5'-3" (±) or as directed by the engineer.
8. The Double Arrow sign (W12-1) shall be mounted at a height of 2'-3" (±). The Chevron sign (W1-8), Roundabout Chevron panel (R6-4B), Clearance Markers (W5-52), Mile Markers (D10 series), In Road Object Markers (W5-54) & End of Road Markers (W5-56) shall be mounted at a height of 4'-3" (±).

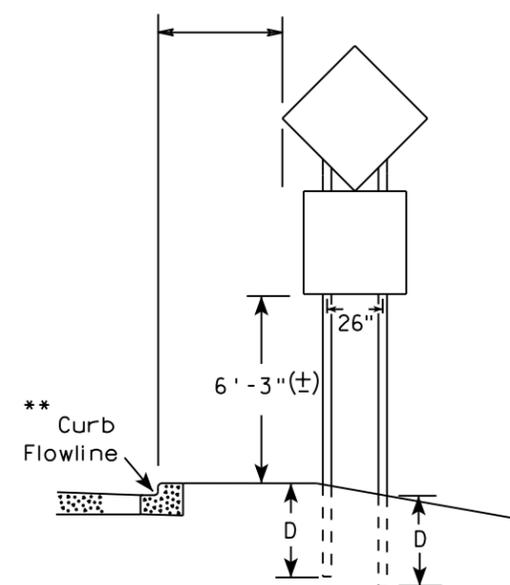
URBAN AREA



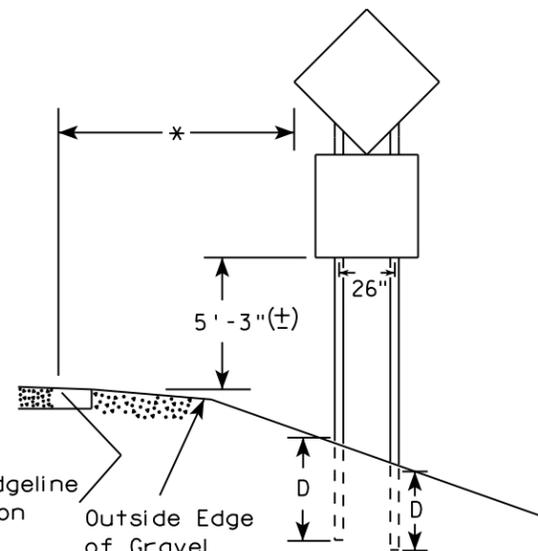
RURAL AREA (See Note 3)



2' Min - 4' Max (See Note 6)



48" DIAMOND WARNING SIGN



48" DIAMOND WARNING SIGN

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

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

*** See A4-3 sign plate for signs 4' or less in width and less than 20 S.F. in area.

SIGN SHAPE OTHER THAN DIAMOND (TWO POSTS REQUIRED)	
L	E
Greater than 48" Less than 60"	12"
60" to 108"	L/5

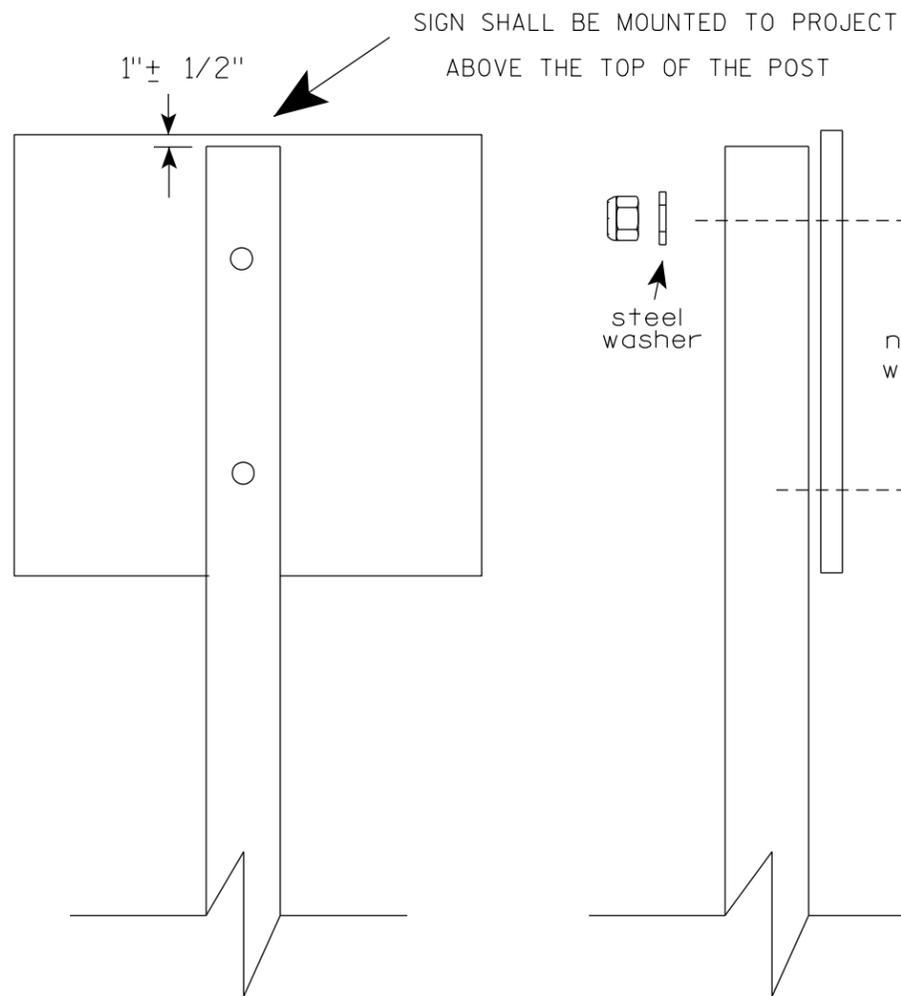
SIGN SHAPE OTHER THAN DIAMOND (THREE POSTS REQUIRED)	
L	E
Greater than 108" to 144"	12"

POST EMBEDMENT DEPTH

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

TYPICAL INSTALLATION OF TYPE II SIGNS ON MULTIPLE POSTS

WISCONSIN DEPT OF TRANSPORTATION
 APPROVED *Matthew R. Rauch*
 For State Traffic Engineer
 DATE 8/21/17 PLATE NO. A4-4.15



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

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

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

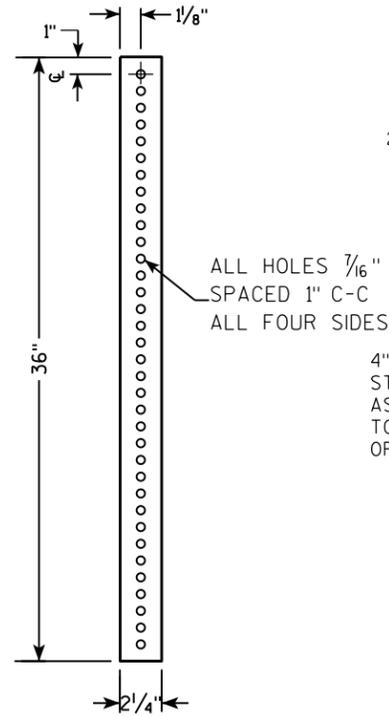
- STRINGER BOLTING TO ALUMINUM SIGNS (SEE SIGN PLATE A4-18)
- MACHINE BOLTS - $\frac{5}{16}$ " X 1-3/4" Length w/ lock nuts
- WOOD POSTS (4" x 6")
- LAG SCREWS - $\frac{3}{8}$ " X 3" (NO STRINGERS ON BACK OF SIGN)
 - $\frac{3}{8}$ " X 4" (STRINGERS ON BACK OF SIGN)
- SQUARE STEEL POSTS (2" x 2")
- MACHINE BOLTS - $\frac{3}{8}$ " X 3-1/4" Length w/ nuts (NO STRINGER ON BACK OF SIGN)
 - $\frac{3}{8}$ " X 5" Length w/ nuts (STRINGERS ON BACK OF SIGN)
- RIVETS - $\frac{9}{32}$ " (6605-9-6) BULB-TITE, TRI-FOLD, ALUMINUM BODY/MANDREL
- O.D. FLANGE .720-.765 INCH, GRIP RANGE .042-.375 INCH
- WASHERS (ALL POSTS) -
- 1-1/4" O.D. X $\frac{3}{8}$ " I.D. X $\frac{1}{16}$ " STEEL
 - 1-1/4" O.D. X $\frac{3}{8}$ " I.D. X .080 NYLON

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

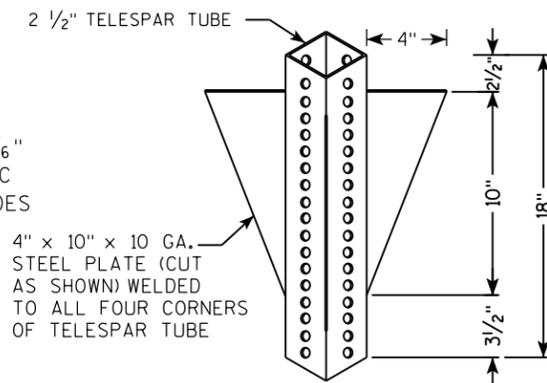
ATTACHMENT OF SIGNS TO POSTS	
WISCONSIN DEPT OF TRANSPORTATION	
APPROVED	<i>Matthew R Rauch</i> For State Traffic Engineer
DATE 4/1/2020	PLATE NO. A4-8.9

**TELESCOPIC TUBING ANCHORS
TWO PIECE SYSTEM**

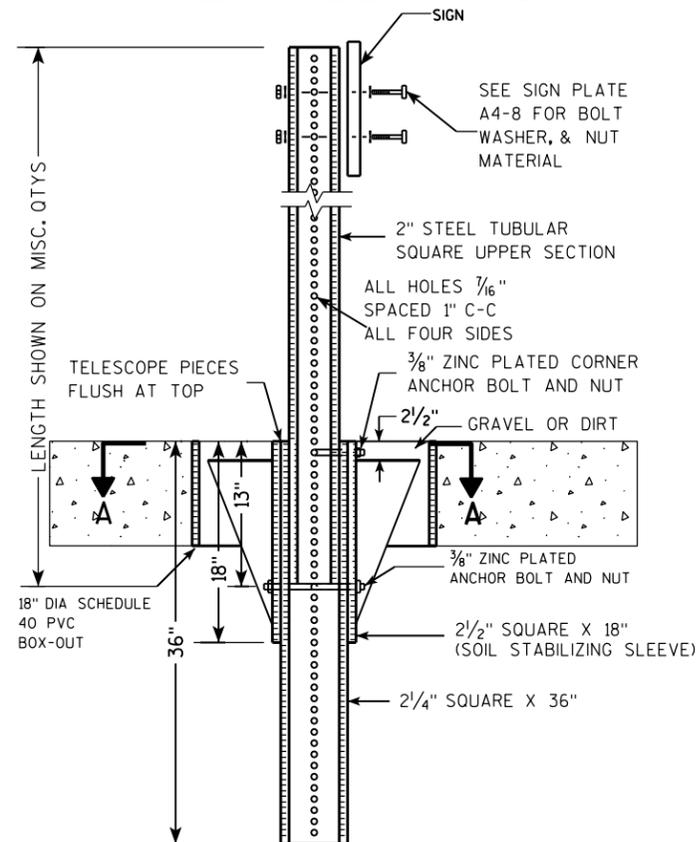
2 1/4" SQUARE
12 GAUGE
PERFORATED
GALVANIZED FINISH



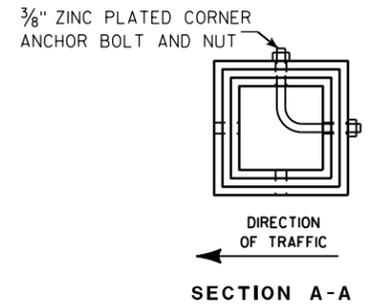
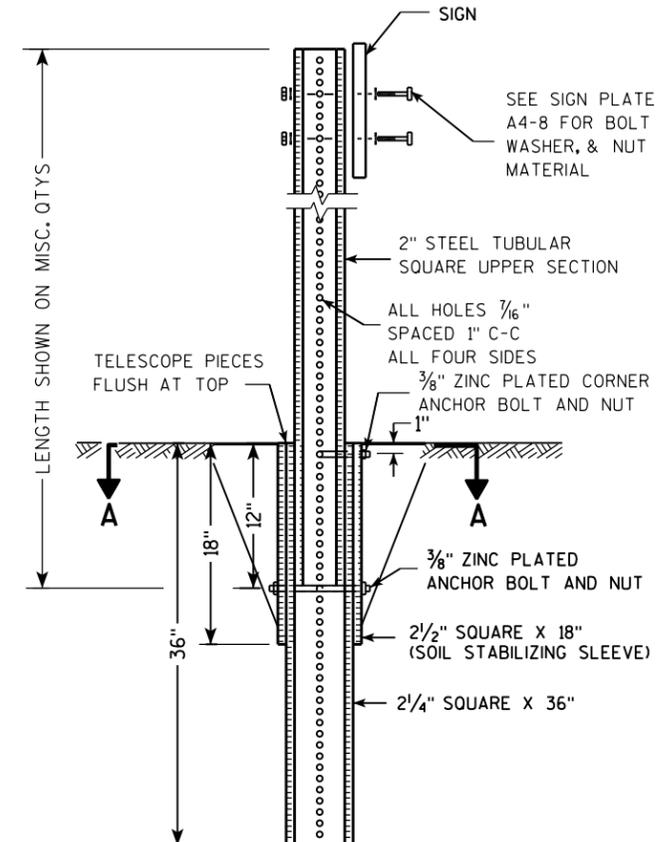
2 1/2" SQUARE
12 GAUGE
OMNI-DIRECTIONAL
PERFORATED
SOIL STABILIZING SLEEVE
GALVANIZED FINISH



**DETAIL OF TUBULAR STEEL SIGN POST
(IN POURED CONCRETE OR ASPHALT)**



**DETAIL OF TUBULAR STEEL SIGN POST
(IN LOCATIONS OTHER THAN POURED CONCRETE OR ASPHALT)**



Area of Sign Installation (Sq. Ft.)	Number of Required Posts
9 or less	1
Greater than 9 less than or equal to 18	2
Greater than 18 less than or equal to 27	3

Signs wider than 3 feet or larger than 9 sq. ft shall be mounted on multiple posts (see above table).

**TUBULAR STEEL
SIGN POST
A4-9**

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 2/05/15 PLATE NO. A4-9.9

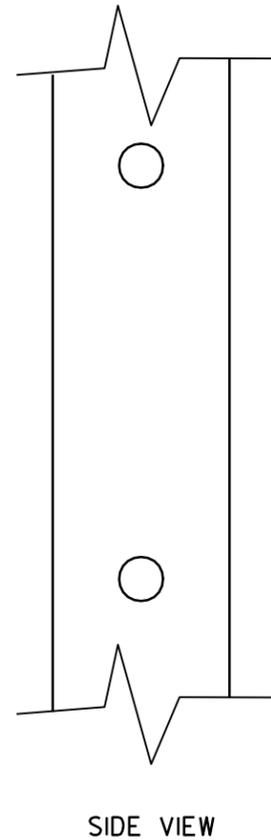
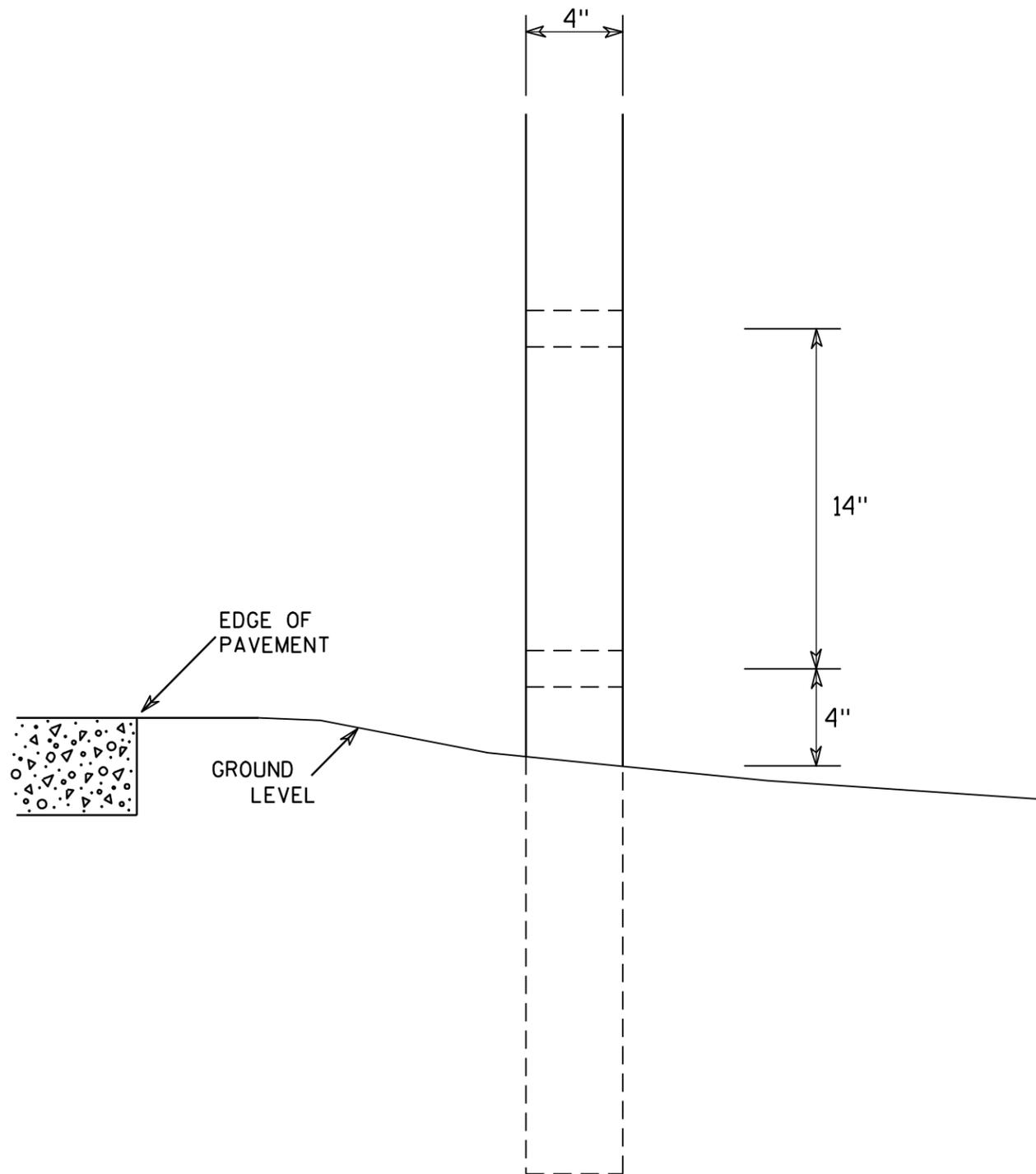
PROJECT NO:

HWY:

COUNTY:

SHEET NO:

E



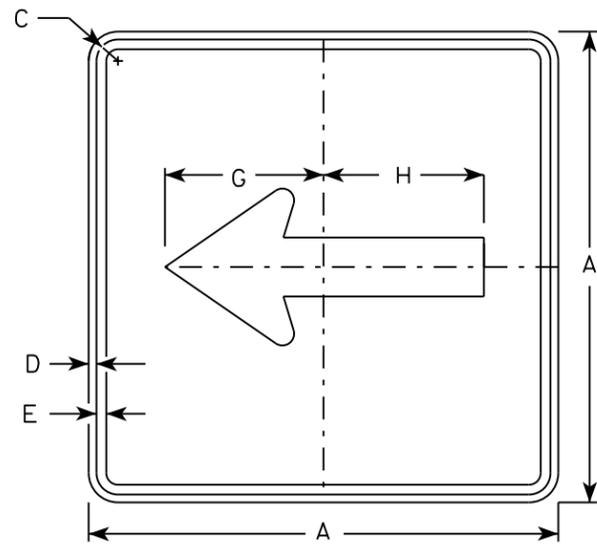
GENERAL NOTES

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

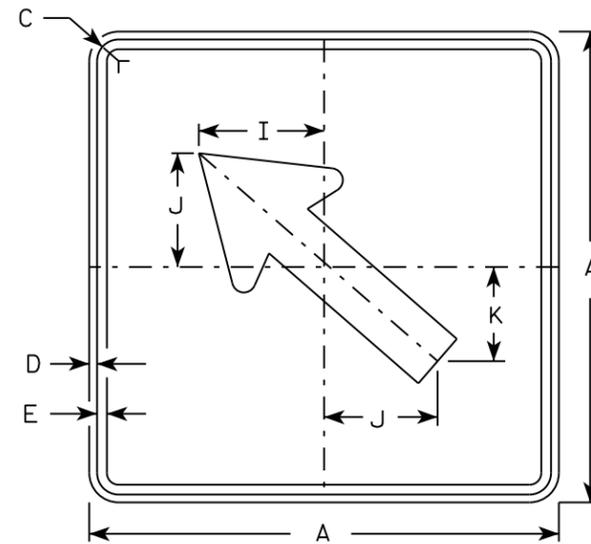
7

7

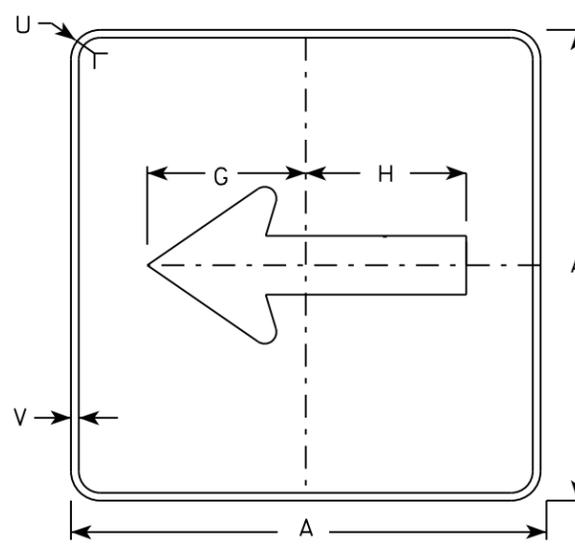
4 X 6 WOOD POST MODIFICATIONS	
<i>WISCONSIN DEPT OF TRANSPORTATION</i>	
APPROVED	<i>Chester J. Spang</i> for State Traffic Engineer
DATE <u>3/27/97</u>	PLATE NO. <u>A4-11.2</u>



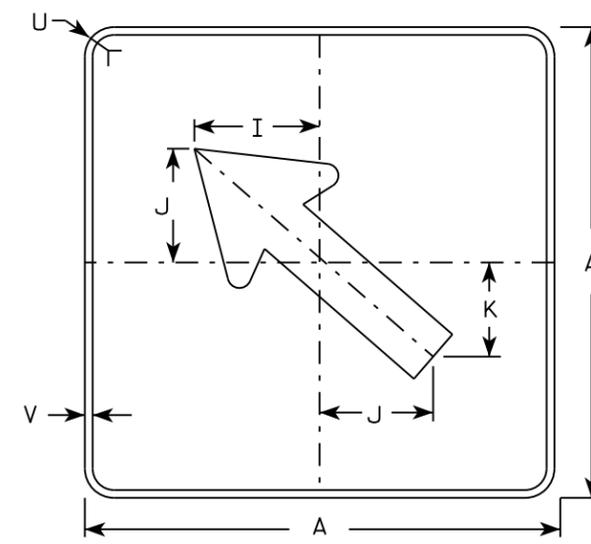
M6-1
MM6-1
M06-1
MP6-1



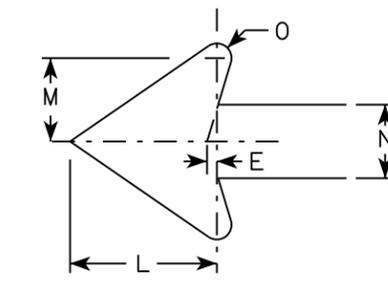
M6-2
MM6-2
M06-2
MP6-2



MB6-1
MK6-1
MN6-1
MR6-1



MB6-2
MK6-2
MN6-2
MR6-2



NOTES

- Signs are Type II - Type H except as Shown
- Color:
Background - See note 4
Message - See note 4
- Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
- M6-1 and M6-2 Background - White
Message - Black
MB6-1 and MB6-2 Background - Blue
Message - White
MK6-1 and MK6-2 Background - Green
Message - White
MM6-1 and MM6-2 Background - White
Message - Green
MN6-1 and MN6-2 Background - Brown
Message - White
M06-1 and M06-2 Background - Orange - Type F Reflective
Message - Black
MP6-1 and MP6-2 Background - White
Message - Blue
MR6-1 and MR6-2 Background - Brown
Message - Yellow

7

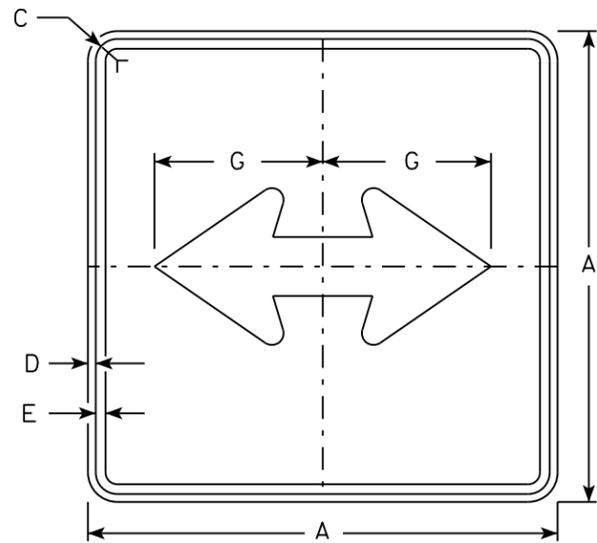
SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2	21		1 1/8	3/8	3/8		7 1/2	7 1/8	5 5/8	5	4 1/4	5 1/4	3	2 5/8	1/2						1 1/2	1/2					3.06
3	30		1 3/8	1/2	5/8		10 3/4	10 1/4	8	7 1/4	6	7 1/2	4 1/4	3 3/4	3/4						1 7/8	1/2					6.25
4	30		1 3/8	1/2	5/8		10 3/4	10 1/4	8	7 1/4	6	7 1/2	4 1/4	3 3/4	3/4						1 7/8	1/2					6.25
5	30		1 3/8	1/2	5/8		10 3/4	10 1/4	8	7 1/4	6	7 1/2	4 1/4	3 3/4	3/4						1 7/8	1/2					6.25

STANDARD SIGN
M6-1 & M6-2
SERIES

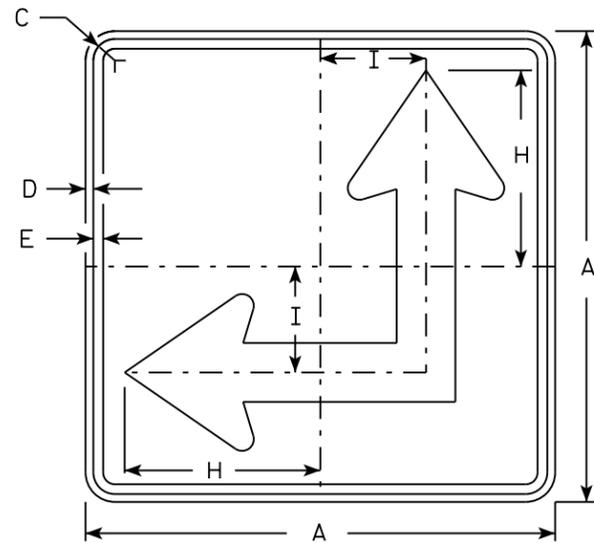
WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

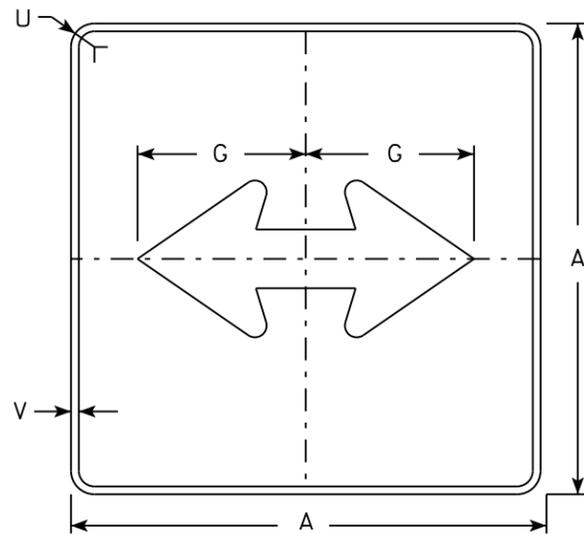
DATE 10/15/15 PLATE NO. M6-1.15



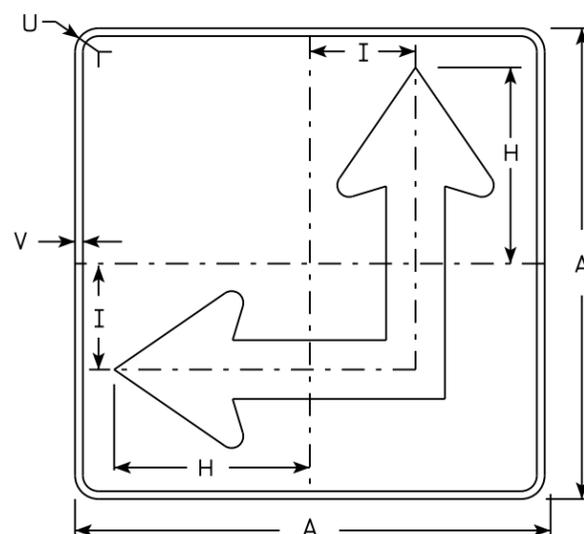
M6-4
MM6-4
M06-4
MP6-4



M6-6
MM6-6
M06-6
MP6-6



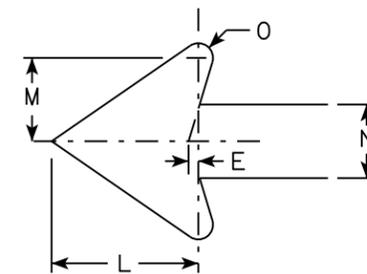
MB6-4
MK6-4
MN6-4
MR6-4



MB6-6
MK6-6
MN6-6
MR6-6

NOTES

- Signs are Type II - Type H except as Shown
- Color:
Background - See Note 4
Message - See Note 4
- Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
- M6-4 and M6-6 Background - White
Message - Black
MB6-4 and MB6-6 Background - Blue
Message - White
MK6-4 and MK6-6 Background - Green
Message - White
MM6-4 and MM6-6 Background - White
Message - Green
MN6-4 and MN6-6 Background - Brown
Message - White
M06-4 and M06-6 Background - Orange - Type F Reflective
Message - Black
MP6-4 and MP6-6 Background - White
Message - Blue
MR6-4 and MR6-6 Background - Brown
Message - Yellow
- M6-6R same as M6-6L except arrow points ahead and right.



7

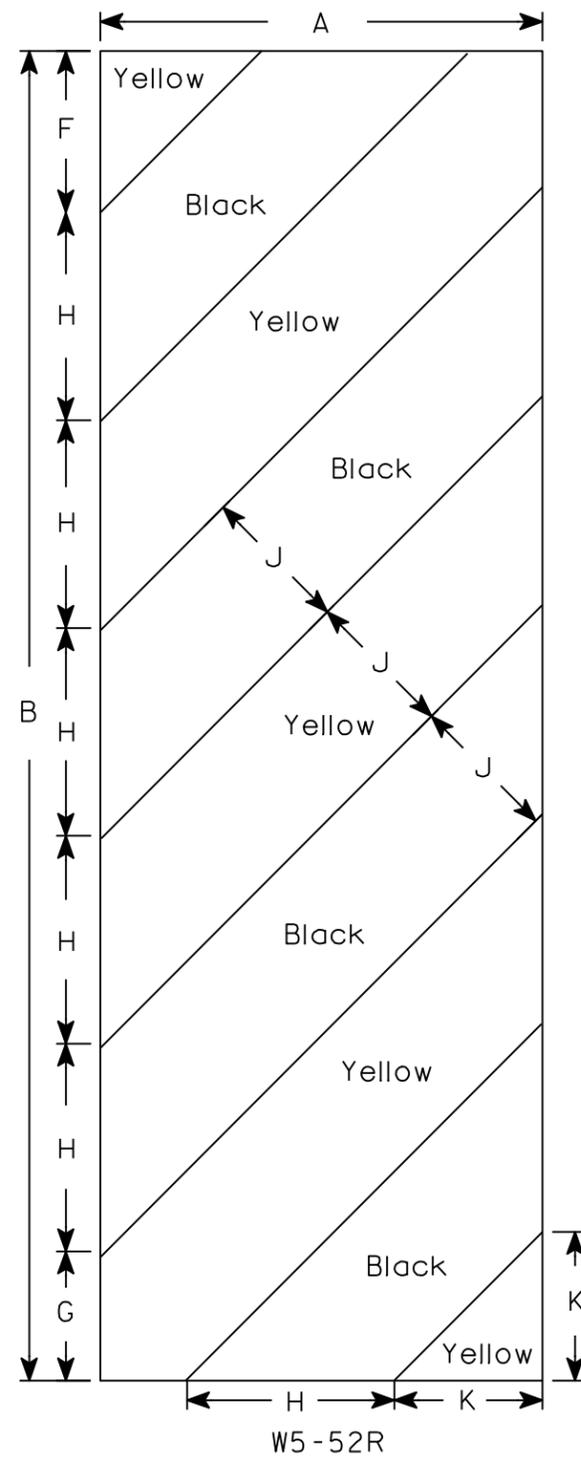
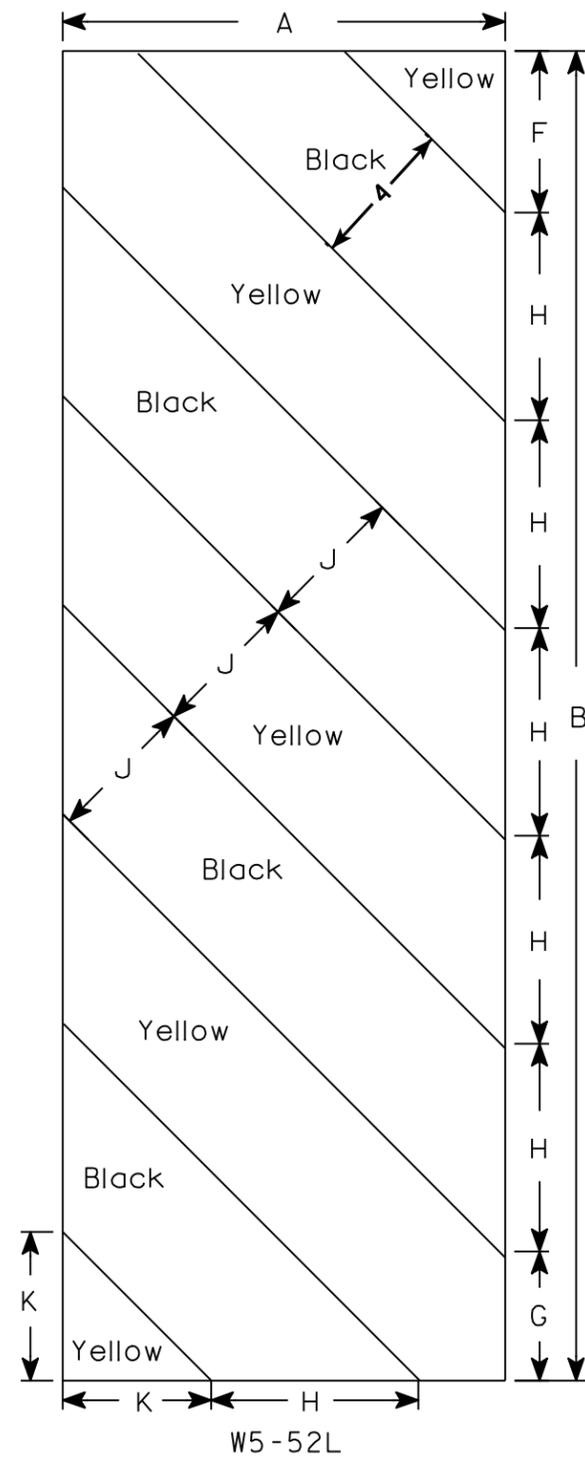
SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2	21		1 1/8	3/8	3/8		7 1/2	8 3/4	4 1/4			5 1/4	3	2 5/8	1/2						1 1/2	1/2					3.06
3	30		1 3/8	1/2	5/8		10 3/4	12 1/2	6 3/4			7 1/2	4 1/4	3 3/4	3/4						1 7/8	1/2					6.25
4	30		1 3/8	1/2	5/8		10 3/4	12 1/2	6 3/4			7 1/2	4 1/4	3 3/4	3/4						1 7/8	1/2					6.25
5	30		1 3/8	1/2	5/8		10 3/4	12 1/2	6 3/4			7 1/2	4 1/4	3 3/4	3/4						1 7/8	1/2					6.25

STANDARD SIGN
M6-4 & M6-6
SERIES

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 10/15/15 PLATE NO. M6-4.10



NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - Yellow
Message - Black
3. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
4. Alternate colors of stripes as shown.

7

7

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2S	12	36				4 3/8	3 1/2	5 5/8	45°	4	4																3.0
2M	12	36				4 3/8	3 1/2	5 5/8	45°	4	4																3.0
3	18	54				6	5 1/2	8 1/2	45°	6	6 9/16																6.75
4																											
5																											

STANDARD SIGN
W5-52L & W5-52R

WISCONSIN DEPT OF TRANSPORTATION

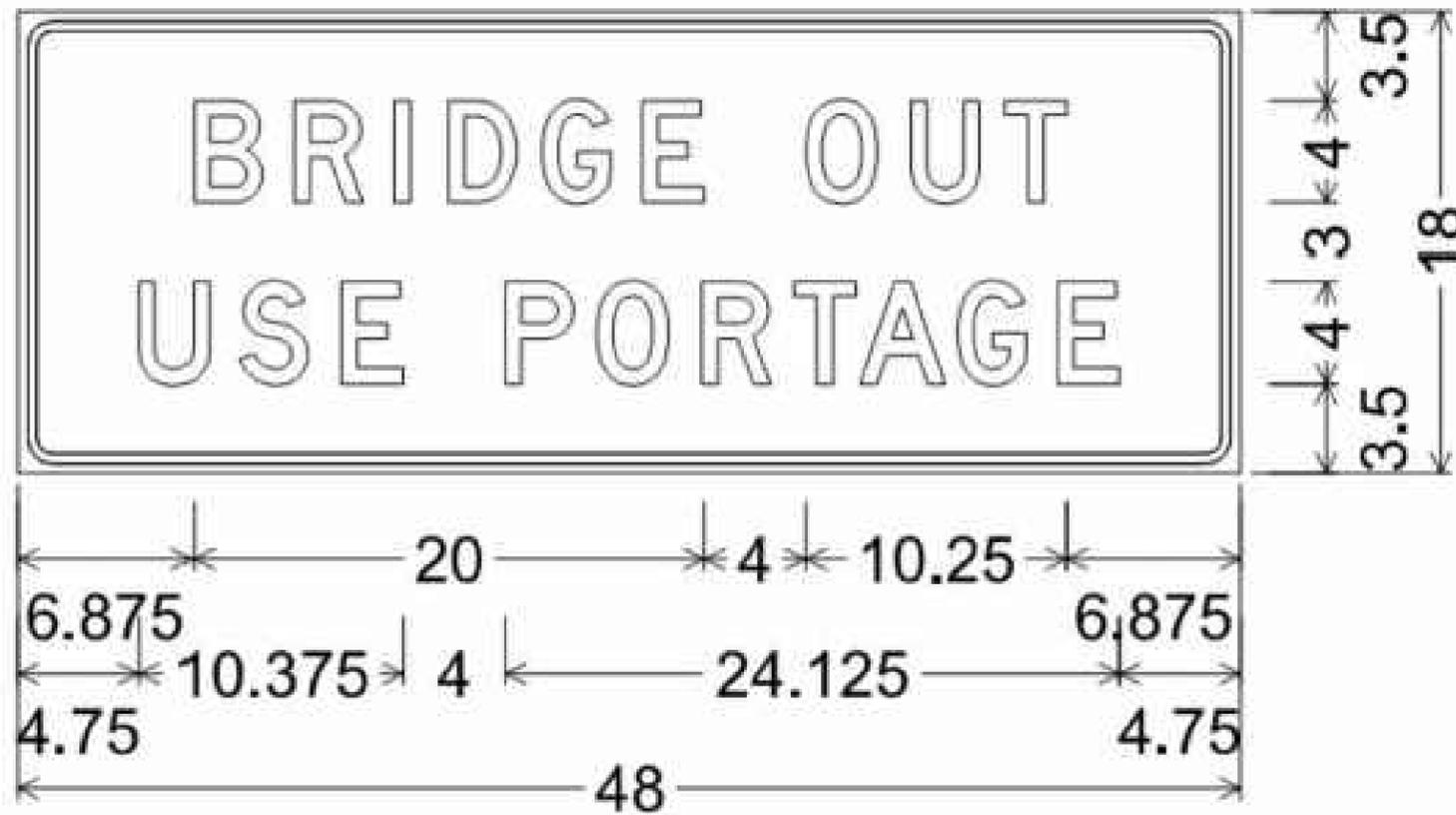
APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 5/29/12 PLATE NO. W5-52.9

PROJECT NO: _____ HWY: _____ COUNTY: _____ SHEET NO: _____ E

NOTES

1. Fixed Message Type II Sign - Type F Reflective
2. Color:
Background - Orange
Message - Black
3. Message Series - D



1.375" Radius, 0.375" Border, 0.375" Indent

7

7

DESIGN DATA

LIVE LOAD:
 DESIGN LOAD: HL-93
 INVENTORY RATING FACTOR = 1.30
 OPERATING RATING FACTOR = 1.68
 WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = 250 KIPS

STRUCTURE IS DESIGNED FOR A FUTURE WEARING SURFACE OF 20 PSF.

MATERIAL PROPERTIES:

CONCRETE MASONRY:
 SUPERSTRUCTURE.....f'c = 4,000 PSI
 ALL OTHER.....f'c = 3,500 PSI
 HIGH-STRENGTH BAR STEEL REINFORCEMENT, GRADE 60.....fy = 60,000 PSI

FOUNDATION DATA

ABUTMENTS TO BE SUPPORTED ON PILING STEEL HP 10-INCH X 42 LB AND DRIVEN TO A REQUIRED DRIVING RESISTANCE OF 180 TONS** PER PILE AS DETERMINED BY THE MODIFIED GATES DYNAMIC FORMULA.

ESTIMATED 60'-0" LONG AT WEST ABUTMENT
 ESTIMATED 50'-0" LONG AT EAST ABUTMENT

PIERS TO BE SUPPORTED ON PILING STEEL HP 10-INCH X 42 LB AND DRIVEN TO A REQUIRED DRIVING RESISTANCE OF 180 TONS** PER PILE AS DETERMINED BY THE MODIFIED GATES DYNAMIC FORMULA.

ESTIMATED 60'-0" LONG AT PIER 1
 ESTIMATED 55'-0" LONG AT PIER 2

** THE FACTORED AXIAL RESISTANCE OF PILES IN COMPRESSION USED FOR DESIGN IS THE REQUIRED DRIVING RESISTANCE MULTIPLIED BY A RESISTANCE FACTOR OF 0.5 USING MODIFIED GATES FORMULA TO DETERMINE DRIVEN PILE CAPACITY.

HYDRAULIC DATA

100 YEAR FREQUENCY

Q₁₀₀ = 6,000 C.F.S
 Q_{BR} = 5,848 C.F.S
 Q_{RD} = 152 C.F.S.
 VEL. = 5.93 F.P.S.
 HW₁₀₀ = EL. 592.61
 WATERWAY AREA = 986 SQ. FT.
 DRAINAGE AREA = 126 SQ. MI.
 SCOUR CRITICAL CODE = 5

ROADWAY OVERTOPPING FREQUENCY

FREQUENCY = 76 YEARS
 Q₇₆ = 5,600 C.F.S
 HW₇₆ = EL. 591.96

2 YEAR FREQUENCY

Q₂ = 1,600 C.F.S.
 VEL. = 2.51 F.P.S.
 HW₂ = EL. 586.80

TRAFFIC DATA

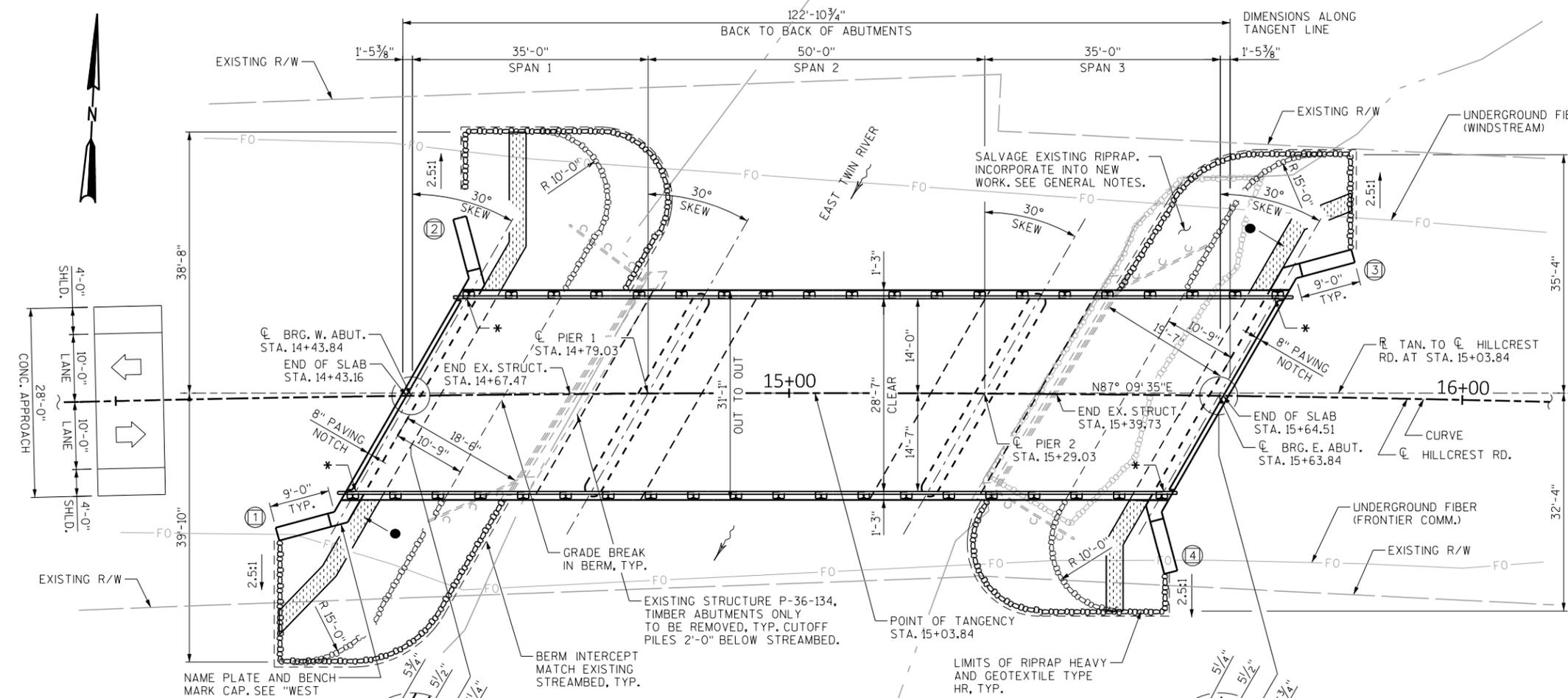
HILLCREST ROAD
 A.D.T. = 155 (2022)
 A.D.T. = 190 (2042)
 R.D.S. = 45 MPH

LIST OF DRAWINGS

- GENERAL PLAN AND ELEVATION
- CROSS SECTION AND QUANTITIES
- SUBSURFACE EXPLORATION
- WEST ABUTMENT
- WEST ABUTMENT DETAILS
- EAST ABUTMENT
- EAST ABUTMENT DETAILS
- ABUTMENT DETAILS
- PIER 1
- PIER 2
- SUPERSTRUCTURE
- SUPERSTRUCTURE DETAILS 1
- SUPERSTRUCTURE DETAILS 2
- TUBULAR STEEL RAILING TYPE 'M'

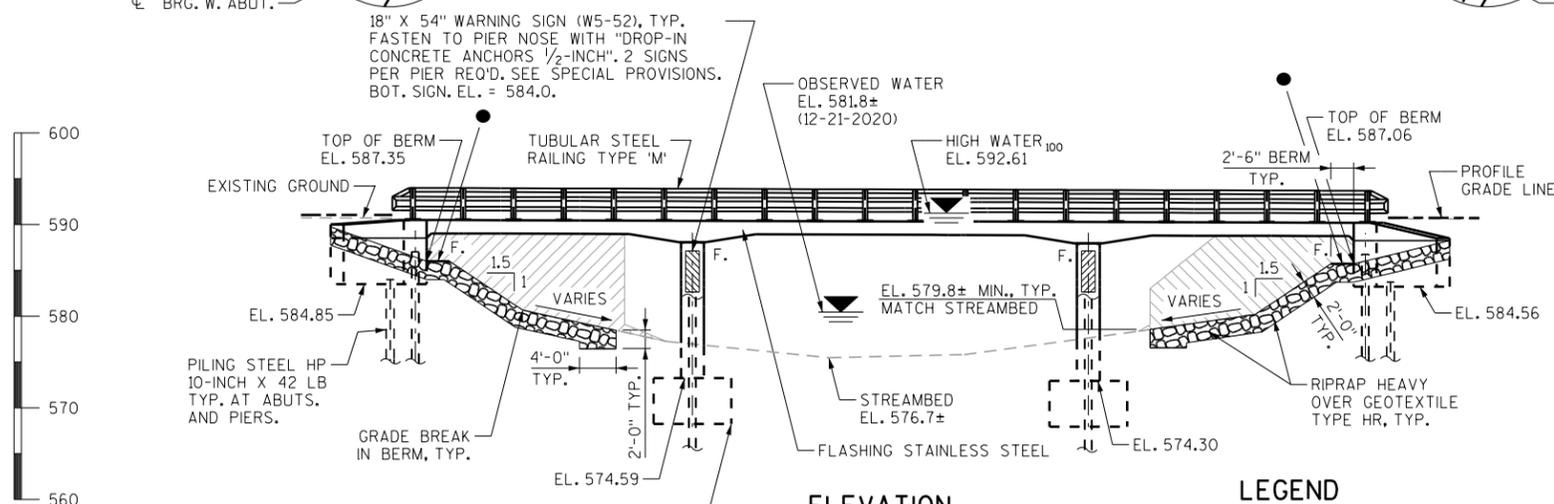
CURVE DATA

PISTA. = 15+58.38
 Y = 339352.943
 X = 246256.931
 DELTA = 4°04'45"
 D = 1°15'08"
 T = 162.96'
 L = 325.78'
 R = 4575.87'
 PC STA. = 13+95.42
 PT STA. = 17+21.20



PLAN

THREE-SPAN REINFORCED CONCRETE HAUNCHED SLAB



ELEVATION

LOOKING NORTH
 (NORMAL TO EAST TWIN RIVER)

LEGEND

- COST OF EXCAVATION SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR "EXCAVATION FOR STRUCTURE BRIDGES B-36-250"
- (X) INDICATES WINGWALL NUMBER
- F. FIXED BEARING
- * THRIE BEAM CONNECTION REQUIRED
- ECO-PASSAGE. SEE DETAIL ON SHEET 2.

NOTE

PROPOSED RIGHT-OF-WAY AND TEMPORARY LIMITED EASEMENT IS OFF OF THE PAGE AND IS NOT SHOWN FOR CLARITY. SEE SECTION 4 OF THE PLANS FOR PROPOSED RIGHT-OF-WAY AND EASEMENT LIMITS.

BENCH MARK

NO.	STATION	DESCRIPTION	ELEVATION
51	11+60.39, 7.05'L.T.	SET PK NAIL IN PAVEMENT	598.99
52	13+81.23, 9.08'RT	SET PK NAIL IN PAVEMENT	592.32
53	16+88.11, 9.88'RT.	SET PK NAIL IN PAVEMENT	591.97
54	19+03.65, 11.63'L.T.	SET SURVEY SPIKE IN SHOULDER	595.24
3001	17+81.16, 60.40'L.T.	SET IRON PIPE AT GRADE	588.55



STRUCTURES DESIGN CONTACTS

BRIDGE OFFICE:
 AARON BONK (608) 261-0261
 CONSULTANT:
 VINCENT DIFRANCES, P.E. (920) 468-4771

NO.	DATE	REVISION	BY



STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

ACCEPTED *[Signature]* SDR 02/09/22
 CHIEF STRUCTURES DESIGN ENGINEER DATE

STRUCTURE B-36-250

HILLCREST ROAD OVER EAST TWIN RIVER

COUNTY MANITOWOC TOWN TWO RIVERS

DESIGN SPEC. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

DESIGNED BY VJD DESIGN CK'D. FKH DRAWN BY VJD PLANS CK'D. FKH

GENERAL PLAN AND ELEVATION SHEET 1 OF 14

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

ALL STATIONS AND ELEVATIONS ARE IN FEET. ELEVATIONS ARE REFERENCED TO NAVD 88 (2012). HORIZONTAL POSITIONS ARE WISCONSIN COUNTY COORDINATES, MANITOWOC COUNTY, NAD 83 (2011).

THE EXISTING STRUCTURE, P-36-134, WAS ORIGINALLY CONSTRUCTED IN 1963. THE SUPERSTRUCTURE AND PART OF THE EAST ABUTMENT WERE REMOVED IN 2019 AFTER OVERNIGHT FAILURES. ONLY TIMBER BACKED ABUTMENTS REMAIN. THE REMAINDER OF THE EXISTING ABUTMENTS ARE TO BE REMOVED. REMOVE TIMBER PILING TO 2'-0" BELOW THE STREAMBED.

THE UPPER LIMIT OF "EXCAVATION FOR STRUCTURES BRIDGES B-36-250" SHALL BE THE EXISTING GROUNDLINE.

FILL AND/OR EXCAVATE TO THE BOTTOM OF THE ABUTMENT ELEVATION PRIOR TO DRIVING PILES.

EXCAVATION BELOW THE ABUTMENT AND ABUTMENT BEDDING MATERIALS REQUIRES ENGINEER APPROVAL. GEOTEXTILE SHALL BE SET AT THE BOTTOM OF EXCAVATION AND EXTEND 2'-0" ABOVE BOTTOM OF ABUTMENT.

▲ THE BACKFILL QUANTITIES ARE BASED ON THE PAY LIMITS SHOWN ON THE PLANS AND MAY NOT REFLECT ACTUAL PLACED QUANTITIES. "BACKFILL STRUCTURE TYPE A" REQUIRED DIRECTLY BEHIND ABUTMENTS AND ABUTMENT WINGS FOR 3 FEET. BACKFILL PLACED BEYOND PAY LIMITS OR EXCEEDING PLAN QUANTITIES SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURE.

THE SLOPE OF FILL IN FRONT OF THE ABUTMENTS SHALL BE COVERED WITH RIPRAP HEAVY AND GEOTEXTILE TYPE HR TO THE EXTENTS SHOWN ON SHEET 1. RIPRAP HEAVY SHALL BE PLACED PRIOR TO THE ERECTION OF FALSEWORK.

BEVEL EXPOSED EDGES OF CONCRETE 3/4" UNLESS OTHERWISE NOTED.

THE FIRST DIGIT OF A THREE DIGIT OR FIRST TWO DIGITS OF A FOUR DIGIT BAR MARK SIGNIFIES THE BAR SIZE.

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

COFFERDAM AND COFFERDAM DEWATERING ARE REQUIRED AT PIERS 1 AND 2. THE ASSUMED WATER ELEVATION USED TO DETERMINE SEAL THICKNESS IS THE TWO-YEAR HIGH WATER ELEVATION = 586.80.

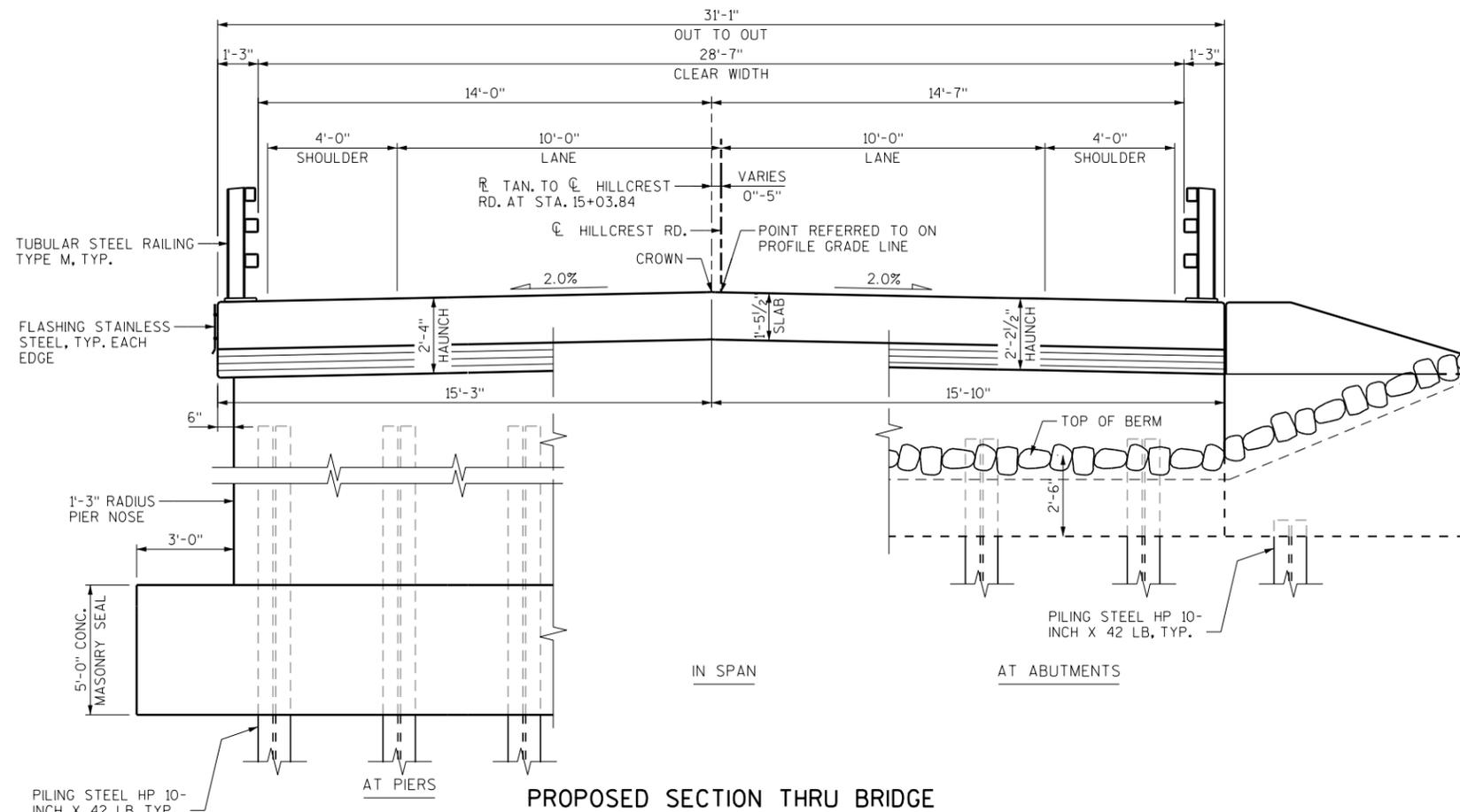
SLAB FALSEWORK SHALL BE SUPPORTED BY PILES OR THE SUBSTRUCTURE UNLESS AN ALTERNATIVE METHOD IS APPROVED BY THE ENGINEER IN THE FIELD.

PREFORMED FILLER SHALL CONFORM TO THE REQUIREMENTS OF A.A.S.H.T.O. DESIGNATION M153, TYPES I, II OR III OR M213.

PROTECTIVE SURFACE TREATMENT IS TO BE APPLIED TO THE ENTIRE TOP OF DECK, EDGES OF THE DECK, THE EXTERIOR 1'-0" OF THE UNDERSIDE OF THE DECK, AND THE EXPOSED FRONT FACES OF THE ABUTMENTS AND WINGWALLS. SEE DETAILS ON SHEETS 8 AND 12.

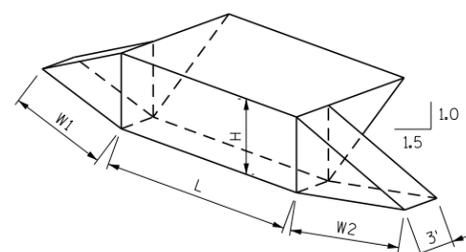
THE COST FOR SALVAGING EXISTING RIPRAP SHALL BE INCIDENTAL TO THE BID ITEM "RIPRAP HEAVY". SALVAGED RIPRAP WILL BE INCLUDED IN THE MEASURED QUANTITY FOR PAYMENT OF RIPRAP HEAVY IN ITS FINAL INSTALLED CONDITION.

THE UTILITY INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND AND OVERHEAD UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATIONS AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE.



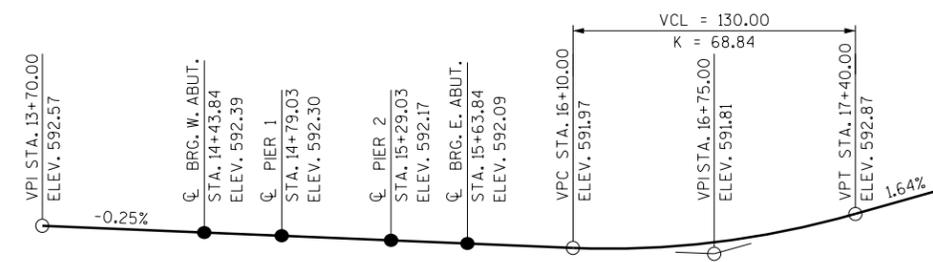
PROPOSED SECTION THRU BRIDGE

LOOKING EAST
DIMENSIONS ARE NORMAL TO THE REF. LINE

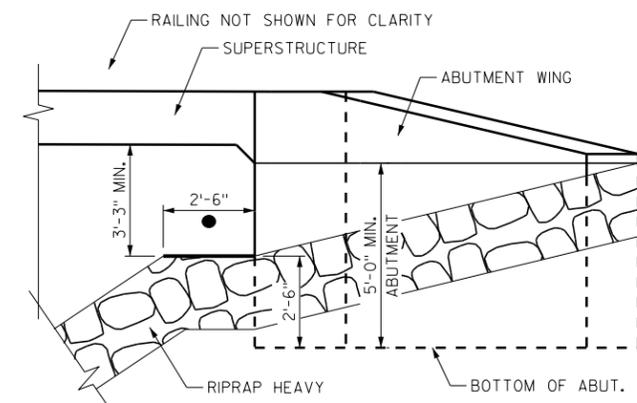


ABUTMENT BACKFILL DIAGRAM

- L = OUT TO OUT OF ABUTMENT BODY (FT)
- H = AVERAGE ABUTMENT FILL HEIGHT (FT)
- W1 = WING 1 LENGTH (FT)
- W2 = WING 2 LENGTH (FT)
- EF = EXPANSION FACTOR (1.00 FOR TON BID ITEMS)
- Vcf = (L)(3.0')(H) + (L)(0.5)(1.5H)(H) + (3.0')(0.5)(W1+W2)(H)
- Vcy = Vcf (EF)/27
- Vton = Vcy (2.0)



PROFILE GRADE LINE - HILLCREST ROAD



ECO-PASSAGE DETAIL

BOTH ABUTMENTS SIMILAR

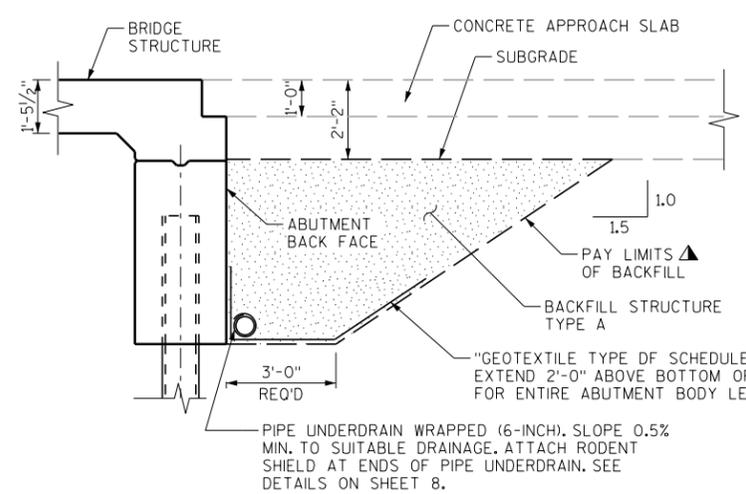
FILL VOIDS IN RIPRAP HEAVY WITH "SELECT CRUSHED MATERIAL FOR TRAVEL CORRIDOR" TO FULLY FILL ALL VOIDS AND LEAVE, ON AVERAGE, 2-INCHES ABOVE THE HIGHEST ROCK POINTS WHERE THEY ABUT EACH OTHER. PROVIDE LEVEL SURFACE OF THE ECO-PASSAGE.

THE TRANSITIONS OF THE AT-GRADE ECO-PASSAGE TO THE EDGES OF THE RIPRAP HEAVY SHALL BE GRADUAL WITH NO MORE THAN 2:1 SLOPE. SELECT CRUSHED MATERIAL SHALL BE COMPACTED ONCE IN PLACE.

TOTAL ESTIMATED QUANTITIES

BID ITEM NO.	BID ITEM	UNIT	W. ABUT.	PIER 1	PIER 2	E. ABUT.	SUPER	TOTAL
203.0260	REMOVING STRUCTURE OVER WATERWAY MINIMAL DEBRIS P-36-134	EACH	-	-	-	-	-	1
206.1000	EXCAVATION FOR STRUCTURES BRIDGES B-36-250	LS	-	-	-	-	-	1
206.5000	COFFERDAMS B-36-250	LS	-	-	-	-	-	1
210.1500	BACKFILL STRUCTURE TYPE A	TON	122	-	-	122	-	244
502.0100	CONCRETE MASONRY BRIDGES	CY	31	44	44	31	233	383
502.1100	CONCRETE MASONRY SEAL	CY	-	64	64	-	-	128
502.3200	PROTECTIVE SURFACE TREATMENT	SY	15	-	-	15	452	482
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	2,630	2,220	2,230	2,630	-	9,710
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	1,440	80	80	1,440	62,010	65,050
513.4061	RAILING TUBULAR TYPE M	LF	-	-	-	-	250	250
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	7	-	-	7	-	14
550.1100	PIILING STEEL HP 10-INCH X 42 LB	LF	475	540	495	395	-	1905
606.0300	RIPRAP HEAVY	CY	160	-	-	140	-	300
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	LF	75	-	-	75	-	150
645.0111	GEOTEXTILE TYPE DF SCHEDULE A	SY	52	-	-	52	-	104
645.0120	GEOTEXTILE TYPE HR	SY	290	-	-	260	-	550
SPV.0060.01	DROP-IN CONCRETE ANCHORS 1/2-INCH	EACH	-	4	4	-	-	8
SPV.0090.01	FLASHING STAINLESS STEEL	LF	-	-	-	-	235	235
SPV.0195.01	SELECT CRUSHED MATERIAL FOR TRAVEL CORRIDOR	TON	16	-	-	14	-	30
NON-BID ITEMS								
	PREFORMED JOINT FILLER	SIZE						1/2" & 3/4"
	NON-STAINING GRAY, NON-BITUMINOUS JOINT SEALER	SIZE						1"
	NAME PLATE	EACH						1

ALL B-36-250 BID ITEMS ARE CATEGORY 0020



STRUCTURE BACKFILL DETAIL

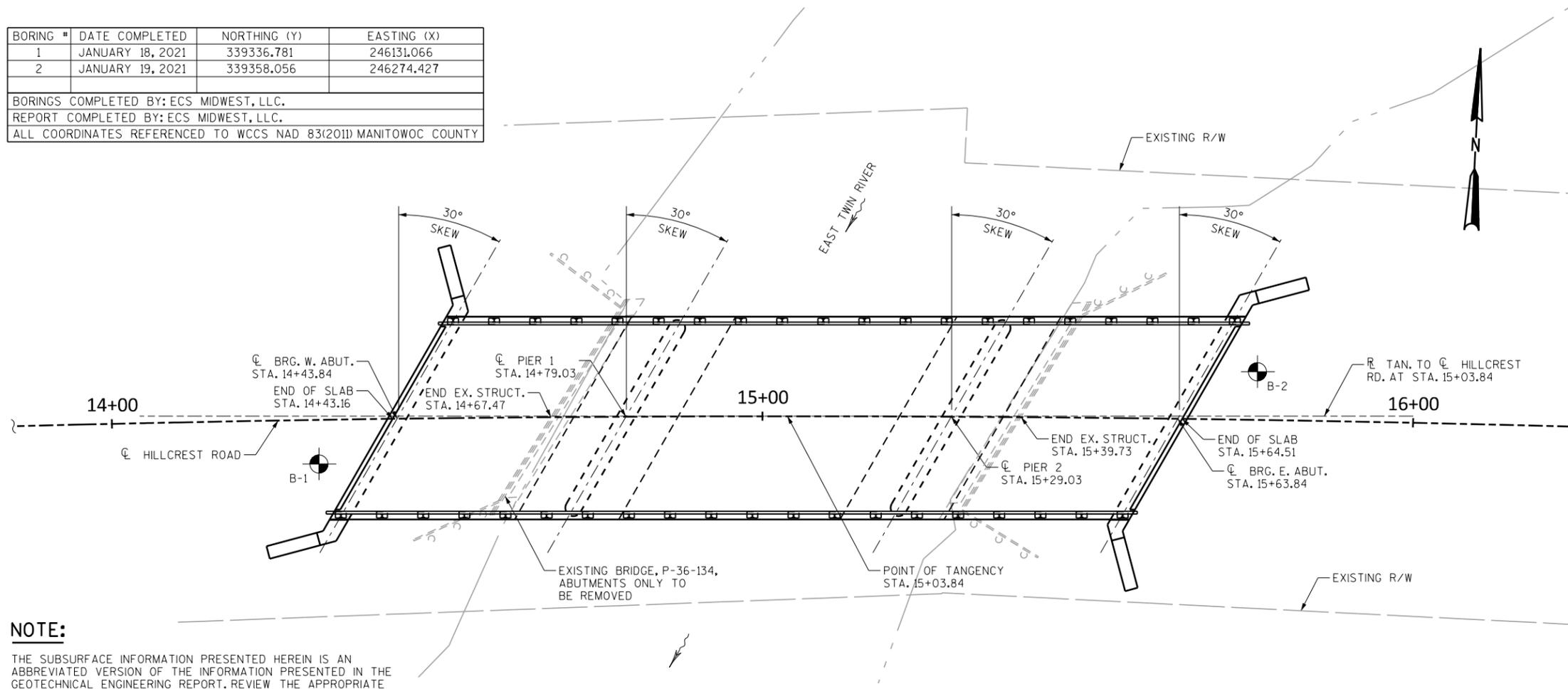
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
		DRAWN BY VJD	PLANS CK'D. FKH
CROSS SECTION AND QUANTITIES			SHEET 2 OF 14

8

8

BORING #	DATE COMPLETED	NORTHING (Y)	EASTING (X)
1	JANUARY 18, 2021	339336.781	246131.066
2	JANUARY 19, 2021	339358.056	246274.427

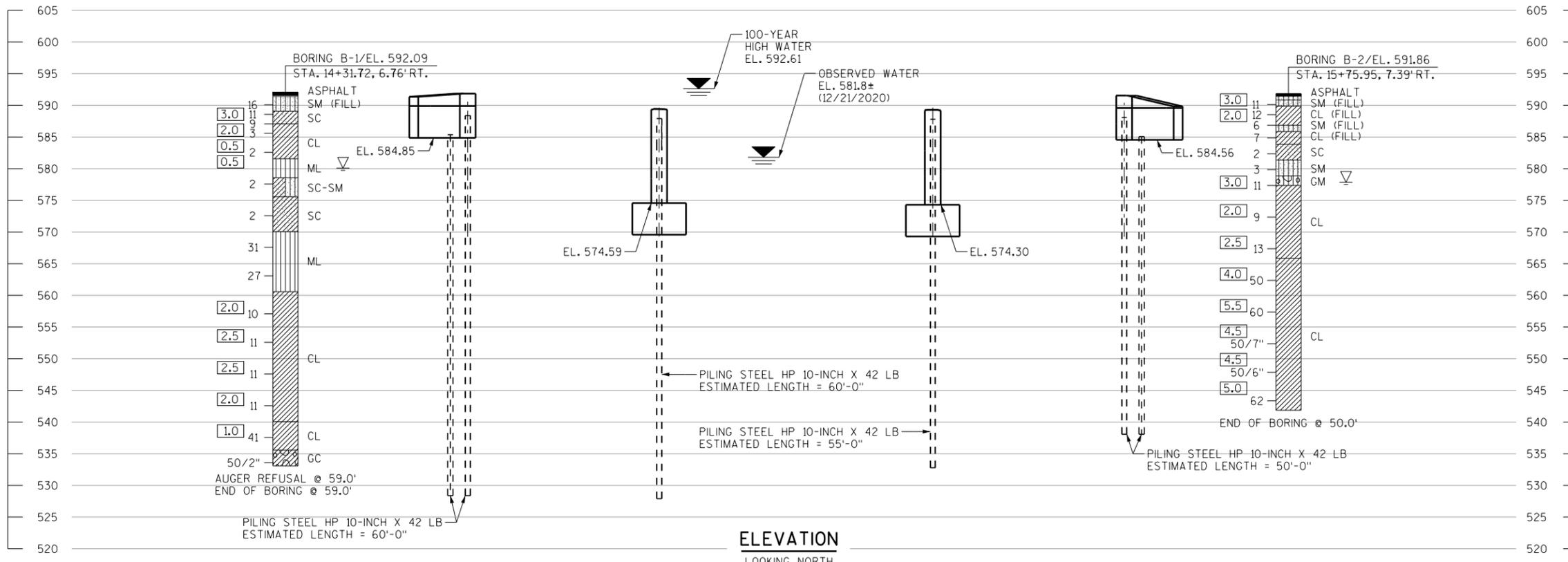
BORINGS COMPLETED BY: ECS MIDWEST, LLC.
 REPORT COMPLETED BY: ECS MIDWEST, LLC.
 ALL COORDINATES REFERENCED TO WCCS NAD 83(2011) MANITOWOC COUNTY



NOTE:
 THE SUBSURFACE INFORMATION PRESENTED HEREIN IS AN ABBREVIATED VERSION OF THE INFORMATION PRESENTED IN THE GEOTECHNICAL ENGINEERING REPORT. REVIEW THE APPROPRIATE GEOTECHNICAL REPORT AND SOIL BORING LOGS FOR ADDITIONAL SUBSURFACE INFORMATION.

BORING STATIONS AND OFFSETS ARE BASED ON CL HILLCREST ROAD.

PLAN



ELEVATION
 LOOKING NORTH

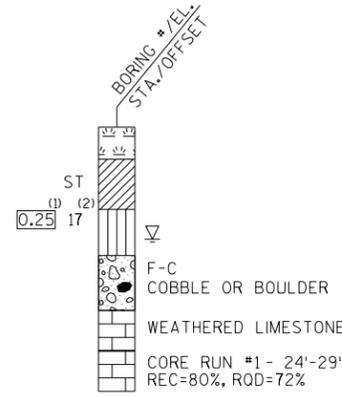
STATE PROJECT NUMBER

4305-03-71

MATERIAL SYMBOLS

ASPHALT	TOPSOIL	PEAT
CONCRETE	FILL	GRAVEL
SAND	CLAY	SILT
BOULDERS OR COBBLES	LIMESTONE	BEDROCK (UNKNOWN)
SHALE	SANDSTONE	IGNEOUS/META

LEGEND OF BORING



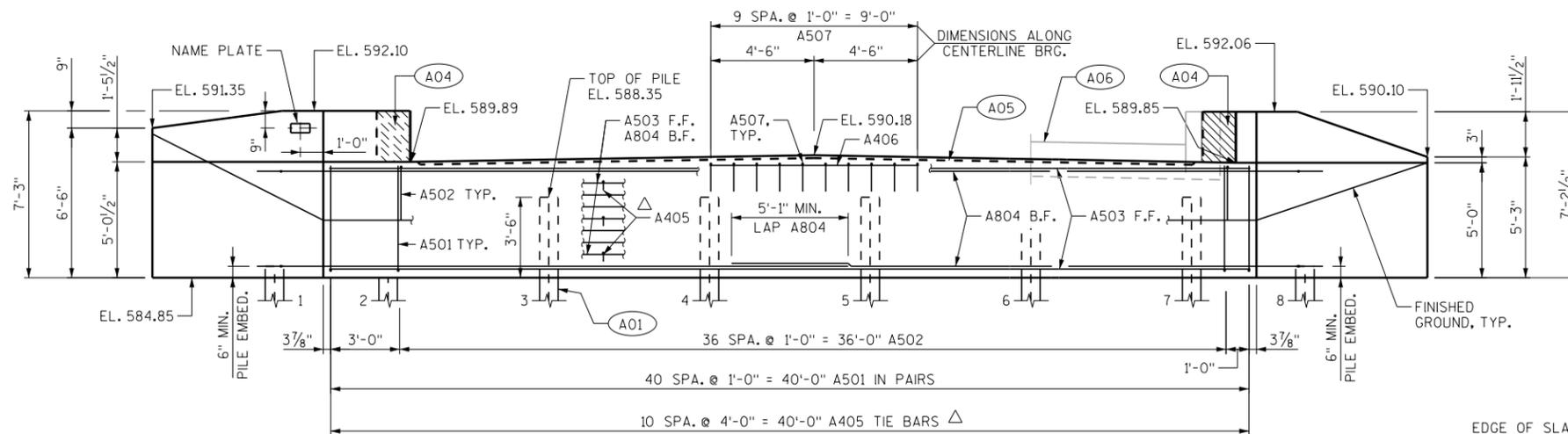
(1) UNCONFINED STRENGTH, AS DETERMINED BY A POCKET PENETROMETER (TSF)
 (2) UNLESS OTHERWISE, SPECIFIED THE SPT 'N' VALUE IS BASED ON AASHTO T-206, STANDARD PENETRATION TEST. THE SPT 'N' VALUE PRESENTED HAS NOT BEEN CORRECTED FOR OVERBURDEN PRESSURE OR HAMMER EFFICIENCY.

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION
 BORINGS WERE COMPLETED AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING TO OBTAIN INFORMATION CONCERNING THE CHARACTER OF SUBSURFACE MATERIALS FOUND AT THE SITE, BECAUSE THE INVESTIGATED DEPTHS ARE LIMITED AND THE AREA OF THE BORINGS IS VERY SMALL IN RELATION TO THE ENTIRE SITE, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT SIMILAR SUBSURFACE CONDITIONS BELOW, BETWEEN, OR BEYOND THESE BORINGS. VARIATIONS IN SOIL CONDITIONS SHOULD BE EXPECTED AND FLUCTUATIONS IN GROUNDWATER LEVELS MAY OCCUR.

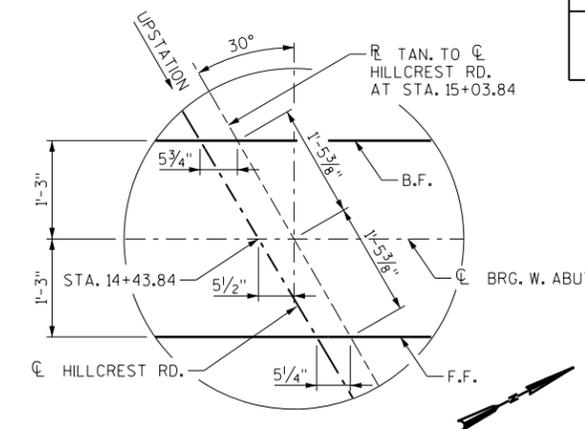
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
DRAWN BY VJD		PLANS CKD. FKH	
SUBSURFACE EXPLORATION		SHEET 3 OF 14	

8

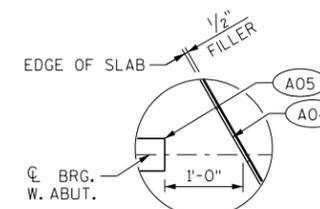
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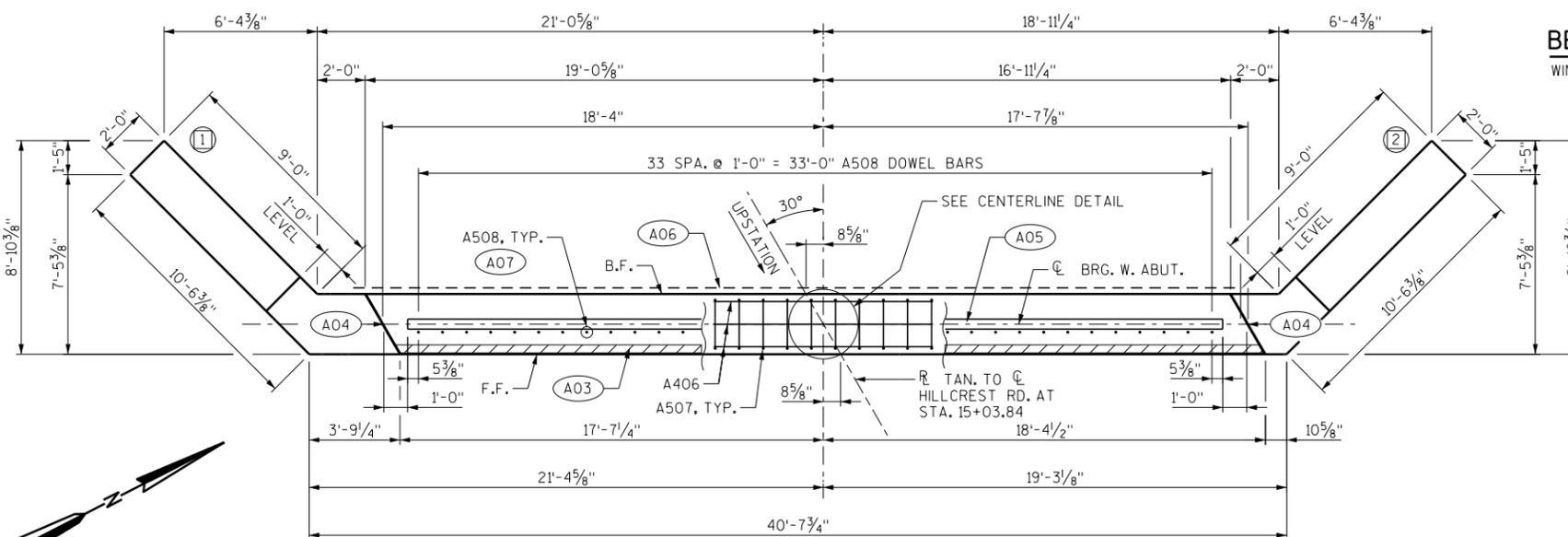
ELEVATION
LOOKING WEST AT FRONT FACE



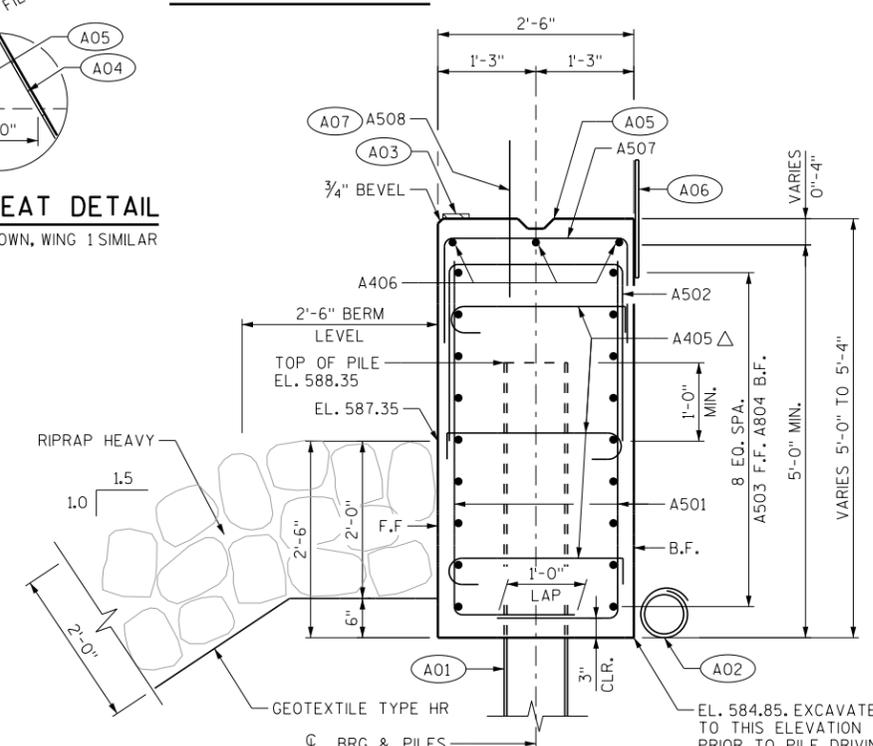
CENTERLINE DETAIL



BEARING SEAT DETAIL
WING 2 EDGE SHOWN, WING 1 SIMILAR



PLAN



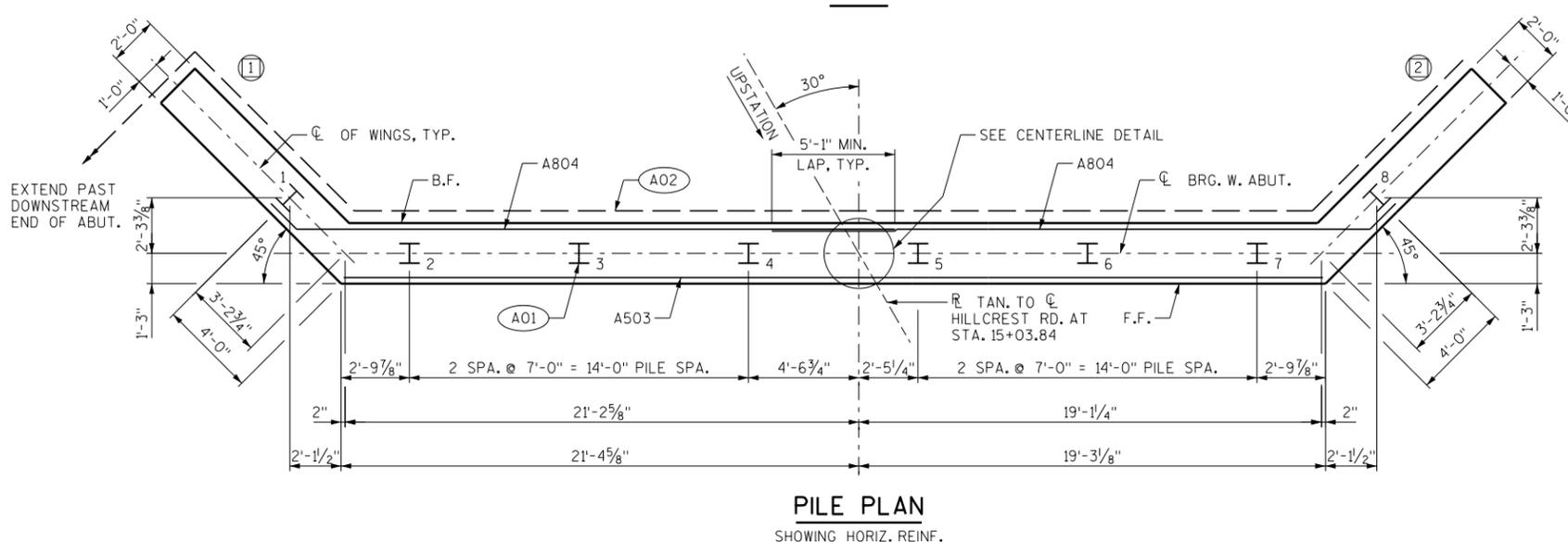
SECTION THRU BODY

LEGEND

- (A01) ABUTMENT TO BE SUPPORTED ON PILING STEEL HP 10-INCH X 42 LB DRIVEN TO A REQ'D DRIVING RESISTANCE OF 180 TON PER PILE. ESTIMATED 60'-0" PILE LENGTH.
 - (A02) PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. SEE SHEET 8 FOR DETAILS.
 - (A03) 4" X 3/4" PREFORMED FILLER.
 - (A04) 1/2" FILLER. EXTEND FROM BEARING ELEVATION TO TOP OF WING AS SHOWN. SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF 1/2" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER (1" DEEP AND HOLD 1/8" BELOW SURFACE OF CONCRETE).
 - (A05) KEYED CONST. JOINT FORMED BY BEVELED 2" X 6".
 - (A06) 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACK FACE.
 - (A07) BARS MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE. EMBED BARS 1'-0".
 - (X) INDICATES WINGWALL NUMBER.
 - △ ALTERNATE THE POSITION OF THE 90° AND 180° HOOKS AT EACH VERTICAL LAYER OF TIES.
- F.F. = FRONT FACE B.F. = BACK FACE

NOTES

- DO NOT PLACE BACKFILL ABOVE 3'-0" FROM BOTTOM OF ABUTMENT UNTIL SUPERSTRUCTURE IS IN PLACE.
- SOME BARS HAVE BEEN OMITTED FOR CLARITY. SEE BILL OF BARS ON SHEET 8.
- FOR PILE SPLICE DETAIL, SEE SHEET 8.
- SPACE REINFORCEMENT TO MISS PILING STEEL.
- CONCRETE POURED UNDERWATER WILL BE ALLOWED AND SHALL BE DONE IN ACCORDANCE WITH SECTION 502.3.5.3 OF THE STANDARD SPECIFICATIONS.



PILE PLAN
SHOWING HORIZ. REINF.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
DRAWN BY VJD		PLANS CK'D. FKH	
WEST ABUTMENT			SHEET 4 OF 14

LEGEND

- (A01) ABUTMENT TO BE SUPPORTED ON PILING STEEL HP 10-INCH X 42 LB DRIVEN TO A REQ'D DRIVING RESISTANCE OF 180 TON PER PILE. ESTIMATED 60'-0" PILE LENGTH.
 - (A02) PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. SEE SHEET 8 FOR DETAILS.
 - (A04) 1/2" FILLER. EXTEND FROM BEARING ELEVATION TO TOP OF WING AS SHOWN. SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF 1/2" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER (1" DEEP AND HOLD 1/8" BELOW SURFACE OF CONCRETE).
 - (A05) OPTIONAL KEYED CONST. JOINT FORMED BY BEVELED 2" X 6". PROVIDE 3/4" "V" GROOVE ON F.F. OF WINGWALL IF OPTIONAL JOINT IS USED.
 - (A06) 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACK FACE.
 - (X) INDICATES WINGWALL NUMBER.
- F.F. = FRONT FACE B.F. = BACK FACE

NOTES

DO NOT PLACE BACK FILL ABOVE 3'-0" FROM BOTTOM OF ABUTMENT UNTIL SUPERSTRUCTURE IS IN PLACE.

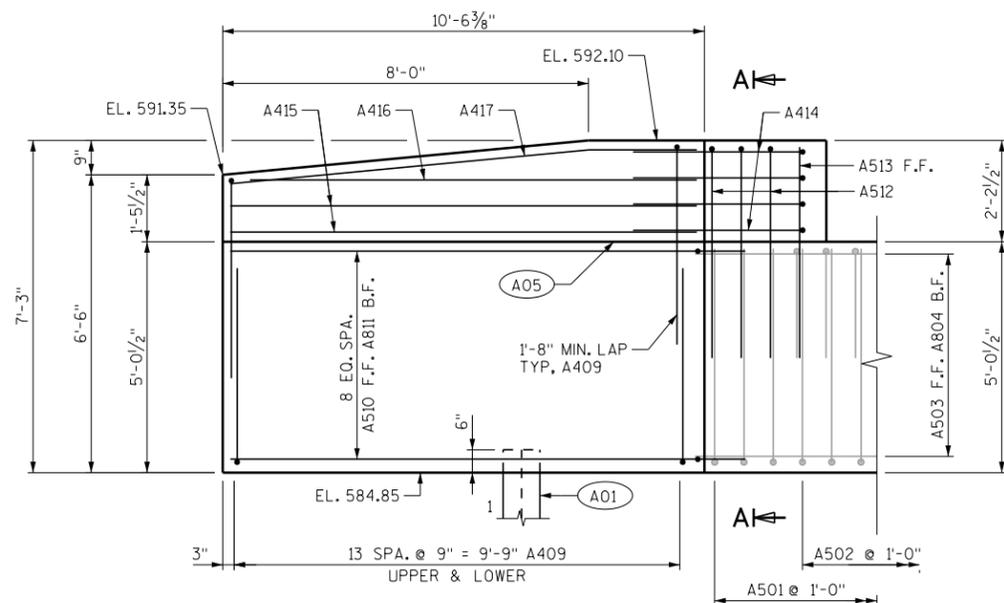
SOME BARS HAVE BEEN OMITTED FOR CLARITY. SEE BILL OF BARS ON SHEET 8.

FOR PILE SPLICE DETAIL, SEE SHEET 8.

SPACE REINFORCEMENT TO MISS PILING STEEL.

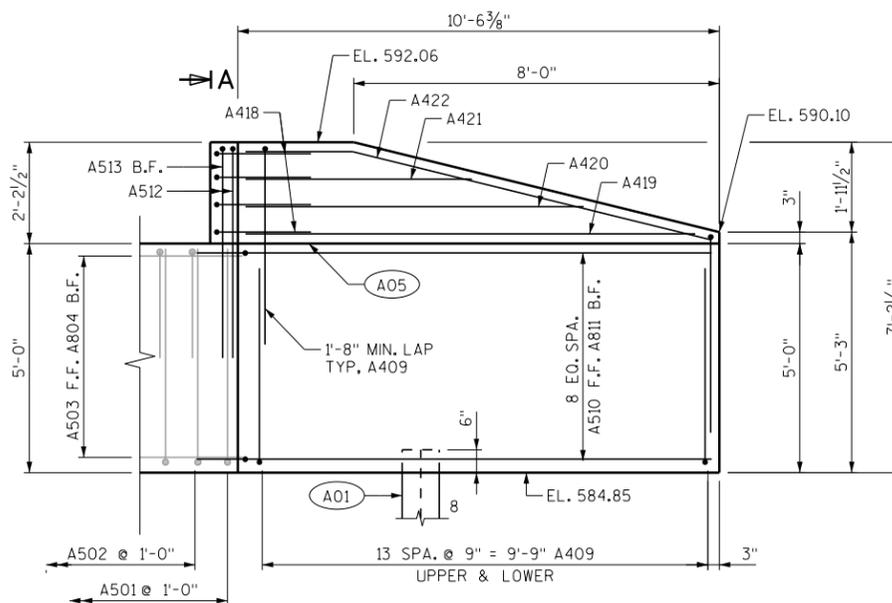
CONCRETE POURED UNDERWATER WILL BE ALLOWED AND SHALL BE DONE IN ACCORDANCE WITH SECTION 502.3.5.3 OF THE STANDARD SPECIFICATIONS.

IF OPTIONAL CONSTRUCTION JOINT IS USED, THE COST FOR RUBBERIZED MEMBRANE WATERPROOFING ALONG THE JOINT SHALL BE INCIDENTAL TO "CONCRETE MASONRY BRIDGES".



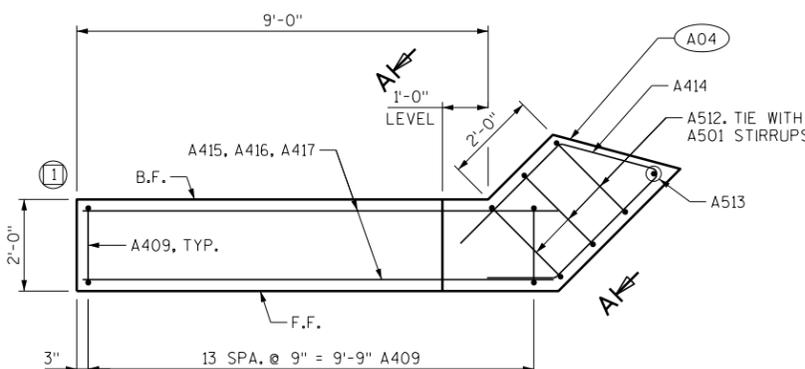
WING 1 ELEVATION

SHOWING FRONT FACE OF WING
NAME PLATE NOT SHOWN FOR CLARITY



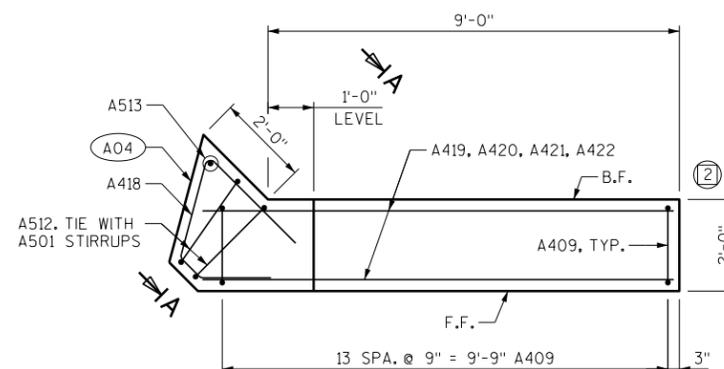
WING 2 ELEVATION

SHOWING FRONT FACE OF WING



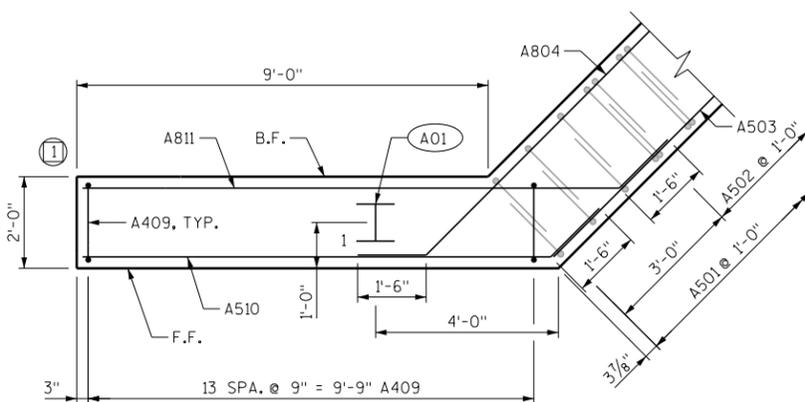
WING 1 PLAN

SHOWING UPPER WING REINFORCEMENT



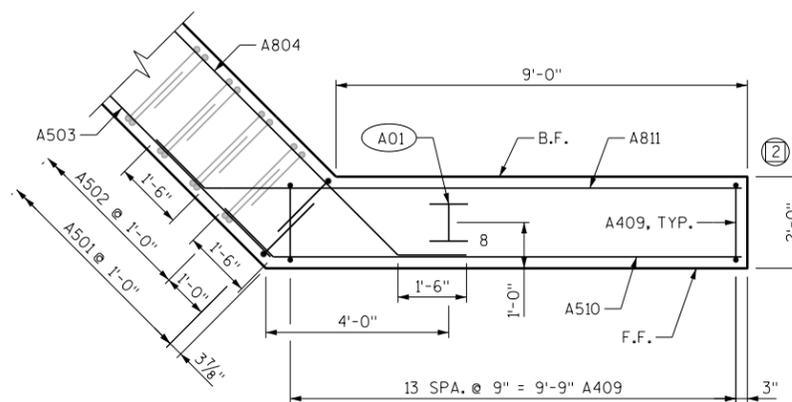
WING 2 PLAN

SHOWING UPPER WING REINFORCEMENT



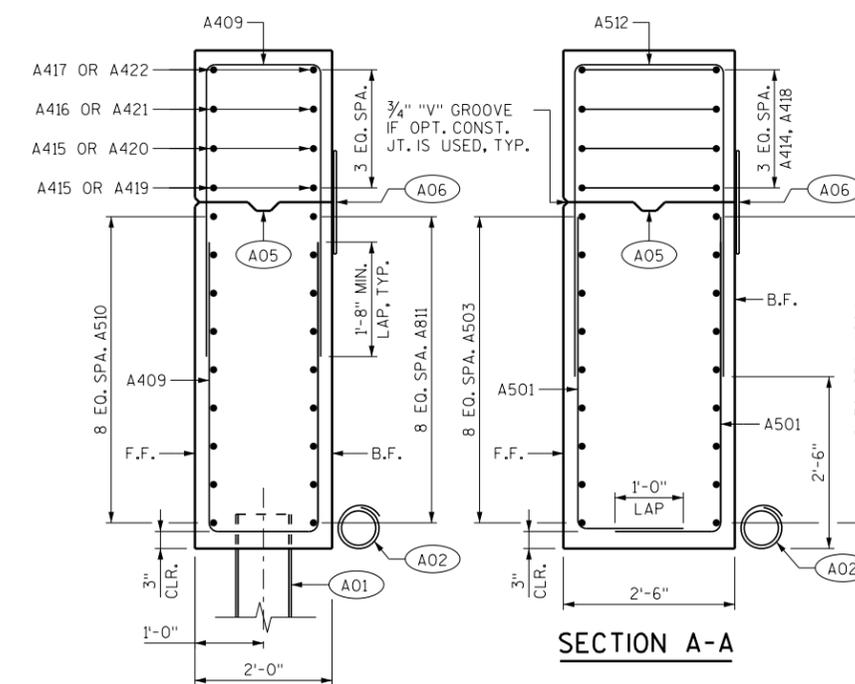
WING 1 PLAN

SHOWING LOWER WING REINFORCEMENT



WING 2 PLAN

SHOWING LOWER WING REINFORCEMENT



SECTION THRU WING

SECTION A-A

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
DRAWN BY VJD		PLANS CK'D. FKH	
WEST ABUTMENT DETAILS			SHEET 5 OF 14

LEGEND

- (A01) ABUTMENT TO BE SUPPORTED ON PILING STEEL HP 10-INCH X 42 LB DRIVEN TO A REQ'D DRIVING RESISTANCE OF 180 TON PER PILE. ESTIMATED 50'-0" PILE LENGTH.
 - (A02) PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. SEE SHEET 8 FOR DETAILS.
 - (A04) 1/2" FILLER. EXTEND FROM BEARING ELEVATION TO TOP OF WING AS SHOWN. SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF 1/2" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER (1" DEEP AND HOLD 1/8" BELOW SURFACE OF CONCRETE).
 - (A05) OPTIONAL KEYED CONST. JOINT FORMED BY BEVELED 2" X 6". PROVIDE 3/4" "V" GROOVE ON F.F. OF WINGWALL IF OPTIONAL JOINT IS USED.
 - (A06) 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACK FACE.
 - (X) INDICATES WINGWALL NUMBER.
- F.F. = FRONT FACE B.F. = BACK FACE

NOTES

DO NOT PLACE BACKFILL ABOVE 3'-0" FROM BOTTOM OF ABUTMENT UNTIL SUPERSTRUCTURE IS IN PLACE.

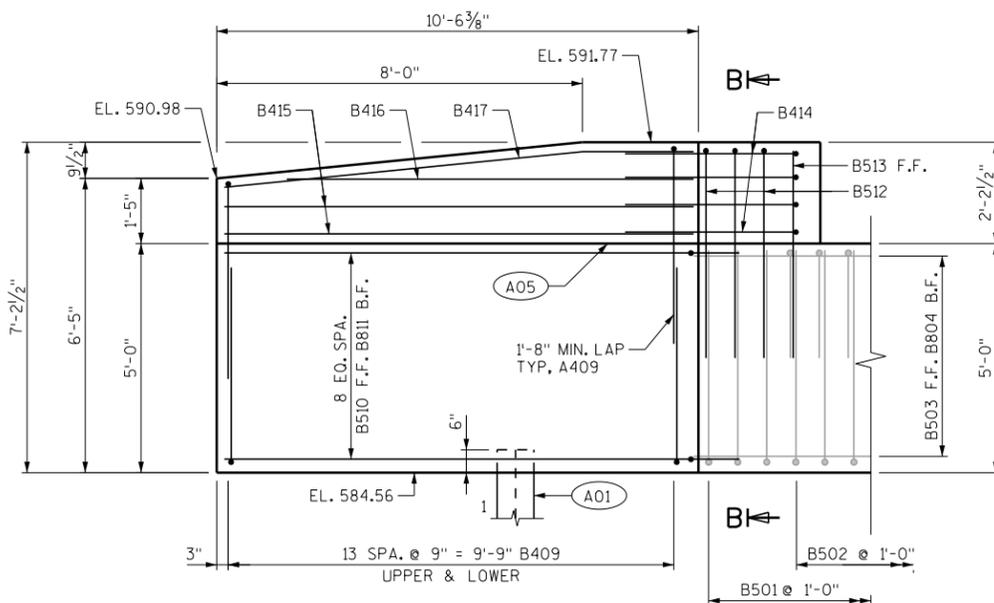
SOME BARS HAVE BEEN OMITTED FOR CLARITY. SEE BILL OF BARS ON SHEET 8.

FOR PILE SPLICE DETAIL, SEE SHEET 8.

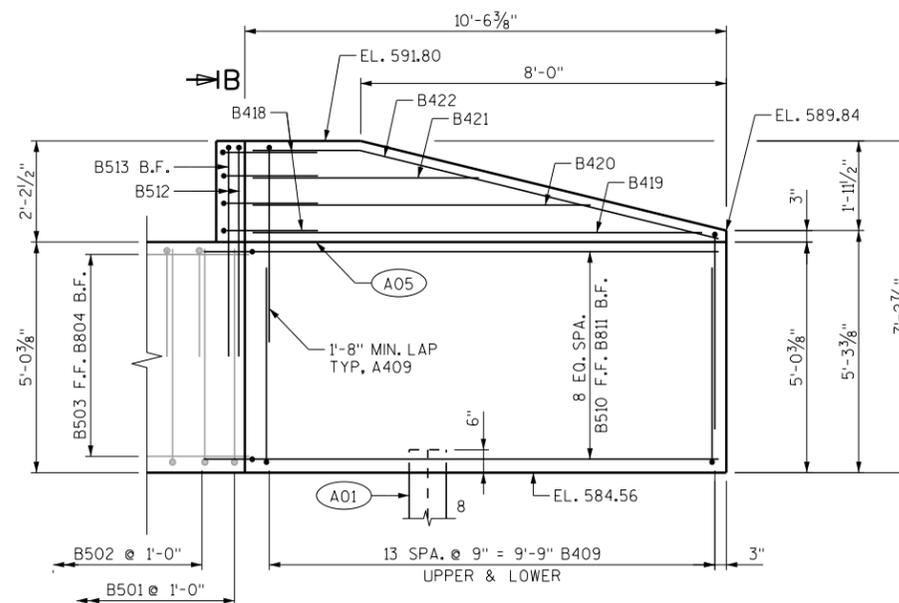
SPACE REINFORCEMENT TO MISS PILING STEEL.

CONCRETE POURED UNDERWATER WILL BE ALLOWED AND SHALL BE DONE IN ACCORDANCE WITH SECTION 502.3.5.3 OF THE STANDARD SPECIFICATIONS.

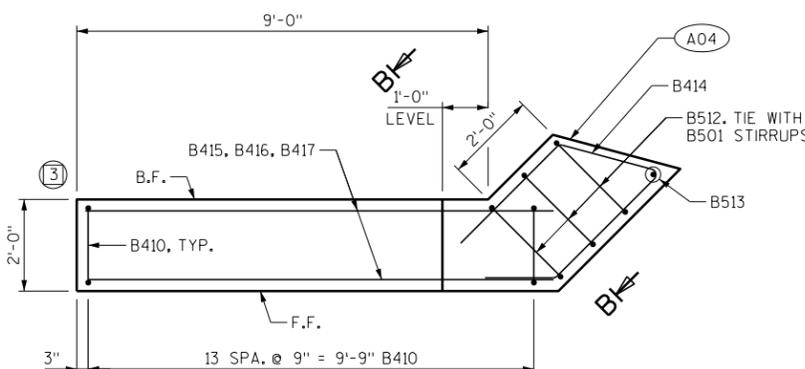
IF OPTIONAL CONSTRUCTION JOINT IS USED, THE COST FOR RUBBERIZED MEMBRANE WATERPROOFING ALONG THE JOINT SHALL BE INCIDENTAL TO "CONCRETE MASONRY BRIDGES".



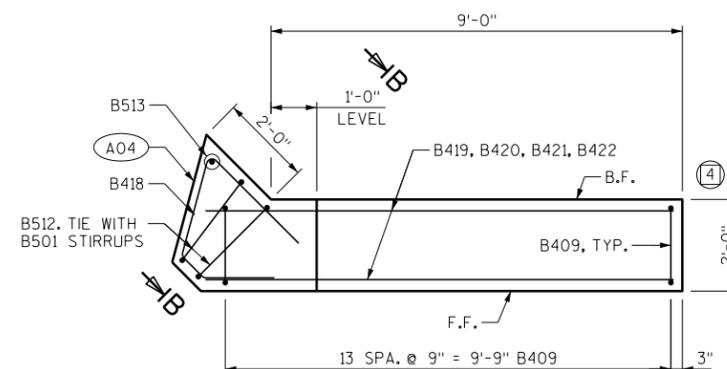
WING 3 ELEVATION
SHOWING FRONT FACE OF WING



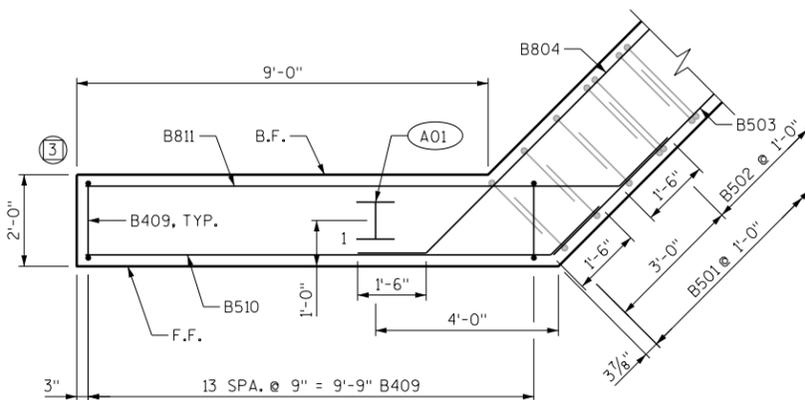
WING 4 ELEVATION
SHOWING FRONT FACE OF WING



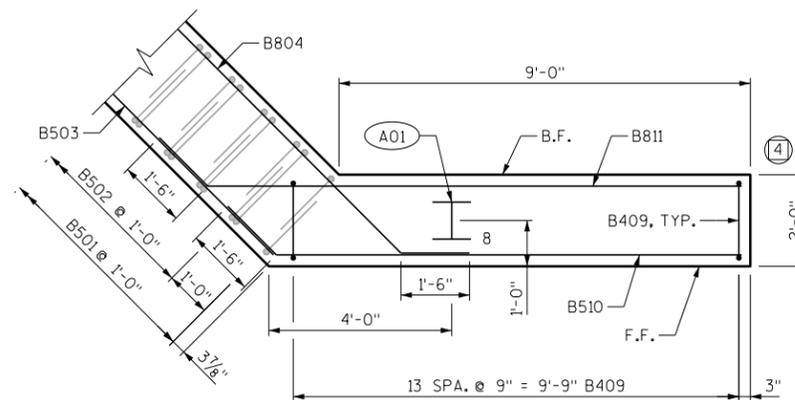
WING 3 PLAN
SHOWING UPPER WING REINFORCEMENT



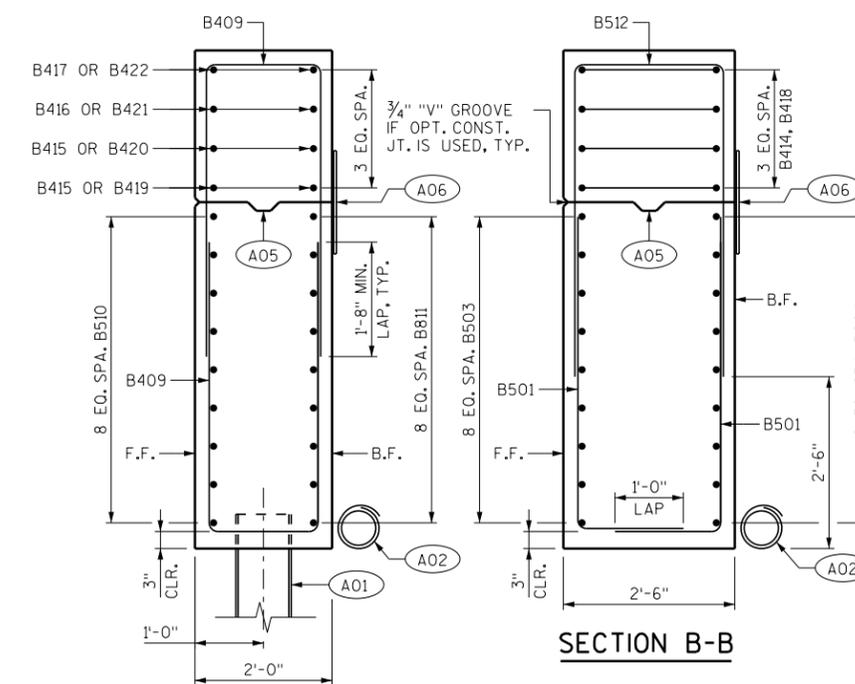
WING 4 PLAN
SHOWING UPPER WING REINFORCEMENT



WING 3 PLAN
SHOWING LOWER WING REINFORCEMENT



WING 4 PLAN
SHOWING LOWER WING REINFORCEMENT

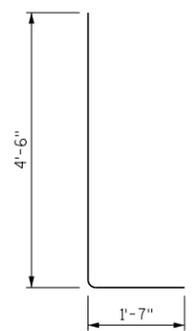


SECTION THRU WING

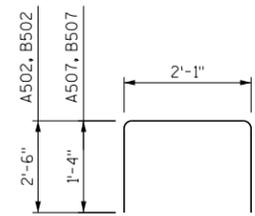
SECTION B-B

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
DRAWN BY VJD		PLANS CK'D. FKH	
EAST ABUTMENT DETAILS			SHEET 7 OF 14

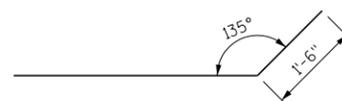
BILL OF BARS - WEST ABUTMENT						COATED: 1,440 LBS
						UNCOATED: 2,630 LBS
BAR MARK	COAT	NO REQ'D	LENGTH	BENT	BAR SERIES	LOCATION
A501		82	6'-0"	X		BODY - BOTTOM - VERTICAL
A502		37	6'-10"	X		BODY - TOP - VERTICAL
A503		9	40'-5"			BODY - HORIZ - FRONT FACE
A804		18	26'-3"	X		BODY - HORIZ - BACK FACE
A405		33	3'-0"	X		BODY - HORIZ - TIES
A406		3	9'-2"			BODY - HORIZ - HIGH SEAT
A507		10	4'-6"	X		BODY - VERTICAL - HIGH SEAT
A508		34	2'-0"			BODY - VERTICAL - DOWELS
A409	X	56	9'-11"	X		WINGS 1 & 2 - VERTICAL
A510	X	18	11'-7"	X		WINGS 1 & 2 - HORIZ - FRONT FACE
A811	X	18	13'-1"	X		WINGS 1 & 2 - HORIZ - BACK FACE
A512	X	5	11'-0"	X		WINGS 1 & 2 - VERTICAL - UPPER
A513	X	2	4'-7"			WINGS 1 & 2 - VERTICAL - UPPER
A414	X	4	9'-11"	X		WING 1 - HORIZ - UPPER
A415	X	4	10'-3"			WING 1 - HORIZ - UPPER
A416	X	2	9'-9"			WING 1 - HORIZ - UPPER
A417	X	2	10'-3"	X		WING 1 - HORIZ - UPPER
A418	X	4	7'-2"	X		WING 2 - HORIZ - UPPER
A419	X	2	9'-10"			WING 2 - HORIZ - UPPER
A420	X	2	7'-4"			WING 2 - HORIZ - UPPER
A421	X	2	5'-0"			WING 2 - HORIZ - UPPER
A422	X	2	10'-6"	X		WING 2 - HORIZ - UPPER



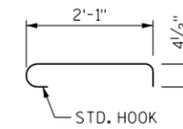
A501, B501



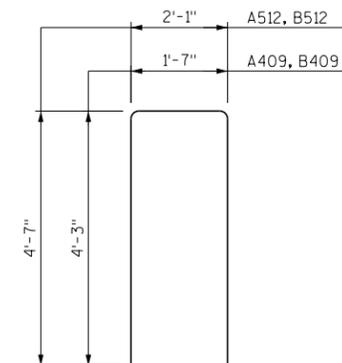
A502, B502, A507, B507



A804, A510, A811
B804, B510, B811

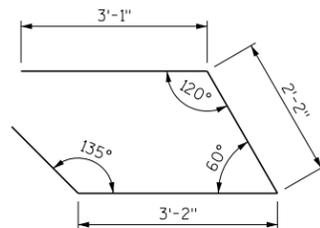


A405, B405

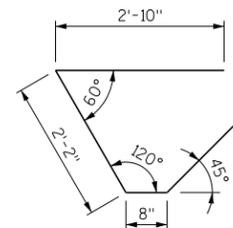


A409, B409, A512, B512

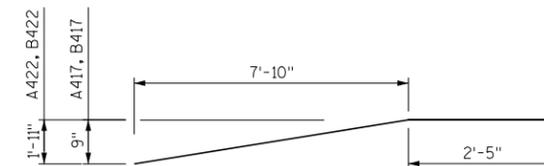
BILL OF BARS - EAST ABUTMENT						COATED: 1,440 LBS
						UNCOATED: 2,630 LBS
BAR MARK	COAT	NO REQ'D	LENGTH	BENT	BAR SERIES	LOCATION
B501		82	6'-0"	X		BODY - BOTTOM - VERTICAL
B502		37	6'-10"	X		BODY - TOP - VERTICAL
B503		9	40'-5"			BODY - HORIZ - FRONT FACE
B804		18	26'-3"	X		BODY - HORIZ - BACK FACE
B405		33	3'-0"	X		BODY - HORIZ - TIES
B406		3	9'-2"			BODY - HORIZ - HIGH SEAT
B507		10	4'-6"	X		BODY - VERTICAL - HIGH SEAT
B508		34	2'-0"			BODY - VERTICAL - DOWELS
B409	X	56	9'-11"	X		WINGS 3 & 4 - VERTICAL
B510	X	18	11'-7"	X		WINGS 3 & 4 - HORIZ - FRONT FACE
B811	X	18	13'-1"	X		WINGS 3 & 4 - HORIZ - BACK FACE
B512	X	5	11'-0"	X		WINGS 3 & 4 - VERTICAL - UPPER
B513	X	2	4'-7"			WINGS 3 & 4 - VERTICAL - UPPER
B414	X	4	9'-11"	X		WING 3 - HORIZ - UPPER
B415	X	4	10'-3"			WING 3 - HORIZ - UPPER
B416	X	2	9'-9"			WING 3 - HORIZ - UPPER
B417	X	2	10'-3"	X		WING 3 - HORIZ - UPPER
B418	X	4	7'-2"	X		WING 4 - HORIZ - UPPER
B419	X	2	9'-10"			WING 4 - HORIZ - UPPER
B420	X	2	7'-4"			WING 4 - HORIZ - UPPER
B421	X	2	5'-0"			WING 4 - HORIZ - UPPER
B422	X	2	10'-6"	X		WING 4 - HORIZ - UPPER



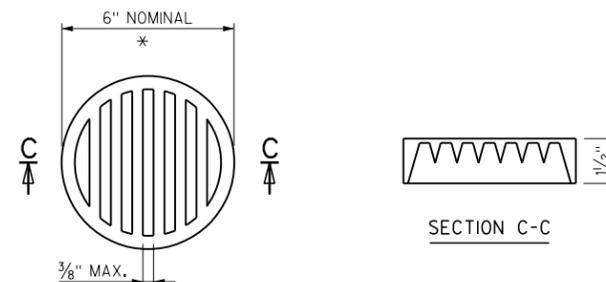
A414, B414



A418, B418



A417, A422, B417, B422

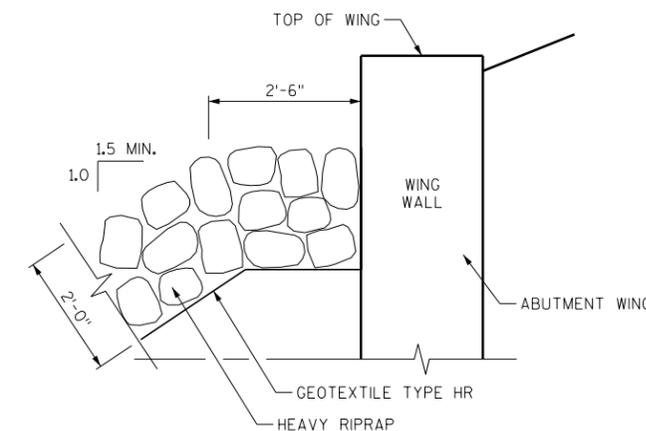


RODENT SHIELD DETAIL

* DIMENSIONS ARE APPROXIMATE. THE GRATE IS SIZED TO FIT INTO A PIPE COUPLING. ORIENT SO SLOTS ARE VERTICAL

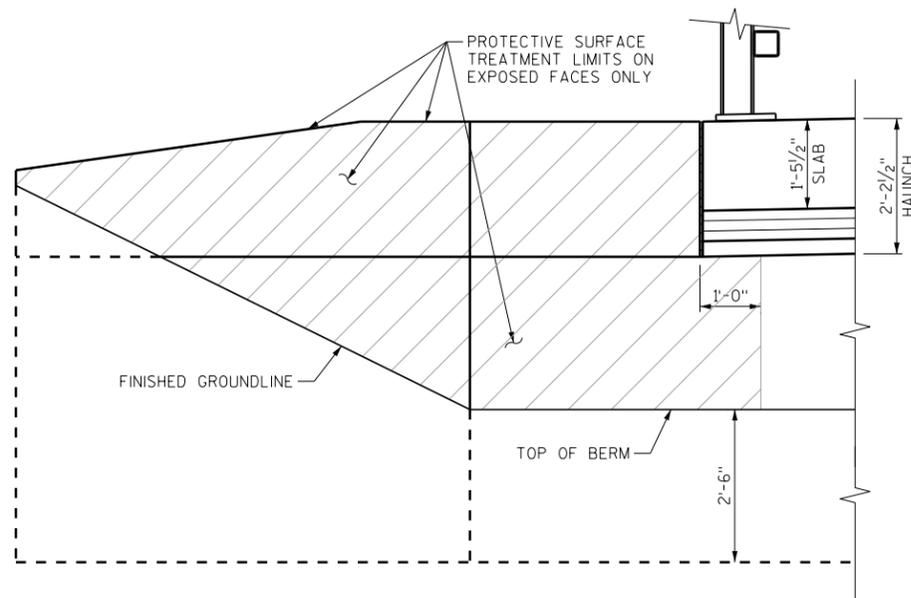
THE RODENT SHIELD, PIPE COUPLING, AND SCREWS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH".

THE RODENT SHIELD SHALL BE A PVC GRATE SIMILAR TO THIS DETAIL. THE GRATE IS COMMERCIALY AVAILABLE AS A FLOOR STRAINER. A PIPE COUPLING IS REQUIRED FOR THE ATTACHMENT OF THIS SHIELD TO THE EXPOSED END OF THE PIPE UNDERDRAIN. THE SHIELD SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO. 10 X 1-INCH STAINLESS STEEL SHEET METAL SCREWS



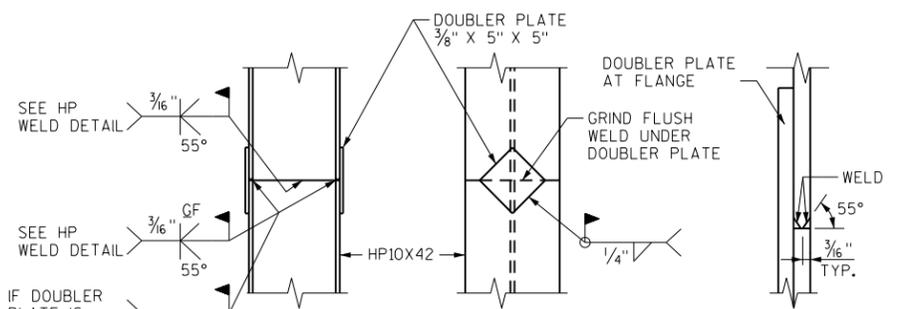
TYPICAL FILL SECTION AT WING

PLACE HEAVY RIPRAP AS SHOWN IN WING ELEVATION DETAIL.



PROTECTIVE SURFACE TREATMENT

AT ABUTMENT AND WINGWALLS
ALL WINGS SIMILAR



STEEL 'HP' SHAPE

PILE SPLICE DETAIL

HP WELD DETAIL

FLANGE SHOWN, WEB SIMILAR

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
DRAWN BY VJD		PLANS CK'D. FKX	
ABUTMENT DETAILS			SHEET 8 OF 14

NOTES

AT PIER 1, COFFERDAM AND COFFERDAM DEWATERING REQUIRED. COFFERDAM SHALL BE DEWATERED PRIOR TO PLACEMENT OF PIER SHAFT CONCRETE.

TOP OF PIER ELEVATIONS ARE 3/4" BELOW BOTTOM OF SLAB TO ALLOW FOR PREFORMED FILLER.

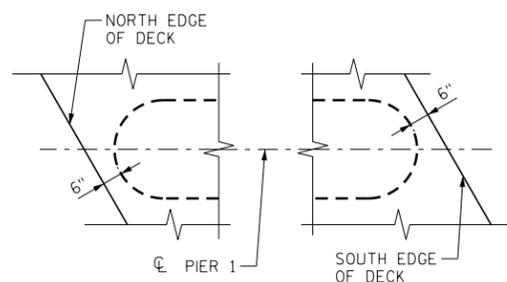
SOME BARS HAVE BEEN OMITTED FOR CLARITY. SEE BILL OF BARS ON THIS SHEET.

FOR PILE SPLICE DETAIL, SEE SHEET 8.

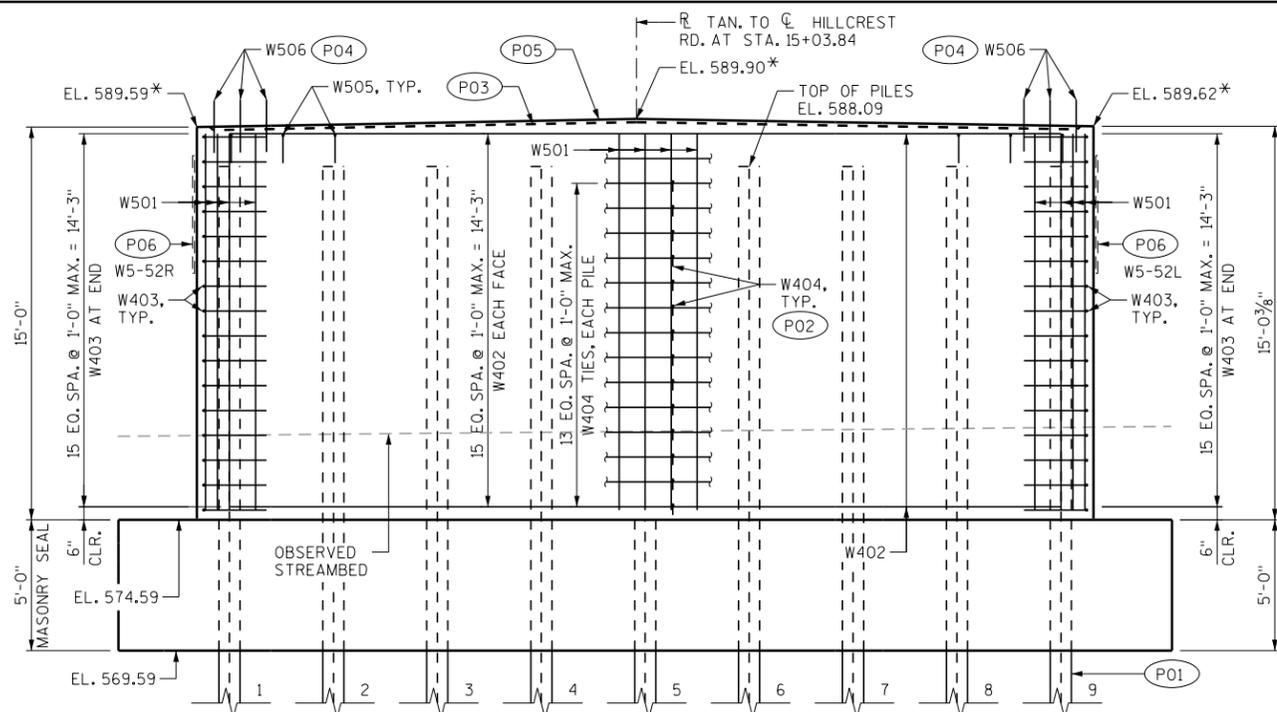
BILL OF BARS - PIER 1

COATED: 80 LBS
UNCOATED: 2,220 LBS

BAR MARK	COAT	NO REQ'D	LENGTH	BENT	BAR SERIES	LOCATION
W501		72	14'-3"			SHAFT - VERTICAL
W402		32	31'-10"			SHAFT - HORIZONTAL
W403		32	6'-0"	X		SHAFT - HORIZONTAL - ENDS
W404		126	3'-0"	X		SHAFT - VERTICAL - TIES
W505		17	4'-4"	X		SHAFT - VERTICAL - TOP
W506	X	34	2'-0"			SHAFT - VERTICAL - DOWELS

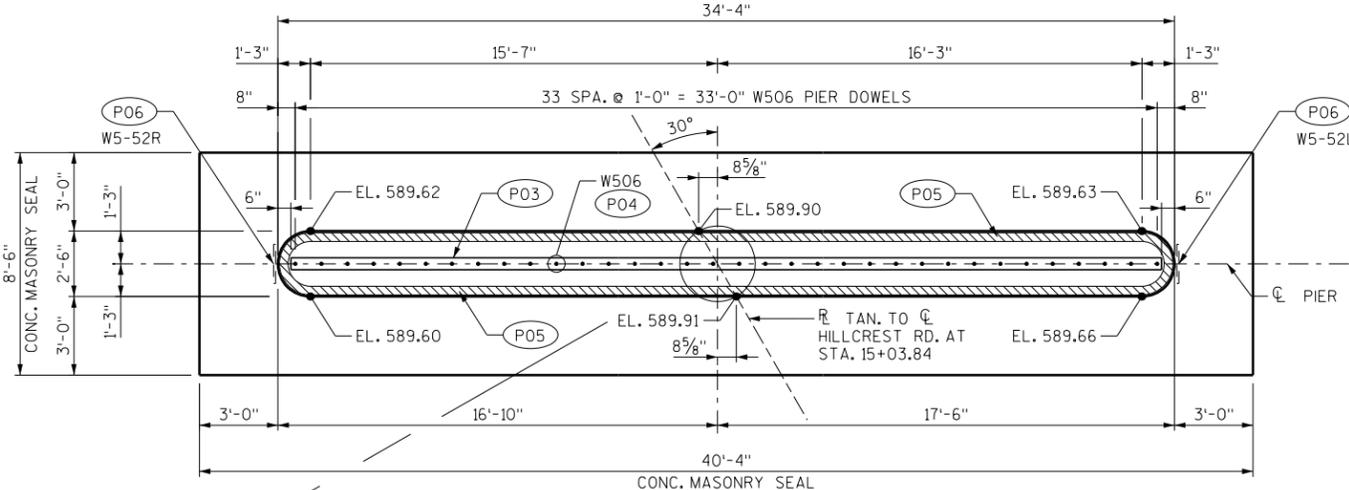


PLAN AT PIER ENDS

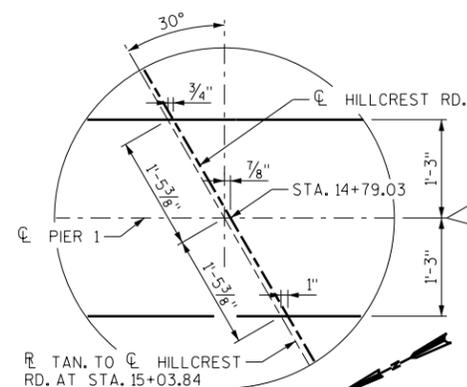


ELEVATION

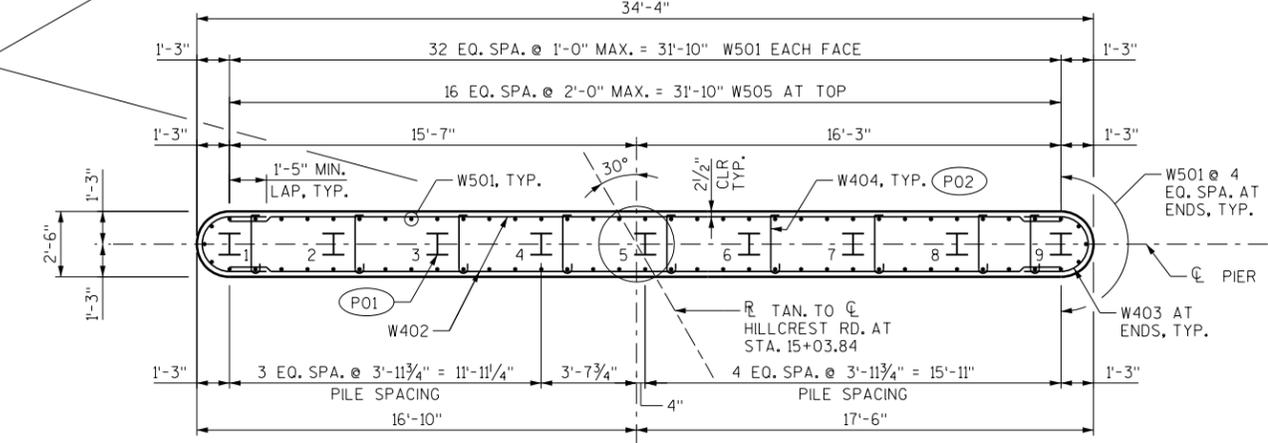
LOOKING EAST
DIMENSIONS ARE AT CENTERLINE OF PIER



PLAN

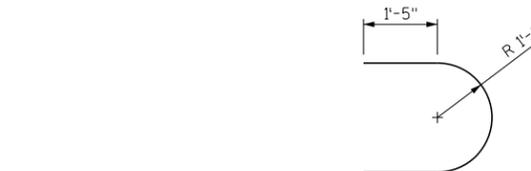


CENTERLINE DETAIL

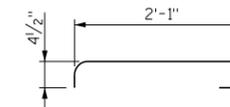


PILE PLAN

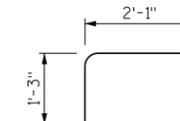
SHOWING SHAFT REINFORCEMENT



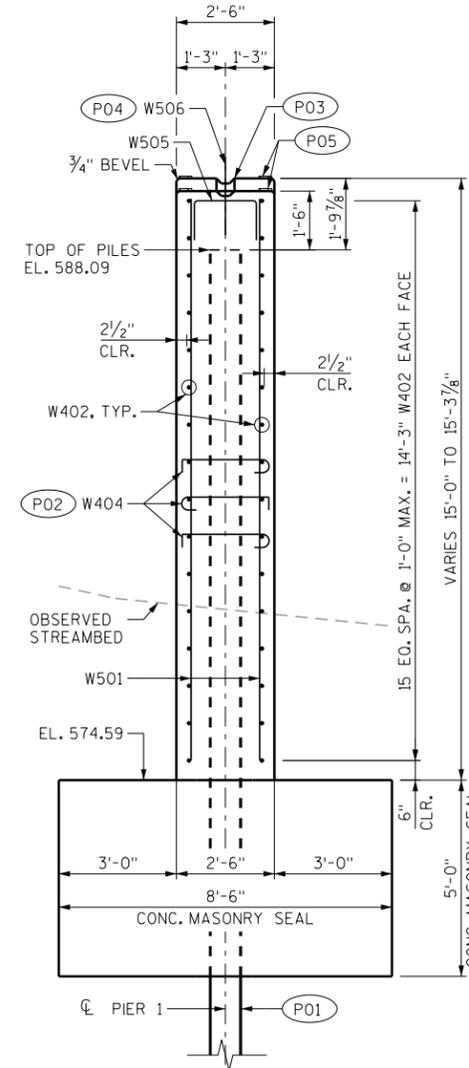
W403



W404



W505



SECTION THRU PIER

LOOKING NORTH, NORMAL TO PIER

LEGEND

- (P01) PIER TO BE SUPPORTED ON PILING STEEL HP 10-INCH X 42 LB DRIVEN TO A REQ'D DRIVING RESISTANCE OF 180 TON PER PILE. ESTIMATED 60'-0" PILE LENGTH.
- (P02) PLACE W404 ADJACENT TO EACH PILE ON ONE SIDE ONLY. TIE TO NEAREST VERTICAL W501. VERTICALLY SPACE AT 1'-0" MAX. TO MATCH W402 OUTSIDE BARS. ALTERNATE THE POSITION OF THE 90° AND 180° HOOKS AT EACH VERTICAL LAYER OF TIES.
- (P03) KEYED CONST. JOINT FORMED BY BEVELED 2" X 6".
- (P04) W506 PIER DOWELS. 2'-0" LONG SPACED AT 1'-0" CENTERS. EMBED 1'-0" INTO CONCRETE. BARS MAY BE PLACED AFTER CONCRETE HAS BEEN POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE.
- (P05) 4" X 3/4" PREFORMED FILLER.
- (P06) 18" X 54" WARNING SIGN (W5-52). FASTEN TO PIER NOSE WITH "DROP-IN CONCRETE ANCHOR 1/2-INCH". 2 DROP-IN ANCHORS PER SIGN REQ'D. SEE SPECIAL PROVISIONS. BOTTOM SIGN EL. = 584.0.

* ELEVATION IS AT CENTERLINE OF PIER. ELEVATIONS NEGLECT THE KEYED CONSTRUCTION JOINT.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
DRAWN BY VJD		PLANS CK'D. FKH	
PIER 1			SHEET 9 OF 14

8

8

NOTES

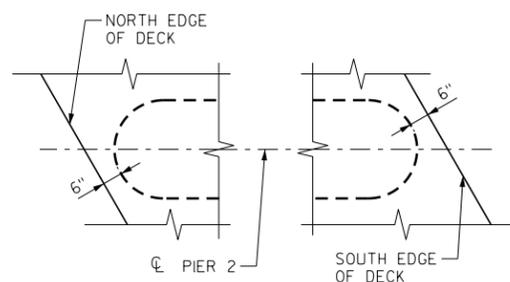
AT PIER 2, COFFERDAM AND COFFERDAM DEWATERING REQUIRED. COFFERDAM SHALL BE DEWATERED PRIOR TO PLACEMENT OF PIER SHAFT CONCRETE.

TOP OF PIER ELEVATIONS ARE 3/4" BELOW BOTTOM OF SLAB TO ALLOW FOR PREFORMED FILLER.

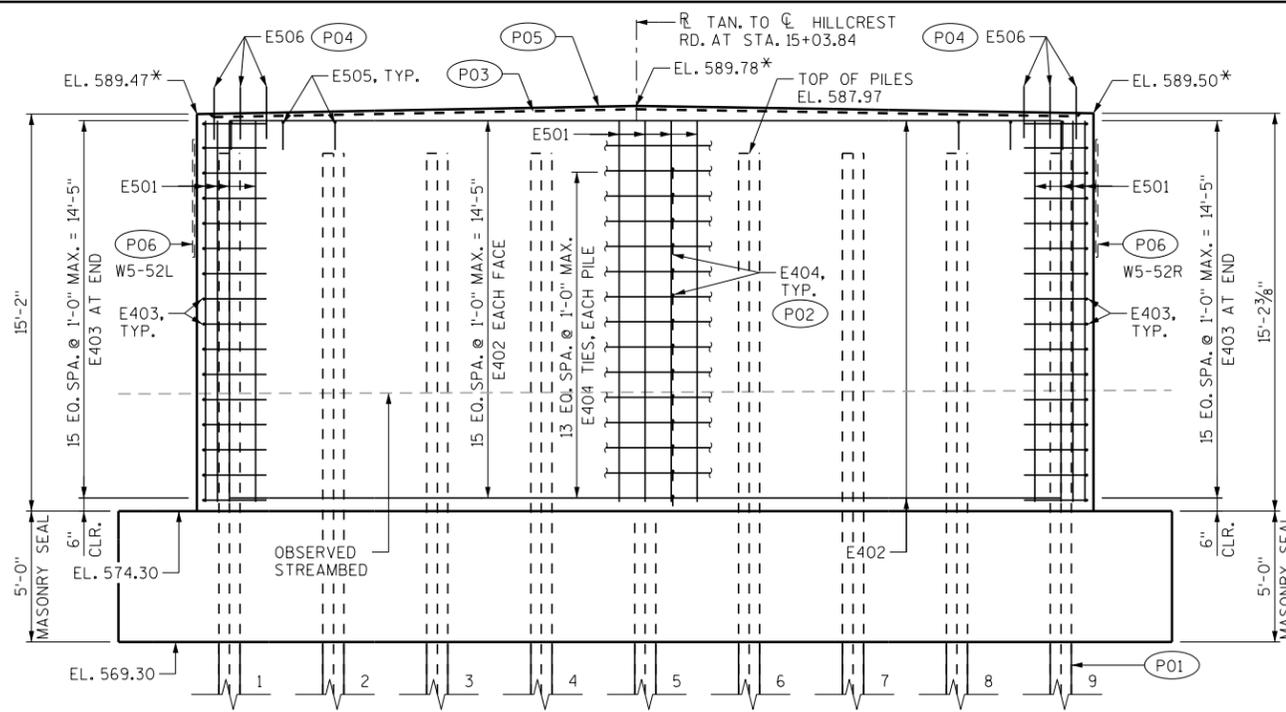
SOME BARS HAVE BEEN OMITTED FOR CLARITY. SEE BILL OF BARS ON THIS SHEET.

FOR PILE SPLICE DETAIL, SEE SHEET 8.

BILL OF BARS - PIER 2						COATED: 80 LBS	UNCOATED: 2,230 LBS
BAR MARK	COAT	NO REQ'D	LENGTH	BENT	BAR SERIES	LOCATION	
E501		72	14'-5"			SHAFT - VERTICAL	
E402		32	31'-10"			SHAFT - HORIZONTAL	
E403		32	6'-0"	X		SHAFT - HORIZONTAL - ENDS	
E404		126	3'-0"	X		SHAFT - VERTICAL - TIES	
E505		17	4'-4"	X		SHAFT - VERTICAL - TOP	
E506	X	34	2'-0"			SHAFT - VERTICAL - DOWELS	

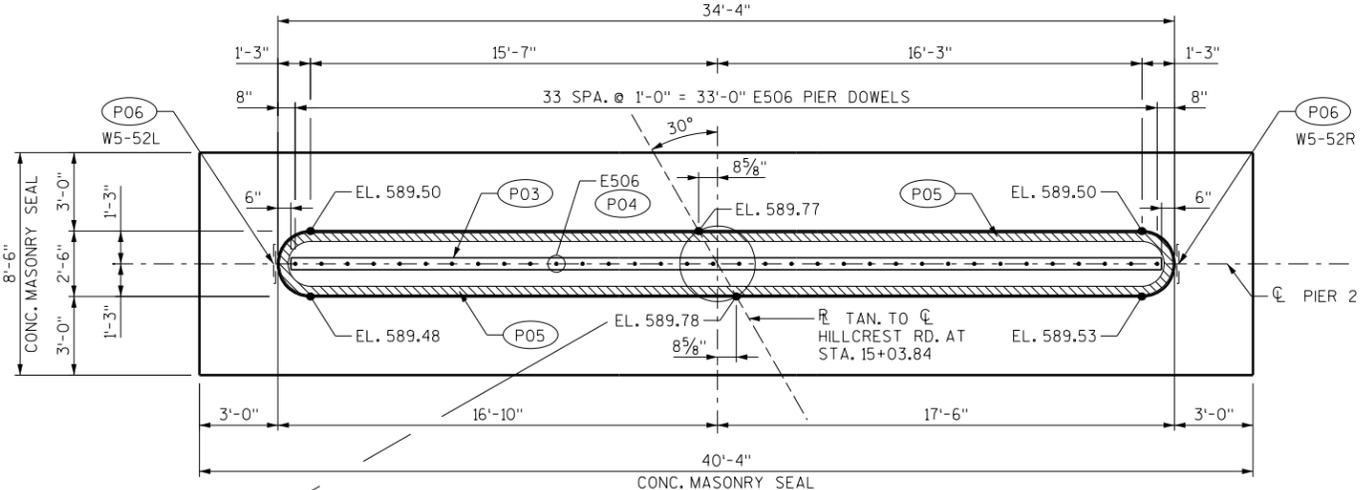


PLAN AT PIER ENDS

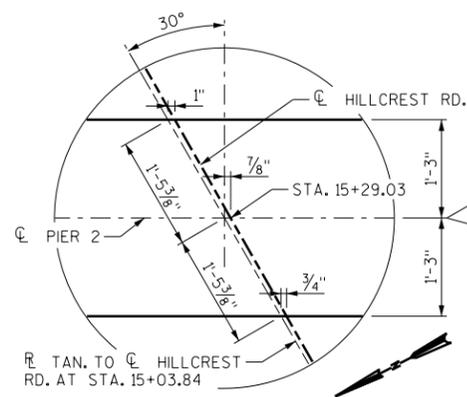


ELEVATION

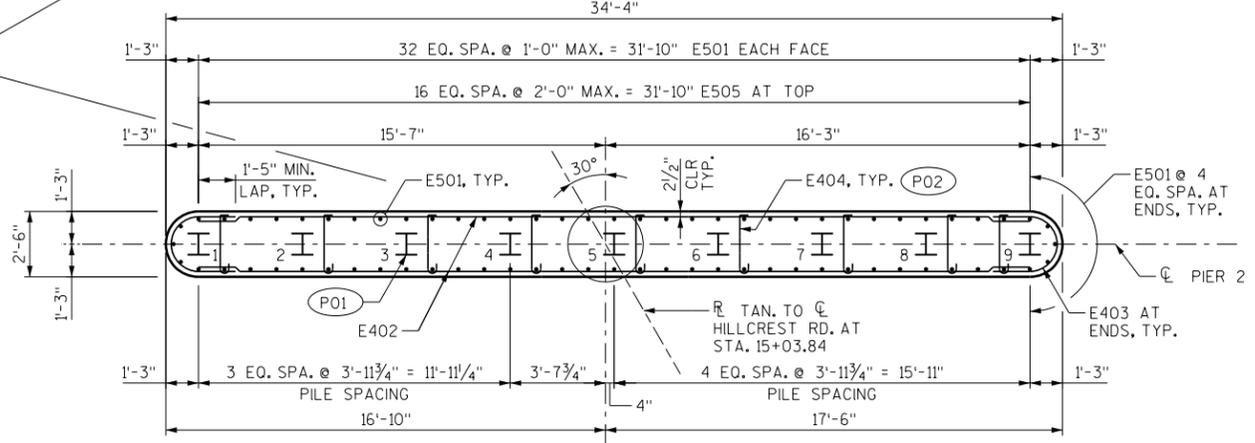
LOOKING EAST
DIMENSIONS ARE AT CENTERLINE OF PIER



PLAN

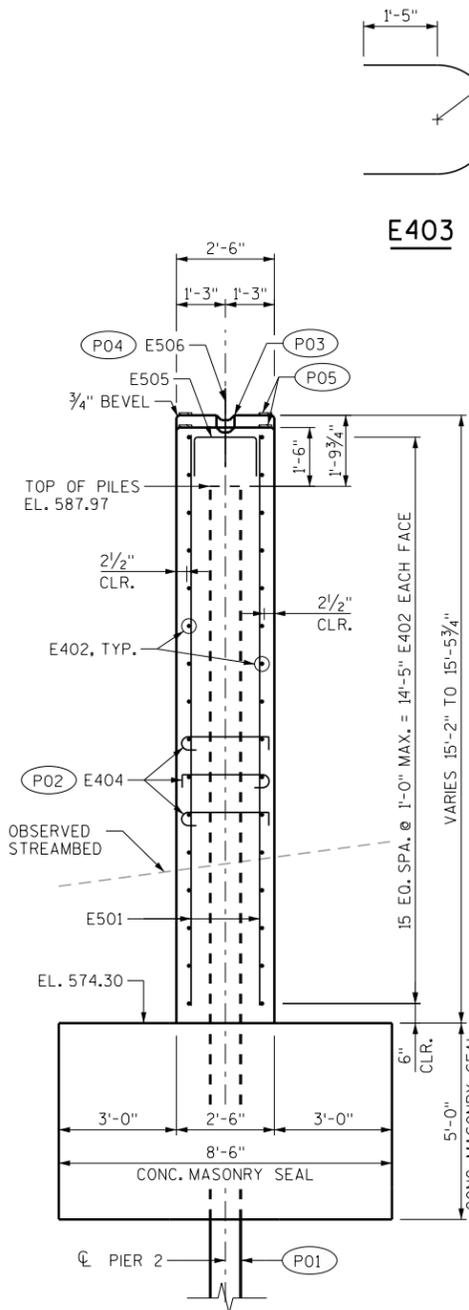


CENTERLINE DETAIL



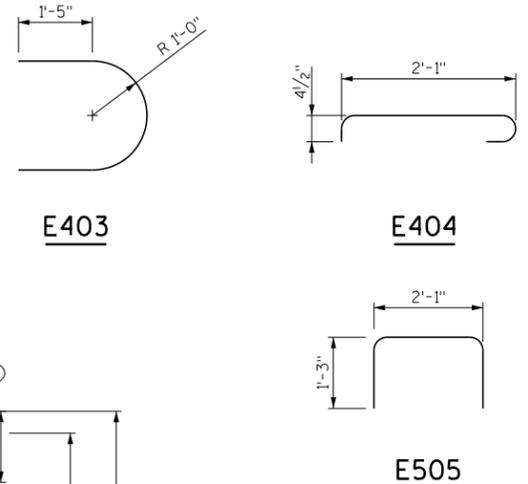
PILE PLAN

SHOWING SHAFT REINFORCEMENT



SECTION THRU PIER

LOOKING NORTH, NORMAL TO PIER



LEGEND

- (P01) PIER TO BE SUPPORTED ON PILING STEEL HP 10-INCH X 42 LB DRIVEN TO A REQ'D DRIVING RESISTANCE OF 180 TON PER PILE. ESTIMATED 55'-0" PILE LENGTH.
- (P02) PLACE E404 ADJACENT TO EACH PILE ON ONE SIDE ONLY. TIE TO NEAREST VERTICAL E501. VERTICALLY SPACE AT 1'-0" MAX. TO MATCH E402 OUTSIDE BARS. ALTERNATE THE POSITION OF THE 90° AND 180° HOOKS AT EACH VERTICAL LAYER OF TIES.
- (P03) KEYED CONST. JOINT FORMED BY BEVELED 2" X 6".
- (P04) W506 PIER DOWELS. 2'-0" LONG SPACED AT 1'-0" CENTERS. EMBED 1'-0" INTO CONCRETE. BARS MAY BE PLACED AFTER CONCRETE HAS BEEN POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE.
- (P05) 4" X 3/4" PREFORMED FILLER.
- (P06) 18" X 54" WARNING SIGN (W5-52). FASTEN TO PIER NOSE WITH "DROP-IN CONCRETE ANCHOR 1/2-INCH". 2 DROP-IN ANCHORS PER SIGN REQ'D. SEE SPECIAL PROVISIONS. BOTTOM SIGN EL. = 584.0.

* ELEVATION IS AT CENTERLINE OF PIER. ELEVATIONS NEGLECT THE KEYED CONSTRUCTION JOINT.

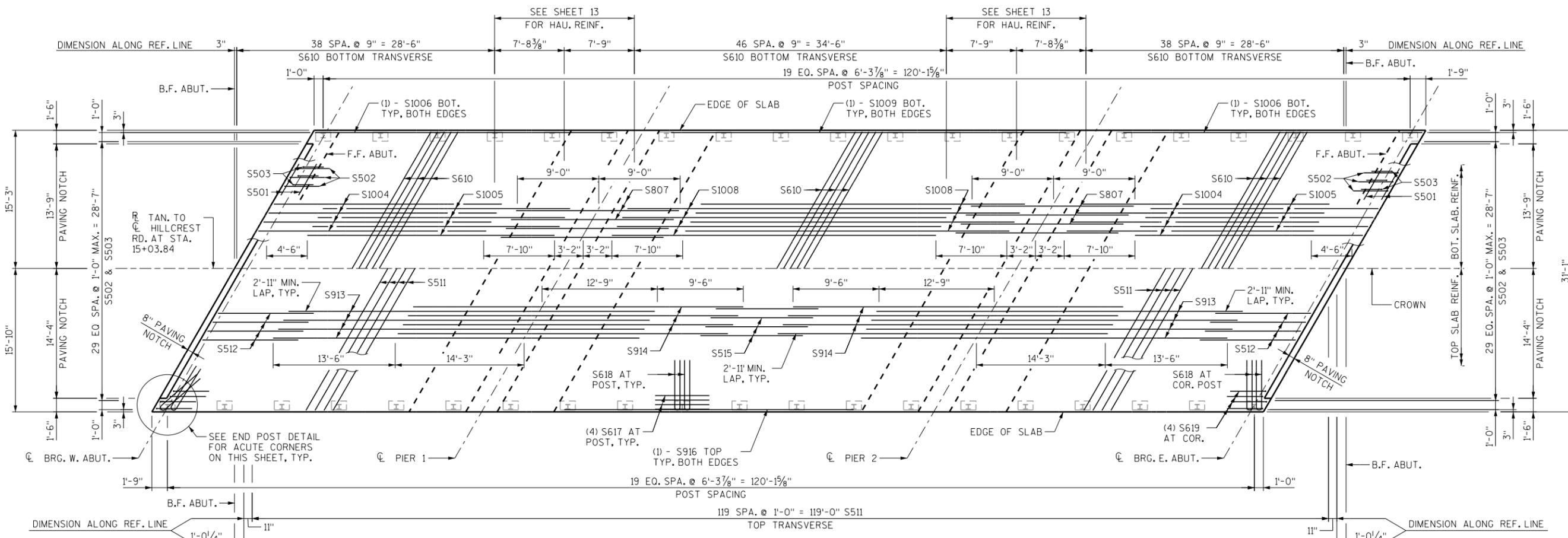
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
DRAWN BY VJD		PLANS CK'D. FKH	
PIER 2			SHEET 10 OF 14

8

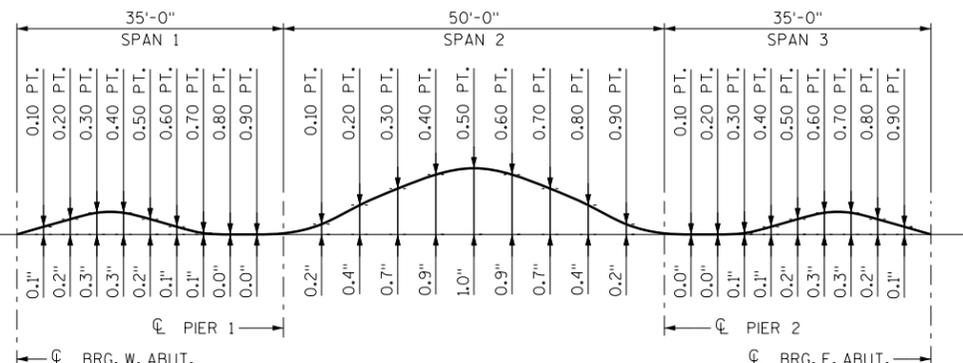
8

TOP OF DECK ELEVATIONS

LOCATION	CL BRG. W. ABUT.	0.10 PT	0.20 PT	0.30 PT	0.40 PT	0.50 PT	0.60 PT	0.70 PT	0.80 PT	0.90 PT	CL PIER 1	0.10 PT	0.20 PT	0.30 PT	0.40 PT	0.50 PT	0.60 PT	0.70 PT	0.80 PT	0.90 PT	CL PIER 2	0.10 PT	0.20 PT	0.30 PT	0.40 PT	0.50 PT	0.60 PT	0.70 PT	0.80 PT	0.90 PT	CL BRG. E. ABUT.
N. EDGE OF DECK	592.06	592.05	592.04	592.04	592.03	592.02	592.01	592.00	591.99	591.98	591.97	591.96	591.95	591.93	591.92	591.91	591.90	591.88	591.87	591.86	591.85	591.84	591.83	591.82	591.82	591.81	591.80	591.79	591.78	591.78	591.77
CROWN	592.39	592.38	592.37	592.36	592.35	592.35	592.34	592.33	592.32	592.31	592.30	592.29	592.27	592.26	592.25	592.23	592.22	592.21	592.20	592.19	592.17	592.17	592.16	592.15	592.14	592.13	592.12	592.12	592.11	592.10	592.09
S. EDGE OF DECK	592.10	592.09	592.08	592.07	592.06	592.05	592.04	592.03	592.02	592.02	592.01	591.99	591.98	591.97	591.95	591.94	591.93	591.92	591.90	591.89	591.88	591.87	591.86	591.85	591.85	591.84	591.83	591.82	591.81	591.80	591.80



REINFORCEMENT PLAN

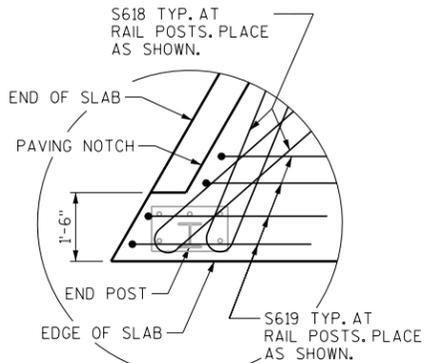


CAMBER DIAGRAM

CAMBER SPANS AS SHOWN TO PROVIDE FOR DEAD LOAD DEFLECTION AND FUTURE CREEP. CAMBER DOES NOT INCLUDE ALLOWANCE FOR FORM SETTLEMENT.

NOTES

- SEE SHEET 13 FOR BILL OF BARS. SOME BARS HAVE BEEN OMITTED FOR CLARITY. SEE SUPERSTRUCTURE DETAIL SHEETS FOR BAR SPACINGS THAT ARE NOT SHOWN ON THIS SHEET.
- TOP TRANSVERSE BARS IN SLAB SHALL BE SUPPORTED BY INDIVIDUAL BAR CHAIRS AT APPROXIMATELY 3'-0" CENTERS EACH WAY. BOTTOM LONGITUDINAL BARS SHALL BE SUPPORTED BY CONTINUOUS BAR CHAIRS AT APPROXIMATELY 4'-0" CENTERS.
- PLACE TRANSVERSE BARS PARALLEL TO THE CENTERLINE OF SUBSTRUCTURE UNITS.
- PRIOR TO RELEASING SLAB FALSEWORK, TAKE TOP OF SLAB ELEVATIONS AT THE CENTERLINE OF ABUTMENTS, PIERS, AND AT 5/10 POINTS TO VERIFY CAMBER. TAKE ELEVATIONS ALONG EDGE OF SLAB AND CROWN OR REFERENCE LINE. RECORD THE ELEVATIONS IN THE TABLE ON THIS SHEET FOR THE "AS BUILT" PLANS.



END POST DETAIL

AT ACUTE CORNERS ONLY

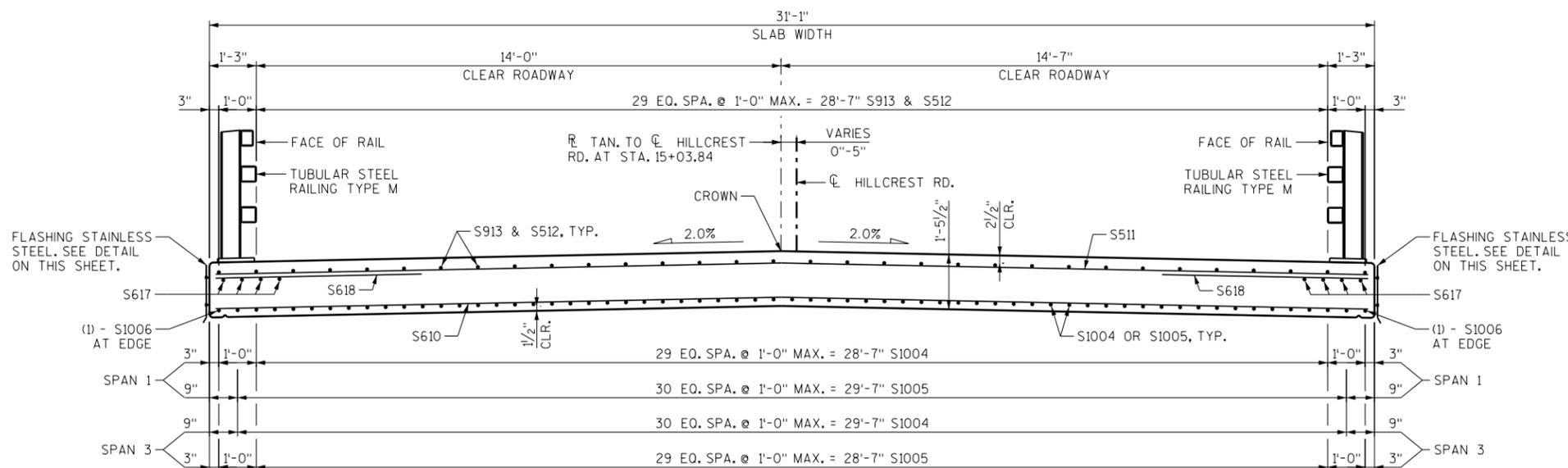
SURVEY TOP OF SLAB ELEVATIONS

	W. ABUT.	0.5 PT	PIER 1	0.5 PT	PIER 2	0.5 PT	E. ABUT.
NORTH EDGE OF SLAB							
CROWN							
SOUTH EDGE OF SLAB							

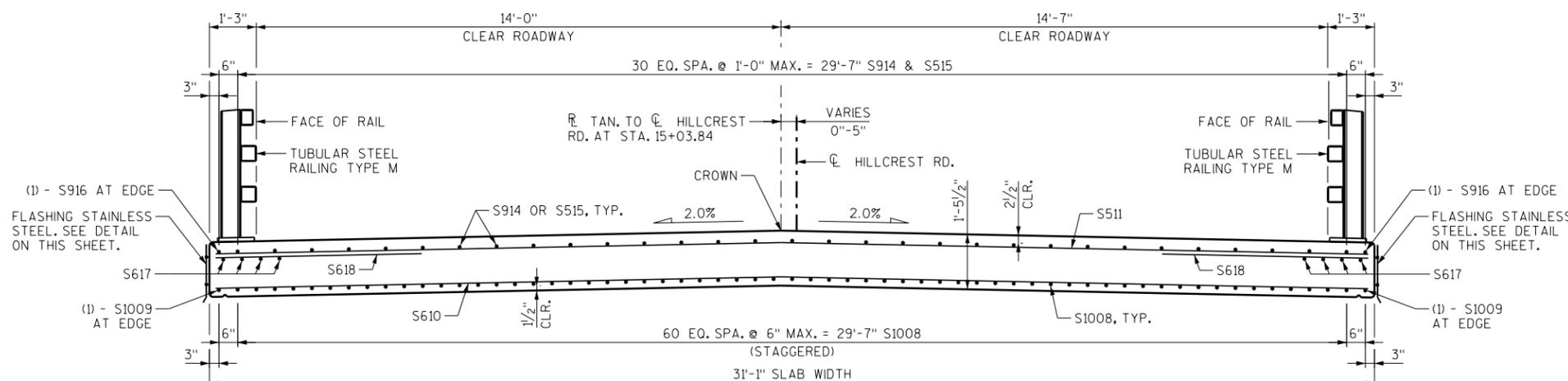
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
DRAWN BY VJD		PLANS CK'D. FKH	
SUPERSTRUCTURE			SHEET 11 OF 14

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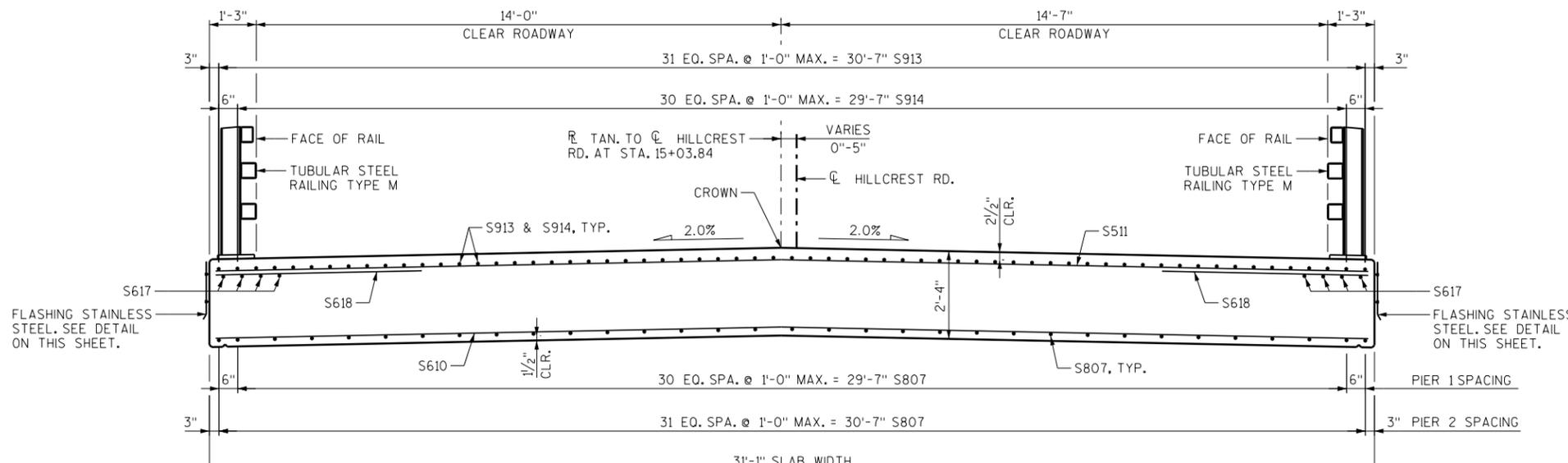
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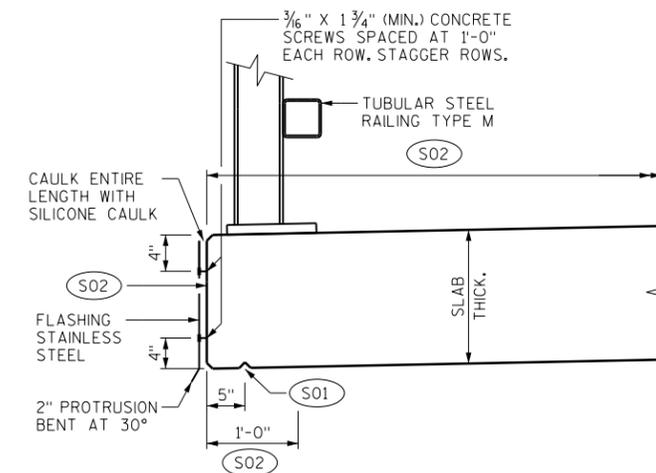
CROSS SECTION THRU BRIDGE - SPANS 1 & 3
IN SPAN LOOKING EAST



CROSS SECTION THRU BRIDGE - SPAN 2
IN SPAN LOOKING EAST



CROSS SECTION THRU BRIDGE - AT PIERS
LOOKING EAST
SHOWING REINFORCEMENT AT PIER 1



TYPICAL EDGE OF DECK DETAIL
SHOWING PROTECTIVE SURFACE TREATMENT AND FLASHING STAINLESS STEEL

LEGEND

- (S01) 3/4" V-GROOVE REQUIRED. EXTEND TO 6" FROM FRONT FACE OF ABUTMENT DIAPHRAGM.
- (S02) COAT WITH "PROTECTIVE SURFACE TREATMENT" AS PER THE STANDARD SPECIFICATIONS. APPLY PRIOR TO INSTALLING FLASHING. SEE NOTES.

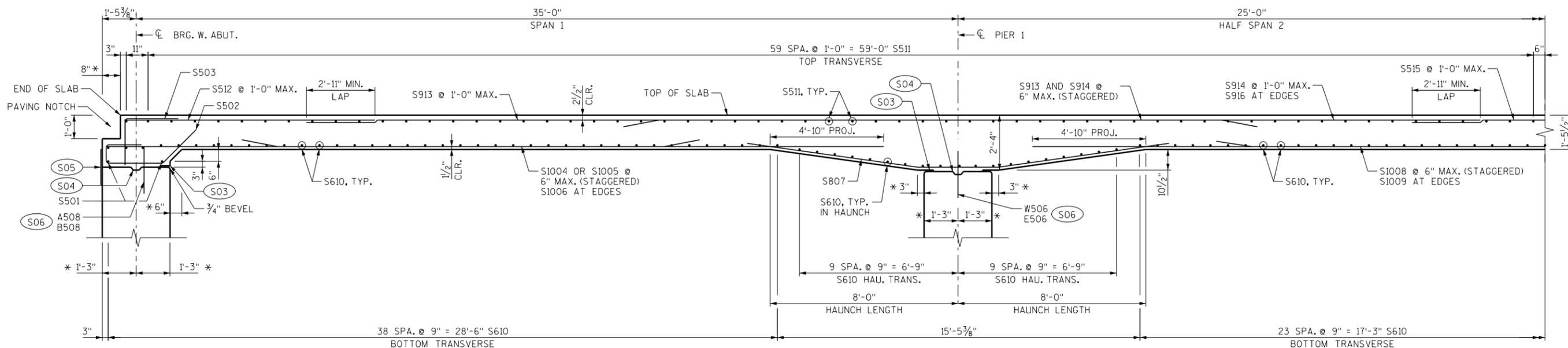
NOTES

- SEE SHEET 13 FOR BILL OF BARS.
- DIMENSIONS ON THIS SHEET ARE NORMAL TO THE REFERENCE LINE.
- TOP TRANSVERSE BARS IN SLAB SHALL BE SUPPORTED BY INDIVIDUAL BAR CHAIRS AT APPROXIMATELY 3'-0" CENTERS EACH WAY. BOTTOM LONGITUDINAL BARS SHALL BE SUPPORTED BY CONTINUOUS BAR CHAIRS AT APPROXIMATELY 4'-0" CENTERS.
- ALL SLAB THICKNESS DIMENSIONS ARE MINIMUM. ANY TOLERANCES NECESSARY TO CORRECT CONSTRUCTION DISCREPANCIES ARE TO BE PLUS (+).
- PLACE TRANSVERSE BARS PARALLEL TO THE CENTERLINE OF THE SUBSTRUCTURE UNITS.
- THE BID ITEM "FLASHING STAINLESS STEEL" SHALL INCLUDE PROVIDING AND INSTALLING THE STAINLESS STEEL FLASHING, SILICONE CAULK, AND 3/16" CONCRETE SCREWS.
- FLASHING TO BE INSTALLED AFTER PROTECTIVE SURFACE TREATMENT APPLICATION.
- CONCRETE SCREWS SHALL BE 410 STAINLESS STEEL.
- EXTEND FLASHING STAINLESS STEEL TO BACK FACE OF ABUTMENT HAUNCHES.
- TOP OF FLASHING STAINLESS STEEL TO BEGIN APPROXIMATELY 1-INCH BELOW TOP OF SLAB SURFACE.
- THE FLASHING IS TO BE A CONSTANT HEIGHT BASED ON THE THINNEST SLAB DEPTH OVER THE BRIDGE LENGTH.

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NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
DRAWN BY VJD		PLANS CK'D. FKH	
SUPERSTRUCTURE DETAILS 1			SHEET 12 OF 14



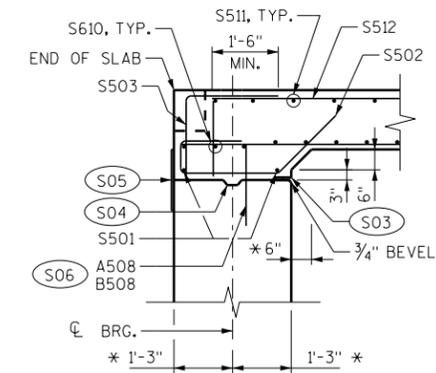
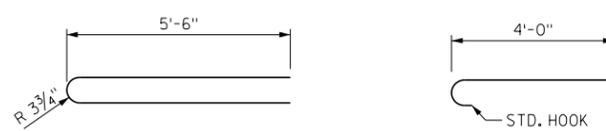
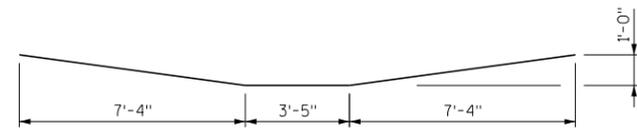
PARTIAL LONGITUDINAL SECTION

DIMENSIONS ARE ALONG REF. LINE UNLESS OTHERWISE NOTED
SYMMETRICAL ABOUT MID-SPAN 2

LEGEND

- (S03) 4" x 3/4" PREFORMED FILLER.
- (S04) KEYED CONST. JOINT FORMED BY BEVELED 2" X 6".
- (S05) 18" RUBBERIZED MEMBRANE WATERPROOFING, SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACK FACE.
- (S06) ABUTMENT & PIER DOWEL BARS. BARS MAY BE PLACED AFTER SUBSTRUCTURE CONCRETE IS POURED BUT BEFORE INTIAL SET HAS TAKEN PLACE. EMBED BARS 1'-0".
- * DIMENSION IS NORMAL TO THE CENTERLINE OF SUBSTRUCTURE.

BILL OF BARS - SUPERSTRUCTURE						COATED: 62,010 LBS	UNCOATED: 0 LBS
BAR MARK	COAT	NO REQ'D	LENGTH	BENT	BAR SERIES	LOCATION	
S501	X	4	35'-5"			ABUT. HAUNCH - HORIZONTAL	
S502	X	64	6'-5"	X		ABUT. HAUNCH - VERTICAL	
S503	X	64	4'-0"	X		ABUT. HAUNCH - VERTICAL	
S1004	X	61	25'-3"			SLAB - BOT. LONGIT. - SPANS 1 & 3	
S1005	X	61	27'-4"			SLAB - BOT. LONGIT. - SPANS 1 & 3	
S1006	X	4	33'-1"			SLAB - BOT. LONGIT. - EDGE - SPANS 1 & 3	
S807	X	65	18'-3"	X		SLAB - BOT. LONGIT. - PIER HAUNCHES	
S1008	X	61	35'-10"			SLAB - BOT. LONGIT. - SPAN 2	
S1009	X	2	43'-8"			SLAB - BOT. LONGIT. - EDGE - SPAN 2	
S610	X	163	35'-5"			SLAB - BOT. TRANS. - ALL SPANS	
S511	X	122	35'-5"			SLAB - TOP TRANS. - ALL SPANS	
S512	X	64	10'-8"			SLAB - TOP LONGIT. - SPANS 1 & 3	
S913	X	64	40'-6"			SLAB - TOP LONGIT. - OVER PIERS	
S914	X	62	36'-6"			SLAB - TOP LONGIT. - OVER PIERS	
S515	X	31	11'-5"			SLAB - TOP LONGIT. - SPAN 2	
S916	X	2	32'-0"			SLAB - TOP LONGIT. - EDGE - SPAN 2	
S617	X	144	6'-0"			SLAB - LONGIT. - AT RAIL POSTS	
S618	X	80	12'-0"	X		SLAB - TRANS. - AT RAIL POSTS	
S619	X	16	4'-8"	X		SLAB - LONGIT. - AT CORNER RAIL POSTS	

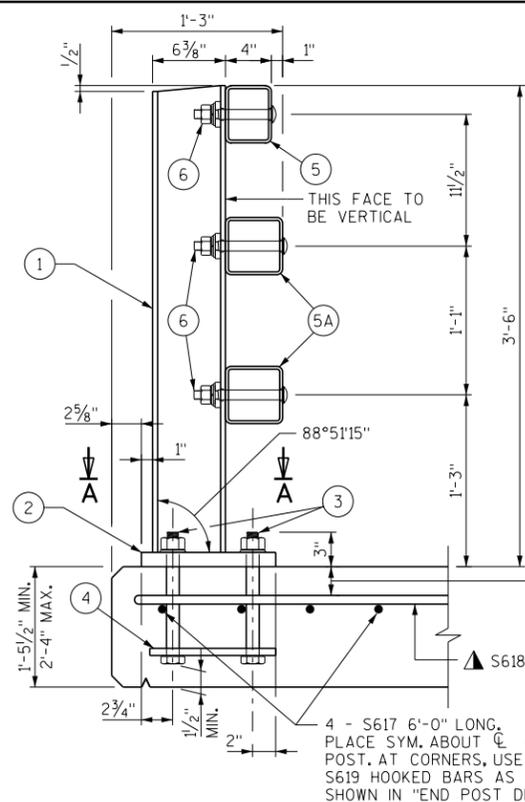


SECTION THRU HAUNCH
AT SLAB CORNERS

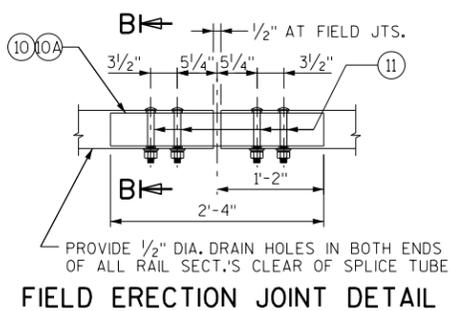
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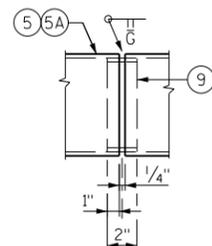
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
DRAWN BY VJD		PLANS CK'D. FKH	
SUPERSTRUCTURE DETAILS 2			SHEET 13 OF 14



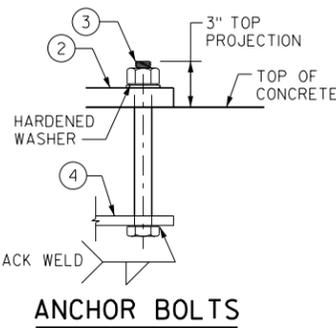
SECTION THRU RAILING ON DECK
FLASHING NOT SHOWN FOR CLARITY



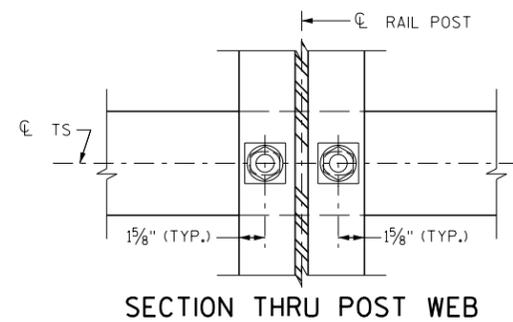
FIELD ERECTION JOINT DETAIL



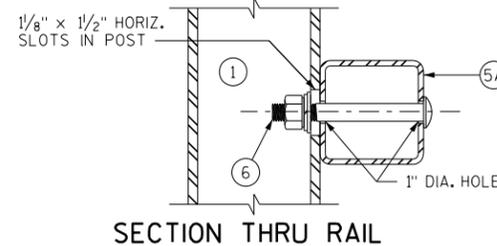
SHOP RAIL SPLICE DETAIL



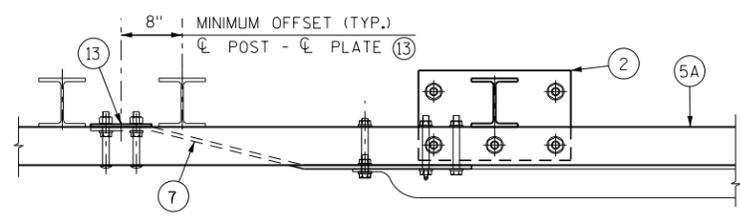
ANCHOR BOLTS



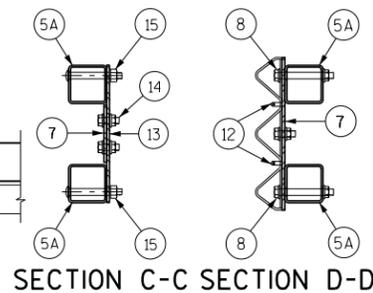
SECTION THRU POST WEB



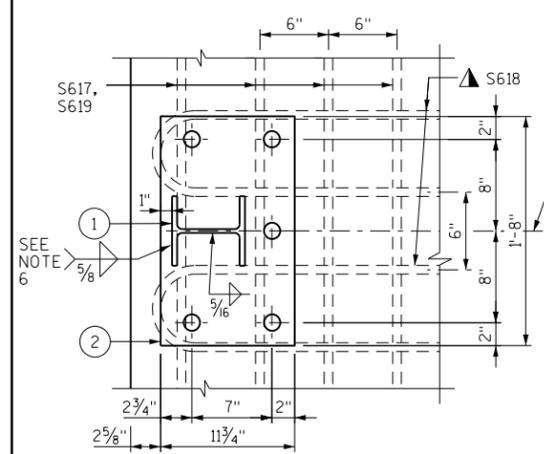
SECTION THRU RAIL
NOTE: CONNECTIONS AT LOWER RAILS SHOWN. CONNECTIONS AT TOP RAIL SIMILAR.
TYPICAL RAIL TO POST CONNECTIONS



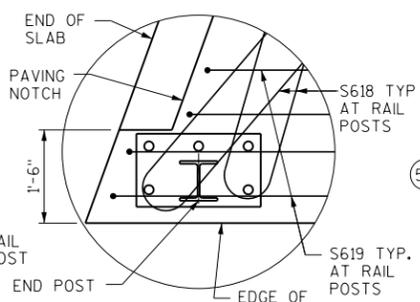
TOP VIEW AT END POST
THREE BEAM RAIL ATTACHMENT



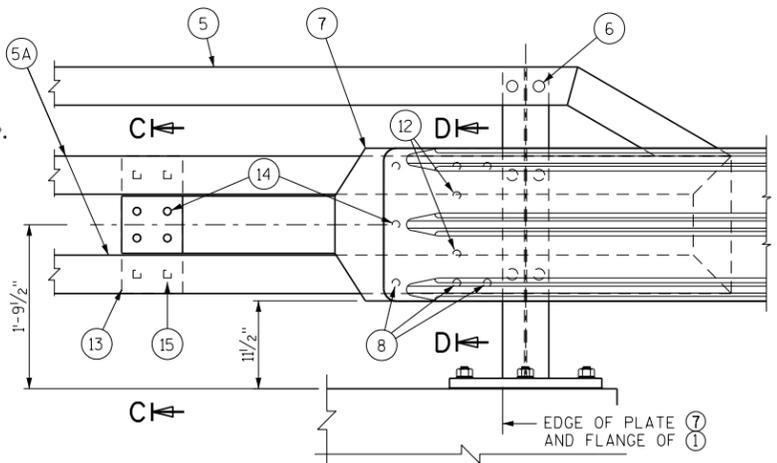
SECTION C-C SECTION D-D



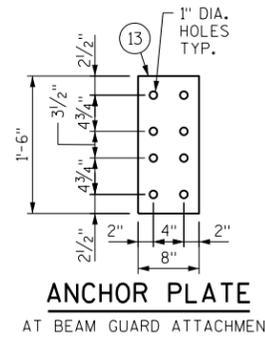
SECTION A-A



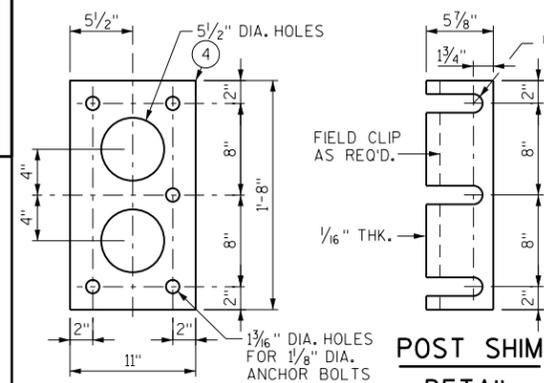
END POST DETAIL



DETAIL AT END POST
THREE BEAM RAIL ATTACHMENT



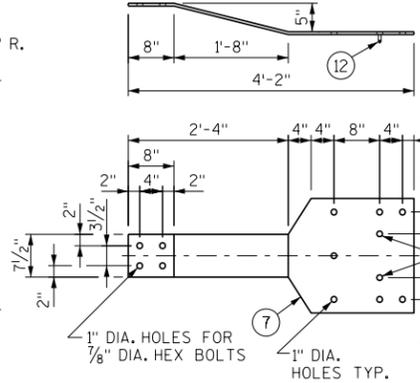
ANCHOR PLATE
AT BEAM GUARD ATTACHMENT



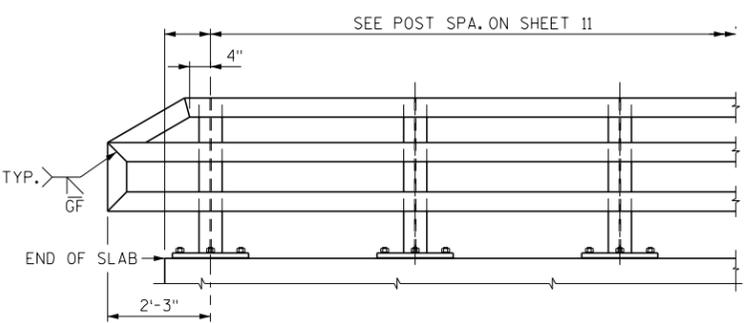
ANCHOR PLATE



POST SHIM



BACK-UP PLATE DETAIL



PART ELEVATION OF RAILING

LEGEND

- ① W6 x 25 WITH 1/8" x 1/2" HORIZ. SLOTS ON EACH SIDE OF POST FOR BOLT NO. 6. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY. PLACE POST VERTICAL. PLACE POSTS NORMAL TO GRADE LINE.
- ② PLATE 1/4" x 1 3/4" x 1'-8" WITH 1 7/8" DIA. OVERSIZED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1 AS SHOWN.
- ③ ASTM A449 - 1/8" DIA. ANCHOR BOLTS WITH NUT AND HARDENED WASHER (ALL GALVANIZED), 5 REQ'D. PER POST. THREAD 3" AND PLACE NORMAL TO PLATE NO. 2. CHAMFER TOP OF BOLTS BEFORE THREADING. USE 1'-9" LONG IN ABUTMENT WINGS. AT POSTS ON CONCRETE SLAB SUPERSTRUCTURES WHERE THE SLAB THICKNESS IS > 16" USE 1'-3" LONG. USE 10 3/4" LONG AT ALL OTHER LOCATIONS. (AN EQUIVALENT THREADED ROD WITH NUTS AND HARDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINGS IF REQ'D. FOR CONSTRUCTABILITY.)
- ④ 5/8" x 11" x 1'-8" ANCHOR PLATE (GALVANIZED) WITH 1 3/8" DIA. HOLES FOR ANCHOR BOLTS NO. 3
- ⑤ TS 5 x 4 x 0.25 STRUCTURAL TUBING. ATTACH TO NO. 1 WITH NO. 6.
- ⑤A TS 5 x 5 x 0.25 STRUCTURAL TUBING. ATTACH TO NO. 1 WITH NO. 6.
- ⑥ 7/8" DIA. A325 SLOTTED ROUND HEAD BOLT WITH NUT, 3/16" x 1 5/8" x 1 5/8" MIN. WASHER, AND LOCK WASHER (2 REQ'D. AT EACH RAIL TO POST LOCATION.)
- ⑦ 1/2" THK. BACK-UP PLATE WITH 2 - 7/8" x 1/2" THREADED SHOP WELDED STUDS (NO. 12). BOLT TO RAIL AS SHOWN IN DETAIL. REQUIRED AT THREE BEAM GUARD RAIL ATTACHMENTS ONLY. PLACE SYMMETRICALLY ABOUT TUBES NO. 5A.
- ⑧ 1" DIA. HOLES IN PLATE NO. 7 & TUBES NO. 5A FOR 7/8" DIA. A325 BOLTS WITH HEX NUTS AND WASHERS. 6 HOLES IN TUBES AND PLATE NO. 7.
- ⑨ SPLICE SLEEVE FABRICATED FROM 1/4" PLATE. PROVIDE "SLIDING FIT".
- ⑩ 3/8" x 3 5/8" x 2'-4" PLATE. 2 PER RAIL. USED IN NO. 5 & 5A.
- ⑩A 3/8" x 2 5/8" x 2'-4" PLATE USED IN NO. 5, 3/8" x 3 5/8" x 2'-4" PLATE USED IN NO. 5A. 2 PER RAIL.
- ⑪ 7/8" DIA. A325 ROUND HEAD BOLT WITH NUT, WASHER, AND LOCK WASHER. USE 1 1/8" x 1 1/4" LONGIT. SLOTTED HOLES AT FIELD JOINTS AND 1 1/8" x 2 1/4" MIN. LONGIT. SLOTTED HOLES AT EXP. JOINTS IN PLATE NO. 10A.
- ⑫ 7/8" DIA. x 1/2" LONG THREADED SHOP WELDED STUDS (2 REQ'D.)
- ⑬ 3/8" x 8" x 1'-6" PLATE. BOLT TO RAIL AS SHOWN IN DETAIL. REQ'D. AT THREE BEAM GUARD RAIL ATTACHMENTS ONLY. PLACE SYM. ABOUT TUBES NO. 5A.
- ⑭ 7/8" DIA. x 2" LONG A325 HEX BOLT WITH NUT AND WASHER (5 REQ'D.).
- ⑮ 1" DIA. HOLES IN TUBES NO. 5A FOR 7/8" DIA. A325 ROUND HEAD BOLT WITH NUT, WASHER AND LOCK WASHER (4 REQ'D.). 4 HOLES IN TUBES.

GENERAL NOTES

1. BID ITEM SHALL BE "RAILING TUBULAR TYPE M" WHICH INCLUDES ALL ITEMS SHOWN.
2. RAIL POST AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 50. HOLLOW RAILING STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B OR C WITH A CERTIFIED FY = 50 KSI. ANCHOR PLATES, AND SPLICE TUBE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 36.
3. THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.
4. RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF THREE (3) POSTS WITHOUT SPLICES WHERE POSSIBLE. RAILS SHALL BE SPLICED IN A PANEL OVER EXPANSION JOINTS.
5. ENDS OF TUBE SECTIONS SHALL BE SAWED. GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.
6. WELD IS THE SAME ON BOTH FLANGES. FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING.
7. FILL BOLT SLOT OPENINGS IN POST SHIMS AND PLATE NO. 2 AND CAULK AROUND PERIMETER OF PLATE NO. 2 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. STEEL POST SHIMS MAY BE USED UNDER POSTS WHERE REQ'D. FOR ALIGNMENT.
8. POST BASE PLATES SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUT.
9. ALL MATERIAL SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, ALL STEEL RAILING POSTS & STEEL TUBING SHALL BE GIVEN A NO. 6 BLAST CLEANING BY SSPC SPECIFICATIONS.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-36-250			
		DRAWN BY: VJD	PLANS CKD: FKH
TUBULAR STEEL RAILING TYPE 'M'			SHEET 14 OF 14

HILLCREST EARTHWORK SUMMARY

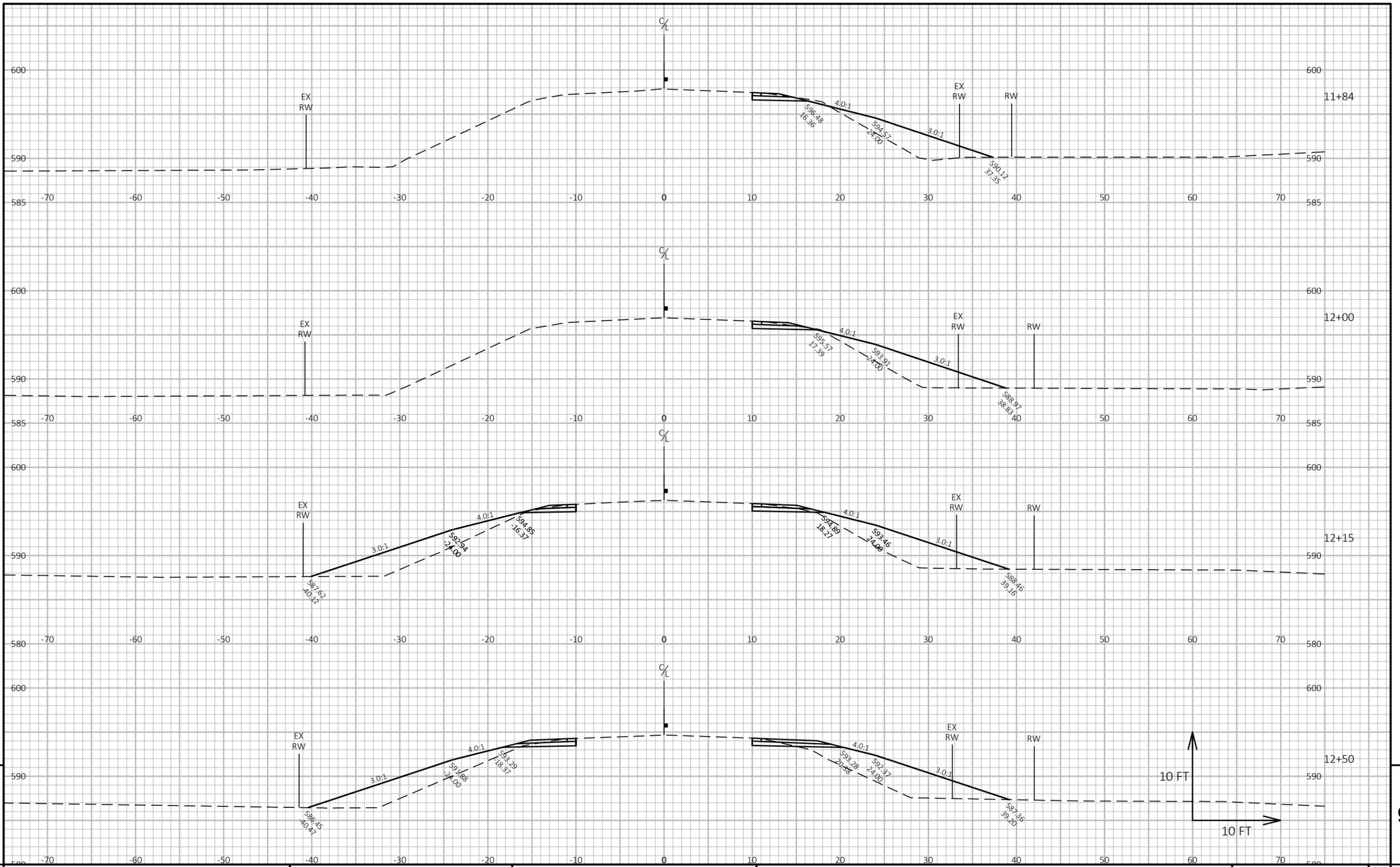
STATION	LOCATION	DISTANCE	AREA (SF)				INCREMENTAL VOL (CY) UNADJUSTED				CUMULATIVE VOL (CY)				MASS ORDINATE
			CUT	EBS	SLAVAGED/UNUSABLE PAVEMENT MATERIAL	FILL	CUT	EBS	SLAVAGED/UNUSABLE PAVEMENT MATERIAL	FILL	CUT 1.00	EBS	SLAVAGED/UNUSABLE PAVEMENT MATERIAL	EXPANDED FILL 1.25	
11+84	LT & RT	0	2.2	0.0	0.0	28.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12+00	LT & RT	16	2.0	0.0	0.0	34.0	1.2	0.0	0.0	18.6	1.2	0.0	0.0	23.2	-21.9
12+14	LT & RT	14	3.5	0.0	0.0	76.7	1.4	0.0	0.0	28.7	2.7	0.0	0.0	59.1	-56.4
12+25	LT & RT	11	3.3	0.0	0.0	80.5	1.4	0.0	0.0	32.0	4.0	0.0	0.0	99.1	-95.1
12+50	LT & RT	25	2.8	0.0	0.0	85.1	2.8	0.0	0.0	76.7	6.8	0.0	0.0	194.9	-188.1
12+75	LT & RT	25	2.1	0.0	0.0	270.7	2.3	0.0	0.0	164.7	9.1	0.0	0.0	400.8	-391.7
13+00	LT & RT	25	1.2	0.0	0.0	384.5	26.5	0.0	0.0	303.3	35.7	0.0	0.0	780.0	-744.3
13+25	LT & RT	25	1.2	0.0	0.0	219.5	1.1	0.0	0.0	279.6	36.7	0.0	0.0	1129.5	-1092.8
13+50	LT & RT	25	2.3	0.0	0.0	66.0	1.6	0.0	0.0	132.2	38.3	0.0	0.0	1294.8	-1256.4
13+75	LT & RT	25	50.2	0.0	0.0	80.1	24.3	0.0	0.0	67.6	62.6	0.0	0.0	1379.3	-1316.7
14+00	LT & RT	25	98.5	0.0	0.0	44.4	68.8	0.0	0.0	57.6	131.4	0.0	0.0	1451.3	-1319.8
14+25	LT & RT	25	41.7	0.0	0.0	24.6	64.9	0.0	0.0	31.9	196.3	0.0	0.0	1491.2	-1294.9
15+75	LT & RT	0	45.8	0.0	0.0	22.1	0.0	0.0	0.0	0.0	196.3	0.0	0.0	1491.2	-1294.9
16+00	LT & RT	25	46.6	0.0	0.0	56.0	42.8	0.0	0.0	36.2	239.1	0.0	0.0	1536.4	-1297.3
16+25	LT & RT	25	49.5	0.0	0.0	44.6	44.5	0.0	0.0	46.6	283.6	0.0	0.0	1594.6	-1311.1
16+50	LT & RT	25	59.5	0.0	0.0	50.6	50.4	0.0	0.0	44.1	334.0	0.0	0.0	1649.7	-1315.7
16+75	LT & RT	25	61.7	0.0	0.0	56.8	56.1	0.0	0.0	49.7	390.1	0.0	0.0	1711.8	-1321.7
17+00	LT & RT	25	56.3	0.0	0.0	65.2	54.6	0.0	0.0	56.5	444.7	0.0	0.0	1782.4	-1337.7
17+25	LT & RT	25	49.4	0.0	0.0	60.4	48.9	0.0	0.0	58.1	493.7	0.0	0.0	1855.1	-1361.4
17+50	LT & RT	25	6.1	0.0	0.0	55.9	25.7	0.0	0.0	53.8	519.4	0.0	0.0	1922.4	-1403.0
17+75	LT & RT	25	4.0	0.0	0.0	53.4	4.7	0.0	0.0	50.6	524.0	0.0	0.0	1985.6	-1461.6
17+93	LT & RT	18	3.8	0.0	0.0	45.7	2.6	0.0	0.0	33.0	526.6	0.0	0.0	2026.9	-1500.3
18+00	LT & RT	7	1.1	0.0	0.0	28.4	0.6	0.0	0.0	9.6	527.2	0.0	0.0	2038.9	-1511.6
18+23	LT & RT	23	1.1	0.0	0.0	25.7	0.9	0.0	0.0	23.0	528.2	0.0	0.0	2067.7	-1539.5

SUBTOTAL

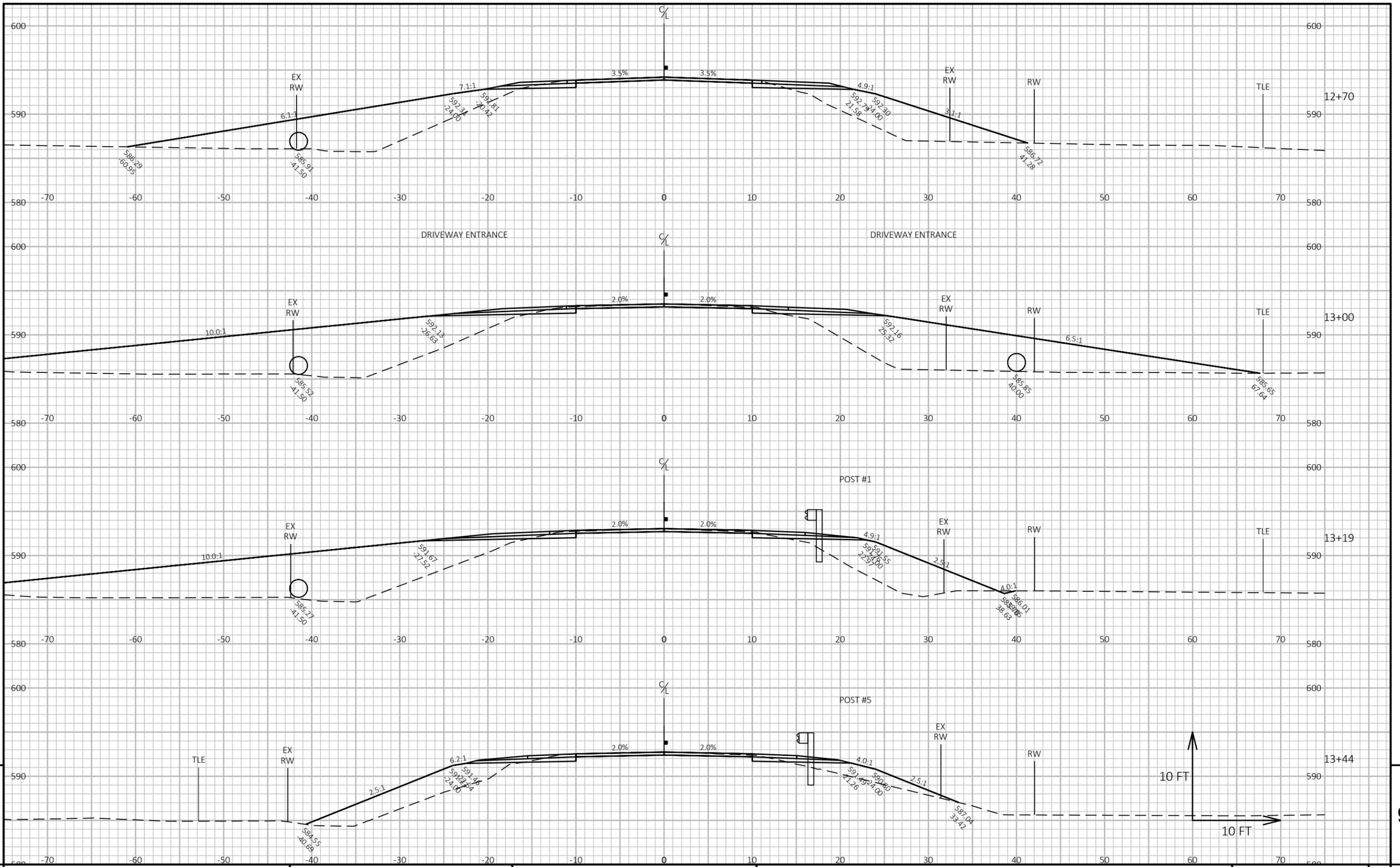
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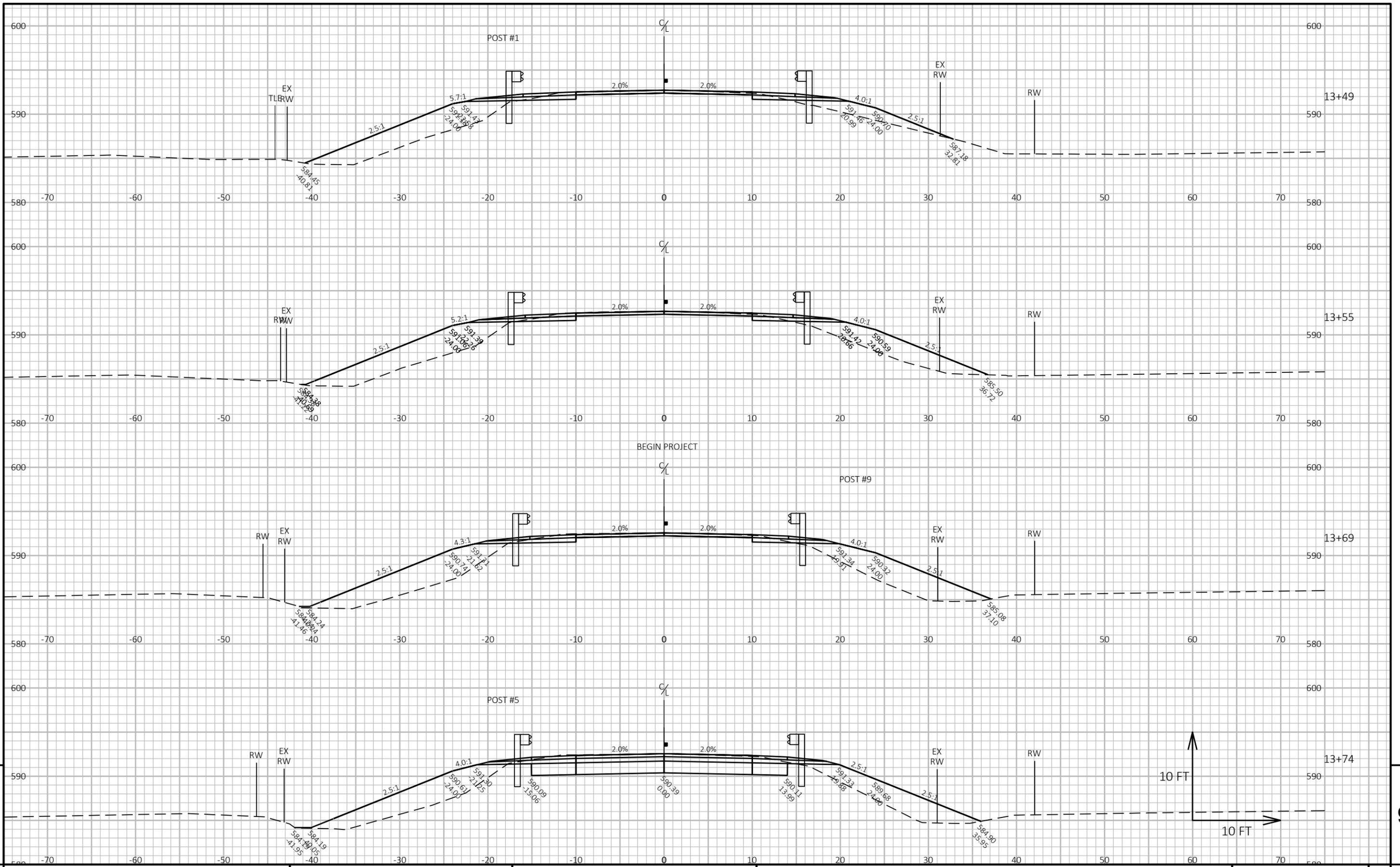
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COUNTY: MANITOWOC

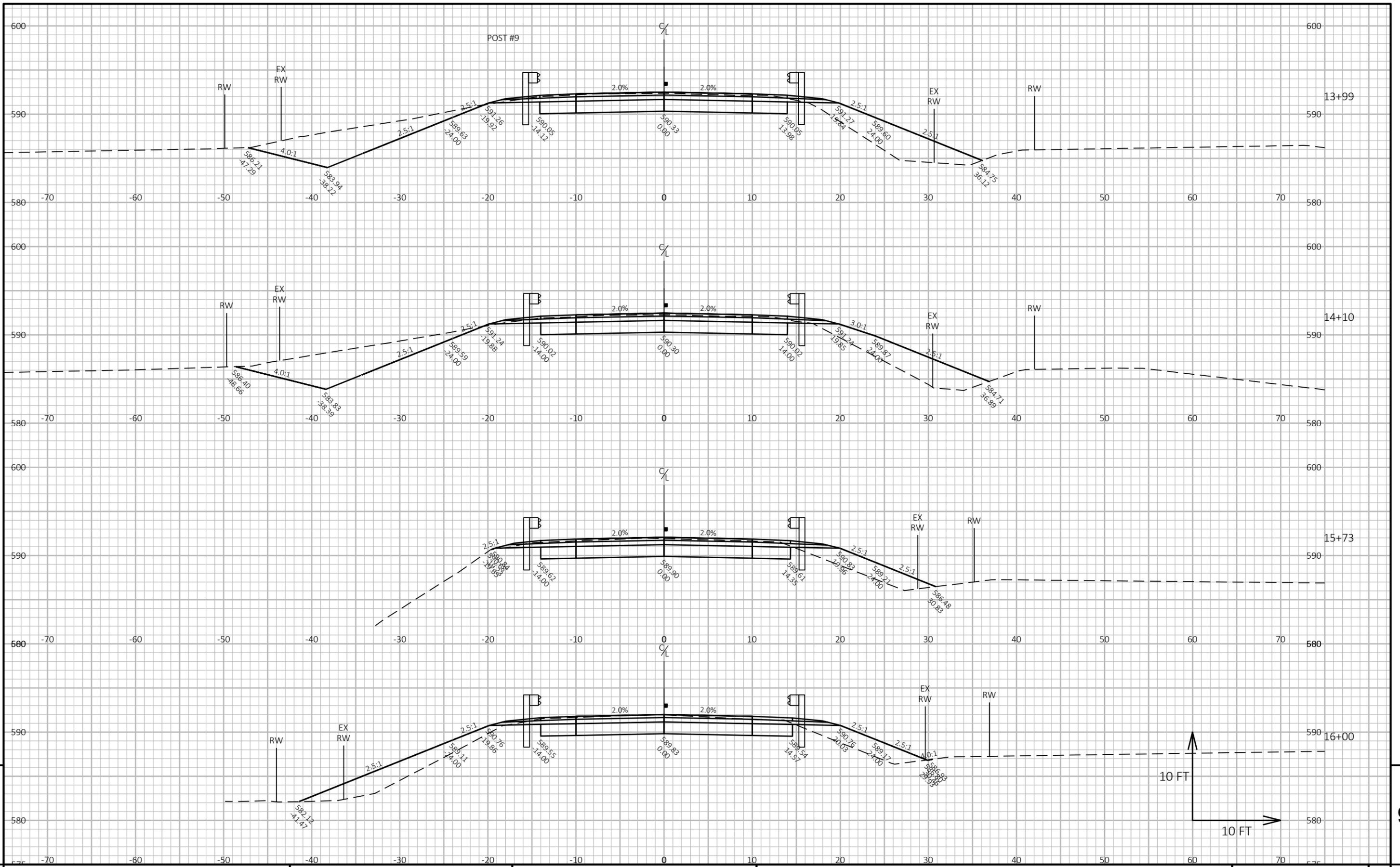
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SHEET

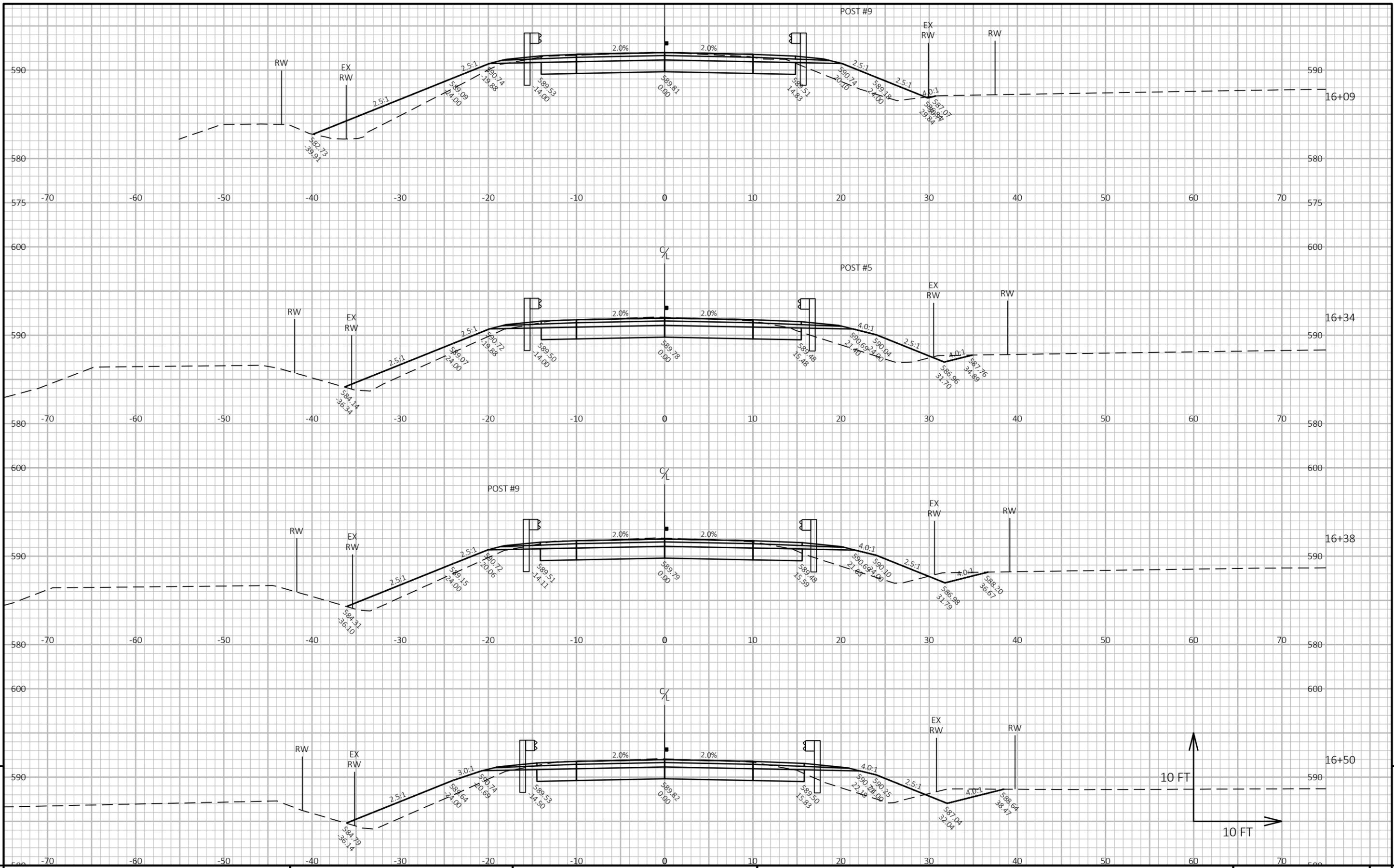
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PROJECT NO: 4305-03-71	HWY: LOCAL STREET	COUNTY: MANITOWOC	CROSS SECTIONS: HILLCREST ROAD	SHEET 9
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PROJECT NO: 4305-03-71 HWY: LOCAL STREET COUNTY: MANITOWOC CROSS SECTIONS: HILLCREST ROAD SHEET 9



PROJECT NO: 4305-03-71

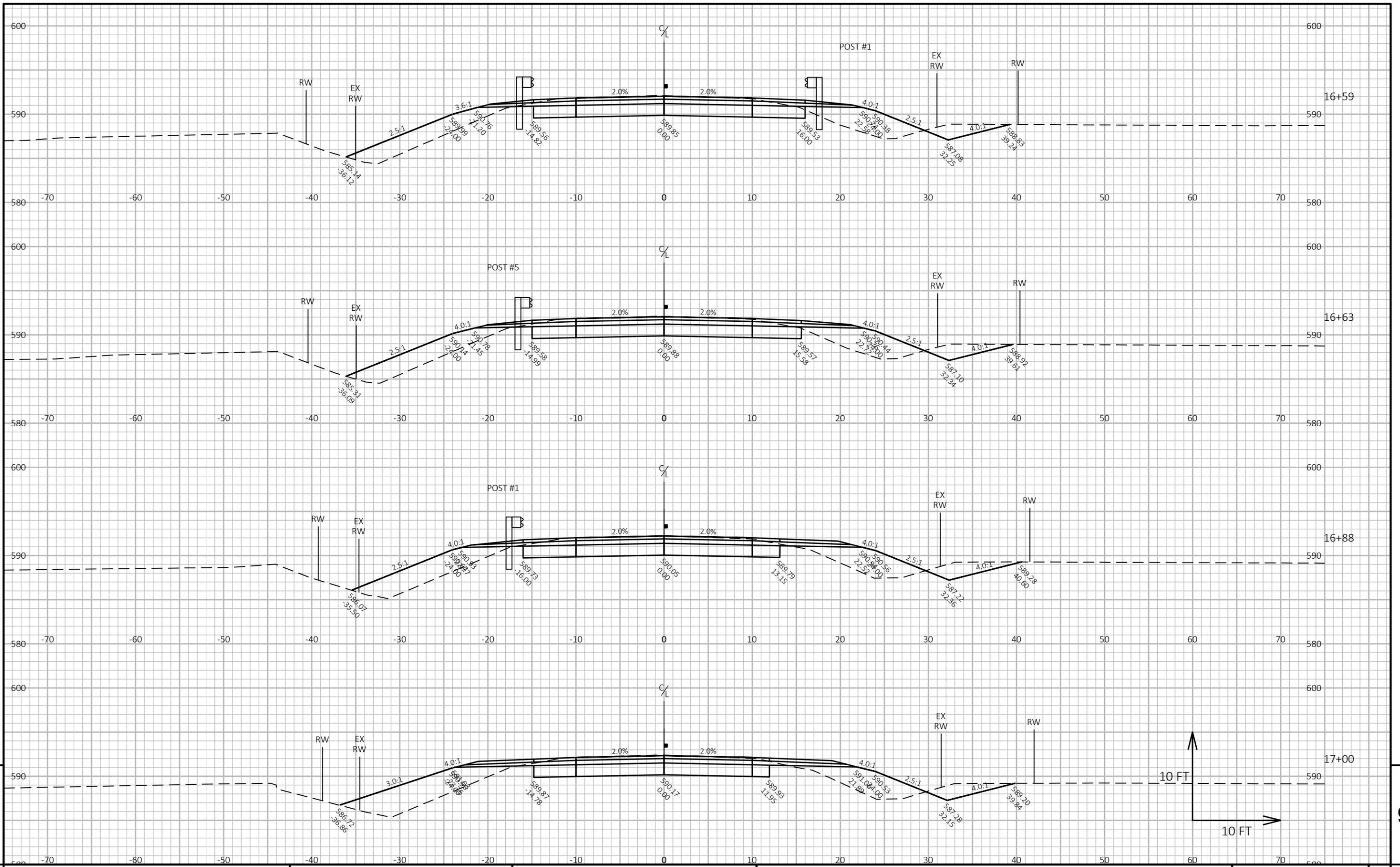
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COUNTY: MANITOWOC

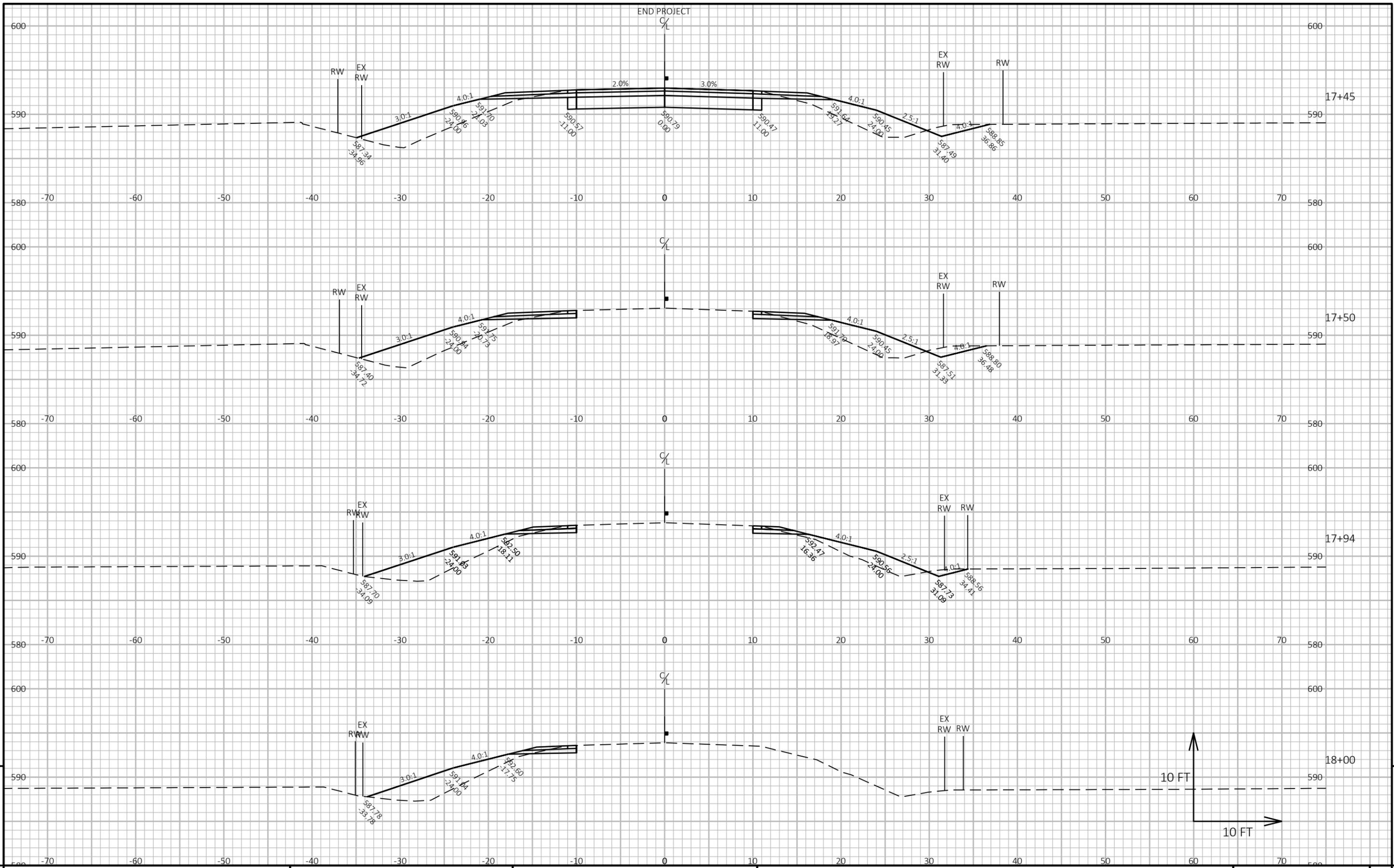
CROSS SECTIONS: HILLCREST ROAD

SHEET

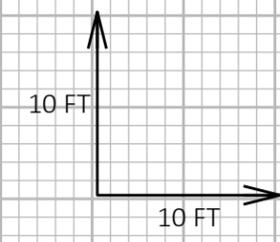
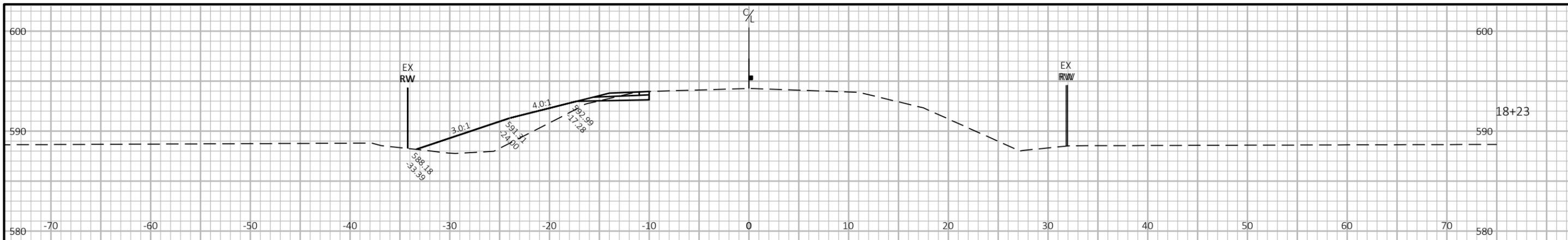
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PROJECT NO: 4305-03-71 HWY: LOCAL STREET COUNTY: MANITOWOC CROSS SECTIONS: HILLCREST ROAD SHEET E



PROJECT NO: 4305-03-71 HWY: LOCAL STREET COUNTY: MANITOWOC CROSS SECTIONS: HILLCREST ROAD SHEET 9

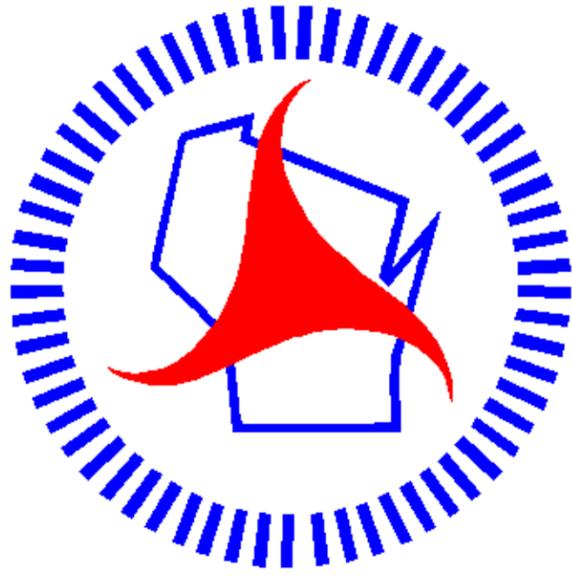


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PROJECT NO: 4305-03-71	HWY: LOCAL STREET	COUNTY: MANITOWOC	CROSS SECTIONS: HILLCREST ROAD	SHEET	E
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Notes



Wisconsin Department of Transportation

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