

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 Plot
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 = 84

PROJECT LOCATION



19

DESIGN DESIGNATION

A.A.D.T.	2020	=	605
A.A.D.T.	2040	=	755
D.H.V.		=	---
D.D.		=	60/40
T.		=	5.8%
DESIGN SPEED		=	35 MPH
ESALS		=	88,000

CONVENTIONAL SYMBOLS

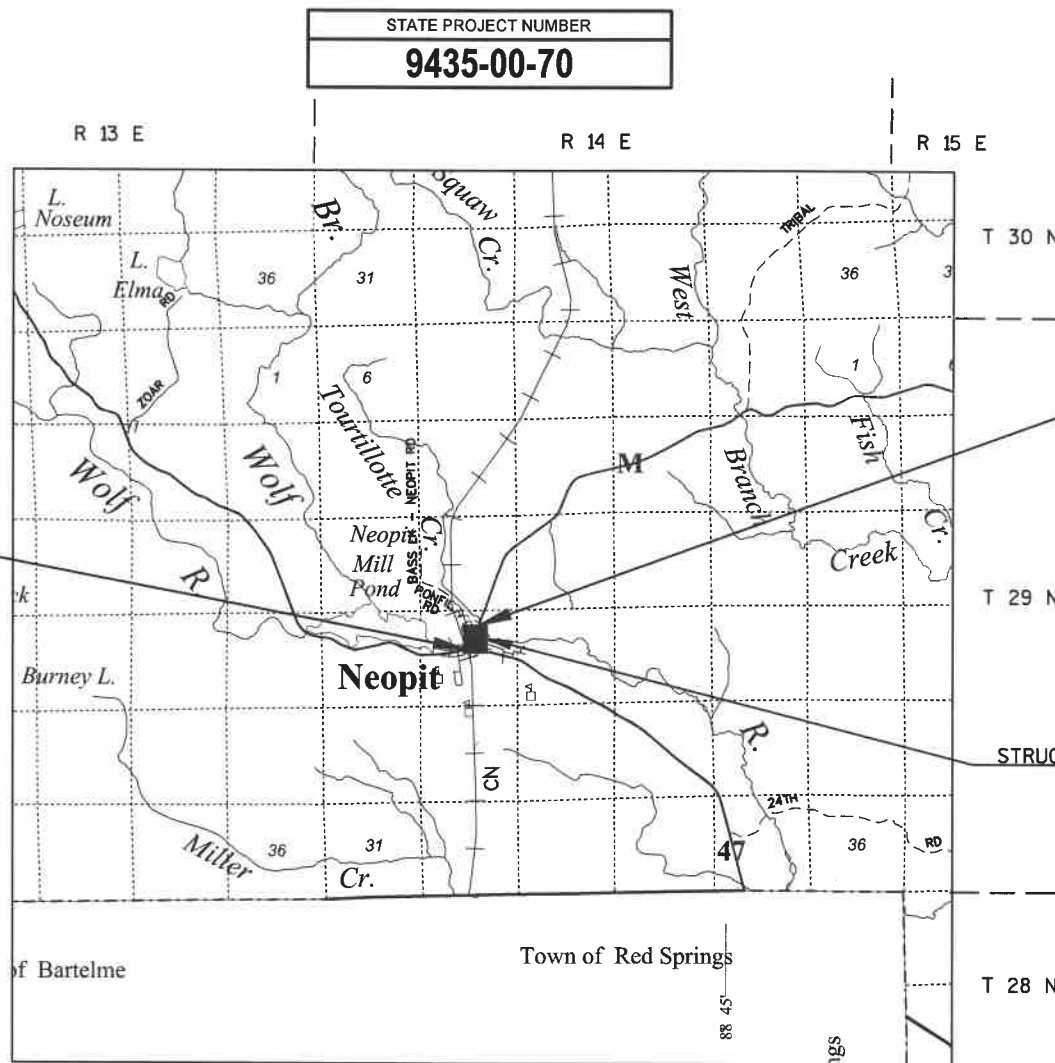
PLAN	
CORPORATE LIMITS	
PROPERTY LINE	
LOT LINE	
LIMITED HIGHWAY EASEMENT	
EXISTING RIGHT OF WAY	
PROPOSED OR NEW R/W LINE	
SLOPE INTERCEPT	
REFERENCE LINE	
EXISTING CULVERT	
PROPOSED CULVERT (Box or Pipe)	
COMBUSTIBLE FLUIDS	
MARSH AREA	
WOODED OR SHRUB AREA	

PROFILE

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	

BEGIN PROJECT STA. 10+65
Y=96633.299
X=239944.536

END PROJECT STA. 12+15



TOTAL NET LENGTH OF CENTERLINE = 0.028 MI.

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COORDINATE REFERENCE SYSTEM (WISCRS), MENOMINEE 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 (2011). GPS DERIVED ELEVATIONS ARE BASED ON GEOID 12A.

STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

STH 47 - STH 55

WEST BRANCH WOLF RIVER BRIDGE

CTH M

MENOMINEE COUNTY

STATE PROJECT NUMBER

9435-00-70

STATE PROJECT

9435-00-70

FEDERAL PROJECT

PROJECT

CONTRACT

ACCEPTED FOR MENOMINEE COUNTY

27 Jun 2019 DATE
J. C. Brown COUNTY HIGHWAY COMMISSIONER

ORIGINAL PLANS PREPARED BY

AYRES ASSOCIATES



6-24-19 (Date)

STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor	AYRES ASSOCIATES
Designer	AYRES ASSOCIATES
Regional Examiner	MICHAEL GRAGE
Regional Supervisor	ROBIN STAFFORD

APPROVED FOR THE DEPARTMENT

DATE: 7/09/2019
(Signature)

E

GENERAL NOTES

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

FILL EXPANSION FACTOR IS 30%.

CONSTRUCT ASPHALTIC SURFACE WITH A 1 3/4" UPPER LAYER AND A 2 1/4" LOWER LAYER. PROPERTY LINES AS SHOWN ARE APPROXIMATE.

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

BEARINGS SHOWN ON THIS PLAN ARE TRUE BEARINGS TO THE NEAREST SECOND.

ALL TIES ON THIS PLAN ARE HORIZONTAL UNLESS DESCRIBED OTHERWISE.

EROSION CONTROL LOCATIONS AS SHOWN ON THE EROSION CONTROL PLAN ARE APPROXIMATE. THE EXACT LOCATIONS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.

DISTURBED AREAS WITHIN THE RIGHT OF WAY, EXCEPT THE AREAS WITHIN THE FINISHED SUBGRADE SHOULDER POINTS ARE TO BE FERTILIZED, SEEDED, AND EROSION MAT AS DIRECTED BY THE ENGINEER.

PRIOR TO ORDERING DRAINAGE PIPES, THE CONTRACTOR WILL VERIFY RELATED DRAINAGE INFORMATION IN THE PLAN WITH THE ENGINEER IN THE FIELD.

ALL ELEVATIONS ON THIS PLAN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF NAVD 88 (2007).

WISDOT WILL FURNISH A BENCHMARK MONUMENT TO BE SET BY THE CONTRACTOR.

SAW CUT LOCATIONS SHOWN ON THE PLAN ARE SUBJECT TO ADJUSTMENT BY THE ENGINEER IN THE FIELD.

UTILITIES

***ALLIANT ENERGY**
708 NE 7TH STREET
MARION, WI 54950
ATTENTION: STEVEN CYCHOSZ
E-MAIL: STEVENCYCHOSZ@ALLIANTENERGY.COM

TELEPHONE 920-290-4102

***FRONTIER COMMUNICATIONS**
26 WEST 12TH STREET
CLINTONVILLE, WI 54929
ATTENTION: JIM JASKOLSKI
E-MAIL: JAMES.JASKOLSKI@FTR.COM

TELEPHONE 715-823-1227

MENOMINEE TRIBAL UTILITY
PO BOX 250
KESHENA, WI 54135
ATTENTION: MARLIN WAUPOOSE
E-MAIL: MWAUPOOSE@MITW.ORG

TELEPHONE 715-853-4897

*-MEMBER OF DIGGERS HOTLINE



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

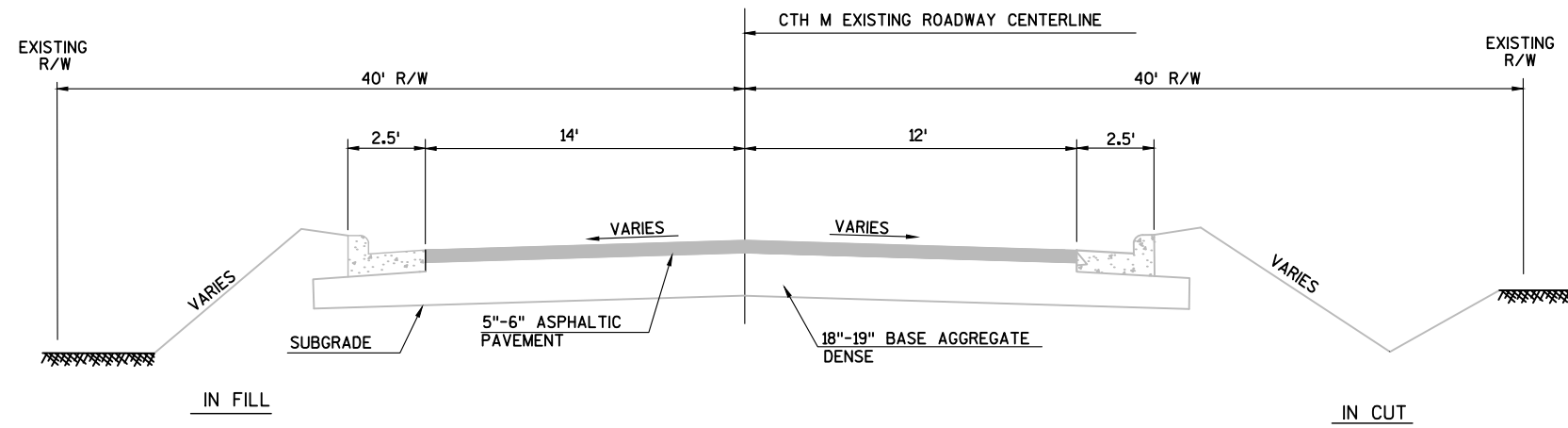
TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = ** ACRES
SOIL GROUP C

DEPARTMENT OF NATURAL RESOURCES

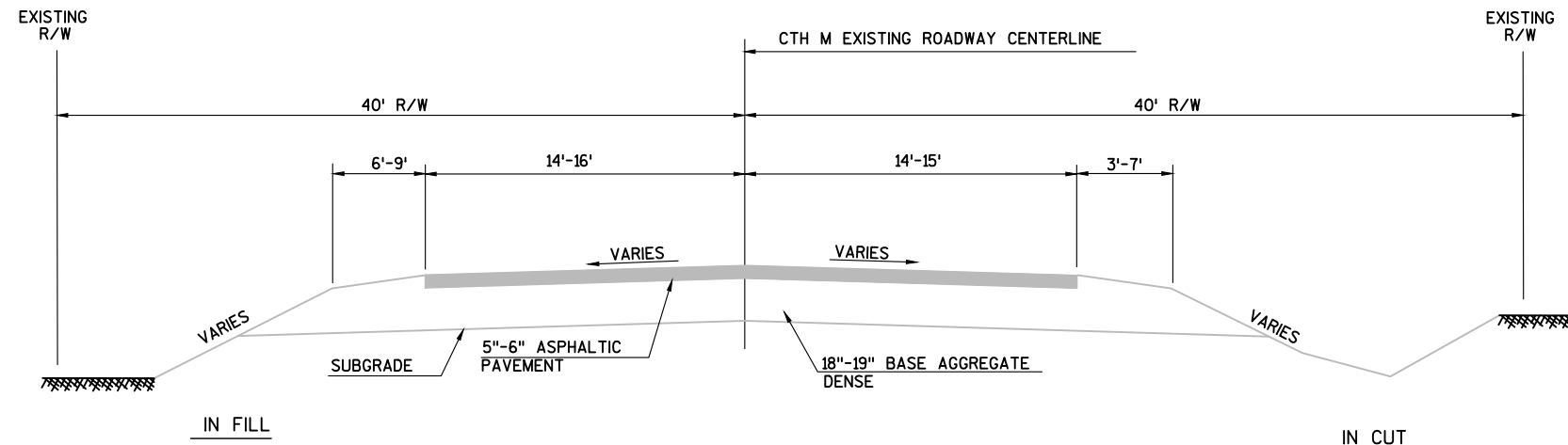
WDNR

TELEPHONE 920-412-0165

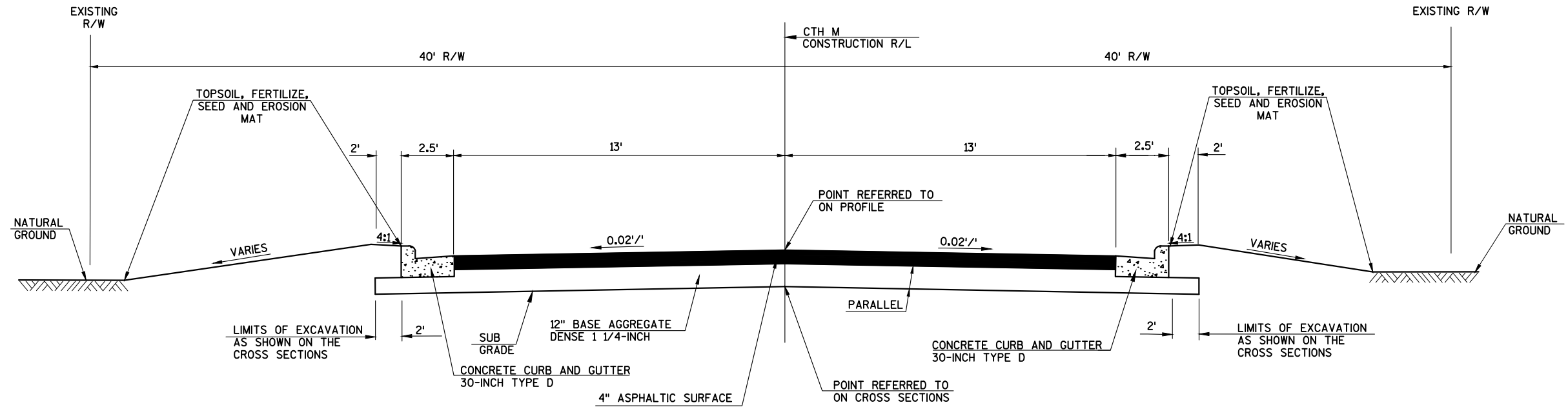
2984 SHAWANO AVE.
GREEN BAY, WISCONSIN 54313
ATTENTION: JIM DOPERALSKI
E-MAIL: JAMES.DOPERALSKI@WISCONSIN.GOV



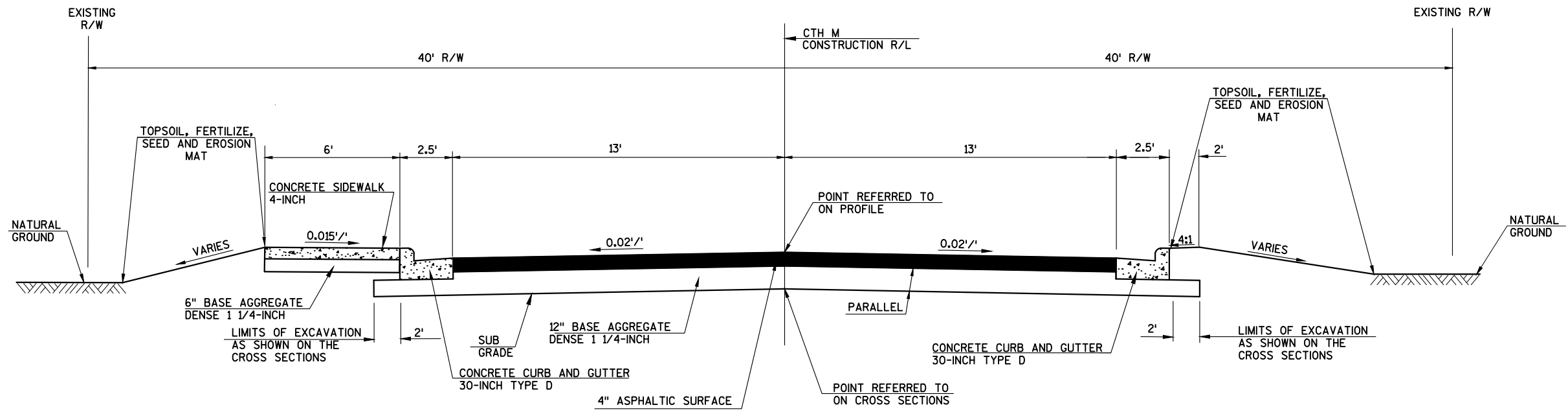
TYPICAL EXISTING SECTION FOR CTH M
 STA. 10+65-STA. 11+14



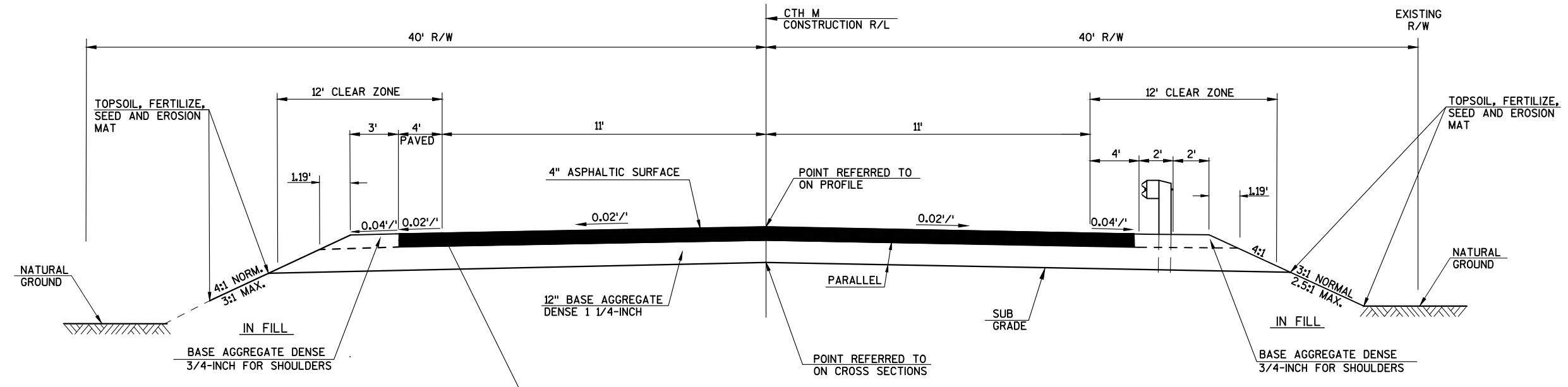
TYPICAL EXISTING SECTION FOR CTH M
 STA. 11+62-STA. 12+15



TYPICAL FINISHED SECTION FOR CTH M
 STA. 10+65 - STA. 10+95

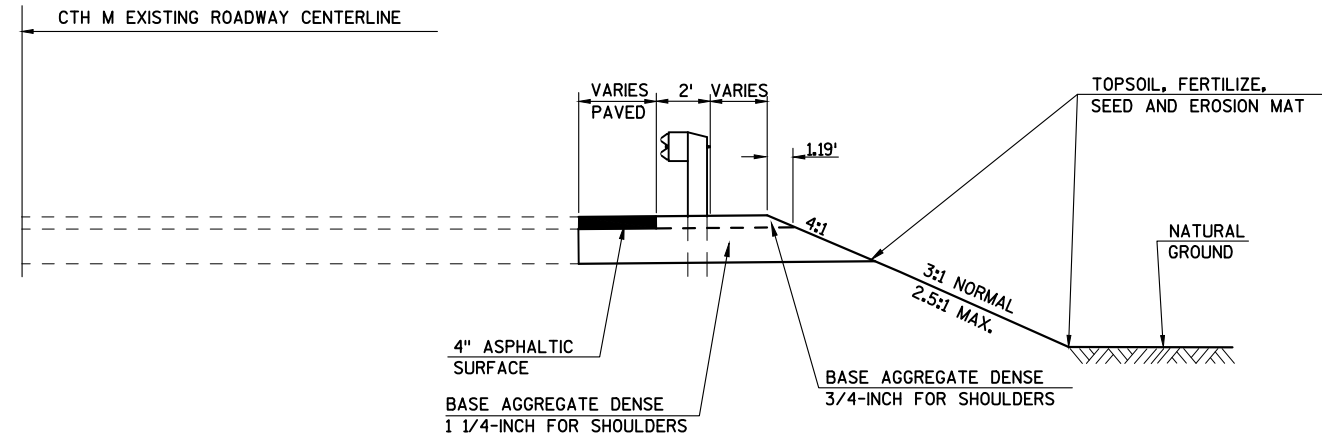
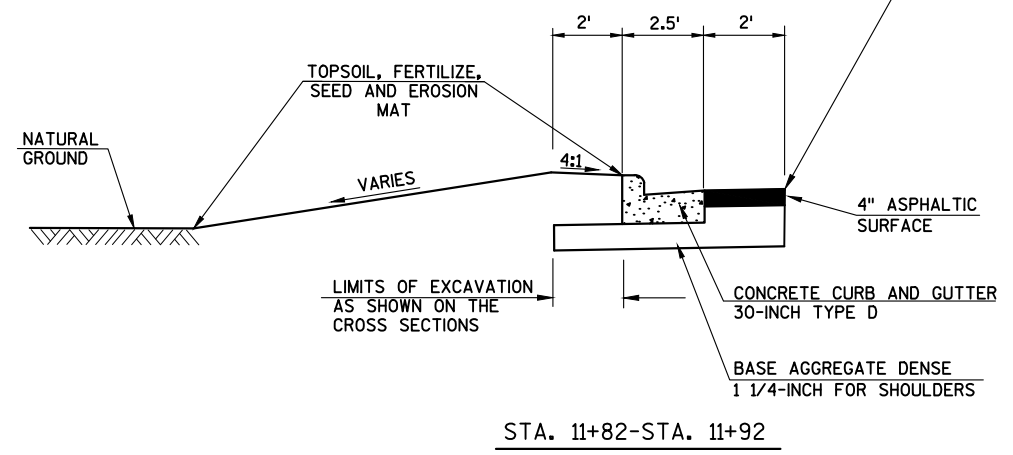
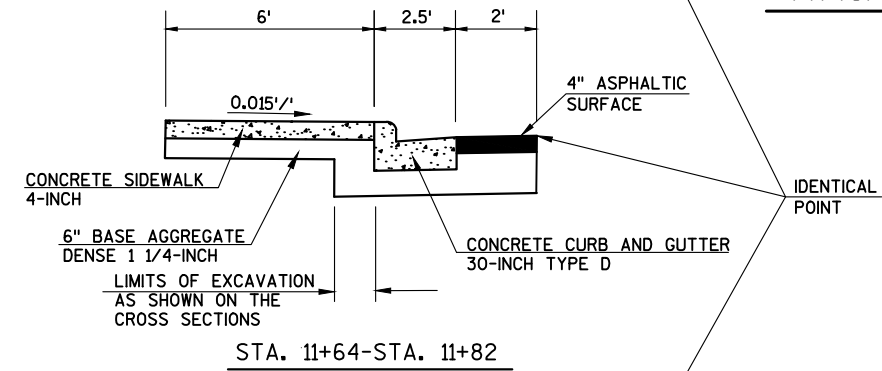


TYPICAL FINISHED SECTION FOR CTH M
 STA. 10+95 - STA. 11+12



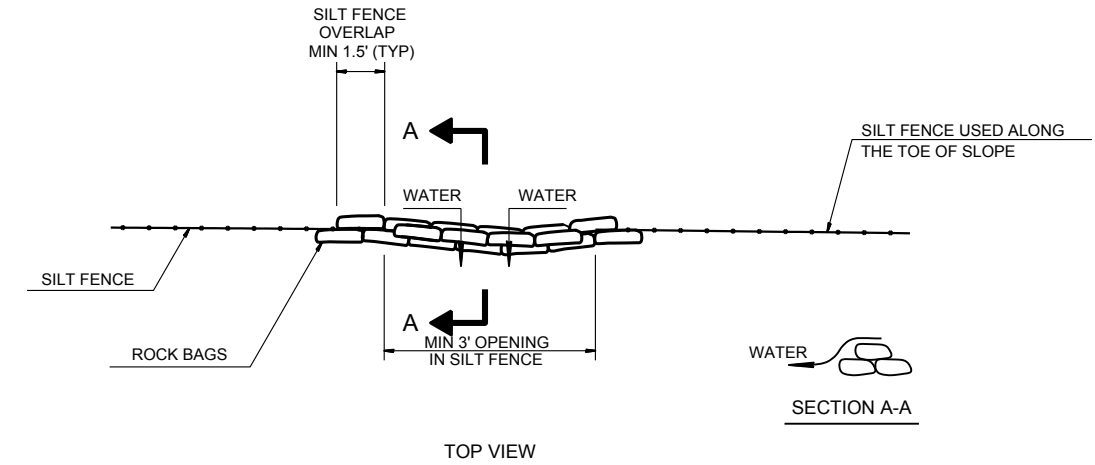
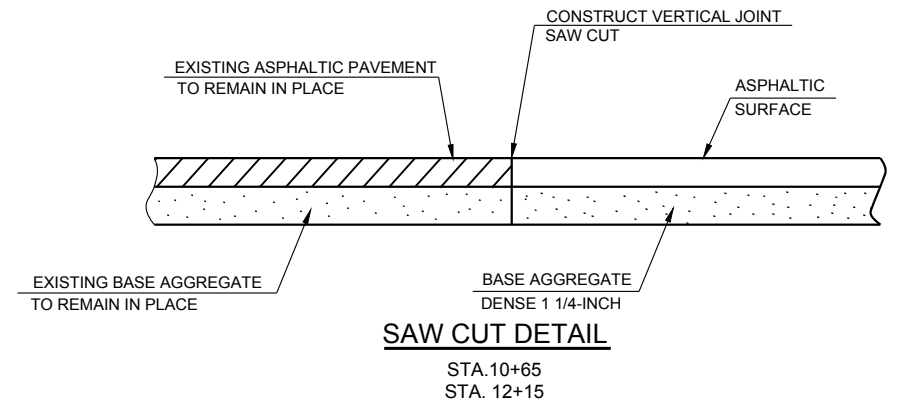
TYPICAL FINISHED SECTION FOR CTH M

STA. 11+64 - STA. 12+15



TYPICAL FINISHED SECTION FOR CTH M

STA. 12+15 - STA. 12+73



ROCK BAGS USED FOR SILT FENCE RELIEF DETAIL

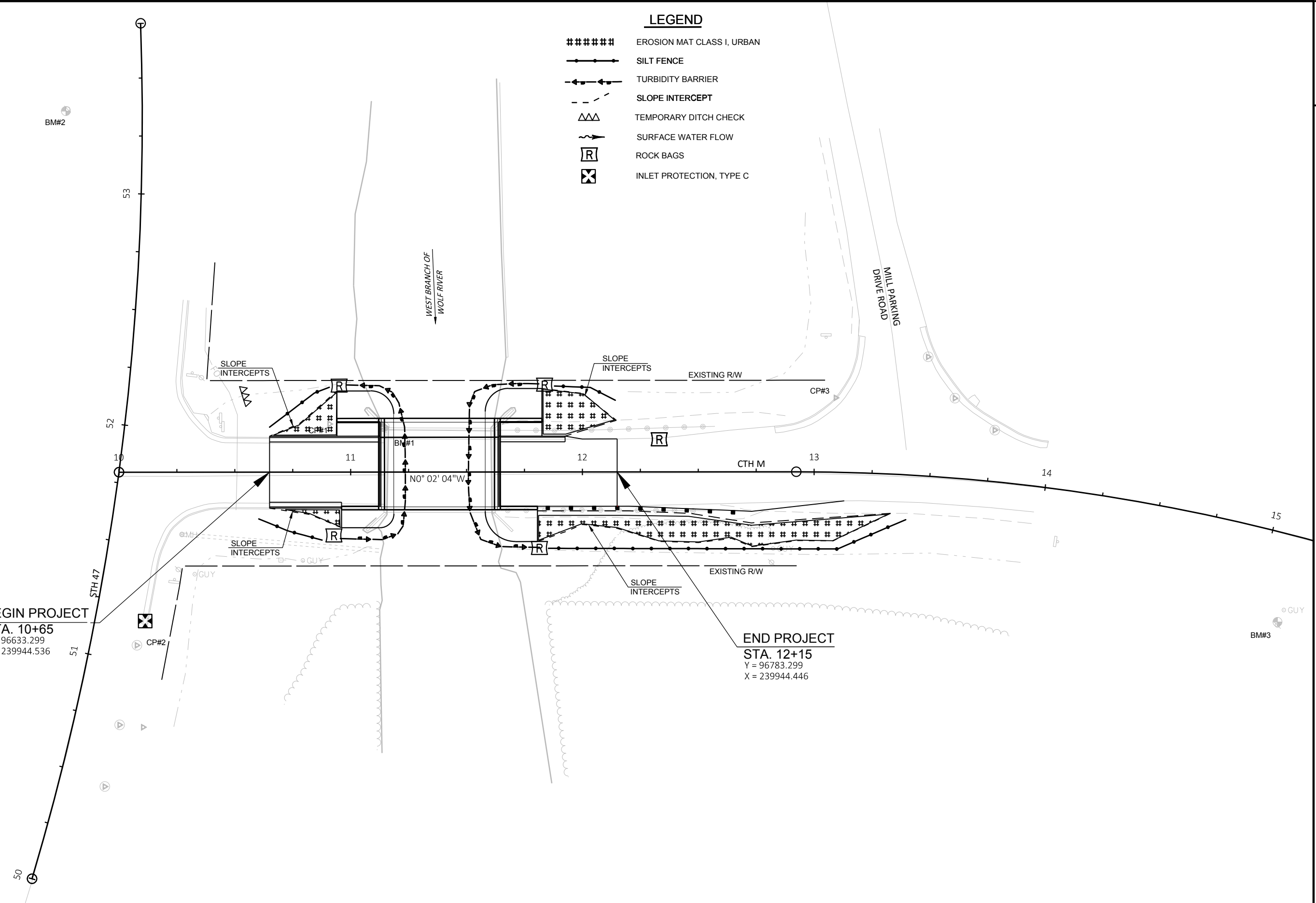
PAID AS ROCK BAGS
(SEE MISCELLANEOUS QUANTITIES FOR LOCATIONS)

LEGEND

- ##### EROSION MAT CLASS I, URBAN
- SILT FENCE
- ▲— TURBIDITY BARRIER
- - - SLOPE INTERCEPT
- △△△ TEMPORARY DITCH CHECK
- ~ SURFACE WATER FLOW
- [R] ROCK BAGS
- [X] INLET PROTECTION, TYPE C

BEGIN PROJECT
STA. 10+65
 Y = 96633.299
 X = 239944.536

END PROJECT
STA. 12+15
 Y = 96783.299
 X = 239944.446



Estimate Of Quantities

9435-00-70

Line	Item	Item Description	Unit	Total	Qty
0002	203.0600.S	Removing Old Structure Over Waterway With Minimal Debris (station) 01. 11+38	LS	1.000	1.000
0004	204.0150	Removing Curb & Gutter	LF	100.000	100.000
0006	205.0100	Excavation Common	CY	245.000	245.000
0008	206.1000	Excavation for Structures Bridges (structure) 01. B-73-8	LS	1.000	1.000
0010	210.1500	Backfill Structure Type A	TON	570.000	570.000
0012	213.0100	Finishing Roadway (project) 01. 9435-00-70	EACH	1.000	1.000
0014	305.0110	Base Aggregate Dense 3/4-Inch	TON	40.000	40.000
0016	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	380.000	380.000
0018	455.0605	Tack Coat	GAL	25.000	25.000
0020	465.0105	Asphaltic Surface	TON	80.000	80.000
0022	502.0100	Concrete Masonry Bridges	CY	302.000	302.000
0024	502.3200	Protective Surface Treatment	SY	265.000	265.000
0026	505.0400	Bar Steel Reinforcement HS Structures	LB	6,140.000	6,140.000
0028	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	36,290.000	36,290.000
0030	513.4061	Railing Tubular Type M	LF	87.000	87.000
0032	513.7084	Railing Steel Type NY4	LF	92.000	92.000
0034	516.0500	Rubberized Membrane Waterproofing	SY	22.000	22.000
0036	550.0500	Pile Points	EACH	18.000	18.000
0038	550.1100	Piling Steel HP 10-Inch X 42 Lb	LF	540.000	540.000
0040	601.0411	Concrete Curb & Gutter 30-Inch Type D	LF	105.000	105.000
0042	602.0405	Concrete Sidewalk 4-Inch	SF	216.000	216.000
0044	606.0300	Riprap Heavy	CY	105.000	105.000
0046	612.0406	Pipe Underdrain Wrapped 6-Inch	LF	170.000	170.000
0048	614.0920	Salvaged Rail	LF	192.000	192.000
0050	614.2500	MGS Thrie Beam Transition	LF	40.000	40.000
0052	614.2610	MGS Guardrail Terminal EAT	EACH	1.000	1.000
0054	618.0100	Maintenance And Repair of Haul Roads (project) 01. 9435-00-70	EACH	1.000	1.000
0056	619.1000	Mobilization	EACH	1.000	1.000
0058	624.0100	Water	MGAL	4.000	4.000
0060	625.0100	Topsoil	SY	465.000	465.000
0062	628.1504	Silt Fence	LF	340.000	340.000
0064	628.1520	Silt Fence Maintenance	LF	340.000	340.000
0066	628.1905	Mobilizations Erosion Control	EACH	3.000	3.000
0068	628.1910	Mobilizations Emergency Erosion Control	EACH	2.000	2.000
0070	628.2008	Erosion Mat Urban Class I Type B	SY	550.000	550.000
0072	628.6005	Turbidity Barriers	SY	200.000	200.000
0074	628.7015	Inlet Protection Type C	EACH	2.000	2.000
0076	628.7504	Temporary Ditch Checks	LF	30.000	30.000

Estimate Of Quantities

9435-00-70

Line	Item	Item Description	Unit	Total	Qty
0078	628.7570	Rock Bags	EACH	80.000	80.000
0080	629.0210	Fertilizer Type B	CWT	0.500	0.500
0082	630.0120	Seeding Mixture No. 20	LB	10.000	10.000
0084	630.0140	Seeding Mixture No. 40	LB	3.000	3.000
0086	630.0200	Seeding Temporary	LB	15.000	15.000
0088	630.0500	Seed Water	MGAL	13.000	13.000
0090	634.0612	Posts Wood 4x6-Inch X 12-FT	EACH	4.000	4.000
0092	637.2230	Signs Type II Reflective F	SF	12.000	12.000
0094	638.2602	Removing Signs Type II	EACH	4.000	4.000
0096	638.3000	Removing Small Sign Supports	EACH	4.000	4.000
0098	642.5001	Field Office Type B	EACH	1.000	1.000
0100	643.0420	Traffic Control Barricades Type III	DAY	850.000	850.000
0102	643.0705	Traffic Control Warning Lights Type A	DAY	1,020.000	1,020.000
0104	643.0900	Traffic Control Signs	DAY	850.000	850.000
0106	643.1050	Traffic Control Signs PCMS	DAY	14.000	14.000
0108	643.5000	Traffic Control	EACH	1.000	1.000
0110	645.0111	Geotextile Type DF Schedule A	SY	80.000	80.000
0112	645.0120	Geotextile Type HR	SY	230.000	230.000
0114	646.1020	Marking Line Epoxy 4-Inch	LF	600.000	600.000
0116	650.4500	Construction Staking Subgrade	LF	218.000	218.000
0118	650.5000	Construction Staking Base	LF	218.000	218.000
0120	650.6500	Construction Staking Structure Layout (structure) 01. B-73-8	LS	1.000	1.000
0122	650.9910	Construction Staking Supplemental Control (project) 01. 9435-00-70	LS	1.000	1.000
0124	650.9920	Construction Staking Slope Stakes	LF	218.000	218.000
0126	690.0150	Sawing Asphalt	LF	155.000	155.000
0128	690.0250	Sawing Concrete	LF	5.000	5.000
0130	715.0502	Incentive Strength Concrete Structures	DOL	1,812.000	1,812.000

REMOVING CURB & GUTTER

STATION	TO	STATION	LOCATION	204.0150 LF
10+65	-	11+15	CTH M, RT	50
10+65	-	11+15	CTH M, LT	50
TOTAL				100

BASE AGGREGATE DENSE AND WATER

STATION	TO	STATION	LOCATION	305.0110 3/4-INCH TON	305.0120 1 1/4-INCH TON	624.0100 WATER MGAL
10+65	-	11+12.75	CTH M	15	130	1
11+63.91	-	12+15	CTH M	3	150	2
12+15	-	13+34	CTH M, RT	22	100	1
TOTALS				40	380	4

ASPHALTIC SURFACE & TACK COAT

STATION	TO	STATION	LOCATION	455.0605 TACK COAT GAL	465.0105 ASPHALTIC SURFACE TON
10+65	-	11+12.75	CTH M	11	35
11+63.91	-	12+15	CTH M	12	40
12+15	-	13+34	CTH M, RT	2	5
TOTALS				25	80

EARTHWORK SUMMARY

Division	From/To Station	Location	Common Excavation (item #205.0100)	Salvaged/Unusable Pavement Material (4)	Available Material (5)	Unexpanded Fill	Expanded Fill (13)	Mass Ordinate +/- (14)	Borrow (item #208.0100)	Comment:
			Cut				Factor 1.30			
1	10+65 - 13+34	CTH M	245	51	194	27	35	159	0	
Division 1 Total			245	51	194	27	35	159	0	

- 4) Unusable Pavement Material = Existing Asphaltic Pavement
- 5) Available Material = Cut - Unusable Pavement Material
- 13) Expanded Fill. Factor = 1.3 Expanded Fill = Unexpanded Fill * Fill Factor
- 14) The Mass Ordinate + or - Qty calculated for the Division. Plus quantity indicates an excess of material w ithin the Division. Minus indicates a shortage of material w ithin the Division.

CONCRETE CURB & GUTTER 30-INCH TYPE D

STATION	TO	STATION	LOCATION	601.0411 LF
10+65	-	10+97	CTH M, RT	32
10+65	-	11+13	CTH M, LT	45
11+64	-	11+92	CTH M, LT	28
TOTAL				105

CONCRETE SIDEWALK 4-INCH

STATION	TO	STATION	LOCATION	602.0405 SF
10+95	-	11+13	CTH M, LT	108
11+64	-	11+82	CTH M, LT	108
TOTAL				216

SALVAGED RAIL

STATION	TO	STATION	LOCATION	614.0920 LF
11+62	-	12+58	CTH M, RT	96
11+62	-	12+58	CTH M, LT	96
TOTAL				192

3

MGS GUARDRAIL

STATION	TO	STATION	LOCATION	614.2500 THRIE BEAM TRANSITION LF	614.2610 TERMINAL EAT EACH
11+62	-	12+55	CTH M, RT	40	1
TOTAL				40	1

TOPSOIL, MULCHING, FERTILIZER AND SEED

STATION	TO	STATION	LOCATION	625.0100 TOPSOIL SY	629.0210 FERTILIZER TYPE B CWT	630.0120 SEEDING MIXTURE NO. 20 LB	630.0140 SEEDING MIXTURE NO. 40 LB	630.0200 SEEDING TEMPORARY LB	630.0500 SEED WATER MGAL
10+65	-	11+12.75	CTH M, LT	70	0.1	-	2	2.5	2
10+65	-	11+12.75	CTH M, RT	50	0.1	-	1	2.5	2
11+63.91	-	12+15	CTH M, LT	85	0.1	3	-	3	2.5
11+63.91	-	13+34	CTH M, RT	260	0.2	7	-	7	6.5
TOTALS				465	0.5	10	3	15	13

3

MOBILIZATIONS EROSION CONTROL

LOCATION	628.1905 MOBILIZATIONS EROSION CONROL EACH	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL EACH
CTH M	3	2
TOTAL	3	2

SILT FENCE

STATION	TO	STATION	LOCATION	628.1504 SILT FENCE LF	628.1520 MAINTENANCE LF
10+50	-	10+95	CTH M, RT	45	45
10+50	-	10+95	CTH M, LT	45	45
11+80	-	12+25	CTH M, RT	45	45
11+80	-	13+40	CTH M, LT	160	160
UNDISTRIBUTED				45	45
TOTALS				340	340

EROSION MAT URBAN CLASS I TYPE B

STATION	TO	STATION	LOCATION	628.2008 SY
10+65	-	11+12.75	CTH M, LT	70
10+65	-	11+12.75	CTH M, RT	50
11+63.91	-	12+15	CTH M, LT	85
11+63.91	-	13+34	CTH M, RT	260
UNDISTRIBUTED				85
TOTAL				550

TURBIDITY BARRIERS

STATION	LOCATION	628.6005 SY
SOUTH ABUTMENT	CTH M	100
NORTH ABUTMENT	CTH M	100
TOTAL		200

INLET PROTECTION TYPE C

STATION	LOCATION	628.7015 EACH
10+20	CTH M, RT	1
UNDISTRIBUTED		1
TOTAL		2

TEMPORARY DITCH CHECKS

STATION	LOCATION	628.7504 LF
10+50	CTH M, LT	15
UNDISTRIBUTED		15
TOTAL		30

ROCK BAGS

STATION	LOCATION	628.7570 EACH
10+95	CTH M, RT	15
10+95	CTH M, LT	15
11+80	CTH M, RT	15
11+80	CTH M, RT	15
UNDISTRIBUTED		20
TOTAL		80

3

REMOVING SIGNS AND SUPPORTS

STATION	LOCATION	638.2602	638.3000
		REMOVING SIGNS TYPE II EA	REMOVING SMALL SIGN SUPPORTS EA
11+14	CTH M, RT	1	1
11+14	CTH M, LT	1	1
11+62	CTH M, RT	1	1
11+62	CTH M, LT	1	1
TOTALS		4	4

SIGNS REFLECTIVE TYPE II AND WOOD POSTS

STATION	LOCATION	634.0612	637.2230	
		WOOD POSTS 4"x6"x12' EACH	W5-52L S.F.	W5-52R S.F.
NW QUADRANT	CTH M	1	-	3
SW QUADRANT	CTH M	1	3	-
NE QUADRANT	CTH M	1	3	-
SE QUADRANT	CTH M	1	-	3
TOTALS		4	12	

MARKING LINE EPOXY

STATION	TO	STATION	LOCATION	646.1020	
				4-INCH (WHITE) LF	4-INCH (YELLOW) LF
10+65	-	12+15	CTH M	300	300
TOTAL				600	

3

TRAFFIC CONTROL SUMMARY

LOCATION	APPROXIMATE SERVICE DAYS	643.0420 BARRICADES TYPE III		643.0705 WARNING LIGHTS TYPE A		643.0900 SIGNS		643.1050 SIGNS PCMS		ROAD WORK AHEAD AND END ROAD WORK SEE BARRICADES AND SIGNS FOR MAINLINE CLOSURES DETAIL B & D SEE BARRICADES AND SIGNS FOR MAINLINE CLOSURES DETAIL B & D
		NO. IN SERVICE	DAYS	NO. IN SERVICE	DAYS	NO. IN SERVICE	DAYS	NO. IN SERVICE	DAYS	
STH 47	85	-	-	-	-	4	340	-	-	
CTH M/STH 47	85	5	425	6	510	3	255	1	7	
CTH M/MILL PARKING ROAD	85	5	425	6	510	3	255	1	7	
TOTALS			850		1,020		850		14	

CONSTRUCTION STAKING

STATION	TO	STATION	LOCATION	650.4500	650.5000	650.6500	650.9910	650.9920	GROUP CODE
				SUBGRADE LF	BASE LF	STRUCTURE LAYOUT LS	SUPPLEMENTAL CONTROL LS	SLOPE STAKES LF	
10+65	-	11+12.75	CTH M	48	48	-	1	48	0010
11+63.91	-	12+15	CTH M	51	51	-	-	51	0010
12+15	-	13+34	CTH M	119	119	-	-	119	0010
SUBTOTALS				218	218	0	1	218	0010
10+00 CTH M				-	-	1	-	-	0020
SUBTOTALS				0	0	1	0	0	0020
TOTALS				218	218	1	1	218	

SAWING ASPHALT

STATION	LOCATION	690.0150 LF
10+65	CTH M	26
12+15	CTH M	30
12+15 TO 13+13	CTH M	99
TOTAL		155

SAWING CONCRETE

STATION	LOCATION	690.0250 LF
10+65	CTH M, RT	2.5
10+65	CTH M, LT	2.5
TOTAL		5

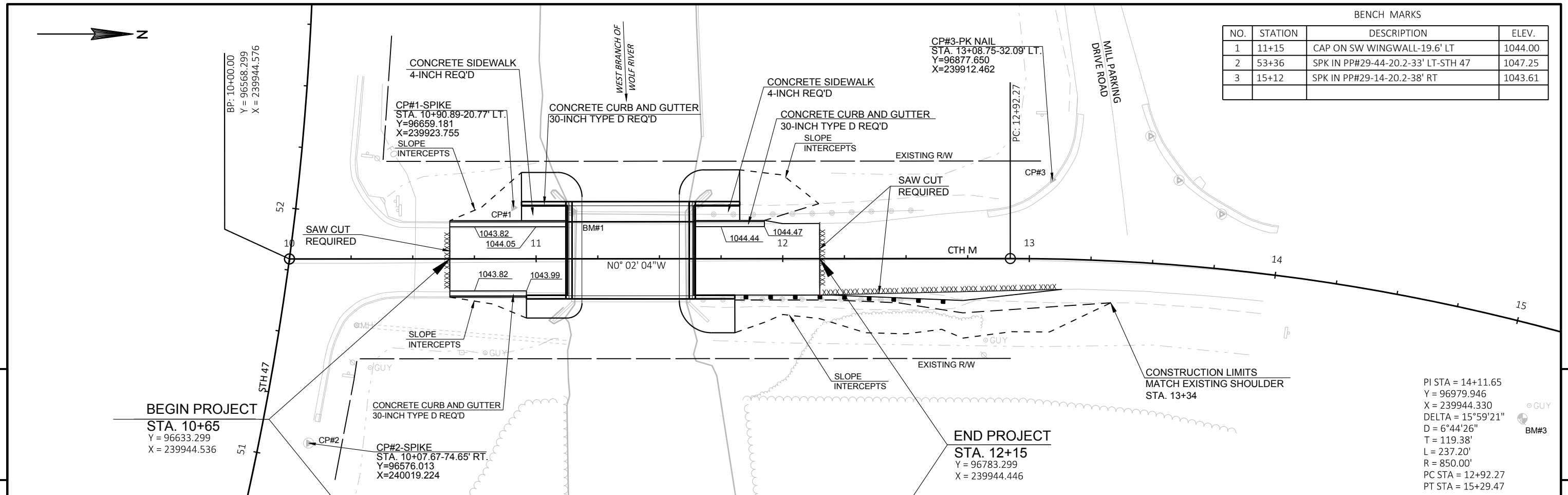


BENCH MARKS

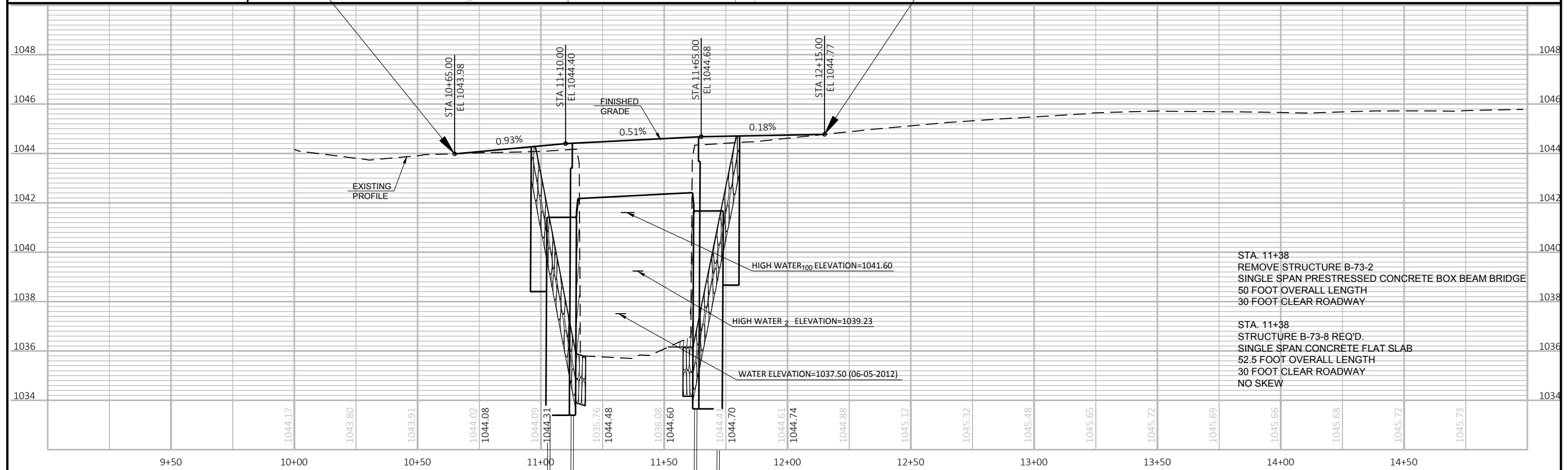
NO.	STATION	DESCRIPTION	ELEV.
1	11+15	CAP ON SW WINGWALL-19.6' LT	1044.00
2	53+36	SPK IN PP#29-44-20.2-33' LT-STH 47	1047.25
3	15+12	SPK IN PP#29-14-20.2-38' RT	1043.61

5

5



PI STA = 14+11.65
 Y = 96979.946
 X = 239944.330
 DELTA = 15°59'21"
 D = 6°44'26"
 T = 119.38'
 L = 237.20'
 R = 850.00'
 PC STA = 12+92.27
 PT STA = 15+29.47



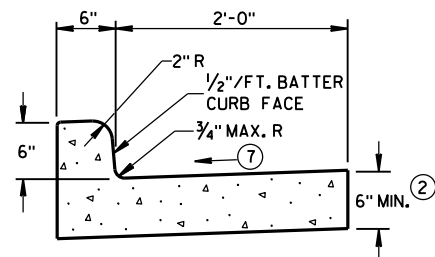
STA. 11+38
 REMOVE STRUCTURE B-73-2
 SINGLE SPAN PRESTRESSED CONCRETE BOX BEAM BRIDGE
 50 FOOT OVERALL LENGTH
 30 FOOT CLEAR ROADWAY

STA. 11+38
 STRUCTURE B-73-8 REQ'D.
 SINGLE SPAN CONCRETE FLAT SLAB
 52.5 FOOT OVERALL LENGTH
 30 FOOT CLEAR ROADWAY
 NO SKEW

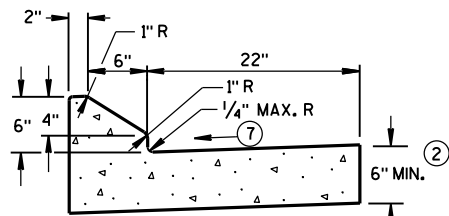
PROJECT NO: 9435-00-70	HWY: CTH M	COUNTY: MENOMINEE	PLAN AND PROFILE:	SHEET	E
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Standard Detail Drawing List

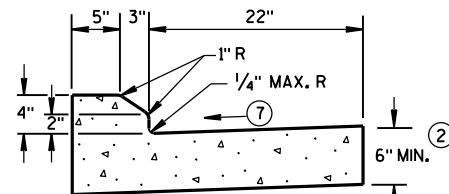
08D01-20A	CONCRETE CURB & GUTTER
08D01-20B	CONCRETE CURB, TIES AND CURB AND GUTTER APPLICATIONS
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E10-02	INLET PROTECTION TYPE A, B, C AND D
08E11-02	TURBIDITY BARRIER
12A03-10	NAME PLATE (STRUCTURES)
14B42-06A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06D	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B44-04A	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-04B	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-04C	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B45-05A	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05B	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05C	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05D	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05E	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05F	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05G	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05H	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05I	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05J	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05K	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05L	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
15C02-07A	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C02-07B	BARRICADES AND SIGNS FOR VARIOUS CLOSURES
15C06-09	SIGNING & MARKING FOR TWO LANE BRIDGES
15C11-07B	CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS
15D38-02A	TEMPORARY TRAFFIC CONTROL SIGN MOUNTING
15D38-02B	ATTACHMENT OF SIGNS TO POSTS



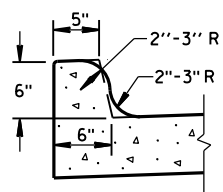
TYPES A^① & D



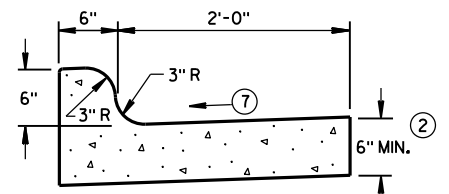
6" SLOPED CURB TYPES G^① & J



4" SLOPED CURB TYPES G^① & J

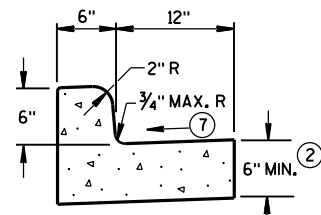


TYPES K^① & L
(OPTIONAL CURB SHAPE)



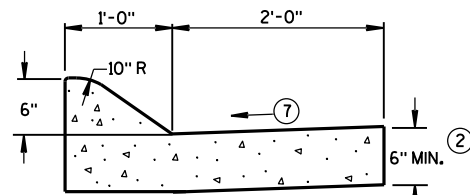
TYPES K^① & L

CONCRETE CURB & GUTTER 30"

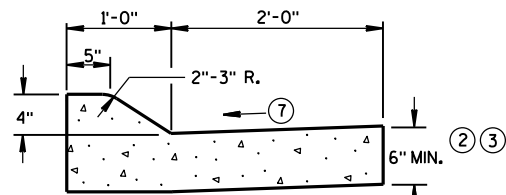


TYPES A^① & D

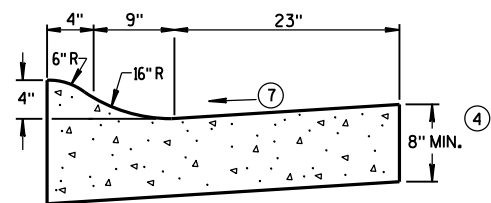
CONCRETE CURB & GUTTER 18"



6" SLOPED CURB TYPES A^① & D

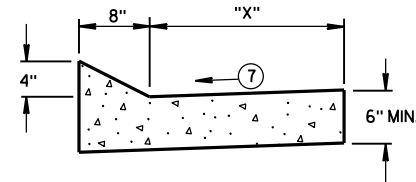


4" SLOPED CURB TYPES A^① & D



4" SLOPED CURB TYPES R^① & T^⑤

CONCRETE CURB & GUTTER 36"



TYPES TBT & TBTT^①

CONCRETE CURB & GUTTER

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

GENERAL NOTES

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

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

INTEGRAL CURB & GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB & GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE.

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

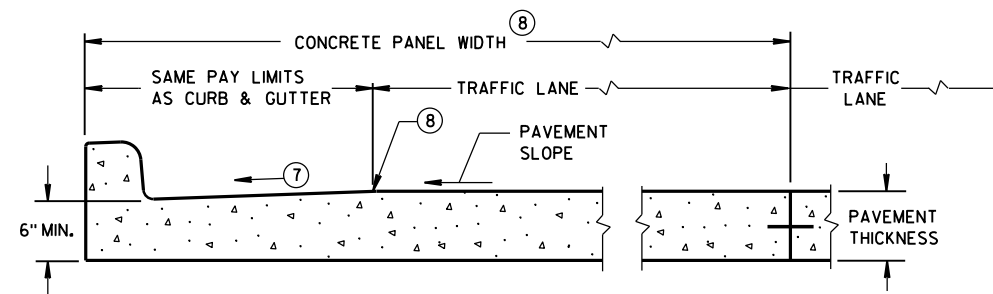
UNLESS OTHERWISE SHOWN ON THE TYPICAL CROSS SECTIONS, THE BASE AGGREGATE AND COMMON EXCAVATION LIMITS ARE 2'-0" BEHIND THE BACK OF CURBS.

- ① TIE BARS ARE REQUIRED FOR CURB AND GUTTER TYPES A, G, K, R AND TBTT.
- ② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ③ USE 8" MINIMUM GUTTER THICKNESS WHEN USED WITH AN ADJACENT CONCRETE TRUCK APRON PLACED BEHIND BACK OF CURB.
- ④ THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 8" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ⑤ THE FACE OF CURB IS 6" FROM THE BACK OF CURB.
- ⑥ WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATION(S) WILL BE SHOWN ELSEWHERE IN THE PLAN.
- ⑦ USE 4% GUTTER CROSS SLOPE UNLESS OTHERWISE NOTED IN THE PLANS.
- ⑧ INCLUDE LONGITUDINAL JOINT AND TIE BARS ALONG LANE EDGE WHEN CONCRETE PANEL WIDTH EXCEEDS THE MAXIMUM WIDTH PER TABLE BELOW. LONGITUDINAL JOINT(S) ARE NOT ALLOWED WITHIN TRAFFIC LANES AND BIKE LANES. LONGITUDINAL JOINT MAY BE SAWED.

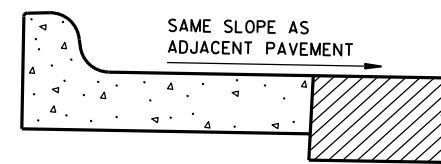
PAVEMENT THICKNESS AND MAXIMUM CONCRETE PANEL WIDTH TABLE

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

* BIKE LANE IS NOT SHOWN.



PARTIAL SECTION OF PAVEMENT WITH INTEGRAL CURB & GUTTER

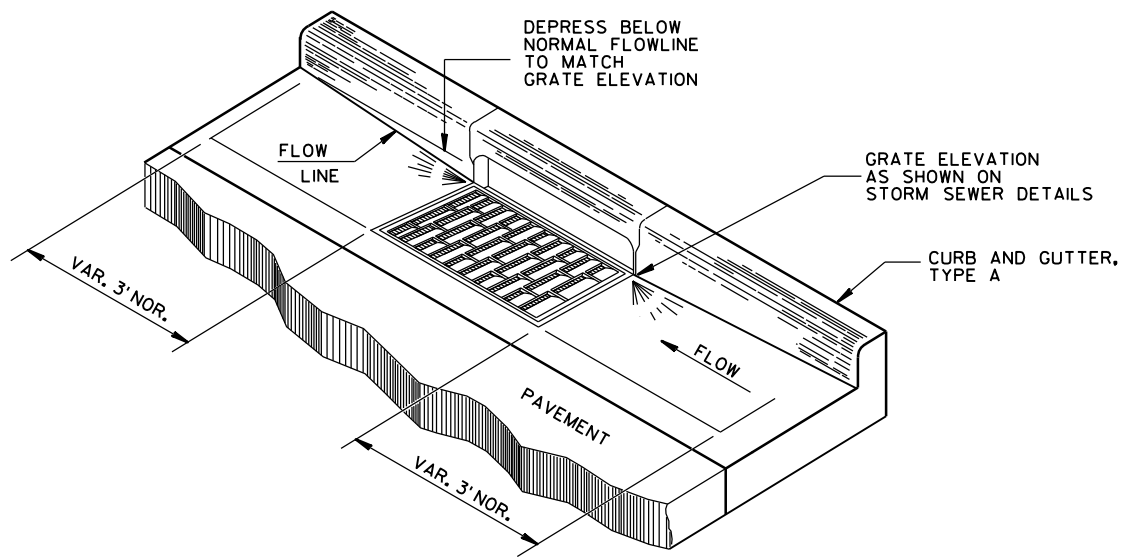


REVERSE SLOPE GUTTER^⑥

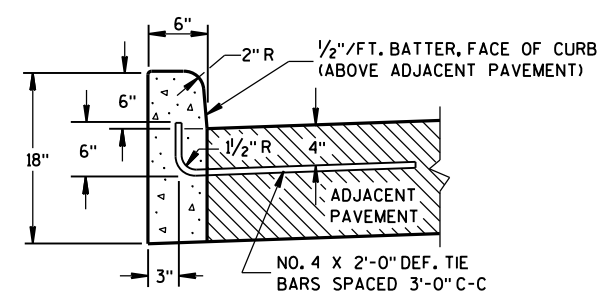
(TYPICAL FOR ALL CURB & GUTTER TYPES)

CONCRETE CURB & GUTTER

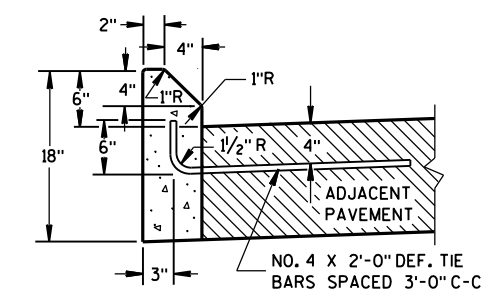
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



DETAIL OF CURB AND GUTTER AT INLETS
(TYPE H INLET COVER SHOWN)



TYPES A^① & D

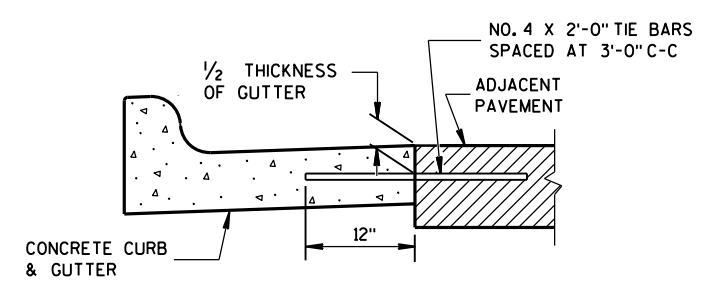


TYPES G^① & J

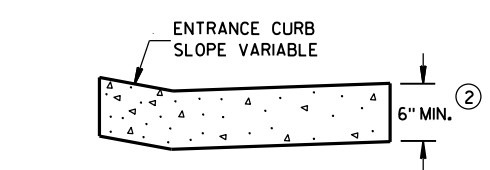
GENERAL NOTES

- DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.
- PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.
- UNLESS OTHERWISE SHOWN ON THE TYPICAL CROSS SECTIONS, THE BASE AGGREGATE AND COMMON EXCAVATION LIMITS ARE 2'-0" BEHIND THE BACK OF CURBS.
- ① TIE BARS ARE REQUIRED FOR CURB AND GUTTER TYPES A, G, K, R AND TBTT.
 - ② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
 - ③ REFER TO SDD 8D18 AND SDD 8D19 FOR ADDITIONAL DRIVEWAY ENTRANCE CURB DETAILS.

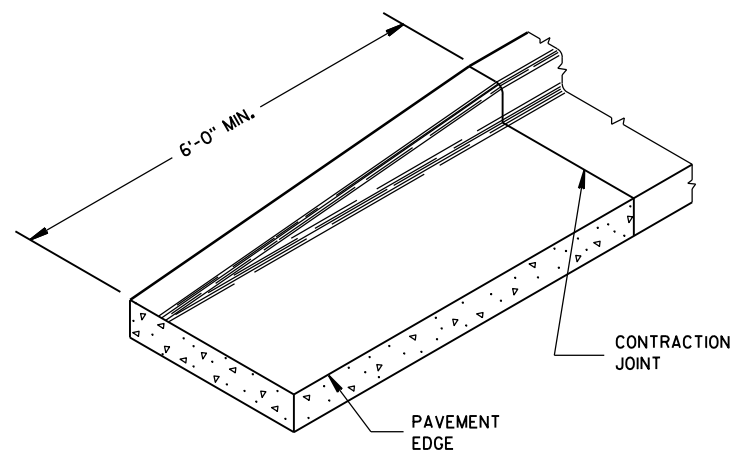
CONCRETE CURB



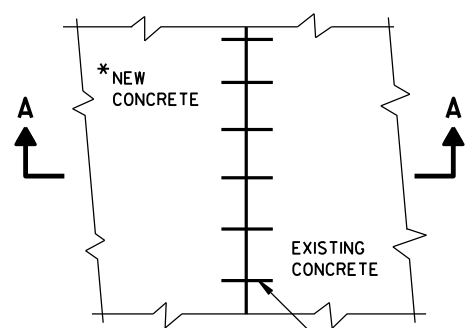
TYPICAL TIE BAR LOCATION^①



DRIVEWAY ENTRANCE CURB^⑨
(WHEN DIRECTED BY THE ENGINEER)



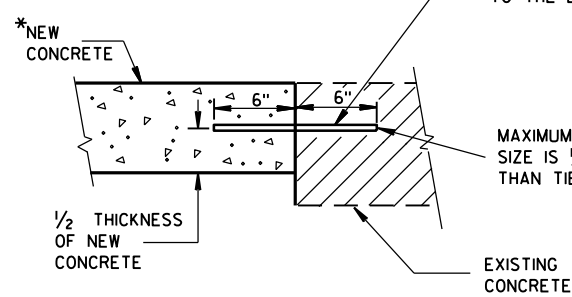
END SECTION CURB & GUTTER



PLAN VIEW

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

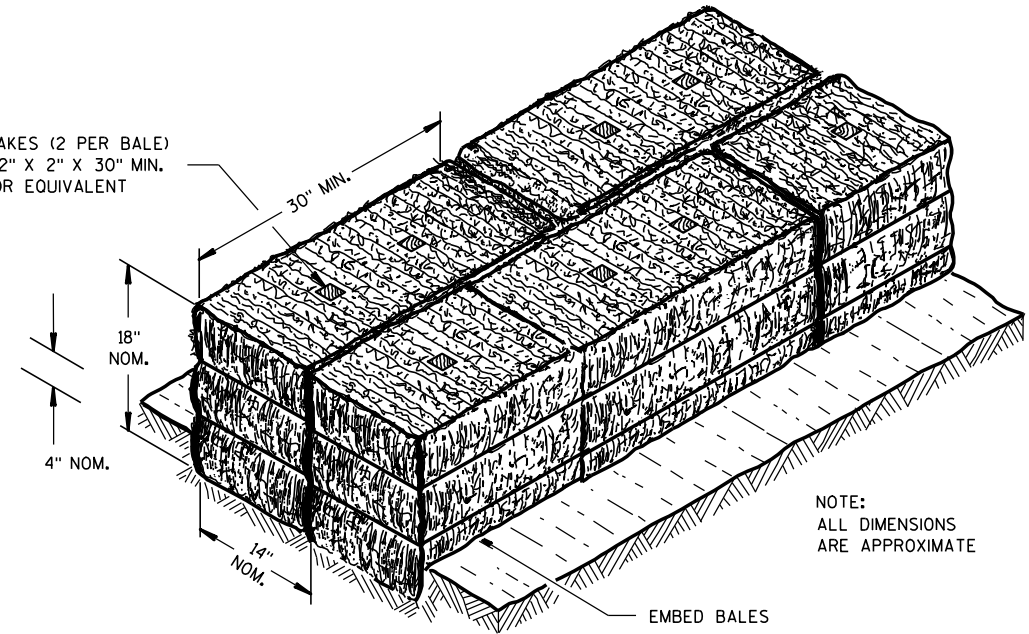
NO. 6 TIE BARS SPACED 2'-6" C-C, INSTALLED PERPENDICULAR TO THE LONGITUDINAL JOINT.



SECTION A-A
TIE BARS DRILLED INTO EXISTING PAVEMENT

CONCRETE CURB, TIES AND CURB AND GUTTER APPLICATIONS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June, 2017 DATE	/s/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
FHWA	

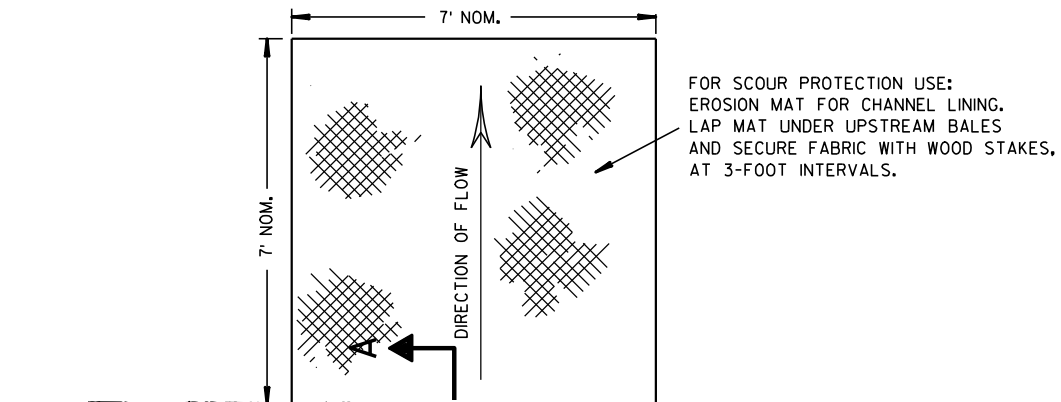
WOOD STAKES (2 PER BALE)
NOMINAL 2" X 2" X 30" MIN.
LENGTH OR EQUIVALENT



NOTE:
ALL DIMENSIONS
ARE APPROXIMATE

EMBED BALES

SECTION A-A

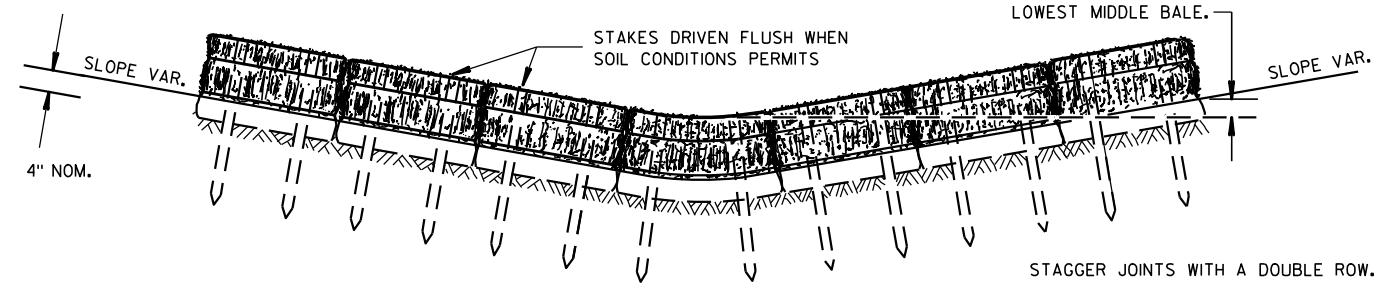


FOR SCOUR PROTECTION USE:
EROSION MAT FOR CHANNEL LINING.
LAP MAT UNDER UPSTREAM BALES
AND SECURE FABRIC WITH WOOD STAKES,
AT 3-FOOT INTERVALS.

PLAN VIEW

STAGGER JOINTS BETWEEN ADJACENT
ROWS OF BALES.

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



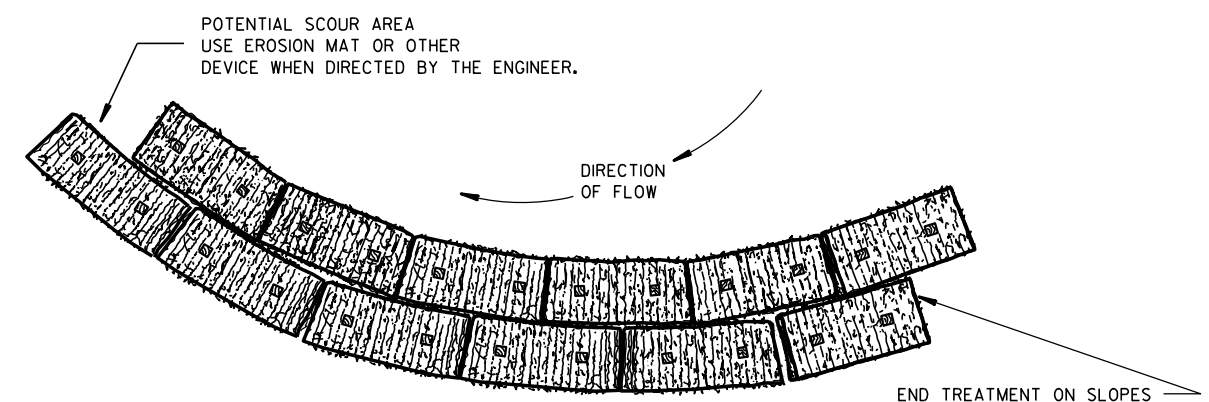
FRONT ELEVATION

TEMPORARY DITCH CHECK USING EROSION BALES ①

GENERAL NOTES

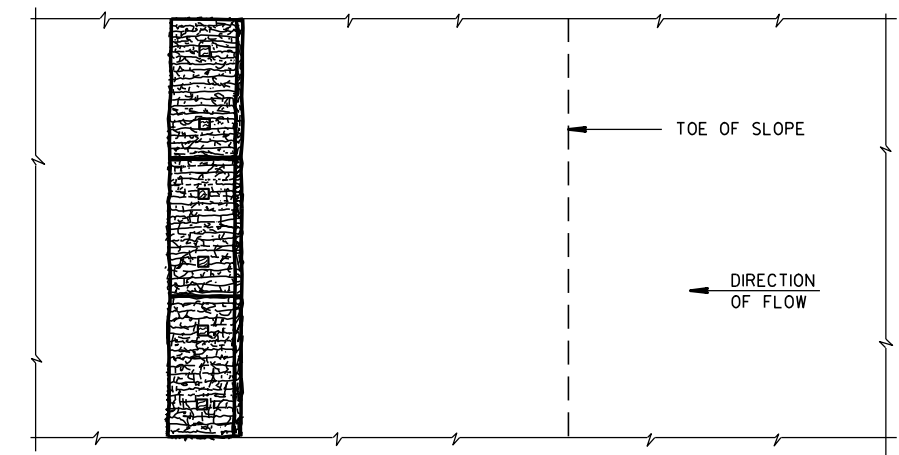
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- 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.

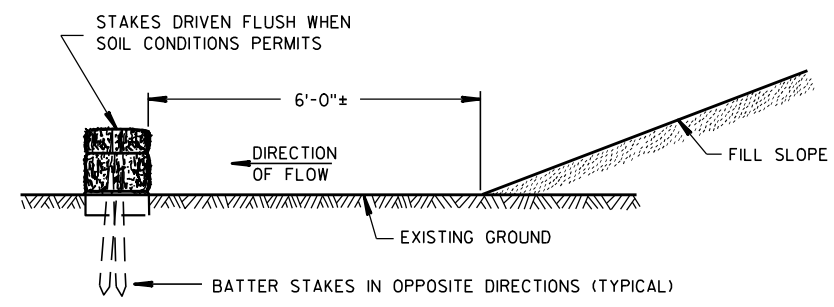


PLAN VIEW

WHEN ALTERING THE DIRECTION OF FLOW



PLAN VIEW



FRONT ELEVATION

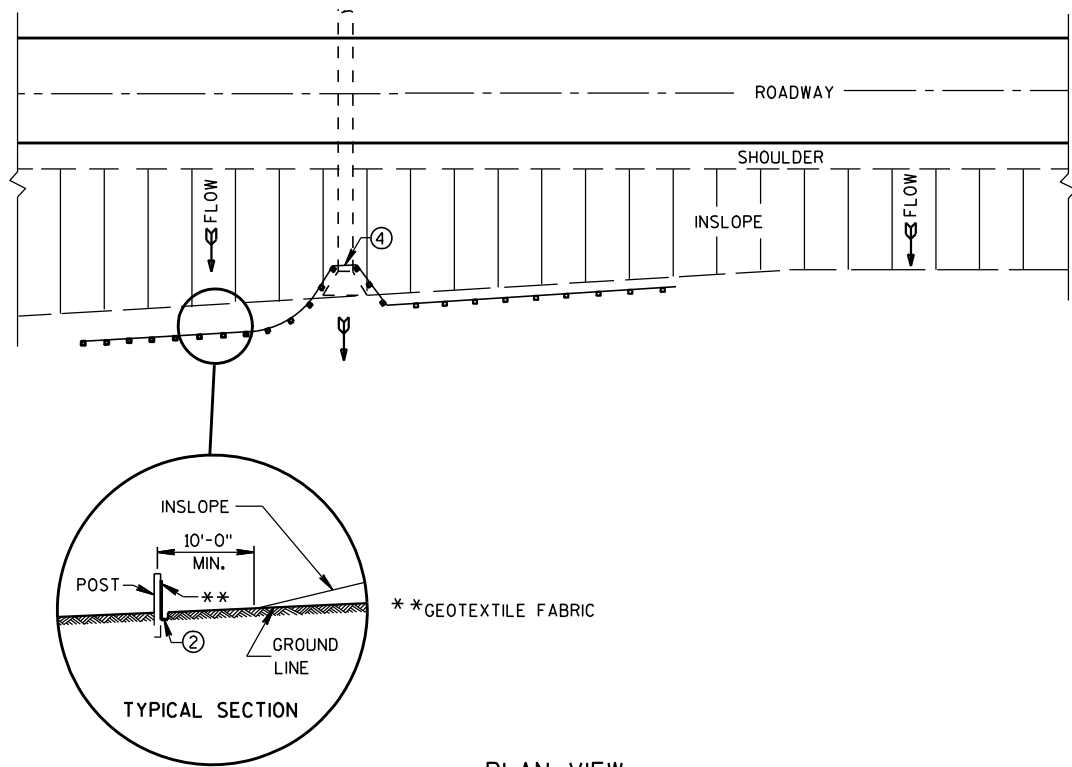
WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE

EROSION BALES FOR SHEET FLOW

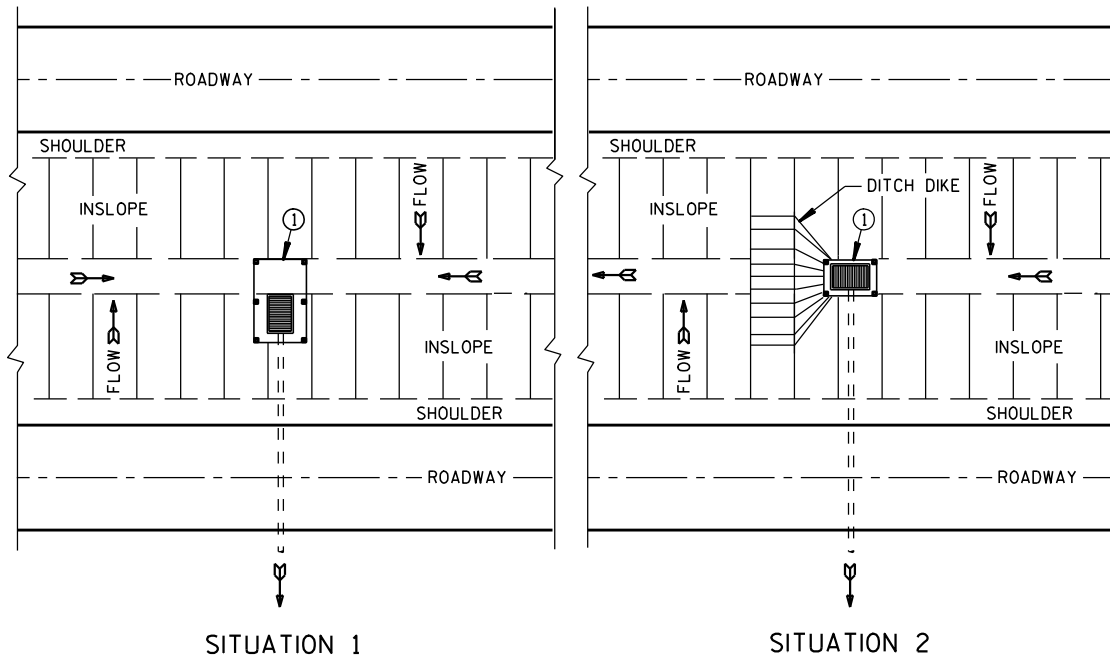
TYPICAL INSTALLATIONS OF
EROSION BALES / TEMPORARY
DITCH CHECKS

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

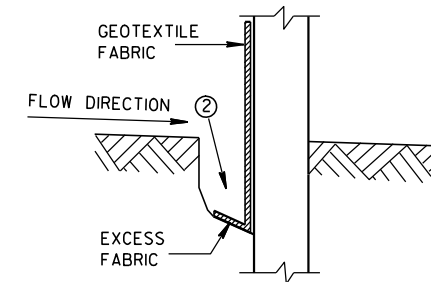


SITUATION 1 SITUATION 2
PLAN VIEW
SILT FENCE AT MEDIAN SURFACE DRAINS

GENERAL NOTES

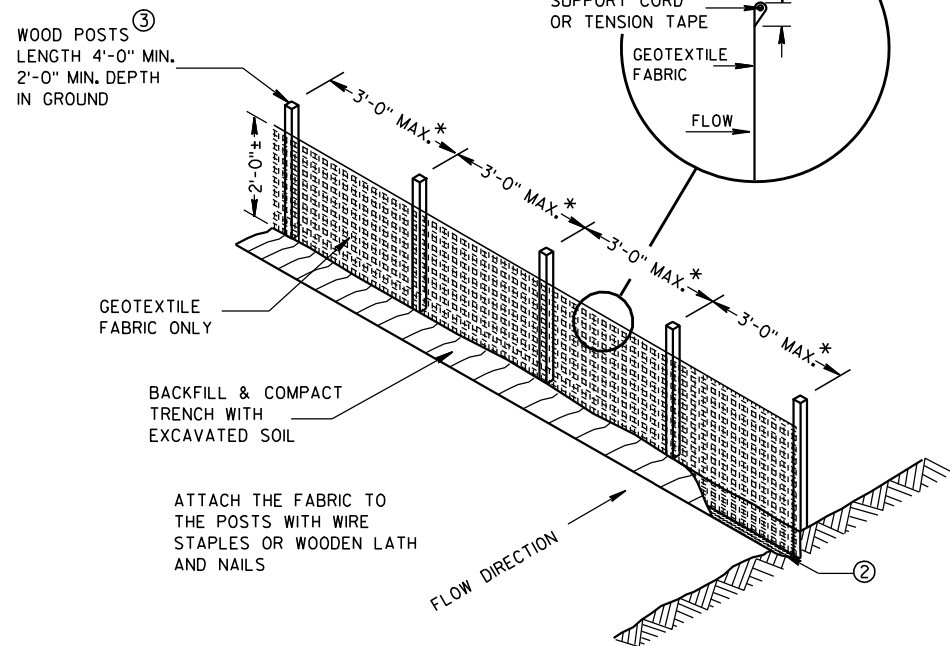
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

- 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.



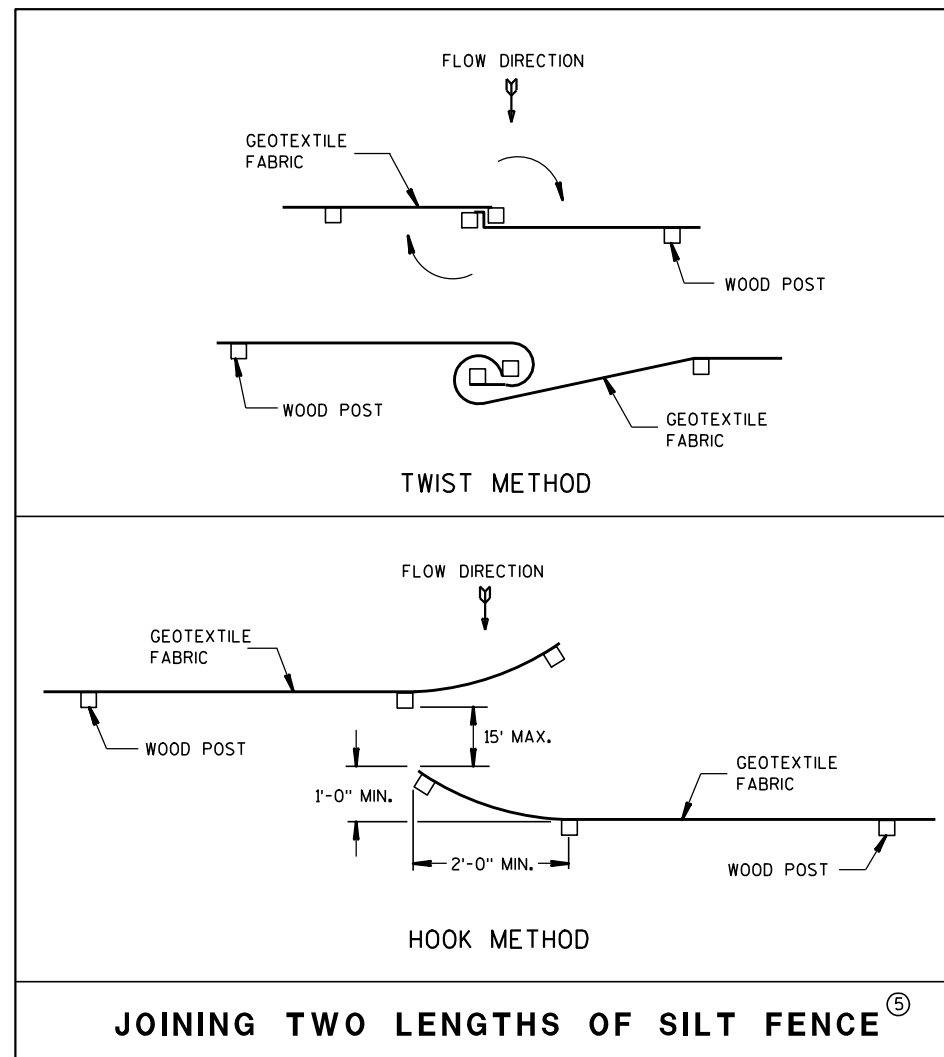
TRENCH DETAIL

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

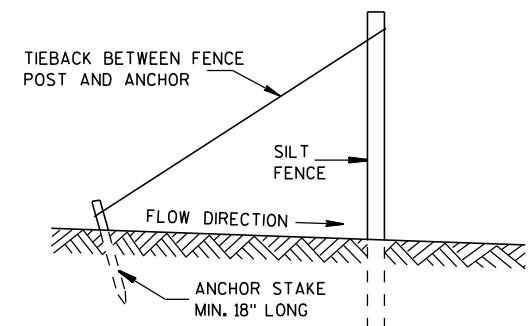


SILT FENCE

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



JOINING TWO LENGTHS OF SILT FENCE ⑤



SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)

SILT FENCE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

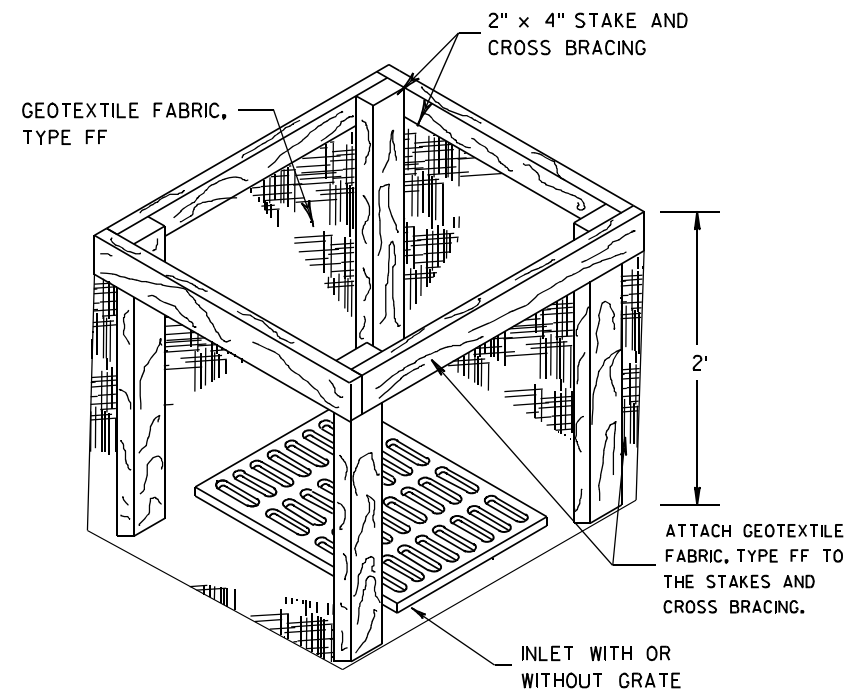
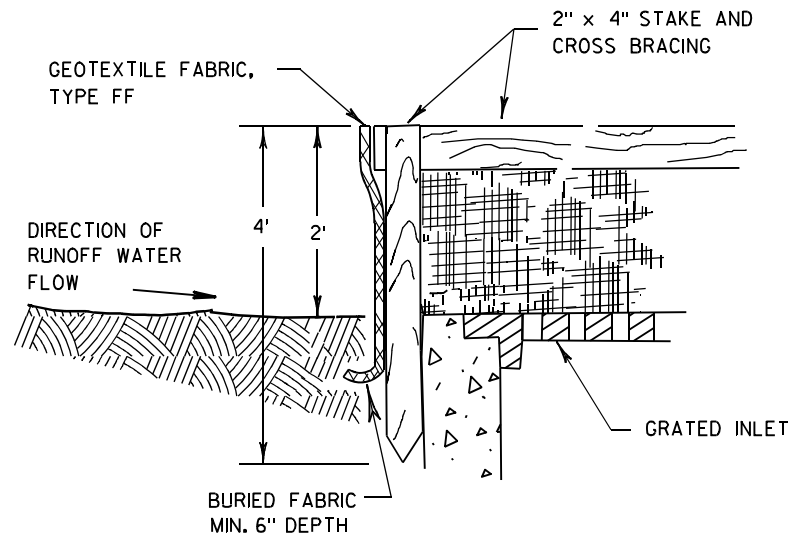
APPROVED

4-29-05

DATE

FHWA

/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER



INLET PROTECTION, TYPE A

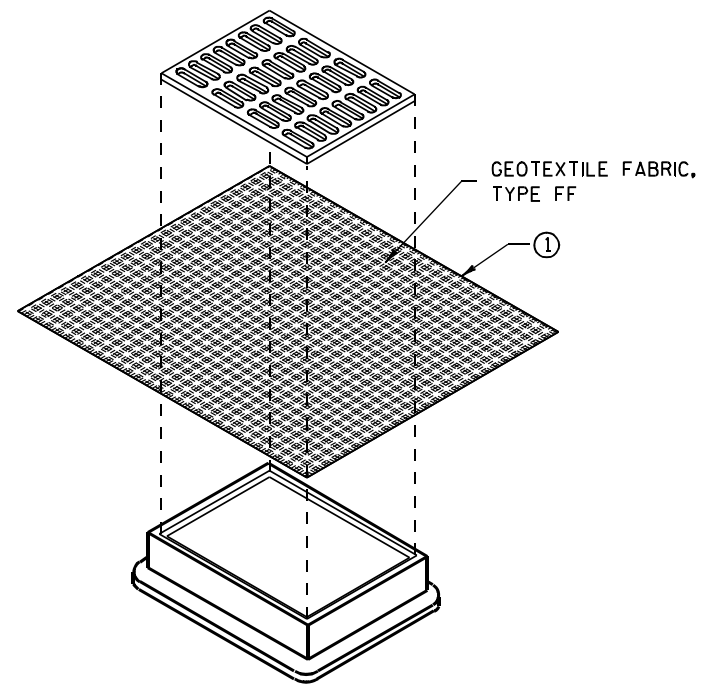
GENERAL NOTES

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

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

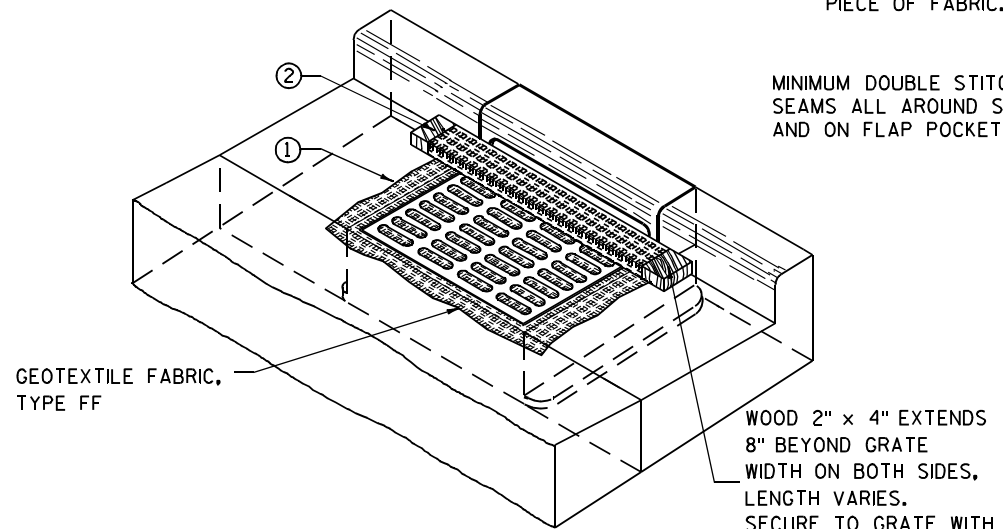
WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

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



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

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



INLET PROTECTION, TYPE C (WITH CURB BOX)

INSTALLATION NOTES

TYPE B & C

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

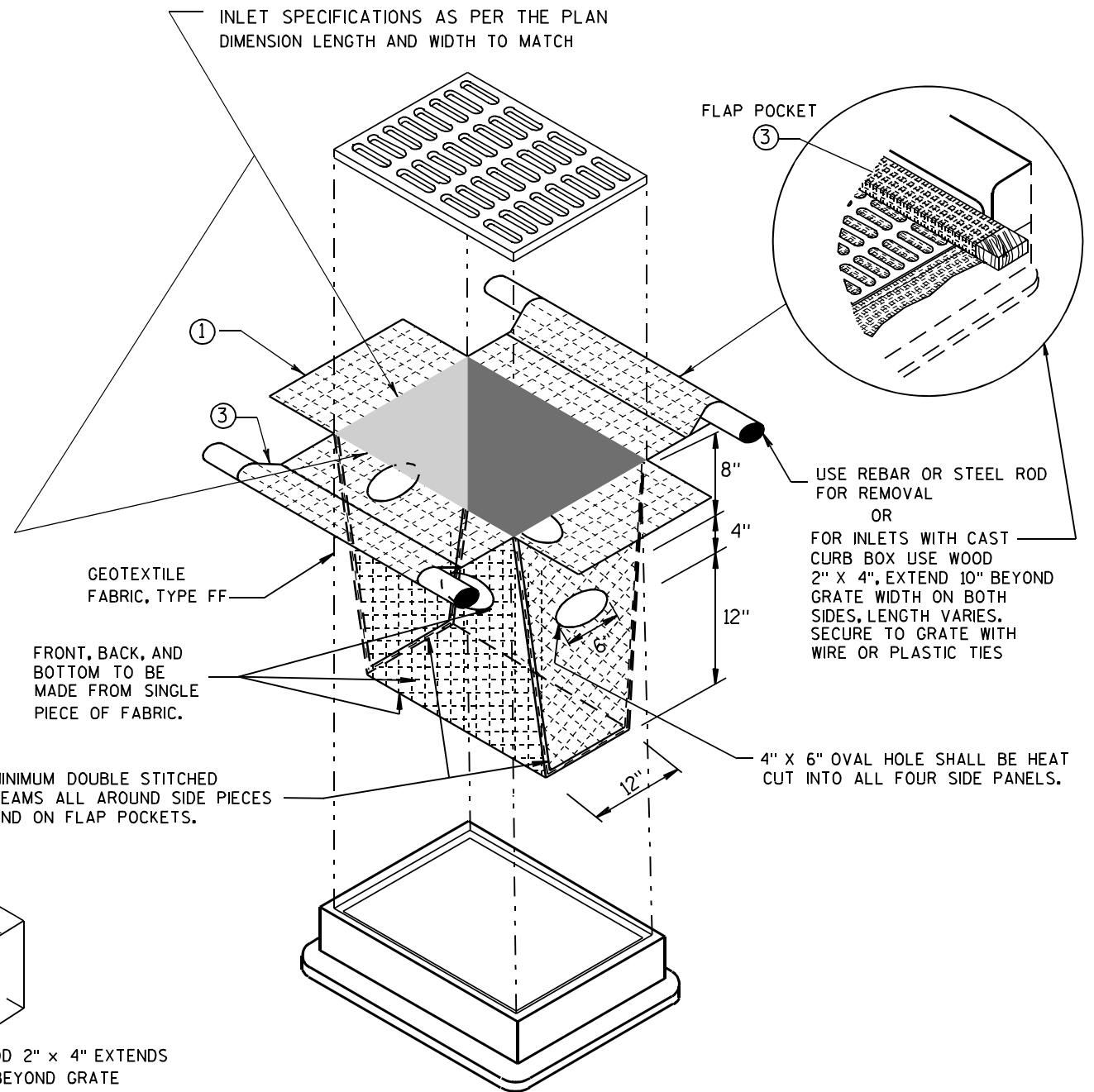
THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

TYPE D

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

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

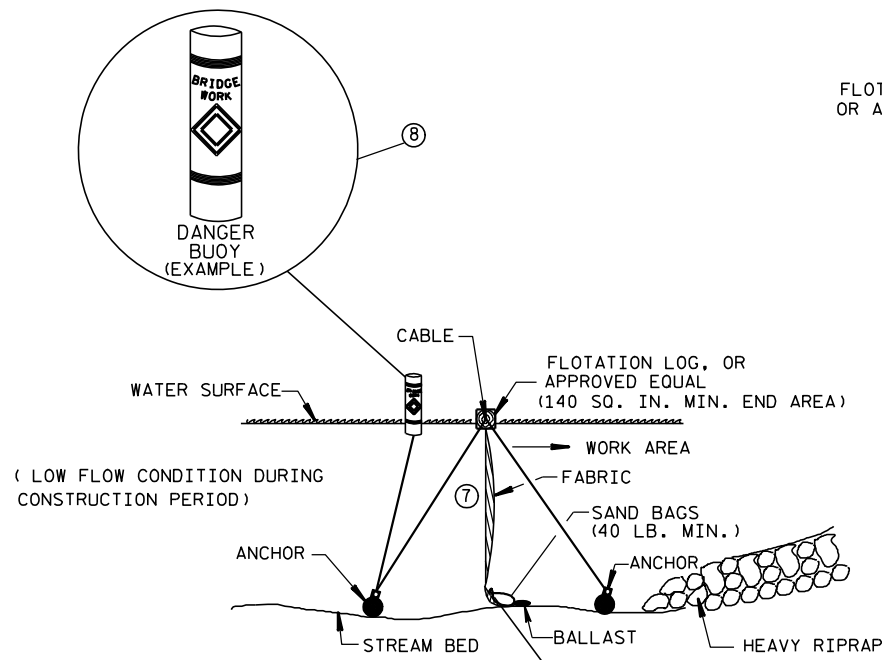
THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE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



INLET PROTECTION, TYPE D

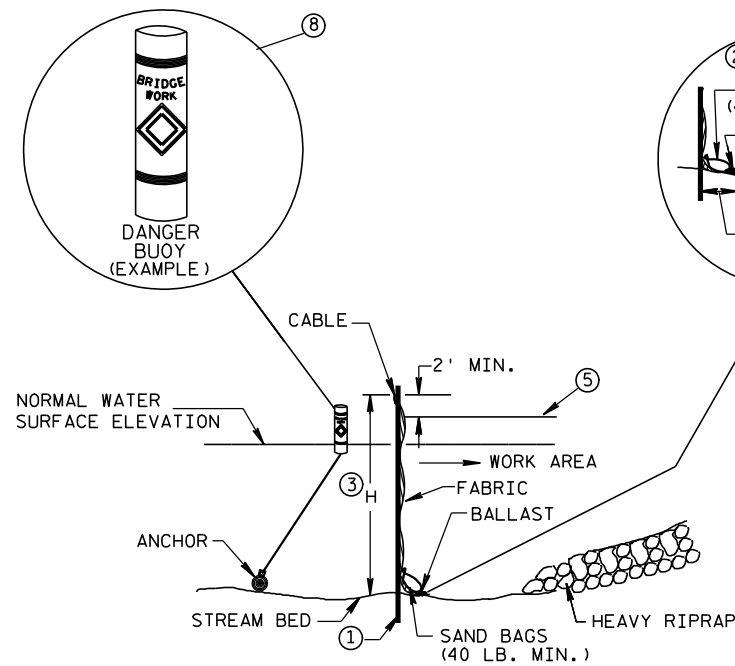
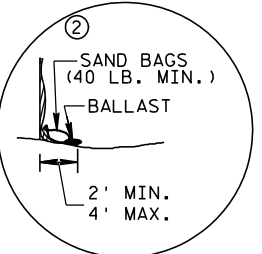
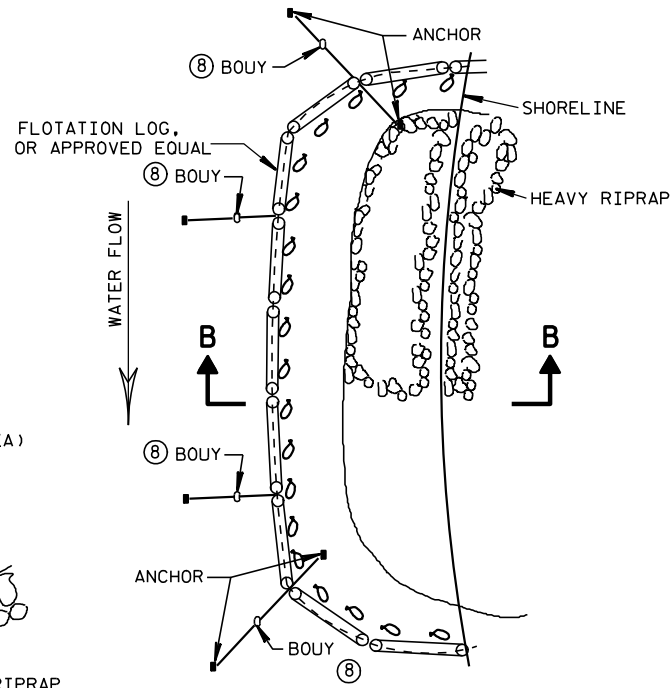
(CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX AS PER NOTE ②)

INLET PROTECTION TYPE A, B, C, AND D	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 10/16/02 DATE	/s/ Beth Connestra CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA	



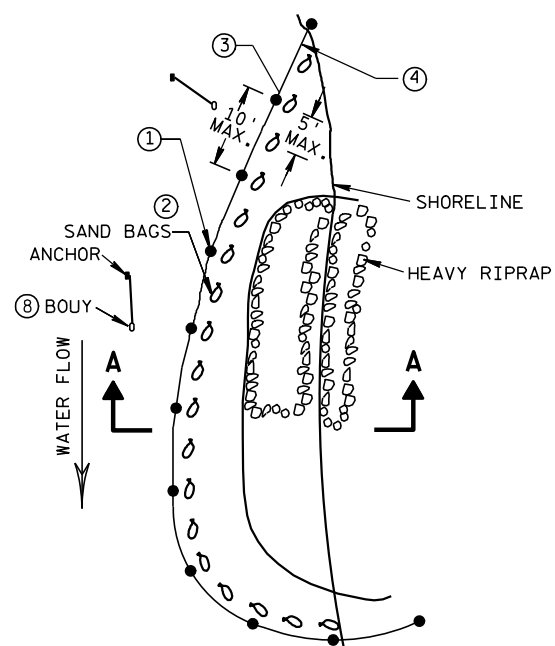
SECTION B-B

TURBIDITY BARRIER FLOAT ALTERNATIVE
CAUTION - SEE NOTE 6



SECTION A-A

TURBIDITY BARRIER STANDARD POST INSTALLATION



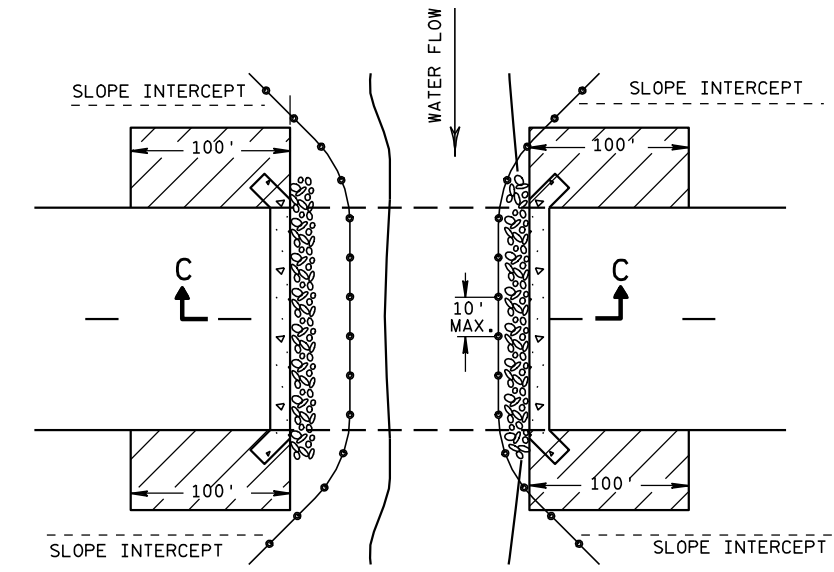
PLAN VIEW

GENERAL NOTES

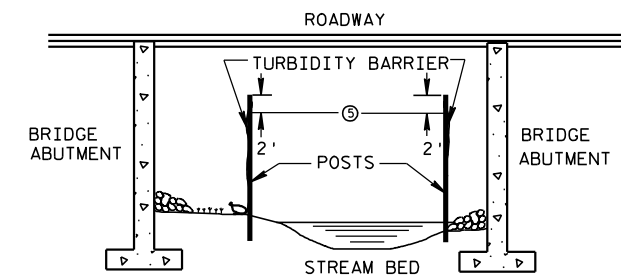
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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 SANDBAGS 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 FT., 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 O2 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 BED ROCK 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



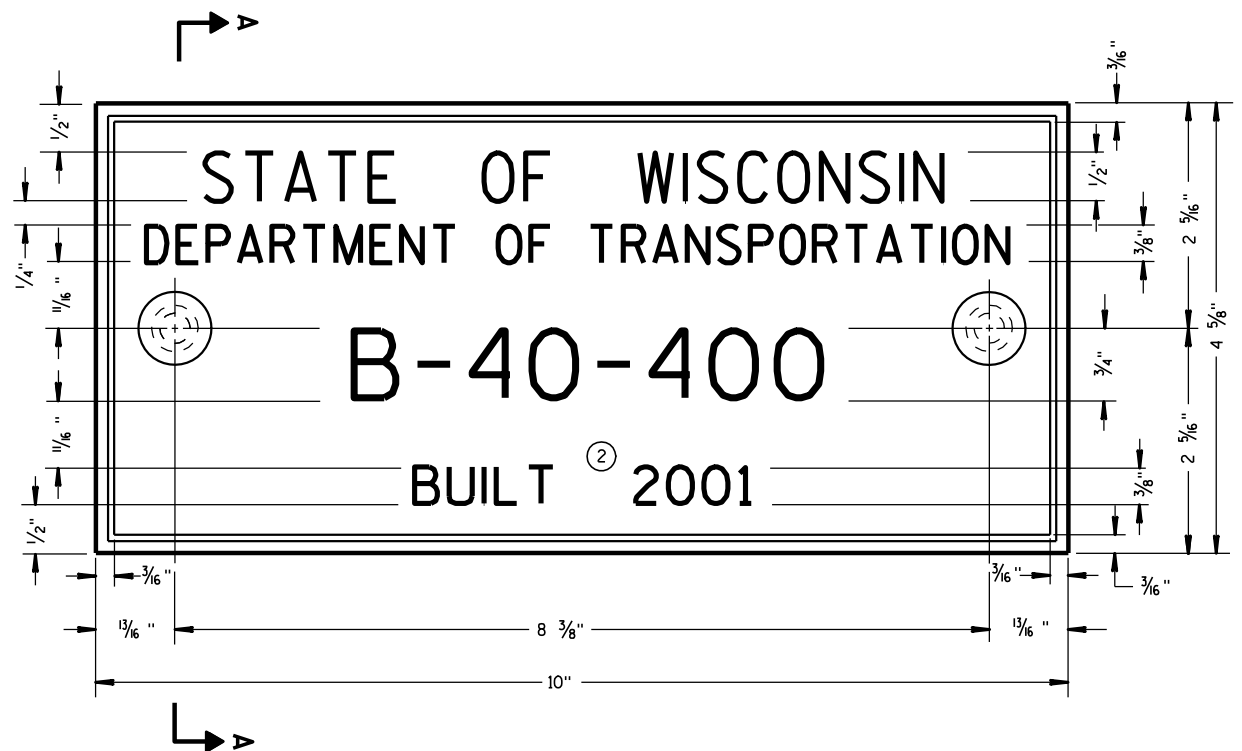
SECTION C-C

TURBIDITY BARRIER DETAIL SHOWING
TYPICAL PLACEMENT AT STRUCTURES

TURBIDITY BARRIER

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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



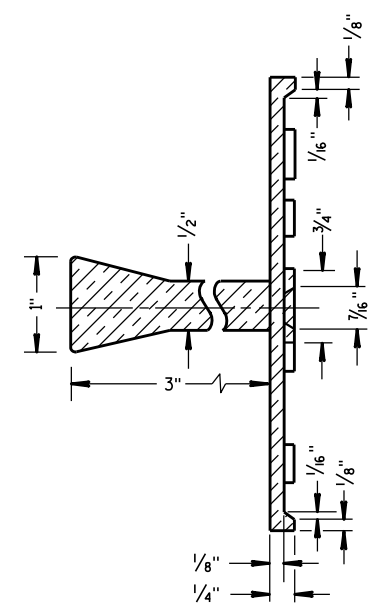
TYPICAL NAME PLATE
(BRIDGES, CULVERTS, AND RETAINING WALLS)

GENERAL NOTES

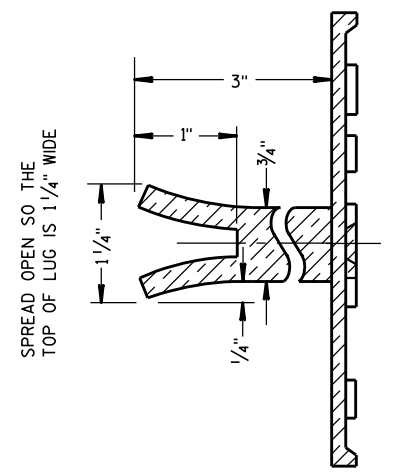
NAME PLATES TO BE INSTALLED ON BRIDGES, CULVERTS, AND RETAINING WALLS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS.

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.



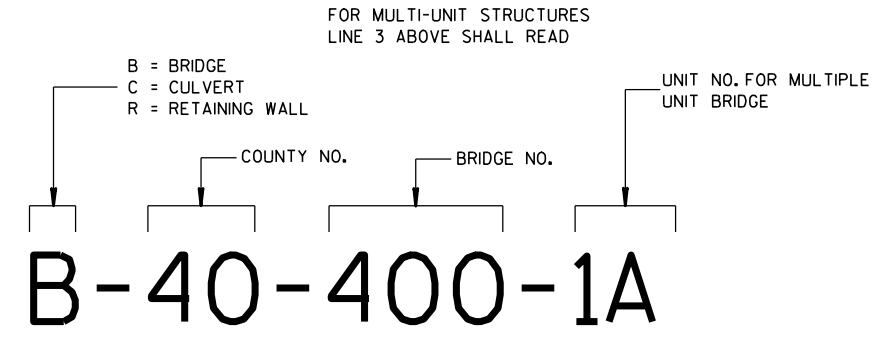
SECTION A-A



ALTERNATE LUG

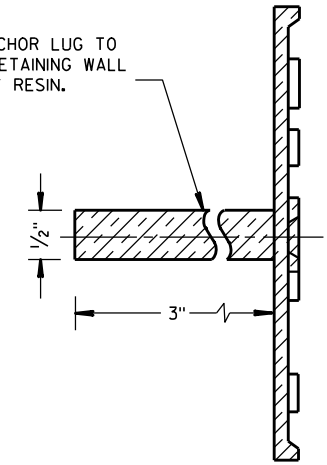
6

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**NUMBERING DESIGNATION
MULTI-UNIT STRUCTURES**

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



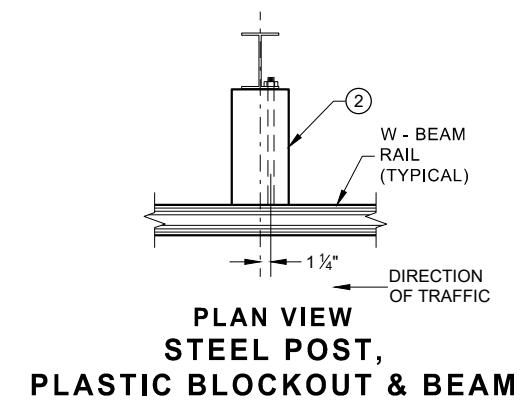
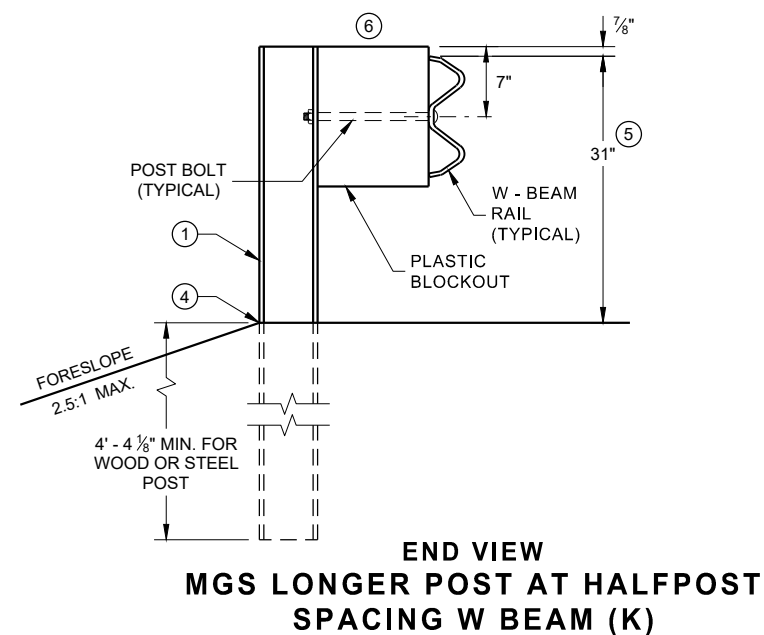
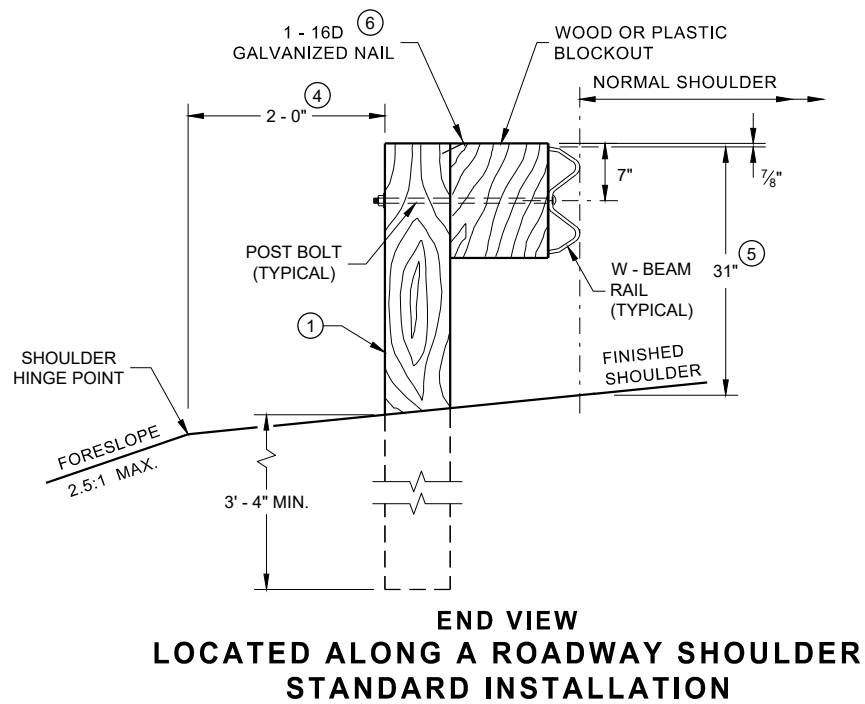
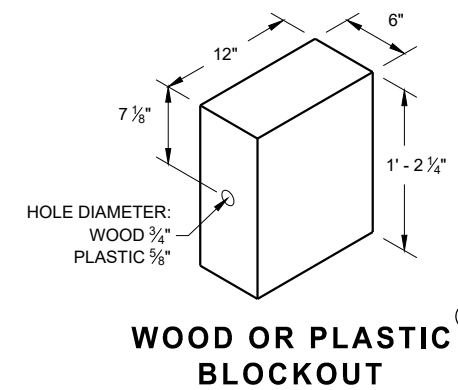
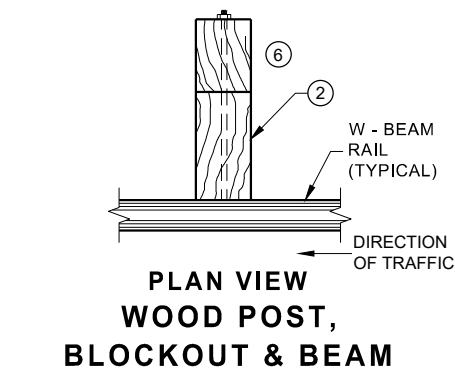
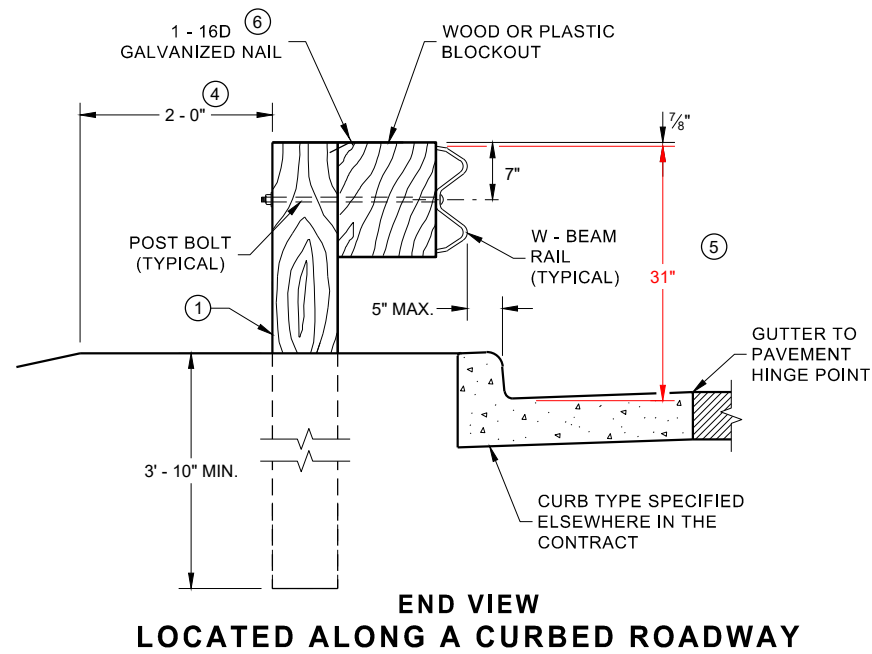
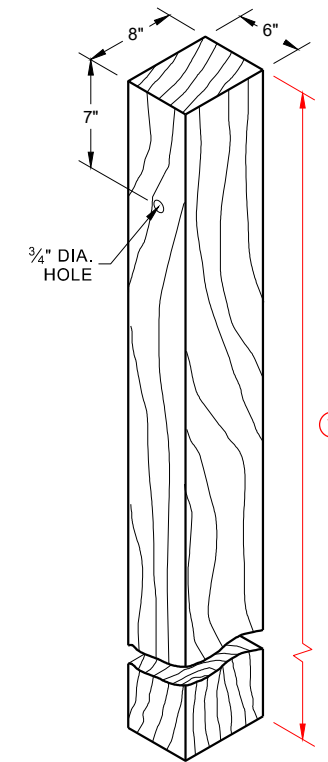
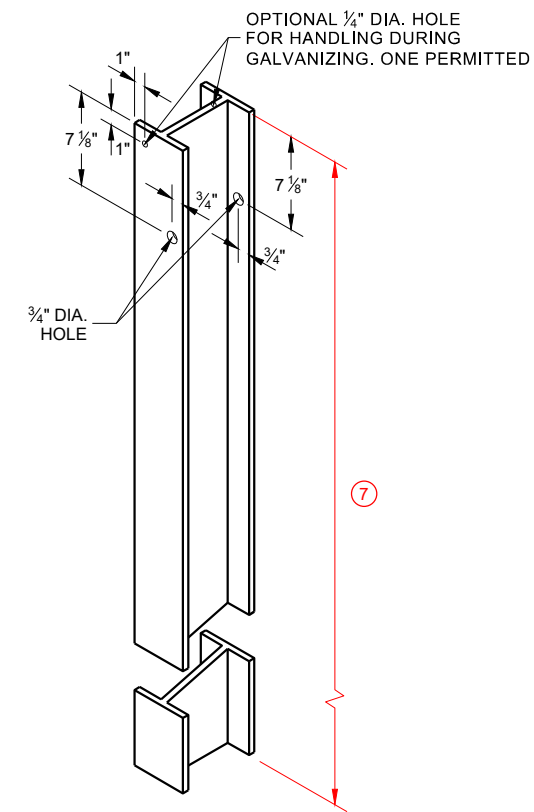
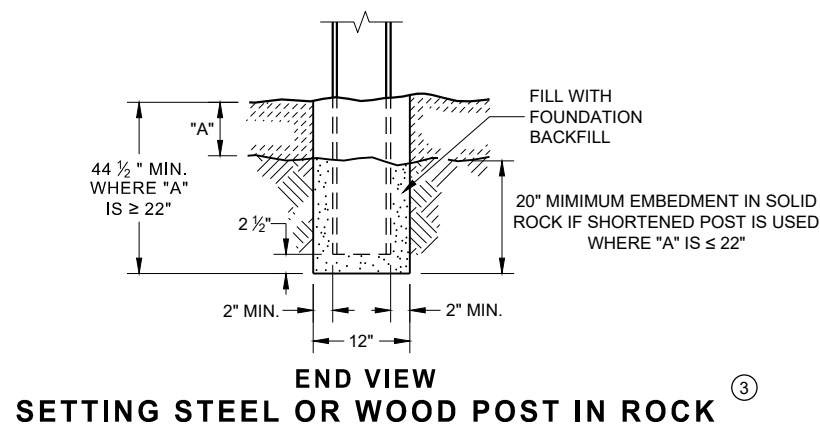
ALTERNATE LUG
(FOR ATTACHMENT TO PRECAST STRUCTURES)

S.D.D. 12 A 3-10

S.D.D. 12 A 3-10

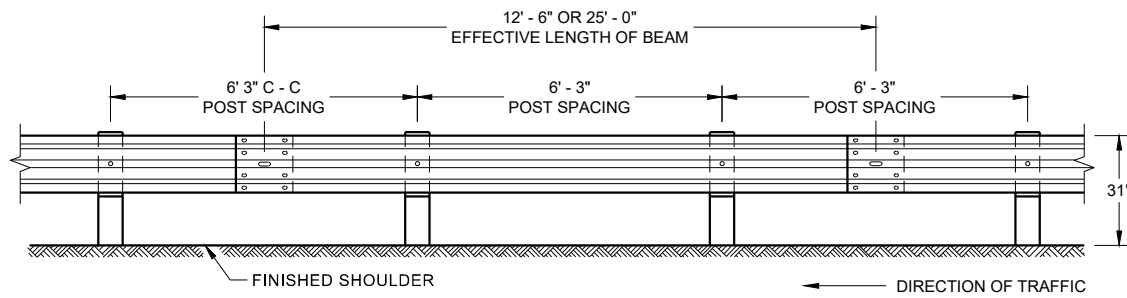
NAME PLATE (STRUCTURES)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED DATE 3/26/10	/S/ Scot Becker CHIEF STRUCTURAL DEVELOPMENT ENGINEER
FHWA	

- 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".

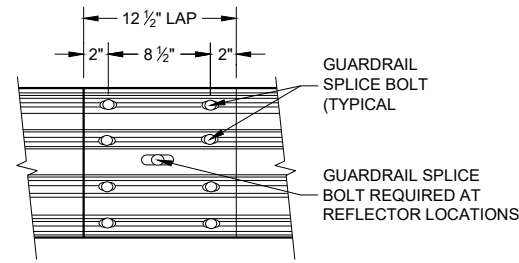


**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



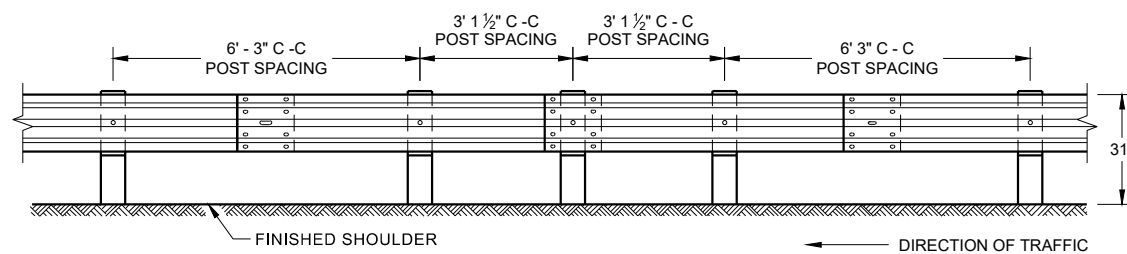
**FRONT VIEW
POST SPACING STANDARD INSTALLATION**



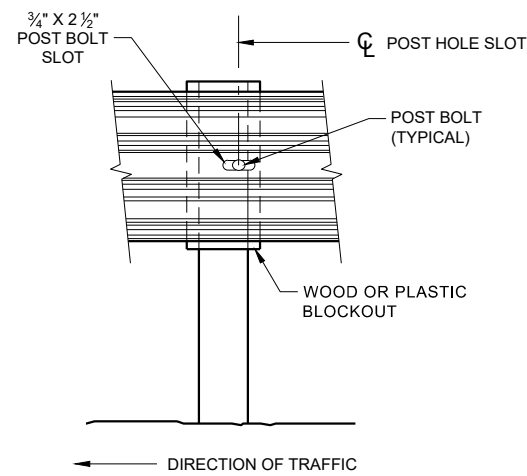
**FRONT VIEW
MID-SPAN BEAM SPLICE**

GENERAL NOTES

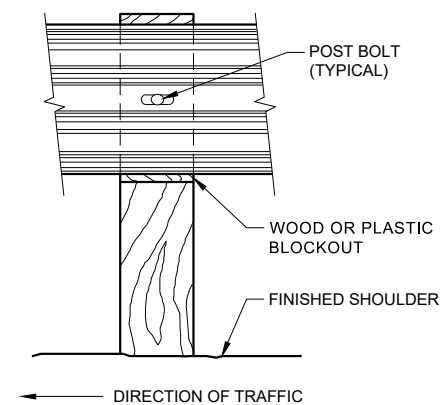
- ⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPLICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.
 - ⑨ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.
- POST BOLTS ARE A 3/8"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



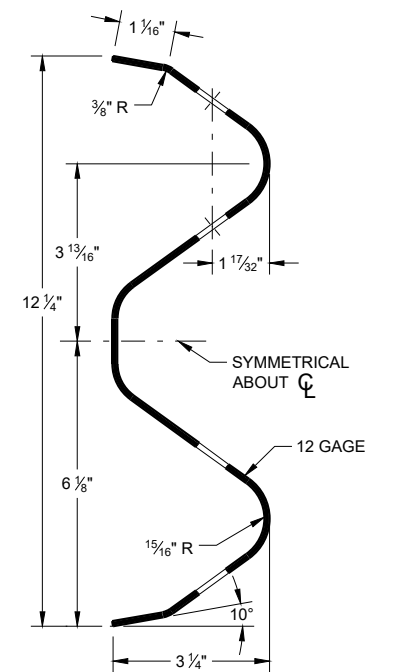
**FRONT VIEW
HALF POST SPACING (HS) AND
HALF POST SPACING WITH LONGER POSTS (K)**



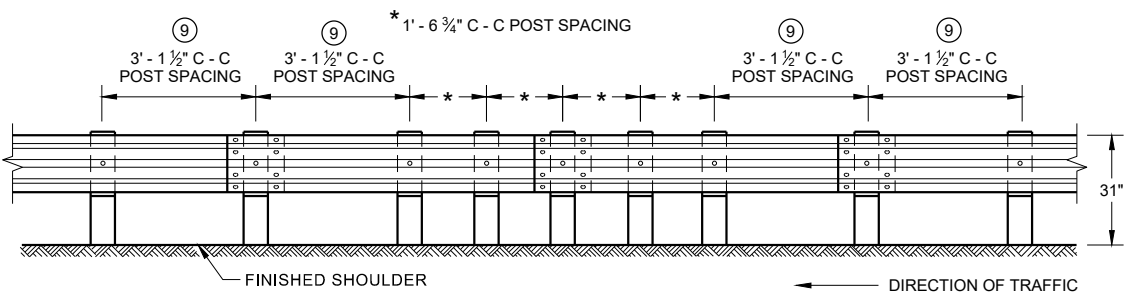
FRONT VIEW AT STEEL POST



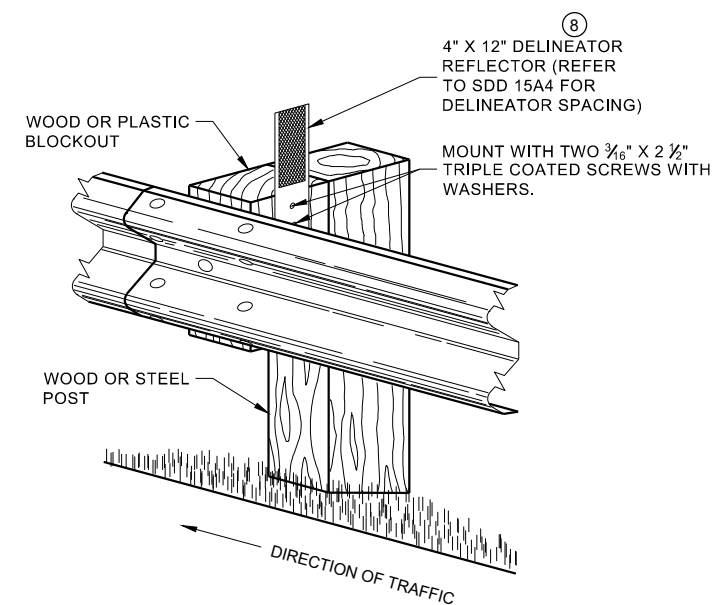
FRONT VIEW AT WOOD POST



SECTION THRU W-BEAM RAIL



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



**ONE SIDED REFLECTOR DETAIL
AND TYPICAL INSTALLATION**

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

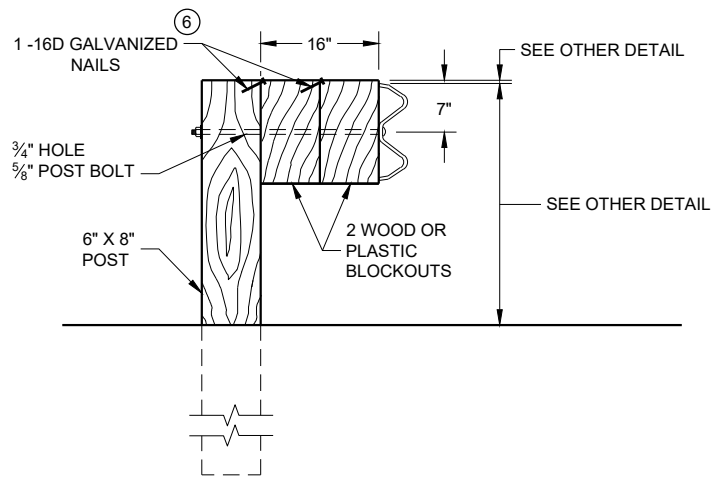
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

6

SDD 14B42 - 06b

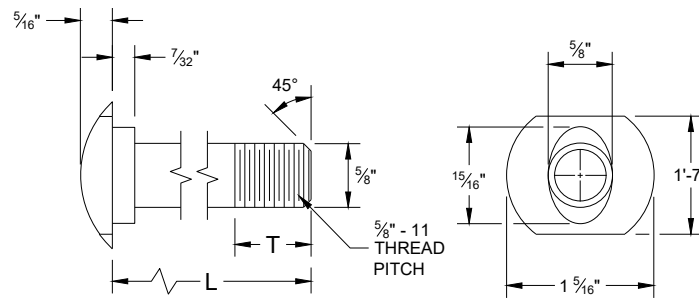
SDD 14B42 - 06b



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.

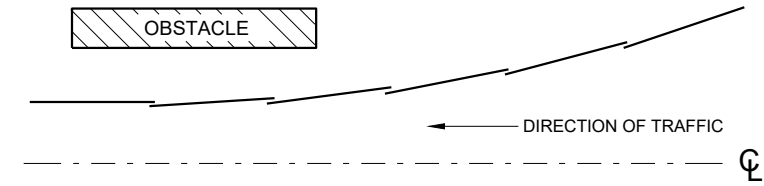
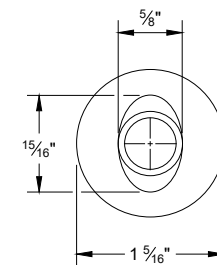
- NOTE:
1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 3/16".
 2. IF THE BOLT EXTENDS MORE THAN 1/4" FROM THE NUT THE BOLT SHOULD BE TRIMMED BACK.



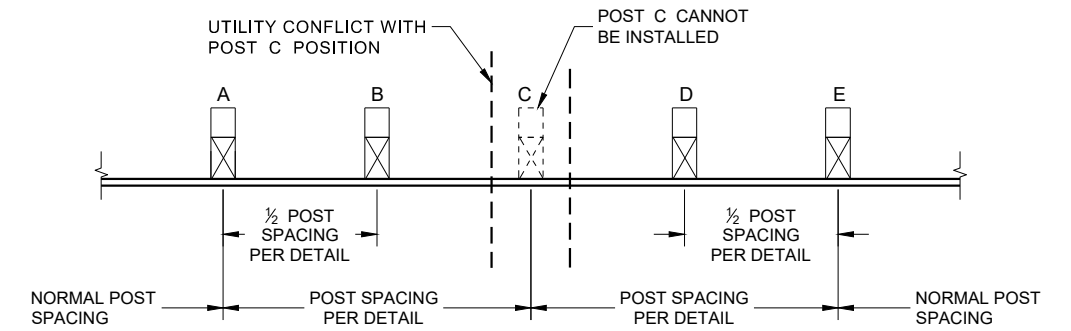
ALTERNATE BOLT HEAD

POST BOLT TABLE

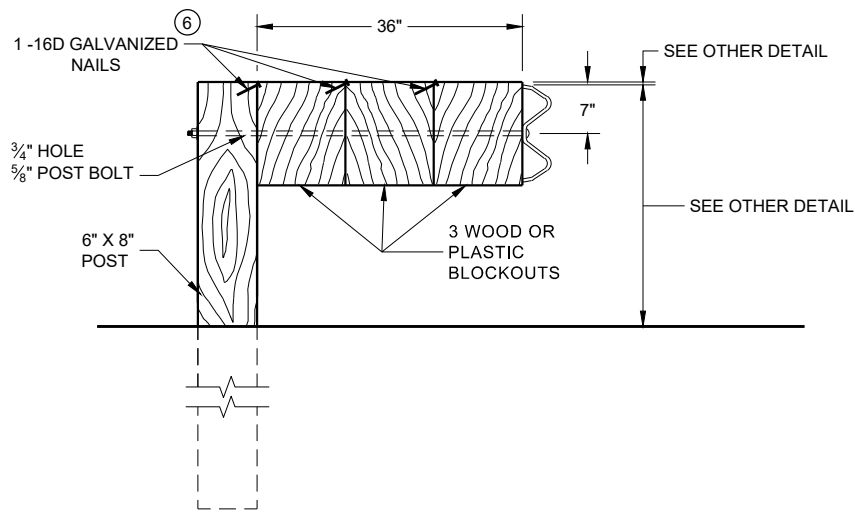
L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



**PLAN VIEW
BEAM LAPPING DETAIL**

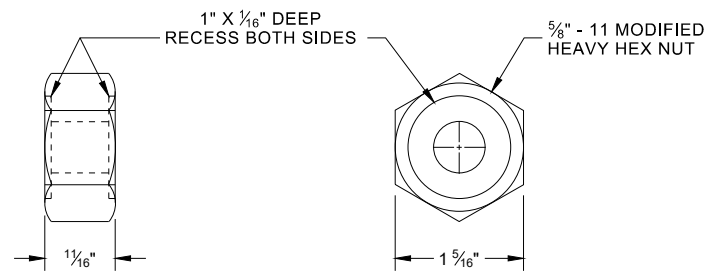


**POST DRIVING FOR CONTINUOUS
UNDERGROUND OBSTRUCTION**

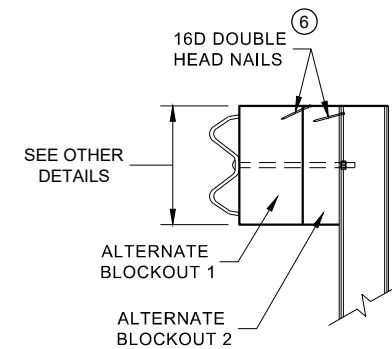


DETAIL FOR 36" BLOCKOUT DEPTH

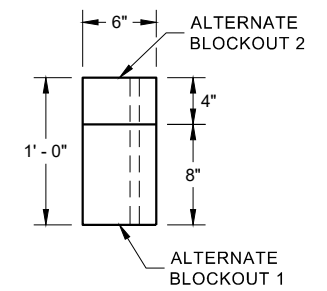
NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT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



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



SIDE VIEW



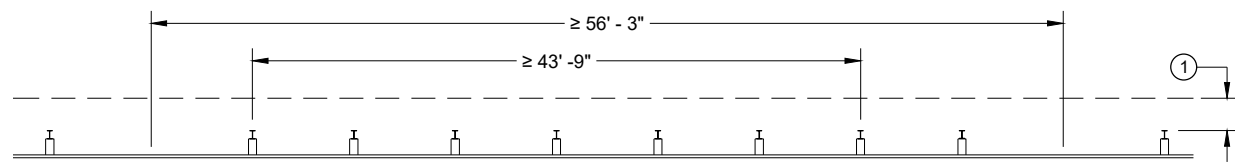
PLAN VIEW

**ALTERNATE WOOD
BLOCKOUT DETAIL**

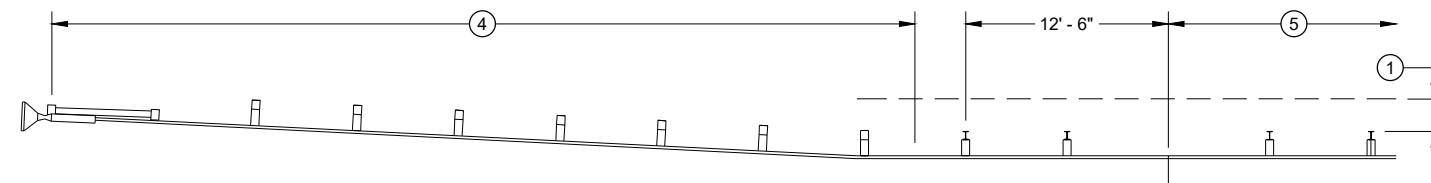
6 WHEN USING STEEL POST AND WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

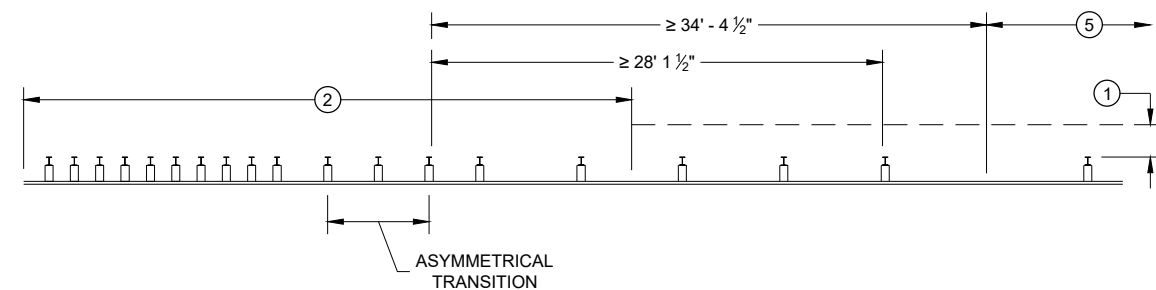
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



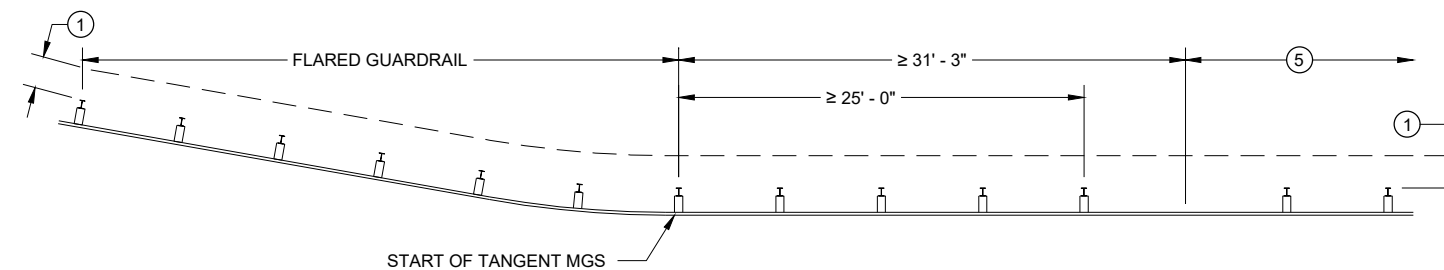
MISSING POST IN NORMAL BEAM GUARD RUN



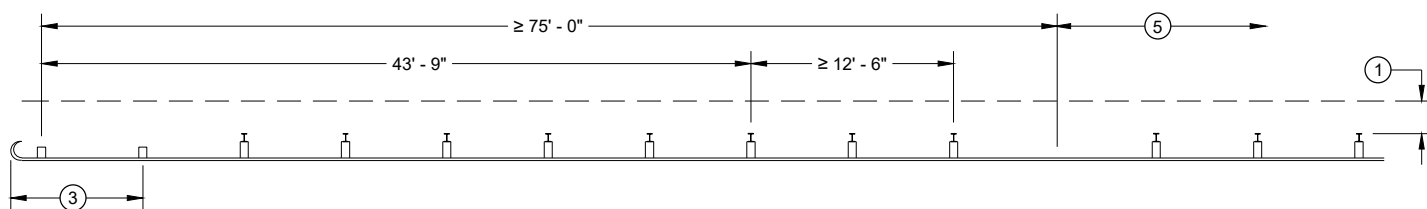
MISSING POST IN NORMAL BEAM GUARD RUN NEAR EAT



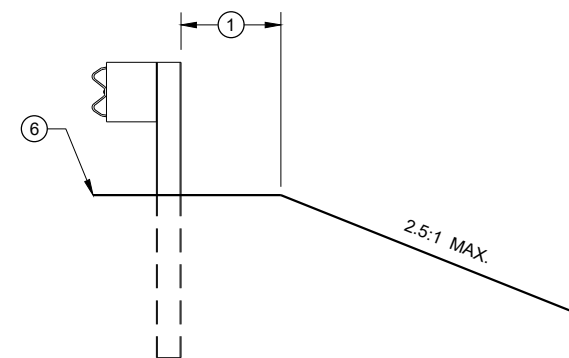
MISSING POST NEAR APPROACH THRIE BEAM TRANSITION



MISSING POST IN NORMAL BEAM GUARD RUN NEAR FLARED BEAM GUARD



MISSING POST IN NORMAL BEAM GUARD RUN NEAR TYPE 2 TERMINAL



CROSS SECTION VIEW

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

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

FHWA

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.

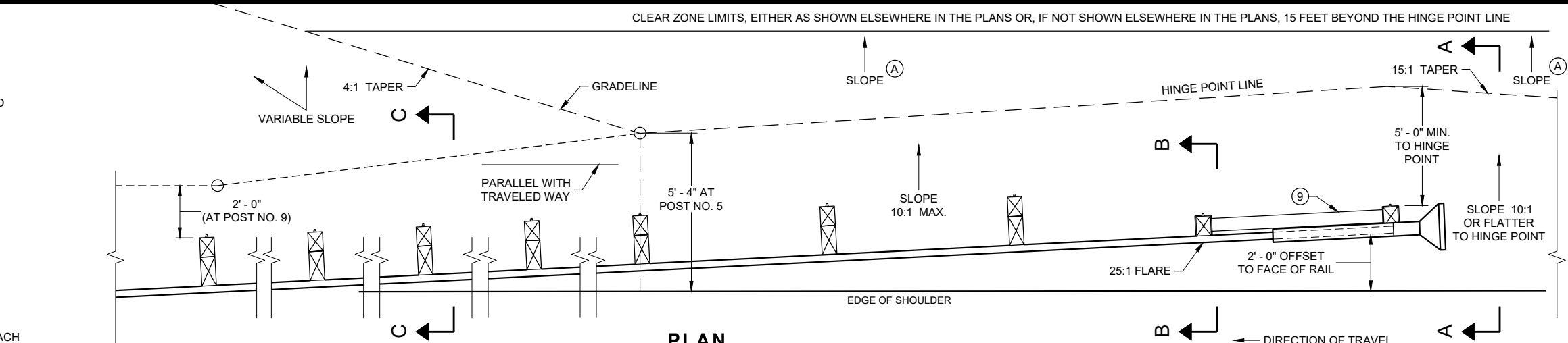
SEE SDD 14B42 FOR MORE INFORMATION.

* DO NOT ATTACH BLOCKOUTS TO POST 1 AND 2.

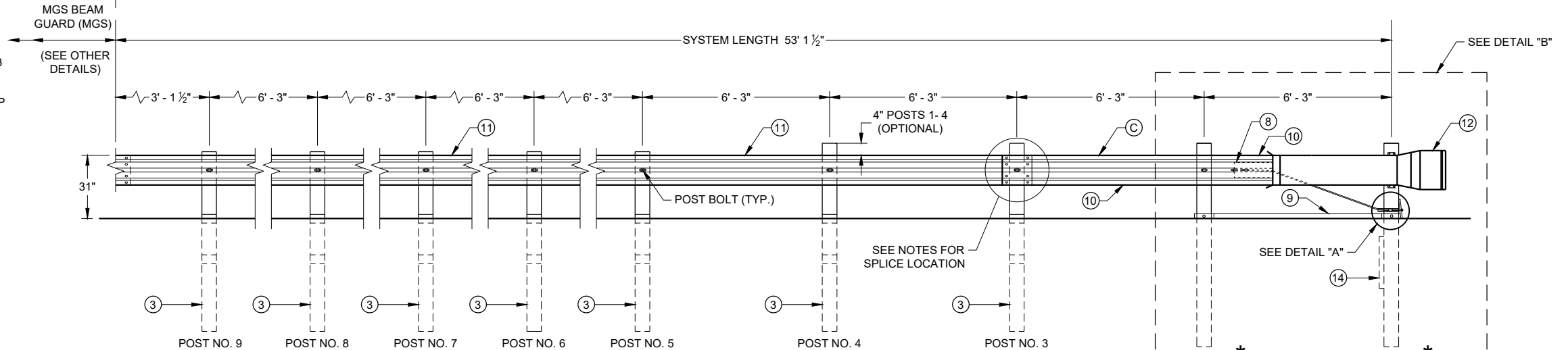
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

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

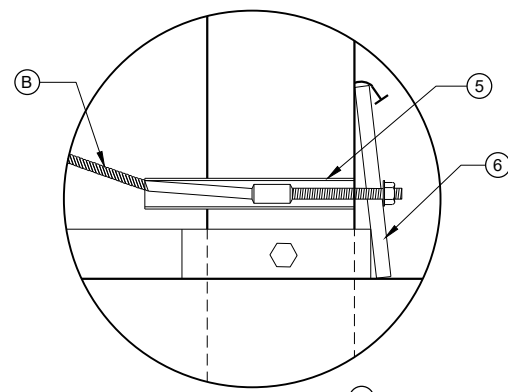
THE CENTER OF THE UPPER 3 1/2" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE. WOOD BLOCKS ON POSTS NUMBERED 3 THROUGH 9 MAY BE ADJUSTED UP TO 3" ABOVE THE TOP OF POST.



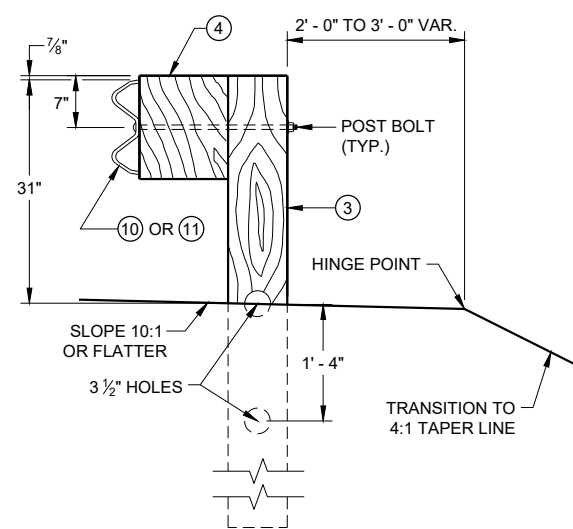
PLAN



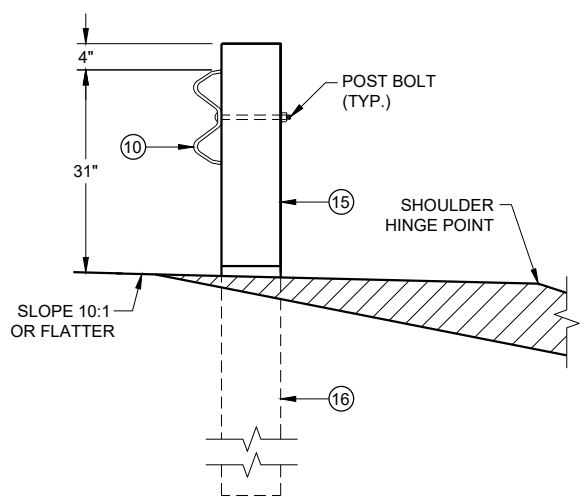
ELEVATION



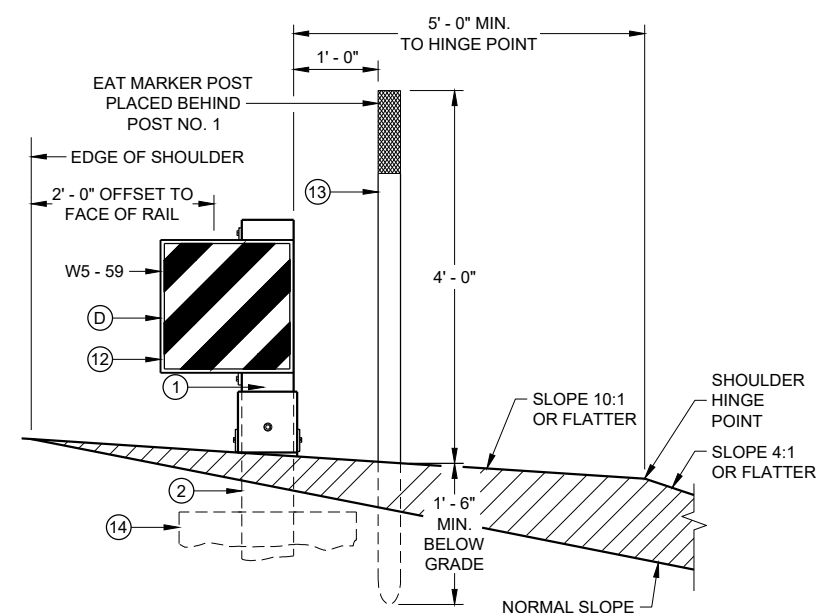
DETAIL "A"



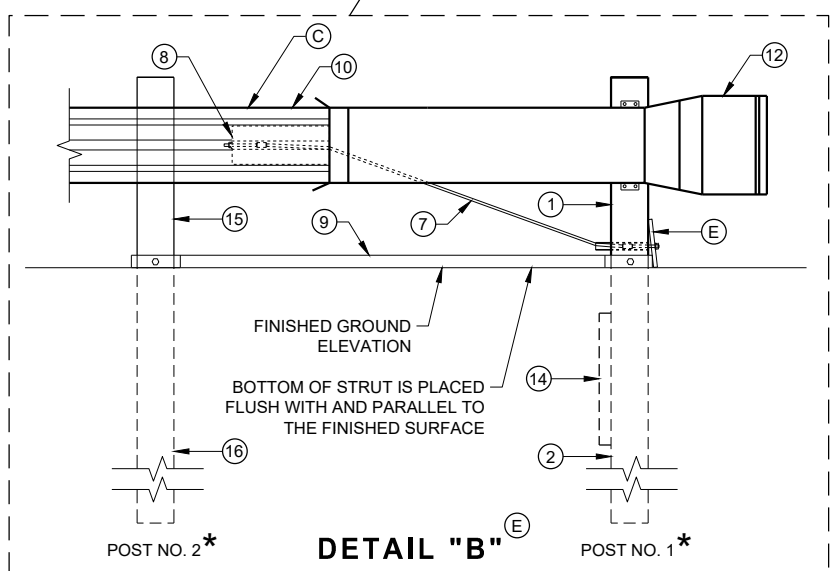
**SECTION C - C
TYPICAL AT POST NOS. 3 - 9**



**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

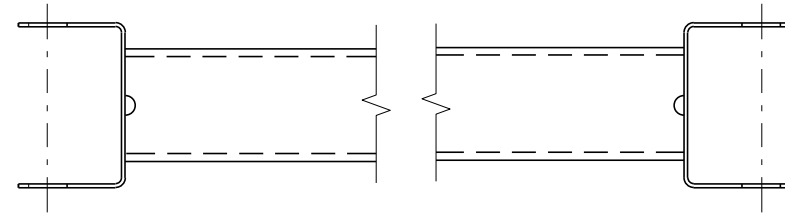
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SDD 14B44 - 04a

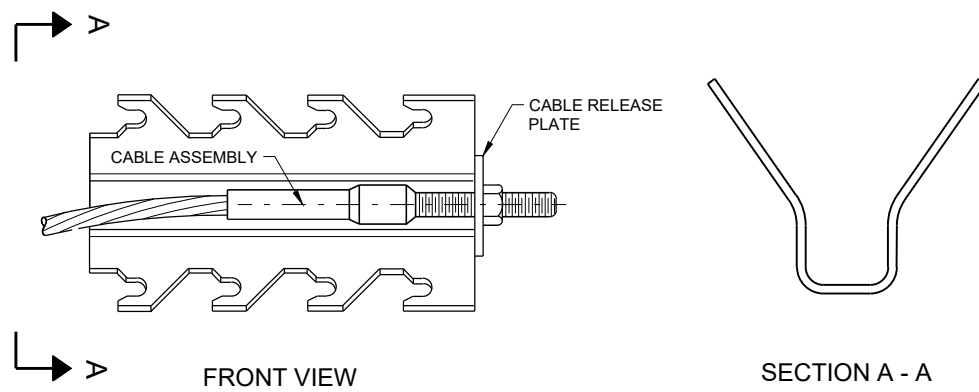
SDD 14B44 - 04a

BILL OF MATERIALS

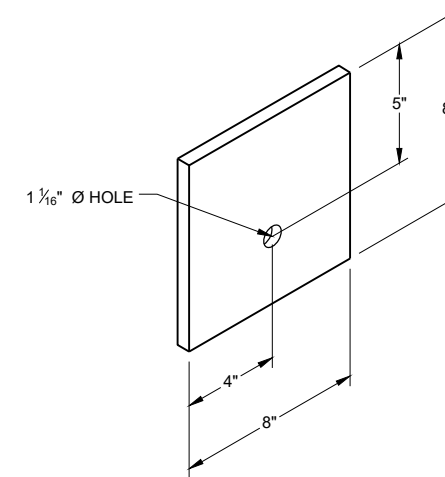
PART NO.	DESCRIPTION MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
①	UPPER POST NO. 1 6" X 6" TUBE
②	LOWER POST NO. 1
③	WOOD CRT
④	WOOD BLOCKOUT
⑤	PIPE SLEEVE
⑥	BEARING PLATE
⑦	BCT CABLE ASSEMBLY
⑧	ANCHOR CABLE BOX
⑨	GROUND STRUT
⑩	PERFORATED W-BEAM RAIL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



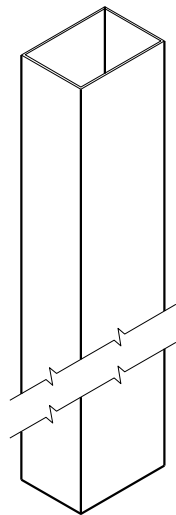
GENERIC GROUND STRUT ⑨ ⑤



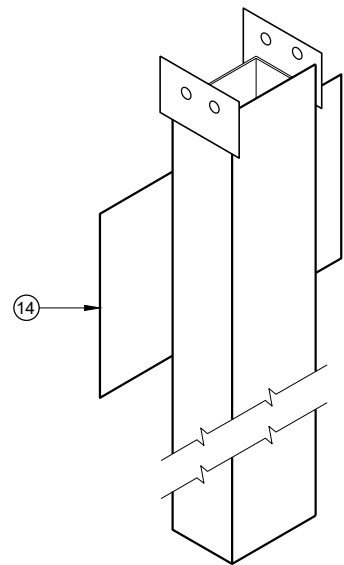
GENERIC ANCHOR CABLE BOX ⑨ ⑤



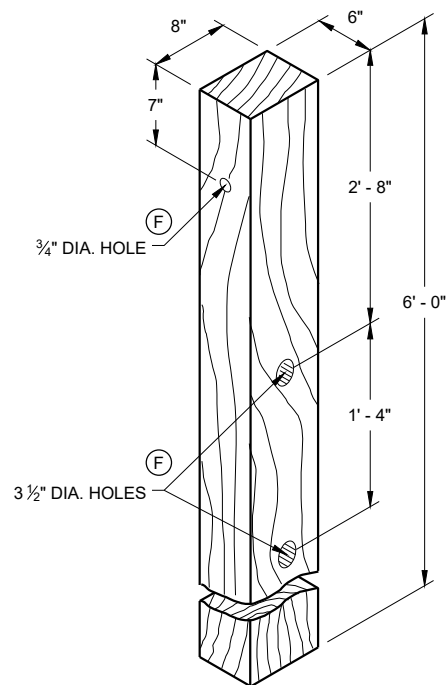
BEARING PLATE ⑥ ⑤



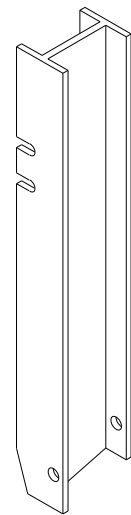
UPPER POST NO. 1 ⁽¹⁾ (E)



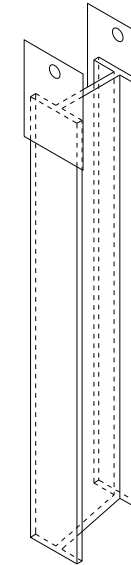
LOWER POST NO. 1 ⁽²⁾ (E)



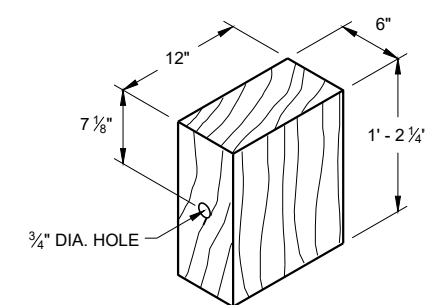
WOOD CRT POST ⁽³⁾ (E)
POSTS NUMBER 3-9



UPPER POST NO. 2 ⁽¹⁵⁾ (E)

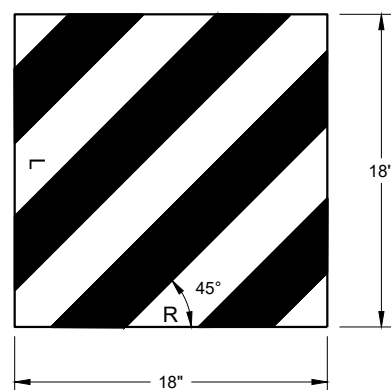


LOWER POST NO. 2 ⁽¹⁶⁾ (E)



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

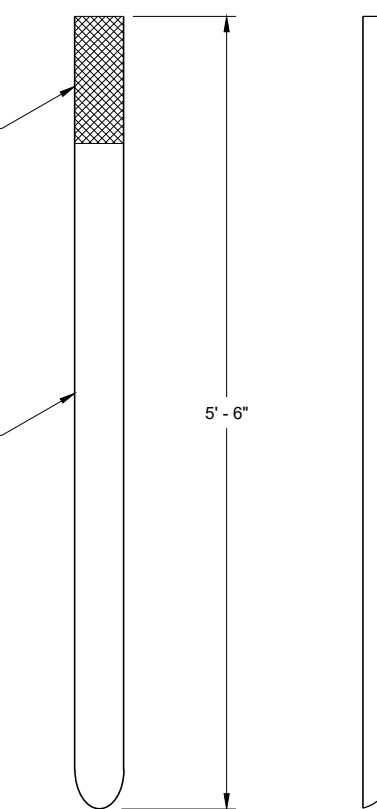
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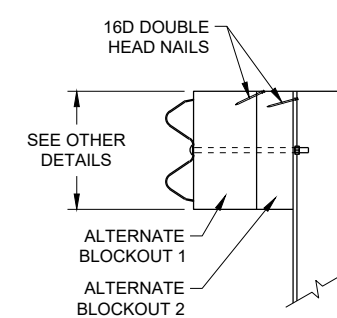
REFLECTIVE SHEETING DETAIL ^(E)

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

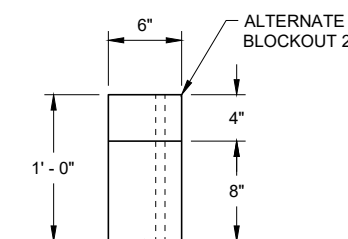
E.A.T. MARKER
POST (YELLOW)



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



SIDE VIEW



TOP VIEW

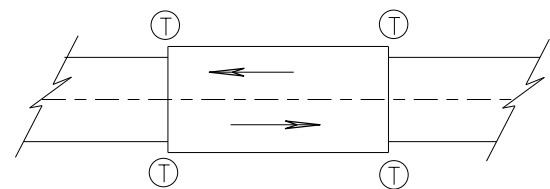
ALTERNATE WOOD
BLOCKOUT DETAIL

6

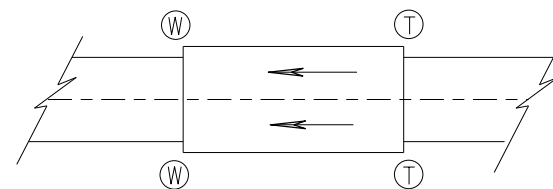
**MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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



TWO WAY TRAFFIC



ONE WAY TRAFFIC

(T) THRIE BEAM CONNECTION

(W) W-BEAM CONNECTION WHEN REQUIRED

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

GENERAL NOTES

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

TRANSITION USES STEEL POSTS ONLY.

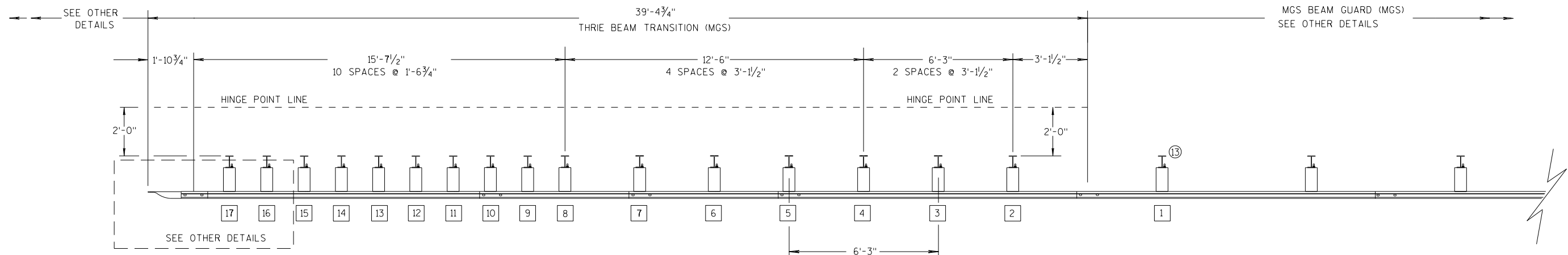
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

POST 2 THROUGH 17 USES STEEL POST ONLY

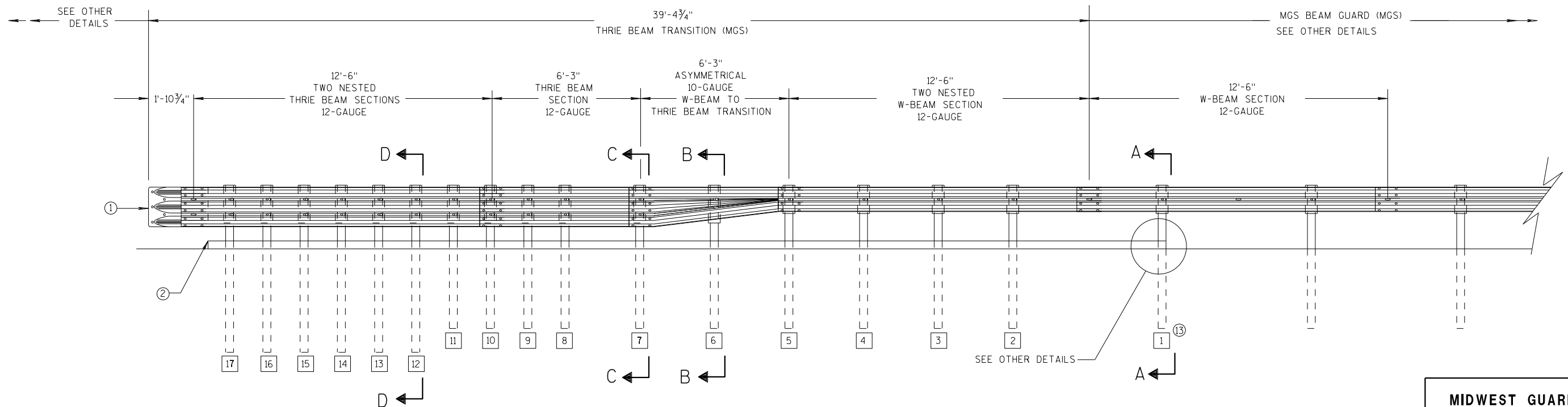
① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.

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

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



PLAN VIEW



ELEVATION VIEW

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

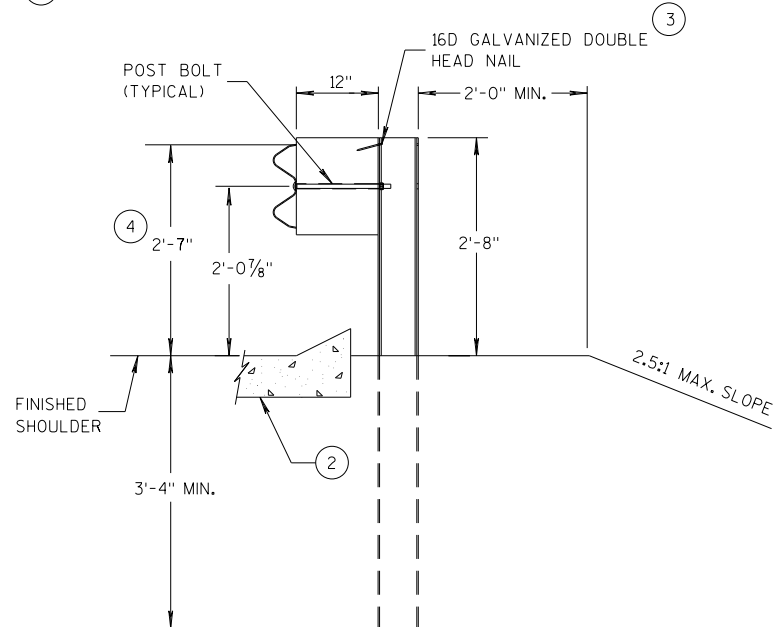
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S.D.D. 14 B 45-5a

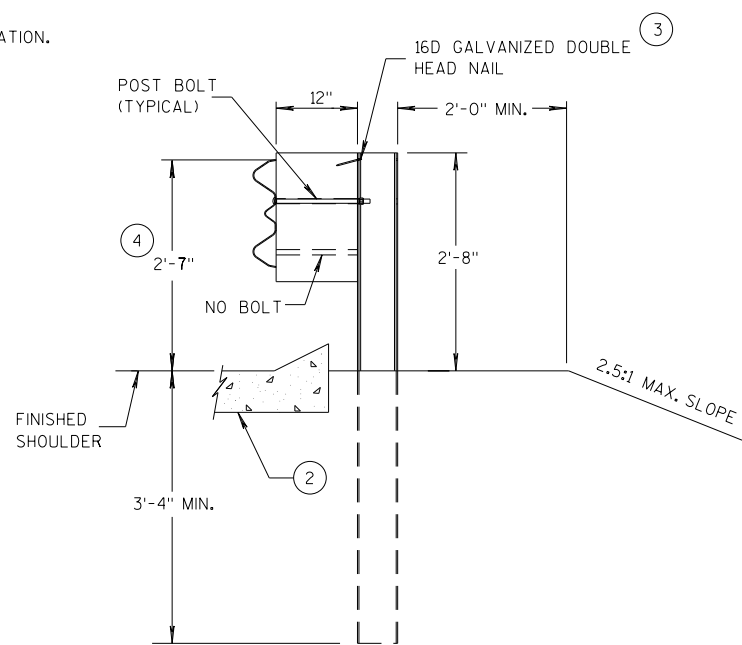
S.D.D. 14 B 45-5a

GENERAL NOTES

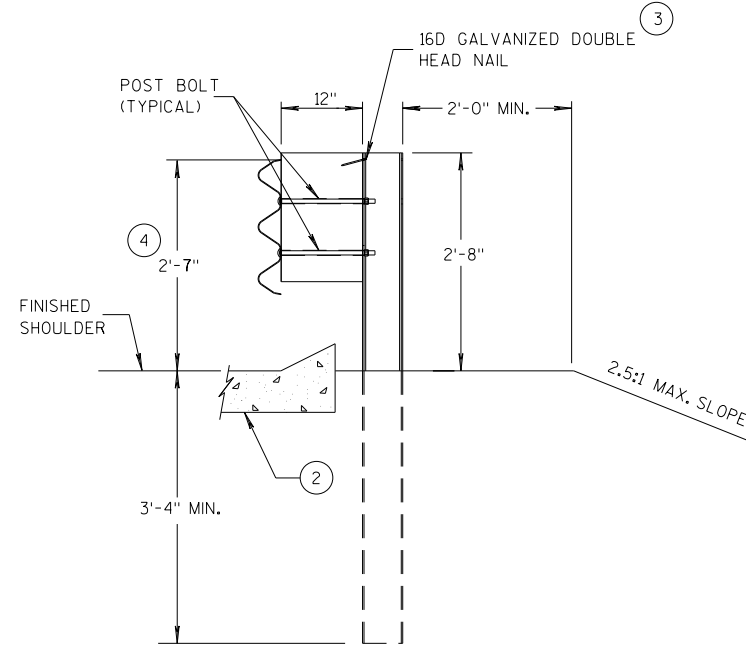
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ③ WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 10D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- ④ TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".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



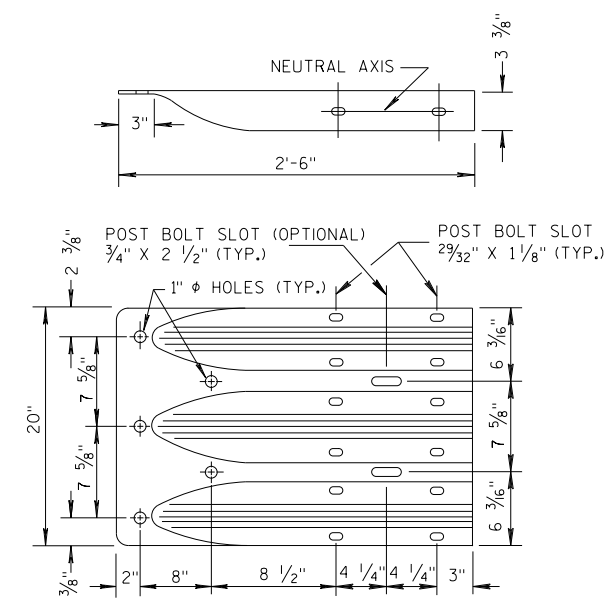
**SECTION A-A
POSTS 1-5**



**SECTION B-B
POST 6**



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



**THRIE BEAM
TERMINAL CONNECTOR**

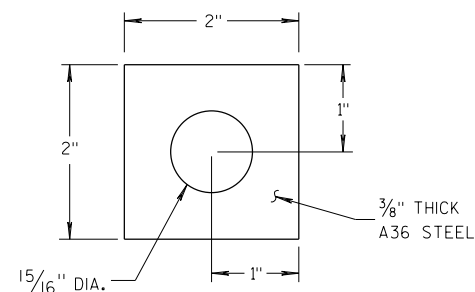
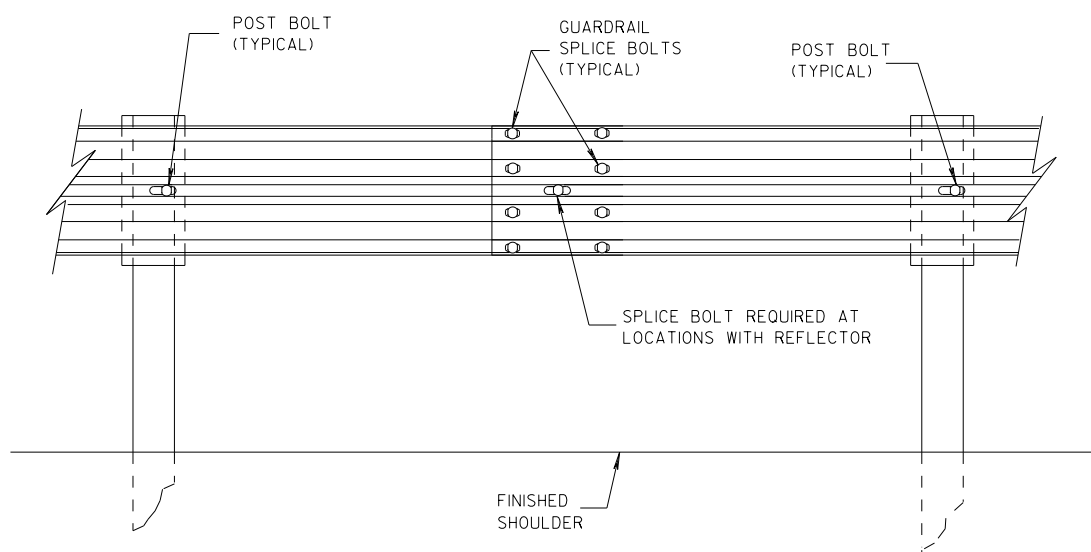
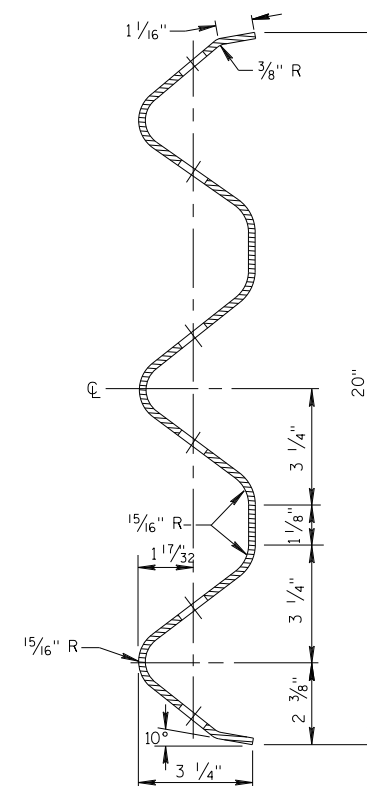


PLATE WASHER DETAIL



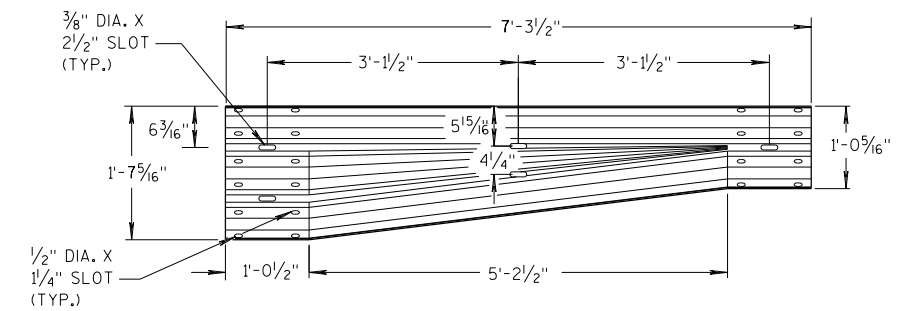
SPLICE DETAIL



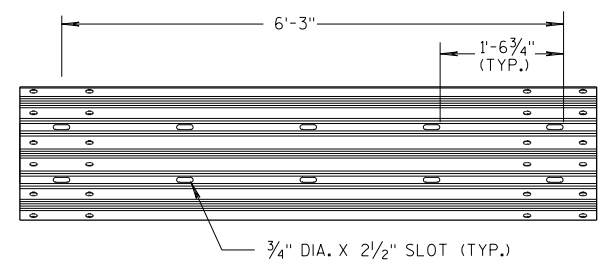
**SECTION THRU THRIE
BEAM RAIL ELEMENT**

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

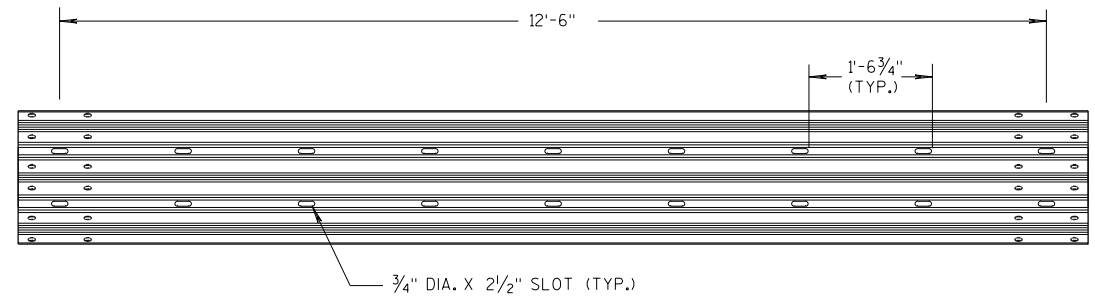
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



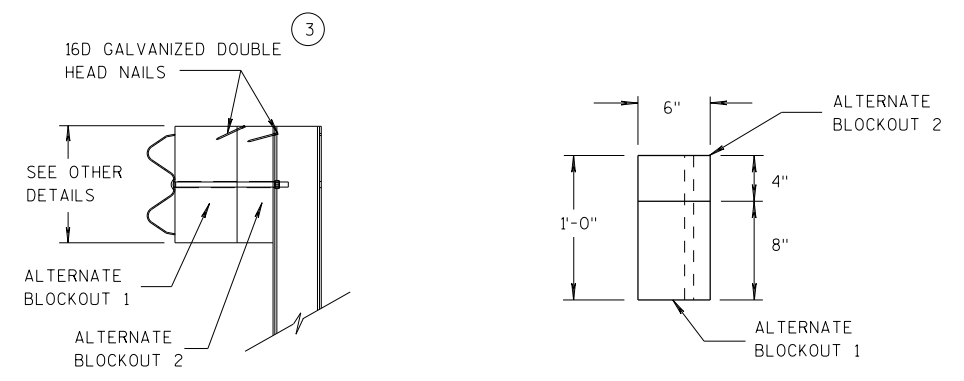
W-BEAM TO THRIE BEAM TRANSITION SECTION



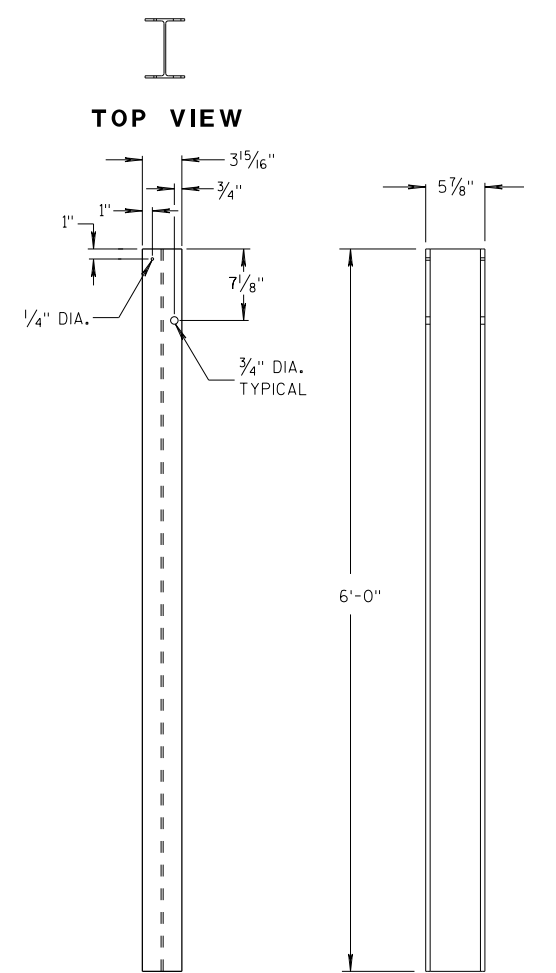
6'-3\"/>



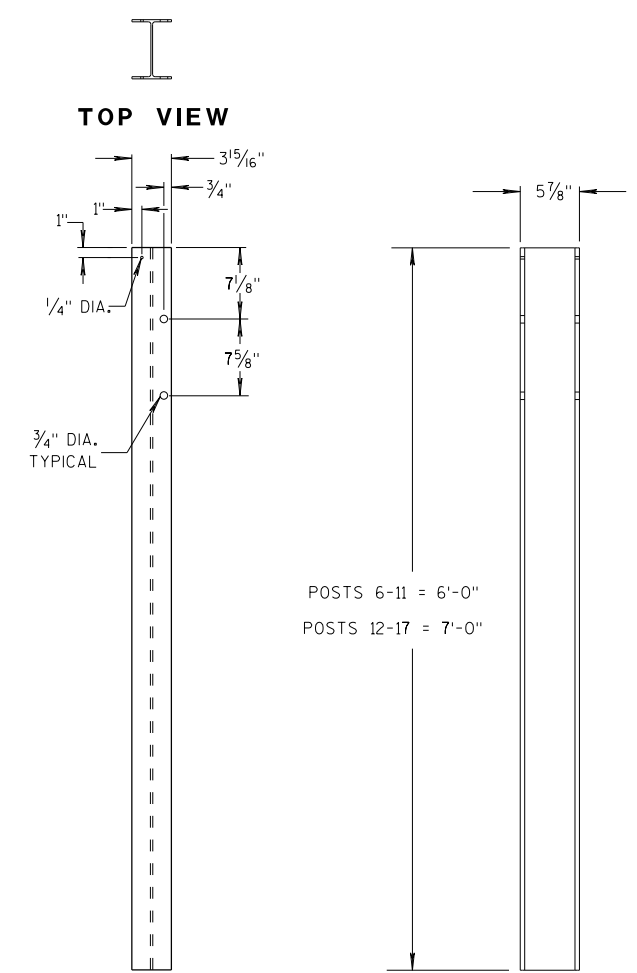
12'-6\"/>



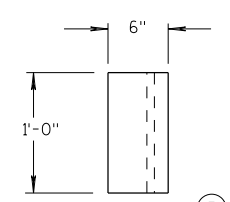
ALTERNATE WOOD BLOCKOUT DETAIL



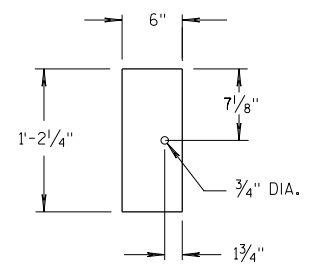
STEEL POSTS 1-5



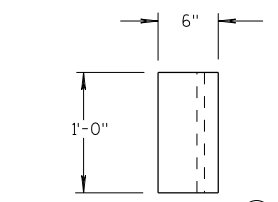
STEEL POSTS 6-17



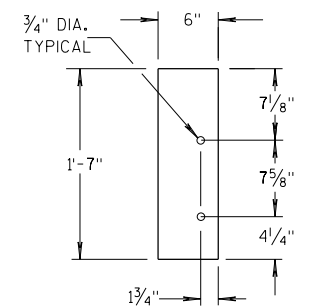
TOP VIEW



**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)**

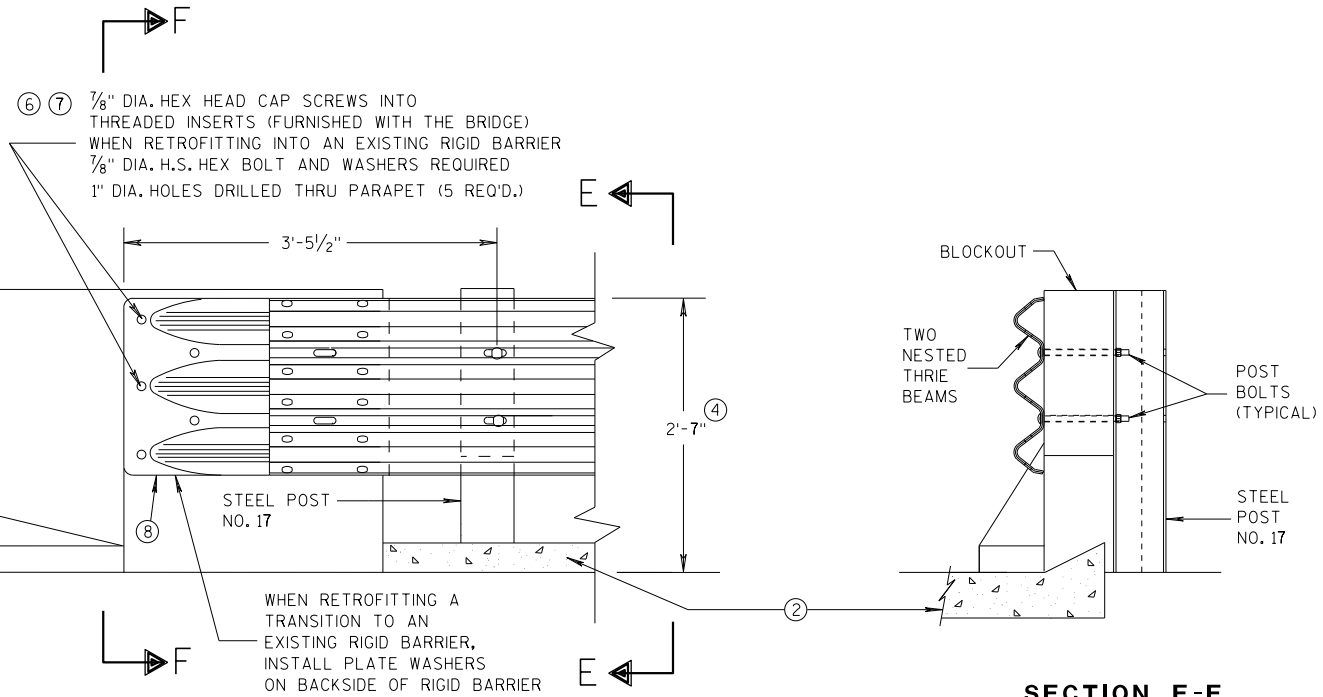
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

6

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

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



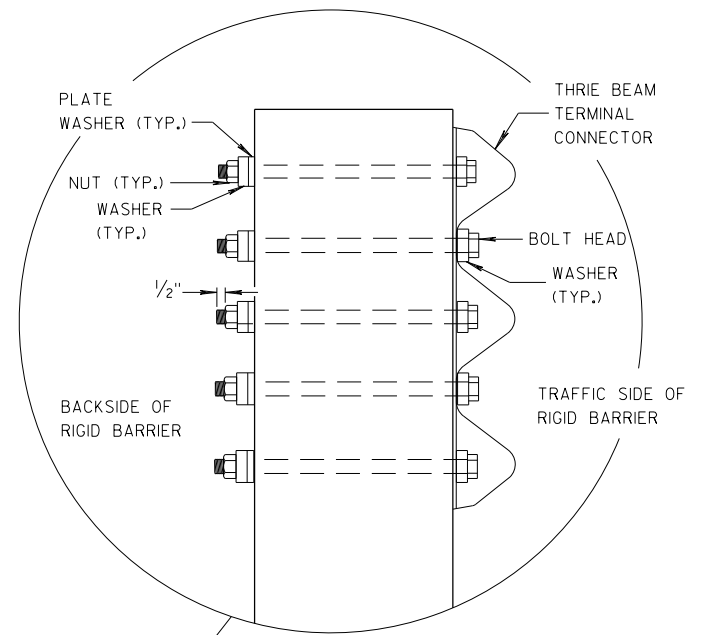
FRONT VIEW

THRIE BEAM CONNECTION TO BRIDGE PARAPET WITH SQUARE ENDS

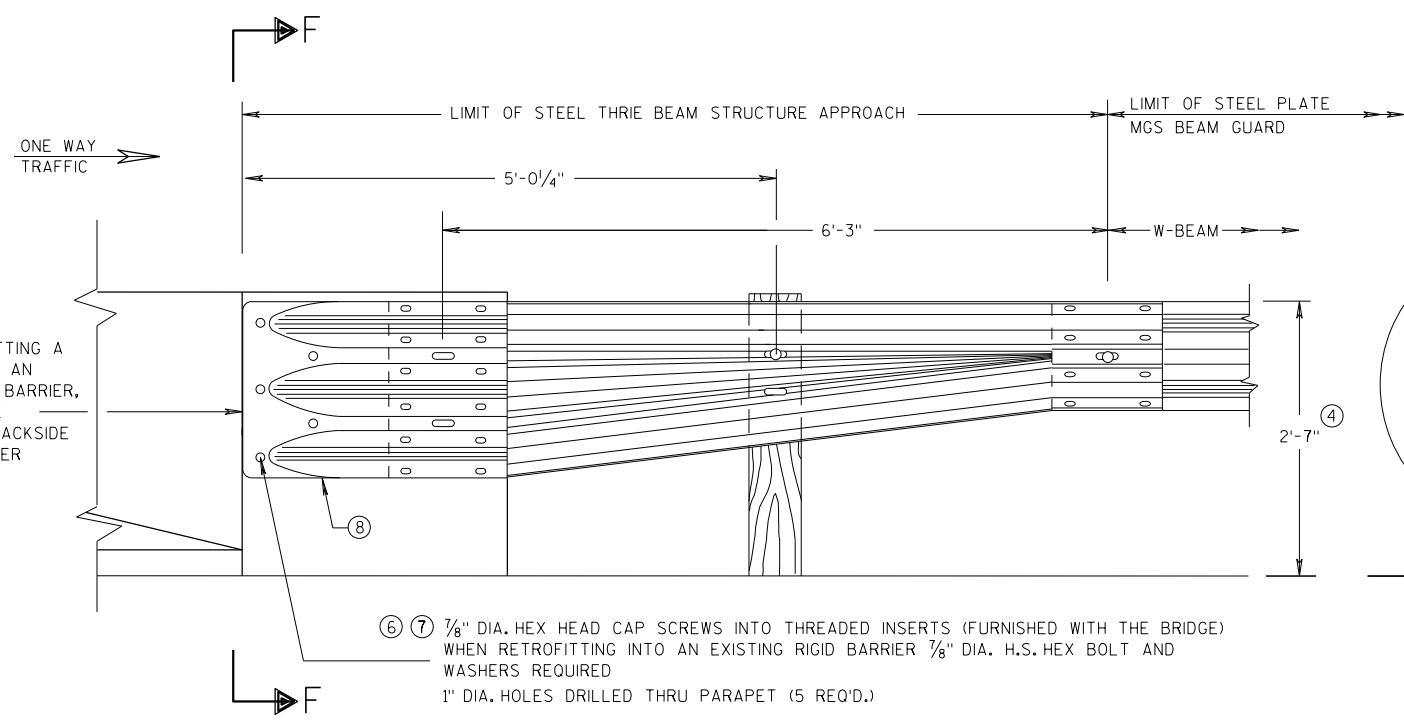
SECTION E-E

GENERAL NOTES

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

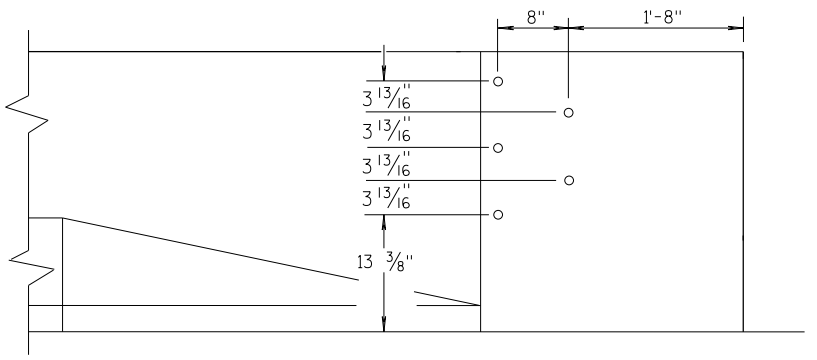


SECTION F-F



FRONT VIEW

**W BEAM TRANSITION AND CONNECTION TO BRIDGE PARAPETS WITH SQUARE ENDS
(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)**



DRILL HOLE LOCATION

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

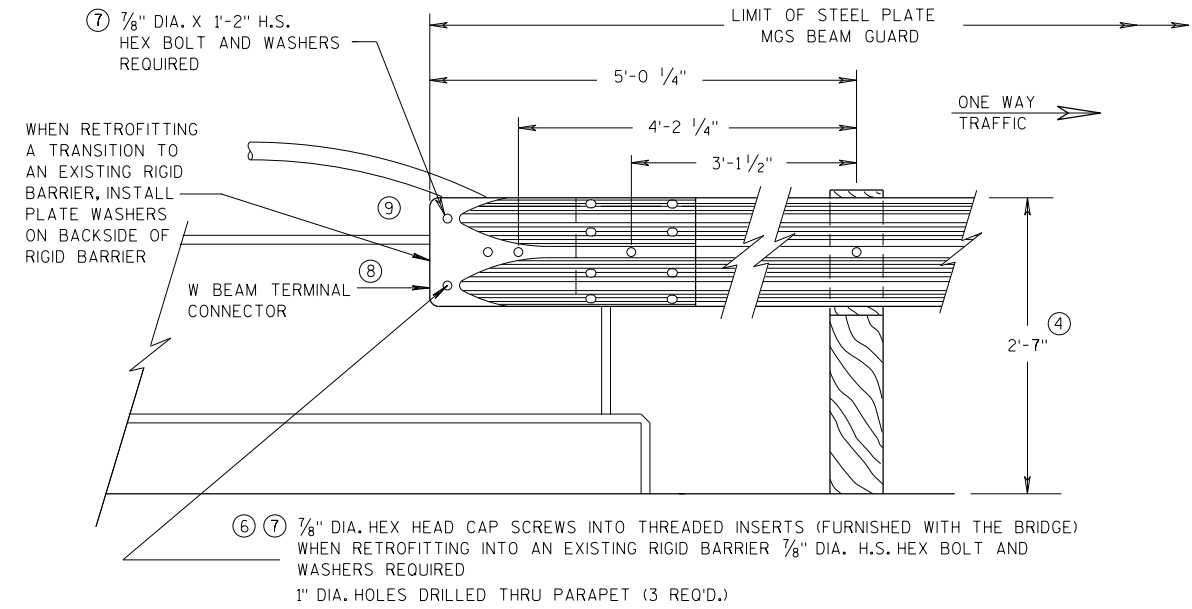
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

GENERAL NOTES

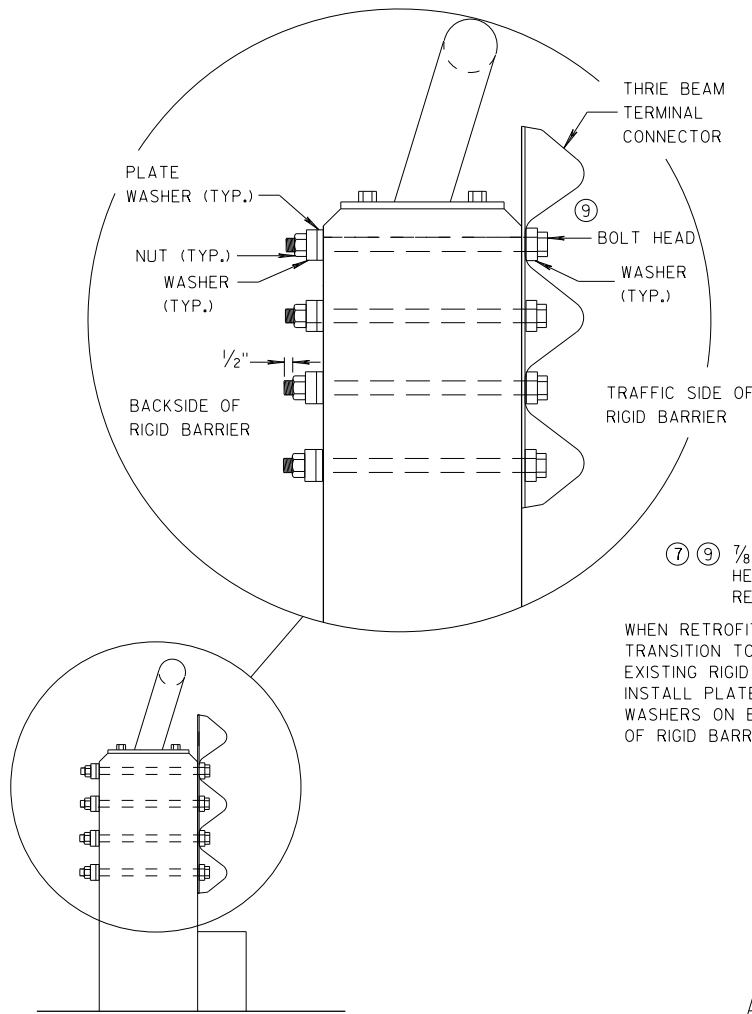
THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSITION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.

- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ④ TOLERANCE FOR TOP OF BEAM IS ± 1".
- ⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ⑧ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".
- ⑨ BOLT, NUT AND WASHERS NOT REQUIRED FOR THIS LOCATION WHEN RETROFITTING AN EXISTING PAPAPET AND THE HOLE IS EITHER ABOVE PARAPET OR WITHIN 4 INCHES OF THE EDGE OF PARAPET.

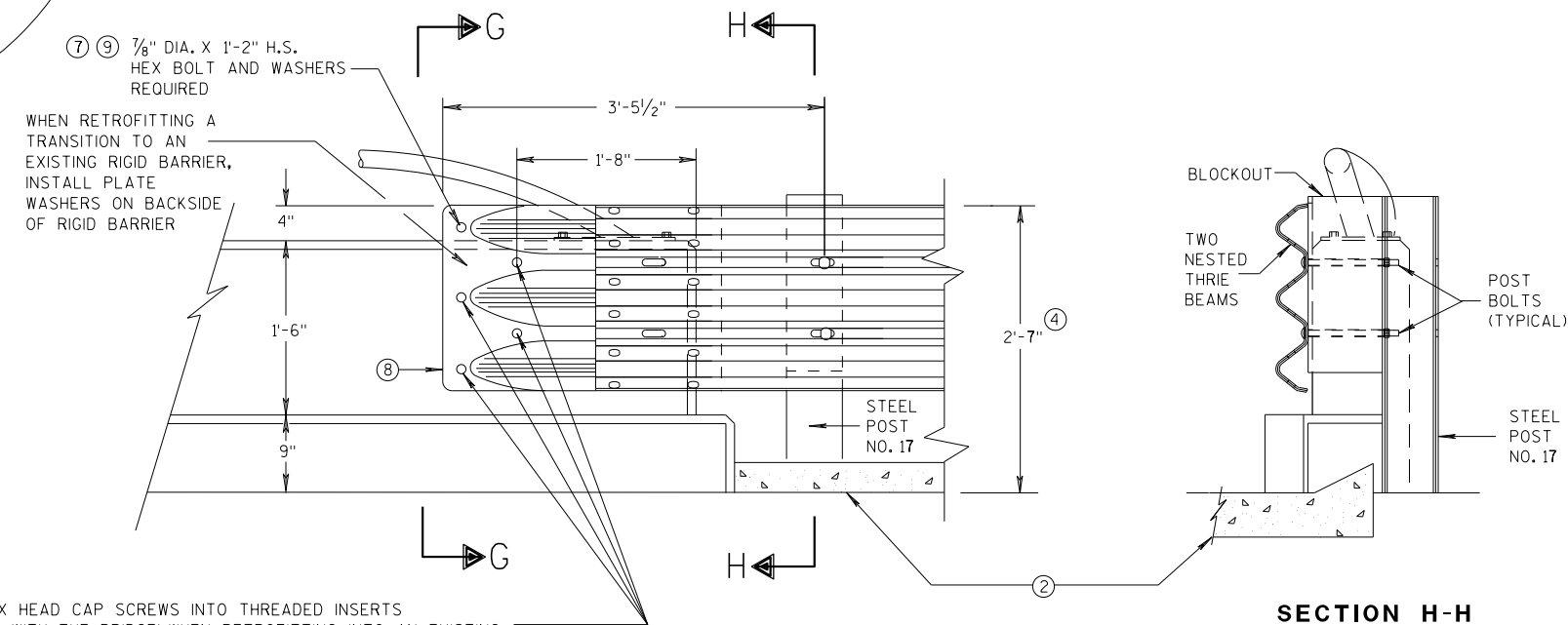


FRONT VIEW

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



SECTION G-G



FRONT VIEW

THRIE BEAM CONNECTION TO VERTICAL FACED PARAPETS

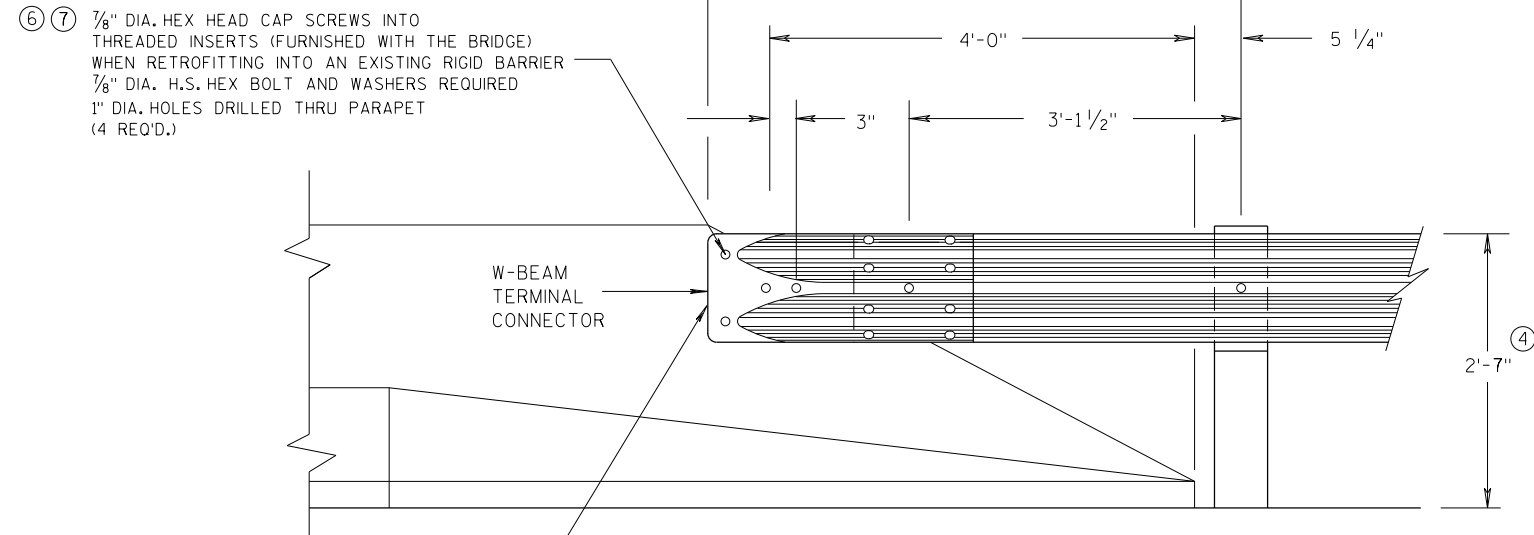
- ⑥ ⑦ 7/8" DIA. HEX HEAD CAP SCREWS INTO THREADED INSERTS (FURNISHED WITH THE BRIDGE) WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER 7/8" DIA. H.S. HEX BOLT AND WASHERS REQUIRED 1" DIA. HOLES DRILLED THRU PARAPET (4 REQ'D.)

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

ONE WAY
TRAFFIC



FRONT VIEW

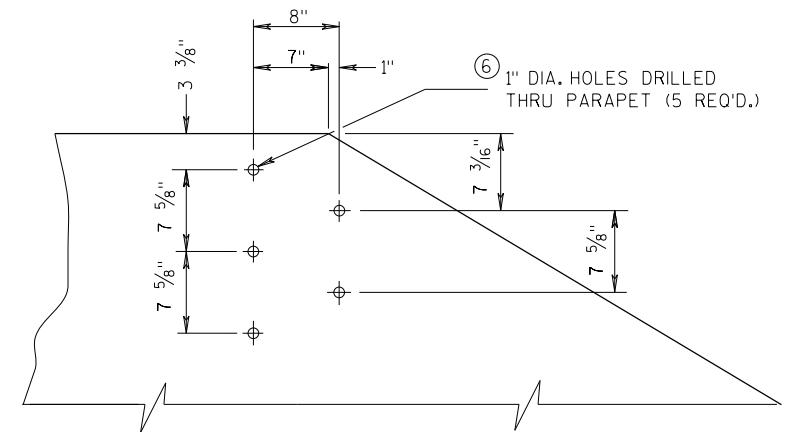
**W BEAM CONNECTION TO
PARAPETS WITH SLOPED ENDS**

(USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)

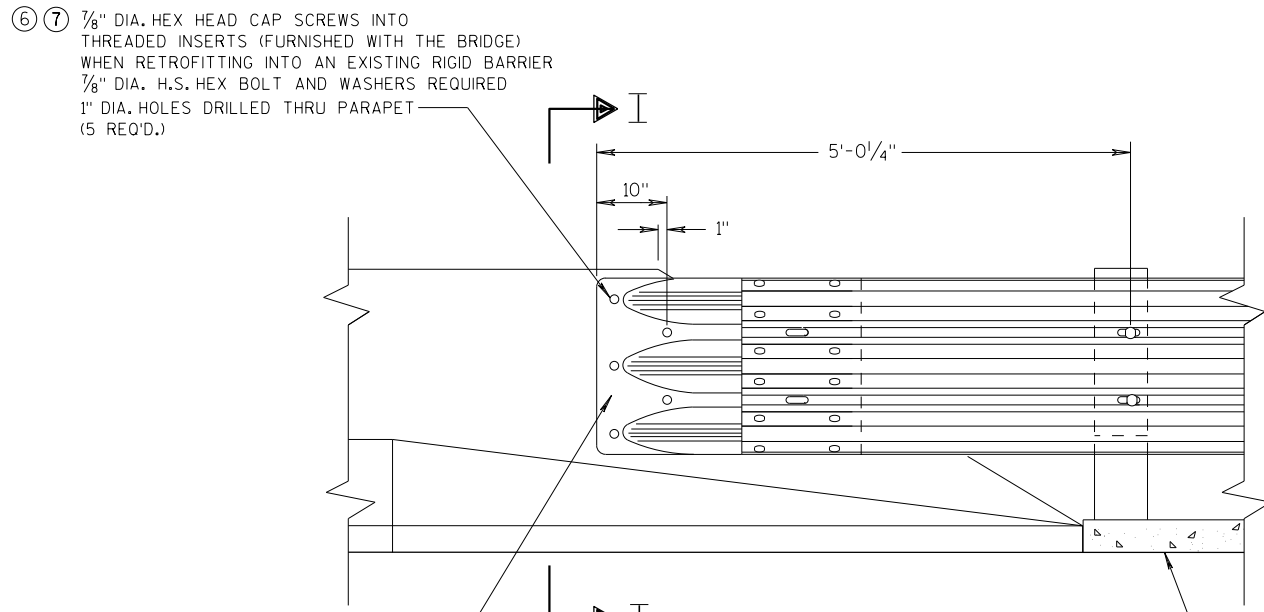
WHEN RETROFITTING A TRANSITION
TO AN EXISTING RIGID BARRIER,
INSTALL PLATE WASHERS ON
BACKSIDE OF RIGID BARRIER.

GENERAL NOTES

- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 3/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.



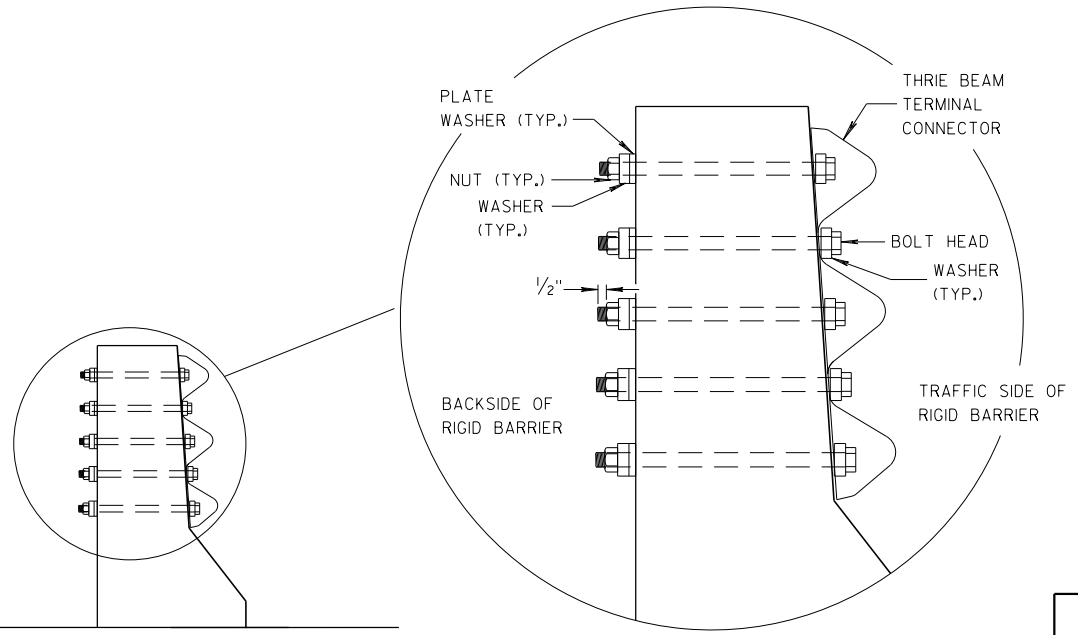
**DRILL HOLE LOCATION AND PATTERN
FOR THRIE BEAM CONNECTION**



FRONT VIEW

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

WHEN RETROFITTING A TRANSITION
TO AN EXISTING RIGID BARRIER,
INSTALL PLATE WASHERS ON
BACKSIDE OF RIGID BARRIER.

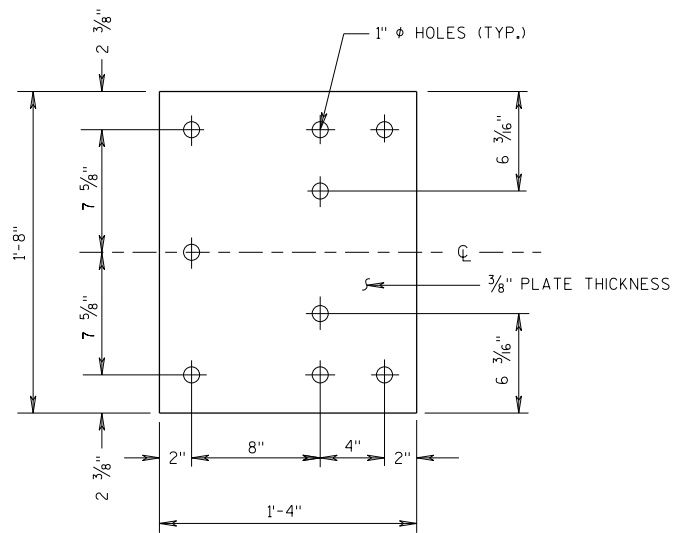


SECTION I-I

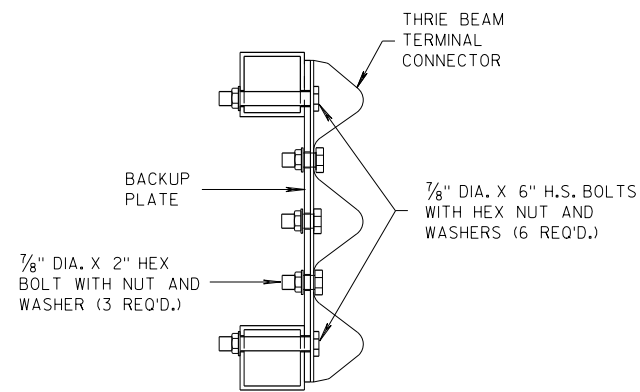
**MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

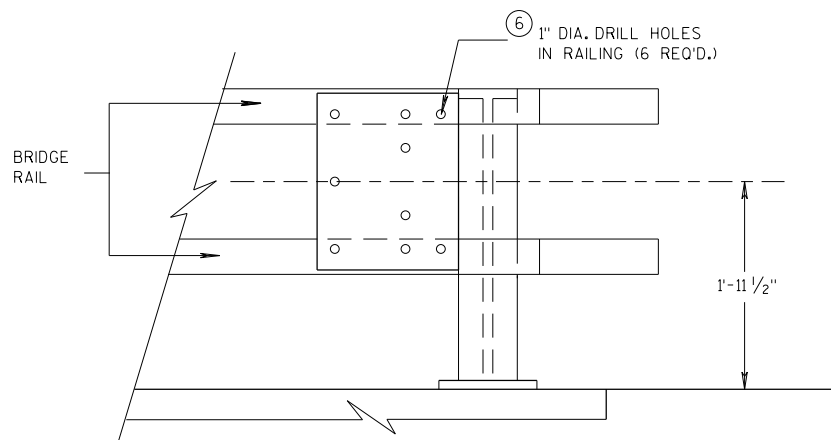
APPROVED
DATE 07/2018 /S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR
FHWA



BACK-UP PLATE DETAIL



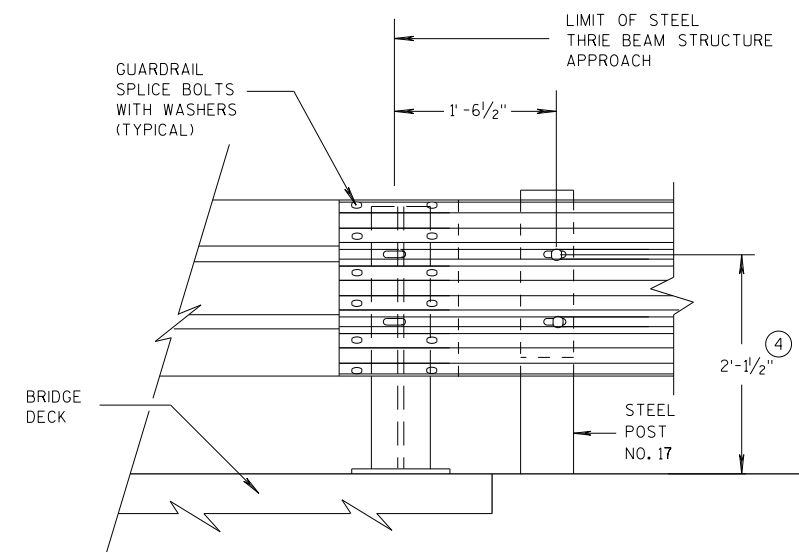
SECTION J-J



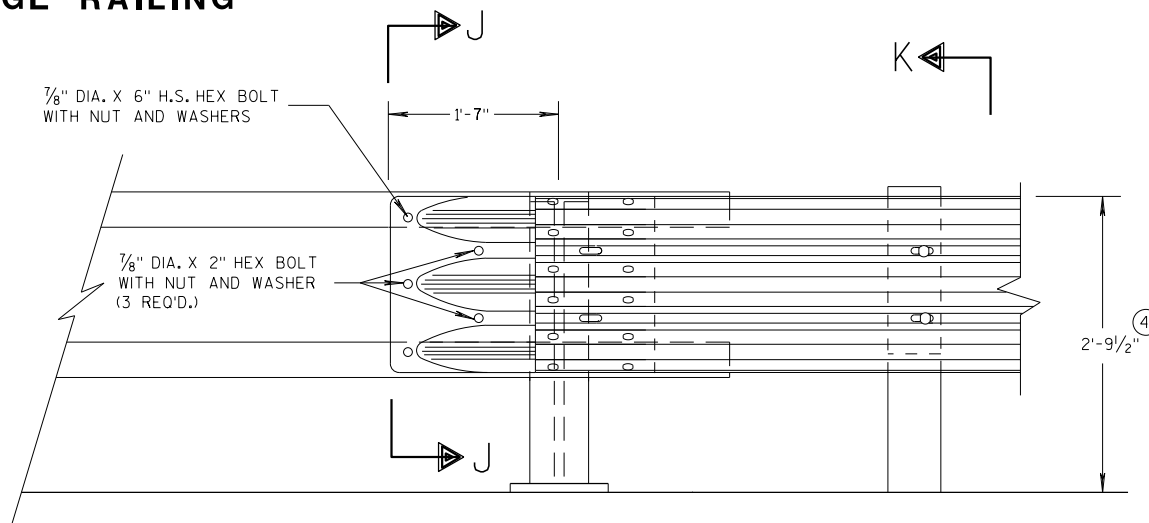
BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING

GENERAL NOTES

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

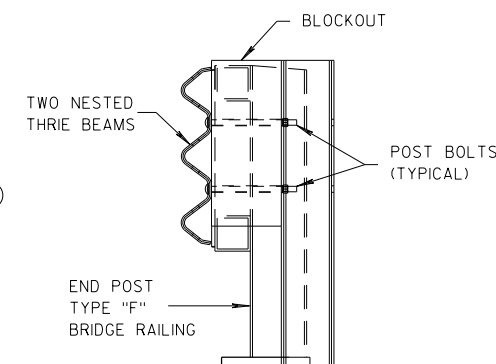


**FRONT VIEW
THRIE BEAM CONNECTION TO
STEEL RAILING TYPE "W"**



FRONT VIEW

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

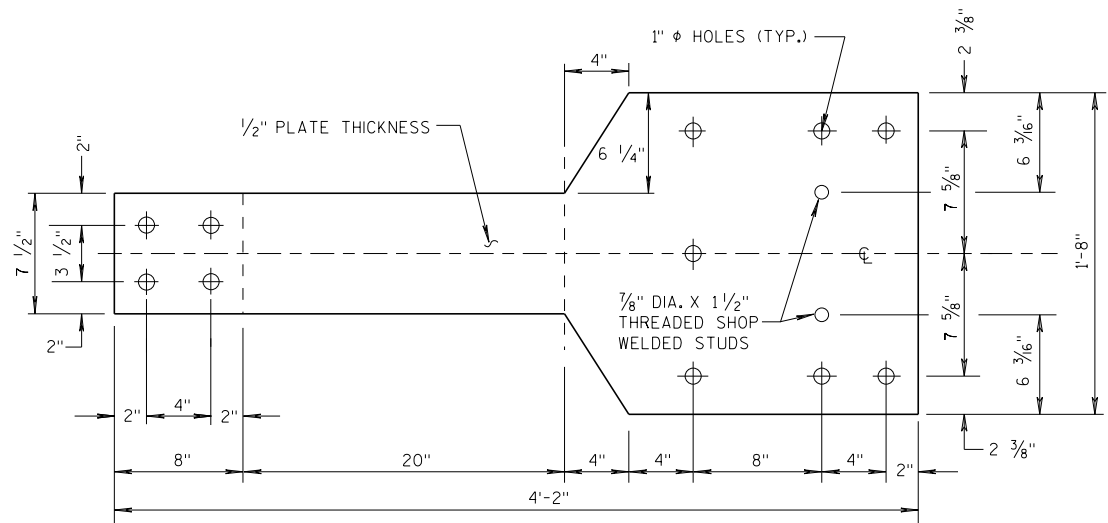


SECTION K-K

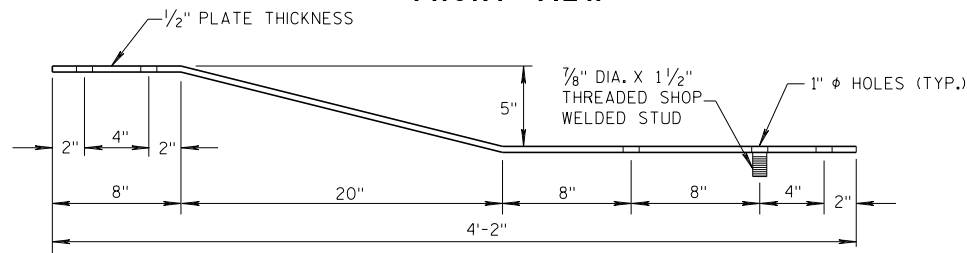
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 07/2018 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
FHWA	

GENERAL NOTES

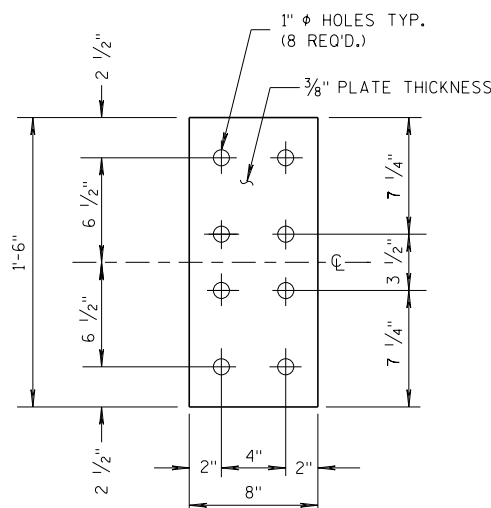
(4) TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".



FRONT VIEW

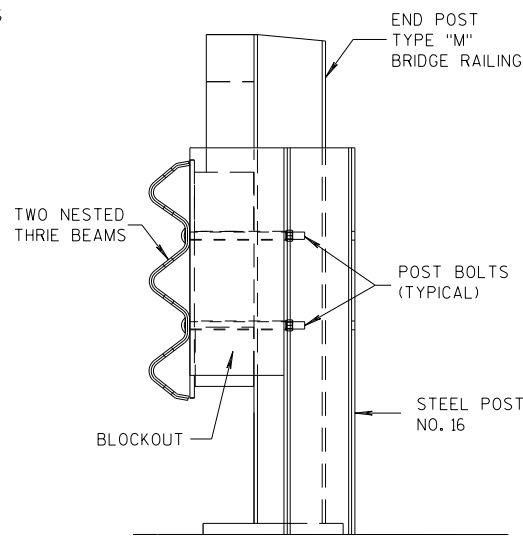


**PLAN VIEW
BACK-UP PLATE DETAIL, TYPE "M"**

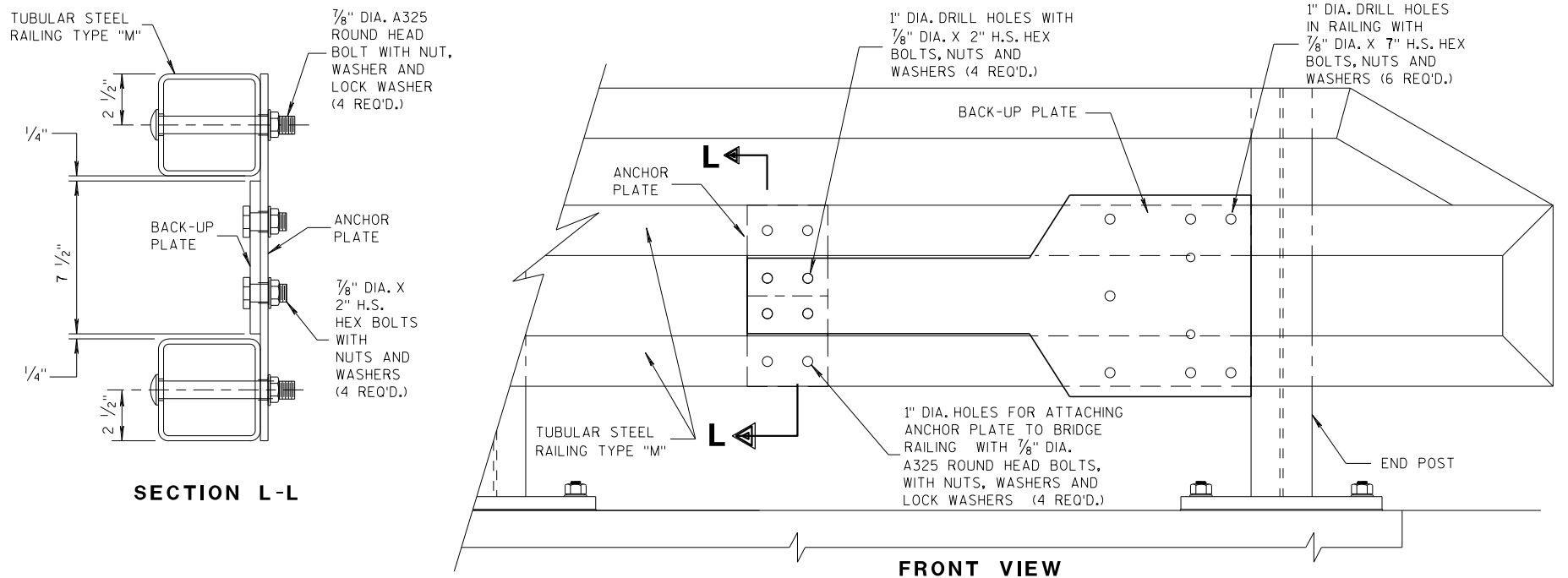


FRONT VIEW

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



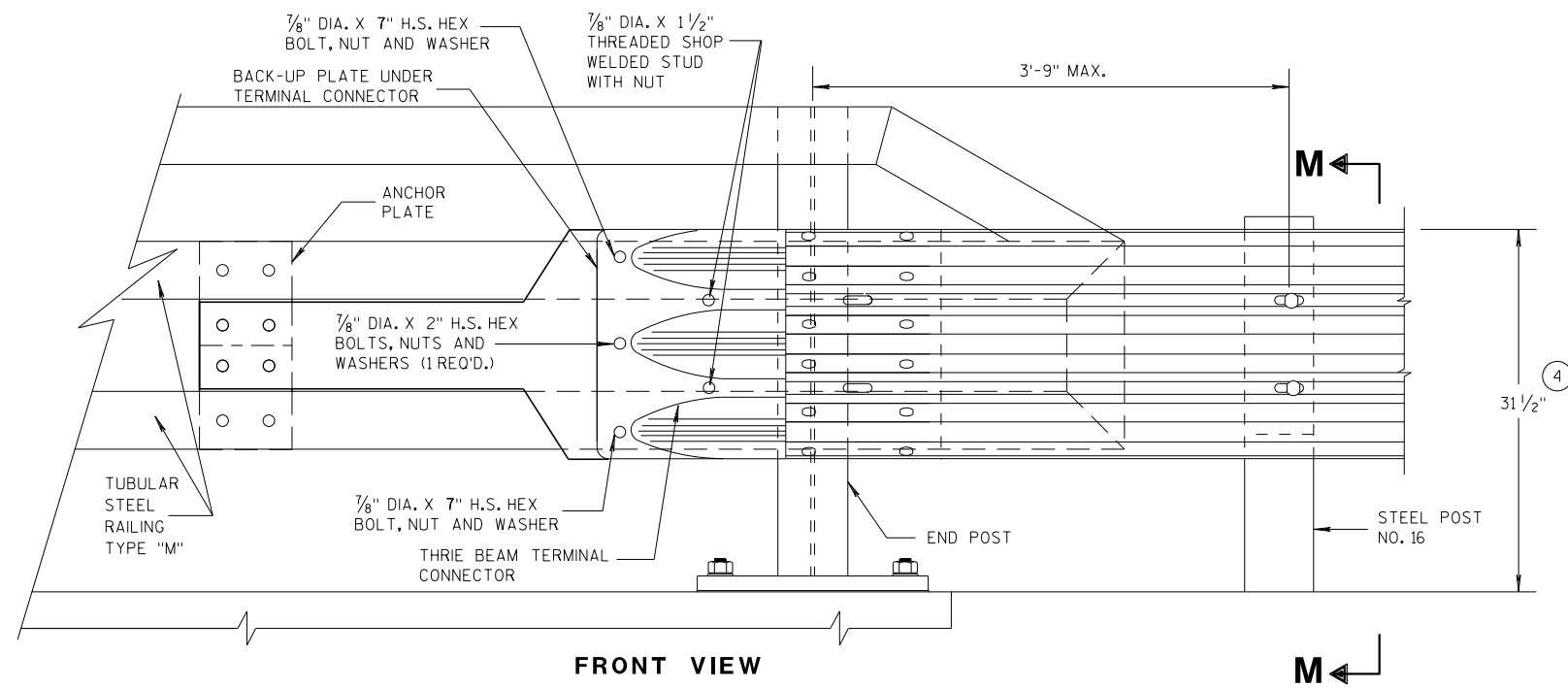
SECTION M-M



SECTION L-L

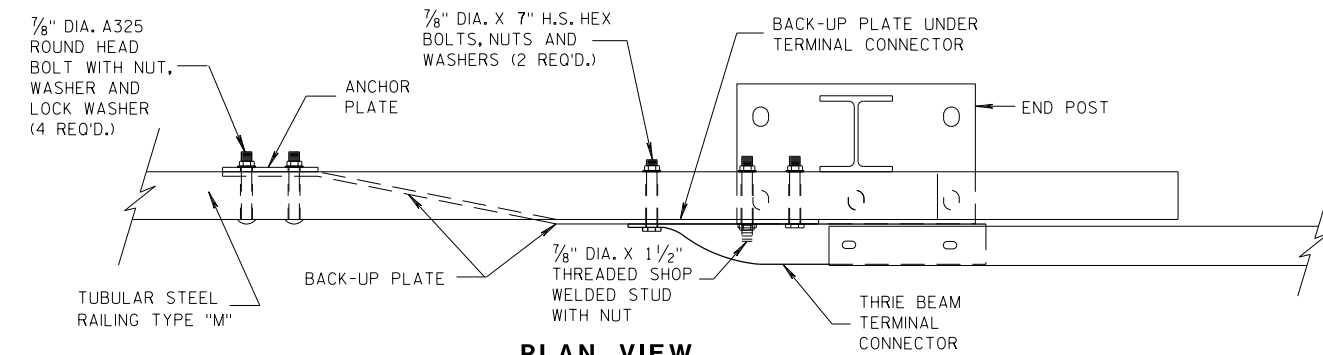
FRONT VIEW

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



FRONT VIEW

M



PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

6

6

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

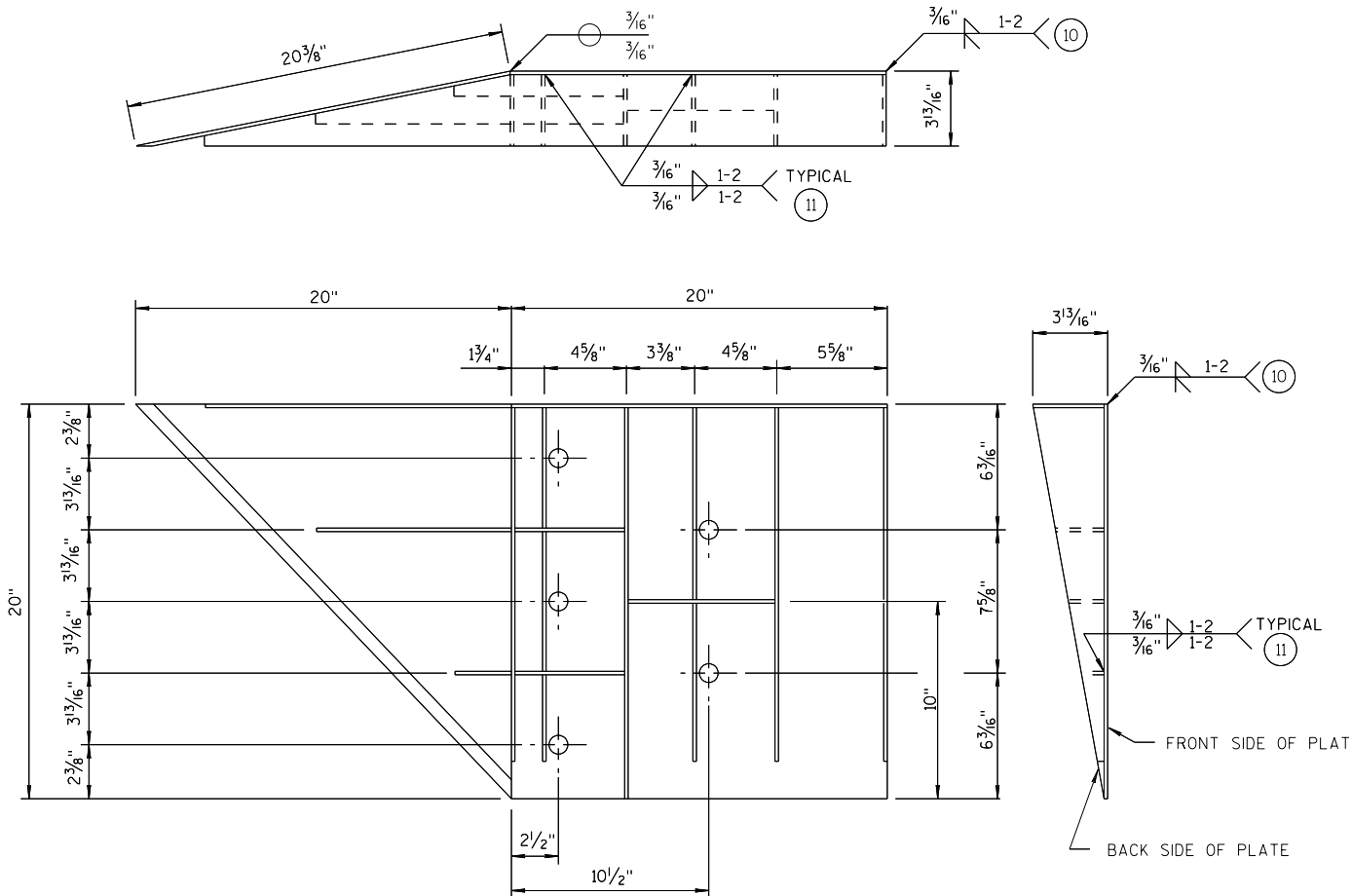
S.D.D. 14 B 45-5h

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

GENERAL NOTES

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

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



WELDING INSTRUCTION
(VIEWED FROM BACK SIDE OF PLATE)

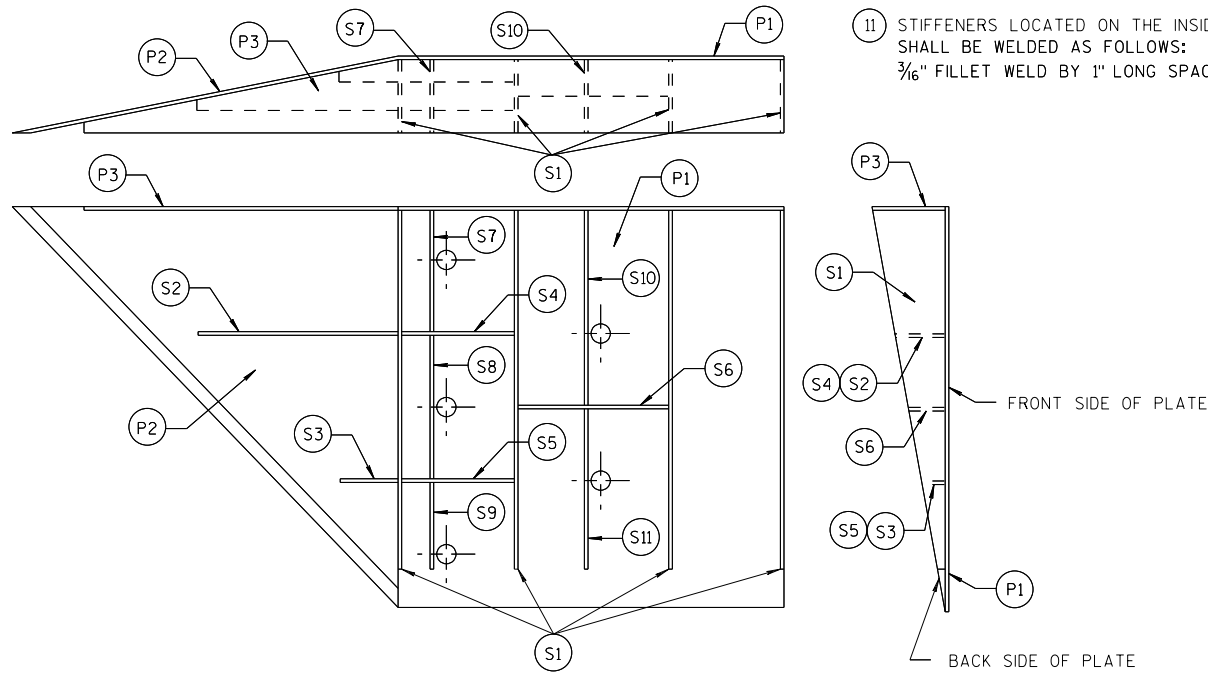


PLATE AND STIFFENER IDENTIFICATION
(VIEWED FROM BACK SIDE OF PLATE)

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

SINGLE SLOPE CONNECTION PLATE

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

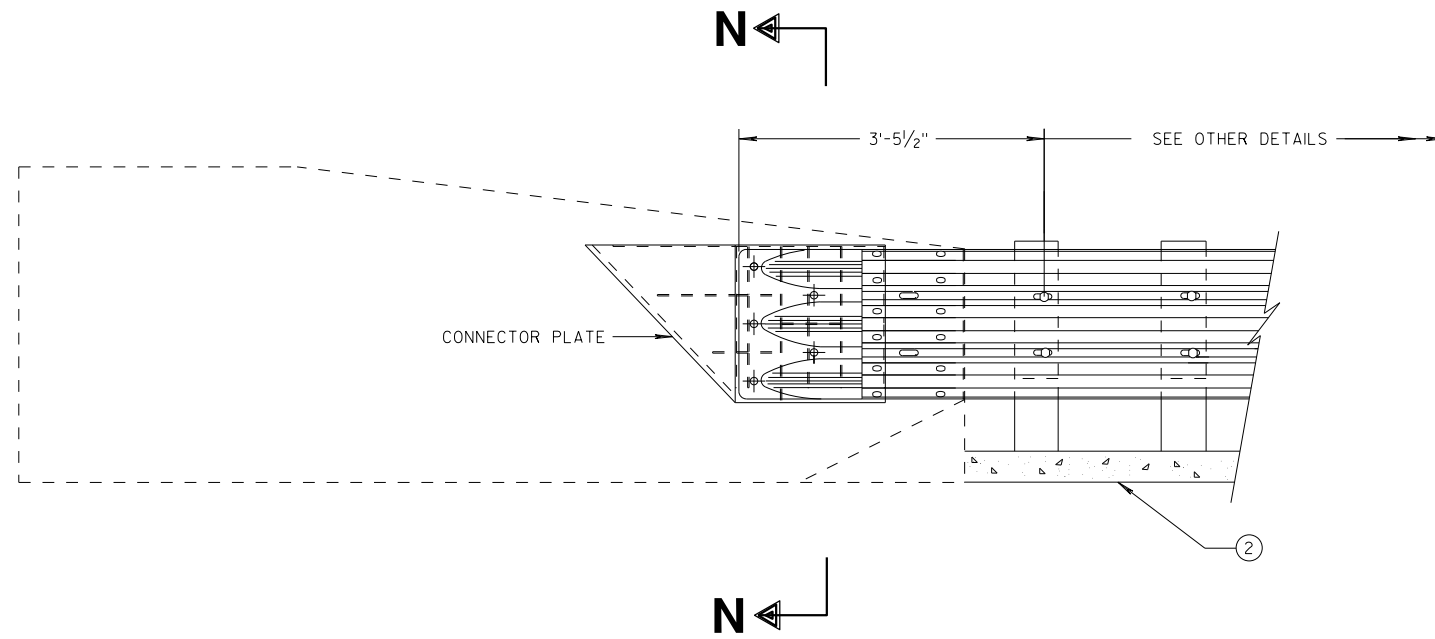
APPROVED
7/2018 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT
FHWA UNIT SUPERVISOR

GENERAL NOTES

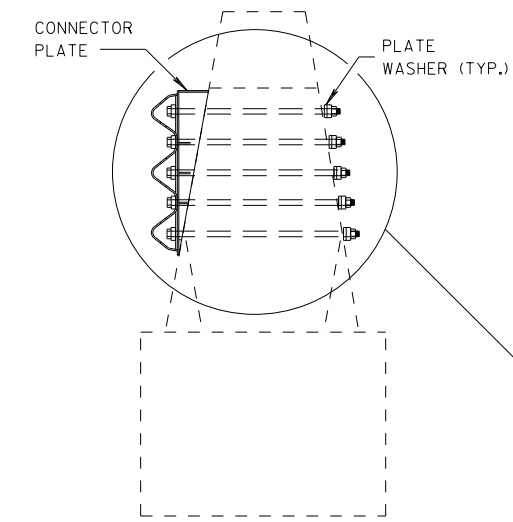
CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

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

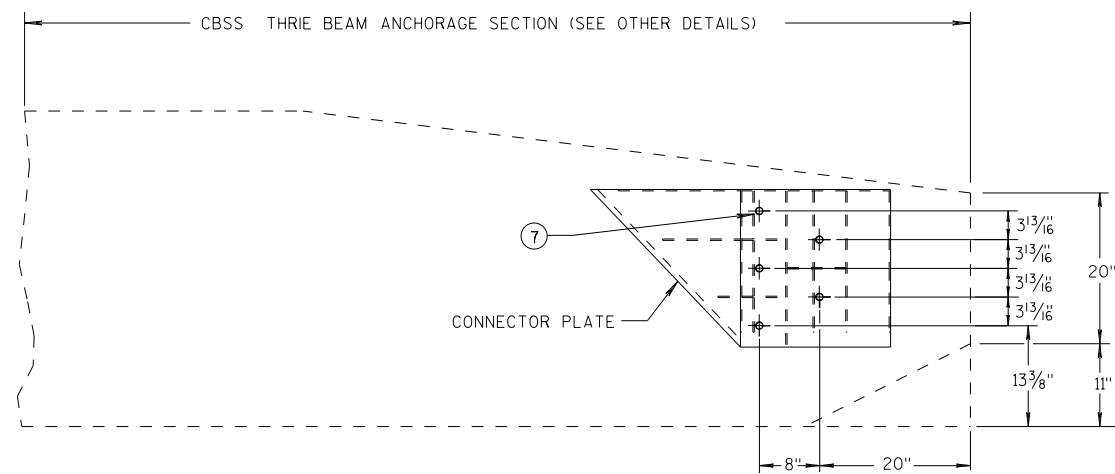
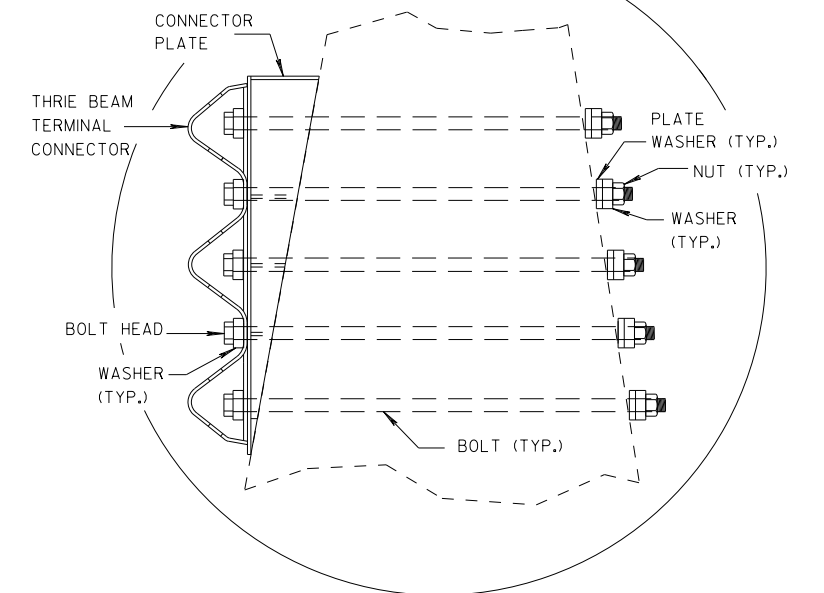
⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTION PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.



THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER



SECTION N-N

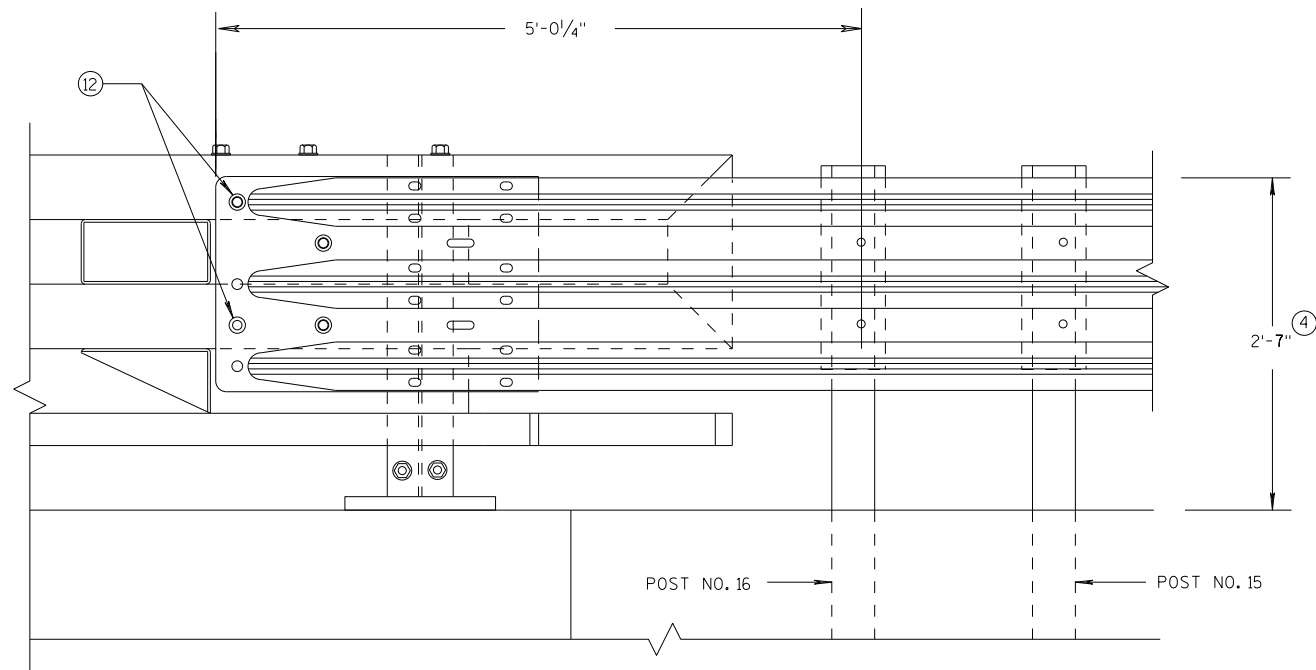


SINGLE SLOPE CONNECTION PLATE PLACEMENT

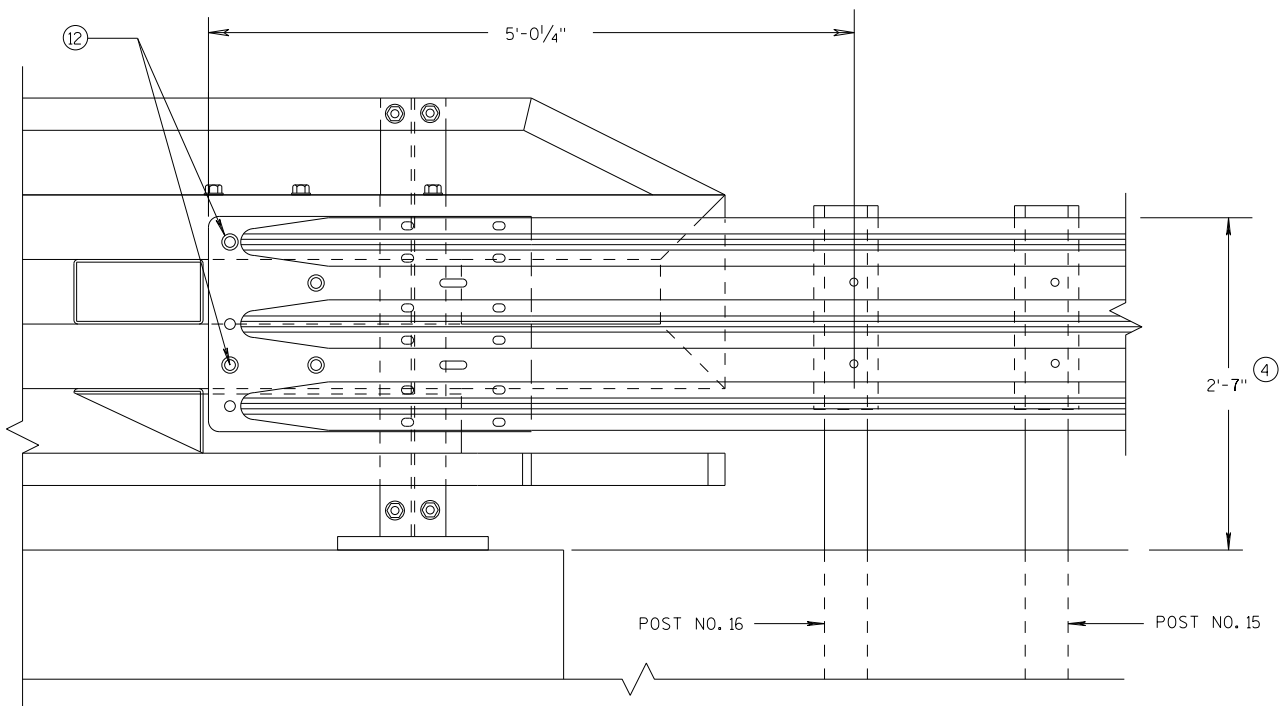
**MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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



**ELEVATION OF DETAIL AT NY3 END POST
THRIE BEAM RAIL ATTACHMENT**



**ELEVATION OF DETAIL AT NY4 END POST
THRIE BEAM RAIL ATTACHMENT**

GENERAL NOTES

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

6

6

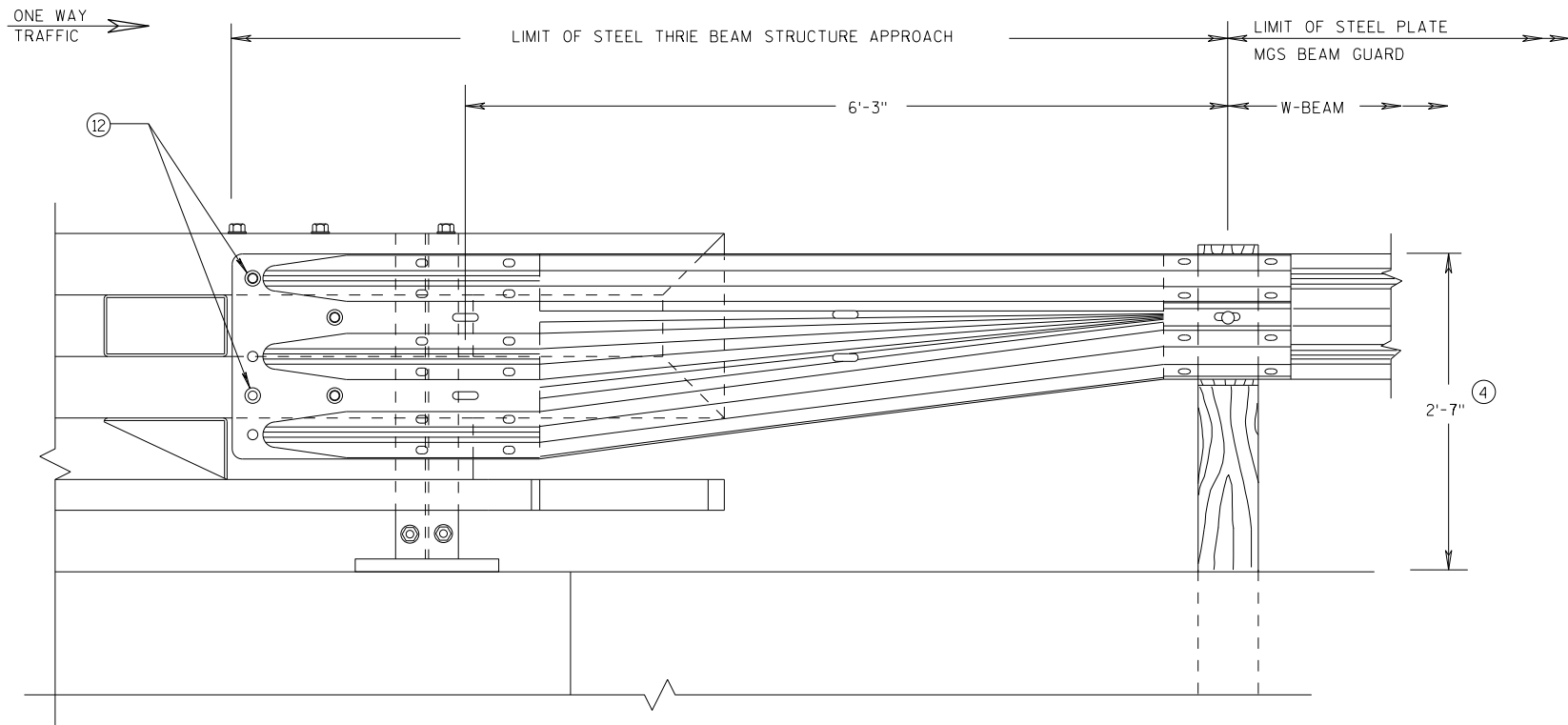
S.D.D. 14 B 45-5K

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

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

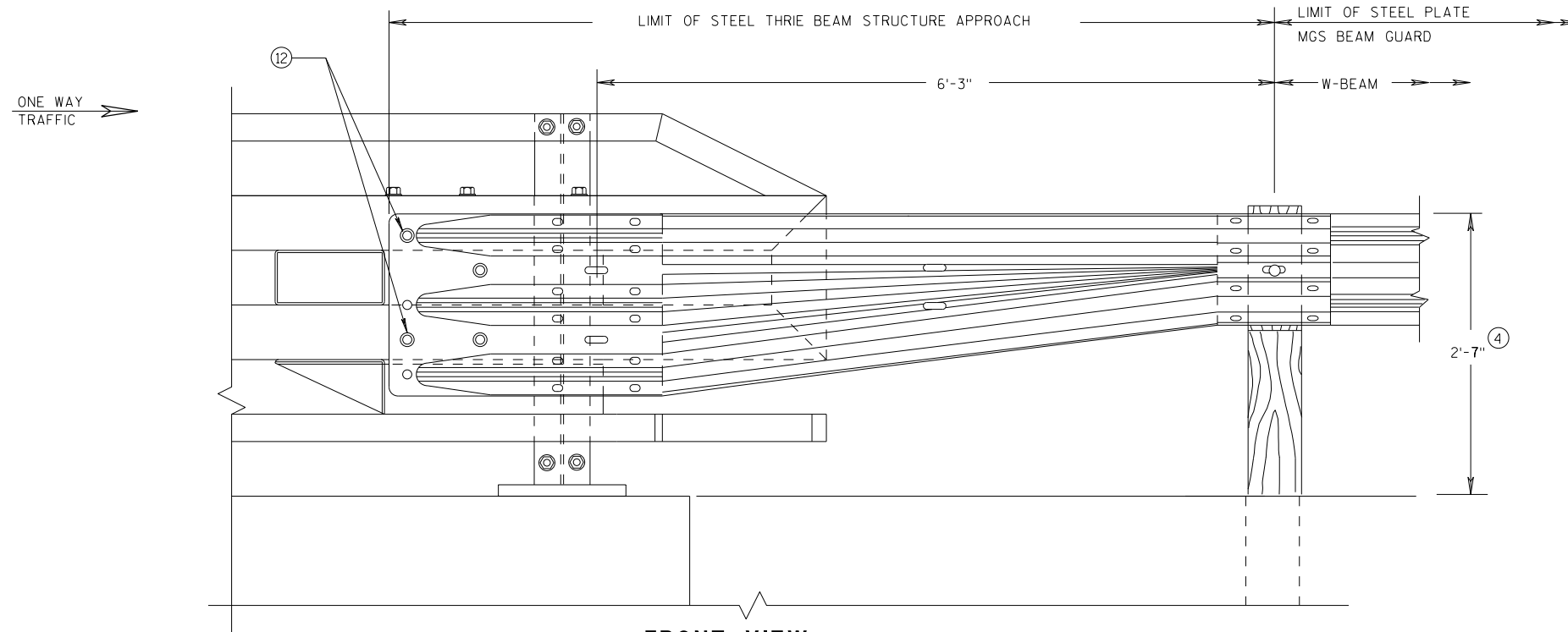
APPROVED
DATE 7/2018 /S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR
FHWA



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

GENERAL NOTES

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

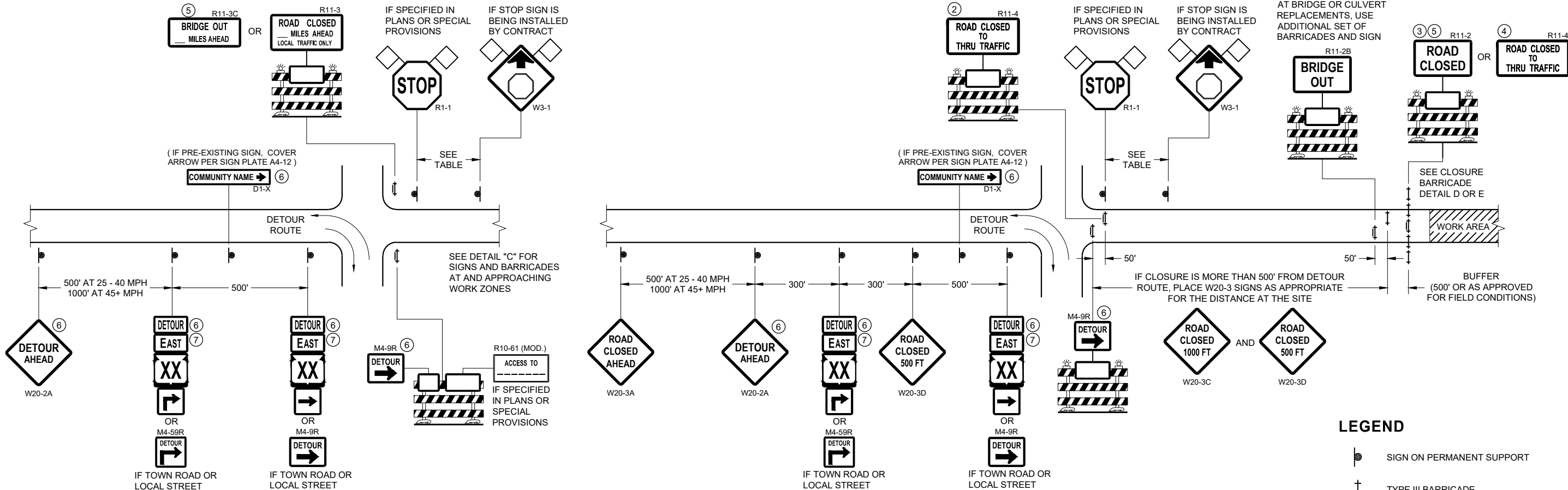


FRONT VIEW
W BEAM TRANSITION AND
CONNECTION TO BRIDGE RAILING TYPE "NY4"
 (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

APPROVED
 DATE 7/2018 /S/ Rodney Taylor
 ROADWAY STANDARDS DEVELOPMENT
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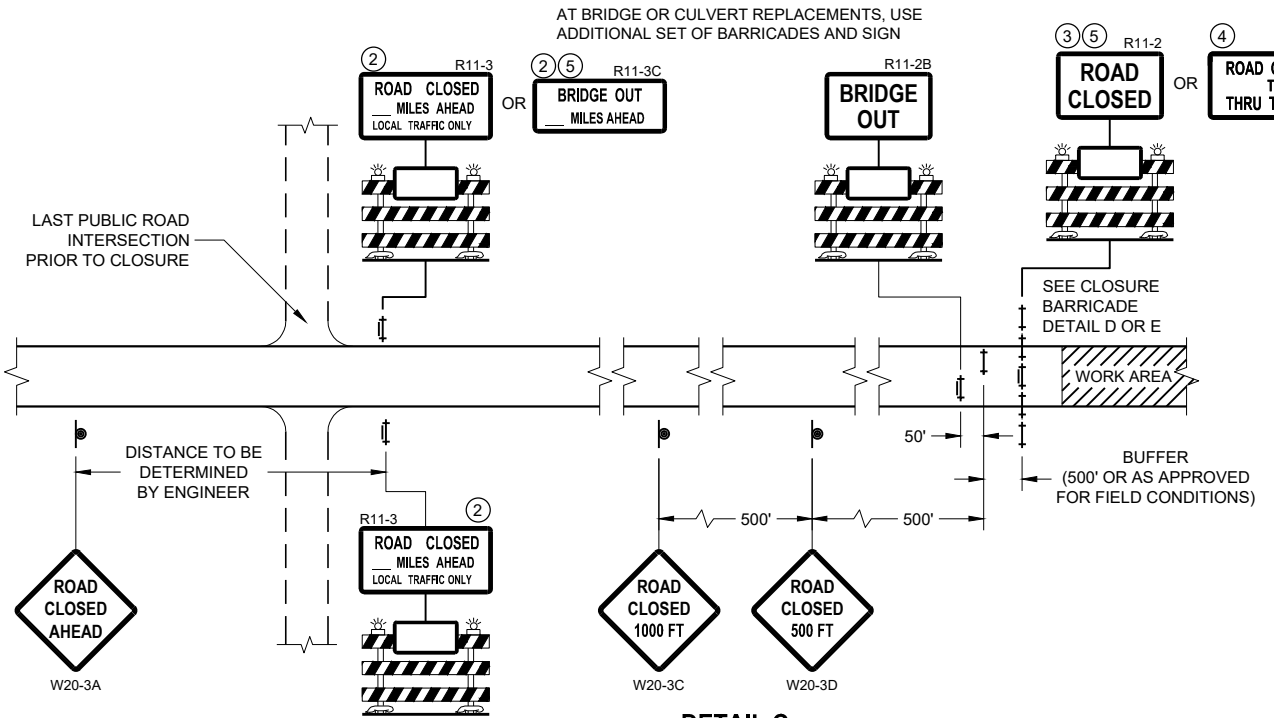
DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR
 WORK ZONE GREATER THAN OR EQUAL TO 1/2 MILE FROM
 DETOUR ROUTE (1000 FEET IF URBAN)

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

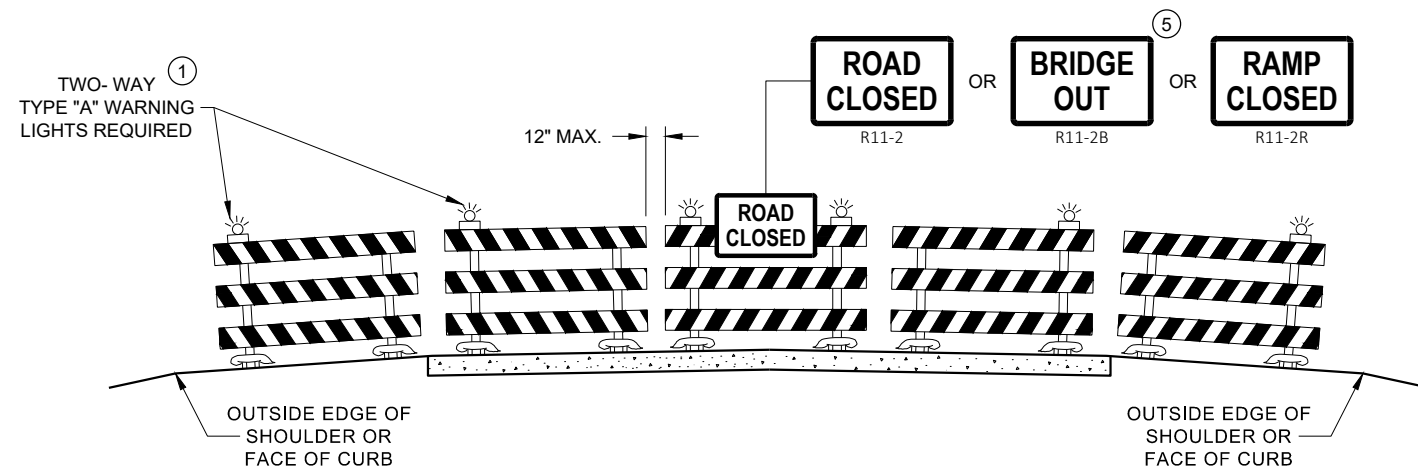
SEE SDD 15C2-SHEET "b"
 FOR GENERAL NOTES
 AND FOOTNOTES ① THROUGH ⑦

**BARRICADES AND SIGNS
 FOR MAINLINE CLOSURES**

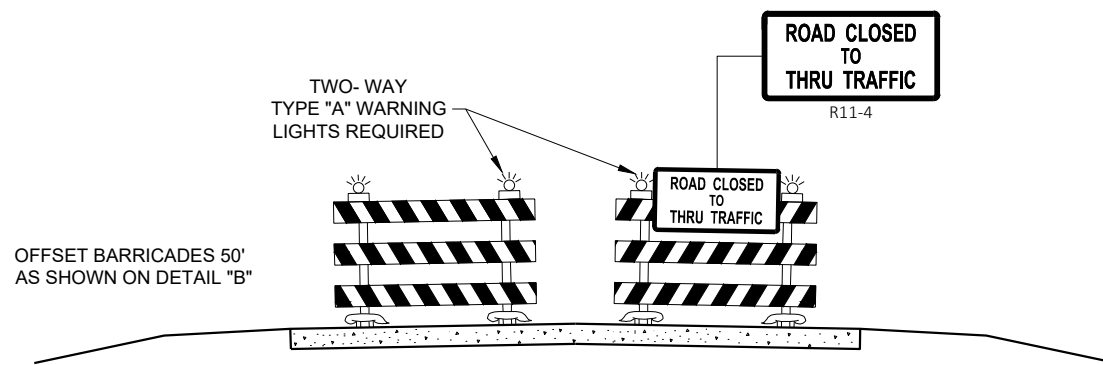
STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

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

GENERAL NOTES

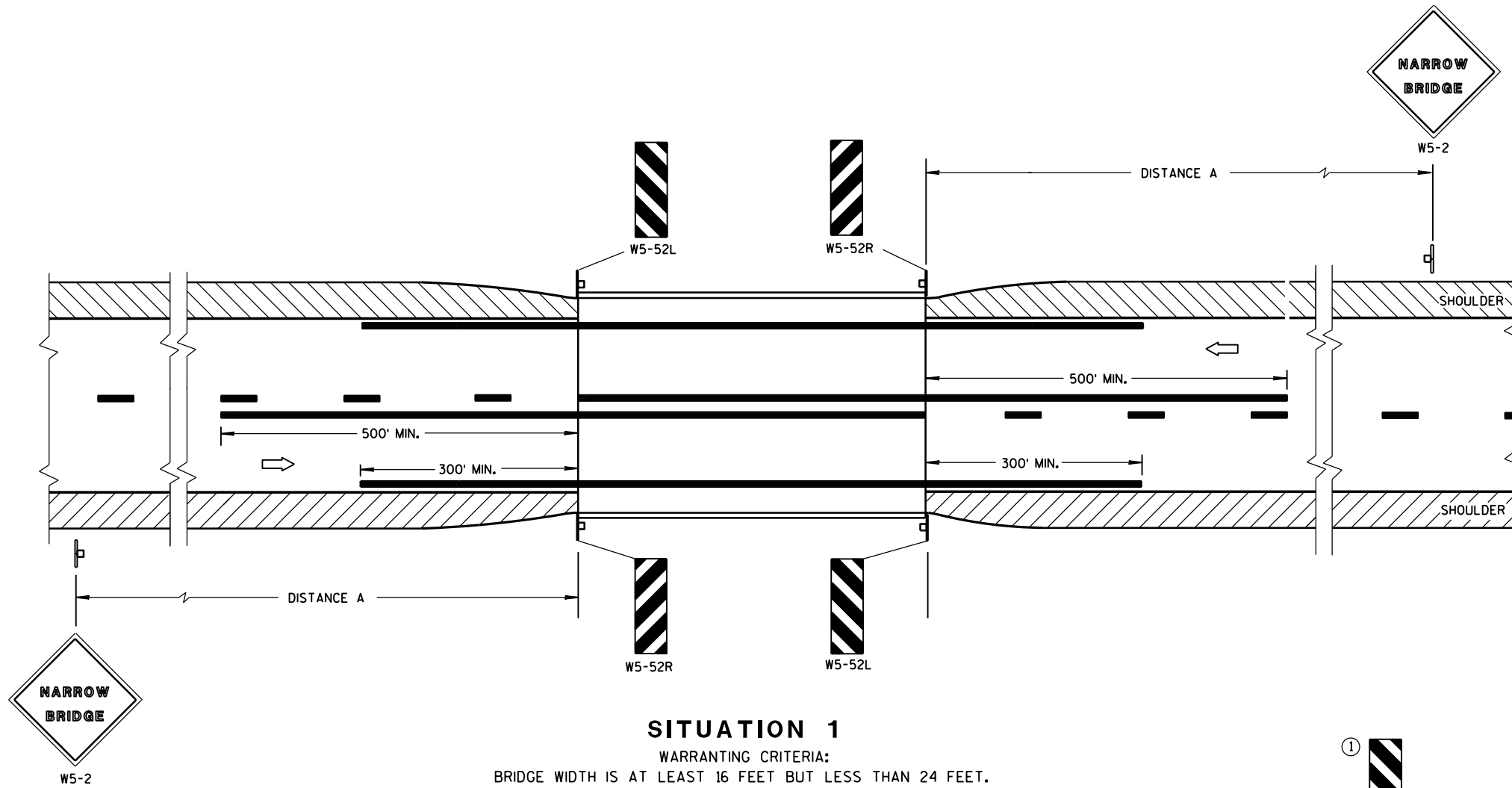
DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

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

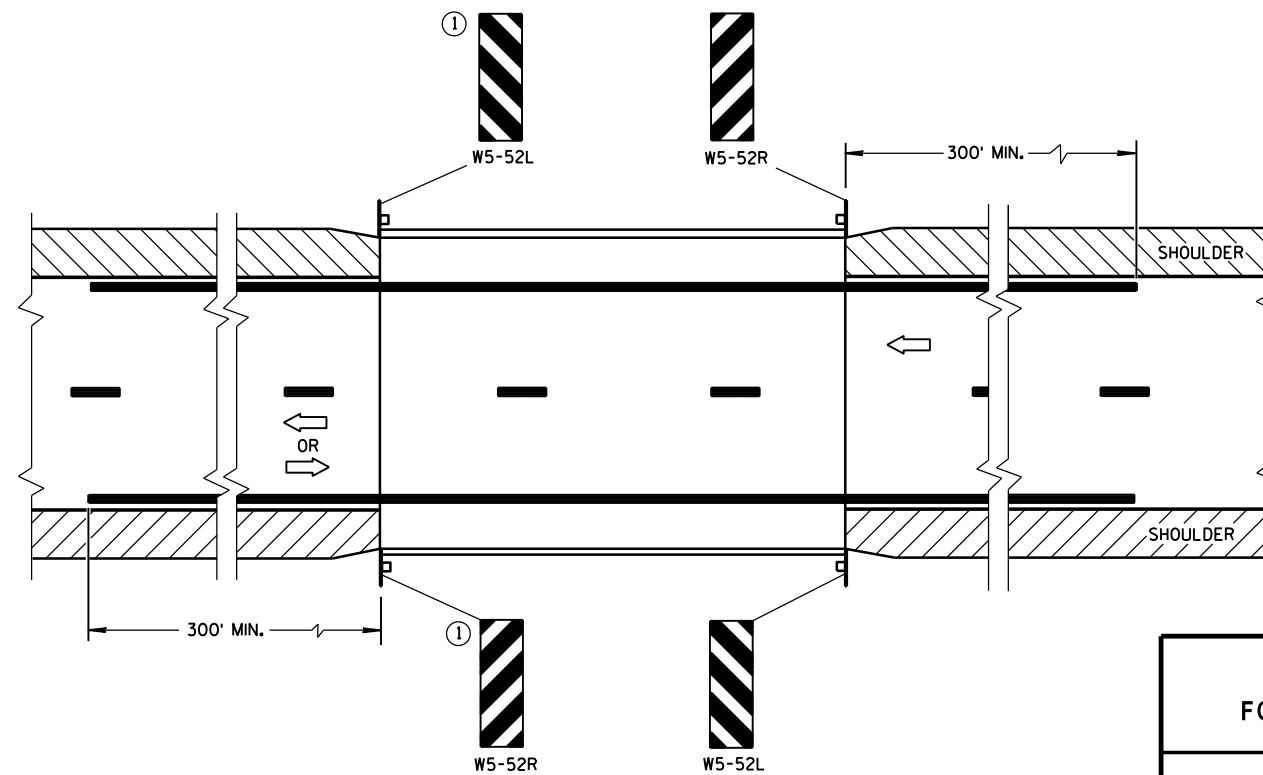
PLACE THE EDGE OF THE W5-52 SIGN IN LINE WITH FACE OF CURB OR PARAPET.

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.

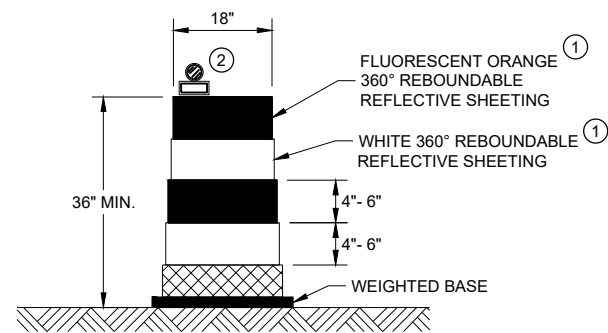
DISTANCE TABLE

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

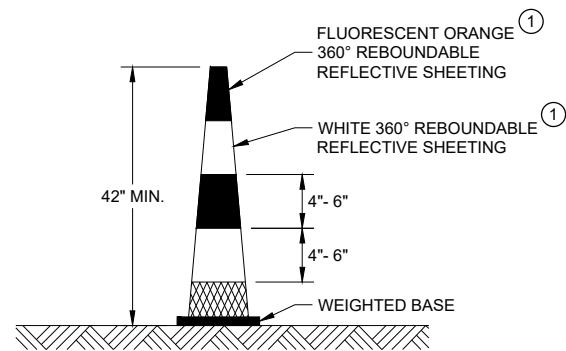
SIGNING & MARKING FOR TWO LANE BRIDGES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

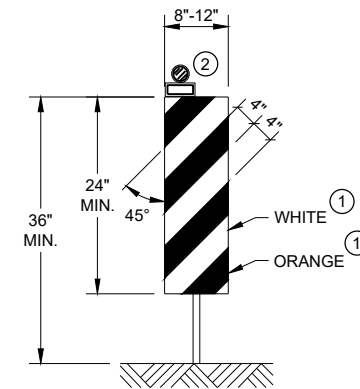


DRUM



42" CONE

DO NOT USE IN TAPERS
 1/2 SPACING OF DRUMS

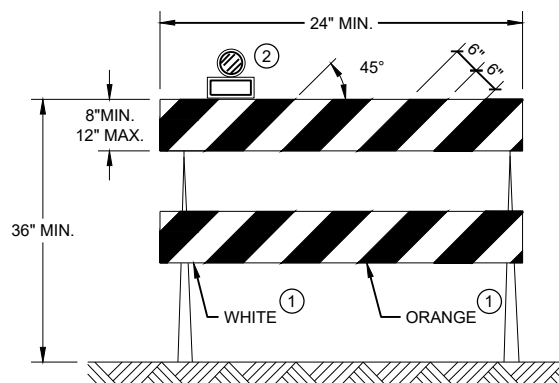


VERTICAL PANEL

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

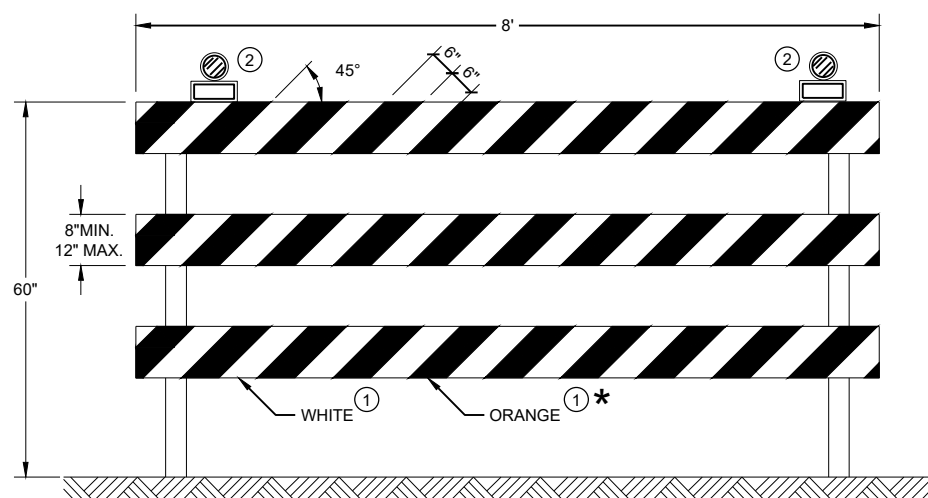
GENERAL NOTES

- 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.

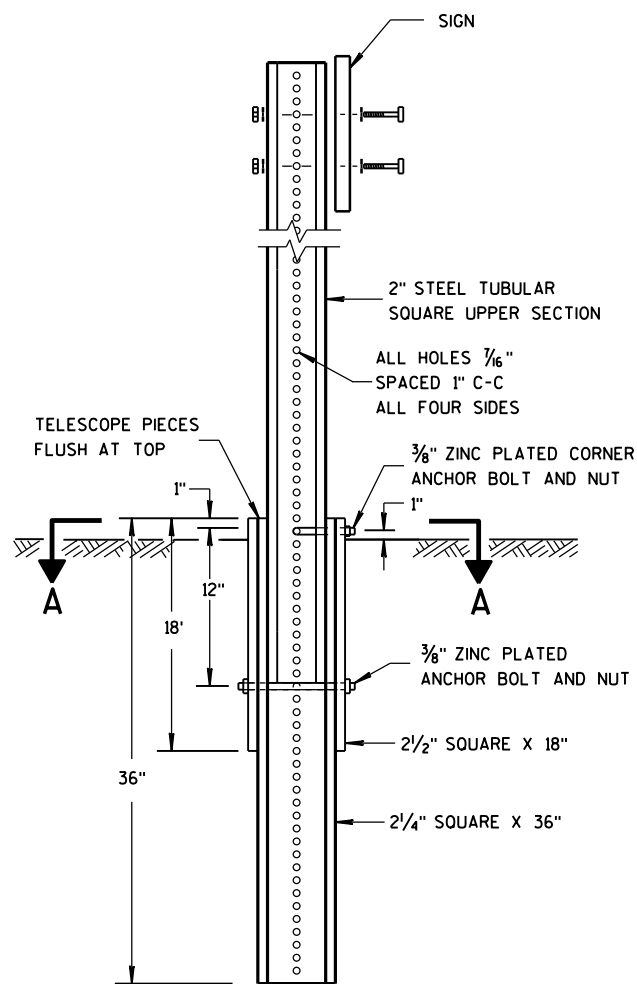


TYPE III BARRICADE

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 June 2017 DATE	/S/ Andrew Heidtke WORK ZONE ENGINEER
<small>FHWA</small>	



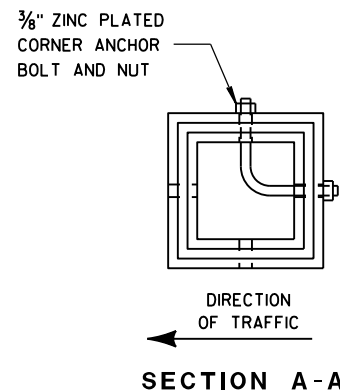
DETAIL OF TUBULAR STEEL SIGN POST

TUBULAR STEEL POSTS

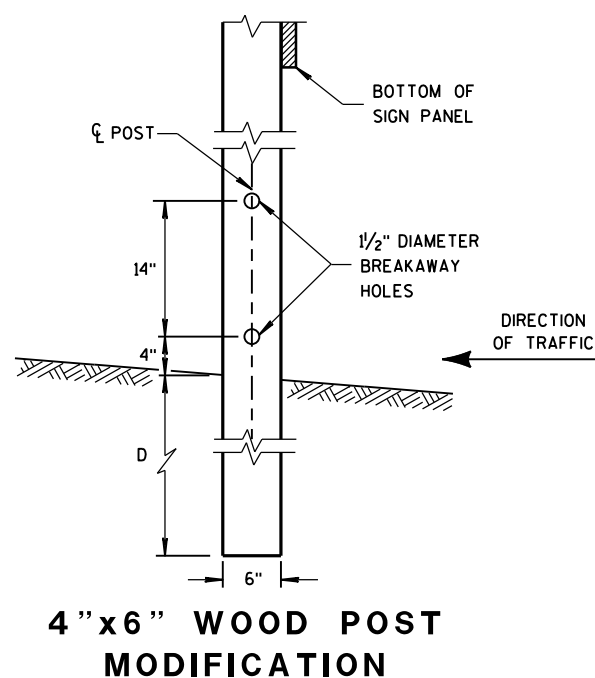
AREA OF SIGN INSTALLATION (SQ. FT.)	NUMBER OF REQUIRED TUBULAR STEEL POSTS
9 OR LESS	1
GREATER THAN 9 LESS THAN OR EQUAL TO 18	2
GREATER THAN 18 LESS THAN OR EQUAL TO 27	3

SIGNS WIDER THAN 3 FEET OR LARGER THAN 9 SQ. FT. SHALL BE MOUNTED ON MULTIPLE POSTS (SEE ABOVE TABLE).

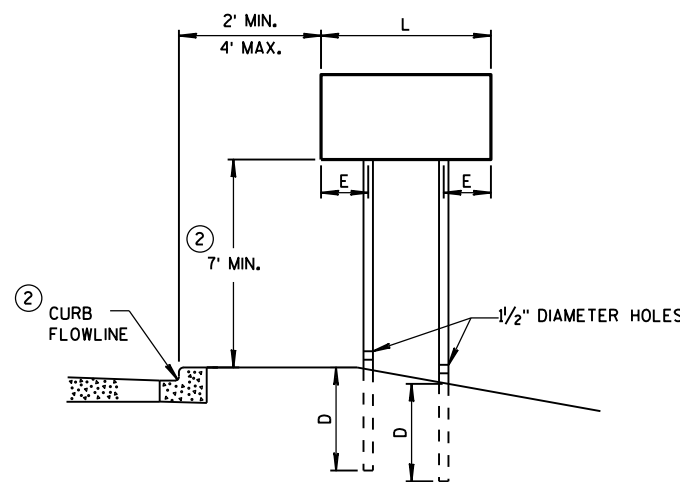
SIGNS LARGER THAN 27 SQ. FT. SHALL NOT BE MOUNTED ON TUBULAR STEEL POSTS.



SECTION A-A



4" X 6" WOOD POST MODIFICATION

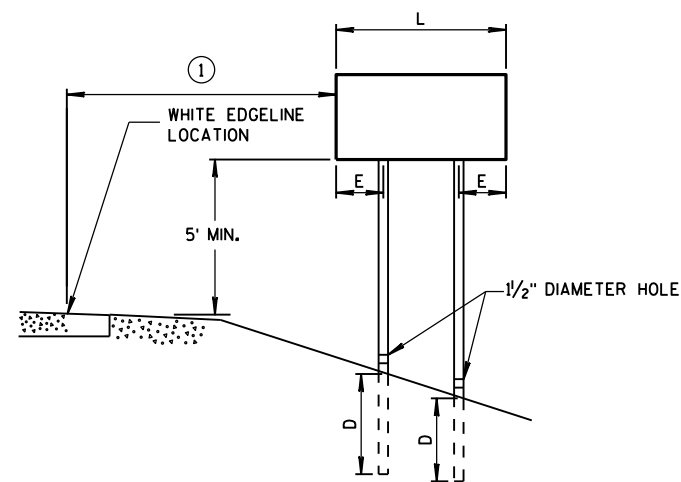


URBAN AREA

POST MOUNTING DETAIL FOR TEMPORARY TRAFFIC CONTROL FIXED MESSAGE SIGNS

WOOD POST EMBEDMENT DEPTH

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



RURAL AREA

4" X 6" WOOD POST

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

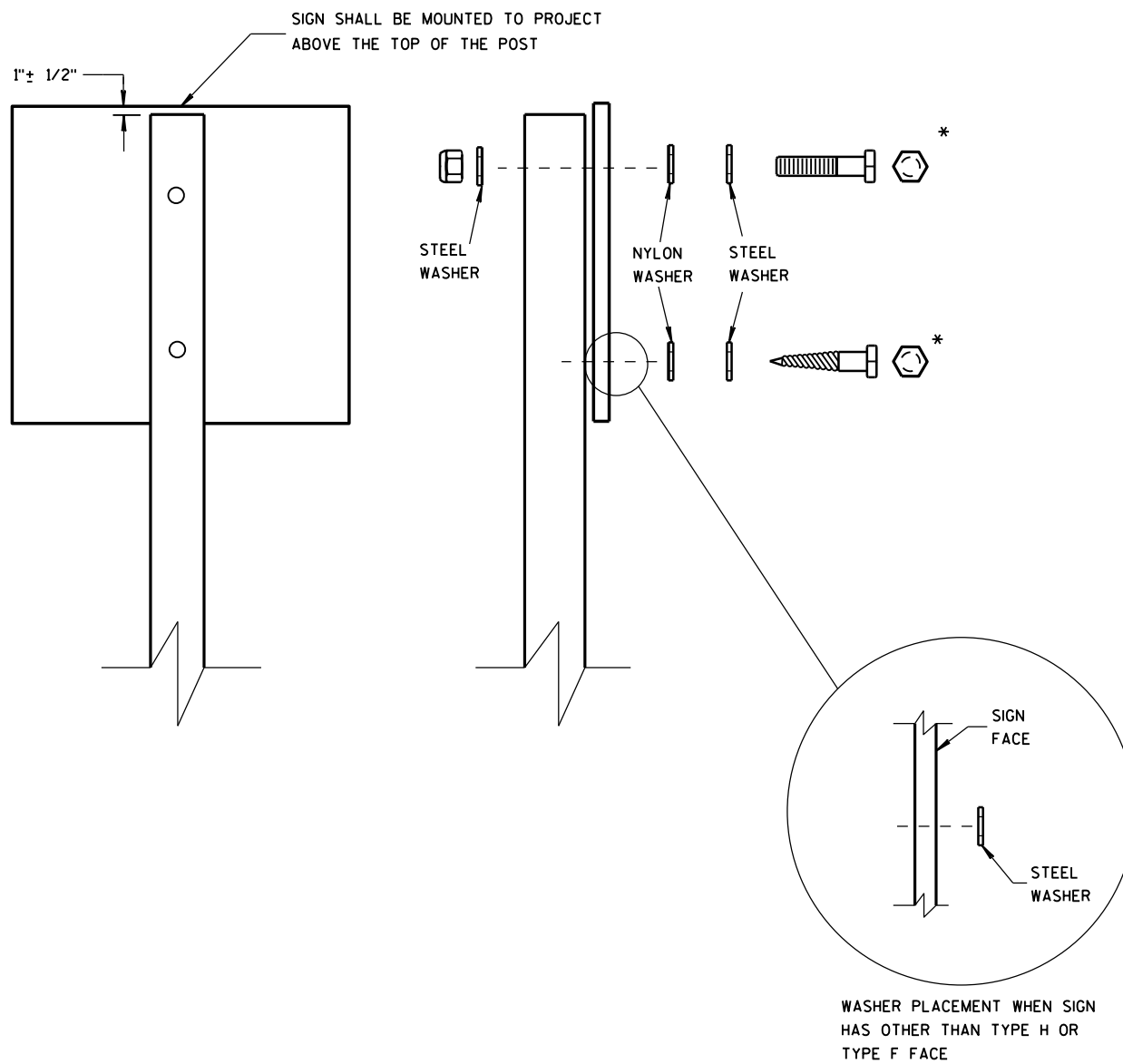
SEE NOTE ③

GENERAL NOTES

- ① 6 FEET FROM THE EDGE OF PAVEMENT (EDGE LINE LOCATION) UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER. LATERAL OFFSET SHOULD BE ADJUSTED TO AVOID THE DITCH FLOWLINE.
- ② THE EXISTENCE OF CURB AND GUTTER DOES NOT IN ITSELF MANDATE THE VERTICAL CLEARANCE ILLUSTRATED. THAT HEIGHT IS TYPICALLY MEASURED WHERE THERE IS SIDEWALK ADJACENT TO THE ROADWAY OR PARKING IS PERMITTED. IN THE ABSENCE OF SIDEWALK, VERTICAL CLEARANCE IS MEASURED FROM THE TOP OF THE CURB. IF NO SIDEWALK AND NO PARKING, VERTICAL CLEARANCE MAY BE REDUCED TO 5 FOOT MINIMUM. OFFSET OF SIGNS IS MEASURED FROM THE CURB FLOWLINE.
- ③ FOR SIGNS REQUIRING 4 POSTS, SPACE INTERMEDIATE POSTS EVENLY.

TEMPORARY TRAFFIC CONTROL SIGN MOUNTING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



NUTS, BOLTS AND LAGS USED FOR MOUNTING SIGNS SHALL HAVE HEXAGONAL HEADS AND SHALL BE EITHER:

A. HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM DESIGNATION: A 153, CLASS D, OR SC 3

B. ELECTRO-GALVANIZED IN ACCORDANCE WITH ASTM DESIGNATION: B 633, TYPE III, SC 3

THREADS ON BOLTS AND NUTS SHALL BE MANUFACTURED WITH SUFFICIENT ALLOWANCE FOR THE CADMIUM PLATE OR GALVANIZED COATING TO PERMIT THE NUTS TO RUN FREELY ON THE BOLTS.

WOOD POSTS (4" x 4" or 4" x 6")

LAG SCREWS - 3/8" x 3"

MACHINE BOLTS - 5/16" x 6-1/2" OR 7" LENGTH W/ NUTS

SQUARE STEEL POSTS (2" x 2")

MACHINE BOLTS - 3/8" x 3-1/4" LENGTH W/ NUTS

RIVETS - 5/32" (6605-9-6) BULB-TITE, TRI-FOLD, ALUMINUM BODY/MANDREL O.D. FLANGE .720-.765 INCH, GRIP RANGE .042-.375 INCH

WASHERS (ALL POSTS) -

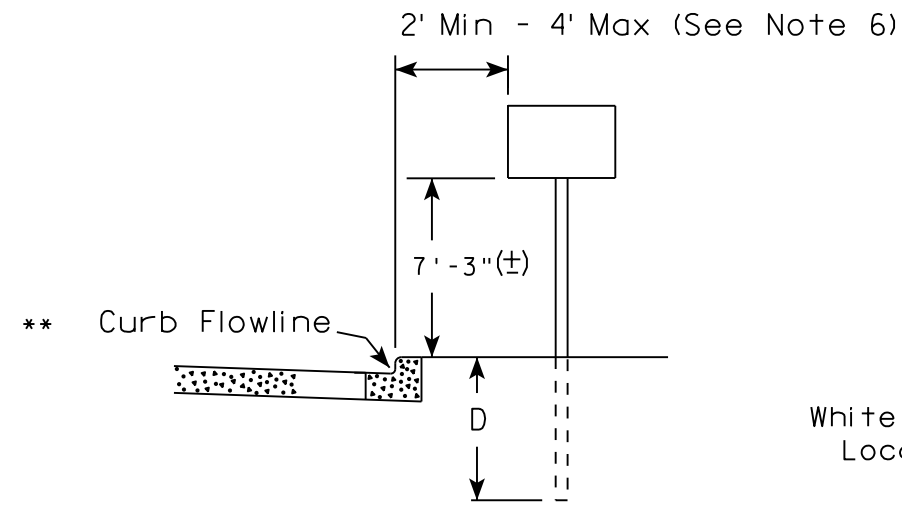
1-1/4" O.D. x 3/8" I.D. x 1/16" STEEL

1-1/4" O.D. x 3/8" I.D. x .080 NYLON FOR ALL TYPE H SIGNS

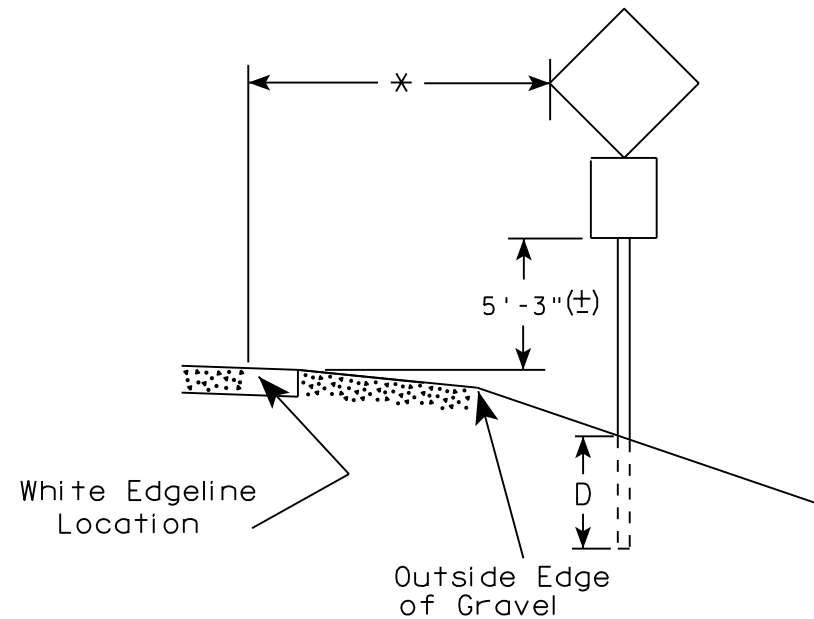
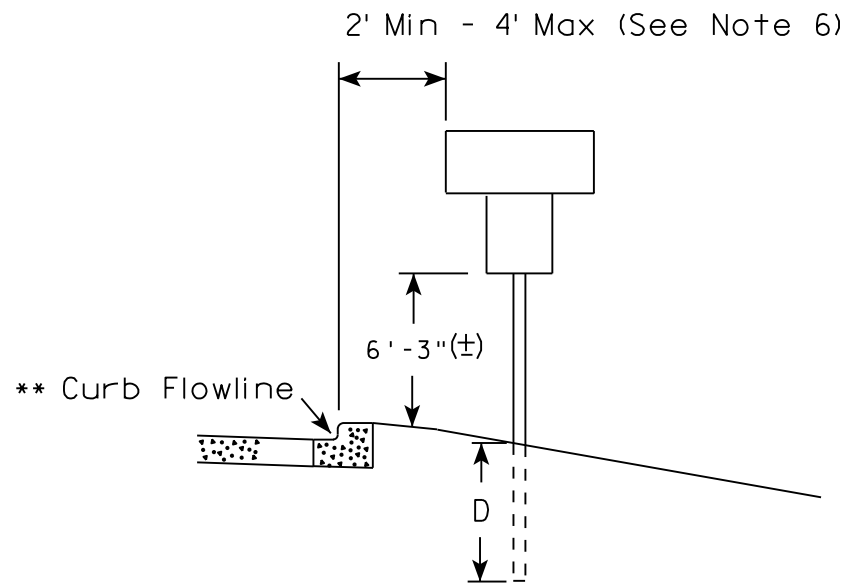
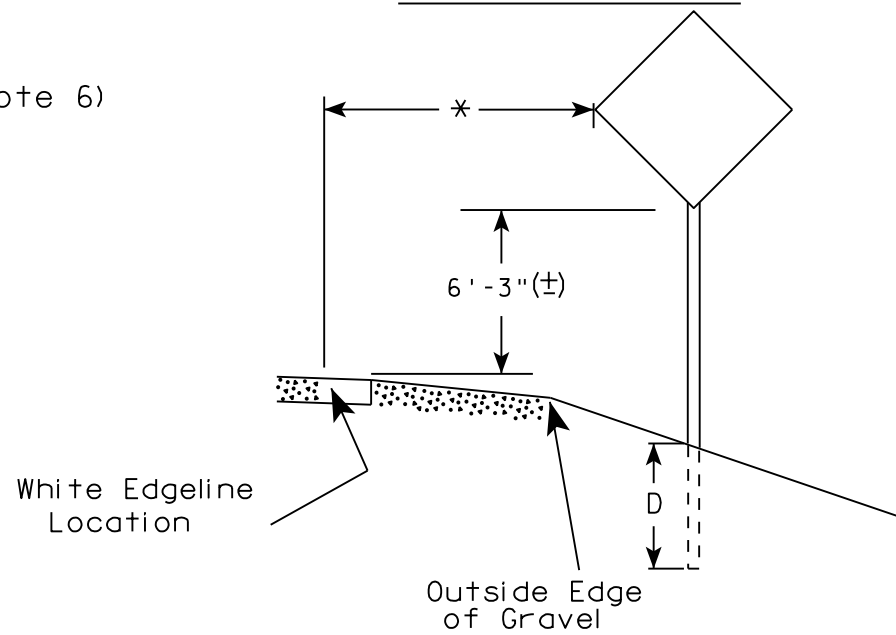
* TWO DIFFERENT FASTENING SYSTEMS ARE SHOWN FOR ILLUSTRATION PURPOSES. ON ANY INDIVIDUAL SIGN, EITHER ONE OR THE OTHER SYSTEM SHALL BE USED. ACTUAL NUMBER OF FASTENERS PER SIGN VARIES WITH THE SIGN AREA. FOR A SINGLE POST INSTALLATION, ALL SIGNS GREATER THAN 9 SQ. FT. REQUIRE THE USE OF 3 FASTENERS.

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

URBAN AREA



RURAL AREA (See Note 2)



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

** 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.

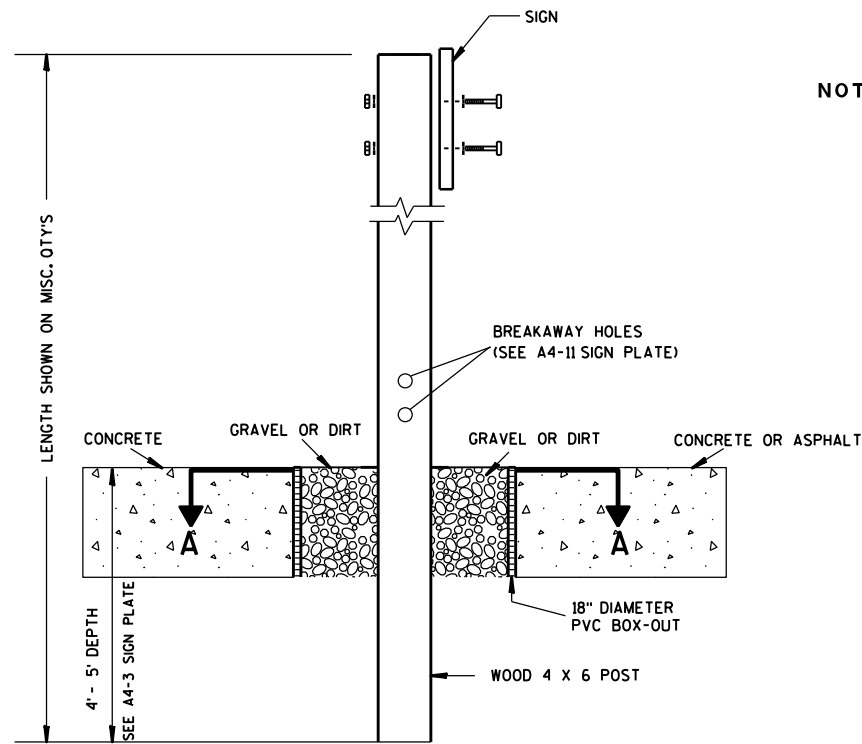
* 6 feet from edge of a paved shoulder or 12 feet from the edge of pavement (edge line location) or 2 feet from outside edge of gravel, whichever is greater unless directed by project engineer.

TYPICAL INSTALLATION OF PERMANENT TYPE II SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

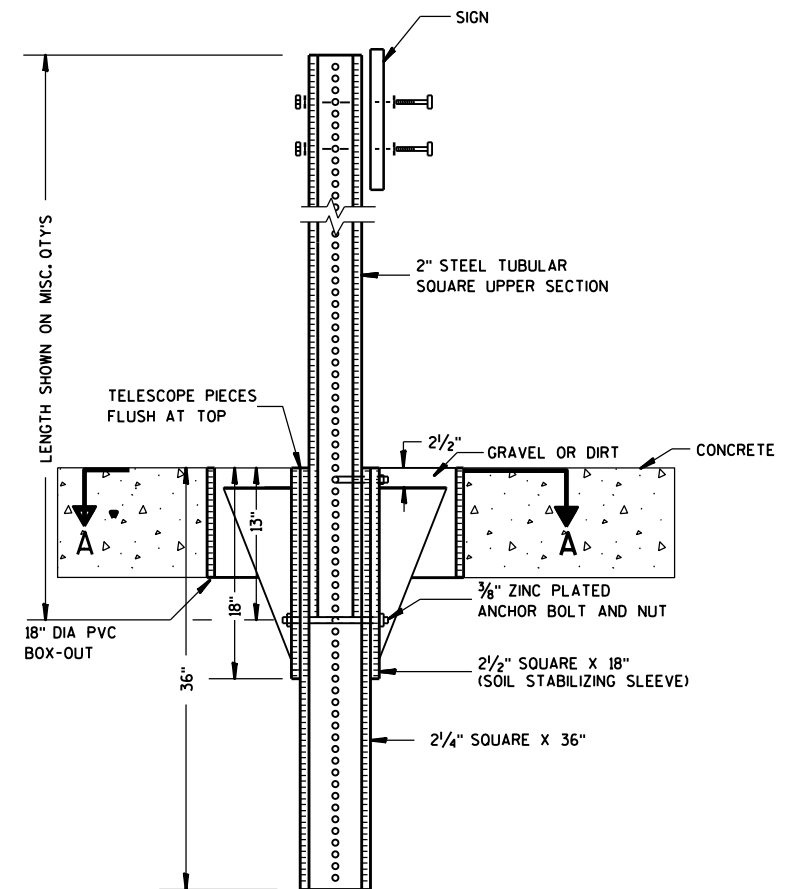
DATE 8/21/17 PLATE NO. A4-3.21



ELEVATION VIEW

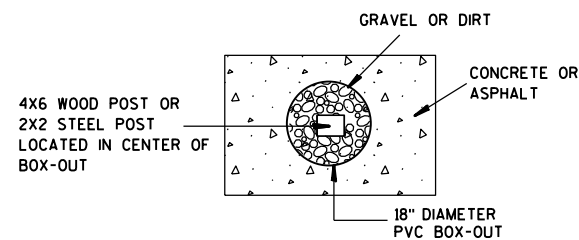
DETAIL OF WOOD 4 X 6 SIGN POST IN BOX-OUT

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



ELEVATION VIEW

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



PLAN VIEW

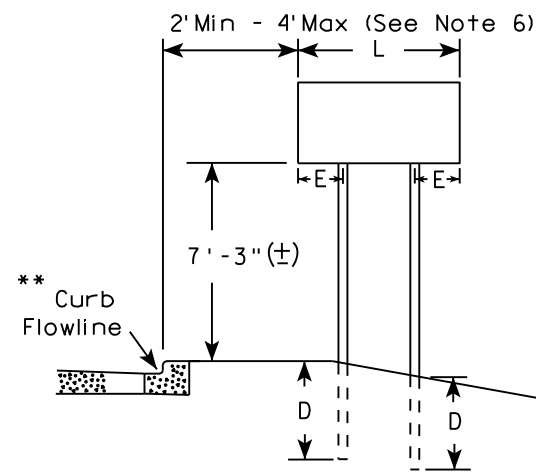
FOR NEW CONCRETE/ ASPHALT INSTALLATIONS

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

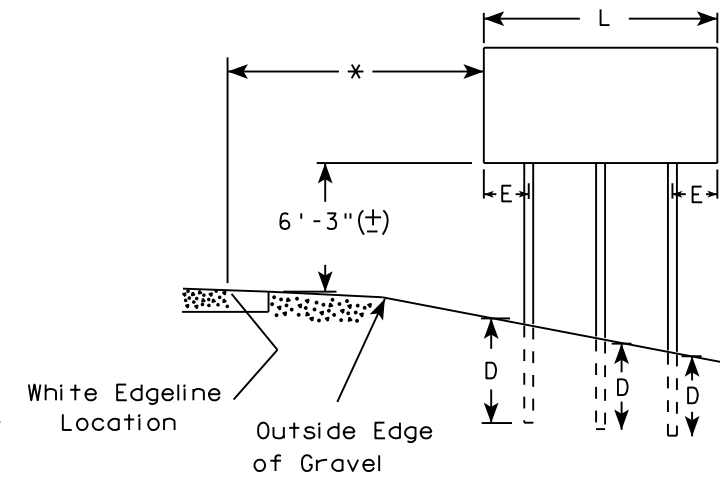
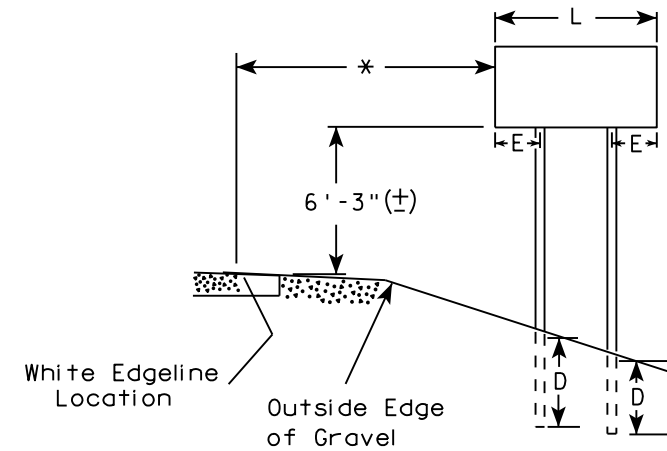
GENERAL NOTES

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" (±).

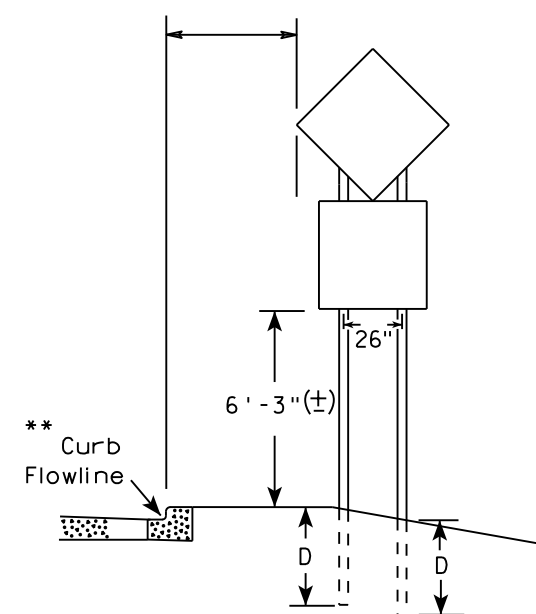
URBAN AREA



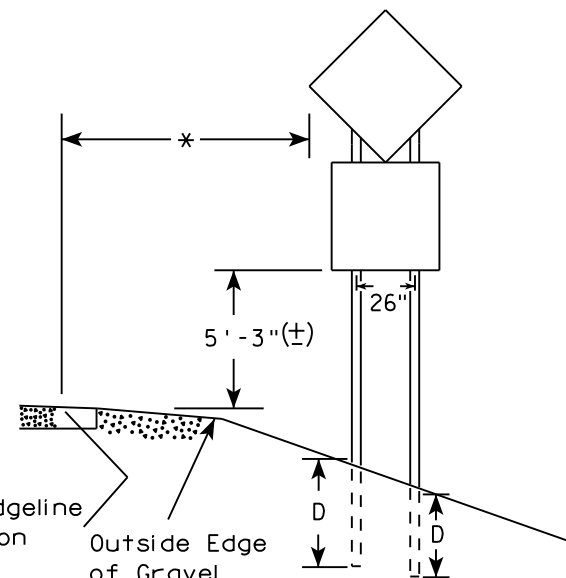
RURAL AREA (See Note 3)



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

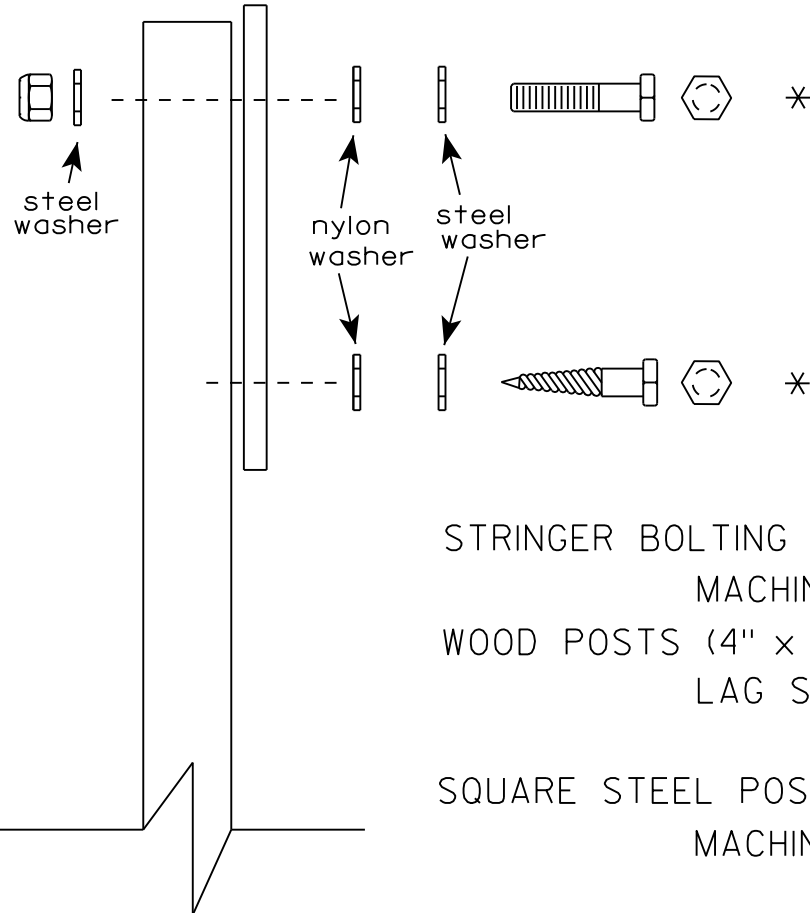
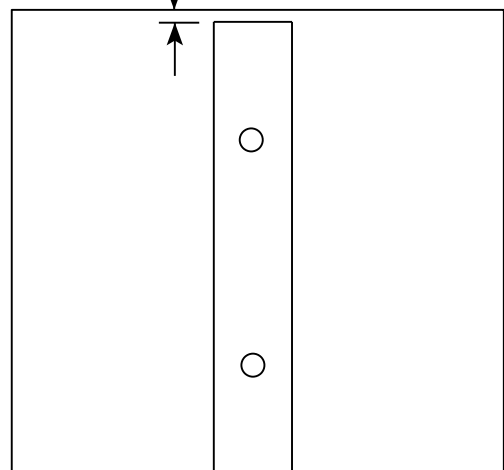
Area of Sign Installation (Sq. Ft.)	D (Min)
20 or Less	4'
Greater than 20	5'

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

1"± 1/2"

SIGN SHALL BE MOUNTED TO PROJECT ABOVE THE TOP OF THE POST



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

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

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

STRINGER BOLTING TO ALUMINUM SIGNS (SEE SIGN PLATE A4-18)

MACHINE BOLTS - 5/16" X 1-3/4" Length w/ lock nuts

WOOD POSTS (4" x 4" or 4" x 6")

LAG SCREWS - 3/8" X 3" (NO STRINGERS ON BACK OF SIGN)
3/8" X 4" (STRINGERS ON BACK OF SIGN)

SQUARE STEEL POSTS (2" x 2")

MACHINE BOLTS - 3/8" X 3-1/4" Length w/ nuts (NO STRINGER ON BACK OF SIGN)
3/8" X 5" Length w/ nuts (STRINGERS ON BACK OF SIGN)

RIVETS - 9/32" (6605-9-6) BULB-TITE, TRI-FOLD, ALUMINUM BODY/MANDREL
O.D. FLANGE .720-.765 INCH, GRIP RANGE .042-.375 INCH

WASHERS (ALL POSTS) -

1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL

1-1/4" O.D. X 3/8" I.D. X .080 NYLON

* 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

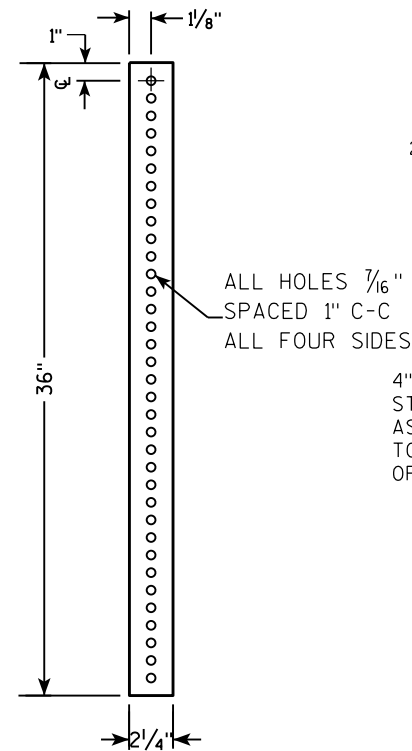
APPROVED *Matthew R. Rauch*
For State Traffic Engineer

DATE 8/11/16 PLATE NO. A4-8.8

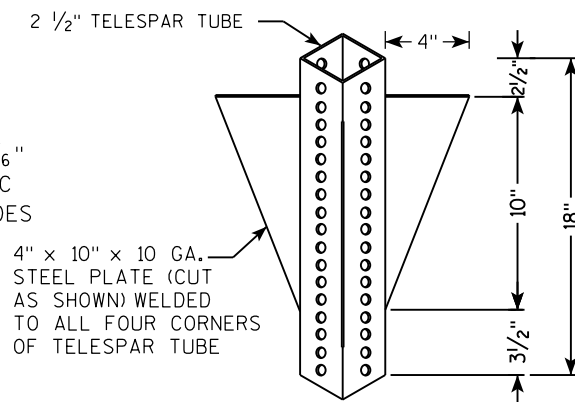
7

**TELESCOPIC TUBING ANCHORS
TWO PIECE SYSTEM**

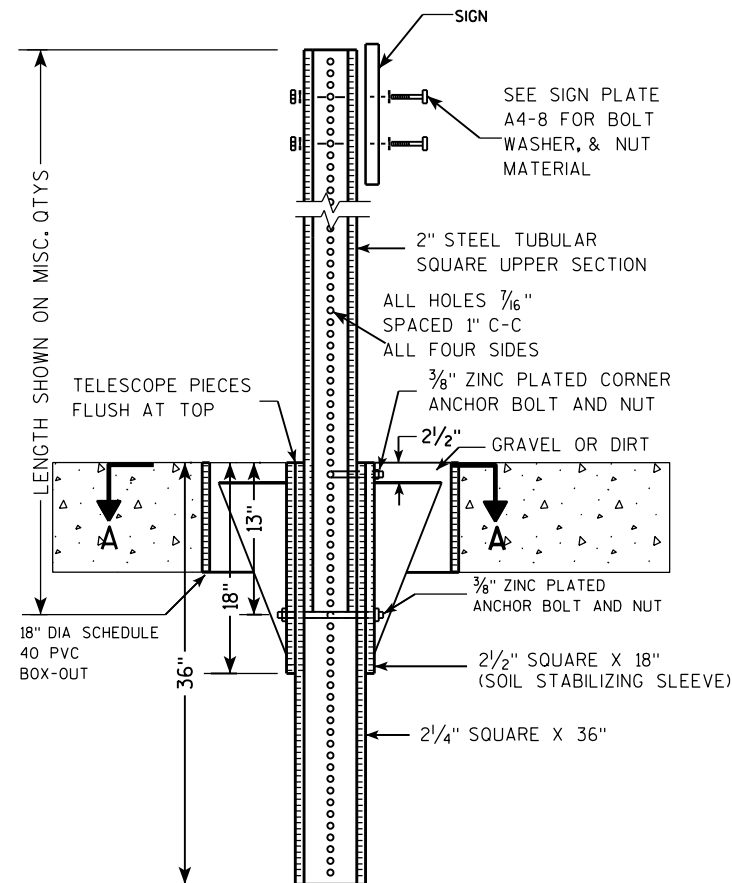
2 1/4" SQUARE
12 GAUGE
PERFORATED
GALVANIZED FINISH



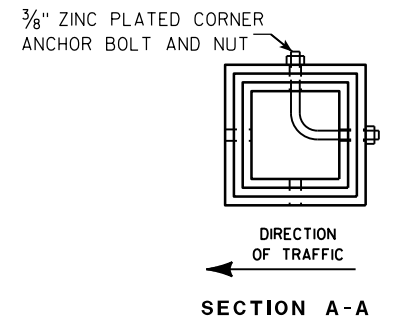
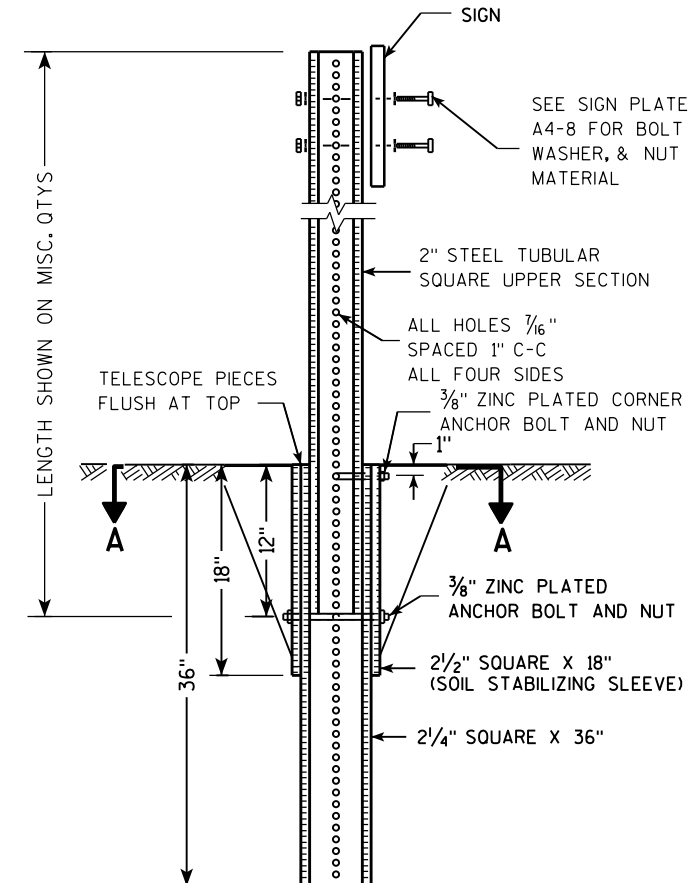
2 1/2" SQUARE
12 GAUGE
OMNI-DIRECTIONAL
PERFORATED
SOIL STABILIZING SLEEVE
GALVANIZED FINISH



**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

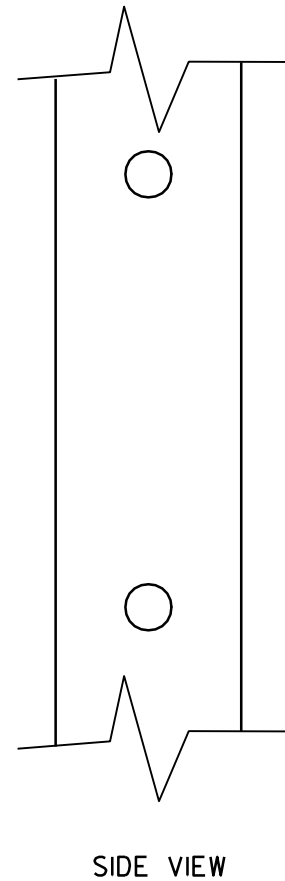
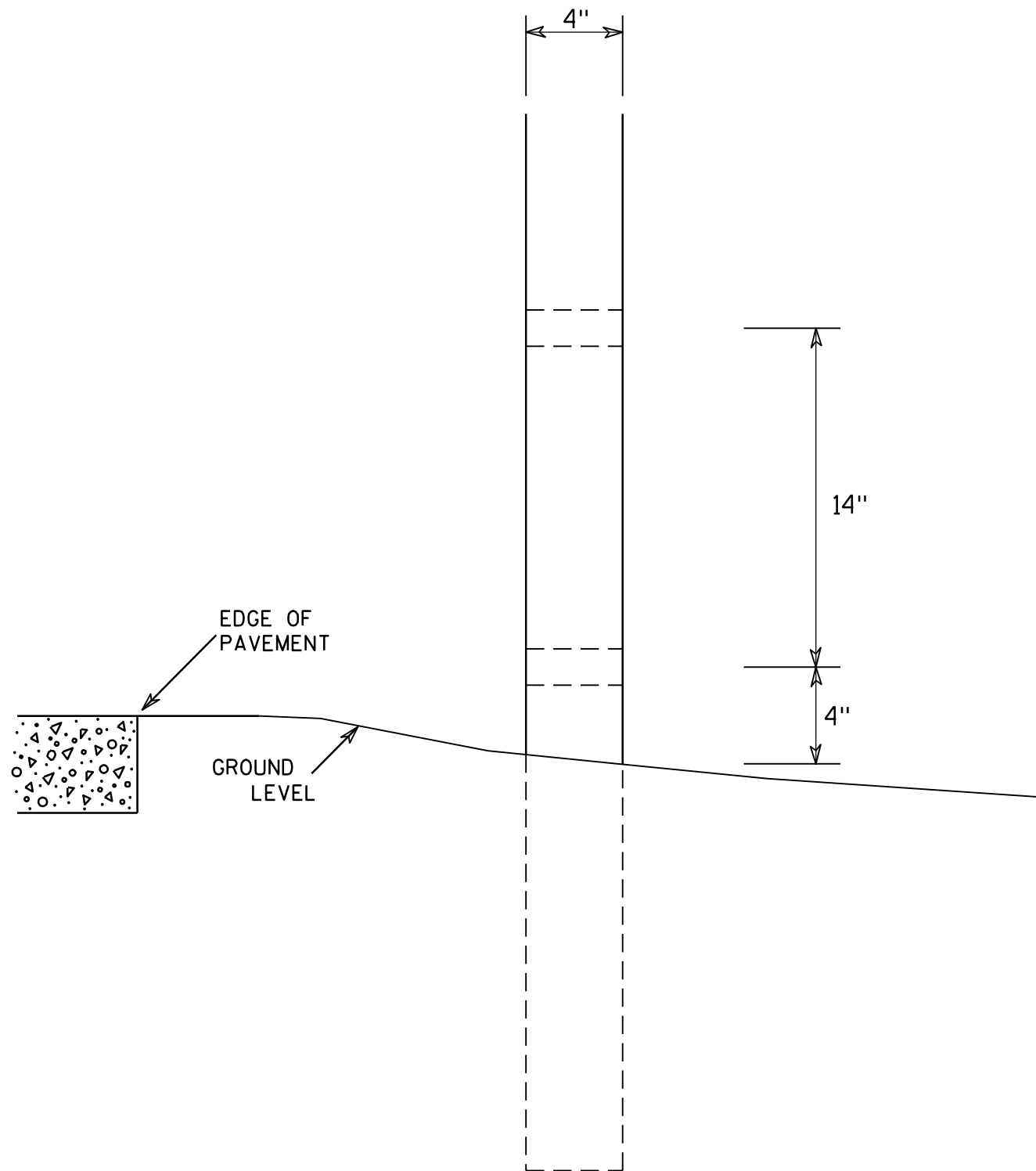
Signs wider than 3 feet or larger than 9 sq. ft shall be mounted on multiple posts (see above table).

**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



GENERAL NOTES

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

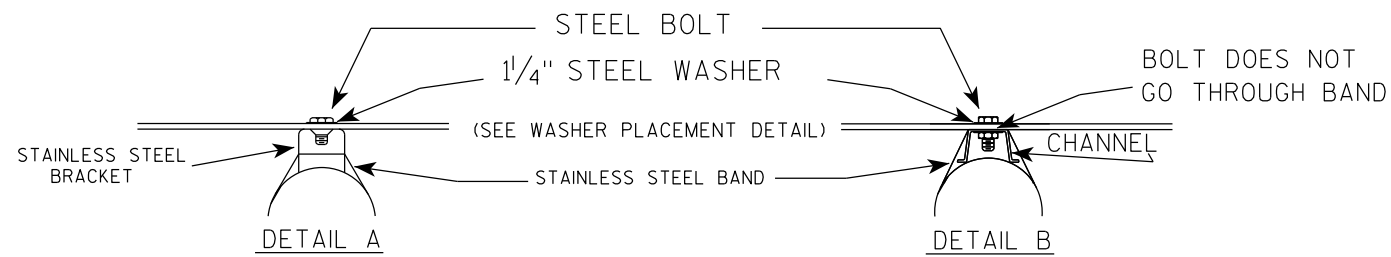
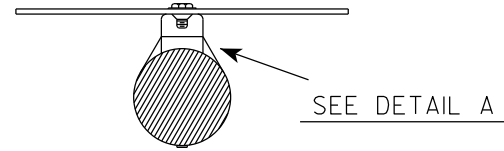
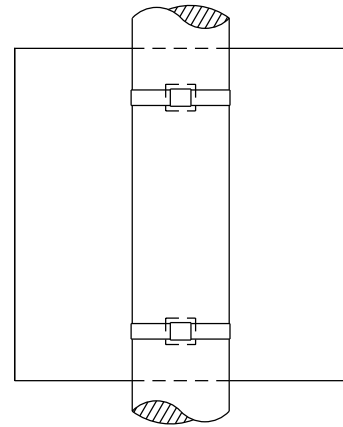
7

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>

BANDING

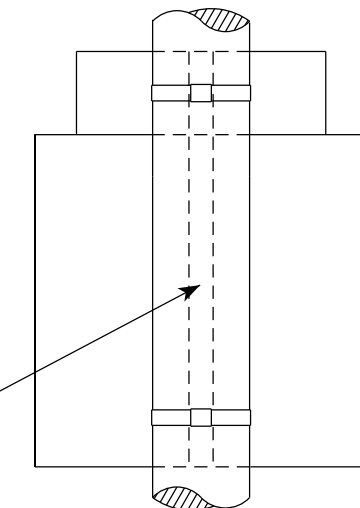
SINGLE SIGN



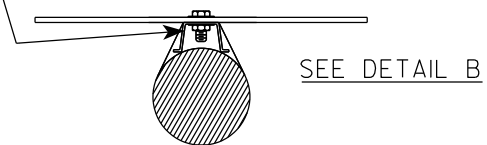
GENERAL NOTES

1. Any sign over 3 feet in width shall use the V-Block banding method. See A5-10 standard plate.
2. Signs 3 feet or greater in height shall have three bracket bands installed. Signs less than 3 feet in height shall have two bracket bands installed.
3. Banding and assembly bracket shall be stainless steel. All bands shall be 3/4" in width and 0.025" thickness.
4. ALL SIGN MOUNTING BOLTS AND WASHERS SHALL BE EITHER:
 - a. Hot dip or mechanically galvanized in accordance with ASTM Designation: A 153, Class D
 - b. Electro-galvanized in accordance with ASTM designation: B 633, Type III, SC 3

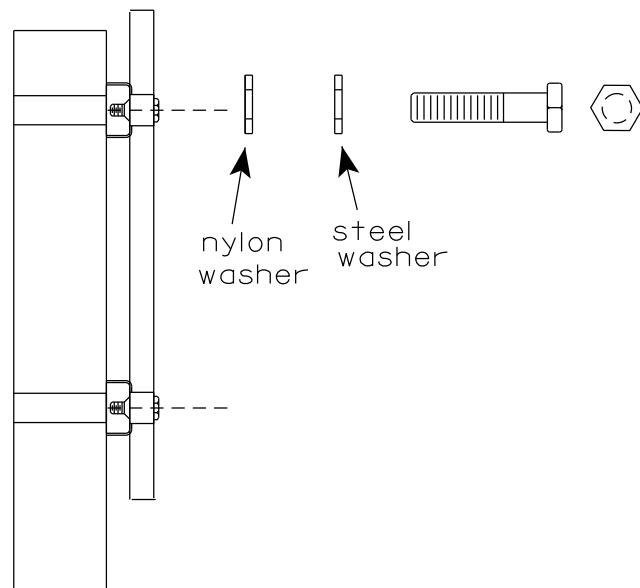
"J" ASSEMBLY



CHANNEL
SEE TYPICAL PANEL
INSTALLATION SHEET

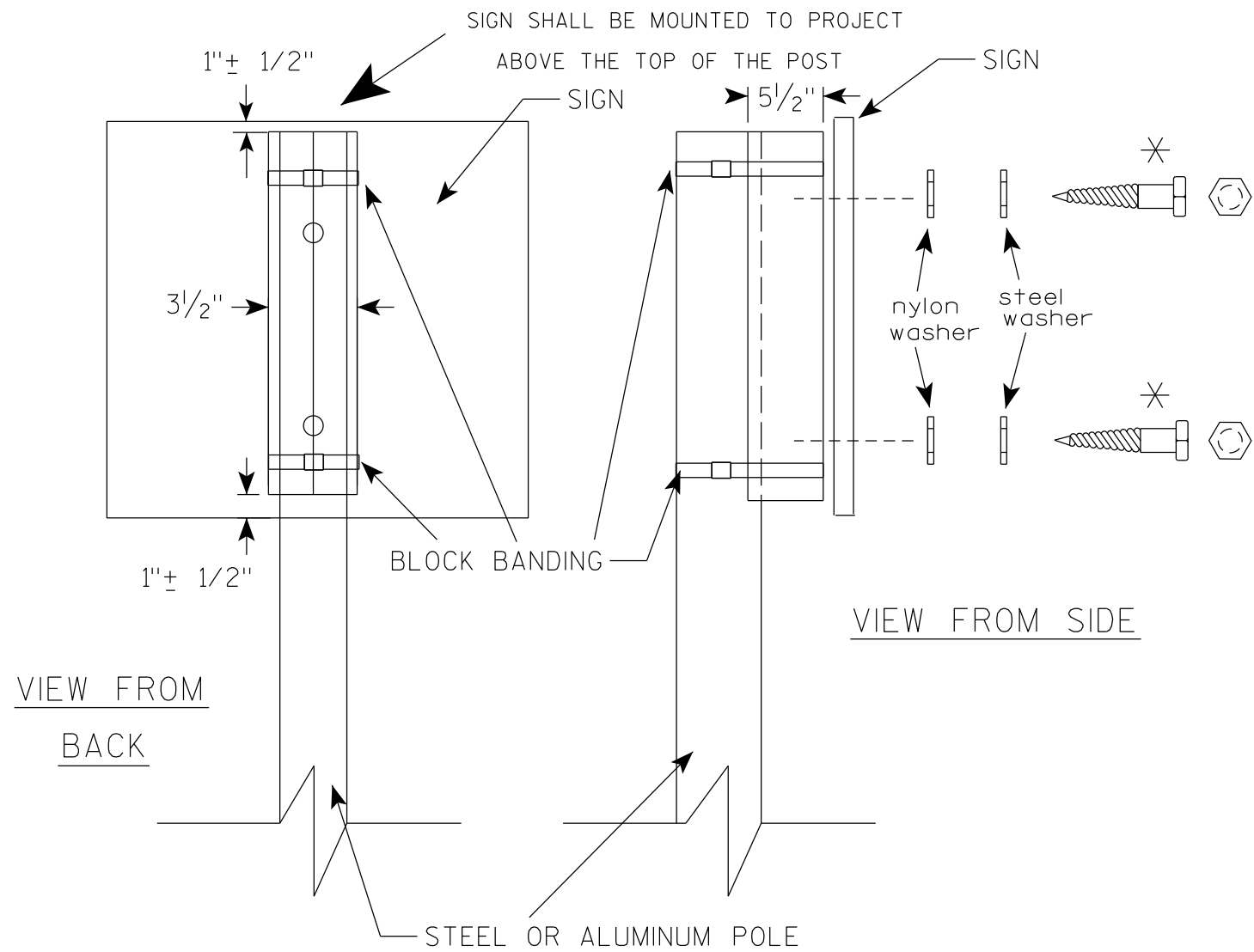


WASHER PLACEMENT



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

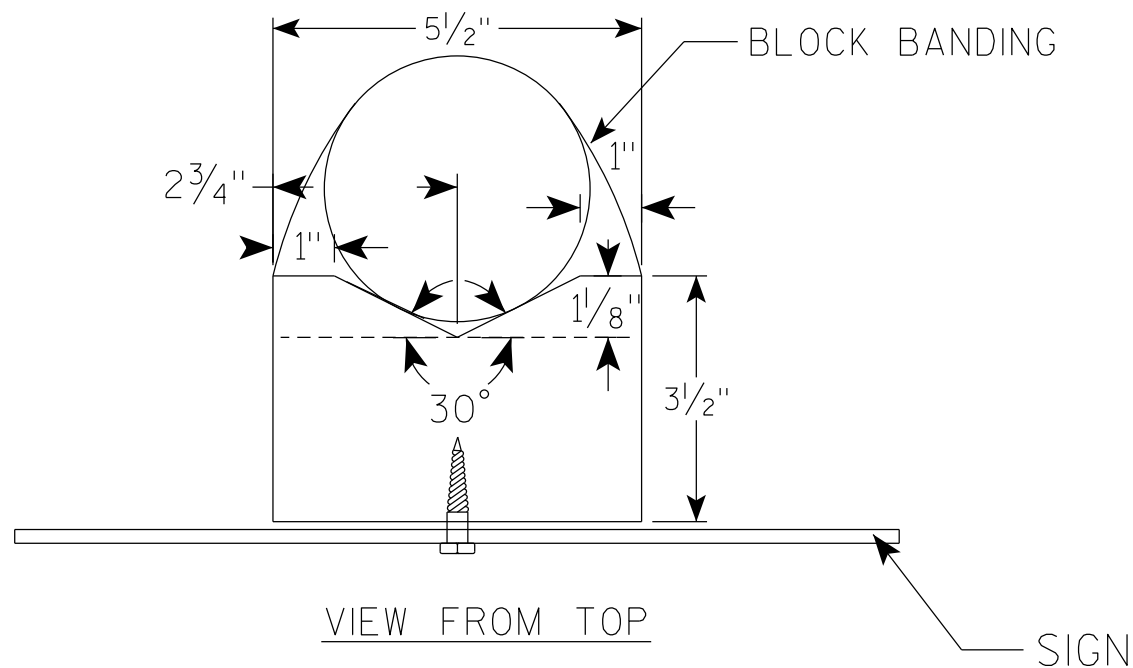
STANDARD SIGN
SIGN BANDING DETAILS
WISCONSIN DEPT OF TRANSPORTATION
APPROVED *Matthew R. Rauch*
for State Traffic Engineer
DATE 6/10/19 PLATE NO. A5-9.4



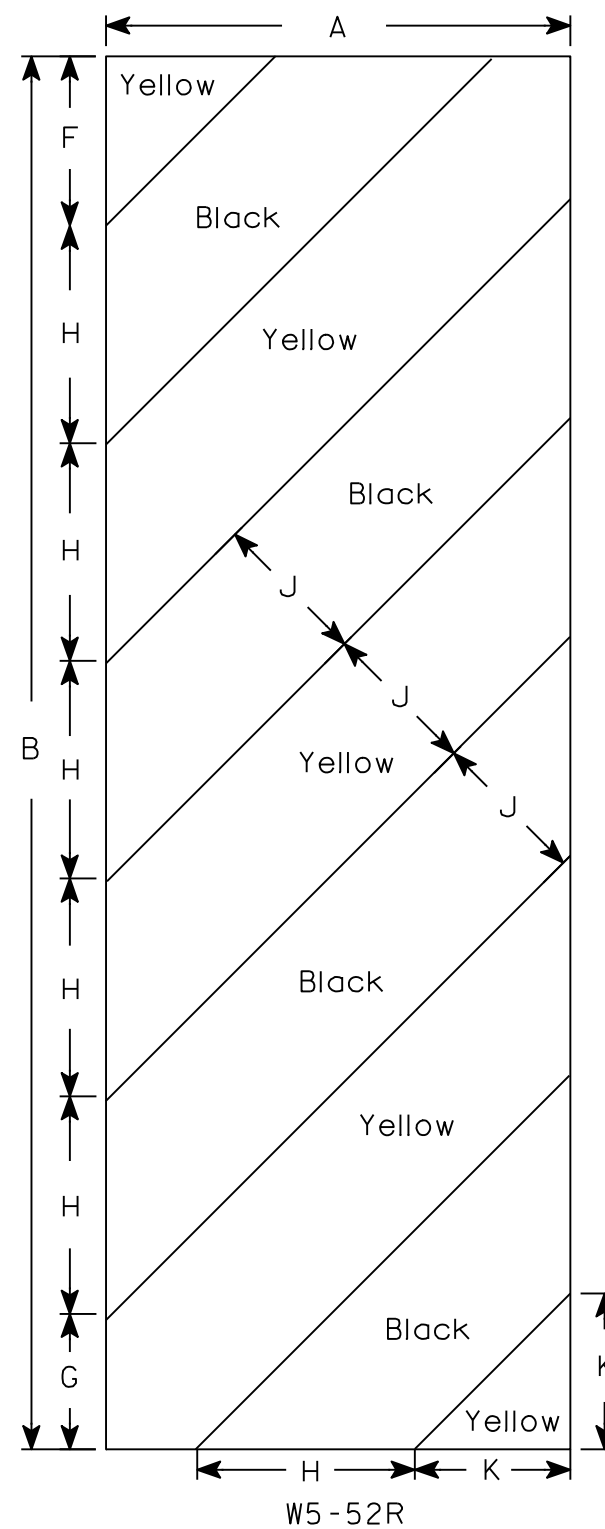
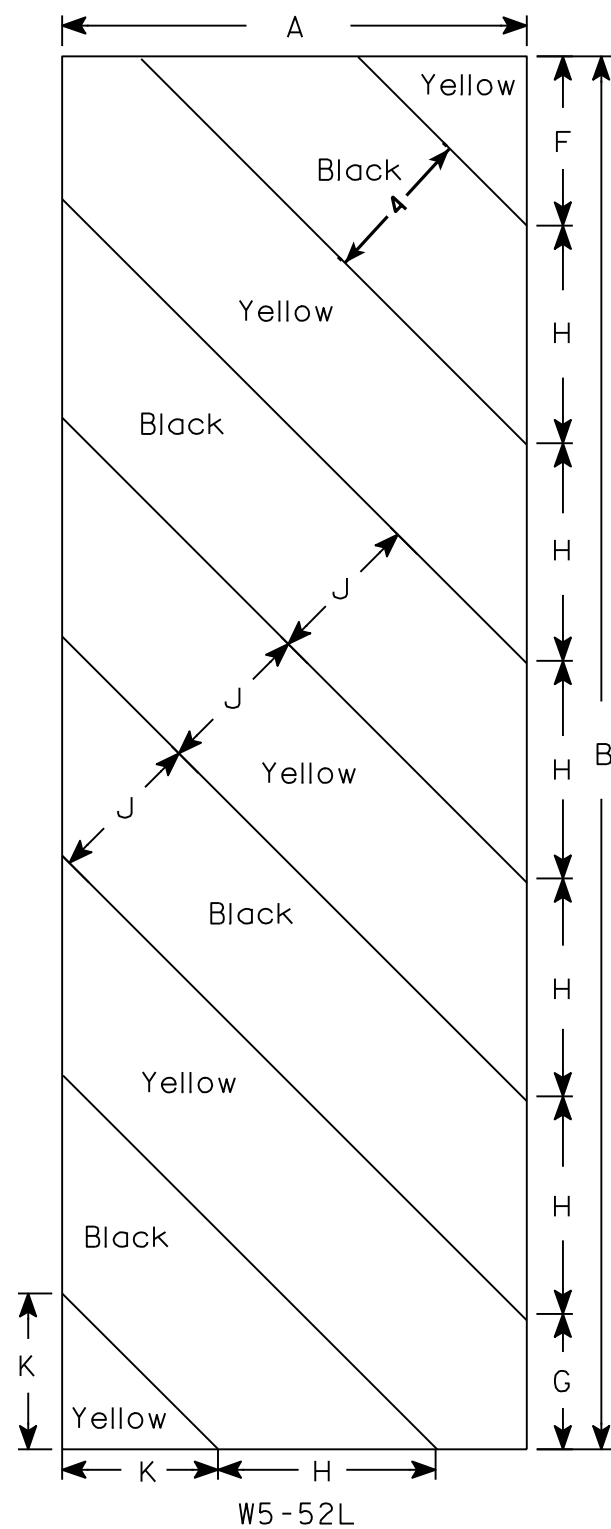
GENERAL NOTES

1. WOOD 4"X6" POST MATERIAL SHALL CONFORM TO 507.2.2 OF THE WisDOT STANDARD SPECIFICATIONS
2. BLOCK BANDING AND CLIPS SHALL BE STAINLESS STEEL, 3/4" WIDTH AND 0.025" THICKNESS
3. SIGNS 3' OR GREATER IN HEIGHT SHALL UTILIZE 3 BLOCK BANDS. SIGNS UNDER 3' IN HEIGHT SHALL UTILIZE 2 BLOCK BANDS
4. ACTUAL NUMBER OF FASTENERS PER SIGN VARIES WITH THE SIGN AREA, BUT NORMALLY THERE ARE TWO. FOR SIGNS GREATER THAN 9 S.F. 3 FASTENERS SHALL BE USED.
5. ALL SIGN MOUNTING BOLTS AND WASHERS SHALL BE EITHER:
 - a. Hot dip or mechanically galvanized in accordance with ASTM Designation: A 153, Class D
 - b. Electro-galvanized in accordance with ASTM Designation : B 633, TYPE III, SC 3
6. ALL BOLTS SHALL HAVE HEXAGONAL HEADS.
7. STEEL WASHERS SHALL BE 1/4" O.D. X 3/8" I.D. X 1/16"
8. NYLON WASHERS SHALL BE 1/4" O.D. X 3/8" I.D. X .080 FOR TYPE H OR TYPE F FACE SIGN

* LAG BOLTS SHALL BE 3/8" X 2 1/2"



BLOCK BANDING DETAIL (V-BLOCK OPTION)	
WISCONSIN DEPT OF TRANSPORTATION	
APPROVED	<i>Matthew R Rauch</i> For State Traffic Engineer
DATE 6/10/19	PLATE NO. A5-10.2



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

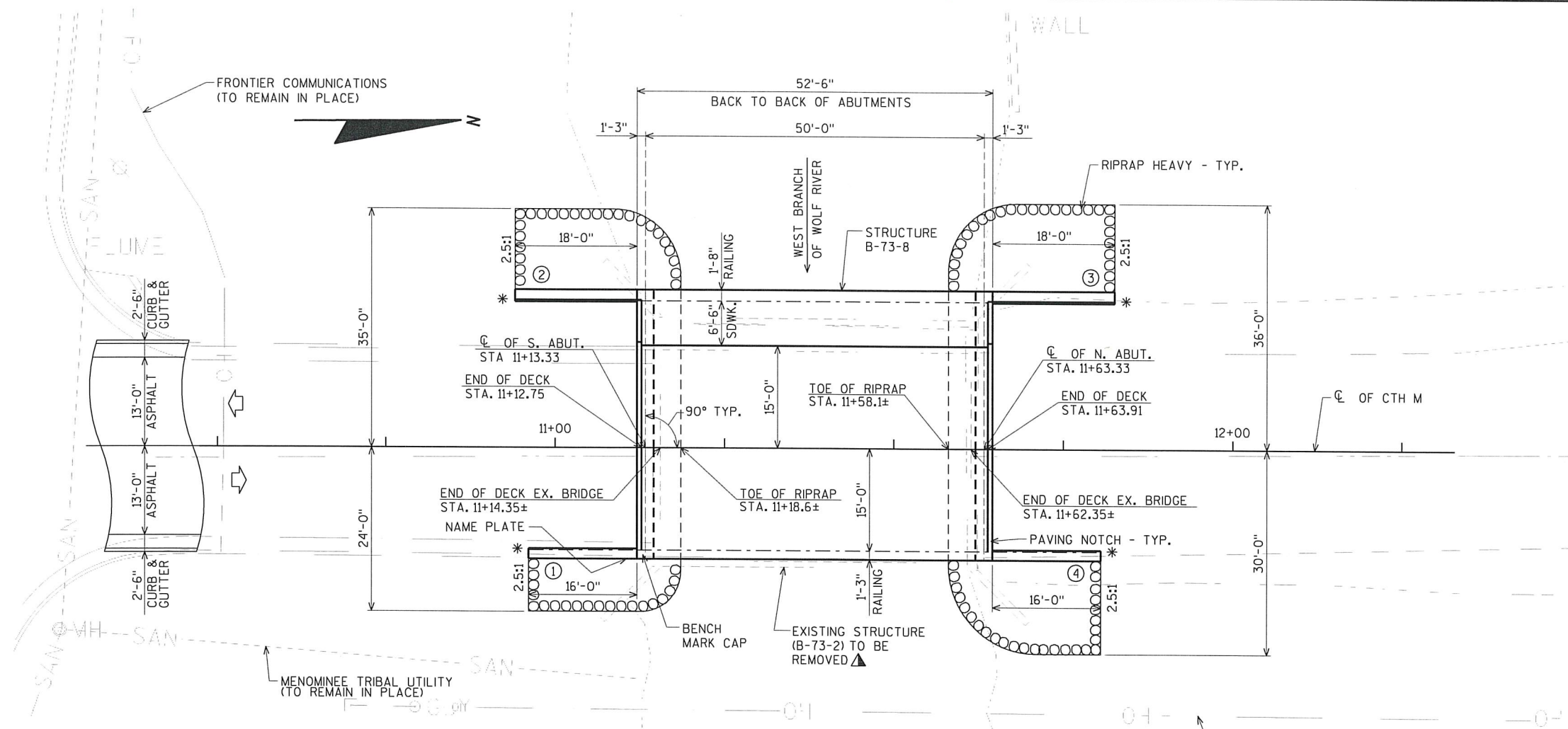
APPROVED *Matthew R. Rauch*
for State Traffic Engineer

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

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

LIST OF DRAWINGS

1. GENERAL PLAN
2. TYPICAL SECTION AND DESIGN DATA
3. QUANTITIES AND NOTES
4. SUBSURFACE EXPLORATION
5. SOUTH ABUTMENT
6. SOUTH ABUTMENT PILE LAYOUT
7. SOUTH ABUTMENT WING 1 DETAILS
8. SOUTH ABUTMENT WING 2 DETAILS
9. NORTH ABUTMENT
10. NORTH ABUTMENT PILE LAYOUT
11. NORTH ABUTMENT WING 3 DETAILS
12. NORTH ABUTMENT WING 4 DETAILS
13. ABUTMENT BILL OF BARS
14. SUPERSTRUCTURE
15. SUPERSTRUCTURE PLAN
16. SUPERSTRUCTURE DETAILS
17. RAILING TUBULAR TYPE M
18. TUBULAR STEEL RAILING TYPE NY4
19. END POST DETAILS FOR TUBULAR STEEL RAILING TYPE NY4

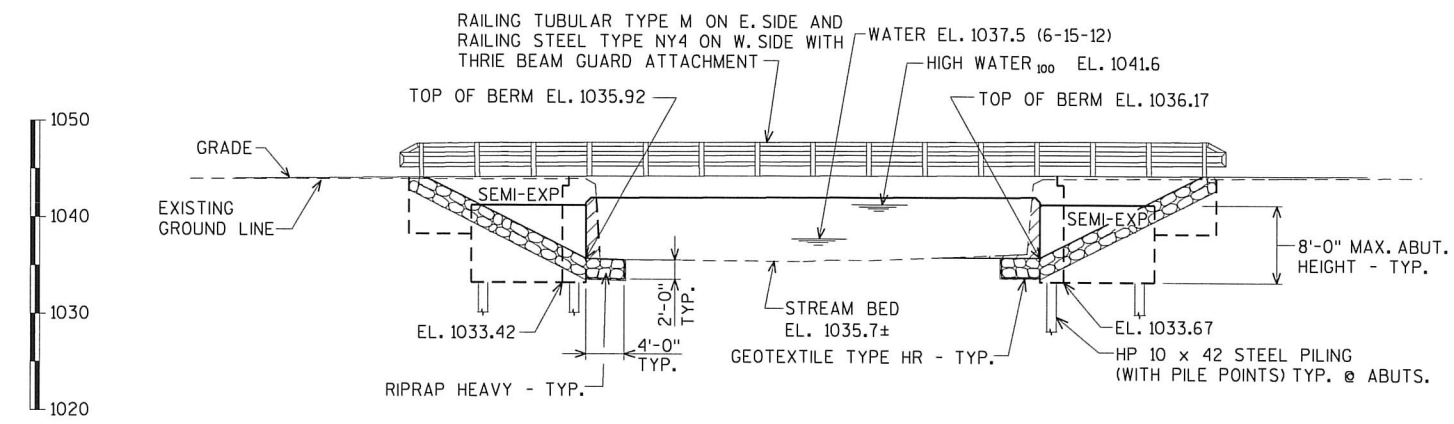


PLAN
SINGLE SPAN CONCRETE FLAT SLAB

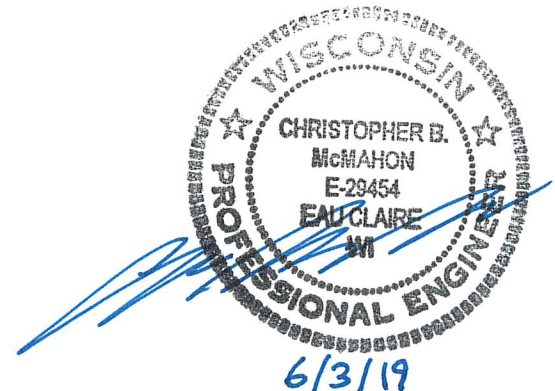
- * ANCHOR ASSEMBLY FOR THRIE BEAM TYPE GUARDRAIL.
- ▲ EXISTING ABUTMENT SPREAD FOOTINGS TO BE REMOVED AS NEEDED TO ALLOW PILE DRIVING.
- DENOTES WING NUMBER

▨ COST OF EXCAVATION OR FILL IN THE HATCHED AREAS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR "EXCAVATION FOR STRUCTURES BRIDGES B-73-8".

FOR TYPICAL SECTION, DESIGN DATA & PROFILE GRADE LINE SEE SHEET 2



ELEVATION



BRIDGE OFFICE CONTACT:
WILLIAM DREHER
(608)-266-8489

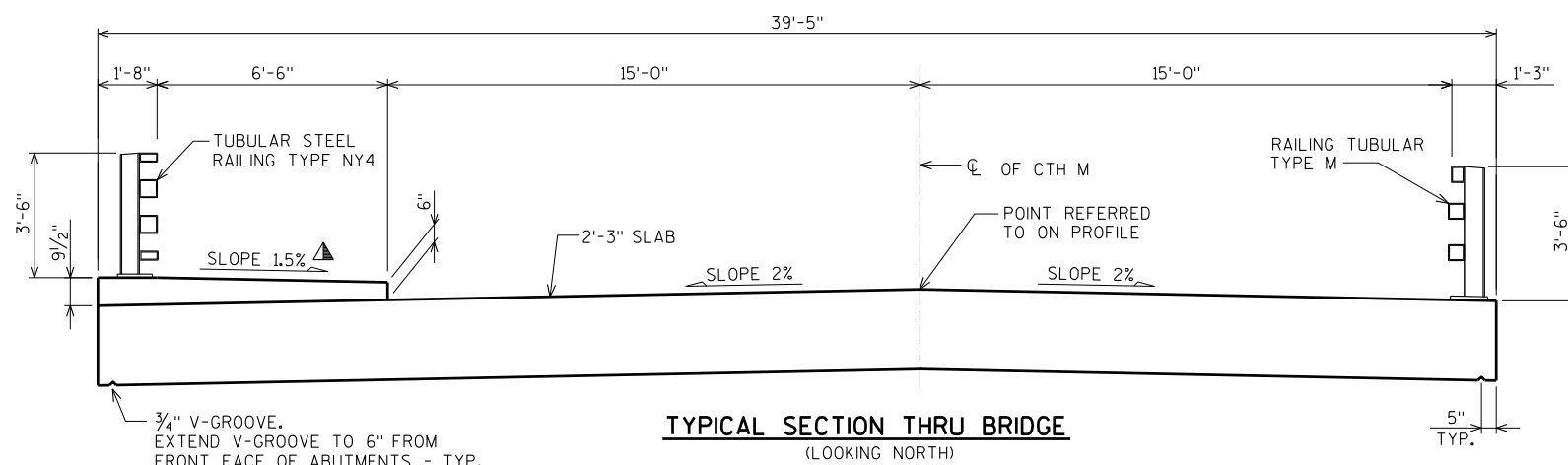
CONSULTANT CONTACT:
CHRIS MCMAHON
(715)-834-3161

NO.	DATE	REVISION	BY
ORIGINAL PLANS PREPARED BY			
AYRES ASSOCIATES		3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
ACCEPTED	<i>William C. Dreher</i> SDR		08/26/19
CHIEF STRUCTURES DESIGN ENGINEER		DATE	
STRUCTURE B-73-8			
CTH M OVER WEST BRANCH WOLF RIVER			
COUNTY	MENOMINEE	TOWN/VILLAGE	NEOPIT
DESIGN SPEC.	AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS		
DESIGNED BY	JLB	DESIGN CR'D.	CJM
DRAWN BY	CLS	PLANS CR'D.	CBM
GENERAL PLAN			SHEET 1 OF 19

\$PRFNAME\$ U:\45-0470.00 - Menominee Co. CTH M over W. Br. Wolf River Structures\450470_gp.dgn
 CHECKED BY: BACK CHECKED BY: CORRECTED BY:
 DATE: DATE: DATE:

8

8



±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

DESIGN DATA

LIVE LOAD:

DESIGN LOADING: HL-93
 INVENTORY RATING FACTOR: 1.16
 OPERATING RATING FACTOR: 1.50
 WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = 250 KIPS

STRUCTURE IS DESIGNED FOR A FUTURE WEARING SURFACE OF 20 #/S.F.

MATERIAL PROPERTIES:

CONCRETE MASONRY { SUPERSTRUCTURE $f'_c = 4,000$ p.s.i.
 ALL OTHER $f'_c = 3,500$ p.s.i.
 HIGH STRENGTH BAR STEEL REINFORCEMENT (GRADE 60) $f_y = 60,000$ p.s.i.

HYDRAULIC DATA:

<u>100 YEAR FREQUENCY</u>		<u>2 YEAR FREQUENCY</u>
$Q_{100} = 1,300$ c.f.s.		$Q_2 = 500$ c.f.s.
VEL. = 5.1 f.p.s.		VEL. = 3.3 f.p.s.
HW ₁₀₀ = EL. 1041.6		HW ₂ = EL. 1039.2
WATERWAY AREA = 256 sq. ft.		
DRAINAGE AREA = 91.6 sq. mi.		
ROADWAY OVERTOPPING = N/A		
SCOUR CRITICAL CODE = 8		
DATUM = NAVD88 (2012)		

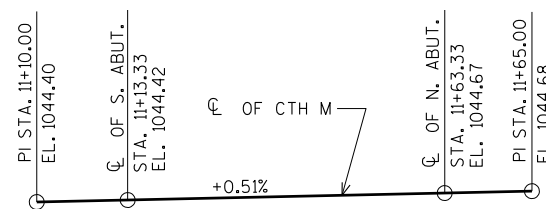
FOUNDATION DATA:

ABUTMENTS TO BE SUPPORTED ON HP 10 x 42 STEEL PILING (WITH PILE POINTS) DRIVEN TO A REQUIRED DRIVING RESISTANCE OF 180 TONS ± PER PILE AS DETERMINED BY THE MODIFIED GATES DYNAMIC FORMULA. ESTIMATED LENGTH 30'-0" FOR THE SOUTH AND NORTH ABUTMENTS.

±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 TO DETERMINE DRIVEN PILE CAPACITY.

TRAFFIC DATA:

A.A.D.T. = 602 (2020)
 A.A.D.T. = 755 (2040)
 R.D.S. = 35 M.P.H.



PROFILE GRADE LINE
(CTH M)

BENCH MARK:
 CAP IN TOP OF SW WINGWALL
 STA. 11+09, 20.5' LT.
 EL. 1044.00

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NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
TYPICAL SECTION DESIGN DATA			SHEET 2 OF 19

ORIGINAL PLANS PREPARED BY
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TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	S. ABUT.	N. ABUT.	SUPER.	TOTAL
203.0600.S	REMOVING OLD STRUCTURE OVER WATERWAY WITH MINIMAL DEBRIS STATION 11+38	LS	-----	-----	-----	1
206.1000	EXCAVATION FOR STRUCTURES BRIDGES B-73-8	LS	-----	-----	-----	1
210.1500	BACKFILL STRUCTURE TYPE A	TON	285	285	-----	570
502.0100	CONCRETE MASONRY BRIDGES	CY	57	57	188	302
502.3200	PROTECTIVE SURFACE TREATMENT	SY	-----	-----	265	265
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	3,070	3,070	-----	6,140
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	2,620	2,620	31,050	36,290
513.4061	RAILING TUBULAR TYPE M	LF	17	17	53	87
513.7084	RAILING STEEL TYPE NY4	LF	19.5	19.5	53	92
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	11	11	-----	22
550.0500	PILE POINTS	EACH	9	9	-----	18
550.1100	PILING STEEL HP 10-INCH x 42 LB	LF	270	270	-----	540
606.0300	RIPRAP HEAVY	CY	45	60	-----	105
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	LF	85	85	-----	170
645.0111	GEOTEXTILE TYPE DF SCHEDULE A	SY	40	40	-----	80
645.0120	GEOTEXTILE TYPE HR	SY	105	125	-----	230
NON-BID ITEMS						
	FILLER	SIZE	-----	-----	-----	1/2" & 3/4"

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.
 BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS SHOWN OR NOTED OTHERWISE.

THE FIRST DIGIT OF A THREE DIGIT BAR NO. AND THE FIRST TWO DIGITS OF A FOUR DIGIT BAR NO. SIGNIFIES THE BAR SIZE. JOINT FILLER SHALL CONFORM TO THE REQUIREMENTS OF A.A.S.H.T.O. DESIGNATION M 153, TYPE I, II OR III OR A.A.S.H.T.O. DESIGNATION M 213.

THE SLOPE OF THE FILL IN FRONT OF THE ABUTMENTS SHALL BE COVERED WITH RIPRAP HEAVY AND GEOTEXTILE TYPE HR TO THE EXTENT SHOWN ON THE GENERAL PLAN SHEET AND IN THE ABUTMENT DETAILS.

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

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES BRIDGES B-73-8" SHALL BE THE EXISTING GROUNDLINE.

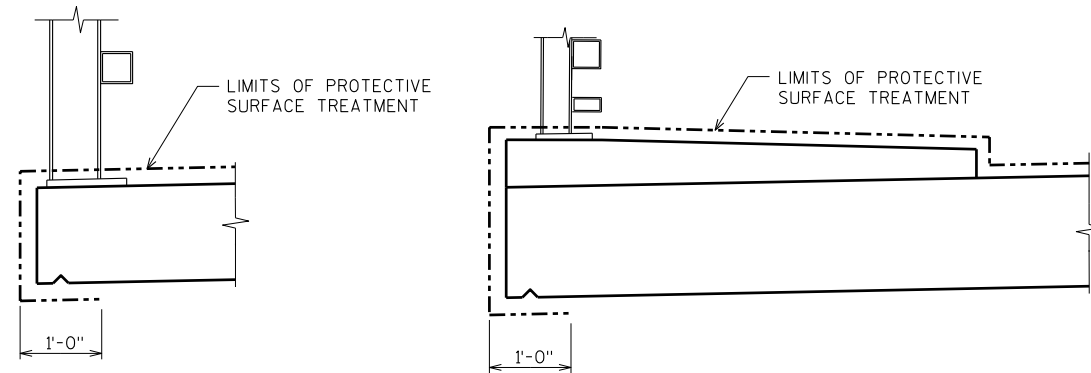
THE EXISTING STRUCTURE, B-73-2, TO BE REMOVED, IS A SINGLE SPAN PRESTRESSED CONCRETE BOX BEAM BRIDGE, 50 FOOT OVERALL LENGTH WITH A 30 FOOT CLEAR ROADWAY WIDTH AND A 4 FOOT RAISED SIDEWALK.

PROTECTIVE SURFACE TREATMENT IS TO BE APPLIED AS SHOWN IN DETAIL ON THIS SHEET.

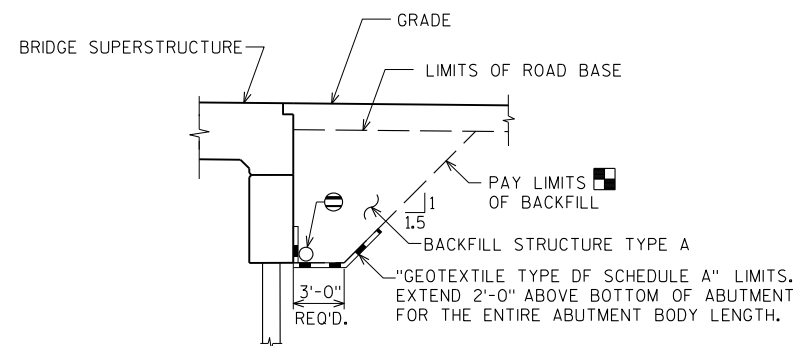
BEVEL EXPOSED EDGES OF CONCRETE 3/4" UNLESS NOTED OTHERWISE.

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 STRUCTURES.



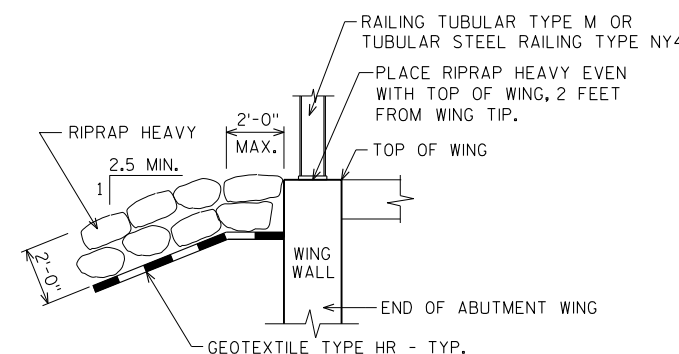
PROTECTIVE SURFACE TREATMENT DETAIL



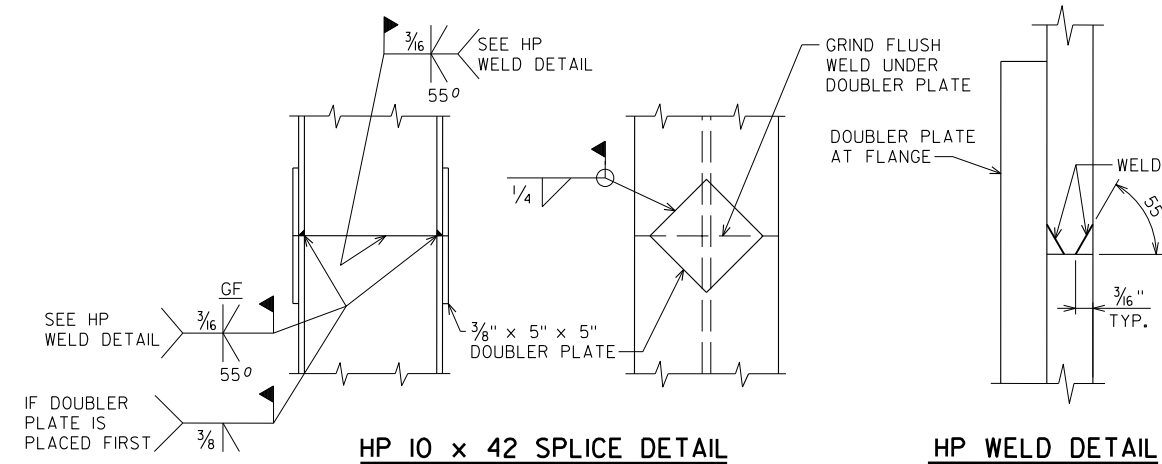
BACKFILL STRUCTURE LIMITS

BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

PIPE UNDERDRAIN WRAPPED 6-INCH, SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN AS DETAILED ON SHEET 6.



TYPICAL FILL SECTION AT WING TIPS



HP 10 x 42 SPLICE DETAIL

HP WELD DETAIL

FLANGE SHOWN, WEB SIMILAR

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
QUANTITIES AND NOTES			SHEET 3 OF 19

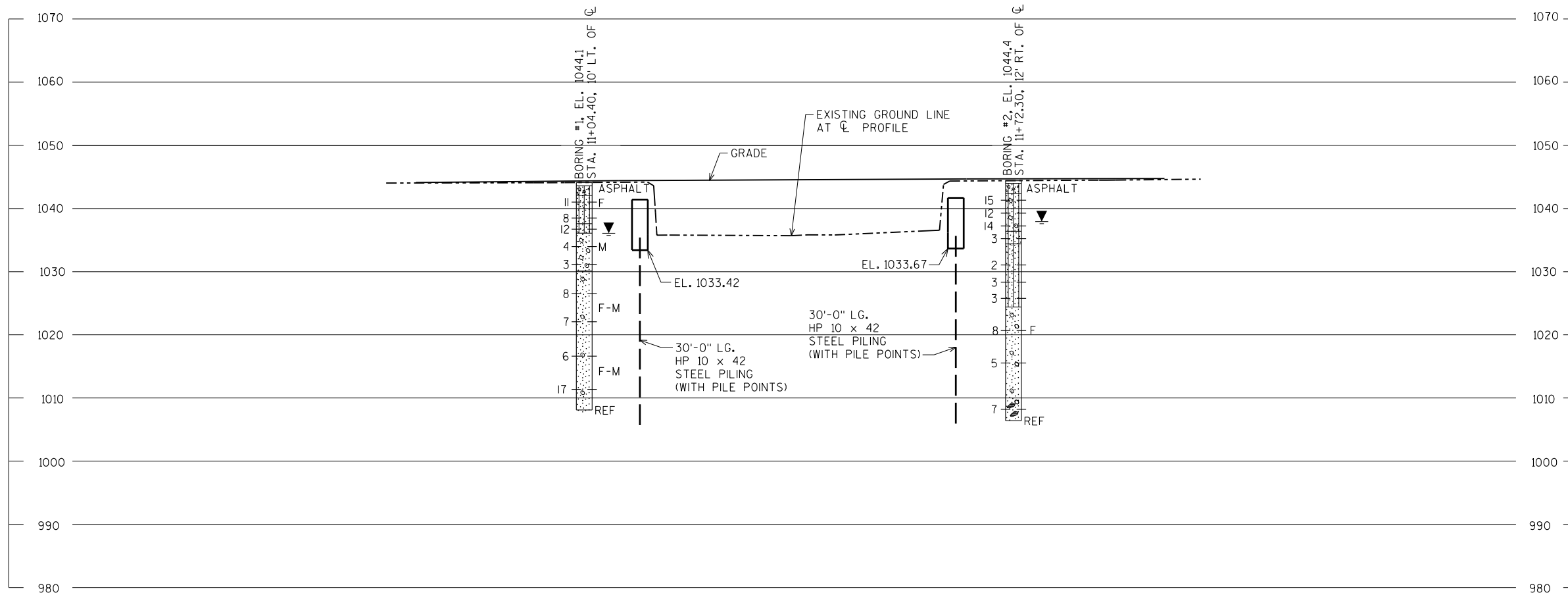
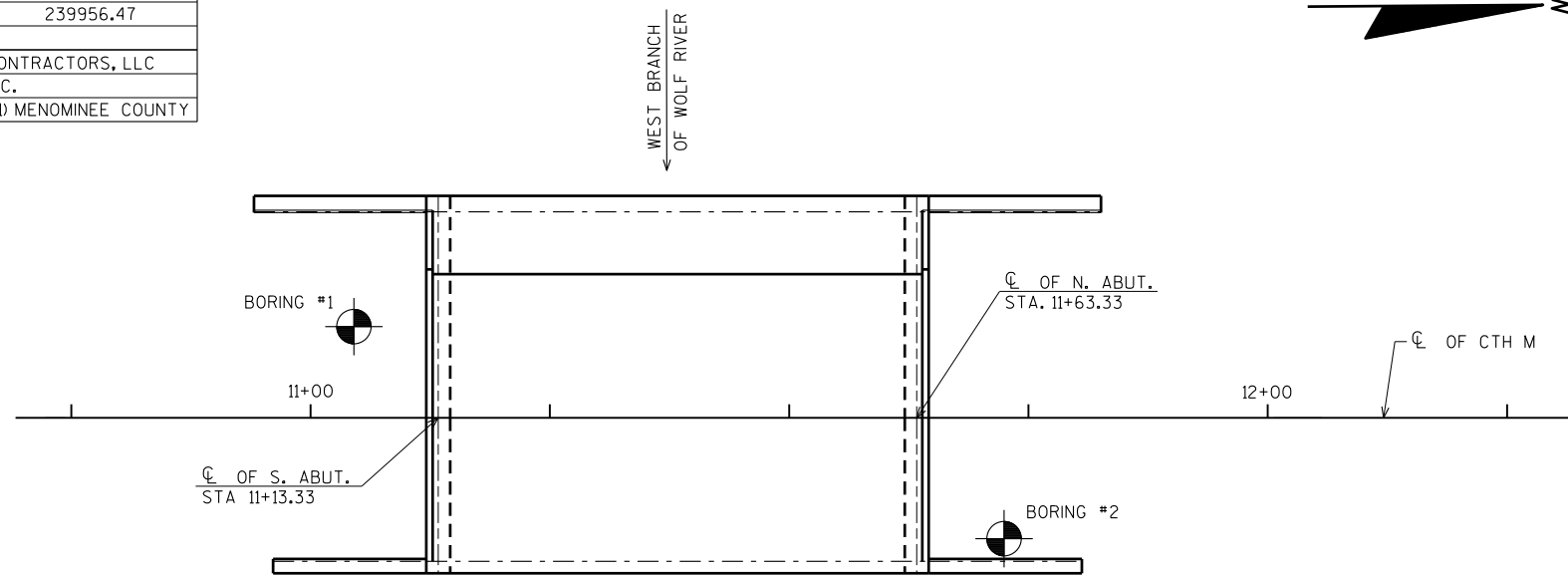
ORIGINAL PLANS PREPARED BY
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\$PRNAME\$ U:\45-0470.00 - Menominee Co. CTH M over W. Br. Wolf River Structures\450470 soils.dgn

BORING #	DATE COMPLETED	NORTHING (Y)	EASTING (X)
1	FEBRUARY 28, 2013	96672.69	239934.51
2	FEBRUARY 28, 2013	96740.61	239956.47

BORINGS COMPLETED BY: GEOTECHNICAL DRILLING CONTRACTORS, LLC
 REPORT COMPLETED BY: RIVER VALLEY TESTING, INC.
 ALL COORDINATES REFERENCED TO WCCS NAD 83(91) MENOMINEE COUNTY



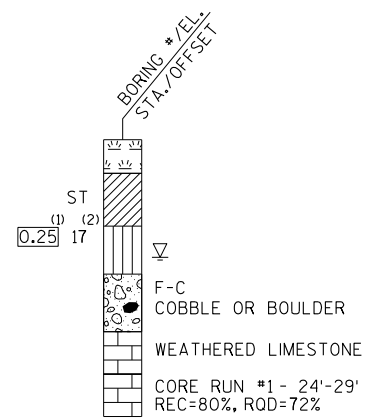
STATE PROJECT NUMBER

9435-00-70

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.

GROUND WATER ELEVATION

- ▽ AT TIME OF DRILLING
- ▽ END OF DRILLING
- ▽ AFTER DRILLING

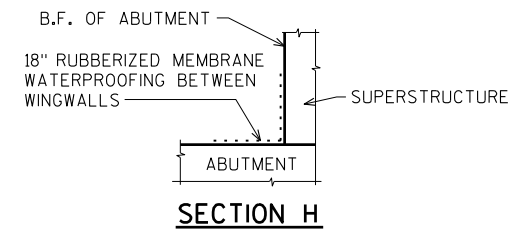
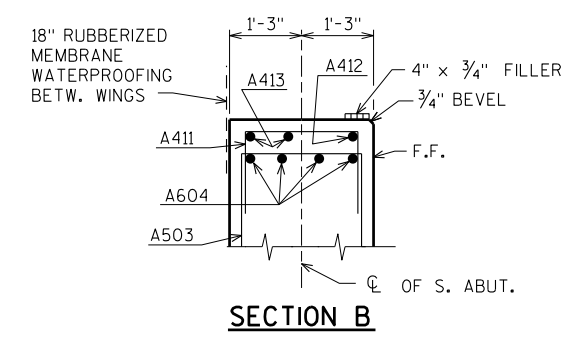
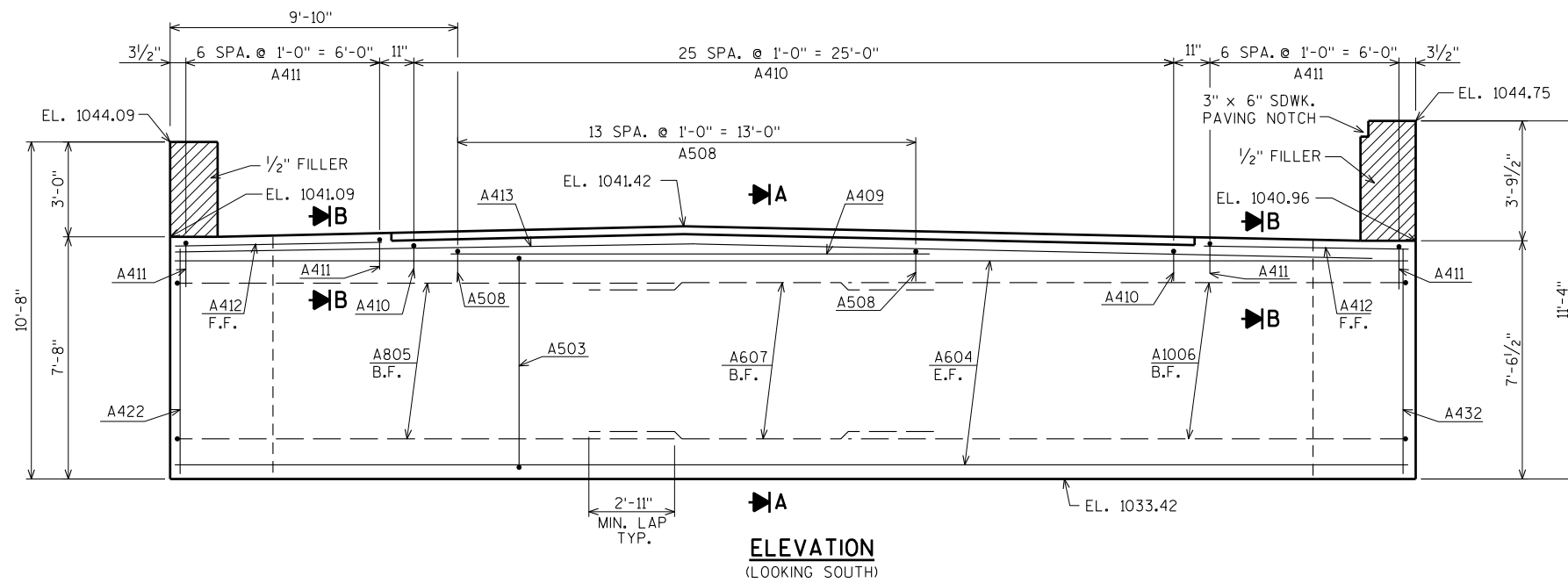
ABBREVIATIONS

F-FINE M-MEDIUM C-COARSE ST-SHELBY TUBE

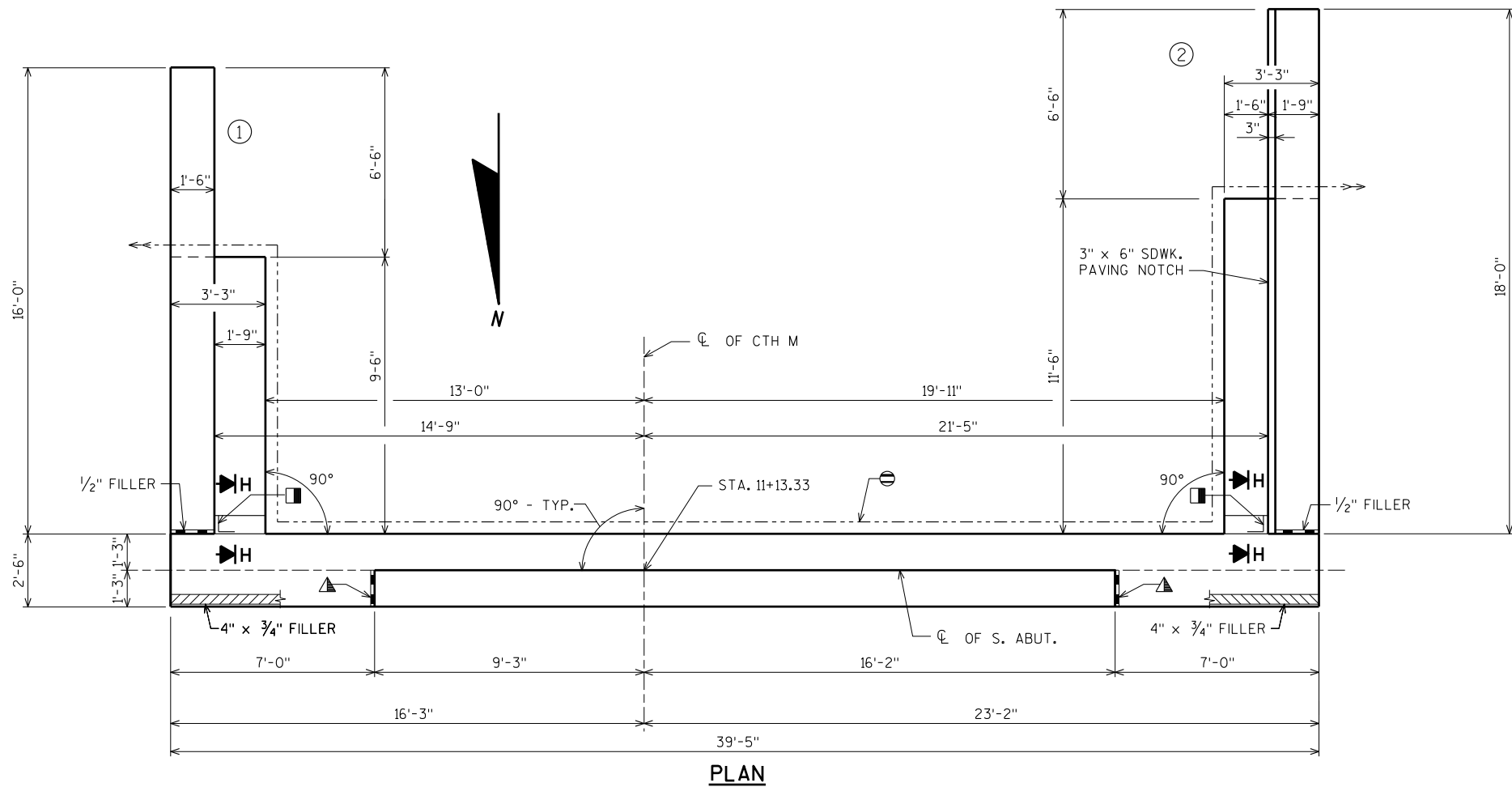
SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

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-73-8			
DRAWN BY		CLS	PLANS CKD. CBM
SUBSURFACE EXPLORATION			SHEET 4 OF 19



- FOR SECTION A SEE SHEET 6.
- VERTICAL 18" RUBBERIZED MEMBRANE WATERPROOFING TO EXTEND FROM BRIDGE SEAT TO TOP OF WING WALL.
 - ▲ 3/4" CORK FILLER ON VERTICAL FACE ONLY.
 - ⊖ PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN AS DETAILED ON SHEET 6.
- B.F. DENOTES BACK FACE.
 F.F. DENOTES FRONT FACE.
 E.F. DENOTES EACH FACE.



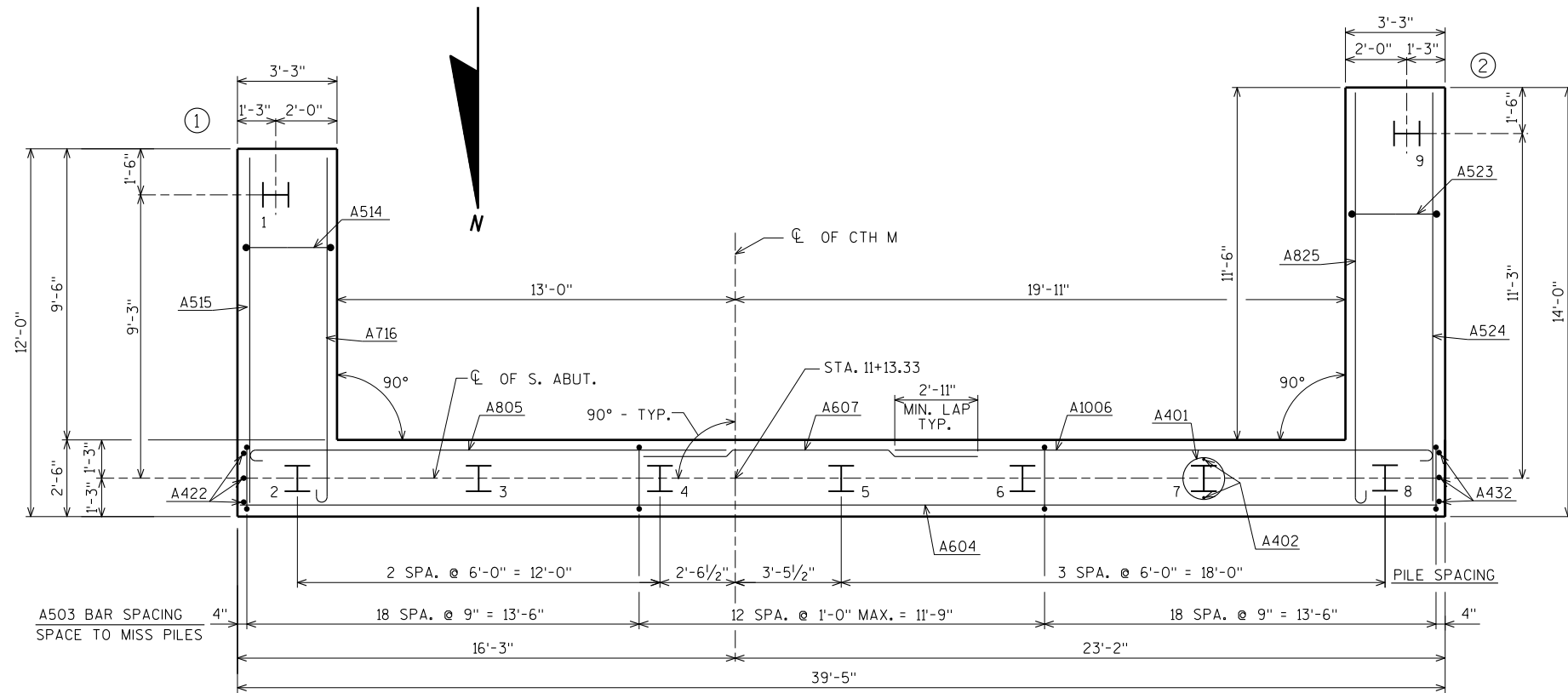
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
SOUTH ABUTMENT			SHEET 5 OF 19

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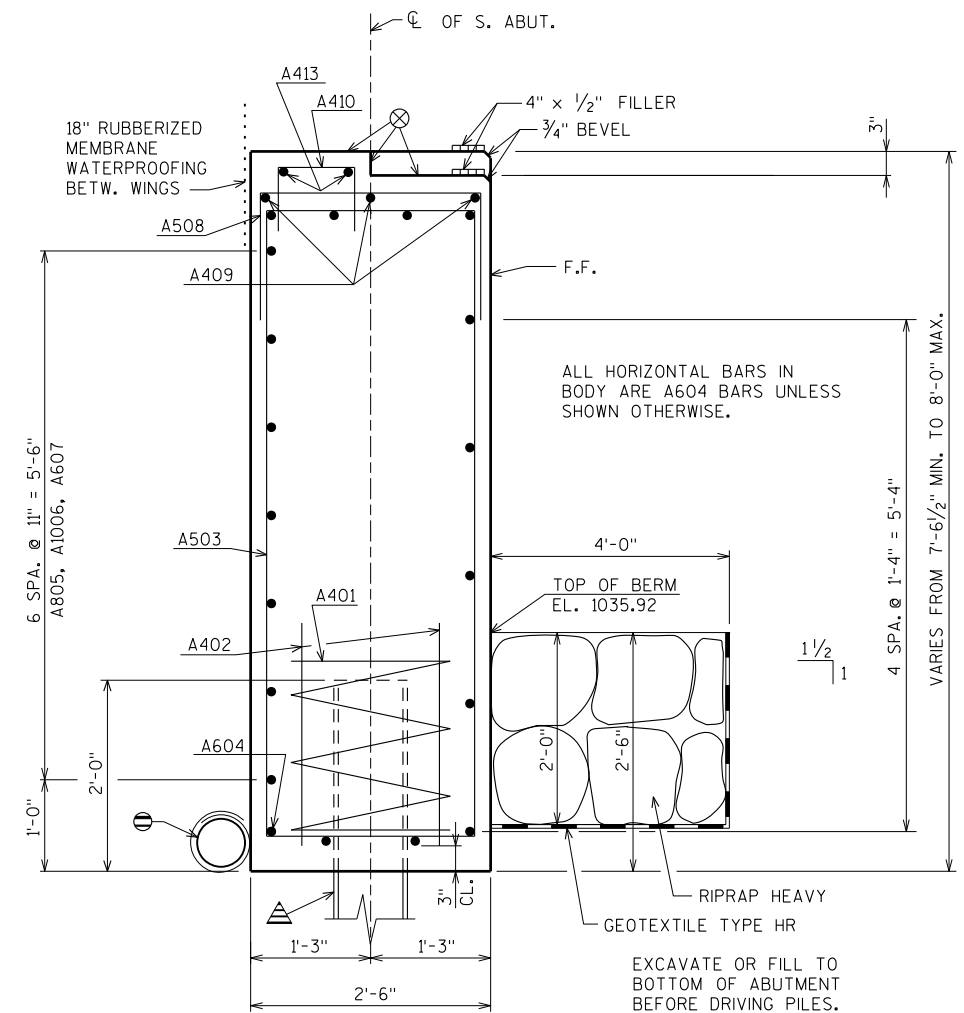
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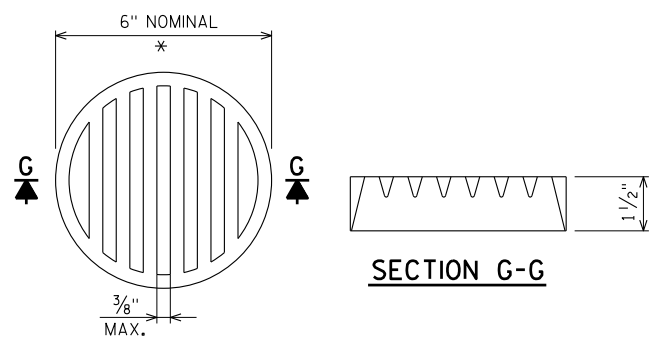


PILE LAYOUT



SECTION A

▲ ABUTMENT TO BE SUPPORTED ON HP 10 x 42 STEEL PILING (WITH PILE POINTS) DRIVEN TO A REQ'D. DRIVING RESISTANCE OF 180 TONS PER PILE. ESTIMATED LENGTH 30'-0".



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 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 SHEET METAL SCREWS.

⊖ PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. SEE DETAIL ON THIS SHEET.

⊗ STEEL TROWEL TOP SURFACE OF ABUTMENT. PLACE MULTIPLE LAYERS OF POLYETHYLENE SHEETS OVER ENTIRE ABUTMENT TOP BEFORE PLACING BEARING PADS AND SUPERSTRUCTURE. TOTAL THICKNESS OF SHEETS SHALL BE AT LEAST 0.03".

FOR PILE SPLICE DETAIL SEE SHEET 3.

FOR LOCATION OF SECTION A SEE SHEET 5.

F.F. DENOTES FRONT FACE.

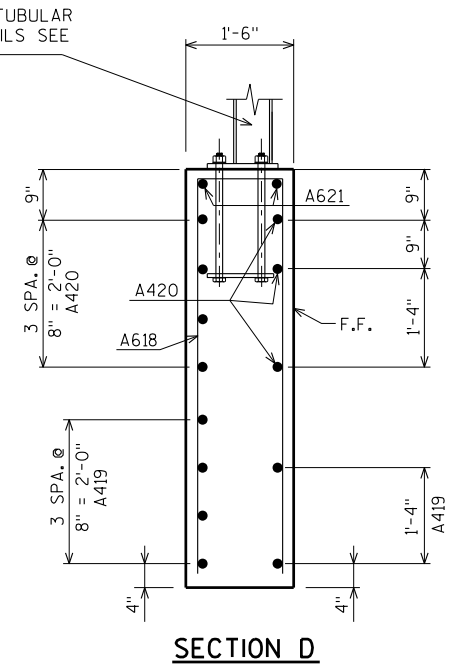
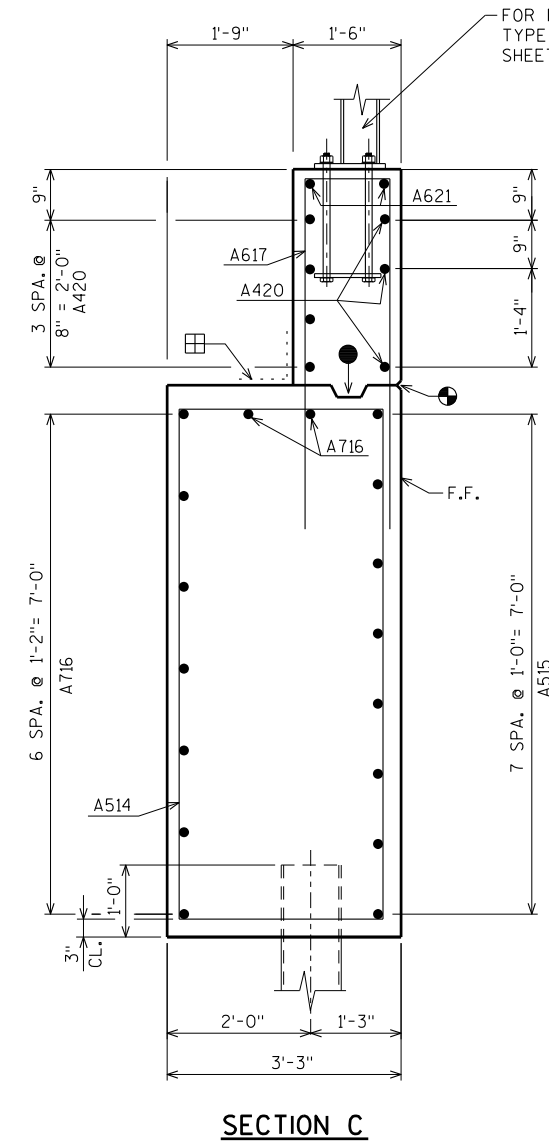
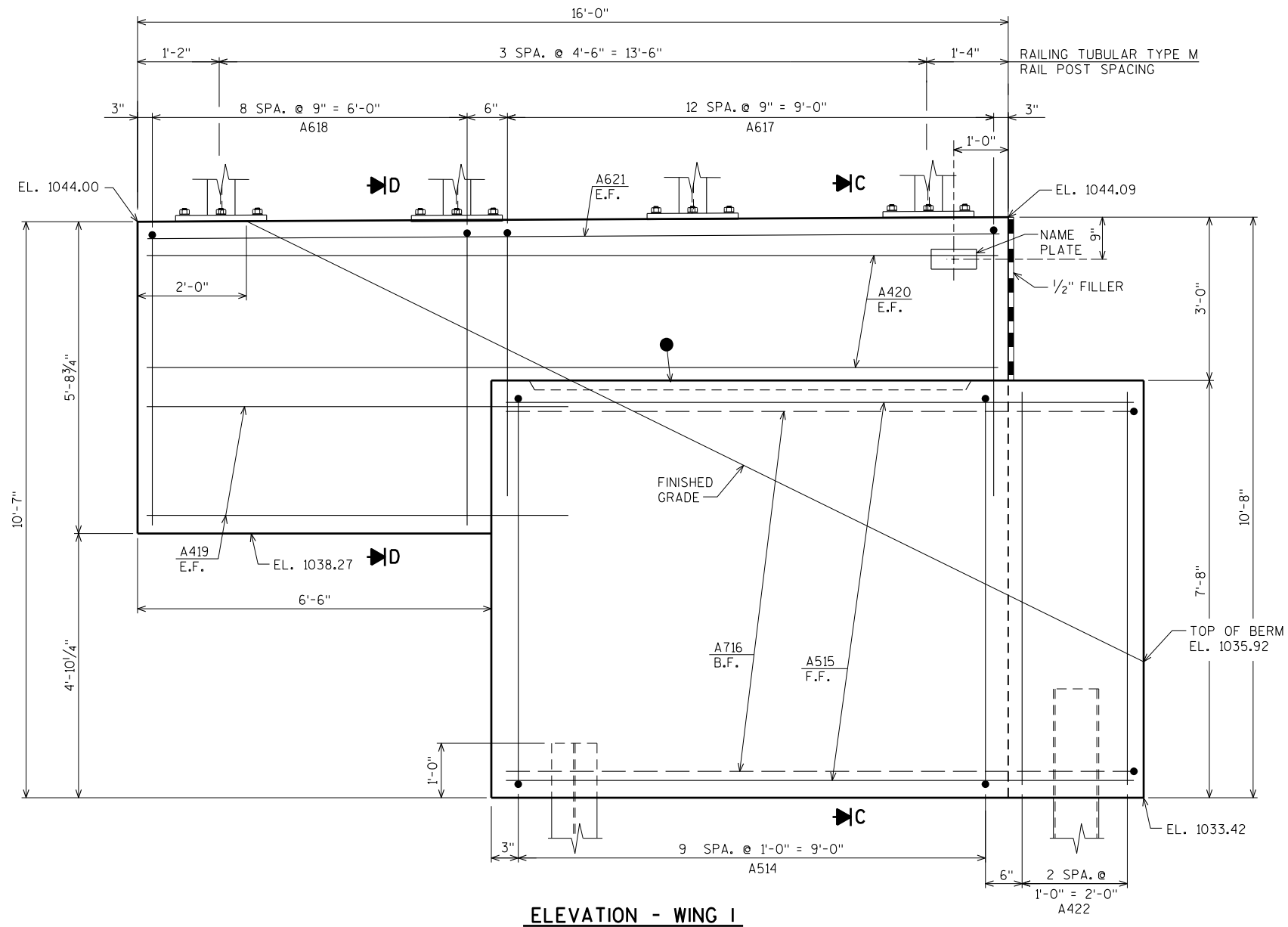
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NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
SOUTH ABUTMENT PILE LAYOUT			SHEET 6 OF 19

ORIGINAL PLANS PREPARED BY
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FOR PILE SPLICE DETAIL SEE SHEET 3.

- ⊕ 3/4" *V" GROOVE ON FRONT FACE OF WINGWALL.
- OPTIONAL CONST. JOINT FORMED BY BEVELED 2" x 6" KEYWAY WITH MEMBRANE ON BACKFACE.
- ⊞ 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.

B.F. DENOTES BACK FACE.
 F.F. DENOTES FRONT FACE.
 E.F. DENOTES EACH FACE.

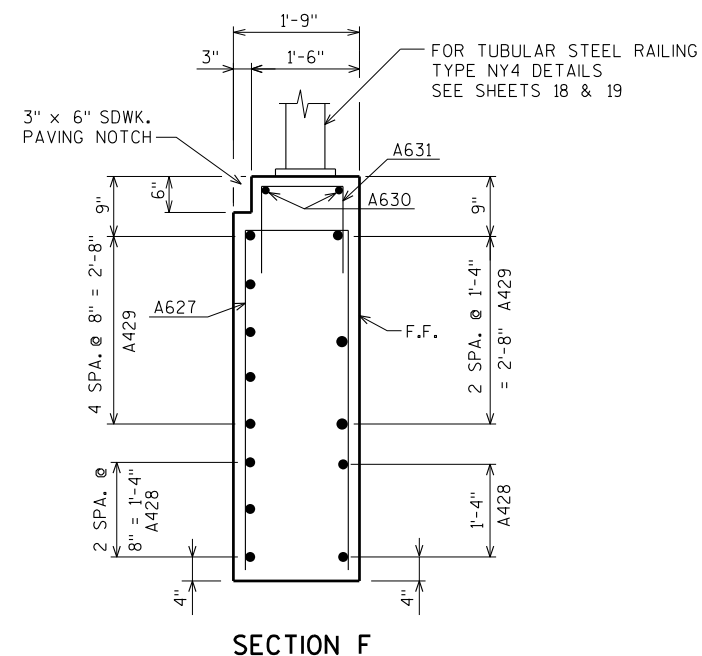
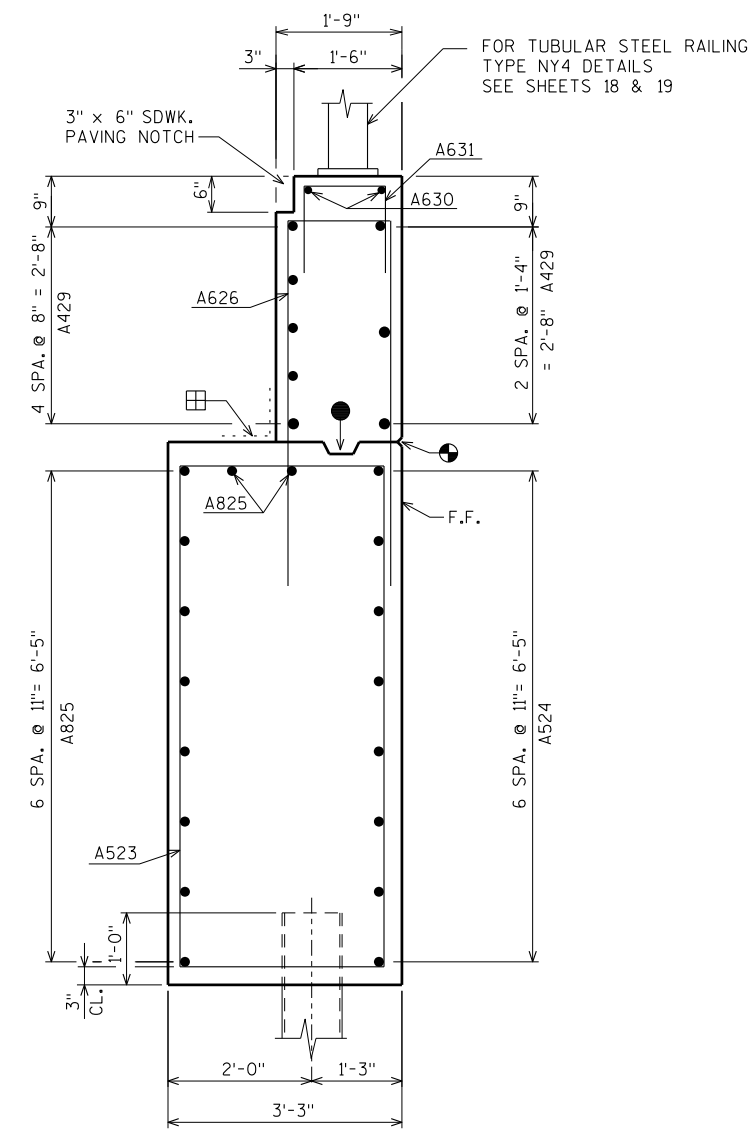
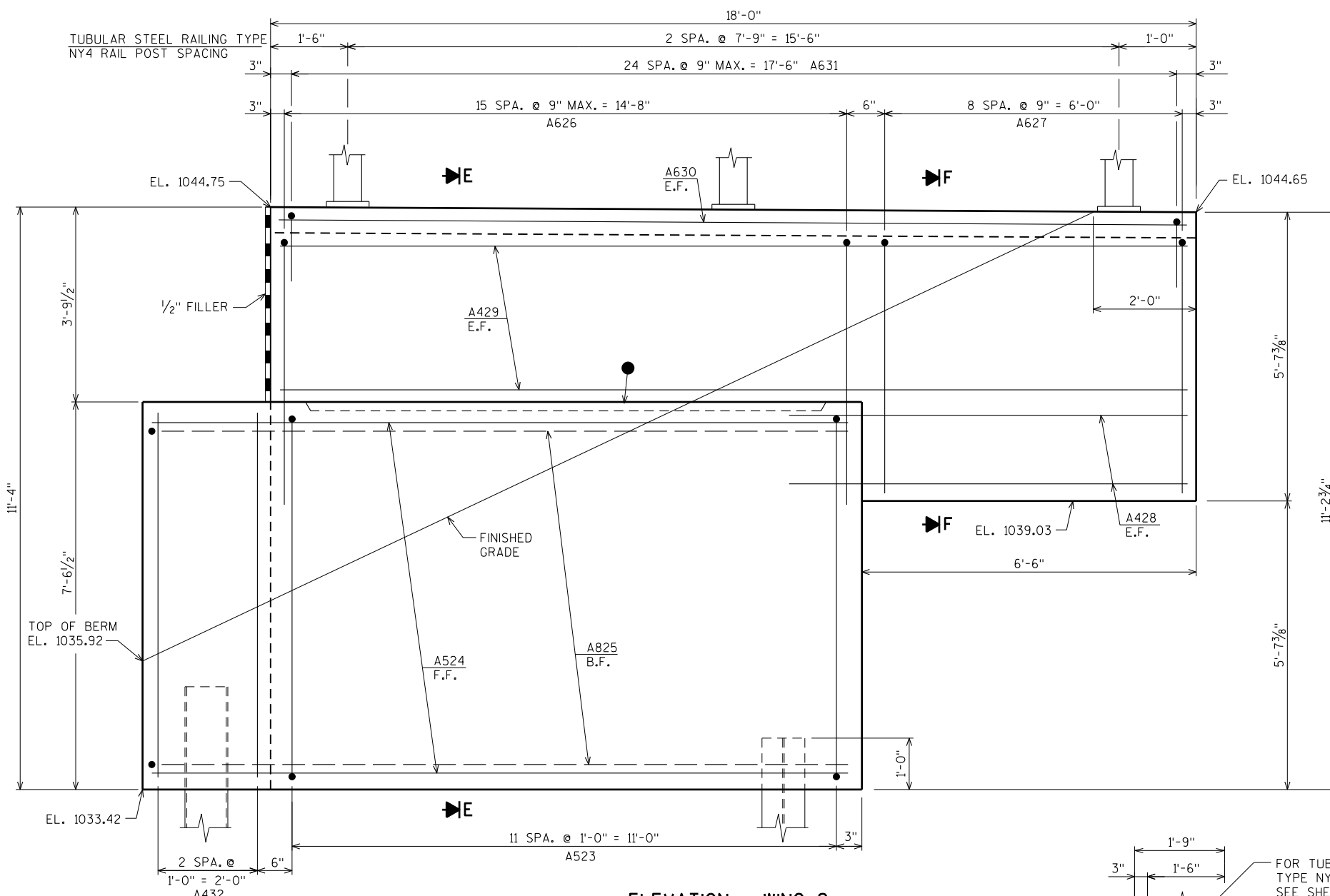
ORIGINAL PLANS PREPARED BY
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NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
SOUTH ABUTMENT WING 1 DETAILS			SHEET 7 OF 19

6/2/2019 PENTABLE:Wisdot_shd.tbl

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- FOR PILE SPLICE DETAIL SEE SHEET 3.
- ⊕ 3/4" "V" GROOVE ON FRONT FACE OF WINGWALL.
- OPTIONAL CONST. JOINT FORMED BY BEVELED 2" x 6" KEYWAY WITH MEMBRANE ON BACKFACE.
- ⊠ 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- B.F. DENOTES BACK FACE.
- F.F. DENOTES FRONT FACE.
- E.F. DENOTES EACH FACE.

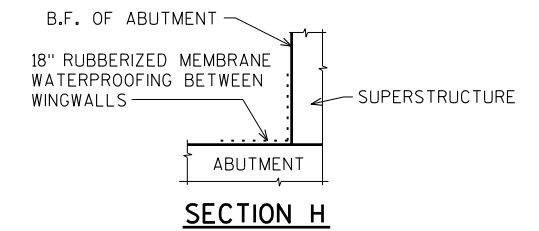
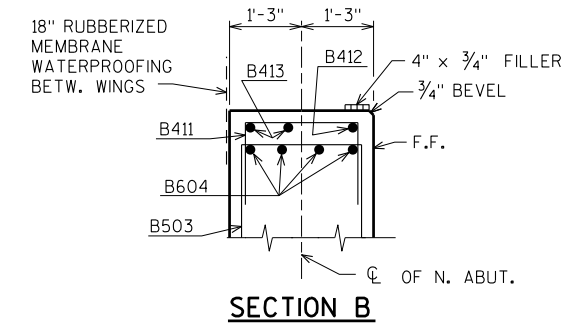
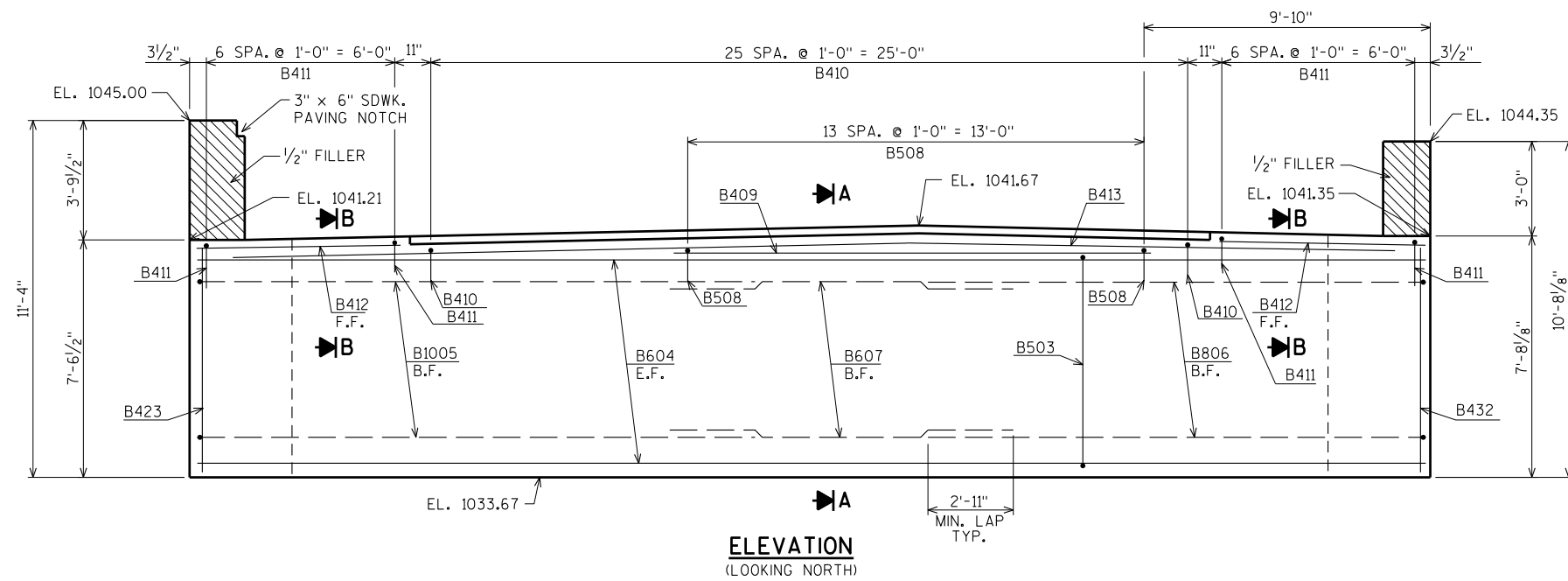
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
SOUTH ABUTMENT WING 2 DETAILS			SHEET 8 OF 19

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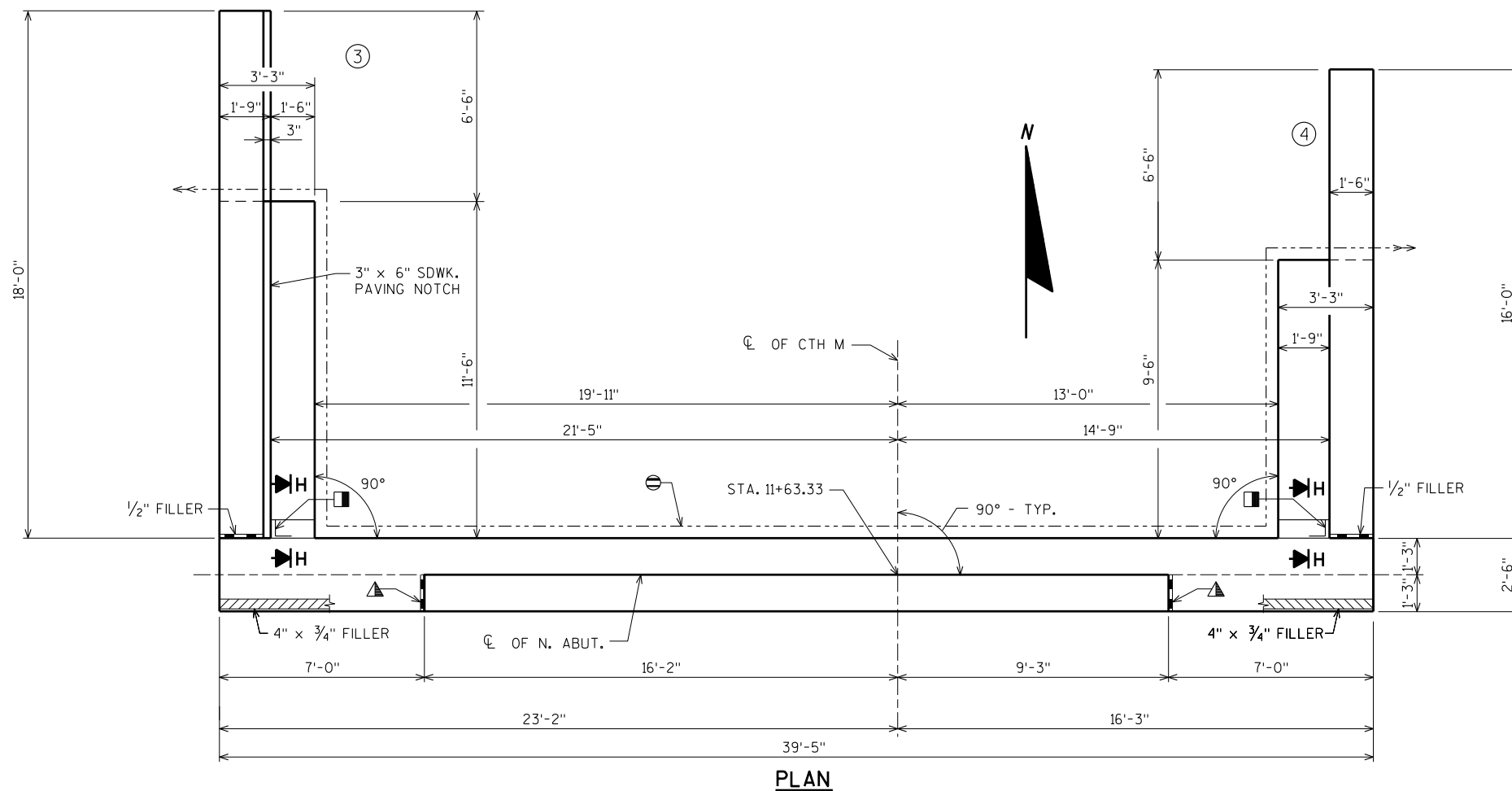
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FOR SECTION A SEE SHEET 10

- VERTICAL 18" RUBBERIZED MEMBRANE WATERPROOFING TO EXTEND FROM BRIDGE SEAT TO TOP OF WING WALL.
- ▲ 3/4" CORK FILLER ON VERTICAL FACE ONLY.
- ⊖ PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN AS DETAILED ON SHEET 6.

B.F. DENOTES BACK FACE.
 F.F. DENOTES FRONT FACE.
 E.F. DENOTES EACH FACE.



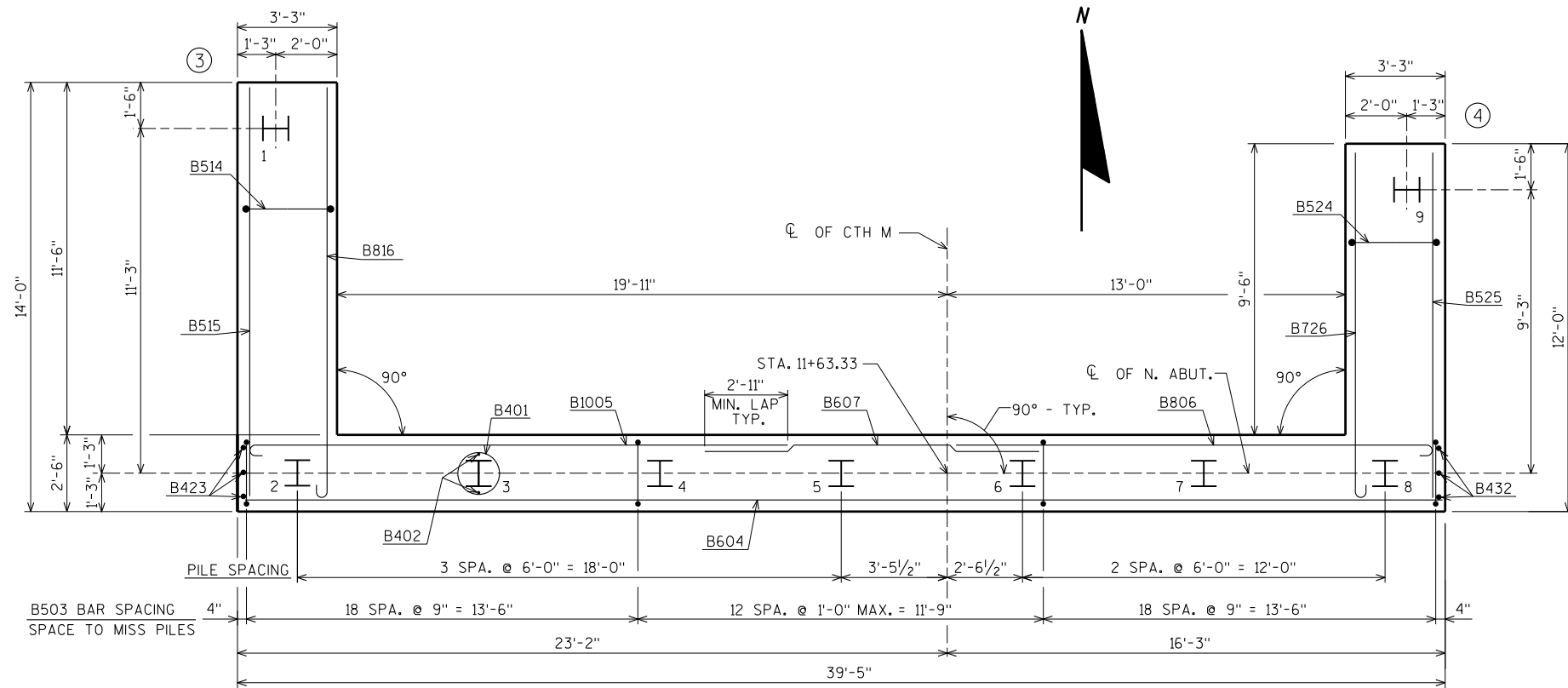
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
NORTH ABUTMENT			SHEET 9 OF 19

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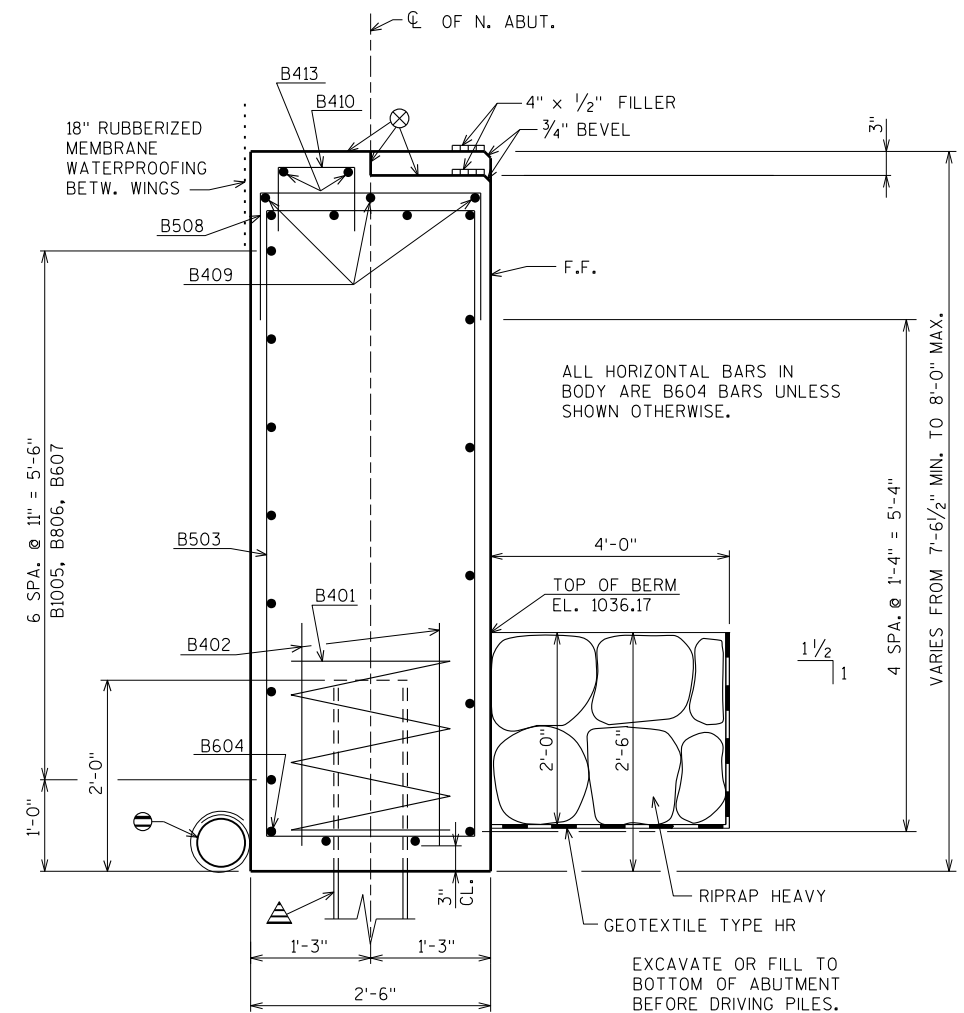
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PILE LAYOUT



SECTION A

▲ ABUTMENT TO BE SUPPORTED ON HP 10 x 42 STEEL PILING (WITH PILE POINTS) DRIVEN TO A REQ'D. DRIVING RESISTANCE OF 180 TONS PER PILE. ESTIMATED LENGTH 30'-0".

⊖ PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. SEE DETAIL ON SHEET 6.

⊗ STEEL TROWEL TOP SURFACE OF ABUTMENT. PLACE MULTIPLE LAYERS OF POLYETHYLENE SHEETS OVER ENTIRE ABUTMENT TOP BEFORE PLACING BEARING PADS AND SUPERSTRUCTURE. TOTAL THICKNESS OF SHEETS SHALL BE AT LEAST 0.03".

FOR PILE SPLICE DETAIL SEE SHEET 3.

FOR LOCATION OF SECTION A SEE SHEET 9.

F.F. DENOTES FRONT FACE.

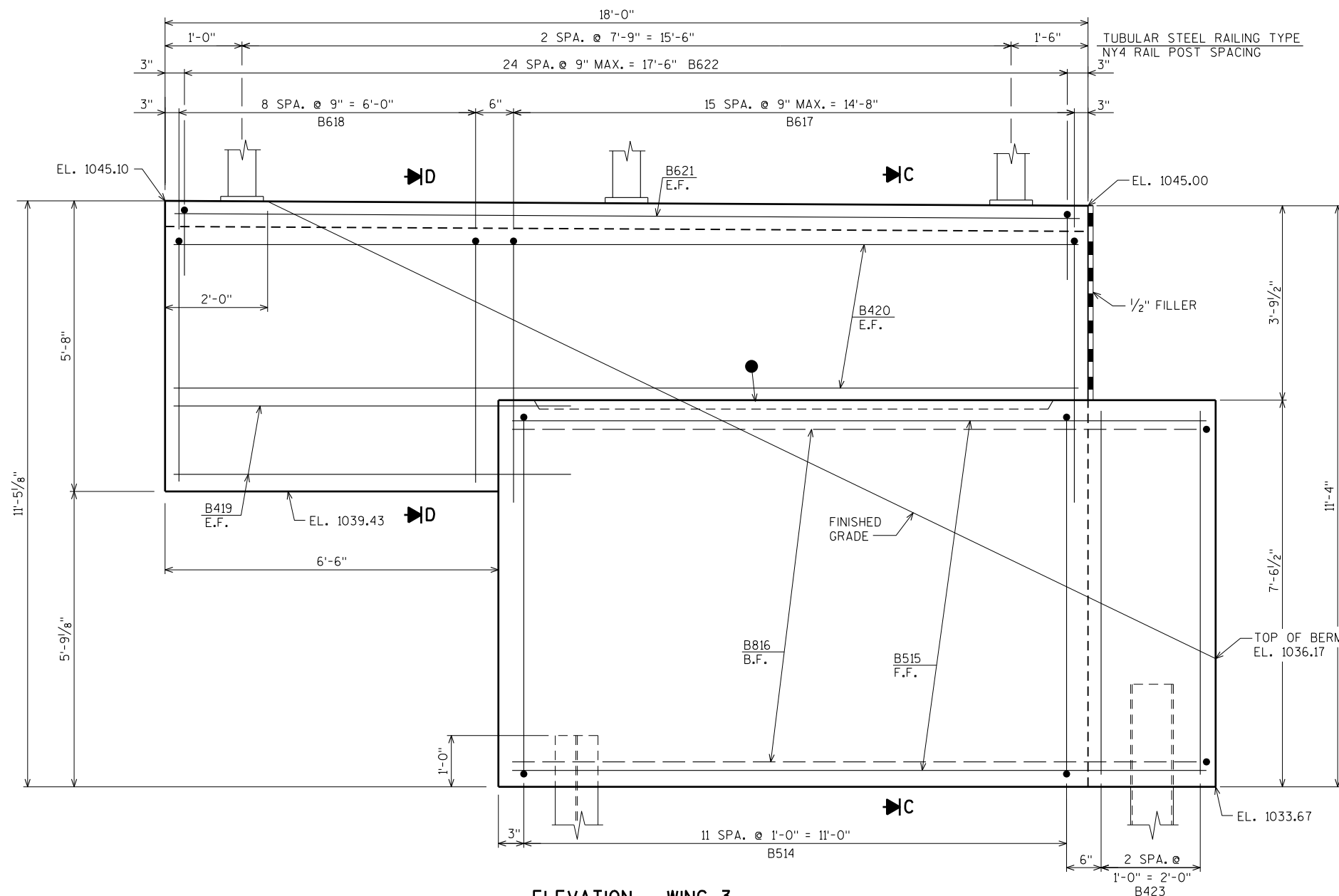
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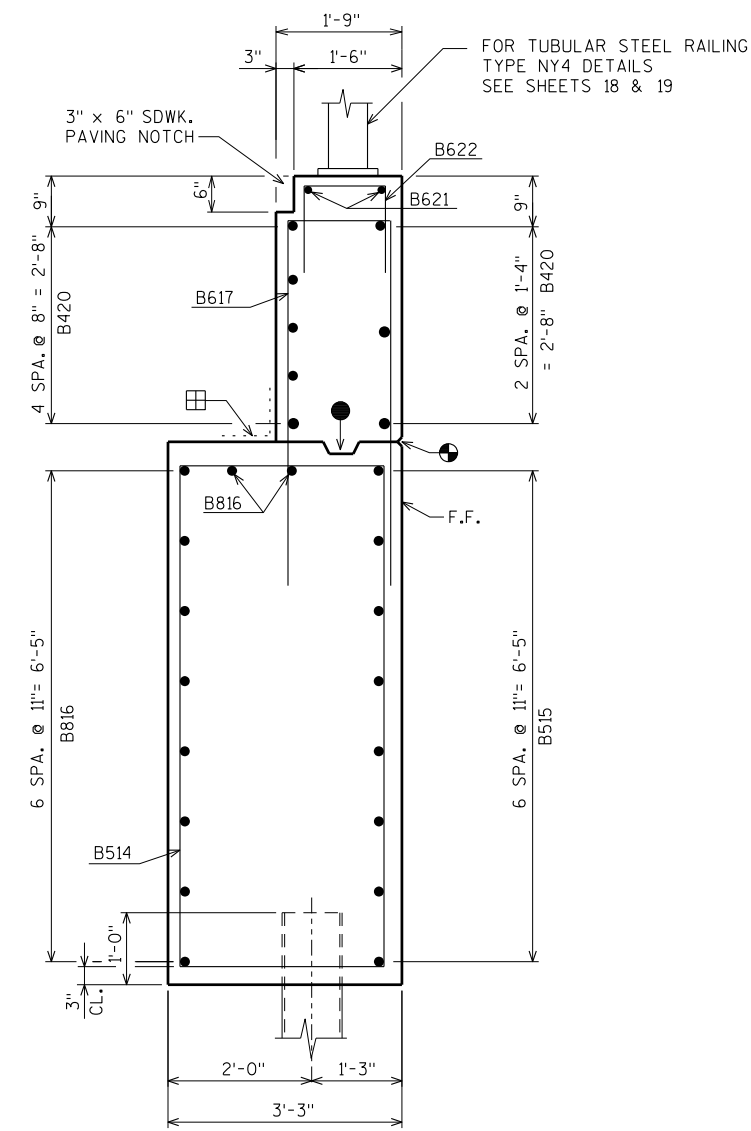
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NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
NORTH ABUTMENT PILE LAYOUT			SHEET 10 OF 19

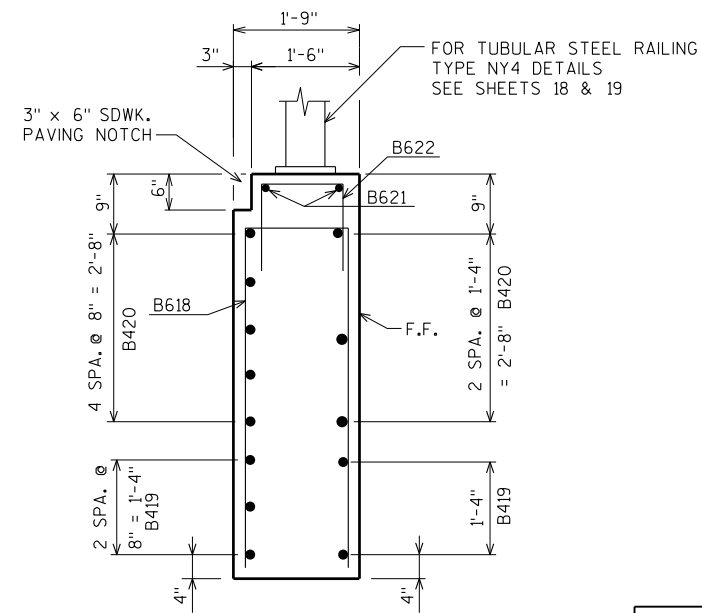
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ELEVATION - WING 3



SECTION C



SECTION D

FOR PILE SPLICE DETAIL SEE SHEET 3.

- ⊕ 3/4" "V" GROOVE ON FRONT FACE OF WINGWALL.
 - OPTIONAL CONST. JOINT FORMED BY BEVELED 2" x 6" KEYWAY WITH MEMBRANE ON BACKFACE.
 - ⊠ 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- B.F. DENOTES BACK FACE.
 F.F. DENOTES FRONT FACE.
 E.F. DENOTES EACH FACE.

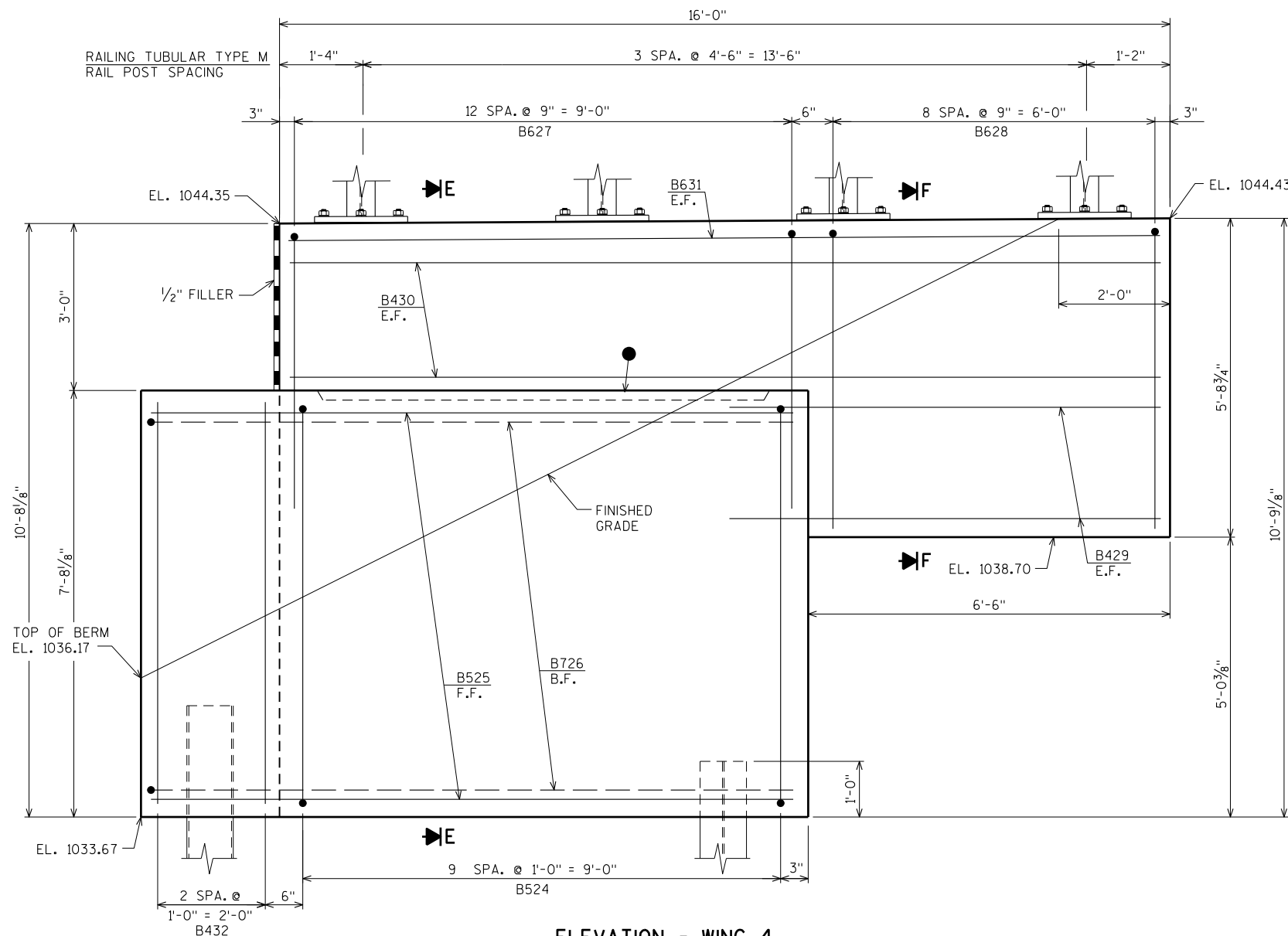
NO.	DATE	REVISION	BY
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STRUCTURE B-73-8			
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NORTH ABUTMENT WING 3 DETAILS			SHEET 11 OF 19

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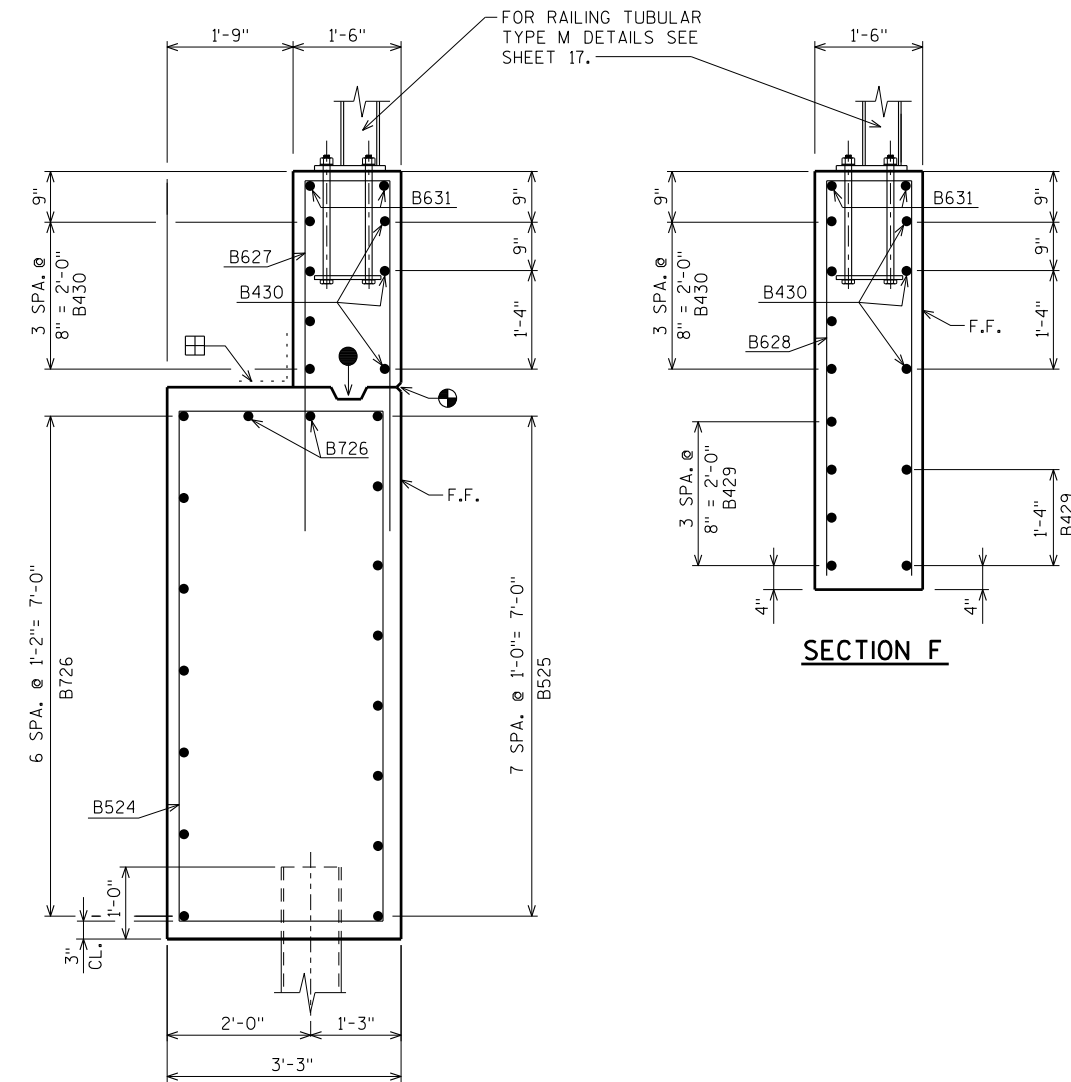
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ELEVATION - WING 4



SECTION E

SECTION F

FOR PILE SPLICE DETAIL SEE SHEET 3.

- ⊕ 3/4" *V* GROOVE ON FRONT FACE OF WINGWALL.
- OPTIONAL CONST. JOINT FORMED BY BEVELED 2" x 6" KEYWAY WITH MEMBRANE ON BACKFACE.
- ⊞ 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.

B.F. DENOTES BACK FACE.

F.F. DENOTES FRONT FACE.

E.F. DENOTES EACH FACE.

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STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
NORTH ABUTMENT WING 4 DETAILS			SHEET 12 OF 19

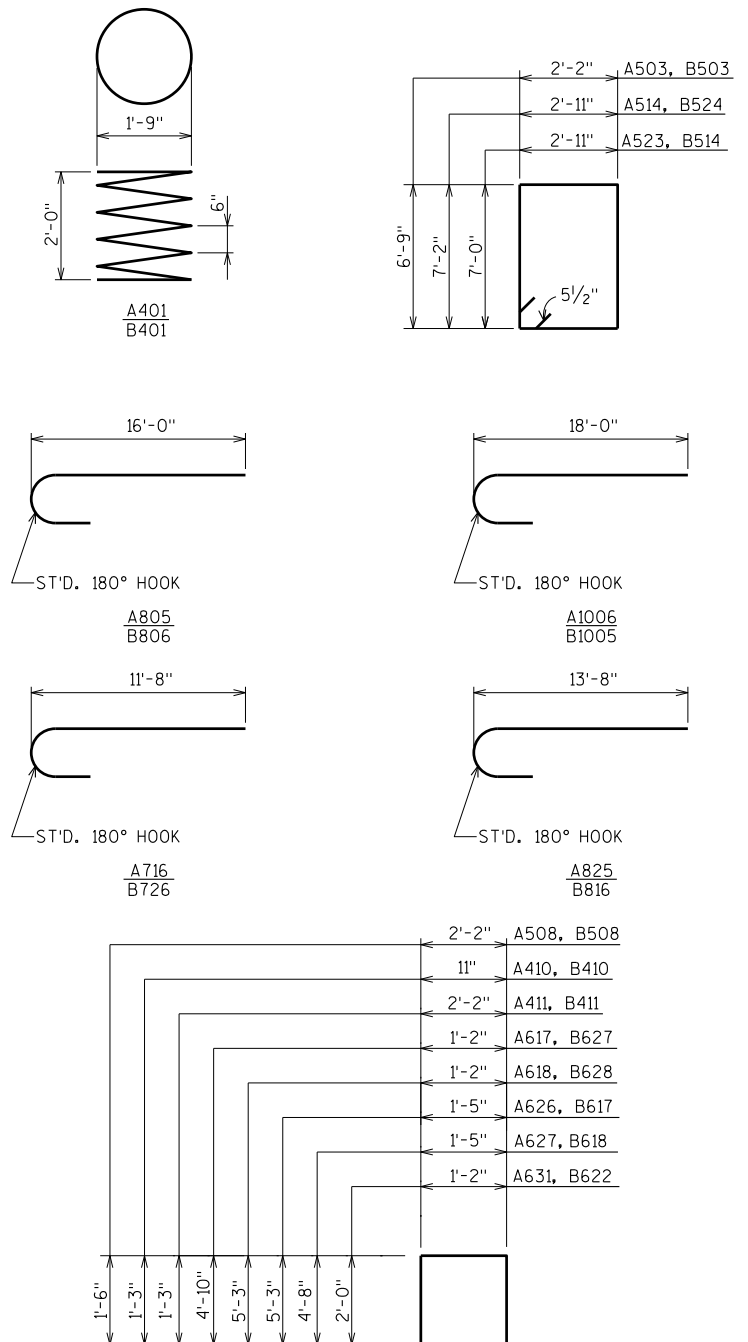
BILL OF BARS - SOUTH ABUTMENT

BAR NO.	COATED BAR	NO. REQ'D.	LENGTH	BENT BAR BUNDLED	BAR SERIES	3,070# UNCOATED 2,620# COATED
						LOCATION
A401		7	28-0	X		BODY @ PILES
A402		14	2-3			BODY @ PILES
A503		49	18-5	X		BODY VERT.
A604		12	39-1			BODY HORIZ.
A805		7	16-11	X		BODY HORIZ. B.F. @ WING 1
A1006		7	19-5	X		BODY HORIZ. B.F. @ WING 2
A607		7	10-11			BODY HORIZ. B.F. BTWN WINGS
A508		14	4-11	X		BODY VERT. TOP
A409		3	13-4			BODY HORIZ. TOP
A410		26	3-3	X		BODY VERT. TOP
A411		14	4-6	X		BODY VERT. TOP @ WINGS
A412		2	6-8			BODY HORIZ. TOP F.F. @ WINGS
A413		2	39-1			BODY HORIZ. TOP
A514	X	10	20-9	X		WING 1 VERT.
A515	X	8	11-8			WING 1 HORIZ. F.F.
A716	X	9	12-6	X		WING 1 HORIZ. B.F. & TOP
A617	X	13	10-6	X		WING 1 VERT.
A618	X	9	11-4	X		WING 1 VERT.
A419	X	6	7-9			WING 1 HORIZ. E.F.
A420	X	7	15-8			WING 1 HORIZ. E.F.
A621	X	2	15-8			WING 1 HORIZ. TOP E.F.
A422	X	3	7-3			BODY VERT. @ END @ WING 1
A523	X	12	20-5	X		WING 2 VERT.
A524	X	8	13-8			WING 2 HORIZ. F.F.
A825	X	10	14-7	X		WING 2 HORIZ. B.F. & TOP
A626	X	16	11-7	X		WING 2 VERT.
A627	X	9	10-5	X		WING 2 VERT.
A428	X	5	7-9			WING 2 HORIZ. E.F.
A429	X	8	17-8			WING 2 HORIZ. E.F.
A630	X	2	17-8			WING 2 HORIZ. TOP E.F.
A631	X	25	4-10	X		WING 2 VERT. TOP
A432	X	3	7-1			BODY VERT. @ END @ WING 2

BILL OF BARS - NORTH ABUTMENT

BAR NO.	COATED BAR	NO. REQ'D.	LENGTH	BENT BAR BUNDLED	BAR SERIES	3,070# UNCOATED 2,620# COATED
						LOCATION
B401		7	28-0	X		BODY @ PILES
B402		14	2-3			BODY @ PILES
B503		49	18-5	X		BODY VERT.
B604		12	39-1			BODY HORIZ.
B1005		7	19-5	X		BODY HORIZ. B.F. @ WING 3
B806		7	16-11	X		BODY HORIZ. B.F. @ WING 4
B607		7	10-11			BODY HORIZ. B.F. BTWN WINGS
B508		14	4-11	X		BODY VERT. TOP
B409		3	13-4			BODY HORIZ. TOP
B410		26	3-3	X		BODY VERT. TOP
B411		14	4-6	X		BODY VERT. TOP @ WINGS
B412		2	6-8			BODY HORIZ. TOP F.F. @ WINGS
B413		2	39-1			BODY HORIZ. TOP
B514	X	12	20-5	X		WING 3 VERT.
B515	X	8	13-8			WING 3 HORIZ. F.F.
B816	X	10	14-7	X		WING 3 HORIZ. B.F. & TOP
B617	X	16	11-7	X		WING 3 VERT.
B618	X	9	10-5	X		WING 3 VERT.
B419	X	5	7-9			WING 3 HORIZ. E.F.
B420	X	8	17-8			WING 3 HORIZ. E.F.
B621	X	2	17-8			WING 3 HORIZ. TOP E.F.
B622	X	25	4-10	X		WING 3 VERT. TOP
B423	X	3	7-1			BODY VERT. @ END @ WING 3
B524	X	10	20-9	X		WING 4 VERT.
B525	X	8	11-8			WING 4 HORIZ. F.F.
B726	X	9	12-6	X		WING 4 HORIZ. B.F. & TOP
B627	X	13	10-6	X		WING 4 VERT.
B628	X	9	11-4	X		WING 4 VERT.
B429	X	6	7-9			WING 4 HORIZ. E.F.
B430	X	7	15-8			WING 4 HORIZ. E.F.
B631	X	2	15-8			WING 4 HORIZ. TOP E.F.
B432	X	3	7-3			BODY VERT. @ END @ WING 4

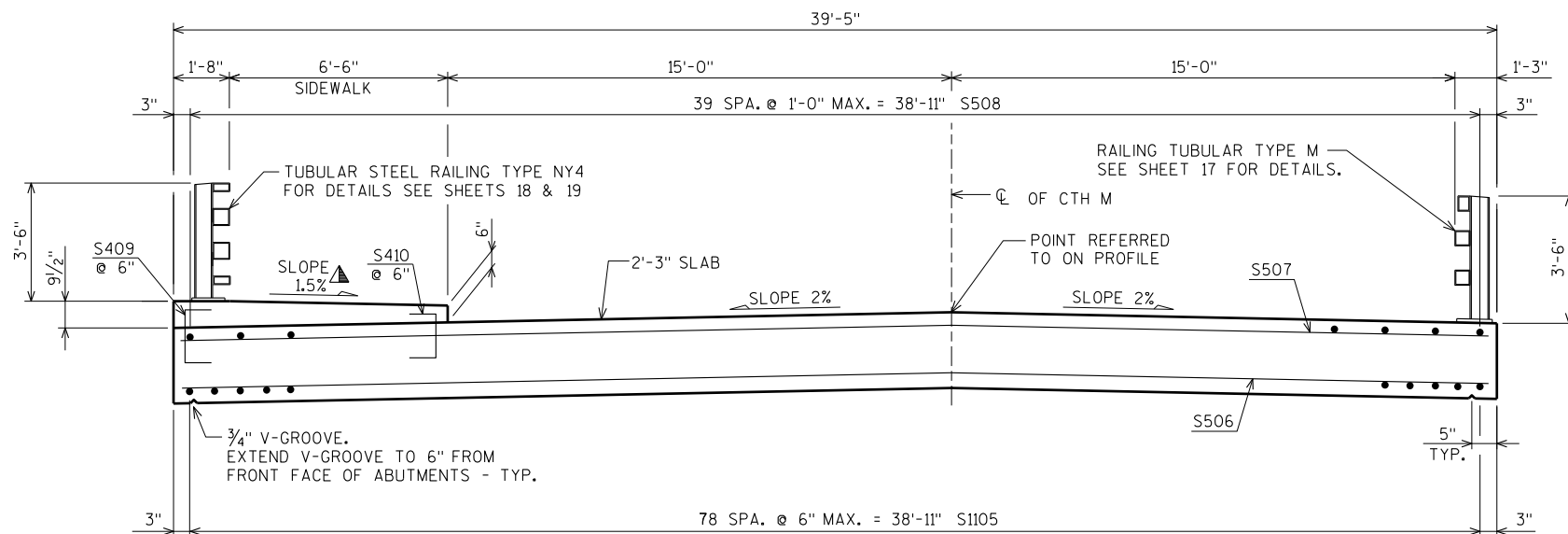
BENDING DIMENSIONS ARE OUT TO OUT OF BARS.



F.F. DENOTES FRONT FACE
E.F. DENOTES EACH FACE
B.F. DENOTES BACK FACE

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
ABUTMENT BILL OF BARS			SHEET 13 OF 19

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TYPICAL SECTION THRU BRIDGE
(LOOKING NORTH)

BILL OF BARS

BAR NO.	COATED BAR	NO. REQ'D.	LENGTH	BENT BAR	BUNDLED	BAR SERIES	31,050# COATED	LOCATION
S401	X	52	3-3	X				SLAB @ ABUT. NOTCH
S402	X	4	25-1					SLAB @ ABUT. NOTCH
S503	X	80	7-5	X				SLAB @ ABUT.
S504	X	80	4-0	X				SLAB @ ABUT.
S1105	X	79	45-8					SLAB LONG. BOT.
S506	X	84	39-1					SLAB TRANS. BOT.
S507	X	53	39-1					SLAB TRANS. TOP
S508	X	40	50-10					SLAB LONG. TOP
S409	X	105	4-0	X				SLAB @ SDWK. @ EDGE OF SLAB
S410	X	105	3-8	X				SLAB @ SDWK. @ CURB
S411	X	22	26-3					SDWK. LONG. TOP
S512	X	103	8-4	X				SDWK. TRANS. TOP
S613	X	16	12-0	X				SDWK. @ RAIL POSTS
S614	X	24	6-0					SDWK. @ INT. RAIL POSTS
S615	X	8	6-0	X				SDWK. @ END RAIL POSTS
S616	X	18	12-0	X				SLAB @ RAIL POSTS
S617	X	28	6-0					SLAB @ INT. RAIL POSTS
S618	X	8	6-0	X				SLAB @ END RAIL POSTS

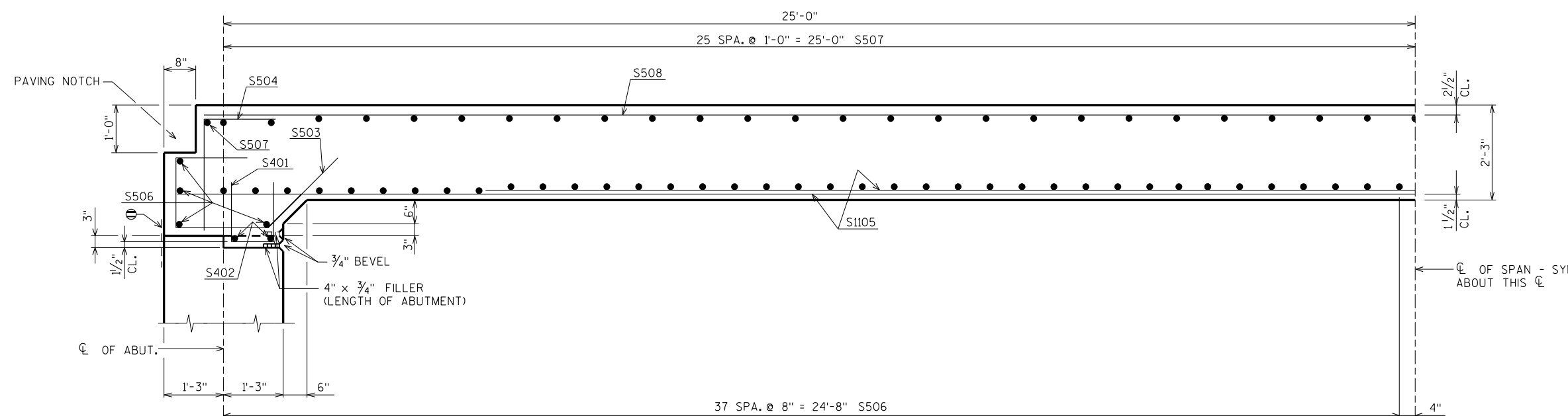
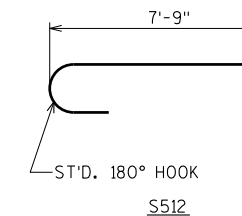
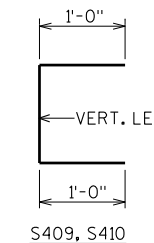
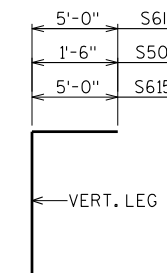
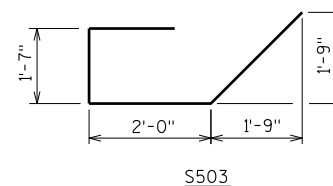
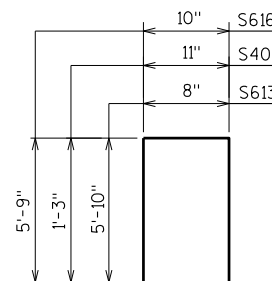
BENDING DIMENSIONS ARE OUT TO OUT OF BARS.

▲ ±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

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 (+).

⊖ 18" RUBBERIZED MEMBRANE WATERPROOFING BETWEEN WINGS.

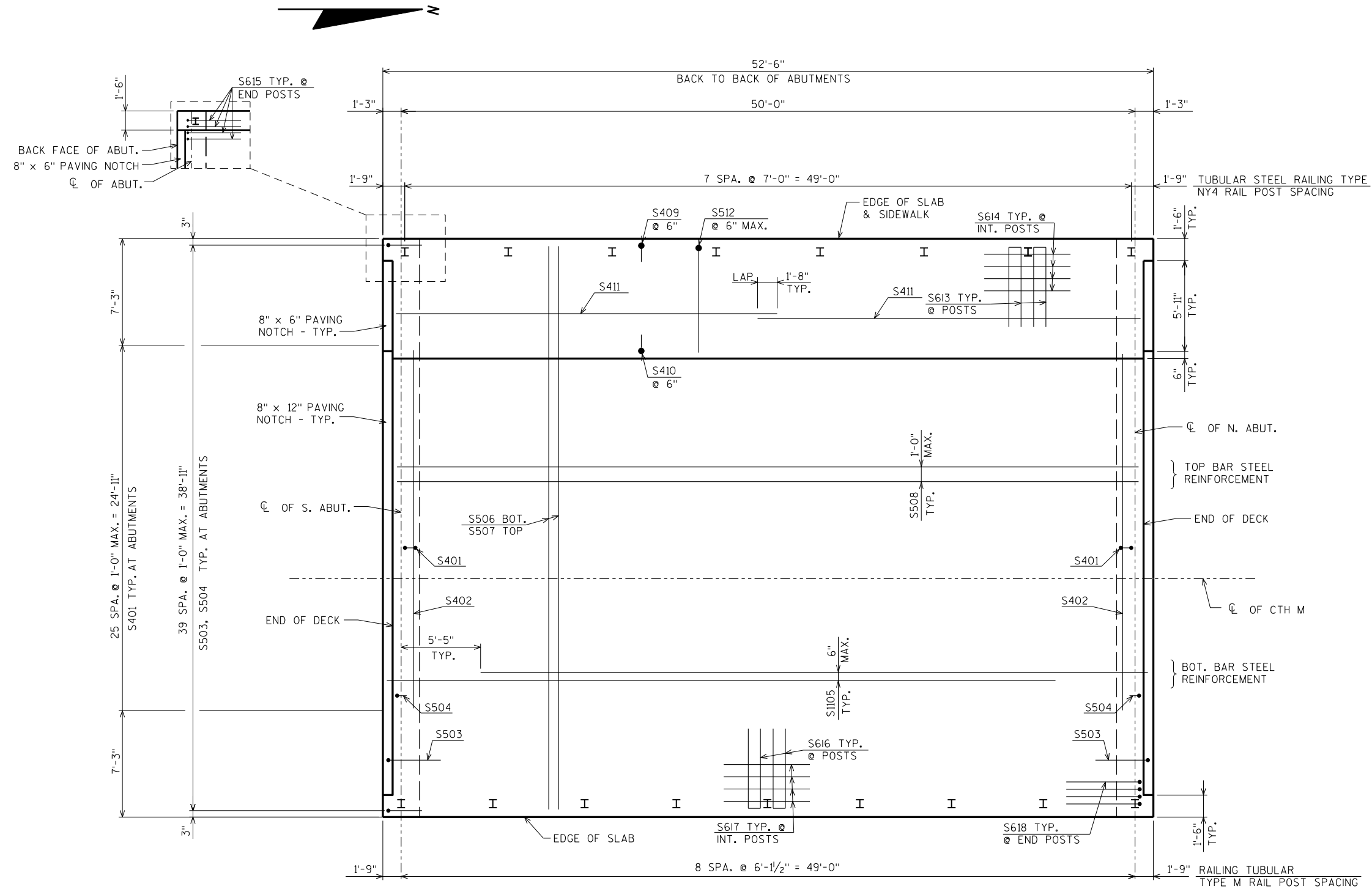


PART LONGITUDINAL SECTION

NO.	DATE	REVISION	BY
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STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
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PLAN

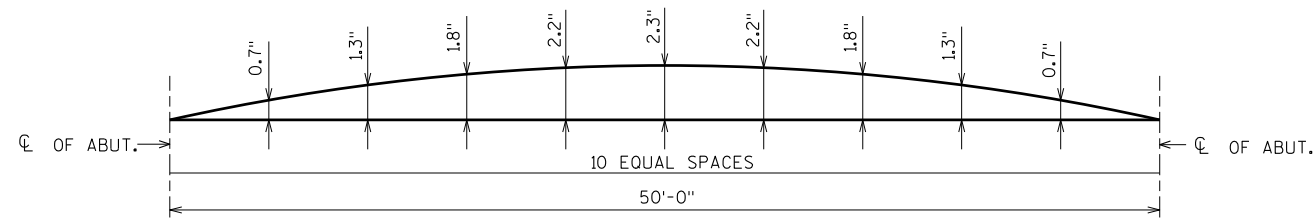
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NO.	DATE	REVISION	BY
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STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
SUPERSTRUCTURE PLAN			SHEET 15 OF 19

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CAMBER DIAGRAM

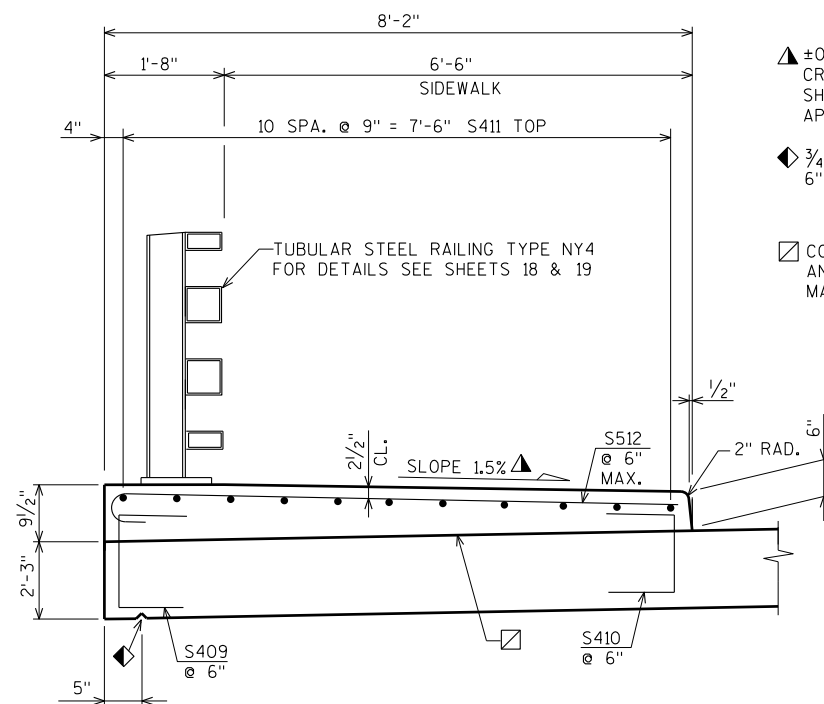
CAMBER SPANS AS SHOWN TO PROVIDE FOR DEAD LOAD DEFLECTION & FUTURE CREEP. CAMBER DOES NOT INCLUDE ALLOWANCE FOR FORM SETTLEMENT.

PRIOR TO RELEASING SLAB FALSEWORK, TAKE TOP OF SLAB ELEVATIONS AT THE ϕ OF ABUTMENTS, AND AT 5/10 PTS. TO VERIFY CAMBER. TAKE ELEVATIONS ALONG EDGE OF SLAB AND CROWN OR ϕ .

TOP OF DECK ELEVATIONS

LOCATION	ϕ OF S. ABUT.	0.1 PT	0.2 PT	0.3 PT	0.4 PT	0.5 PT	0.6 PT	0.7 PT	0.8 PT	0.9 PT	ϕ OF N. ABUT.
W. EDGE OF SLAB	1043.95	1043.98	1044.00	1044.03	1044.06	1044.08	1044.11	1044.13	1044.16	1044.18	1044.21
E. EDGE OF SIDEWALK	1044.12	1044.14	1044.17	1044.19	1044.22	1044.24	1044.27	1044.30	1044.32	1044.35	1044.37
ϕ OF CTH M	1044.42	1044.44	1044.47	1044.49	1044.52	1044.54	1044.57	1044.60	1044.62	1044.65	1044.67
E. EDGE OF SLAB	1044.09	1044.12	1044.14	1044.17	1044.19	1044.22	1044.24	1044.27	1044.30	1044.32	1044.35

ELEVATIONS SHOWN ARE FINISHED DECK AND DO NOT INCLUDE ALLOWANCES OF DEAD LOAD DEFLECTION AND FUTURE CREEP.



TYPICAL SECTION THRU SIDEWALK

▲ ±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

◆ 3/4" V-GROOVE. EXTEND V-GROOVE TO 6" FROM FRONT FACE OF ABUTMENTS - TYP.

☒ CONST. JOINT - STRIKE OFF AS SHOWN AND LEAVE ROUGH. FOR DECK POUR, MATCH BRIDGE X-SLOPE.

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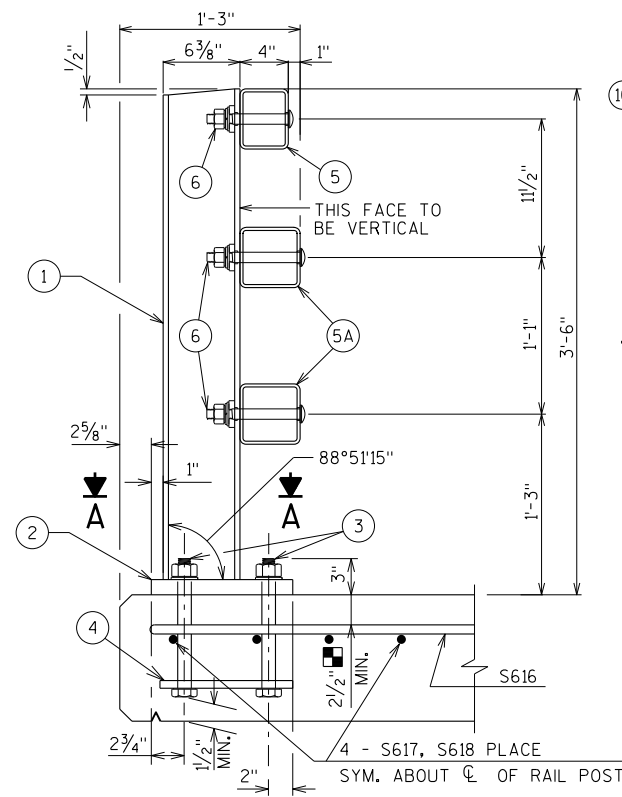
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STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
SUPERSTRUCTURE DETAILS			SHEET 16 OF 19

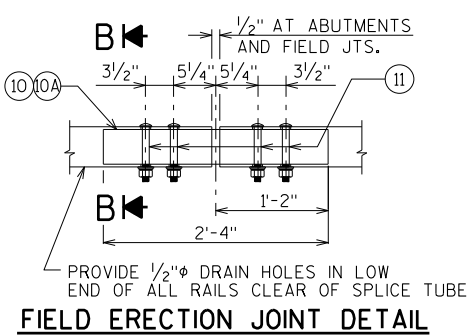
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LEGEND

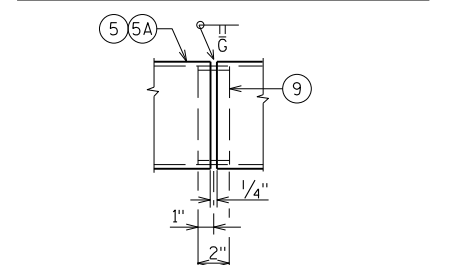
- W6 x 25 WITH 1/8" x 1/2" HORIZ. SLOTS ON EACH SIDE OF POST FOR BOLT NO. 6. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY. PLACE POST VERTICAL. PLACE POSTS NORMAL TO GRADE LINE.
- PLATE 1/4" x 11 3/4" x 1'-8" WITH 1 5/8" x 1 5/8" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1 AS SHOWN. SLOTS PARALLEL TO SHORT SIDE OF PLATE.
- 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 1/2" 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 CONSTRUCTIBILITY.)
- 5/8" x 11" x 1'-8" ANCHOR PLATE (GALVANIZED) WITH 1 3/8" DIA. HOLES FOR ANCHOR BOLTS NO. 3
- TS 5 x 4 x 0.25 STRUCTURAL TUBING. ATTACH TO NO. 1 WITH NO. 6.
- TS 5 x 5 x 0.25 STRUCTURAL TUBING. ATTACH TO NO. 1 WITH NO. 6.
- 7/8" DIA. A325 SLOTTED ROUND HEAD BOLT WITH NUT, 3/8" x 1 5/8" x 1 5/8" WASHER, AND LOCK WASHER (2 REQ'D. AT EACH RAIL TO POST LOCATION.)
- 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.
- 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.
- SPLICE SLEEVE FABRICATED FROM 1/4" PLATE. PROVIDE "SLIDING FIT".
- 3/8" x 3 5/8" x 2'-4" PLATE. 2 PER RAIL. USED IN NO. 5 & 5A.
- 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.
- 7/8" φ A325 ROUND HEAD BOLT WITH NUT, WASHER, AND LOCK WASHER, USE 1 5/8" x 1/4" LONGIT. SLOTTED HOLES AT FIELD JOINTS AND 1 5/8" x 2 1/4" MIN. LONGIT. SLOTTED HOLES AT EXP. JOINTS IN PLATE NO. 10A.
- 3/8" DIA. x 1/2" LONG THREADED SHOP WELDED STUDS (2 REQ'D.)
- 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.
- 7/8" DIA. x 2" LONG A325 HEX BOLT WITH NUT AND WASHER (5 REQ'D.).
- 1" φ 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.



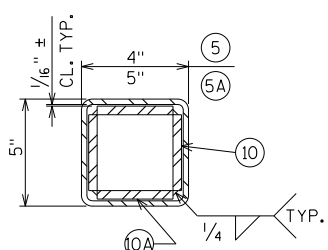
SECTION THRU RAILING ON DECK



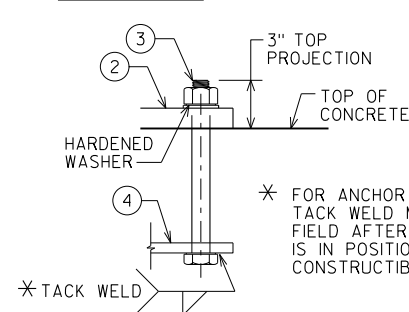
FIELD ERECTION JOINT DETAIL



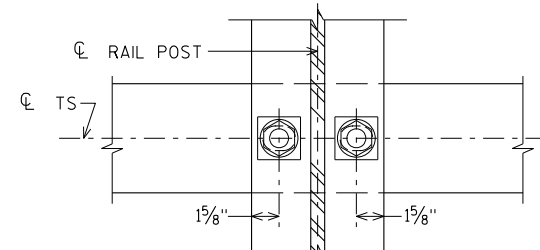
SHOP RAIL SPLICE DETAIL
(LOCATION MUST BE SHOWN ON THE SHOP DRAWINGS)



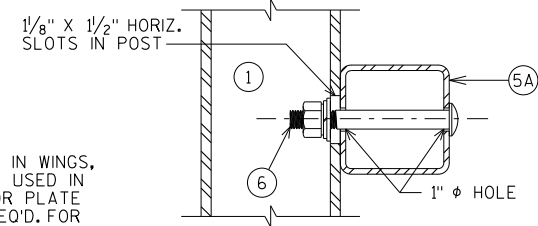
SECTION B



ANCHOR BOLTS



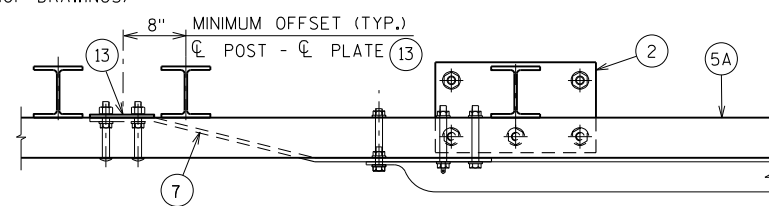
SECTION THRU POST WEB



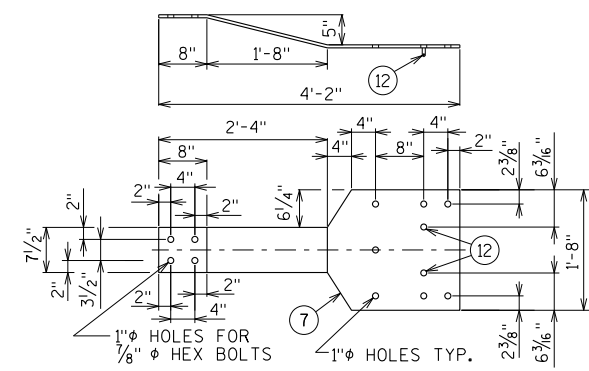
SECTION THRU RAIL

NOTE: CONNECTIONS AT LOWER RAILS SHOWN. CONNECTIONS AT TOP RAIL SIMILAR.

TYPICAL RAIL TO POST CONNECTIONS



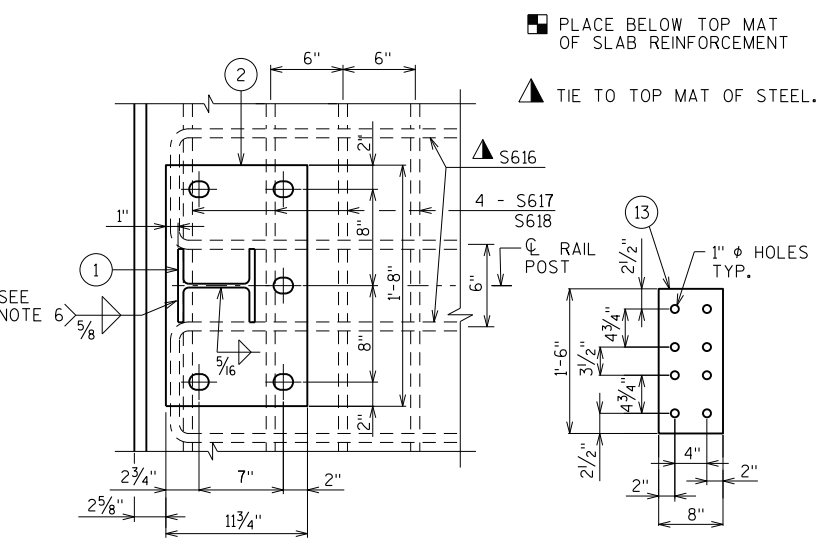
TOP VIEW AT END POST
(THREE BEAM RAIL ATTACHMENT)



BACK-UP PLATE DETAIL
(AT BEAM GUARD ATTACHMENT)

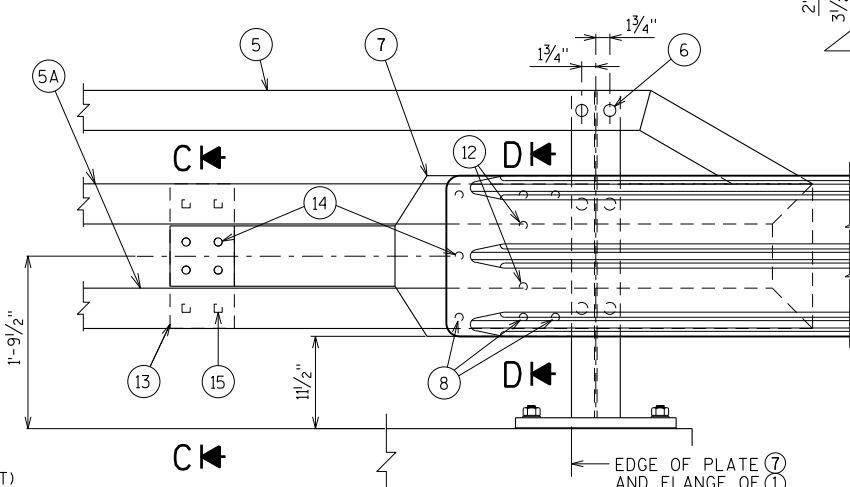
GENERAL NOTES

- BID ITEM SHALL BE "RAILING TUBULAR TYPE M" WHICH INCLUDES ALL ITEMS SHOWN.
- 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.
- THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.
- 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.
- ENDS OF TUBE SECTIONS SHALL BE SAWED, GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.
- WELD IS THE SAME ON BOTH FLANGES. FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING.
- 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.
- 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.
- 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 S.S.P.C. SPECIFICATIONS.
- WHEN PAINTING IS REQUIRED, ALL MATERIAL EXCEPT ANCHORAGE DETAIL (NO. 3 & 4) SHALL BE PAINTED OVER GALVANIZING WITH APPROVED TIE COAT AND TOP COAT.

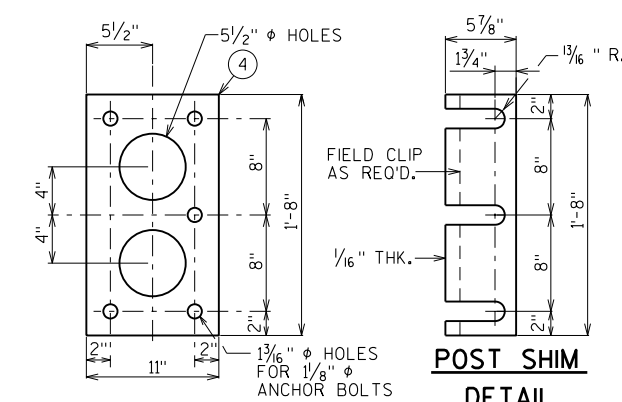


SECTION A

ANCHOR PLATE
(AT BEAM GUARD ATTACHMENT)

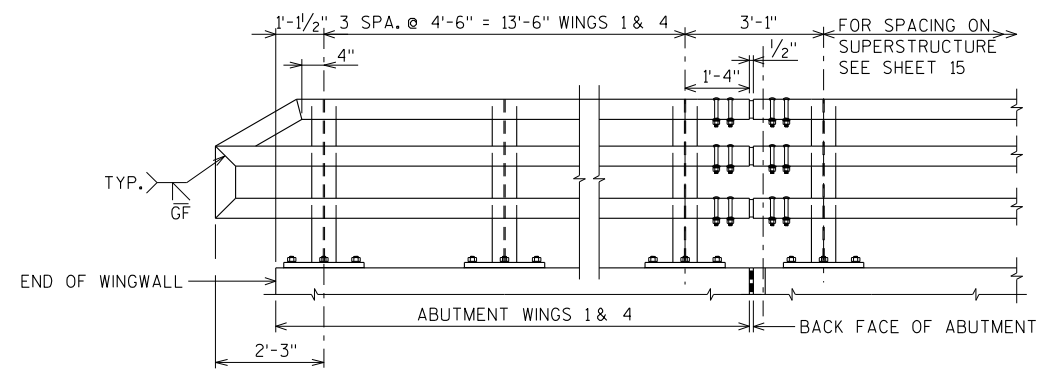


DETAIL AT END POST
(THREE BEAM RAIL ATTACHMENT)

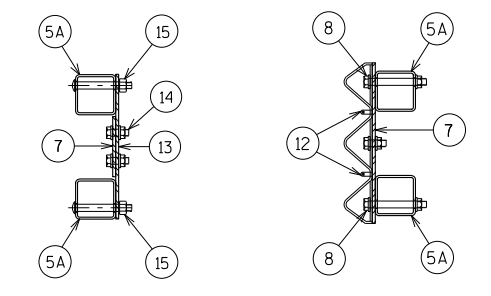


ANCHOR PLATE
(AT RAIL TO DECK CONNECTION)

POST SHIM
DETAIL



PART ELEVATION OF RAILING



SECTION C

SECTION D

\$PRNAME\$ U:\45-0470\00 - Menominee Co. CTH M over W. Br. Wolf River Structures\450470 M-rail.dgn

8

8

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY CLS		PLANS CK'D. CBM	
RAILING TUBULAR TYPE M			SHEET 17 OF 19

ORIGINAL PLANS PREPARED BY
AVRES ASSOCIATES
 3433 Oakwood Hills Parkway
 Eau Claire, WI 54701
 www.AvresAssociates.com

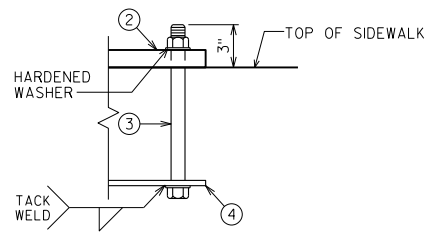
\$PRNAME\$ U:\45-0470.00 - Menominee Co. CTH M over W. Br. Wolf River Structures\450470 NY4 RAIL.DGN

LEGEND

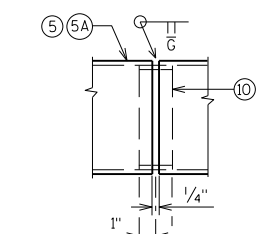
- ① W6 X 25 WITH 1/4" X 1 3/4" HORIZONTAL SLOTTED HOLES ON EACH SIDE OF POST FOR BOLT NO. 6 AT TOP TWO RAILS. USE 1" DIA. HOLES FOR BOLT NO. 6 AT BOTTOM NO. 5A & FOR BOLT NO. 6A AT NO. 7. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF SIDEWALK. PLACE POST VERTICAL. PLACE POSTS NORMAL TO GRADE LINE.
 - ② PLATE 1/4" X 10" X 1'-2" WITH 1/8" X 1 1/6" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1 AS SHOWN. SLOTS PARALLEL TO SHORT SIDE OF PLATE.
 - ③ ASTM A449 - 1" DIA. ANCHOR BOLTS WITH HEAVY HEX NUT AND 2" O.D. HARDENED WASHER (ALL GALVANIZED). 4 REQUIRED PER POST. THREAD 3" AND PLACE NORMAL TO PLATE NO. 2. CHAMFER TOP OF BOLTS BEFORE THREADING. USE 1 1/2" LONG BOLT FOR CONCRETE DECKS. ON CONCRETE SLAB SUPERSTRUCTURES, USE 1 3/4" LONG BOLT FOR SLAB THICKNESS > 16" AND 1 1/2" LONG FOR THICKNESS < 16". USE 1 3/4" LONG BOLT FOR CONCRETE SIDEWALK. USE 1'-9" LONG IN ABUTMENT WINGS. (AN EQUIVALENT THREADED ROD WITH HEAVY HEX NUTS AND HARDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINGS IF REQUIRED FOR CONSTRUCTIBILITY.)
 - ④ 3/8" X 10" X 1'-2" ANCHOR PLATE (GALVANIZED) WITH 1/6" DIA. HOLES FOR ANCHOR BOLTS NO. 3.
 - ⑤ TS 6 X 6 X 3/16" STRUCTURAL TUBING. USE 1" DIA. HOLES FOR BOLT NO. 6 (FRONT & BACK) & 7/8" DIA. HOLES FOR BOLT NO. 6A (TOP & BOTTOM).
 - ⑤A TS 5 X 3 X 1/4" STRUCTURAL TUBING. USE 1" DIA. HOLES FOR BOLT NO. 6 IN TOP RAIL (FRONT & BACK). USE 1/8" X 1 1/6" HORIZONTAL SLOTTED HOLES FOR BOLT NO. 6 IN BOTTOM RAIL (FRONT & BACK) AND A 2" O.D. WASHER UNDER BOLT HEAD.
 - ⑥ 7/8" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, 3/8" X 1 3/4" X 1 3/4" WASHER, AND SPRING LOCK WASHER (2 REQUIRED AT RAIL TO POST LOCATIONS SHOWN).
 - ⑥A 3/4" DIA. A325 BOLT WITH HEX NUT AND SPRING LOCK WASHER (1 REQUIRED AT RAIL TO ANGLE AND 2 REQUIRED AT ANGLE TO POST LOCATIONS SHOWN WITH 3/8" X 1 3/4" WASHER).
 - ⑦ L 5 X 5 X 5/8" STRUCTURAL ANGLE. ATTACH TO NO. 1 AND NO. 5 AS SHOWN.
 - ⑧ TS 5 X 5 X 3/16" X 2'-4" LONG SPLICE TUBE. 1 PER RAIL. USED IN NO. 5.
 - ⑧A 1/4" X 2 1/8" X 2'-4" LONG SPLICE BAR. 1 PER RAIL. USED IN NO. 5A.
 - ⑨ 3/4" DIA. A325 FULLY THREADED BOLTS, 7/2" LONG, WITH 2 WASHERS AND HEAVY HEX NUT ON EACH BOLT. NUT TO BE FINGER TIGHT. (4 REQUIRED PER SPLICE). USE 1" X 4" SLOTTED HOLES IN TOP AND BOTTOM OF NO. 5.
 - ⑨A 3/4" DIA. A325 FULLY THREADED BOLTS, 4 1/2" LONG, WITH 2 WASHERS AND HEAVY HEX NUT ON EACH BOLT. NUT TO BE FINGER TIGHT. (4 REQUIRED PER SPLICE). USE 1" X 4" SLOTTED HOLES IN TOP AND BOTTOM OF NO. 5A.
 - ⑩ SPLICE SLEEVE FABRICATED FROM 1/4" PLATE. PROVIDE "SLIDING FIT".
- ▲ ROADWAY OPENING OR 2 1/2" MIN. FOR STRIP SEAL EXP. JOINT & 1/2" OPENING FOR A1 ABUTMENT. 1/2" AT FIXED JOINTS. SPLICES ARE REQUIRED IN ANY RAILING SPAN BETWEEN POSTS THAT CONTAINS A SUPERSTRUCTURE EXPANSION JOINT.
- ▲ PROTRUSIONS CAUSED BY WELDING OR GALVANIZING ARE NOT PERMITTED ON THE ADJOINING SURFACES OF THE RAILS, SPLICE TUBES AND FILL PLATES.

NOTES

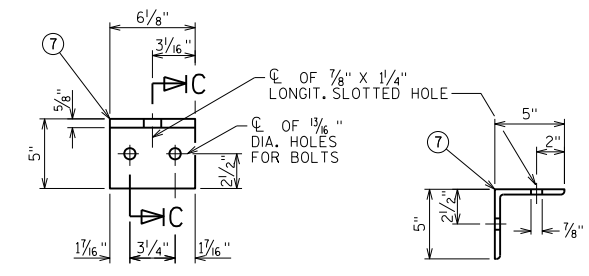
- BID ITEM SHALL BE "RAILING STEEL TYPE NY4", WHICH INCLUDES ALL ITEMS SHOWN.
- RAILING SHALL BE CONTINUOUS OVER A MINIMUM OF THREE (3) POSTS WITHOUT SPLICES WHERE POSSIBLE.
- POST BASE PLATES SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT, AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUT.
- ALL MATERIAL SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, ALL STEEL RAILING POSTS, ANGLES, SPLICE TUBES, SPLICE BARS AND STEEL TUBING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SSPC SPECIFICATIONS.
- RAIL POST, BASE PLATES, SPLICE BAR, ANGLES AND SPLICE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 50. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B OR C WITH A CERTIFIED $f_y = 50$ KSI. ANCHOR PLATES & SHIMS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 36.
- THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8" TURN.
- FILL BOLT SLOT OPENINGS IN POST SHIMS AND PLATE NO. 2 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. CAULK AROUND PERIMETER OF NO. 2 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.
- STEEL SHIMS SHALL BE PROVIDED & USED UNDER PLATE NO. 2 WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.
- WORK THIS SHEET WITH "END POST DETAILS FOR TUBULAR STEEL RAILING TYPE NY4" SHEET.



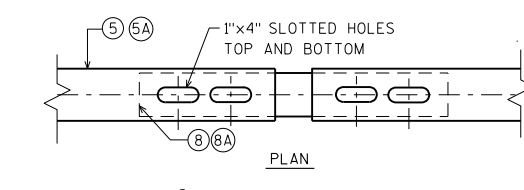
ANCHOR BOLTS
FOR ANCHOR BOLTS IN WINGS, TACK WELD MAY BE USED IN FIELD AFTER ANCHOR PLATE IS IN POSITION IF REQ'D FOR CONSTRUCTIBILITY.



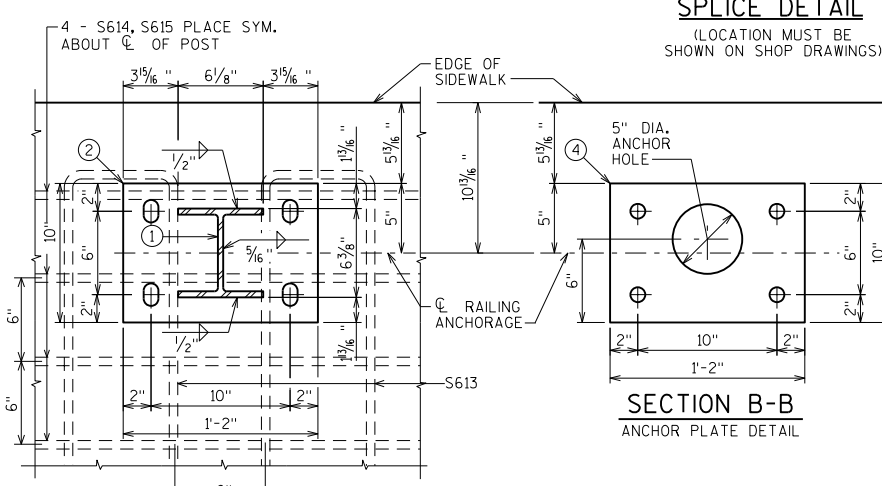
SHOP RAIL SPLICE DETAIL
(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)



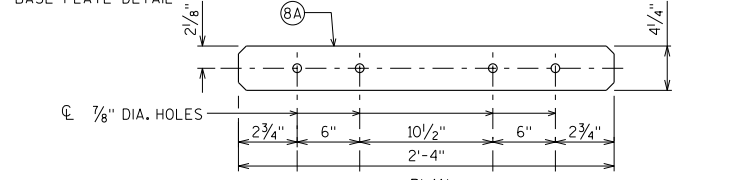
RAILING ANGLE DETAIL
INTERIOR ELEVATION
SECTION C-C
ANGLE SECTION



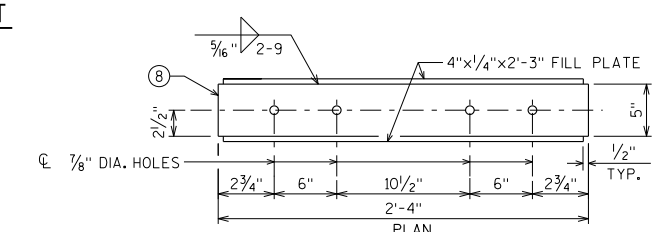
FIELD ERECTION JOINT DETAIL
ELEVATION
PROVIDE 1/2" DIA. DRAIN HOLES IN LOW END OF ALL RAILS CLEAR OF SPLICE TUBE



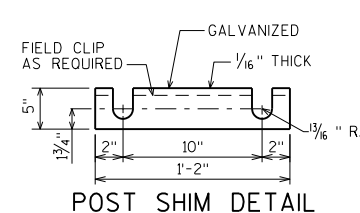
SECTION A-A
BASE PLATE DETAIL



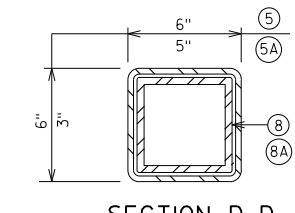
SPLICE BAR



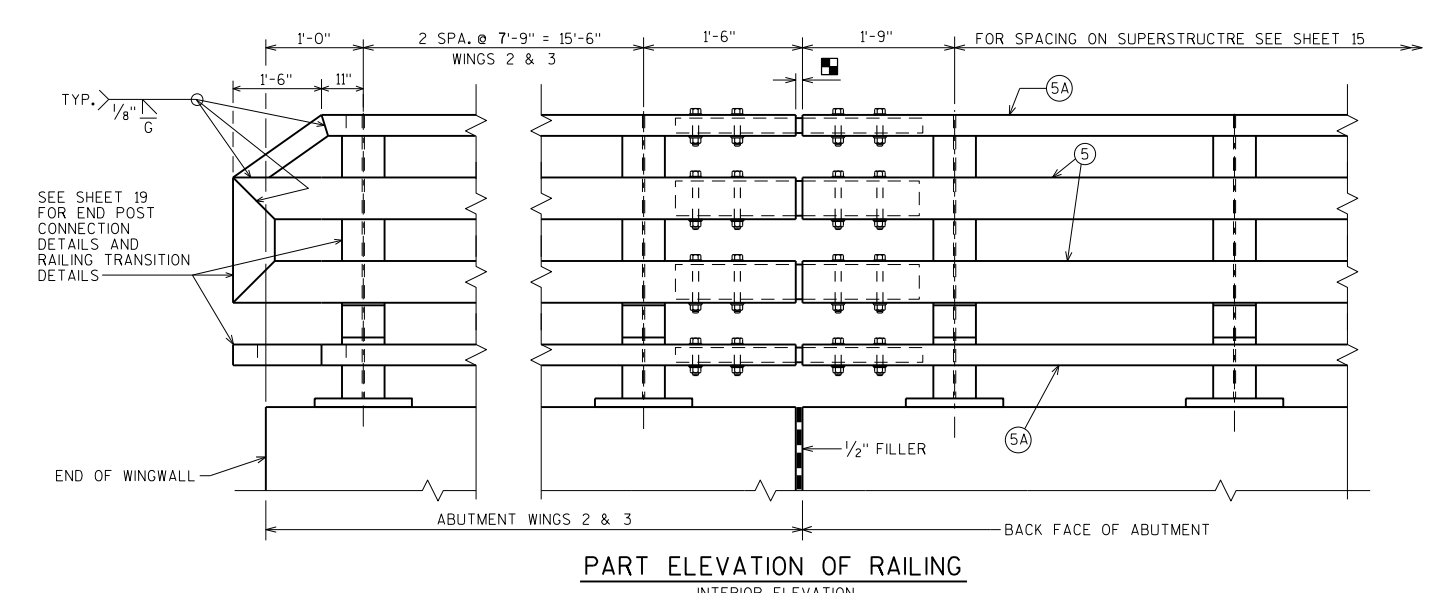
SPLICE TUBE



POST SHIM DETAIL



SECTION D-D



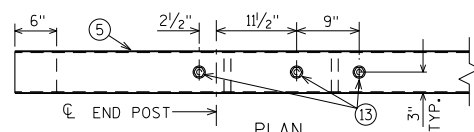
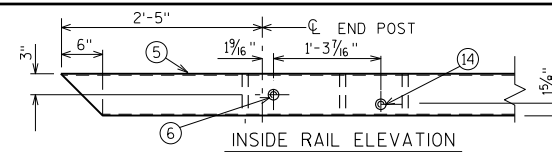
PART ELEVATION OF RAILING
INTERIOR ELEVATION

SEE SHEET 19 FOR END POST CONNECTION DETAILS AND RAILING TRANSITION DETAILS

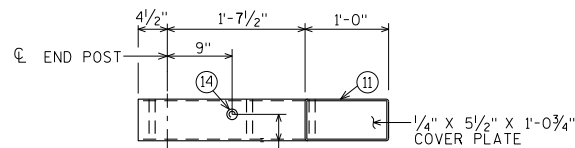
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY		CLS	PLANS CK'D. CBM
TUBULAR STEEL RAILING TYPE NY4			SHEET 18 OF 19

ORIGINAL PLANS PREPARED BY
AVRES ASSOCIATES
3433 Oakwood Hills Parkway
Eau Claire, WI 54701
www.AyresAssociates.com

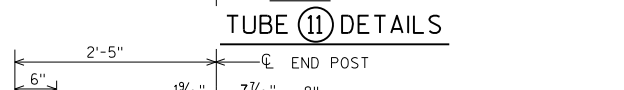
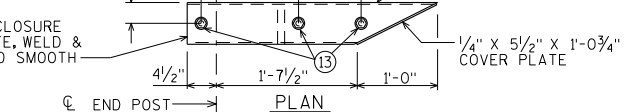
\$PRNAME\$ U:\45-0470.00 - Menominee Co. CTH M over W. Br. Wolf River Structures\450470 NY4 RAIL.DGN



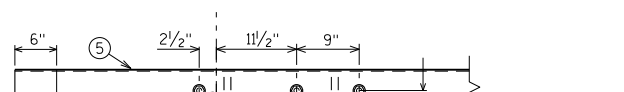
TOP RAIL (5) DETAILS



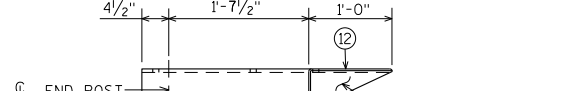
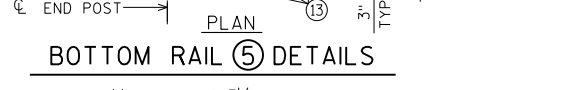
TUBE (11) DETAILS



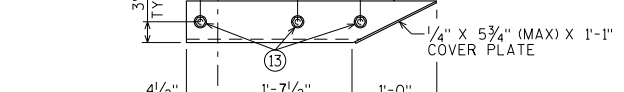
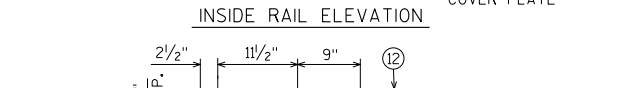
ANGLE (12) DETAILS



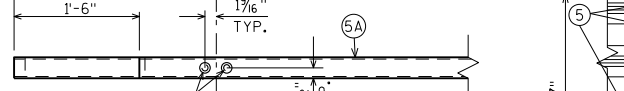
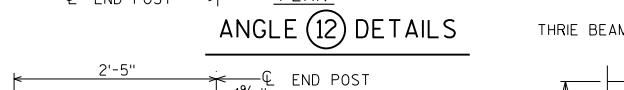
BOTTOM RAIL (5) DETAILS



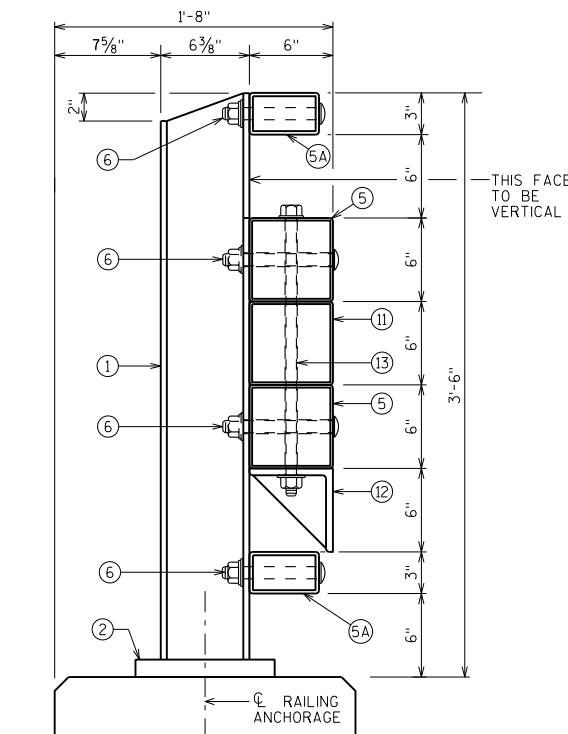
ANGLE (12) DETAILS



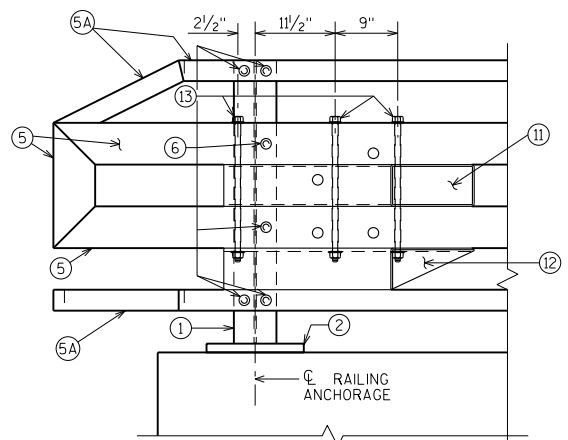
ANGLE (12) DETAILS



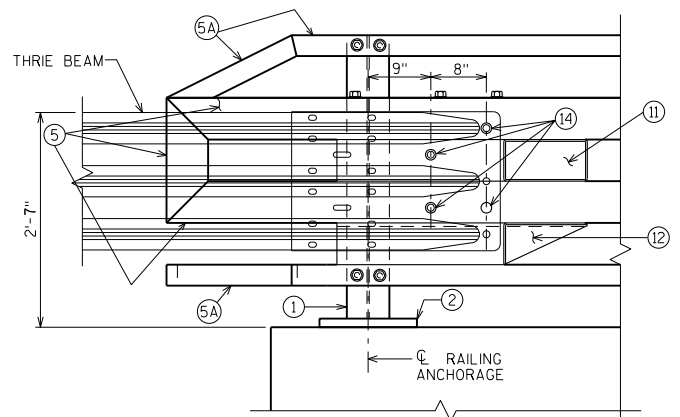
BOTTOM RAIL (5A) DETAILS



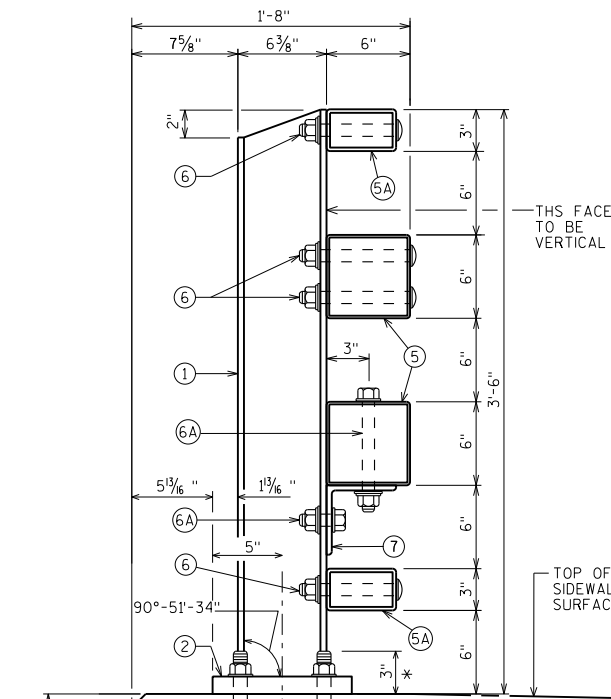
SECTION THRU RAILING END POST



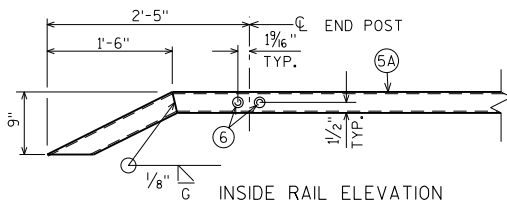
ELEVATION DETAIL AT END POST



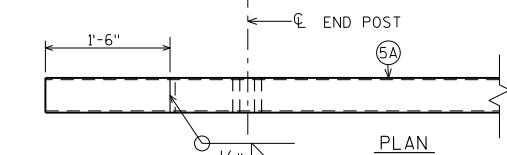
ELEVATION OF DETAIL AT END POST



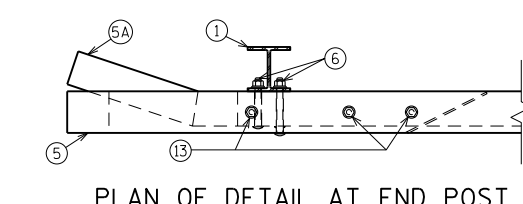
SECTION THRU RAILING ON SIDEWALK



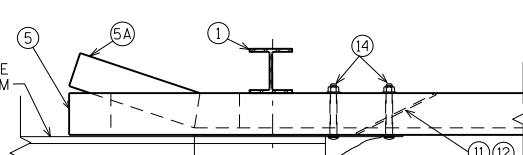
INSIDE RAIL ELEVATION



TOP RAIL (5A) DETAILS



PLAN OF DETAIL AT END POST



PLAN OF DETAIL AT END POST

THRIE BEAM RAIL ATTACHMENT

LEGEND

- ① W6 X 25 WITH 1/8" X 1 3/4" HORIZONTAL SLOTTED HOLES ON SIDE OF POST FOR BOLT NO. 6 AT NO. 5 & AT TOP RAIL USE 1" DIA. HOLE FOR BOLT NO. 6 AT NO. 5A BOTTOM RAIL. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF SIDEWALK. PLACE POST VERTICAL. PLACE POSTS NORMAL TO GRADE LINE.
- ② PLATE 1/4" X 10" X 1'-2" WITH 1/8" X 1 1/2" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1 AS SHOWN. SLOTS PARALLEL TO SHORT SIDE OF PLATE.
- ③ ASTM A449 - 1" DIA. ANCHOR BOLTS WITH HEAVY HEX NUT AND 2" O.D. HARDENED WASHER (ALL GALVANIZED), 4 REQUIRED PER POST. THREAD 3" AND PLACE NORMAL TO PLATE NO. 2. CHAMFER TOP OF BOLTS BEFORE THREADING. USE 1/2" LONG BOLT FOR CONCRETE SIDEWALKS ≥ 11'-0" WIDE AND SEE TABLE BELOW FOR CONCRETE SIDEWALKS ≥ 6'-0" AND < 11'-0" WIDE FOR PROPER BOLT LENGTHS. USE 1'-9" LONG IN ABUTMENT WINGS. (AN EQUIVALENT THREADED ROD WITH HEAVY HEX NUTS AND HARDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINGS IF REQUIRED FOR CONSTRUCTABILITY.)
- ④ 3/8" X 10" X 1'-2" ANCHOR PLATE (GALVANIZED) WITH 1/16" DIA. HOLES FOR ANCHOR BOLTS NO. 3.
- ⑤ TS 6 X 6 X 3/16" STRUCTURAL TUBING. USE 7/8" DIA. HOLES IN TOP AND BOTTOM OF RAILS FOR BOLT NO. 13 AS SHOWN IN PLAN DETAILS. USE 1" DIA. HOLES IN FRONT AND BACK OF RAILS FOR BOLTS NO. 6 & NO. 14 AS SHOWN IN ELEVATION DETAILS.
- ⑤A TS 5 X 3 X 1/4" STRUCTURAL TUBING. USE 1" DIA. HOLES FOR BOLT NO. 6 IN TOP RAIL (FRONT & BACK). USE 1/8" X 1 3/8" HORIZONTAL SLOTTED HOLES FOR BOLT NO. 6 IN BOTTOM RAIL (FRONT & BACK) AND A 2" O.D. WASHER UNDER BOLT HEAD.
- ⑥ 7/8" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, 3/16" X 1 3/4" X 1 3/4" WASHER, AND SPRING LOCK WASHER (1 REQUIRED AT RAIL NO. 5 TO POST NO. 1 CONNECTION LOCATIONS SHOWN, 2 REQUIRED AT RAIL NO. 5A TO POST NO. 1 CONNECTION LOCATIONS SHOWN).
- ⑪ TS 6 X 6 X 3/16" STRUCTURAL TUBING. USE 1" DIA. HOLES IN FRONT AND BACK FOR BOLT NO. 14 & 7/8" DIA. HOLES IN TOP & BOTTOM FOR BOLT NO. 13.
- ⑫ L 6 X 6 X 1/2" STRUCTURAL ANGLE. USE 7/8" DIA. HOLES IN TOP FLANGE FOR BOLT NO. 13.
- ⑬ 3/4" DIA. A325 FULLY THREADED BOLTS, 2 WASHERS AND A HEAVY HEX NUT, ON EACH BOLT. NUT TO BE FINGER TIGHT. 3 BOLTS AT EACH END POST.
- ⑭ 7/8" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT AND 3/16" X 2" X 2" WASHER FOR CONNECTION OF THRIE BEAM (4 REQUIRED)

NOTES

STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B OR C WITH A CERTIFIED $f_y = 50$ KSI. STRUCTURAL ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 50.

WORK THIS SHEET WITH "TUBULAR STEEL RAILING TYPE NY4" SHEET.

±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

SIDEWALK WIDTH	BOLT LENGTH
6'-0"	17 1/2"
7'-0"	17 3/4"
8'-0"	18 1/4"
9'-0"	18 3/4"
10'-0"	19"

NO.	DATE	REVISION	BY

STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-73-8			
DRAWN BY	CLS	PLANS CK'D.	CBM
END POST DETAILS FOR TUBULAR STEEL RAILING TYPE NY4		SHEET 19 OF 19	

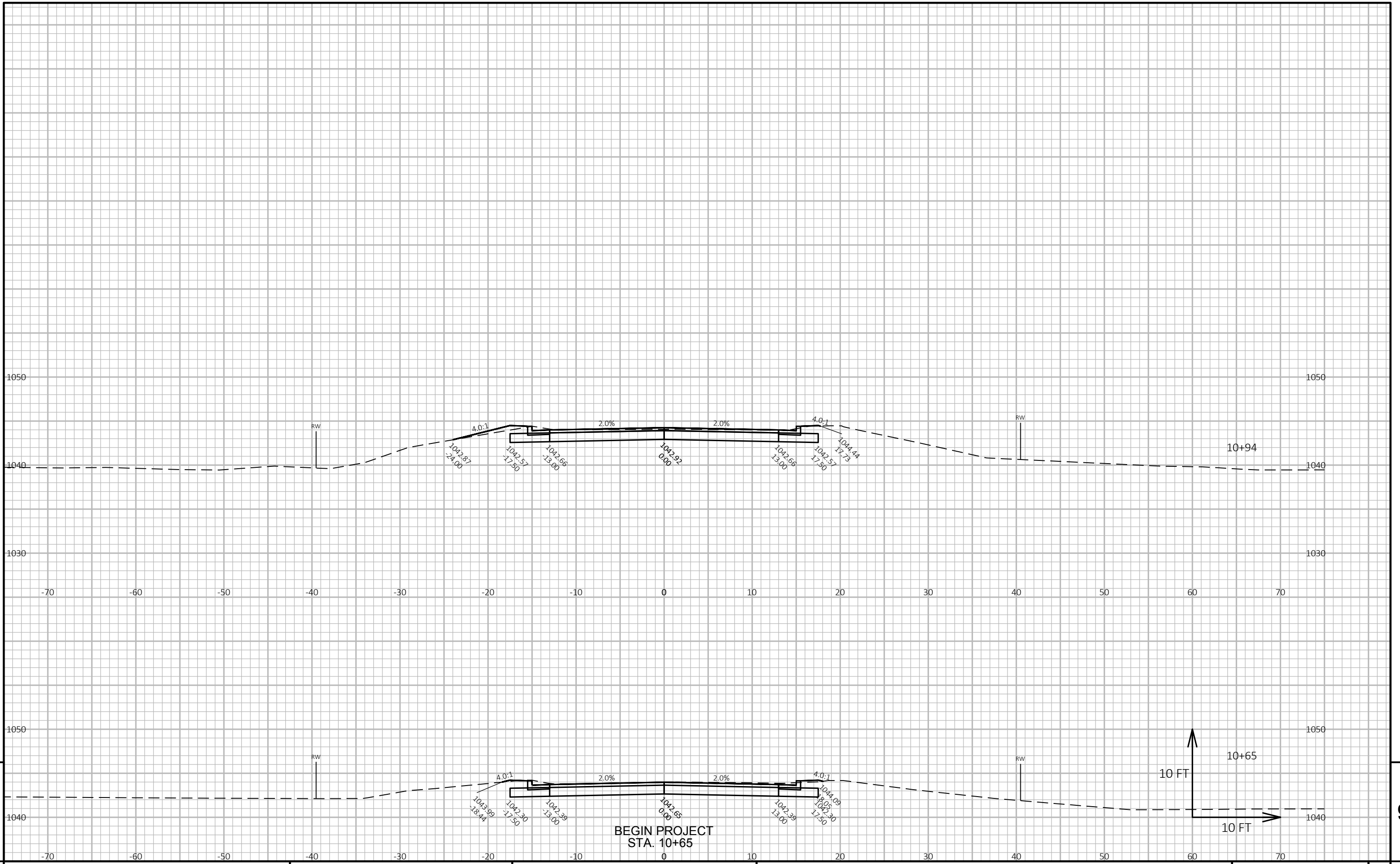
ORIGINAL PLANS PREPARED BY
AVRES ASSOCIATES
 3433 Oakwood Hills Parkway
 Eau Claire, WI 54701
 www.AvresAssociates.com

EARTHWORK - CTH M

STATION	AREA (SF)			Incremental Vol (CY) (Unadjusted)			Cumulative Vol (CY)		Mass Ordinate Note 8
	Cut	Unusable Pavement Material	Fill	Cut Note 1	Unusable Pavement Material Note 2	Fill Note 3	Cut 1.00	Expanded Fill 1.30	
							Note 1	Note 1	
10+65	51	13	0	0	0	0	0	0	0
10+94	47	13	2	53	14	1	53	1	37
11+00	50	13	6	11	3	1	63	3	44
11+12	61	13	16	25	6	5	88	9	57
B-73-8									
11+63	55	14	29	0	0	0	88	9	57
11+82	41	14	10	34	10	14	122	27	63
11+92	45	14	5	16	5	3	138	30	70
12+00	56	14	0	15	4	1	153	31	80
12+15	63	14	0	33	8	0	186	31	105
12+20	11	0	0	7	1	0	193	31	110
12+38	14	0	0	8	0	0	201	31	119
12+50	15	0	0	6	0	0	207	31	125
12+73	11	0	3	11	0	1	219	33	135
13+00	12	0	0	12	0	2	230	35	144
13+34	12	0	0	15	0	0	245	35	159

245 51 27

Notes:	
1 - Cut	Cut includes Unusable Pavement material
2 - Unusable Pavement Material	This does not show up in cross sections
3 - Fill	Does not include Unusable Pavement Exc volume
8 - Mass Ordinate	Cut - Unusable Pavement Material - (Fill * Fill Factor)



PROJECT NO: 9435-00-70

HWY: CTH M

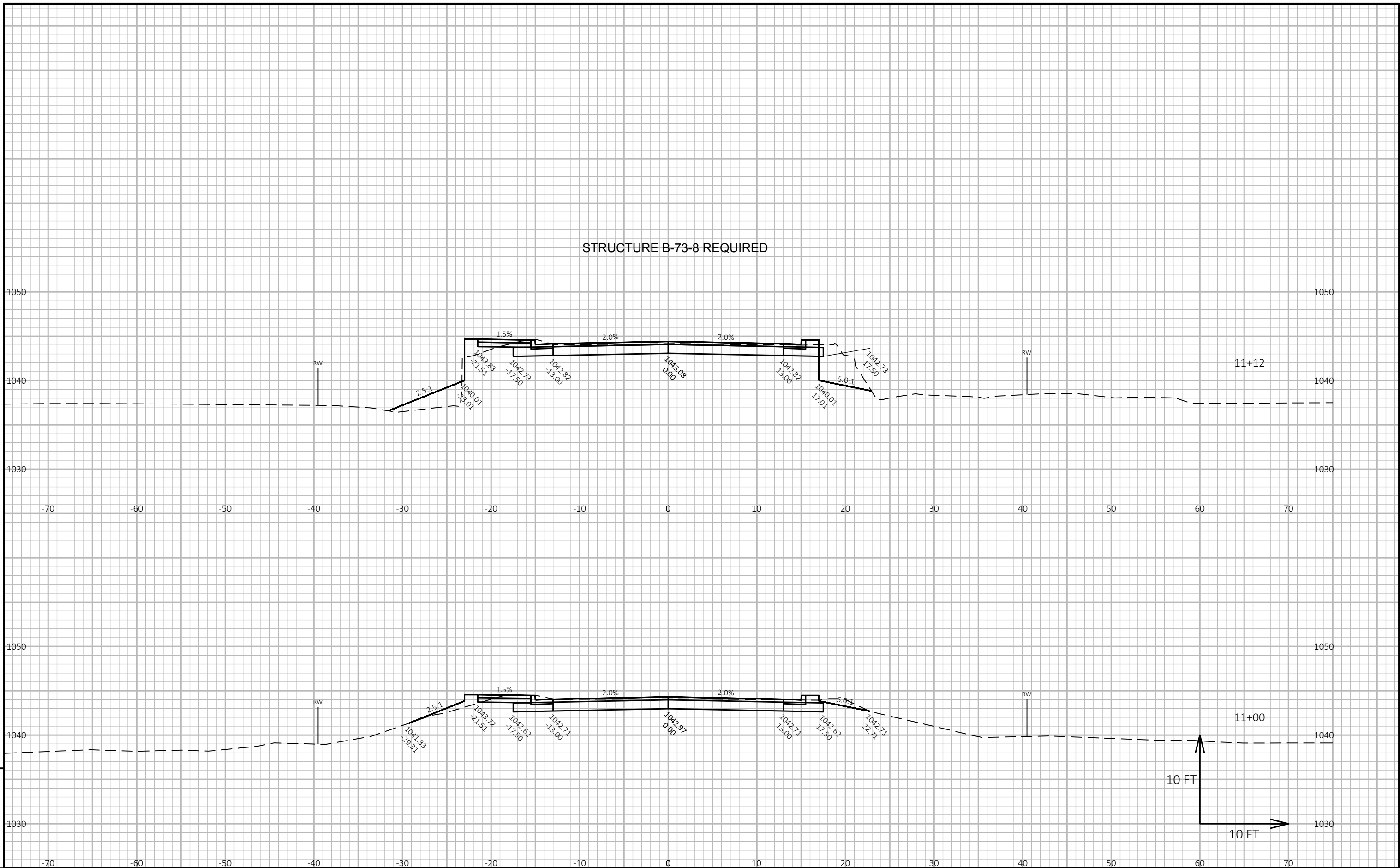
COUNTY: MENOMINEE

CROSS SECTIONS:

SHEET

E

STRUCTURE B-73-8 REQUIRED



PROJECT NO: 9435-00-70

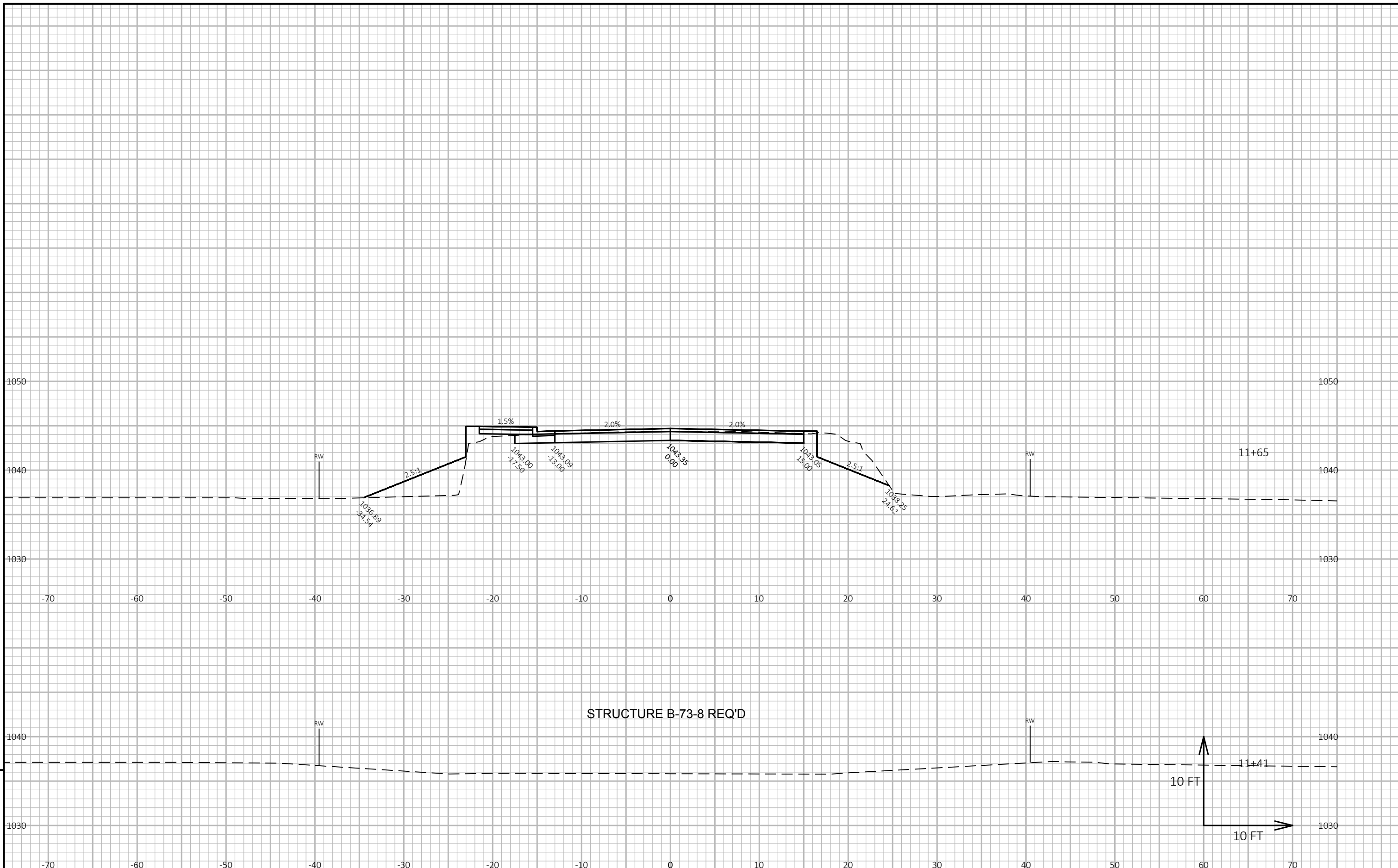
HWY: CTH M

COUNTY: MENOMINEE

CROSS SECTIONS:

SHEET

E



PROJECT NO: 9435-00-70

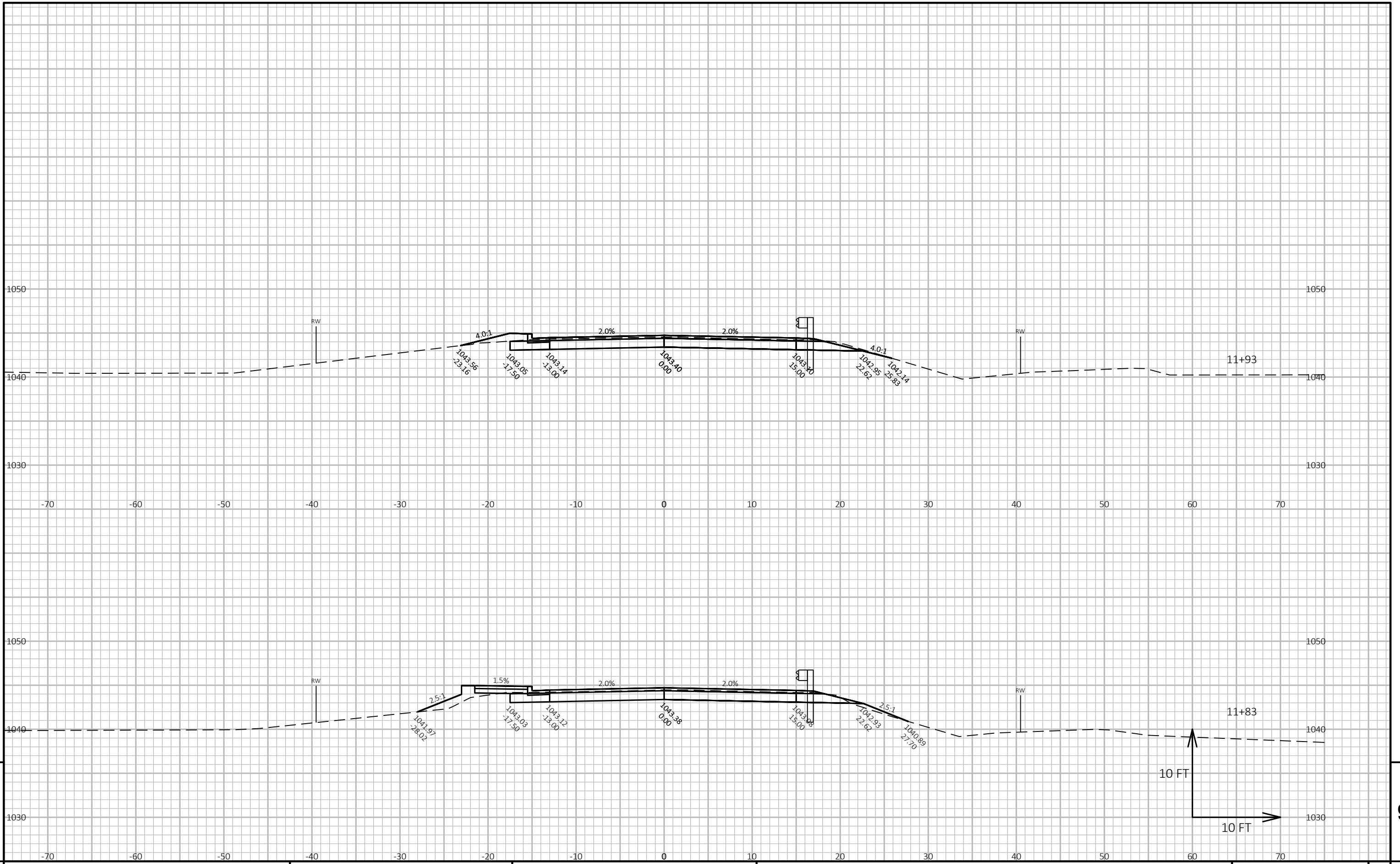
HWY: CTH M

COUNTY: MENOMINEE

CROSS SECTIONS:

SHEET

E



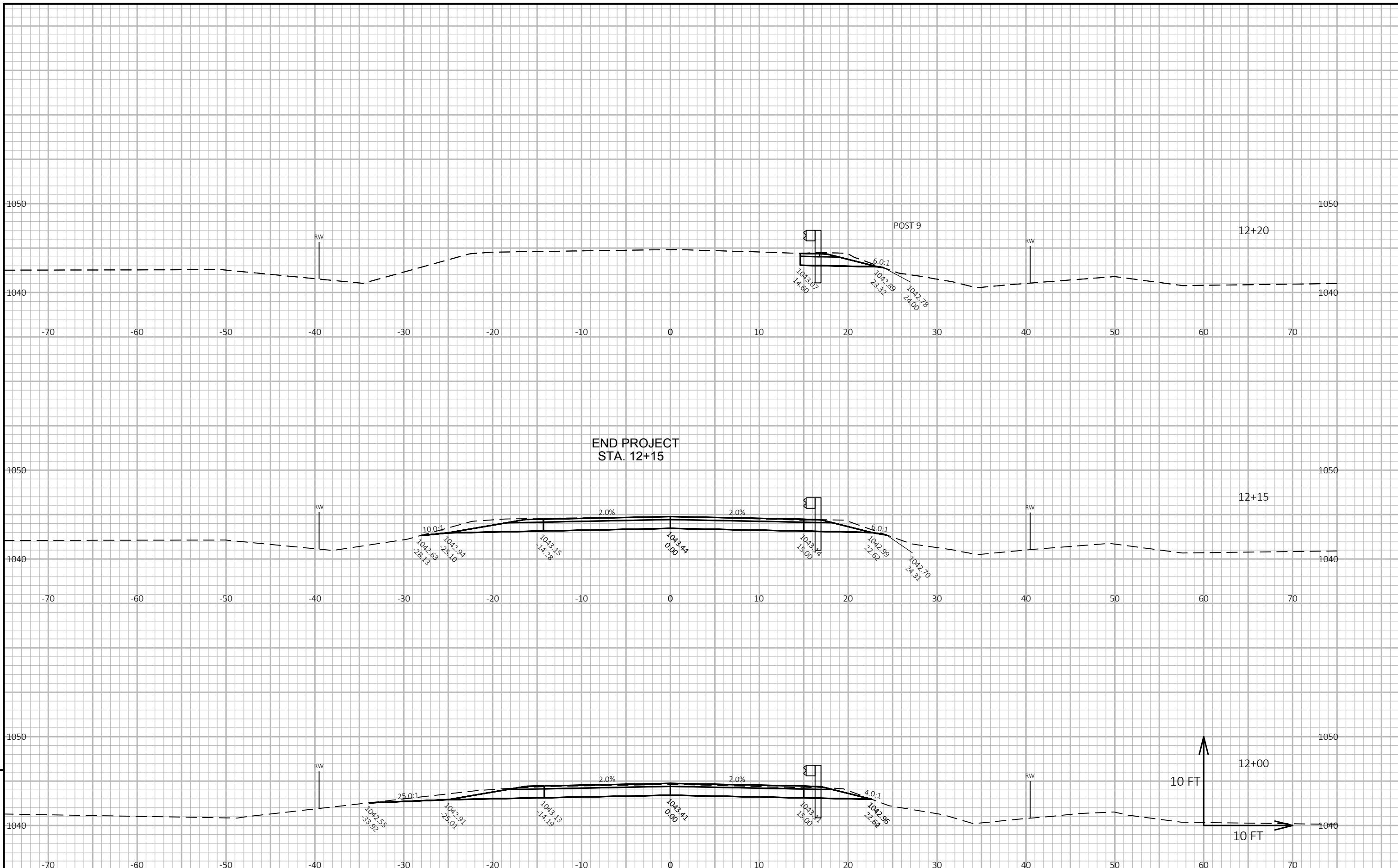
9

9

PROJECT NO: 9435-00-70 HWY: CTH M COUNTY: MENOMINEE CROSS SECTIONS: SHEET E

FILE NAME: V:\TRANS-GB\450470 MENOMINEE CTH M\C3D\SHEETSPLAN\090201-XS.DWG PLOT DATE: 6/2/2019 9:15 AM PLOT BY: SOUFAL, KEVIN PLOT NAME: PLOT SCALE: 1 IN:10 FT HORZ. / 1 IN:10 FT VERT. WISDOT/CADD SHEET 49

LAYOUT NAME - 4



PROJECT NO: 9435-00-70

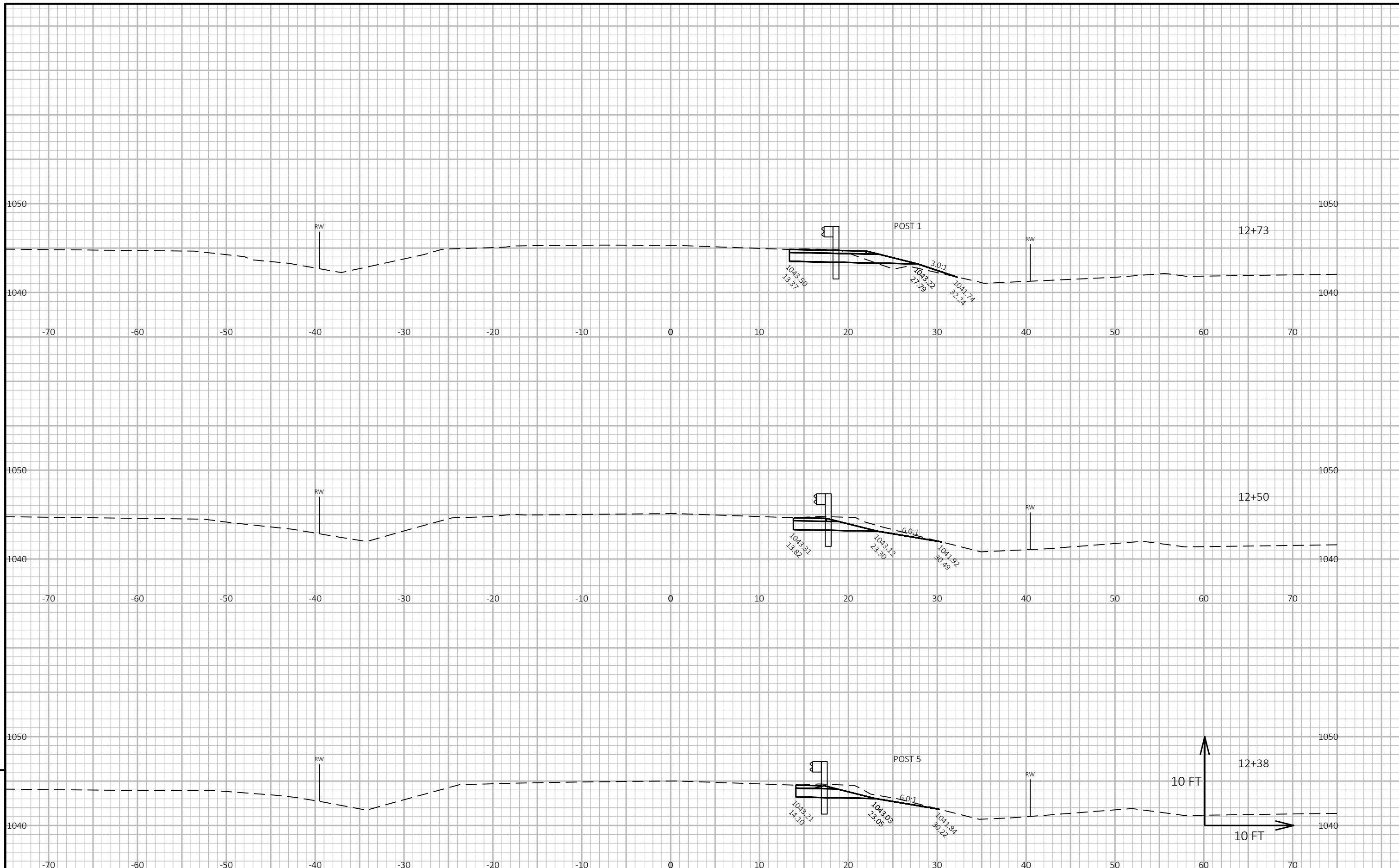
HWY: CTH M

COUNTY: MENOMINEE

CROSS SECTIONS:

SHEET

E



PROJECT NO: 9435-00-70

HWY: CTH M

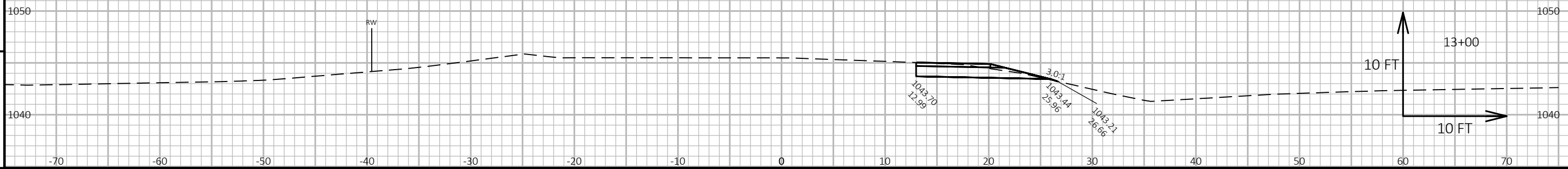
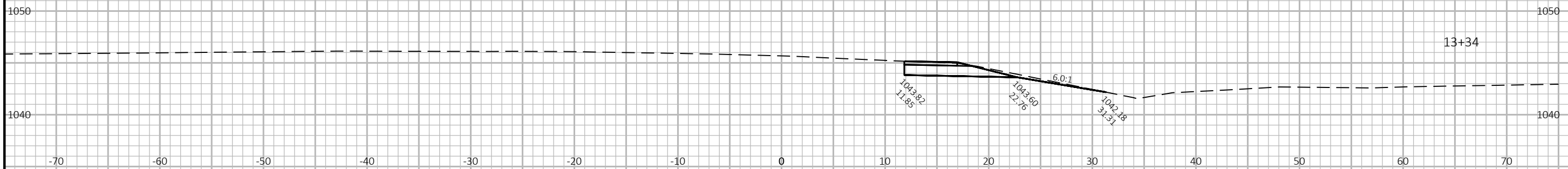
COUNTY: MENOMINEE

CROSS SECTIONS:

SHEET

E

CONSTRUCTION LIMITS
STA. 13+34



PROJECT NO: 9435-00-70

HWY: CTH M

COUNTY: MENOMINEE

CROSS SECTIONS:

SHEET

E

Notes



Wisconsin Department of Transportation

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