

RHI

MAR 10, 2020

ORDER OF SHEETS

Section No.	1	Title
Section No.	2	Typical Sections and Details
Section No.	3	Estimate of Quantities
Section No.	3	Miscellaneous Quantities
Section No.	4	Right of Way Plat
Section No.	5	Plan and Profile (Includes Erosion Control Details)
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 = 66

STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

CTH O - STH 86

SPIRIT RIVER BRIDGE B-35-0018

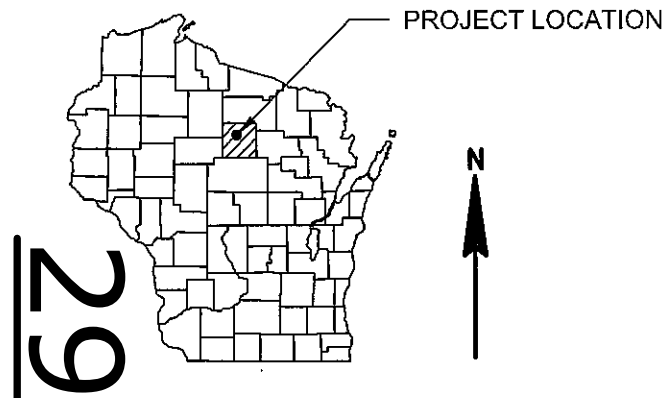
CTH E

LINCOLN COUNTY

STATE PROJECT NUMBER
9411-00-70

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
9411-00-70	WISC 2020086	1

PROJECT ID: 9411-00-70
WITH: N/A



DESIGN DESIGNATION

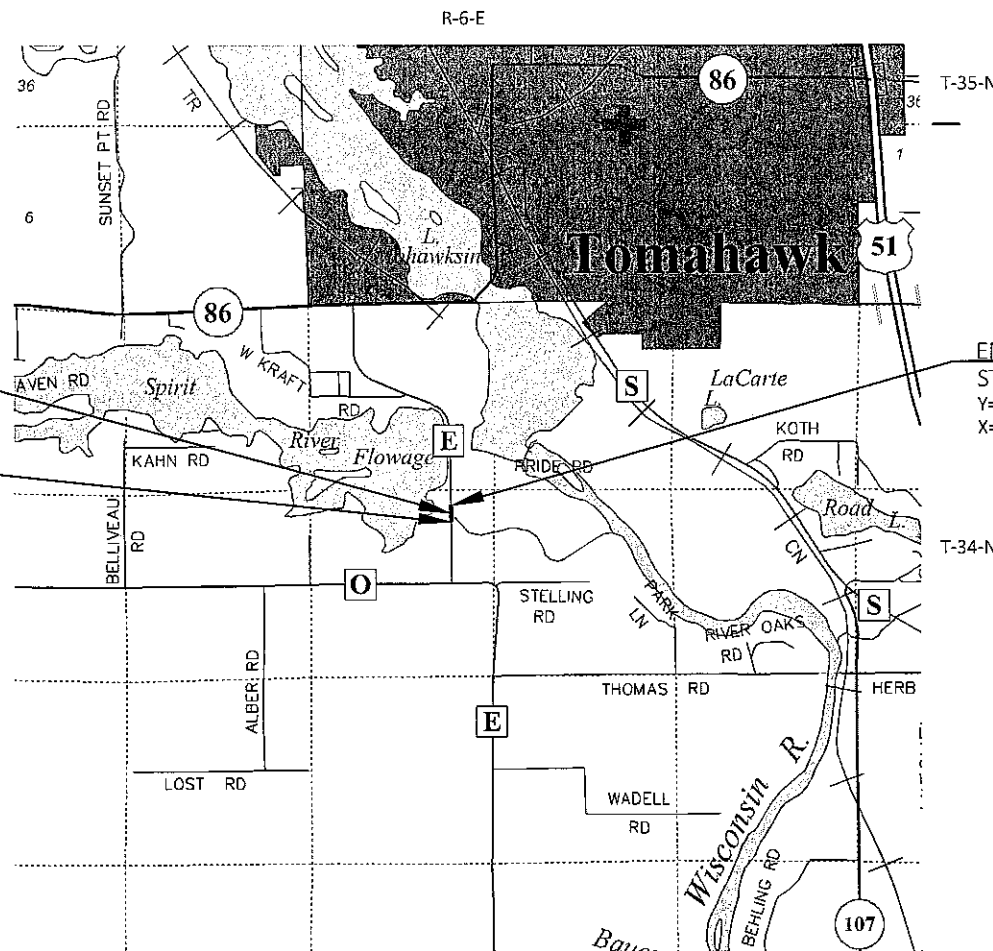
A.A.D.T.	2020	=	2200
A.A.D.T.	2040	=	2400
D.H.V.		=	NA
D.D.		=	NA
T.		=	13.3%
DESIGN SPEED		=	25 MPH
ESALS		=	92 DESIGN LANE DAILY

CONVENTIONAL SYMBOLS

PLAN		PROFILE	
CORPORATE LIMITS		GRADE LINE	
PROPERTY LINE		ORIGINAL GROUND	
LOT LINE		MARSH OR ROCK PROFILE (To be noted as such)	
LIMITED HIGHWAY EASEMENT		SPECIAL DITCH	
EXISTING RIGHT OF WAY		GRADE ELEVATION	
PROPOSED OR NEW R/W LINE		CULVERT (Profile View)	
SLOPE INTERCEPT		UTILITIES	
REFERENCE LINE		ELECTRIC	
EXISTING CULVERT		FIBER OPTIC	
PROPOSED CULVERT (Box or Pipe)		GAS	
COMBUSTIBLE FLUIDS		SANITARY SEWER	
MARSH AREA		STORM SEWER	
WOODED OR SHRUB AREA		TELEPHONE	
		WATER	
		UTILITY PEDESTAL	
		POWER POLE	
		TELEPHONE POLE	

BEGIN PROJECT 9411-00-70
STA. 8+50
Y=215,996.24
X=379,652.49

END PROJECT 9411-00-70
STA. 11+75
Y=216,321.02
X=379,728.07



LAYOUT
SCALE 0 1 MI
TOTAL NET LENGTH OF CENTERLINE = 0.062 MI

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COORDINATE REFERENCE SYSTEM (WISCRS), LINCOLN COUNTY, U.S. SURVEY FEET. VALUES ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES MAY BE USED AS GROUND DISTANCES. VERTICAL DATUM IS SITE SPECIFIC TO WISCONSIN GEOID 12B. CONTRACTOR TO USE VERTICAL CONTROL AS PROVIDED ON PLAN. FIELD WORK PERFORMED OCTOBER 2018.

ACCEPTED FOR
COUNTY OF LINCOLN
Date 10/22/19 *John Haney*
(Signature and Title of Official)

ORIGINAL PLANS PREPARED BY
MSA ENGINEERING | ARCHITECTURE | SURVEYING
FUNDING | PLANNING | ENVIRONMENTAL
www.msa-ps.com
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WISCONSIN
SEAN M. SPROMBERG
E 37771-008
SCHOFIELD, WI
PROFESSIONAL ENGINEER
DATE: 10/22/2019
(Professional Engineer Signature)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY
Surveyor: MSA PROFESSIONAL SERVICES, INC.
Designer: MSA PROFESSIONAL SERVICES, INC.
Project Manager: MICHAEL GRAGE, PE
Regional Examiner: N/A
Regional Supervisor: ROBIN STAFFORD

APPROVED FOR THE DEPARTMENT
DATE: 10/22/19 *Will [Signature]*
(Signature)

COUNTY: LINCOLN

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GENERAL NOTES

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

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

THE BRIDGE APPROACHES SHALL BE PLACED IN TWO LIFTS. THE 4.5" ASPHALTIC SURFACE SHALL CONSIST OF A 2 1/4" UPPER LAYER WITH NO. 4 (12.5 MM) NOMINAL SIZE AGGREGATE AND A 2 1/4" LOWER LAYER WITH NO. 3 (19.0 MM) NOMINAL SIZE AGGREGATE.

DISTURBED AREAS WITHIN THE RIGHT-OF-WAY, EXCEPT THE AREAS WITHIN THE FINISHED SHOULDER POINTS, SHALL BE FERTILIZED, SEEDED AND MULCHED AS DIRECTED BY THE ENGINEER.

SECTION 2 ORDER

GENERAL NOTES
TYPICAL SECTIONS
CONSTRUCTION DETAILS

DESIGN CONTACT

MSA PROFESSIONAL SERVICES, INC.
1835 N. STEVENS STREET
RHINELANDER, WI 54501
ATTN: SEAN SPROMBERG, PE
PHONE: (715) 304-0451
sspromberg@msa-ps.com

COUNTY CONTACT

LINCOLN COUNTY HIGHWAY DEPARTMENT
100 COOPER STREET
MERRILL, WI 54452
ATTN: JOHN HANZ, COMMISSIONER
PHONE: (715) 539-2554
jhanz@co.lincoln.wi.us

UTILITIES

BURIED COMMUNICATIONS:
FRONTIER COMMUNICATIONS
521 4TH STREET
WAUSAU, WI 54403
(715) 847-1240
christopher.pollack@ftr.com

DNR CONTACT

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
107 SUTLIFF AVENUE
RHINELANDER, WI 54501
ATTN: WENDY HENNIGES
PHONE: (715) 365-8916
wendy.henniges@wisconsin.gov

GAS & ELECTRIC:
WISCONSIN PUBLIC SERVICE CORPORATION
1700 SHERMAN STREET
P.O.BOX 1166
WAUSAU, WI 54402
(715) 848-7487
dalutzow@wisconsinpublicservice.com

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
MEDIAN STRIP TURF	0.19	0.20	0.24	0.19	0.22	0.26	0.20	0.23	0.30	0.20	0.25 0.32	0.30 0.40
SIDE SLOPE TURF			0.25			0.27			0.28			0.30 0.38
PAVEMENT:	0.40 - 0.60											
ASPHALT:	0.70 - 0.95											
CONCRETE:	0.80 - 0.95											
BRICK:	0.70 - 0.80											
DRIVES, WALKS:	0.75 - 0.85											
ROOFS:	0.75 - 0.95											
GRAVEL ROADS, SHOULDERS	0.40 - 0.60											

TOTAL PROJECT AREA = 0.49 ACRES
TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 0.37 ACRES

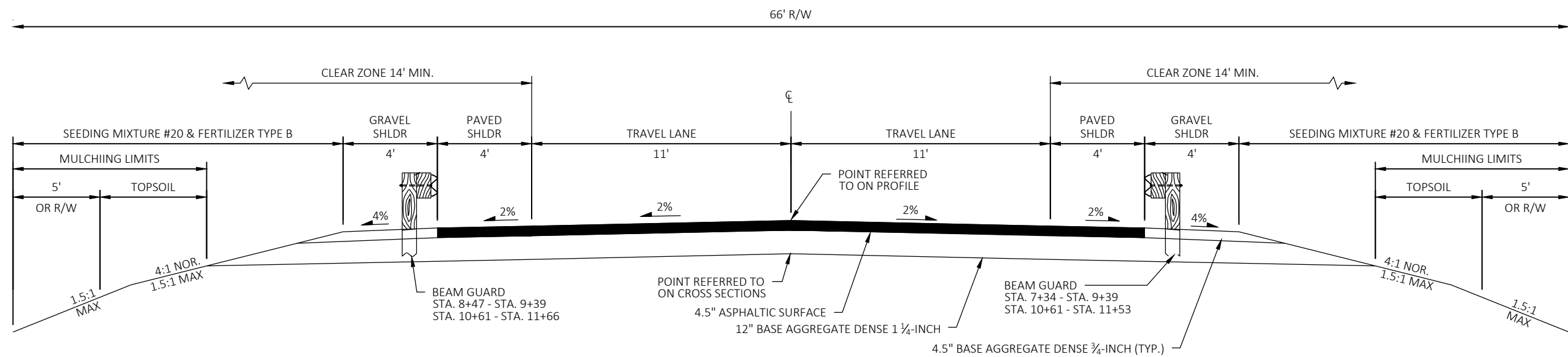
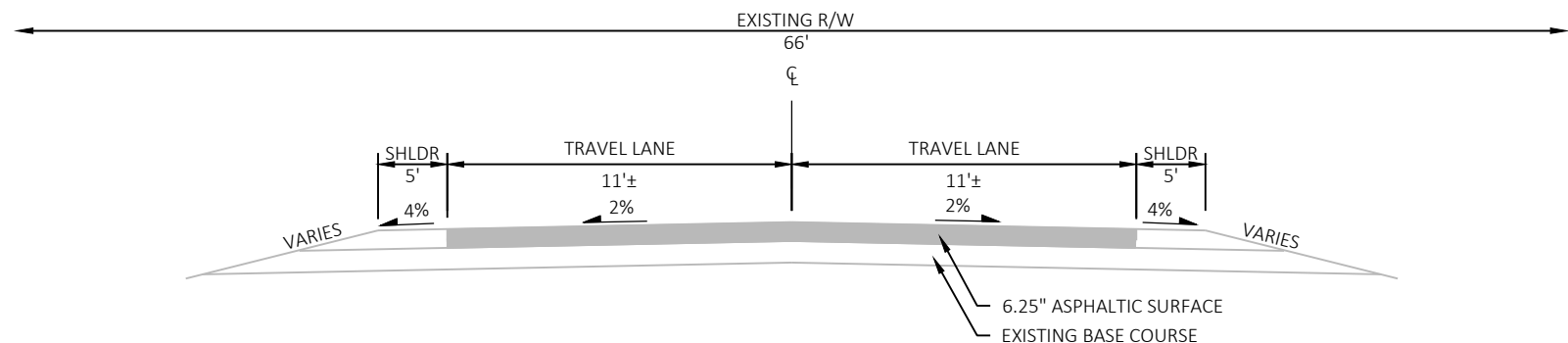
EROSION CONTROL NOTES

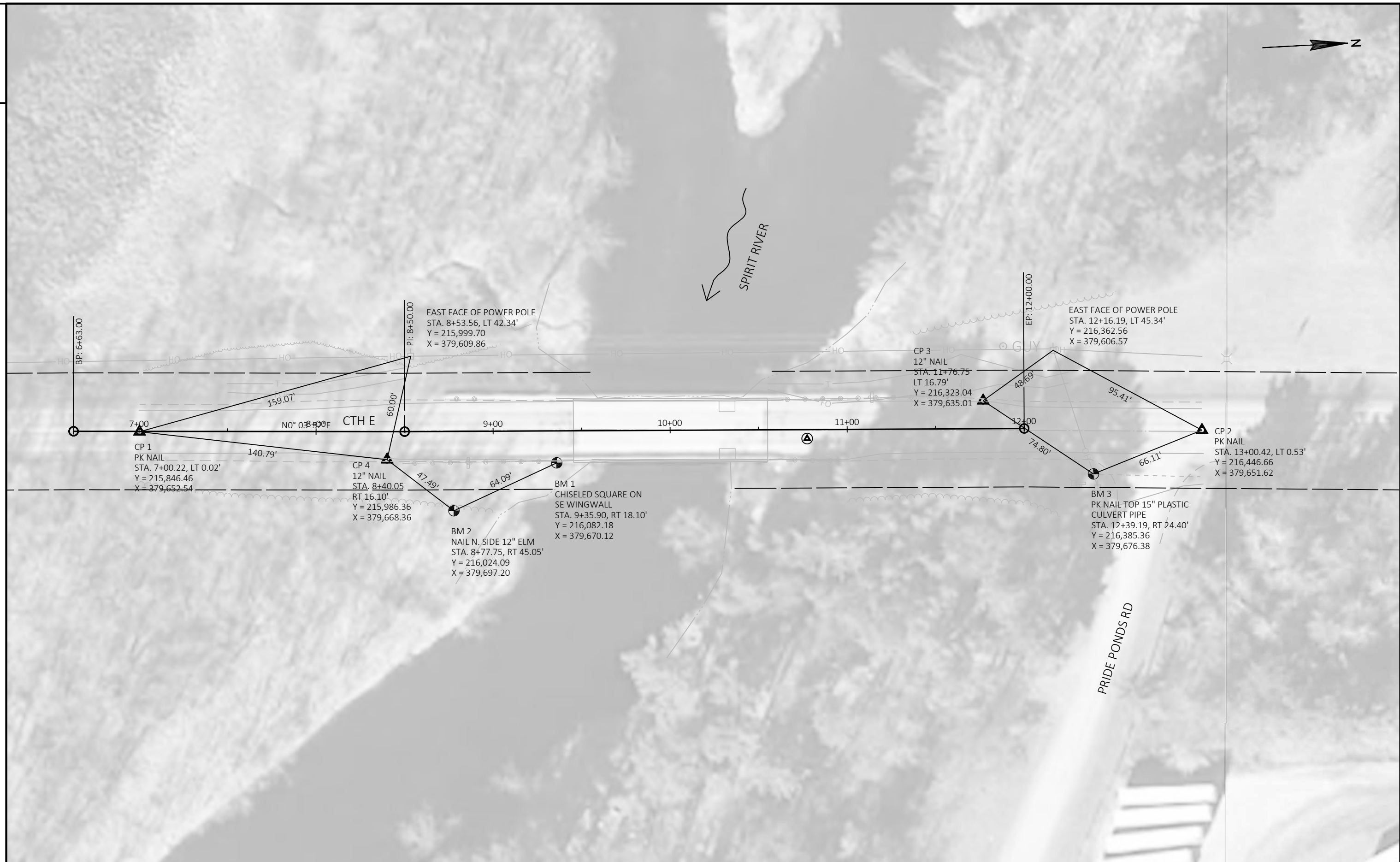
RUNOFF COEFFICIENTS FOR THIS PROJECT: EXISTING PAVEMENT 0.95, EXISTING SLOPES 0.30,
NEW PAVEMENT 0.95, NEW SLOPES 0.30.

* - NOT A MEMBER OF DIGGERS HOTLINE



PROJECT NO: 9411-00-70	HWY: CTH E	COUNTY: LINCOLN	GENERAL NOTES	SHEET	E
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Estimate Of Quantities

9411-00-70

Line	Item	Item Description	Unit	Total	Qty
0002	201.0105	Clearing	STA	5.000	5.000
0004	201.0205	Grubbing	STA	5.000	5.000
0006	203.0210.S	Abatement of Asbestos Containing Material (structure) 01. B-35-18	LS	1.000	1.000
0008	203.0600.S	Removing Old Structure Over Waterway With Minimal Debris (station) 01. 10+00	LS	1.000	1.000
0010	205.0100	Excavation Common	CY	466.000	466.000
0012	206.1000	Excavation for Structures Bridges (structure) 01. B-35-18	LS	1.000	1.000
0014	210.1500	Backfill Structure Type A	TON	56.000	56.000
0016	213.0100	Finishing Roadway (project) 01. 9411-00-70	EACH	1.000	1.000
0018	305.0110	Base Aggregate Dense 3/4-Inch	TON	68.000	68.000
0020	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	791.000	791.000
0022	455.0605	Tack Coat	GAL	39.000	39.000
0024	465.0105	Asphaltic Surface	TON	196.000	196.000
0026	502.0100	Concrete Masonry Bridges	CY	112.000	112.000
0028	502.3200	Protective Surface Treatment	SY	473.000	473.000
0030	502.4204	Adhesive Anchors No. 4 Bar	EACH	30.000	30.000
0032	502.4205	Adhesive Anchors No. 5 Bar	EACH	148.000	148.000
0034	502.4206	Adhesive Anchors No. 6 Bar	EACH	104.000	104.000
0036	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	38,570.000	38,570.000
0038	506.4000	Steel Diaphragms (structure) 01. B-35-18	EACH	6.000	6.000
0040	509.1500	Concrete Surface Repair	SF	60.000	60.000
0042	513.4061	Railing Tubular Type M	LF	265.000	265.000
0044	516.0500	Rubberized Membrane Waterproofing	SY	10.000	10.000
0046	517.4000.S	Containment and Collection of Waste Materials (structure) 01. B-35-18	LS	1.000	1.000
0048	606.0300	Riprap Heavy	CY	128.000	128.000
0050	614.0920	Salvaged Rail	LF	298.000	298.000
0052	614.2300	MGS Guardrail 3	LF	125.000	125.000
0054	614.2500	MGS Thrie Beam Transition	LF	157.600	157.600
0056	614.2610	MGS Guardrail Terminal EAT	EACH	4.000	4.000
0058	618.0100	Maintenance And Repair of Haul Roads (project) 01. 9411-00-70	EACH	1.000	1.000
0060	619.1000	Mobilization	EACH	1.000	1.000
0062	624.0100	Water	MGAL	12.000	12.000
0064	625.0100	Topsoil	SY	585.000	585.000
0066	627.0200	Mulching	SY	407.000	407.000
0068	628.1504	Silt Fence	LF	587.000	587.000
0070	628.1520	Silt Fence Maintenance	LF	587.000	587.000
0072	628.1905	Mobilizations Erosion Control	EACH	4.000	4.000

Estimate Of Quantities

9411-00-70

Line	Item	Item Description	Unit	Total	Qty
0074	628.1910	Mobilizations Emergency Erosion Control	EACH	2.000	2.000
0076	628.2004	Erosion Mat Class I Type B	SY	178.000	178.000
0078	628.2006	Erosion Mat Urban Class I Type A	SY	50.000	50.000
0080	628.6005	Turbidity Barriers	SY	304.000	304.000
0082	629.0210	Fertilizer Type B	CWT	0.580	0.580
0084	630.0120	Seeding Mixture No. 20	LB	22.000	22.000
0086	630.0500	Seed Water	MGAL	18.000	18.000
0088	634.0612	Posts Wood 4x6-Inch X 12-FT	EACH	4.000	4.000
0090	637.2230	Signs Type II Reflective F	SF	12.000	12.000
0092	642.5001	Field Office Type B	EACH	1.000	1.000
0094	643.0420	Traffic Control Barricades Type III	DAY	1,320.000	1,320.000
0096	643.0705	Traffic Control Warning Lights Type A	DAY	1,980.000	1,980.000
0098	643.0900	Traffic Control Signs	DAY	1,056.000	1,056.000
0100	645.0120	Geotextile Type HR	SY	373.000	373.000
0102	646.1005	Marking Line Paint 4-Inch	LF	1,800.000	1,800.000
0104	650.4500	Construction Staking Subgrade	LF	341.000	341.000
0106	650.5000	Construction Staking Base	LF	341.000	341.000
0108	650.6500	Construction Staking Structure Layout (structure) 01. B-35-18	LS	1.000	1.000
0110	650.9910	Construction Staking Supplemental Control (project) 01. 9411-00-70	LS	1.000	1.000
0112	650.9920	Construction Staking Slope Stakes	LF	341.000	341.000
0114	690.0150	Sawing Asphalt	LF	213.000	213.000
0116	715.0502	Incentive Strength Concrete Structures	DOL	672.000	672.000
0118	ASP.1T0A	On-the-Job Training Apprentice at \$5.00/HR	HRS	300.000	300.000
0120	ASP.1T0G	On-the-Job Training Graduate at \$5.00/HR	HRS	600.000	600.000
0122	SPV.0060	Special 01. Cleaning and Painting Piling	EACH	6.000	6.000

EARTHWORK PROJECT I.D. 9411-00-70

Division	From/To Station	Location	Common Excavation (1)		Salvaged/Unusable Pavement Material (4)	Available Material (5)	Unexpanded Fill	Expanded Fill (6)		Mass Ordinate +/- (7)	Waste	Comment:
			Cut (2)	EBS Excavation (3)				Factor				
Project ID 9411-00-70												
1	7+25 - 9+45.40	CTH E - South Approach	197	0	0	197	26	32		165	165	
2	10+55.05 - 11+75	CTH E - North Approach	219	0	0	219	30	37		182	182	
UNDISTRIBUTED EBS			0	50								
Grand Total			416	50	0	416	56	70		347	347	

CLEARING & GRUBBING

CATEGORY	STATION	TO STATION	LOCATION	201.0105	201.0205
				CLEARING	GRUBBING
0010	7+25	8+50	RT	2	2
	8+50	9+45	LT	1	1
	10+55	11+75	RT	2	2
PROJECT TOTALS				5	5

- 1) Common Excavation is the sum of the Cut and EBS Excavation columns. Item number 205.0100
- 2) Salvaged/Unusable Pavement Material is included in Cut.
- 3) EBS Excavation to be backfilled with Breaker Run material.
- 4) Salvaged/Unusable Pavement Material
- 5) Available Material = Cut - Salvaged/Unusable Pavement Material
- 6) Expanded Fill. Factor = 1.25
- 7) The Mass Ordinate + or - Qty calculated for the Division. Plus quantity indicates an excess of material within the Division. Minus indicates a shortage of material within the Division.

MGS GUARDRAIL

CATEGORY	STATION	TO STATION	LOCATION	614.2300	614.2500	614.2610
				MGS GUARDRAIL 3	MGS THRIE BEAM TRANSITION	MGS GUARDRAIL TERMINAL EAT
0010	7+34	-	RT	-	-	1
	8+47	-	LT	-	-	1
	7+87	9+39	RT	112.5	39.4	-
	9+00	9+39	LT	-	39.4	-
	10+61	11+13	LT	12.5	39.4	-
	10+61	11+00	RT	-	39.4	-
	11+66	-	LT	-	-	1
	11+53	-	RT	-	-	1
TOTALS:				125	157.6	4

ROADWAY STRUCTURE

CATEGORY	STATION	TO STATION	LOCATION	305.0120	305.0110	455.0605	465.0105	690.0150
				BASE AGGREGATE DENSE 1 1/4-INCH	BASE AGGREGATE DENSE 3/4-INCH	TACK COAT	ASPHALTIC SURFACE	SAWING ASPHALT
0010	7+25	8+50	SHOULDERS	123	22	3	16	155
	8+50	9+45	LT & RT	290	19	16	80	30
	10+55	11+75	LT & RT	379	27	20	100	28
UNDISTRIBUTED								
PROJECT TOTALS				791	68	39	196	213

SALVAGED RAIL

CATEGORY	STATION	TO STATION	LOCATION	614.0920
				LF
0010	8+48	9+38	RT	90
	8+72	9+38	LT	66
	10+63	11+03	RT	40
	10+63	11+65	LT	102
PROJECT TOTAL				298

WATER

CATEGORY	DESCRIPTION	624.0100
0010	PROJECT 9411-00-70	12
PROJECT TOTALS		12

NOTE: WATER BID ITEM TO BE USED FOR BASE AGGREGATE DUST CONTROL AND COMPACTION.

MOBILIZATIONS EROSION CONTROL

CATEGORY	DESCRIPTION	628.1905	628.1910
		MOBILIZATION EROSION CONTROL EACH	EMERGENCY EROSION CONTROL EACH
0010	PROJECT 9411-00-70	4	2
PROJECT TOTALS		4	2

LANDSCAPING ITEMS

CATEGORY	STATION	TO STATION	LOCATION	625.0100	627.0200	628.1504	628.1520	628.2004	628.2006	628.6005	629.0210	630.0120	630.0500
				TOPSOIL	MULCHING	SILT FENCE	SILT FENCE MAINTENANCE	EROSION MAT CLASS I TYPE B	EROSION MAT URBAN CLASS I TYPE A	TURBIDITY BARRIERS	FERTILIZER TYPE B	SEEDING MIXTURE NO. 20	SEED WATER
0010	7+25	9+45	RT	177	101	210	210	76	-	-	0.20	8	7
	8+25	9+45	LT	103	71	98	98	32	-	-	0.09	4	3
	9+35	9+61	LT & RT	-	-	-	-	-	-	132	-	-	-
	10+55	11+75	RT	147	93	140	140	54	-	-	0.12	5	4
	10+55	11+75	LT	105	105	113	113	-	-	-	0.07	3	3
	10+32	10+54	LT & RT	-	-	-	-	-	-	157	-	-	-
UNDISTRIBUTED				53	37	26	26	16	50	15	0.10	2	1
PROJECT TOTALS				585	407	587	587	178	50	304	0.58	22	18

PROJECT NO: 9411-00-70

HWY: CTH E

COUNTY: LINCOLN

MISCELLANEOUS QUANTITIES

SHEET

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RIPRAP

CATEGORY	STATION	TO STATION	LOCATION	606.0300	645.0120
				HEAVY CY	GEOTEXTILE TYPE HR SY
0010	8+50	8+78	RT	62	157
	9+23	9+56	LT	18	54
	10+45	11+55	LT	43	142
	10+53	10+66	RT	5	20
PROJECT TOTALS				128	373

PERMANENT SIGNING

CATEGORY	STATION	LOCATION	SIGN CODE	637.2230	634.0612
				SIGNS TYPE II REFLECTIVE F	POSTS WOOD 4X6-INCH X 12-FT EACH
0010	9+35	RT	W5-52R	3.00	1
	9+35	LT	W5-52L	3.00	1
	10+55	RT	W5-52R	3.00	1
	10+55	LT	W5-52L	3.00	1
PROJECT TOTALS				12.00	4

PAVEMENT MARKINGS

CATEGORY	STATION	TO STATION	646.1005	NOTES
			MARKING LINE PAINT 4-INCH LF	
0010	7+25	11+75	900	DOUBLE YELLOW CENTERLINE
	7+25	11+75	900	SOLID WHITE EDGE LINE
PROJECT TOTALS			1,800	

TRAFFIC CONTROL ITEMS

CATEGORY	LOCATION	DAYS	643.0420	643.0705	643.0900			
			TRAFFIC CONTROL BARRICADES TYPE III EACH	TRAFFIC CONTROL WARNING LIGHTS TYPE A EACH	TRAFFIC CONTROL SIGNS EACH	TRAFFIC CONTROL SIGNS DAYS		
0010	STH 86 INTERSECTION	66	2	132	4	264	2	132
	BEGINNING OF PROJECT	66	7	462	10	660	5	330
	END OF PROJECT	66	7	462	10	660	5	330
	CTH O INTERSECTION	66	2	132	4	264	2	132
	UNDISTRUBUTED	66	2	132	2	132	2	132
PROJECT TOTALS			20	1,320	30	1,980	16	1,056

CONSTRUCTION STAKING

CATEGORY	STATION	TO STATION	650.9910.01	650.6500	650.4500	650.5000	650.9920
			SUPPLEMENTAL CONTROL LS	STRUCTURE LAYOUT LS	SUBGRADE LF	BASE LF	SLOPE STAKES LF
0010	7+25	9+45	-	-	220	220	220
	10+54	11+75	-	-	121	121	121
	PROJECT 9411-00-70		1	-	-	-	-
0020	B-35-0018		-	1	-	-	-
PROJECT TOTALS			1	1	341	341	341

PROJECT NO: 9411-00-70

HWY: CTH E

COUNTY: LINCOLN

MISCELLANEOUS QUANTITIES

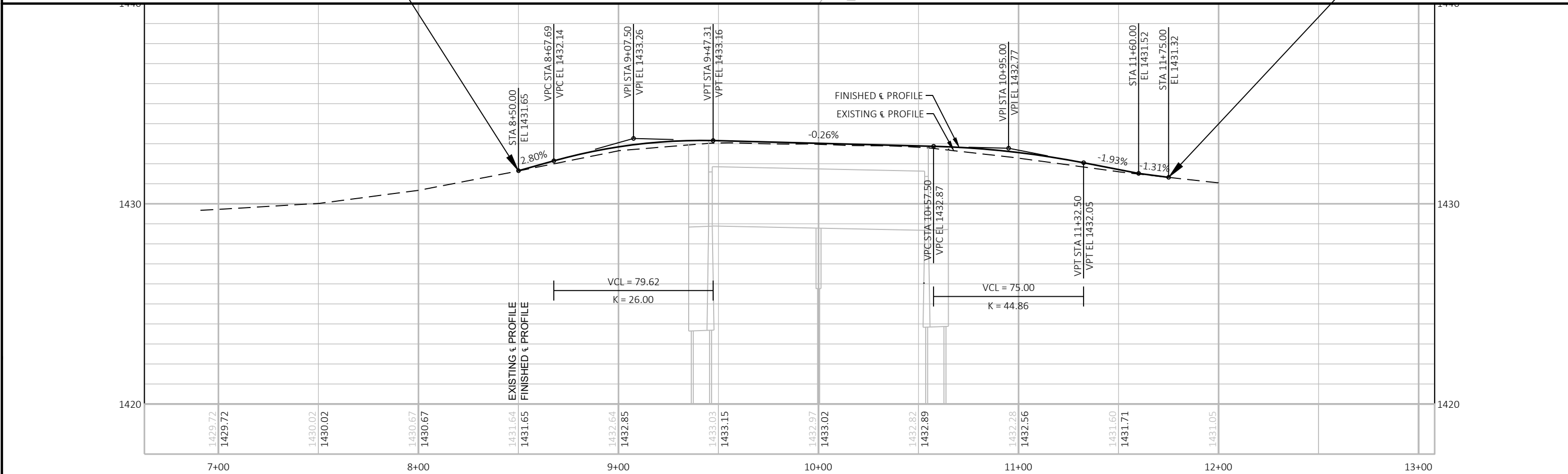
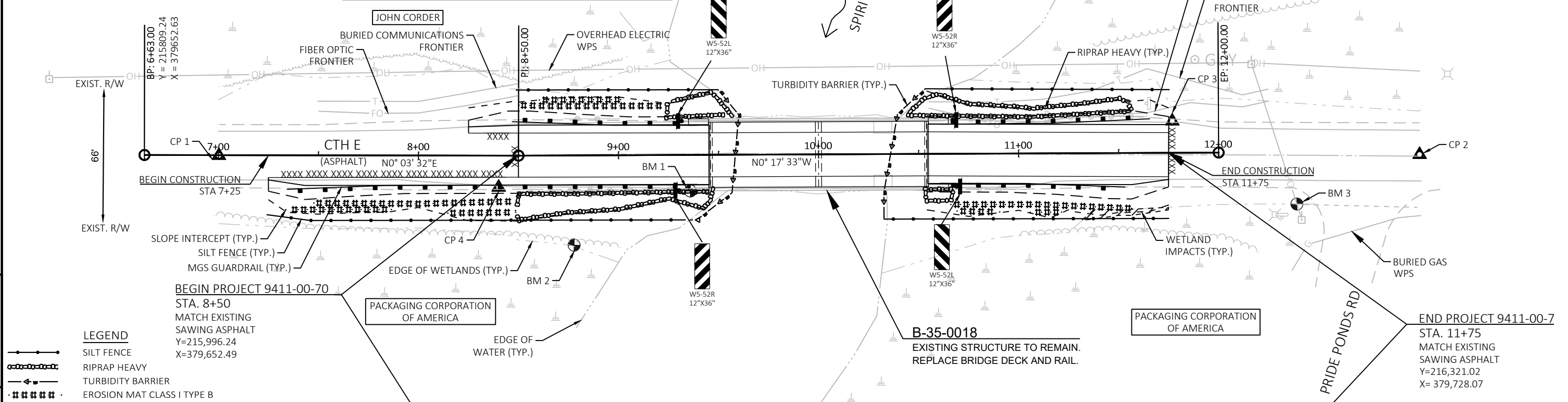
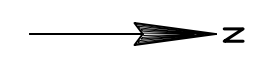
SHEET

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BENCHMARKS			
NO.	STATION	ELEV.	DESCRIPTION
1	9+36, RT 18'	1434.96	CHISELED SQUARE ON SE WINGWALL
2	8+78, RT 45'	1424.55	NAIL NORTH SIDE 12" ELM
3	12+39, RT 24'	1428.99	PK NAIL TOP 15" PLASTIC CULVERT PIPE

CONTROL POINTS			
NO.	STATION	ELEV.	DESCRIPTION
1	7+00, LT 0.2'	1429.71	PK" NAIL
2	13+00, LT 0.5'	1430.78	PK" NAIL
3	11+77, LT 17'	1430.83	12" NAIL
4	8+40, RT 16'	1430.79	12" NAIL

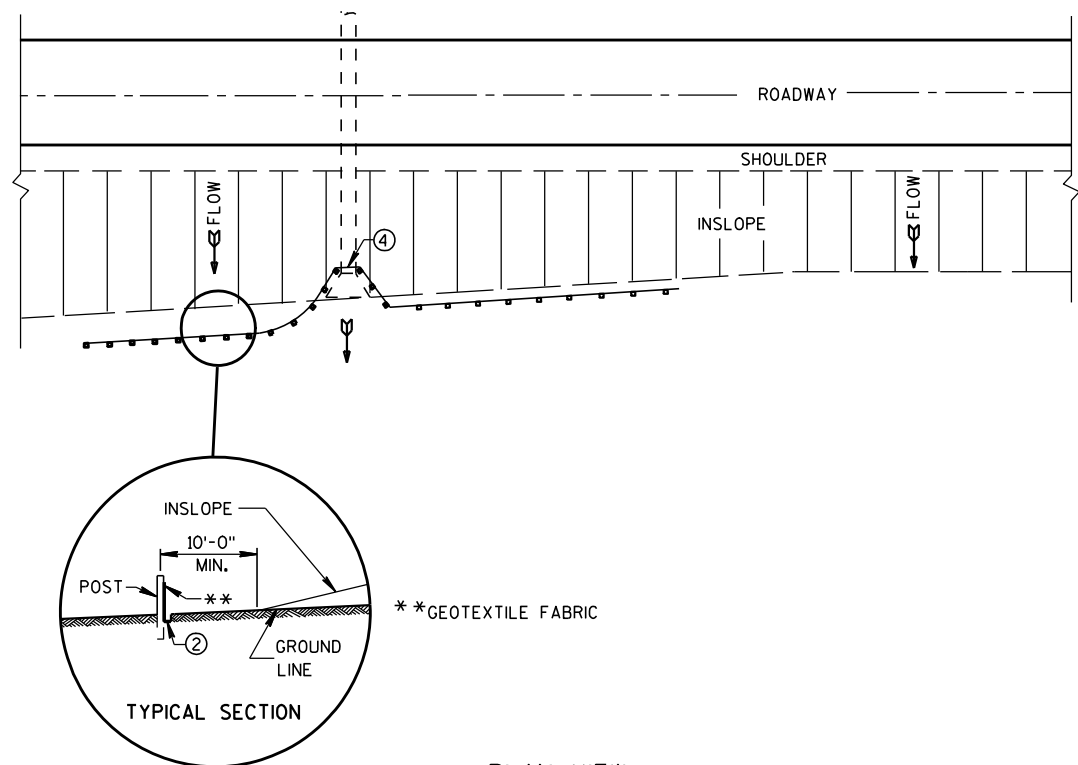
WISCONSIN VALLEY
IMPROVEMENT COMPANY



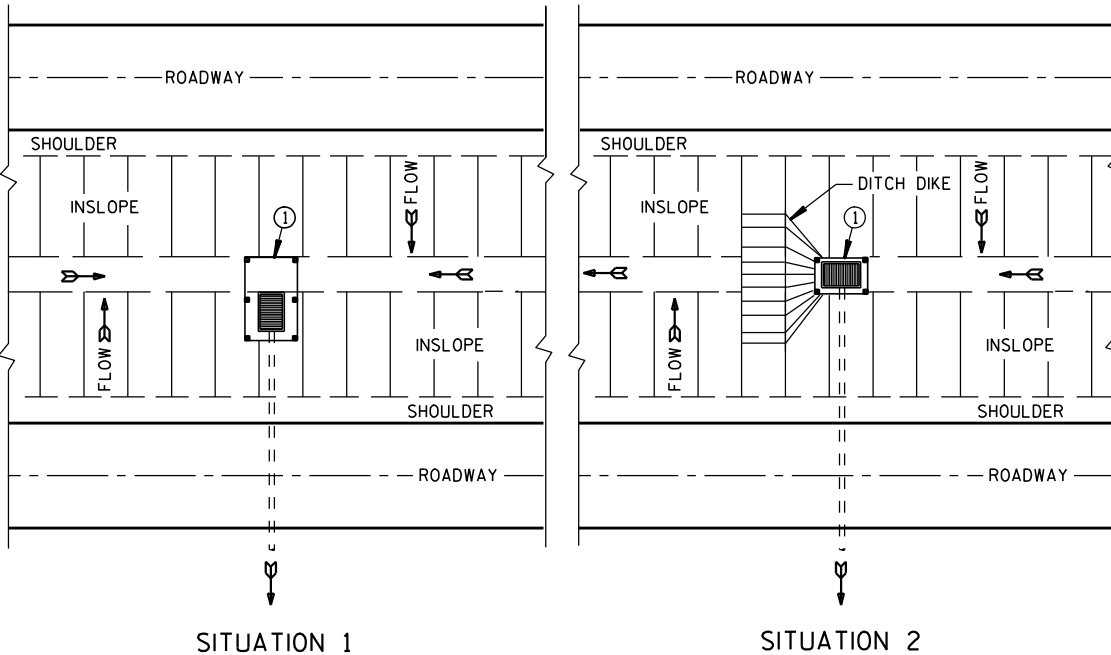
PROJECT NO: 9411-00-70 HWY: CTH E COUNTY: LINCOLN PLAN AND PROFILE: CTH E SHEET **E**

Standard Detail Drawing List

08E09-06	SILT FENCE
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
15C08-19A	LONGITUDINAL MARKING (MAINLINE)
15C11-07B	CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS



PLAN VIEW
TYPICAL APPLICATION OF SILT FENCE

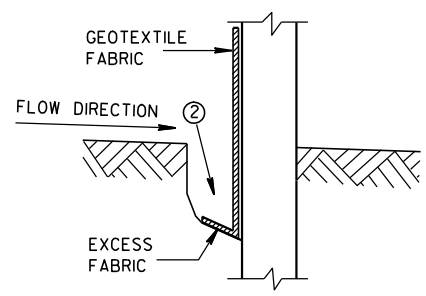


SITUATION 1 SITUATION 2
PLAN VIEW
SILT FENCE AT MEDIAN SURFACE DRAINS

GENERAL NOTES

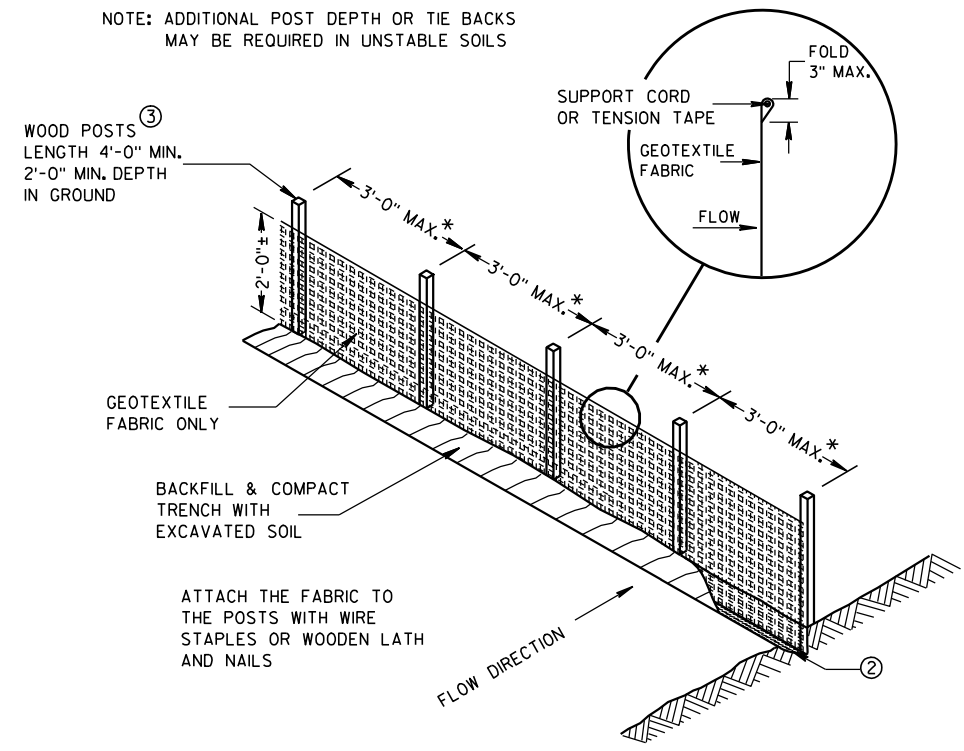
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

- 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.



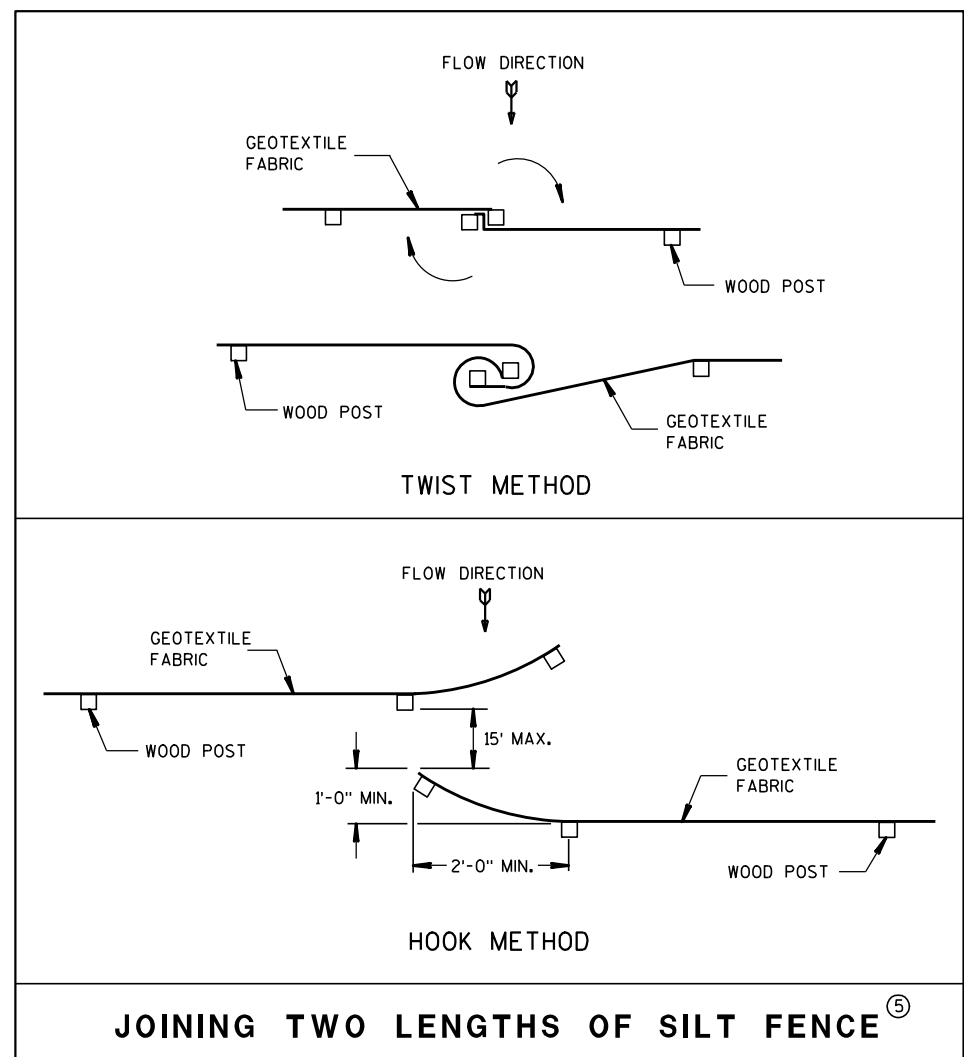
TRENCH DETAIL

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

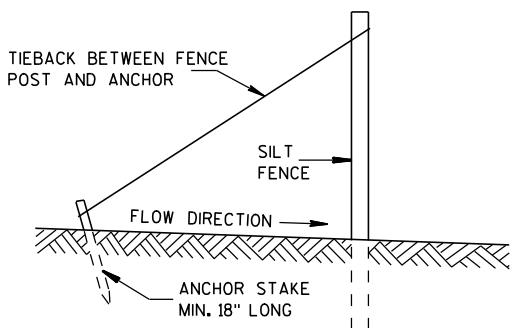


SILT FENCE

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

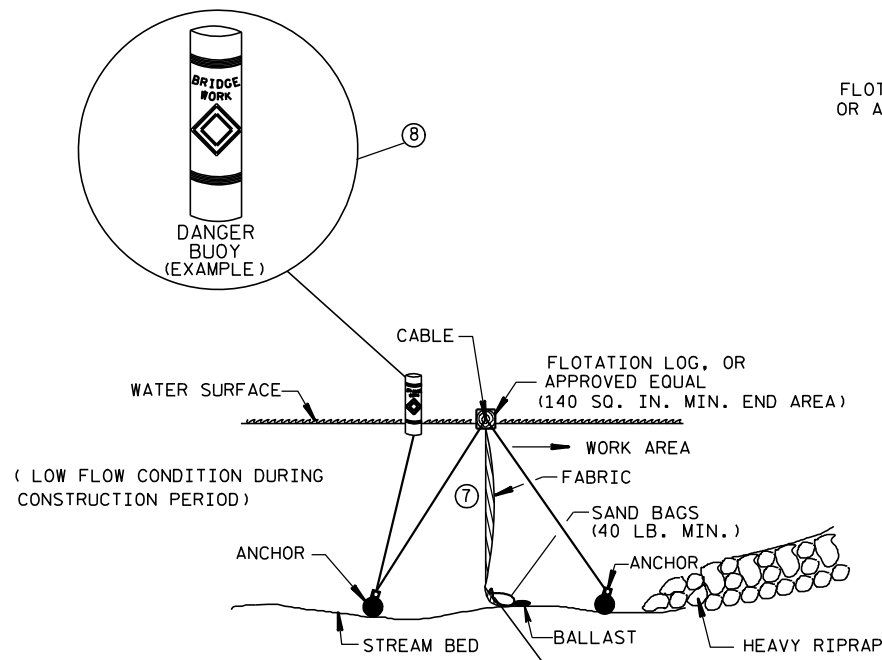


JOINING TWO LENGTHS OF SILT FENCE ⑤



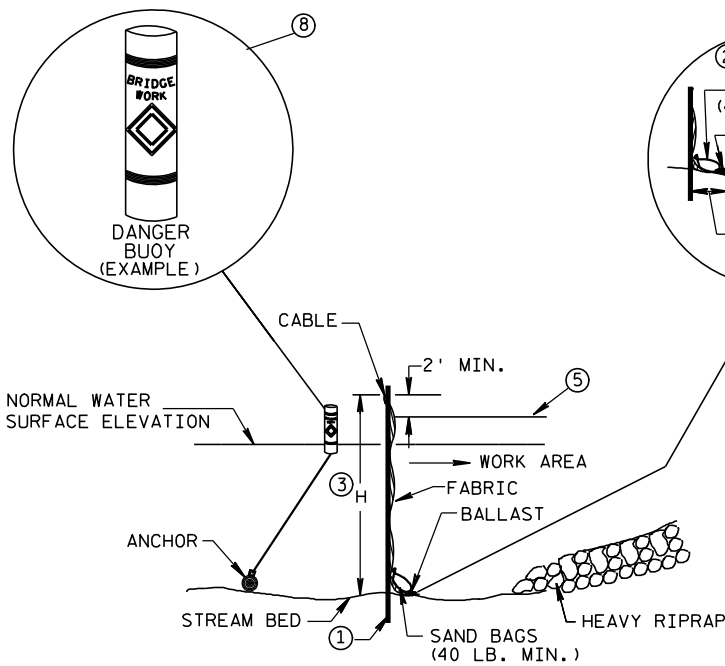
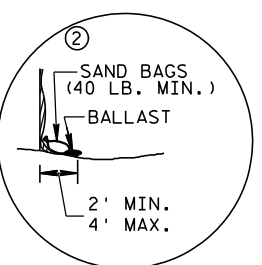
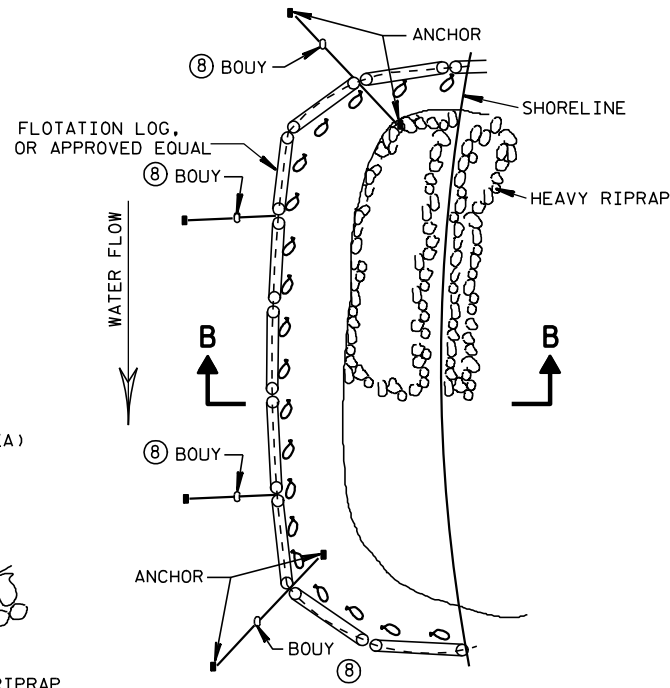
SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)

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



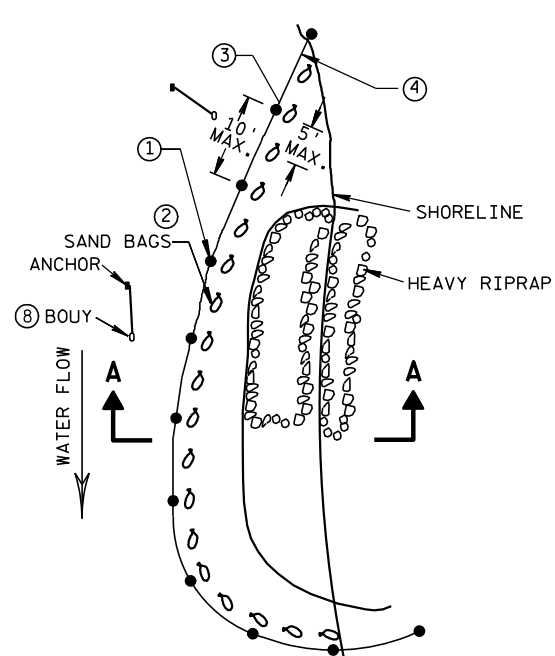
SECTION B-B

TURBIDITY BARRIER FLOAT ALTERNATIVE
CAUTION - SEE NOTE 6



SECTION A-A

TURBIDITY BARRIER STANDARD POST INSTALLATION



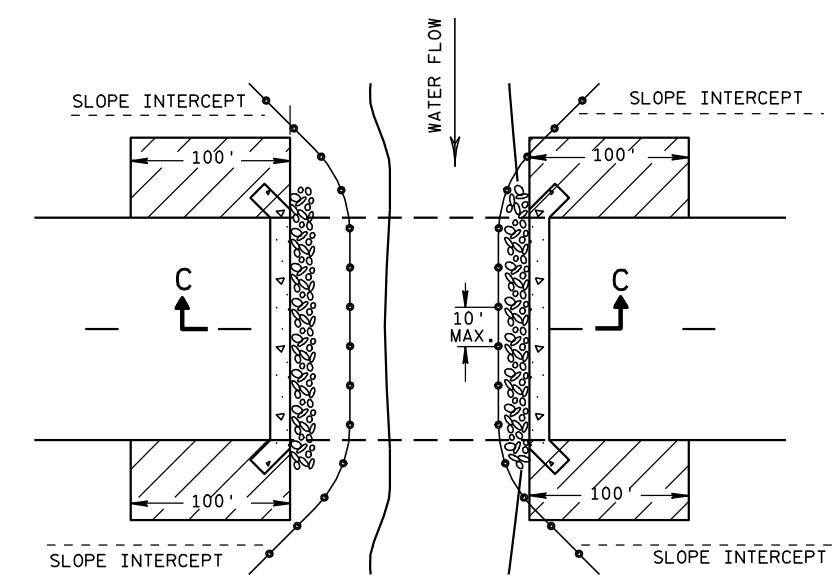
PLAN VIEW

GENERAL NOTES

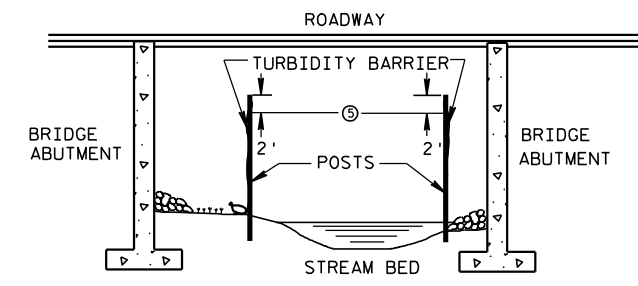
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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.



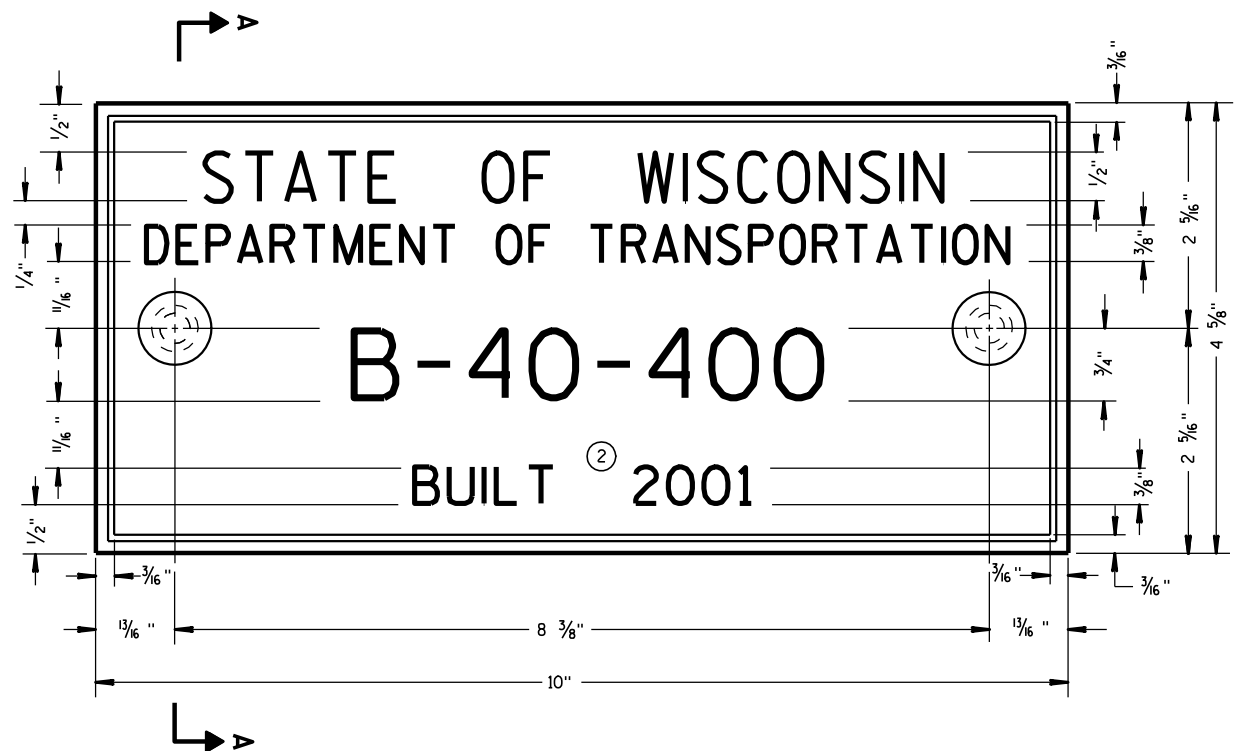
PLAN VIEW



SECTION C-C

TURBIDITY BARRIER DETAIL SHOWING
TYPICAL PLACEMENT AT STRUCTURES

TURBIDITY BARRIER	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED	/S/ Beth Canestra
6/04/02 DATE	CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA	



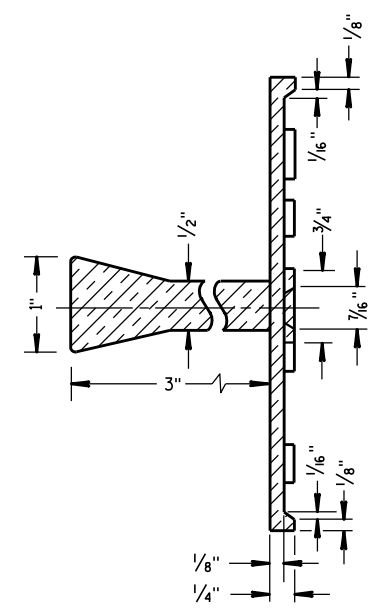
TYPICAL NAME PLATE
(BRIDGES, CULVERTS, AND RETAINING WALLS)

GENERAL NOTES

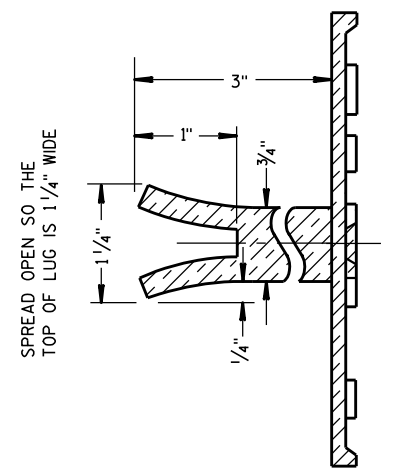
NAME PLATES TO BE INSTALLED ON BRIDGES, CULVERTS, AND RETAINING WALLS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS.

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

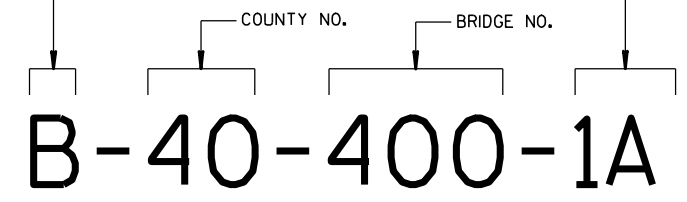
6

6

FOR MULTI-UNIT STRUCTURES
LINE 3 ABOVE SHALL READ

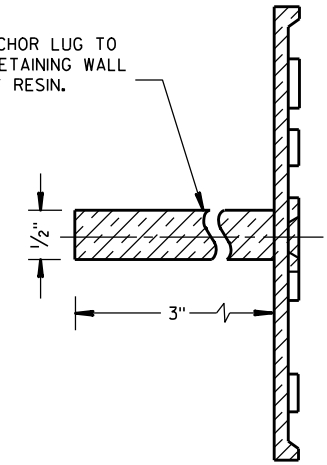
B = BRIDGE
C = CULVERT
R = RETAINING WALL

UNIT NO. FOR MULTIPLE
UNIT BRIDGE



**NUMBERING DESIGNATION
MULTI-UNIT STRUCTURES**

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



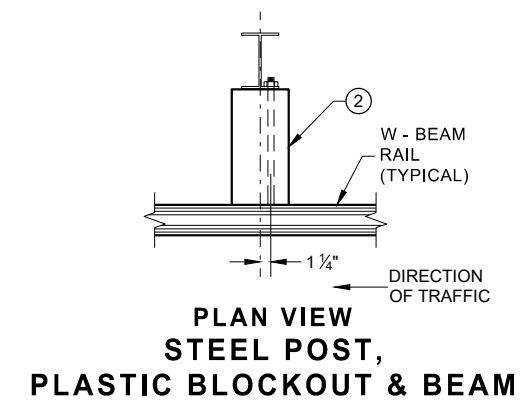
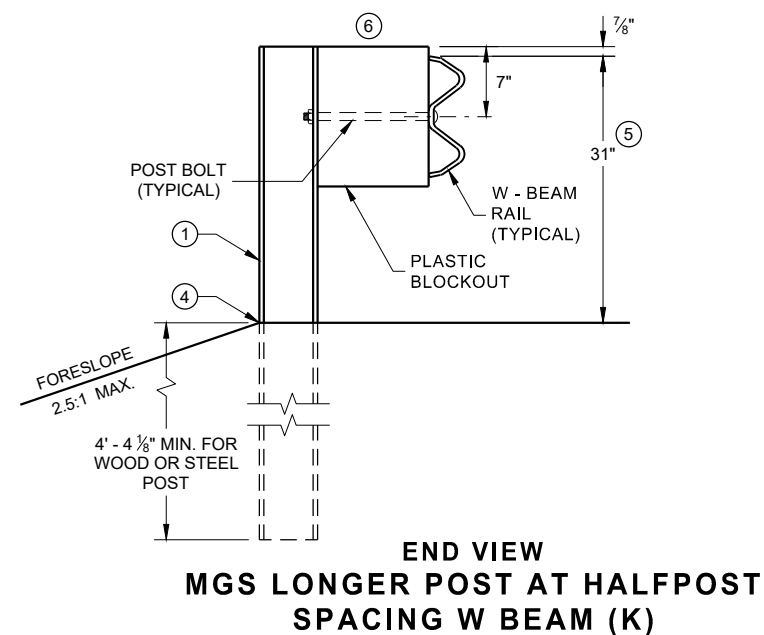
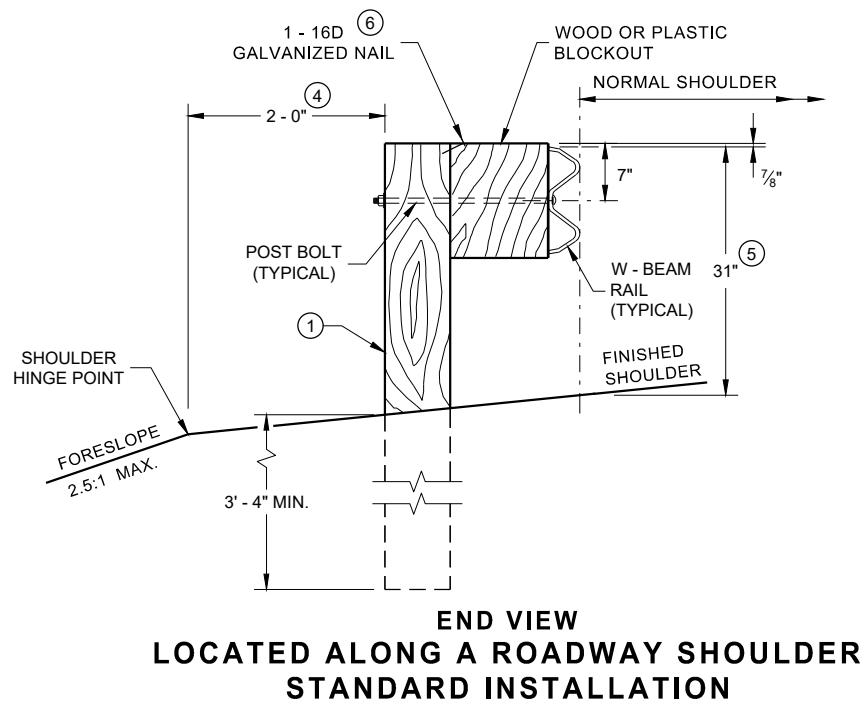
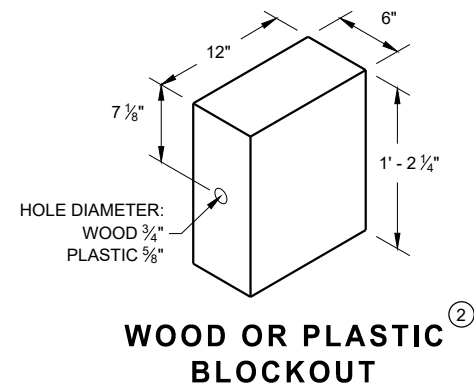
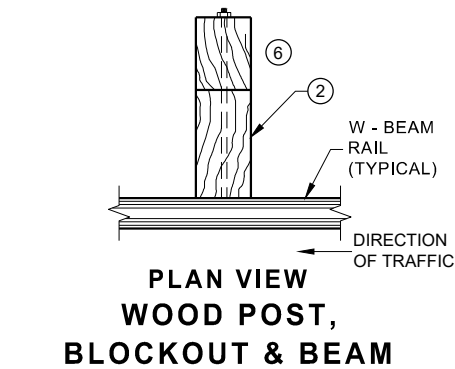
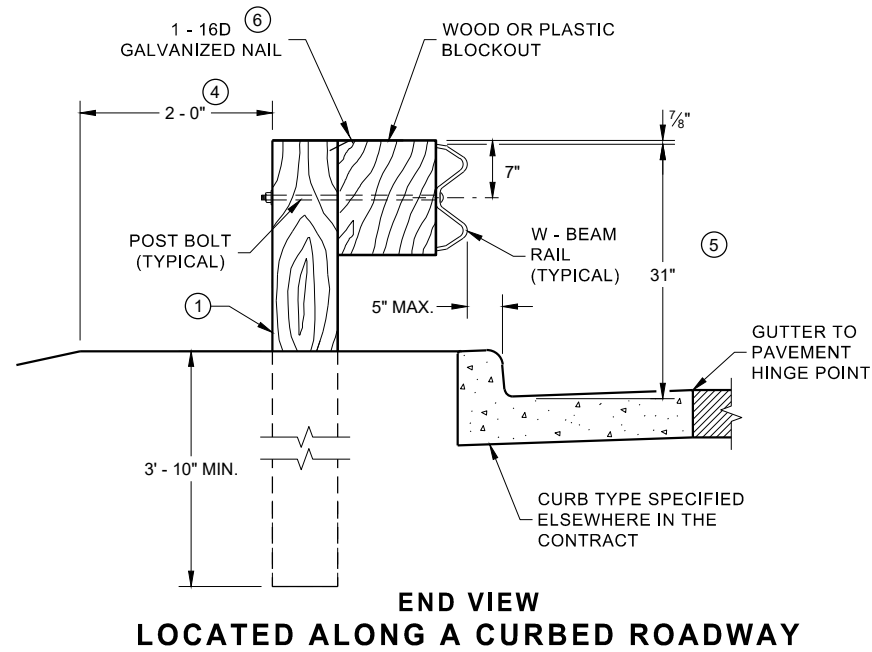
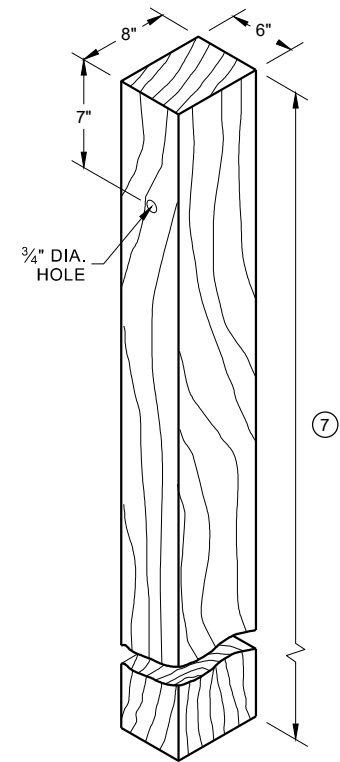
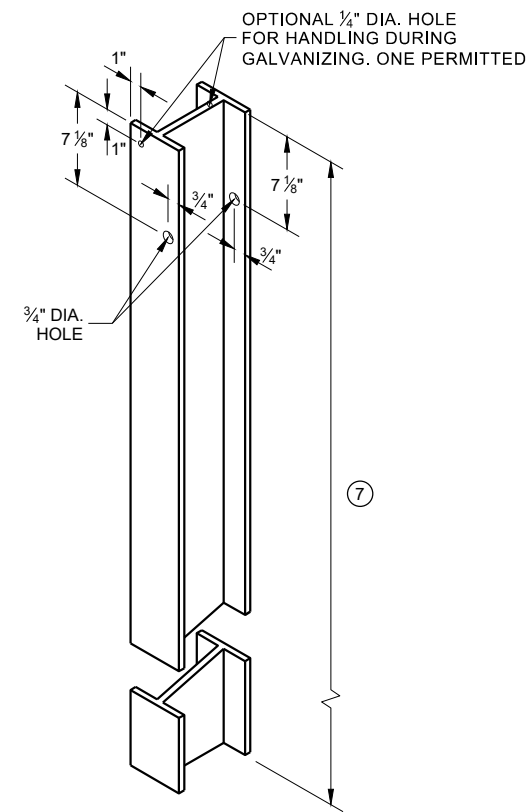
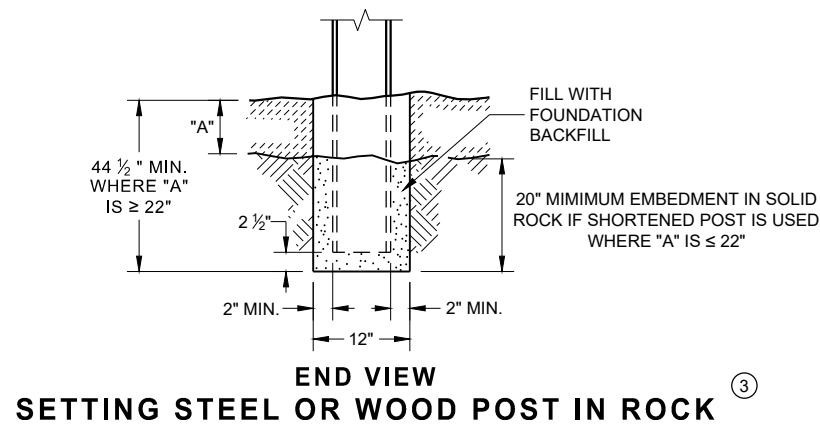
ALTERNATE LUG
(FOR ATTACHMENT TO PRECAST STRUCTURES)

S.D.D. 12 A 3-10

S.D.D. 12 A 3-10

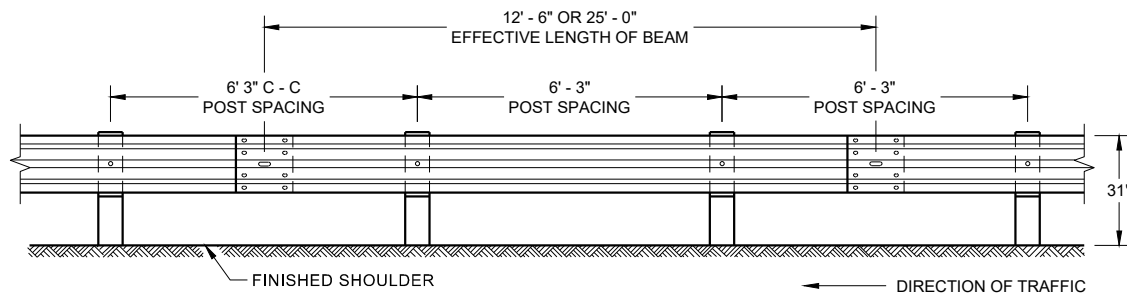
NAME PLATE (STRUCTURES)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED DATE 3/26/10	/S/ Scot Becker CHIEF STRUCTURAL DEVELOPMENT ENGINEER
FHWA	

- ① WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- ② USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.
- ③ IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2 1/2" INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AND INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.
- ④ WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).
- ⑤ FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS +1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27 3/4" TO 32".
- ⑥ WHEN USING STEEL POST AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- ⑦ TOTAL POST LENGTH FOR TYPE K IS 7' - 0". TOTAL POST LENGTH FOR OTHER MGS TYPES IS 6' - 0".

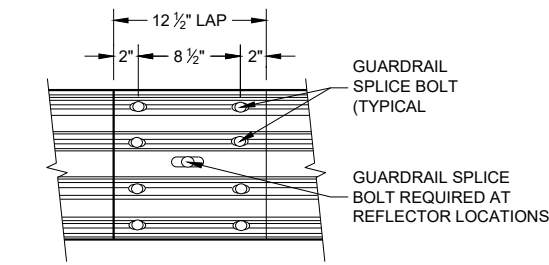


**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



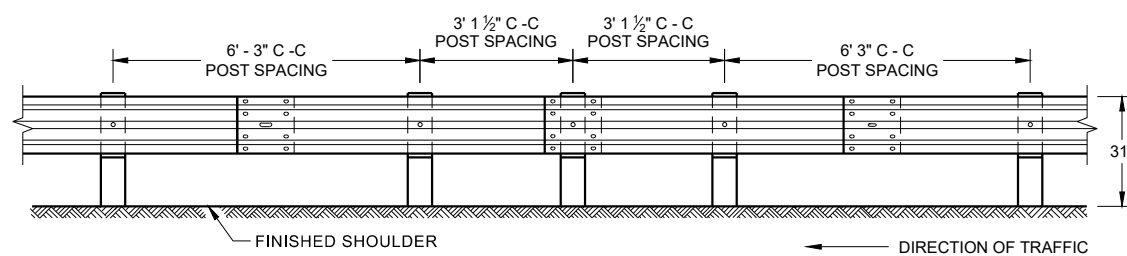
**FRONT VIEW
POST SPACING STANDARD INSTALLATION**



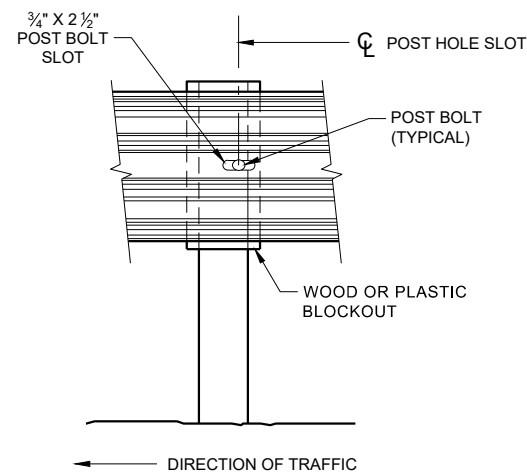
**FRONT VIEW
MID-SPAN BEAM SPLICE**

GENERAL NOTES

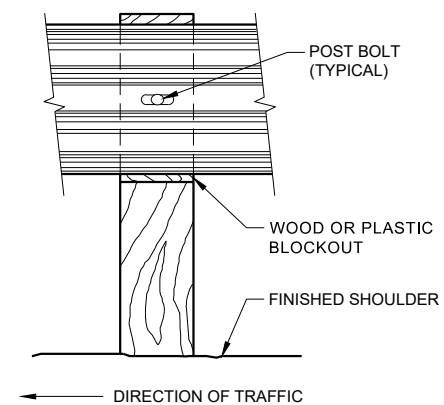
- ⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPLICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.
 - ⑨ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.
- POST BOLTS ARE A 3/8" 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.



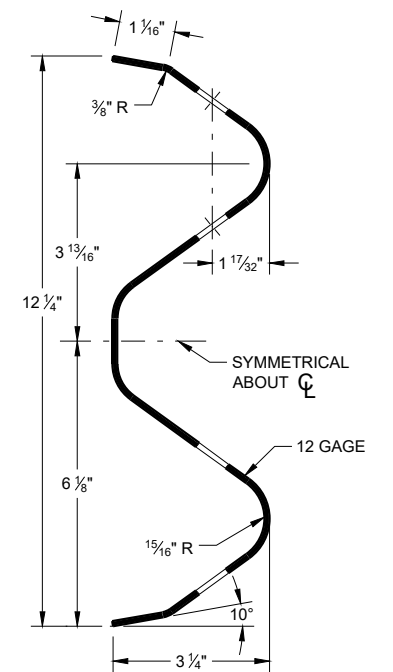
**FRONT VIEW
HALF POST SPACING (HS) AND
HALF POST SPACING WITH LONGER POSTS (K)**



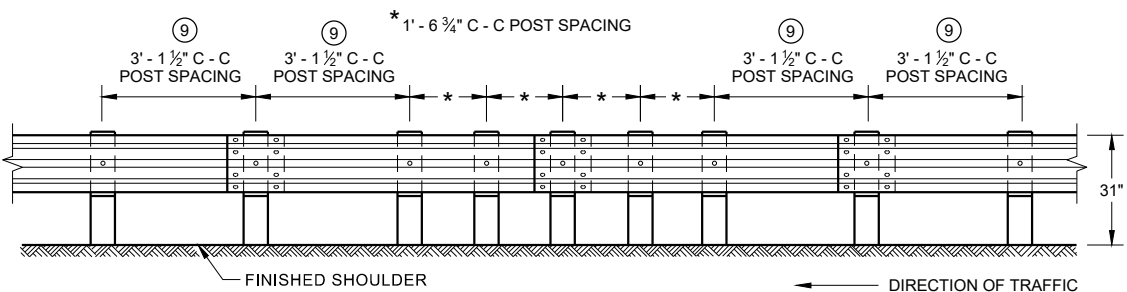
FRONT VIEW AT STEEL POST



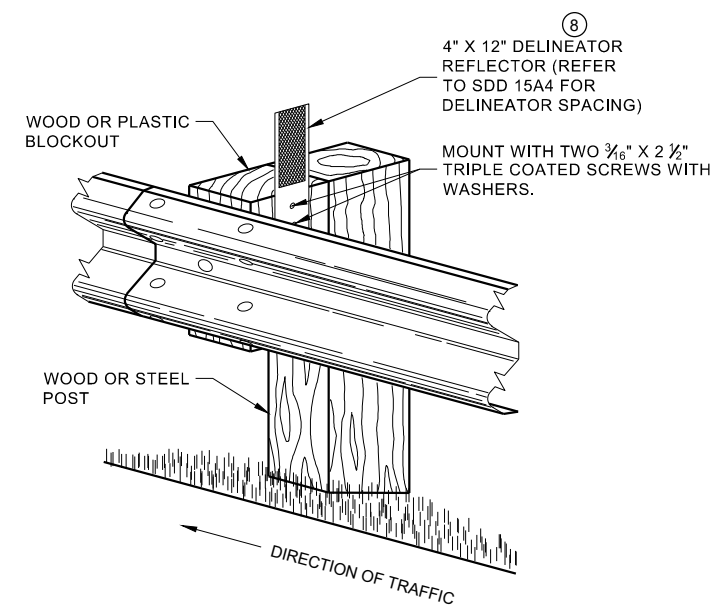
FRONT VIEW AT WOOD POST



SECTION THRU W-BEAM RAIL



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



**ONE SIDED REFLECTOR DETAIL
AND TYPICAL INSTALLATION**

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

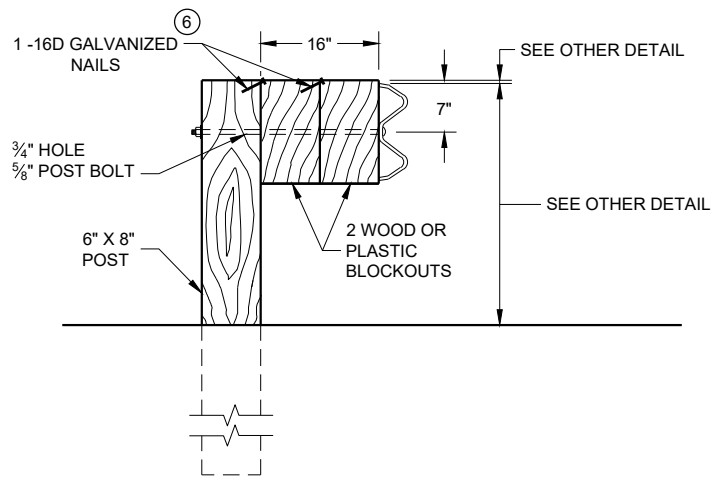
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

6

SDD 14B42 - 06b

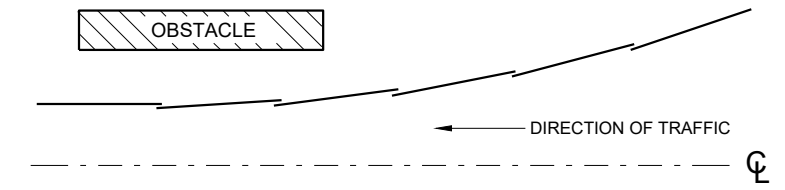
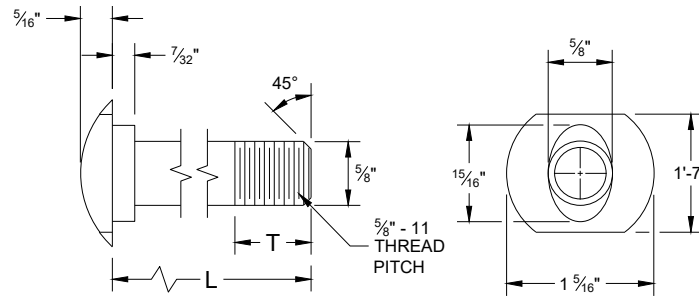
SDD 14B42 - 06b



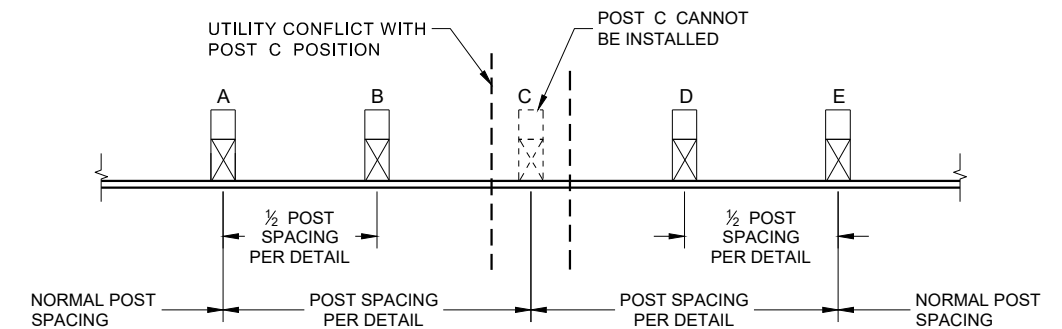
DETAIL FOR 16" BLOCKOUT DEPTH

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.



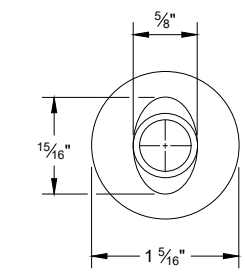
**PLAN VIEW
BEAM LAPPING DETAIL**



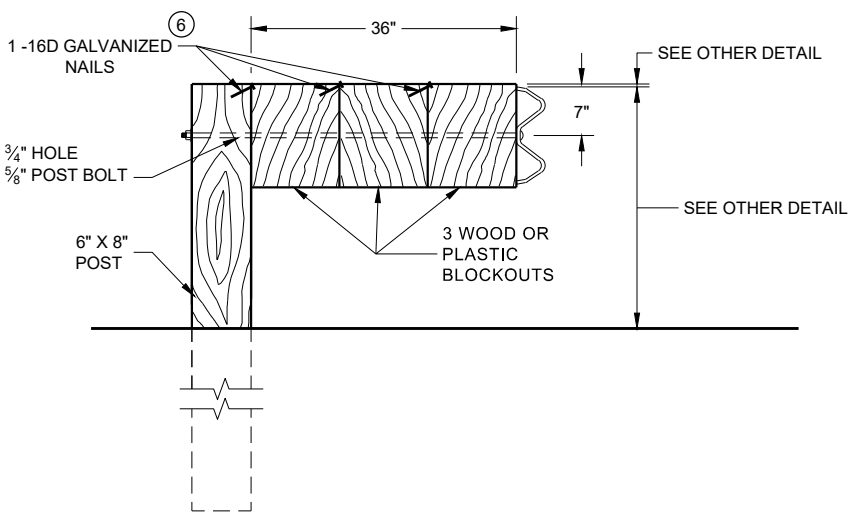
**POST DRIVING FOR CONTINUOUS
UNDERGROUND OBSTRUCTION**

POST BOLT TABLE

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

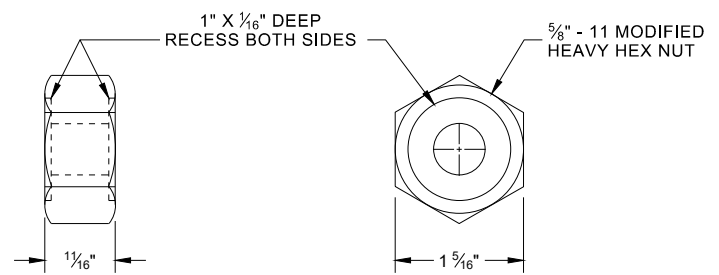


ALTERNATE BOLT HEAD

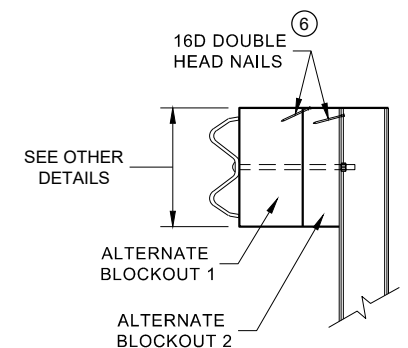


DETAIL FOR 36" BLOCKOUT DEPTH

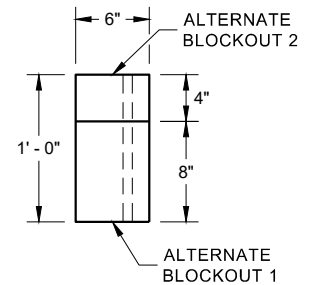
NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT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



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



SIDE VIEW



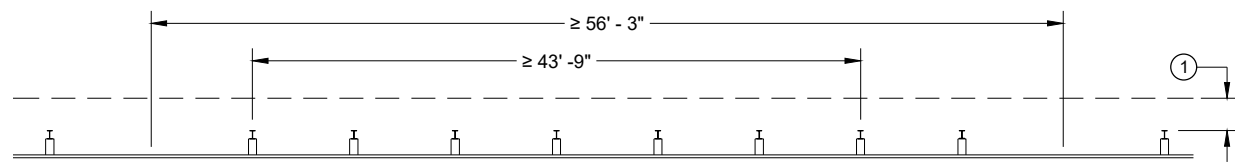
PLAN VIEW

**ALTERNATE WOOD
BLOCKOUT DETAIL**

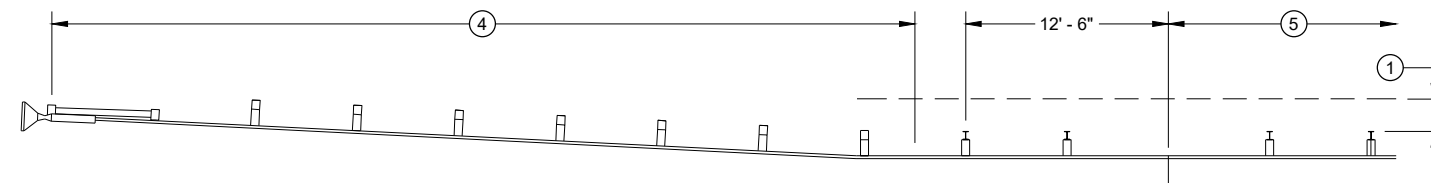
6 WHEN USING STEEL POST AND WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

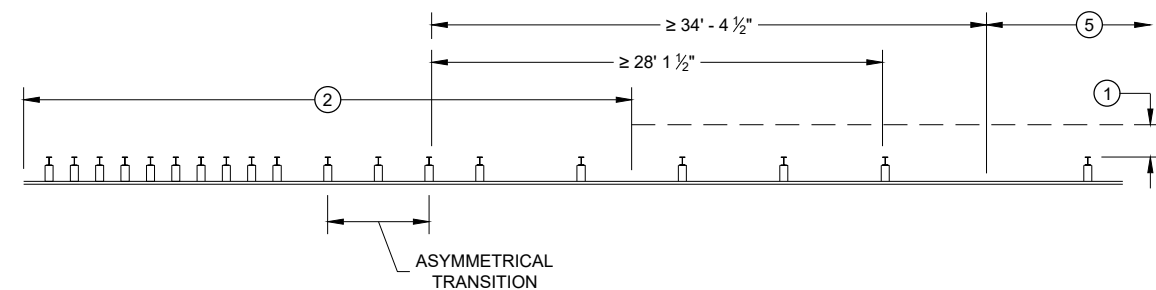
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



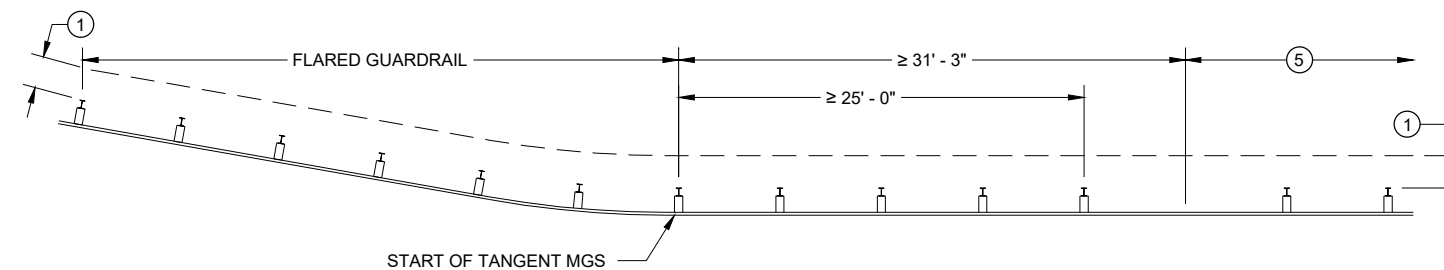
MISSING POST IN NORMAL BEAM GUARD RUN



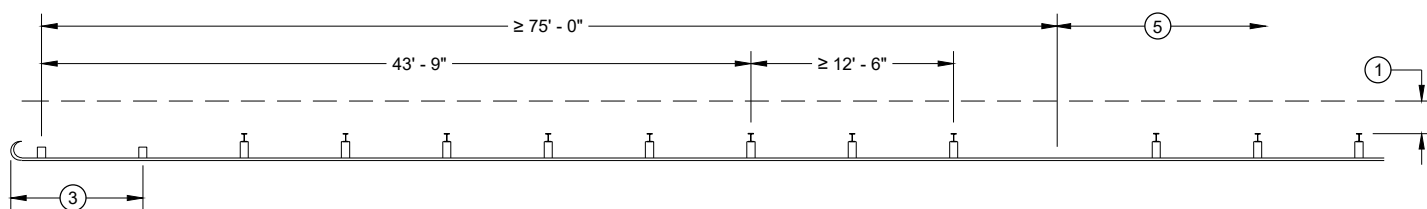
MISSING POST IN NORMAL BEAM GUARD RUN NEAR EAT



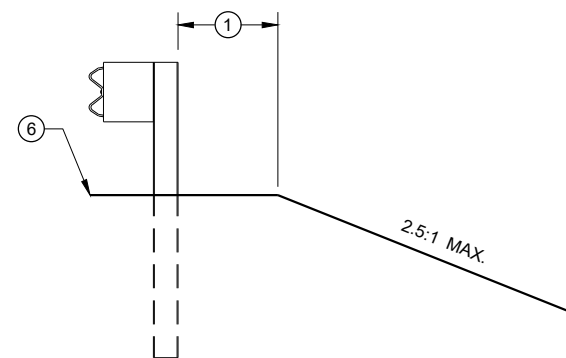
MISSING POST NEAR APPROACH THRIE BEAM TRANSITION



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

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.

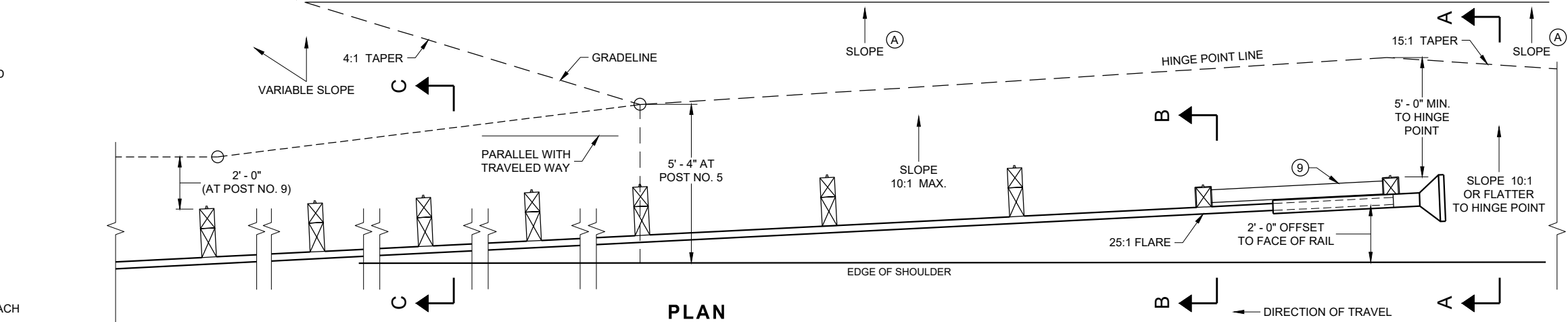
* DO NOT ATTACH BLOCKOUTS TO POST 1 AND 2.

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

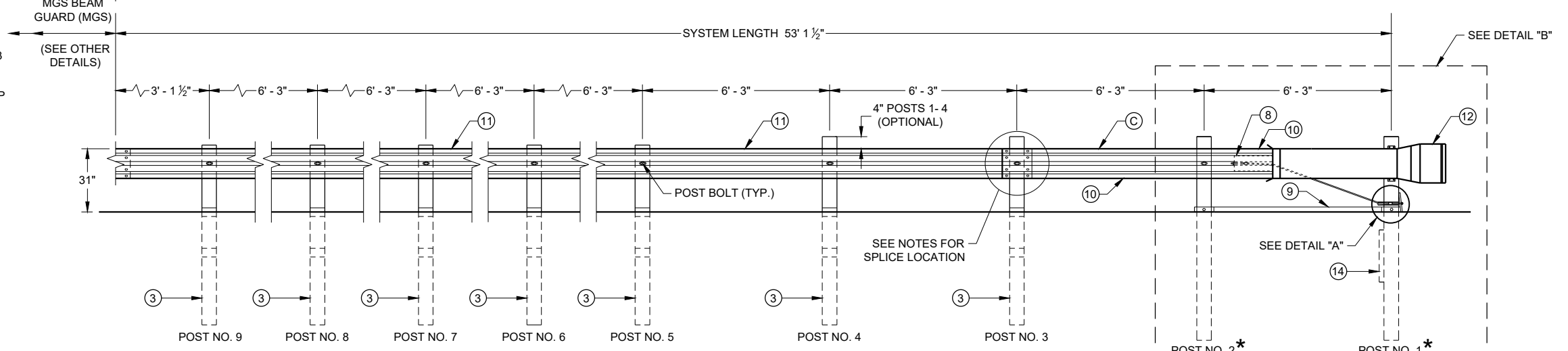
SEE MANUFACTURER'S DRAWING FOR SPLICE LOCATION, HARDWARE DIMENSIONS AND INSTALLATION INSTRUCTIONS.

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.

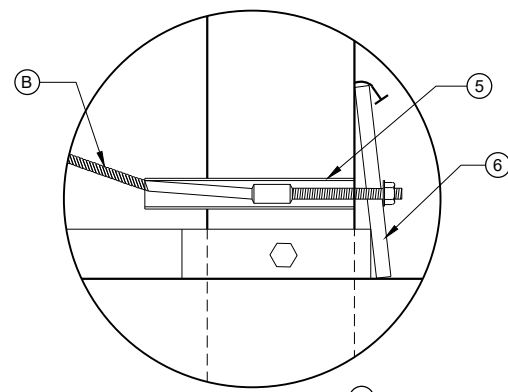
CLEAR ZONE LIMITS, EITHER AS SHOWN ELSEWHERE IN THE PLANS OR, IF NOT SHOWN ELSEWHERE IN THE PLANS, 15 FEET BEYOND THE HINGE POINT LINE



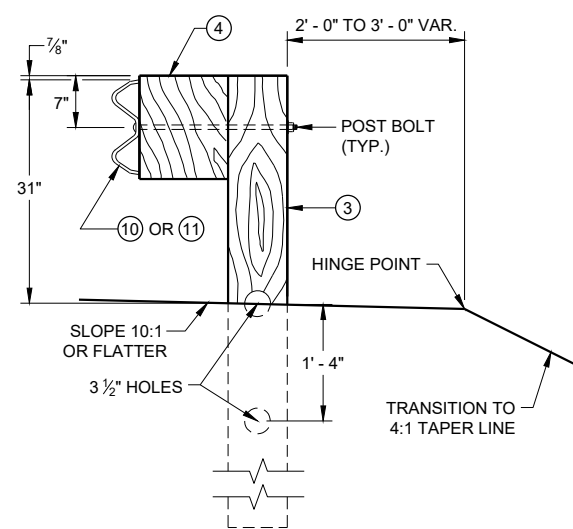
PLAN



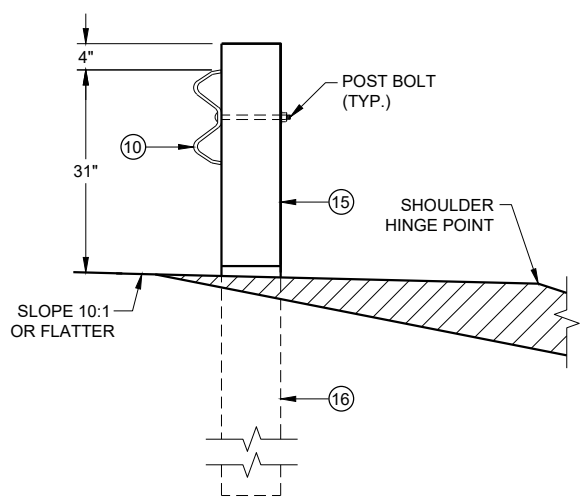
ELEVATION



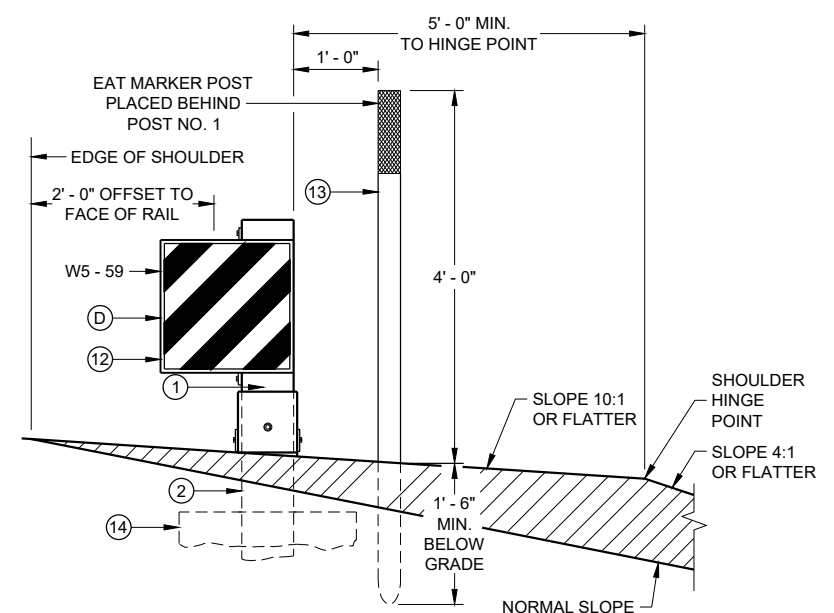
DETAIL "A"



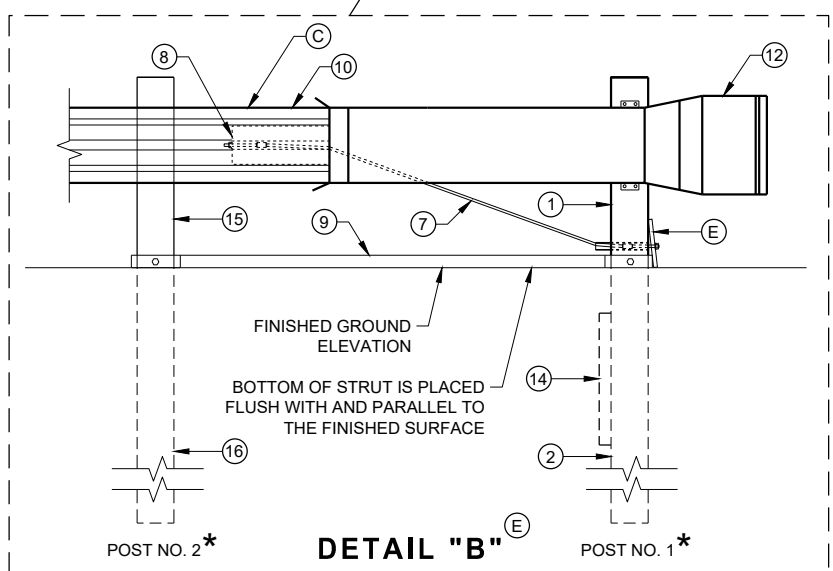
**SECTION C - C
TYPICAL AT POST NOS. 3 - 9**



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



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



DETAIL "B"

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

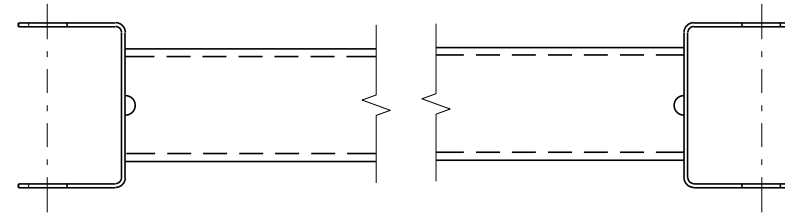
6

SDD 14B44 - 04a

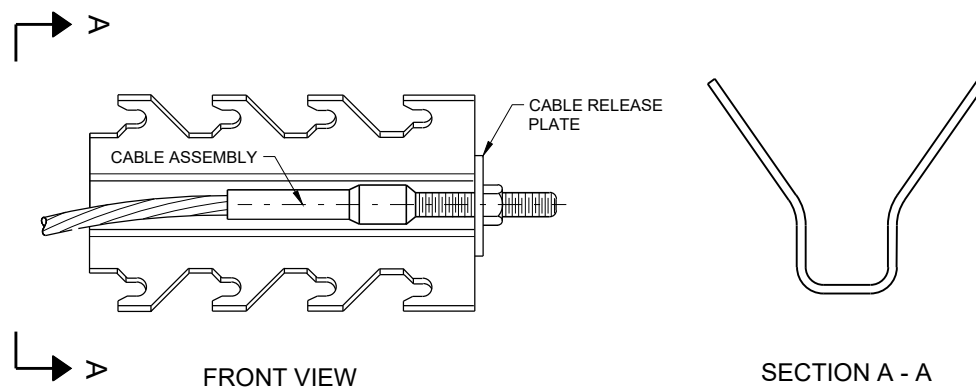
SDD 14B44 - 04a

BILL OF MATERIALS

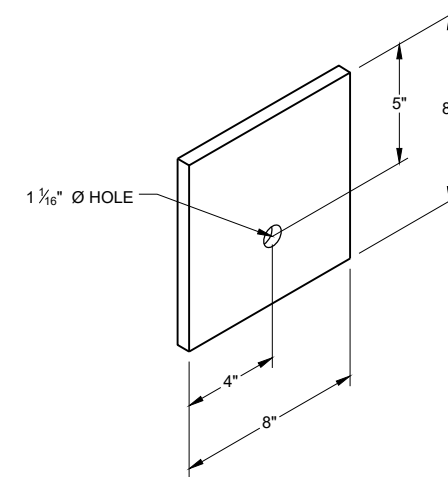
PART NO.	DESCRIPTION MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
①	UPPER POST NO. 1 6" X 6" TUBE
②	LOWER POST NO. 1
③	WOOD CRT
④	WOOD BLOCKOUT
⑤	PIPE SLEEVE
⑥	BEARING PLATE
⑦	BCT CABLE ASSEMBLY
⑧	ANCHOR CABLE BOX
⑨	GROUND STRUT
⑩	PERFORATED W-BEAM RAIL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



GENERIC GROUND STRUT ⑨ ⑤



GENERIC ANCHOR CABLE BOX ⑨ ⑤



BEARING PLATE ⑥ ⑤

6

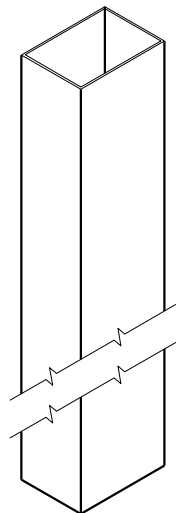
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SDD 14B44 - 04b

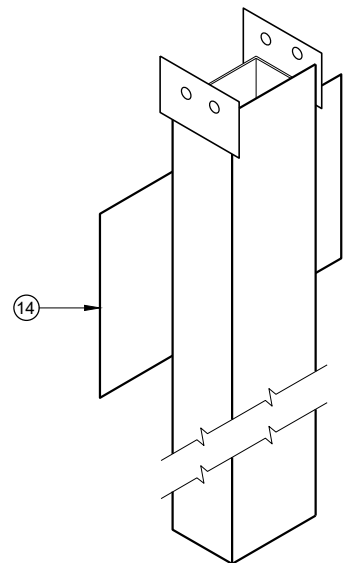
SDD 14B44 - 04b

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

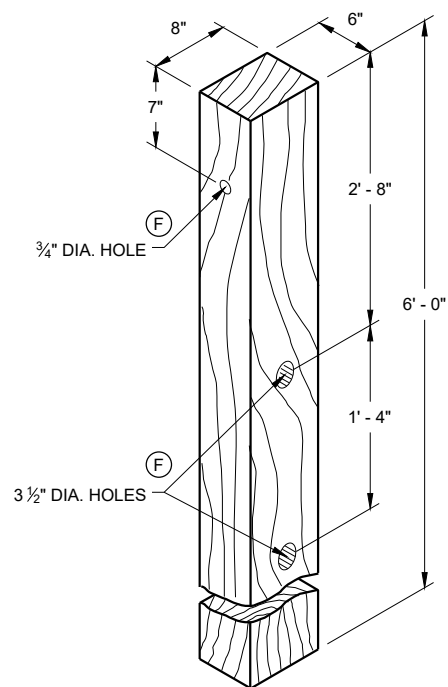
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



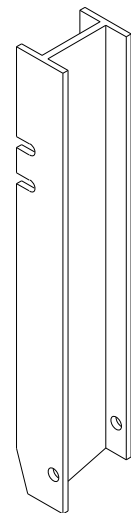
UPPER POST NO. 1 ⁽¹⁾ (E)



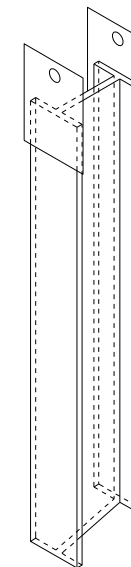
LOWER POST NO. 1 ⁽²⁾ (E)



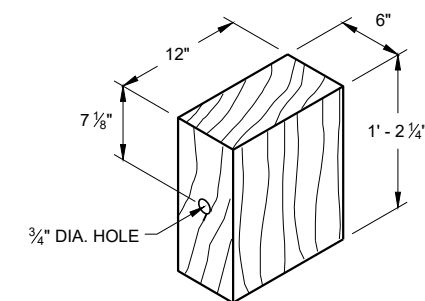
WOOD CRT POST ⁽³⁾ (E)
POSTS NUMBER 3-9



UPPER POST NO. 2 ⁽¹⁵⁾ (E)

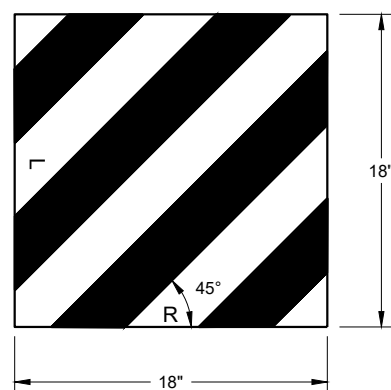


LOWER POST NO. 2 ⁽¹⁶⁾ (E)



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

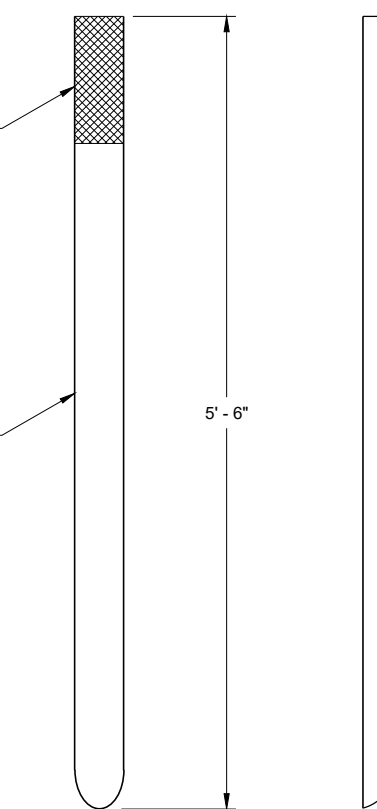
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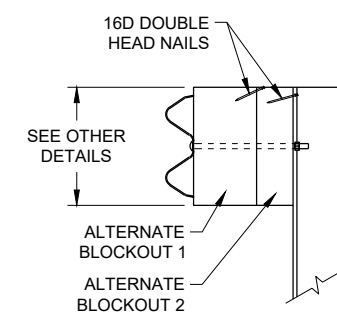
W5 - 59
REFLECTIVE SHEETING DETAIL ^(E)

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

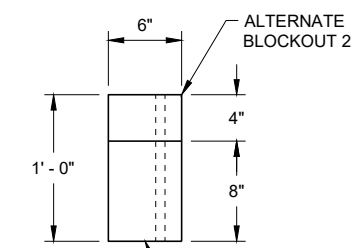
E.A.T. MARKER
POST (YELLOW)



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



SIDE VIEW



TOP VIEW

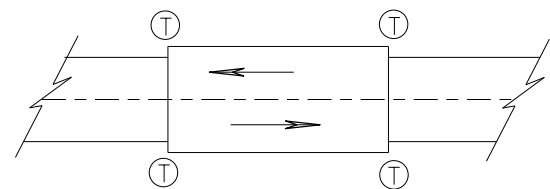
ALTERNATE WOOD
BLOCKOUT DETAIL

6

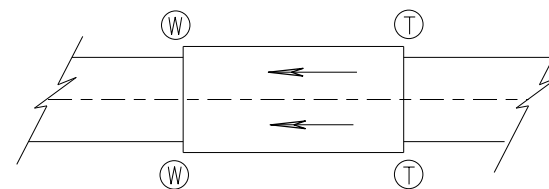
**MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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



TWO WAY TRAFFIC



ONE WAY TRAFFIC

(T) THRIE BEAM CONNECTION

(W) W-BEAM CONNECTION WHEN REQUIRED

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

GENERAL NOTES

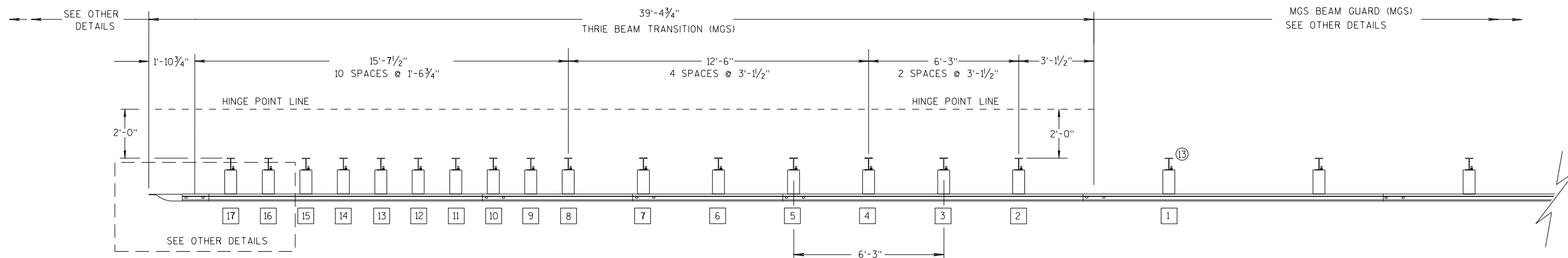
IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2", AND 12" DIAMETER AROUND POST. SEE 14B42 FOR MORE DETAILS.

TRANSITION USES STEEL POSTS ONLY.

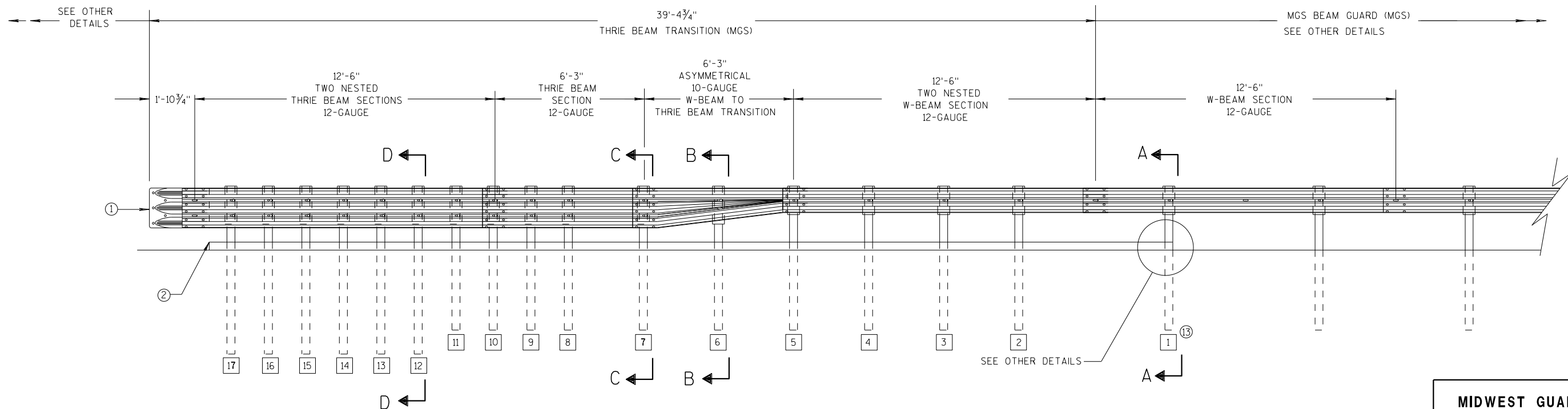
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

POST 2 THROUGH 17 USES STEEL POST ONLY

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



PLAN VIEW



ELEVATION VIEW

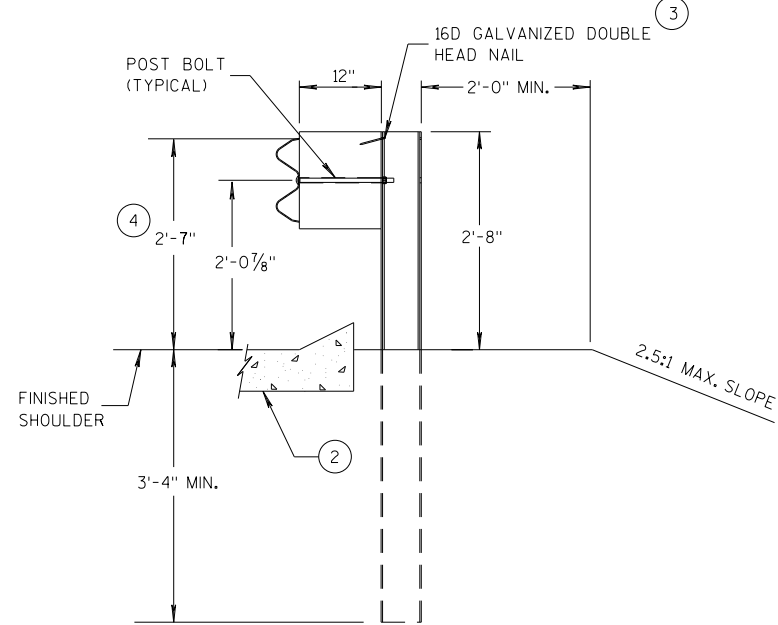
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

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

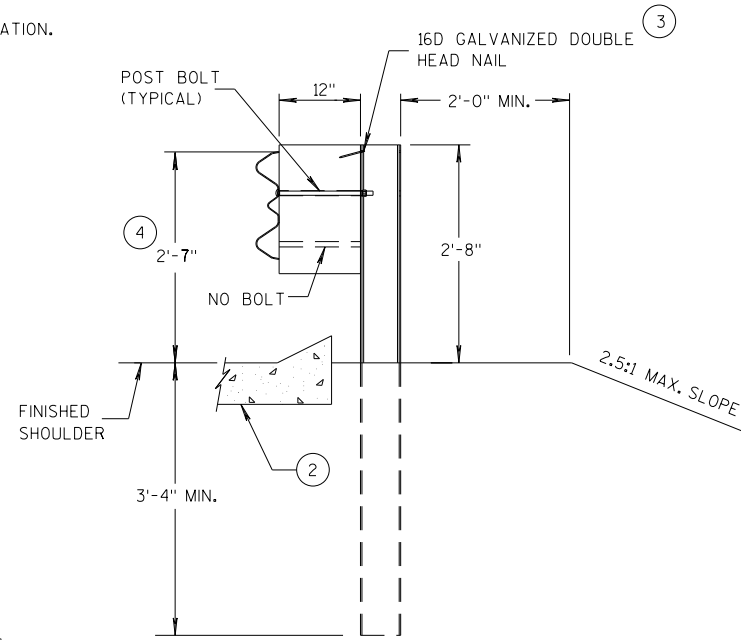
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

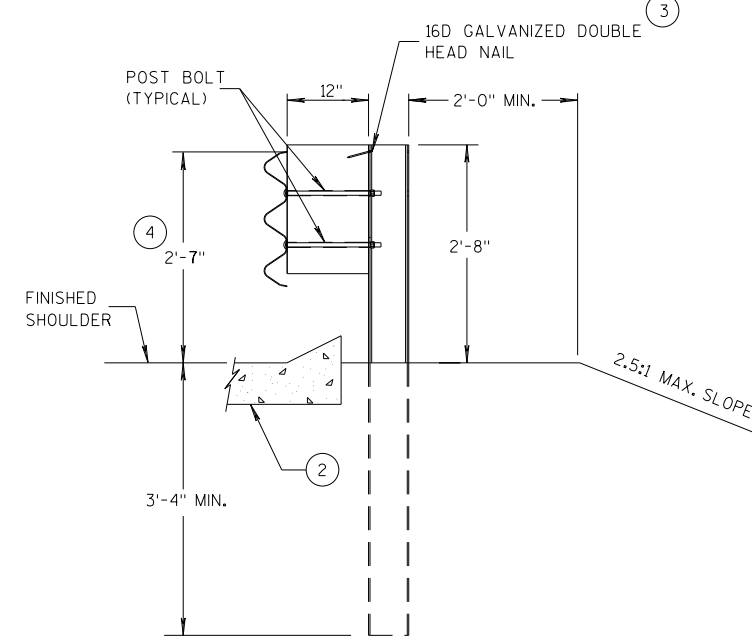
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ③ WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 10D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- ④ TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".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



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



**SECTION B-B
POST 6**



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

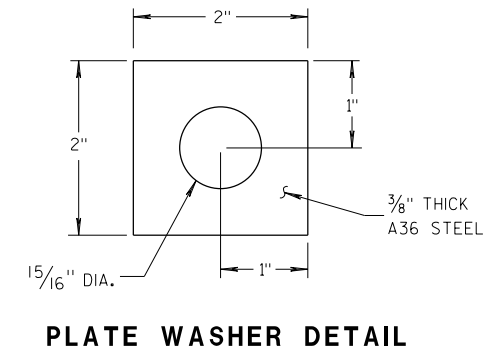
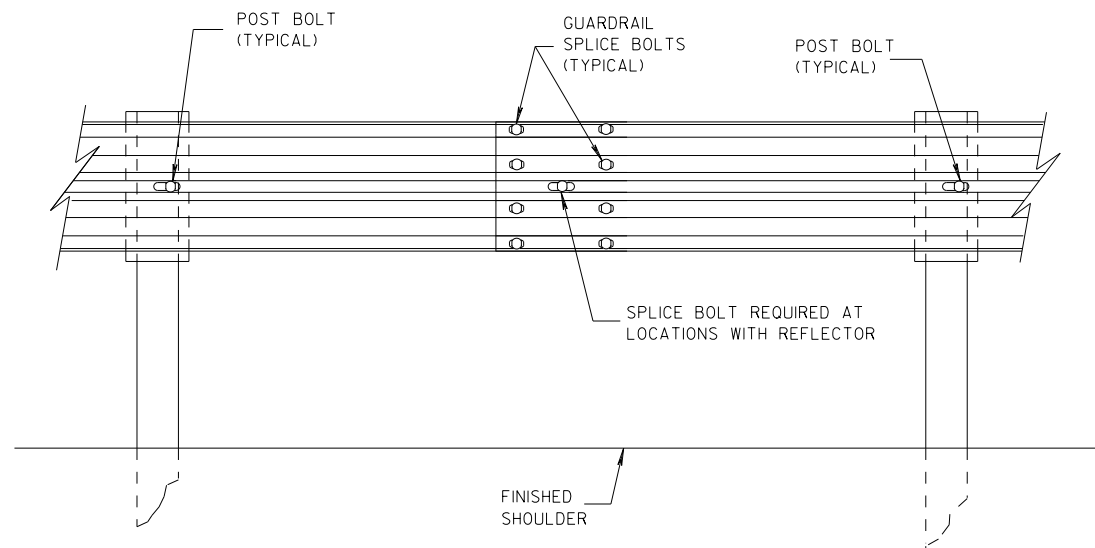
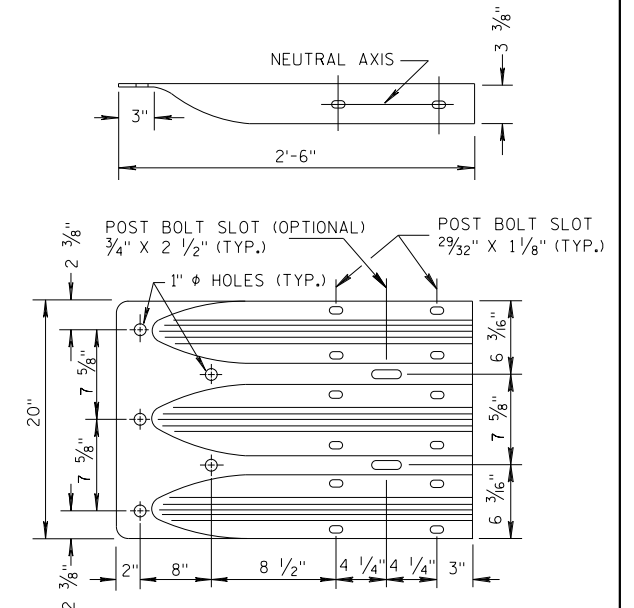


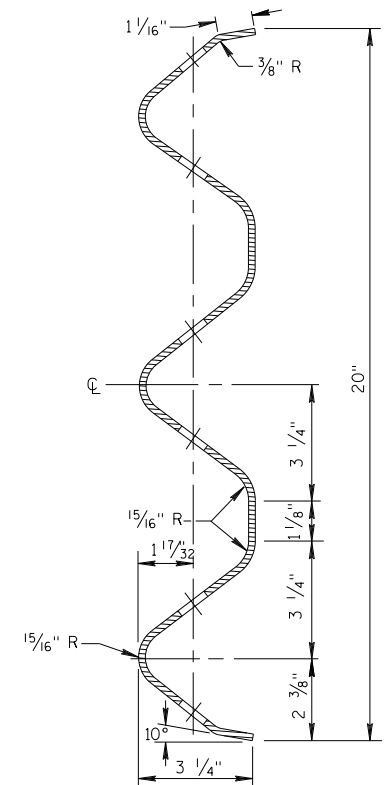
PLATE WASHER DETAIL



SPLICE DETAIL



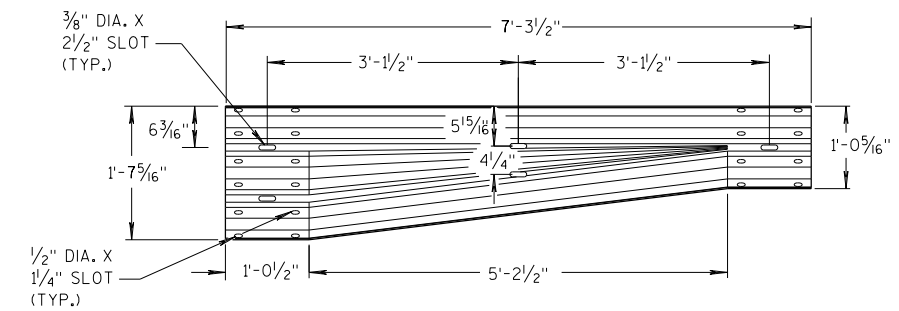
**THRIE BEAM
TERMINAL CONNECTOR**



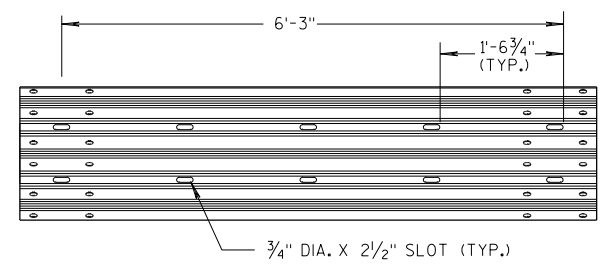
**SECTION THRU THRIE
BEAM RAIL ELEMENT**

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

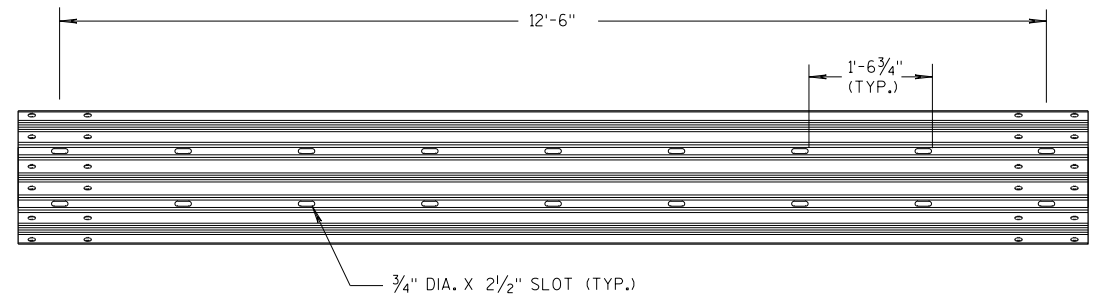
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



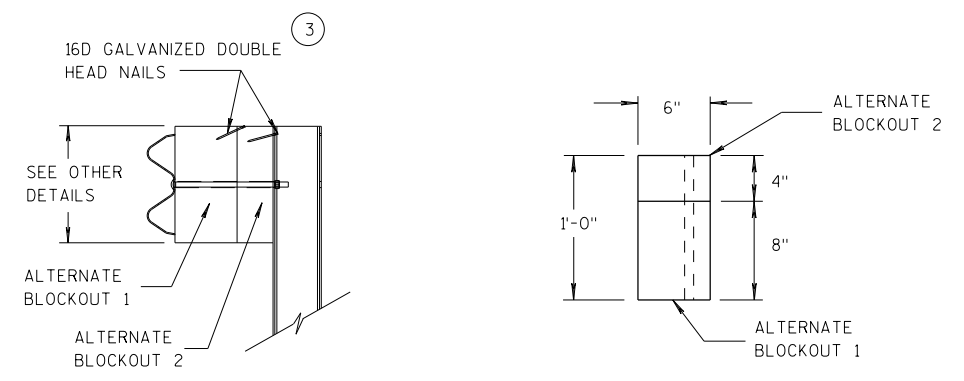
W-BEAM TO THRIE BEAM TRANSITION SECTION



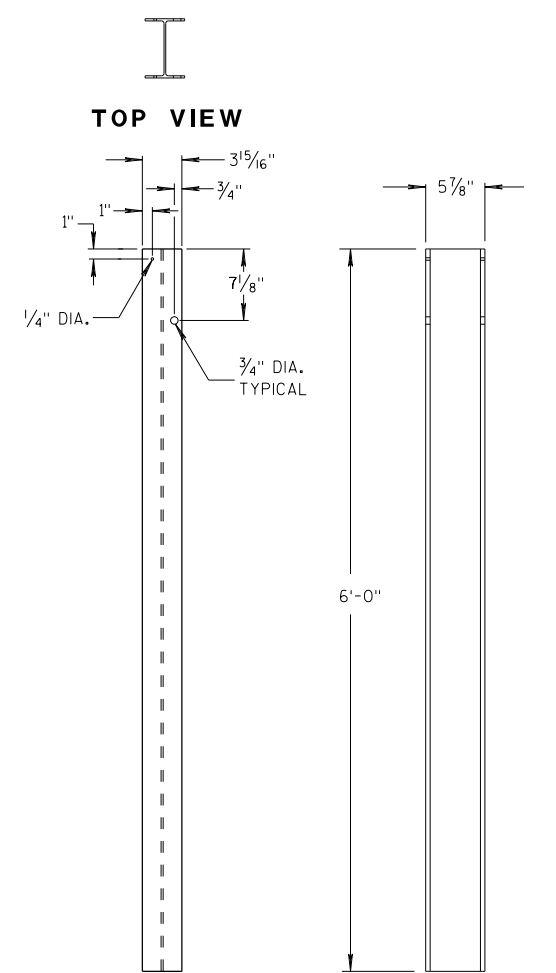
6'-3\"/>



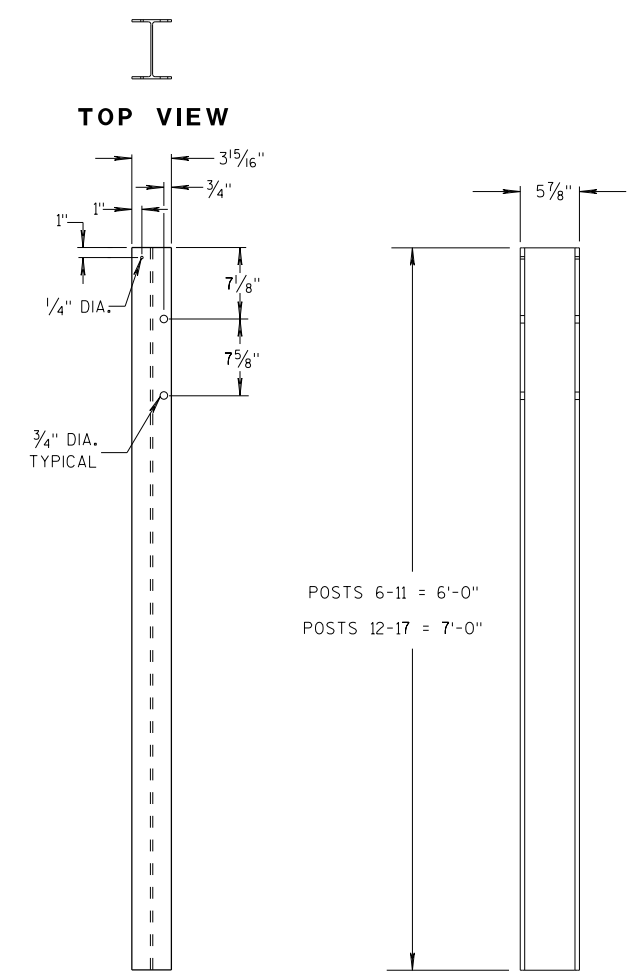
12'-6\"/>



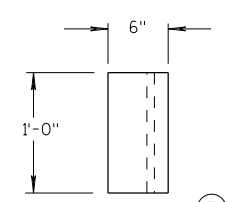
ALTERNATE WOOD BLOCKOUT DETAIL



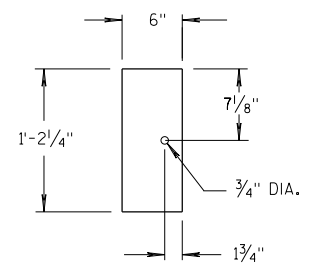
STEEL POSTS 1-5



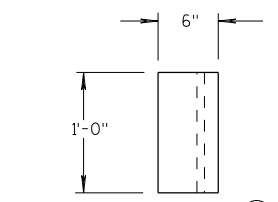
STEEL POSTS 6-17



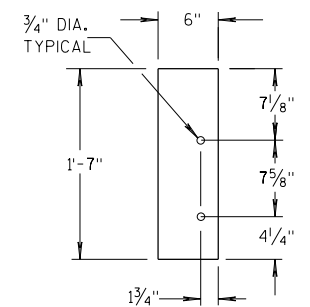
TOP VIEW



**FRONT VIEW
BLOCKOUT
POSTS 1-5**



TOP VIEW



**FRONT VIEW
BLOCKOUT
POSTS 6-17**

GENERAL NOTES

- STEEL POSTS ARE W6X9 OR W6X8.5.
- BOLT HOLES FOR POST ARE ON FRONT AND OF SIDE OF POST.
- (3) WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- (5) WOOD BLOCKS MAY BE CONSTRUCTED OUT OF 2 WOOD BLOCKS. SEE ALTERNATE WOOD BLOCK DETAIL.
- (13) STEEL OR WOOD POST IS ACCEPTABLE AT POST 1. SEE SDD 14B42.

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

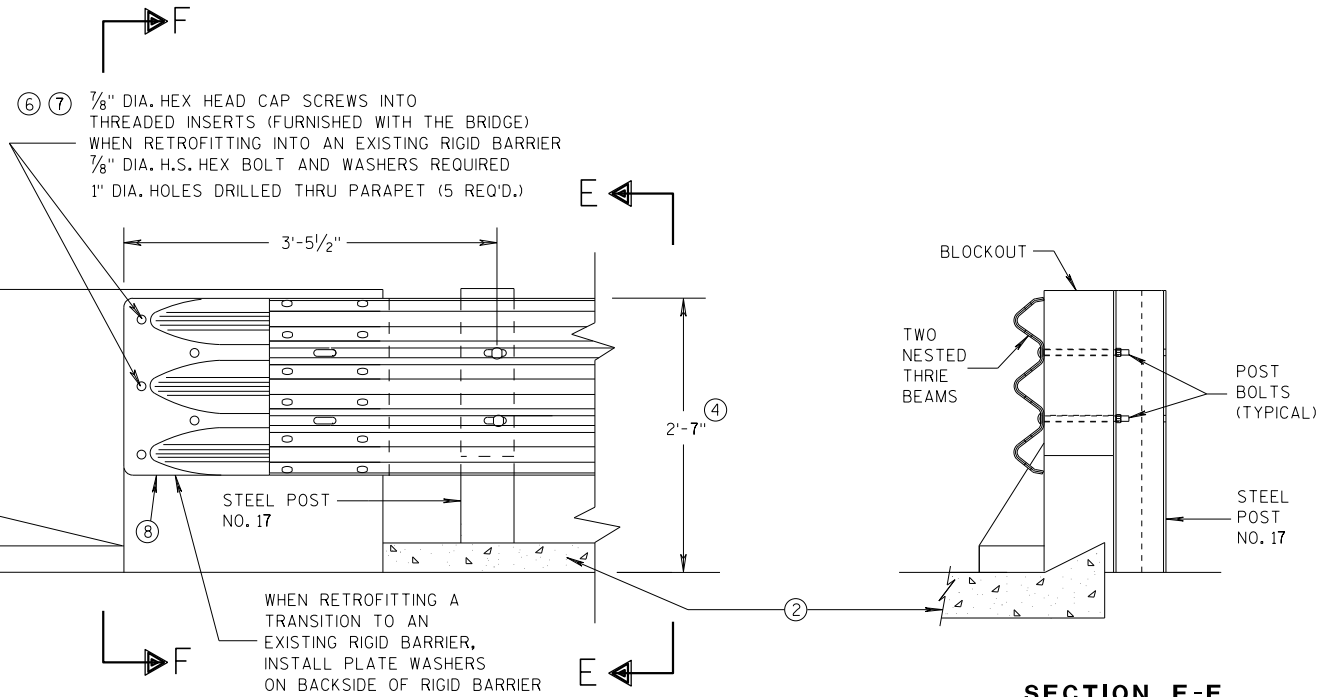
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

6

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

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



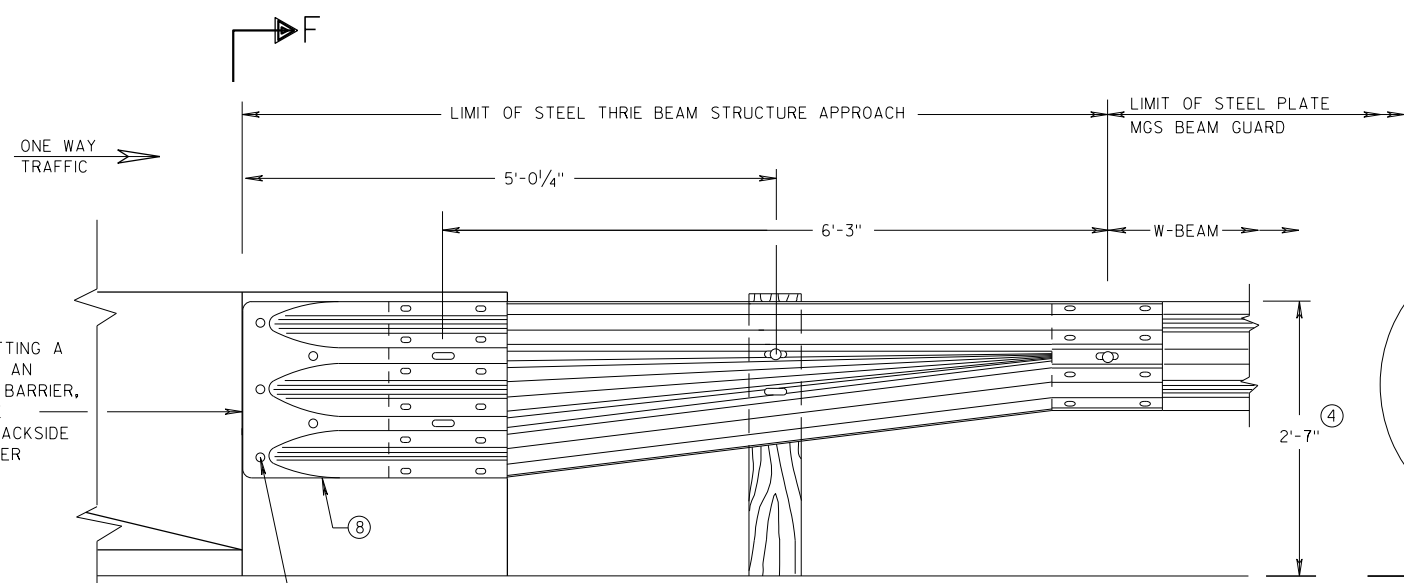
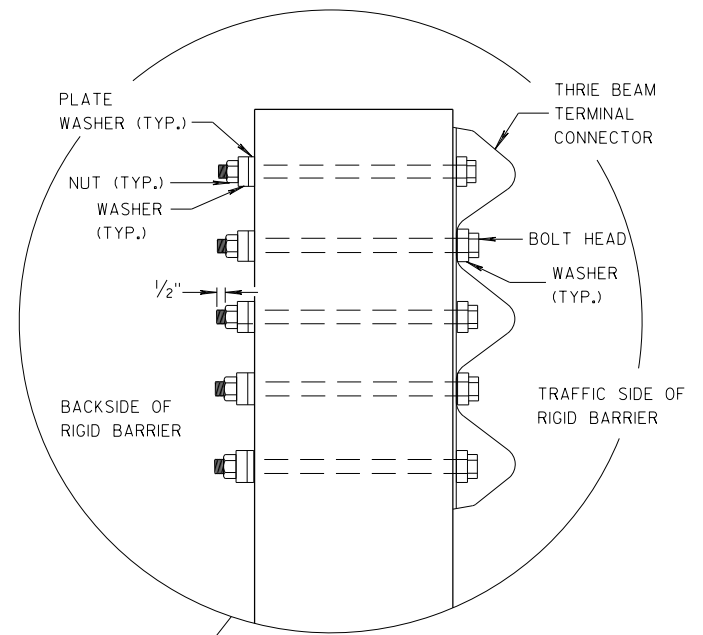
FRONT VIEW

THRIE BEAM CONNECTION TO BRIDGE PARAPET WITH SQUARE ENDS

SECTION E-E

GENERAL NOTES

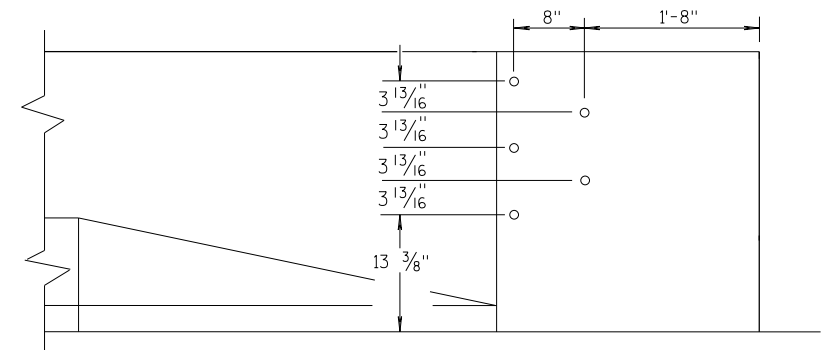
- THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSITION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.
- (2) OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- (4) TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- (6) DRILLING BOLT HOLES THROUGH THE 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".



FRONT VIEW

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

SECTION F-F



DRILL HOLE LOCATION

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

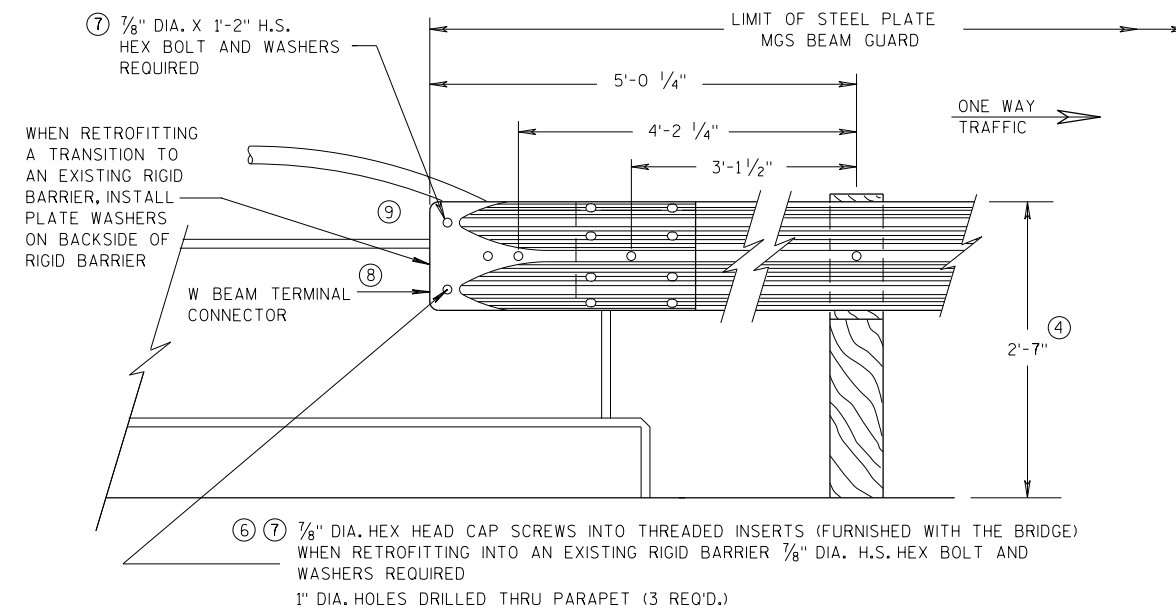
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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.

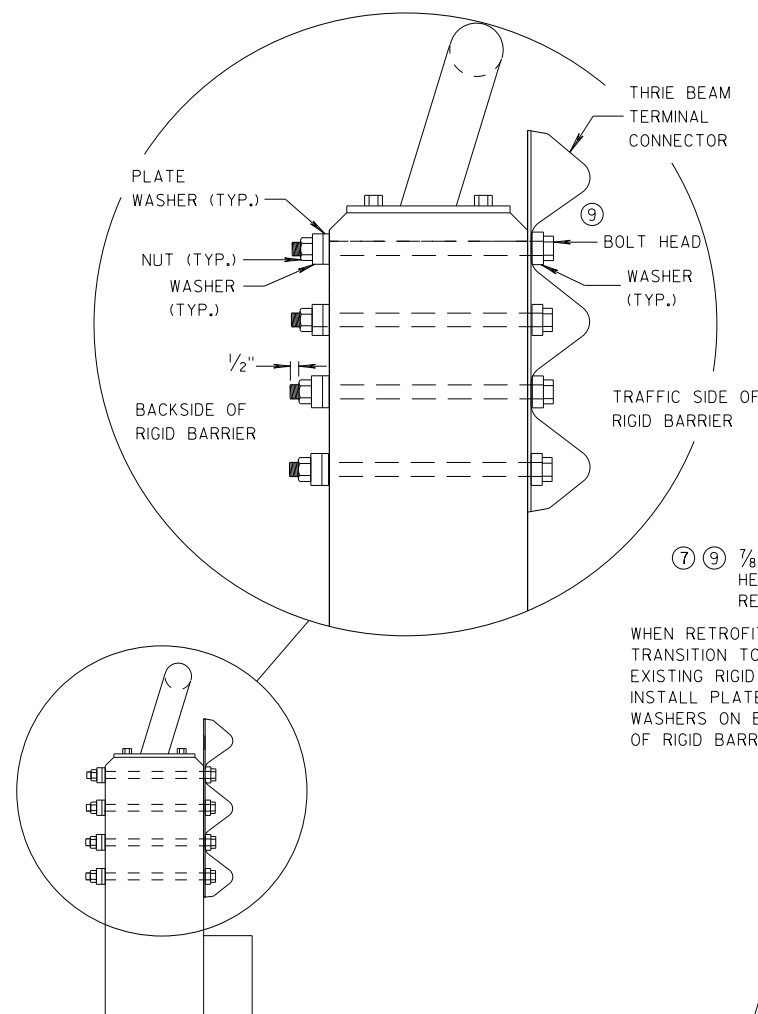
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH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



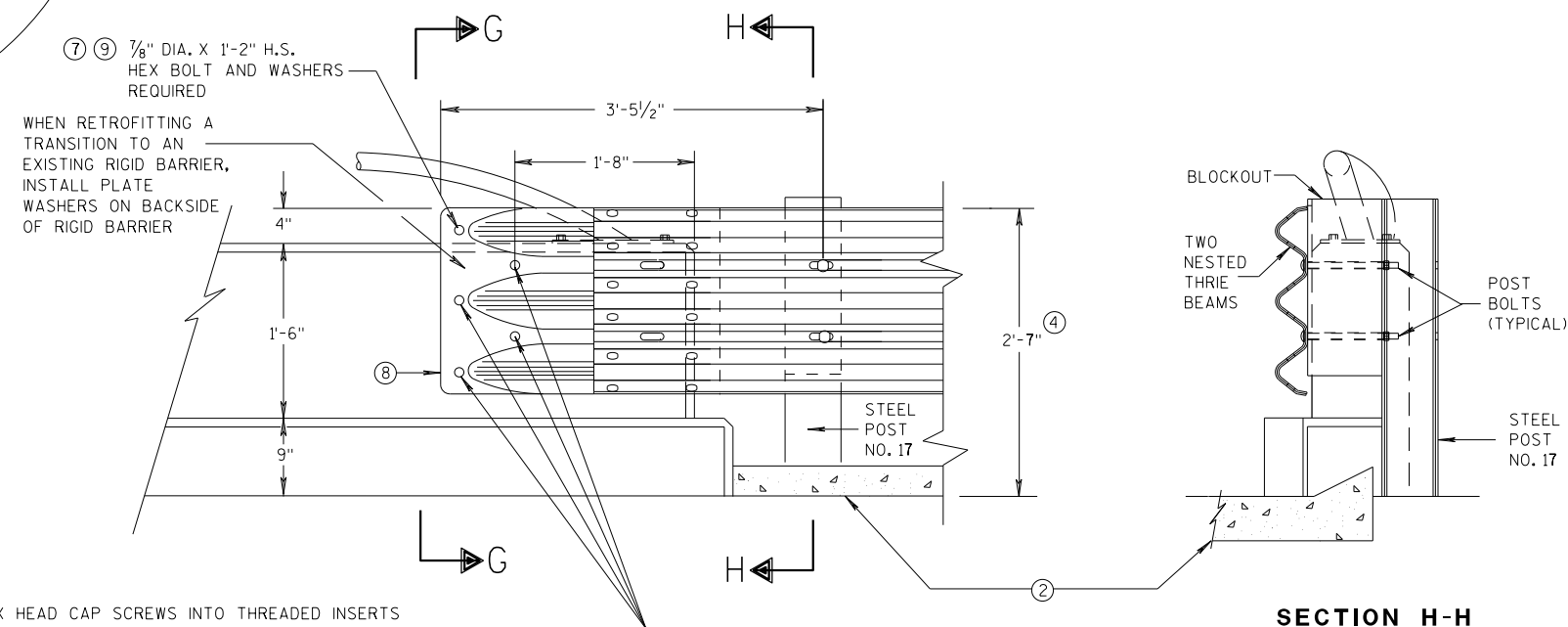
FRONT VIEW

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

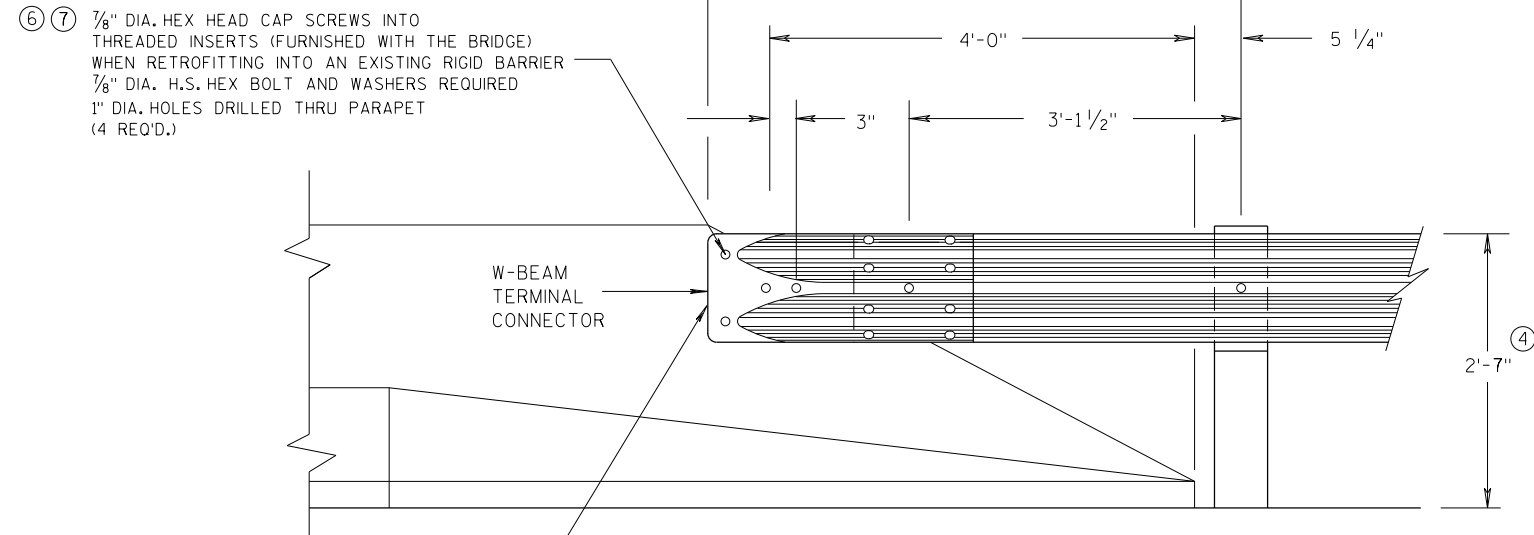
- ⑥ ⑦ $\frac{7}{8}"$ DIA. HEX HEAD CAP SCREWS INTO THREADED INSERTS (FURNISHED WITH THE BRIDGE) WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER $\frac{7}{8}"$ DIA. H.S. HEX BOLT AND WASHERS REQUIRED 1" DIA. HOLES DRILLED THRU PARAPET (4 REQ'D.)

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



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

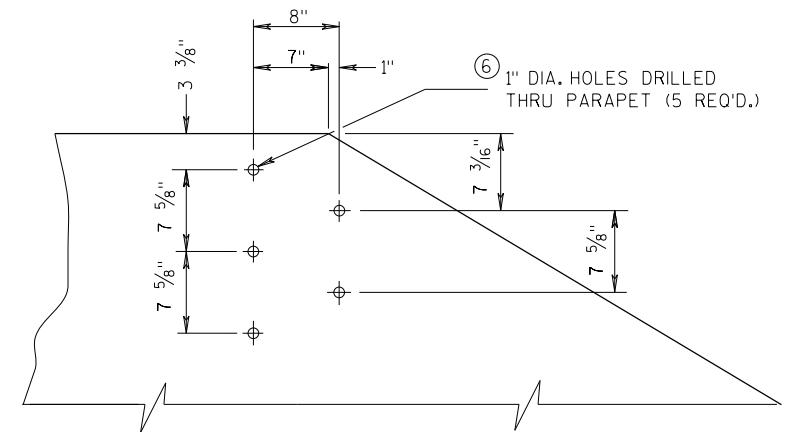
FRONT VIEW

W BEAM CONNECTION TO PARAPETS WITH SLOPED ENDS

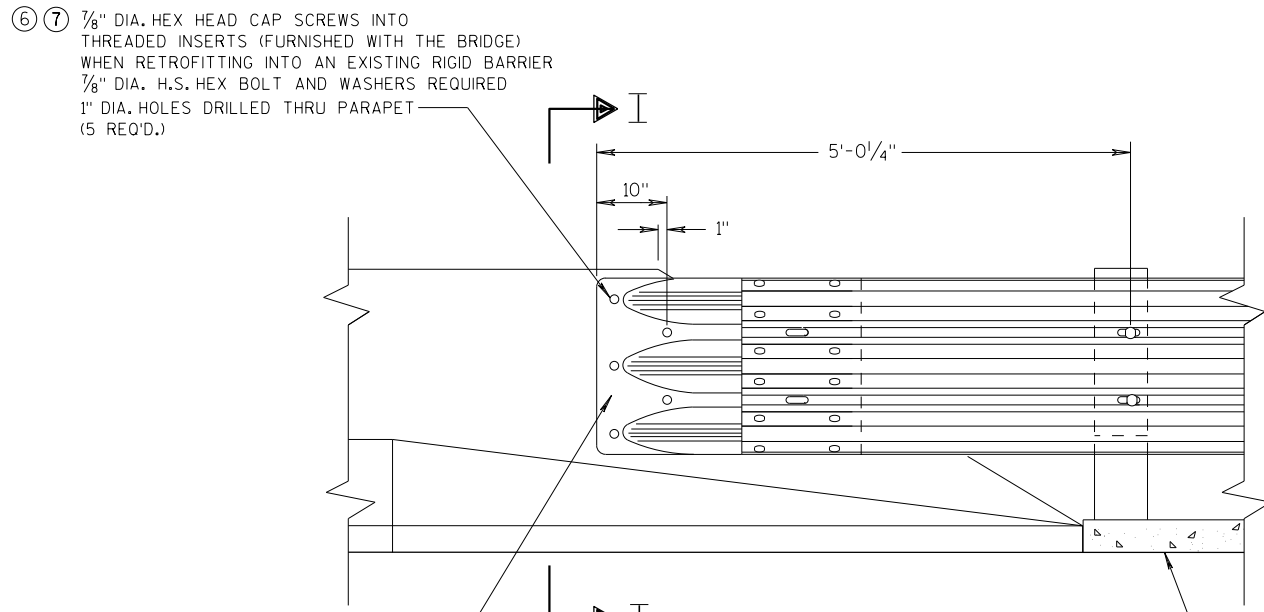
(USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)

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.



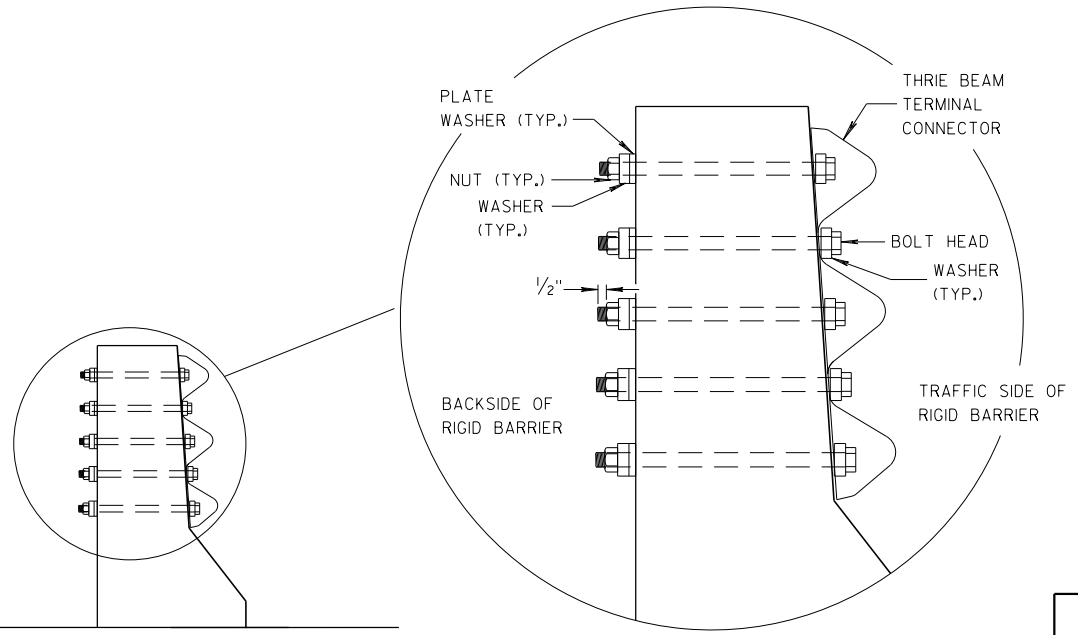
DRILL HOLE LOCATION AND PATTERN FOR THRIE BEAM CONNECTION



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

FRONT VIEW

THRIE BEAM CONNECTION TO BRIDGE PARAPETS WITH SLOPED ENDS

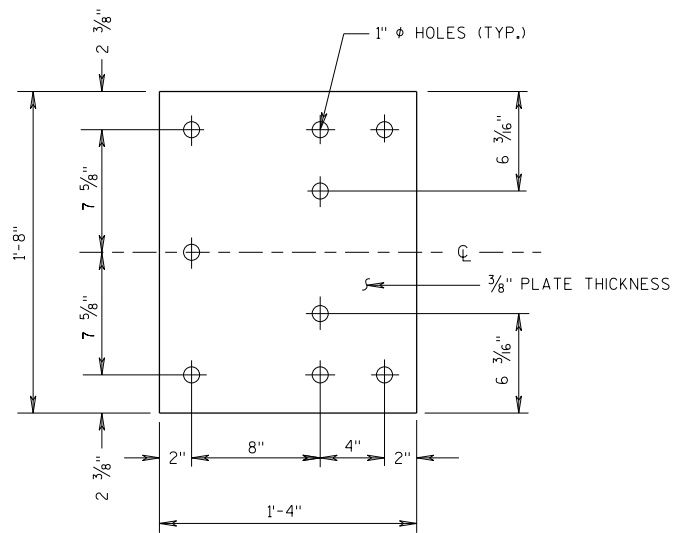


SECTION I-I

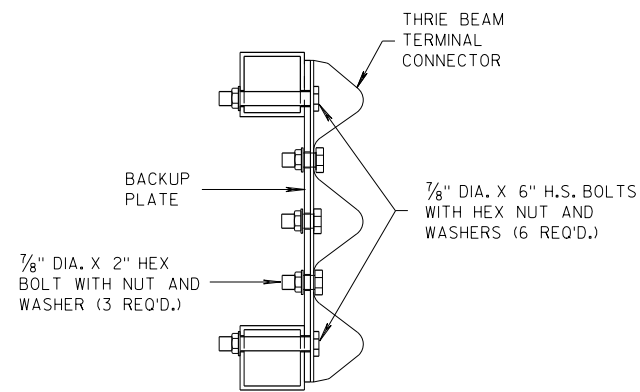
**MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

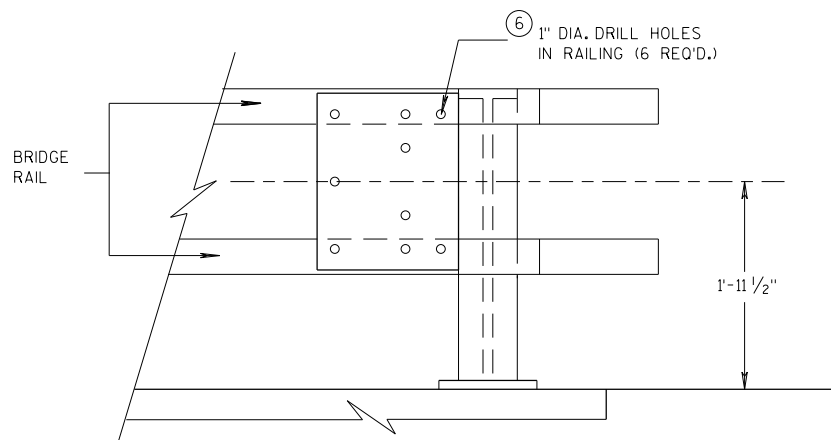
APPROVED
DATE 07/2018 /S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR
FHWA



BACK-UP PLATE DETAIL



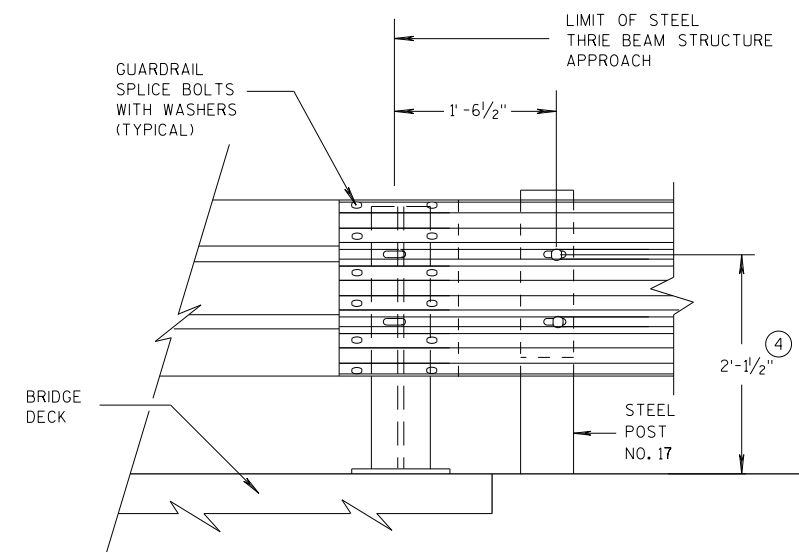
SECTION J-J



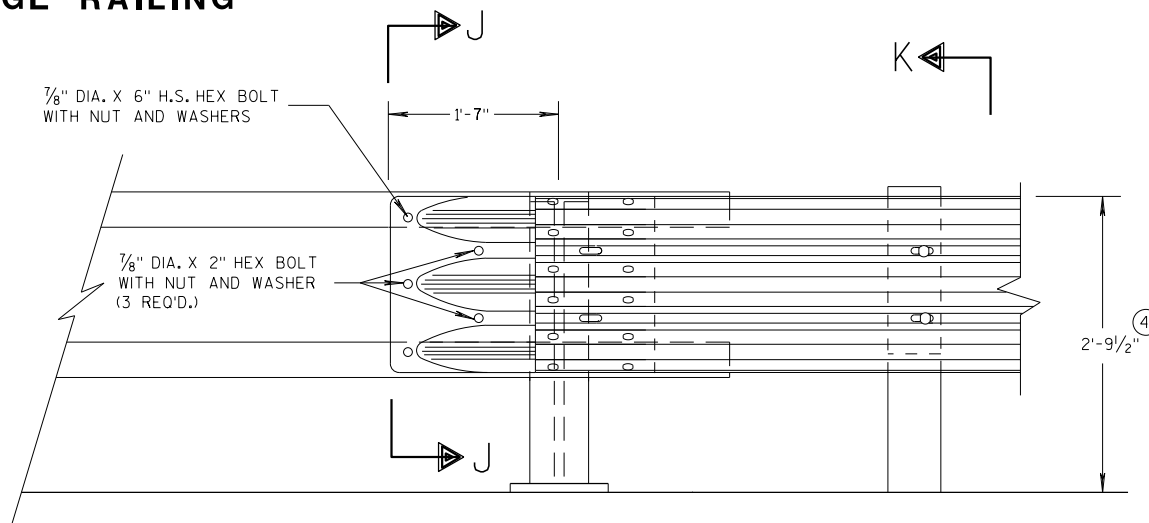
BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING

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.

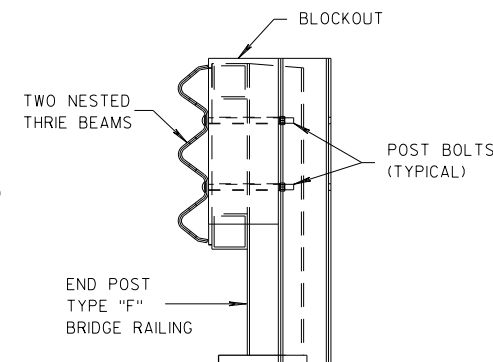


FRONT VIEW THRIE BEAM CONNECTION TO STEEL RAILING TYPE "W"



FRONT VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING TYPE "F"



SECTION K-K

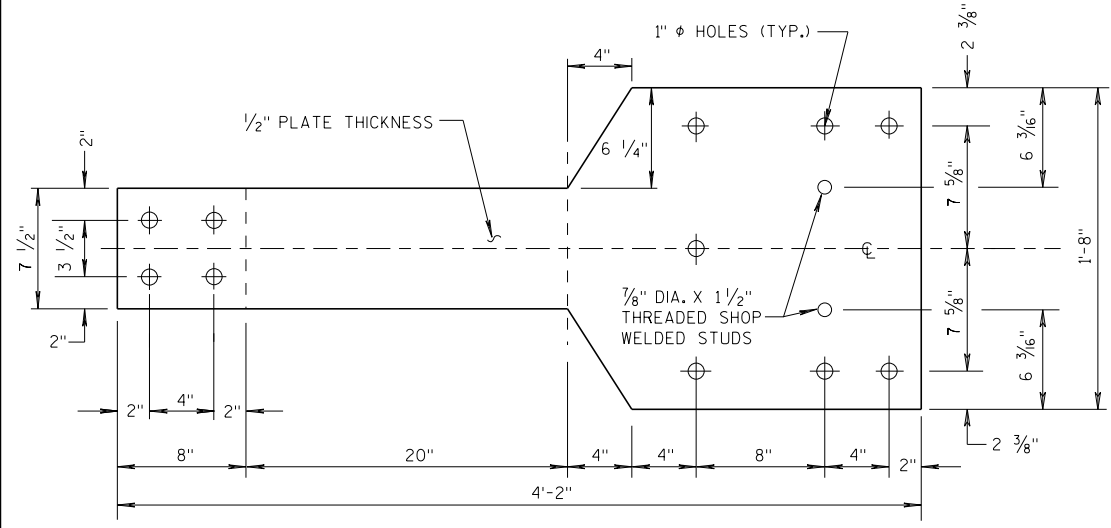
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 07/2018 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
FHWA	

6

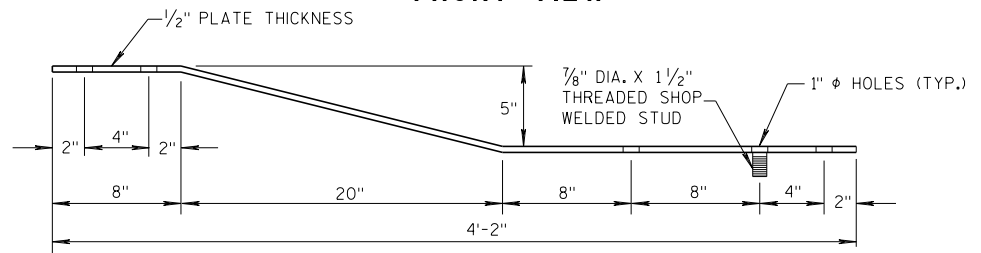
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GENERAL NOTES

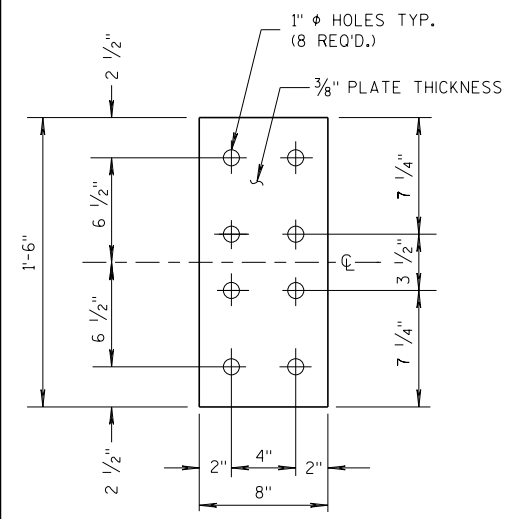
(4) TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".



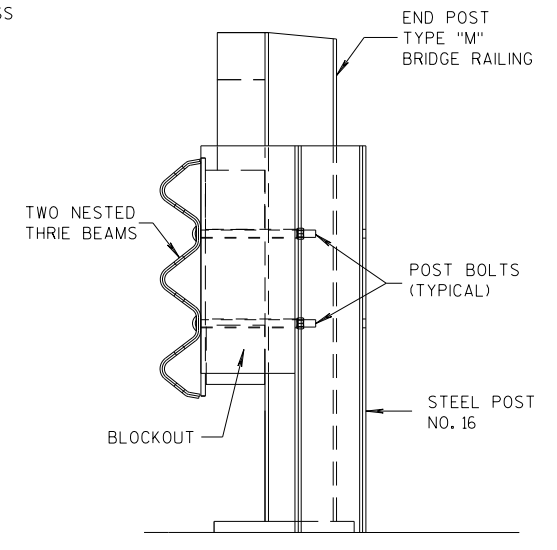
FRONT VIEW



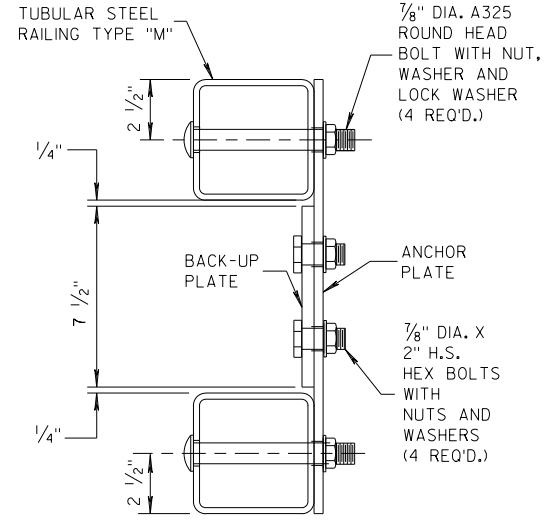
**PLAN VIEW
BACK-UP PLATE DETAIL, TYPE "M"**



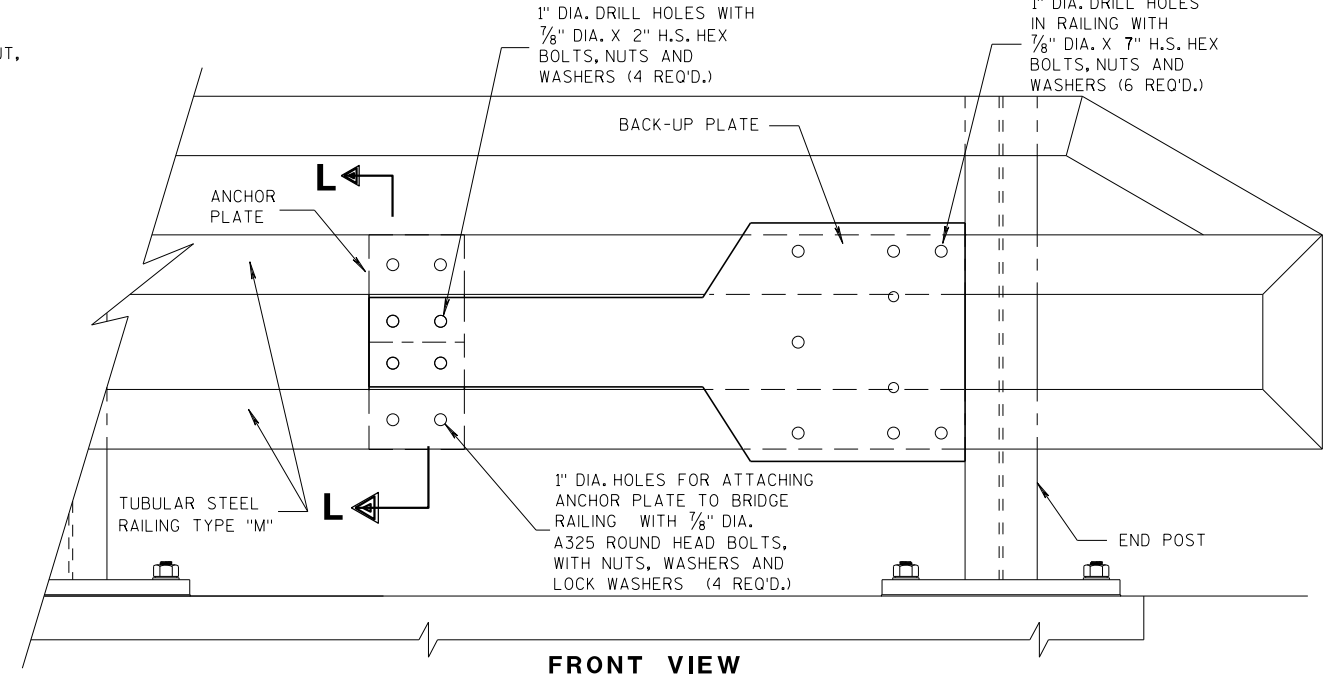
**FRONT VIEW
ANCHOR PLATE DETAIL, TYPE "M"**



SECTION M-M

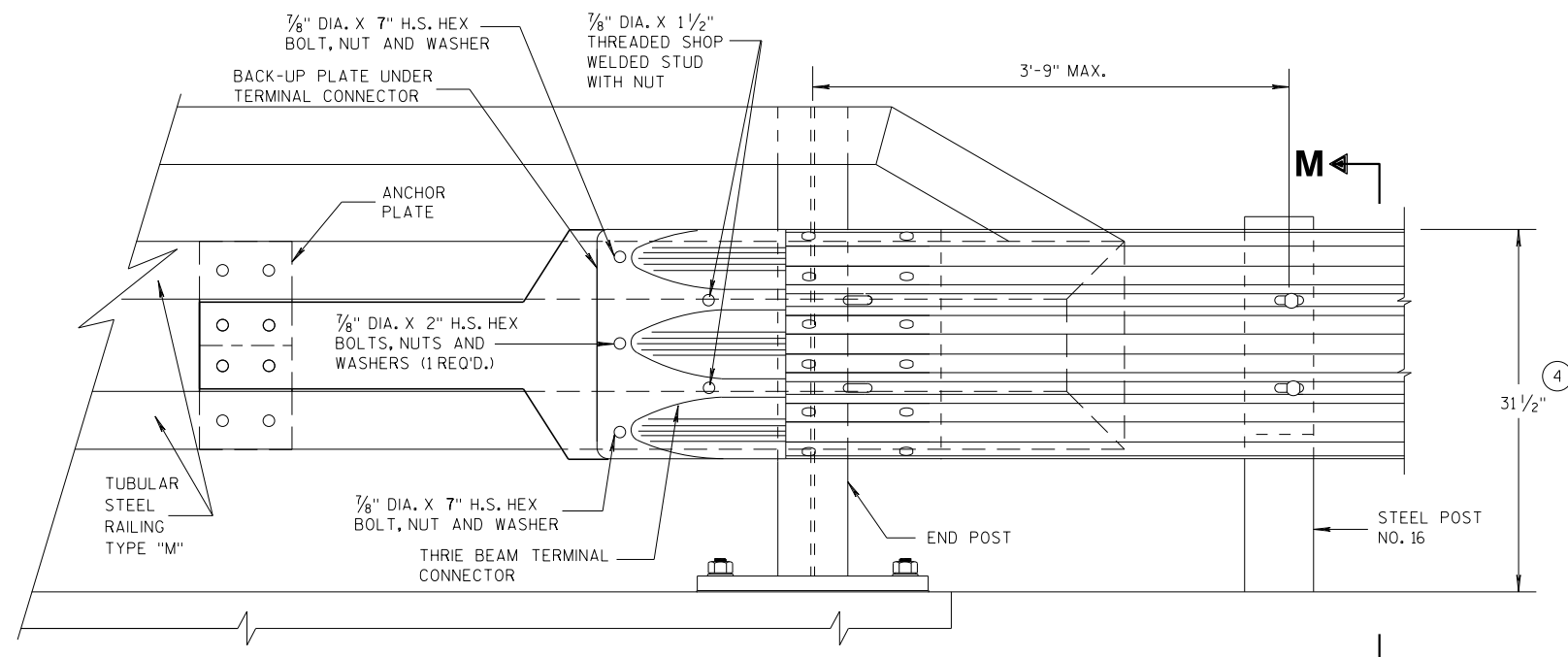


SECTION L-L

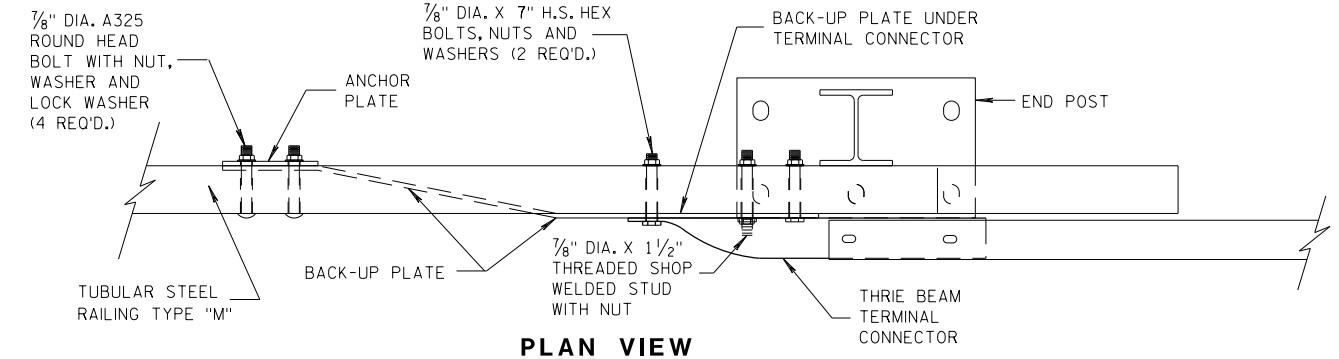


FRONT VIEW

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



FRONT VIEW



PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

6

6

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

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

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

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.

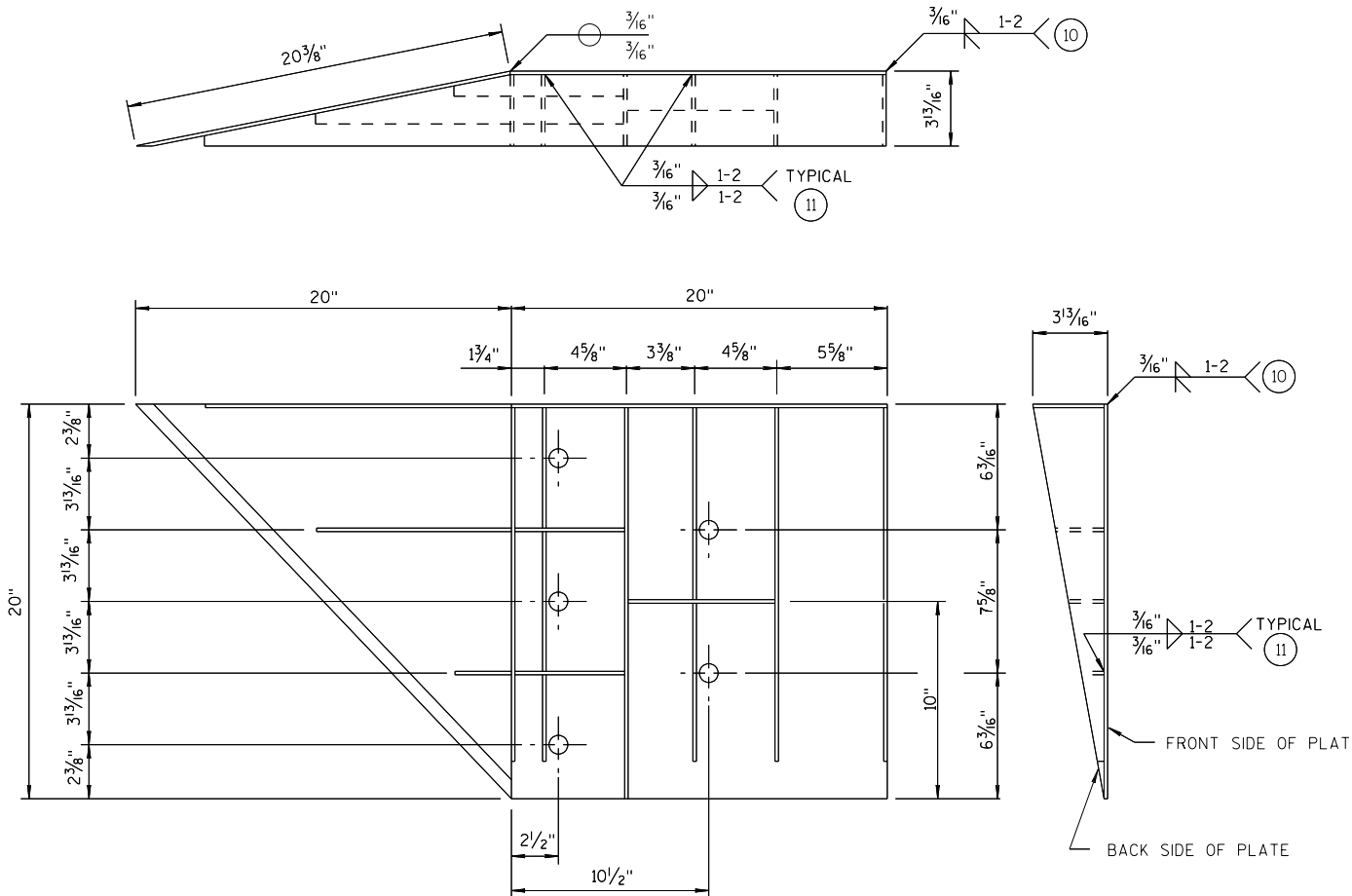
FOR GALVANIZED REQUIREMENTS, SEE SECTION 614 OF THE STANDARD SPECIFICATIONS.

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)

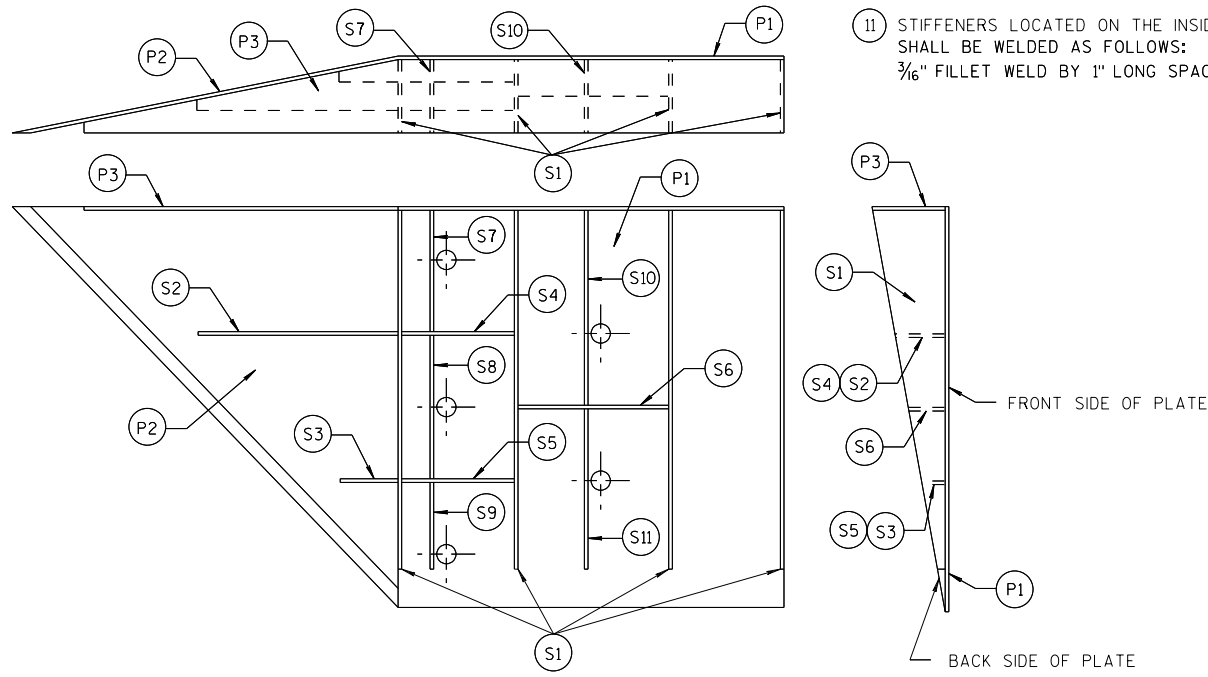


PLATE AND STIFFENER IDENTIFICATION
(VIEWED FROM BACK SIDE OF PLATE)

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 7/16"	1/4"
S5	1		6 1/8" x 1 1/16"	1/4"
S6	1		7 3/4" x 1 3/4"	1/4"
S7	1		2 3/16" x 6" x 3 5/8" x 5 7/8"	1/4"
S8	1		1 5/32" x 7 1/2" x 2 1/2" x 7 3/8"	1/4"
S9	1		6 1/16" x 6 3/16" x 1 3/32"	1/4"
S10	1		1 7/8" x 9 7/8" x 3 5/8" x 9 11/16"	1/4"
S11	1		8 1/2" x 8 3/4" x 1 3/16"	1/4"

SINGLE SLOPE CONNECTION PLATE

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
7/2018
DATE

/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR

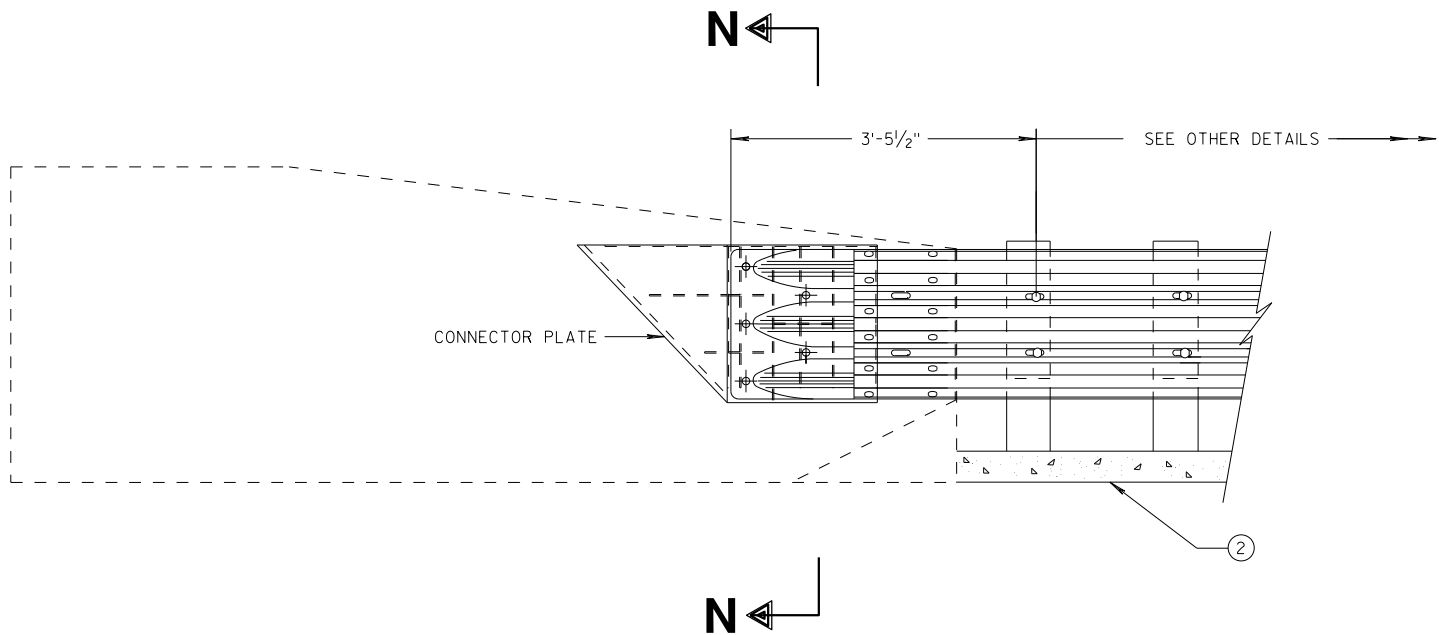
FHWA

GENERAL NOTES

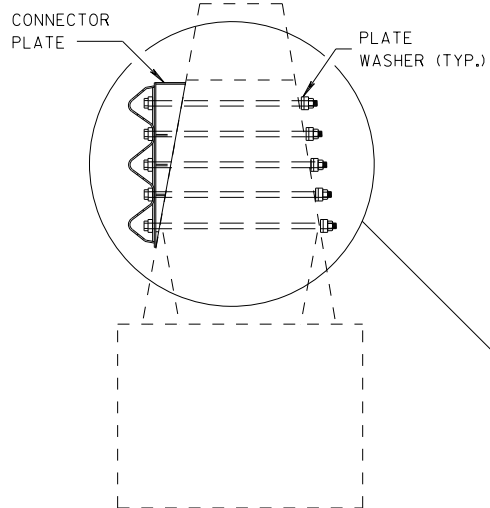
CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

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

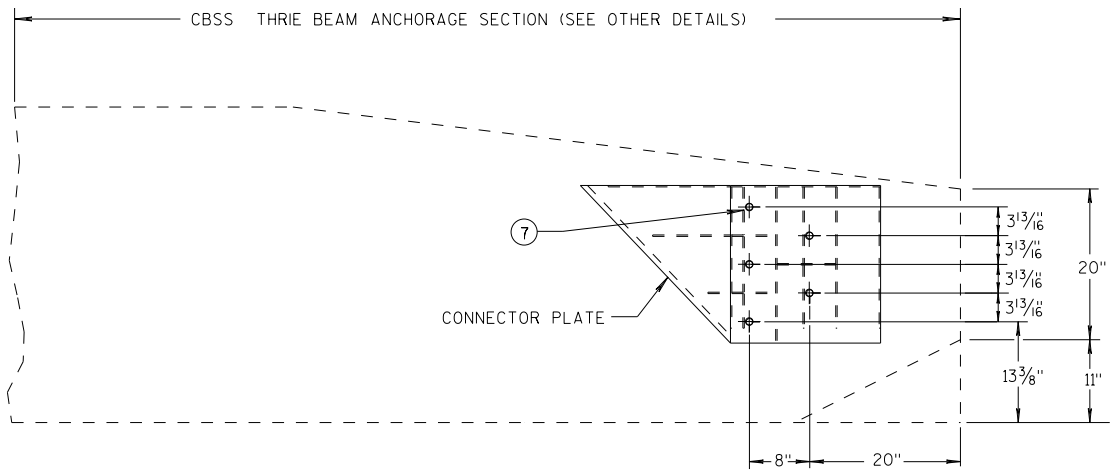
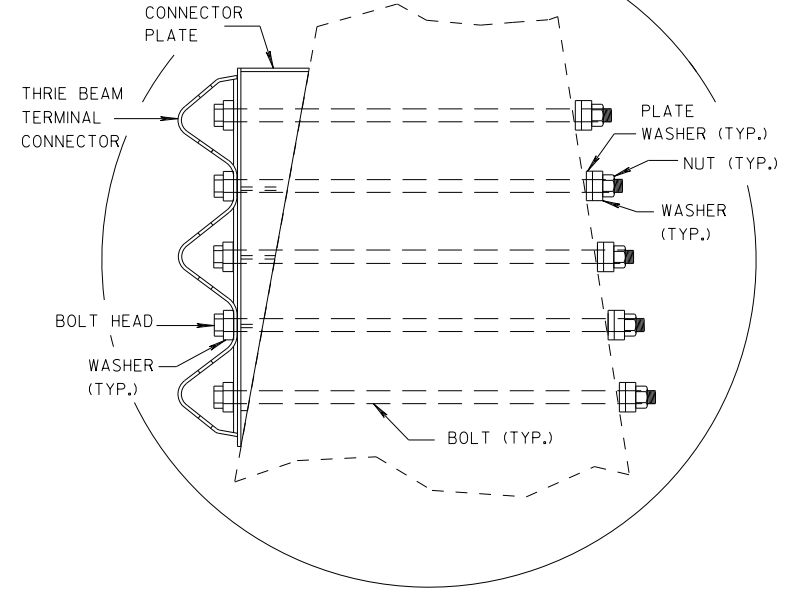
⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTION PLATE. 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

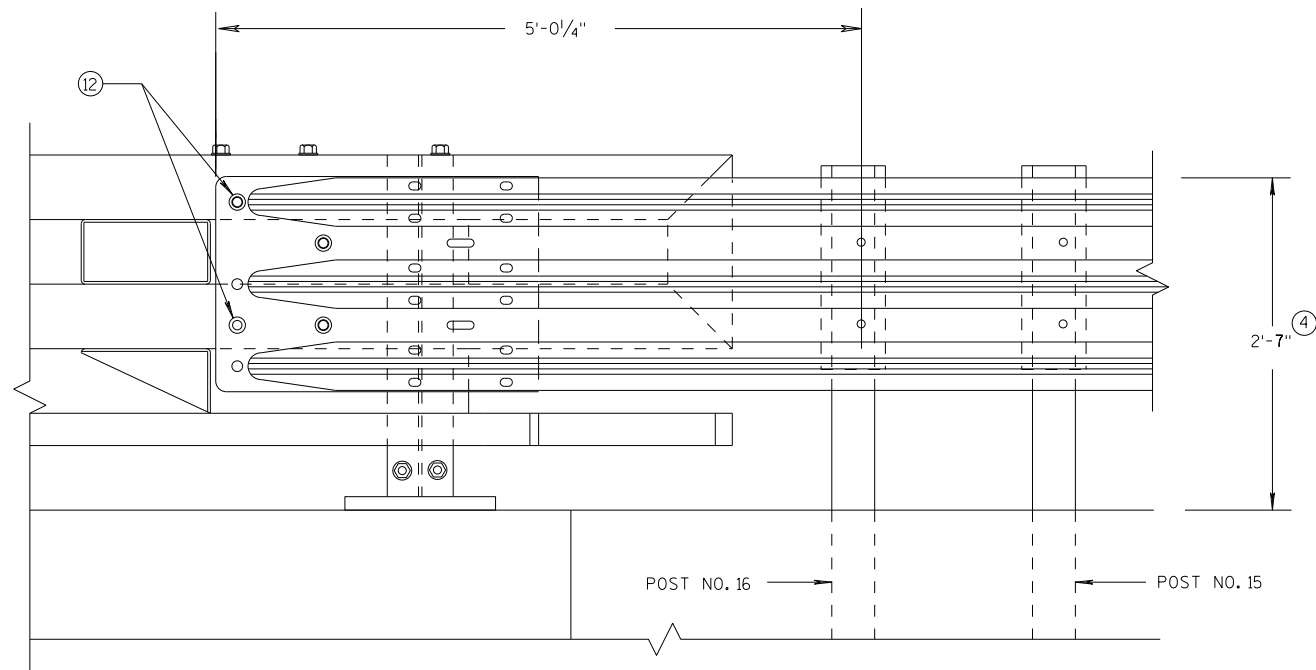


SINGLE SLOPE CONNECTION PLATE PLACEMENT

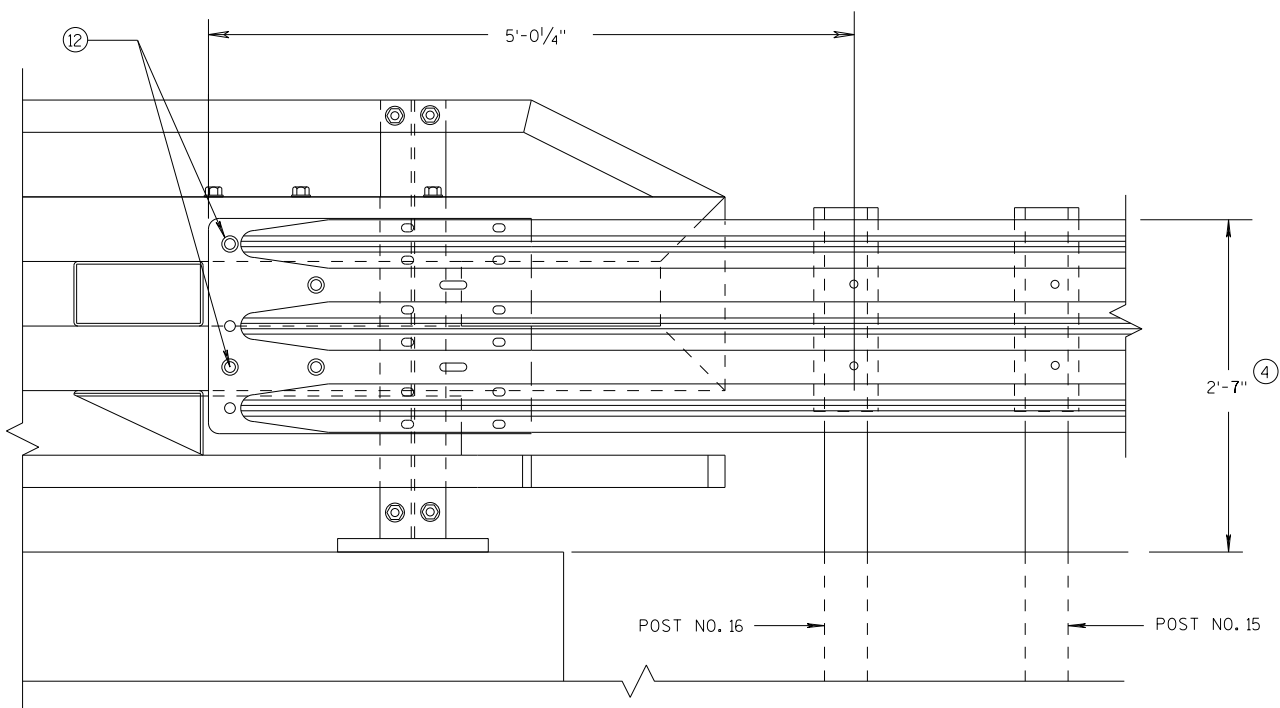
**MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)**

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.

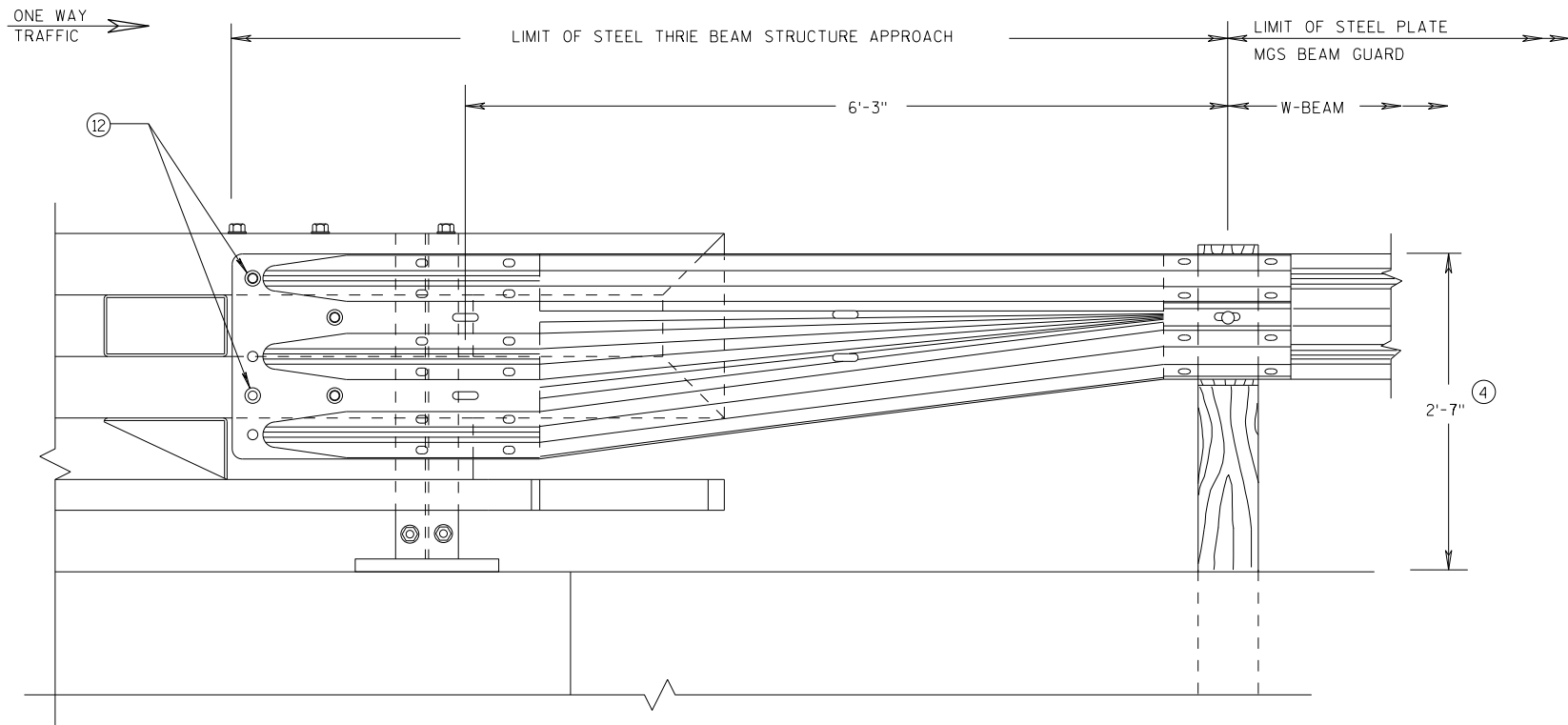
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6

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

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

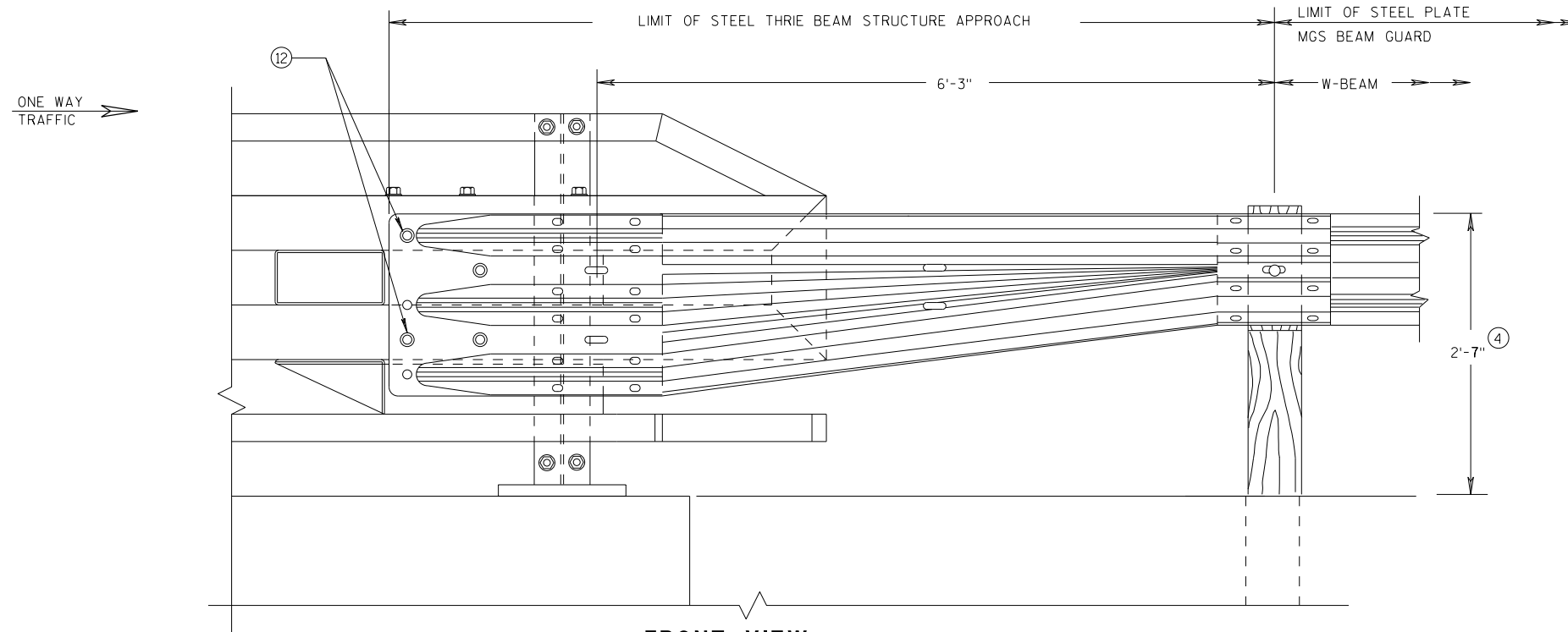
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 7/2018 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
FHWA	



GENERAL NOTES

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

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

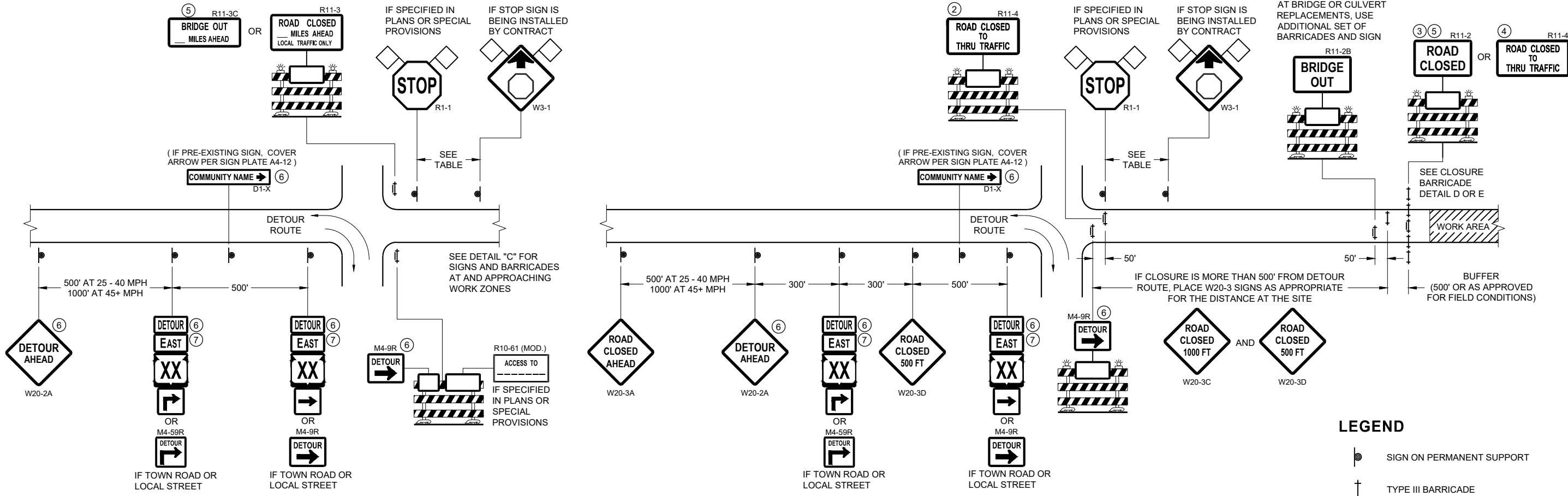


FRONT VIEW
W BEAM TRANSITION AND
CONNECTION TO BRIDGE RAILING TYPE "NY4"
 (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
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APPROVED
 DATE 7/2018 /S/ Rodney Taylor
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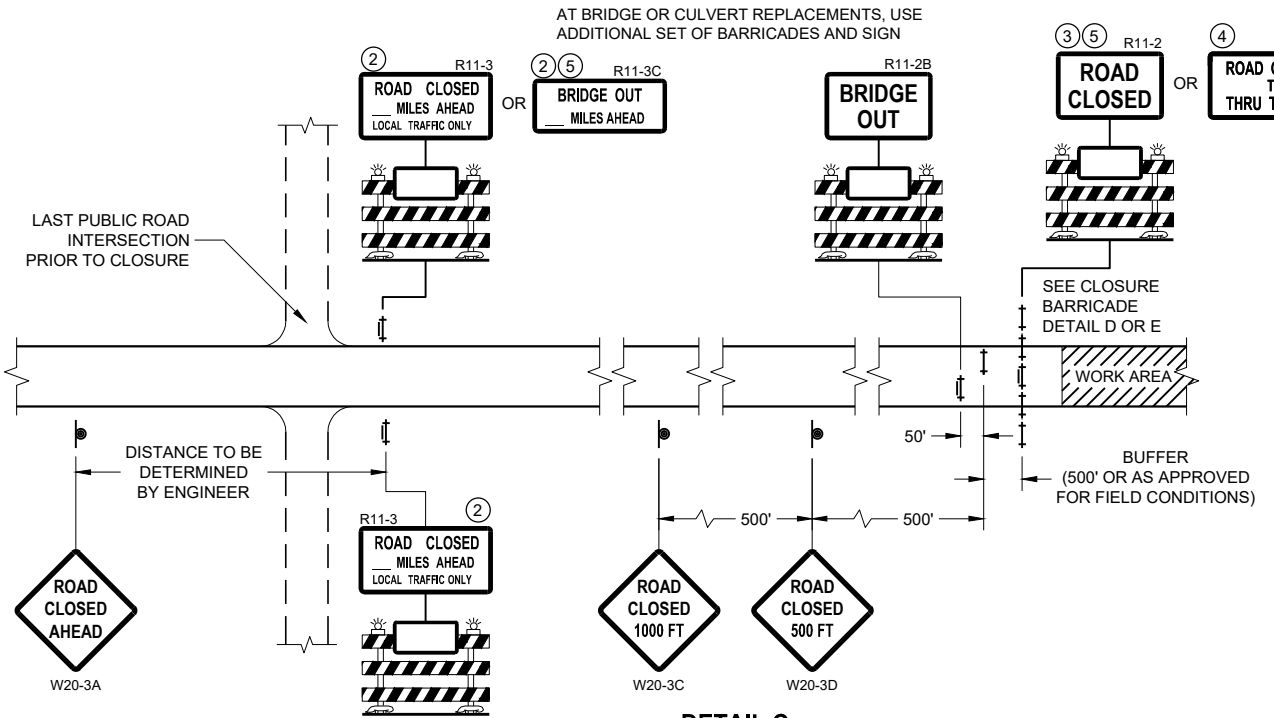
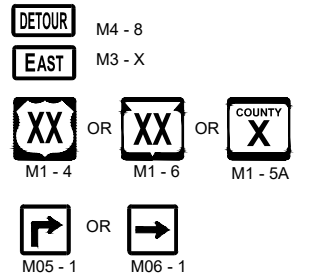


DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR
 WORK ZONE GREATER THAN OR EQUAL TO 1/2 MILE FROM
 DETOUR ROUTE (1000 FEET IF URBAN)

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



DETAIL C
MAINLINE CLOSURE, NO POSTED DETOUR

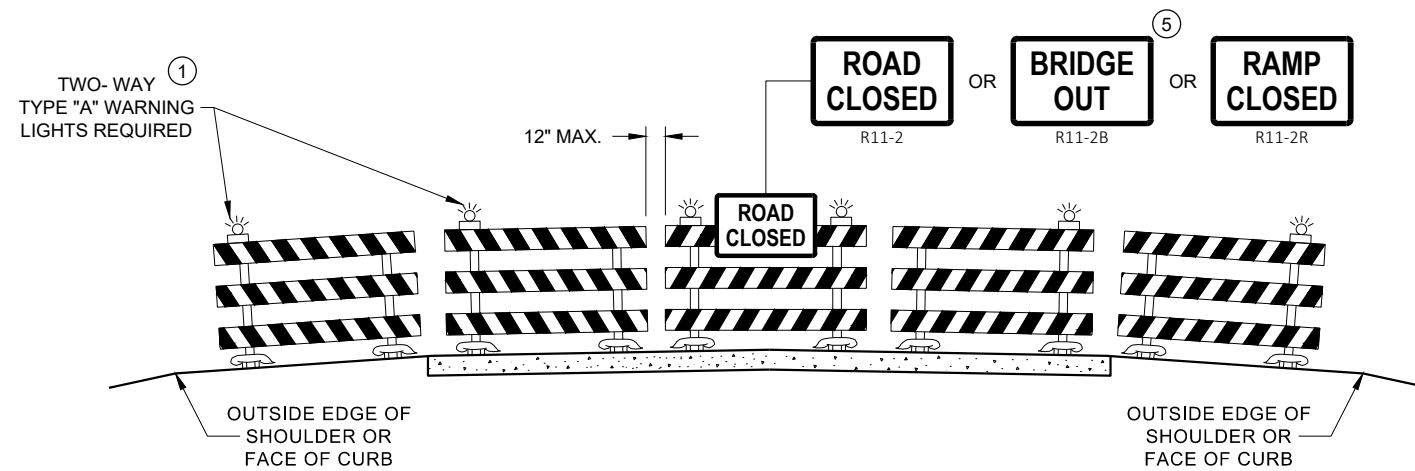
SEE SDD 15C2-SHEET "b"
 FOR GENERAL NOTES
 AND FOOTNOTES ① THROUGH ⑦

**BARRICADES AND SIGNS
 FOR MAINLINE CLOSURES**

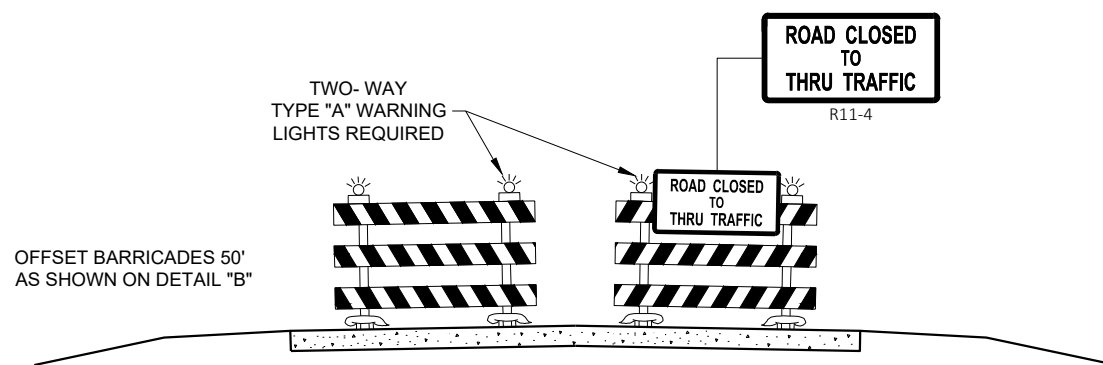
STATE OF WISCONSIN
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APPROVED
 November 2018 /S/ Andrew Heidtke
 DATE WORK ZONE ENGINEER

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**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

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GENERAL NOTES

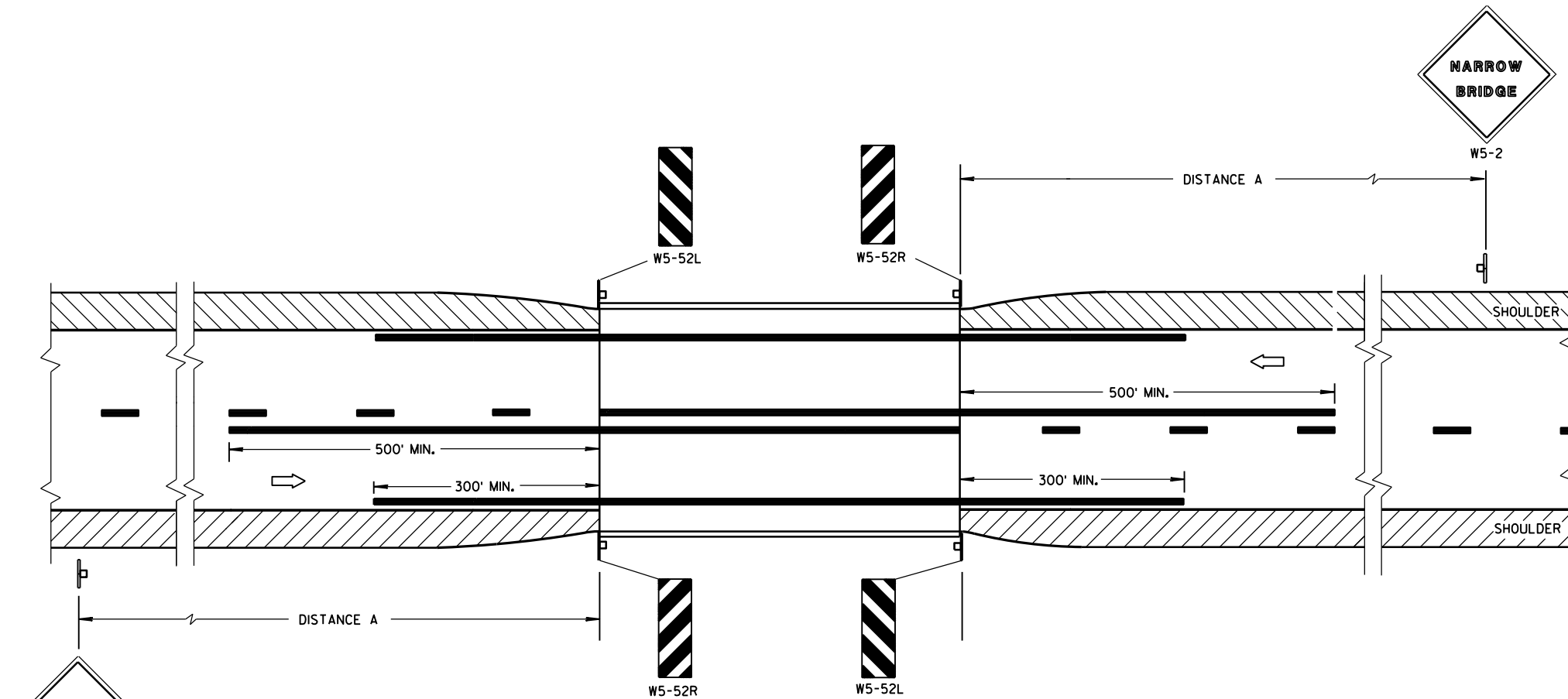
DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

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

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

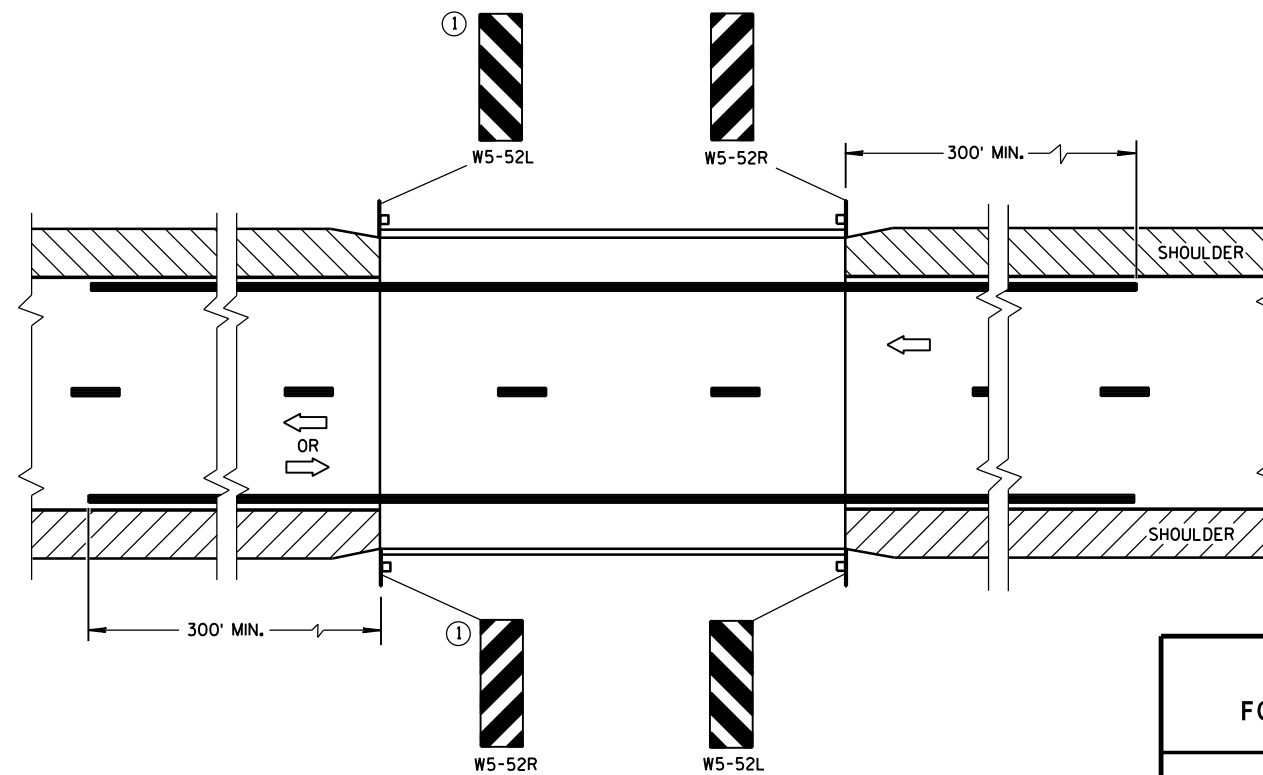
① OMIT ON ONE-WAY TRAVELLED WAYS.

➡ DIRECTION OF TRAFFIC



SITUATION 1

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



SITUATION 2

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

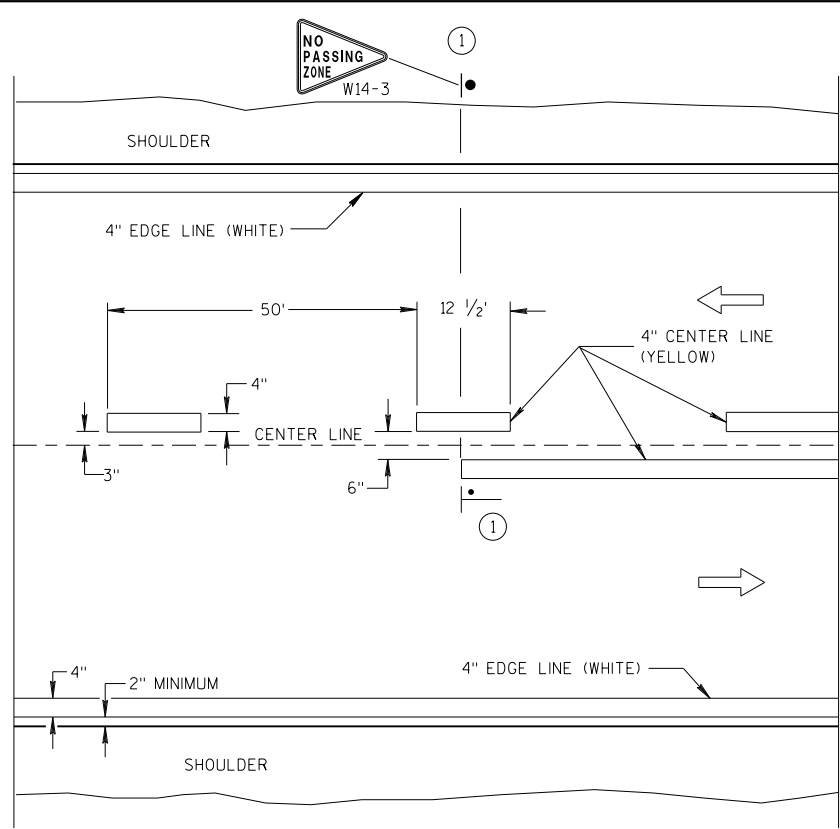
DISTANCE TABLE

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

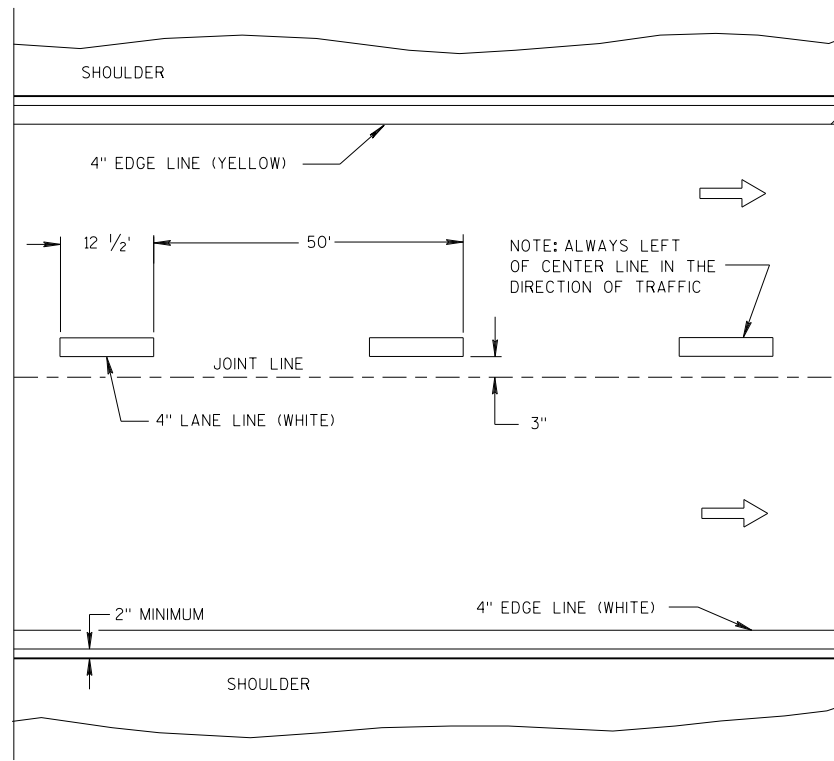
SIGNING & MARKING FOR TWO LANE BRIDGES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

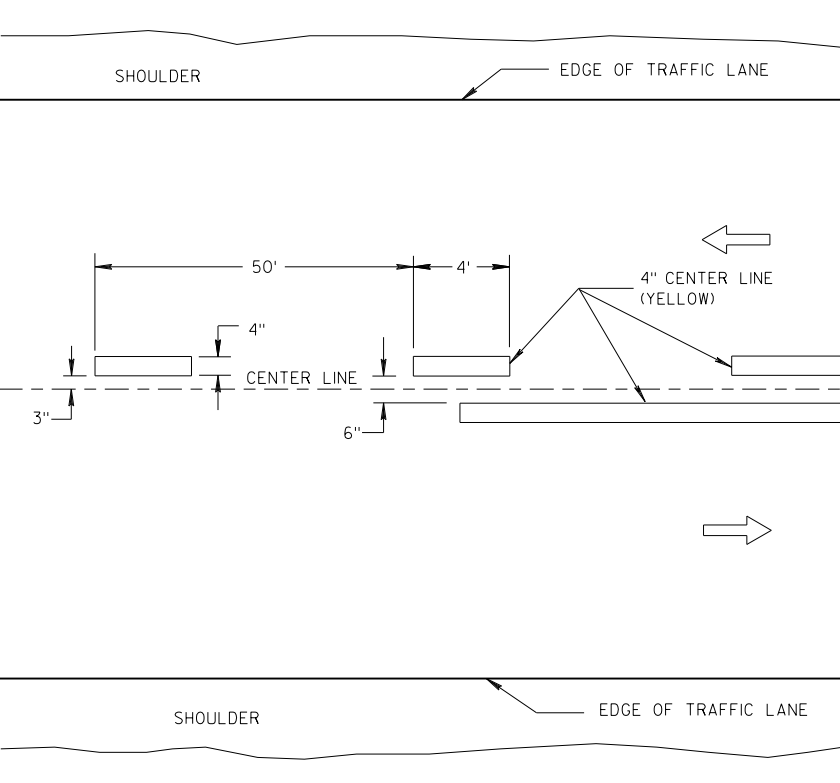


TWO WAY TRAFFIC

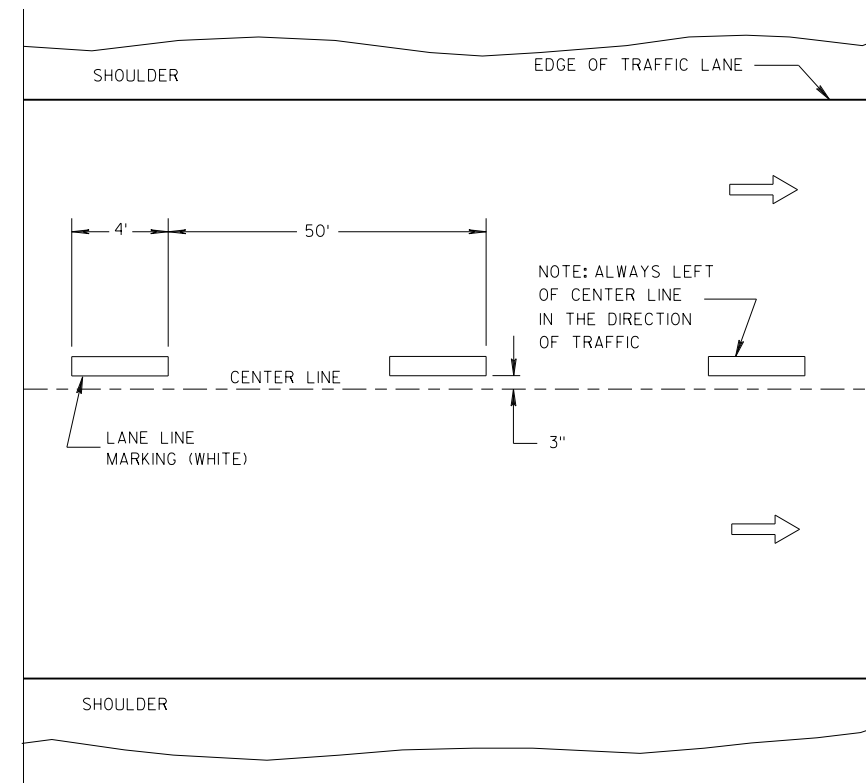


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY PAVEMENT MARKING

GENERAL NOTES

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

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

NOTE

ARROW SYMBOL (→) SHOWS DIRECTION OF TRAVEL

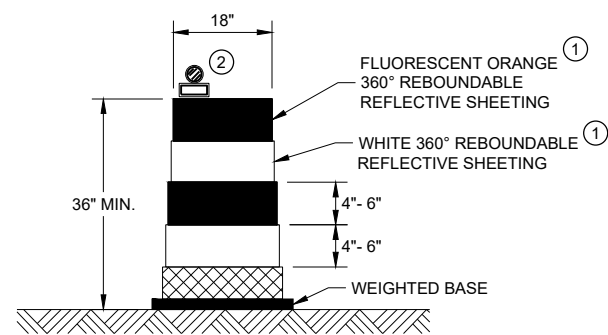
LEGEND

- "T" MARKING
- POST MOUNTED SIGN

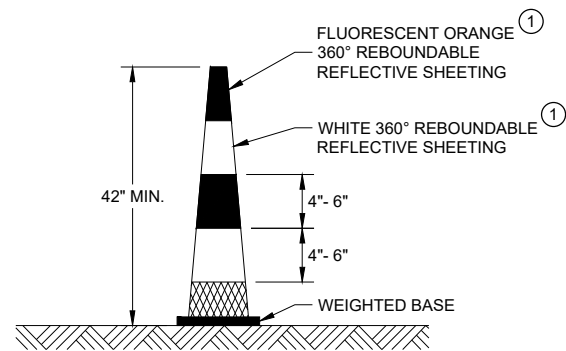
**LONGITUDINAL MARKING
(MAINLINE)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

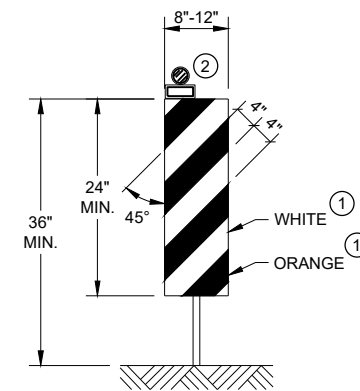


DRUM



42" CONE

DO NOT USE IN TAPERS
 1/2 SPACING OF DRUMS

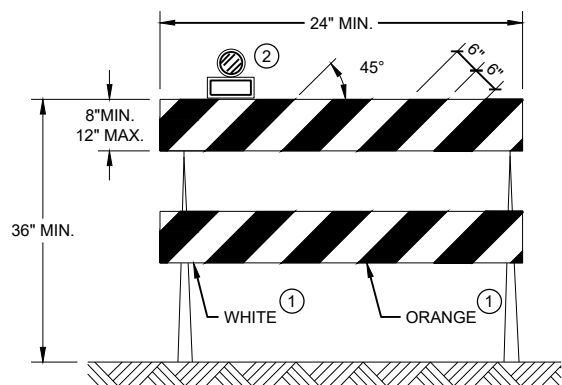


VERTICAL PANEL

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

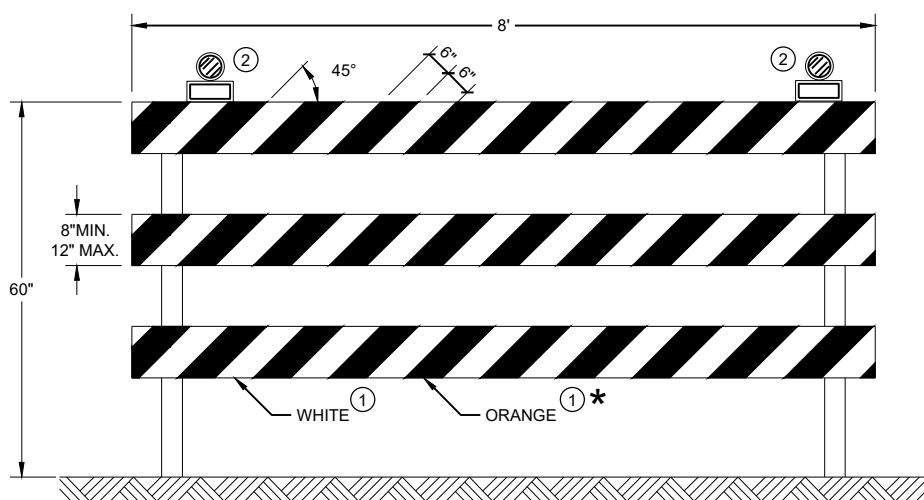
GENERAL NOTES

- 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.



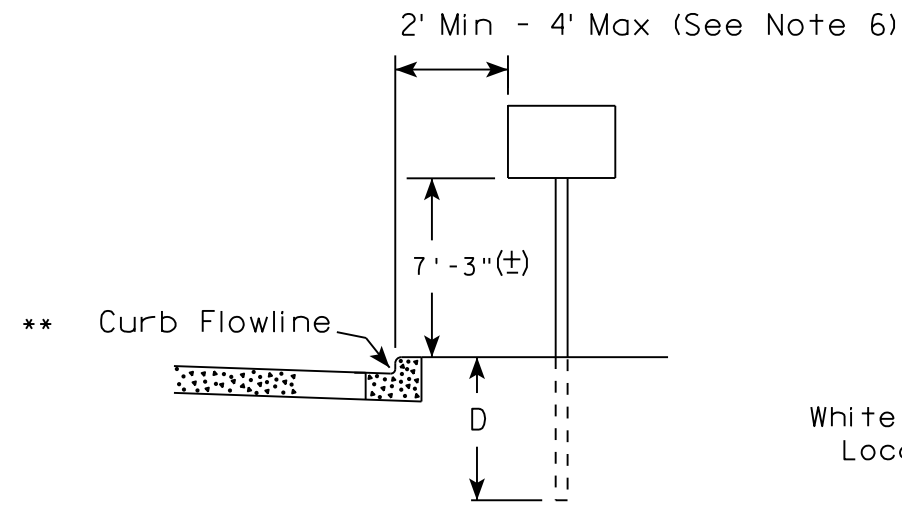
TYPE III BARRICADE

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

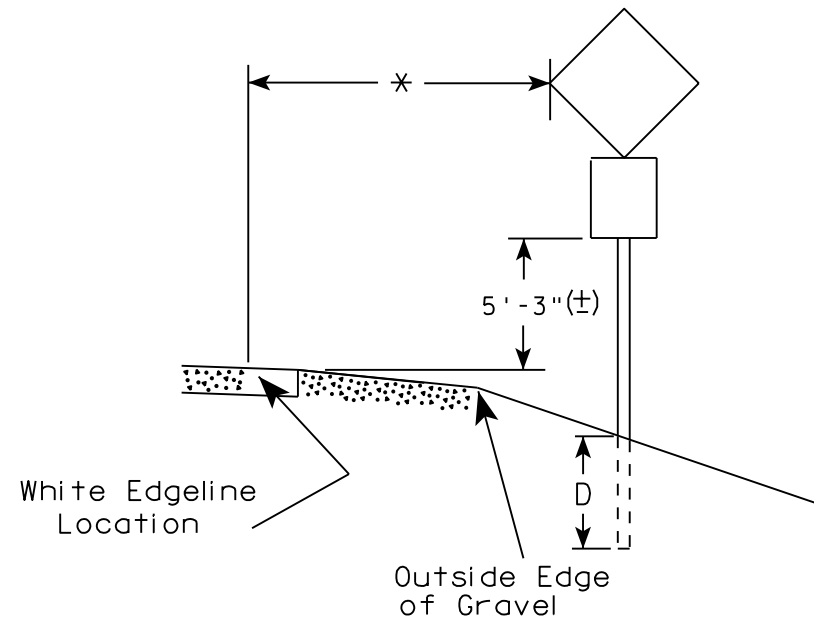
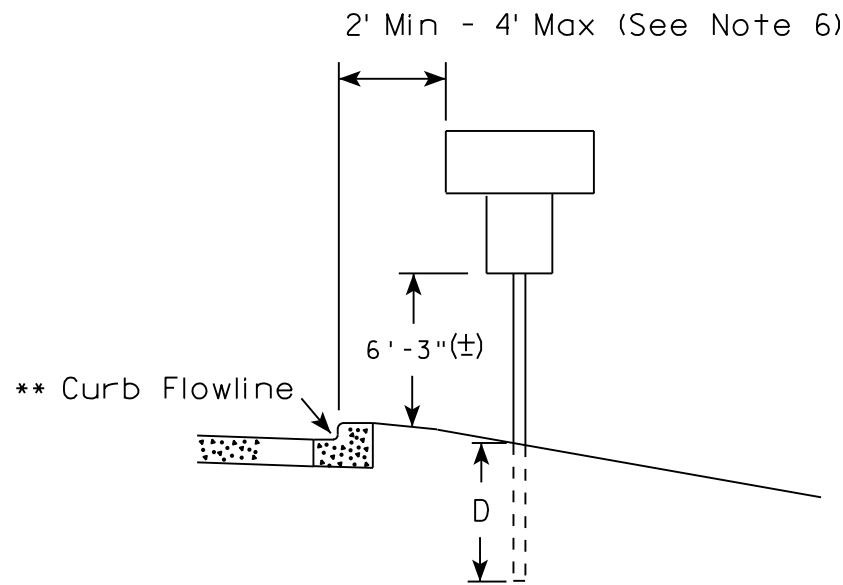
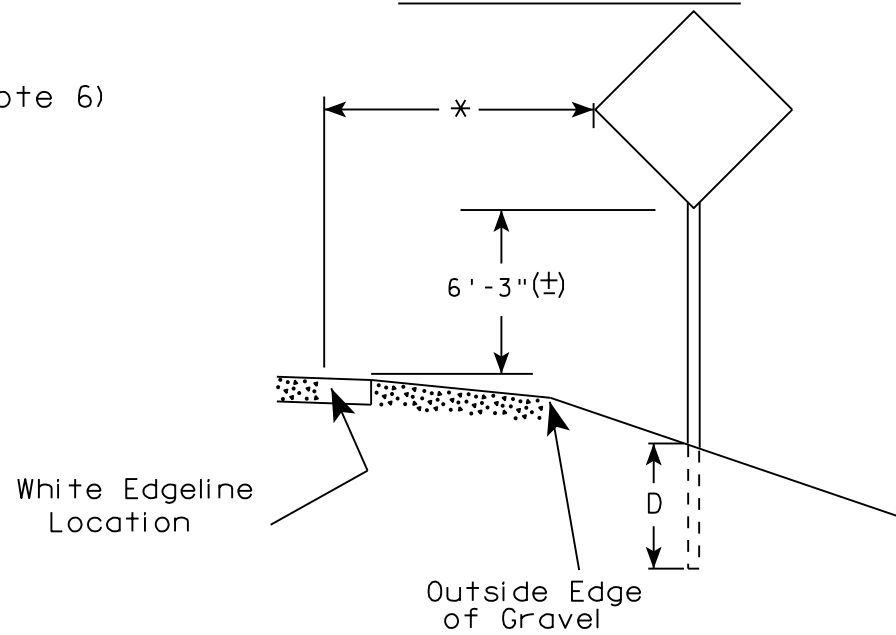
* IF USED FOR A PERMANENT APPLICATION USE RED SHEETING.

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>	

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.

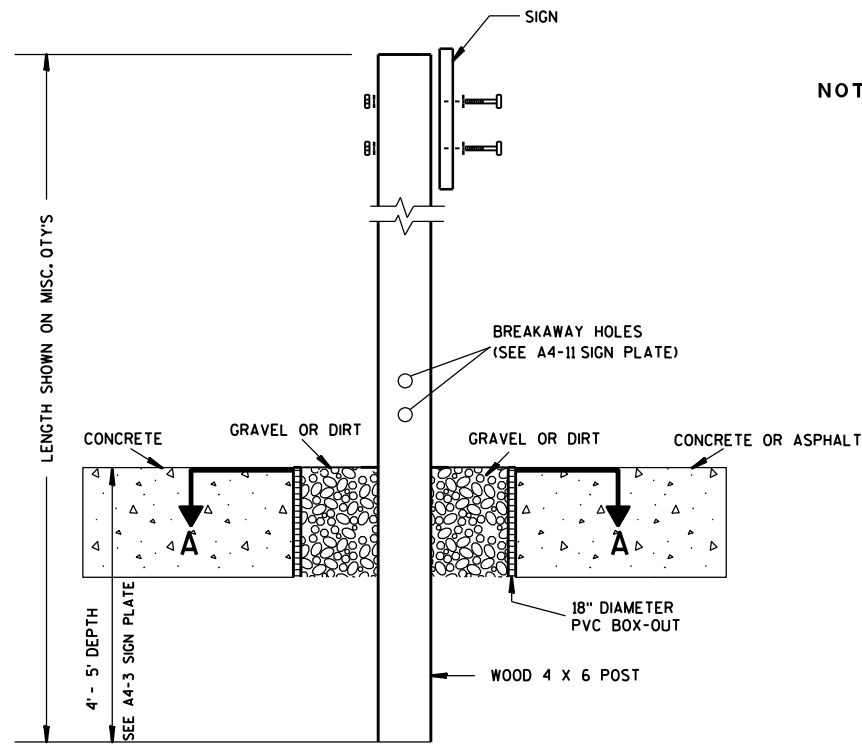
* 6 feet from edge of a paved shoulder or 12 feet from the edge of pavement (edge line location) or 2 feet from outside edge of gravel, whichever is greater unless directed by project engineer.

TYPICAL INSTALLATION OF PERMANENT TYPE II SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

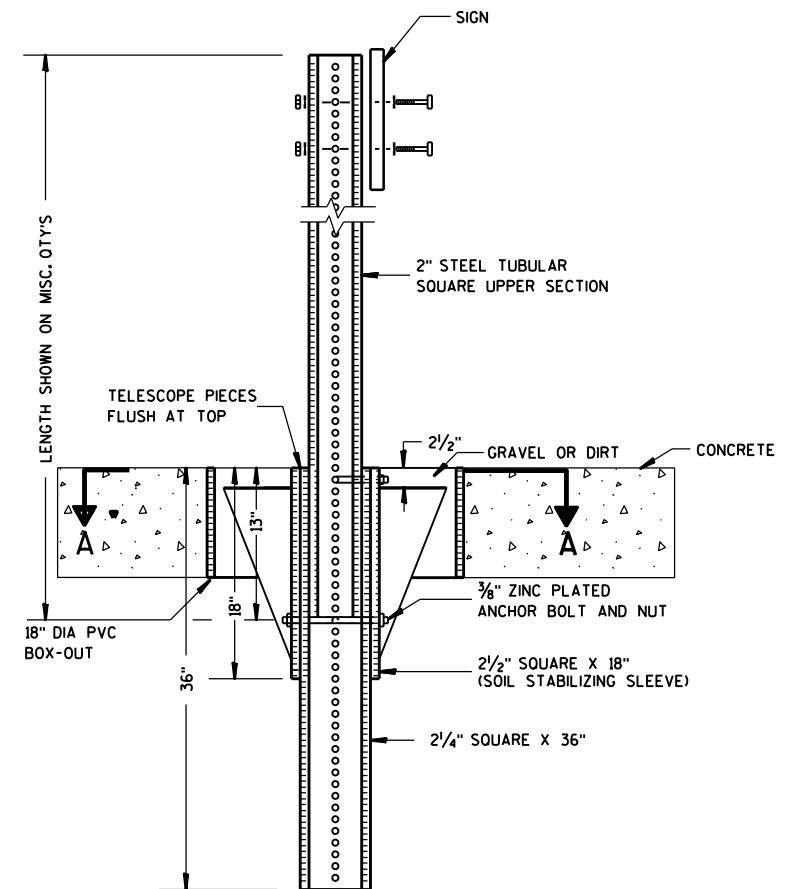
DATE 8/21/17 PLATE NO. A4-3.21



ELEVATION VIEW

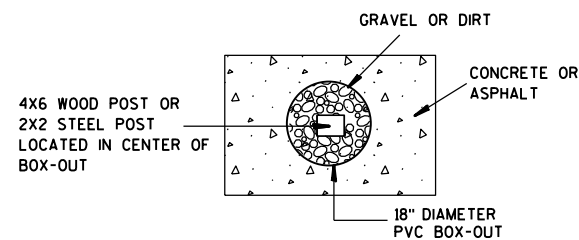
DETAIL OF WOOD 4 X 6 SIGN POST IN BOX-OUT

- 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

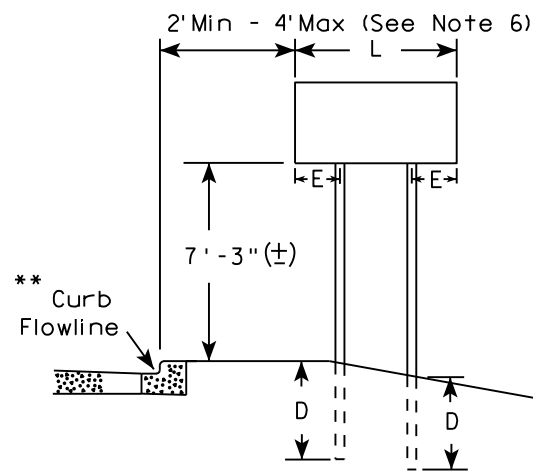
FOR NEW CONCRETE/ ASPHALT INSTALLATIONS

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

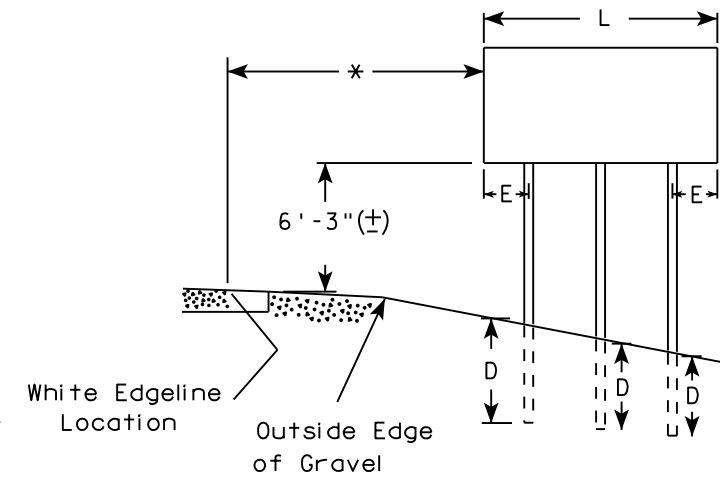
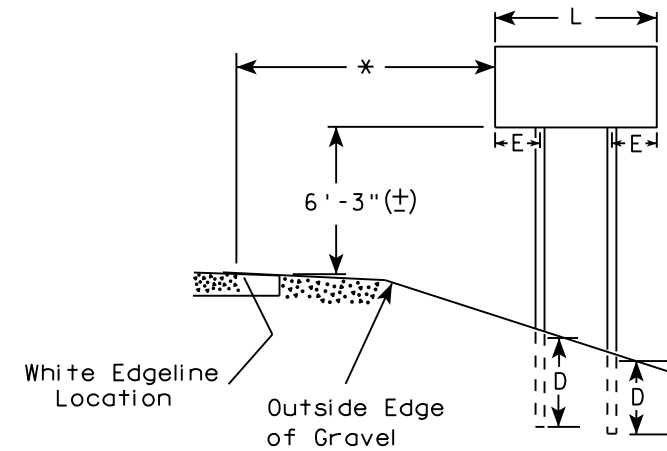
GENERAL NOTES

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

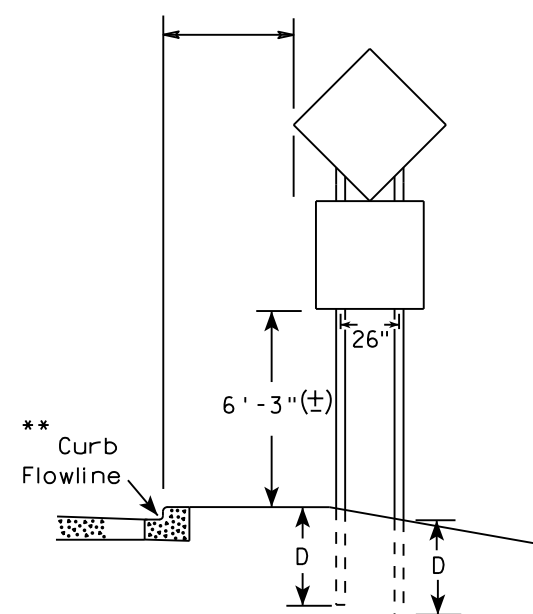
URBAN AREA



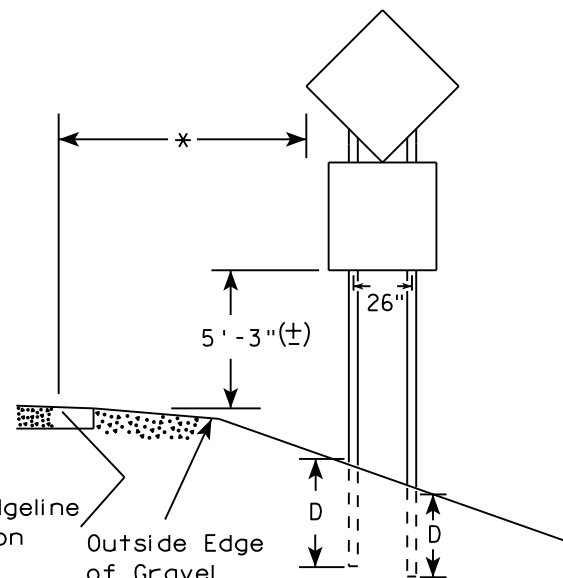
RURAL AREA (See Note 3)



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



48" DIAMOND WARNING SIGN



48" DIAMOND WARNING SIGN

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

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

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

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

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

POST EMBEDMENT DEPTH

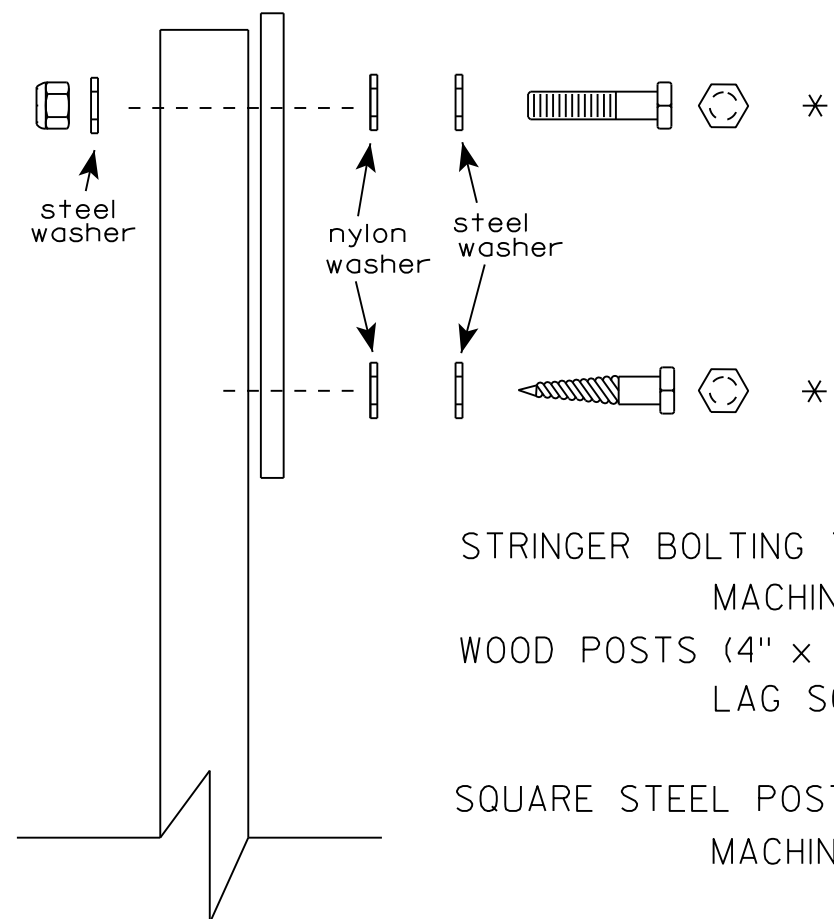
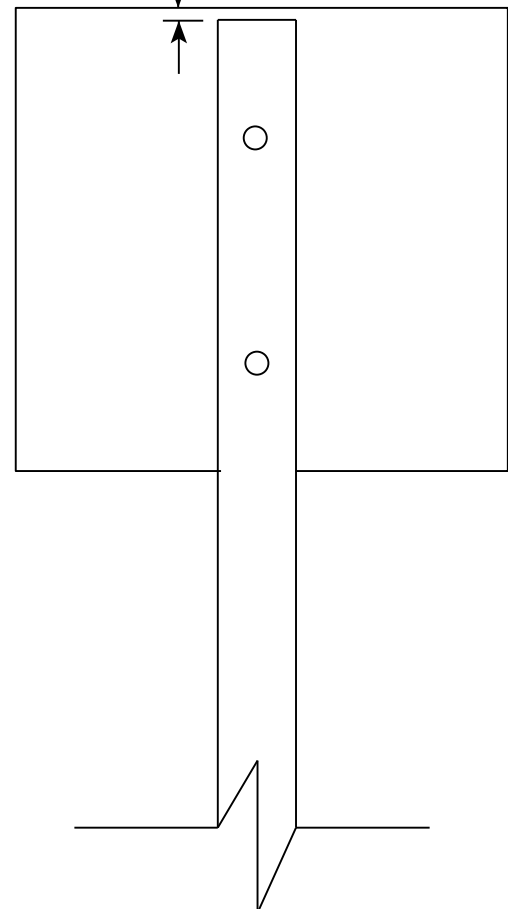
Area of Sign Installation (Sq. Ft.)	D (Min)
20 or Less	4'
Greater than 20	5'

TYPICAL INSTALLATION OF TYPE II SIGNS ON MULTIPLE POSTS

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

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

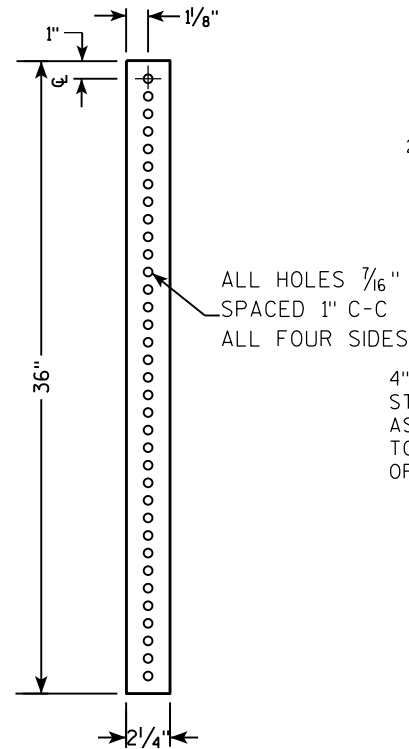
* Two different fastening systems are shown for illustration purposes. On any individual sign, either one or the other system shall be used. Actual number of fasteners per sign varies with the sign area, but normally there are two. For a single post installation, all signs greater than 9 sq. ft. require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

7

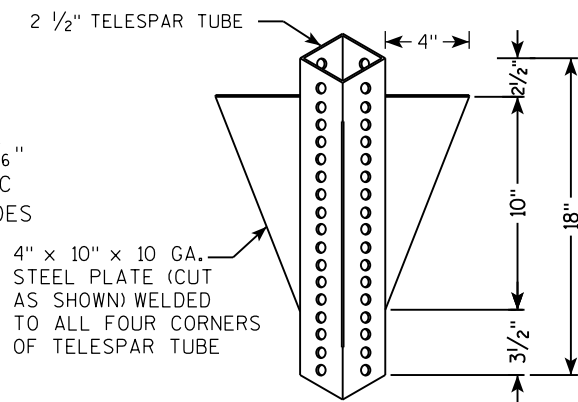
ATTACHMENT OF SIGNS TO POSTS	
WISCONSIN DEPT OF TRANSPORTATION	
APPROVED	<i>Matthew R. Rauch</i> For State Traffic Engineer
DATE 8/11/16	PLATE NO. A4-8.8

**TELESCOPIC TUBING ANCHORS
TWO PIECE SYSTEM**

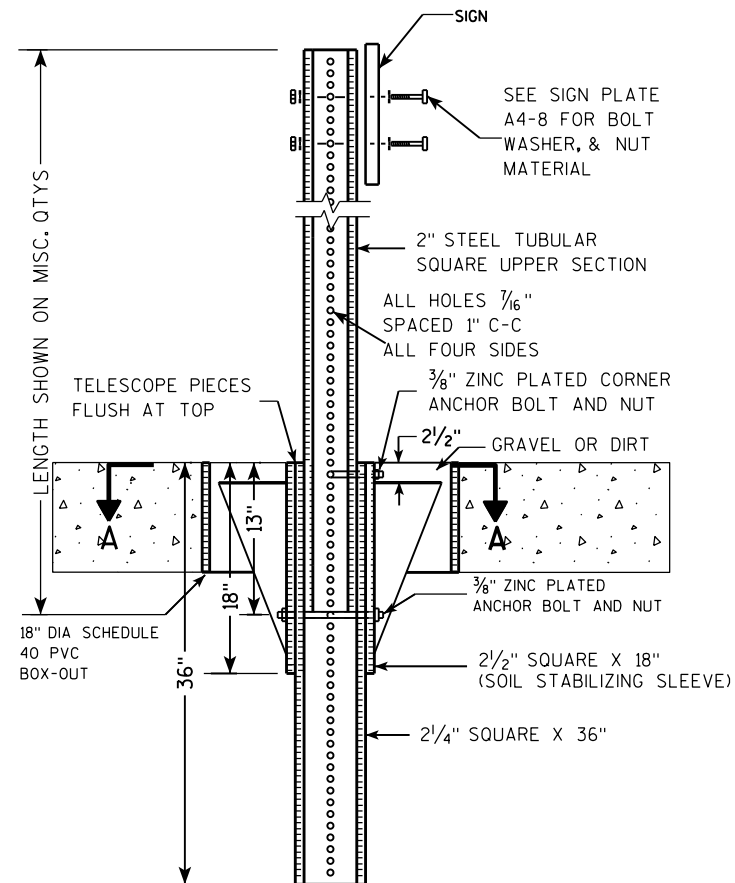
2 1/4" SQUARE
12 GAUGE
PERFORATED
GALVANIZED FINISH



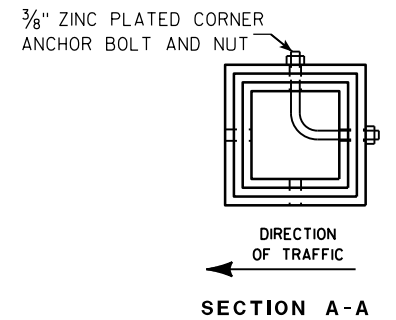
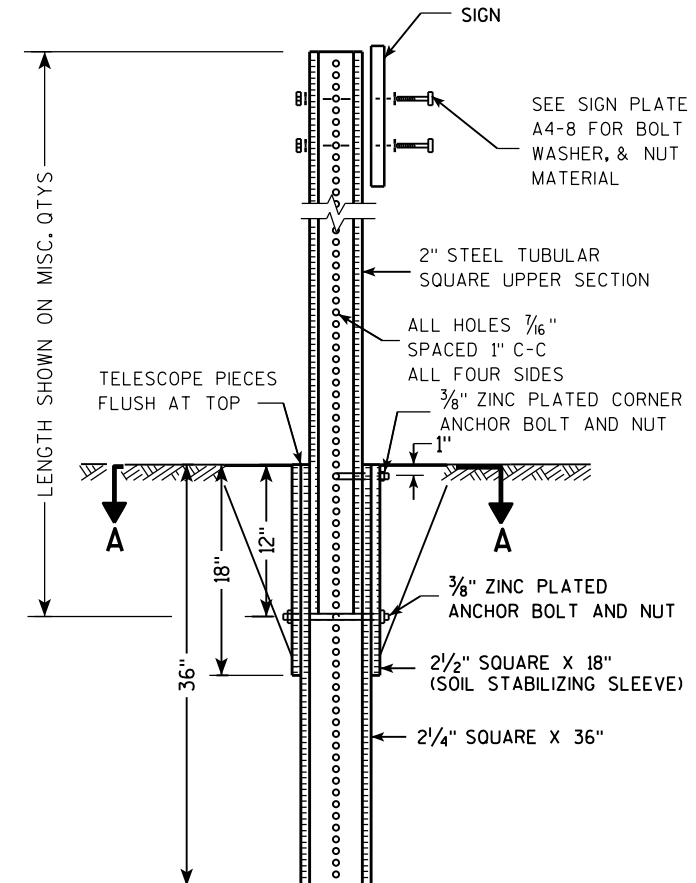
2 1/2" SQUARE
12 GAUGE
OMNI-DIRECTIONAL
PERFORATED
SOIL STABILIZING SLEEVE
GALVANIZED FINISH



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



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



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

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

**TUBULAR STEEL
SIGN POST
A4-9**

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

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

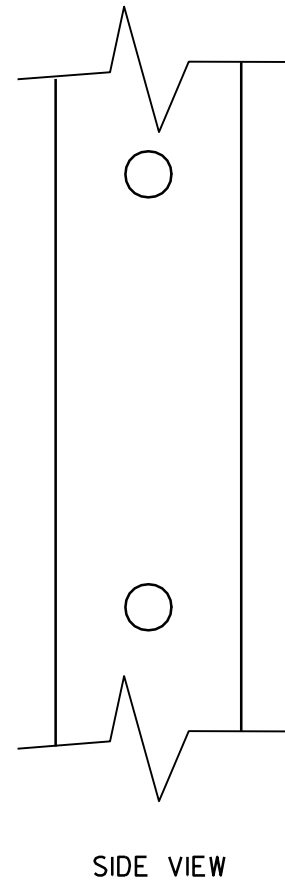
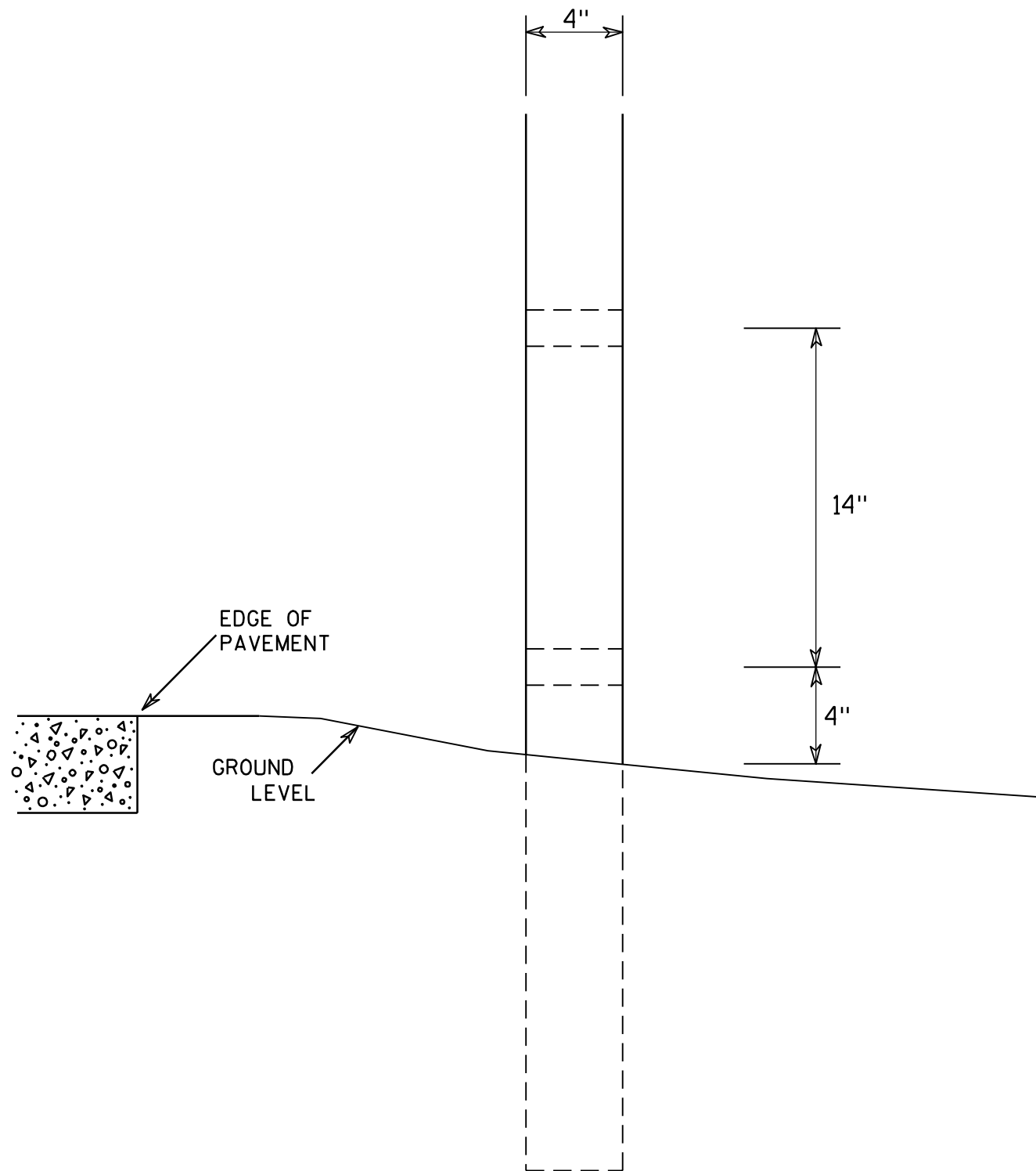
PROJECT NO:

HWY:

COUNTY:

SHEET NO:

E



GENERAL NOTES

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

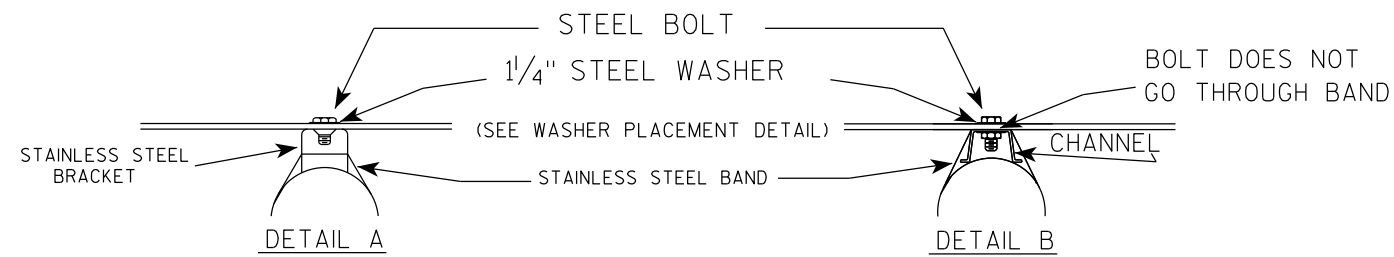
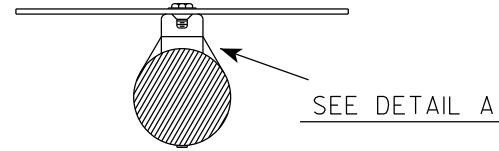
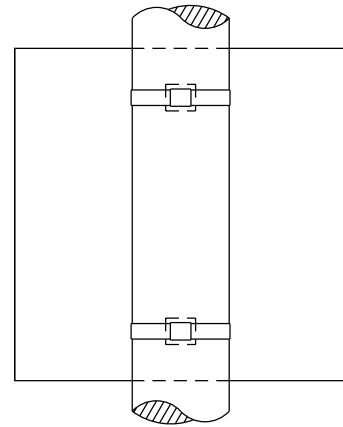
7

7

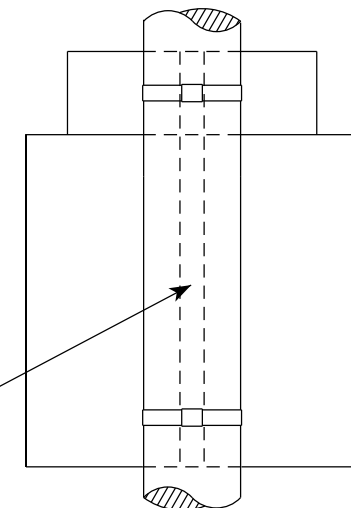
4 X 6 WOOD POST MODIFICATIONS	
<i>WISCONSIN DEPT OF TRANSPORTATION</i>	
APPROVED	<i>Chester J Spang</i> for State Traffic Engineer
DATE <u>3/27/97</u>	PLATE NO. <u>A4-11.2</u>

BANDING

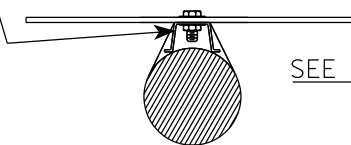
SINGLE SIGN



"J" ASSEMBLY

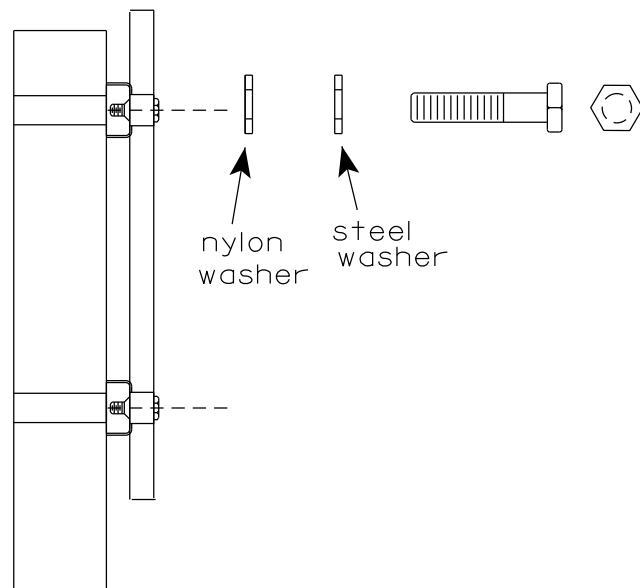


CHANNEL
SEE TYPICAL PANEL
INSTALLATION SHEET



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

WASHER PLACEMENT



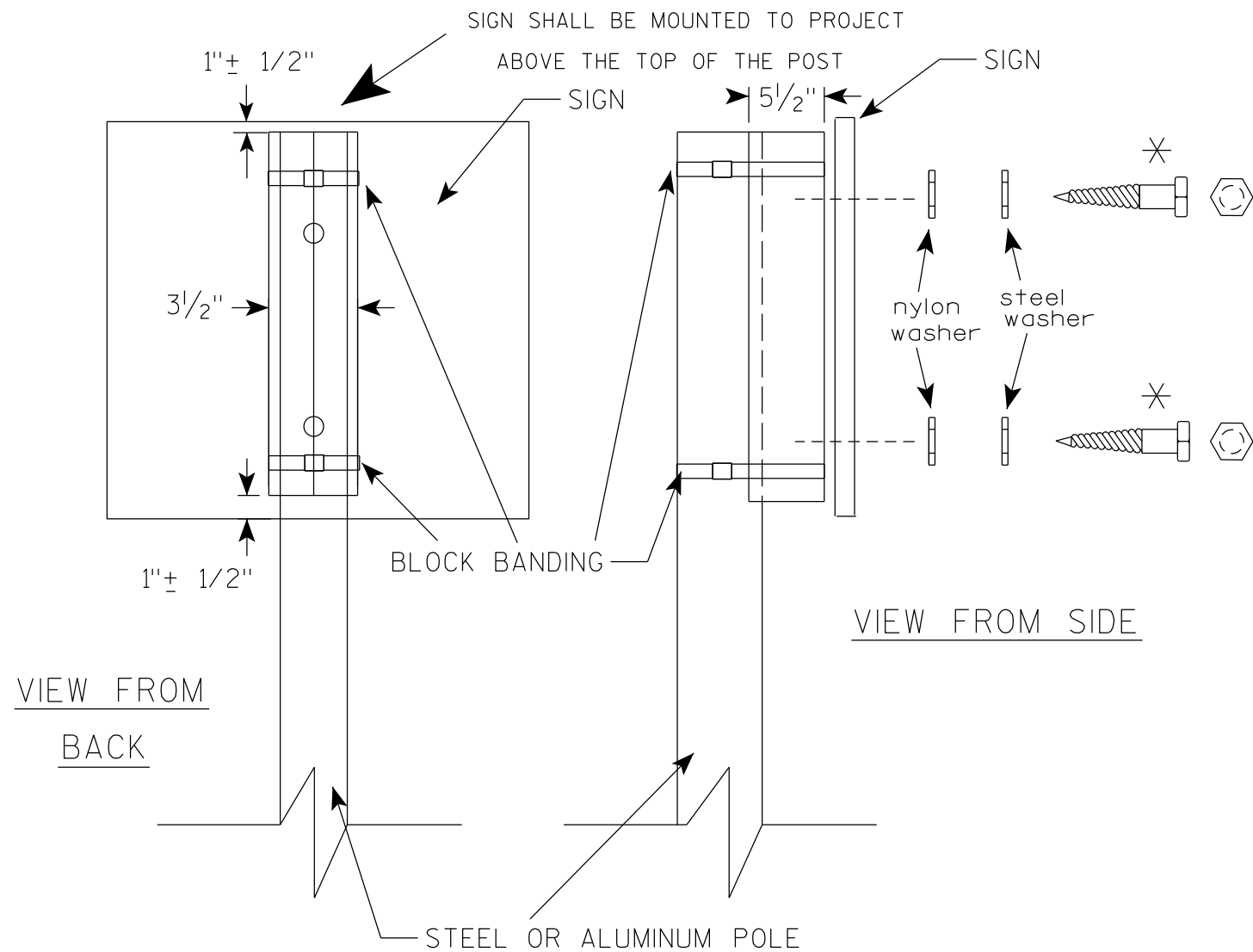
WASHERS (ALL POSTS) -
 1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL
 1-1/4" O.D. X 3/8" I.D. X .080 NYLON
 FOR ALL TYPE H SIGNS

STANDARD SIGN
SIGN BANDING DETAILS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

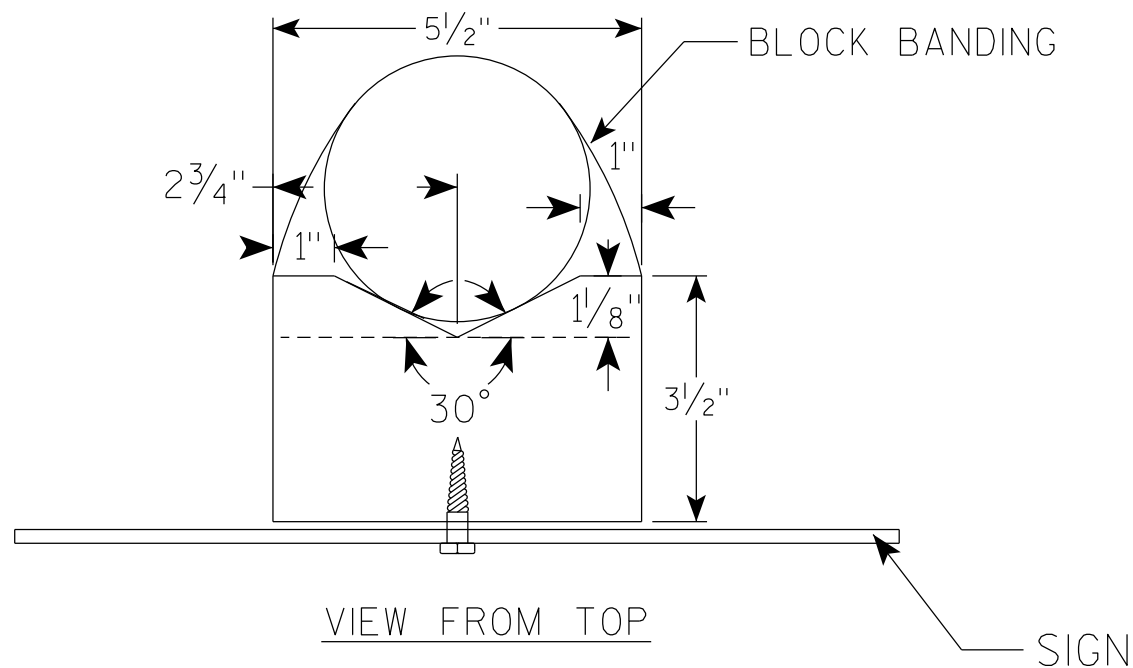
DATE 6/10/19 PLATE NO. A5-9.4



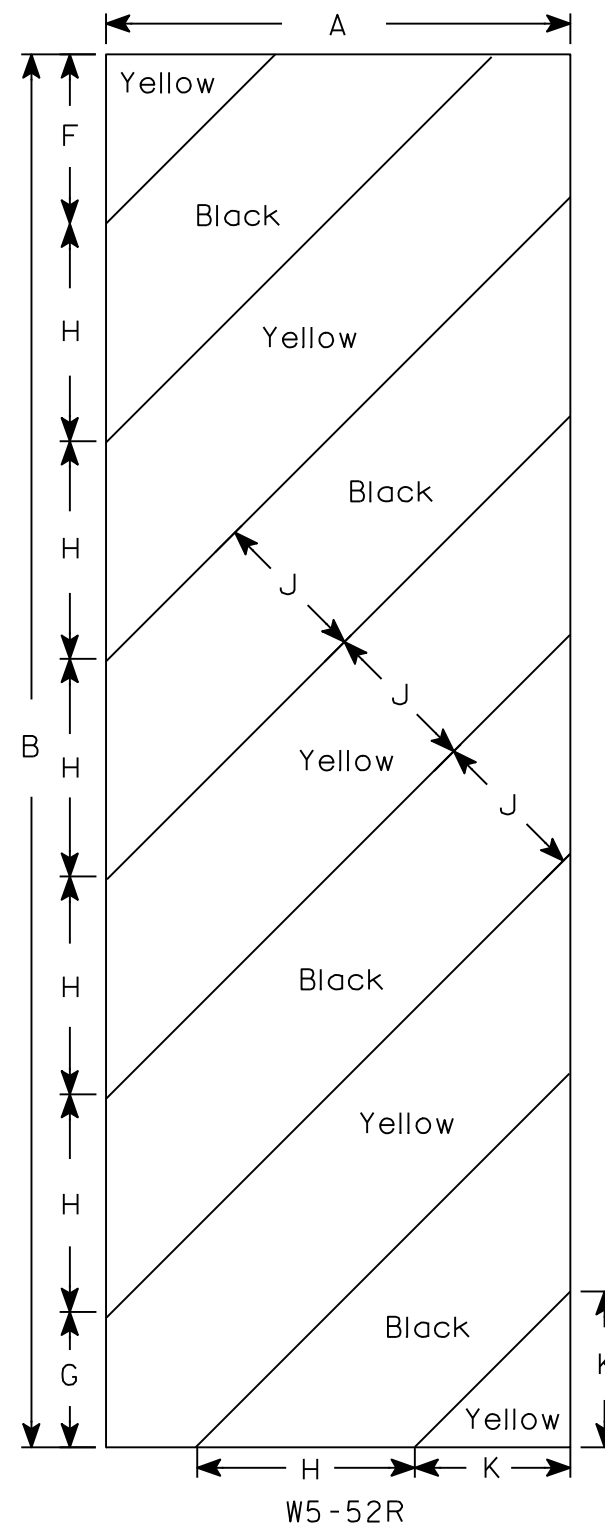
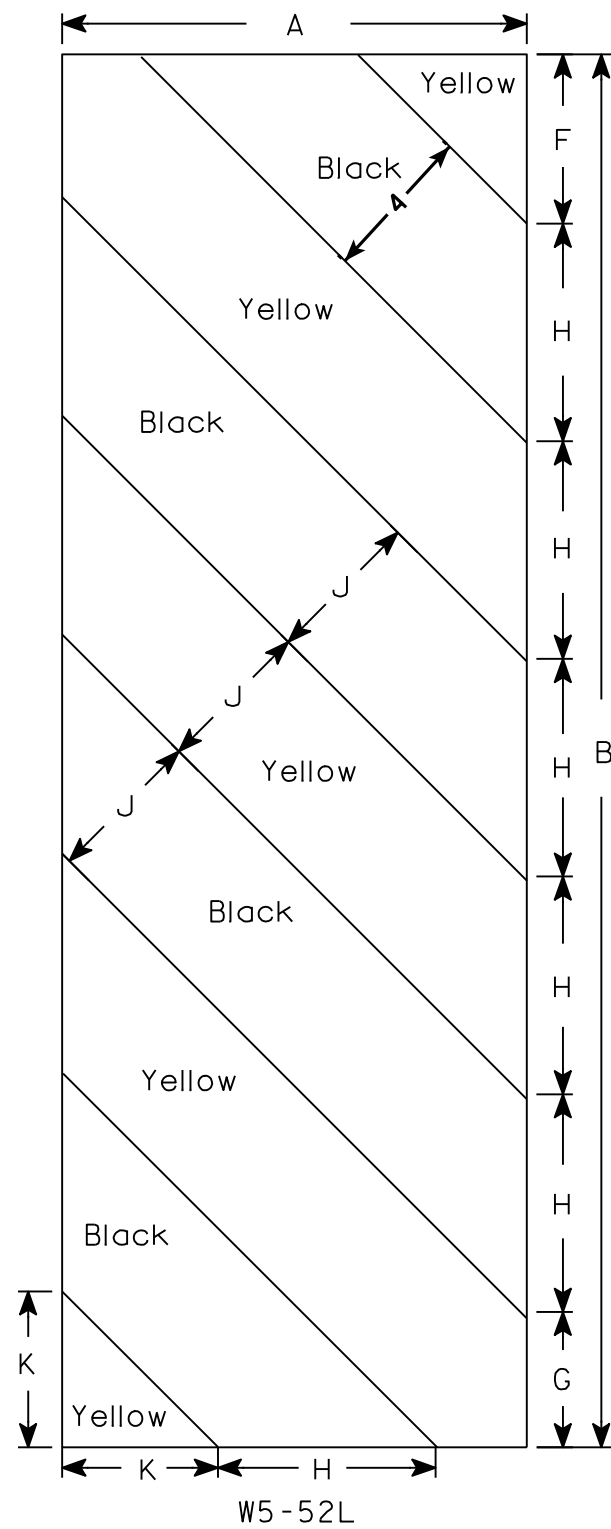
GENERAL NOTES

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 <u>6/10/19</u>	PLATE NO. <u>A5-10.2</u>



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																											

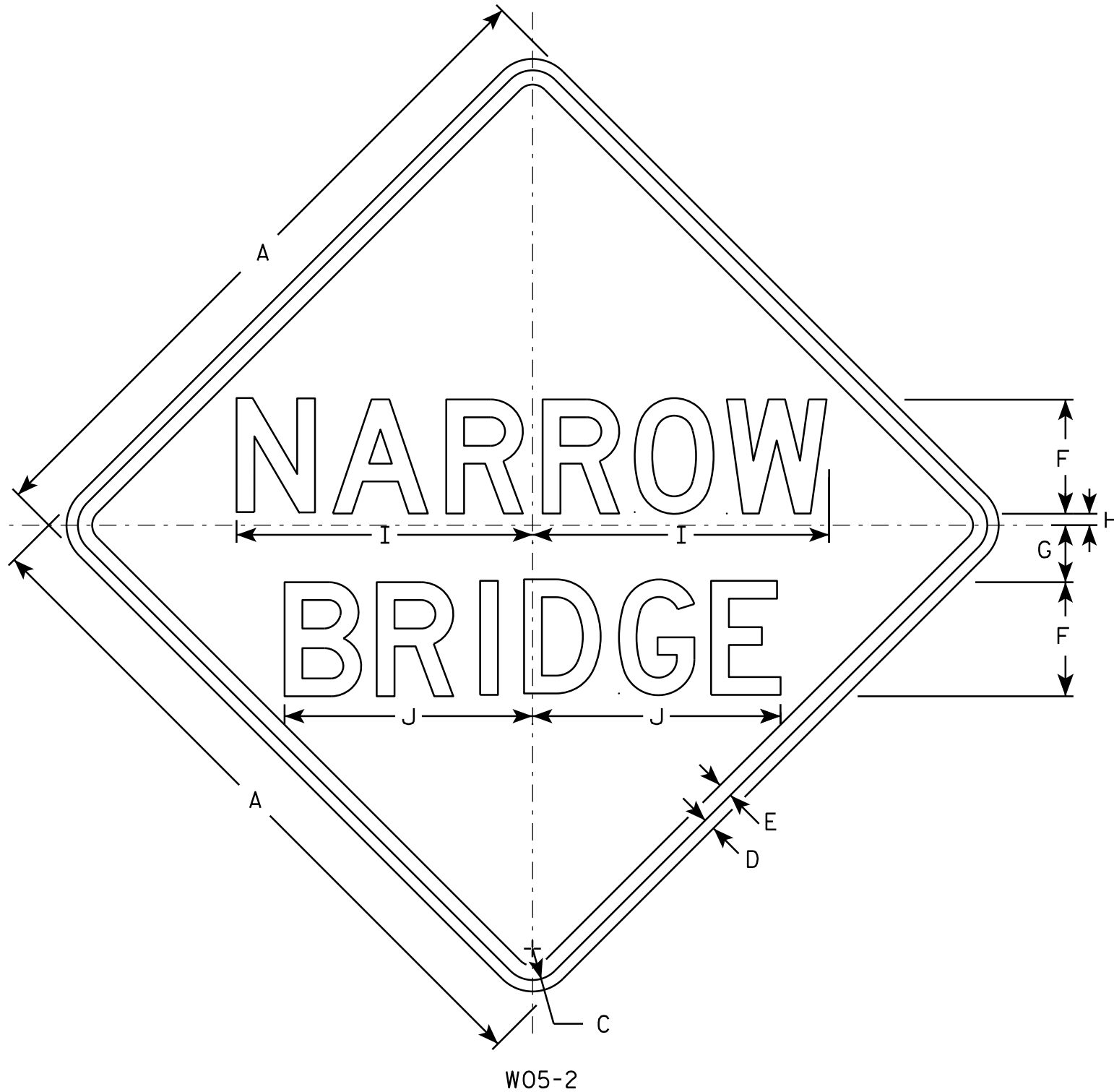
STANDARD SIGN
W5-52L & W5-52R

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



W05-2

NOTES

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

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	36		1 5/8	5/8	3/4	6	3	3/4	15 5/8	13 1/8																	9.0
2S	48		2 1/4	3/4	1	8	4	3/4	20 3/4	17 3/8																	16.0
2M	48		2 1/4	3/4	1	8	4	3/4	20 3/4	17 3/8																	16.0
3	48		2 1/4	3/4	1	8	4	3/4	20 3/4	17 3/8																	16.0
4	48		2 1/4	3/4	1	8	4	3/4	20 3/4	17 3/8																	16.0
5	48		2 1/4	3/4	1	8	4	3/4	20 3/4	17 3/8																	16.0

STANDARD SIGN
W05-2

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 11/20/13 PLATE NO. W05-2.1

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

BENCHMARKS			
NO.	STATION	ELEV.	DESCRIPTION
1	9+36, RT 18'	1434.96	CHISELED SQUARE ON SE WINGWALL
2	8+78, RT 45'	1424.55	NAIL NORTH SIDE 12" ELM
3	12+39, RT 24'	1428.99	PK NAIL TOP 15" PLASTIC CULVERT PIPE

DESIGN DATA

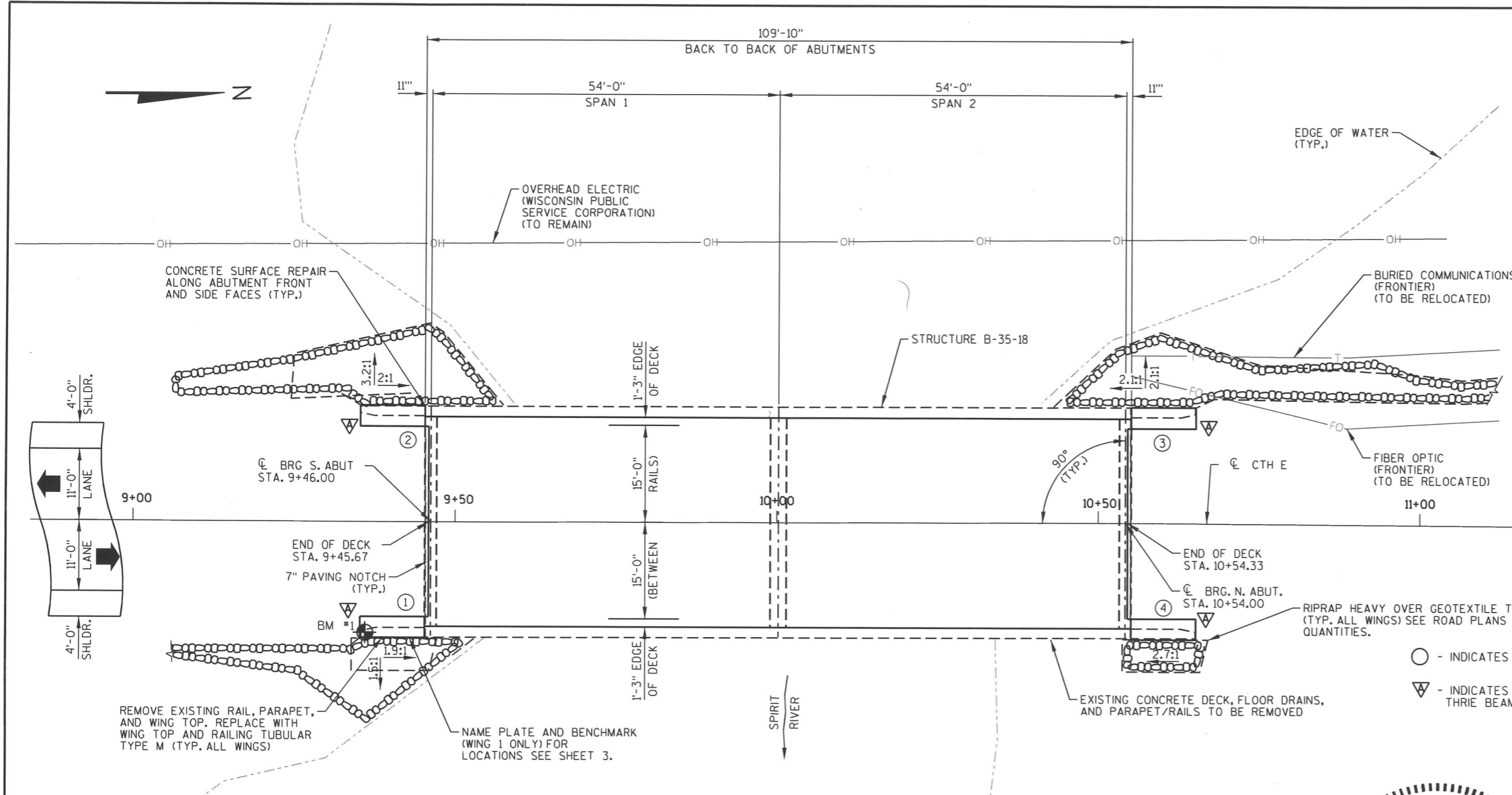
LIVE LOAD:
 DESIGN LOADING : H20
 INVENTORY RATING FACTOR : HS13
 OPERATIONAL RATING FACTOR : HS22
 WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = 155 KIPS.

TRAFFIC DATA:
 A.A.D.T. (2020) = 2,200
 A.A.D.T. (2040) = 2,400
 R.D.S. = 25 MPH

MATERIAL PROPERTIES:
 CONCRETE MASONRY, DECK $f'_c = 4,000$ 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.

LIST OF DRAWINGS

1. GENERAL PLAN
2. CROSS SECTIONS, QUANTITIES, NOTES & DETAILS
3. SOUTH ABUTMENT WING DETAILS
4. NORTH ABUTMENT WING DETAILS
5. SUPERSTRUCTURE
6. SUPERSTRUCTURE SECTIONS & DETAILS
7. RAILING TUBULAR TYPE M
8. STEEL DIAPHRAGM



PLAN

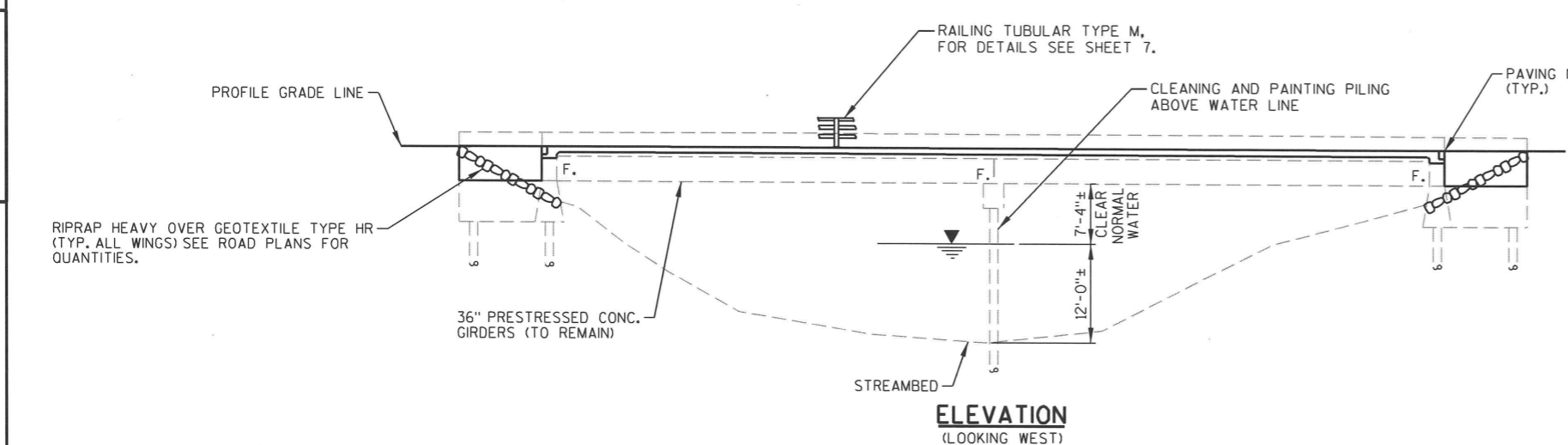
(REHAB - DECK REPLACEMENT ON EXISTING TWO SPAN PRESTRESSED CONCRETE GIRDER)



10/29/2019

CONSULTANT DESIGN CONTACT:
 KYLE BUSCH
 (608) 216-2063

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



ELEVATION
(LOOKING WEST)

NO.	DATE	REVISION	BY

MSA ENGINEERING | ARCHITECTURE | SURVEYING
 FUNDING | PLANNING | ENVIRONMENTAL
 1230 SOUTH BLVD., BARABOO WI 53913
 (608) 356-2771 www.msa-ps.com

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 ACCEPTED *William C. Dreher* SDR 11/13/19
 CHIEF STRUCTURES DESIGN ENGINEER DATE

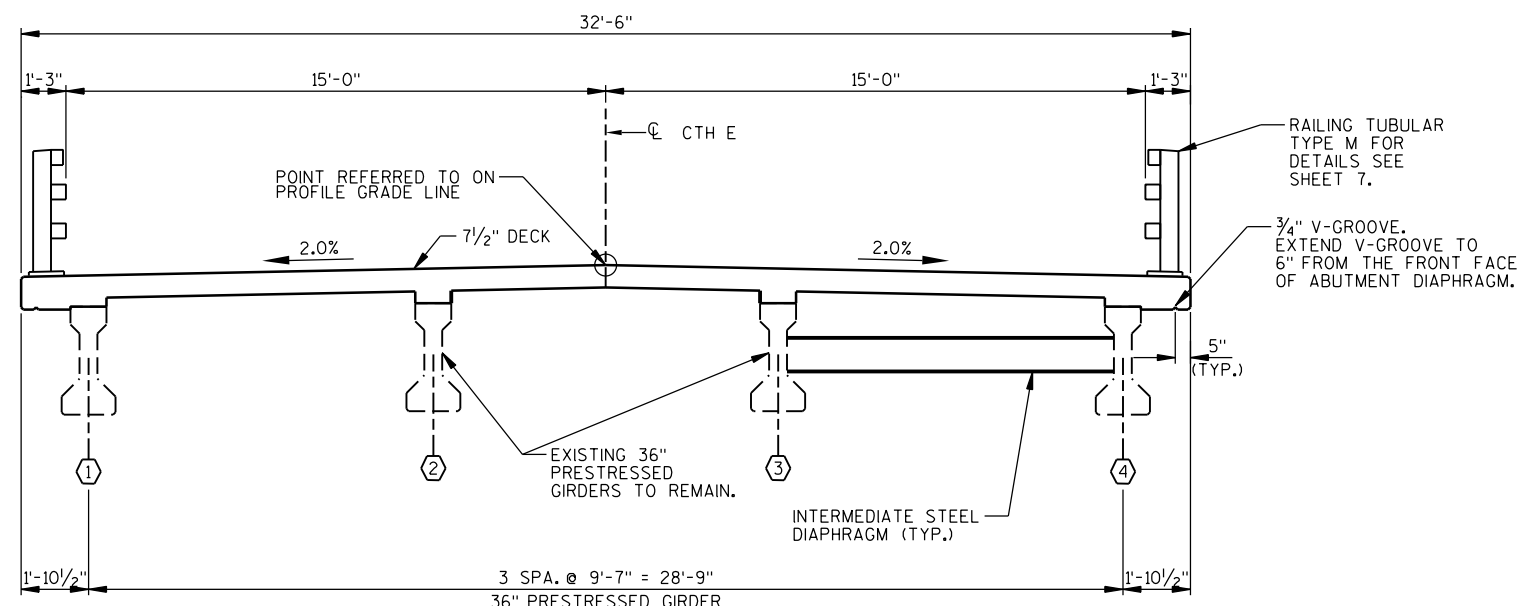
STRUCTURE B-35-18
 CTH E OVER SPIRIT RIVER

COUNTY LINCOLN TOWN/VILLAGE BRADLEY

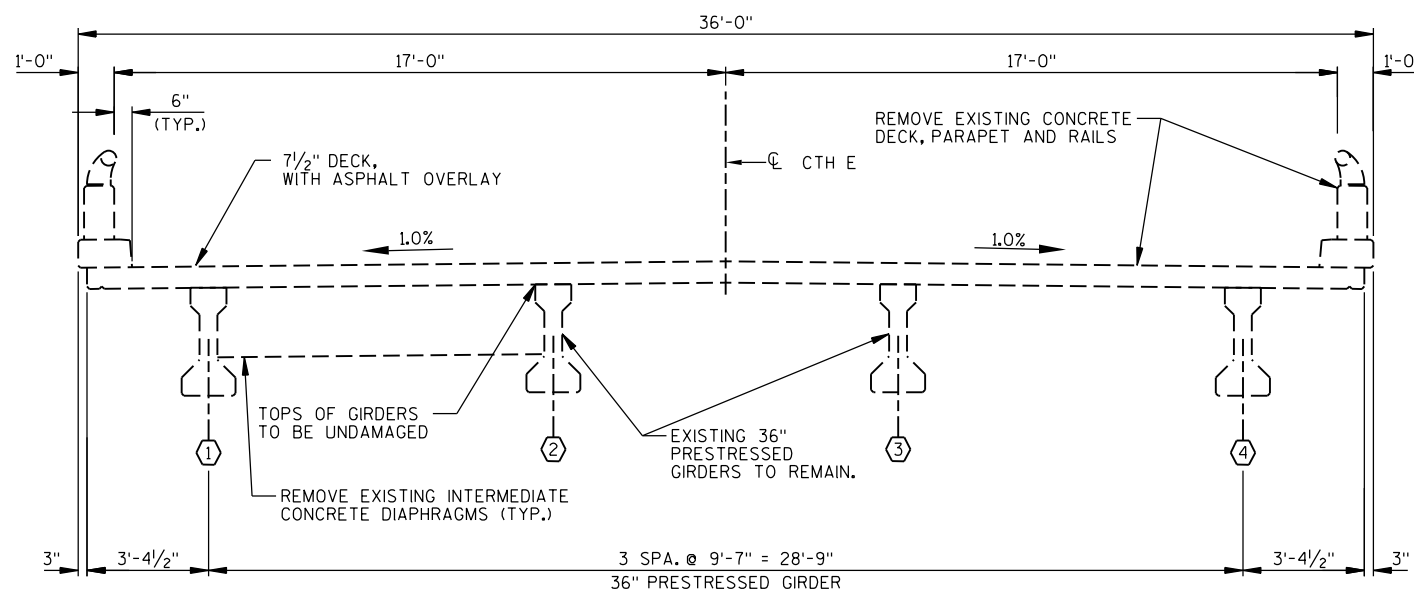
DESIGN SPEC. AASHTO LRFD BRIDGE DESIGN SPEC.

DESIGNED BY: KHB	DESIGN CK'D: LJR	DRAWN BY: RLR	PLANS CK'D: KHB
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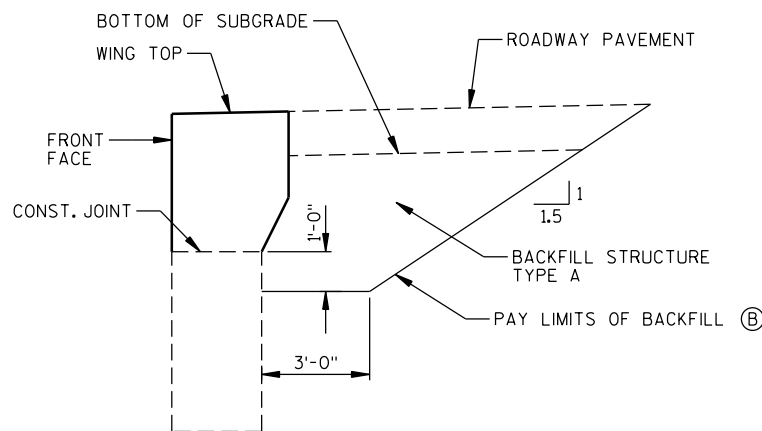
GENERAL PLAN SHEET 1 OF 8



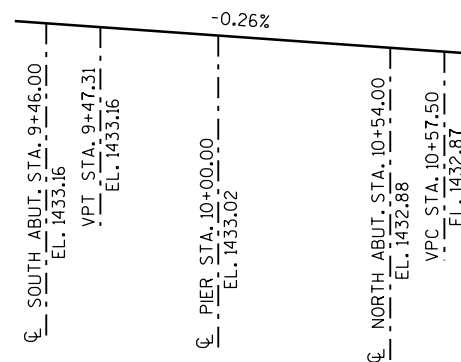
CROSS SECTION THRU BRIDGE - DECK REPLACEMENT
(LOOKING NORTH)



CROSS SECTION THRU EXISTING BRIDGE
(LOOKING NORTH)



WINGWALL BACKFILL DETAIL



PROFILE GRADE LINE - CTH E

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

⊖ INDICATES GIRDER NUMBER

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

THE FIRST DIGIT OF A THREE DIGIT BAR MARK SIGNIFIES THE BAR SIZE.

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

UTILIZE EXISTING BAR STEEL REINFORCEMENT WHERE SHOWN AND EXTEND 24 BAR DIAMETERS INTO NEW WORK, UNLESS SPECIFIED OTHERWISE.

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

VARIATIONS TO THE NEW GRADE LINE OVER 1/4" MUST BE SUBMITTED TO THE DESIGN ENGINEER FOR REVIEW.

THIS PROJECT WILL REHABILITATE THE EXISTING STRUCTURE B-35-18, A 109.83 FT. LONG, TWO SPAN PRESTRESSED CONCRETE GIRDER BRIDGE SET ON CONCRETE SILL ABUTMENTS ON TREATED TIMBER PILING AND A PILE BENT PIER WITH CIP STEEL PILING. IMPROVEMENTS INCLUDE REPLACEMENT OF THE CONCRETE DECK, WING TOP REPLACEMENT, NEW TYPE M RAILS, CONCRETE SURFACE REPAIRS, AND CLEANING AND PAINTING OF CIP STEEL PILING.

THE EXISTING GROUNDLINE SHALL BE THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES"

ALL EXCAVATED VOLUME BELOW THE ROADWAY SUBGRADE NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH BACKFILL STRUCTURE TYPE A.

(B) BACKFILL PAY LIMITS, BACKFILL BEYOND BACKFILL LIMITS SHOWN SHALL BE INCIDENTAL TO "EXCAVATION FOR STRUCTURES". LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

(C) CONCRETE SURFACE REPAIR SHALL BE USED FOR NEEDED REPAIRS ALONG ABUTMENT FRONT AND SIDE FACES AND AT THE EXPOSED FACES OF THE TOP OF THE ABUTMENT DIAPHRAGMS. LOCATIONS AND LIMITS OF REPAIRS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER. QUANTITY LISTED IS TENTATIVE.

PROTECTIVE SURFACE TREATMENT SHALL BE APPLIED TO THE TOP AND EDGES OF DECK AND TO THE OUTSIDE 1'-0" OF THE UNDERSIDE OF DECK AND TO THE EXPOSED F.F. AND TOP OF THE RECONSTRUCTED WING TOPS.

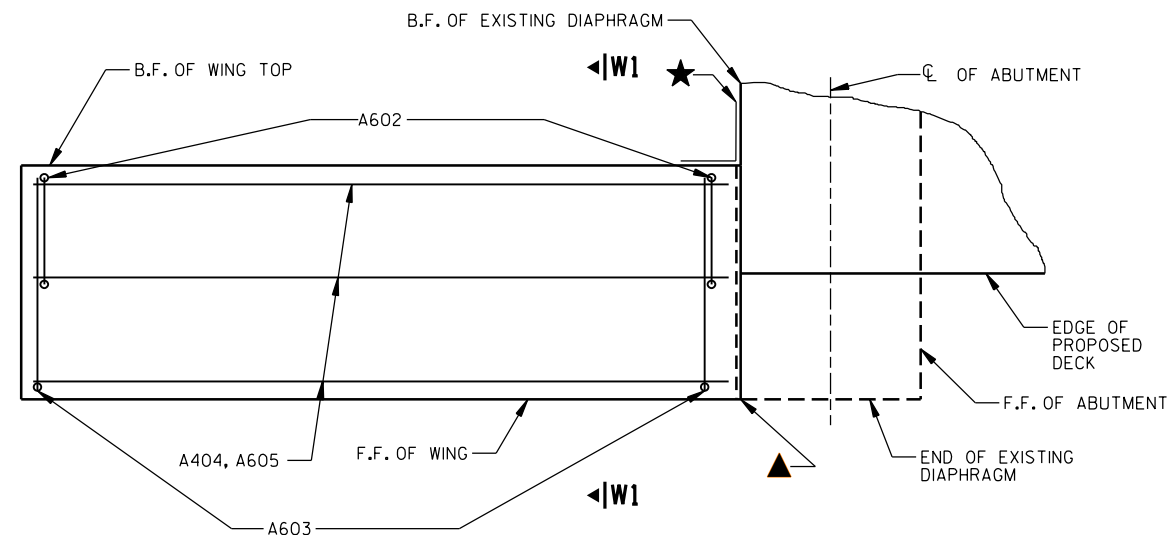
CLEAN AND PAINT EXPOSED AREAS OF PILES AT PIER ABOVE THE WATERLINE. THE COLOR OF THE FINISH TOP COAT FOR ALL PAINTED STEEL SHALL BE GRAY (FEDERAL STANDARD COLOR NO. 26293) OR SIMILAR COLOR APPROVED BY THE ENGINEER.

THE CONTRACTOR SHALL SUPPLY A NEW NAME PLATE IN ACCORDANCE WITH SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS. NAME PLATE SHALL SHOW THE ORIGINAL CONSTRUCTION YEAR OF 1967.

TOTAL ESTIMATED QUANTITIES

ITEM NUMBER	BID ITEM	UNIT	SOUTH ABUT.	PIER	NORTH ABUT.	SUPER	TOTAL
203.0210.S.01	ABATEMENT OF ASBESTOS CONTAINING MATERIAL B-35-18	LS	-	-	-	-	1
203.0600.S.01	REMOVING OLD STRUCTURE OVER WATERWAY WITH MINIMAL DEBRIS STATION 10+00	LS	-	-	-	-	1
206.1000.01	EXCAVATION FOR STRUCTURES BRIDGES B-35-18	LS	-	-	-	-	1
(B) 210.1500	BACKFILL STRUCTURE TYPE A	TON	28	-	28	-	56
502.0100	CONCRETE MASONRY BRIDGES	CY	9	-	9	94	112
502.3200	PROTECTIVE SURFACE TREATMENT	SY	15	-	15	443	473
502.4204	ADHESIVE ANCHORS NO. 4 BAR	EACH	-	-	-	30	30
502.4205	ADHESIVE ANCHORS NO. 5 BAR	EACH	-	-	-	148	148
502.4206	ADHESIVE ANCHORS NO. 6 BAR	EACH	52	-	52	-	104
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	1095	-	1095	36380	38570
506.4000.01	STEEL DIAPHRAGMS B-35-18	EACH	-	-	-	6	6
(C) 509.1500	CONCRETE SURFACE REPAIR	SF	30	-	30	-	60
513.4061	RAILING TUBULAR TYPE M	LF	-	-	-	265	265
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	5	-	5	-	10
517.4000.S.01	CONTAINMENT AND COLLECTION OF WASTE MATERIALS B-35-18	LS	-	-	-	-	1
SPV.0060.01	CLEANING AND PAINTING PILING	EACH	-	6	-	-	6
NON-BID ITEMS							
	FILLER	SIZE					1/2"

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-35-18			
DRAWN BY RLR		PLANS CK'D. KHB	
CROSS SECTIONS, QUANTITIES, NOTES & DETAILS			SHEET 2 OF 8



PLAN WING 1

WING 1 SHOWN
WING 2 OPPOSITE HAND

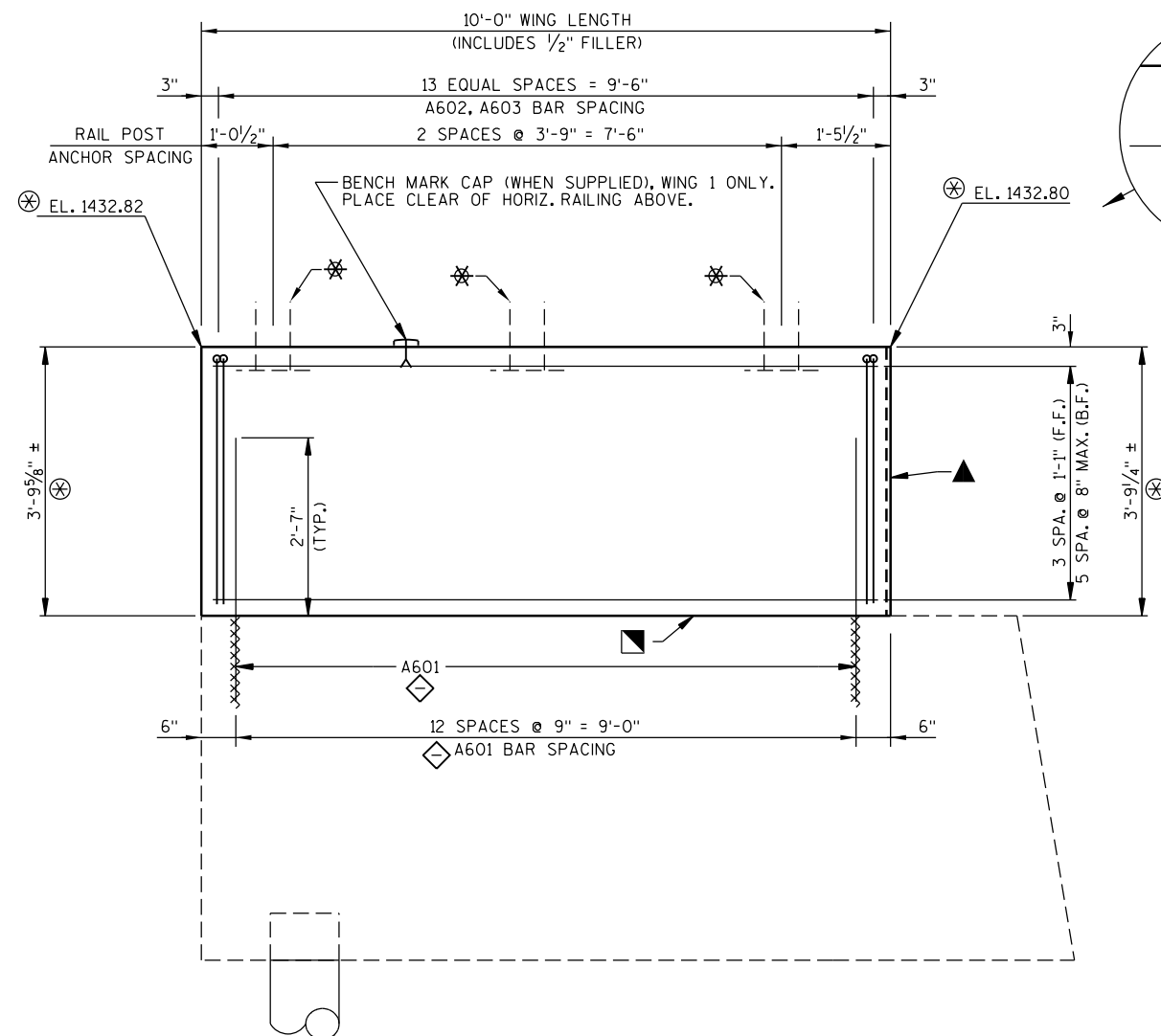
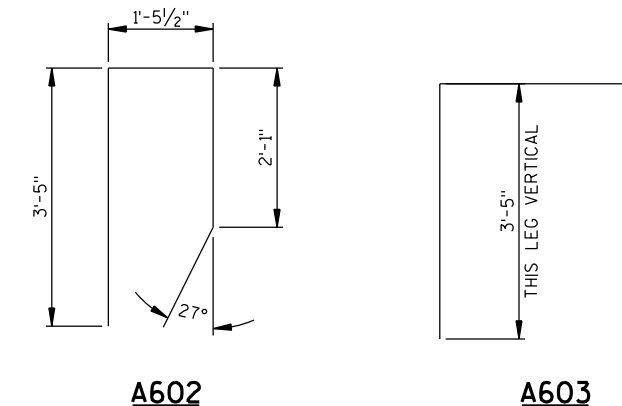
LEGEND

- F.F. - FRONT FACE B.F. - BACK FACE CL. - CLEAR
- ▣ - 3/4" "V" GROOVE ON FRONT FACE OF WING WALL AT CONST. JOINT.
- ▲ - 1/2" FILLER EXTEND AS SHOWN. SEAL ALL EXPOSED HORIZ. & VERT. SURFACES OF FILLER WITH NON-STAINING GRAY, NON-BITUMINOUS JOINT SEALER. (1" DEEP & HOLD 1/8" BELOW SURFACE OF CONCRETE).
- ★ - VERTICAL 18" WIDE RUBBERIZED MEMBRANE WATERPROOFING. EXTEND FROM BRIDGE SEAT TO TOP OF WINGS.
- - HORIZONTAL 18" WIDE RUBBERIZED MEMBRANE WATERPROOFING. EXTEND FULL LENGTH OF WING.
- ◇ - AFTER REMOVAL OF EXISTING WING TOPS, INSTALL ADHESIVE ANCHORS NO. 6 BAR AT SPACING SHOWN. EMBED 1'-3" IN CONCRETE. ANCHORS SHALL BE APPROVED FOR USE IN CRACKED CONCRETE. ANCHORS SHALL BE 4 1/2" CLEAR TO FACE OF EXISTING CONCRETE.
- ✱ - FOR RAIL POST ANCHOR DETAILS SEE SHEET 7.
- ⊗ - ELEVATIONS AND DIMENSIONS ARE GIVEN AT THE F.F. OF WING.

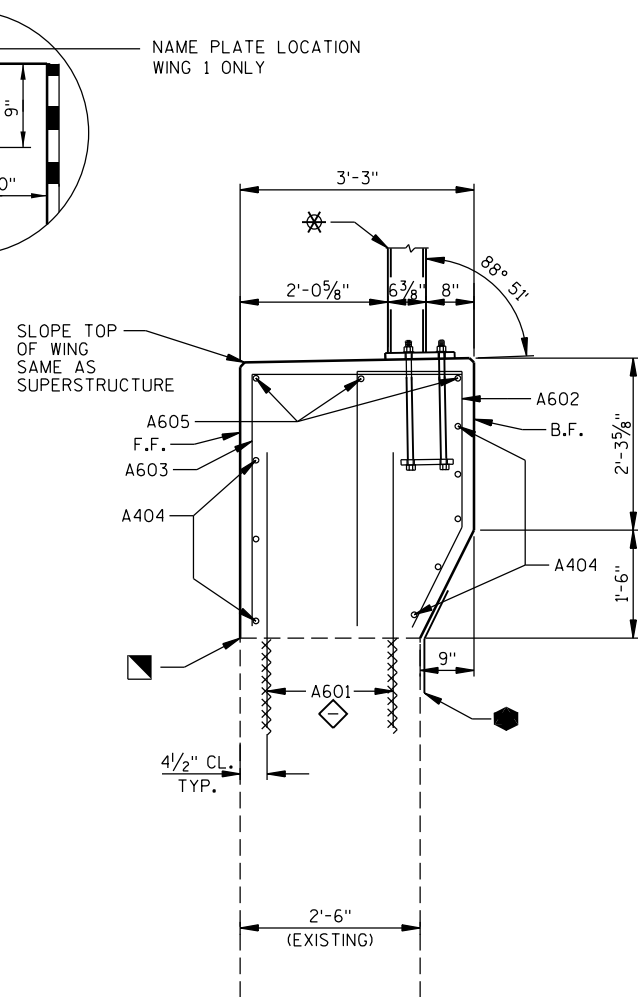
BILL OF BARS (COATED) 1095 LBS.

MARK	NO. REQ'D.	LENGTH	BENT	LOCATION
◇ A601	52	3'-10"		WINGS - DOWEL - VERT.
A602	28	8'-3"	X	WINGS - STIRRUP - B.F. - VERT.
A603	28	6'-2"	X	WINGS - STIRRUP - F.F. - VERT.
A404	16	9'-7"		WINGS - HORIZ.
A605	6	9'-7"		WINGS - TOP - HORIZ.

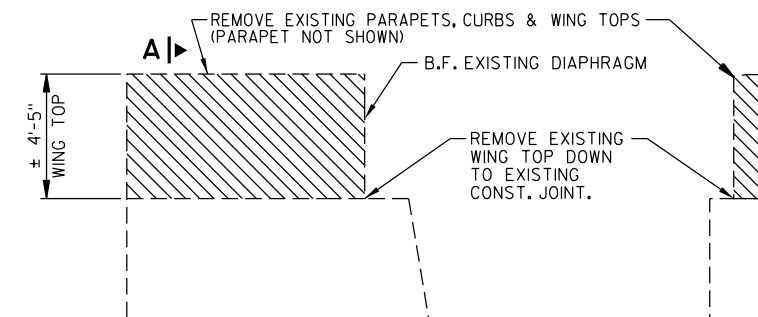
DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.
EPOXY COAT ALL BAR STEEL REINFORCEMENT.



ELEVATION - WING 1

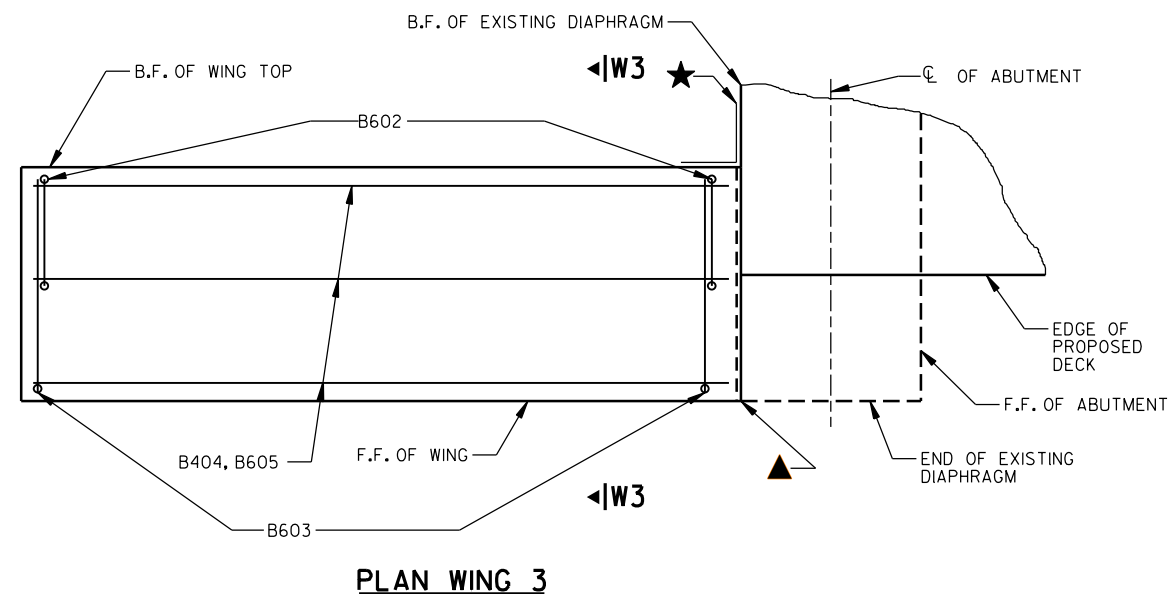


SECTION W1-W1



ELEVATION - WINGS
EXISTING ABUTMENT REMOVAL LIMITS

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-35-18			
DRAWN BY: RLR		PLANS CK'D: KHB	
SOUTH ABUTMENT WING DETAILS			SHEET 3 OF 8

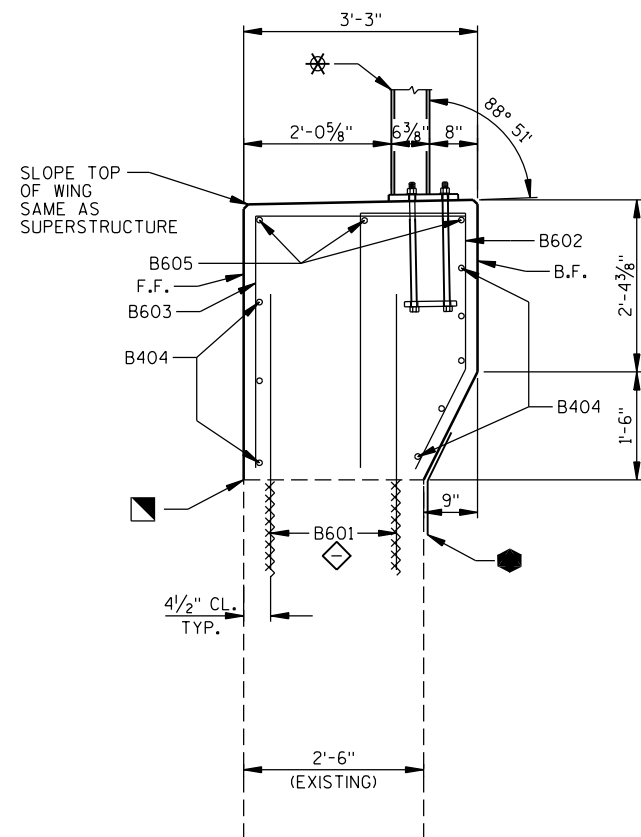
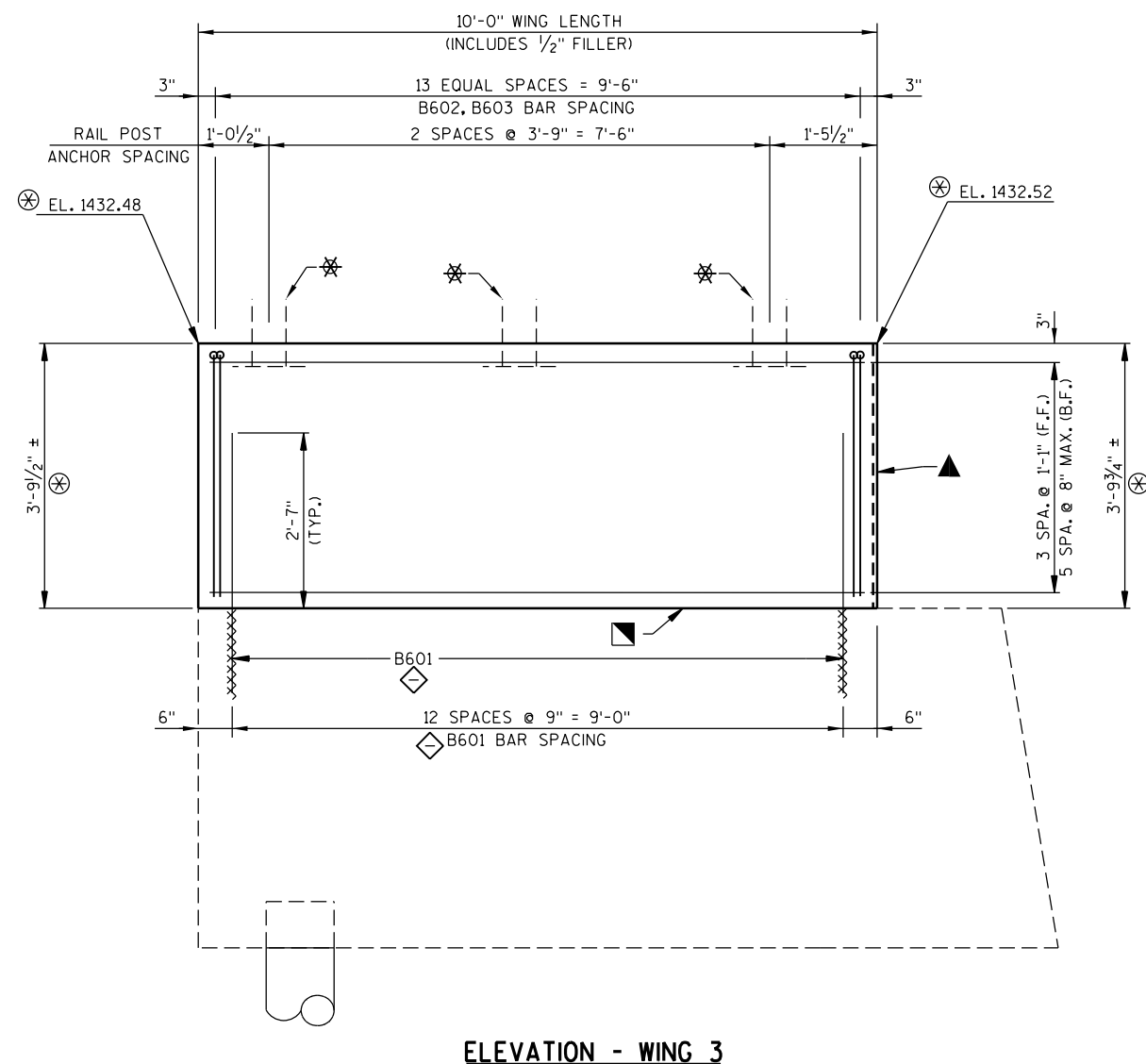
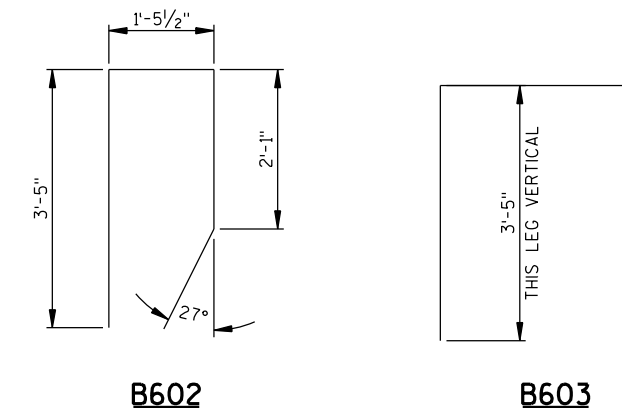


WING 3 SHOWN
WING 4 OPPOSITE HAND

BILL OF BARS (COATED) 1095 LBS.

MARK	NO. REQ'D.	LENGTH	BENT	LOCATION
B601	52	3'-10"		WINGS - DOWEL - VERT.
B602	28	8'-3"	X	WINGS - STIRRUP - B.F. - VERT.
B603	28	6'-2"	X	WINGS - STIRRUP - F.F. - VERT.
B404	16	9'-7"		WINGS - HORIZ.
B605	6	9'-7"		WINGS - TOP - HORIZ.

DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.
EPOXY COAT ALL BAR STEEL REINFORCEMENT.



LEGEND

- F.F. - FRONT FACE B.F. - BACK FACE CL. - CLEAR
- ▣ - 3/4" "V" GROOVE ON FRONT FACE OF WING WALL AT CONST. JOINT.
- ▲ - 1/2" FILLER EXTEND AS SHOWN. SEAL ALL EXPOSED HORIZ. & VERT. SURFACES OF FILLER WITH NON-STAINING GRAY, NON-BITUMINOUS JOINT SEALER. (1" DEEP & HOLD 1/8" BELOW SURFACE OF CONCRETE).
- ★ - VERTICAL 18" WIDE RUBBERIZED MEMBRANE WATERPROOFING. EXTEND FROM BRIDGE SEAT TO TOP OF WINGS.
- - HORIZONTAL 18" WIDE RUBBERIZED MEMBRANE WATERPROOFING. EXTEND FULL LENGTH OF WING.
- ◇ - AFTER REMOVAL OF EXISTING WING TOPS, INSTALL ADHESIVE ANCHORS NO. 6 BAR AT SPACING SHOWN. EMBED 1'-3" IN CONCRETE. ANCHORS SHALL BE APPROVED FOR USE IN CRACKED CONCRETE. ANCHORS SHALL BE 4 1/2" CLEAR TO FACE OF EXISTING CONCRETE.
- ✱ - FOR RAIL POST ANCHOR DETAILS SEE SHEET 7.
- ⊗ - ELEVATIONS AND DIMENSIONS ARE GIVEN AT THE F.F. OF WING.

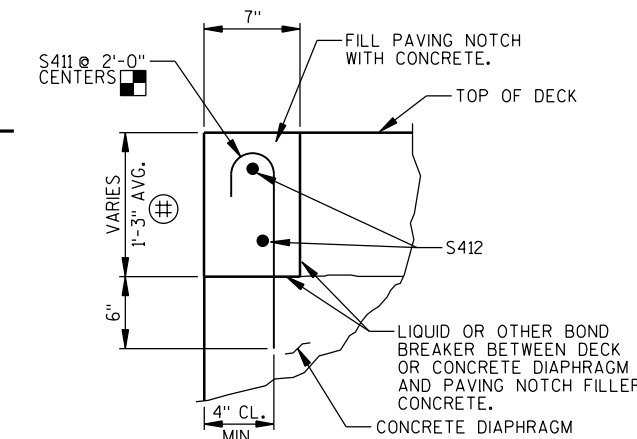
8

8

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-35-18			
DRAWN BY RLR		PLANS CK'D. KHB	
NORTH ABUTMENT WING DETAILS			SHEET 4 OF 8

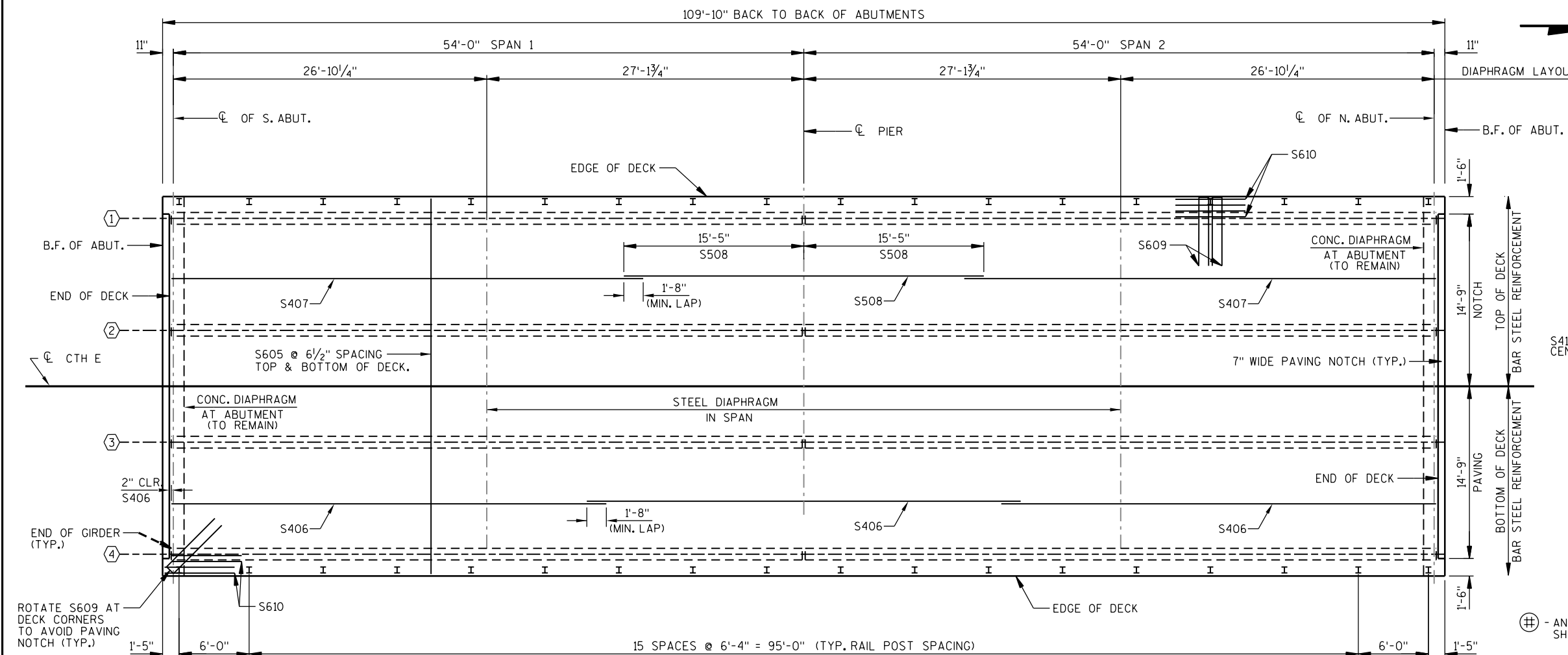
GENERAL NOTES

- - INDICATES GIRDER NUMBER
- SEE SHEET 6 FOR TRANSVERSE AND LONGITUDINAL BAR SPACING.
- SEE SHEET 7 FOR DETAILS OF RAILING TUBULAR TYPE M.
- SEE SHEET 8 FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS.
- - ADHESIVE ANCHORS NO. 4 BAR. EMBED 6" IN CONCRETE. ANCHORS SHALL BE APPROVED FOR USE IN CRACKED CONCRETE. ANCHORS SHALL BE 4" CLEAR MIN. TO FACE OF EXISTING CONCRETE.



PAVING NOTCH DETAIL

⊕ - ANY BACKFILL NEEDED ALONG THE BACK OF THE ABUTMENT SHALL BE INCIDENTAL TO "EXCAVATION FOR STRUCTURES".



PLAN

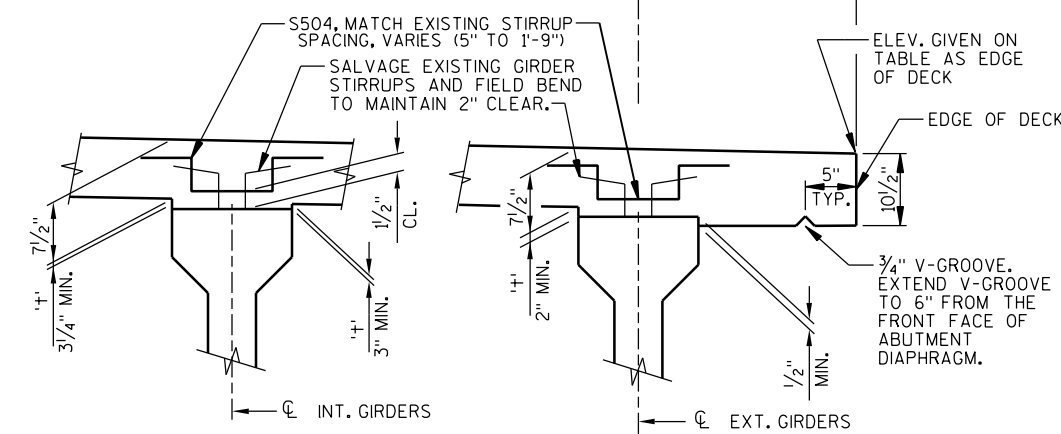
TOP OF DECK ELEVATIONS

LOCATION	SPAN POINT	EAST DECK EDGE	C/L GIRDER 4	C/L GIRDER 3	C/L CTH E	C/L GIRDER 2	C/L GIRDER 1	WEST DECK EDGE
S. ABUT.	1	1432.83	1432.87	1433.06	1433.16	1433.06	1432.87	1432.83
	1.1	1432.82	1432.86	1433.05	1433.14	1433.05	1432.86	1432.82
	1.2	1432.81	1432.84	1433.03	1433.13	1433.03	1432.84	1432.81
	1.3	1432.79	1432.83	1433.02	1433.12	1433.02	1432.83	1432.79
	1.4	1432.78	1432.81	1433.01	1433.10	1433.01	1432.81	1432.78
	1.5	1432.76	1432.80	1432.99	1433.09	1432.99	1432.80	1432.76
	1.6	1432.75	1432.79	1432.98	1433.07	1432.98	1432.79	1432.75
	1.7	1432.74	1432.77	1432.96	1433.06	1432.96	1432.77	1432.74
	1.8	1432.72	1432.76	1432.95	1433.05	1432.95	1432.76	1432.72
	1.9	1432.71	1432.74	1432.94	1433.03	1432.94	1432.74	1432.71
CL PIER	2	1432.69	1432.73	1432.92	1433.02	1432.92	1432.73	1432.69
	2.1	1432.68	1432.72	1432.91	1433.00	1432.91	1432.72	1432.68
	2.2	1432.66	1432.70	1432.89	1432.99	1432.89	1432.70	1432.66
	2.3	1432.65	1432.69	1432.88	1432.98	1432.88	1432.69	1432.65
	2.4	1432.64	1432.67	1432.87	1432.96	1432.87	1432.67	1432.64
	2.5	1432.62	1432.66	1432.85	1432.95	1432.85	1432.66	1432.62
	2.6	1432.61	1432.65	1432.84	1432.93	1432.84	1432.65	1432.61
	2.7	1432.59	1432.63	1432.82	1432.92	1432.82	1432.63	1432.59
	2.8	1432.58	1432.62	1432.81	1432.91	1432.81	1432.62	1432.58
	2.9	1432.57	1432.60	1432.80	1432.89	1432.80	1432.60	1432.57
N. ABUT.	3	1432.55	1432.59	1432.78	1432.88	1432.78	1432.59	1432.55

TO DETERMINE '+', ELEV. OF TOP OF GIRDERS AT CL OF SUBSTRUCTURE UNITS & AT 1/10 POINTS OF EACH SPAN SHALL BE TAKEN. TO DETERMINE THE TOP OF DECK ELEVATION FOR POINT REFERRED USE TABLE ON THIS SHEET AND ADJUST FOR CROSS SLOPE OVER GIRDER. THEN FOLLOW THIS PROCESS:

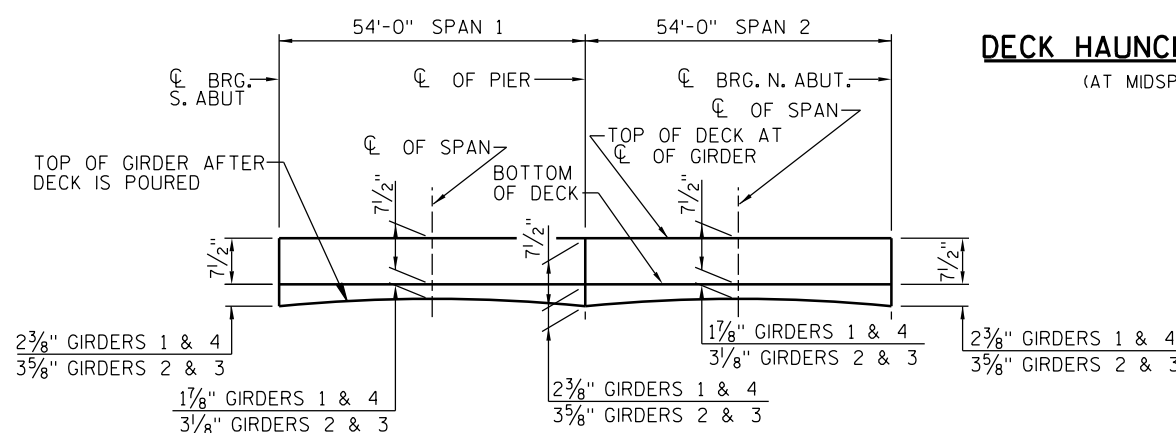
NOTE: AN AVERAGE HAUNCH ("H") OF 3 3/8" FOR INTERIOR GIRDERS AND 2 1/8" FOR EXTERIOR GIRDERS WAS USED IN THE QUANTITY "CONCRETE MASONRY BRIDGES."
 TOP OF DECK ELEV. AT FINAL GRADE
 - TOP OF GIRDER ELEVATION
 + DEADLOAD DEFLECTION
 - DECK THICKNESS

 = HAUNCH HEIGHT '+'



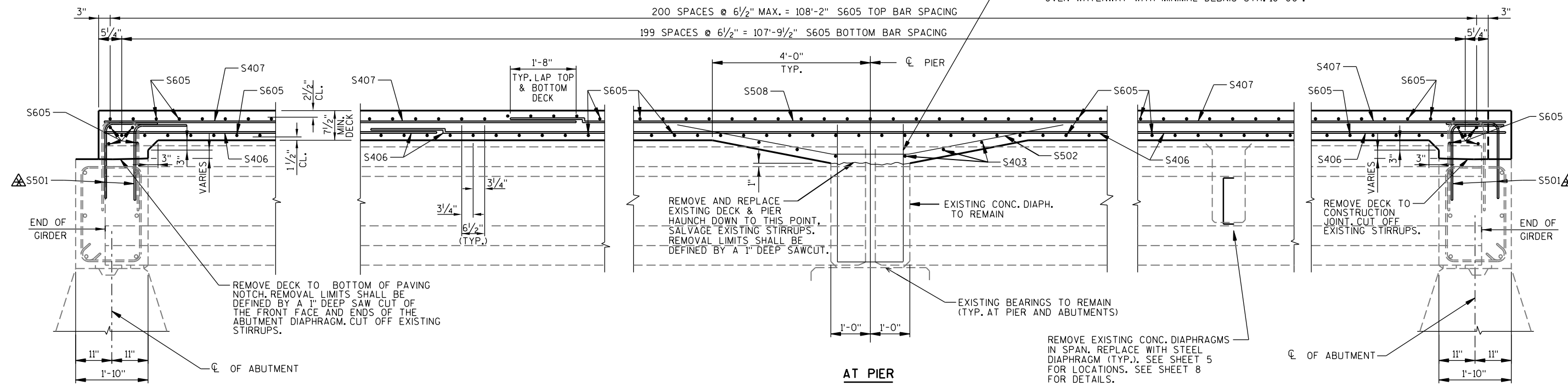
DECK HAUNCH DETAIL

(AT MIDSPAN)

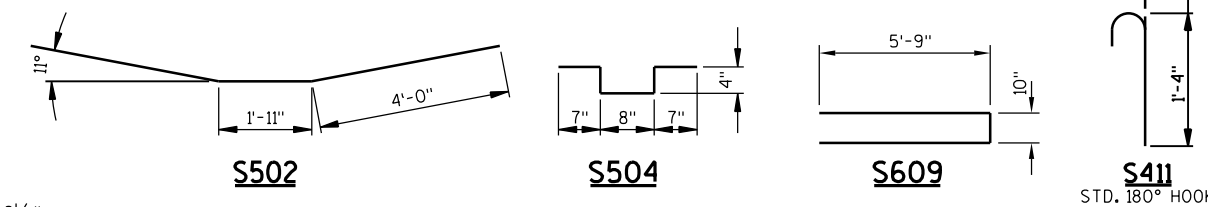


HAUNCH HEIGHTS FOR GIRDER STIRRUP PROJECTION

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-35-18			
DRAWN BY RLR		PLANS CK'D. KHB	
SUPERSTRUCTURE			SHEET 5 OF 8



PART LONGITUDINAL SECTION



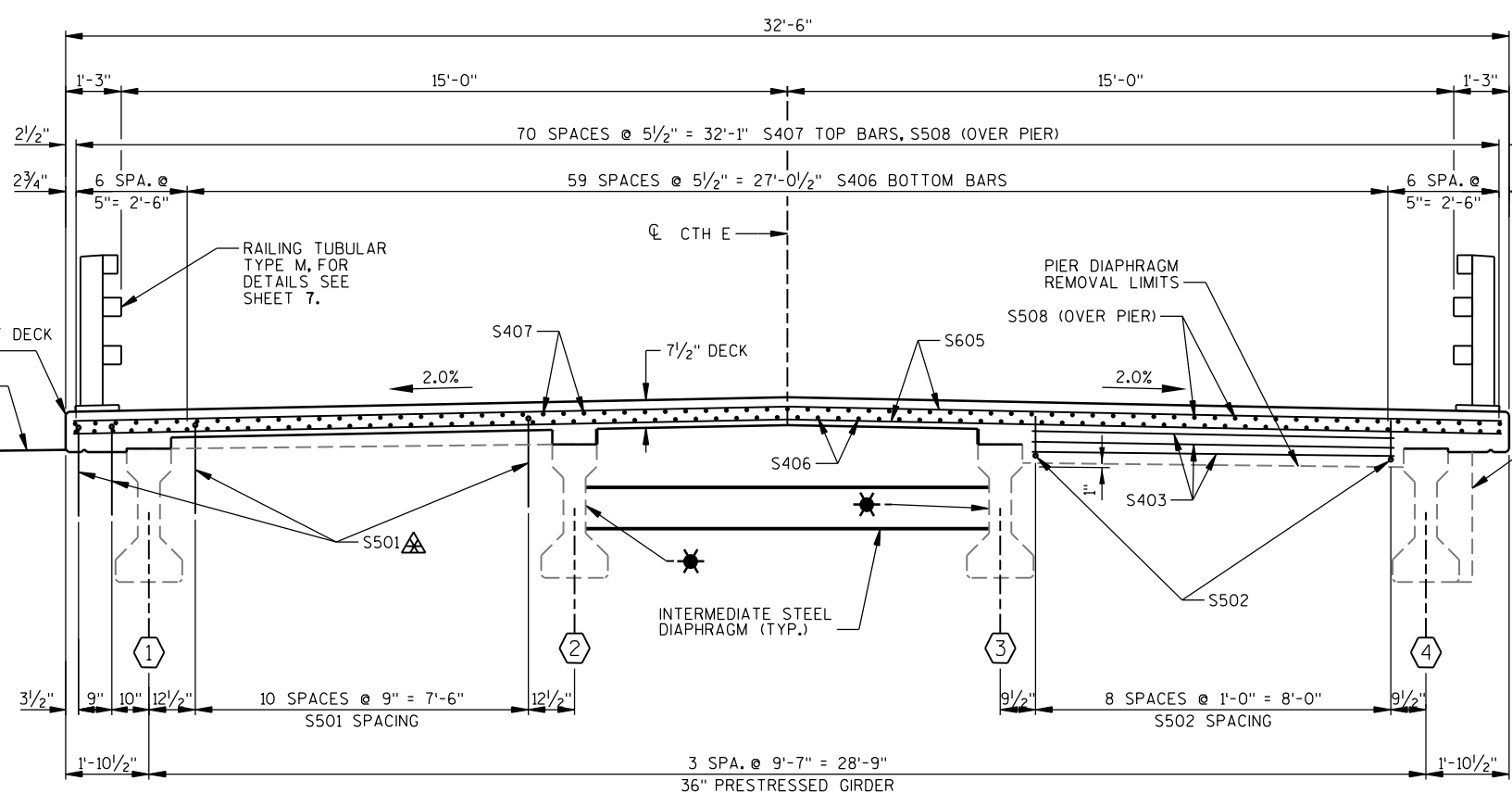
BILL OF BARS (COATED) 36,380 LBS.

MARK	NO. REQ'D.	LENGTH	BENT	LOCATION
△ S501	148	3'-11"	X	DIAPHRAGM @ ABUTS. - VERT. ANCHOR
S502	27	9'-11"	X	DIAPHRAGM @ PIER - LONGIT.
S403	18	8'-2"		DIAPHRAGM @ PIER - TRANS.
S504	632	2'-2"	X	DECK - OVER GIRDERS - HAT BARS - VERT.
S605	409	32'-2"		DECK TOP & BOTTOM - TRANS.
S406	216	37'-3"		DECK BOTTOM - LONGIT.
S407	142	40'-5"		DECK TOP - LONGIT.
S508	71	30'-10"		DECK TOP - OVER PIER - LONGIT.
S609	72	12'-0"	X	DECK @ RAIL POSTS, 2 PER POST - TRANS.
S610	144	6'-0"		DECK @ RAIL POSTS, 4 PER POST - LONGIT.
S411	30	1'-10"	X	PAVING NOTCH FILLER - VERT.
S412	4	29'-2"		PAVING NOTCH FILLER - HORIZ.

DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BAR.
 EPOXY COAT ALL SUPERSTRUCTURE BAR STEEL REINFORCEMENT.

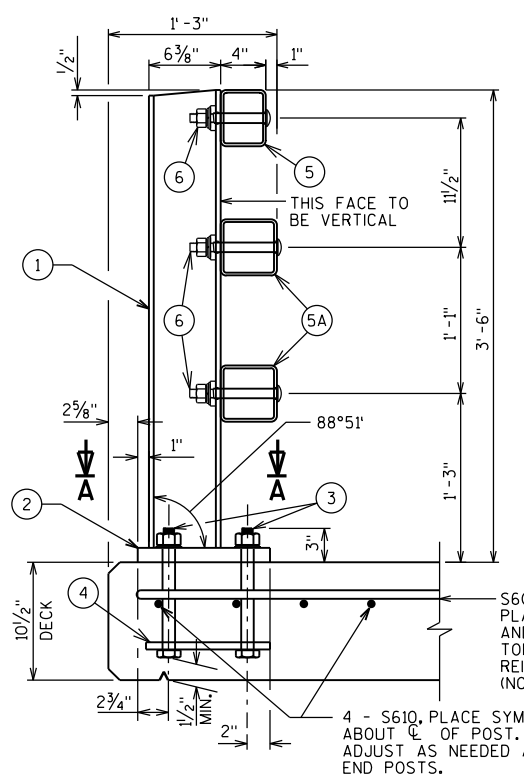
LEGEND

- - INDICATES GIRDER NUMBER
- - SEE SHEET 5 FOR DESCRIPTION.
- B.F. - BACK FACE F.F. - FRONT FACE
- ★ - FOR DETAILS OF DIAPHRAGM CONNECTIONS SEE SHEET 8.
- △ - AFTER REMOVAL OF EXISTING DIAPHRAGM STIRRUP, INSTALL ADHESIVE ANCHORS NO. 5 BAR AT SPACING SHOWN, EMBED 1'-6" IN CONCRETE. ANCHORS SHALL BE APPROVED FOR USE IN CRACKED CONCRETE. ANCHORS SHALL BE 4" CLEAR MIN. TO FACE OF EXISTING CONCRETE AND 8" CLEAR MIN. TO ADJACENT ADHESIVE ANCHORS.
- ⊠ - EXISTING BAR STEEL IS UNCOATED. COAT EXPOSED BAR STEEL WITH EPOXY IN ACCORDANCE WITH SECTION 505.2.4.2 OF THE STANDARD SPECIFICATION, INCIDENTAL TO "CONCRETE MASONRY BRIDGES".
- ⊕ - PROVIDE A CLEAN CUT ON ABUTMENT DIAPHRAGM AT THE LEVEL OF THE EXISTING PAVING NOTCH. ANY EXPOSED BAR STEEL SHALL BE COATED WITH EPOXY IN ACCORDANCE WITH SECTION 505.2.4.2 OF THE STANDARD SPECIFICATION, INCIDENTAL TO "CONCRETE SURFACE REPAIR". APPLY CONCRETE SURFACE REPAIR AND PROTECTIVE SURFACE TREATMENT TO TOP OF DIAPHRAGM AFTER REMOVAL AS DIRECTED BY THE ENGINEER.

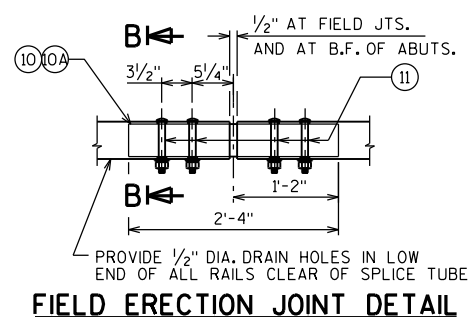


CROSS SECTION THRU BRIDGE - DECK REPLACEMENT
 (LOOKING NORTH)

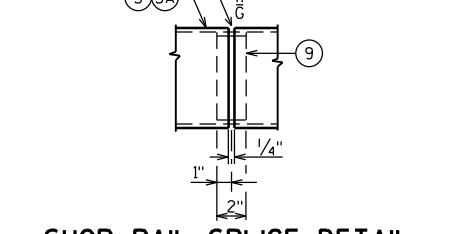
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-35-18			
DRAWN BY RLR		PLANS CK'D. KHB	
SUPERSTRUCTURE SECTIONS & DETAILS			SHEET 6 OF 8



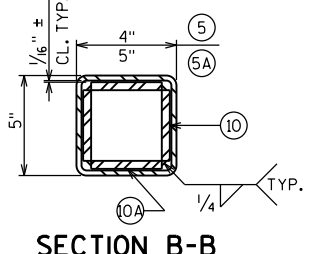
SECTION THRU RAILING ON SLAB



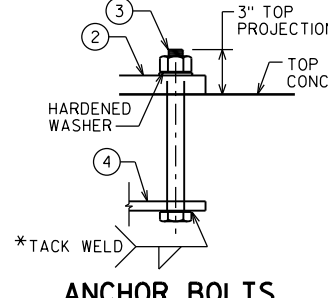
FIELD ERECTION JOINT DETAIL



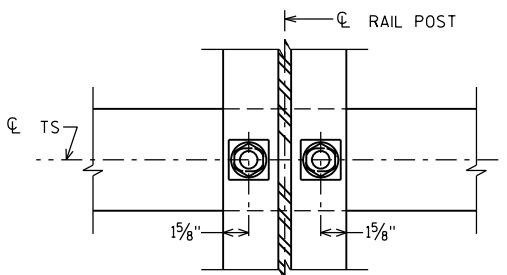
SHOP RAIL SPLICE DETAIL



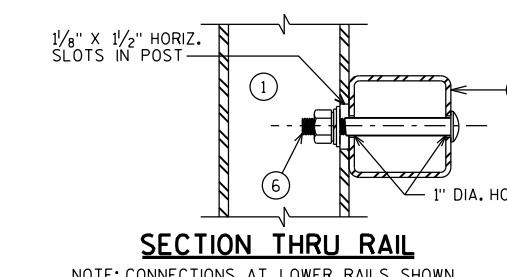
SECTION B-B



ANCHOR BOLTS

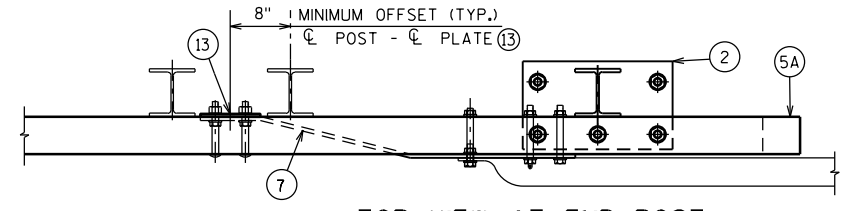


SECTION THRU POST WEB

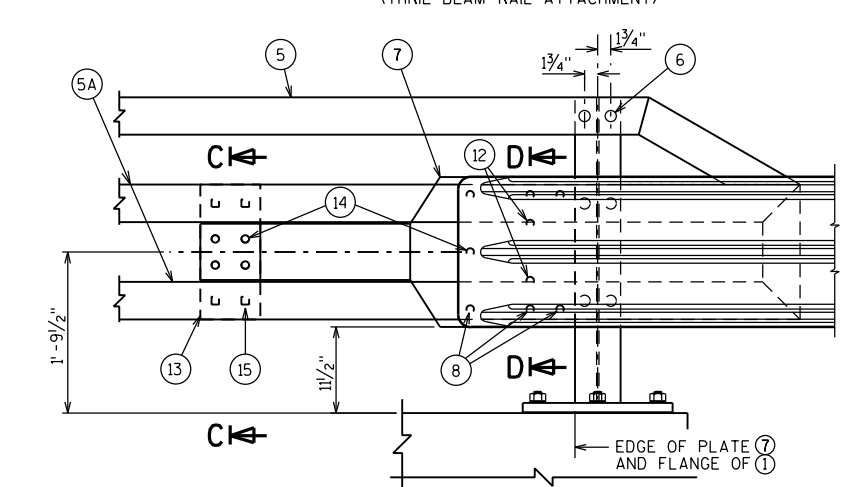


SECTION THRU RAIL

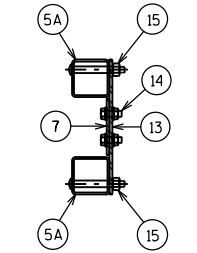
TYPICAL RAIL TO POST CONNECTIONS



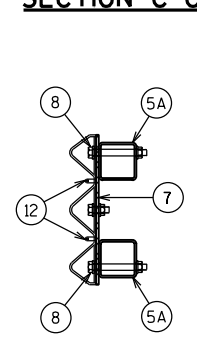
TOP VIEW AT END POST



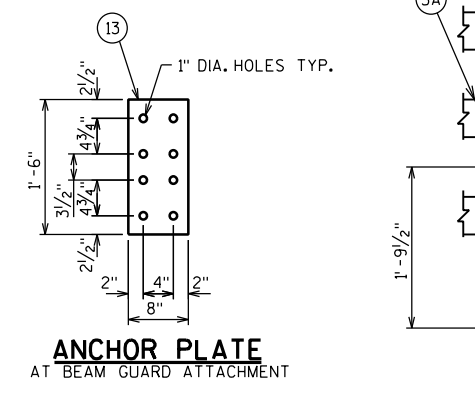
DETAIL AT END POST



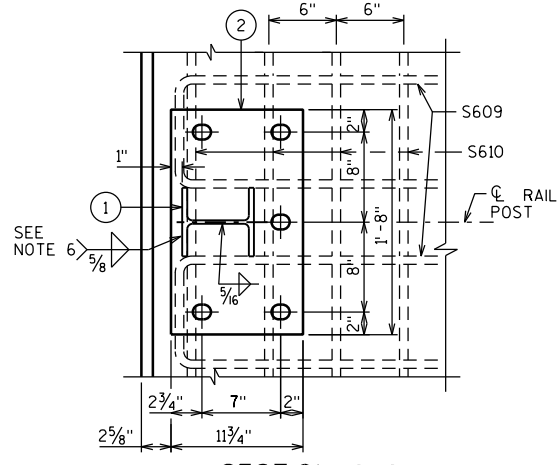
SECTION C-C



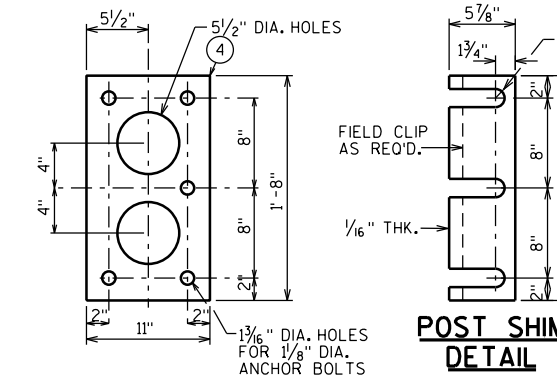
SECTION D-D



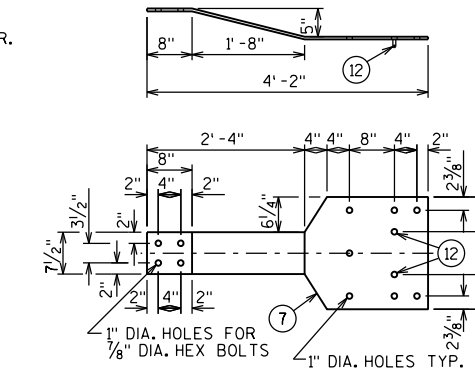
ANCHOR PLATE AT BEAM GUARD ATTACHMENT



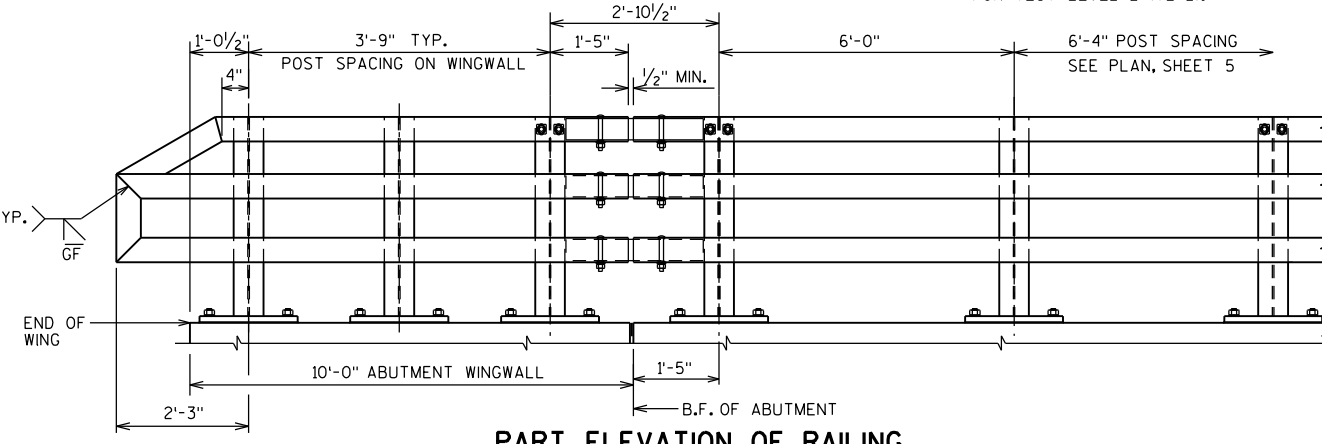
SECTION A-A



ANCHOR PLATE AT RAIL TO DECK ATTACHMENT



BACK-UP PLATE DETAIL



PART ELEVATION OF RAILING

LEGEND

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

GENERAL NOTES

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

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE		B-35-18	
DRAWN BY: RLR		PLANS CK'D: KHB	
RAILING TUBULAR TYPE M		SHEET 7 OF 8	

NOTES

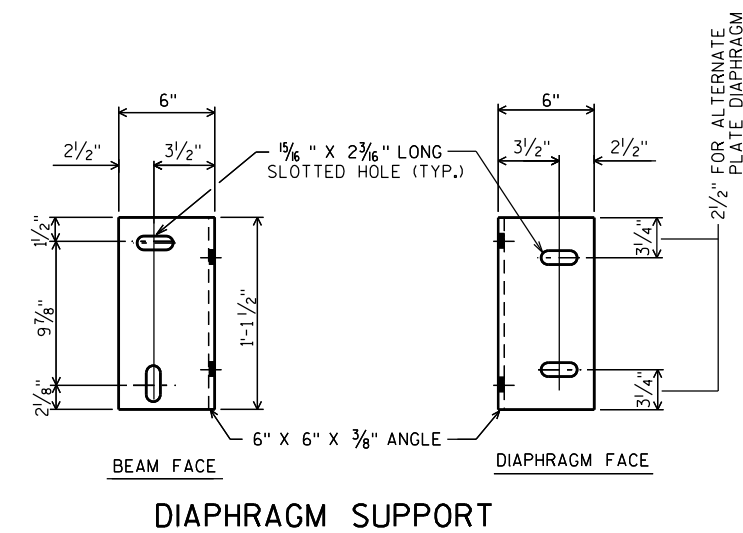
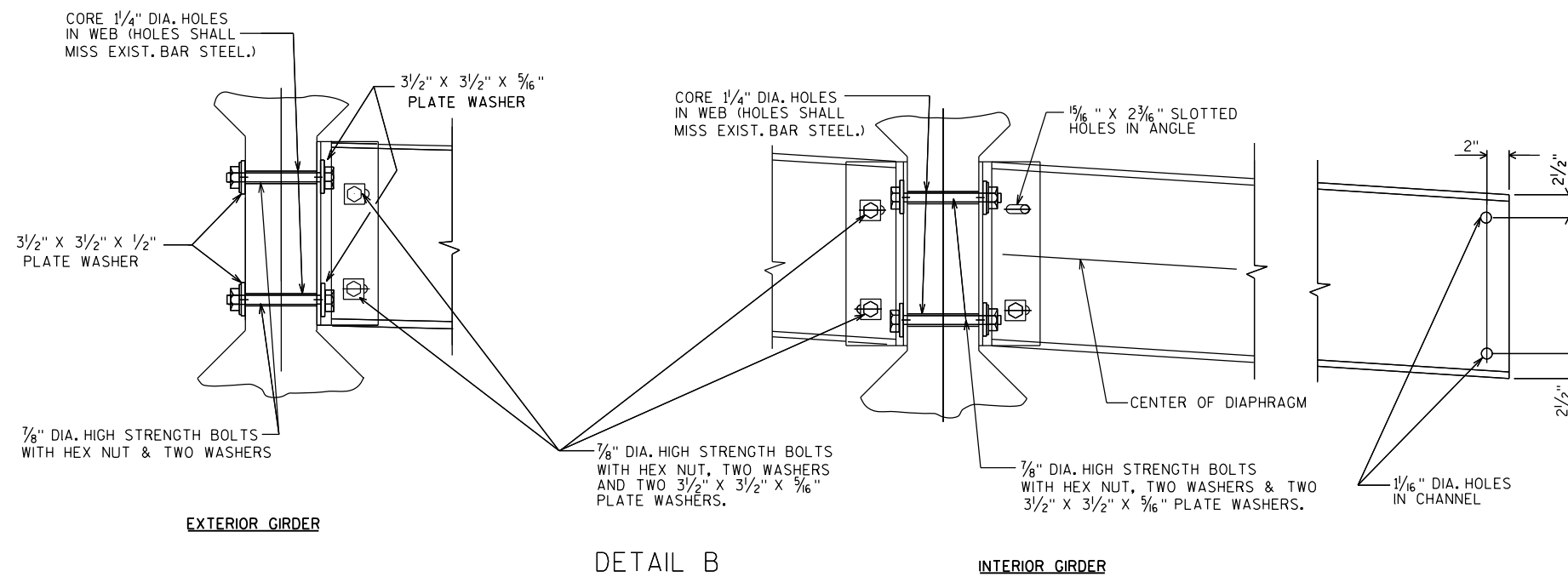
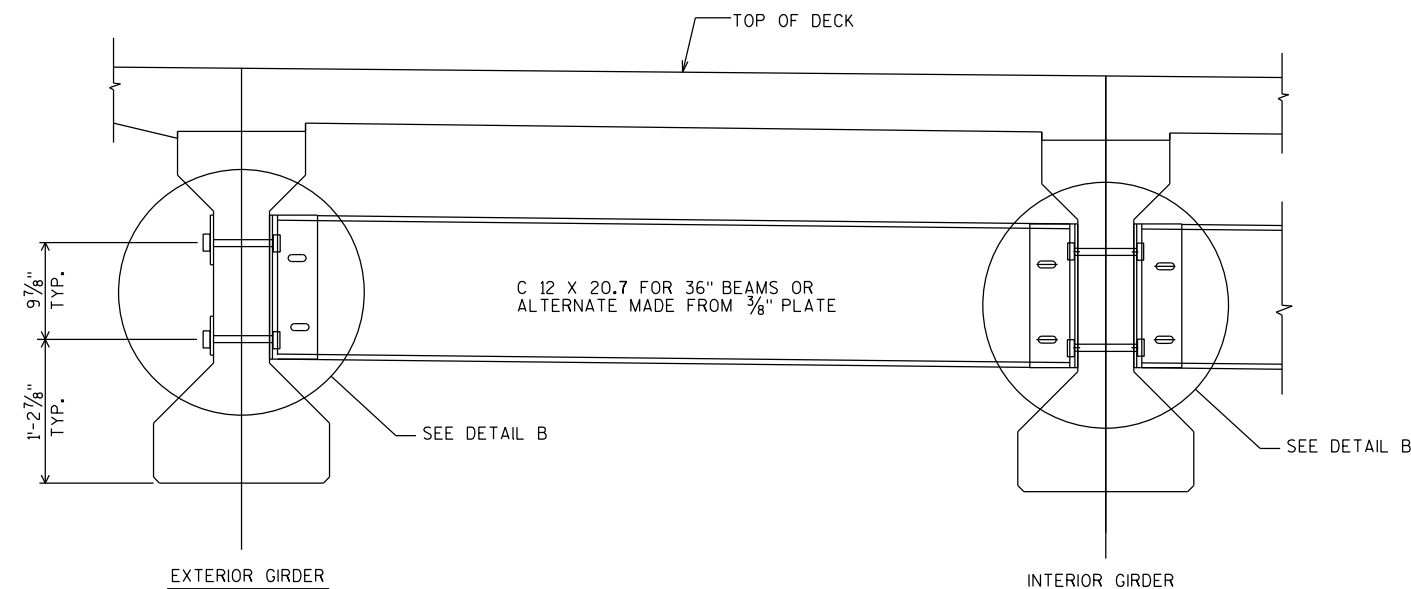
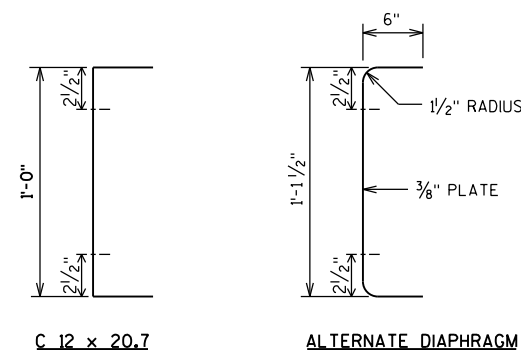
ALL DIAPHRAGM MATERIAL AND CORING OF EXISTING WEBS SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "STEEL DIAPHRAGMS B-35-18", EACH.

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36.

ALL DIAPHRAGM MATERIAL INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION.

STEEL DIAPHRAGM TO CONCRETE WEB CONNECTION SHALL BE SNUG-TIGHT PLUS 1/4 TURN, UNLESS NOTED OTHERWISE. HIGH STRENGTH BOLTS FOR WEB CONNECTION SHALL MEET THE REQUIREMENTS FOR ASTM A325 OR ASTM A449.



8

8

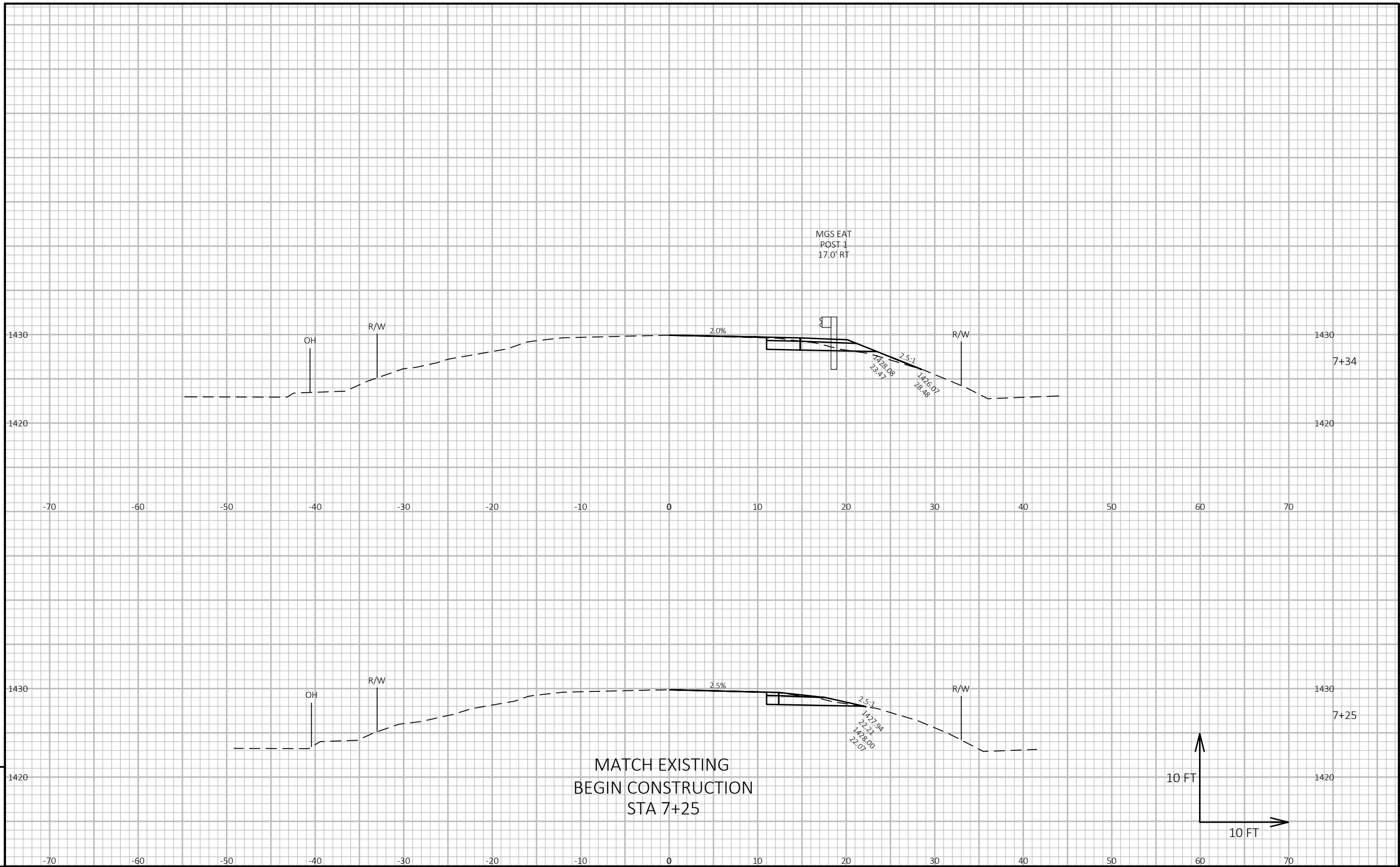
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-35-18			
DRAWN BY RLR		PLANS CK'D. KHB	
STEEL DIAPHRAGM			SHEET 8 OF 8

EARTHWORK PROJECT I.D. 9411-00-70 - CTH E - BRIDGE REHABILITATION- DIVISION 1

STATION	Distance	AREA (SF)			Incremental Vol (CY) (Unadjusted)			Cumulative Vol (CY)		Mass Ordinate
		Cut	Salvaged/Unusable Pavement Material	Fill	Cut	Salvaged/Unusable Pavement Material	Fill	Cut 1.00	Expanded Fill 1.25	
7+25		9	0	0	0	0	0	0	0	0
7+34.	9.00	8	0	2	3	0	0	3	0	2
7+59.	25.00	7	0	4	7	0	2	10	3	6
7+84.	25.00	8	0	2	7	0	3	16	7	10
8+25.	41.00	20	0	2	21	0	3	37	10	27
8+47.	22.00	21	0	4	17	0	2	54	13	41
8+72.	25.00	45	0	5	31	0	4	84	18	66
8+97.	25.00	42	0	8	40	0	6	124	26	98
9+25.	28.00	41	0	1	43	0	4	167	32	135
9+45.4	20.40	39	0	1	30	0	0	197	32	165
B-35-0018										
					197	0	26			

EARTHWORK PROJECT I.D. 9411-00-70 - CTH E - BRIDGE REHABILITATION- DIVISION 2

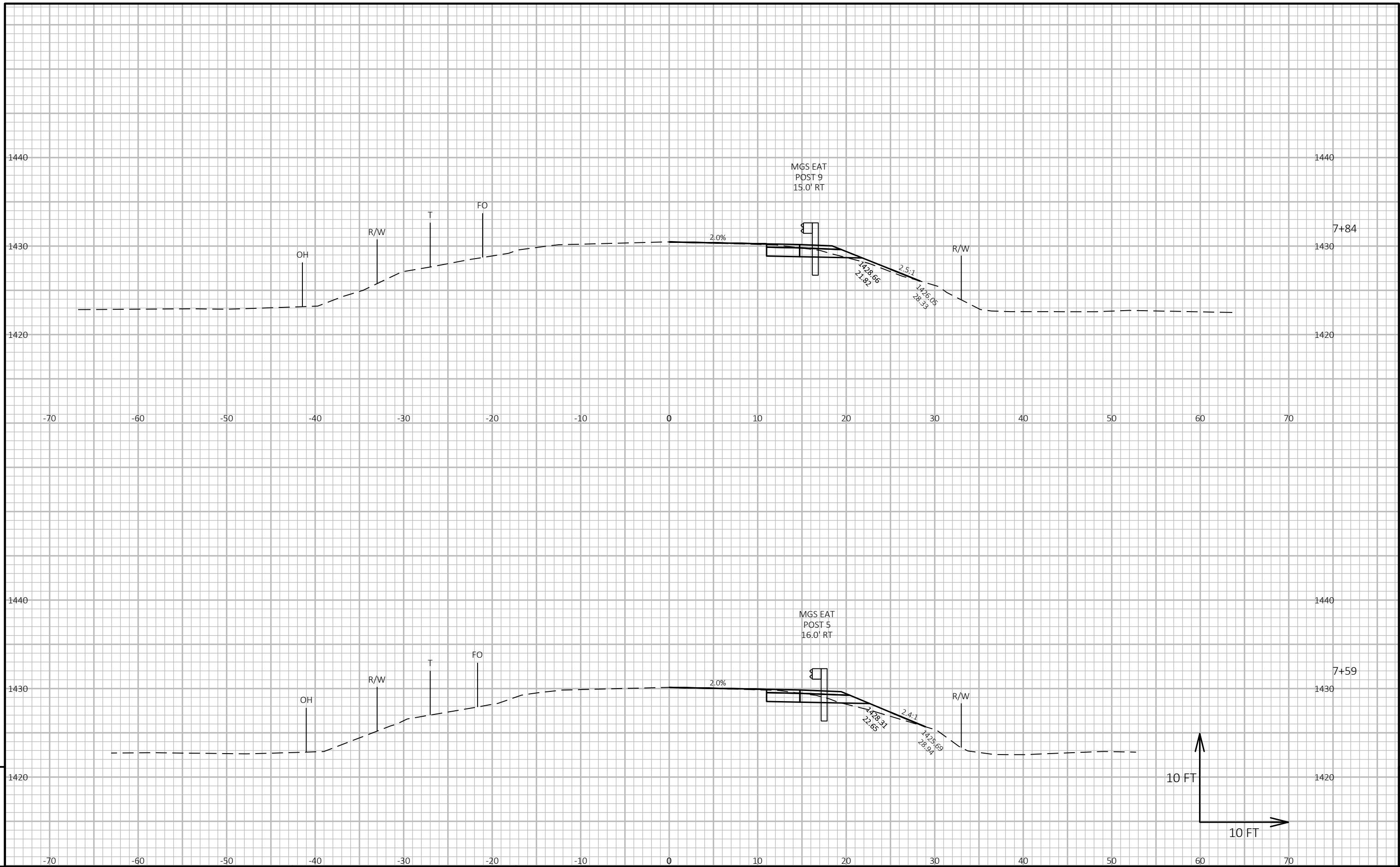
STATION	Distance	AREA (SF)			Incremental Vol (CY) (Unadjusted)			Cumulative Vol (CY)		Mass Ordinate
		Cut	Salvaged/Unusable Pavement Material	Fill	Cut	Salvaged/Unusable Pavement Material	Fill	Cut 1.00	Expanded Fill 1.25	
B-35-0018										
10+55		47	0	0	0	0	0	0	0	0
10+75.	19.95	47	0	1	32	0	0	32	1	32
11+03.	28.00	40	0	2	41	0	1	74	2	71
11+16.	13.00	40	0	8	19	0	2	93	5	87
11+28.	12.00	40	0	6	18	0	3	111	9	102
11+41.	13.00	43	0	11	21	0	4	132	14	118
11+53.	12.00	45	0	13	21	0	5	153	21	133
11+66.	13.00	48	0	13	24	0	6	177	28	149
11+75.	22.00	51	0	1	42	0	7	195	30	165
					219	0	30			



9

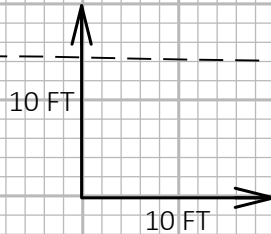
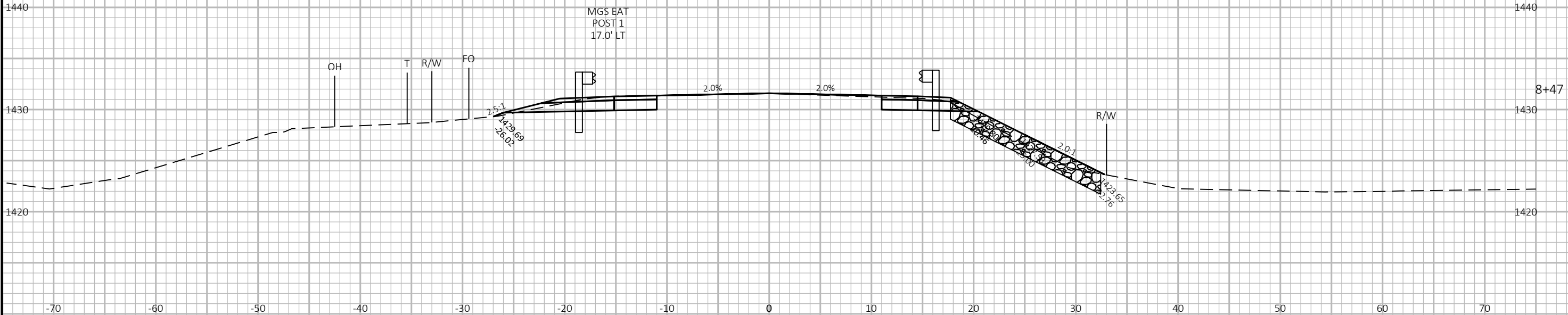
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PROJECT NO: 9411-00-70	HWY: CTH E	COUNTY: LINCOLN	CROSS SECTIONS: CTH E	SHEET	E
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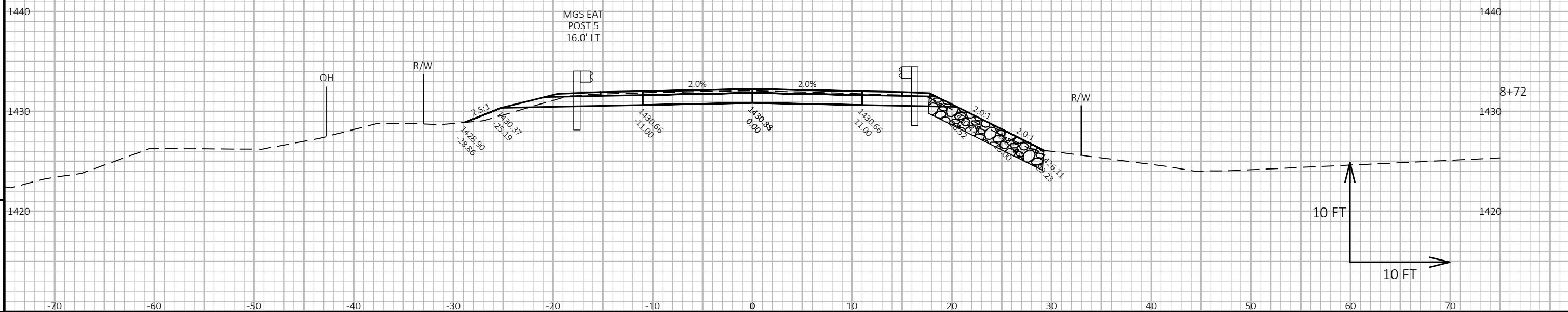
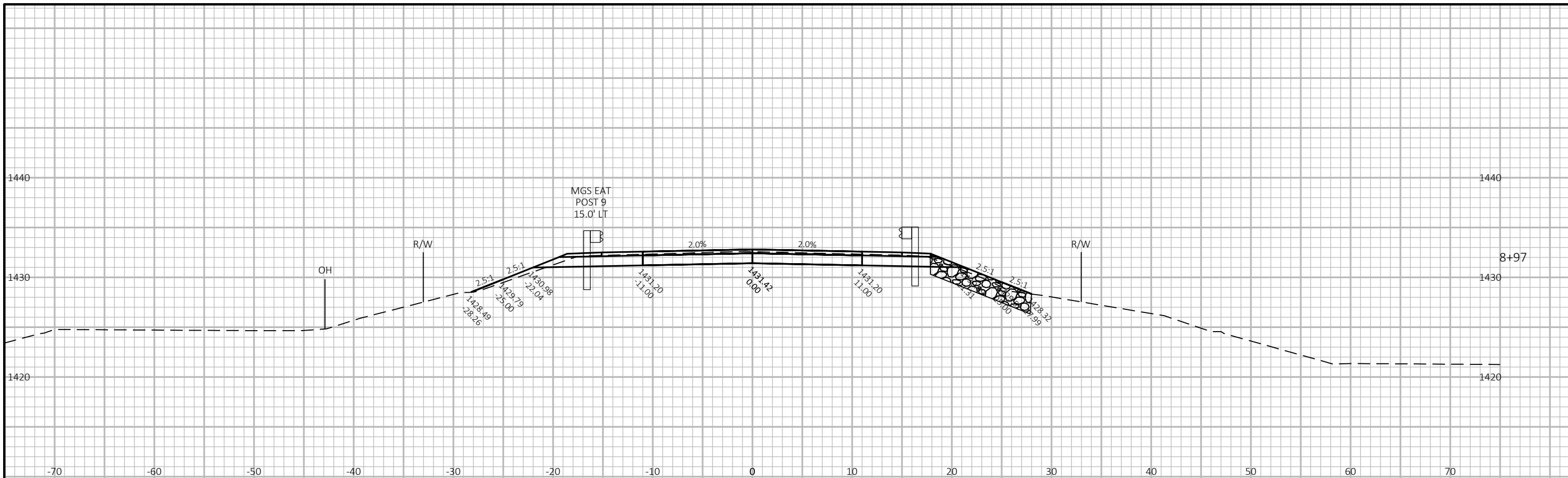
BEGIN PROJECT
STA 8+50



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9

PROJECT NO: 9411-00-70	HWY: CTH E	COUNTY: LINCOLN	CROSS SECTIONS: CTH E	SHEET	E
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PROJECT NO: 9411-00-70

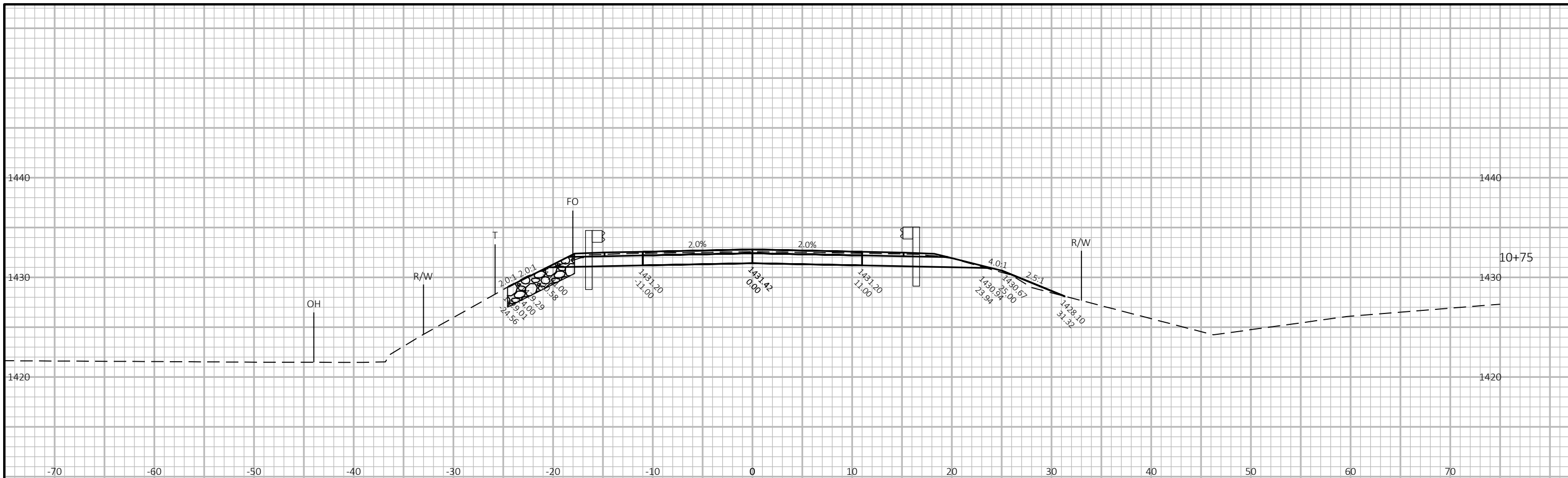
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COUNTY: LINCOLN

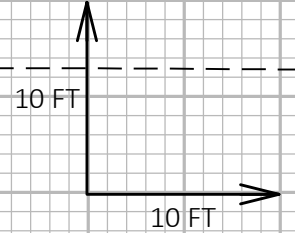
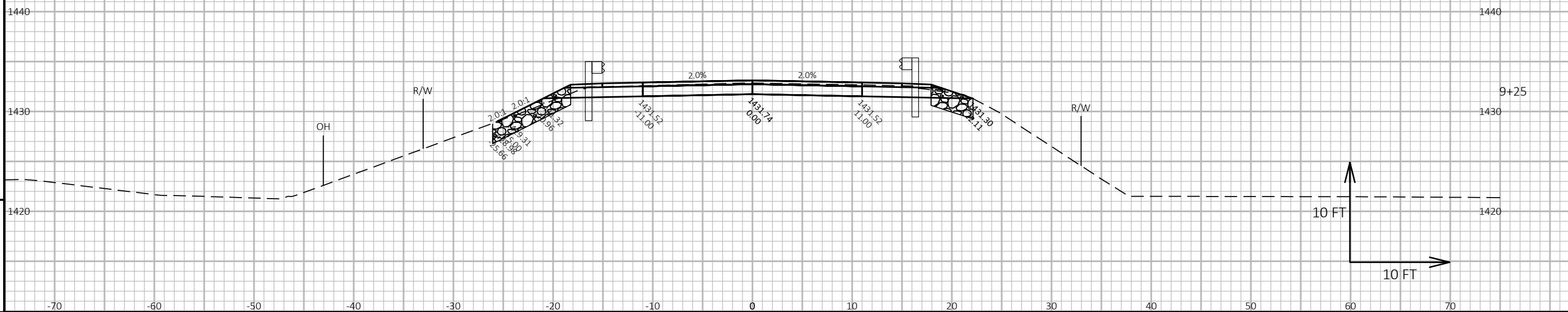
CROSS SECTIONS: CTH E

SHEET

E



STRUCTURE B-35-18



PROJECT NO: 9411-00-70

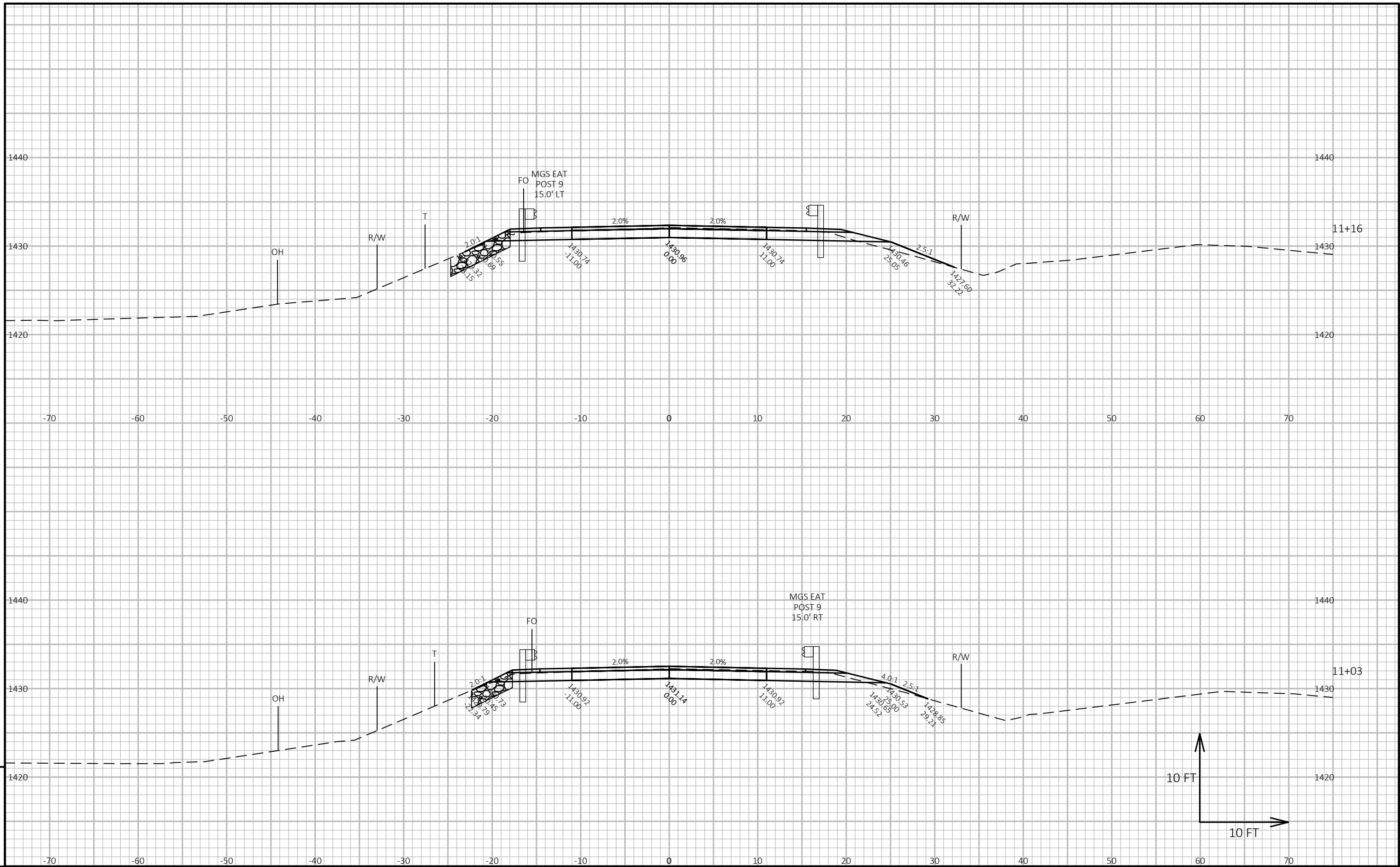
HWY: CTH E

COUNTY: LINCOLN

CROSS SECTIONS: CTH E

SHEET

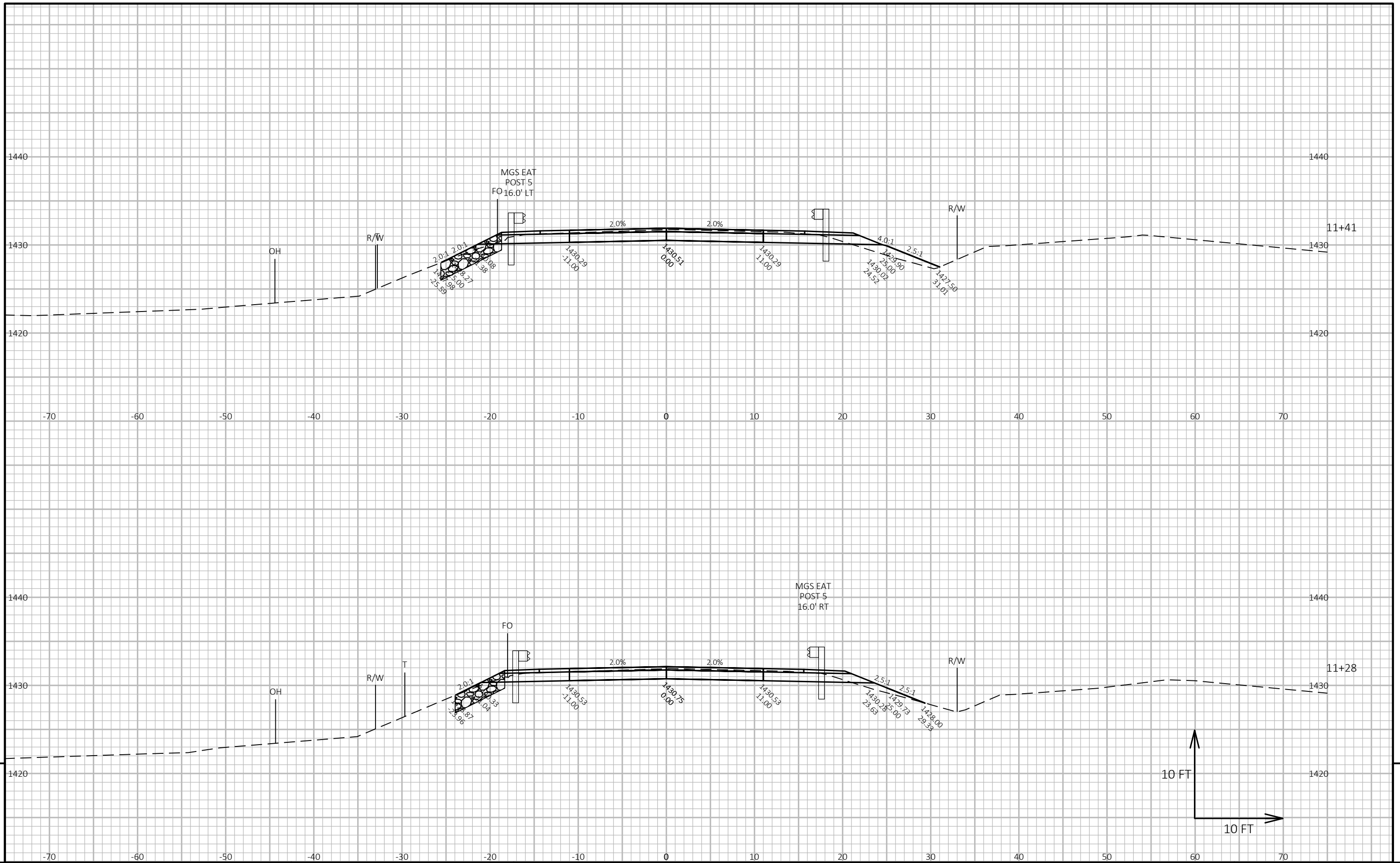
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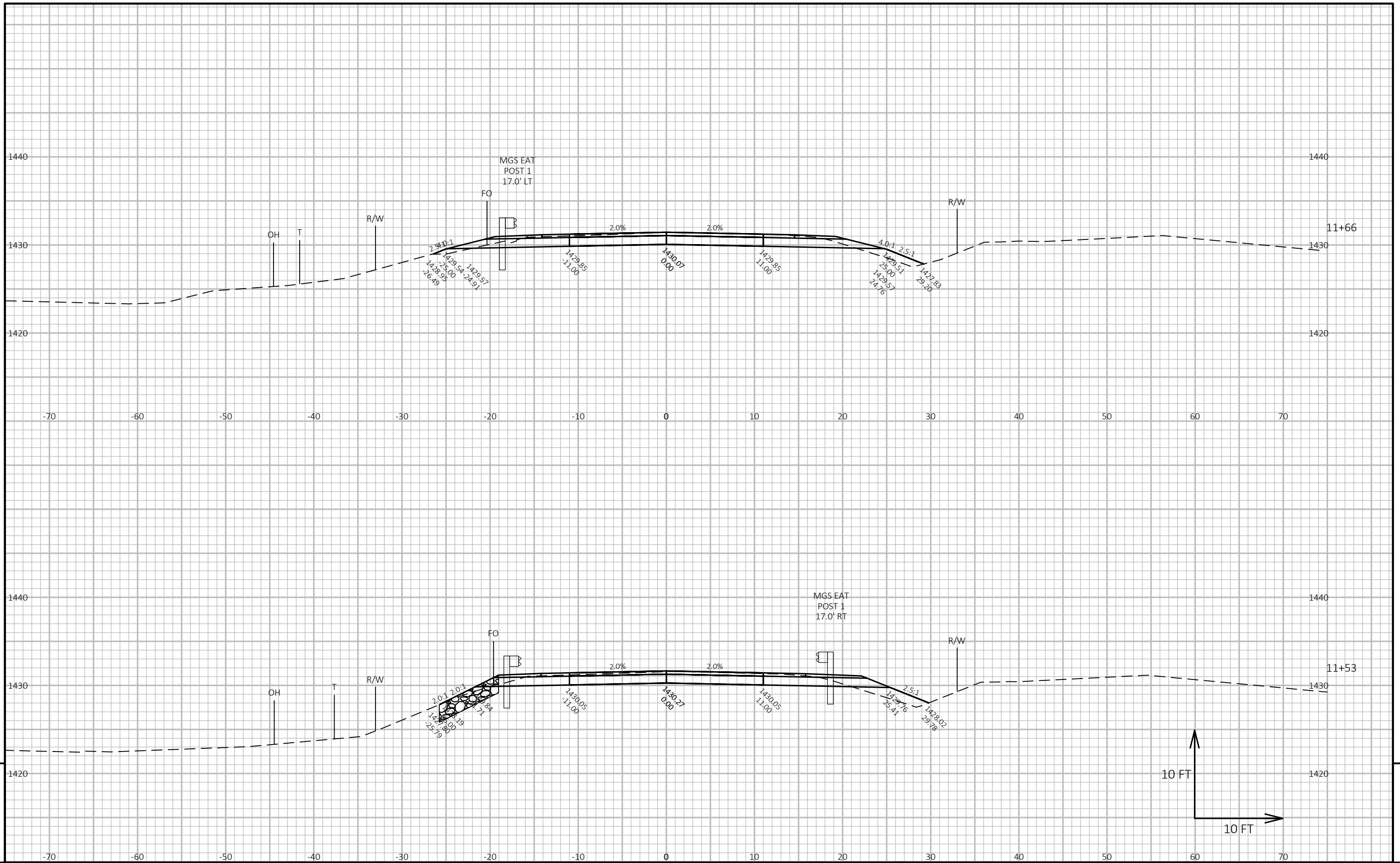
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PROJECT NO: 9411-00-70	HWY: CTH E	COUNTY: LINCOLN	CROSS SECTIONS: CTH E	SHEET	E
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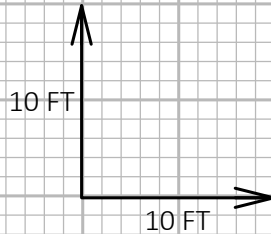


PROJECT NO: 9411-00-70	HWY: CTH E	COUNTY: LINCOLN	CROSS SECTIONS: CTH E	SHEET
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9

9



PROJECT NO: 9411-00-70	HWY: CTH E	COUNTY: LINCOLN	CROSS SECTIONS: CTH E	SHEET	E
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MATCH EXISTING
 END CONSTRUCTION
 END PROJECT
 STA 11+75



9

9

PROJECT NO: 9411-00-70	HWY: CTH E	COUNTY: LINCOLN	CROSS SECTIONS: CTH E	SHEET	E
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