

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

TOTAL SHEETS = 72

STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

USH 61 - LIVINGSTON

(LEGGETT CREEK BRIDGE B-22-0286)

CTH E
GRANT COUNTY

AS-BUILT PLAN

SUPERVISOR: Tim Maedke
PROJECT LEADER: Gretchen Bockenbauer, IIW PC
CONTRACTOR: Larson Construction, Company
WORK COMPLETED 9/13/18

SUBCONTRACTOR LIST

Arbor Green
Augelli Concrete & Excavating
Guide Line Pavement Markings
H. James and Sons
Hard Rock Sawing & Drilling
Hegg Contractor
Hi-Boom Erecting
Iverson Construction
Safemark, LLC
SJK Engineering LLC

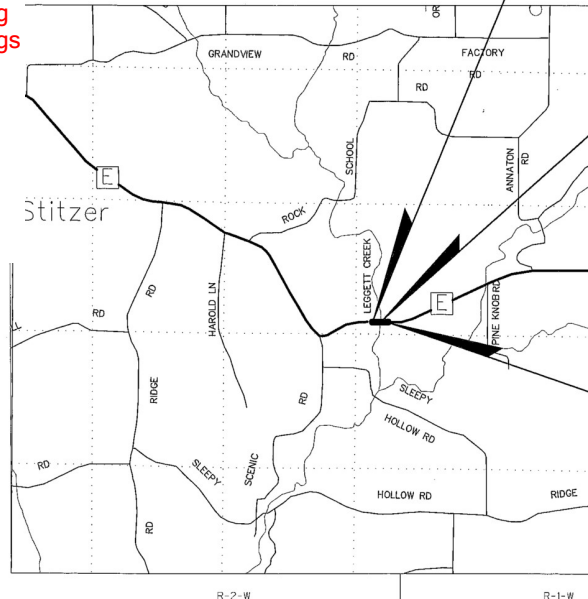
STATE PROJECT NUMBER
5587-00-72

BEGIN PROJECT 5587-00-72

STA 7+00.00
Y = 543,441.877
X = 858,443.022

STRUCTURE B-22-0286
STA 8+65.94

END PROJECT
STA 10+20.00
Y = 543,412.210
X = 858,761.640



R-2-W

R-1-W

LAYOUT

SCALE 0 1 MI

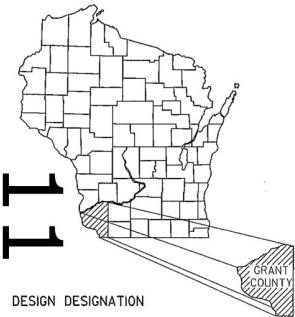
TOTAL NET LENGTH OF CENTERLINE = 0.060 MI.

COORDINATES ON THIS PLAN ARE REFERENCED TO THE WISCONSIN COUNTY
COORDINATE SYSTEM (WCCS), 'GRANT' COUNTY.

STATE PROJECT

5587-00-72

FEDERAL PROJECT

PROJECT
WISC 2017507CONTRACT
1

DESIGN DESIGNATION

A.A.D.T. 2017	=	480
A.A.D.T. 2037	=	580
D.H.V. 2033	=	---
D.D.	=	---
T. 2033	=	5%
DESIGN SPEED	=	30 mph
ESALS	=	131,400

CONVENTIONAL SYMBOLS

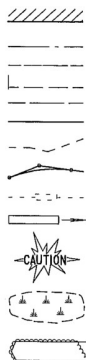
PLAN
CORPORATE LIMITS
PROPERTY LINE
LOT LINE
LIMITED HIGHWAY EASEMENT
EXISTING RIGHT OF WAY
PROPOSED OR NEW R/W LINE

SLOPE INTERCEPT
REFERENCE LINE
EXISTING CULVERT
PROPOSED CULVERT
(Box or Pipe)

COMBUSTIBLE FLUIDS

MARSH AREA

WOODED OR SHRUB AREA



PROFILE

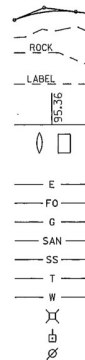
GRADE LINE
ORIGINAL GROUND
MARSH OR ROCK PROFILE
(To be noted as such)
SPECIAL DITCH

GRADE ELEVATION

CULVERT (Profile View)

UTILITIES

ELECTRIC
FIBER OPTIC
GAS
SANITARY SEWER
STORM SEWER
TELEPHONE
WATER
UTILITY PEDESTAL
POWER POLE
TELEPHONE POLE



ACCEPTED FOR

COUNTY of GRANT

4/05/17 David J. Hest
(DOT) (COUNTY HIGHWAY ENGINEER)

ORIGINAL PLANS PREPARED BY

Mead & Hunt

Mead & Hunt, Inc.
6501 Watts Road
Madison, WI 53719
608.273.6380
fax: 608.273.6391
www.meadhunt.com



Keith Kosbau
4-4-2017

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

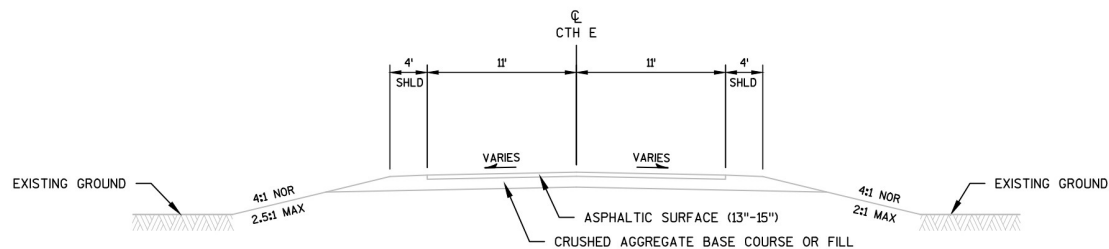
PREPARED BY

Surveyor Mead & Hunt, Inc.
Designer Mead & Hunt, Inc.
Management Consultant KL ENGINEERING

APPROVED FOR THE DEPARTMENT

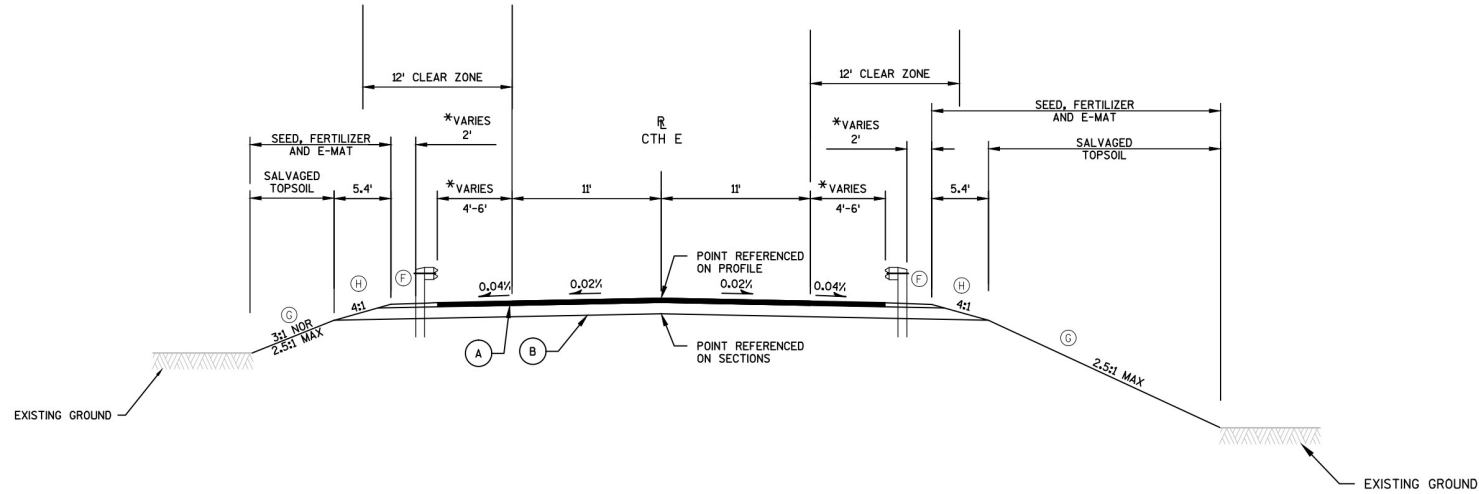
DATE: 4/28/17 (Manager/Consultant Signature)

WISDOT/CADDS SHEET 42



EXISTING TYPICAL SECTION

STA 6+46 TO STA 13+05

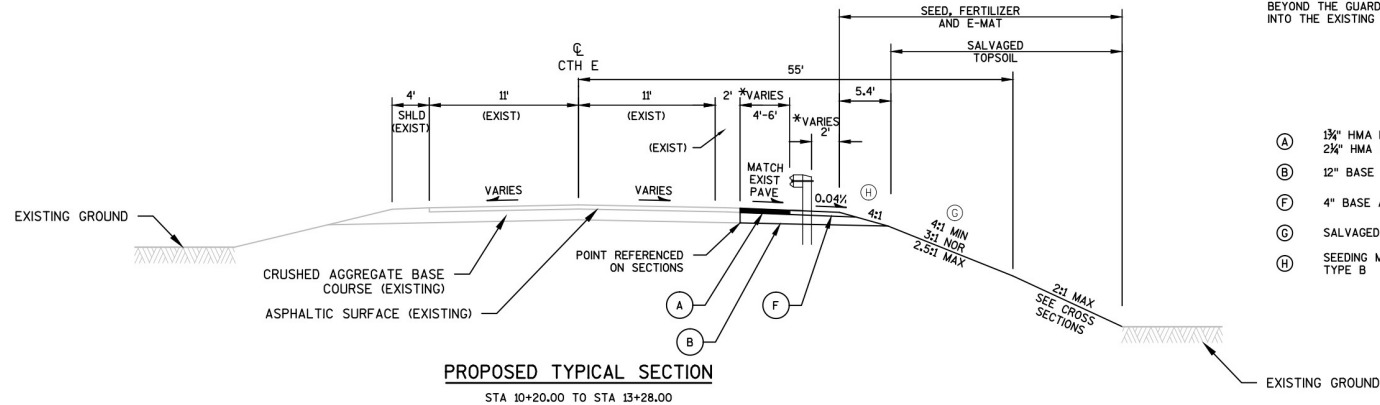


PROPOSED TYPICAL SECTION

STA 7+00 TO STA 10+20.00

NOTE:

- *PAVE THE SHOULDER FULL WIDTH TO THE FACE OF THE BEAM GUARD WHERE BEAM GUARD IS PROPOSED
- BEYOND THE GUARD RAIL LIMITS TAPER THE SHOULDER WIDTH TO MATCH INTO THE EXISTING SHOULDER

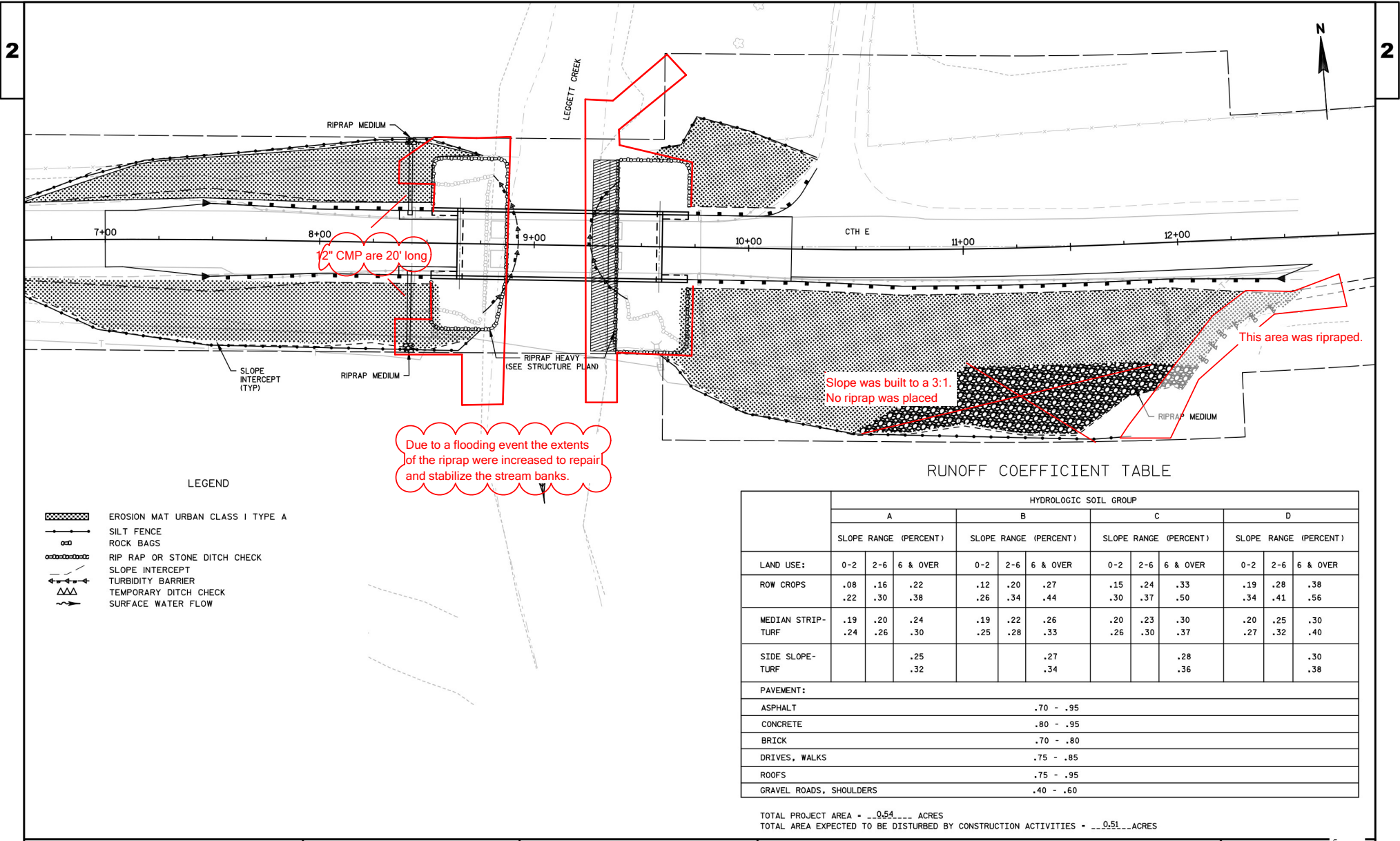


PROPOSED TYPICAL SECTION

STA 10+20.00 TO STA 13+28.00

KEY

- (A) 1 1/2\"/>

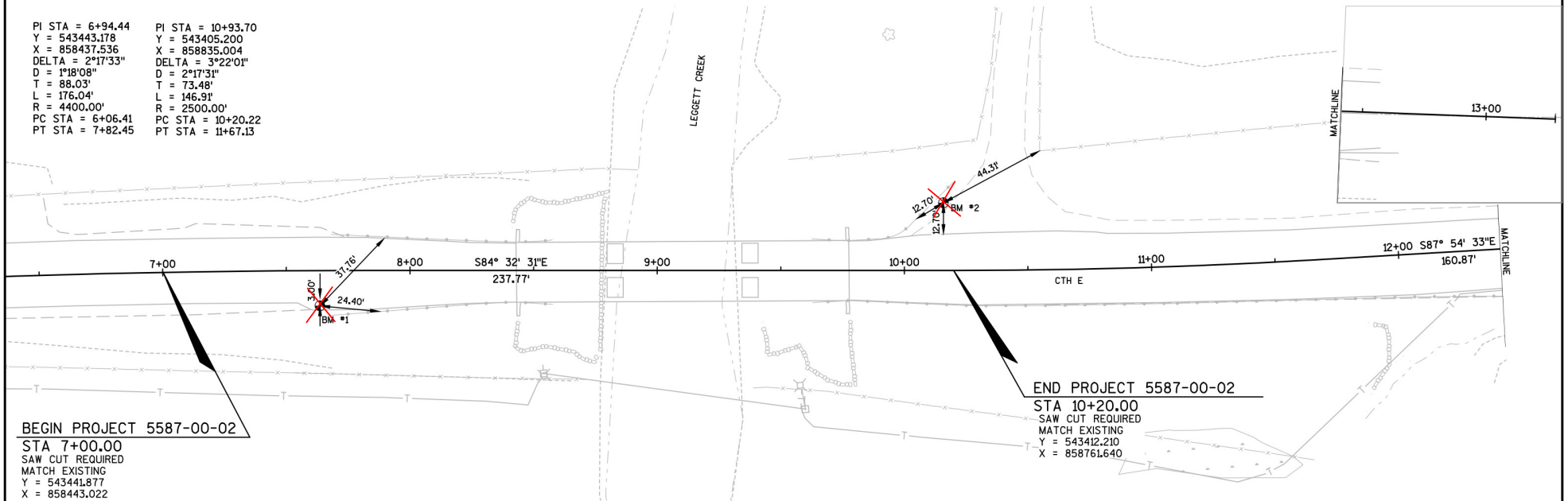


BENCH MARKS AND CONTROL POINTS

NO.	STATION	OFFSET	Y	X	DESCRIPTION	ELEV.
1	7+63.6	14.3'	RT	543422.306	058505.079	PK NAIL 855.34'
2	10+15.0	27.3'	LT	543439.794	058760.072	REBAR 862.76'

PI STA = 6+94.44
 Y = 543443.178
 X = 858437.536
 DELTA = 2°17'33"
 D = 1°18'08"
 T = 88.03'
 L = 176.04'
 R = 4400.00'
 PC STA = 6+06.41
 PT STA = 7+82.45

PI STA = 10+93.70
 Y = 543405.200
 X = 858835.004
 DELTA = 3°22'01"
 D = 2°17'31"
 T = 73.48'
 L = 146.91'
 R = 2500.00'
 PC STA = 10+20.22
 PT STA = 11+67.13



Estimate Of Quantities

Page 1

5587-00-72

Line	Item	Item Description	Unit	Total	Qty
0002	201.0105	Clearing	STA	2.000	2.000
0004	201.0205	Grubbing	STA	2.000	2.000
0006	203.0600.S	Removing Old Structure Over Waterway With Minimal Debris (station) 01. 9+12	LS	1.000	1.000
0008	205.0100	Excavation Common **P**	CY	247.000	247.000
0010	206.1000	Excavation for Structures Bridges (structure) 01. B-22-286	LS	1.000	1.000
0012	208.0100	Borrow	CY	4,407.000	4,407.000
0014	210.1500	Backfill Structure Type A	TON	470.000	470.000
0016	213.0100	Finishing Roadway (project) 01. 5587-00-72	EACH	1.000	1.000
0018	305.0110	Base Aggregate Dense 3/4-Inch	TON	125.000	125.000
0020	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	895.000	895.000
0022	416.1010	Concrete Surface Drains	CY	4.600	4.600
0024	455.0605	Tack Coat	GAL	61.000	61.000
0026	460.2000	Incentive Density HMA Pavement	DOL	130.000	130.000
0028	460.5223	HMA Pavement 3 LT 58-28 S	TON	111.000	111.000
0030	460.5224	HMA Pavement 4 LT 58-28 S	TON	86.000	86.000
0032	502.0100	Concrete Masonry Bridges	CY	217.000	217.000
0034	502.3200	Protective Surface Treatment	SY	320.000	320.000
0036	502.3210	Pigmented Surface Sealer	SY	100.000	100.000
0038	503.0146	Prestressed Girder Type I 45W-Inch	LF	376.000	376.000
0040	505.0400	Bar Steel Reinforcement HS Structures	LB	3,360.000	3,360.000
0042	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	27,710.000	27,710.000
0044	506.2605	Bearing Pads Elastomeric Non-Laminated	EACH	8.000	8.000
0046	506.4000	Steel Diaphragms (structure) 01. B-22-286	EACH	6.000	6.000
0048	516.0500	Rubberized Membrane Waterproofing	SY	14.000	14.000
0050	520.1012	Apron Endwalls for Culvert Pipe 12-Inch	EACH	2.000	2.000
0052	550.1120	Piling Steel HP 12-Inch X 53 Lb	LF	420.000	420.000
0054	606.0200	Riprap Medium	CY	130.000	130.000
0056	606.0300	Riprap Heavy	CY	415.000	415.000
0058	606.0700	Grouted Riprap Heavy	CY	100.000	100.000
0060	611.0654	Inlet Covers Type V	EACH	2.000	2.000
0062	611.3220	Inlets 2x2-FT	EACH	2.000	2.000
0064	612.0212	Pipe Underdrain Unperforated 12-Inch	LF	45.000	45.000
0066	612.0406	Pipe Underdrain Wrapped 6-Inch	LF	158.000	158.000
0068	614.0150	Anchor Assemblies for Steel Plate Beam Guard	EACH	4.000	4.000
0070	614.0200	Steel Thrie Beam Structure Approach	LF	21.000	21.000
0072	614.0305	Steel Plate Beam Guard Class A	LF	13.000	13.000
0074	614.0390	Steel Plate Beam Guard Short Radius Terminal	EACH	1.000	1.000
0076	614.0920	Salvaged Rail	LF	575.000	575.000

Estimate Of Quantities

Page 2

5587-00-72

Line	Item	Item Description	Unit	Total	Qty
0078	614.2300	MGS Guardrail 3	LF	207.000	207.000
0080	614.2500	MGS Thrie Beam Transition	LF	117.000	117.000
0082	614.2610	MGS Guardrail Terminal EAT	EACH	3.000	3.000
0084	619.1000	Mobilization	EACH	1.000	1.000
0086	624.0100	Water	MGAL	18.800	18.800
0088	625.0500	Salvaged Topsoil **P**	SY	2,625.000	2,625.000
0090	627.0200	Mulching	SY	27,750.000	27,750.000
0092	628.1504	Silt Fence	LF	666.000	666.000
0094	628.1520	Silt Fence Maintenance	LF	666.000	666.000
0096	628.1905	Mobilizations Erosion Control	EACH	5.000	5.000
0098	628.1910	Mobilizations Emergency Erosion Control	EACH	5.000	5.000
0100	628.2006	Erosion Mat Urban Class I Type A	SY	2,551.000	2,551.000
0102	628.6005	Turbidity Barriers	SY	105.000	105.000
0104	628.7504	Temporary Ditch Checks	LF	150.000	150.000
0106	628.7570	Rock Bags	EACH	30.000	30.000
0108	629.0210	Fertilizer Type B	CWT	20.120	20.120
0110	630.0130	Seeding Mixture No. 30 **P**	LB	48.000	48.000
0112	630.0200	Seeding Temporary **P**	LB	36.000	36.000
0114	630.0300	Seeding Borrow Pit	LB	375.000	375.000
0116	634.0614	Posts Wood 4x6-Inch X 14-FT	EACH	4.000	4.000
0118	637.2230	Signs Type II Reflective F	SF	12.000	12.000
0120	638.2602	Removing Signs Type II	EACH	4.000	4.000
0122	638.3000	Removing Small Sign Supports	EACH	4.000	4.000
0124	642.5001	Field Office Type B	EACH	1.000	1.000
0126	643.0100	Traffic Control (project) 01. 5587-00-72	EACH	1.000	1.000
0128	645.0111	Geotextile Type DF Schedule A	SY	100.000	100.000
0130	645.0120	Geotextile Type HR	SY	890.000	890.000
0132	645.0130	Geotextile Type R	SY	473.000	473.000
0134	646.0106	Pavement Marking Epoxy 4-Inch	LF	1,535.000	1,535.000
0136	650.4000	Construction Staking Storm Sewer	EACH	2.000	2.000
0138	650.4500	Construction Staking Subgrade	LF	520.000	520.000
0140	650.5000	Construction Staking Base	LF	520.000	520.000
0142	650.6500	Construction Staking Structure Layout (structure) 01. B-22-286	LS	1.000	1.000
0144	650.9910	Construction Staking Supplemental Control (project) 01. 5587-00-72	LS	1.000	1.000
0146	650.9920	Construction Staking Slope Stakes	LF	520.000	520.000
0148	690.0150	Sawing Asphalt	LF	295.000	295.000
0150	715.0502	Incentive Strength Concrete Structures	DOL	1,284.000	1,284.000
0152	ASP.1T0A	On-the-Job Training Apprentice at \$5.00/HR	HRS	1,200.000	1,200.000

Estimate Of Quantities

		5587-00-72	
0154	ASP.1T0G On-the-Job Training Graduate at \$5.00/HR	HRS	600.000 600.000
0161	ICE Hot Weather Concreting \$0.75/LB	DOL	7,230.000 7,230.00
0166	Salvaged Topsoil	SY	1,277.000 1,277.000
0171	Seeding Mixture NO. 30	LB	17.00 17.00

CLEARING & GRUBBING

				201.0105	201.0205
				CLEARING	GRUBBING
PROJECT ID	CATEGORY	STATION - STATION	LOCATION	(STA)	(STA)
5587-00-72	0010	8+00 - 9+00	RT	1	1
		11+50 - 12+50	RT	1	1
		TOTAL		2	2

BASE AGGREGATE

				305.0110	305.0120	624.0100	
				BASE AGGREGATE DENSE 3/4-INCH	BASE AGGREGATE DENSE 1 1/4-INCH	WATER	
PROJECT ID	CATEGORY	STATION - STATION	LOCATION	(TON)	(TON)	(MGAL)	
5587-00-72	0010	7+00	7+50	LT & RT	20	175	3.9
		7+50	8+52	LT & RT	35		
		7+50	8+64	LT & RT		385	8.5
		9+60	10+20	LT & RT		180	2.3
		9+72	10+20	LT & RT	20		
		10+20	12+50	LT & RT	40	155	3.9
		10+45		PE LT	10		0.2
TOTAL				125	895	18.8	

CONCRETE SURFACE DRAIN

				415.1010
				CONCRETE SURFACE DRAINS
PROJECT ID	CATEGORY	STATION - STATION	LOCATION	(CY)
5587-00-72	0010	8+52 - 8+64	LT	
		8+52 - 8+64	RT	
		8+37 - 8+64	LT	2.3
		8+37 - 8+64	RT	2.3
		TOTAL		4.6

ASPHALTIC SURFACE

				455.0605	460.5223	460.5224
				TACK COAT	HMA PAVEMENT 3 LT 58-28 S	HMA PAVEMENT 4 LT 58-28 S
PROJECT ID	CATEGORY	STATION - STATION	LOCATION	(GAL)	(TON)	(TON)
5587-00-72	0010	7+00 - 7+50	MAINLINE	12	21	15
		7+50 - 8+64	MAINLINE	28	50	40
		9+60 - 10+20	MAINLINE	14	25	20
		10+20 - 12+50	MAINLINE	7	15	10
		TOTAL		61	111	86

EARTHWORK SUMMARY

205.0100										208.0100			
EXCAVATION COMMON										BORROW			
CATEGORY	STATION	- STATION	LOCATION	(1)	(2)	(2A)	(3)	(3A)	(4)	(5)	(6)	(7)	WASTE (CY)
				CUT FROM EW DATA (CY)	EBS (CY)	SALVAGED/ UNUSABLE PAVEMENT MATERIAL (CY)	REDUCED EBS IN FILL FACTOR = 0.8 (CY)	REDUCED EBS IN FILLS (30%) (CY)	EXPANDED FILL FROM EW DATA (CY)	EXPANDED FILL (CY)	MASS ORDINATE (CY)	BORROW (CY)	
0010	6+46	- 8+52	LT/RT	187					892	892	-705		
	9+72	- 13+28	LT/RT	60					3,762	3,762	-3,702		
	TOTAL			247					4,654	4,654	-4,407	4,407	

- (1) COMMON FROM COMPUTER EARTHWORK DATA, INCLUDES PAVEMENT REMOVAL (CONTAINS SALVAGED/UNUSABLE PAVEMENT MATERIAL)
- (2) UNDISTRIBUTED EBS
- EBS IS ESTIMATED AS AN UNDISTRIBUTED QUANTITY
- EBS QUANTITIES ARE PARTIALLY USED IN EARTHWORK BALANCE
- (2A) SALVAGED/UNUSABLE PAVEMENT MATERIAL
- (3) REDUCED EBS IN FILL - EXCAVATED EBS MATERIAL IS USABLE IN FILLS OUTSIDE THE 1:1 SLOPE. EBS IN FILL REDUCTION FACTOR = 0.8
- (3A) IT IS ESTIMATED THAT 30% OF THE EBS MATERIAL CAN BE USED IN FILLS. THE BALANCE IS CONSIDERED WASTE
- (4) EXPANDED FILL FROM COMPUTER EARTHWORK DATA
- (5) EXPANDED FILL FACTOR = 1.3
- EXPANDED FILL = EW DATA FILL - REDUCED EBS IN FILL
- (6) MASS ORDINATE IS + OR - QUANTITY FOR STAGE. PLUS IS EXCESS, MINUS IS SHORTAGE
- (7) BORROW TO BE OBTAINED FROM LOCATION OF CONTRACTOR'S CHOICE

SALVAGED

				614.0920
				SALVAGED RAIL
PROJECT ID	CATEGORY	STATION - STATION	LOCATION	(LF)
5587-00-72	0010	7+50 - 8+65	LT	115
		7+50 - 8+65	RT	115
		9+61 - 10+20	LT	65
		9+61 - 12+41	RT	280
		TOTAL		575

SAWING ASPHALT

				690.0150
				SAWING ASPHALT
PROJECT ID	CATEGORY	STATION - STATION	LOCATION	(LF)
5587-00-72	0010	7+00 - 12+67	LT & RT	24
		10+20 - 12+67	LT & RT	247
		10+20 -	RT	24
		TOTAL		295

BEAM GUARD

				614.0200	614.0305	614.0390	614.2300	614.2500	614.2610
				STEEL THRIE BEAM STRUCTURE APPROACH	STEEL PLATE BEAM GUARD CLASS A	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL	MGS GUARDRAIL 3	MGS THRIE BEAM TRANSITION	MGS GUARDRAIL TERMINAL EAT
PROJECT ID	CATEGORY	STATION - STATION	LOCATION	(LF)	(LF)	(EA)	(LF)	(LF)	(EA)
5587-00-72	0010	9+71 - 9+92	LT	21					
		9+92 - 10+04.5	LT		13				
		10+04.5 - 10+31.34	LT			1			
		8+02.5 - 8+13	LT				13		
		8+02.5 - 8+13	RT				13		
		10+10 - 11+92	RT				182		
		8+13 - 8+52	LT					39	
		8+13 - 8+52	RT					39	
		9+71 - 10+10	RT					39	
		7+49 - 8+02.5	LT						1
		7+49 - 8+02.5	RT						1
		11+92.58 - 12+45.58	RT						1
		TOTAL		21	13	1	207	117	3

3

STORM SEWER

		61L3220		61L0654		612.0212		520.1012	
		INLETS 2X2-FT		INLET COVERS TYPE V		PIPE UNDERDRAIN UNPERFORATED 12-INCH		APRON ENDWALLS FOR CULVERT PIPE 12-INCH	
PROJECT ID	CATEGORY	STATION	LOCATION	(EACH)	(EACH)	(LF)	(EACH)	(EACH)	
5587-00-72	0010	8+42	14' LT	1	1	20	1		
		8+42	14' RT	1	1	25	1		
		TOTAL		2	2	45	2		

PAVEMENT MARKING

PROJECT		646.0106	
		PAVEMENT MARKING EPOXY 4-INCH	
ID	CATEGORY	STATION - STATION	LOCATION (LF)
5587-00-72	0010	7+00 10+20	CL 640
		7+00 12+75	RT 575
		7+00 10+20	LT 320
		TOTAL	

TRAFFIC CONTROL

PROJECT ID	CATEGORY	LOCATION	(EA)
5587-00-72	0010	PROJECT	1
TOTAL			1

643.0100

TRAFFIC
CONTROL
(PROJECT)

SIGNING

					634.0614	637.2230	638.2602	638.3000
					POSTS WOOD 4x6-INCH x 14-FT	SIGNS TYPE II REFLECTIVE F	REMOVING SIGNS TYPE II	REMOVING SMALL SIGN SUPPORTS
PROJECT ID	CATEGORY	STATION	LOCATION	SIGN CODE	(EACH)	(SF)	(EA)	(EA)
5587-00-72	0010	8+50	LT	W5-52L	1	3		
		8+50	RT	W5-52R	1	3		
		9+73	LT	W5-52L	1	3		
		9+73	RT	W5-52R	1	3		
		SE QUAD	BRIDGE				1	1
		SW QUAD	BRIDGE				1	1
		NE QUAD	BRIDGE				1	1
		NW QUAD	BRIDGE				1	1
TOTAL					4	12	4	4

CONSTRUCTION STAKING

		650.4000		650.4500		650.5000		650.9920	
		CONSTRUCTION STAKING STORM SEWER		CONSTRUCTION STAKING SUBGRADE		CONSTRUCTION STAKING BASE		CONSTRUCTION STAKING SLOPE STAKES	
PROJECT ID	CATEGORY	STATION - STATION	LOCATION	(EA)	(LF)	(LF)	(LF)	(LF)	
5587-00-72	0010	8+00 - 9+00	RT	1	218	218	218		
		11+50 - 12+50	RT	1	302	302	302		
		TOTAL		2	520	520	520		

EROSION CONTROL

				628.6005	628.7504	628.7570	628.1504	628.1520	628.2006	606.0200	645.0130	628.1905	628.1910	627.0200	629.0210	630.0130	630.0200	625.0500	630.0300
PROJECT ID	CATEGORY	STATION - STATION	LOCATION	TURBIDITY BARRIERS (SY)	TEMPORARY DITCH CHECKS (LF)	ROCK BAGS (EACH)	SILT FENCE (LF)	SILT FENCE MAINTENANCE (LF)	EROSION MAT URBAN CLASS I TYPE A (SY)	RIPRAP MEDIUM (SY)	GEOTEXTILE FABRIC TYPE R (SY)	MOBILIZATIONS EROSION CONTROL (EACH)	MOBILIZATIONS EMERGENCY EROSION CONTROL (EACH)	MULCHING (SY)	FERTILIZER TYPE B (CWT)	SEEDING MIXTURE NO. 30 (LB)	SEEDING TEMPORARY (LB)	SALVAGED TOPSOIL (SY)	SEEDING BORROW PIT (LB)
5587-00-72	0010	8+92 - 9+25	LT & RT	55			1	1	1	1	1	1	1	1	1	1	1	1	
UNDISTRIBUTED					150														
						10													
						10													
						10													

PROJECT NO: 5587-00-72

HWY: CTH E

COUNTY: GRANT

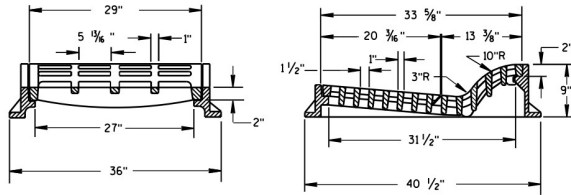
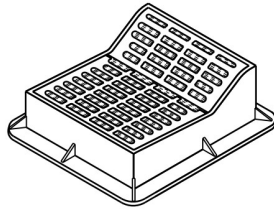
MISCELLANEOUS QUANTITIES

SHEET

3

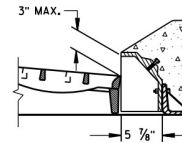
Standard Detail Drawing List

08A05-19C	INLET COVERS TYPE F, HM, HM-S, S, T, V, HM-GJ, & HM-GJ-S
08C07-02	INLETS 2X2-FT, 2X2.5-FT, 2X3-FT AND 2.5X3-FT
08D03-06	CONCRETE SURFACE DRAINS DROP INLET TYPE AT STRUCTURES
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E11-02	TURBIDITY BARRIER
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
12A03-10	NAME PLATE (STRUCTURES)
14B20-11A	STEEL THRIE BEAM STRUCTURE APPROACH
14B20-11B	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO SQUARE END PARAPETS
14B27-01A	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B27-01B	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B27-01C	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B42-04A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-04B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-04C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B44-02A	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-02B	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-02C	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B45-04A	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04B	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04C	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04D	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04J	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
15C02-06A	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C02-06B	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C08-16A	PAVEMENT MARKING (MAINLINE)



TYPE "F"

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



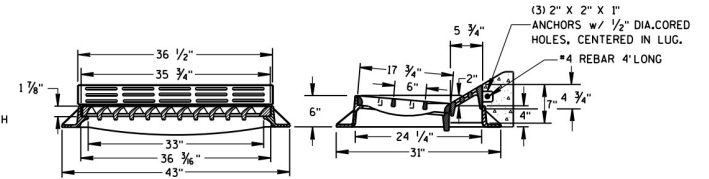
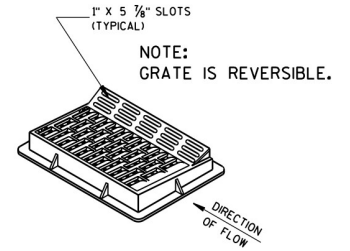
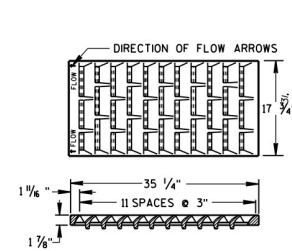
ALTERNATIVE CURB BOX
FOR TYPE "HM" COVER

USE WITH TYPES G & J CONCRETE CURB & GUTTER, 30 INCH
NOTED AS TYPE HM-GJ ON DRAINAGE TABLE

GENERAL NOTES

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

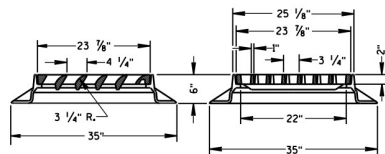
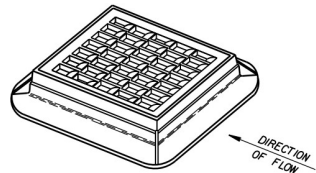
DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR INLET COVERS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.



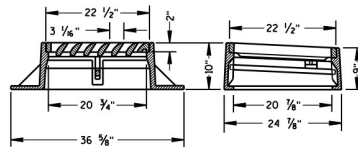
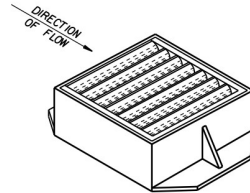
TYPE "HM"

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

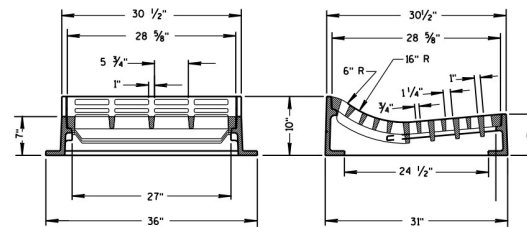
NOTE:
SPECIAL GRATE FOR THE
TYPE "H" COVER MAY ALSO BE
USED FOR THE TYPE "HM" COVER
NOTED AS TYPE HM-S ON DRAINAGE TABLE



TYPE "S"

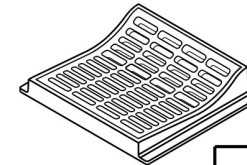


TYPE "V"



TYPE "T"

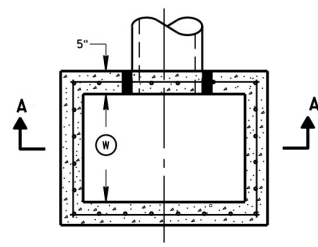
USE WITH TYPES R & T CONCRETE CURB & GUTTER, 36 INCH.



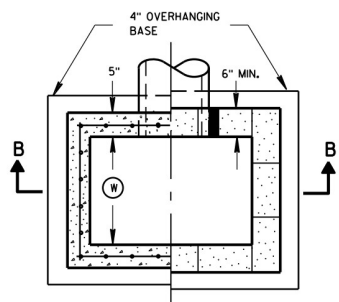
INLET COVERS
TYPE F, HM, HM-S, S, T, V,
HM-GJ, & HM-GJ-S

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

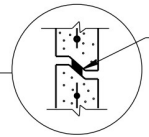
APPROVED
11/27/2013 /S/ Jerry H. Zogg
DATE ROADWAY STANDARDS 14 ENT
FHWA ENGINEER



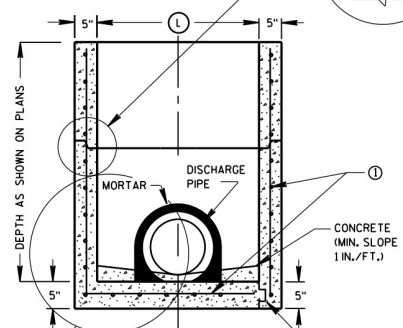
PLAN VIEW



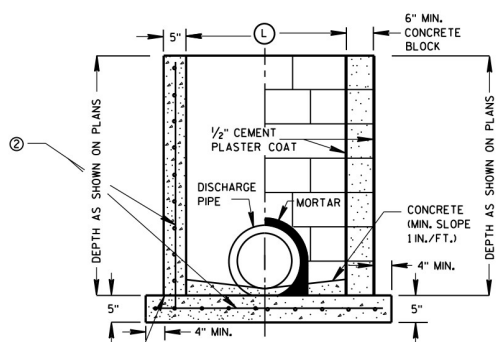
PLAN VIEW



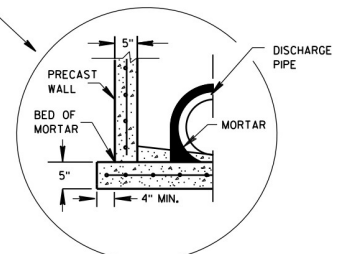
RISER JOINTS TO BE SEALED WITH A BUTYL RUBBER SEAL PER SEALANT MANUFACTURERS RECOMMENDATIONS CONFORMING TO ASTM C 990 (TYP)



SECTION A-A



SECTION B-B



SEPARATE PRECAST REINFORCED CONCRETE BASE OPTION

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

GENERAL NOTES

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

UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE ENGINEER, THE CONTRACTOR SHALL NOT ORDER AND DELIVER PRECAST INLET UNITS REQUIRED FOR THE PROJECT UNTIL A LIST OF SIZES IS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ALL PRECAST INLET UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF ASTM C 913.

ALL DRAINAGE STRUCTURES ARE DESIGNATED ON THE PLANS AS "MANHOLES 3X3-L", "CATCH BASINS 4-B", "INLETS 2X3-H", ETC. THE FIRST NUMBERS DESIGNATES THE SIZE OF THE STRUCTURE, AND THE FOLLOWING LETTER DESIGNATES THE TYPE OF COVER TO BE USED TO COMPRISE THE COMPLETE UNIT.

BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS OF FOUNDATION BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

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

PRECAST REINFORCED RISERS SHALL HAVE A TONGUE AND GROOVE JOINT WITH TONGUE UP OR DOWN.

4" OVERHANGING BASES ARE REQUIRED FOR CAST-IN-PLACE REINFORCED CONCRETE AND CONCRETE BLOCK INSTALLATIONS. 4" OVERHANG IS REQUIRED WHEN SEPARATE PRECAST BASE IS PROVIDED. OVERHANG IS NOT REQUIRED ON PRECAST STRUCTURES WITH AN INTEGRAL OR MONOLITHIC BASE.

MAXIMUM INSIDE PIPE DIAMETER DETERMINED BY 3 INCH CLEARANCE ON EACH SIDE OF THE OUTSIDE WALL OF THE PIPE. SEE DETAIL "A". ASSUMES PIPE ENTERS PERPENDICULAR TO THE STRUCTURE.

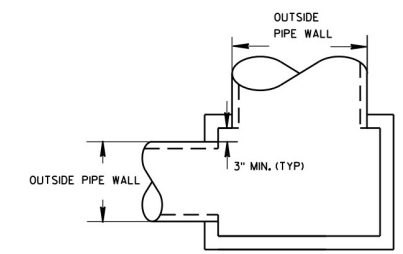
- ① FOR PRECAST INLETS PROVIDE REINFORCING STEEL IN ACCORDANCE TO ASTM C 913.
- ② CONTRACTOR TO PROVIDE DRAWING(S) STAMPED BY A PROFESSIONAL ENGINEER FOR STEEL REINFORCING DESIGN FOR CAST-IN-PLACE STRUCTURES.

INLET COVER MATRIX

INLET SIZE	INLET COVER TYPE		ALL A'S	ALL B'S	BW	F	ALL H'S	S	T	V	WM
	WIDTH (1) (FT)	LENGTH (1) (FT)									
2X2-FT	2	2	X	X				X		X	
2X2.5-FT	2	2.5			X				X	X	X
2X3-FT	2	3					X				
2.5X3-FT	2.5	3				X					

PIPE MATRIX

INLET SIZE	MAXIMUM INSIDE PIPE DIAMETER	
	WIDTH (IN)	LENGTH (IN)
2X2-FT	12	12
2X2.5-FT	12	18
2X3-FT	12	24
2.5X3-FT	18	24



DETAIL "A"

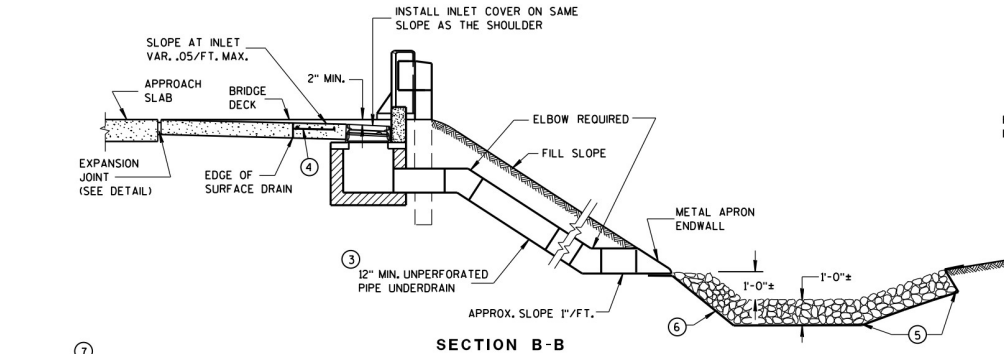
INLETS 2X2-FT, 2X2.5-FT,
2X3-FT AND 2.5X3-FT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
Sept., 2016
DATE
FHW

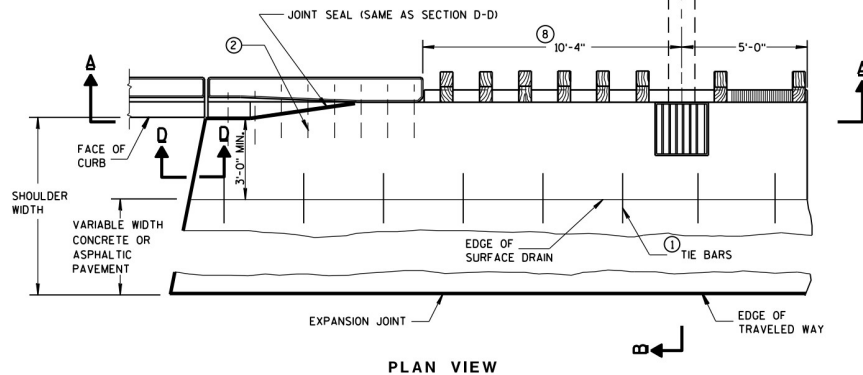
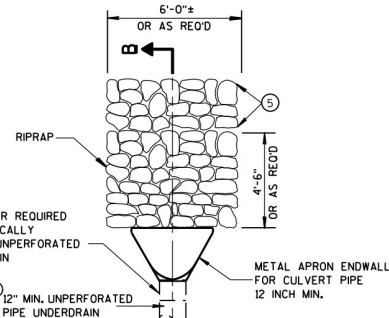
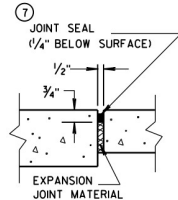
/s/ Rodney Taylor
ROADWAY STANDARDS D
UNIT SUPERVISOR

15
IT

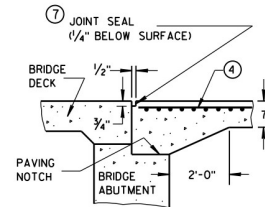


SECTION B-B

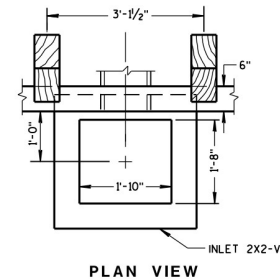
EXPANSION JOINT DETAIL



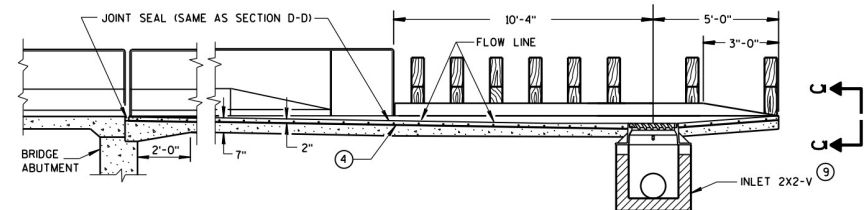
PLAN VIEW



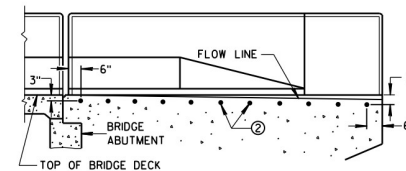
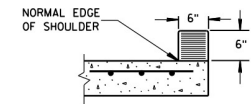
SECTION D-D



PLAN VIEW



SECTION A-A

LOCATION OF
TIE BARS IN WINGWALL

SECTION C-C

GENERAL NOTES

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

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

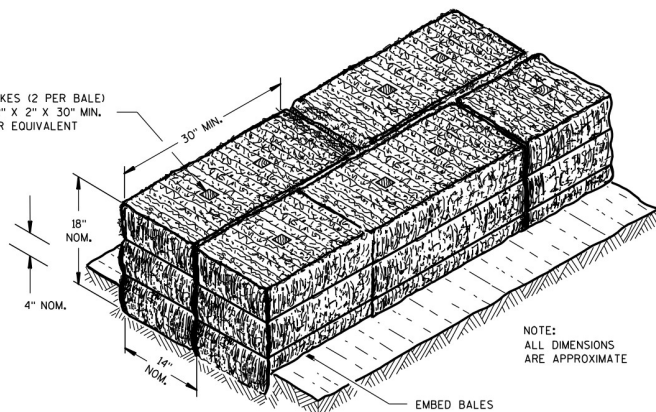
- ① NO. 4 X 2'-0" TIE BARS SPACED AT 3'-0" CENTERS TO BE USED ONLY WHEN ADJACENT TO P.C. CONCRETE.
- ② NO. 4 X 2'-0" TIE BARS SPACED AT 12" CENTERS TO BE PLACED BY BRIDGE CONTRACTOR, OR DRILLED TIE BARS PLACED AS DIRECTED BY THE ENGINEER.
- ③ THE PIPE UNDERDRAIN MAY BE ANY ONE OF THE SIX MATERIALS LISTED IN THE STANDARD SPECIFICATIONS SECTION 612.2 EXCEPT DRAIN TILE.
- ④ MINIMUM REINFORCEMENT SHALL BE 6" X 6" - #4.0 X #4.0 OR NO. 3 BARS LONGITUDINAL AND TRANSVERSE SPACING 12" C-C.
- ⑤ LIMITS OF ADDITIONAL RIPRAP WHEN SPECIAL DITCH IS REQUIRED.
- ⑥ GEOTEXTILE FABRIC, TYPE "R"
- ⑦ HOT POURED SEALANT UNLESS OTHERWISE SPECIFIED.
- ⑧ THIS DIMENSION MAY VARY DEPENDING ON THE SPACING OF POSTS FOR THE STEEL PLATE BEAM GUARD. THE TYPICAL LOCATION FOR THE SURFACE DRAIN IS WHERE THE POST SPACING WIDENS TO 3'-1/2".
- ⑨ SEE CURRENT STANDARD DETAIL DRAWINGS 8A5 AND 8C7 FOR DETAILS.

CONCRETE SURFACE DRAINS
DROP INLET TYPE
AT STRUCTURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
9/4/08 /S/ Jerry H. Zogg
DATE ROADWAY STANDARDS 16 JENT
FHWA ENGINEER

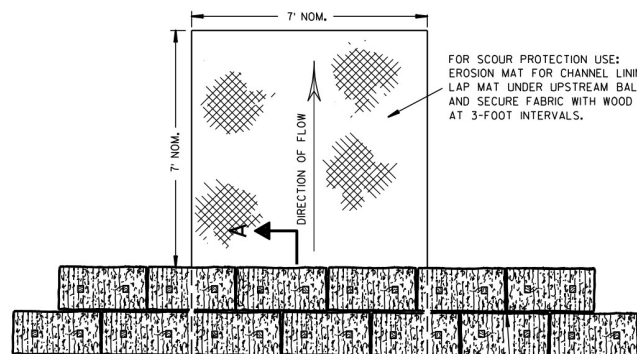
WOOD STAKES (2 PER BALE)
NOMINAL 2" X 2" X 30" MIN.
LENGTH OR EQUIVALENT



NOTE:
ALL DIMENSIONS
ARE APPROXIMATE

EMBED BALES

SECTION A-A

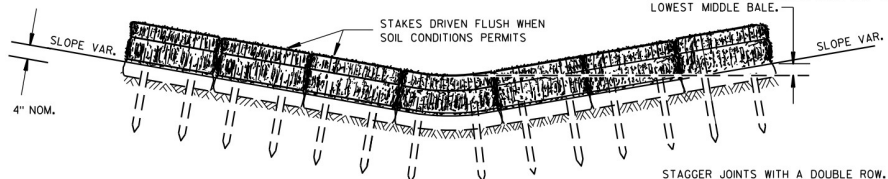


FOR SCOUR PROTECTION USE:
EROSION MAT FOR CHANNEL LINING,
LAP MAT UNDER UPSTREAM BALES
AND SECURE FABRIC WITH WOOD STAKES
AT 3-FOOT INTERVALS.

PLAN VIEW

STAGGER JOINTS BETWEEN ADJACENT
ROWS OF BALES.

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



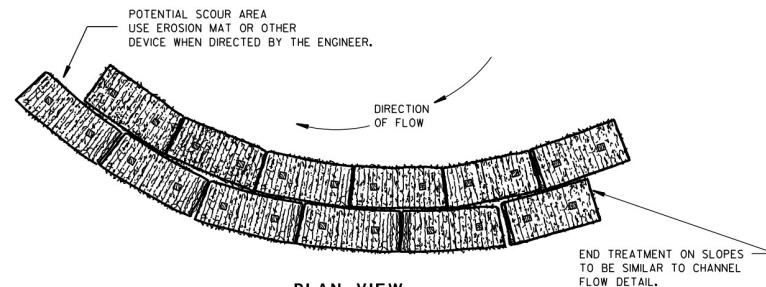
FRONT ELEVATION

TEMPORARY DITCH CHECK USING EROSION BALES ①

GENERAL NOTES

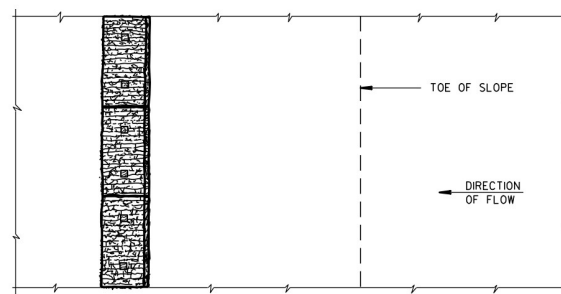
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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

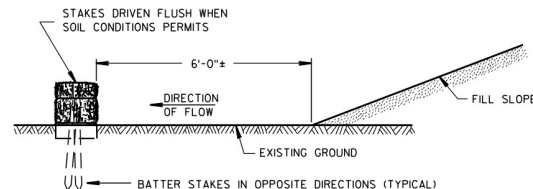


PLAN VIEW

WHEN ALTERING THE DIRECTION OF FLOW



PLAN VIEW



FRONT ELEVATION

WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE

EROSION BALES FOR SHEET FLOW

TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

6/04/02 DATE 1/5/ Beth Connors
CHIEF ROADWAY DEVELOPER

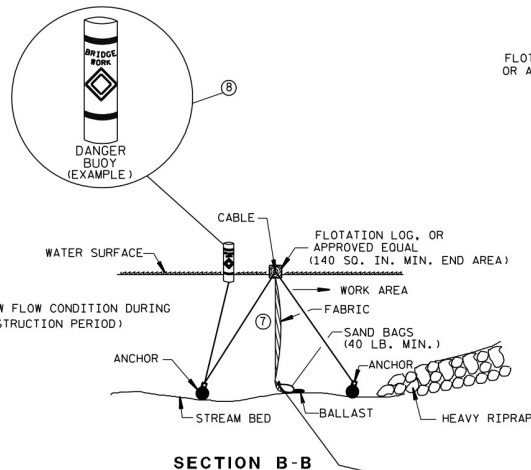
FHWA JUNEER



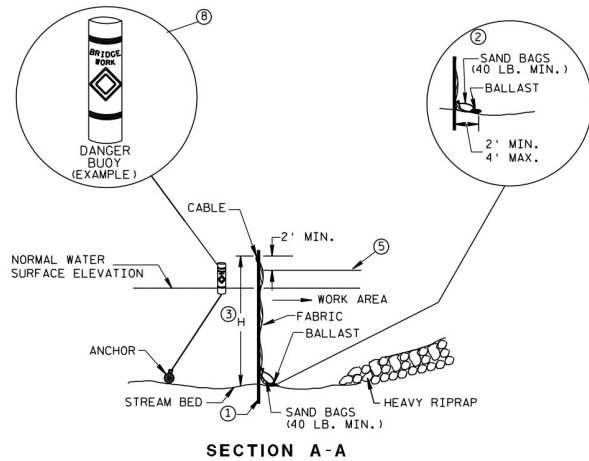
A cross-sectional diagram of a geotextile fabric installation. A vertical line represents the fabric, with a horizontal arrow pointing to it labeled "FLOW DIRECTION". Above the fabric, the text "GEOTEXTILE FABRIC" has an arrow pointing to the top edge. Below the fabric, the text "EXCESS FABRIC" has an arrow pointing to a section of the fabric that is folded back. A circled number "2" is placed near the fabric, with an arrow pointing to it.

A cross-sectional diagram of a silt fence system. A vertical post is driven into the ground. A line representing the silt fence material is attached to the post and extends diagonally down and to the left. This line is labeled "TIEBACK BETWEEN FENCE POST AND ANCHOR". At the end of this line is a stake driven into the ground, labeled "ANCHOR STAKE MIN. 18" LONG". An arrow labeled "FLOW DIRECTION" points from left to right, passing through the silt fence material. The ground surface is indicated by a horizontal line with diagonal hatching below it. The area between the fence and the post is labeled "SILT FENCE".

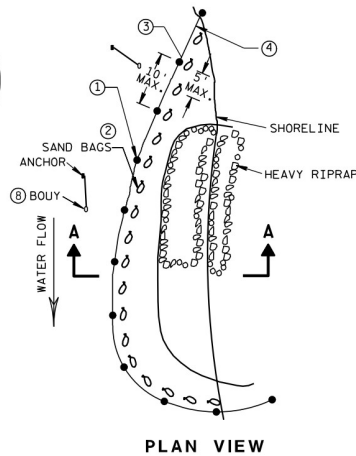
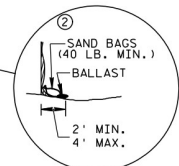
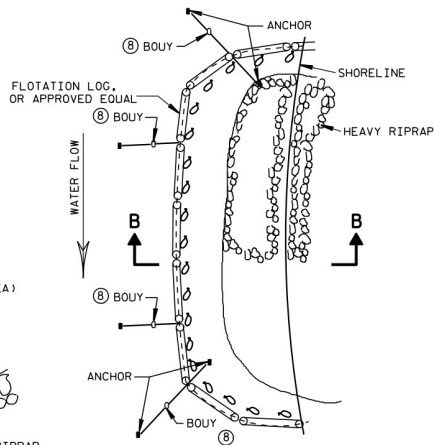
APPROVED
4-29-05 /S/ Beth Conn
DATE CHIEF ROADWAY DEVELOP 18 HINEE
FHWA



TURBIDITY BARRIER FLOAT ALTERNATIVE
CAUTION - SEE NOTE 6



TURBIDITY BARRIER STANDARD POST INSTALLATION



PLAN VIEW

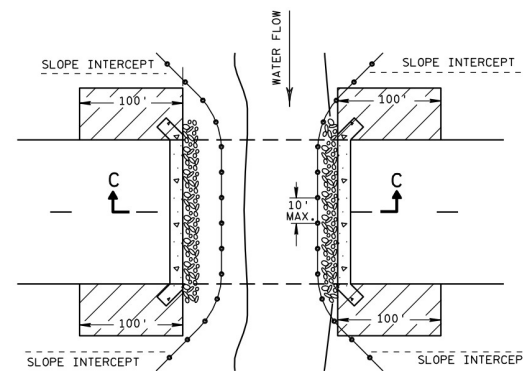
TURBIDITY BARRIER PLACEMENT DETAILS

GENERAL NOTES

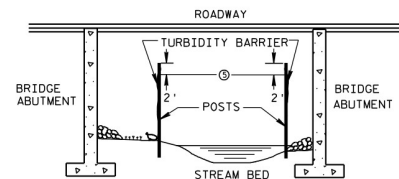
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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

- 1 DRIVEN STEEL POSTS, PIPES, OR CHANNELS. LENGTH SHALL BE SUFFICIENT TO SECURELY SUPPORT BARRIER AT HIGH WATER ELEVATIONS.
- 2 SANDBAGS TO BE USED AS ADDITIONAL BALLAST WHEN ORDERED BY THE ENGINEER TO MEET ADVERSE FIELD CONDITIONS. SPACE AS APPROPRIATE FOR SITE CONDITIONS.
- 3 WHEN BARRIER HEIGHT, H, EXCEEDS 8 FT., POST SPACING MAY NEED TO BE DECREASED.
- 4 IN WATERWAYS SUBJECT TO FLUCTUATING WATER ELEVATIONS, PROVISIONS SHOULD BE MADE TO ALLOW THE WATER TO EQUALIZE ON EACH SIDE OF THE BARRIER. THIS MAY BE ACCOMPLISHED BY LEAVING A PORTION OF THE BARRIER OPEN ON THE UPSTREAM END.
- 5 ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION PERIOD. MINIMUM BARRIER HEIGHT SHALL BE 2' GREATER THAN EITHER THE O2 ELEVATION OR THE ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION, WHICHEVER IS GREATER.
- 6 FLOAT ALTERNATIVE WILL ONLY BE ALLOWED WITH WRITTEN APPROVAL OF THE ENGINEER, AND IS MEANT FOR LOCATIONS WHERE BED ROCK PREVENTS THE INSTALLATION OF POSTS.
- 7 ALLOW SUFFICIENT SLACK VERTICALLY AND HORIZONTALLY SO THAT SEDIMENT BUILD UP WILL NOT SEPARATE OR LOWER THE TURBIDITY BARRIER.
- 8 USE AS DIRECTED BY COAST GUARD OR DNR PERMIT WHEN WORKING IN NAVIGABLE WATERWAYS.



PLAN VIEW



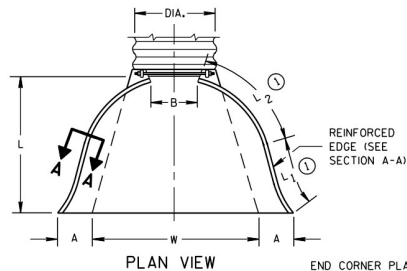
SECTION C-C

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

TURBIDITY BARRIER	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 6/04/02 DATE	15/ Beth Connors CHIEF ROADWAY DEVELOPER
FHW	

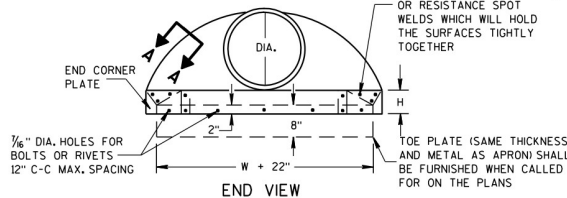
METAL APRON ENDWALLS										
PIPE DIA. (IN.)	MIN. THICK. (INCHES)		DIMENSIONS (INCHES)						APPROX. SLOPE	BODY
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 (±2")	W (±2")		
12	.064	.060	6	6	6	21	12	17 1/2	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 1/4	3 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	3 to 1	1 Pc.
21	.064	.060	9	12	6	36	18	29 3/4	3 to 1	1 Pc.
24	.064	.075	10	13	6	41	18	37 1/4	3 to 1	1 Pc.
30	.079	.075	12	16	8	51	18	52 1/4	3 to 1	1 Pc.
36	.079	.105	14	19	9	60	24	59 3/4	2 to 1	2 Pc.
42	.109	.105	16	22	11	69	24	75 3/4	2 to 1	2 Pc.
48	.109	.105	18	27	12	78	24	81	2 to 1	3 Pc.
54	.109	.105	18	30	12	84	30	85 1/2	2 to 1	3 Pc.
60	.109*	.105*	18	33	12	87	—	114	2 to 1	3 Pc.
66	.109*	.105*	18	36	12	87	—	120	2 to 1	3 Pc.
72	.109*	.105*	18	39	12	87	—	126	2 to 1	3 Pc.
78	.109*	.105*	18	42	12	87	—	132	1 1/2 to 1	3 Pc.
84	.109*	.105*	18	45	12	87	—	138	1 1/2 to 1	3 Pc.
90	.109*	.105*	18	37	12	87	—	144	1 1/2 to 1	3 Pc.
96	.109*	.105*	18	35	12	87	—	150	1 1/2 to 1	3 Pc.

* EXCEPT CENTER PANEL
SEE GENERAL NOTES

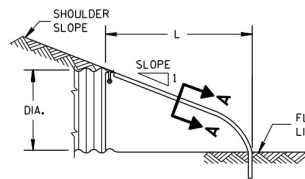


PLAN VIEW

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

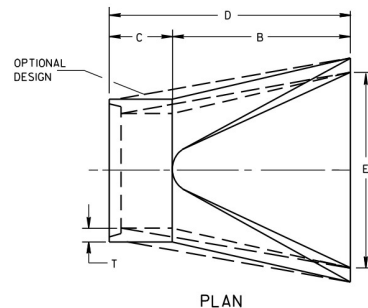


END VIEW

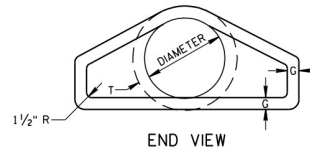
SIDE ELEVATION
METAL ENDWALLS

REINFORCED CONCRETE APRON ENDWALLS										
PIPE DIA. (IN.)	DIMENSIONS (INCHES)							APPROX. SLOPE		
	T	A	B	C	D	E	G			
12	2	4	24	48 1/8	72 1/8	24	2	3 to 1		
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1		
18	2 1/2	9	27	46	73	36	2 1/2	3 to 1		
21	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	3 to 1		
24	3	9 1/2	43 1/2	30	73 1/2	48	3	3 to 1		
27	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	3 to 1		
30	3 1/2	12	54	19 3/4	73 1/2	60	3 1/2	3 to 1		
36	4	15	63	34 3/4	97 3/4	72	4	3 to 1		
42	4 1/2	21	63	35	98	78	4 1/2	3 to 1		
48	5	24	72	26	98	84	5	3 to 1		
54	5 1/2	27	65	33 1/4-35	98 1/4-100	90	5 1/2	2 1/2 to 1		
60	6	30-35	60	39	99	96	5	2 to 1		
66	6 1/2	34-36	72-78	21-27	99	102	5 1/2	2 to 1		
72	7	34-36	78	21	99	108	6	2 to 1		
78	7 1/2	34-36	78	21	99	114	6 1/2	2 to 1		
84	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1		
90	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	1 1/2 to 1		

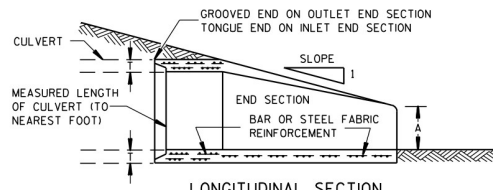
* MINIMUM
** MAXIMUM

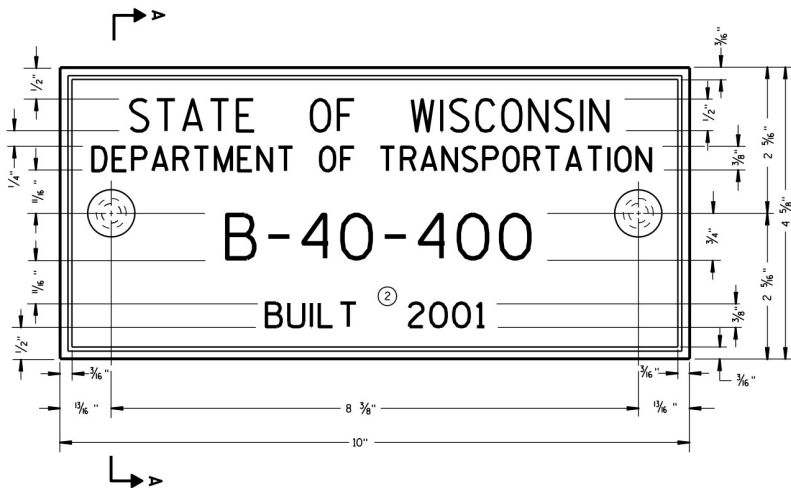


PLAN

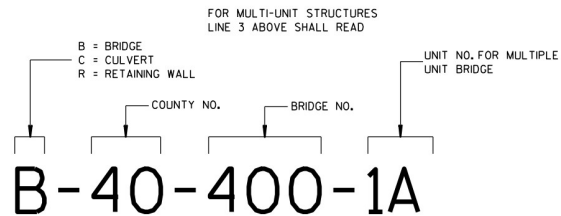


END VIEW





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



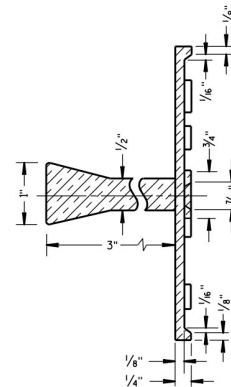
**NUMBERING DESIGNATION
MULTI-UNIT STRUCTURES**

GENERAL NOTES

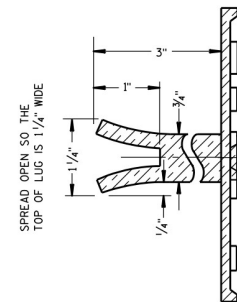
NAME PLATES TO BE INSTALLED ON BRIDGES, CULVERTS, AND RETAINING WALLS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS.

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

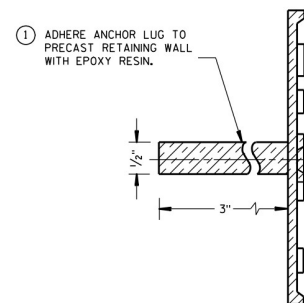
- ① EPOXY RESIN SHALL BE FROM AN APPROVED MANUFACTURER AND USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ② REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.



SECTION A-A



ALTERNATE LUG



ALTERNATE LUG
(FOR ATTACHMENT TO PRECAST STRUCTURES)

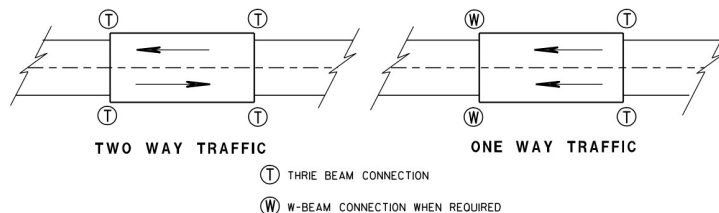
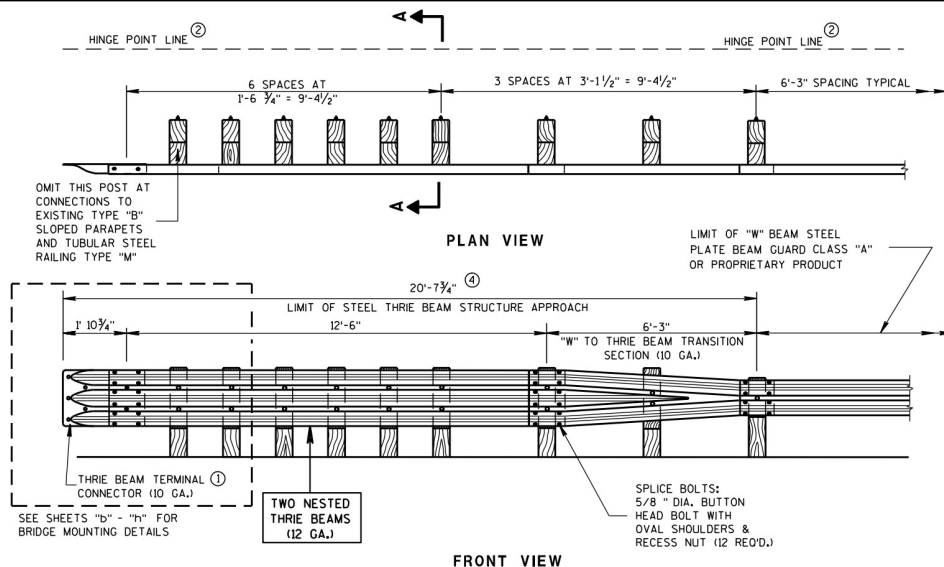
**NAME PLATE
(STRUCTURES)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

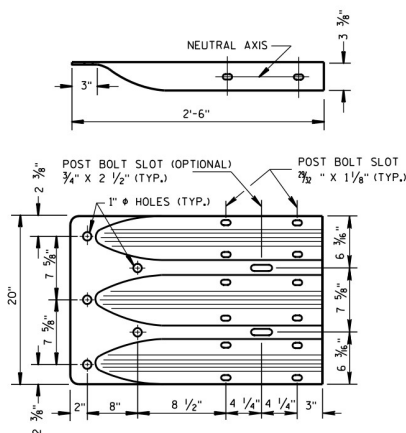
APPROVED

3/26/10 DATE 15/ Scot Beck 21
CHIEF STRUCTURAL DEVELOPER

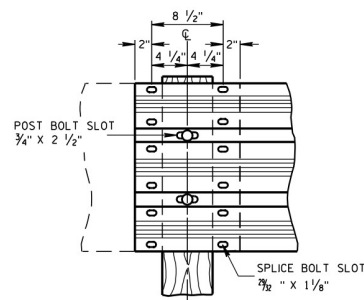
FHWA



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



THRIE BEAM TERMINAL CONNECTOR



THRIE BEAM SPLICE

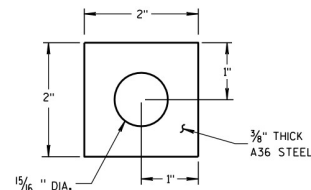
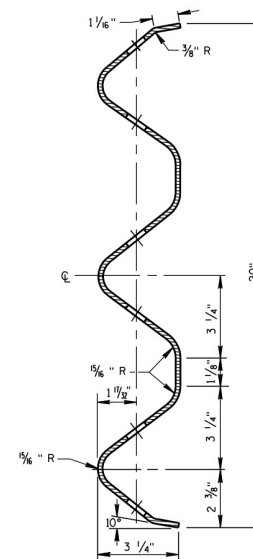
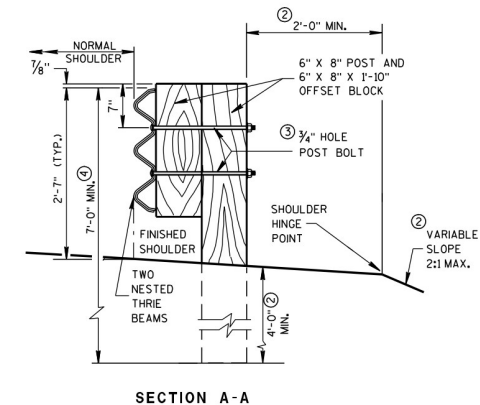


PLATE WASHER DETAIL



SECTION THRU THRIE BEAM RAIL ELEMENT



GENERAL NOTES

BOLT THE THRIE BEAM TO ALL POSTS AND BLOCKOUTS. DRILL OR PUNCH BOLT HOLES IN THE BEAM IF THE POST SPACING IS LESS THAN 6'-3".

DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.

IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 $\frac{1}{2}"$, AND 12" DIAMETER AROUND POST. SEE 14B15 FOR MORE DETAILS.

- BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.
- MINIMUM EMBEDMENT SHALL BE 4'-0", WHERE EXISTING CONDITIONS DO NOT PERMIT THE APPROPRIATE EARTHWORK SHOWN ON THE PLAN TYPICAL SECTIONS OR DETAILS, THE ENGINEER MAY ALLOW THE REDUCTION OR ELIMINATION OF THE 2 FOOT DISTANCE TO THE HINGE POINT, OTHERWISE BUILD AS THE PLAN SHOWS OR AS THE ENGINEER DIRECTS. IF THE 2 FOOT DISTANCE TO THE HINGE POINT IS REDUCED OR ELIMINATED, INCREASE THE POST EMBEDMENT DEPTH TO 4'-6" OR MORE.
- POST BOLTS ARE $\frac{3}{8}"$ DIAMETER ASTM A307 BUTTON HEAD BOLT. A POST BOLT REQUIRES A $\frac{3}{8}"$ DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX AND A $\frac{3}{8}"$ DIAMETER F844 FLAT WASHER. LENGTH OF POST BOLT MAY VARY.
- ALL WOOD POSTS MUST BE 6" X 8" AND AT LEAST 7'-0" LONG.

STEEL THRIE BEAM STRUCTURE APPROACH

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8/31/2012

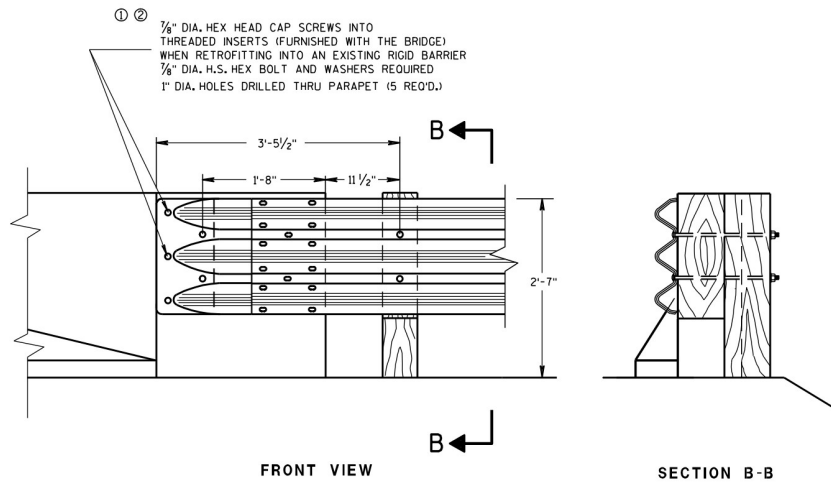
DATE

/S/ Jerry H. Zoon

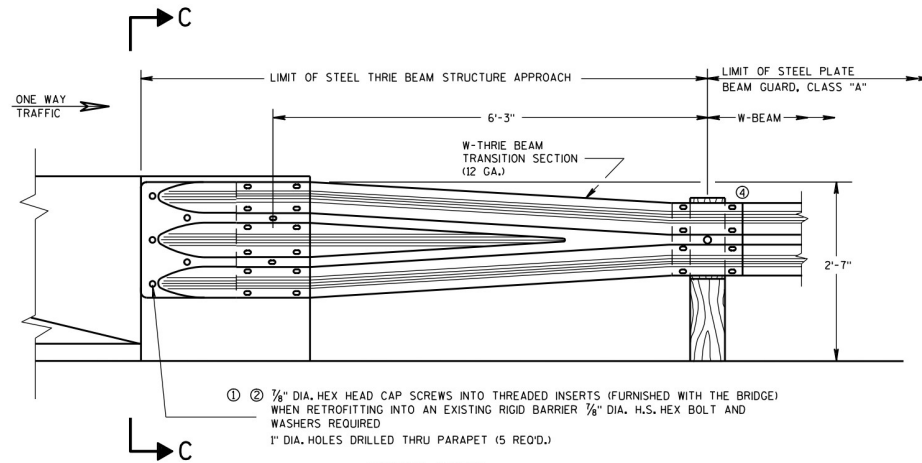
ROADWAY STANDARDS 122

ENGINEER

FHWA



THRIE BEAM CONNECTION TO BRIDGE
PARAPET WITH SQUARE ENDS



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

GENERAL NOTES

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

BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A325, A449 AND GALVANIZED PER STANDARD SPECIFICATIONS 614.

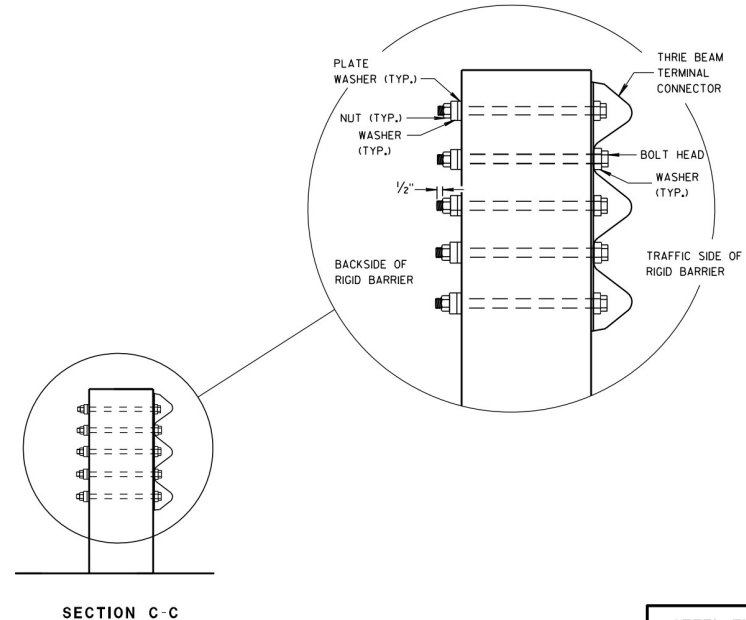
① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

② 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 TERMINAL CONNECTOR. 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.

③ 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".

④ W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POST WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.

DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.



STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO SQUARE END PARAPETS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8/31/2012

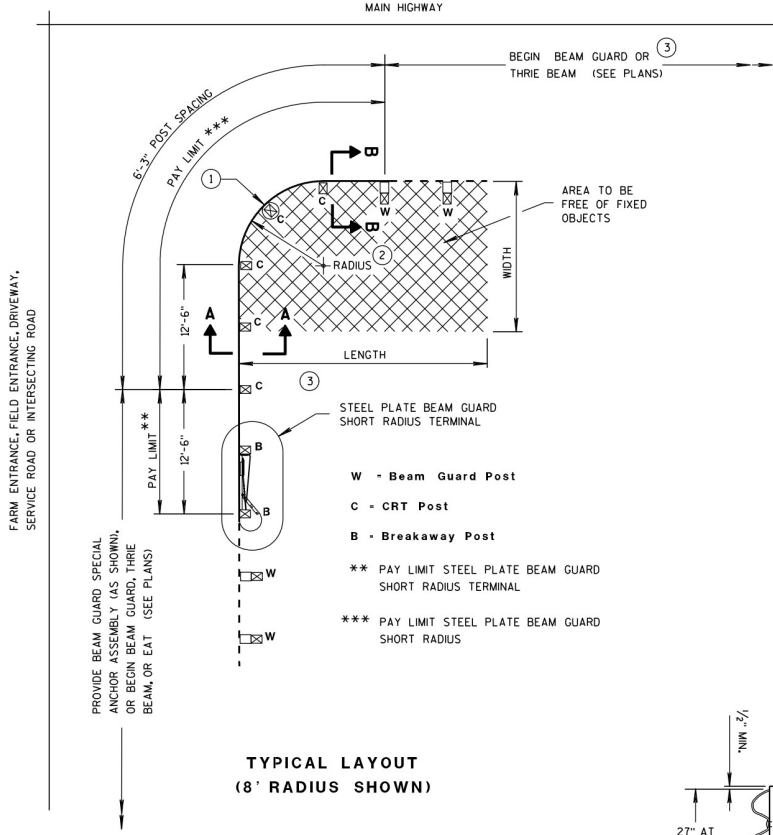
DATE

/S/ Jerry H. Zorn

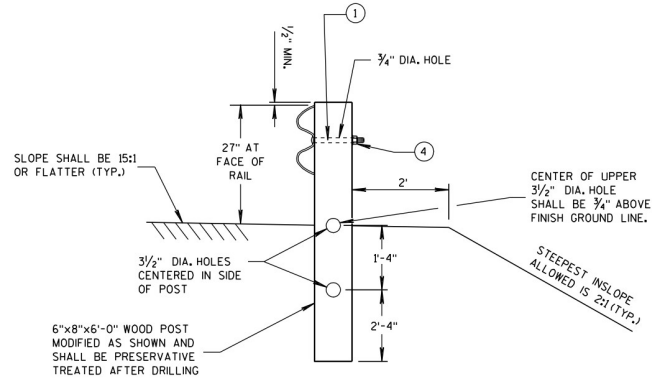
ROADWAY STANDARDS 123

ENGINEER

FHWA



TYPICAL LAYOUT
(8' RADIUS SHOWN)



SECTION A-A
(CRT POST)

GENERAL NOTES

ALL ANGLES, CHANNELS, AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36 AND THE STRUCTURAL TUBING SHALL CONFORM TO ASTM A 500. WELDING SHALL MEET THE CURRENT REQUIREMENTS OF THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE ANSI/AWS D11. ALL STRUCTURAL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123. PUNCHING, DRILLING, CUTTING, OR WELDING WILL NOT BE PERMITTED AFTER GALVANIZING. FURNISH AND INSTALL HARDWARE PER STANDARD SPECIFICATION 614.2, UNLESS NOTED OTHERWISE.

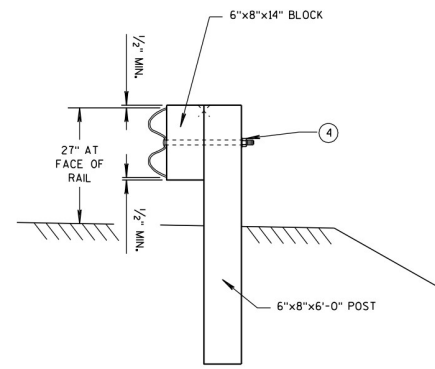
SHOP BEND CURVED RAIL SECTIONS.

SEE STANDARD DETAIL DRAWING 14 B 15 FOR OTHER DETAIL.

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

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

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

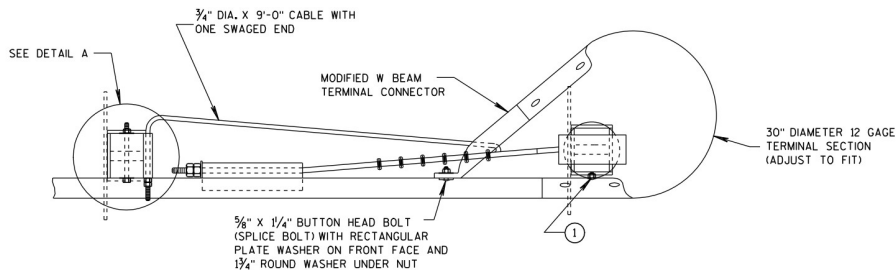


SECTION B-B
(BEAM GUARD POST)

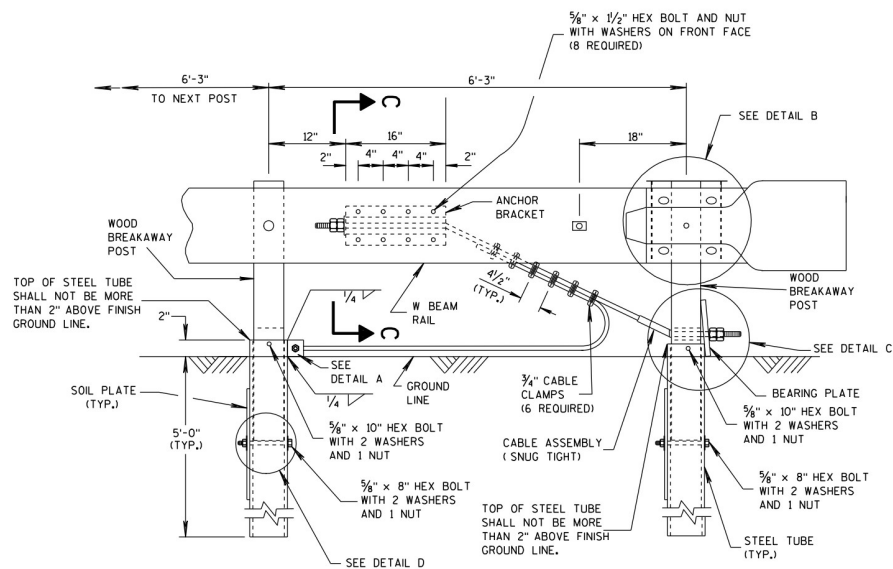
STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

STEEL PLATE BEAM GUARD
SHORT RADIUS TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



PLAN VIEW



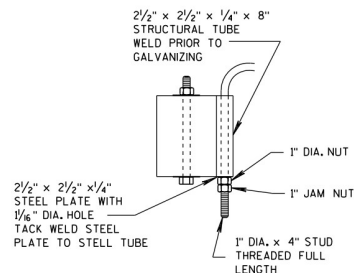
ELEVATION VIEW

STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

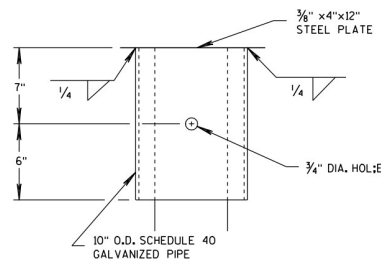
GENERAL NOTES

- 1 ATTACH W BEAM RAIL TO THE STEEL PIPE WITH A 3/8" X 2" BUTTON HEAD BOLT WITH NO WASHER. CONNECTION TO THE POST IS NOT REQUIRED.

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



DETAIL A

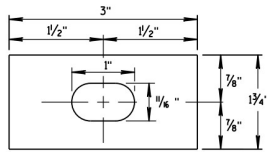


DETAIL B

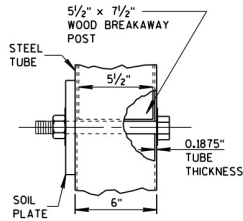
(BEAM GUARD AND TERMINAL SECTION NOT SHOWN)

STEEL PLATE BEAM GUARD
SHORT RADIUS TERMINAL

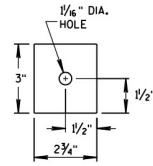
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



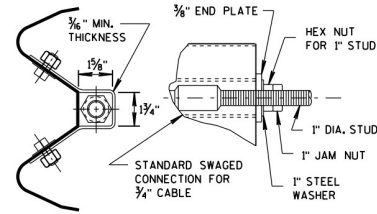
**RECTANGULAR
PLATE WASHER**



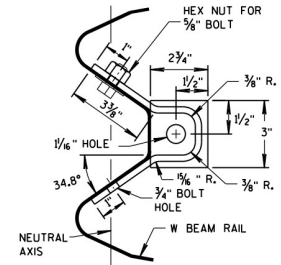
DETAIL D



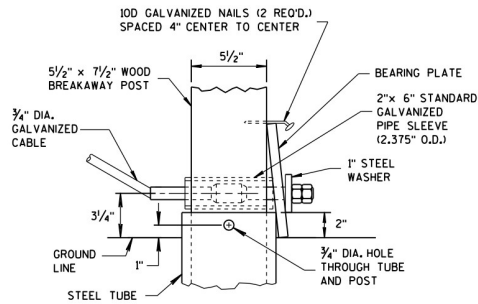
END PLATE



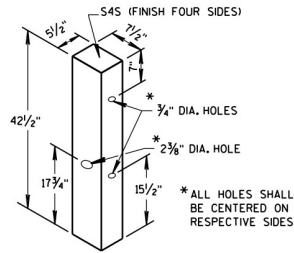
**SECTION C-C
(END PLATE REMOVED)**



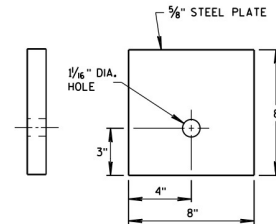
ANCHOR BRACKET



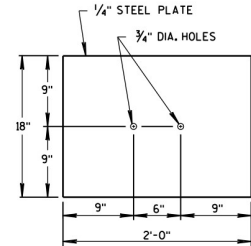
DETAIL C



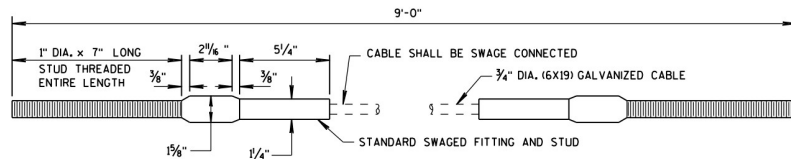
WOOD BREAKAWAY POST



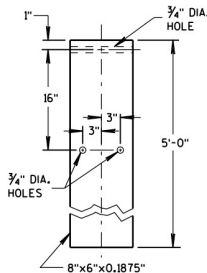
BEARING PLATE



SOIL PLATE



CABLE ASSEMBLY



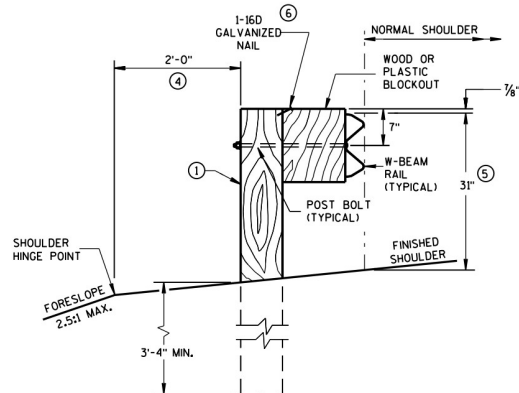
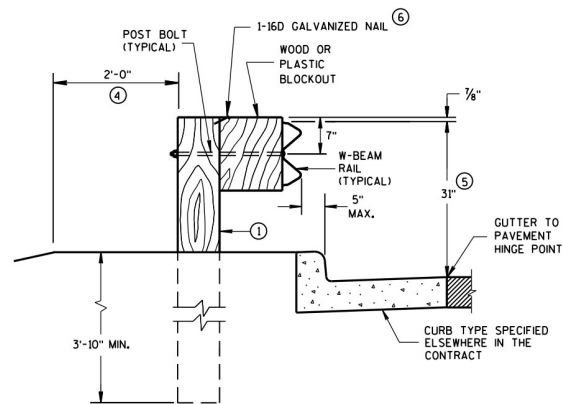
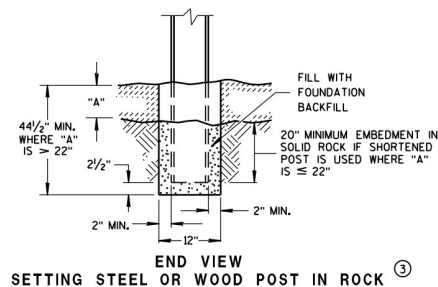
STEEL TUBE

**STEEL PLATE BEAM GUARD
SHORT RADIUS TERMINAL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
12/18/08 /S/ Jerry H. Zogg
DATE ROADWAY STANDARDS C 26 NT
FHWA ENGINEER

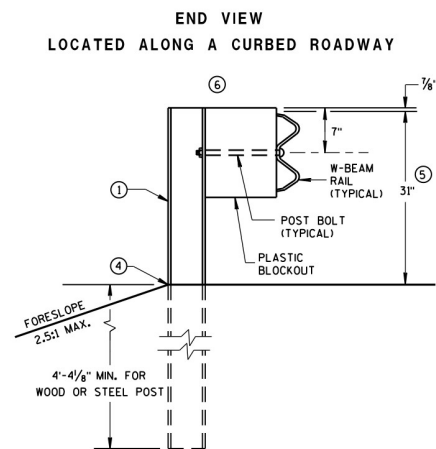
- ① WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED, DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- ② USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. 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 2½ INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS TO THE 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 27¾" 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.



END VIEW

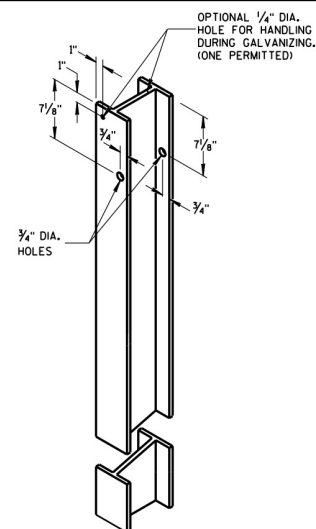
LOCATED ALONG A ROADWAY SHOULDER

STANDARD INSTALLATION

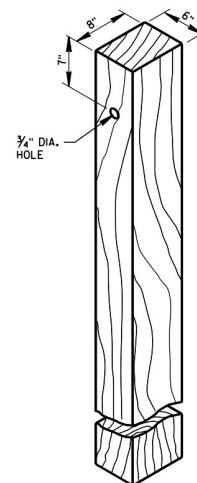


END VIEW

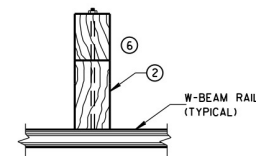
MGS LONGER POST AT HALFPOST SPACING W BEAM (K)



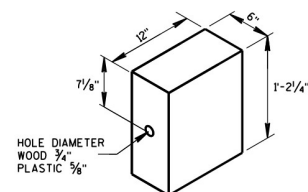
STEEL POST &
HOLE PUNCHING DETAIL
(w6X9)^①



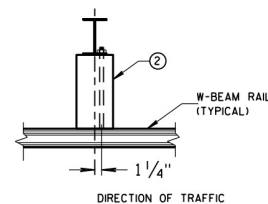
WOOD POST
(6" X 8") NOMINAL ①



PLAN VIEW
WOOD POST,
BLOCKOUT & BEAM



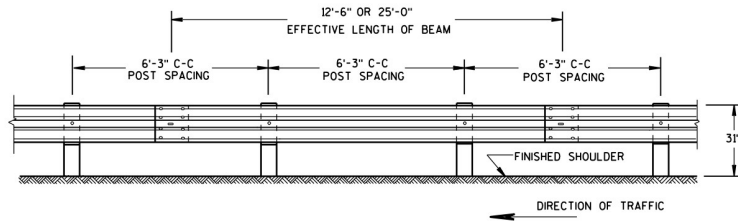
WOOD OR
PLASTIC BLOCKOUT ⁽²⁾



PLAN VIEW
STEEL POST,
PLASTIC BLOCKOUT & BEAM

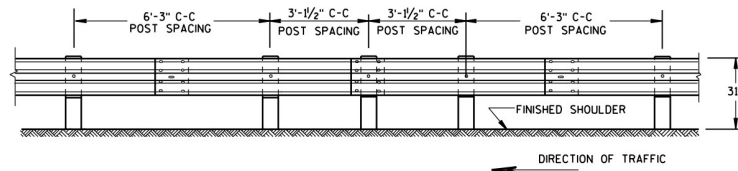
**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION²⁷



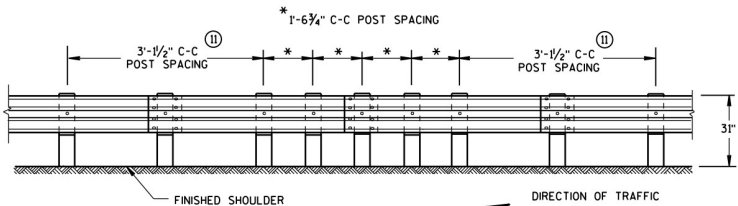
FRONT VIEW

POST SPACING STANDARD INSTALLATION



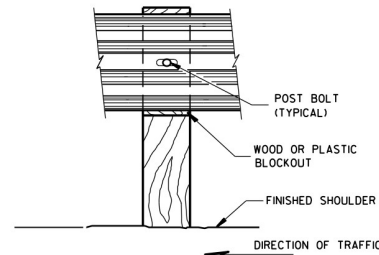
FRONT VIEW

HALF POST SPACING (HS) AND HALF POST SPACING WITH LONGER POSTS (K)

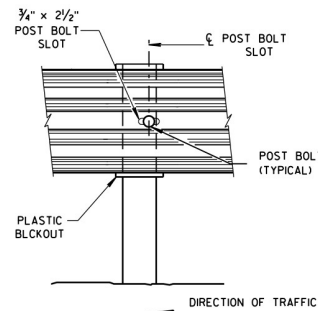


FRONT VIEW

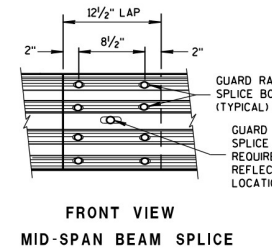
QUARTER POST SPACING (QS)



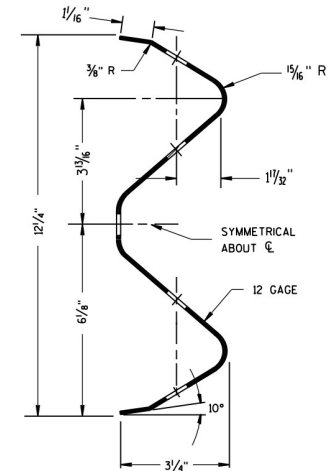
FRONT VIEW AT WOOD POST



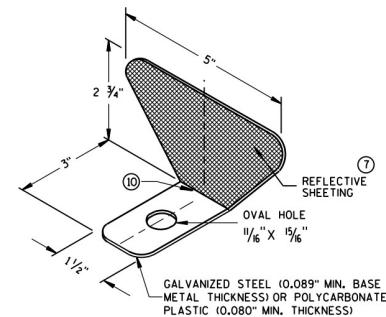
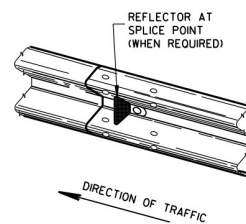
FRONT VIEW AT STEEL POST



FRONT VIEW
MID-SPAN BEAM SPLICE



SECTION THRU W-BEAM RAIL



ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION

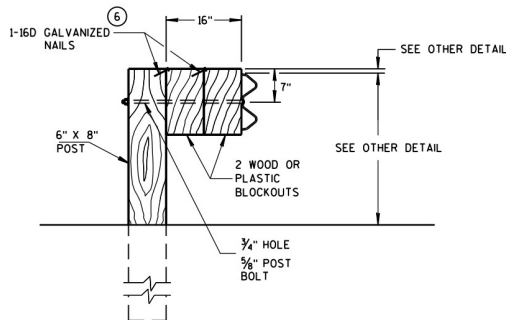
- ⑦ PROVIDE SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH YELLOW REFLECTIVE SHEETING. SHEETING IS TYPE H. SEE STANDARD SPECIFICATION 637.
 - ⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPLICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.
 - ⑨ REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.
 - ⑩ PROVIDE AN ANGLE OF BEND OF $90^\circ \pm 1^\circ$ FOR TWO-SIDED REFLECTORS.
 - ⑪ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.
- POST BOLTS ARE A $\frac{3}{8}$ " DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES $\frac{3}{8}$ " DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND $\frac{3}{8}$ " DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.
- GUARD RAIL SPLICE BOLTS ARE A $\frac{3}{8}$ " DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES $\frac{3}{8}$ " DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.

REFLECTOR SPACING

	BEAM GUARD LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200'	50' C-C	1	3
	> 200'	100' C-C	1	
TWO WAY TRAFFIC	< 200'	25' C-C	1	6
	> 200'	50' C-C	1	
TWO WAY TRAFFIC	< 200'	50' C-C	2	3
	> 200'	100' C-C	2	

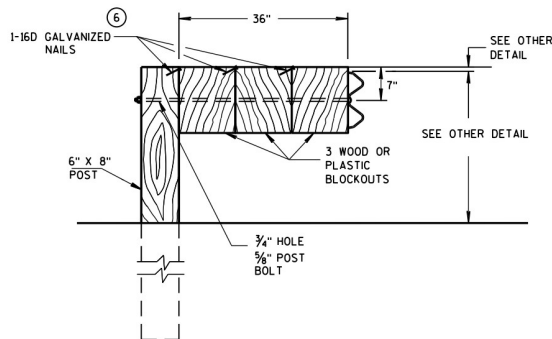
MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



DETAIL FOR 16" BLOCKOUT DEPTH

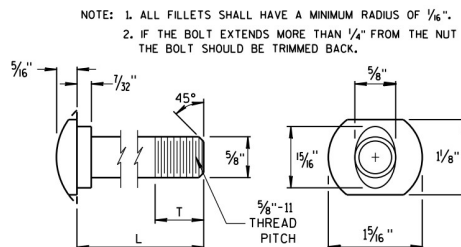
IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.



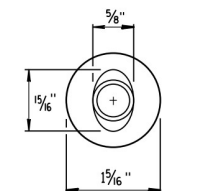
DETAIL FOR 36" BLOCKOUT DEPTH

NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.

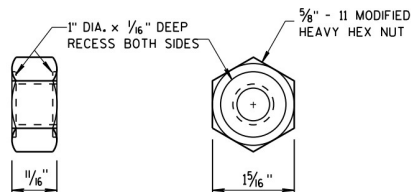
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.



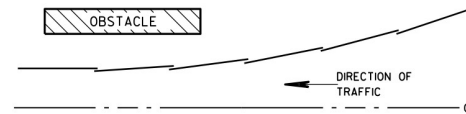
POST BOLT TABLE



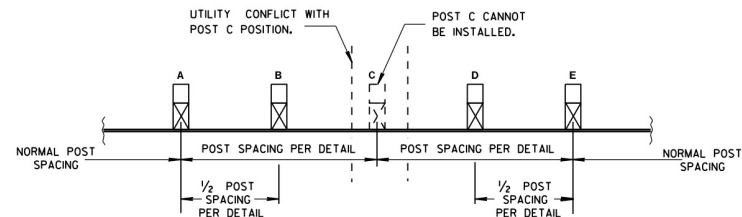
ALTERNATE BOLT HEAD



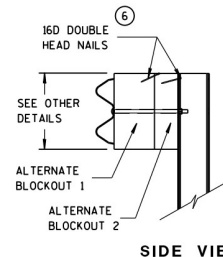
POST BOLT, SPLICE BOLT AND RECESS NUT



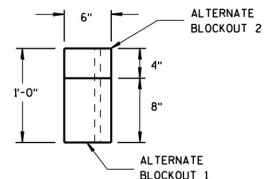
PLAN VIEW
BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION



SIDE VIEW



TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

June 2016

DATE

FHWA

/s/ Jerry H. Zogg

ROADWAY STANDARDS (29)

ENGINEER

GENERAL NOTES

- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL), AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
- (B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED.
- (C) DIFFERENT MANUFACTURES REQUIRE DIFFERENT PERFORATED W-BEAM RAIL END PANELS. SEE MANUFACTURES INFORMATION.
- (D) THE TOP OF THE STEEL TUBE ON POST 1 AND POST 2 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.
- (E) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS, ONE SCREW PER CORNER.
- (F) 1/2" DIAMETER X 3" LONG LAG BOLT AND WASHER.
- (H) HARDWARE VARIES BETWEEN DIFFERENT MANUFACTURES. SEE MANUFACTURE'S DRAWING FOR INFORMATION.
- (I) DIMENSIONS MAY VARY. SEE MANUFACTURE'S INFORMATION.

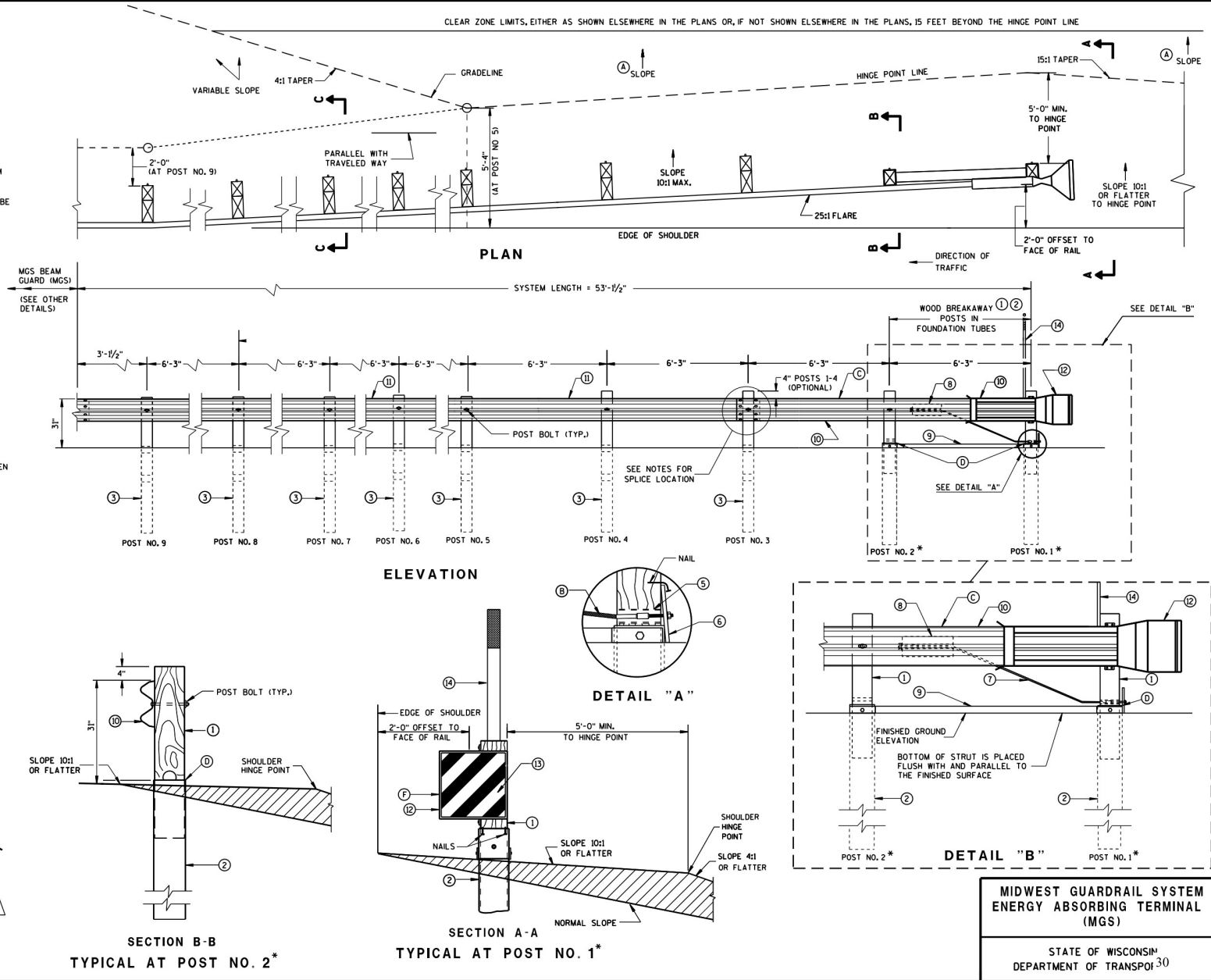
SEE SDD 14B42 FOR MORE INFORMATION.

* DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.

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

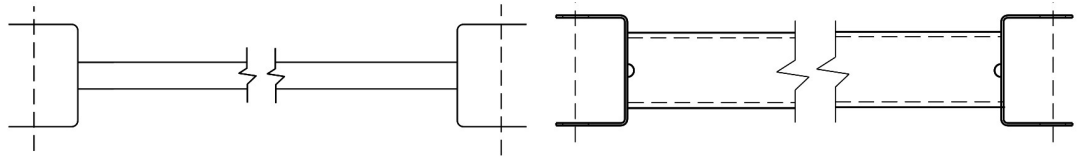
W-BEAM RAIL SPLICES ARE LOCATED AT POST NUMBER 3, AND BETWEEN POST 5 AND 6, BETWEEN POSTS 7 AND 8, AND MIDDLE OF THE SPAN AFTER POST 9.

THE CENTER OF THE UPPER 3/2" 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.

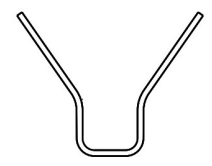
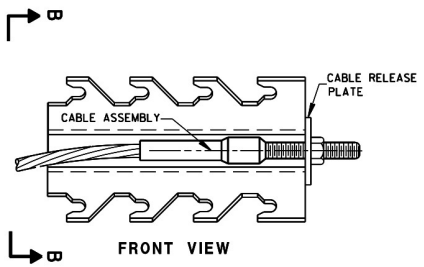


MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

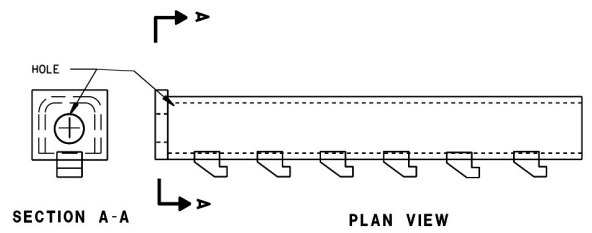
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



GENERIC GROUND STRUT (9) (H)

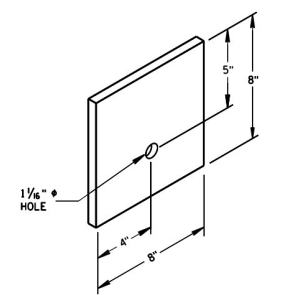


GENERIC ANCHOR CABLE BOX (8) (H)

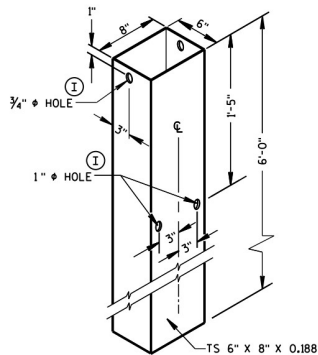


BILL OF MATERIALS

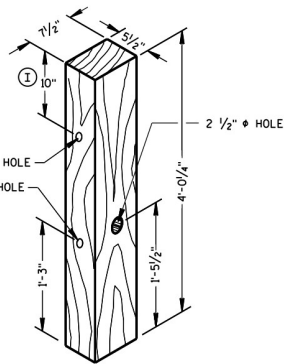
PART NO.	DESCRIPTION
MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.	
(1)	WOOD BREAKAWAY POST
(2)	6" X 8" X 0.188", 6'-0" LONG FOUNDATION TUBE AT POSTS 1 AND 2
(3)	WOOD CRT
(4)	WOOD BLOCKOUT
(5)	PIPE SLEEVE
(6)	BEARING PLATE
(7)	BCT CABLE ASSEMBLY
(8)	ANCHOR 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)	END SECTION EAT
(13)	0.040" ALUMINUM SHEET WITH REFLECTIVE SHEETING TYPE F PER SECTION 637 OF THE STANDARD SPECIFICATIONS
(14)	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)



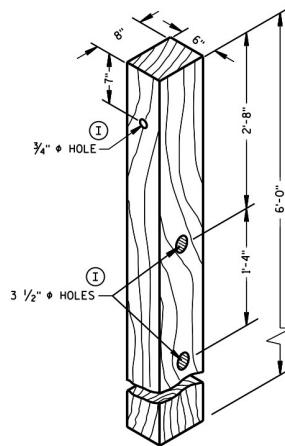
BEARING PLATE (6)



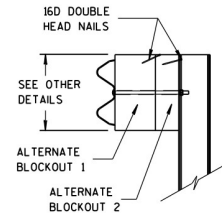
FOUNDATION TUBE (2)



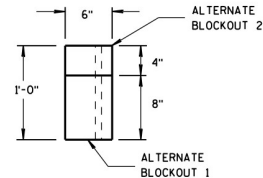
WOOD BREAKAWAY POST (1)



WOOD CRT POST (3)

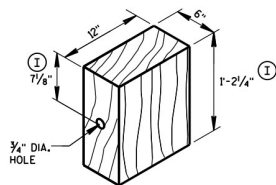


SIDE VIEW



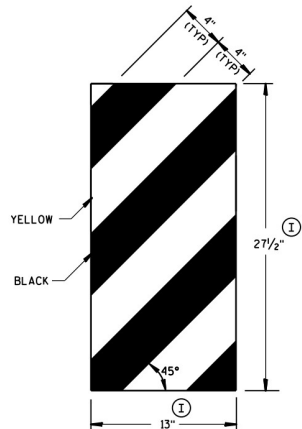
TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL

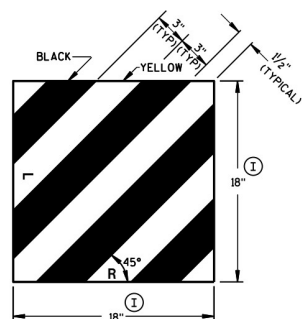


WOOD BLOCKOUT (4)
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2

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



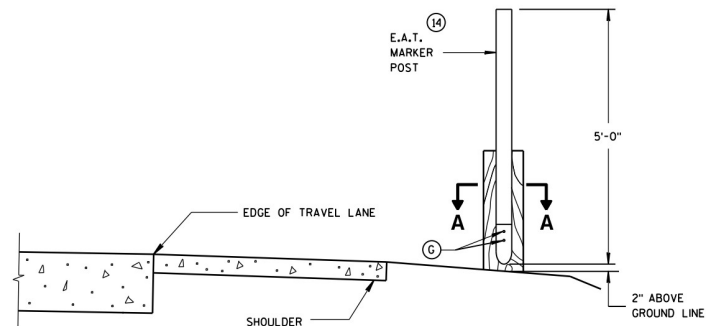
GENERIC REFLECTIVE SHEETING (13) (H)



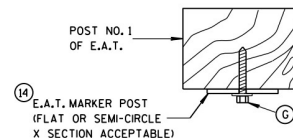
FRONT VIEW

SIDE VIEW

E.A.T. MARKER POST (14)



TYPICAL INSTALLATION OF E.A.T. MARKER POST BACKSIDE OF POST NO. 1
(E.A.T. AND RAIL REMOVED FOR CLARITY)

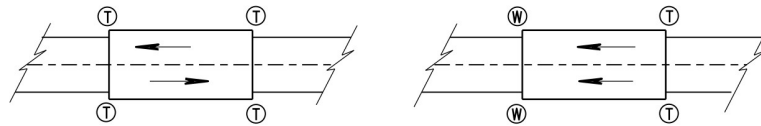


SECTION A-A

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2014 /S/ Jerry H. Zogg
DATE ROADWAY STANDARDS 132 ENT
FHWA ENGINEER



TWO WAY TRAFFIC

ONE WAY TRAFFIC

① THRIE BEAM CONNECTION

② W-BEAM CONNECTION WHEN REQUIRED

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

GENERAL NOTES

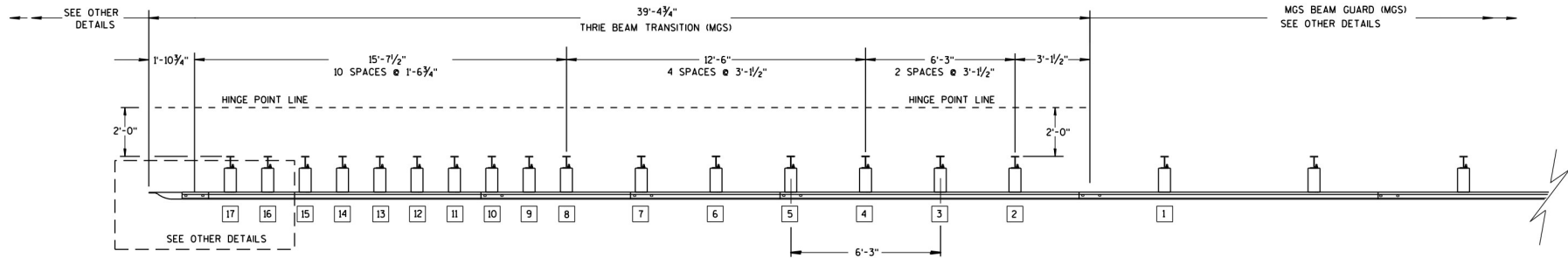
IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2", AND 12" DIAMETER AROUND POST. SEE 14B42 FOR MORE DETAILS.

TRANSITION USES STEEL POSTS ONLY.

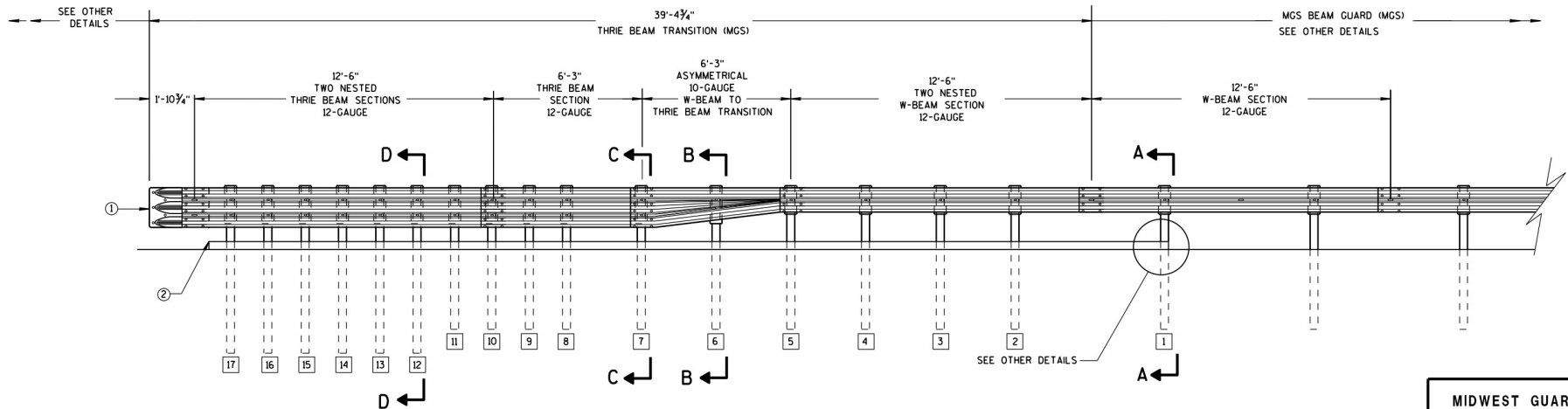
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

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

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



PLAN VIEW



ELEVATION VIEW

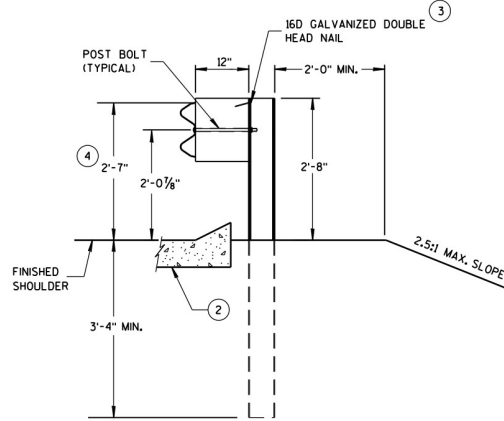
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

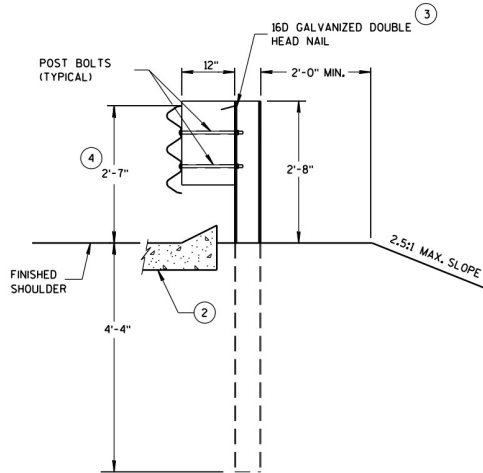
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

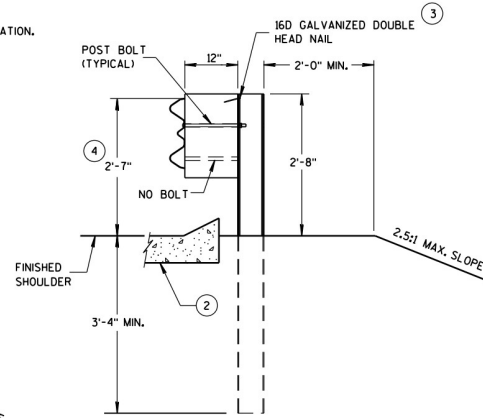
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ③ WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 100 GALVANIZED NAILS, INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- ④ TOLERANCE FOR TOP OF W-BEAM RAIL IS $\pm 1"$.



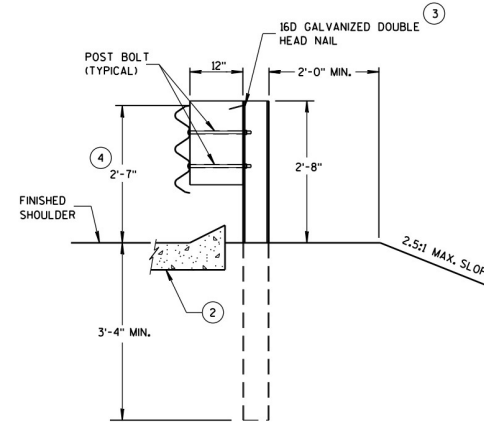
SECTION A-A
POSTS 1-5



SECTION D-D
POSTS 12-17



SECTION B-B
POST 6



SECTION C-C
POSTS 7-11

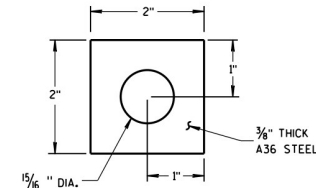
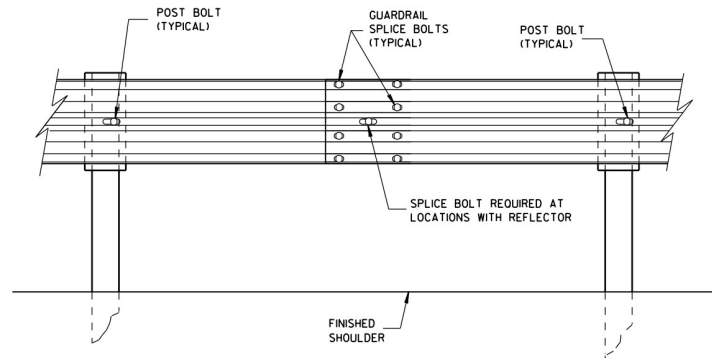
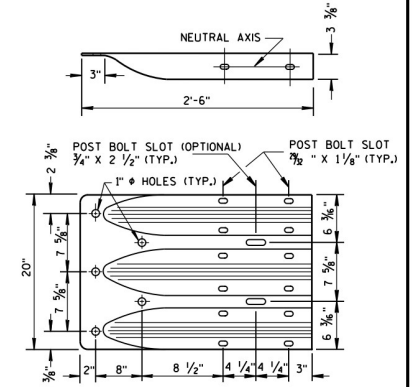


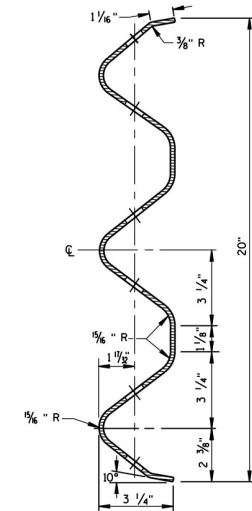
PLATE WASHER DETAIL



SPLICE DETAIL



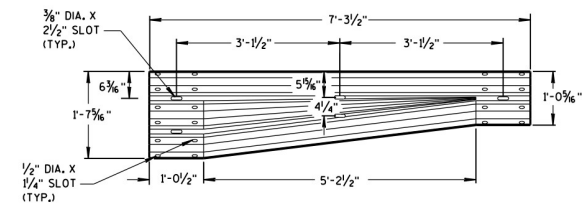
THRIE BEAM
TERMINAL CONNECTOR



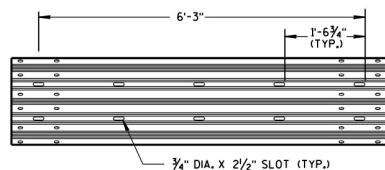
SECTION THRU THRIE
BEAM RAIL ELEMENT

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

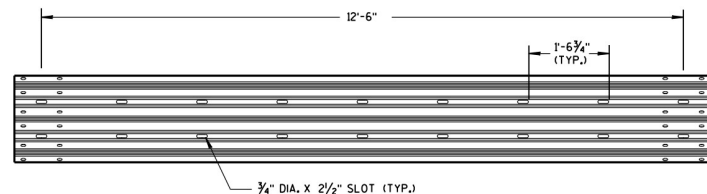
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



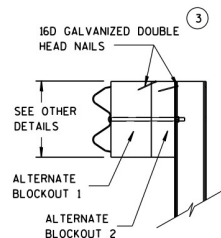
W-BEAM TO THRIE BEAM TRANSITION SECTION



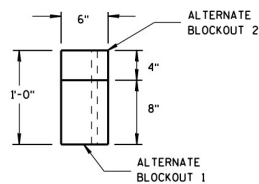
6'-3" THRIE BEAM SECTION



12'-6" THRIE BEAM SECTION

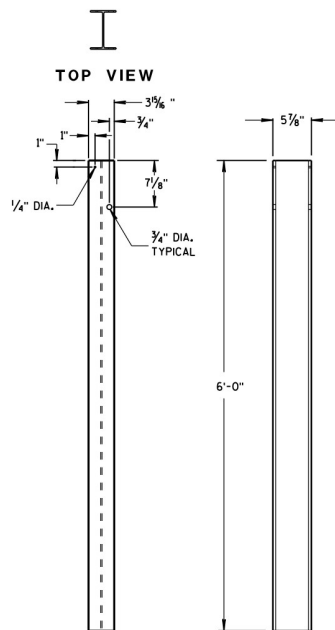


SIDE VIEW



TOP VIEW

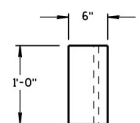
ALTERNATE WOOD BLOCKOUT DETAIL



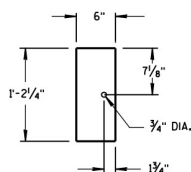
FRONT VIEW

SIDE VIEW

STEEL POSTS 1-5

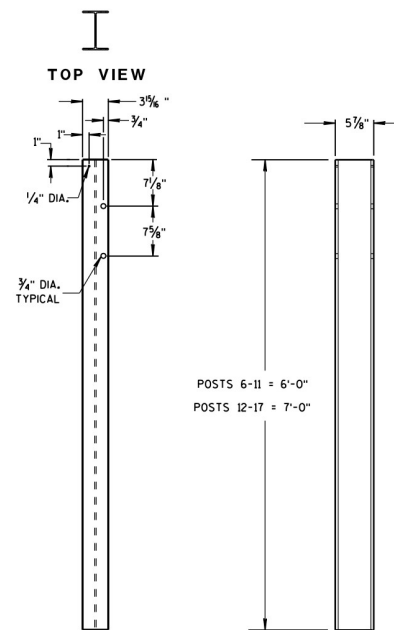


TOP VIEW



FRONT VIEW

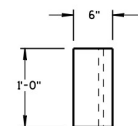
BLOCKOUT
POSTS 1-5



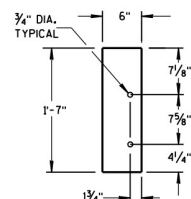
FRONT VIEW

SIDE VIEW

STEEL POSTS 6-17



TOP VIEW



FRONT VIEW

BLOCKOUT
POSTS 6-17

GENERAL NOTES

STEEL POSTS ARE W6X9 OR W6X8.5.

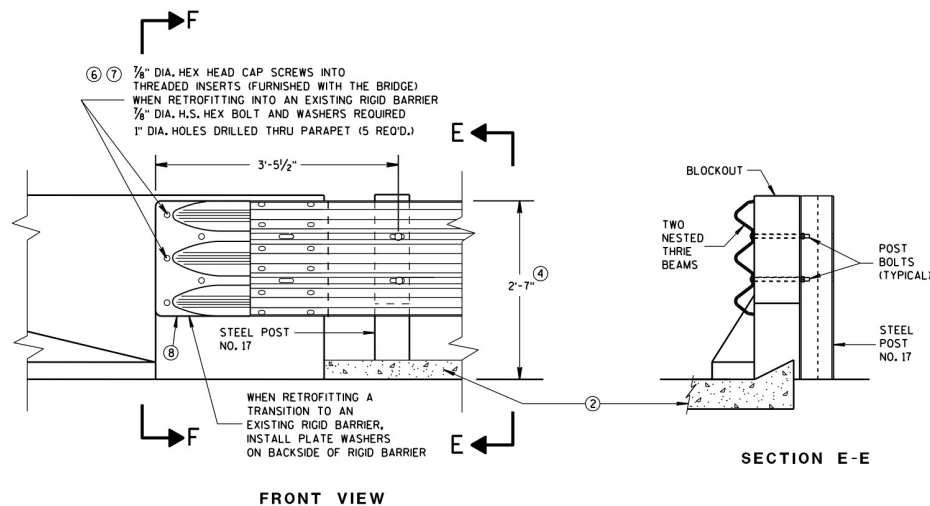
BOLT HOLES FOR POST ARE ON FRONT AND OF SIDE OF POST.

③ WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 160 GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

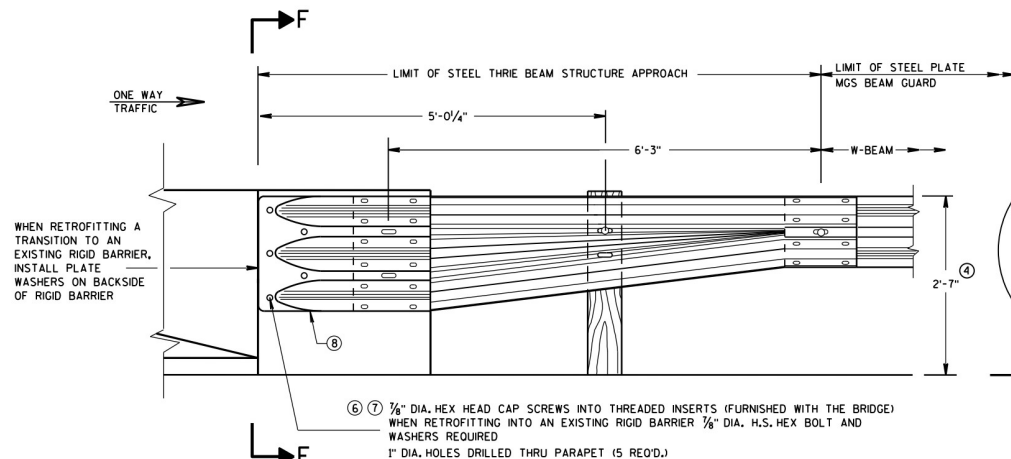
⑤ WOOD BLOCKS MAY BE CONSTRUCTED OUT OF 2 WOOD BLOCKS. SEE ALTERNATE WOOD BLOCK DETAIL.

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



THRIE BEAM CONNECTION TO BRIDGE PARAPET WITH SQUARE ENDS



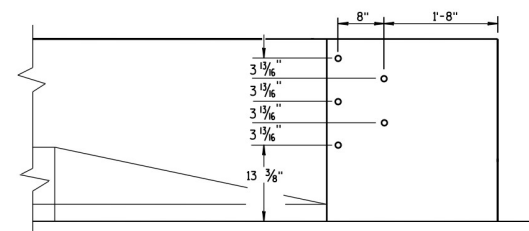
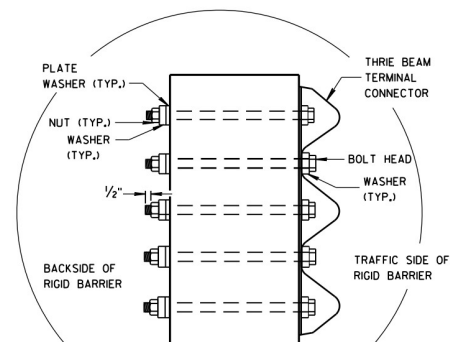
W BEAM TRANSITION AND CONNECTION TO BRIDGE PARAPETS WITH SQUARE ENDS

(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

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".

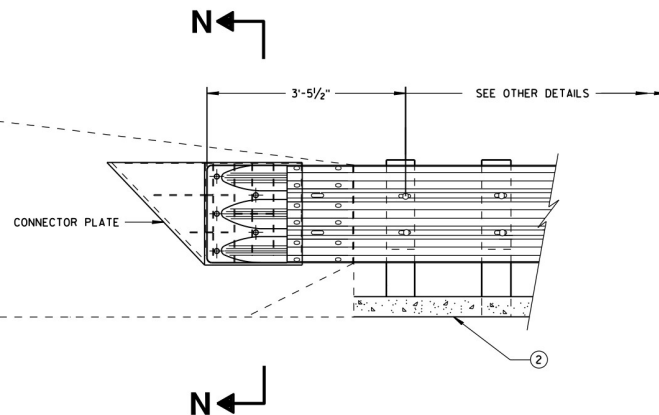


DRILL HOLE LOCATION

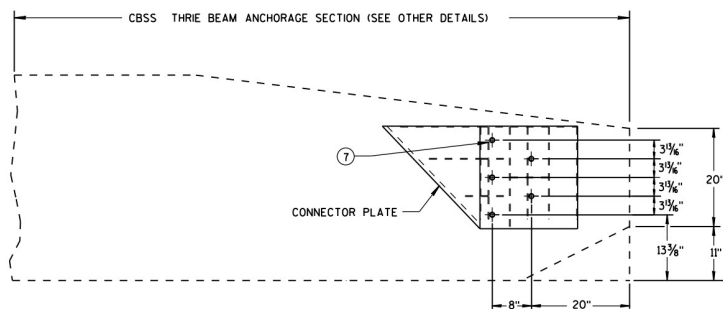
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June, 2015 /S/ Jerry H. Zogg
DATE ROADWAY STANDARDS D 36 NT
FHWA ENGINEER



THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER



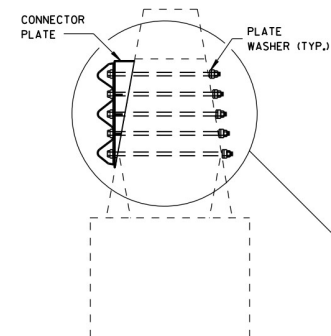
SINGLE SLOPE CONNECTION PLATE PLACEMENT

GENERAL NOTES

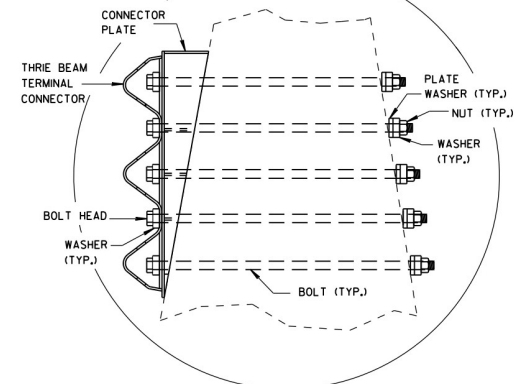
CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

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

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



SECTION N-N



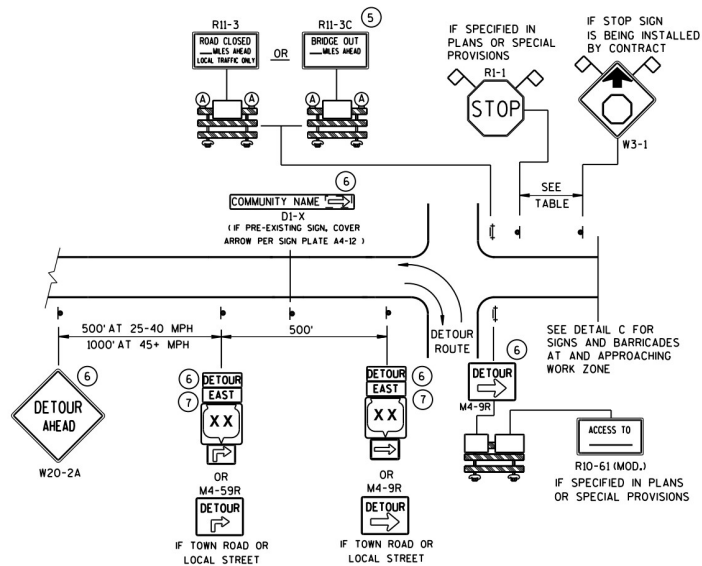
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED		
June, 2015	/s/ Jerry H. Zoga	
DATE	ROADWAY STANDARDS D 37	NT
FHWA	ENGINEER	

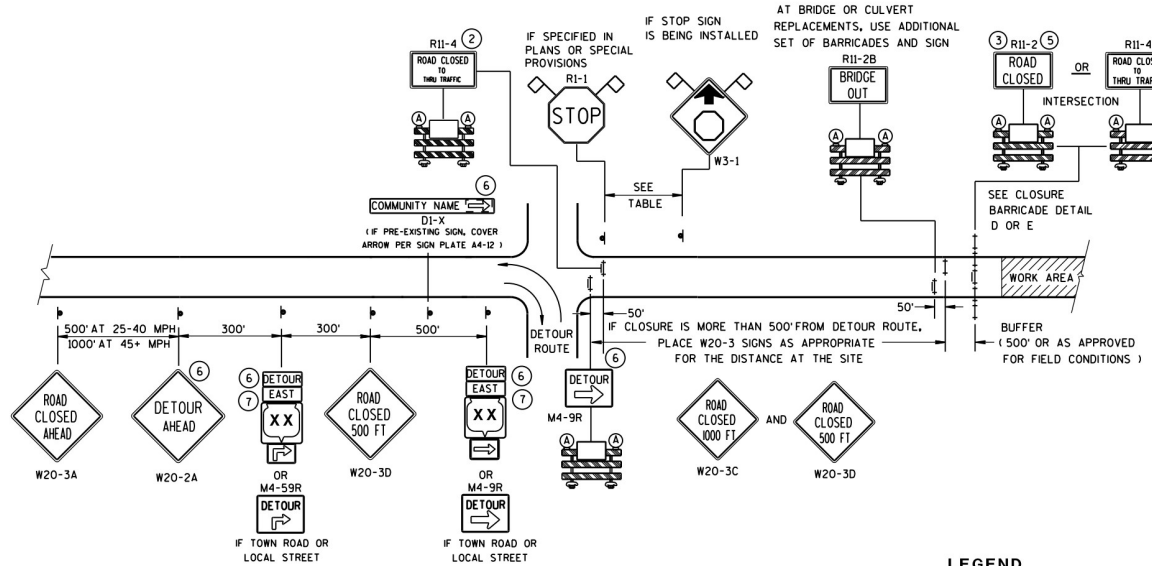
DETAIL A MAINLINE CLOSURE WITH POSTED DETOUR

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



DETAIL B MAINLINE CLOSURE WITH POSTED DETOUR

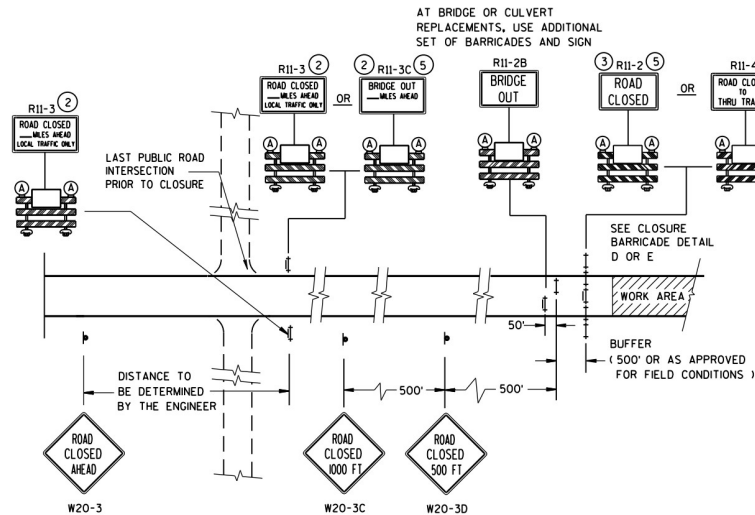
WORK ZONE LESS THAN 1/2 MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)



LEGEND

- SIGN ON PERMANENT SUPPORT
- ⋈ TYPE III BARRICADE
- ⋈ TYPE III BARRICADE WITH ATTACHED SIGN
- Ⓐ TYPE "A" WARNING LIGHT (FLASHING)
- ▨ WORK AREA
- DETOUR EAST M4-8 M3-X
- XX OR COUNTY XX OR XX M1-4 M1-5A M1-6
- M05-1 OR M06-1
- ◇ ◇ 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



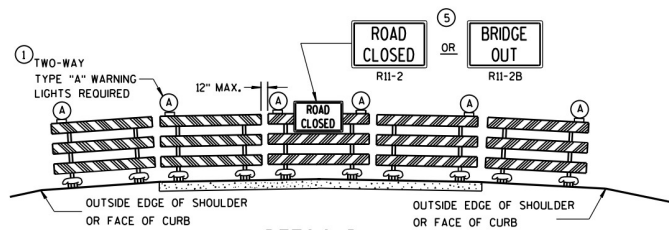
DETAIL C MAINLINE CLOSURE, NO POSTED DETOUR

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

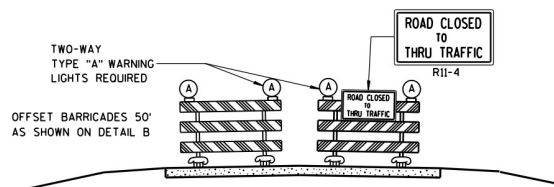
BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

Sept. 2015 /S/ Peter Amakobe Atepe
DATE STATEWIDE WORK ZONE SAFETY ENGINEER
FHWA



DETAIL D
ROAD CLOSURE BARRICADE DETAIL
APPROACH VIEW



DETAIL E
LANE CLOSURE BARRICADE DETAIL
APPROACH VIEW

SEE SDD 15C2-SHEET "a" FOR LEGEND

GENERAL NOTES

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

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

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

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

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

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

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

THE R11-2, R11-3, M4-9, R11-4 AND R10-61 SIGNS PLACED ON BARRICADES SHALL COVER NO MORE THAN THE TOP RAIL. THE SIGNS SHALL NOT COVER ANY PORTION OF THE MIDDLE 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, 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", (30" X 15" 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.)

M05-1 AND M06-1 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.

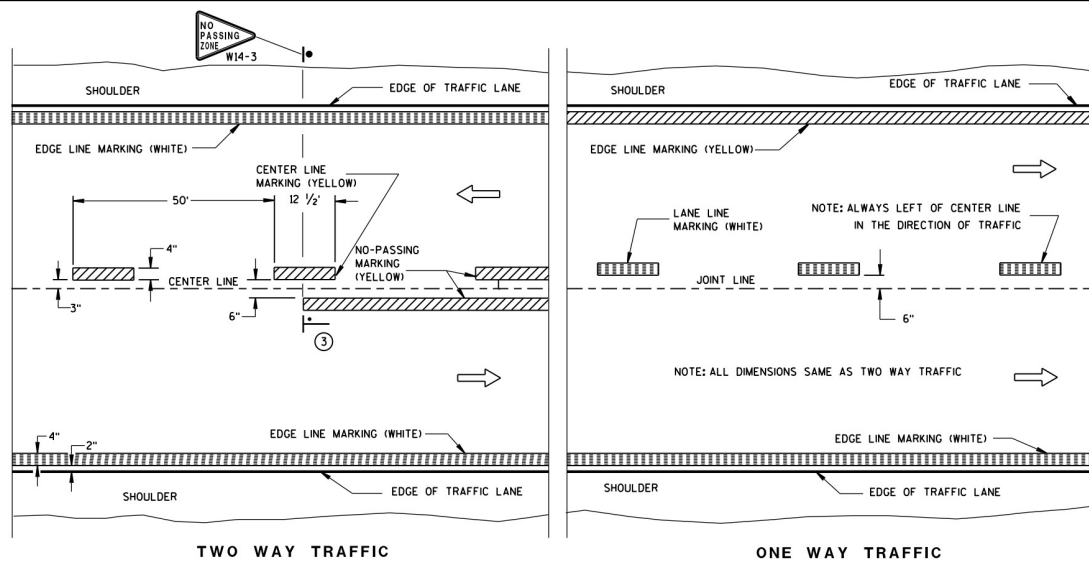
R1-1 SHALL BE 36" X 36".

- 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 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 LANE 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.

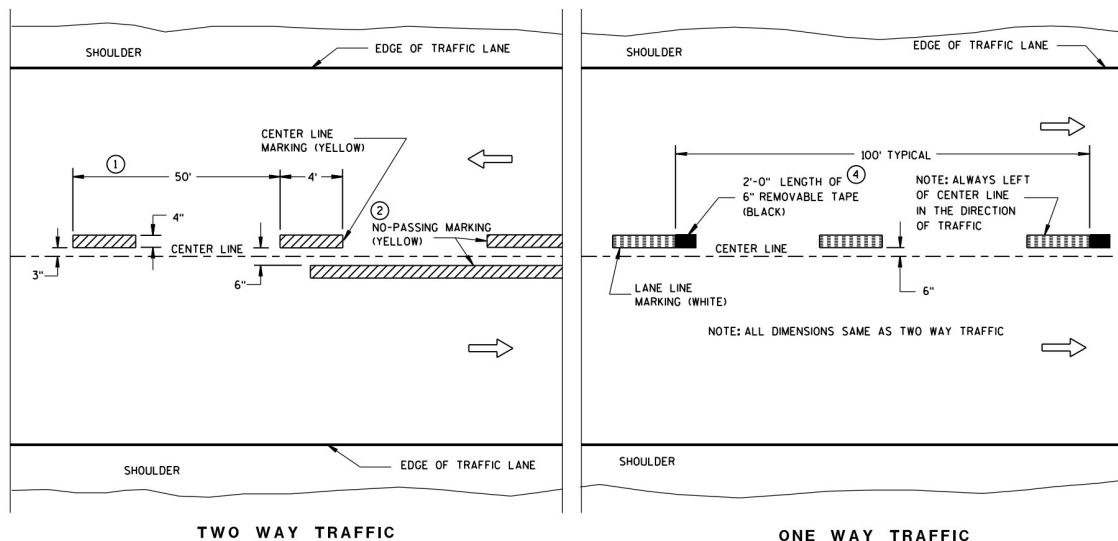
BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

Sept. 2015	/S/ Peter Amakobe Atepe
DATE	STATEWIDE WORK ZO 39
FHWA	SAFETY ENGR



PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC

ONE WAY TRAFFIC

TEMPORARY (INTERMEDIATE) PAVEMENT MARKING
(SHOWS CYCLE FOR TEMPORARY CENTER LINE OR TEMPORARY LANE LINE MARKING)

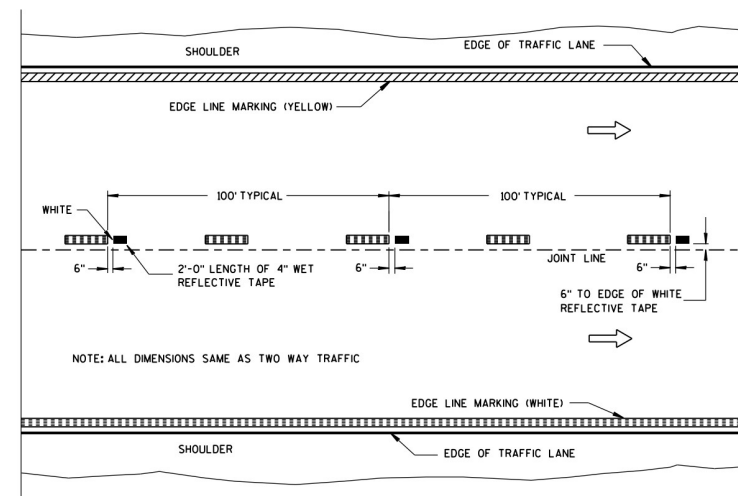
GENERAL NOTES

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

- 1 HALF CYCLE LENGTHS (25'-±) WITH 2' MINIMUM STRIPE LENGTHS SHALL BE PROVIDED ON ROADWAYS (INCLUDING TEMPORARY TRAVELED WAYS) WITH REVERSE CURVATURE, CURVATURE OF OVER 5 DEGREES OR WHEN DIRECTED BY THE ENGINEER TO MARK UNUSUAL ALIGNMENT OF THE TRAVELED WAY.
- 2 NO PASSING ZONE TEMPORARY PAVEMENT MARKING IS REQUIRED TO BE PLACED, WHERE APPROPRIATE, ALONG WITH CENTERLINE TEMPORARY PAVEMENT MARKING WHEN A SAME DAY PERMANENT PAVEMENT MARKING ITEM IS INCLUDED IN THE CONTRACT.
- 3 NO PASSING ZONE MARKINGS ARE PLACED ACCORDING TO "T" MARKINGS. IF EXISTING NO PASSING ZONE W14-3 SIGNS ARE BEYOND 50 FEET IN EITHER DIRECTION, THE SIGNS SHALL BE MOVED TO THE "T" MARKINGS.
- 4 CONCRETE ONLY.

NOTE

ARROW SYMBOL (→) SHOWS DIRECTION OF TRAVEL



**WET REFLECTIVE TAPE SUPPLEMENT TO
SPRAYED OR NON WET REFLECTIVE TAPE LANE LINE**

LEGEND

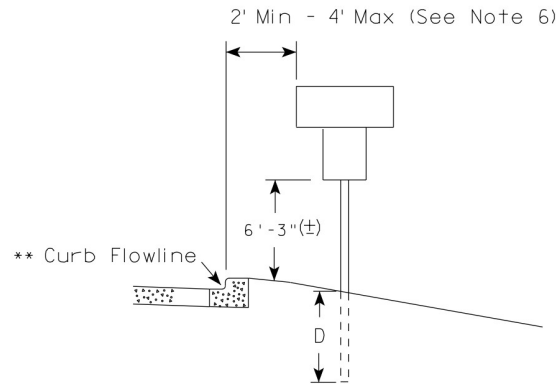
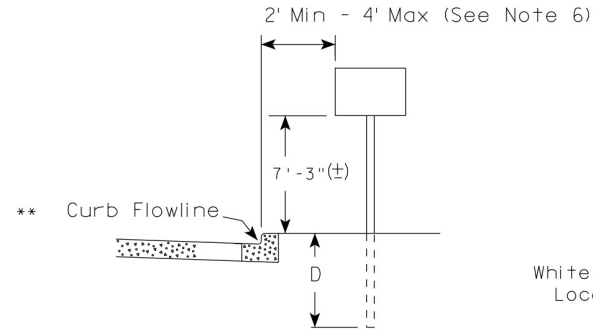
- "T" MARKING
- POST MOUNTED SIGN

**PAVEMENT MARKING
(MAINLINE)**

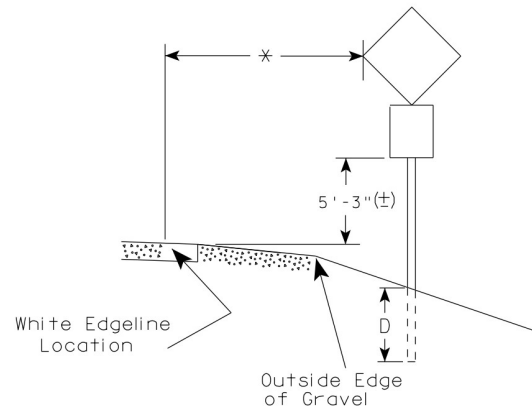
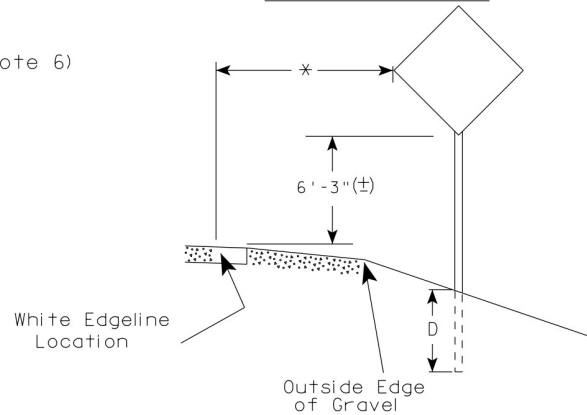
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
5-13-2013 /S/ Travis Feites
DATE STATE TRAFFIC E.40
FHWA

URBAN AREA



RURAL AREA (See Note 2)



POST EMBEDMENT DEPTH

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

** 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.

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. Minimum mounting height for J assemblies (A2-1S) is 7'-3" (±) or 6'-3" (±) per urban or rural detail respectively.
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" (±).

TYPICAL INSTALLATION
OF PERMANENT TYPE II
SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 7/23/15 PLATE NO. A4-3.20

41

PROJECT NO:

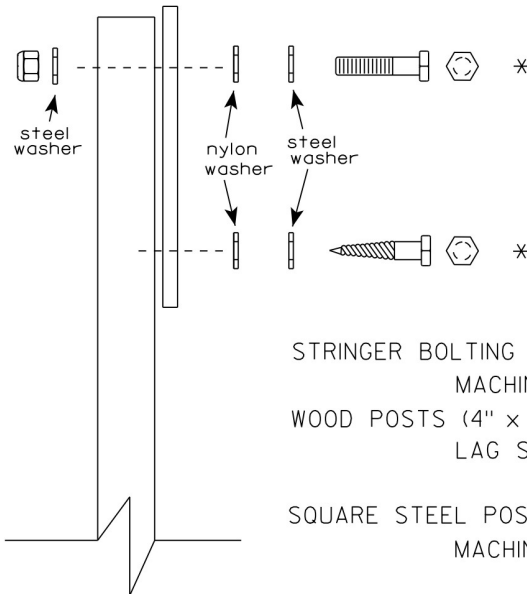
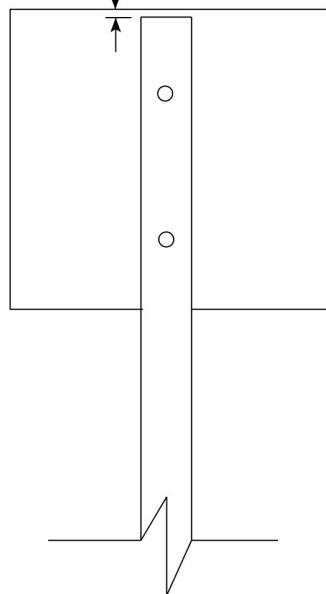
HWY:

COUNTY:

SHEET NO:

E

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 :

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

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

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

MACHINE BOLTS - $\frac{5}{16}$ " X 1-3/4" Length w/ lock nuts

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

LAG SCREWS - $\frac{3}{8}$ " X 3" (NO STRINGERS ON BACK OF SIGN)
 $\frac{3}{8}$ " X 4" (STRINGERS ON BACK OF SIGN)

SQUARE STEEL POSTS (2" x 2")

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

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

WASHERS (ALL POSTS) -

1-1/4" O.D. X $\frac{3}{8}$ " I.D. X $\frac{1}{16}$ " STEEL

1-1/4" O.D. X $\frac{3}{8}$ " I.D. X .080 NYLON

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

ATTACHMENT OF SIGNS TO POSTS

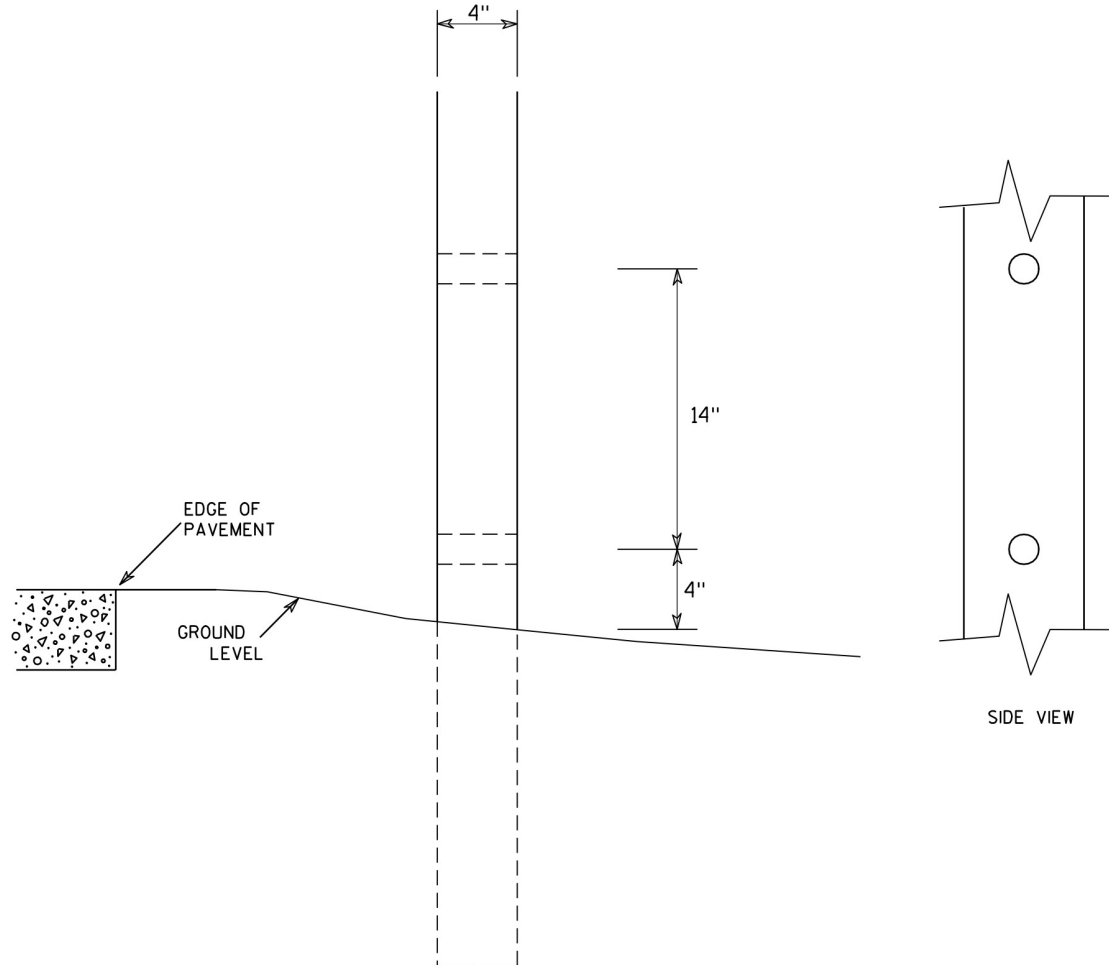
WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
For State Traffic Engineer

DATE 8/11/16 PLATE NO. A4-8.8
42

SHEET NO: **E**

PROJECT NO:



GENERAL NOTES

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

4 X 6 WOOD POST MODIFICATIONS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED

Christa J. Spang
for State Traffic Engineer

DATE 3/27/97

PLATE NO. A4-11.2

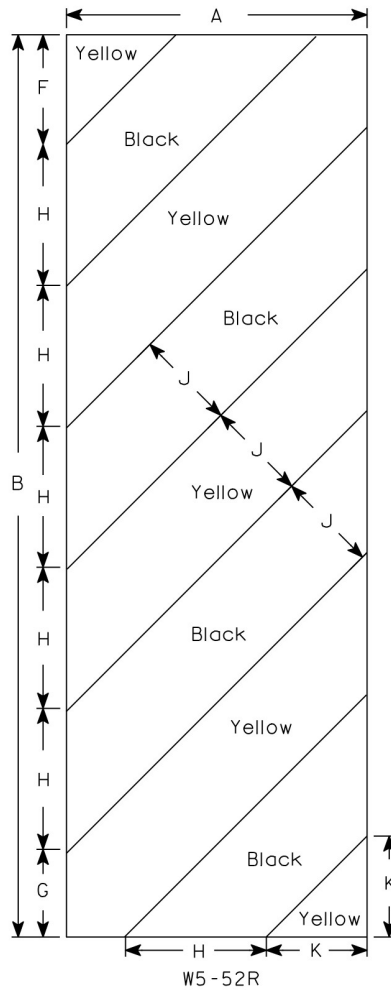
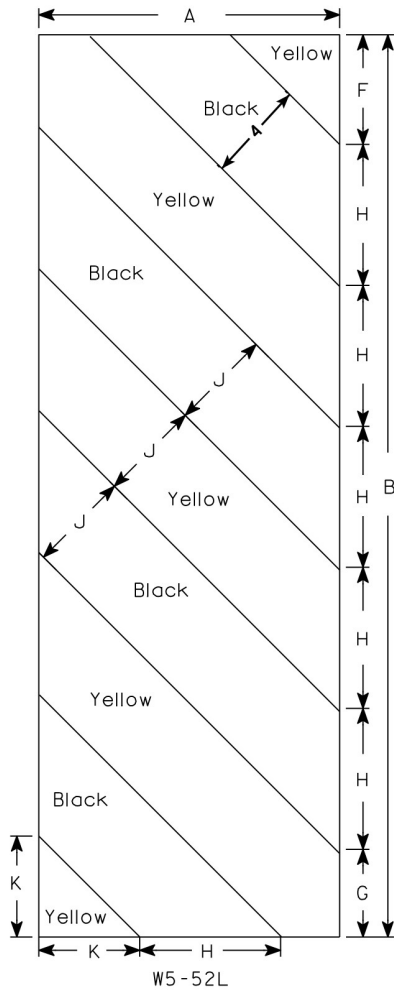
PROJECT NO:

HWY:

COUNTY:

SHEET NO: 43

E



NOTES

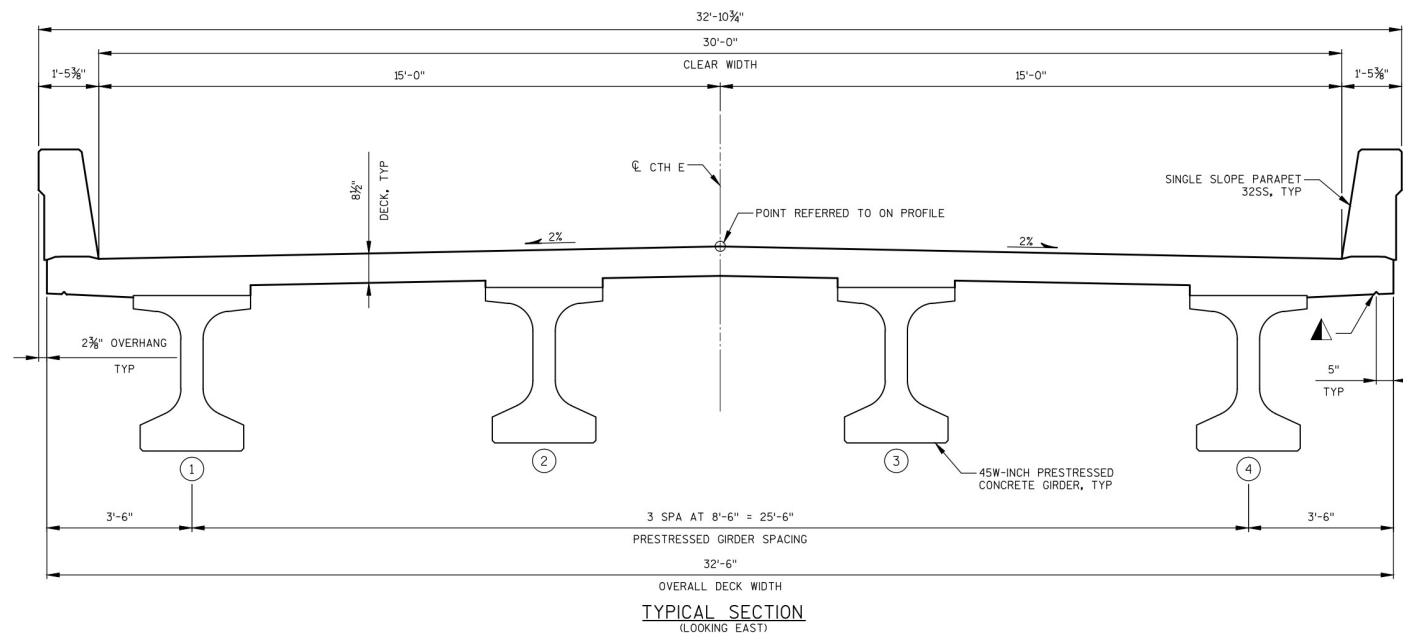
1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - Yellow
Message - Black
3. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material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

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



BENCH MARKS

NO.	STATION	OFFSET	DESCRIPTION	ELEV.
1	7+63.6	14.3' RT	SOUTH SIDE PK NAIL	855.34
2	10+15.8	27.3' LT	NORTH SIDE REBAR IN SHOULDER	862.76

TOTAL ESTIMATED QUANTITIES

BID ITEM NO.	BID ITEMS	UNIT	W ABUT	E ABUT	SUPER	TOTALS
203.0600.S	REMOVING OLD STRUCTURE OVER WATERWAY WITH MINIMAL DEBRIS STATION 9+12	LS	---	---	---	1
206.1000	EXCAVATION FOR STRUCTURES BRIDGES B-22-286	LS	---	---	---	1
210.1500	STRUCTURE BACKFILL TYPE A	TON	230	240	---	470
502.0100	CONCRETE MASONRY BRIDGES	CY	38	39	140	217
502.3200	PROTECTIVE SURFACE TREATMENT	SY	---	---	320	320
502.3210	PIGMENTED SURFACE SEALER	SY	10	10	80	100
503.0146	PRESTRESSED GIRDER TYPE I 45W-INCH	LF	---	---	376	376
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	1680	1680	---	3360
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	2350	2370	22990	27710
506.2605	BEARING PADS ELASTOMERIC NON-LAMINATED	EACH	---	---	8	8
506.4000	STEEL DIAPHRAGMS B-22-286	EACH	---	---	6	6
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	7	7	---	14
550.1120	PIILING STEEL HP 12-INCH X 53 LB	LF	210	210	---	420
606.0300	RIPRAP HEAVY	CY	205	210	---	415
606.0700	GROUTED RIPRAP HEAVY	CY	---	100	---	100
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	LF	79	79	---	158
614.0150	ANCHOR ASSEMBLIES FOR STEEL PLATE BEAM GUARD	EACH	2	2	---	4
645.0111	GEOTEXTILE TYPE DF SCHEDULE A	SY	50	50	---	100
645.0120	GEOTEXTILE TYPE HR	SY	360	530	---	890
NON BID ITEMS						
	FILLER	SIZE				1/2" & 3/4"

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

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

THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES THE BAR SIZE.

THE SLOPE OF THE FILL IN FRONT OF THE ABUTMENTS SHALL BE COVERED WITH HEAVY RIPRAP OR GROUTED HEAVY RIPRAP AND GEOTEXTILE TYPE HR TO THE EXTENT SHOWN ON SHEET 1 AND IN THE ABUTMENT DETAILS.

AT THE BACKFACE OF ABUTMENT ALL VOLUME WHICH CANNOT BE PLACED BEFORE ABUTMENT CONSTRUCTION AND IS NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH STRUCTURE BACKFILL.

THE EXISTING STRUCTURE TO BE REMOVED IS A 135' LONG BY 24.0' CLEAR ROADWAY WIDTH, THREE SPAN STEEL GIRDER BRIDGE WITH CONCRETE ABUTMENTS AND PIERS (B-22-0037).

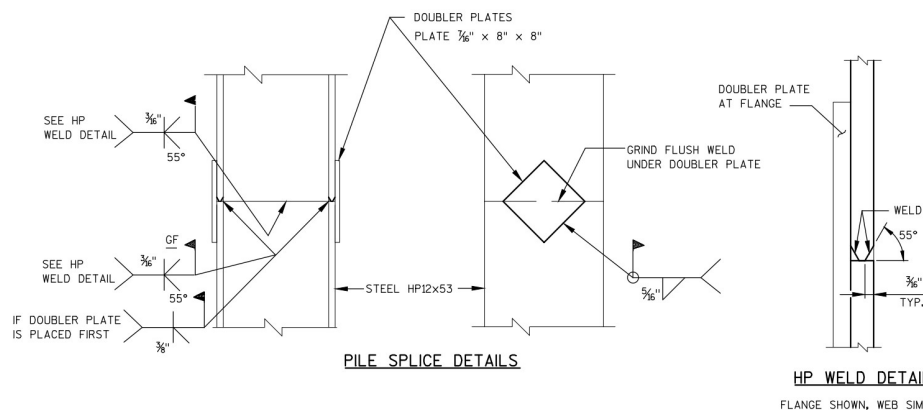
ALL STATIONS AND ELEVATIONS ARE IN FEET.

● ELEVATIONS SHOWN ON THE PLAN ARE REFERENCED TO NAVD88.

▲ 3/4" V-GROOVE REQ'D. EXTEND TO 6" FROM FRONT FACE OF ABUTMENT DIAPHRAGM.

THE HAUNCH CONCRETE QUANTITY IS BASED ON THE AVERAGE HAUNCH SHOWN ON THE PRESTRESSED GIRDER DETAIL SHEET.

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURE BRIDGES B-22-286" SHALL BE THE EXISTING GROUNDLINE.

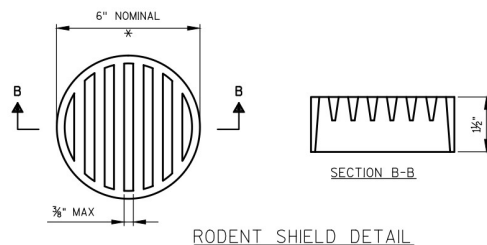


PILE SPLICE DETAILS

HP WELD DETAIL

FLANGE SHOWN, WEB SIMILAR

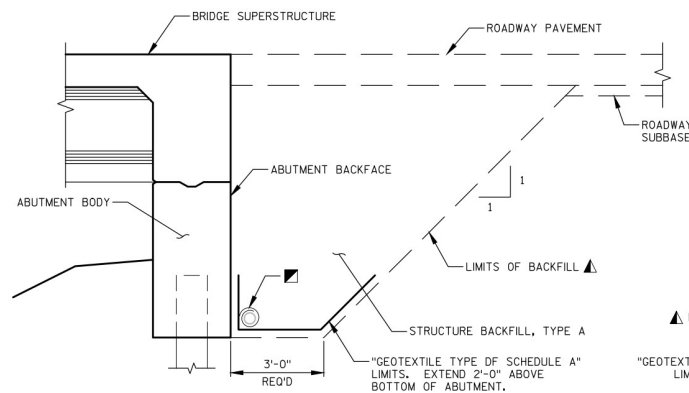
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
DRAWN BY		JAK	PLANS CK'D. JSH
TYPICAL SECTION, GENERAL NOTES, AND QUANTITIES		SHEET 46 OF 16	



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

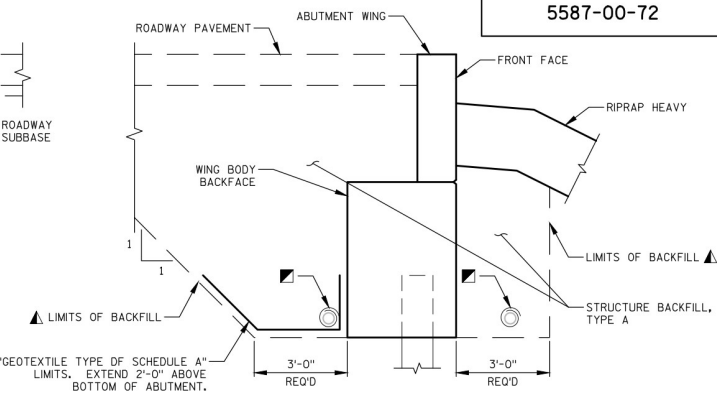
THE RODENT SHIELD, PIPE COUPLING AND SCREWS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH".

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



STRUCTURE BACKFILL & PIPE UNDERDRAIN DETAIL

(TYPICAL AT BOTH ABUTMENTS)

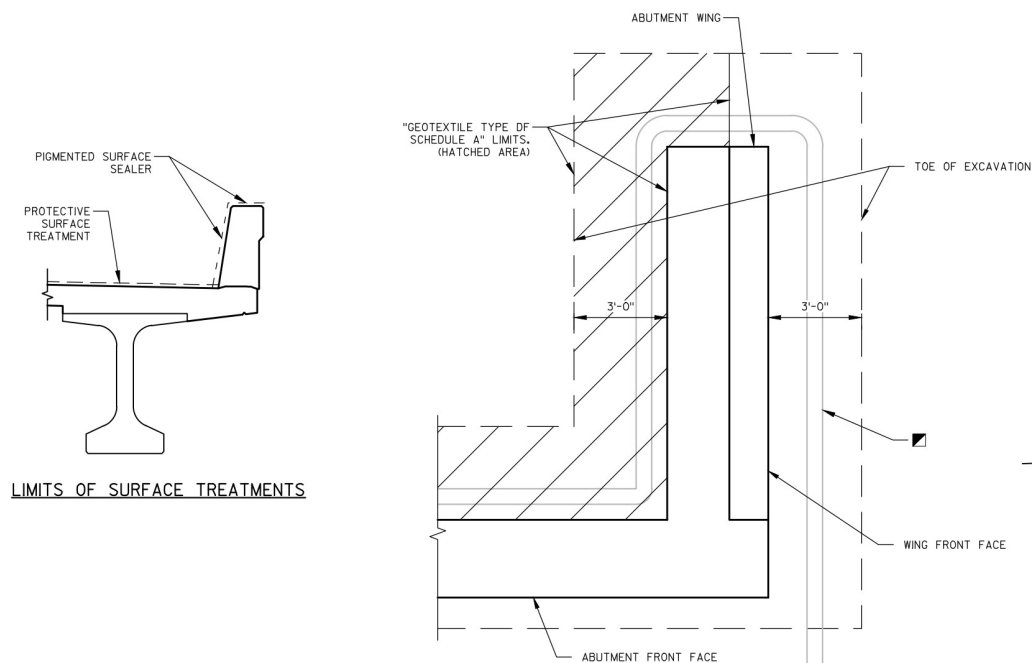


TYPICAL SECTION THRU WING

(SHOWING STRUCTURE BACKFILL LIMITS)

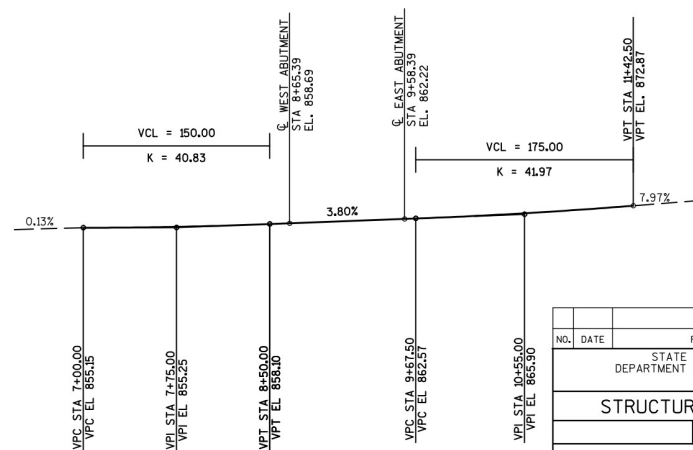
▲ BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

■ PIPE UNDERDRAIN WRAPPED (6-INCH), SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN.



ABUTMENT PLAN WITH WING

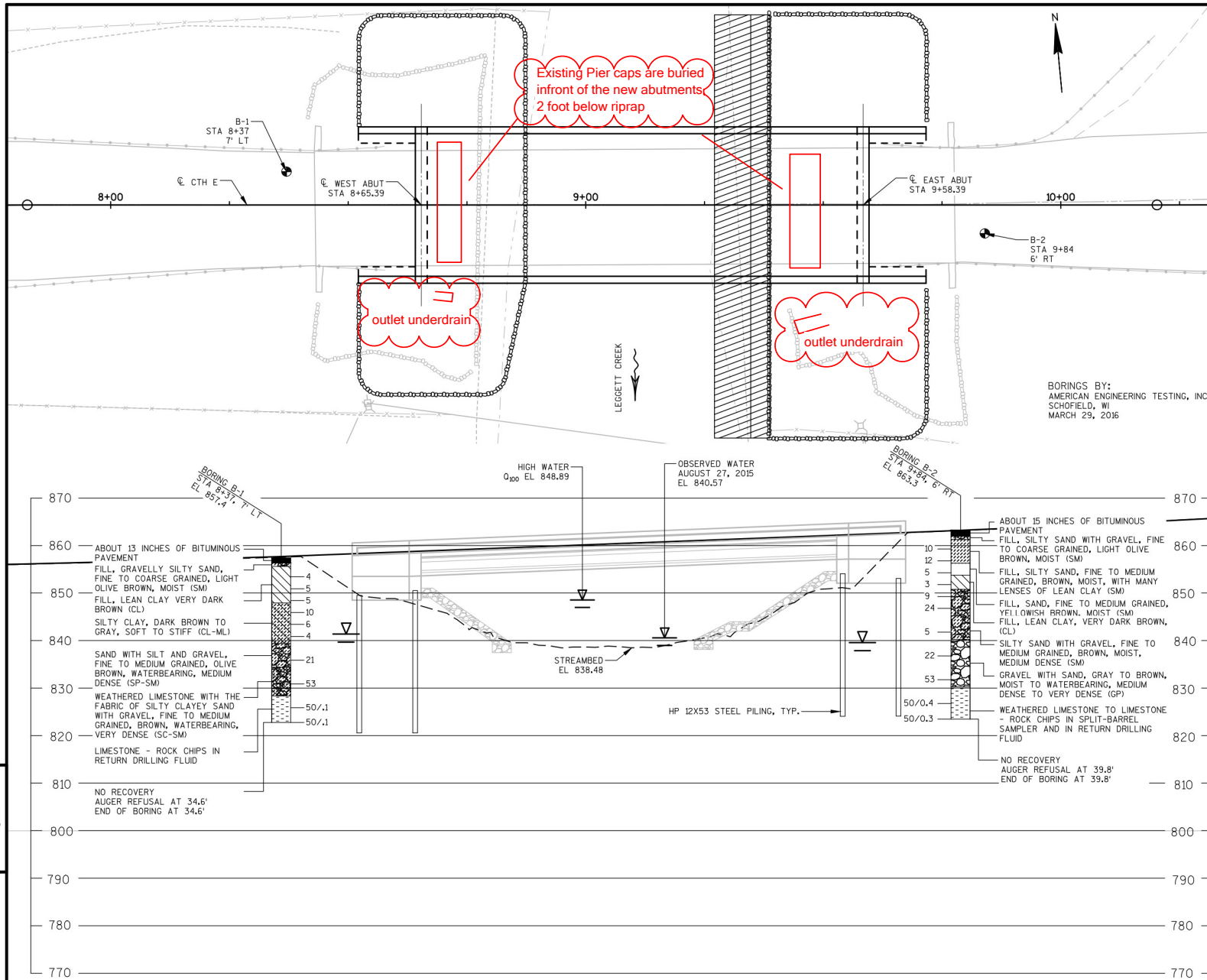
(SHOWING STRUCTURE BACKFILL LIMITS)



PROFILE GRADE LINE, CTH E

LIMITS OF SURFACE TREATMENTS

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
DRAWN BY		PLANS CK'D.	JSH
SHEI 47		16	



STATE PROJECT NUMBER

5587-00-72

ABBREVIATIONS

F— Fine M—Medium C— Coarse
Ws— Weathered So— Sound

MATERIAL SYMBOLS

Asphalt Concrete Gravel

Silt Peat Clay

Sand Air Water

LEGEND OF PROBING

Probing No.
Sta.
Elevation
7 Average Blows Per Foot
Refusal 95/6

95/6=95 BLOWS FOR 6"
PENETRATION
PROBING TAKEN WITH
A 350* WT.
FALLING 18" ON A 2"
O.D. POINT.

LEGEND OF BORING

Boring No.
Sta.
Elev.
Unconfined STRENGTH
Blows Per Ft.
USING 140* WT.
FALLING 30"
Wash Sample
Shelby Tube— S.T.
Ground Water
No Ground Water
OBSERVED ABOVE
THIS ELEVATION

Sandy Gravel
F. Boulders or COBBLES
Sand
Silty Clay
So
Limestone

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

TO OBTAIN RELATIVE DATA CONCERNING THE CHARACTER OF MATERIAL IN AND UPON WHICH THE FOUNDATION MIGHT BE BUILT, BORINGS AND/OR SOUNDINGS WERE MADE AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING. THE DATA PRESENTED HEREIN REPRESENTS THE FINDINGS OF THE SUBSURFACE EXPLORATIONS MADE. HOWEVER, BECAUSE THE DEPTHS INVESTIGATED ARE LIMITED AND THE AREA OF THE BORINGS AND/OR SOUNDINGS IS VERY SMALL IN RELATION TO THE ENTIRE AREA, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT CONDITIONS BELOW THE DEPTHS INVESTIGATED OR THAT THE CLASSIFICATION OF MATERIAL ENCOUNTERED IN THESE INVESTIGATIONS IS NECESSARILY TYPICAL OF THE ENTIRE SITE.

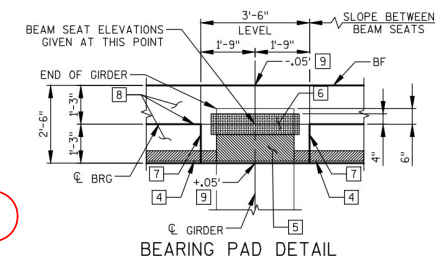
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
DRAWN BY		JAK	CKD. JSH
SUBSURFACE EXPLORATION		SHEET 48	16

SEE SHEET 7 FOR SECTION THRU ABUTMENT BODY.

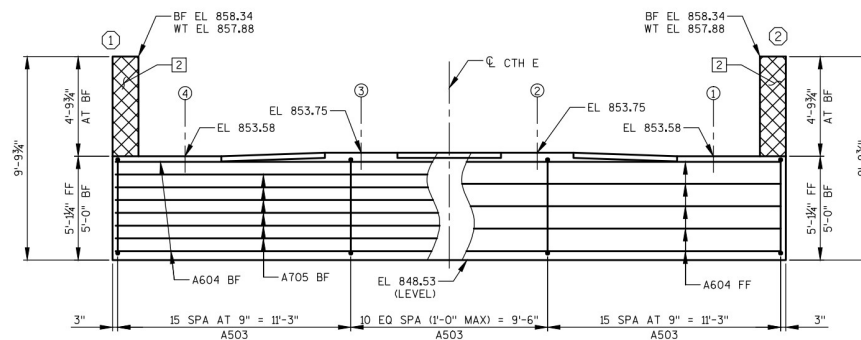
FILL/EXCAVATE TO BOTTOM OF WEST ABUTMENT EL 848.53 BEFORE
DRIVING PILING.

WEST ABUTMENT TO BE SUPPORTED ON HP 12X53 STEEL PILING DRIVEN TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE AS DETERMINED BY THE MODIFIED GATES DYNAMIC EQUATION, ESTIMATED AT 30' LONG.

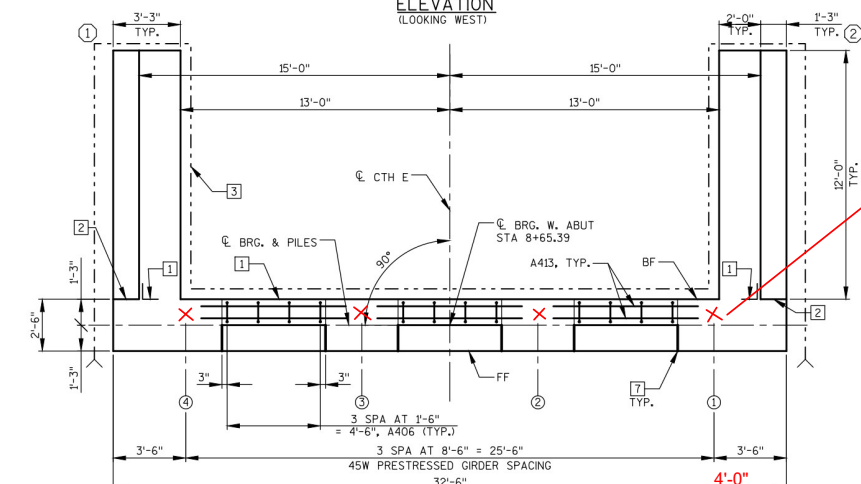
- 1 1" RUBBERIZING MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
 - 2 ½" FILLER - TO EXTEND FROM BRIDGE SEAT TO TOP OF CONCRETE PARAPET, INCLUDED IN WING LENGTH. SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF ½" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ¼" BELOW SURFACE OF CONCRETE). EXTEND SEALER 3" BELOW GUTTER LINE AT INSIDE FACE.
 - 3 PIPE UNDERDRAIN WRAPPED (6-INCH) SLOPE 0.5% MIN TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. SEE SHEET 3 FOR RODENT SHIELD DETAILS.
 - 4 4" X ¾" FILLER LENGTH OF ABUTMENT.
 - 5 ¾" PERFORMED FILLER UNDER GIRDERS.
 - 6 NON-LAMINATED ELASTOMERIC BEARING PAD ½" X 8" X 2'-10".
 - 7 ¾" CORK FILLER ON VERTICAL BEAM SEAT FACES THAT RUN PARALLEL WITH GIRDER.
 - 8 STEEL TROWEL TOP SURFACE OF ABUTMENT. PLACE MULTIPLE LAYERS OF POLYETHYLENE SHEETS OVER ENTIRE ABUTMENT TOP BEFORE PLACING BEARING PADS AND SUPERSTRUCTURE. TOTAL THICKNESS OF ALL SHEETS TO BE AT LEAST 0.03".
 - 9 SLOPED BEAM SEAT REQUIRED. USE THESE ADJUSTMENTS FROM ELEVATIONS GIVEN TO LAYOUT BEAM SEAT AT FRONT FACE AND BACK FACE.
- * INDICATES WING NUMBER
- INDICATES GIRDER NUMBER
- FF - FRONT FACE
BF - BACK FACE
WT - WING TIP



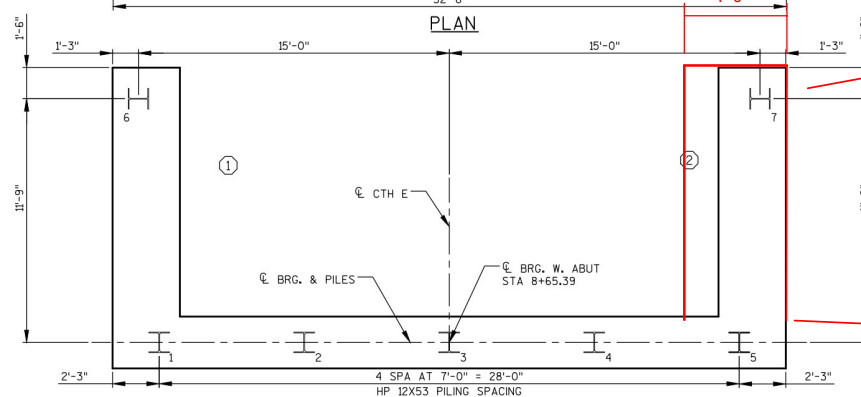
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
		DRAWN BY	PLANS CHK'D.
		MJB	JL
WEST ABUTMENT		SHEET 49	1



ELEVATION
(LOOKING WEST)



PLAN



PILE PLAN

NOTE: 3x3 inch epoxy coated angle irons were lagged onto the top of the West abutment, in front of girders to hold the girders from sliding off the abutment.

Lags were 5/16 "sleeve anchors".
- as directed by WISDOT

- ▶ Abutment wing was poured wider to encapsulate the out of plumb pile.
- ▶ Additional reinforcing steel was installed.
- ▶ See Wing 2 Modification Drawing

Pile has 6 inch piece welded on the top

See next sheet for wing re-design.

Construction Joint-the wing was placed and removed to encapsulate the piling.

BILL OF BARS

304# COATED

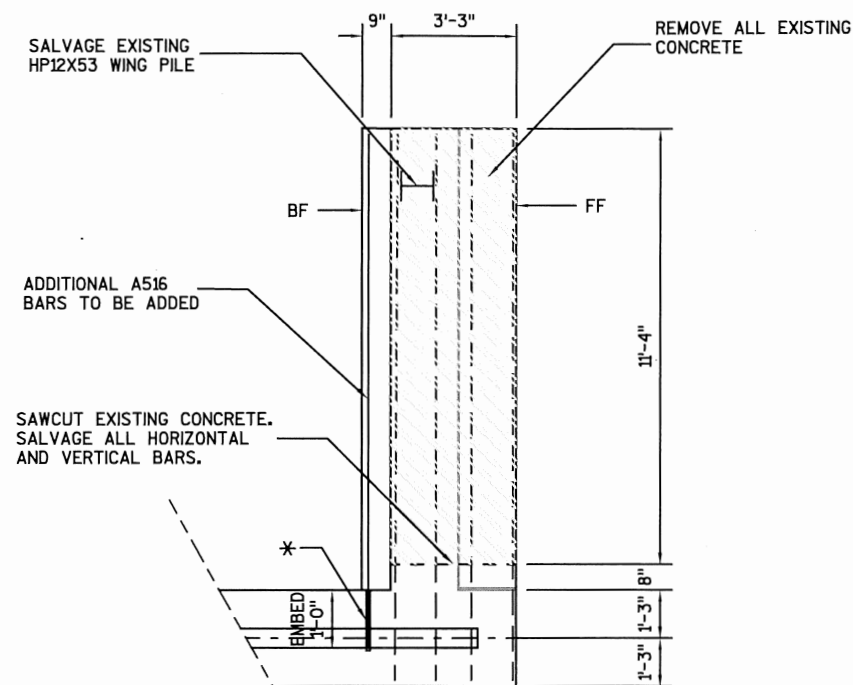
BAR MARK	COAT	NO. REQUIRED	LENGTH	BENT	BAR SERIES	LOCATION
A515	X	12	16'-9"	X		ADDITIONAL WING WALL - VERT
* A516	X	7	12'-10"			ADDITIONAL WING WALL - HORZ

NOTE: BAR DIMENSIONS ARE OUT TO OUT OF BAR. THE FIRST DIGIT OF A THREE-DIGIT BAR MARK OR THE FIRST TWO DIGITS OF A FOUR-DIGIT BAR MARK SIGNIFIES THE BAR SIZE.

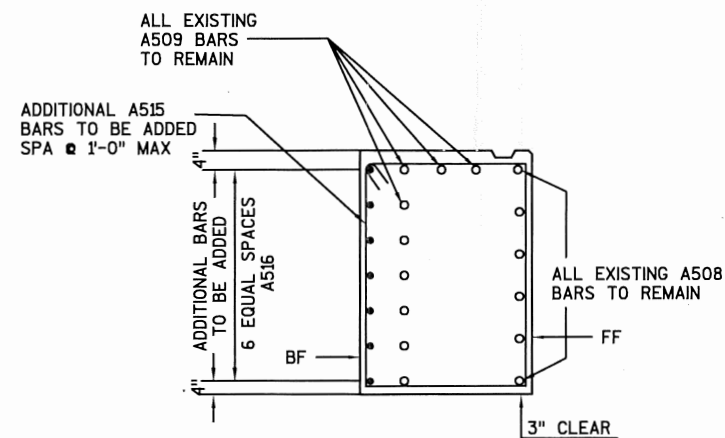
* ADHESIVE ANCHORS NO. 5. EMBED 1'-0" INTO EXISTING CONCRETE ABUTMENT.

GENERAL NOTES

THIS SHEET MODIFIES WING 2 OF THE WEST ABUTMENT ONLY.
ALL OTHER REINFORCEMENT IS TO FOLLOW THE ORIGINAL PLANS.

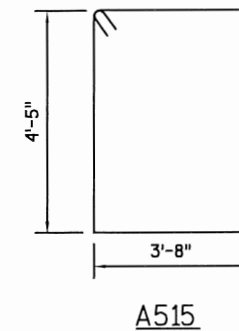


WING 2 PLAN



BF = BACK FACE
FF = FRONT FACE

TYPICAL SECTION THRU WING 2



A515

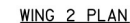
WEST ABUTMENT



6/26/18



NO.	DATE	REVISION	BY
ORIGINAL PLANS PREPARED BY			
Cedar corporation MENOMONIE - MADISON - GREEN BAY www.cedarcorp.com 800-472-7372			
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
DRAWN BY ATA		PLANS CKD. TLP	
WING 2 MODIFICATION			SHEET 1 OF 1



- 1 PIPE UNDERDRAIN WRAPPED (6-INCH) SLOPE 0.5% MIN TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. SEE SHEET 3 FOR RODENT SHIELD DETAILS.
- 2 OPTIONAL CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6" KEYWAY WITH MEMBRANE ON BACKFACE.
- 3 PARAPET REINFORCEMENT NOT SHOWN FOR CLARITY. SEE SHEET 16 FOR DETAILS.
- 4 A414 DOWELS AT 1'-0" MAX. SPACING ALONG ENTIRE WING LENGTH. SEE STANDARD DETAIL DRAWING "CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES".
- 5 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.

WING 1 SECTION

ALL HORIZONTAL BARS NOT LABELED IN
WING TOP ARE A412 BARS.



ALL HORIZONTAL BARS NOT LABELED IN
WING TOP ARE A412 BARS.

1 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.

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3 4" X $\frac{3}{4}$ " FILLER LENGTH OF ABUTMENT.

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

FF - FRONT FACE
BF - BACK FACE



ALL HORIZONTAL BARS NOT LABELED ARE A604 BARS.



COATED= 1620 LBS.
UNCOATED= 1680 LBS.

MARK	NUMBER		LENGTH	BENT	BAR SERIES	LOCATION
	COATED	UNCOATED				
A401	5	28 - 0		X		ABUTMENT BODY - 1 PER PILE SPIRA
A402	10	2 - 3				ABUTMENT BODY - 2 PER PILE VERT
A503	41	13 - 8		X		ABUTMENT BODY - STRIPUS VERT
A604	11	32 - 2				ABUTMENT BODY - FF, TOP, BTM HORIZ
A705	6	32 - 2				ABUTMENT BODY - BF HORIZ
A406	12	3 - 4		X		ABUTMENT BODY - SEAT STEP VERT
A507	26	15 - 4		X		WING WALL - BODY VERT
A508	12	14 - 2				WING WALL - FF OF TIES HORIZ
A509	18	14 - 2				WING WALL - BODY HORIZ
A510	34	14 - 0		X		WING WALL - TOP TIES VERT
A611	4	11 - 7				WING WALL - TOP HORIZ
A412	20	11 - 7				WING WALL - TOP HORIZ
A413	6	7 - 0				ABUTMENT BODY - SEAT STEP HORIZ
A414	24	2 - 0				WING WALL - TOP DOWELS HORIZ

BAR DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BARS.
THE FIRST OR FIRST TWO DIGITS OF A BAR MARK SIGNIFIES THE BAR SIZE.

NOTES:

FOR PILE SPICE DETAILS SEE SHEET 2.

SEE SHEET 10 FOR SECTION THRU ABUTMENT BODY.

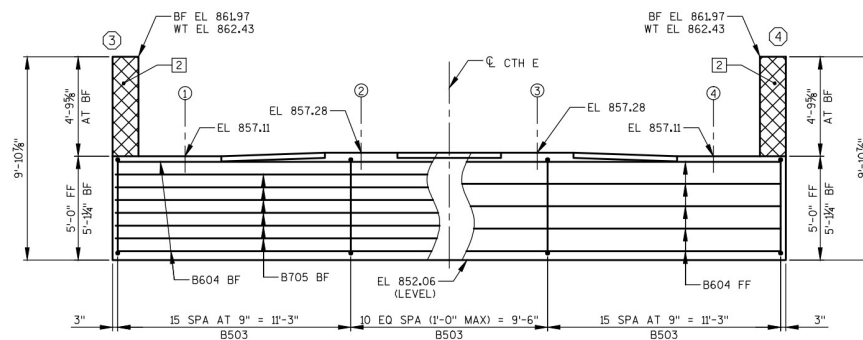
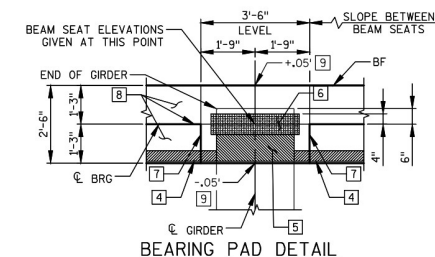
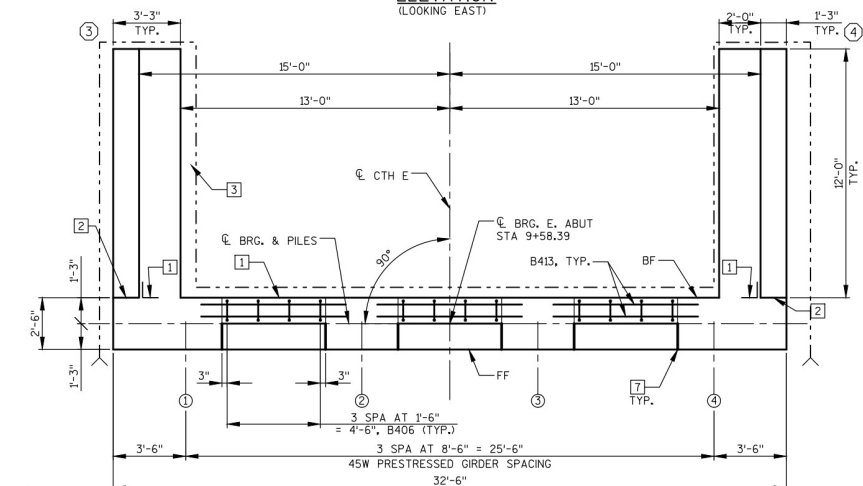
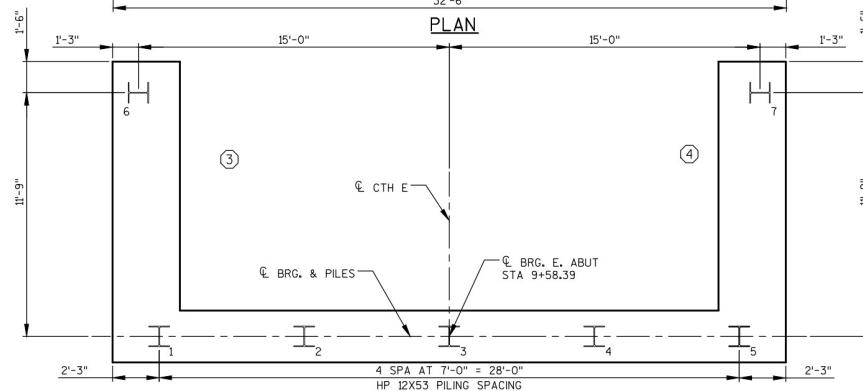
FILL/EXCAVATE TO BOTTOM OF EAST ABUTMENT EL 852.06 BEFORE DRIVING PILING.

EAST ABUTMENT TO BE SUPPORTED ON HP 12X53 STEEL PILING DRIVEN TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE AS DETERMINED BY THE MODIFIED GATES DYNAMIC EQUATION. ESTIMATED AT 30' LONG.

- 1 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
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- 9 SLOPED BEAM SEAT REQUIRED. USE THESE ADJUSTMENTS FROM ELEVATIONS GIVEN TO LAYOUT BEAM SEAT AT FRONT FACE AND BACK FACE.

* INDICATES WING NUMBER

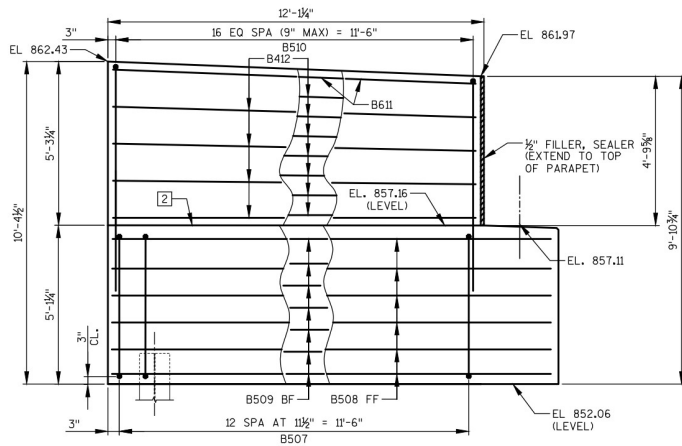
Ⓢ INDICATES GIRDER NUMBER

FF - FRONT FACE
BF - BACK FACE**ELEVATION**
(LOOKING EAST)**PLAN****PILE PLAN**

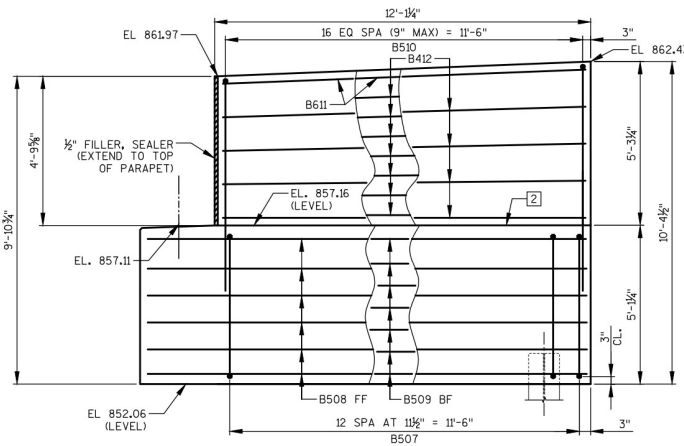
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8

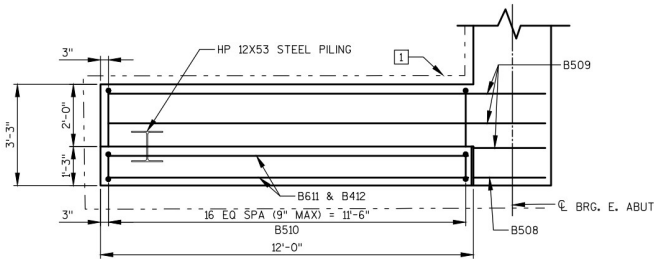
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
DRAWN BY		PLANS CK'D.	JSH
EAST ABUTMENT		SHEET 52	16



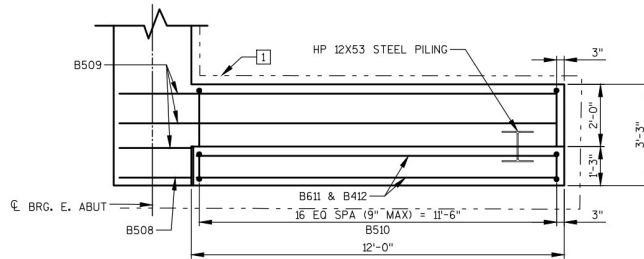
WING 3 ELEVATION



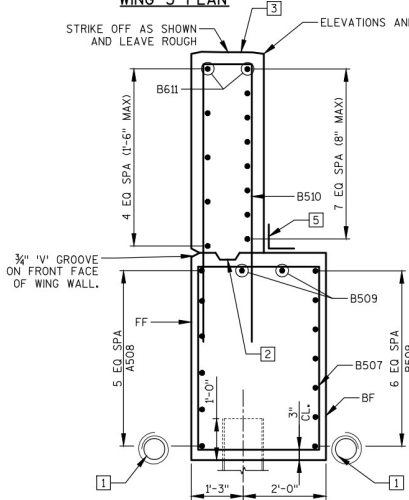
WING 4 ELEVATION



WING 3 PLAN

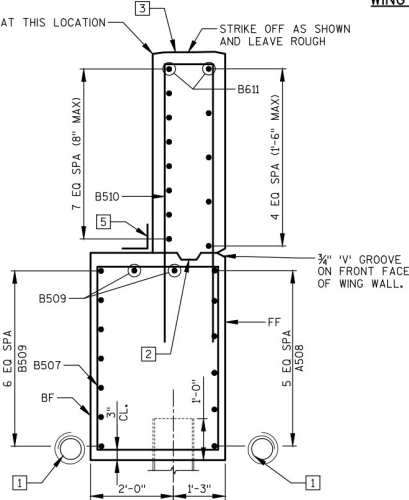


WING 4 PLAN



WING 3 SECTION

ALL HORIZONTAL BARS NOT LABELED IN WING TOP ARE B412 BARS.



WING 4 SECTION

ALL HORIZONTAL BARS NOT LABELED IN WING TOP ARE B412 BARS.

NOTES:

- 1 PIPE UNDERDRAIN WRAPPED (6-INCH) SLOPE 0.5% MIN TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. SEE SHEET 3 FOR RODENT SHIELD DETAILS.
 - 2 OPTIONAL CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6" KEYWAY WITH MEMBRANE ON BACKFACE.
 - 3 PARAPET REINFORCEMENT NOT SHOWN FOR CLARITY. SEE SHEET 16 FOR DETAILS.
 - 4 A414 DOWELS AT 1'-0" MAX. SPACING ALONG ENTIRE WING LENGTH. SEE STANDARD DETAIL DRAWING "CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES".
 - 5 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- FF - FRONT FACE
BF - BACK FACE

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
DRAWN BY		MJB	PLANS CKD. JSH
EAST ABUTMENT DETAILS		SHEET 53	16

NOTES:

- [1] 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- [2] PIPE UNDERDRAIN WRAPPED (6-INCH) SLOPE 0.5% MIN TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. SEE SHEET 3 FOR RODENT SHIELD DETAILS.
- [3] 4" X 3/4" FILLER LENGTH OF ABUTMENT.
- [4] STEEL TROWEL TOP SURFACE OF ABUTMENT. PLACE MULTIPLE LAYERS OF POLYETHYLENE SHEETS OVER ENTIRE ABUTMENT TOP BEFORE PLACING BEARING PADS AND SUPERSTRUCTURE. TOTAL THICKNESS OF ALL SHEETS TO BE AT LEAST 0.03".

FF - FRONT FACE
BF - BACK FACE

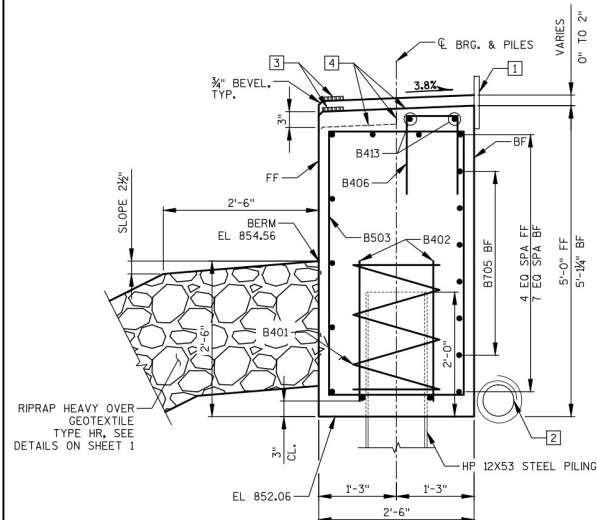
BILL OF BARS
EAST ABUTMENT

COATED= 1640 LBS.
UNCOATED= 1680 LBS.

MARK	NUMBER		LENGTH	BENT	BAR SERIES	LOCATION
	COATED	UNCOATED				
			FT - IN			
B401	5	28 - 0	X			ABUTMENT BODY - 1 PER PILE SPIRAL
B402	10	2 - 3				ABUTMENT BODY - 2 PER PILE VERT
B503	41	13 - 8	X			ABUTMENT BODY - STIRRUPS VERT
B604	11	32 - 2				ABUTMENT BODY - FF, TOP, BTM HORIZ
B705	6	32 - 2				ABUTMENT BODY - BF HORIZ
B406	12	3 - 5	X			ABUTMENT BODY - SEAT STEP VERT
B507	26	15 - 6	X			WING WALL - BODY VERT
B508	12	14 - 2				WING WALL - FF OF BODY HORIZ
B509	18	14 - 2				WING WALL - BODY HORIZ
B510	34	15 - 0	X			WING WALL - TOP TIES VERT
B611	4	11 - 7				WING WALL - TOP HORIZ
B412	22	11 - 7				WING WALL - TOP HORIZ
B413	6	7 - 0				ABUTMENT BODY - SEAT STEP HORIZ

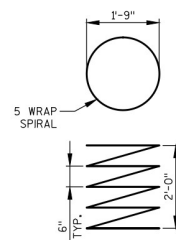
BAR DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BARS.

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

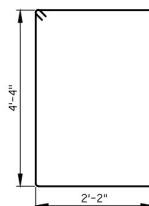


SECTION THRU ABUTMENT BODY

ALL HORIZONTAL BARS NOT LABELED ARE B604 BARS.



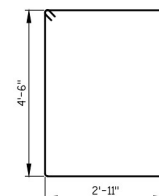
B401



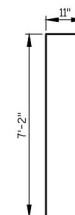
B503



B406



B507



B510

NO.	DATE	REVISION		BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION				
STRUCTURE B-22-286				
		DRAWN BY	MJB	PLANS CK'D. JS
EAST ABUTMENT DETAILS			SHEET 54	OF 16

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 8" OF GIRDER, WHICH SHALL RECEIVE A SMOOTH FINISH. AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 8" OF THE TOP FLANGE.

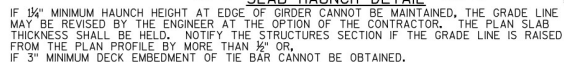
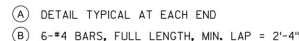
THE GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE GIRDERS. SEE SECTION 503.3.3 OF STANDARD SPECIFICATIONS FOR GUIDANCE.

STRANDS SHALL BE FLUSH WITH END OF GIRDER, FOR GIRDER ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER. FOR GIRDER ENDS THAT ARE FINALLY EXPOSED, COAT THE GIRDER ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE GIRDER ENDS WITH A NON-PIGMENTED EPOXY CONFORMING TO AASHTO M-235 TYPE III, GRADE 2, CLASS B OR C. THE EPOXY SHALL BE APPLIED AT LEAST 3 DAYS AFTER MOIST CURING HAS CEASED AND PRIOR TO APPLICATION OF THE SEALER.

SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT.

AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A497 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

PRESTRESSING STRANDS SHALL BE (0.6" DIA.) -7 WIRE
LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF
270,000 PSI.

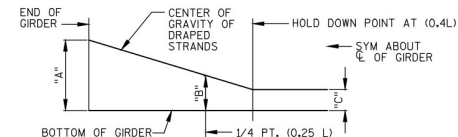


TO DETERMINE 'T', ELEV. OF TOP OF GIRDERS AT \mathcal{C} OF SUBSTRUCTURE UNITS & AT 1/10 POINTS OF EACH SPAN SHALL BE TAKEN. THEN FOLLOW THIS PROCESS:

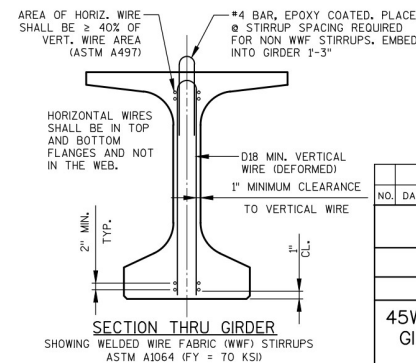
TOP OF DECK ELEV. AT FINAL GRADE
- TOP OF GIRDER ELEVATION
+ DEAD LOAD DEFLECTION
- SLAB THICKNESS

= HAUNCH HEIGHT 'T'

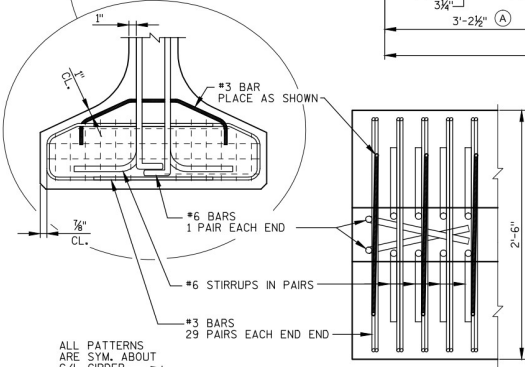
NOTE: AN AVERAGE HAUNCH ('T') OF 3 $\frac{5}{8}$ " WAS USED IN THE QUANTITY "CONCRETE MASONRY BRIDGES".



DRAPED STRAND PROFILE



SECTION THRU GIRDER
SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS
ASTM A1064 (FY = 70 KSI)



ALL PATTERNS
ARE SYM. ABOVE
6.41 CIPED

THE THEORETICAL INITIAL CAMBER VALUE AT THE TIME OF STRAND RELEASE AT MIDSPAN MULTIPLIED BY A FACTOR OF 1.4 TO ACCOUNT FOR CAMBER GROWTH FROM THE TIME OF STRAND RELEASE TO JOB SITE PLACEMENT.

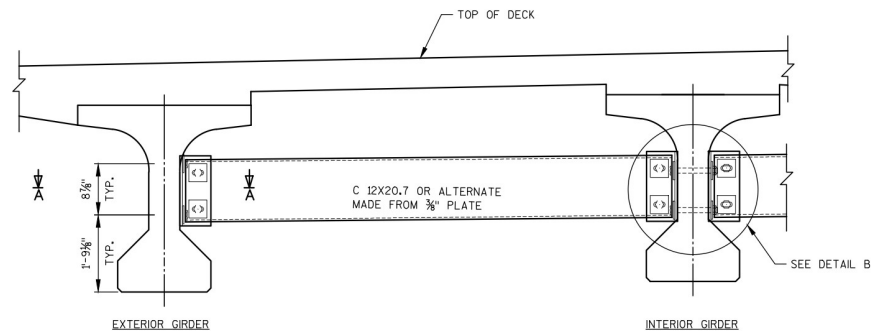
SPAN	CAMBER (IN.)
1	3 $\frac{5}{8}$

THESE VALUES ARE NOT TO BE
USED IN DETERMINING 'T'. USE
ACTUAL GIRDER SHOTS.
THESE VALUES ARE FOR
INFORMATIONAL PURPOSES ONLY.

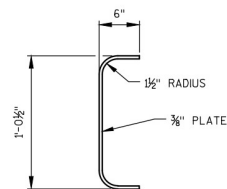
TYP STRAND PATTERN

*MINIMUM CYLINDER STRENGTH OF CONCRETE @ TIME OF TRANSFER OF PRESTRESS FORCE.

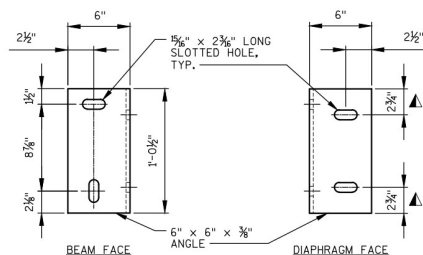
GIRDER DATA																								
SPAN	GIRDER	GIRDER LENGTH "L"	DEAD LOAD DEF. (IN.)								CONC. STRGTH. f'c (p.s.i.)	"P" 1st % OF GIRDER	"P" MID % OF GIRDER	"P" END % OF GIRDER	DIA. OF STRAND (IN.)	TOTAL NO. OF STRANDS	DRAPED PATTERN					UNDRAPED PATTERN		
			%	%	%	%	%	%	%	%							f'cl (P.S.i.)	"A"	"B" MIN.	"B" MAX.	"C"	TOTAL NO. OF STRANDS	f'cl (P.S.i.)	
1	ALL	94'-0"	½	1	1¾	1¾	1¾	1¾	1¾	1	½	8000	8	7	8	0.6	36	6400	33	12	15	5	—	—



PART TRANSVERSE SECTION AT DIAPHRAGM

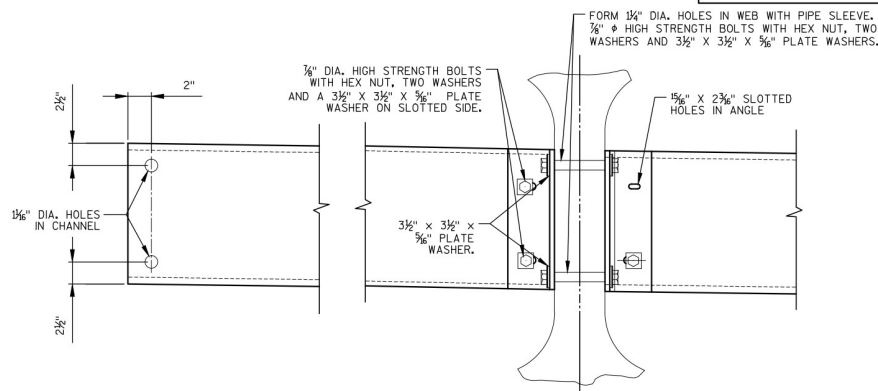
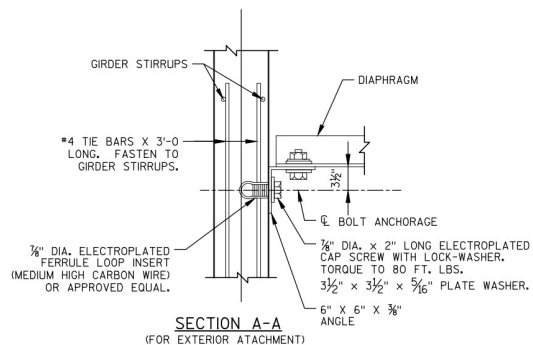


SECTION THRU ALTERNATE DIAPHRAGM



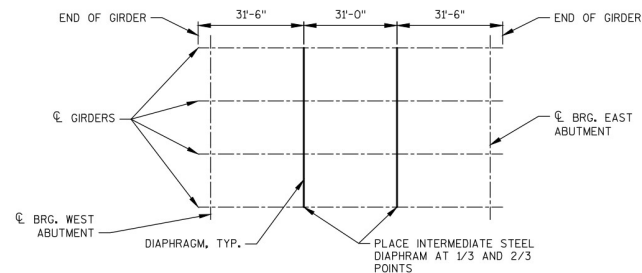
DIAPHRAGM SUPPORT

▲ IF ALTERNATE DIAPHRAGM IS USED THIS
DIMENSION TO BE 2 1/2"



DETAIL B

(FOR CONTINUOUS LINE OF DIAPHRAGMS)



PLAN VIEW OF DIAPHRAGM

(SHOWING TYPICAL SPAN)

NOTES

ALL DIAPHRAGM MATERIAL NOT EMBEDDED IN THE CONCRETE GIRDER
SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "STEEL DIAPHRAGMS
B-22-286", EACH.

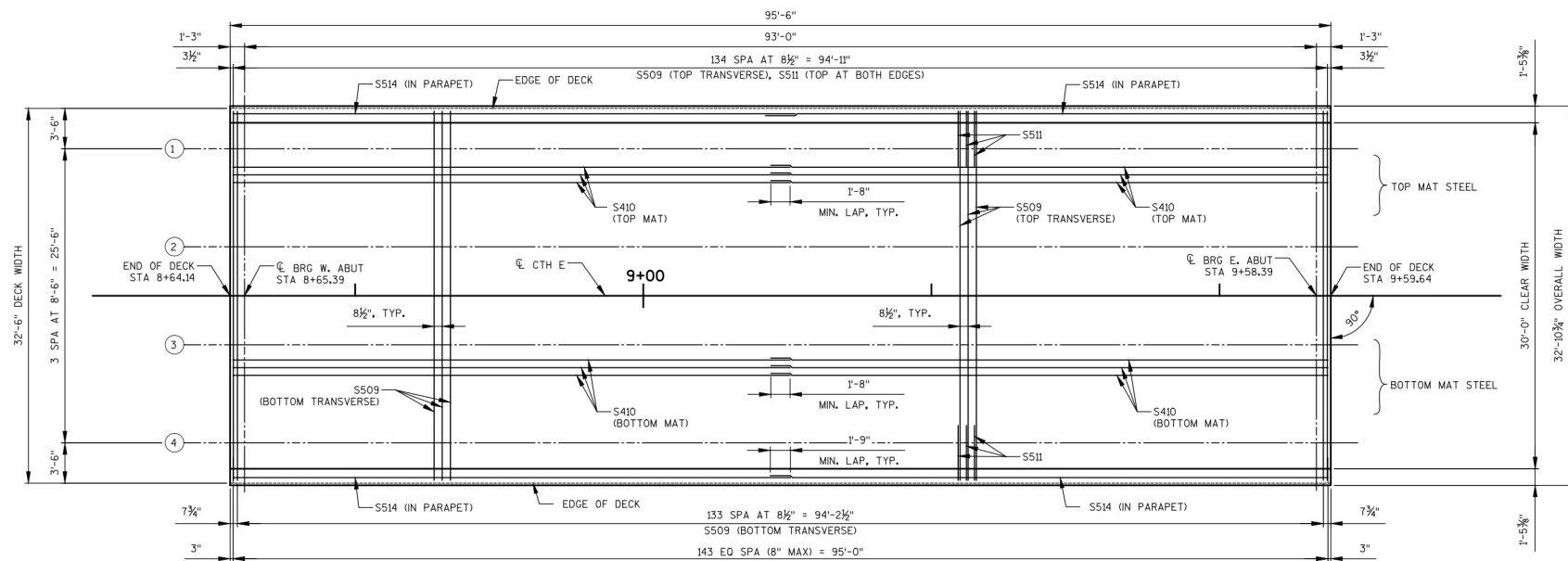
EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36.

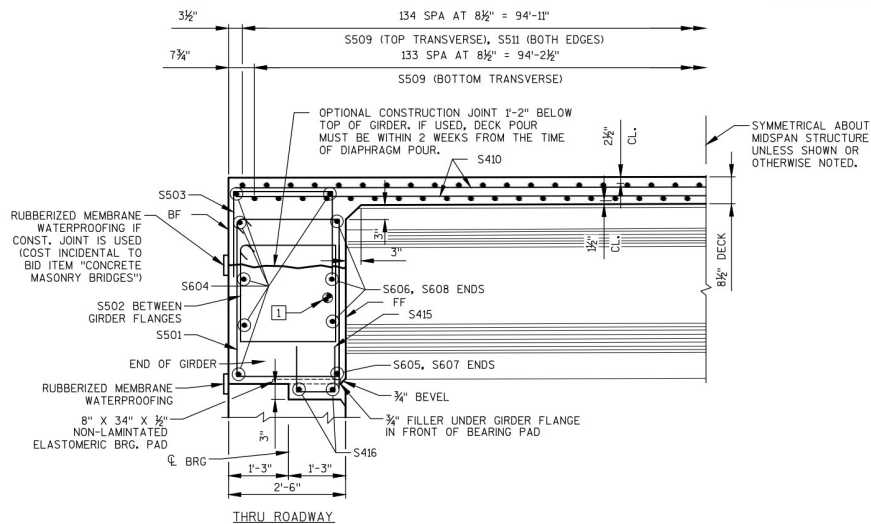
ALL DIAPHRAGM MATERIAL INCLUDING BOLTS, NUTS AND WASHERS
SHALL GALVANIZED AFTER FABRICATION.

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 A443.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
DRAWN BY		MJB	PLANS CKD.
SHEI 56		JSH	
INTERMEDIATE STEEL DIAPHRAGMS		16	



REINFORCEMENT PLAN



PARTIAL LONGITUDINAL SECTION

NOTES

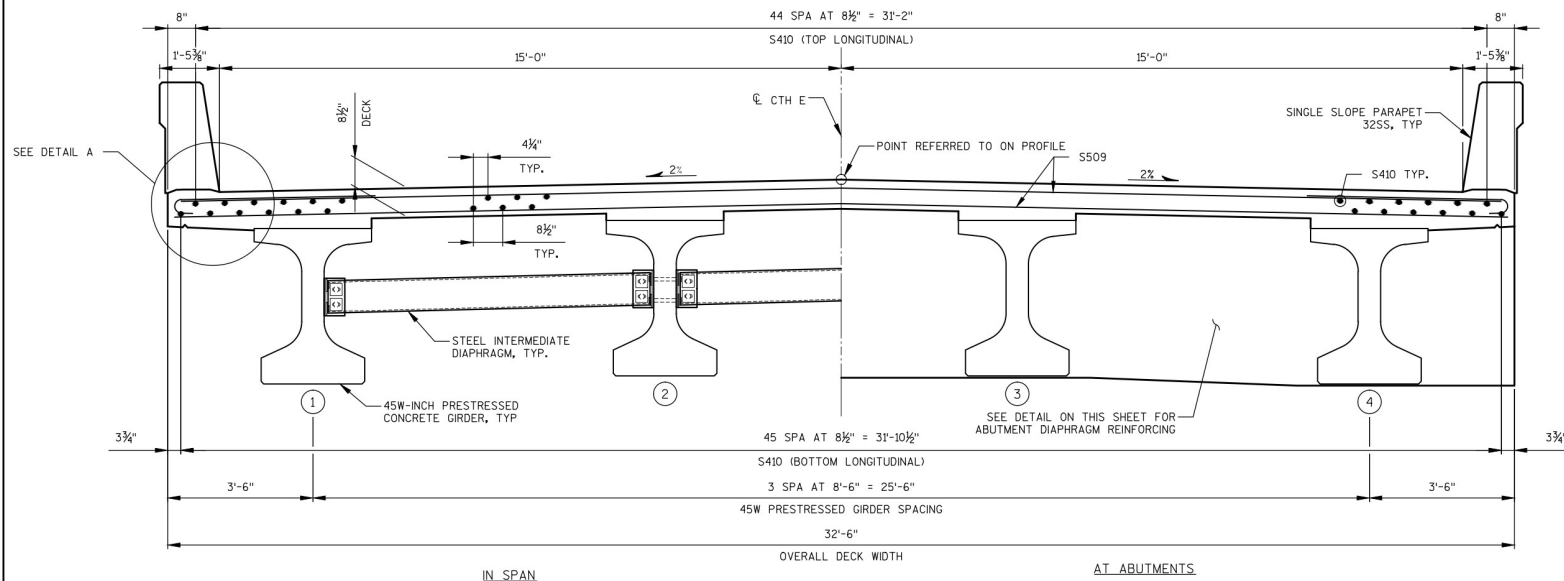
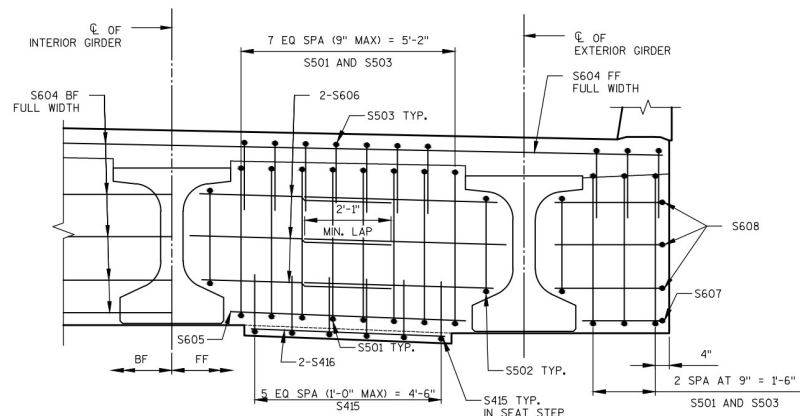
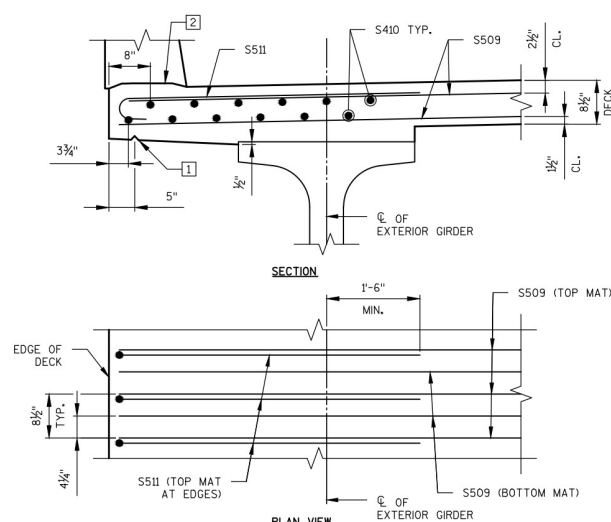
INDICATES GIRDER NUMBER

① 1) -1/4" DIA. HOLE IN WEB FOR (2) S517 HORIZ. BARS AND PLACED SYM. ABOUT CL OF GIRDER.

FF - FRONT FACE

BF - BACK FACE

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
DRAWN BY		MJB	PLANS CKD. JSH
SUPERSTRUCTURE		SHEET 57	OF 16

CROSS SECTION THRU ROADWAY
(LOOKING EAST)ABUTMENT DIAPHRAGMS
DECK STEEL NOT SHOWN FOR CLARITY

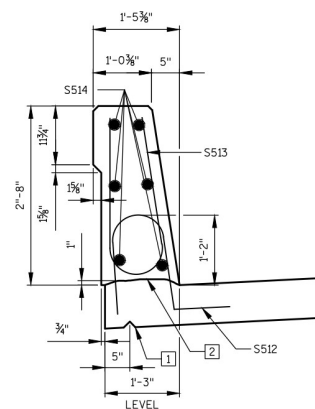
PLAN VIEW

DETAIL A

NOTES:

- 1 3/4" V-GROOVE REQ'D. EXTEND TO 6" FROM FF OF ABUTMENT DIAPHRAGM.
- 2 HORIZONTAL CONSTRUCTION JOINT - STRIKE OFF AS SHOWN AND LEAVE ROUGH.

FF - FRONT FACE
BF - BACK FACE

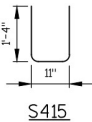
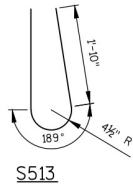
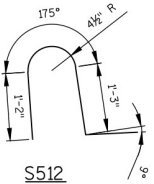
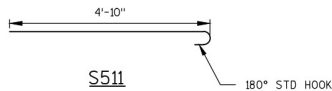
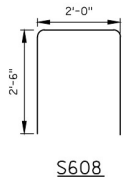
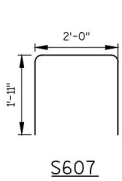
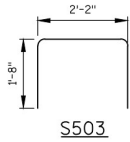
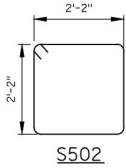
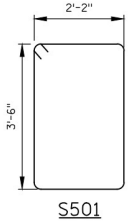


SECTION THRU PARAPET ON BRIDGE

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
DRAWN BY		PLANS CKD.	JSH
SUPERSTRUCTURE DETAILS		SHEET 58	OF 16

DECK ELEVATIONS

SPAN POINT	LEFT EDGE OF DECK	GIRDER 1		GIRDER 2		REFERENCE LINE		GIRDER 3		GIRDER 4		RIGHT EDGE OF DECK
	ELEVATION	TD	TG	TD	TG	STATION	ELEVATION	TD	TG	TD	TG	ELEVATION
C/L W. ABUT.	858.39	858.43	857.37	858.60	857.54	8+65.39	858.69	858.60	857.54	858.43	857.37	858.39
0.1	858.74	858.79		858.96		8+74.69	859.04	858.96		858.79		858.74
0.2	859.09	859.14		859.31		8+83.99	859.39	859.31		859.14		859.09
0.3	859.45	859.49		859.66		8+93.29	859.75	859.66		859.49		859.45
0.4	859.80	859.85		860.02		9+02.59	860.10	860.02		859.85		859.80
0.5	860.15	860.20		860.37		9+11.89	860.45	860.37		860.20		860.15
0.6	860.51	860.55		860.72		9+21.19	860.81	860.72		860.55		860.51
0.7	860.86	860.91		861.08		9+30.49	861.16	861.08		860.91		860.86
0.8	861.21	861.26		861.43		9+39.79	861.51	861.43		861.26		861.21
0.9	861.57	861.61		861.78		9+49.09	861.87	861.78		861.61		861.57
C/L E. ABUT.	861.92	861.97	860.90	862.14	861.07	9+58.39	862.22	862.14	861.07	861.97	860.90	861.92



BILL OF BARS
SUPERSTRUCTURE

COATED= 22990 LBS.
UNCOATED= 0 LBS.

MARK	NUMBER		LENGTH	BENT	BAR SERIES	LOCATION
	COATED	UNCOATED				
S501	60	12	0	X		DIAPHRAGM - STIRRUPS VERT
S502	16	9	4	X		DIAPHRAGM - STIRRUPS VERT
S503	60	5	3	X		DIAPHRAGM - TIES VERT
S604	12	32	2			DIAPHRAGM - BF TRANS
S605	6	5	8			DIAPHRAGM - FF BETWEEN GIRDERS TRANS
S606	36	4	11			DIAPHRAGM - FF BETWEEN GIRDERS TRANS
S607	4	5	6	X		DIAPHRAGM - AT ENDS HORIZ
S608	12	6	8	X		DIAPHRAGM - AT ENDS HORIZ
S509	269	32	2			SLAB - TOP & BOTTOM TRANS
S410	182	48	5			SLAB - TOP & BOTTOM LONGIT
S511	270	5	5	X		SLAB - TOP AT EDGES TRANS
S512	288	4	5	X		PARAPET - TIES VERT
S513	288	5	0	X		PARAPET - STIRRUPS VERT
S514	24	48	5			PARAPET LONGIT
S415	36	3	5	X		DIAPHRAGM - SEAT STEP VERT
S416	12	4	8			DIAPHRAGM - BETWEEN BEAM SEATS HORIZ
S517	16	6	0			DIAPHRAGM - BETWEEN BEAM SEATS HORIZ

BAR DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BARS.

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

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
DRAWN BY		MJB	JSH
SUPERSTRUCTURE DETAILS		SHEET 59	OF 16

WEST ABUTMENT COATED = 730 LBS.
 WEST ABUTMENT UNCOATED = 0 LBS.
 EAST ABUTMENT COATED = 730 LBS.
 EAST ABUTMENT UNCOATED = 0 LBS.

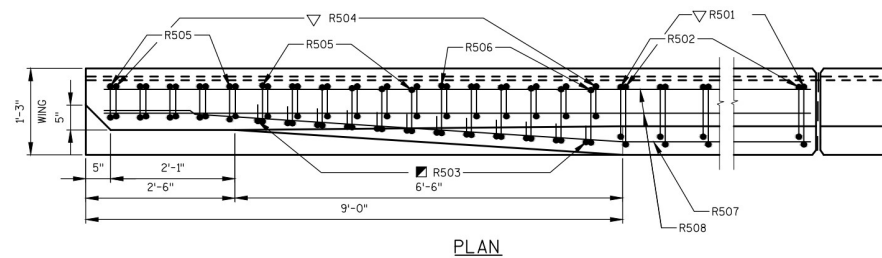
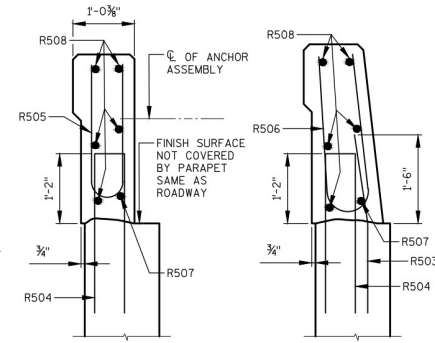
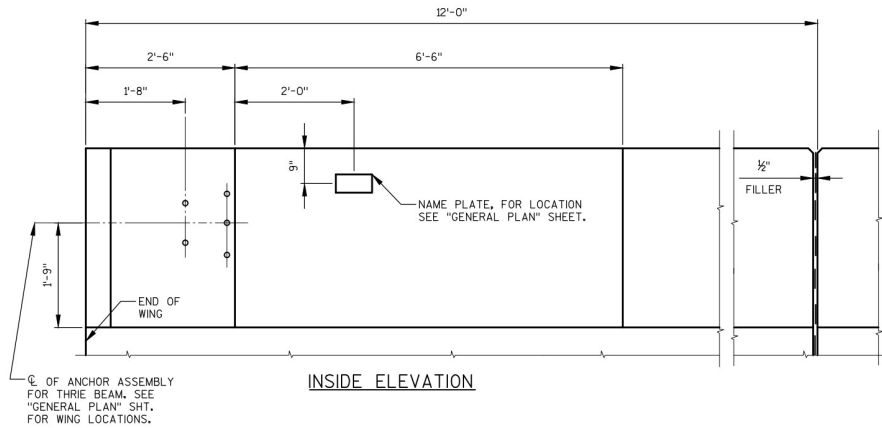
BILL OF BARS
 SINGLE SLOPE PARAPET 32SS

MARK	COATED	NO. REQ'D.		LENGTH FT - IN	BENT	BAR SERIES	LOCATION
		WEST ABUTMENT	EAST ABUTMENT				
R501	X	12	12	5 - 10	X		PARAPET TIE VERT
R502	X	12	12	5 - 0	X		PARAPET STIRRUP VERT
R503	X	24	24	3 - 0	X		PARAPET TIE VERT
R504	X	34	34	5 - 7	X		PARAPET TIE VERT
R505	X	22	22	4 - 9	X		PARAPET STIRRUP VERT
R506	X	12	12	4 - 10	X		PARAPET STIRRUP VERT
R507	X	2	2	11 - 7	X		PARAPET - LONGITUDINAL - TRANSITION HORIZ
R508	X	10	10	11 - 7	X		PARAPET - LONGITUDINAL HORIZ

BAR DIMENSIONS IN BENDING DETAILS ARE OUT TO OUT OF BARS.

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

INCLUDED IN ABUTMENT QUANTITIES FOR BAR STEEL REINFORCEMENT AND CONCRETE MASONRY

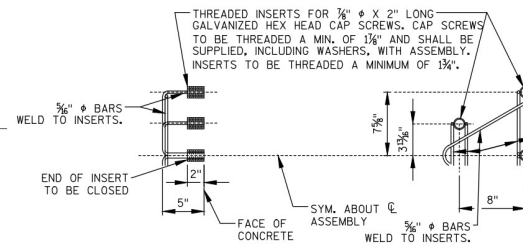
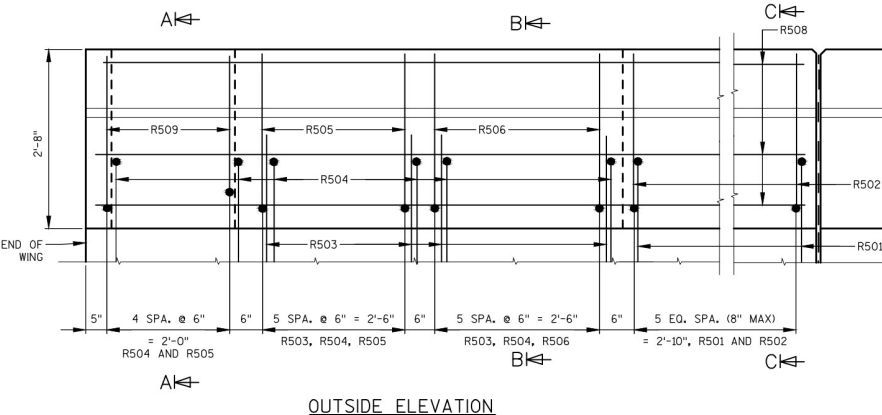
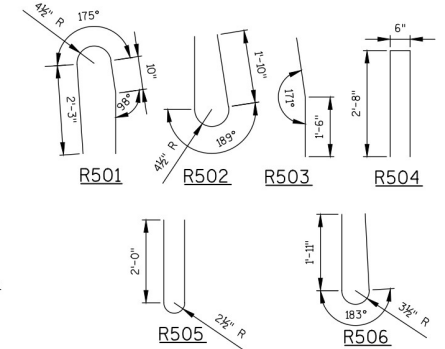
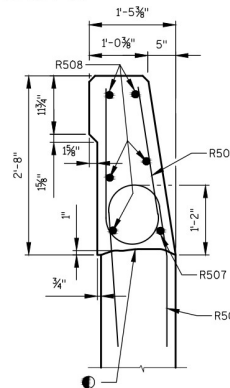


OPTIONAL CONSTRUCTION JOINTS
 IN THE PARAPETS MAY BE USED.
 RUN BAR REINF. THRU THE JOINT.
 LAP LONGIT. BARS A MIN. OF 1'-9".
 MIN. JOINT SPACING OF 80'-0".
 DEFINE CONST. JOINT WITH A 3/4" -
 V GROOVE.

CONST. JOINT - STRIKE OFF AS SHOWN.

R503 BARS MAY BE PLACED AFTER
 CONCRETE IS POURED BUT BEFORE INITIAL
 SET HAS TAKEN PLACE. USE CARE TO
 PLACE R503 BARS CORRECTLY ALONG
 TRANSITION OF PARAPET.

R501 AND R504 BARS TO BE TIED TO WING
 STEEL BEFORE WING IS POURED.



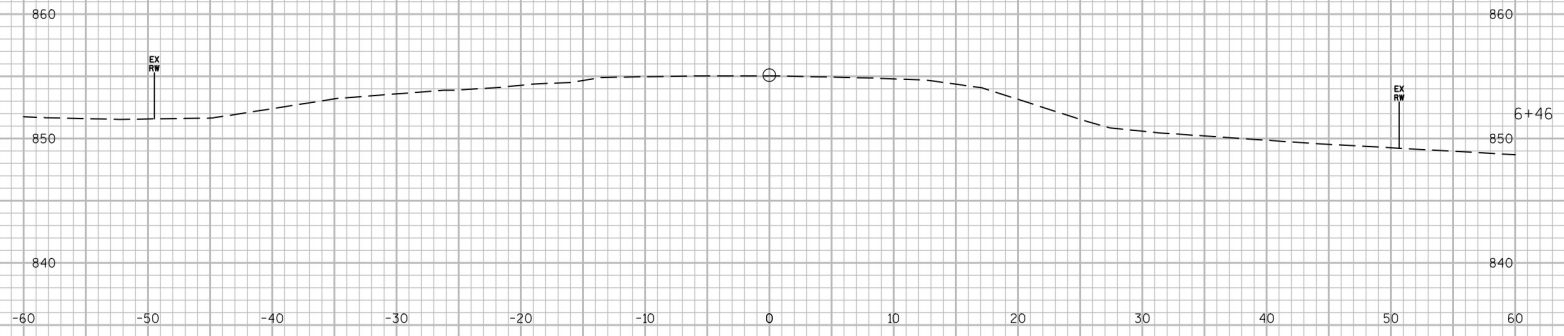
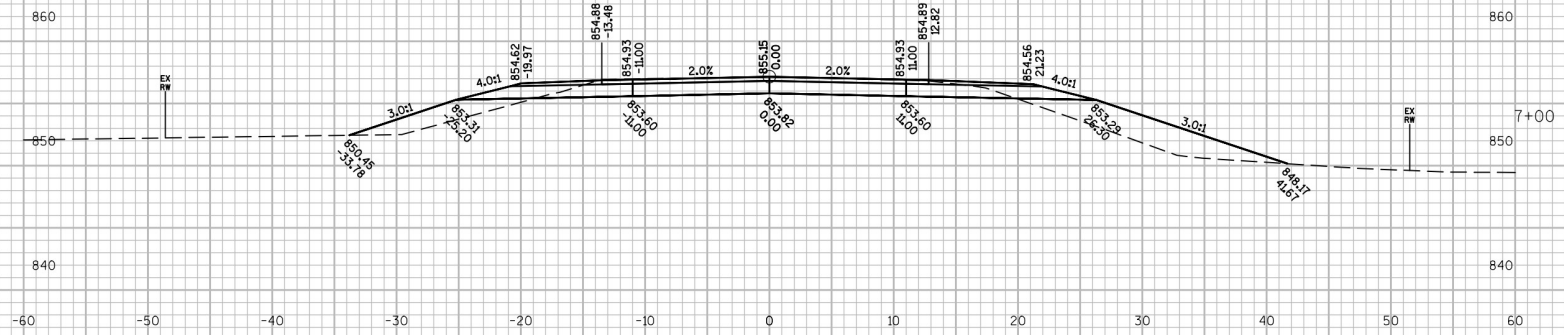
NOTE: HEX. HEAD CAP SCREWS & WASHERS TO BE GALVANIZED
 IN ACCORDANCE WITH AASHTO M232 CLASS C.

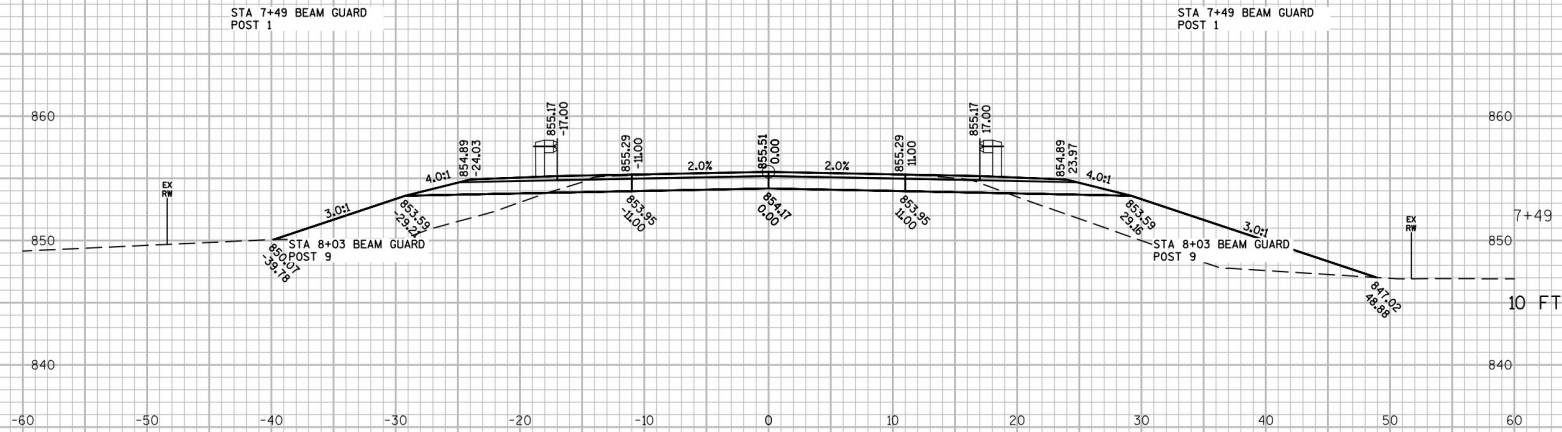
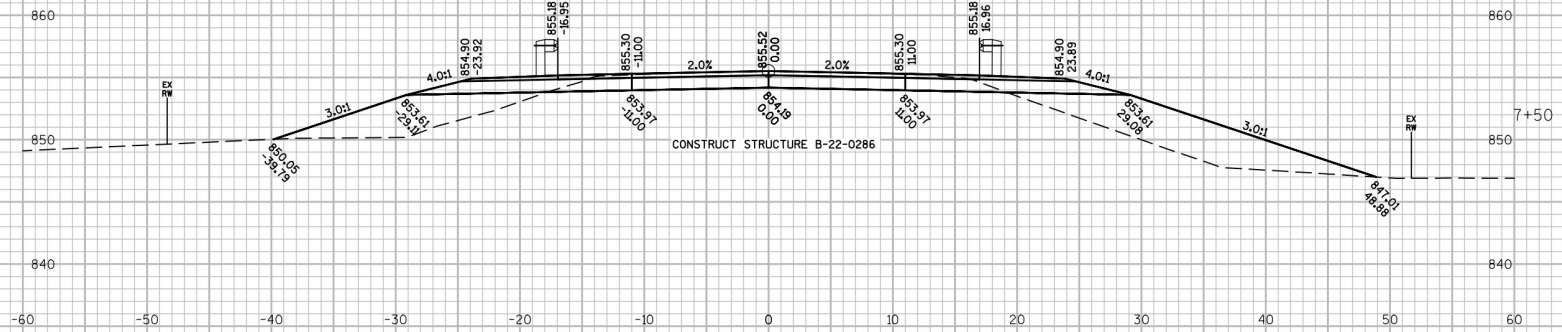
ASSEMBLY BID ITEM SHALL BE "ANCHOR ASSEMBLIES FOR
 STEEL PLATE BEAM GUARD", EACH.

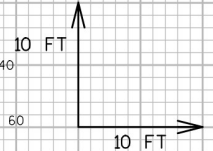
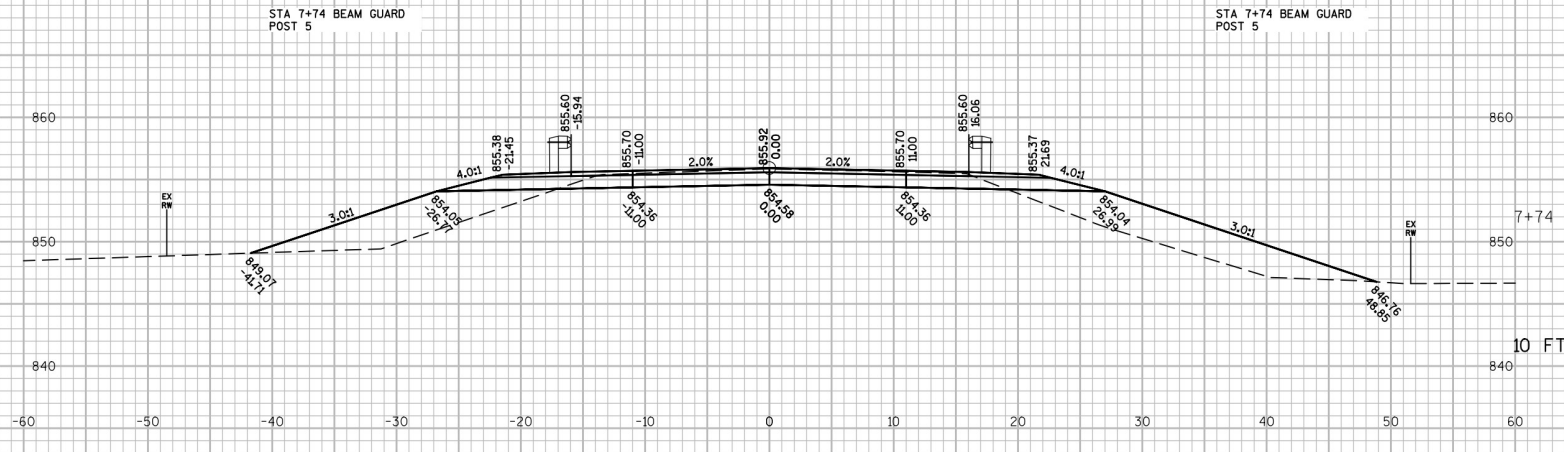
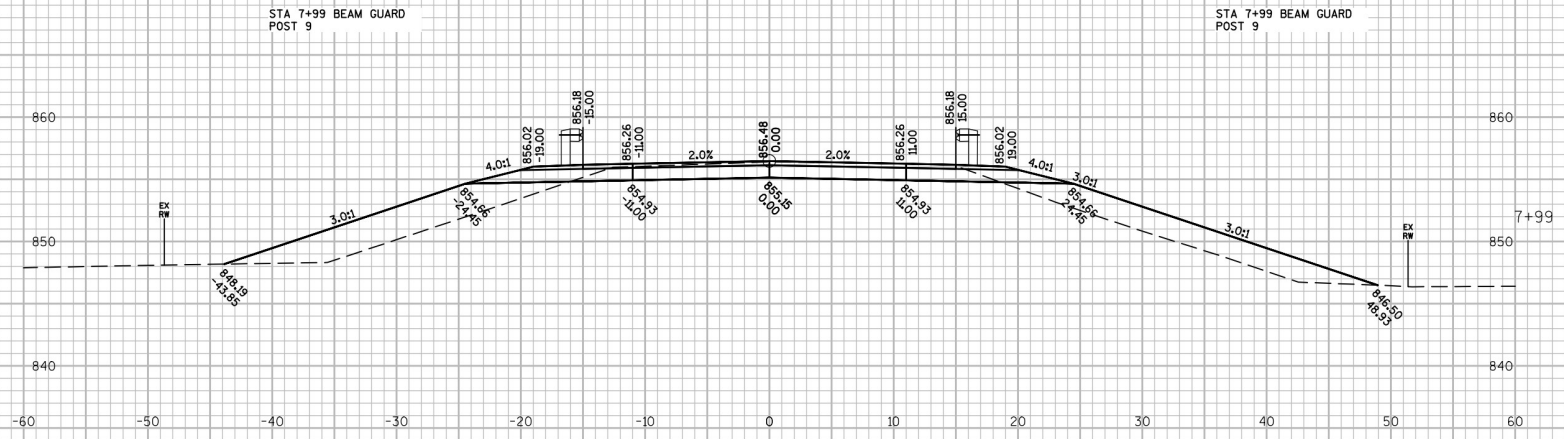
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE B-22-286			
DRAWN BY	MJB	PLANS CK'D.	JSH
SINGLE SLOPE PARAPET 32SS			SHEET 60 OF 16

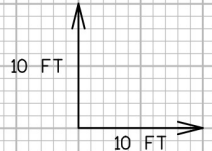
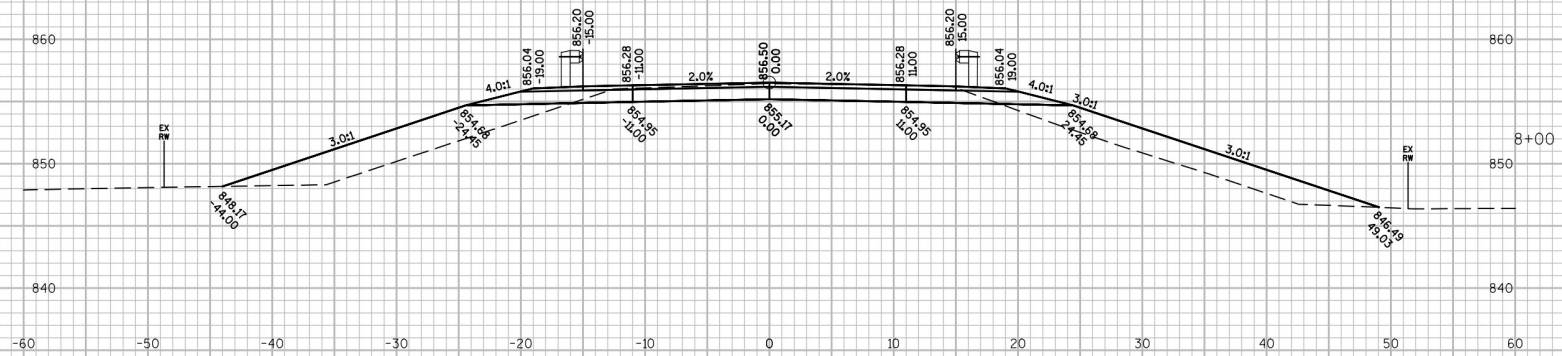
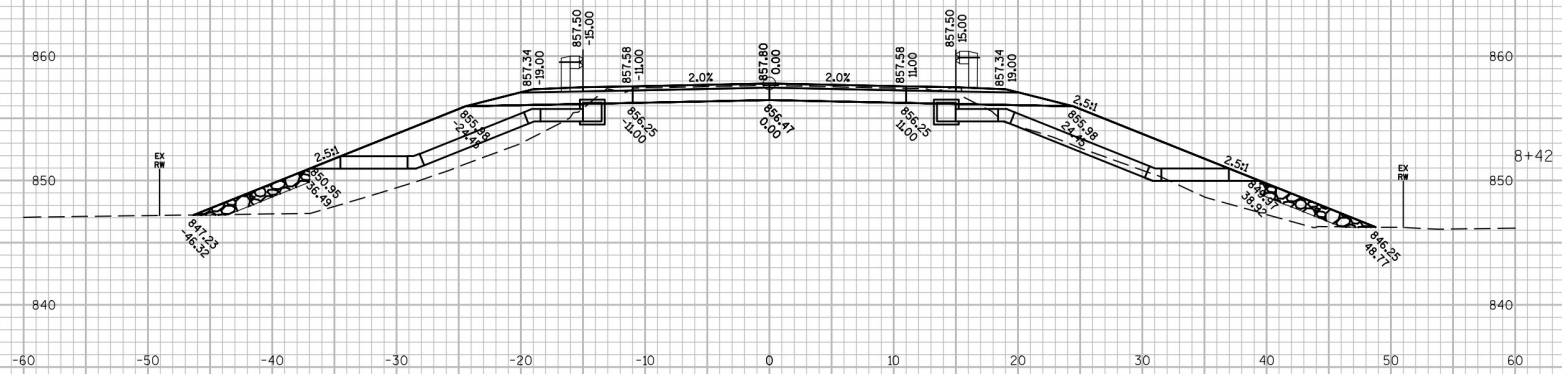
EXPANSION FACTOR = 1.3

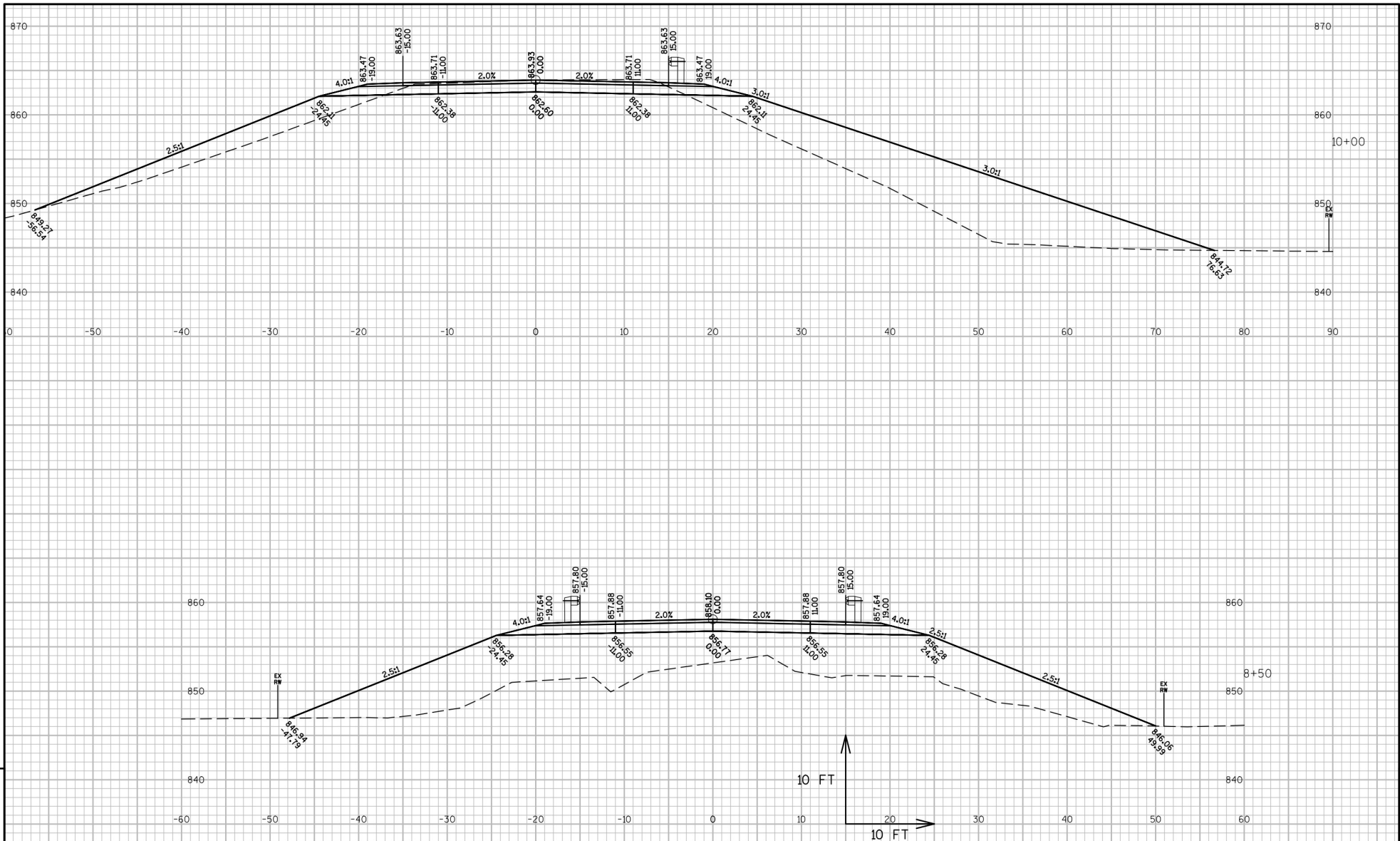
TOTAL	247	4,654
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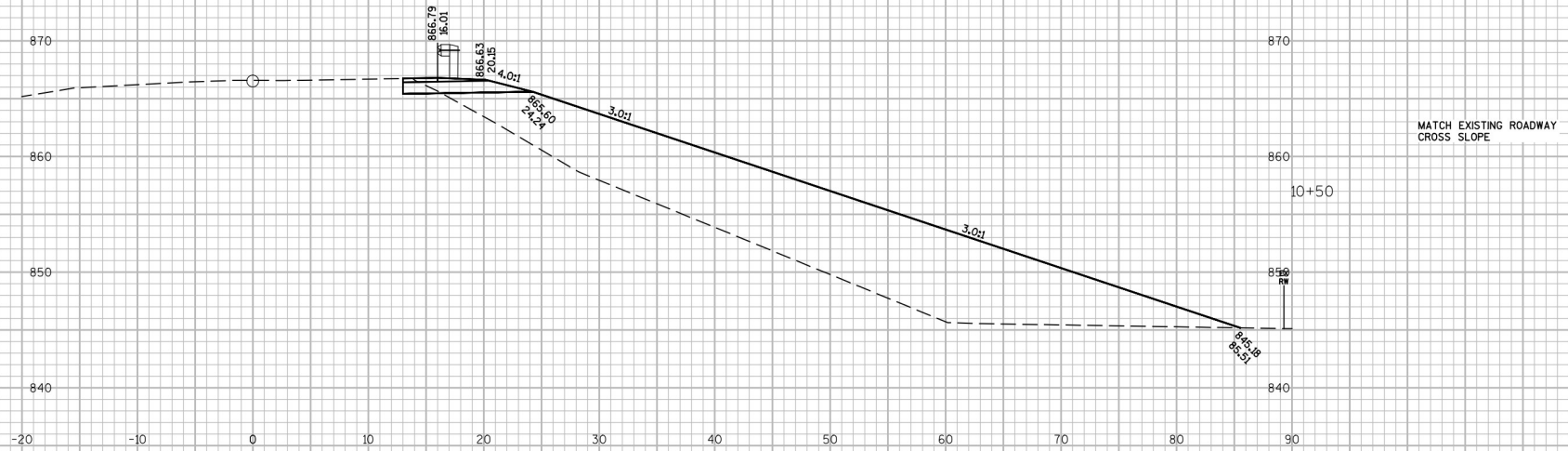




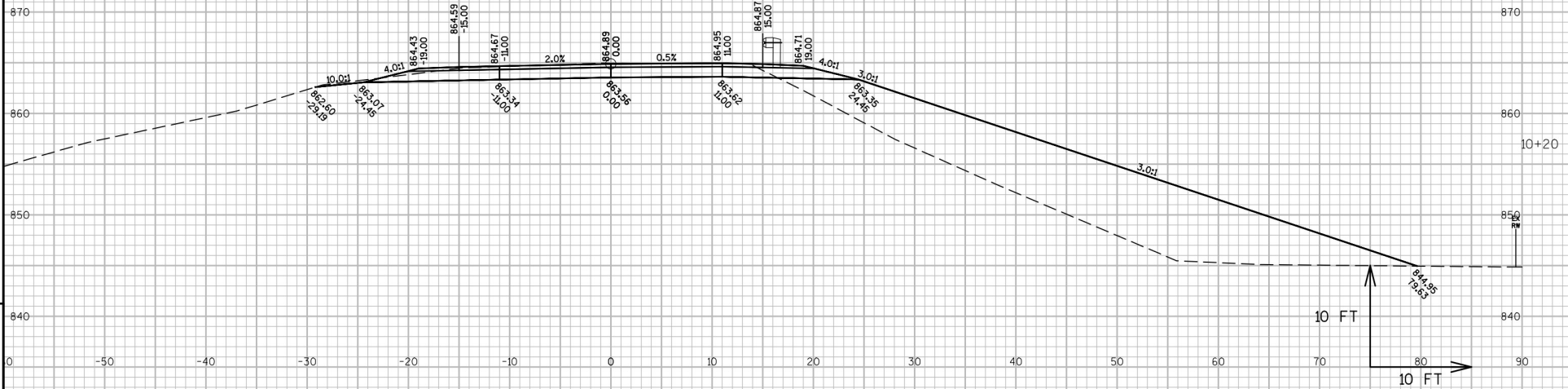








MATCH EXISTING ROADWAY
CROSS SLOPE



PROJECT NO:5587-00-72

HWY: CTH E

COUNTY: GRANT

CROSS SECTIONS: MAINLINE

SHEET

67

E

FILE NAME : X:\3016900\155830.01\TECH\CAD\55870002\SHEETS\PLAN\090201.XS.DWG
LAYOUT NAME - 090206.XS

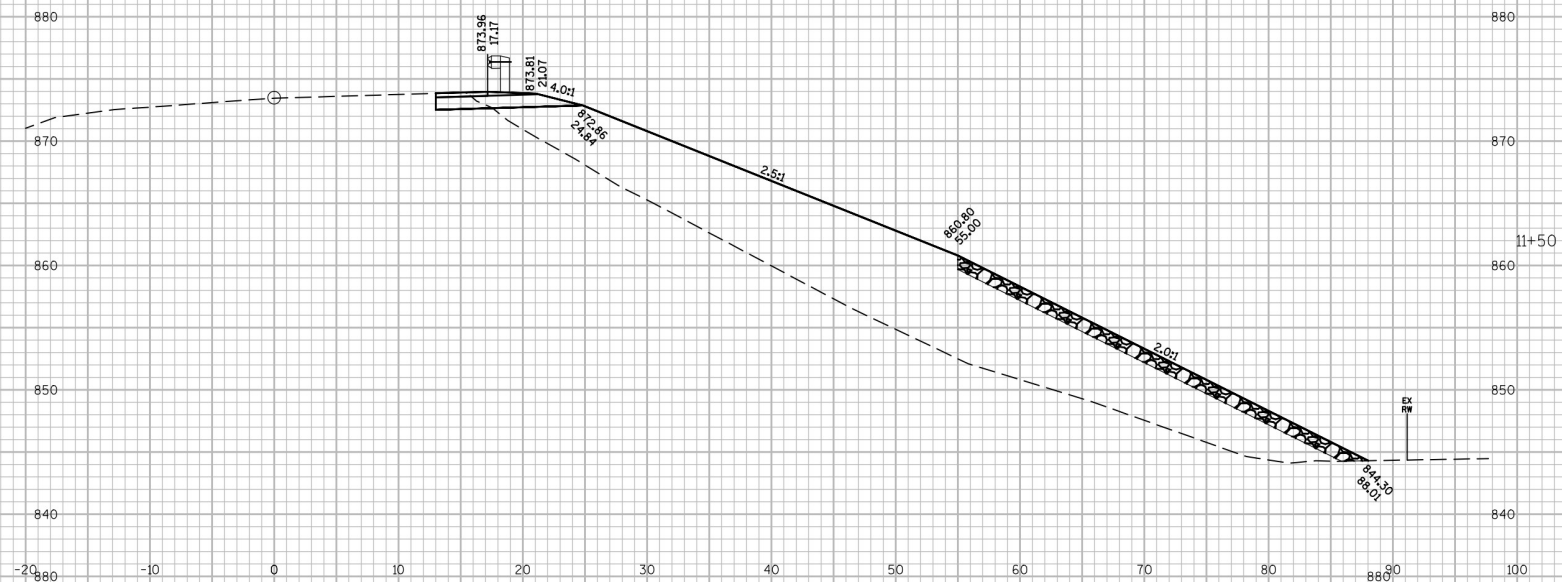
PLOT DATE : 4/11/2017 1:46 PM

PLOT BY : JASON KLEIST

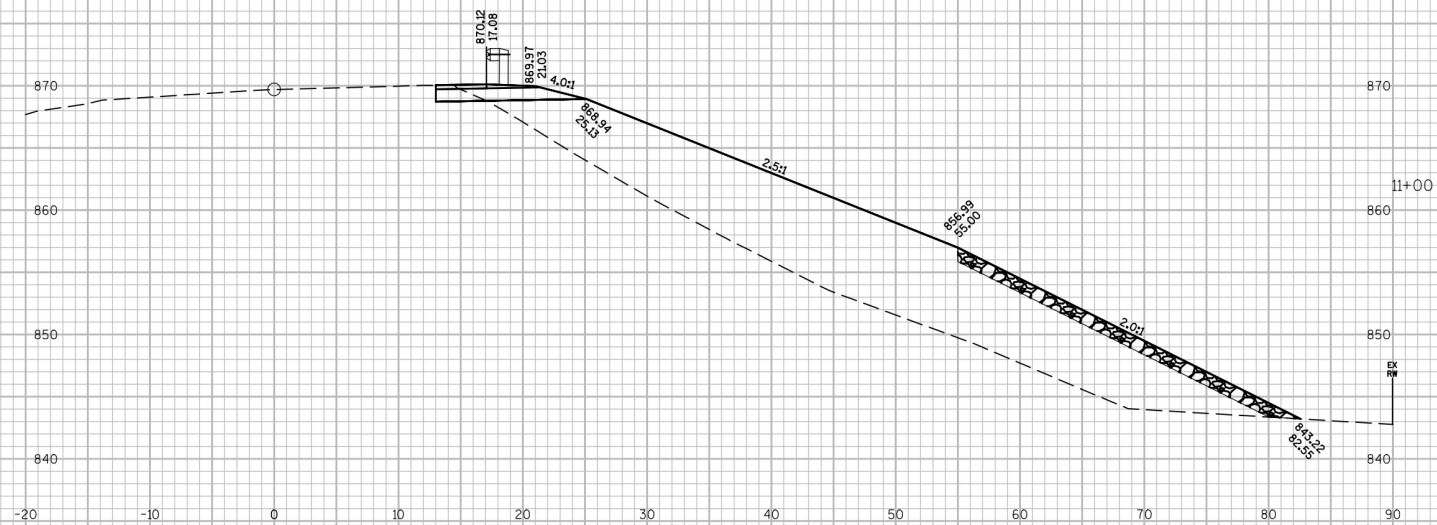
PLOT NAME :

PLOT SCALE : 1 IN:10 FT

WISDOT/CADDs SHEET 49



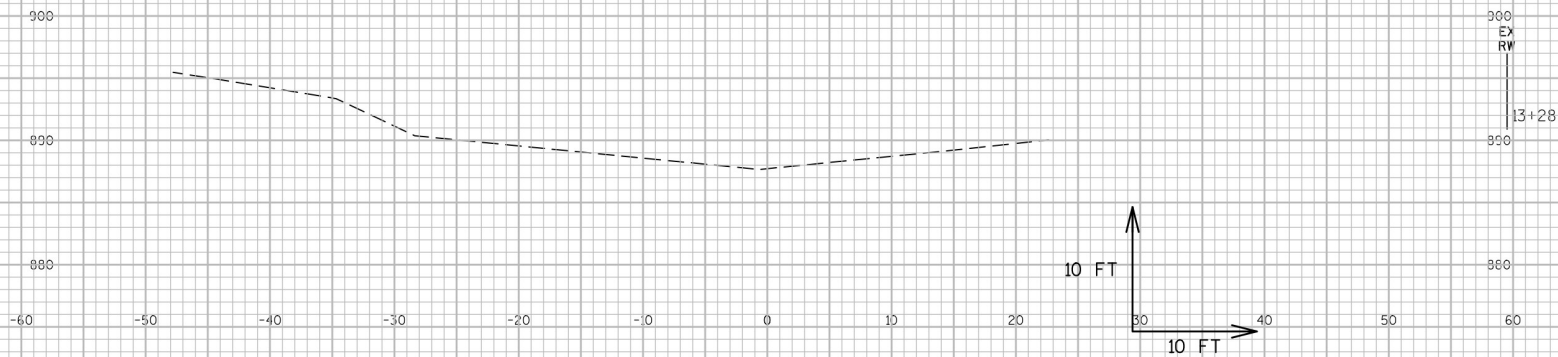
MATCH EXISTING ROADWAY
CROSS SLOPE



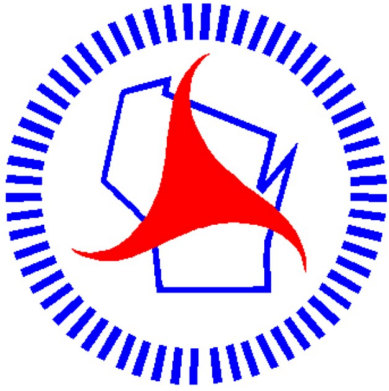
10 FT

10 FT -

9



9



Wisconsin Department of Transportation

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through innovation and exceptional service.

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