LAX

JAN 2016

PROJECT ID: 1016-04-61
WITH: N/A

COUNTY: JUNEAU

ORDER OF SHEETS

TOTAL SHEETS = 70

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
1016-04-61		

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY REHABILITATION-MAINTENANCE PROJECT

TOMAH-MAUSTON

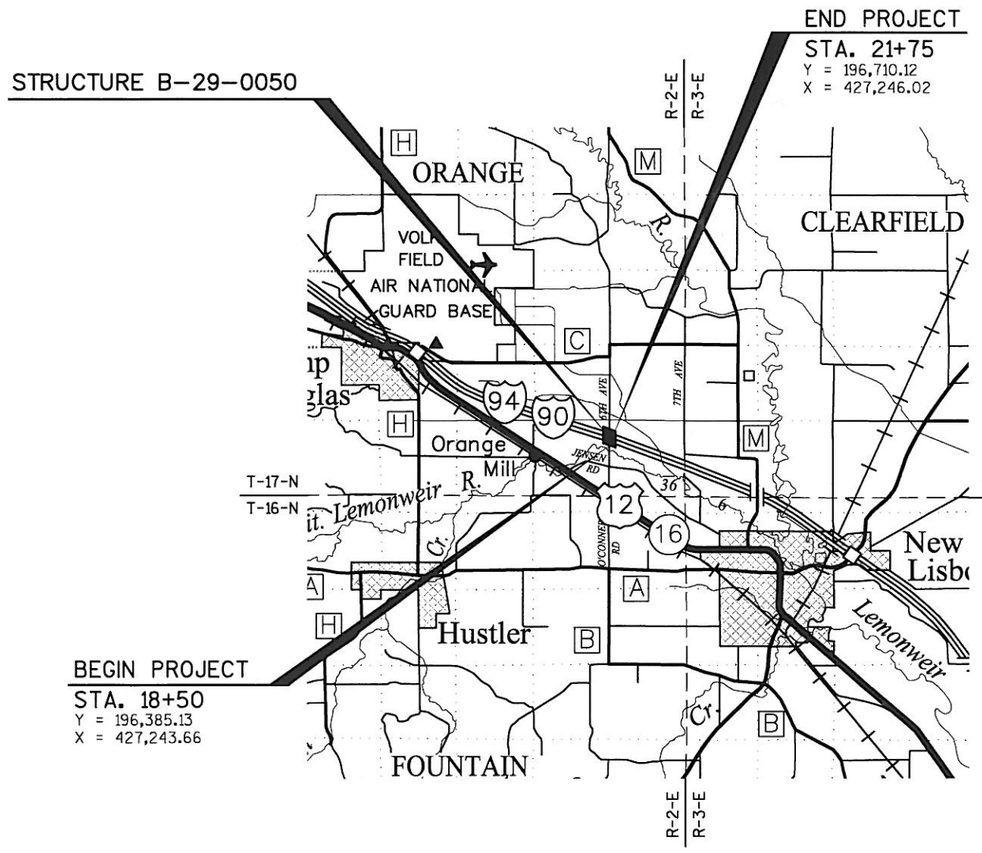
6TH AVENUE BRIDGE B-29-0050

IH 90

JUNEAU COUNTY

STATE PROJECT NUMBER
1016-04-61

N



LAYOUT
SCALE 0 1 MI.

TOTAL NET LENGTH OF CENTERLINE = 0.062 MI.

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

DESIGN DESIGNATION

		6TH AVE	I-90/94
A.A.D.T.	2015	= 250	= 33,200
A.A.D.T.	2035	= 295	= 39,800
D.H.V.	2035	= 50	= 3,100
D.D.		= 62/38	= 58/42
T.		= 4.8%	= 30.5%
DESIGN SPEED		= 40 M.P.H.	= 70 M.P.H.
ESALS		= 25,000	= 33,000,000

CONVENTIONAL SYMBOLS

PLAN

CORPORATE LIMITS

REFERENCE LINE

COMBUSTIBLE FLUIDS (CAUTION)

UTILITIES

ELECTRIC — E —
FIBER OPTIC — FO —
GAS — G —
SANITARY SEWER — SAN —
STORM SEWER — SS —
TELEPHONE — T —
WATER — W —
UTILITY PEDESTAL
POWER POLE
TELEPHONE POLE

ORIGINAL PLANS PREPARED BY

JEWELL
associates engineers, inc.
Engineers - Planners - Surveyors

WISCONSIN
ELLERY A. SCHAFFER
E-41742-6
SPRING GREEN, WI
PROFESSIONAL ENGINEER

7-22-13

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor JEWELL ASSOCIATES ENGINEERS, INC.
Designer JEWELL ASSOCIATES ENGINEERS, INC.
Project Manager FRED GRUBER, P.E., R.L.S.
Regional Examiner ROBERT WINTERTON, P.E.
Regional Supervisor OSCAR I. WINGER, P.E.
C.O. Examiner

APPROVED FOR THE DEPARTMENT

DATE: 7-22-2013
Signature

E

FILE NAME : S:\PROJECTS\W11507 IH90 OVERLAY B-29-0050 6TH AVE\CADD FILES\ROADWAY\01_TITLE SHEET.DWG
LAYOUT : TITLE SHEET
PLOT DATE : 7/22/2013
PLOT TIME : 11:09:03 AM
PLOT BY : HANOLD, ROBERT
PLOT SCALE : 1" = 1'
WISDOT/CADDS SHEET 10

2

LIST OF STANDARD ABBREVIATIONS

ABUT	Abutment	INV	Invert	SALV	Salvaged
AC	Acre	IP	Iron Pipe or Pin	SAN S	Sanitary Sewer
AGG	Aggregate	IRS	Iron Rod Set	SEC	Section
AH	Ahead	JT	Joint	SHLDR	Shoulder
<	Angle	JCT	Junction	SHR	Shrinkage
ASPH	Asphaltic	LHF	Left–Hand Forward	SW	Sidewalk
AVG	Average	L	Length of Curve	S	South
ADT	Average Daily Traffic	LIN FT or LF	Linear Foot	SQ	Square
BAD	Base Aggregate Dense	LC	Long Chord of Curve	SF or SQ FT	Square Feet
BK	Back	MH	Manhole	SY or SQ YD	Square Yard
BF	Back Face	MB	Mailbox	STD	Standard
BM	Bench Mark	ML or M/L	Match Line	SDD	Standard Detail Drawings
BR	Bridge	N	North	STH	State Trunk Highways
C or C/L	Center Line	Y	North Grid Coordinate	STA	Station
CC	Center to Center	OD	Outside Diameter	SS	Storm Sewer
CTH	County Trunk Highway	PLE	Permanent Limited Easement	SG	Subgrade
CR	Creek			SE	Superelevation
CR	Crushed	PT	Point	SL or S/L	Survey Line
CY or CU YD	Cubic Yard	PC	Point of Curvature	SV	Septic Vent
CP	Culvert Pipe	PI	Point of Intersection	T	Tangent
C & G	Curb and Gutter	PRC	Point of Reverse Curvature	TEL	Telephone
D	Degree of Curve	PT	Point of Tangency	TEMP	Temporary
DHV	Design Hour Volume	POC	Point On Curve	TI	Temporary Interest
DIA	Diameter	POT	Point on Tangent	TLE	Temporary Limited Easement
E	East	PVC	Polyvinyl Chloride		
X	East Grid Coordinate	PCC	Portland Cement Concrete	t	Ton
ELEC	Electric (al)	LB	Pound	T or TN	Town
EL or ELEV	Elevation	PSI	Pounds Per Square Inch	TRANS	Transition
ESALS	Equivalent Single Axle Loads	PE	Private Entrance	TL or T/L	Transit Line
		R	Radius	T	Trucks (percent of)
EBS	Excavation Below Subgrade	RR	Railroad	TYP	Typical
FF	Face to Face	R	Range	UNCL	Unclassified
FE	Field Entrance	RL or R/L	Reference Line	UG	Underground Cable
F	Fill	RP	Reference Point	USH	United States Highway
FG	Finished Grade	RCCP	Reinforced Concrete Culvert Pipe	VAR	Variable
FL or F/L	Flow Line			V	Velocity or Design Speed
FT	Foot	REQ'D	Required	VERT	Vertical
FTG	Footing	RES	Residence or Residential	VC	Vertical Curve
GN	Grid North	RW	Retaining Wall	VOL	Volume
HT	Height	RT	Right	WM	Water Main
CWT	Hundredweight	RHF	Right–Hand Forward	WV	Water Valve
HYD	Hydrant	R/W	Right–of–Way	W	West
INL	Inlet	R	River	WB	Westbound
ID	Inside Diameter	RD	Road	YD	Yard
		RDWY	Roadway		

GENERAL NOTES

COORDINATES AND BEARINGS ON THIS PLAN ARE REFERENCED TO THE WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), JUNEAU COUNTY.

ELEVATIONS SHOWN ON THE PLAN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

NO TREES OR SHRUBS ARE TO BE REMOVED UNLESS SUCH TREES OR SHRUBS HAVE FIRST BEEN DESIGNATED FOR REMOVAL BY THE ENGINEER IN THE FIELD.

WHEN THE QUANTITY OF THE ITEM OF BASE AGGREGATE DENSE OR ASPHALTIC SURFACE IS MEASURED FOR PAYMENT BY THE TON, THE THICKNESS SHOWN ON THE PLAN IS APPROXIMATE. THE ACTUAL THICKNESS WILL DEPEND ON THE DISTRIBUTION OF THE MATERIAL AS DIRECTED BY THE ENGINEER IN THE FIELD.

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

REMOVAL OF ASPHALTIC SURFACES WHERE AN ABUTTING ASPHALTIC SURFACE IS TO REMAIN IN PLACE SHALL REQUIRE A SAWCUT MEETING THE APPROVAL OF THE ENGINEER IN THE FIELD.

EXCAVATION BELOW SUBGRADE (EBS) IS NOT USED TO BALANCE YARDAGE AND IS NOT SHOWN ON THE CROSS SECTIONS BUT IS MEASURED AND PAID FOR AS EXCAVATION COMMON. EXACT LOCATIONS OF EBS WILL BE DETERMINED BY ENGINEER.

4 INCHES OF ASPHALTIC SURFACE SHALL BE CONSTRUCTED WITH A 2-INCH LOWER LAYER AND A 2-INCH UPPER LAYER. THE NOMINAL SIZE OF AGGREGATE USED FOR THE LOWER LAYER SHALL BE 12.5 MM.

SILT FENCE SHALL BE PLACED AS SHOWN ON THE PLAN OR AS DIRECTED BY THE ENGINEER IN THE FIELD. SILT FENCE SHALL BE PLACED PRIOR TO CONSTRUCTION.

THE LOCATION OF ALL PERMANENT SIGNING SHALL BE VERIFIED BY THE ENGINEER IN THE FIELD PRIOR TO PLACEMENT.

CONTACTS

WISDOT

WISCONSIN DEPARTMENT OF TRANSPORTATION
3550 MORMON COULEE ROAD
LA CROSSE, WI 54601
ATTN: ROBERT WINTERTON, P.E.
PHONE: (608) 789-7879
EMAIL: robert.winterton@dot.wi.gov

DESIGN CONSULTANT

JEWELL ASSOCIATES ENGINEERS, INC.
560 SUNRISE DR
SPRING GREEN, WI 53588
ATTN: FRED GRUBER, P.E., R.L.S.
PHONE: (608) 588-7484
FAX: (608) 588-9322
EMAIL: fred.gruber@jewellassoc.com

DNR LIAISON

STATE OF WISCONSIN
DNR SERVICE CENTER
473 GRIFFITH DR
WISCONSIN RAPIDS, WI 54494
ATTN: MARC HERSHFIELD
PHONE: (715) 421-7867
EMAIL: marc.hershfield@wisconsin.gov

UTILITIES

COMMUNICATION LINE

AT&T LEGACY
ATTN: WILLIAM KOENIG
JMC ENGINEERS & ASSOCIATES
P.O. BOX 244
127 N MAIN ST
LAKE MILLS, WI 53551
PHONE: (608) 628-0575
EMAIL: jmc140@myfrontiermail.com

LEMONWEIR VALLEY TELEPHONE COMPANY
ATTN: BEN GRILLEY
127 US HWY 12
P.O. BOX 267
CAMP DOUGLAS, WI 54618
PHONE: (608) 427-6515
EMAIL: bengrilley@mwt.net

ELECTRIC

OAKDALE ELECTRIC COOPERATIVE
ATTN: SCOTT BROOKMAN
489 N. OAKWOOD ST
P.O. BOX 128
OAKDALE, WI 54649
PHONE: (608) 372-4131
EMAIL: sbrookma@oakdalerec.com

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

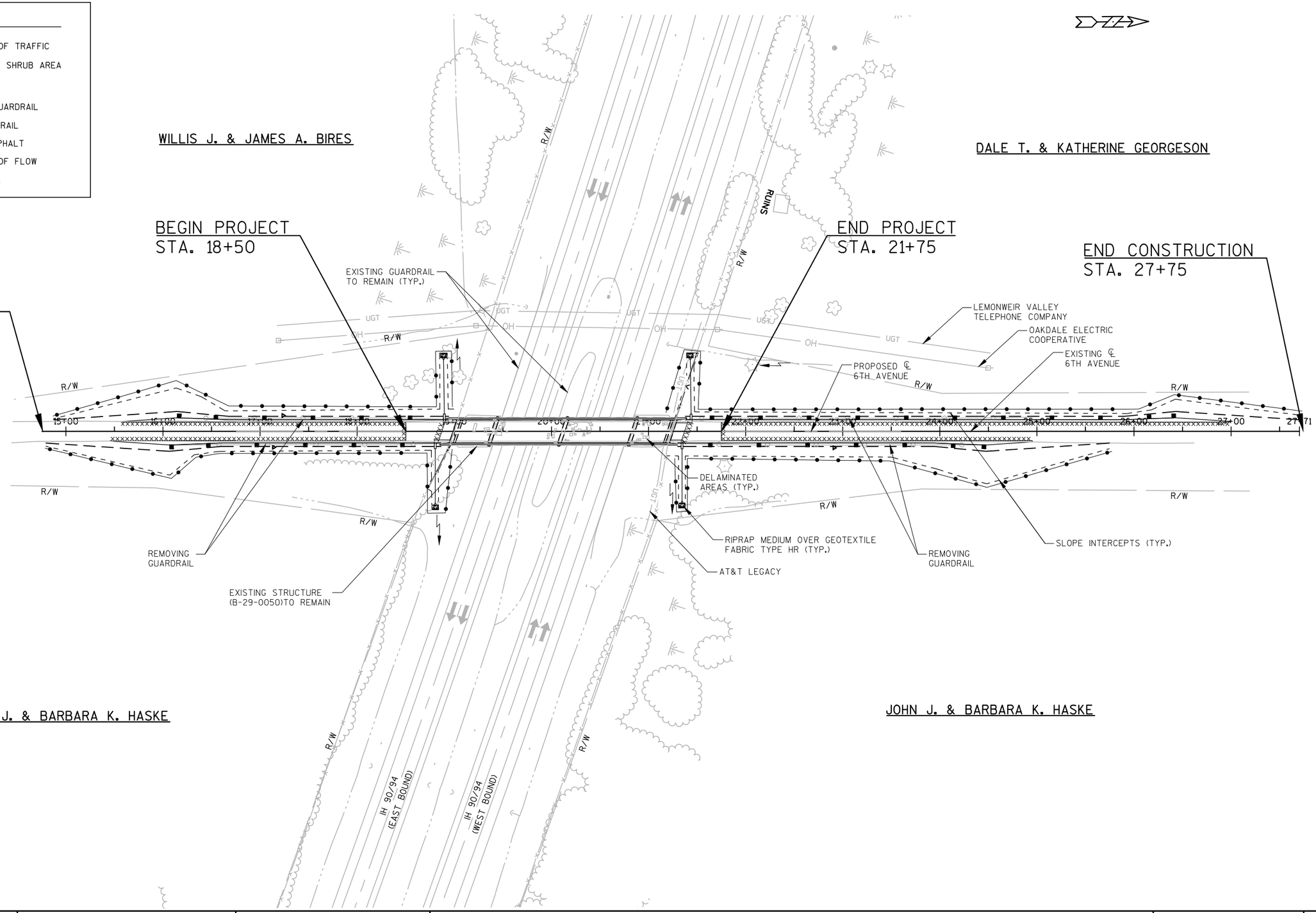
	HYDROLOGIC SOIL GROUP											
	A			B			C			D		
	SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)		
LAND USE	0-2	2-6	6 & OVER	0-2	2-6	6 & OVER	0-2	2-6	6 & OVER	0-2	2-6	6 & OVER
ROW CROPS	.08 .22	.16 .30	.22 .38	.12 .26	.20 .34	.27 .44	.15 .30	.24 .37	.33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

TOTAL PROJECT AREA= 1.97 ACRES
TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 1.29 ACRES

2

LEGEND

- DIRECTION OF TRAFFIC
- WOODED OR SHRUB AREA
- WETLANDS
- EXISTING GUARDRAIL
- MGS GUARDRAIL
- SAWING ASPHALT
- DIRECTION OF FLOW
- SILT FENCE



PROJECT NO: 1016-04-61	HWY: 6TH AVENUE	COUNTY: JUNEAU	PROJECT OVERVIEW	SHEET 3	E

FILE NAME : S:\PROJECTS\NEW FOLDER\W11507 IH90 OVERLAY B-29-0050 6TH AVE\CADD FILES\ROADWAY\03_PROJECT OVERVIEW.DWG
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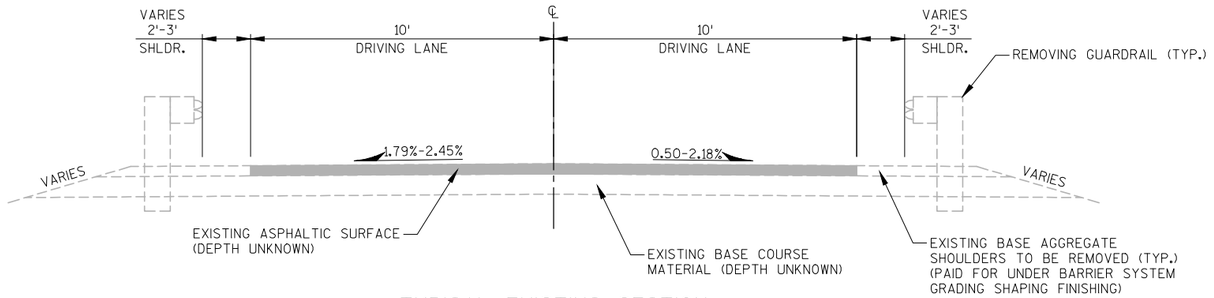
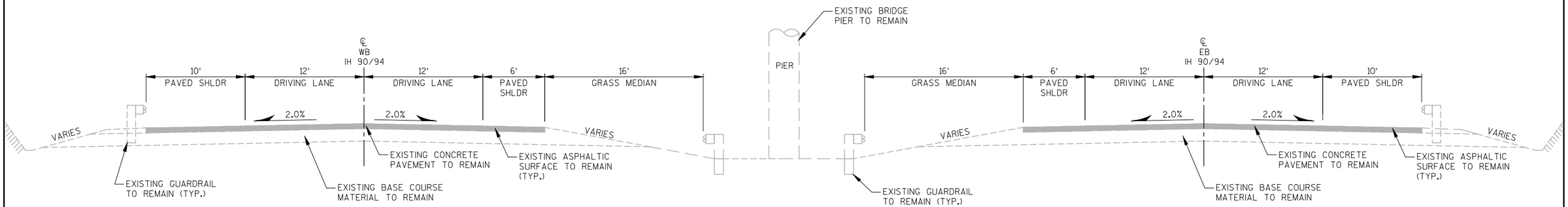
PLOT DATE : 10/28/2015
PLOT TIME : 3:37:25 PM
PLOT BY : BALLWEG,THOMAS
PLOT SCALE : 1" = 1'

2



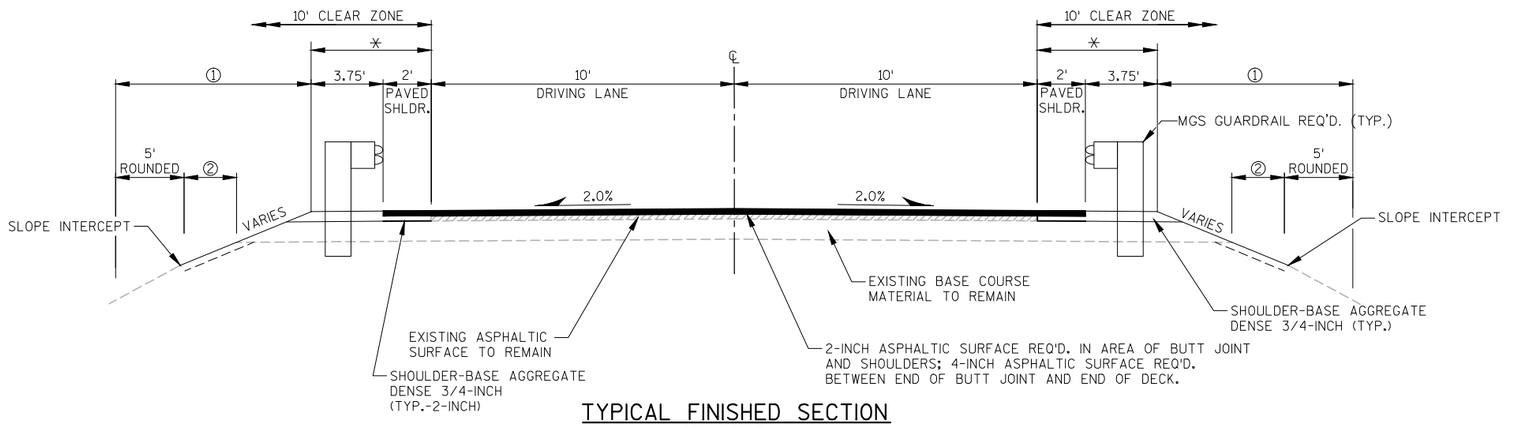
TYPICAL EXISTING SECTION

6TH AVENUE
STA. 14+75 - STA. 18+99.80
STA. 21+24.49 - STA. 27+75



TYPICAL EXISTING SECTION

IH 90/94



TYPICAL FINISHED SECTION

6TH AVENUE
STA. 18+50 - STA. 18+99.80
STA. 21+24.49 - STA. 21+75

✳ PAY LIMITS FOR PREPARE FOUNDATION FOR ASPHALTIC SHOULDERS

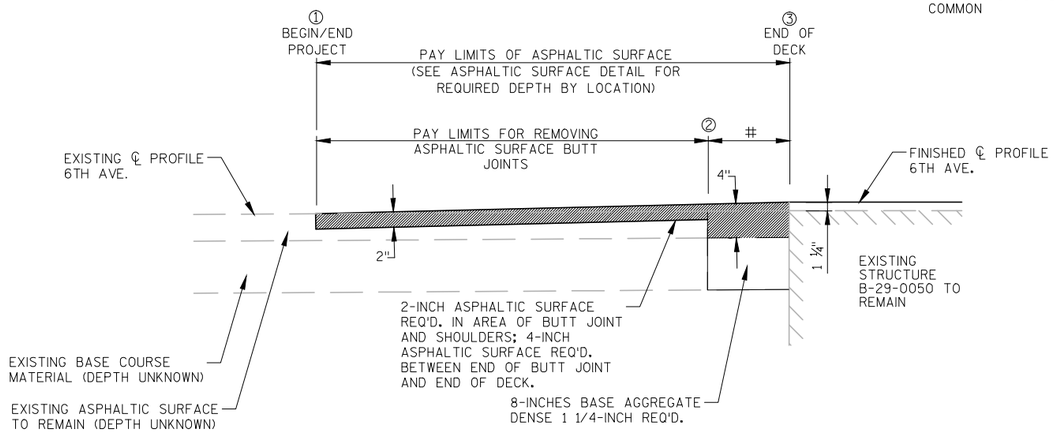
① LIMITS OF FERTILIZER TYPE B, SEEDING MIXTURE NO. 20, MULCHING, & SEEDING TEMPORARY (INCIDENTAL TO BARRIER SYSTEM GRADING SHAPING FINISHING BID ITEM).

② LIMITS OF TOPSOIL (INCIDENTAL TO BARRIER SYSTEM GRADING SHAPING FINISHING BID ITEM).

NOTE: 4-INCH ASPHALTIC SURFACE OVER 8-INCHES BASE AGGREGATE DENSE 1 1/4-INCH
STA. 18+87 - STA. 18+99.80
STA. 21+24.49 - STA. 21+37

PROJECT NO: 1016-04-61	HWY: 6TH AVENUE	COUNTY: JUNEAU	TYPICAL EXISTING SECTIONS & TYPICAL FINISHED SECTION	SHEET 4	E

FILE NAME : S:\PROJECTS\W11507 IH90 OVERLAY B-29-0050 6TH AVE\CADD FILES\ROADWAY\TYPICALS\TYPICAL.DWG
LAYOUT : LAYOUT
PLOT DATE : 7/31/2013
PLOT TIME : 8:40:22 AM
PLOT BY : STRINE, THERESA
PLOT SCALE : 1" = 1'



BUTT JOINT DETAIL
PROFILE VIEW

(PROFILE VIEW AT 6TH AVENUE CENTERLINE)

① STATION	② STATION	③ STATION
18+50	18+87	18+99.80
21+75	21+37	21+24.49

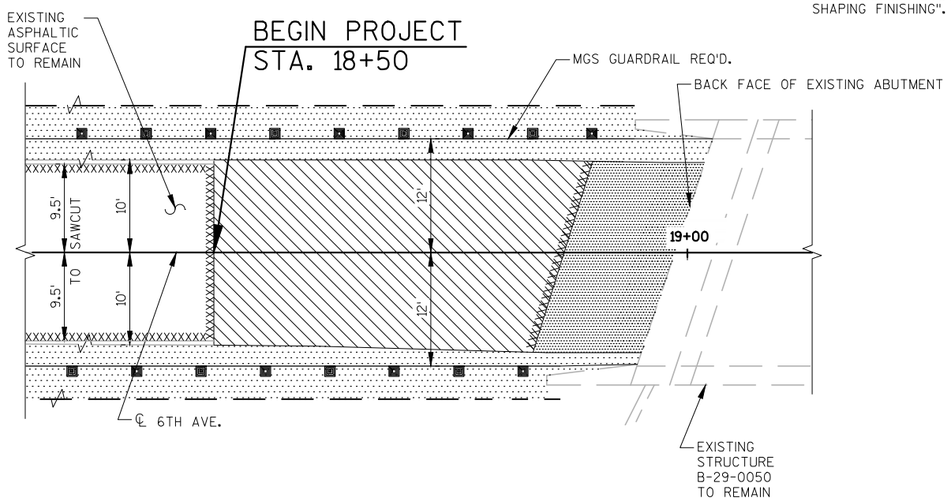
LIMITS FOR EXCAVATION COMMON

LIMITS FOR EXCAVATION COMMON (INCLUDED IN BID ITEM BARRIER SYSTEM GRADING SHAPING FINISHING)

PAY LIMITS FOR REMOVING ASPHALTIC SURFACE BUTT JOINTS

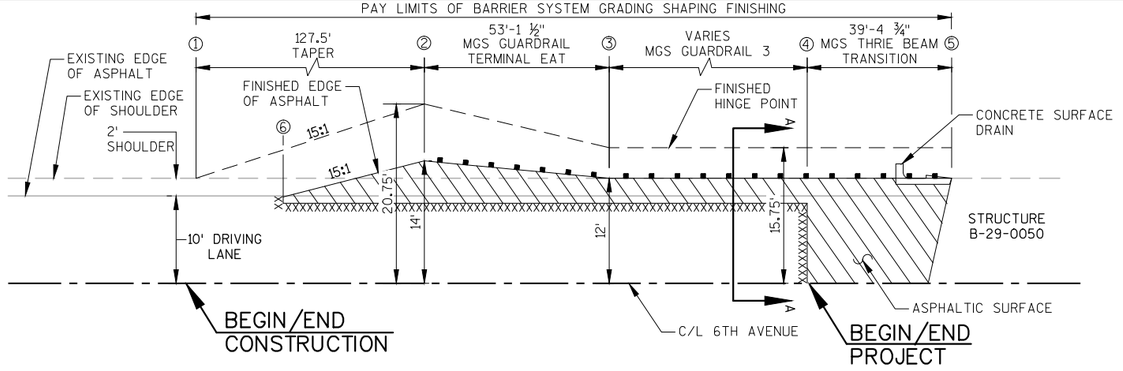
xxxxxxxx SAWING ASPHALT REQ'D.

NOTE: USE MATERIAL EXCAVATED UNDER "EXCAVATION COMMON" IN AREA OF BORROW MATERIAL NEEDED FOR BID ITEM "BARRIER SYSTEM GRADING SHAPING FINISHING".



BUTT JOINT DETAIL
PLAN VIEW

6TH AVENUE
(SOUTH END SHOWN, NORTH END SIMILAR)
NOTE: DETAIL NOT TO SCALE



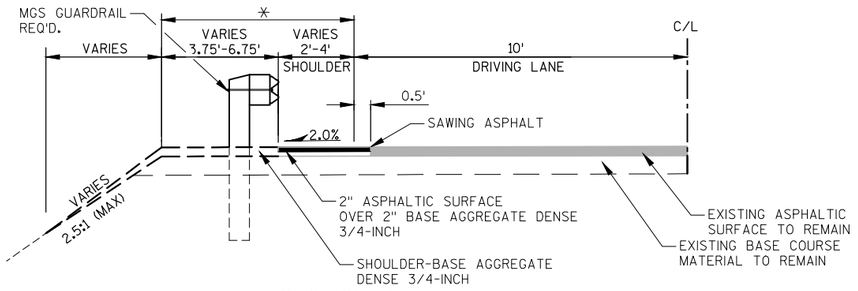
BEAMGUARD LAYOUT DETAIL

LEGEND

xxxxxxxx SAWING ASPHALT

BEAMGUARD LAYOUT TABLE

QUADRANT	LOCATION	STATION ①	②	③	④	⑤	⑥
SOUTHWEST	6TH AVENUE, LT.	14+87	16+14	16+68	18+55	18+94	15+58
SOUTHEAST	6TH AVENUE, RT.	14+79	16+07	16+60	18+47	18+87	15+45
NORTHWEST	6TH AVENUE, LT.	27+71	26+43	25+90	21+77	21+38	26+99
NORTHEAST	6TH AVENUE, RT.	25+75	24+48	23+95	21+69	21+30	24+95



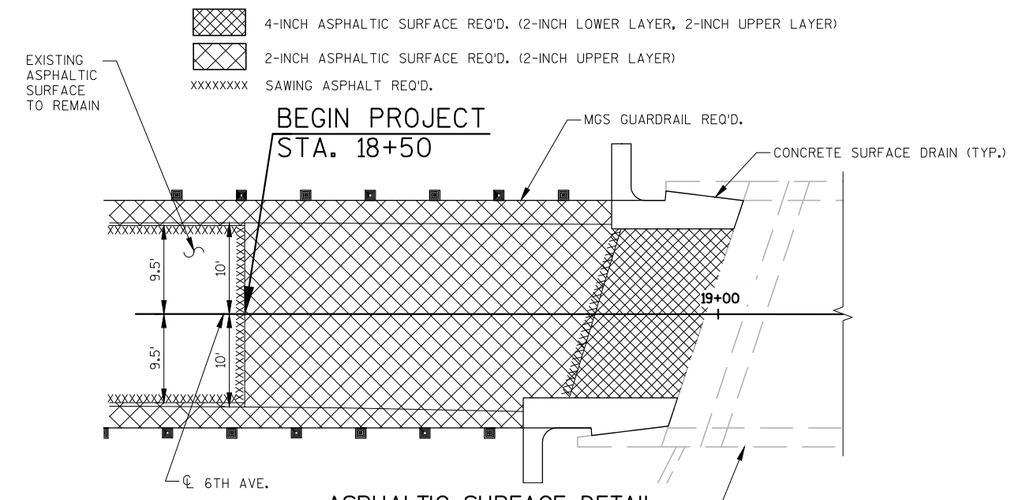
✳PAY LIMITS FOR PREPARE FOUNDATION FOR ASPHALTIC SHOULDERS

SECTION A–A

4-INCH ASPHALTIC SURFACE REQ'D. (2-INCH LOWER LAYER, 2-INCH UPPER LAYER)

2-INCH ASPHALTIC SURFACE REQ'D. (2-INCH UPPER LAYER)

xxxxxxxx SAWING ASPHALT REQ'D.

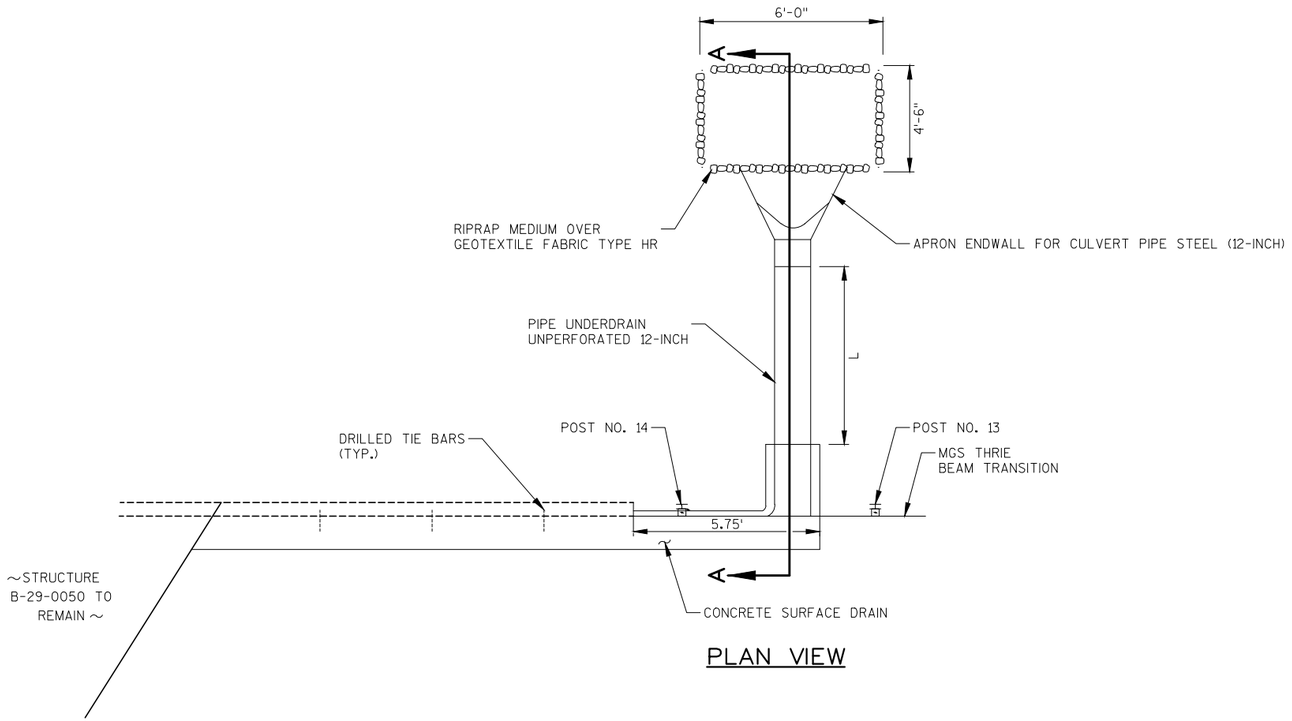


ASPHALTIC SURFACE DETAIL

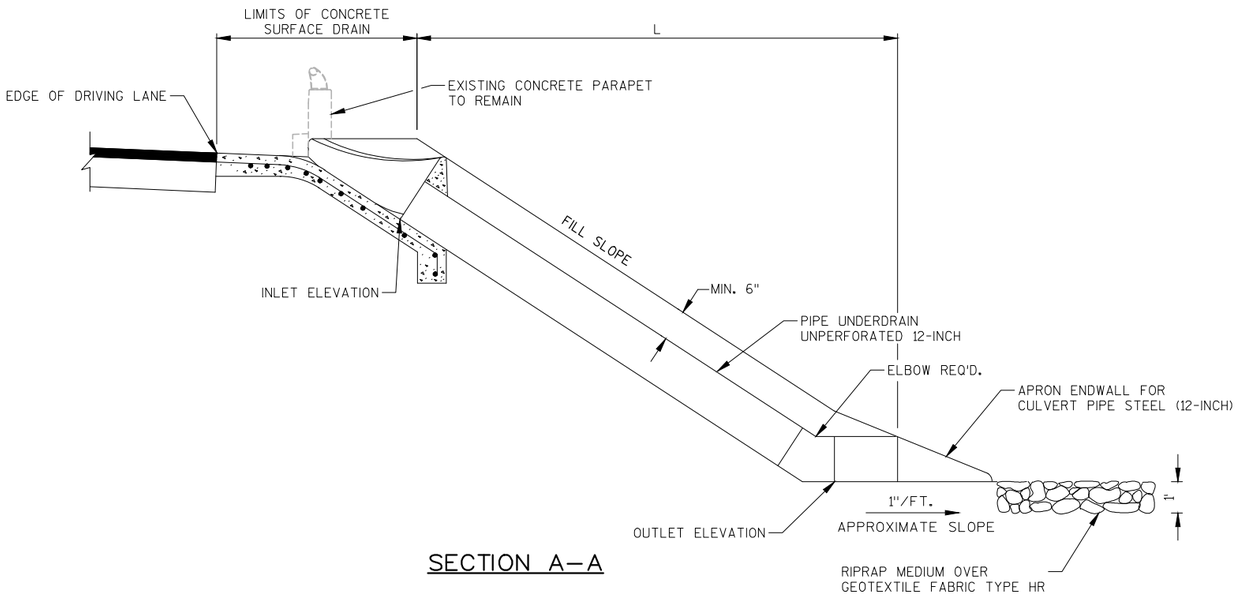
6TH AVENUE
(SOUTH END SHOWN, NORTH END SIMILAR)
NOTE: DETAIL NOT TO SCALE

PROJECT NO: 1016-04-61	HWY: 6TH AVENUE	COUNTY: JUNEAU	CONSTRUCTION DETAILS	SHEET 5	E

FILE NAME : S:\PROJECTS\W11507 IH90 OVERLAY B-29-0050 6TH AVE\CADD FILES\ROADWAY\04_DETAILS.DWG
LAYOUT : LAYOUT
PLOT DATE : 7/31/2013
PLOT TIME : 8:42:33 AM
PLOT BY : STRINE, THERESA
PLOT SCALE : 1" = 1'



PLAN VIEW

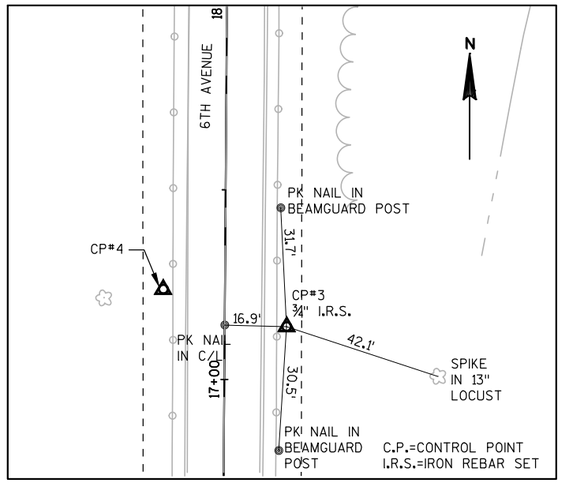


SECTION A–A

PIPE UNDERDRAIN LAYOUT TABLE

QUADRANT	LOCATION	INLET OFFSET	INLET ELEVATION	OUTLET OFFSET	OUTLET ELEVATION	L (FT.)
SOUTHWEST	6TH AVENUE, LT.	18.0	909.77	74.0	891.32	56
SOUTHEAST	6TH AVENUE, RT.	18.0	909.84	72.0	892.53	54
NORTHWEST	6TH AVENUE, LT.	18.0	911.53	74.0	890.75	56
NORTHEAST	6TH AVENUE, RT.	18.0	911.89	74.0	893.23	56

NOTE: DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF S.D.D. DRAWING "CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES"



TIES TO CP#3
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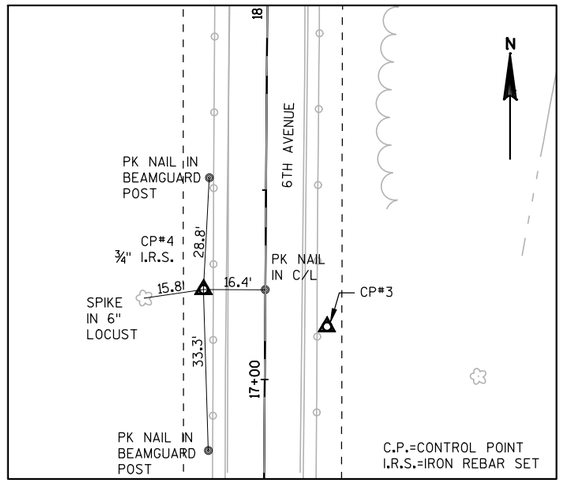
X=427,259.00



TIES TO CP#4
STA. 17+23.6, 16.3' LT
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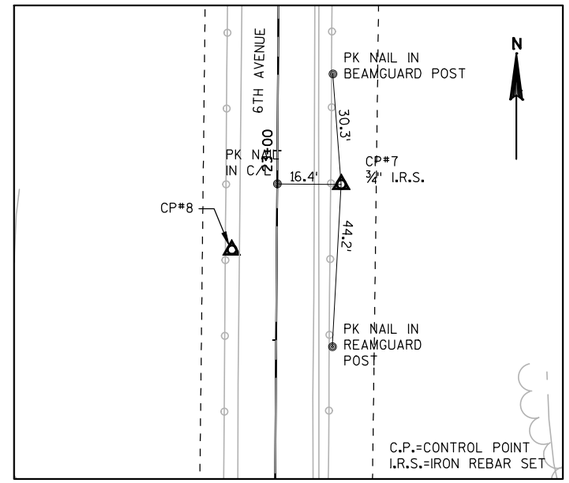
X=427,226.44



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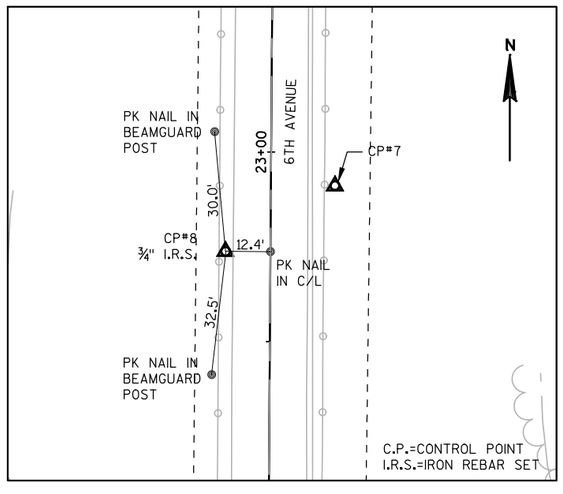


TIES TO CP#8
STA. 22+73.7, 11.9' LT
Y=196,808.91
X=427,234.85

▲ CONTROL POINTS

NO.	STA.	DESCRIPTION	Y	X
3	17+14.0	¾" REBAR, 16.3' RT	196,249.03	427,259.00
4	17+23.6	¾" REBAR, 16.3' LT.	196,258.88	427,226.44
7	22+91.2	¾" REBAR, 16.9' RT.	196,826.20	427,263.74
8	22+73.7	¾" REBAR, 11.9' LT	196,808.91	427,234.85

6TH AVENUE STATION LAYOUT

STATION	Y	X	COMMENTS
14+75	196,010.14	427,240.93	BEGIN CONSTRUCTION
15+00	196,035.14	427,241.11	–
15+50	196,085.14	427,241.48	–
16+00	196,135.13	427,241.84	–
16+50	196,185.13	427,242.20	–
17+00	196,235.13	427,242.57	–
17+50	196,285.13	427,242.93	–
18+00	196,335.13	427,243.29	–
18+50	196,385.13	427,243.66	BEGIN PROJECT
18+99.80	196,434.93	427,244.02	END OF DECK
19+00	196,435.13	427,244.02	–
19+50	196,485.13	427,244.38	–
20+00	196,535.12	427,244.75	–
20+50	196,585.12	427,245.11	–
21+00	196,635.12	427,245.47	–
21+24.49	196,659.61	427,245.65	END OF DECK
21+50	196,685.12	427,245.84	–
21+75	196,710.12	427,246.02	END PROJECT
22+00	196,735.12	427,246.20	–
22+50	196,785.12	427,246.57	–
23+00	196,835.12	427,246.93	–
23+50	196,885.11	427,247.29	–
24+00	196,935.11	427,247.66	–
24+50	196,985.11	427,248.02	–
25+00	197,035.11	427,248.38	–
25+50	197,085.11	427,248.75	–
26+00	197,135.11	427,249.11	–
26+50	197,185.11	427,249.47	–
27+00	197,235.11	427,249.84	–
27+50	197,285.10	427,250.20	–
27+75	197,310.10	427,250.38	END CONSTRUCTION

DATE 03NOV15 E S T I M A T E O F Q U A N T I T I E S

LINE NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	1016-04-61 QUANTITY
0010	201.0105	Clearing	STA	4.000	4.000
0020	201.0205	Grubbing	STA	4.000	4.000
0030	203.0200	Removing Old Structure (station) 01. 20+12.15	LS	1.000	1.000
0040	204.0115	Removing Asphaltic Surface Butt Joints	SY	170.000	170.000
0050	204.0165	Removing Guardrail	LF	1,250.000	1,250.000
0060	204.0170	Removing Fence	LF	120.000	120.000
0070	204.0175	Removing Concrete Slope Paving	SY	33.000	33.000
0080	205.0100	Excavation Common	CY	20.000	20.000
0090	206.1000	Excavation for Structures Bridges (structure) 01. B-29-0050	LS	1.000	1.000
0100	210.0100	Backfill Structure	CY	40.000	40.000
0110	211.0400	Prepare Foundation for Asphaltic Shoulders	STA	19.000	19.000
0120	213.0100	Finishing Roadway (project) 01. 1016-04-61	EACH	1.000	1.000
0130	305.0110	Base Aggregate Dense 3/4-Inch	TON	320.000	320.000
0140	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	50.000	50.000
0150	416.0610	Drilled Tie Bars	EACH	12.000	12.000
0160	416.1010	Concrete Surface Drains	CY	5.000	5.000
0170	455.0605	Tack Coat	GAL	2.000	2.000
0180	465.0105	Asphaltic Surface	TON	75.000	75.000
0190	502.0100	Concrete Masonry Bridges	CY	22.000	22.000
0200	502.0717.S	Crack Sealing Epoxy	LF	85.000	85.000
0210	502.3200	Protective Surface Treatment	SY	600.000	600.000
0220	502.5002	Masonry Anchors Type L No. 4 Bars	EACH	12.000	12.000
0230	502.5010	Masonry Anchors Type L No. 6 Bars	EACH	16.000	16.000
0240	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	3,820.000	3,820.000
0250	506.0105	Structural Steel Carbon	LB	1,640.000	1,640.000
0260	506.2605	Bearing Pads Elastomeric Non-Laminated	EACH	8.000	8.000
0270	506.7050.S	Removing Bearings (structure) 01. B-29-0050	EACH	8.000	8.000
0280	509.0301	Preparation Decks Type 1	SY	63.000	63.000
0290	509.0302	Preparation Decks Type 2	SY	25.000	25.000
0300	509.0500	Cleaning Decks	SY	590.000	590.000
0310	509.2000	Full-Depth Deck Repair	SY	5.000	5.000
0320	509.2500	Concrete Masonry Overlay Decks	CY	45.000	45.000
0330	516.0500	Rubberized Membrane Waterproofing	SY	10.000	10.000
0340	517.3000.S	Structure Overcoating Cleaning and Priming (structure) 01. B-29-0050	LS	1.000	1.000
0350	517.4000.S	Containment and Collection of Waste Materials (structure) 01. B-29-0050	LS	1.000	1.000
0360	521.1012	Apron Endwalls for Culvert Pipe Steel 12-Inch	EACH	4.000	4.000
0370	604.0400	Slope Paving Concrete	SY	33.000	33.000
0380	606.0200	Riprap Medium	CY	5.000	5.000
0390	612.0212	Pipe Underdrain Unperforated 12-Inch	LF	222.000	222.000
0400	612.0406	Pipe Underdrain Wrapped 6-Inch	LF	150.000	150.000
0410	612.0806	Apron Endwalls for Underdrain Reinforced Concrete 6-Inch	EACH	4.000	4.000
0420	614.0010	Barrier System Grading Shaping Finishing	EACH	4.000	4.000
0430	614.2300	MGS Guardrail 3	LF	1,014.000	1,014.000
0440	614.2500	MGS Thrie Beam Transition	LF	160.000	160.000
0450	614.2610	MGS Guardrail Terminal EAT	EACH	4.000	4.000

3

DATE 03NOV15 E S T I M A T E O F Q U A N T I T I E S

LINE NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	1016-04-61 QUANTITY
0460	616.0100	Fence Woven Wire (height) 01. 4 - Ft	LF	120.000	120.000
0470	618.0100	Maintenance And Repair of Haul Roads (project) 01. 1016-04-61	EACH	1.000	1.000
0480	619.1000	Mobilization	EACH	1.000	1.000
0490	624.0100	Water	MGAL	3.000	3.000
0500	628.1504	Silt Fence	LF	3,000.000	3,000.000
0510	628.1520	Silt Fence Maintenance	LF	6,000.000	6,000.000
0520	628.1905	Mobilizations Erosion Control	EACH	3.000	3.000
0530	628.1910	Mobilizations Emergency Erosion Control	EACH	2.000	2.000
0540	633.5200	Markers Culvert End	EACH	4.000	4.000
0550	634.0612	Posts Wood 4x6-Inch X 12-FT	EACH	4.000	4.000
0560	637.2230	Signs Type II Reflective F	SF	12.000	12.000
0570	642.5001	Field Office Type B	EACH	1.000	1.000
0580	643.0100	Traffic Control (project) 01. 1016-04-61	EACH	1.000	1.000
0590	643.0300	Traffic Control Drums	DAY	430.000	430.000
0600	643.0420	Traffic Control Barricades Type III	DAY	10.000	10.000
0610	643.0715	Traffic Control Warning Lights Type C	DAY	170.000	170.000
0620	643.0800	Traffic Control Arrow Boards	DAY	10.000	10.000
0630	643.0900	Traffic Control Signs	DAY	80.000	80.000
0640	645.0120	Geotextile Fabric Type HR	SY	24.000	24.000
0650	646.0106	Pavement Marking Epoxy 4-Inch	LF	420.000	420.000
0660	646.0600	Removing Pavement Markings	LF	420.000	420.000
0670	646.0805.S	Pavement Marking Outfall	EACH	4.000	4.000
0680	649.0400	Temporary Pavement Marking Removable Tape 4-Inch	LF	1,560.000	1,560.000
0690	650.4500	Construction Staking Subgrade	LF	25.000	25.000
0700	650.5000	Construction Staking Base	LF	25.000	25.000
0710	650.6000	Construction Staking Pipe Culverts	EACH	4.000	4.000
0720	650.9910	Construction Staking Supplemental Control (project) 01. 1016-04-61	LS	1.000	1.000
0730	650.9920	Construction Staking Slope Stakes	LF	565.000	565.000
0740	690.0150	Sawing Asphalt	LF	1,540.000	1,540.000
0750	715.0502	Incentive Strength Concrete Structures	DOL	500.000	500.000
0760	SPV.0060	Special 01. Removing Floor Drains	EACH	6.000	6.000
0770	SPV.0105	Special 01. Remove And Replace Tubular Railing	LS	1.000	1.000

3

CLEARING & GRUBBING

STATION - STATION	LOCATION	201.0105 CLEARING (STA.)	201.0205 GRUBBING (STA.)
15+00 - 18+00	6TH AVENUE	3	3
24+00 - 25+00	6TH AVENUE	1	1
	TOTALS =	4	4

REMOVING ASPHALTIC SURFACE BUTT JOINTS

STATION - STATION	LOCATION	204.0115 (SY.)
18+50 - 18+87	6TH AVENUE	84
21+37 - 21+75	6TH AVENUE	86
	TOTAL =	170

REMOVING GUARDRAIL

STATION - STATION	LOCATION	204.0165 (LF)
16+08 - 18+87	6th AVENUE, RT.	284
16+14 - 18+94	6TH AVENUE, LT.	286
21+30 - 24+45	6TH AVENUE, RT.	320
21+38 - 24+92	6TH AVENUE, LT.	360
	TOTAL =	1250

REMOVING FENCE

STATION - STATION	LOCATION	204.0170 (LF)	REMARKS
18+73 - 18+96	6TH AVENUE, RT.	50	FENCE WOVEN WIRE
21+29 - 21+50	6TH AVENUE, LT.	70	FENCE WOVEN WIRE
	TOTAL =	120	

3

EARTHWORK SUMMARY

FROM/TO STA	LOCATION	(1) 205.0100 COMMON EXCAVATION CUT (2) (CY)	(1) 205.0100 COMMON EXCAVATION EBS (3) (CY)	SALVAGED/ UNUSABLE PAVEMENT MATERIAL (CY) (4)	AVAILABLE MATERIAL (CY) (5)	205.0400 MARSH EXCAVATION (CY) (6)	205.0200 ROCK EXCAVATION (CY) (7)	REDUCED MARSH IN FILL (CY) FACTOR 0.6 (8)	REDUCED EBS IN FILL (CY) FACTOR 0.8 (9)	EXPANDED MARSH BACKFILL (CY) FACTOR 1.5 (10)	EXPANDED EBS BACKFILL (CY) FACTOR 1.5 (11)	EXPANDED ROCK (CY) FACTOR 1.1 (12)	UNEXPANDED FILL (CY)	EXPANDED FILL (CY) FACTOR 1.25 (13)	MASS ORDINATE +/- (CY) (14)	WASTE (CY)	208.0100 BORROW (CY)	COMMENT:
18+87 - 18+99	6TH AVENUE	10	-	-	10	-	-	-	-	-	-	-	-	-	10	10	-	
21+25 - 21+37	6TH AVENUE	10	-	-	10	-	-	-	-	-	-	-	-	-	10	10	-	
	TOTALS =	20			20										20	20		

NOTES:
1.) COMMON EXCAVATION IS THE SUM OF THE CUT AND EBS EXCAVATION COLUMNS. ITEM NUMBER 205.0100
2.) SALVAGED/UNUSABLE PAVEMENT MATERIAL IS INCLUDED IN CUT
3.) EBS EXCAVATION TO BE BACKFILLED WITH SELECT CRUSHED MATERIAL.
4.) SALVAGED/UNUSABLE PAVEMENT MATERIAL
5.) AVAILABLE MATERIAL = CUT - SALVAGED/UNUSABLE PAVEMENT MATERIAL
6.) MARSH EXCAVATION - TO BE BACKFILLED WITH SELECT CRUSHED MATERIAL. ITEM 205.0400
7.) ROCK EXCAVATION. ITEM NUMBER 205.0200
8.) REDUCED MARSH IN FILL - EXCAVATED MARSH MATERIAL IS USABLE IN FILLS OUTISDE THE 1:1 SLOPE. MARSH IN FILL REDUCTION FACTOR = 0.6
9.) REDUCED EBS IN FILL - EXCAVATED EBS MATERIAL IS USEABLE IN FILLS OUTISDE 1:1 SLOPE. EBS IN FILL REDUCTION FACTOR = 0.8
10) EXPANDED MARSH BACKFILL - THIS IS TO BE FILLED WITH SELECT CRUSHED MATERIAL. MARSH BACKFILL FACTOR = 1.5. ITEM NUMBER 312.0115
11.)EXPANDED EBS BACKFILL - THIS IS TO BE FILLED WITH SELECT CRUSHED MATERIAL. EBS BACKFILL FACTOR = 1.3. ITEM NUMBER 312.0115
12.) EXPANDED ROCK FACTOR = 1.1
13.) EXPANDED FILL FACTOR 1.25: EXPANDED FILL = (UNEXPANDED FILL - REDUCED MARSH IN FILL)*1.25
14.) THE MASS ORDINATE+ OR - QTY CALCULATED FOR THE DIVISION. PLUS QUANTITY INDICATES AN EXCESS OF MATERIOAL QITHIN THE CATEGORY. MINUS INDICATES A SHORTAGE OF MATERIAL WITHIN THE CATEGORY.

WATER

STATION - STATION	LOCATION	624.0100 (MGAL)
14+79 - 25+75	6TH AVENUE	3
	TOTAL =	3

PREPARE FOUNDATION FOR ASPHALTIC SHOULDERS

STATION - STATION	LOCATION	211.0400 (STA.)
14+79 - 18+87	6TH AVENUE, RT.	4
14+87 - 18+94	6TH AVENUE, LT.	4
21+30 - 25+75	6TH AVENUE, RT.	5
21+38 - 27+71	6TH AVENUE, LT.	6
	TOTAL =	19

BASE AGGREGATE DENSE

STATION - STATION	LOCATION	305.0110 BASE AGGREGATE DENSE 3/4-INCH (TON)	305.0120 BASE AGGREGATE DENSE 1 1/4-INCH (TON)
14+87 - 18+94	6TH AVENUE, LT.	64	--
14+79 - 18+87	6TH AVENUE, RT.	64	--
18+87 - 18+99	6TH AVENUE	--	22
21+26 - 21+37	6TH AVENUE	--	20
21+38 - 27+71	6TH AVENUE, LT.	98	--
21+30 - 25+75	6TH AVENUE, RT.	70	--
--	UNDISTRIBUTED	24	8
	TOTAL =	320	50

CONCRETE SURFACE DRAIN

QUADRANT	LOCATION	416.0610 DRILLED TIE BARS (EACH)	416.1010 CONCRETE SURFACE DRAINS (CY)	521.1012 APRON ENDWALLS FOR CULVERT PIPE STEEL 12-INCH (EACH)	610.0200 RIPRAP MEDIUM (CY)	612.0212 PIPE UNDERDRAIN UNPERFORATED 12-INCH (LF)	633.5200 MARKERS CULVERT END (EACH)	645.0120 GEOTEXTILE FABRIC TYPE HR (SY)	650.6000 CONSTRUCTION STAKING PIPE CULVERTS (EACH)
SOUTHWEST	6TH AVENUE, LT.	3	1	1	1	56	1	6	1
SOUTHEAST	6TH AVENUE, RT.	3	1	1	1	54	1	6	1
NORTHWEST	6TH AVENUE, LT.	3	1	1	1	56	1	6	1
NORTHEAST	6TH AVENUE, RT.	3	1	1	1	56	1	6	1
--	UNDISTRIBUTED	--	1	--	1	--	--	-	-
	TOTALS =	12	5	4	5	222	4	24	4

ASPHALTIC SURFACE

STATION - STATION	LOCATION	455.0605 TACK COAT (GAL)	465.0105 ASPHALTIC SURFACE (TON)
15+45 - 18+87	6TH AVENUE, RT.	--	12
15+58 - 18+94	6TH AVENUE, LT.	--	12
18+87 - 18+99	6TH AVENUE (DRIVING LANE)	1	6
21+26 - 21+37	6TH AVENUE (DRIVING LANE)	1	6
21+38 - 26+99	6TH AVENUE, LT.	--	19
21+30 - 24+95	6TH AVENUE, RT.	--	13
--	UNDISTRIBUTED	--	7
	TOTALS =	2	75

BARRIER SYSTEM GRADING SHAPING FINISHING

STATION - STATION	LOCATION	614.0010 BARRIER SYSTEM GRADING SHAPING FINISHING (EACH)	FOR INFORMATION ONLY: EXCAVATION COMMON (CY)	UNEXPANDED FILL (CY)	EXPANDED FILL (25%) (CY)	WASTE (CY)	BORROW (CY)	SALVAGED TOPSOIL (SY)	FERTILIZER TYPE B (CWT)	SEEDING MIX NO. 20 (LB)	MULCHING (SY)	SEEDING TEMPORARY (LB)
14+79 - 18+87	6TH AVENUE, RT.	1	31	132	165	0	134	310	0.39	17	650	9
14+87 - 18+94	6TH AVENUE, LT.	1	32	181	226	0	194	285	0.38	18	620	9
21+30 - 25+75	6TH AVENUE, RT.	1	32	225	282	0	250	175	0.43	19	700	9
21+38 - 27+71	6TH AVENUE, LT.	1	45	69	87	0	42	960	0.8	36	1330	18
TOTALS =		4	140	607	760	0	620	1730	2.0	90	3300	45

MGS GUARDRAIL

STATION - STATION	LOCATION	614.2300 MGS GUARDRAIL 3 (LF)	614.2500 MGS THRIE BEAM TRANSITION (LF)	614.2610 MGS GUARDRAIL TERMINAL EAT (EACH)
16+14 - 18+94	6TH AVENUE, LT.	188	40	1
16+07 - 18+87	6TH AVENUE, RT.	188	40	1
21+38 - 26+43	6TH AVENUE, LT.	413	40	1
21+30 - 24+48	6TH AVENUE, RT.	225	40	1
TOTAL =		1014	160	4

FENCE WOVEN WIRE (4-FT)

STATION - STATION	LOCATION	616.0100 (LF)
18+73 - 18+96	6TH AVENUE, RT.	50
21+29 - 21+50	6TH AVENUE, LT.	70
TOTAL =		120

MAINTENANCE AND REPAIR OF HAUL ROADS (1016-04-61)

PROJECT	618.0100 (EACH)
1016-04-61	1
TOTAL =	1

SILT FENCE

STATION - STATION	LOCATION	628.1504 SILT FENCE (LF)	628.1520 SILT FENCE MAINTENANCE (LF)
14+75 - 19+00	6TH AVENUE, RT.	550	1100
14+75 - 19+00	6TH AVENUE, LT.	550	1100
21+20 - 27+75	6TH AVENUE, LT.	785	1570
21+20 - 25+75	6TH AVENUE, RT.	545	1090
--	UNDISTRIBUTED	570	1140
TOTALS =		3000	6000

MOBILIZATION EROSION CONTROL

PROJECT	628.1905 MOBILIZATION EROSION CONTROL (EACH)	628.1910 MOBILIZATION EMERGENCY EROSION CONTROL (EACH)
1016-04-61	3	2
TOTALS =	3	2

PERMANENT SIGNING

QUADRANT	LOCATION	634.0612 POSTS WOOD 4X6-INCH X 12-FT (EACH)	637.2230 SIGNS TYPE II REFLECTIVE F (SF)
SOUTHWEST	6TH AVENUE, LT.	1	3
SOUTHEAST	6TH AVENUE, RT.	1	3
NORTHWEST	6TH AVENUE, LT.	1	3
NORTHEAST	6TH AVENUE, RT.	1	3
TOTALS =		4	12

TRAFFIC CONTROL

LOCATION	643.0100 TRAFFIC CONTROL PROJECT (1016-04-61) (EACH)	643.0300 TRAFFIC CONTROL DRUMS (DAYS)	643.0420 TRAFFIC CONTROL BARRICADES TYPE III (DAYS)	643.0715 TRAFFIC CONTROL WARNING LIGHTS TYPE C (DAYS)	643.0800 TRAFFIC CONTROL ARROW BOARDS (DAYS)	643.0900 TRAFFIC CONTROL SIGNS (DAYS)	COMMENTS
PROJECT	1	--	--	--	--	--	
IH 90/94	--	--	--	--	--	6	SLOPE PAVING; (2) W20-1 ROAD WORK 1 MILE
IH 90/94	--	--	--	--	--	6	SLOPE PAVING; (2) W20-5 RIGHT LANE CLOSED 1/2 MILE
IH 90/94	--	--	--	--	--	6	SLOPE PAVING; (2) W20-5 RIGHT LANE CLOSED 1500 FEET
IH 90/94	--	--	--	--	--	6	SLOPE PAVING; (2) W04-2R
IH 90/94	--	129	3	51	3	--	SLOPE PAVING
IH 90/94	--	--	--	--	--	14	FULL DEPTH DECK REPAIR & REMOVING FLOOR DRAINS; (2) W20-1 ROAD WORK 1 MILE
IH 90/94	--	--	--	--	--	14	FULL DEPTH DECK REPAIR & REMOVING FLOOR DRAINS; (2) W20-5 RIGHT LANE CLOSED 1/2 MILE
IH 90/94	--	--	--	--	--	14	FULL DEPTH DECK REPAIR & REMOVING FLOOR DRAINS; (2) W20-5 RIGHT LANE CLOSED 1500 FEET
IH 90/94	--	--	--	--	--	14	FULL DEPTH DECK REPAIR & REMOVING FLOOR DRAINS; (2) W04-2R
IH 90/94	--	301	7	119	7	--	FULL DEPTH DECK REPAIR & REMOVING FLOOR DRAINS
TOTALS =	1	430	10	170	10	80	

3

PAVEMENT MARKING

QUADRANT	LOCATION/QUADRANT	646.0106 PAVEMENT MARKING EPOXY 4-INCH (LF)	646.0600 REMOVING PAVMENT MARKINGS (LF)	646.0805.S PAVEMENT MARKING OUTFALL (EACH)	649.0400 TEMPORARY PAVEMENT MARKINGS REMOVABLE TAPE 4-INCH (LF)	COMMENTS
--	IH 90/94	210	210	–	780	SLOPE PAVING
--	IH 90/94	210	210	–	780	FULL DEPTH DECK REPAIR & REMOVING FLOOR DRAIN
SOUTHWEST	6TH AVENUE, LT.	--	--	1	--	
SOUTHEAST	6TH AVENUE, RT.	--	--	1	--	
NORTHWEST	6TH AVENUE, LT.	–	–	1	–	
NORTHEAST	6TH AVENUE, RT.	--	--	1	--	
	TOTALS =	420	420	4	1560	

CONSTRUCTION STAKING

STATION - STATION	LOCATION	650.4500 SUBGRADE (LF)	650.5000 BASE (LF)	650.9910 SUPPLEMENTAL CONTROL (1016-04-61) (EACH)	650.9920 SLOPE STAKES (LF)
14+79 - 16+68	6TH AVENUE	--	--	--	189
18+87 - 18+99	6TH AVENUE	13	13	--	--
21+26 - 21+37	6TH AVENUE	12	12	--	–
23+95 - 27+71	6TH AVENUE	--	--	--	376
--	PROJECT	–	–	1	--
	TOTALS =	25	25	1	565

SAWING ASPHALT

STATION - STATION	LOCATION	690.0150 (LF)
15+58 - 18+50	6TH AVENUE, LT.	292
15+45 - 18+50	6TH AVENUE, RT.	305
21+75 - 26+99	6TH AVENUE, LT.	523
21+75 - 24+95	6TH AVENUE, RT.	320
18+50	6TH AVENUE	20
18+87	6TH AVENUE	30
21+37	6TH AVENUE	30
21+75	6TH AVENUE	20
	TOTAL =	1540

WILLIS J. & JAMES A. BIRES

DALE T. & KATHERINE GEORGESON

R/W

LEGEND

- DIRECTION OF TRAVEL
- XXXXXXXXX SAWING ASPHALT
- WOODED OR SHRUB AREA
- DIRECTION OF FLOW
- RIPRAP MEDIUM OVER GEOTEXTILE FABRIC TYPE HR

BM 4

BM 3

EXISTING C/L 6TH AVENUE

EXISTING FENCELINE TO REMAIN (TYP.)

STA. 18+96
14.0' RT.

W5-52L
12"X36"

EXISTING STRUCTURE TO REMAIN (B-29-0050)

W5-52R
12"X36"

STA. 18+73
58.7' RT.

IH 90/94 (EAST BOUND)

IH 90/94 (WEST BOUND)

DELAMINATED AREAS (TYP.)

STA. 21+29
14.0' LT.

W5-52R
12"X36"

STA. 21+50
80.8' LT.

AT&T LEGACY

PROPOSED MGS GUARDRAIL

SLOPE INTERCEPTS (TYP.)

BM 8

BM 7

6TH AVENUE

PROPOSED C/L 6TH AVENUE

W5-52L
12"X36"

EXISTING FENCELINE TO REMAIN (TYP.)

18+00 19+00 20+00 21+00 22+00 23+0

BEGIN PROJECT
STA. 18+50
Y=196,385.13
X=427,243.66

BEGIN CONSTRUCTION
STA. 14+75

JOHN J. & BARBARA K. HASKE

END PROJECT
STA. 21+75
Y=196,710.12
X=427,246.02

END CONSTRUCTION
STA. 27+75

JOHN J. & BARBARA K. HASKE

EARTHWORK SUMMARY

EXCAVATION COMMON	= 20	C.Y.
FILL	= 0	C.Y.
FILL EXPANSION	= 0	25%
*WASTE	= 20	C.Y.

* USE MATERIAL EXCAVATED UNDER "EXCAVATION COMMON" IN AREA OF BORROW MATERIAL NEEDED FOR BID ITEM "BARRIER SYSTEM GRADING SHAPING FINISHING"

STA. 18+50

STA. 21+75

STA. 20+12.15
STRUCTURE B-29-0050 TO REMAIN
CONCRETE MASONRY OVERLAY DECKS
BEARING PADS ELASOMETRIC NON-LAMINATED
SLOPE PAVING CONCRETE
SEE STRUCTURE PLANS FOR DETAILS.

VPC STA = 17+40.00
EL = 908.62

4.09%

PI STA 20+50.00
EL 921.30
K = 79.60'
L = 620.00'

-3.70%

MATCH EXISTING
STA. 18+50
EL. = 912.31

MATCH EXISTING
STA. 21+75
EL. = 914.59

EXISTING C/L PROFILE 6TH AVENUE

EXISTING C/L ELEVATION

** 16.5'

C/L IH 90/94 (EAST BOUND)

** 16.7'

C/L IH 90/94 (WEST BOUND)

920 915 910 905 900 895 890

907.98 909.02 910.00 910.91 911.67 912.31 912.83 913.43 913.96 914.34 914.69 914.96 915.15 915.26 915.21 915.21 915.02 914.84 914.59 914.20 913.73 913.16 912.49

17+25 17+50 17+75 18+00 18+25 18+50 18+75 19+00 19+25 19+50 19+75 20+00 20+25 20+50 20+75 21+00 21+25 21+50 21+75 22+00 22+25 22+50 22+75

BENCH MARKS

NO.	STA.	DESCRIPTION	ELEV.
3	17+14	¾" IRON REBAR SET, 16.3' RT	906.46
4	17+24	¾" IRON REBAR SET, 16.3' LT	906.91
7	22+91	¾" IRON REBAR SET, 16.9' RT	911.07
8	22+74	¾" IRON REBAR SET, 11.9' LT	912.10

STA. 20+12.15
STRUCTURE B-29-0050 TO REMAIN
4-SPAN 36-INCH PRESTRESSED CONCRETE GIRDER STRUCTURE
CLEAR ROADWAY WIDTH = 24.0'
O.A.L. = 226.98'
SKEW = 18°26' LHF

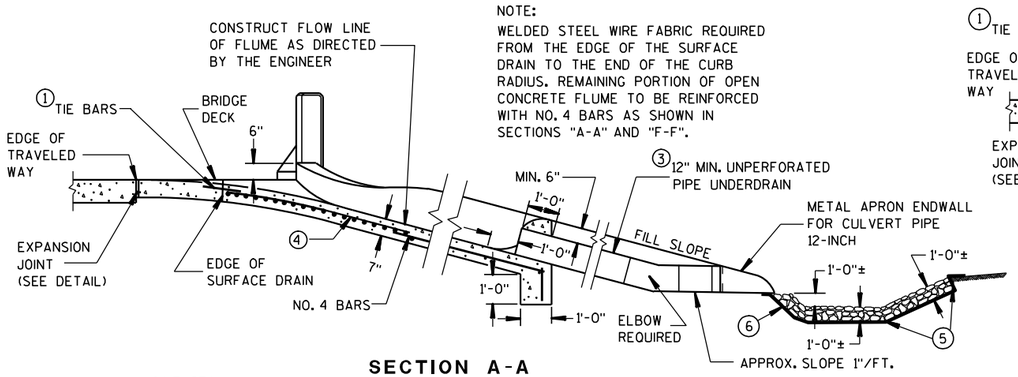
NOTES:
* FINISHED GRADE ON BRIDGE DECK ELEVATION 1 1/4-INCH HIGHER THAN EXISTING C/L PROFILE. SEE STRUCTURE PLANS FOR DETAILS. FINISHED GRADE ELEVATION ON APPROACHES TO MATCH FROM END OF DECK TO BEGIN/END PROJECT
** EXISTING VERTICAL CLEARANCE TAKEN FROM THE EDGE OF PAVED SHOULDERS ON IH-90/94

6TH AVENUE VERTICAL CURVE DATA

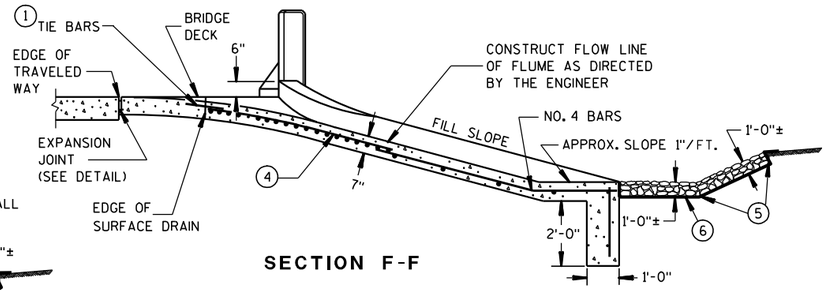
VPI STA.	= 20+50.00
VPI EL.	= 921.30
VPC STA.	= 17+40.00
VPC EL.	= 908.62
VPT STA.	= 23+60.00
VPT EL.	= 909.83
K	= 79.60'
L	= 620.00'

Standard Detail Drawing List

08D02-06	CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES
08D15-04A	EDGEDRAIN OUTLET AND OUTFALL MARKERS
08E09-06	SILT FENCE
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
08F06-04	REINFORCED CONCRETE APRON ENDWALL FOR PIPE UNDERDRAIN
14B42-03A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-03B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-03C	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)
14B45-04E	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04F	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04G	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04H	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04I	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04J	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04K	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04L	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
15A03-02A	FLEXIBLE MARKER POST FOR CULVERT END
15A03-02B	FLEXIBLE MARKER POST FOR CULVERT END
15B01-08A	FENCE WOVEN WIRE
15B01-08B	FENCE WOVEN WIRE
15C02-05A	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C02-05B	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C06-07	SIGNING & MARKING FOR TWO LANE BRIDGES
15C08-16A	PAVEMENT MARKING (MAINLINE)
15D12-05A	TRAFFIC CONTROL, LANE CLOSURE



SECTION A-A



SECTION F-F

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) PIPE UNDERDRAIN MAY BE ANY OF THE MATERIALS LISTED IN SECTION 612.2 OF THE STANDARD SPECIFICATIONS EXCEPT DRAIN TILE.

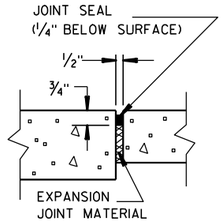
(4) MINIMUM REINFORCEMENT SHALL BE 6" X 6" - W4.0 X W4.0 OR NO. 3 BARS LONGITUDINAL AND TRANSVERSE SPACING 12" C-C.

(5) LIMITS OF ADDITIONAL RIPRAP WHEN SPECIAL DITCH IS REQUIRED.

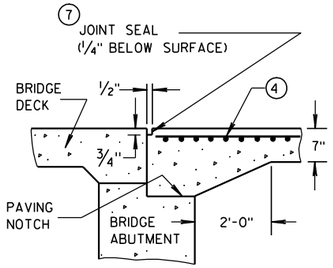
(6) GEOTEXTILE FABRIC, TYPE 'R"

(7) HOT POURED SEALANT UNLESS OTHERWISE SPECIFIED.

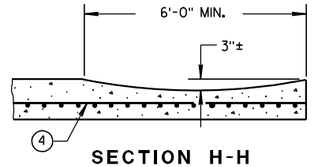
(8) THIS DIMENSION MAY VARY DEPENDING ON THE SPACING OF POSTS FOR THE STEEL PLATE BEAM GUARD. THE TYPICAL LOCATION FOR THE SURFACE DRAIN IS WHERE THE POST SPACING WIDENS TO 3'-1½".



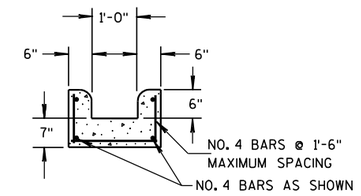
EXPANSION JOINT DETAIL



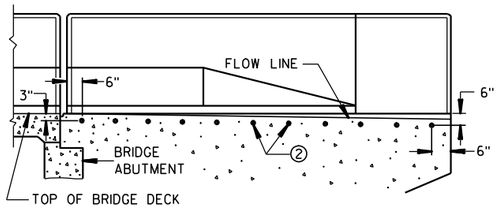
SECTION D-D



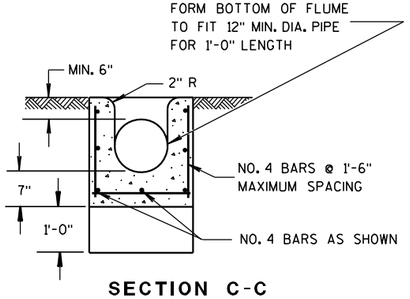
SECTION H-H



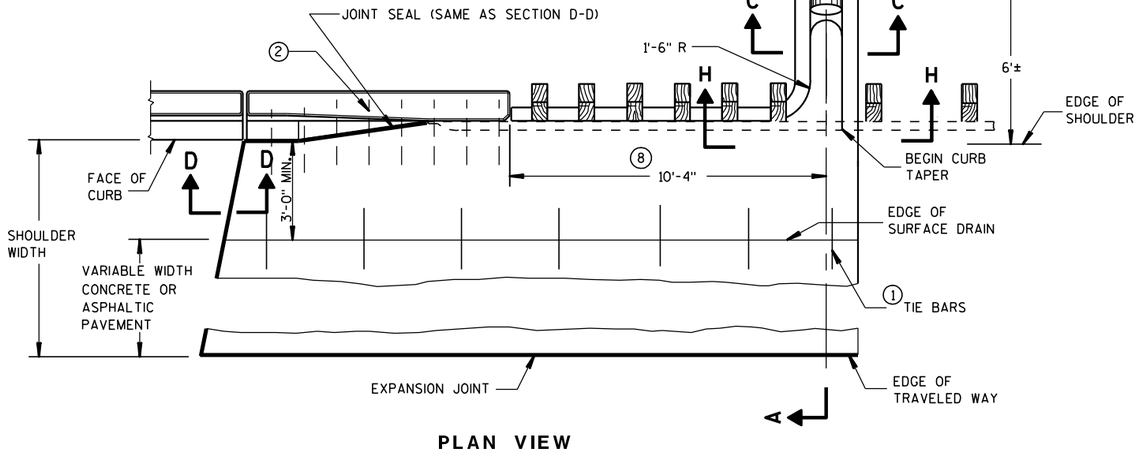
SECTION E-E



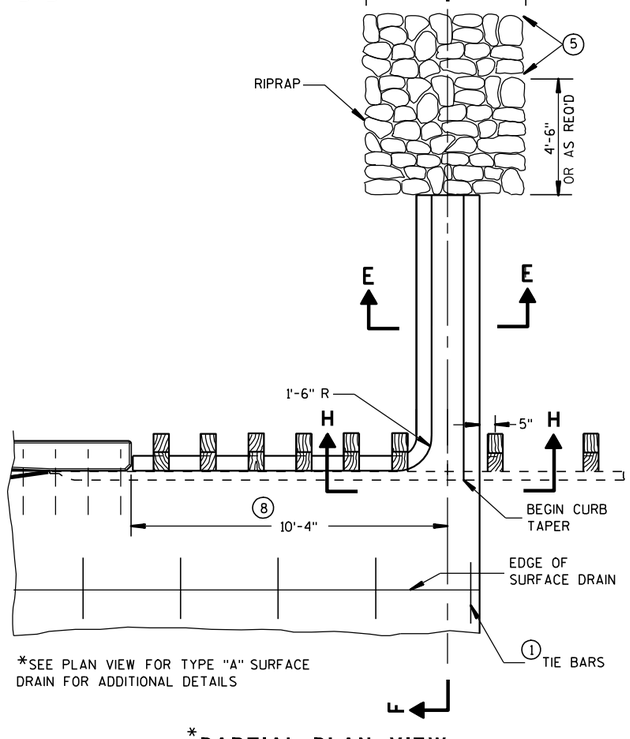
LOCATION OF TIE BARS IN WINGWALL



SECTION C-C



PLAN VIEW
SURFACE DRAIN WITH PIPE
TYPE "A"



*SEE PLAN VIEW FOR TYPE "A" SURFACE DRAIN FOR ADDITIONAL DETAILS

*PARTIAL PLAN VIEW
SURFACE DRAIN WITHOUT PIPE
TYPE "B"

CONCRETE SURFACE DRAINS
FLUME TYPE
AT STRUCTURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

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) UNPERFORATED PIPE UNDERDRAIN AND FITTINGS FURNISHED FOR OUTFALL PIPE SHALL MEET THE REQUIREMENTS OF ONE OF THE FOLLOWING SPECIFICATIONS:

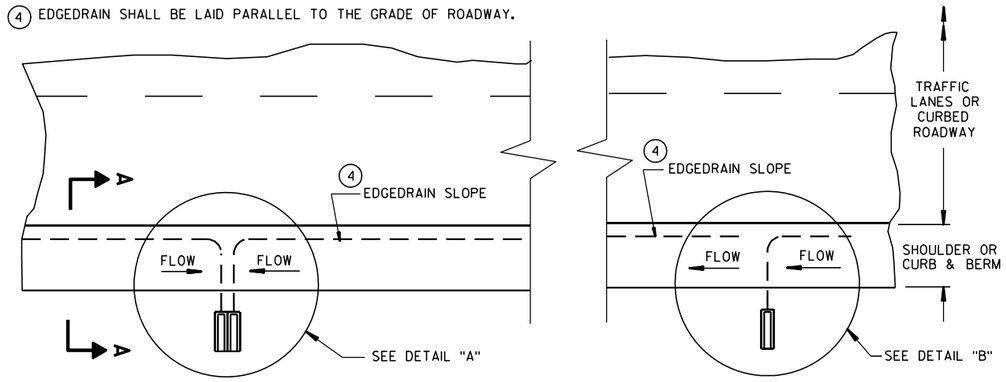
POLYVINYL CHLORIDE (PVC) PLASTIC DRAIN, WASTE, AND VENT PIPE AND FITTINGS, ASTM D 2665, SCHEDULE 40 PVC.

TYPE PSM POLYVINYL CHLORIDE (PVC) SEWER PIPE AND FITTINGS, ASTM D 3034, SDR 23.5 PVC SEWER PIPE.

(2) MAXIMUM SPACING OF EDGEDRAIN OUTLETS SHALL BE 250 FEET UNLESS OTHERWISE SPECIFIED IN THE CONTRACT OR DIRECTED BY THE ENGINEER.

(3) EDGEDRAIN SHALL BE CONNECTED TO INLETS REGARDLESS OF FLOW DIRECTION FOR DRAINAGE AND MAINTENANCE ACCESS.

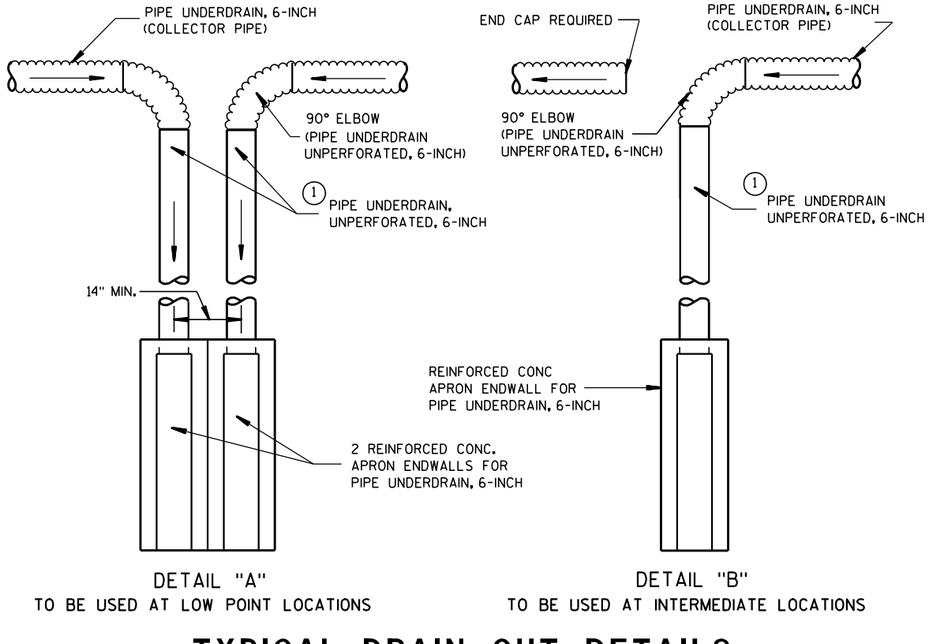
(4) EDGEDRAIN SHALL BE LAID PARALLEL TO THE GRADE OF ROADWAY.



PLAN VIEW

ROADWAY WITH SHOULDERS OR CURBS

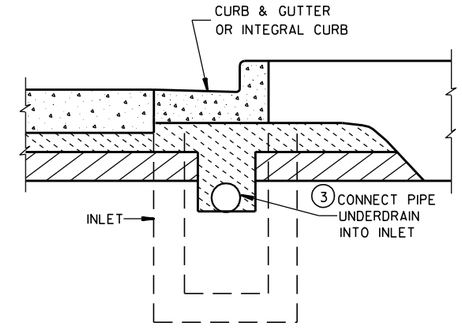
(EDGEDRAIN OUTLETS TO ROADSIDE) (2)



DETAIL "A"
TO BE USED AT LOW POINT LOCATIONS

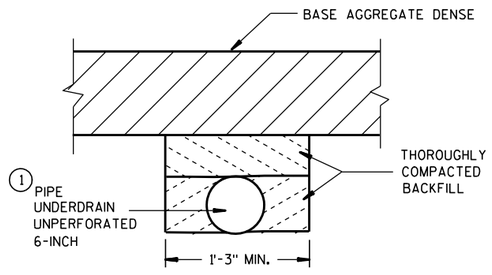
DETAIL "B"
TO BE USED AT INTERMEDIATE LOCATIONS

TYPICAL DRAIN OUT DETAILS



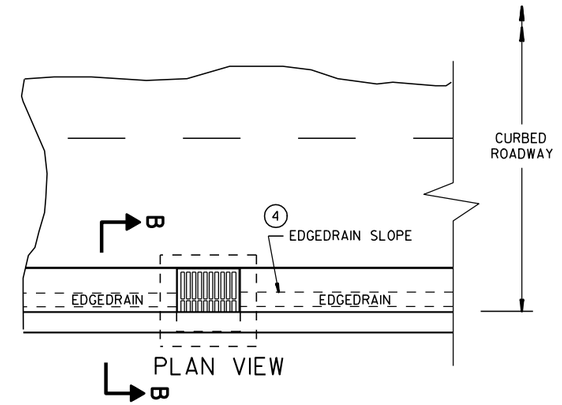
SECTION B-B

URBAN CROSS SECTION



SECTION C-C

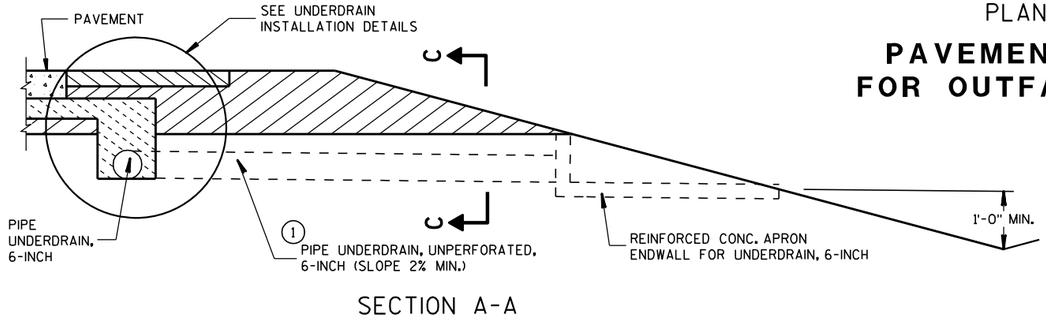
(TRENCH FOR OUTFALL PIPE)



PLAN VIEW

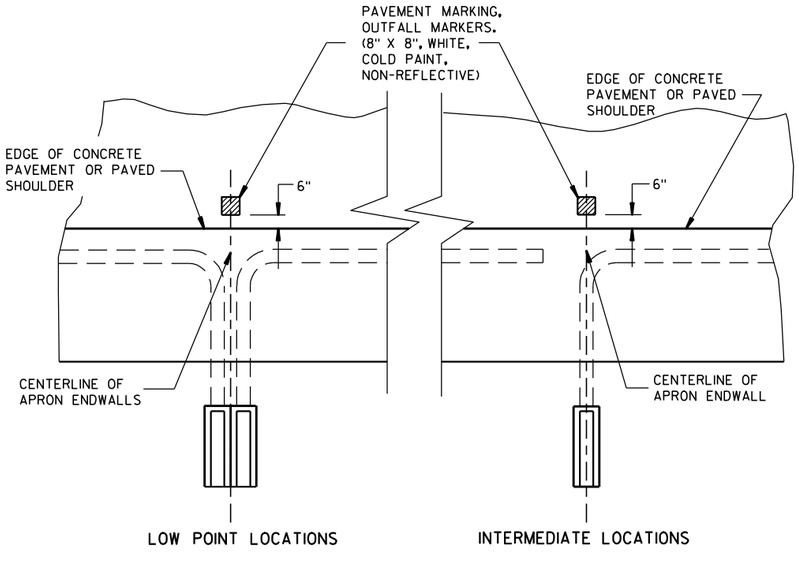
ROADWAY WITH CURBS

(EDGEDRAIN CONNECTS INTO INLET STRUCTURE)



SECTION A-A

RURAL CROSS SECTION



PLAN VIEW

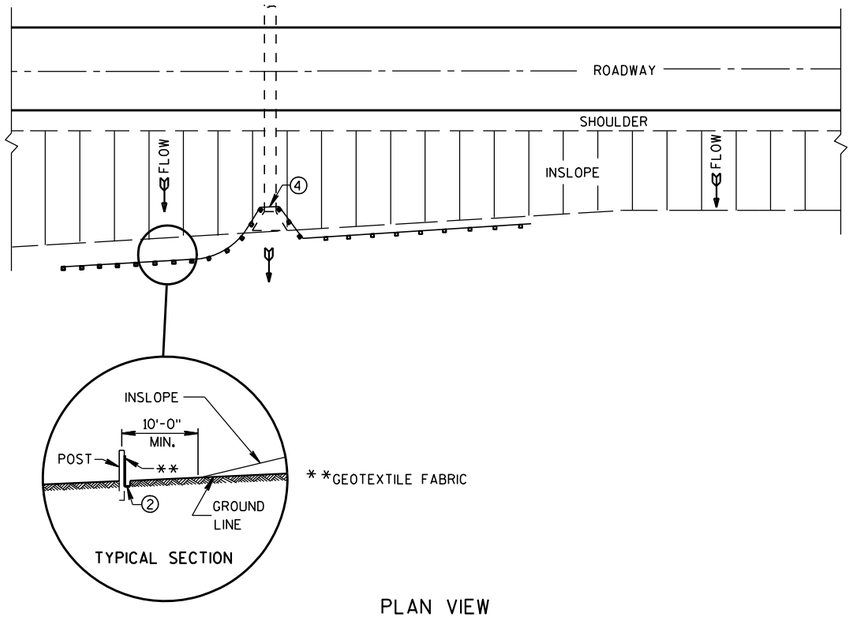
PAVEMENT MARKING FOR OUTFALL MARKERS

EDGEDRAIN OUTLET AND OUTFALL MARKERS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

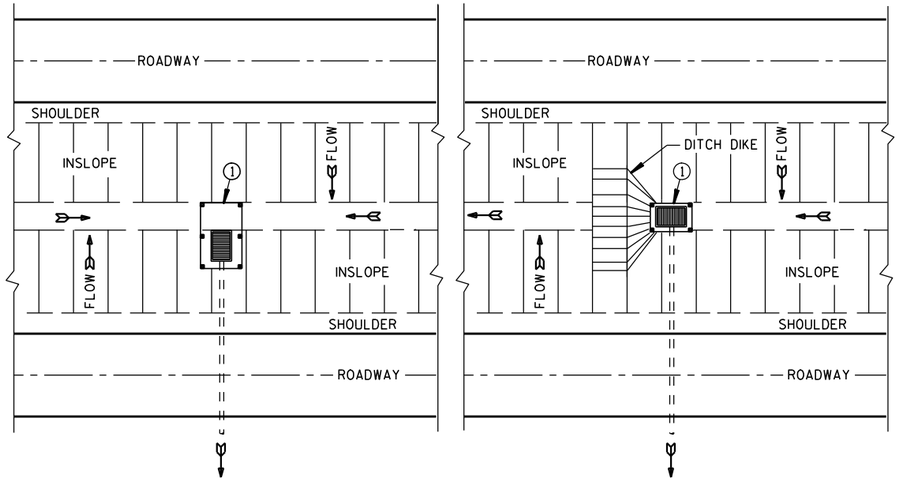
6

S.D.D. 8 D 15-4a



PLAN VIEW

TYPICAL APPLICATION OF SILT FENCE



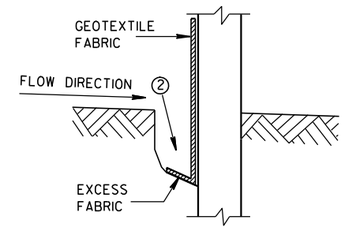
PLAN VIEW

SILT FENCE AT MEDIAN SURFACE DRAINS

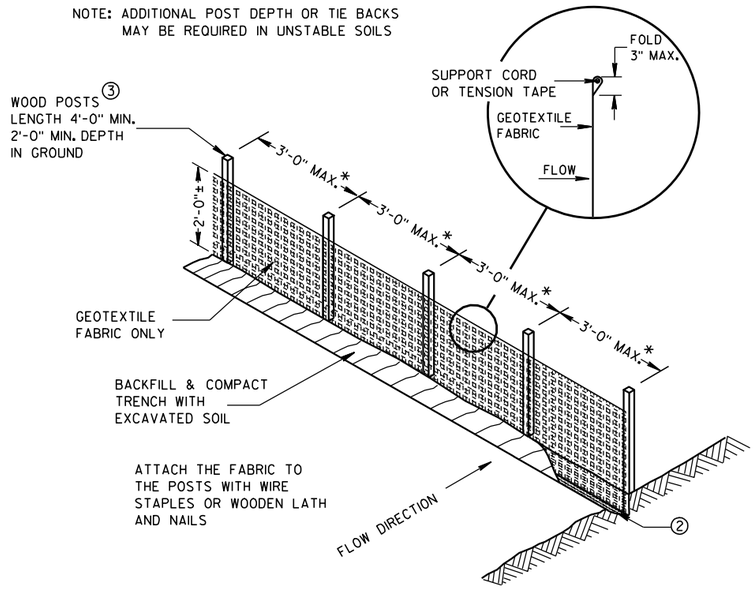
GENERAL NOTES

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

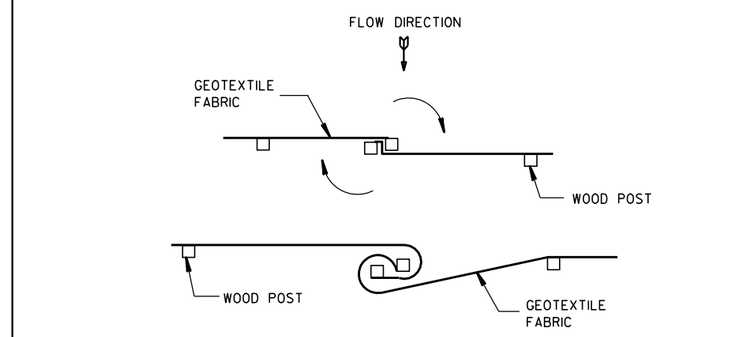
1. HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
2. FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
3. WOOD POSTS SHALL BE A MINIMUM SIZE OF 1⅛" X 1⅛" OF OAK OR HICKORY.
4. SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.
5. CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.



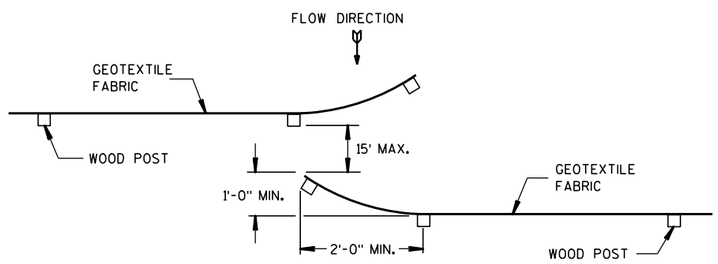
TRENCH DETAIL



SILT FENCE

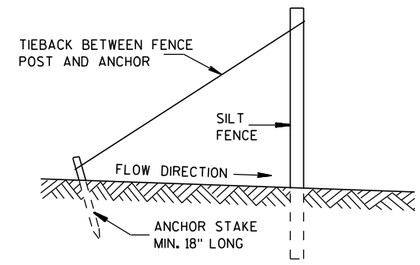


TWIST METHOD



HOOK METHOD

JOINING TWO LENGTHS OF SILT FENCE 5



SILT FENCE TIE BACK

(WHEN REQUIRED BY THE ENGINEER)

SILT FENCE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
4-29-05 DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

6

S.D.D. 8 E 9-6

6

S.D.D. 8 E 9-6

METAL APRON ENDWALLS

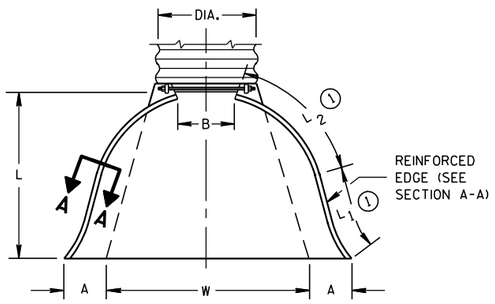
PIPE DIA. (IN.)	MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 ①	L2 ①	W (±2")		
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	36	2 1/2 to 1	1 Pc.
21	.064	.060	9	12	6	36	18	29 5/8	42	2 1/2 to 1	1 Pc.
24	.064	.075	10	13	6	41	18	37 1/4	48	2 1/2 to 1	1 Pc.
30	.079	.075	12	16	8	51	18	52 1/4	60	2 1/2 to 1	1 Pc.
36	.079	.105	14	19	9	60	24	59 3/4	72	2 1/2 to 1	2 Pc.
42	.109	.105	16	22	11	69	24	75 5/8	84	2 1/2 to 1	2 Pc.
48	.109	.105	18	27	12	78	24	81	90	2 1/4 to 1	3 Pc.
54	.109	.105	18	30	12	84	30	85 1/2	102	2 1/4 to 1	3 Pc.
60	.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

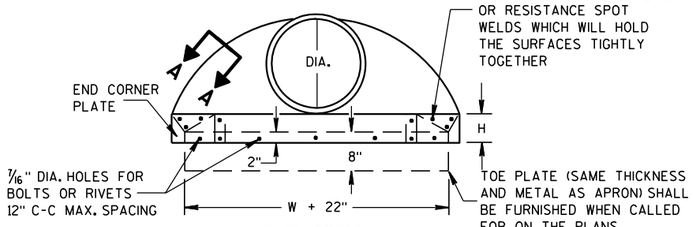
REINFORCED CONCRETE APRON ENDWALLS

PIPE DIA. (IN.)	DIMENSIONS (Inches)							APPROX. SLOPE
	T	A	B	C	D	E	G	
12	2	4	24	48 7/8	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 2/5 to 1
60	6	* 30 - ** 35	60	39	99	96	5	2 to 1
66	6 1/2	* 24 - ** 30	* 72 - ** 78	* 21 - ** 27	99	102	5 1/2	2 to 1
72	7	* 24 - ** 36	78	21	99	108	6	2 to 1
78	7 1/2	* 24 - ** 36	78	21	99	114	6 1/2	2 to 1
84	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1
90	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	1 1/2 to 1

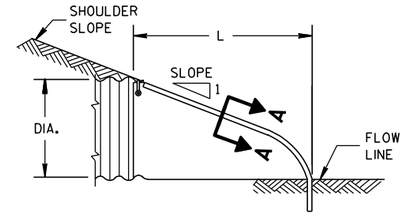
*MINIMUM
**MAXIMUM



PLAN VIEW

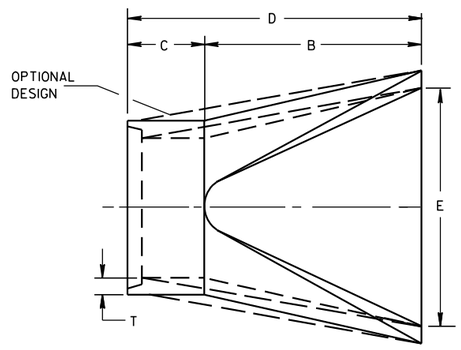


END VIEW

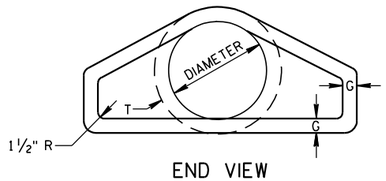


SIDE ELEVATION

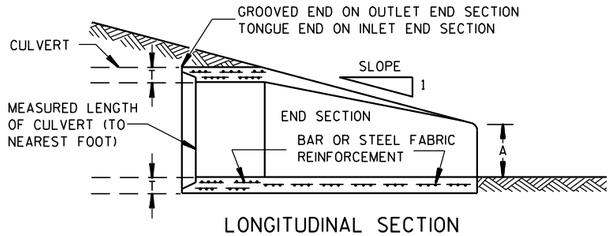
METAL ENDWALLS



PLAN

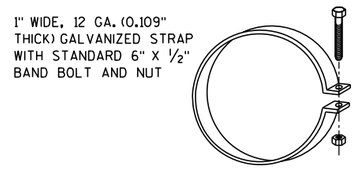


END VIEW



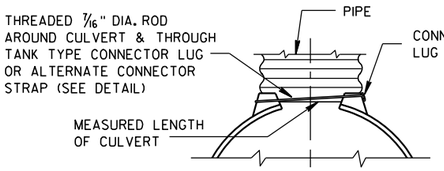
LONGITUDINAL SECTION

CONCRETE ENDWALLS

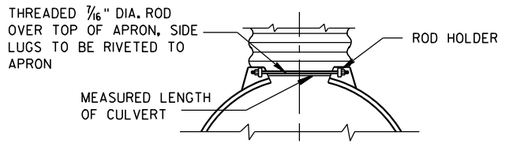


ALTERNATE FOR TYPE 1 CONNECTION

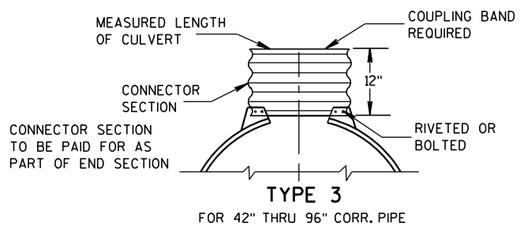
END SECTION CONNECTOR STRAP



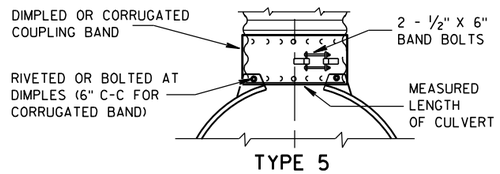
TYPE 1
FOR 12" THRU 24" CORR. PIPE



TYPE 2
FOR 30" THRU 96" CORR. PIPE



TYPE 3
FOR 42" THRU 96" CORR. PIPE



TYPE 5
ALTERNATE FOR:
ALL SIZES CORRUGATED CIRCULAR PIPE

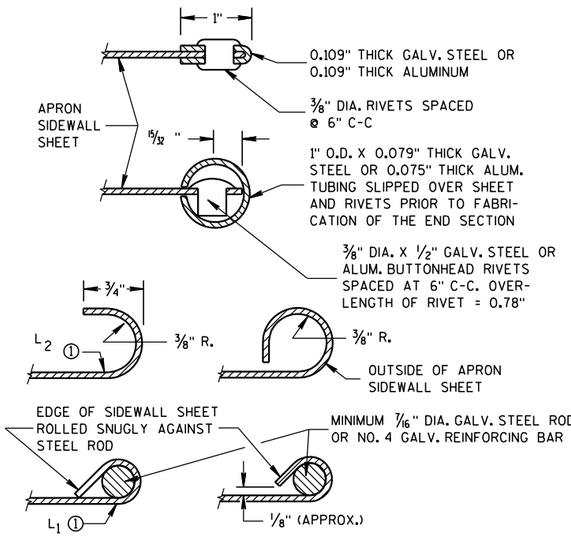
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL. AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

FOR CIRCUMFERENTIALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2, 3 OR 5 AS APPLICABLE.

FOR HELICALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2 OR 5.

FOR HELICALLY CORRUGATED PIPES WITH TWO CIRCUMFERENTIAL CORRUGATIONS AT EACH END USE ENDWALL CONNECTION DETAILS 1, 2 OR 3.

CONNECTION DETAILS



SECTION A-A

GENERAL NOTES

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

CONCRETE CULVERT ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VISE VERSA. GALVANIZED STEEL OR ALUMINUM ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL.

ALL THREE PIECE STEEL APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.105" SIDES AND 0.134" CENTER PANELS. THE WIDTH OF CENTER PANELS SHALL BE GREATER THAN 20 PERCENT OF THE PIPE PERIMETER.

LAP SEAMS SHALL BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM RIVETS AND BOLTS FOR ALUMINUM UNITS. FOR THE 60" THROUGH 96" DIAMETER APRON ENDWALL SIZES, THE REINFORCED EDGES AND CENTER PANEL SEAMS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER ANGLES. THE ANGLES SHALL BE ATTACHED BY GALVANIZED NUTS AND BOLTS FOR STEEL UNITS AND ALUMINUM NUTS AND BOLTS FOR ALUMINUM UNITS.

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

① FOR PIPE SIZES UP TO 60" DIAMETER, A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.

APRON ENDWALLS FOR CULVERT PIPE

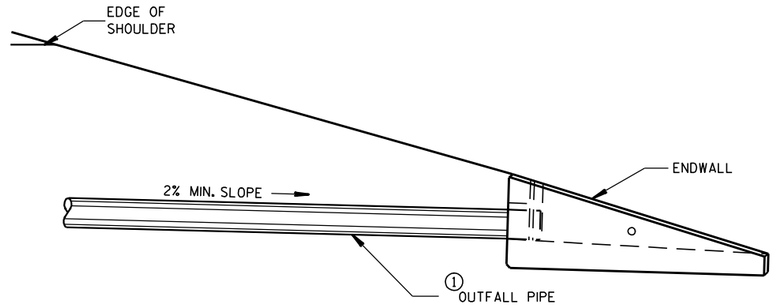
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

6
S.D.D. 8 F 1-11

DIMENSIONS IN INCHES											
PIPE DIA.	A	B	C	D	E	F	G	H	J	L	Z
**4	6	12	5 1/4	9	8	32	36	11	2 3/8	6 1/2	4
6	8	14	7 1/4	11	10	42	44	13	3 5/8	8 1/2	6

**APRON ENDWALL FOR 6 INCH DIAMETER PIPE MAY BE SUBSTITUTED FOR THIS SIZE PROVIDED THE HOLE IN THE HEADWALL IS SIZED AND LOCATED TO CONFORM TO THE 4 INCH DIAMETER PIPE DIMENSIONS (C & J)



INSTALLATION DETAIL

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.

ALTERNATIVE DESIGNS WHICH PROVIDE EQUIVALENT CAPACITY AND STRENGTH MAY BE USED WHEN APPROVED BY THE ENGINEER. ENDWALL MAY BE EITHER PRECAST OR CAST-IN-PLACE CONCRETE.

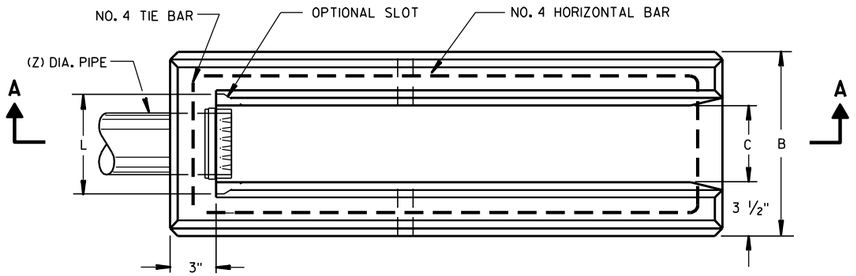
THE UNDERDRAIN PIPE SHALL BE FULLY INSERTED AND SEALED INTO THE ENDWALL WITH CEMENT MORTAR PRIOR TO BACKFILLING AROUND THE STRUCTURE.

THE UPPERMOST POINT OF THE ENDWALL SHALL BE PLACED FLUSH WITH THE ROADWAY SLOPE. ADJACENT EMBANKMENT SLOPES SHALL BE SHAPED TO FIT THE SIDES AND TOE OF THE ENDWALL. EXACT PLACEMENT OF THE OUTFALL PIPE AND ENDWALL SHALL BE DETERMINED BY THE ENGINEER TO MATCH THE ELEVATIONS AND FLOW DIRECTION OF THE ROADSIDE DITCH.

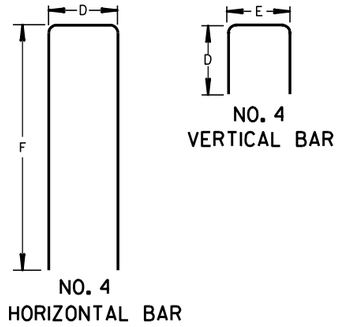
① THE OUTFALL PIPE UNDERDRAIN AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF THE SPECIFICATION FOR POLY (VINYL CHORIDE) (PVC) PLASTIC DRAIN, WASTE AND VENT PIPE AND FITTINGS, ASTM DESIGNATION: D 2665, SCHEDULE 40 PVC OR THE STANDARD SPECIFICATION FOR TYPE PSM POLY (VINYL CHORIDE) (PVC) SEWER PIPE AND FITTINGS, ASTM DESIGNATION: D 3034, TYPE PSM SDR 23.5 PVC SEWER PIPE, ALL JOINTS SHALL BE SOLVENT WELDED.

THE OUTFALL PIPE INCLUDING ALL FITTINGS AND THE RODENT SHIELD SHALL BE MEASURED AND PAID FOR AS PIPE UNDERDRAIN UNPERFORATED.

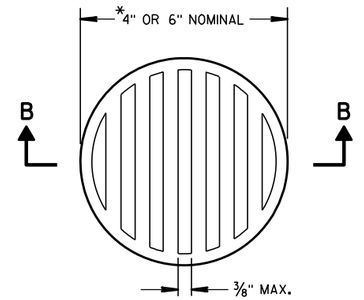
② THE RODENT SHIELD SHALL BE A PVC GRATE SIMILAR TO THIS DETAIL. THE GRATE IS COMMERCIALLY AVAILABLE AS A FLOOR STRAINER. A PIPE COUPLING IS REQUIRED FOR THE ATTACHMENT OF THIS SHIELD TO THE OUTFALL PIPE. THE SHIELD SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO. 10 X 1-INCH STAINLESS STEEL SHEET METAL SCREWS.



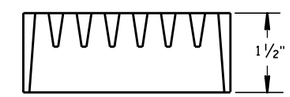
PLAN VIEW



BAR STEEL REINFORCEMENT DETAILS



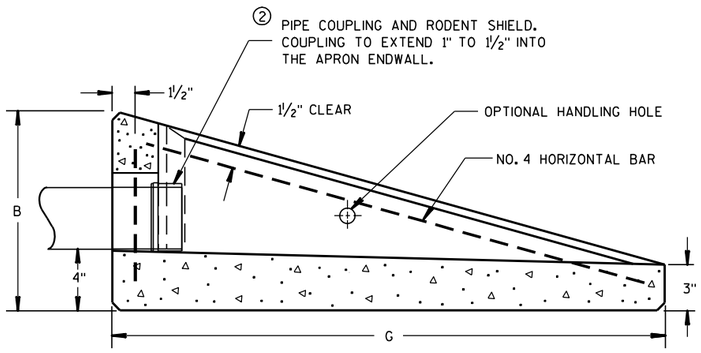
NOTE: ORIENT SHIELD SO SLOTS ARE VERTICAL.



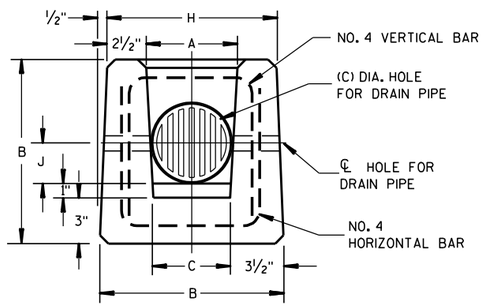
SECTION B-B

② RODENT SHIELD

*NOTE: DIMENSIONS ARE APPROXIMATE. THE GRATE IS SIZED TO FIT INTO A PIPE COUPLING.



SECTION A-A



END VIEW

CONCRETE APRON ENDWALL FOR UNDERDRAIN

REINFORCED CONCRETE APRON ENDWALL FOR PIPE UNDERDRAIN

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
3/10/98 DATE
/S/ Rory L. Rhinesmith
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

6

S.D.D. 8 F 6-4

GENERAL NOTES

(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.

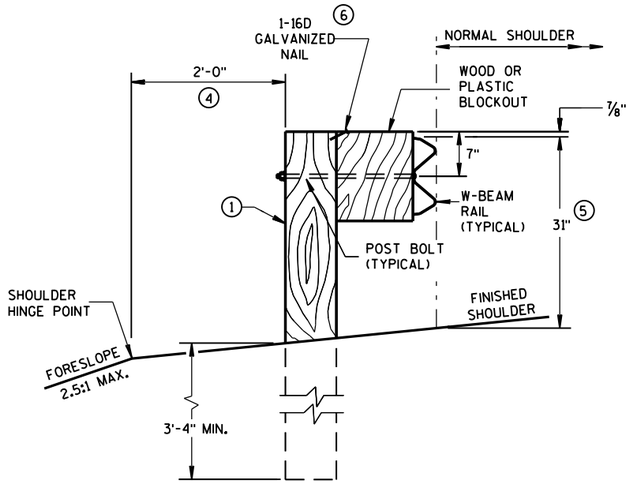
(2) USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.

(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 THE TO LENGTH AMD 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).

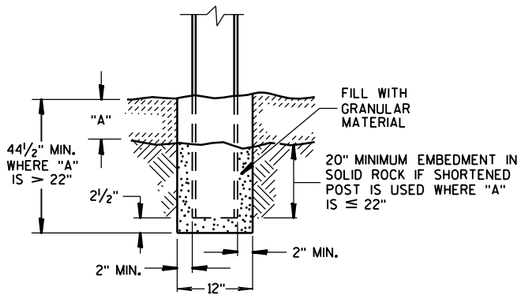
(5) FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS ± 1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27¾" TO 32".

(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.



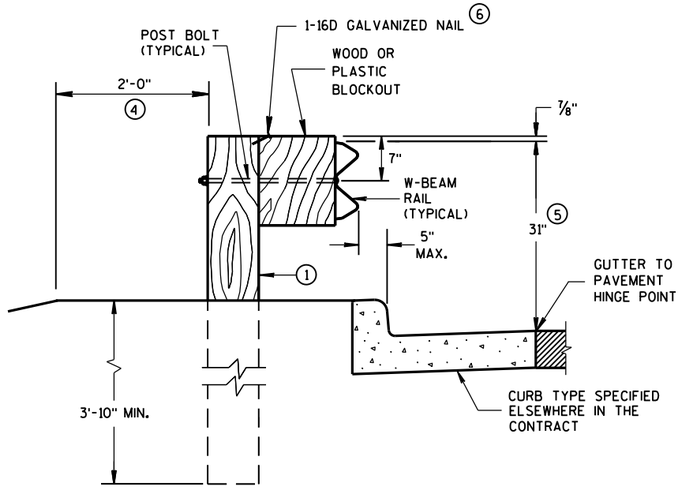
END VIEW

LOCATED ALONG A ROADWAY SHOULDER
STANDARD INSTALLATION



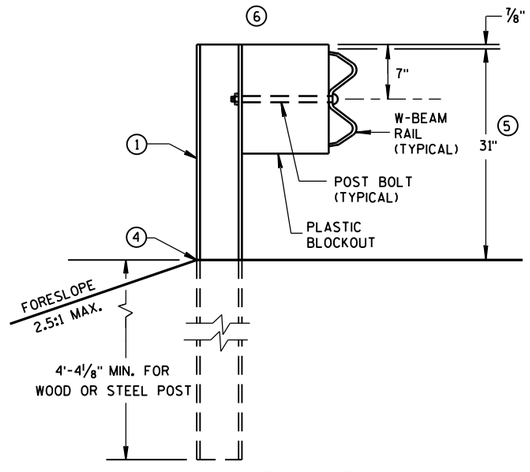
END VIEW

SETTING STEEL OR WOOD POST IN ROCK (3)



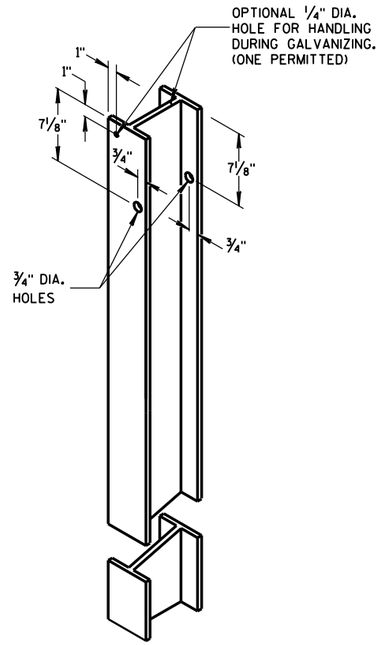
END VIEW

LOCATED ALONG A CURBED ROADWAY

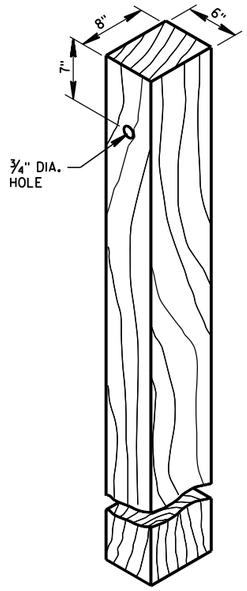


END VIEW

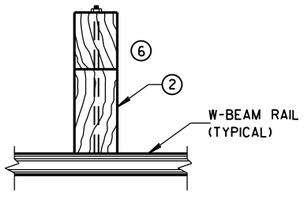
MGS LONGER POST AT HALFPOST SPACING W BEAM (K)



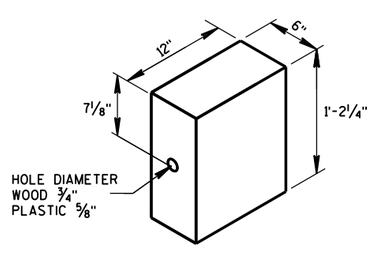
STEEL POST &
HOLE PUNCHING DETAIL
(w6X9) (1)



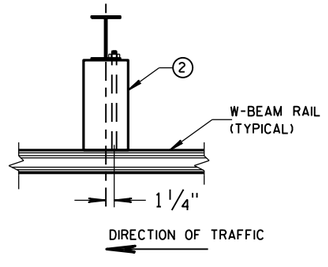
WOOD POST
(6" X 8") NOMINAL (1)



PLAN VIEW
WOOD POST,
BLOCKOUT & BEAM



WOOD OR
PLASTIC BLOCKOUT (2)

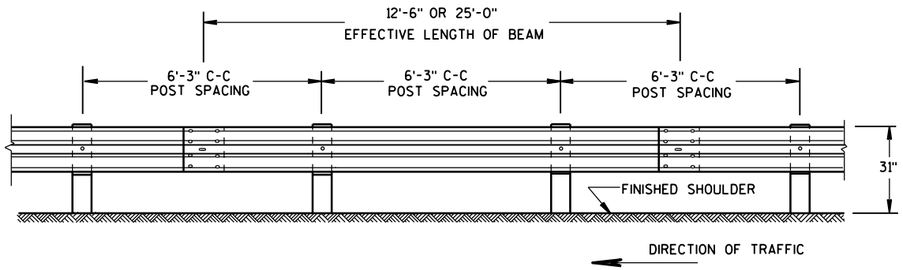


PLAN VIEW
STEEL POST,
PLASTIC BLOCKOUT & BEAM

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

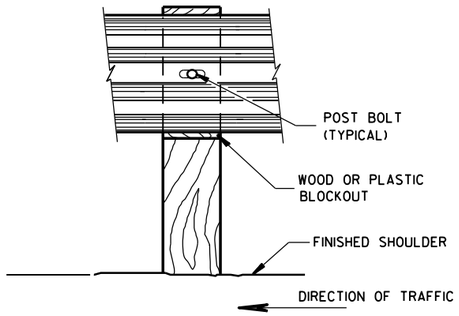
STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

6
S.D.D. 14 B 42-3a



FRONT VIEW

POST SPACING STANDARD INSTALLATION



FRONT VIEW AT WOOD POST

GENERAL NOTES

(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.

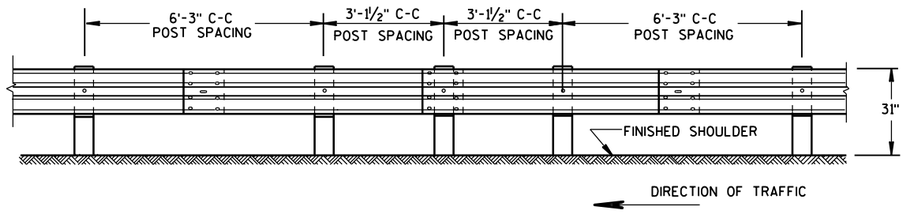
(9) REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.

(10) PROVIDE AN ANGLE OF BEND OF 90° ± 1° FOR TWO-SIDED REFLECTORS.

(11) 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.

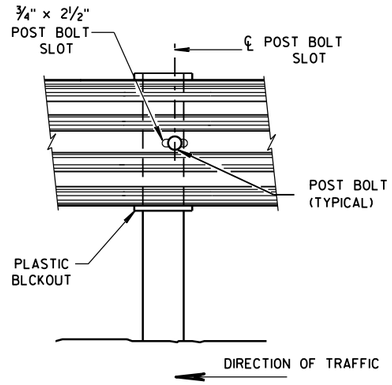
POST BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 5/8" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.

GUARD RAIL SPLICE BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.

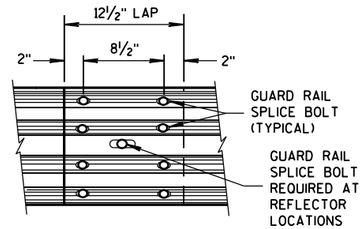


FRONT VIEW

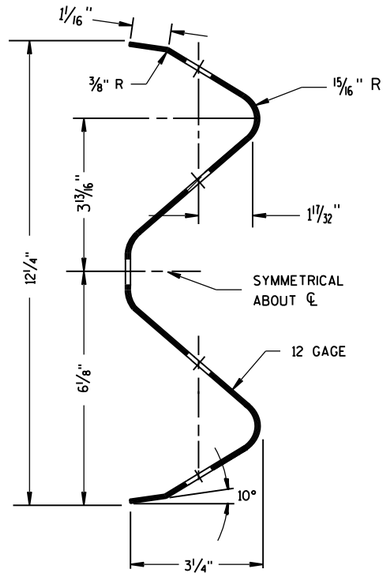
HALF POST SPACING (HS) AND HALF POST SPACING WITH LONGER POSTS (K)



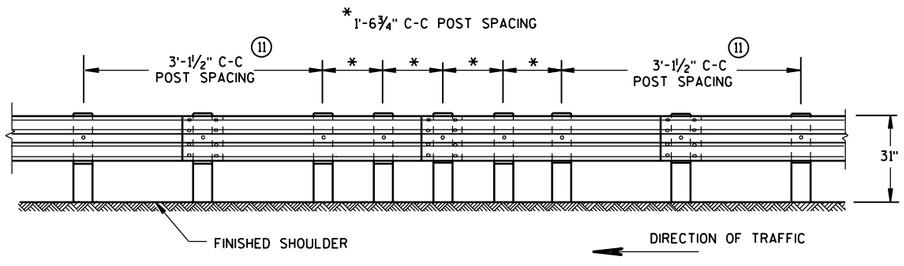
FRONT VIEW AT STEEL POST



FRONT VIEW
MID-SPAN BEAM SPLICE

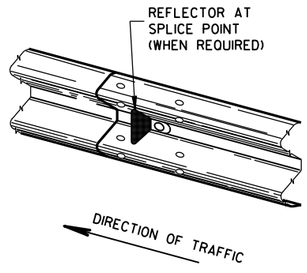


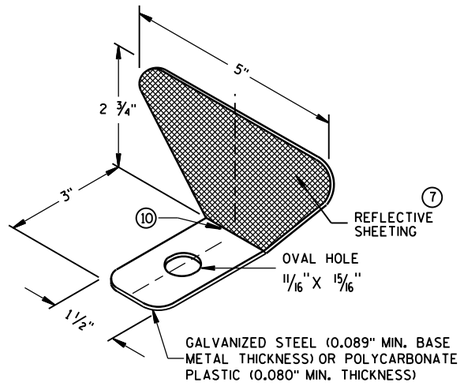
SECTION THRU W-BEAM RAIL



FRONT VIEW

QUARTER POST SPACING (QS)





ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION (7)

REFLECTOR SPACING (8)

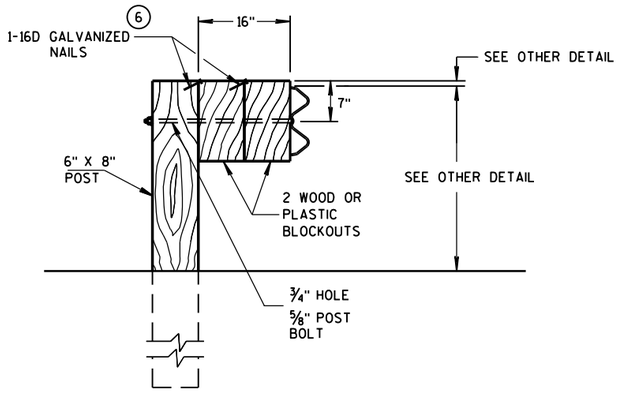
	BEAM GUARD LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200'	50' C-C	1	3
	> 200'	100' C-C	1	
TWO WAY TRAFFIC	< 200'	25' C-C	1 (9)	6
	> 200'	50' C-C	1	
TWO WAY TRAFFIC	< 200'	50' C-C	2	3
	> 200'	100' C-C	2 (10)	

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPO

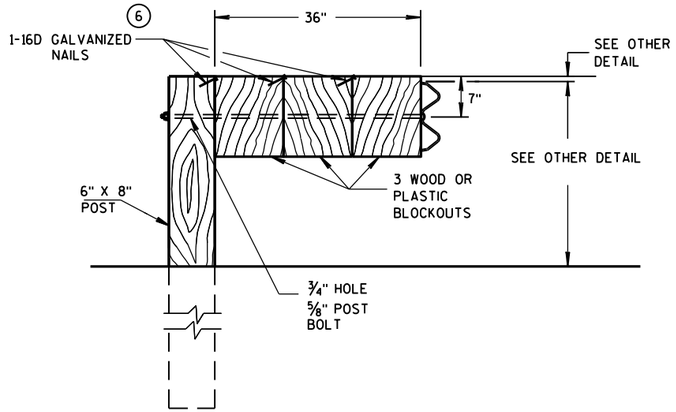
6

S.D.D. 14 B 42-3b



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.

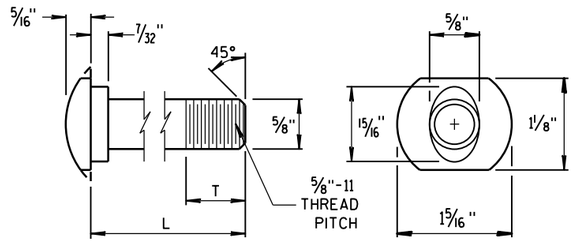


DETAIL FOR 36" BLOCKOUT DEPTH

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.

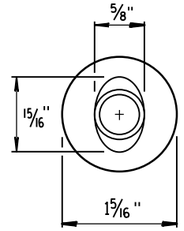
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.

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

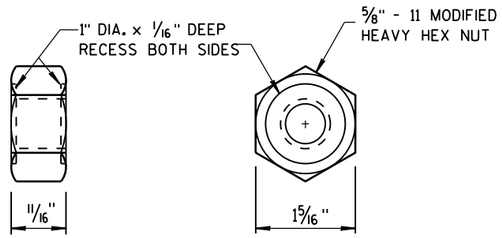


POST BOLT TABLE

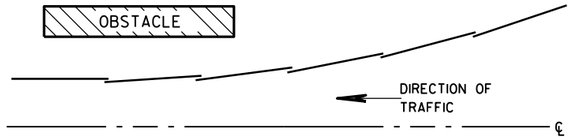
L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



ALTERNATE BOLT HEAD

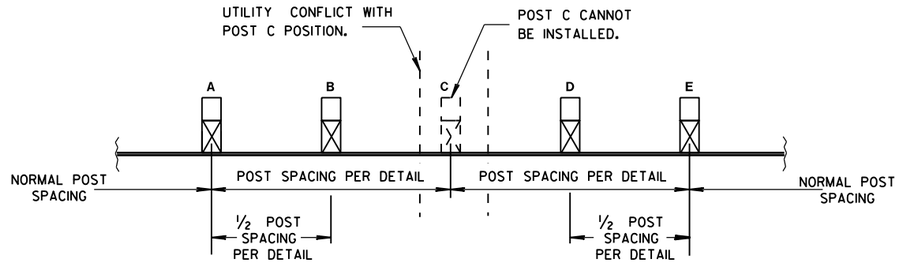


POST BOLT AND RECESS NUT

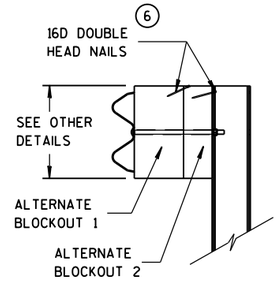


PLAN VIEW

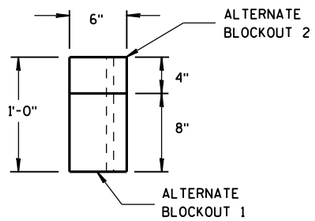
BEAM LAPPING DETAIL



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 2014
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS ENGINEER
FHWA

6
S.D.D. 14 B 42-3c

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.

(F) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS. ONE SCREW PER CORNER.

(G) ½" 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.

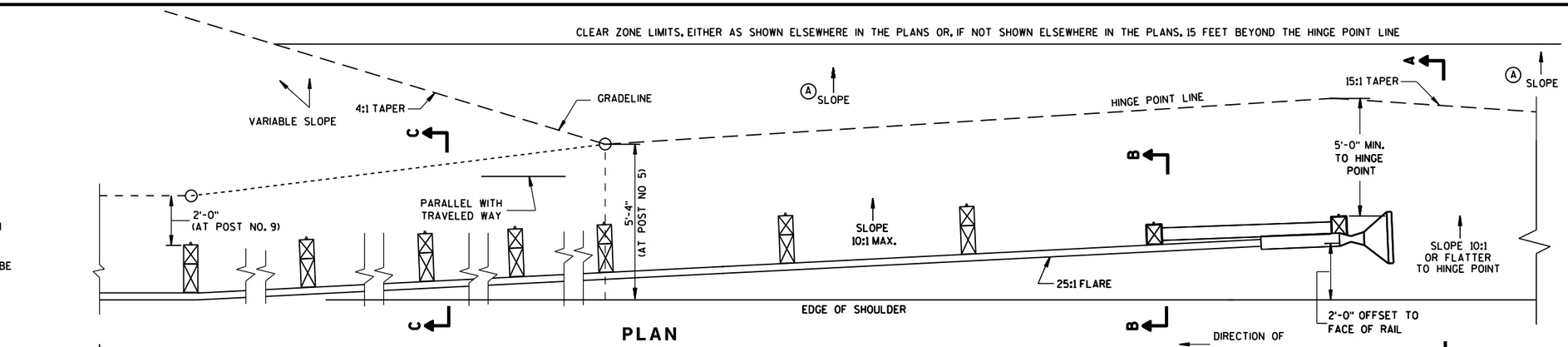
SEE SDD 14B42 FOR MORE INFORMATION.

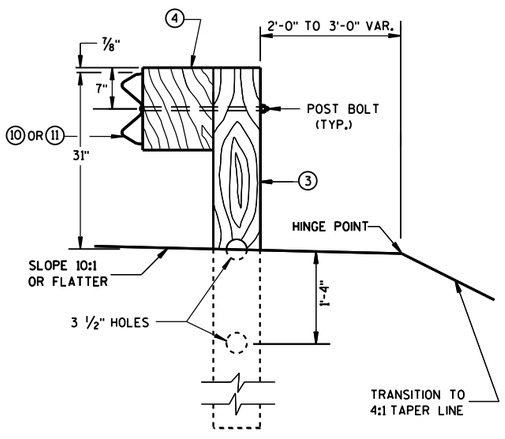
* DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.

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

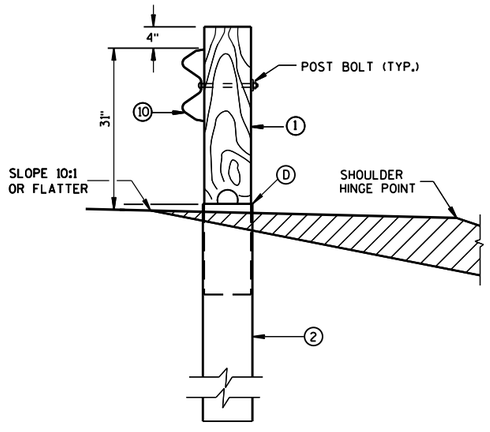
W-BEAM RAIL SPLICES ARE LOCATED AT POST NUMBER 3, AND BETWEEN POST 5 AND 6, BETWEEN POSTS 7 AND 8, AND MIDDLE OF THE SPAN AFTER POST 9.

THE CENTER OF THE UPPER 3½" 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.

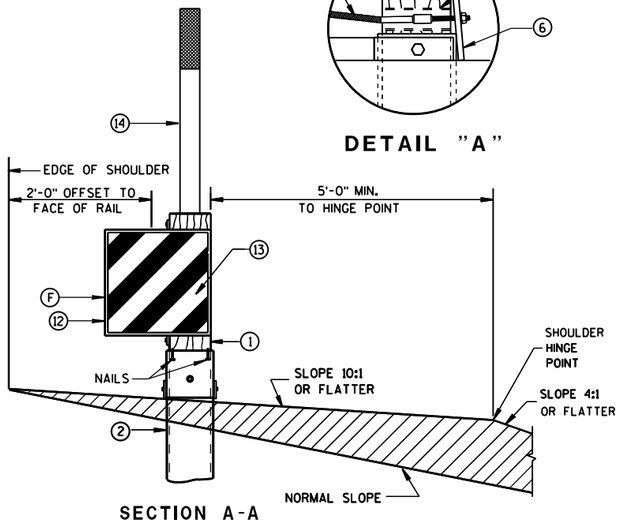




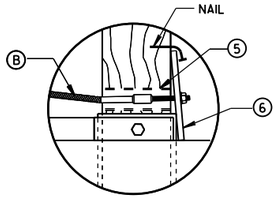
SECTION C-C
TYPICAL AT POST NOS. 3-9



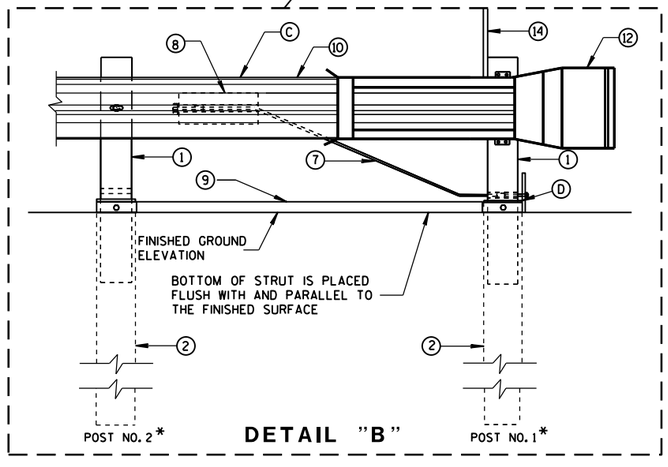
SECTION B-B
TYPICAL AT POST NO. 2*



SECTION A-A
TYPICAL AT POST NO. 1*



DETAIL "A"

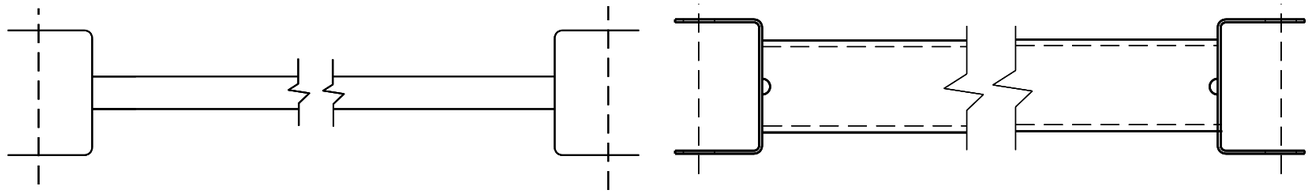


DETAIL "B"

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPO

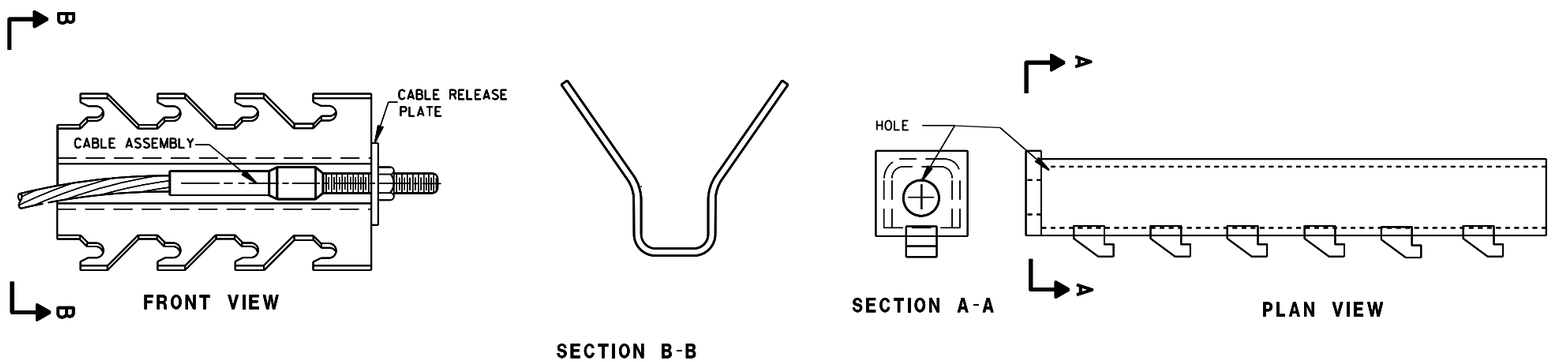
S.D.D. 14 B 44-2a



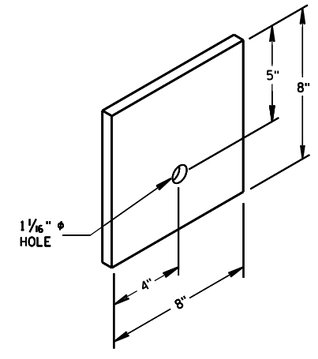
GENERIC GROUND STRUT (9) (H)

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)



GENERIC ANCHOR CABLE BOX (8) (H)



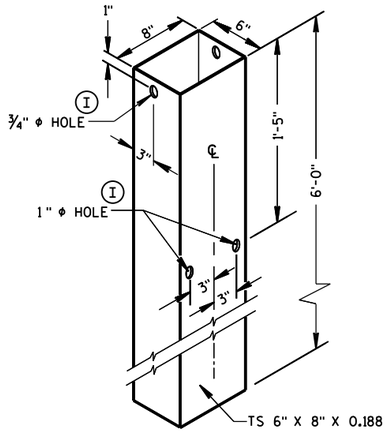
BEARING PLATE (6)

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

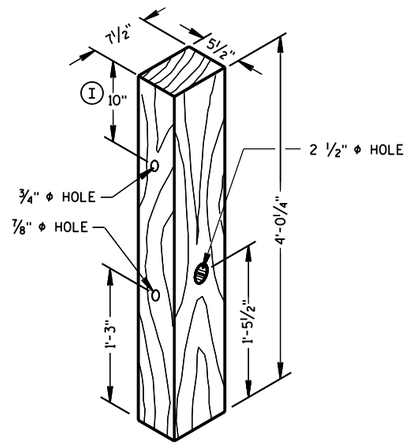
STATE OF WISCONSIN
DEPARTMENT OF TRANSPO

6

S.D.D. 14 B 44-2b

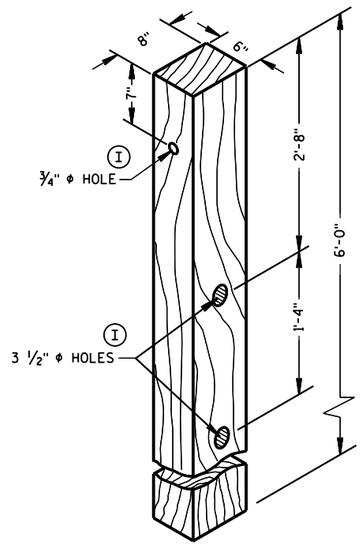


FOUNDATION TUBE (2)



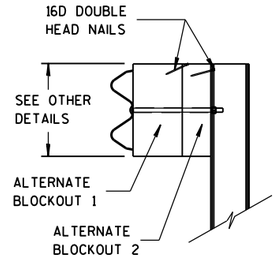
POSTS NUMBER 1 AND 2

WOOD BREAKAWAY POST (1)

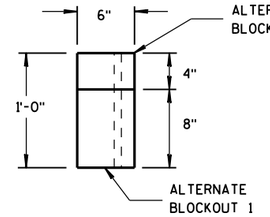


POSTS NUMBER 3-9

WOOD CRT POST (3)

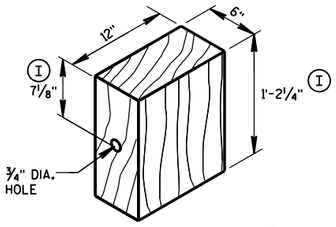


SIDE VIEW



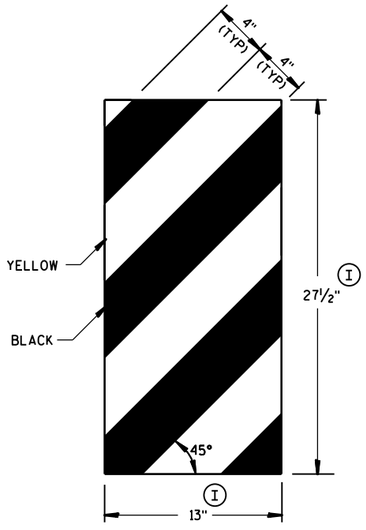
TOP VIEW

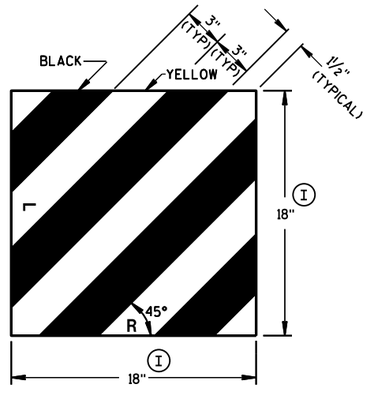
ALTERNATE WOOD BLOCKOUT DETAIL



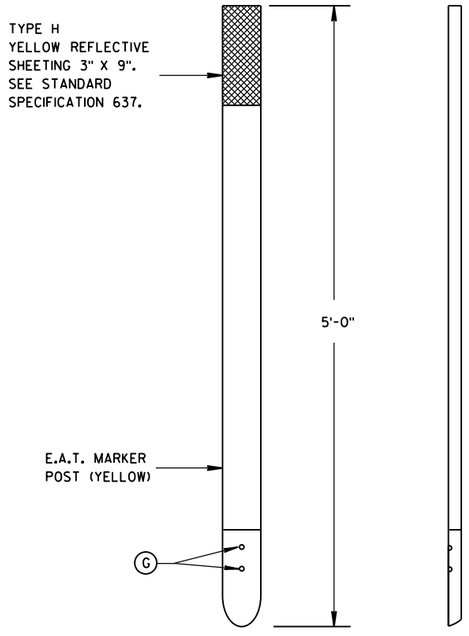
WOOD BLOCKOUT (4)

REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2





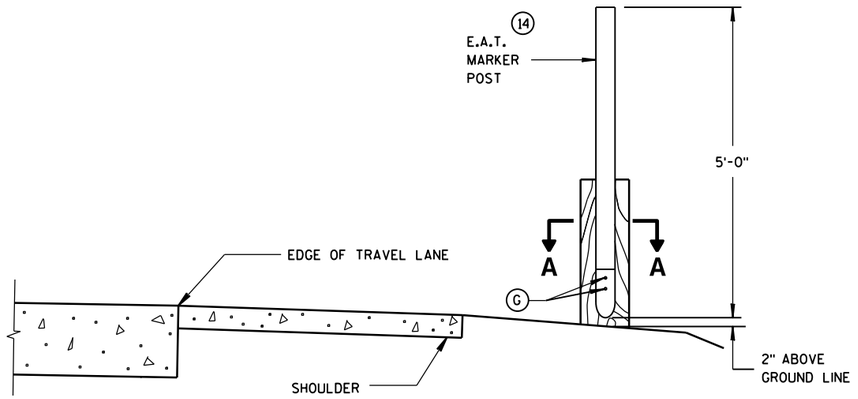
GENERIC REFLECTIVE SHEETING (13) (H)



FRONT VIEW

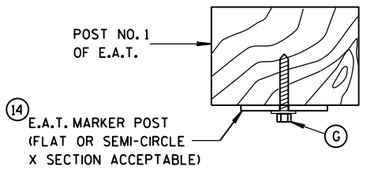
SIDE VIEW

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

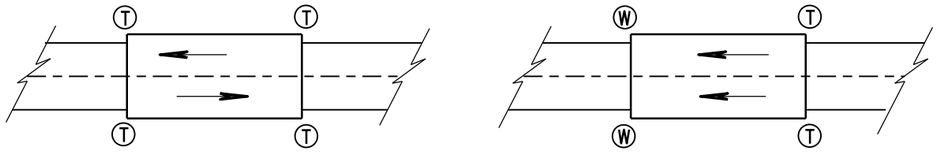
APPROVED
June 2014 — DATE
/S/ Jerry H. Zogg — ROADWAY STANDARDS ENGINEER
FHWA

6

S.D.D. 14 B 44-2c

6

S.D.D. 14 B 44-2c



TWO WAY TRAFFIC

ONE WAY TRAFFIC

Ⓣ THRIE BEAM CONNECTION

Ⓦ W-BEAM CONNECTION WHEN REQUIRED

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

GENERAL NOTES

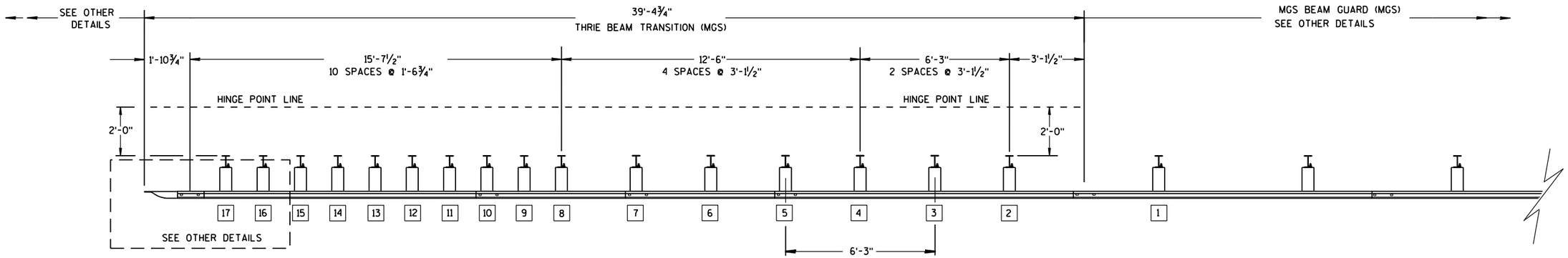
IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2½", AND 12" DIAMETER AROUND POST. SEE 14B42 FOR MORE DETAILS.

TRANSITION USES STEEL POSTS ONLY.

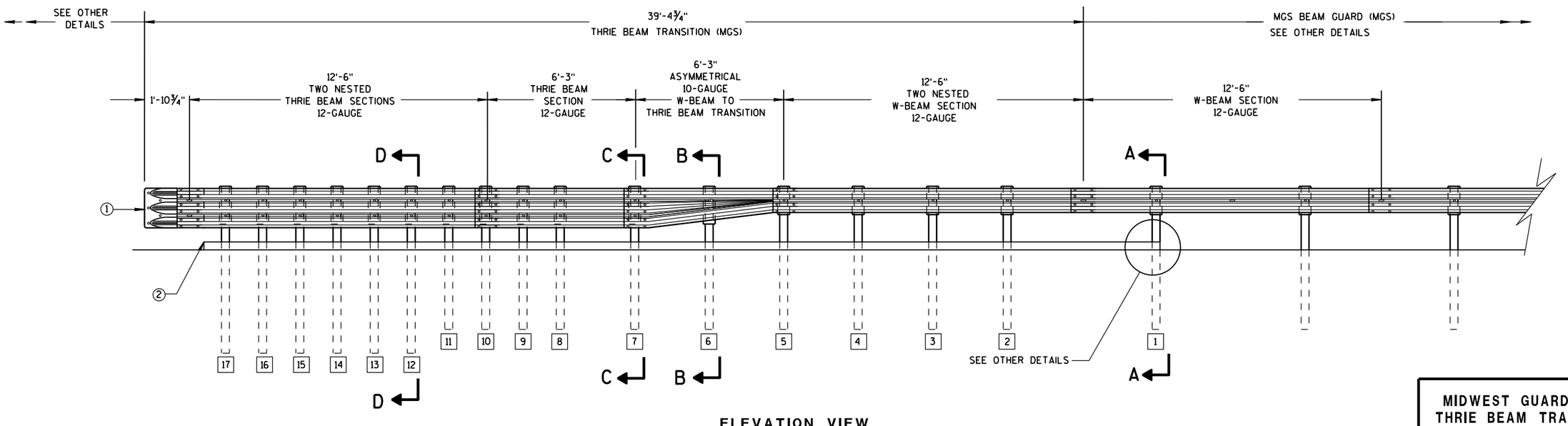
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

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 TRANSPOI

6

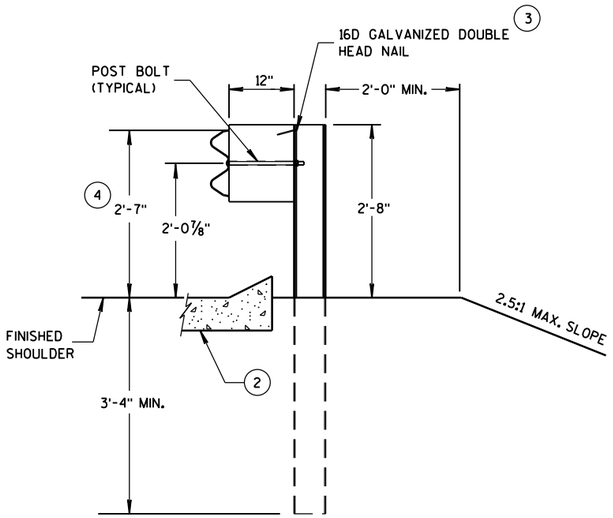
S.D.D. 14 B 45-4a

GENERAL NOTES

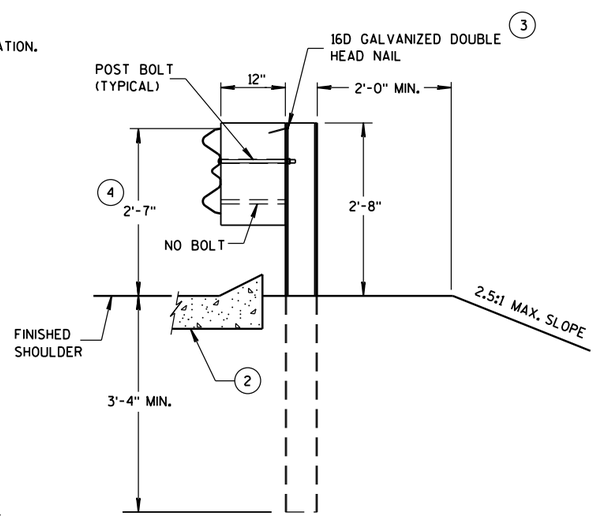
(2) OPTIONAL CURB AND GUTTER OR DRAINAGE_FEATURE SEE PLAN FOR INFORMATION.

(3) WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 10D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

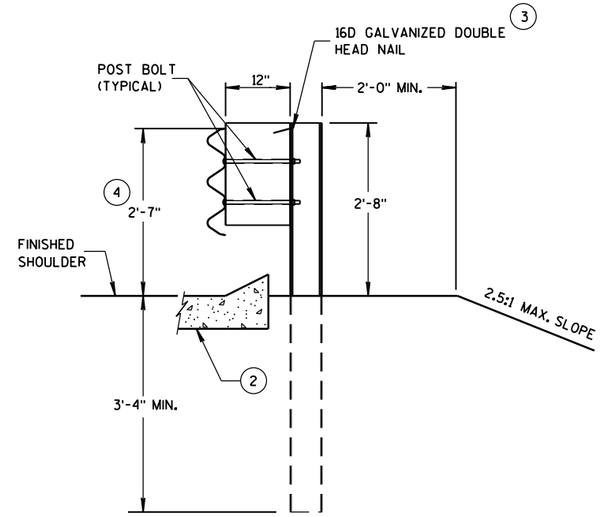
(4) TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".



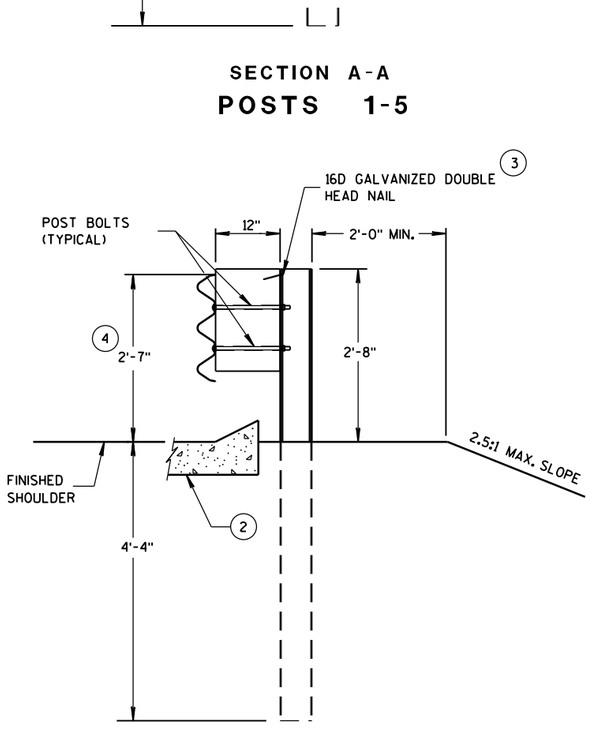
SECTION A-A
POSTS 1-5



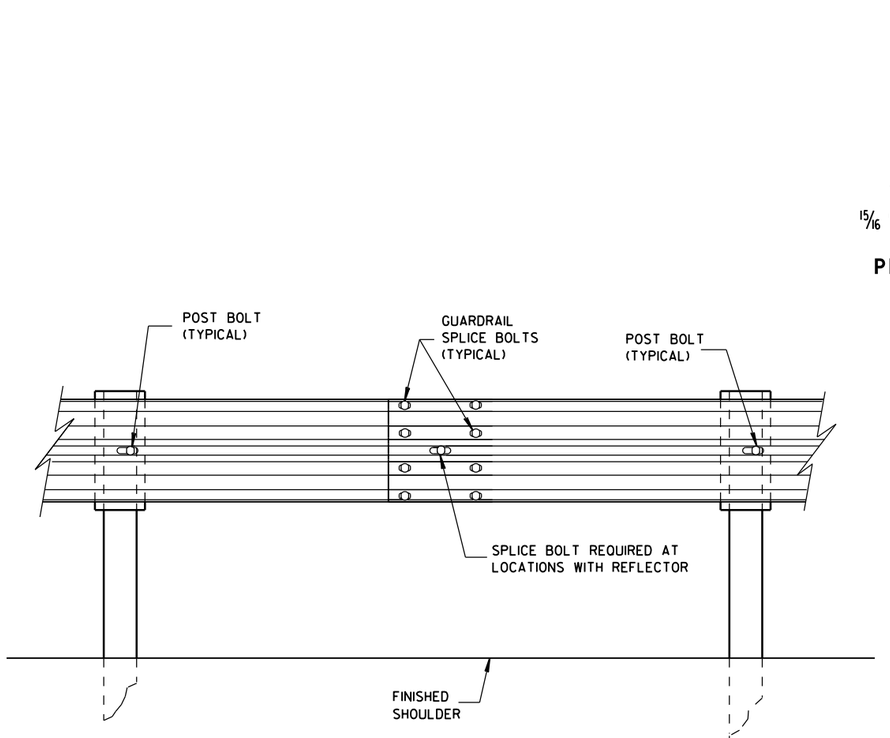
SECTION B-B
POST 6



SECTION C-C
POSTS 7-11



SECTION D-D
POSTS 12-17



SPLICE DETAIL

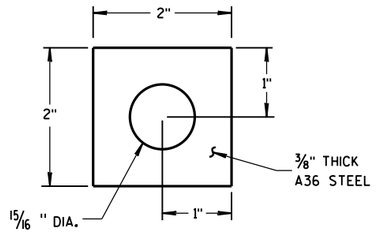
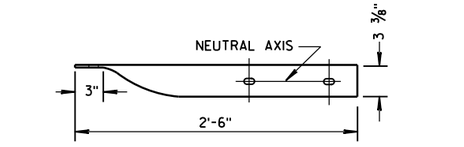
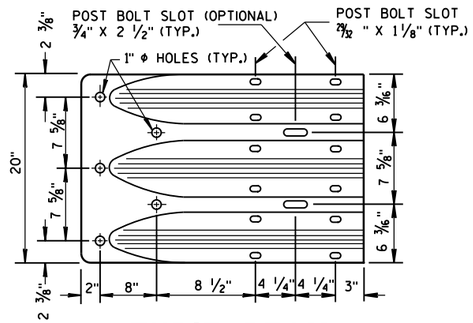
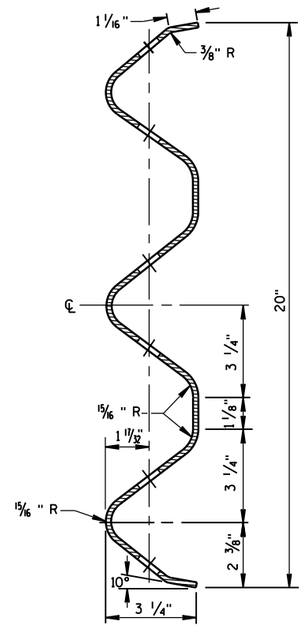


PLATE WASHER DETAIL





THRIE BEAM TERMINAL CONNECTOR



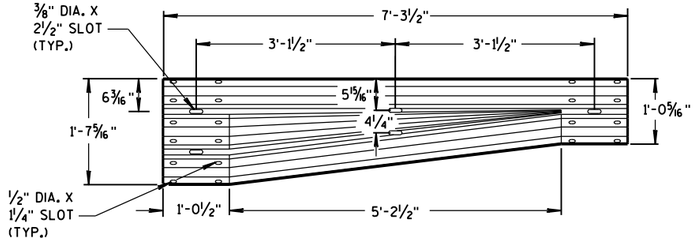
SECTION THRU THRIE BEAM RAIL ELEMENT

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

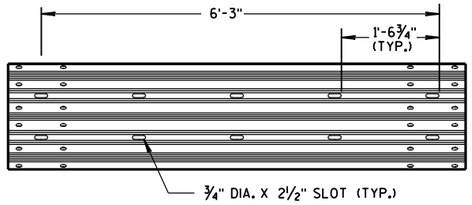
STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

6

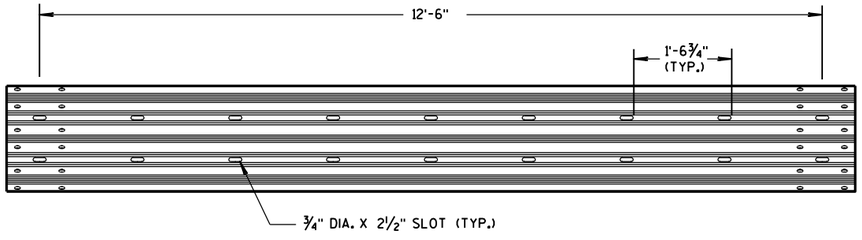
S.D.D. 14 B 45-4b



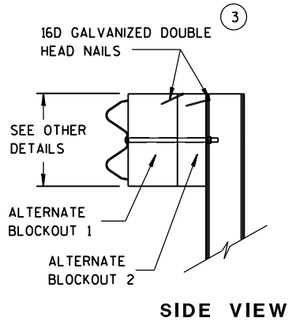
W-BEAM TO THRIE BEAM TRANSITION SECTION



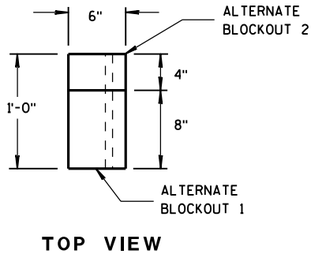
6'-3" THRIE BEAM SECTION



12'-6" THRIE BEAM SECTION

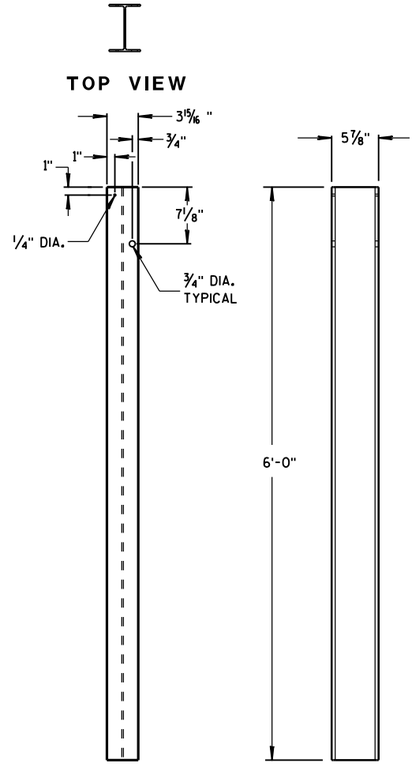


SIDE VIEW



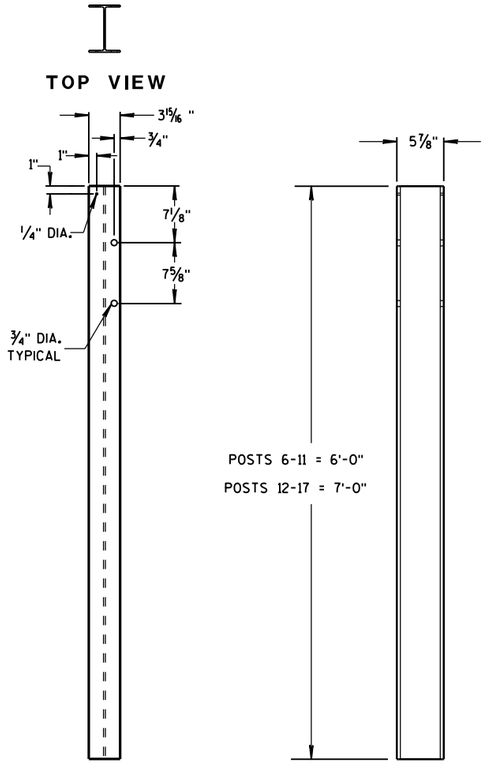
TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL



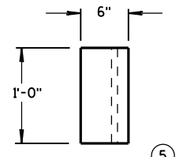
FRONT VIEW SIDE VIEW

STEEL POSTS 1-5

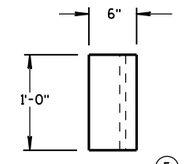


FRONT VIEW SIDE VIEW

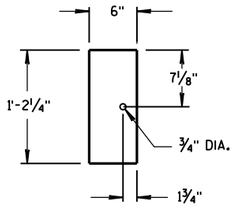
STEEL POSTS 6-17



TOP VIEW (5)

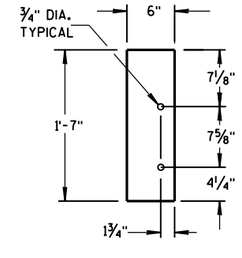


TOP VIEW (5)



FRONT VIEW

BLOCKOUT POSTS 1-5



FRONT VIEW

BLOCKOUT POSTS 6-17

GENERAL NOTES

STEEL POSTS ARE W6X9 OR W6X8.5.

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

(3) WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

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

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

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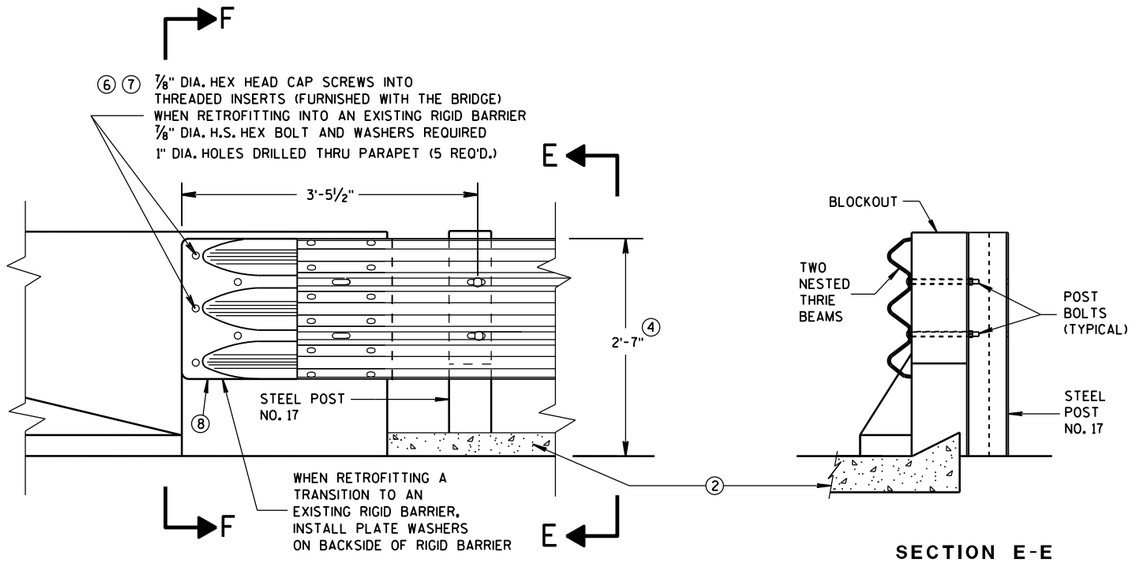


FRONT VIEW

SECTION E-E

THRIE BEAM CONNECTION TO BRIDGE PARAPET WITH SQUARE ENDS

GENERAL NOTES

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

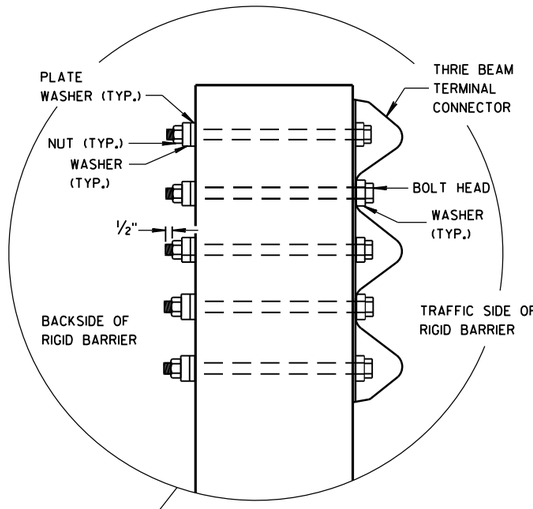
② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.

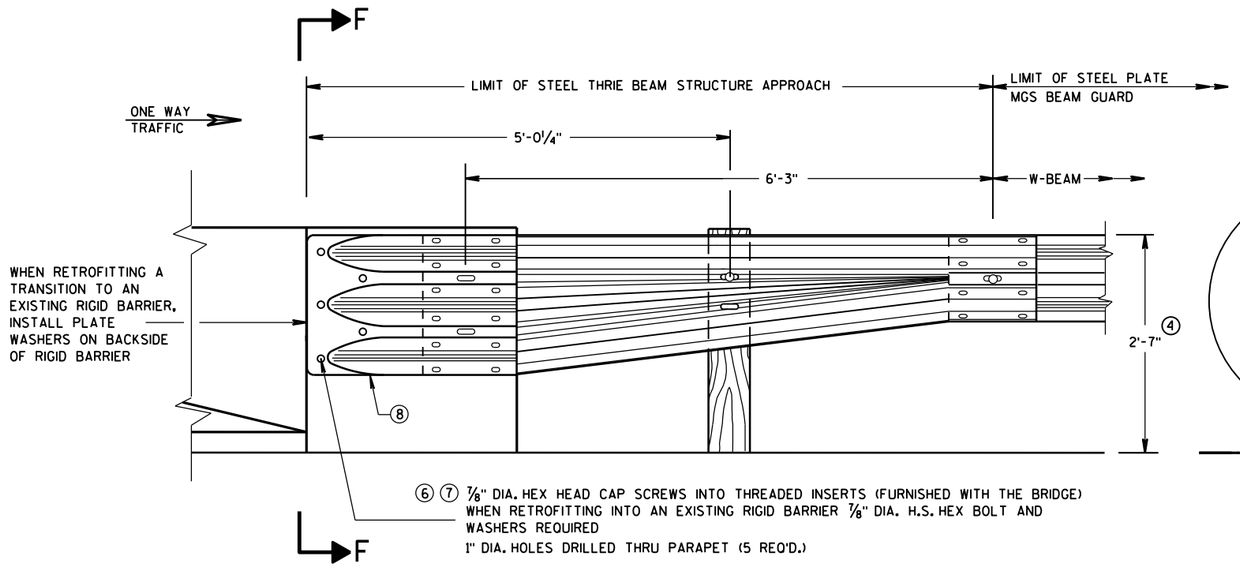
④ TOLERANCE FOR TOP OF BEAM IS ± 1".

⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

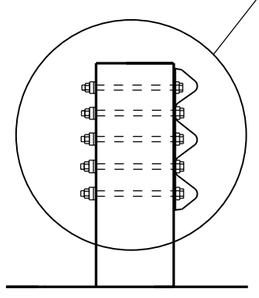
⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE.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

⑧ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".

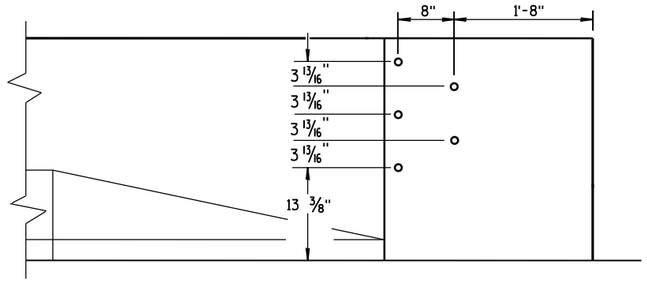




FRONT VIEW



SECTION F-F



DRILL HOLE LOCATION

W BEAM TRANSITION AND CONNECTION TO BRIDGE PARAPETS WITH SQUARE ENDS

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

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June, 2015 — DATE
/S/ Jerry H. Zogg — ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

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GENERAL NOTES

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

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

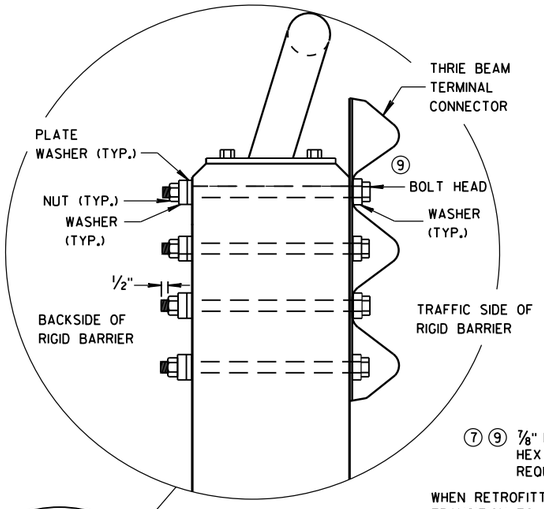
(4) TOLERANCE FOR TOP OF BEAM IS ± 1".

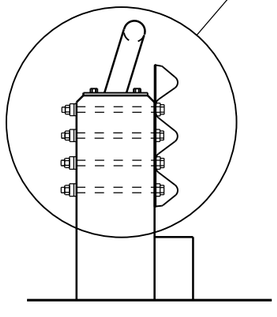
(6) DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

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

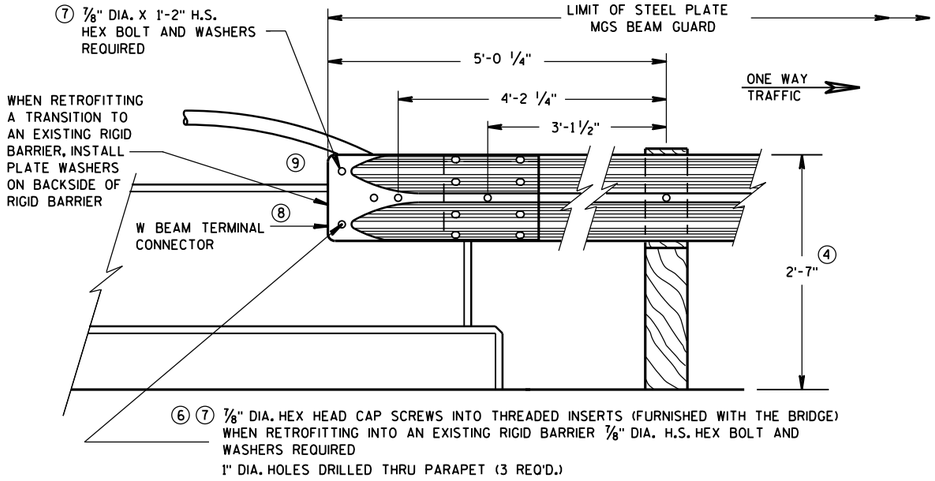
(8) THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".

(9) BOLT, NUT AND WASHERS NOT REQUIRED FOR THIS LOCATION WHEN RETROFITTING AN EXISTING PAPAPET AND THE HOLE IS EITHER ABOVE PARAPET OR WITHIN 4 INCHES OF THE EDGE OF PARAPET.





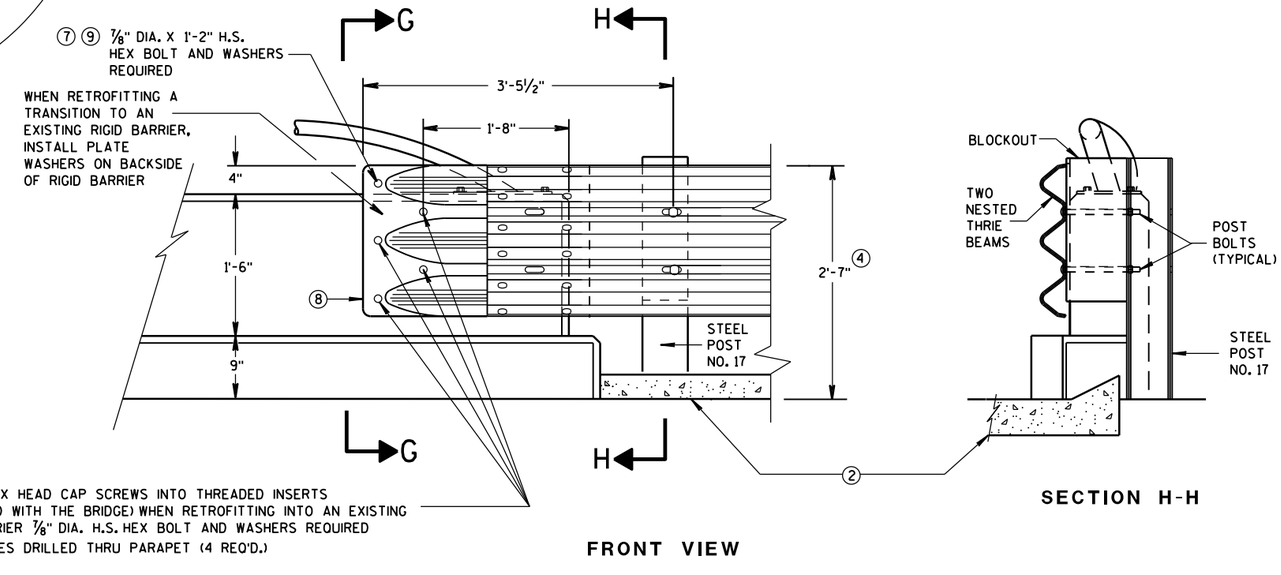
SECTION G-G



FRONT VIEW

W BEAM CONNECTION TO VERTICAL FACE PARAPET

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



FRONT VIEW

SECTION H-H

THRIE BEAM CONNECTION TO VERTICAL FACED PARAPETS

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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June, 2015 — DATE
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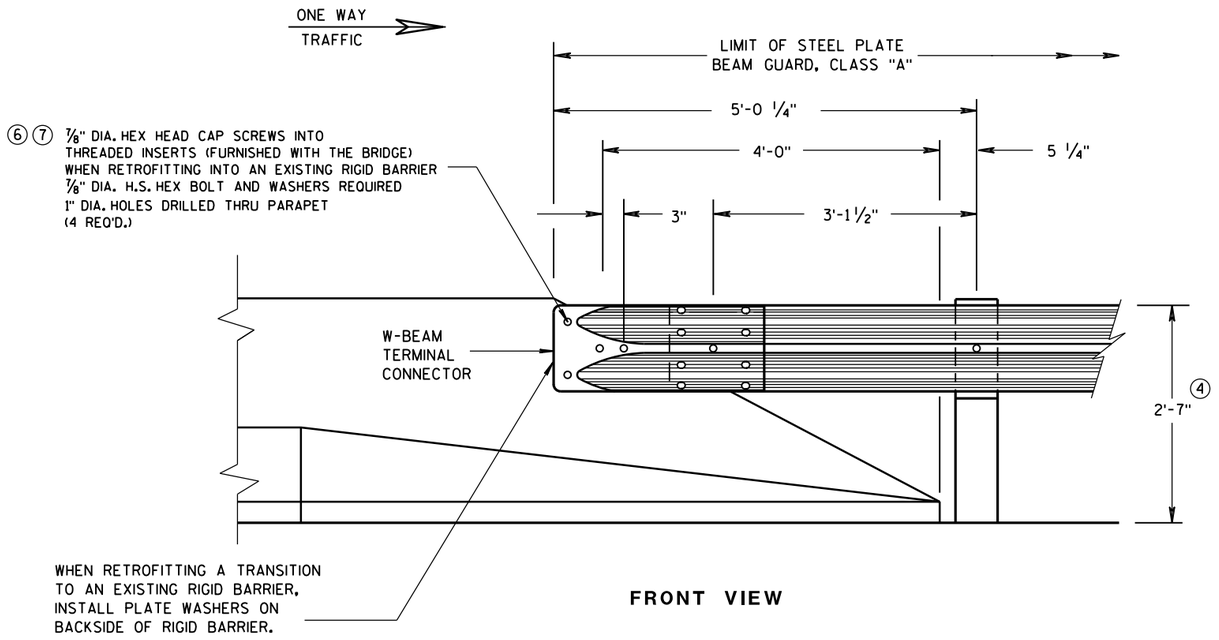


FRONT VIEW

W BEAM CONNECTION TO PARAPETS WITH SLOPED ENDS

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

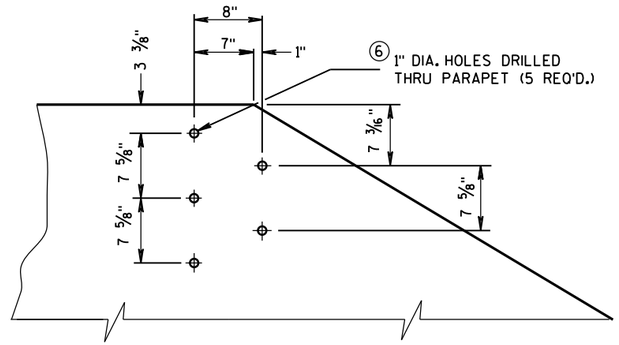
GENERAL NOTES

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

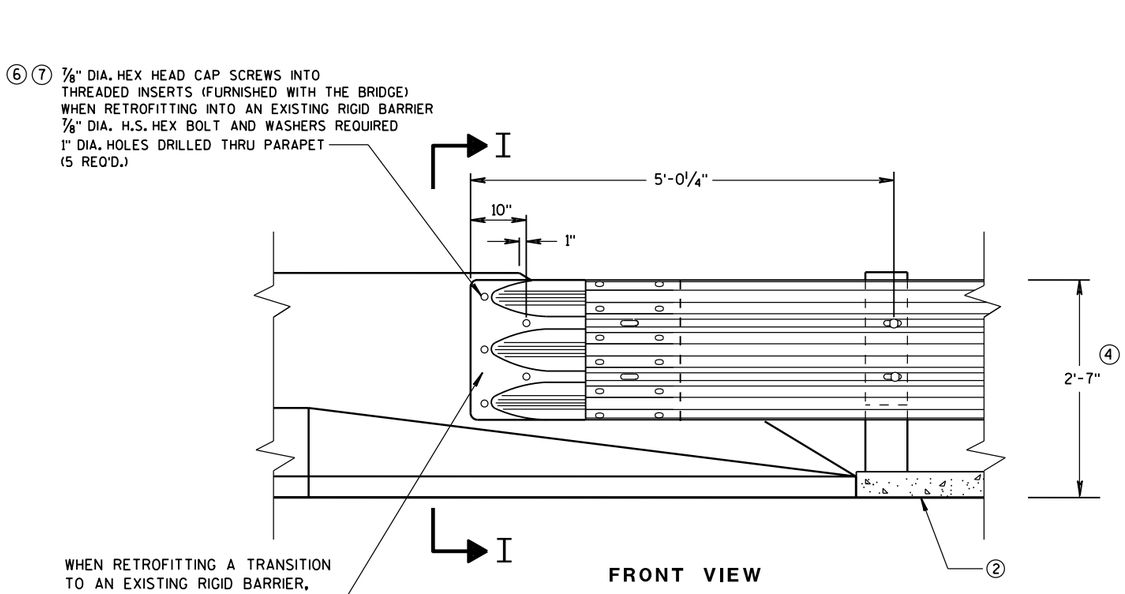
④ TOLERANCE FOR TOP OF BEAM IS ± 1".

⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

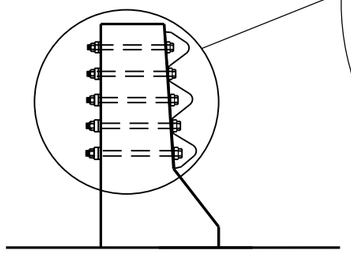
⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE.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



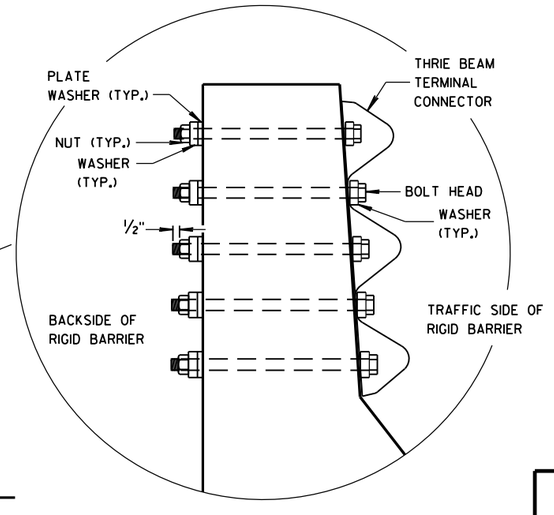
DRILL HOLE LOCATION AND PATTERN
FOR THRIE BEAM CONNECTION



FRONT VIEW



SECTION I-I



THRIE BEAM CONNECTION TO BRIDGE PARAPETS WITH SLOPED ENDS

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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/S/ Jerry H. Zogg — ROADWAY STANDARDS DEVELOPMENT ENGINEER
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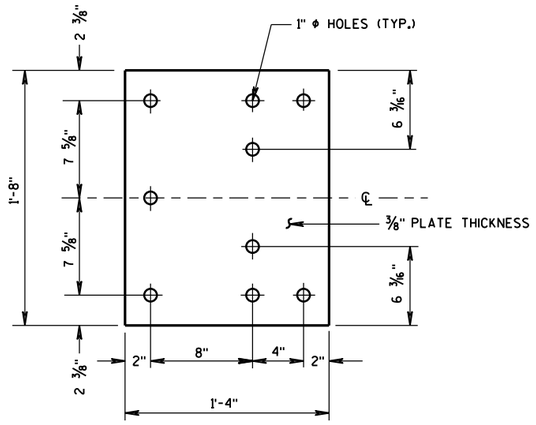
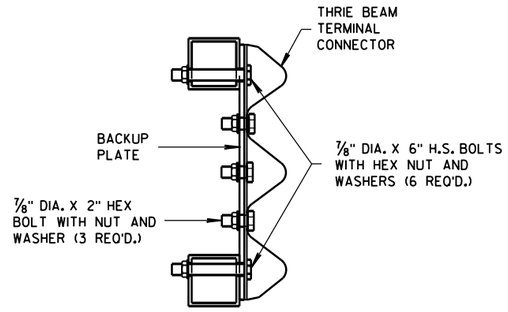
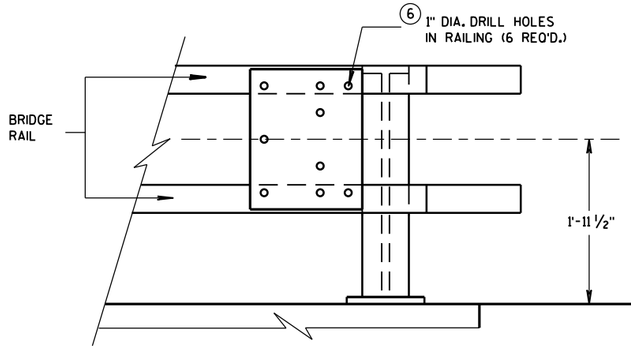


BACK-UP PLATE DETAIL



SECTION J-J

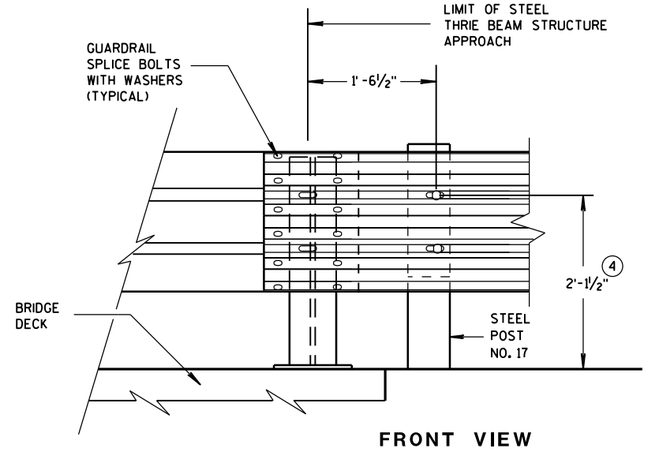


BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING

GENERAL NOTES

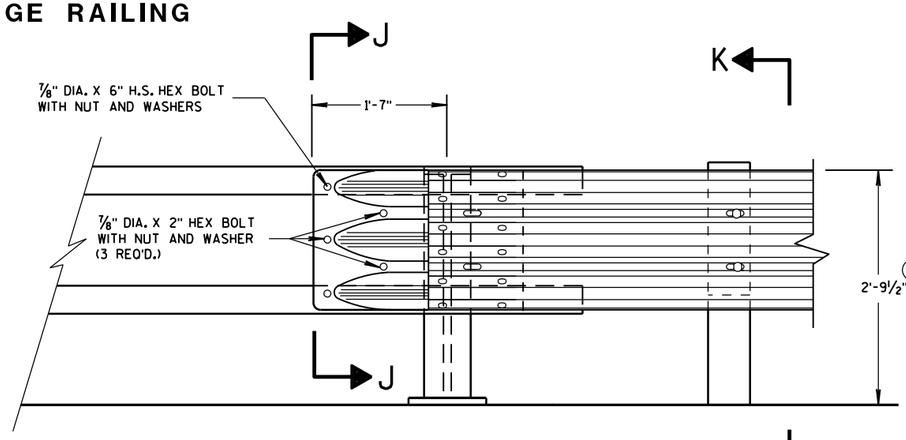
4 TOLERANCE FOR TOP OF BEAM IS ± 1".

6 DRILLING HOLES THROUGH THE PAPRPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

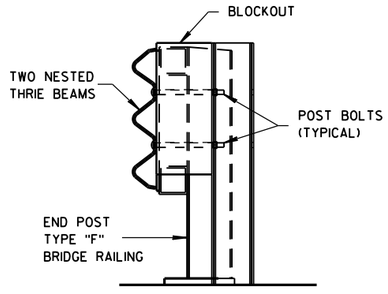


FRONT VIEW

THRIE BEAM CONNECTION TO STEEL RAILING TYPE "W"



FRONT VIEW



SECTION K-K

THRIE BEAM CONNECTION TO TUBULAR RAILING TYPE "F"

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June, 2015 — DATE
/S/ Jerry H. Zogg — ROADWAY STANDARDS DEVELOPMENT ENGINEER
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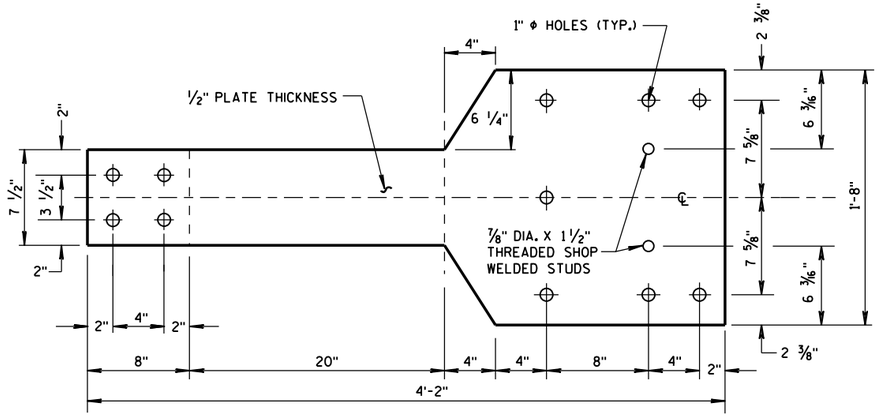
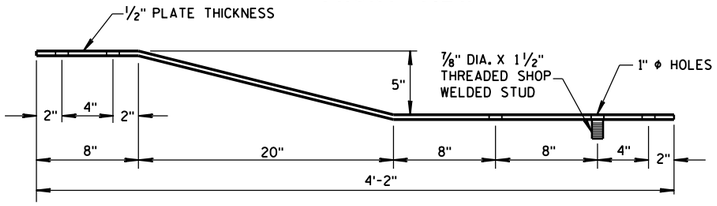
GENERAL NOTES

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

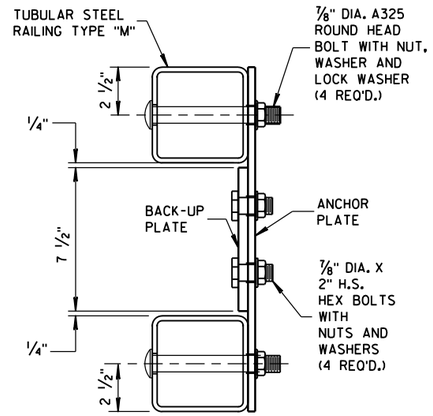


FRONT VIEW

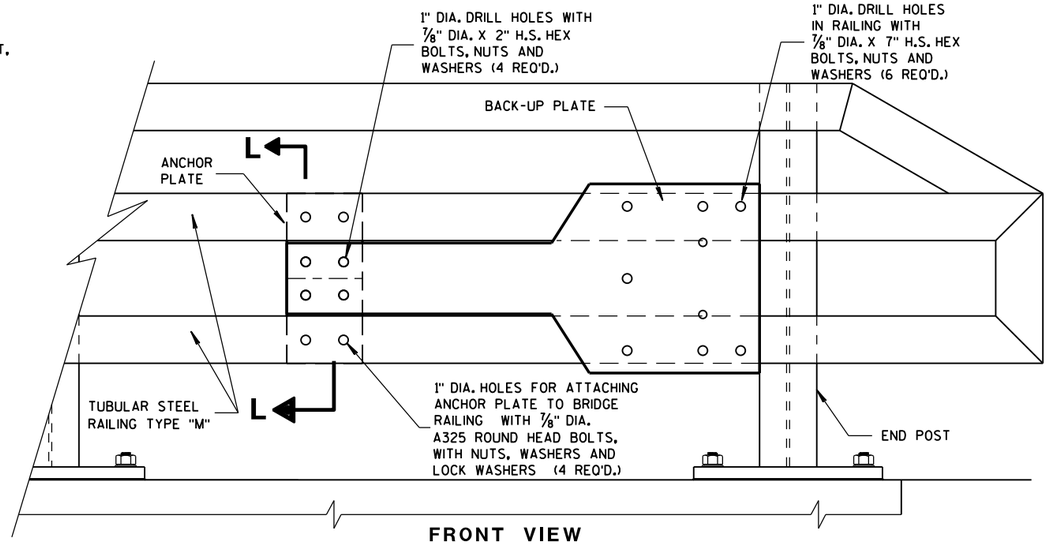


PLAN VIEW

BACK-UP PLATE DETAIL, TYPE "M"

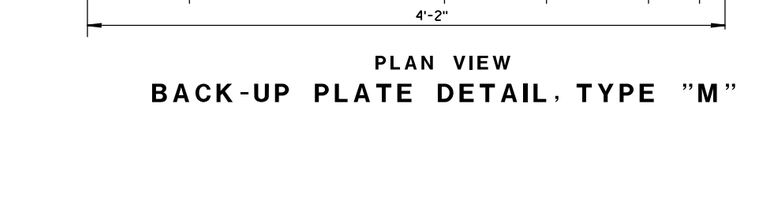


SECTION L-L



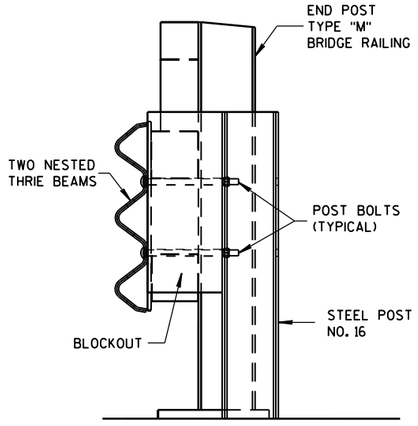
FRONT VIEW

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

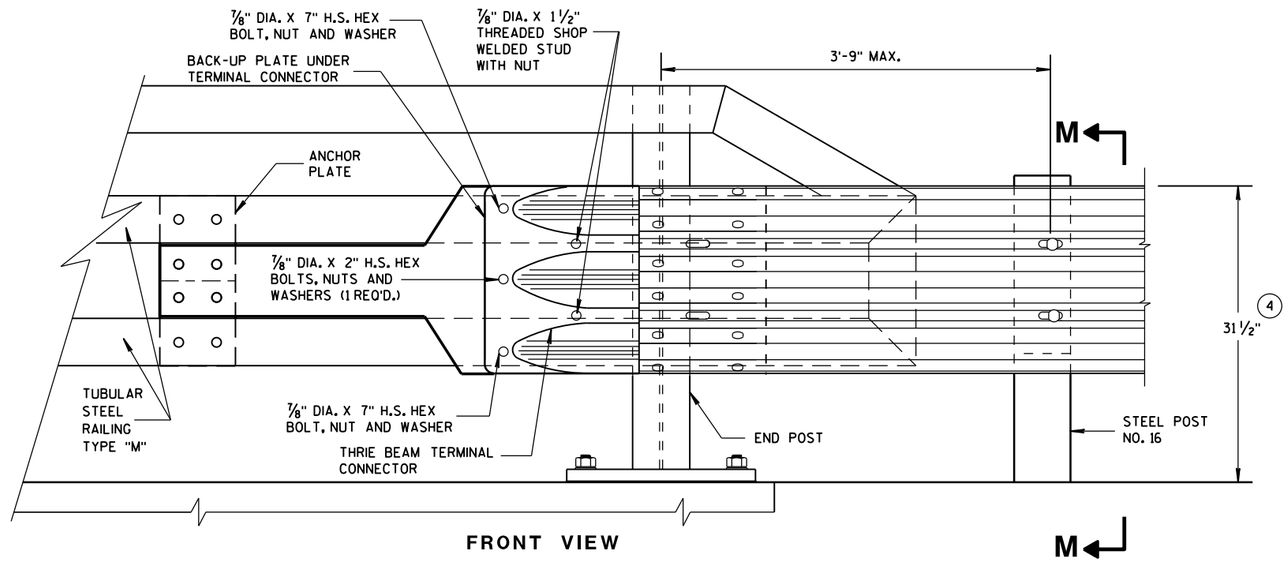


FRONT VIEW

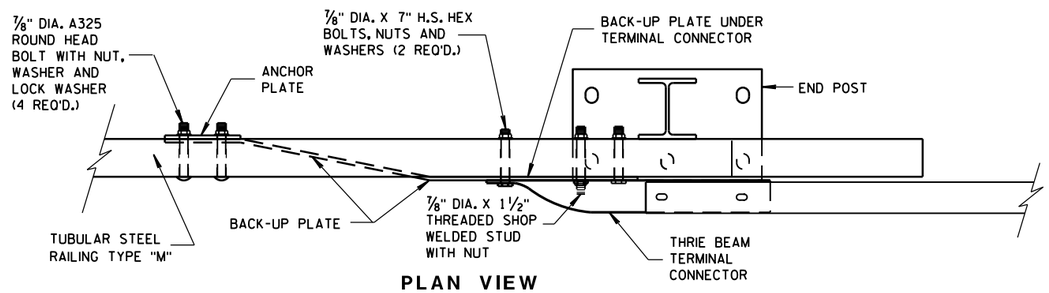
ANCHOR PLATE DETAIL, TYPE "M"



SECTION M-M



FRONT VIEW



PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June, 2015 DATE	/S/ Jerry H. Zogg ROADWAY STANDARDS ENGINEER
FHWA	

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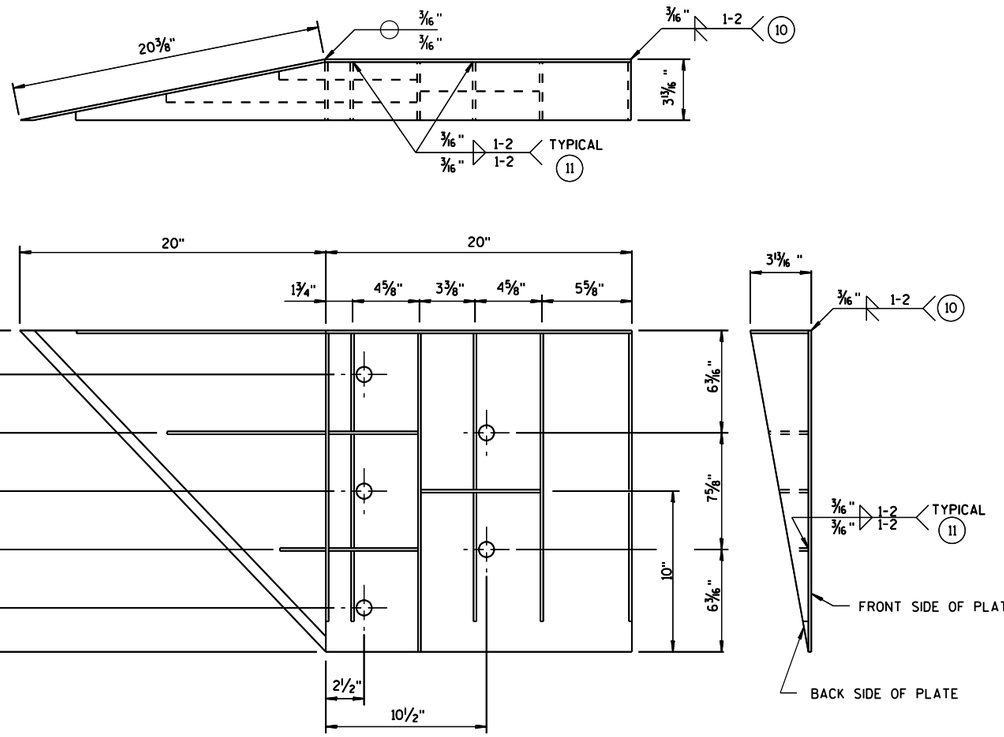
S.D.D. 14 B 45-4h



WELDING INSTRUCTION

(VIEWED FROM BACK SIDE OF PLATE)

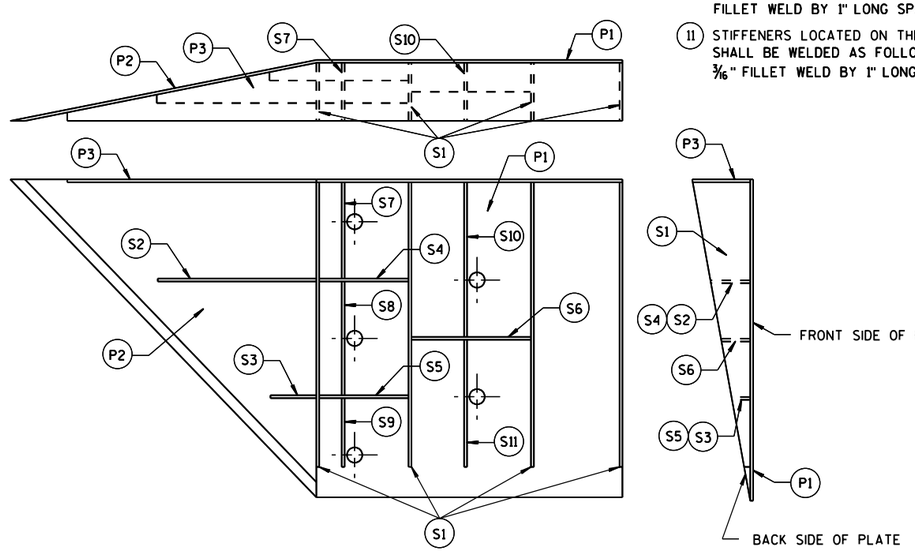


PLATE AND STIFFENER IDENTIFICATION

(VIEWED FROM BACK SIDE OF PLATE)

GENERAL NOTES

COVER PLATE PANELS ARE 3/16" THICK.

ALL STIFFENERS ARE 1/4" THICK.

CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.

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

ALL HOLE DIAMETERS SHALL BE 1".

FOR OPPOSITE SIDE INSTALLATION MIRROR DRAWINGS.

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

(11) STIFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:
3/16" FILLET WELD BY 1" LONG SPACED AT 2".

CONNECTOR PLATE DIMENSION (PER ASSEMBLY)

PLATE	QUANTITY	SHAPE	SIZE (A x B x C x D)	THICKNESS
P1	1		20" x 20"	3/16"
P2	1		20" x 20" x 28 9/16"	3/16"
P3	1		39" x 3 5/8" x 20" x 19 5/16"	3/16"
S1	4		18 7/16" x 3 3/8" x 18 3/4"	1/4"
S2	1		10 1/4" x 2 7/16" x 10 3/8" x 1/2"	1/4"
S3	1		3" x 1 1/16" x 3 1/8" x 1/2"	1/4"
S4	1		6 1/8" x 2 7/16"	1/4"
S5	1		6 1/8" x 1 1/16"	1/4"
S6	1		7 3/4" x 1 3/4"	1/4"
S7	1		2 9/16" x 6" x 3 5/8" x 5 7/8"	1/4"
S8	1		1 5/32" x 7 1/2" x 2 1/2" x 7 3/8"	1/4"
S9	1		6 1/16" x 6 3/16" x 1 1/32"	1/4"
S10	1		1 7/8" x 9 7/8" x 3 5/8" x 9 11/16"	1/4"
S11	1		8 1/2" x 8 3/4" x 1 13/16"	1/4"

SINGLE SLOPE CONNECTION PLATE

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June, 2015 — DATE
/S/ Jerry H. Zogg — ROADWAY STANDARDS ENGINEER
FHWA

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S.D.D. 14 B 45-4i

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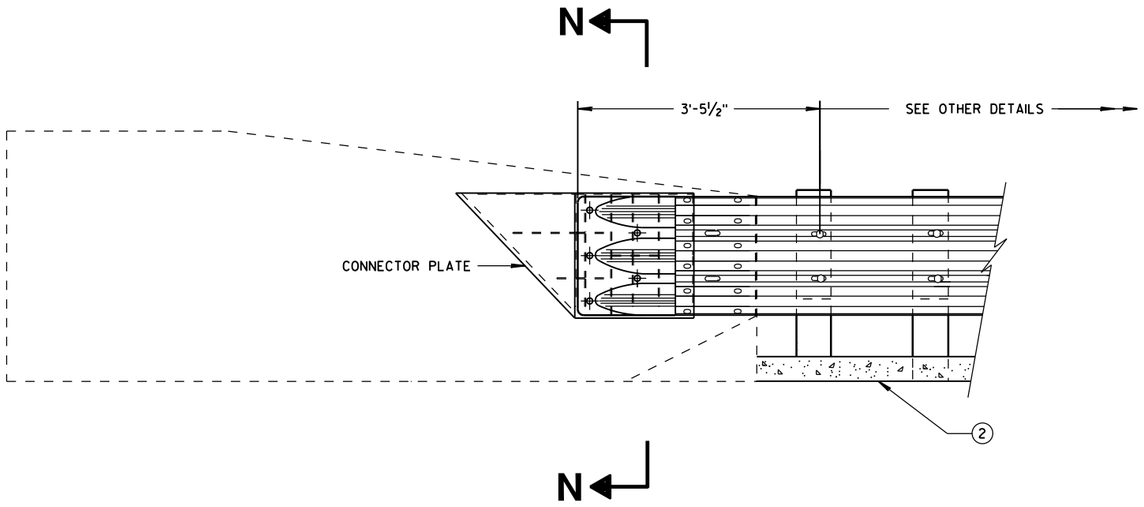
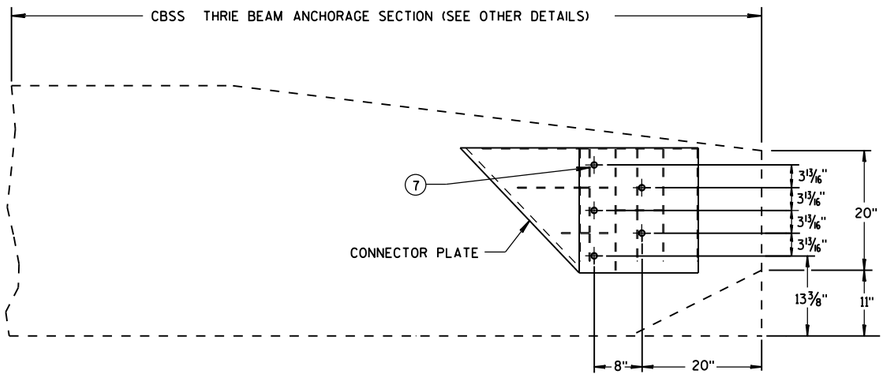


THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER



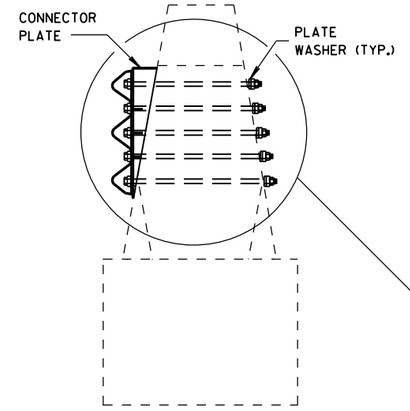
SINGLE SLOPE CONNECTION PLATE PLACEMENT

GENERAL NOTES

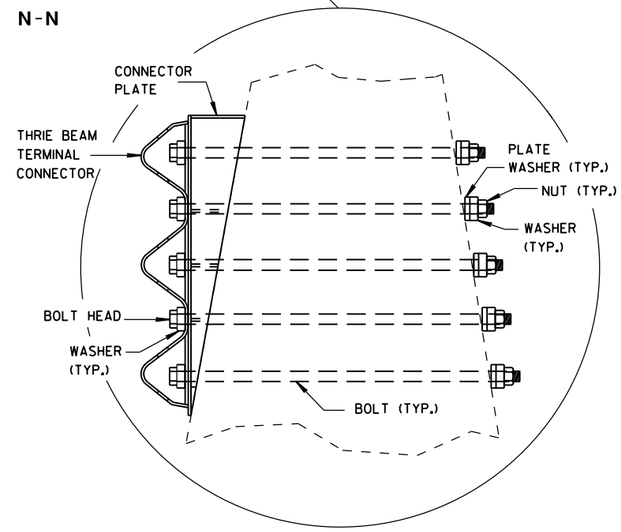
CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

(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
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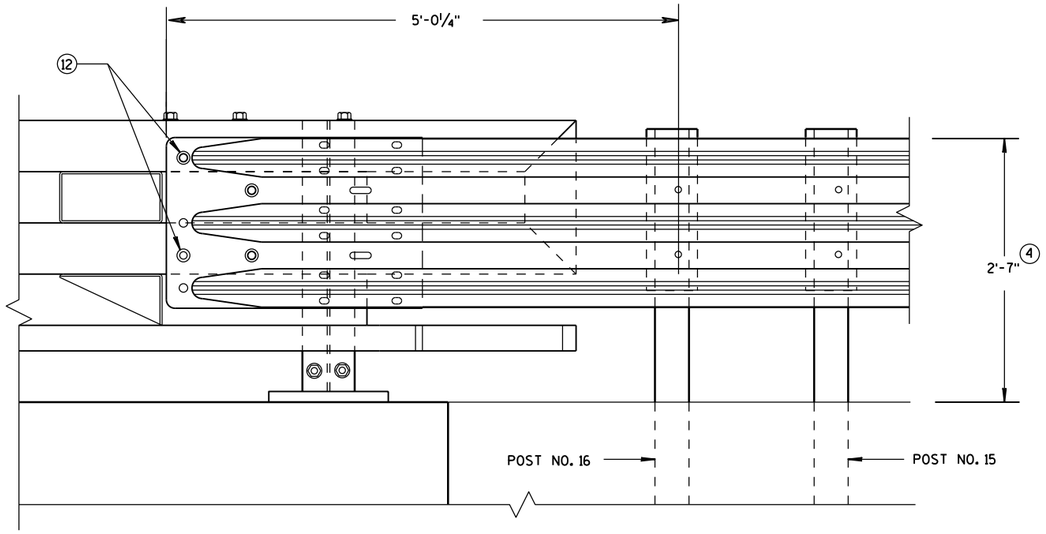
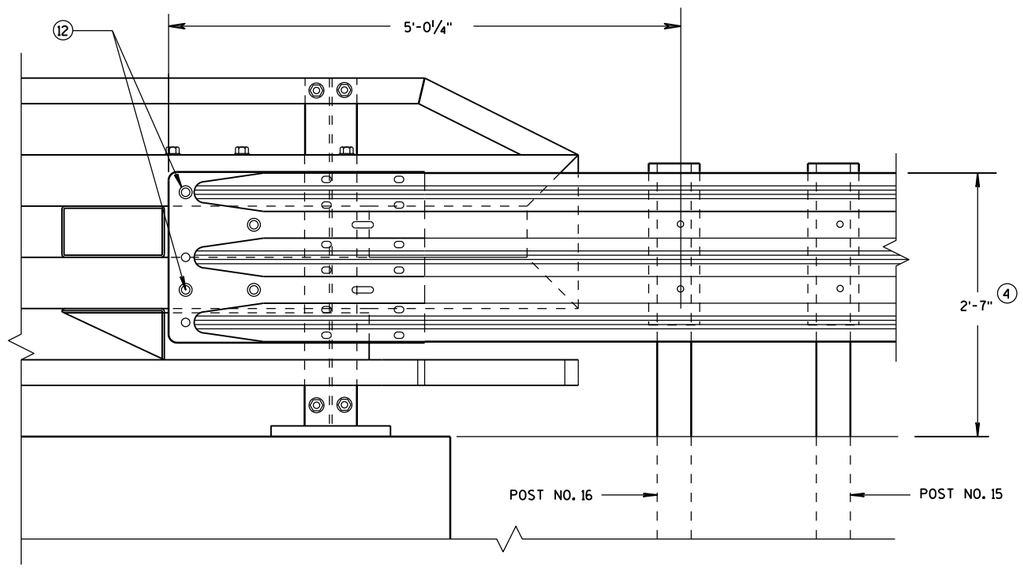


ELEVATION OF DETAIL AT NY3 END POST

THRIE BEAM RAIL ATTACHMENT



ELEVATION OF DETAIL AT NY4 END POST

THRIE BEAM RAIL ATTACHMENT

GENERAL NOTES

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

(12) BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND ½-INCH BEYOND NUT.

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June, 2015
DATE

/S/ Jerry H. Zogg
ROADWAY STANDARDS D ENGINEER

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S.D.D. 14 B 45-4k

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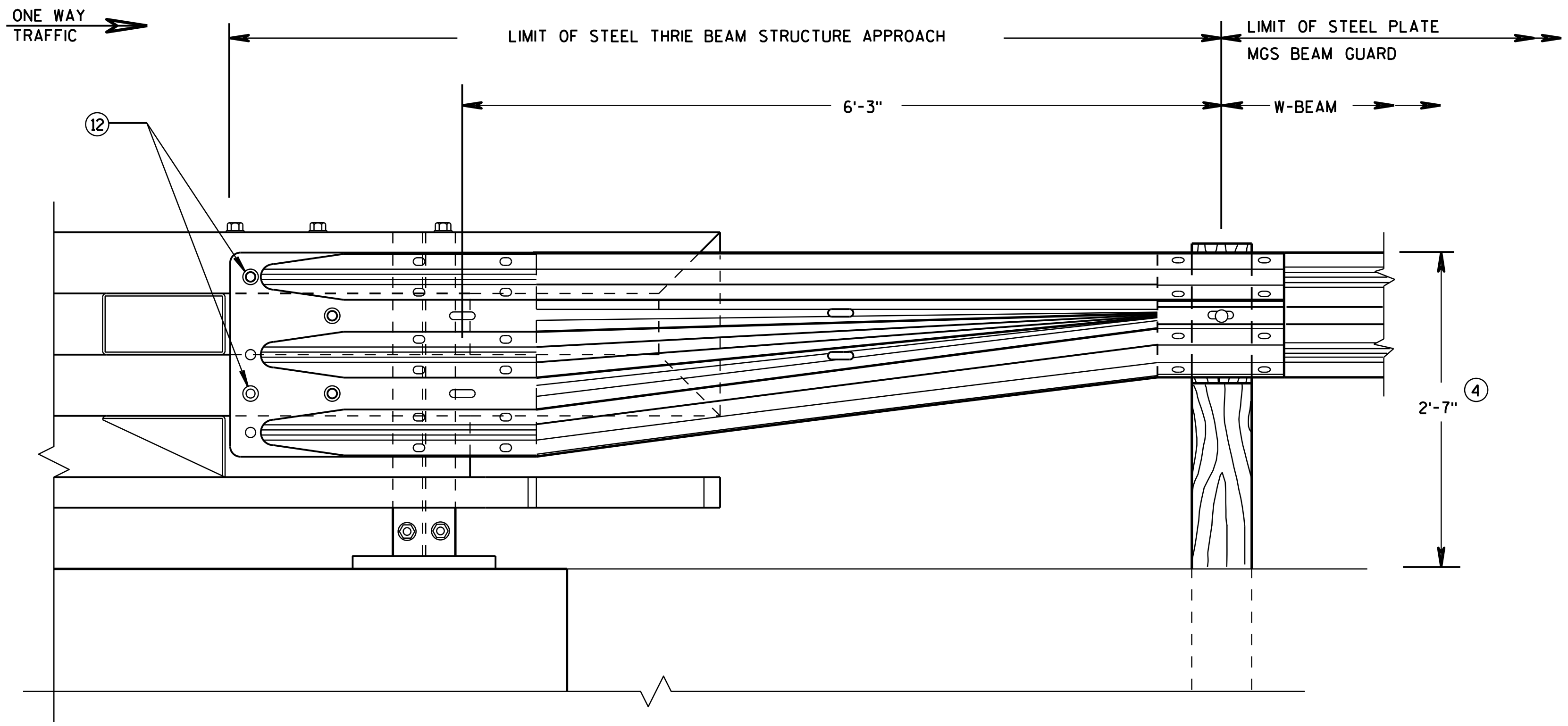


FRONT VIEW

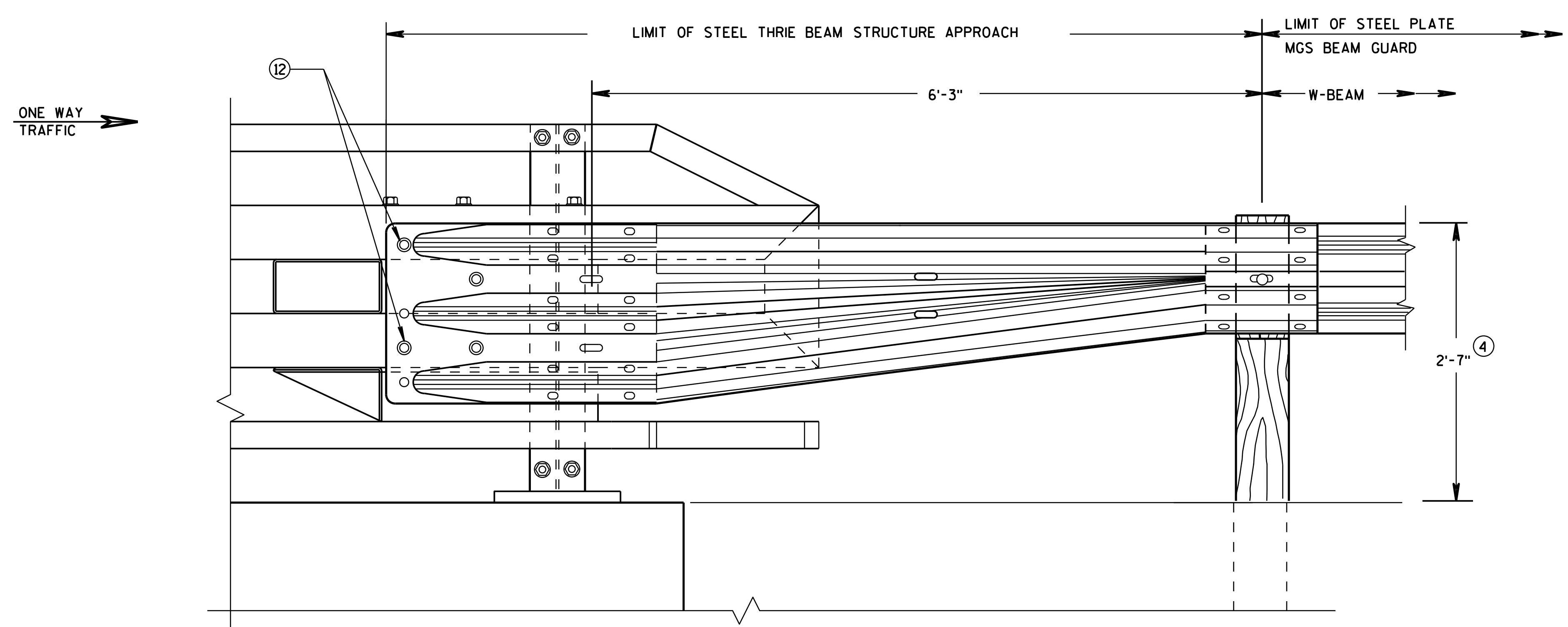
W BEAM TRANSITION AND CONNECTION TO BRIDGE RAILING TYPE "NY3"

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

GENERAL NOTES

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

(12) BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND ½-INCH BEYOND NUT.



FRONT VIEW

W BEAM TRANSITION AND CONNECTION TO BRIDGE RAILING TYPE "NY4"

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

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June, 2015 — DATE
/S/ Jerry H. Zogg — ROADWAY STANDARDS DEVELOPMENT ENGINEER
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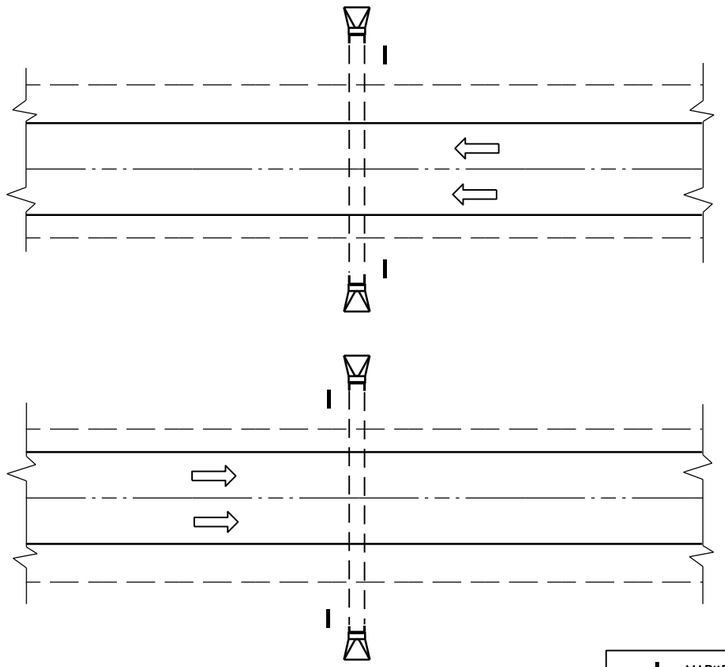
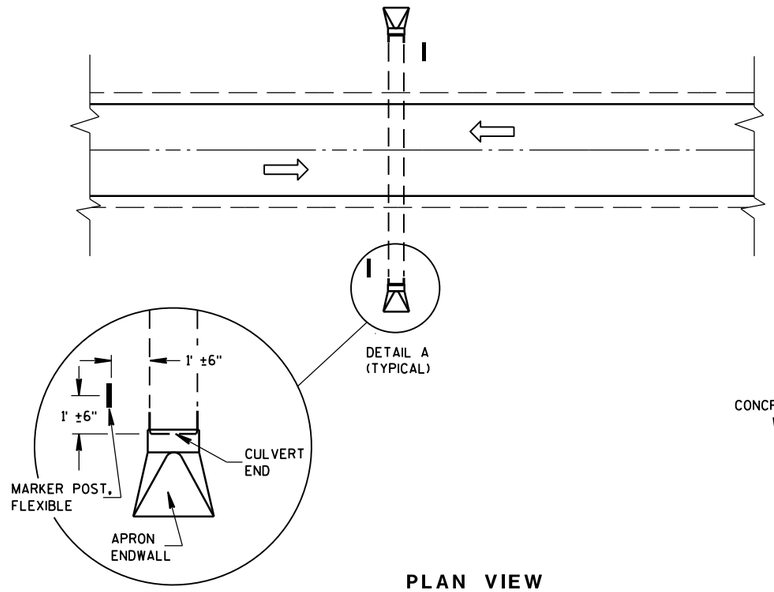


PLAN VIEW

DIVIDED HIGHWAY



DETAIL A
(TYPICAL)

PLAN VIEW

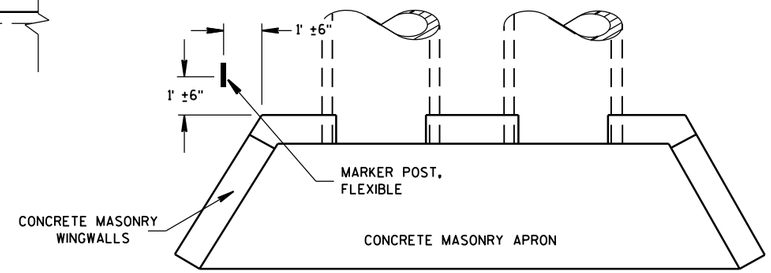
UNDIVIDED HIGHWAY

MARKER POST, FLEXIBLE

DIRECTION OF TRAFFIC FLOW

GENERAL NOTES

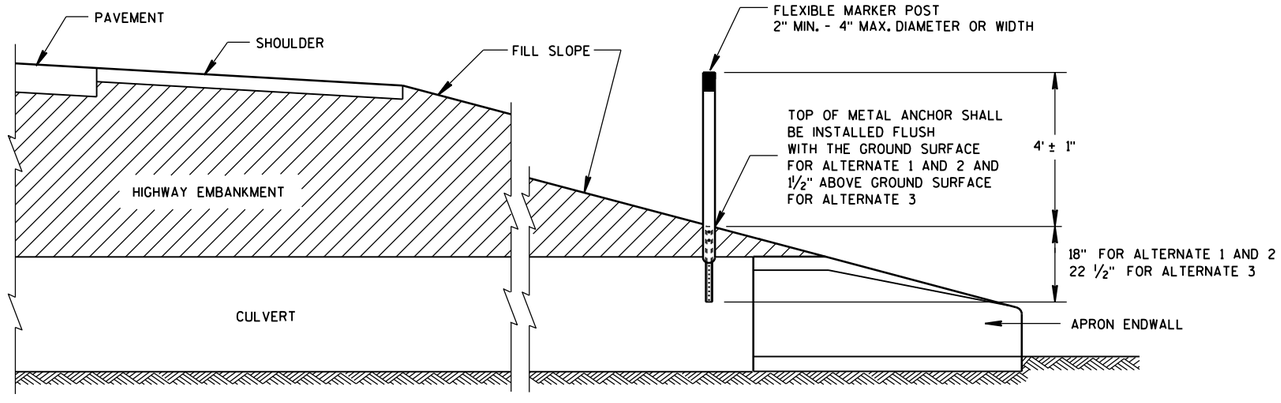
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.



PLAN VIEW

CONCRETE MASONRY ENDWALLS FOR CULVERT PIPE AND PIPE ARCH

FLEXIBLE MARKER POST LOCATION



CROSS SECTION

FLEXIBLE MARKER POST

FLEXIBLE MARKER POST FOR CULVERT END

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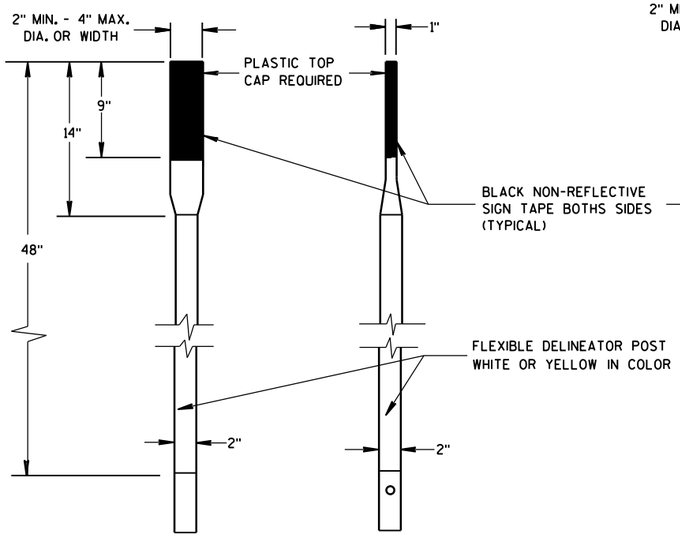
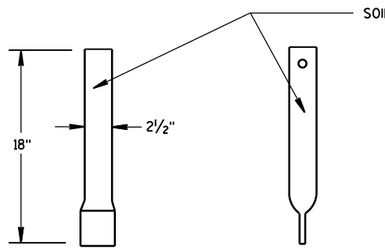
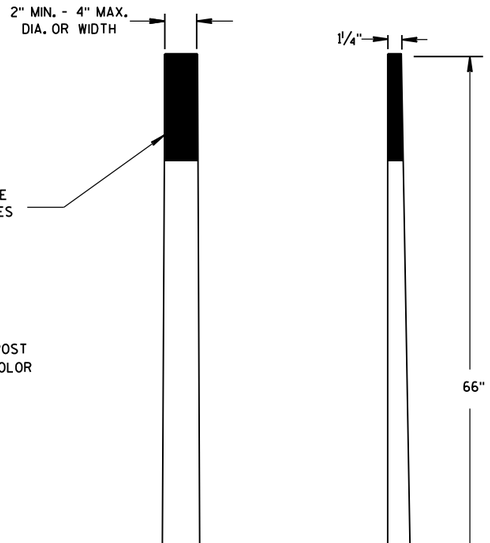




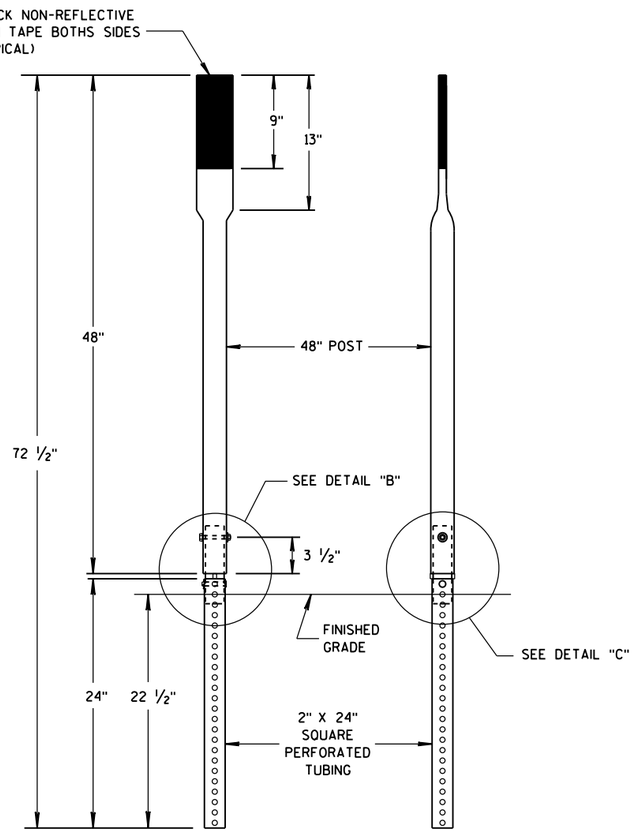
FRONT VIEW SIDE VIEW

ALTERNATE 1



FRONT VIEW SIDE VIEW

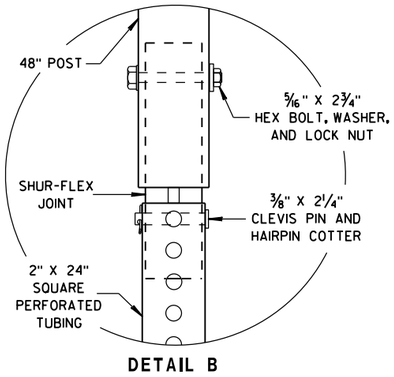
ALTERNATE 2



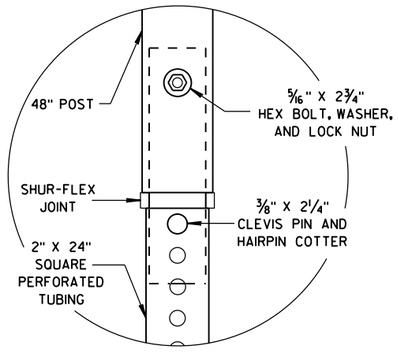
FRONT VIEW SIDE VIEW

ALTERNATE 3

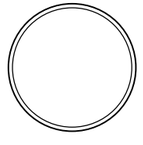
FLEXIBLE MARKER POSTS



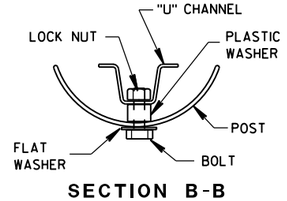
DETAIL B



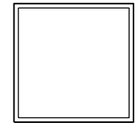
DETAIL C



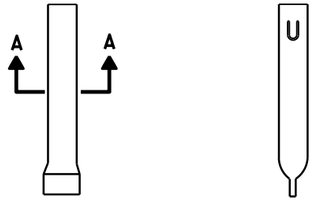
SECTION A-A



SECTION B-B

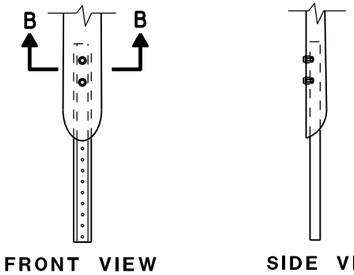


SECTION C-C



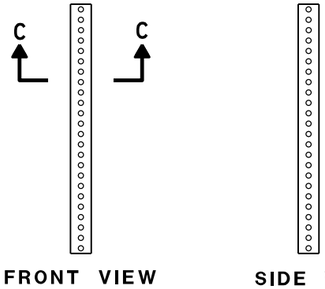
FRONT VIEW SIDE VIEW

ALTERNATE 1



FRONT VIEW SIDE VIEW

ALTERNATE 2



FRONT VIEW SIDE VIEW

ALTERNATE 3

FLEXIBLE MARKER POST ANCHORS

FLEXIBLE MARKER POST
FOR CULVERT END

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
10/1/2012 — DATE
/S/ Travis Feltes — STATE TRAFFIC ENGINEER
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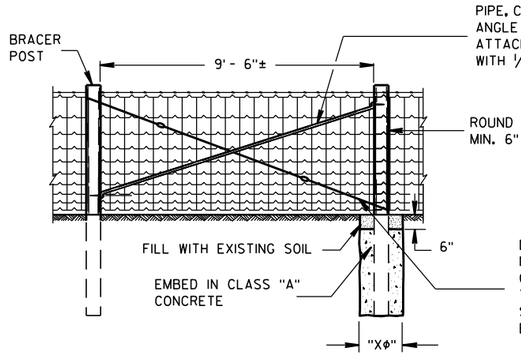
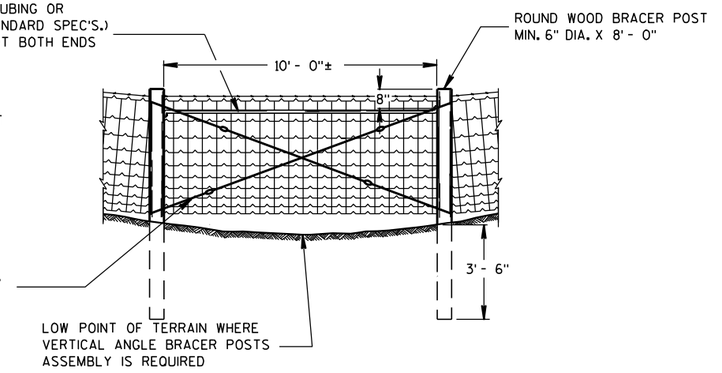
NOTE: PULL OR STRETCHER POST ASSEMBLIES SHALL BE PLACED MIDWAY BETWEEN END POSTS AND CORNER POSTS WHERE A RUN OF FENCE EXCEEDS 660' BUT IS LESS THAN 1,320'. FOR RUNS OF FENCE IN EXCESS OF 1,320' MAXIMUM SPACING OF PULL OR STRETCHER POST ASSEMBLIES SHALL BE 660'± C-C.

ILLUSTRATION SHOWS POSITION OF STANDARD STEEL BRACE, DOUBLE STRAND GALVANIZED WIRE, AND THE POST TO BE EMBEDDED IN CONCRETE WHEN WIRE FENCE IS INSTALLED FROM LEFT TO RIGHT. THE BRACES SHALL BE POSITIONED ON THE OPPOSITE DIAGONALS AND THE OPPOSITE POST SHALL BE EMBEDDED IN CONCRETE WHEN WIRE FENCE IS INSTALLED FROM RIGHT TO LEFT.



PULL OR STRETCHER POSTS ASSEMBLY



VERTICAL ANGLE BRACER POSTS ASSEMBLY

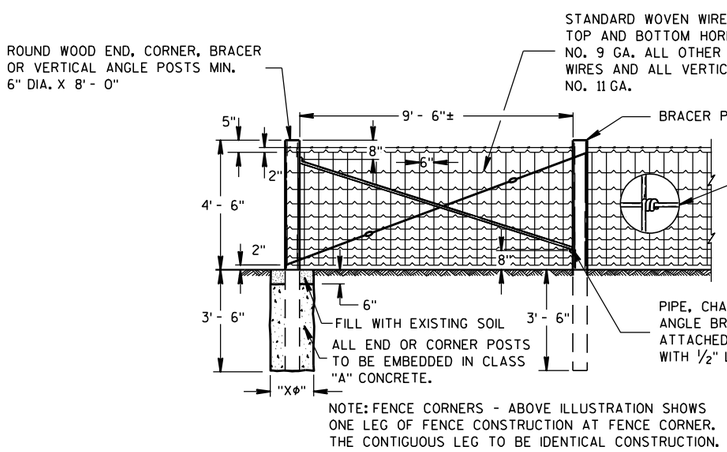
GENERAL NOTES

"XΦ" = DIAMETER OF THE POST PLUS 12".

FENCE STAPLES SHOULD NEVER BE DRIVEN VERTICALLY INTO WOOD POSTS (WITH BOTH LEGS PARALLEL WITH THE WOOD GRAIN). DOING SO CAN SEPARATE THE GRAIN AND SIGNIFICANTLY REDUCE THE HOLDING POWER. ROTATING THE STAPLES SLIGHTLY OFF VERTICAL STRADDLES THE GRAIN AND PROVIDES MORE RESISTANCE TO PULL-OUT.

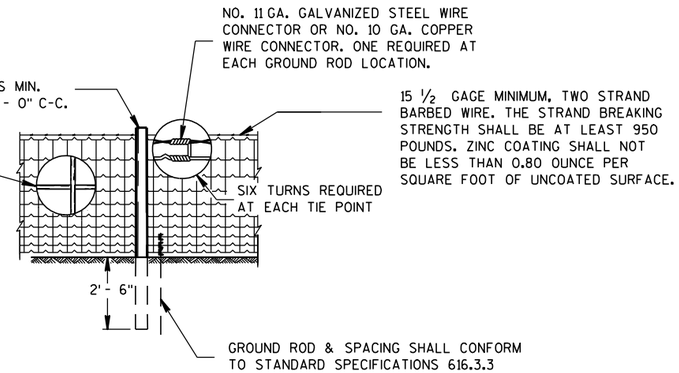
DO NOT STAPLE WIRE TIGHT TO THE LINE POSTS. ALLOW MOVEMENT OF WIRE FOR EXPANSION AND CONTRACTION. STAPLE ARRANGEMENT SHALL BE THE SAME FOR ALL OTHER POSTS EXCEPT THAT THEY SHALL BE DRIVEN TIGHT TO POSTS. ALL STAPLES SHALL BE 2" X 9 GAGE AND SHALL BE MANUFACTURED FROM GALVANIZED WIRE OR HOT DIP GALVANIZED AFTER FORMING. STAPLES SHALL HAVE SLASH-CUT POINTS.

FENCE SHALL BE LOCATED 3'-0" INSIDE THE RIGHT OF WAY LINE UNLESS OTHERWISE INDICATED ON THE PLANS.



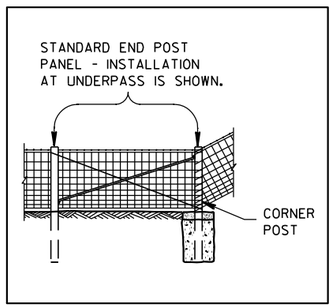
NOTE: FENCE CORNERS - ABOVE ILLUSTRATION SHOWS ONE LEG OF FENCE CONSTRUCTION AT FENCE CORNER. THE CONTIGUOUS LEG TO BE IDENTICAL CONSTRUCTION.

END OR CORNER POSTS ASSEMBLY

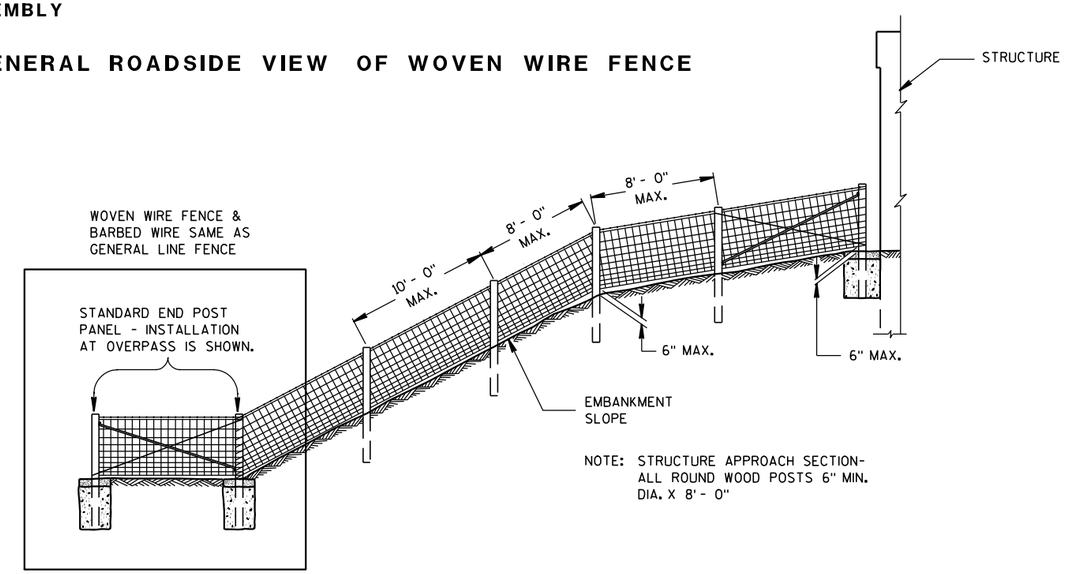


LINE FENCE CONSTRUCTION

GENERAL ROADSIDE VIEW OF WOVEN WIRE FENCE



ALTERNATE FENCE DESIGN AT STRUCTURE



NOTE: STRUCTURE APPROACH SECTION- ALL ROUND WOOD POSTS 6" MIN. DIA. X 8' - 0"

FENCE DESIGN AT STRUCTURE APPROACH

FENCE WOVEN WIRE

STATE OF WISCONSIN
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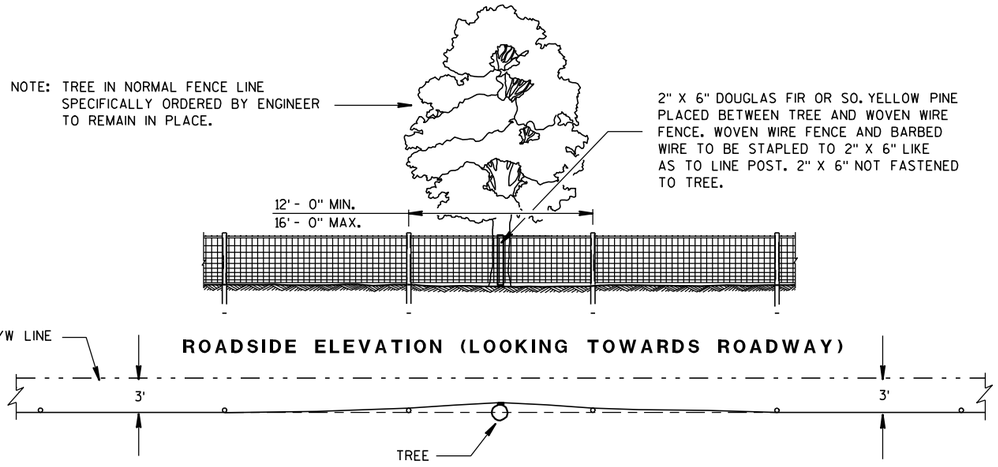
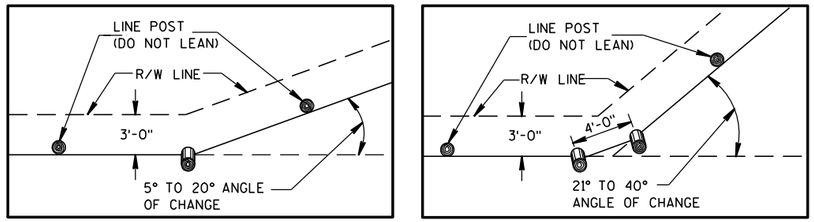


PLAN VIEW

FENCE DESIGN AT TREES REMAINING IN NORMAL FENCE LINE



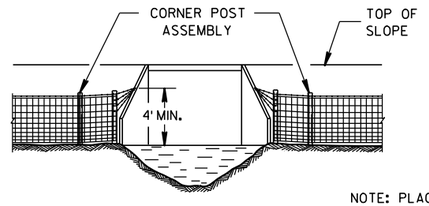
PLAN VIEW
SINGLE POST CORNER

PLAN VIEW
DOUBLE POST CORNER

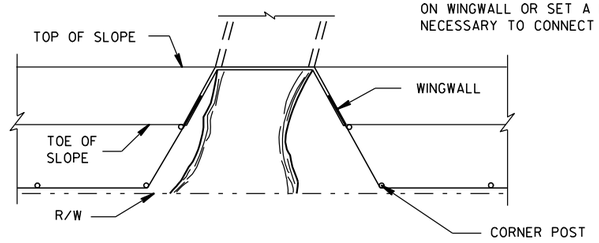
RIGHT OF WAY LINE CHANGE 40° AND LESS

NOTE: SINGLE AND DOUBLE POSTS SHALL BE A MIN. 6" DIA. X 8'-0" WITH A LEAN OF 4" TOWARD THE OUTSIDE OF THE CURVE.

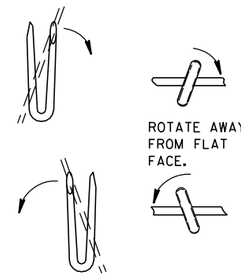
WHEN THE RIGHT OF WAY LINE CHANGE IS MORE THAN 40° USE THE CORNER OR STRETCHER POSTS ASSEMBLY.



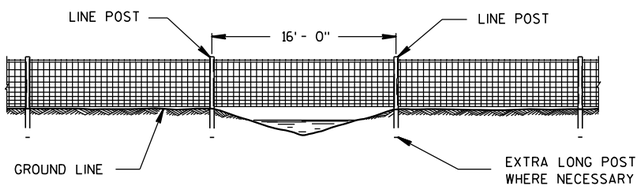
NOTE: PLACE A MINIMUM OF 4 STRANDS OF BARBED WIRE, 6" MAXIMUM CENTERS IN FAN SHAPE CONNECTED TO AN EYE BOLT ON WINGWALL OR SET A LONE POST WHEN NECESSARY TO CONNECT BARBED WIRE.



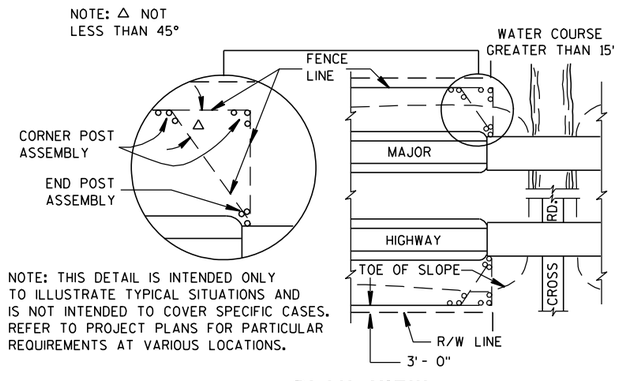
FENCE INSTALLATION TO WINGWALLS



LINE POST

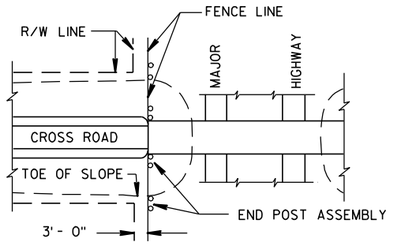


FENCE CONSTRUCTION OVER STREAM COURSES OF 15 FT. OR LESS IN WIDTH



PLAN VIEW

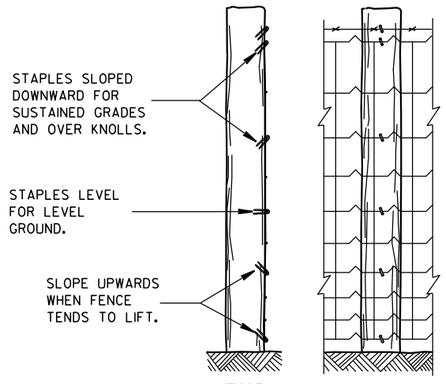
MAJOR HIGHWAY OVERPASS OR STREAM COURSE CROSSING OF GREATER THAN 15 FT. IN WIDTH



PLAN VIEW

MAJOR HIGHWAY UNDERPASS

NOTE: WHEN POSTS ARE DRIVEN THE SMALL END SHALL BE DOWN.



END ELEVATION

FARM SIDE ELEVATION

FENCE MOUNTING DETAIL

FENCE LOCATION AT STRUCTURES

FENCE WOVEN WIRE

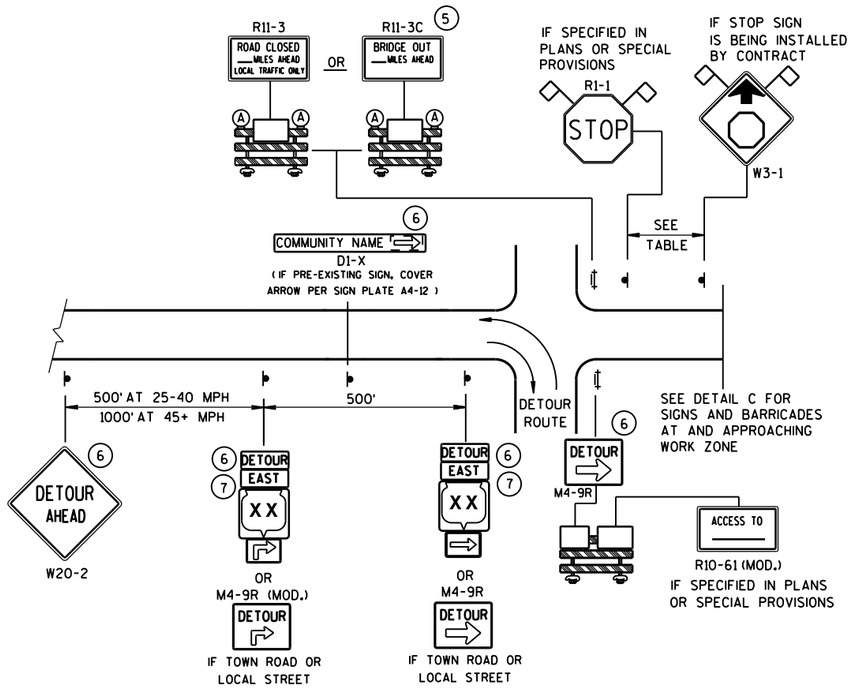
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
4/4/2008
DATE
/S/ Jerry H. [illegible]
ROADWAY STANDARDS [illegible]
ENGINEER

FHWA

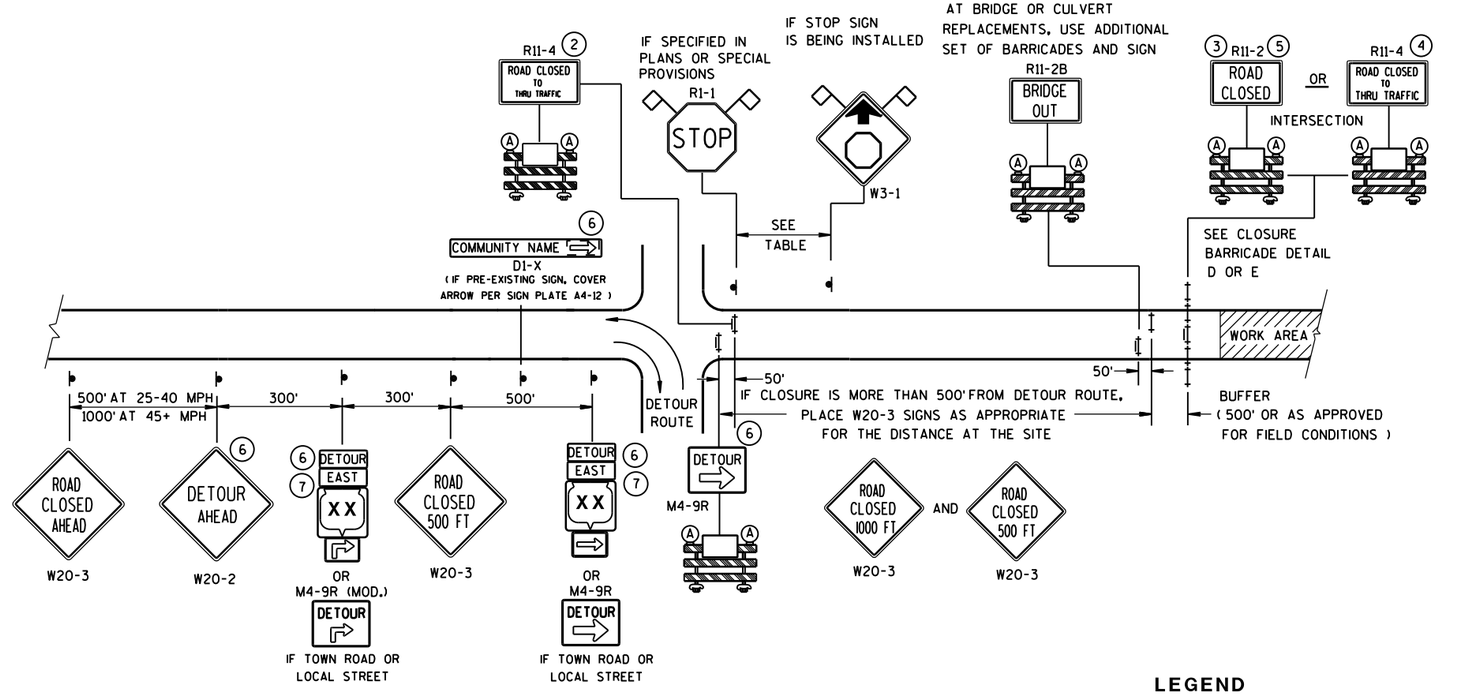
6

S.D.D. 15 B 1-8b



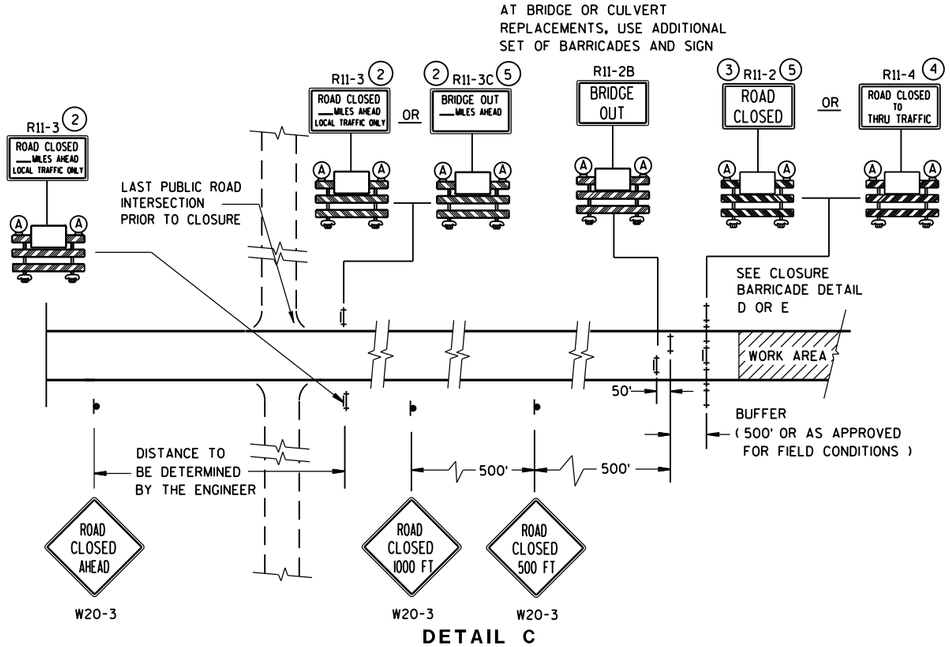
DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR

WORK ZONE GREATER THAN ½ MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)



DETAIL B
MAINLINE CLOSURE WITH POSTED DETOUR

WORK ZONE LESS THAN ½ MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)



DETAIL C
MAINLINE CLOSURE, NO POSTED DETOUR

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

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

LEGEND

- SIGN ON PERMANENT SUPPORT
- TYPE III BARRICADE
- TYPE III BARRICADE WITH ATTACHED SIGN
- (A) TYPE "A" WARNING LIGHT (FLASHING)
- WORK AREA
- DETOUR / EAST — M4-8 / M3-X
- XX — M1-4; COUNTY XX — M1-5A; XX — M1-6
- M05-1 OR M06-1
- FLAGS, 16" X 16" MIN., (ORANGE)

BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

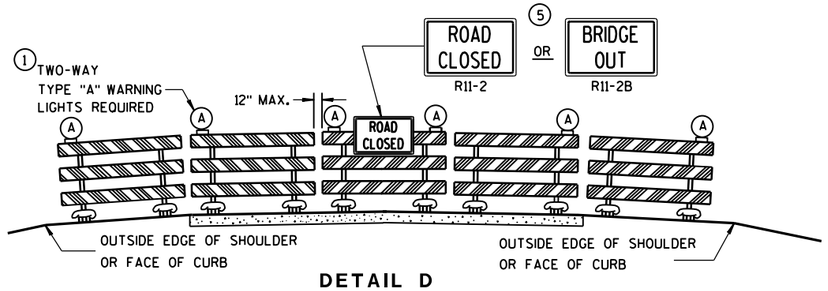
8/2013 DATE

/S/ Travis Feltes
STATE TRAFFIC ENGINEER

FHWA

6

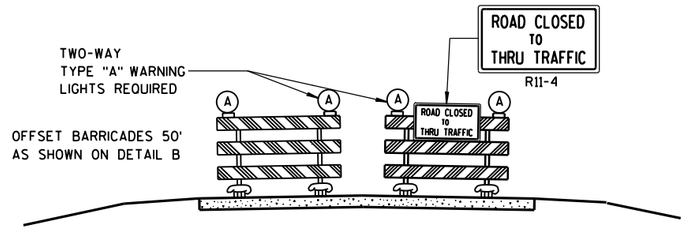
S.D.D. 15 C 2-5a



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

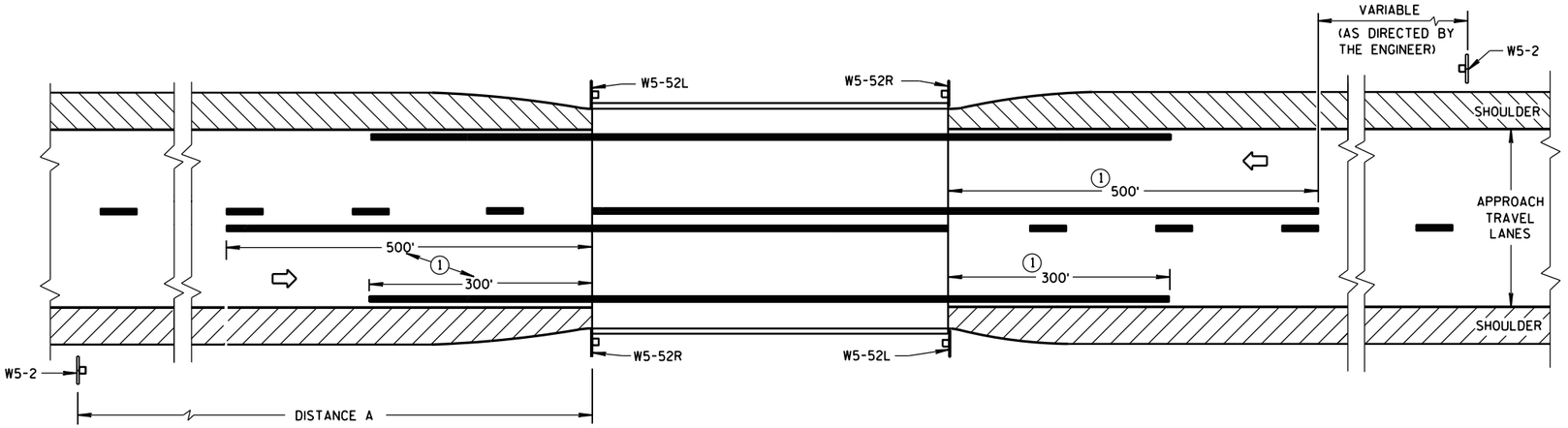
8/2013 DATE

/S/ Travis Feltes
STATE TRAFFIC ENGINEER

FHWA

6

S.D.D. 15 C 2-5b



GENERAL NOTES

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

PAVEMENT MARKING SHOWN ON THIS DRAWING IS NOT REQUIRED UNLESS OTHERWISE SPECIFIED IN THE CONTRACT. WHEN SPECIFIED, PAVEMENT MARKING SHALL CONFORM TO THIS DRAWING AND OTHER CONTRACT REQUIREMENTS.

(1) MINIMUM DISTANCE UNLESS OTHERWISE SHOWN ON THE PLAN.

(2) FACE OF OBJECT MARKERS W5-52R, AND W5-52L SHALL BE COVERED WITH TYPE F REFLECTIVE SHEETING.

(3) LOCATE OBJECT MARKER POST(S) BEHIND GUARDRAIL WHEN PRESENT.

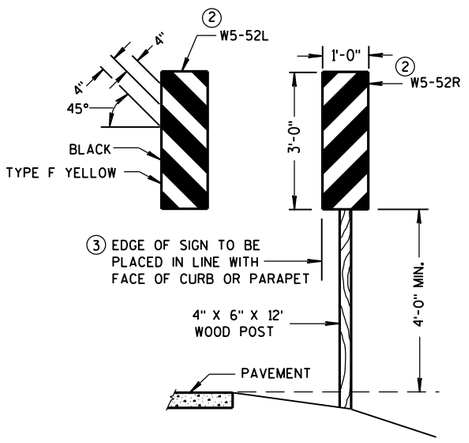
DISTANCE TABLE

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

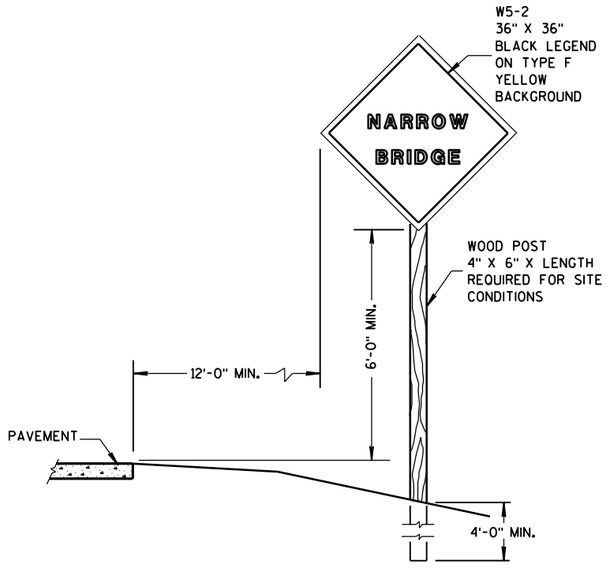
SITUATION 1

WARRANTING CRITERIA:

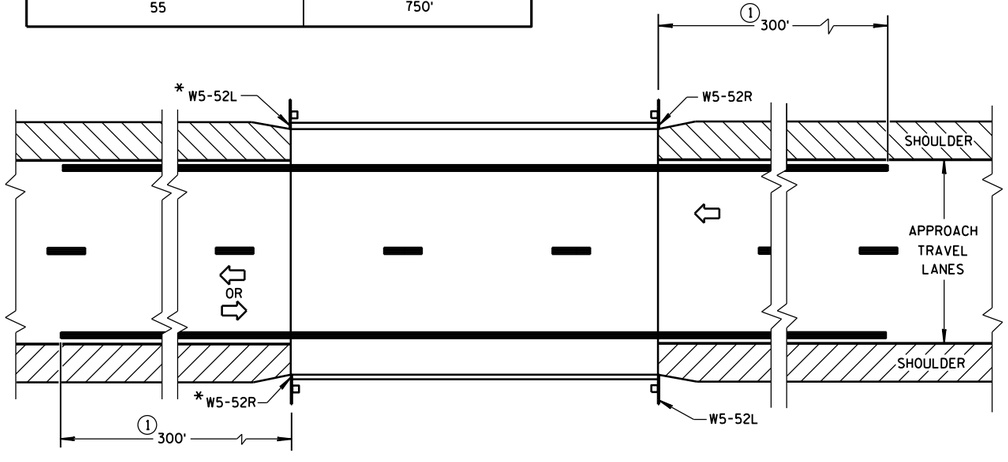
BRIDGE WIDTH IS AT LEAST 16 FEET BUT LESS THAN 24 FEET



OBJECT MARKER PLACEMENT



SIGN PLACEMENT



*OMIT ON ONE-WAY TRAVELLED WAYS

SITUATION 2

WARRANTING CRITERIA:

1. BRIDGE WIDTH IS AT LEAST 24 FEET AND
2. BRIDGE IS LESS THAN 6 FEET WIDER (ON EACH SIDE) THAN APPROACH TRAVEL LANES.

SIGNING & MARKING
FOR TWO LANE BRIDGES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

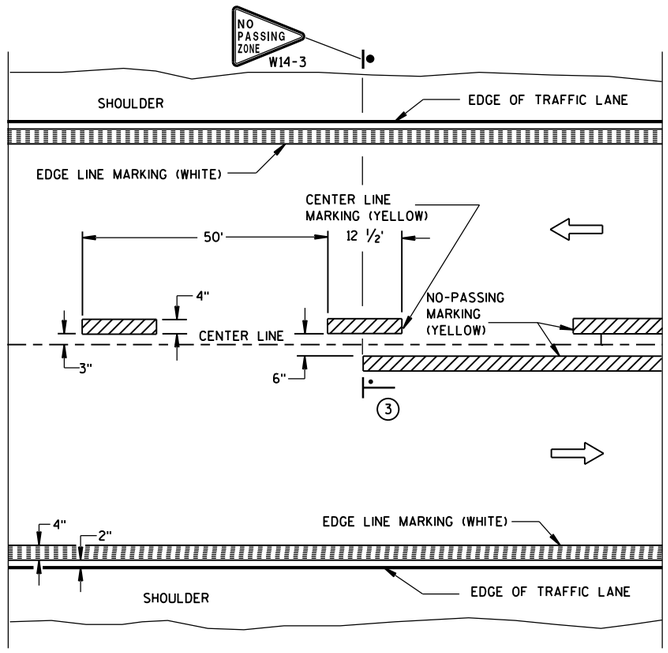
3-2014 DATE

/S/ Travis Feltes STATE TRAFFIC ENGINEER

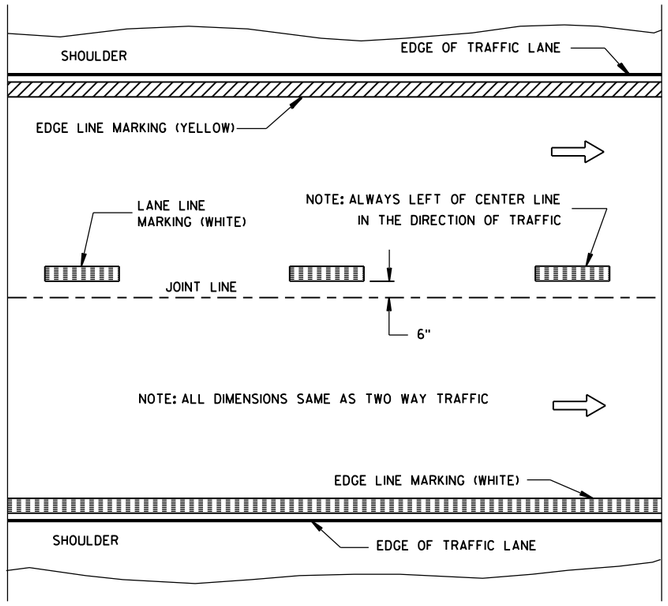
FHWA

6

S.D.D. 15 C 6-7

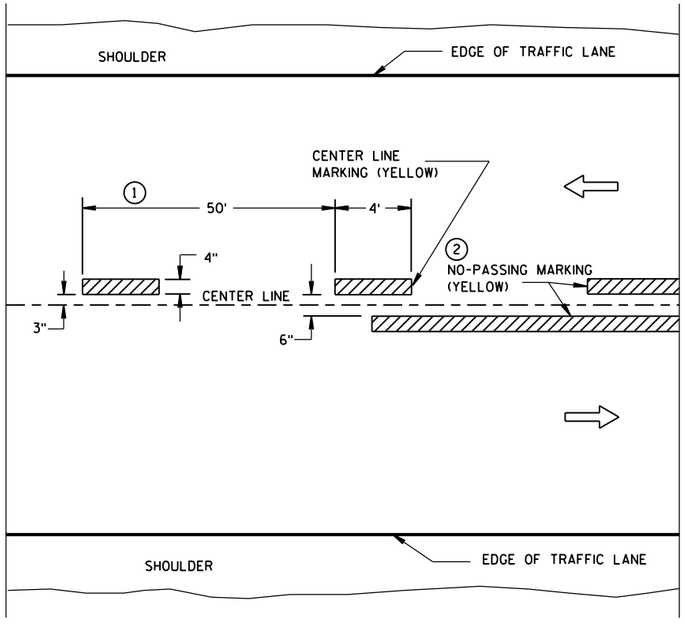


TWO WAY TRAFFIC

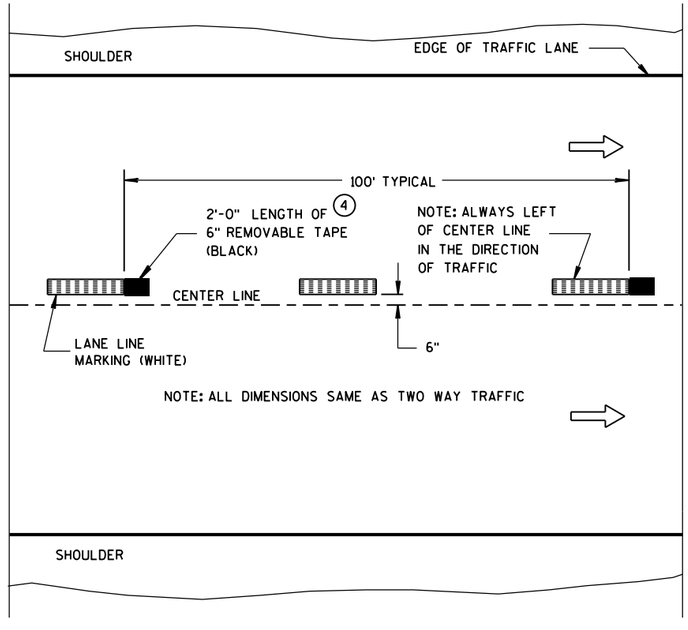


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY (INTERMEDIATE) PAVEMENT MARKING

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

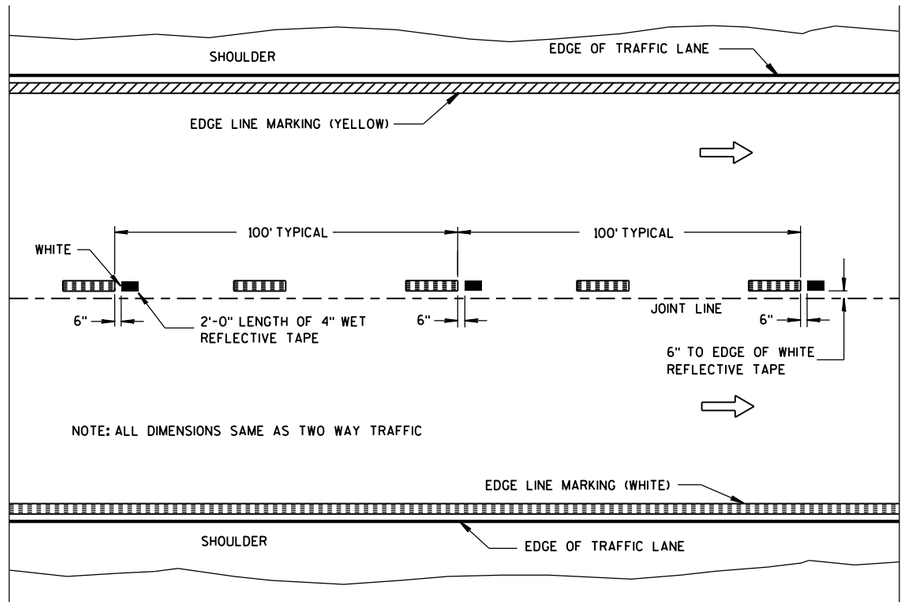
GENERAL NOTES

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
DATE

/S/ Travis Feltes
STATE TRAFFIC E

FHWA

6

S.D.D. 15 C 8-16a

6

S.D.D. 15 C 8-16a

LEGEND

- TYPE III BARRICADE WITH ATTACHED SIGN
- SIGN ON PERMENENT SUPPORT
- TRAFFIC CONTROL DRUM WITH TYPE "C" STEADY BURN LIGHT
- TRAFFIC CONTROL DRUM
- FLASHING ARROW BOARD
- (A) TYPE "A" WARNING LIGHT (FLASHING)
- REMOVING PAVEMENT MARKING
- DIRECTION OF TRAFFIC
- WORK AREA

GENERAL NOTES

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

THE SPACING BETWEEN SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 200 FEET, (500 FEET DESIREABLE) DISTANCE TO EXISTING SIGNS.

THIS LANE CLOSURE IS TYPICAL FOR CLOSING RIGHT LANE - REVERSE FOR CLOSING LEFT LANE.

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED.

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

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. NO WARNING LIGHTS SHALL BE WORKING ON "COVERED" OR "DOWNED" SIGNS.

CONSIDER GEOMETRICS WHEN LOCATING SIGNS AND ARROW BOARD SO THE DRIVER HAS A CLEAR VIEW OF THE ARROW BOARD AND LANE CLOSURE DRUMS FOR A MINIMUM 1500 FEET IN FRONT OF DRUMS.

FOR A LANE CLOSURE THAT IS IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS, THE ADVANCED WARNING SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS.

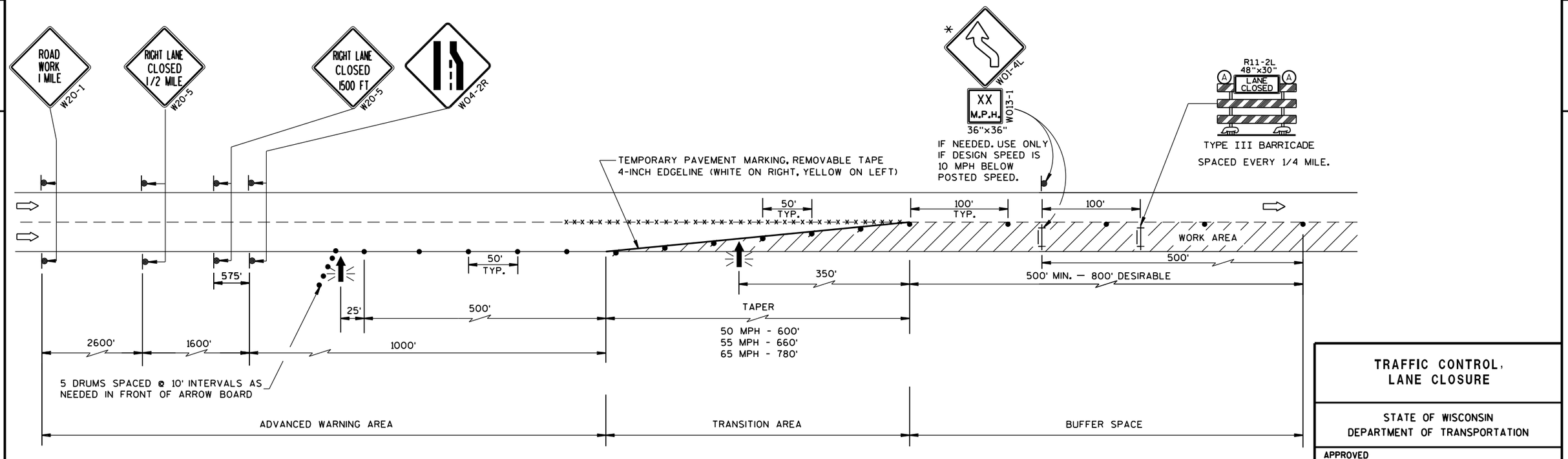
REMOVE PAVEMENT MARKINGS IF LANE CLOSURE IS TO BE IN PLACE FOR LONGER THAN 4 OR MORE DAYS AND NIGHTS.

WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.

IF THE HORIZONTAL ALIGNMENT IS SUCH THAT A CURVE MAY REQUIRE ADDITIONAL DELINEATION, THE DEVICE SPACING MAY BE DECREASED TO 50 FEET.

ADJUSTMENTS IN BUFFER SPACE NEED TO BE INCORPORATED WHEN THE LANE CLOSURE OCCURS NEAR AN INTERCHANGE EXIT OR ENTRANCE RAMP. THE LANE CLOSURE MUST MUST TAKE PLACE FAR ENOUGH IN ADVANCE OF AN EXIT OR ENTRANCE RAMP TO STILL ALLOW FOR ADEQUATE BUFFER SPACE. THE MINIMUM LENGTH OF THE BUFFER SPACE BEFORE AN EXIT RAMP SHOULD BE 1/2 THE LENGTH OF THE TRANSITION AREA. THE ENTRANCE RAMP SHOULD BE FOLLOWED BY THE ORIGINAL BUFFER SPACE LENGTH OF 800 FEET DESIRABLE PRIOR TO ANOTHER TRAFFIC CONTROL CHANGE SUCH AS A CROSSOVER MANEUVER.

* THE LEFT REVERSE CURVE SIGN (WO1-4L) IS ONLY REQUIRED WHEN THIS DETAIL IS USED IN COMBINATION WITH "SINGLE LANE CROSSOVER" DETAIL.



TRAFFIC CONTROL, LANE CLOSURE

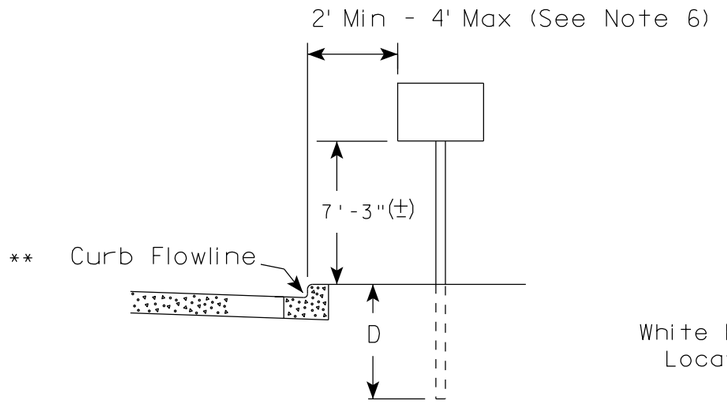
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
Feb. 2015 — DATE
/S/ Travis Feltes — STATE TRAFFIC ENGINEER
FHWA

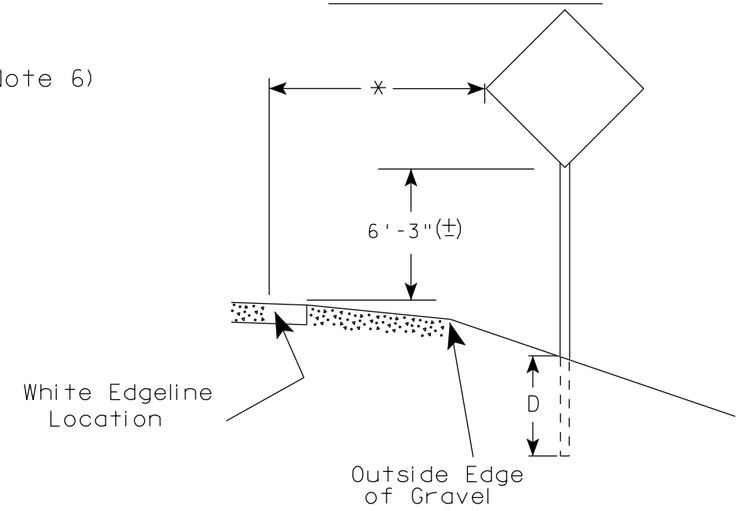
S.D.D. 15 D 12-5a

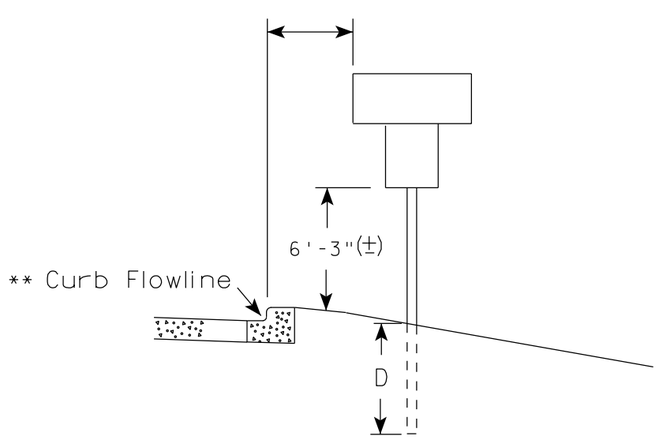
S.D.D. 15 D 12-5a

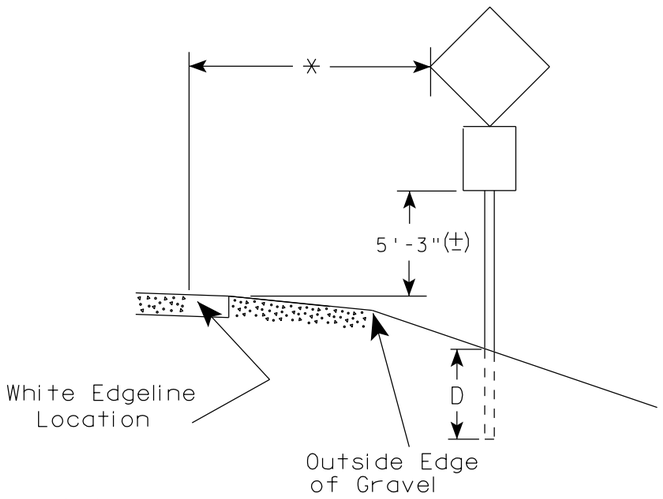
URBAN AREA



RURAL AREA (See Note 2)







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

POST EMBEDMENT DEPTH

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

GENERAL NOTES

1. Signs wider than 4 feet or 20 sq.ft or larger, shall be mounted on multiple posts. Refer to plate A4-4.
2. If signs are mounted on barrier wall, see A4-10 sign plate.
3. For expressways and freeways, mounting height is 7'- 3" (±) or 6'-3" (±) depending upon existence of a sub-sign.
4. 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 directd 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" (±).

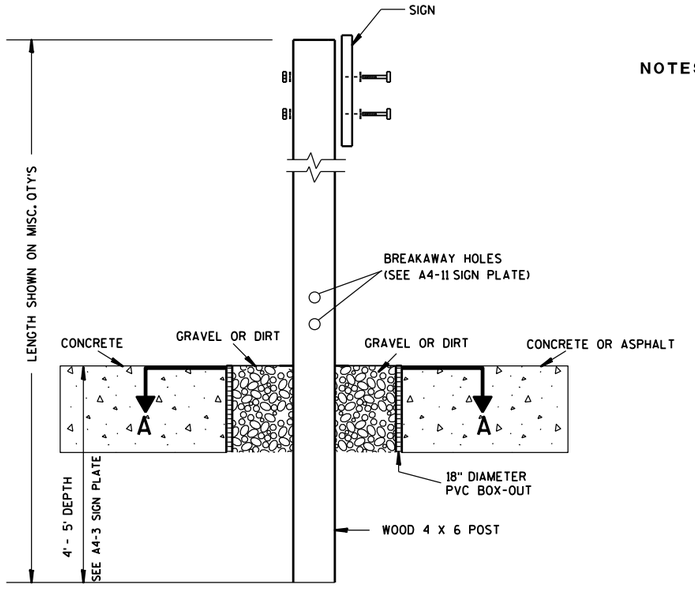
TYPICAL INSTALLATION OF PERMANENT TYPE II SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

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

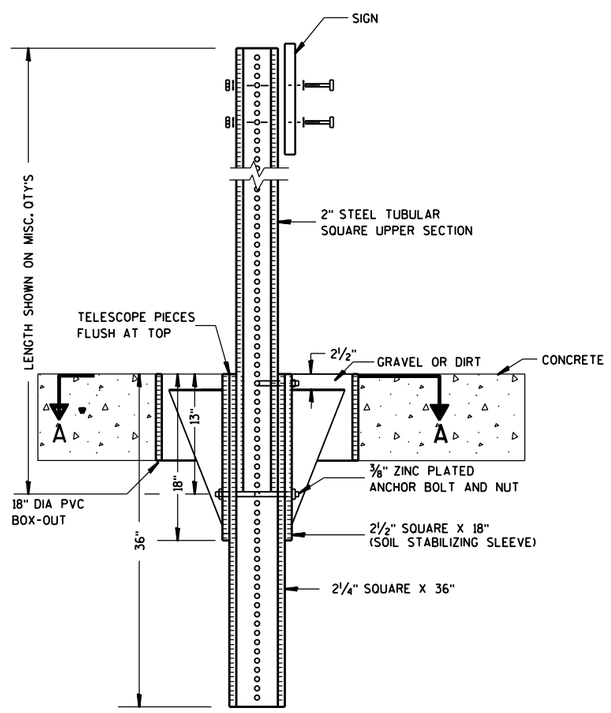
PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E



ELEVATION VIEW

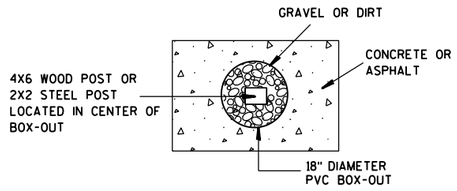
DETAIL OF WOOD 4 X 6 SIGN POST IN BOX-OUT

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



ELEVATION VIEW

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



PLAN VIEW

FOR NEW CONCRETE/ASPHALT INSTALLATIONS

SIGN POST BOX-OUTS A4-3B

WISCONSIN DEPT OF TRANSPORTATION

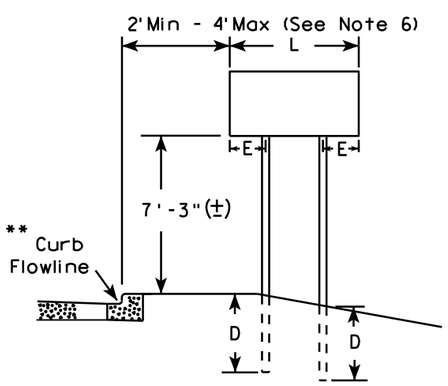
APPROVED Matthew R Rauch
for State Traffic Engineer

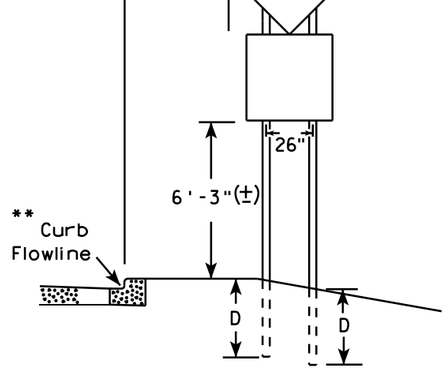
DATE 1/27/14 PLATE NO. A4-3B.1

PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E

FILE NAME : C:\CAEFiles\Projects\tr_stdplate\A43B.DGN PLOT DATE : 27-JAN-2014 09:48 PLOT BY : mscsja PLOT NAME : PLOT SCALE : 13.659812:1.000000 WISDOT/CADDS SHEET 42

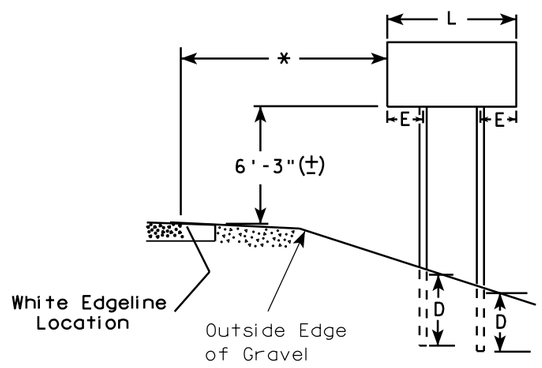
URBAN AREA

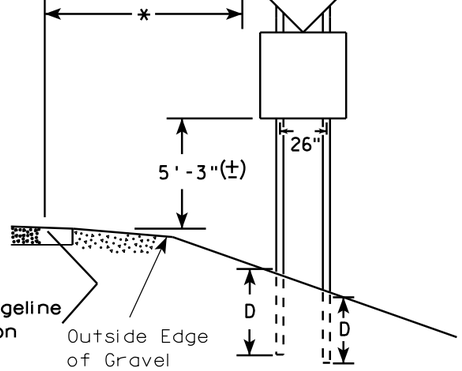




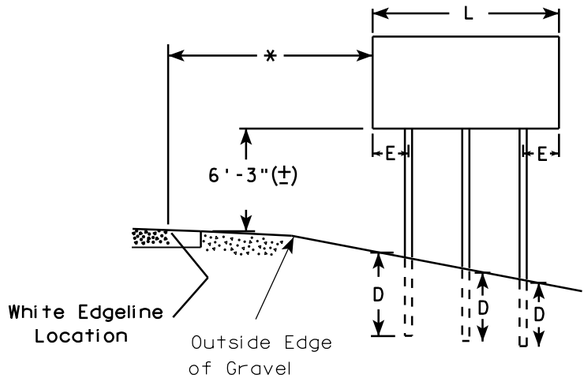
48" DIAMOND WARNING SIGN

RURAL AREA (See Note 3)





48" DIAMOND WARNING SIGN



GENERAL NOTES

1. For 3 or 4 post installations, individual post spacing shall be greater than 3'-6".
2. See tables below for required number of posts.
3. For expressways and freeways, mounting height is 7'-3" (±) or 6'-3" (±) depending upon existence of sub-sign.
4. The (±) tolerance for mounting height is 3 inches.
5. Minimum mounting height for J assemblies (A2-1S) is 7'-3" (±) or 6'-3" (±) per urban or rural detail respectively.
6. Offset distance shall be consistent with existing signs or consistent throughout length of project.
7. Folding signs shall be mounted at a height of 5'-3" (±) or as directed by the engineer.
8. The Double Arrow sign (W12-1) shall be mounted at a height of 2'-3" (±). The Chevron sign (W1-8), Roundabout Chevron panel (R6-4B), Clearance Markers (W5-52), Mile Markers (D10 series), In Road Object Markers (W5-54) & End of Road Markers (W5-56) shall be mounted at a height of 4"-3" (±).

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

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

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

SIGN SHAPE OTHER THAN DIAMOND (TWO POSTS REQUIRED)	
L	E
Greater than 48" Less than 60"	12"
60" to 120"	L/5

***

SIGN SHAPE OTHER THAN DIAMOND (THREE POSTS REQUIRED)	
L	E
Greater than 120" less than 168"	12"

SIGN SHAPE OTHER THAN DIAMOND (FOUR POSTS REQUIRED)	
L	E
168" and greater	12"

POST EMBEDMENT DEPTH

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

TYPICAL INSTALLATION OF TYPE II SIGNS ON MULTIPLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

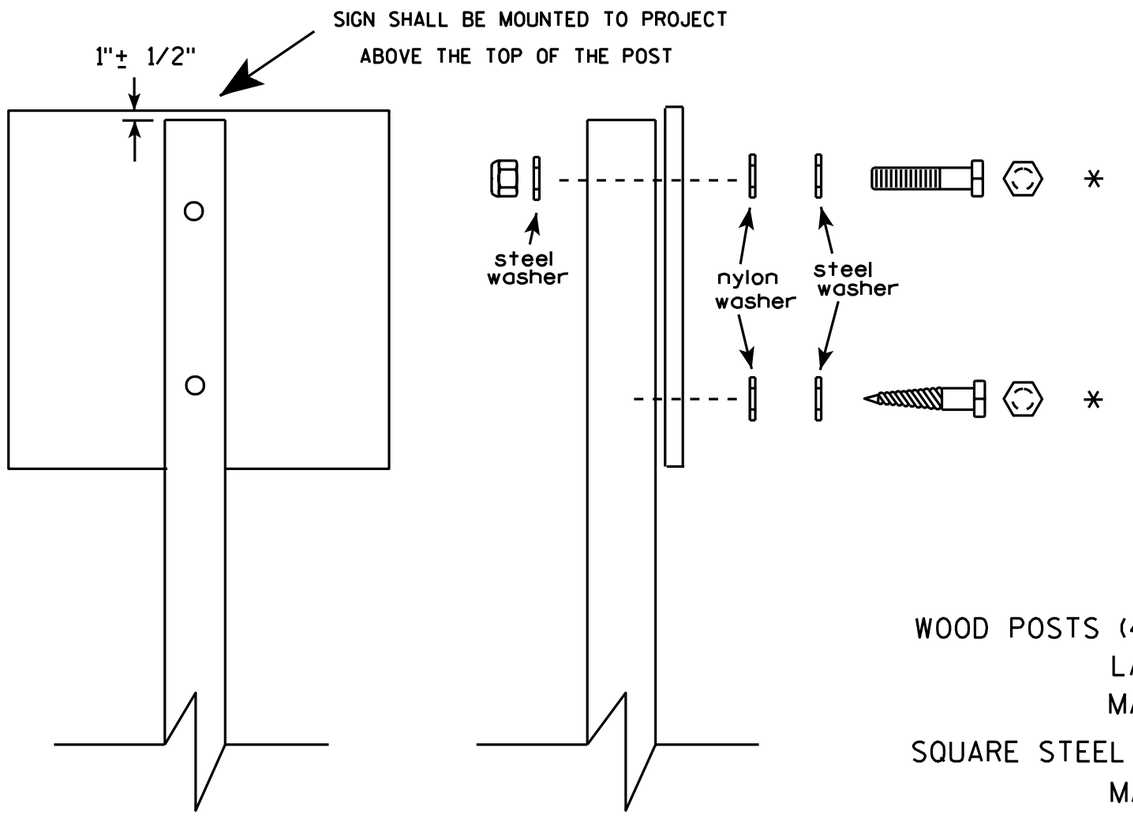
APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 7/23/15 PLATE NO. A4-4 14
49

PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E

FILE NAME : C:\CAEfiles\Projects\tr_stdplate\A44.DGN PLOT DATE : 23-JUL-2015 15:23 PLOT BY : mscj9h PLOT NAME : PLOT SCALE : 107.021305:1.000000

WISDOT/CADDS SHEET 42



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

a. Hot dip galvanized in accordance with ASTM Designation: A 153, Class D, or SC 3

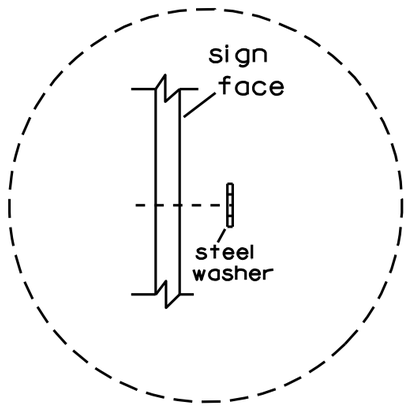
b. Electro-galvanized in accordance with ASTM Designation : B 633, TYPE III, SC 3.

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

WOOD POSTS (4" x 4" or 4" x 6")
LAG SCREWS - 3/8" X 3"
MACHINE BOLTS - 5/16" X 6-1/2" or 7" Length w/ nuts

SQUARE STEEL POSTS (2" x 2")
MACHINE BOLTS - 3/8" X 3-1/4" Length w/ nuts
RIVETS - 9/32 " (6605-9-6) BULB-TITE, TRI-FOLD, ALUMINUM BODY/MANDREL
O.D. FLANGE .720-.765 INCH, GRIP RANGE .042-.375 INCH

WASHERS (ALL POSTS) -
1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL
1-1/4" O.D. X 3/8" I.D. X .080 NYLON for all Type H signs.



Washer Placement when Sign Has Other Than Type H or Type F Face

* 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 3/23/10 PLATE NO. A4-8.7

7

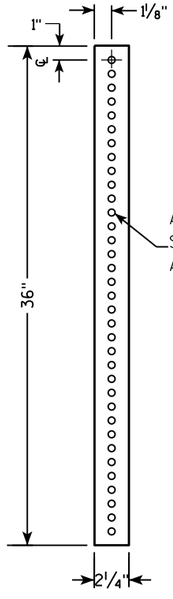
7

PROJECT NO:

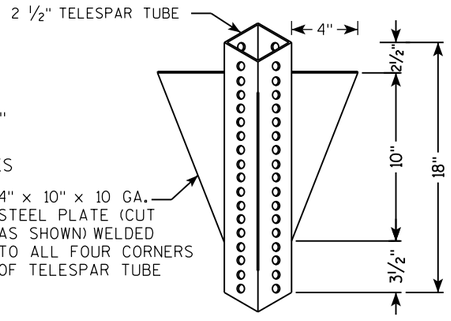
SHEET NO: 50 E

TELESCOPIC TUBING ANCHORS
TWO PIECE SYSTEM

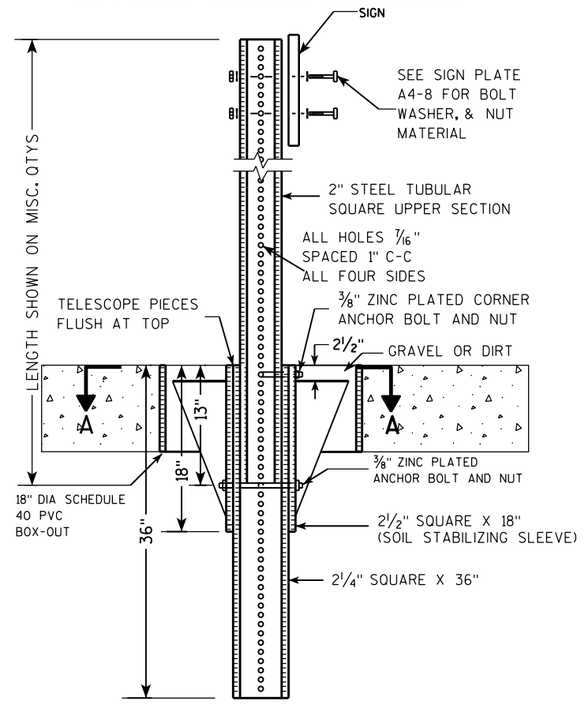
2 1/4 " SQUARE
12 GAUGE
PERFORATED
GALVANIZED FINISH



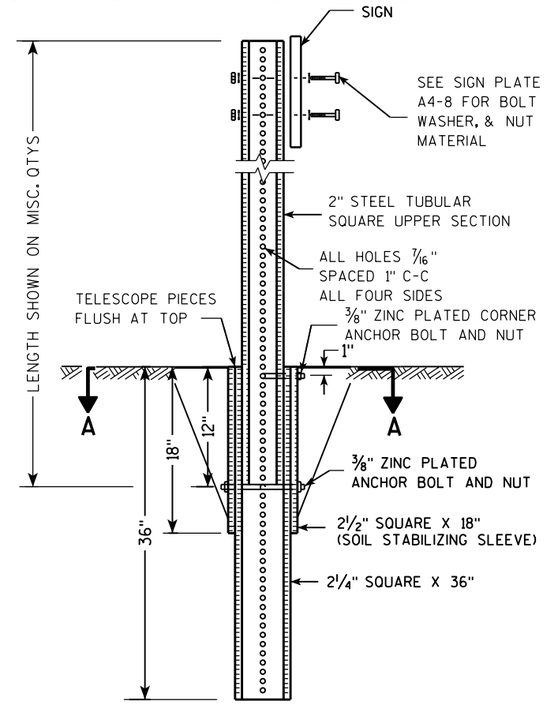
2 1/2 " SQUARE
12 GAUGE
OMNI-DIRECTIONAL
PERFORATED
SOIL STABILIZING SLEEVE
GALVANIZED FINISH

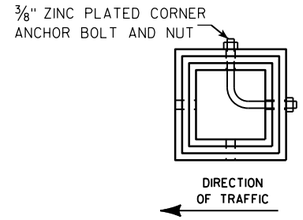


DETAIL OF TUBULAR STEEL SIGN POST
(IN POURED CONCRETE OR ASPHALT)



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





SECTION A-A

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

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

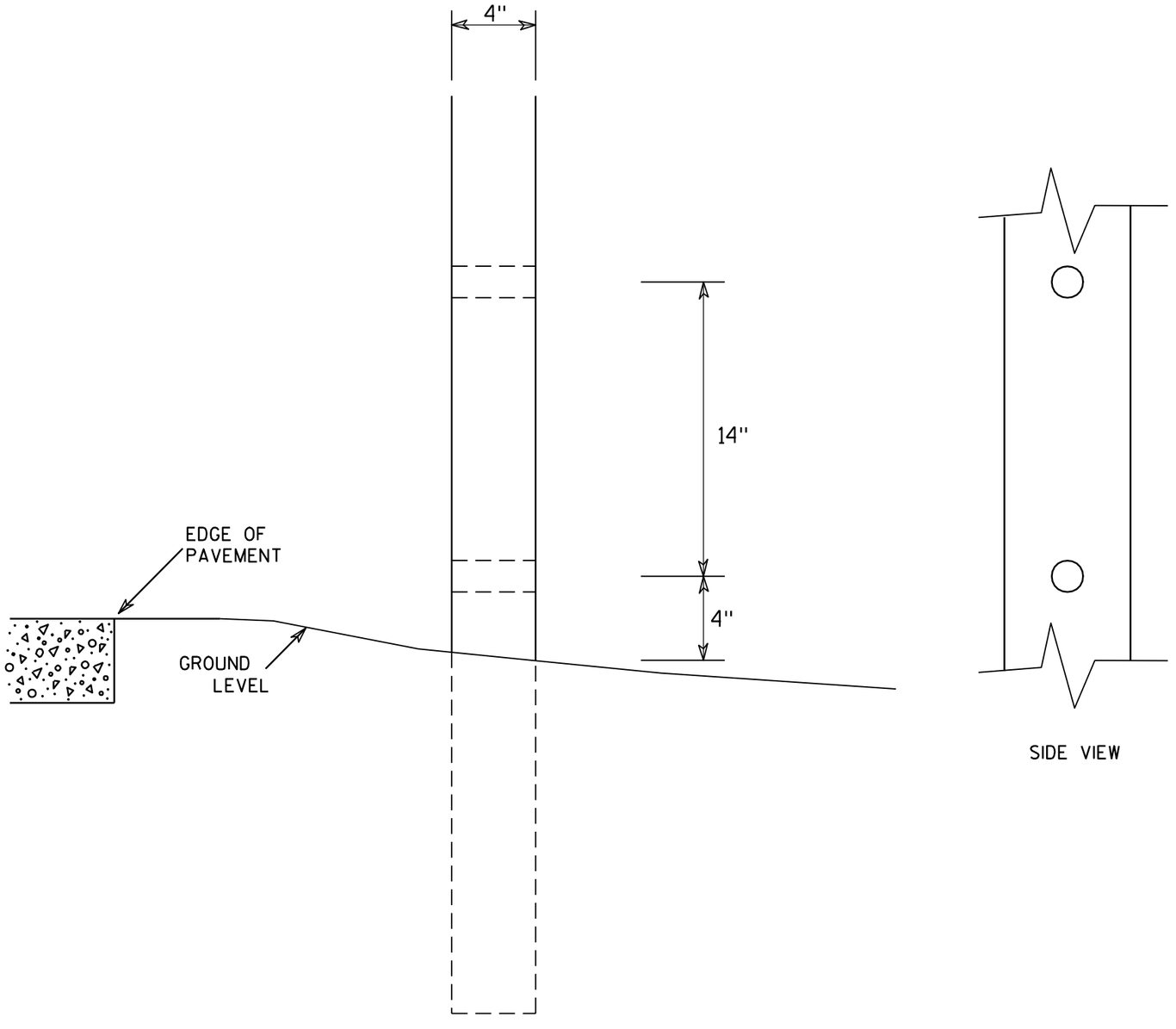
TUBULAR STEEL
SIGN POST
A4-9

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 2/05/15 PLATE A4-9.9

PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E



SIDE VIEW

GENERAL NOTES

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

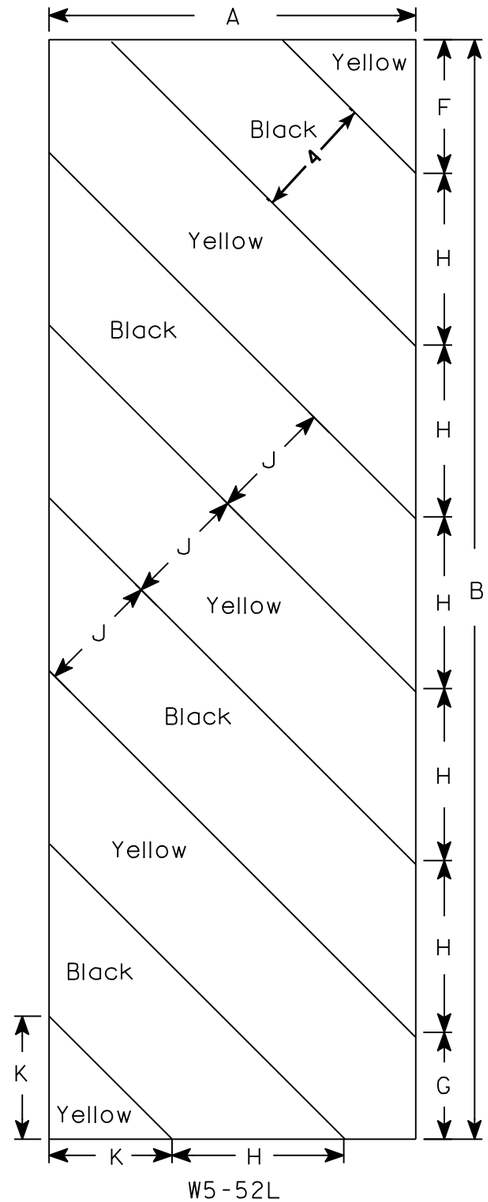
4 X 6 WOOD POST MODIFICATIONS

WISCONSIN DEPT OF TRANSPORTATION

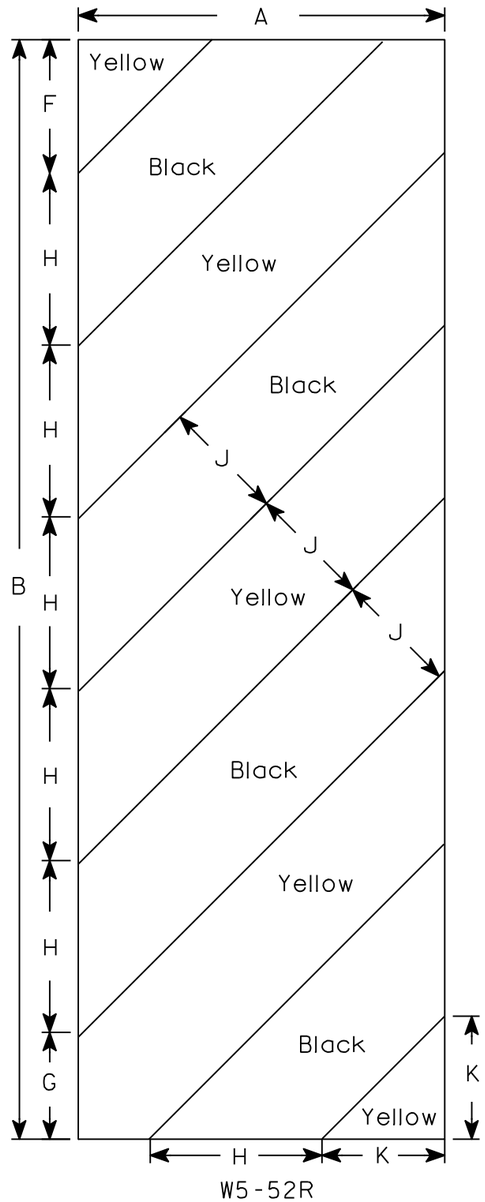
APPROVED Chester J Spang for State Traffic Engineer

DATE 3/27/97 PLATE NO. A4-11.2

PROJECT NO:	HWY:	COUNTY:		SHEET NO: 52	E



W5-52L



W5-52R

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

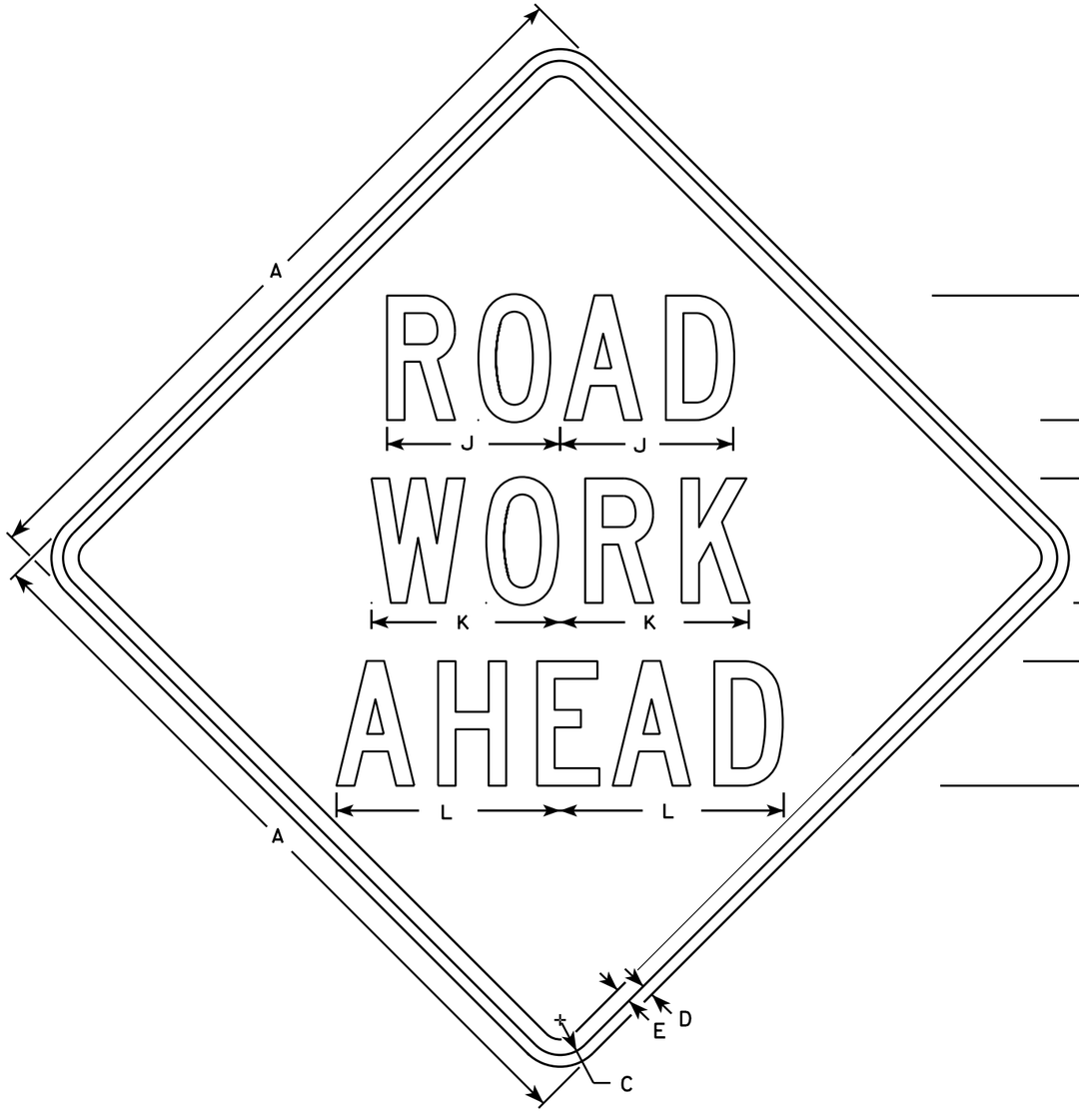
W5-52L & W5-52R

WISCONSIN DEPT OF TRANSPORTATION

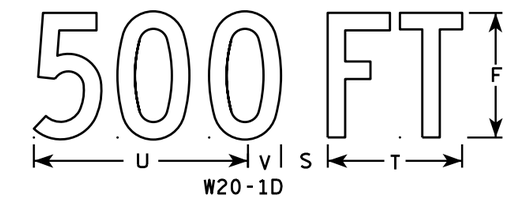
APPROVED Matthew R Rauch
for State Traffic Engineer

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

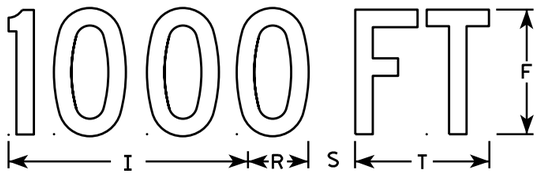
PROJECT NO: | HWY: | COUNTY: | SHEET NO: 53 | E



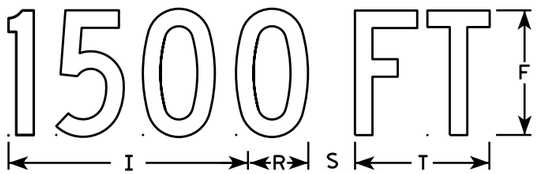
W20-1A



W20-1D



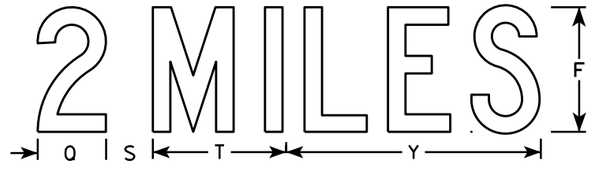
W20-1C



W20-1B

W20-1G

W20-1F



W20-1E

NOTES

1. Sign is Type II - Type F Reflective
2. Color:
   Background - Orange
   Message - Black
3. Message Series - C
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	36		1 3/8	1/2	5/8	5	2 5/8	3 1/4	10 1/8	7	7 5/8	8 7/8	1 1/8	4 1/2	3 1/2	9		2 1/2	2 1/4	5 5/8	9	1 3/8	8	1 3/4	10 3/4	6	9.0
2S	48		2 1/4	3/4	1	8	3 3/4	5 1/8	15 3/8	11 1/8	12 1/8	14 3/8	1 5/8	6 7/8	5 3/8	13 7/8	4 3/8	3 7/8	3	8 5/8	13 3/4	2 1/8	11 7/8	2 3/4	16 3/8	9	16.0
2M	48		2 1/4	3/4	1	8	3 3/4	5 1/8	15 3/8	11 1/8	12 1/8	14 3/8	1 5/8	6 7/8	5 3/8	13 7/8	4 3/8	3 7/8	3	8 5/8	13 3/4	2 1/8	11 7/8	2 3/4	16 3/8	9	16.0
3	48		2 1/4	3/4	1	8	3 3/4	5 1/8	15 3/8	11 1/8	12 1/8	14 3/8	1 5/8	6 7/8	5 3/8	13 7/8	4 3/8	3 7/8	3	8 5/8	13 3/4	2 1/8	11 7/8	2 3/4	16 3/8	9	16.0
4	48		2 1/4	3/4	1	8	3 3/4	5 1/8	15 3/8	11 1/8	12 1/8	14 3/8	1 5/8	6 7/8	5 3/8	13 7/8	4 3/8	3 7/8	3	8 5/8	13 3/4	2 1/8	11 7/8	2 3/4	16 3/8	9	16.0
5	48		2 1/4	3/4	1	8	3 3/4	5 1/8	15 3/8	11 1/8	12 1/8	14 3/8	1 5/8	6 7/8	5 3/8	13 7/8	4 3/8	3 7/8	3	8 5/8	13 3/4	2 1/8	11 7/8	2 3/4	16 3/8	9	16.0

STANDARD SIGN
W20-1A, B, C, D, F & G

WISCONSIN DEPT OF TRANSPORTATION

APPROVED

State Traffic Engineer

DATE 5/07/15 PLATE NO. W20-1.10

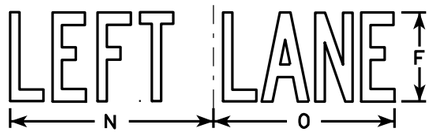
PROJECT NO:

SHEET NO: E

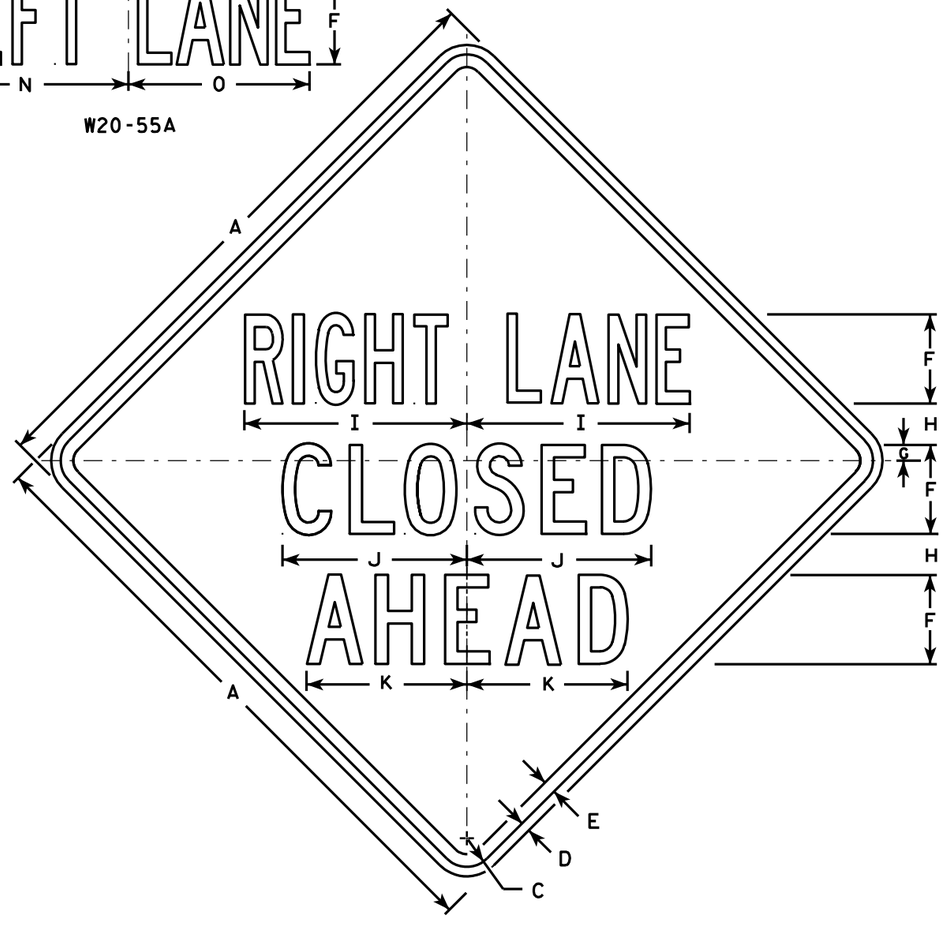
FILE NAME : C:\CAEFiles\Projects\tr_stdplate\W201.dgn PLOT DATE : 27-MAY-2015 15:58 PLOT BY : mscsja

WISDOT/CADDS SHEET 42

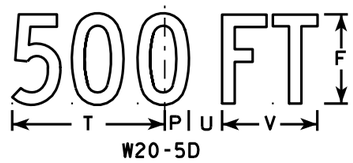
W20-56A



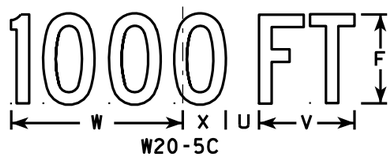
W20-55A



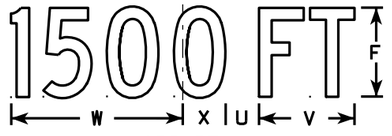
W20-5A



W20-5D



W20-5C



W20-5B

W20-5G

W20-5F

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - Orange
   Message - Black
3. Message Series - See Note 5
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
5. " _____ LANE" is Series B.
   All other copy is Series C.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	36	6	1 5/8	5/8	3/4	5	1/8	2 1/2	13 1/8	10 3/4	9 1/2	14 1/4	13 5/8	12	12	1 3/8	1 1/8	4 1/2	3 1/2	9	1 1/8	5 5/8	10 1/8	2 1/2	1 3/4	8	9.0
2S	48	8	2 1/4	3/4	1	7	1 1/4	3 1/4	17 1/2	14 3/8	12 5/8	19	18 3/8	16	14 1/4	1 7/8	1 1/2	6	4 5/8	12	2 5/8	7 1/2	13 1/2	3 3/8	2 3/8	10 5/8	16.0
2M	48	8	2 1/4	3/4	1	7	1 1/4	3 1/4	17 1/2	14 3/8	12 5/8	19	18 3/8	16	14 1/4	1 7/8	1 1/2	6	4 5/8	12	2 5/8	7 1/2	13 1/2	3 3/8	2 3/8	10 5/8	16.0
3	48	8	2 1/4	3/4	1	7	1 1/4	3 1/4	17 1/2	14 3/8	12 5/8	19	18 3/8	16	14 1/4	1 7/8	1 1/2	6	4 5/8	12	2 5/8	7 1/2	13 1/2	3 3/8	2 3/8	10 5/8	16.0
4	48	8	2 1/4	3/4	1	7	1 1/4	3 1/4	17 1/2	14 3/8	12 5/8	19	18 3/8	16	14 1/4	1 7/8	1 1/2	6	4 5/8	12	2 5/8	7 1/2	13 1/2	3 3/8	2 3/8	10 5/8	16.0
5	48	8	2 1/4	3/4	1	7	1 1/4	3 1/4	17 1/2	14 3/8	12 5/8	19	18 3/8	16	14 1/4	1 7/8	1 1/2	6	4 5/8	12	2 5/8	7 1/2	13 1/2	3 3/8	2 3/8	10 5/8	16.0

STANDARD SIGN
W20-5A, B, C, D, F & G

WISCONSIN DEPT OF TRANSPORTATION

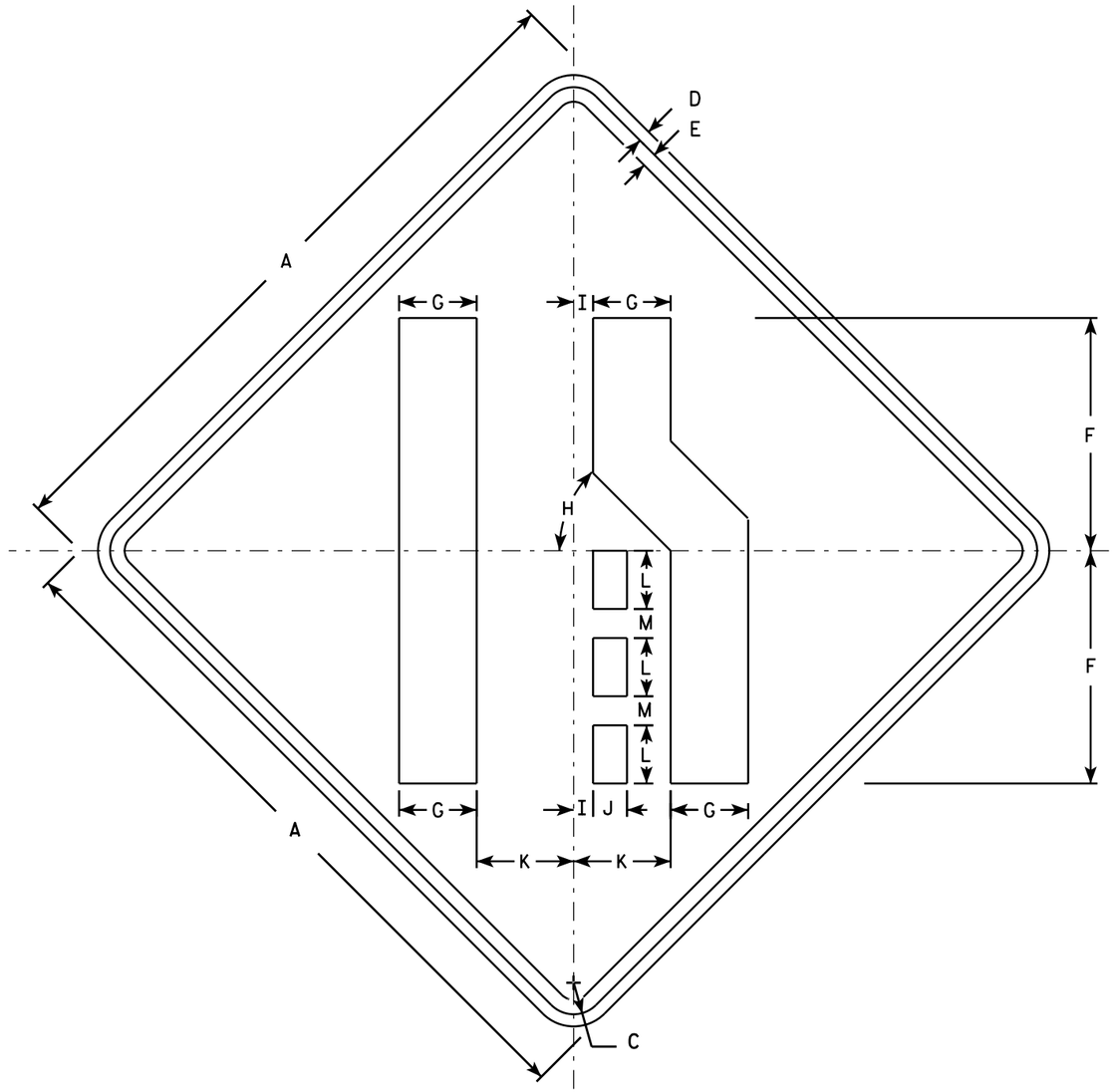
APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 3/18/11 PLATE NO. W20-5.11

PROJECT NO:	HWY:	COUNTY:		SHEET NO: 55	E

7

FILE NAME : C:\Users\PROJECTS\tr_stdplate\W205.DGN PLOT DATE : 18-MAR-2011 12:15 PLOT BY : mscj9h PLOT NAME : PLOT SCALE : 11.918087:1.000000 WISDOT/CADDS SHEET 42



W04-2R

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - Orange
   Message - Black
3. 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. W04-2L is the same as W04-2R except the symbol is reversed along the vertical centerline.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	36		1 5/8	5/8	3/4	12	4	45°	1	1 3/4	5	3	1 1/2														9.0
2S	48		2 1/4	3/4	1	16	5 3/8	45°	1 1/4	2 3/8	6 3/4	4	2														16.0
2M	48		2 1/4	3/4	1	16	5 3/8	45°	1 1/4	2 3/8	6 3/4	4	2														16.0
3	48		2 1/4	3/4	1	16	5 3/8	45°	1 1/4	2 3/8	6 3/4	4	2														16.0
4	48		2 1/4	3/4	1	16	5 3/8	45°	1 1/4	2 3/8	6 3/4	4	2														16.0
5	48		2 1/4	3/4	1	16	5 3/8	45°	1 1/4	2 3/8	6 3/4	4	2														16.0

STANDARD SIGN
W04-2

WISCONSIN DEPT OF TRANSPORTATION

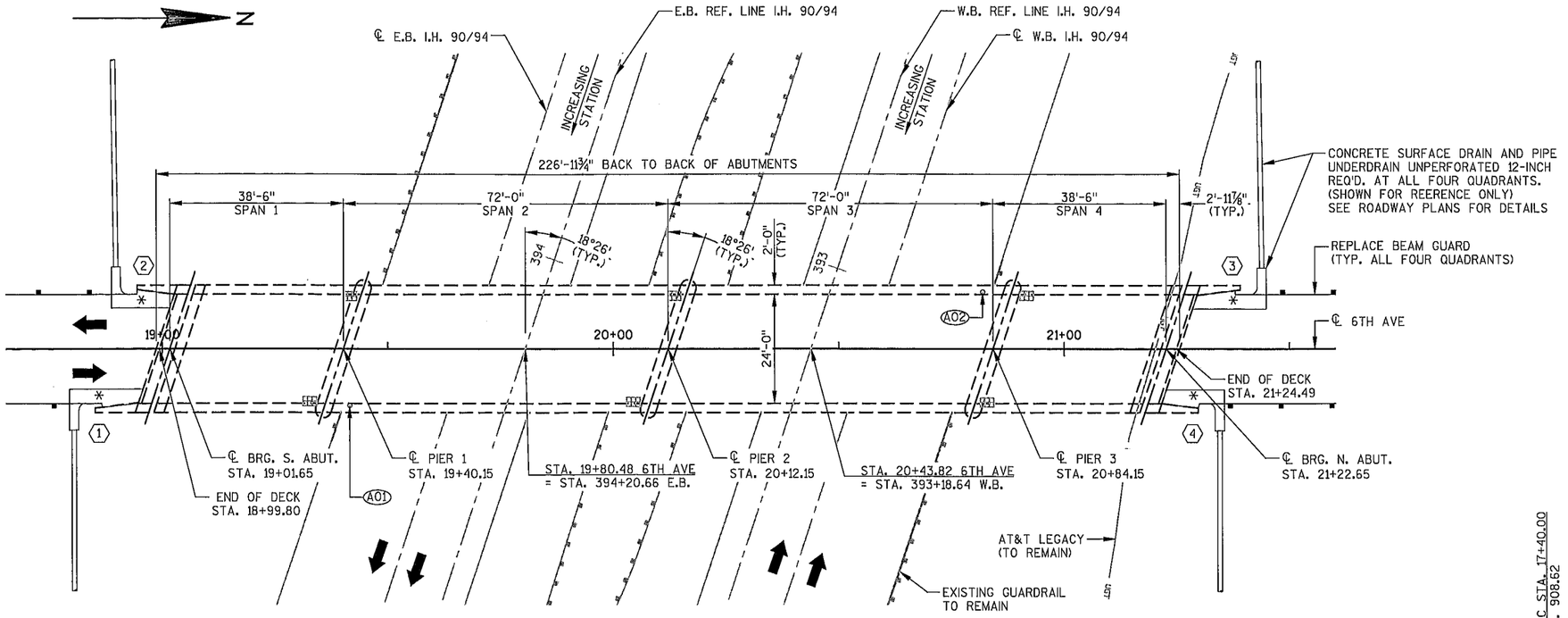
APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 11/20/13 PLATE 56 W04-2.1

PROJECT NO:

SHEET NO: E

STATE PROJECT NUMBER
1016-04-61



PLAN B-29-0050

4-SPAN 36-INCH PRESTRESSED CONCRETE GIRDERS

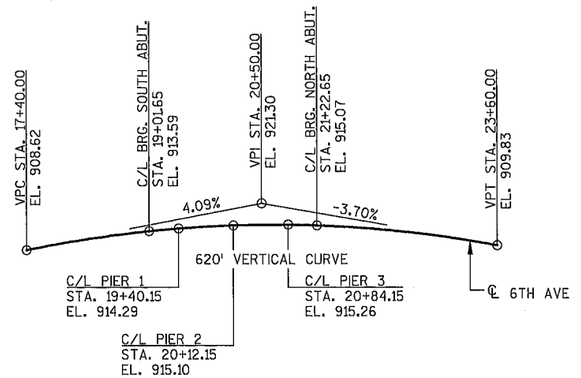
LIST OF DRAWINGS

NOTE

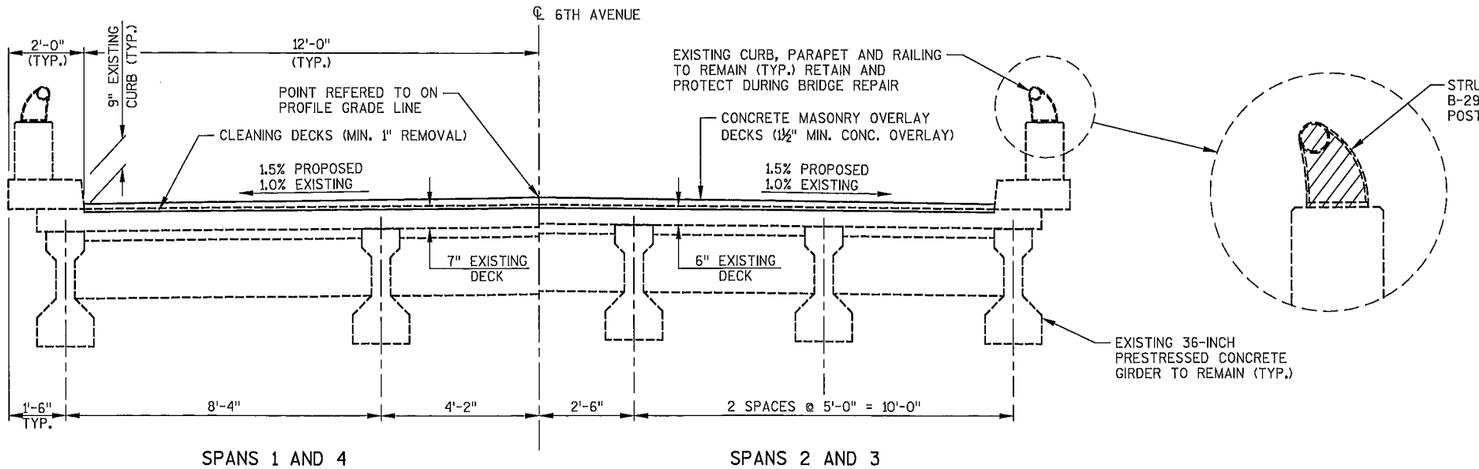
- (A01) POINT OF CRITICAL VERTICAL CLEARANCE 16.5'
- (A02) POINT OF CRITICAL VERTICAL CLEARANCE 16.7'
- * PROVIDE FOR THRIE BEAM GUARDRAIL ATTACHMENT
- ⬡ INDICATES WING NUMBER

BENCH MARKS

NO.	STA.	DESCRIPTION	ELEV.
3	17+14	¾" IRON REBAR SET, 16.3' RT	906.46
4	17+24	¾" IRON REBAR SET, 16.3' LT	906.91
7	22+91	¾" IRON REBAR SET, 16.9' RT	911.07
8	22+74	¾" IRON REBAR SET, 11.9' LT	912.10



PROFILE GRADE LINE - 6TH AVE



CROSS SECTION THROUGH ROADWAY

(LOOKING NORTH)

STRUCTURE OVERCOATING CLEANING AND PRIMING B-29-0050. TYP. BOTH SIDES OF BRIDGE (68 RAIL POSTS TOTAL).

NO.	DATE	REVISION	BY

JEWELL associates engineers, Inc.
Engineers - Planners - Surveyors
560 SUNRISE DRIVE
SPRING GREEN, WI 53588
PHONE: (608) 588-7484
FAX: (608) 588-9322

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

ACCEPTED William C. Dreher SDR 08/04/15
CHIEF STRUCTURES DESIGN ENGINEER — DATE

STRUCTURE B-29-0050

6TH AVENUE OVER I.H. 90/94

COUNTY	TOWN/~~CITY/VILLAGE~~
JUNEAU	ORANGE

DESIGN SPEC. REHABILITATION N/A

DESIGNED BY	DESIGN CK'D.	DRAWN BY	PLANS CK'D.
AK	PTB	AK	PTB

GENERAL PLAN

SHEET 1 OF 8

57

DESIGN CONSULTANT
PATRICK BOLAND, PE
(608) 588-7484

BRIDGE OFFICE CONTACT
WILLIAM DREHER, PE
(608) 266-8489

FILE NAME : \\JEWELL-FILES\PROJECT_ARCHIVE\ARCHIVED JOBS_FROM SERVER\W11507 IH90 OVERLAY B-29-0050 6TH AVE\CADD FILES\STRUCTURE\FINALS\W11507_01_GP.DWG
LAYOUT : GENERAL PLAN
PLOT DATE : 7/17/2015
PLOT TIME : 3:40:19 PM
PLOT BY : BOLAND, PATRICK
PLOT SCALE : 1'-0" = 1'-0"

STATE PROJECT NUMBER

1016-04-61

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS, INSPECTION REPORTS AND FIELD SURVEY.

TOP OF EXISTING DECK ELEVATIONS SHALL BE DETERMINED FROM A FIELD SURVEY AT LOCATIONS DEEMED NECESSARY FOR ESTABLISHED OVERLAY THICKNESS, ACCURATE RATINGS AND POINT OF MINIMUM THICKNESS.

PREPARATION DECKS SHALL BE DETERMINED BY ENGINEER IN THE FIELD.

PROFILE GRADE LINE SHALL BE DETERMINED BASED ON A MINIMUM OVERLAY THICKNESS OF 1½" PLACED ABOVE THE DECK SURFACE AFTER CLEANING. EXPECTED AVERAGE OVERLAY THICKNESS IS 2". VARIATIONS TO THE NEW GRADE LINE OVER ¼" MUST BE SUBMITTED BY THE FIELD ENGINEER TO THE STRUCTURES DESIGN SECTION FOR REVIEW.

A MINIMUM OF 1" OF CONCRETE SHALL BE REMOVED FROM THE ENTIRE BRIDGE DECK UNDER THE BID ITEM "CLEANING DECKS."

CLEAN AND FILL LONGITUDINAL AND TRANSVERSE CRACKS WITH PENETRATING EPOXY AFTER THE DECK PREPARATION HAS BEEN COMPLETED AND PRIOR TO PLACING CONCRETE DECK OVERLAY, AS DIRECTED BY THE FIELD ENGINEER. REMOVE EXCESS EPOXY MATERIAL ON DECK SURFACE BEFORE PLACING OVERLAY. EXCESS EPOXY REMOVAL COST IS INCIDENTAL TO THE BID ITEM "CLEANING DECKS".

REMOVE EXISTING EXPANSION JOINT AT BOTH ABUTMENTS. COST IS INCIDENTAL TO THE BID ITEM "REMOVING OLD STRUCTURE STA. 20+12.15".

ALL CONCRETE REMOVAL NOT COVERED WITH A CONCRETE OVERLAY SHALL BE DEFINED BY A 1" DEEP SAW CUT.

CLEAN LOWER PORTION OF PARAPET JOINT BETWEEN WING AND DECK AND SEAL WITH NON-STAINING GRAY NON-BITUMINUOS JOINT SEALER. CLEANING AND SEALING TO BE INCLUDED IN THE BID ITEM "CONCRETE MASONRY OVERLAY DECKS".

AT EACH FLOOR DRAIN LOCATION, REMOVE EXISTING GRATE, REMOVE DOWNSPOUT AND CLOSE FLOOR DRAIN. TO BE PAID UNDER BID ITEM "REMOVING FLOOR DRAINS".

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

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

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

PRIOR TO BEGINNING PARAPET WORK, REMOVE THOSE SECTIONS OF TUBULAR RAIL LOCATED IN THE AREA OF PARAPET REMOVAL. FOLLOWING COMPLETION OF THE PARAPET WORK, REINSTALL TUBULAR RAIL SECTIONS IN THEIR ORIGINAL LOCATIONS. REMOVAL, STORAGE AND REPLACING THE TUBULAR RAILING WILL BE PAID UNDER THE BID ITEM "REMOVE AND REPLACE TUBULAR RAILING".

ALL TUBULAR RAILING SECTIONS TO BE IN-PLACE PRIOR TO COMMENCING PAINTING OPERATIONS.

THE GRADATION OF THE STRUCTURE BACKFILL SHALL MEET THE REQUIREMENTS OF SECTION 209.2.2 OF THE STANDARD SPECIFICATIONS FOR GRADE 1 MATERIAL.

JOINT FILLER SHALL CONFORM TO A.A.S.H.T.O. DESIGNATION M153. TYPE I, II OR III OR A.A.S.H.T.O. DESIGNATION M213.

DESIGN DATA

LIVE LOAD:

DESIGN RATING	HS20
INVENTORY RATING	HS11
OPERATING RATING	HS26
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV)	190 KIPS

ULTIMATE DESIGN STRESSES:

CONCRETE MASONRY, DECK	f'c = 4,000 P.S.I.
ALL OTHER	f'c = 3,500 P.S.I.
HIGH-STRENGTH BAR STEEL REINFORCEMENT, GRADE 60	fy = 60,000 P.S.I.

TRAFFIC DATA

6TH AVENUE

A.D.T. (2015)	250
A.D.T. (2035)	295
DESIGN SPEED	40 M.P.H.

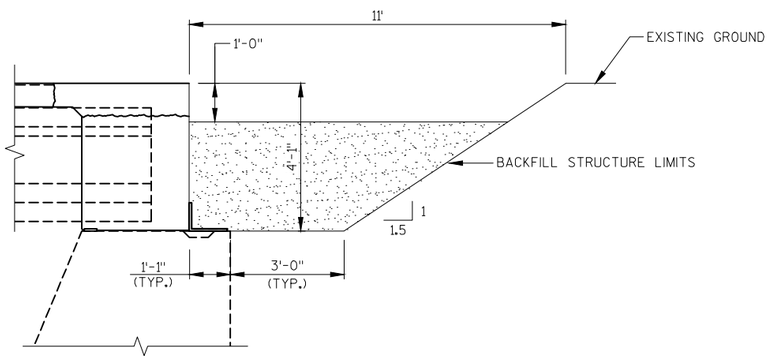
I.H. 90/94

A.D.T. (2015)	33,200
A.D.T. (2035)	39,800
DESIGN SPEED	70 M.P.H.

TOTAL ESTIMATED QUANTITIES

ITEM NUMBER	ITEM DESCRIPTION	UNIT	SUPER	S. ABUT.	N. ABUT.	TOTALS
203.0200	REMOVING OLD STRUCTURE STA. 20+12.15	LS	--	--	--	1
204.0175	REMOVING CONCRETE SLOPE PAVING	SY	--	--	33	33
206.1000	EXCAVATION FOR STRUCTURES BRIDGES B-29-0050	LS	--	--	--	1
210.0100	BACKFILL STRUCTURE	CY	--	20	20	40
502.0100	CONCRETE MASONRY BRIDGES	CY	--	11	11	22
502.0717.S	CRACK SEALING EPOXY	LF	85	--	--	85
502.3200	PROTECTIVE SURFACE TREATMENT	SY	600	--	--	600
502.5002	MASONRY ANCHORS TYPE L NO. 4 BARS	EACH	--	6	6	12
502.5010	MASONRY ANCHORS TYPE L NO. 6 BARS	EACH	--	8	8	16
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	--	1,910	1,910	3,820
506.0105	STRUCTURAL STEEL CARBON	LB	--	820	820	1,640
506.2605	BEARING PADS ELASTOMERIC NON-LAMINATED	EACH	--	4	4	8
506.7050.S	REMOVING BEARINGS B-29-0050	EACH	--	4	4	8
509.0301	PREPARATION DECKS TYPE 1	SY	63	--	--	63
509.0302	PREPARATION DECKS TYPE 2	SY	25	--	--	25
509.0500	CLEANING DECKS	SY	590	--	--	590
509.2000	FULL-DEPTH DECK REPAIR	SY	5	--	--	5
509.2500	CONCRETE MASONRY OVERLAY DECKS*	CY	45	--	--	45
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	--	5	5	10
517.3000.S	STRUCTURE OVERCOATING CLEANING AND PRIMING B-29-0050	LS	--	--	--	1
517.4000.S	CONTAINMENT AND COLLECTION OF WASTE MATERIALS B-29-0050	LS	--	--	--	1
604.0400	SLOPE PAVING CONCRETE	SY	--	--	33	33
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	LF	--	74	76	150
612.0806	APRON ENDWALLS FOR UNDERDRAIN REINFORCED CONCRETE 6-INCH	EACH	--	2	2	4
SPV.0060.01	REMOVING FLOOR DRAINS	EACH	6	--	--	6
SPV.0105.01	REMOVING AND REPLACING TUBULAR RAILING	LS	--	--	--	1
	NON-BID ITEMS					
	FILLER	SIZE	--	--	--	¾" & 1"

* QUANTITY INCLUDES CONCRETE OVERLAY, TYPE I DECK PREPARATION, TYPE II DECK PREPARATION AND FULL DEPTH DECK REPAIR VOLUMES.



BACKFILL STRUCTURE DETAIL

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-29-0050

DRAWN BY AK | PLANS CK'D. PTB

GENERAL NOTES AND QUANTITIES

SHEET 2 OF 8

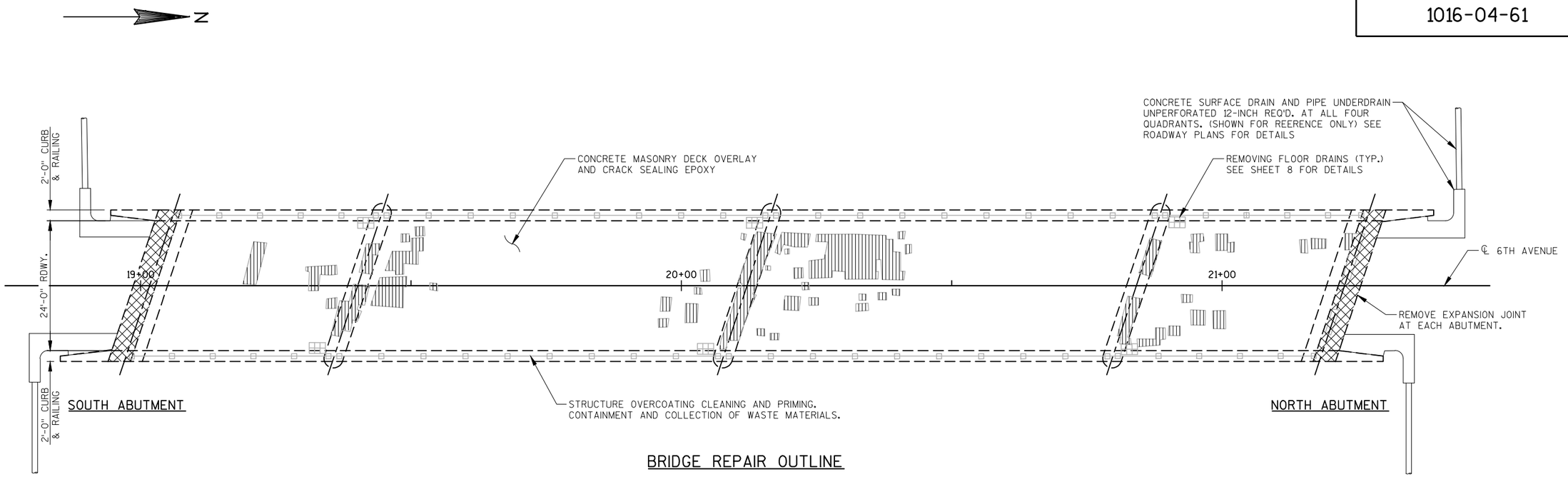
FILE NAME : S:\PROJECTS\W11507 NEW PSE DOCS\E-SUBMIT DOCUMENTS\W11507_02_GN_QTY.DWG
LAYOUT : LAYOUT

PLOT DATE : 7/17/2015
PLOT TIME : 3:36:43 PM

PLOT BY : BOLAND, PATRICK

PLOT SCALE : 1" = 1'

STATE PROJECT NUMBER
1016-04-61



BRIDGE REPAIR OUTLINE

PROPOSED REPAIR AREAS

FIELD OBSERVATION SUMMARY	STRUCTURE NO. B-29-0050		
ITEM	UNIT	QUANTITY	%
TOTAL AREA	SY	590	100
DELAMINATED AREA	SY	57	9.76
PREPARATION DECKS, TYPE 1	SY	63	10.80
PREPARATION DECKS, TYPE 2*	SY	25	4.45

LEGEND

DECK PREPARATION AREA

DECK RECONSTRUCTION AREA

8

NOTES:

* ESTIMATED

JOINT REMOVAL AREAS ARE NOT INCLUDED IN PROPOSED REPAIR AREA QUANTITIES.

DECK INSPECTION AND DECK REPAIR AREA SHOWN ARE FOR REFERENCE ONLY. ENGINEER TO VERIFY REPAIR AREAS. DECK REPAIRS SHALL BE MADE ONLY AS DIRECTED BY THE ENGINEER IN THE FIELD.

SEE SHEET 4 FOR PROPOSED BEARING AND SLOPE PAVING REPAIR.

8

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-29-0050

DRAWN BY AK | PLANS CK'D. PTB

REPAIR OUTLINE

SHEET 3 OF 8

FILE NAME : S:\PROJECTS\W11507 IH90 OVERLAY B-29-0050 6TH AVE\CADD FILES\STRUCTURE\FINALS\W11507_03_REPAIR_OUTLINE.DWG
LAYOUT : REPAIR OUTLINE

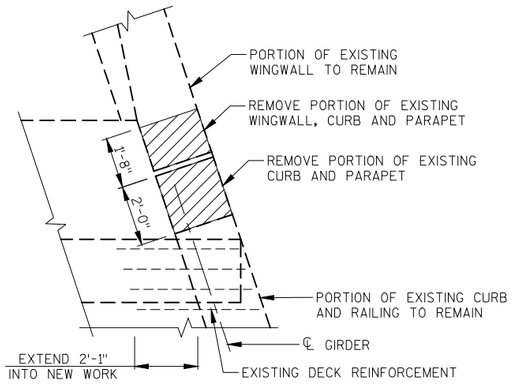
PLOT DATE : 7/30/2013
PLOT TIME : 4:36:48 PM

PLOT BY : BOLAND, PATRICK

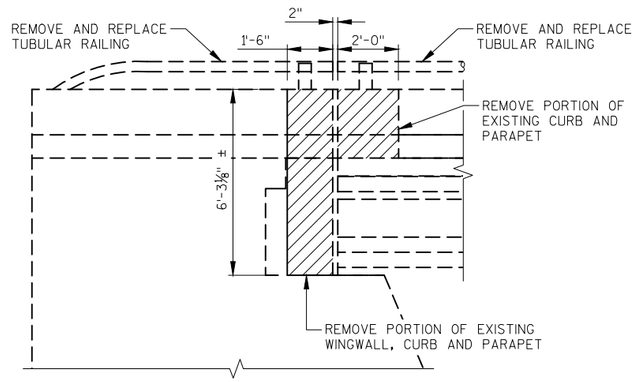
PLOT SCALE : 1" = 1'

STATE PROJECT NUMBER

1016-04-61

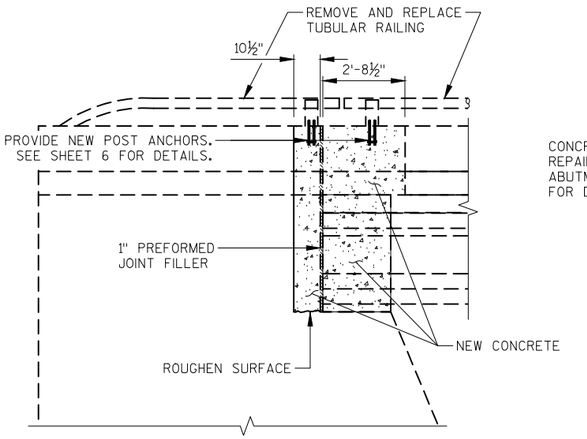


PARTIAL PLAN



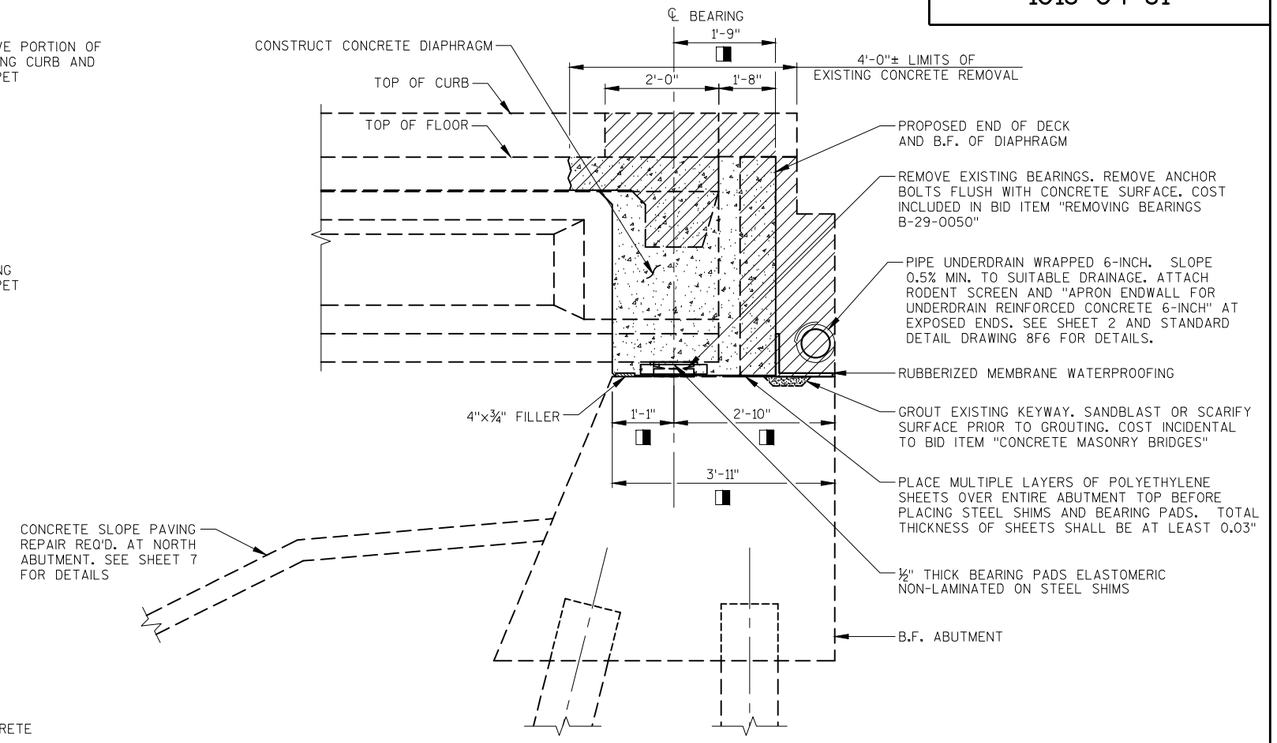
F.F. ELEV. - NW WING REMOVAL

OTHER WINGS SIMILAR



F.F. ELEV. - NW WING CONSTRUCTION

OTHER WINGS SIMILAR

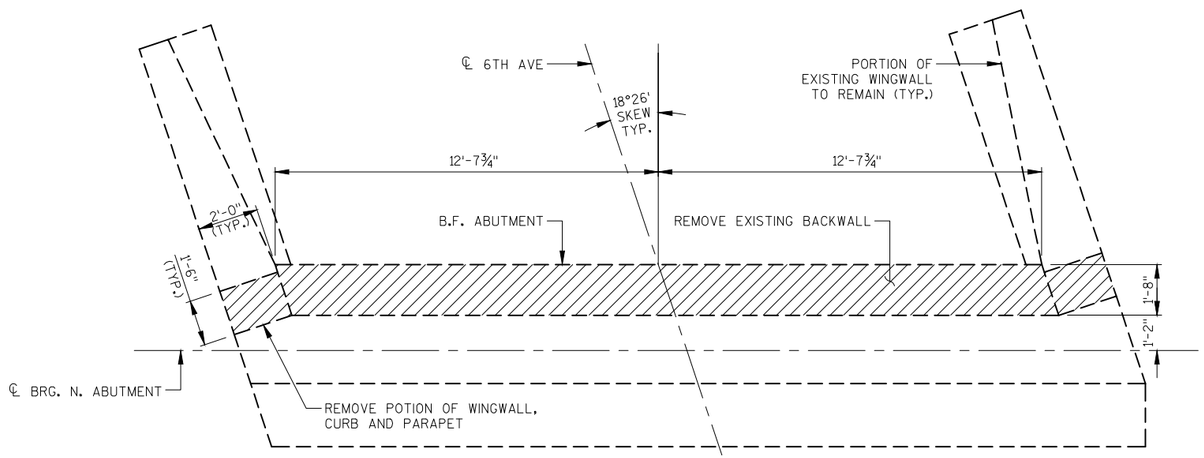


SECTION THROUGH NORTH ABUTMENT

NORTH ABUTMENT SHOWN, SOUTH ABUTMENT SHOWN

LEGEND

- EXISTING CONCRETE REMOVAL
- PROPOSED CONCRETE CONSTRUCTION
- DIMENSIONS GIVEN ARE NORMAL TO ℄ BEARING



EXISTING ABUTMENT PLAN

SHOWING REMOVAL AREA

NORTH ABUTMENT SHOWN, SOUTH ABUTMENT SIMILAR

BRIDGE JACKING NOTES

1. THE CONTRACTOR SHALL SUBMIT PLANS FOR JACKING AND CRIBBING TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCING ANY WORK AT THE BEARINGS IN ACCORDANCE WITH THE SPECIAL PROVISIONS. SHOW TYPE OF JACKS, SIZE OF JACKS, SHORING OR FALSEWORK AND SEQUENCE OF WORK IN THE PLAN.
2. PRIOR TO ORDERING MATERIAL AND COMMENCING ANY WORK AT THE BEARINGS, THE CONTRACTOR SHALL FIELD VERIFY ALL BEARING HEIGHT AND SHIM THICKNESS DIMENSIONS. SUPPORT JACKS ADJACENT TO EXISTING SUBSTRUCTURE UNITS.
3. JACKING AND REMOVING EXISTING BEARINGS SHALL BE DONE AFTER EXISTING CONCRETE REMOVAL IS COMPLETE AND BEFORE PLACING NEW CONCRETE.
4. TEMPORARY SUPPORT SYSTEM SHALL BE IN PLACE. JACKS, SHIMS AND BEARING PLATES SHALL BE POSITIONED TO PROVIDE FULL CONTACT AGAINST GIRDER SOFFIT IN THE NO LOAD POSITION.
5. ALL GIRDERS SHALL BE LIFTED SIMULTANEOUSLY SUCH THAT THE RELATIVE ELEVATION BETWEEN ADJACENT GIRDERS DOES NOT VARY BY MORE THAN ½", AND SUCH THAT THE RELATIVE ELEVATIONS BETWEEN ADJACENT SUBSTRUCTURE UNITS DOES NOT VARY MORE THAN ¾" DURING OR AFTER THE JACKING OPERATIONS.
6. THE MAXIMUM DEAD LOAD REACTION IS 32 KIPS PER GIRDER.
7. LIFTING SHALL BE DONE BY JACKING. MEASURES SHALL BE TAKEN TO PREVENT LATERAL OR LONGITUDINAL DISPLACEMENT OR DISTORTION OF GIRDERS DURING LIFTING OPERATIONS. ANY SWAY OF GIRDERS DURING LIFTING OPERATIONS SHALL BE CORRECTED IMMEDIATELY.
8. LIFT GIRDERS A MAXIMUM OF ¾" TO REMOVE EXISTING BEARINGS.
9. WHILE GIRDERS ARE IN THE RAISED POSITION AND SECURED, INSTALL NEW BEARING PADS. FIELD VERIFY ELEVATIONS PRIOR TO LOWERING GIRDERS.
10. ALL BRIDGE JACKING INCLUDED IN THE BID ITEM "REMOVING BEARINGS B-29-0050".

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-29-0050

DRAWN BY AK | PLANS CK'D. PTB

ABUTMENT REPAIR

SHEET 4 OF 8

8

8

FILE NAME : S:\PROJECTS\W11507 IH90 OVERLAY B-29-0050 6TH AVE\CADD FILES\STRUCTURE\FINALS\W11507_04_ABUT.DWG
LAYOUT : LAYOUT

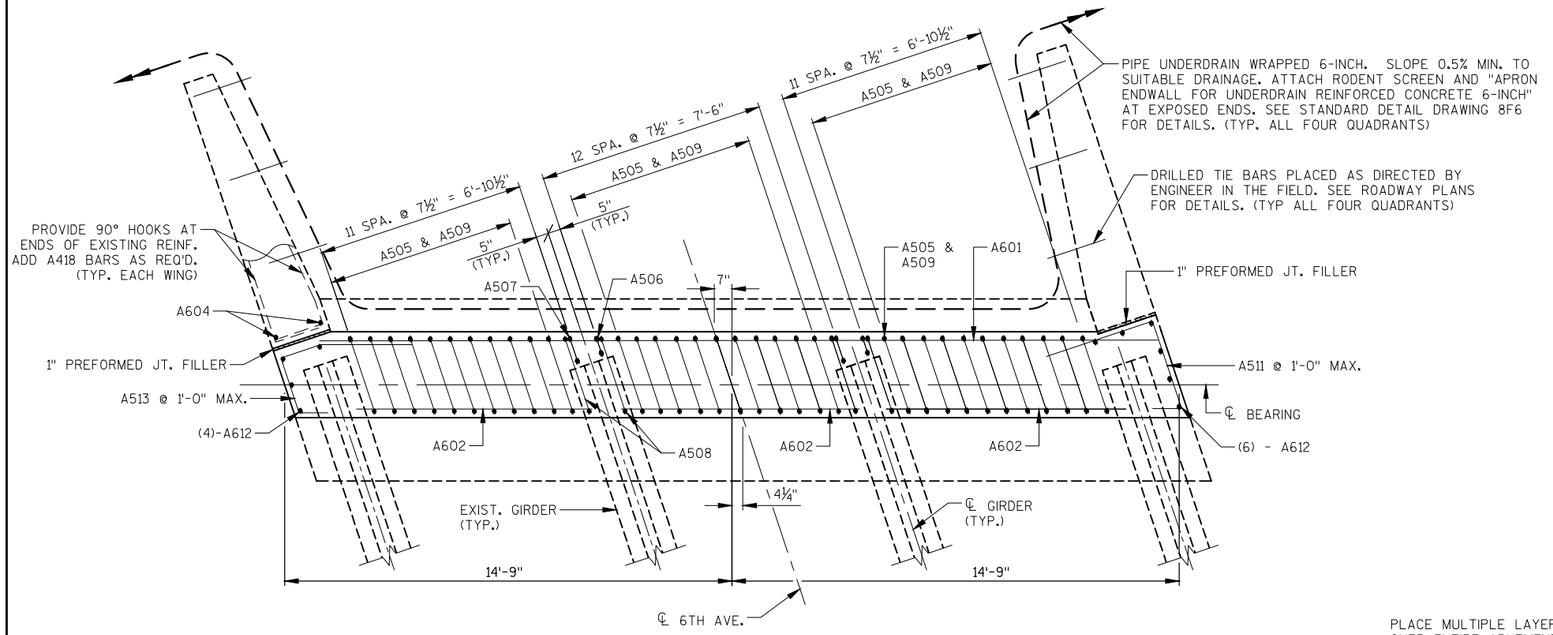
PLOT DATE : 7/30/2013
PLOT TIME : 4:36:55 PM

PLOT BY : BOLAND, PATRICK

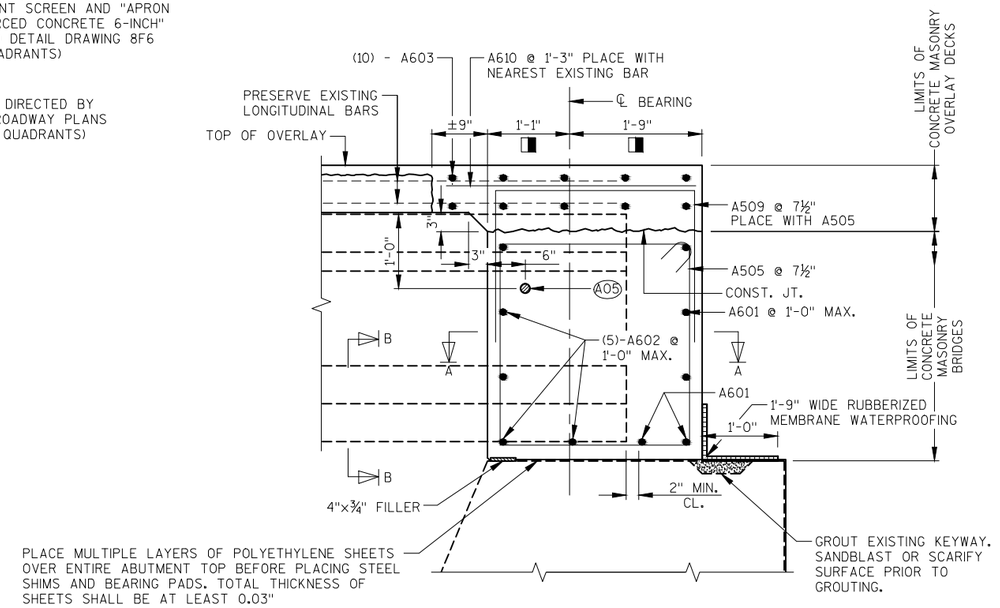
PLOT SCALE : 1" = 1'

STATE PROJECT NUMBER

1016-04-61



SECTION A-A



SECTION THROUGH ABUTMENT DIAPHRAGM

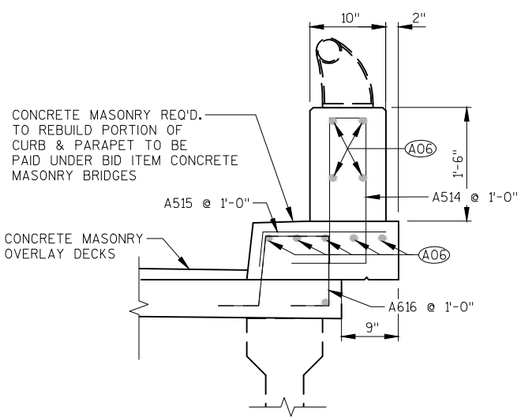
N. ABUTMENT SHOWN, S. ABUTMENT SIMILAR

NOTE:

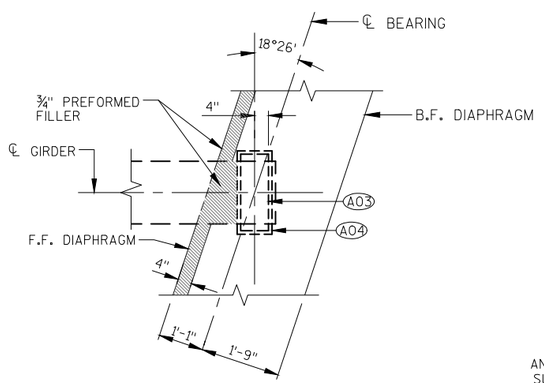
1. NORTH ABUTMENT SHOWN (SOUTH ABUTMENT SIMILAR)
2. REFERENCE SHEET 4 FOR REMOVAL DETAILS.

NOTE:

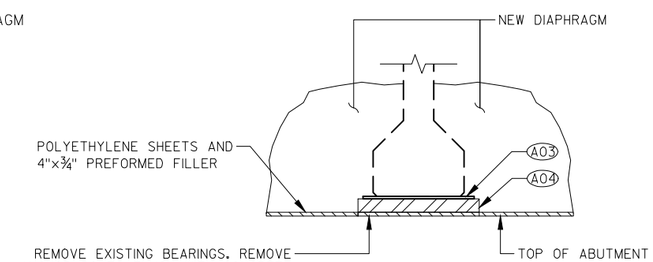
- ◨ DIMENSIONS GIVEN ARE NORMAL TO ℄ BEARING
- (A03) ½"×8"×1'-10" NON-LAMINATED ELASTOMERIC BEARING PAD
- (A04) PL. 2⅞"×10"×2'-0" GALVANIZED (ASTM A36)
- (A05) DRILL 1½" DIA. HOLE IN WEB FOR (2) NO. 5 HORIZ. BARS (A519). NO. 5 BARS TO BE 6'-0" LONG AND PLACED SYM. ABOUT ℄ OF GIRDERS. FIELD BEND BARS ALONG SKEW.
- (A06) PRESERVE EXISTING LONGITUDINAL BARS. SPLICE WITH BAR A617.



CURB AND PARAPET DETAIL



BEARING LAYOUT



VIEW B-B

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-29-0050

DRAWN BY AK | PLANS CK'D. PTB

ABUTMENT DETAILS

SHEET 5 OF 8

61

8

8

FILE NAME : S:\PROJECTS\W11507 IH90 OVERLAY B-29-0050 6TH AVE\CADD FILES\STRUCTURE\FINALS\W11507_05_ABUT_DET.DWG
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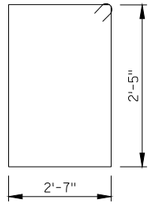
PLOT DATE : 7/30/2013
PLOT TIME : 4:37:00 PM

PLOT BY : BOLAND, PATRICK

PLOT SCALE : 1" = 1'

STATE PROJECT NUMBER

1016-04-61



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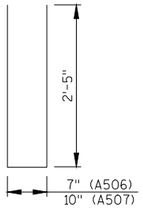
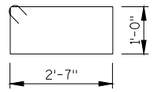


A506
A507



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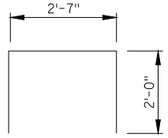

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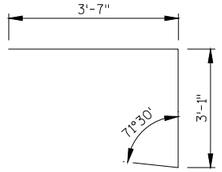

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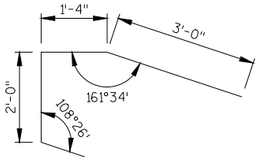

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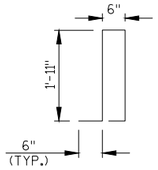

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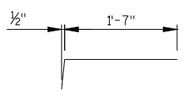

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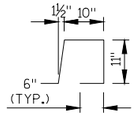

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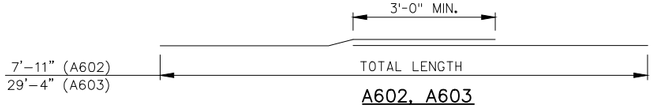
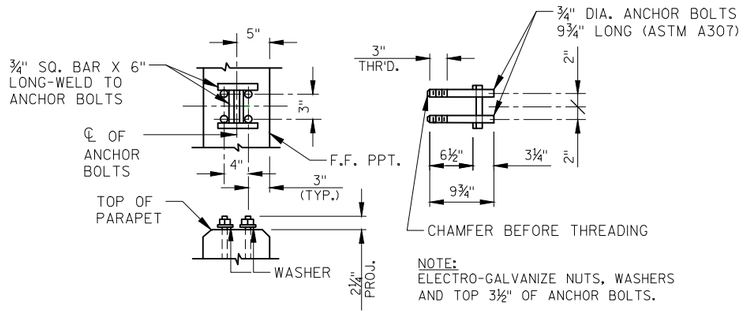


A602, A603

BAR SPLICE DETAILS



NOTE:
ELECTRO-GALVANIZE NUTS, WASHERS AND TOP 3½" OF ANCHOR BOLTS.

ANCHOR BOLTS AT POSTS

BILL OF BARS
BOTH ABUTMENTS

3,820 LB (COATED)

	BAR MARK	NORTH ABUT.	SOUTH ABUT.	LENGTH	BENT	COAT	LOCATION
◭	A601	5	5	26-3		X	DIAPH. - HORIZ. - B.F.
◪	A602	10	10	5-6		X	DIAPH. - HORIZ. - F.F.
◪	A603	20	20	16-2		X	DECK - TOP & BOT. - TRAN.
◑	A604	8	8	5-6	X	X	ABUT. - WING - VERTICAL
	A505	33	33	10-8	X	X	ABUT. - DIAPH. - VERTICAL
	A506	2	2	5-2	X	X	ABUT. - DIAPH. - VERTICAL
	A507	2	2	5-5	X	X	ABUT. - DIAPH. - VERTICAL
	A508	4	4	7-9	X	X	ABUT. - DIAPH. - VERTICAL
	A509	33	33	6-4	X	X	ABUT. - DIAPH. - VERTICAL
	A610	23	23	3-3		X	DECK - TOP - LONGIT.
	A511	5	5	7-5	X	X	ABUT. - DIAPH. - HORIZ.
	A612	10	10	3-6		X	ABUT. - DIAPH. - VERTICAL
	A513	5	5	7-2	X	X	ABUT. - DIAPH. - HORIZ.
	A514	12	12	4-10	X	X	PARAPET - VERTICAL
	A515	12	12	2-0	X	X	CURB - HORIZ. - TRAN.
	A616	6	6	4-0	X	X	CURB - HORIZ. - TRAN.
	A617	5	5	2-4		X	CURB & PARAPET - HORIZ. - LONGITUDINAL
*	A418	6	6	2-0		X	ABUT. - WING - HORIZ. (AS REQ'D.)
	A519	8	8	6-0		X	ABUT. - DIAPH. - HORIZ.

NOTES:

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

◭ SPLICE BAR A602 WITH ANOTHER BAR A602 TO PROVIDE THE REQ'D. TOTAL LENGTH.

◪ SPLICE BAR A603 WITH ANOTHER BAR A603 TO PROVIDE THE REQ'D. TOTAL LENGTH.

◑ MASONRY ANCHORS TYPE L NO 6 BARS. MIN. PULLOUT CAPACITY OF 26 KIPS. EMBED 1'–1" IN CONCRETE.

* MASONRY ANCHORS TYPE L NO. 4 BARS. MIN. PULLOUT CAPACITY OF 12 KIPS. EMBED 7½" IN CONCRETE. TO REPLACE DAMAGED WING HORIZONTAL BARS DURING WING REMOVAL.

8

8

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-29-0050

DRAWN BY AK | PLANS CK'D. PTB

BAR DETAILS

SHEET 6 OF 8

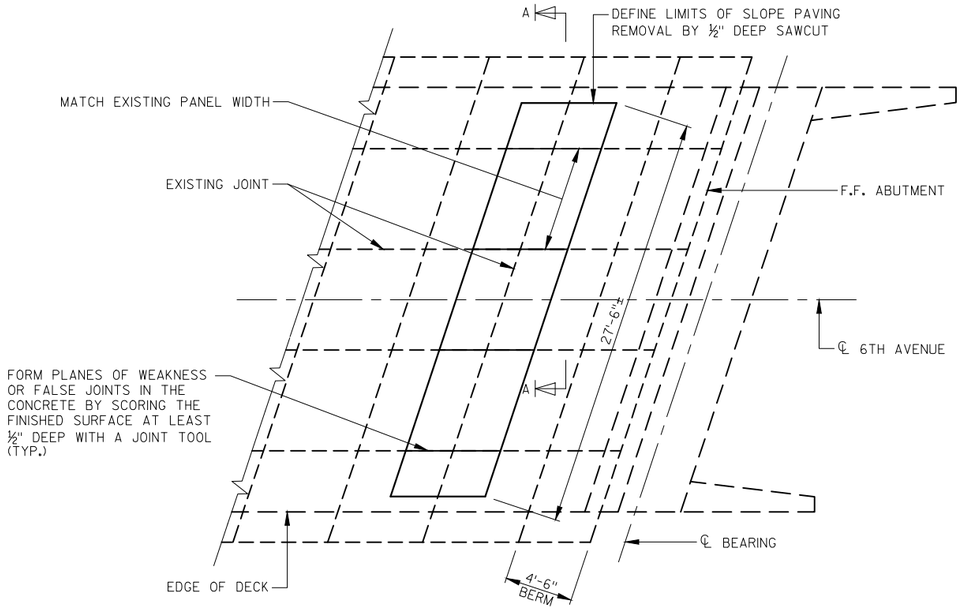
FILE NAME : S:\PROJECTS\W11507 IH90 OVERLAY B-29-0050 6TH AVE\CADD FILES\STRUCTURE\FINALS\W11507_06_ABUT_BAR_DET.DWG
LAYOUT : LAYOUT

PLOT DATE : 7/30/2013
PLOT TIME : 4:37:05 PM

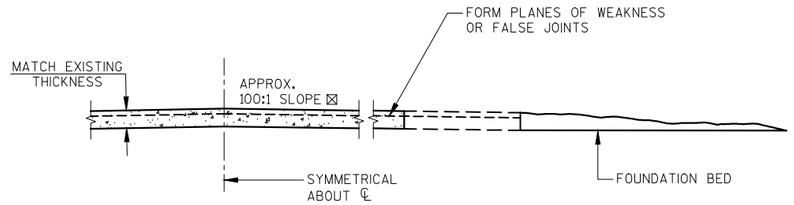
PLOT BY : BOLAND, PATRICK

PLOT SCALE : 1" = 1'

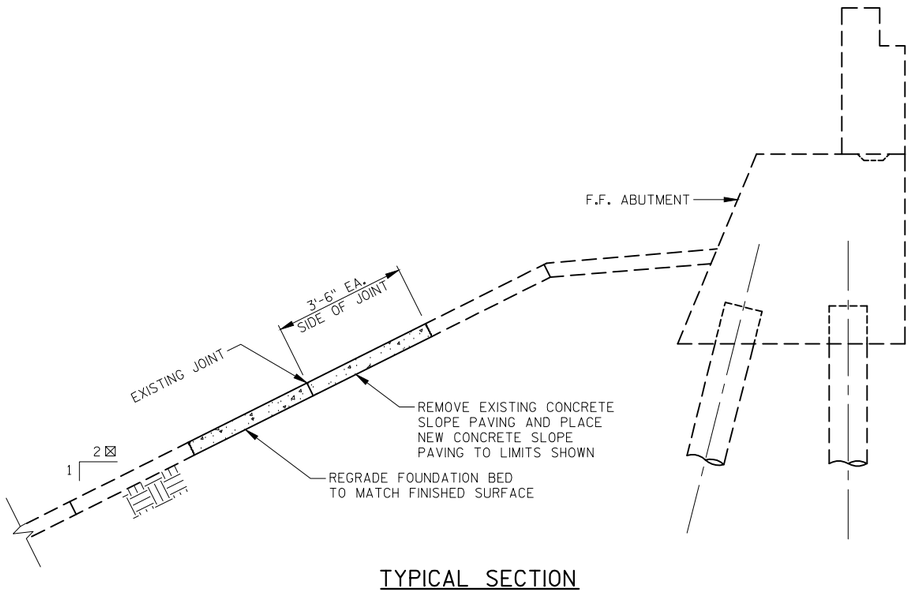
STATE PROJECT NUMBER
1016-04-61



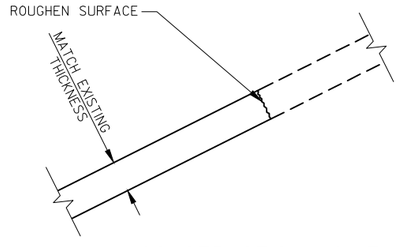
SLOPE PAVING PLAN



SECTION A-A



TYPICAL SECTION



CONSTRUCTION JOINT

NOTE:

FIELD VERIFY SLOPE PAVING PANEL WIDTH AND THICKNESS.

REMOVING CONCRETE SLOPE PAVING AND SLOPE PAVING CONCRETE QUANTITIES ARE ESTIMATES. EXTENT OF CONCRETE PANEL REPLACEMENT SHALL BE DETERMINED BY FIELD ENGINEER.

DETAILS OF CONSTRUCTION NOT SHOWN SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS.

☒ MATCH EXISTING WORK

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-29-0050

DRAWN BY AK | PLANS CK'D. PTB

SLOPE PAVING REPAIR

SHEET 7 OF 8

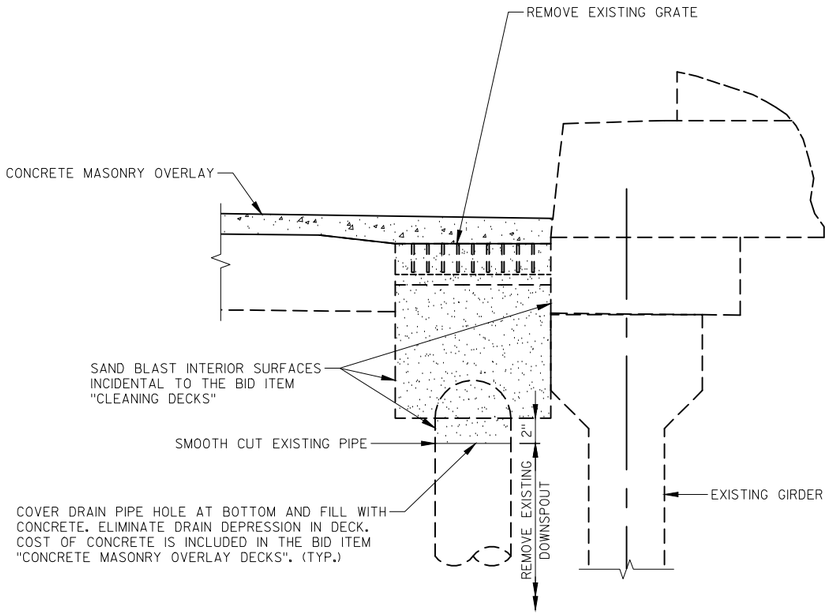
8

8

FILE NAME : S:\PROJECTS\W11507 IH90 OVERLAY B-29-0050 6TH AVE\CADD FILES\STRUCTURE\FINALS\W11507_07_SLOPE_PAVING.DWG
LAYOUT : LAYOUT
PLOT DATE : 7/30/2013
PLOT TIME : 4:37:10 PM
PLOT BY : BOLAND, PATRICK
PLOT SCALE : 1" = 1'

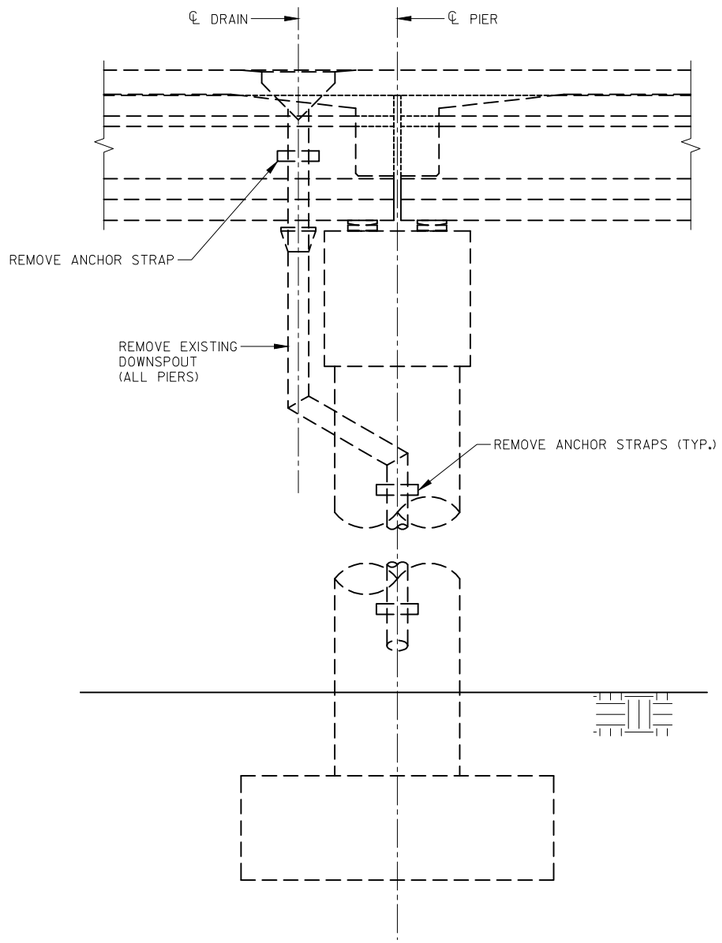
STATE PROJECT NUMBER

1016-04-61



REMOVING FLOOR DRAIN DETAIL

NOTE: REMOVING GRATES, CLEANING DRAINS, CUTTING PIPES, REMOVING DOWNSPOUTS AND COVERING DRAIN PIPE HOLES SHALL BE PAID UNDER THE BID ITEM "REMOVING FLOOR DRAINS".



DOWNSPOUT REMOVAL

8

8

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

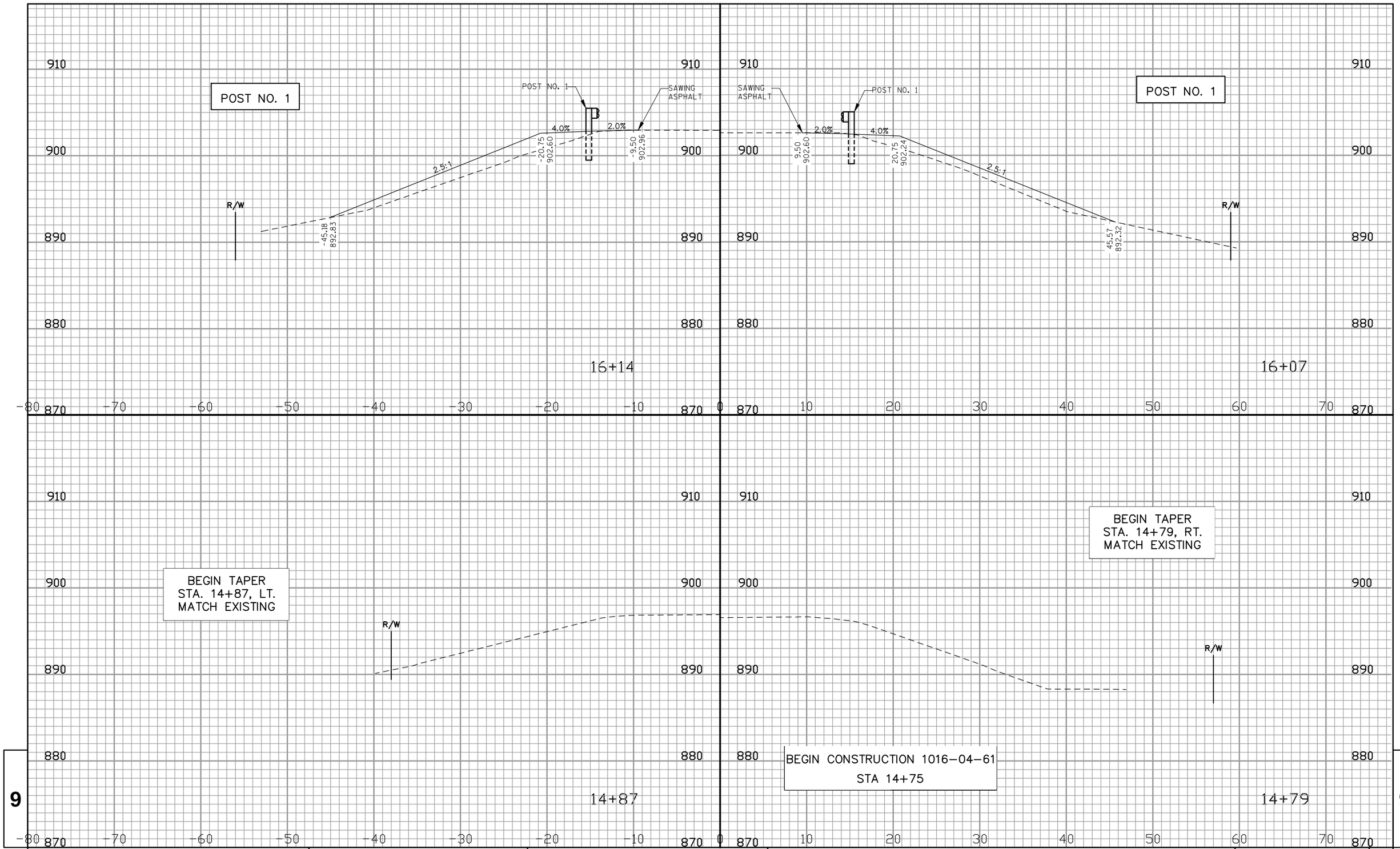
STRUCTURE B-29-0050

DRAWN BY AK | PLANS CK'D. PTB

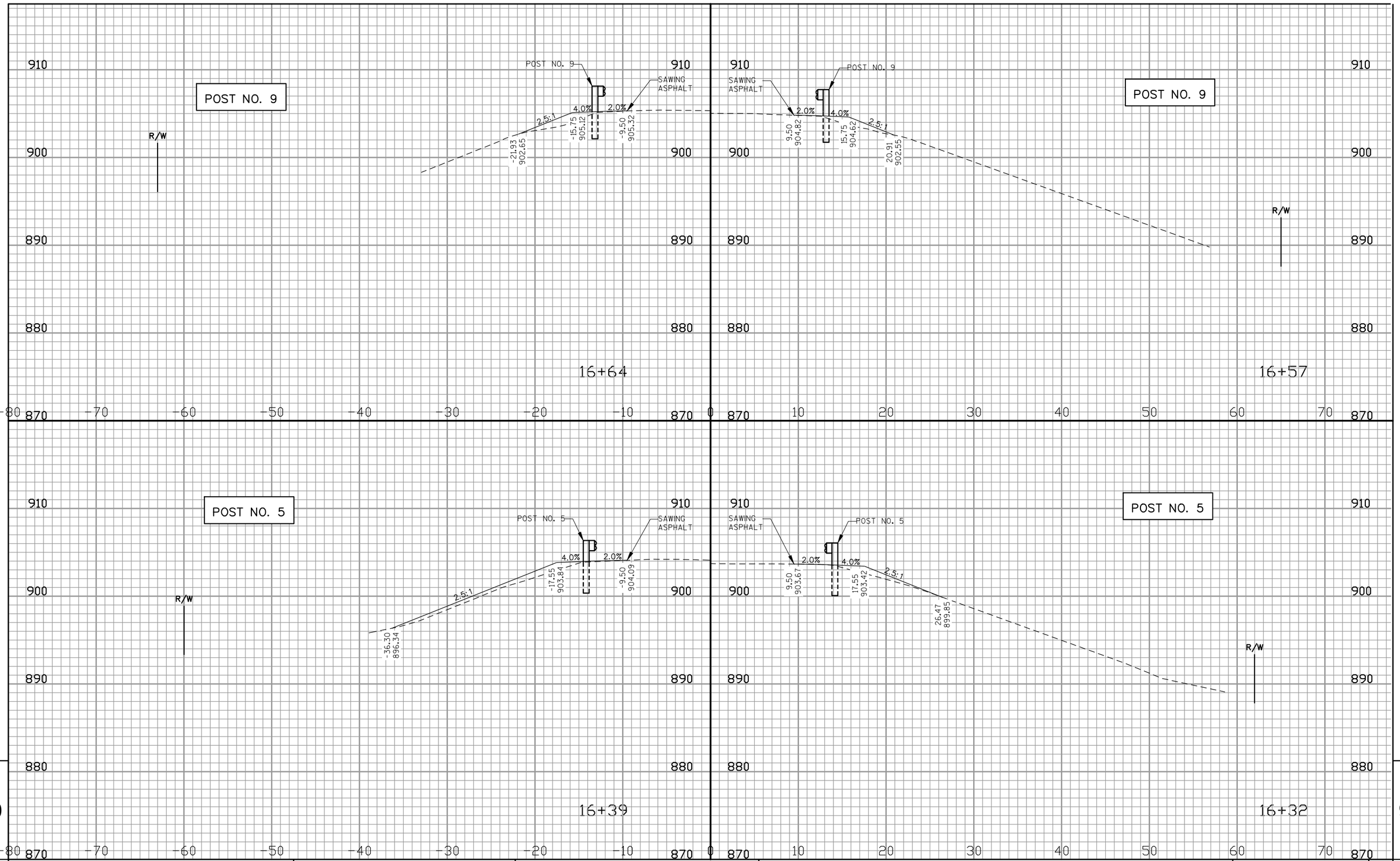
FLOOR DRAIN DETAIL

SHEET 8 OF 8

FILE NAME : S:\PROJECTS\W11507 IH90 OVERLAY B-29-0050 6TH AVE\CADD FILES\STRUCTURE\FINALS\W11507_08_FLOOR_DRAIN.DWG
LAYOUT : LAYOUT
PLOT DATE : 7/30/2013
PLOT TIME : 4:37:14 PM
PLOT BY : BOLAND, PATRICK
PLOT SCALE : 1" = 1'



PROJECT NO: 1016-04-61	HWY: 6TH AVENUE	COUNTY: JUNEAU	CROSS SECTIONS	SHEET	E



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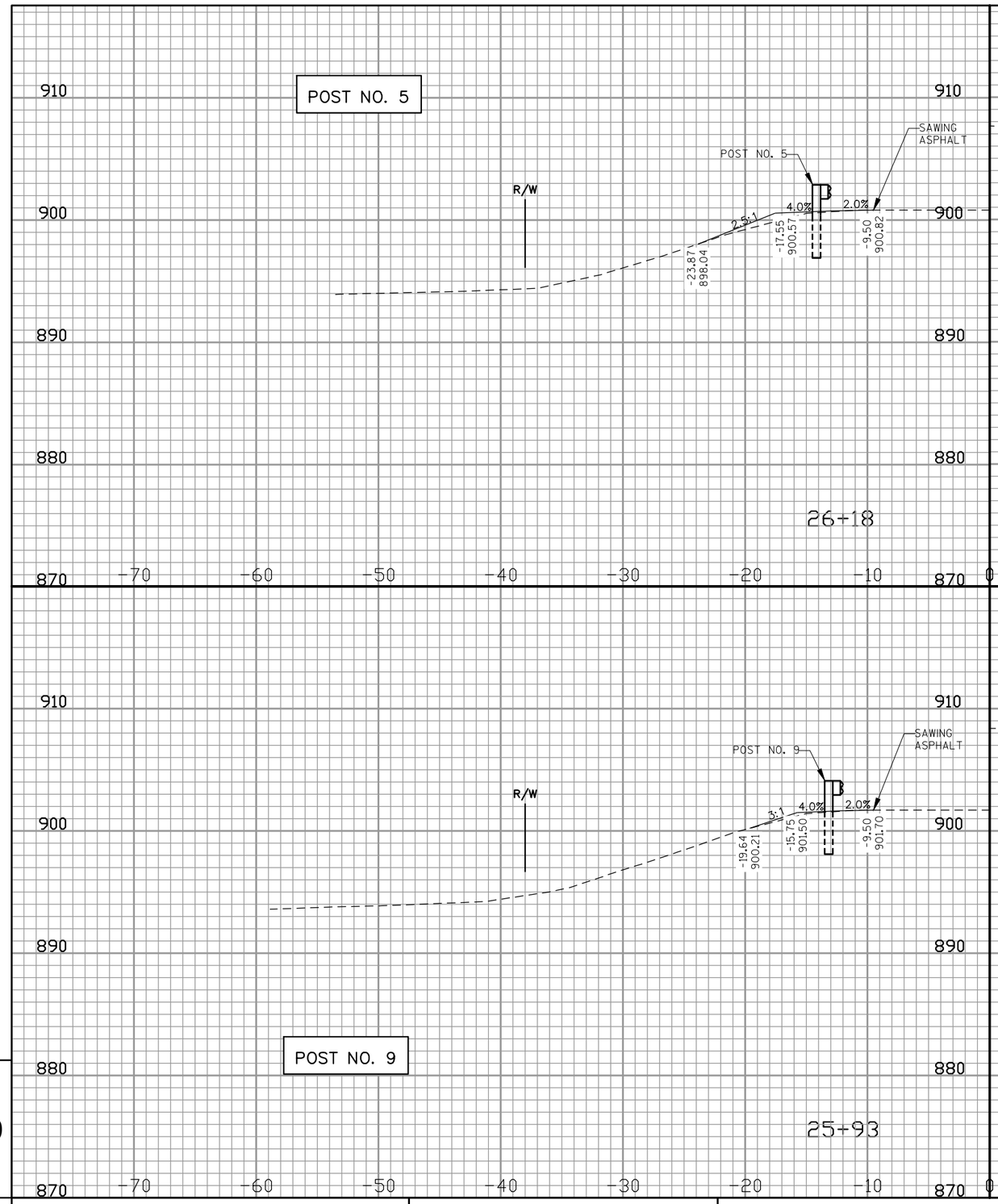
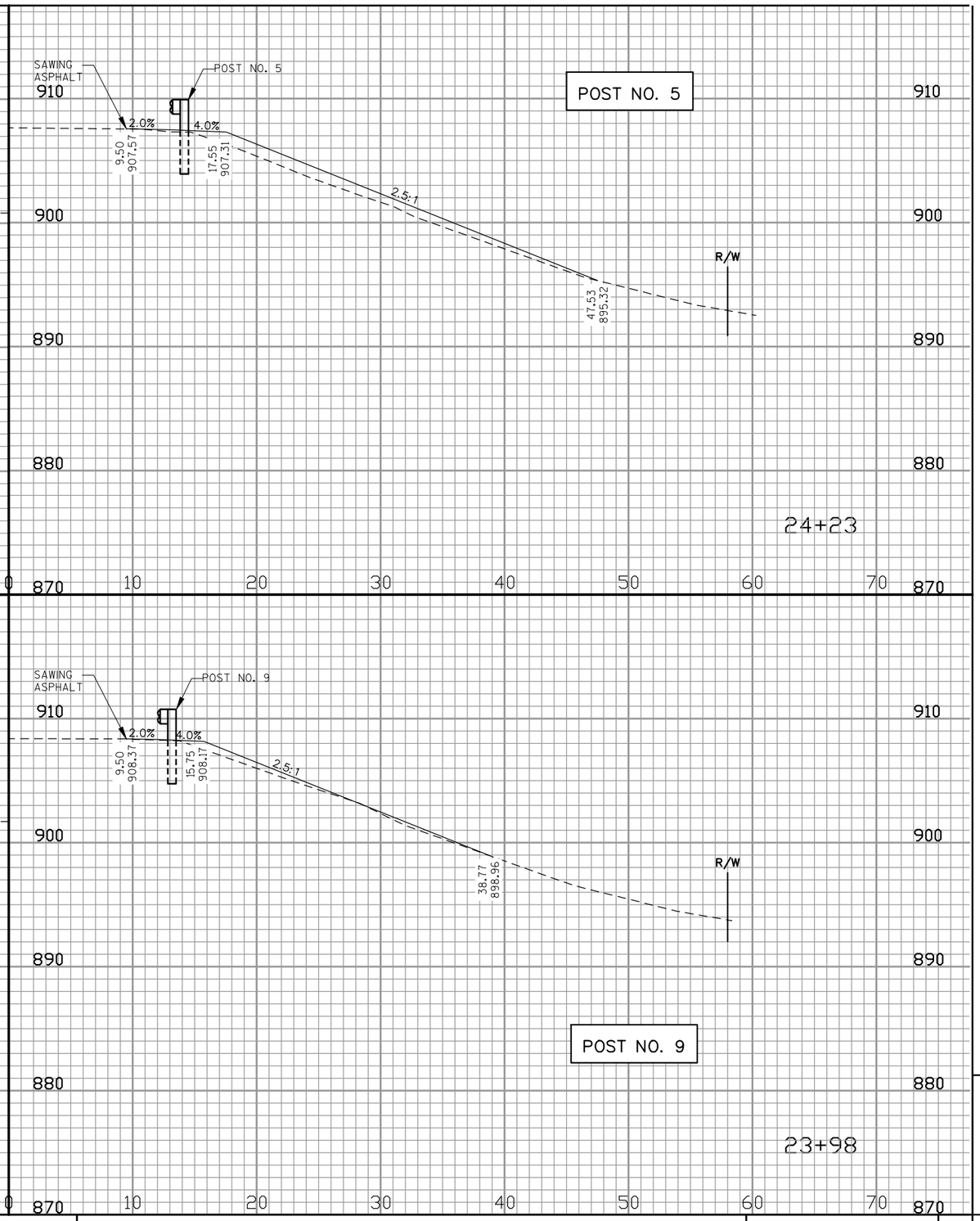
PROJECT NO: 1016-04-61	HWY: 6TH AVENUE	COUNTY: JUNEAU	CROSS SECTIONS	SHEET	E

9





9

9

PROJECT NO: 1016-04-61	HWY: 6TH AVENUE	COUNTY: JUNEAU	CROSS SECTIONS	SHEET	E

END TAPER
STA. 26+20, LT.
MATCH EXISTING

R/W

27+71

910
900
890
880
870
-70 -60 -50 -40 -30 -20 -10 0

END CONSTRUCTION 1016-04-61
STA 26+25

END TAPER
STA. 25+75, RT.
MATCH EXISTING

R/W

25+75

910
900
890
880
870
0 10 20 30 40 50 60 70

POST NO. 1

POST NO. 1

SAWING
ASPHALT

R/W

4.0%
2.0%
2.5:1

-20.75
899.65

-9.50
900.01

-33.57
894.52

26+43

910
900
890
880
870
-70 -60 -50 -40 -30 -20 -10 0

SAWING
ASPHALT

POST NO. 1

POST NO. 1

2.0%
4.0%
2.5:1

9.50
906.81

20.75
906.45

54.56
892.92

R/W

24+48

910
900
890
880
870
0 10 20 30 40 50 60 70

9

9

PROJECT NO: 1016-04-61	HWY: 6TH AVENUE	COUNTY: JUNEAU	CROSS SECTIONS	SHEET	E

Notes

Wisconsin Department of Transportation

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