SEL April 2016

PROJECT ID: 2699-02-70
WITH: N/A

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
2699-02-70	WISC 2016094	1

ORDER OF SHEETS

TOTAL SHEETS = 80

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

MALCHINE ROAD

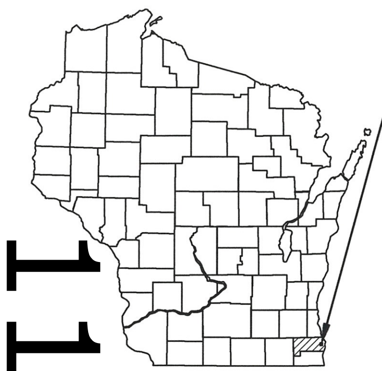
BRIDGE OVER WIND LAKE DRAINAGE CANAL

LOCAL STREET
RACINE COUNTY

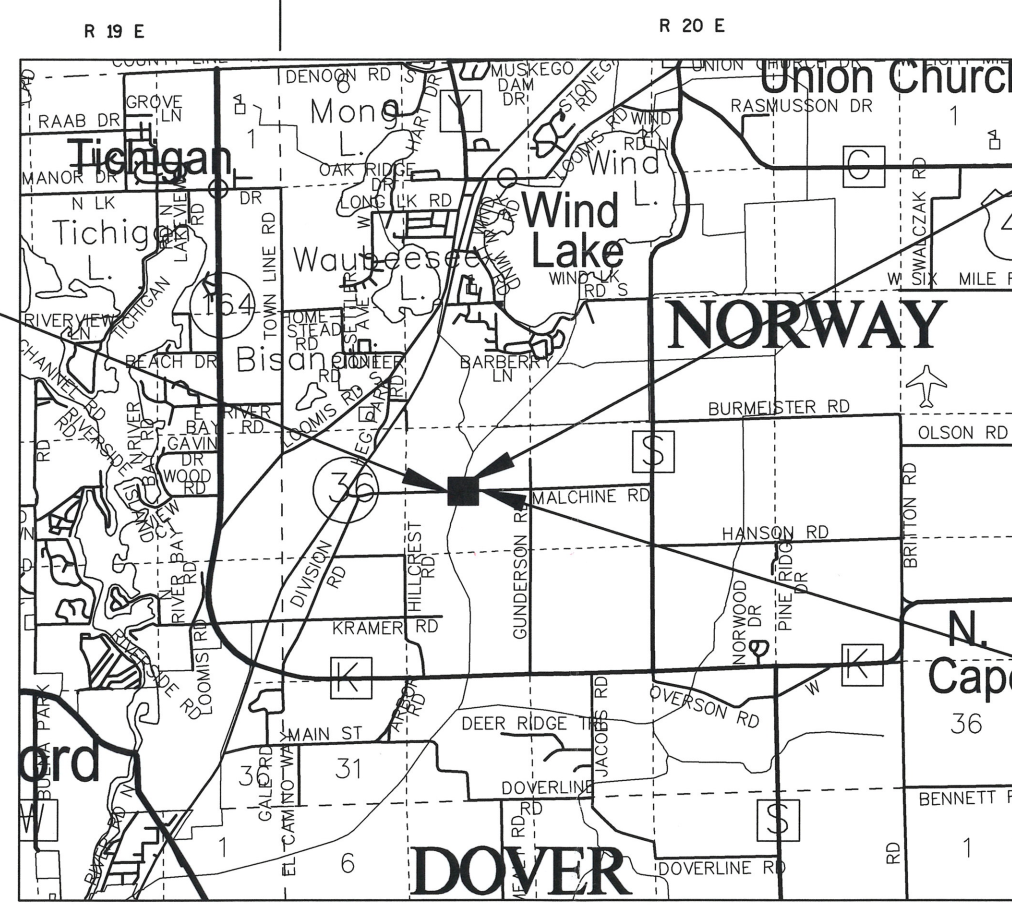
STATE PROJECT NUMBER
2699-02-70

PROJECT LOCATION

11



N



BEGIN PROJECT 2699-02-70
STA. 9+00.00
Y = 538338.769
X = 210125.107

END PROJECT 2699-02-70
STA. 11+75.00

STRUCTURE B-51-152

ACCEPTED FOR TOWN OF NORWAY

9-18-15 — DATE
ADMINISTRATOR/TREASURER

ORIGINAL PLANS PREPARED BY

WISCONSIN PHILIP J. BAIN JR. E-36474 WAUWATOSA, WI PROFESSIONAL ENGINEER

09/30/2015 (Date)

COUNTY: RACINE

DESIGN DESIGNATION

A.A.D.T.	2016	=	670
A.A.D.T.	2036	=	730
D.H.V.	2036	=	77
D.D.		=	60/40
T		=	24.1%
DESIGN SPEED		=	60 MPH
ESALS		=	233,600

CONVENTIONAL SYMBOLS

PLAN
- CORPORATE LIMITS
- PROPERTY LINE (PL + 58.1)
- LOT LINE
- LIMITED HIGHWAY EASEMENT
- EXISTING RIGHT OF WAY
- PROPOSED OR NEW R/W LINE
- SLOPE INTERCEPT
- REFERENCE LINE
- EXISTING CULVERT
- PROPOSED CULVERT (Box or Pipe)
- COMBUSTIBLE FLUIDS (CAUTION)
- MARSH AREA
- WOODED OR SHRUB AREA

PROFILE
- GRADE LINE
- ORIGINAL GROUND
- MARSH OR ROCK PROFILE (To be noted as such) (ROCK)
- SPECIAL DITCH (LABEL)
- GRADE ELEVATION (95.36)
- CULVERT (Profile View)

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

LAYOUT
SCALE 0 — 1 MI.

TOTAL NET LENGTH OF CENTERLINE = 0.052 MI.

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE RACINE COUNTY COORDINATES, COUNTY, NAD83 (2011), IN U.S. SURVEY FEET. VALUES ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES MAY BE USED AS GROUND DISTANCES.

ELEVATIONS SHOWN ON THE PLAN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF NAVD 88 (2012).

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor	AYRES ASSOCIATES
Designer	AYRES ASSOCIATES
Management Consultant	DAAR ENGINEERING, INC.
C.O. Examiner	

APPROVED FOR THE DEPARTMENT
DATE: 10/22/15 (Management Consultant Signature)

E

2

GENERAL NOTES

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

FILL EXPANSION FACTOR IS 25%.

SAW CUT LOCATIONS SHOWN ON THE PLAN ARE SUBJECTED TO ADJUSTMENT BY THE ENGINEER IN FIELD. THE LINE OF SUCH SAW CUTS WILL BE NEATLY DELINEATED THROUGH THE ASPHALT WITHOUT ANY DAMAGE TO THE REMAINING PORTION OF THE EXISTING PAVEMENT.

CONSTRUCT 5-INCH HMA PAVEMENT TYPE E-0.3 WITH A 2-INCH UPPER LAYER AND A 3-INCH LOWER LAYER. 19.00 MM HMA TYPE E-0.3 FOR LOWER LAYER. 12.5 MM HMA TYPE E-0.3 FOR UPPER LAYER

ASPHALTIC MATERIAL PG 58-28 REQUIRED FOR UPPER LAYER AND LOWER.

PROPERTY LINES AS SHOWN ARE APPROXIMATE.

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

EXACT LOCATION AND WIDTH OF FIELD ENTRANCES WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.

ENTRANCES ARE TO BE REPLACED IN KIND.

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

THE EXACT LOCATION AND LENGTHS OF CULVERT PIPES WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.

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

THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING MOTORISTS AND PEDESTRIANS THAT MAY ENTER THE WORK ZONE FORM POSSIBLE HAZARDS.

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

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

ELEVATIONS SHOWN ON THE ROADWAY CROSS SECTIONS ARE SUBGRADE ELEVATIONS.

UTILITIES

* WE energies - GAS AND ELECTRIC — TELEPHONE 414-221-5617
  333 W. EVERETT STREET - A299
  MILWAUKEE, WISCONSIN 53203
  ATTENTION: LATROY BRUMFIELD
  E-MAIL: latroy.brumfield@we-energies.com

* TDS TELECOM — TELEPHONE 262-754-3052
  16924 WEST VICTOR ROAD
  NEW BERLIN, WISCONSIN 53151
  ATTENTION: MICHAEL JOHNSON
  E-MAIL:michael.johnson@tdstelecom.com

* TIME WARNER CABLE — TELEPHONE 414-277-4045
  1320 N. DR. MARTIN LUTHER KING JR. DRIVE
  MILWAUKEE, WISCONSIN 53212
  ATTENTION: STEVE CRAMER
  E-MAIL: wis.engineering@twcable.com

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

*-MEMBER OF DIGGERS HOTLINE

RUNOFF COEFFICIENT TABLE

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

TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 0.85 ACRES
SOIL GROUP

STANDARD ABBREVIATIONS

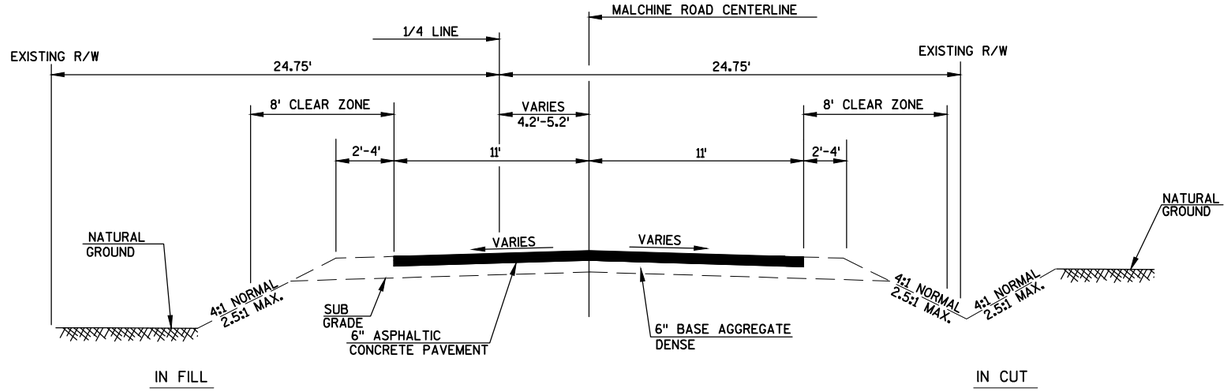
ADT	AVERAGE DAILY TRAFFIC	NC	NORMAL CROWN
AC	ASPHALT CEMENT	PT	POINT OF TANGENCY
AGG	AGGREGATE	PC	POINT OF CURVATURE
ASPH	ASPHALT	PI	POINT OF INTERSECTION
BM	BENCH MARK	PE	PRIVATE ENTRANCE
C/L	CENTERLINE	R	RADIUS
CONC	CONCRETE	REM	REMOVE
CMP	CORRUGATED METAL PIPE	R/L OR RL	REFERENCE LINE
CR.	CREEK	RCCP	REINFORCED CONCRETE CULVERT PIPE
D	DEGREE OF CURVE	RCPSS	REINFORCED CONCRETE PIPE STORM SEWER
DHV	DESIGN HOUR VOLUME	R.O.	RUNOUT
ESALS	EQUIVALENT SINGLE AXIS LOADS	R/W	RIGHT-OF-WAY
EXIST	EXISTING	STA	STATION
FE	FIELD ENTRANCE	SE	SUPER ELEVATION
HYD	HYDRANT	SS	STORM SEWER
IP	IRON PIPE OR PIN	T	TANGENT
L	LENGTH OF CURVE	TEL	TELEPHONE
LC	LONG CHORD OF CURVE	TLE	TEMPORARY LIMITED EASEMENT
LR	LENGTH OF RUNOFF	T	TRUCKS
MH	MANHOLE	VC	VERTICAL CURVE
		W	WELL

RACINE COUNTY SURVEYOR

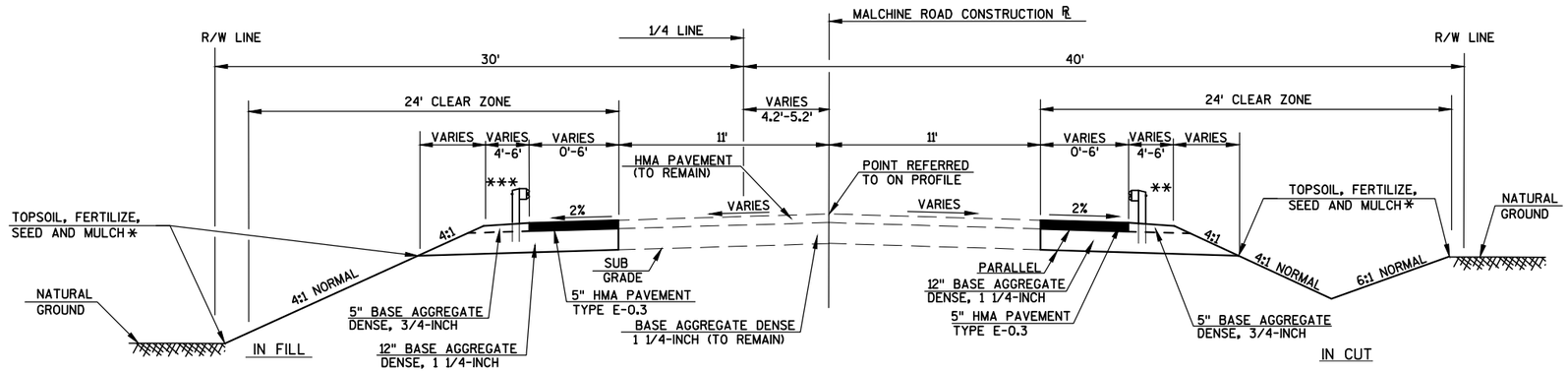
NIELSEN MADSEN & BARBER, SC — TELEPHONE 1-262-634-5588
1458 HORIZON BLVD, SUITE 200
RACINE WI, 53406
mmadsen@nmbsc.net

DNR LIAISON

DEPARTMENT OF NATURAL RESOURCES — TELEPHONE 1-262-574-2141
DNR SERVICE CENTER
141 NW BARSTOW ROOM 180
WAUKESHA, WISCONSIN 53188
ATTENTION: CRAIG WEBSTER



EXISTING TYPICAL SECTION FOR MALCHINE ROAD



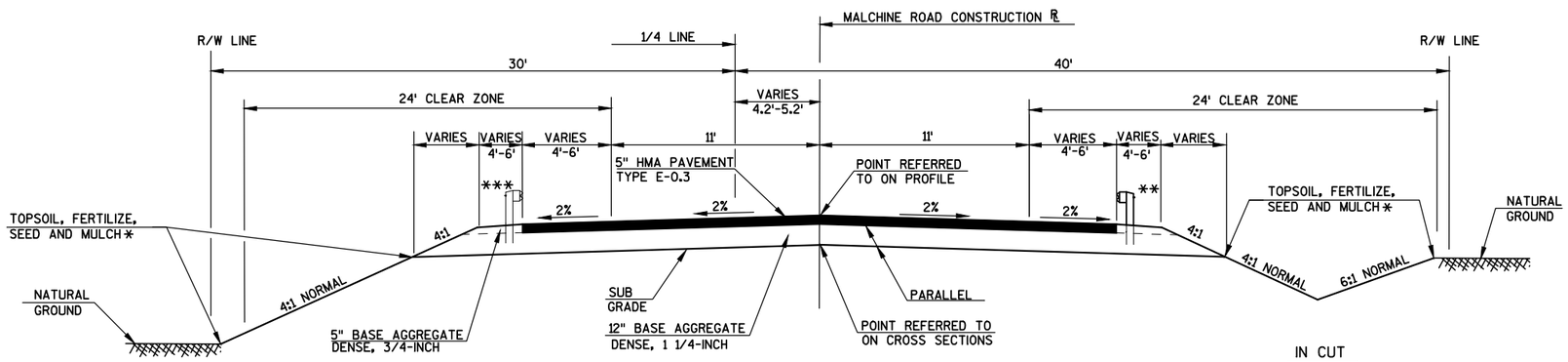
TYPICAL FINISHED SECTION FOR MALCHINE ROAD

STA. 6+39 - STA. 9+00
STA. 11+75 - STA. 13+83

*-SEE EROSION CONTROL PLAN FOR LOCATION OF EROSION MAT.

***-GUARDRAIL TO BE INSTALLED FROM
STA. 8+85 TO STA. 9+00 LEFT
STA. 11+75 TO STA. 12+32 LEFT

**-GUARDRAIL TO BE INSTALLED FROM
STA. 7+75 TO STA. 9+00 RIGHT



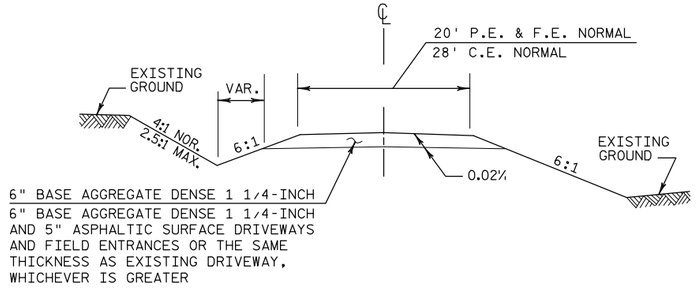
TYPICAL FINISHED SECTION FOR MALCHINE ROAD

STA. 9+00 - STA. 9+78
STA. 10+23 - STA. 11+75

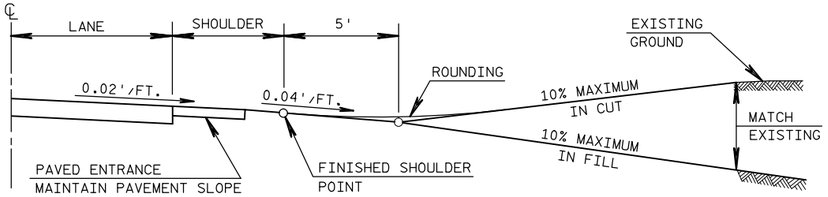
***-GUARDRAIL TO BE INSTALLED FROM
STA. 9+00 TO STA. 9+76 LEFT
STA. 10+29 TO STA. 11+75 LEFT

**-GUARDRAIL TO BE INSTALLED FROM
STA. 9+00 TO STA. 9+66 RIGHT
STA. 10+18 TO STA. 11+21 RIGHT

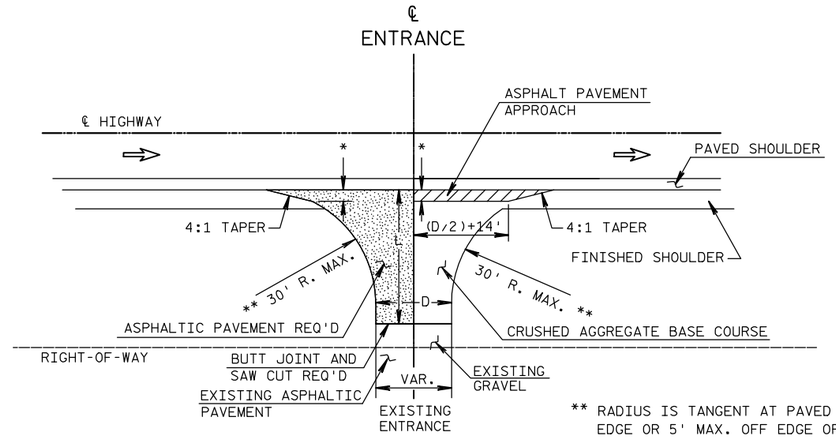
PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	TYPICAL SECTIONS	SHEET 3	E



TYPICAL CROSS SECTION



PROFILE VIEW



L=VARIABLE, EXACT LENGTH TO BE DETERMINED IN THE FIELD BY THE ENGINEER. BLEND BACK ON THE ENTRANCE FAR ENOUGH TO GET A SMOOTH PROFILE.

D=DRIVEWAY WIDTH
D=20'TYP.(PE's & FE's) (16'MIN.-24'MAX.)
D=28'TYP.(CE's & FARM ENT.) (24'MIN.-35'MAX.)

** RADIUS IS TANGENT AT PAVED SHOULDER EDGE OR 5' MAX. OFF EDGE OF MAIN LINE PAVEMENT WHICH EVER IS LESS.

* 3' MAX. OR TO FINISHED SHOULDER WHICH EVER IS LESS.

PLAN VIEW

RURAL DRIVEWAY INTERSECTION DETAIL
(PE's, FE's & CE'S)
(FOR NEW CONSTRUCTION)

(SIZE TO BE DETERMINED IN FIELD AS INDICATED BELOW:)

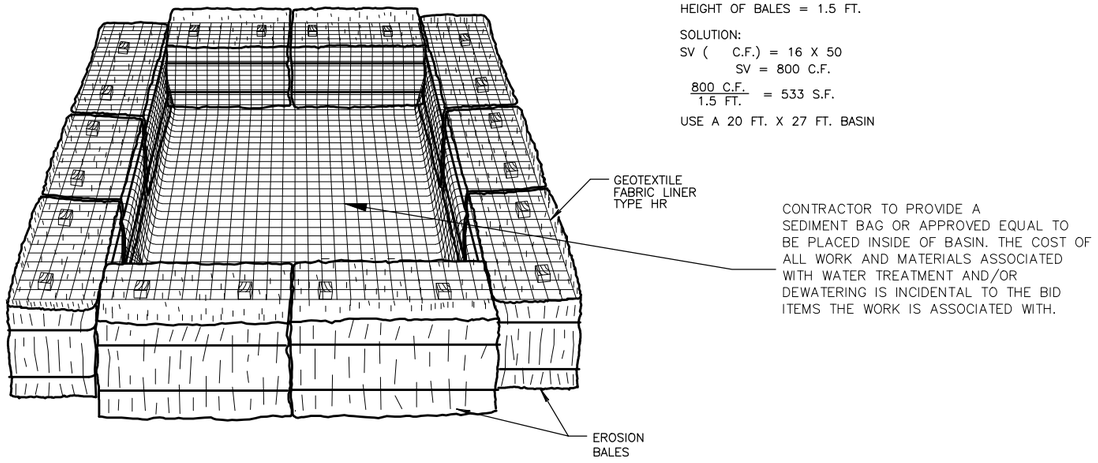
STORAGE VOLUME (C.F.) = 16 X GPM (PUMP RATE)

EXAMPLE:
CONTRACTOR INDICATES PUMP CAPABLE OF 50 GPM
HEIGHT OF BALES = 1.5 FT.

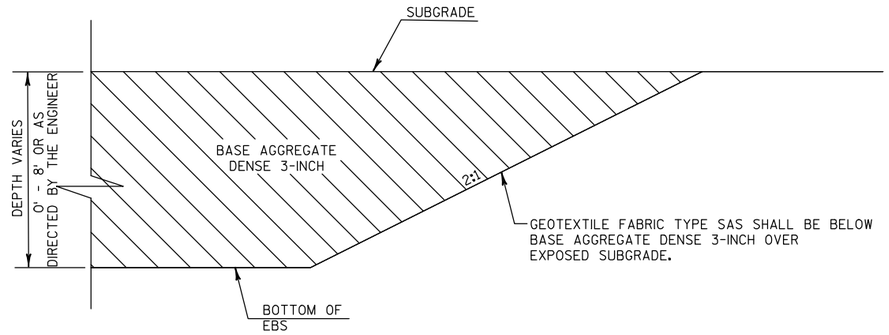
SOLUTION:
SV (C.F.) = 16 X 50
SV = 800 C.F.

$\frac{800 \text{ C.F.}}{1.5 \text{ FT.}}$ = 533 S.F.

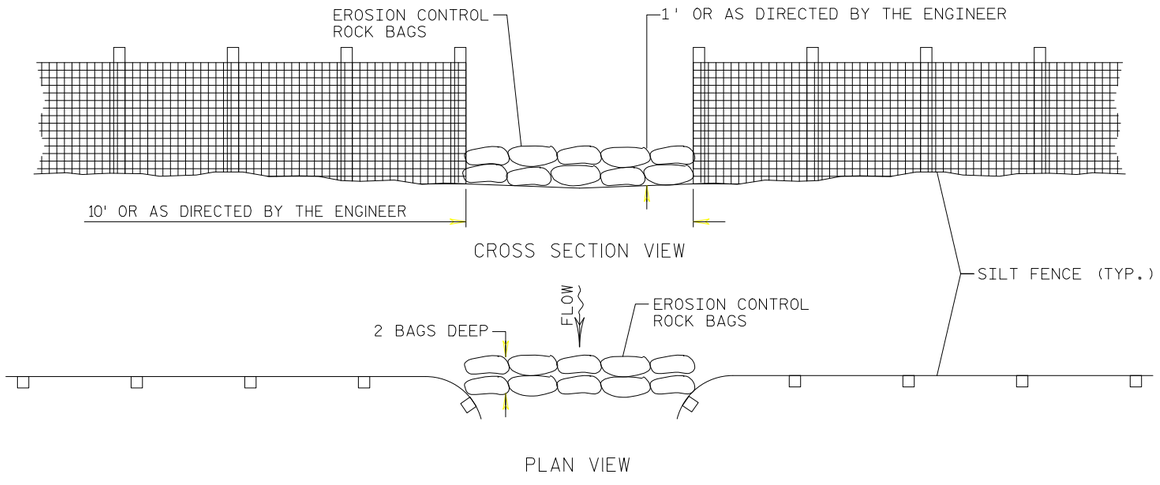
USE A 20 FT. X 27 FT. BASIN



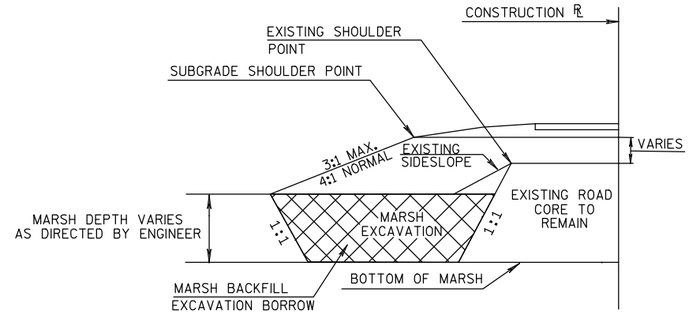
TEMPORARY SETTLING BASIN WITH SEDIMENT BAG



DETAIL FOR BACKFILL IN EBS AREAS

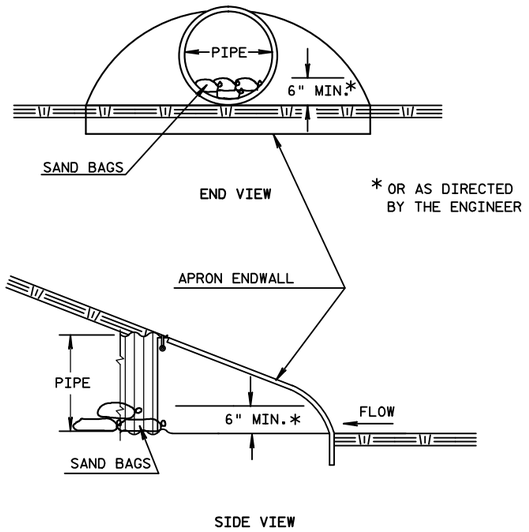


EROSION CONTROL ROCK BAG
OPENING IN SILT FENCE

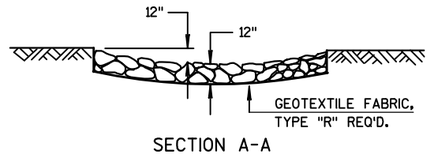


TYPICAL SECTION-MARSH EXCAVATION

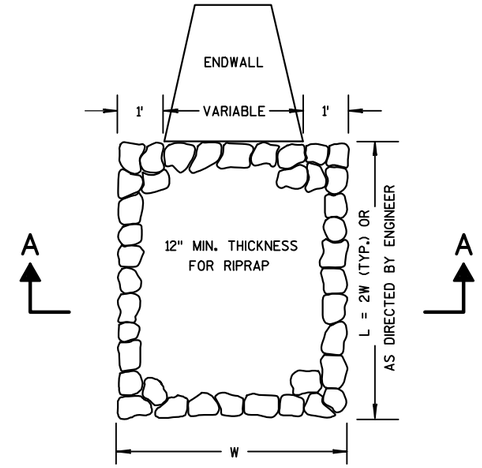
PROJECT NO:2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET 5	E



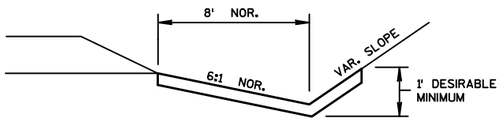
CULVERT PIPE CHECKS



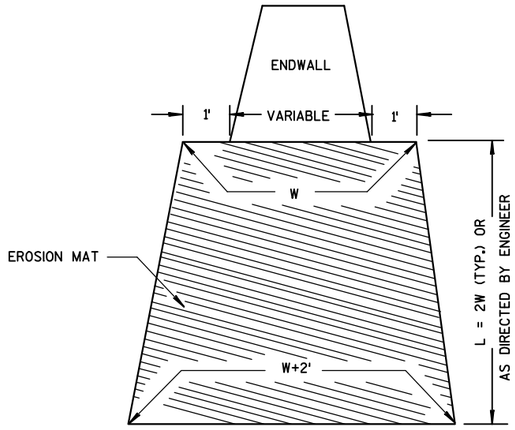
SECTION A-A



RIPRAP TREATMENT AT CULVERTS



EROSION MAT DETAIL FOR DITCHES



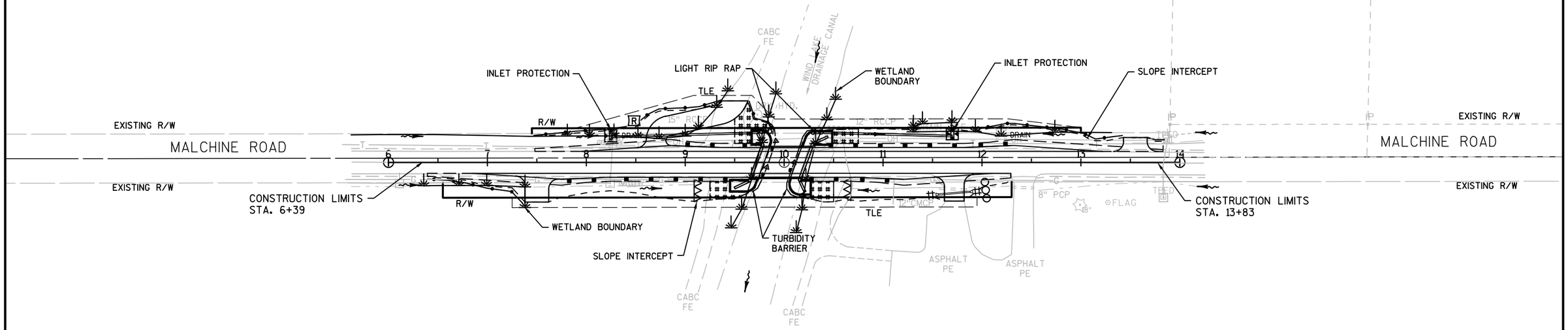
EROSION MAT TREATMENT AT CULVERTS

PROJECT NO:2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET 6	E

NOTES:

1) SILT FENCE PLACED ALONG AND/OR WITHIN WETLAND ARAS SHALL HAVE A MAXIMUM POST SPACING OF 1.5-FT. OR 4-FT. IF A WOVEN GEOTEXTILE FABRIC IS USED. THIS IS INCIDENTAL TO THE SILT FENCE BID ITEM.

2) UNLESS NOTED OTHERWISE OR DIRECTED BY THE ENGINEER, ALL DISTURBED AREAS TO BE RESTORED WITH TOPSOIL, FERTILIZER TYPE B, MULCH, AND SEEDING MIXTURE NO. 10 OR NO. 40.



LEGEND

#######	EROSION MAT CLASS II, TYPE C
	SILT FENCE
	LIGHT RIP RAP
	SLOPE INTERCEPT
	TURBIDITY BARRIER
	INLET PROTECTION, TYPE A
	TEMPORARY DITCH CHECK
	CULVERT PIPE CHECKS
	SURFACE WATER FLOW
R	ROCK BAG

PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	EROSION CONTROL PLAN	SHEET 7	E

FILE NAME : V:\TRANS-WK\45038900 MALCHINE\DWG\SHEETSPLAN\022001-EC.DWG
LAYOUT NAME - 022001_EC

PLOT DATE : 1/20/2016 3:24 PM PLOT BY : STEUCK, ROBERT PLOT NAME : PLOT SCALE : 1 IN:100 FT

WISDOT/CADDS SHEET 42

DATE 28JAN16 — 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	2699-02-70 QUANTITY
0010	203.0100	Removing Small Pipe Culverts	EACH	2.000	2.000
0020	203.0210.S	Abatement of Asbestos Containing Material (structure) 01. B-51-0011	LS	1.000	1.000
0030	203.0600.S	Removing Old Structure Over Waterway With Minimal Debris (station) 01. 10+00	LS	1.000	1.000
0040	204.0170	Removing Fence	LF	48.000	48.000
0050	204.0270	Abandoning Culvert Pipes	EACH	1.000	1.000
0060	205.0100	Excavation Common	CY	1,156.000	1,156.000
0070	205.0400	Excavation Marsh	CY	183.000	183.000
0080	206.1000	Excavation for Structures Bridges (structure) 01. B-51-152	LS	1.000	1.000
0090	206.5000	Cofferdams (structure) 01. B-51-152	LS	1.000	1.000
0100	208.0100	Borrow	CY	536.000	536.000
0110	210.0100	Backfill Structure	CY	480.000	480.000
0120	213.0100	Finishing Roadway (project) 01. 2699-02-70	EACH	1.000	1.000
0130	305.0110	Base Aggregate Dense 3/4-Inch	TON	156.000	156.000
0140	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	1,415.000	1,415.000
0150	305.0130	Base Aggregate Dense 3-Inch	TON	440.000	440.000
0160	455.0105	Asphaltic Material PG58-28	TON	15.000	15.000
0170	455.0605	Tack Coat	GAL	48.000	48.000
0180	460.1100	HMA Pavement Type E-0.3	TON	253.000	253.000
0190	460.2000	Incentive Density HMA Pavement	DOL	170.000	170.000
0200	502.0100	Concrete Masonry Bridges	CY	270.000	270.000
0210	502.3200	Protective Surface Treatment	SY	225.000	225.000
0220	505.0400	Bar Steel Reinforcement HS Structures	LB	5,800.000	5,800.000
0230	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	29,710.000	29,710.000
0240	513.4061	Railing Tubular Type M (structure) 01. B-51-152	LF	108.000	108.000
0250	516.0500	Rubberized Membrane Waterproofing	SY	24.000	24.000
0260	521.1515	Apron Endwalls for Culvert Pipe Sloped Side Drains Steel 15-Inch 6 to 1	EACH	2.000	2.000
0270	522.0315	Culvert Pipe Reinforced Concrete Class IV 15-Inch	LF	32.000	32.000
0280	530.0118	Culvert Pipe Corrugated Polyethylene 18-Inch	LF	280.000	280.000
0290	550.1100	Piling Steel HP 10-Inch X 42 Lb	LF	650.000	650.000
0300	606.0100	Riprap Light	CY	4.000	4.000
0310	606.0300	Riprap Heavy	CY	150.000	150.000
0320	611.0642	Inlet Covers Type MS	EACH	6.000	6.000
0330	611.3903	Inlets Median 3 Grate	EACH	2.000	2.000
0340	612.0206	Pipe Underdrain Unperforated 6-Inch	LF	100.000	100.000
0350	612.0406	Pipe Underdrain Wrapped 6-Inch	LF	190.000	190.000
0360	612.0700	Drain Tile Exploration	LF	620.000	620.000
0370	612.0806	Apron Endwalls for Underdrain Reinforced Concrete 6-Inch	EACH	5.000	5.000
0380	614.2300	MGS Guardrail 3	LF	225.000	225.000
0390	614.2500	MGS Thrie Beam Transition	LF	157.600	157.600
0400	614.2610	MGS Guardrail Terminal EAT	EACH	4.000	4.000
0410	616.0700.S	Fence Safety	LF	200.000	200.000
0420	619.1000	Mobilization	EACH	1.000	1.000
0430	625.0100	Topsoil	SY	2,010.000	2,010.000
0440	627.0200	Mulching	SY	1,683.000	1,683.000
0450	628.1104	Erosion Bales	EACH	20.000	20.000

3

DATE 28JAN16 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	2699-02-70 QUANTITY
0460	628.1504	Silt Fence	LF	604.000	604.000
0470	628.1520	Silt Fence Maintenance	LF	1,812.000	1,812.000
0480	628.1905	Mobilizations Erosion Control	EACH	5.000	5.000
0490	628.1910	Mobilizations Emergency Erosion Control	EACH	3.000	3.000
0500	628.2027	Erosion Mat Class II Type C	SY	332.000	332.000
0510	628.6005	Turbidity Barriers	SY	200.000	200.000
0520	628.7005	Inlet Protection Type A	EACH	2.000	2.000
0530	628.7504	Temporary Ditch Checks	LF	30.000	30.000
0540	628.7555	Culvert Pipe Checks	EACH	10.000	10.000
0550	628.7570	Rock Bags	EACH	45.000	45.000
0560	629.0210	Fertilizer Type B	CWT	1.270	1.270
0570	630.0110	Seeding Mixture No. 10	LB	24.000	24.000
0580	630.0140	Seeding Mixture No. 40	LB	5.000	5.000
0590	630.0200	Seeding Temporary	LB	18.000	18.000
0600	634.0612	Posts Wood 4x6-Inch X 12-FT	EACH	4.000	4.000
0610	637.2230	Signs Type II Reflective F	SF	12.000	12.000
0620	638.2602	Removing Signs Type II	EACH	5.000	5.000
0630	638.3000	Removing Small Sign Supports	EACH	5.000	5.000
0640	642.5001	Field Office Type B	EACH	1.000	1.000
0650	643.0100	Traffic Control (project) 01. 2699-02-70	EACH	1.000	1.000
0660	643.0300	Traffic Control Drums	DAY	800.000	800.000
0670	643.0420	Traffic Control Barricades Type III	DAY	1,440.000	1,440.000
0680	643.0705	Traffic Control Warning Lights Type A	DAY	2,240.000	2,240.000
0690	643.0900	Traffic Control Signs	DAY	1,120.000	1,120.000
0700	645.0120	Geotextile Fabric Type HR	SY	310.000	310.000
0710	645.0130	Geotextile Fabric Type R	SY	20.000	20.000
0720	645.0140	Geotextile Fabric Type SAS	SY	300.000	300.000
0730	646.0106	Pavement Marking Epoxy 4-Inch	LF	1,700.000	1,700.000
0740	650.4000	Construction Staking Storm Sewer	EACH	2.000	2.000
0750	650.4500	Construction Staking Subgrade	LF	692.000	692.000
0760	650.5000	Construction Staking Base	LF	692.000	692.000
0770	650.6000	Construction Staking Pipe Culverts	EACH	3.000	3.000
0780	650.6500	Construction Staking Structure Layout (structure) 01. B-51-152	LS	1.000	1.000
0790	650.9910	Construction Staking Supplemental Control (project) 01. 2699-02-70	LS	1.000	1.000
0800	650.9920	Construction Staking Slope Stakes	LF	692.000	692.000
0810	690.0150	Sawing Asphalt	LF	739.000	739.000
0820	715.0502	Incentive Strength Concrete Structures	DOL	1,620.000	1,620.000
0830	ASP.1T0A	On-the-Job Training Apprentice at $5.00/HR	HRS	300.000	300.000
0840	ASP.1T0G	On-the-Job Training Graduate at $5.00/HR	HRS	400.000	400.000
0850	SPV.0060	Special 01. Utility Line Opening	EACH	6.000	6.000

3

3

EARTHWORK

Division	From/To Station	Location	Excavation Common (1)		Salvaged/ Unusable Pavement Material (4)	Base Aggregate Dense 3-inch (3)	Geotextile Fabric Type SAS (3)	Excavation Marsh (5)	Exp. Marsh Backfill (6)	Unexp. Fill	Expanded Fill (7)	Borrow	Waste (8)	Comment:
			item 205.0100			item 305.0130	item 645.0140	item 205.0400	Factor 1.50		Factor 1.25	item 208.0100		
			Cut (2)	EBS (3)										
			CY	CY	CY	TON	SY	CY	CY	CY	CY	CY	CY	
	6+39 to 13+83	MALCHINE ROAD	956	0	93	0	0	183	274	209	261	536	1,139	
		UNDISTRIBUTED	0	200	0	440	300	0	0	0	0	0	200	
Total			1,156		93	440	300	183	274	209	261	536	1,339	

1) Common Excavation is the sum of the Cut and EBS Excavation columns. Item number 205.0100
2) Salvaged/Unsuable Pavement Material is included in Cut.
3) EBS Excavation to be backfilled with Base Aggregate Dense 3-Inch and Geotextile Fabric Type SAS placed on exposed subgrade.
4) Salvaged/Unusable Pavement Material
5) Marsh Excavation to be backfilled with borrow material. Item number 205.0400
6) Expanded Marsh Backfill Factor =1.50. This to be backfilled with Borrow material.
7) Expanded Fill Factor = 1.25. This to be backfilled with Borrow material
8) Waste = EBS + Marsh Excavation + Cut

3

REMOVING/ABANDONING CULVERT PIPES

STATION	TO	STATION	LOCATION	DESCRIPTION	203.0100 REMOVING SMALL PIPE CULVERTS EACH	204.0270 ABANDONING CULVERT PIPES EACH
9+13	-	9+87	LT	15" RCCP	1	-
11+31			LT	15" RCCP	-	1
11+57	-	11+90	RT	12" CMCP	1	-
TOTALS					2	1

NOTES:
- UNDER THE ABANDONING CULVERT PIPES BID ITEM:
- REMOVE PIPE PAST RIGHT-OF-WAY LINE
- ABANDON INLET END ONLY

REMOVING FENCE

STATION	TO	STATION	LOCATION	204.0170 REMOVING FENCE LF
6+39	-	13+83	MALCHINE ROAD	48
TOTALS				48

3

MISCELLANEOUS ITEMS

LOCATION	213.0100 FINISHING ROADWAY 01. 2699-02-70 EACH	619.1000 MOBILIZATION EACH	642.5001 FIELD OFFICE TYPE B EACH	643.0100 TRAFFIC CONTROL 01. 2699-02-70 EACH
MALCHINE ROAD	1	1	1	1
TOTAL	1	1	1	1

HMA PAVEMENT

STATION	TO	STATION	LOCATION	455.0105 ASPHALTIC MATERIAL PG58-28 (5.5%) TON	455.0605 TACK COAT GAL	460.1100 HMA PAVEMENT TYPE E-0.3 TON
6+39	-	9+00	LT & RT SHOULDERS	2	7	11
9+00	-	9+70	MAINLINE RECONSTRUCT	4	12	90
10+23	-	11+75	MAINLINE RECONSTRUCT	8	26	84
11+75	-	13+83	LT & RT SHOULDERS	1	3	68
TOTALS				15	48	253

BASE AGGREGATE DENSE

STATION	TO	STATION	LOCATION	305.0110 3/4-INCH TON	305.0120 1 1/4-INCH TON
6+39	-	9+70	LT & RT	77	569
7+50			FE - RT	-	18
8+70			FE - LT	-	90
10+23	-	13+83	LT & RT	79	713
11+72			PE - RT	-	16
13+55			FE - LT	-	9
TOTALS				156	1415

ALL ITEMS ARE CATEGORY 0010 UNLESS OTHERWISE STATED

3

CULVERT PIPES

INLET END STATION	INLET END OFFSET	INLET END ELEV	DISCHARGE END STATOIN	DISCHARGE END OFFSET	DISCHARGE END ELEV	SLOPE	521.1515 APRON ENDWALLS FOR CULVERT PIPE SLOPED SIDE DRAINS STEEL 15-INCH 6 TO 1 EACH	522.0315 CULVERT PIPE REINFORCED CONCRETE CLASS IV 15-INCH LF	530.0118 CULVERT PIPE CORRUGATED POLYETHYLENE 18-INCH LF
8+25	24.7' LT	767.50	9+75	30' LT	764.95	1.70%	-	-	150
11+70	25.6' LT	767.75	10+40	30' LT	765.41	1.80%	-	-	130
11+90.5	29.5' RT	768.92	11+53.5	32.6' RT	768.80	0.30%	2	32	-
						TOTALS	2	32	280

REMARKS:
-IF THERE IS AN ENDWALL, STATION, OFFSETS & ELEVATION ARE SHOWN TO THE END OF ENDWALL
-FINAL LOCATION TO BE DETERMINED BY THE ENGINEER.

INLETS AND COVERS

INLET LOCATION STATION	INLET LOCATION OFFSET	ENDWALL LOCATION STATION	ENDWALL LOCATION OFFSET	611.3903 INLETS MEDIAN 3 GRATE EACH	611.0642 INLET COVERS TYPE MS EACH
8+25	32.2' LT	9+75	30' LT	1	3
11+70	33.1' LT	10+40	30' LT	1	3
TOTALS				2	6

REMARKS:
-SEE PLAN & PROFILE SHEET FOR ADDITIONAL INFORMATION
-FINAL LOCATION TO BE DETERMINED BY THE ENGINEER.

PIPE UNDERDRAIN

STATION		TO STATION	LOCATION	612.0206 PIPE UNDERDRAIN UNPERFORATED 6-INCH LF	612.0700 DRAIN TILE EXPLORATION LF	612.0806 APRON ENDWALLS FOR UNDERDRAIN REINFORCED CONCRETE 6-INCH EACH
7+65	-	9+65	RT	-	200	-
8+15	-	9+75	LT	-	160	-
10+40	-	13+00	LT	-	260	-
UNDISTRIBUTED				100	-	5
			TOTALS	100	620	5

GUARDRAIL

STATION		TO STATION	LOCATION	614.2300 MGS GUARDRAIL 3 LF	614.2500 MGS THRIE BEAM TRANSITION LF	614.2610 MGS GUARDRAIL TERMINAL EAT EACH
7+75	-	9+65	RT	100.0	39.4	1
8+85	-	9+76	LT	-	39.4	1
10+18	-	11+21	RT	12.5	39.4	1
10+29	-	12+32	LT	112.5	39.4	1
		TOTALS		225.0	157.6	4

FENCE SAFETY

STATION	LOCATION	616.0700.S LF
NE QUADRANT	MALCHINE ROAD, LT	50
SE QUADRANT	MALCHINE ROAD, RT	50
NW QUADRANT	MALCHINE ROAD, LT	50
SW QUADRANT	MALCHINE ROAD, RT	50
TOTALS		200

ALL ITEMS ARE CATEGORY 0010 UNLESS OTHERWISE STATED

3

TOPSOIL, FERTILIZER, AND SEED

STATION	TO	STATION	LOCATION	625.0100 TOPSOIL SY	629.0210 FERTILIZER TYPE B CWT	630.0110 SEEDING MIXTURE NO. 10 LB	630.0140 SEEDING MIXTURE NO. 40 LB	630.0200 SEEDING TEMPORARY LB
6+39	-	9+70	LT & RT	805	0.51	11	-	7
10+23	-	13+83	LT & RT	803	0.51	8	4	7
UNDISTRIBUTED				402	0.25	5	1	4
TOTALS				2,010	1.27	24	5	18

*NOTE: - FERTILIZER NOT TO BE PLACED WITHIN WETLAND AREAS.
- TEMPORARY SEEDING TO BE PLACED ONLY ON TEMPORARY STOCKPILES AND TEMPORARY EMBANKMENTS, IF NEEDED.

SILT FENCE

STATION	TO	STATION	LOCATION	628.1504 SILT FENCE LF	628.1520 SILT FENCE MAINTENANCE LF
6+39	-	7+36	RT	103	309
7+47	-	9+87	LT	233	699
11+98	-	13+42	LT	147	441
UNDISTRIBUTED				121	363
TOTALS				604	1,812

MULCH/EROSION MAT

STATION	TO	STATION	LOCATION	627.0200 MULCHING SY	628.2027 EROSION MAT CLASS II TYPE C SY
6+39	-	9+70	RT	326	60
7+50	-	9+70	LT	325	95
10+23	-	11+60	RT	272	58
10+23	-	13+83	LT	423	52
UNDISTRIBUTED				337	67
TOTAL				1,683	332

3

MOBILIZATIONS EROSION CONTROL

STATION	TO	STATION	628.1905 MOBILIZATIONS EROSION CONTROL EACH	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL EACH
6+39	-	13+83	5	3
TOTALS			5	3

INLET PROTECTION

STATION	LOCATION	628.7005 TYPE A EACH	REMARKS
8+25	LT	1	INLET MEDIAN 3 GRATE
11+70	LT	1	INLET MEDIAN 3 GRATE
TOTALS		2	

EROSION BALES

STATION	TO	STATION	628.1104 EACH
UNDISTRIBUTED			20
TOTALS			20

TEMPORARY DITCH CHECKS

STATION	LOCATION	628.7504 LF
9+25	RT	12
10+50	RT	12
UNDISTRIBUTED		6
TOTALS		30

TURBIDITY BARRIERS

LOCATION	APPROX. HEIGHT FT	628.6005 SY
WEST ABUTMENT	8.5	80
EAST ABUTMENT	8.5	80
UNDISTRIBUTED		40
TOTAL		200

RIPRAP LIGHT

STATION	LOCATION	606.0100 RIPRAP LIGHT CY	645.0130 GEOTEXTILE FABRIC TYPE R SY
9+75	LT	2	10
10+40	LT	2	10
TOTALS		4	20

CULVERT PIPE CHECKS

STATION	LOCATION	628.7555 EACH
11+90	RT	8
UNDISTRIBUTED		2
TOTALS		10

ROCK BAGS

STATION	LOCATION	628.7570 EACH
8+50	LT	30
UNDISTRIBUTED		15
TOTALS		45

ALL ITEMS ARE CATEGORY 0010 UNLESS OTHERWISE STATED

3

SIGNS REFLECTIVE TYPE II AND WOOD POSTS

STATION	634.0612 POSTS WOOD 4x6-INCHx12-FT EACH	637.2230 SIGNS TYPE II REFLECTIVE F W5-52L S.F.	W5-52R S.F.	638.2602 REMOVING SIGNS TYPE II EACH	638.3000 REMOVING SMALL SIGN SUPPORTS EACH	SIGN
NW QUADRANT	1	3	-	1	1	BRIDGE MARKER
SW QUADRANT	1	-	3	1	1	BRIDGE MARKER
NE QUADRANT	1	-	3	1	1	BRIDGE MARKER
SE QUADRANT	1	3	-	1	1	BRIDGE MARKER
9+60, RT	-	-	-	1	1	WEIGHT LIMIT SIGN
TOTALS	4	12		5	5	

UTILITY LINE OPENING

STATION	APPROX. OFFSET	LOCATION	SPV.0060.01 EACH	REMARKS
8+30	RT	MALCHINE ROAD	1	LOCATING TDS TELECOM AT BEAM GUARD CROSSING
8+50	RT	MALCHINE ROAD	1	LOCATING TDS TELECOM AT WING WALL
8+50	RT	MALCHINE ROAD	1	LOCATING WE ENERGIES GAS AT WING WALL
10+20	RT	MALCHINE ROAD	1	LOCATING TDS TELECOM AT WING WALL
10+20	RT	MALCHINE ROAD	1	LOCATING WE ENERGIES GAS AT WING WALL
12+00	LT	MALCHINE ROAD	1	LOCATING TDS TELECOM AT BEAM GUARD CROSSING
	TOTAL		6	

3

TRAFFIC CONTROL SUMMARY

LOCATION	APPROXIMATE SERVICE DAYS	643.0300 DRUMS NO. IN SERVICE	DAYS	643.0420 BARRICADES TYPE III NO. IN SERVICE	DAYS	643.0705 WARNING LIGHTS TYPE A NO. IN SERVICE	DAYS	643.0900 SIGNS NO. IN SERVICE	DAYS	NOTES
										SEE SDD BARRICADES AND SIGNS FOR MAINLINE CLOSURES:
WEST APPROACH	80	-	-	9	720	14	1,120	7	560	DETAIL C
EAST APPROACH	80	-	-	9	720	14	1,120	7	560	DETAIL C
UNDISTRIBUTED	80	10	800	-	-	-	-	-	-	-
TOTALS			800		1,440		2,240		1,120	

SAWING

STATION	TO	STATION	LOCATION	ASPHALT 690.0150 LF	REMARKS
6+39	-	9+00	MALCHINE ROAD	435	WEST APPROACH
11+75	-	13+83	MALCHINE ROAD	284	EAST APPROACH
		11+72	RT	20	DRIVEWAY
		TOTAL		739	

CONSTRUCTION STAKING

STATION	TO	STATION	LOCATION	650.4000 STORM SEWER EACH	650.4500 SUBGRADE LF	650.5000 BASE LF	650.6000 PIPE CULVERTS EACH	650.6500 STRUCTURE LAYOUT 01. B-51-152 LS	650.9910 SUPPLEMENTAL CONTROL LS	650.9920 SLOPE STAKES LF	CATEGORY
6+39	-	9+71	MALCHINE ROAD	1	332	332	1	-	1	332	0010
10+23	-	13+83	MALCHINE ROAD	1	360	360	2	-	-	360	0010
SUBTOTALS				2	692	692	3	0	1	692	0010
10+00			MALCHINE ROAD	-	-	-	-	1	-	-	0020
SUBTOTALS				0	0	0	0	1	0	0	0020
TOTALS				2	692	692	3	1	1	692	

PAVEMENT MARKING EPOXY

STATION	TO	STATION	646.0106 4-INCH LF	REMARKS
6+39	-	13+83	200	CENTERLINE SKIPS
6+39	-	13+83	1500	EDGELINE
TOTALS			1,700	

ALL ITEMS ARE CATEGORY 0010 UNLESS OTHERWISE STATED

CONVENTIONAL ABBREVIATIONS

ACCESS POINT / DRIVEWAY CONNECTION	AP	RELEASE OF RIGHTS	ROR
ACCESS RIGHTS	AR	REMAINING	REM.
ACRES	AC.	RIGHT-OF-WAY	R/W
AND OTHERS	ET.AL.	SECTION	SEC.
CENTERLINE	C/L	STATION	STA.
CERTIFIED SURVEY MAP	CSM	TEMPORARY LIMITED EASEMENT	TLE
CORNER	COR.	VOLUME	V.
DOCUMENT	DOC.		
EASEMENT	EASE.		
HIGHWAY EASEMENT	H.E.		
LAND CONTRACT	LC		
MONUMENT	MON.		
PAGE	P.		
PERMANENT LIMITED EASEMENT	PLE		
PROPERTY LINE	PL		
RECORDED AS	(100')		
REFERENCE LINE	R/L		

CURVE DATA

LONG CHORD	LCH
LONG CHORD BEARING	LCB
RADIUS	R
DEGREE OF CURVE	D
CENTRAL ANGLE OR DELTA	DELTA
LENGTH OF CURVE	L
TANGENT	TAN

FOUND IRON PIPE/PIN

R/W MONUMENT

R/W STANDARD SIGN

SECTION CORNER MONUMENT

SECTION CORNER SYMBOL

HIGHWAY EASEMENT (HE)

TEMPORARY LIMITED EASEMENT

PERMANENT LIMITED EASEMENT

R/W BOUNDARY POINT

PARCEL NUMBER

UTILITY INTEREST

SIGN NUMBER (OFF PREMISE)

BUILDING

CONVENTIONAL SYMBOLS

PROPOSED R/W LINE

EXISTING H.E. LINE

PROPERTY LINE

LOT & TIE LINES

SLOPE INTERCEPTS (S.I.)

CORPORATE LIMITS

ACCESS RESTRICTED (BY PREVIOUS ACQUISITION/CONTROL)

ACCESS RESTRICTED (BY ACQUISITION)

NO ACCESS (BY STATUTORY AUTHORITY)

SECTION LINE

QUARTER LINE

SIXTEENTH LINE

EXISTING CENTERLINE

PROPOSED REFERENCE LINE

PARALLEL OFFSET

POINT REFERENCED IN LEGAL DESCRIPTION (I.E. POINT A)

CONVENTIONAL UTILITY SYMBOLS

WATER	W
GAS	G
TELEPHONE	T
OVERHEAD	OH
TRANSMISSION LINES ELECTRIC	E
CABLE TELEVISION	TV
FIBER OPTIC	FO
SANITARY SEWER	SAN
STORM SEWER	SS

NON COMPENSABLE / COMPENSABLE

POWER POLE

TELEPHONE POLE

TELEPHONE PEDESTAL

ELECTRIC TOWER

GN

0 50 100

SCALE, FEET

SCHEDULE OF LANDS & INTERESTS REQUIRED

OWNER'S NAMES ARE SHOWN FOR REFERENCE PURPOSES ONLY AND ARE SUBJECT TO CHANGE PRIOR TO THE TRANSFER OF LAND INTERESTS TO THE TOWN.

PARCEL NUMBER	OWNER(S)	INTEREST REQUIRED	R/W NEW ACRES	R/W EXISTING ACRES	R/W TOTAL ACRES	TLE ACRES
1	JOHN A STALBAUM	FEE & TLE	0.03	0.19	0.22	0.10
2	JOHN A STALBAUM	FEE & TLE	0.03	0.16	0.19	0.05
3	LAWRENCE GREIL & MINNIE GREIL FAMILY TRUST DATED JANUARY 6, 2009	FEE & TLE	0.06	0.13	0.19	0.03
4	JOHN A STALBAUM	FEE & TLE	0.02	0.03	0.05	0.01
5	TNGF TRANSITION TRUST ® OF SEPTEMBER 3, 2009	FEE & TLE	0.11	0.18	0.29	0.05

NOTE: AREAS WITHIN THE WIND LAKE DRAINAGE CANAL ARE NOT INCLUDED IN THE ACREAGES LISTED ABOVE

SCHEDULE OF UTILITIES & INTERESTS REQUIRED

PARCEL NO.	OWNER(S)	INTEREST REQUIRED
100	WE ENGERIES (FORMERLY WEPCO)	RELEASE OF RIGHTS

UTILITY EASEMENT INFORMATION		
UTILITY	RECORDING INFORMATION	PARCEL(S)
WE ENGERIES (FORMERLY WEPCO)	VOL. 400, PG. 491*	4

* WIDTH AND LOCATION OF EASEMENT IS NOT DEFINED OF RECORD AND THEREFORE NOT PLOTTED HEREON.

R/W PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS
2699-02-00	4.01	1
FEDERAL PROJECT NUMBER ----------		

PLAT OF RIGHT-OF-WAY REQUIRED FOR

MALCHINE ROAD

(BRIDGE OVER WIND LAKE DRAINAGE CANAL)

TOWN ROAD — RACINE COUNTY

CONSTRUCTION PROJECT NUMBER

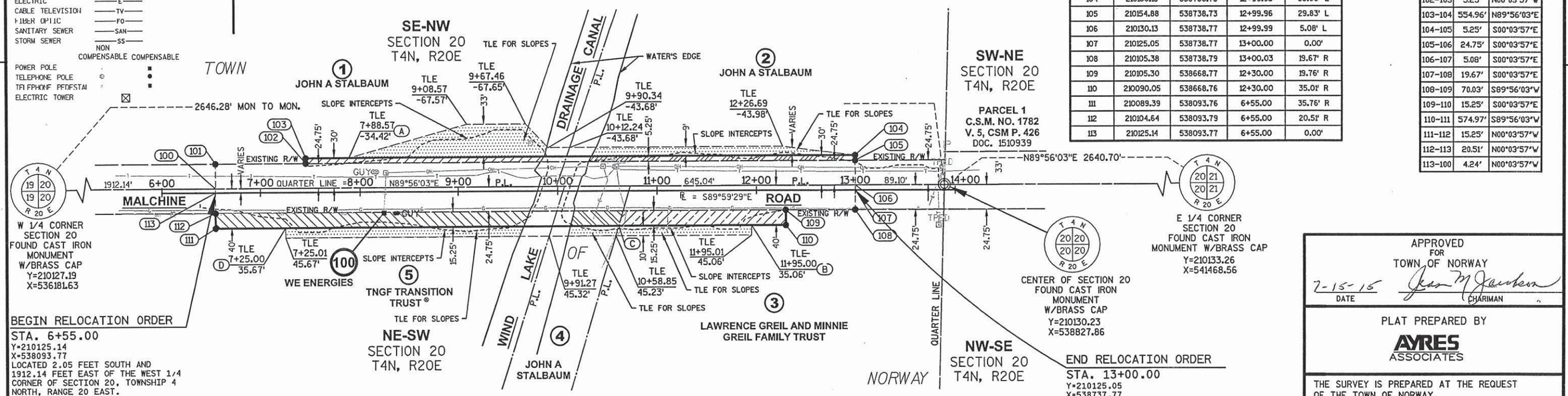
2699-02-70

RIGHT-OF-WAY COORDINATE, STATION, AND OFFSET TABLE

POINT #	Y	X	STATION	OFFSET
100	210129.39	538093.76	6+55.00	4.24' L
101	210154.14	538093.74	6+55.00	28.99' L
102	210154.24	538183.77	7+45.00	29.11' L
103	210159.49	538183.77	7+45.00	34.36' L
104	210160.13	538738.73	12+99.95	35.08' L
105	210154.88	538738.73	12+99.96	29.83' L
106	210130.13	538738.77	12+99.99	5.08' L
107	210125.05	538738.77	13+00.00	0.00'
108	210105.38	538738.79	13+00.03	19.67' R
109	210105.30	538668.77	12+30.00	19.76' R
110	210090.05	538668.76	12+30.00	35.01' R
111	210089.39	538093.76	6+55.00	35.76' R
112	210104.64	538093.79	6+55.00	20.51' R
113	210125.14	538093.77	6+55.00	0.00'

R/W COURSE TABLE

LINE	LENGTH	DIRECTION
100-101	24.75'	N00°03'57"W
101-102	90.04'	N89°56'03"E
102-103	5.25'	N00°03'57"W
103-104	554.96'	N89°56'03"E
104-105	5.25'	S00°03'57"E
105-106	24.75'	S00°03'57"E
106-107	5.08'	S00°03'57"E
107-108	19.67'	S00°03'57"E
108-109	70.03'	S89°56'03"W
109-110	15.25'	S00°03'57"E
110-111	574.97'	S89°56'03"W
111-112	15.25'	N00°03'57"W
112-113	20.51'	N00°03'57"W
113-100	4.24'	N00°03'57"W



W 1/4 CORNER SECTION 20 FOUND CAST IRON MONUMENT W/BRASS CAP Y=210127.19 X=536181.63

E 1/4 CORNER SECTION 20 FOUND CAST IRON MONUMENT W/BRASS CAP Y=210133.26 X=541468.56

CENTER OF SECTION 20 FOUND CAST IRON MONUMENT W/BRASS CAP Y=210130.23 X=538827.86

BEGIN RELOCATION ORDER
STA. 6+55.00
Y=210125.14
X=538093.77
LOCATED 2.05 FEET SOUTH AND 1912.14 FEET EAST OF THE WEST 1/4 CORNER OF SECTION 20, TOWNSHIP 4 NORTH, RANGE 20 EAST.

END RELOCATION ORDER
STA. 13+00.00
Y=210125.05
X=538737.77
LOCATED 2.14 FEET SOUTH AND 2556.14 FEET EAST OF THE WEST 1/4 CORNER OF SECTION 20, TOWNSHIP 4 NORTH, RANGE 20 EAST.

NOTES:

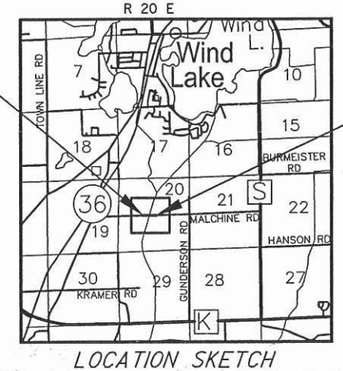
COORDINATES AND BEARINGS ON THIS PLAT ARE ORIENTED TO THE WISCONSIN COUNTY COORDINATE SYSTEM, RACINE COUNTY ZONE, NAD 83 (2011) ADJUSTMENT. THE COORDINATES SHOWN ARE GRID COORDINATES AND ARE TO BE USED AS GRID OR GROUND VALUES ON THIS PLAT.

RIGHT-OF-WAY MONUMENTS ARE TYPE 2 (3/4"x24" IRON REBAR WEIGHING 1.50 LBS./ LIN. FT.) AND ARE PLACED PRIOR TO OR AT THE TIME OF LAND TRANSFER.

RIGHT-OF-WAY BOUNDARIES ARE DEFINED WITH COURSES OF THE PERIMETER OF THE HIGHWAY LANDS REFERENCED TO THE U.S. PUBLIC LAND SURVEY SYSTEM OR OTHER SURVEYS OF PUBLIC RECORD.

DIMENSIONING FOR THE NEW RIGHT-OF WAY IS MEASURED ALONG AND PERPENDICULAR TO THE REFERENCE LINE.

EXISTING RIGHT-OF-WAY SHOWN HEREON IS DETERMINED FROM THE EAST-WEST QUARTER LINE OF SECTION 20 BEING THE CENTERLINE, WITH A WIDTH OF 49.5 FEET FROM THE TOWN ROAD ORDER RECORDED IN THE RACINE, WISCONSIN, COUNTY HIGHWAY REGISTER IN VOLUME 4, NORWAY, PAGE 159 DATED JANUARY 20, 1893.



LOCATION SKETCH

0 1 2

SCALE IN MILES

TOTAL NET LENGTH OF RELOCATION ORDER = 0.12 MI.

REVISION DATE

APPROVED FOR TOWN OF NORWAY

7-15-15 DATE — CHAIRMAN

PLAT PREPARED BY

AYRES ASSOCIATES

THE SURVEY IS PREPARED AT THE REQUEST OF THE TOWN OF NORWAY.

THE FIELD SURVEY WAS PERFORMED IN JUNE AND AUGUST 2014.

THIS SURVEY IS ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

WISCONSIN Matthew E. Hoglund S-1910 Fall River WI LAND SURVEYOR

6/29/2015

MATTHEW E. HOGLUND, P.L.S. — DATE

S-1910

E

FILE NAME : 450389_RW_PLAT.dwg
APPRAISAL DATE:

PLOT DATE : 6/25/2015

PLOT BY : MATTHEW HOGLUND

WISDOT/CADDS

BENCH MARKS

NO.	STATION	DESCRIPTION	ELEV.
1	9+83	CHISELED BOX ON BRIDGE	773.67
3	13+89	TOP OF RACINE COUNTY SURVEY MONUMENT	773.95
4	8+24	SET PK NAIL IN E FACE PPOL	773.17

LEGEND

- (E) MGS ENERGY ABSORBING TERMINAL
- (G) MGS GUARDRAIL
- (T) MGS THRIE BEAM TRANSITION
- (I) INLET MEDIAN 3 GRATE
- XXXX SAWCUT

N

JOHN STALBAUM

JOHN STALBAUM

JEFFREY & PATRICA PRZYBYLKA

WARP RIGHT LANE 0% TO 2% STA. 9+00 TO STA. 9+50

STA 6+00.00 MALCHINE RD.
Y=538038.769
X=210125.1516

PIPE OUTFALL
STA 9+75, 30' LT
ELEV=764.95

CPCPE 18-INCH @ 1.7%

STA 8+70 LT CONSTRUCT FE

PIPE OUTFALL
STA 10+40, 30' LT
ELEV=765.41

CPCPE 18-INCH @ 1.8%

ABANDONING CULVERT PIPES * (INLET END ONLY)

SLOPE INTERCEPT

STA 13+55 LT CONSTRUCT FE

DO NOT DISTURB BENCHMARK
COORDINATE WITH COUNTY SURVEYOR

BM3

STA 14+00.00 MALCHINE RD.
Y=538838.769
X=210125.0319

EXISTING R/W

MALCHINE ROAD

S89° 59' 29"E

CONSTRUCTION LIMITS STA. 6+39

CONSTRUCTION LIMITS STA. 13+83

STA 7+50 RT CONSTRUCT FE

REMOVE ACCESS

WETLANDS

STA 11+72 RT CONSTRUCT PE 1-15" CPRC CLASS IV 2 SLOPED ENDWALLS

WARP RIGHT LANE 2% TO 3% STA. 11+50 TO STA. 11+75

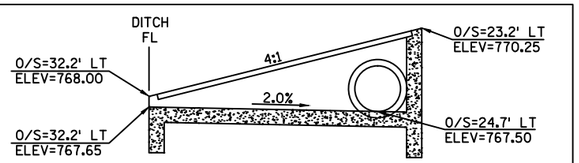
TNGF TRANSITION TRUST

LAWRENCE & MINNIE GREIL TRUST

BEGIN PROJECT STA. 9+00.00

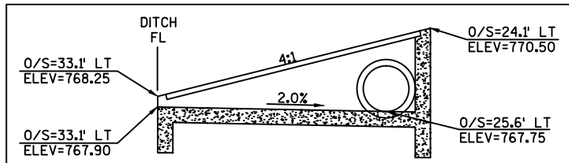
END PROJECT STA. 11+75.00

*REMOVE CULVERT PIPE TO 5-FT NORTH OF RIGHT-OF-WAY. REMOVAL AND BACKFILL INCIDENTAL TO BID FROM ABANDONING CULVERT PIPES.



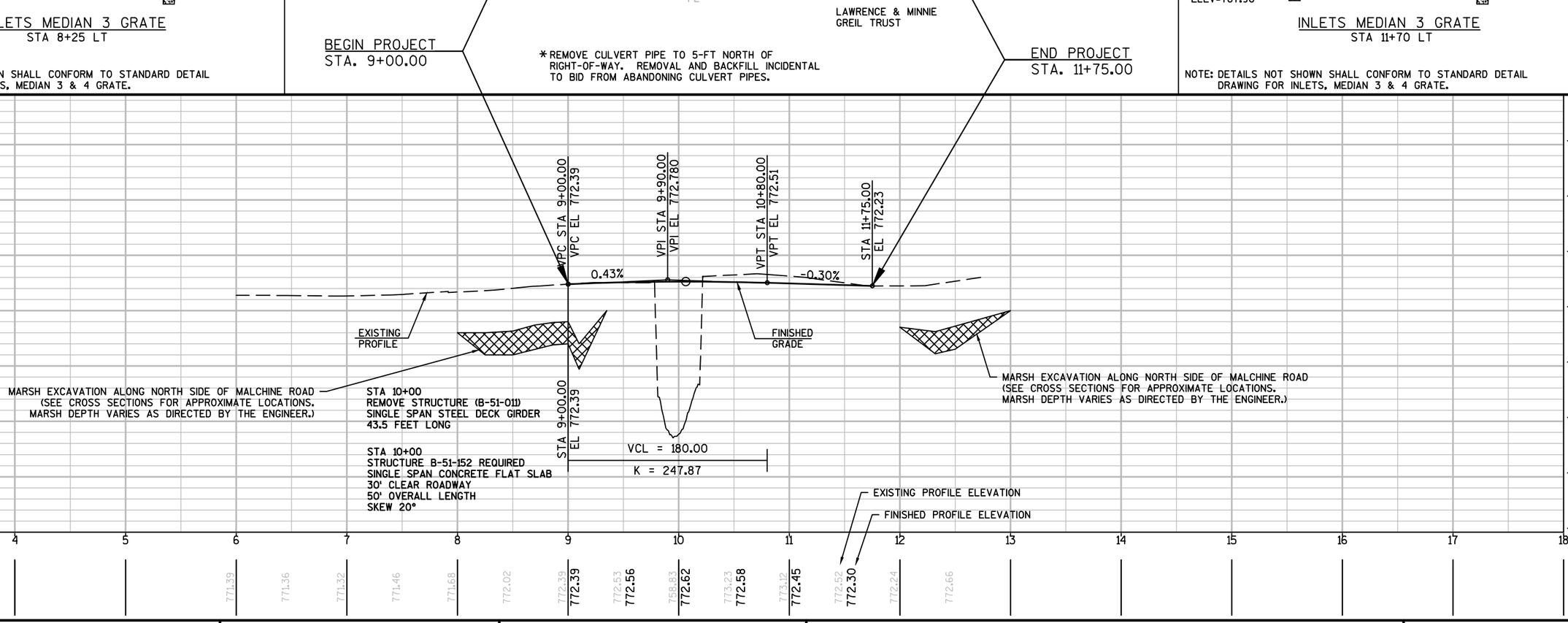
INLETS MEDIAN 3 GRATE
STA 8+25 LT

NOTE: DETAILS NOT SHOWN SHALL CONFORM TO STANDARD DETAIL DRAWING FOR INLETS, MEDIAN 3 & 4 GRATE.



INLETS MEDIAN 3 GRATE
STA 11+70 LT

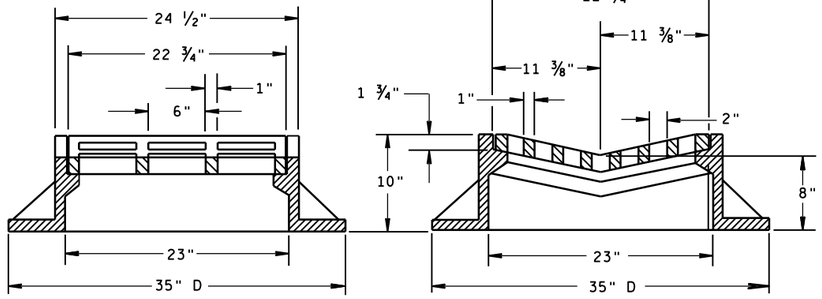
NOTE: DETAILS NOT SHOWN SHALL CONFORM TO STANDARD DETAIL DRAWING FOR INLETS, MEDIAN 3 & 4 GRATE.

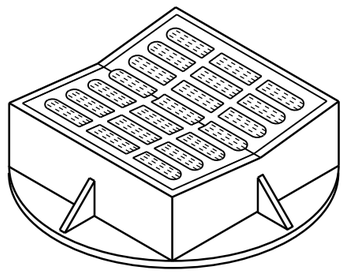


PROJECT NO:2699-02-70	HWY:MALCHINE ROAD	COUNTY:RACINE	PLAN AND PROFILE: MALCHINE ROAD	SHEET 16	E

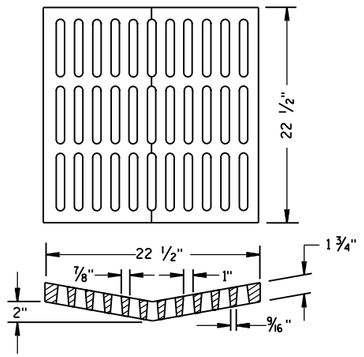
Standard Detail Drawing List

08A05-19B	INLET COVERS TYPE B, B-A, C, MS, MS-A, & WM
08C09-01	INLETS MEDIAN 3 AND 4 GRATE
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E10-02	INLET PROTECTION TYPE A, B, C AND D
08E11-02	TURBIDITY BARRIER
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
08F04-07	JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL
08F05-01	CLASS "B" BEDDING FOR CULVERT PIPE OR STORM SEWER
08F06-04	REINFORCED CONCRETE APRON ENDWALL FOR PIPE UNDERDRAIN
08F07-05	STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SLOPED SIDE FRAINS
12A03-10	NAME PLATE (STRUCTURES)
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)
14B45-03A	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03B	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03C	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03D	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03H	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
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)





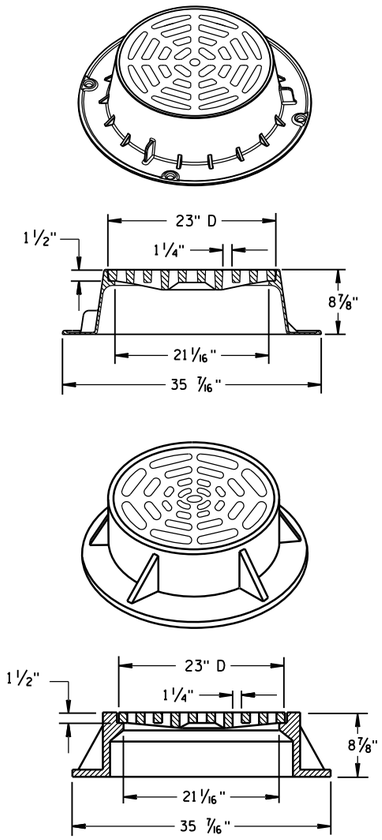
TYPE "B"



ALTERNATIVE GRATE FOR TYPE "B" COVER

USE WHERE PEDESTRIAN OR BICYCLE TRAFFIC IS POSSIBLE.

NOTED AS TYPE B-A ON THE DRAINAGE TABLE



TYPE "C"

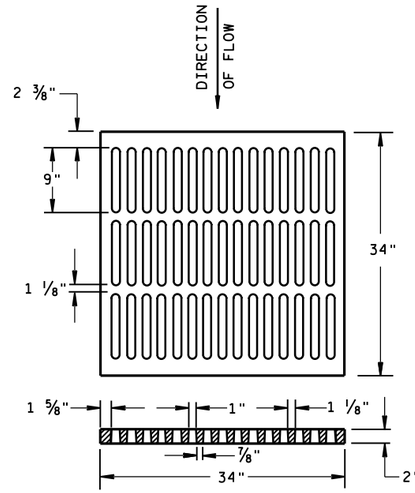
NOTE: EITHER CASTING IS ACCEPTABLE

GENERAL NOTES

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

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

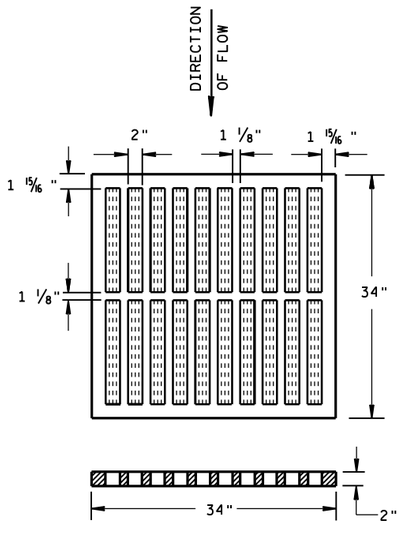
ROUND FRAMES AND COVERS SHALL HAVE CONTINUOUSLY MACHINED BEARING SURFACES TO PREVENT ROCKING AND RATTLING.



ALTERNATIVE TYPE "MS"

USE WHERE PEDESTRIAN OR BICYCLE TRAFFIC IS PERMITTED

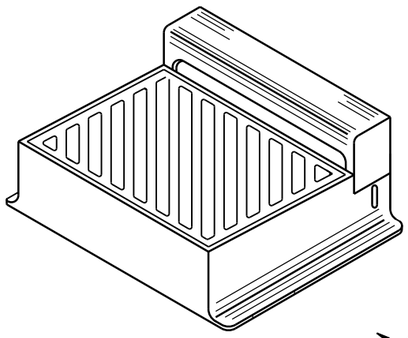
NOTED AS TYPE MS-A ON THE DRAINAGE TABLE



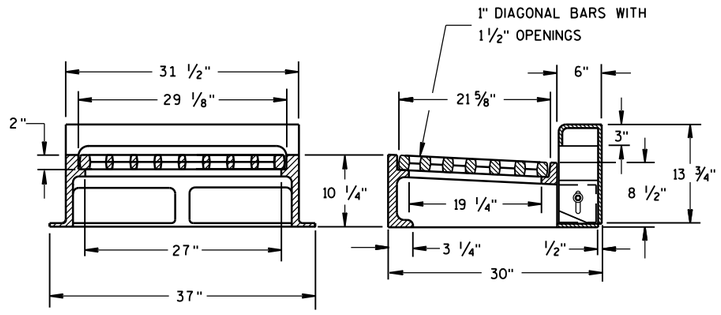
TYPE "MS"

USE ON FREEWAYS AND EXPRESSWAYS

NOTED AS TYPE MS ON DRAINAGE TABLE



DIAGONAL SLOTS, SHALL BE ORIENTED TO THE DIRECTION OF FLOW AS ILLUSTRATED. GRATES ARE MANUFACTURED TO BE REVERSIBLE.



NOTE: CURB BOX HEIGHT ADJUSTABLE 6" TO 9"

TYPE "WM"

INLET COVERS
TYPE B, B-A, C,
MS, MS-A, & WM

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

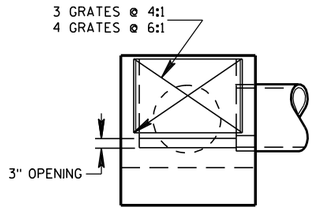
11/27/2013 — DATE

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

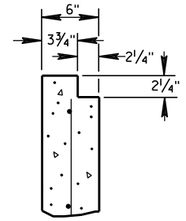
FHWA

6

S.D.D. 8 A 5-19b



SECTION B-B



SECTION C-C

GENERAL NOTES

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

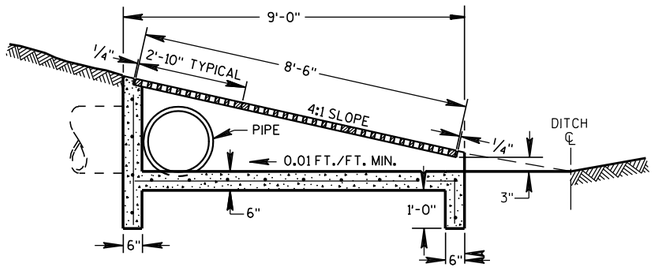
UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE ENGINEER, THE CONTRACTOR SHALL NOT ORDER AND DELIVER PRECAST INLET UNITS REQUIRED FOR THE PROJECT UNTIL A LIST OF SIZES IS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR INLETS WHICH MAY INCLUDE PRECAST REINFORCED CONCRETE INLETS, SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

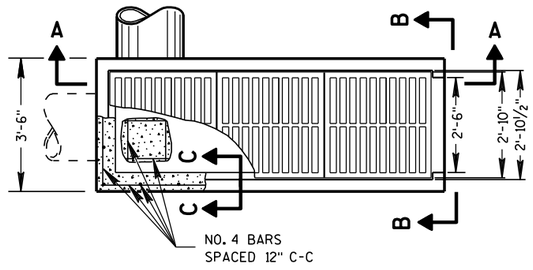
ALL MEDIAN INLETS ARE DESIGNATED ON THE PLANS AS "INLETS, 3G-MS", ETC. THE FIRST NUMBER AND LETTER DESIGNATE THE TYPE OF STRUCTURE, AND THE FOLLOWING LETTERS DESIGNATE THE TYPE OF COVER TO BE USED TO COMPRISE THE COMPLETE UNIT.

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

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

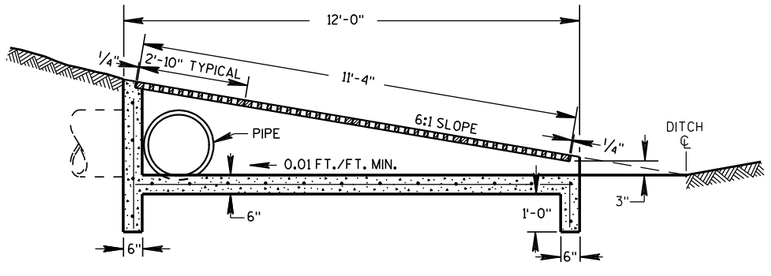


SECTION A-A

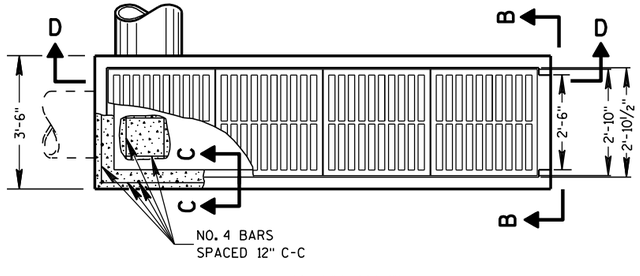


PLAN VIEW

INLETS MEDIAN 3 GRATE



SECTION D-D



PLAN VIEW

INLETS MEDIAN 4 GRATE

INLETS MEDIAN 3 AND 4 GRATE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

6/5/2012
DATE

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEV ENGINEER

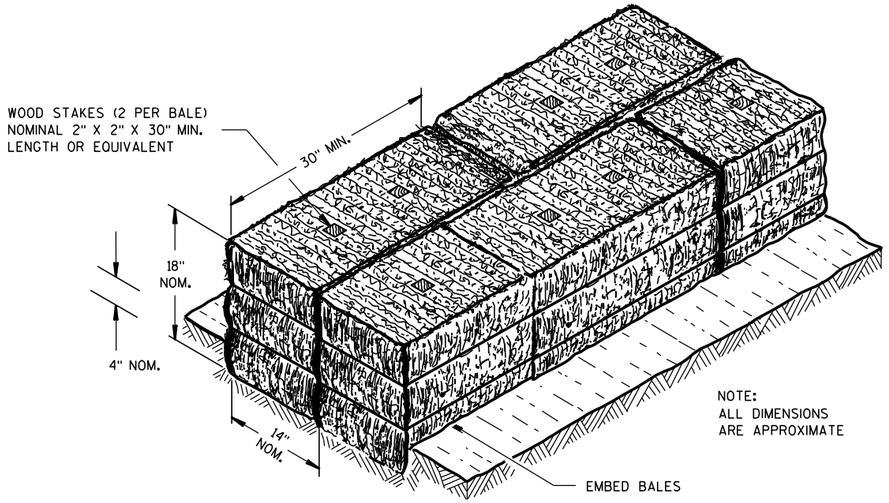
FHWA

6

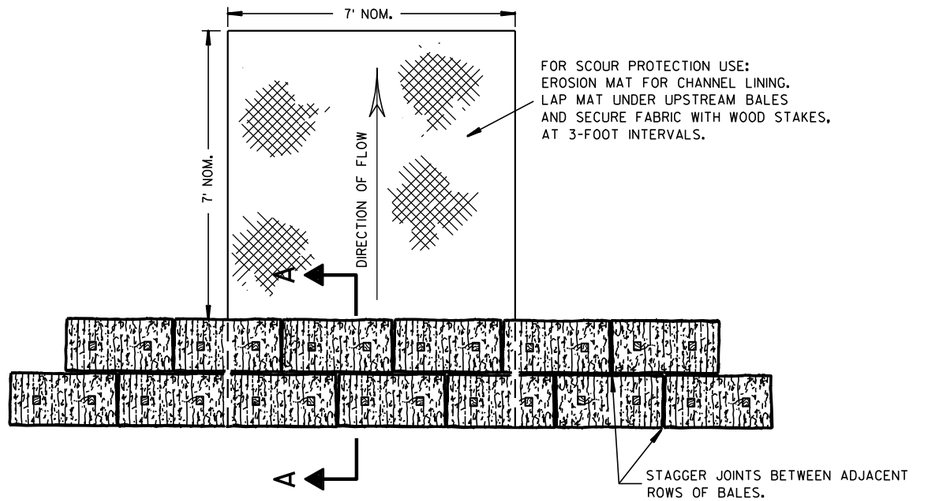
S.D.D. 8 C 9-1

6

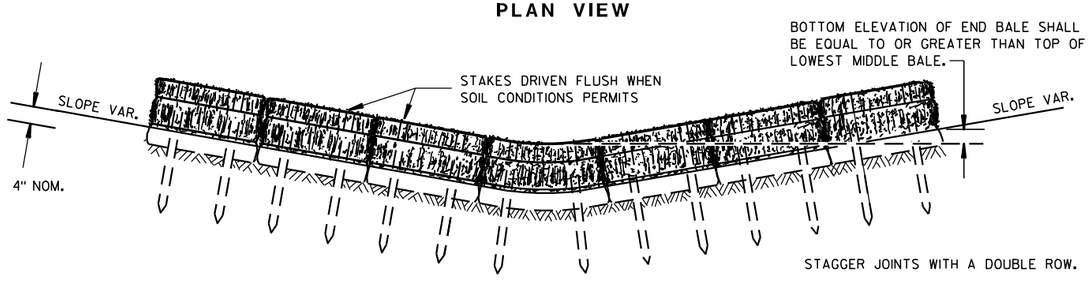
S.D.D. 8 C 9-1



SECTION A-A



PLAN VIEW



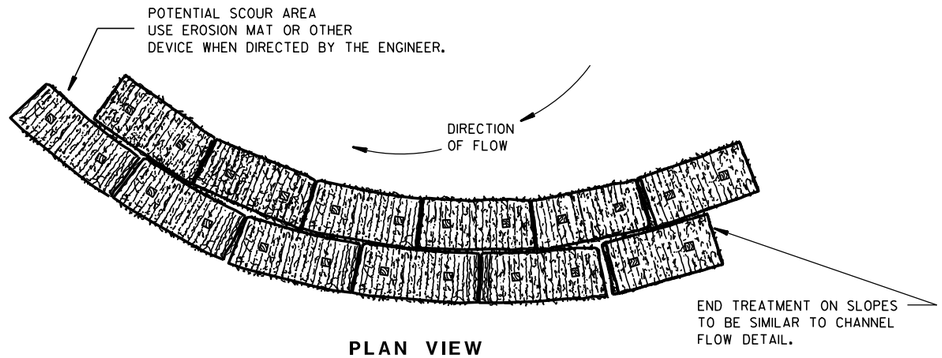
FRONT ELEVATION

TEMPORARY DITCH CHECK USING EROSION BALES (1)

GENERAL NOTES

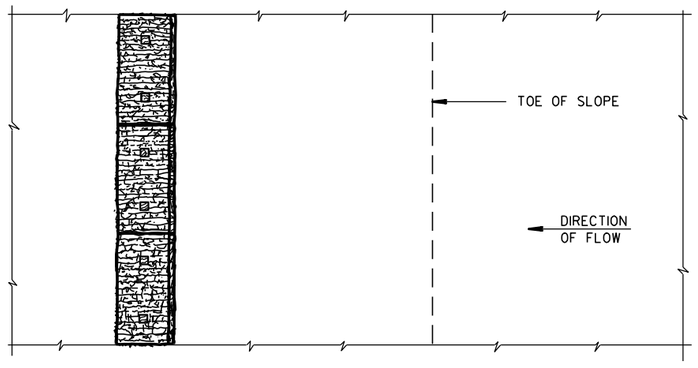
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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

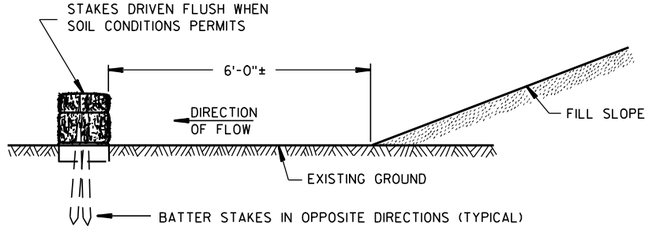


PLAN VIEW

WHEN ALTERING THE DIRECTION OF FLOW



PLAN VIEW



FRONT ELEVATION

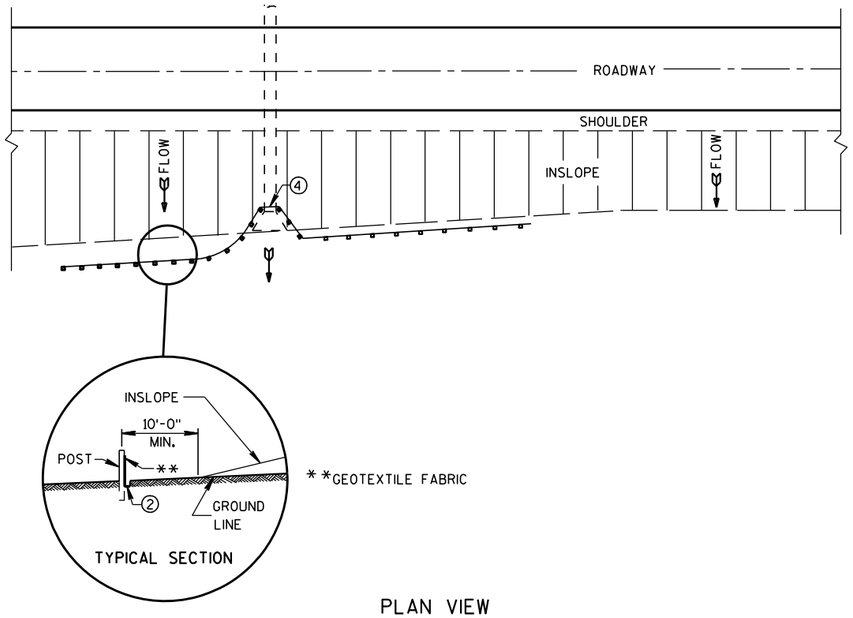
WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE

EROSION BALES FOR SHEET FLOW

TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS

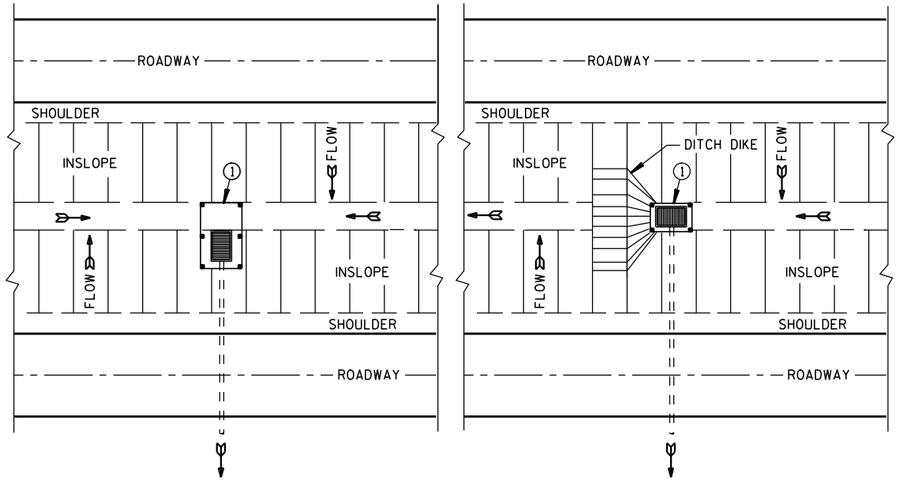
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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



PLAN VIEW

TYPICAL APPLICATION OF SILT FENCE



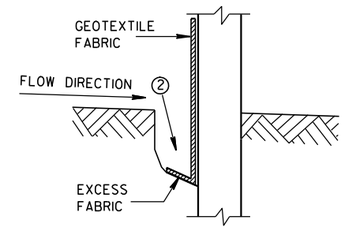
PLAN VIEW

SILT FENCE AT MEDIAN SURFACE DRAINS

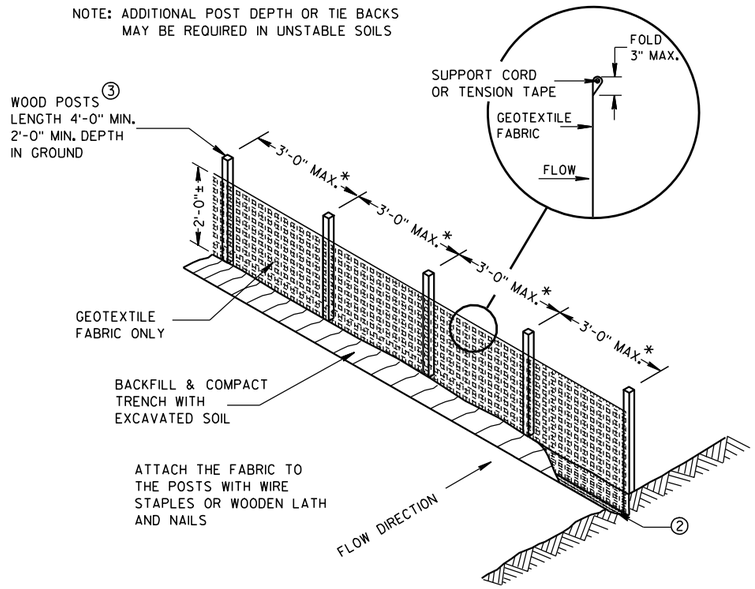
GENERAL NOTES

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

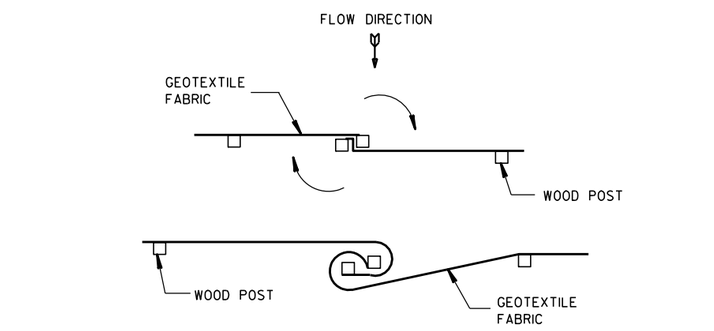
1. HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
2. FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
3. WOOD POSTS SHALL 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.



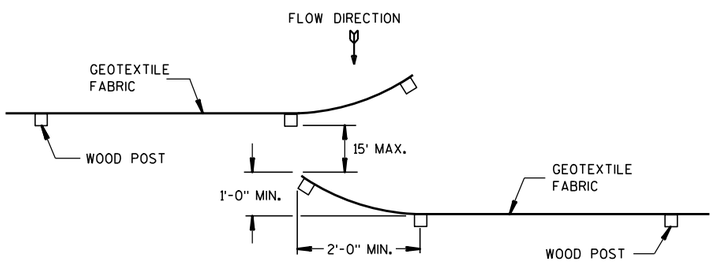
TRENCH DETAIL



SILT FENCE

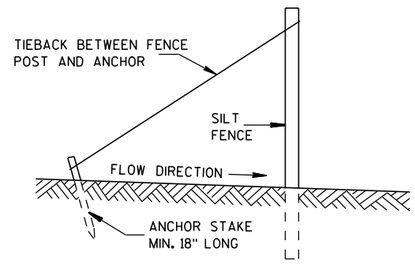


TWIST METHOD



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

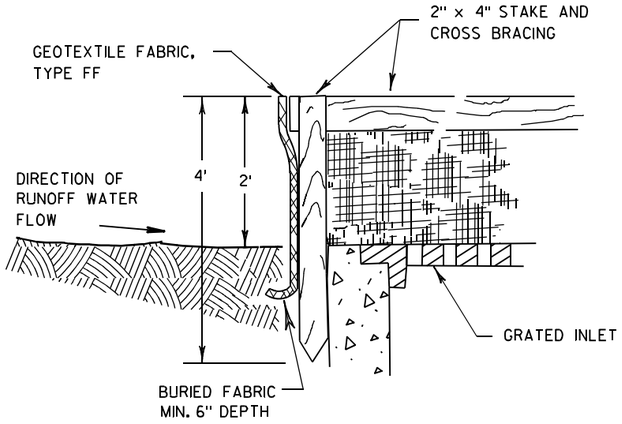
APPROVED
4-29-05 DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

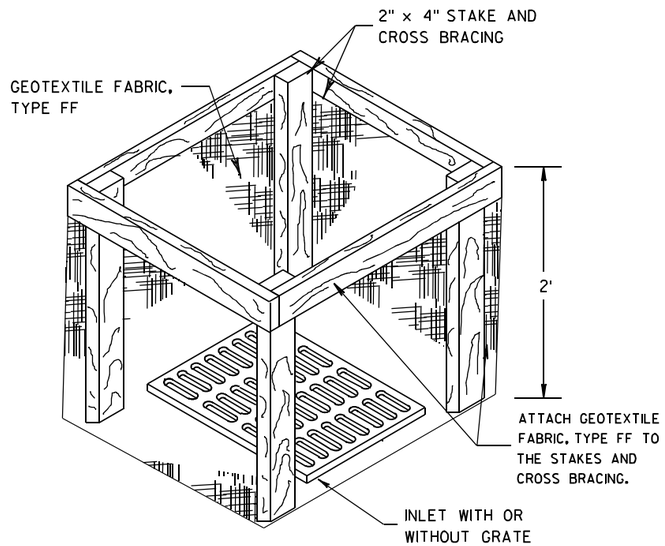
6

S.D.D. 8 E 9-6

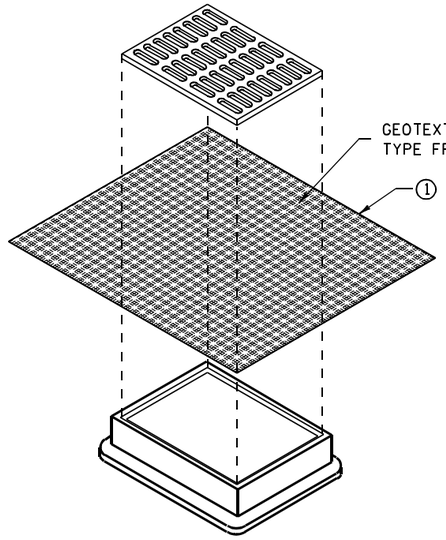
6

S.D.D. 8 E 9-6



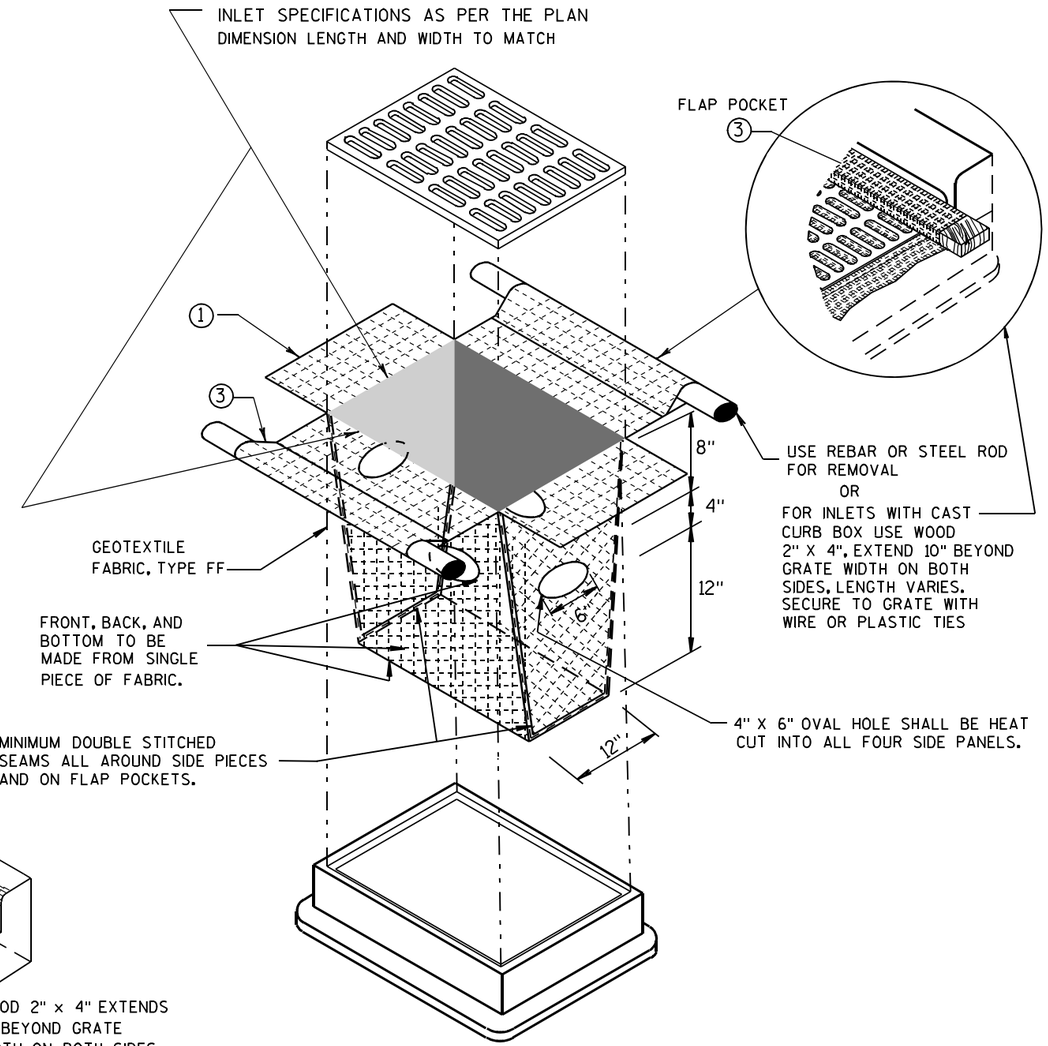


INLET PROTECTION, TYPE A



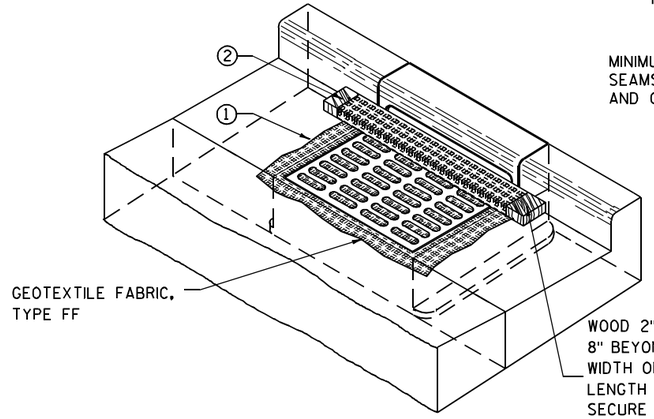
INLET PROTECTION, TYPE B
(WITHOUT CURB BOX)

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



INLET PROTECTION, TYPE D

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



INLET PROTECTION, TYPE C (WITH CURB BOX)

GENERAL NOTES

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

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

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

① FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

② FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.

③ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.

INSTALLATION NOTES

TYPE B & C

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

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

TYPE D

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

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

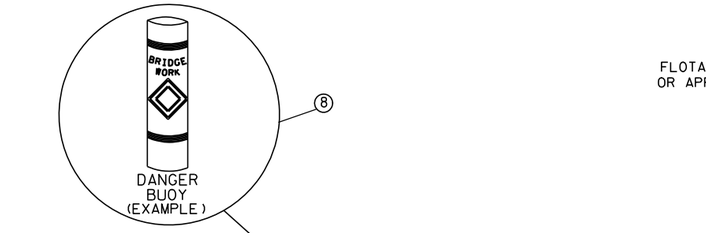
THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE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

INLET PROTECTION
TYPE A, B, C, AND D

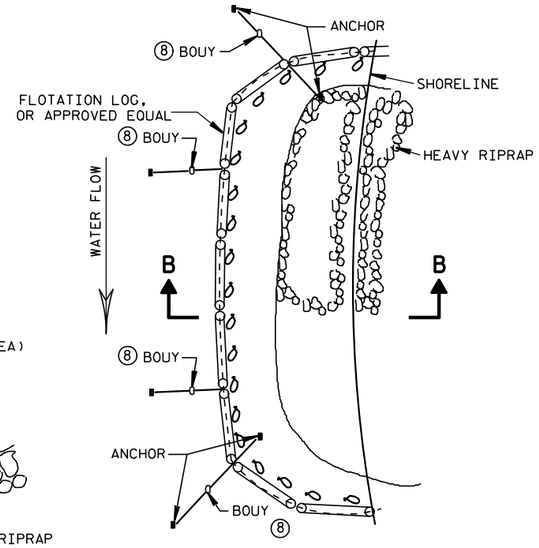
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

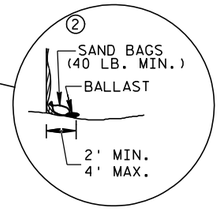
APPROVED
10/16/02
DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

6
S.D.D. 8 E 10-2

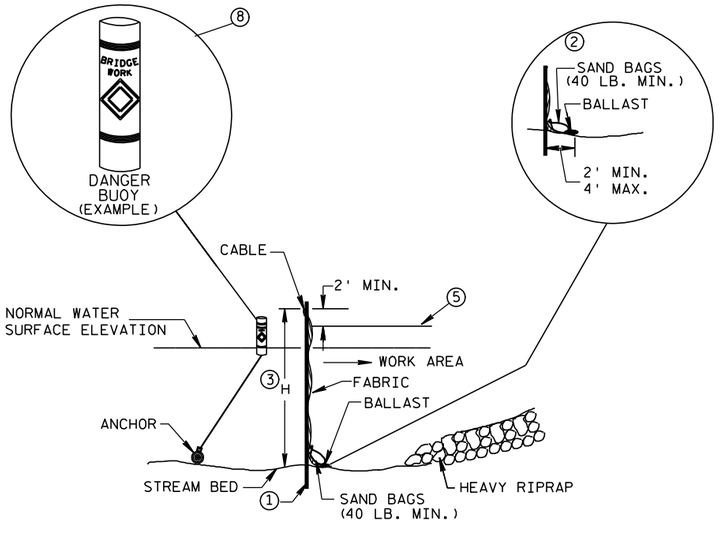


SECTION B-B

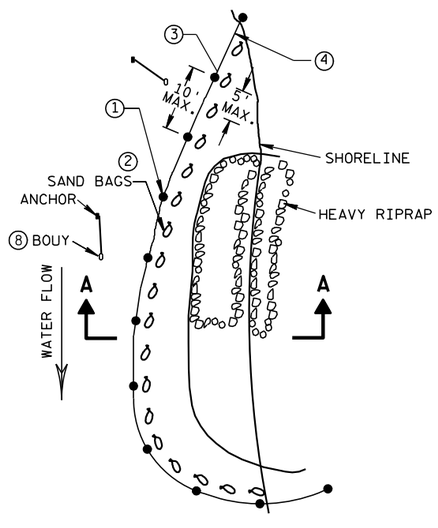




TURBIDITY BARRIER FLOAT ALTERNATIVE
CAUTION - SEE NOTE 6



SECTION A-A



PLAN VIEW

TURBIDITY BARRIER STANDARD POST INSTALLATION

TURBIDITY BARRIER PLACEMENT DETAILS

GENERAL NOTES

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

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

① DRIVEN STEEL POSTS, PIPES, OR CHANNELS. LENGTH SHALL BE SUFFICIENT TO SECURELY SUPPORT BARRIER AT HIGH WATER ELEVATIONS.

② SANDBAGS TO BE USED AS ADDITIONAL BALLAST WHEN ORDERED BY THE ENGINEER TO MEET ADVERSE FIELD CONDITIONS. SPACE AS APPROPRIATE FOR SITE CONDITIONS.

③ WHEN BARRIER HEIGHT, H, EXCEEDS 8 FT., POST SPACING MAY NEED TO BE DECREASED.

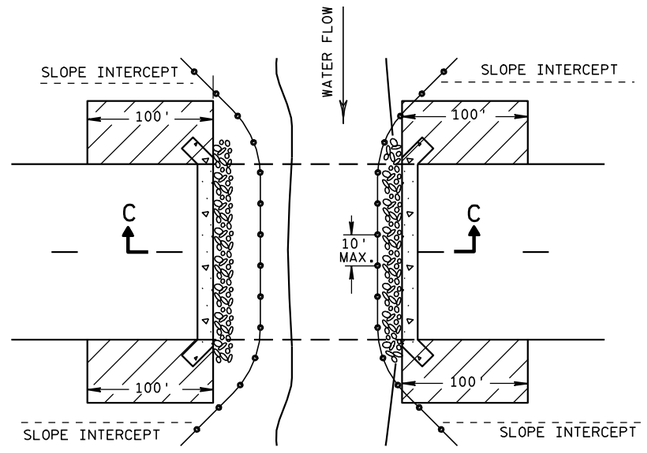
④ IN WATERWAYS SUBJECT TO FLUCTUATING WATER ELEVATIONS, PROVISIONS SHOULD BE MADE TO ALLOW THE WATER TO EQUALIZE ON EACH SIDE OF THE BARRIER. THIS MAY BE ACCOMPLISHED BY LEAVING A PORTION OF THE BARRIER OPEN ON THE UPSTREAM END.

⑤ ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION PERIOD. MIMIMUM BARRIER HEIGHT SHALL BE 2'GREATER THAN EITHER THE O2 ELEVATION OR THE ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION, WICHEVER IS GREATER.

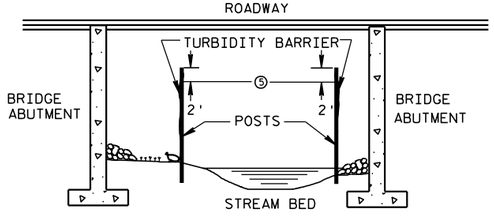
⑥ FLOAT ALTERNATIVE WILL ONLY BE ALLOWED WITH WRITTEN APPROVAL OF THE ENGINEER, AND IS MEANT FOR LOCATIONS WHERE BED ROCK PREVENTS THE INSTALLATION OF POSTS.

⑦ ALLOW SUFFICIENT SLACK VERTICALLY AND HORIZONTALLY SO THAT SEDIMENT BUILD UP WILL NOT SEPARATE OR LOWER THE TURBIDITY BARRIER.

⑧ USE AS DIRECTED BY COAST GUARD OR DNR PERMIT WHEN WORKING IN NAVIGABLE WATERWAYS.



PLAN VIEW



SECTION C-C

TURBIDITY BARRIER DETAIL SHOWING TYPICAL PLACEMENT AT STRUCTURES

TURBIDITY BARRIER

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

6

S.D.D. 8 E 11-2

6

S.D.D. 8 E 11-2

METAL APRON ENDWALLS

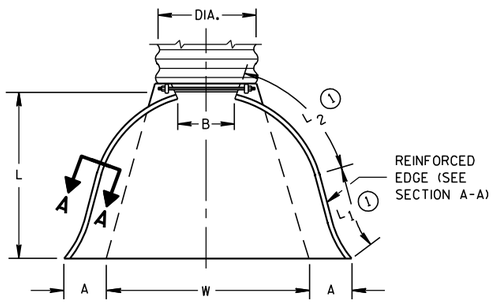
PIPE DIA. (IN.)	MIN. THICK. (Inches) STEEL	MIN. THICK. (Inches) ALUM.	DIMENSIONS (Inches) A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 ①	L2 ①	W (±2")	APPROX. SLOPE	BODY
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	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

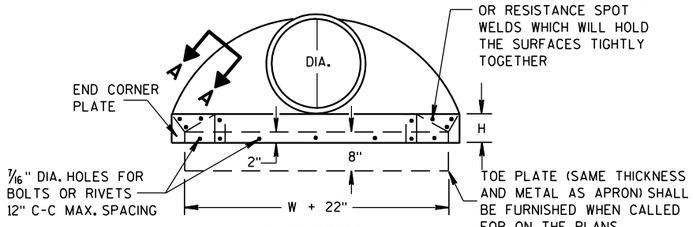
REINFORCED CONCRETE APRON ENDWALLS

PIPE DIA. (IN.)	DIMENSIONS (Inches) T	A	B	C	D	E	G	APPROX. SLOPE
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

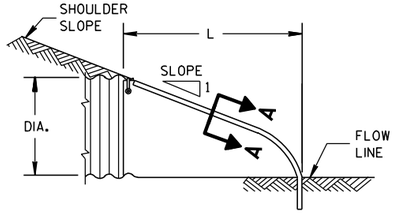
*MINIMUM
**MAXIMUM



PLAN VIEW

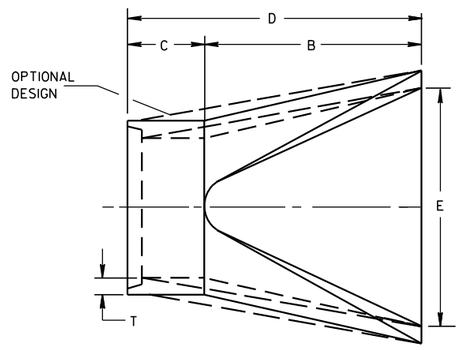


END VIEW

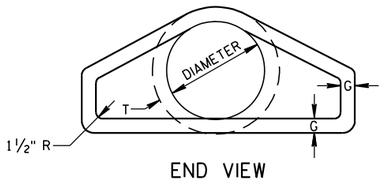


SIDE ELEVATION

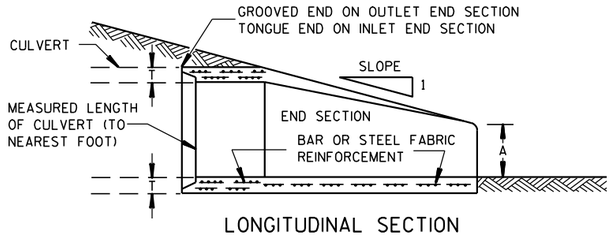
METAL ENDWALLS



PLAN

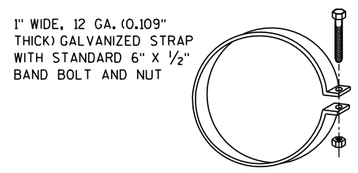


END VIEW



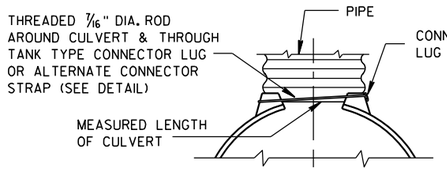
LONGITUDINAL SECTION

CONCRETE ENDWALLS

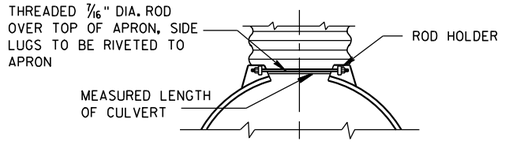


ALTERNATE FOR TYPE 1 CONNECTION

END SECTION CONNECTOR STRAP

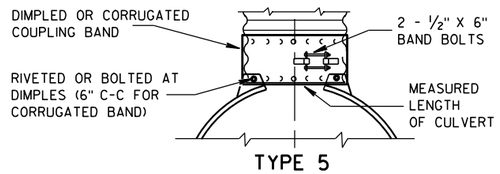


TYPE 1
FOR 12" THRU 24" CORR. PIPE



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

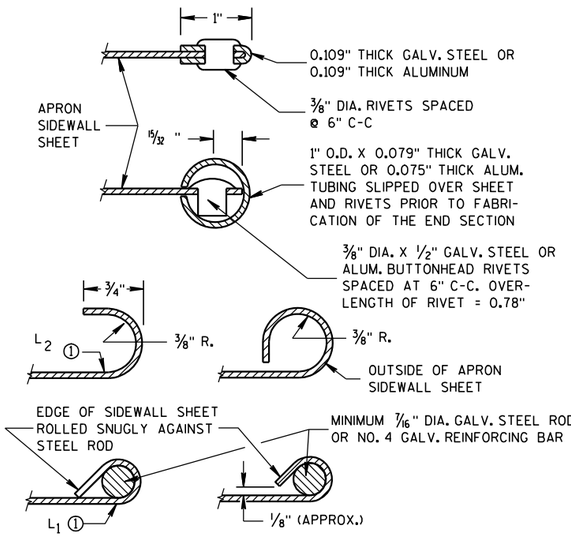
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL. AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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.

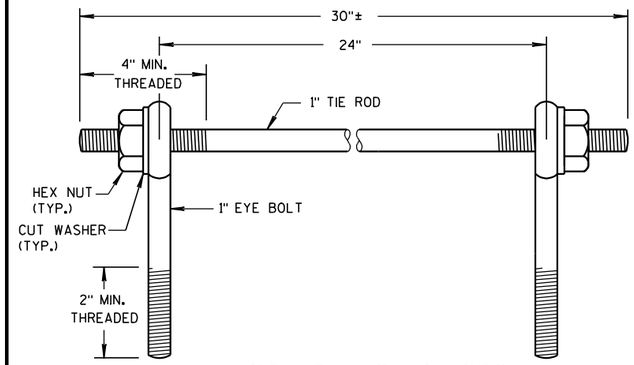
APRON ENDWALLS FOR CULVERT PIPE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

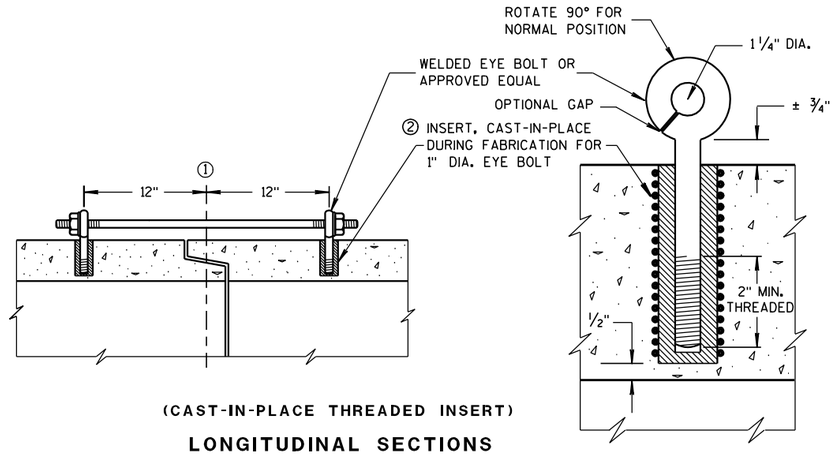
APPROVED
11/30/94 DATE
/S/ Rory L. Rhinesmith
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

6

S.D.D. 8 F 1-11



EYE BOLTS AND TIE ROD



(CAST-IN-PLACE THREADED INSERT)

LONGITUDINAL SECTIONS

EYE BOLT AND TIE ROD ASSEMBLY (ALTERNATE NO. 1)

GENERAL NOTES

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

CONCRETE CULVERT AND STORM SEWER PIPE SHALL BE TIED TOGETHER IN THE MANNER ILLUSTRATED BY THIS DETAIL AT LOCATIONS DESIGNATED IN THE STANDARD SPECIFICATIONS AND THE PLAN. THE CONTRACTOR MAY USE EITHER ALTERNATE 1, 2 OR 3 FOR DRAINAGE STRUCTURES. ONLY ALTERNATE 1 AND 3 MAY BE USED FOR CATTLE PASSES, UNLESS OTHERWISE STATED IN THE CONTRACT. THE MATERIALS, FABRICATION AND WORK NECESSARY TO TIE THE PIPE BY THIS DETAIL WILL BE CONSIDERED INCIDENTAL TO THE PIPE AND APRON ENDWALLS IF REQUIRED.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR JOINT TIES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

JOINT TIES TO BE HOT-DIP GALVANIZED PER ASTM A 153.

① ℄ OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS.

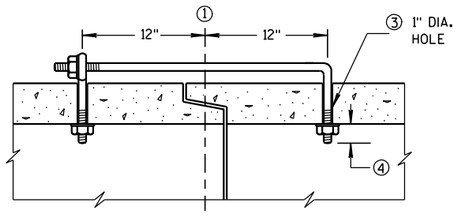
② THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS.

③ HOLES SHALL BE CAST-IN-PLACE OR DRILLED 12 INCHES FROM ℄ OF TONGUE AND GROOVE.

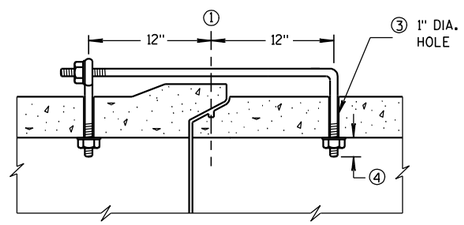
④ BOLT PROJECTION INSIDE OF PIPE SHALL NOT EXCEED 2 INCHES.

⑤ OPENING TO BE ROD DIAMETER PLUS 1 INCH.

⑥ LENGTH ADEQUATE TO EXTEND TO WITHIN 1/2 INCH OF THE INNER SURFACE OF THE PIPE.



(TONGUE & GROOVE PIPE)

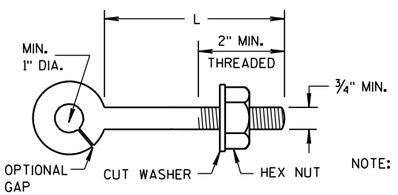


(MODIFIED BELL PIPE)

LONGITUDINAL SECTION

EYE BOLT DIMENSION TABLE

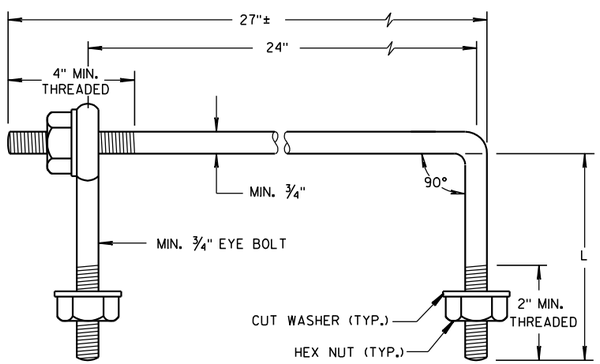
PIPE SIZE	L = LENGTH	
	TONGUE & GROOVE PIPE	MODIFIED BELL PIPE
18" TO 24"	4 1/2"	6 1/4"
30"	5"	7"
36"	5 1/2"	7"
42"	6"	
48"	6 1/2"	
60"	7 1/2"	
66"	8"	



NOTE:

EYE BOLT

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



EYE BOLT AND TIE ROD

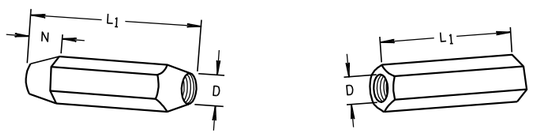
(JOINT TIES FOR 18" TO 66" DIA. CONCRETE PIPE)

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

ADJUSTABLE TIE ROD TABLE

PIPE DIAMETER	TIE ROD DIAMETER	D	L_1	N
12-60	5/8	5/8	5	1/2
66-84	3/4	3/4	5	1/2
90-108	1	1	7	1 7/16

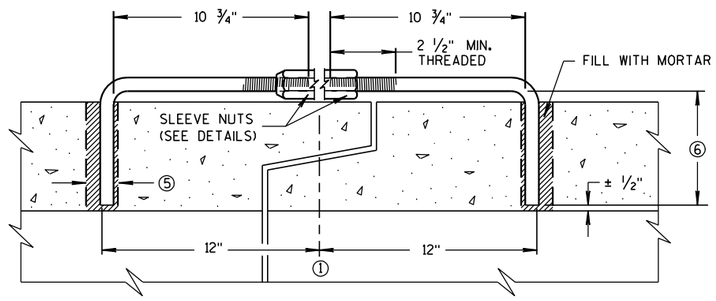
DIMENSIONS SHOWN ARE IN INCHES



TAPERED PLAIN

RIGHT AND LEFT THREADS

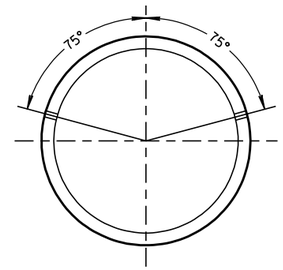
SLEEVE NUTS



LONGITUDINAL SECTION

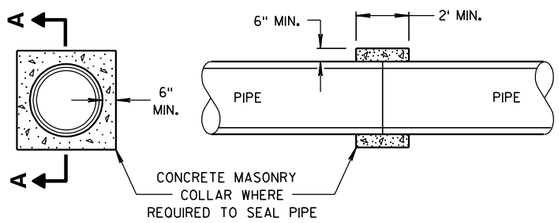
(JOINT TIES FOR 12" TO 108" DIA. CONCRETE PIPE)

ADJUSTABLE TIE ROD (ALTERNATE NO. 3)



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

TRANSVERSE SECTION



SECTION A-A

CONCRETE COLLAR DETAIL

JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
6/5/2012 — DATE
/S/ Jerry H. Zogg — ROADWAY STANDARDS ENGINEER
FHWA

6

S.D.D. 8 F 4-7

6

S.D.D. 8 F 4-7

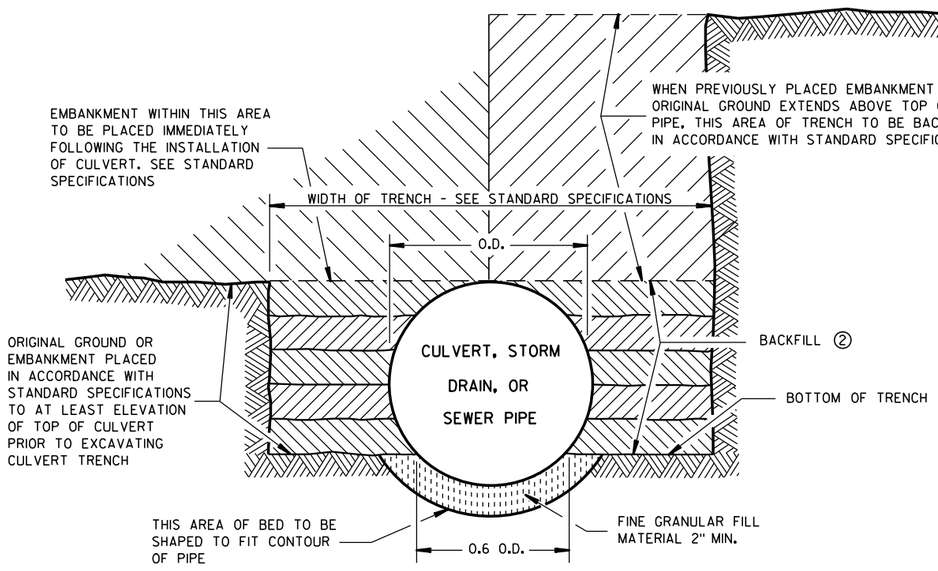
GENERAL NOTES

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

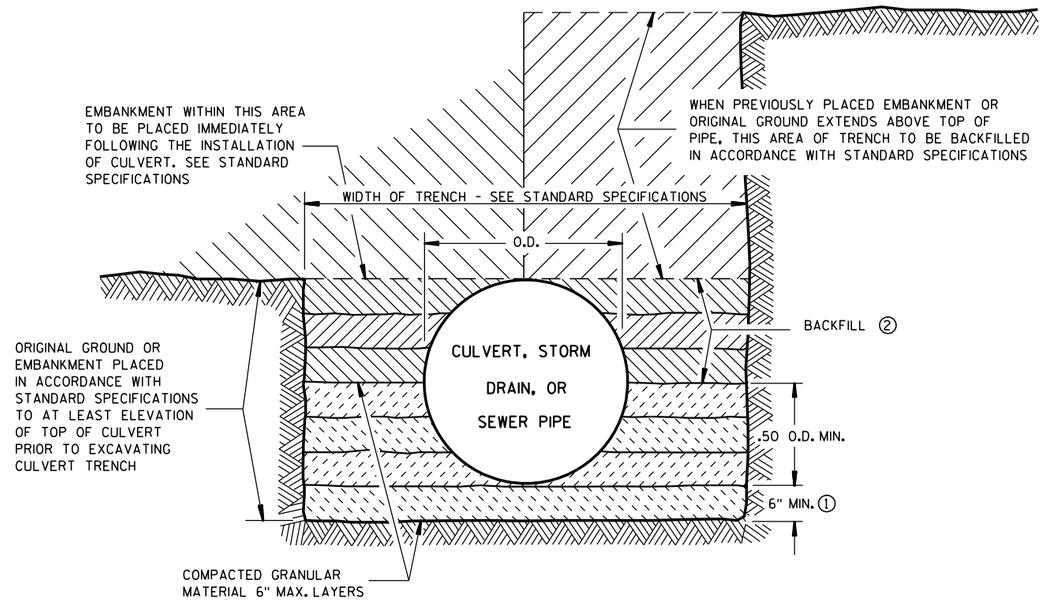
THE SHAPED SUBGRADE WITH GRANULAR FOUNDATION IS AN EQUAL ALTERNATE TO THE GRANULAR FOUNDATION EXCEPT WHERE ROCK IS ENCOUNTERED.

① WHERE ROCK, HARD PAN OR FRAGMENTED MATERIAL IS ENCOUNTERED, THE TRENCH SHALL BE EXCAVATED BELOW THE BOTTOM OF THE PIPE AN AMOUNT EQUAL TO ½ INCH PER FOOT OF PROPOSED EMBANKMENT ABOVE THE TOP OF THE PIPE, BUT NOT LESS THAN 6 INCHES.

② TRENCH SHALL BE BACKFILLED AS REQUIRED BY STANDARD SPECIFICATIONS; SECTION 520 FOR PIPE CULVERTS AND SECTION 607 FOR STORM SEWERS.



SHAPED SUBGRADE WITH GRANULAR FOUNDATION



GRANULAR FOUNDATION

CLASS "B" BEDDING

CLASS "B" BEDDING FOR CULVERT PIPE OR STORM SEWER	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED	
4/7/83 DATE	/S/ D. L. Strand STATE DESIGN ENGINEER
FHWA	HWYS

6

S.D.D. 8 F 5-1

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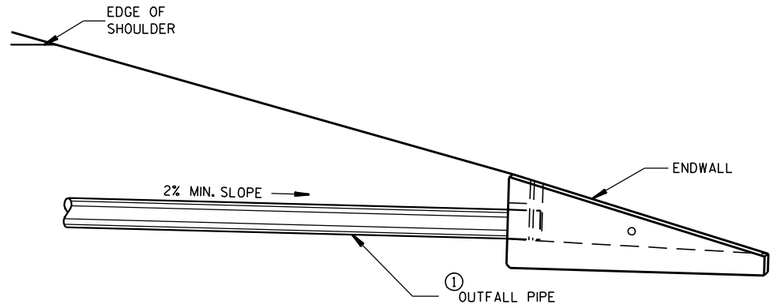
S.D.D. 8 F 5-1

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.

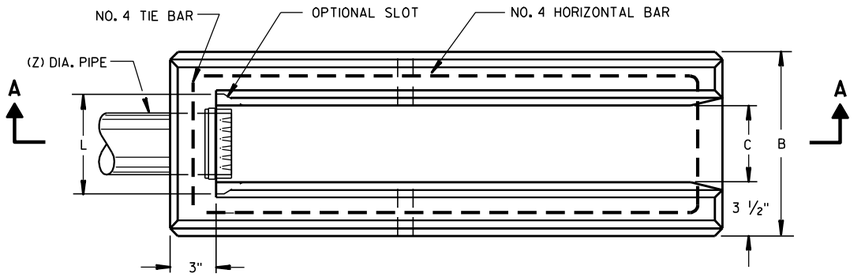
THE UNDERDRAIN PIPE SHALL BE FULLY INSERTED AND SEALED INTO THE ENDWALL WITH CEMENT MORTAR PRIOR TO BACKFILLING AROUND THE STRUCTURE.

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.

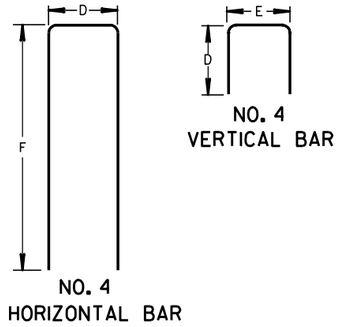
① THE OUTFALL PIPE UNDERDRAIN AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF THE SPECIFICATION FOR POLY (VINYL CHORIDE) (PVC) PLASTIC DRAIN, WASTE AND VENT PIPE AND FITTINGS, ASTM DESIGNATION: D 2665, SCHEDULE 40 PVC OR THE STANDARD SPECIFICATION FOR TYPE PSM POLY (VINYL CHORIDE) (PVC) SEWER PIPE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

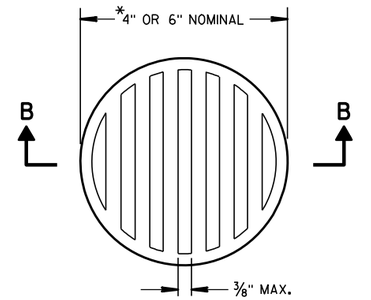
② THE RODENT SHIELD SHALL BE A PVC GRATE SIMILAR TO THIS DETAIL. THE GRATE IS COMMERCIALLY AVAILABLE AS A FLOOR STRAINER. A PIPE COUPLING IS REQUIRED FOR THE ATTACHMENT OF THIS SHIELD TO THE OUTFALL PIPE. THE SHIELD SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO. 10 X 1-INCH STAINLESS STEEL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



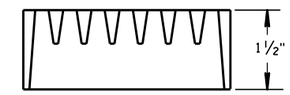
PLAN VIEW



BAR STEEL REINFORCEMENT DETAILS



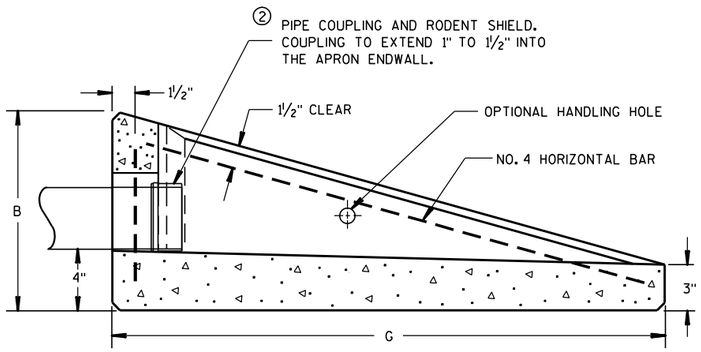
NOTE: ORIENT SHIELD SO SLOTS ARE VERTICAL.



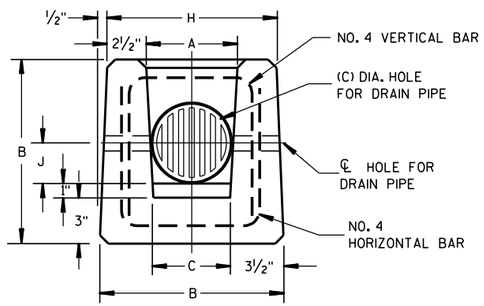
SECTION B-B

② RODENT SHIELD

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



SECTION A-A



END VIEW

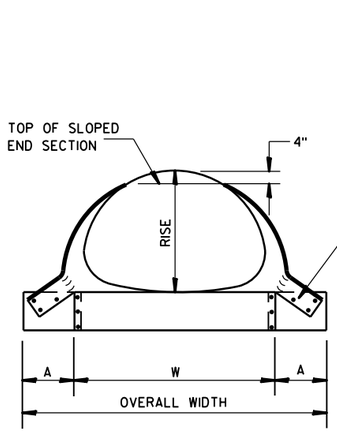
CONCRETE APRON ENDWALL FOR UNDERDRAIN

REINFORCED CONCRETE APRON ENDWALL FOR PIPE UNDERDRAIN

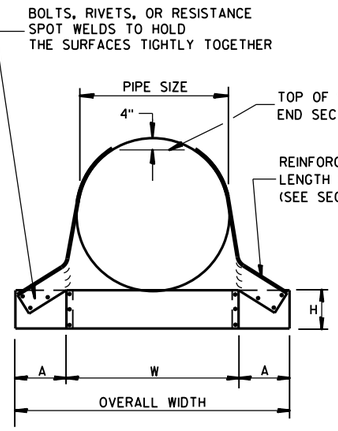
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

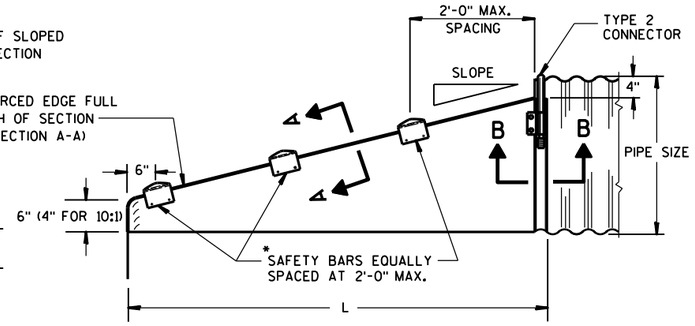
6
S.D.D. 8 F 6-4



FRONT VIEW



FRONT VIEW



SIDE VIEW

GENERAL NOTES

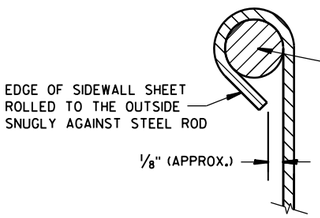
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

SLOPED END SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS, SECTION 521 FOR STEEL APRON ENDWALLS.

SAFETY BARS SHALL BE FABRICATED FROM GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A-53, GRADE B, SCHEDULE 40 OR APPROVED EQUAL.

STEEL APRON ENDWALLS FOR CULVERT PIPE
SLOPED SIDE DRAINS

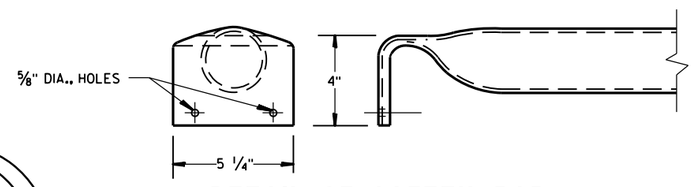
PIPE DIA. (IN.)	MIN. THICK. (Inches)	DIMENSIONS (Inches)				L DIMENSIONS					
		A	H	W	OVERALL WIDTH	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES
15	.064	8	6	21	37	4:1	20	6:1	30	10:1	70
18	.064	8	6	24	40	4:1	32	6:1	48	10:1	100
21	.064	8	6	27	43	4:1	44	6:1	66	10:1	130
24	.064	8	6	30	46	4:1	56	6:1	84	10:1	160
30	.109	12	9	36	60	4:1	80	6:1	120	10:1	220
36	.109	12	9	42	66	4:1	104	6:1	156	10:1	280
42	.109	16	12	48	80	4:1	128	6:1	192	——	——
48	.109	16	12	54	86	4:1	152	6:1	228	——	——
54	.109	16	12	60	92	4:1	176	6:1	264	——	——
60	.109	16	12	66	98	4:1	200	6:1	300	——	——



SECTION A-A

*NOTE:
THREE SAFETY BARS ARE SHOWN. ACTUAL NUMBER OF BARS REQUIRED AT A 2'-0" C-C MAX. SPACING WILL VARY DEPENDING ON THE LENGTH OF THE END SECTION.

3" GALVANIZED PIPE. FLATTEN ENDS, THEN BEND OUTSIDE 4" TO MATCH END SECTION SIDES.

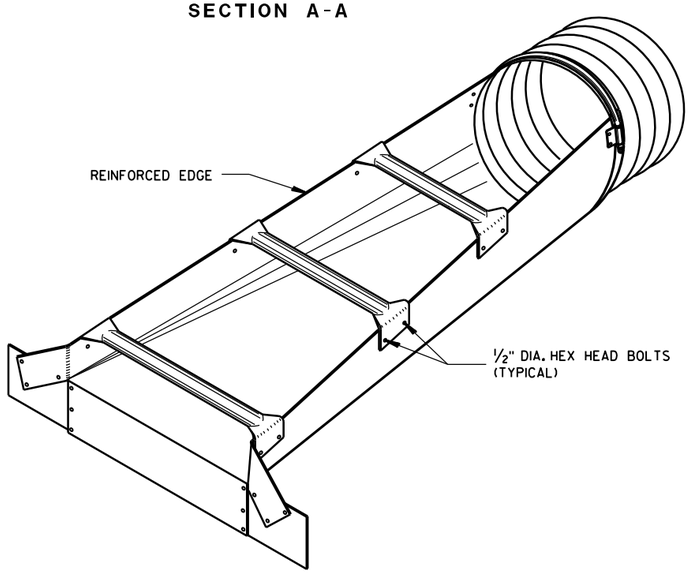


DETAIL OF SAFETY BAR

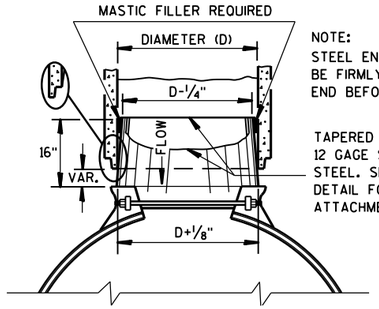
STEEL APRON ENDWALLS FOR PIPE ARCH
SLOPED SIDE DRAINS

EQUIV. DIA. (Inches)	(Inches) SPAN	(Inches) RISE	MIN. THICK. (Inches) ①	DIMENSIONS (Inches) A	H	W	OVERALL WIDTH	L DIMENSIONS SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES
15	17	13	.064 *	7	6	30	44	4:1	19	6:1	30	10:1 ②	70
18	21	15	.064 *	8	6	27	43	4:1	20	6:1	30	10:1	70
21	24	18	.064 *	8	6	30	46	4:1	32	6:1	48	10:1	100
24	28	20	.064 *	8	6	34	50	4:1	40	6:1	60	10:1	120
30	35	24	.079 *	12	9	41	65	4:1	56	6:1	84	10:1	160
36	42	29	.109 *	12	9	48	72	4:1	76	6:1	114	10:1	210
42	49	33	.109	16	12	55	87	4:1	92	6:1	138	——	——
48	57	38	.109	16	12	63	95	4:1	112	6:1	168	——	——
54	64	43	.109	16	12	70	102	4:1	132	6:1	198	——	——

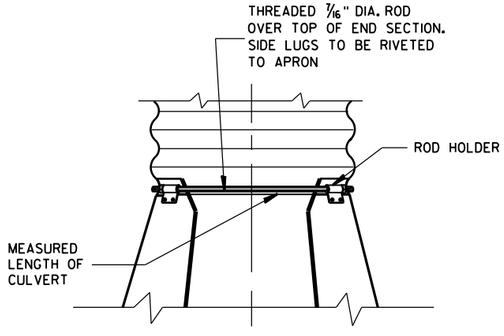
① * MINIMUM THICKNESS OF ALL 10:1 SLOPED SIDE DRAINS IS 0.109".
② ACTUAL SLOPE GREATER THAN 10:1.



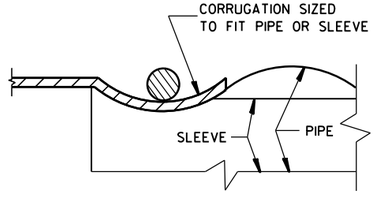
ISOMETRIC VIEW



STEEL ADAPTER SLEEVE FOR CONCRETE PIPE



TYPE 2
CONNECTION DETAIL



SECTION B-B

STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SLOPED SIDE DRAINS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

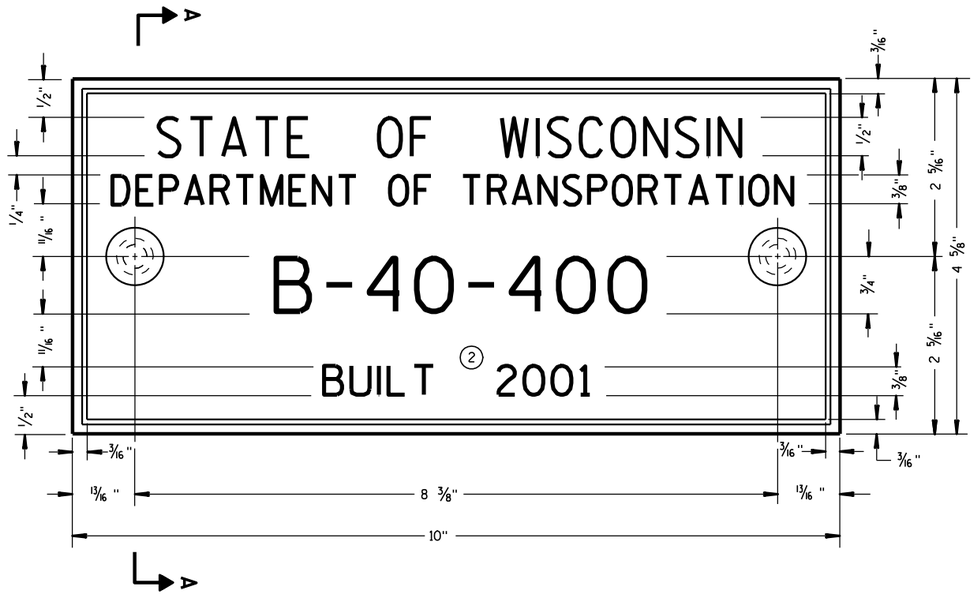
APPROVED
9/14/2012 — DATE
/S/ Jerry H. Zoda — ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

6

S.D.D. 8 F 7-5

6

S.D.D. 8 F 7-5



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

FOR MULTI-UNIT STRUCTURES
LINE 3 ABOVE SHALL READ

B = BRIDGE
C = CULVERT
R = RETAINING WALL

COUNTY NO.

BRIDGE NO.

UNIT NO. FOR MULTIPLE UNIT BRIDGE

B-40-400-1A

NUMBERING DESIGNATION
MULTI-UNIT STRUCTURES

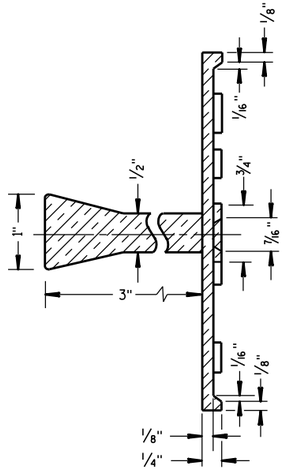
GENERAL NOTES

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

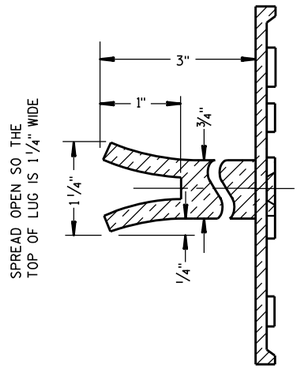
THE BRIDGE NUMBER AND YEAR BUILT SHOWN ON THIS DRAWING ARE EXAMPLES ONLY. SEE CONSTRUCTION PLANS FOR INDIVIDUAL NUMBERING AND YEAR BUILT.

(1) EPOXY RESIN SHALL BE FROM AN APPROVED MANUFACTURER AND USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

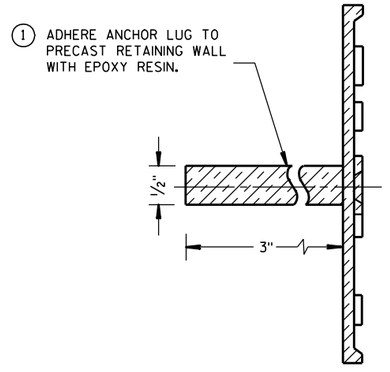
(2) REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.



SECTION A-A



ALTERNATE LUG



ALTERNATE LUG
(FOR ATTACHMENT TO PRECAST STRUCTURES)

NAME PLATE (STRUCTURES)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

3/26/10 DATE

/S/ Scot Beck -- CHIEF STRUCTURAL DEVELOP ENGINEER

FHWA

6

S.D.D. 12 A 3-10

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.

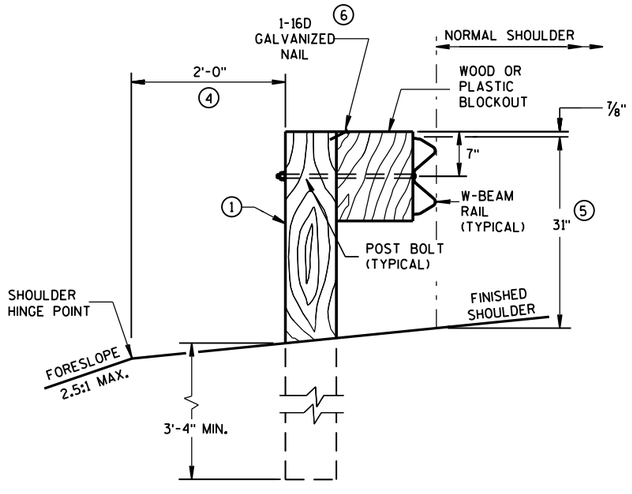
(2) USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.

(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).

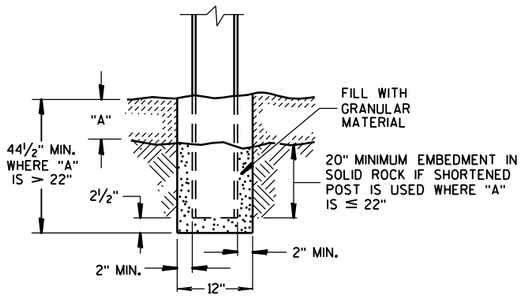
(5) FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS ± 1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27¾" TO 32".

(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.



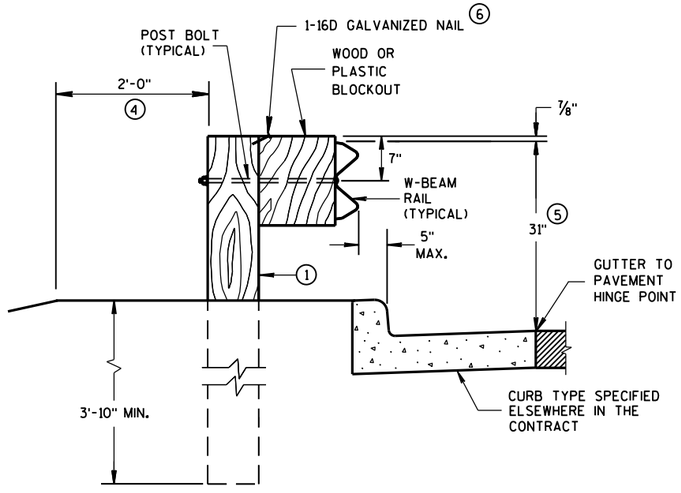
END VIEW

LOCATED ALONG A ROADWAY SHOULDER
STANDARD INSTALLATION



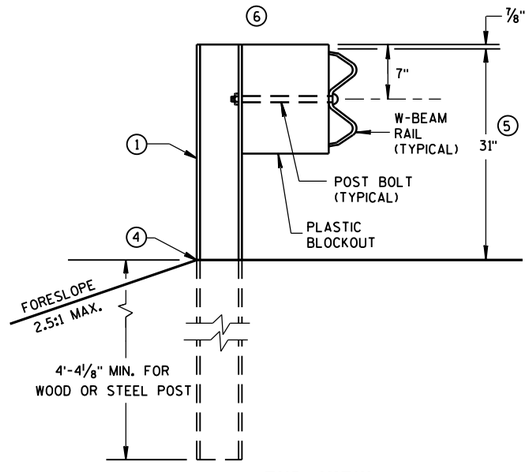
END VIEW

SETTING STEEL OR WOOD POST IN ROCK (3)



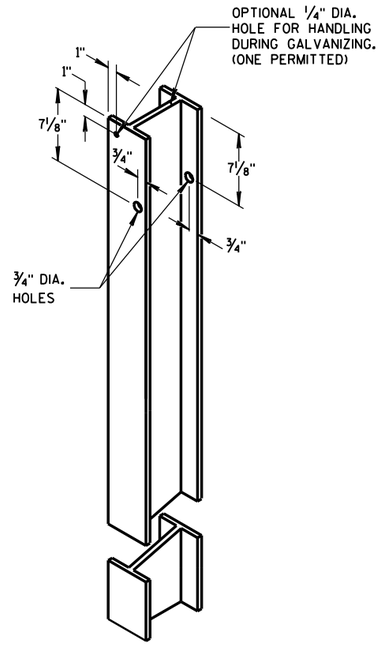
END VIEW

LOCATED ALONG A CURBED ROADWAY

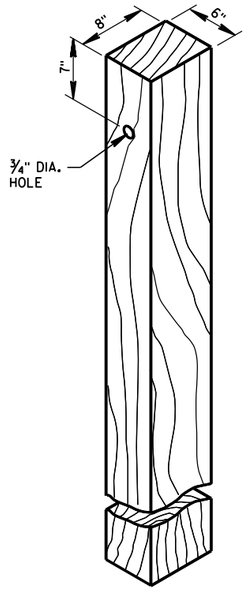


END VIEW

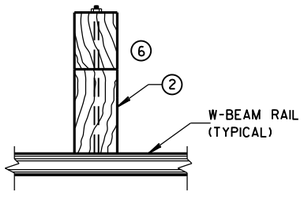
MGS LONGER POST AT HALFPOST SPACING W BEAM (K)



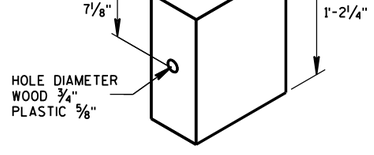
STEEL POST &
HOLE PUNCHING DETAIL
(w6X9) (1)



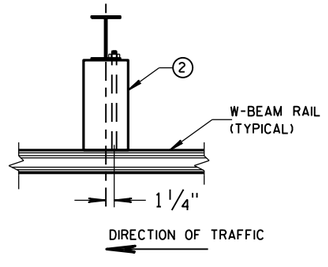
WOOD POST
(6" X 8") NOMINAL (1)



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

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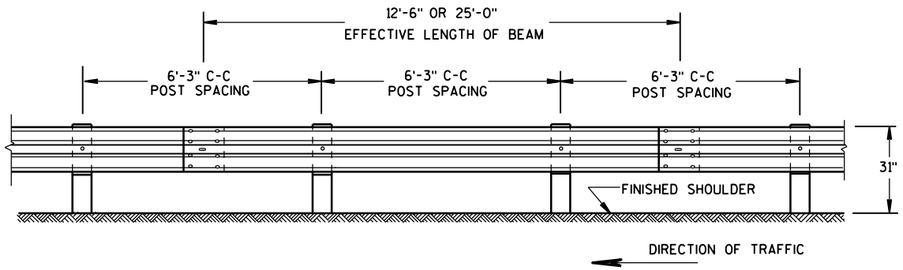
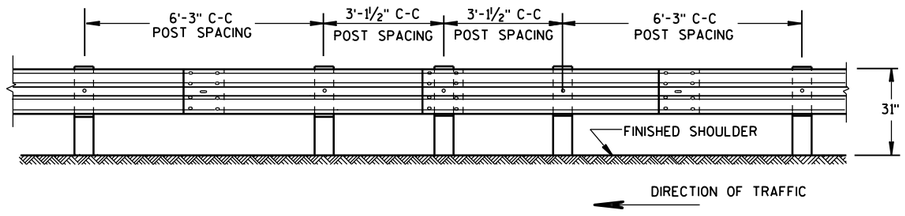
S.D.D. 14 B 42-3a



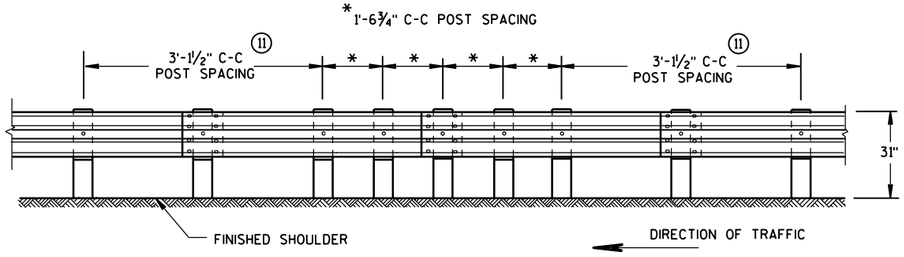
FRONT VIEW

POST SPACING STANDARD INSTALLATION



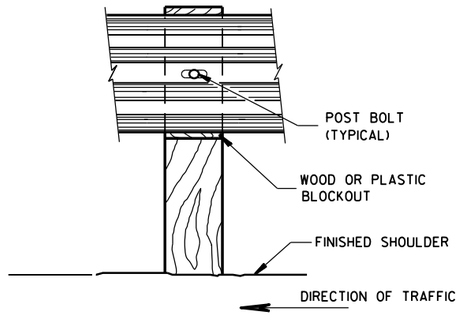
FRONT VIEW

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

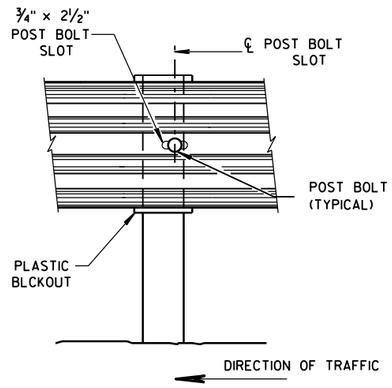


FRONT VIEW

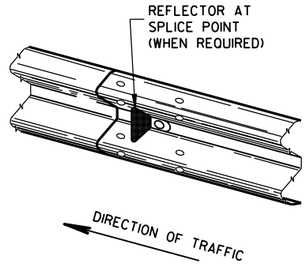
QUARTER POST SPACING (QS)

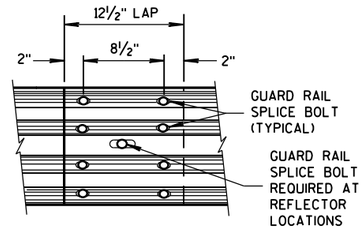


FRONT VIEW AT WOOD POST



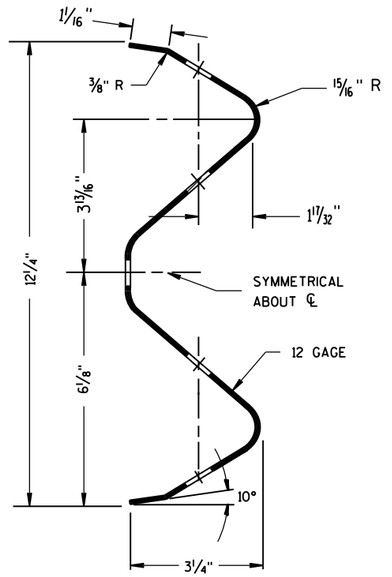
FRONT VIEW AT STEEL POST



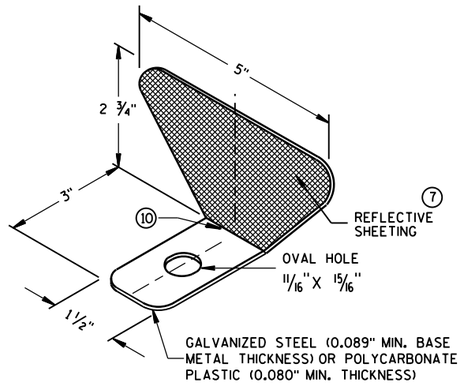


FRONT VIEW

MID-SPAN BEAM SPLICE



SECTION THRU W-BEAM RAIL



ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION ⑦

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 ⅝" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES ⅝" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND ⅝" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.

GUARD RAIL SPLICE BOLTS ARE A ⅝" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES ⅝" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.

REFLECTOR SPACING ⑧

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

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

STATE OF WISCONSIN
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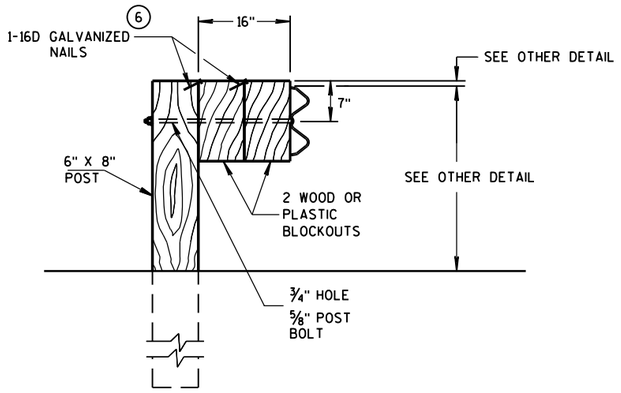
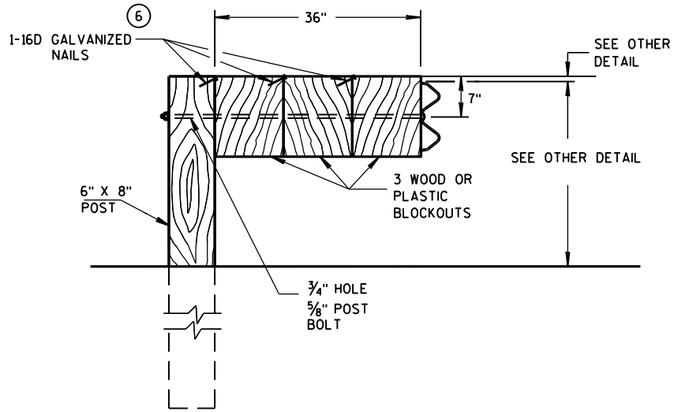


DETAIL FOR 16" BLOCKOUT DEPTH

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.

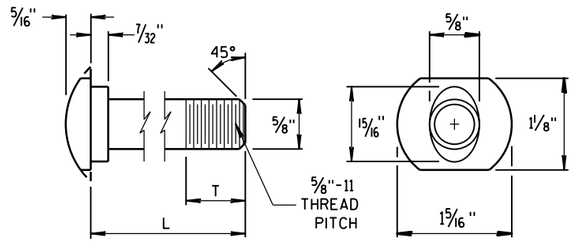


DETAIL FOR 36" BLOCKOUT DEPTH

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.

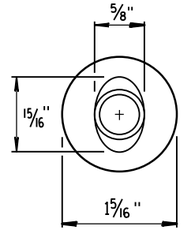
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.

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.

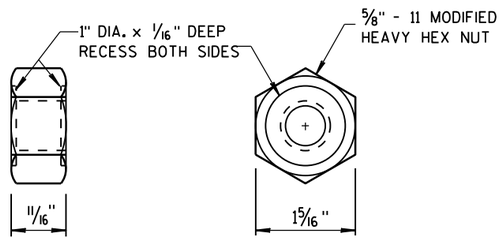


POST BOLT TABLE

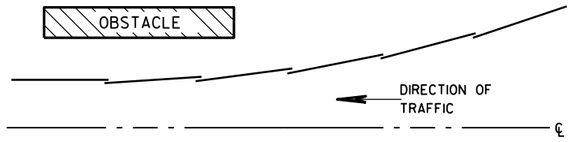
L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



ALTERNATE BOLT HEAD

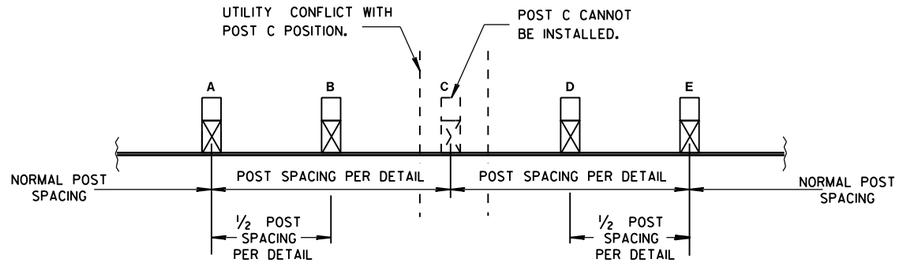


POST BOLT AND RECESS NUT

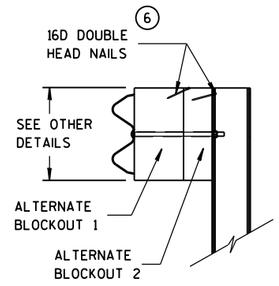


PLAN VIEW

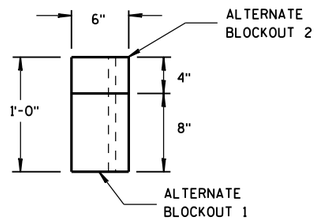
BEAM LAPPING DETAIL



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.

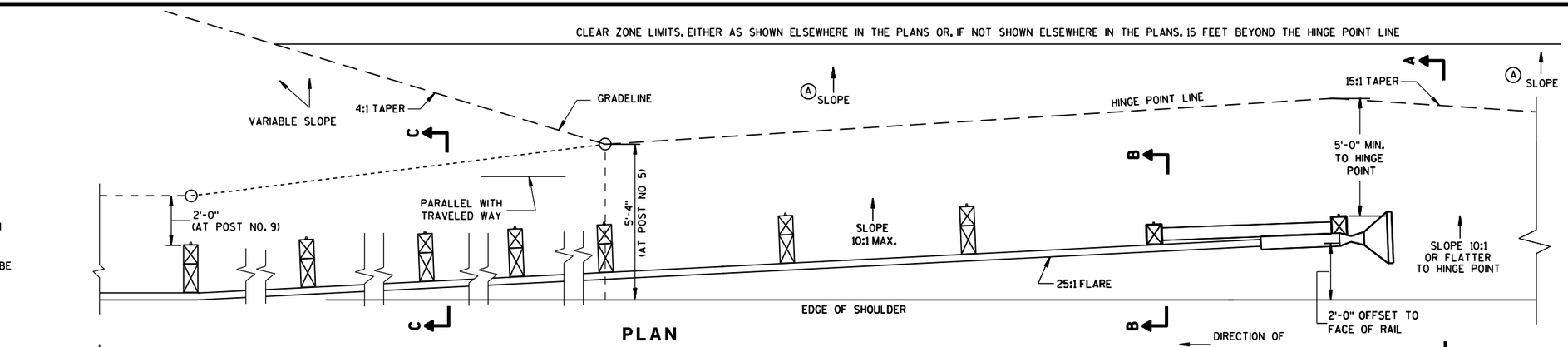
SEE SDD 14B42 FOR MORE INFORMATION.

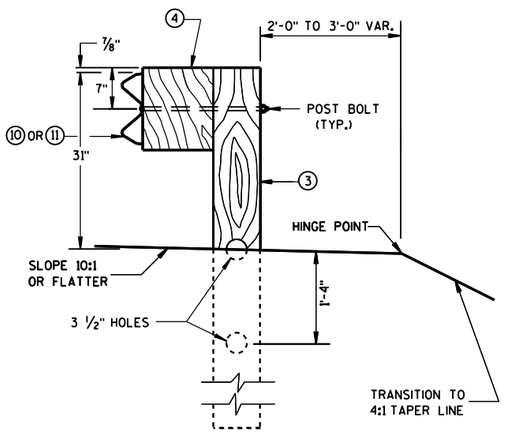
* DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.

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

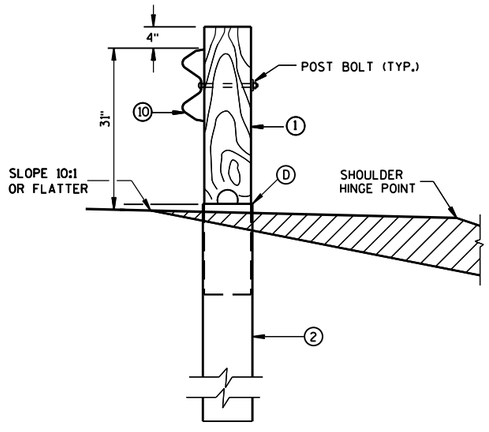
W-BEAM RAIL SPLICES ARE LOCATED AT POST NUMBER 3, AND BETWEEN POST 5 AND 6, BETWEEN POSTS 7 AND 8, AND MIDDLE OF THE SPAN AFTER POST 9.

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.

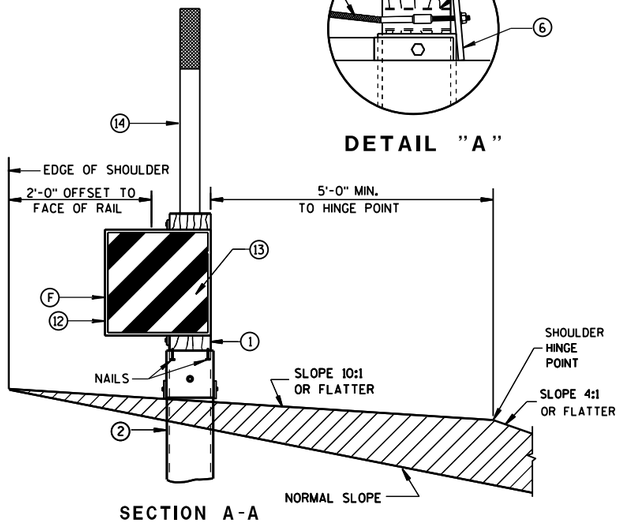




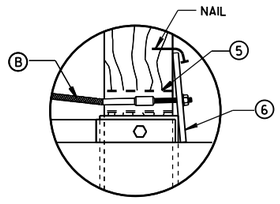
SECTION C-C
TYPICAL AT POST NOS. 3-9



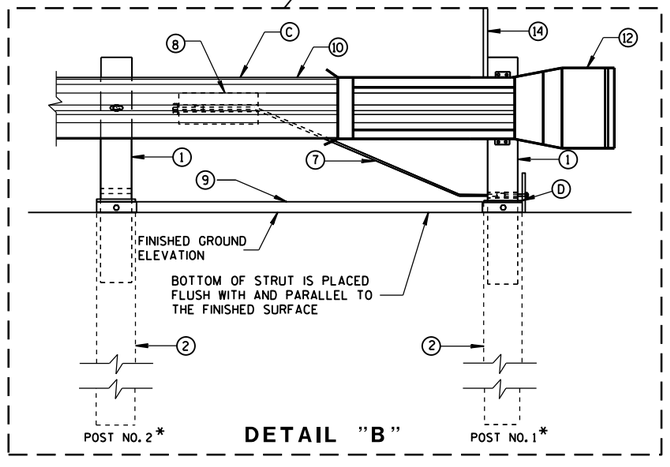
SECTION B-B
TYPICAL AT POST NO. 2*



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

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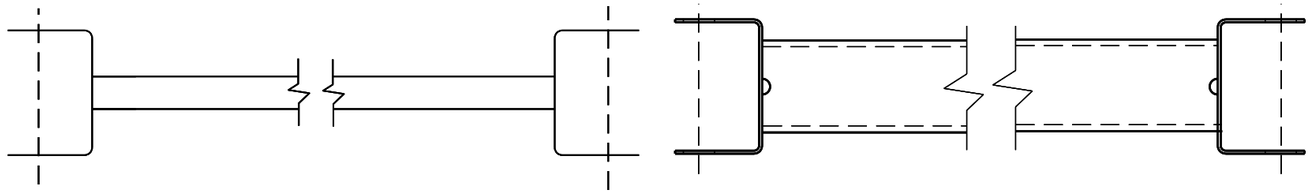
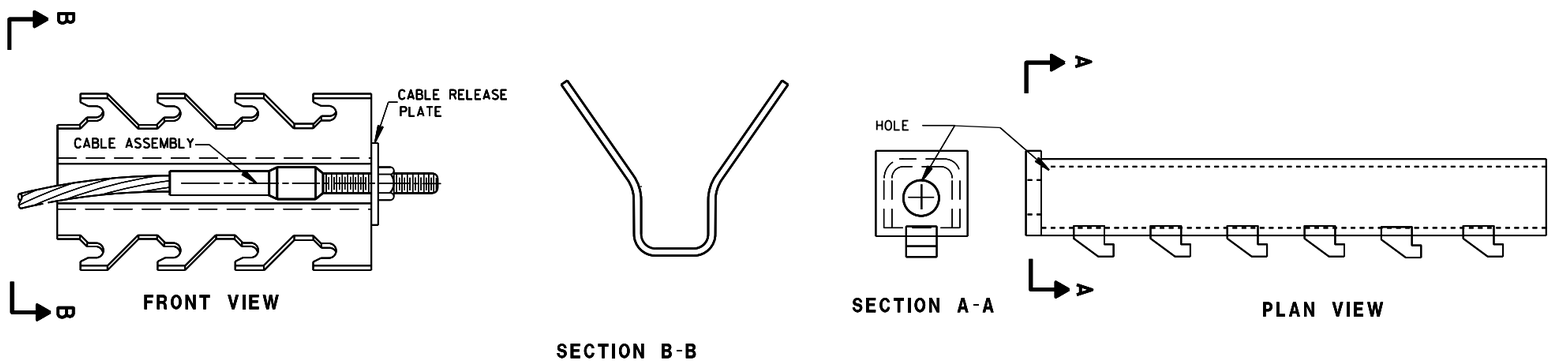
S.D.D. 14 B 44-2a



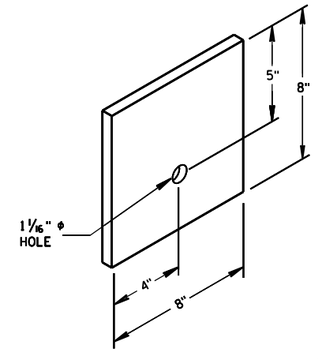
GENERIC GROUND STRUT (9) (H)

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

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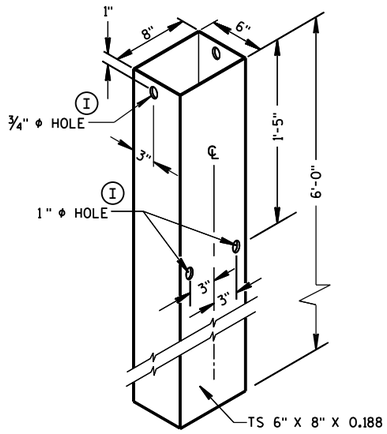
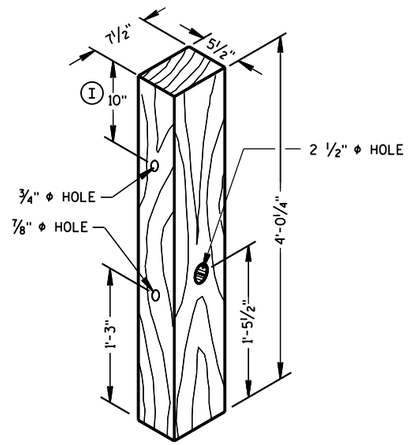
S.D.D. 14 B 44-2b

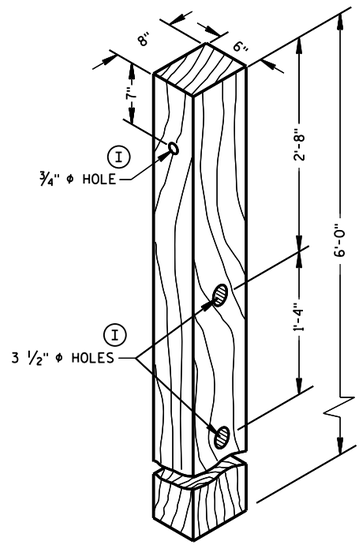


FOUNDATION TUBE (2)



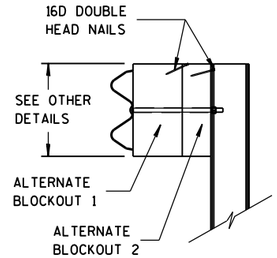
POSTS NUMBER 1 AND 2

WOOD BREAKAWAY POST (1)

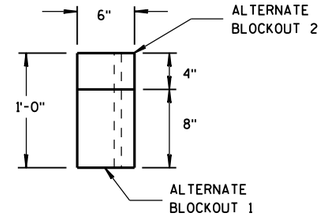


POSTS NUMBER 3-9

WOOD CRT POST (3)

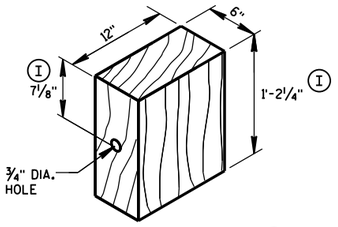


SIDE VIEW



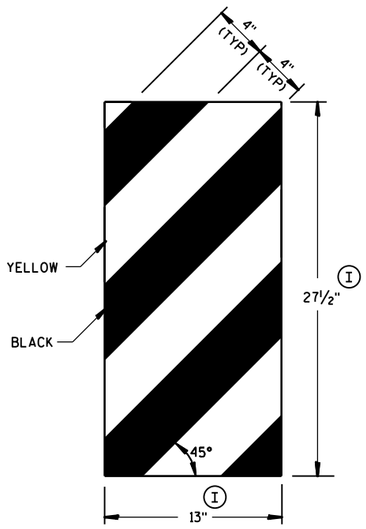
TOP VIEW

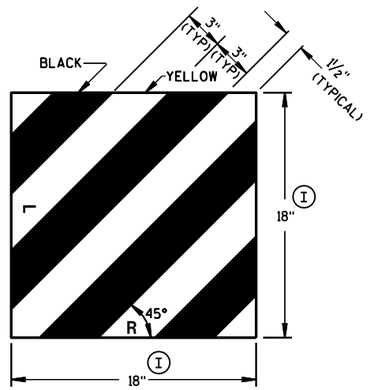
ALTERNATE WOOD BLOCKOUT DETAIL



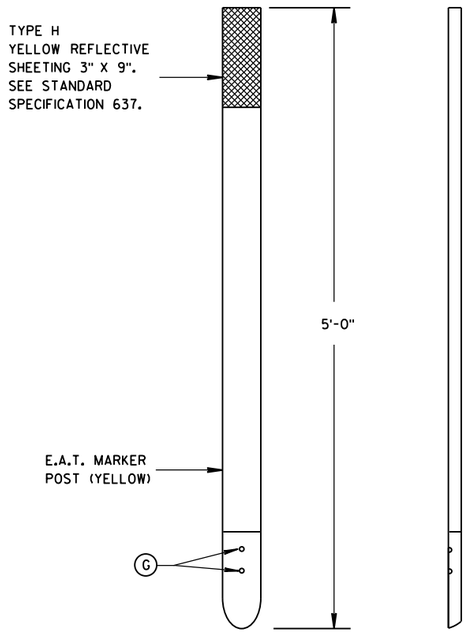
WOOD BLOCKOUT (4)

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





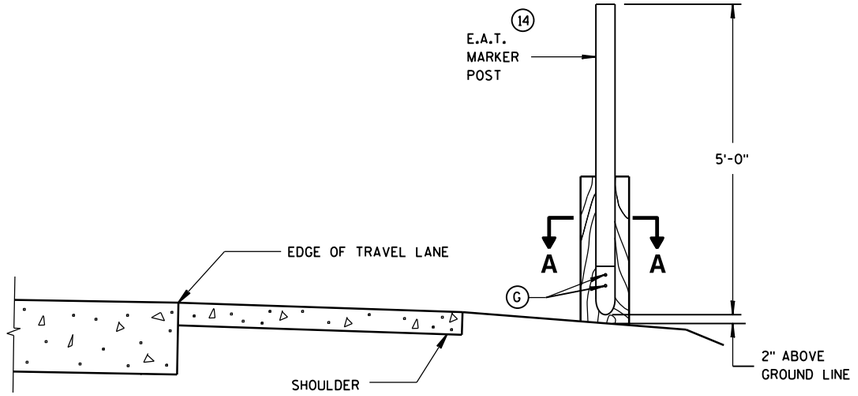
GENERIC REFLECTIVE SHEETING (13) (H)



FRONT VIEW

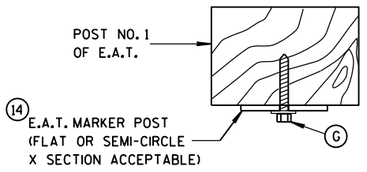
SIDE VIEW

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)

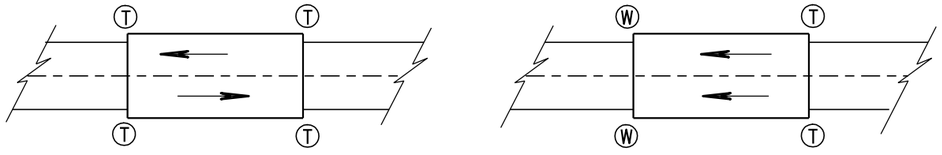
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

FHWA

6

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



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

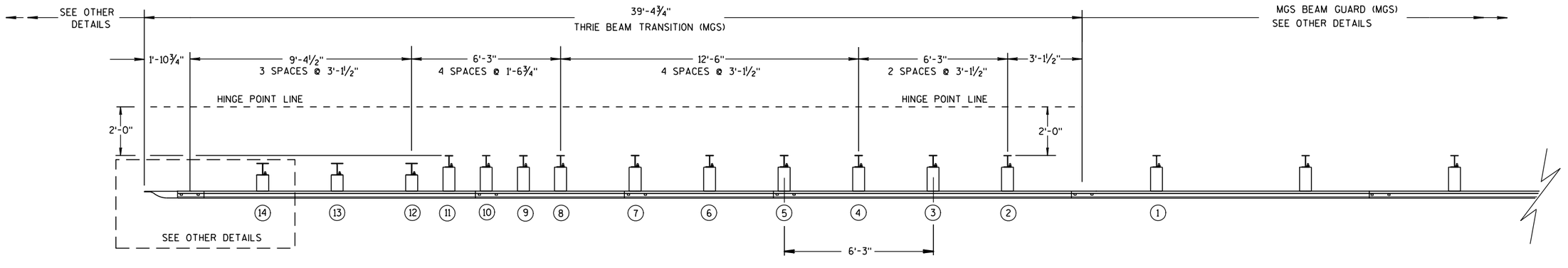
BOLT THE THRIE BEAM TO ALL POSTS AND BLOCKOUTS. DRILL OR PUNCH BOLT HOLES IN THE BEAM IF THE POST SPACING IS LESS THAN 6'-3.

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

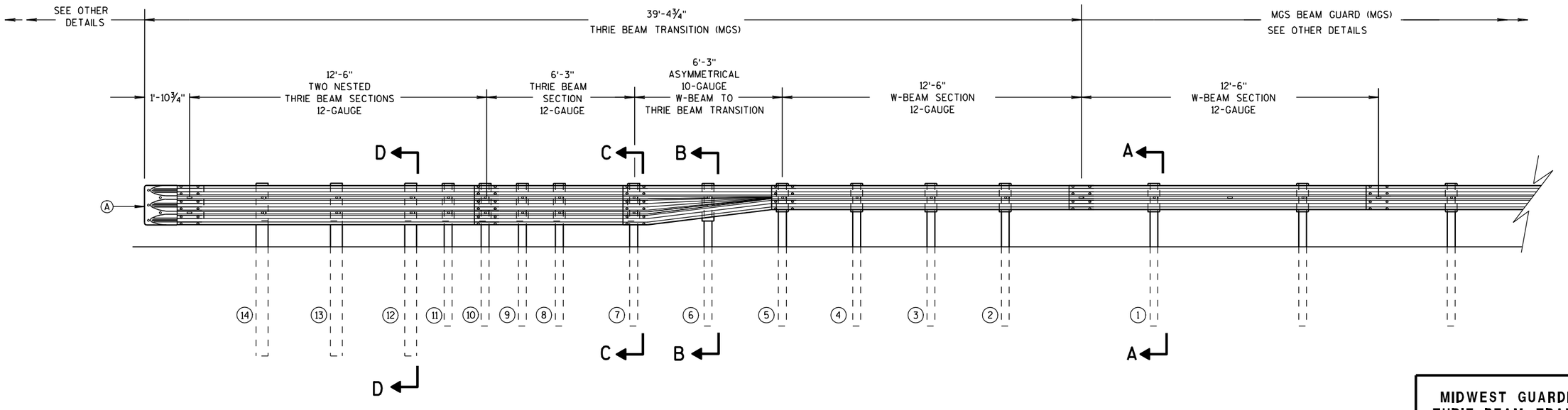
TRANSITION USES STEEL POSTS ONLY.

SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

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



PLAN VIEW



ELEVATION VIEW

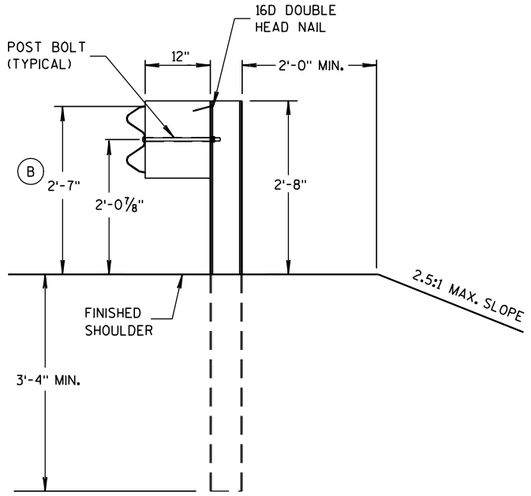
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

6
S.D.D. 14 B 45-3a

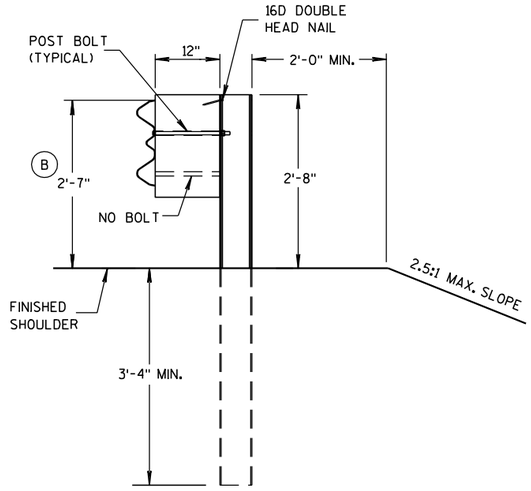
GENERAL NOTES

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



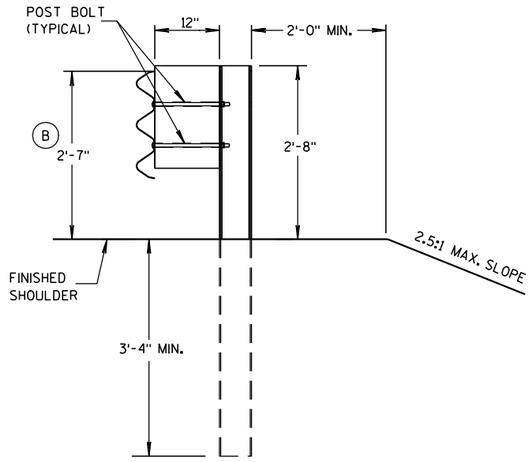
SECTION A-A

POSTS 1-5



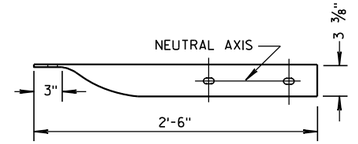
SECTION B-B

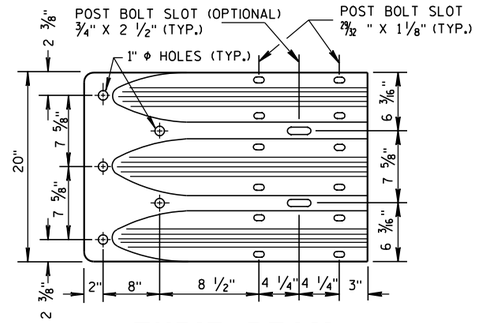
POST 6



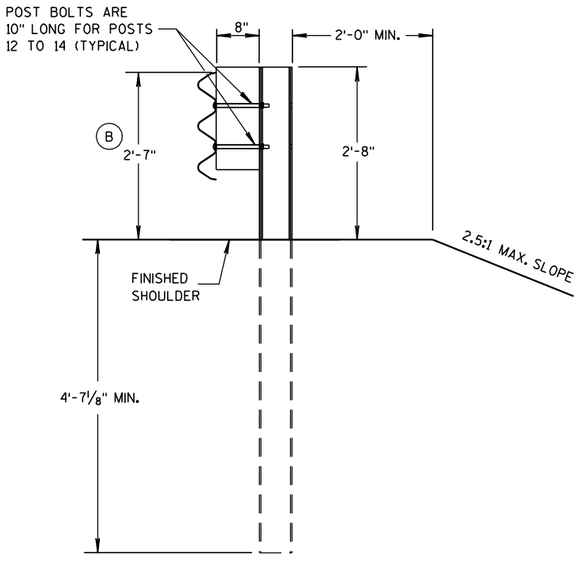
SECTION C-C

POSTS 7-11





THRIE BEAM TERMINAL CONNECTOR



SECTION D-D

POSTS 12-14

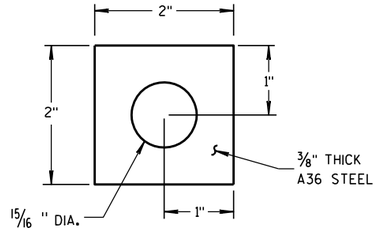
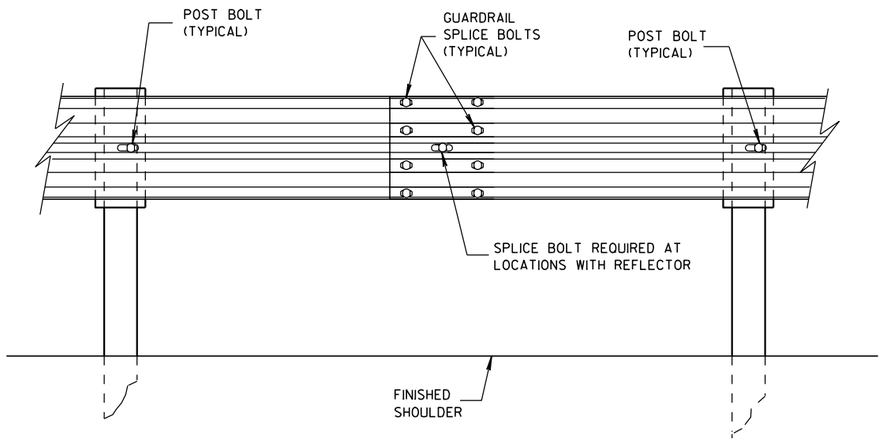
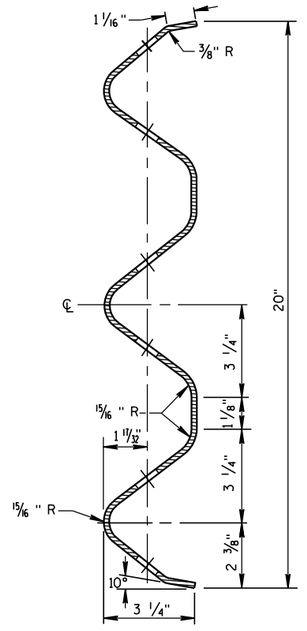


PLATE WASHER DETAIL



SPLICE DETAIL

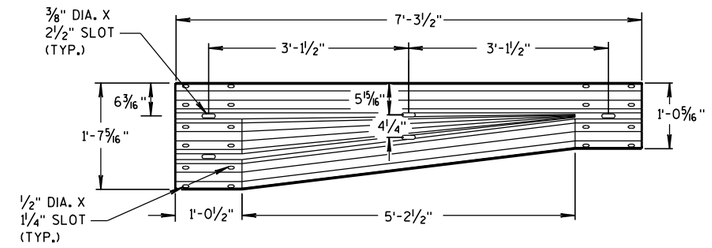


SECTION THRU THRIE BEAM RAIL ELEMENT

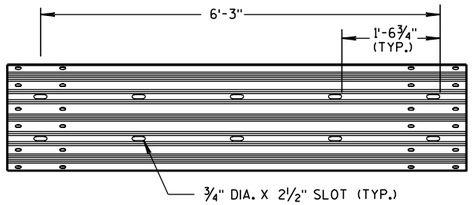
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

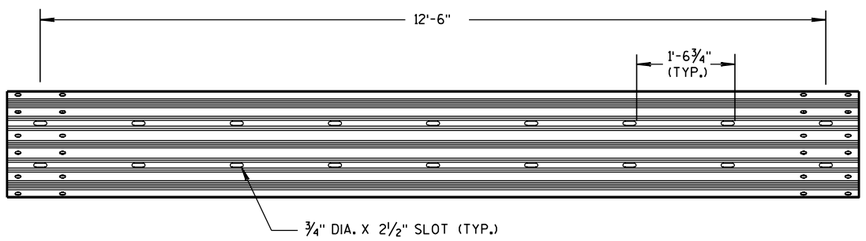
6
S.D.D. 14 B 45-3b



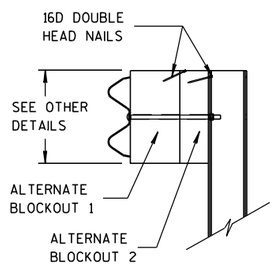
W-BEAM TO THRIE BEAM TRANSITION SECTION



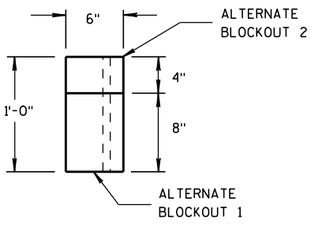
6'-3" THRIE BEAM SECTION



12'-6" THRIE BEAM SECTION

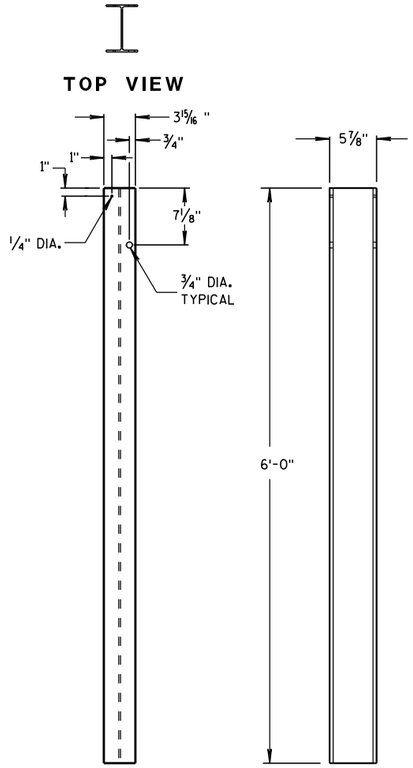


SIDE VIEW

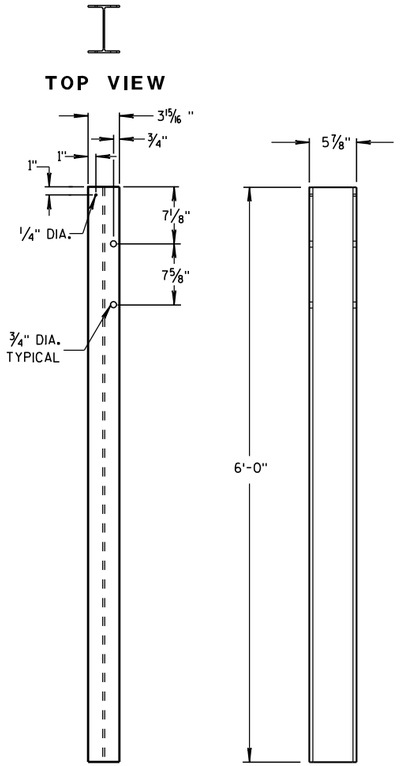


TOP VIEW

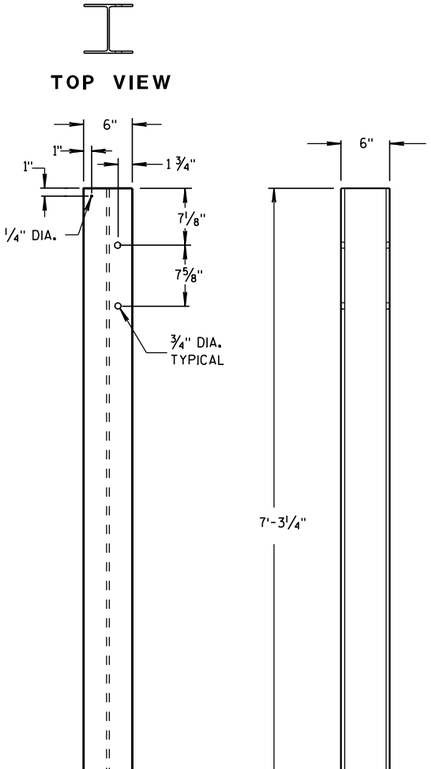
ALTERNATE WOOD BLOCKOUT DETAIL



STEEL POSTS 1-5

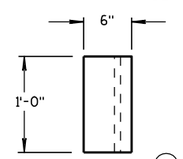


STEEL POSTS 6-11

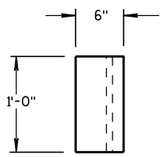


STEEL POSTS 12-14

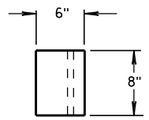
1 WOOD BLOCKS MAY BE CONSTRUCTED OUT OF 2 WOOD BLOCKS. SEE ALTERNATE WOOD BLOCK DETAIL.



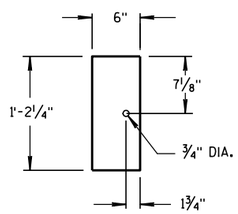
TOP VIEW (1)



TOP VIEW (1)

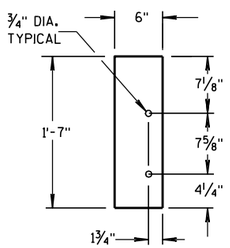


TOP VIEW



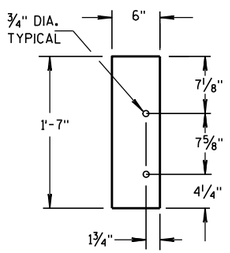
FRONT VIEW

BLOCKOUT POSTS 1-5



FRONT VIEW

BLOCKOUT POSTS 6-11



FRONT VIEW

BLOCKOUT POSTS 12-14

STEEL POST SIZES

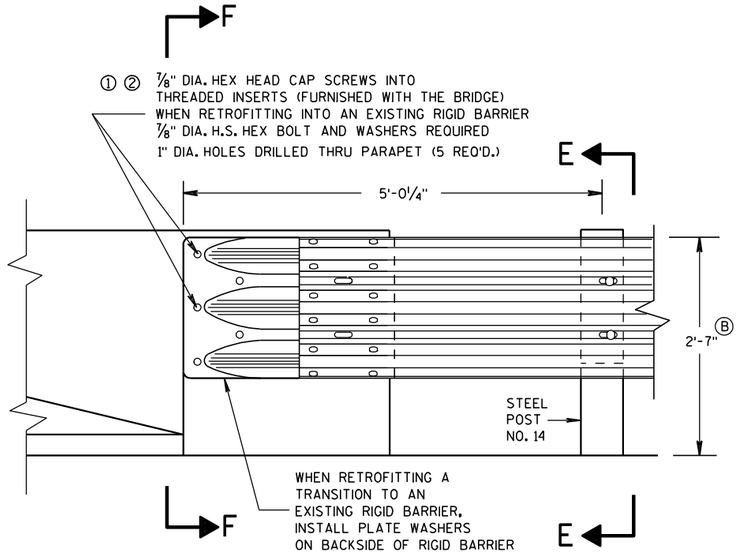
POST NUMBER	SECTION TYPE	LENGTH
1	W6x9	72"
2	W6x9	72"
3	W6x9	72"
4	W6x9	72"
5	W6x9	72"
6	W6x9	72"
7	W6x9	72"
8	W6x9	72"
9	W6x9	72"
10	W6x9	72"
11	W6x9	72"
12	W6x15	87 1/8"
13	W6x15	87 1/8"
14	W6x15	87 1/8"

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

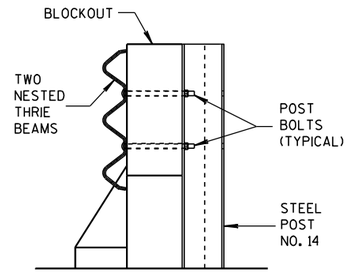
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

S.D.D. 14 B 45-3c



FRONT VIEW



SECTION E-E

GENERAL NOTES

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

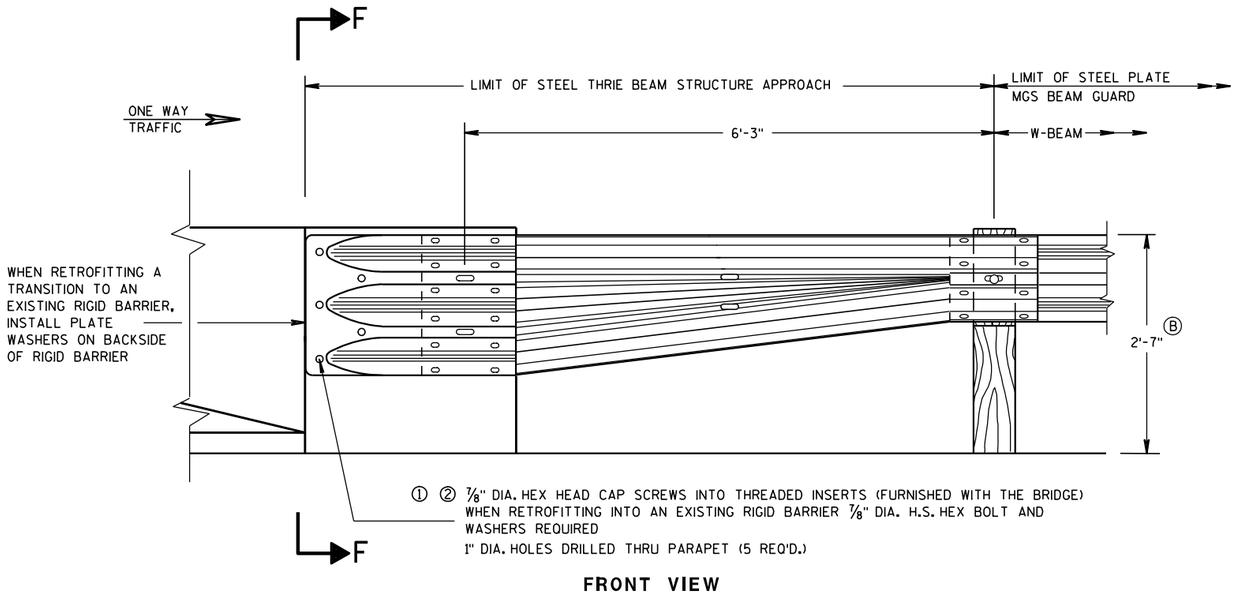
① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM 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.

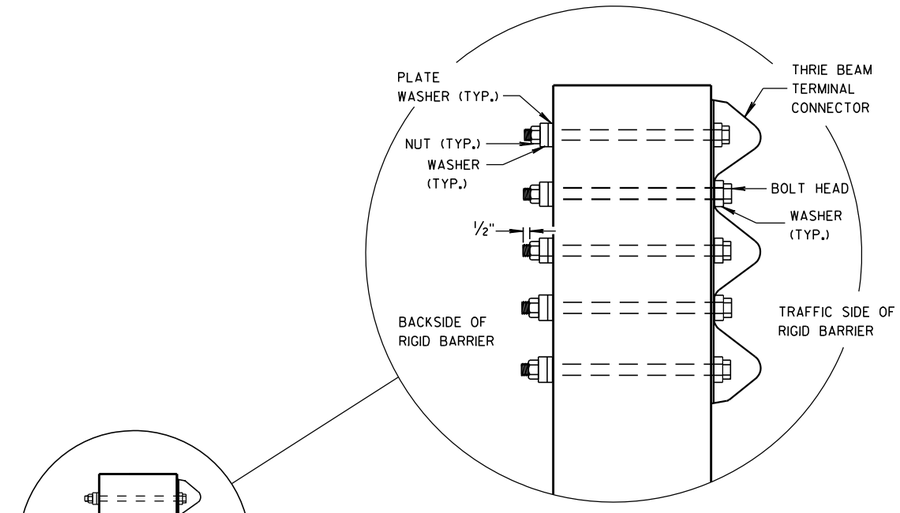
③ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".

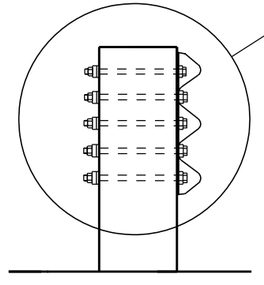
Ⓑ TOLERANCE FOR TOP OF BEAM IS ± 1".

THRIE BEAM CONNECTION TO BRIDGE PARAPET WITH SQUARE ENDS



FRONT VIEW





SECTION F-F

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

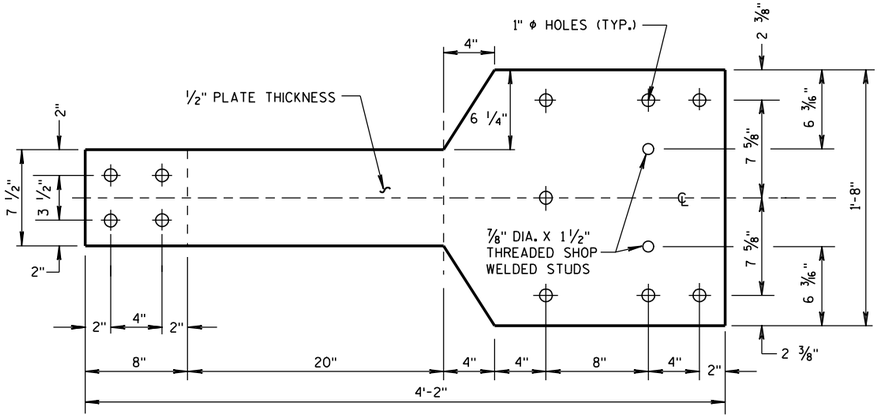
8/31/2012 — DATE

/S/ Jerry H. [illegible] — ROADWAY STANDARDS [illegible] ENGINEER

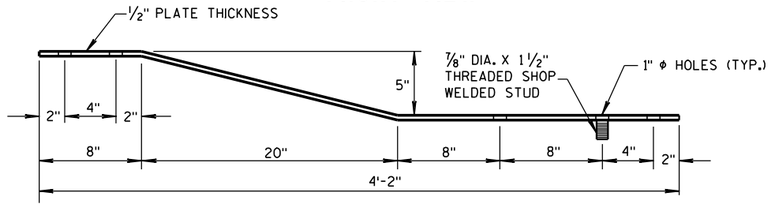
FHWA

GENERAL NOTES

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

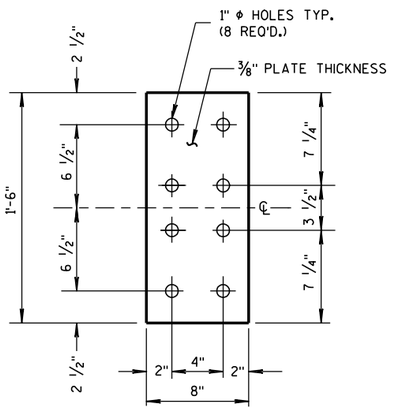


FRONT VIEW



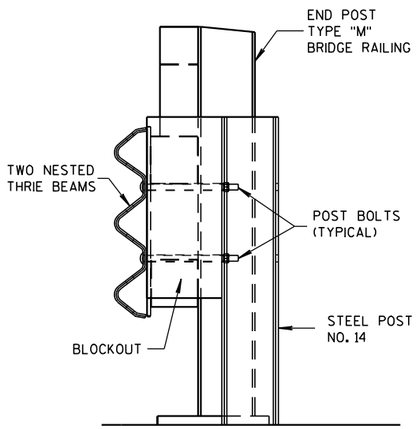
PLAN VIEW

BACK-UP PLATE DETAIL, TYPE "M"

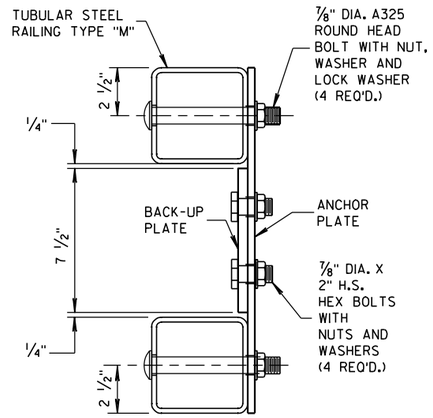


FRONT VIEW

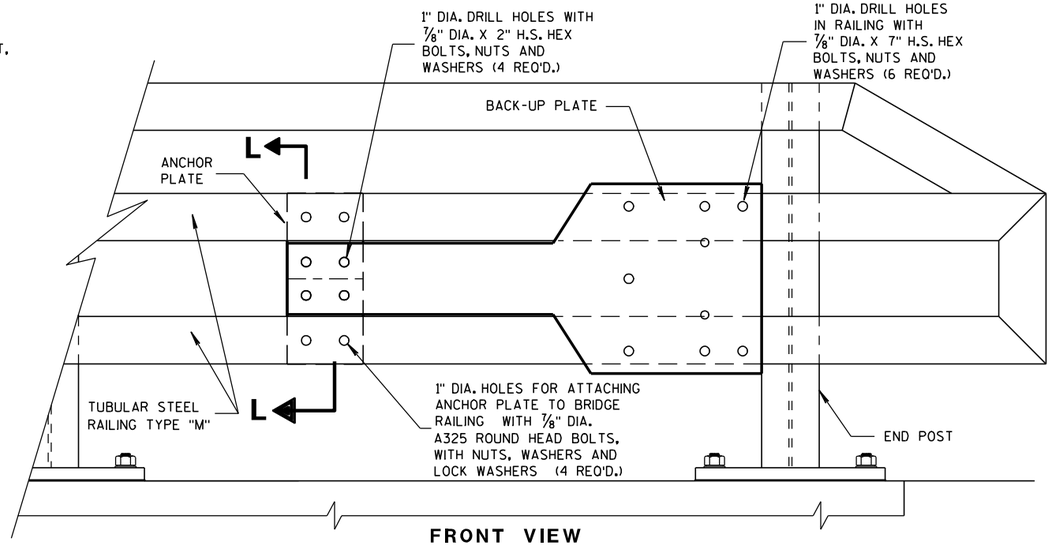
ANCHOR PLATE DETAIL, TYPE "M"



SECTION M-M

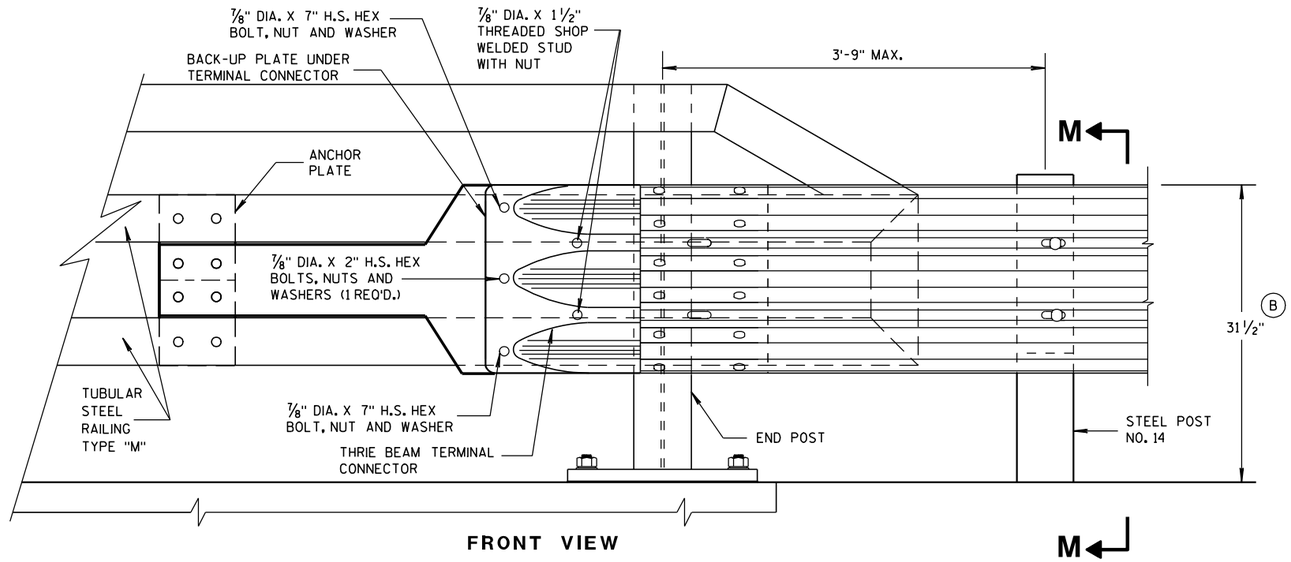


SECTION L-L

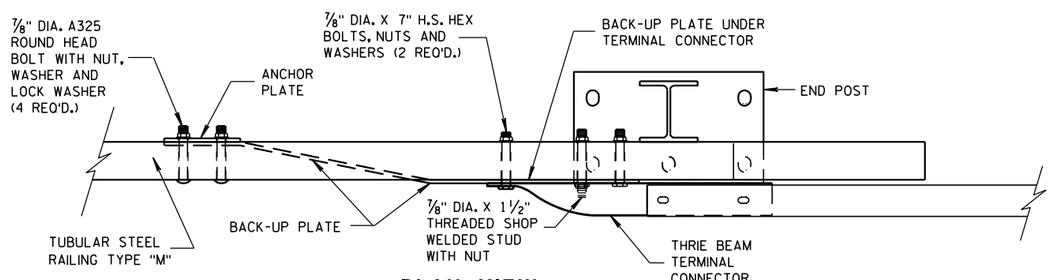


FRONT VIEW

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



FRONT VIEW



PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8-31-2012
DATE

/S/ Jerry H. Zogg
ROADWAY STANDARDS ENGINEER

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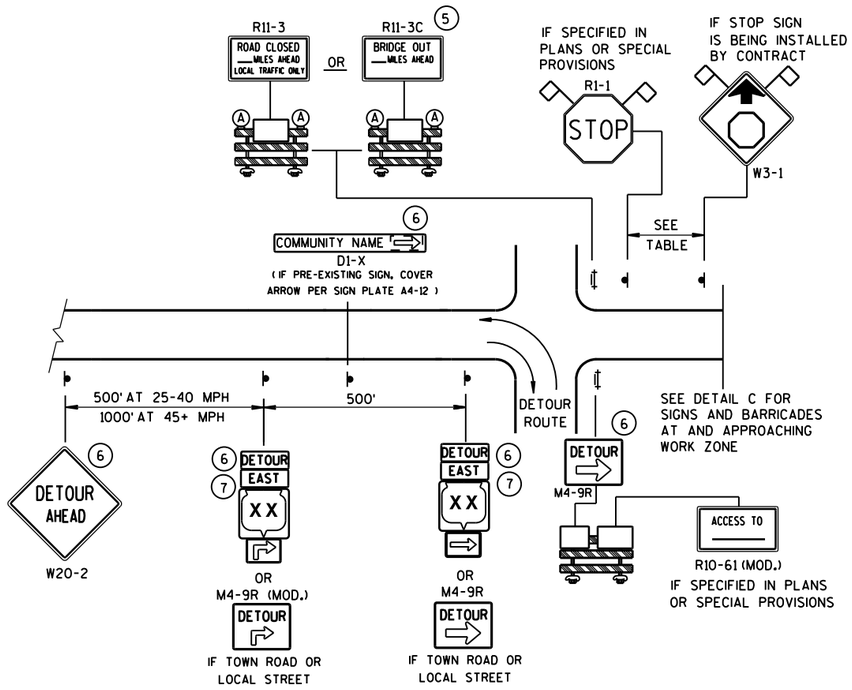
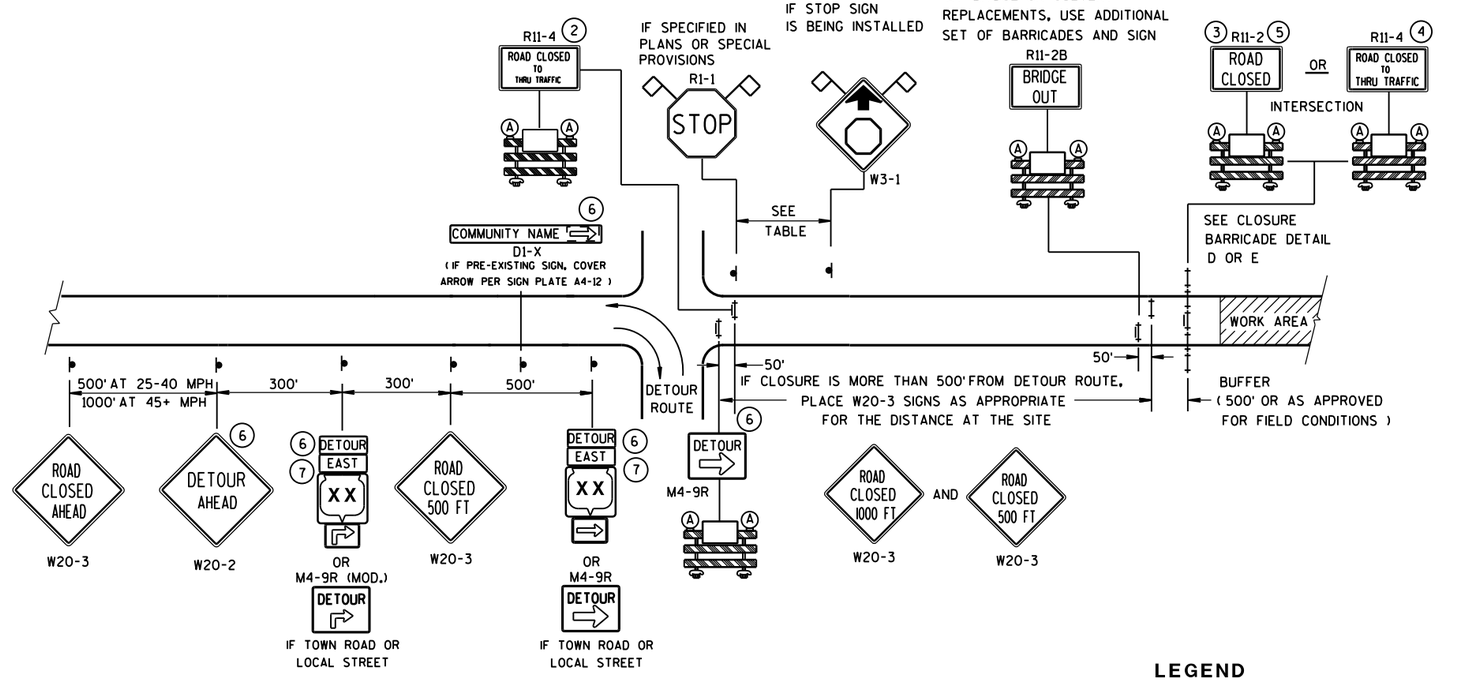
FHWA



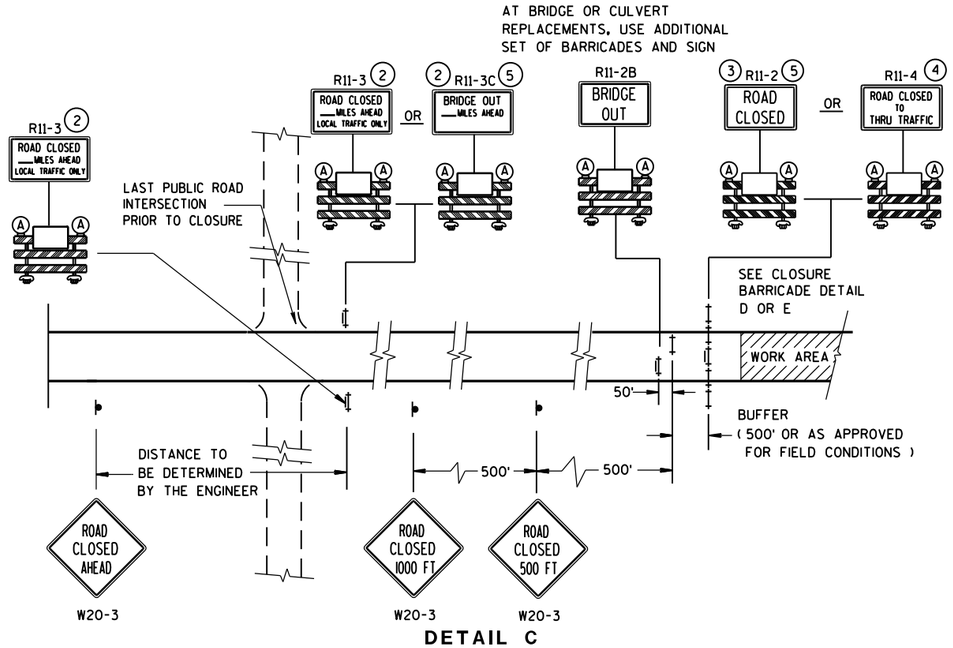
DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR

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

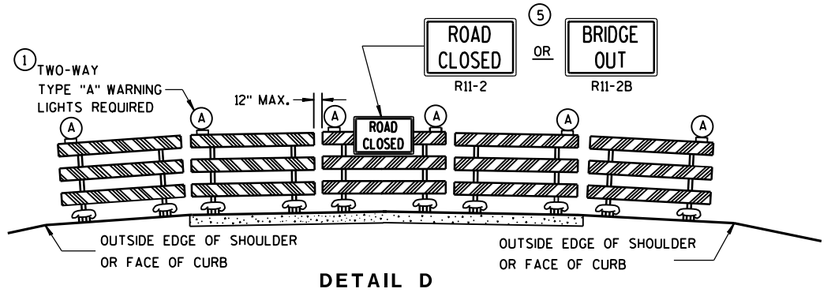
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

8/2013 DATE — /S/ Travis Feltes STATE TRAFFIC ENGINEER — DESIGN

FHWA

6

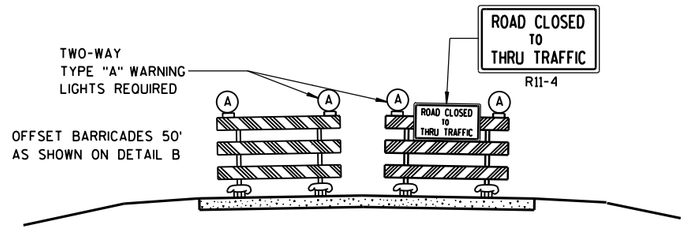
S.D.D. 15 C 2-5a



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.

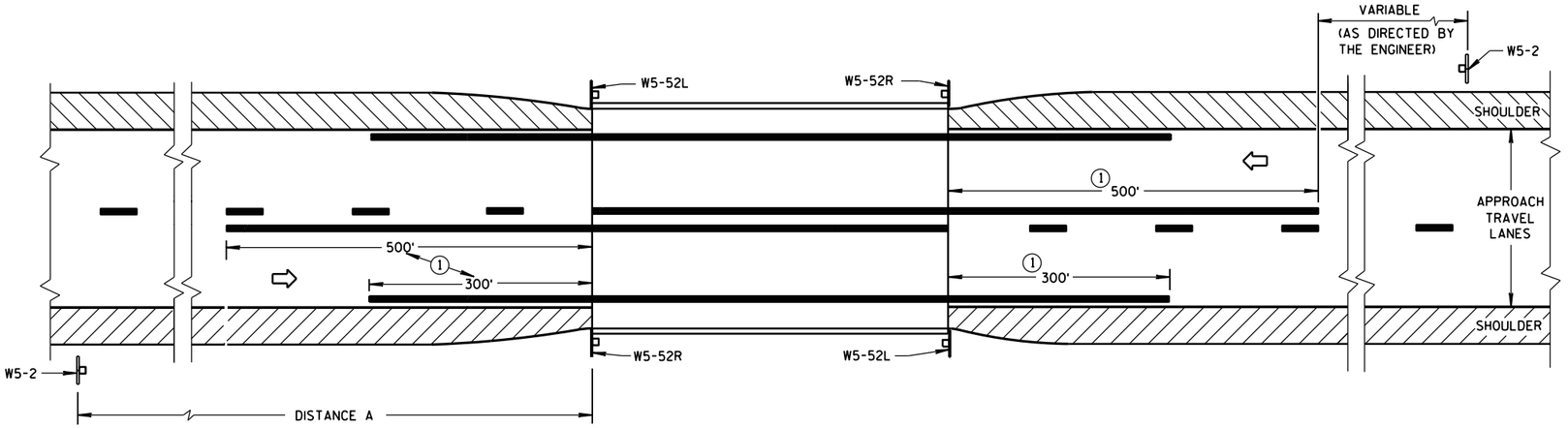
BARRICADES AND SIGNS FOR MAINLINE CLOSURES

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.

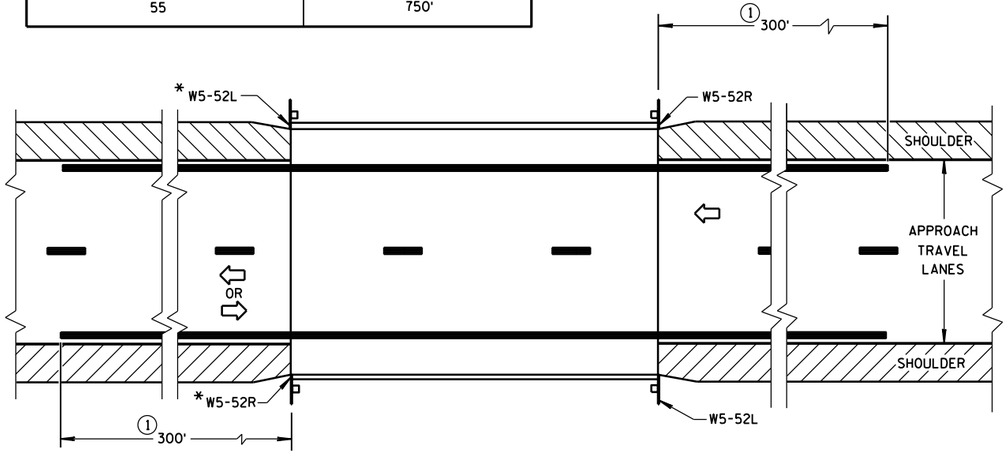
DISTANCE TABLE

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

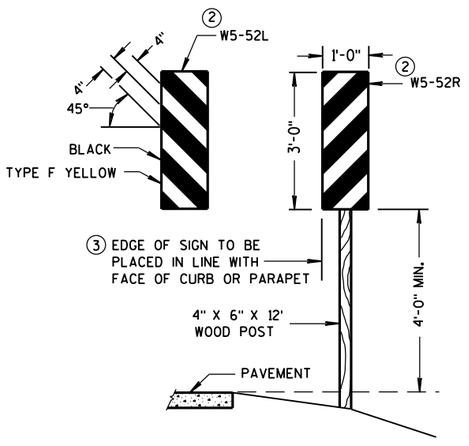


*OMIT ON ONE-WAY TRAVELLED WAYS

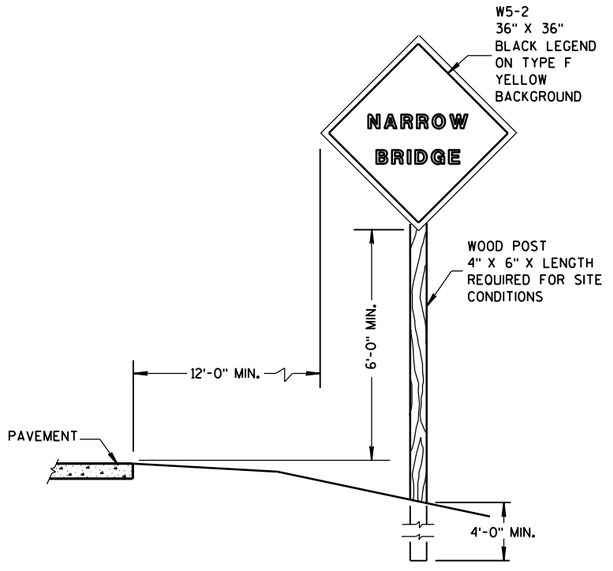
SITUATION 2

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.



OBJECT MARKER PLACEMENT



SIGN PLACEMENT

SIGNING & MARKING FOR TWO LANE BRIDGES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

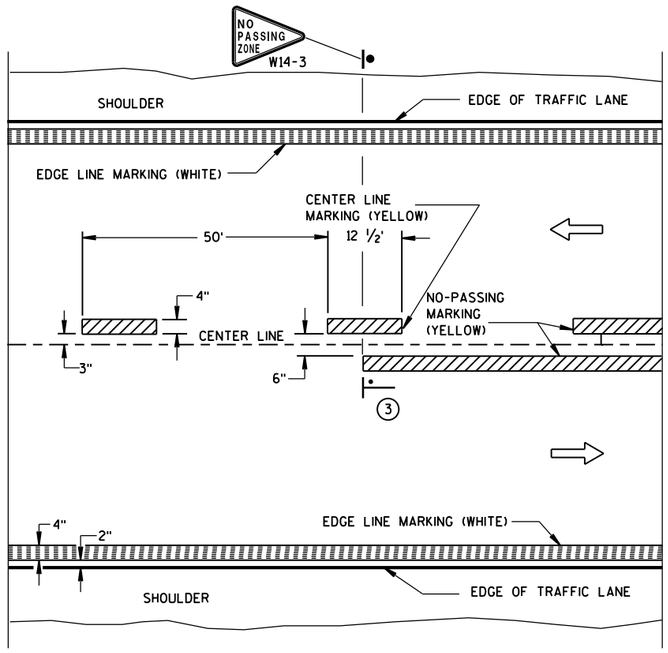
APPROVED

3-2014 DATE — /S/ Travis Feltes STATE TRAFFIC ENGINEER — SIGN

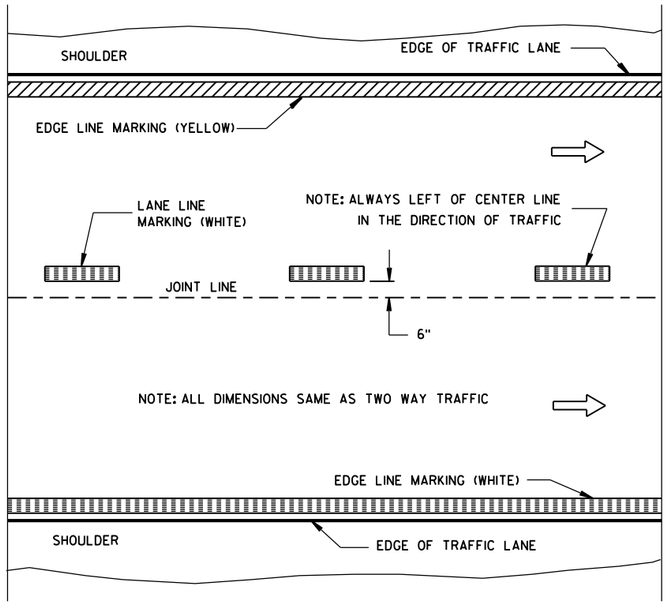
FHWA

6

S.D.D. 15 C 6-7

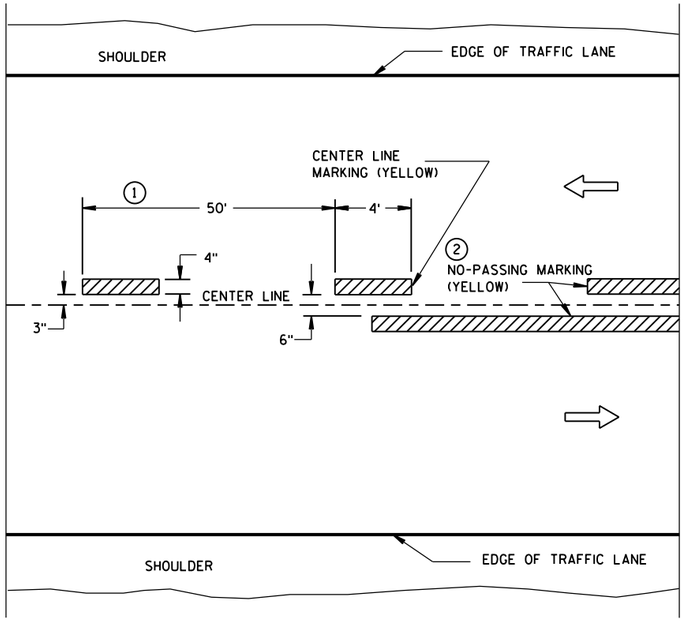


TWO WAY TRAFFIC

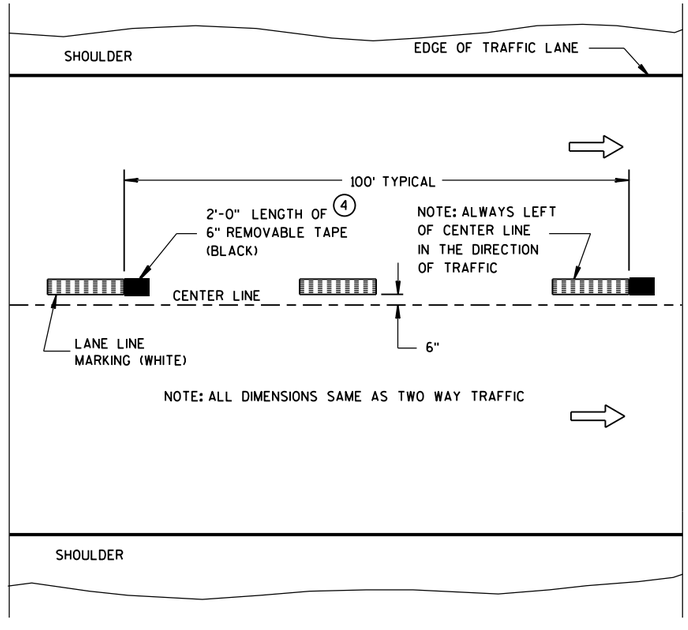


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY (INTERMEDIATE) PAVEMENT MARKING

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

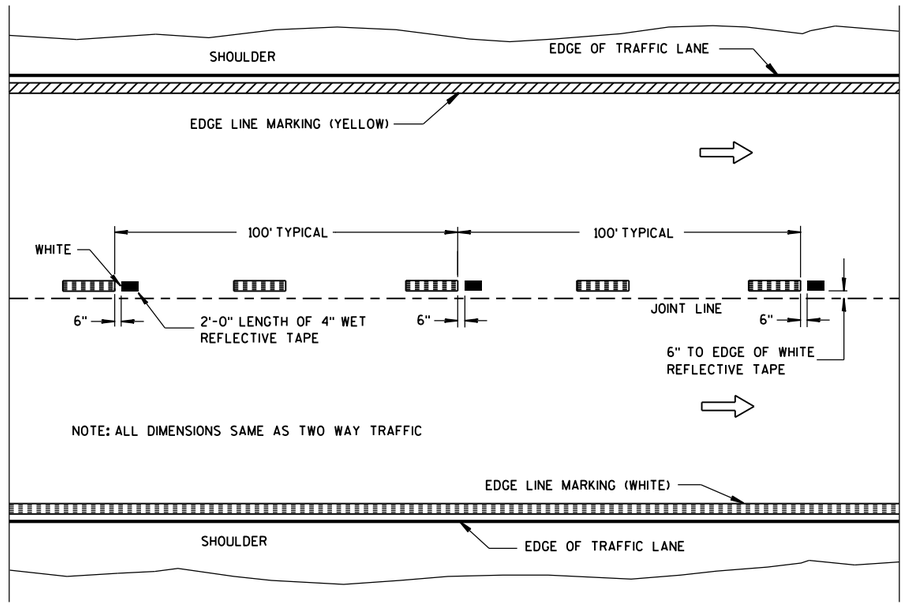
GENERAL NOTES

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

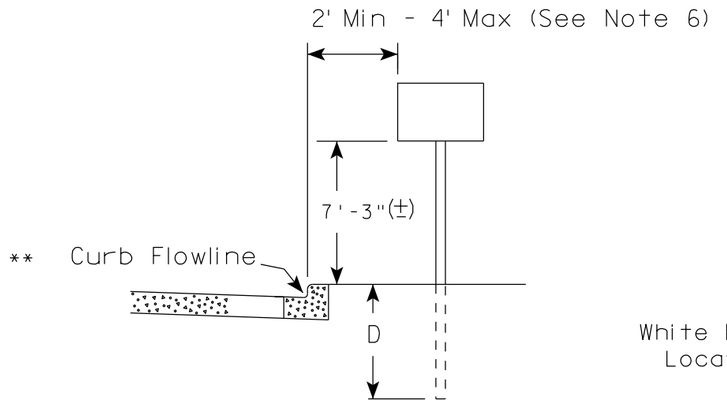
6

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

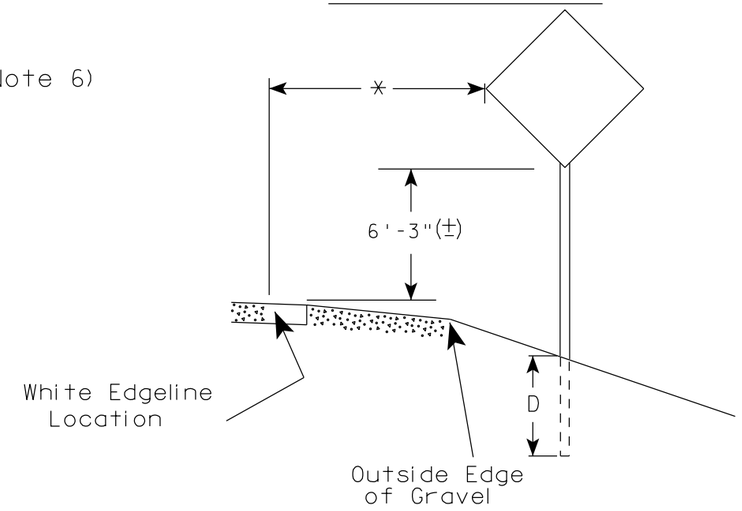
6

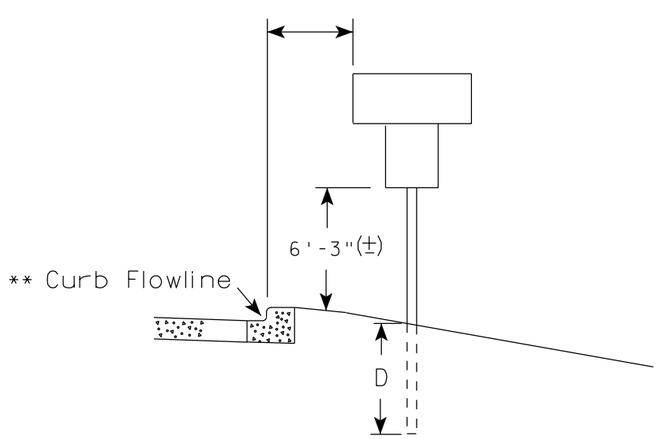
S.D.D. 15 C 8-16a

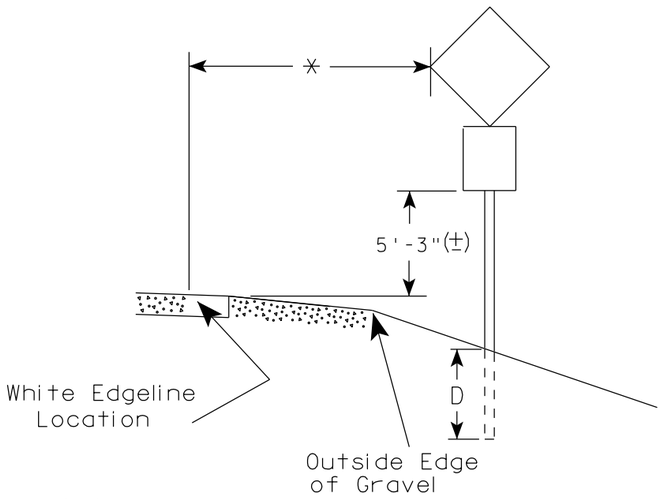
URBAN AREA



RURAL AREA (See Note 2)







GENERAL NOTES

1. Signs wider than 4 feet, 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" (±).

POST EMBEDMENT DEPTH

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

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

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

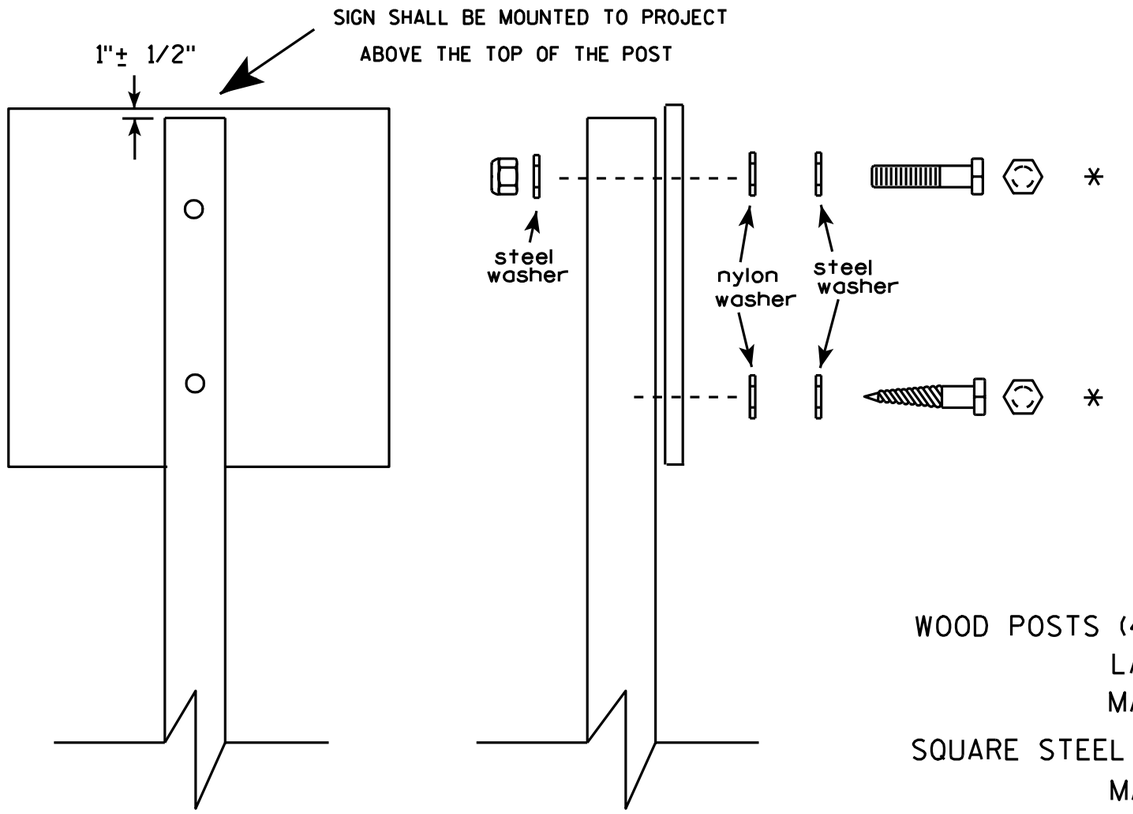
TYPICAL INSTALLATION OF PERMANENT TYPE II SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 11/12/14 PLATE NO. A4-3.19

PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E



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

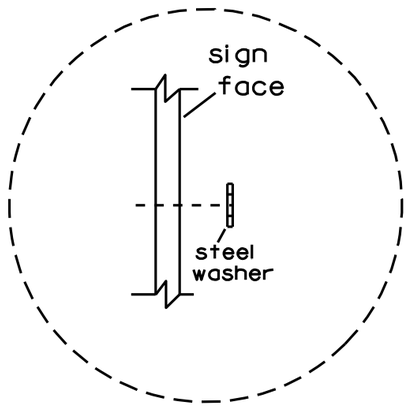
b. Electro-galvanized in accordance with ASTM Designation : B 633, TYPE III, SC 3.

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

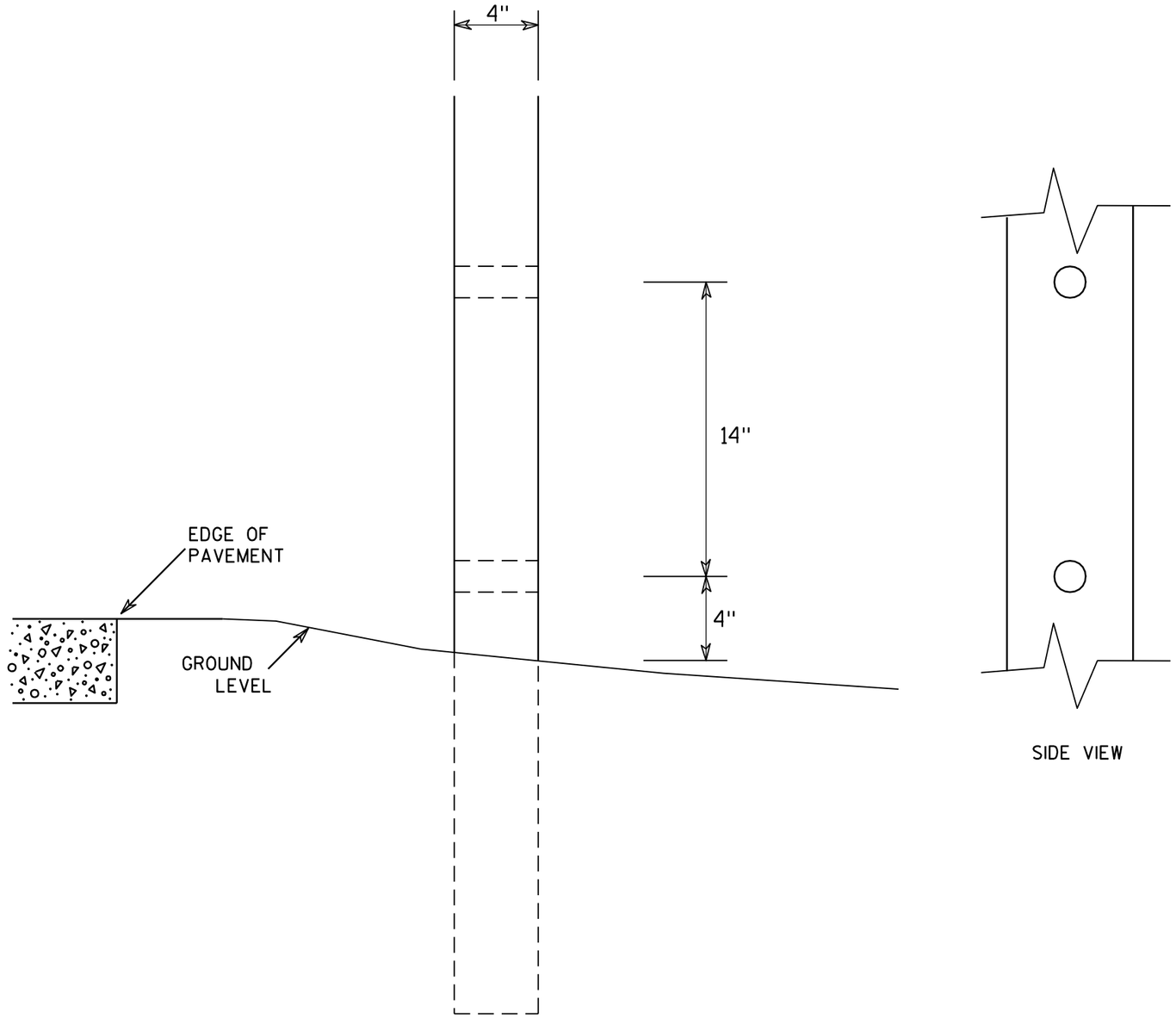
* Two different fastening systems are shown for illustration purposes. On any individual sign, either one or the other system shall be used. Actual number of fasteners per sign varies with the sign area, but normally there are two. For a single post installation, all signs greater than 9 sq. ft. require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



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.

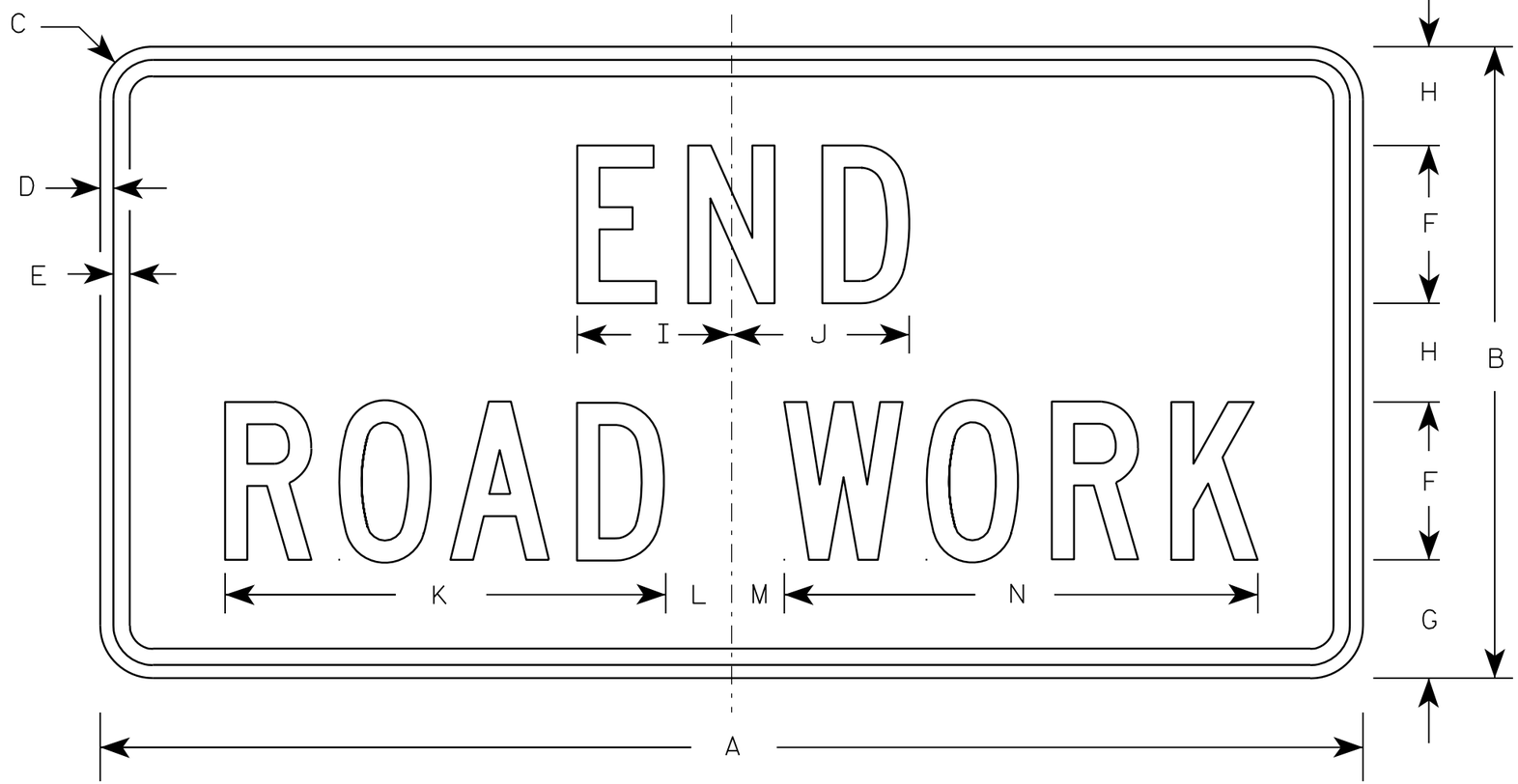
4 X 6 WOOD POST MODIFICATIONS

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: 47	E



G20-2A

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 - 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.

Metric equivalent for this sign is:

SIZE	
1	900 mm X 450 mm
2	1200 mm X 600 mm
3	1200 mm X 600 mm
4	1200 mm X 600 mm
5	1200 mm X 600 mm

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.	Area m2
1	36	18	1 1/8	3/8	1/2	4	3 3/4	2 1/2	4 1/8	4 1/8	11 1/8	2	1	12 1/8													4.5	0.41
2	48	24	1 1/2	1/2	5/8	6	4 1/2	3 3/4	5 7/8	6 3/4	16 3/4	2 1/2	1 3/4	18 1/2													8.0	0.72
3	48	24	1 1/2	1/2	5/8	6	4 1/2	3 3/4	5 7/8	6 3/4	16 3/4	2 1/2	1 3/4	18 1/2													8.0	0.72
4	48	24	1 1/2	1/2	5/8	6	4 1/2	3 3/4	5 7/8	6 3/4	16 3/4	2 1/2	1 3/4	18 1/2													8.0	0.72
5	48	24	1 1/2	1/2	5/8	6	4 1/2	3 3/4	5 7/8	6 3/4	16 3/4	2 1/2	1 3/4	18 1/2													8.0	0.72

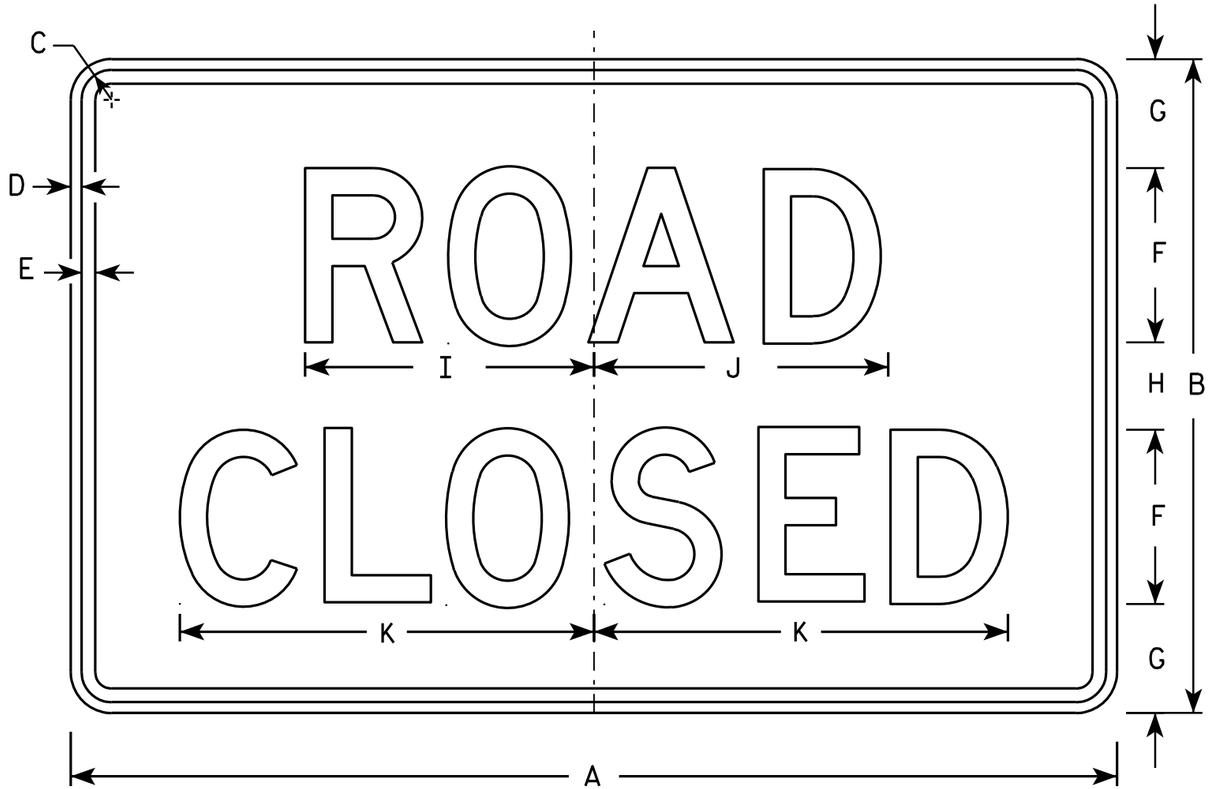
STANDARD SIGN
G20-2A

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 9/30/09 PLATE NO. G20-2A.8

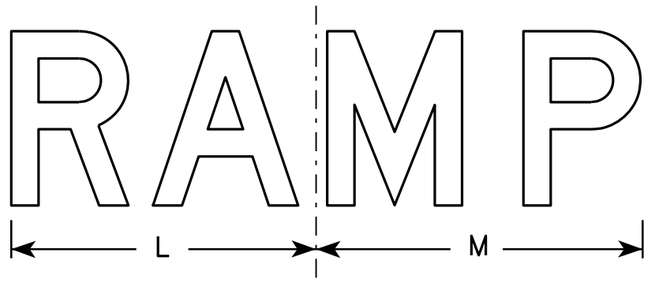
PROJECT NO:	HWY:	COUNTY:		SHEET NO: 48	E



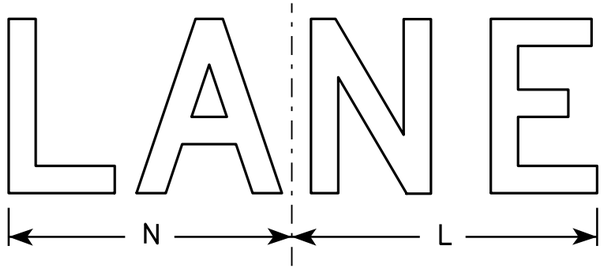
R11-2

NOTES

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



R11-2R



R11-2L

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	48	30	1 3/8	1/2	5/8	8	5	4	13 1/4	13 1/2	19	14	15	13													10.0
2M	48	30	1 3/8	1/2	5/8	8	5	4	13 1/4	13 1/2	19	14	15	13													10.0
3	48	30	1 3/8	1/2	5/8	8	5	4	13 1/4	13 1/2	19	14	15	13													10.0
4	48	30	1 3/8	1/2	5/8	8	5	4	13 1/4	13 1/2	19	14	15	13													10.0
5	48	30	1 3/8	1/2	5/8	8	5	4	13 1/4	13 1/2	19	14	15	13													10.0

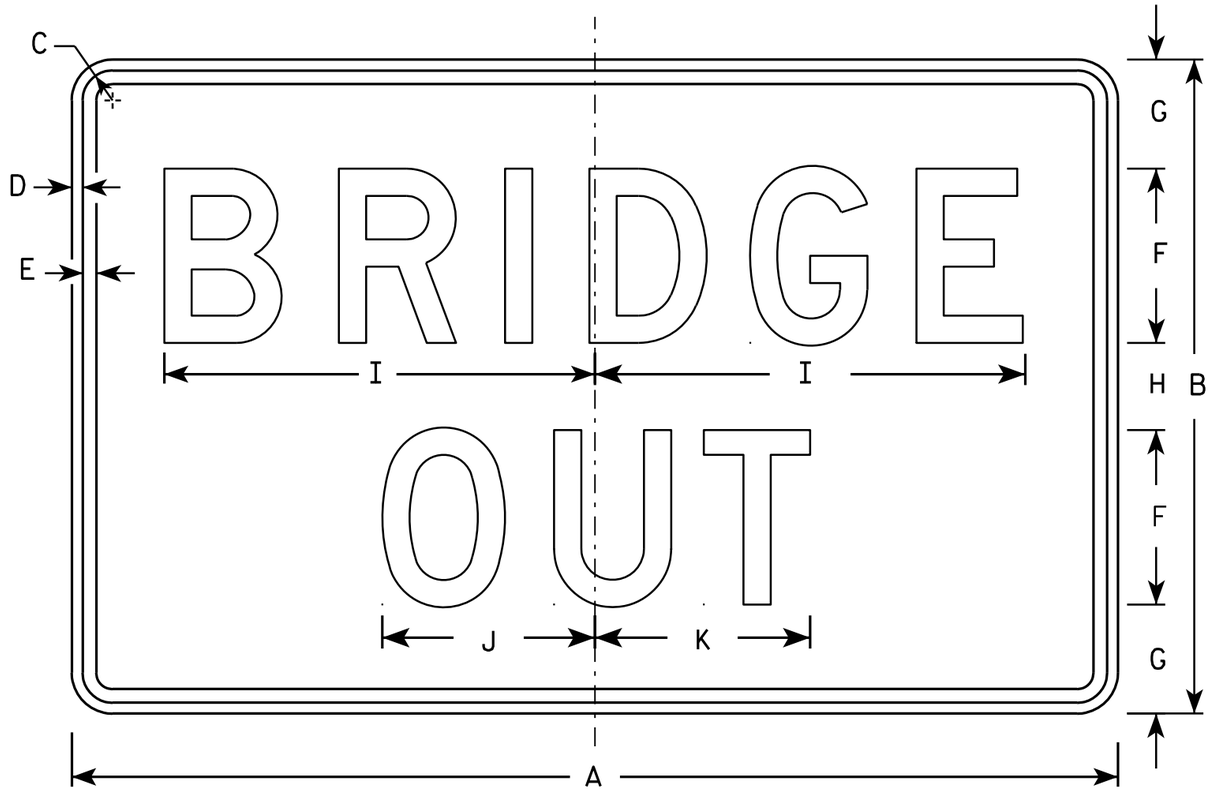
STANDARD SIGN
R11-2

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 4/1/11 PLATE NO. R11-2.10

PROJECT NO:	HWY:	COUNTY:		SHEET NO: 49	E



R11-2B

NOTES

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

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	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
2M	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
3	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
4	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
5	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0

STANDARD SIGN
R11-2B

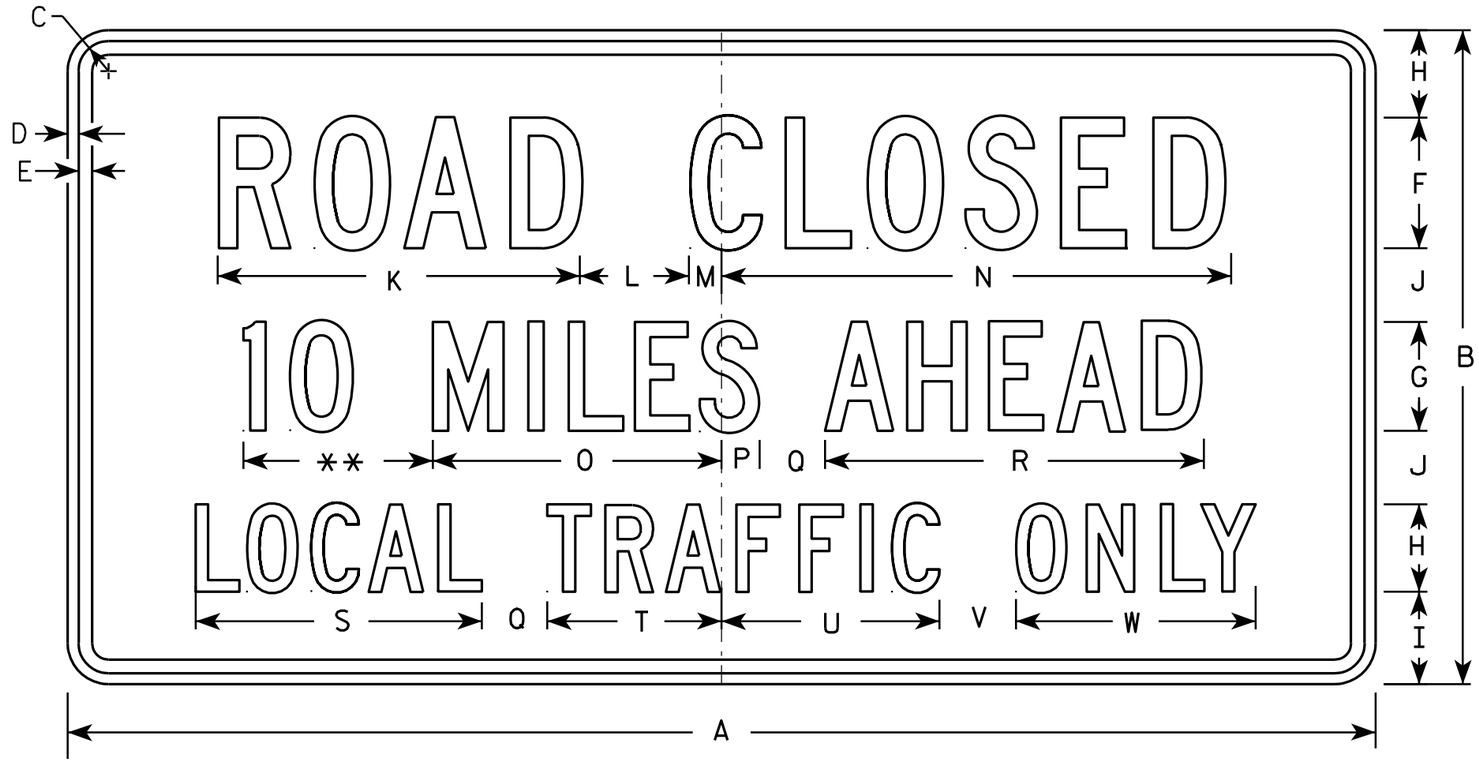
WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 4/1/11 PLATE NO. R11-2B.2

PROJECT NO:

SHEET NO: 50 E



R11-3

NOTES

1. Sign is Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - White
   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.
5. Substitute appropriate numerals and optically adjust spacing to achieve proper balance.

** See Note 5

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	18	1 3/8	1/2	5/8	4	3	2 1/2	2	2	11 1/8	3	1 1/8	15 1/4	8	1 1/2	2	10 3/4	8 3/8	4 3/4	6 1/2	2	6 3/4				4.5
2S	60	30	1 3/8	1/2	5/8	6	5	4	4 1/4	3 3/8	16 5/8	5	1 1/2	23	13 1/4	1 3/4	3	17 3/8	13 1/8	8	10	3 1/2	11				12.5
2M	60	30	1 3/8	1/2	5/8	6	5	4	4 1/4	3 3/8	16 5/8	5	1 1/2	23	13 1/4	1 3/4	3	17 3/8	13 1/8	8	10	3 1/2	11				12.5
3																											
4																											
5																											

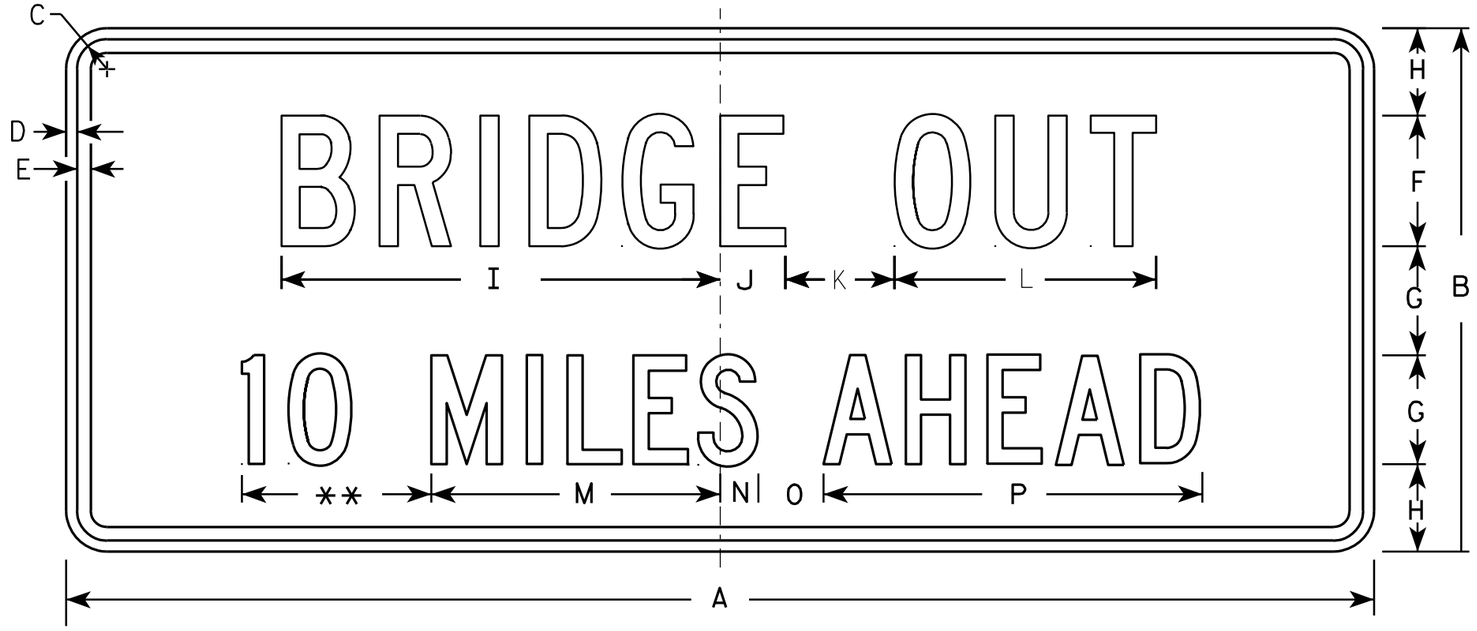
STANDARD SIGN
R11-3

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 4/1/11 PLATE NO. R11-3.6

PROJECT NO: | HWY: | COUNTY: | SHEET NO: 51 | E



R11-3C

NOTES

1. Sign is Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - White
   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.
5. Substitute appropriate numerals and optically adjust spacing to achieve proper balance.

** See Note 5

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	15	1 3/8	1/2	5/8	4	3	2 1/2	13 1/4	2 1/4	3	8	8	1 1/2	2	10 3/4											3.75
2S	60	24	1 3/8	1/2	5/8	6	5	4	20 1/8	3	5	12	13 1/4	1 3/4	3	17 3/8											10.0
2M	60	24	1 3/8	1/2	5/8	6	5	4	20 1/8	3	5	12	13 1/4	1 3/4	3	17 3/8											10.0
3																											
4																											
5																											

STANDARD SIGN
R11-3C

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 4/1/11 PLATE NO. R11-3C.2

PROJECT NO:

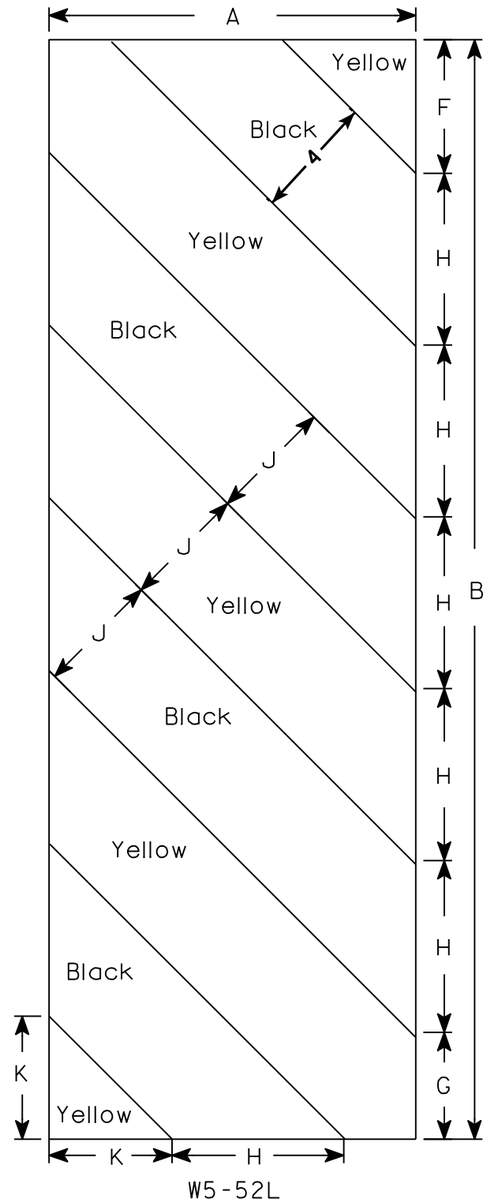
SHEET NO: 52 E

FILE NAME : C:\Users\PROJECTS\tr_stdplate\R113C.DGN PLOT DATE : 01-APR-2011 14:15 PLOT BY : mscj9h

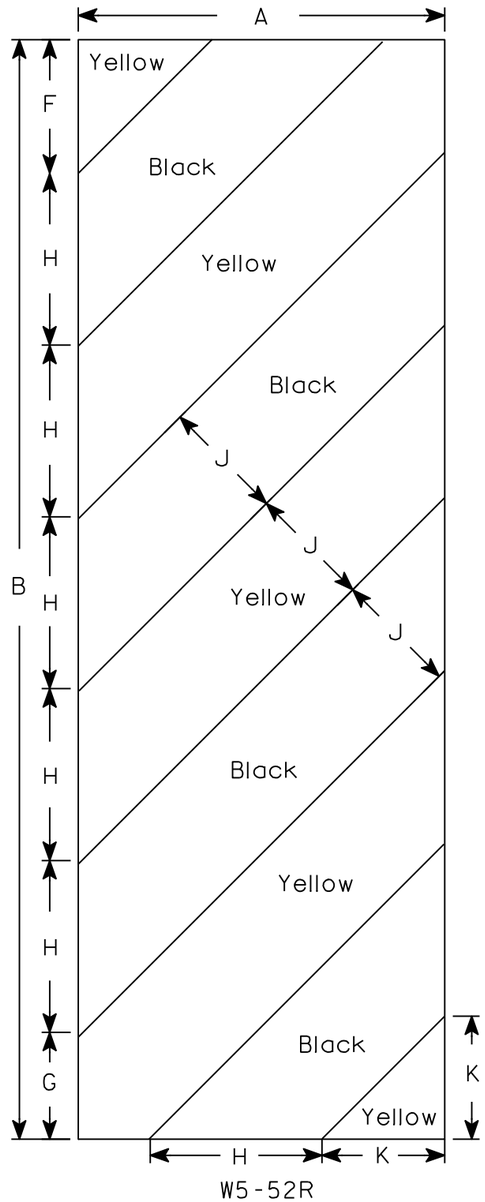
WISDOT/CADDS SHEET 42

7

7



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

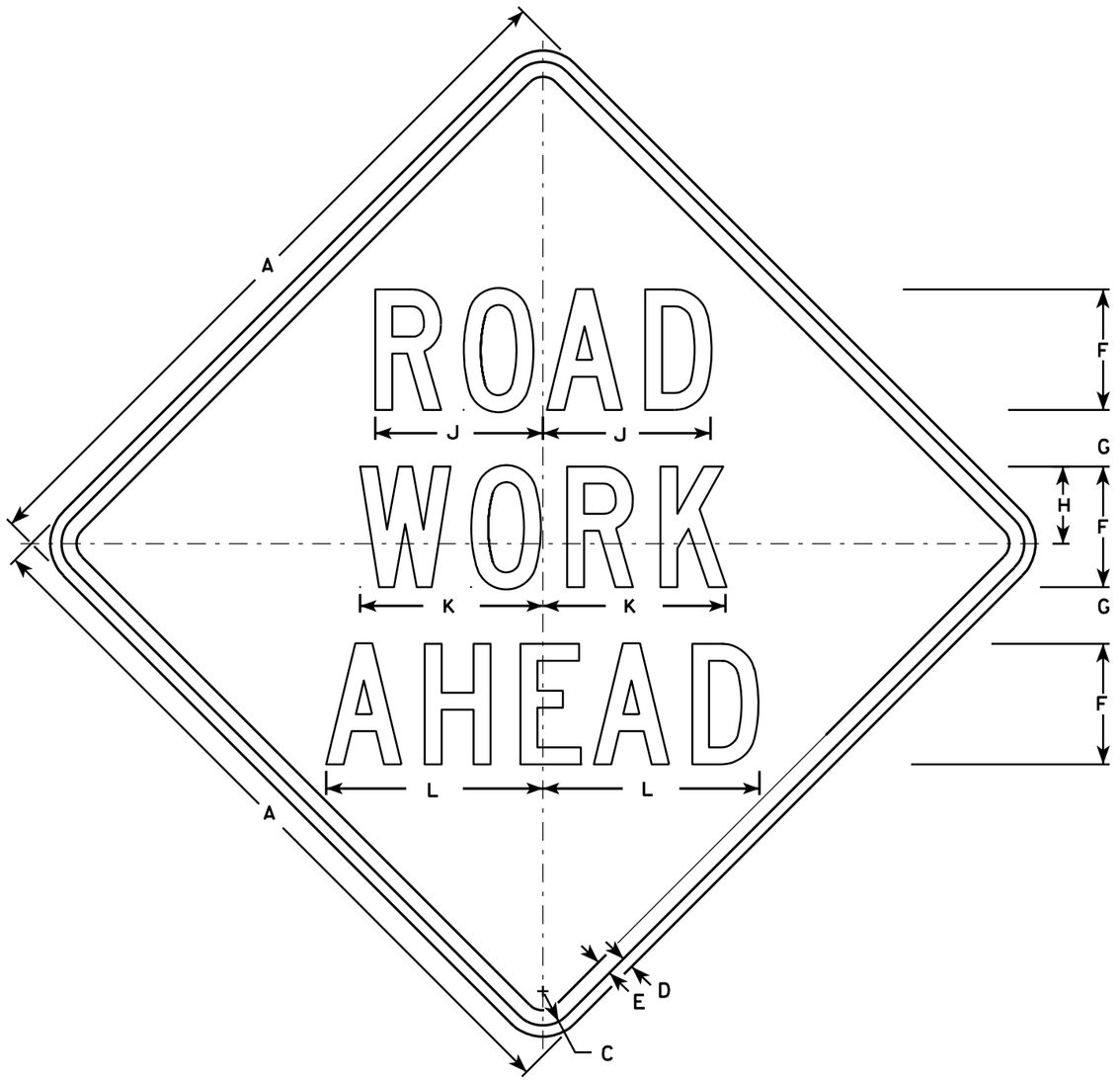
W5-52L & W5-52R

WISCONSIN DEPT OF TRANSPORTATION

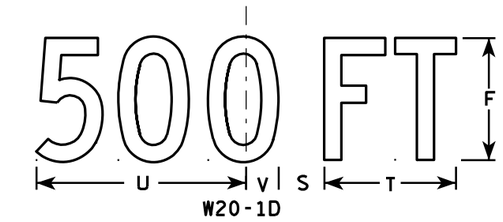
APPROVED Matthew R Rauch
for State Traffic Engineer

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

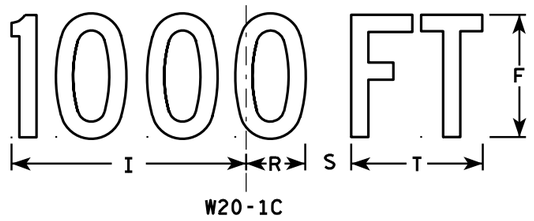
PROJECT NO: | HWY: | COUNTY: | SHEET NO: 53 | E



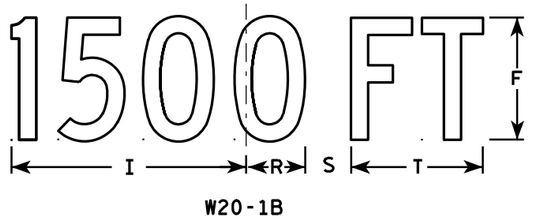
W20-1A



W20-1D

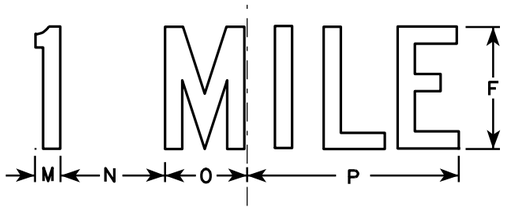


W20-1C



W20-1B

W20-1G



W20-1F

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 - 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	1 7/8	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		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		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		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		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		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 Matthew R Rauch
for State Traffic Engineer

DATE 3/18/11 PLATE NO. W20-1.9

PROJECT NO:

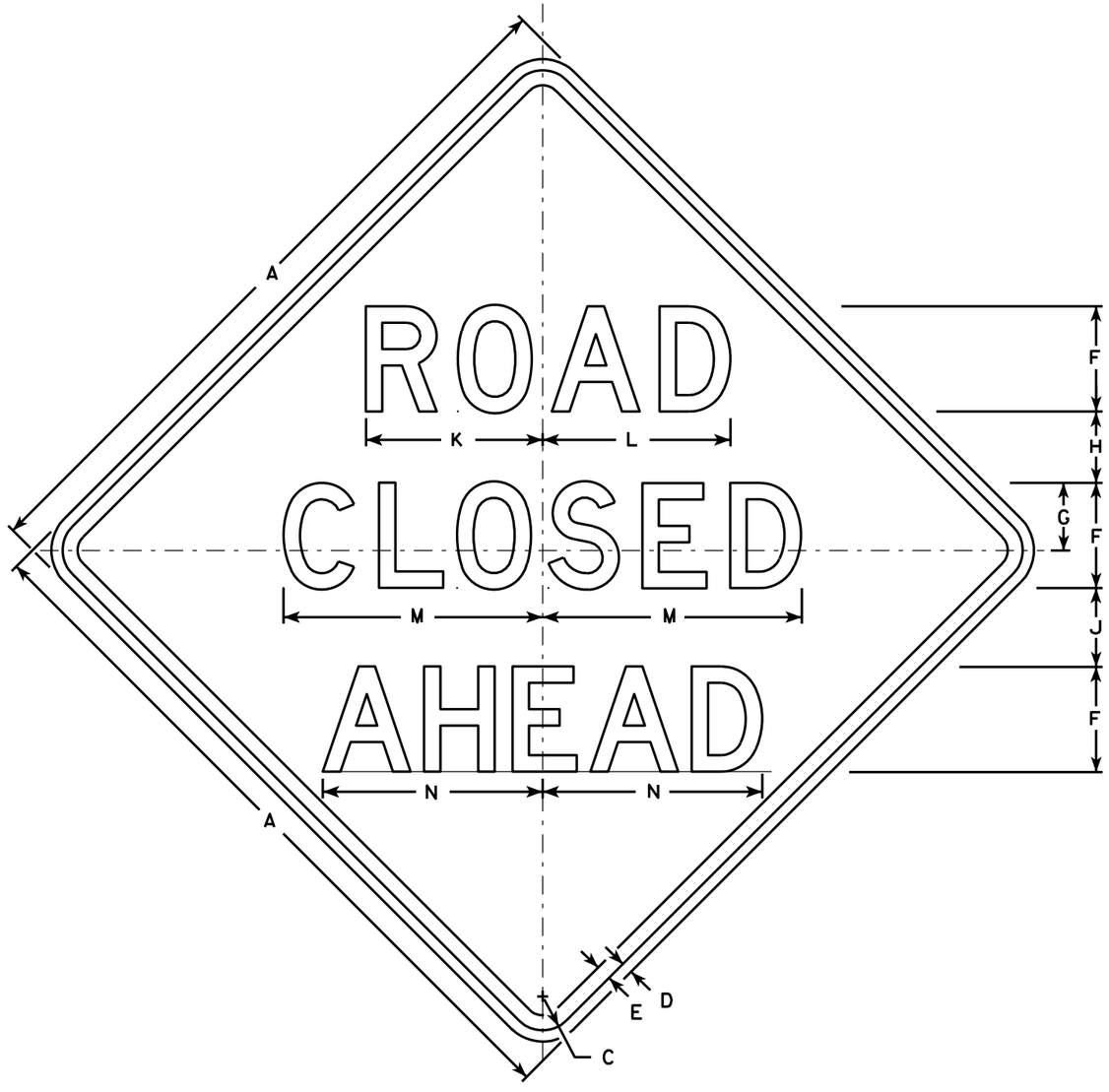
SHEET NO: 54 E

FILE NAME : C:\Users\PROJECTS\tr_stdplate\W201.DGN PLOT DATE : 18-MAR-2011 09:56 PLOT BY : mscj9h

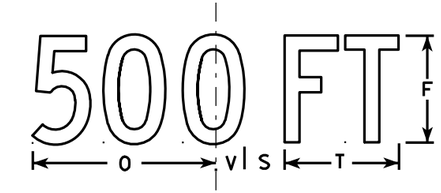
WISDOT/CADDS SHEET 42

7

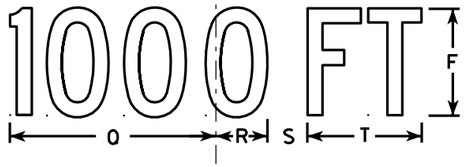
7



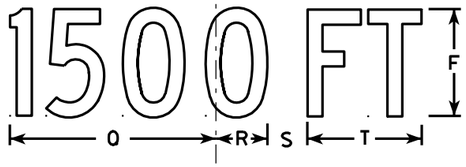
W20-3A



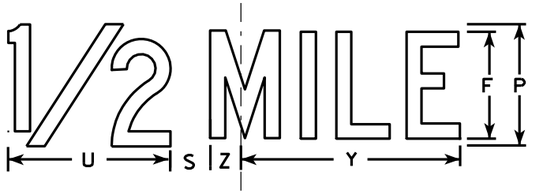
W20-3D



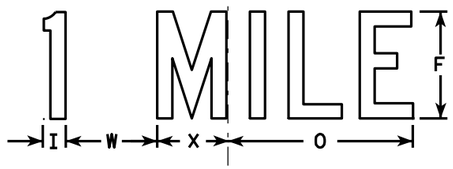
W20-3C



W20-3B



W20-3G



W20-3F

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. Lines 1 and 2 are Series D.
   Line 3 is Series D for AHEAD and Series C for all other distances.

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	5	3 3/8	3 1/2	1 1/8	4	8 3/8	8 7/8	12 1/2	11	9	6	10 1/8	2 1/2	1 7/8	5 5/8	8	1 3/8	4 1/2	3 1/2	10 3/4	1 3/4	9.0
2S	48		2 1/4	3/4	1	7	4 1/2	4 3/4	1 1/2	5 1/4	11 3/4	12 1/2	17 1/4	14 5/8	12	8	13 1/2	3 3/8	2 5/8	7 1/2	10 5/8	1 7/8	6	4 5/8	14 3/8	2 3/8	16.0
2M	48		2 1/4	3/4	1	7	4 1/2	4 3/4	1 1/2	5 1/4	11 3/4	12 1/2	17 1/4	14 5/8	12	8	13 1/2	3 3/8	2 5/8	7 1/2	10 5/8	1 7/8	6	4 5/8	14 3/8	2 3/8	16.0
3	48		2 1/4	3/4	1	7	4 1/2	4 3/4	1 1/2	5 1/4	11 3/4	12 1/2	17 1/4	14 5/8	12	8	13 1/2	3 3/8	2 5/8	7 1/2	10 5/8	1 7/8	6	4 5/8	14 3/8	2 3/8	16.0
4	48		2 1/4	3/4	1	7	4 1/2	4 3/4	1 1/2	5 1/4	11 3/4	12 1/2	17 1/4	14 5/8	12	8	13 1/2	3 3/8	2 5/8	7 1/2	10 5/8	1 7/8	6	4 5/8	14 3/8	2 3/8	16.0
5	48		2 1/4	3/4	1	7	4 1/2	4 3/4	1 1/2	5 1/4	11 3/4	12 1/2	17 1/4	14 5/8	12	8	13 1/2	3 3/8	2 5/8	7 1/2	10 5/8	1 7/8	6	4 5/8	14 3/8	2 3/8	16.0

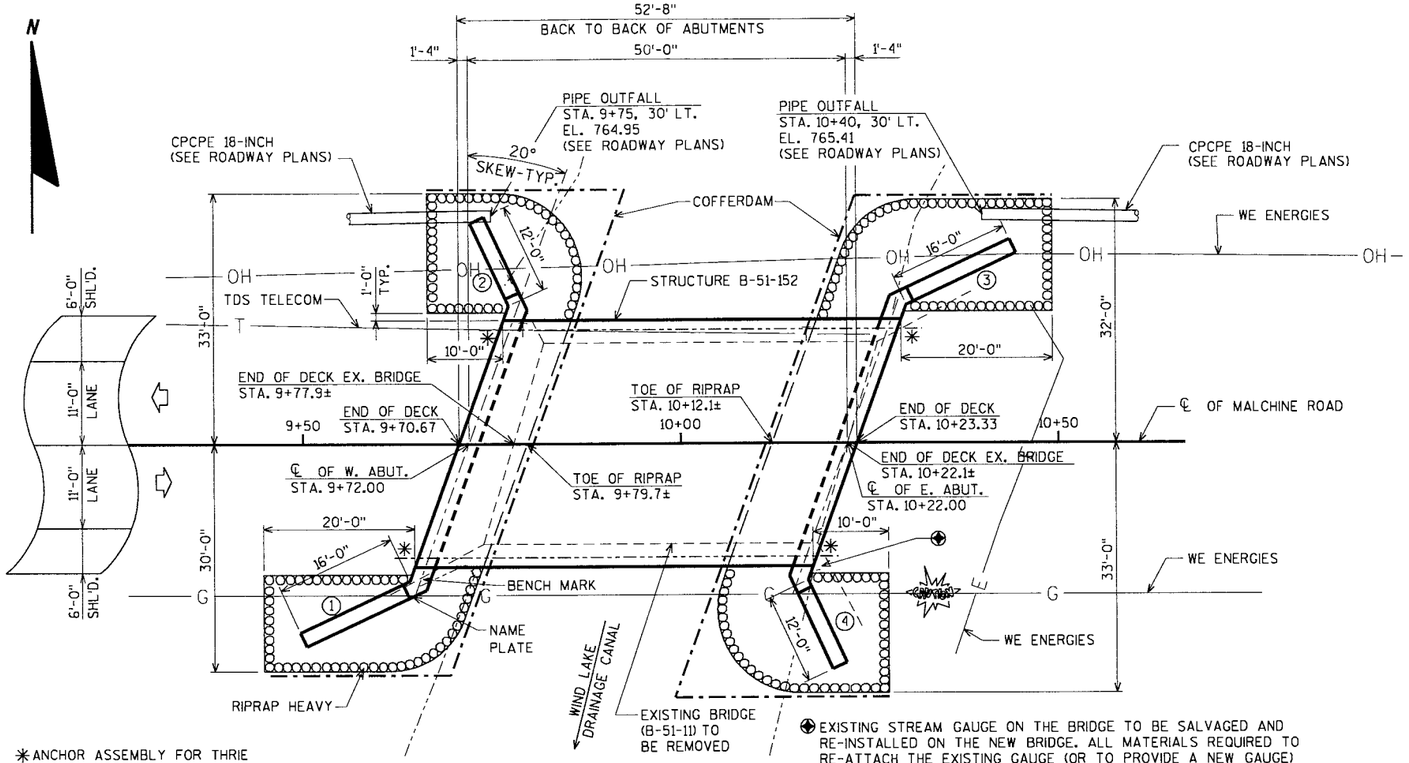
STANDARD SIGN
W20-3A, B, C, D, F & G

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer
DATE 3/18/11 PLATE NO. W20-3.7

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

STATE PROJECT NUMBER
2699-02-70



✳ANCHOR ASSEMBLY FOR THRIE BEAM TYPE GUARDRAIL.

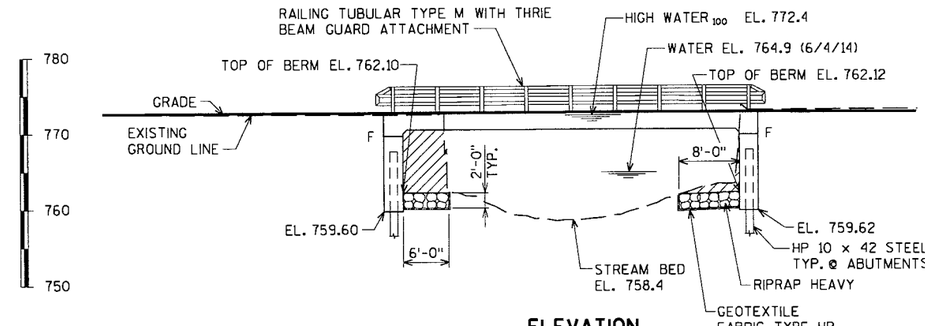
◯ DENOTES WING NUMBER.

PLAN

SINGLE SPAN CONCRETE FLAT SLAB

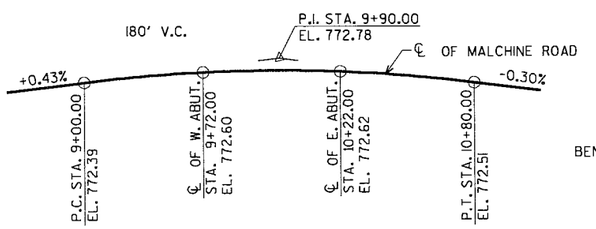
◈EXISTING STREAM GAUGE ON THE BRIDGE TO BE SALVAGED AND RE-INSTALLED ON THE NEW BRIDGE. ALL MATERIALS REQUIRED TO RE-ATTACH THE EXISTING GAUGE (OR TO PROVIDE A NEW GAUGE) SHALL BE PROVIDED BY THE RACINE COUNTY FARM DRAINAGE DISTRICT. COST FOR SALVAGING AND RE-INSTALLING THE GAUGE IS INCLUDED IN THE CONTRACT BID PRICE FOR "CONCRETE MASONRY BRIDGES".

COST OF EXCAVATION IN THE HATCHED AREAS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR "EXCAVATION FOR STRUCTURES BRIDGES B-51-152".



ELEVATION

(NORMAL TO ℄ OF CANAL)

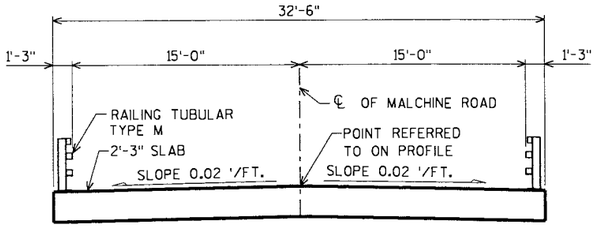


PROFILE GRADE LINE

(MALCHINE ROAD)

BENCH MARK:
CHIS. BOX IN NW CORNER OF BRIDGE
STA. 9+81.9, 13' LT.
EL. 773.67

LIST OF DRAWINGS



TYPICAL SECTION THRU ROADWAY

DESIGN DATA

LIVE LOAD:

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

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

MATERIAL PROPERTIES:

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

HYDRAULIC DATA:

100 YEAR FLOOD

DRAINAGE AREA = 51.6 sq. mi.
WATERWAY AREA = 412 sq. ft.
V = 1.5 f.p.s.
Q_{100} = 665 c.f.s. { BRIDGE = 599 cfs
Q_{100} = 665 c.f.s. { OVERFLOW = 66 cfs
HIGH WATER100 EL. 772.4
HIGH WATER2 EL. 770.9
SCOUR CRITICAL CODE = 8
DATUM = NAVD88 (2012)
Q_2 = 390 c.f.s.

FREQUENCY OF OVERTOPPING

Q_{11} = 475 c.f.s.
WATER SURFACE EL. = 771.3

FOUNDATION DATA:

ABUTMENTS TO BE SUPPORTED ON HP 10 x 42 STEEL PILING DRIVEN TO A REQUIRED DRIVING RESISTANCE OF 160 TONS ‡ PER PILE AS DETERMINED BY THE MODIFIED GATES DYNAMIC FORMULA. ESTIMATED LENGTH OF 35'-0" AT THE WEST ABUTMENT AND 50'-0" AT THE EAST ABUTMENT.

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

TRAFFIC DATA:

A.D.T. = 670 (2016)
A.D.T. = 730 (2036)
R.D.S. = 60 M.P.H.

WISCONSIN
CHRISTOPHER B. McMAHON
E-29454
EAU CLAIRE
PROFESSIONAL ENGINEER
10/27/15

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

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

NO.	DATE	REVISION	BY

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

ACCEPTED William C. Dreher SDR 11/04/15
CHIEF STRUCTURES DESIGN ENGINEER DATE

STRUCTURE B-51-152

MALCHINE ROAD OVER WIND LAKE DRAINAGE CANAL

COUNTY: RACINE
TOWN/~~CITY/VILLAGE~~: NORWAY

DESIGN SPEC.: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

DESIGNED BY	JWZ	DESIGN CK'D.	AEB	DRAWN BY	JCK	PLANS CK'D.	CBM

GENERAL PLAN

SHEET 1 OF 13
56

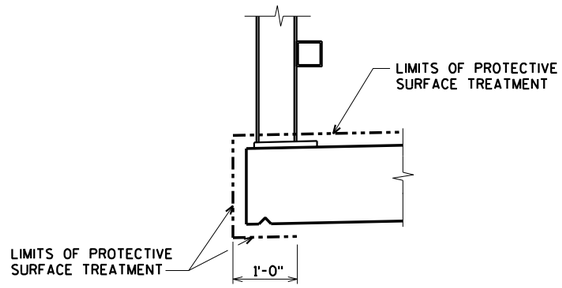
DATE:
DATE:
DATE:
CHECKED BY:
BACK CHECKED BY:
CORRECTED BY:

8

8

TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	W. ABUT.	E. ABUT.	SUPER.	TOTAL
203.0210.S	ABATEMENT OF ASBESTOS CONTAINING MATERIAL B-51-11	LS	-----	-----	-----	1
203.0600.S	REMOVING OLD STRUCTURE OVER WATERWAY WITH MINIMAL DEBRIS STATION 10+00	LS	-----	-----	-----	1
206.1000	EXCAVATION FOR STRUCTURES BRIDGES B-51-152	LS	-----	-----	-----	1
206.5000	COFFERDAMS B-51-152	LS	-----	-----	-----	1
210.0100	BACKFILL STRUCTURE	CY	240	240	-----	480
502.0100	CONCRETE MASONRY BRIDGES	CY	61	61	148	270
502.3200	PROTECTIVE SURFACE TREATMENT	SY	-----	-----	225	225
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	2,900	2,900	-----	5,800
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	2,170	2,170	25,370	29,710
513.4061	RAILING TUBULAR TYPE M B-51-152	LF	-----	-----	108	108
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	12	12	-----	24
550.1100	PILING STEEL HP 10-INCH x 42 LB	LF	265	385	-----	650
606.0300	RIPRAP HEAVY	CY	70	80	-----	150
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	LF	95	95	-----	190
645.0120	GEOTEXTILE FABRIC TYPE HR	SY	150	160	-----	310
	NON-BID ITEMS					
	FILLER	SIZE	-----	-----	-----	½" & ¾"



PROTECTIVE SURFACE TREATMENT DETAIL

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

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

THE FIRST DIGIT OF A THREE DIGIT BAR NO. AND THE FIRST TWO DIGITS OF A FOUR DIGIT BAR NO. SIGNIFIES THE BAR SIZE.

JOINT FILLER SHALL CONFORM TO THE REQUIREMENTS OF A.A.S.H.T.O. DESIGNATION M 153, TYPE I, II OR III OR A.A.S.H.T.O. DESIGNATION M 213.

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

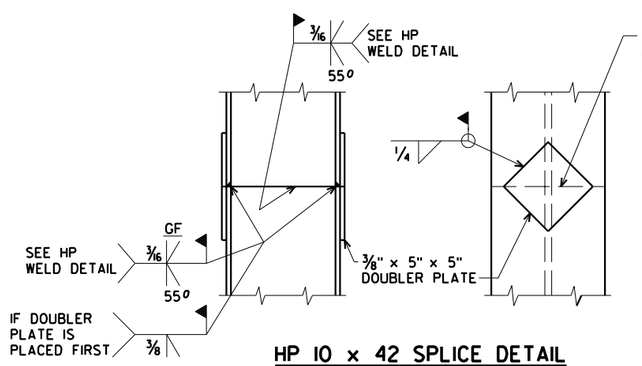
SLAB FALSEWORK SHALL BE SUPPORTED ON PILES OR THE SUBSTRUCTURE UNLESS OTHERWISE APPROVED BY THE ENGINEER.

THE EXISTING GROUND LINE SHALL BE THE UPPER LIMIT FOR EXCAVATION FOR STRUCTURES.

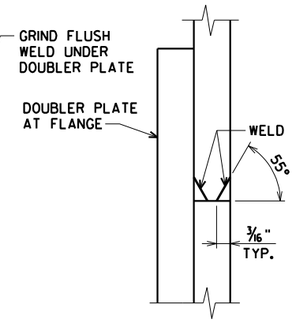
THE EXISTING STRUCTURE, B-51-11, TO BE REMOVED, IS A SINGLE SPAN STEEL DECK GIRDER BRIDGE, 44.2 FT. LONG WITH A 24 FT. CLEAR ROADWAY WIDTH.

AT BACKFACE OF ABUTMENTS ALL EXCAVATED VOLUME NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH BACKFILL STRUCTURE.

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



HP 10 x 42 SPLICE DETAIL



HP WELD DETAIL

FLANGE SHOWN, WEB SIMILAR

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

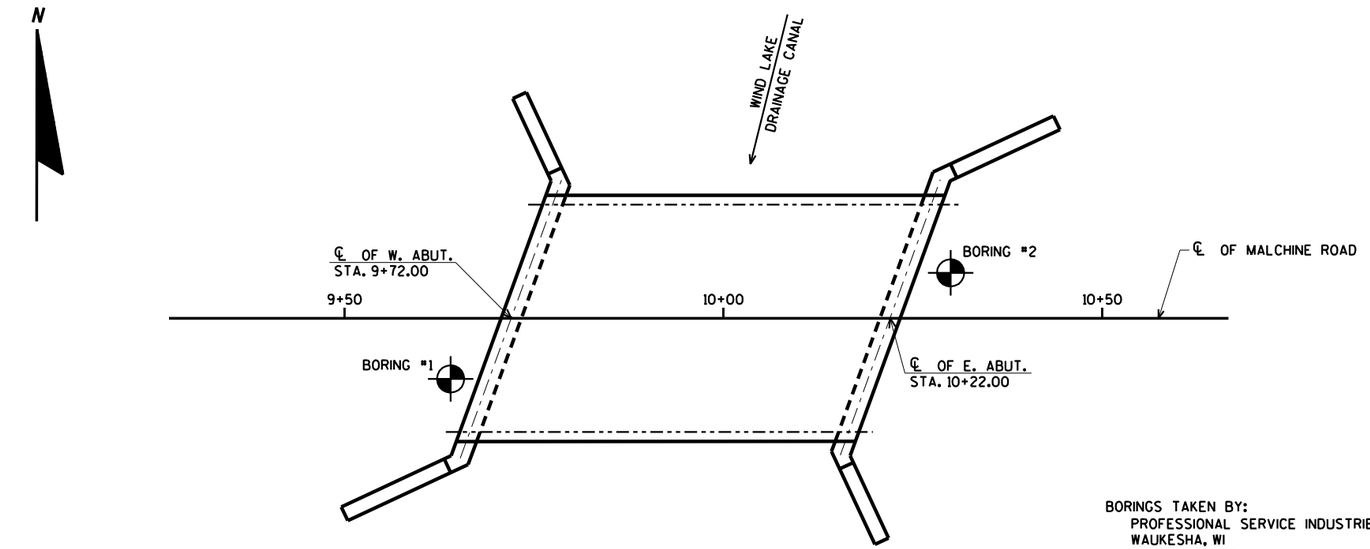
STRUCTURE B-51-152

DRAWN BY JCK | PLANS CK'D. JWZ

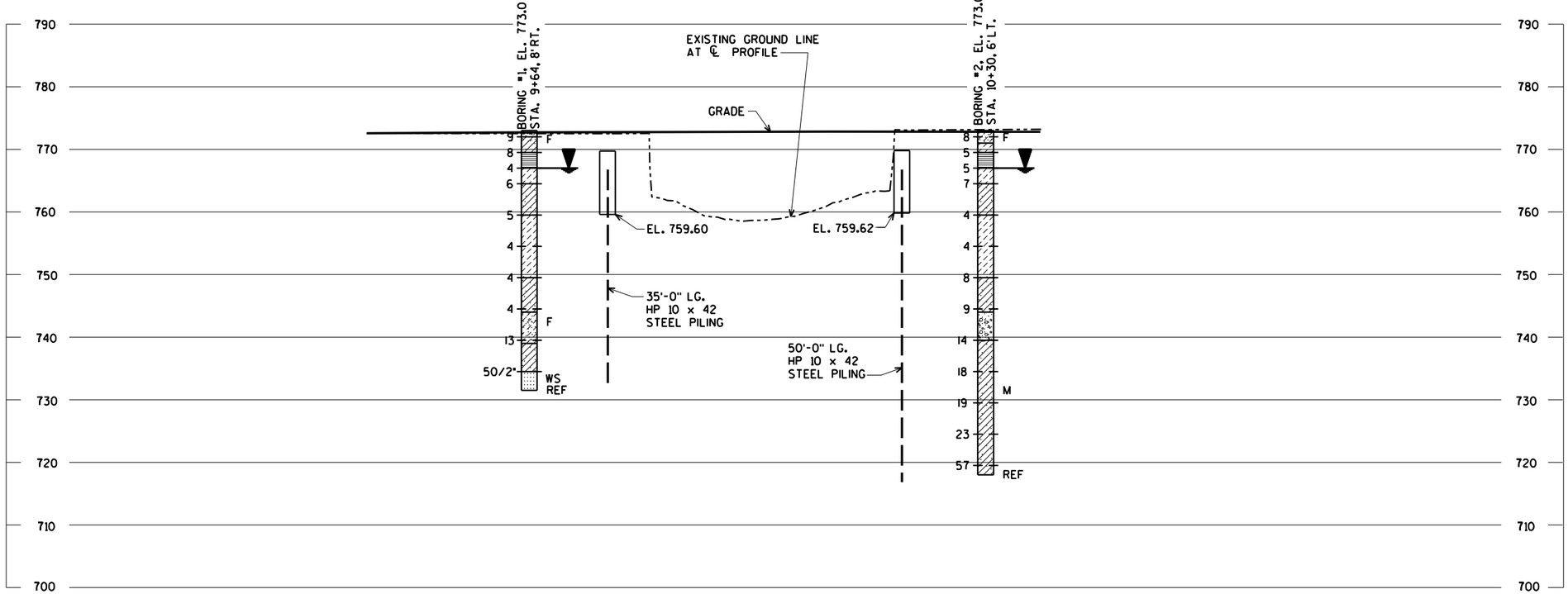
QUANTITIES AND NOTES

SHEET 2 OF 13
57

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



BORINGS TAKEN BY:
PROFESSIONAL SERVICE INDUSTRIES, INC.
WAUKESHA, WI
SEPTEMBER 22, 2014



STATE PROJECT NUMBER

2699-02-70

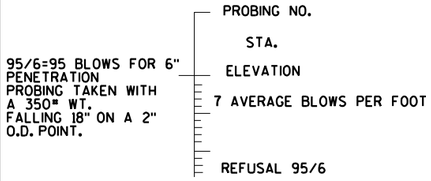
ABBREVIATIONS

F — FINE M — MEDIUM C — COARSE
WS — WEATHERED SO — SOUND

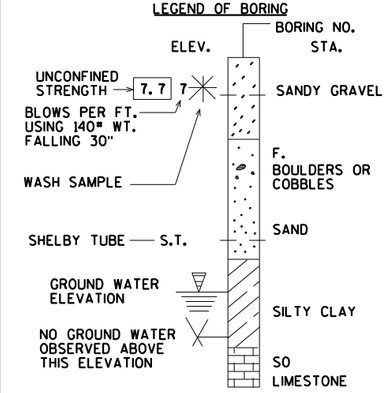
MATERIAL SYMBOLS

TOPSOIL, SILT, SANDSTONE
SAND, PEAT, LIMESTONE
GRAVEL, CLAY, IGNEOUS ROCK

LEGEND OF PROBING



LEGEND OF BORING



UNLESS OTHERWISE SPECIFIED, THE BLOWS PER FOOT AT THE LOCATIONS INDICATED ARE BASED ON DRIVING A 2" O.D. X 1.4" I.D. SPLIT SPOON SAMPLER WITH A 140# HAMMER HAVING A FREE FALL OF 30". THE BLOW COUNT IS TAKEN IN UNDISTURBED SOIL IMMEDIATELY BELOW A CASED OR OPEN HOLE ELIMINATING SIDE FRICTION ON THE DRIVE PIPE.

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

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

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-51-152

DRAWN BY JCK | PLANS CK'D. CBM

SUBSURFACE EXPLORATION

SHEET 3 OF 13
58

8

8

$PRFNAME$
U:\45-0389.00 - Racine Co - Malchine Road\BRIDGE\450389 soil.dgn

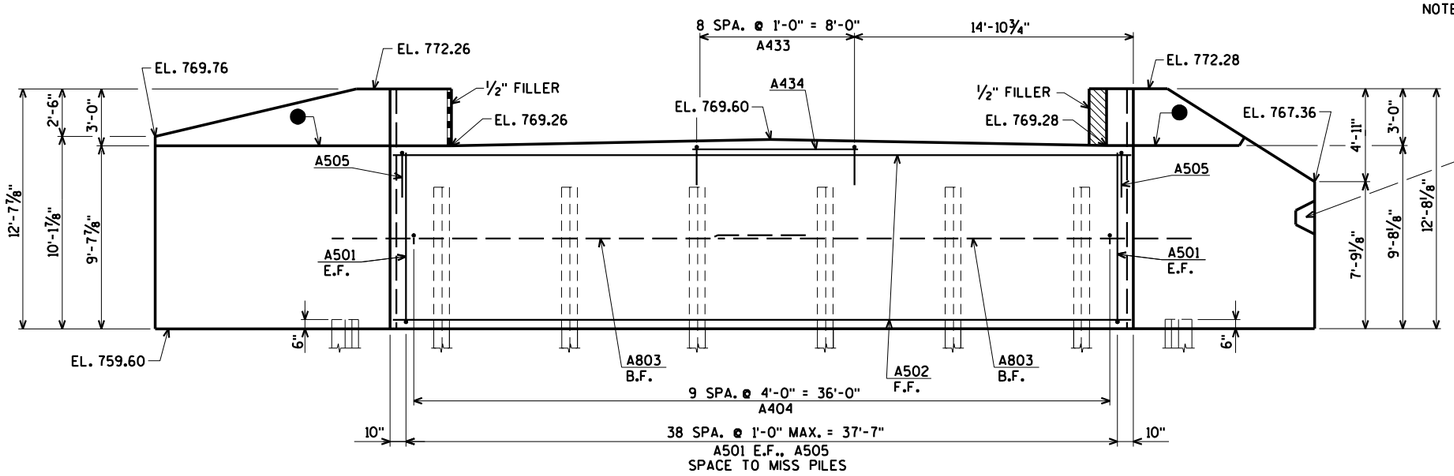
7/28/2015

PENTABLE:BReau_shd_util.tbl

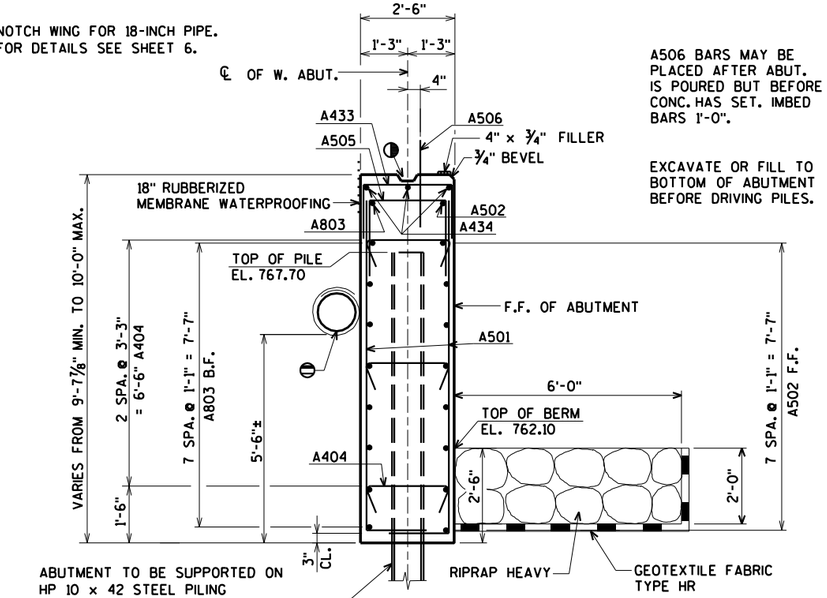
STATE PROJECT NUMBER

2699-02-70

NOTE: SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF ½" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONCRETE.)



ELEVATION
(LOOKING WEST)



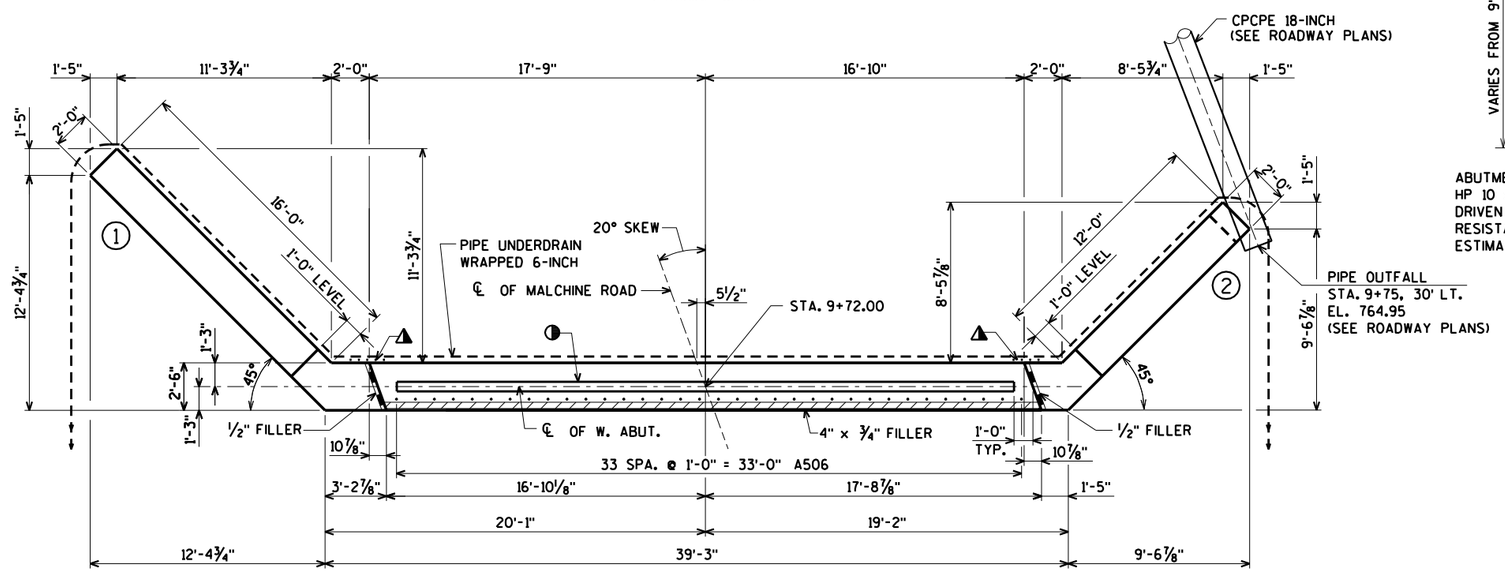
A506 BARS MAY BE PLACED AFTER ABUT. IS POURED BUT BEFORE CONC. HAS SET. IMBED BARS 1'-0".

EXCAVATE OR FILL TO BOTTOM OF ABUTMENT BEFORE DRIVING PILES.

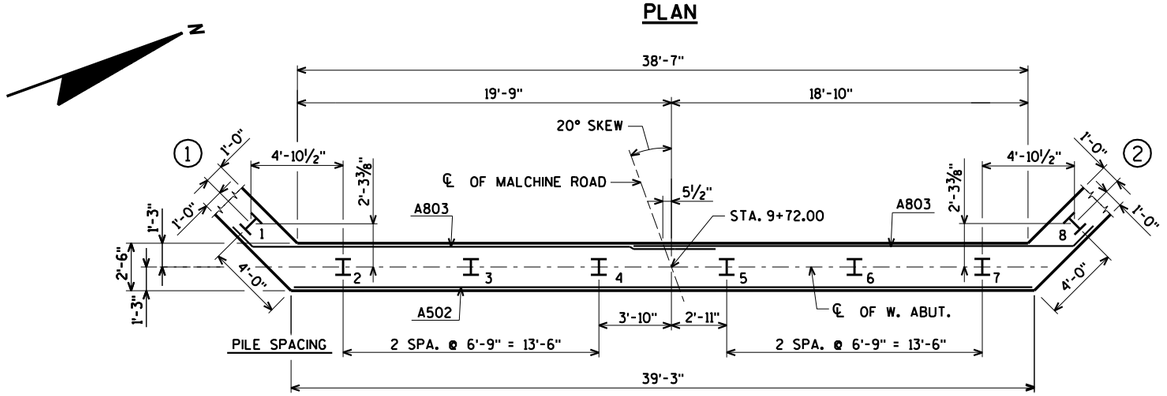
TYPICAL SECTION THRU BODY

NOTES: DO NOT PLACE FILL ABOVE THREE FEET FROM BOTTOM OF ABUTMENT UNTIL SUPERSTRUCTURE IS IN PLACE.

FOR RODENT SHIELD DETAIL SEE SHEET 5.



PLAN



PILE LAYOUT

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

● OPT. KEYED CONST. JOINT - FORMED BY A BEVELED 2" x 6".

◑ KEYED CONST. JOINT - FORMED BY A BEVELED 2" x 6".

⚠ 18" RUBBERIZED MEMBRANE WATERPROOFING TO EXTEND FROM BRIDGE SEAT TO TOP OF WING.

FOR PILE SPLICE DETAIL SEE SHEET 2.

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

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-51-152

DRAWN BY CLS | PLANS CK'D. JWZ

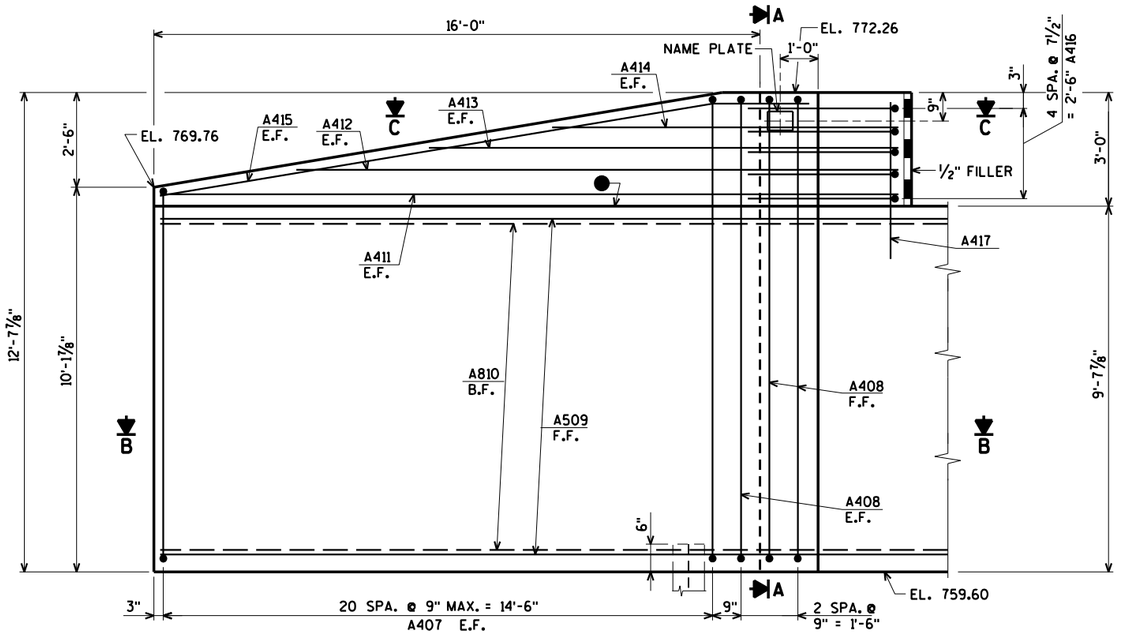
WEST ABUTMENT

SHEET 4 OF 13
59

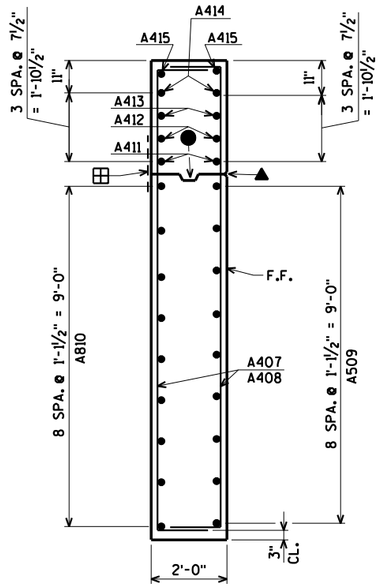
ORIGINAL PLANS PREPARED BY
AYRES ASSOCIATES
3433 Oakwood Hills Parkway
Eau Claire, WI 54701
www.AyresAssociates.com

8

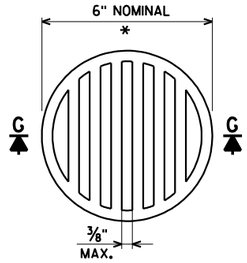
8

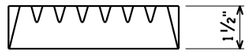


ELEVATION - WING 1



SECTION A





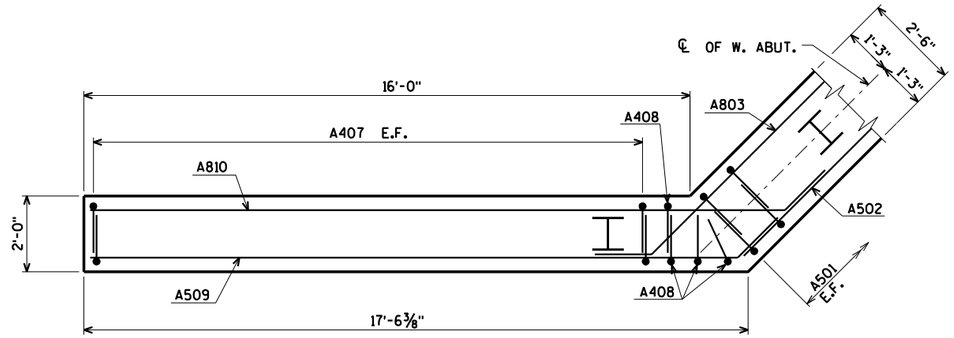
SECTION G-G

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

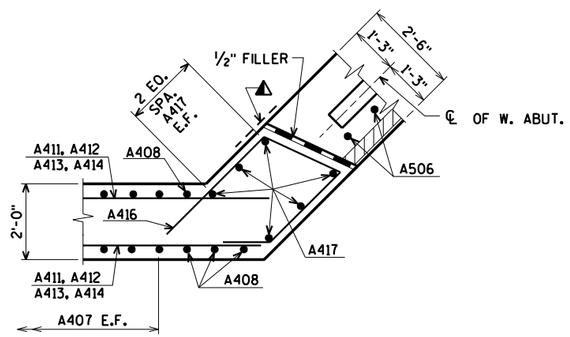
THE RODENT SHIELD, PIPE COUPLING AND SCREWS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH".

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

RODENT SHIELD DETAIL



SECTION B



SECTION C

▲ ¾" 'V' GROOVE ON F.F. OF WING WALL - NOT REQUIRED IF CONST. JT. IS NOT USED.

● OPT. KEYED CONST. JOINT - FORMED BY A BEVELED 2" x 6".

◭ 18" RUBBERIZED MEMBRANE WATERPROOFING TO EXTEND FROM BEAM SEAT TO TOP OF WINGWALL.

⊞ 18" RUBBERIZED MEMBRANE WATERPROOFING ON BACK FACE. NOT REQUIRED IF CONST. JT. IS NOT USED.

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

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-51-152

DRAWN BY CLS | PLANS CK'D. JWZ

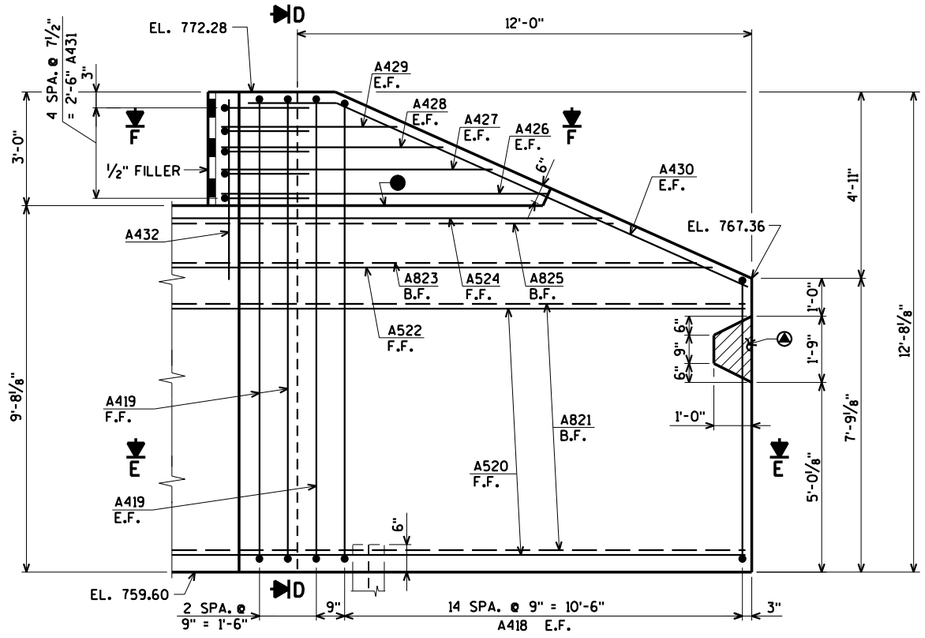
WEST ABUTMENT
WING 1
DETAILS

SHEET 5 OF 13
60

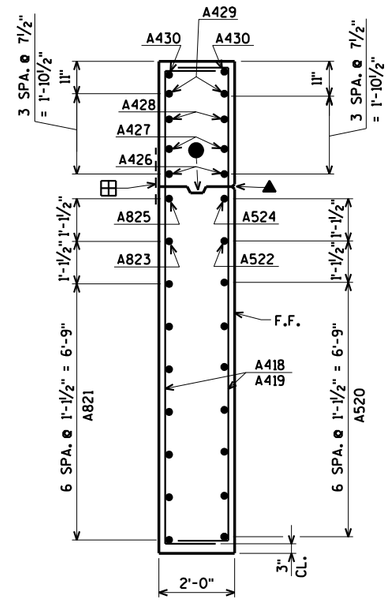
ORIGINAL PLANS PREPARED BY
AYRES ASSOCIATES
3433 Oakwood Hills Parkway
Eau Claire, WI 54701
www.AyresAssociates.com

STATE PROJECT NUMBER

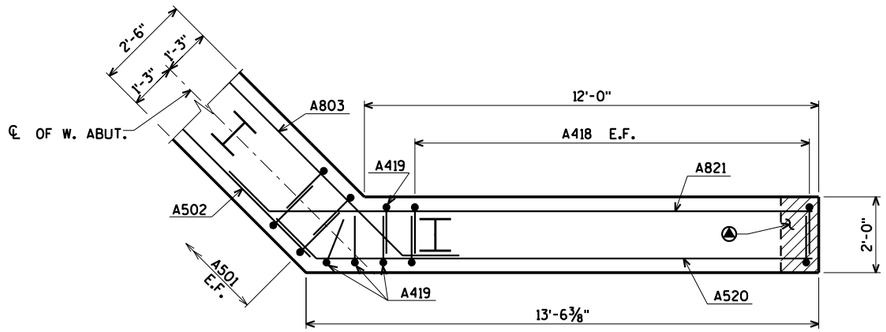
2699-02-70



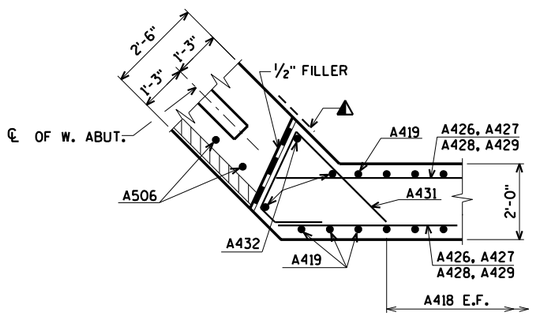
ELEVATION - WING 2



SECTION D



SECTION E



SECTION F

▲ NOTCH OUT WING AS SHOWN TO ALLOW ROOM FOR 18-INCH CPCPE PIPE (SEE ROADWAY PLANS). CUT BAR STEEL AS NECESSARY TO MISS NOTCH. COST FOR FORMING THE NOTCH AND CUTTING THE BAR STEEL IS INCLUDED IN THE BID ITEM "CONCRETE MASONRY BRIDGES"

▲ ¾" 'V' GROOVE ON F.F. OF WING WALL - NOT REQUIRED IF CONST. JT. IS NOT USED.

● OPT. KEYED CONST. JOINT - FORMED BY A BEVELED 2" x 6".

▲ 18" RUBBERIZED MEMBRANE WATERPROOFING TO EXTEND FROM BEAM SEAT TO TOP OF WINGWALL.

⊞ 18" RUBBERIZED MEMBRANE WATERPROOFING ON BACK FACE. NOT REQUIRED IF CONST. JT. IS NOT USED.

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

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

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-51-152

DRAWN BY CLS | PLANS CK'D. JWZ

WEST ABUTMENT
WING 2
DETAILS

SHEET 6 OF 13
61

8

8

$PRFNAME$
U:±45-0389.00 - Racine Co - Malchine Road±BRIDGE±450389 wa.dgn

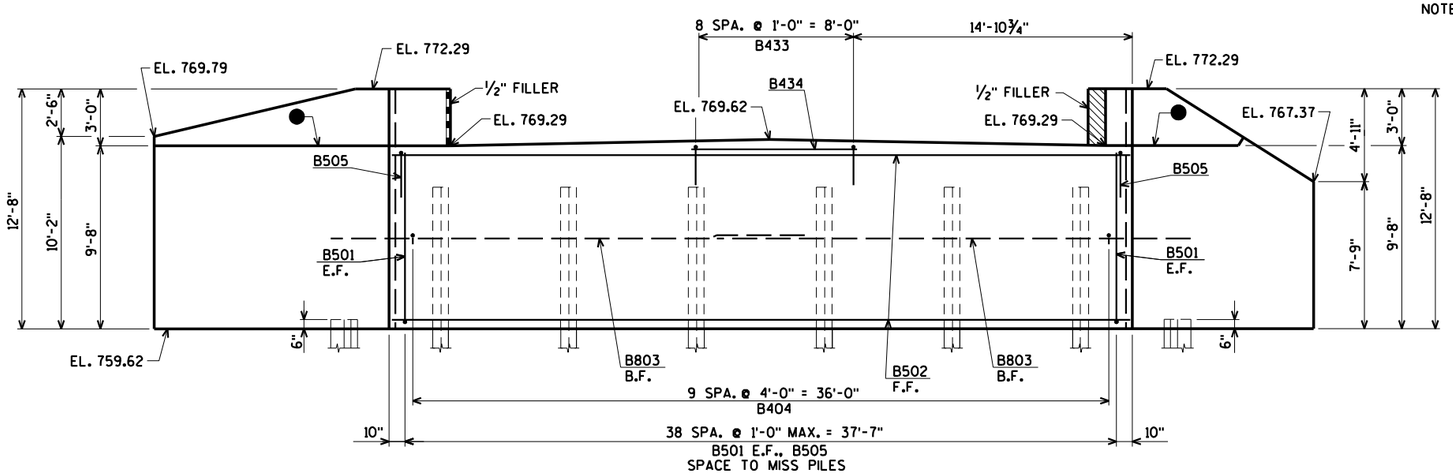
9/24/2015

PENTABLE:BReau_shd_util.tbl

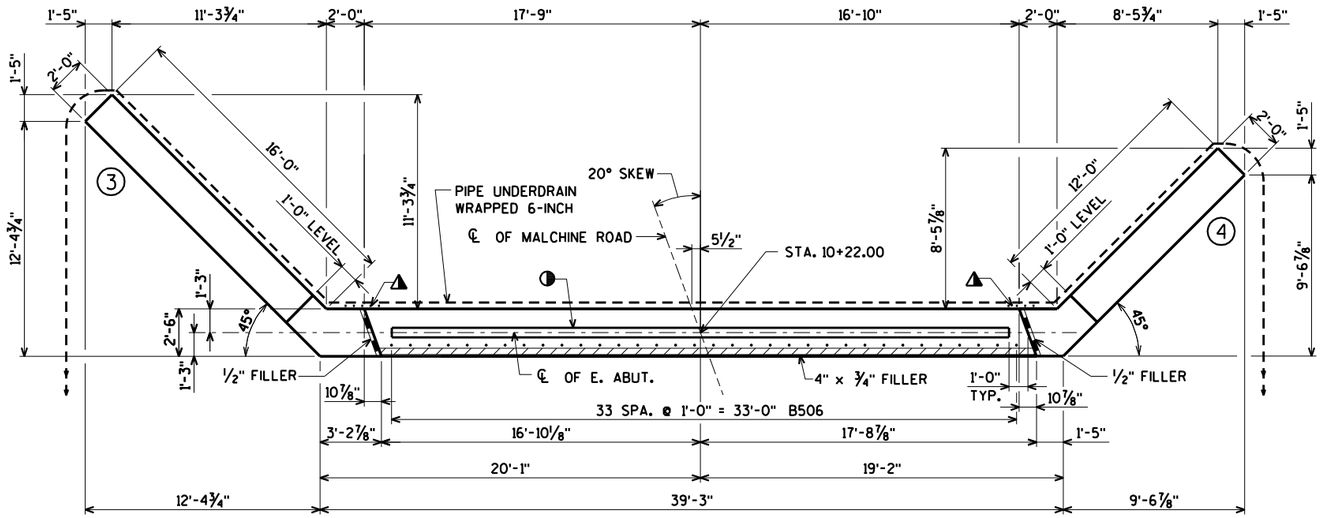
STATE PROJECT NUMBER

2699-02-70

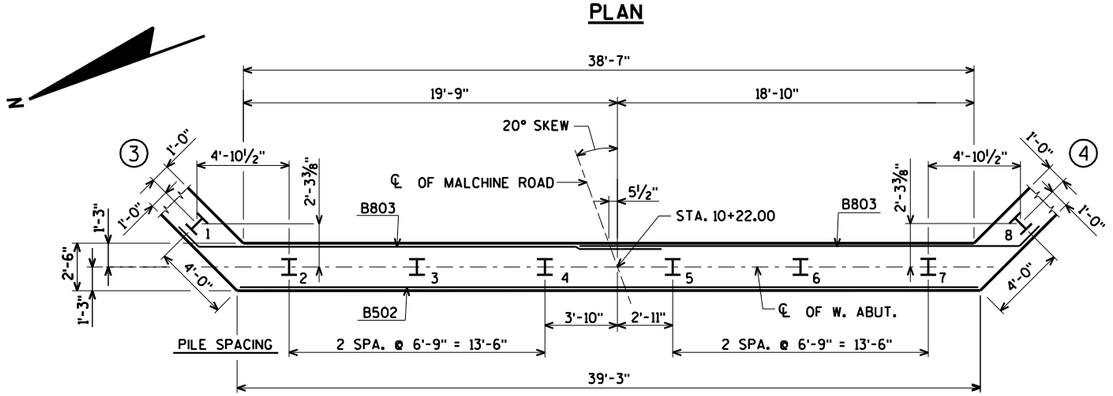
NOTE: SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF ½" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONCRETE.)



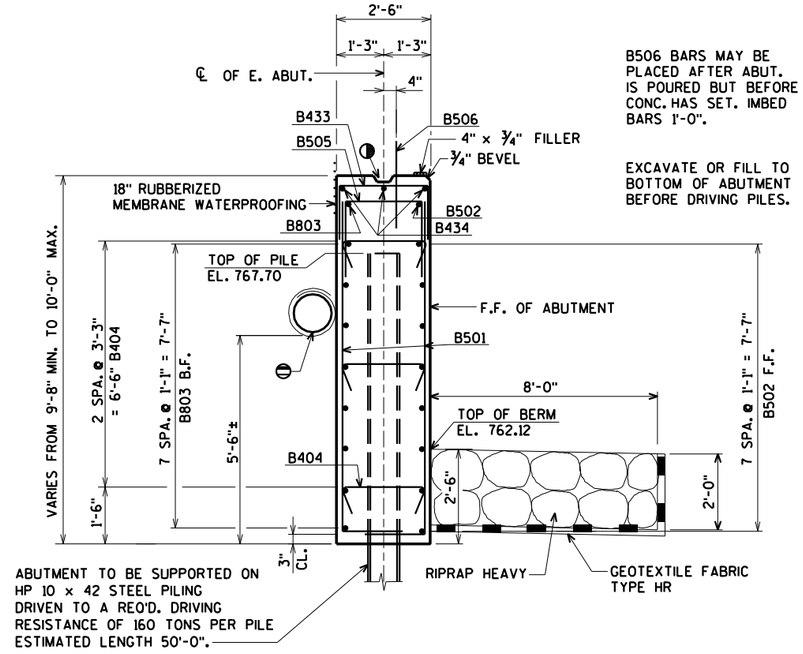
ELEVATION
(LOOKING EAST)



PLAN



PILE LAYOUT



B506 BARS MAY BE PLACED AFTER ABUT. IS POURED BUT BEFORE CONC. HAS SET. IMBED BARS 1'-0".

EXCAVATE OR FILL TO BOTTOM OF ABUTMENT BEFORE DRIVING PILES.

TYPICAL SECTION THRU BODY

NOTES: DO NOT PLACE FILL ABOVE THREE FEET FROM BOTTOM OF ABUTMENT UNTIL SUPERSTRUCTURE IS IN PLACE.

FOR RODENT SHIELD DETAIL SEE SHEET 8.

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

● OPT. KEYED CONST. JOINT - FORMED BY A BEVELED 2" x 6".

◑ KEYED CONST. JOINT - FORMED BY A BEVELED 2" x 6".

⚠ 18" RUBBERIZED MEMBRANE WATERPROOFING TO EXTEND FROM BRIDGE SEAT TO TOP OF WING.

FOR PILE SPLICE DETAIL SEE SHEET 2.

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

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-51-152

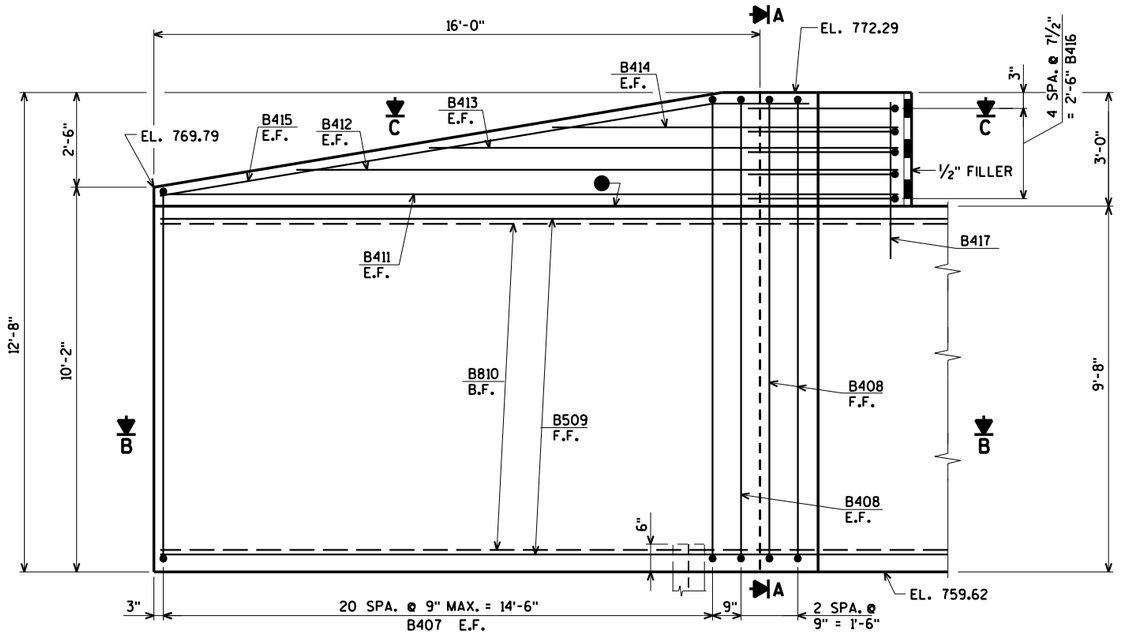
DRAWN BY CLS | PLANS CK'D. JWZ

EAST ABUTMENT

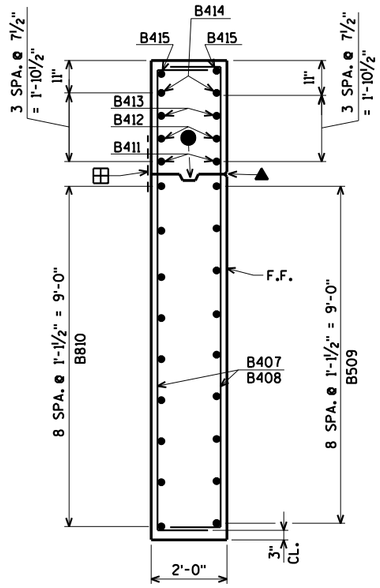
SHEET 7 OF 13
62

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

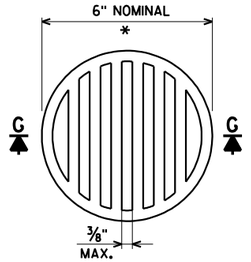
8

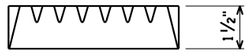


ELEVATION - WING 3



SECTION A





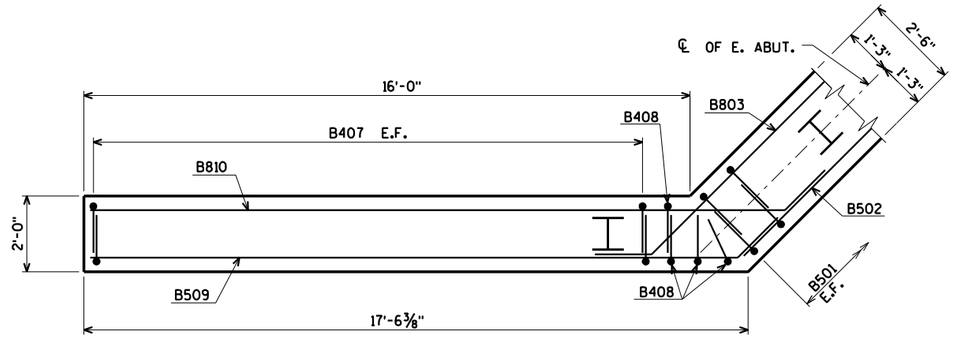
SECTION G-G

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

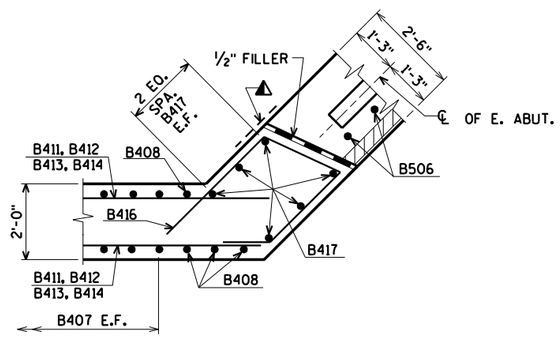
THE RODENT SHIELD, PIPE COUPLING AND SCREWS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH".

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

RODENT SHIELD DETAIL



SECTION B



SECTION C

▲ ¾" 'V' GROOVE ON F.F. OF WING WALL - NOT REQUIRED IF CONST. JT. IS NOT USED.

● OPT. KEYED CONST. JOINT - FORMED BY A BEVELED 2" x 6".

◭ 18" RUBBERIZED MEMBRANE WATERPROOFING TO EXTEND FROM BEAM SEAT TO TOP OF WINGWALL.

⊞ 18" RUBBERIZED MEMBRANE WATERPROOFING ON BACK FACE. NOT REQUIRED IF CONST. JT. IS NOT USED.

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

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-51-152

DRAWN BY CLS | PLANS CK'D. JWZ

EAST ABUTMENT
WING 3
DETAILS

SHEET 8 OF 13
63

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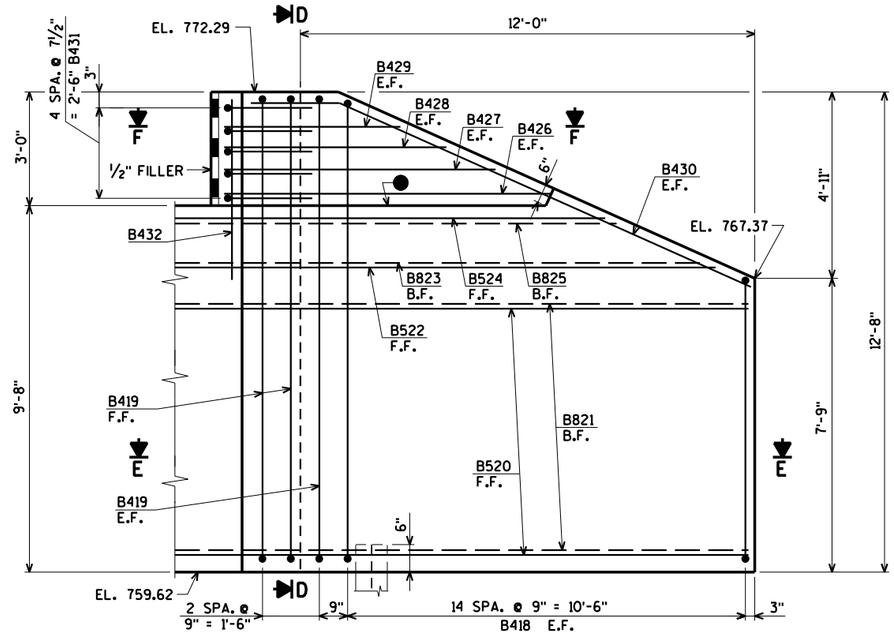
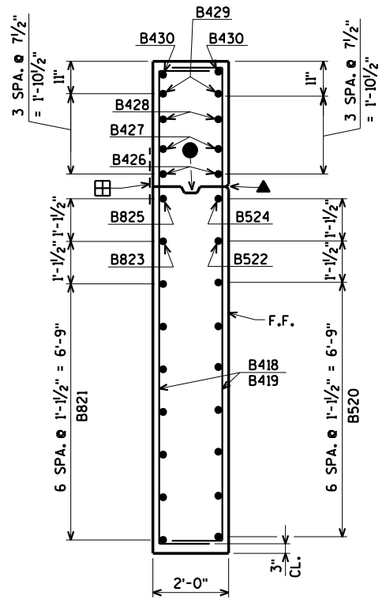
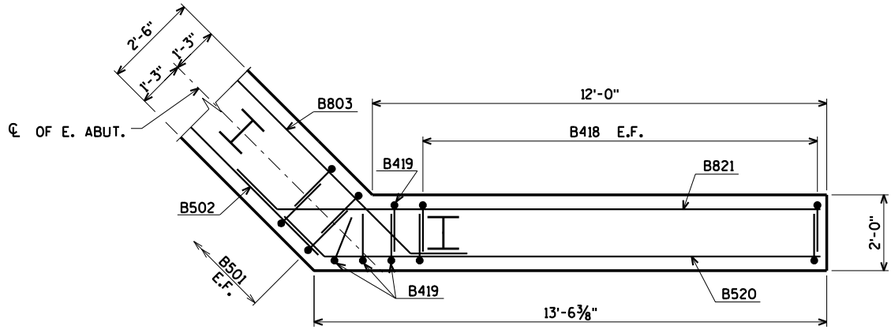


ELEVATION - WING 4



SECTION D



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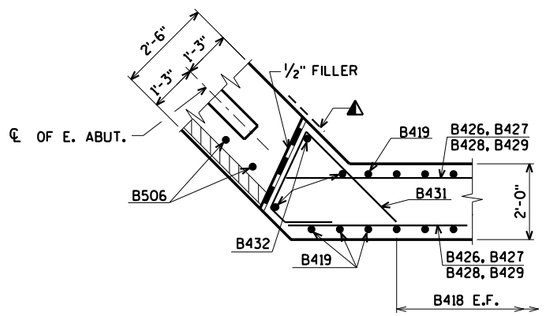

SECTION F

▲ ¾" 'V' GROOVE ON F.F. OF WING WALL - NOT REQUIRED IF CONST. JT. IS NOT USED.

● OPT. KEYED CONST. JOINT - FORMED BY A BEVELED 2" x 6".

⚠ 18" RUBBERIZED MEMBRANE WATERPROOFING TO EXTEND FROM BEAM SEAT TO TOP OF WINGWALL.

⊞ 18" RUBBERIZED MEMBRANE WATERPROOFING ON BACK FACE. NOT REQUIRED IF CONST. JT. IS NOT USED.

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

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STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-51-152

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EAST ABUTMENT
WING 4
DETAILS

SHEET 9 OF 13
64

8

8

$PRFNAME$
U:±45-0389.00 - Racine Co - Malchine Road±BRIDGE±450389 ea.dgn

7/28/2015

PENTABLE:BReau_shd_util.tbl

BILL OF BARS - WEST ABUTMENT

BAR. NO.	COATED BAR	NO. REQ'D.	LENGTH	BENT BAR	BUNDLED BAR SERIES	2,900# UNCOATED 2,170# COATED LOCATION
A501		78	10-9	X		BODY VERT. E.F.
A502		9	39-1			BODY HORIZ. F.F.
A803		18	26-0	X		BODY HORIZ. B.F.
A404		30	2-9	X		BODY TIES
A505		39	7-5	X		BODY VERT. TOP
A506	X	34	2-0			BODY DOWELS
A407	X	42	13-4	X	⊗	WING 1 VERT. E.F.
A408	X	4	14-8	X		WING 1 VERT. E.F.
A509	X	9	18-9	X		WING 1 HORIZ. F.F.
A810	X	9	20-4	X		WING 1 HORIZ. B.F.
A411	X	2	17-1			WING 1 HORIZ. E.F.
A412	X	2	13-9			WING 1 HORIZ. E.F.
A413	X	2	10-3			WING 1 HORIZ. E.F.
A414	X	2	6-9			WING 1 HORIZ. E.F.
A415	X	2	17-3	X		WING 1 DIAG. E.F.
A416	X	5	9-8	X		WING 1 HORIZ.
A417	X	6	4-4			WING 1 VERT.
A418	X	30	12-2	X	⊗	WING 2 VERT. E.F.
A419	X	4	14-9	X		WING 2 VERT. E.F.
A520	X	7	14-9	X		WING 2 HORIZ. F.F.
A821	X	7	16-3	X		WING 2 HORIZ. B.F.
A522	X	1	13-7	X		WING 2 HORIZ. F.F.
A823	X	1	15-1	X		WING 2 HORIZ. B.F.
A524	X	1	11-1	X		WING 2 HORIZ. F.F.
A825	X	1	12-7	X		WING 2 HORIZ. B.F.
A426	X	2	7-11			WING 2 HORIZ. E.F.
A427	X	2	6-7			WING 2 HORIZ. E.F.
A428	X	2	5-3			WING 2 HORIZ. E.F.
A429	X	2	4-0			WING 2 HORIZ. E.F.
A430	X	2	14-3	X		WING 2 DIAG. E.F.
A431	X	5	7-10	X		WING 2 HORIZ.
A432	X	3	4-4			WING 2 VERT.
A433		9	5-4	X		BODY VERT. TOP
A434		3	8-9			BODY HORIZ.

BENDING DIMENSIONS ARE OUT TO OUT OF BARS.

⊗ LENGTH SHOWN FOR BAR IS AN AVERAGE LENGTH AND SHOULD ONLY BE USED FOR BAR WEIGHT CALCULATIONS. SEE BAR SERIES TABLE FOR ACTUAL LENGTHS.

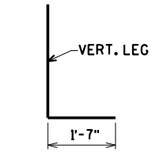
B.F. DENOTES BACK FACE.

F.F. DENOTES FRONT FACE.

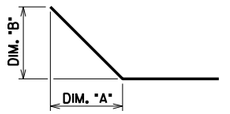
E.F. DENOTES EACH FACE.

BILL OF BARS - EAST ABUTMENT

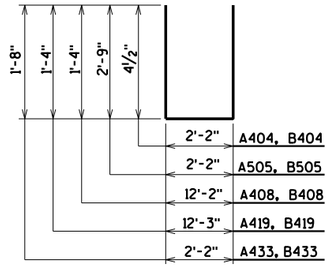
BAR. NO.	COATED BAR	NO. REQ'D.	LENGTH	BENT BAR	BUNDLED BAR SERIES	2,900# UNCOATED 2,170# COATED LOCATION
B501		78	10-9	X		BODY VERT. E.F.
B502		9	39-1			BODY HORIZ. F.F.
B803		18	26-0	X		BODY HORIZ. B.F.
B404		30	2-9	X		BODY TIES
B505		39	7-5	X		BODY VERT. TOP
B506	X	34	2-0			BODY DOWELS
B407	X	42	13-4	X	⊗	WING 3 VERT. E.F.
B408	X	4	14-8	X		WING 3 VERT. E.F.
B509	X	9	18-9	X		WING 3 HORIZ. F.F.
B810	X	9	20-4	X		WING 3 HORIZ. B.F.
B411	X	2	17-1			WING 3 HORIZ. E.F.
B412	X	2	13-9			WING 3 HORIZ. E.F.
B413	X	2	10-3			WING 3 HORIZ. E.F.
B414	X	2	6-9			WING 3 HORIZ. E.F.
B415	X	2	17-3	X		WING 3 DIAG. E.F.
B416	X	5	9-8	X		WING 3 HORIZ.
B417	X	6	4-4			WING 3 VERT.
B418	X	30	12-2	X	⊗	WING 4 VERT. E.F.
B419	X	4	14-9	X		WING 4 VERT. E.F.
B520	X	7	14-9	X		WING 4 HORIZ. F.F.
B821	X	7	16-3	X		WING 4 HORIZ. B.F.
B522	X	1	13-7	X		WING 4 HORIZ. F.F.
B823	X	1	15-1	X		WING 4 HORIZ. B.F.
B524	X	1	11-1	X		WING 4 HORIZ. F.F.
B825	X	1	12-7	X		WING 4 HORIZ. B.F.
B426	X	2	7-11			WING 4 HORIZ. E.F.
B427	X	2	6-7			WING 4 HORIZ. E.F.
B428	X	2	5-3			WING 4 HORIZ. E.F.
B429	X	2	4-0			WING 4 HORIZ. E.F.
B430	X	2	14-3	X		WING 4 DIAG. E.F.
B431	X	5	7-10	X		WING 4 HORIZ.
B432	X	3	4-4			WING 4 VERT.
B433		9	5-4	X		BODY VERT. TOP
B434		3	8-9			BODY HORIZ.

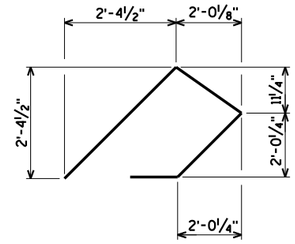


A501, B501

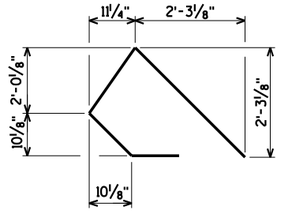


BAR NO.	DIM. "A"	DIM. "B"
A803	1'-0¾"	1'-0¾"
A509	1'-0¾"	1'-0¾"
A810	1'-0¾"	1'-0¾"
A415	14'-10"	2'-5"
A520	1'-0¾"	1'-0¾"
A821	1'-0¾"	1'-0¾"
A522	1'-0¾"	1'-0¾"
A823	1'-0¾"	1'-0¾"
A524	1'-0¾"	1'-0¾"
A825	1'-0¾"	1'-0¾"
A430	10'-10"	4'-10"
B803	1'-0¾"	1'-0¾"
B509	1'-0¾"	1'-0¾"
B810	1'-0¾"	1'-0¾"
B415	14'-10"	2'-5"
B520	1'-0¾"	1'-0¾"
B821	1'-0¾"	1'-0¾"
B522	1'-0¾"	1'-0¾"
B823	1'-0¾"	1'-0¾"
B524	1'-0¾"	1'-0¾"
B825	1'-0¾"	1'-0¾"
B430	10'-10"	4'-10"





A416, B416

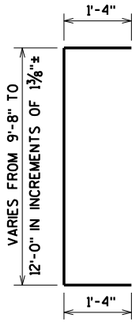


A431, B431

BAR SERIES TABLE

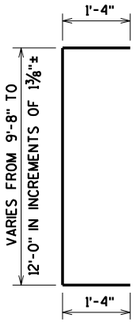
BAR MARK	NO REQ'D.	LENGTH
A407	2 SERIES OF 21	12'-2" TO 14'-6"
A418	2 SERIES OF 15	9'-10" TO 14'-6"
B407	2 SERIES OF 21	12'-2" TO 14'-6"
B418	2 SERIES OF 15	9'-10" TO 14'-6"

BUNDLE AND TAG EACH SERIES SEPARATELY.



A407

A418



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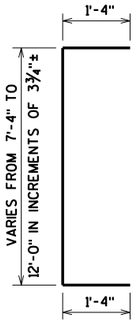

B418

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STRUCTURE B-51-152

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ABUTMENT DETAILS AND BILL OF BARS

SHEET 10 OF 13
65

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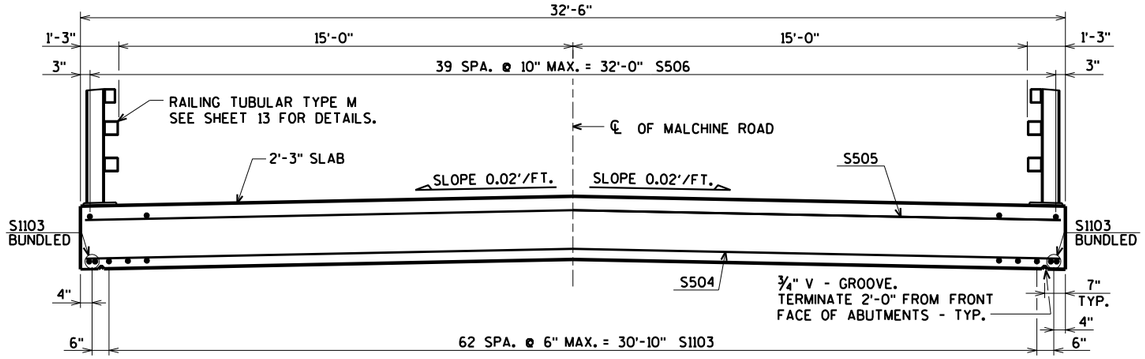
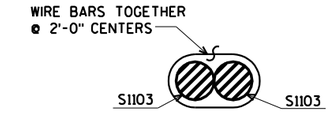


CROSS SECTION THRU ROADWAY

TOP TRANSVERSE BARS IN SLAB SHALL BE SUPPORTED BY INDIVIDUAL BAR CHAIRS AT APPROXIMATELY 3'-0" CENTERS EACH WAY. BOTTOM LONGITUDINAL BARS SHALL BE SUPPORTED BY CONTINUOUS BAR CHAIRS AT APPROXIMATELY 4'-0" CENTERS.

ALL SLAB THICKNESS DIMENSIONS ARE MINIMUM. ANY TOLERANCES NECESSARY TO CORRECT CONSTRUCTION DISCREPANCIES ARE TO BE PLUS (+).

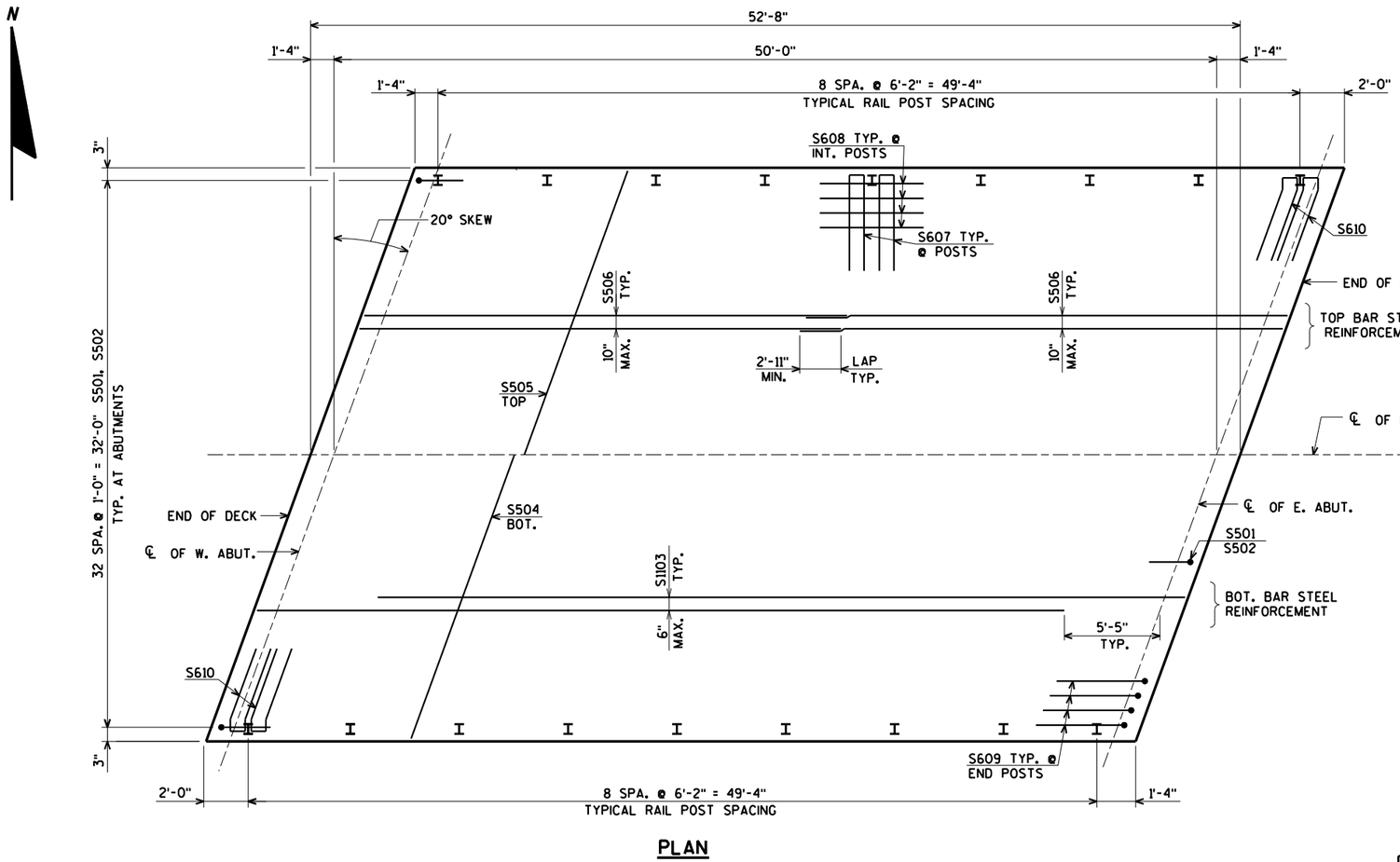


BUNDLING DETAIL

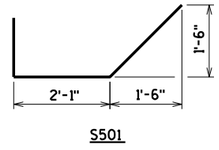
BILL OF BARS

BAR. NO.	COATED BAR	NO. REQ'D.	LENGTH	BENT BAR	BUNDLED BAR SERIES	25,370# COATED LOCATION
S501	X	66	5-9	X		SLAB @ ABUT.
S502	X	66	4-0	X		SLAB @ ABUT.
S1103	X	67	45-9		X	SLAB LONG. BOT.
S504	X	82	34-2			SLAB TRANS. BOT.
S505	X	53	34-2			SLAB TRANS. TOP
S506	X	80	27-7			SLAB LONG. TOP
S607	X	32	12-0	X		SLAB @ RAIL POSTS
S608	X	56	6-0			SLAB @ INT. RAIL POSTS
S609	X	16	6-0	X		SLAB @ END RAIL POSTS
S610	X	4	12-0	X		SLAB @ END RAIL POSTS

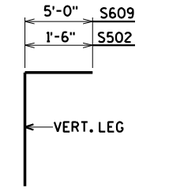
BENDING DIMENSIONS ARE OUT TO OUT OF BARS.

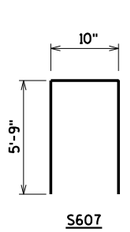


PLAN

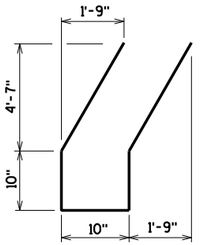


S501





S607



S610

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-51-152

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SUPERSTRUCTURE

SHEET 11 OF 13
66

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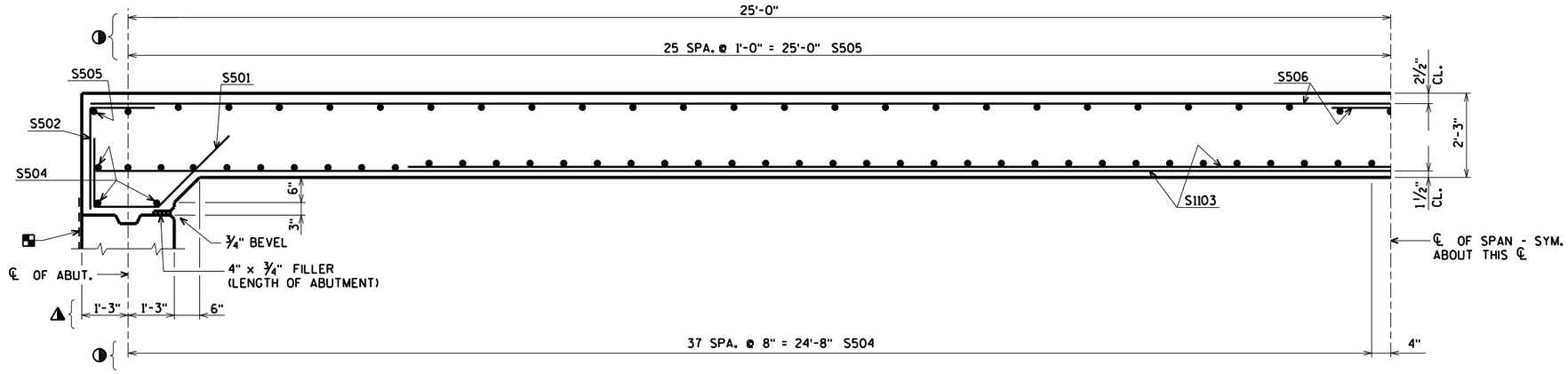
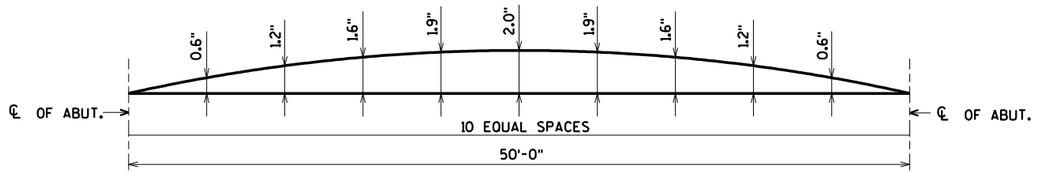


PART LONGITUDINAL SECTION

▪ 18" RUBBERIZED MEMBRANE WATERPROOFING

◑ DIMENSIONS MEASURED ALONG ℄ OF MALCHINE ROAD.

◭ DIMENSIONS MEASURED NORMAL TO ℄ OF SUBSTRUCTURE.



CAMBER DIAGRAM

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

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

TOP OF DECK ELEVATIONS

LOCATION	℄ OF W. ABUT.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ OF E. ABUT.
N. EDGE OF SLAB	772.28	772.28	772.29	772.29	772.29	772.30	772.30	772.29	772.29	772.29	772.29
℄ OF STRUCTURE	772.60	772.60	772.61	772.61	772.62	772.62	772.62	772.62	772.62	772.62	772.62
S. EDGE OF SLAB	772.26	772.27	772.28	772.28	772.29	772.29	772.29	772.29	772.30	772.30	772.29

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

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-51-152

DRAWN BY CLS | PLANS CK'D. JWZ

SUPERSTRUCTURE DETAILS

SHEET 12 OF 13
67

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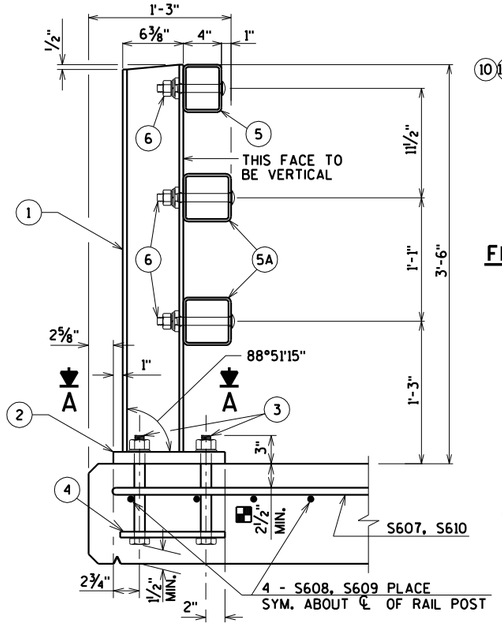
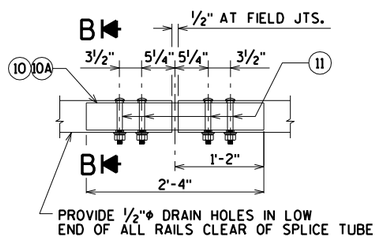
STATE PROJECT NUMBER

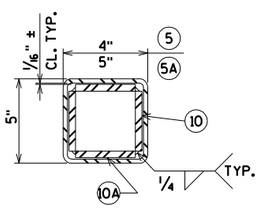
2699-02-70



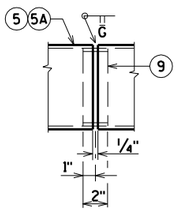
SECTION THRU RAILING ON DECK



FIELD ERECTION JOINT DETAIL

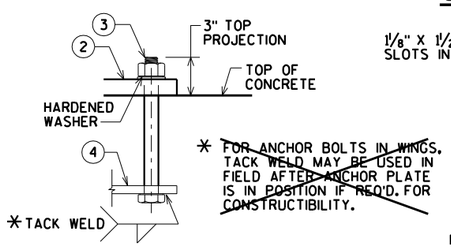


SECTION B

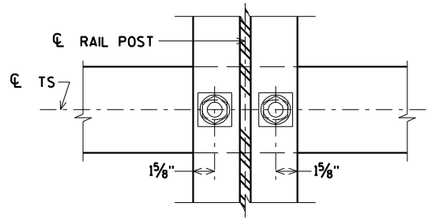


SHOP RAIL SPLICE DETAIL

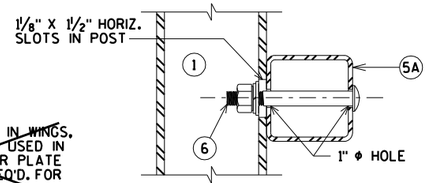
(LOCATION MUST BE SHOWN ON THE SHOP DRAWINGS)



ANCHOR BOLTS



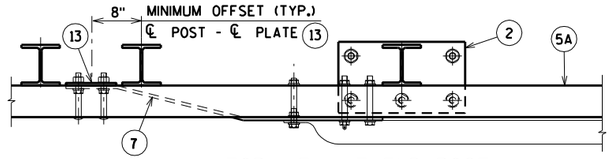
SECTION THRU POST WEB



SECTION THRU RAIL

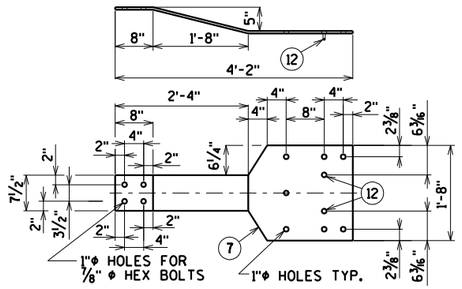
NOTE: CONNECTIONS AT LOWER RAILS SHOWN. CONNECTIONS AT TOP RAIL SIMILAR.

TYPICAL RAIL TO POST CONNECTIONS



TOP VIEW AT END POST

(THRIE BEAM RAIL ATTACHMENT)

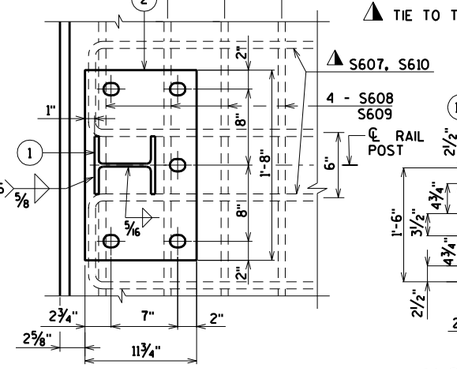


BACK-UP PLATE DETAIL

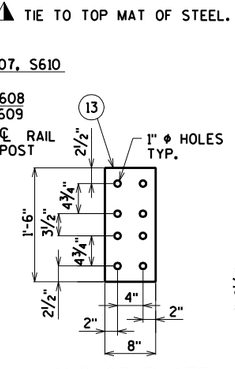
(AT BEAM GUARD ATTACHMENT)

LEGEND

1. W6 x 25 WITH 1⅛" X 1½" HORIZ. SLOTS ON EACH SIDE OF POST FOR BOLT NO. 6. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY. PLACE POST VERTICAL. PLACE POSTS NORMAL TO GRADE LINE.
2. PLATE 1¼" x 11¾" x 1'-8" WITH 1⅝" X 1⅝" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1 AS SHOWN. SLOTS PARALLEL TO SHORT SIDE OF PLATE.
3. ASTM A449 - 1⅛" DIA. ANCHOR BOLTS WITH NUT AND HARDENED WASHER (ALL GALVANIZED). 5 REQ'D. PER POST. THREAD 3" AND PLACE NORMAL TO PLATE NO. 2. CHAMFER TOP OF BOLTS BEFORE THREADING. ~~USE 1'-9" LONG IN ABUTMENT WINGS.~~ AT POSTS ON CONCRETE SLAB SUPERSTRUCTURES WHERE THE SLAB THICKNESS IS > 16" USE 1'-3" LONG. ~~USE 10¾" LONG AT ALL OTHER LOCATIONS.~~ (AN EQUIVALENT THREADED ROD WITH NUTS AND HARDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINGS IF REQ'D. FOR CONSTRUCTIBILITY.)
4. ⅝" x 11" x 1'-8" ANCHOR PLATE (GALVANIZED) WITH 1³⁄₁₆" DIA. HOLES FOR ANCHOR BOLTS NO. 3
5. TS 5 x 4 x 0.25 STRUCTURAL TUBING. ATTACH TO NO. 1 WITH NO. 6.
5A. TS 5 x 5 x 0.25 STRUCTURAL TUBING. ATTACH TO NO. 1 WITH NO. 6.
6. ⅞" DIA. A325 SLOTTED ROUND HEAD BOLT WITH NUT, 3⁄16" X 1⅝" X 1⅝" WASHER, AND LOCK WASHER (2 REQ'D. AT EACH RAIL TO POST LOCATION.)
7. ½" THK. BACK-UP PLATE WITH 2 - ⅞" X 1½" THREADED SHOP WELDED STUDS (NO. 12). BOLT TO RAIL AS SHOWN IN DETAIL. REQUIRED AT THRIE BEAM GUARD RAIL ATTACHMENTS ONLY. PLACE SYMMETRICALLY ABOUT TUBES NO. 5A.
8. 1" DIA. HOLES IN PLATE NO. 7 & TUBES NO. 5A FOR ⅞" DIA. A325 BOLTS WITH HEX NUTS AND WASHERS. 6 HOLES IN TUBES AND PLATE NO. 7.
9. SPLICE SLEEVE FABRICATED FROM ¼" PLATE. PROVIDE "SLIDING FIT".
10. ⅜" X 3⅝" X 2'-4" PLATE. 2 PER RAIL. USED IN NO. 5 & 5A.
10A. ⅜" X 2⅝" X 2'-4" PLATE USED IN NO. 5, ⅜" X 3⅝" X 2'-4" PLATE USED IN NO. 5A. 2 PER RAIL.
11. ⅞" Φ A325 ROUND HEAD BOLT WITH NUT, WASHER, AND LOCK WASHER. USE 1⅝" X 1¼" LONGIT. SLOTTED HOLES AT FIELD JOINTS ~~AND 1⅝" X 2¼" MIN. LONGIT. SLOTTED HOLES AT EXP. JOINTS~~ IN PLATE NO. 10A.
12. ⅞" DIA. X 1½" LONG THREADED SHOP WELDED STUDS (2 REQ'D).
13. ⅜" X 8" X 1'-6" PLATE. BOLT TO RAIL AS SHOWN IN DETAIL. REQ'D. AT THRIE BEAM GUARD RAIL ATTACHMENTS ONLY. PLACE SYM. ABOUT TUBES NO. 5A.
14. ⅞" DIA. X 2" LONG A325 HEX BOLT WITH NUT AND WASHER (5 REQ'D.).
15. 1" Φ HOLES IN TUBES NO. 5A FOR ⅞" DIA. A325 ROUND HEAD BOLT WITH NUT, WASHER AND LOCK WASHER (4 REQ'D.). 4 HOLES IN TUBES.

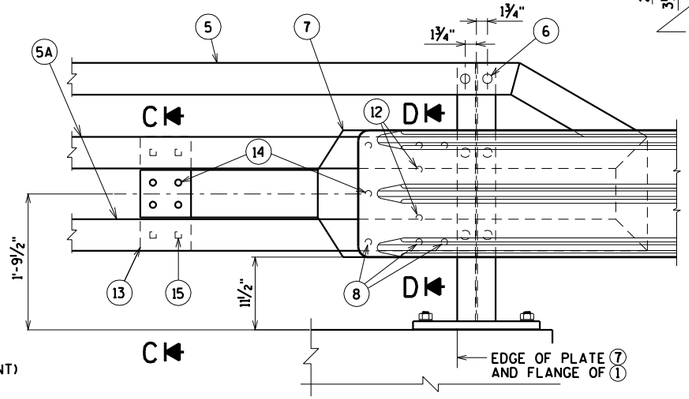


SECTION A



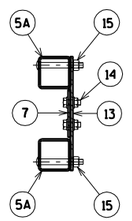
ANCHOR PLATE

(AT BEAM GUARD ATTACHMENT)



DETAIL AT END POST

(THRIE BEAM RAIL ATTACHMENT)



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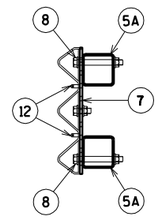
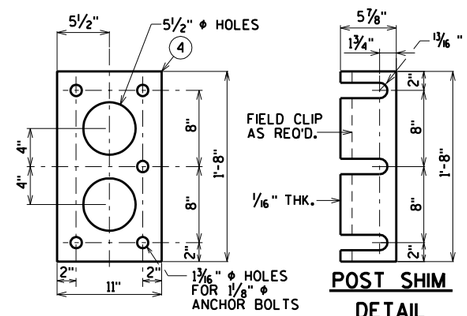


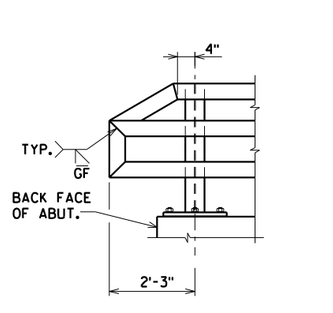
SECTION D



ANCHOR PLATE

(AT RAIL TO DECK CONNECTION)

POST SHIM DETAIL



PART ELEVATION OF RAILING

GENERAL NOTES

1. BID ITEM SHALL BE "RAILING TUBULAR TYPE M B-51-152" WHICH INCLUDES ALL ITEMS SHOWN.
2. RAIL POST AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 50. HOLLOW RAILING STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B OR C WITH A CERTIFIED FY = 50 KSI. ANCHOR PLATES, AND SPLICE TUBE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 36.
3. THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ⅛ TURN.
4. RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF THREE (3) POSTS WITHOUT SPLICES WHERE POSSIBLE. ~~RAILS SHALL BE SPLICED IN A PANEL OVER EXPANSION JOINTS.~~
5. ENDS OF TUBE SECTIONS SHALL BE SAWED. GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.
6. WELD IS THE SAME ON BOTH FLANGES. FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING.
7. FILL BOLT SLOT OPENINGS IN POST SHIMS AND PLATE NO. 2 AND CAULK AROUND PERIMETER OF PLATE NO. 2 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. STEEL POST SHIMS MAY BE USED UNDER POSTS WHERE REQ'D. FOR ALIGNMENT.
8. POST BASE PLATES SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUT.
9. ALL MATERIAL SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, ALL STEEL RAILING POSTS & STEEL TUBING SHALL BE GIVEN A NO. 6 BLAST CLEANING BY S.S.P.C. SPECIFICATIONS.
10. ~~WHEN PAINTING IS REQUIRED, ALL MATERIAL EXCEPT ANCHORAGE DETAIL (NO. 3 & 4) SHALL BE PAINTED OVER GALVANIZING WITH APPROVED TIE COAT AND TOP COAT.~~
11. THIS RAILING MEETS NCHRP REPORT 350 EVALUATION CRITERIA FOR TEST LEVEL 4 (TL-4).
12. PLACE FIRST BOTTOM LONGITUDINAL BAR CLEAR OF DRIP GROOVE.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-51-152

DRAWN BY CLS | PLANS CK'D. JWZ

RAILING TUBULAR TYPE M

SHEET 13 OF 13
68

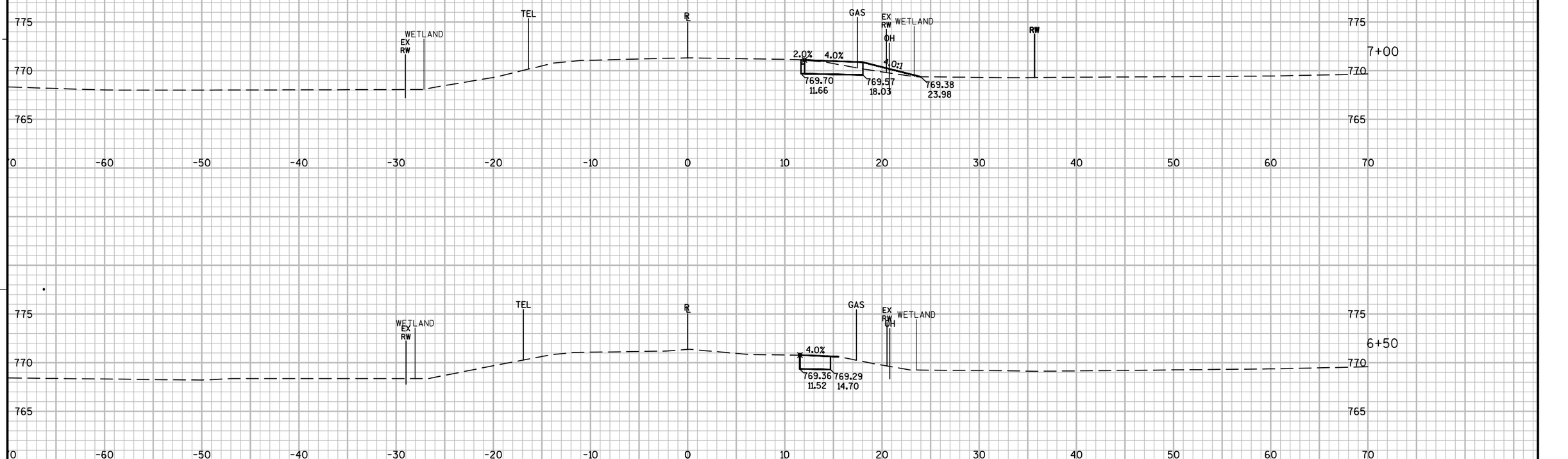
ORIGINAL PLANS PREPARED BY
AYRES ASSOCIATES
3433 Oakwood Hills Parkway
Eau Claire, WI 54701
www.AyresAssociates.com

7/28/2015

EARTHWORK STATION-BY-STATION

STATION	REAL STATION	Distance	AREA (SF) Cut	Salvaged/ Unusable Pave. Mat.	Fill	Marsh Exc	Incremental Vol (CY) (Unadjusted) Cut (Note 1)	Salvaged/ Unusable Pave. Mat. (Note 2)	Fill (Note 3)	Marsh Exc	Cumulative Vol (CY) Cut 1.00 (Note 1)	Exp. Fill 1.25
MALCHINE ROAD												
6+39	639		0.0	0.0	0.0	0.0	0	0	0	0	0	0
6+50	650	11	2.3	0.0	0.0	0.0	0	0	0	0	0	0
7+00	700	50	8.5	0.0	0.0	0.0	10	0	0	0	10	0
7+50	750	50	14.3	0.0	1.4	0.0	21	0	1	0	32	2
7+75	775	25	19.8	0.0	3.0	0.0	16	0	2	0	47	4
8+00	800	25	15.5	0.0	6.4	0.0	16	0	4	0	64	10
8+25	825	25	21.8	0.0	12.1	11.5	17	0	9	5	81	20
8+50	850	25	16.3	0.0	14.8	20.2	18	0	12	15	99	36
8+70	870	20	18.7	0.0	51.5	55.0	13	0	25	28	111	67
8+86	886	16	23.4	0.0	39.5	51.5	12	0	27	32	124	100
9+00	900	14	61.6	11.0	29.8	42.7	22	3	18	24	146	123
9+10	910	10	73.0	11.0	22.9	47.5	25	4	10	17	171	135
9+35	935	25	121.7	11.0	0.0	0.0	90	10	11	22	261	148
9+50	950	15	127.7	11.0	0.0	0.0	69	6	0	0	330	148
9+65	965	15	90.1	11.0	13.1	0.0	60	6	4	0	391	153
STRUCTURE B-51-152												
10+29	1029		94.7	11.0	14.1	0.0	0	0	0	0	391	153
10+50	1050	21	134.7	11.0	0.0	0.0	89	9	5	0	480	160
10+59	1059	9	132.3	11.0	0.0	0.0	45	4	0	0	525	160
10+71	1071	12	106.6	11.0	0.0	0.0	53	5	0	0	578	160
11+00	1100	29	86.1	11.0	6.0	0.0	103	12	3	0	681	164
11+21	1121	21	72.9	11.0	10.2	0.0	62	9	6	0	743	171
11+50	1150	29	53.5	11.0	12.6	0.0	68	12	12	0	811	187
11+72	1172	22	73.1	11.0	6.6	0.0	52	9	8	0	862	197
12+00	1200	28	11.5	0.0	8.3	0.0	44	6	8	0	906	206
12+32	1232	32	7.8	0.0	19.6	23.1	11	0	16	14	918	227
12+50	1250	18	8.1	0.0	11.7	15.0	5	0	10	13	923	240
13+00	1300	50	4.0	0.0	3.4	0.0	11	0	14	14	934	257
13+50	1350	50	9.9	0.0	0.0	0.0	13	0	3	0	947	261
13+83	1383	33	5.7	0.0	0.3	0.0	10	0	0	0	956	261
							956	93	209	183		

NOTES:
1. Cut includes Salvaged/Unusable Pavement material
2. This does not show up in cross sections
3. Does not include Unusable Pavement Exc volume



9

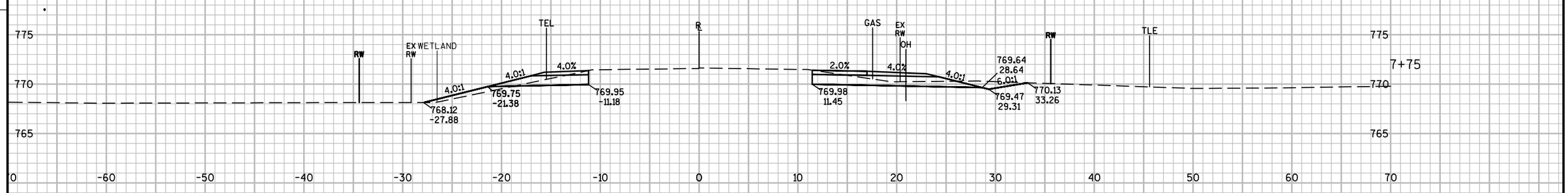
9

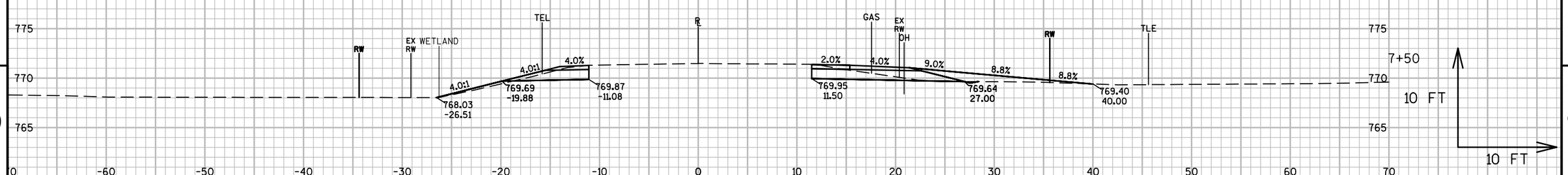
PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CROSS SECTIONS: MALCHINE ROAD	SHEET 70	E

FILE NAME : V:\TRANS-WK\45038900 MALCHINE\DWG\DESIGN\CORRIDORS\CORRIDORS-MALCHINE.DWG
LAYOUT NAME - 17

PLOT DATE : 9/24/2015 9:29 AM PLOT BY : AYRES ASSOCIATES PLOT NAME : 17 PLOT SCALE : 1 IN:10 FT

WISDOT/CADDS SHEET 49





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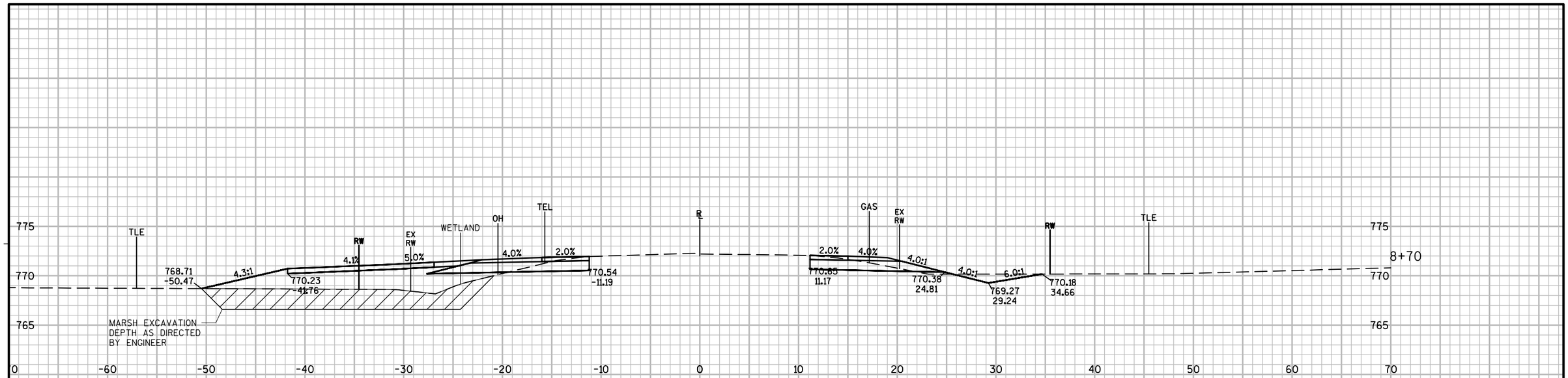
9

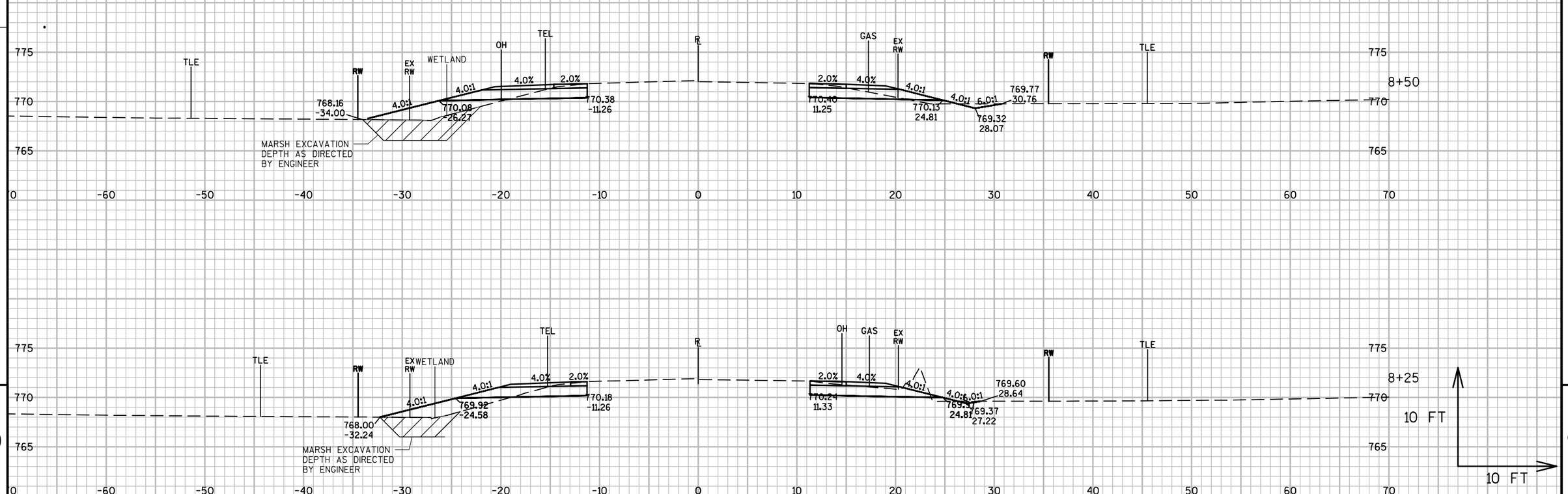
PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CROSS SECTIONS: MALCHINE ROAD	SHEET 71	E

FILE NAME : V:\TRANS-WK\45038900 MALCHINE\DWG\DESIGN\CORRIDORS\CORRIDORS-MALCHINE.DWG
LAYOUT NAME - 18

PLOT DATE : 9/24/2015 9:29 AM PLOT BY : AYRES ASSOCIATES PLOT NAME : 18 PLOT SCALE : 1 IN:10 FT

WISDOT/CADDS SHEET 49





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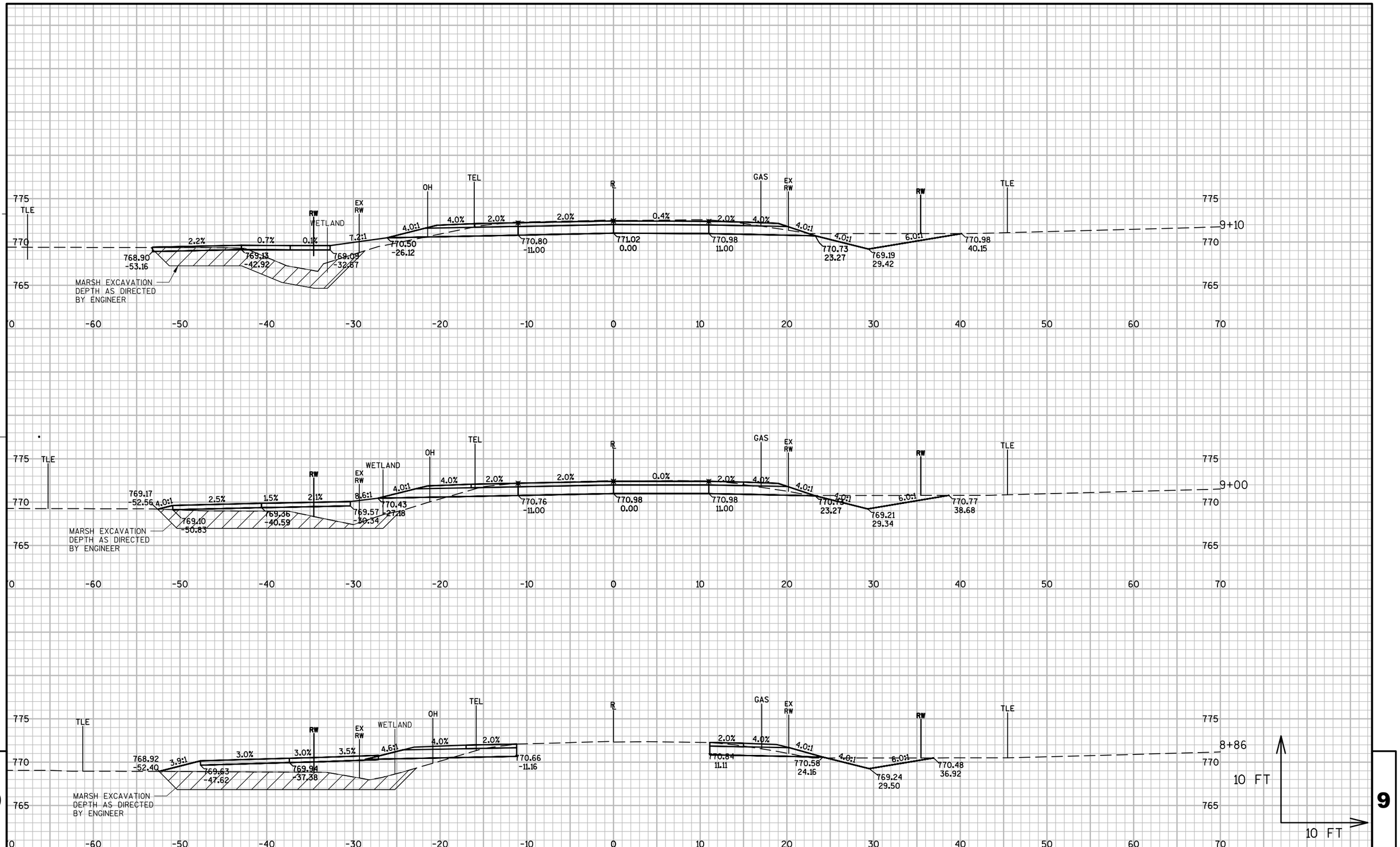
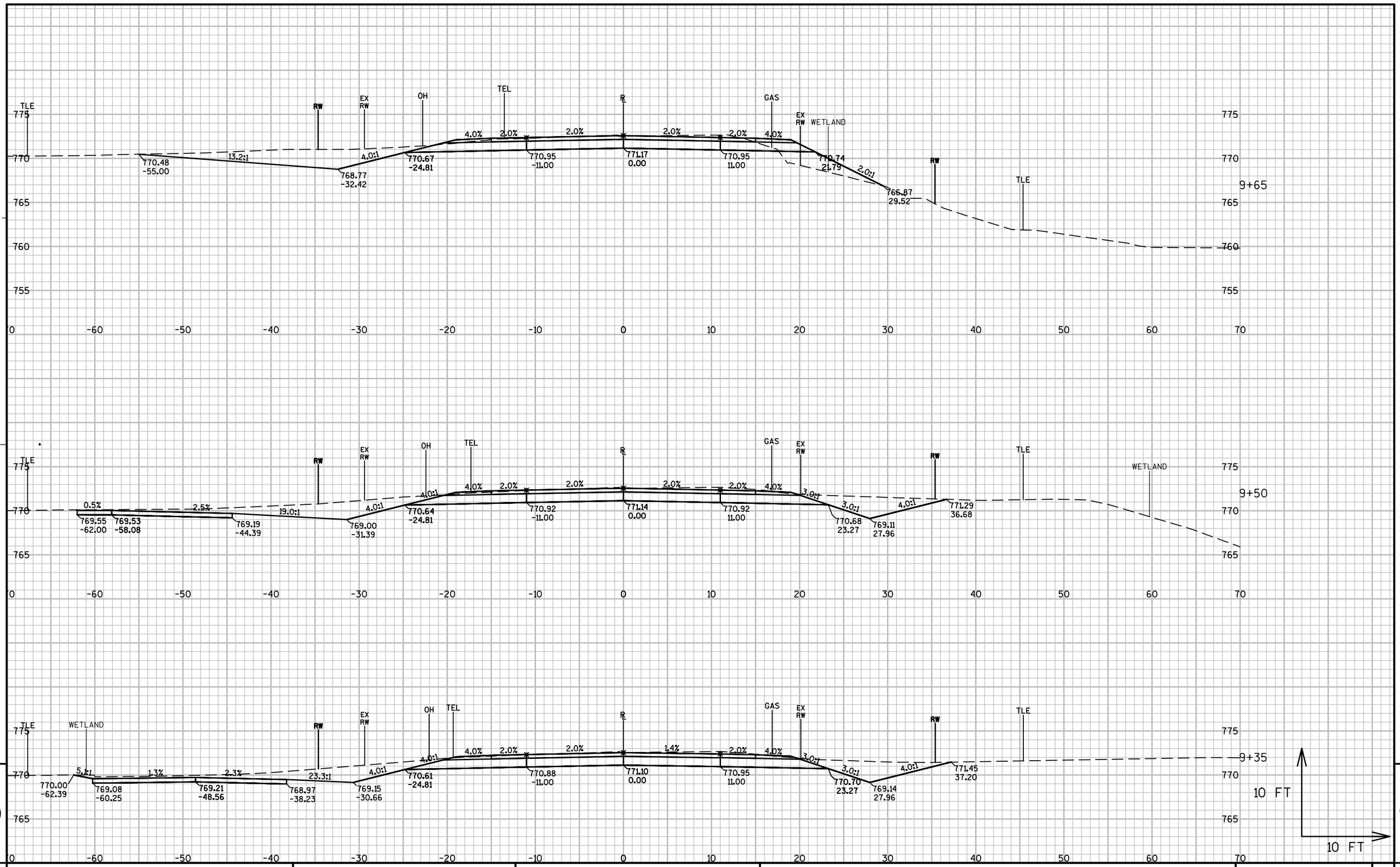
PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CROSS SECTIONS: MALCHINE ROAD	SHEET 72	E



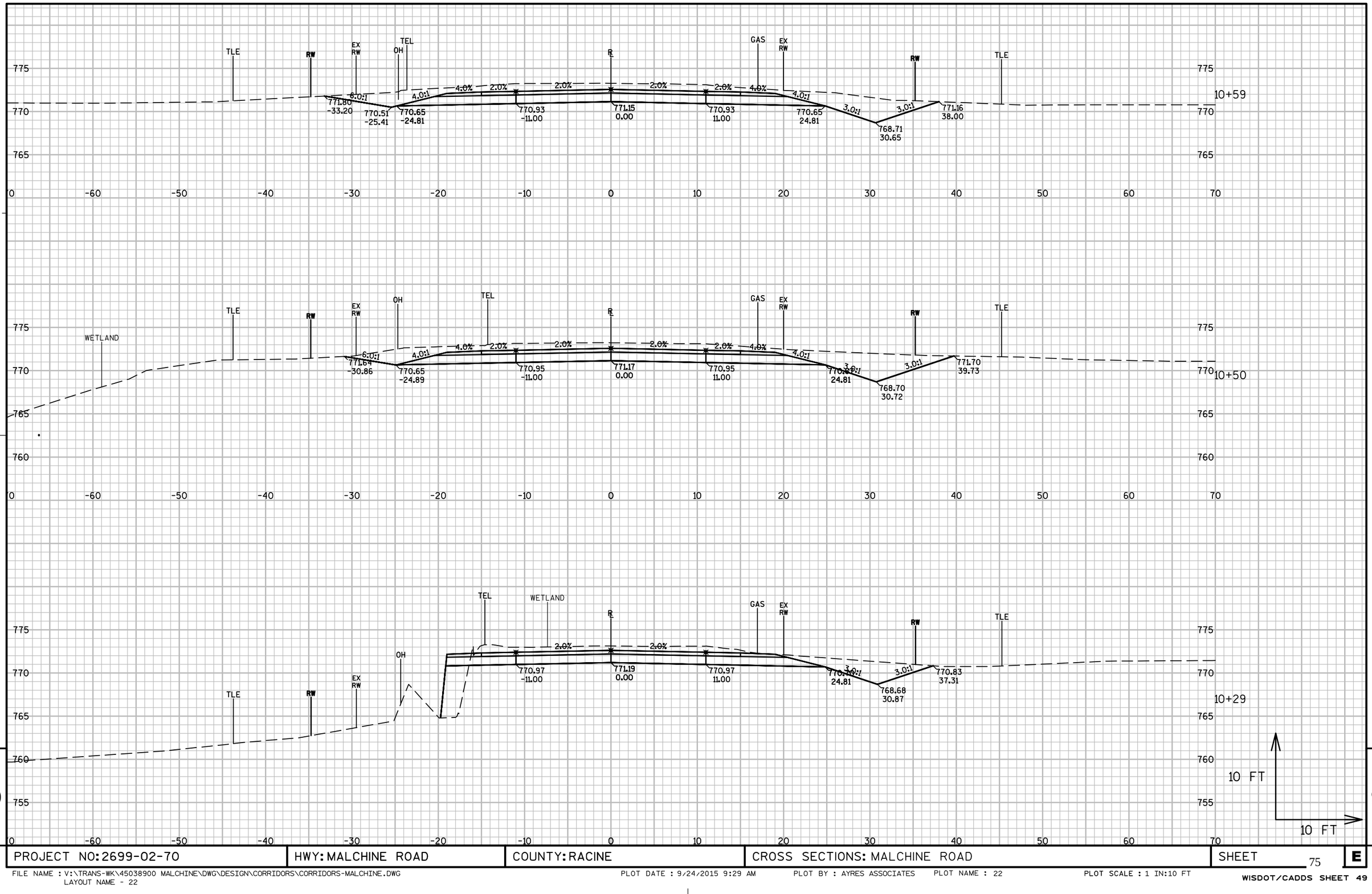
PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CROSS SECTIONS: MALCHINE ROAD	SHEET 73	E



9 9

PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CROSS SECTIONS: MALCHINE ROAD	SHEET 74	E

FILE NAME : V:\TRANS-WK\45038900 MALCHINE\DWG\DESIGN\CORRIDORS\CORRIDORS-MALCHINE.DWG
LAYOUT NAME - 21
PLOT DATE : 9/24/2015 9:29 AM PLOT BY : AYRES ASSOCIATES PLOT NAME : 21 PLOT SCALE : 1 IN:10 FT

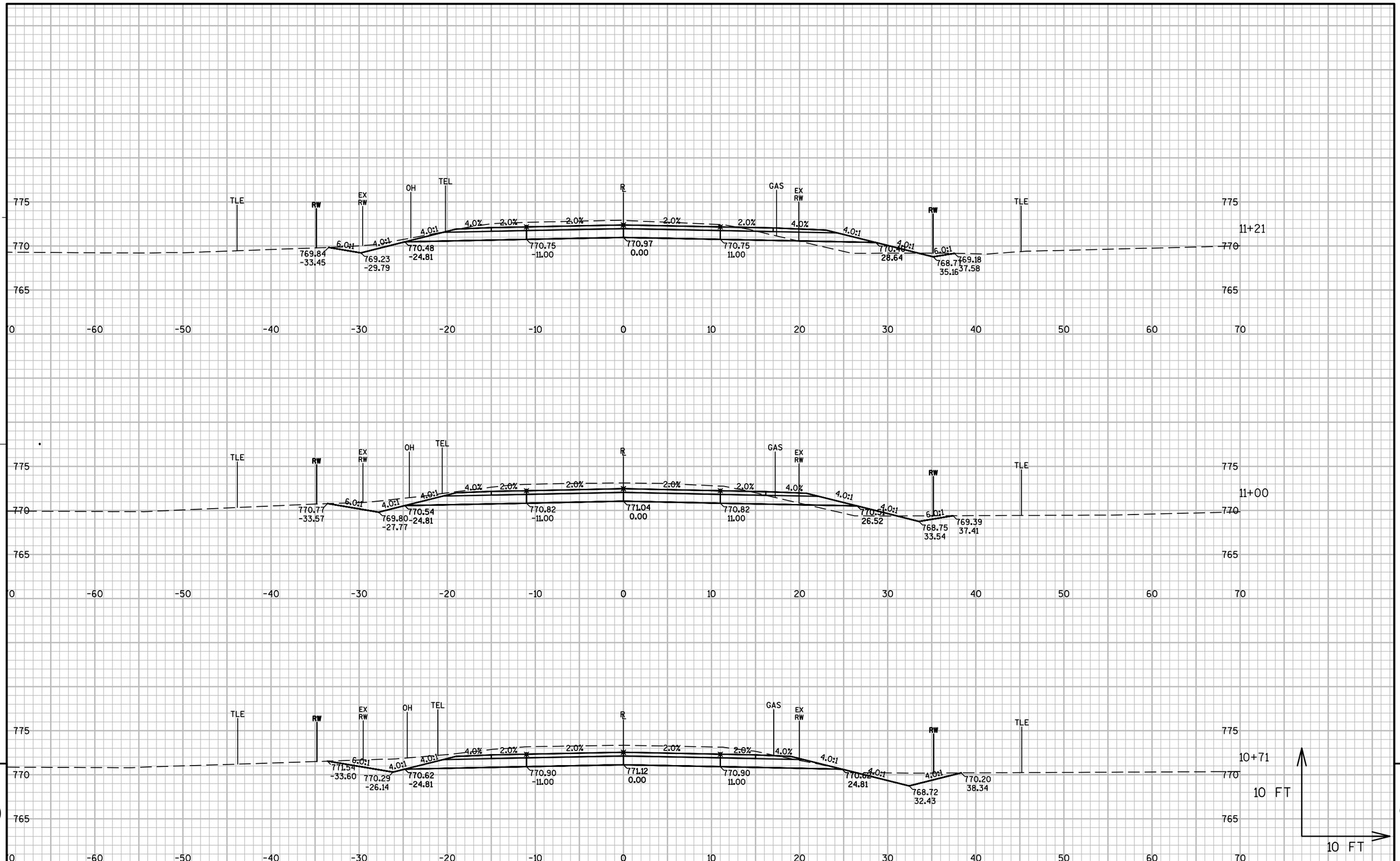


PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CROSS SECTIONS: MALCHINE ROAD	SHEET 75 E

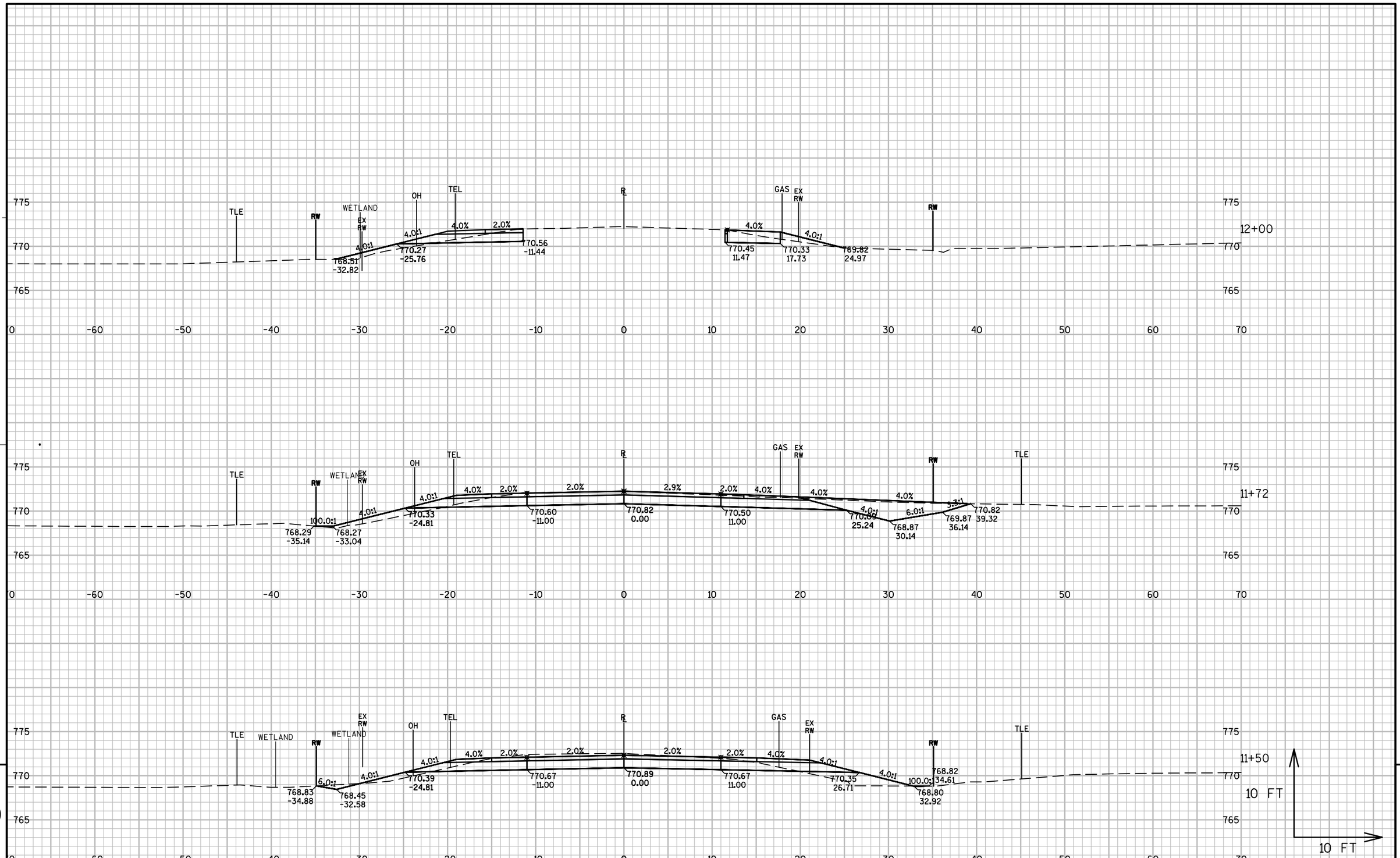
FILE NAME : V:\TRANS-WK\45038900 MALCHINE\DWG\DESIGN\CORRIDORS\CORRIDORS-MALCHINE.DWG
LAYOUT NAME - 22

PLOT DATE : 9/24/2015 9:29 AM PLOT BY : AYRES ASSOCIATES PLOT NAME : 22 PLOT SCALE : 1 IN:10 FT

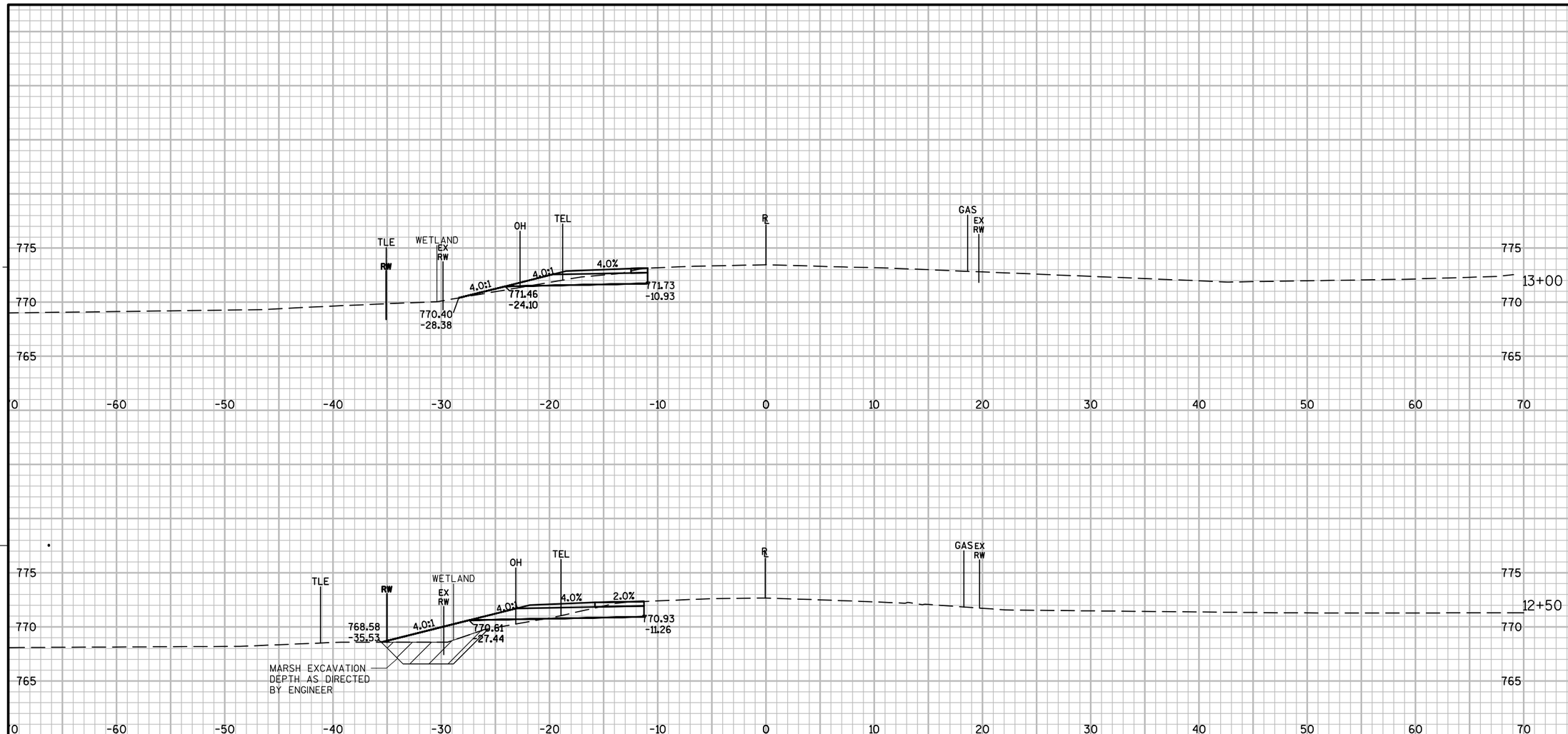
WISDOT/CADDS SHEET 49

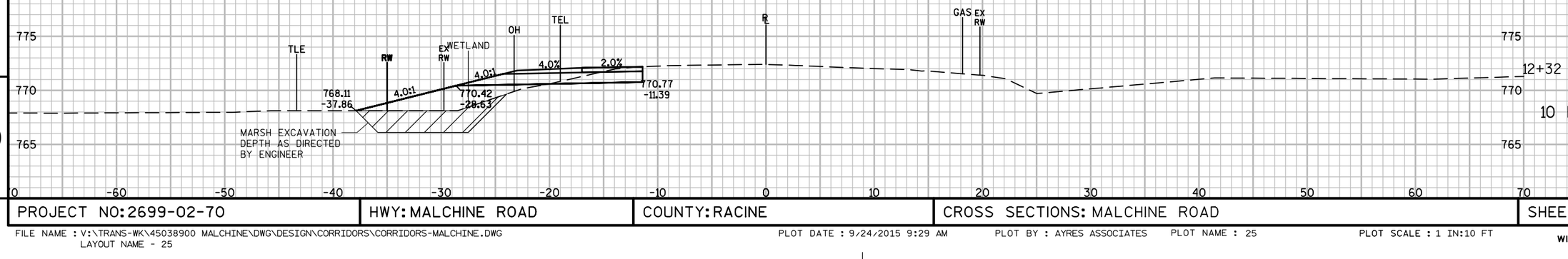


PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CROSS SECTIONS: MALCHINE ROAD	SHEET 76	E



PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CROSS SECTIONS: MALCHINE ROAD	SHEET 77	E





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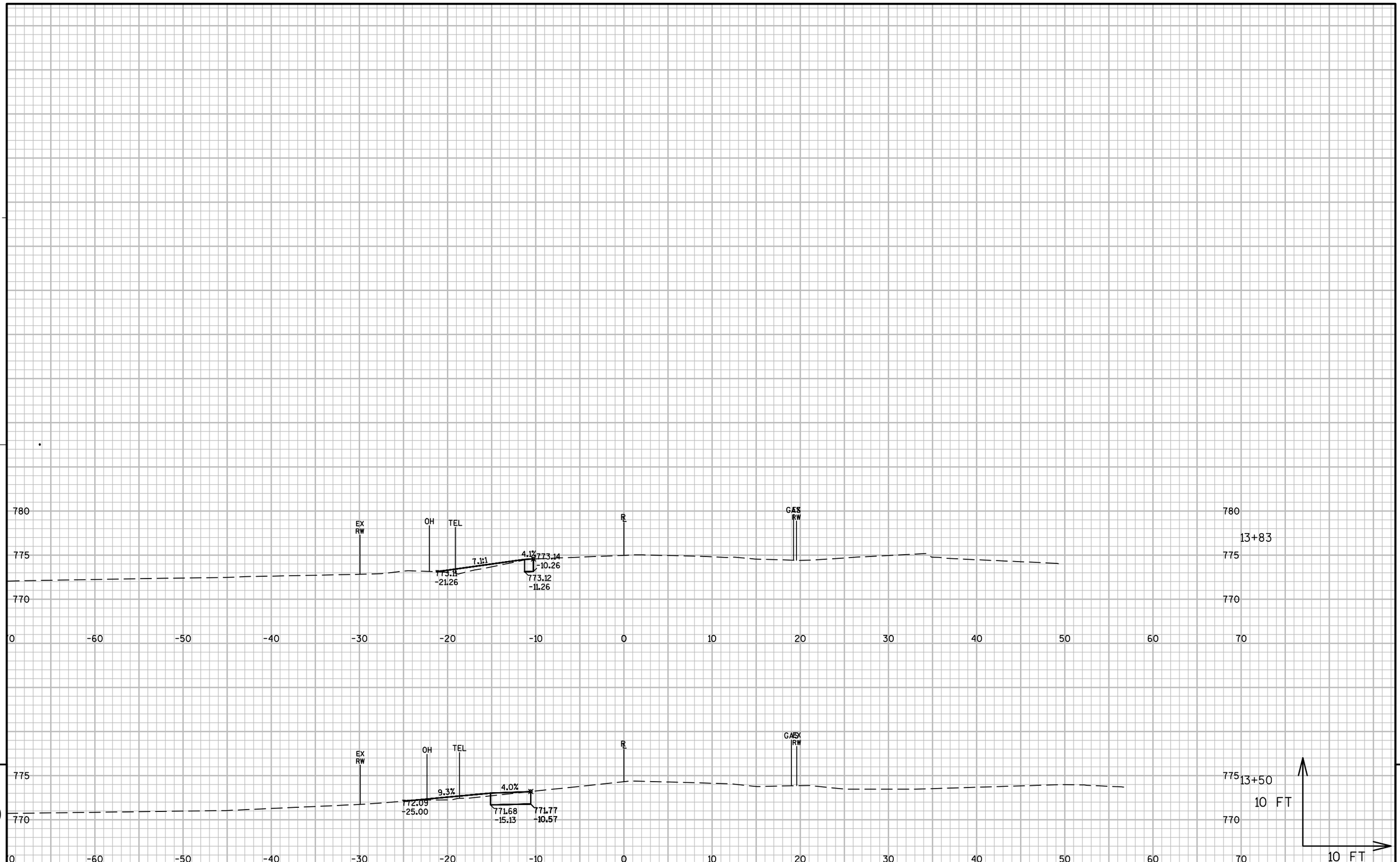
PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CROSS SECTIONS: MALCHINE ROAD	SHEET 78	E



9

9

PROJECT NO: 2699-02-70	HWY: MALCHINE ROAD	COUNTY: RACINE	CROSS SECTIONS: MALCHINE ROAD	SHEET 79	E

FILE NAME : V:\TRANS-WK\45038900 MALCHINE\DWG\DESIGN\CORRIDORS\CORRIDORS-MALCHINE.DWG
LAYOUT NAME - 26

PLOT DATE : 9/24/2015 9:29 AM PLOT BY : AYRES ASSOCIATES PLOT NAME : 26 PLOT SCALE : 1 IN:10 FT

WISDOT/CADDS SHEET 49

Wisconsin Department of Transportation

Dedicated people creating transportation solutions
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