GRE

DECEMBER 2019

PROJECT ID: 4362-02-71

WITH: N/A

COUNTY: MANITOWOC

ORDER OF SHEETS

TOTAL SHEETS = 90

18

DESIGN DESIGNATION

A.A.D.T.	2020	= 1,800
A.A.D.T.	2040	= 2,000
D.H.V.		= 137
D.D.		= 60/40
T.		= 3.0%
DESIGN SPEED		= 50 MPH
ESALS		= 170,000

CONVENTIONAL SYMBOLS

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

STATE OF WISCONSIN

DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

T CATO, CTH S

MANITOWOC RIVER BRIDGE

CTH S

MANITOWOC COUNTY

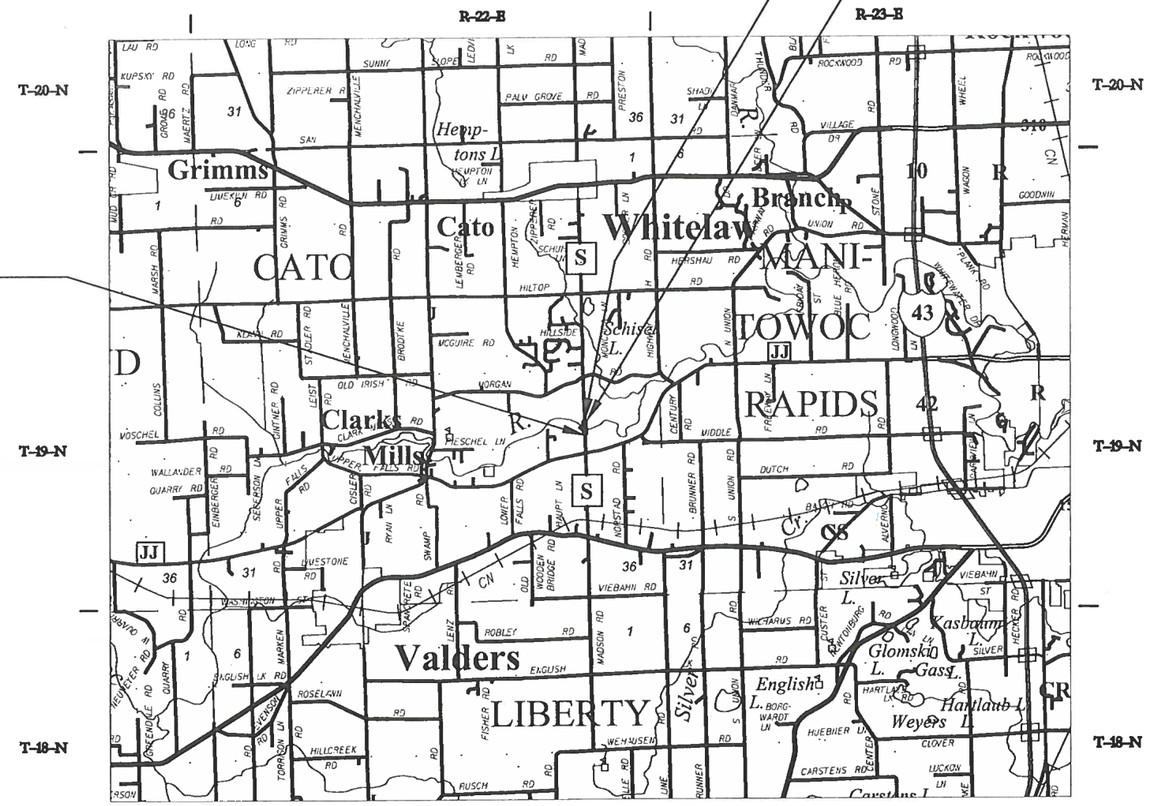
STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
4362-02-71	———	———

STATE PROJECT NUMBER
4362-02-71

STRUCTURE B-36-233

END PROJECT
STA 12+50.00

BEGIN PROJECT
STA 8+00.00
Y = 303070.191
X = 190680.374



LAYOUT
SCALE 0 2 MI

TOTAL NET LENGTH OF CENTERLINE = 0.085 MILES

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COUNTY COORDINATES, MANITOWOC 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. PLAN ELEVATIONS = USGS DATUM, NAVD 88 (2012).

ACCEPTED FOR MANITOWOC COUNTY

DATE: 7/15/19 (Signature)

(Title)

ORIGINAL PLANS PREPARED BY

OMNNI ASSOCIATES

WISCONSIN
KRISTOFER R. OLSON
E-35236
APPLETON, WI
PROFESSIONAL ENGINEER
7/8/19

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor	OMNNI ASSOCIATES
Designer	OMNNI ASSOCIATES
Regional Examiner	SCOTT EBELL
Regional Supervisor	JAMES THOMPSON

APPROVED FOR THE DEPARTMENT

DATE: 7/2/19

E

GENERAL NOTES

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

FILL AS SHOWN ON THE PLANS PERTAINS TO EMBANKMENTS CONSTRUCTED FROM COMMON EXCAVATION. THE ALLOWANCE USED FOR EXPANDING THE FILLS TO COMPUTE THE VOLUME OF MATERIAL REQUIRED IS 25 PERCENT. ALL FILL VOLUMES SHOWN ARE THE ACTUAL VOLUMES.
NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT THE APPROVAL OF THE ENGINEER.

ALL DISTURBED AREAS NOT OTHERWISE SURFACED ARE TO BE TOPSOILED, FERTILIZED, SEEDED AND COVERED WITH EROSION MAT.

SEED MIXTURE NO. 30 SHALL BE USED ON ALL DISTURBED AREAS, EXCEPT WETLANDS SHALL BE SEEDED WITH MIXTURE NO. 60.

FERTILIZER SHALL NOT BE USED WITHIN 10-FEET OF NAVIGABLE WATERWAYS AND WETLANDS.

WETLAND AREAS ARE SHOWN ON THE PLANS. CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITIES TO WORK WITHIN THE SLOPE INTERCEPTS IN THE WETLAND AREAS.

THE EXACT LOCATIONS OF ALL EROSION CONTROL ITEMS SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.

PLAN ELEVATIONS = USGS DATUM, NAVD 88 (2012)

THE WISCONSIN DEPARTMENT OF TRANSPORTATION WILL FURNISH THE CONTRACTOR A MONUMENT WHICH SHALL BE SET IN THE STRUCTURE AS DESIGNATED BY THE ENGINEER.

EROSION CONTROL NOTES

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

TOTAL PROJECT AREA = 1.99 ACRES
TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 1.05 ACRES.

CONTACTS

ELECTRIC
WISCONSIN PUBLIC SERVICE CORPORATION
700 NORTH ADAMS STREET, PO BOX 19001
GREEN BAY, WI 54307-9001
ATTN: LORI BUTRY
TELEPHONE: (920) 433-1703
EMAIL: lori.butry@wisconsinpublicservice.com

LOCAL CONTACT (ELECTRIC): SCOTT GAUGER
TELEPHONE: 920-617-5151
CELL PHONE: 920-660-0430
EMAIL: scott.gauger@wisconsinpublicservice.com

COMMUNICATIONS
TDS TELECOM
229 E GREEN BAY STREET
BONDUEL, WI 54107
ATTN: JEREMIAH LUBEN
TELEPHONE: 715-758-6583
CELL: 920-850-2987
EMAIL: Jeremiah.luben@tdstelecom.com

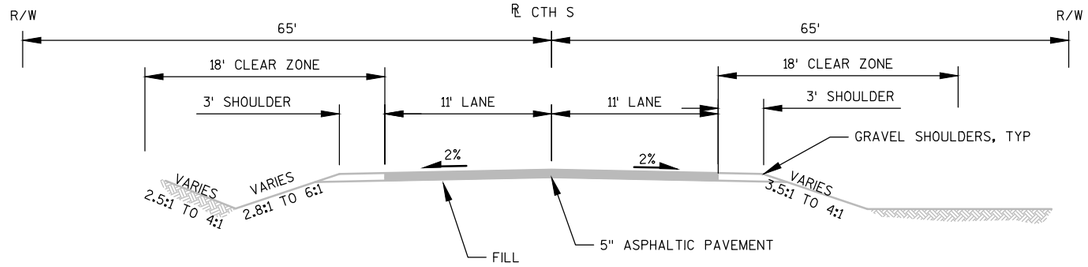
COMMUNICATIONS
COMCAST
PO BOX 429
MANITOWOC, WI 54221
ATTN: JON BURGETT
TELEPHONE:
CELL: 920-629-2365
EMAIL: jon_burgett@cable.comcast.com

DNR LIAISON
MATT SCHAEVE
DEPARTMENT OF NATURAL RESOURCES
2984 SHAWANO AVENUE
GREEN BAY, WI 54313
TELEPHONE: 920-662-5472
EMAIL: matthew.schaeve@wisconsin.gov

MANITOWOC COUNTY
MARC HOLSEN
HIGHWAY COMMISSIONER
3500 STATE HIGHWAY 310
MANITOWOC, WI 54220
TELEPHONE: 920-683-4363
EMAIL: MARCHOLSEN@MANITOWOC.WI.US

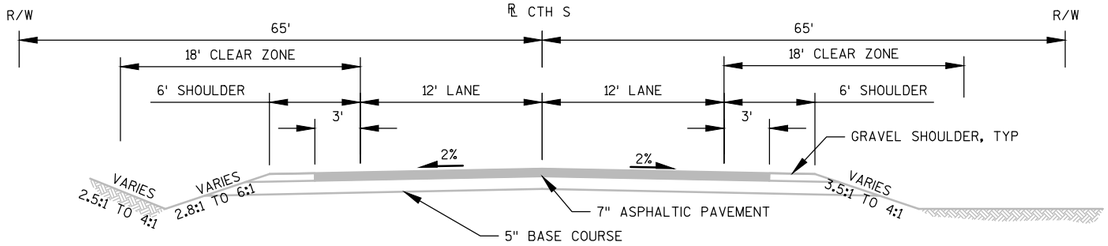
ORDER OF SECTION 2 SHEETS

** DENOTES UTILITIES THAT ARE NOT DIGGERS HOTLINE MEMBERS.



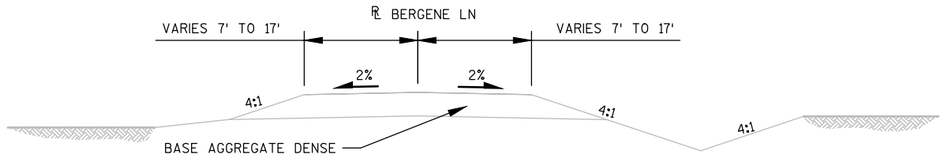
TYPICAL EXISTING SECTION - CTH S

STA 7+00 TO BRIDGE



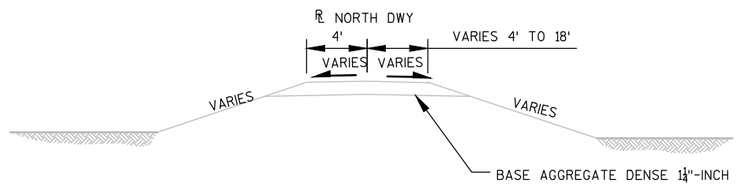
TYPICAL EXISTING SECTION - CTH S

BRIDGE TO STA 14+00



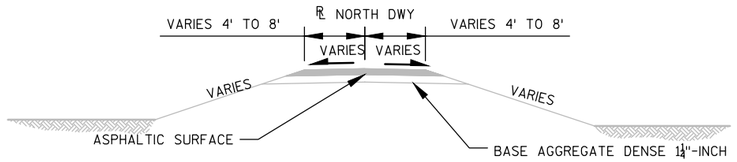
TYPICAL EXISTING SECTION - BERGENE LN

STA 100+00.00 TO STA 101+05.91



TYPICAL EXISTING SECTION - NORTH DWY

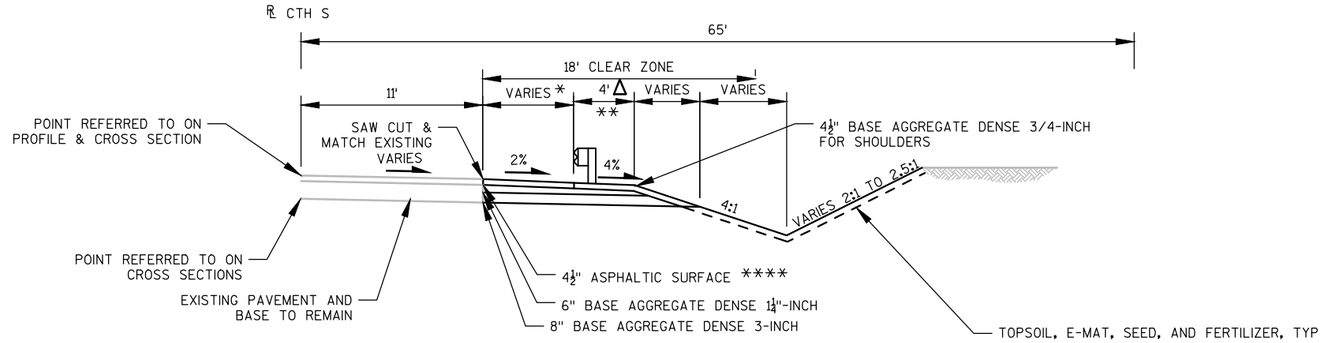
STA 20+35.11 TO STA 20+43.00



TYPICAL EXISTING SECTION - NORTH DWY

STA 20+43 TO STA 22+12.50

PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	TYPICAL SECTIONS	SHEET 3	E



TYPICAL FINISHED SECTION - CTH S

STA 6+83.36 TO STA 8+00.00

NOTES

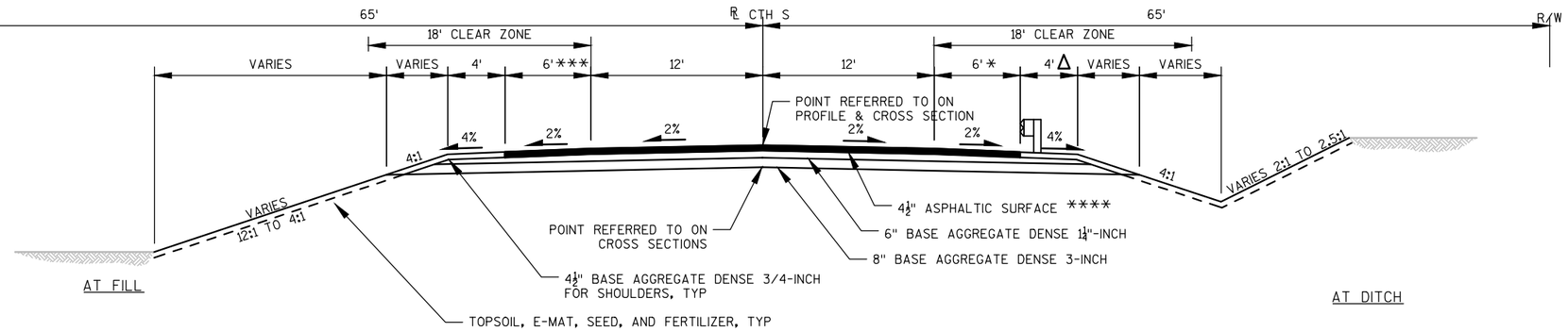
Δ INCREASE TO 6' AT POST NO. 1 OF ENERGY ABSORBING TERMINAL

* VARIES TO 8' AT TERMINAL AND 5' AT BRIDGE

** BEAM GUARD FROM STA 7+79.85 TO STA 8+00.00

*** VARIES TO 11' AT BRIDGE

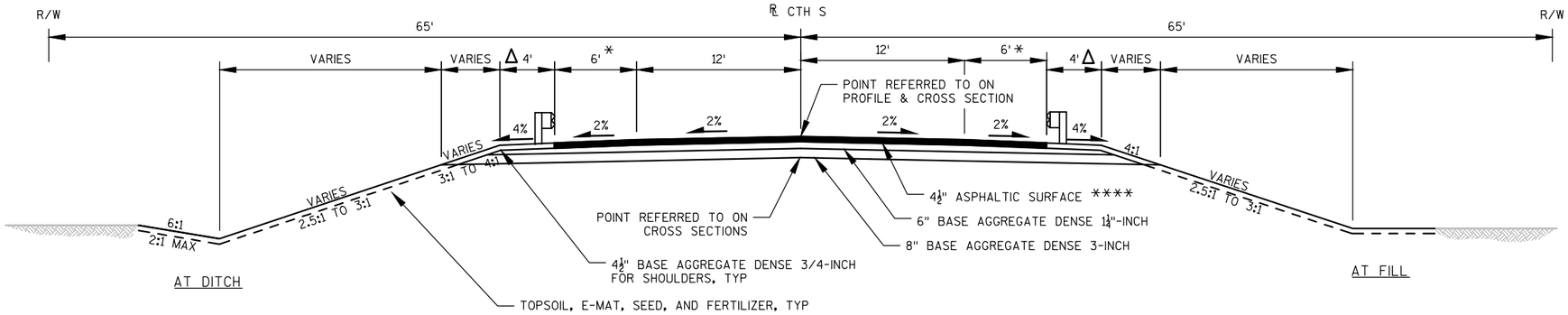
**** CONSTRUCT CTH S ASPHALTIC SURFACE(MAINLINE) 4.5" DEPTH AS FOLLOWS:
2" UPPER LAYER (19 MM NOMINAL SIZE AGGREGATE)
2 1/2" LOWER LAYER (19 MM NOMINAL SIZE AGGREGATE)



TYPICAL FINISHED SECTION - CTH S

STA 8+00.00 TO BRIDGE

PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	TYPICAL SECTIONS	SHEET 4	E



TYPICAL FINISHED SECTION - CTH S

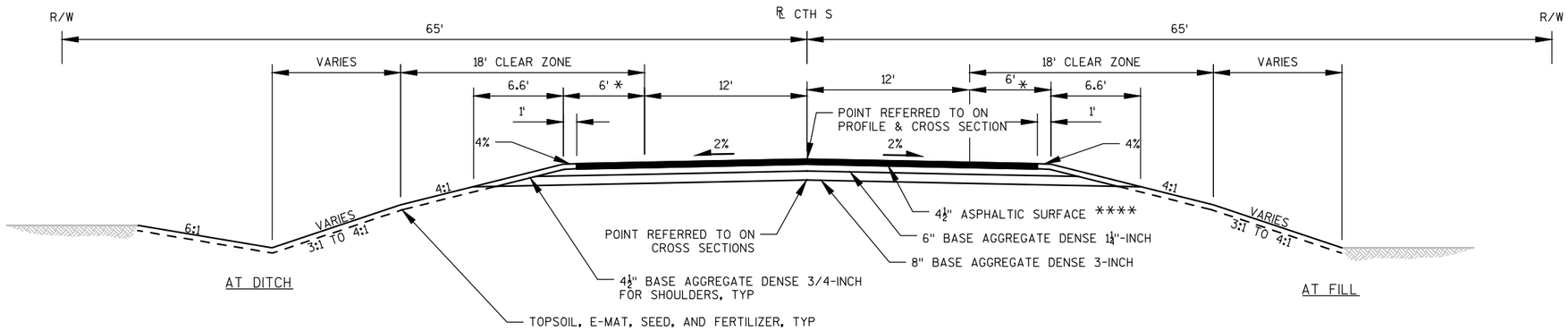
BRIDGE TO STA 11+78.50

NOTES

Δ INCREASE TO 6' AT POST NO. 1 OF ENERGY ABSORBING TERMINAL

* VARIES TO 8' AT TERMINAL AND 5' AT BRIDGE

**** CONSTRUCT CTH S ASPHALTIC SURFACE(MAINLINE) 4.5" DEPTH AS FOLLOWS:
2" UPPER LAYER (19 MM NOMINAL SIZE AGGREGATE)
2 1/2" LOWER LAYER (19 MM NOMINAL SIZE AGGREGATE)

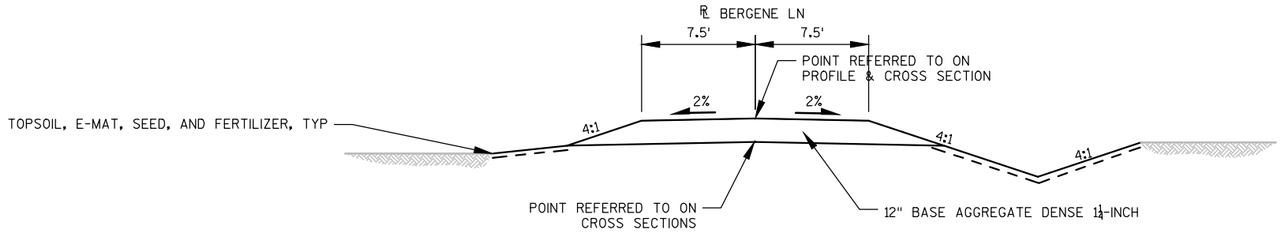


TYPICAL FINISHED SECTION - CTH S

STA 11+78.50 TO STA 12+50.00

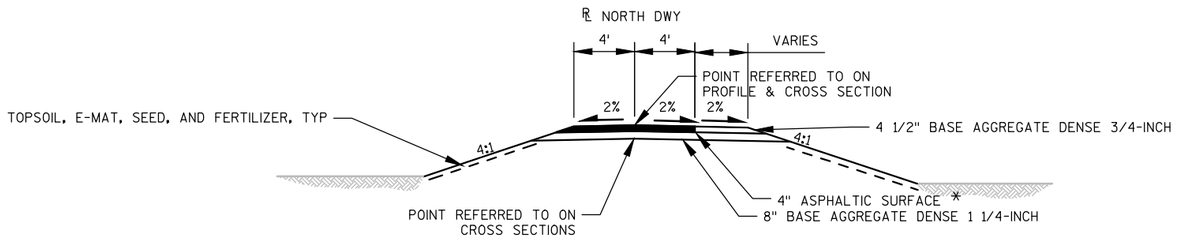
PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	TYPICAL SECTIONS	SHEET 5	E

2



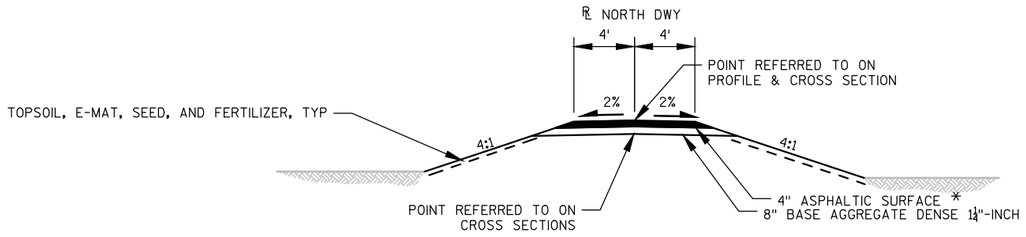
TYPICAL FINISHED SECTION - BERGENE LN

STA 100+00.00 TO STA 101+05.91



TYPICAL FINISHED SECTION - NORTH DWY

STA 20+35.11 TO STA 20+75.00



TYPICAL FINISHED SECTION - NORTH DWY

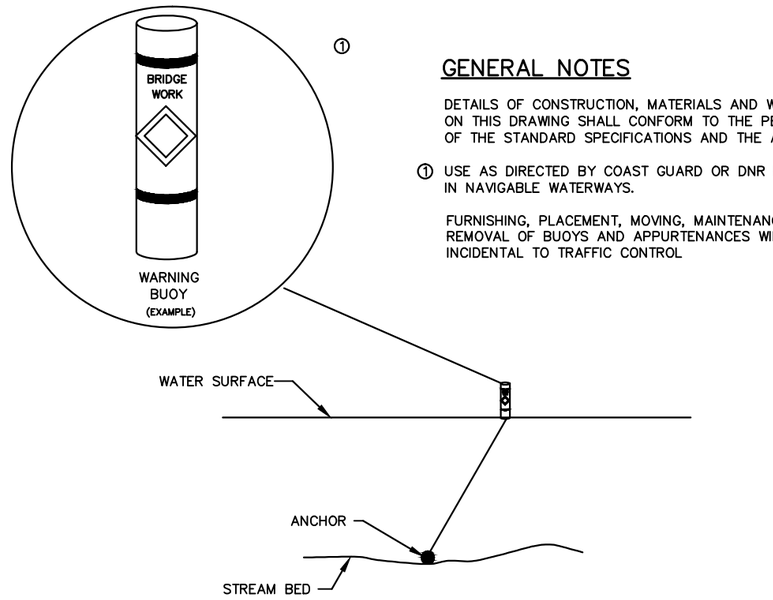
STA 20+75.00 TO STA 22+12.50

NOTES

* CONSTRUCT DWY ASPHALTIC SURFACE
4" DEPTH AS FOLLOWS:
2" UPPER LAYER (19 MM NOMINAL SIZE AGGREGATE)
2" LOWER LAYER (19 MM NOMINAL SIZE AGGREGATE)

PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	TYPICAL SECTIONS	SHEET 6	E

2



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

FURNISHING, PLACEMENT, MOVING, MAINTENANCE AND REMOVAL OF BUOYS AND APPURTENANCES WIL BE CONSIDERED INCIDENTAL TO TRAFFIC CONTROL

WARNING BUOY DETAIL

PLACE WARNING BUOYS NEAR EACH BANK AT 100' & 200' UPSTREAM OF THE BRIDGE OR AS DIRECTED BY THE ENGINEER

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-021001-CD.DWG
LAYOUT NAME - 43620271-021001-PD
PLOT DATE : 9/27/2019 2:11 PM PLOT BY : ANDREW WESTBROOK PLOT NAME : PLOT SCALE : **********
WISDOT/CADDS SHEET 42

2

N

BERGENE LANE

HEAVY RIPRAP

EDGE ASPHALT SURFACE

CRASH CUSHION

+96.71'
-17.00' LT

757.68

757.61

757.52

CONCRETE PAVEMENT
APPROACH SLAB

9+00

CTH S

758.11

757.95

757.79

757.86

757.62

757.55

+87.60'
16.99' RT

N

HEAVY RIPRAP

MEDIUM RIPRAP

+96.71'
-17.00' LT

755.53

755.48

CONCRETE PAVEMENT
APPROACH SLAB

CTH S

755.83

11+00

755.89

755.50

755.50

+87.60'
17.00' RT

MEDIUM RIPRAP

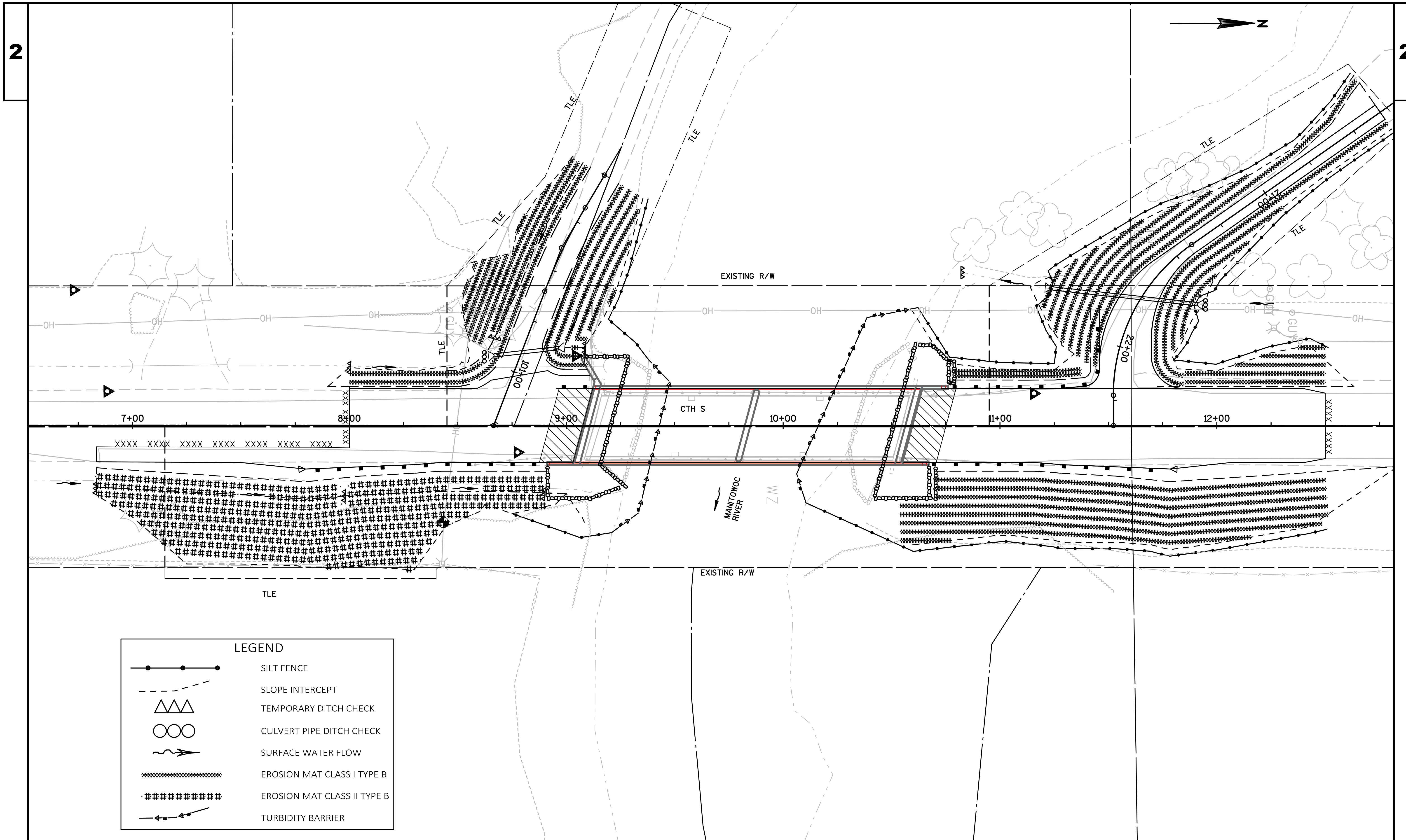
2

PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	PAVING DETAIL	SHEET 8	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-021201-PD.DWG
LAYOUT NAME - 43620271-021001-PD

PLOT DATE : 5/31/2019 8:36 AM PLOT BY : MATT TOMSOVIC PLOT NAME : PLOT SCALE : 1 IN:10 FT

WISDOT/CADDS SHEET 42



PROJECT NO:4362-02-71	HWY:CTH S	COUNTY:MANITOWOC	EROSION CONTROL	SHEET 9	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-022001-EC.DWG
LAYOUT NAME - 43620271-022001-EC
PLOT DATE : 7/2/2019 3:36 PM
PLOT BY : MATT TOMSOVIC
PLOT NAME :
PLOT SCALE : 1 IN:40 FT
WISDOT/CADDS SHEET 42

2

N

BERGENE LN REFERENCE LINE

S59°05'02.53"E
17.496

PI STA = 100+38.96
Y = 303168.325
X = 190598.763
DELTA = 009°48'53"
D = 022°55'06"
T = 21.46
L = 42.82
R = 250.00
PC STA = 100+17.50
PT STA = 100+60.32
SE = NC

BF: 100+00.00

PC: 100+17.50

PT: 100+60.32

BERGENE LN

00+10

S68°53'55.64"E
66.287

NORTH DRIVEWAY REFERENCE LINE

141.293
S34°52'49.98"E

NORTH DWY

21+00

PI STA = 21+85.45
Y = 303422.730
X = 190623.624
DELTA = 054°53'55"
D = 067°24'24"
T = 44.15
L = 81.44
R = 85.00
PC STA = 21+41.29
PT STA = 22+22.74
SE = NC

PC: 21+41.29

22+00

PC: 12+35.10

CTH S REFERENCE LINE

7+00 8+00 9+00 N00°13'14.86"E 1533.274 10+00 CTH S 11+00 12+00 13

S89°46'45.14"E
13.956

PT: 22+22.74

EP: 22+36.69

EP: 101+26.61

ALI-CTH S STA 11+52.32=
NORTH DRIVEWAY STA 22+36.69

STA 6+83.36
Y = 302953.552
X = 190679.925

STA 8+00.00
Y = 303070.191
X = 190680.324

ALI-CTH S STA 8+66.54=
BERGENE LANE STA 101+26.61

STA 12+50.00
Y = 303520.188
X = 190682.108

PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	ALIGNMENT DETAIL	SHEET 10	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-027201-AD.DWG
LAYOUT NAME - 43620271-027201-AD
PLOT DATE : 5/31/2019 8:47 AM PLOT BY : MATT TOMSOVIC PLOT NAME : PLOT SCALE : 1 IN:40 FT
WISDOT/CADDS SHEET 42

4362-02-71

Line	Item	Item Description	Unit	Total	Qty
0002	201.0205	Grubbing	STA	3.000	3.000
0004	203.0100	Removing Small Pipe Culverts	EACH	2.000	2.000
0006	203.0600.S	Removing Old Structure Over Waterway With Minimal Debris (station) 01. 9+84	LS	1.000	1.000
0008	204.0165	Removing Guardrail	LF	200.000	200.000
0010	205.0100	Excavation Common	CY	1,440.000	1,440.000
0012	206.1000	Excavation for Structures Bridges (structure) 01. B-36-233	LS	1.000	1.000
0014	206.1050.S	Underwater Foundation Inspection (location) 01. B-36-233	EACH	1.000	1.000
0016	206.5000	Cofferdams (structure) 01. B-36-233	LS	1.000	1.000
0018	208.0100	Borrow	CY	747.000	747.000
0020	210.1500	Backfill Structure Type A	TON	370.000	370.000
0022	213.0100	Finishing Roadway (project) 01. 4362-02-71	EACH	1.000	1.000
0024	305.0110	Base Aggregate Dense 3/4-Inch	TON	100.000	100.000
0026	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	910.000	910.000
0028	305.0130	Base Aggregate Dense 3-Inch	TON	890.000	890.000
0030	415.0410	Concrete Pavement Approach Slab	SY	120.000	120.000
0032	455.0605	Tack Coat	GAL	80.000	80.000
0034	465.0105	Asphaltic Surface	TON	350.000	350.000
0036	502.0100	Concrete Masonry Bridges	CY	363.000	363.000
0038	502.3200	Protective Surface Treatment	SY	690.000	690.000
0040	503.0137	Prestressed Girder Type I 36W-Inch	LF	595.000	595.000
0042	505.0400	Bar Steel Reinforcement HS Structures	LB	7,230.000	7,230.000
0044	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	44,040.000	44,040.000
0046	506.2605	Bearing Pads Elastomeric Non-Laminated	EACH	16.000	16.000
0048	506.4000	Steel Diaphragms (structure) 01. B-36-233	EACH	6.000	6.000
0050	513.4061	Railing Tubular Type M 01. B-5-233	LF	342.000	342.000
0052	516.0500	Rubberized Membrane Waterproofing	SY	23.000	23.000
0054	521.1018	Apron Endwalls for Culvert Pipe Steel 18-Inch	EACH	4.000	4.000
0056	521.3118	Culvert Pipe Corrugated Steel 18-Inch	LF	98.000	98.000
0058	550.1120	Piling Steel HP 12-Inch X 53 Lb	LF	1,750.000	1,750.000
0060	606.0200	Riprap Medium	CY	5.000	5.000
0062	606.0300	Riprap Heavy	CY	140.000	140.000
0064	612.0406	Pipe Underdrain Wrapped 6-Inch	LF	130.000	130.000
0066	614.0800	Crash Cushions Permanent	EACH	1.000	1.000
0068	614.2300	MGS Guardrail 3	LF	100.000	100.000
0070	614.2350	MGS Guardrail Short Radius	LF	25.000	25.000
0072	614.2500	MGS Thrie Beam Transition	LF	118.200	118.200
0074	614.2610	MGS Guardrail Terminal EAT	EACH	2.000	2.000

4362-02-71

Line	Item	Item Description	Unit	Total	Qty
0076	614.2630	MGS Guardrail Short Radius Terminal	EACH	1.000	1.000
0078	619.1000	Mobilization	EACH	1.000	1.000
0080	624.0100	Water	MGAL	12.000	12.000
0082	625.0100	Topsoil	SY	2,900.000	2,900.000
0084	628.1504	Silt Fence	LF	1,090.000	1,090.000
0086	628.1520	Silt Fence Maintenance	LF	1,090.000	1,090.000
0088	628.1905	Mobilizations Erosion Control	EACH	2.000	2.000
0090	628.1910	Mobilizations Emergency Erosion Control	EACH	4.000	4.000
0092	628.2004	Erosion Mat Class I Type B	SY	1,980.000	1,980.000
0094	628.2023	Erosion Mat Class II Type B	SY	920.000	920.000
0096	628.6005	Turbidity Barriers	SY	135.000	135.000
0098	628.7504	Temporary Ditch Checks	LF	128.000	128.000
0100	628.7555	Culvert Pipe Checks	EACH	6.000	6.000
0102	629.0210	Fertilizer Type B	CWT	9.110	9.110
0104	630.0130	Seeding Mixture No. 30	LB	52.000	52.000
0106	630.0160	Seeding Mixture No. 60	LB	10.000	10.000
0108	630.0500	Seed Water	MGAL	65.000	65.000
0110	634.0614	Posts Wood 4x6-Inch X 14-FT	EACH	5.000	5.000
0112	637.2230	Signs Type II Reflective F	SF	19.460	19.460
0114	638.2602	Removing Signs Type II	EACH	5.000	5.000
0116	638.3000	Removing Small Sign Supports	EACH	5.000	5.000
0118	642.5001	Field Office Type B	EACH	1.000	1.000
0120	643.0420	Traffic Control Barricades Type III	DAY	1,632.000	1,632.000
0122	643.0705	Traffic Control Warning Lights Type A	DAY	3,265.000	3,265.000
0124	643.0900	Traffic Control Signs	DAY	816.000	816.000
0126	643.5000	Traffic Control	EACH	1.000	1.000
0128	645.0111	Geotextile Type DF Schedule A	SY	90.000	90.000
0130	645.0120	Geotextile Type HR	SY	215.000	215.000
0132	646.1020	Marking Line Epoxy 4-Inch	LF	1,286.000	1,286.000
0134	650.4500	Construction Staking Subgrade	LF	704.000	704.000
0136	650.5000	Construction Staking Base	LF	704.000	704.000
0138	650.6000	Construction Staking Pipe Culverts	EACH	2.000	2.000
0140	650.6500	Construction Staking Structure Layout (structure) 01. B-36-233	LS	1.000	1.000
0142	650.9910	Construction Staking Supplemental Control (project) 01. 3271-00-71	LS	1.000	1.000
0144	650.9920	Construction Staking Slope Stakes	LF	704.000	704.000
0146	690.0150	Sawing Asphalt	LF	180.000	180.000
0148	715.0415	Incentive Strength Concrete Pavement	DOL	500.000	500.000
0150	715.0502	Incentive Strength Concrete Structures	DOL	2,178.000	2,178.000

EARTHWORK SUMMARY

Division	From/To Station	Common Excavation (item # 205.0100)		Available Material	Unexpanded Fill	Expanded Fill	Mass Ordinate +/- (1)	Waste	Borrow
Division 1		Cut	EBS Excavation			Factor 1.25			(item #208.0100)
CTH S	6+83.36/12+75	1,335	0	1,335	1,452	1,815	-480	0	480
NORTH DRIVEWAY	20+00/22+00	8	0	8	220	275	-267	0	267
BERGENE LN	100+00/100+75	98	0	98	0	0	97	97	0
Grand Total		1,441	0	1,441	1,672	2,090	-649	97	747
Total Common Exc			1,441						

1) The Mass Ordinate + or - Qty calculated for the Division. Plus quantity indicates an excess of material within the Division. Minus indicates a shortage of material within the Division.

CLEARING AND GRUBBING

STATION	TO	STATION	LOCATION	201.0205 GRUBBING STA
CATEGORY 0010				
7+00	-	9+00	CTH S	2
100+00	-	101+00	DRIVEWAY	1
			PROJECT TOTALS	3

REMOVING SMALL CULVERT PIPE

STATION	DIR	LOCATION	203.0100 REMOVING SMALL CULVERT PIPE EACH	COMMENT
CATEGORY 0010				
100+98	R/L	BERGENE LN	1	18" CMP
21+75	R/L	NORTH DWY	1	18" CMP
		PROJECT TOTAL	2	

REMOVING GUARDRAIL

STATION	TO	STATION	DIR	LOCATION	204.0165 REMOVING GUARDRAIL LF
CATEGORY 0010					
8+55	-	9+05	RT	CTH S	50
10+50	-	11+00	RT	CTH S	50
10+60	-	11+10	LT	CTH S	50
100+60	-	101+10	LT	BERGENE LN	50
				PROJECT TOTAL	200

BASE COURSE

STATION TO STATION	LOCATION	305.0110 BASE AGGREGATE DENSE 3/4-INCH TON	305.0120 BASE AGGREGATE DENSE 1 1/4-INCH TON	305.0130 BASE AGGREGATE DENSE 3-INCH TON	624.0100 WATER MGAL
CATEGORY 0010					
6+83 - 9+08	CTH S	40	260	380	4
10+60 - 12+50	CTH S	50	340	510	5
100+00 - 101+04	BERGENE LN	---	150	---	1
20+35 - 22+20	NORTH DWY	10	160	---	1
	PROJECT TOTALS	100	910	890	12

CONCRETE PAVEMENT APPROACH SLAB

STATION	TO	STATION	DIR	LOCATION	415.0410 CONC. PAVEMENT APPROACH SLAB SY
CATEGORY 0010					
8+92	-	9+07	R/L	CTH S	60
10+60	-	10+75	R/L	CTH S	60
				PROJECT TOTAL	120

3

ASPHALTIC ITEMS

STATION	TO	STATION	LOCATION	455.0605 TACK COAT GAL	465.0105 ASPHALTIC SURFACE TON
6+83	-	9+08	CTH S	30	120
10+60	-	12+50	CTH S	50	170
20+35	-	22+20	NORTH DWY	---	60
			PROJECT TOTAL	80	350

CULVERT PIPES

STATION	DIR	LOCATION	521.1018 APRON ENDWALLS FOR CULVERT PIPE STEEL 18-INCH EA	521.3118 CULVERT PIPE CORRUGATED STEEL 18-INCH LF	MIN WALL THICKNESS
100+90	R/L	BERGENE LN	2	30	0.064"
21+72	R/L	NORTH DWY	2	68	0.064"
		PROJECT TOTALS	4	98	

BEAM GUARD

STATION TO STATION	STRUCT	ROADWAY	LOCATION	614.2300 MGS GUARDRAIL 3 LF	614.2350 MGS GUARDRAIL SHORT RADIUS LF	614.2500 MGS THRIE BEAM TRANSITION LF	614.2610 MGS GUARDRAIL TERMINAL EAT EA	614.2630 MGS GUARDRAIL SHORT RADIUS TERMINAL EA
7+80 - 8+94	B-36-233	CTH S	RT	25	---	39.4	1	---
10+64 - 11+79	B-36-233	CTH S	RT	25	---	39.4	1	---
10+73 - 11+45	B-36-233	CTH S	LT	50	25	39.4	---	1
PROJECT TOTALS				**100**	**25**	**118.2**	**2**	**1**

CRASH CUSHIONS

STATION	LOCATION	614.0800 CRASH CUSHIONS PERMANENT EACH	BACK WIDTH FT	OBJECT MARKING PATTERN	CRASH TEST LEVEL	TRAFFIC DIRECTION	TRAFFIC LOCATION	CRASH CUSHION SHIELDS
8+95 LT	CTH S	1	2	OM-3L	TL-3	UNIDIRECTIONAL	RT	PERMANENT BRIDGE RAILING
	PROJECT TOTAL	1						

** CRASH CUSHION DESIGN PARAMETERS
AREA REQUIREMENTS L = 17', N = 6', F = 2'

LANDSCAPING ITEMS

STATION	TO	STATION	DIR	LOCATION	625.0100 TOPSOIL SY	628.2004 EROSION MAT CLASS I TYPE B SY	628.2023 EROSION MAT CLASS II TYPE B SY	629.0210 FERTILIZER TYPE B CWT	630.0130 SEEDING MIX NO. 30 LB	630.0160 SEEDING MIX NO. 60 LB	630.0500 SEED WATER MGAL
6+83	-	9+08	RT	CTH S	770	0	770	0.49	14	---	17
6+83	-	9+08	LT	CTH S	70	70	0	0.04	1	---	2
10+60	-	12+50	RT	CTH S	640	640	0	0.41	12	---	14
10+60	-	12+50	LT	CTH S	150	150	0	0.10	3	---	3
100+00	-	101+04	RT	BERGENE LN	120	120	0	0.07	2	---	3
100+00	-	101+04	LT	BERGENE LN	190	190	0	0.12	3	---	4
20+35	-	22+20	RT	NORTH DWY	300	300	0	0.19	5	---	7
20+35	-	22+20	LT	NORTH DWY	180	180	0	0.11	3	---	4
				UNDISTRIBUTED	480	330	150	7.59	9	10	11
				PROJECT TOTALS	2,900	1,980	920	9.11	52	10	65

REMOVING SIGNS TYPE II AND REMOVING SMALL SIGN SUPPORTS

STATION	DIR	LOCATION	DESCRIPTION	638.2602 REMOVING SIGNS TYPE II EACH	638.3000 REMOVING SMALL SIGN SUPPORTS EACH
870	LT	CTH S	STOP SIGN	1	1
9+03	RT	CTH S	OBJECT MARKER	1	1
9+17	LT	CTH S	OBJECT MARKER	1	1
10+52	RT	CTH S	OBJECT MARKER	1	1
10+70	LT	CTH S	OBJECT MARKER	1	1
			TOTAL	**5**	**5**

EROSION CONTROL ITEMS

STATION	TO	STATION	DIR	LOCATION	628.1504 SILT FENCE	628.1520 SILT FENCE MAINT	628.1905 MOB. EROSION CONTROL	628.1910 MOB. EROSION CONTROL EMERGENCY	628.6005 TURBIDITY BARRIERS SY	628.7504 TEMP. DITCH CHECKS	628.7555 CULVERT PIPE CHECKS
6+83	-	9+08	RT	CTH S	50	50	---	---	55	48	---
6+83	-	9+08	LT	CTH S	---	---	---	---	---	32	---
10+60	-	12+50	RT	CTH S	250	250	---	---	80	---	---
10+60	-	12+50	LT	CTH S	75	75	---	---	---	---	---
100+00	-	101+04	RT	BERGENE LN	---	---	---	---	---	16	2
100+00	-	101+04	LT	BERGENE LN	85	85	---	---	---	16	---
20+35	-	22+20	RT	NORTH DWY	300	300	---	---	---	---	---
20+35	-	22+20	LT	NORTH DWY	150	150	---	---	---	---	2
UNDISTRIBUTED					180	180	2	4	---	16	2
				PROJECT TOTALS	1,090	1,090	2	4	135	128	6

SIGNS REFLECTIVE TYPE II & POSTS WOOD

STATION	DIR	LOCATION	CODE	SIGN SIZE HORIZ X VERT IN X IN	634.0614 POSTS WOOD 4X6-INCH X 14-FT EACH	637.2230 SIGNS TYPE II RELFECTIVE F SF
8+70	LT	CTH S	R1-1	36 X 36	1	7.46
	RT	CTH S	W5-52R	12 X 36	1	3
	LT	CTH S	W5-52L	12 X 36	1	3
	RT	CTH S	W5-52L	12 X 36	1	3
	LT	CTH S	W5-52R	12 X 36	1	3
				TOTAL	**5**	**19.46**

TRAFFIC CONTROL

LOCATION	EST. SERVICE PERIOD DAYS	643.0420 BARRICADES TYPE III NO	643.0420 BARRICADES TYPE III DAYS	643.0705 WARNING LIGHTS TYPE A NO	643.0705 WARNING LIGHTS TYPE A DAYS	643.0900 SIGNS NO	643.0900 SIGNS DAYS	643.5000 TRAFFIC CONTROL EACH
CATEGORY 0010								
CTH S	106	14	1,484	28	2,968	7	742	---
	SUBTOTALS		1,484		2,968		742	0
UNDISTRIBUTED	---		148		297		74	1
	SUBTOTALS		148		297	0	74	1
	PROJECT TOTALS		1,632		3,265		816	1

MARKING LINE

STATION - STATION			LOCATION	646.1020 EPOXY 4-INCH (WHITE) LF	646.1020 EPOXY 4-INCH (YELLOW) LF
CATEGORY 0010					
6+83	-	12+50	CTH S	1,144	142
			PROJECT TOTALS	1,286	

CONSTRUCTION STAKING

STATION TO STATION			LOCATION	650.4500 CONSTRUCTION STAKING SUBGRADE LF	650.5000 CONSTRUCTION STAKING BASE LF	650.6000 CONSTRUCTION STAKING PIPE CULVERTS EACH	650.9910 CONSTRUCTION STAKING SUPPLEMENTAL CONTROL LS	650.9920 CONSTRUCTION STAKING SLOPE STAKES LF
6+83	-	9+08	CTH S	225	225	---	---	225
10+60	-	12+50	CTH S	190	190	---	---	190
100+00	-	101+04	BERGENE LN	104	104	1	---	104
20+35	-	22+20	NORTH DWY	185	185	1	---	185
PROJECT 4362-02-71				---	---	---	1	---
			PROJECT TOTALS	704	704	2	1	704

SAW CUTTING

STATION	DIR	LOCATION	690.0150 SAWING ASPHALT
6+83	R/L	CTH S	150
12+50	R/L	CTH S	30
		PROJECT TOTALS	180

Conventional Signs and Abbreviations

- SECTION LINE
- QUARTER LINE
- TOWNSHIP AND RANGE LINE
- PROPOSED OR NEW CENTERLINE
- PROPOSED OR NEW R/W LINE
- EXISTING R/W LINE
- LOT LINE
- P.L. PROPERTY LINE
- COUNTY LIMITS LINE
- SLOPE INTERCEPTS
- EXISTING MONUMENTATION
- X X FENCE
- SECTION OR QUARTER CORNER
- T T TELEPHONE
- G G GAS
- W W WATER
- E E ELECTRIC
- FO FO FIBER OPTIC
- SAN SAN SANITARY
- SS SS STORM SEWER
- NO ACCESS (BY ACQUISITION)
- NO ACCESS (BY STATUTORY AUTHORITY)
- NO ACCESS (BY PREVIOUS PROJECT)
- TEMPORARY LIMITED EASEMENT
- PERMANENT LIMITED EASEMENT
- FEE TITLE
- RIGHT-OF-WAY MONUMENTS SET AT NEWLY ACQUIRED R/W ANGLE POINTS
- (6) PARCEL NUMBER
- (92) UTILITY PARCEL NUMBER
- R/W POINT NUMBER

AC	ACRES	R	RADIUS
△	CENTRAL ANGLE	R.	RANGE
C/L	CENTERLINE	R/L	REFERENCE LINE
COR.	CORNER	R/W	RIGHT OF WAY
CTH	COUNTY TRUNK HIGHWAY	1/4LINE	QUARTER LINE
D	DEGREE OF CURVE	1/16LINE	SIXTEENTH LINE
E.	EAST	S.	SOUTH
L	LENGTH OF CURVE	SEC	SECTION
LC	LONG CHORD	SEC LINE	SECTION LINE
LCB	LONG CHORD BEARING	STH	STATE TRUNK HIGHWAY
MI	MILE	SF	SQUARE FEET
N.	NORTH	STA	STATION
N.T.S.	NOT TO SCALE	T.	TOWN
PC	POINT OF CURVATURE	T	TANGENT LENGTH OF CURVE
PI	POINT OF INTERSECTION	TLE	TEMPORARY LIMITED EASEMENT
PT	POINT OF TANGENCY	USH	UNITED STATES HIGHWAY
PLE	PERMANENT LIMITED EASEMENT	W.	WEST
P/L	PROPERTY LINE		
PC LINE	PRIVATE CLAIM LINE		

	COMPENSABLE	NON-COMPENSABLE
POWER POLE	■	□
TELEPHONE POLE	●	⊘
TELEPHONE PEDESTAL	■	⊡

REVISIONS	R/W PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS
6-6-19	4362-02-71	4.01	2
	FEDERAL PROJECT NUMBER ----------		

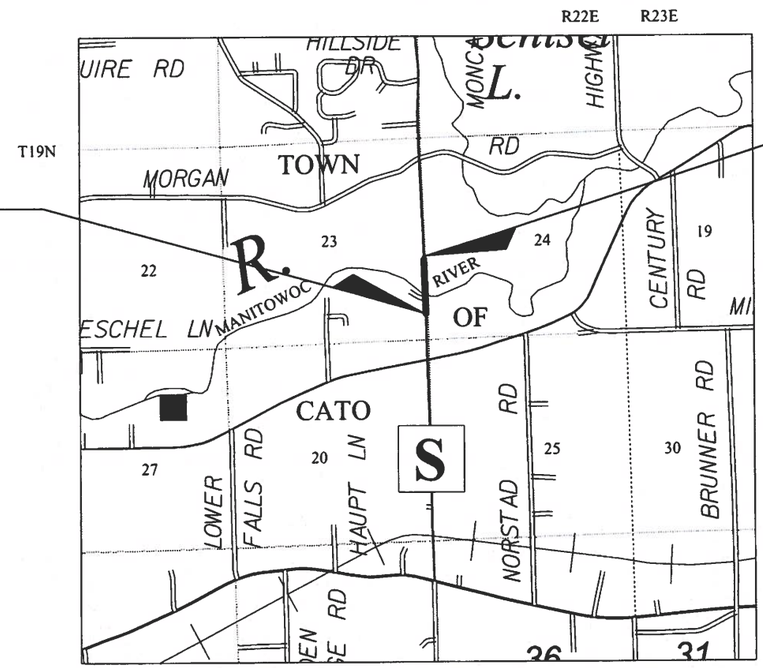
PLAT OF RIGHT-OF-WAY REQUIRED FOR

T CATO
CTH S
MANITOWOC RIVER BRIDGE

TOWN OF CATO — MANITOWOC COUNTY

CONSTRUCTION PROJECT NUMBER
4362-02-71

N



BEGIN RELOCATION ORDER
STA 7+00.00
861.39' NORTH OF AND 2.59' EAST OF
THE SOUTHEAST CORNER OF SECTION 23,
T19N, R22E, TOWN OF CATO, MANITOWOC
COUNTY WISCONSIN
Y: 302970.192
X: 190679.989

END RELOCATION ORDER
STA 12+90.00
1451.38' NORTH OF AND 4.86' EAST OF
THE SOUTHEAST CORNER OF SECTION 23,
T19N, R22E, TOWN OF CATO, MANITOWOC COUNTY WISCONSIN
Y: 303560.187
X: 190682.262

LAYOUT
SCALE 0 2640' 5280'

TOTAL NET LENGTH OF CENTERLINE = 0.112 MI.

ACCEPTED FOR
MANITOWOC COUNTY

(Date) (Signature & Title of Official)

ORIGINAL PLANS PREPARED BY
OMNNI ASSOCIATES
APPLETON, WISCONSIN

WISCONSIN
DAVID A. YURK
S-2648
OSHKOSH, WI
PROFESSIONAL LAND SURVEYOR

9-13-2018 (Date) David A. Yurk (Signature)

Notes:

POSITIONS SHOWN ON THIS PLAT ARE WISCONSIN COUNTY COORDINATES, MANITOWOC COUNTY, NAD 83 (1991) IN US SURVEY FEET. VALUES SHOWN ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES MAY BE USED AS GROUND DISTANCES.

RIGHT OF WAY MONUMENTS ARE TYPE 2 MONUMENTS (TYPICALLY 3/4 X 24" REBAR) AND WILL BE PLACED PRIOR TO THE COMPLETION OF THE PROJECT.

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

PROPERTY LINES SHOWN ON THIS PLAT ARE DRAWN FROM DATA DERIVED OF MAPS AND DOCUMENTS OF PUBLIC RECORD AND/ OR EXISTING OCCUPATION LINES. EXCLUDING RIGHT-OF-WAY BOUNDARIES, THIS PLAT MAY NOT BE A TRUE REPRESENTATION OF EXISTING PROPERTY LINES AND SHOULD NOT BE USED AS A SUBSTITUTE FOR AN ACCURATE FIELD SURVEY.

DIMENSIONS FOR THE NEW RIGHT-OF-WAY IS MEASURED ALONG AND PERPENDICULAR TO THE NEW REFERENCE LINES.

A TEMPORARY LIMITED EASEMENT (TLE) IS A RIGHT FOR CONSTRUCTION PURPOSES, AS DEFINED HEREIN, INCLUDING THE RIGHT TO OPERATE NECESSARY EQUIPMENT THEREON AND THE RIGHT OF INGRESS AND EGRESS, AS LONG AS REQUIRED FOR SUCH PUBLIC PURPOSE, INCLUDING THE RIGHT TO PRESERVE, PROTECT, REMOVE, OR PLANT THEREON ANY VEGETATION THAT THE HIGHWAY AUTHORITIES MAY DEEM NECESSARY OR DESIRABLE. ALL TLE'S EXPIRE AT THE COMPLETION OF THE CONSTRUCTION PROJECT FOR WHICH THIS INSTRUMENT IS GIVEN.

EXISTING R/W CTH S IS ESTABLISHED FROM MANITOWOC COUNTY PROJECT E0-0161, DATED 11-16-1961

MANITOWOC COUNTY

LEVELS ON = 01.02.03.04.05.06.07.08.09.10.11.12.13.14.15.16.17.18.19.20.21.22.23.24.25.26.27.28.29.30.31.32.33.34.35.36.37.38.39.40.41.42.43.44.45.46.47.48.49.50.51.52.53.54.55.56.57.58.59.60.61.62.63

"OWNERS" NAMES ARE SHOWN FOR REFERENCE PURPOSES ONLY AND ARE SUBJECT TO CHANGE PRIOR TO TRANSFER OF LAND INTERESTS TO MANITOWOC COUNTY

SCHEDULE OF LANDS AND INTERESTS

PARCEL NUMBER	OWNER	INTEREST REQUIRED	AREA ACRES REQUIRED NEW	EXISTING	TOTAL	TLE AREA
1	DENNIS P. GRABOWSKI AND LINDA M. GRABOWSKI	FEE TLE	0.01 AC	------	0.01 AC	0.10 AC
2	MANITOWOC COUNTY FISH AND GAME	TLE	-----	-----	-----	0.26 AC
3	DOUGLAS I. RICHTER	TLE	-----	-----	-----	0.01 AC

UTILITY INTEREST REQUIRED

PARCEL NUMBER	OWNER	INTEREST REQUIRED
90	TDS TELECOM	RELEASE OF RIGHTS

GN

R/W POINT TABLE

PT#	Y	X	STA	O/S
26	303161.575	190616.254	8+91.14	64.47'
27	303168.325	190598.763	8+97.82	81.99'
28	303196.163	190552.278	9+25.48	128.58'
29	303171.269	190616.289	9+00.83	64.47'

4

4

BEGIN RELOCATION ORDER
STA 7+00.00
861.40' NORTH OF AND 2.59' EAST OF THE SOUTHEAST CORNER OF SECTION 23, T19N, R22E, TOWN OF CATO, MANITOWOC COUNTY WISCONSIN
Y: 302970.192
X: 190679.989

END RELOCATION ORDER
STA 12+90.00
1451.38' NORTH OF AND 4.86' EAST OF THE SOUTHEAST CORNER OF SECTION 23, T19N, R22E, TOWN OF CATO, MANITOWOC COUNTY WISCONSIN
Y: 303560.187
X: 190682.262

CATO

TOWN OF MANITOWOC

SE-SE SECTION 23

NE-SE SECTION 23

SW-SW SECTION 24

NW-SW SECTION 24

CTH S

1/16 LINE

P/L

65'

NORTH LINE OF LANDS DESCRIBED IN V. 936, PG. 325, DOC# 682425

1 DENNIS P. GRABOWSKI LINDA M. GRABOWSKI

2 MANITOWOC COUNTY FISH AND GAME

3 DOUGLAS I. RICHTER

90 TDS TELECOM

9+27.57
203.67' TLE

TLE FOR SLOPING

9+75.97
183.35' TLE

96.50'

128.92'

N67°00'20"W 67.58'

S67°00'20"E

8+90.21
114.69' TLE

8+44.99
64.46' TLE

N47°41'04"W

9+26.07
64.48' TLE

10+95.00
64.51' TLE

N31°29'42"W 194.51'

S41°22'34"E 109.29'

12+05.08
64.53' TLE

S00°12'35"W 110.08'

SLOPE INTERCEPT

12+60.47
166.77' TLE

TLE FOR SLOPING

12+86.81
137.09' TLE

N89°46'45"W 65.00'

N00°12'35"E 861.40'

N00°12'35"E 876.39'

N00°13'15"E 8+00

1006.39'

10+00

590.00' R/L

S00°12'35"W

2643.83' 1/4 LINE

12+00

1387.43'

S89°46'45"E 65.00'

S00°12'35"W 125.00'

N00°12'35"E 125.00'

7+15.00
65.56' TLE
70.56' TLE

8+40.00
65.54' TLE
70.54' TLE

SLOPE INTERCEPT

P.K. W/WASHER FOUND
Y: 302208.803
X: 190677.403

P.K. W/WASHER FOUND
Y: 304752.612
X: 190687.014

LINE TABLE

LINE	BEARING	DISTANCE
L1	S89°47'26"E	5.00'
L2	N89°47'26"W	5.00'
L3	N22°59'40"E	26.60'
L4	N48°37'26"E	39.68'
L5	N68°53'56"W	18.75'
L6	N59°05'03"W	54.18'
L7	S68°44'55"E	68.68'
L8	S00°12'35"W	9.70'
L9	S00°12'35"W	25.24'
L10	S58°21'25"E	8.80'
L11	S68°44'55"E	61.38'
L12	N22°59'40"E	25.90'
L13	N68°44'55"W	130.06'
L14	N00°12'35"E	46.14'
L15	N00°12'35"E	55.84'

DETAIL A

DETAIL A
7+00 N00°13'15"E R/L
N89°47'25"W 0.57'
N00°12'35"E 861.40'
SEC LINE

REVISION DATE	DATE 9-13-2018	SCALE, FEET 0 30' 60'	HWY: CTH S	STATE R/W PROJECT NUMBER 4362-02-71	PLAT SHEET 4. 02	
6-6-19	GRID FACTOR N/A		COUNTY: MANITOWOC	CONSTRUCTION PROJECT NUMBER 4362-02-71	PS&E SHEET 17	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\RW\RW PLAT.DWG
LAYOUT NAME - 92860571-040102-rp

PLOT DATE : 5/30/2019 7:30 AM PLOT BY : DAVE A. YURK PLOT NAME : PLOT SCALE : ##########

WISDOT/CADDS SHEET 75

BENCH MARKS				
NO.	STATION	OFFSET	DESCRIPTION	ELEV.
BM4	8+43	43' LT	60D SPIKE IN PP *1922 24L10	764.17
BM5	15+07	41' LT	60D SPIKE IN PP *1922 23R25	757.85
BM6	13+12	45' LT	60D SPIKE IN PP *1922 23R1	751.56

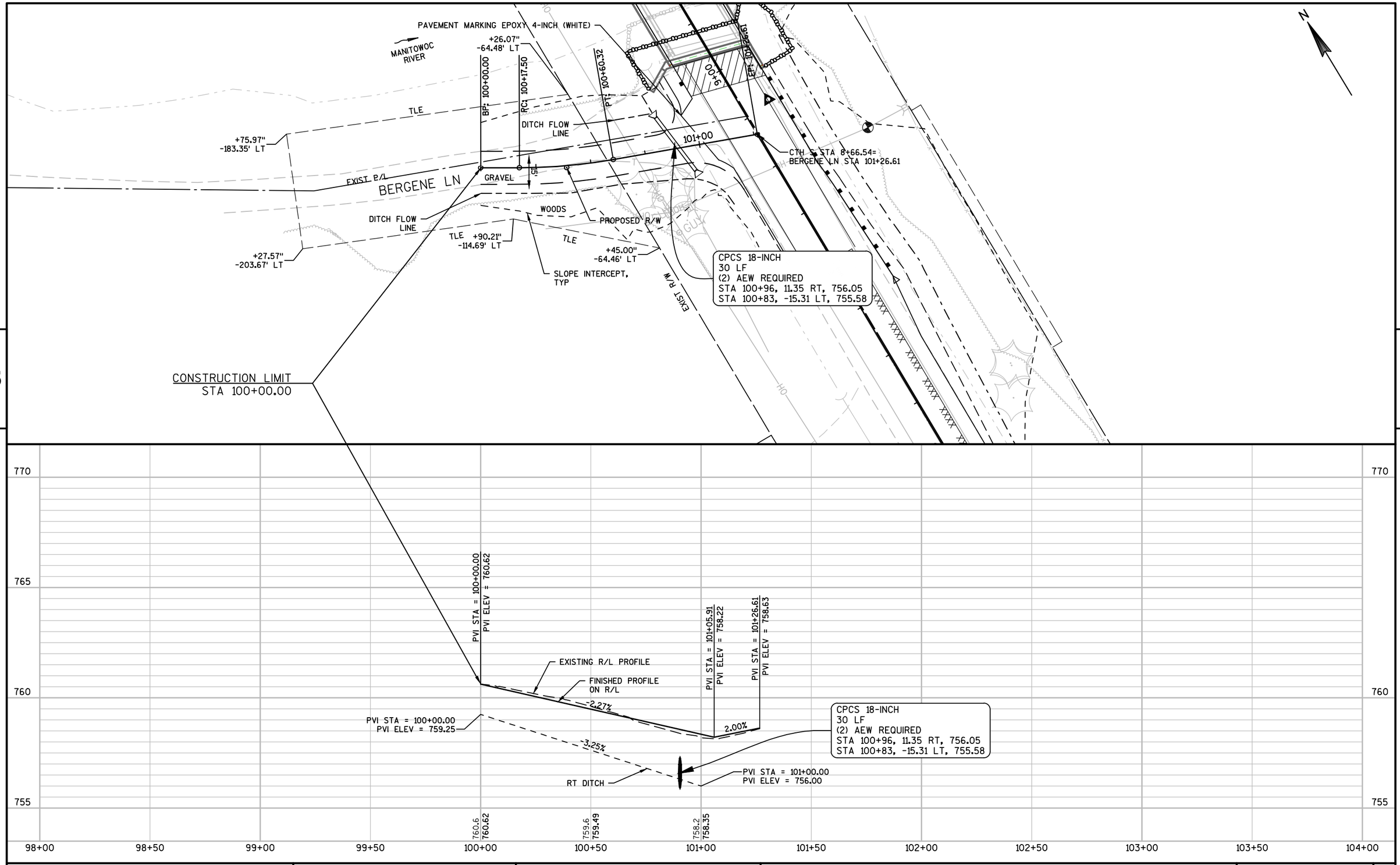
DENNIS P. GRABOWSKI
LINDA M. GRABOWSKI
HENRY L. TOMPKINS
MANITOWOC COUNTY FISH AND GAME
DOUGLAS T. RICHTER & LORI L. RICHTER
GERALD A CLAYBROOK & SARA P. CLAYBROOK
WOODS
GRAVEL
ASPH
SIXTEENTH LINE
MANITOWOC RIVER
CTH S
EXISTING R/W
PROPOSED R/W
DITCH FLOW LINE
SLOPE INTERCEPT
TLE
P/L
R/L
WPS
CPCS 18-INCH
30 LF
(2) AEW REQUIRED
STA 100+96, 11.35 RT, 756.05
STA 100+83, -15.31 LT, 755.58
+45.00" -64.46' LT
+26.07" -64.48' LT
+95.57" -23.00' LT
+11.46" -23.00' LT
+60.08" -15.00' LT
+95.00" -64.51' LT
+05.08" -64.53' LT
+40.21" -17.00' LT
REMOVE EXISTING CULVERT PIPE
REMOVE OLD STRUCTURE B-36-20
CRASH CUSHION
MGS ℄5.00'
39.40' MGS TRANSITION
+25.42" 17.00' LT
+37.87" -18.00' LT
28.125'
8' RADIUS
22+00
10+00
BEGIN CONSTRUCTION
STA 6+83.36
SAW CUT & MATCH EXISTING
7+00
8+00
9+00
10+00
11+00
12+00
CTH S STA 8+66.54= BERGENE LN STA 101+26.61
CTH S STA 11+52.32= NORTH DWY STA 22+36.69
65.00'
15:1
10:1
+49.85" 17.00' RT
+79.85" 20.00' RT
+29.85" 18.00' RT
+42.31" 17.00' RT
+16.04" 17.00' RT
+28.50" 18.00' RT
+78.50" 20.00' RT
+06.33" 17.00' RT
+40.16" 17.00' RT
BM4
DITCH FLOW LINE
STRUCTURE B-36-223
CONCRETE PAVEMENT APPROACH SLAB, TYP
53.125' MGS EAT
25.00' MGS
39.40' MGS TRANSITION
+40.00" 65.54' RT
+40.00" 70.54' RT
+15.00" 65.56' RT
+15.00" 70.56' RT
SLOPE INTERCEPT, TYP
BEGIN PROJECT
STA 8+00.00
Y: 303070.191
X: 190680.374
END PROJECT
STA 12+50.00
5

765
760
755
750
745
740
739
-2.40%
-2.04%
1.43%
VPI STA = 10+75.00
VPI ELEV = 754.38
g1 = -2.04%
g2 = 1.43%
L = 335.00
K = 97
PVI ELEV = 759.99
PVI STA = 8+00.00
RT DITCH
PVI ELEV = 755.00
PVI STA = 8+98.85
VPC STA = 9+07.50
VPC ELEV = 757.80
LP STA = 11+04.71
LP ELEV = 755.784
FINISHED PROFILE ON R/L
EXISTING R/L PROFILE
VPT STA = 12+42.50
VPT ELEV = 756.77
PVI ELEV = 756.87
PVI STA = 12+50.00
HW100 ELEV = 750.08
OBSERVED WATER ELEV = 742.83 (APRIL 2017)
STA 9+84
REMOVE STRUCTURE B-36-20
TWO SPAN PPC GIRDER STRUCTURE
SUPPORTED ON SILL ABUTMENTS
& MULTI COLUMN PIER
144' BACK TO BACK OF ABUTMENTS
28' CLEAR WIDTH
STA 9+84
STRUCTURE B-36-233
TWO SPAN 36W" PRESTRESSED CONCRETE GIRDER BRIDGE
151.96' BACK TO BACK ABUTMENTS
34' CLEAR WIDTH
SEE BRIDGE DRAWINGS 1-13

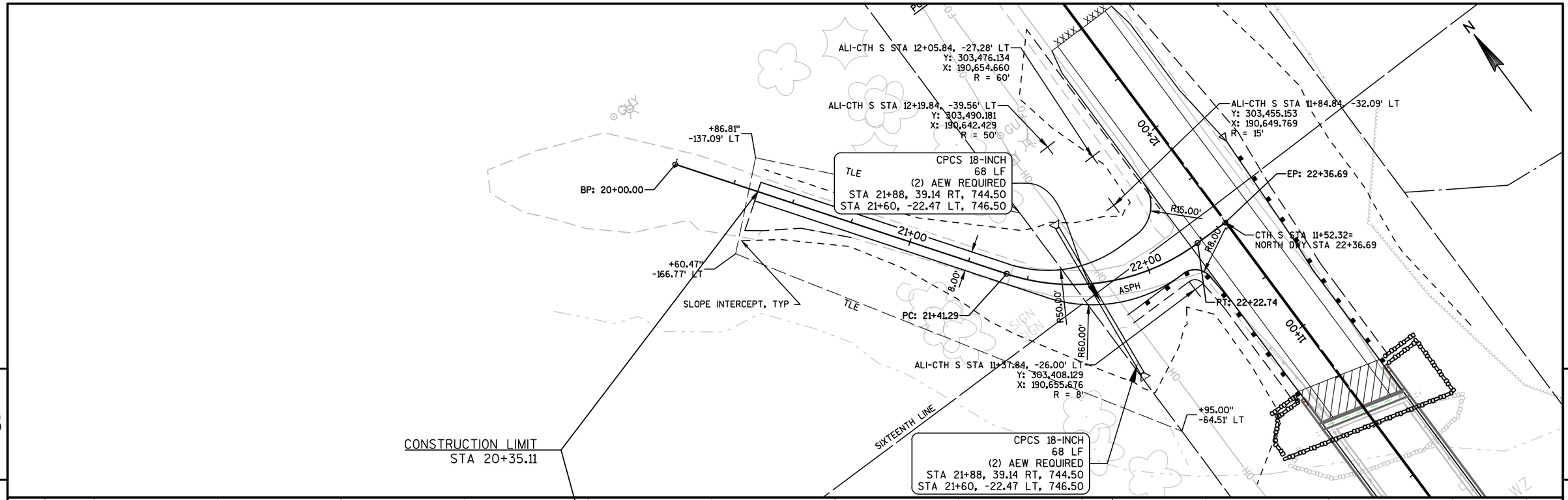
762.9 762.4 761.9 761.2 760.6 760.0 759.99 759.4 759.48 758.9 758.97 758.4 758.46 757.9 757.95 744.9 757.46 739.8 757.02 739.3 756.65 740.7 756.35 742.3 756.11 747.1 755.94 755.6 755.83 755.6 755.78 755.6 755.80 755.7 755.89 755.9 756.04 756.2 756.25 756.5 756.53 756.9 756.87 757.2
6+75 7+00 7+25 7+50 7+75 8+00 8+25 8+50 8+75 9+00 9+25 9+50 9+75 10+00 10+25 10+50 10+75 11+00 11+25 11+50 11+75 12+00 12+25 12+50 12+75

PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	PLAN AND PROFILE: CTH S	SHEET 18	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-050101-PP.DWG
LAYOUT NAME - 43620271-050101-PP
PLOT DATE : 7/2/2019 3:57 PM PLOT BY : MATT TOMSOVIC PLOT NAME : PLOT SCALE : **********



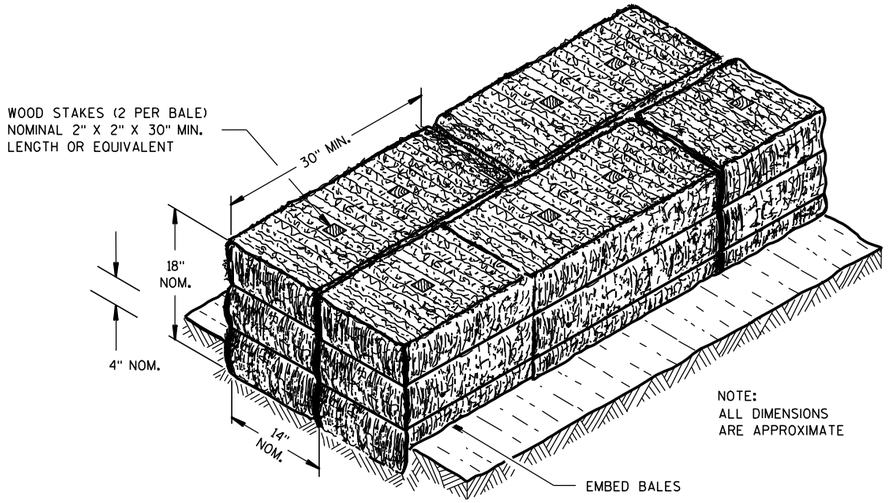
PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	PLAN AND PROFILE: BERGENE LANE	SHEET 19	E



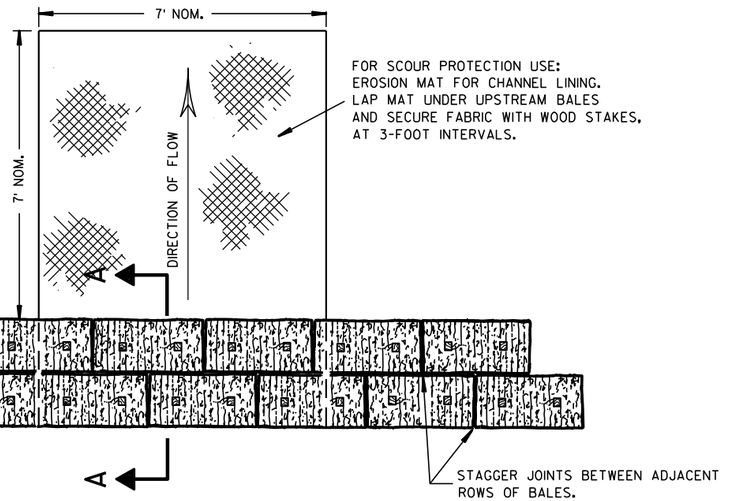
PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	PLAN AND PROFILE: NORTH DRIVEWAY	SHEET 20	E

Standard Detail Drawing List

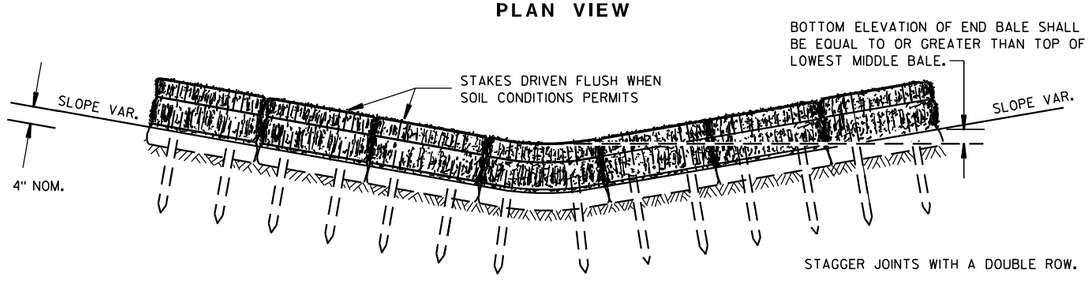
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E11-02	TURBIDITY BARRIER
08E15-01	CULVERT PIPE CHECK
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
12A03-10	NAME PLATE (STRUCTURES)
13B02-09A	CONCRETE PAVEMENT APPROACH SLAB
14B42-06A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-06D	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B44-04A	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-04B	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-04C	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B45-05A	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05B	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05C	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-05H	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B53-01A	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01B	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01C	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01D	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01E	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01F	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01G	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01H	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01I	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
15C02-07A	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C02-07B	BARRICADES AND SIGNS FOR VARIOUS CLOSURES
15C06-09	SIGNING & MARKING FOR TWO LANE BRIDGES
15C08-19A	LONGITUDINAL MARKING (MAINLINE)
15C11-07B	CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS
15D38-02A	TEMPORARY TRAFFIC CONTROL SIGN MOUNTING
15D38-02B	ATTACHMENT OF SIGNS TO POSTS



SECTION A-A



PLAN VIEW



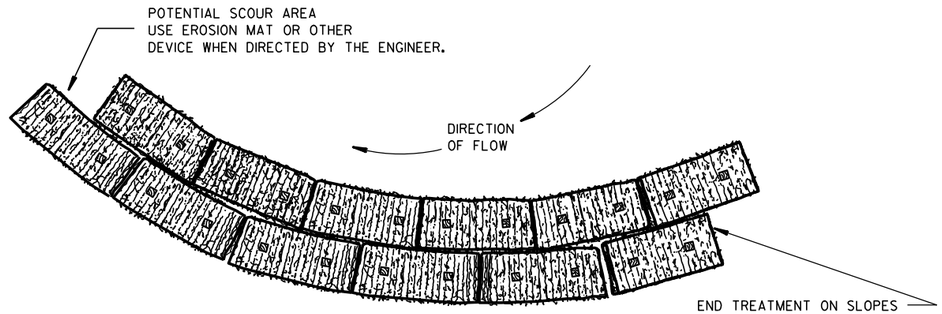
FRONT ELEVATION

TEMPORARY DITCH CHECK USING EROSION BALES ①

GENERAL NOTES

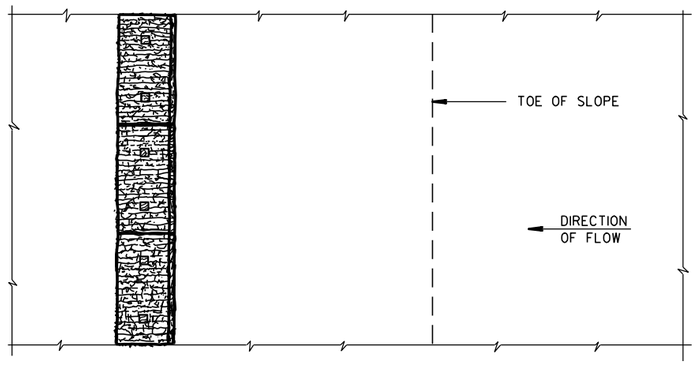
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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.

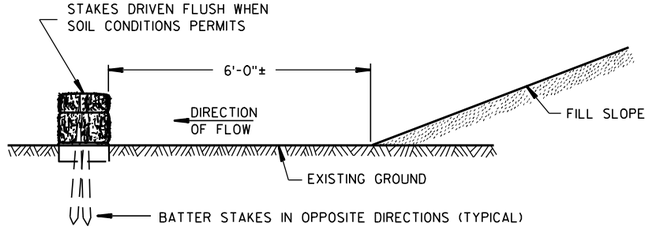


PLAN VIEW

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

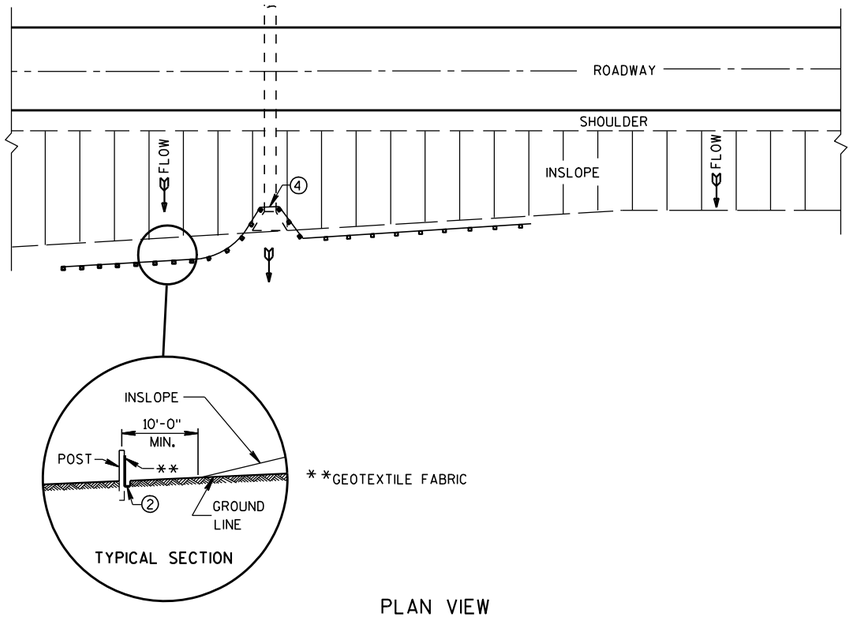
APPROVED
6/04/02 DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

6

S.D.D. 8 E 8-3

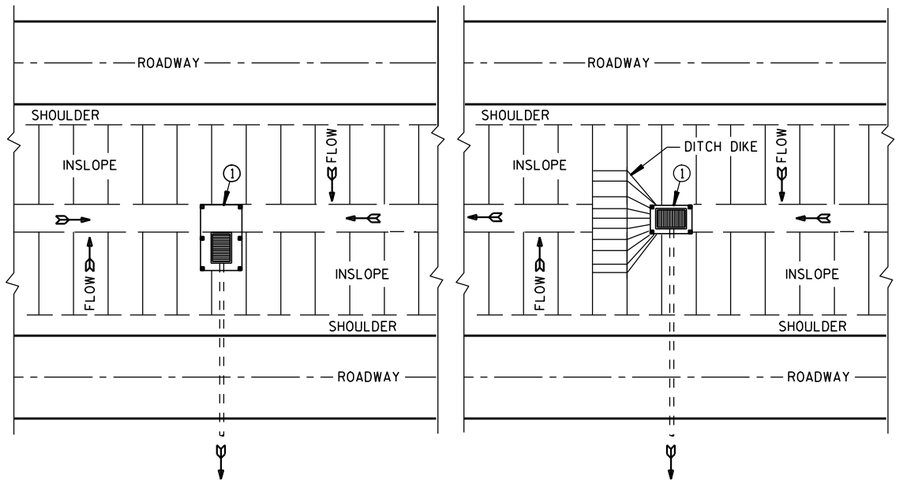
6

S.D.D. 8 E 8-3



PLAN VIEW

TYPICAL APPLICATION OF SILT FENCE



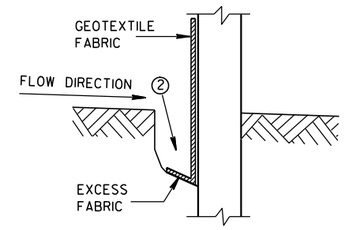
PLAN VIEW

SILT FENCE AT MEDIAN SURFACE DRAINS

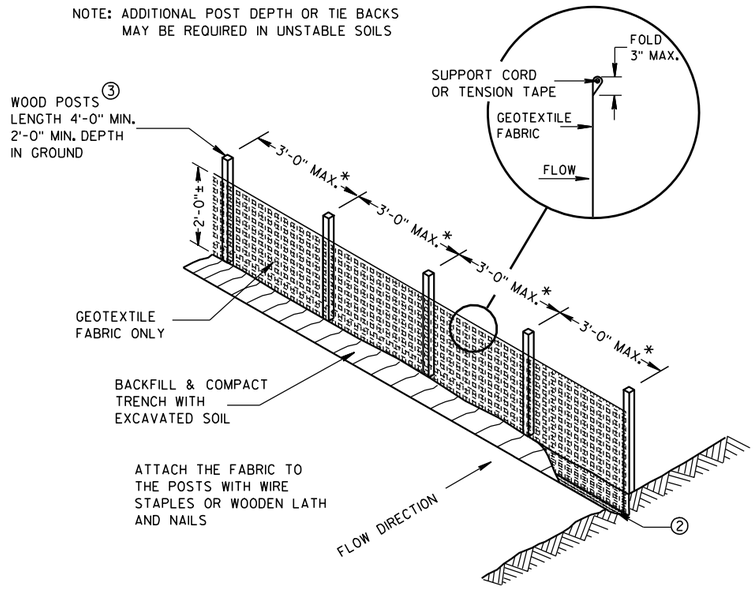
GENERAL NOTES

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

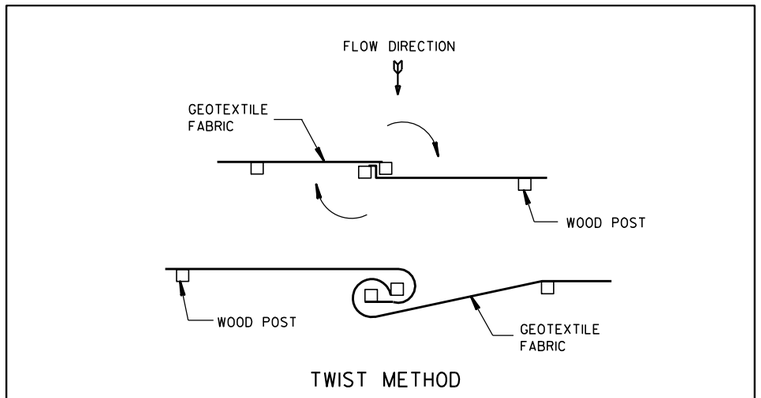
1. HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
2. FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
3. WOOD POSTS SHALL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



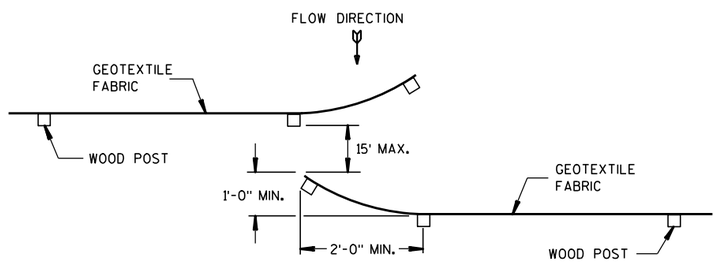
TRENCH DETAIL



SILT FENCE

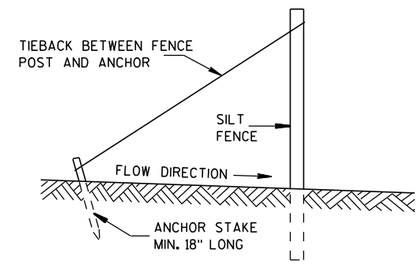


TWIST METHOD



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

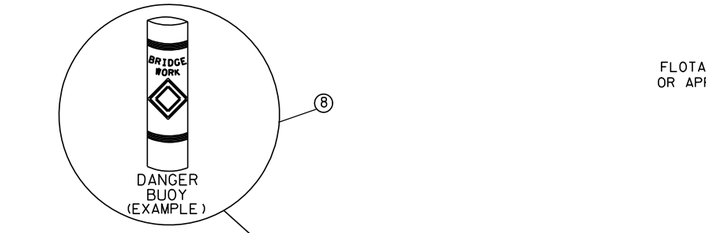
APPROVED
4-29-05 DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

6

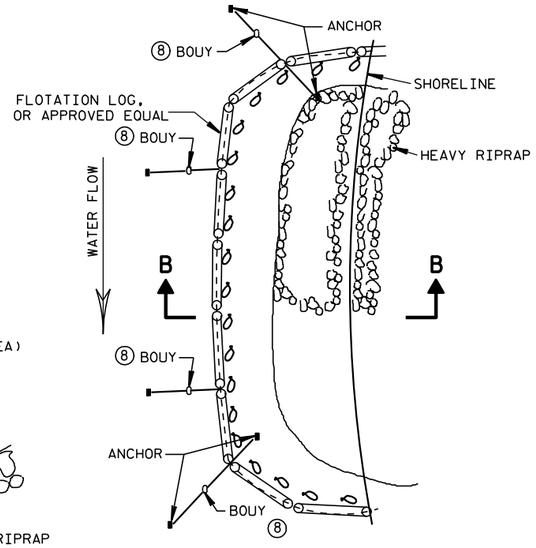
S.D.D. 8 E 9-6

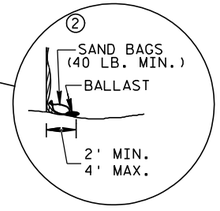
6

S.D.D. 8 E 9-6

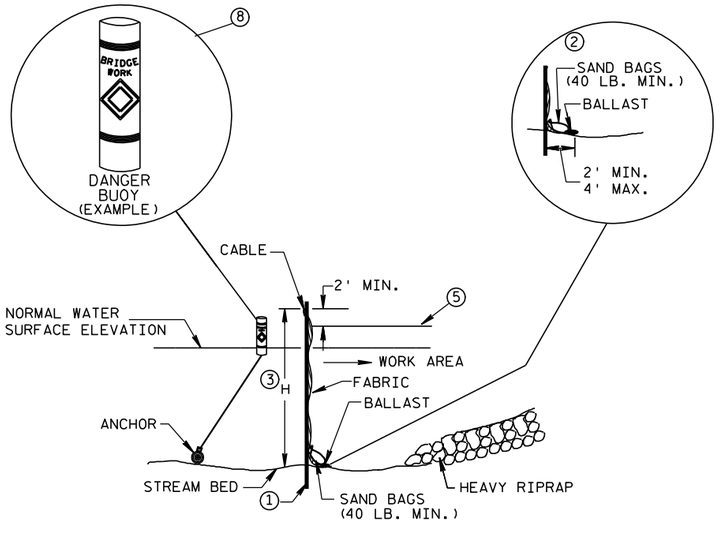


SECTION B-B

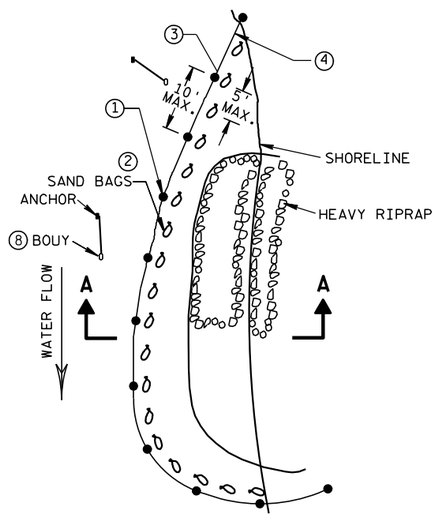




TURBIDITY BARRIER FLOAT ALTERNATIVE
CAUTION - SEE NOTE 6



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.

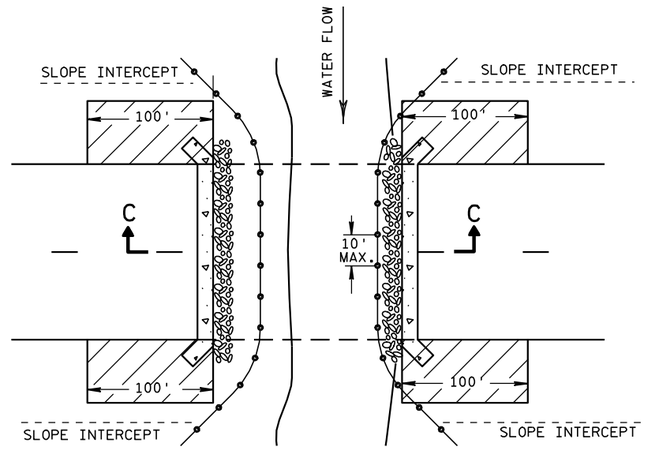
④ IN WATERWAYS SUBJECT TO FLUCTUATING WATER ELEVATIONS, PROVISIONS SHOULD BE MADE TO ALLOW THE WATER TO EQUALIZE ON EACH SIDE OF THE BARRIER. THIS MAY BE ACCOMPLISHED BY LEAVING A PORTION OF THE BARRIER OPEN ON THE UPSTREAM END.

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.

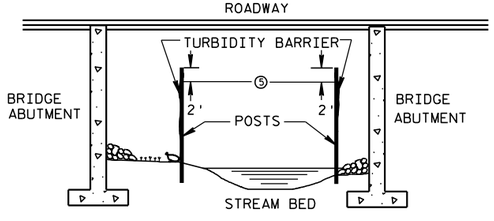
⑥ FLOAT ALTERNATIVE WILL ONLY BE ALLOWED WITH WRITTEN APPROVAL OF THE ENGINEER, AND IS MEANT FOR LOCATIONS WHERE BED ROCK PREVENTS THE INSTALLATION OF POSTS.

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

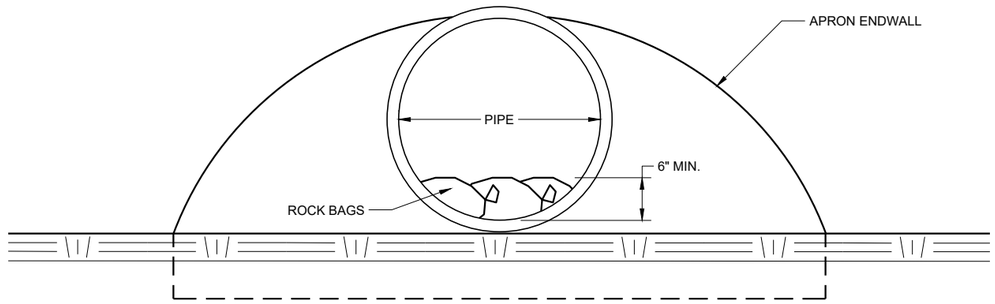
APPROVED
6/04/02 — DATE
/S/ Beth Cannestra — CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

6

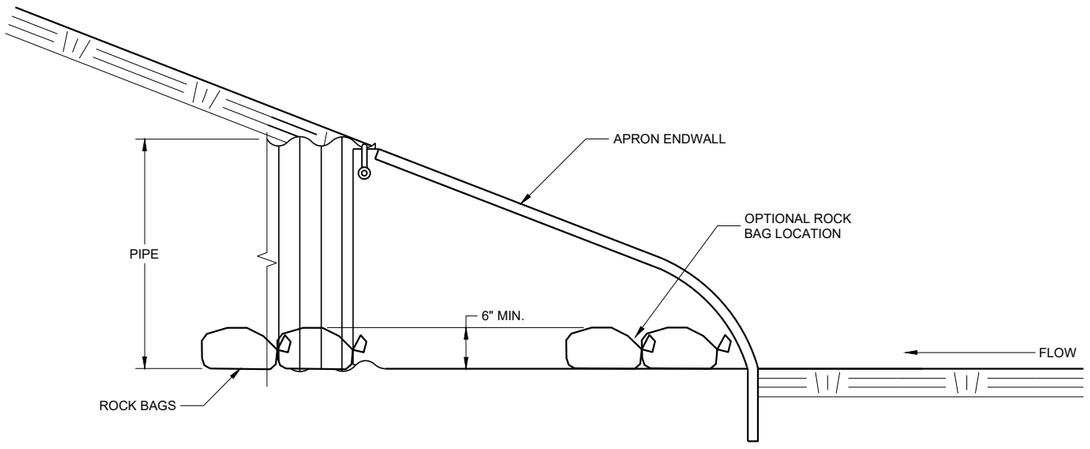
S.D.D. 8 E 11-2

6

S.D.D. 8 E 11-2



END VIEW



SIDE VIEW

CULVERT PIPE CHECK

(INSTALL ON INLET END ONLY)

CULVERT PIPE CHECK

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
May 2019 — DATE
/S/ Daniel Schave — EROSION CONTROL ENGI
FHWA

6

SDD 08E15 - 01

6

SDD 08E15 - 01

METAL APRON ENDWALLS

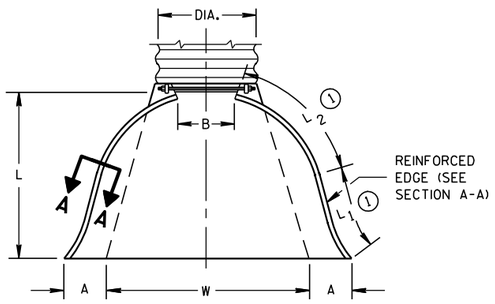
PIPE DIA. (IN.)	MIN. THICK. (Inches) STEEL	MIN. THICK. (Inches) ALUM.	DIMENSIONS (Inches) A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 ①	L2 ①	W (±2")	APPROX. SLOPE	BODY
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4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

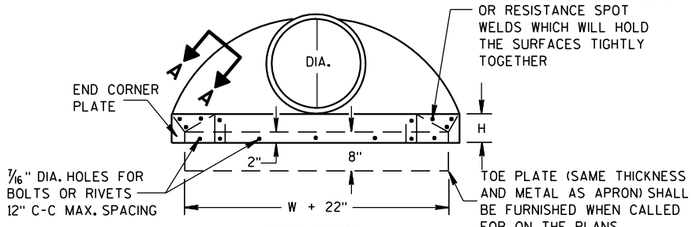
REINFORCED CONCRETE APRON ENDWALLS

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

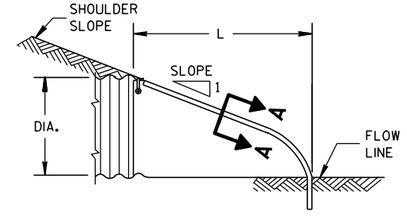
*MINIMUM
**MAXIMUM



PLAN VIEW

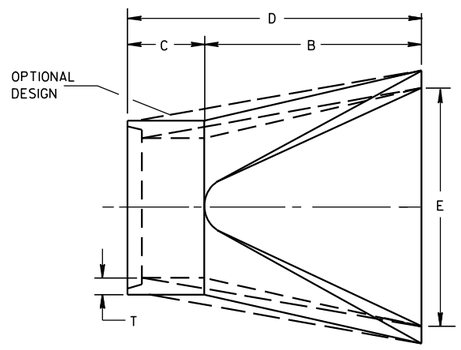


END VIEW

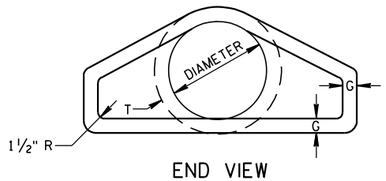


SIDE ELEVATION

METAL ENDWALLS



PLAN



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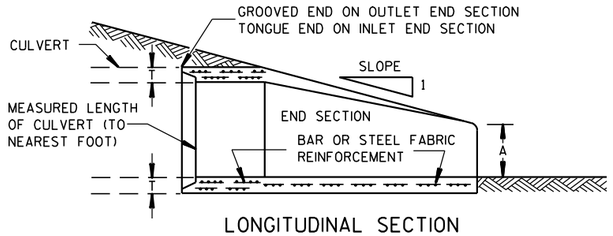
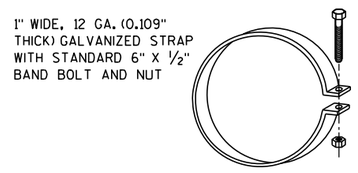


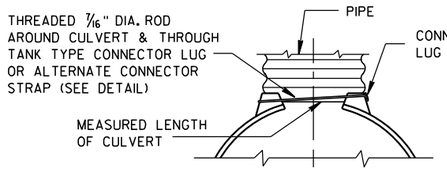
LONGITUDINAL SECTION

CONCRETE ENDWALLS

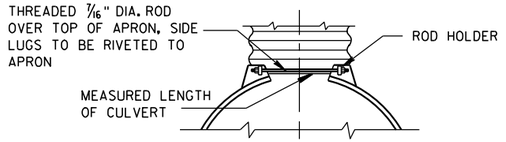


ALTERNATE FOR TYPE 1 CONNECTION

END SECTION CONNECTOR STRAP

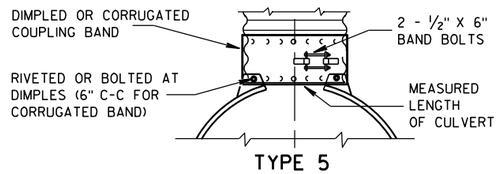


TYPE 1
FOR 12" THRU 24" CORR. PIPE



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

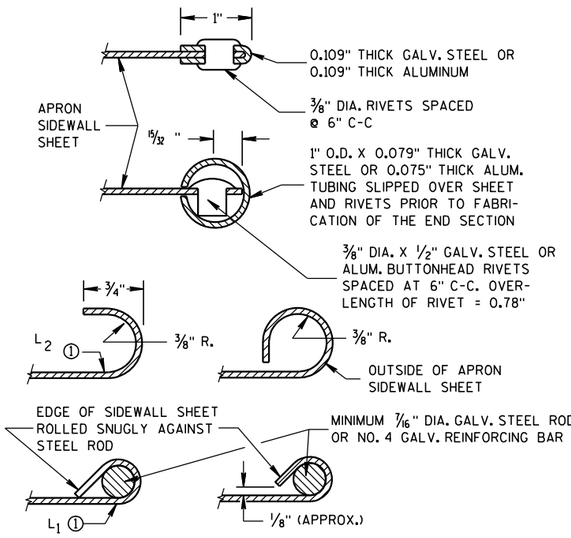
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL. AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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

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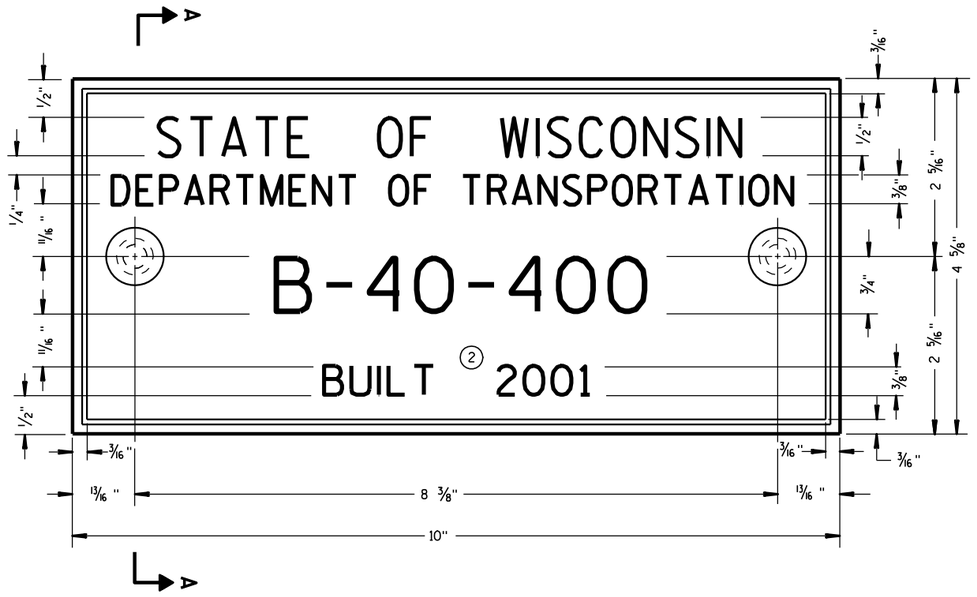
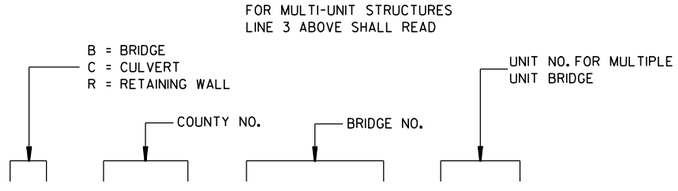
S.D.D. 8 F 1-11



TYPICAL NAME PLATE

(BRIDGES, CULVERTS, AND RETAINING WALLS)



NUMBERING DESIGNATION MULTI-UNIT STRUCTURES

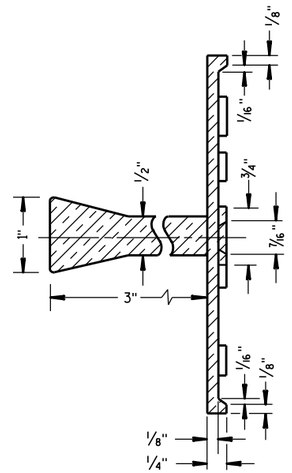
GENERAL NOTES

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

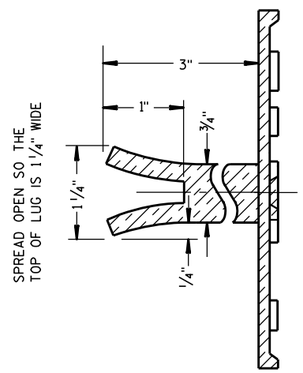
THE BRIDGE NUMBER AND YEAR BUILT SHOWN ON THIS DRAWING ARE EXAMPLES ONLY. SEE CONSTRUCTION PLANS FOR INDIVIDUAL NUMBERING AND YEAR BUILT.

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

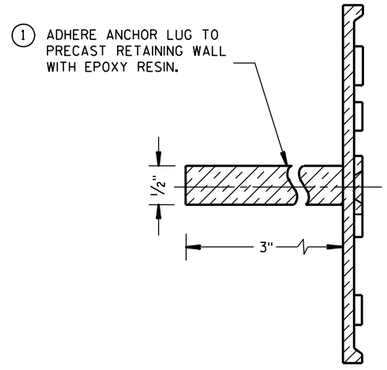
(2) REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.



SECTION A-A



ALTERNATE LUG



ALTERNATE LUG

(FOR ATTACHMENT TO PRECAST STRUCTURES)

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

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S.D.D. 12 A 3-10

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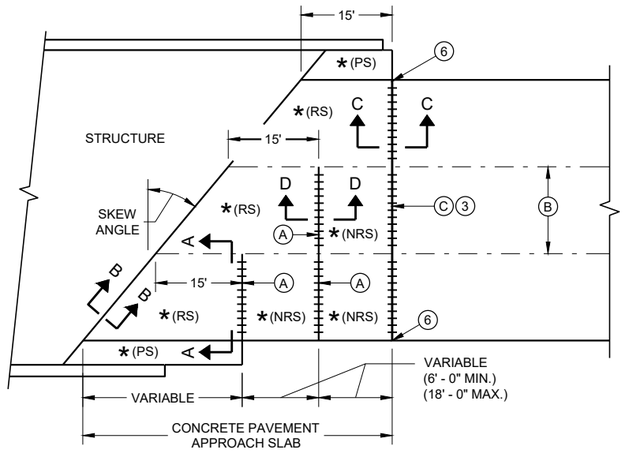
S.D.D. 12 A 3-10



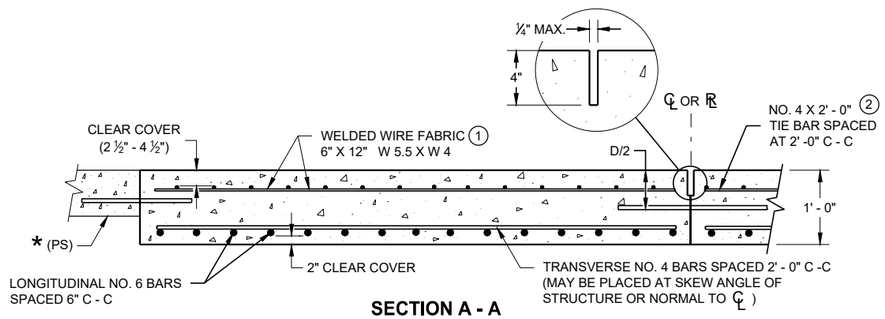
SKEWED APPROACH
(PAVEMENT MORE THAN TWO LANES)

* (RS) = REINFORCED CONCRETE SLAB

* (PS) = PAVED CONCRETE SHOULDER OR CONCRETE DRAINAGE SLAB

* (NRS) - NON - REINFORCED CONCRETE SLAB

*** STANDARD DOWEL BAR DIAMETER (SEE SDD 13C11 AND SDD 13C13)



SECTION A - A
REINFORCEMENT POSITIONING DETAIL

GENERAL NOTES

THE CONTRACTOR MAY SPLICE NO. 6 BARS IN THE APPROACH SLAB FOR SKEWED STRUCTURES ONLY. STAGGER SPLICES WITH A MAXIMUM OF ONE SPLICE PER BAR. THE LENGTH OF LAP IS 20 INCHES.

TACK WELD DOWEL BARS TO THE BASKETS ON ALTERNATE ENDS.

(1) THE CONTRACTOR MAY USE NO. 4 BARS SPACED AT 2' - 0 " C - C IN BOTH THE LONGITUDINAL AND TRANSVERSE DIRECTIONS FOR TOP REINFORCEMENT AS AN ALTERNATIVE TO THE WELDED WIRE FABRIC.

(2) THE CONTRACTOR MAY OMIT THE BARS BETWEEN REINFORCED SLABS WHERE SLAB REINFORCEMENT BARS EXTEND ACROSS THE CENTERLINE OR REFERENCE LINE.

(3) DO NOT CONSTRUCT AN EXPANSION JOINT OR INSTALL DOWEL BARS WHEN ABUTTING AN HMA PAVEMENT.

(4) USE A JOINT SEALANT MEETING THE REQUIREMENTS OF ASTM D6690.

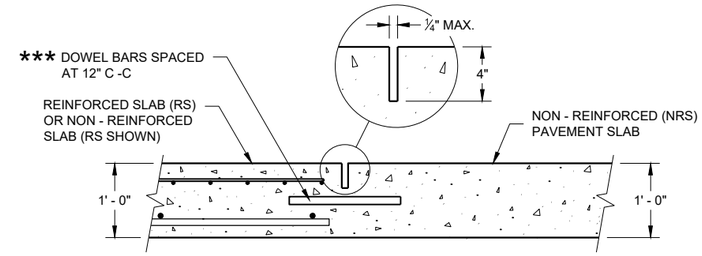
(5) PLACE EXPANSION CAP ON THE END OF THE DOWEL THAT IS NOT TACK WELDED TO THE BASKET. DO NOT FORCE DOWEL BAR PAST THE DOWEL STOP.

(6) EXTEND EXPANSION JOINT THROUGH ANY ADJACENT TIED CONCRETE.

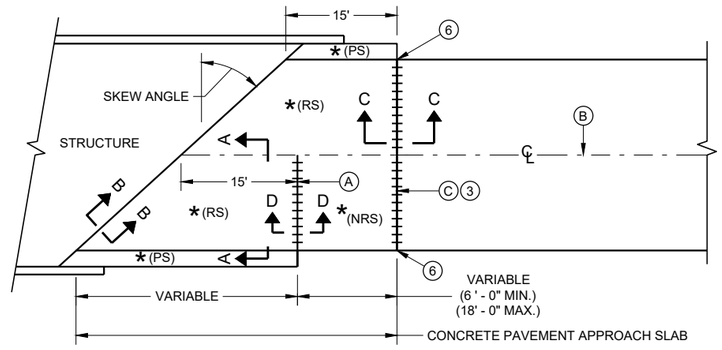
(A) STANDARD CONTRACTION JOINT NORMAL TO ℄ OR ℞.

(B) STANDARD LONGITUDINAL JOINT WITH TIE BARS.

(C) 1 ½" EXPANSION JOINT WITH DOWEL BARS NORMAL TO ℄ OR ℞

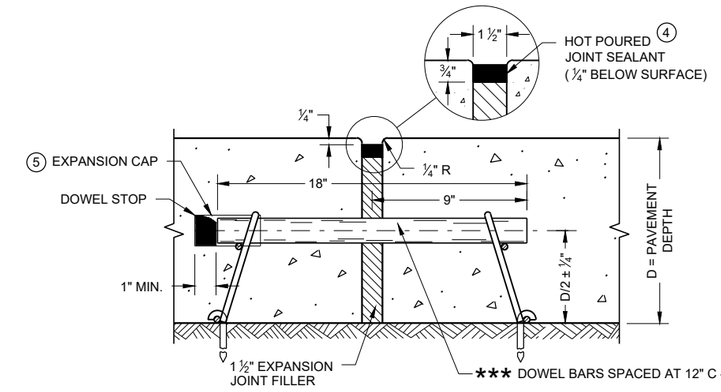


SECTION D - D
CONTRACTION JOINT

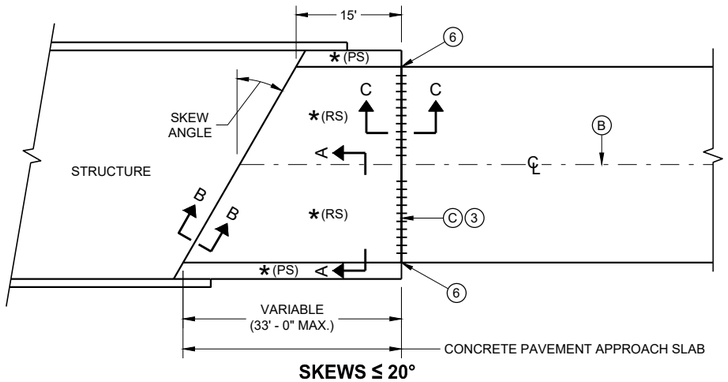


SKEWS > 20°
(PAVEMENT WIDTH ≤ 30')

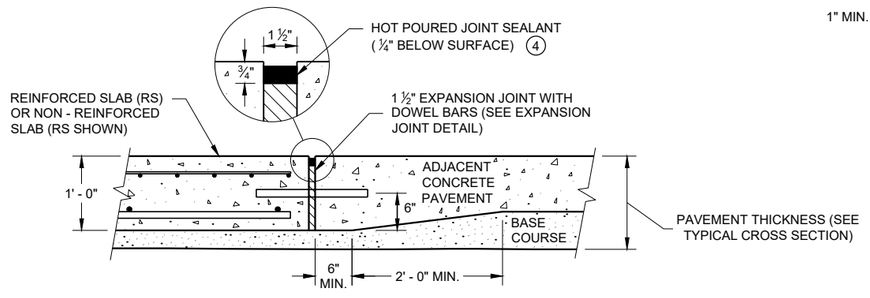
SECTION B - B
BEND DETAIL
BOTTOM REINFORCEMENT



EXPANSION JOINT DETAIL



SKEWS ≤ 20°
(PAVEMENT WIDTH ≤ 30')



SECTION C - C
TRANSITION DETAIL
APPROACH SLAB TO ADJACENT PAVEMENT

APPROACH SLAB AND ADJACENT PAVEMENT

CONCRETE PAVEMENT APPROACH SLAB

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2018
DATE

/S/ Peter Kemp P.E.
PAVEMENT SUPERVISI

FHWA

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SDD 13B02 - 09a

SDD 13B02 - 09a

(1) WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.

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

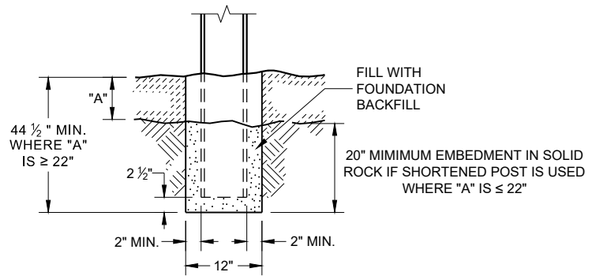
(3) IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2 1/2" INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AMD INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL 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).

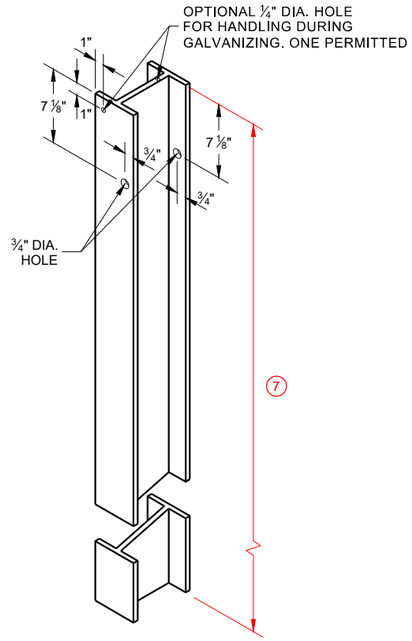
(5) FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS ±1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27 ¾" TO 32".

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

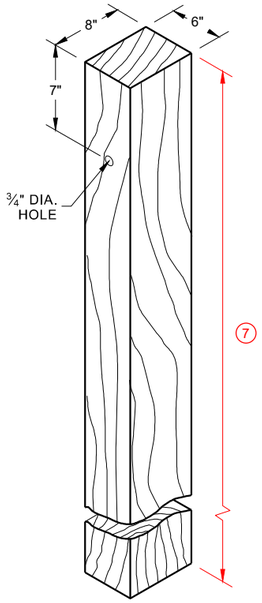
(7) TOTAL POST LENGTH FOR TYPE K IS 7' - 0".
TOTAL POST LENGTH FOR OTHER MGS TYPES IS 6' - 0".



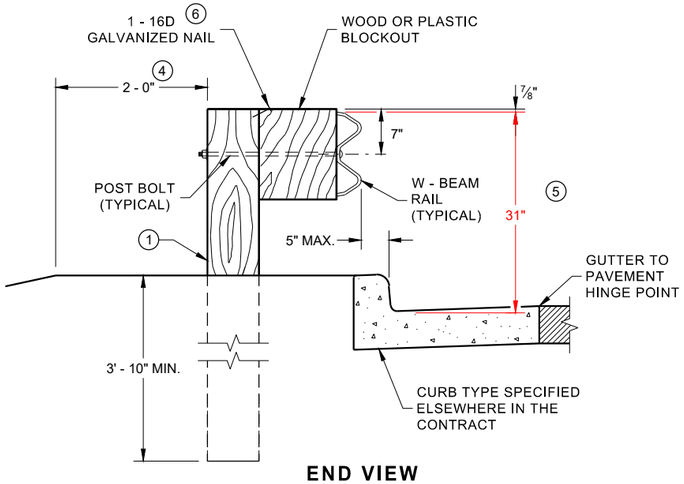
END VIEW
SETTING STEEL OR WOOD POST IN ROCK (3)



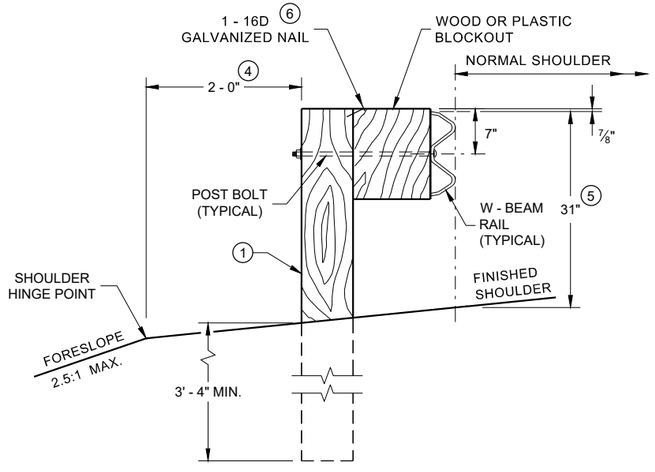
STEEL POST & HOLE PUNCHING DETAIL (W 6 X 9) (1)



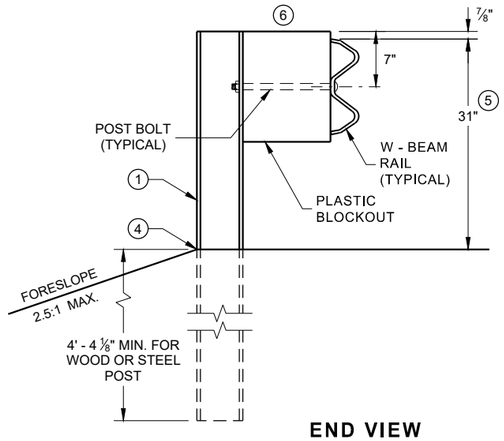
WOOD POST (6" X 8") NOMINAL (1)



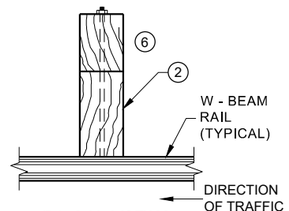
END VIEW
LOCATED ALONG A CURBED ROADWAY



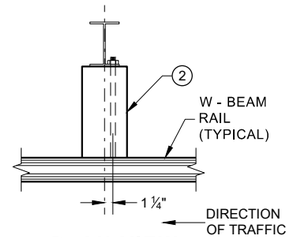
END VIEW
LOCATED ALONG A ROADWAY SHOULDER STANDARD INSTALLATION



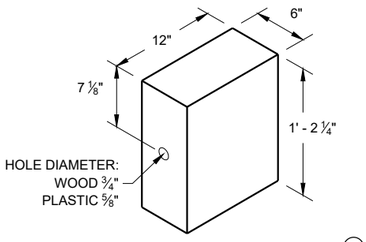
END VIEW
MGS LONGER POST AT HALFPOST SPACING W BEAM (K)



PLAN VIEW
WOOD POST, BLOCKOUT & BEAM



PLAN VIEW
STEEL POST, PLASTIC BLOCKOUT & BEAM



WOOD OR PLASTIC BLOCKOUT (2)

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

SDD 14B42 - 06a

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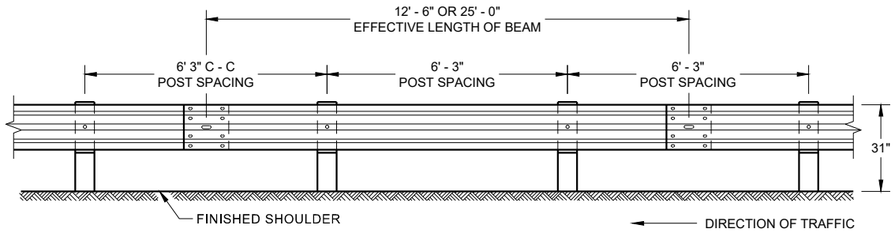
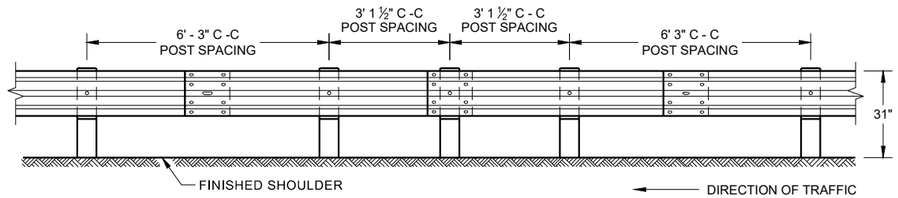
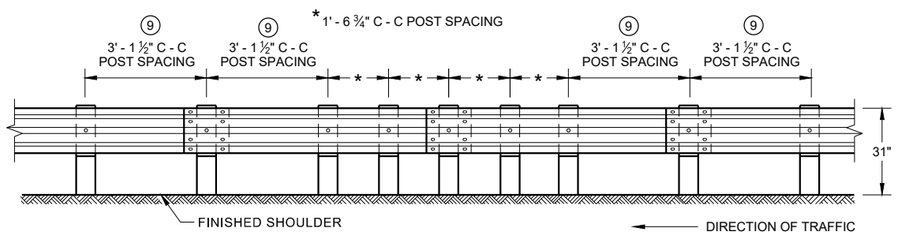
SDD 14B42 - 06a



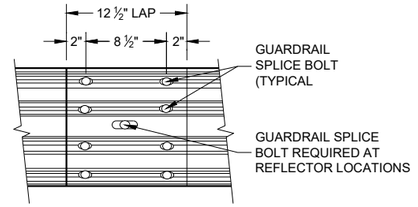
FRONT VIEW
POST SPACING STANDARD INSTALLATION



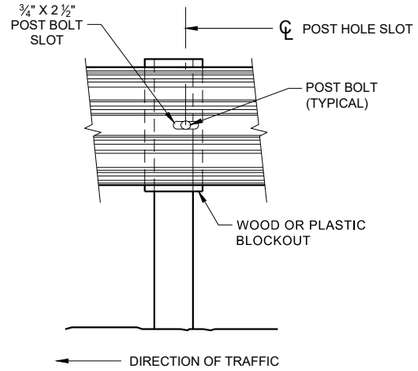
FRONT VIEW
HALF POST SPACING (HS) AND
HALF POST SPACING WITH LONGER POSTS (K)



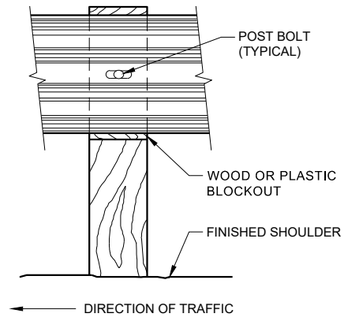
FRONT VIEW
QUARTER POST SPACING (QS)



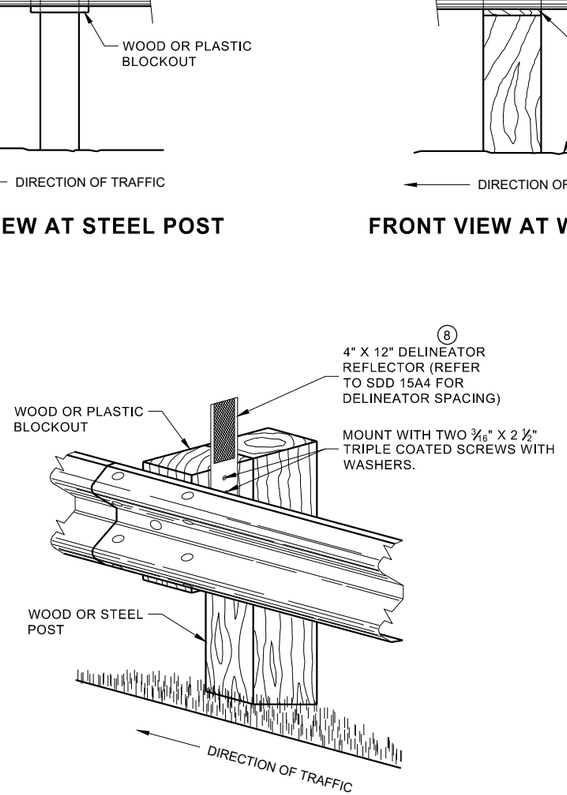
FRONT VIEW
MID-SPAN BEAM SPLICE



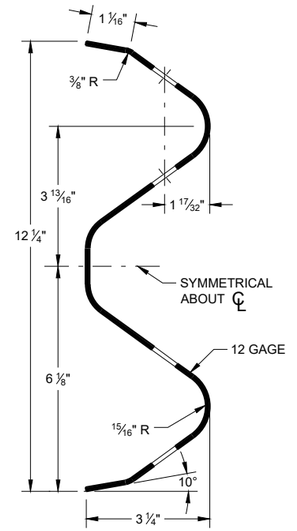
FRONT VIEW AT STEEL POST



FRONT VIEW AT WOOD POST



ONE SIDED REFLECTOR DETAIL
AND TYPICAL INSTALLATION



SECTION THRU W-BEAM RAIL

GENERAL NOTES

⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPLICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.

⑨ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.

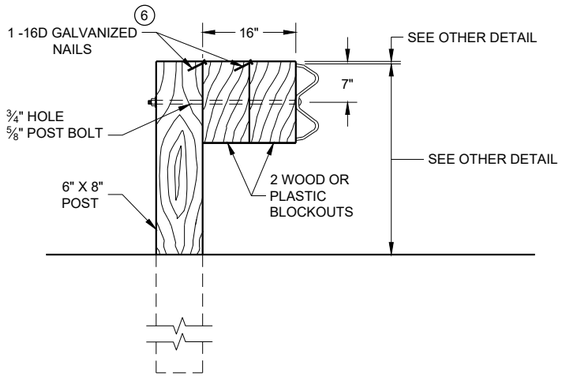
POST BOLTS ARE A ¾" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES ⅝" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND ⅝" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.

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.

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6
SDD 14B42 - 06b

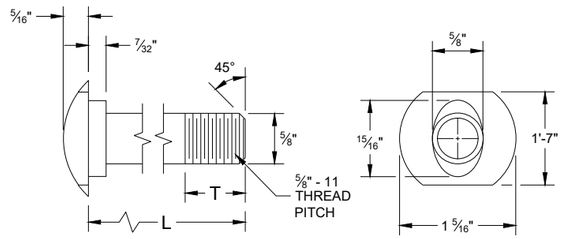


DETAIL FOR 16" BLOCKOUT DEPTH

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

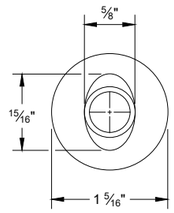
NOTE:

1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 3/16".
2. IF THE BOLT EXTENDS MORE THAN ¼" FROM THE NUT THE BOLT SHOULD BE TRIMMED BACK.

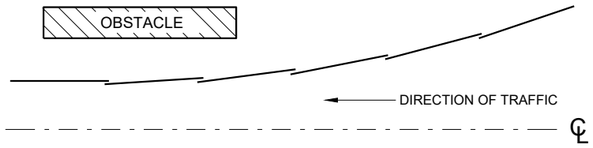


POST BOLT TABLE

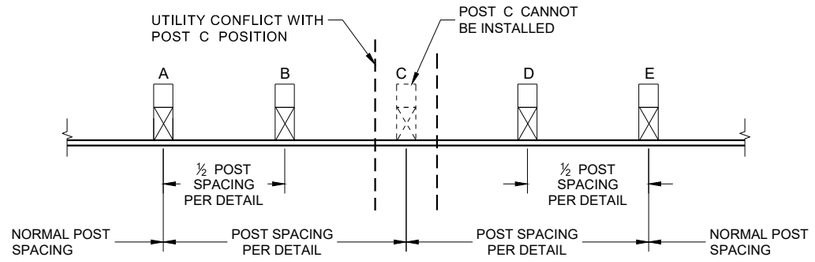
L	T (MIN.)
1 ¼"	1 ⅛"
2"	1 ¾"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



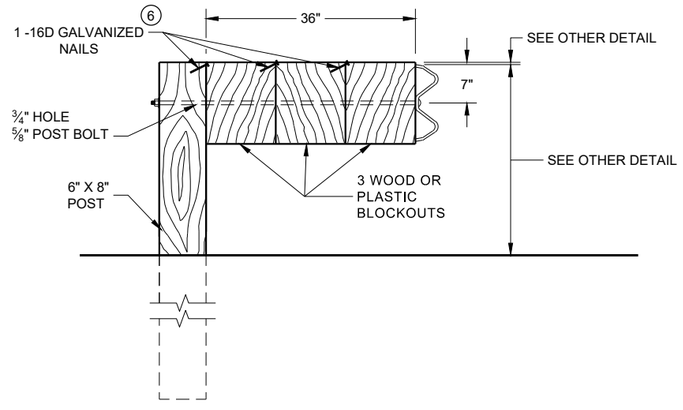
ALTERNATE BOLT HEAD



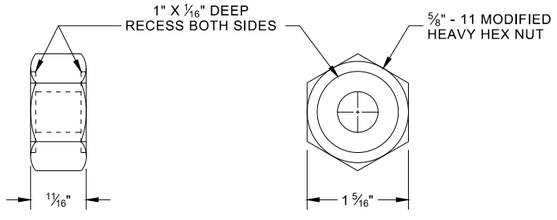
PLAN VIEW
BEAM LAPPING DETAIL



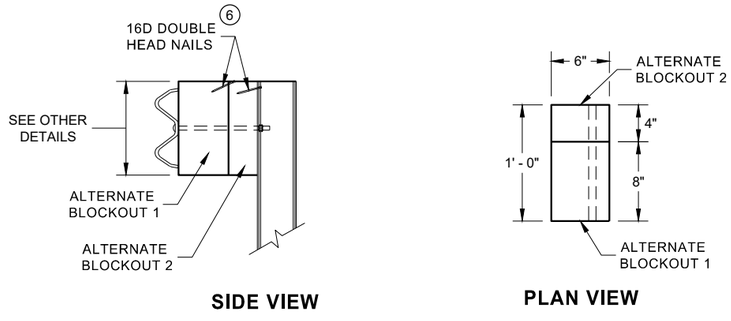
POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION



DETAIL FOR 36" BLOCKOUT DEPTH



POST BOLT, SPLICE BOLT AND RECESS NUT



SIDE VIEW

PLAN VIEW

ALTERNATE WOOD BLOCKOUT DETAIL

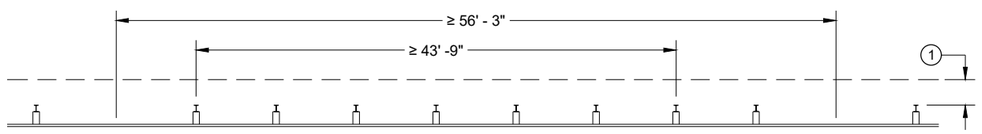
NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.

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.

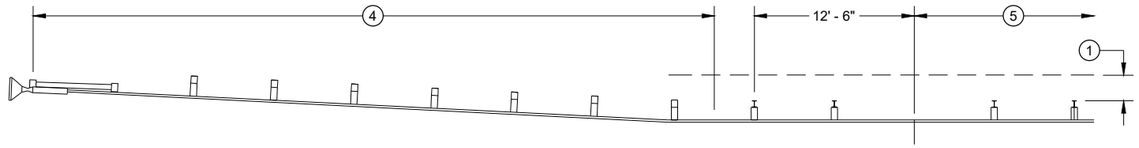
(6) WHEN USING STEEL POST AD WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

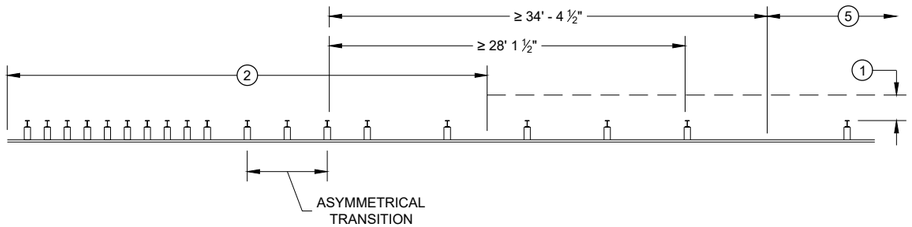
6
SDD 14B42 - 06c



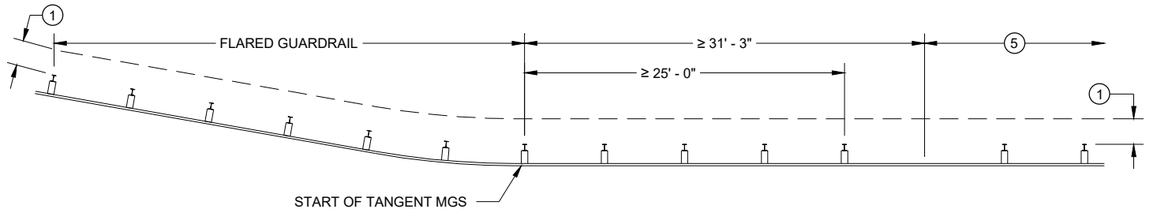
MISSING POST IN NORMAL BEAM GUARD RUN



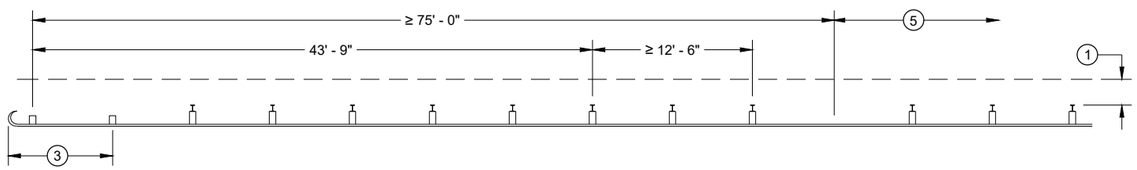
MISSING POST IN NORMAL BEAM GUARD RUN NEAR EAT



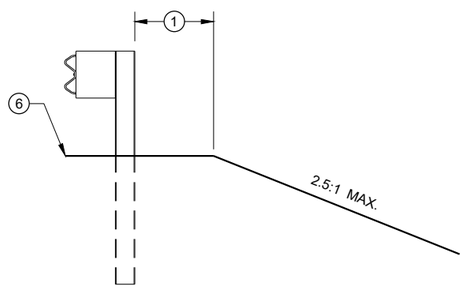
MISSING POST NEAR APPROACH THRIE BEAM TRANSITION



MISSING POST IN NORMAL BEAM GUARD RUN NEAR FLARED BEAM GUARD



MISSING POST IN NORMAL BEAM GUARD RUN NEAR TYPE 2 TERMINAL



CROSS SECTION VIEW

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

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

SDD 14B42 - 06d

SDD 14B42 - 06d

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 MANUFACTURERS REQUIRE DIFFERENT PERFORATED W - BEAM RAIL END PANELS. SEE MANUFACTURER'S INFORMATION.

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

(E) HARDWARE MAY VARY BETWEEN MANUFACTURER. SEE MANUFACTURER'S DRAWING FOR INFORMATION.

DIMENSIONS MAY VARY, MANUFACTURER'S INFORMATION.

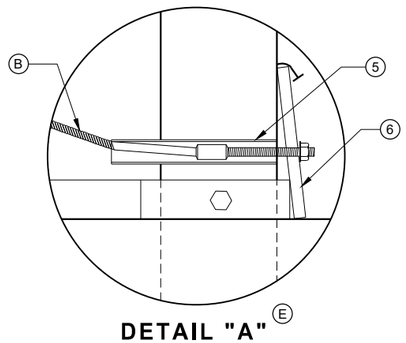
SEE SDD 14B42 FOR MORE INFORMATION.

* DO NOT ATTACH BLOCKOUTS TO POST 1 AND 2.

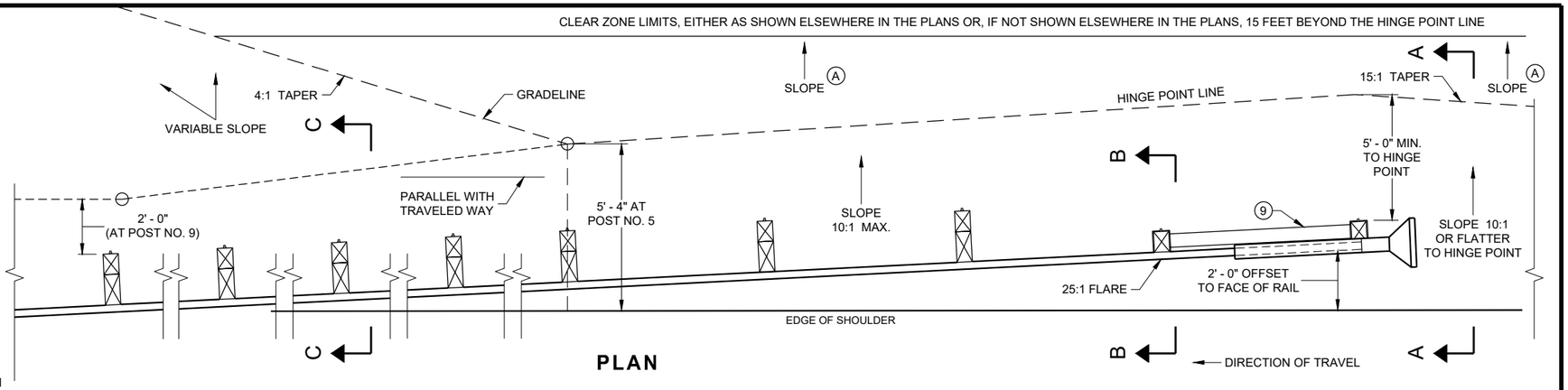
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

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

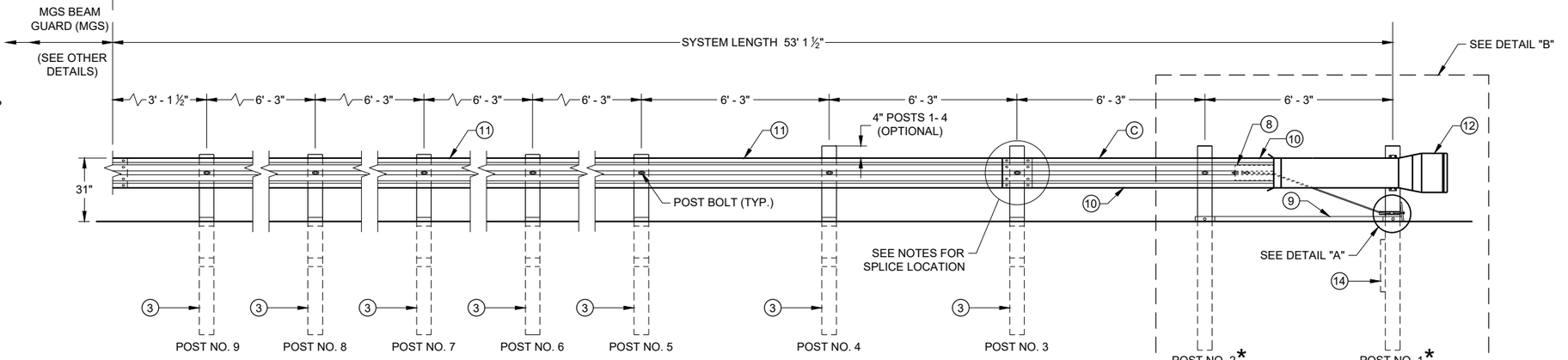
THE CENTER OF THE UPPER 3 ½" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE. WOOD BLOCKS ON POSTS NUMBERED 3 THROUGH 9 MAY BE ADJUSTED UP TO 3" ABOVE THE TOP OF POST.



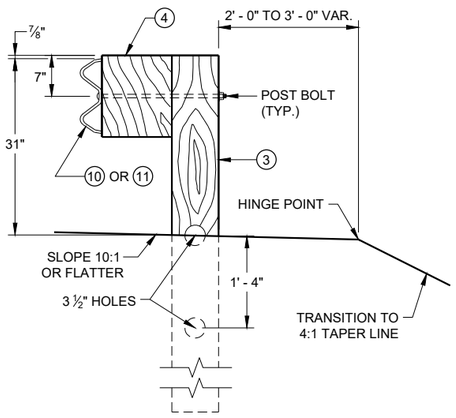
DETAIL "A" (E)



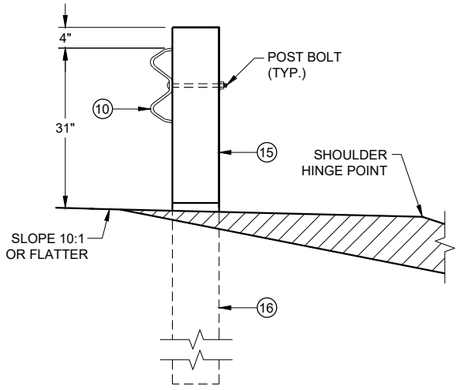
PLAN



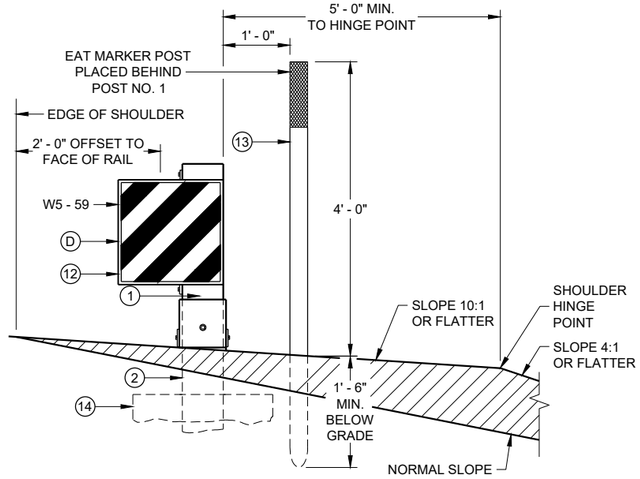
ELEVATION



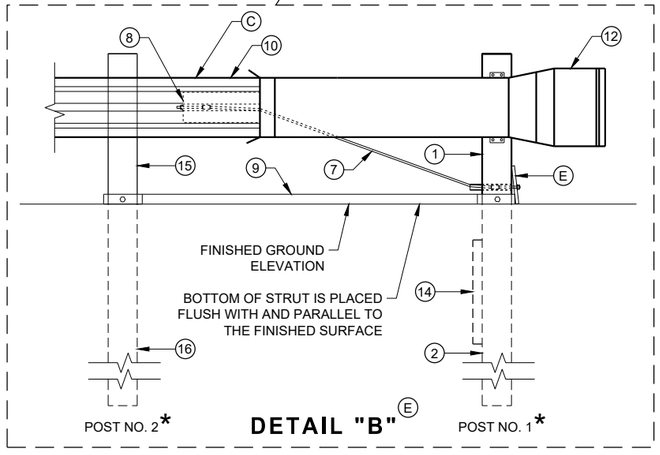
SECTION C - C
TYPICAL AT POST NOS. 3 - 9



SECTION B - B
TYPICAL AT POST NO. 2*



SECTION A - A
TYPICAL AT POST NO. 1*



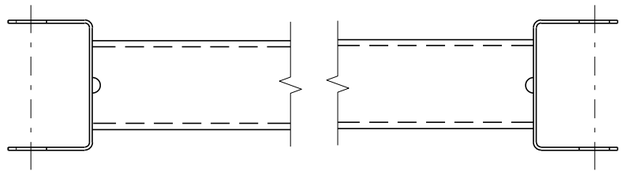
DETAIL "B" (E)

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

SDD 14B44 - 04a

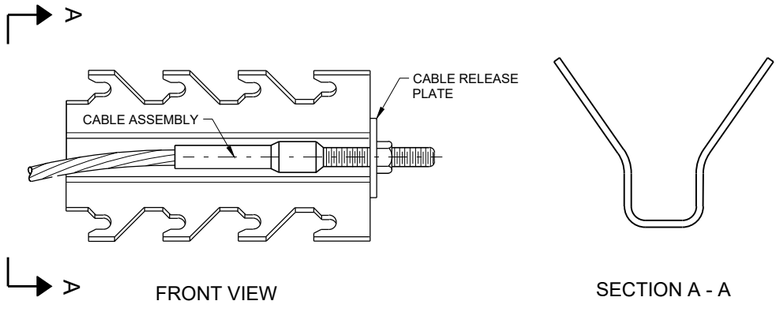
SDD 14B44 - 04a



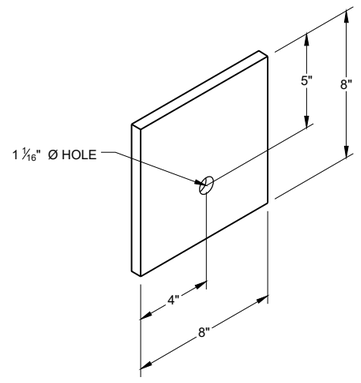
GENERIC GROUND STRUT ⑨ Ⓔ

BILL OF MATERIALS

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



GENERIC ANCHOR CABLE BOX ⑨ Ⓔ



BEARING PLATE ⑥ Ⓔ

6

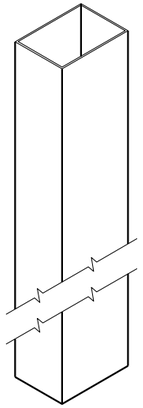
6

SDD 14B44 - 04b

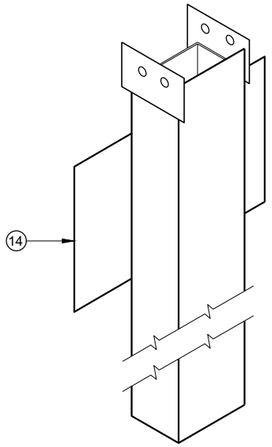
SDD 14B44 - 04b

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

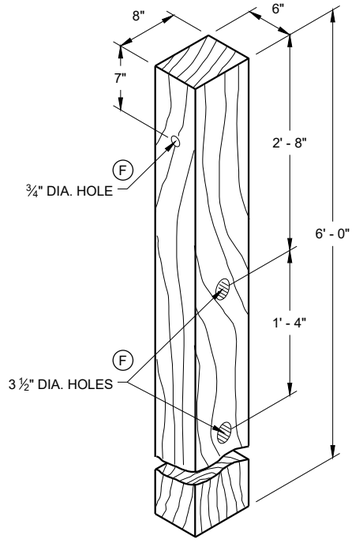
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



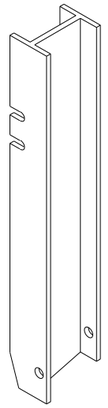
UPPER POST NO. 1 (1) (E)



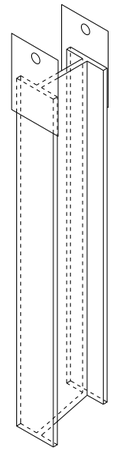
LOWER POST NO. 1 (2) (E)



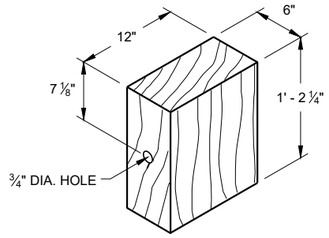
WOOD CRT POST (3) (E)
POSTS NUMBER 3-9



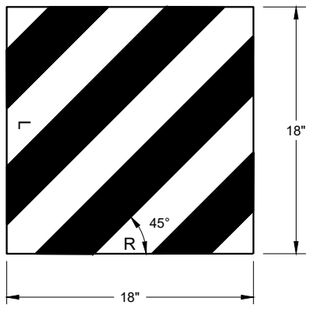
UPPER POST NO. 2 (15) (E)



LOWER POST NO. 2 (16) (E)

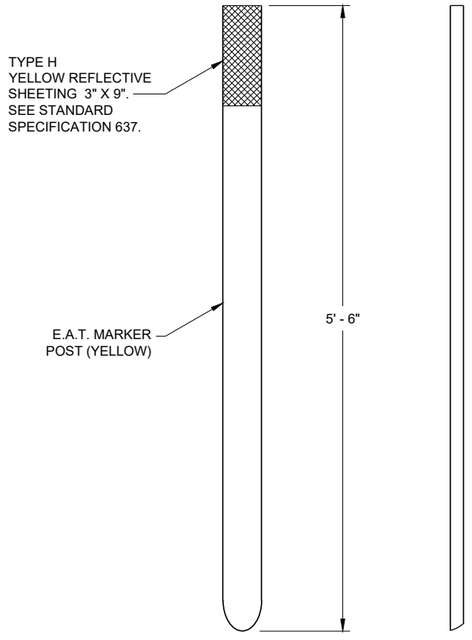


WOOD BLOCKOUT (4)
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2



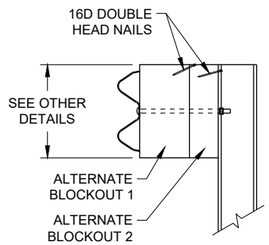
W5 - 59

REFLECTIVE SHEETING DETAIL (E)

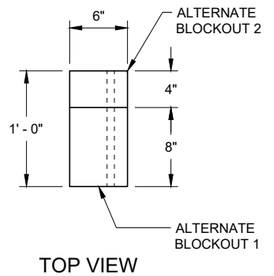


FRONT VIEW SIDE VIEW

E.A.T. MARKER POST (13)



SIDE VIEW



TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL

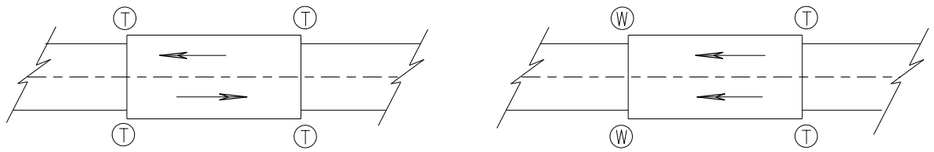
MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

6

SDD 14B44 - 04c



TWO WAY TRAFFIC

ONE WAY TRAFFIC

(T) THRIE BEAM CONNECTION

(W) W-BEAM CONNECTION WHEN REQUIRED

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

GENERAL NOTES

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

TRANSITION USES STEEL POSTS ONLY.

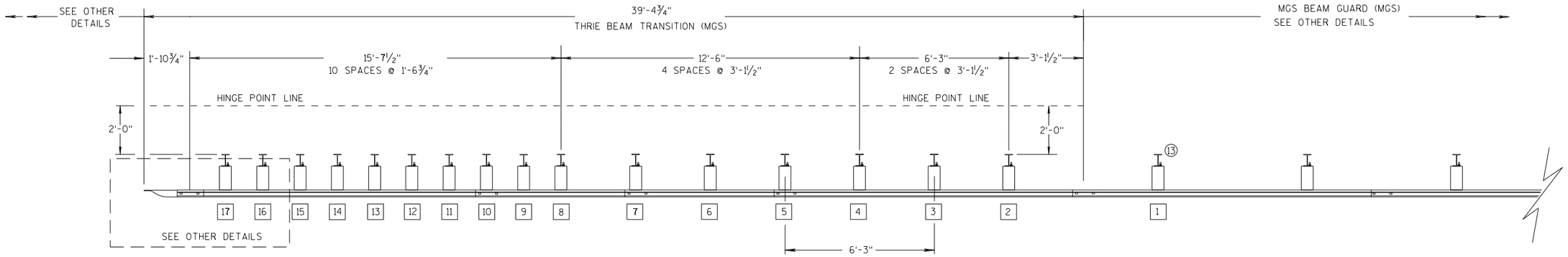
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

POST 2 THROUGH 17 USES STEEL POST ONLY

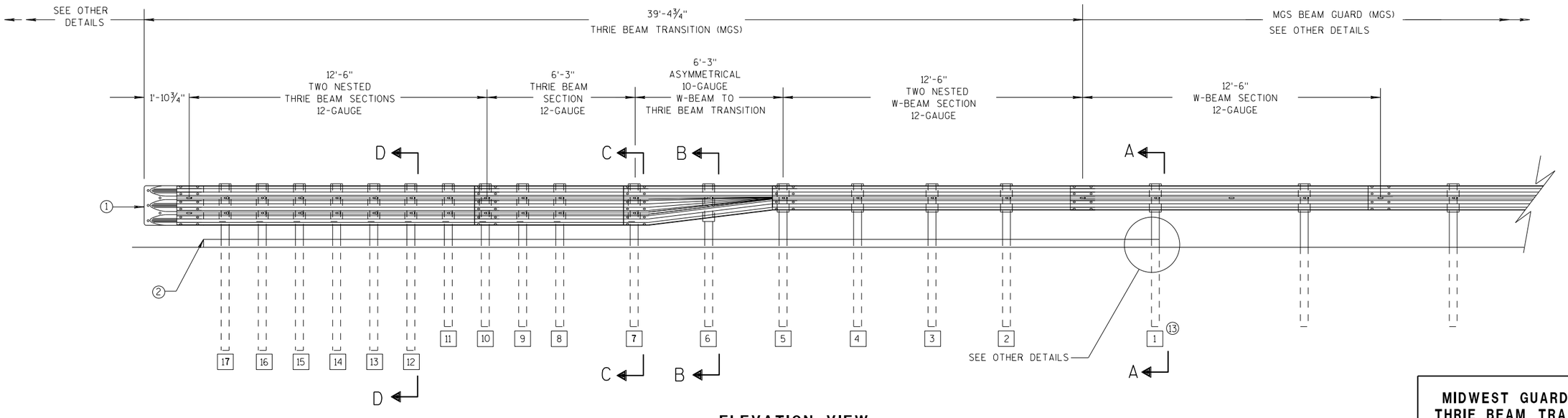
(1) BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.

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

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



PLAN VIEW



ELEVATION VIEW

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

6
S.D.D. 14 B 45-5a

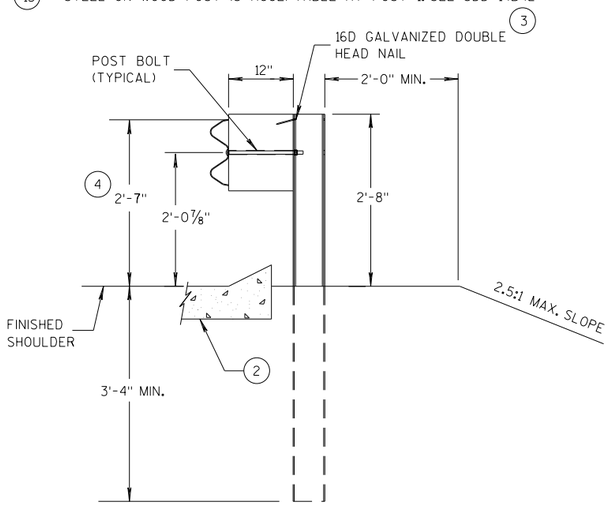
GENERAL NOTES

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

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

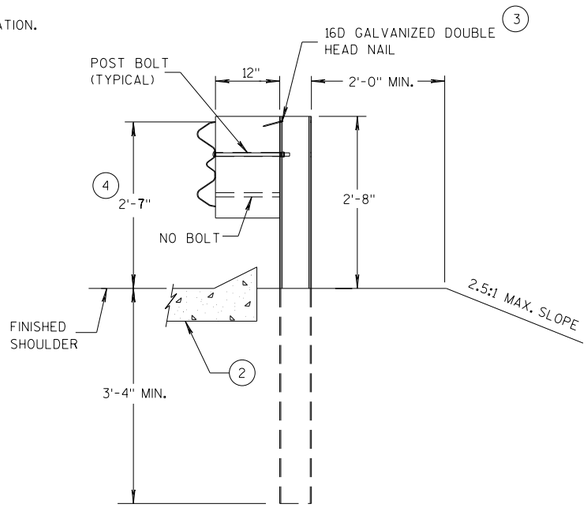
(4) TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".

(13) STEEL OR WOOD POST IS ACCEPTABLE AT POST 1. SEE SDD 14B42



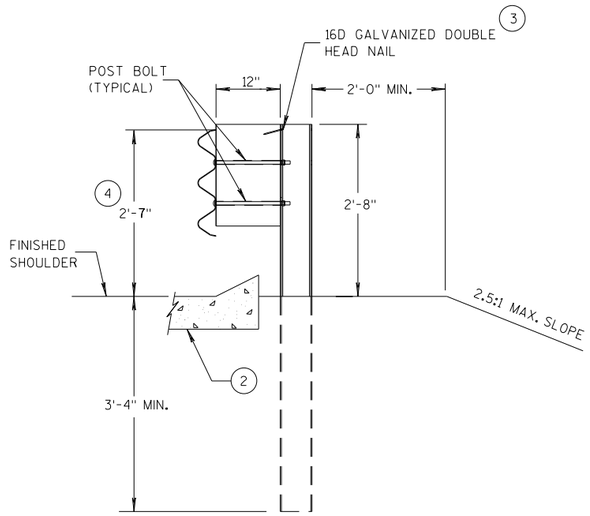
SECTION A-A (13)

POSTS 1-5



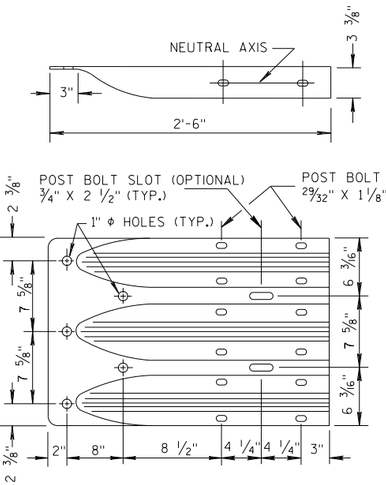
SECTION B-B

POST 6

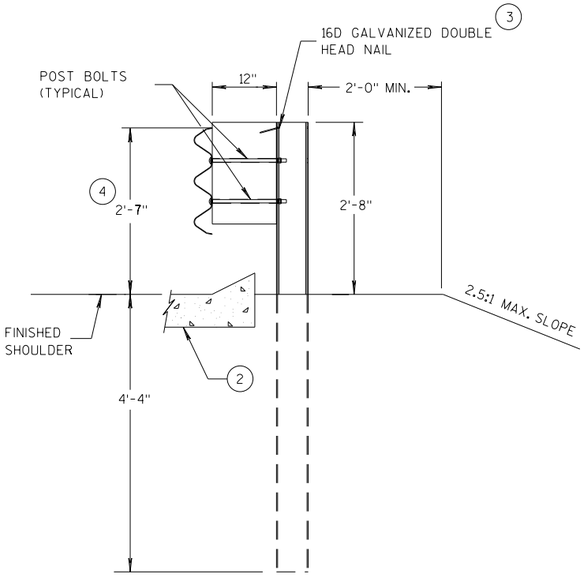


SECTION C-C

POSTS 7-11

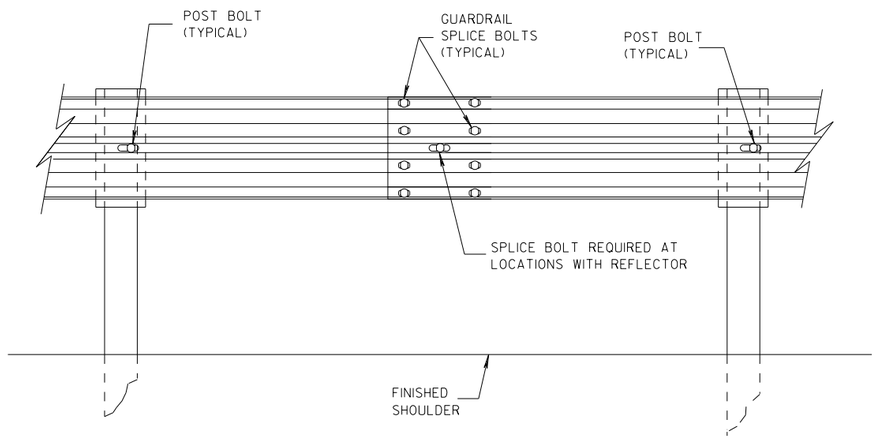


THRIE BEAM TERMINAL CONNECTOR



SECTION D-D

POSTS 12-17



SPLICE DETAIL

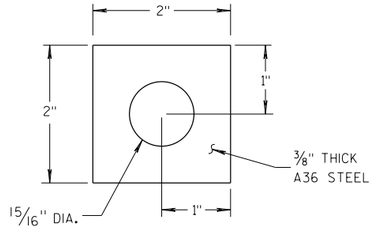
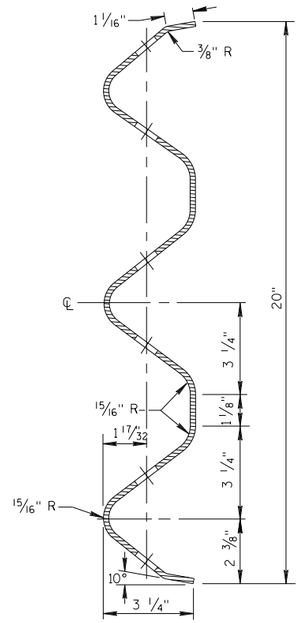


PLATE WASHER DETAIL



SECTION THRU THRIE BEAM RAIL ELEMENT

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOF

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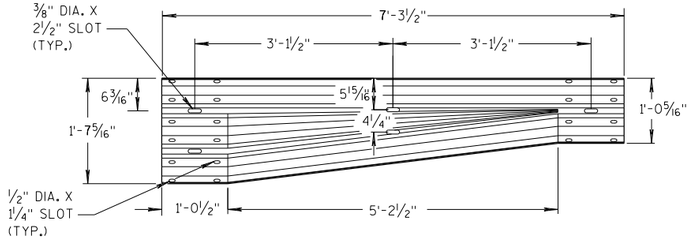
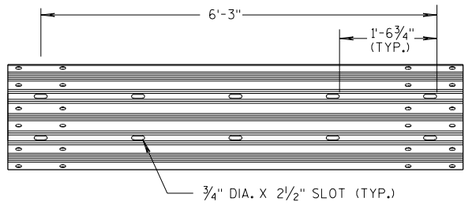
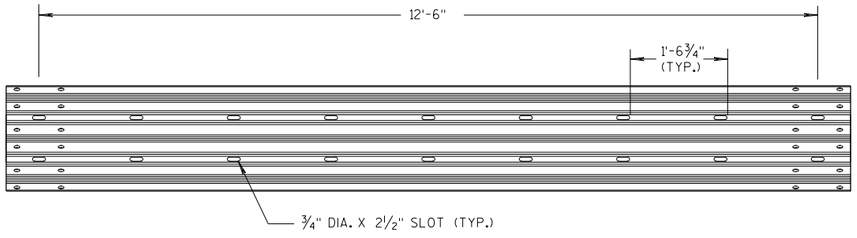


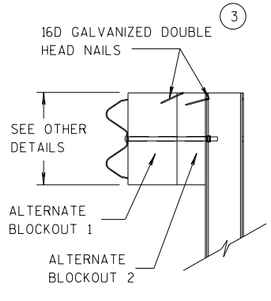
W-BEAM TO THRIE BEAM TRANSITION SECTION



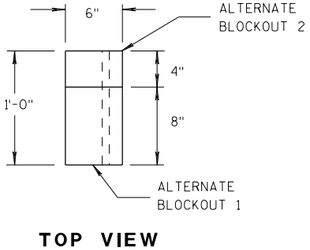
6'-3" THRIE BEAM SECTION



12'-6" THRIE BEAM SECTION

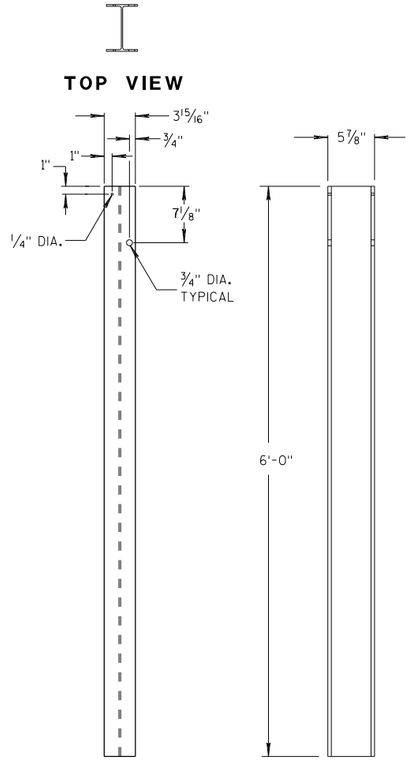


SIDE VIEW



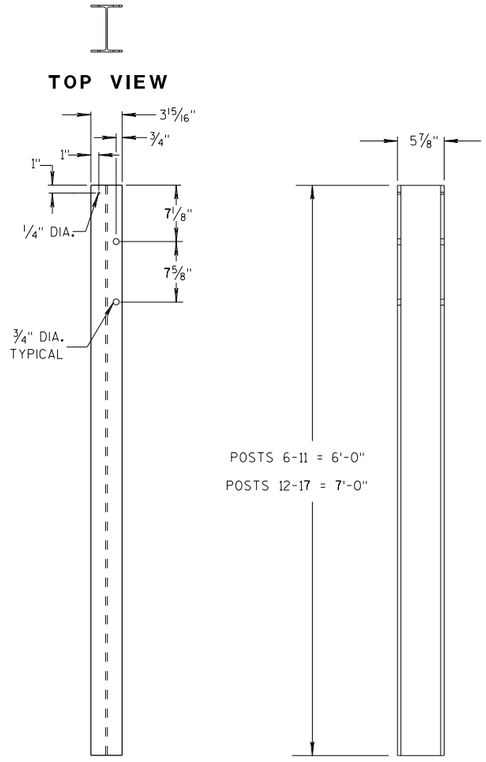
TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL



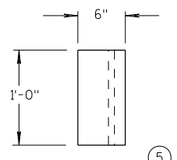
FRONT VIEW SIDE VIEW

STEEL POSTS 1-5 (13)

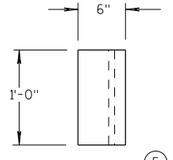


FRONT VIEW SIDE VIEW

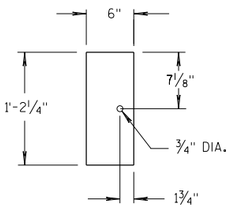
STEEL POSTS 6-17



TOP VIEW (5)

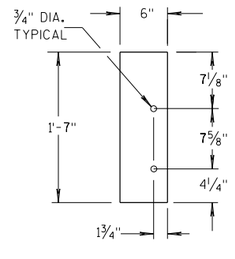


TOP VIEW (5)



FRONT VIEW

BLOCKOUT POSTS 1-5



FRONT VIEW

BLOCKOUT POSTS 6-17

GENERAL NOTES

STEEL POSTS ARE W6X9 OR W6X8.5.

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

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

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

(13) STEEL OR WOOD POST IS ACCEPTABLE AT POST 1. SEE SDD 14B42.

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
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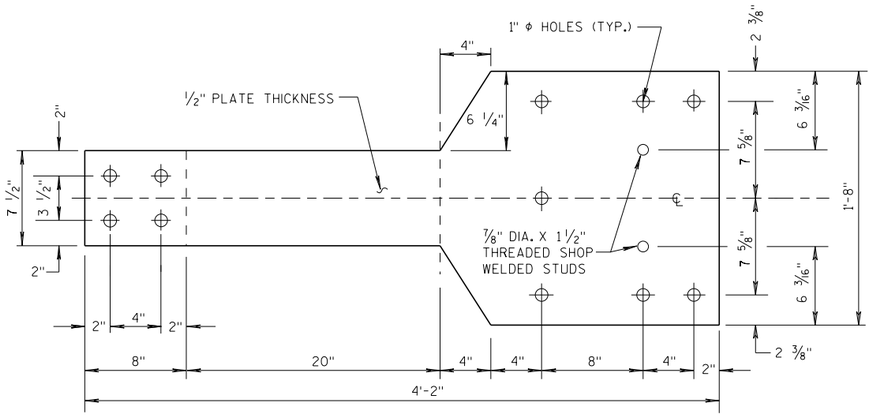
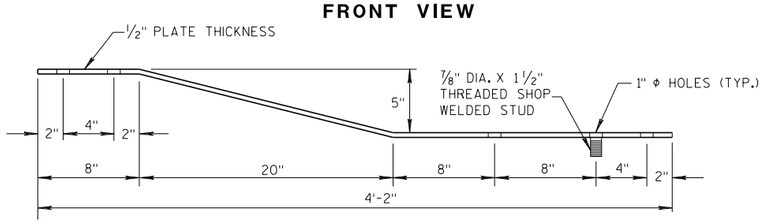
GENERAL NOTES

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

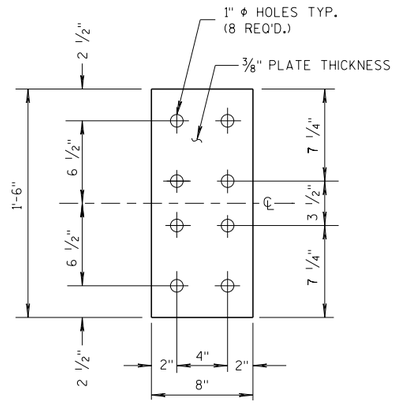


FRONT VIEW



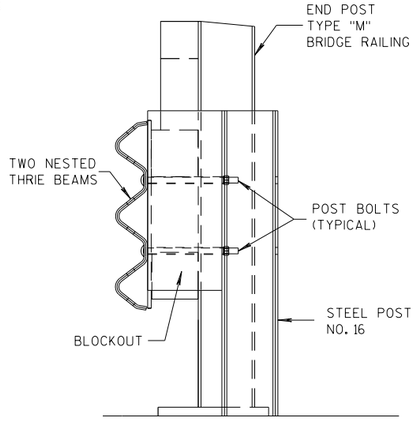
PLAN VIEW

BACK-UP PLATE DETAIL, TYPE "M"

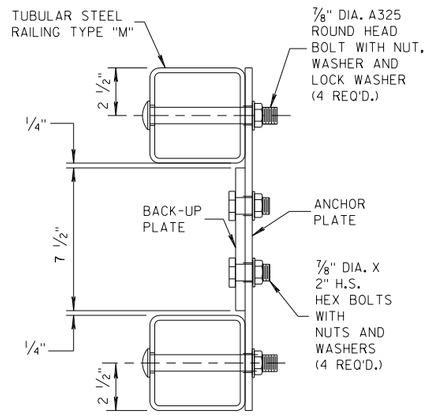


FRONT VIEW

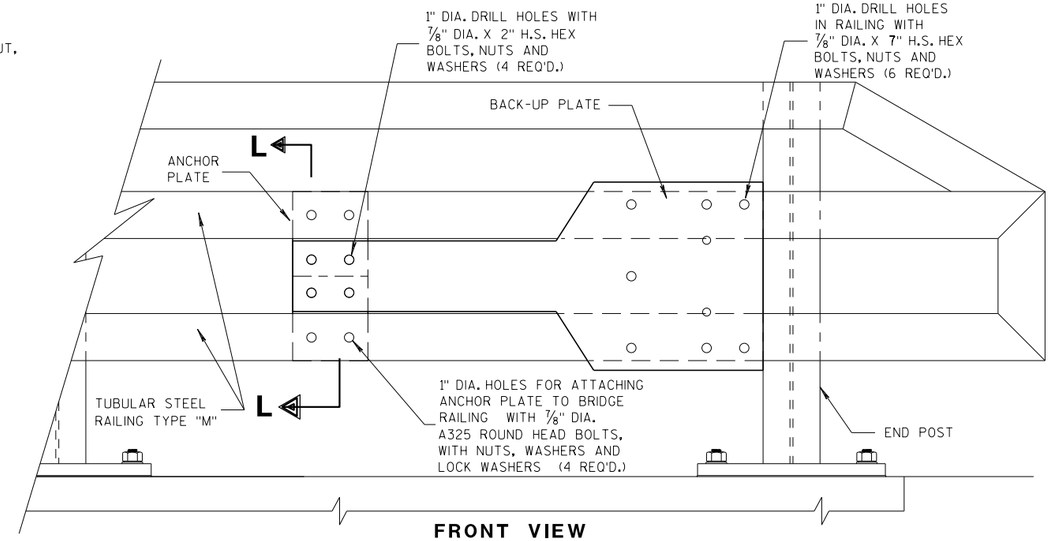
ANCHOR PLATE DETAIL, TYPE "M"



SECTION M-M

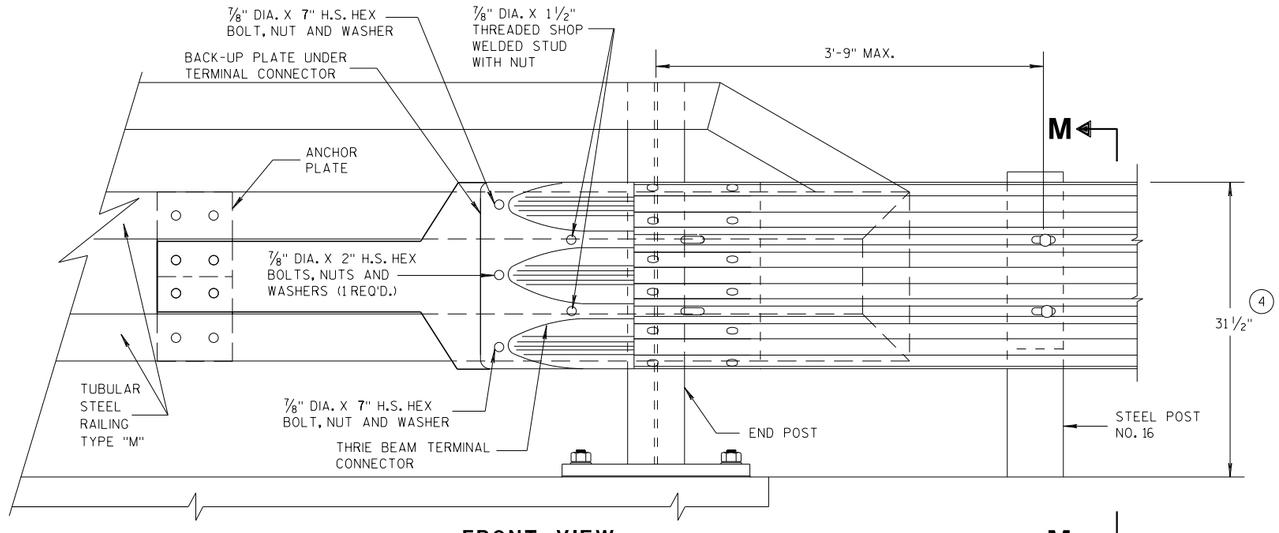


SECTION L-L

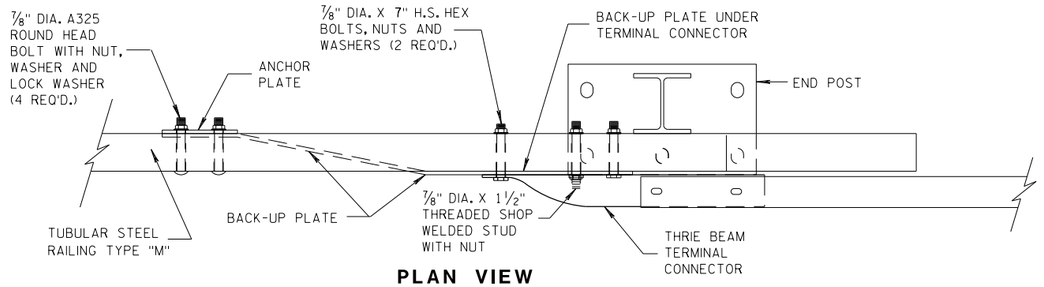


FRONT VIEW

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



FRONT VIEW



PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

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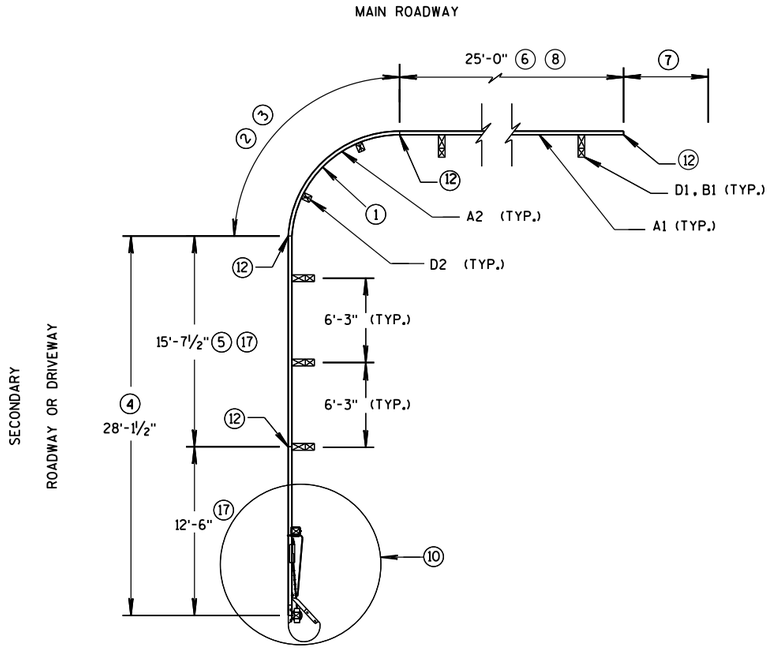
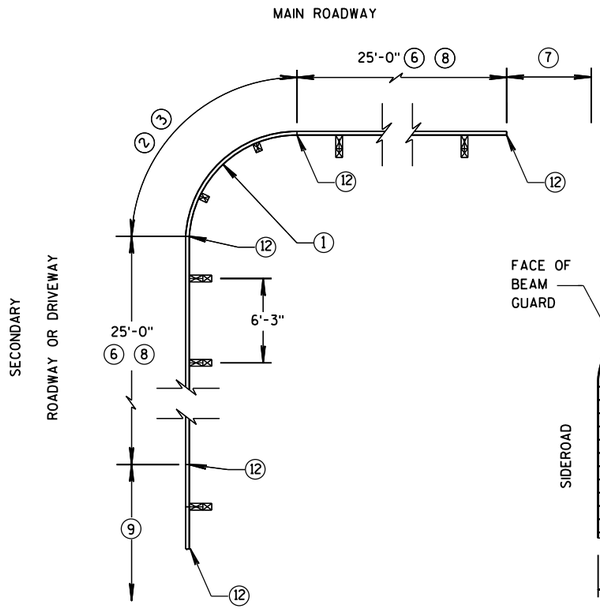
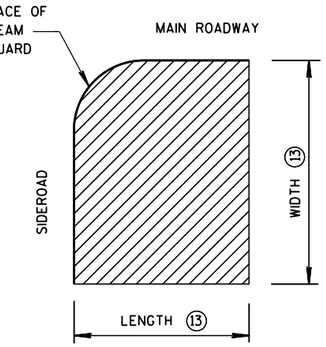


SHORT RADIUS BEAM GUARD WITH SHORT RADIUS TERMINAL ON SECONDARY ROAD OR DRIVEWAY PLAN VIEW



SHORT RADIUS BEAM GUARD WITH EAT, ADDITIONAL BEAM GUARD OR TRANSITION TO RIGID BARRIER ON SECONDARY ROAD OR DRIVEWAY PLAN VIEW



AREA FREE OF FIXED OBJECTS FOR RADIUS 32' AND LESS (16)

TABLE FOR RADIUS OF 32' AND LESS

RADIUS FT	LENGTH FT	WIDTH FT
8	25	15
16	30	15
24	40	20
32	50	30

GENERAL NOTES

SEE PLANS FOR OTHER BARRIER SYSTEM AND LOCATION SPECIFICS.

SEE 14B42 FOR MORE INFORMATION ON BEAM GUARD INSTALLATION, PARTS, MATERIALS, AND INSTALLATION INFORMATION.

GALVANIZE PARTS AFTER FABRICATION.

WELDING IS TO FOLLOW CURRENT REQUIREMENTS OF THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE ANSI/AWS D1.1

UNLESS NOTED OTHERWISE, ALL PLATES ARE FLAT AND FREE OF WARP.

UNLESS NOTED OTHERWISE, ALL EDGES ARE SMOOTH, STRAIGHT AND VERITCAL.

ALL CUTS AND HOLES, EXCEPT IN BEAM GUARD RAIL ARE TO BE MACHINED OR MACHINE FLAME CUTS.

UNLESS NOTED OTHERWISE CUT OR PROVIDE BOLTS THAT ARE ¼" TO ½" BEYOND THE NUT

DRAWINGS ARE NOT TO SCALE.

(1) RADIUS MEASURE FROM INSIDE OF RAIL. LENGTH OF BEAM GUARD SHORT RADIUS GUARD MEASURED ALONG TRAFFIC SIDE OF RAIL. RADIUS BETWEEN 8 FEET TO 150 FEET. SEE PLAN FOR REQUIRED RADIUS. BEAM GUARD RAIL IN RADIUS IS SHOP BENT. ODD RAIL LENGTH OR FIELD CUTS MAY BE REQUIRED.

(2) CONTROLLED RELEASE TERMINAL (CRT) POSTS ARE USED IN THE RADIUS. CONTROLLED RELEASE TERMINAL (CRT) POSTS ARE SPACED 6'-3". SEE PLAN FOR NUMBER OF CONTROLLED RELEASE TERMINAL (CRT) POSTS.

(3) WITHIN RADIUS BEAM GUARD RAILS ARE NOT BOLTED TO POSTS. BEAM GUARD RAILS RESTED ON TOP OF LAG SCREW.

(4) MINIMUM LENGTH OF BEAM GUARD ALONG SIDE ROAD OR DRIVEWAY TO INSTALL SHORT RADIUS TERMINAL. BEAM GUARD IS PAID FOR WITH BEAM GUARD ITEM.

(5) ODD LENGTH OF BEAM GUARD REQUIRED TO INSTALL SHORT RADIUS TERMINAL.

(6) MINIMUM AMOUNT OF BEAM GUARD TO BE INSTALLED PRIOR TRANSITION TO RIGID BARRIER, ADDITIONAL BEAM GUARD, OR EAT. BEAM GUARD PAID FOR WITH BEAM GUARD ITEM. SEE PLANS FOR MORE DETAIL.

(7) BEAM GUARD, EAT OR TRANSITION TO RIGID BARRIER. SEE PLAN.

(8) TOP OF BEAM GUARD BY THE RADIUS IS 27". HEIGHT OF BEAM GUARD IS 31" BY TRANSITION TO RIGID BARRIER, ADDITIONAL BEAM GUARD OR EAT.

(9) ADDITIONAL BEAM GUARD, EAT OR TRANSITION TO RIGID BARRIER. BEAM GUARD SHOWN. SEE PLAN FOR DETAILS.

(10) SHORT RADIUS TERMINAL (SEE OTHER DETAILS)

(11) HEIGHT VARIES. SEE NOTE (8) AND (17).

(12) BEAM GUARD RAIL SPLICE LOCATION. SPLICE LOCATION REQUIRE PART F1 AND F2. SEE SDD 14B42 FOR DETAILS.

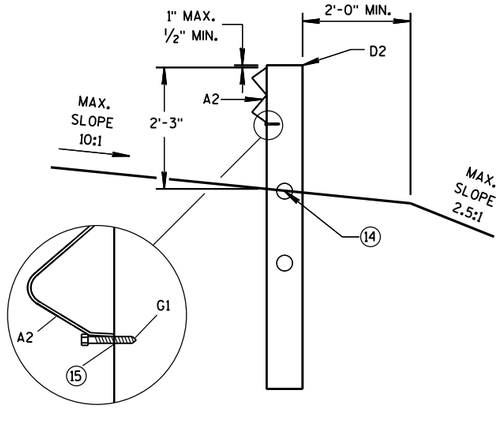
(13) SEE TABLE FOR VALUES.

(14) MAXIMUM HEIGHT FOR CENTER OF HOLE IS ¾" ABOVE FINISHED GROUND ±1".

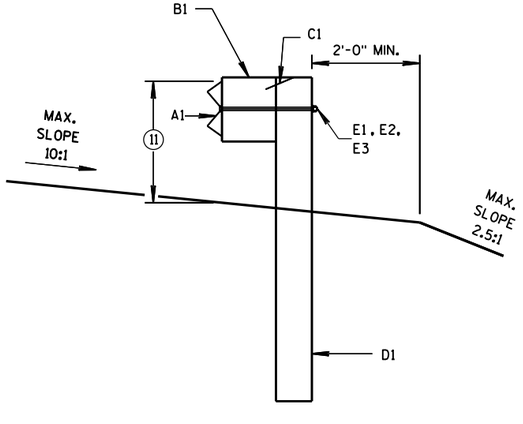
(15) DRILL 15/64" DIA. PILOT HOLE. DO NOT HAMMER LAG SCREW INTO POST.

(16) SMALL SIGNS ON BREAKAWAY HARDWARE ARE ACCEPTABLE.

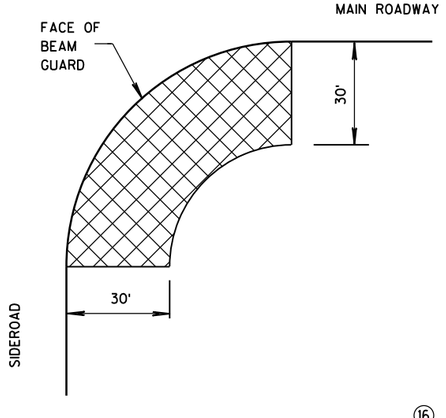
(17) TOP OF RAIL HEIGHT IS 27" WHEN USING A SHORT RADIUS TERMINAL.



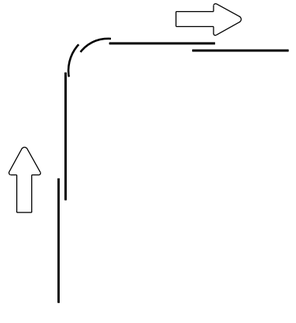
CONTROLLED RELEASE TERMINAL POST (CRT) IN RADIUS



BEAM GUARD POSTS IN HEIGHT TRANSITION



AREA FREE OF FIXED OBJECTS (16) RADIUS GREATER THAN 32'



LAP SPLICE DETAIL

SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)

STATE OF WISCONSIN
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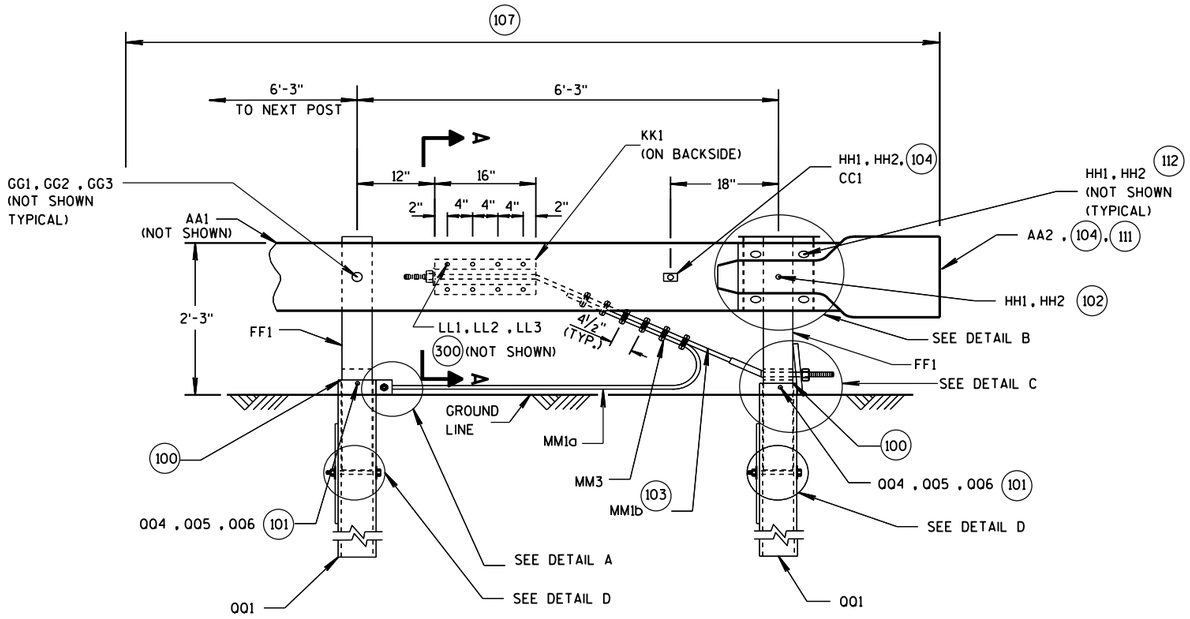
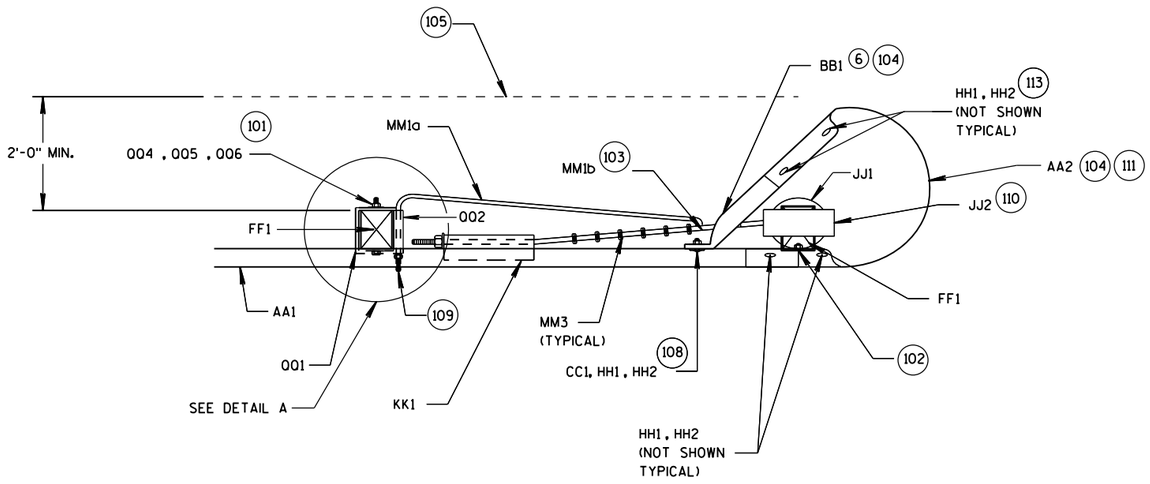
S.D.D. 14 B 53-1a



SHORT RADIUS TERMINAL
PROFILE VIEW



SHORT RADIUS TERMINAL
TOP VIEW

(100) TOP OF FOUNDATION TUBE 2 INCHES MAXIMUM ABOVE FINISHED GROUND.

(101) WASHERS REQUIRED BETWEEN BOLT HEAD AND FOUNDATION TUBE AND BETWEEN NUT AND FOUNDATION TUBE.

(102) SPLICE BOLT AND NUT CONNECTS BEAM GUARD RAIL, W-BEAM END SECTION BUFFER, AND STEEL PIPE ASSEMBLY. NO WASHER REQUIRED. SEE DETAIL B.

(103) CABLE IS TAUT.

(104) ADJUST AA2 AND BB1 TO FIT.

(105) BREAK POINT OF SHOULDER.

(106) TACK WELD CABLE CONNECTOR TUBE PLATE TO CABLE CONNECTION TUBE. SEE DETAIL A PROFILE VIEW.

(107) PAY LIMIT FOR BEAM GUARD.

(108) SQUARE WASHER BETWEEN HEAD OF BOLT AND TRAFFIC FACE OF BEAM GUARD. ROUND WASHER REQUIRED BETWEEN NUT AND BB1.

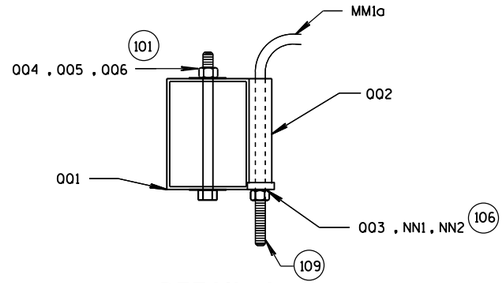
(109) CUT OR PROVIDE THREADED STUD THAT IS FLUSH WITH FACE OF BEAM GUARD RAIL KK1 (PLUS OR MINUS ½" TOLERANCE). DEBURR AFTER CUTTING.

(110) SEE STEEL PIPE ASSEMBLY DETAILS.

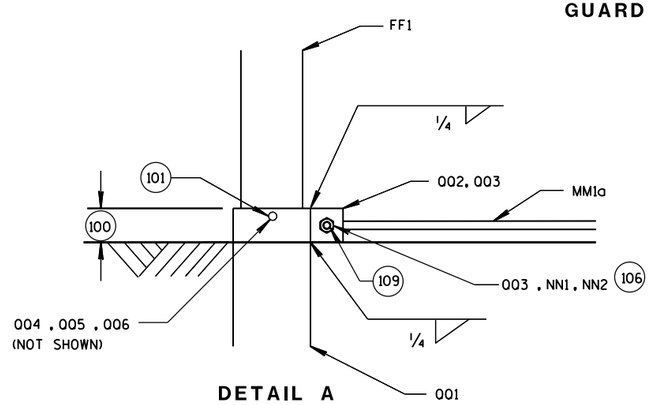
(111) ATTACH UU2 WITH UU3. SHOP APPLY UU1 TO UU2.

(112) FOUR HH1 AND HH2 REQUIRED TO ATTACH AA1 TO AA2.

(113) FOUR HH1 AND HH2 REQUIRED TO ATTACH AA2 TO BB1.



DETAIL A
TOP VIEW
(WOOD BREAKAWAY AND BEAM GUARD RAIL POSTS NOT SHOWN)



DETAIL A
PROFILE VIEW

STEEL PLATE BEAM GUARD
SHORT RADIUS TERMINAL
MGS

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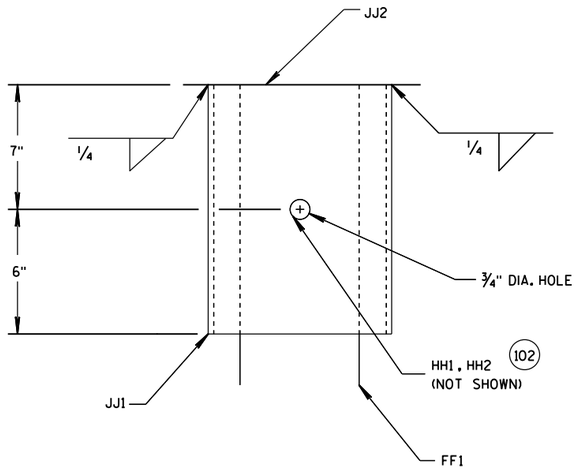
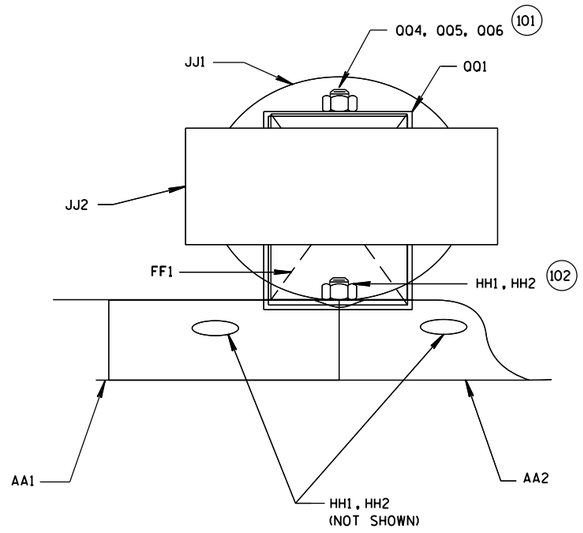
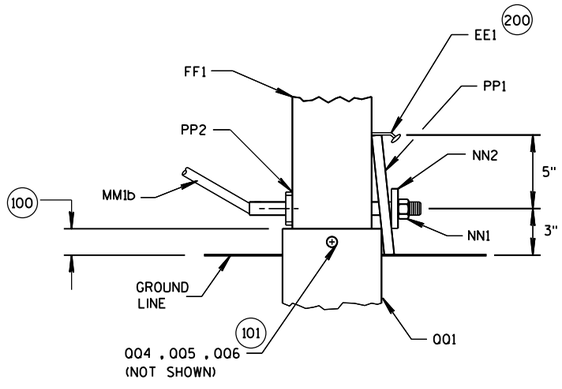


DETAIL B
PROFILE VIEW OF STEEL PIPE ASSEMBLY
(BEAM GUARD AND W-BEAM
END SECTION NOT SHOWN)

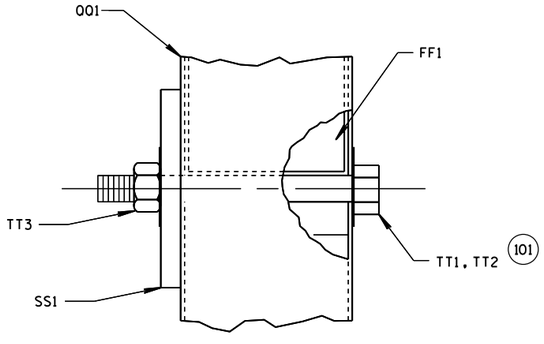


DETAIL B
PLAN VIEW OF STEEL PIPE ASSEMBLY

200 2 NAILS SPACED 4 INCHES CENTER TO CENTER.



DETAIL C
PROFILE VIEW



DETAIL D
PROFILE VIEW

SHORT RADIUS BEAM GUARD
(MGS) SHORT RADIUS
TERMINAL (MGS)

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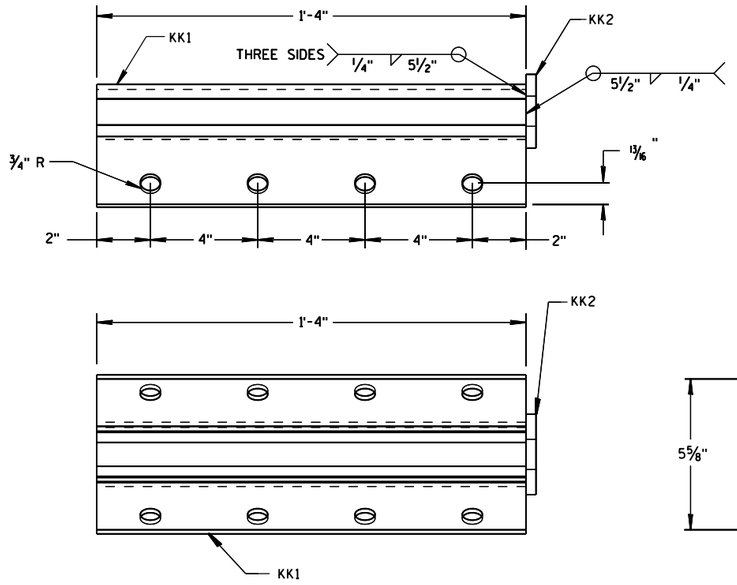
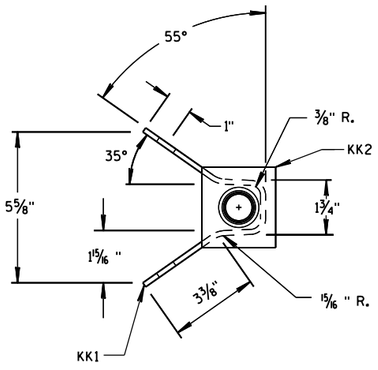
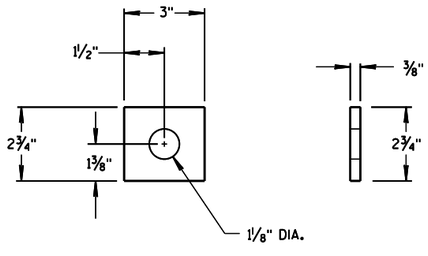
(300) WASHERS REQUIRED BETWEEN BOLT HEAD AND BEAM GUARD RAIL AND BETWEEN NUT AND ANCHOR BRACKET. EIGHT LL1 AND LL3 REQUIRED. SIXTEEN LL2 REQUIRED.

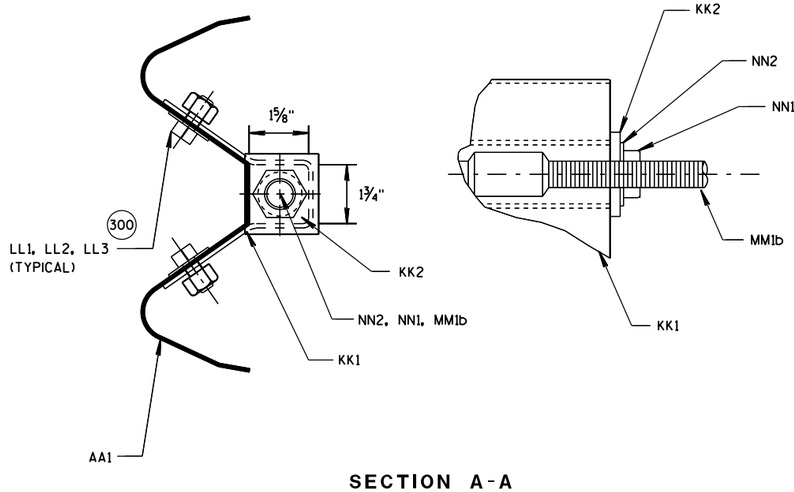




ANCHOR BRACKET (KK1, KK2)



ANCHOR BRACKET BEARING PLATE (KK2)



SECTION A-A

SHORT RADIUS BEAM GUARD
(MGS) SHORT RADIUS
TERMINAL (MGS)

STATE OF WISCONSIN
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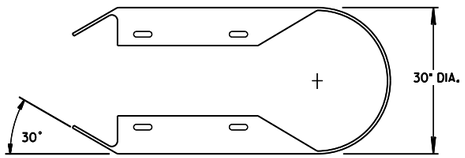
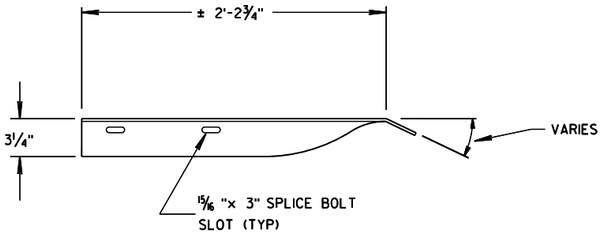
S.D.D. 14 B 53-1d



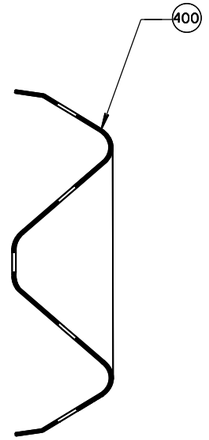
TOP VIEW



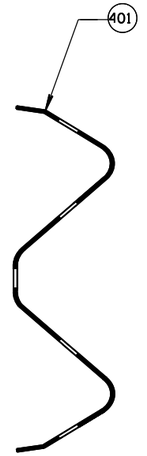
TOP VIEW

(400) CROSS SECTON OF PART IS TO FIT OVER AA1.

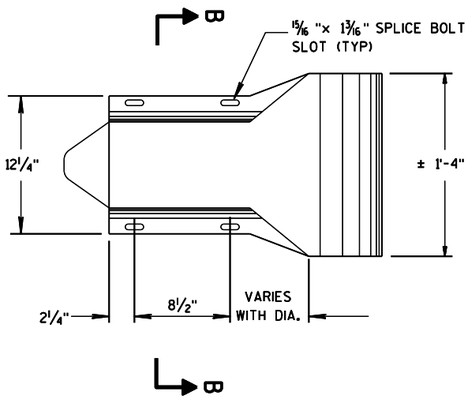
(401) CROSS SECTON OF PART IS TO FIT OVER OR UNDER AA1.



SECTION B-B

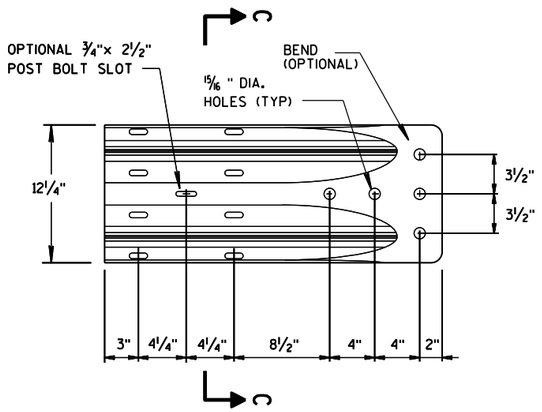


SECTION C-C



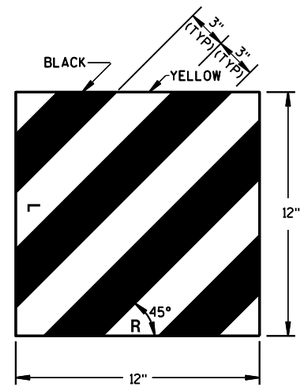
W-BEAM
END SECTION BUFFER (AA2)

PROFILE VIEW



W-BEAM
TERMINAL CONNECTOR (BB1)

PROFILE VIEW



REFLECTIVE SHEETING
(UU1, UU2)

SHORT RADIUS BEAM GUARD
(MGS) SHORT RADIUS
TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOI

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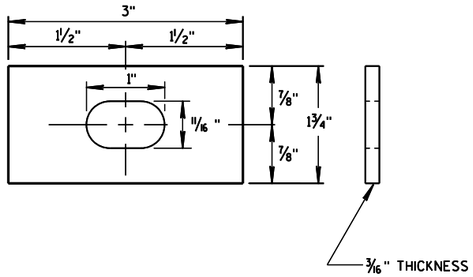
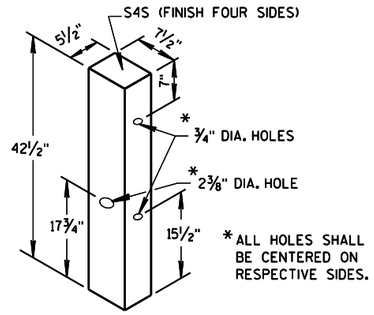
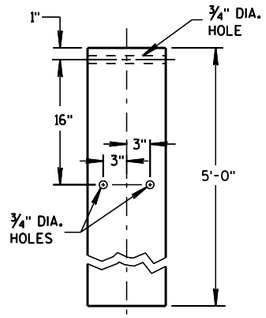


RECTANGULAR PLATE WASHER (CC1)



WOOD BREAKAWAY POST (FF1)



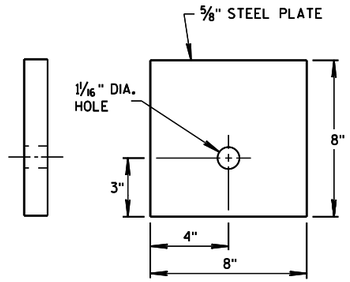
FOUNDATION TUBE (QQ1) (500)

(500) SEE DETAIL "D" FOR LOCATION AND ATTACHING SS1.

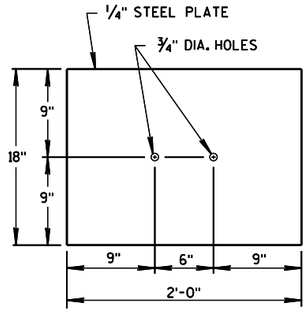
(501) FOR MM1a THREADED STUD ONLY REQUIRED ON ONE END. SWAGED FITTING REQUIRED.

(502) LOCATE HOLES ON THE CENTERLINE OF THE SIDE OF THE POST.

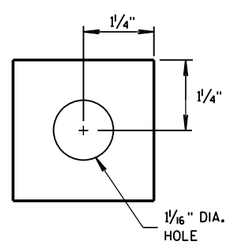
(503) MM1a MAY HAVE ONE THREADED STUD 4 INCHES LONG. SEE NOTE (109).



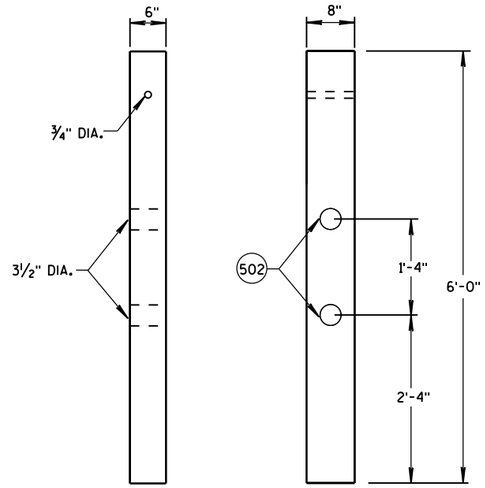
BEARING PLATE (PP1)



SOIL PLATE (SS1)

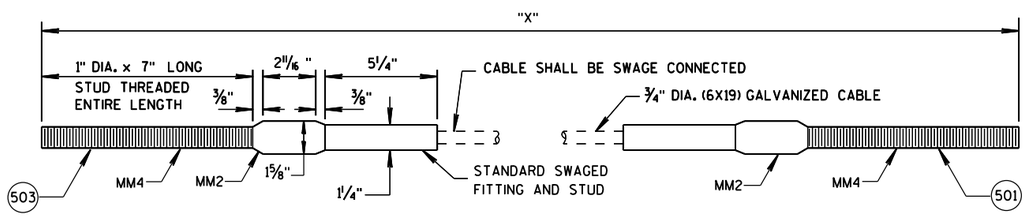


TUBE END PLATE (QQ3)



FRONT VIEW SIDE VIEW

CONTROLLED RELEASE TERMINAL POST (CRT) (D2)



"X" LENGTH	
MM1a	9'-0"
MM1b	6'-8"

CABLE ASSEMBLY (MM1a , MM1b)

SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

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S.D.D. 14 B 53-1f

BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
A1	BEAM GUARD RAIL	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
A2	BEAM GUARD RAIL - SHOP BENT	INDICATE ON BACK OF RAIL RADIUS THAT RAIL WAS BENT TO. SHOP BEND RADIUS IS TO THE NEAREST FOOT. FOLLOW AASHTO M180 ON HOW TO MARK RADIUS INFORMATION.	
		AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
B1	BLOCK - WOOD	WISDOT SPEC. 614	SEE SDD 14B42
C1	NAIL	ASTM A153 HOT DIP CLASS D	
		ASTM F1667 TYPE 1 STYLE 12 (16 DOUBLE HEAD)	
D1	POST-STRONG POST-WOOD	WISDOT SPEC. 614	SEE SDD 14B42
D2	POST-CRT-WOOD	WISDOT SPEC. 614	
E1	POST BOLT	ASTM A307 GRADE A OR SAE J429 GRADE 2	5/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C/ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		UNC	
E2	POST BOLT-WASHER	ASTM F436 TYPE 1 (HARDEN TYPICALLY USED WITH STEEL) OR ASTM F844 (UNHARDENED TYPICALLY WITH WOOD)	5/8" DIA.
		GALV. AASHTO M111/ASTM A 123 OR GALV. HOT DIP. TO AASHTO M232 CLASS C/ASTM A153 CLASS C/ASTM F2329	
E3	POST BOLT - NUT		5/8" DIA. SEE SDD 14B42 FOR GEOMETRY
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C/ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		UNC	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		ASTM A563 GRADE A HEAVY HEX HEAD	
F1	SPLICE BOLT	GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C/ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		ASTM A307 GRADE A OR SAE J429 GRADE 2	5/8" DIA. SEE SDD 14B42 FOR GEOMETRY AND OTHER INFORMATION
		UNC	
		AASHTO M180	

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
F2	SPLICE BOLT - NUT	ASTM A563 GRADE A	5/8" DIA. SEE SDD 14B42 FOR GEOMETRY
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C/ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
G1	LAG SCREW	ASTM A308 GRADE A ASTM A153 CLASS D	
			3/8" DIA. 3" LONG
H1	DELINEATOR - BEAM GUARD		SEE SDD 14B42 FOR MORE INFORMATION
H2	DELINEATION - SHEETING	YELLOW OR WHITE	
		WISDOT SPEC 637 TYPE SH	
		APPROVED PRODUCT LIST	
J1	FOUNDATION BACKFILL	STANDARD SPEC. 614	
AA1	BEAM GUARD RAIL - PUNCHED	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
AA2	BEAM GUARD RAIL - END SECTION BUFFER	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
BB1	BEAM GUARD RAIL - TERMINAL CONNECTOR MODIFIED	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
CC1	SHORT RADIUS - SQUARE WASHER	AASHTO M180	
		GALV. AASHTO M111 / ASTM A123	
EE1	NAIL	ASTM A153 HOT DIP CLASS D	
		ASTM F1667 TYPE 1 STYLE 12 (16 DOUBLE HEADED)	
FF1	POST - BCT - WOOD	S4S FINISH ON 4 SIDES	
		WISDOT SPEC. 614	
GG1	POST BOLT	ASTM A307 GRADE A OR SAE J429 GRADE 2	3/8" DIA. SEE SDD 14B42 FOR GEOMETRY
		AASHTO M180	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		UNC	
GG2	POST BOLT - WASHER	ASTM F436 TYPE 1 (HARDEN TYPICALLY USED WITH STEEL) OR ASTM F844 (UNHARDENED TYPICALLY WITH WOOD)	3/8" DIA.
		GALV. AASHTO M111 / ASTM A123 OR5 GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	

SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)

STATE OF WISCONSIN
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S.D.D. 14 B 53-1g

BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
GG3	POST BOLT - NUT	ASTM A563 GRADE A	3/8" DIA.
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	SEE 14B42 FOR GEOMETRY
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		UNC	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		ASTM A563 GRADE A HEAVY HEX HEAD	
HH1	SPLICE BOLT	GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	3/8" DIA. SEE 14B42 FOR GEOMETRY
		ASTM A307 GRADE A OR SAE J429 GRADE 2	
		UNC	
		AASHTO M180 HEAD GEOMETRY	
HH2	SPLICE BOLT - NUT	ASTM A563 GRADE A	3/8" DIA.
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	SEE 14B42 FOR GEOMETRY
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
JJ1	PIPE - STEEL	ASTM A53 GALVANIZED GRADE B SCHEDULE 40	10" O.D.
JJ2	TOP PLATE	ASTM A36 MIN STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	DIMENSIONS 3/8" X 4" X 1'-0"
		GALV. AASHTO M111 / ASTM A123	
KK1	ANCHOR BRACKET	ASTM A36 MIN STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
KK2	ANCHOR BRACKET - BEARING PLATE	ASTM A36 MIN STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
LL1	ANCHOR BRACKET - BOLT	ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	5/8" DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		UNC	
LL2	ANCHOR BRACKET - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	5/8" DIA.
		GALV. AASHTO M111 / ASTM A123 OR5 GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
LL3	ANCHOR BRACKET - NUT	ASTM A563 GRADE A	5/8" DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A563	
		UNC	

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
MM1a	ANCHOR CABLE	AASHTO M30 / ASTM A741 INDEPENDENT WIRE CORE (IWRC) OR WIRE STRAND CORE (WCS), IMPROVED PLOW STEEL (IPS), 6X19, TYPE II OR IIc CLASS C ZINC COATED	
MM1b	ANCHOR CABLE	AASHTO M30 / ASTM A741 INDEPENDENT WIRE CORE (IWRC) OR WIRE STRAND CORE (WCS), IMPROVED PLOW STEEL (IPS), 6X19, TYPE II OR IIc CLASS C ZINC COATED	
MM2	ANCHOR CABLE - SWAGE FITTING	ASTM A576 GRADE 1035	
		SWAGE FITTINGS ARE TO BE FACTORY SWEDGED. WITH A BREAKING STRENGTH 40,000 LBS.	
		GALV. AASHTO M111 / ASTM A123	
		ASME B30.26 FORGED, CAST, OR DIE STAMPED WITH THE FOLLOWING INTO CONNECTION: NAME OF MANUFACTURER OR TRADEMARK OF CONNECTION'S MANUFACTURER, SIZE OR RATED LOAD, GRADE.	
MM3	WIRE ROPE CABLE CLAMPS	FF-C-450D TYPE 1 CLASS 1	3/4"
		ASTM A153 HOT DIP CLASS D	
MM4	ANCHOR CABLE - SWAGE FITTING - STUD	ASTM F3125 GRADE A325 TYPE 1 OR SAE GRADE 5 OR ASTM A449 TYPE 1 HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		UNC	
NN1	ANCHOR CABLE - NUT	ASTM A563 GRADE A	1" DIA.
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A563	
		UNC	
NN2	ANCHOR CABLE - NUT - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	1" DIA.
		GALV. AASHTO M111 / ASTM A123 OR5 GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
PP1	BEARING PLATE AT POST	ASTM A36 MIN STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
PP2	PIPE - STEEL	ASTM A53 GALVANIZED GRADE B SCHEDULE 40	2" DIA. x 6" LONG
QQ1	FOUNDATION TUBE	ASTM A500 GRADE B	8" X 6" X 3/16"
		GALV. AASHTO M111 / ASTM A123	
QQ2	SHORT RADIUS - FOUNDATION TUBE - ANCHOR CABLE - TUBE	ASTM A500 GRADE B	DIMENSIONS 2 1/2" X 2 1/4" X 1/4" X 8"
		GALV. AASHTO M111 / ASTM A123	

SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)

STATE OF WISCONSIN DEPARTMENT OF TRANSPOI

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S.D.D. 14 B 53-1h

BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
003	SHORT RADIUS - SOIL TUBE - ANCHOR CABLE - TUBE - END PLATE	ASTM A36 MIN STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	DIMENSIONS 2½" X 2½" X ¼"
		GALV. AASHTO M111 / ASTM A123	
004	GROUND STRUT AND YOKE - BOLT	GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	⅝" DIA.
		ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	
		UNC	
005	GROUND PLATE AND YOKE - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	⅝" DIA.
		GALV. AASHTO M111 / ASTM A123 OR5 GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
006	GROUND STRUT AND YOKE - NUT	HEAVY HEX	⅝" DIA.
		UNC	
		ASTM A563 GRADE A	
		OVER TAPPED NUTS AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
SS1	SOIL PLATE	ASTM A36 MIN STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
TT1	SOIL PLATE - BOLT	ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	⅝" DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		UNC	
TT2	SOIL PLATE - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	⅝" DIA.
		GALV. AASHTO M111 / ASTM A123 OR5 GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
TT3	SOIL PLATE - NUT	GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	⅝" DIA.
UU1	OBJECT MARKER - SHEETING	MUTCD / WISDOT OBJECT MARKER TYPE 3	PATTERN AND COLOR FOR SHEETING SHEETING TYPE FOR MARKER
		WISDOT SPEC 637 TYPE F	
		APPROVED PRODUCT LIST	
UU2	OBJECT MARKER - ALUMINUM PLATE	WISDOT SPEC 637 ALUMINUM PLATE	MATERIAL AND THICKNESS OF MATERIALS
UU3	OBJECT MARKER - SCREWS	STAINLESS SELF-TAPPING SCREWS	
VV1	FOUNDATION BACKFILL	WISDOT SPEC 614	

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S.D.D. 14 B 53-1i

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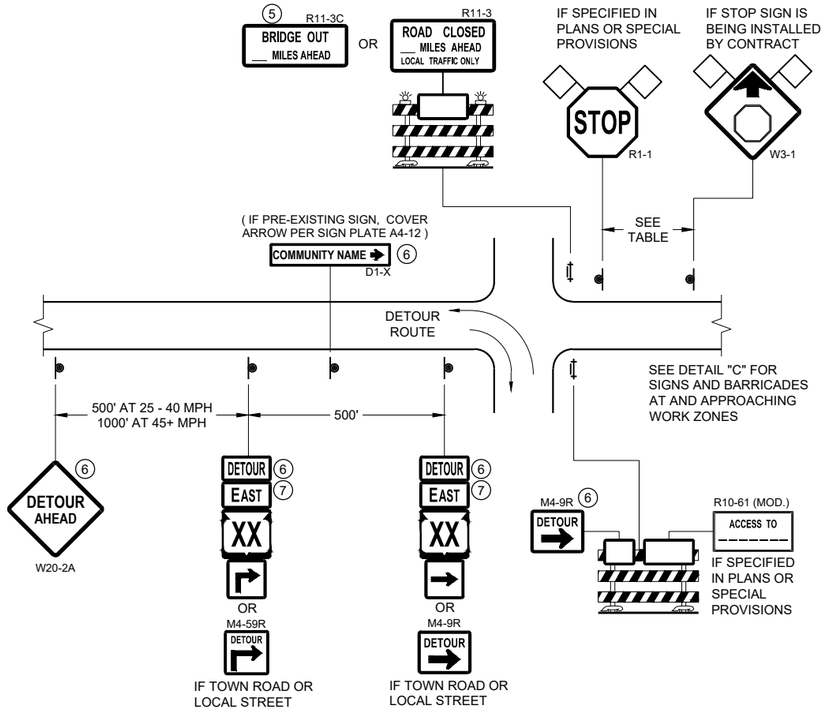
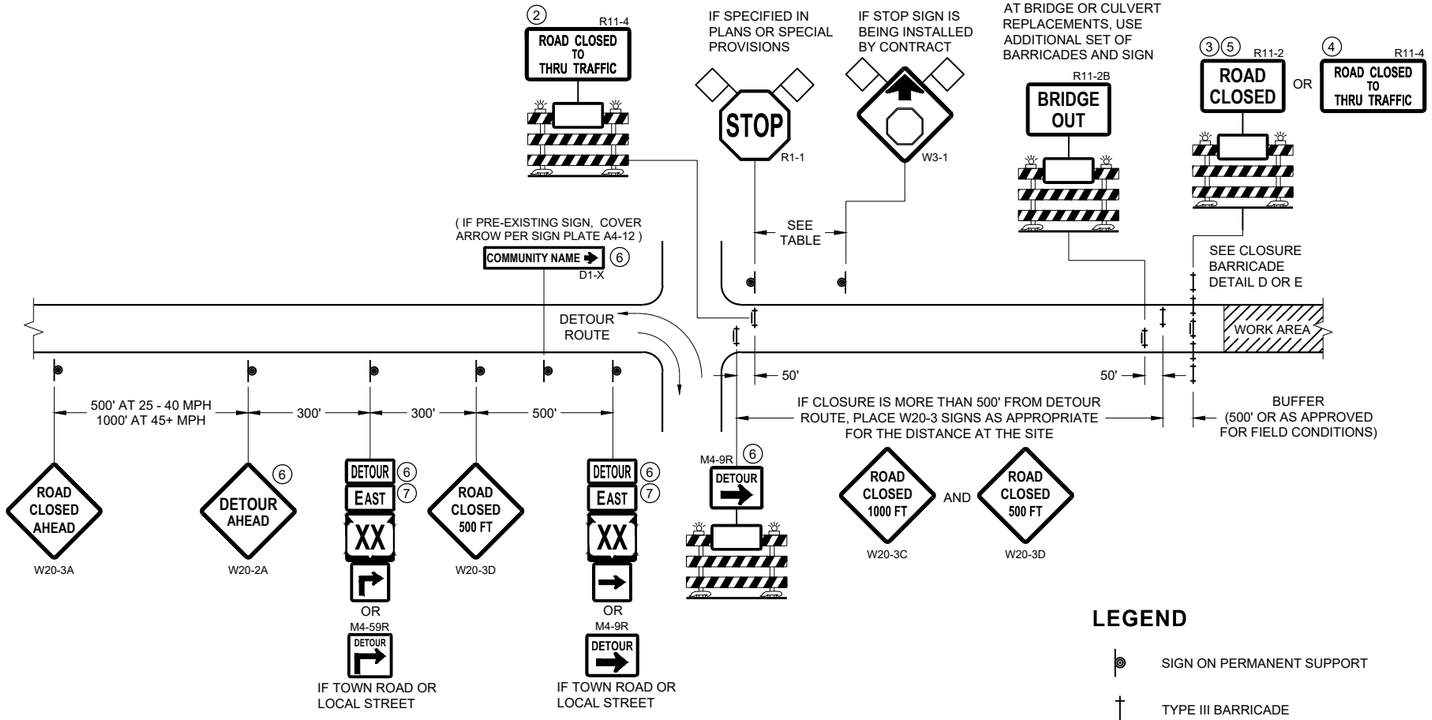
S.D.D. 14 B 53-1i

SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017
DATE
/S/ Rodney Taylor
ROADWAY STANDARDS D
UNIT SUPERVI
FHWA



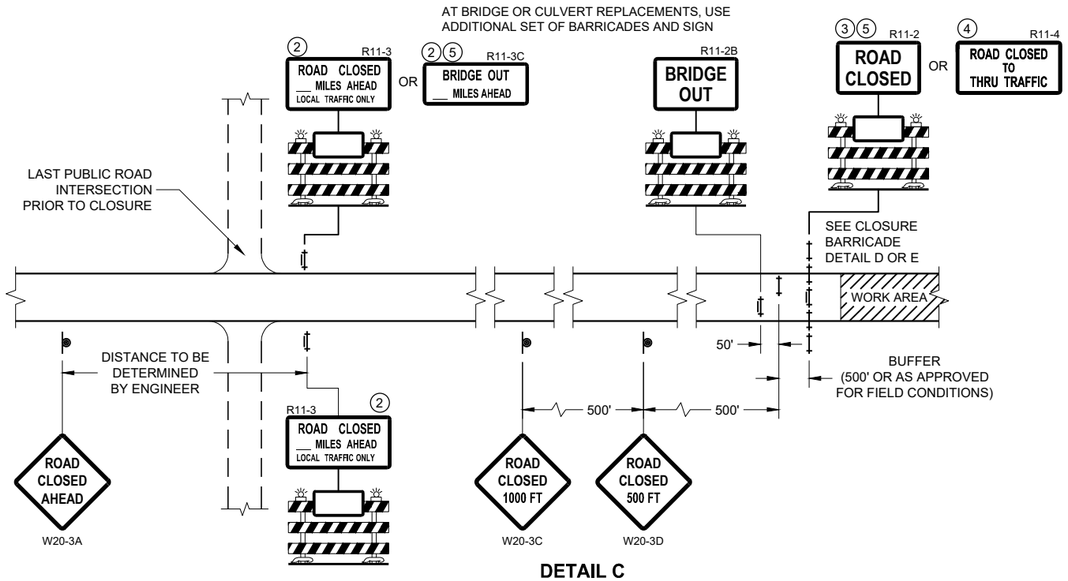


DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR

WORK ZONE GREATER THAN OR EQUAL TO 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
- TYPE "A" WARNING LIGHT (FLASHING)
- WORK AREA
- FLAGS, 16" X 16" MIN. (ORANGE)

DETOUR M4 - 8
EAST M3 - X
XX M1 - 4 OR XX M1 - 6 OR COUNTY X M1 - 5A
M05 - 1 OR M06 - 1

BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

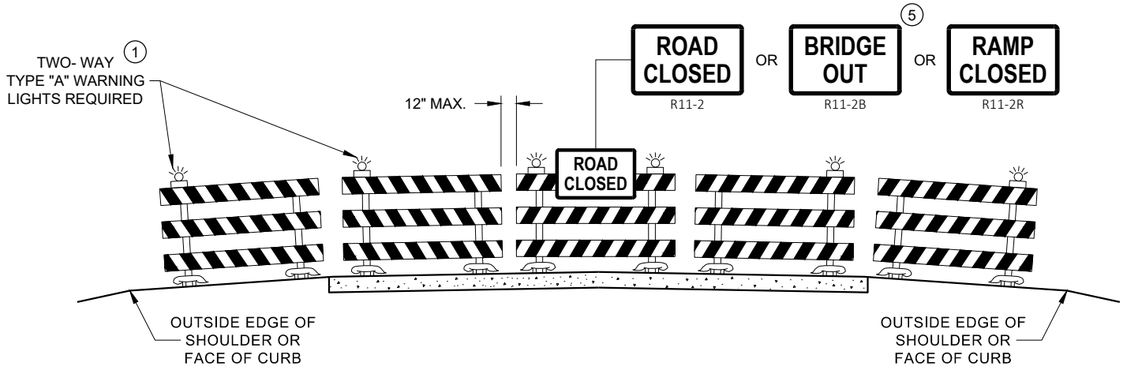
APPROVED
November 2018
DATE
/S/ Andrew Heidtke
WORK ZONE ENGINEER

FHWA

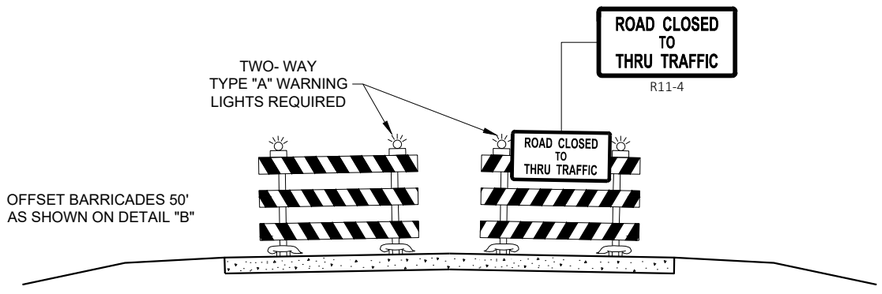
6

SDD 15C02 - 07a

SDD 15C02 - 07a



DETAIL D
ROAD CLOSURE BARRICADE DETAIL
APPROACH VIEW



DETAIL E
LANE CLOSURE BARRICADE DETAIL
APPROACH VIEW

SEE SDD 15C2 - SHEET "a" FOR LEGEND

GENERAL NOTES

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

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

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

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

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

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

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

THE R11 - 2, R11 - 3, M4 - 9, R11 - 4, AND R10 - 61 SIGNS PLACED ON THE BARRICADES SHALL COVER NO MORE THAN THE TOP RAIL. THE SIGNS SHALL NOT COVER ANY PORTION OF THE MIDDLE RAIL OR BOTTOM RAILS.

"WO" AND "MO" SIGNS ARE THE SAME AS "W" AND "M" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:
- R11 - 2 SHALL BE 48" X 30"
- R11 - 3 SHALL, R11 - 4 AND R10 - 61 SHALL BE 60 " X 30"
- M4 - 9 SHALL BE 30" X 24"
- M3 - X SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)
- M4 - 8 SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)
- M1 - 4, M1 - 5A AND M1 - 6 SHALL BE 24" X 24" (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS)
- MO5 - 1 AND MO6 - 1 SHALL BE 21" X 21" (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS)
- D1 - X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.
- R1 - 1 SHALL BE 36" X 36"

(1) TWO WARNING LIGHTS SHALL BE PROVIDED ON THE CENTER BARRICADE AND A MINIMUM OF ONE WARNING LIGHT SHALL BE PROVIDED ON EACH OF THE OTHER BARRICADES WITHIN THE ROADWAY LIMITS. SPACING OF THE WARNING LIGHTS SHALL BE UNIFORM TO THE EDGE OF ROADWAY AS SHOWN (APPROX. 8 FOOT LIGHT SPACING.

(2) THESE SIGNS AND BARRICADES ARE NOT REQUIRED IF ROAD CLOSURE BEGINS AT AN INTERSECTION.

(3) FOR ROAD CLOSURE WITHOUT LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL "D".

(4) FOR ROAD CLOSURE WITH LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL "E".

(5) FOR BRIDGE OR CULVERT REPLACEMENTS, SUBSTITUTE "BRIDGE OUT" INSTEAD OF "ROAD CLOSED" ON R11 - 2 AND R11 - 3 SIGNS.

(6) INSTALL DETOUR AND COMMUNITY GUIDE SIGNS AND ARROWS ONLY IF SPECIFIED IN THE CONTRACT. IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. MODIFY EXISTING SIGNS WHERE POSSIBLE. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. IF DETOUR SIGNS ARE BEING INSTALLED BY OTHERS, PLACE THE CONTRACTED TRAFFIC CONTROL SIGNS TO ALLOW FOR PLACEMENT OF ALL WARNING, DETOUR AND GUIDE SIGNS AS SHOWN.

(7) "EAST" CARDINAL DIRECTION MARKERS AND RIGHT TURN ARROWS ARE SHOWN. USE OTHER CARDINAL DIRECTIONS AND ARROWS AS APPROPRIATE.

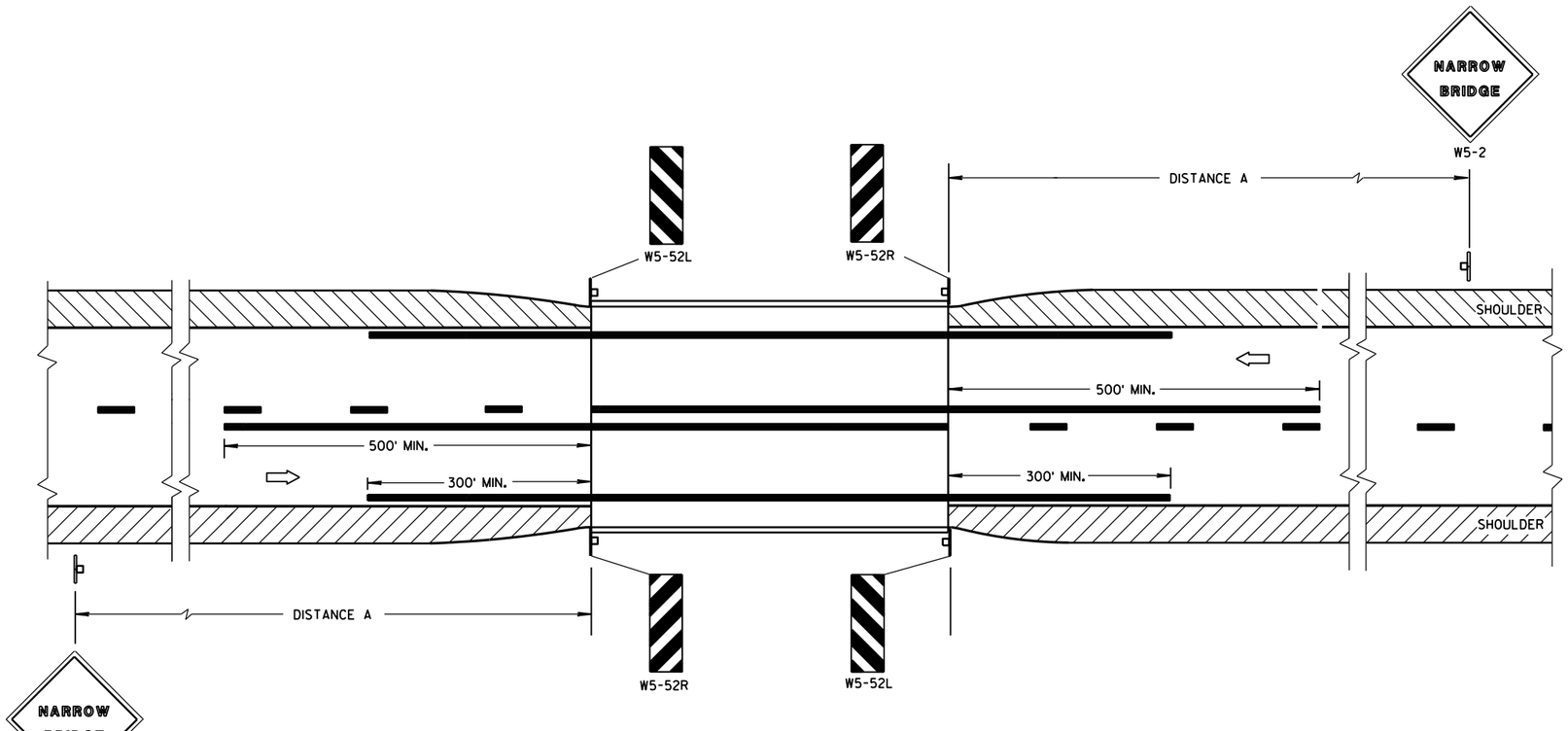
BARRICADES AND SIGNS FOR VARIOUS CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

6

SDD 15C02 - 07b



SITUATION 1

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

DISTANCE TABLE

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

GENERAL NOTES

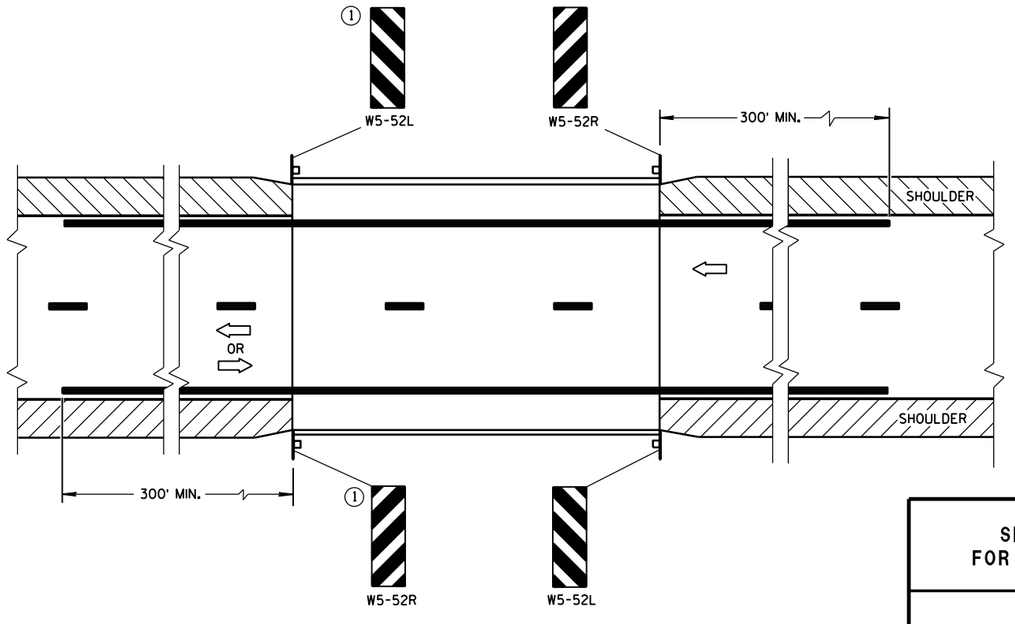
DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

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

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

(1) OMIT ON ONE-WAY TRAVELLED WAYS.

⇨ DIRECTION OF TRAFFIC



SITUATION 2

WARRANTING CRITERIA:

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

SIGNING & MARKING FOR TWO LANE BRIDGES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017 — DATE
/S/ Matthew R. Rauch — STATE SIGNING AND MAR ...IEER
FHWA

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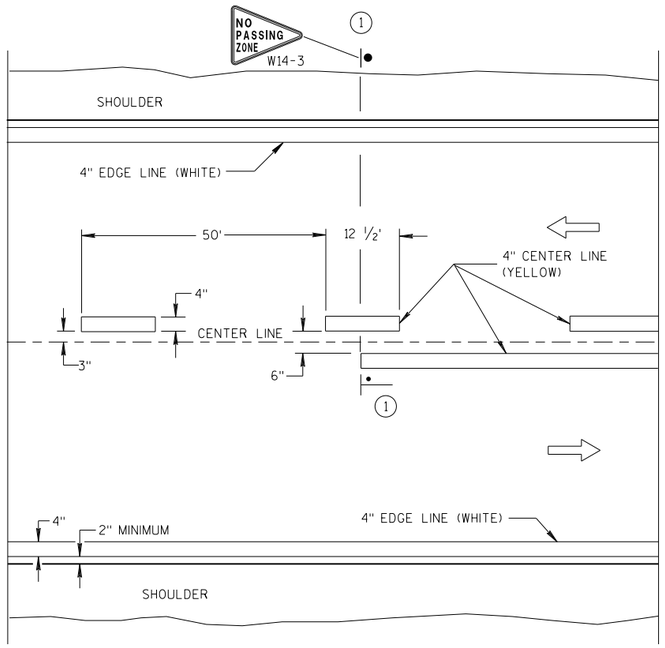
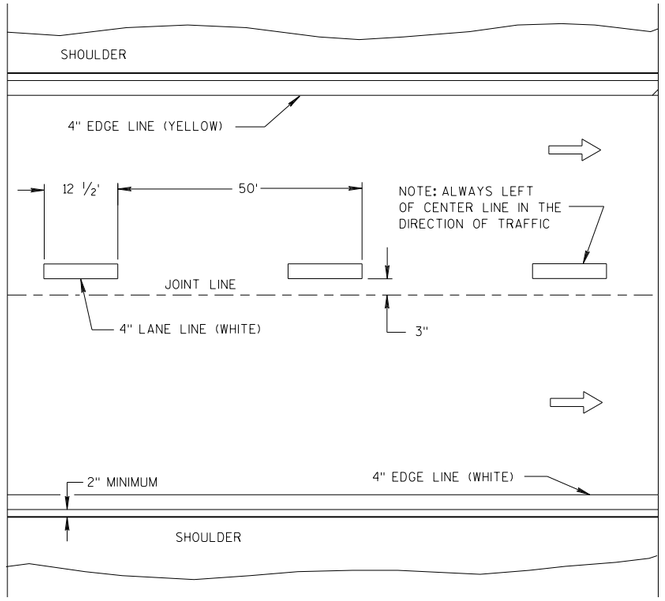
S.D.D. 15 C 6-9

6

S.D.D. 15 C 6-9



TWO WAY TRAFFIC



ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING

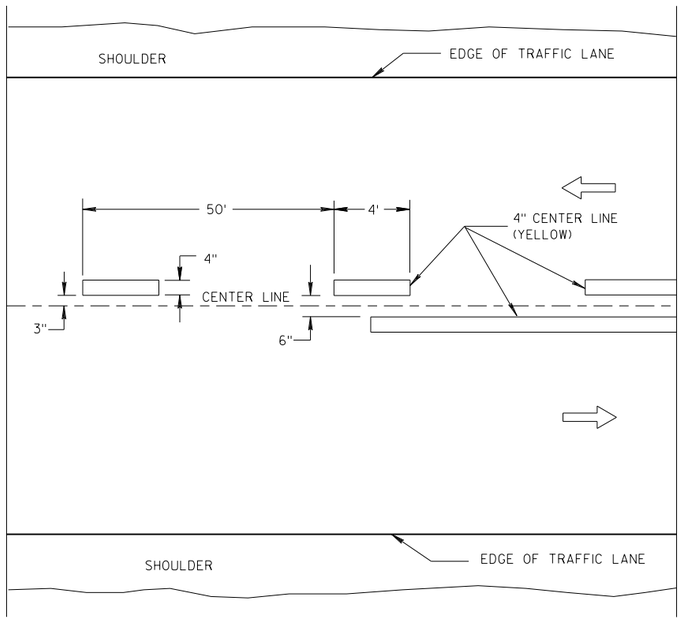
GENERAL NOTES

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

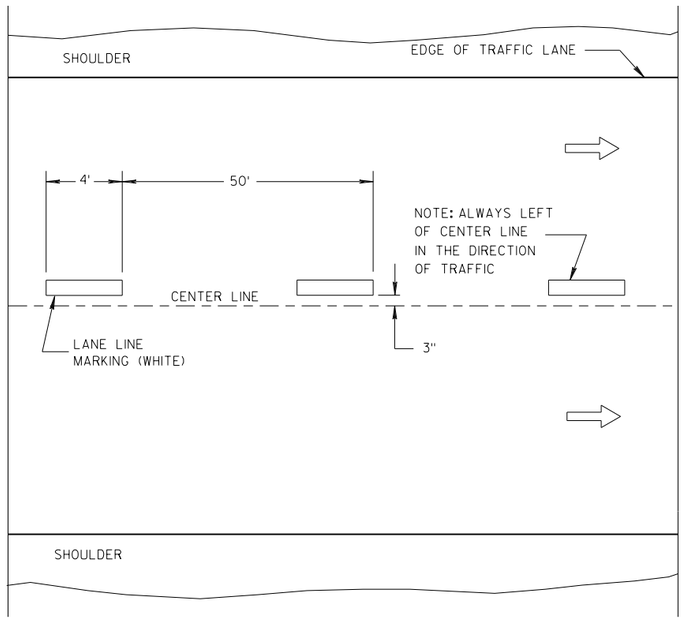
(1) LOCATE THE NO PASSING ZONE W14-3 SIGN WITHIN 50 FEET OF THE "T" MARKING.

NOTE

ARROW SYMBOL (⇨) SHOWS DIRECTION OF TRAVEL



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY PAVEMENT MARKING

LEGEND

"T" MARKING

POST MOUNTED SIGN

LONGITUDINAL MARKING (MAINLINE)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

7/2018 — DATE

/S/ Matthew R. Rauch — STATE SIGNING AND MARKING ENGINEER

FHWA

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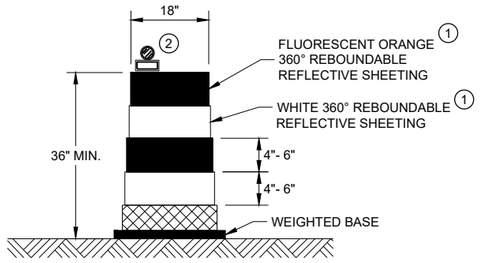
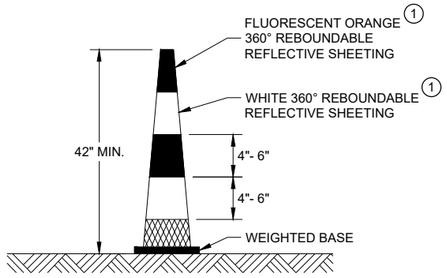
S.D.D. 15 C 8-19a

GENERAL NOTES

1. REFLECTIVE SHEETING SHALL FOLLOW THE REQUIREMENTS IN THE APPROVED PRODUCTS LISTING FOR SIGN SHEETING.
2. LOCATION OF WARNING LIGHTS WHEN SHOWN ON THE PLAN.

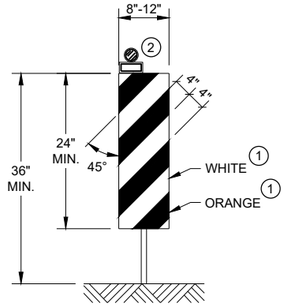


DRUM



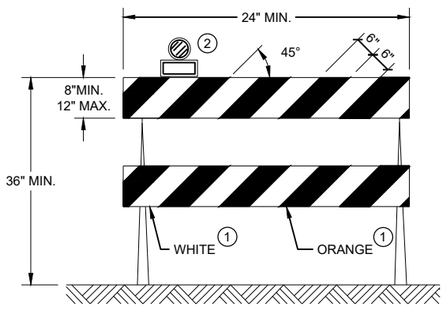
42" CONE

DO NOT USE IN TAPERS
½ SPACING OF DRUMS



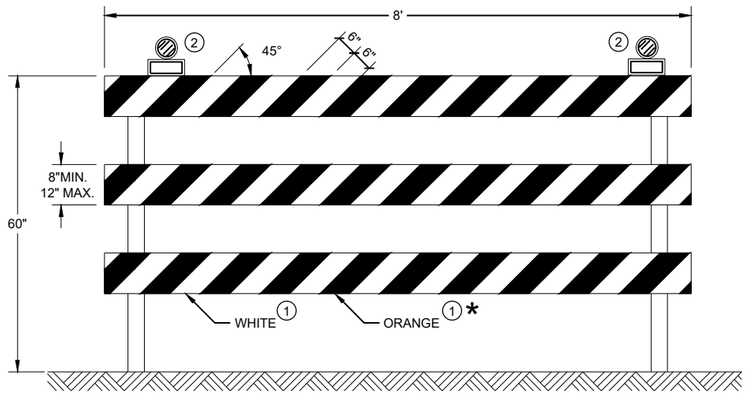
VERTICAL PANEL

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



TYPE II BARRICADE

FOR RAILS LESS THAN 36" LONG, 4" WIDE STRIPES
MAY BE USED. ALL STRIPES SHALL SLOPE DOWNWARD
TO THE TRAFFIC SIDE FOR CHANNELIZATION.



TYPE III BARRICADE

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

* IF USED FOR A PERMANENT APPLICATION USE RED SHEETING.

CHANNELIZING DEVICES
DRUMS, CONES, BARRICADES
AND VERTICAL PANELS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017 — DATE
/S/ Andrew Heidtke — WORK ZONE ENGINEER
FHWA

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SDD 15C11 - 07b

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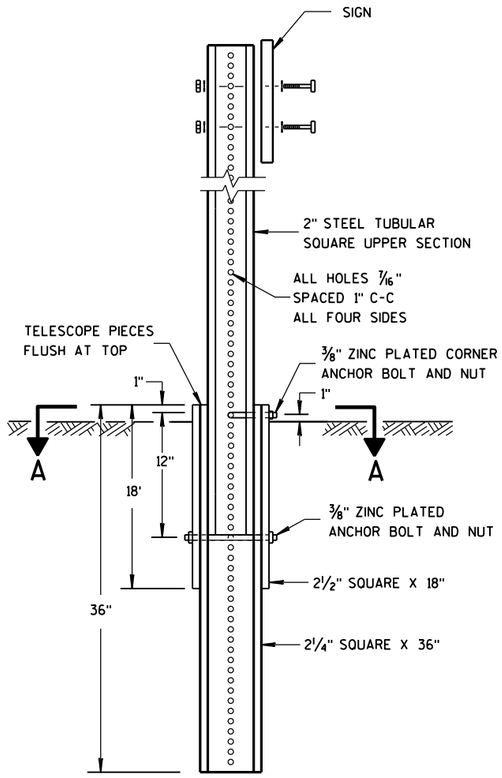
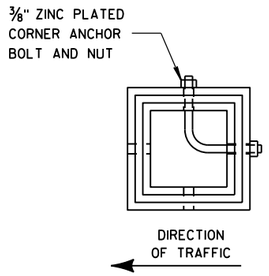
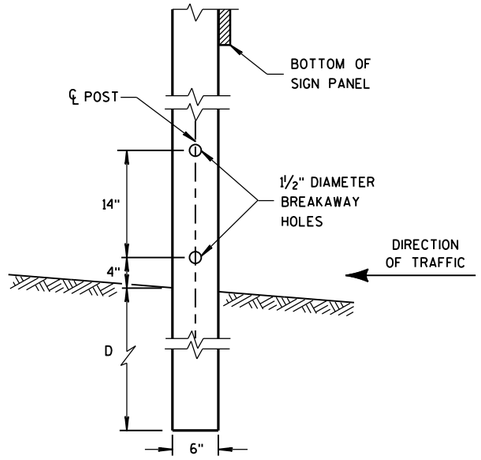
SDD 15C11 - 07b



DETAIL OF TUBULAR STEEL SIGN POST



SECTION A-A



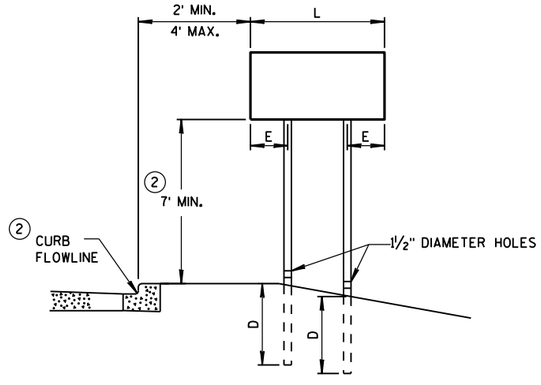
4"x6" WOOD POST MODIFICATION

GENERAL NOTES

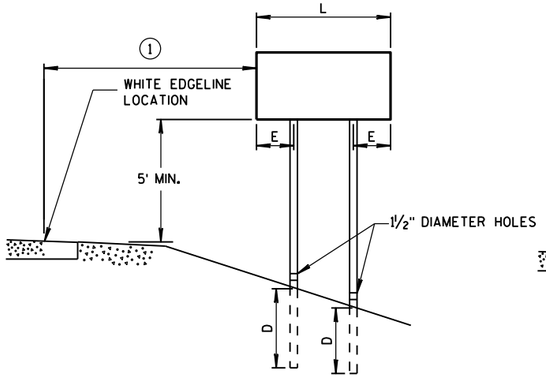
(1) 6 FEET FROM THE EDGE OF PAVEMENT (EDGE LINE LOCATION) UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER. LATERAL OFFSET SHOULD BE ADJUSTED TO AVOID THE DITCH FLOWLINE.

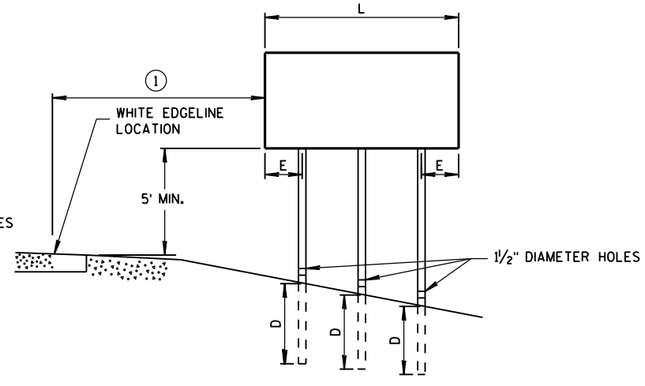
(2) THE EXISTENCE OF CURB AND GUTTER DOES NOT IN ITSELF MANDATE THE VERTICAL CLEARANCE ILLUSTRATED. THAT HEIGHT IS TYPICALLY MEASURED WHERE THERE IS SIDEWALK ADJACENT TO THE ROADWAY OR PARKING IS PERMITTED. IN THE ABSENCE OF SIDEWALK, VERTICAL CLEARANCE IS MEASURED FROM THE TOP OF THE CURB. IF NO SIDEWALK AND NO PARKING, VERTICAL CLEARANCE MAY BE REDUCED TO 5 FOOT MINIMUM. OFFSET OF SIGNS IS MEASURED FROM THE CURB FLOWLINE.

(3) FOR SIGNS REQUIRING 4 POSTS, SPACE INTERMEDIATE POSTS EVENLY.



URBAN AREA





RURAL AREA

POST MOUNTING DETAIL FOR TEMPORARY TRAFFIC CONTROL FIXED MESSAGE SIGNS

TUBULAR STEEL POSTS

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

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

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

WOOD POST EMBEDMENT DEPTH

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

4" X 6" WOOD POST

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

SEE NOTE (3)

TEMPORARY TRAFFIC CONTROL SIGN MOUNTING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

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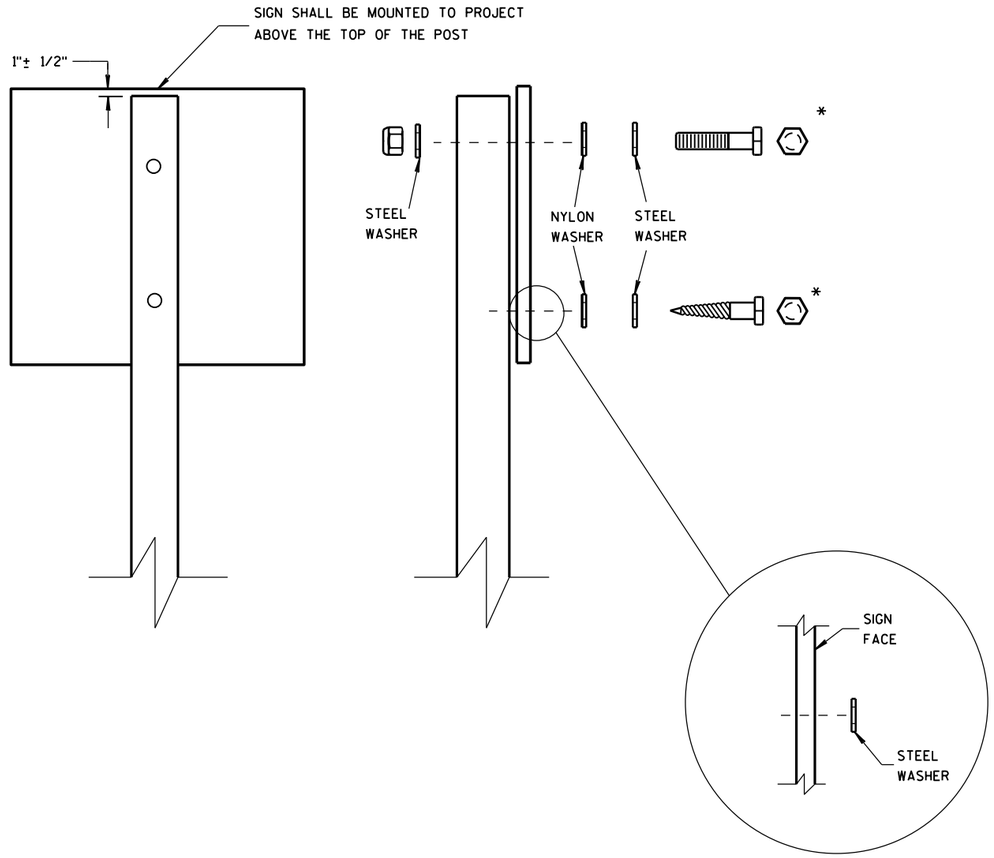
S.D.D. 15 D 38-2a



WASHER PLACEMENT WHEN SIGN HAS OTHER THAN TYPE H OR TYPE F FACE

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

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

6

6

S.D.D. 15 D 38-2b

S.D.D. 15 D 38-2b

ATTACHMENT OF SIGNS TO POSTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

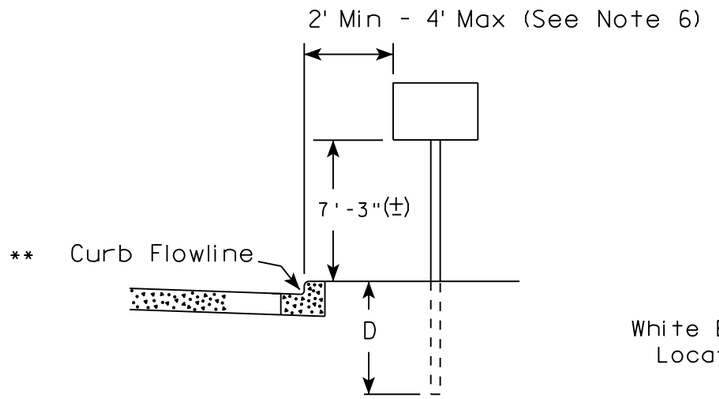
APPROVED

June 2017
DATE

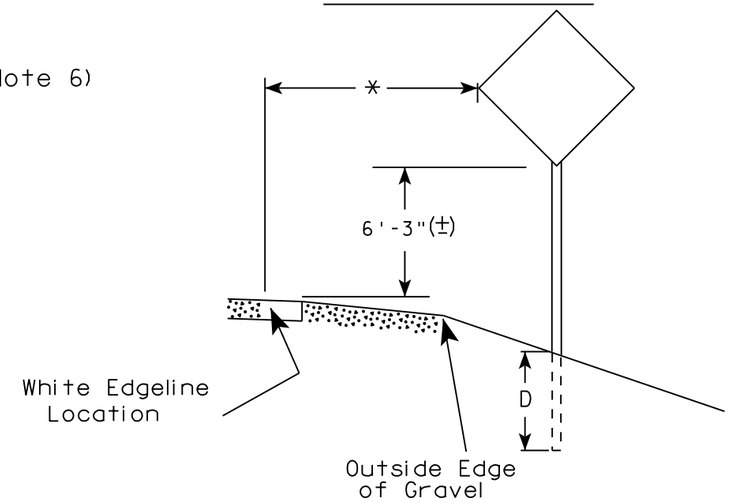
/S/ Andrew Heldtke
WORK ZONE ENG

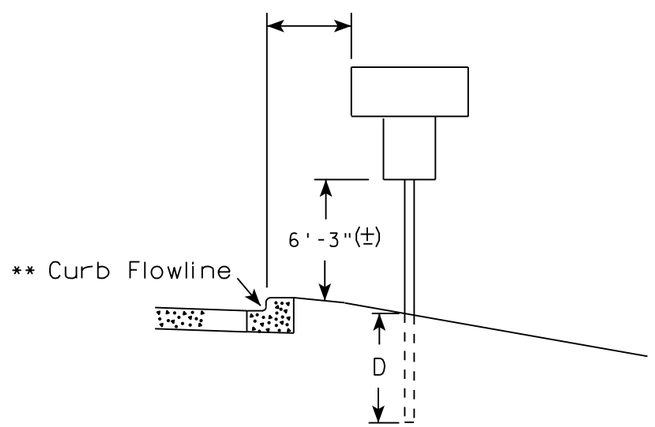
FHWA

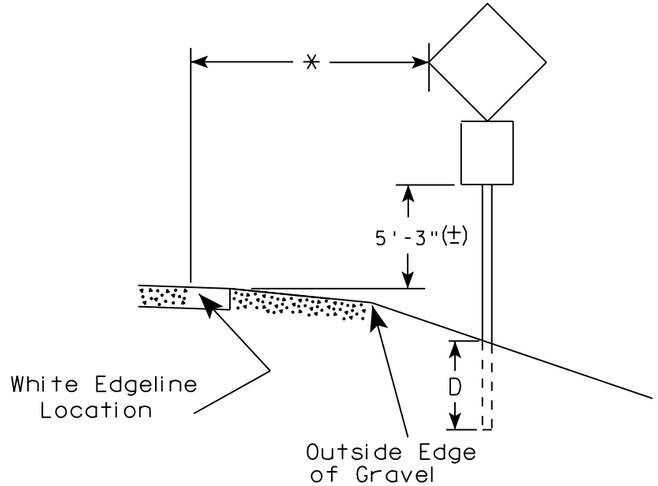
URBAN AREA



RURAL AREA (See Note 2)







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

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

POST EMBEDMENT DEPTH

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

GENERAL NOTES

1. Signs wider than 4 feet or 20 sq.ft or larger, shall be mounted on multiple posts. Refer to plate A4-4.
2. If signs are mounted on barrier wall, see A4-10 sign plate.
3. For expressways and freeways, mounting height is 7'- 3" (±) or 6'-3" (±) depending upon existence of a sub-sign.
4. J-Assemblies are considered to be one sign for mounting height.
5. Minimum mounting height for signs mounted on traffic signal poles is 5'- 3" (±).
6. Offset distance shall be consistent with existing signs or consistent throughout length of project.
7. The (±) tolerance for mounting height is 3 inches.
8. Folding signs shall be mounted at a height of 5'-3" (±) or as directd by the Engineer.
9. The Double Arrow sign (W12-1) shall be mounted at a height of 2'-3" (±). The Chevron sign (W1-8), Roundabout Chevron panel (R6-4B), Enhanced Reference Markers, Clearance Markers (W5-52), Mile Markers (D10 series), In Road Object Markers (W5-54) & End of Road Markers (W5-56) shall be mounted at a height of 4'-3" (±).

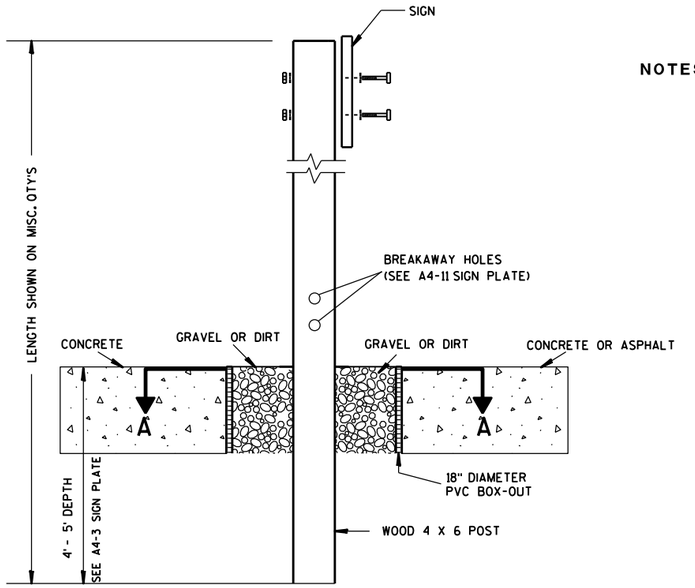
TYPICAL INSTALLATION OF PERMANENT TYPE II SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

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

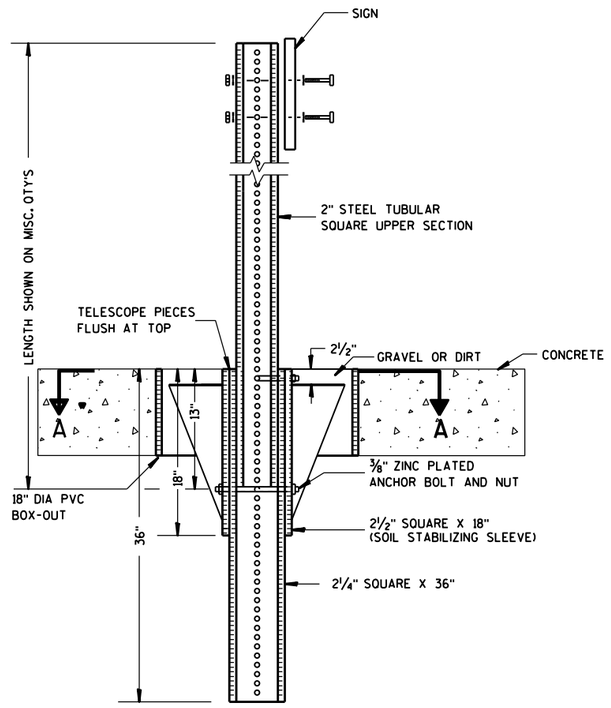
PROJECT NO:	HWY:	COUNTY:		SHEET NO: 56	E



ELEVATION VIEW

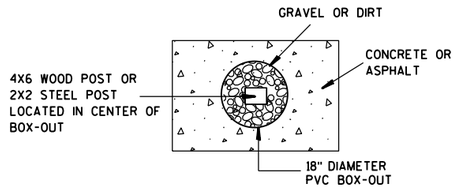
DETAIL OF WOOD 4 X 6 SIGN POST IN BOX-OUT

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



ELEVATION VIEW

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



PLAN VIEW

FOR NEW CONCRETE/ASPHALT INSTALLATIONS

SIGN POST BOX-OUTS A4-3B

WISCONSIN DEPT OF TRANSPORTATION

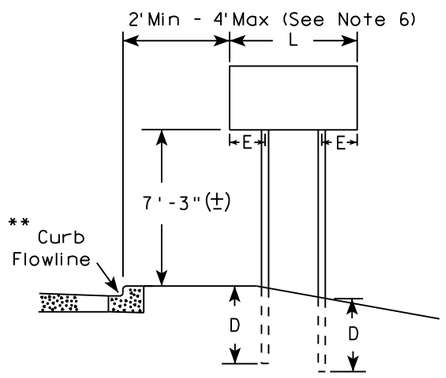
APPROVED Matthew R Rauch
for State Traffic Engineer

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

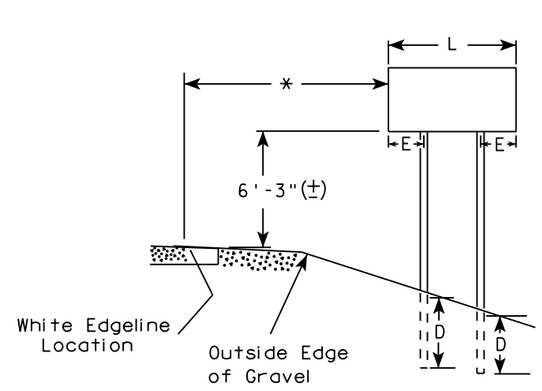
PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E

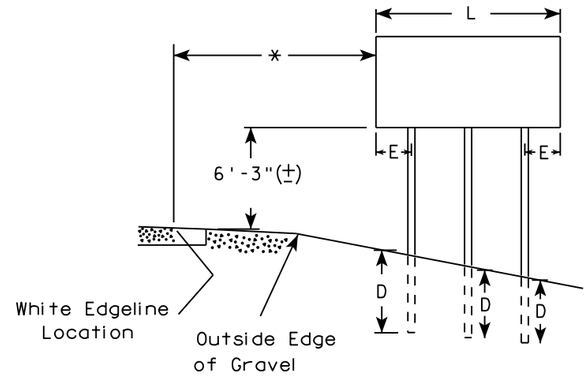
FILE NAME : C:\CAEFiles\Projects\tr_stdplate\A43B.DGN PLOT DATE : 27-JAN-2014 09:48 PLOT BY : mscsja PLOT NAME : PLOT SCALE : 13.659812:1.000000 WISDOT/CADDS SHEET 42

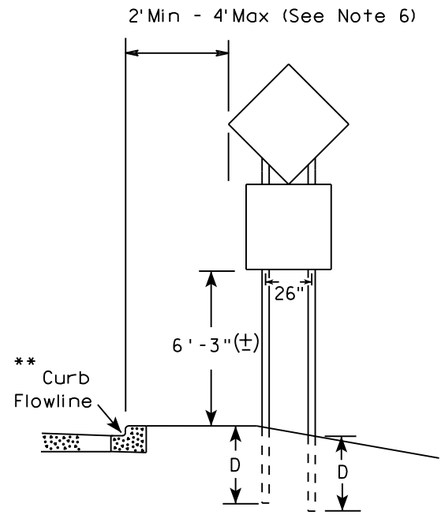
URBAN AREA



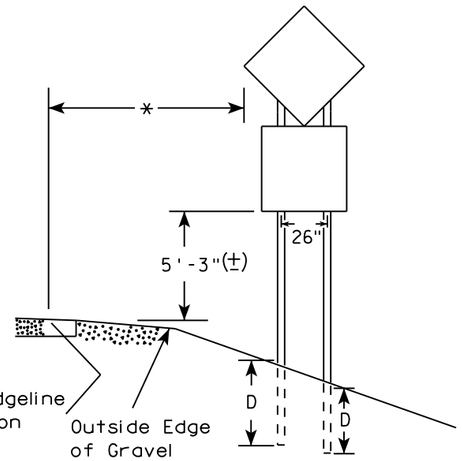
RURAL AREA (See Note 3)







48" DIAMOND WARNING SIGN



48" DIAMOND WARNING SIGN

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

***

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

GENERAL NOTES

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

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

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

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

POST EMBEDMENT DEPTH

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

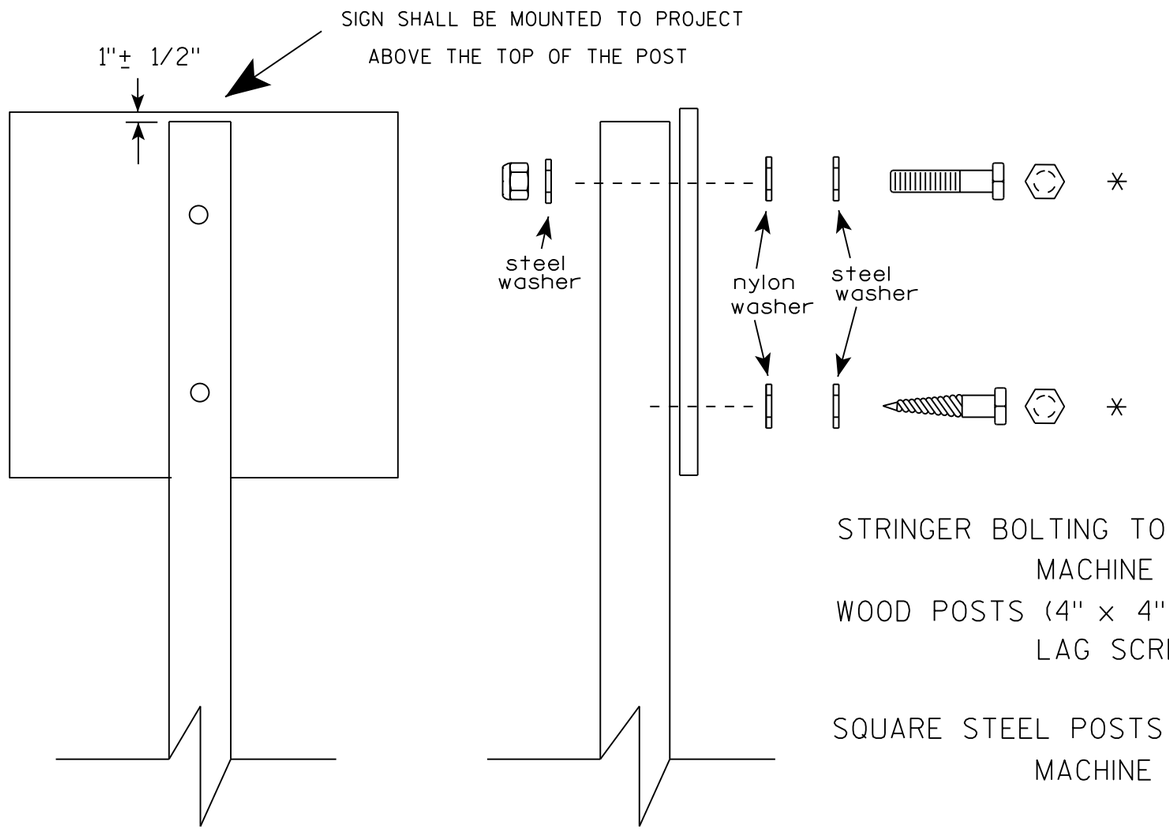
TYPICAL INSTALLATION OF TYPE II SIGNS ON MULTIPLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 8/21/17 PLATE NO. A4-4.15

PROJECT NO:	HWY:	COUNTY:		SHEET NO: 58	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.

STRINGER BOLTING TO ALUMINUM SIGNS (SEE SIGN PLATE A4-18)
MACHINE BOLTS - 5/16" X 1-3/4" Length w/ lock nuts
WOOD POSTS (4" x 4" or 4" x 6")
LAG SCREWS - 3/8" X 3" (NO STRINGERS ON BACK OF SIGN)
3/8" X 4" (STRINGERS ON BACK OF SIGN)
SQUARE STEEL POSTS (2" x 2")
MACHINE BOLTS - 3/8" X 3-1/4" Length w/ nuts (NO STRINGER ON BACK OF SIGN)
3/8" X 5" Length w/ nuts (STRINGERS ON BACK OF SIGN)
RIVETS - 9/32 " (6605-9-6) BULB-TITE, TRI-FOLD, ALUMINUM BODY/MANDREL
O.D. FLANGE .720-.765 INCH, GRIP RANGE .042-.375 INCH
WASHERS (ALL POSTS) -
1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL
1-1/4" O.D. X 3/8" I.D. X .080 NYLON

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

ATTACHMENT OF SIGNS TO POSTS

WISCONSIN DEPT OF TRANSPORTATION

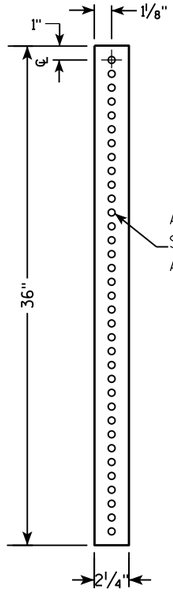
APPROVED Matthew R Rauch
For State Traffic Engineer

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

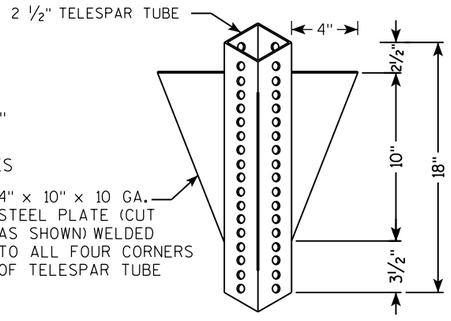
PROJECT NO: SHEET NO: E

TELESCOPIC TUBING ANCHORS
TWO PIECE SYSTEM

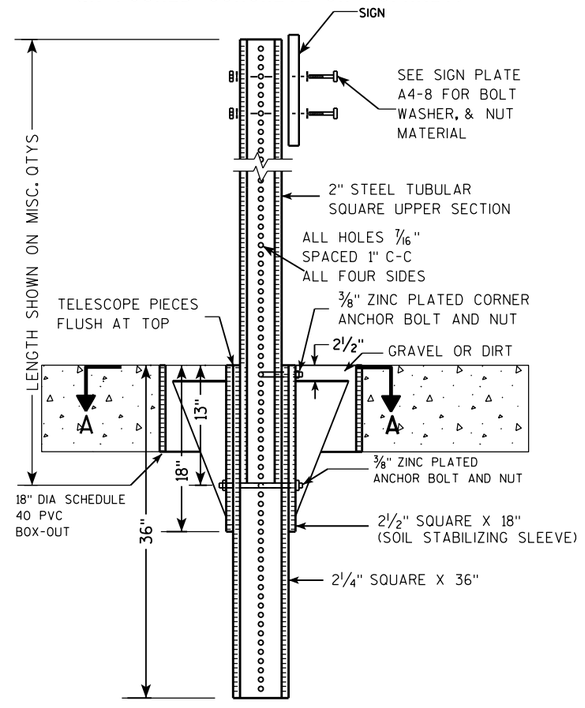
2 1/4 " SQUARE
12 GAUGE
PERFORATED
GALVANIZED FINISH



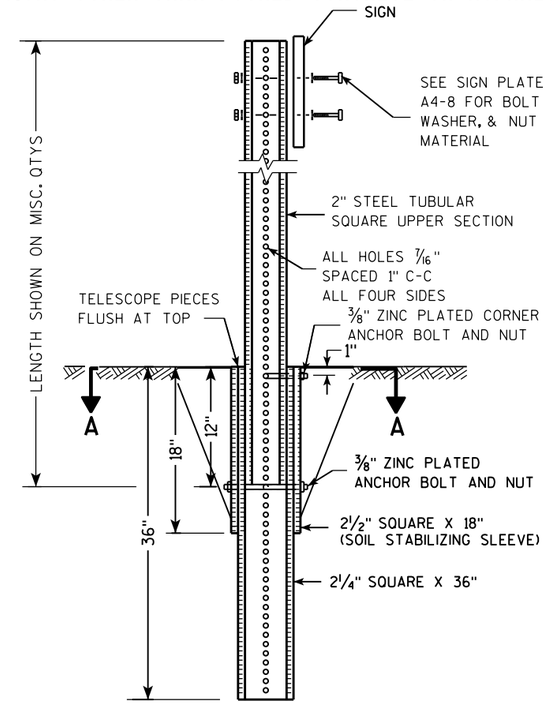
2 1/2 " SQUARE
12 GAUGE
OMNI-DIRECTIONAL
PERFORATED
SOIL STABILIZING SLEEVE
GALVANIZED FINISH

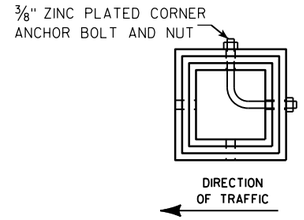


DETAIL OF TUBULAR STEEL SIGN POST
(IN POURED CONCRETE OR ASPHALT)



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





SECTION A-A

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

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

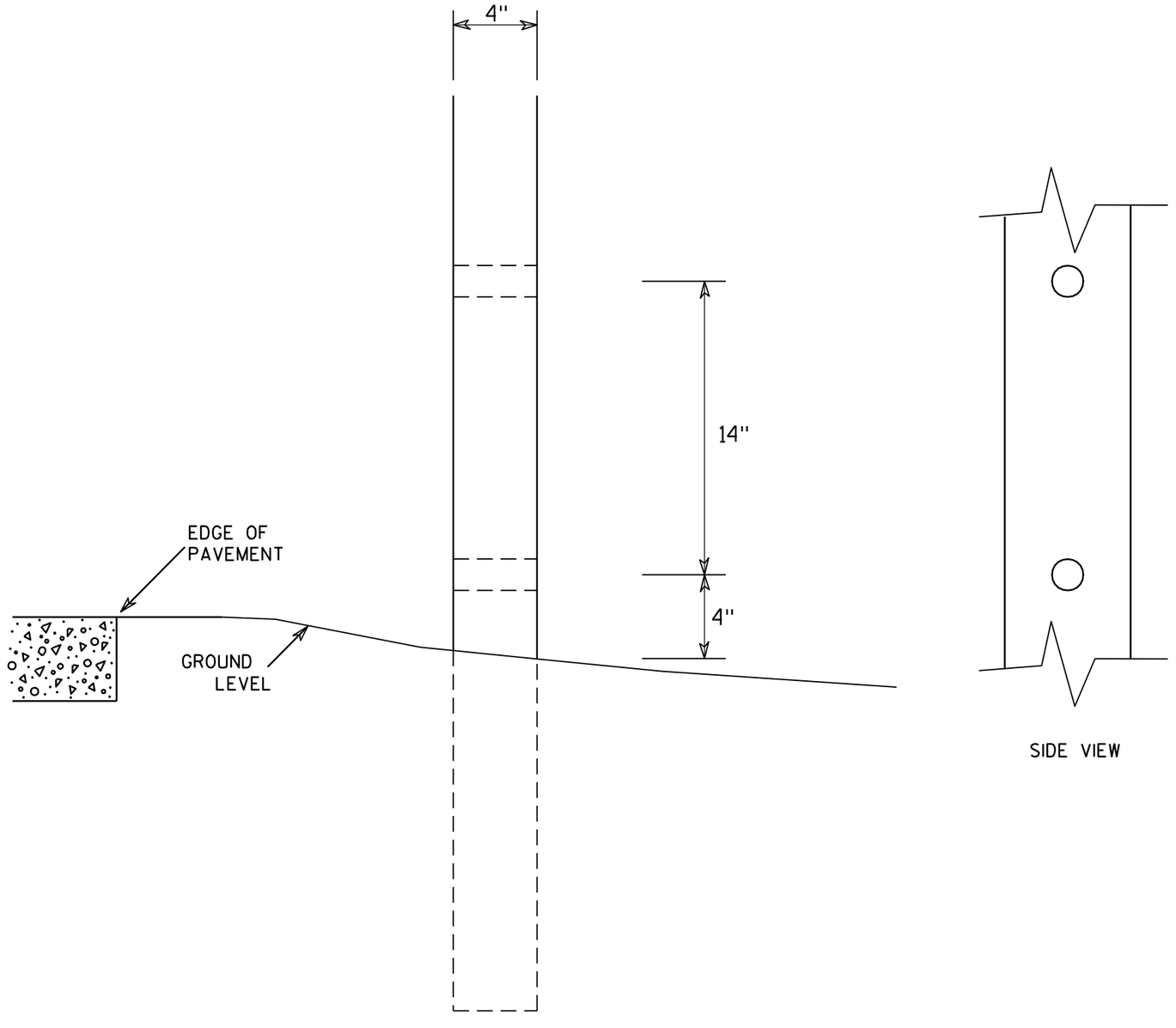
TUBULAR STEEL
SIGN POST
A4-9

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 2/05/15 PLATE 60 A4-9.9

PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E



SIDE VIEW

GENERAL NOTES

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

7

7

4 X 6 WOOD POST MODIFICATIONS

WISCONSIN DEPT OF TRANSPORTATION

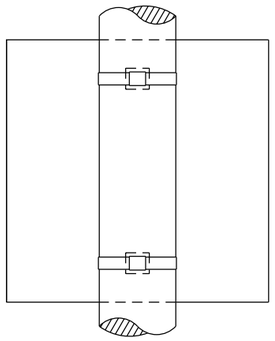
APPROVED Chester J Spang
for State Traffic Engineer

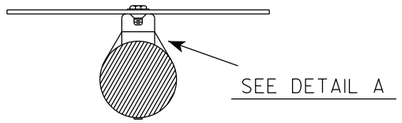
DATE 3/27/97 PLATE NO. A4-11.2

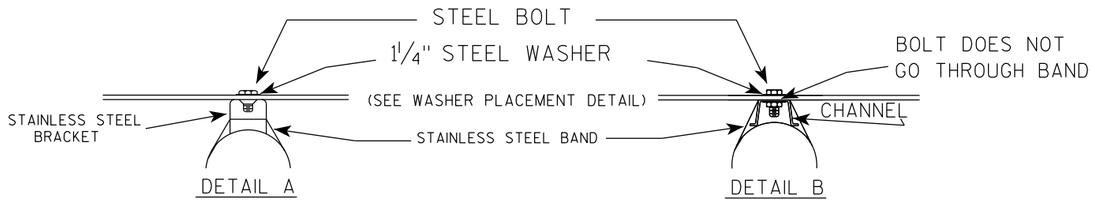
PROJECT NO:	HWY:	COUNTY:		SHEET NO: 61	E

BANDING

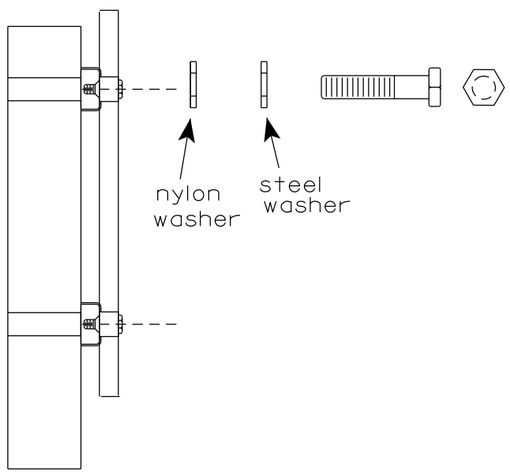
SINGLE SIGN







WASHER PLACEMENT

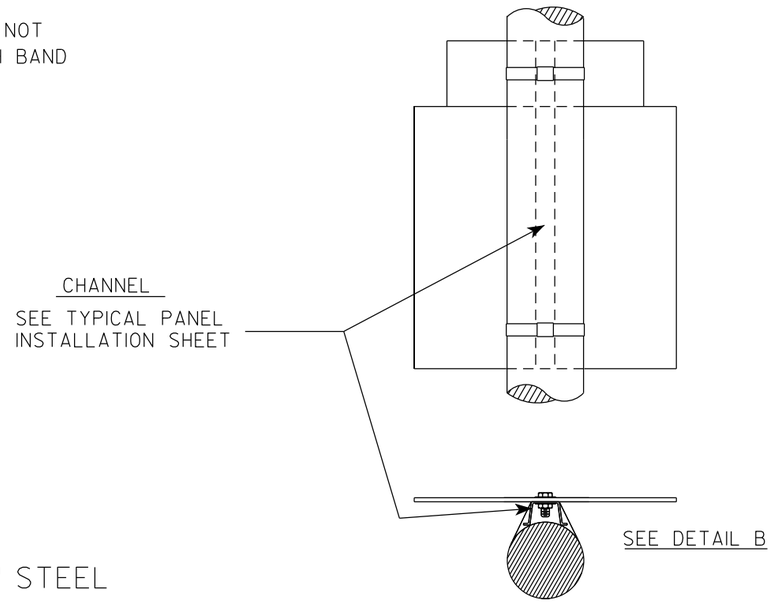


WASHERS (ALL POSTS) -
1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL
1-1/4" O.D. X 3/8" I.D. X .080 NYLON
FOR ALL TYPE H SIGNS

GENERAL NOTES

1. Any sign over 3 feet in width shall use the V-Block banding method. See A5-10 standard plate.
2. Signs 3 feet or greater in height shall have three bracket bands installed. Signs less than 3 feet in height shall have two bracket bands installed.
3. Banding and assembly bracket shall be stainless steel. All bands shall be ¾" in width and 0.025" thickness.
4. ALL SIGN MOUNTING BOLTS AND WASHERS SHALL BE EITHER:
   a. Hot dip or mechanically galvanized in accordance with ASTM Designation: A 153, Class D
   b. Electro-galvanized in accordance with ASTM designation: B 633, Type III, SC 3

"J" ASSEMBLY



STANDARD SIGN
SIGN BANDING DETAILS

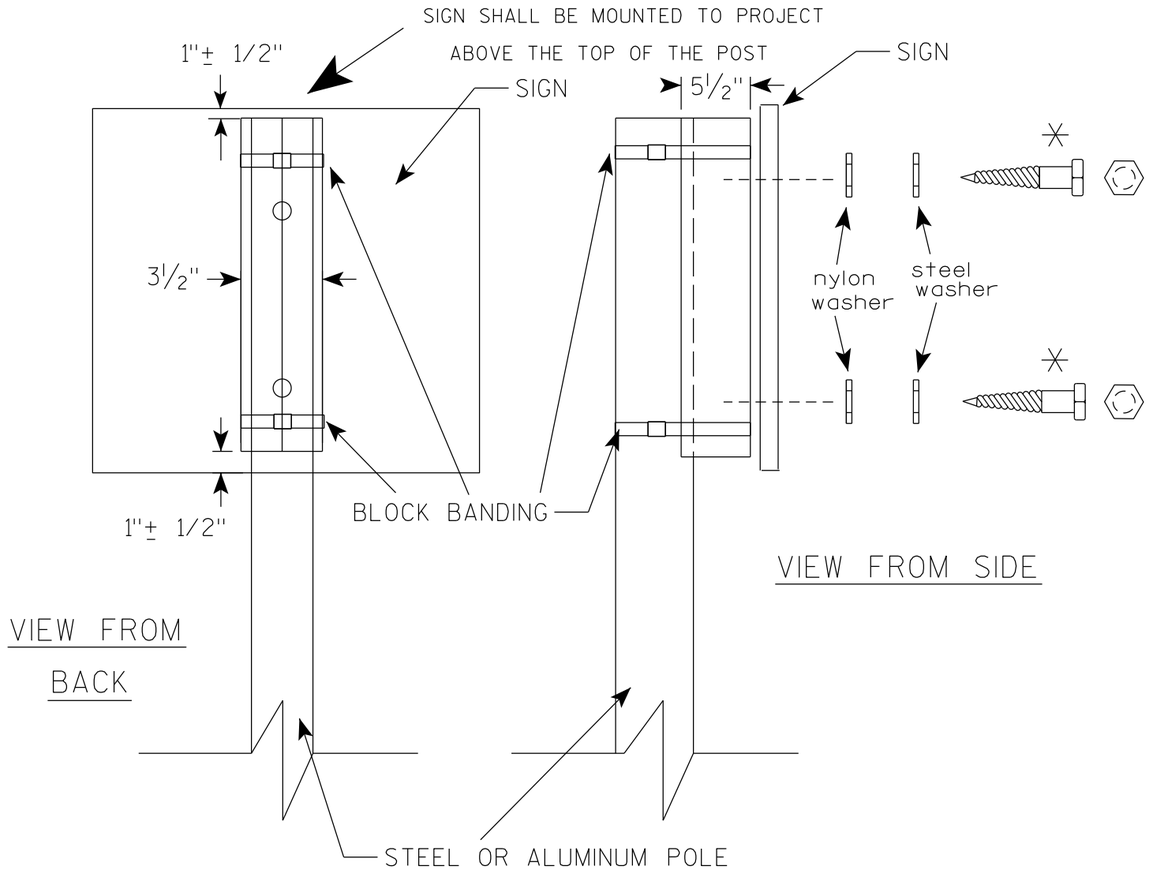
WISCONSIN DEPT OF TRANSPORTATION

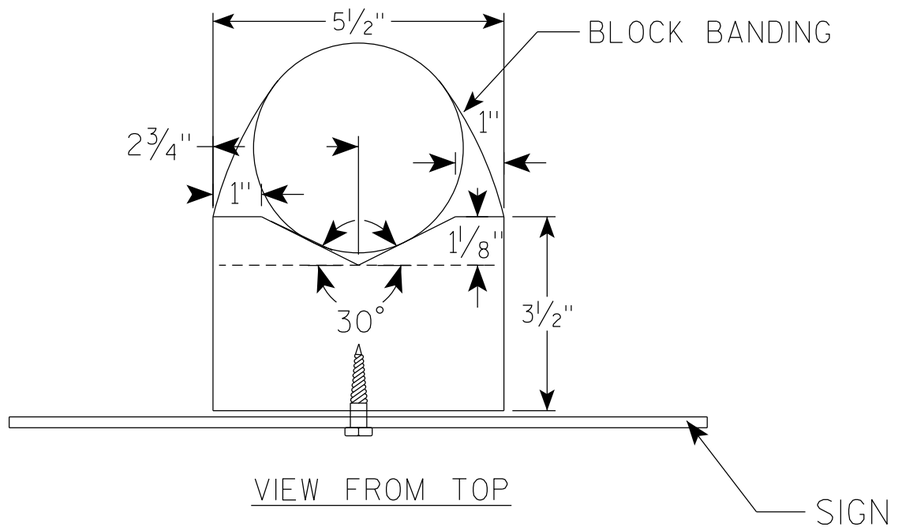
APPROVED Matthew R Rauch
for State Traffic Engineer

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

PROJECT NO:	HWY:	COUNTY:		SHEET NO: 62	E

FILE NAME : C:\CAEfiles\Projects\tr_stdplate\A59.dgn PLOT DATE : 10-JUN 2019 4:10 PLOT BY : mscj9h PLOT NAME : PLOT SCALE : $$.....plotscale.....$$





GENERAL NOTES

1. WOOD 4"X6" POST MATERIAL SHALL CONFORM TO 507.2.2 OF THE WisDOT STANDARD SPECIFICATIONS
2. BLOCK BANDING AND CLIPS SHALL BE STAINLESS STEEL, ¾" WIDTH AND 0.025" THICKNESS
3. SIGNS 3' OR GREATER IN HEIGHT SHALL UTILIZE 3 BLOCK BANDS. SIGNS UNDER 3' IN HEIGHT SHALL UTILIZE 2 BLOCK BANDS
4. ACTUAL NUMBER OF FASTENERS PER SIGN VARIES WITH THE SIGN AREA, BUT NORNALLY THERE ARE TWO. FOR SIGNS GREATER THAN 9 S.F. 3 FASTENERS SHALL BE USED.
5. ALL SIGN MOUNTING BOLTS AND WASHERS SHALL BE EITHER:
   a. Hot dip or mechanically galvanized in accordance with ASTM Designation: A 153, Class D
   b. Electro-galvanized in accordance with ASTM Designation : B 633, TYPE III, SC 3
6. ALL BOLTS SHALL HAVE HEXAGONAL HEADS.
7. STEEL WASHERS SHALL BE 1¼" O.D. X ⅜" I.D. X 1/16"
8. NYLON WASHERS SHALL BE 1¼" O.D. X ⅜" I.D. X .080 FOR TYPE H OR TYPE F FACE SIGN

✳ LAG BOLTS SHALL BE ⅜" X 2½"

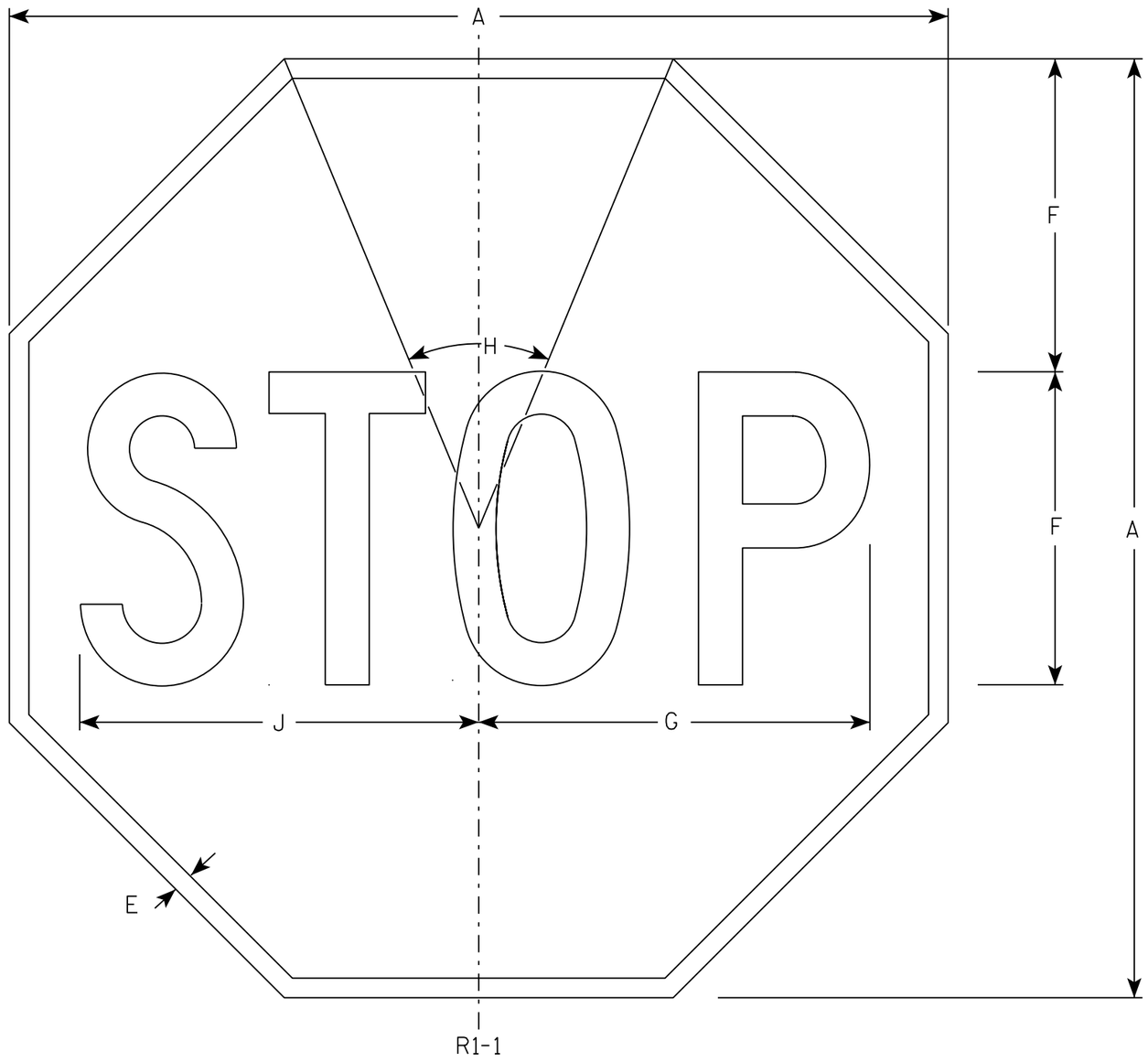
BLOCK BANDING DETAIL (V-BLOCK OPTION)

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
For State Traffic Engineer

DATE 6/10/19 PLATE NO. A5-10.2

PROJECT NO: | SHEET NO: 63 | E



NOTES

1. Sign is Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
   Background - Red
   Message - White
3. Message Series - C

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	30				5/8	10	12 1/2	45°		12 3/4																	5.18
2S	30				5/8	10	12 1/2	45°		12 3/4																	5.18
2M	36				3/4	12	15	45°		15 3/8																	7.46
3	36				3/4	12	15	45°		15 3/8																	7.46
4	48				1	16	20	45°		20 1/2																	13.25
5	48				1	16	20	45°		20 1/2																	13.25
6	18				3/8	6	7 3/4	45°		7 3/4																	1.86
7	12				1/4	4	5	45°		5 1/8																	0.78

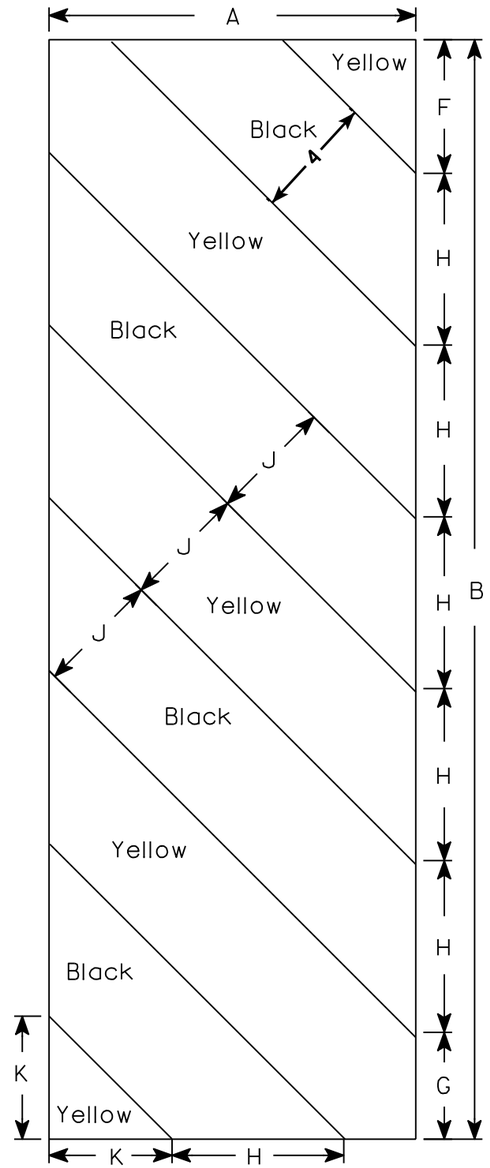
STANDARD SIGN
R1-1

WISCONSIN DEPT OF TRANSPORTATION

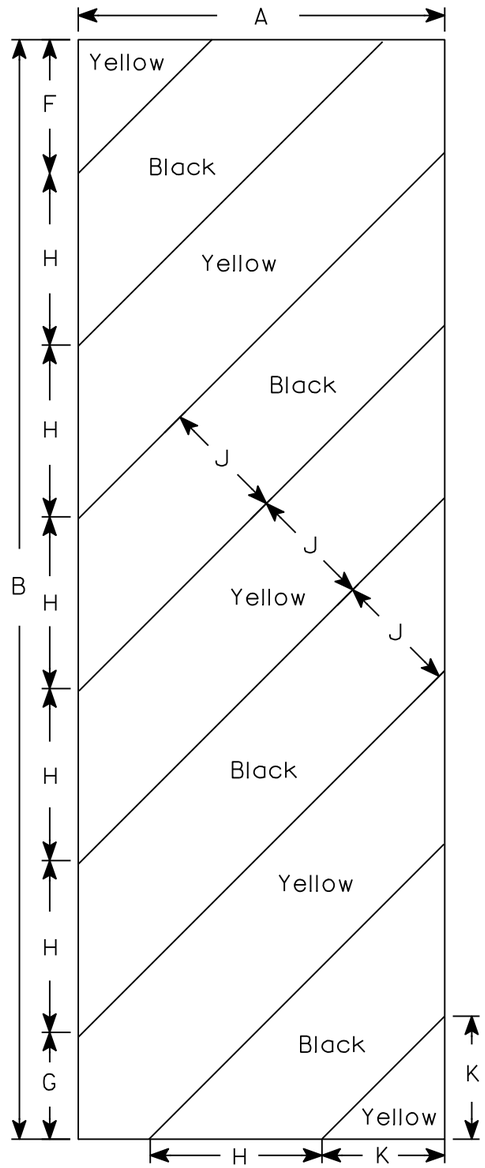
APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 11/12/15 PLATE NO. R1-1.13

PROJECT NO:	HWY:	COUNTY:		SHEET NO: 64	E



W5-52L



W5-52R

NOTES

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

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2S	12	36				4 3/8	3 1/2	5 5/8	45°	4	4																3.0
2M	12	36				4 3/8	3 1/2	5 5/8	45°	4	4																3.0
3	18	54				6	5 1/2	8 1/2	45°	6	6 9/16																6.75
4																											
5																											

STANDARD SIGN

W5-52L & W5-52R

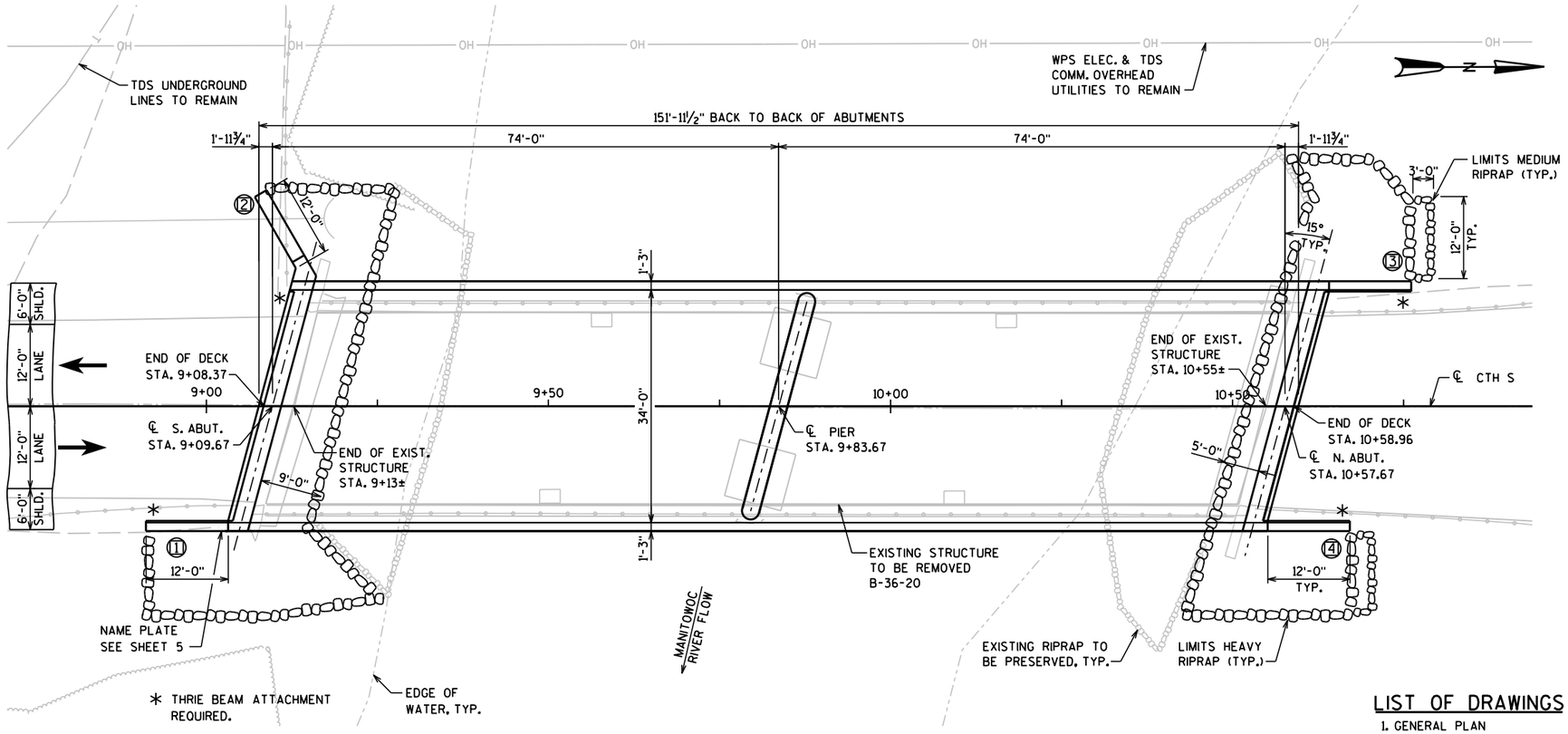
WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

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

PROJECT NO: | HWY: | COUNTY: | SHEET NO: 65 | E

STATE PROJECT NUMBER
4362-02-71



PLAN

TWO SPAN 36W" PRESTRESSED GIRDER BRIDGE

TRAFFIC DATA

ADT = 1,800 (2020)
2,000 (2040)
RDS = 50 M.P.H.

LIST OF DRAWINGS

DESIGN DATA

STRUCTURE IS DESIGNED FOR FUTURE WEARING SURFACE OF 20#/SQ. FT.

LIVE LOAD:

DESIGN LOADING — HL-93
INVENTORY RATING FACTOR — RF = 1.13
OPERATING RATING FACTOR — RF = 1.50
WISCONSIN STANDARD PERMIT
VEHICLE (Wis-SPV) — 250 KIPS

MATERIAL PROPERTIES:

CONCRETE MASONRY
SUPERSTRUCTURE — f'c = 4,000 P.S.I.
ALL OTHER — f'c = 3,500 P.S.I.
36W" PRESTRESSED
GIRDERS CONCRETE MASONRY — f'c = 8,000 P.S.I.
HIGH STRENGTH BAR STEEL
REINFORCEMENT, GRADE 60 — fy = 60,000 P.S.I.
PRESTRESSED STRANDS - 0.6" DIA.
WITH ULTIMATE TENSILE STRENGTH — fy = 270,000 P.S.I.

HYDRAULIC DATA

100 YEAR FREQUENCY

Q_{100} — 6,900 C.F.S.
VELOCITY — 8.18 F.P.S.
HIGH WATER — EL. 750.08 (100 YEAR)
WATERWAY AREA — 843 S.F.
DRAINAGE AREA — 400 SQ. MILES
OVERTOPPING FREQUENCY = N/A
SCOUR CRITICAL CODE = 5

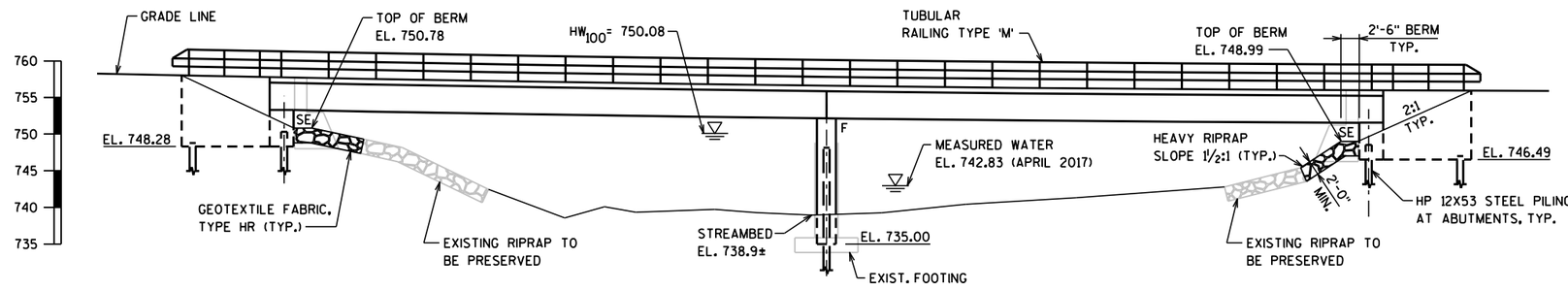
2 YEAR FREQUENCY

Q_2 — 2,117 C.F.S.
VELOCITY — 4.39 F.P.S.
HIGH WATER — EL. 746.06 (2 YEAR)

FOUNDATION DATA

ABUTMENTS AND PIER TO BE SUPPORTED ON HP 12X53 STEEL PILING. PILES SHALL BE DRIVEN TO A REQUIRED DRIVING RESISTANCE OF 220 TONS ** PER PILE.
ESTIMATED LENGTH = 75' AT SOUTH ABUTMENT.
ESTIMATED LENGTH = 70' AT PIER.
ESTIMATED LENGTH = 75' AT NORTH 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.



ELEVATION

(LOOKING WEST)

WISCONSIN
BRIAN R. EPLEY
E-42388
APPLETON
WI
PROFESSIONAL ENGINEER
8/20/2019

CONSULTANT CONTACT

BRIAN EPLEY
OMNNI ASSOCIATES, INC.
(920) 735-6900

BRIDGE OFFICE CONTACT

WILLIAM DREHER
(608) 266-8489

NO.	DATE	REVISION	BY

ORIGINAL PLANS PREPARED BY
OMNNI ASSOCIATES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
ACCEPTED William C. Dreher SDR 09/05/19
CHIEF STRUCTURES DESIGN ENGINEER — DATE

STRUCTURE B-36-233

CTH S OVER MANITOWOC RIVER

COUNTY	TOWN
MANITOWOC	CATO

DESIGN SPEC.	LOAD
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS	HL-93

DESIGNED BY	DESIGN CK'D.	DRAWN BY	PLANS CK'D.
BRE	KRO	BRE	KRO

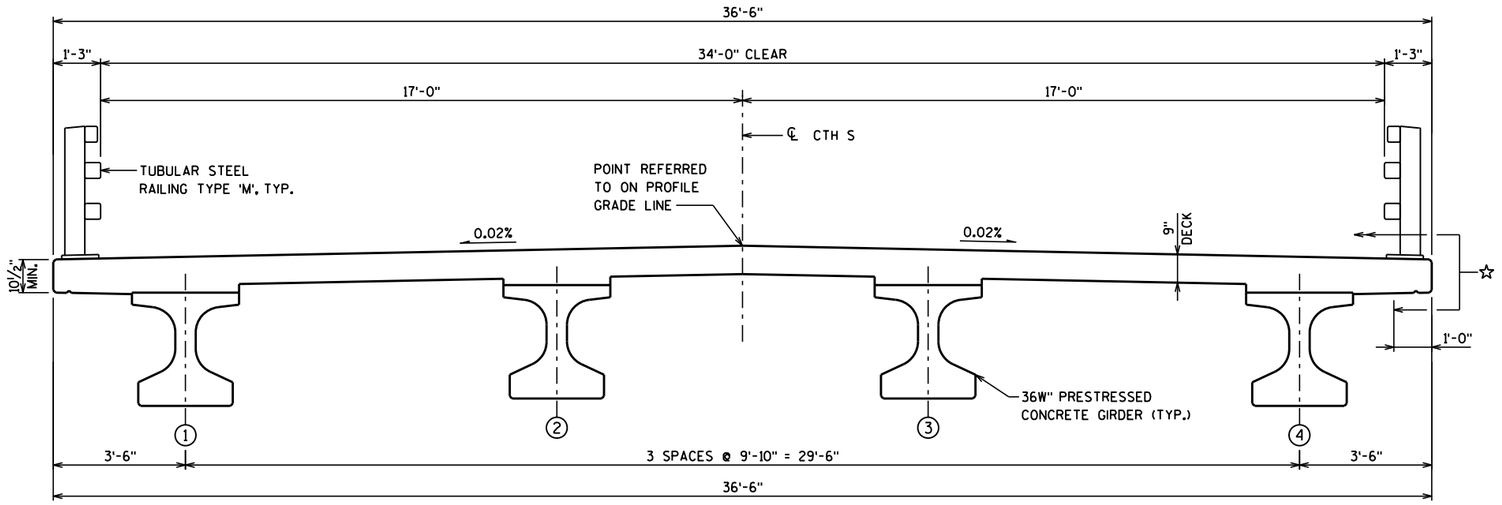
GENERAL PLAN

SHEET 1 OF 13

66

8

8



CROSS SECTION THRU ROADWAY

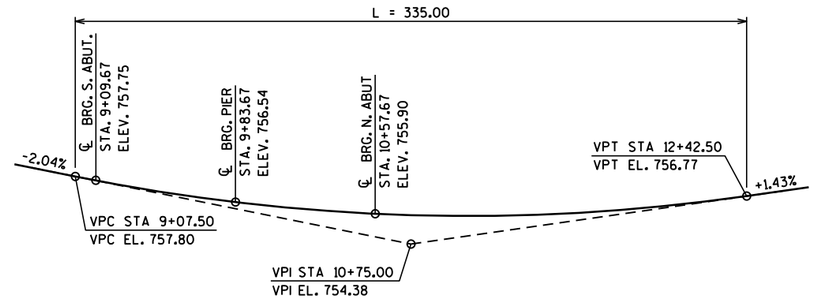
(LOOKING NORTH)

BENCH MARKS (NAVD 88)

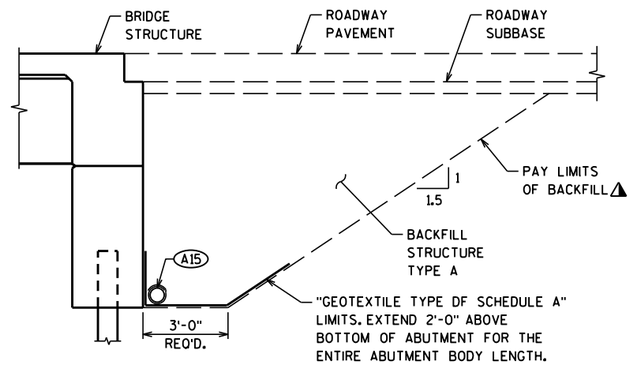
NO.	STATION	DESCRIPTION	ELEV.
BM4	8+43, 43' LT.	60D SPIKE IN PP*1922-24L10	764.17
BM5	15+07, 41' LT.	60D SPIKE IN PP*1922-23R25	757.45
BM6	13+12, 45' LT.	60D SPIKE IN PP*1922-23R1	751.56

TOTAL ESTIMATED QUANTITIES

ITEM NO.	BID ITEMS	UNIT	SUPER.	SOUTH ABUT.	NORTH ABUT.	PIER	TOTALS
203.0600.S	REMOVING OLD STRUCTURE OVER WATERWAY WITH MINIMAL DEBRIS STA 9+84	LS	-----	-----	-----	-----	1
206.1000	EXCAVATION FOR STRUCTURES BRIDGES B-36-233	LS	-----	-----	-----	-----	1
206.1050.S	UNDERWATER FOUNDATION INSPECTION B-36-233	EACH	-----	-----	-----	1	1
206.5000	COFFERDAMS B-36-233	LS	-----	-----	-----	1	1
210.1500	BACKFILL STRUCTURE TYPE A	TON	-----	190	180	-----	370
502.0100	CONCRETE MASONRY BRIDGES	CY	215	44	42	62	363
502.3200	PROTECTIVE SURFACE TREATMENT	SY	690	-----	-----	-----	690
503.0137	PRESTRESSED GIRDER TYPE I36W-INCH	LF	595	-----	-----	-----	595
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	-----	2,290	2,000	2,940	7,230
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	40,560	1,760	1,720	-----	44,040
506.2605	BEARING PADS ELASTOMERIC NON-LAMINATED	EACH	16	-----	-----	-----	16
506.4000	STEEL DIAPHRAGMS B-36-233	EACH	6	-----	-----	-----	6
513.4061	RAILING TUBULAR TYPE M	LF	342	-----	-----	-----	342
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	-----	12	11	-----	23
550.1120	PILING STEEL HP 12-INCH X 53 LB	LF	-----	525	525	700	1,750
606.0200	RIPRAP MEDIUM	CY	-----	-----	5	-----	5
606.0300	RIPRAP HEAVY	CY	-----	80	60	-----	140
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	LF	-----	70	60	-----	130
645.0111	GEOTEXTILE TYPE DF SCHEDULE A	SY	-----	45	45	-----	90
645.0120	GEOTEXTILE TYPE HR	SY	-----	115	100	-----	215
	NON-BID ITEMS						
	FILLER	SIZE	——	——	——	——	½"&¾"



PROFILE GRADE LINE



TYPICAL SECTION THRU ABUTMENT

STATE PROJECT NUMBER

4362-02-71

GENERAL NOTES

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

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

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

ELASTOMERIC BEARING PADS NEED NOT BE INDIVIDUALLY MOLDED PROVIDED THE CUT EDGES ARE SMOOTH AND TRUE.

THE EXISTING GROUND LINE SHALL BE USED AS THE UPPER LIMITS OF EXCAVATION.

THIS BRIDGE WILL REPLACE THE EXISTING B-36-20 TWO SPAN CONCRETE GIRDER BRIDGE SUPPORTED ON SILL ABUTMENTS AND A MULTICOLUMN PIER. THE STRUCTURE WAS BUILT IN 1962.

THE HAUNCH CONCRETE QUANTITY IS BASED ON AN AVERAGE HAUNCH SHOWN ON THE PRESTRESSED GIRDER DETAIL SHEET, WHICH IS THE MAXIMUM HAUNCH QUANTITY FOR WHICH THE CONTRACTOR WILL BE PAID.

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

☆ PROTECTIVE SURFACE TREATMENT SHALL BE APPLIED TO THE ENTIRE TOP, SIDES, EXTERIOR 1'-0" OF THE UNDERSIDE OF THE DECK, TOP AND EXTERIOR EXPOSED FACE OF WINGS, AND THE END 1'-0" OF THE FRONT FACE OF ABUTMENT.

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

(A15) PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN, SEE SHEET 7 FOR DETAILS.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-36-233

DRAWN BY BRE | PLANS CK'D. KRO

CROSS SECTION & QUANTITIES

SHEET 2 OF 13

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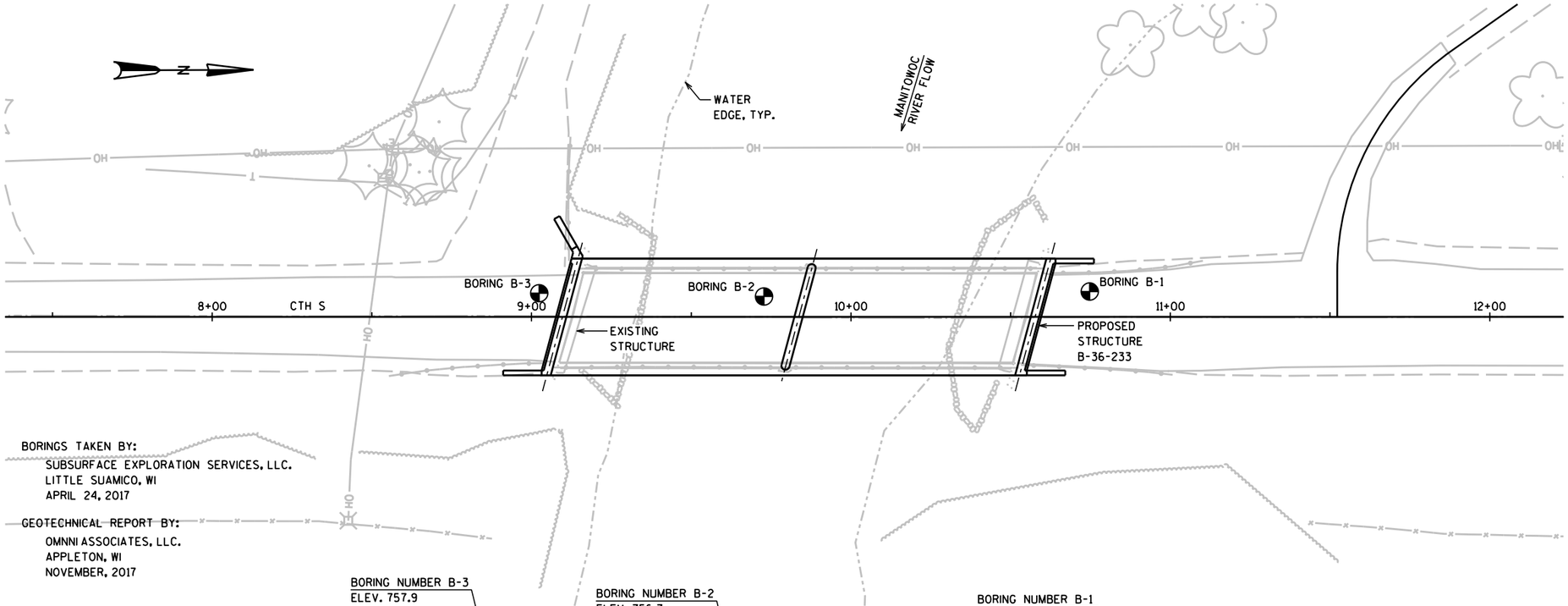
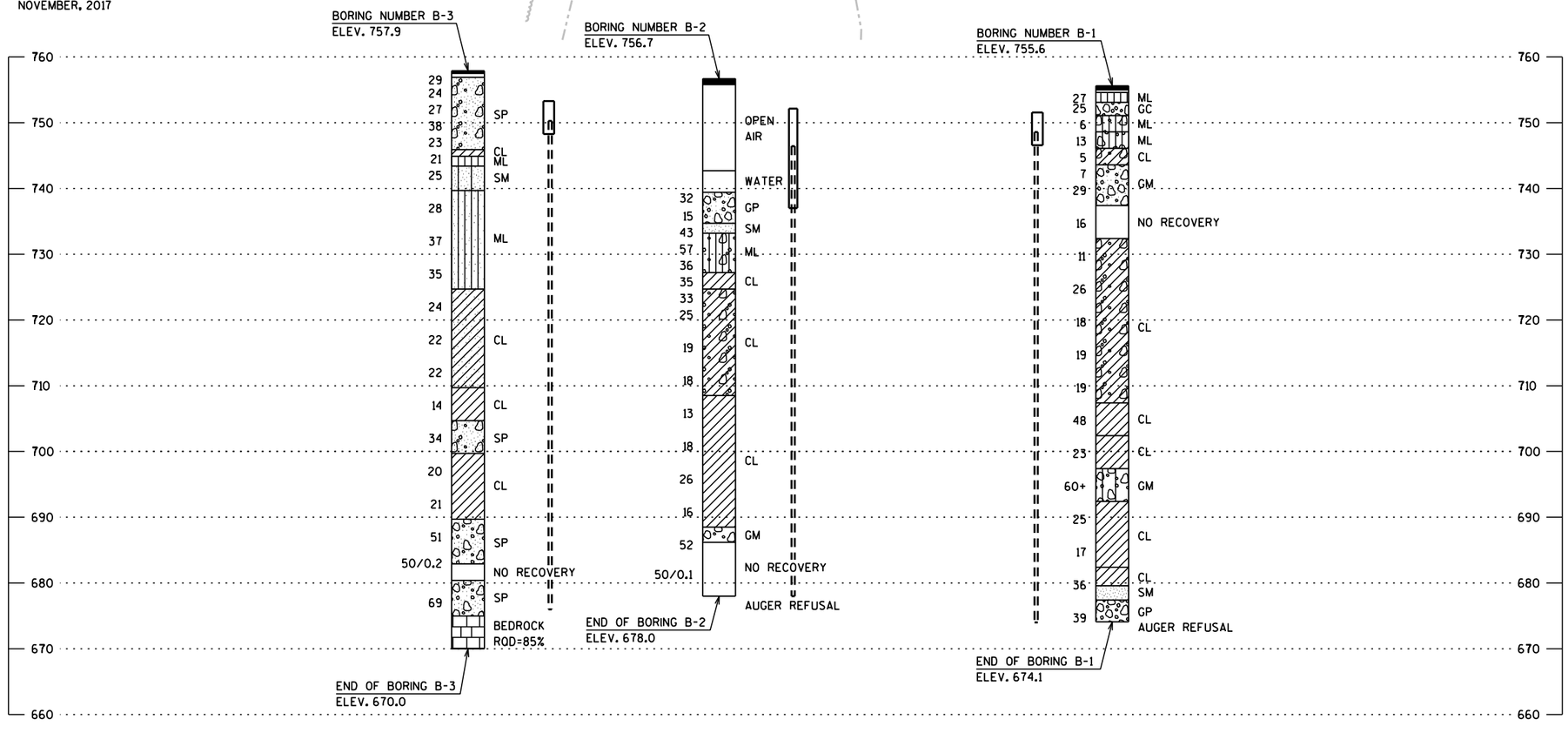


BORINGS TAKEN BY:
SUBSURFACE EXPLORATION SERVICES, LLC.
LITTLE SUAMICO, WI
APRIL 24, 2017

GEOTECHNICAL REPORT BY:
OMNNI ASSOCIATES, LLC.
APPLETON, WI
NOVEMBER, 2017



STATE PROJECT NUMBER

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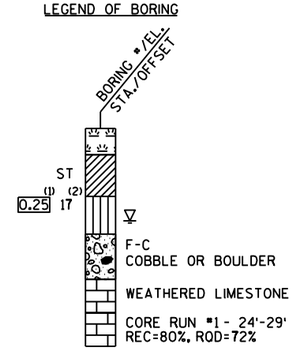
MATERIAL SYMBOLS

ASPHALT	TOPSOIL	PEAT
CONCRETE	FILL	GRAVEL
SAND	CLAY	SILT
BOULDERS OR COBBLES	LIMESTONE	BEDROCK (UNKNOWN)
SHALE	SANDSTONE	IGNEOUS/ META

LEGEND OF BORING



(1) UNCONFINED STRENGTH, AS DETERMINED BY A POCKET PENETROMETER (TSF)

(2) UNLESS OTHERWISE, SPECIFIED THE SPT 'N' VALUE IS BASED ON AASHTO T-206, STANDARD PENETRATION TEST. THE SPT 'N' VALUE PRESENTED HAS NOT BEEN CORRECTED FOR OVERBURDEN PRESSURE OR HAMMER EFFICIENCY.

GROUND WATER ELEVATION

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

ABBREVIATIONS

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

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

BORINGS WERE COMPLETED AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING TO OBTAIN INFORMATION CONCERNING THE CHARACTER OF SUBSURFACE MATERIALS FOUND AT THE SITE. BECAUSE THE INVESTIGATED DEPTHS ARE LIMITED AND THE AREA OF THE BORINGS IS VERY SMALL IN RELATION TO THE ENTIRE SITE, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT SIMILAR SUBSURFACE CONDITIONS BELOW, BETWEEN, OR BEYOND THESE BORINGS. VARIATIONS IN SOIL CONDITIONS SHOULD BE EXPECTED AND FLUCTUATIONS IN GROUNDWATER LEVELS MAY OCCUR.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-36-233

DRAWN BY BRE | PLANS CK'D. KRO

SUBSURFACE EXPLORATION

SHEET 3 OF 13

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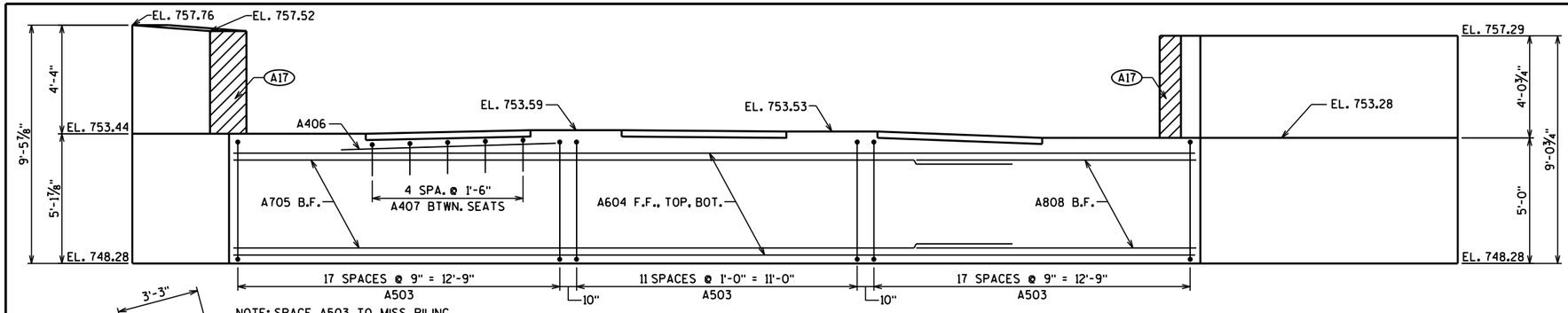
STATE PROJECT NUMBER
4362-02-71

LEGEND

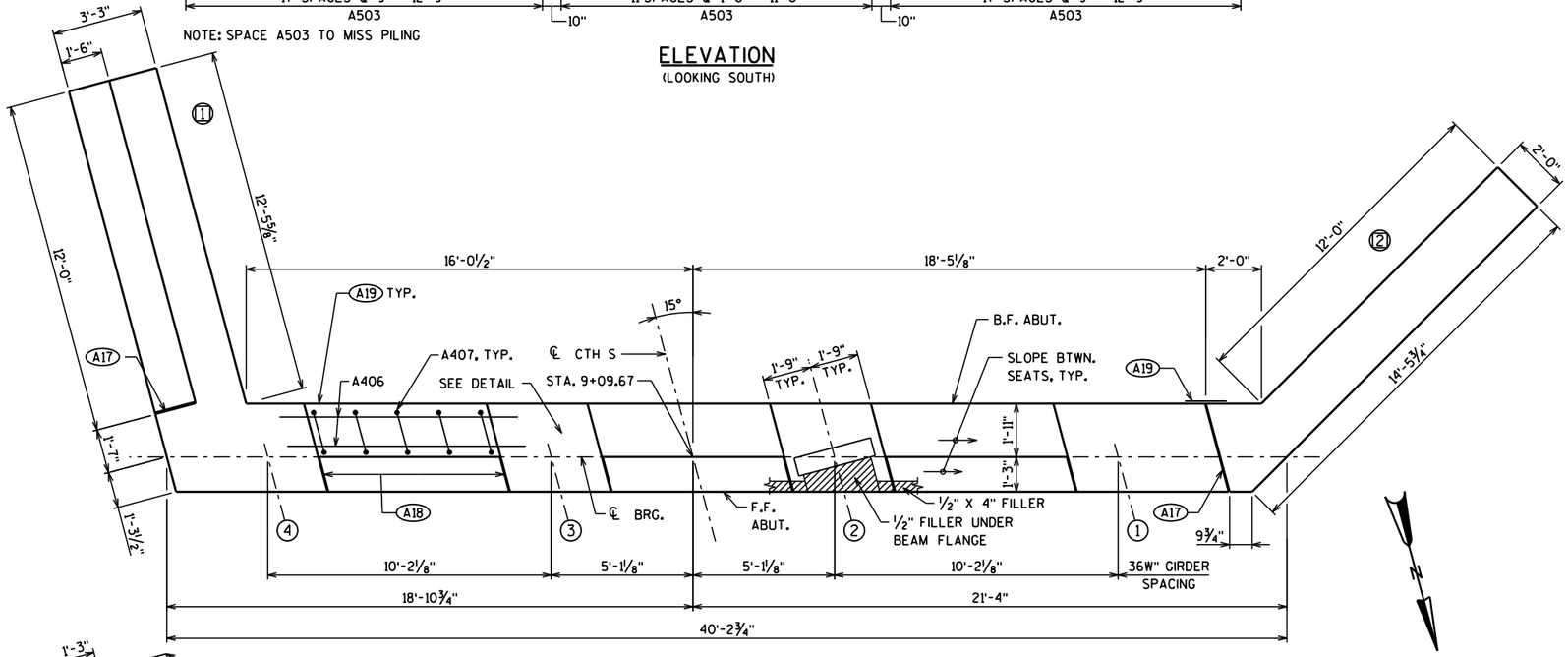
- (A07) SOUTH ABUTMENT TO BE SUPPORTED ON HP 12 X 53 STEEL PILING. ESTIMATED 75' LONG WITH A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE.
- (A15) PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN, SEE SHEET 7 FOR DETAILS.
- (A17) ½" FILLER INCLUDED IN WING LENGTH, SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF ½" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONCRETE).
- (A18) ¾" CORK FILLER UP VERT. BEAM SEAT FACES THAT RUN PARALLEL WITH GIRDER.
- (A19) 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- (X) DENOTES WING NUMBER
- ◪ STEEL TROWEL TOP SURFACE OF ABUTMENT. PLACE MULTIPLE LAYERS OF POLYETHYLENE SHEETS OVER ENTIRE ABUTMENT TOP BEFORE PLACING BEARING PADS AND/OR SUPERSTRUCTURE. TOTAL THICKNESS OF SHEETS SHALL BE AT LEAST 0.03".

SEE SHEET 5 FOR WINGWALL DETAILS, BILL OF BARS, BAR BENDING DIAGRAMS. SEE SHEET 7 FOR PILE SPLICE DETAILS.

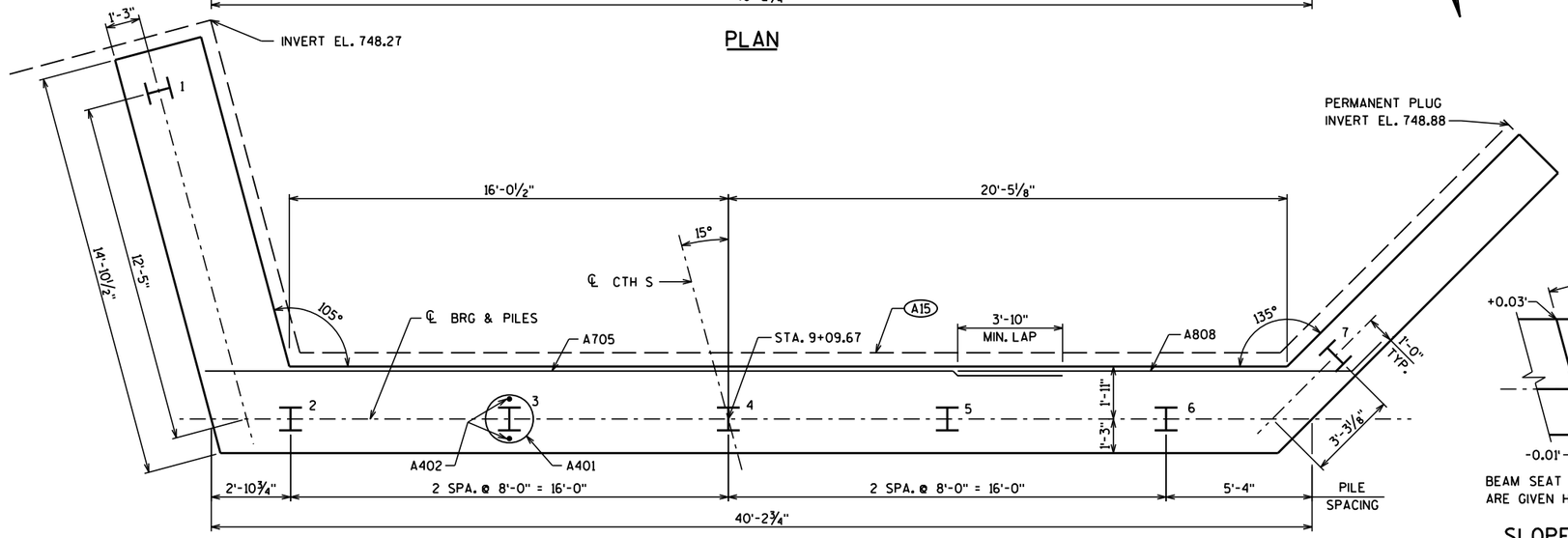


NOTE: SPACE A503 TO MISS PILING

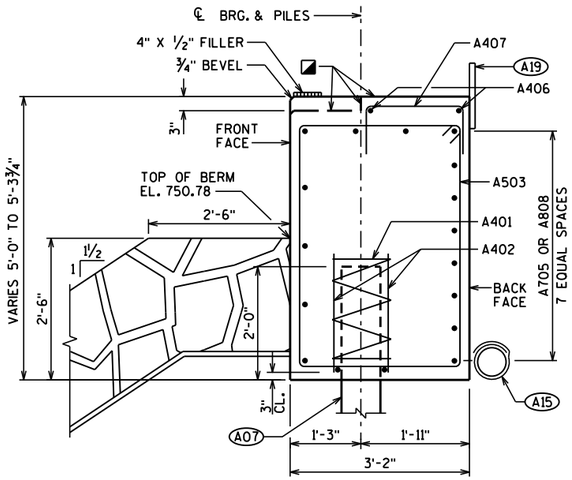
ELEVATION
(LOOKING SOUTH)



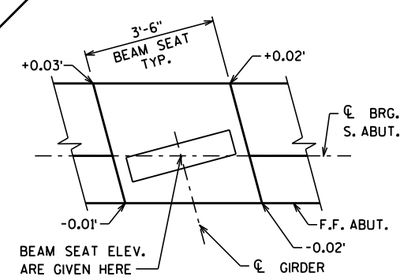
PLAN



PILE PLAN



SECTION THRU BODY
HORZ. BARS NOT OTHERWISE IDENTIFIED ARE A604 BARS



SLOPED BEAM SEAT DETAIL

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-36-233

DRAWN BY NRT | PLANS CK'D. BRE

SOUTH ABUTMENT

SHEET 4 OF 13

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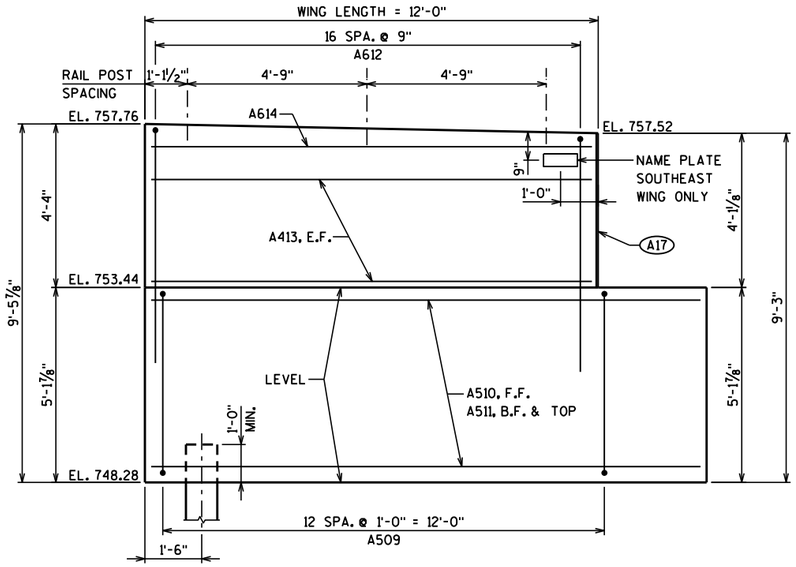
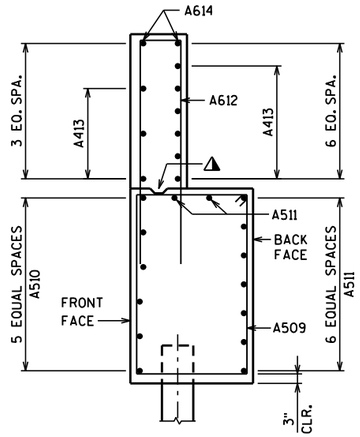
FILE NAME : F:±TR±JOBS±E2243A16±Sheets±B-36-0233 04 s abut.dgn PLOT BY : EpleyB PLOT DATE: 8/19/2019 9:58:22 AM

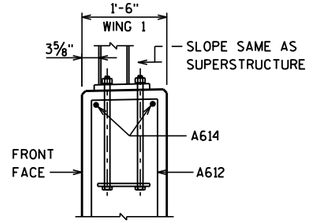
STATE PROJECT NUMBER
4362-02-71



WING 1 ELEVATION



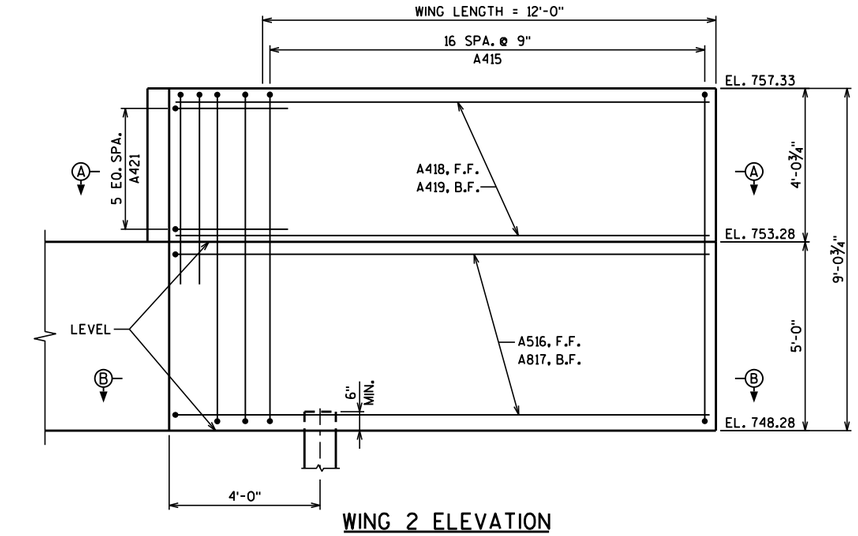
WING 1 SECTION



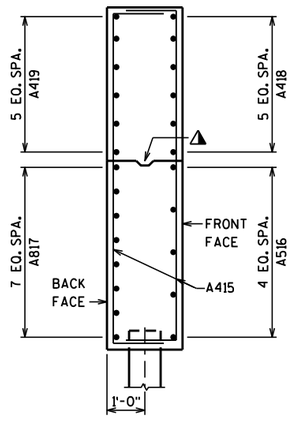
TYPE 'M' RAIL AT TOP OF WING

BILL OF BARS

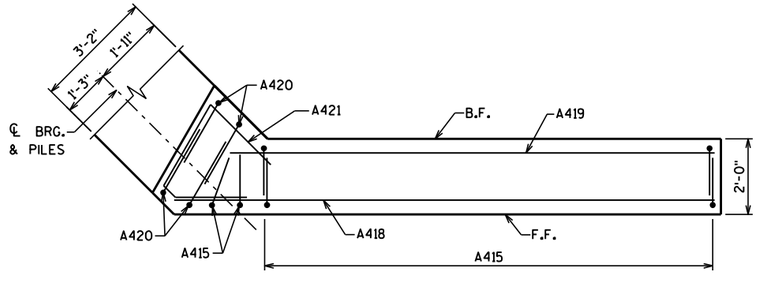
BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	LOCATION
A401		6	28'-0"	X	BODY - ONE PER PILE
A402		12	2'-3"		BODY - TWO PER PILE
A503		46	15'-0"	X	BODY - STIRRUPS
A604		9	38'-3"		BODY - HORIZONTAL
A705		8	31'-4"		BODY - HORIZONTAL, B.F.
A406		6	8'-7"		BODY - HORIZONTAL TOP
A407		15	3'-11"	X	BODY - VERTICAL TOP
A808		8	16'-0"	X	BODY - HORIZONTAL, B.F.
A509	X	13	15'-8"	X	WING 1 - STIRRUPS
A510	X	6	14'-6"		WING 1 - HORIZONTAL, F.F.
A511	X	9	14'-1"		WING 1 - HORIZONTAL, B.F. & TOP
A612	X	17	13'-2"	X	WING 1 - VERTICAL
A413	X	9	11'-8"		WING 1 - HORIZONTAL
A614	X	2	11'-8"		WING 1 - HORIZONTAL, TOP
A415	X	36	11'-1"	X	WING 2 - VERTICAL
A516	X	5	15'-9"	X	WING 2 - HORIZTONAL, F.F.
A817	X	8	17'-4"	X	WING 2 - HORIZONTAL, B.F.
A418	X	6	14'-3"		WING 2 - HORIZONTAL
A419	X	6	12'-10"		WING 2 - HORIZONTAL
A420	X	4	7'-11"	X	WING 2 - VERTICAL
A421	X	6	7'-7"	X	WING 2 - HORIZONTAL



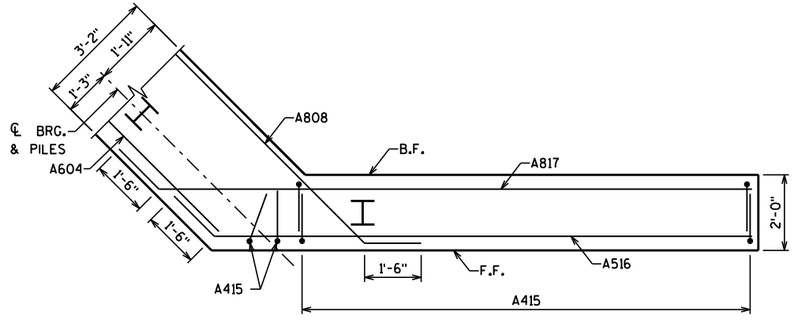
WING 2 ELEVATION



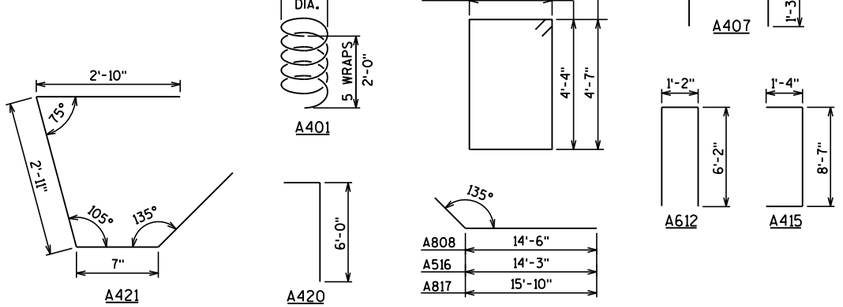
WING 2 SECTION



SECTION A-A



SECTION B-B



BAR BENDING DIAGRAMS

NOTES:

⚠ OPTIONAL CONST. JOINT: KEYWAY FORMED BY BEVELED 2" X 6". (18" R.M.W. @ B.F. & ¾" "V" GROOVE @ F.F. IF JOINT IS USED.)

(A17) ½" FILLER, SEALER (EXTEND TO TOP OF WING)

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-36-233

DRAWN BY NRT | PLANS CK'D. BRE

SOUTH ABUTMENT DETAILS

SHEET 5 OF 13

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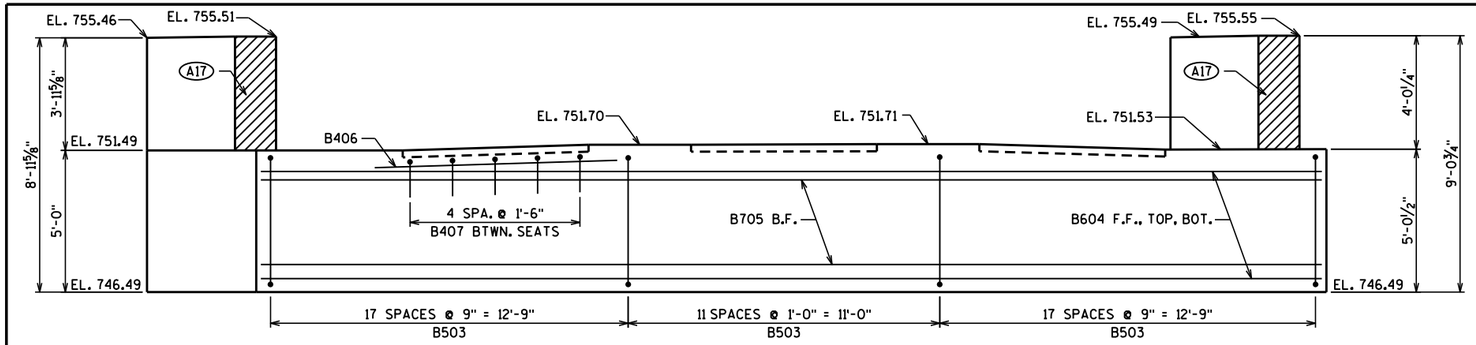
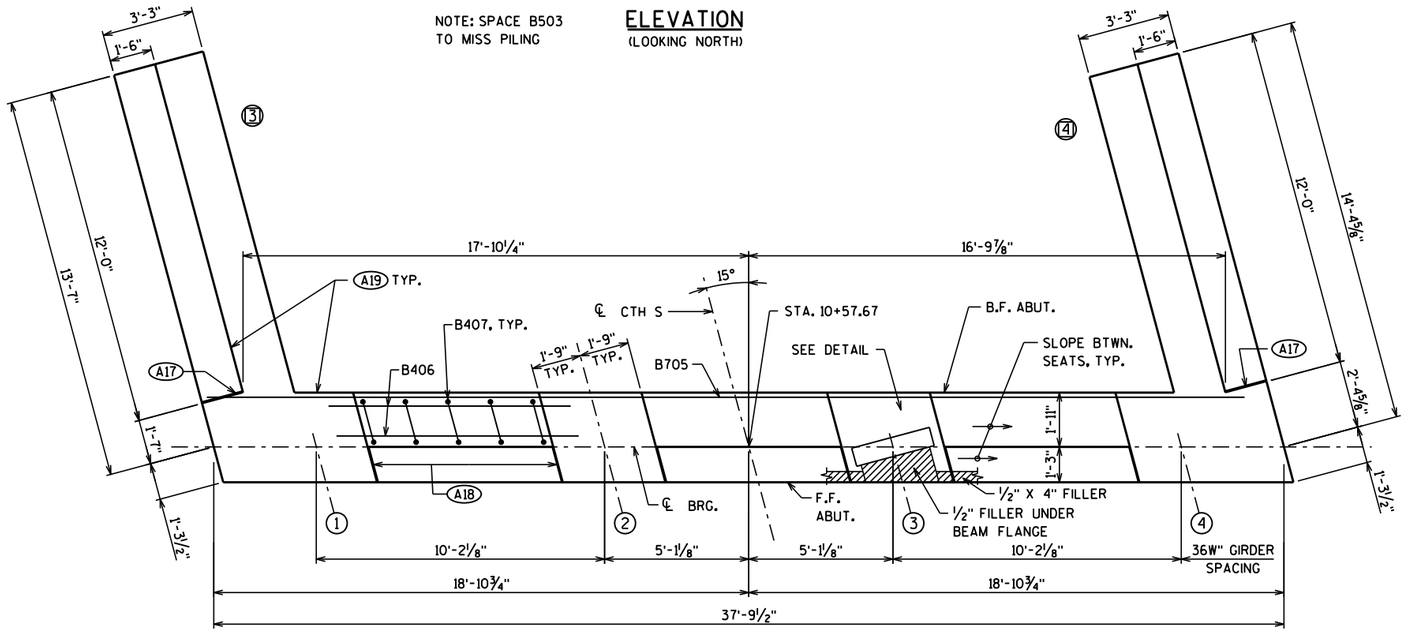
STATE PROJECT NUMBER
4362-02-71

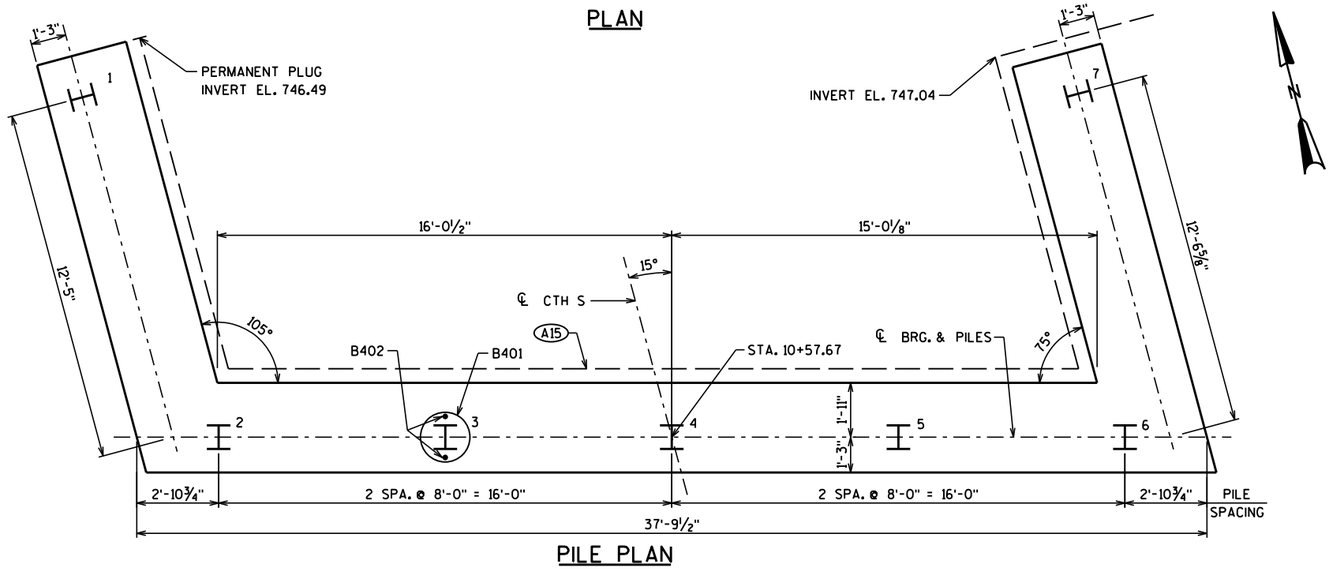


NOTE: SPACE B503 TO MISS PILING

ELEVATION
(LOOKING NORTH)



PLAN



PILE PLAN

LEGEND

(A07) NORTH ABUTMENT TO BE SUPPPORTED ON HP 12 X 53 STEEL PILING. ESTIMATED 75'-0" LONG WITH A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE.

(A15) PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO EAST SLOPES. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. SEE SHEET 7 FOR DETAILS.

(A17) ½" FILLER INCLUDED IN WING LENGTH, SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF ½" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONCRETE).

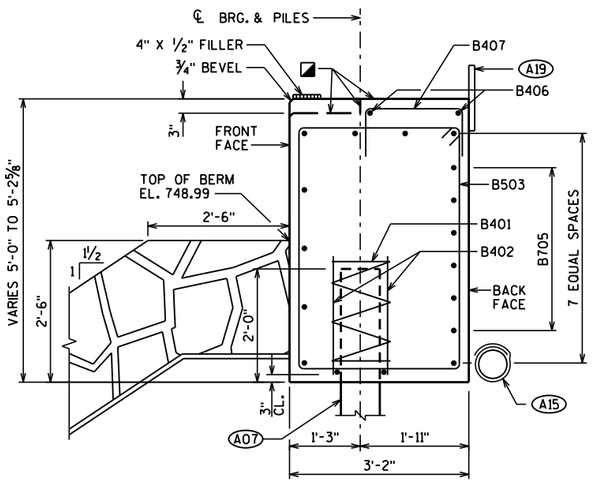
(A18) ¾" CORK FILLER UP VERT. BEAM SEAT FACES THAT RUN PARALLEL WITH GIRDER.

(A19) 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.

(X) DENOTES WING NUMBER

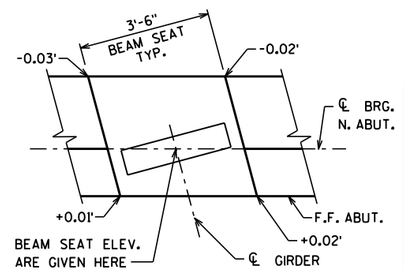
◪ STEEL TROWEL TOP SURFACE OF ABUTMENT. PLACE MULTIPLE LAYERS OF POLYETHYLENE SHEETS OVER ENTIRE ABUTMENT TOP BEFORE PLACING BEARING PADS AND/OR SUPERSTRUCTURE. TOTAL THICKNESS OF SHEETS SHALL BE AT LEAST 0.03".

SEE SHEET 7 FOR WINGWALL DETAILS, BILL OF BARS AND BAR BENDING DIAGRAMS. SEE SHEET 7 FOR PILE SPLICE DETAILS.



SECTION THRU BODY

HORIZ. BARS NOT OTHERWISE IDENTIFIED ARE B604 BARS



SLOPED BEAM SEAT DETAIL

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-36-233

DRAWN BY NRT | PLANS CK'D. BRE

NORTH ABUTMENT

SHEET 6 OF 13

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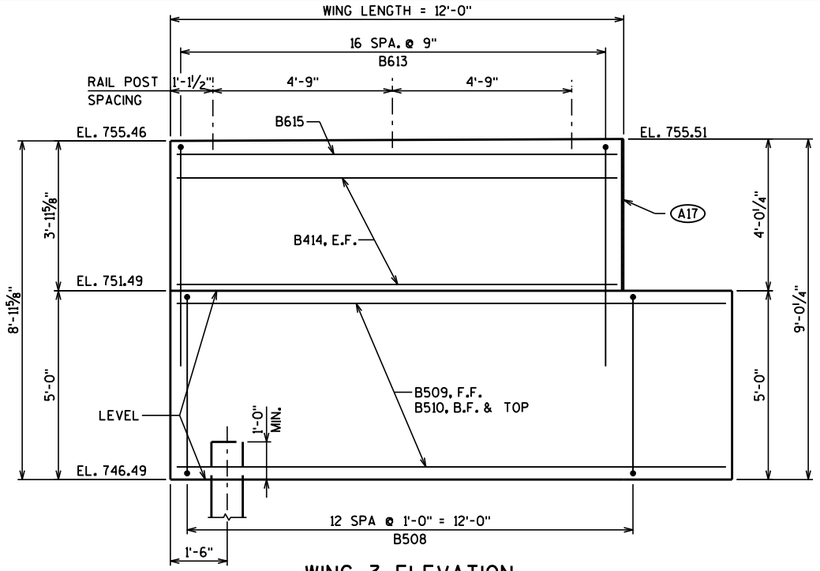
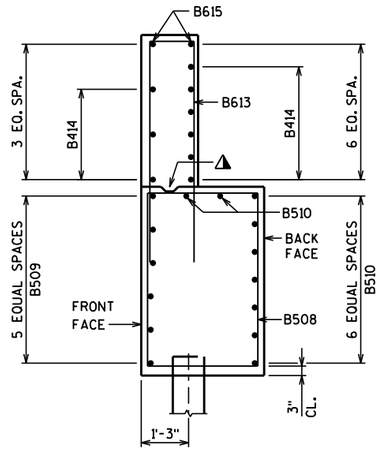
8

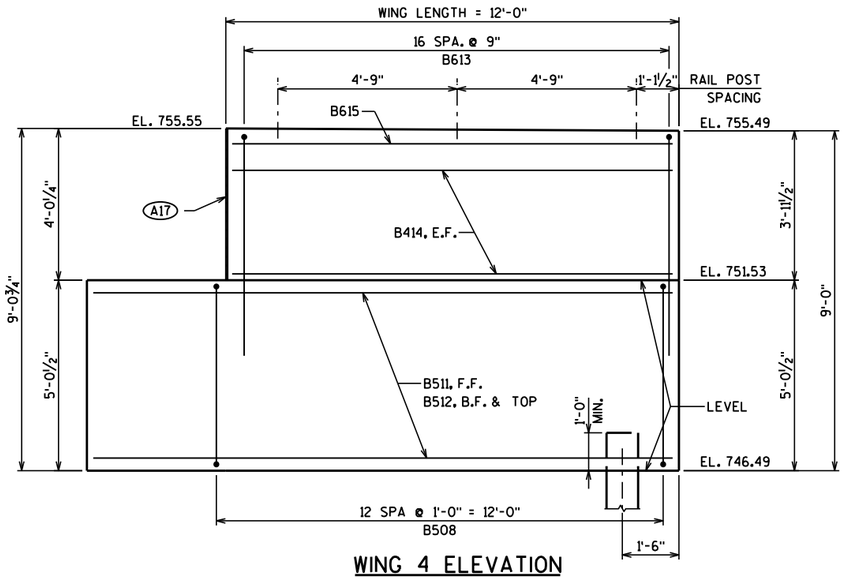
STATE PROJECT NUMBER
4362-02-71



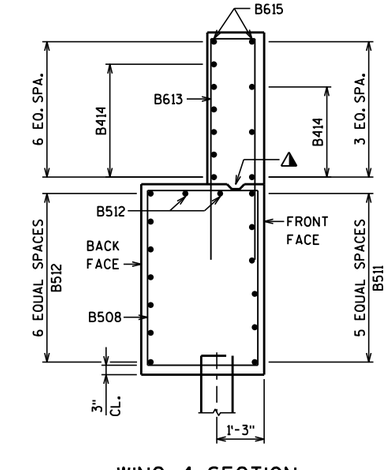
WING 3 ELEVATION



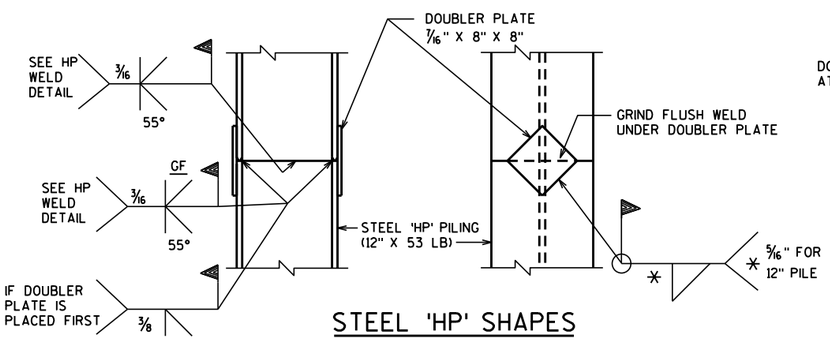
WING 3 SECTION



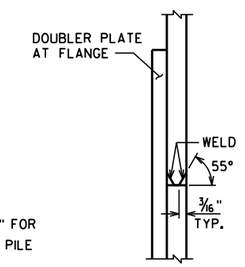
WING 4 ELEVATION



WING 4 SECTION



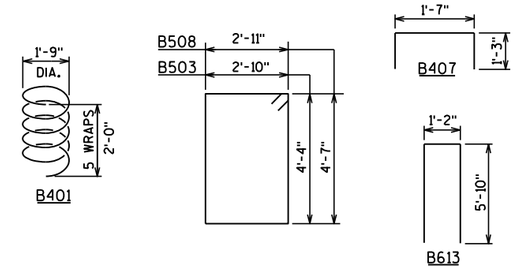
STEEL 'HP' SHAPES



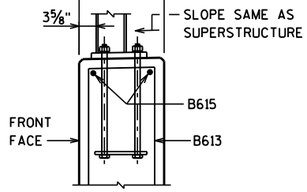
HP WELD DETAIL
FLANGE SHOWN, WEB SIMILAR

BILL OF BARS

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	LOCATION
B401		6	28'-0"	X	BODY - ONE PER PILE
B402		12	2'-3"		BODY - TWO PER PILE
B503		46	15'-0"	X	BODY - STIRRUPS
B604		11	37'-5"		BODY - HORIZONTAL
B705		6	37'-5"		BODY - HORIZONTAL B.F.
B406		6	8'-7"		BODY - HORIZONTAL TOP
B407		15	3'-11"	X	BODY - VERTICAL TOP
B508	X	26	15'-8"	X	WINGS - STIRRUPS
B509	X	6	14'-6"		WING 3 - HORIZONTAL, F.F.
B510	X	9	14'-3"		WING 3 - HORIZONTAL, B.F. & TOP
B511	X	6	15'-3"		WING 4 - HORIZONTAL, F.F.
B512	X	9	13'-4"		WING 4 - HORIZONTAL, B.F. & TOP
B613	X	34	12'-6"	X	WINGS - VERTICAL
B414	X	18	11'-8"		WINGS - HORIZONTAL
B615	X	4	11'-8"		WINGS - HORIZONTAL, TOP



BAR BENDING DIAGRAMS

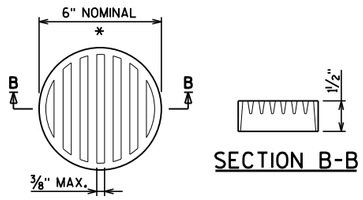


TYPE 'M' RAIL AT TOP OF WING

NOTES:

⚠ OPTIONAL CONST. JOINT: KEYWAY FORMED BY BEVELED 2" X 6". (18" R.M.W. @ B.F. & ¾" "V" GROOVE @ F.F. IF JOINT IS USED.)

(A17) ½" FILLER, SEALER (EXTEND TO TOP OF WING)



RODENT SCREEN DETAIL

SECTION B-B

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

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

THE RODENT SCREEN 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 SCREEN TO THE EXPOSED END OF THE PIPE UNDERDRAIN. THE SCREEN SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO. 10 X 1-INCH SHEET METAL SCREWS.

NO.	DATE	REVISION	BY

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STRUCTURE B-36-233

DRAWN BY NRT | PLANS CK'D. BRE

NORTH ABUTMENT DETAILS

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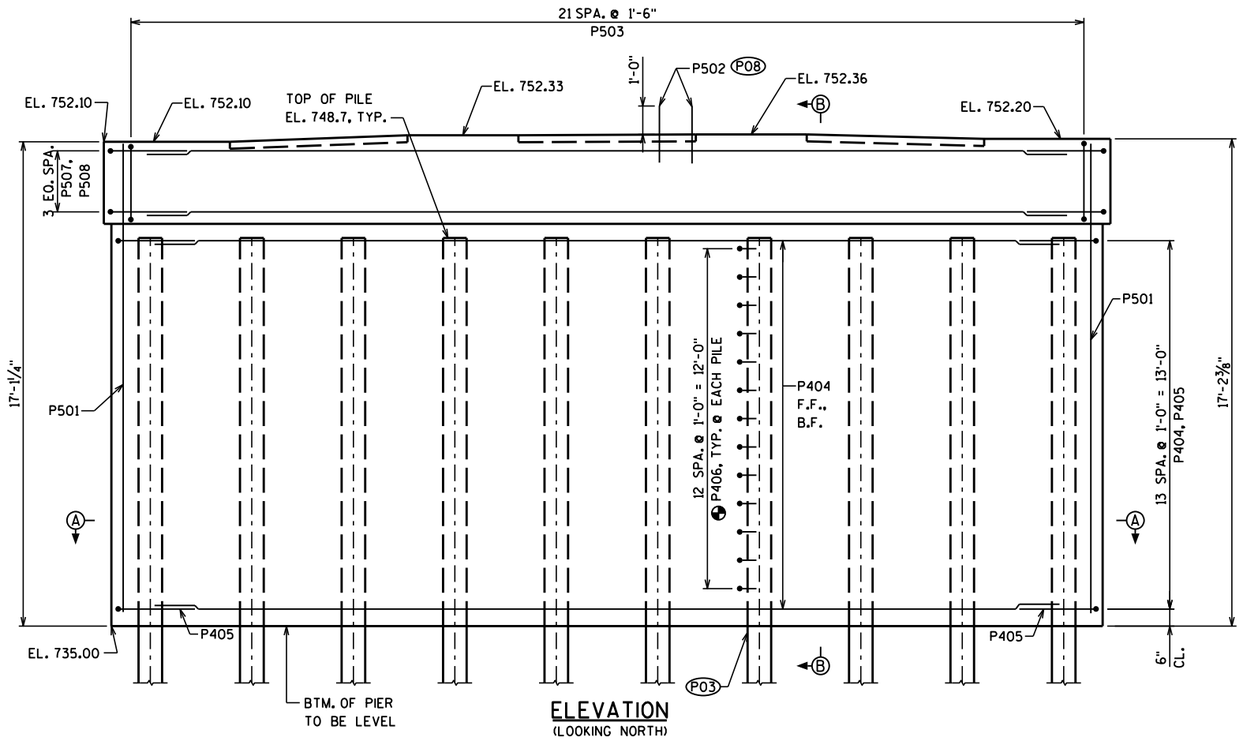
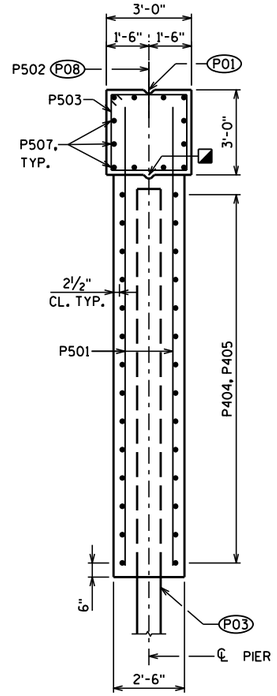


ELEVATION
(LOOKING NORTH)



SECTION B-B

LEGEND

(P01) KEYED CONST. JOINT FORMED BY BEVELED 2" x 6" BETWEEN BEAM SEATS.

(P03) PIER TO BE SUPPORTED ON HP12X53 STEEL PILING. ESTIMATED 70'-0" LONG WITH A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE.

(P08) P502 BARS @ 1'-0" CTRS. MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE. (EMBED 1'-0" INTO CONC.)

◔ P406 BARS, PLACE ADJACENT TO EACH PILE ONLY. **TIE TO NEAREST VERT. #5 BAR. VERTICAL SPA. @ 1'-0" TO MATCH P404 OUTSIDE BARS. ALTERNATE THE POSITION OF THE 90° AND 180° HOOKS AT EACH VERTICAL LAYER OF TIES.

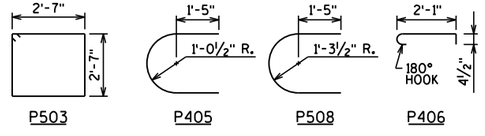
◪ OPTIONAL CONST. JOINT WITH 2" x 6" BEVELED KEYWAY.

SEE SHEET 7 FOR PILE SPLICE DETAILS.

AT PIER, COFFERDAM REQUIRED. CONCRETE POURED UNDERWATER WILL BE ALLOWED AND SHALL BE DONE IN ACCORDANCE WITH STANDARD SPEC 502.3.5.3. CONCRETE POURED UNDERWATER SHALL NOT EXCEED 10.0 FEET IN DEPTH, UNLESS APPROVED OTHERWISE.

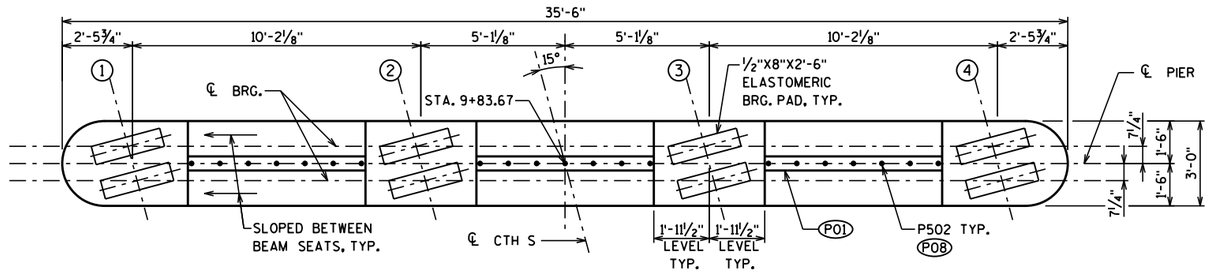
BILL OF BARS

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	LOCATION
P501		72	16'-4"		VERTICAL
P502		21	2'-0"		VERTICAL DOWELS
P503		22	11'-0"	X	CAP BEAM - STIRRUPS
P404		28	32'-6"		HORIZONTAL
P405		28	6'-2"	X	HORIZONTAL ENDS
P406		130	2'-11"	X	HORIZONTAL TIES
P507		12	32'-6"		CAP BEAM - HORIZONTAL
P508		8	7'-0"	X	CAP BEAM - ENDS

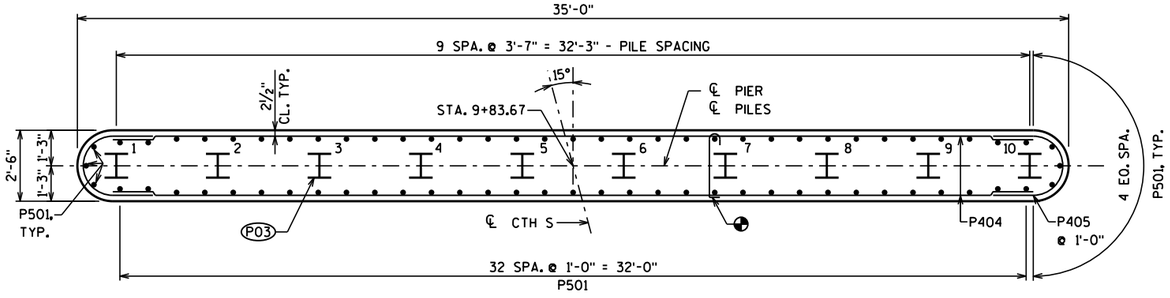


P503 P405 P508 P406

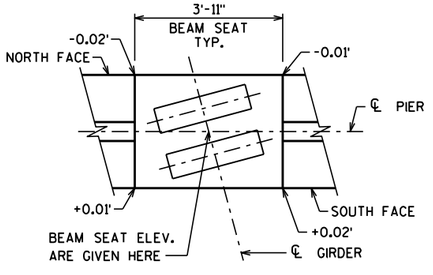
BAR BENDING DIAGRAMS



PLAN



SECTION A-A



SLOPED BEAM SEAT DETAIL

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STATE OF WISCONSIN
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STRUCTURE B-36-233

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PIER

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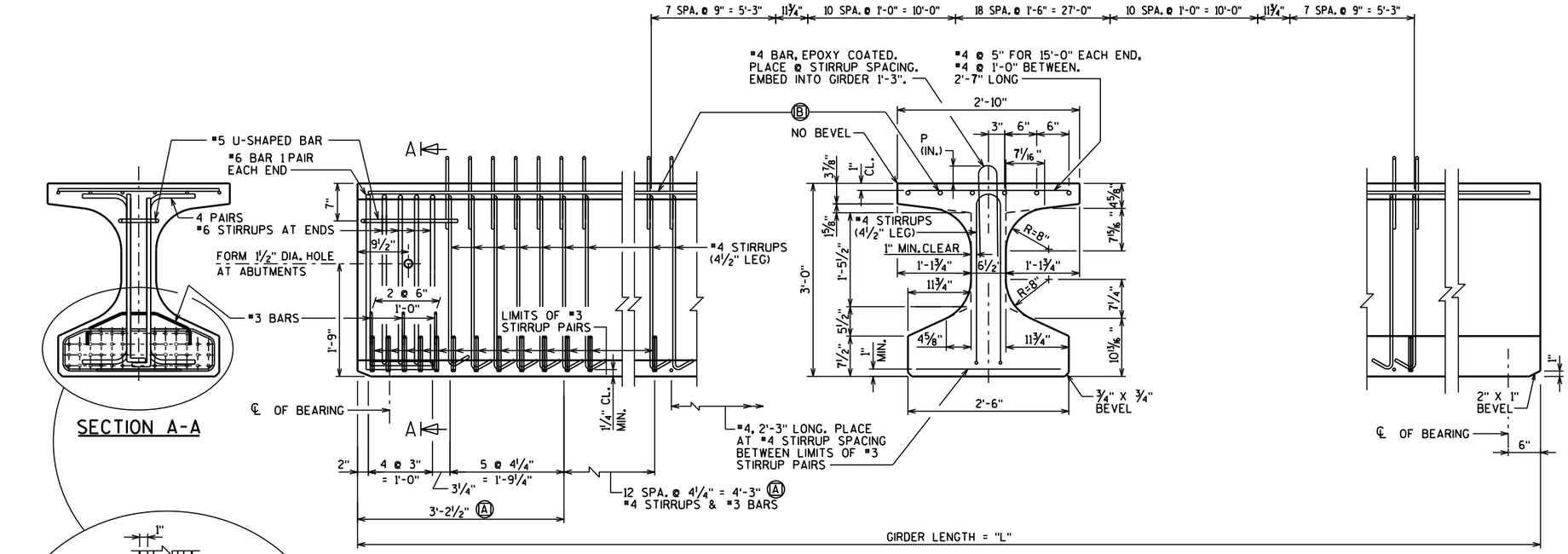
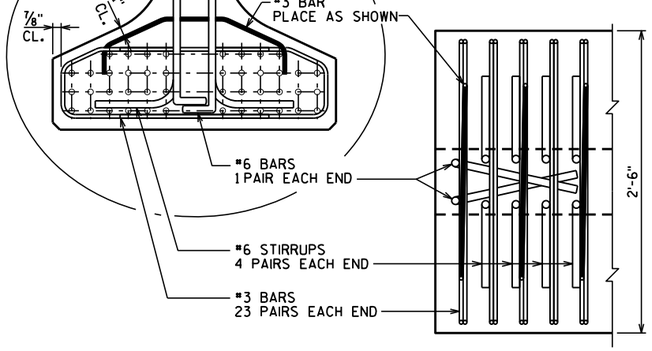


SECTION A-A

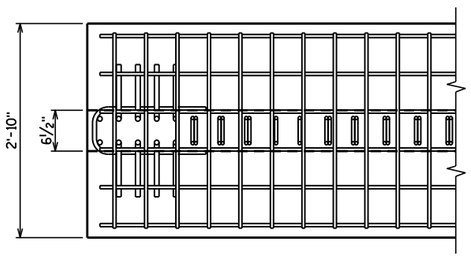
SIDE VIEW & TYPICAL SECTION IN SPAN

(A) DETAIL TYP. AT EACH END

(B) 6 *4 BARS, FULL LENGTH, MIN. LAP = 1'-11"



BOTTOM FLANGE

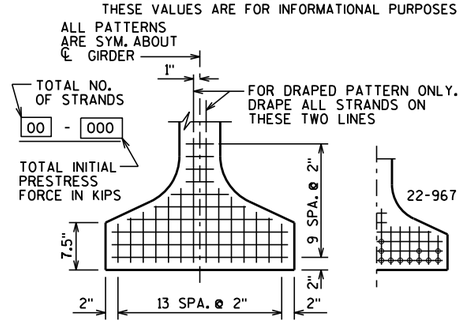


TOP FLANGE

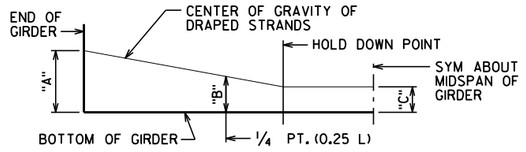
*THE THEORETICAL INITIAL CAMBER VALUE AT THE TIME OF STRAND RELEASE AT MIDSPAN MULTIPLIED BY A FACTOR OF 1.4 TO ACCOUNT FOR CAMBER GROWTH FROM THE TIME OF STRAND RELEASE TO JOBSITE PLACEMENT.

SPAN	CAMBER (IN.) *
1	1.76
2	1.76

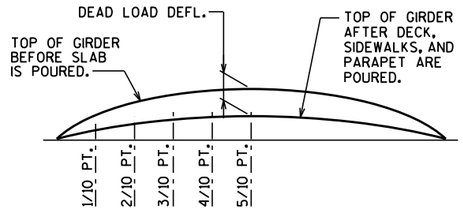
THESE VALUES ARE NOT TO BE USED IN DETERMINING 'T', USE ACTUAL GIRDER SHOTS. THESE VALUES ARE FOR INFORMATIONAL PURPOSES ONLY.



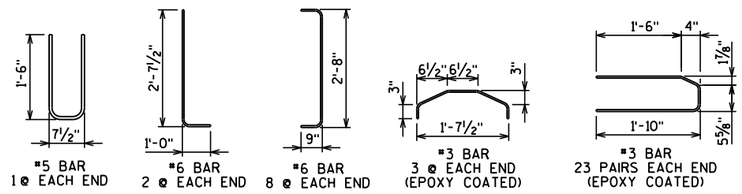
TYP. STRAND PATTERN



DRAPED STRAND PROFILE



DEAD LOAD DEFLECTION DIAGRAM



GIRDER NOTES

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

DO NOT APPLY CONCRETE SEALER TO SURFACES RECEIVING APPLICATION OF CONCRETE STAINING.

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

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

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

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

AN EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A1064 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES MAINTENANCE SECTION. IF USED, WWF SUBSTITUTION DETAILS SHALL BE SUBMITTED ELECTRONICALLY TO THE WISDOT FABRICATION LIBRARY AND ACCEPTED PRIOR TO SHOP DRAWING SUBMITTAL.

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

FOR DIAPHRAGM INSERT & CONNECTION DETAILS SEE "STEEL DIAPHRAGM" SHEET.

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

GIRDER DATA

SPAN	GIRDER	GIRDER LENGTH "L"	DEAD LOAD DEFL. (IN.) 1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	CONC. STRGTH. f'c (P.S.I.)	"P" 1ST ⅓ OF GIRDER	"P" MID ⅓ OF GIRDER	"P" END ⅓ OF GIRDER	DIA. OF STRAND (IN.)	DRAPED PATTERN TOTAL NO. OF STRANDS	DRAPED PATTERN f'ci (P.S.I.) *	DRAPED PATTERN (IN.) "A"	"B" MIN.	"B" MAX.	"C"	UNDRAPED PATTERN TOTAL NO. OF STRANDS	UNDRAPED PATTERN f'ci (P.S.I.) *
1	ALL	74.375'	0.37	0.73	1.01	1.19	1.25	1.18	1.01	0.73	0.37	8,000	8"	7"	8"	0.6	22	6,800	32"	11"	14"	4"	---	---
2	ALL	74.375'	0.37	0.73	1.01	1.18	1.25	1.19	1.01	0.73	0.37	8,000	8"	7"	8"	0.6	22	6,800	32"	11"	14"	4"	---	---

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DEPARTMENT OF TRANSPORTATION

STRUCTURE B-36-233

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36W" PRESTRESSED GIRDER DETAILS

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STATE PROJECT NUMBER
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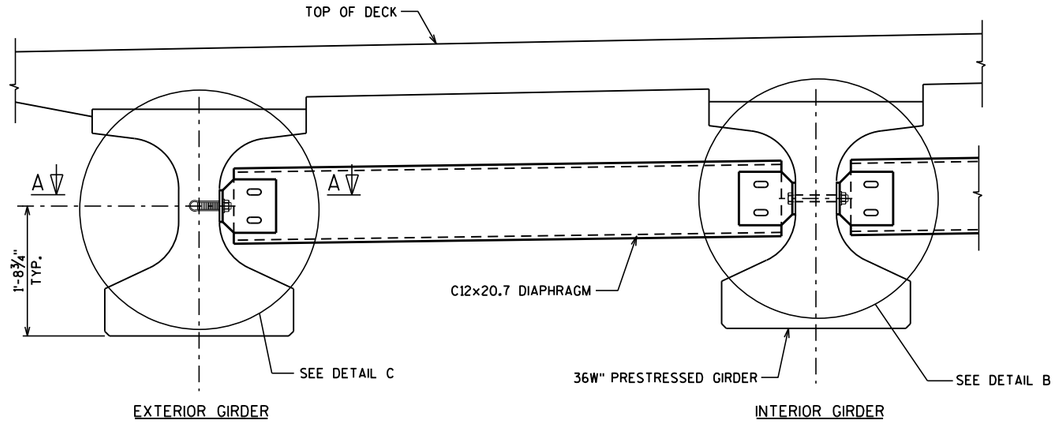
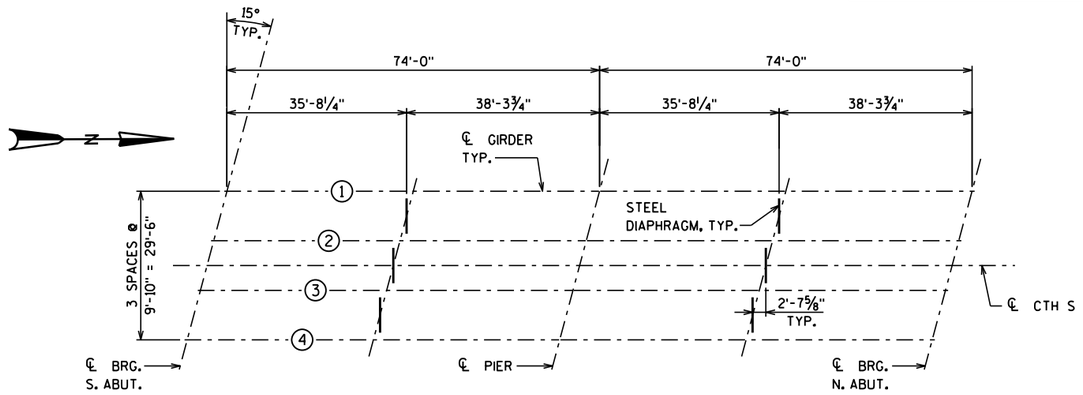
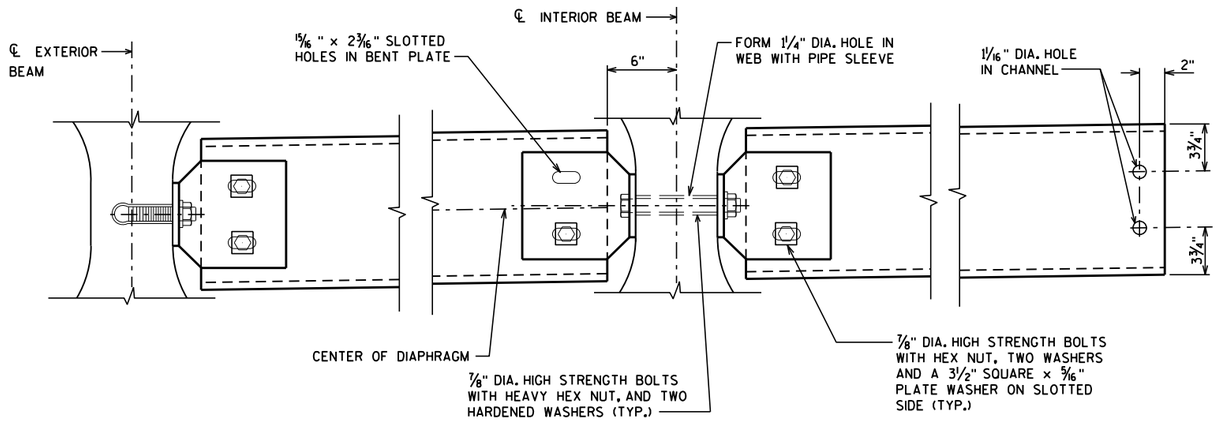


PART TRANSVERSE SECTION AT DIAPHRAGM

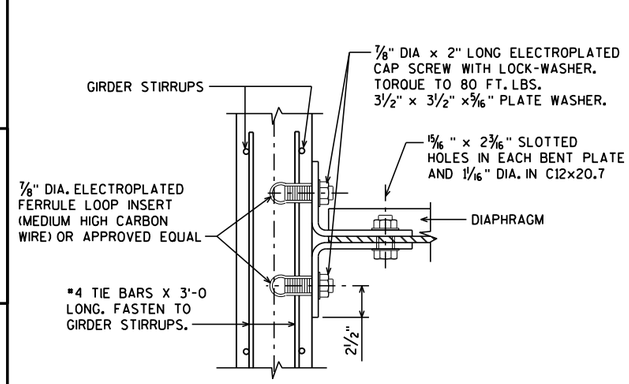


FRAMING DIAGRAM



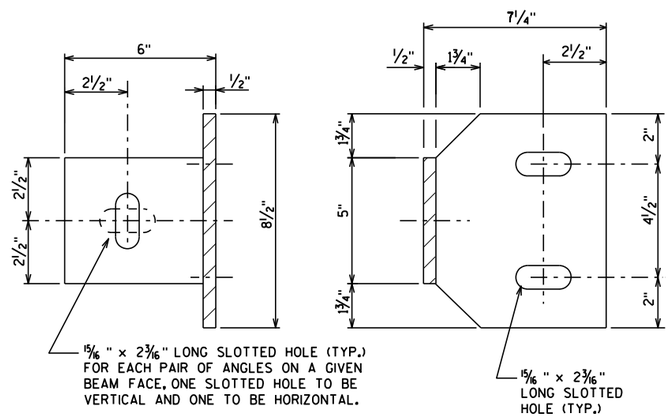
DETAIL C

DETAIL B



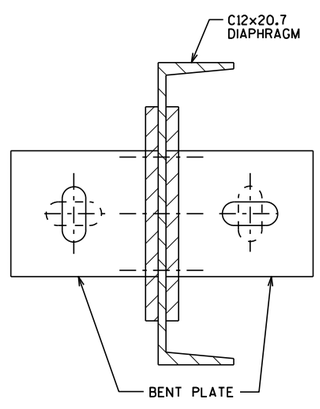
SECTION A-A

(FOR EXTERIOR ATTACHMENT)



BEAM FACE

DIAPHRAGM FACE



ATTACHMENT TO CHANNEL

NOTES

ALL DIAPHRAGM MATERIAL NOT EMBEDDED IN THE CONCRETE GIRDER SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "STEEL DIAPHRAGMS B-36-233", EACH.

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36.

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

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

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-36-233

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STEEL DIAPHRAGMS

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STATE PROJECT NUMBER
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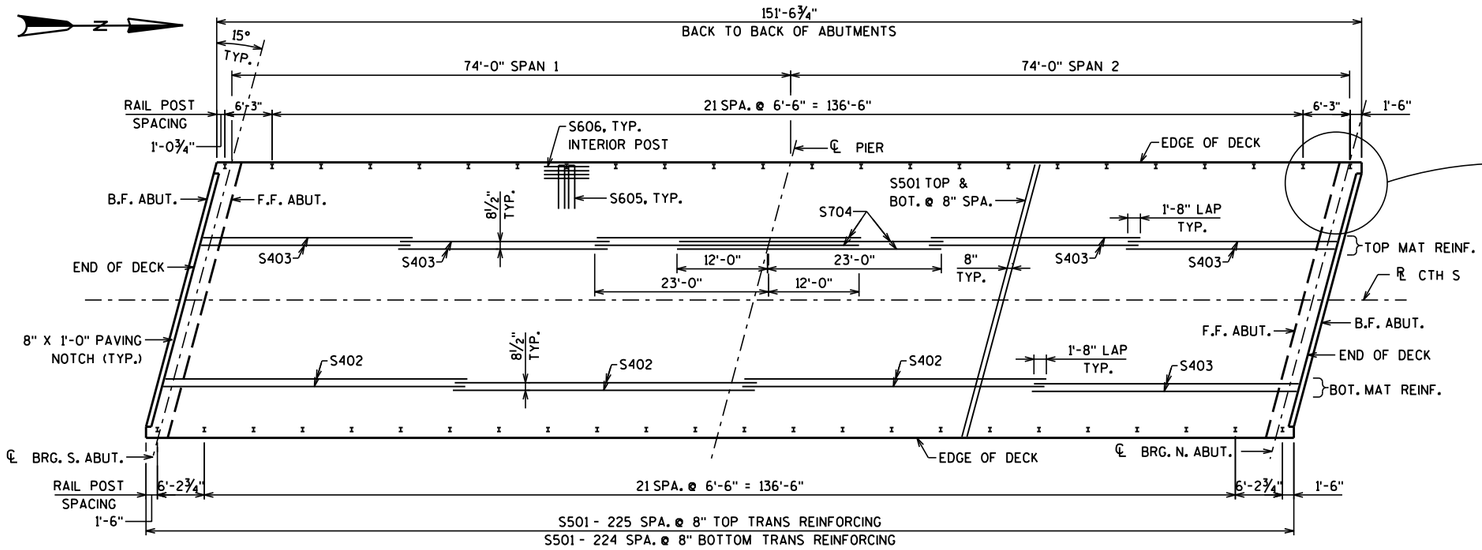
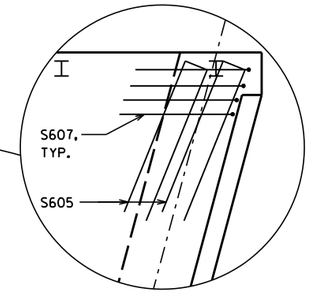
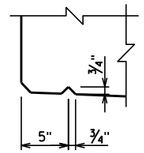


PLAN

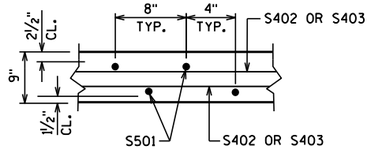


RAIL POST REINFORCEMENT AT DECK CORNERS

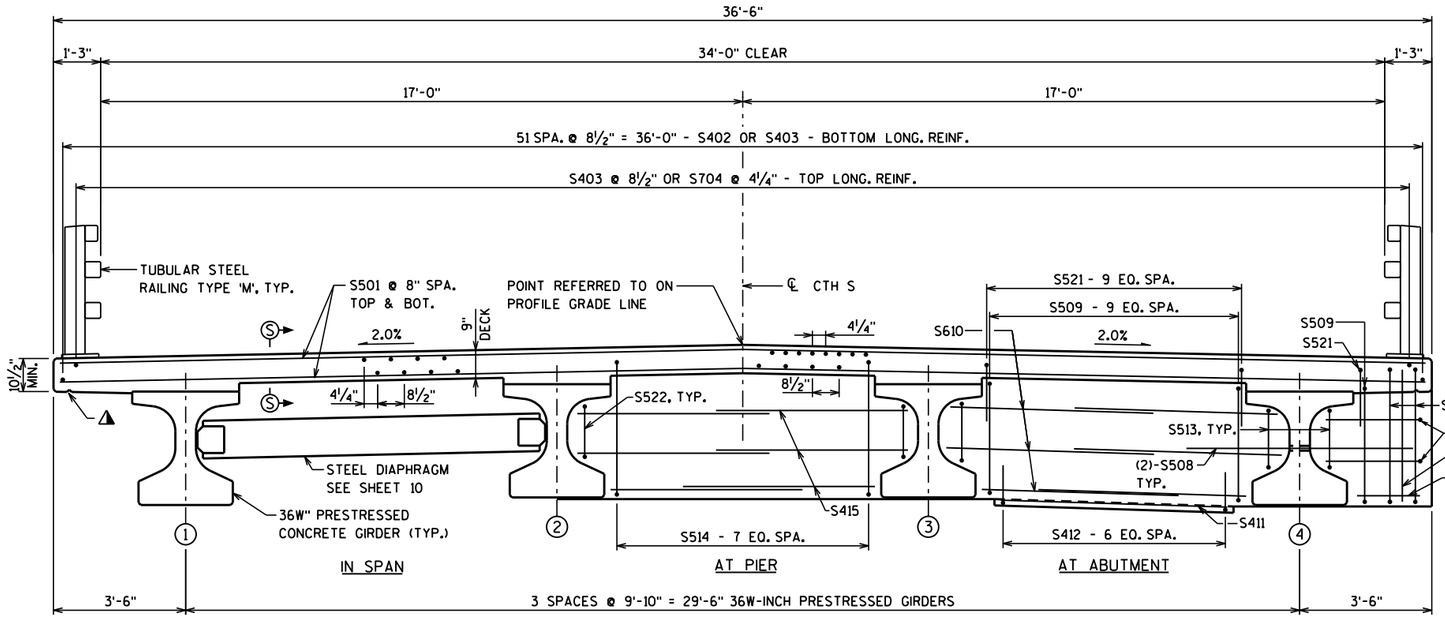


¾" V-GROOVE DETAIL

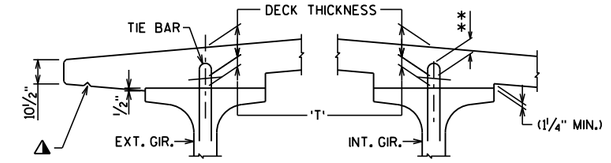
⚠ 3/4" DRIP-EDGE. EXTEND DRIP-EDGE TO 6" FROM FRONT FACE OF ABUTMENT DIAPHRAGM.



SECTION S-S



CROSS SECTION THRU ROADWAY



DECK HAUNCH DETAIL

IF 1¼" MINIMUM HAUNCH HEIGHT AT EDGE OF GIRDER CANNOT BE MAINTAINED, THE GRADE LINE MAY BE REVISED BY THE ENGINEER AT THE OPTION OF THE CONTRACTOR. THE PLAN SLAB THICKNESS SHALL BE HELD. NOTIFY THE STRUCTURES SECTION IF THE GRADE LINE IS RAISED FROM THE PLAN PROFILE BY MORE THAN ½" OR,

** IF 3" MINIMUM DECK EMBEDMENT OF TIE BAR CANNOT BE OBTAINED.

TO DETERMINE 'T', ELEV. OF TOP OF GIR'S. AT ℄ OF SUBSTRUCTURE UNITS & AT 1/10 POINTS OF EACH SPAN SHALL BE TAKEN. THEN FOLLOW THIS PROCESS:

TOP OF DECK ELEV. AT FINAL GRADE
- TOP OF GIRDER ELEVATION
+ DEAD LOAD DEFLECTION
- DECK THICKNESS
= HAUNCH HEIGHT 'T'

NOTE: AN AVERAGE HAUNCH ('T') OF 2⅞" WAS USED IN THE QUANTITY "CONCRETE MASONRY BRIDGES".

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-36-233

DRAWN BY	NRT	PLANS CK'D.	BRE

SUPERSTRUCTURE

SHEET 11 OF 13

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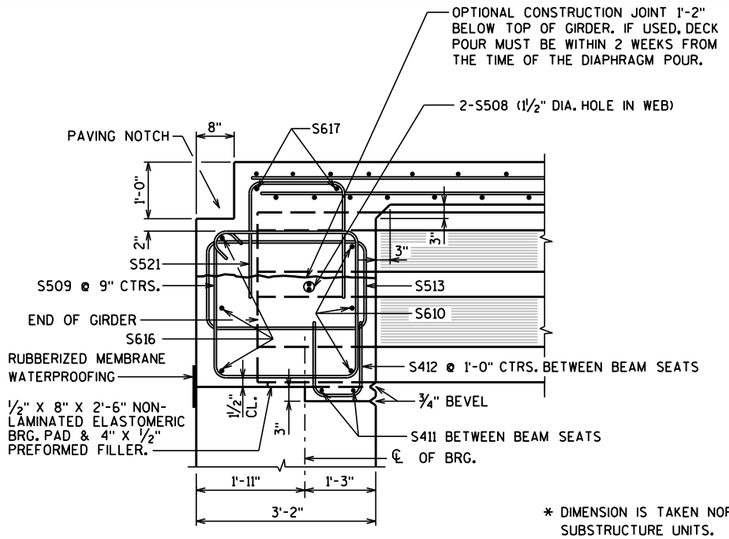
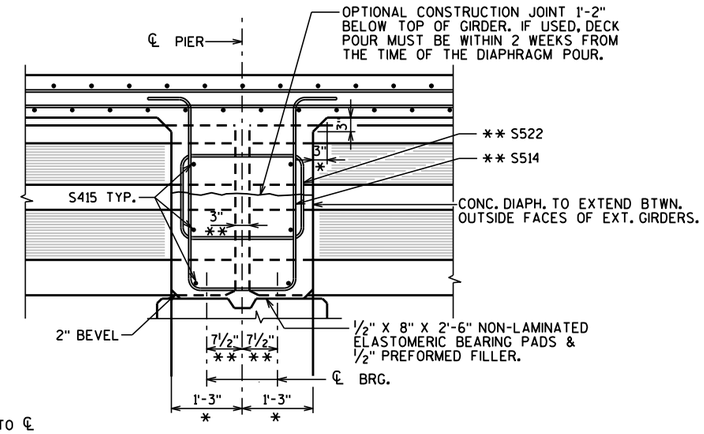
FILE NAME : F:±TR±JOBS±E2243A16±Sheets±B-36-0233 11 super.dgn PLOT BY : EpleyB PLOT DATE: 7/28/2019 2:04:41 PM



AT ABUTMENTS



AT PIER DIAPHRAGM

* DIMENSION IS TAKEN NORMAL TO ℄ SUBSTRUCTURE UNITS.

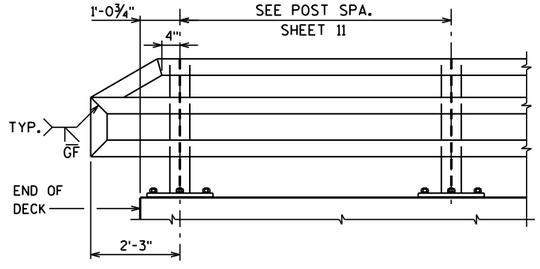
** DIMENSION IS TAKEN PARALLEL TO ℄ GIRDER.

PART LONGITUDINAL SECTION

BILL OF BARS

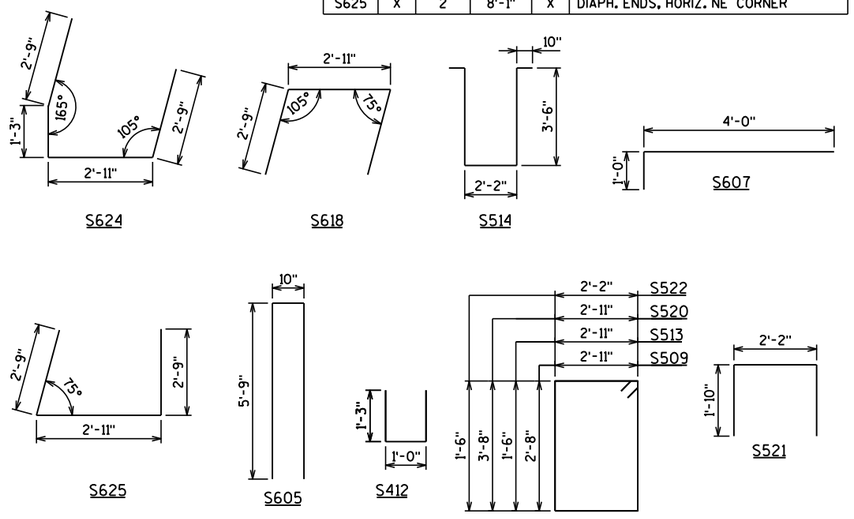
BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	LOCATION
S501	X	451	37'-4"		TRANS. TOP & BOT.
S402	X	156	42'-6"		LONG. BOT.
S403	X	256	27'-9"		LONG. TOP & BOT.
S704	X	102	35'-0"		LONG. TOP OVER PIERS
S605	X	96	12'-0"	X	AT RAIL POST
S606	X	176	6'-0"		AT INTERIOR RAIL POST
S607	X	16	4'-10"	X	AT END RAIL POST
S508	X	16	6'-0"		ABUTMENT DIAPHRAGM - HORIZ.
S509	X	64	11'-10"	X	ABUTMENT DIAPHRAGM STIRRUP
S610	X	36	5'-7"		ABUTMENT DIAPHRAGM - HORIZ.
S411	X	12	6'-1"		ABUTMENT DIAPHRAGM - HORIZ.
S412	X	42	3'-4"	X	ABUTMENT DIAPHRAGM - VERT.
S513	X	16	9'-6"	X	ABUTMENT DIAPHRAGM STIRRUP
S514	X	24	10'-4"	X	PIER DIAPHRAGM
S415	X	36	5'-1"		PIER DIAPHRAGM
S616	X	6	36'-0"		ABUTMENT DIAPHRAGM - HORIZ.
S617	X	4	37'-5"		ABUTMENT DIAPHRAGM - HORIZ.
S618	X	2	8'-1"	X	DIAPH. ENDS, HORIZ. SW CORNER
S619	X	4	1'-11"		DIAPH. ENDS, HORIZ.
S520	X	8	13'-10"	X	ABUTMENT DIAPHRAGM - VERT.
S521	X	64	5'-7"	X	ABUTMENT DIAPHRAGM - VERT.
S522	X	6	8'-0"	X	PIER DIAPHRAGM STIRRUP
S423	X	8	3'-8"		ABUTMENT DIAPHRAGM - VERT. ENDS
S624	X	4	9'-4"	X	DIAPH. ENDS, HORIZ. SE & NW CORNERS
S625	X	2	8'-1"	X	DIAPH. ENDS, HORIZ. NE CORNER

BEARING PAD DETAIL



PART ELEVATION OF RAILING

TYPICAL SOUTH WEST CORNER OF DECK.
SEE SHEET 13 FOR RAILING DETAILS.



BAR BENDING DIAGRAMS

TOP OF DECK ELEVATIONS

LOCATION	S. ABUT.	1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	PIER	1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	N. ABUT.
W. EDGE	757.29	757.15	757.01	756.88	756.75	756.63	756.52	756.41	756.31	756.21	756.12	756.03	755.95	755.88	755.81	755.75	755.69	755.64	755.59	755.55	755.51
GIRDER 1	757.38	757.24	757.10	756.97	756.84	756.72	756.60	756.49	756.39	756.29	756.20	756.11	756.03	755.96	755.89	755.82	755.76	755.71	755.66	755.62	755.59
GIRDER 2	757.63	757.48	757.34	757.21	757.08	756.96	756.84	756.73	756.62	756.52	756.43	756.34	756.26	756.18	756.11	756.04	755.98	755.93	755.88	755.83	755.80
GIRDER 3	757.68	757.53	757.39	757.26	757.13	757.00	756.88	756.77	756.66	756.56	756.46	756.37	756.29	756.21	756.13	756.06	756.00	755.95	755.89	755.85	755.81
GIRDER 4	757.54	757.39	757.25	757.11	756.97	756.85	756.73	756.61	756.50	756.40	756.30	756.21	756.12	756.04	755.96	755.89	755.83	755.77	755.72	755.67	755.63
E. EDGE	757.49	757.34	757.19	757.05	756.92	756.79	756.67	756.56	756.44	756.34	756.24	756.15	756.06	755.98	755.90	755.83	755.76	755.71	755.65	755.60	755.56

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-36-233

DRAWN BY NRT | PLANS CK'D. BRE

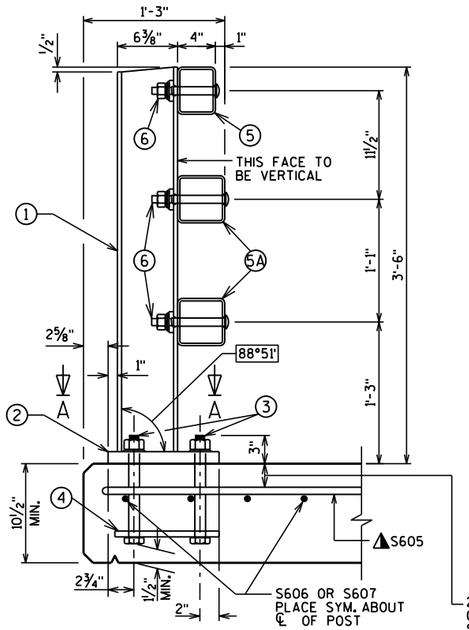
SUPERSTRUCTURE DETAILS

SHEET 12 OF 13

77

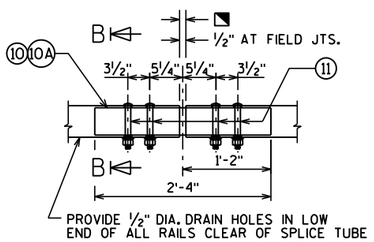
8

8

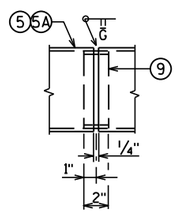


SECTION THRU RAILING ON DECK

2½" FOR SLABS ON GIRDERS; FOR OTHER STRUCTURES, PLACE BELOW TOP MAT SLAB REINFORCEMENT.

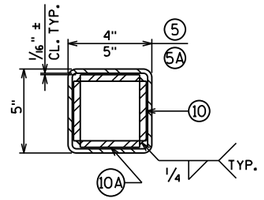


FIELD ERECTION JOINT DETAIL

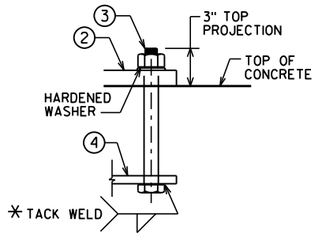


SHOP RAIL SPLICE DETAIL

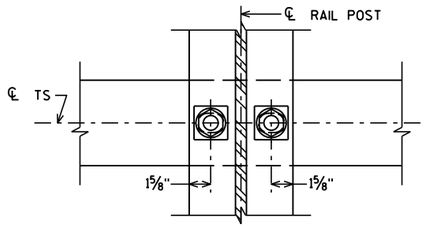
LOCATION MUST BE SHOWN ON SHOP DRAWINGS



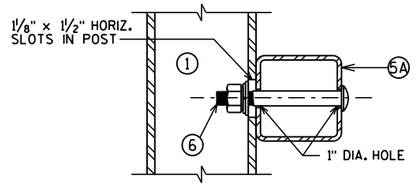
SECTION B-B



ANCHOR BOLTS



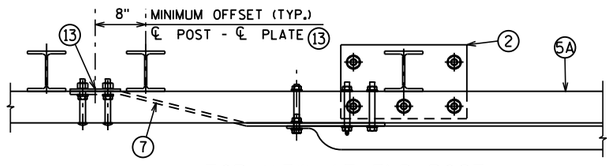
SECTION THRU POST WEB



SECTION THRU RAIL

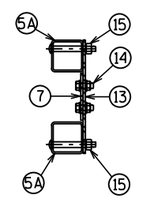
NOTE: CONNECTIONS AT LOWER RAILS SHOWN. CONNECTIONS AT TOP RAIL SIMILAR.

TYPICAL RAIL TO POST CONNECTIONS



TOP VIEW AT END POST

THRIE BEAM RAIL ATTACHMENT



SECTION C-C

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 1¾6" 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.

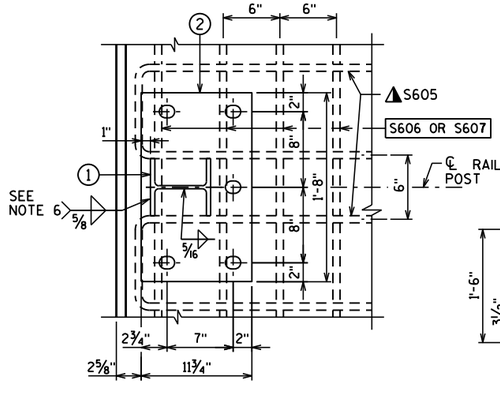
(11) ⅞" DIA. A325 ROUND HEAD BOLT WITH NUT, WASHER, AND LOCK WASHER. USE 1⅝ " X 1¼" LONGIT. SLOTTED HOLES AT FIELD JOINTS AND 1⅝ " X 2¼" MIN. LONGIT. SLOTTED HOLES AT EXP. JOINTS IN PLATE NO. 10A.

(12) ⅞" DIA. X 1½" LONG THREADED SHOP WELDED STUDS (2 REQ'D).

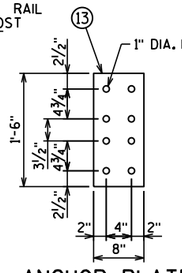
(13) ⅜" X 8" X 1'-6" PLATE. BOLT TO RAIL AS SHOWN IN DETAIL. REQ'D. AT THRIE BEAM GUARD RAIL ATTACHMENTS ONLY. PLACE SYM. ABOUT TUBES NO. 5A.

(14) ⅞" DIA. X 2" LONG A325 HEX BOLT WITH NUT AND WASHER (5 REQ'D.).

(15) 1" DIA. 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.

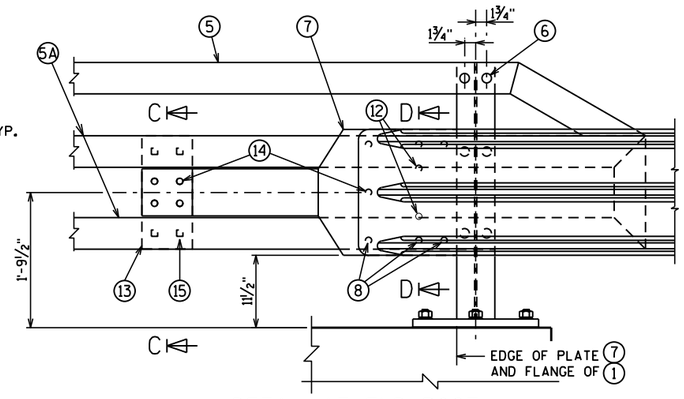


SECTION A-A



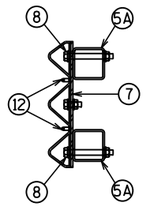
ANCHOR PLATE

AT BEAM GUARD ATTACHMENT



DETAIL AT END POST

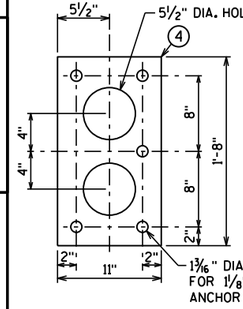
THRIE BEAM RAIL ATTACHMENT



SECTION D-D

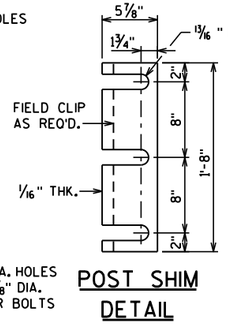
GENERAL NOTES

1. BID ITEM SHALL BE "RAILING TUBULAR TYPE M" WHICH INCLUDES ALL ITEMS SHOWN.
2. RAIL POST AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 50. HOLLOW RAILING STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B OR C WITH A CERTIFIED FY = 50 KSI. ANCHOR PLATES, AND SPLICE TUBE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 36.
3. THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 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 SSPC SPECIFICATIONS.
10. THIS RAILING MEETS NCHRP REPORT 350 EVALUATION CRITERIA FOR TEST LEVEL 4 (TL-4).

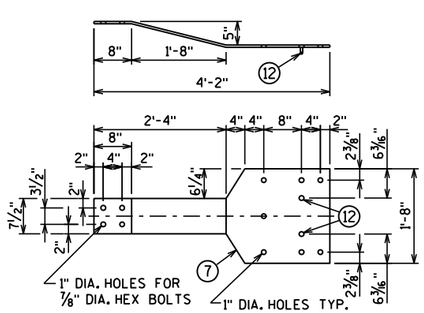


ANCHOR PLATE

AT RAIL TO DECK CONNECTION

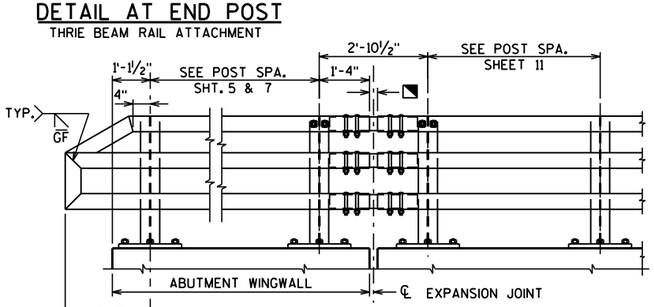


POST SHIM DETAIL



BACK-UP PLATE DETAIL

AT BEAM GUARD ATTACHMENT



PART ELEVATION OF RAILING

TYPICAL WINGS 1, 3, & 4
SEE SHEET 12 FOR WING 2

⚠ TIE TO TOP MAT OF STEEL.

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

◥ RDWY. OPENING OR 2½" MIN. FOR STRIP SEAL EXP. JOINT & ½" OPENING FOR A1 ABUTMENT.

STATE PROJECT NUMBER

4362-02-71

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-36-233

DRAWN BY NRT | PLANS CK'D. BRE

TUBULAR STEEL RAILING TYPE 'M'

SHEET 13 OF 13

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8

8

EARTHWORK - CTH S

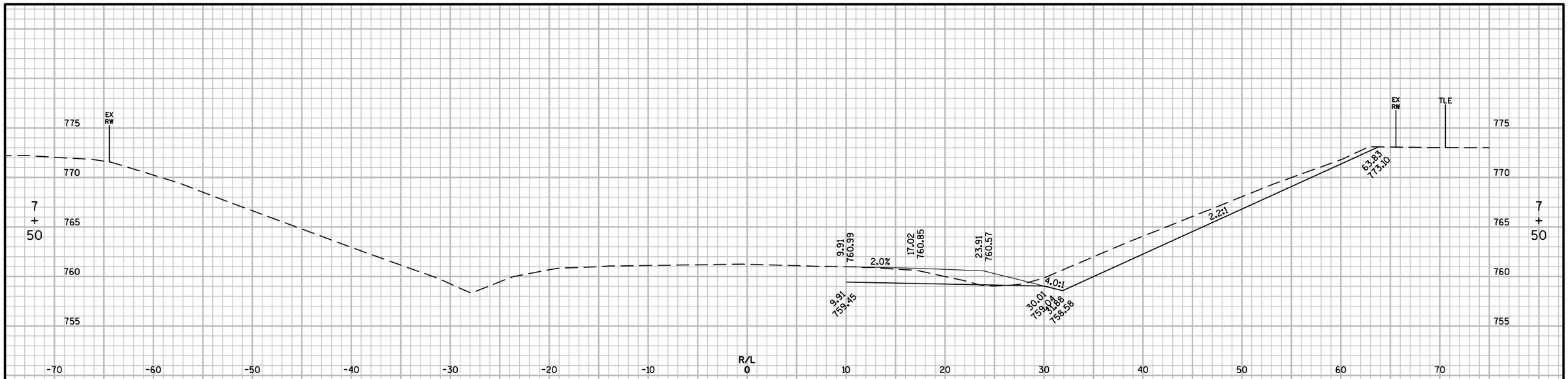
STATION	AREA (SF)		Incremental Vol (CY) (Unadjusted)		Cumulative Vol (CY)		Mass Ordinate
	Cut	Fill	Cut	Fill	Cut 1.00	Expanded Fill 1.25	
06+83.36	14.47	1.44	0	0	0	0	0.00
07+00	22.83	1.26	11	1	11	1	10.45
07+50	60.12	0.19	77	1	88	3	85.57
07+79.85	89.74	0.00	83	0	171	3	168.29
08+00	117.29	0.00	77	0	248	3	245.53
08+04.85	111.54	0.00	21	0	269	3	266.10
08+29.85	91.06	0.24	94	0	363	3	359.77
08+50	70.96	0.33	60	0	423	3	419.95
09+00	137.19	5.13	193	5	616	10	606.37
09+08.37	101.30	43.91	37	8	653	19	633.84
BRIDGE							
10+59.65	49.44	169.66	277	951	930	1,207	-277.35
11+00	48.44	30.99	73	150	1,003	1,395	-391.62
11+28.5	48.27	33.12	51	34	1,054	1,437	-382.87
11+50	49.93	51.75	39	34	1,093	1,479	-386.01
11+53.5	50.32	52.51	7	7	1,100	1,488	-387.96
11+78.5	52.53	177.74	48	107	1,147	1,621	-473.59
12+00	60.45	42.48	45	88	1,192	1,731	-538.20
12+50	62.61	20.19	114	58	1,306	1,803	-496.80
12+75	0.00	0.00	29	9	1,335	1,815	-479.50

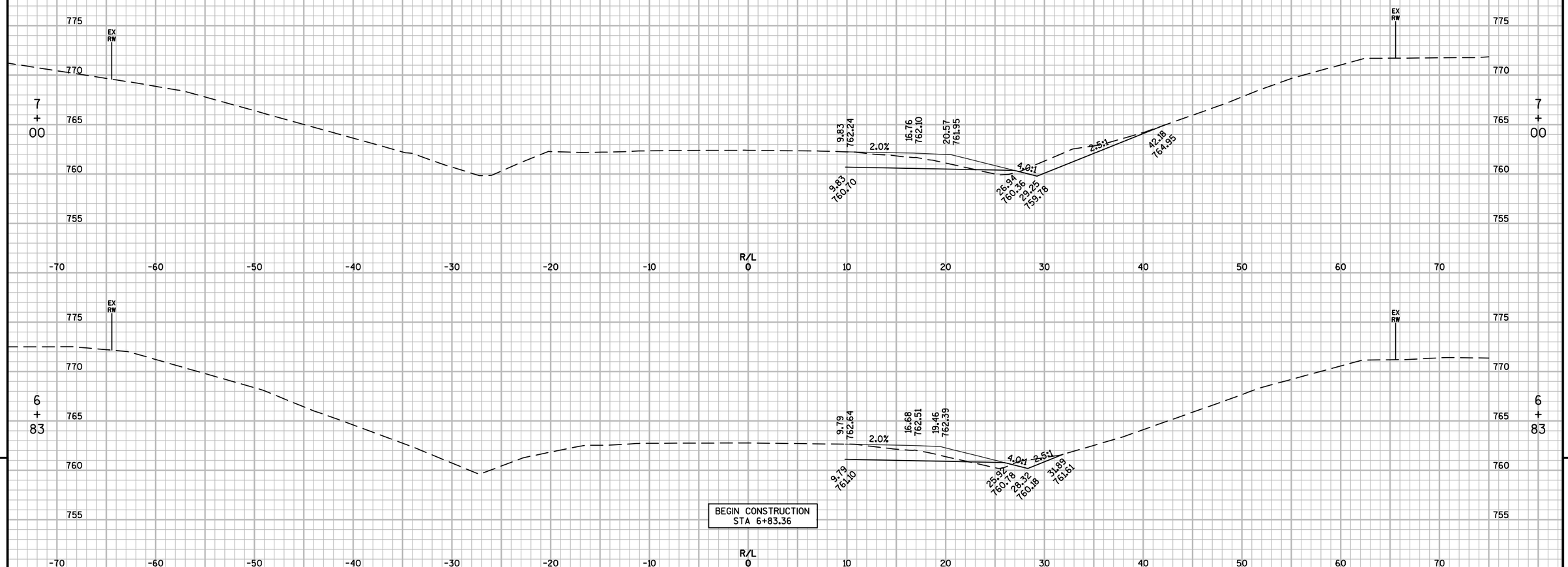
EARTHWORK - NORTH DRIVEWAY

STATION	AREA (SF)		Incremental Vol (CY) (Unadjusted)		Cumulative Vol (CY)		Mass Ordinate
	Cut	Fill	Cut	Fill	Cut 1.00	Expanded Fill 1.25	
20+00	0.00	0.00	0	0	0	0	0.00
20+35.11	0.00	0.00	0	0	0	0	0.00
20+50	6.39	4.46	2	1	2	2	0.23
21+00	0.00	10.50	6	14	8	19	-11.17
21+50	0.00	75.68	0	80	8	119	-110.92
22+00	0.00	59.54	0	125	8	275	-267.44

EARTHWORK - BERGENE LANE

STATION	AREA (SF)		Incremental Vol (CY) (Unadjusted)		Cumulative Vol (CY)		Mass Ordinate
	Cut	Fill	Cut	Fill	Cut 1.00	Expanded Fill 1.25	
99+99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100+00	19.84	0.00	0	0	0	0	0.37
100+25	32.92	0.00	24	0	25	0	24.79
100+50	35.78	0.00	32	0	57	0	56.60
100+75	52.73	0.15	41	0	98	0	97.48





9

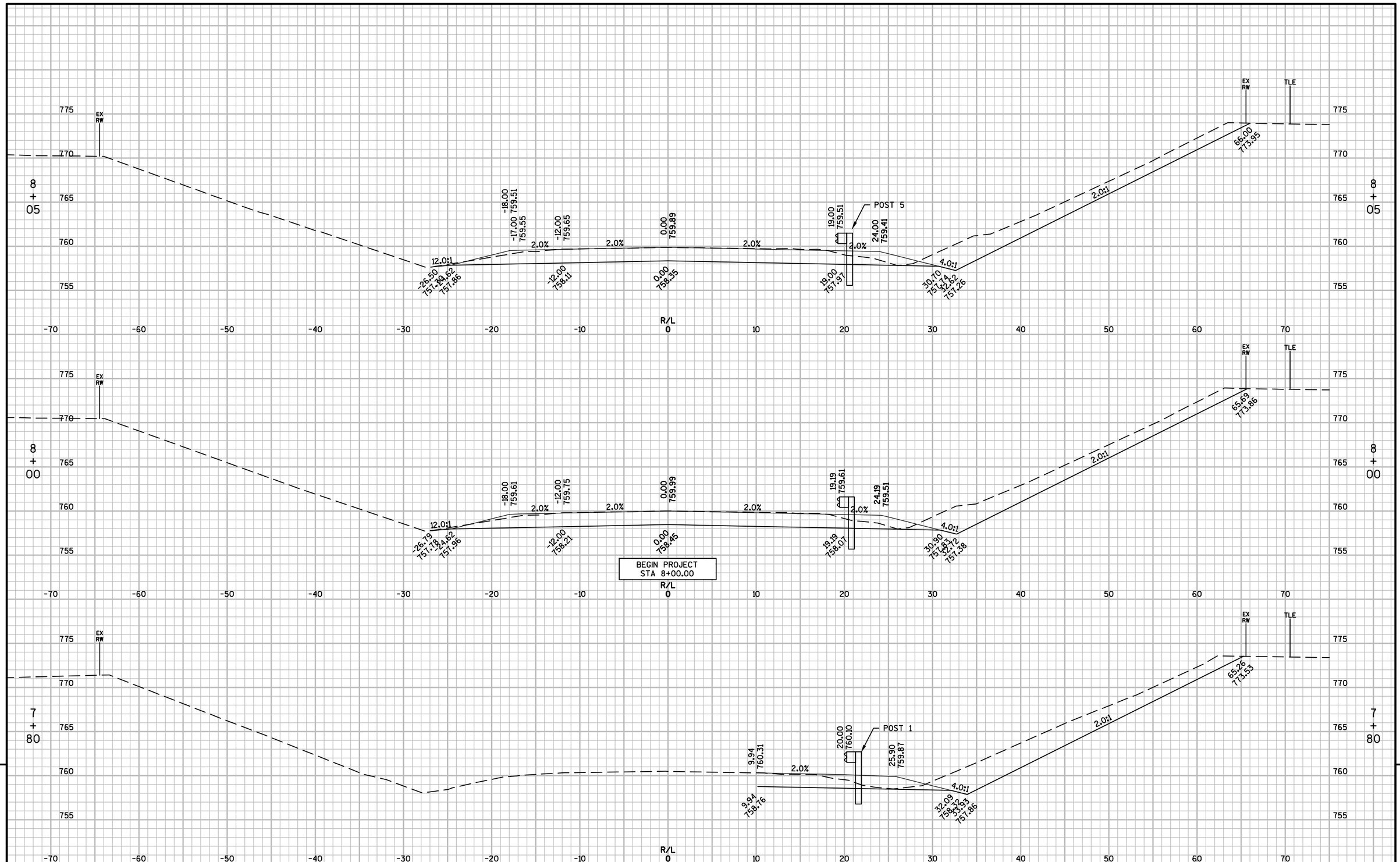
9

PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	CROSS SECTIONS: CTH S	SHEET 80	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-090101-XS.DWG
LAYOUT NAME - 43620271-090201-XS

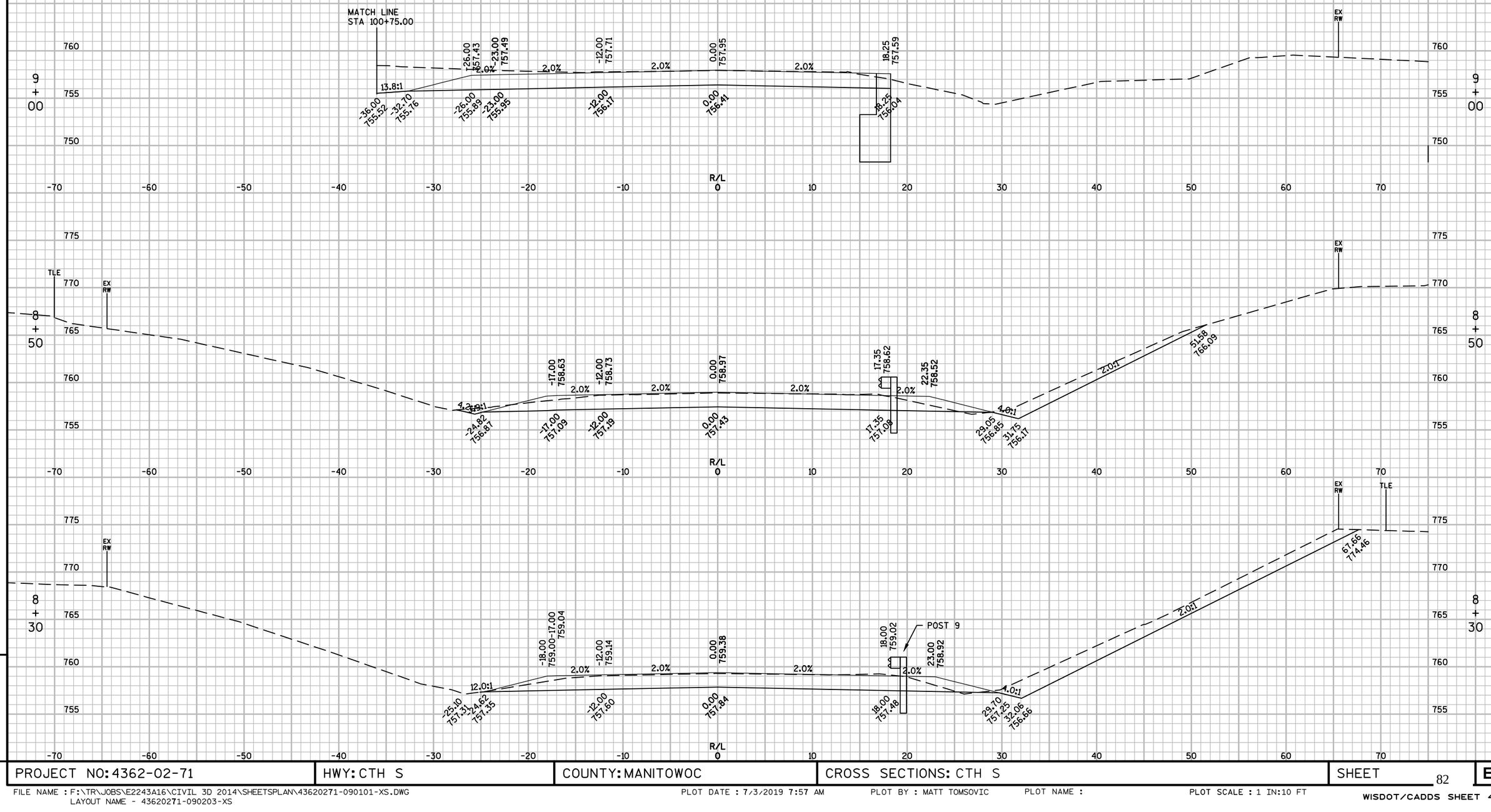
PLOT DATE : 7/3/2019 7:57 AM PLOT BY : MATT TOMSOVIC PLOT NAME : PLOT SCALE : 1 IN:10 FT

WISDOT/CADDS SHEET 49



PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	CROSS SECTIONS: CTH S	SHEET 81	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-090101-XS.DWG
LAYOUT NAME - 43620271-090202-XS
PLOT DATE : 7/3/2019 7:57 AM PLOT BY : MATT TOMSOVIC PLOT NAME : PLOT SCALE : 1 IN:10 FT
WISDOT/CADDS SHEET 49



PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	CROSS SECTIONS: CTH S	SHEET 82	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-090101-XS.DWG
LAYOUT NAME - 43620271-090203-XS
PLOT DATE : 7/3/2019 7:57 AM
PLOT BY : MATT TOMSOVIC
PLOT NAME :
PLOT SCALE : 1 IN:10 FT
WISDOT/CADDS SHEET 49

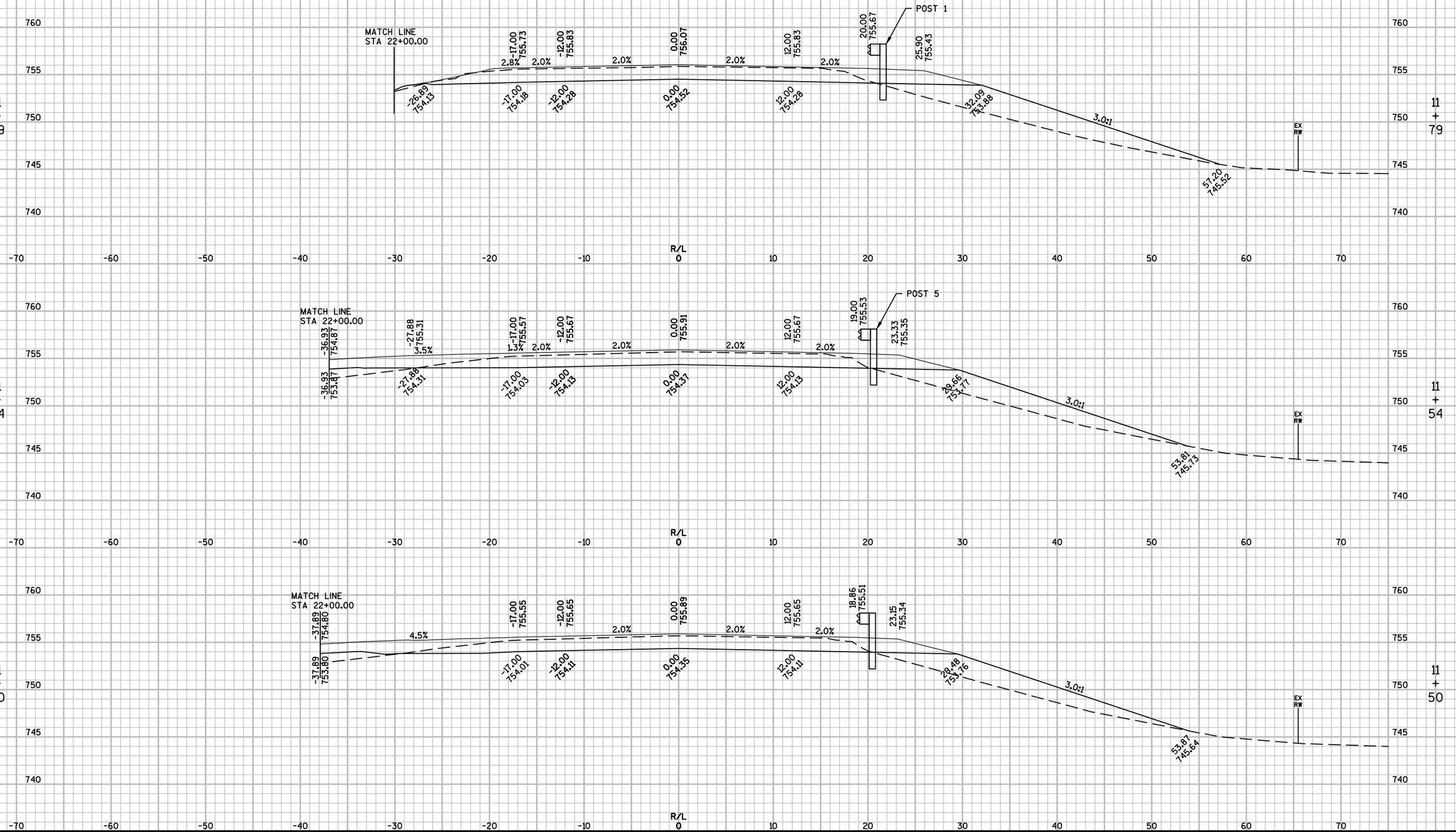
9

PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	CROSS SECTIONS: CTH S	SHEET 83	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-090101-XS.DWG
LAYOUT NAME - 43620271-090204-XS

PLOT DATE : 7/3/2019 7:57 AM PLOT BY : MATT TOMSOVIC PLOT NAME : PLOT SCALE : 1 IN:10 FT

WISDOT/CADDS SHEET 49



PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	CROSS SECTIONS: CTH S	SHEET 84	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-090101-XS.DWG
LAYOUT NAME - 43620271-090205-XS

PLOT DATE : 7/3/2019 7:57 AM PLOT BY : MATT TOMSOVIC PLOT NAME : PLOT SCALE : 1 IN:10 FT

WISDOT/CADDS SHEET 49

END CONSTUCTION
STA 12+75.00

END PROJECT
STA 12+50.00

12 + 75

EX RW

760
755
750
745

R/L
0

-70 -60 -50 -40 -30 -20 -10 10 20 30 40 50 60 70

-18.00 756.45
-14.98 756.57
-12.00 756.63
0.00 756.87
12.00 756.63
15.24 756.57
21.13 756.33
30.00 754.12
-33.35 752.62
-24.44 754.84
-12.00 755.09
0.00 755.33
12.00 755.09
27.32 754.19
44.90 749.15
4.0:1
3.0:1
2.0%

12 + 50

-18.00 755.87
-17.00 755.91
-12.00 756.01
0.00 756.25
12.00 756.01
17.68 755.90
24.46 755.63
-25.28 754.19
-24.62 754.22
-12.00 754.47
0.00 754.71
12.00 754.47
30.58 754.10
54.30 746.20
25.0:1
3.0:1
2.0%

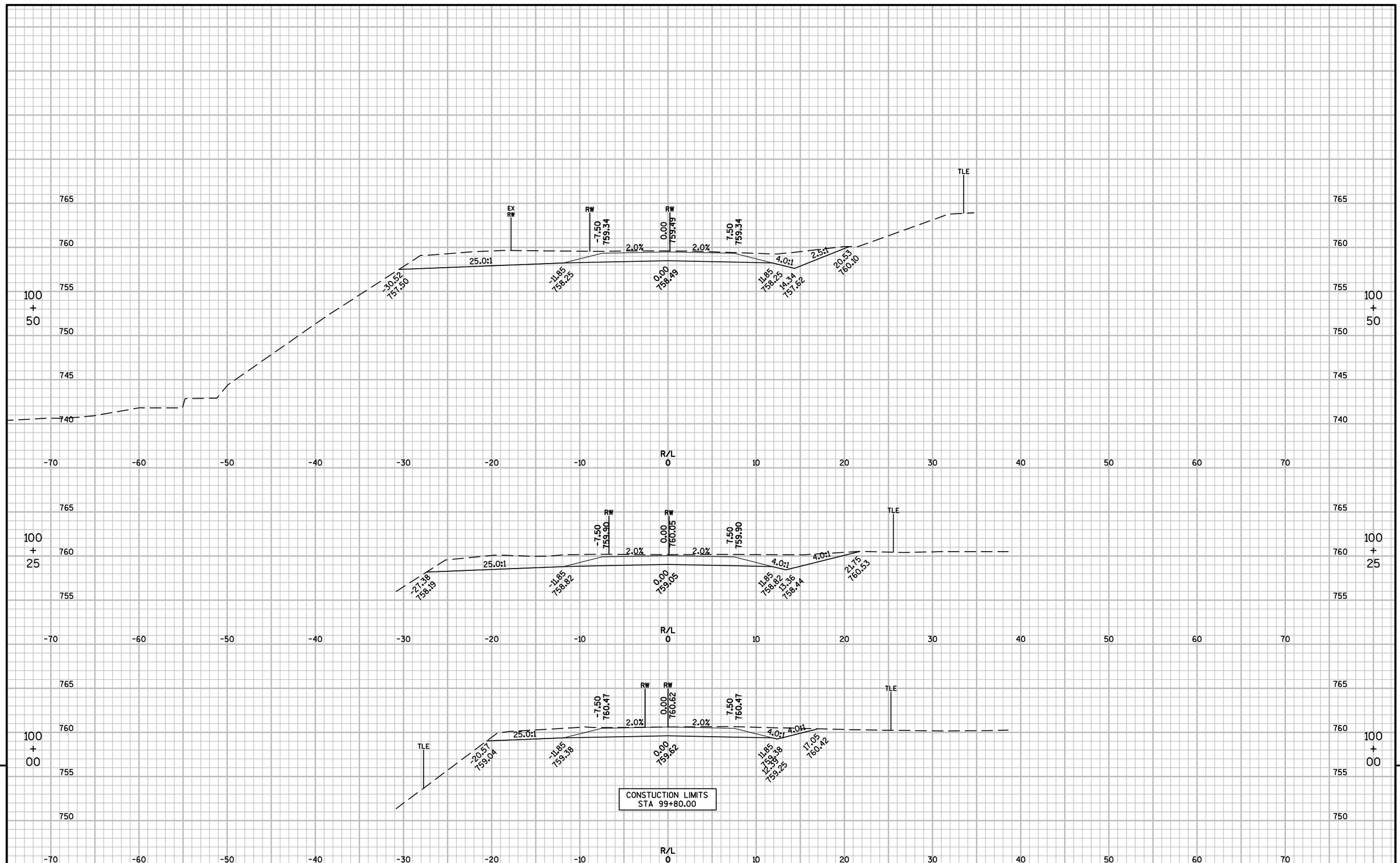
12 + 00

9

PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	CROSS SECTIONS: CTH S	SHEET 85	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-090101-XS.DWG
LAYOUT NAME - 43620271-090206-XS

PLOT DATE : 5/31/2019 11:03 AM PLOT BY : MATT TOMSOVIC PLOT NAME : PLOT SCALE : 1 IN:10 FT

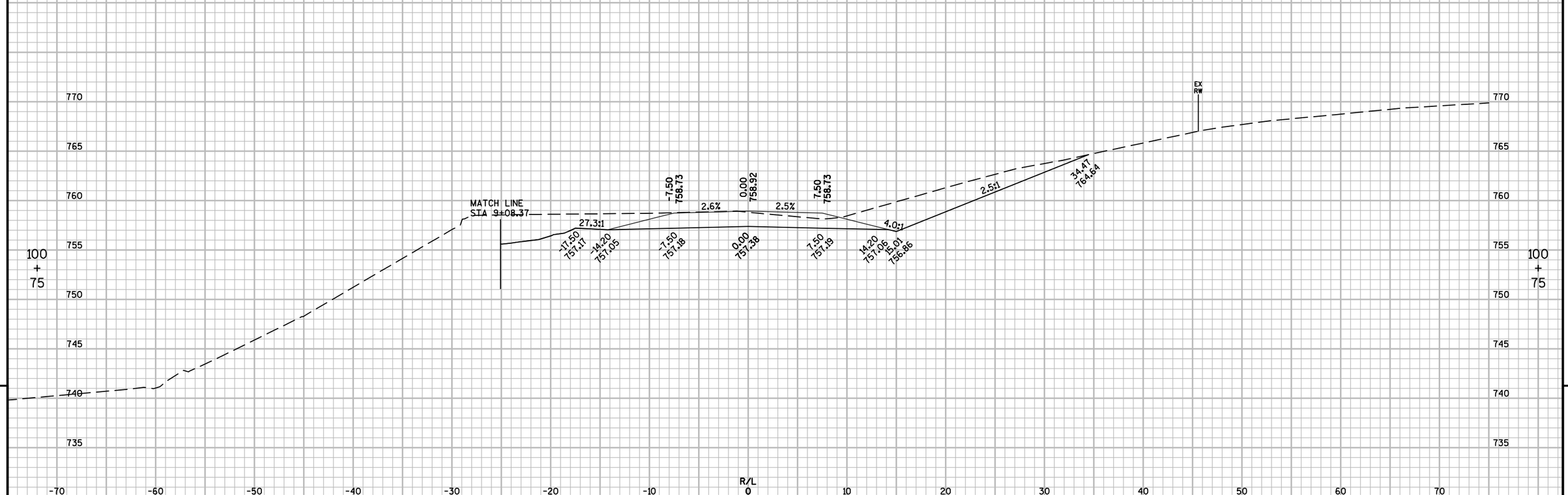


PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	CROSS SECTIONS: BERGENE LANE	SHEET 86	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-090101-XS.DWG
LAYOUT NAME - 43620271-090220-XS

PLOT DATE : 5/31/2019 11:03 AM PLOT BY : MATT TOMSOVIC PLOT NAME : PLOT SCALE : 1 IN:10 FT

WISDOT/CADDS SHEET 49



9

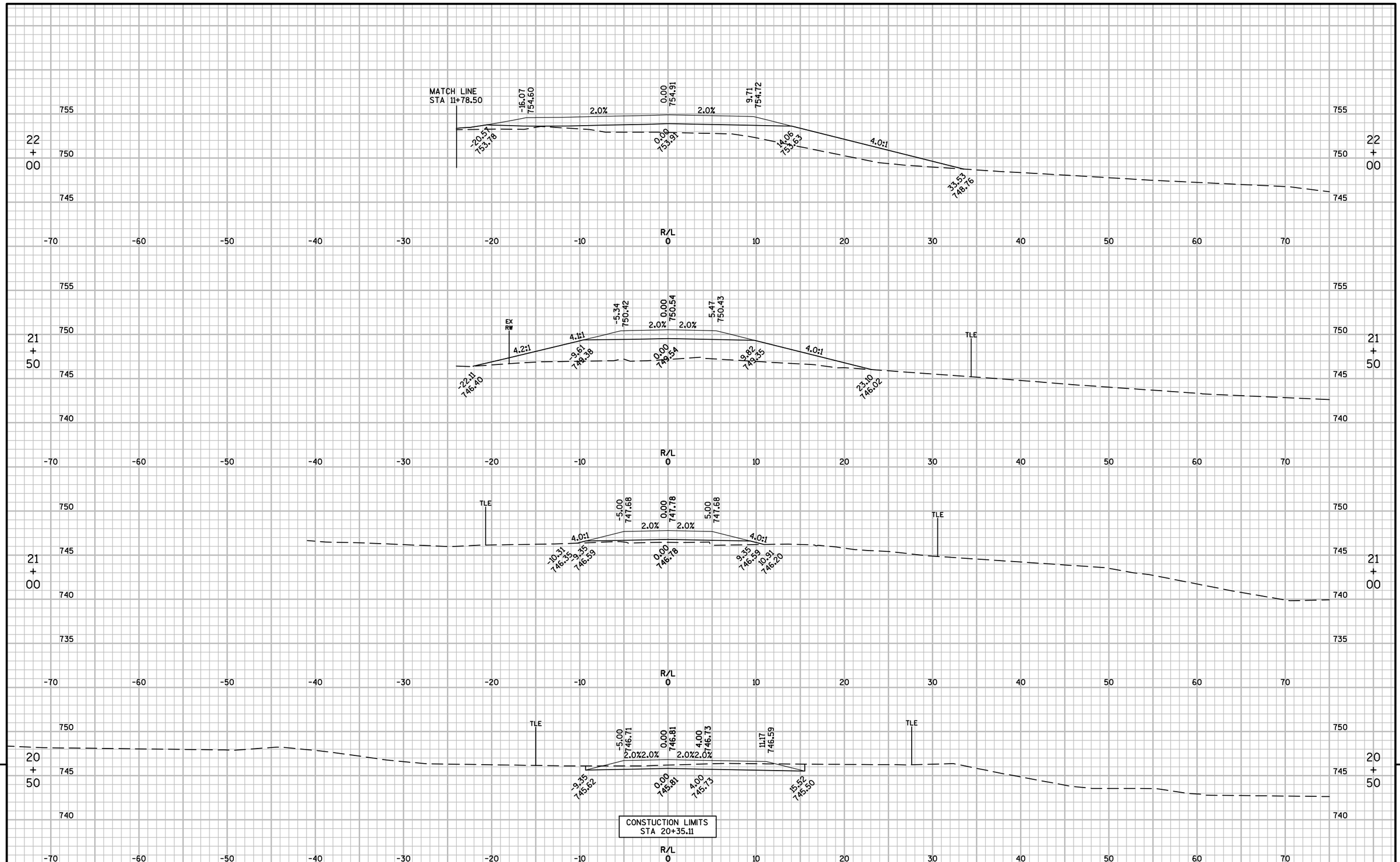
9

PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	CROSS SECTIONS: BERGENE LANE	SHEET 87	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-090101-XS.DWG
LAYOUT NAME - 43620271-090221-XS

PLOT DATE : 5/31/2019 11:03 AM PLOT BY : MATT TOMSOVIC PLOT NAME : PLOT SCALE : 1 IN:10 FT

WISDOT/CADDS SHEET 49



9

9

PROJECT NO: 4362-02-71	HWY: CTH S	COUNTY: MANITOWOC	CROSS SECTIONS: NORTH DRIVEWAY	SHEET 88	E

FILE NAME : F:\TR\JOBS\E2243A16\CIVIL 3D 2014\SHEETSPLAN\43620271-090101-XS.DWG
LAYOUT NAME - 43620271-090230-XS

PLOT DATE : 5/31/2019 11:03 AM PLOT BY : MATT TOMSOVIC PLOT NAME : PLOT SCALE : 1 IN:10 FT

WISDOT/CADDS SHEET 49

Notes

Wisconsin Department of Transportation

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