

SUP

MAY 2023

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
7900-00-70	WISC 2023399	1

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
 PLAN OF PROPOSED IMPROVEMENT
C RIVER FALLS, POWELL AVE
 KINNICKINNIC RIVER BRIDGE P-55-0148
LOC STR
ST. CROIX COUNTY

STATE PROJECT NUMBER
7900-00-70

ORDER OF SHEETS

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

TOTAL SHEETS = 92

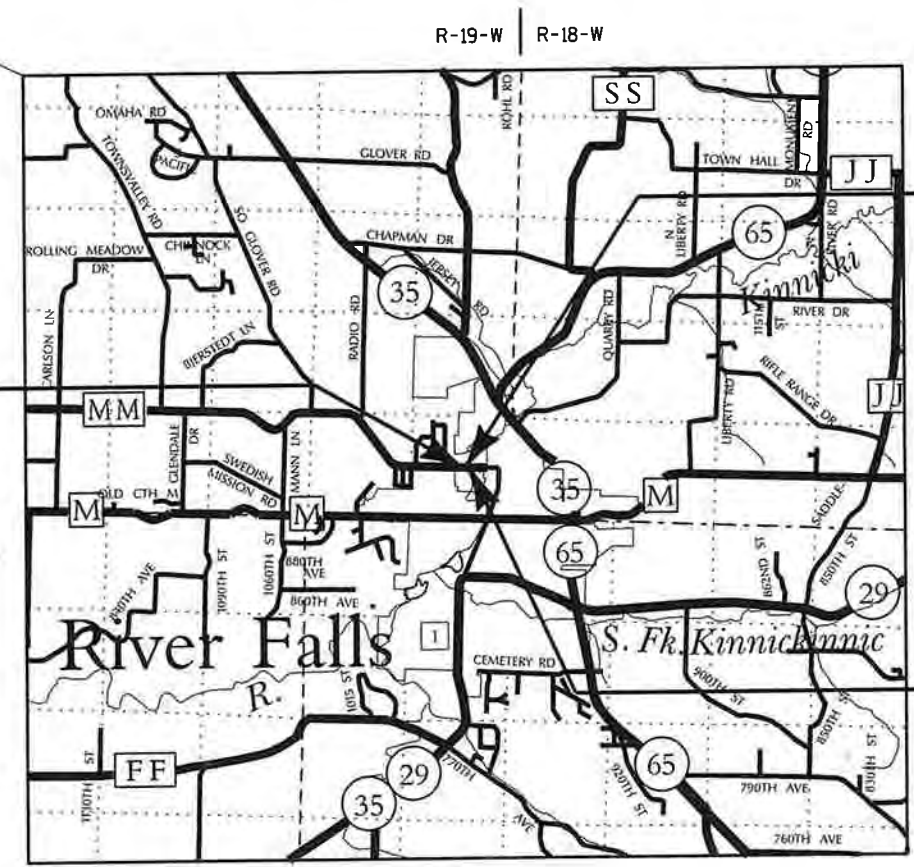
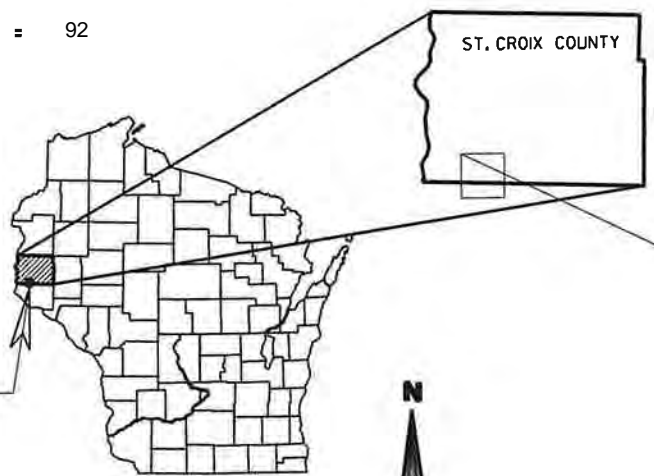
PROJECT ID: 7900-00-70
WITH: N/A

DESIGN DESIGNATION
28

- DESIGN DESIGNATION**
- A.A.D.T. (2023) = 2,700
 - A.A.D.T. (2043) = 3,640
 - D.H.V. = 270
 - D. = 50/50
 - T. = 5%
 - DESIGN SPEED = 40 MPH
 - ESALS =

CONVENTIONAL SYMBOLS PLAN

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

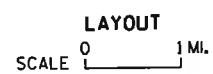


BEGIN PROJECT
STA. 17+52
 Y = 303977.75
 X = 544010.59

STRUCTURE P-55-0148

T-28-N ST. CROIX COUNTY
 T-27-N PIERCE COUNTY

END PROJECT
STA. 22+16
 Y = 303994.35
 X = 544474.20



TOTAL NET LENGTH OF CENTERLINE = 0.088 MI.

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COORDINATE REFERENCE SYSTEM (WISCRS), ST. CROIX COUNTY, NAD83 (2011), IN U.S. SURVEY FEET. POSITIONS SHOWN ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES ARE THE SAME AS GROUND DISTANCES. ELEVATIONS ARE REFERENCED TO NAVD88 (2012). GPS DERIVED ELEVATIONS ARE BASED ON GEOID 12A.

ACCEPTED FOR
 City of River Falls
 1-25-2023
 Date
 [Signature]
 City Engineer

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

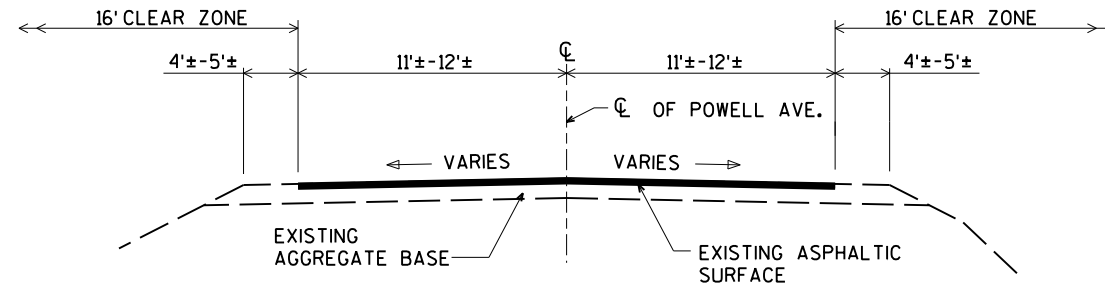
DANIEL N. SYDOW
 E-38363
 WI
 01/25/2023
 DATE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY
 Surveyor AYRES ASSOCIATES INC
 Designer AYRES ASSOCIATES INC
 PROJECT MANAGER PAULA GROOM, PE
 Regional Examiner TOU YANG, PE
 Regional Supervisor TYLER RONGSTAD, PE

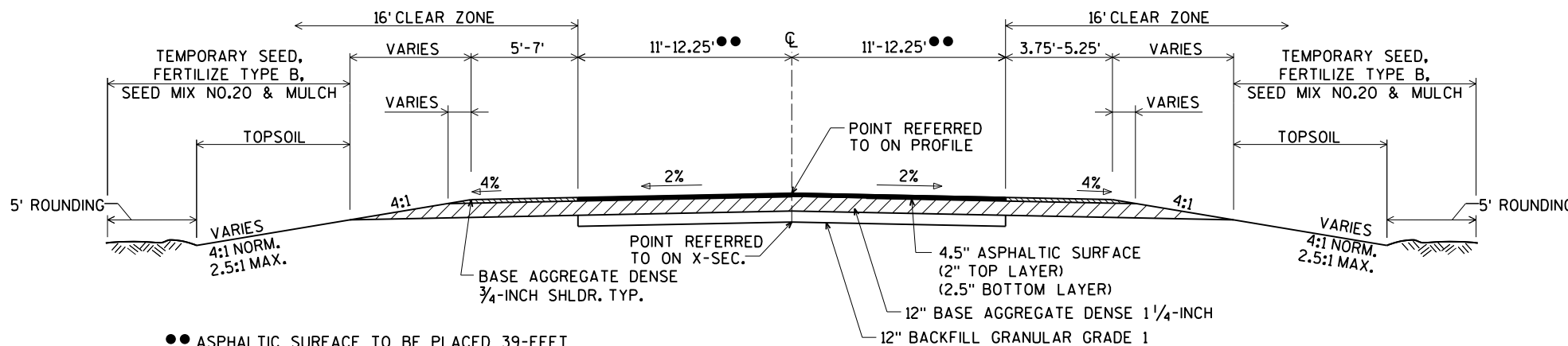
APPROVED FOR THE DEPARTMENT
 DATE: 1/30/2023
 [Signature]
 (Signature)

E



EXISTING TYPICAL SECTION

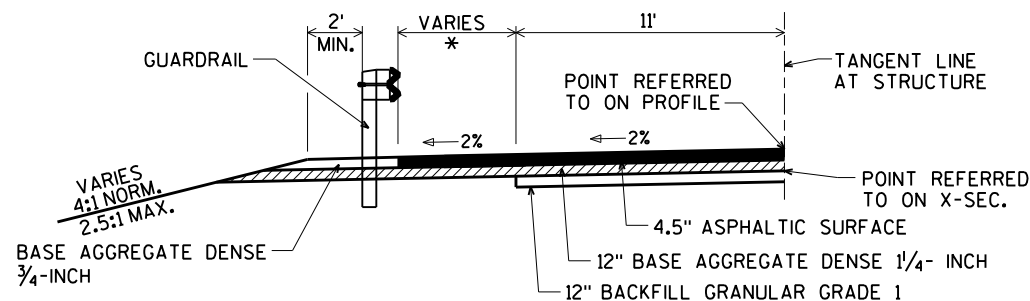
STA. 17+52 - STA. 22+16



- ASPHALTIC SURFACE TO BE PLACED 39- FEET WIDE AT THE ENDS OF BRIDGE AND FOLLOW THE FACE OF GUARDRAIL AND TAPER TO MATCH INTO EXISTING AT THE ENDS OF THE PROJECT

FINISHED TYPICAL SECTION

STA. 17+52 - STA. 19+24.55
STA. 20+73.12 - STA. 22+16



TYPICAL FINISHED HALF SECTION WITH GUARDRAIL

* 8.5' MIN (AT END OF BRIDGE)
10.5' MAX (AT END TERMINAL)

WISCONSIN DEPARTMENT OF NATURAL RESOURCES CONTACT:

AMY LESIK
1300 WEST HILLS CLAIREMONT AVENUE
EAU CLAIRE, WI 54701
715-495-1903
amy.l.lesik@wisconsin.gov

DESIGNER

AYRES ASSOCIATES
3433 OAKWOOD HILLS PARKWAY
EAU CLAIRE, WI 54701
ATTN: DANIEL N. SYDOW
715-834-3161
sydowd@AyresAssociates.com

CITY CONTACT:

CITY OF RIVER FALLS ENGINEER
222 LEWIS STREET
RIVER FALLS, WI 54022
ATTN: TODD NICKLESKI, PE
715-426-3409
tnickleski@RFCITY.ORG

GENERAL NOTES

EROSION CONTROL ITEMS TO BE PLACED AS SHOWN ON THE PLAN OR AS DIRECTED BY THE ENGINEER.

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

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

DISTURBED AREAS WITHIN THE RIGHT-OF-WAY, EXCLUSIVE OF THE ROADBED, SHALL BE FERTILIZED, SEED, AND MULCHED AS DIRECTED BY THE ENGINEER.

WHEN THE QUANTITY OF THE ITEM OF BASE AGGREGATE DENSE IS MEASURED FOR PAYMENT BY THE TON, THE DEPTH OR THICKNESS OF THE LAYER SHOWN ON THE PLANS IS APPROXIMATE AND THE ACTUAL THICKNESS WILL DEPEND ON THE DISTRIBUTION OF THE MATERIAL AS DIRECTED BY THE ENGINEER.

ASPHALTIC REMOVAL IS INCLUDED IN THE ITEM EXCAVATION COMMON.

TOPSOIL SHALL BE PLACED ON THE SLOPES, TO THE POINT OF INTERCEPT WITH THE ORIGINAL GROUND SHOWN ON THE CROSS SECTIONS.

THE DEPARTMENT OF TRANSPORTATION WILL FURNISH THE CONTRACTOR WITH A MONUMENT TO BE INSTALLED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER.

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

ASPHALT SURFACE SHALL USE 1/2" NOMINAL AGGREGATE SIZE.

WETLANDS EXIST IN THE PROJECT AREA. NO DISTURBANCE IS ALLOWED OUTSIDE THE SLOPE INTERCEPTS.

UTILITIES

COMCAST
4255 LEXINGTON AVENUE N.
SUITE 100
ARDEN HILLS, MN 55126
ATTN: BEN UELAND
651-493-5158
612-462-7911 (CELL)
benjamin_ueland@comcast.com

AT&T
304 S. DEWEY STREET
EAU CLAIRE, WI 54701
ATTN: RICK PODOLAK
715-839-5565
715-410-0565 (CELL)
RP514@att.com

BALDWIN TELECOM, INC.
930 MAPLE STREET
BALDWIN, WI 54002
ATTN: MATT KNEGENDORF
715-688-1034
715-760-0968 (CELL)
mknegendorf@lswi.net

RIVER FALLS MUNICIPAL UTILITY
222 LEWIS STREET
RIVER FALLS, WI 54022
(ELECTRIC)
ATTN: WAYNE SIVERLING
715-426-3480
715-495-6317 (CELL)
wsiverling@rfcity.org
(SANITARY SEWER & WATER)
ATTN: RON GROTH
715-426-3428
rgroth@rfcity.org

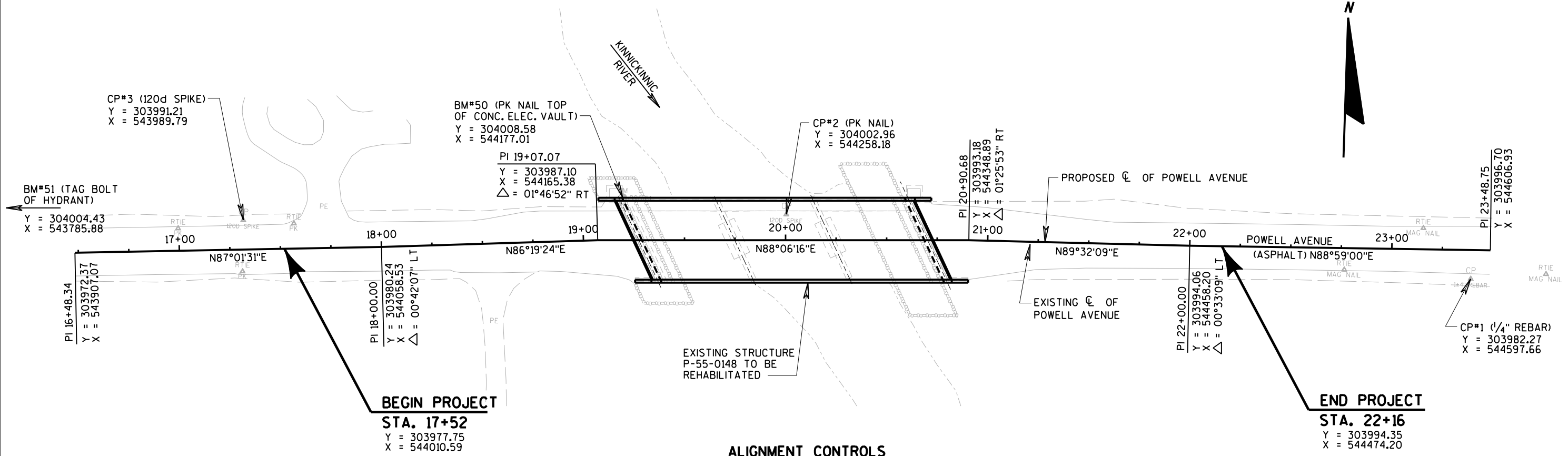
ST. CROIX VALLEY NATURAL GAS
415 S. SECOND STREET
RIVER FALLS, WI 54022
ATTN: GREG LEE
715-425-6177
715-760-5038 (CELL)
greg@stcroixgas.com
24 HR EMERGENCY CONTACTS:
GREG LEE - 715-760-5038
MARK HAUENSTEIN - 715-760-5182

* * DENOTES UTILITIES THAT ARE NOT DIGGERS HOTLINE MEMBERS

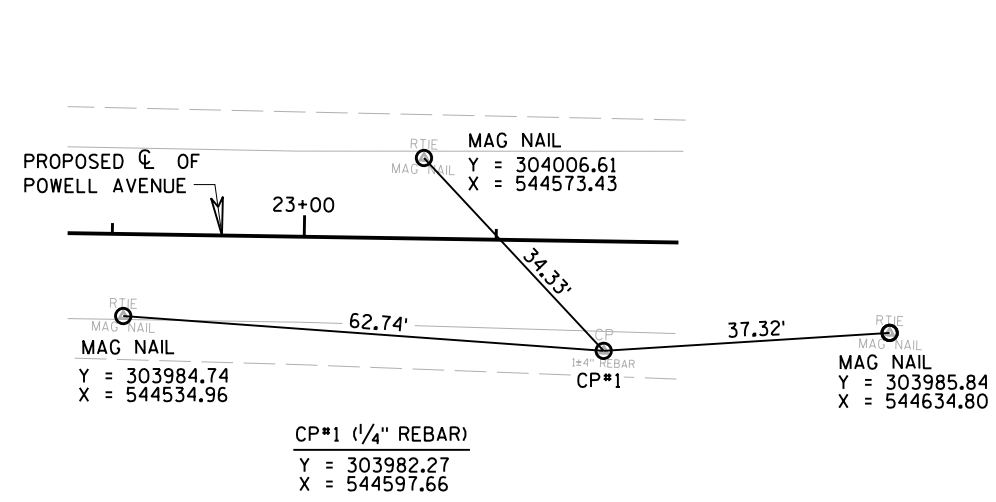
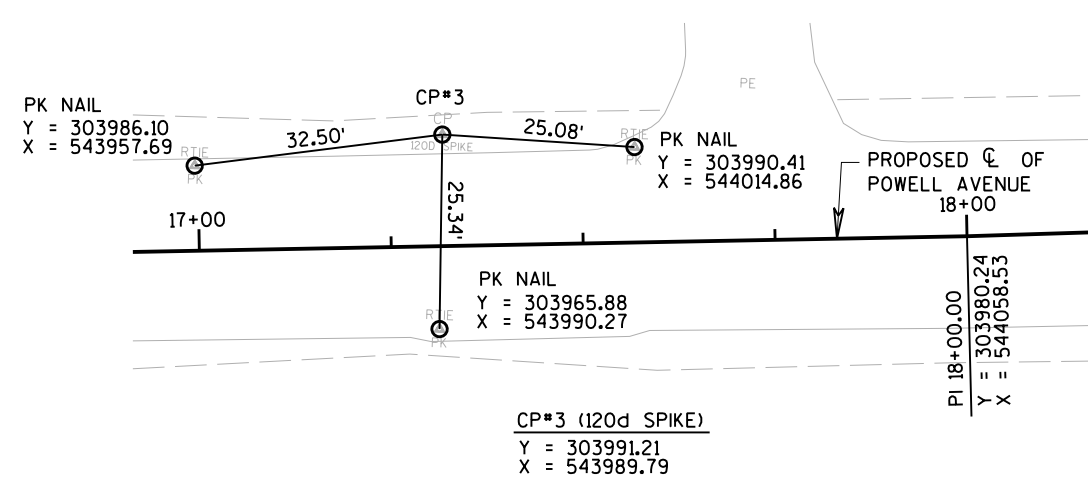


Dial 811 or (800)242-8511

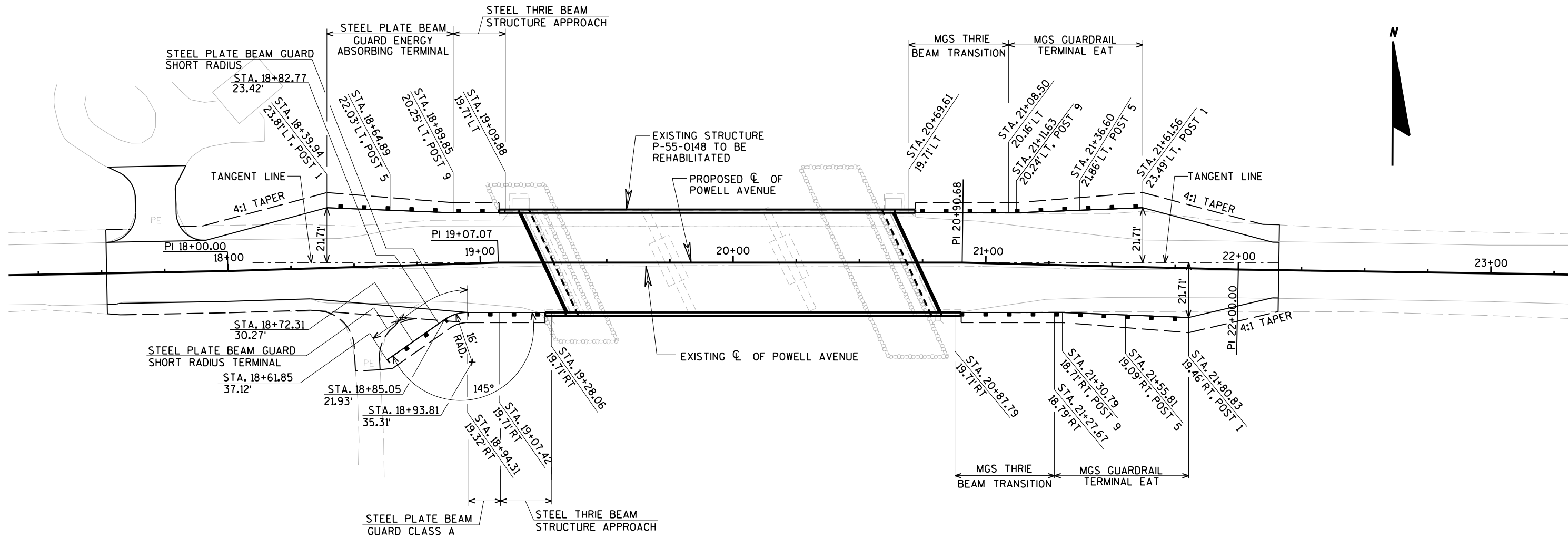
www.DiggersHotline.com



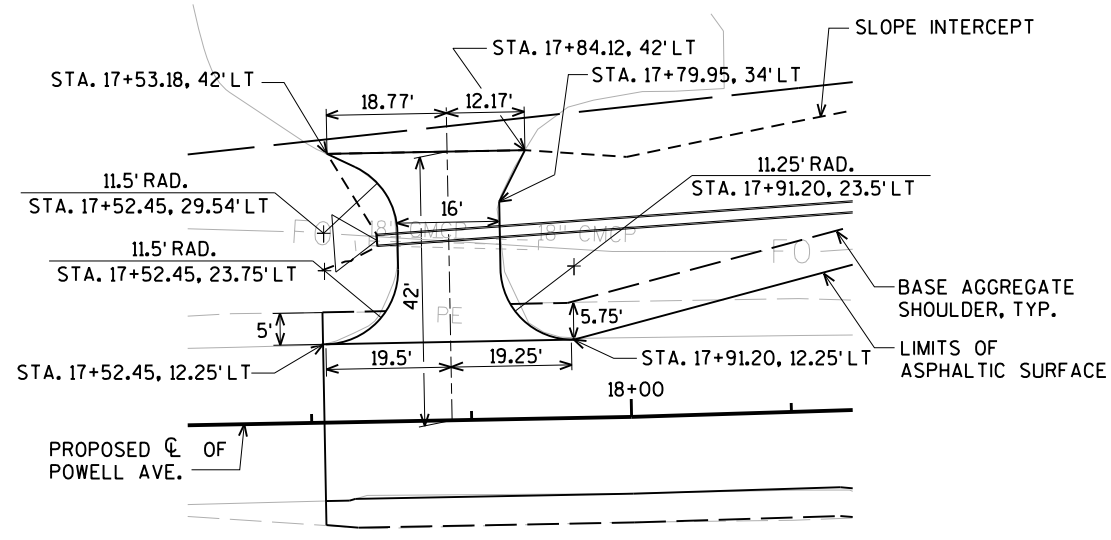
ALIGNMENT CONTROLS



ALIGNMENT TIES

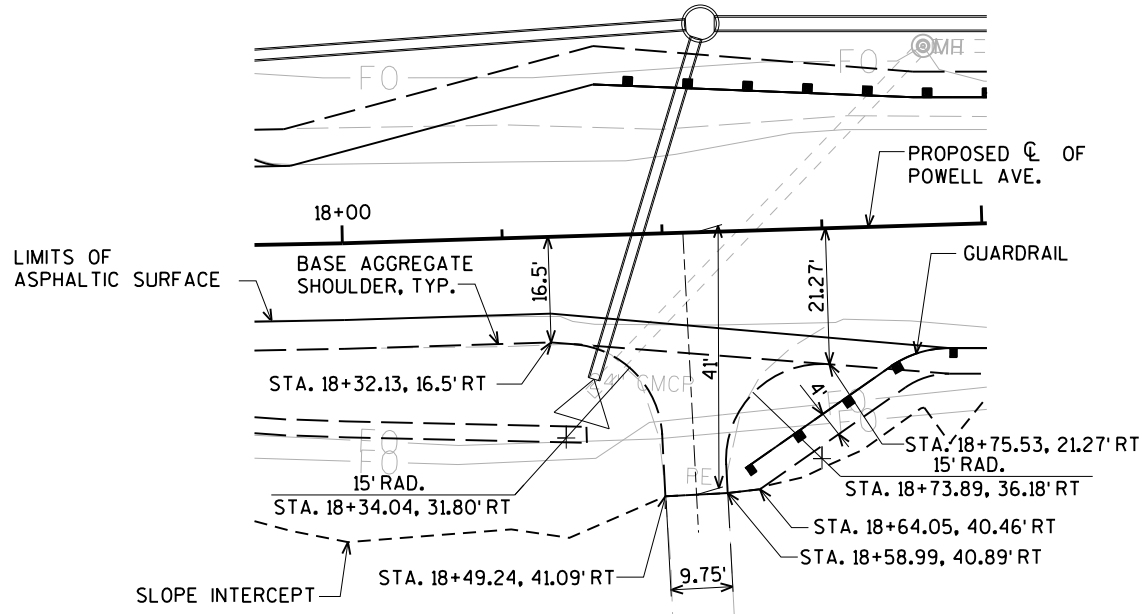


GUARDRAIL LAYOUT

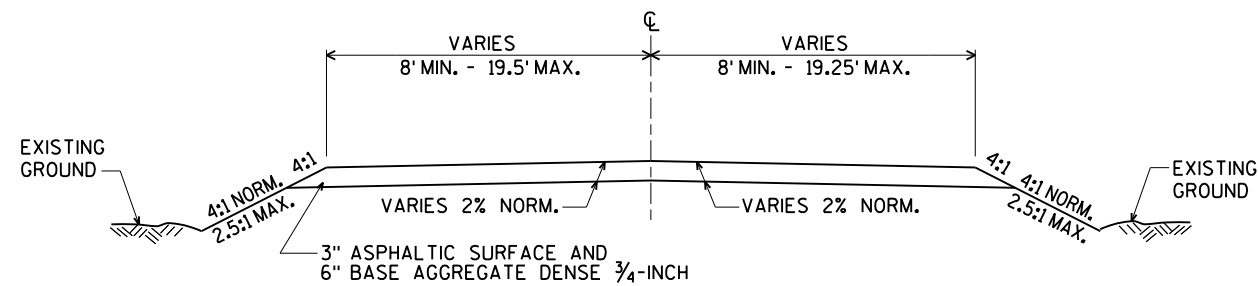


PLAN
STA. 17+71.95, LT

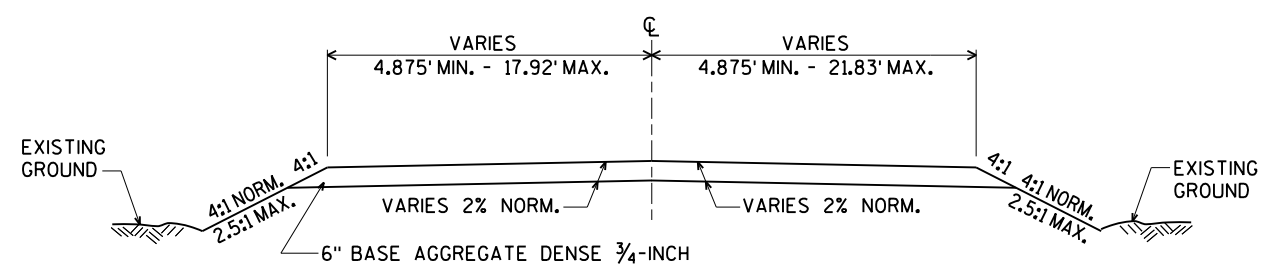
NOTE:
SEE STORM SEWER
SHEET FOR PIPE INFORMATION



PLAN
STA. 18+54.12, RT

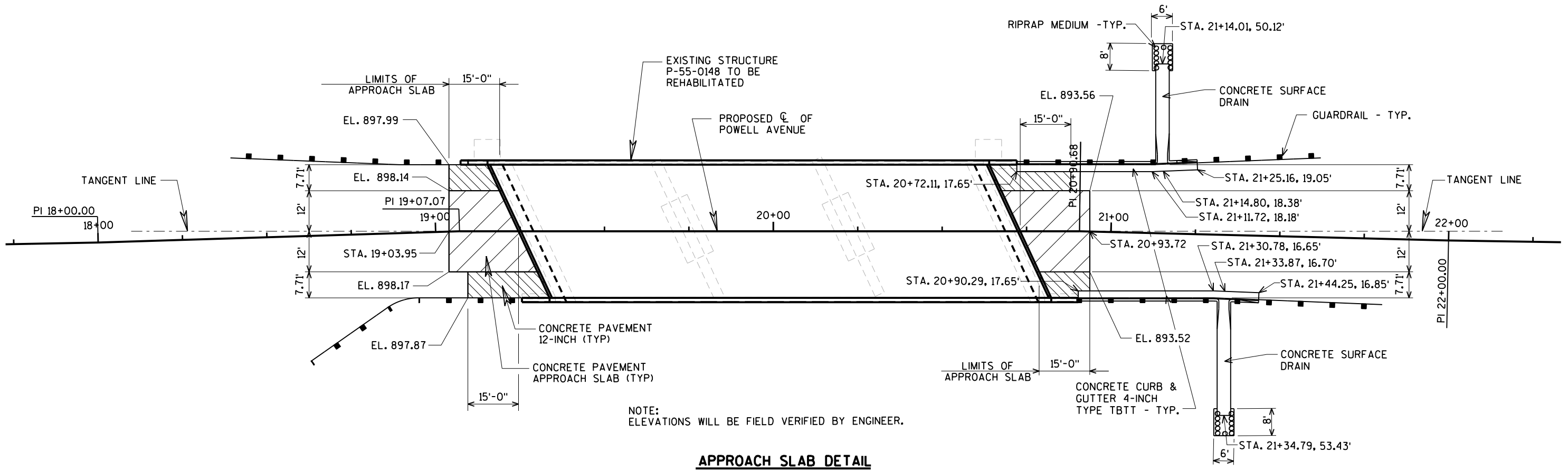


TYPICAL CROSS SECTION
STA. 17+71.95, LT

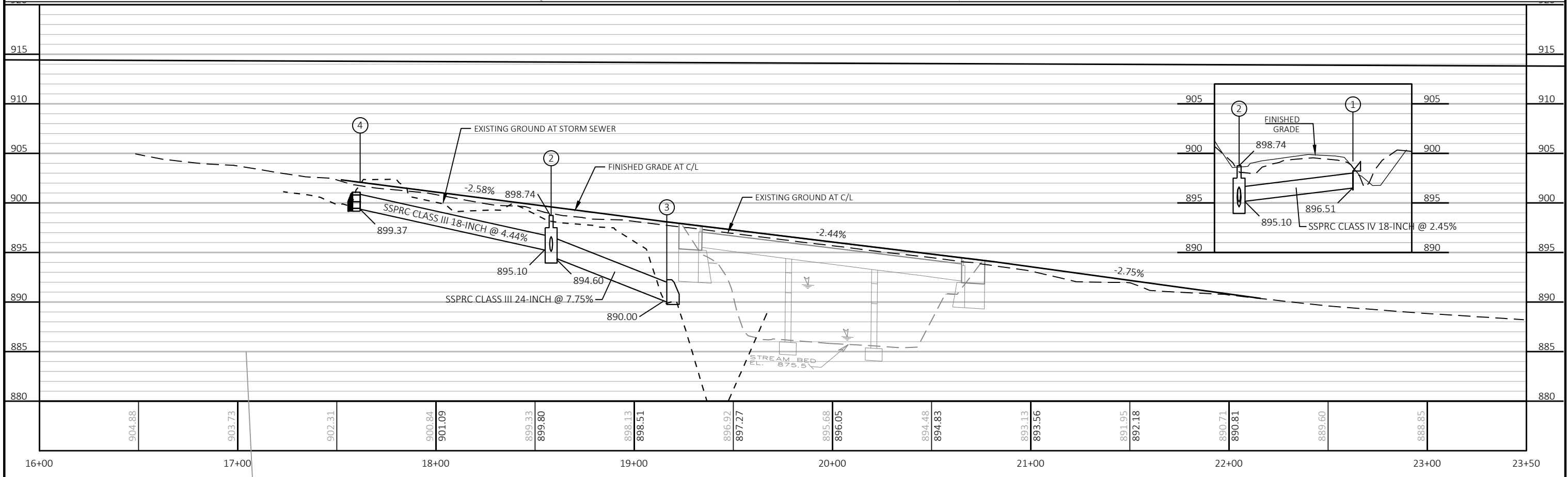
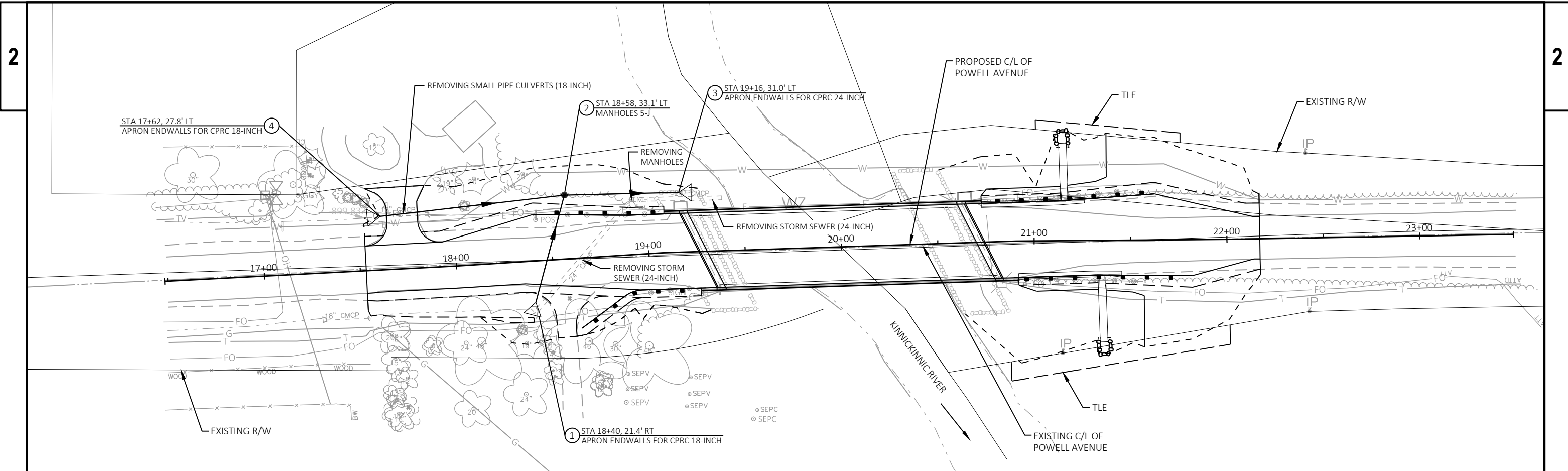


TYPICAL CROSS SECTION
STA. 18+54.12, RT

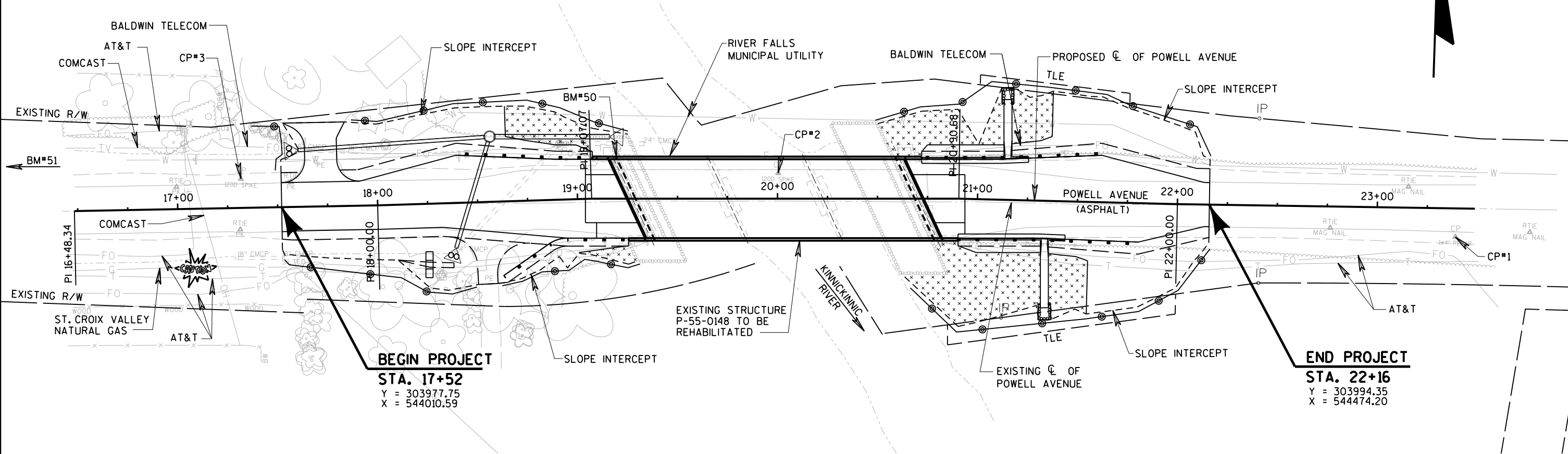
PRIVATE ENTRANCE DETAILS



APPROACH SLAB DETAIL



PROJECT NO:	7900-00-70	HWY:	POWELL AVENUE	COUNTY:	ST. CROIX	STORM SEWER	SHEET	E
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BEGIN PROJECT
STA. 17+52
 Y = 303977.75
 X = 544010.59

END PROJECT
STA. 22+16
 Y = 303994.35
 X = 544474.20

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

- LEGEND**
- ⊗ ⊗ ⊗ EROSION MAT CLASS II TYPE C
 - ⊙ ⊙ ⊙ SILT FENCE
 - ▤▤▤ TEMPORARY DITCH CHECKS
 - ▨▨▨ RIPRAP MEDIUM
 - ∞ ∞ ∞ CULVERT PIPE CHECKS

TOTAL PROJECT AREA = 1.111 ACRES
 TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 0.818 ACRES

Estimate Of Quantities

7900-00-70

Line	Item	Item Description	Unit	Total	Qty
0002	201.0205	Grubbing	STA	5.000	5.000
0004	203.0100	Removing Small Pipe Culverts	EACH	1.000	1.000
0006	203.0211.S	Abatement of Asbestos Containing Material (structure) 01. P-55-148	EACH	1.000	1.000
0008	203.0260	Removing Structure Over Waterway Minimal Debris (structure) 01. P-55-148	EACH	1.000	1.000
0010	204.0165	Removing Guardrail	LF	235.000	235.000
0012	204.0210	Removing Manholes	EACH	1.000	1.000
0014	204.0245	Removing Storm Sewer (size) 01. 24-INCH	LF	155.000	155.000
0016	205.0100	Excavation Common	CY	1,000.000	1,000.000
0018	206.1001	Excavation for Structures Bridges (structure) 01. P-55-148	EACH	1.000	1.000
0020	209.1500	Backfill Granular Grade 1	TON	745.000	745.000
0022	210.1500	Backfill Structure Type A	TON	130.000	130.000
0024	213.0100	Finishing Roadway (project) 01. 7900-00-70	EACH	1.000	1.000
0026	305.0110	Base Aggregate Dense 3/4-Inch	TON	90.000	90.000
0028	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	1,015.000	1,015.000
0030	415.0120	Concrete Pavement 12-Inch	SY	60.000	60.000
0032	415.0410	Concrete Pavement Approach Slab	SY	120.000	120.000
0034	416.1010	Concrete Surface Drains	CY	6.000	6.000
0036	455.0605	Tack Coat	GAL	145.000	145.000
0038	465.0105	Asphaltic Surface	TON	270.000	270.000
0040	502.0100	Concrete Masonry Bridges	CY	195.600	195.600
0042	502.3200	Protective Surface Treatment	SY	645.000	645.000
0044	502.3210	Pigmented Surface Sealer	SY	65.000	65.000
0046	502.4204	Adhesive Anchors No. 4 Bar	EACH	140.000	140.000
0048	502.4205	Adhesive Anchors No. 5 Bar	EACH	188.000	188.000
0050	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	59,520.000	59,520.000
0052	506.2605	Bearing Pads Elastomeric Non-Laminated	EACH	6.000	6.000
0054	506.2610	Bearing Pads Elastomeric Laminated	EACH	6.000	6.000
0056	506.4000	Steel Diaphragms (structure) 01. P-55-148	EACH	15.000	15.000
0058	506.7050.S	Removing Bearings (structure) 01. P-55-148	EACH	12.000	12.000
0060	509.1500	Concrete Surface Repair	SF	100.000	100.000
0062	513.7006	Railing Steel Type C1	LF	327.200	327.200
0064	516.0500	Rubberized Membrane Waterproofing	SY	20.000	20.000
0066	517.1015.S	Concrete Staining Multi-Color (structure) 01. P-55-148	SF	880.000	880.000
0068	517.1050.S	Architectural Surface Treatment (structure) 01. P-55-148	SF	880.000	880.000
0070	522.1018	Apron Endwalls for Culvert Pipe Reinforced Concrete 18-Inch	EACH	2.000	2.000
0072	522.1024	Apron Endwalls for Culvert Pipe Reinforced Concrete 24-Inch	EACH	1.000	1.000
0074	601.0588	Concrete Curb & Gutter 4-Inch Sloped 36-Inch Type TBT	LF	108.000	108.000
0076	606.0200	Riprap Medium	CY	10.000	10.000
0078	608.0318	Storm Sewer Pipe Reinforced Concrete Class III 18-Inch	LF	96.000	96.000
0080	608.0324	Storm Sewer Pipe Reinforced Concrete Class III 24-Inch	LF	60.000	60.000
0082	608.0418	Storm Sewer Pipe Reinforced Concrete Class IV 18-Inch	LF	58.000	58.000
0084	611.0530	Manhole Covers Type J	EACH	1.000	1.000
0086	611.2005	Manholes 5-FT Diameter	EACH	1.000	1.000
0088	612.0406	Pipe Underdrain Wrapped 6-Inch	LF	160.000	160.000
0090	614.0150	Anchor Assemblies for Steel Plate Beam Guard	EACH	4.000	4.000
0092	614.0200	Steel Thrie Beam Structure Approach	LF	42.000	42.000
0094	614.0305	Steel Plate Beam Guard Class A	LF	12.500	12.500
0096	614.0345	Steel Plate Beam Guard Short Radius	LF	25.000	25.000
0098	614.0370	Steel Plate Beam Guard Energy Absorbing Terminal	EACH	1.000	1.000

Estimate Of Quantities

7900-00-70

Line	Item	Item Description	Unit	Total	Qty
0100	614.0390	Steel Plate Beam Guard Short Radius Terminal	EACH	1.000	1.000
0102	614.2500	MGS Thrie Beam Transition	LF	80.000	80.000
0104	614.2610	MGS Guardrail Terminal EAT	EACH	2.000	2.000
0106	618.0100	Maintenance And Repair of Haul Roads (project) 01. 7900-00-70	EACH	1.000	1.000
0108	619.1000	Mobilization	EACH	1.000	1.000
0110	623.0200	Dust Control Surface Treatment	SY	1,640.000	1,640.000
0112	624.0100	Water	MGAL	11.000	11.000
0114	625.0100	Topsoil	SY	1,525.000	1,525.000
0116	627.0200	Mulching	SY	1,770.000	1,770.000
0118	628.1504	Silt Fence	LF	905.000	905.000
0120	628.1520	Silt Fence Maintenance	LF	2,715.000	2,715.000
0122	628.1905	Mobilizations Erosion Control	EACH	4.000	4.000
0124	628.1910	Mobilizations Emergency Erosion Control	EACH	4.000	4.000
0126	628.2027	Erosion Mat Class II Type C	SY	700.000	700.000
0128	628.7504	Temporary Ditch Checks	LF	12.500	12.500
0130	628.7555	Culvert Pipe Checks	EACH	4.000	4.000
0132	629.0210	Fertilizer Type B	CWT	1.600	1.600
0134	630.0120	Seeding Mixture No. 20	LB	69.000	69.000
0136	630.0200	Seeding Temporary	LB	69.000	69.000
0138	630.0500	Seed Water	MGAL	55.000	55.000
0140	634.0614	Posts Wood 4x6-Inch X 14-FT	EACH	4.000	4.000
0142	637.2210	Signs Type II Reflective H	SF	25.000	25.000
0144	637.2230	Signs Type II Reflective F	SF	12.000	12.000
0146	638.2602	Removing Signs Type II	EACH	7.000	7.000
0148	638.3000	Removing Small Sign Supports	EACH	5.000	5.000
0150	642.5001	Field Office Type B	EACH	1.000	1.000
0152	643.0420	Traffic Control Barricades Type III	DAY	1,980.000	1,980.000
0154	643.0705	Traffic Control Warning Lights Type A	DAY	3,080.000	3,080.000
0156	643.0900	Traffic Control Signs	DAY	1,540.000	1,540.000
0158	643.5000	Traffic Control	EACH	1.000	1.000
0160	645.0111	Geotextile Type DF Schedule A	SY	80.000	80.000
0162	645.0120	Geotextile Type HR	SY	20.000	20.000
0164	646.1020	Marking Line Epoxy 4-Inch	LF	1,856.000	1,856.000
0166	650.4000	Construction Staking Storm Sewer	EACH	6.000	6.000
0168	650.4500	Construction Staking Subgrade	LF	316.000	316.000
0170	650.5000	Construction Staking Base	LF	316.000	316.000
0172	650.5500	Construction Staking Curb Gutter and Curb & Gutter	LF	108.000	108.000
0174	650.6501	Construction Staking Structure Layout (structure) 01. P-55-148	EACH	1.000	1.000
0176	650.7000	Construction Staking Concrete Pavement	LF	74.000	74.000
0178	650.9911	Construction Staking Supplemental Control (project) 01. 7900-00-70	EACH	1.000	1.000
0180	650.9920	Construction Staking Slope Stakes	LF	316.000	316.000
0182	690.0150	Sawing Asphalt	LF	78.000	78.000
0184	715.0502	Incentive Strength Concrete Structures	DOL	1,173.600	1,173.600
0186	715.0720	Incentive Compressive Strength Concrete Pavement	DOL	500.000	500.000
0188	999.2005.S	Maintaining Bird Deterrent System (station) 01. 19+98.83	EACH	1.000	1.000
0190	ASP.1T0A	On-the-Job Training Apprentice at \$5.00/HR	HRS	300.000	300.000
0192	ASP.1T0G	On-the-Job Training Graduate at \$5.00/HR	HRS	300.000	300.000
0194	SPV.0060	Special 01. Supply and Install Threaded Inserts for Conduit Pack (AT&T)	EACH	1.000	1.000
0196	SPV.0060	Special 02. Supply and Install Threaded Inserts for Conduit Pack (Baldwin Telecom)	EACH	1.000	1.000

Estimate Of Quantities

7900-00-70

Line	Item	Item Description	Unit	Total	Qty
0198	SPV.0060	Special 03. Protection of Conduit Pack (AT&T)	EACH	1.000	1.000
0200	SPV.0060	Special 04. Protection of Conduit Pack (Baldwin Telecom)	EACH	1.000	1.000

CLEARING AND GRUBBING

CATEGORY	STATION	TO	STATION	LOCATION	STA
0010	17+52	-	12+16	LT & RT	5
TOTAL 0010					5

NOTE: CLEARING TO BE DONE PRIOR TO CONSTRUCTION BY OTHERS

REMOVING GUARDRAIL

CATEGORY	STATION	TO	STATION	LOCATION	LF
0010	18+53	-	19+07	LT	55
0010	18+87	-	19+26	RT	38
0010	20+72	-	21+48	LT	77
0010	20+90	-	21+55	RT	65
TOTAL 0010					235

BASE AGGREGATE

CATEGORY	STATION	TO	STATION	LOCATION	305.0110 BASE AGGREGATE DENSE 3/4-INCH TON	305.0120 BASE AGGREGATE DENSE 1 1/4-INCH TON	209.1500 BACKFILL GRANULAR GRADE 1 TON	624.0100 WATER MGAL	REMARKS
0010	17+25	-	19+24.55	LT/RT	55	545	390	6	WEST APPROACH
0010	20+73.12	-	22+16	LT/RT	35	470	355	5	EAST APPROACH
TOTAL 0010					90	1,015	745	11	

ASPHALT

CATEGORY	STATION	TO	STATION	LOCATION	* 455.0605 TACK COAT GAL	** 465.0105 ASPHALTIC SURFACE TON	REMARKS
0010	17+52	-	19+03.95	MAINLINE	77	135	
0010	20+93.72	-	22+16	MAINLINE	69	125	
0010			PELT		-	10	
TOTAL 0010					146	270	

NOTES:

* TACK COAT APPLICATION RATE = 0.07 GAL/SY

** ASSUMED HMA AT 112 LBS/SY/IN

POWELL AVENUE EARTHWORK SUMMARY

From/To Station	Location	Common Excavation (1) (Item 205.0100)	Unexpanded Fill	Expanded Fill (2)	Mass Ordinate +/- (3)	Waste	Borrow (Item 208.0100)	Comment:
		Cut		Factor 1.30				
17+52 - 19+24.55	MAINLINE	560	51	66	494	494	-	
20+73.12 - 22+16	MAINLINE	440	419	545	-105	389	-	
		1000					0	

1) Common Excavation is the Cut. Item number 205.0100.

2) Expanded Fill. Factor = 1.30; Expanded Fill = Unexpanded Fill * Fill Factor

3) The Mass Ordinate + or - Qty calculated for the Division. Plus quantity indicates an excess of material on the project.

4) All quantities shown in CY.

CONCRETE PAVEMENT

CATEGORY	STATION	TO	STATION	LOCATION	415.0120 CONCRETE PAVEMENT 12-INCH SY	415.041 CONCRETE PAVEMENT APPROACH SLAB SY	REMARKS
0010	19+03.95	-	19+25.28	MAINLINE	30	60	
0010	20+72.39	-	20+93.72	MAINLINE	30	60	
TOTAL 0010					60	120	

CONCRETE SURFACE DRAIN FLUME TYPE AT STRUCTURE

CATEGORY	STATION	TO	STATION	LOCATION	416.1010 CONCRETE SURFACE DRAINS CY	601.0588 CONCRETE CURB & GUTTER 4-INCH SLOPED 36-INCH TYPE TBT LF	606.0200 RIPRAP MEDIUM CY	645.0120 GEOTEXTILE FABRIC TYPE HR SY	
0010	20+72.11	-	21+25.16	LT	--	54	--	--	
0010	20+90.29	-	21+44.25	RT	--	54	--	--	
0010			21+15	LT	3	--	5	10	
0010			21+33	RT	3	--	5	10	
TOTALS					TOTAL 0010	6	108	10	20

3

REMOVING STORM SEWER

FROM	-	TO	204.0245 24-INCH LF
18+41, 25.4' RT	-	18+93, 28.5' LT	74
18+93, 28.5' LT	-	19+38, 27.4' LT	81
TOTALS			155

REMOVING MANHOLES

LOCATION	204.0210 EACH
18+93, 28.5' LT	1
TOTALS	1

REMOVING SMALL PIPE CULVERTS

FROM	-	TO	203.0100 EACH
17+58, 28.5' LT	-	17+87, 27.7' LT	1
TOTALS			1

3

APRON ENDWALLS

STRUCTURE	STATION, OFFSET	522.1018	522.1024
		CULVERT PIPE REINFORCED CONCRETE 18-INCH LF	CULVERT PIPE REINFORCED CONCRETE 24-INCH LF
4	17+62, 27.9' LT	1	-
1	18+39, 23.3' RT	1	-
3	19+19, 31.0' LT	-	1
TOTALS		2	1

STORM SEWER PIPE REINFORCED CONCRETE

FROM	-	TO	608.0318 CLASS III 18-INCH LF	608.0324 CLASS III 24-INCH LF	608.0418 CLASS IV 18-INCH LF	JOINT TIES* EACH	INLET ELEVATION	DISCHARGE ELEVATION	SLOPE FT/FT
4	-	2	96	-	-	6	899.37	895.10	0.0444
1	-	2	-	-	58	6	896.51	895.10	0.0245
2	-	3	-	60	-	15	894.60	890.00	0.0775
TOTALS			96	60	58				

*NON-BID ITEM: FOR INFORMATION ONLY

STORM SEWER MANHOLES

STRUCTURE	STATION, OFFSET	MANHOLES 5-FT DIAMETER		RIM ELEVATION	INVERT* ELEVATION	DEPTH** VF
		611.2005 EACH	611.0530 EACH			
2	STA 18+58, 33.1' LT	1	1	898.74	894.60	3.14
TOTALS		1	1			

*THE INVERT ELEVATION IS THE ELEVATION OF THE LOWEST PIPE FLOW LINE.

**DEPTH = RIM ELEV - TOP OF STRUCTURE BASE ELEV - COVER HEIGHT - 6-INCH ADJUSTMENT RING HEIGHT

GUARDRAIL

CATEGORY	STATION	TO	STATION	LOCATION	614.0200	614.0305	614.0345	614.0370	614.0390	614.2500	614.2610
					STEEL THRIE BEAM STRUCTURE APPROACH LF	STEEL PLATE BEAM GUARD CLASS A LF	STEEL PLATE BEAM GUARD SHORT RADIUS LF	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL LF	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL EACH	MGS THRIE BEAM TRANSITION LF	MGS GUARDRAIL TERMINAL EAT EACH
0010	18+39.94	-	18+89.85	LT	--	--	--	1	--	--	--
0010	18+61.85	-	18+72.31	RT	--	--	--	--	1	--	--
0010	18+72.31	-	18+94.31	RT	--	--	25	--	--	--	--
0010	18+89.85	-	19+09.88	LT	21	--	--	--	--	--	--
0010	18+94.31	-	19+07.42	RT	--	12.5	--	--	--	--	--
0010	19+07.42	-	19+28.06	RT	21	--	--	--	--	--	--
0010	20+69.61	-	21+08.5	LT	--	--	--	--	40	--	--
0010	20+87.79	-	21+27.67	RT	--	--	--	--	40	--	--
0010	21+08.5	-	21+61.56	LT	--	--	--	--	--	--	1
0010	21+27.67	-	21+80.83	RT	--	--	--	--	--	--	1
TOTAL 0010					42	12.5	25	1	1	80	2

MAINTENANCE AND REPAIR OF HAUL ROADS

CATEGORY	LOCATION	618.0100.01
		MAINTENANCE AND REPAIR OF HAUL ROADS (PROJECT) (01. 7900-00-70) EACH
0030	POWELL AVE	1
TOTAL 0030		1

EXTRA ITEMS

CATEGORY	STATION	TO	STATION	LOCATION	213.0100.01	623.0200	628.1905	628.1910
					FINISHING ROADWAY (PROJECT) (01. 7900-00-70) EACH	DUST CONTROL SURFACE TREATMENT SY	MOBILIZATIONS EROSION CONTROL EACH	MOBILIZATIONS EMERGENCY EROSION CONTROL EACH
0010	17+52.00	-	22+16.00	PROJECT-WIDE	1	1,640	4	4
TOTAL 0010					1	1,640	4	4

EROSION CONTROL

CATEGORY	STATION	TO	STATION	LOCATION	625.0100	627.0200	628.1504	628.1520	628.2027	629.0210	630.0120	630.0200	630.0500
					TOPSOIL SY	MULCHING SY	SILT FENCE LF	SILT FENCE MAINTENANCE LF	EROSION MAT CLASS II TYPE C SY	FERTILIZER TYPE B CWT	SEEDING MIXTURE NO. 20 LB	SEEDING TEMPORARY LB	SEED WATER MGAL
0010	17+52	-	19+24.55	RT	335	435	180	540	20	0.30	13	13	10
0010	17+52	-	19+24.55	LT	320	335	185	555	80	0.30	12	12	9
0010	20+73.12	-	22+16	RT	475	300	175	525	285	0.40	16	16	13
0010	20+73.12	-	22+16	LT	395	345	185	555	175	0.30	14	14	12
0010			UNDISTRIBUTED		-	355	180	540	140	0.30	14	14	11
TOTAL 0010					1,525	1,770	905	2,715	700	1.6	69	69	55

TEMPORARY DITCH CHECKS

CATEGORY	STATION	LOCATION	628.7504
			TEMPORARY DITCH CHECKS LF
0010	18+25	RT	12.5
TOTAL 0010			12.5

3

3

CULVERT PIPE CHECKS

CATEGORY	STATION	LOCATION	628.7555 CULVERT PIPE CHECKS EACH
0010	17+62	LT	2.0
0010	18+39	RT	2.0
TOTAL 0010			4.0

SIGNS

CATEGORY	STATION	LOCATION	634.0614 POSTS WOOD 4X6-INCH X 14-FT EACH	637.2210 SIGNS TYPE II REFLECTIVE H SF	637.2230 SIGNS TYPE II REFLECTIVE F SF	638.2602 REMOVING SIGNS TYPE II EACH	638.3000 REMOVING SMALL SIGN SUPPORTS EACH	REMARKS
0010	19+07	LT	1	--	3	1	1	W5-52L
0010	19+13	RT	--	--	--	1	1	R12-1 (WEIGHT LIMIT 10 TON)
0010	19+24	RT	1	12.5	3	2	1	W5-52R, I3-1 (KINNICKINNIC RIVER)
0010	20+73	LT	1	12.5	3	2	1	W5-52R, I3-1 (KINNICKINNIC RIVER)
0010	20+91	RT	1	--	3	1	1	W5-52L
0010	20+84	LT	--	--	--	1	1	R12-1 (WEIGHT LIMIT 10 TON)
TOTAL 0010			4	25.0	12	7	5	

TRAFFIC CONTROL

CATEGORY	LOCATION	DURATION DAYS	NO.	643.0420 TRAFFIC CONTROL BARRICADES TYPE III DAY	NO.	643.0705 TRAFFIC CONTROL WARNING LIGHTS TYPE A DAY	NO.	643.0900 TRAFFIC CONTROL SIGNS DAY	643.5000 TRAFFIC CONTROL EACH
0010	PER SDD 15C2	110	18	1,980	28	3,080	14	1,540	-
0010	POWELL AVE	-	-	-	-	-	-	-	1
TOTAL 0010				1,980		3,080		1,540	1

MARKING LINE

CATEGORY	STATION	TO	STATION	LOCATION	646.1020 4-INCH MARKING LINE EPOXY YELLOW LF	WHITE LF	REMARKS
0010	17+52	-	22+16	C/L	928	-	YELLOW SOLID CENTERLINE
0010	17+52	-	22+16	LT	-	464	WHITE EDGELINE
0010	17+52	-	22+16	RT	-	464	WHITE EDGELINE
SUBTOTALS					928	928	
TOTAL 0010						1,856	

STAKING

CATEGORY	STATION	TO	STATION	LOCATION	650.4000 CONSTRUCTION STAKING STORM SEWER EACH	650.4500 CONSTRUCTION STAKING SUBGRADE LF	650.5000 CONSTRUCTION STAKING BASE LF	650.5500 CONSTRUCTION STAKING CURB & GUTTER AND CURB & GUTTER LF	650.6501.01 CONSTRUCTION STAKING STRUCTURE LAYOUT (STRUCTURE) (01. P-55-0148) EACH	650.7000 CONSTRUCTION STAKING CONCRETE PAVEMENT LF	650.9911.01 CONSTRUCTION STAKING SUPPLEMENTAL CONTROL (PROJECT) (01. 7900-00-70) EACH	650.9920 CONSTRUCTION STAKING SLOPE STAKES LF
0010	17+52	-	22+16	MAINLINE	6	316	316	108	-	74	-	316
0010	17+52	-	22+16	PROJECT 8397-00-70	-	-	-	-	-	-	1	-
TOTAL 0010					6	316	316	108	0	74	1	316
0020	19+24.55	-	20+73.12	P-55-0148	-	-	-	-	1	-	-	-
TOTAL 0020					0	0	0	0	1	0	0	0
PROJECT TOTAL					6	316	316	108	1	74	1	316

SAWING ASPHALT

					690.0150
					SAWING
					ASPHALT
CATEGORY	STATION	-	STATION	LOCATION	LF
0010			17+52	MAINLINE	25
0010			22+16	MAINLINE	22
0010	17+53	-	17+84	PELT	31
TOTAL 0010					78

MAINTAINING BIRD DETERRENT SYSTEM

				999.2005.S
				MAINTAINING BIRD DETERRENT
				SYSTEM
CATEGORY	STATION			EACH
0010	19+98.83			1
TOTAL 0010				1

R/W PROJECT NUMBER: 7900-00-00 **SHEET NUMBER: 1**

TLE ACQUISITION EXHIBIT
 RELOCATION ORDER FOR C RIVER FALLS, POWELL AVE
 KINNICKINNIC RIVER BRIDGE P-55-0148

LOC. STR ST. CROIX COUNTY

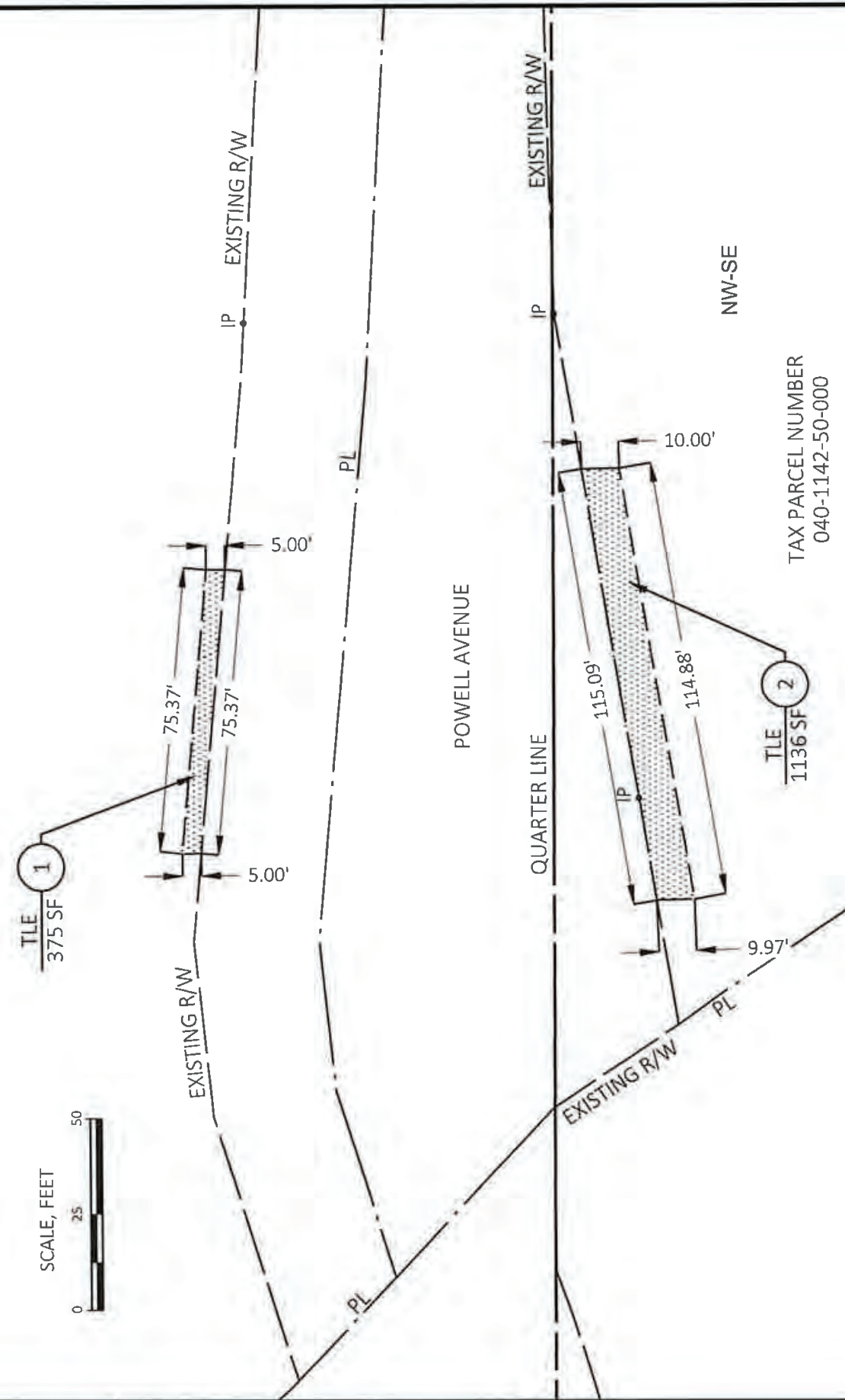
PART OF THE SOUTHWEST ¼ OF THE NORTHWEST ¼ AND PART OF THE NORTHWEST ¼ OF THE
 SOUTHEAST ¼ OF SECTION 36, T28N, R19W, TOWN OF TROY, ST. CROIX COUNTY, WISCONSIN

NOTES:
 THIS EXHIBIT IS A GRAPHIC REPRESENTATION AND IS FOR REFERENCE PURPOSES ONLY. REFER TO THE CONVEYANCE DOCUMENT FOR PARCEL RELATED DETAILS.

THIS TLE IS FOR THE RIGHT TO CONSTRUCT, CUT, AND/OR FILL SLOPES, INCLUDING FOR SUCH PURPOSE THE RIGHT TO OPERATE THE 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 DEEM NECESSARY OR DESIRABLE.

ALL FOUND IRON PIPES ARE 1.25"

SW-NE TAX PARCEL NUMBER
 040-1138-60-000



TAX PARCEL NUMBER
 040-1142-50-000

SCHEDULE OF LANDS & INTERESTS REQUIRED

OWNERS NAMES ARE SHOWN FOR REFERENCE PURPOSES ONLY AND ARE SUBJECT TO CHANGE PRIOR TO THE TRANSFER OF LAND INTERESTS TO THE CITY OF RIVER FALLS.

PARCEL NUMBER	OWNER(S)	INTEREST REQUIRED	TLE	TLE S.F.
1	EUNICE MOODY RESTATED TRUST AGREEMENT	TLE	TLE	375
2	GENEVIEVE A. RUGO	TLE	TLE	1136

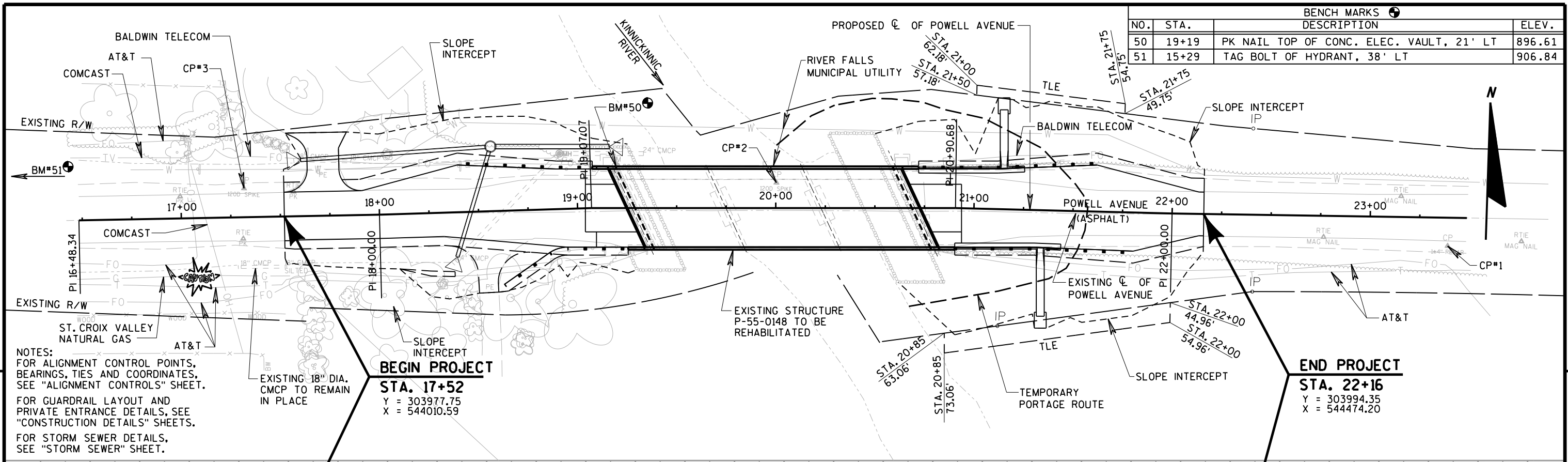
UTILITY INTERESTS REQUIRED

UTILITY NUMBER	UTILITY OWNER(S)	INTEREST REQUIRED
N/A	N/A	N/A

TLE ACQUISITION AREAS ARE LOCATED APPROXIMATELY 87 FEET NORTH AND 8 FEET SOUTH OF THE QUARTER LINE BETWEEN THE NE QUARTER AND THE SE QUARTER OF SEC 36-T28N-R19W

THIS MAP IS APPROVED FOR THE CITY OF RIVER FALLS.

SIGNATURE: *[Signature]* DATE: 12/13/22
 PRINT NAME: Amy Peterson

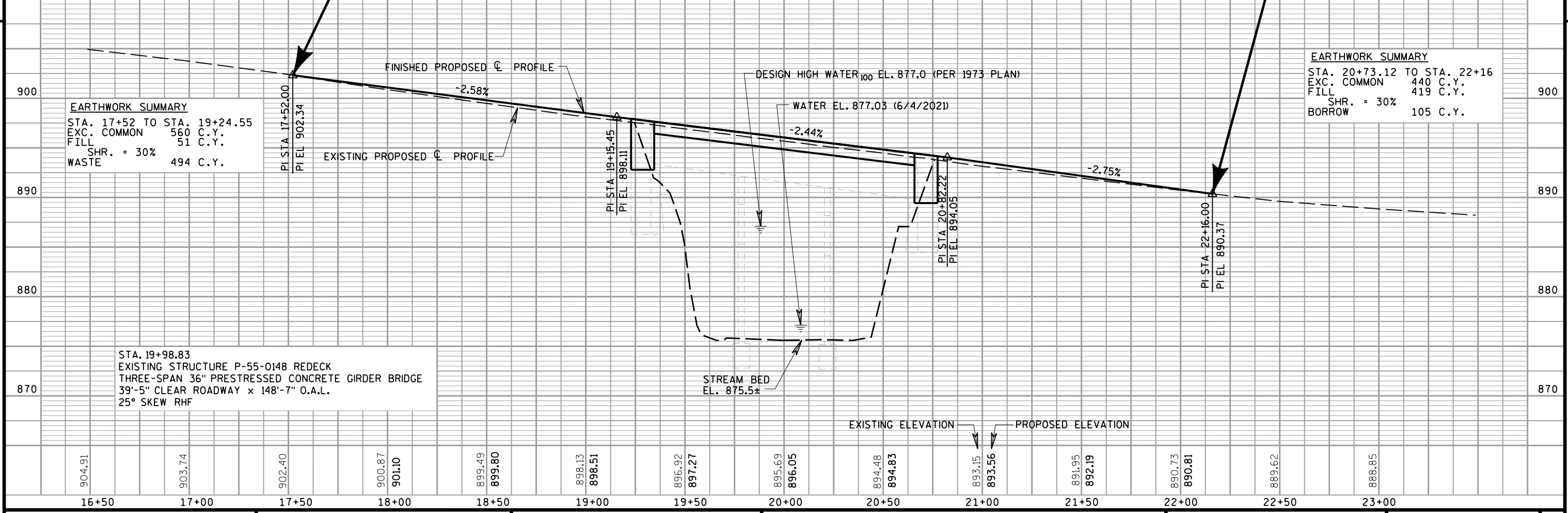


BENCH MARKS			
NO.	STA.	DESCRIPTION	ELEV.
50	19+19	PK NAIL TOP OF CONC. ELEC. VAULT, 21' LT	896.61
51	15+29	TAG BOLT OF HYDRANT, 38' LT	906.84

NOTES:
 FOR ALIGNMENT CONTROL POINTS, BEARINGS, TIES AND COORDINATES, SEE "ALIGNMENT CONTROLS" SHEET.
 FOR GUARDRAIL LAYOUT AND PRIVATE ENTRANCE DETAILS, SEE "CONSTRUCTION DETAILS" SHEETS.
 FOR STORM SEWER DETAILS, SEE "STORM SEWER" SHEET.

BEGIN PROJECT
STA. 17+52
 Y = 303977.75
 X = 544010.59

END PROJECT
STA. 22+16
 Y = 303994.35
 X = 544474.20



EARTHWORK SUMMARY

STA. 17+52 TO STA. 19+24.55	
EXC. COMMON	560 C.Y.
FILL	51 C.Y.
SHR. = 30%	
WASTE	494 C.Y.

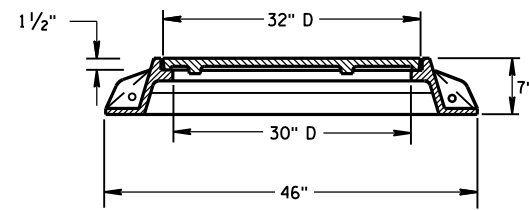
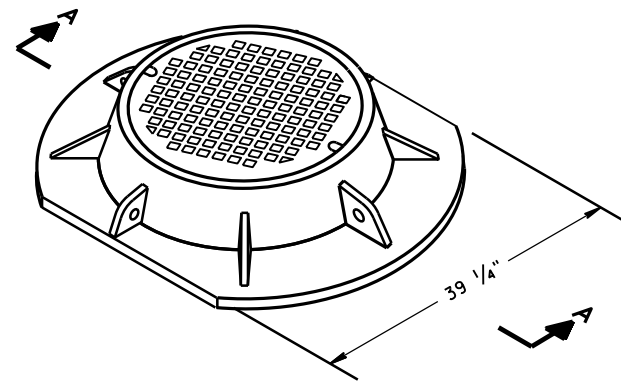
EARTHWORK SUMMARY

STA. 20+73.12 TO STA. 22+16	
EXC. COMMON	440 C.Y.
FILL	419 C.Y.
SHR. = 30%	
BORROW	105 C.Y.

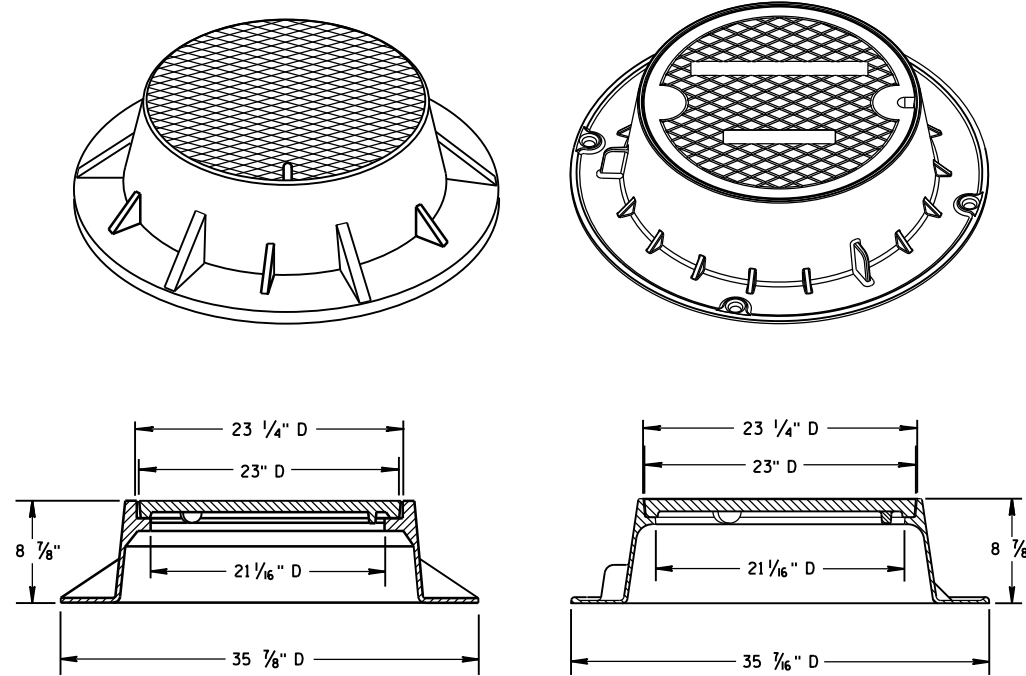
STA. 19+98.83
 EXISTING STRUCTURE P-55-0148 REDECK
 THREE-SPAN 36" PRESTRESSED CONCRETE GIRDER BRIDGE
 39'-5" CLEAR ROADWAY x 148'-7" O.A.L.
 25° SKEW RHF

Standard Detail Drawing List

08A05-19D	INLET COVER TYPE BW, MANHOLE COVERS, TYPE K, J, J-S, L & M
08B09-03	MANHOLES 3-FT, 4-FT, 5-FT, 6-FT, 7-FT, 8-FT, 9-FT, 10-FT DIAMETER
08D01-22A	CONCRETE CURB & GUTTER
08D01-22B	CONCRETE CURB, TIES AND CURB AND GUTTER APPLICATIONS
08D02-07A	CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES
08D02-07B	CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES
08D02-07C	CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E15-01	CULVERT PIPE CHECK
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
08F04-08	JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL
12A03-10	NAME PLATE (STRUCTURES)
13B02-09A	CONCRETE PAVEMENT APPROACH SLAB
13C01-19	CONCRETE PAVEMENT LONGITUDINAL JOINTS AND TIES
14B18-06A	STEEL PLATE BEAM GUARD, CLASS "A" (AT BRIDGES, OBSTACLES AND SIDEROADS/DRIVEWAYS)
14B20-12A	STEEL THREE BEAM STRUCTURE APPROACH
14B20-12B	STEEL THREE BEAM STRUCTURE APPROACH, CONNECTION TO SQUARE END PARAPETS
14B24-09A	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B24-09B	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B24-09C	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B27-01A	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B27-01B	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B27-01C	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B42-07A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-07B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-07C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-07D	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)
14B45-05D	MIDWEST GUARDRAIL SYSTEM THREE BEAM TRANSITION (MGS)
15C02-08A	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C02-08B	BARRICADES AND SIGNS FOR VARIOUS CLOSURES
15C06-10	SIGNING & MARKING FOR TWO LANE BRIDGES
15C08-22A	LONGITUDINAL MARKING (MAINLINE)



SECTION A-A
TYPE "K"



TYPE "J"

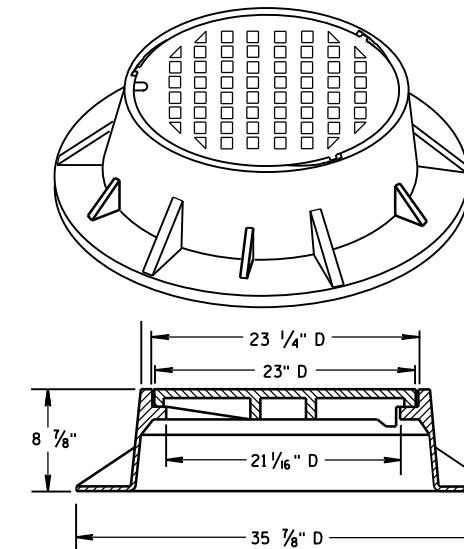
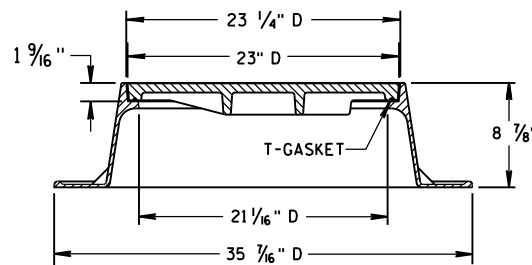
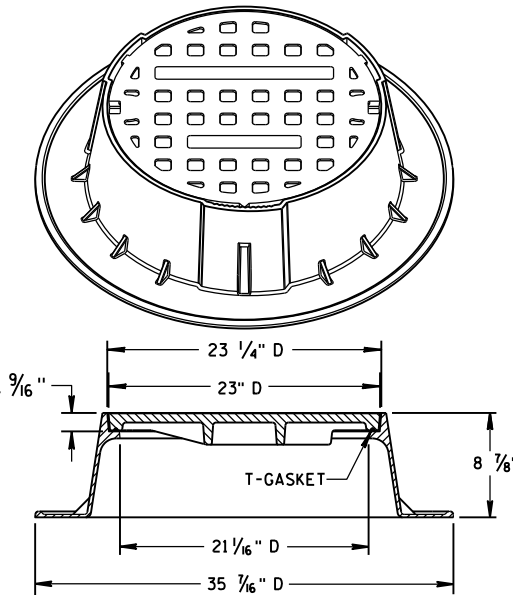
NOTE: EITHER CASTING IS ACCEPTABLE

GENERAL NOTES

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

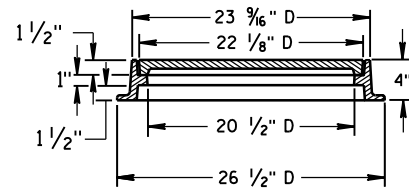
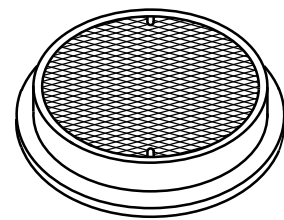
DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR MANHOLE COVERS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

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

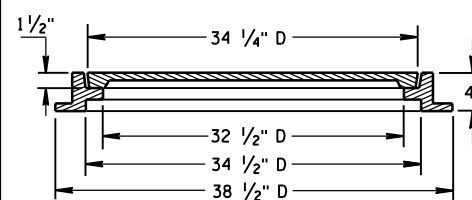
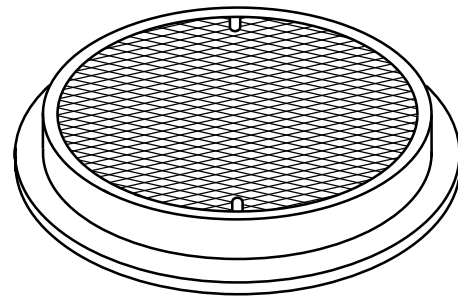


TYPE "J" SPECIAL
TYPE "B" NON-ROCKING SELF-SEAL LID
(NOTED AS TYPE J-S ON THE DRAINAGE TABLE)
NOTE: EITHER CASTING IS ACCEPTABLE

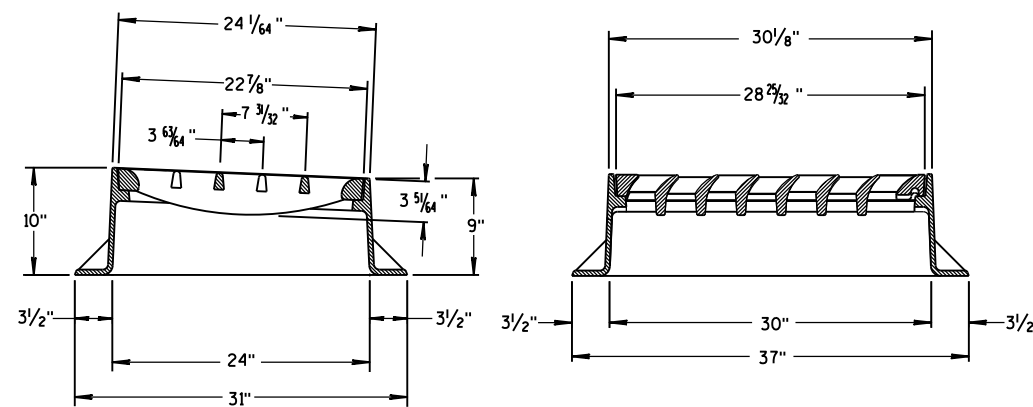
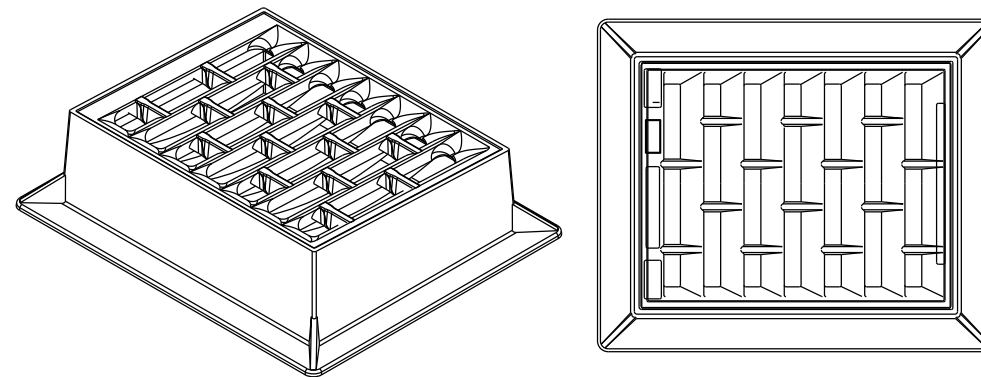
6



TYPE "L"



TYPE "M"



INLET COVER TYPE "BW"

6

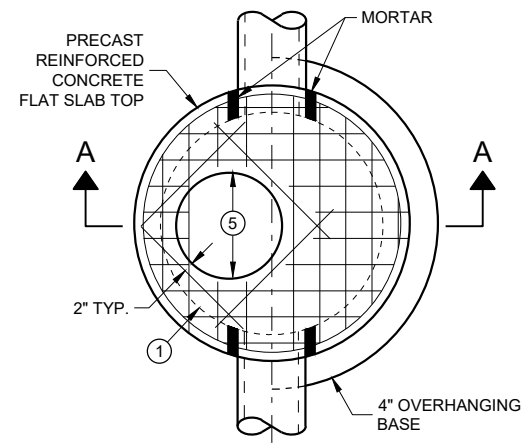
S.D.D. 8 A 5-19d

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

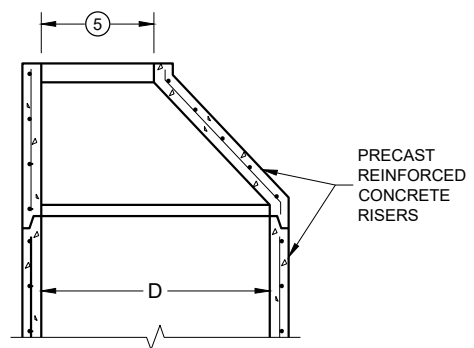
INLET COVER TYPE BW
MANHOLE COVERS, TYPE K,
J, J-S, L & M

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

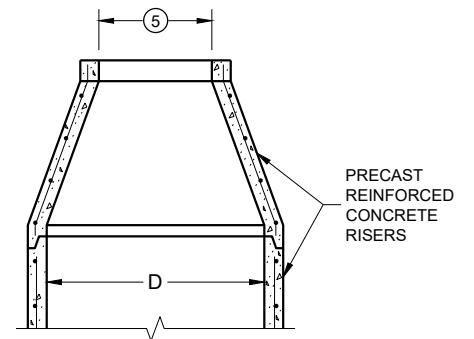
APPROVED
11/27/2013 DATE /S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER
FHWA



**PLAN VIEW
CIRCULAR OPENING**



**OPTIONAL PRECAST
REINFORCED CONCRETE
ECCENTRIC TOP**



**OPTIONAL PRECAST
REINFORCED CONCRETE
CONCENTRIC TOP**

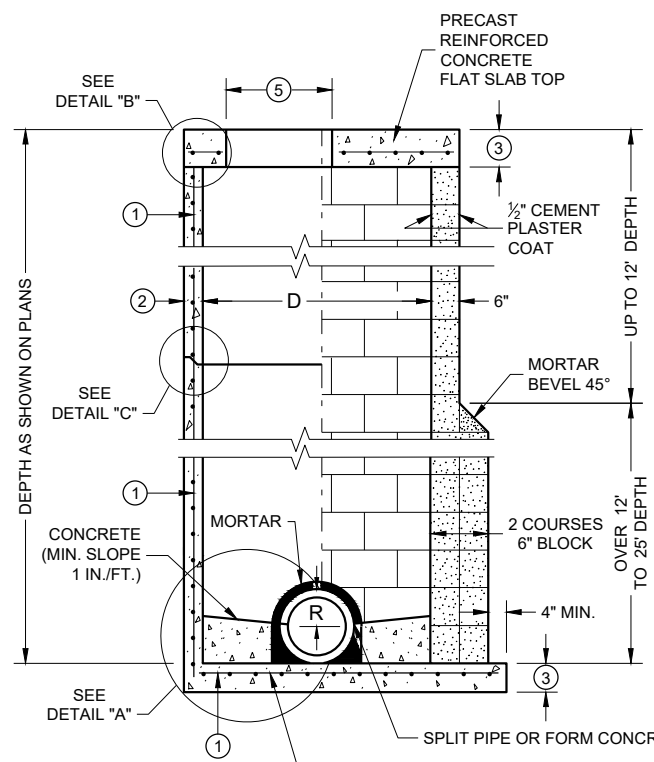
MANHOLE COVER OPENING MATRIX

MANHOLE COVER TYPE OPENING SIZE (FT.)	C	ALL J'S	K	L	M
2 DIA.	X	X		X	
3 DIA.			X		X

PIPE MATRIX

MANHOLE SIZE (DIA.)	MAXIMUM INSIDE PIPE DIAMETER FOR TWO PIPES		MINIMUM WALL THICKNESS (IN)	MINIMUM PRECAST FLAT SLAB TOP AND BASE THICKNESS
	180° SEPARATION (IN)	90° SEPARATION (IN)		
3-FT	15	12	4	6
4-FT	24	18	4	6
5-FT	36	24	5	8
6-FT	42	36	6	8
7-FT	48	36/42*	7	8
8-FT	60	42	8	8
9-FT	66	54	9	10
10-FT	72	60	10	10

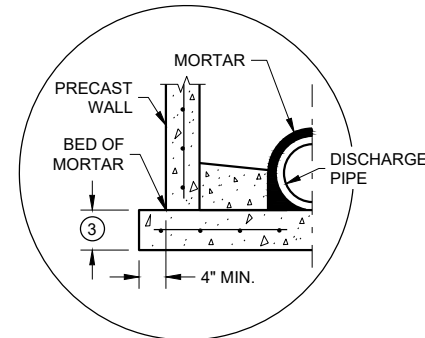
*A 36" PIPE AND A 42" PIPE CAN BE PLACED WITHIN 90 DEGREES. SEE MINIMUM HORIZONTAL PIPE SEPARATION DETAIL.



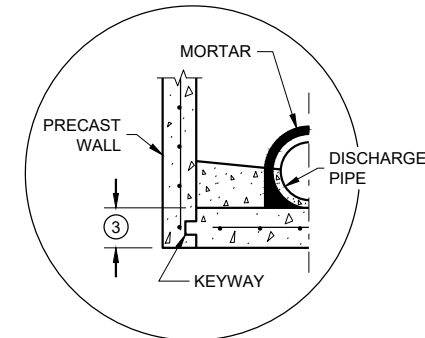
SECTION A - A

PRECAST REINFORCED CONCRETE WITH MONOLITHIC BASE

CONCRETE BLOCK WITH CAST IN PLACE OR PRECAST REINFORCED CONCRETE BASE ①

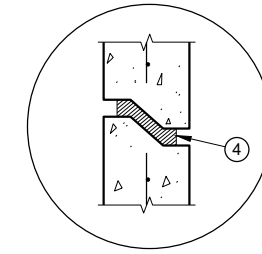
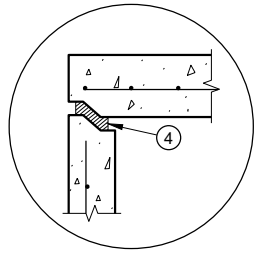
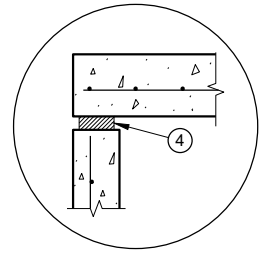


SEPARATE PRECAST REINFORCED CONCRETE BASE OPTION



PRECAST REINFORCED CONCRETE WITH INTEGRAL BASE OPTION

DETAIL "A"



TOP WITH PLAIN END JOINT

TOP WITH TONGUE AND GROOVE JOINT

RISER WITH TONGUE AND GROOVE JOINT

DETAIL "B"

DETAIL "C"

GENERAL NOTES

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

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

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

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

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

PRECAST REINFORCED CONCRETE CONE TOPS (ECCENTRIC OR CONCENTRIC) OR PRECAST REINFORCED CONCRETE FLAT SLAB TOPS MAY BE USED ON CONCRETE BLOCK STRUCTURES.

ECCENTRIC CONE TOPS MAY BE USED ON ALL STRUCTURES. CONCENTRIC CONE TOPS SHALL BE USED ONLY ON STRUCTURES 5 FEET OR LESS IN DEPTH UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

STEPS MEETING AASHTO M199 AND THE FOLLOWING REQUIREMENTS SHALL BE INSTALLED IN ALL STRUCTURES OVER 5 FEET IN DEPTH: 16 INCH C-C MAXIMUM SPACING; PROJECT A MINIMUM CLEAR DISTANCE OF 4 INCHES FROM THE WALL AT THE POINT OF EMBEDMENT; MINIMUM LENGTH OF 10 INCHES; MINIMUM WALL EMBEDMENT OF 3 INCHES. FERROUS METAL STEPS NOT PAINTED OR TREATED TO RESIST CORROSION SHALL HAVE A MINIMUM CROSS SECTIONAL DIMENSION OF 1 INCH.

STEPS OF APPROVED POLYPROPYLENE PLASTIC COATED REINFORCEMENT BAR ARE ACCEPTABLE. REINFORCING BAR MUST BE A MINIMUM OF 1/2 INCH AND MEET THE REQUIREMENTS OF ASTM A615.

CERTIFICATION SHALL BE PROVIDED THAT INSTALLED STEPS WHEN TESTED IN ACCORDANCE WITH SECTION 10 OF AASHTO T280 CAN WITHSTAND A VERTICAL LOAD OF 800 LBS. AND A HORIZONTAL LOAD OF 400 LBS.

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

ALL PRECAST MANHOLE UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF AASHTO DESIGNATION M199.

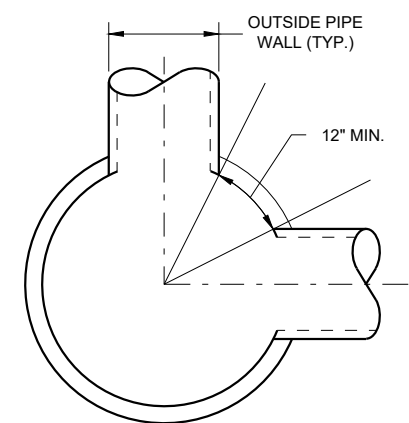
PRECAST REINFORCED RISERS SHALL HAVE A TONGUE AND GROOVE JOINT WITH TONGUE UP OR DOWN.

CONCRETE BLOCK WILL NOT BE PERMITTED FOR STRUCTURES GREATER THAN 4 FEET IN DIAMETER.

4" OVERHANGING BASES ARE REQUIRED FOR ALL CONCRETE BLOCK INSTALLATIONS. 4" OVERHANG IS REQUIRED WHEN SEPARATE PRECAST BASE IS PROVIDED. OVERHANG IS NOT REQUIRED ON PRECAST STRUCTURES WITH AN INTEGRAL OR MONOLITHIC BASE.

FOR ADDITIONAL CONFIGURATIONS, MAINTAIN A MINIMUM OF 12 INCHES AS MEASURED FROM THE INSIDE OF THE STRUCTURE WALL BETWEEN THE OUTSIDE PIPE WALLS OF ADJACENT PIPES. SEE DETAIL "D".

- ① FOR PRECAST MANHOLES PROVIDE REINFORCING STEEL IN ACCORDANCE TO AASHTO M199.
- ② SEE PIPE MATRIX TABLE FOR MINIMUM WALL THICKNESS FOR PRECAST MANHOLES
- ③ SEE PIPE MATRIX TABLE FOR MINIMUM THICKNESS OF PRECAST FLAT SLAB TOPS AND BASES.
- ④ JOINTS TO BE SEALED WITH A BUTYL RUBBER SEAL PER SEALANT MANUFACTURERS RECOMMENDATIONS CONFORMING TO ASTM C 990 (TYP.).
- ⑤ SEE MANHOLE COVER OPENING MATRIX.

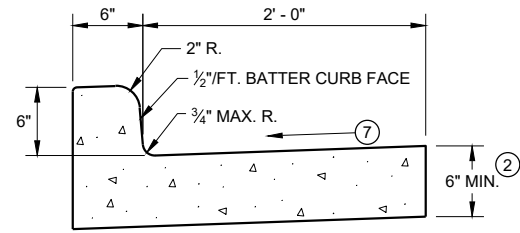


MINIMUM HORIZONTAL PIPE SEPARATION

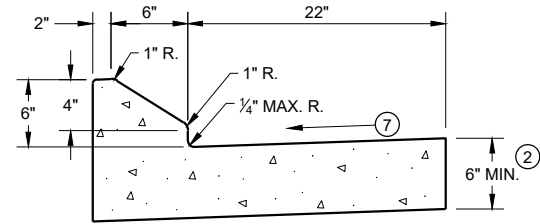
**MANHOLES, 3-FT, 4-FT
5-FT, 6-FT, 7-FT, 8-FT, 9-FT
AND 10-FT DIAMETER**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

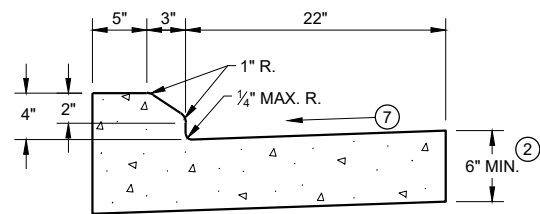
APPROVED
November 2021 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT
ENGINEER
FHWA



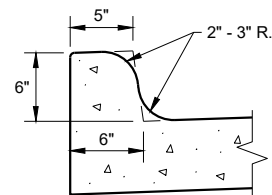
TYPES A^① & D



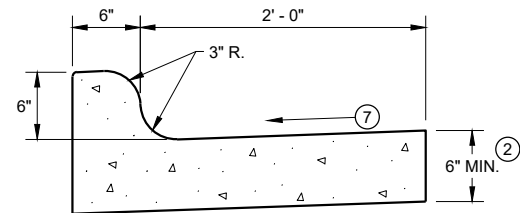
6" SLOPED CURB TYPES G^① & J



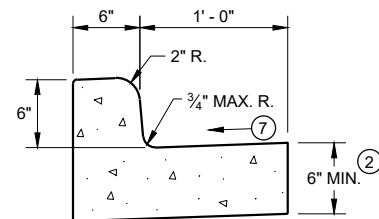
4" SLOPED CURB TYPES G^① & J



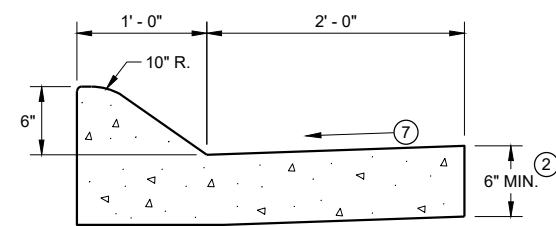
TYPES K^① & L
(OPTIONAL CURB SHAPE)



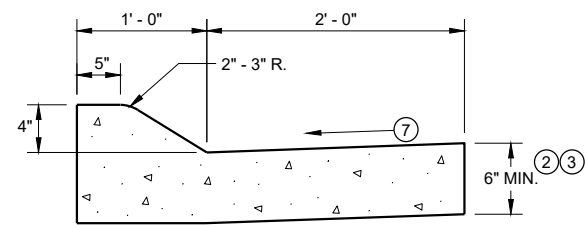
TYPES K^① & L
CONCRETE CURB AND GUTTER 30"



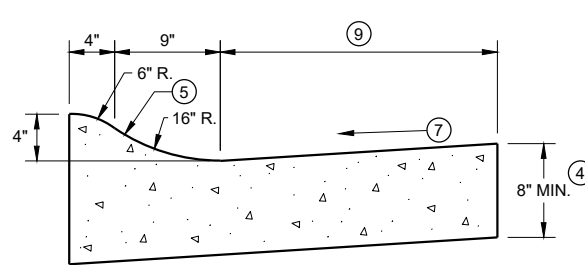
TYPES A^① & D
CONCRETE CURB AND GUTTER 18"



6" SLOPED CURB TYPES A^① & D

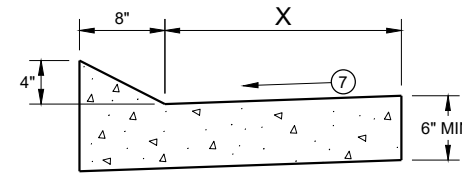


4" SLOPED CURB TYPES A^① & D
CONCRETE CURB AND GUTTER 36"



4" SLOPED CURB TYPES R^① & T

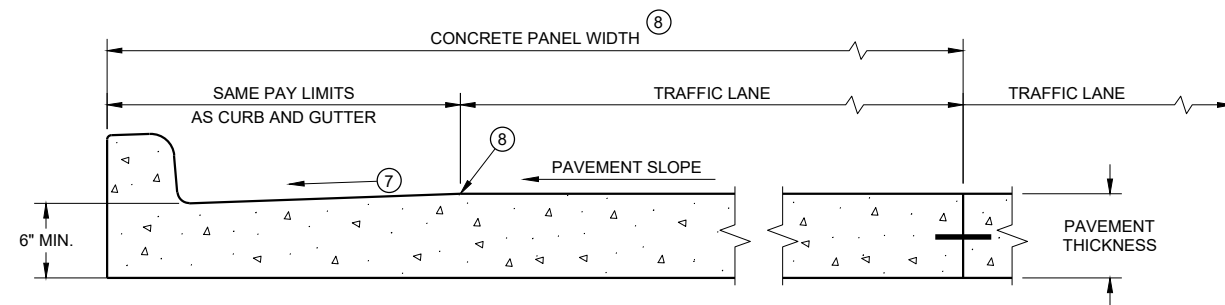
TBT & TBTT	X
30"	22"
36"	28"



TYPES TBT & TBTT^①
CONCRETE CURB AND GUTTER

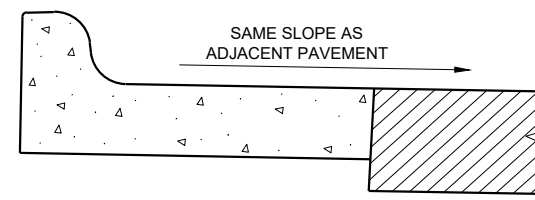
PAVEMENT THICKNESS
AND MAXIMUM CONCRETE
PANEL WIDTH TABLE

PAVEMENT THICKNESS	MAXIMUM PANEL WIDTH
LESS THAN 10"	12'
10" & ABOVE	15'



PARTIAL SECTION OF PAVEMENT *
WITH INTEGRAL CURB AND GUTTER

* BIKE LANE IS NOT SHOWN



REVERSE SLOPE GUTTER^⑥
(TYPICAL FOR ALL CURB & GUTTER TYPES)

GENERAL NOTES

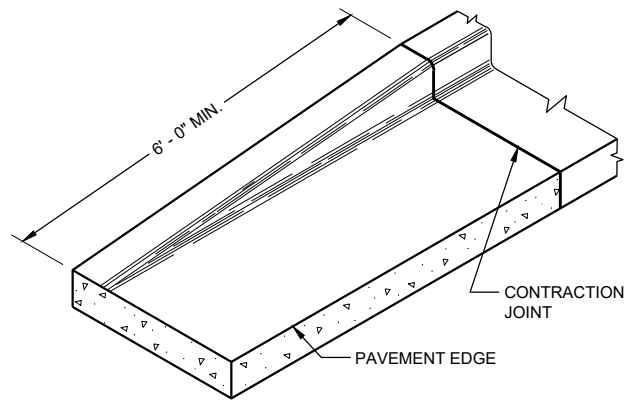
DETAILS OF CONSTRUCTION AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

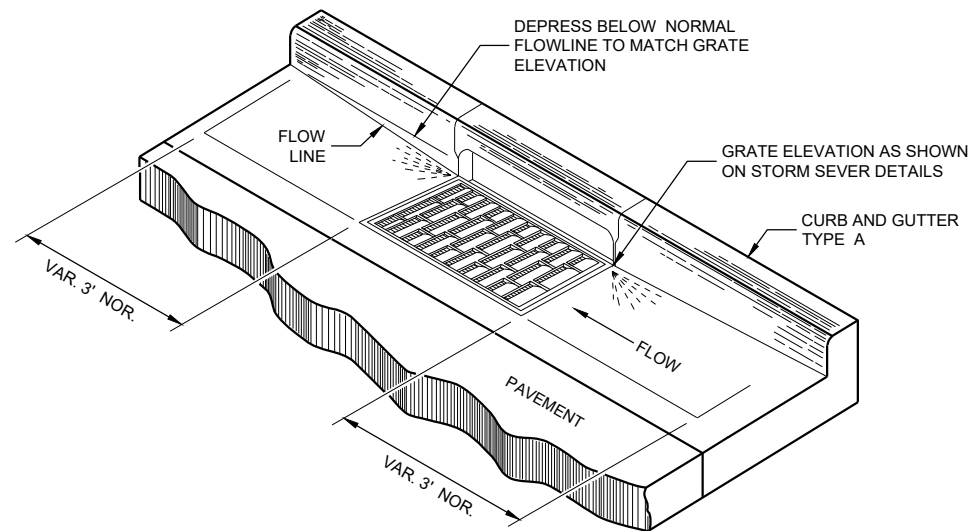
INTEGRAL CURB AND GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB AND GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE.

UNLESS OTHERWISE SHOWN ON THE TYPICAL CROSS SECTIONS, THE BASE AGGREGATE AND COMMON EXCAVATION LIMITS ARE 2' - 0" BEHIND THE BACK OF CURBS.

- ① TIE BARS ARE REQUIRED FOR CURB AND GUTTERS TYPES A, G, K, R, AND TBTT.
- ② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ③ USE 8" MINIMUM GUTTER THICKNESS WHEN USED WITH AN ADJACENT CONCRETE TRUCK APRON PLACED BEHIND BACK OF CURB.
- ④ THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 8" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ⑤ UNLESS OTHERWISE NOTED, FOR STAKING PURPOSES THE FACE OF CURB IS 6" FROM THE BACK OF CURB.
- ⑥ WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATION(S) WILL BE SHOWN ELSEWHERE IN THE PLAN.
- ⑦ USE 4% GUTTER CROSS SLOPE UNLESS OTHERWISE NOTED IN THE PLANS.
- ⑧ INCLUDE LONGITUDINAL JOINT AND TIE BARS ALONG LANE EDGE WHEN CONCRETE PANEL WIDTH EXCEEDS THE MAXIMUM WIDTH PER TABLE BELOW. LONGITUDINAL JOINT(S) ARE NOT ALLOWED WITHIN TRAFFIC LANES AND BIKE LANES. LONGITUDINAL JOINT MAY BE SAWED.
- ⑨ CONCRETE CURB AND GUTTER 4-INCH SLOPED 30-INCH TYPE "R" AND "T" = 17 INCHES
CONCRETE CURB AND GUTTER 4-INCH SLOPED 36-INCH TYPE "R" AND "T" = 23 INCHES



END SECTION CURB AND GUTTER



DETAIL OF CURB AND GUTTER AT INLETS
(TYPICAL H INLET COVER SHOWN)

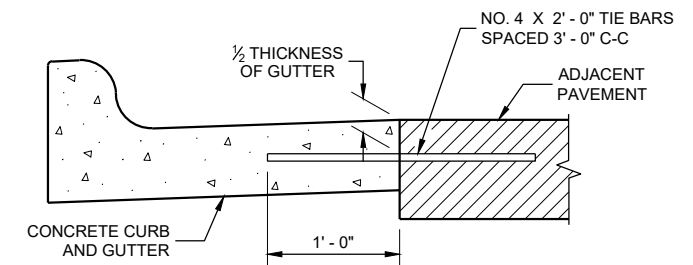
GENERAL NOTES

DETAILS OF CONSTRUCTION AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

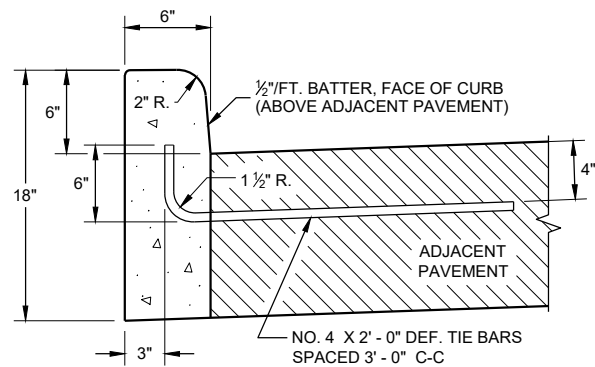
PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

UNLESS OTHERWISE SHOWN ON THE TYPICAL CROSS SECTIONS, THE BASE AGGREGATE AND COMMON EXCAVATION LIMITS ARE 2' - 0" BEHIND THE BACK OF CURBS.

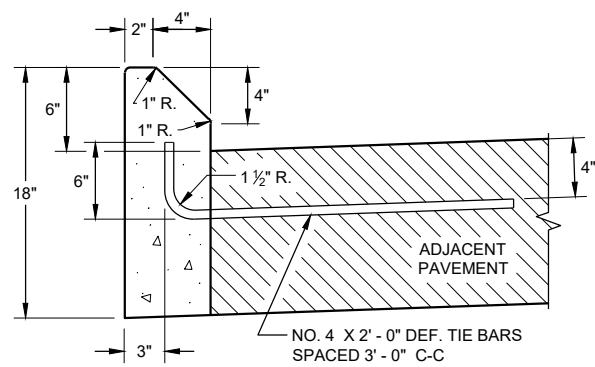
- ① TIE BARS ARE REQUIRED FOR CURB AND GUTTERS TYPES A, G, K, R, AND TBTT.
- ② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ⑨ REFER TO SDD 08D18 AND 08D19 FOR ADDITIONAL DRIVEWAY ENTRANCE CURB DETAILS.



TYPICAL TIE BAR LOCATION ①

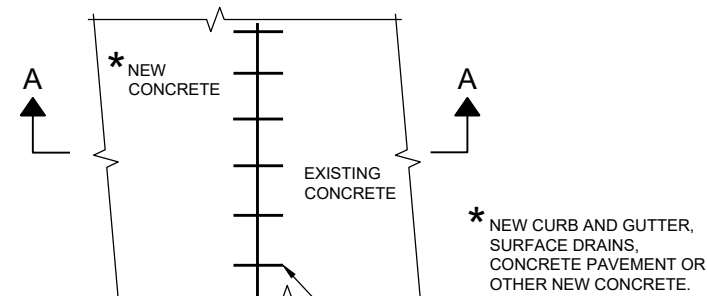


TYPES A ① & D

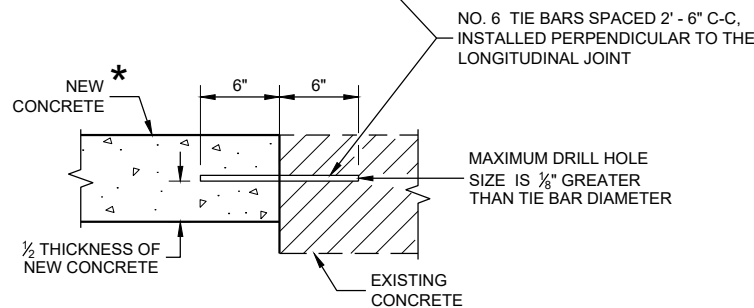


TYPES G ① & J

CONCRETE CURB

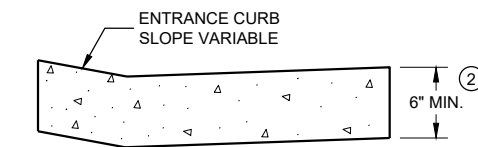


PLAN VIEW



SECTION A - A

TIE BARS DRILLED INTO EXISTING PAVEMENT



DRIVEWAY ENTRANCE CURB ⑨
(WHEN DIRECTED BY THE ENGINEER)

CONCRETE CURB, TIES AND CURB AND GUTTER APPLICATIONS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
February 2021 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT
ENGINEER

FHWA

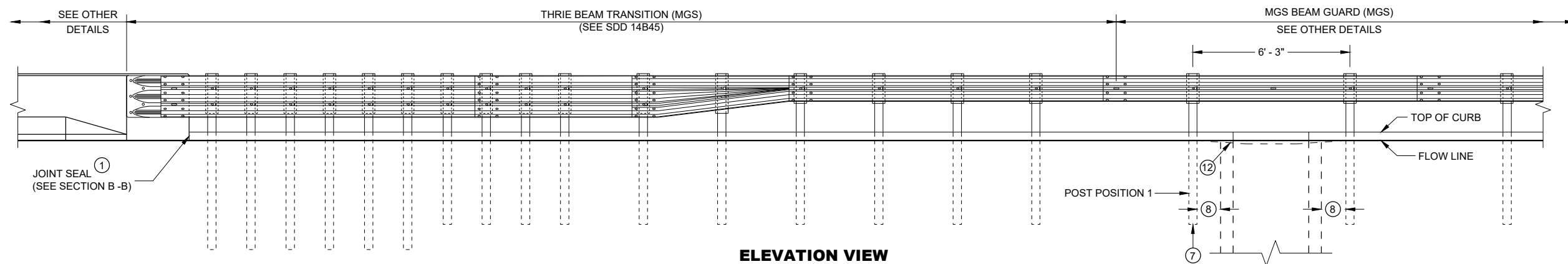
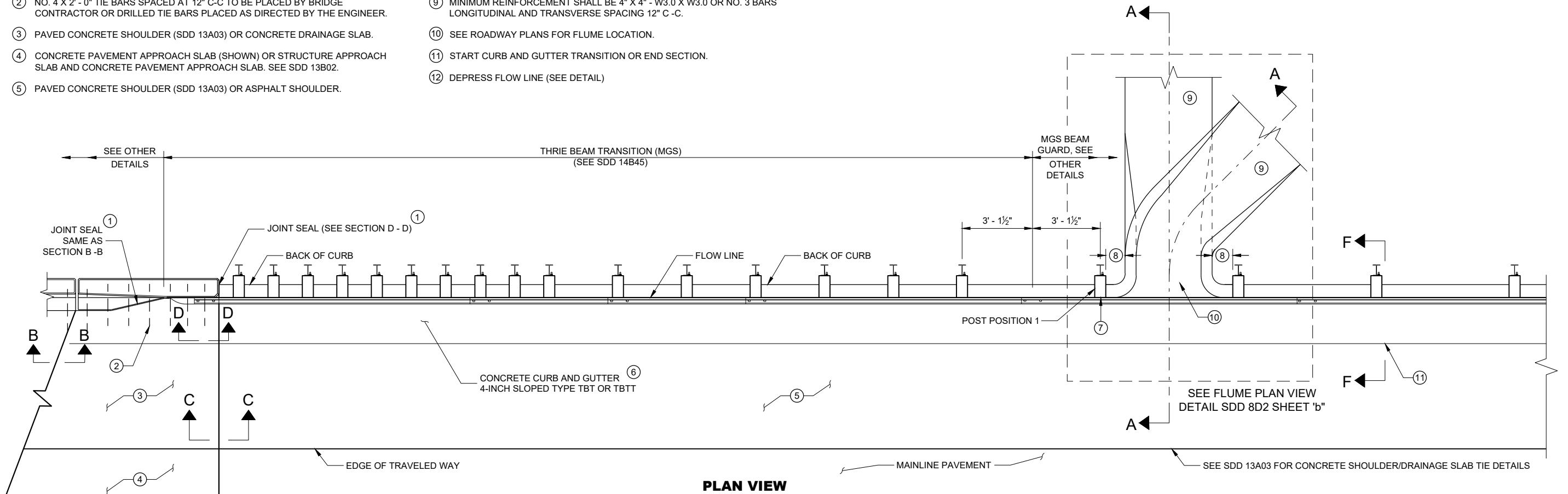
GENERAL NOTES

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

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

- ① USE A JOINT SEALANT CONFORMING TO STANDARD SPECIFICATION 415.2.6.
- ② NO. 4 X 2' - 0" TIE BARS SPACED AT 12" C-C TO BE PLACED BY BRIDGE CONTRACTOR OR DRILLED TIE BARS PLACED AS DIRECTED BY THE ENGINEER.
- ③ PAVED CONCRETE SHOULDER (SDD 13A03) OR CONCRETE DRAINAGE SLAB.
- ④ CONCRETE PAVEMENT APPROACH SLAB (SHOWN) OR STRUCTURE APPROACH SLAB AND CONCRETE PAVEMENT APPROACH SLAB. SEE SDD 13B02.
- ⑤ PAVED CONCRETE SHOULDER (SDD 13A03) OR ASPHALT SHOULDER.

- ⑥ CONCRETE CURB AND GUTTER 4-INCH SLOPED 36-INCH TYPE TBT OR TBTT. USE TYPE TBTT CURB WITH NO. 4 X 2' - 0" TIE BARS SPACED AT 3' - 0" C-C ONLY WHEN ADJACENT TO CONCRETE PAVEMENTS.
- ⑦ PLACE FLUME BEFORE MSG THRIE BEAM TRANSITION POST 1 (SEE SDD 14B45)
- ⑧ CENTER FLUME BETWEEN POSTS. 6-INCH MINIMUM SEPARATION FROM OUTSIDE EDGE OF FLUME TO POSTS.
- ⑨ MINIMUM REINFORCEMENT SHALL BE 4" X 4" - W3.0 X W3.0 OR NO. 3 BARS LONGITUDINAL AND TRANSVERSE SPACING 12" C-C.
- ⑩ SEE ROADWAY PLANS FOR FLUME LOCATION.
- ⑪ START CURB AND GUTTER TRANSITION OR END SECTION.
- ⑫ DEPRESS FLOW LINE (SEE DETAIL)



**CONCRETE SURFACE
DRAINS FLUME TYPE
AT STRUCTURES**

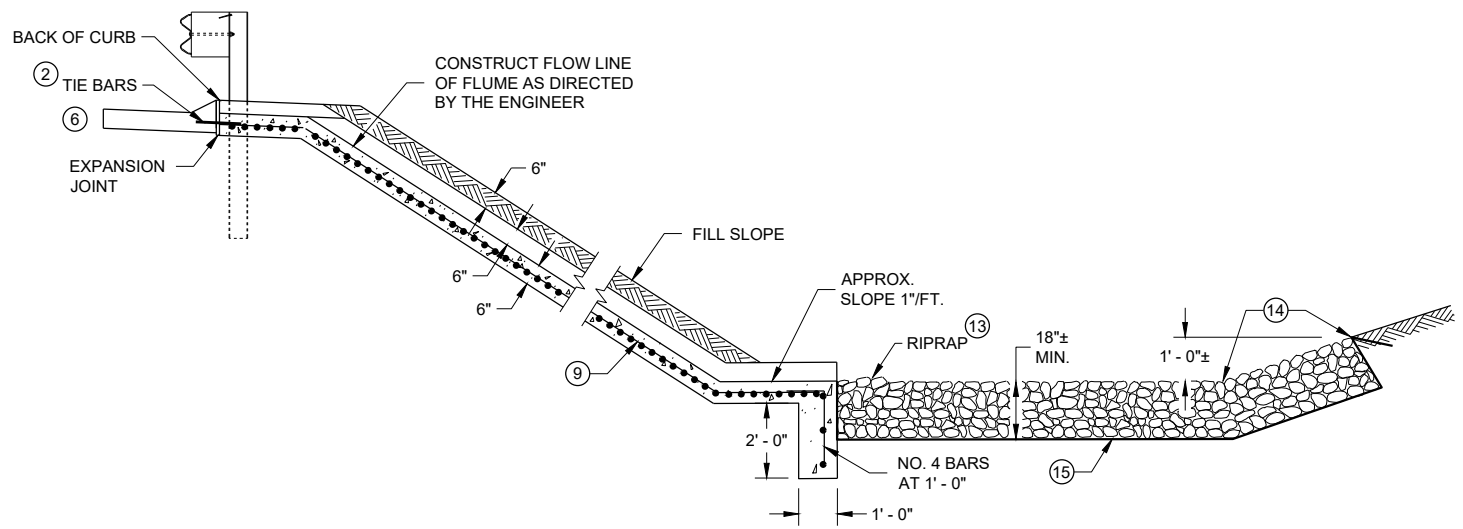
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

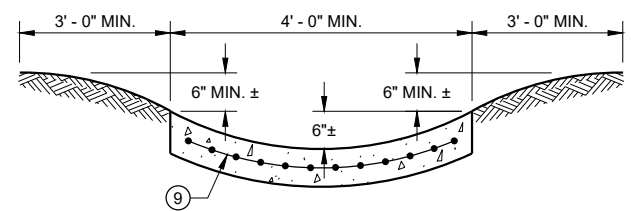
6

SDD 08D02 - 07a

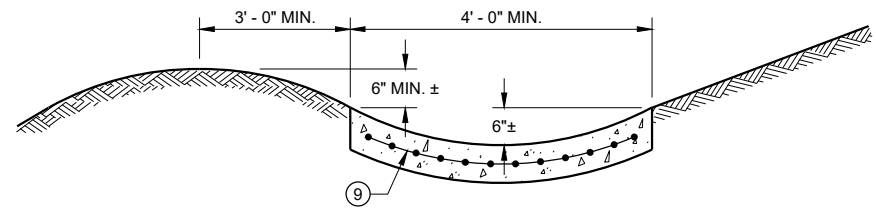
SDD 08D02 - 07a



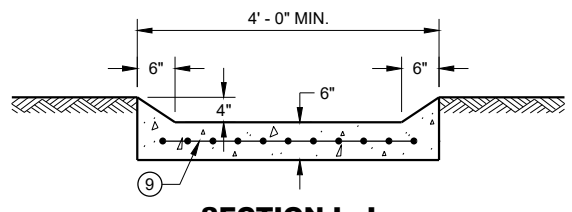
SECTION A - A



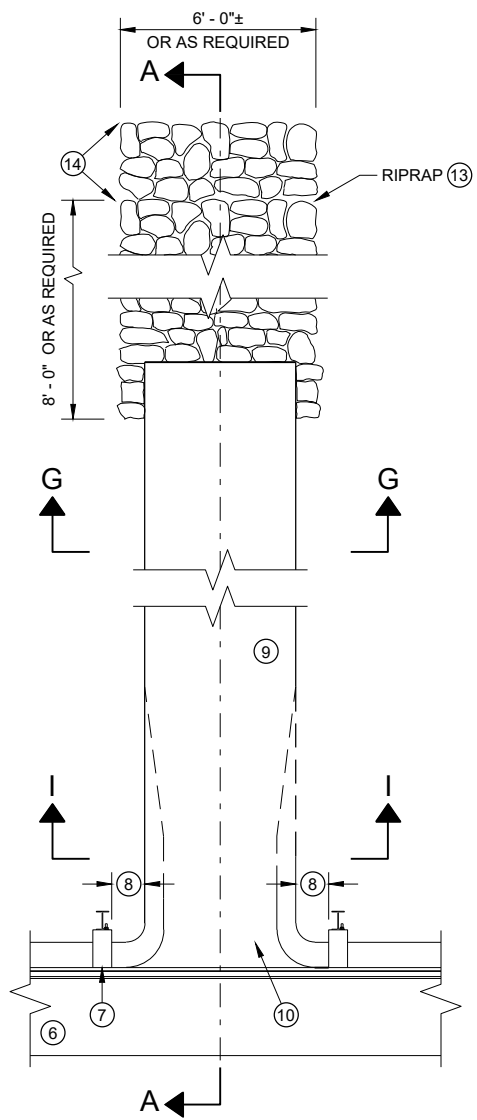
SECTION G - G



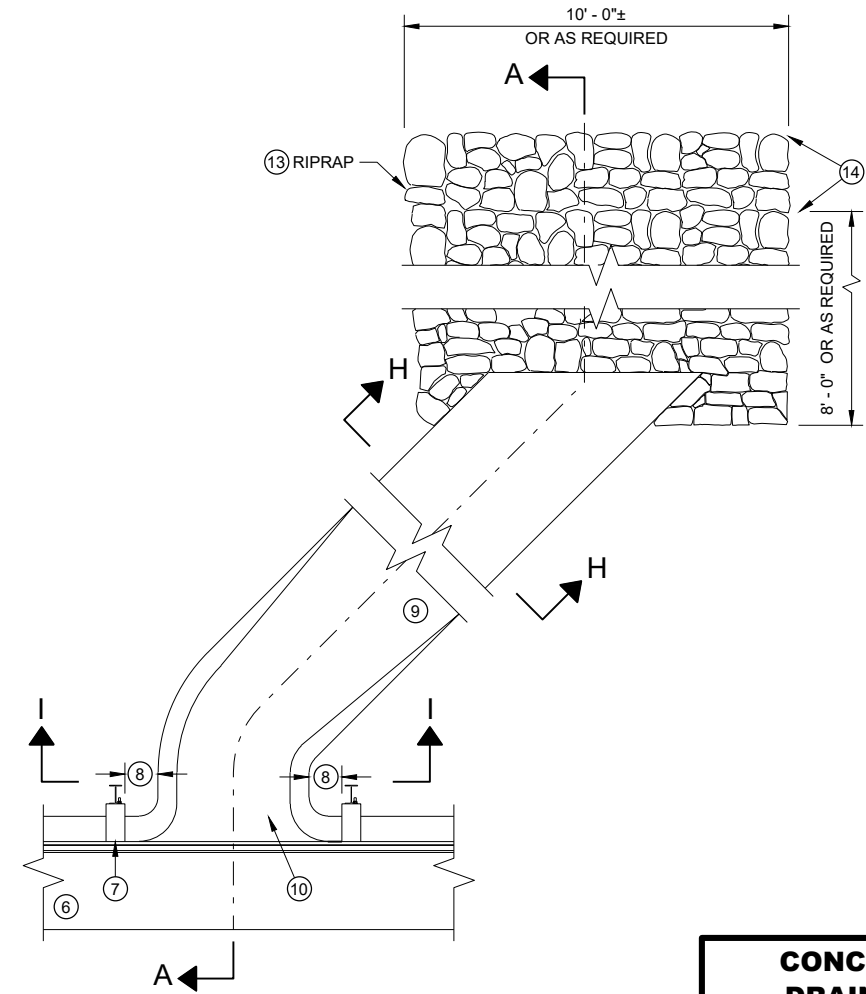
SECTION H - H



SECTION I - I



PLAN VIEW PERPENDICULAR FLUME



PLAN VIEW SKEWED FLUME

GENERAL NOTES

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

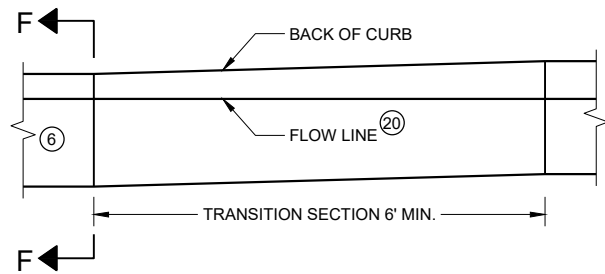
ALL STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

- ① USE A JOINT SEALANT CONFORMING TO STANDARD SPECIFICATION 415.2.6.
- ② NO. 4 X 2'-0" TIE BARS SPACED AT 12" C-C TO BE PLACED BY BRIDGE CONTRACTOR OR DRILLED TIE BARS PLACED AS DIRECTED BY THE ENGINEER.
- ③ PAVED CONCRETE SHOULDER (SDD 13A03) OR CONCRETE DRAINAGE SLAB.
- ④ CONCRETE PAVEMENT APPROACH SLAB (SHOWN) OR STRUCTURE APPROACH SLAB AND CONCRETE PAVEMENT APPROACH SLAB. SEE SDD 13B02 AND STRUCTURE PLANS.
- ⑤ PAVED CONCRETE SHOULDER (SDD 13A03) OR ASPHALT SHOULDER.
- ⑥ CONCRETE CURB AND GUTTER 4-INCH SLOPED 36-INCH TYPE TBT OR TBTT. USE TYPE TBTT CURB WITH NO. 4 X 2'-0" TIE BARS SPACED AT 3'-0" C-C ONLY WHEN ADJACENT TO CONCRETE PAVEMENTS.

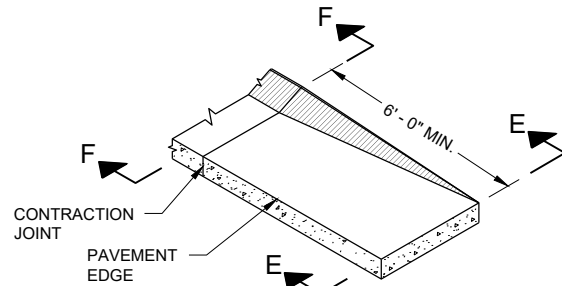
- ⑦ PLACE FLUME BEFORE MSG THRIE BEAM TRANSITION POST 1 (SEE SDD 14B45)
- ⑧ CENTER FLUME BETWEEN POSTS. 6-INCH MINIMUM SEPARATION FROM OUTSIDE EDGE OF FLUME TO POSTS.
- ⑨ MINIMUM REINFORCEMENT SHALL BE 4" X 4" - W3.0 X W3.0 OR NO. 3 BARS LONGITUDINAL AND TRANSVERSE SPACING 12" C-C.
- ⑩ SEE ROADWAY PLANS FOR FLUME LOCATION.
- ⑪ START CURB AND GUTTER TRANSITION OR END SECTION.
- ⑫ DEPRESS FLOW LINE (SEE DETAIL)
- ⑬ MEDIUM RIPRAP UNLESS OTHERWISE SPECIFIED.
- ⑭ LIMITS OF ADDITIONAL RIPRAP WHEN SPECIAL DITCH AS REQUIRED.
- ⑮ GEOTEXTILE FABRIC TYPE HR.

CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES

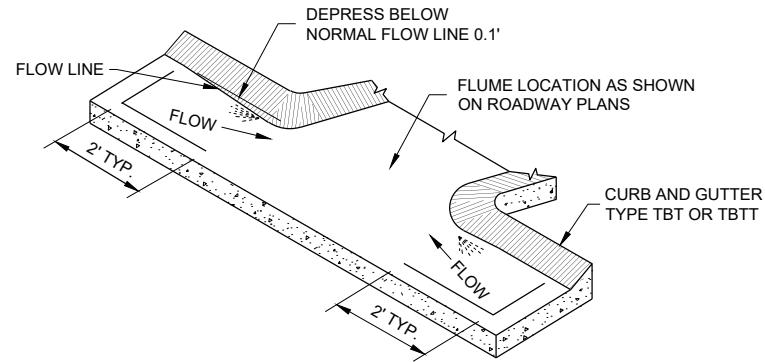
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



**CURB AND GUTTER TRANSITION SECTION
CONCRETE CURB AND GUTTER 4-INCH SLOPED
36 INCH TYPE TBT OR TBTT**



**CURB AND GUTTER END SECTION
CONCRETE CURB AND GUTTER 4-INCH SLOPED
36 INCH TYPE TBT OR TBTT**



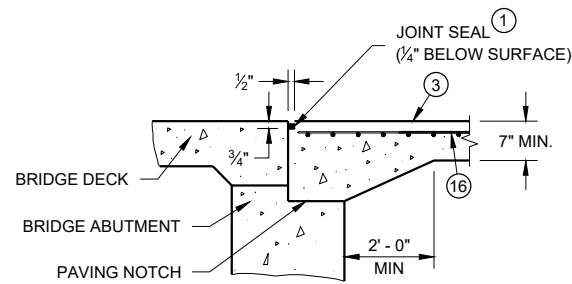
**CURB AND GUTTER FLOW LINE DEPRESSION
AT FLUMES CONCRETE CURB AND GUTTER
4-INCH SLOPED 36 INCH TYPE TBT OR TBTT**

GENERAL NOTES

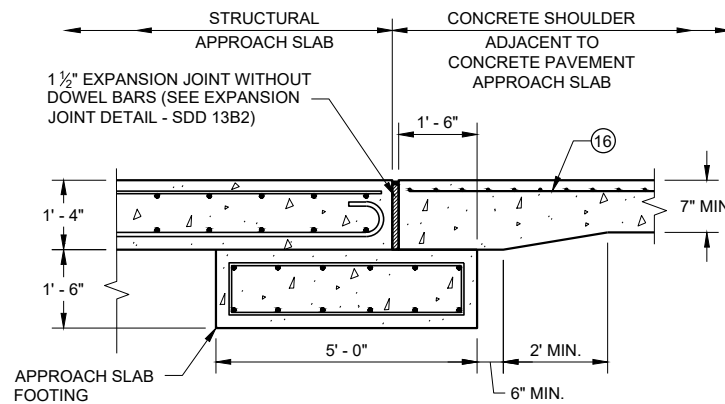
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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

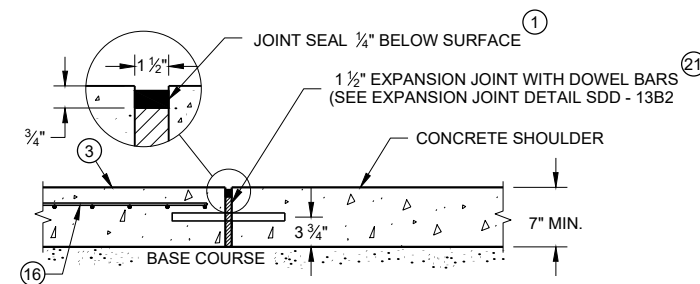
- ① USE A JOINT SEALANT CONFORMING TO STANDARD SPECIFICATION 415.2.6.
- ② NO. 4 X 2' - 0" TIE BARS SPACED AT 12" C-C TO BE PLACED BY BRIDGE CONTRACTOR OR DRILLED TIE BARS PLACED AS DIRECTED BY THE ENGINEER.
- ③ PAVED CONCRETE SHOULDER (SDD 13A03) OR CONCRETE DRAINAGE SLAB.
- ④ CONCRETE PAVEMENT APPROACH SLAB (SHOWN) OR STRUCTURE APPROACH SLAB AND CONCRETE PAVEMENT APPROACH SLAB. SEE SDD 13B02 AND STRUCTURE PLANS.
- ⑤ PAVED CONCRETE SHOULDER (SDD 13A03) OR ASPHALT SHOULDER.
- ⑥ CONCRETE CURB AND GUTTER 4-INCH SLOPED 36-INCH TYPE TBT OR TBTT. USE TYPE TBTT CURB WITH NO. 4 X 2' - 0" TIE BARS SPACED AT 3' - 0" C-C ONLY WHEN ADJACENT TO CONCRETE PAVEMENTS.
- ⑦ PLACE FLUME BEFORE MSG THRIE BEAM TRANSITION POST 1 (SEE SDD 14B45)
- ⑧ CENTER FLUME BETWEEN POSTS. 6-INCH MINIMUM SEPARATION FROM OUTSIDE EDGE OF FLUME TO POSTS.
- ⑨ MINIMUM REINFORCEMENT SHALL BE 4" X 4" - W3.0 X W3.0 OR NO. 3 BARS LONGITUDINAL AND TRANSVERSE SPACING 12" C-C.
- ⑩ SEE ROADWAY PLANS FOR FLUME LOCATION.
- ⑪ START CURB AND GUTTER TRANSITION OR END SECTION.
- ⑫ DEPRESS FLOW LINE (SEE DETAIL)
- ⑬ MEDIUM RIPRAP UNLESS OTHERWISE SPECIFIED.
- ⑭ LIMITS OF ADDITIONAL RIPRAP WHEN SPECIAL DITCH IS REQUIRED.
- ⑮ GEOTEXTILE FABRIC TYPE HR.
- ⑯ MINIMUM REINFORCEMENT SHALL BE 6" X 6" - W4.0 X W4.0 OR NO. 3 BARS LONGITUDINAL AND TRANSVERSE SPACING 12" C-C.
- ⑰ MSG THRIE BEAM TRANSITION POST 1. SEE SDD 14B45 FOR ADDITIONAL CONSTRUCTION DETAILS AND ACCEPTABLE MATERIALS.
- ⑱ MAINTAIN WIDTH, THICKNESS AND CROSS SLOPE OF ADJACENT TYPE TBT OR TBTT CURB. SEE NOTE 6 FOR TIE BAR SPACING.
- ⑲ ALIGN FACE OF POST BLOCK WITH FLOW LINE.
- ⑳ MAINTAIN FLOW LINE AT EDGE OF PAVEMENT/FACE OF BEAM GUARD AS APPLICABLE.
- ㉑ DO NOT CONSTRUCT AN EXPANSION JOINT OR INSTALL DOWEL BARS WHEN ABUTTING HMA PAVEMENTS.



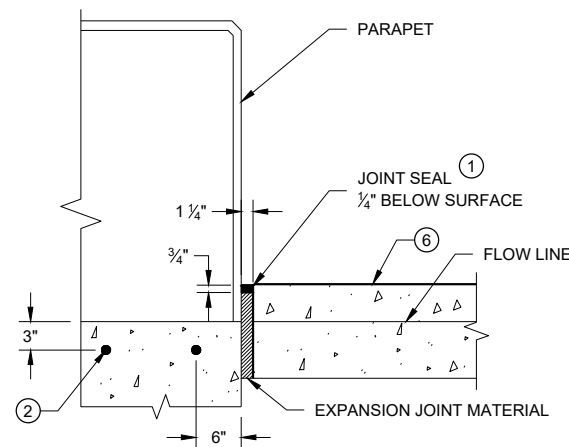
SECTION B-B



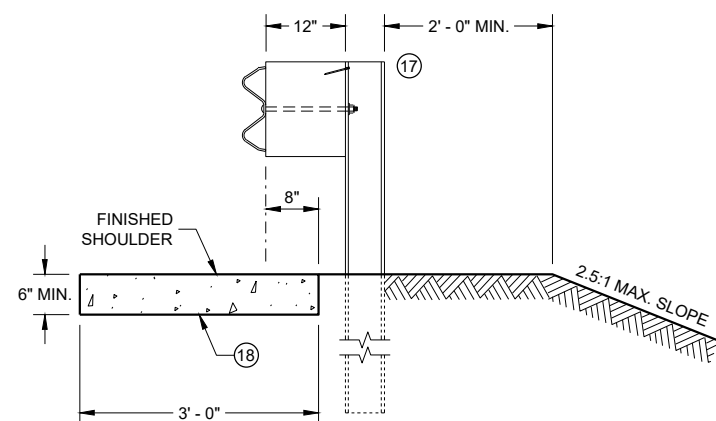
**SECTION C - C
JOINT DETAIL FOR BRIDGE WITH STRUCTURAL
APPROACH SLAB AND CONCRETE APPROACH SLAB**



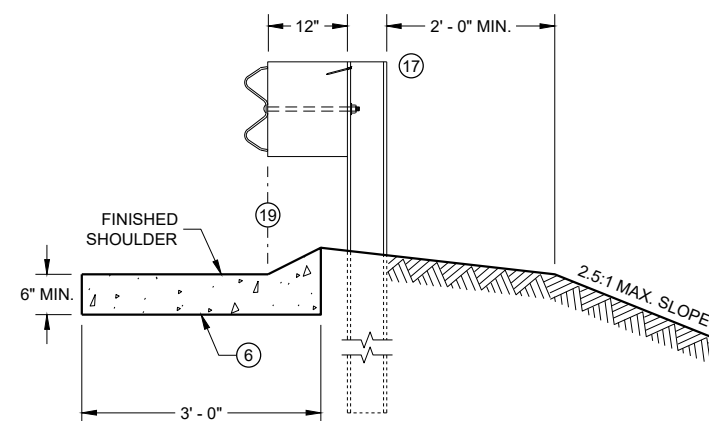
**SECTION C - C
JOINT DETAIL FOR BRIDGE APPROACH
WITH CONCRETE SHOULDERS**



SECTION D - D



SECTION E - E



SECTION F - F

6

6

SDD08D02 - 07C

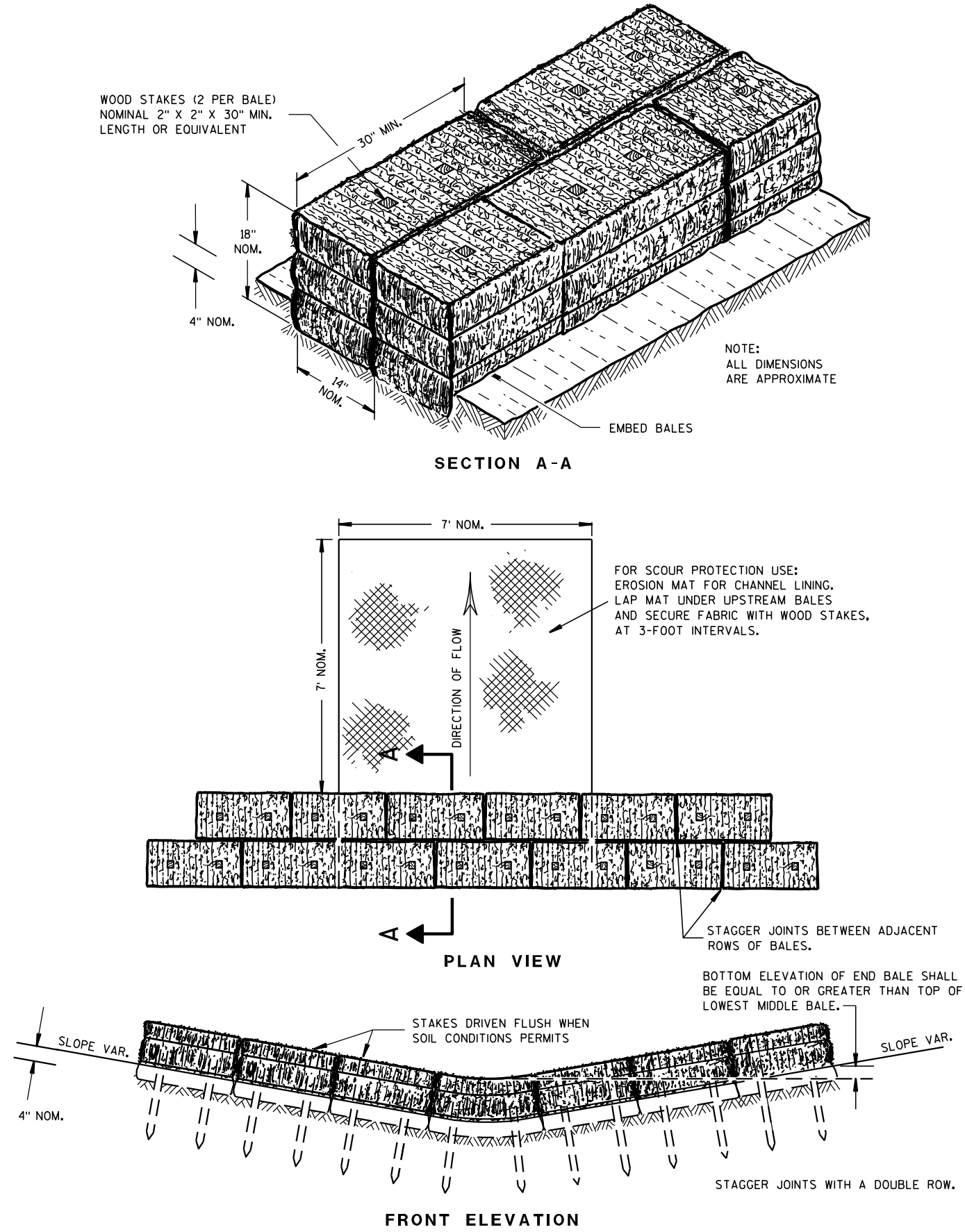
SDD08D02 - 07C

**CONCRETE SURFACE
DRAINS FLUME TYPE
AT STRUCTURES**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
February 2020 DATE /S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
ENGINEER

FHWA

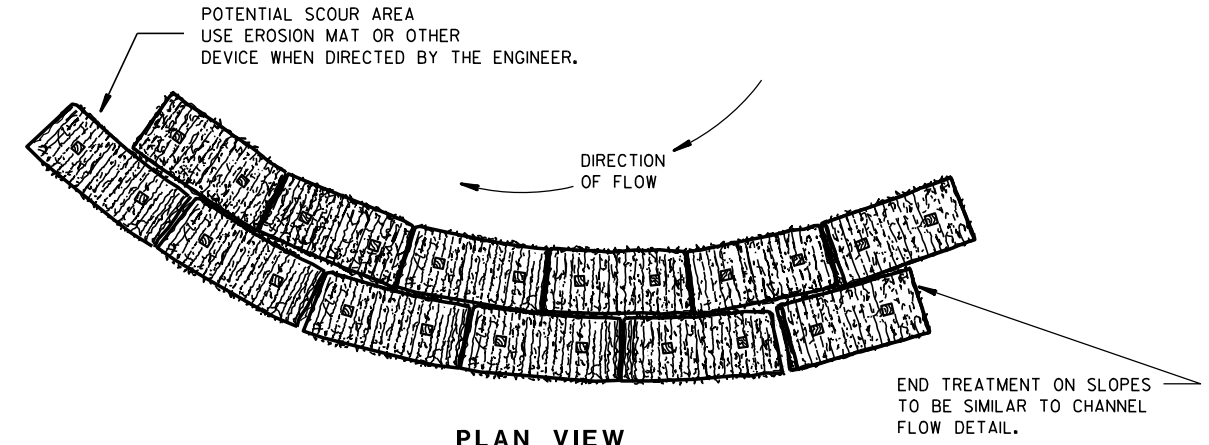


TEMPORARY DITCH CHECK USING EROSION BALES ①

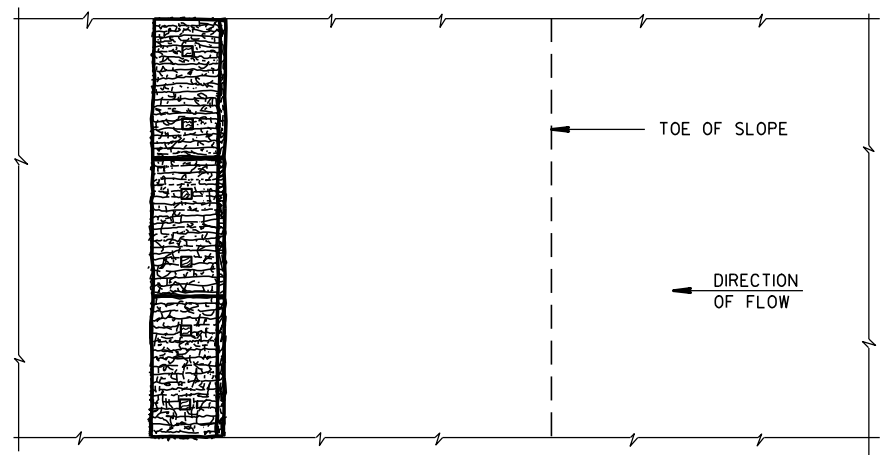
GENERAL NOTES

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.

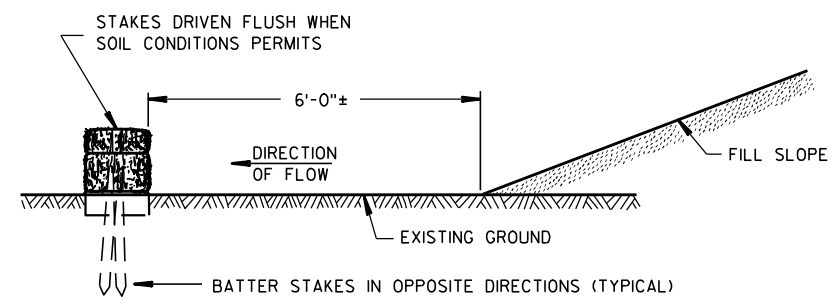
- ① TEMPORARY DITCH CHECKS EITHER EROSION BALES OR MANUFACTURED SHALL BE PAID FOR UNDER THE BID ITEM OF TEMPORARY DITCH CHECK. THE DEPARTMENT WILL NOT PAY FOR TEMPORARY DITCH CHECKS CONSTRUCTED OF A SINGLE ROW OF EROSION BALES.



PLAN VIEW WHEN ALTERING THE DIRECTION OF FLOW



PLAN VIEW

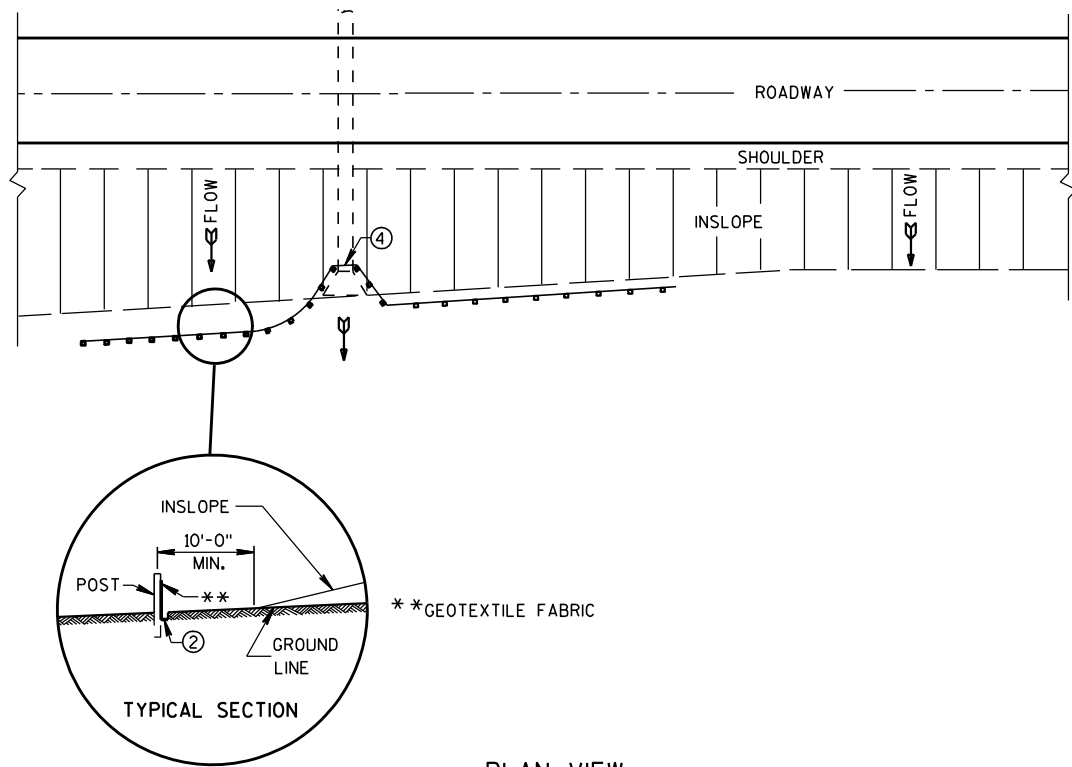


FRONT ELEVATION WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE EROSION BALES FOR SHEET FLOW

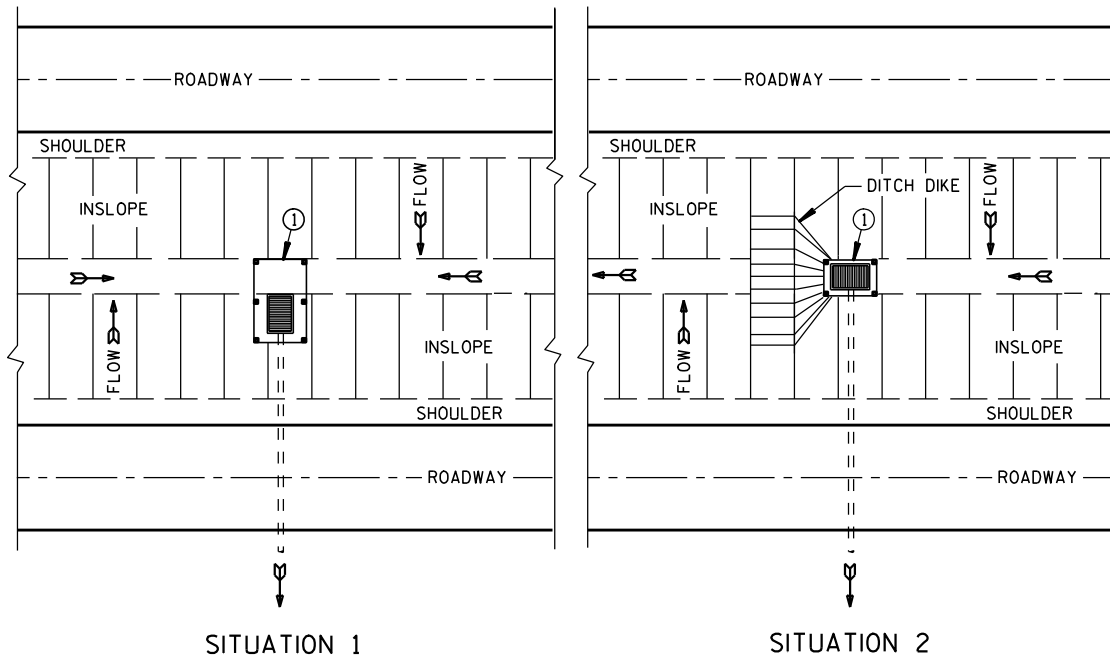
TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS

STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

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



PLAN VIEW
TYPICAL APPLICATION OF SILT FENCE

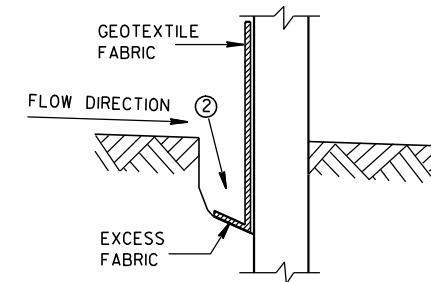


SITUATION 1 SITUATION 2
PLAN VIEW
SILT FENCE AT MEDIAN SURFACE DRAINS

GENERAL NOTES

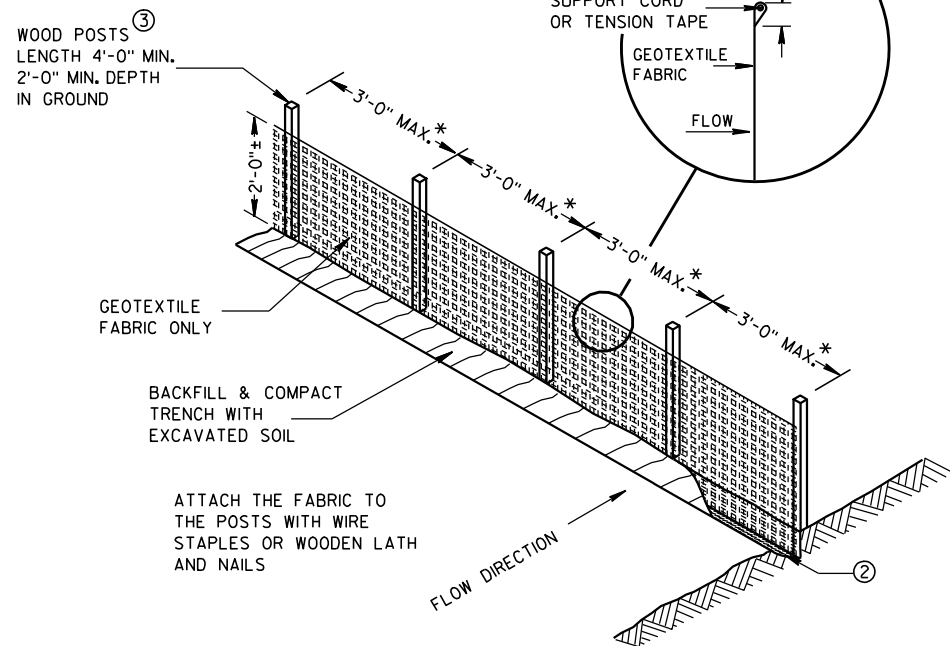
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

- ① HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
- ② FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
- ③ WOOD POSTS SHALL BE A MINIMUM SIZE OF 1 1/8" X 1 1/8" OF OAK OR HICKORY.
- ④ SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.
- ⑤ CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.



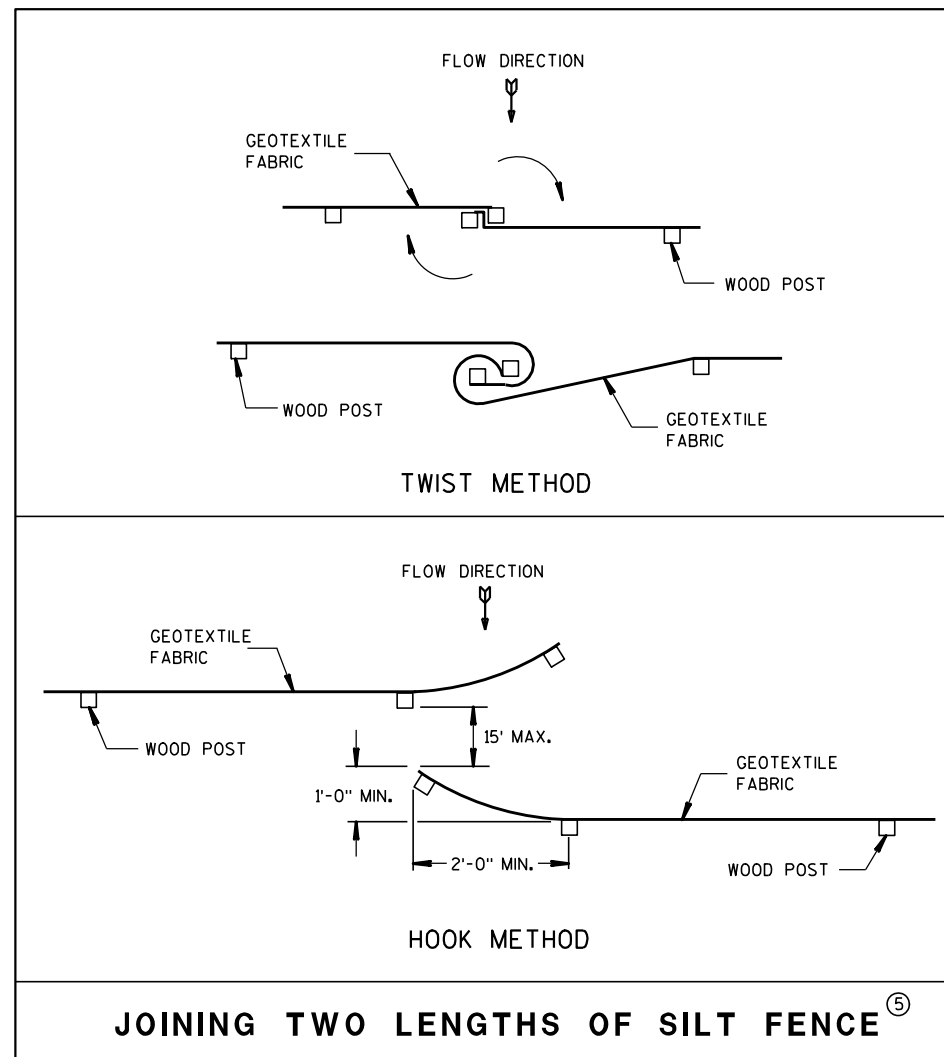
TRENCH DETAIL

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

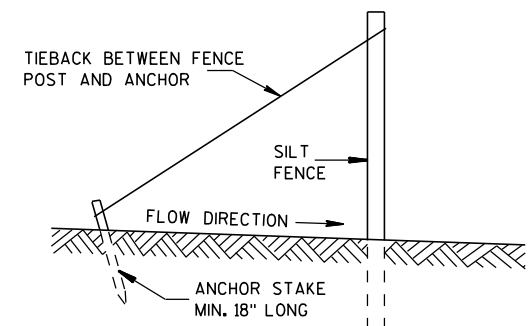


SILT FENCE

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



JOINING TWO LENGTHS OF SILT FENCE



SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)

SILT FENCE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

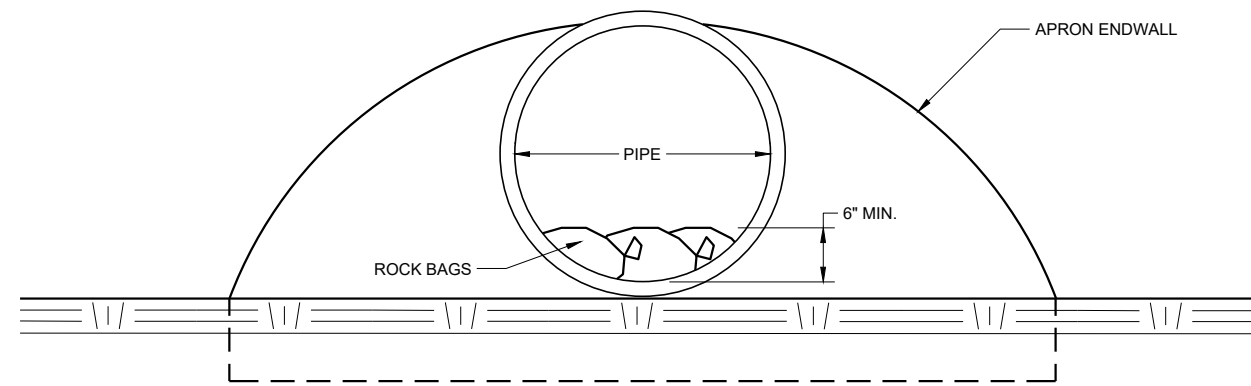
APPROVED

4-29-05

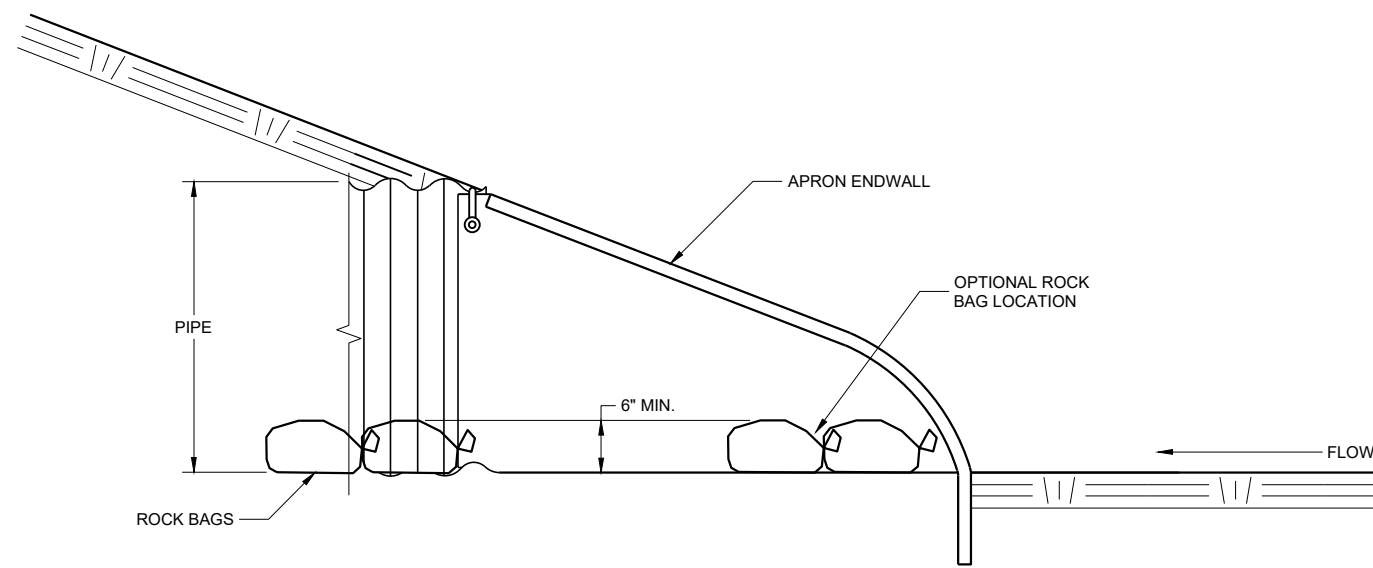
DATE

FHWA

/S/ Beth Canestra
CHIEF ROADWAY DEVELOPMENT ENGINEER



END VIEW



SIDE VIEW

CULVERT PIPE CHECK
(INSTALL ON INLET END ONLY)

CULVERT PIPE CHECK

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
May 2019 /S/ Daniel Schave
DATE EROSION CONTROL ENGINEER

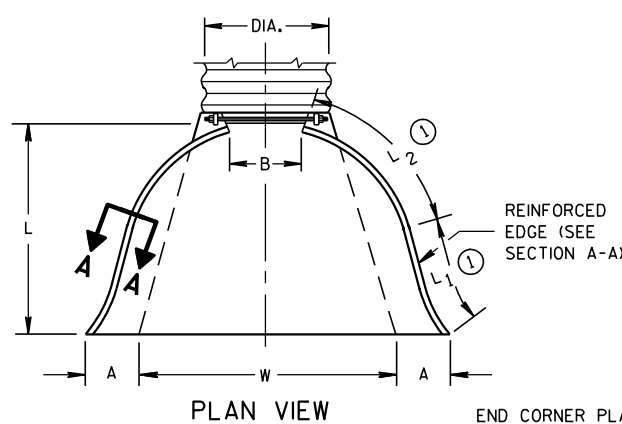
FHWA

METAL APRON ENDWALLS											
PIPE DIA. (IN.)	MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1	L2	W (±2")		
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	36	2 1/2 to 1	1 Pc.
21	.064	.060	9	12	6	36	18	29 5/8	42	2 1/2 to 1	1 Pc.
24	.064	.075	10	13	6	41	18	37 1/4	48	2 1/2 to 1	1 Pc.
30	.079	.075	12	16	8	51	18	52 1/4	60	2 1/2 to 1	1 Pc.
36	.079	.105	14	19	9	60	24	59 3/4	72	2 1/2 to 1	2 Pc.
42	.109	.105	16	22	11	69	24	75 5/8	84	2 1/2 to 1	2 Pc.
48	.109	.105	18	27	12	78	24	81	90	2 1/4 to 1	3 Pc.
54	.109	.105	18	30	12	84	30	85 1/2	102	2 1/4 to 1	3 Pc.
60	.109x	.105x	18	33	12	87	—	—	114	2 to 1	3 Pc.
66	.109x	.105x	18	36	12	87	—	—	120	2 to 1	3 Pc.
72	.109x	.105x	18	39	12	87	—	—	126	2 to 1	3 Pc.
78	.109x	.105x	18	42	12	87	—	—	132	1 1/2 to 1	3 Pc.
84	.109x	.105x	18	45	12	87	—	—	138	1 1/2 to 1	3 Pc.
90	.109x	.105x	18	37	12	87	—	—	144	1 1/2 to 1	3 Pc.
96	.109x	.105x	18	35	12	87	—	—	150	1 1/2 to 1	3 Pc.

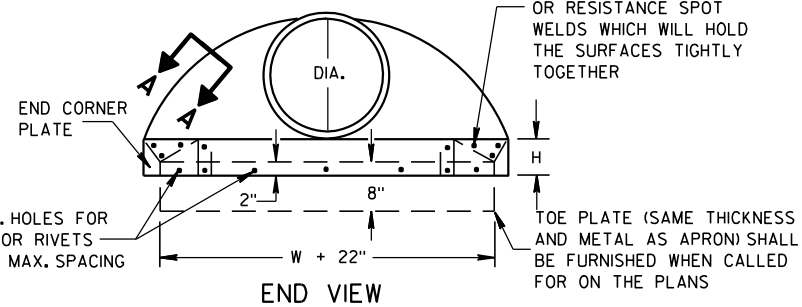
* EXCEPT CENTER PANEL SEE GENERAL NOTES

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

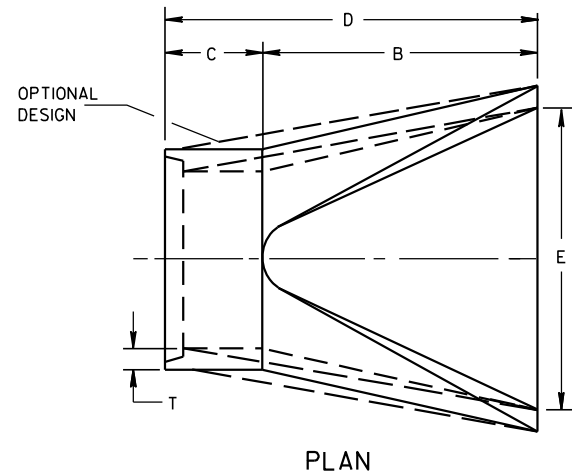
* MINIMUM
** MAXIMUM



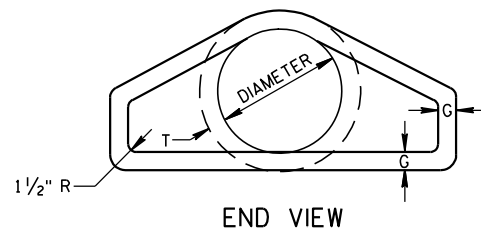
END CORNER PLATES MAY BE FASTENED TO APRON PROPER BY BOLTS, RIVETS, OR RESISTANCE SPOT WELDS WHICH WILL HOLD THE SURFACES TIGHTLY TOGETHER



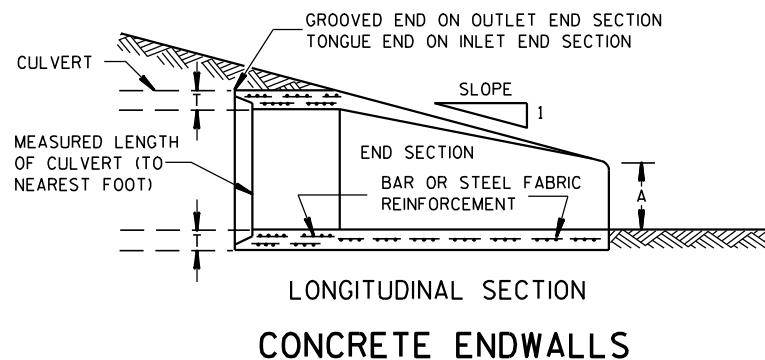
SIDE ELEVATION
METAL ENDWALLS



PLAN

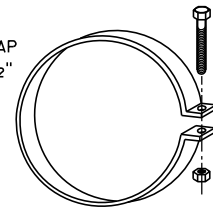


END VIEW

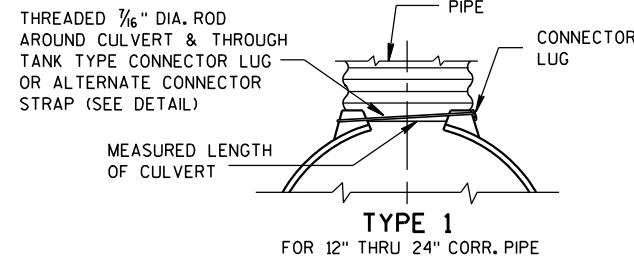


LONGITUDINAL SECTION
CONCRETE ENDWALLS

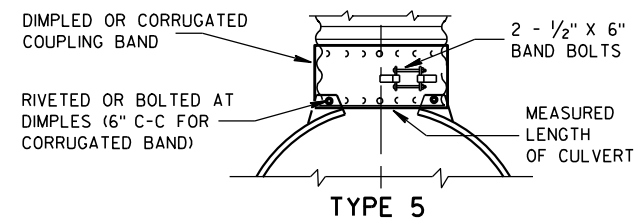
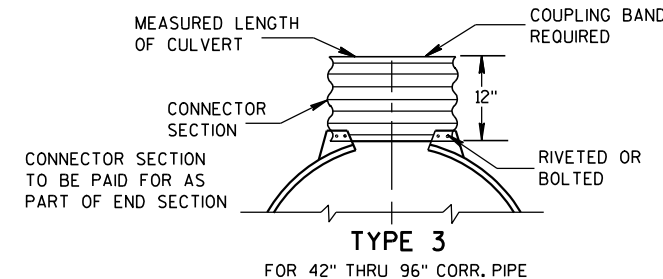
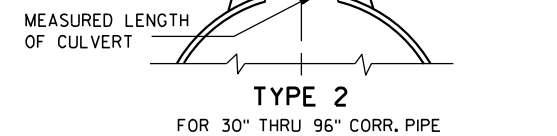
1" WIDE, 12 GA. (0.109" THICK) GALVANIZED STRAP WITH STANDARD 6" X 1/2" BAND BOLT AND NUT



ALTERNATE FOR TYPE 1 CONNECTION
END SECTION CONNECTOR STRAP



THREADED 1/16" DIA. ROD OVER TOP OF APRON, SIDE LUGS TO BE RIVETED TO APRON



ALTERNATE FOR:
ALL SIZES CORRUGATED CIRCULAR PIPE

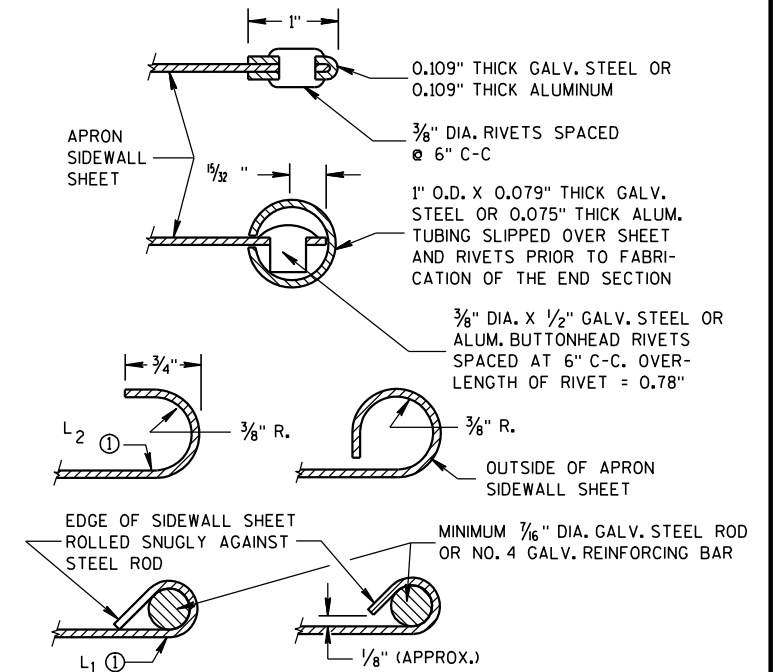
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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 VICE 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.

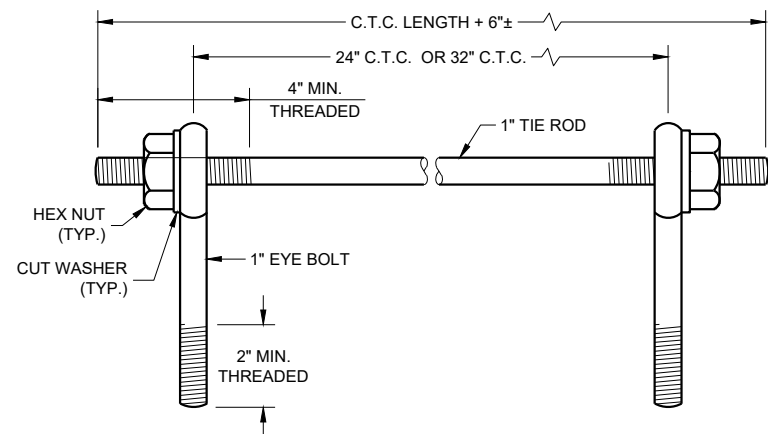
WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

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

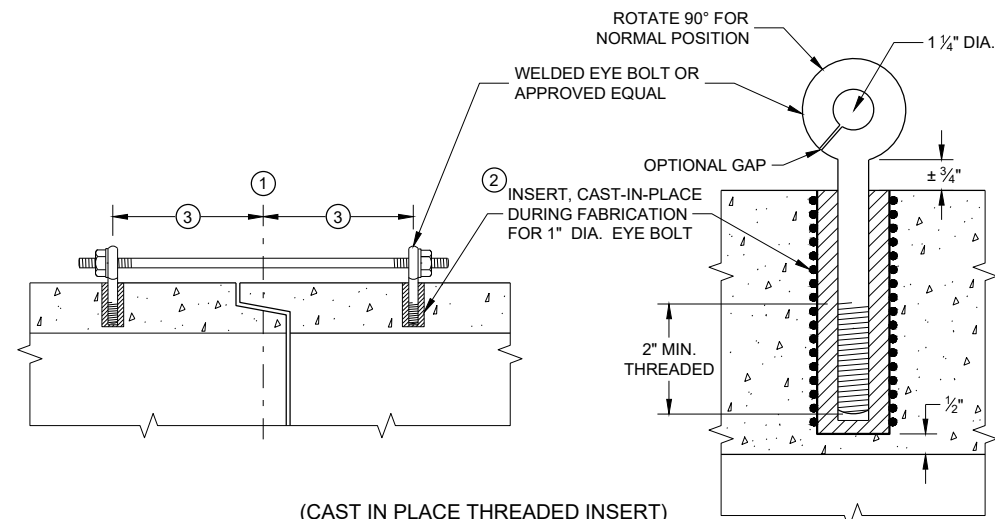
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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



EYE BOLTS AND TIE ROD

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



(CAST IN PLACE THREADED INSERT)
LONGITUDINAL SECTIONS

GENERAL NOTES

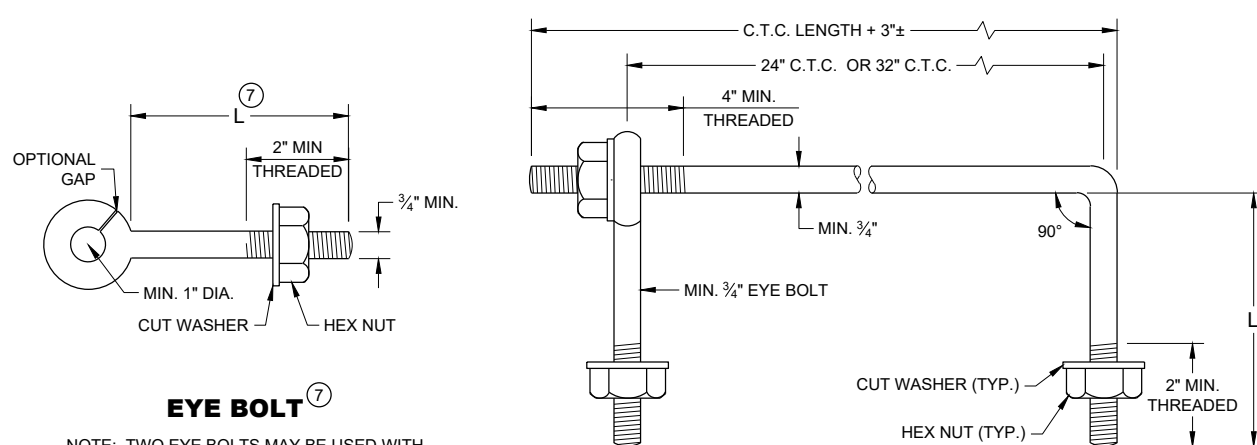
DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

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

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

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

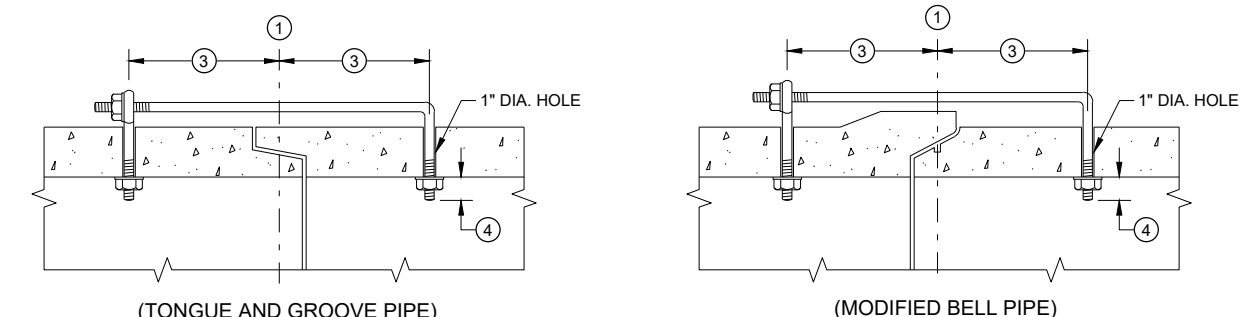
- ① CENTER LINE OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS.
- ② THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS.
- ③ HOLES SHALL BE CAST-IN-PLACE OR DRILLED PER THE APPLICABLE DETAIL, AND EQUAL DISTANCE FROM THE CENTERLINE OF THE JOINT.
- ④ BOLT PROJECTION INSIDE OF PIPE SHALL NOT EXCEED 2 INCHES.
- ⑤ OPENING TO BE ROD DIAMETER PLUS 1 INCH.
- ⑥ LENGTH ADEQUATE TO EXTEND TO WITHIN 1/2 INCH OF THE INNER SURFACE OF THE PIPE.
- ⑦ EYE BOLT LENGTH DETERMINED BY WALL THICKNESS, BELL THICKNESS AND BOLT PROJECTION INSIDE PIPE.



EYE BOLT ⑦

NOTE: TWO EYE BOLTS MAY BE USED WITH A 30" OR 38" LONG THREADED ROD IN LIEU OF THE 90° BENT TIE ROD.

EYE BOLT AND TIE ROD



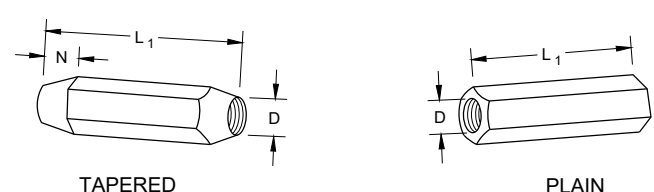
LONGITUDINAL SECTION
(JOINT TIES FOR 18" TO 66" DIA. CONCRETE PIPE)

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

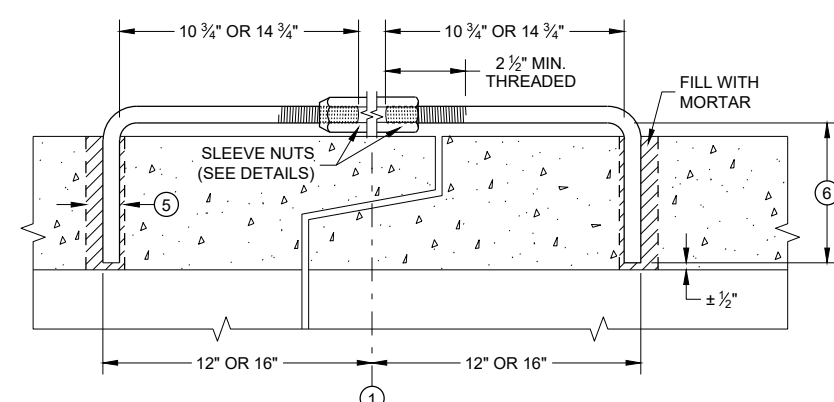
ADJUSTABLE TIE ROD TABLE

PIPE DIAMETER	TIE ROD DIAMETER	D	L ₁	N
12 - 60	5/8	5/8	5	1/2
66 - 84	3/4	3/4	5	1/2
90 - 144	1	1	7	1 7/16

DIMENSIONS SHOWN ARE IN INCHES

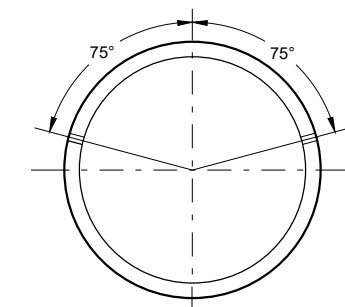


RIGHT AND LEFT THREADS SLEEVE NUTS



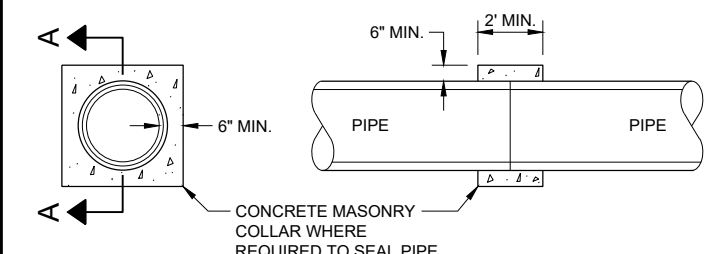
LONGITUDINAL SECTION

ADJUSTABLE TIE ROD (ALTERNATE NO. 3)



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

TRANSVERSE SECTION

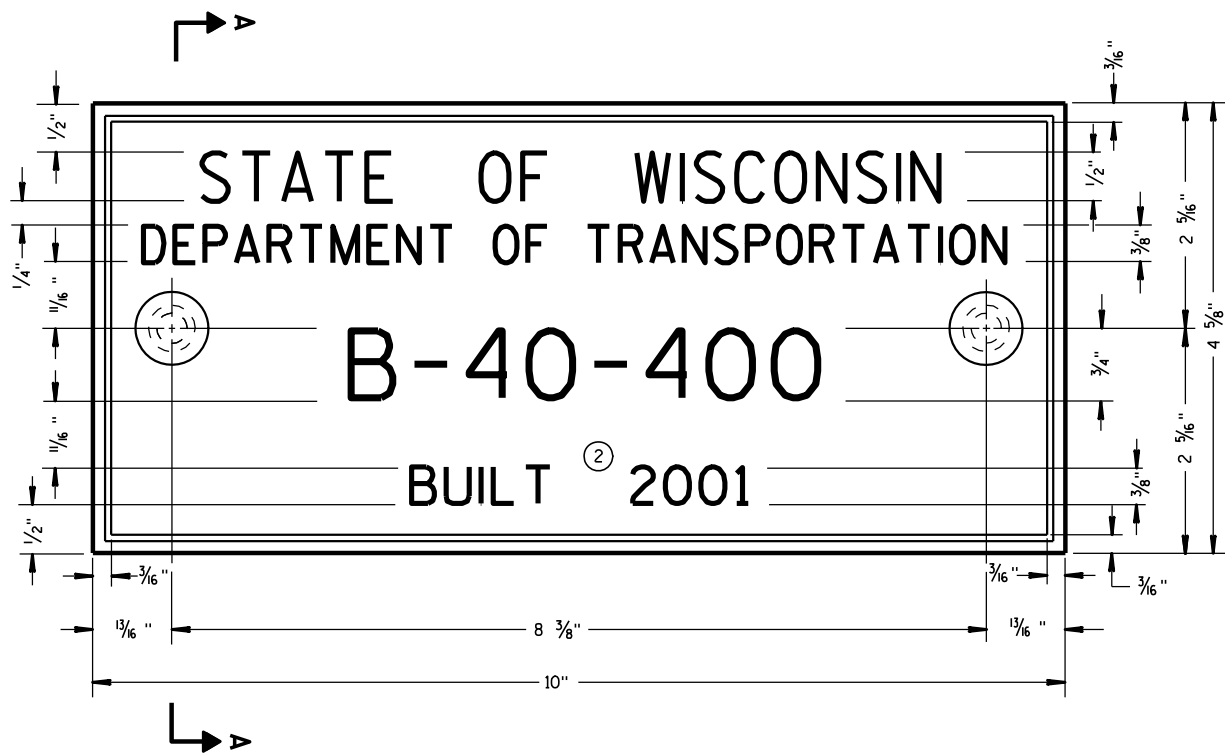


SECTION A - A
CONCRETE COLLAR DETAIL

JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2021 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT
ENGINEER



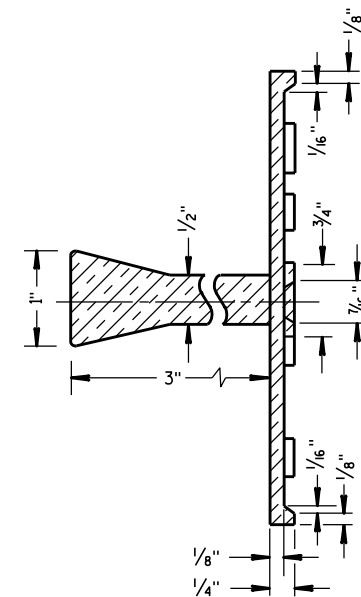
TYPICAL NAME PLATE
(BRIDGES, CULVERTS, AND RETAINING WALLS)

GENERAL NOTES

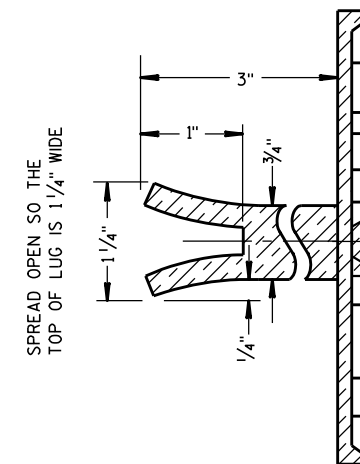
NAME PLATES TO BE INSTALLED ON BRIDGES, CULVERTS, AND RETAINING WALLS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS.

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

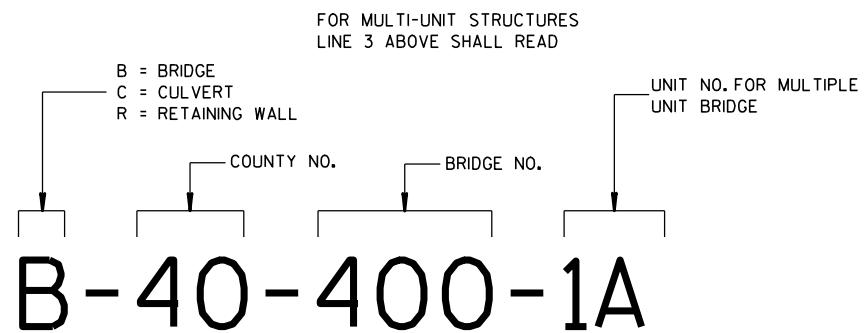
- ① EPOXY RESIN SHALL BE FROM AN APPROVED MANUFACTURER AND USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ② REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.



SECTION A-A

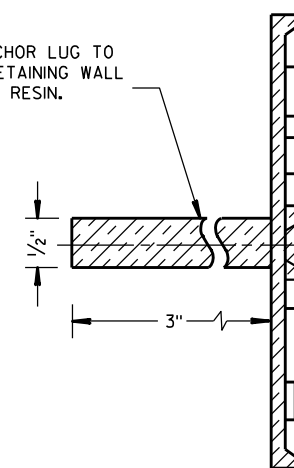


ALTERNATE LUG



**NUMBERING DESIGNATION
MULTI-UNIT STRUCTURES**

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

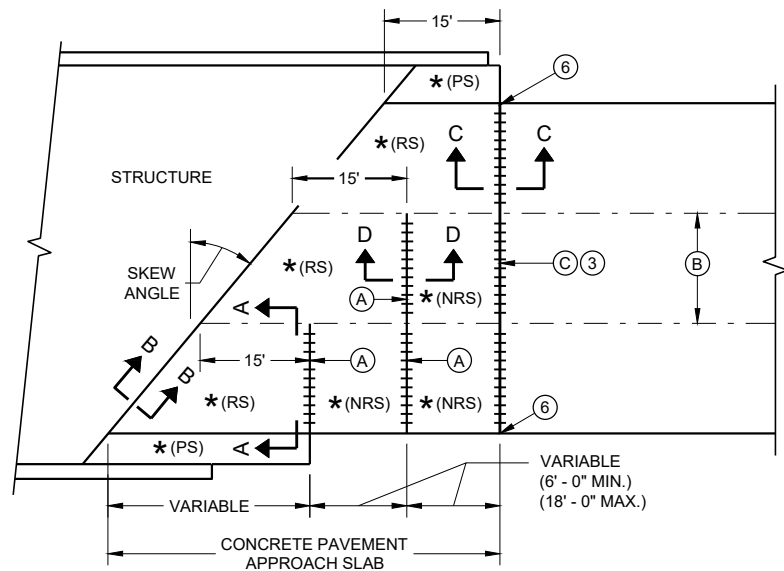


ALTERNATE LUG
(FOR ATTACHMENT TO PRECAST STRUCTURES)

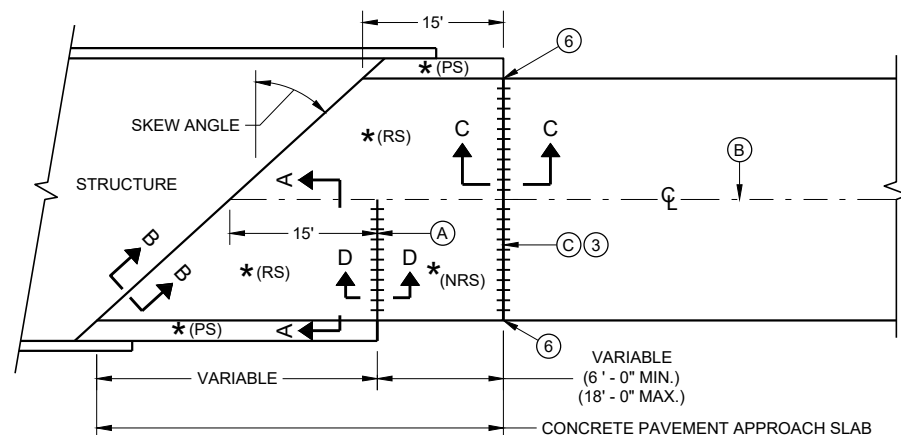
**NAME PLATE
(STRUCTURES)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

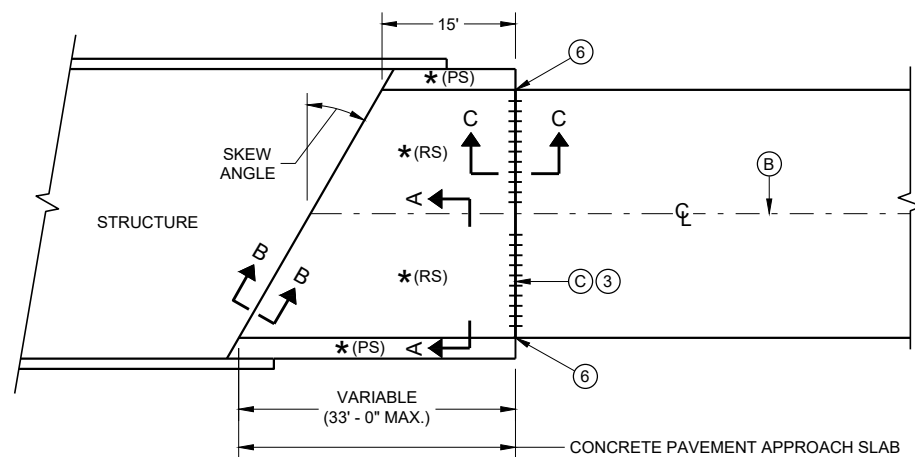
APPROVED
DATE 3/26/10 /S/ Scot Becker
CHIEF STRUCTURAL DEVELOPMENT ENGINEER
FHWA



**SKewed APPROACH
(PAVEMENT MORE THAN TWO LANES)**

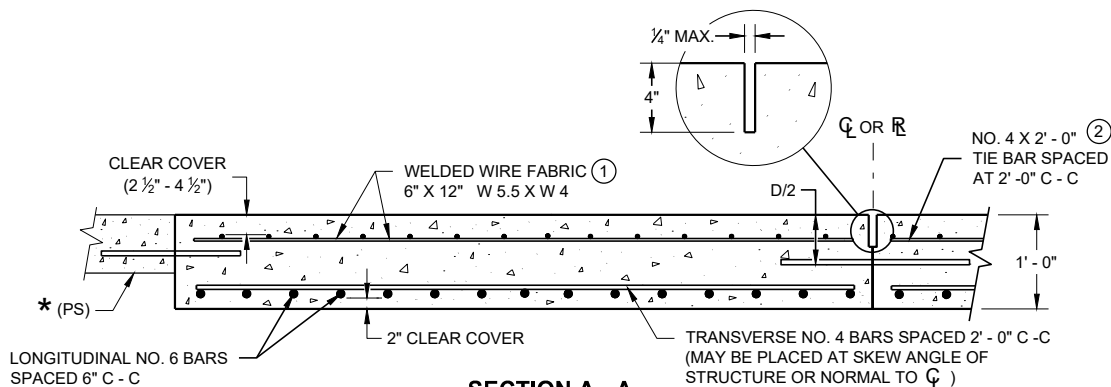


**SKews > 20°
(PAVEMENT WIDTH ≤ 30')**

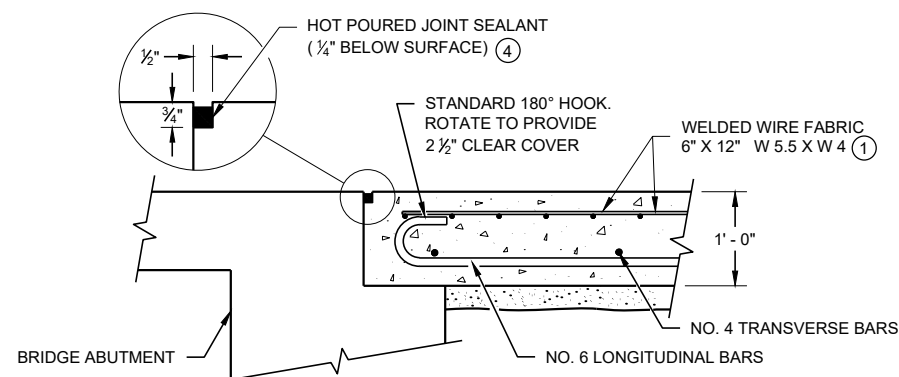


**SKews ≤ 20°
(PAVEMENT WIDTH ≤ 30')**
APPROACH SLAB AND ADJACENT PAVEMENT

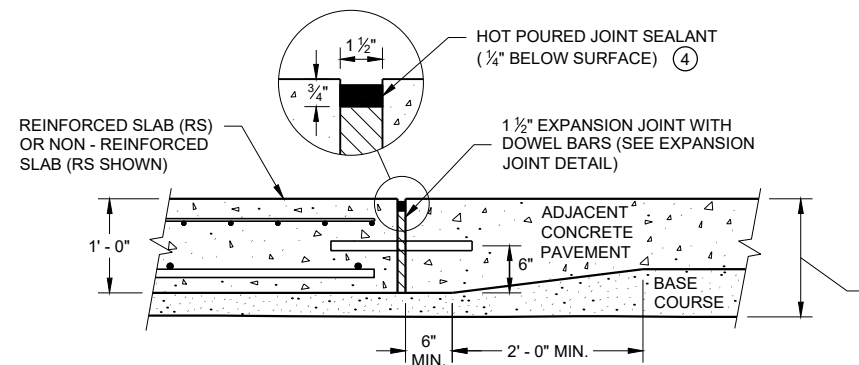
- * (RS) = REINFORCED CONCRETE SLAB
- * (PS) = PAVED CONCRETE SHOULDER OR CONCRETE DRAINAGE SLAB
- * (NRS) = NON - REINFORCED CONCRETE SLAB
- *** STANDARD DOWEL BAR DIAMETER (SEE SDD 13C11 AND SDD 13C13)



**SECTION A - A
REINFORCEMENT POSITIONING DETAIL**



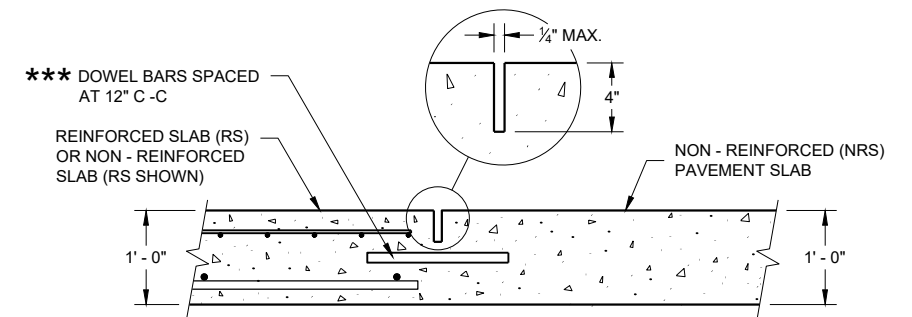
**SECTION B - B
BEND DETAIL
BOTTOM REINFORCEMENT**



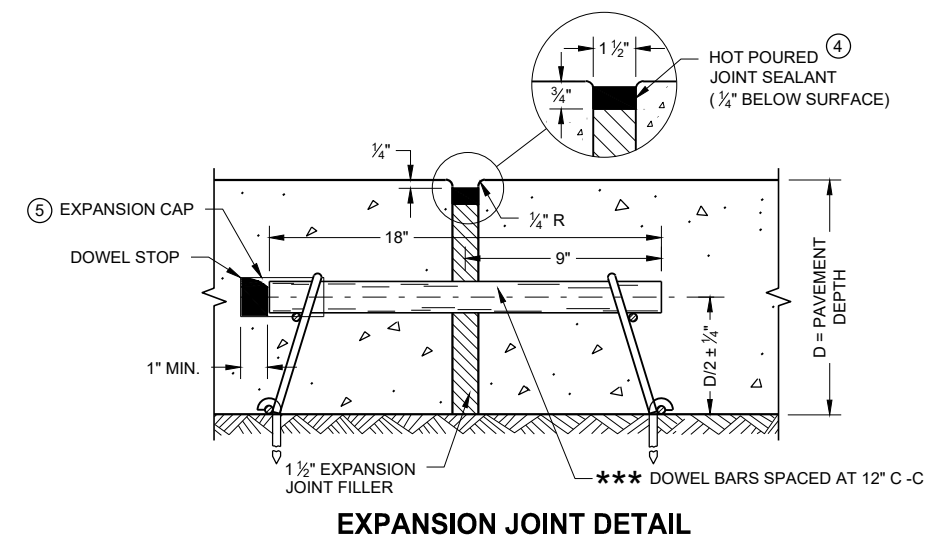
**SECTION C - C
TRANSITION DETAIL
APPROACH SLAB TO ADJACENT PAVEMENT**

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 CONFORMING TO STANDARD SPECIFICATION 415.2.6.
 - 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 \bar{C} OR \bar{R} .
 - (B) STANDARD LONGITUDINAL JOINT WITH TIE BARS.
 - (C) 1 1/2" EXPANSION JOINT WITH DOWEL BARS NORMAL TO \bar{C} OR \bar{R} .



**SECTION D - D
CONTRACTION JOINT**



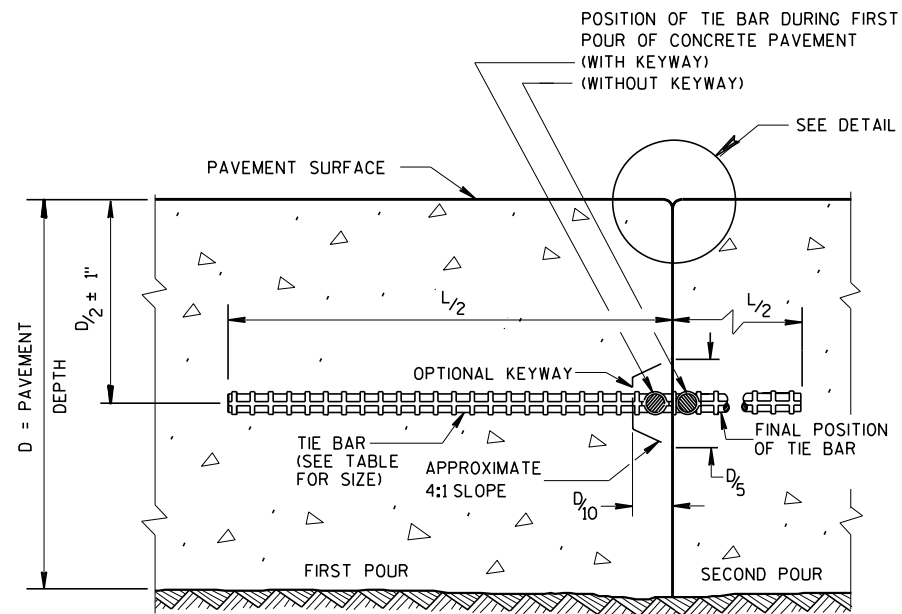
EXPANSION JOINT DETAIL

**CONCRETE PAVEMENT
APPROACH SLAB**

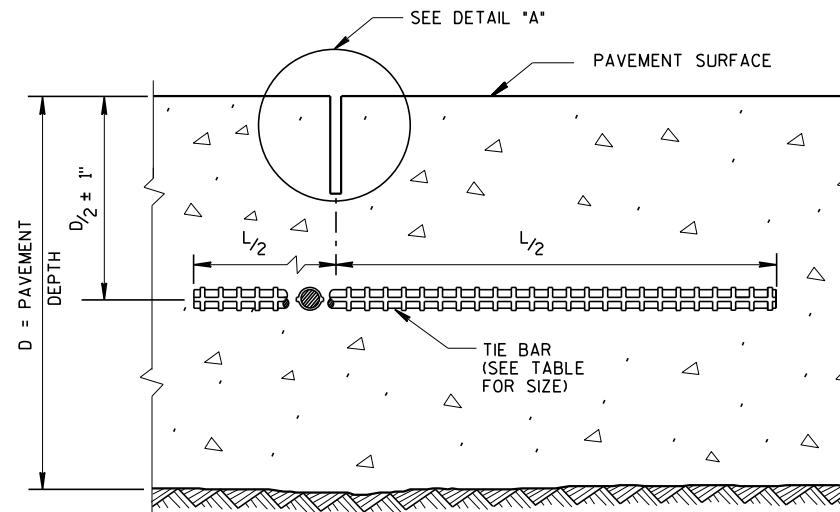
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2018 /S/ Peter Kemp, P.E.
DATE DATE PAVEMENT SUPERVISOR

FHWA



CONSTRUCTION JOINT



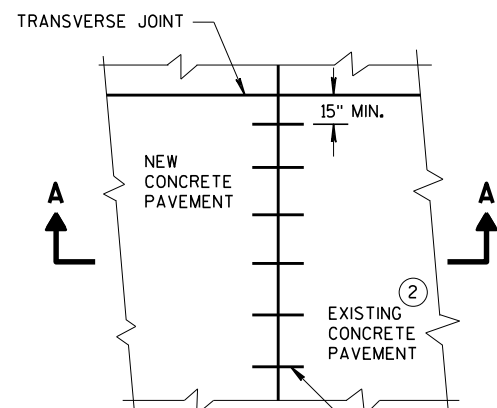
SAWED JOINT

GENERAL NOTES

CREATE A LONGITUDINAL JOINT FOR PAVEMENT WIDTHS GREATER THAN 15 FEET.

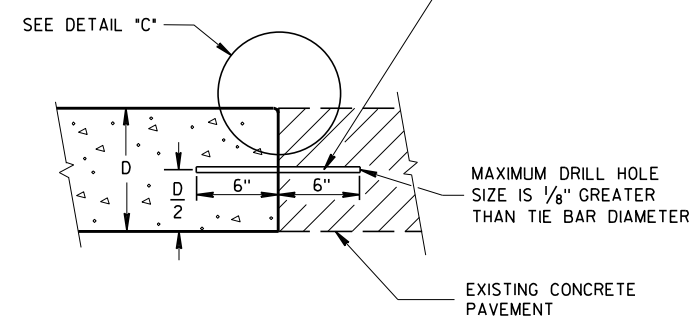
CORRELATE LONGITUDINAL JOINTS WITH LANE LINES WHEN POSSIBLE.

- ① ANCHOR TIE BARS INTO DRILLED HOLES WITH AN EPOXY.
- ② PAVEMENT THAT WAS IN PLACE PRIOR TO THE CONTRACT.

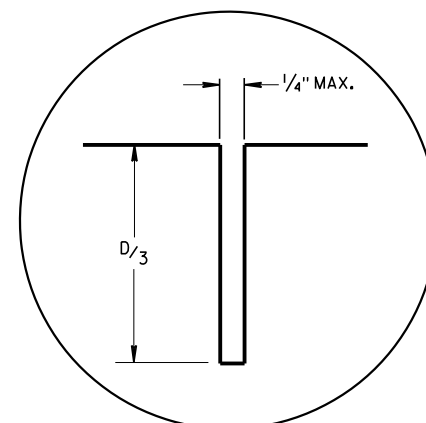


PLAN VIEW

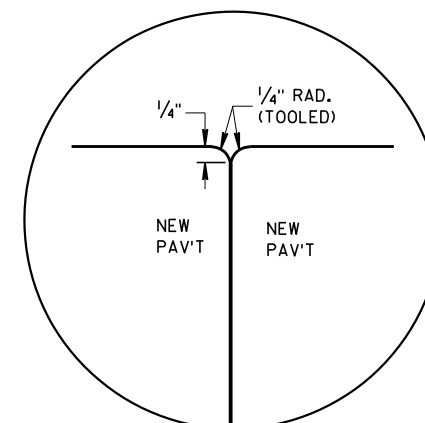
NO. 6 TIE BARS SPACED 30" C-C, INSTALLED PERPENDICULAR TO THE LONGITUDINAL JOINT. ①



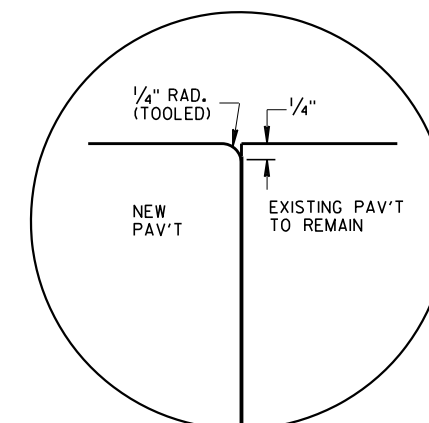
**SECTION A-A
LONGITUDINAL CONSTRUCTION JOINT
TIE BARS ANCHORED
INTO EXISTING PAVEMENT**



DETAIL "A"



DETAIL "B"



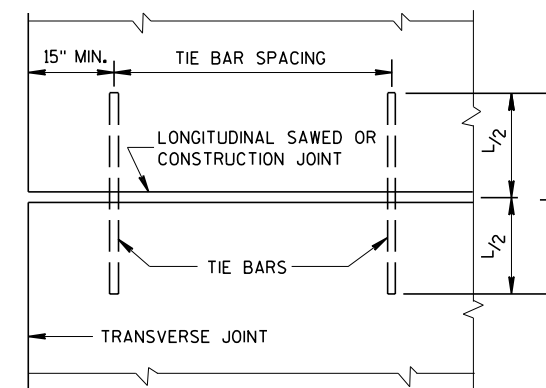
DETAIL "C"

TIE BAR TABLE

PAVEMENT DEPTH (D)	TIE BAR SIZE	TIE BAR LENGTH (L)	MAX. TIE BAR SPACING
< 10 1/2"	NO. 4	30"	36"
≥ 10 1/2"	NO. 5	36"	36"
	NO. 4 *	30"	24" **

* SUBSTITUTE BENT BARS AT LONGITUDINAL JOINTS WHEN EQUIPMENT LIMITATIONS DURING CONSTRUCTION WARRANT (e.g. AUXILIARY LANES OR TURN LANES)

** CONFORM TO 15" MINIMUM SPACING FROM TRANSVERSE JOINTS; SPACING BETWEEN TIE BARS WILL BE 30" AT TRANSVERSE JOINTS.

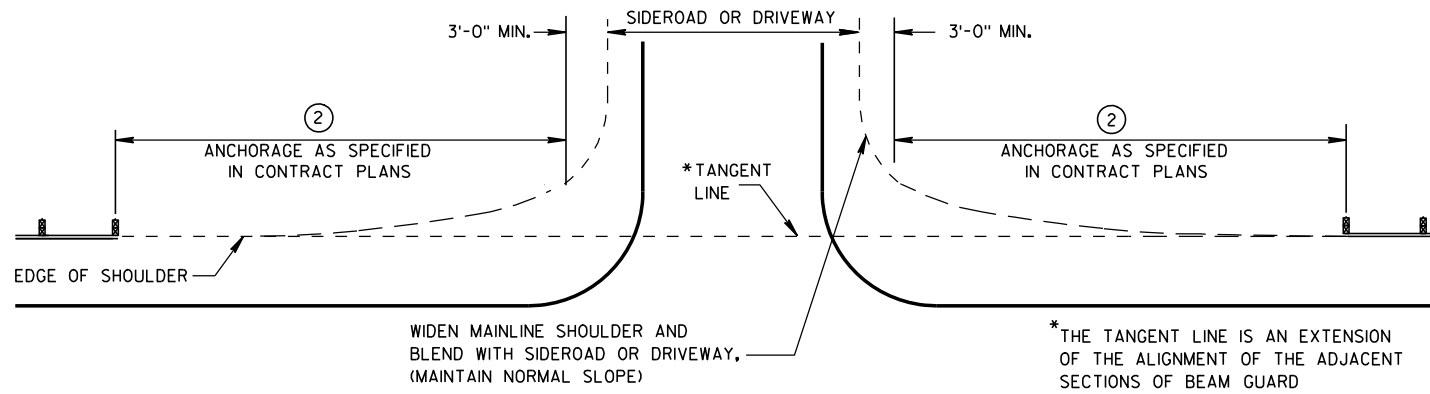


**PLAN VIEW
SHOWING LOCATION OF TIE BARS**

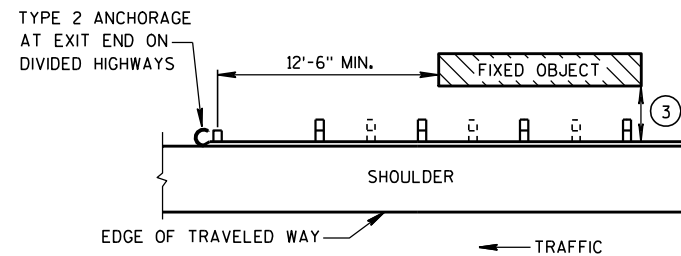
**CONCRETE PAVEMENT
LONGITUDINAL JOINTS AND TIES**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
March 2018 /S/ Peter Kemp, P.E.
DATE PAVEMENT SUPERVISOR
FHWA



BEAM GUARD AT SIDEROADS OR DRIVEWAYS



**BEAM GUARD AT OBSTACLES
EXIT END - ONE WAY TRAFFIC**

GENERAL NOTES

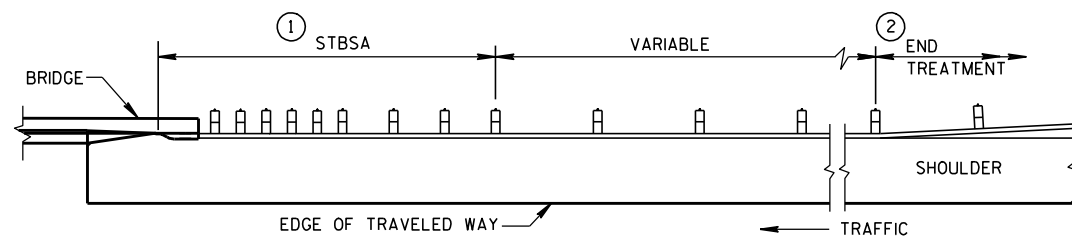
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE PERTINENT STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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

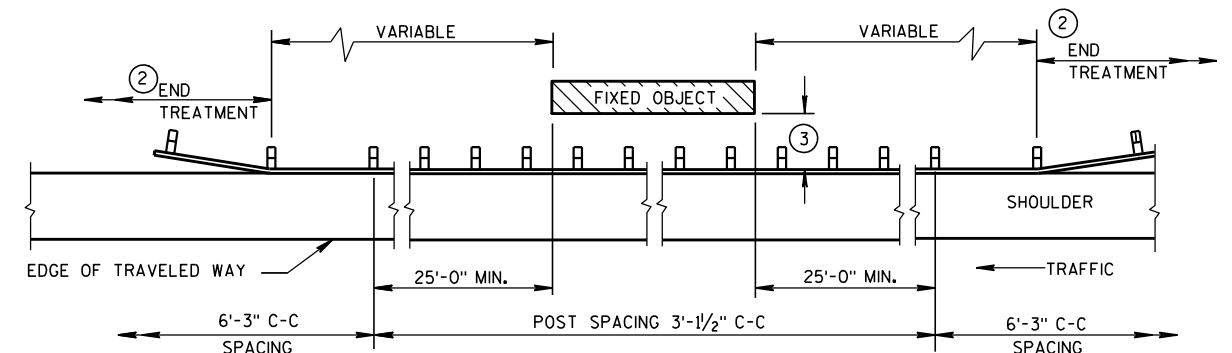
THE LOCATIONS AND LENGTHS OF BEAM GUARD ARE SHOWN ELSEWHERE IN THE PLAN.

- ① STEEL THRIE BEAM STRUCTURAL APPROACH (STBSA) - SEE CURRENT SDD 14B20.
- ② USE AN APPROVED END TREATMENT FOR THE TRAFFIC APPROACH SIDE OF BRIDGE/OBSTACLES. USE TYPE 2 ANCHORAGE ONLY AT THE DOWNSTREAM ENDS OF BEAM GUARD LOCATED ALONG ROADWAYS WITH ONE WAY TRAFFIC.

MINIMUM LATERAL DISTANCE FROM FACE OF BEAM GUARD TO FIXED OBJECT	POST SPACING
3'-6"	3' - 1 1/2"
4'-6"	6' - 3"



BEAM GUARD AT FULL WIDTH BRIDGES

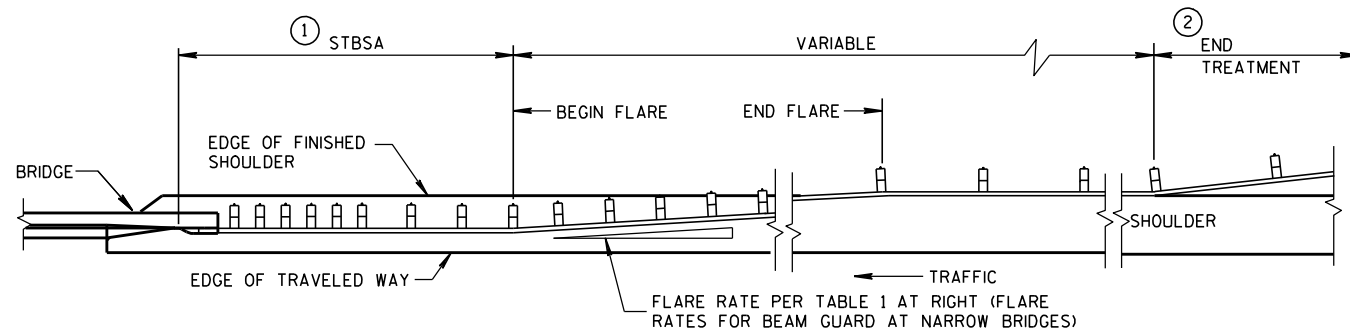


BEAM GUARD AT OBSTACLES - TWO WAY TRAFFIC

(RAIL TO OBSTACLE CLEARANCE 3'-6" TO 4'-6")

**TABLE 1
FLARE RATES FOR BEAM
GUARD AT NARROW BRIDGES**

POSTED SPEED (MPH)	FLARE RATE
25	13:1
30	15:1
35	16:1
40	18:1
45	21:1
50	24:1
55	26:1
65	30:1

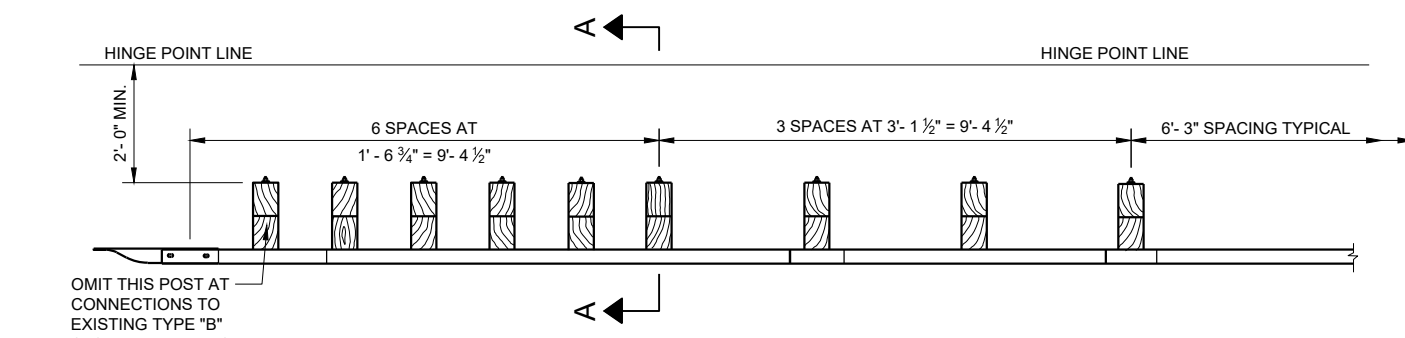


**BEAM GUARD AT NARROW BRIDGES
(FLARED TO SHOULDER EDGE, THEN PARALLEL TO ROADWAY)**

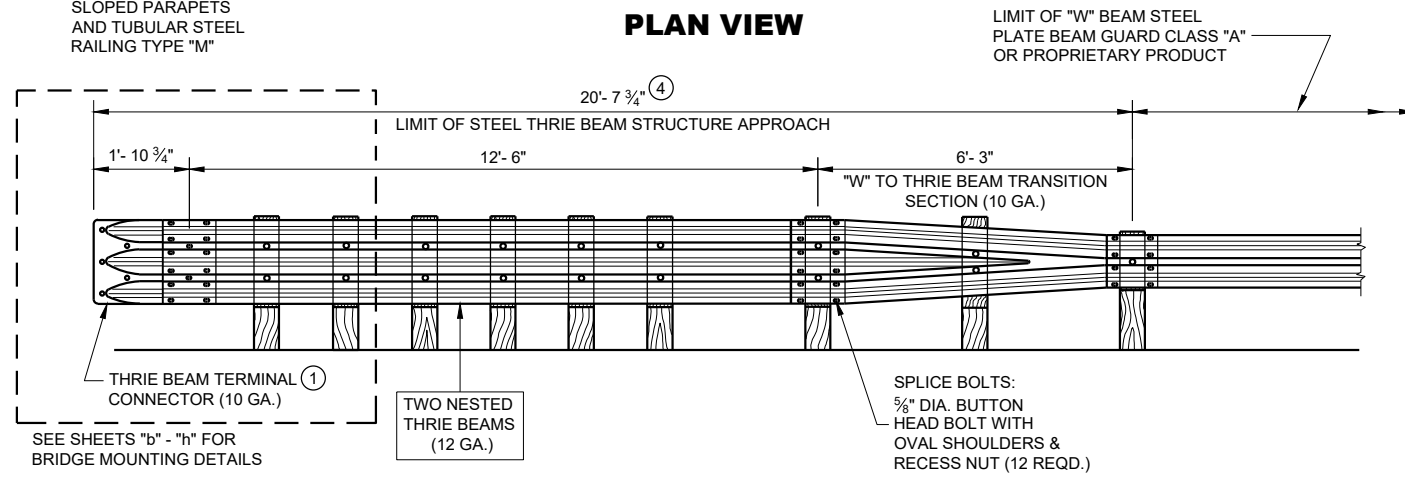
**STEEL PLATE BEAM GUARD
CLASS "A"
AT BRIDGES, OBSTACLES
AND SIDEROADS/DRIVEWAYS**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8-21-07 DATE /s/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA



PLAN VIEW



FRONT VIEW

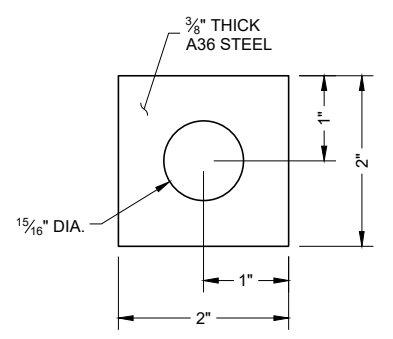


PLATE WASHER DETAIL

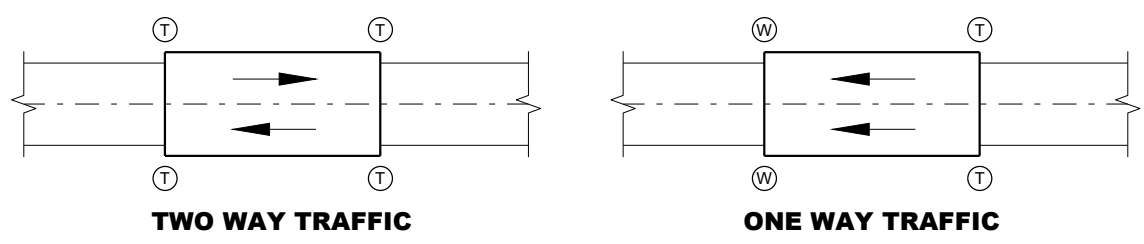
GENERAL NOTES

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

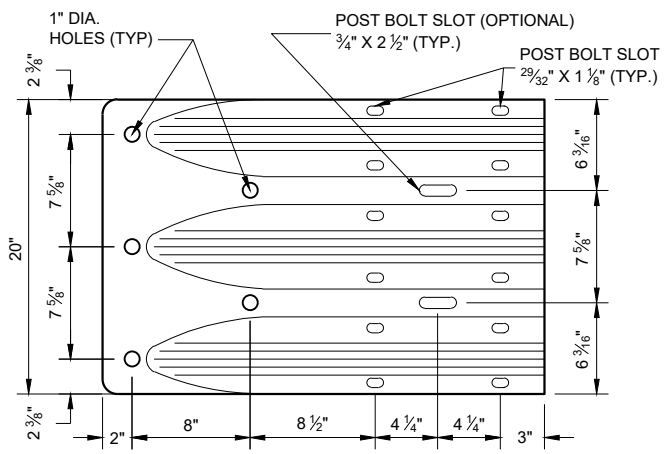
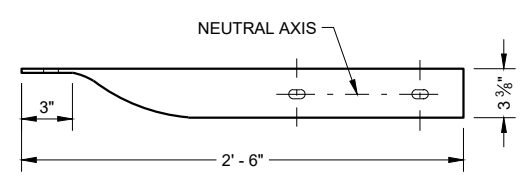
DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.

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

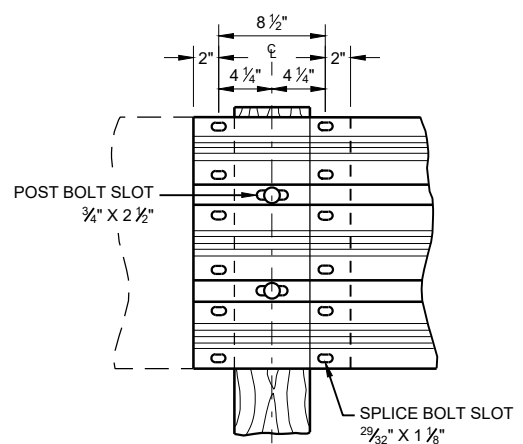
- ① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.
- ② MINIMUM EMBEDMENT SHALL BE 4'-0".
- ③ POST BOLTS ARE 5/8" DIAMETER ASTM A307 BUTTON HEAD BOLT. A POST BOLT REQUIRES A 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX AND A 5/8" DIAMETER F844 FLAT WASHER. LENGTH OF POST BOLT MAY VARY.
- ④ ALL WOOD POSTS MUST BE 6" X 8" AND AT LEAST 7'-0" LONG.



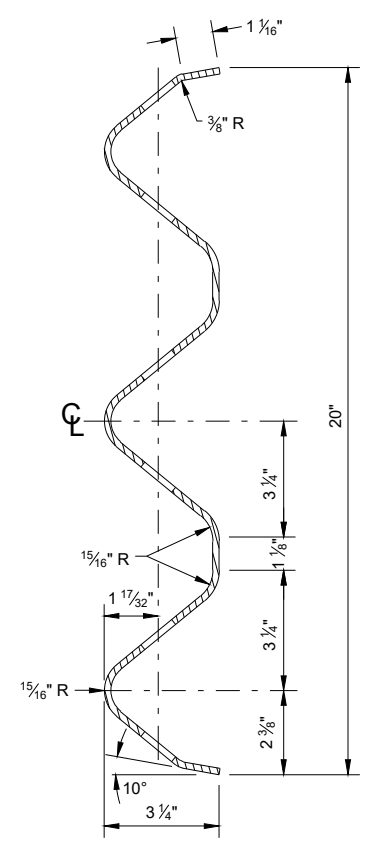
TYPICAL LOCATIONS OF THRIE BEAM AND W-BEAM CONNECTIONS TO BRIDGE



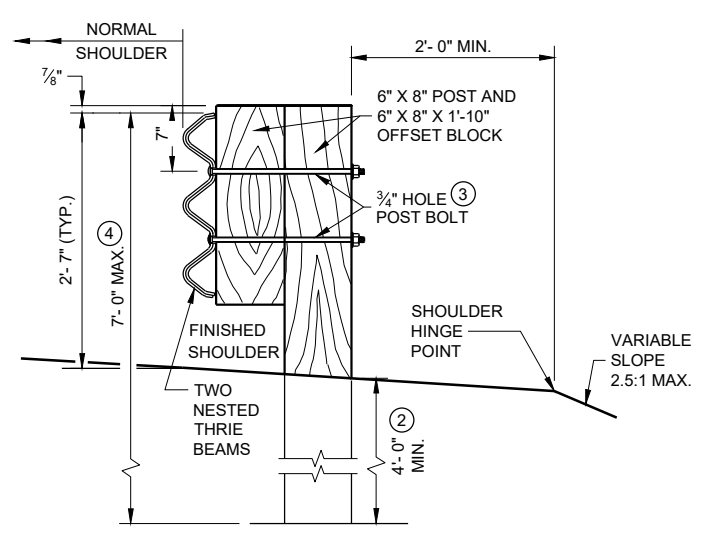
THRIE BEAM TERMINAL CONNECTOR



THRIE BEAM SPLICE



SECTION THRU BEAM RAIL ELEMENT



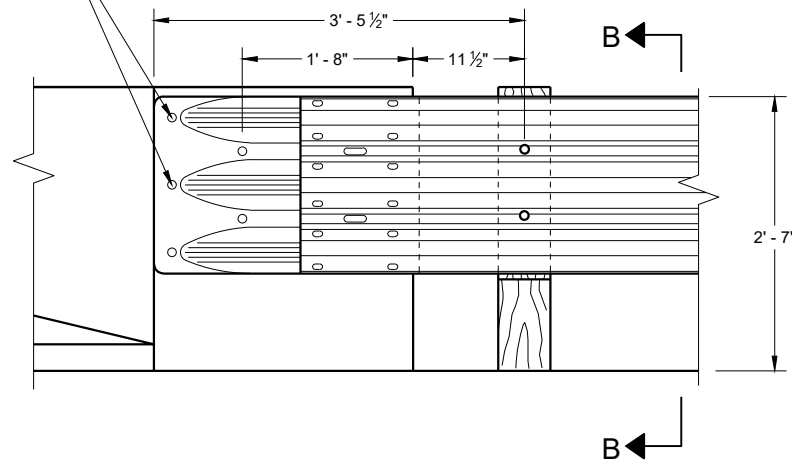
SECTION A-A

STEEL THRIE BEAM STRUCTURE APPROACH

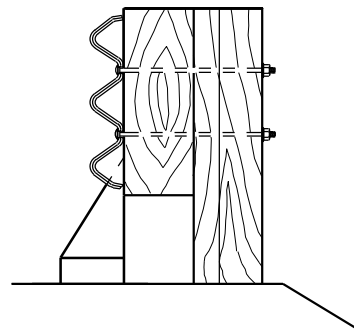
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2022 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT ENGINEER

- ① ② 7/8" DIA. HEX HEAD CAP SCREWS INTO THREADED INSERTS (FURNISHED WITH THE BRIDGE) WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER
7/8" DIA. H.S. HEX BOLT AND WASHERS REQUIRED
1" DIA. HOLES DRILLED THRU PARAPET (5 REQ'D)



FRONT VIEW



SECTION B - B

**THRIE BEAM CONNECTION TO BRIDGE
PARAPET WITH SQUARE ENDS**

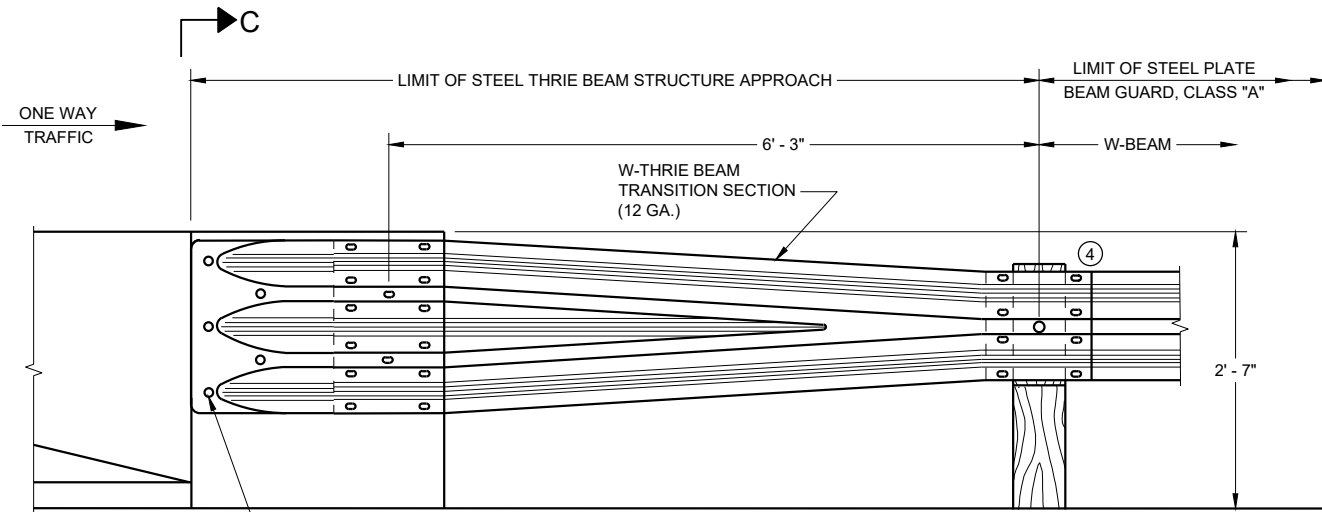
GENERAL NOTES

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

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

- ① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM TERMINAL CONNECTOR. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ③ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".
- ④ W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POST WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.

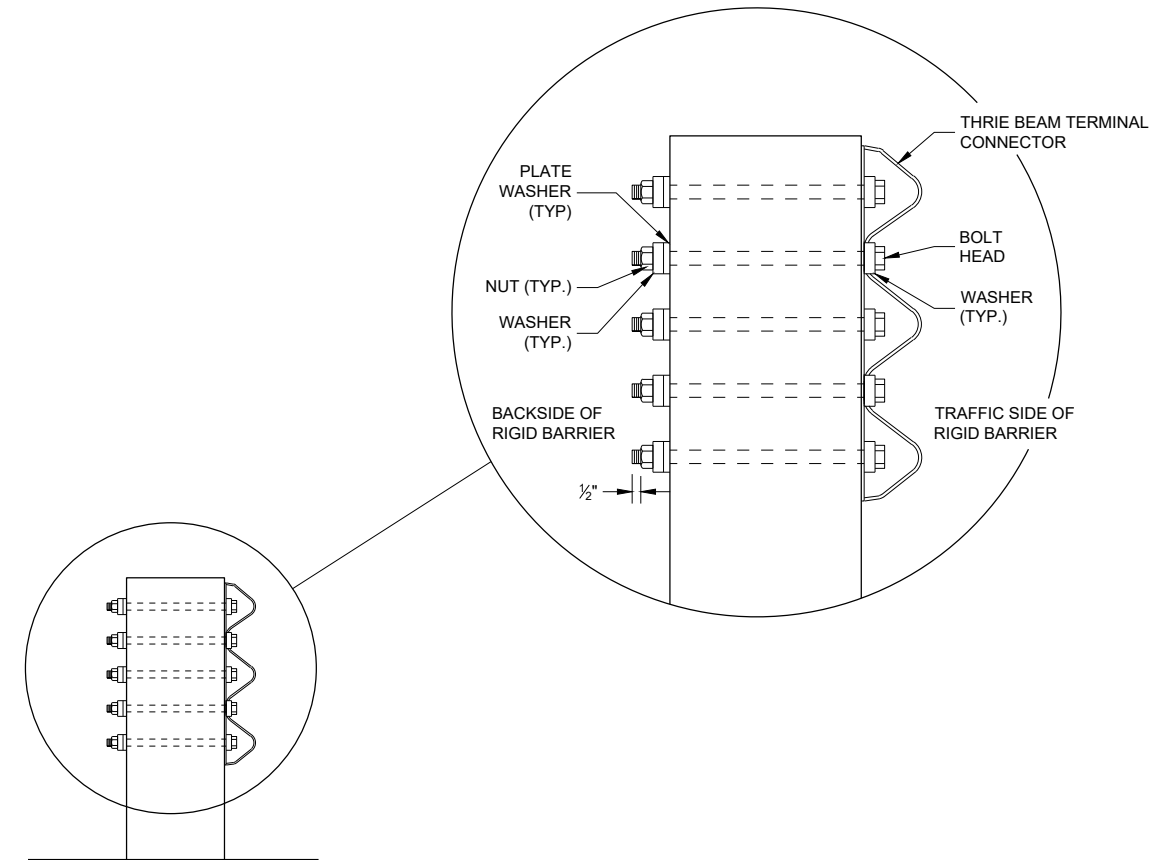
DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.



- ① ② 7/8" DIA. HEX HEAD CAP SCREWS INTO THREADED INSERTS (FURNISHED WITH THE BRIDGE). WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER 7/8" DIA. H.S. HEX BOLT AND WASHERS REQUIRED.
1" DIA. HOLES DRILLED THRU PARAPET. (5 REQ'D.)

FRONT VIEW

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



SECTION C - C

**STEEL THRIE BEAM STRUCTURE
APPROACH, CONNECTION TO
SQUARE END PARAPETS**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2022 DATE /S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
ENGINEER

BILL OF MATERIALS

NOTE NO.	DESCRIPTION
①	WOOD BREAKAWAY TERMINAL POST: 5 1/2" X 7 1/2" X 3'-9"
②	STEEL TUBE TS 8" X 6" X 0.188", 6'-0"
④	WOOD BREAKAWAY CRT POST: 6" X 8" X 6'-0"
⑤	WOOD OFFSET BLOCKS: 6' X 8" X 1'-2"
⑥	PIPE SLEEVE: 2" X 5 1/2" STANDARD PIPE
⑦	BEARING PLATE
⑧	BCT CABLE ASSEMBLY
⑨	CABLE ANCHOR BOX
⑩	STRUT & YOKE
⑪	STEEL PLATE BEAM, END PANEL 12 GA.
⑫	STEEL PLATE BEAM: 12 GA. 13'-6 1/2"
⑬	IMPACT HEAD
⑭	0.040" ALUMINUM SHEET WITH REFLECTIVE SHEETING TYPE F PER SECTION 637 OF THE STANDARD SPECIFICATIONS

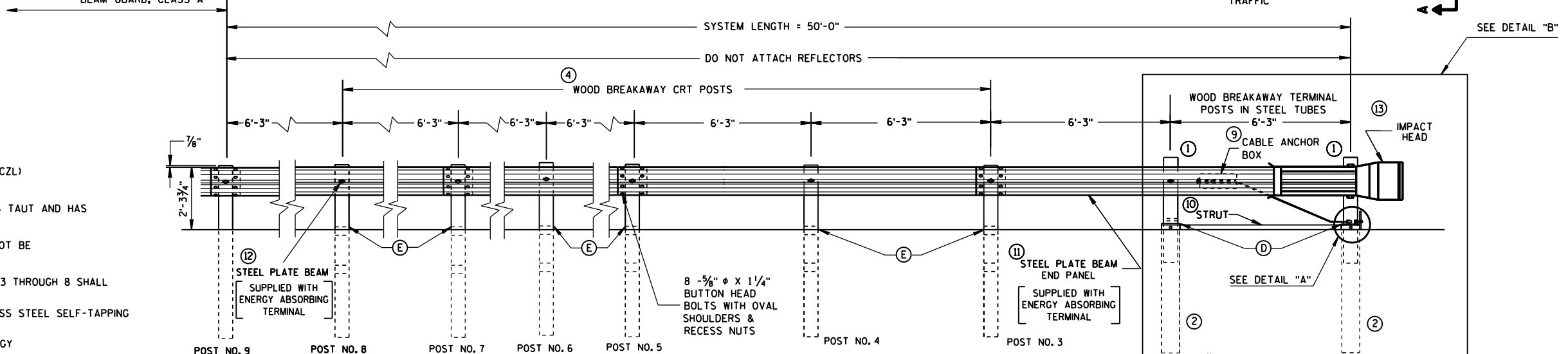
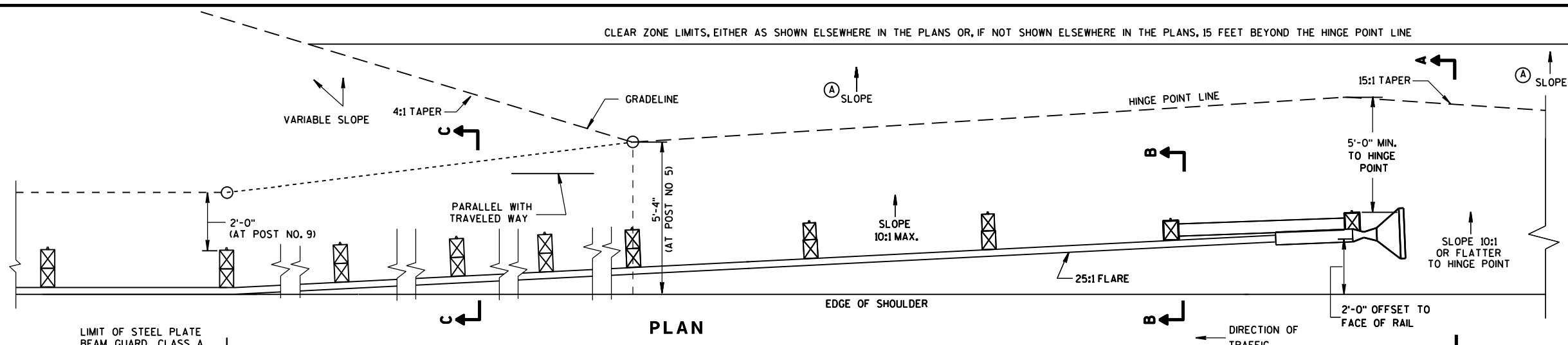
GENERAL NOTES

FOLLOW MANUFACTURE'S BOLTING RECOMMENDATIONS.

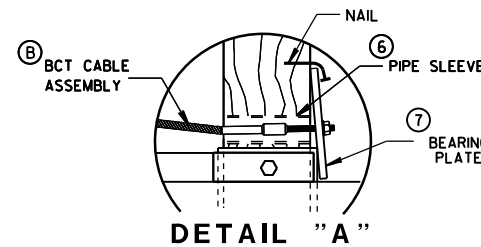
- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL), AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
- (B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED.
- (D) THE TOP OF THE STEEL TUBE ON POSTS 1 AND 2 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.
- (E) THE CENTER OF THE UPPER 3 1/2" DIAMETER HOLE ON POST 3 THROUGH 8 SHALL BE 3/4" ABOVE THE FINISHED GROUND LINE.
- (F) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS, ONE SCREW PER CORNER.

STEEL POSTS SHALL NOT BE ALLOWED FOR USE WITH ENERGY ABSORBING TERMINALS.
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

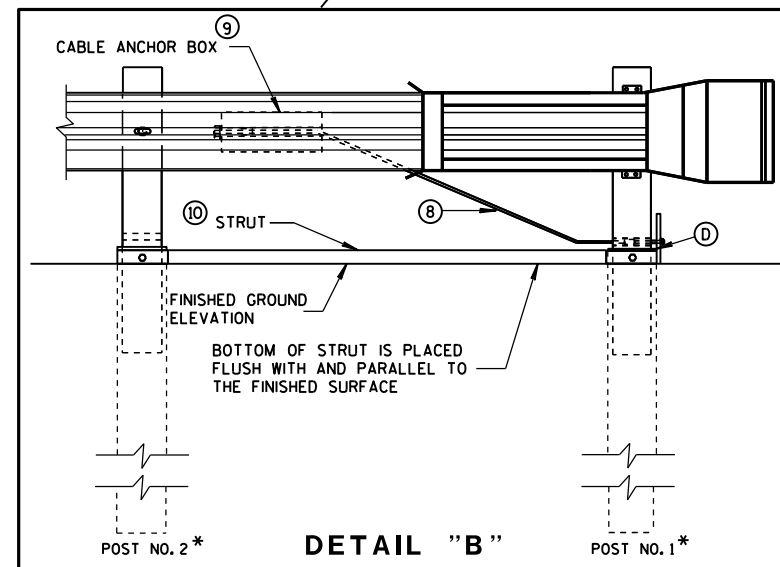
*DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.



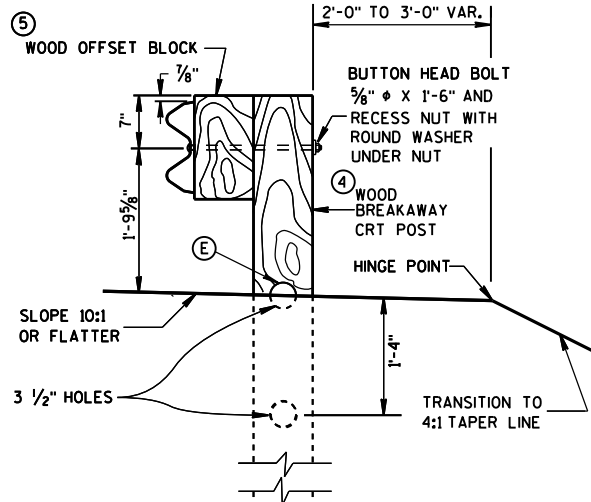
ELEVATION



DETAIL "A"

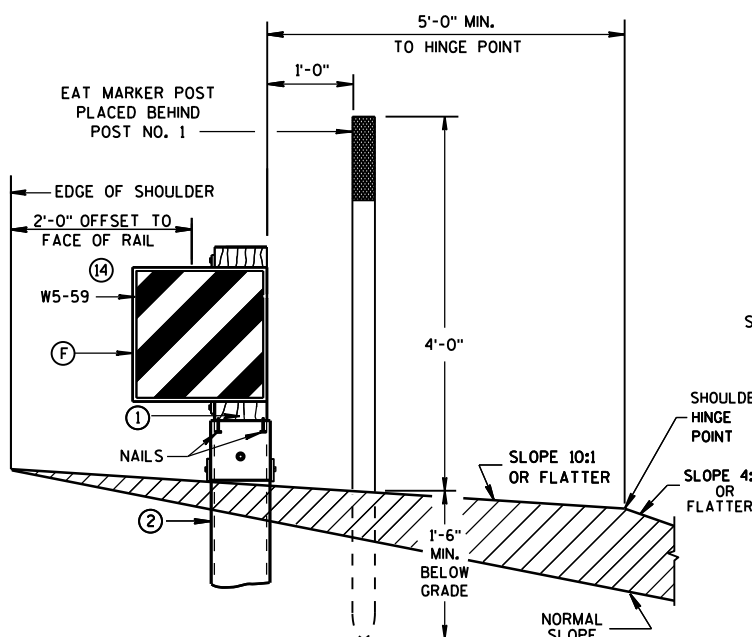


DETAIL "B"



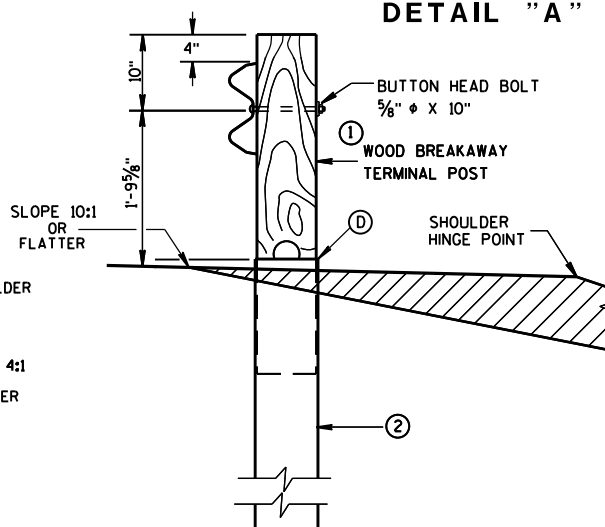
SECTION C-C

TYPICAL AT POST NOS. 6, 8



SECTION A-A

TYPICAL AT POST NO. 1*

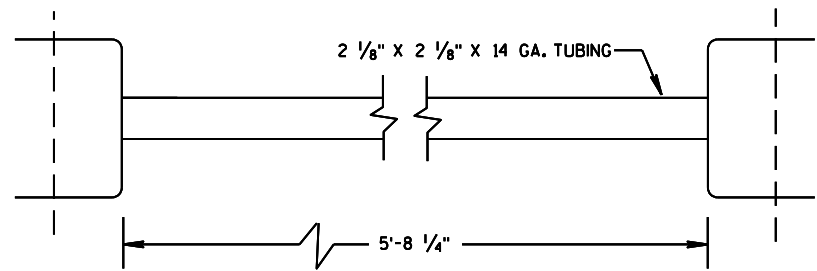


SECTION B-B

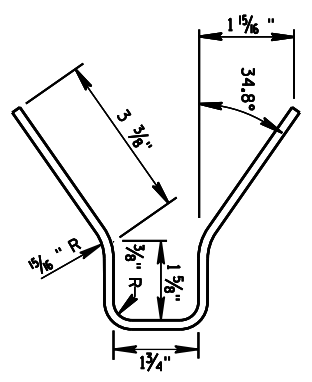
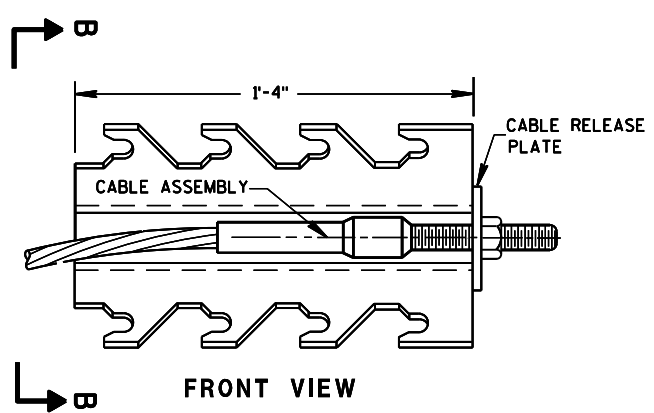
TYPICAL AT POST NO. 2*

STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL

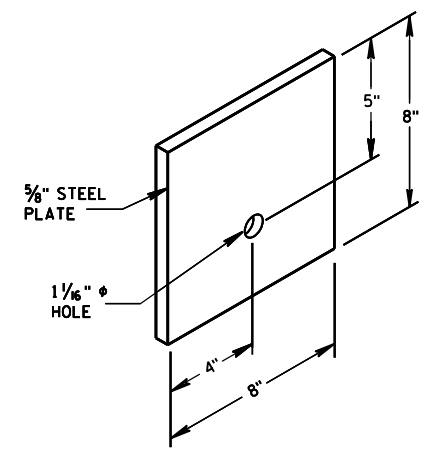
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



⑩ STRUT DETAIL



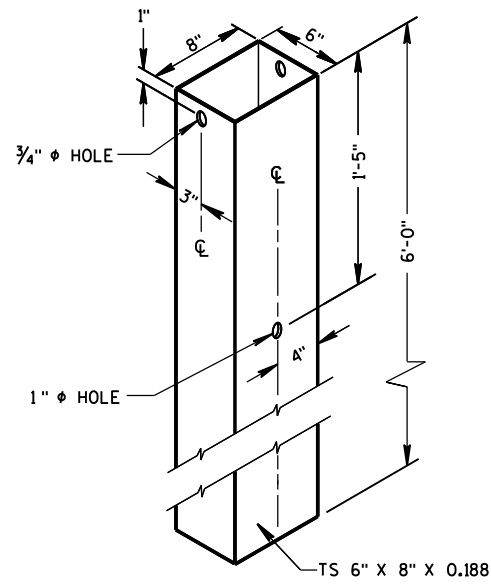
⑨ CABLE ANCHOR BOX



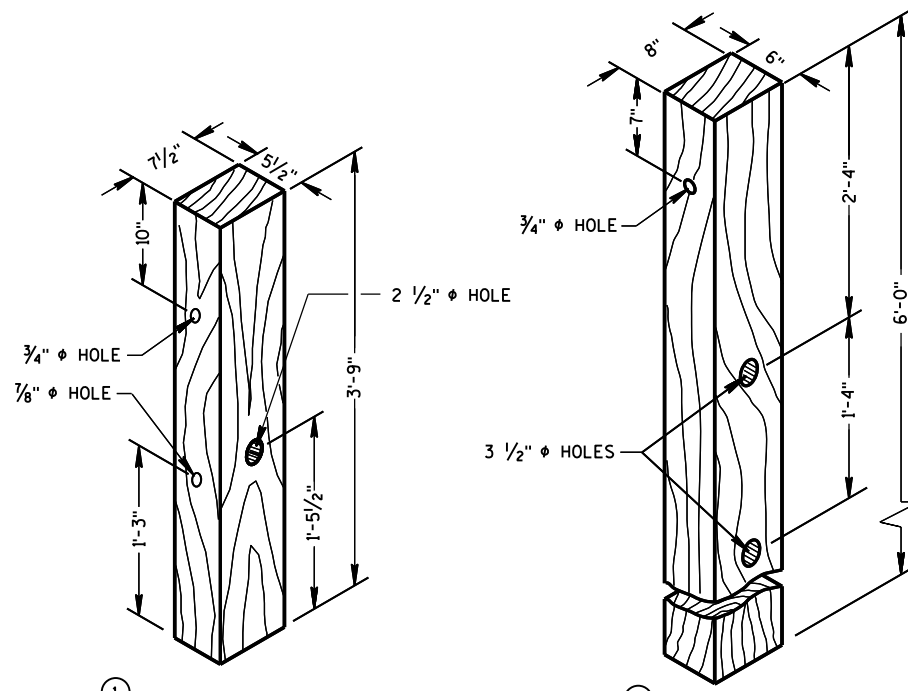
⑦ STEEL BEARING PLATE

6

6



② **72" STEEL TUBE**
(POSTS NO. 1-2)



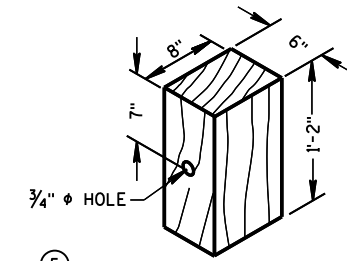
① **TERMINAL POST**

④ **CRT POST**
(POSTS NO'S 5-8)

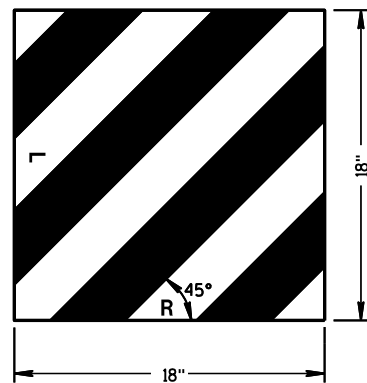
WOOD BREAKAWAY POSTS

GENERAL NOTES

WHEN ROCK IS ENCOUNTERED DURING EXCAVATION, A 12 INCH DIA. POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK MAY BE USED IF APPROVED BY THE ENGINEER. GRANULAR MATERIAL SHALL BE PLACED IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 1/2" INCHES DEEP TO PROVIDE DRAINAGE. THE SOIL TUBES SHALL BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH ADEQUATELY COMPACTED MATERIAL EXCAVATED FROM THE HOLE.

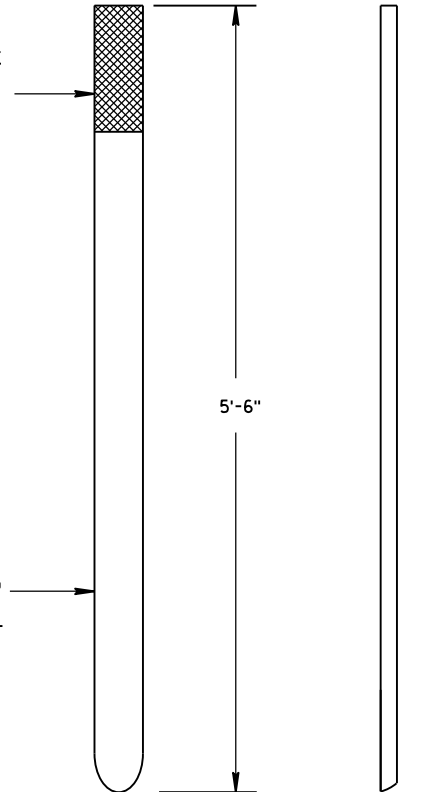


⑤ **WOOD OFFSET BLOCK**
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2



⑭ **REFLECTIVE SHEETING DETAILS**

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



FRONT VIEW **SIDE VIEW**

E.A.T. MARKER POST

E.A.T. MARKER
POST (YELLOW)
SEE APPROVED
PRODUCTS LIST

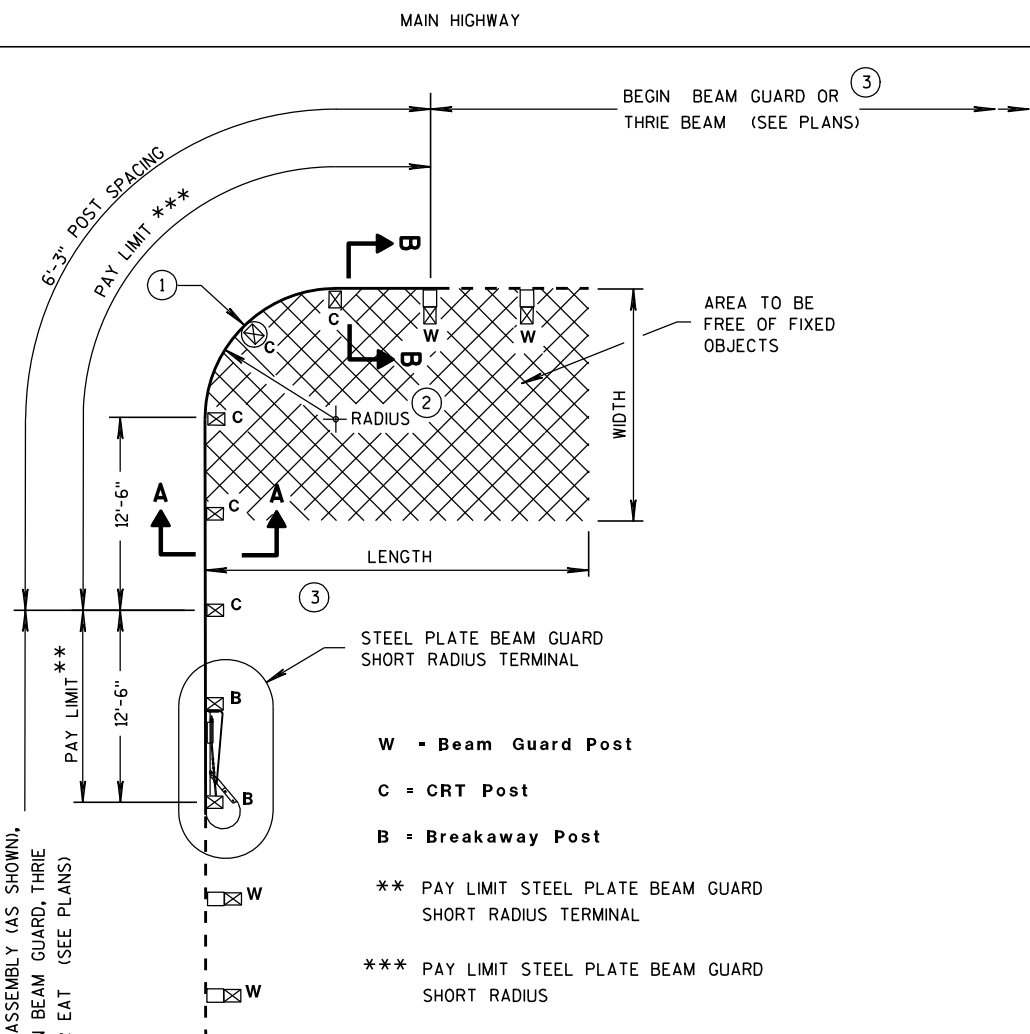
**STEEL PLATE BEAM GUARD
ENERGY ABSORBING TERMINAL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT
FHWA UNIT SUPERVISOR

FARM ENTRANCE, FIELD ENTRANCE, DRIVEWAY,
SERVICE ROAD OR INTERSECTING ROAD

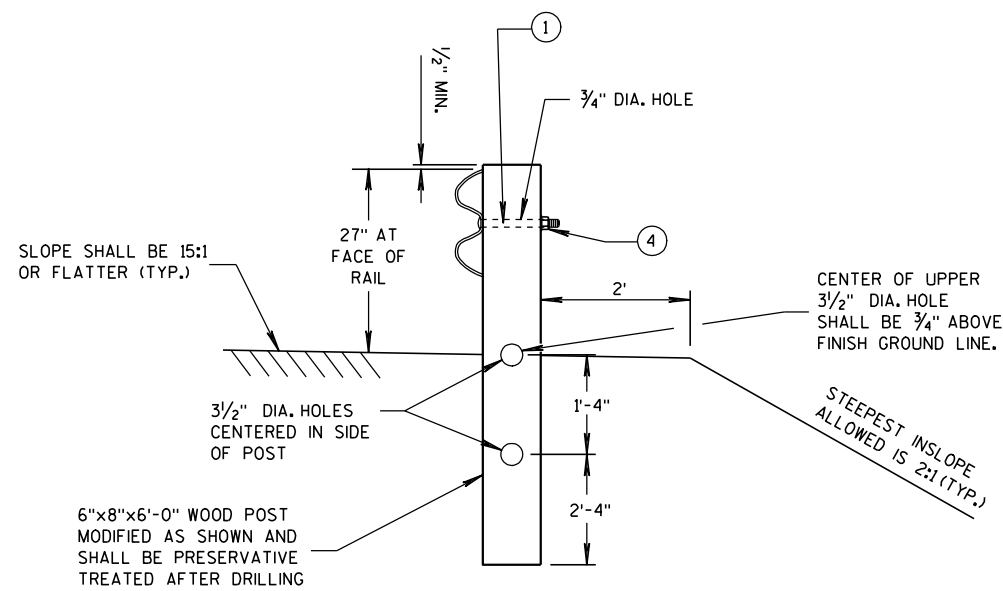
PROVIDE BEAM GUARD SPECIAL
ANCHOR ASSEMBLY (AS SHOWN),
OR BEGIN BEAM GUARD, THREE
BEAM, OR EAT (SEE PLANS)



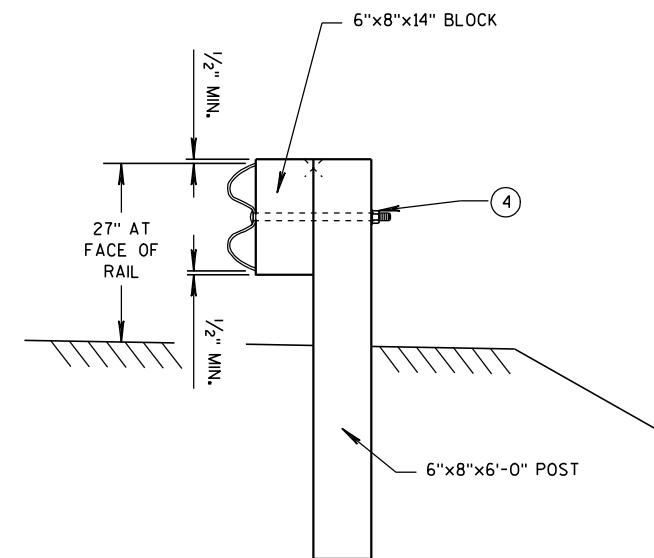
TYPICAL LAYOUT
(8' RADIUS SHOWN)

- W - Beam Guard Post
- C = CRT Post
- B = Breakaway Post
- ** PAY LIMIT STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
- *** PAY LIMIT STEEL PLATE BEAM GUARD SHORT RADIUS

TYPICAL LAP SPLICES
(8' RADIUS SHOWN)



SECTION A-A
(CRT POST)



SECTION B-B
(BEAM GUARD POST)

STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

STEEL PLATE BEAM GUARD
SHORT RADIUS TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

ALL ANGLES, CHANNELS, AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36 AND THE STRUCTURAL TUBING SHALL CONFORM TO ASTM A 500. WELDING SHALL MEET THE CURRENT REQUIREMENTS OF THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE ANSI/AWS D1.1. ALL STRUCTURAL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123. PUNCHING, DRILLING, CUTTING, OR WELDING WILL NOT BE PERMITTED AFTER GALVANIZING. FURNISH AND INSTALL HARDWARE PER STANDARD SPECIFICATION 614.2. UNLESS NOTED OTHERWISE.

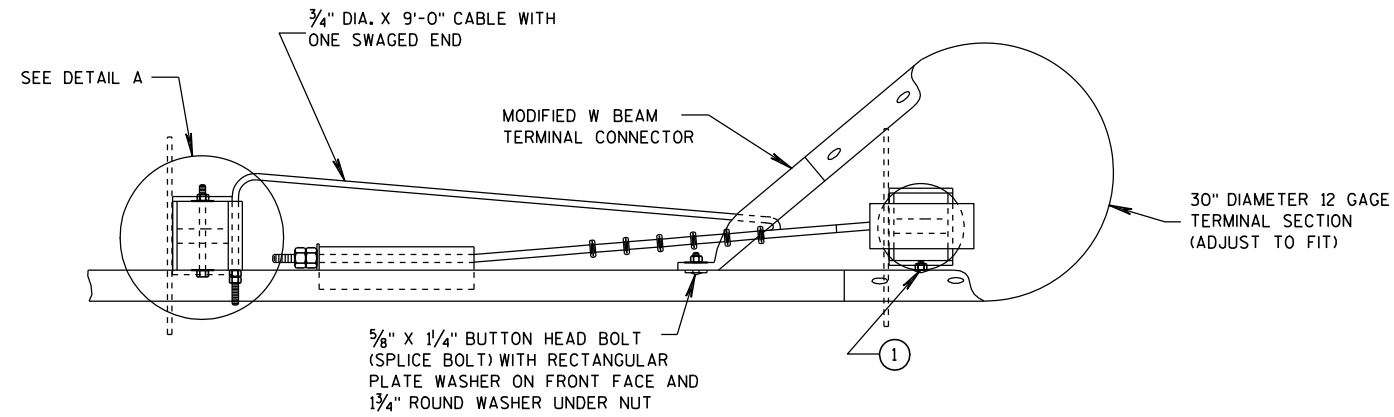
SHOP BEND CURVED RAIL SECTIONS.

SEE STANDARD DETAIL DRAWING 14 B 15 FOR OTHER DETAIL.

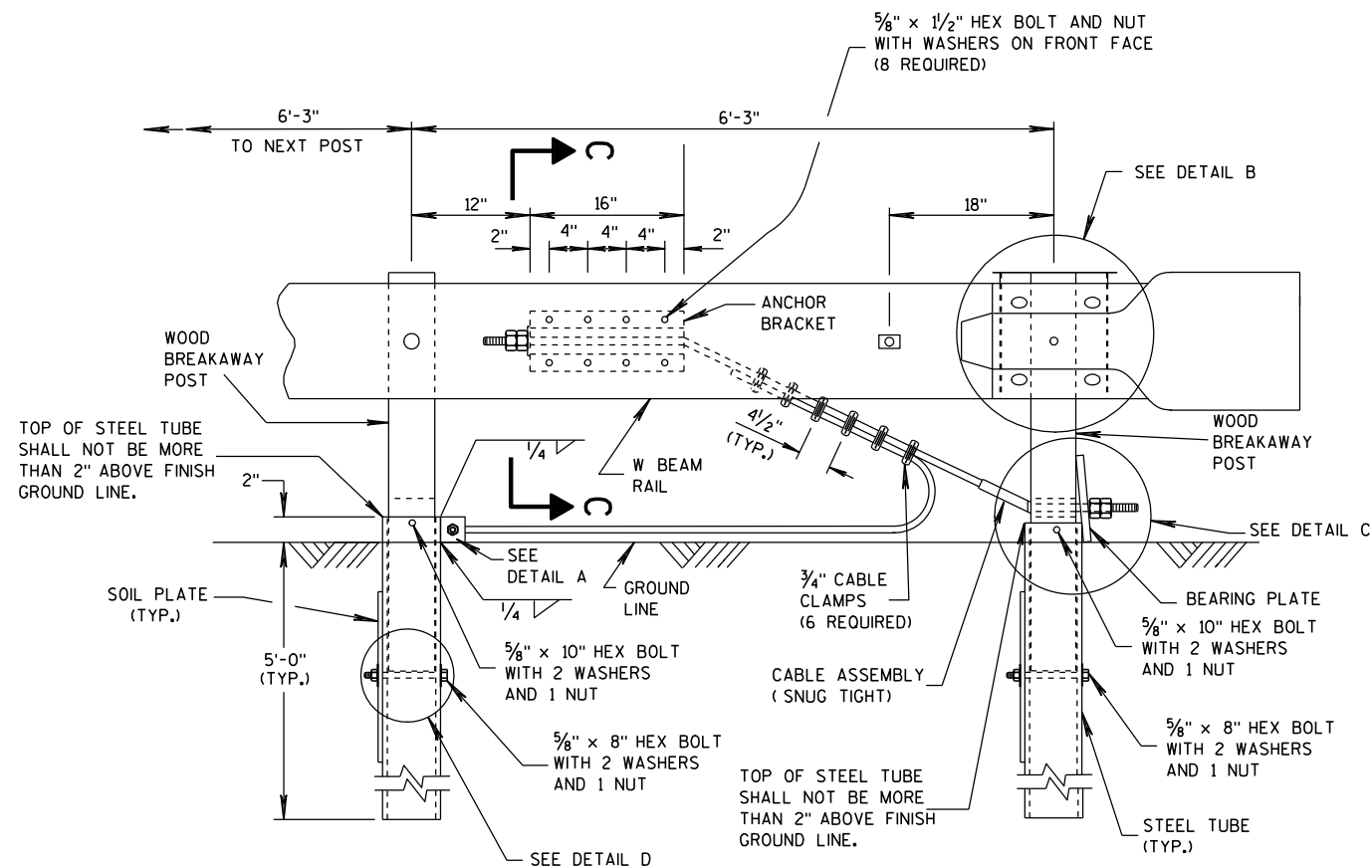
- ① ON THE 8 FOOT RADIUS INSTALLATION, DO NOT INSTALL BUTTON HEAD BOLT AT CENTER CRT POST.
- ② RADIUS FROM 8' - 36'. SEE PLAN.
- ③ HEIGHT TRANSITION MAY BE REQUIRED. SEE PLAN OR PROJECT ENGINEER.
- ④ 5/8" ϕ X 1'-6" BUTTON HEAD BOLT AND RECESS NUT WITH ROUND WASHER UNDER NUT.

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

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



PLAN VIEW



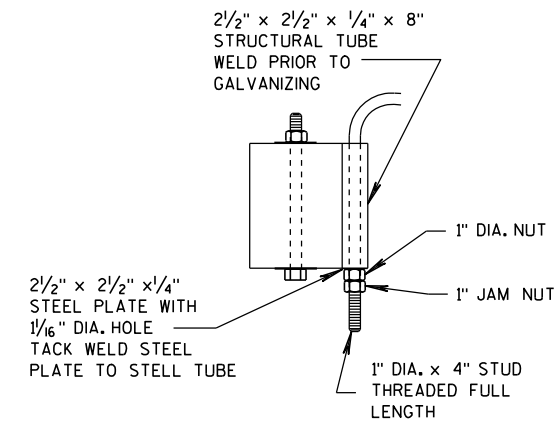
ELEVATION VIEW

STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

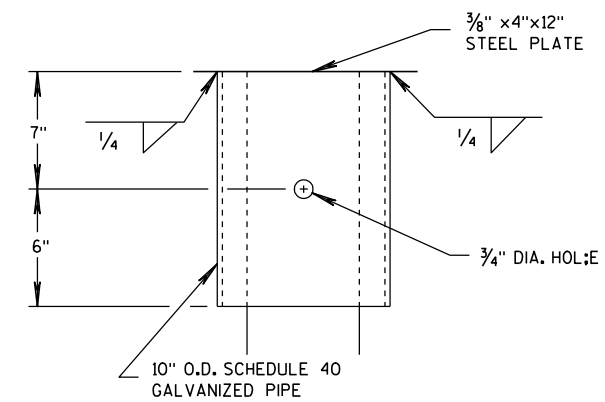
GENERAL NOTES

1 ATTACH W BEAM RAIL TO THE STEEL PIPE WITH A 5/8" X 2" BUTTON HEAD BOLT WITH NO WASHER. CONNECTION TO THE POST IS NOT REQUIRED.

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



DETAIL A

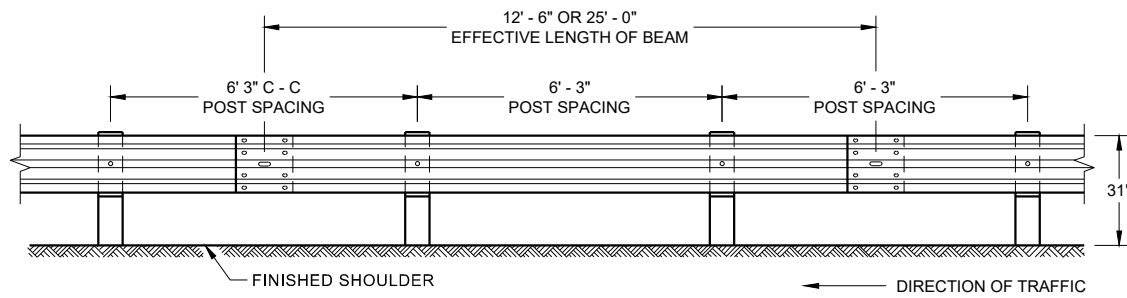


DETAIL B

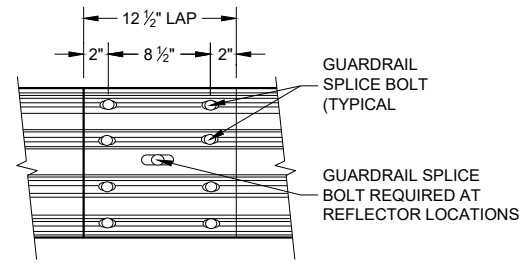
(BEAM GUARD AND TERMINAL SECTION NOT SHOWN)

STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION



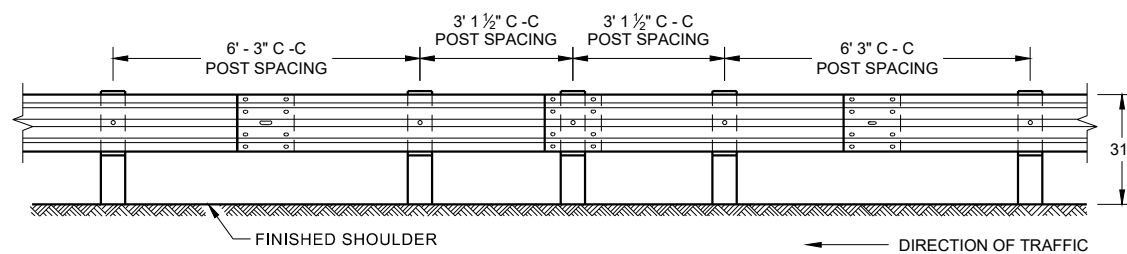
**FRONT VIEW
POST SPACING STANDARD INSTALLATION**



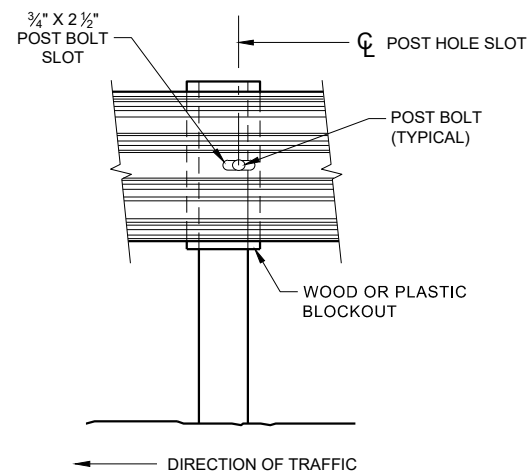
**FRONT VIEW
MID-SPAN BEAM SPLICE**

GENERAL NOTES

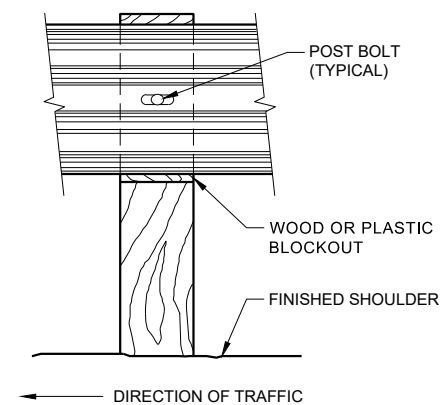
- ⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
 - ⑨ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.
- POST BOLTS ARE A 3/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 3/8" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.
- GUARD RAIL SPLICE BOLTS ARE A 3/8" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 3/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.



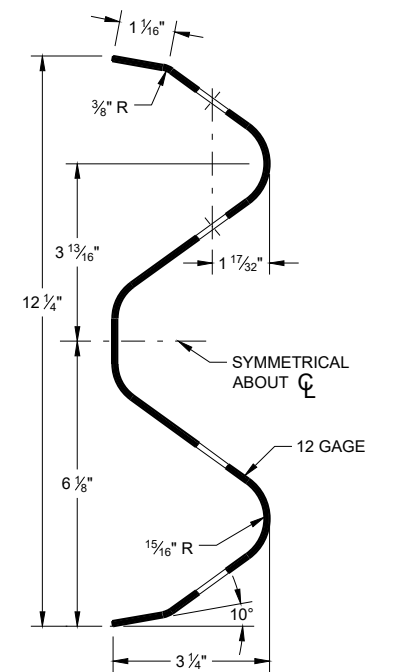
**FRONT VIEW
HALF POST SPACING (HS) AND
HALF POST SPACING WITH LONGER POSTS (K)**



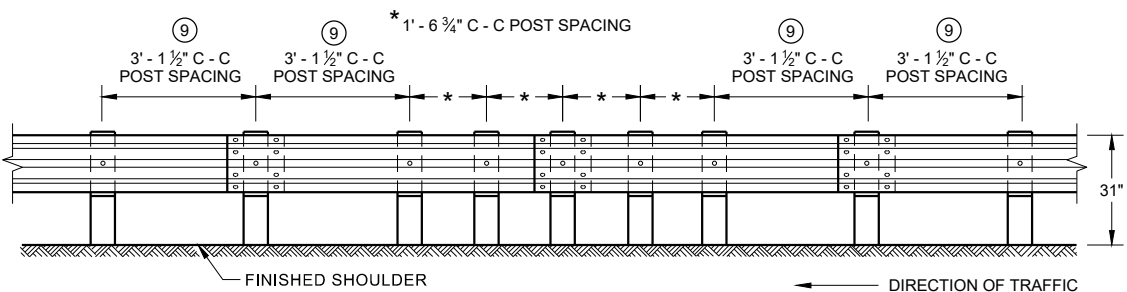
FRONT VIEW AT STEEL POST



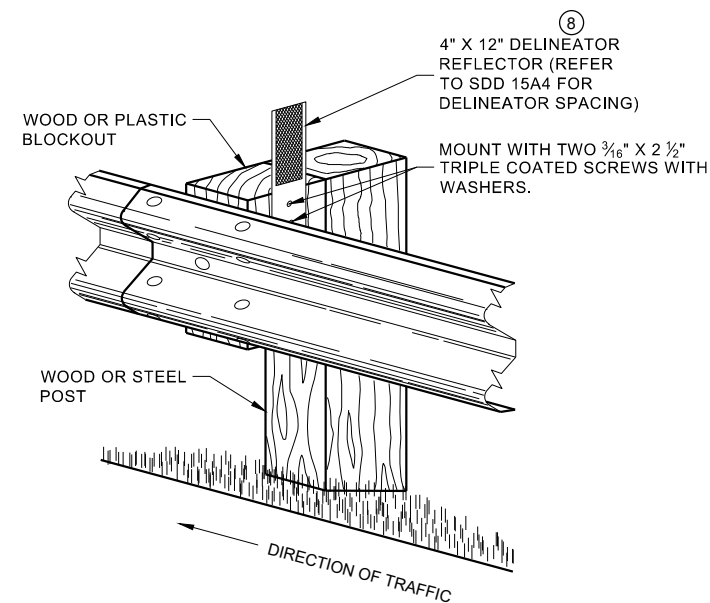
FRONT VIEW AT WOOD POST



SECTION THRU W-BEAM RAIL



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



**ONE SIDED REFLECTOR DETAIL
AND TYPICAL INSTALLATION**

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

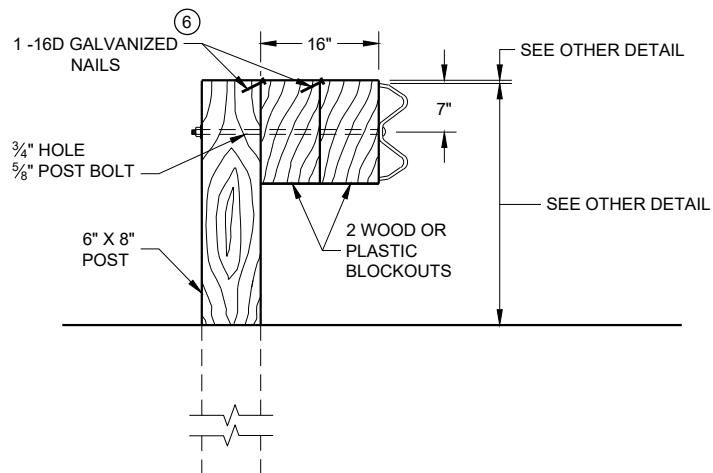
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

6

SDD 14B42 - 07b

SDD 14B42 - 07b

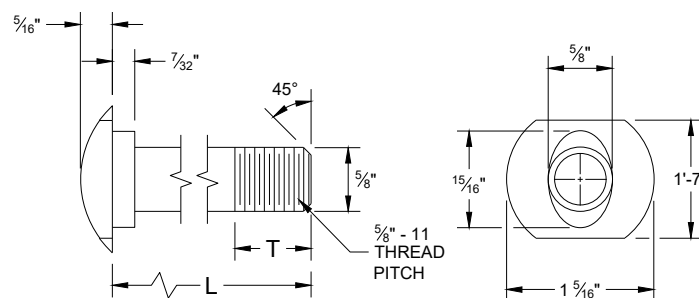


DETAIL FOR 16" BLOCKOUT DEPTH

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

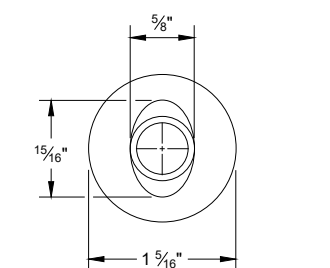
NOTE:

1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 3/16".
2. IF THE BOLT EXTENDS MORE THAN 1/4" FROM THE NUT THE BOLT SHOULD BE TRIMMED BACK.

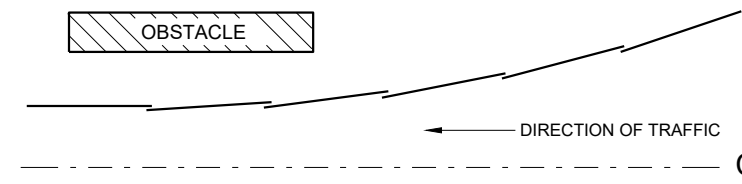


POST BOLT TABLE

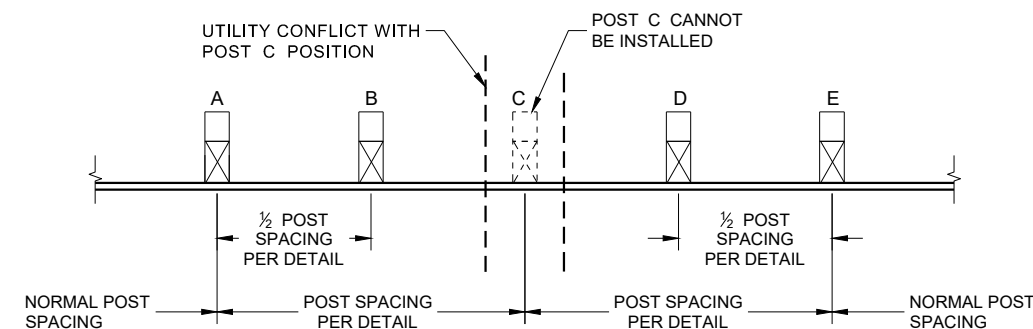
L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



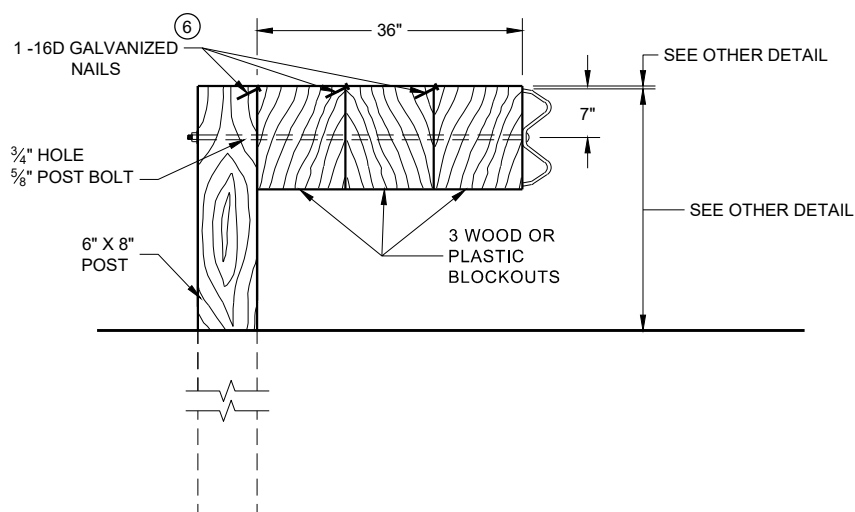
ALTERNATE BOLT HEAD



**PLAN VIEW
BEAM LAPPING DETAIL**

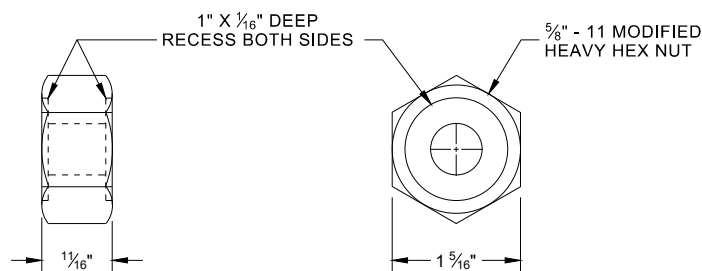


**POST DRIVING FOR CONTINUOUS
UNDERGROUND OBSTRUCTION**

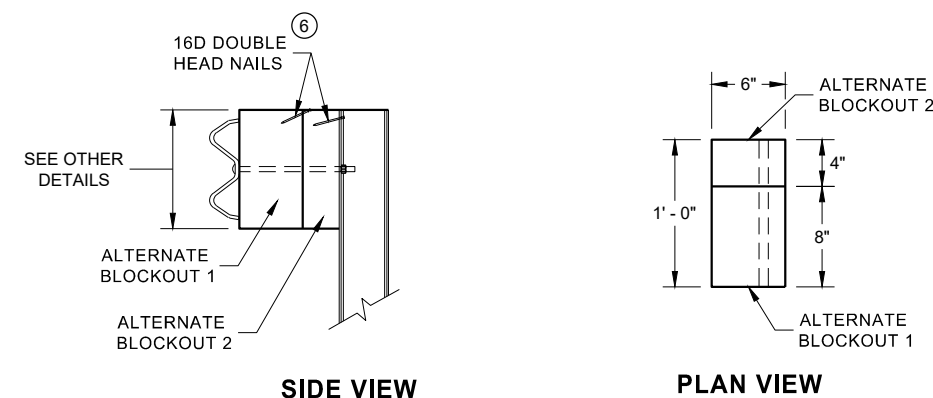


DETAIL FOR 36" BLOCKOUT DEPTH

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



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

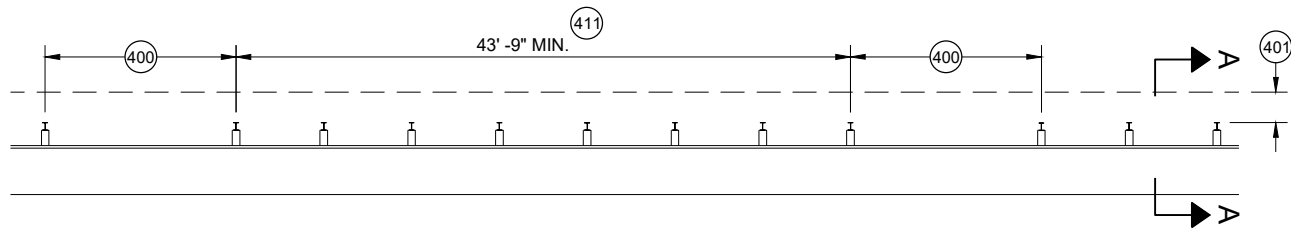


**ALTERNATE WOOD
BLOCKOUT DETAIL**

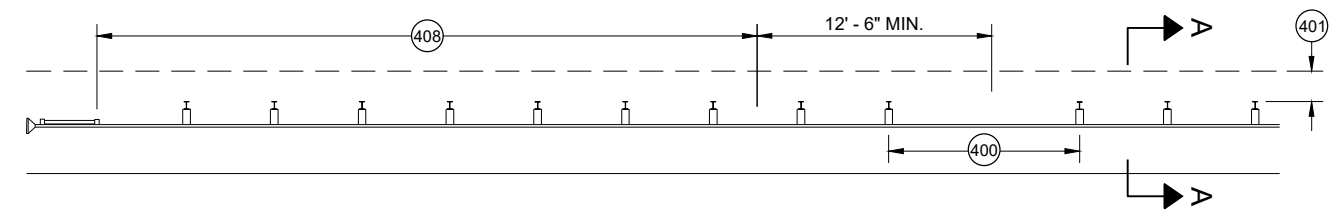
6 WHEN USING STEEL POST AND WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

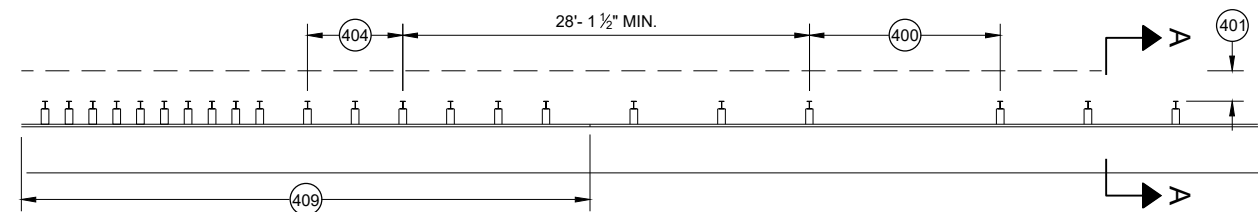
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



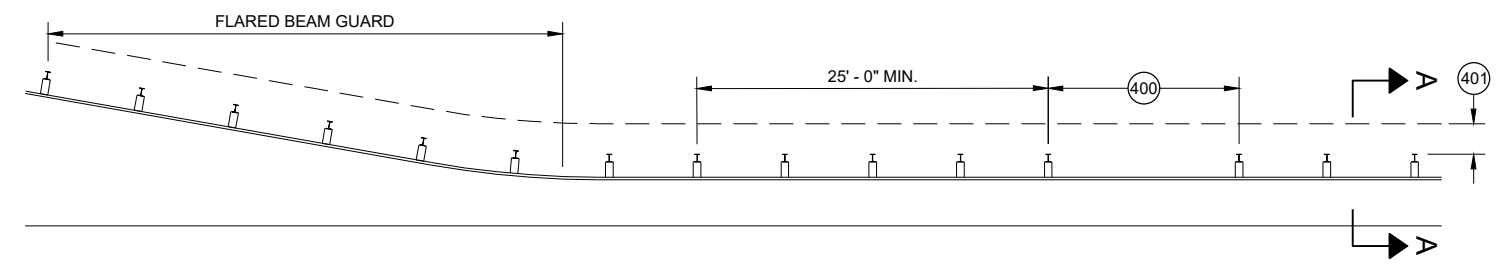
MISSING POST IN MGS GUARDRAIL



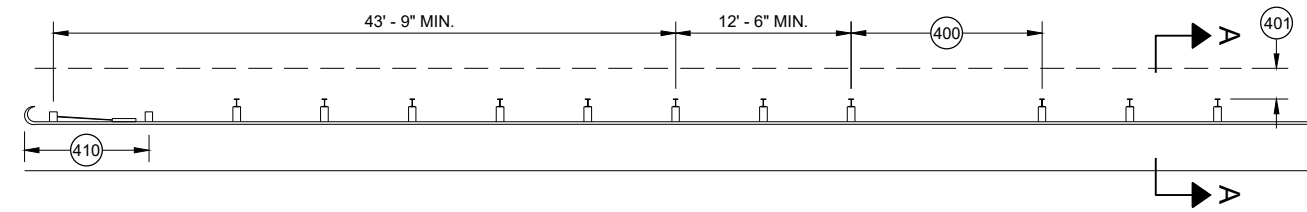
MISSING POST IN MGS GUARDRAIL NEAR EAT



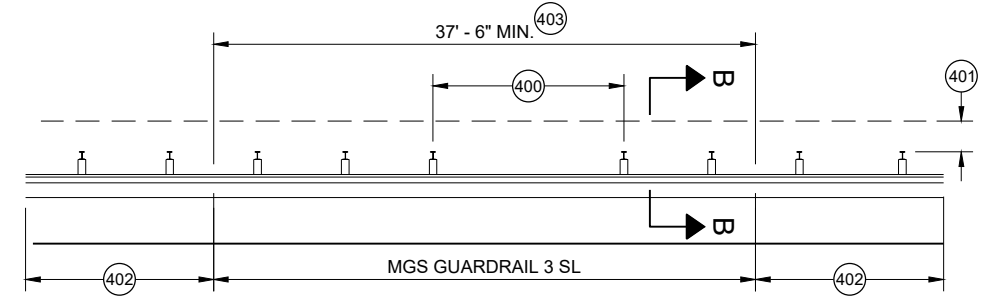
MISSING POST IN MGS GUARDRAIL NEAR AN APPROACH TRANSITION



MISSING POST IN MGS GUARDRAIL NEAR FLARED BEAM GUARD

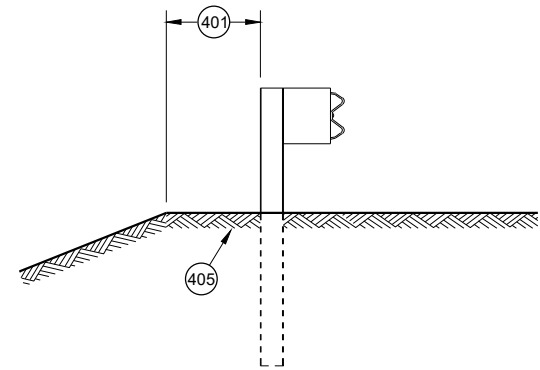


MISSING POST IN MGS GUARDRAIL NEAR A TYPE 2 END TERMINAL

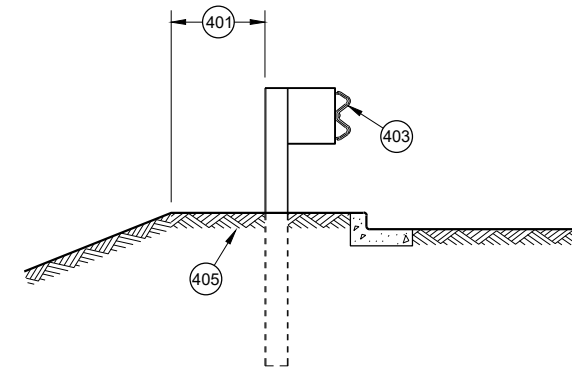


MISSING POST IN SHORT SPAN MGS GUARDRAIL NEAR CURB (SL)

- 400 MAX SPAN 12' - 6"
- 401 2' MIN.
- 402 MGS GUARDRAIL 3
- 403 NESTING BEAM GUARD
- 404 ASYMMETRIC TRANSITION
- 405 SOIL WELL DRAINED AND COMPACTED
- 406 SEE OTHER DRAWINGS IN THIS SDD
- 407 SEE OTHER DRAWINGS FOR MIN. SPACING BETWEEN SPANS
- 408 SEE SDD 14B44
- 409 SEE SDD 14B45
- 410 SEE SDD 14B47
- 411 MINIMUM DISTANCE BETWEEN MISSING POST SPANS.



SECTION A - A



SECTION B - B

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED May 2021 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
<small>FHWA</small>	

GENERAL NOTES

- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
 - (B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED
 - (C) DIFFERENT MANUFACTURERS REQUIRE DIFFERENT PERFORATED W - BEAM RAIL END PANELS. SEE MANUFACTURER'S INFORMATION.
 - (D) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF - TAPPING SCREWS. ONE SCREW PER CORNER.
 - (E) HARDWARE MAY VARY BETWEEN MANUFACTURER. SEE MANUFACTURER'S DRAWING FOR INFORMATION.
- DIMENSIONS MAY VARY, MANUFACTURER'S INFORMATION.

SEE SDD 14B42 FOR MORE INFORMATION.

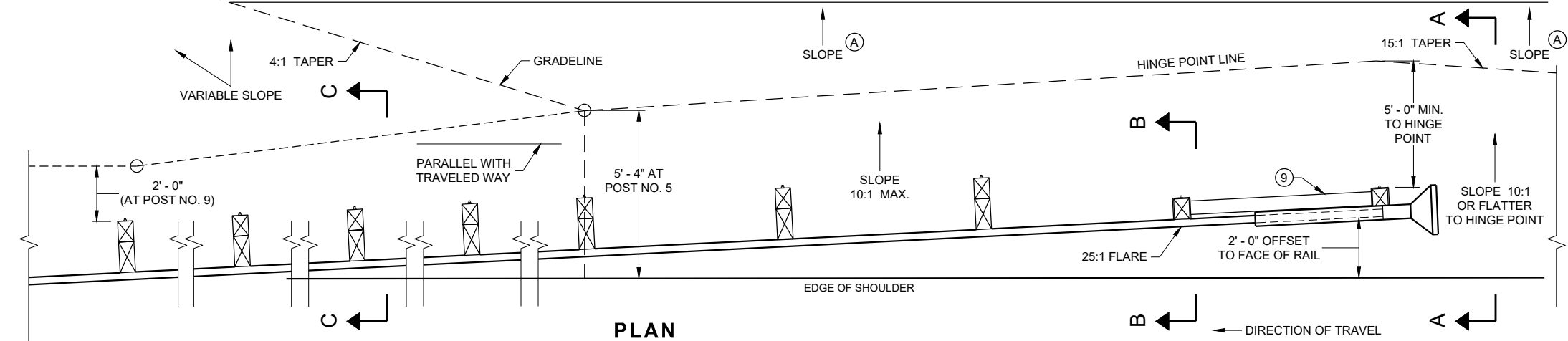
* DO NOT ATTACH BLOCKOUTS TO POST 1 AND 2.

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

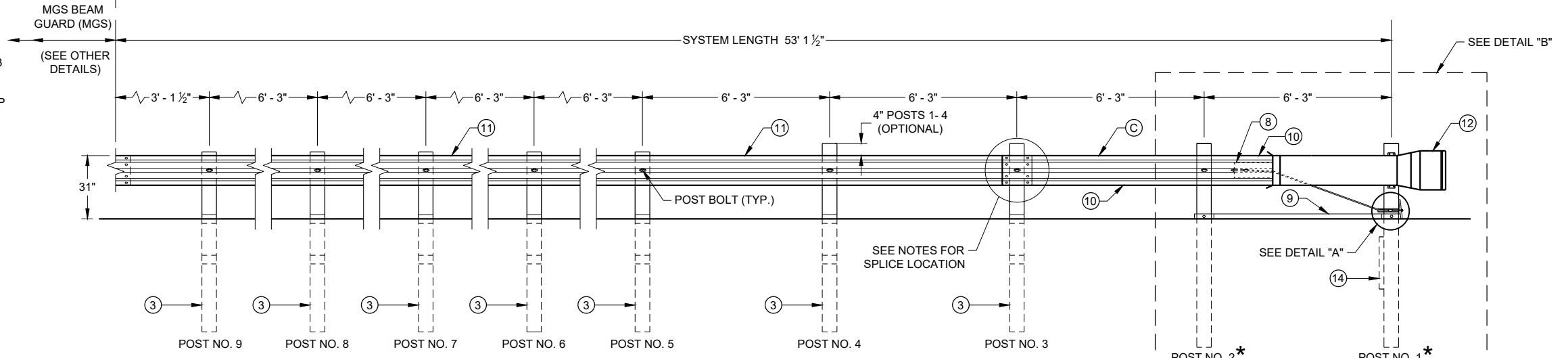
SEE MANUFACTURER'S DRAWING FOR SPLICE LOCATION, HARDWARE DIMENSIONS AND INSTALLATION INSTRUCTIONS.

THE CENTER OF THE UPPER 3 1/2" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE. WOOD BLOCKS ON POSTS NUMBERED 3 THROUGH 9 MAY BE ADJUSTED UP TO 3" ABOVE THE TOP OF POST.

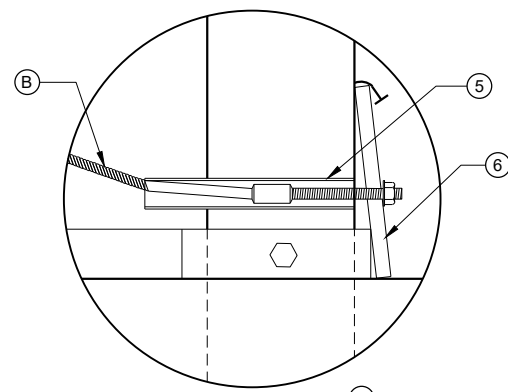
CLEAR ZONE LIMITS, EITHER AS SHOWN ELSEWHERE IN THE PLANS OR, IF NOT SHOWN ELSEWHERE IN THE PLANS, 15 FEET BEYOND THE HINGE POINT LINE



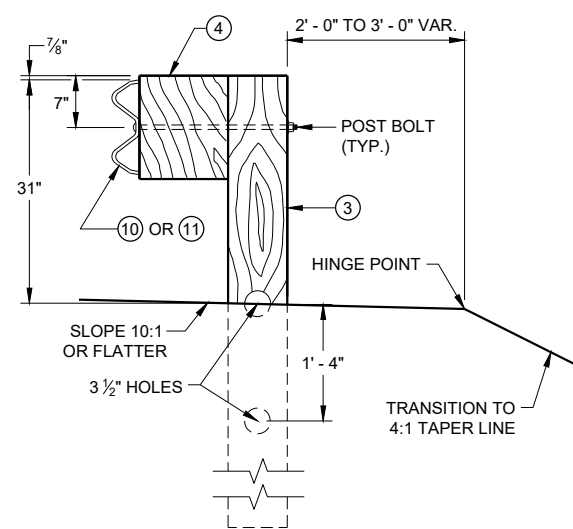
PLAN



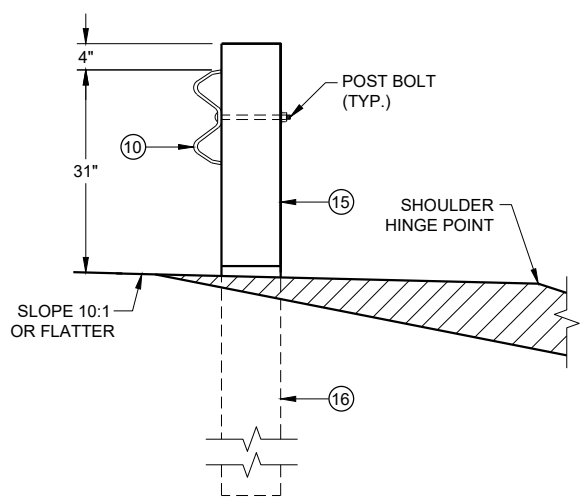
ELEVATION



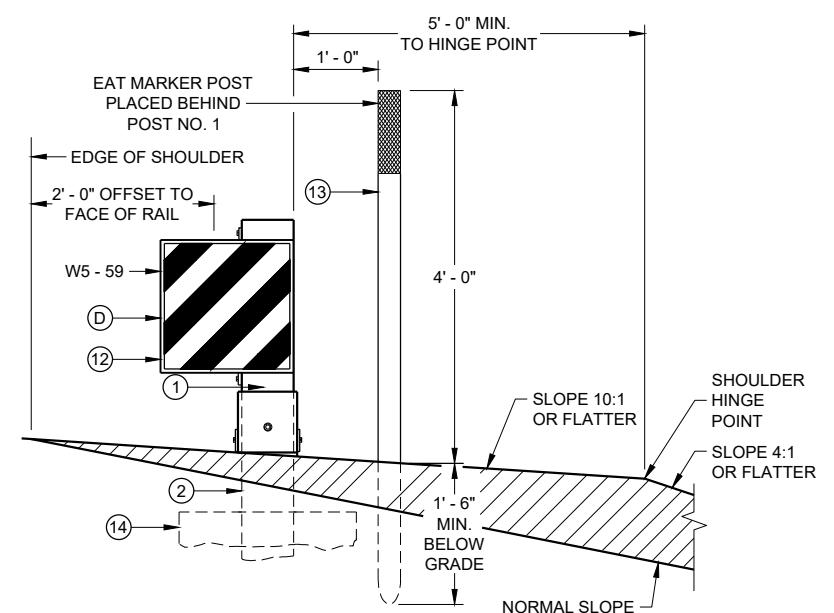
DETAIL "A"



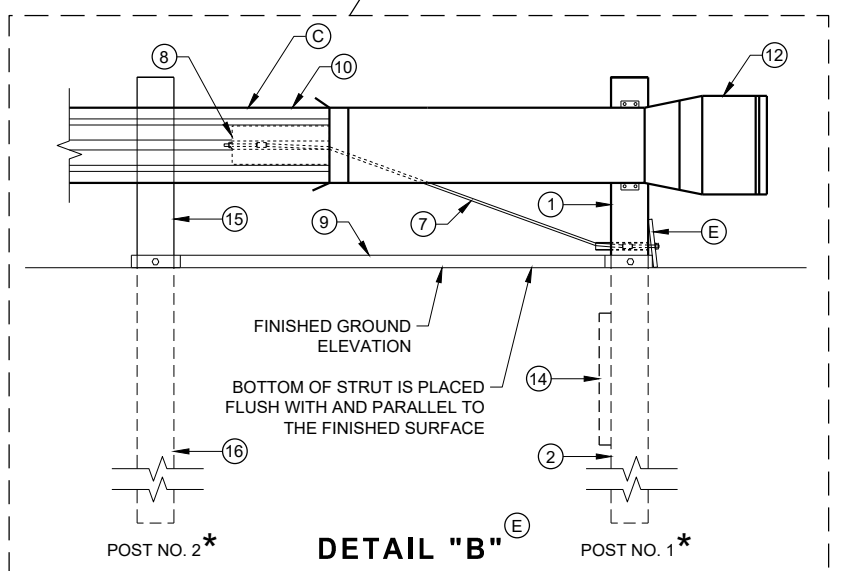
**SECTION C - C
TYPICAL AT POST NOS. 3 - 9**



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



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



DETAIL "B"

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

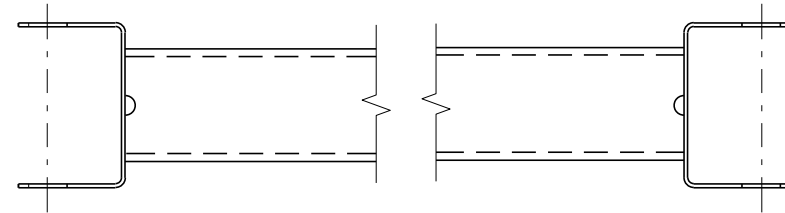
6

SDD 14B44 - 04a

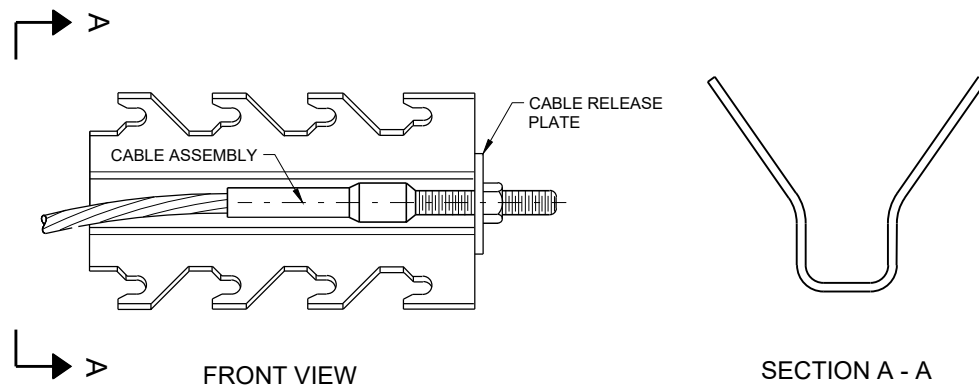
SDD 14B44 - 04a

BILL OF MATERIALS

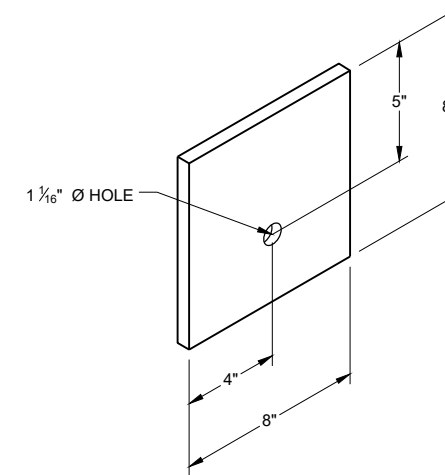
PART NO.	DESCRIPTION MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
①	UPPER POST NO. 1 6" X 6" TUBE
②	LOWER POST NO. 1
③	WOOD CRT
④	WOOD BLOCKOUT
⑤	PIPE SLEEVE
⑥	BEARING PLATE
⑦	BCT CABLE ASSEMBLY
⑧	ANCHOR CABLE BOX
⑨	GROUND STRUT
⑩	PERFORATED W-BEAM RAIL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



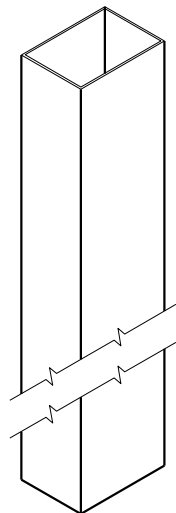
GENERIC GROUND STRUT ⑨ ⑤



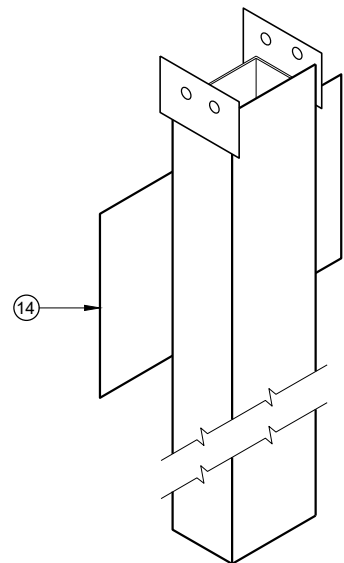
GENERIC ANCHOR CABLE BOX ⑨ ⑤



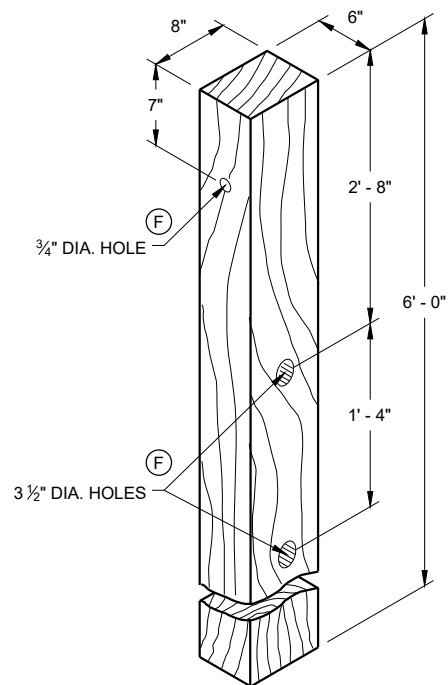
BEARING PLATE ⑥ ⑤



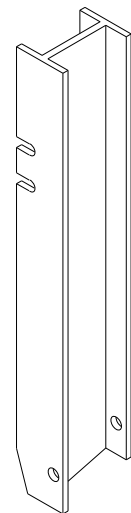
UPPER POST NO. 1 ⁽¹⁾ (E)



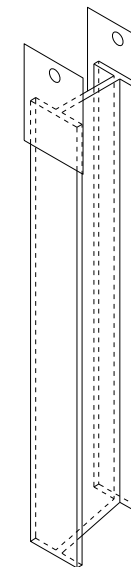
LOWER POST NO. 1 ⁽²⁾ (E)



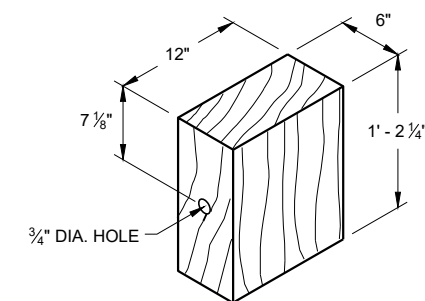
WOOD CRT POST ⁽³⁾ (E)
POSTS NUMBER 3-9



UPPER POST NO. 2 ⁽¹⁵⁾ (E)

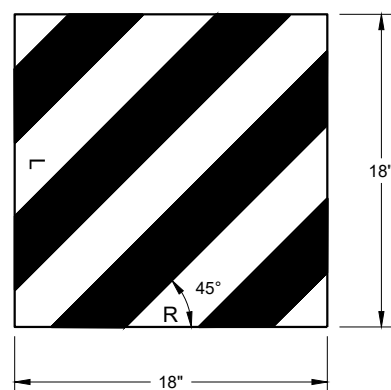


LOWER POST NO. 2 ⁽¹⁶⁾ (E)



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

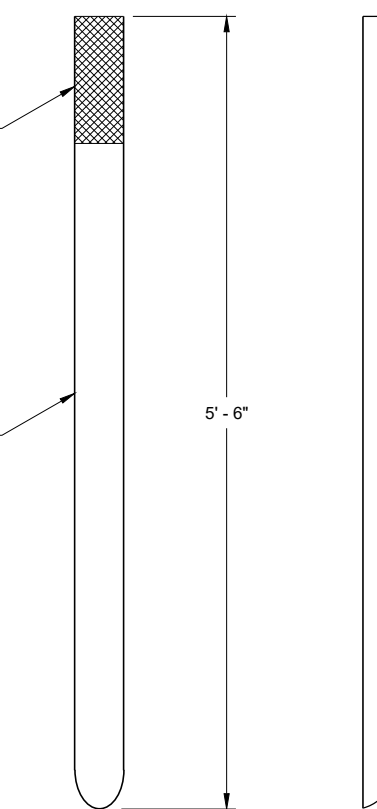
6



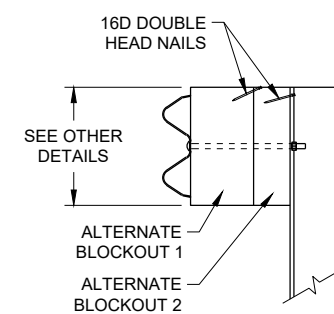
REFLECTIVE SHEETING DETAIL ^(E)

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

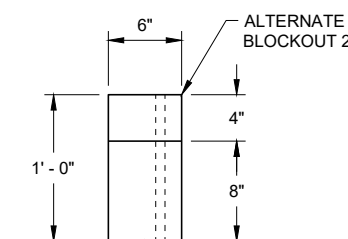
E.A.T. MARKER
POST (YELLOW)



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



SIDE VIEW



TOP VIEW

ALTERNATE WOOD
BLOCKOUT DETAIL

6

SDD 14B44 - 04c

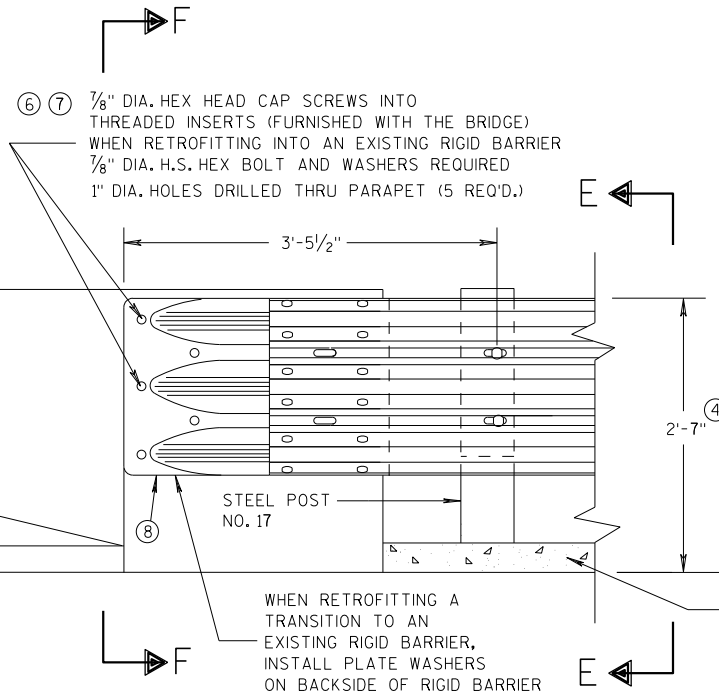
SDD 14B44 - 04c

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

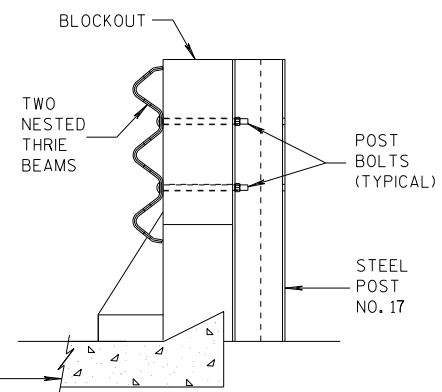
APPROVED
7/2018 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR

FHWA



FRONT VIEW

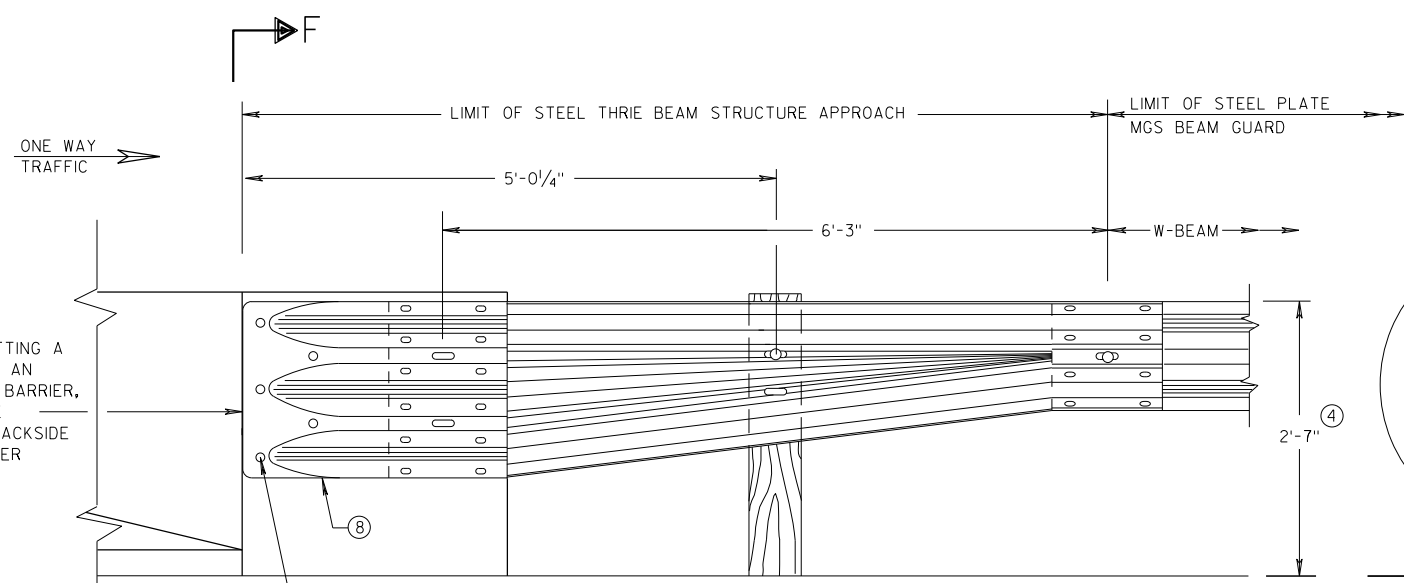
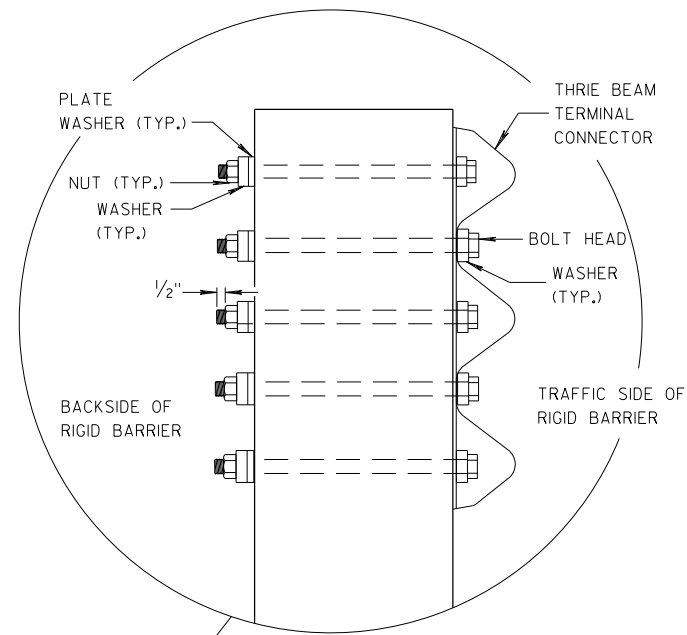
THRIE BEAM CONNECTION TO BRIDGE PARAPET WITH SQUARE ENDS



SECTION E-E

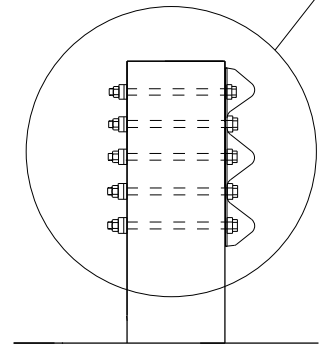
GENERAL NOTES

- THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSITION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.
- (2) OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- (4) TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- (6) DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- (7) BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/32" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- (8) THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".

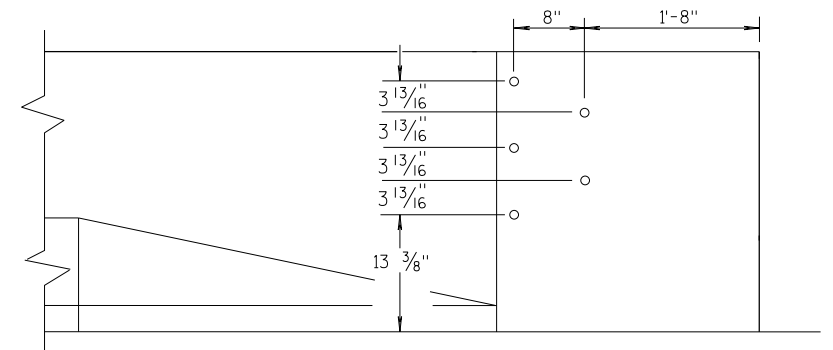


FRONT VIEW

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



SECTION F-F



DRILL HOLE LOCATION

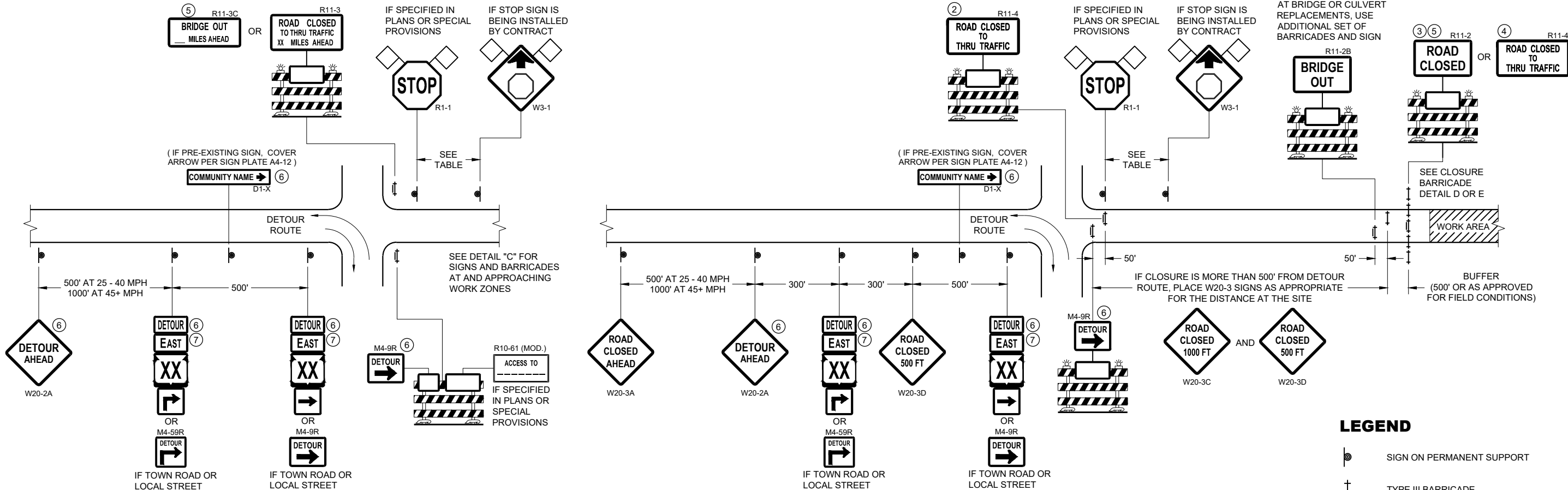
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 07/2018 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
FHWA	

6

6

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

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



**DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR**

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

**DETAIL B
MAINLINE CLOSURE WITH POSTED DETOUR**

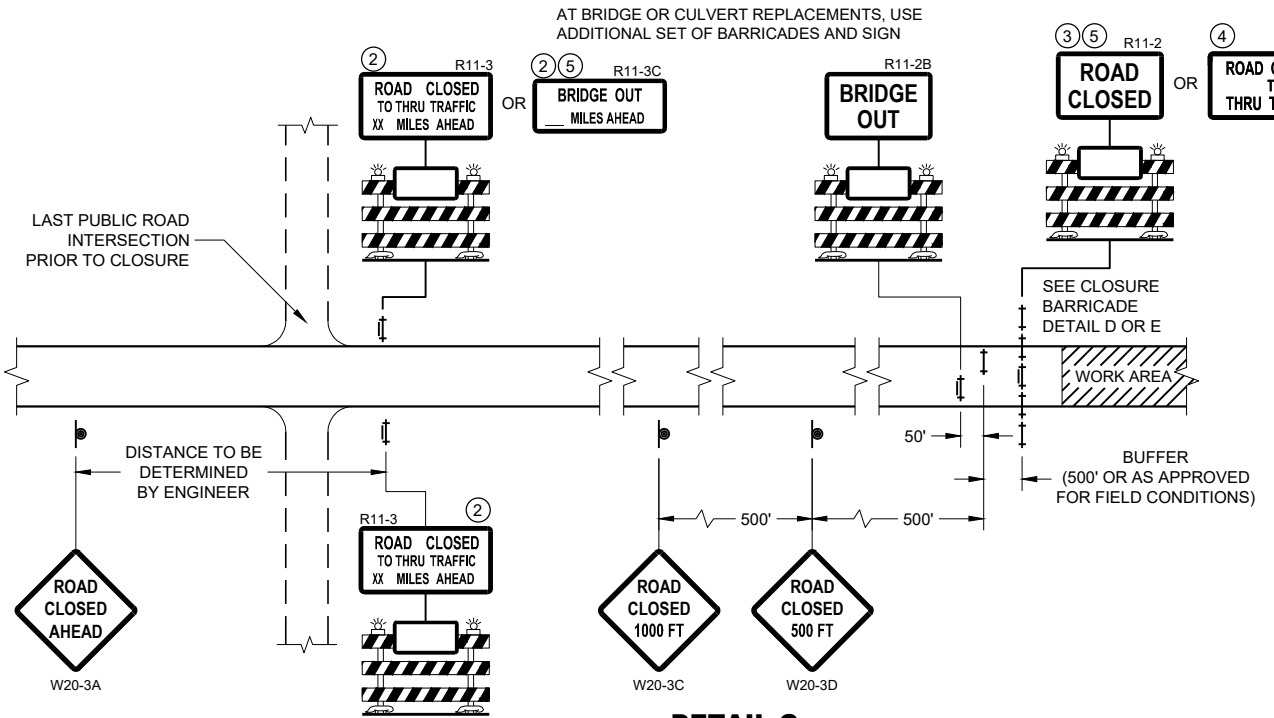
WORK ZONE LESS THAN 1/2 MILE FROM
DETOUR ROUTE (1000 FEET IF URBAN)

LEGEND

- SIGN ON PERMANENT SUPPORT
- TYPE III BARRICADE
- TYPE III BARRICADE WITH ATTACHED SIGN
- TYPE "A" WARNING LIGHT (FLASHING)
- WORK AREA
- FLAGS, 16" X 16" MIN. (ORANGE)

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

- M4 - 8
- M3 - X
- M1 - 4
- M1 - 6
- M1 - 5A
- M05 - 1
- M06 - 1



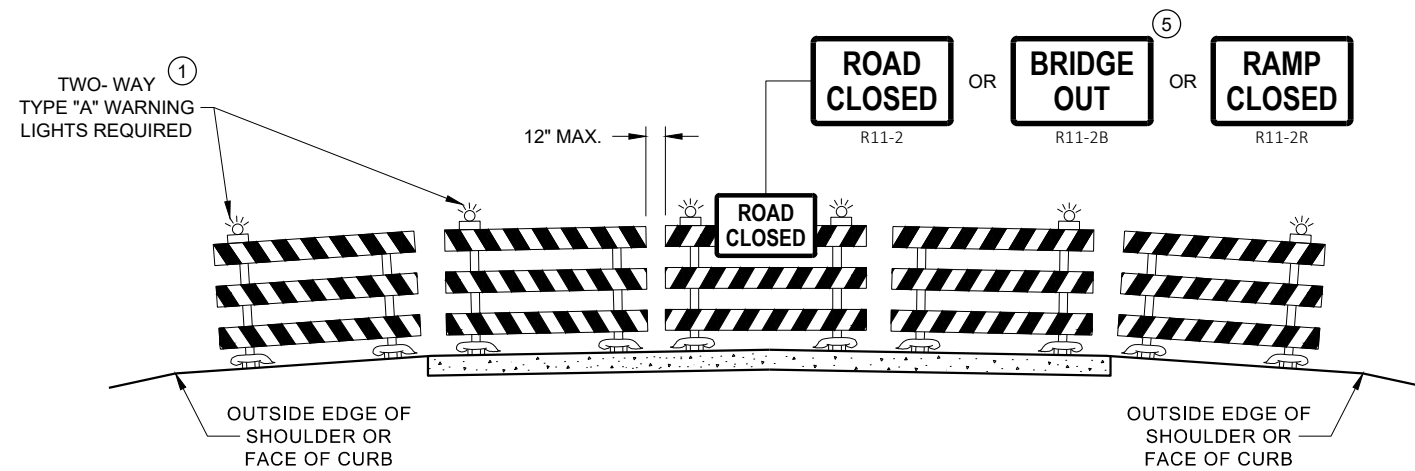
**DETAIL C
MAINLINE CLOSURE, NO POSTED DETOUR**

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

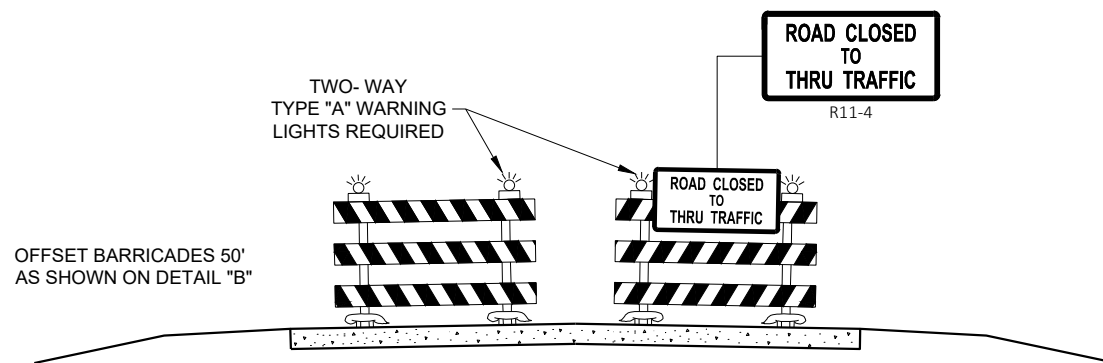
**BARRICADES AND SIGNS
FOR MAINLINE CLOSURES**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
February 2020 /S/ Andrew Heidtke
DATE DATE WORK ZONE ENGINEER
FHWA



**DETAIL D
ROAD CLOSURE BARRICADE DETAIL
APPROACH VIEW**



**DETAIL E
LANE CLOSURE BARRICADE DETAIL
APPROACH VIEW**

SEE SDD 15C2 - SHEET "a" FOR LEGEND

GENERAL NOTES

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

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

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

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

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

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

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

THE R11 - 2, R11 - 3, M4 - 9, R11 - 4, AND R10 - 61 SIGNS PLACED ON 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:

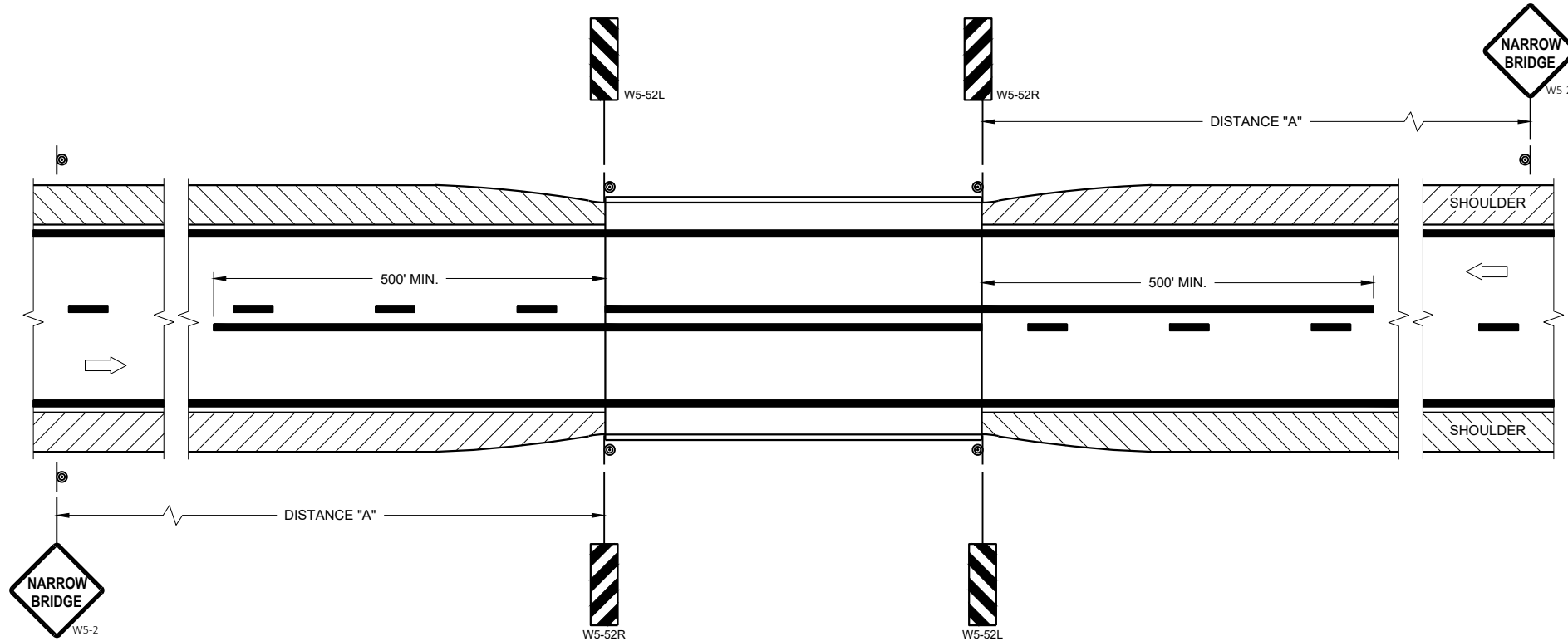
- R11 - 2 SHALL BE 48" X 30"
- R11 - 3 SHALL, R11 - 4 AND R10 - 61 SHALL BE 60" X 30"
- M4 - 9 SHALL BE 30" X 24"
- M3 - X SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)
- M4 - 8 SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)
- M1 - 4, M1 - 5A AND M1 - 6 SHALL BE 24" 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.

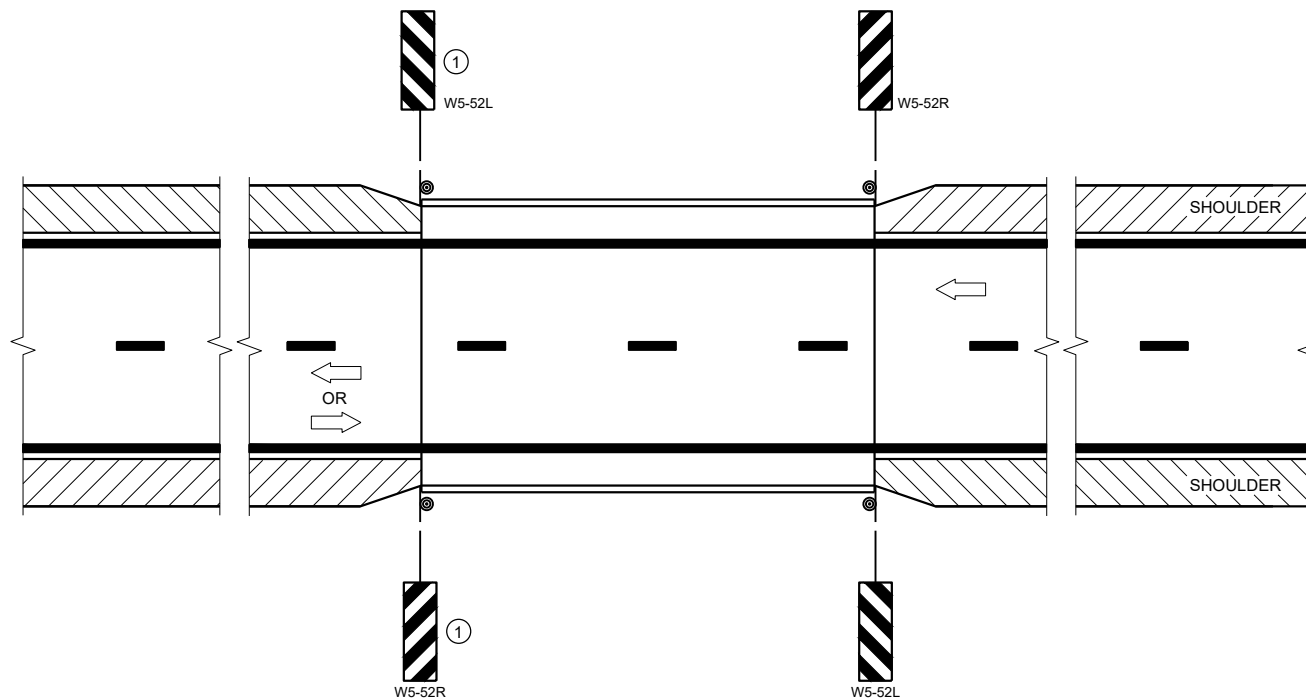
**BARRICADES AND SIGNS
FOR
VARIOUS CLOSURES**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
February 2020 /S/ Andrew Heidtke
DATE WORK ZONE ENGINEER
FHWA



SITUATION 1
 WARRANTING CRITERIA:
 BRIDGE WIDTH IS AT LEAST 16 FEET BUT LESS THAN 24 FEET.



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

GENERAL NOTES

DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THE 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.

ON BRIDGE ONLY PROJECTS, PLACE 300 FEET OF EDGELINE.

OMIT EDGELINES ON ROADWAYS WITHOUT EXISTING EDGELINES.

① OMIT ON ONE-WAY TRAVELED WAYS.

LEGEND

⊙ SIGN ON PERMANENT SUPPORT

➡ DIRECTION OF TRAFFIC

DISTANCE TABLE

POSTED OR 85TH PERCENTILE SPEED	DISTANCE "A"
25	150'
30	200'
35	250'
40	300'
45	400'
50	550'
55	700'

SIGNING AND MARKING FOR TWO LANE BRIDGES

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION




APPROVED
 May 2022 /S/ Jeannie Silver
 DATE STATE SIGNING AND MARKING ENGINEER

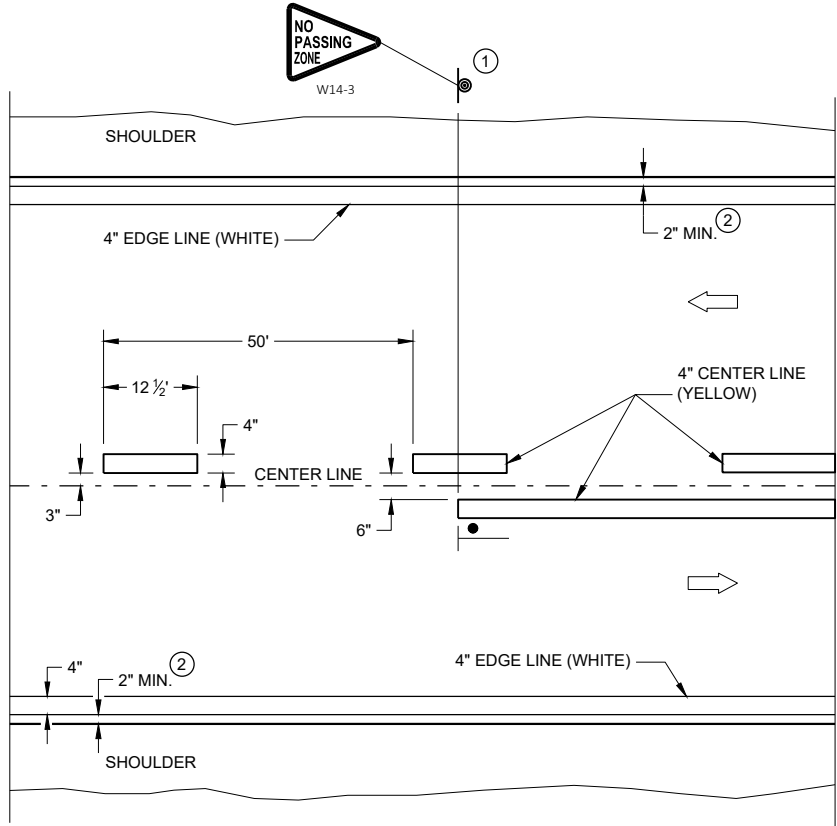
GENERAL NOTES

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

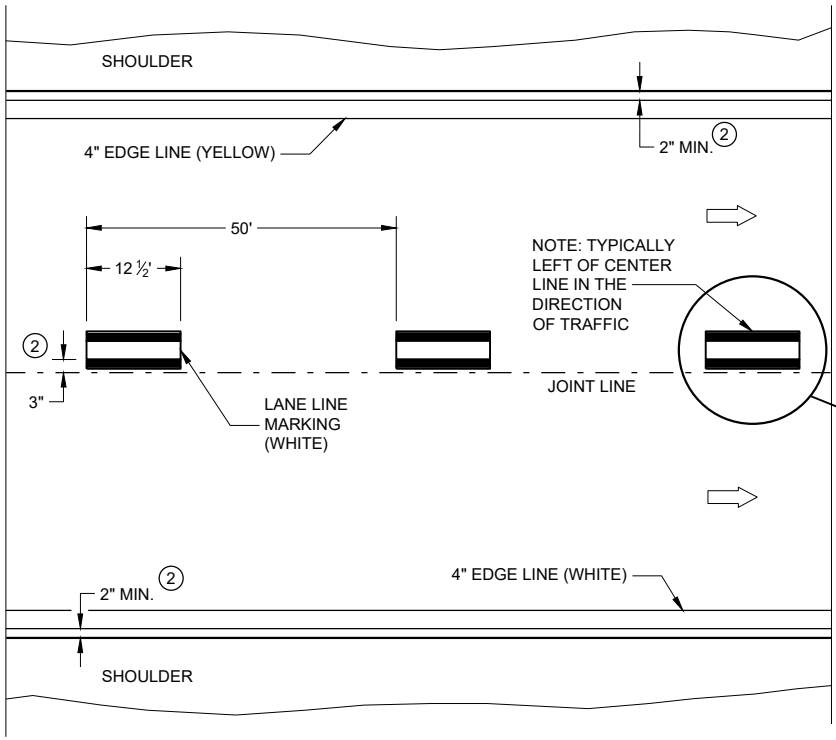
- ① LOCATE THE NO PASSING ZONE W14-3 SIGN WITHIN 50 FEET OF THE "T" MARKING
- ② MEASURE FROM EDGE OF MARKING TO JOINT LINE. THIS DOES NOT INCLUDE SPACE NEEDED FOR GROOVING OPERATIONS.

LEGEND

-  "T" MARKING
-  SIGN ON PERMANENT SUPPORT
-  DIRECTION OF TRAFFIC

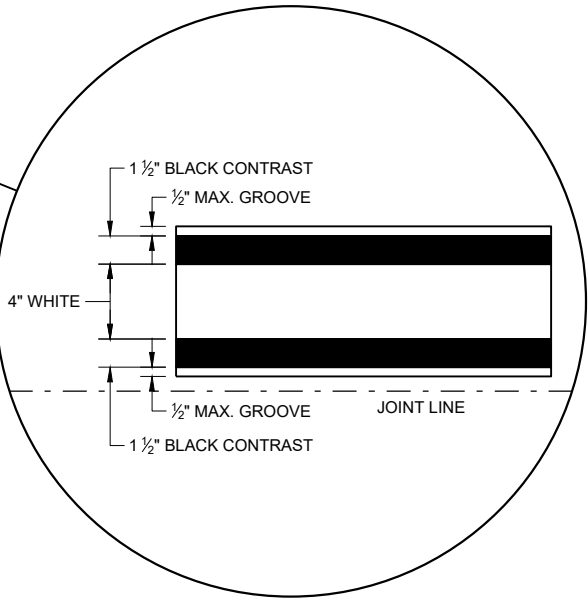


TWO WAY TRAFFIC



ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



6

6

SDD 15C08 - 22a

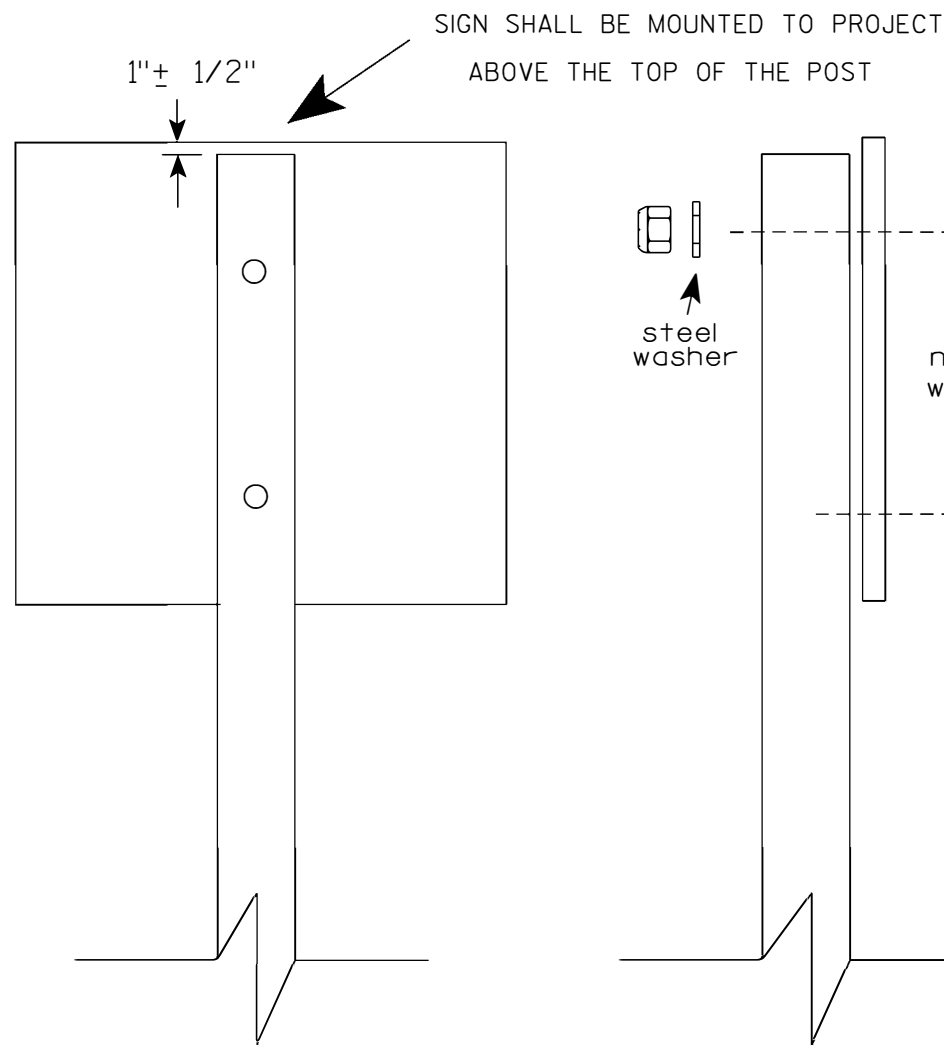
SDD 15C08 - 22a

PERMANENT LONGITUDINAL PAVEMENT MARKINGS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE: May 2022 /S/ Jeannie Silver
STATEWIDE SIGNING AND MARKING ENGINEER

FHWA



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

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

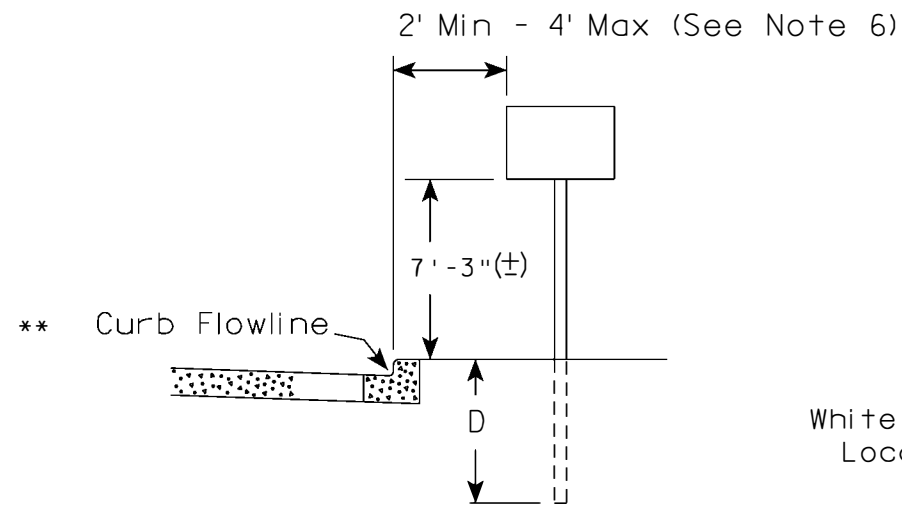
Threads on bolts and nuts shall be manufactured with sufficient allowance for the cadmium plate or galvanized coating to permit the nuts to run freely on the bolts.

- STRINGER BOLTING TO ALUMINUM SIGNS (SEE SIGN PLATE A4-18)
- MACHINE BOLTS - 5/16" X 1-3/4" Length w/ lock nuts
- WOOD POSTS (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

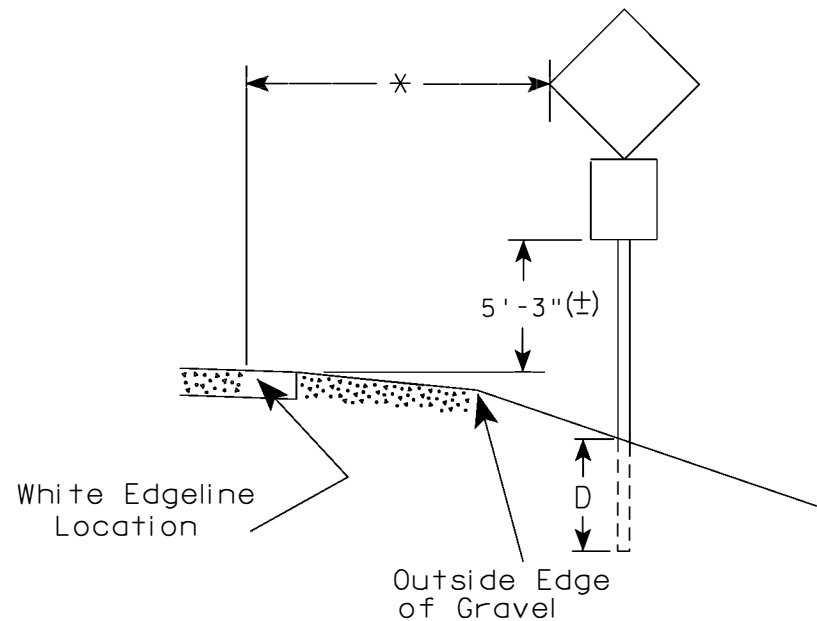
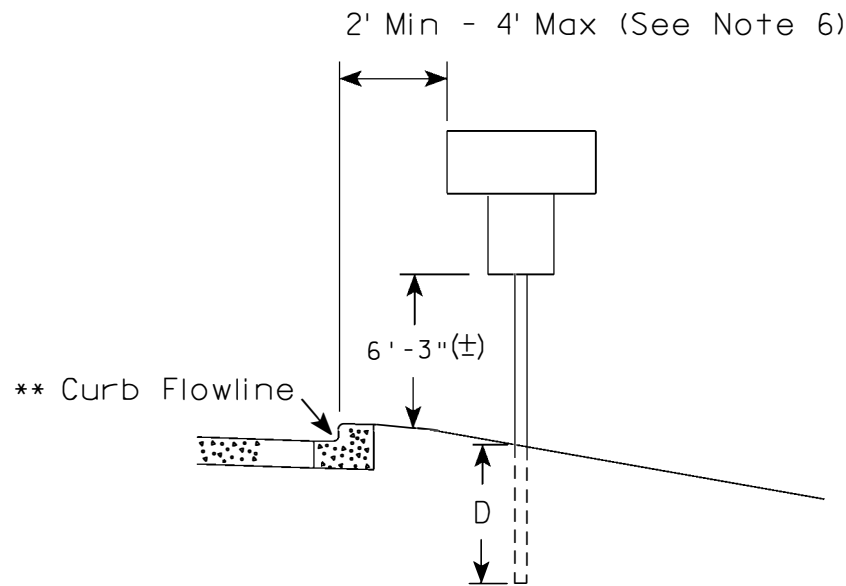
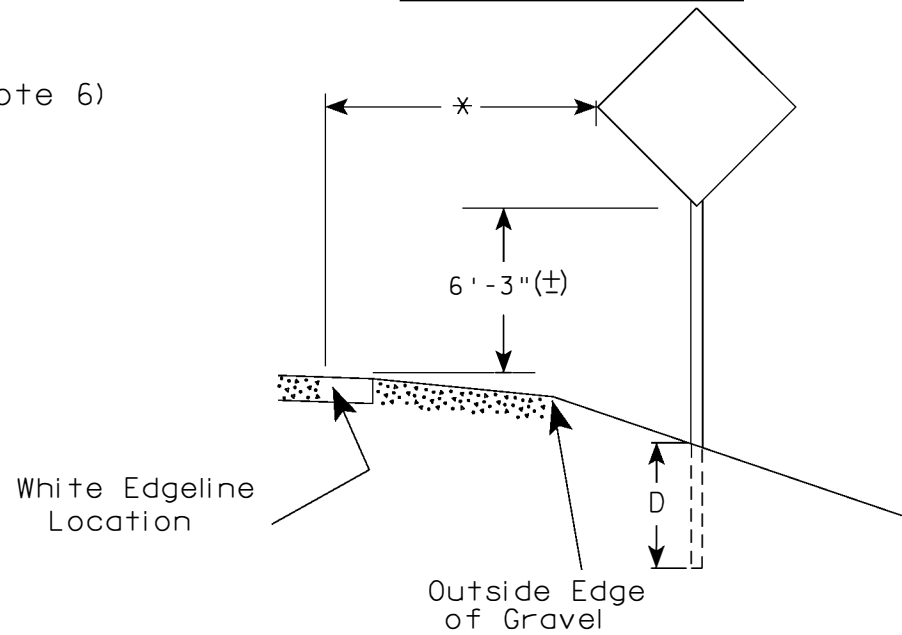
* Two different fastening systems are shown for illustration purposes. On any individual sign, either one or the other system shall be used. Actual number of fasteners per sign varies with the sign area, but normally there are two. For a single post installation, all signs greater than 9 sq. ft. require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

ATTACHMENT OF SIGNS TO POSTS	
WISCONSIN DEPT OF TRANSPORTATION	
APPROVED	<i>Matthew R Rauch</i> For State Traffic Engineer
DATE 4/1/2020	PLATE NO. A4-8.9

URBAN AREA



RURAL AREA (See Note 2)



POST EMBEDMENT DEPTH

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

GENERAL NOTES

1. Signs wider than 4 feet or 20 sq.ft or larger, shall be mounted on multiple posts. Refer to plate A4-4.
2. If signs are mounted on or behind barrier wall, see A4-10 sign plate.
The Double Arrow sign (W12-1D) 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" (±).
3. For expressways and freeways, mounting height is 7'- 3" (±) or 6'-3" (±) depending upon existence of a sub-sign.
4. Minimum mounting height for signs mounted on traffic signal poles is 5' - 3" (±).
5. Offset distance shall be consistent with existing signs or consistent throughout length of project.
6. The (±) tolerance for mounting height is 3 inches.
7. Folding signs shall be mounted at a height of 5'-3" (±) or as directed by the 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.

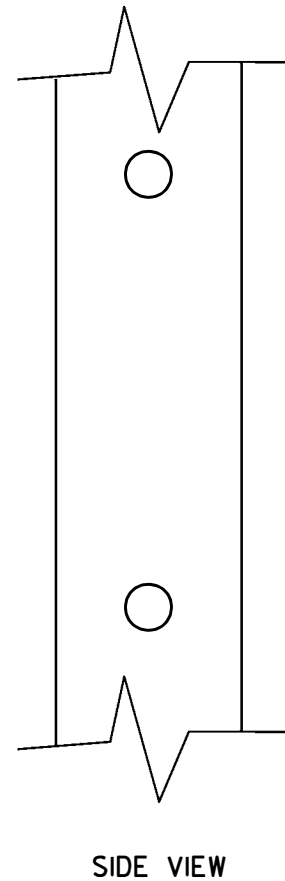
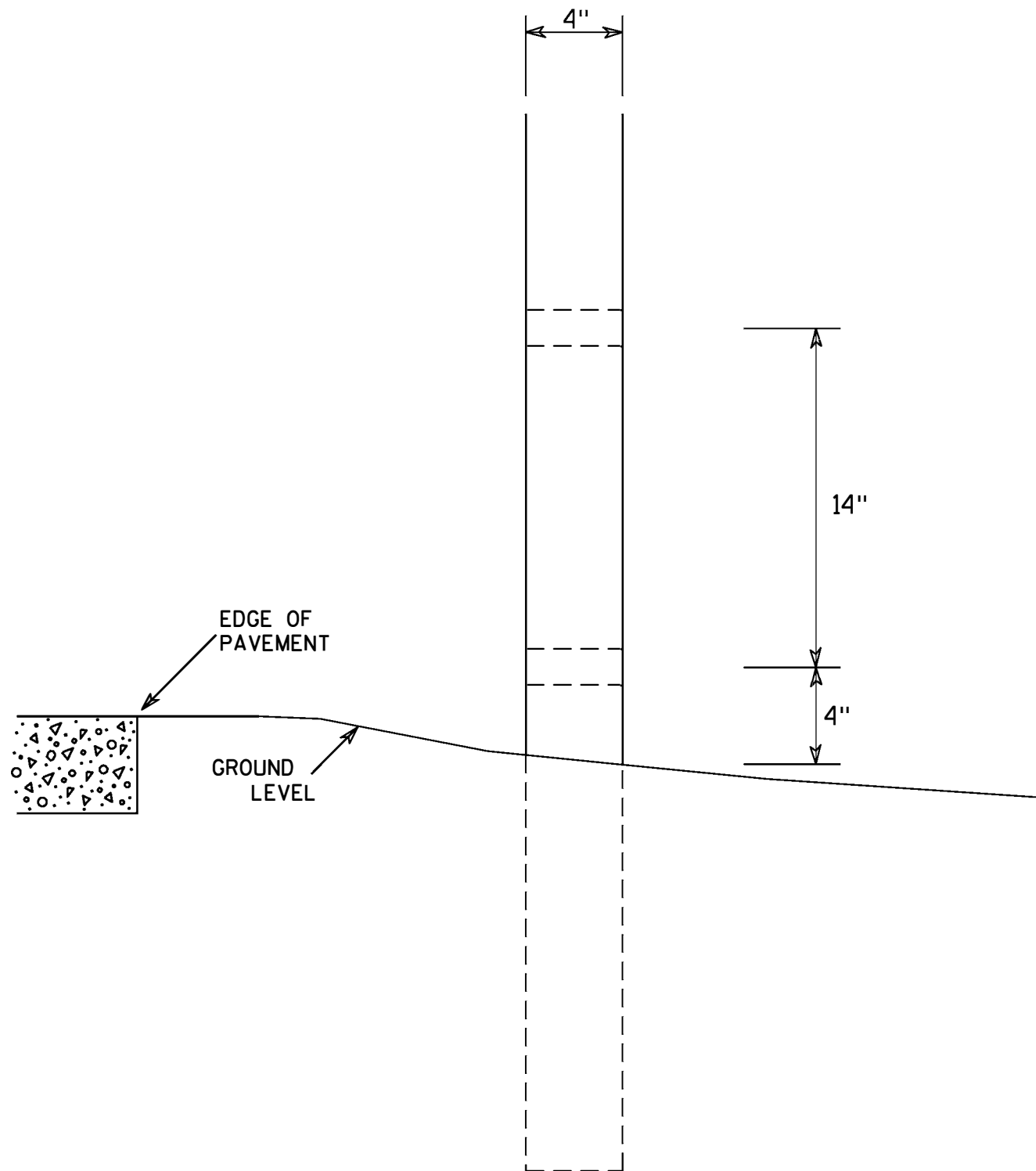
* 6 feet from edge of a paved shoulder or 12 feet from the edge of pavement (edge line location) or 2 feet from outside edge of gravel, whichever is greater unless directed by project engineer.

TYPICAL INSTALLATION OF PERMANENT TYPE II SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Raush*
for State Traffic Engineer

DATE 5/13/2020 PLATE NO. A4-3.22



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

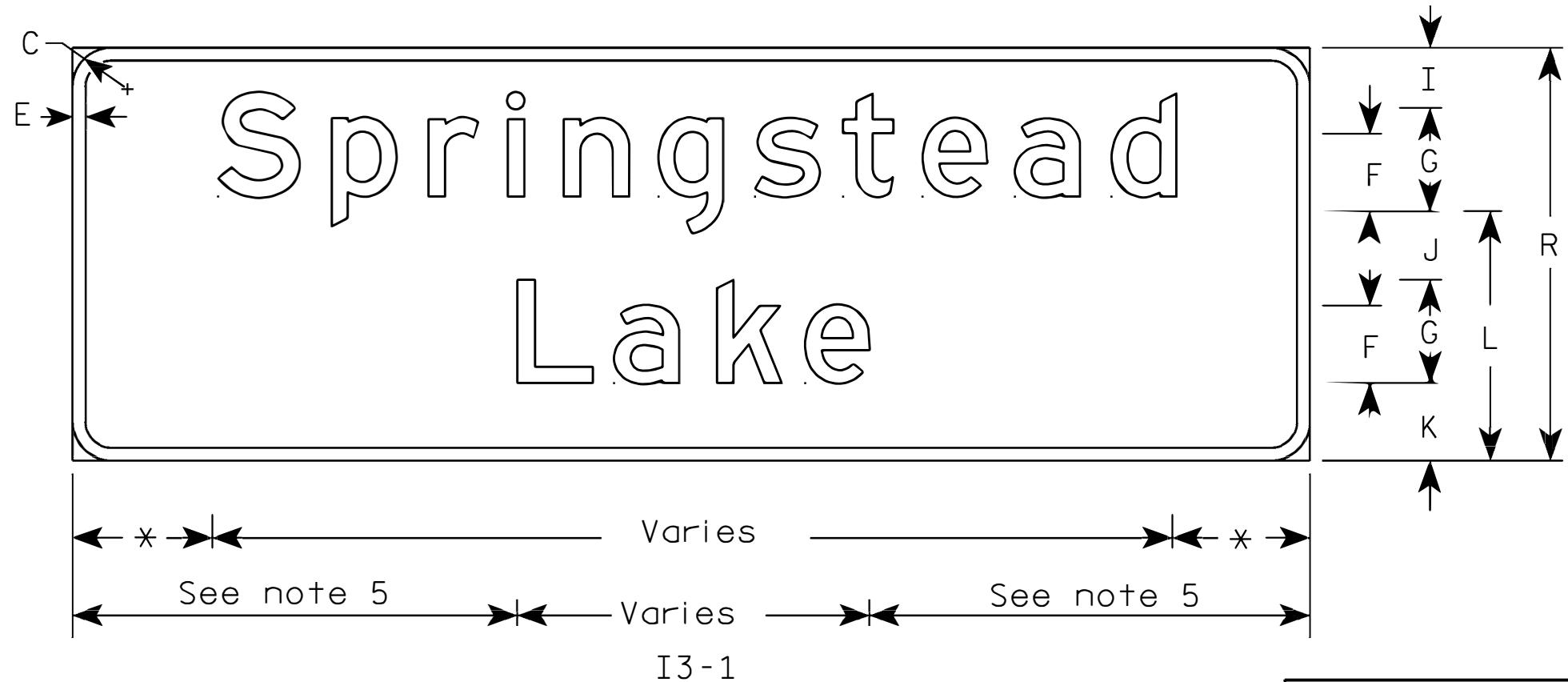
4 X 6 WOOD POST MODIFICATIONS	
WISCONSIN DEPT OF TRANSPORTATION	
APPROVED	<i>Chester J. Spang</i> for State Traffic Engineer
DATE 3/27/97	PLATE NO. A4-11.2



NOTES

1. Sign is Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - Green
Message - White - Type H Reflective
3. Message Series - E except Size 1 is Series C
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
5. Center shorter name over or under the longer name.

* Minimum dimension is normally height of upper case letter.



Metric equivalent for this sign is:

Metric equivalent for this sign is:

SIZE	I3-1	SIZE	I3-1A
1	Varies X 300 mm	1	Varies X 525 mm
2	Varies X 375 mm	2	Varies X 600 mm
3		3	
4	Varies X 525 mm	4	Varies X 900 mm
5	Varies X 525 mm	5	Varies X 900 mm

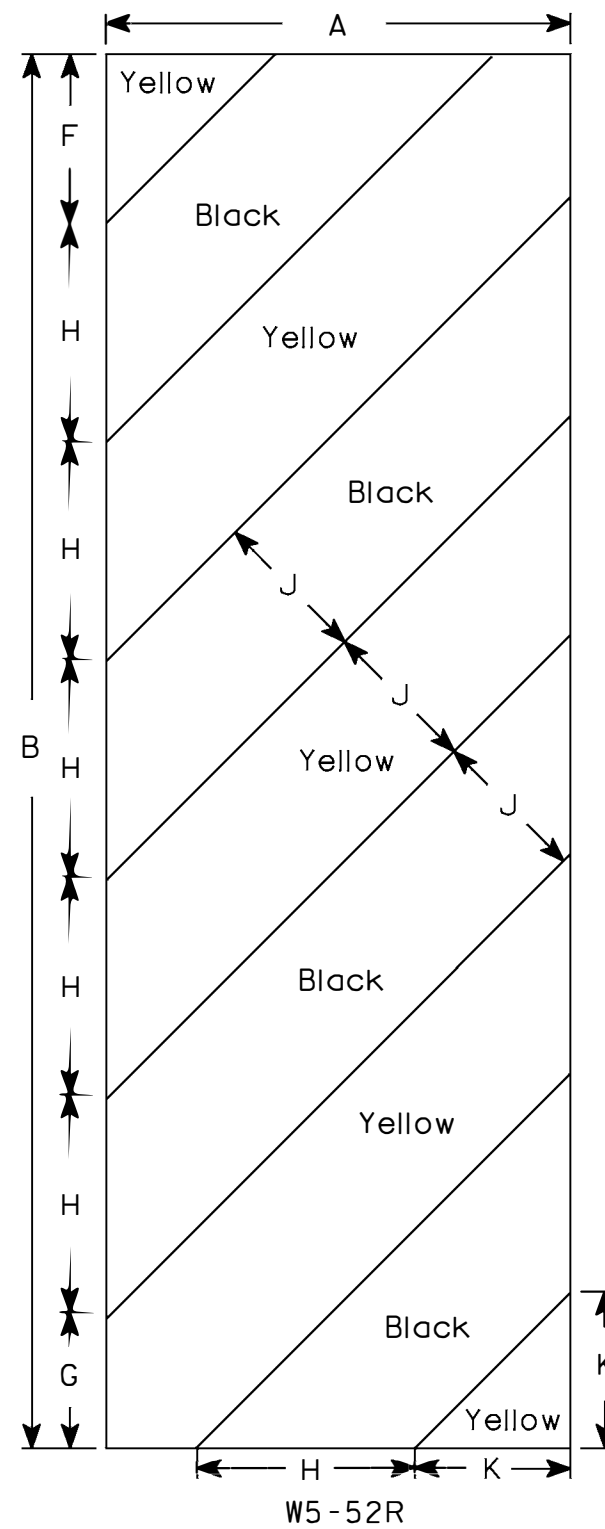
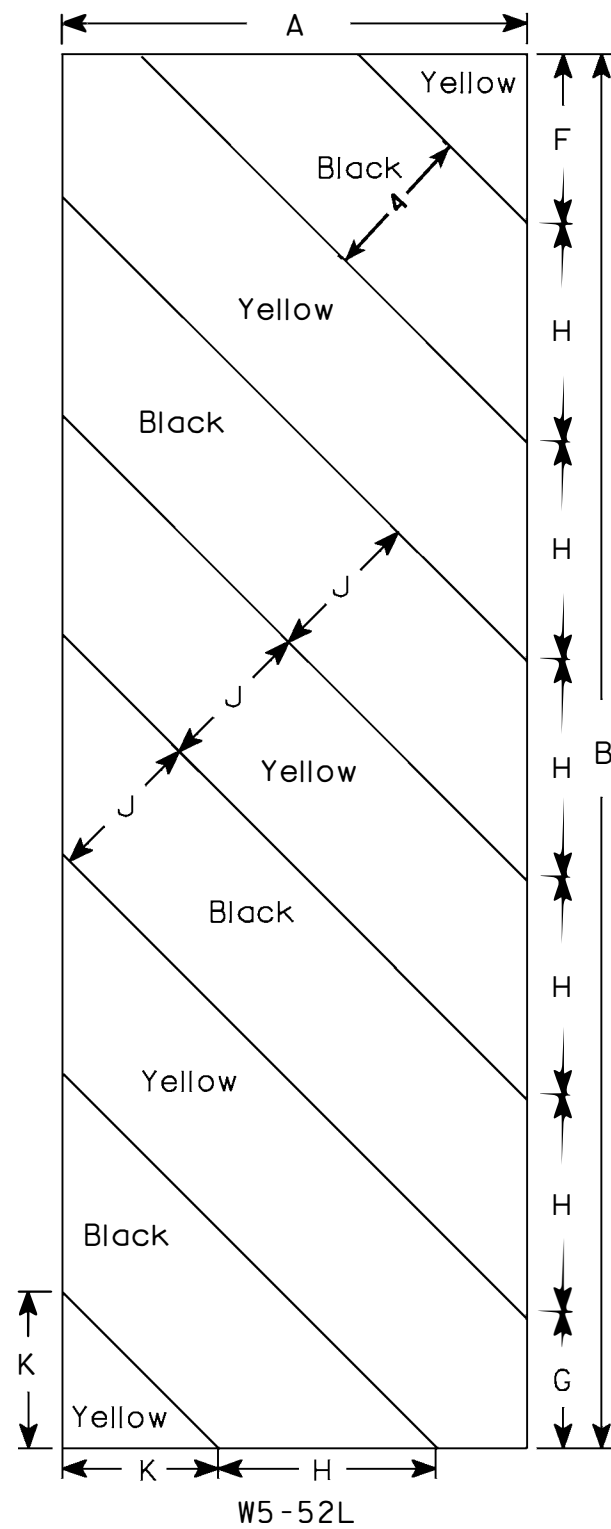
SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.	Area m ²
1	Varies	12	1 1/4		5/8	3 3/4	5	4	3 1/8	3 3/4	4 1/8	12 7/8		3				21									Varies	Varies
2	Varies	15	2 1/4		3/4	4 1/2	6	5	3 1/2	4	4 1/2	14 1/2		4				24									Varies	Varies
3																												
4	Varies	21	3		1	6	8	7 1/8	6 1/4	6 1/4	7 1/2	21 3/4		5 7/8				36									Varies	Varies
5	Varies	21	3		1	6	8	7 1/8	6 1/4	6 1/4	7 1/2	21 3/4		5 7/8				36									Varies	Varies

STANDARD SIGN
I3-1

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Christa J. Spang*
for State Traffic Engineer

DATE 1/25/02 PLATE NO. I3-1.5



NOTES

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

7

7

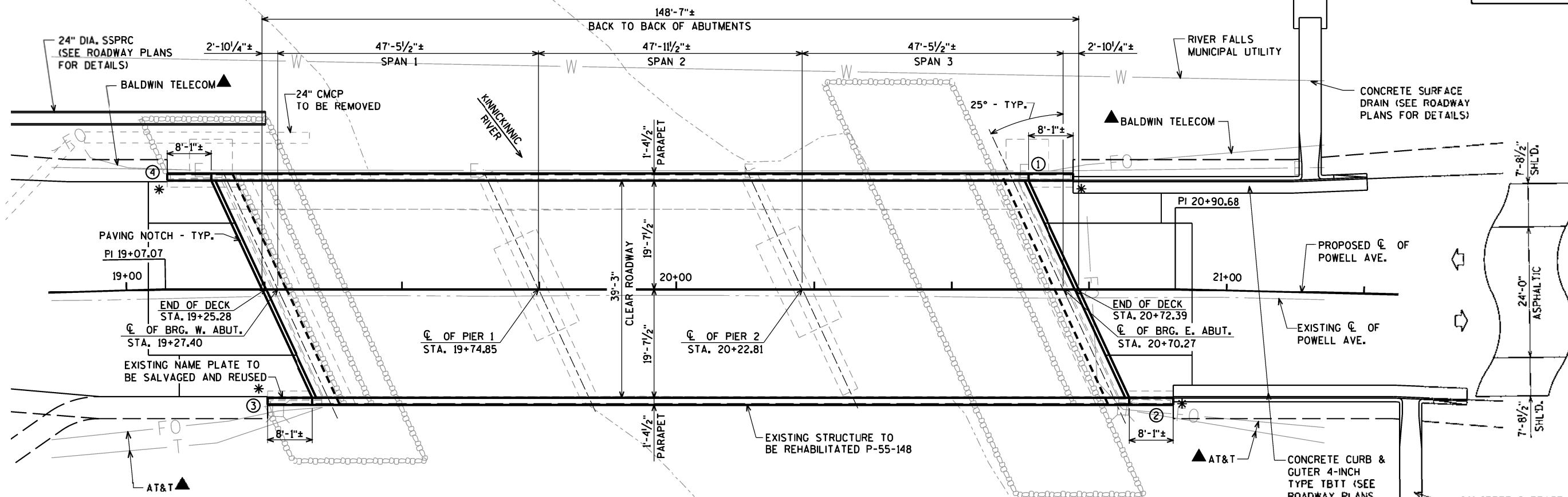
SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2S	12	36				4 3/8	3 1/2	5 5/8	45°	4	4																3.0
2M	12	36				4 3/8	3 1/2	5 5/8	45°	4	4																3.0
3	18	54				6	5 1/2	8 1/2	45°	6	6 5/16																6.75
4																											
5																											

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



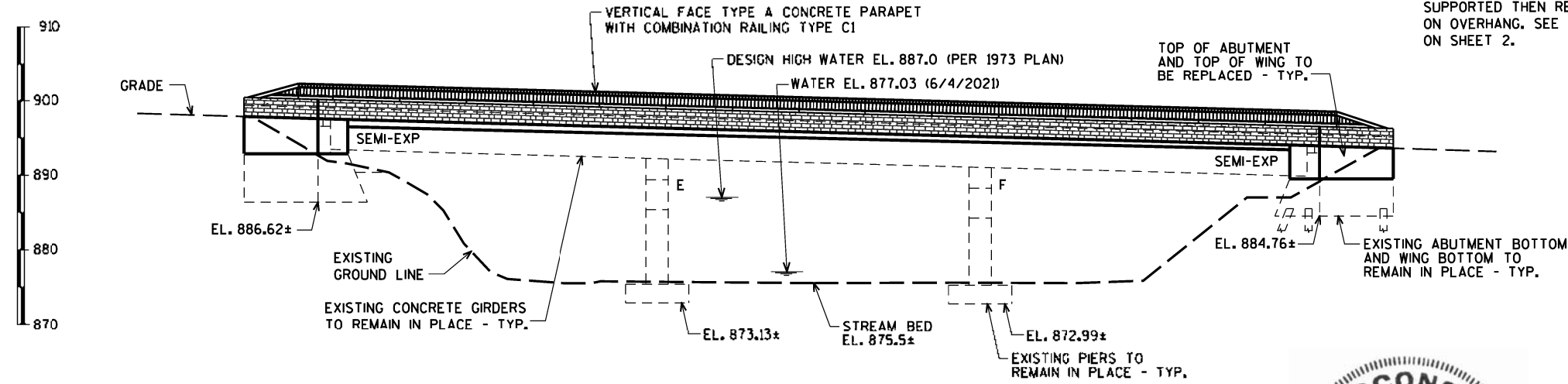
PLAN
THREE-SPAN 36" PRESTRESSED CONCRETE GIRDER BRIDGE
DECK REPLACEMENT

* ATTACHMENT FOR THRIE BEAM TYPE GUARDRAIL.

○ DENOTES WING NUMBER.

UTILITY TO BE TEMPORARILY SUPPORTED THEN REPLACED ON OVERHANG. SEE DETAIL ON SHEET 2.

FOR TYPICAL SECTION, GENERAL NOTES, AND DESIGN DATA, SEE SHEET 2



ELEVATION

LIST OF DRAWINGS

- | | |
|--|---|
| 1. GENERAL PLAN | 10. DECK ELEVATIONS |
| 2. TYPICAL SECTION, DESIGN DATA, AND NOTES | 11. SUPERSTRUCTURE |
| 3. QUANTITIES AND DETAILS | 12. SUPERSTRUCTURE PLAN |
| 4. WEST ABUTMENT | 13. SUPERSTRUCTURE TRANSVERSE DECK STEEL LAYOUT |
| 5. WEST ABUTMENT DETAILS | 14. SUPERSTRUCTURE DETAILS |
| 6. EAST ABUTMENT | 15. SUPERSTRUCTURE DETAILS |
| 7. EAST ABUTMENT DETAILS | 16. COMBINATION RAIL TYPE "C1" |
| 8. BEARING DETAILS | 17. COMBINATION RAIL TYPE "C1" DETAILS |
| 9. INTERM. STEEL DIAPH. DETAILS | |



02/06/2023

BRIDGE OFFICE CONTACT:
AARON BONK
(608)-261-0261
CONSULTANT CONTACT:
ARLEN BEAUDETTE
(715)-834-3161

NO.	DATE	REVISION	BY
ORIGINAL PLANS PREPARED BY AYRES 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com			
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
ACCEPTED	<i>[Signature]</i>	SDR 02/17/23	DATE
STRUCTURE P-55-148			
POWELL AVE. OVER KINNICKINNIC RIVER			
COUNTY	ST. CROIX	TOWN/CITY/VILLAGE	RIVER FALLS
DESIGN SPEC. REHABILITATION N/A			
DESIGNED BY	ZSS	DESIGN CK'D. AEB	DRAWN BY CLP PLANS CK'D. AEB
GENERAL PLAN			SHEET 1 OF 17

2/6/2023
PENTABLE:BRGou_shd_util.tbl

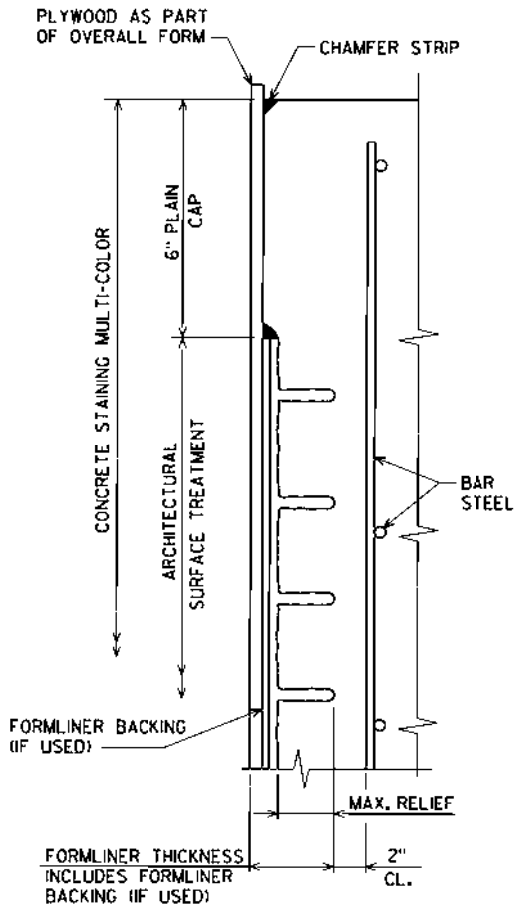
DATE: DATE:
CHECKED BY: BACK CHECKED BY:
CORRECTED BY:

8

8

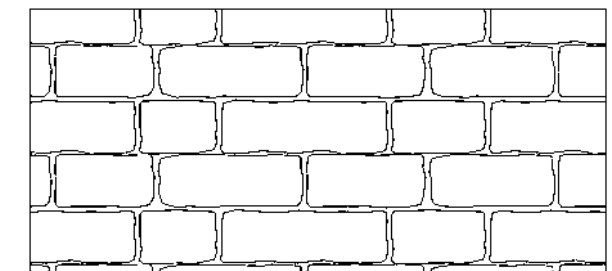
GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.
 DIMENSIONS ARE BASED ON ORIGINAL STRUCTURE PLANS.
 BAR STEEL SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS SHOWN OR NOTED OTHERWISE.
 THE FIRST DIGIT OF A THREE DIGIT BAR NO. AND THE FIRST TWO DIGITS OF A FOUR DIGIT BAR NO. SIGNIFIES THE BAR SIZE.
 ALL CONCRETE REMOVAL SHALL BE DEFINED BY A 1/2" DEEP SAW CUT UNLESS SHOWN OR NOTED OTHERWISE.
 AT ABUTMENTS ALL SPACES EXCAVATED AND NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH BACKFILL STRUCTURE TYPE A. VARIATIONS TO THE NEW GRADE LINE OVER 1/4" MUST BE SUBMITTED BY THE FIELD ENGINEER TO THE STRUCTURES DESIGN SECTION FOR REVIEW.
 PROTECTIVE SURFACE TREATMENT AND PIGMENTED SURFACE SEALER TO BE APPLIED AS SHOWN IN THE DETAILS ON SHEET 3.
 UTILIZE EXISTING BAR STEEL REINFORCEMENT WHERE SHOWN AND EXTEND 24 BAR DIAMETERS INTO NEW WORK, UNLESS SPECIFIED OTHERWISE.
 THE EXISTING GROUNDLINE SHALL BE THE UPPER LIMIT FOR EXCAVATION FOR STRUCTURES.
 JOINT FILLER SHALL CONFORM TO THE REQUIREMENTS OF A.A.S.H.T.O. DESIGNATION M 153, TYPE 1, 11 OR 111 OR A.A.S.H.T.O. DESIGNATION M 213.
 THE MINIMUM CONCRETE HAUNCH SHALL BE 2" FOR DESIGN CALCULATIONS AND THE HAUNCH CONCRETE QUANTITY IS BASED ON AN AVERAGE DEPTH OF 2 3/4", WHICH IS THE MAXIMUM HAUNCH QUANTITY FOR WHICH THE CONTRACTOR WILL BE PAID.
 BEVEL EXPOSED EDGES OF CONCRETE 3/4" UNLESS NOTED OTHERWISE.
 THE CONTRACTOR SHALL SALVAGE AND REINSTALL EXISTING NAME PLATE.
 COMPLETE CONCRETE SURFACE REPAIR OF GIRDER ENDS PRIOR TO POURING NEW SUPERSTRUCTURE DIAPHRAGMS.
 CARE TO BE TAKEN TO MISS EXISTING STRANDS IN GIRDERS WHEN DRILLING HOLES FOR NEW DIAPHRAGMS.



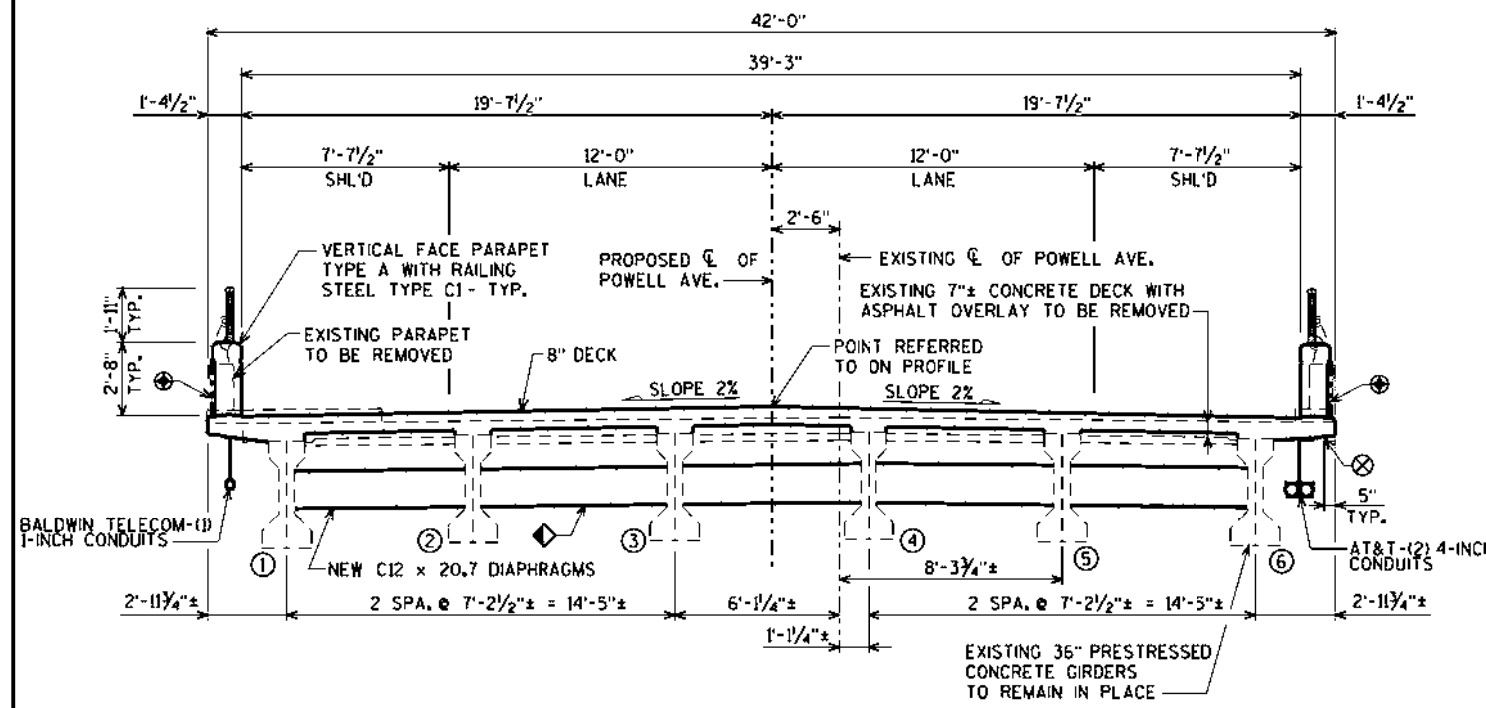
SECTION THRU FORMLINER

FORMLINER COURSING ON PARAPETS SHALL BE PARALLEL TO TOP OF PARAPET



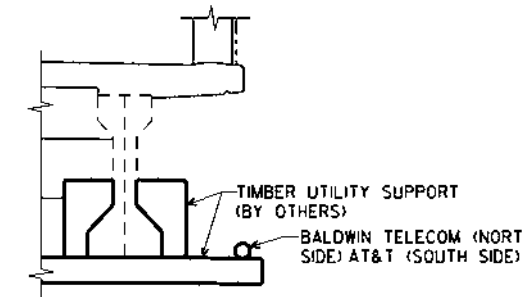
RECTANGULAR CUT STONE

FORMLINER THICKNESS = 4" TO 5 1/2"
 COURSE HEIGHT = 2"±
 MAX. RELIEF = 3" TO 4 1/2"

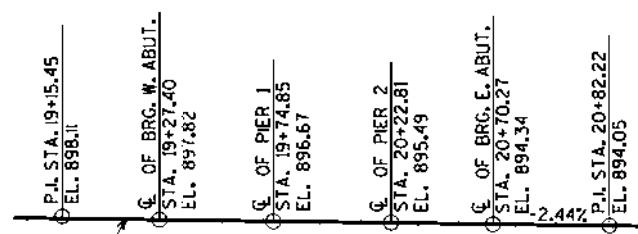


TYPICAL SECTION THRU BRIDGE
 (LOOKING UPSTATION)

- ◀ EXISTING CONCRETE DIAPHRAGMS TO BE REMOVED, MID-SPAN ONLY.
- ⊗ 3/4" V - GROOVE REQ'D. EXTEND TO 6" FROM FRONT FACE OF ABUTMENT DIAPHRAGMS - TYP.
- ⊕ ARCHITECTURAL SURFACE TREATMENT

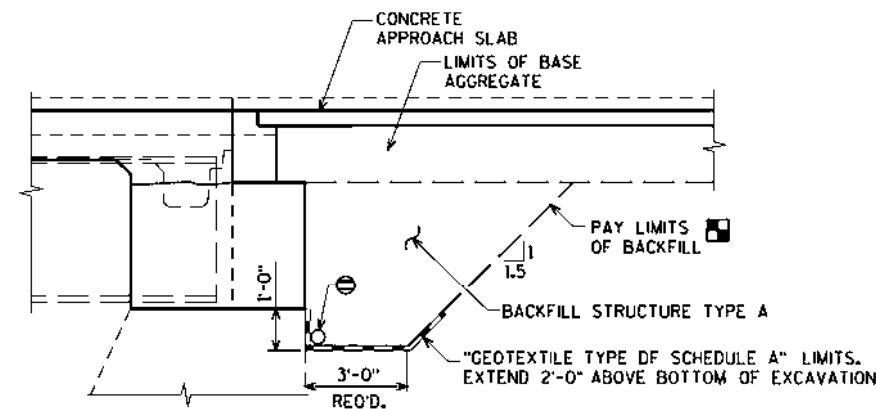


TIMBER UTILITY SUPPORT SYSTEM



PROFILE GRADE LINE
 (POWELL AVE.)

BENCH MARK:
 BM#50, PK NAIL TOP OF CONC. ELEC. VAULT
 STA. 19+19, 21' LT.
 EL. 896.61



BACKFILL STRUCTURE LIMITS
 AT ABUTMENT BACKWALLS

- ▣ BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.
- ⊖ PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN AS DETAILED ON SHEET 3.

DESIGN DATA

LIVE LOAD:
 DESIGN LOADING: HS-20
 INVENTORY RATING FACTOR: HS-16
 OPERATING RATING FACTOR: HS-27
 WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = 240 KIPS

MATERIAL PROPERTIES:

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

TRAFFIC DATA:

A.A.D.T. = 2,700 (2023)
 A.A.D.T. = 3,640 (2043)
 R.D.S. = 40 M.P.H.

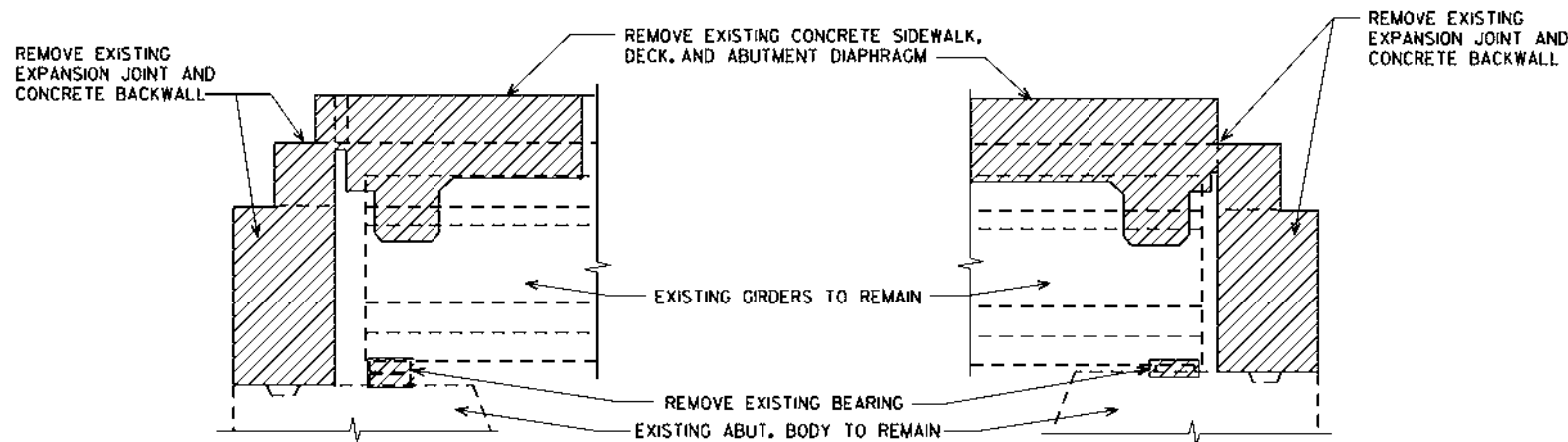
ORIGINAL PLANS PREPARED BY
AYRES 3433 Oakwood Hills Parkway
 Eau Claire, WI 54701
 www.AyresAssociates.com

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE P-55-148			
DRAWN BY		CLP	PLANS CKD. AEB
TYPICAL SECTION, DESIGN DATA, AND NOTES			SHEET 2 OF 17

TOTAL ESTIMATED QUANTITIES

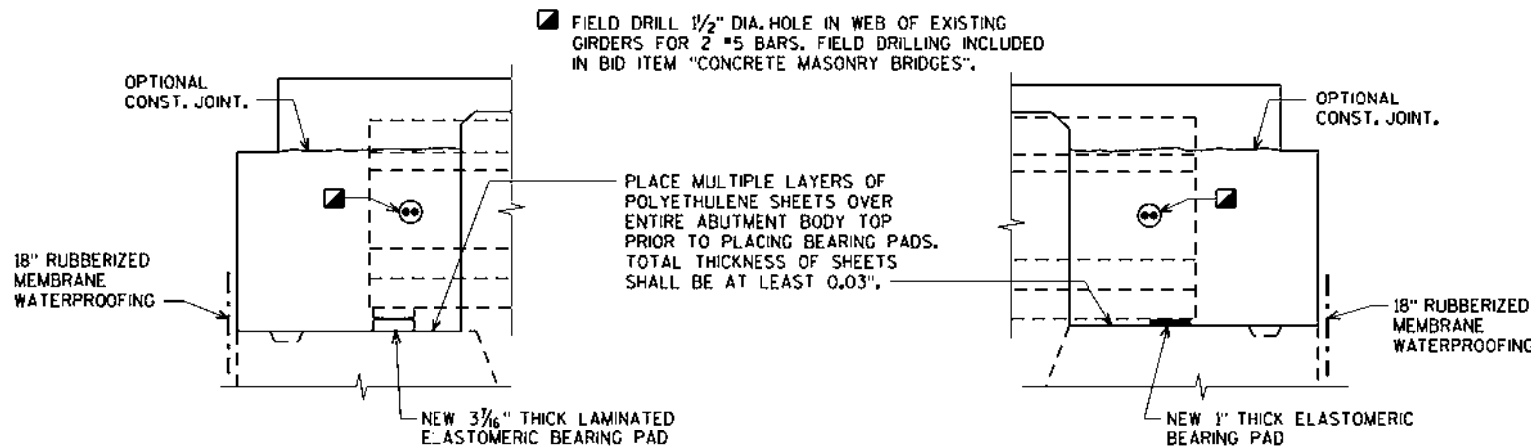
BID ITEM NUMBER	BID ITEMS	UNIT	W. ABUT.	E. ABUT.	SUPER.	TOTAL	CATEGORY 0020	CATEGORY 0030
203.021.S	ABATEMENT OF ASBESTOS CONTAINING MATERIAL P-55-148	EACH	-----	-----	-----	1	1	-----
203.0260	REMOVING STRUCTURE OVER WATERWAY MINIMAL DEBRIS P-55-148	EACH	-----	-----	-----	1	1	-----
206.1001	EXCAVATION FOR STRUCTURES BRIDGES P-55-148	EACH	-----	-----	-----	1	1	-----
210.1500	BACKFILL STRUCTURE TYPE A	TON	65	65	-----	130	130	-----
502.0100	CONCRETE MASONRY BRIDGES	CY	6.6	6.2	182.8	195.6	195.6	-----
502.3200	PROTECTIVE SURFACE TREATMENT	SY	-----	-----	645	645	645	-----
502.3210	PIGMENTED SURFACE SEALER	SY	-----	-----	65	65	65	-----
502.4204	ADHESIVE ANCHORS NO. 4 BARS	EACH	-----	-----	140	140	140	-----
502.4205	ADHESIVE ANCHORS NO. 5 BARS	EACH	94	94	-----	188	188	-----
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	1,090	1,080	57,350	59,520	59,520	-----
506.2605	BEARING PADS ELASTOMERIC NON-LAMINATED	EACH	-----	6	-----	6	6	-----
506.2610	BEARING PADS ELASTOMERIC LAMINATED	EACH	6	-----	-----	6	6	-----
506.4000	STEEL DIAPHRAGMS P-55-148	EACH	-----	-----	15	15	15	-----
506.7050.S	REMOVING BEARINGS P-55-148	EACH	6	6	-----	12	12	-----
** 509.1500	CONCRETE SURFACE REPAIR	SF	-----	-----	-----	100	100	-----
513.7006	RAILING STEEL TYPE C1	LF	15	15	297.2	327.2	327.2	-----
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	10	10	-----	20	20	-----
517.1015.S	CONCRETE STAINING MULTI-COLOR P-55-148	SF	-----	-----	880	880	-----	880
517.1050.S	ARCHITECTURAL SURFACE TREATMENT P-55-148	SF	-----	-----	880	880	-----	880
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	EACH	80	80	-----	160	160	-----
614.0150	ANCHOR ASSEMBLIES FOR STEEL PLATE BEAM GUARD	EACH	2	2	-----	4	4	-----
645.0111	GEOTEXTILE FABRIC TYPE DF SCHEDULE A	SY	40	40	-----	80	80	-----
*** SPV.0060.01	SUPPLY AND INSTALL THREADED INSERTS FOR CONDUIT PACK (AT&T)	EACH	-----	-----	-----	1	-----	1
*** SPV.0060.02	SUPPLY AND INSTALL THREADED INSERTS FOR CONDUIT PACK (BALDWIN TELECOM)	EACH	-----	-----	-----	1	-----	1
*** SPV.0060.03	PROTECTION OF CONDUIT PACK (AT&T)	EACH	-----	-----	-----	1	-----	1
*** SPV.0060.04	PROTECTION OF CONDUIT PACK (BALDWIN TELECOM)	EACH	-----	-----	-----	1	-----	1
NON-BID ITEMS								
	FILLER	SIZE	-----	-----	-----	1/2" & 3/4"		

- ** UNDISTRIBUTED FOR ABUTMENTS, ENDS OF GIRDERS, AND FACE OF GIRDERS WHERE DIAPHRAGMS ARE REMOVED, AS DIRECTED BY THE ENGINEER.
- *** THE SUPPLY AND INSTALL OF THE CONCRETE LOOP TYPE INSERTS AND CONCRETE SETTING PLUGS AS SHOWN ON SHEET 15 TO BE INCLUDED AS PART OF THIS BID ITEM.



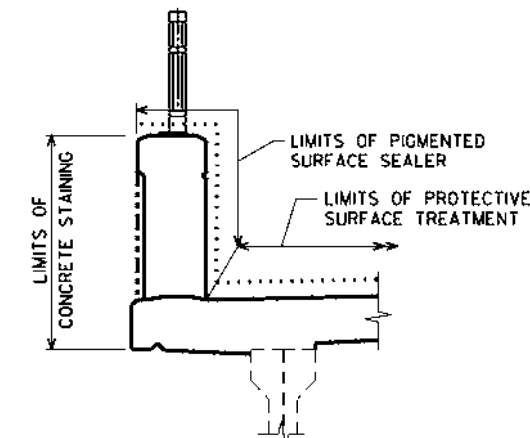
WEST ABUTMENT REMOVAL SECTION

EAST ABUTMENT REMOVAL SECTION

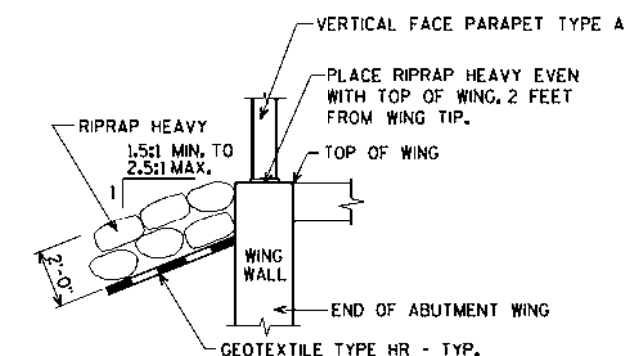


WEST ABUTMENT TYPICAL SECTION

EAST ABUTMENT TYPICAL SECTION

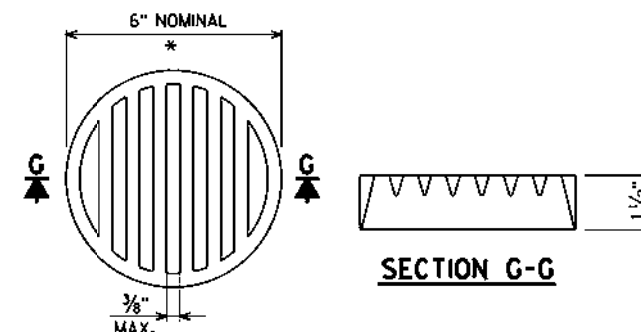


SURFACE TREATMENT DETAIL



TYPICAL FILL SECTION AT WING TIPS

NOTE: PLACE RIPRAP HEAVY AS SHOWN ON GENERAL PLAN SHEET



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

THE RODENT SHIELD, PIPE COUPLING AND SCREWS SHALL BE INCLUDED IN THE BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH".

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

RODENT SHIELD DETAIL

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

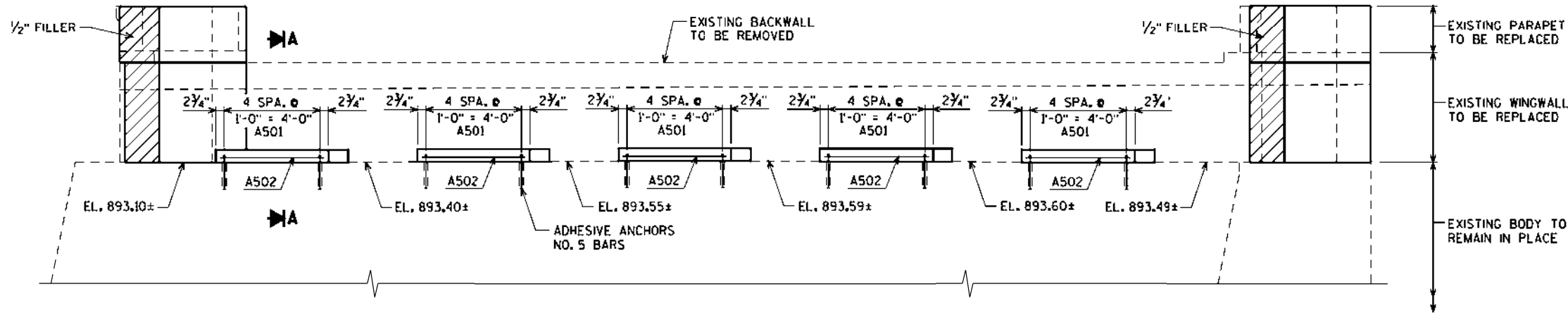
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE P-55-148			
DRAWN BY	CLP	PLANS CKD.	AEB
QUANTITIES AND DETAILS			SHEET 3 OF 17

1/31/2023 PENTABLE:BRcou_shd_util.tbi

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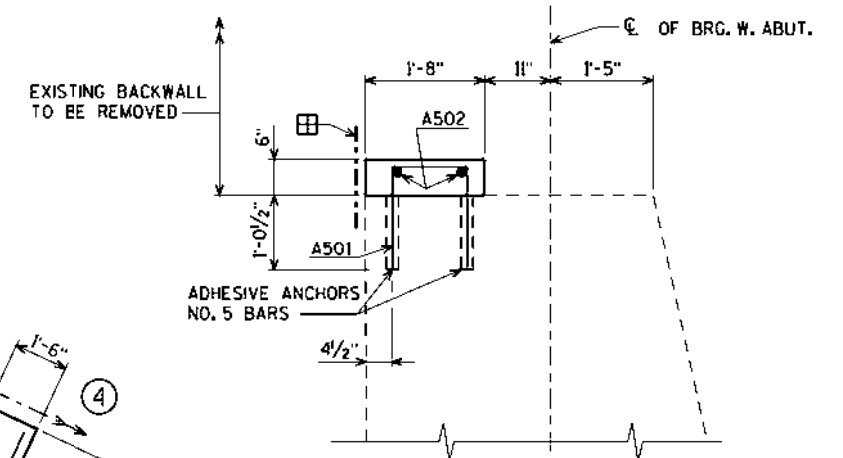
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NOTE:
SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF
1/2" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.
(1" DEEP AND HOLD 1/8" BELOW SURFACE OF CONCRETE.)



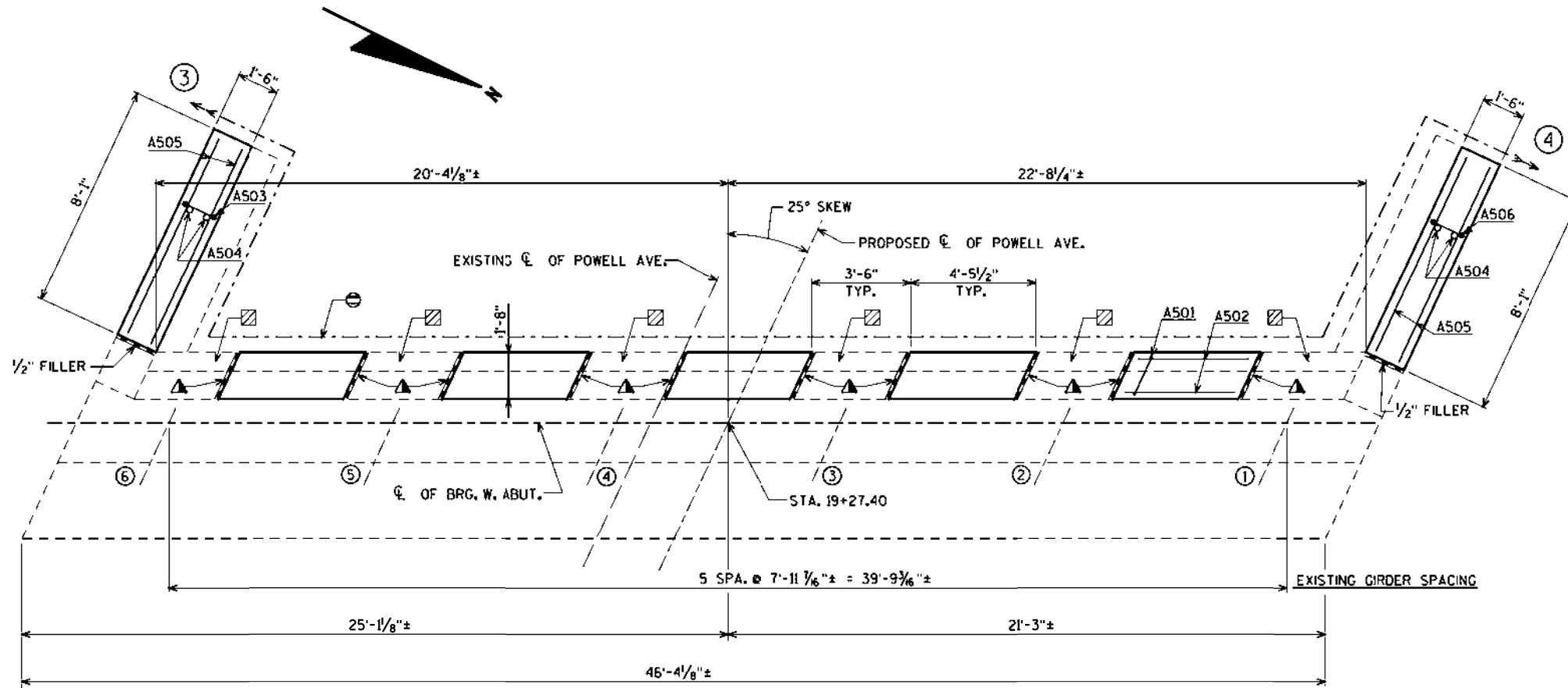
ELEVATION
(LOOKING WEST)

NOTE:
ABUTMENT ELEVATIONS ARE FROM SURVEY.
TO BE VERIFIED IN THE FIELD.



SECTION A

- ▣ 18" RUBBERIZED MEMBRANE WATERPROOFING SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACK FACE OF ABUTMENT AND WINGS.
- ▨ GRIND SMOOTH TOP OF BEAM SEAT AFTER REMOVING TOP OF WINGWALL AND BACKWALL IN BEAM SEAT AREA.
- ▲ 3/4" CORK FILLER ON VERTICAL SEMI-EXPAN. BLOCK FACES THAT RUN PARALLEL WITH GIRDER.
- ⊖ PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN AS DETAILED ON SHEET 3. RODENT SHIELD TO BE INCIDENTAL TO BID PRICE OF "PIPE UNDERDRAIN WRAPPED 6-INCH".



PLAN

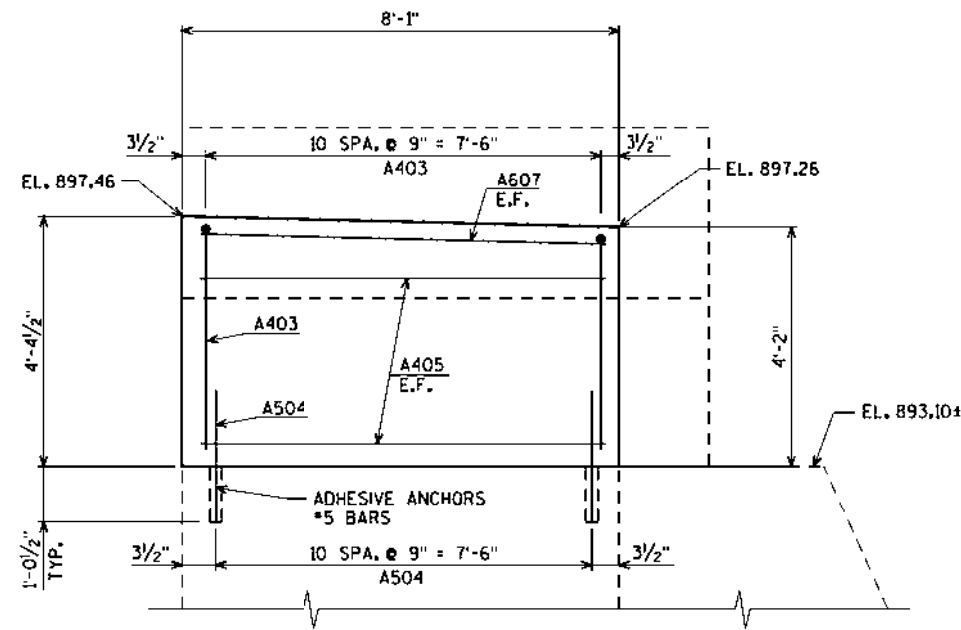
1/31/2023
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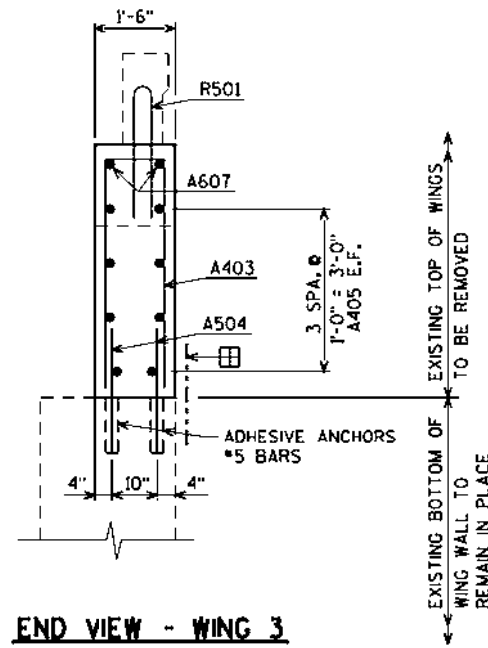
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ORIGINAL PLANS PREPARED BY
AYRES 3433 Oakwood Hills Parkway
Eau Claire, WI 54701
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NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE P-55-148			
DRAWN BY		CLP	PLANS CKD. AEB
WEST ABUTMENT			SHEET 4 OF 17



ELEVATION - WING 3

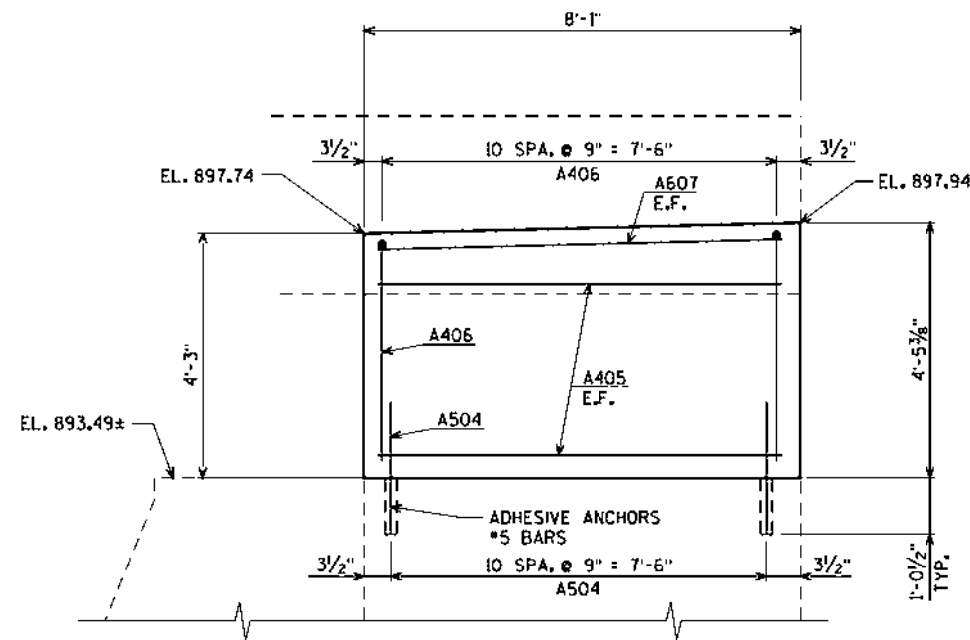
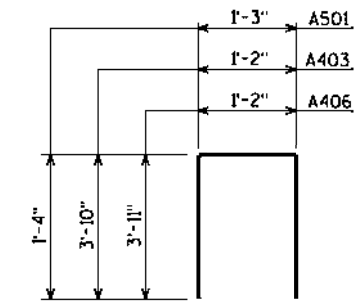


END VIEW - WING 3

BILL OF BARS

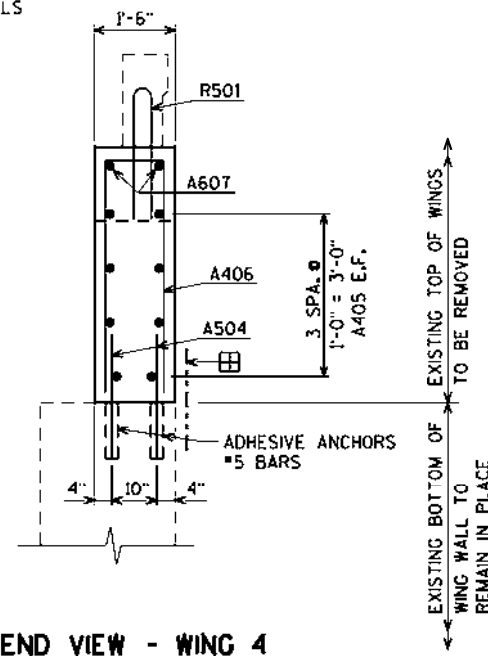
BAR NO.	COATED BAR	NO. REOD.	LENGTH	BENT BAR	BUNDLED	BAR SERIES	1,090* COATED
							LOCATION
A501	X	25	3-8	X			BODY SEMI-EXP. BLOCK VERT.
A502	X	10	4-1				BODY SEMI-EXP. BLOCK HORIZ.
A403	X	11	8-7	X			WINGS 3 VERT.
A504	X	44	2-6				WINGS 3 & 4 DOWELS VERT.
A405	X	20	7-9				WINGS 3 & 4 HORIZ.
A406	X	11	8-9	X			WING 4 VERT.
A607	X	4	7-9				WINGS 3 & 4 HORIZ. TOP

BENDING DIMENSIONS ARE OUT TO OUT OF BARS.



ELEVATION - WING 4

FOR PARAPET DETAILS SEE SHEET 16



END VIEW - WING 4

18" RUBBERIZED MEMBRANE WATERPROOFING SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACK FACE OF ABUTMENT AND WINGS.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE P-55-148

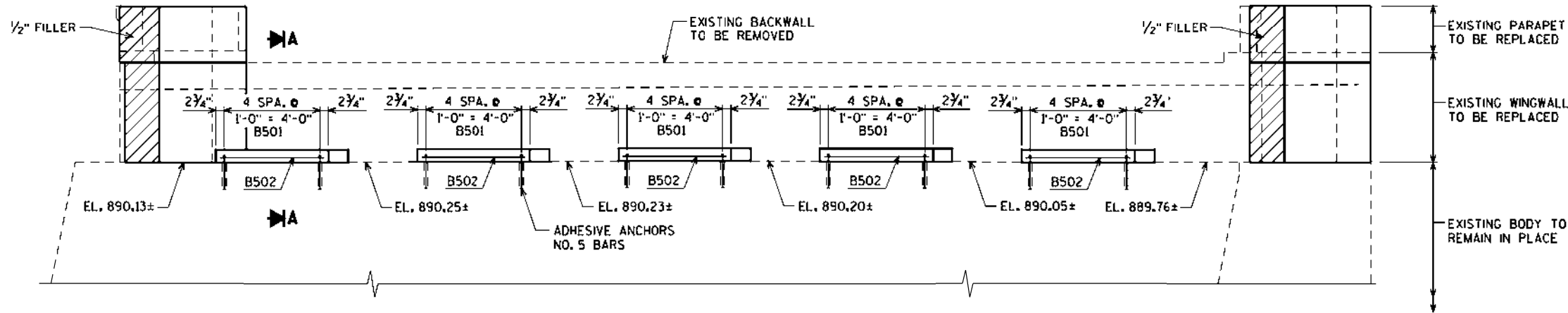
DRAWN BY CLP PLANS CKD. AEB

WEST
ABUTMENT
DETAILS

SHEET 5 OF 17

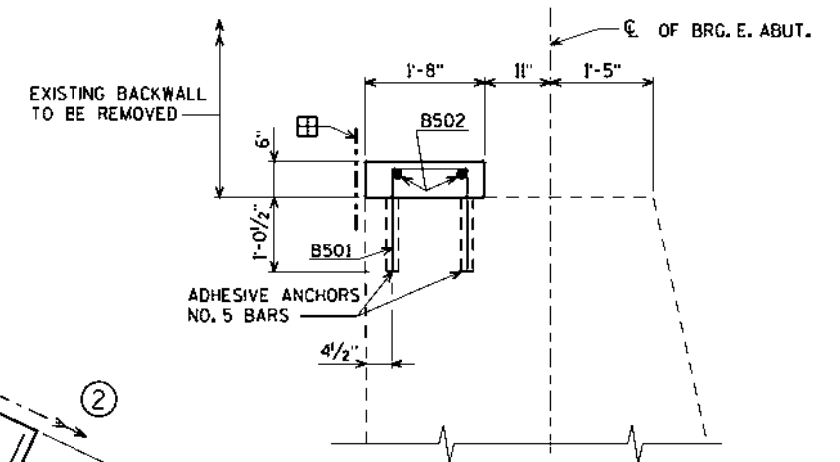
ORIGINAL PLANS PREPARED BY
AYRES 3433 Oakwood Hills Parkway
Eau Claire, WI 54701
www.AyresAssociates.com

NOTE:
SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF
1/2" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.
(1" DEEP AND HOLD 1/8" BELOW SURFACE OF CONCRETE.)



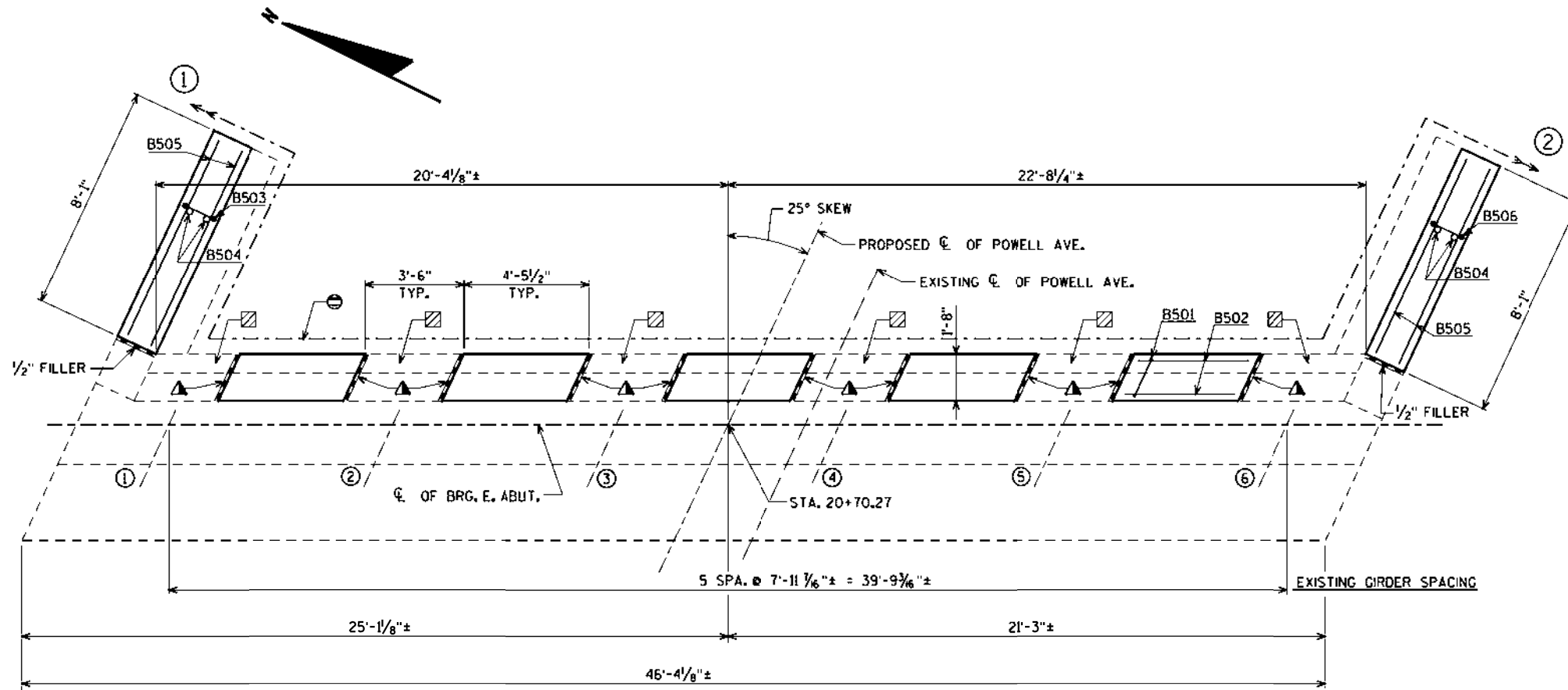
ELEVATION
(LOOKING EAST)

NOTE:
ABLTMENT ELEVATIONS ARE FROM SURVEY.
TO BE VERIFIED IN THE FIELD.



SECTION A

- ▣ 18" RUBBERIZED MEMBRANE WATERPROOFING SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACK FACE OF ABUTMENT AND WINGS.
- ▨ GRIND SMOOTH TOP OF BEAM SEAT AFTER REMOVING TOP OF WINGWALL AND BACKWALL IN BEAM SEAT AREA.
- ▲ 3/4" CORK FILLER ON VERTICAL SEMI-EXPAN. BLOCK FACES THAT RUN PARALLEL WITH GIRDER.
- ⊖ PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN AS DETAILED ON SHEET 3. RODENT SHIELD TO BE INCIDENTAL TO BID PRICE OF "PIPE UNDERDRAIN WRAPPED 6-INCH".



PLAN

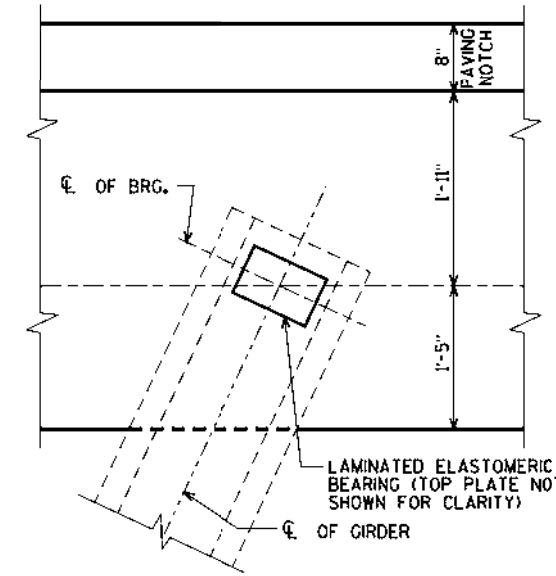
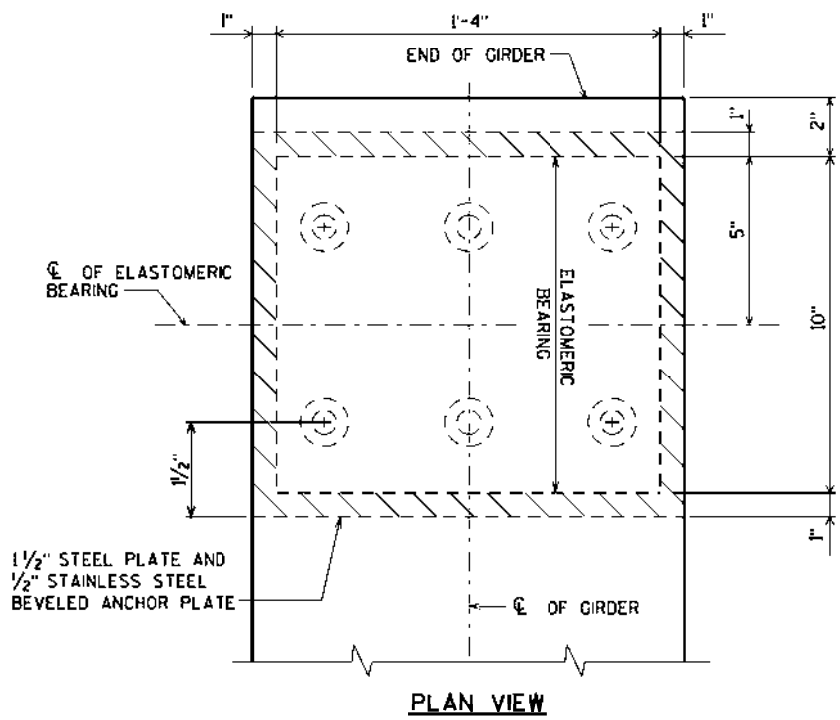
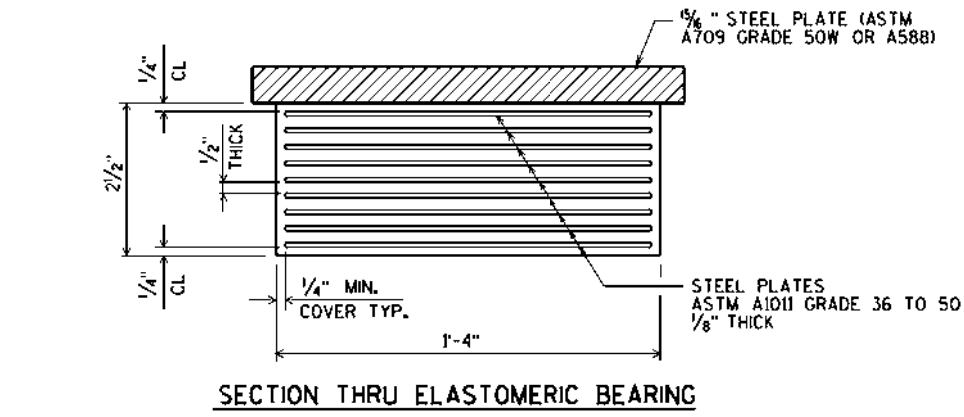
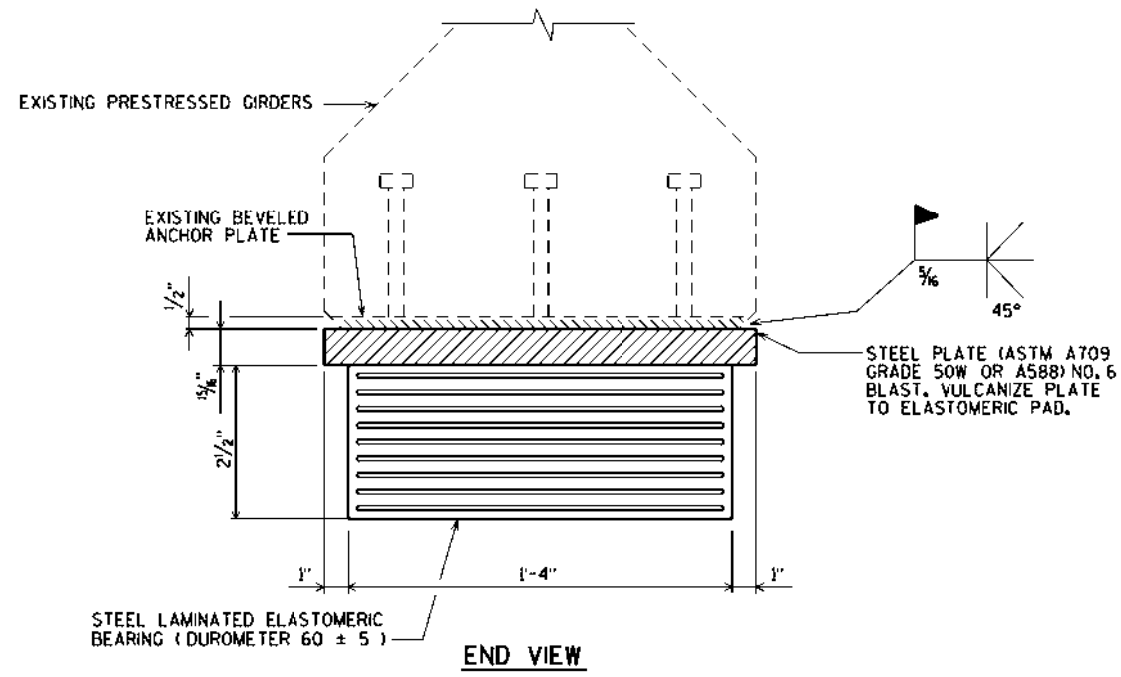
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NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE P-55-148			
DRAWN BY		CLP	PLANS CKD. AEB
EAST ABUTMENT			SHEET 6 OF 17

ORIGINAL PLANS PREPARED BY
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Eau Claire, WI 54701
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NOTES

BEARINGS SHALL NOT BE PLACED AT A TEMPERATURE GREATER THAN 85° F.

ALL MATERIAL USED FOR BEARINGS SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "BEARING PADS ELASTOMERIC LAMINATED", EACH.

ALL STRUCTURAL STEEL PLATES SHALL BE FLAT ROLLED WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT, AND VERTICAL.

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.

WELDING PROCEDURES SHALL BE ESTABLISHED BY THE CONTRACTOR TO RESTRICT THE MAXIMUM TEMPERATURE REACHED BY SURFACES IN CONTACT WITH ELASTOMER TO 200° F (93° C), TEMPERATURES SHALL BE CONTROLLED BY TEMPERATURE INDICATING WAX PENCILS OR OTHER SUITABLE MEANS APPROVED BY THE ENGINEER.

\$PRNAME\$ I:\42\42-1290.00 - River Falls, Powell Ave Redeck\Structures\CAD\Structure\Find\421290 bearing.dgn

8

8

CLEARANCE DIAGRAM

PLAN VIEW

END VIEW

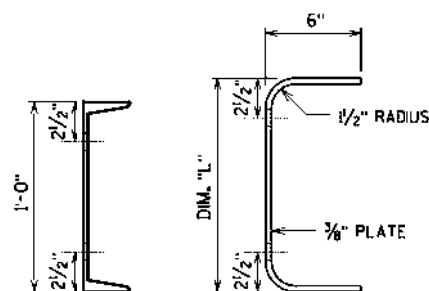
SECTION THRU ELASTOMERIC BEARING

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE P-55-148			
DRAWN BY		CLP	PLANS CKD. AEB
BEARING DETAILS			SHEET 8 OF 17

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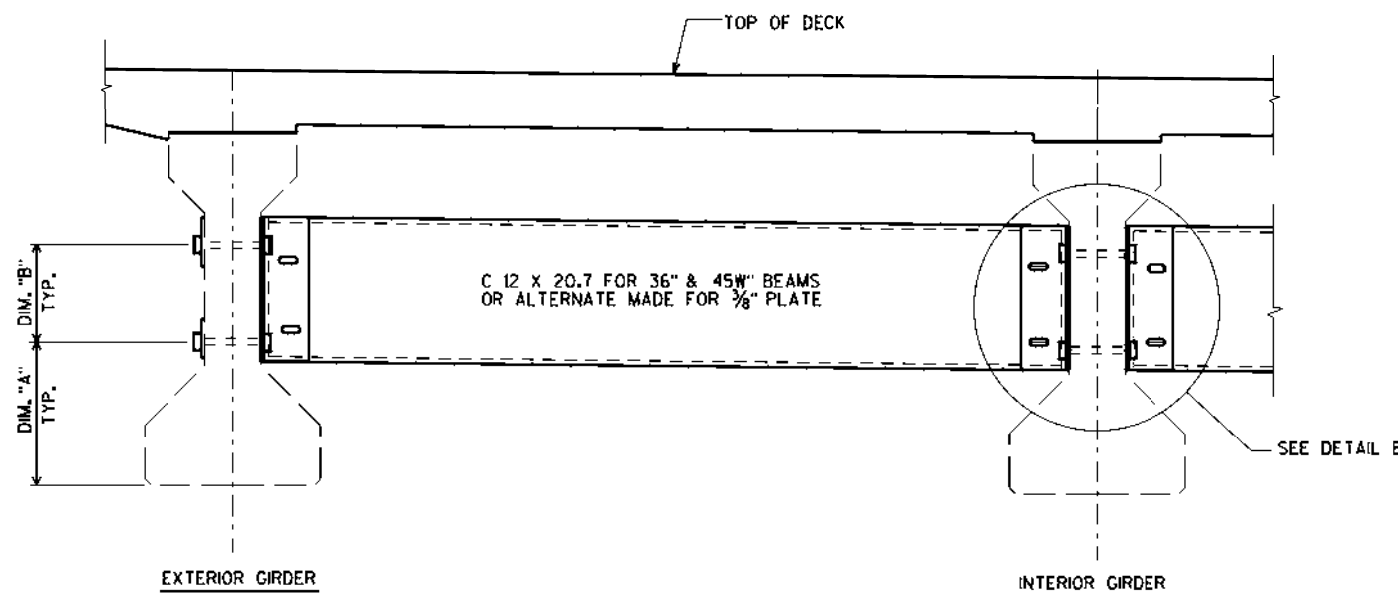
TABLE

GIRDER HEIGHT	DIM. "A"	DIM. "B"	DIM. "L"	* DIM. "X"
36"	1'-2 1/8"	9 3/4"	1'-1 1/2"	3/4"



C 12 x 20.7 ALTERNATE DIAPHRAGM

SECTION THRU DIAPHRAGM



PART TRANSVERSE SECTION AT DIAPHRAGM

NOTES

ALL DIAPHRAGM MATERIAL NOT EMBEDDED IN THE CONCRETE GIRDER SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "STEEL DIAPHRAGMS P-55-148", EACH.

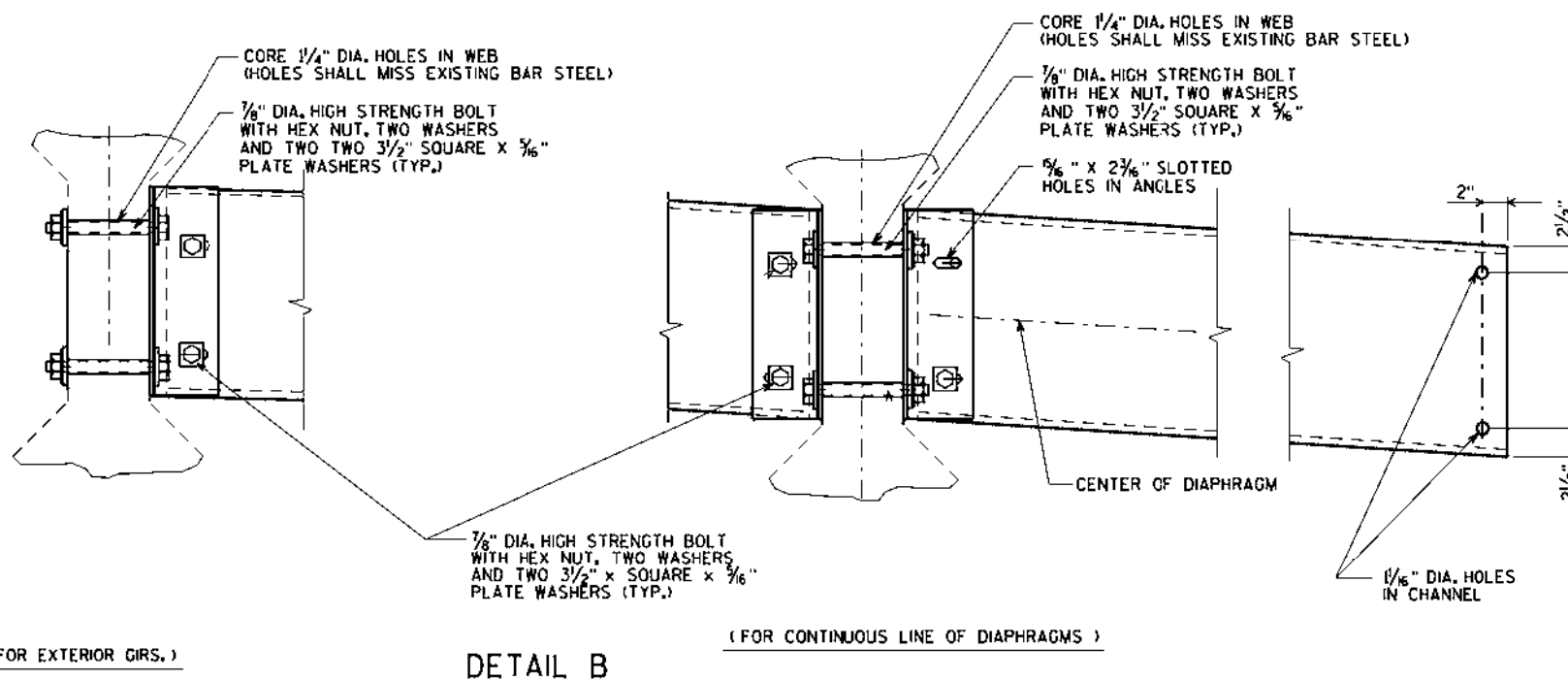
EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

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.

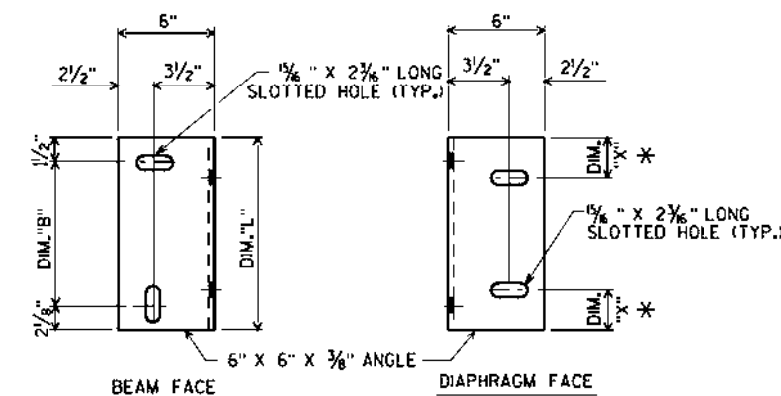
CORING HOLES IN EXISTING GIRDERS SHALL BE CONSIDERED INCIDENTAL TO "STEEL DIAPHRAGMS P-55-148".



(FOR EXTERIOR GIRS.)

DETAIL B

(FOR CONTINUOUS LINE OF DIAPHRAGMS)



DIAPHRAGM SUPPORT

* 2 1/2" FOR ALTERNATE PLATE DIAPHRAGM

\$PRNAME\$ I:\42\42-1290-00 - River Falls, Powell Ave Redeck\Structures\CADD\Structure\Final\421290 DIAP.DGN

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE P-55-148			
DRAWN BY		CLP	PLANS CKD. AEB
INTERM. STEEL DIAPH. DETAILS			SHEET 9 OF 17

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TOP OF DECK ELEVATIONS

SPAN 1											
TOP OF DECK ELEV.	€ OF BRG. W. ABUT.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	€ OF PIER 1
LEFT EDGE OF DECK	897.66	897.55	897.43	897.32	897.20	897.09	896.97	896.86	896.74	896.63	896.51
LEVEL SPOT	897.65	897.53	897.42	897.30	897.19	897.07	896.96	896.84	896.73	896.61	896.50
GIRDER 1	897.66	897.55	897.43	897.32	897.20	897.09	896.97	896.86	896.74	896.63	896.51
GIRDER 2	897.73	897.61	897.50	897.38	897.27	897.15	897.04	896.92	896.80	896.69	896.57
GIRDER 3	897.79	897.67	897.56	897.44	897.33	897.21	897.10	896.98	896.87	896.75	896.64
REFERENCE LINE	897.82	897.71	897.59	897.47	897.36	897.24	897.13	897.01	896.90	896.78	896.67
GIRDER 4	897.71	897.59	897.48	897.36	897.25	897.13	897.02	896.90	896.79	896.67	896.56
GIRDER 5	897.48	897.37	897.25	897.14	897.02	896.91	896.79	896.68	896.56	896.44	896.33
GIRDER 6	897.26	897.14	897.03	896.91	896.80	896.68	896.56	896.45	896.33	896.22	896.10
LEVEL SPOT	897.20	897.09	896.97	896.86	896.74	896.63	896.51	896.40	896.28	896.16	896.05
RIGHT EDGE OF DECK	897.19	897.07	896.96	896.84	896.73	896.61	896.50	896.38	896.27	896.15	896.04

SPAN 2											
TOP OF DECK ELEV.	€ OF PIER 1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	€ OF PIER 2
LEFT EDGE OF DECK	896.51	896.39	896.28	896.16	896.04	895.93	895.81	895.70	895.58	895.46	895.35
LEVEL SPOT	896.50	896.38	896.26	896.15	896.03	895.91	895.80	895.68	895.56	895.45	895.33
GIRDER 1	896.51	896.40	896.28	896.16	896.05	895.93	895.81	895.70	895.58	895.46	895.35
GIRDER 2	896.57	896.46	896.34	896.22	896.11	895.99	895.87	895.76	895.64	895.52	895.41
GIRDER 3	896.64	896.52	896.40	897.29	896.17	896.05	895.94	895.82	895.70	895.59	895.47
REFERENCE LINE	896.67	896.55	896.44	896.32	896.20	896.09	895.97	895.85	895.74	895.62	895.50
GIRDER 4	896.56	896.44	896.32	896.21	896.09	895.97	895.86	895.74	895.62	895.51	895.39
GIRDER 5	896.33	896.21	896.10	895.98	895.86	895.75	895.63	895.51	895.40	895.28	895.16
GIRDER 6	896.10	895.99	895.87	895.75	895.64	895.52	895.40	895.29	895.17	895.05	894.94
LEVEL SPOT	896.05	895.93	895.82	895.70	895.58	895.47	895.35	895.23	895.12	895.00	894.88
RIGHT EDGE OF DECK	896.04	895.92	895.80	895.69	895.57	895.45	895.34	895.22	895.10	894.99	894.87

SPAN 3											
TOP OF DECK ELEV.	€ OF PIER 2	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	€ OF BRG. E. ABUT.
LEFT EDGE OF DECK	895.35	895.23	895.11	895.00	894.88	894.77	894.65	894.54	894.42	894.30	894.19
LEVEL SPOT	895.33	895.22	895.10	894.88	894.87	894.75	894.64	894.52	894.41	894.29	894.17
GIRDER 1	895.35	895.23	895.11	895.00	894.88	894.77	894.65	894.54	894.42	894.31	894.19
GIRDER 2	895.41	895.29	895.18	895.06	894.95	894.83	894.71	894.60	894.48	894.37	894.25
GIRDER 3	895.47	895.35	895.24	895.12	895.01	894.89	894.78	894.66	894.55	894.43	894.31
REFERENCE LINE	895.50	895.39	895.27	895.15	895.04	894.92	894.81	894.69	894.58	894.46	894.35
GIRDER 4	895.39	895.27	895.16	895.04	894.93	894.81	894.70	894.58	894.46	894.35	894.23
GIRDER 5	895.16	895.05	894.93	894.82	894.70	894.58	894.47	894.35	894.24	894.12	894.01
GIRDER 6	894.94	894.82	894.71	894.59	894.47	894.36	894.24	894.13	894.01	893.90	893.78
LEVEL SPOT	894.88	894.77	894.65	894.54	894.42	894.30	894.19	894.07	893.96	893.84	893.73
RIGHT EDGE OF DECK	894.87	894.75	894.64	894.52	894.41	894.29	894.17	894.06	893.94	893.83	893.71

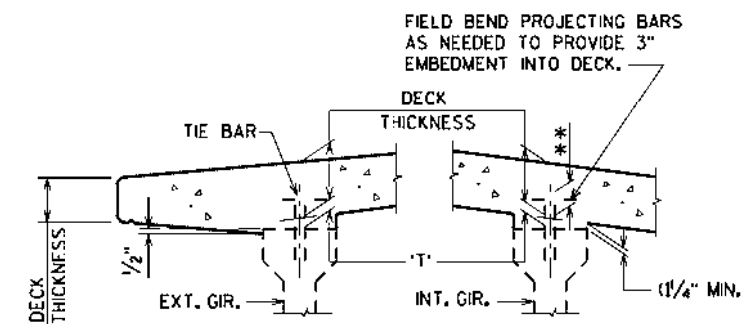
ELEVATIONS SHOWN ARE FINISHED DECK AND DO NOT INCLUDE ALLOWANCES OF DEAD LOAD DEFLECTION.

DEAD LOAD DEFLECTIONS

SPAN 1 & 3											
TOP OF DECK ELEV.	€ OF BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	€ OF BRG.
GIRDER 1 & 6	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.0
GIRDER 2-5	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.0

SPAN 2											
TOP OF DECK ELEV.	€ OF BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	€ OF BRG.
GIRDER 1 & 6	0.0	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.0
GIRDER 2-5	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.0

DEFLECTIONS SHOWN ARE IN INCHES.



SLAB HAUNCH DETAIL

IF 1/4" 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 DECK THICKNESS SHALL BE HELD. NOTIFY THE STRUCTURES SECTION IF THE GRADE LINE IS RAISED FROM THE PLAN PROFILE BY MORE THAN 1/2" OR,
 ** IF 3" MINIMUM DECK EMBEDMENT OF TIE BAR CANNOT BE OBTAINED.

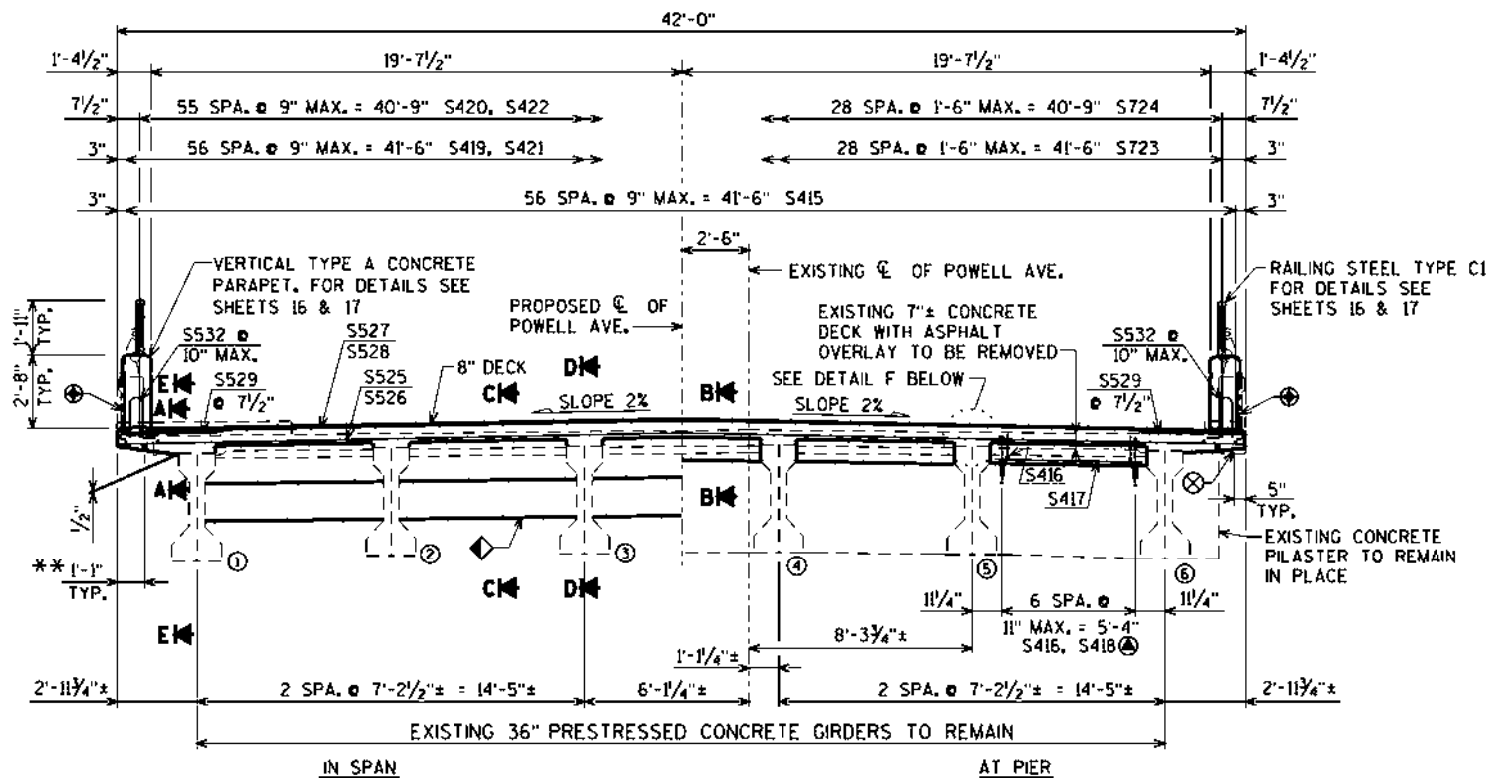
TO DETERMINE 'T', ELEV. OF TOP OF GIR'S. AT € OF SUBSTRUCTURE UNITS & AT 1/10 POINTS OF EACH SPAN SHALL BE TAKEN. THEN FOLLOW THIS PROCESS:
 TOP OF DECK ELEV. AT FINAL GRADE
 - TOP OF GIRDER ELEVATION
 + DEAD LOAD DEFLECTION
 - DECK THICKNESS
 = HAUNCH HEIGHT 'T'

NOTE: AN AVERAGE HAUNCH ('T') OF 2 3/4" WAS USED IN THE QUANTITY "CONCRETE MASONRY BRIDGES".

12/16/2022
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NO.	DATE	REVISION	BY
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STRUCTURE P-55-148			
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DECK ELEVATIONS			SHEET 10 OF 17

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TYPICAL SECTION THRU BRIDGE
(LOOKING UPSTATION)

** LOCATION OF CONCRETE INSERT LOOP. SEE SHEET 15.

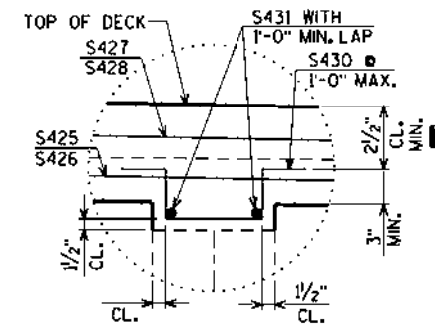
◊ EXISTING CONCRETE INTERMEDIATE DIAPHRAGMS TO BE REPLACED WITH C 12 X 20.7 STEEL DIAPHRAGMS. FOR DETAILS SEE SHEET 9.

⊗ 3/4" V - GROOVE REO'D. EXTEND TO 6" FROM FRONT FACE OF ABUTMENT DIAPHRAGMS - TYP.

⊕ ARCHITECTURAL SURFACE TREATMENT. FOR DETAILS SEE SHEET 2.

⊙ ADHESIVE ANCHORS NO. 4 BARS SHALL NOT BE SPACED LESS THAN 9".

FOR SECTIONS C, D & E SEE SHEET 14.



DETAIL F

TYP. HAUNCHES

■ TILT S430 BARS AS REQ'D. TO MAINTAIN 2 1/2" CLEAR

BAR SERIES TABLE

BAR MARK	NO. REQ'D.	LENGTH
S525	2 SERIES OF 29	2'-1" TO 39'-9"
S527	2 SERIES OF 29	1'-5" TO 39'-1"

BUNDLE AND TAG EACH SERIES SEPARATELY.

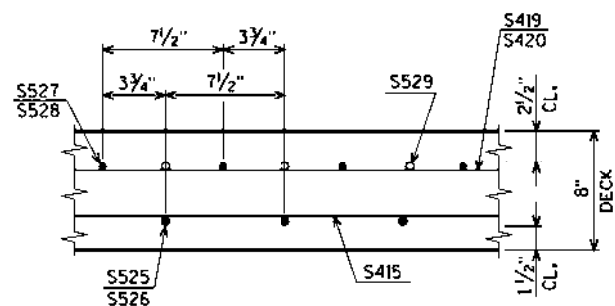
BILL OF BARS

BAR NO.	COATED BAR	NO. REQ'D.	LENGTH	BENT BAR	BUNDLE	BAR SERIES	57,350* COATED	LOCATION
S401	X	70	5-2	X				DIAPH. @ ABUT. NOTCH VERT.
S402	X	20	5-11					DIAPH. @ ABUT. NOTCH HORIZ.
S503	X	84	13-0	X				DIAPH. @ ABUT. BETW. GDR. VERT.
S504	X	80	7-7	X				DIAPH. @ ABUT. BETW. GDR. VERT. TOP
S605	X	12	45-10					DIAPH. @ ABUT. HORIZ.
S606	X	40	5-11					DIAPH. @ ABUT. HORIZ. F.F. INT.
S507	X	36	9-10	X				DIAPH. @ ABUT. @ GDR. VERT.
S508	X	24	5-7	X				DIAPH. @ ABUT. @ GDR. VERT. TOP
S609	X	72	3-2					DIAPH. @ ABUT. @ GDR. HORIZ.
S510	X	24	6-0					DIAPH. @ ABUT. THRU GDR. HORIZ.
S511	X	8	14-1	X				DIAPH. @ ABUT. VERT.
S512	X	12	7-9	X				DIAPH. @ ABUT. VERT. TOP
S613	X	8	2-1					DIAPH. @ ABUT. HORIZ. BOT.
S614	X	16	2-1					DIAPH. @ ABUT. HORIZ. F.F.
S415	X	228	38-4					DECK LONG. BOT.
S416	X	70	10-0	X				DIAPH. @ PIERS LONG.
S417	X	60	5-10					DIAPH. @ PIERS HORIZ.
S418	X	140	2-4	X				VERT. DOWEL BAR @ PIER
S419	X	114	44-11					DECK LONG. TOP SPAN 1 & 3
S420	X	112	38-9					DECK LONG. TOP SPAN 1 & 3
S421	X	114	36-4					DECK LONG. TOP SPAN 2
S422	X	112	16-10					DECK LONG. TOP SPAN 2
S723	X	58	23-6					DECK LONG. TOP @ PIERS
S724	X	58	20-0					DECK LONG. TOP @ PIERS
S525	X	58	20-11					⊗ DECK TRANS. BOT.
S526	X	204	41-8					DECK TRANS. BOT.
S527	X	58	20-3					⊗ DECK TRANS. TOP
S528	X	206	41-8					DECK TRANS. TOP
S529	X	204	5-1					DECK TRANS. TOP @ ENDS
S430	X	876	3-0	X				DECK @ GDR. HAUNCHES
S431	X	48	44-11					DECK LONG. @ HAUNCHES BOT.
S532	X	356	4-4	X				PARAPET VERT.
S533	X	356	4-9	X				PARAPET VERT.
S534	X	64	38-6					PARAPET HORIZ.

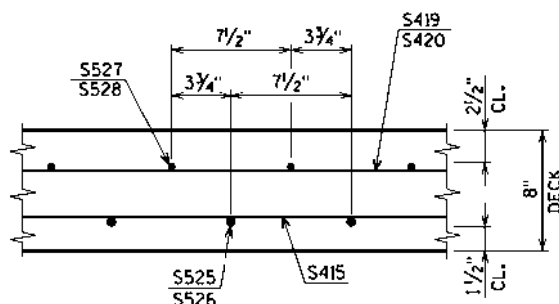
BENDING DIMENSIONS ARE OUT TO OUT OF BARS.

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

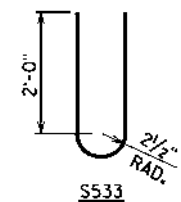
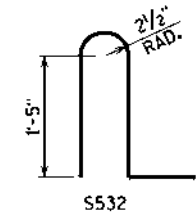
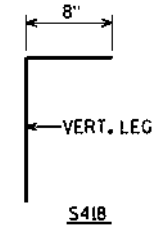
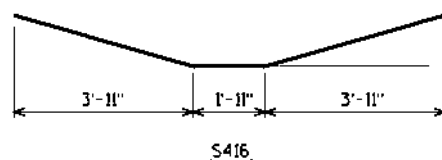
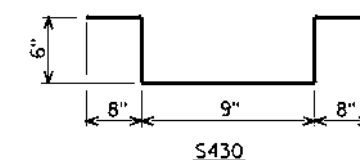
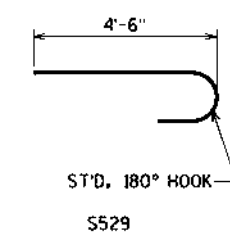
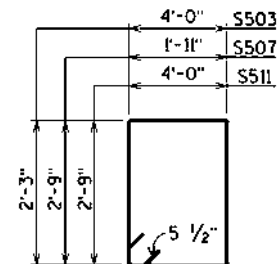
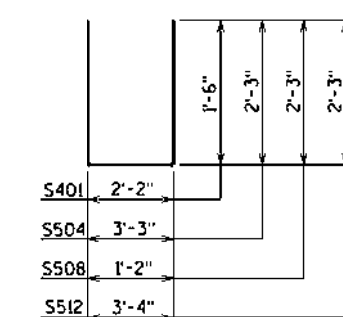
⊕ ADHESIVE ANCHORS NO. 4 BAR



SECTION A



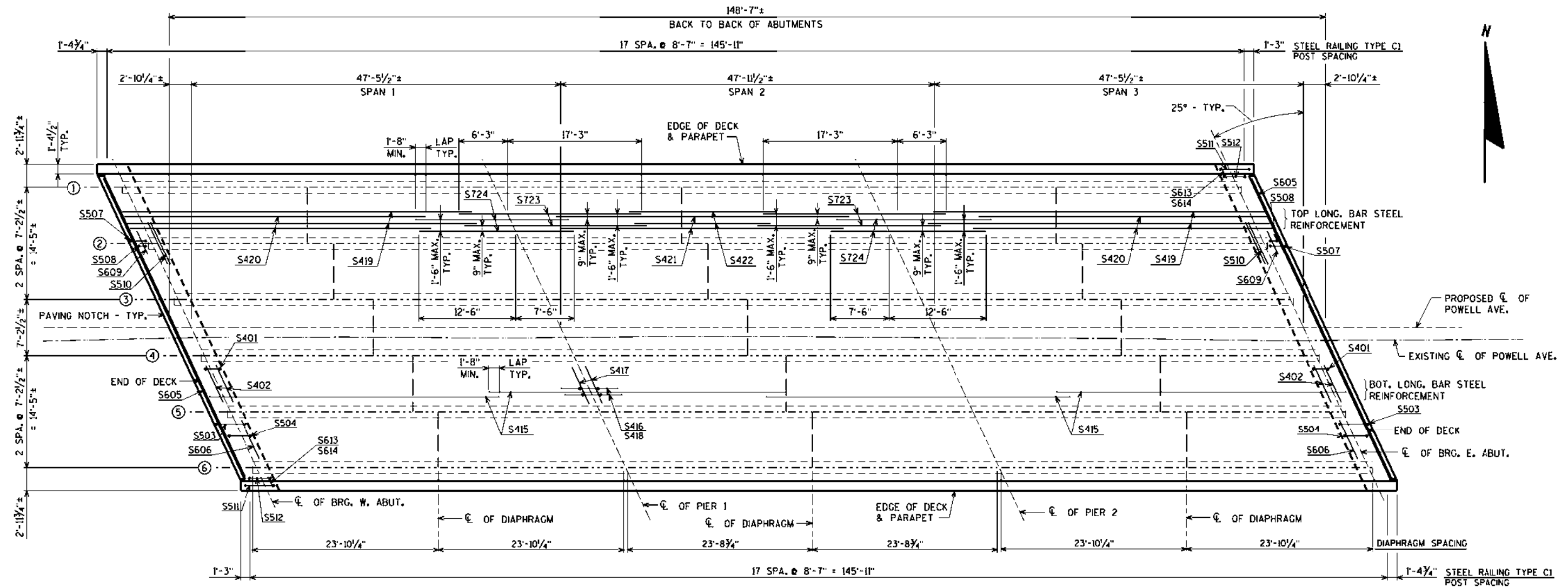
SECTION B



NOTE:
DAMAGE TO THE EXISTING GIRDERS CAUSED DURING DECK REMOVAL OPERATIONS WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

ORIGINAL PLANS PREPARED BY
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NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE P-55-148			
DRAWN BY CLP		PLANS CKD. AEB	
SUPERSTRUCTURE			SHEET 11 OF 17

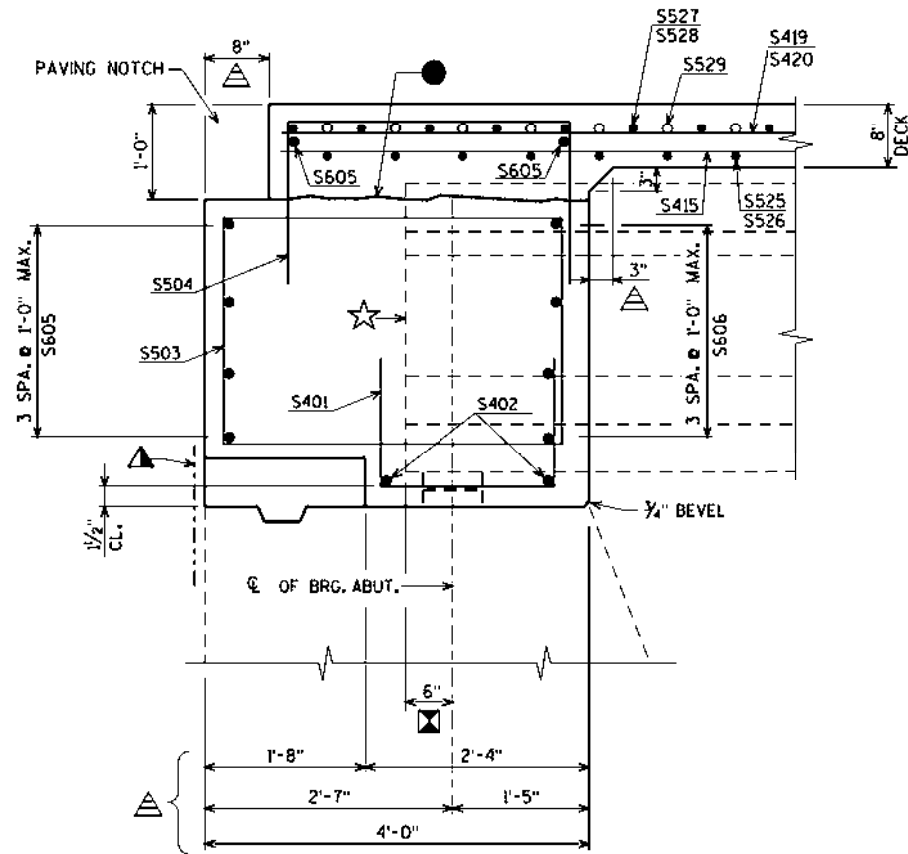


PLAN

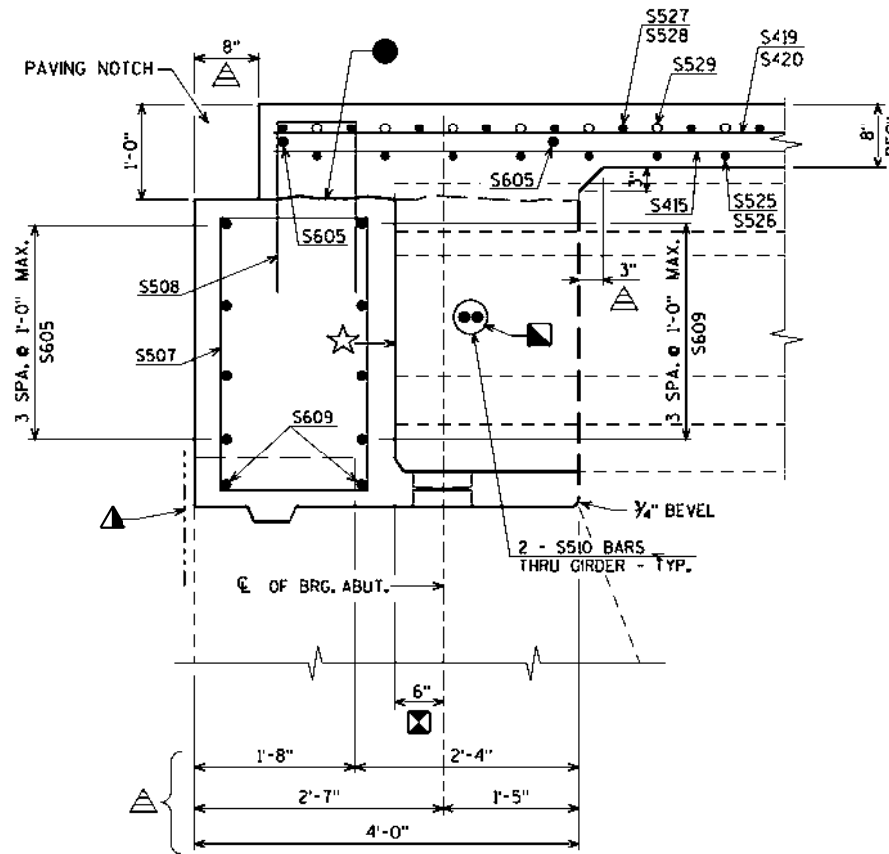
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NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE P-55-148			
DRAWN BY		CLP	PLANS CKD. AEB
SUPERSTRUCTURE PLAN			SHEET 12 OF 17

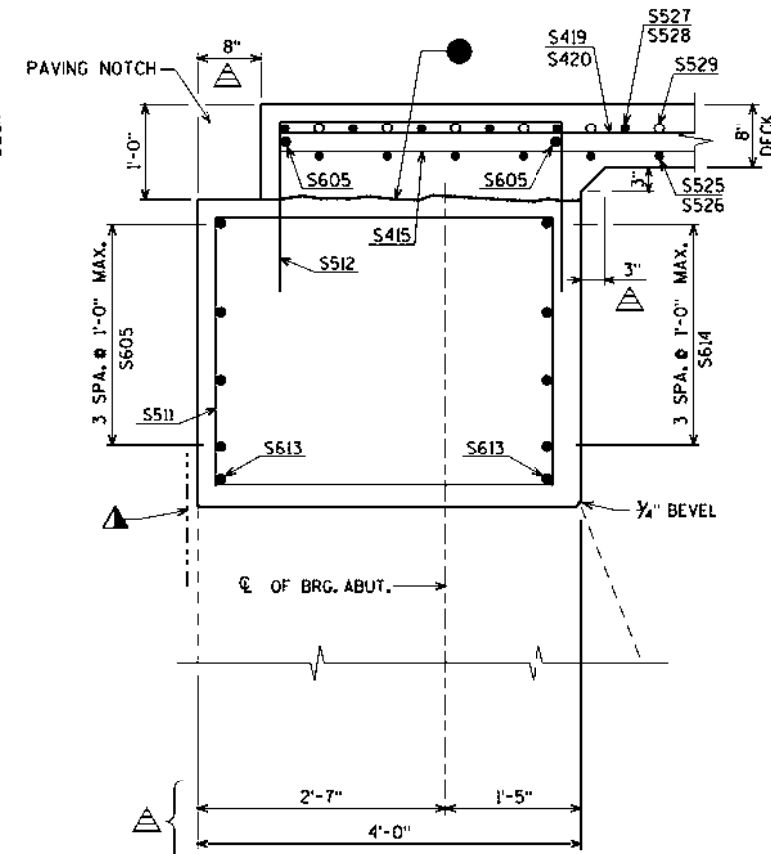
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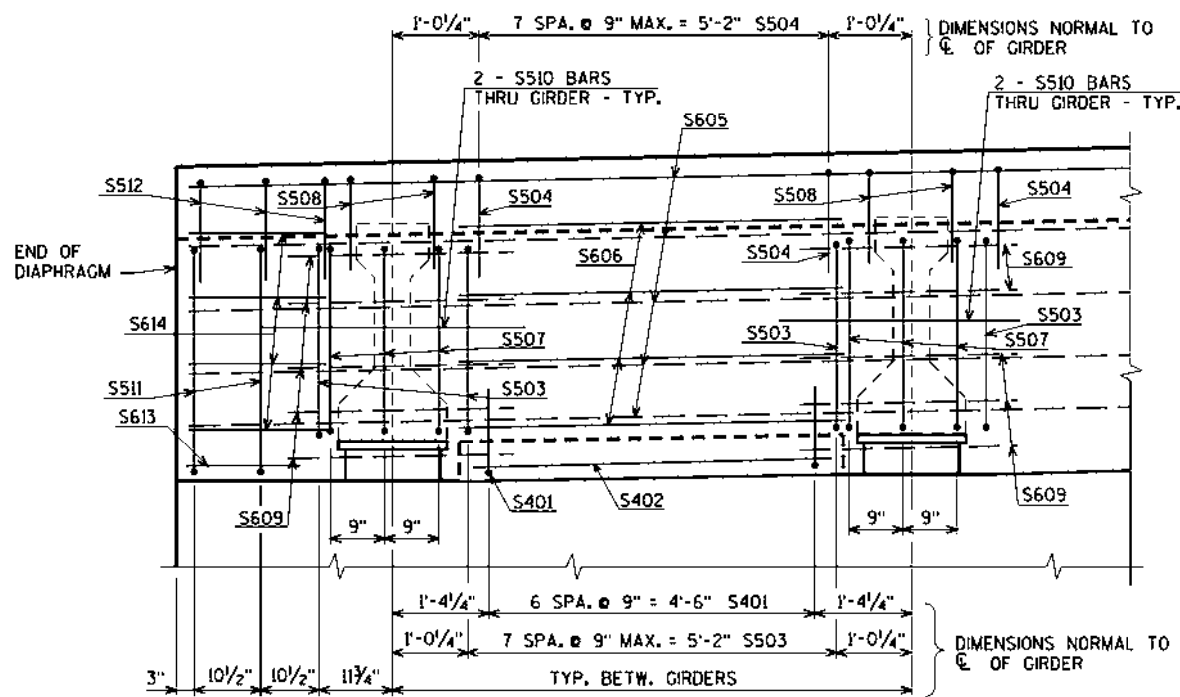
SECTION C
TYP. BTWN. GIRDERS



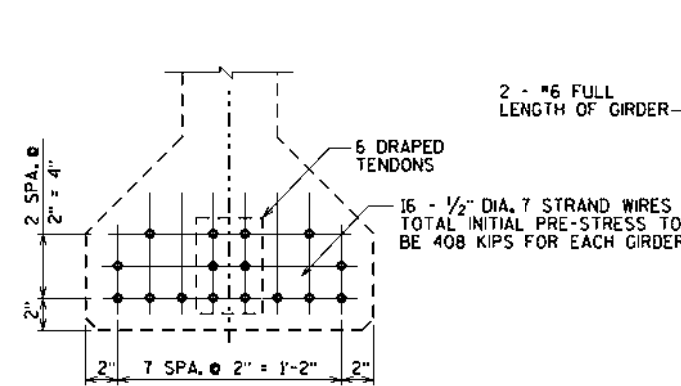
SECTION D
TYP. @ GIRDERS



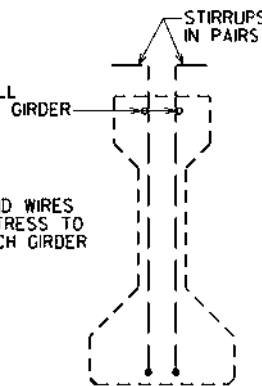
SECTION E



PART ELEVATION AT ABUTMENT



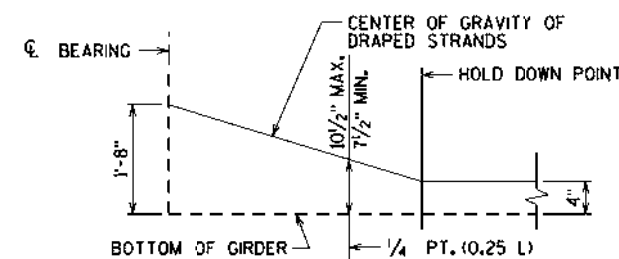
TYP. STRAND PATTERN



SECTION AT GIRDER

- ☆ END OF EXISTING GIRDER
- ⊠ DIMENSIONS MEASURED ALONG CL OF GIRDER.
- △ DIMENSIONS MEASURED NORMAL TO CL OF SUBSTRUCTURE UNIT.
- ◻ FIELD DRILL 1/2" DIA. HOLE IN WEB OF EXISTING GIRDERS FOR 2 #5 BARS, FIELD DRILLING INCLUDED IN BID ITEM "CONCRETE MASONRY BRIDGES".
- ⊙ ADHESIVE ANCHORS NO. 4 BARS SHALL NOT BE SPACED LESS THAN 9".
- ▲ RUBBERIZED MEMBRANE WATERPROOFING
- OPT. CONST. JOINT

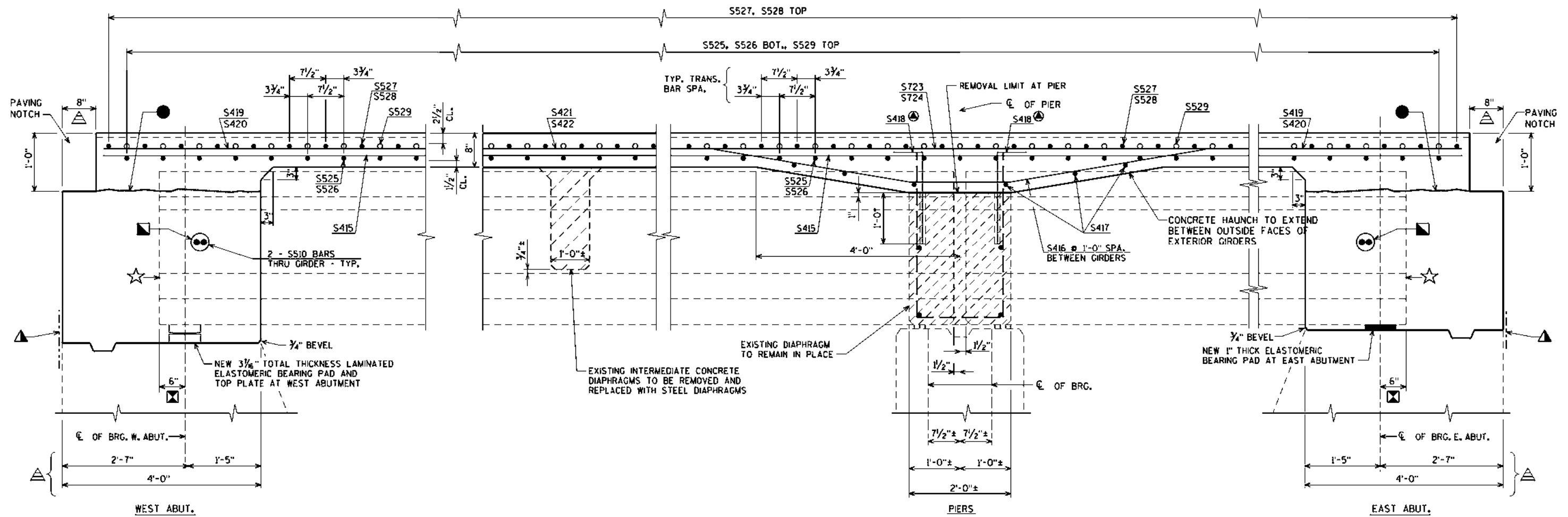
FOR LOCATIONS OF SECTIONS C, D & E SEE SHEET 11



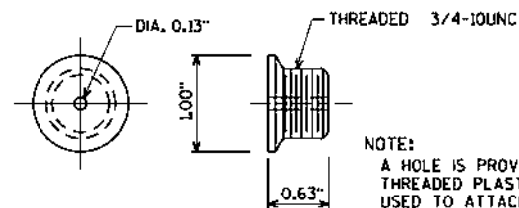
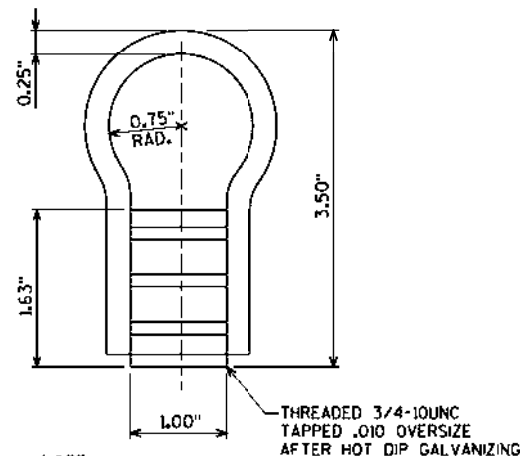
EXISTING DRAPED STRAND PROFILE

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

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE P-55-148			
DRAWN BY		CLP	PLANS CKD. AEB
SUPERSTRUCTURE DETAILS			SHEET 14 OF 17



PART LONGITUDINAL SECTION



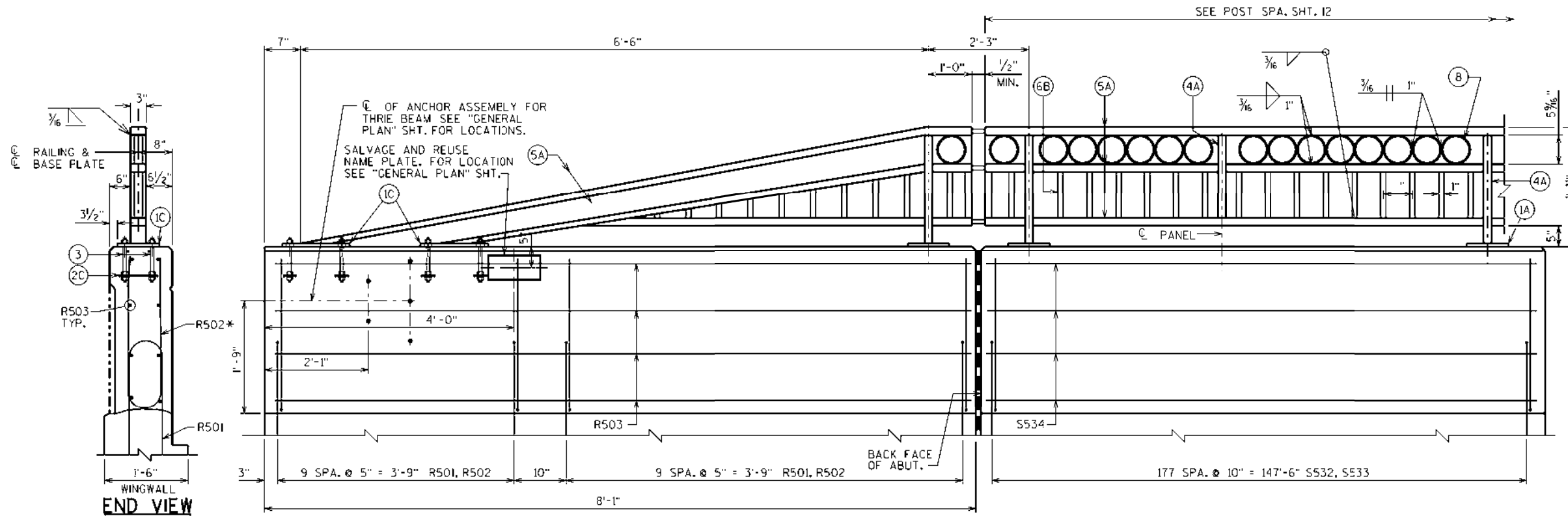
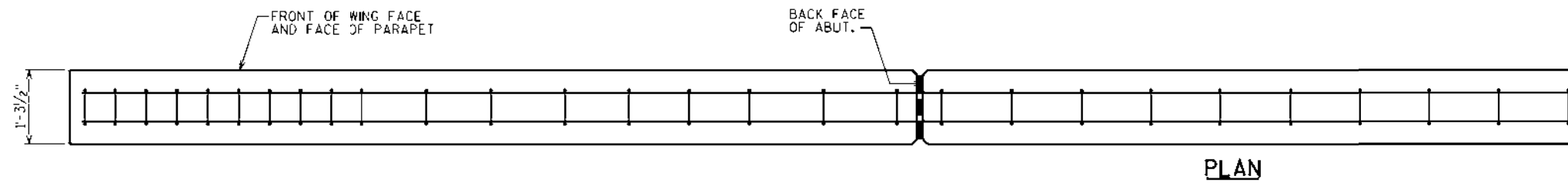
- ☆ END OF EXISTING GIRDER
- ☒ DIMENSIONS MEASURED ALONG C. OF GIRDER.
- △ DIMENSIONS MEASURED NORMAL TO C. OF SUBSTRUCTURE UNIT.
- FIELD DRILL 1/2" DIA. HOLE IN WEB OF EXISTING GIRDERS FOR 2 #5 BARS. FIELD DRILLING INCLUDED IN BID ITEM "CONCRETE MASONRY BRIDGES".
- EXISTING CONCRETE PILASTERS AT PIERS TO REMAIN IN PLACE.
- ⊙ ADHESIVE ANCHORS NO. 4 BARS SHALL NOT BE SPACED LESS THAN 9".
- ▲ RUBBERIZED MEMBRANE WATERPROOFING
- OPT. CONST. JOINT

CONCRETE LOOP TYPE INSERT

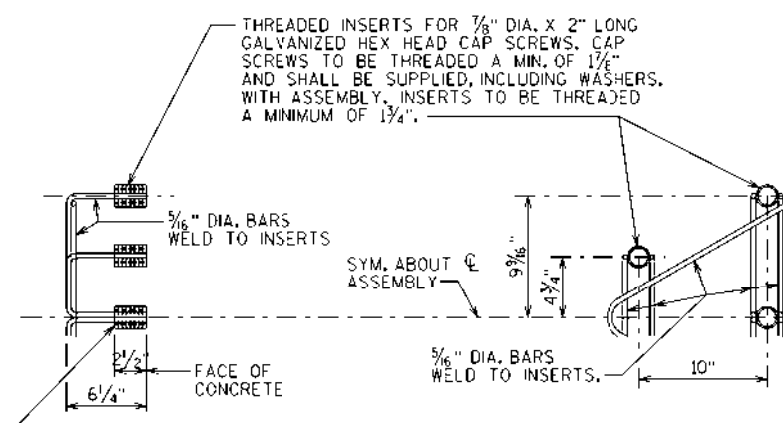
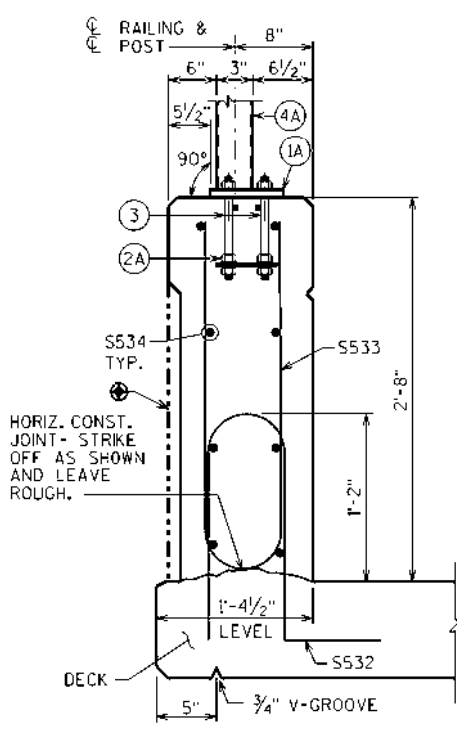
** INSERT TO BE SPACED AT 8'-0" O.C. MAX. AT CENTER OF EACH BRIDGE DECK OVERHANG FOR UTILITY SUPPORT BRACKET. SEE SHEET 1L

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE P-55-148			
DRAWN BY CLP		PLANS CKD. AEB	
SUPERSTRUCTURE DETAILS			SHEET 15 OF 17

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Eau Claire, WI 54701
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ARCHITECTURAL SURFACE TREATMENT. FOR DETAILS SEE SHEET 2.



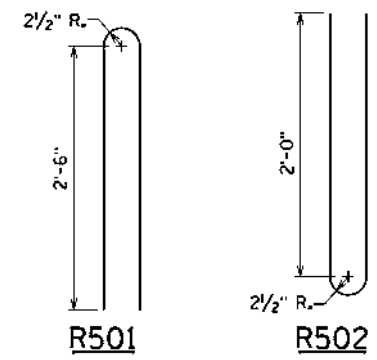
NOTE: HEX HEAD CAP SCREWS & WASHERS TO BE GALVANIZED IN ACCORDANCE WITH AASHTO M232 CLASS C.

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

BILL OF BARS

BAR MARK	COAT	ABUT.		LENGTH	BENT	LOCATION
		SOUTH	NORTH			
R501	X	40	40	5-8	X	PARAPET VERT. @ WINGS
R502	X	40	40	4-9	X	PARAPET VERT. @ WINGS
R503	X	16	16	7-9		PARAPET HORIZ. @ WINGS

BENDING DIMENSIONS ARE OUT TO OUT OF BARS.



WEIGHT OF BAR STEEL REINFORCING IS INCLUDED WITH THE ABUTMENTS ON SHEETS 5 & 7.

560# COATED (SOUTH ABUTMENT)
560# COATED (NORTH ABUTMENT)

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
STRUCTURE P-55-148			
DRAWN BY CLP		PLANS CKD. AEB	
COMBINATION RAIL TYPE "C1"			SHEET 16 OF 17

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Eau Claire, WI 54701
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2/3/2023 PENTABLE:BRRequ_shd_util.tbl

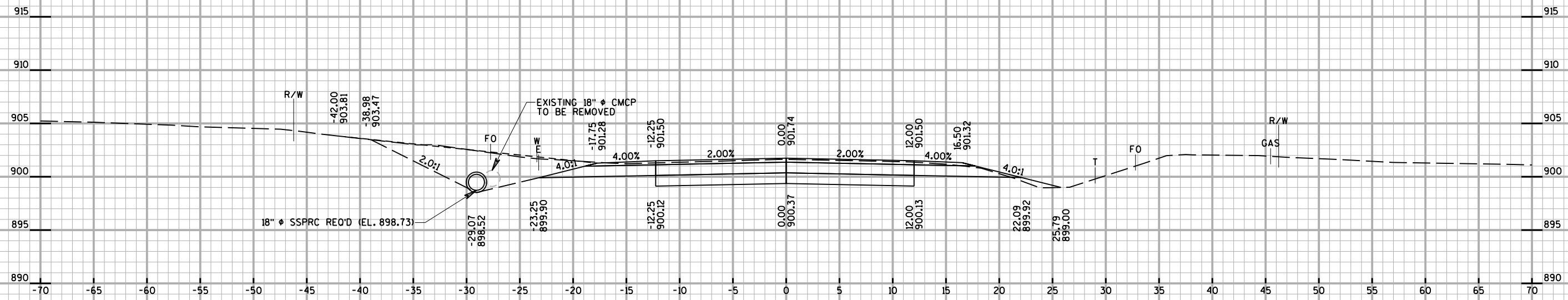
8

8

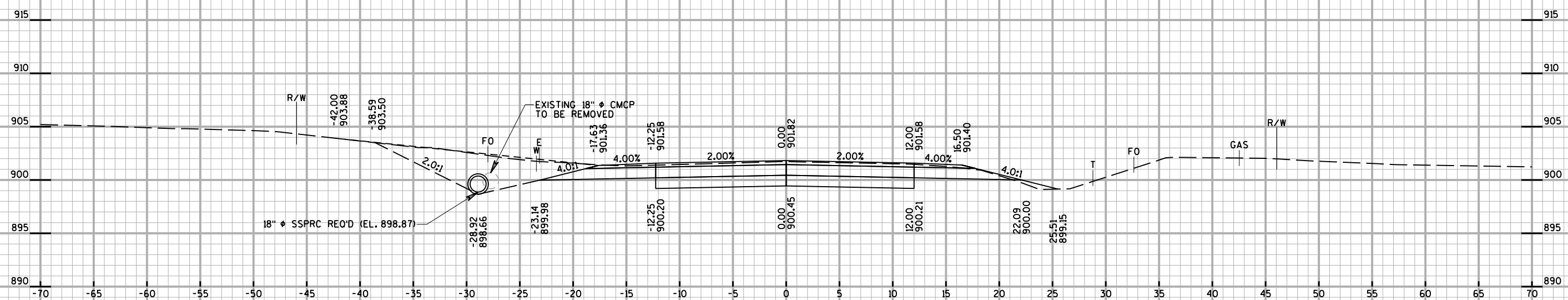
POWELL AVENUE COMPUTER EARTHWORK

Station	Distance	Area (SF)		Incremental Vol (CY) (Unadjusted)		Cumulative Vol (CY)		Mass Ordinate
		Cut	Fill	Cut	Fill	Cut 1.00	Expanded Fill 1.30	
17+52	--	80.0	0.0					
17+71.95	20	112.2	27.8	71	10	71	13	58
17+75	3	113.7	29.0	13	3	84	18	66
18+00	25	71.1	4.8	86	16	169	38	131
18+25	25	89.0	6.4	74	5	243	45	199
18+39.94	15	85.9	0.0	48	2	292	47	245
18+50	10	92.0	0.0	33	0	325	47	278
18+53.25	3	92.1	0.0	11	0	336	47	289
18+64.89	12	92.0	0.0	40	0	376	47	329
18+75	10	89.1	1.8	34	0	410	47	362
18+89.85	15	84.1	0.7	48	1	457	48	409
19+00	10	80.9	4.7	31	1	488	50	439
19+07.38	7	80.0	11.6	22	2	510	52	458
19+24.55	17	77.7	22.6	50	11	560	67	494
BRIDGE	--	--	--	--	--	--	--	--
20+73.12	--	73.9	103.8	--	--	--	--	--
20+90.29	17	79.8	94.2	49	63	609	148	461
21+00	10	85.8	77.6	30	31	639	189	450
21+11.63	12	79.1	67.3	36	31	674	229	445
21+25	13	86.2	53.6	41	30	715	268	447
21+30.79	6	88.1	55.9	19	12	734	283	451
21+36.6	6	90.3	74.2	19	14	753	301	452
21+50	13	87.1	112.6	44	46	797	362	436
21+55.81	6	89.1	125.4	19	26	816	395	421
21+61.56	6	89.7	123.4	19	26	835	429	406
21+75	13	87.0	98.8	44	55	879	501	378
21+80.83	6	85.8	91.7	19	21	898	528	370
22+00	19	76.4	48.3	58	50	955	593	363
22+16	16	73.9	0.0	45	14	1000	611	389
				1000	470			

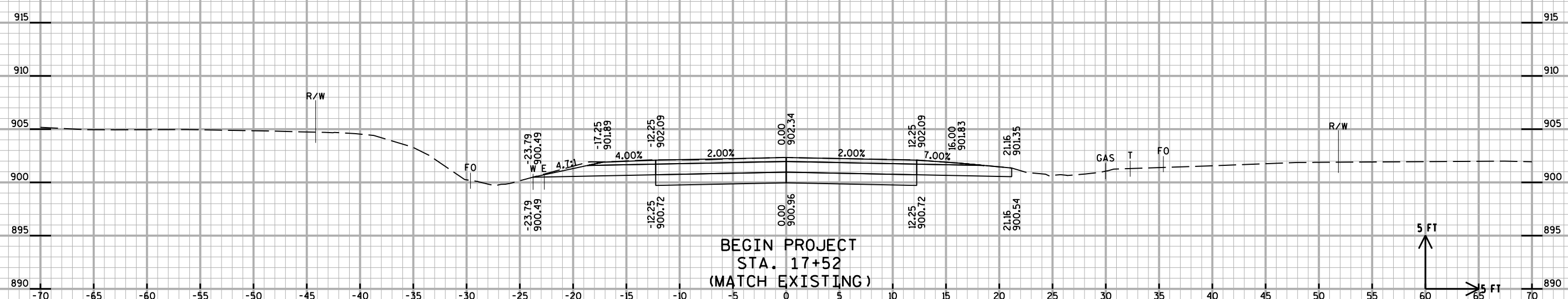
Note 1 - Cut	Volume need to be cut.
Note 2 - Fill	Volume needed to be filled.
Note 3 - Mass Ordinate	(Cut) - (Fill * 1.30)



PE LT
17+75

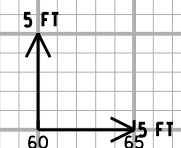


PE LT
17+71.95



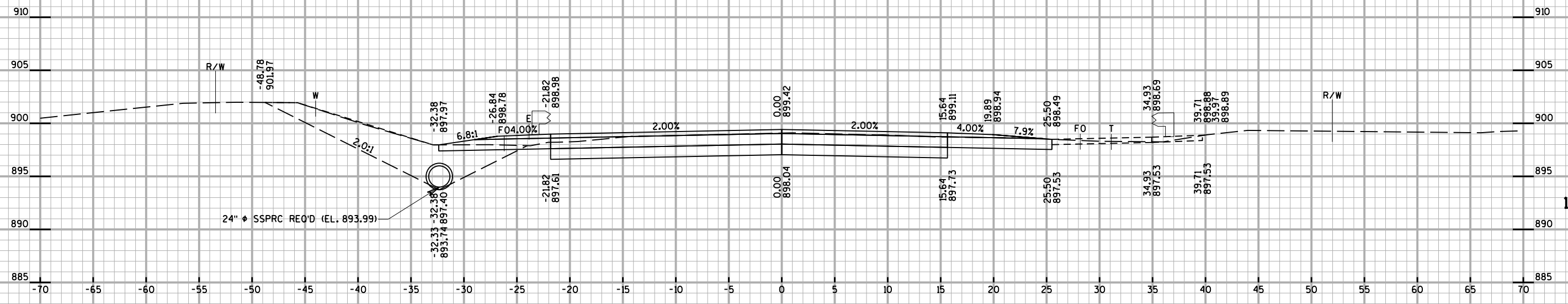
17+52

BEGIN PROJECT
STA. 17+52
(MATCH EXISTING)

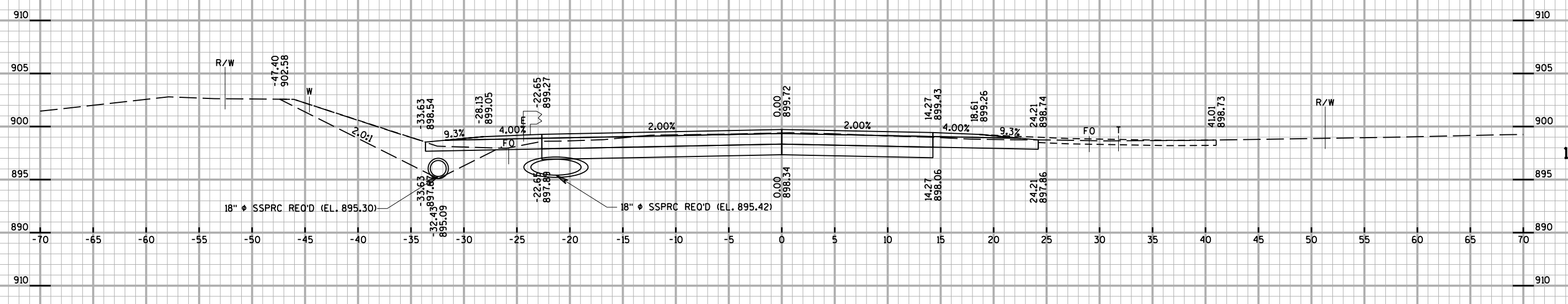


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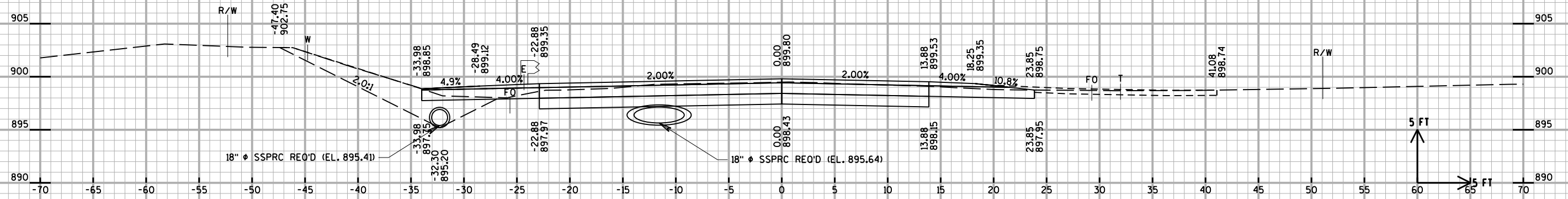
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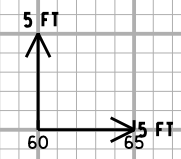
PE RT
POST 5 LT
18+64.89

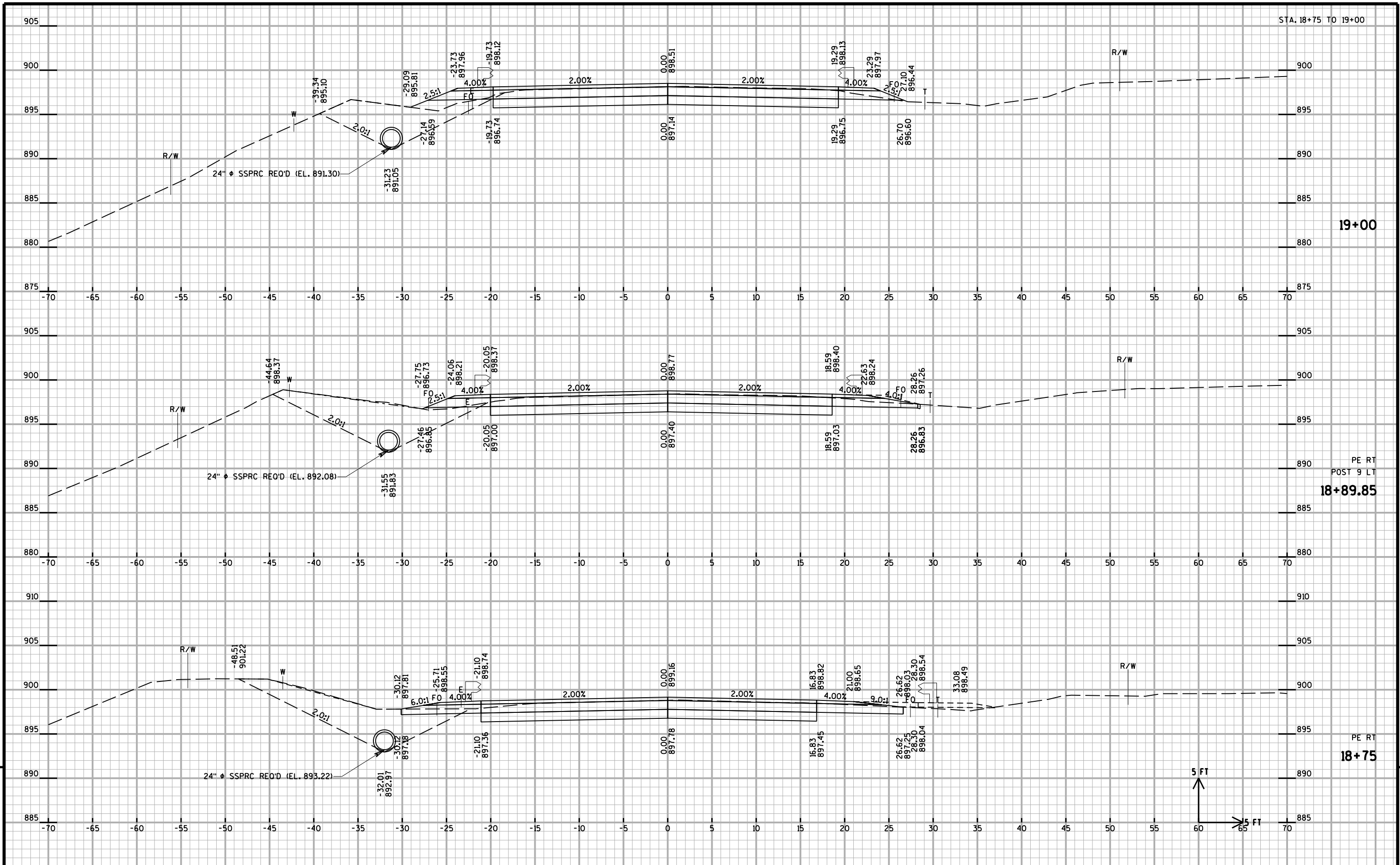


PE RT
18+53.25



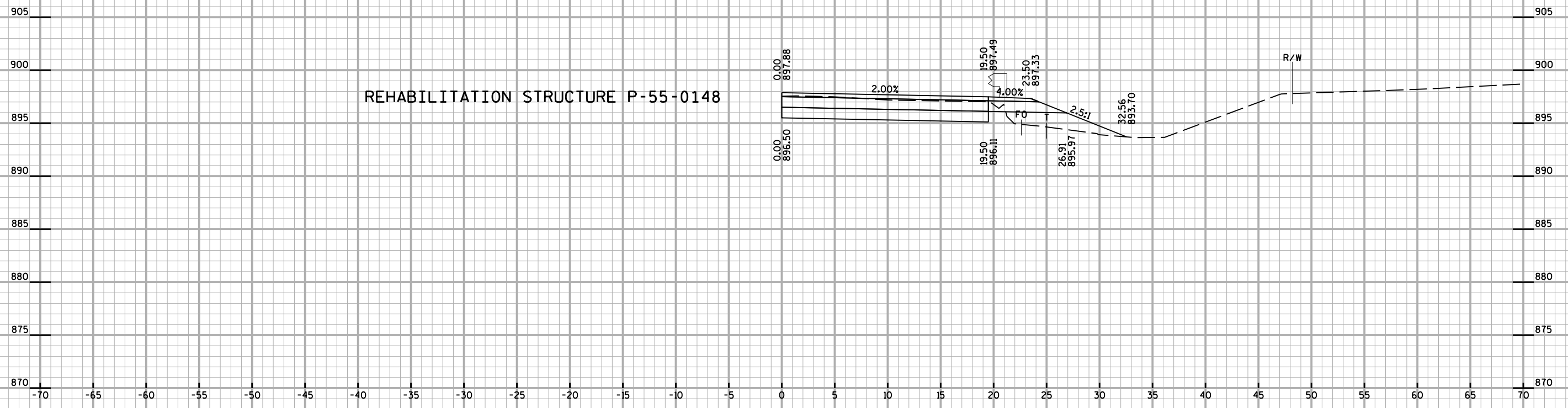
PE RT
18+50



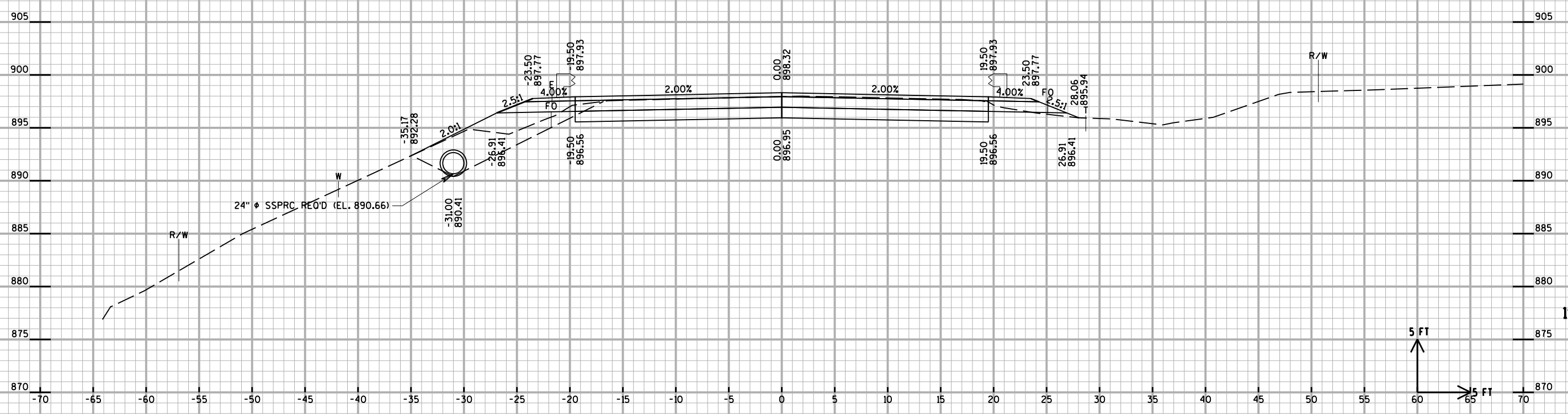


PROJECT NO: 7900-00-70 HWY: POWELL AVENUE COUNTY: ST. CROIX CROSS SECTIONS SHEET E

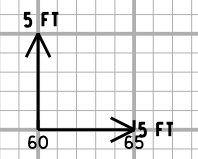
REHABILITATION STRUCTURE P-55-0148



19+25

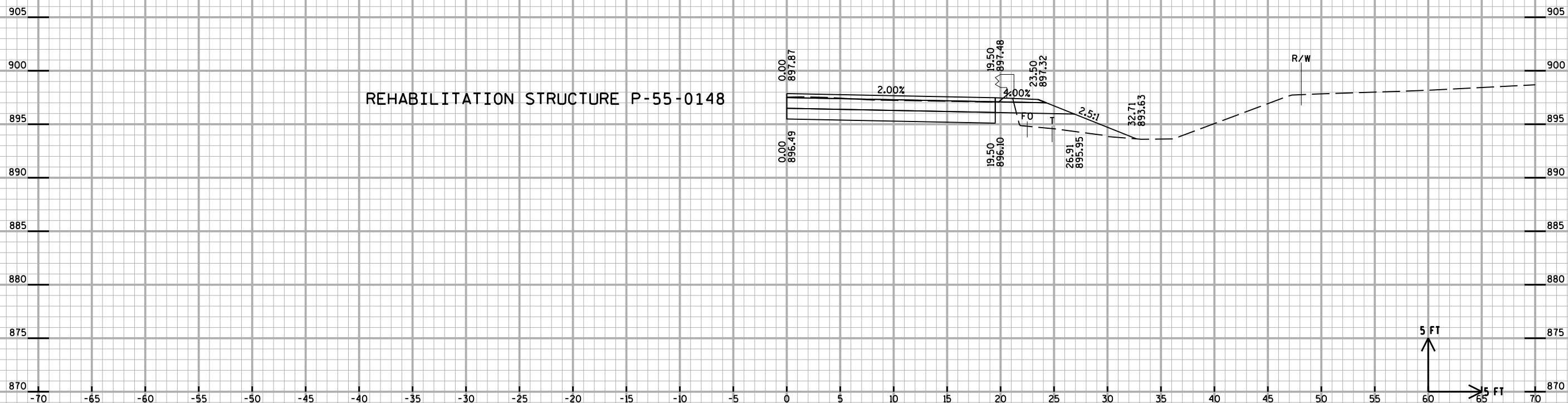


19+07.38



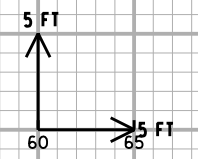
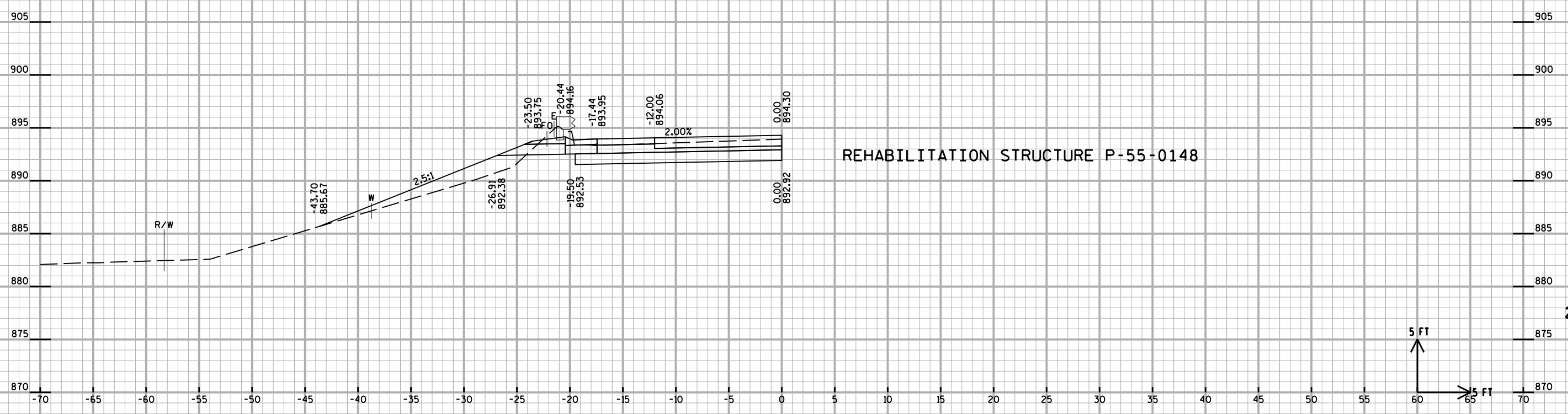
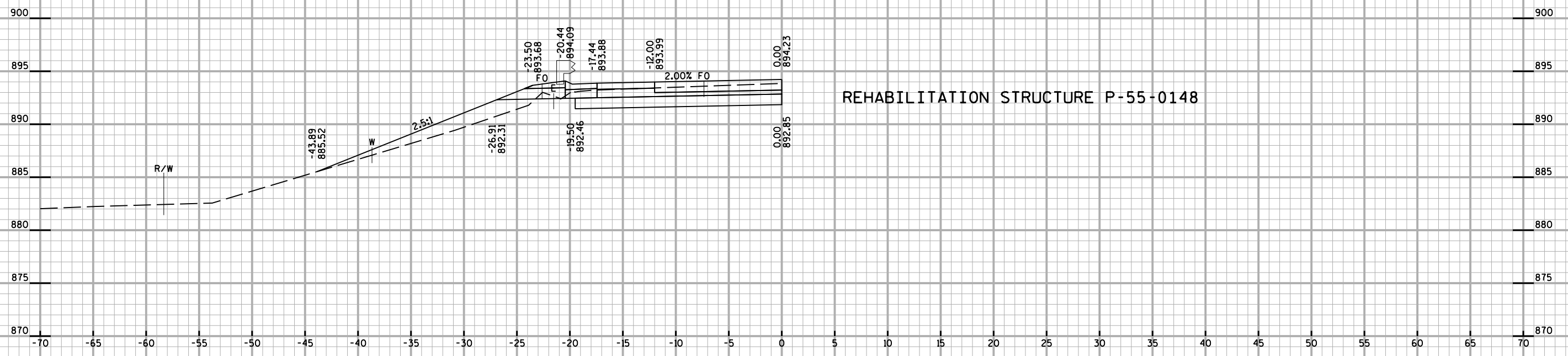
REHABILITATION STRUCTURE P-55-0148

REHABILITATION STRUCTURE P-55-0148



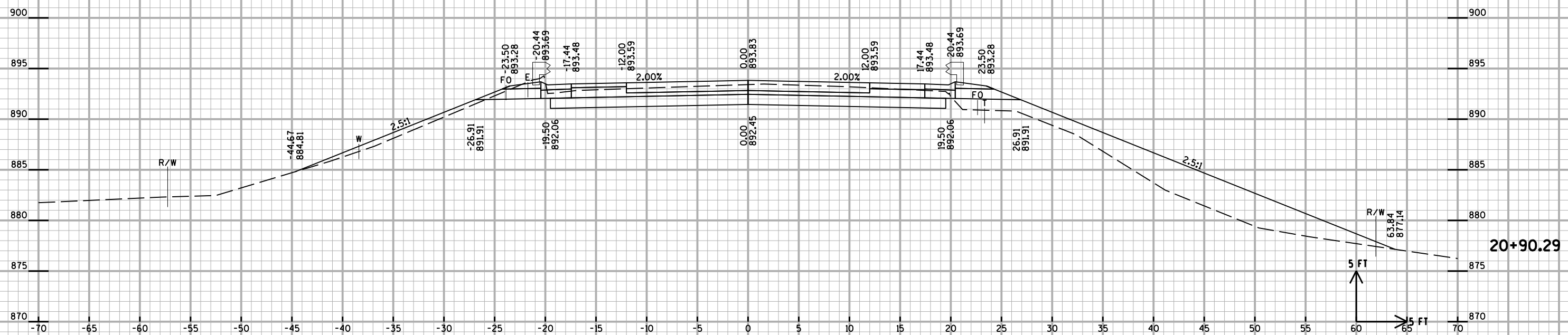
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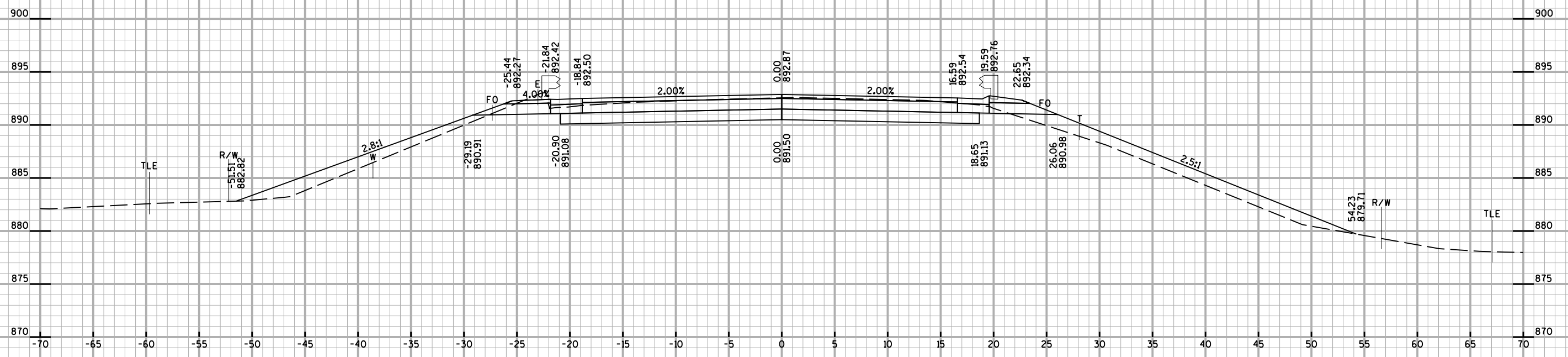
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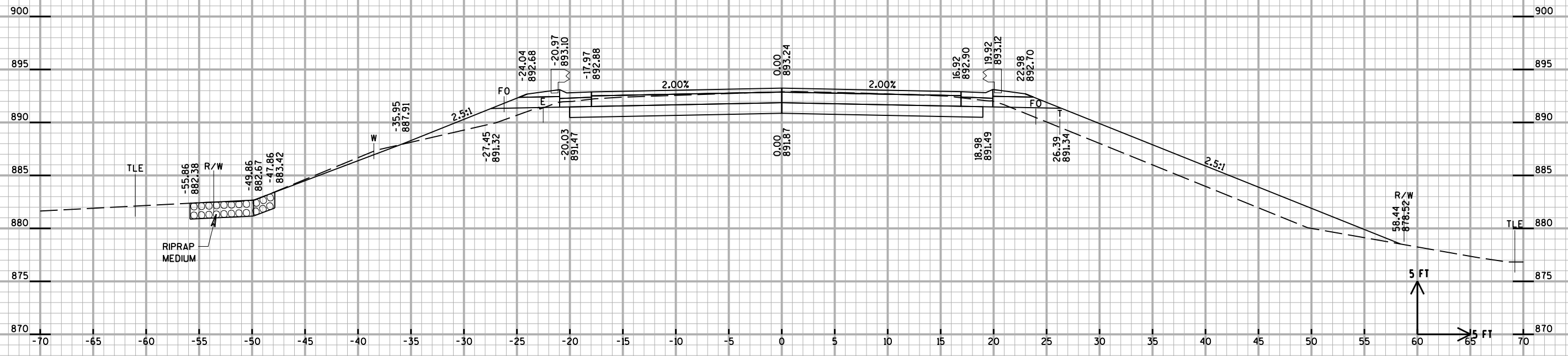
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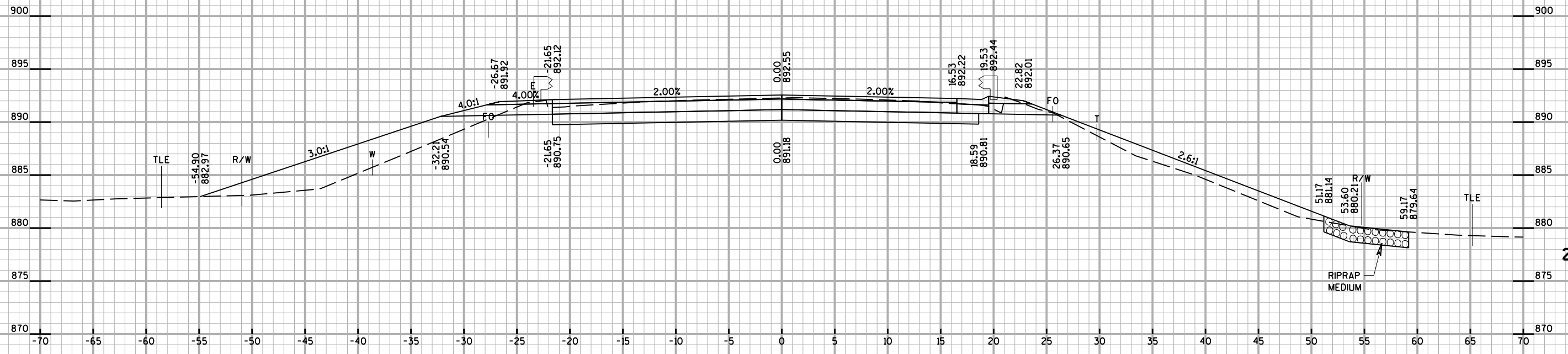




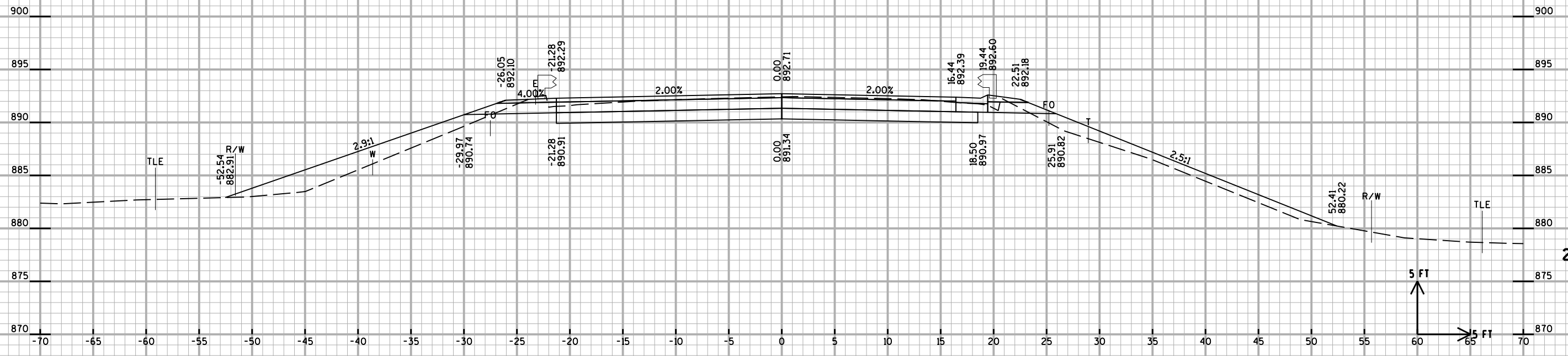
21+25



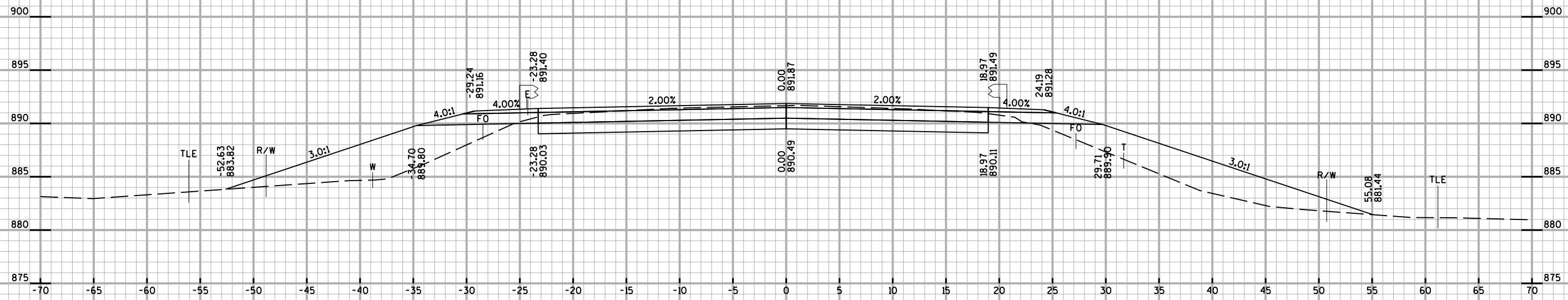
POST 9 LT
21+11.63



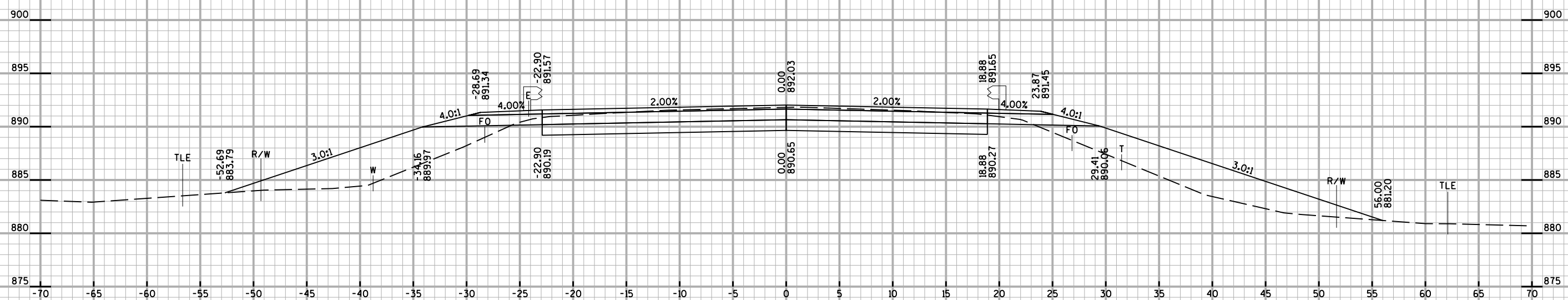
POST 5 LT
21+36.60



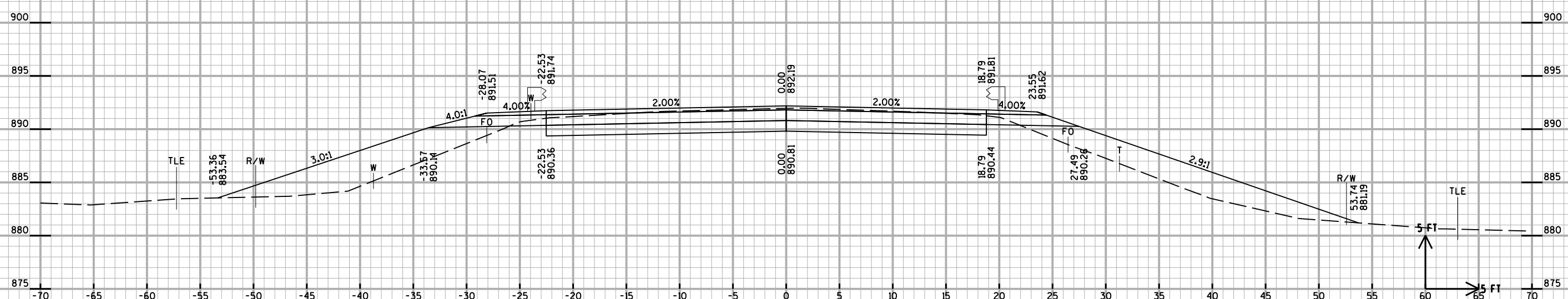
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21+30.79



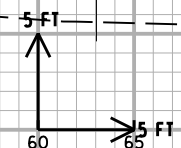
POST 1 LT
21+61.56



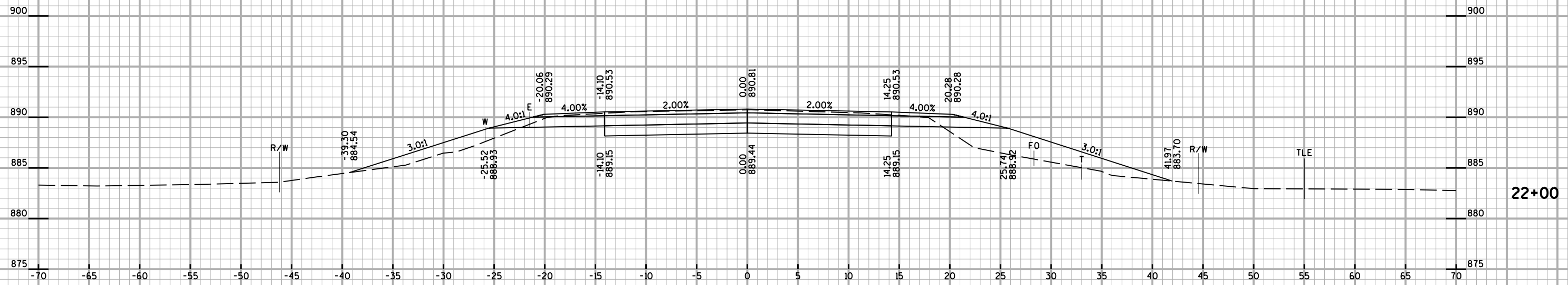
POST 5 RT
21+55.81



21+50



9



22+00

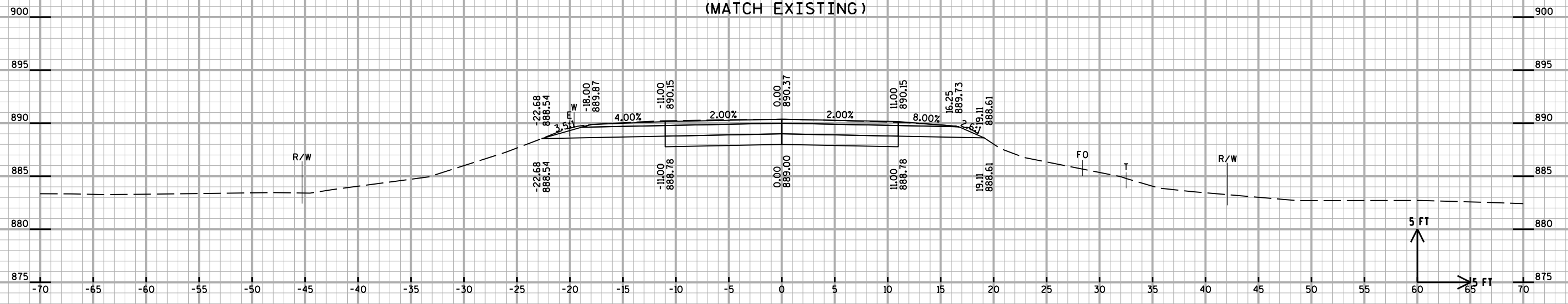


21+80.83



21+75

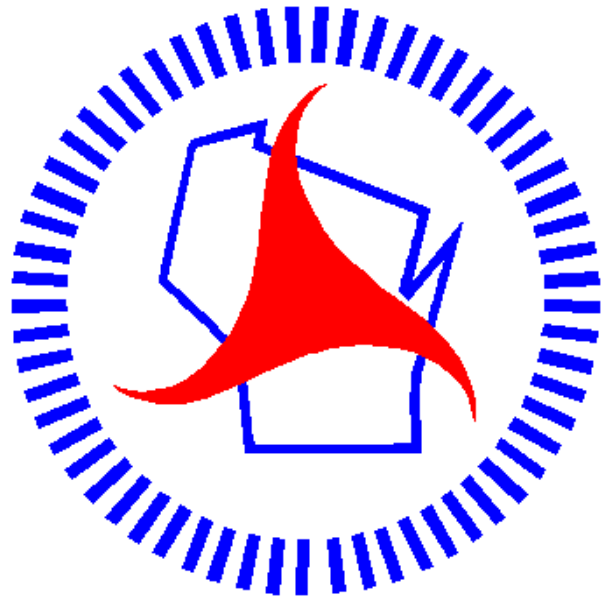
END PROJECT
STA. 22+16
(MATCH EXISTING)



22+16

9

9



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