

ORDER OF SHEETS

Section No.	1	Title
Section No.	2	Typical Sections and Details
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 = 94



07

DESIGN DESIGNATION

A.A.D.T.	2018	=	1160
A.A.D.T.	2042	=	1160
D.H.V.			
D.D.			
T.		=	8.4%
DESIGN SPEED		=	25 MPH / 75 MPH
ESALS		=	110,000

CONVENTIONAL SYMBOLS

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

PROFILE	
GRADE LINE	
ORIGINAL GROUND	
MARSH OR ROCK PROFILE (To be noted as such)	
SPECIAL DITCH	
GRADE ELEVATION	
CULVERT (Profile View)	
UTILITIES	
ELECTRIC	
FIBER OPTIC	
GAS	
SANITARY SEWER	
STORM SEWER	
TELEPHONE	
WATER	
UTILITY PEDESTAL	
POWER POLE	
TELEPHONE POLE	

STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

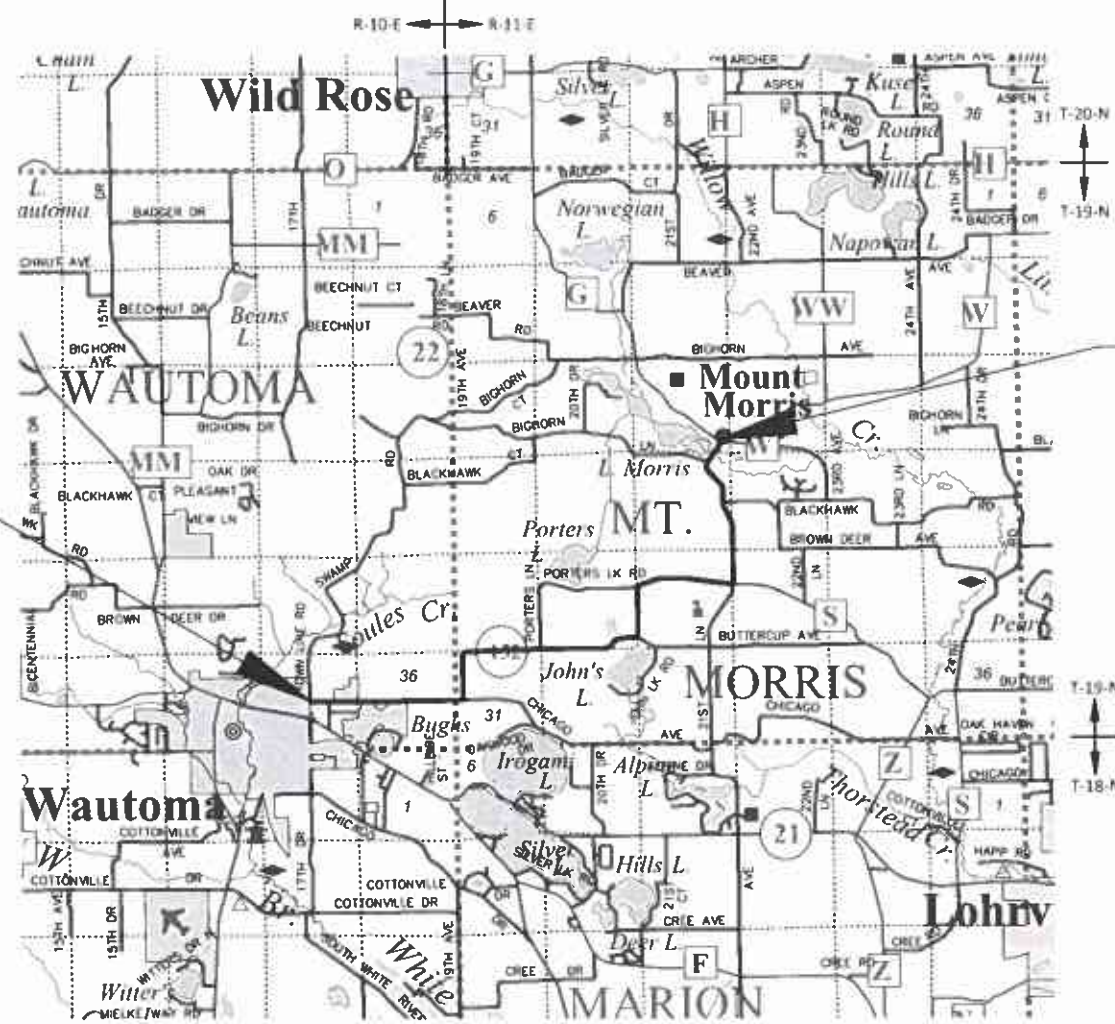
WAUTOMA - MT MORRIS

NORTH TOWNLINE ROAD TO CTH G

STH 152

WAUSHARA COUNTY

STATE PROJECT NUMBER
6866-06-70



BEGIN PROJECT
STA 1+92.14
Y 133920 190
X 384699 119

END PROJECT
STA 373+13

LAYOUT
SCALE 0 2 MI
TOTAL NET LENGTH OF CENTERLINE = 6.993 MI

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COORDINATE REFERENCE SYSTEM (WISCRS), WAUSHARA 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 NAVD 88 (2012). GPS DERIVED ELEVATIONS ARE BASED ON GEOID G18-W1

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
6866-06-70		

ORIGINAL PLANS PREPARED BY
GRAEF
116 S Adams Street,
Green Bay, WI 54301
920 592 9440
920 592 9445 fax
www.graef-usa.com



STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY	
Surveyor	GRAEF
Designer	GRAEF
Project Manager	Bill Bertrand
Regional Examiner	Cheryl Siman
Regional Supervisor	Nichelle Lytle

APPROVED FOR THE DEPARTMENT
DATE: 1-27-2023
Bill Bertrand, P.E.
(Signature)

E

GENERAL NOTES

NO TREES OR SHRUBS ARE TO BE REMOVED UNLESS INDICATED FOR REMOVAL BY THE ENGINEER.

DISTURBED AREAS WITHIN THE RIGHT-OF-WAY, EXCEPT THE AREAS WITHIN THE FINISHED SHOULDER POINTS, SHALL BE TOPSOILED, FERTILIZED, SEEDED.

THE LOCATION OF KNOWN EXISTING UTILITIES IN THE VICINITY OF THE PROJECT ON THE PLANS IS APPROXIMATE. THERE MAY BE OTHER UTILITIES IN THE AREA THAT ARE NOT SHOWN.

THE CONTRACTOR IS TO WORK WITH UTMOST CARE AND PROTECT ALL SURVEY MARKERS. REMOVAL OF ANY SURVEY MARKER IS TO BE WITH THE APPROVAL OF THE ENGINEER. DETAILS OF CONSTRUCTION NOT SHOWN ON THE PLAN SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.

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

NOTE THAT THE BASE MAPPING DEPICTED IN THESE PLANS MAY NOT BE CURRENT.



RUNOFF COEFFICIENTS FOR SPECIFIC LAND USE

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

TOTAL PROJECT AREA = 20.45 ACRES
 TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 0.3 ACRES
 PROJECT 6866-06-70

DEPT. OF NATURAL RESOURCES

WISCONSIN DEPT. OF NATURAL RESOURCES
 CASEY JONES
 625 E COUNTRY ROAD Y, SUITE 700
 OSHKOSH, WI. 54901
 (715) 213-6571
 Casey.Jones@wisconsin.gov

DESIGN CONTACT

GRAEF
 MR. DAN HERZBERG
 116 S. ADAMS STREET, SUITE 201
 GREEN BAY, WI. 54301
 (920) 405-3825
 dan.herzberg@graef-usa.com

UTILITY CONTACTS

ADAMS-COLUMBIA ELECTRIC COOPERATIVE - ELECTRICITY
 DUANE MOORE
 ADAMS-COLUMBIA ELECTRIC COOPERATIVE - ELECTRICITY
 401 E. LAKE STREET
 FRIENDSHIP, WI. 53934
 (800) 831-8629 EXT 424
 dmoore@acecwi.com

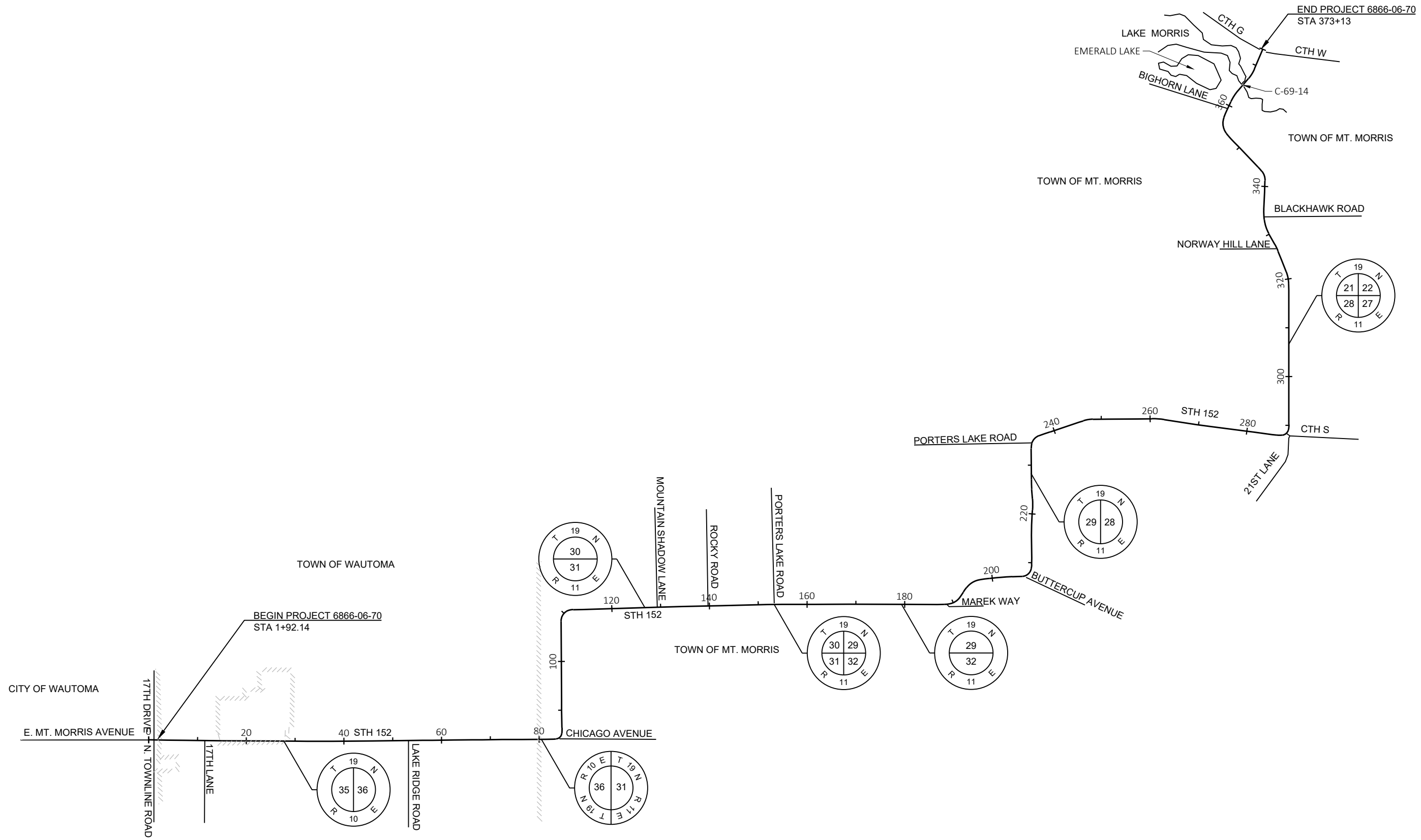
ALLIANT ENERGY
 COREY CLINCH
 ALLIANT ENERGY - ELECTRICITY
 880 N WISCONSIN STREET
 BERLIN, WI. 54923
 (920) 361-5668
 coreyclinch@alliantenergy.com

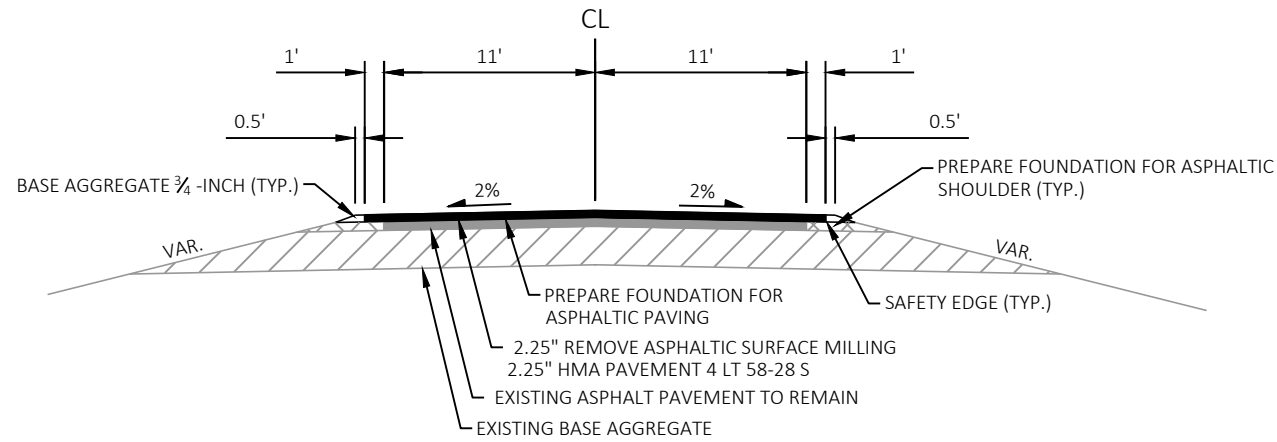
BRIGHTSPEED
 SCOTT HEINZELMAN
 144 N. PEARL STREET
 BERLIN, WI. 54923
 (608) 757-4802
 (920) 757-4802 (MOBILE)
 Scott.Heinzelman@brightspeed.com

SPECTRUM COMMUNICATIONS
 NICK FRASE
 SPECTRUM COMMUNICATIONS - COMMUNICATIONS LINE
 1515 WASHINGTON STREET
 WEST BEND, WI. 53095
 (262) 429-9897
 (920) 304-6797 (MOBILE)
 Nick.Frase@Charter.com

WE ENERGIES - GAS/PETROLEUM
 LARRY KOCH
 WE ENERGIES - GAS/PETROLEUM
 1921 8TH STREET S
 WISCONSIN RAPIDS, WI. 54494
 (715) 421-7249
 (715) 421-9293 (MOBILE)
 Larry.Koch@we-energies.com

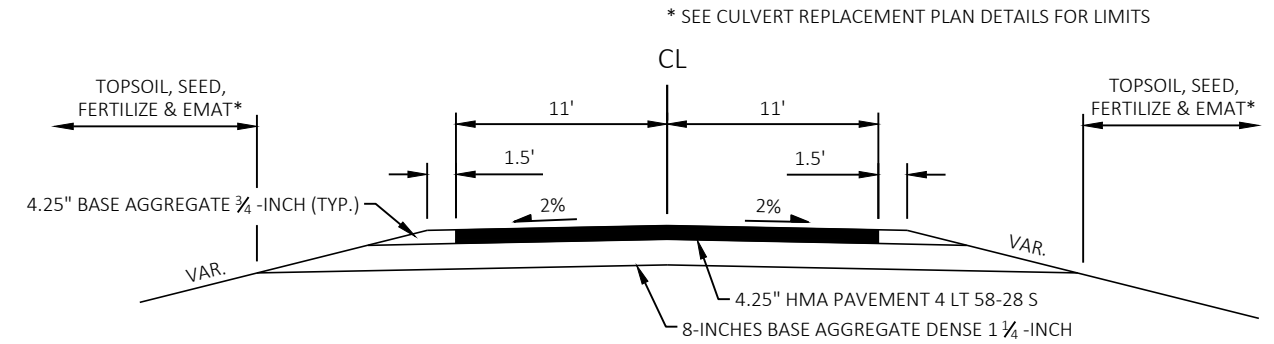
FLINT HILLS RESOURCES, LLC
 CODY NELSON
 741 MASON STREET
 STEVENS POINT, WI. 54481
 (715) 286-0002
 (660) 251-1981 (MOBILE)
 Cody.Nelson@fhr.com





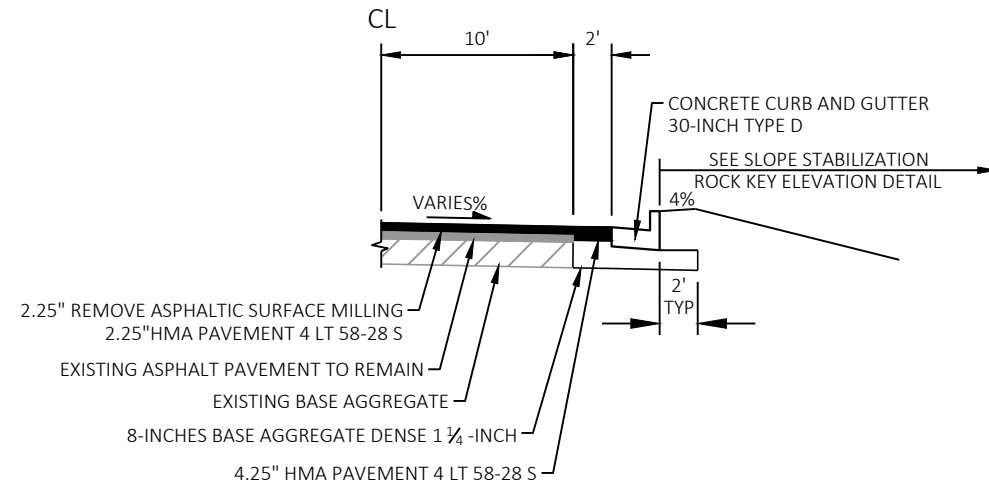
FINISHED TYPICAL SECTION MILL AND OVERLAY

STA. 1+92.14 TO STA. 364+13.41
STA. 367+27.77 TO STA. 373+13.10



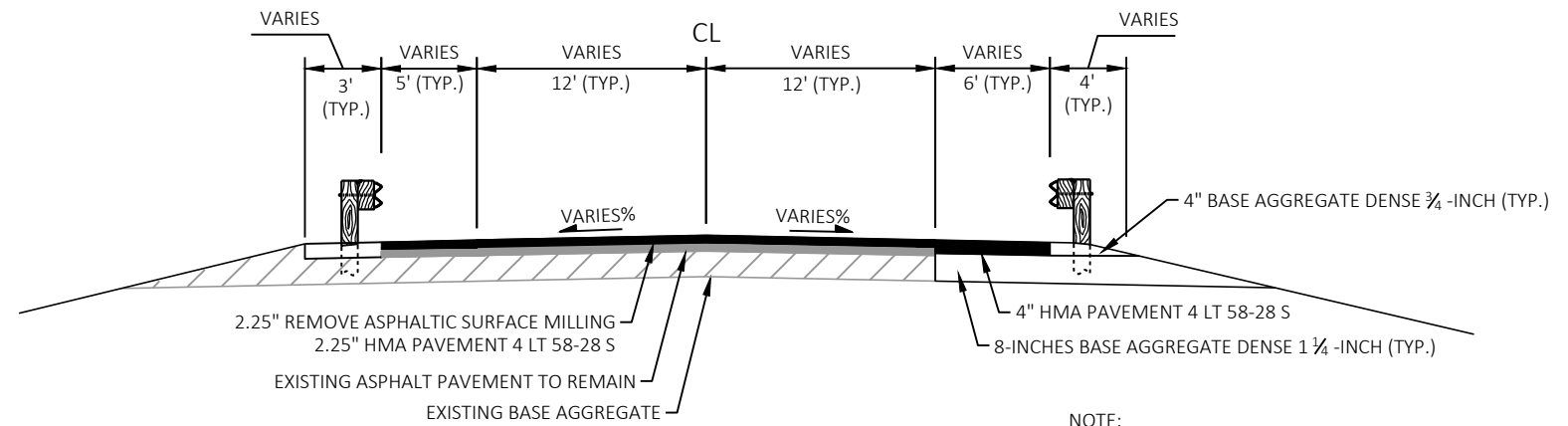
FINISHED TYPICAL SECTIONS CULVERT REPLACEMENTS

* SEE CULVERT REPLACEMENT PLAN DETAILS FOR LIMITS
STA. 11+53.81 TO STA. 12+57.81
STA. 56+62.31 TO STA. 57+69.26
STA. 66+82.40 TO STA. 67+86.90
STA. 91+17.39 TO STA. 92+21.39
STA. 111+38.79 TO STA. 112+43.11
STA. 301+39.98 TO STA. 302+43.98
STA. 353+27.97 TO STA. 354+32.07



FINISHED TYPICAL SECTION SLOPE STABILIZATION

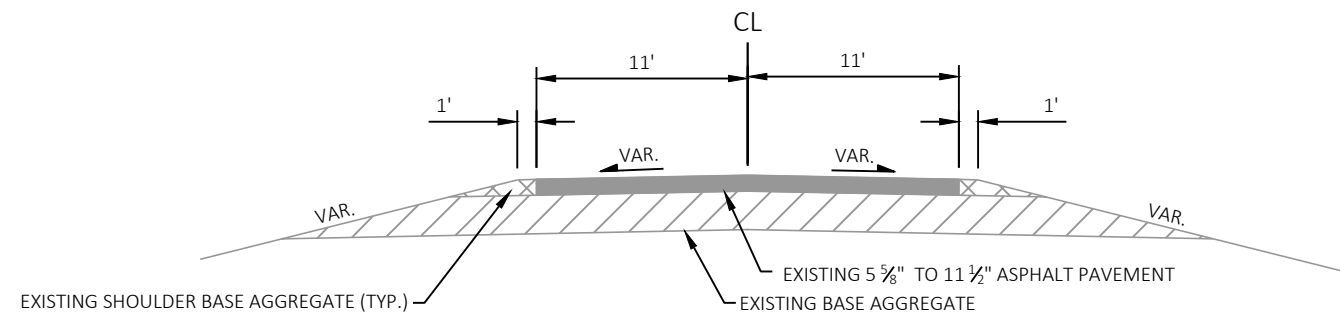
STA. 329+38 TO STA. 331+31



FINISHED TYPICAL SECTION MGS LOCATION

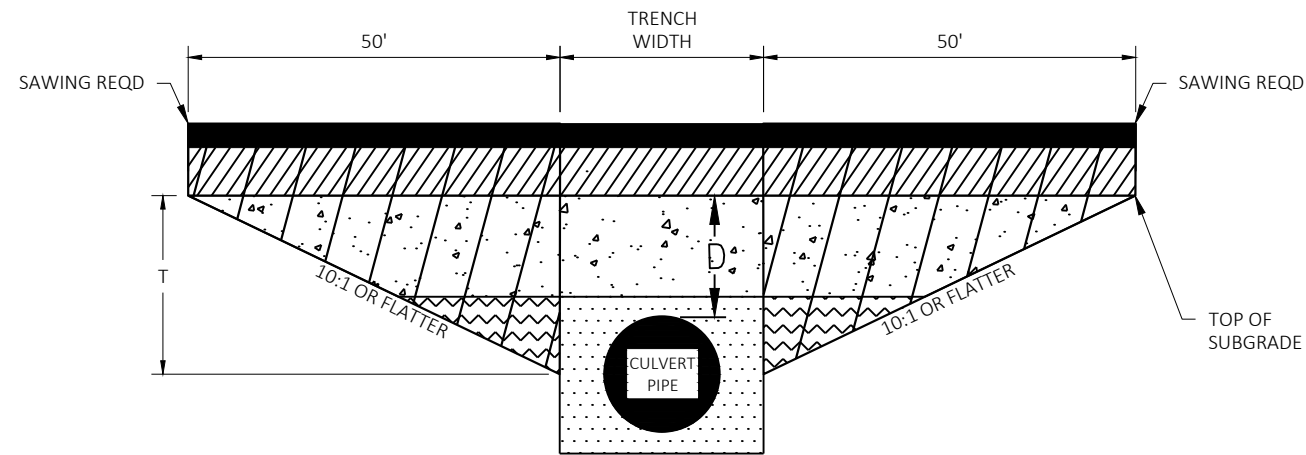
STA. 364+13.41 TO STA. 367+27.77

NOTE:
SEE "PLAN DETAILS: GUARDRAIL REPLACEMENT" PLAN SHEET FOR LOCATIONS OF 4" ASPHALTIC SURFACE PAVEMENT



EXISTING TYPICAL SECTION

STH 152
STA. 1+92 TO STA. 373+13



TRANSITION CUT DEPTH (T) = THE LESSER OF DEPTH TO CENTER OF PIPE OR 5 FT. DO NOT EXTEND TRANSITION CUT BELOW HORIZONTAL CENTER OF PIPE.

DEPTH D < 6 FT

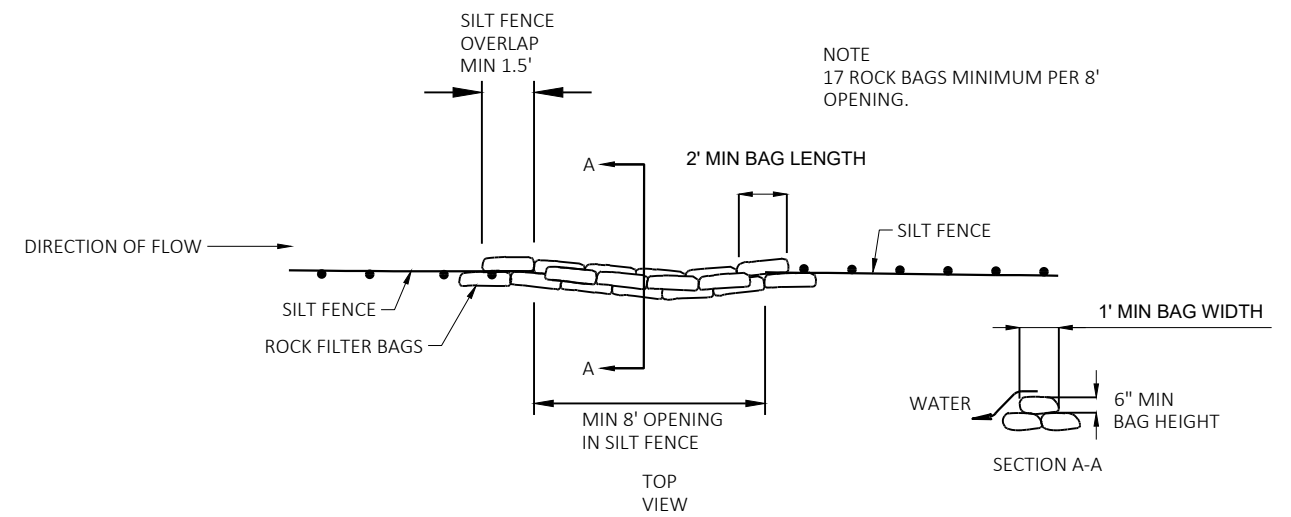
- ASPHALTIC SURFACE
- TRENCH BACKFILL
- TRENCH OR FOUNDATION BACKFILL
- FOUNDATION BACKFILL
- TRANSITION CUT
- BASE AGGREGATE DENSE 1-1/4 INCH

NOTES

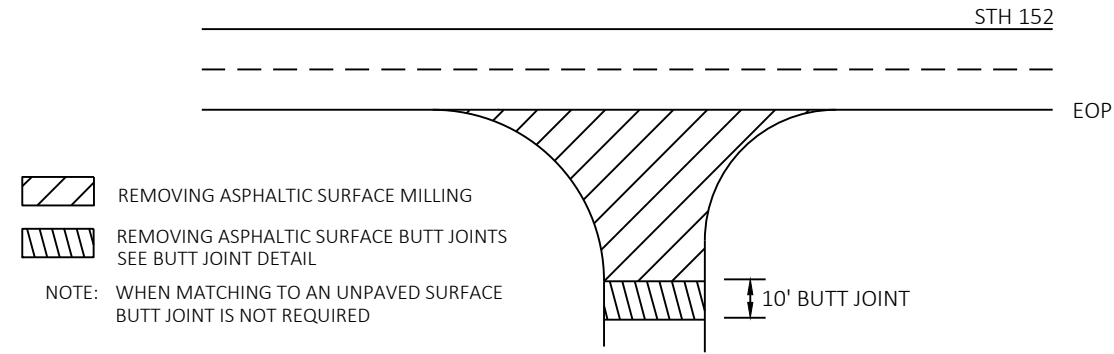
TRANSITION CUT IS PAID AS EXCAVATION COMMON.
 TRANSITION CUT WIDTH IS FROM SUBGRADE SHOULDER POINT TO SUBGRADE SHOULDER POINT.
 TRENCH BACKFILL AND FOUNDATION BACKFILL USED IN TRANSITION CUT AREA IS INCIDENTAL TO PIPE INSTALLATION (PER STD SPEC 520).
 PERFORM CULVERT PIPE REPLACEMENT PRIOR TO MILLING AND PAVING
 REFER TO "FINISHED TYPICAL SECTIONS CULVERT REPLACEMENTS"



CULVERT PIPE TRANSITION

ROUTE	STA (CL)	DEPTH D (FT)	PIPE DIA (IN)	REMARKS
STH 152	STA 12+06	D=2.3 FT	24-INCH	
STH 152	STA 57+16	D=1.3 FT	24-INCH X 38-INCH	
STH 152	STA 67+34	D=1.9 FT	24-INCH	
STH 152	STA 91+70	D=0.8 FT	24-INCH	
STH 152	STA 111+91	D=1.4 FT	14-INCH X 23-INCH	
STH 152	STA 301+92	D=2.1 FT	24-INCH	
STH 152	STA 353+79	D=1.7 FT	24-INCH	



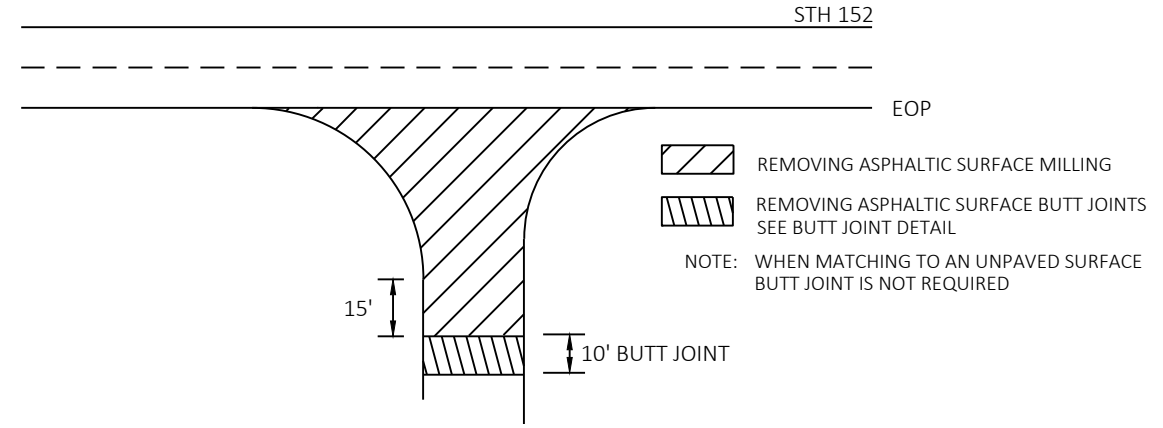
ROCK BAGS USED FOR SILT FENCE RELIEF





 REMOVING ASPHALTIC SURFACE MILLING
 REMOVING ASPHALTIC SURFACE BUTT JOINTS
 SEE BUTT JOINT DETAIL
 NOTE: WHEN MATCHING TO AN UNPAVED SURFACE
 BUTT JOINT IS NOT REQUIRED

SIDE ROAD TYPICAL
WITHOUT CURB AND GUTTER

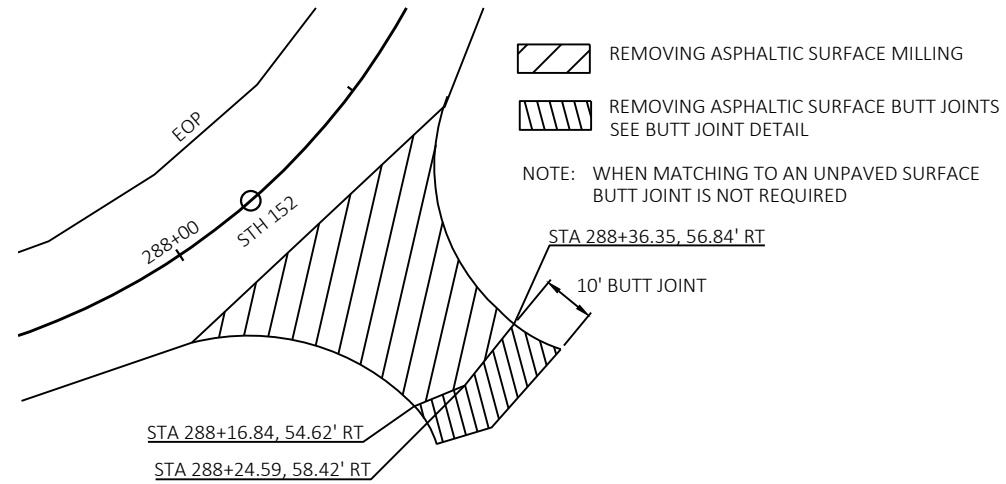
17th LANE
 LAKE RIDGE ROAD
 PORTERS LAKE ROAD (AT STATION 153+25)
 BLACKHAWK ROAD
 BIGHORN LANE





 REMOVING ASPHALTIC SURFACE MILLING
 REMOVING ASPHALTIC SURFACE BUTT JOINTS
 SEE BUTT JOINT DETAIL
 NOTE: WHEN MATCHING TO AN UNPAVED SURFACE
 BUTT JOINT IS NOT REQUIRED

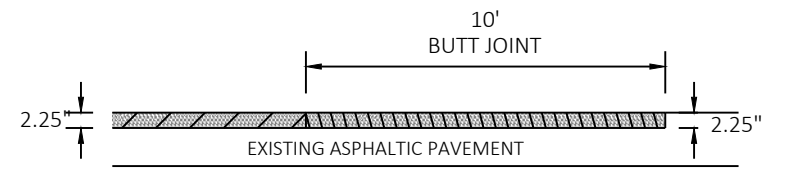
SIDE ROAD SPECIAL
WITHOUT CURB AND GUTTER




CHICAGO AVENUE
 PORTERS LAKE ROAD (AT STATION 234+50)
 BUTTERCUP AVENUE



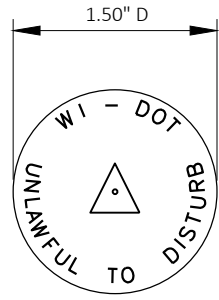
 REMOVING ASPHALTIC SURFACE MILLING
 REMOVING ASPHALTIC SURFACE BUTT JOINTS
 SEE BUTT JOINT DETAIL
 NOTE: WHEN MATCHING TO AN UNPAVED SURFACE
 BUTT JOINT IS NOT REQUIRED

SIDE ROAD CTH S
WITHOUT CURB AND GUTTER

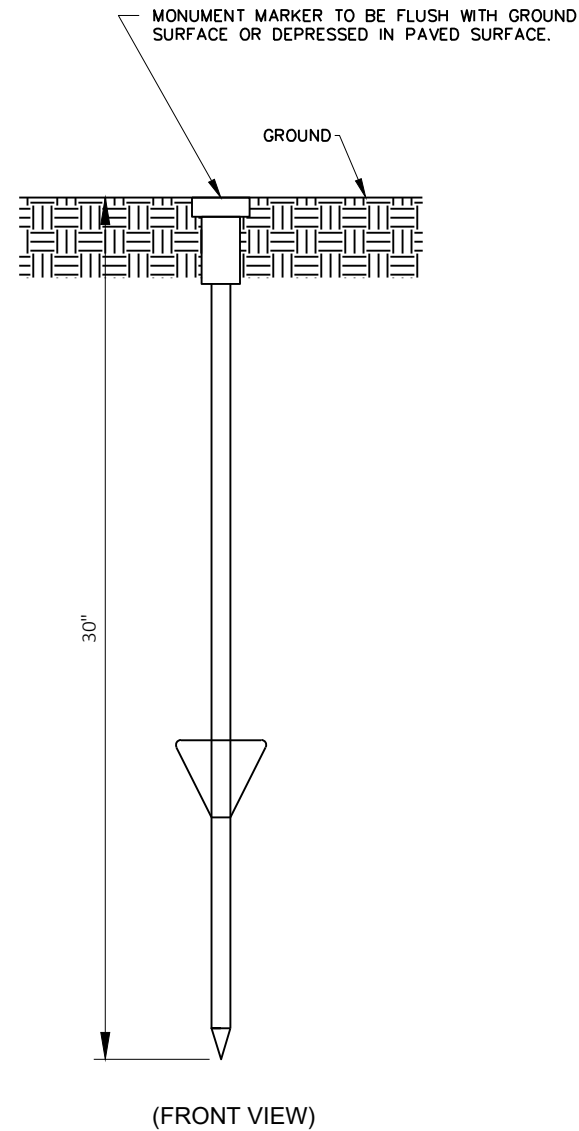


 HMA PAVEMENT
 REMOVING ASPHALTIC SURFACE MILLING
 REMOVING ASPHALTIC SURFACE BUTT JOINTS

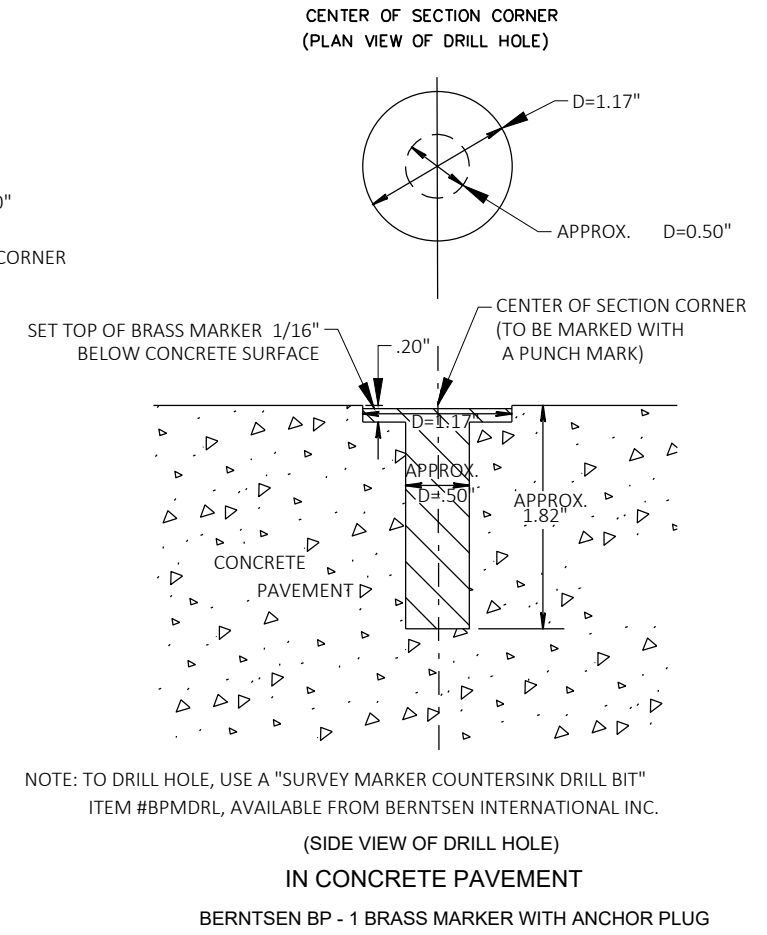
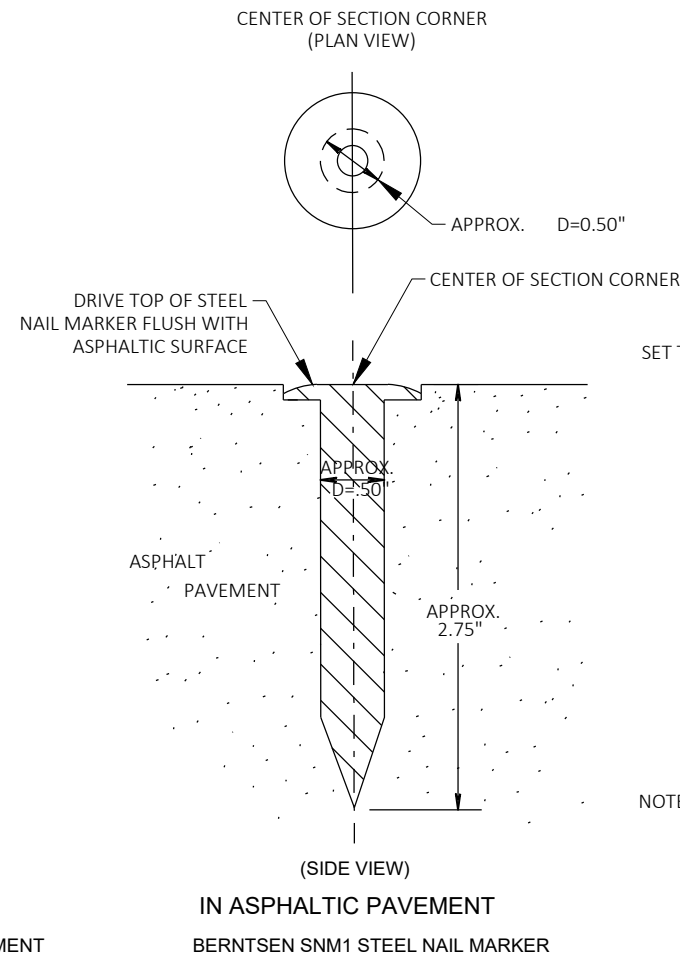
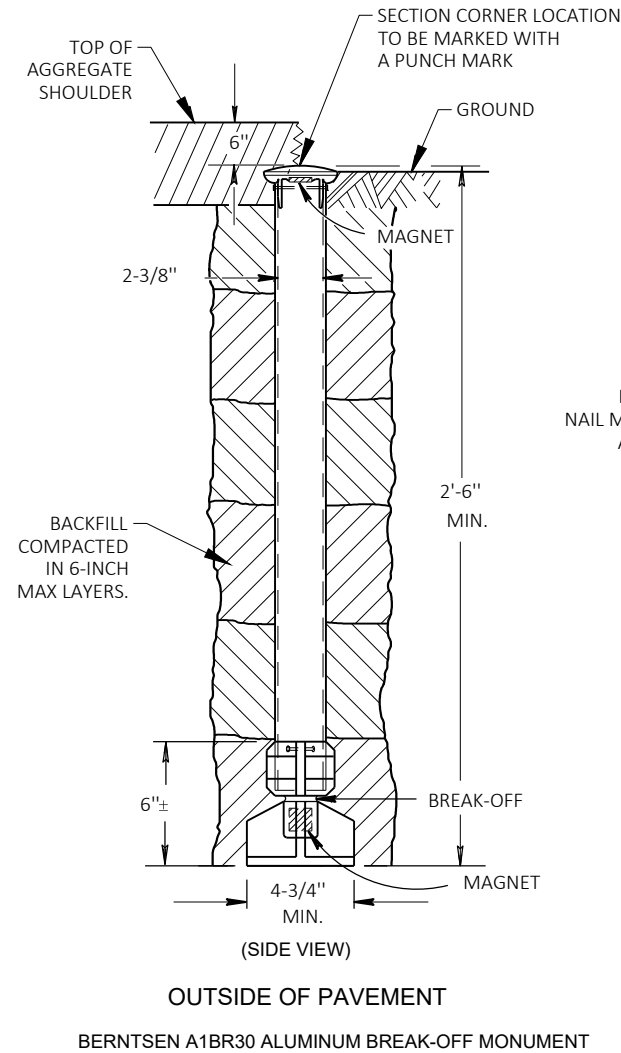
BUTT JOINT
MAINLINE AND SIDE ROADS



WIS DOT MONUMENT CAP MARKER LOGO (SSDR130)
 CONTRACTOR TO ORDER LANDMARK REFERENCE MONUMENTS WITH THE ABOVE STAMPING



BERNSTEN DRIVABLE MONUMENT SSDR130
 LANDMARK REFERENCE MONUMENT (TIES ONLY)

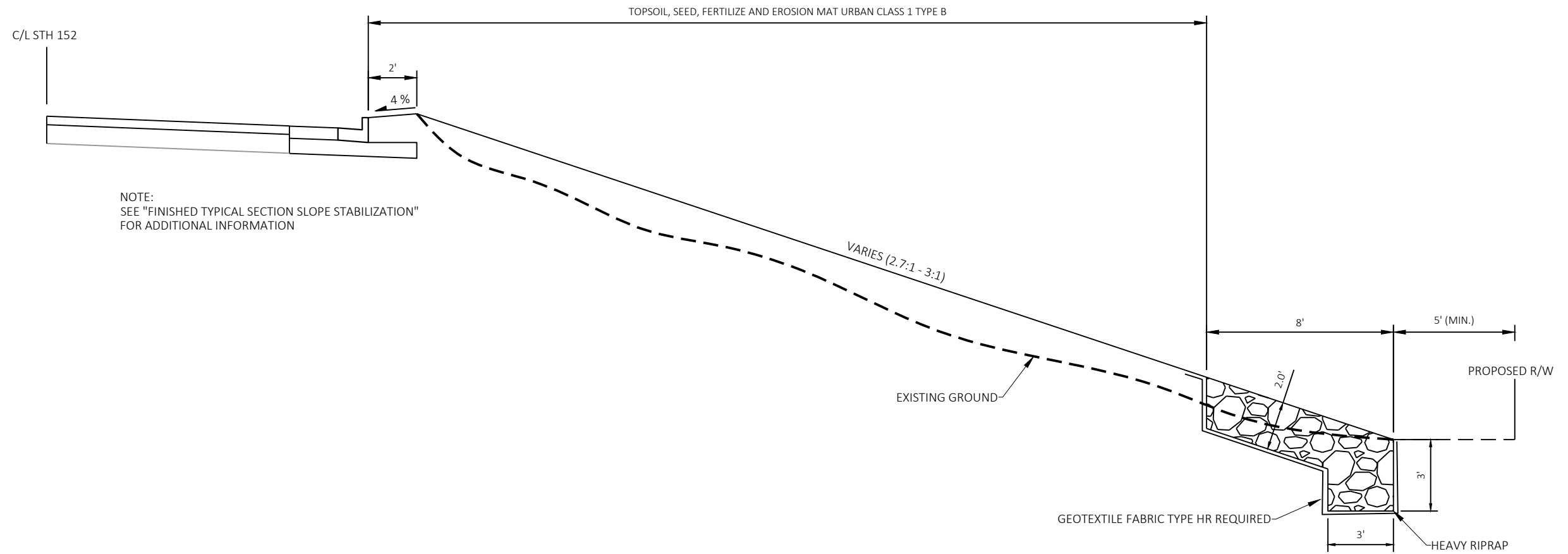


NOTE: TO DRILL HOLE, USE A "SURVEY MARKER COUNTERSINK DRILL BIT" ITEM #BPMRDL, AVAILABLE FROM BERNTSEN INTERNATIONAL INC.

SECTION CORNER MONUMENTS

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.
 LOCATE LANDMARK REFERENCE MONUMENTS OUTSIDE THE CONSTRUCTION LIMITS AND WITHIN WISDOT RIGHT OF WAY. LOCATION TO BE APPROVED BY THE ENGINEER.
 CONTRACTOR WILL SUPPLY ALL REQUIRED SURVEY MONUMENTS.

SECTION CORNER MONUMENT AND LANDMARK REFERENCE MONUMENT DETAIL



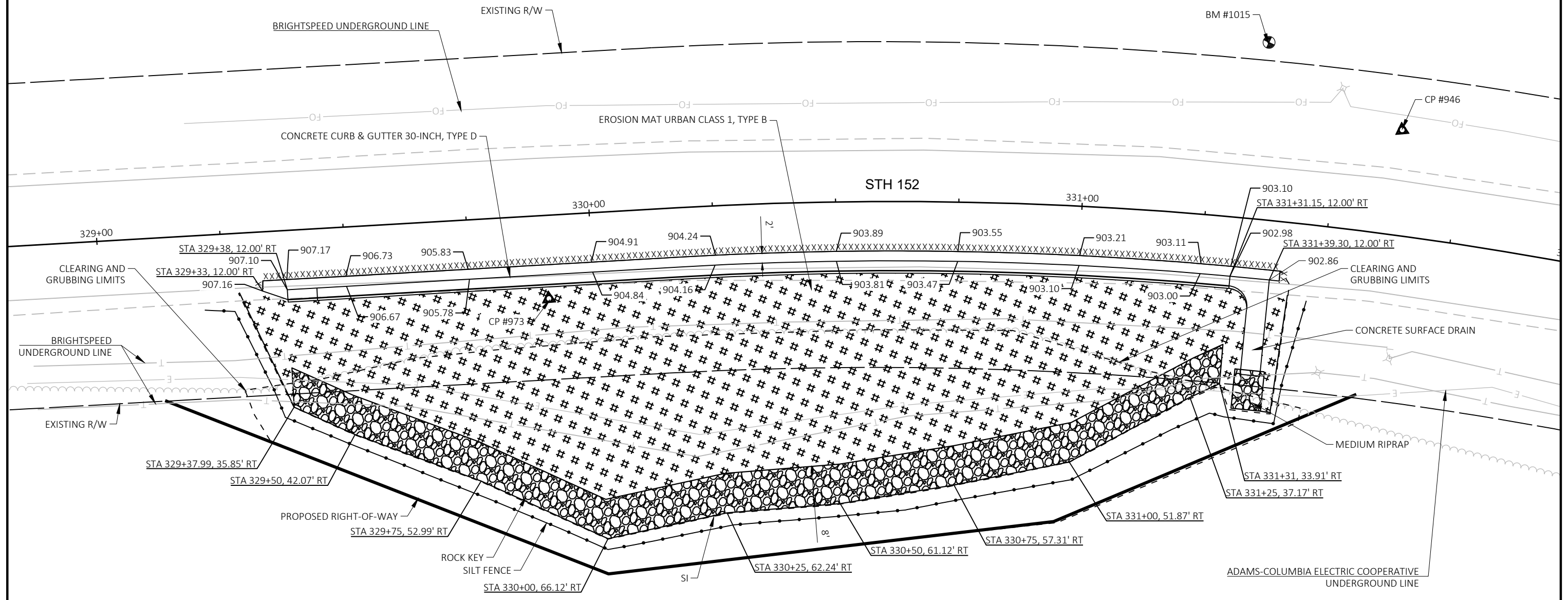
NOTE:
SEE "FINISHED TYPICAL SECTION SLOPE STABILIZATION"
FOR ADDITIONAL INFORMATION

SLOPE STABILIZATION ROCK KEY ELEVATION DETAIL
STA. 329+38 - 331+31

BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1015	331+35, LT	905.51	RR SPIKE IN EAST FACE OF 30-INCH TREE, 250' SOUTH OF BLACKHAWK RD.

CONTROL POINTS			
NO.	Y	X	DESCRIPTION
946	144425.593	407375.273	HUB, 218' SOUTH OF BLACKHAWK RD. AND 10' NORTH OF THE EOP STH 152.
973	144284.720	407481.357	SPIKE, 375' SOUTH OF BLACKHAWK RD. AND 5' SOUTH OF THE EOP. STH 152.

LEGEND	
#####	EROSION MAT URBAN CLASS I, TYPE B
—●—●—●—	SILT FENCE
⊗⊗⊗⊗	RIPRAP HEAVY AND GEOTEXTILE FABRIC TYPE HR
· · · · ·	SAW CUT



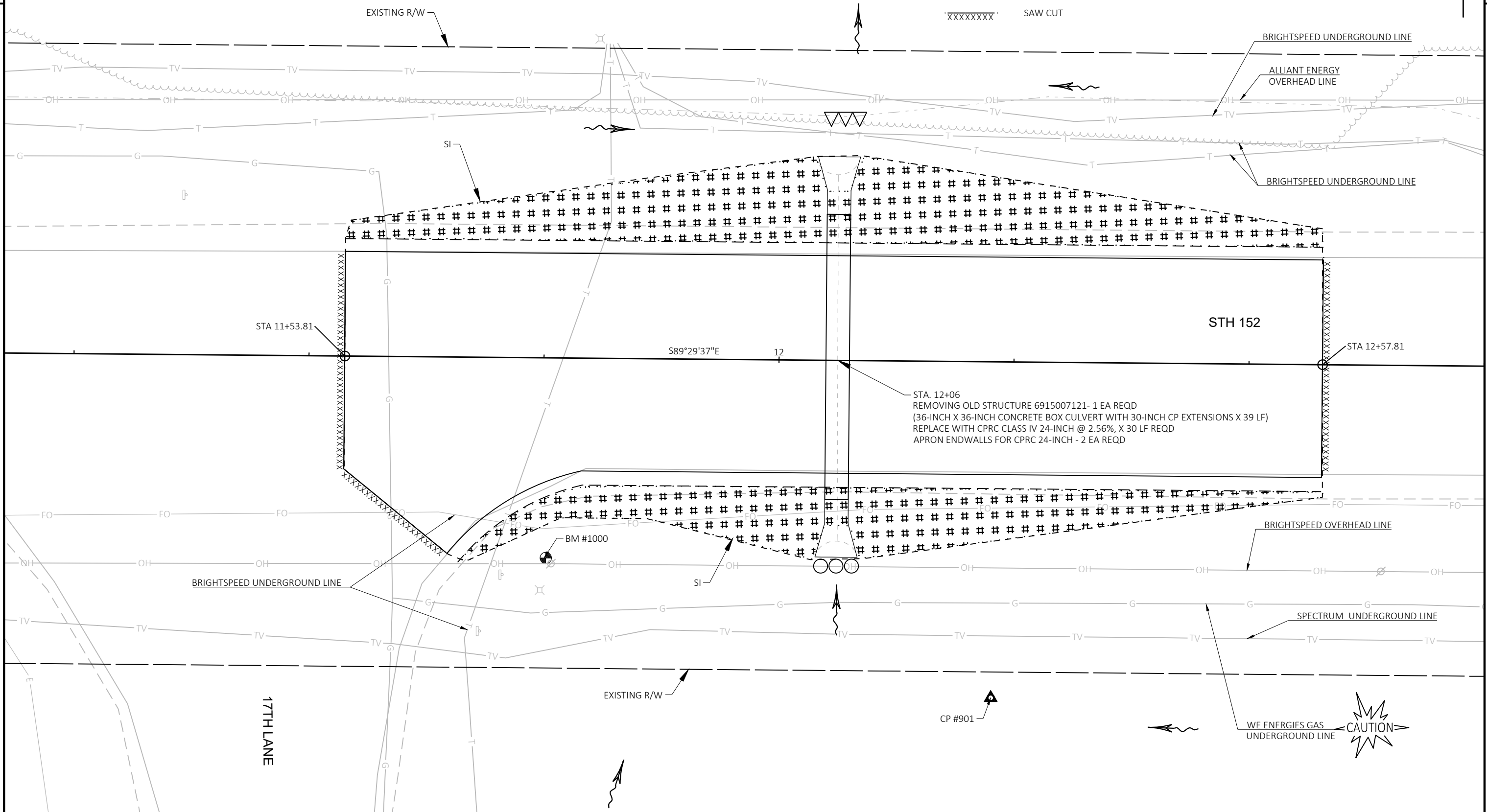
SLOPE STABILIZATION ROCK KEY AND CONCRETE CURB AND GUTTER 30-INCH DETAIL
 STA. 329+38 TO STA. 331+31

BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1000	11+76, 21' RT	874.73	EXISTING MAGNAIL IN POLE AT THE SE CORNER OF STH 12 AND 17TH LANE

CONTROL POINTS			
NO.	Y	X	DESCRIPTION
901	133871.378	385729.576	0.5" REBAR WITH PINK GRAEF CAP, 64' EAST OF EOP 17TH LANE, 24' SOUTH EOP STH 152.

LEGEND

#####	EROSION MAT URBAN CLASS I, TYPE B
▲▲▲	ROCK BAGS FOR SILT FENCE RELIEF
○○○	CULVERT PIPE CHECK
~>	SURFACE WATER FLOW
· · · · ·	SAW CUT

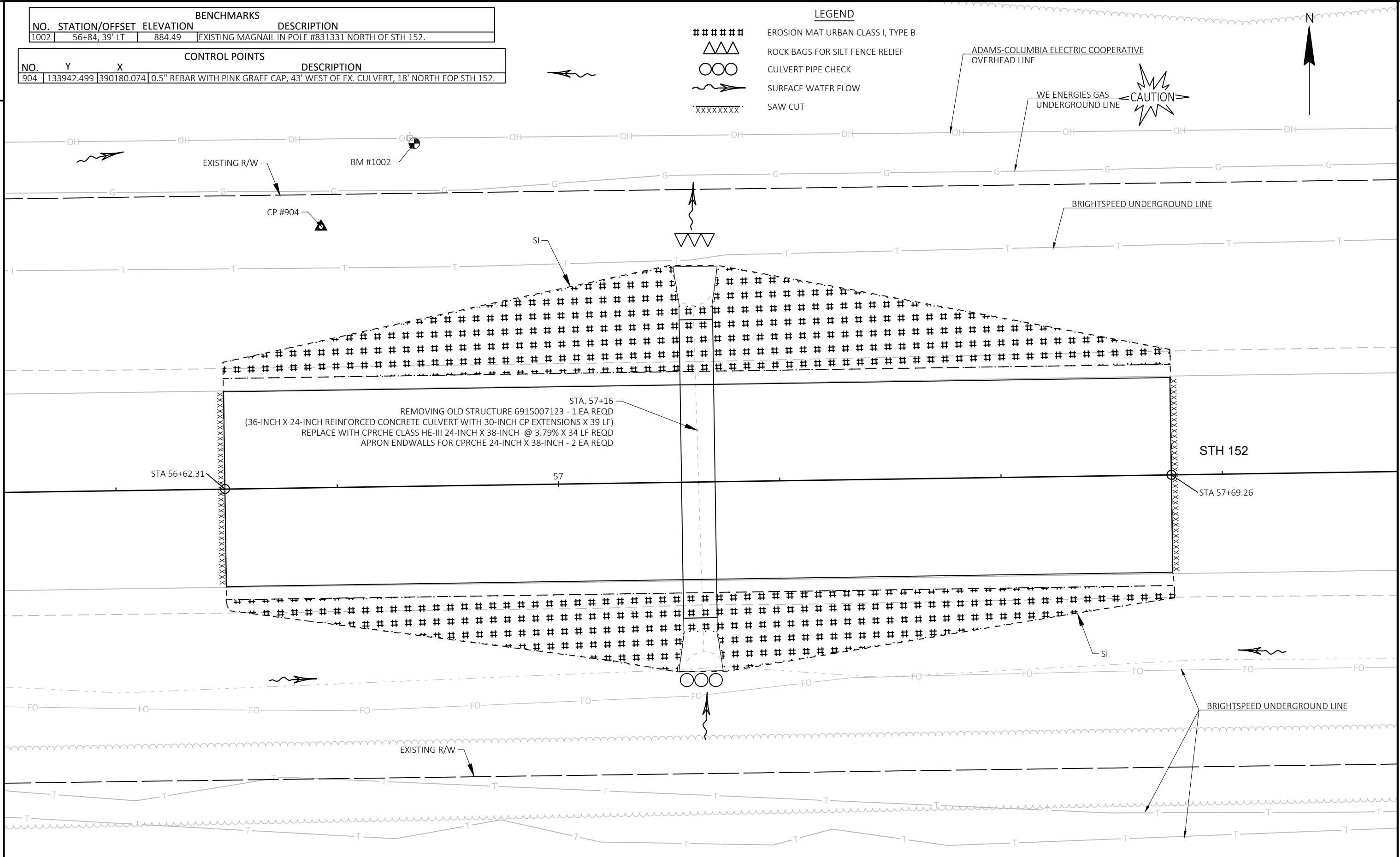


PROJECT NO: 6866-06-70	HWY: STH 152	COUNTY: WAUSHARA	PLAN DETAILS: CULVERT REPLACEMENT STA. 12+06	SHEET	E
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BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1002	56+84, 39' LT	884.49	EXISTING MAGNAIL IN POLE #831331 NORTH OF STH 152.

CONTROL POINTS			
NO.	Y	X	DESCRIPTION
904	133942.499	390180.074	0.5" REBAR WITH PINK GRAEF CAP, 43' WEST OF EX. CULVERT, 18' NORTH EOP STH 152.

- LEGEND**
- ##### EROSION MAT URBAN CLASS I, TYPE B
 - △△△△ ROCK BAGS FOR SILT FENCE RELIEF
 - CULVERT PIPE CHECK
 - ~> SURFACE WATER FLOW
 - · · · · SAW CUT



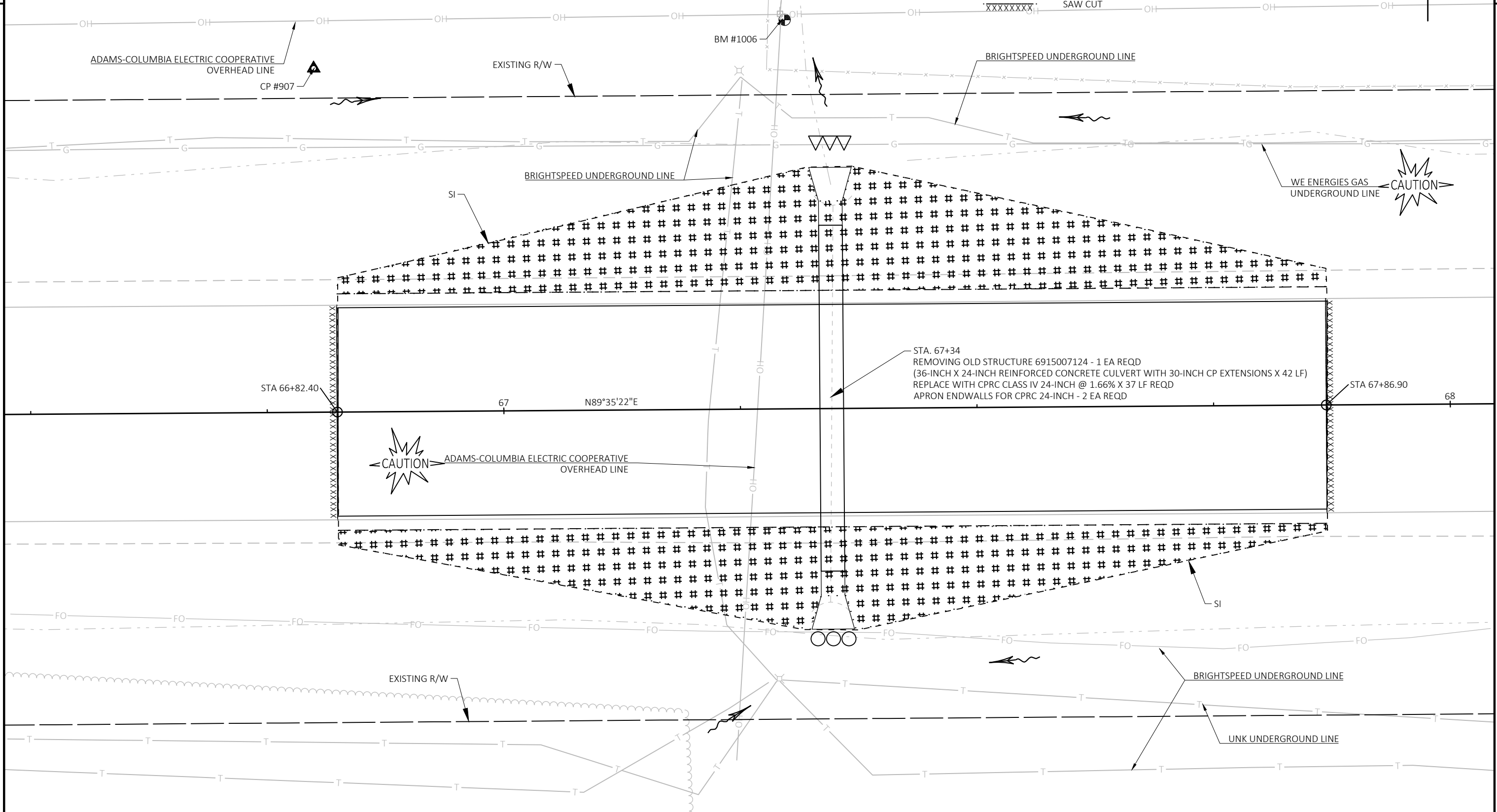
STATION: STA. 57+16
 REMOVING OLD STRUCTURE 6915007123 - 1 EA REQD
 (36-INCH X 24-INCH REINFORCED CONCRETE CULVERT WITH 30-INCH CP EXTENSIONS X 39 LF)
 REPLACE WITH CPRCHE CLASS HE-III 24-INCH X 38-INCH @ 3.79% X 34 LF REQD
 APRON ENDWALLS FOR CPRCHE 24-INCH X 38-INCH - 2 EA REQD

BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1006	67+30, 41' LT	881.77	EXISTING MAGNAIL IN POLE #831335 NORTH OF STH 152.

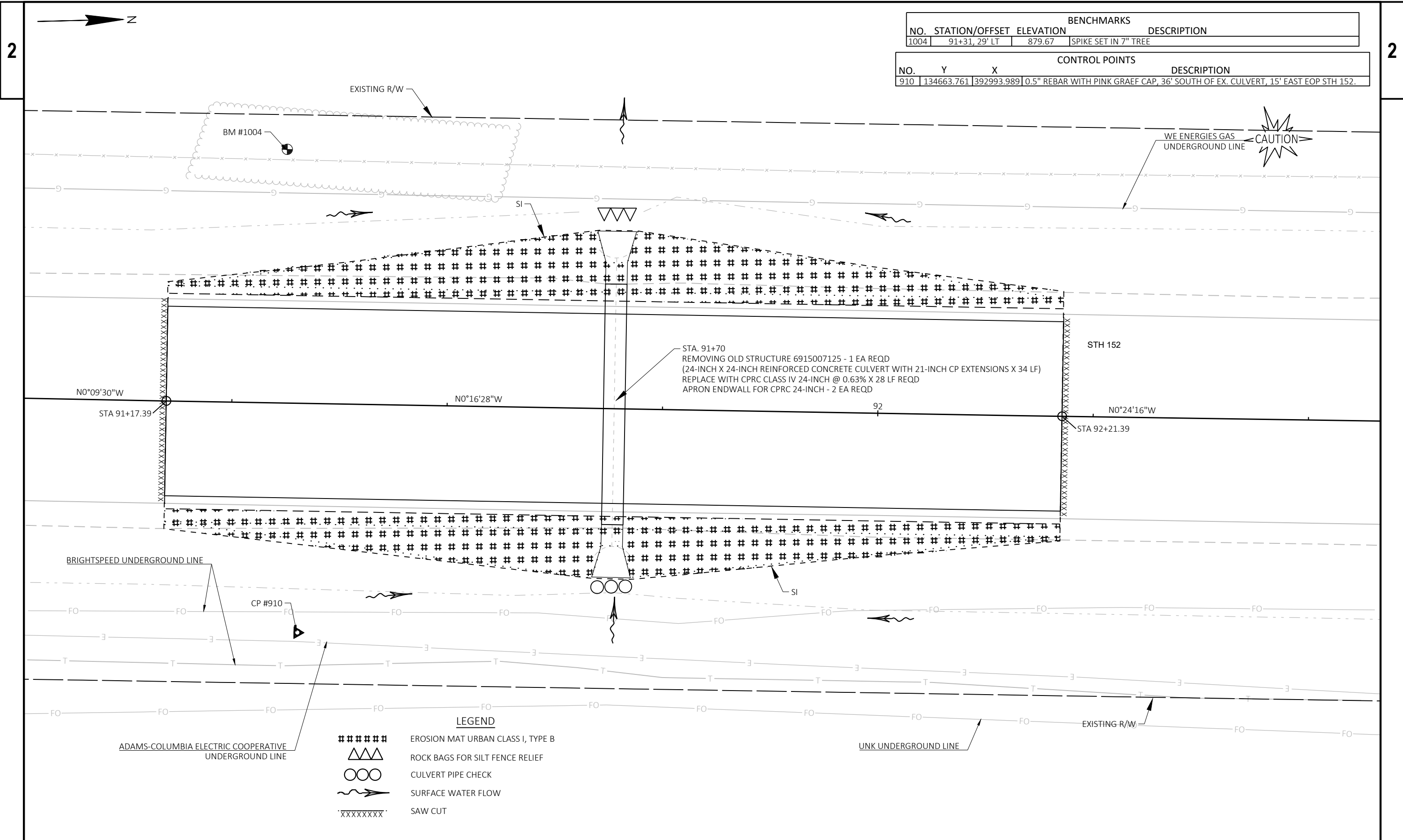
CONTROL POINTS			
NO.	Y	X	DESCRIPTION
907	133959.202	391186.757	0.5" REBAR WITH PINK GRAEF CAP, 55' WEST OF EX. CULVERT, 25' NORTH EOP STH 152.

LEGEND

#####	EROSION MAT URBAN CLASS I, TYPE B
▲▲▲	ROCK BAGS FOR SILT FENCE RELIEF
○○○	CULVERT PIPE CHECK
~~~~~>	SURFACE WATER FLOW
xxxxxxx	SAW CUT



PROJECT NO: 6866-06-70      HWY: STH 152      COUNTY: WAUSHARA      PLAN DETAILS: CULVERT REPLACEMENT STA. 67+35      SHEET      E

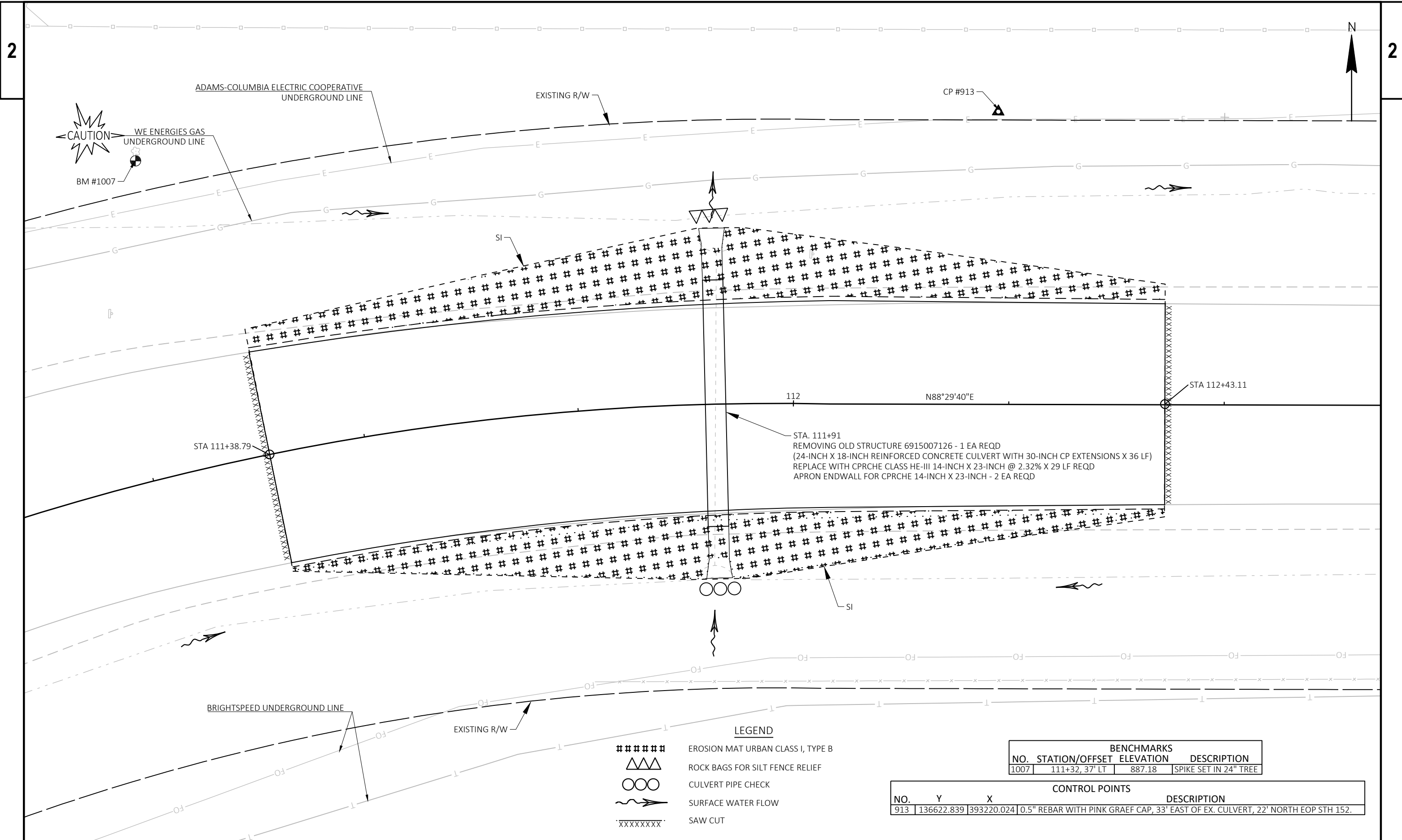


BENCHMARKS			DESCRIPTION
NO.	STATION/OFFSET	ELEVATION	
1004	91+31, 29' LT	879.67	SPIKE SET IN 7" TREE

CONTROL POINTS				DESCRIPTION
NO.	Y	X		
910	134663.761	392993.989	0.5" REBAR WITH PINK GRAEF CAP,	36' SOUTH OF EX. CULVERT, 15' EAST EOP STH 152.

**LEGEND**

- ##### EROSION MAT URBAN CLASS I, TYPE B
- ▲▲▲▲ ROCK BAGS FOR SILT FENCE RELIEF
- CULVERT PIPE CHECK
- ~> SURFACE WATER FLOW
- · · · · SAW CUT



ADAMS-COLUMBIA ELECTRIC COOPERATIVE UNDERGROUND LINE

EXISTING R/W

CP #913

CAUTION  
WE ENERGIES GAS UNDERGROUND LINE  
BM #1007

STA 111+38.79

112

N88°29'40"E

STA 112+43.11

STA. 111+91  
REMOVING OLD STRUCTURE 6915007126 - 1 EA REQD  
(24-INCH X 18-INCH REINFORCED CONCRETE CULVERT WITH 30-INCH CP EXTENSIONS X 36 LF)  
REPLACE WITH CPRCHE CLASS HE-III 14-INCH X 23-INCH @ 2.32% X 29 LF REQD  
APRON ENDWALL FOR CPRCHE 14-INCH X 23-INCH - 2 EA REQD

BRIGHTSPEED UNDERGROUND LINE

EXISTING R/W

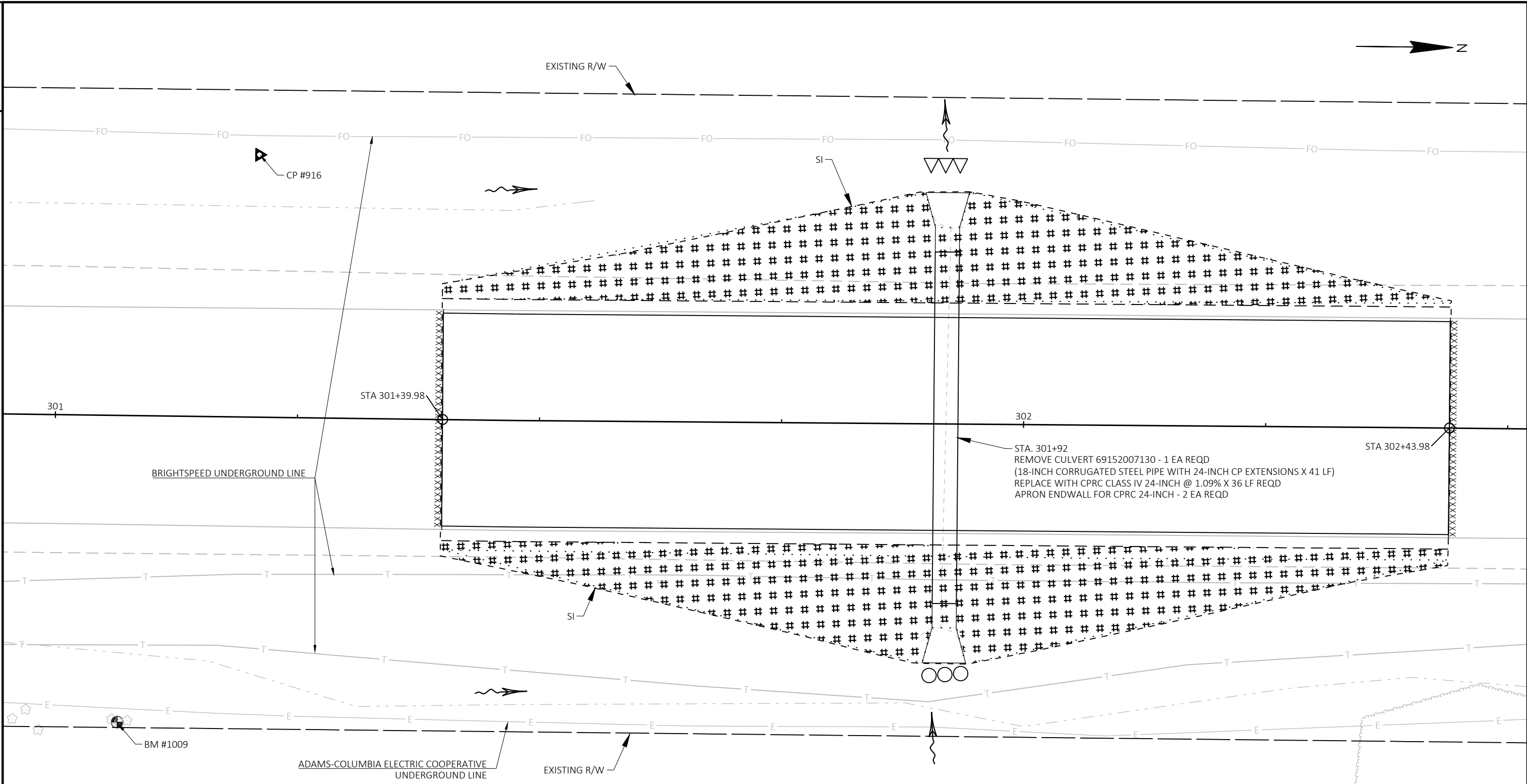
LEGEND

- ##### EROSION MAT URBAN CLASS I, TYPE B
- ▲▲▲▲ ROCK BAGS FOR SILT FENCE RELIEF
- CULVERT PIPE CHECK
- ~~~~~ SURFACE WATER FLOW
- XXXXXXX SAW CUT

BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1007	111+32, 37' LT	887.18	SPIKE SET IN 24" TREE

CONTROL POINTS			
NO.	Y	X	DESCRIPTION
913	136622.839	393220.024	0.5" REBAR WITH PINK GRAEF CAP, 33' EAST OF EX. CULVERT, 22' NORTH EOP STH 152.





- LEGEND**
- ##### EROSION MAT URBAN CLASS I, TYPE B
  - ▲▲▲ ROCK BAGS FOR SILT FENCE RELIEF
  - CULVERT PIPE CHECK
  - ~> SURFACE WATER FLOW
  - XXXXXXX· SAW CUT

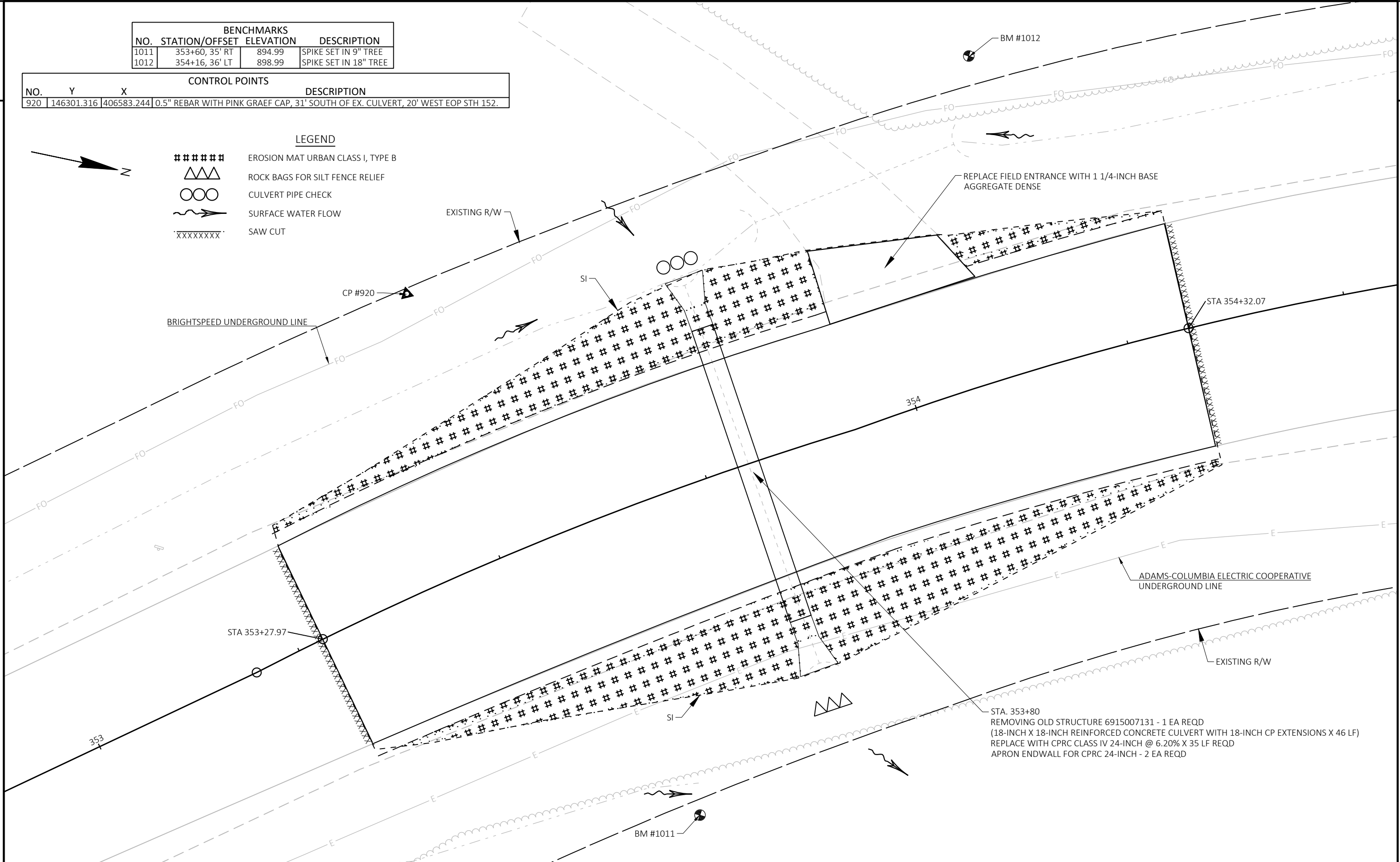
BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1009	301+07, 32' RT	893.87	SPIKE SET IN 5" TREE

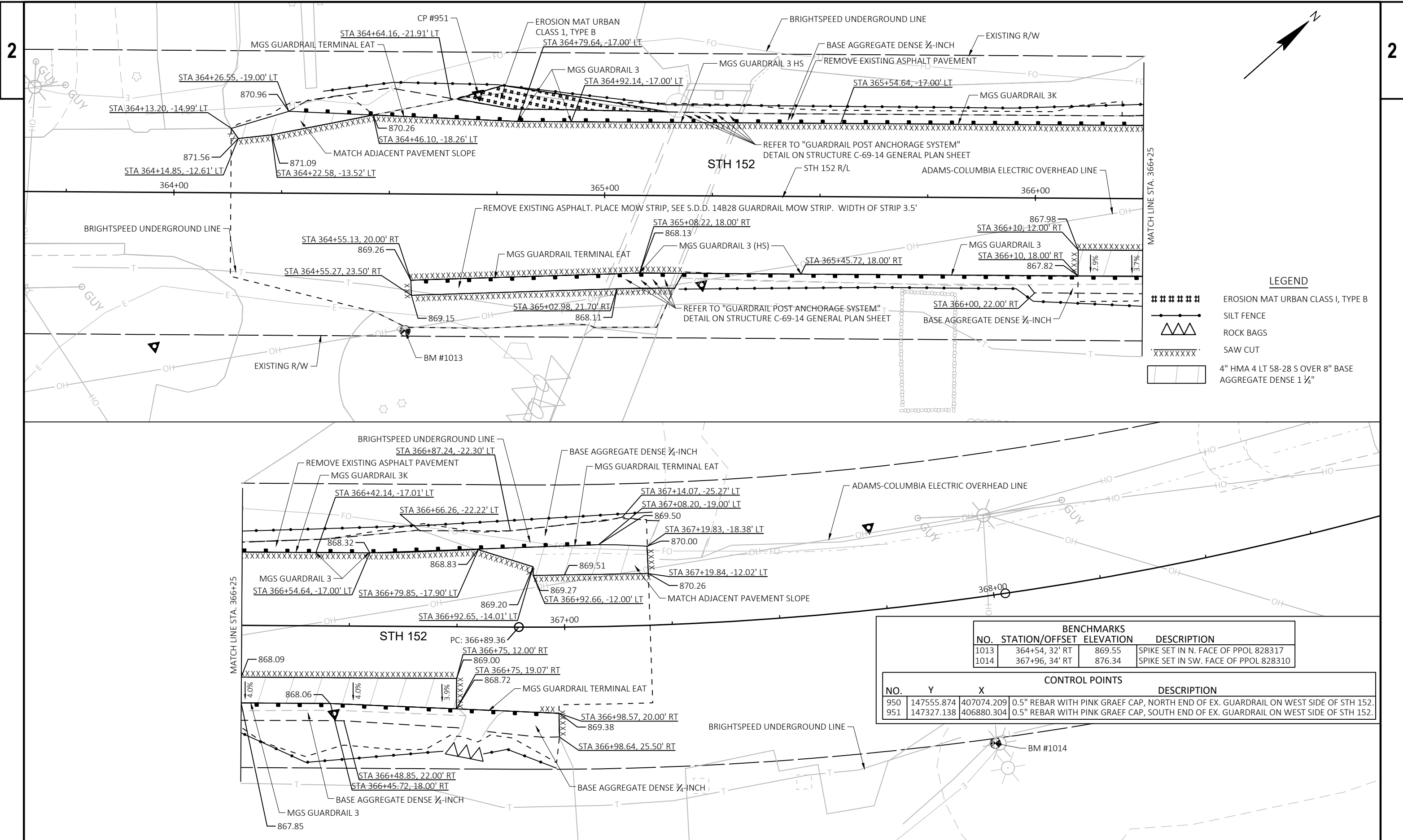
CONTROL POINTS				
NO.	Y	X	DESCRIPTION	
916	141489.476	407840.240	0.5" REBAR WITH PINK GRAEF CAP, 71' SOUTH OF EX. CULVERT, 16' WEST EOP STH 152.	

BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1011	353+60, 35' RT	894.99	SPIKE SET IN 9" TREE
1012	354+16, 36' LT	898.99	SPIKE SET IN 18" TREE

CONTROL POINTS			
NO.	Y	X	DESCRIPTION
920	146301.316	406583.244	0.5" REBAR WITH PINK GRAEF CAP, 31' SOUTH OF EX. CULVERT, 20' WEST EOP STH 152.

- LEGEND**
- ##### EROSION MAT URBAN CLASS I, TYPE B
  - △△△△ ROCK BAGS FOR SILT FENCE RELIEF
  - CULVERT PIPE CHECK
  - ~> SURFACE WATER FLOW
  - 'xxxxxxx' SAW CUT





**LEGEND**

- ##### EROSION MAT URBAN CLASS I, TYPE B
- SILT FENCE
- ▲▲▲ ROCK BAGS
- XXXXXXX SAW CUT
- ▭ 4" HMA 4 LT 58-28 S OVER 8" BASE AGGREGATE DENSE 1 1/4"

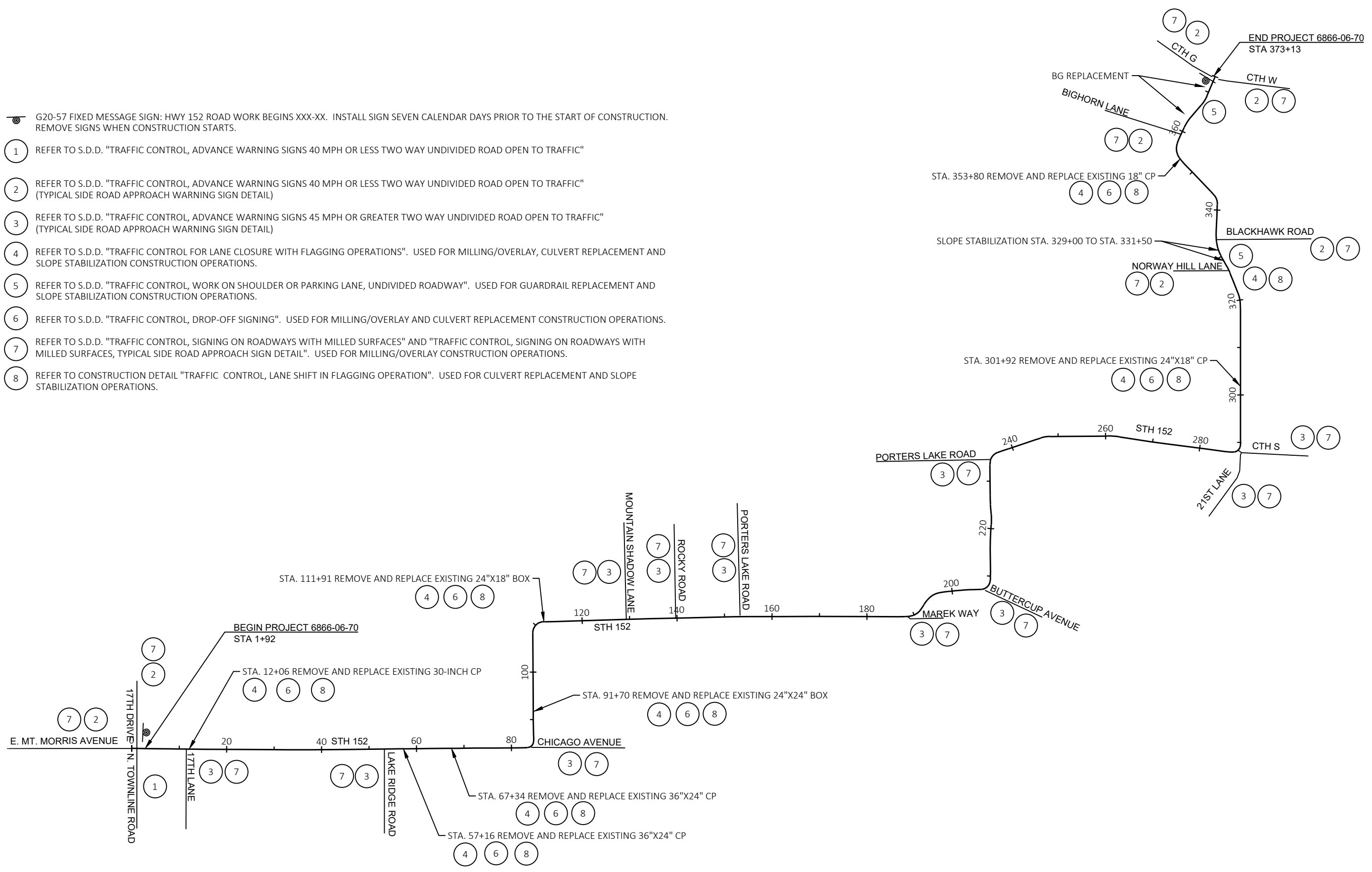
BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1013	364+54, 32' RT	869.55	SPIKE SET IN N. FACE OF PPOL 828317
1014	367+96, 34' RT	876.34	SPIKE SET IN SW. FACE OF PPOL 828310

CONTROL POINTS			
NO.	Y	X	DESCRIPTION
950	147555.874	407074.209	0.5" REBAR WITH PINK GRAEF CAP, NORTH END OF EX. GUARDRAIL ON WEST SIDE OF STH 152.
951	147327.138	406880.304	0.5" REBAR WITH PINK GRAEF CAP, SOUTH END OF EX. GUARDRAIL ON WEST SIDE OF STH 152.



G20-57 FIXED MESSAGE SIGN: HWY 152 ROAD WORK BEGINS XXX-XX. INSTALL SIGN SEVEN CALENDAR DAYS PRIOR TO THE START OF CONSTRUCTION. REMOVE SIGNS WHEN CONSTRUCTION STARTS.

- 1 REFER TO S.D.D. "TRAFFIC CONTROL, ADVANCE WARNING SIGNS 40 MPH OR LESS TWO WAY UNDIVIDED ROAD OPEN TO TRAFFIC"
- 2 REFER TO S.D.D. "TRAFFIC CONTROL, ADVANCE WARNING SIGNS 40 MPH OR LESS TWO WAY UNDIVIDED ROAD OPEN TO TRAFFIC" (TYPICAL SIDE ROAD APPROACH WARNING SIGN DETAIL)
- 3 REFER TO S.D.D. "TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45 MPH OR GREATER TWO WAY UNDIVIDED ROAD OPEN TO TRAFFIC" (TYPICAL SIDE ROAD APPROACH WARNING SIGN DETAIL)
- 4 REFER TO S.D.D. "TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATIONS". USED FOR MILLING/OVERLAY, CULVERT REPLACEMENT AND SLOPE STABILIZATION CONSTRUCTION OPERATIONS.
- 5 REFER TO S.D.D. "TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY". USED FOR GUARDRAIL REPLACEMENT AND SLOPE STABILIZATION CONSTRUCTION OPERATIONS.
- 6 REFER TO S.D.D. "TRAFFIC CONTROL, DROP-OFF SIGNING". USED FOR MILLING/OVERLAY AND CULVERT REPLACEMENT CONSTRUCTION OPERATIONS.
- 7 REFER TO S.D.D. "TRAFFIC CONTROL, SIGNING ON ROADWAYS WITH MILLED SURFACES" AND "TRAFFIC CONTROL, SIGNING ON ROADWAYS WITH MILLED SURFACES, TYPICAL SIDE ROAD APPROACH SIGN DETAIL". USED FOR MILLING/OVERLAY CONSTRUCTION OPERATIONS.
- 8 REFER TO CONSTRUCTION DETAIL "TRAFFIC CONTROL, LANE SHIFT IN FLAGGING OPERATION". USED FOR CULVERT REPLACEMENT AND SLOPE STABILIZATION OPERATIONS.



Estimate Of Quantities

6866-06-70

Line	Item	Item Description	Unit	Total	Qty
0002	201.0110	Clearing	SY	776.000	776.000
0004	201.0210	Grubbing	SY	776.000	776.000
0006	203.0100	Removing Small Pipe Culverts	EACH	1.000	1.000
0008	203.0220	Removing Structure (structure) 01. Culvert ID 6915007121	EACH	1.000	1.000
0010	203.0220	Removing Structure (structure) 02. Culvert ID 6915007123	EACH	1.000	1.000
0012	203.0220	Removing Structure (structure) 03. Culvert ID 6915007124	EACH	1.000	1.000
0014	203.0220	Removing Structure (structure) 04. Culvert ID 6915007125	EACH	1.000	1.000
0016	203.0220	Removing Structure (structure) 05. Culvert ID 6915007126	EACH	1.000	1.000
0018	203.0220	Removing Structure (structure) 06. Culvert ID 6915007131	EACH	1.000	1.000
0020	204.0110	Removing Asphaltic Surface	SY	104.000	104.000
0022	204.0115	Removing Asphaltic Surface Butt Joints	SY	372.000	372.000
0024	204.0120	Removing Asphaltic Surface Milling	SY	99,416.000	99,416.000
0026	204.0165	Removing Guardrail	LF	430.000	430.000
0028	204.0180	Removing Delineators and Markers	EACH	14.000	14.000
0030	205.0100	Excavation Common	CY	2,133.000	2,133.000
0032	206.2001	Excavation for Structures Culverts (structure) 01. C-69-14	EACH	1.000	1.000
0034	208.0100	Borrow	CY	793.000	793.000
0036	208.1500.S	Temporary Lane Shift During Culvert Work	EACH	8.000	8.000
0038	211.0101	Prepare Foundation for Asphaltic Paving (project) 01. 6866-06-70	EACH	1.000	1.000
0040	211.0400	Prepare Foundation for Asphaltic Shoulders	STA	715.000	715.000
0042	213.0100	Finishing Roadway (project) 01. 6866-06-70	EACH	1.000	1.000
0044	305.0110	Base Aggregate Dense 3/4-Inch	TON	1,151.000	1,151.000
0046	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	1,440.000	1,440.000
0048	416.1010	Concrete Surface Drains	CY	1.500	1.500
0050	450.4000	HMA Cold Weather Paving	TON	14,587.000	14,587.000
0052	455.0605	Tack Coat	GAL	6,097.000	6,097.000
0054	460.0105.S	HMA Percent Within Limits (PWL) Test Strip Volumetrics	EACH	1.000	1.000
0056	460.0110.S	HMA Percent Within Limits (PWL) Test Strip Density	EACH	1.000	1.000
0058	460.2005	Incentive Density PWL HMA Pavement	DOL	12,246.000	12,246.000
0060	460.2007	Incentive Density HMA Pavement Longitudinal Joints	DOL	18,570.000	18,570.000
0062	460.2010	Incentive Air Voids HMA Pavement	DOL	14,587.000	14,587.000
0064	460.5224	HMA Pavement 4 LT 58-28 S	TON	14,587.000	14,587.000
0066	465.0110	Asphaltic Surface Patching	TON	130.000	130.000
0068	522.0424	Culvert Pipe Reinforced Concrete Class IV 24-Inch	LF	166.000	166.000
0070	522.1024	Apron Endwalls for Culvert Pipe Reinforced Concrete 24-Inch	EACH	10.000	10.000
0072	522.2314	Culvert Pipe Reinforced Concrete Horizontal Elliptical Class HE-III 14x23-Inch	LF	29.000	29.000
0074	522.2324	Culvert Pipe Reinforced Concrete Horizontal Elliptical Class HE-III 24x38-Inch	LF	34.000	34.000
0076	522.2614	Apron Endwalls for Culvert Pipe Reinforced Concrete Horizontal Elliptical 14x23-Inch	EACH	2.000	2.000
0078	522.2624	Apron Endwalls for Culvert Pipe Reinforced Concrete Horizontal Elliptical 24x38-Inch	EACH	2.000	2.000
0080	601.0411	Concrete Curb & Gutter 30-Inch Type D	LF	193.000	193.000
0082	606.0200	Riprap Medium	CY	2.000	2.000
0084	606.0300	Riprap Heavy	CY	156.000	156.000
0086	614.0397	Guardrail Mow Strip Emulsified Asphalt	SY	27.000	27.000
0088	614.2300	MGS Guardrail 3	LF	112.500	112.500
0090	614.2310	MGS Guardrail 3 HS	LF	100.000	100.000
0092	614.2330	MGS Guardrail 3 K	LF	100.000	100.000
0094	614.2610	MGS Guardrail Terminal EAT	EACH	4.000	4.000
0096	614.8010	Anchor Post Assembly Top Mount	EACH	9.000	9.000
0098	618.0100	Maintenance And Repair of Haul Roads (project) 01. 6866-06-70	EACH	1.000	1.000



Estimate Of Quantities

6866-06-70

Line	Item	Item Description	Unit	Total	Qty
0100	619.1000	Mobilization	EACH	1.000	1.000
0102	624.0100	Water	MGAL	51.800	51.800
0104	625.0100	Topsoil	SY	1,911.000	1,911.000
0106	628.1504	Silt Fence	LF	898.000	898.000
0108	628.1520	Silt Fence Maintenance	LF	898.000	898.000
0110	628.1905	Mobilizations Erosion Control	EACH	8.000	8.000
0112	628.1910	Mobilizations Emergency Erosion Control	EACH	2.000	2.000
0114	628.2008	Erosion Mat Urban Class I Type B	SY	1,906.000	1,906.000
0116	628.7555	Culvert Pipe Checks	EACH	22.000	22.000
0118	628.7570	Rock Bags	EACH	125.000	125.000
0120	629.0210	Fertilizer Type B	CWT	1.250	1.250
0122	630.0120	Seeding Mixture No. 20	LB	49.400	49.400
0124	630.0140	Seeding Mixture No. 40	LB	1.800	1.800
0126	630.0171	Seeding Mixture No. 70A	LB	7.300	7.300
0128	630.0500	Seed Water	MGAL	34.800	34.800
0130	633.5200	Markers Culvert End	EACH	14.000	14.000
0132	642.5201	Field Office Type C	EACH	1.000	1.000
0134	643.0300	Traffic Control Drums	DAY	400.000	400.000
0136	643.0900	Traffic Control Signs	DAY	3,682.000	3,682.000
0138	643.1000	Traffic Control Signs Fixed Message	SF	36.000	36.000
0140	643.3105	Temporary Marking Line Paint 4-Inch	LF	115,752.000	115,752.000
0142	643.5000	Traffic Control	EACH	1.000	1.000
0144	645.0120	Geotextile Type HR	SY	425.000	425.000
0146	646.1020	Marking Line Epoxy 4-Inch	LF	74,093.000	74,093.000
0148	646.4520	Marking Line Same Day Epoxy 4-Inch	LF	60,287.000	60,287.000
0150	646.6464	Cold Weather Marking Epoxy 4-Inch	LF	134,380.000	134,380.000
0152	650.5500	Construction Staking Curb Gutter and Curb & Gutter	LF	193.000	193.000
0154	650.6000	Construction Staking Pipe Culverts	EACH	7.000	7.000
0156	650.8000	Construction Staking Resurfacing Reference	LF	37,121.000	37,121.000
0158	650.9911	Construction Staking Supplemental Control (project) 01. 6866-06-70	EACH	1.000	1.000
0160	650.9920	Construction Staking Slope Stakes	LF	1,196.000	1,196.000
0162	690.0150	Sawing Asphalt	LF	1,100.000	1,100.000
0164	740.0440	Incentive IRI Ride	DOL	28,122.000	28,122.000
0166	SPV.0060	Special 01. Reestablish Section Corner Monuments	EACH	7.000	7.000

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**CLEARING & GRUBBING**

STATION TO STATION	201.0110	201.0210
	CLEARING SY	GRUBBING SY
STH 152		
329+25 RT - 331+50 RT	776	776
TOTALS	776	776

**REMOVING SMALL PIPE CULVERTS**  
 REMOVING SMALL PIPE CULVERTS  
 203.0100

STATION	EACH
STH 152	
301+92	1
TOTALS	1

**REMOVING ASPHALTIC SURFACE**

STATION TO STATION	204.0110
	REMOVING ASPHALTIC SURFACE SY
STH 152	
364+47 - 367+20	104
TOTALS	104

**REMOVING ASPHALTIC SURFACE MILLING**

STATION TO STATION	204.0120
	REMOVING ASPHALTIC SURFACE MILLING SY
STH 152	
2+02 - 11+54	2,425
11+54 - 53+21	10,480
53+21 - 83+34	7,575
83+34 - 153+26	17,925
153+26 - 205+88	13,568
205+88 - 233+97	7,383
233+97 - 287+43	13,976
287+43 - 333+77	12,178
333+77 - 359+30	6,654
359+30 - 373+03	4,631
17TH LANE	156
LAKE RIDGE ROAD	173
CHICAGO AVENUE	678
PORTERS LAKE ROAD	202
BUTTERCUP AVENUE	363
PORTERS LAKE ROAD	327
CTH S	294
BLACKHAWK ROAD	219
BIGHORN LANE	209
TOTALS	99,416

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**REMOVING GUARDRAIL**

STATION TO STATION	204.0165
	REMOVING GUARDRAIL LF
STH 152	
364+62 RT - 366+97 RT	239
364+76 LT - 366+67 LT	191
TOTALS	430

**REMOVING DELINEATORS AND MARKERS**  
 204.0180  
 REMOVING DELINEATORS AND MARKERS

STATION	EACH
STH 152	
12+06	2
57+16	2
67+35	2
91+70	2
111+91	2
301+92	2
353+80	2
TOTALS	14

**REMOVING STRUCTURE**

STATION	DESCRIPTION	REMOVING STRUCTURE
		203.0220 EACH
STH 152		
12+06	CULVERT ID 6915007121	1
57+16	CULVERT ID 6915007123	1
67+35	CULVERT ID 6915007124	1
91+70	CULVERT ID 6915007125	1
111+91	CULVERT ID 6915007126	1
353+80	CULVERT ID 6915007131	1
TOTALS		6

**REMOVING ASPHALTIC SURFACE BUTT JOINTS**

STATION TO STATION	204.0115
	REMOVING ASPHALTIC SURFACE BUTT JOINTS SY
STH 152	
1+92 - 2+02	34
17th LANE	25
LAKE RIDGE ROAD	54
CHICAGO AVENUE	27
PORTERS LAKE ROAD	30
BUTTERCUP AVENUE	22
PORTERS LAKE ROAD	24
CTH S	34
BLACKHAWK ROAD	25
BIGHORN LANE	23
372+46 - 372+56	74
TOTALS	372

NOTE: ALL ITEMS ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED.

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DIVISION	FROM/TO STATION	LOCATION	205.0100 COMMON EXCAVATION	SALVAGED/UNUSABLE PAVEMENT MATERIAL (2)	AVAILABLE MATERIAL (3)	UNEXPANDED FILL	EXPANDED FILL (4)	MASS ORDINATE +/- (5)	WASTE	208.0100 BORROW	COMMENT
			CUT (1)				FACTOR 1.25				
DIVISION 1											
	11+54 - 12+59	CULVERT STA. 12+06	309	31	278	--	--	278	278	--	
	56+63 - 57+69	CULVERT STA. 57+16	264	28	236	--	--	236	236	--	
	66+82 - 67+87	CULVERT STA. 67+35	303	28	275	--	--	275	275	--	
	91+17 - 92+22	CULVERT STA. 91+70	220	30	190	--	--	190	190	--	
	111+39 - 112+43	CULVERT STA. 111+91	249	30	219	--	--	219	219	--	
	301+40 - 302+44	CULVERT STA. 301+92	313	29	284	--	--	284	284	--	
	353+28 - 354+32	CULVERT STA. 353+80	321	32	289	--	--	289	289	--	
	329+38 - 331+31	SLOPE STABILIZATION	118	--	118	634	793	-675	118	793	
	364+13.20 - 364+46.82	GUARDRAIL REPLACEMENT	3	--	3	1	1	2	2	--	
	366+10 - 366+93.80	GUARDRAIL REPLACEMENT	24	6	18	--	--	18	18	--	
	366+79.85 - 367+19.84	GUARDRAIL REPLACEMENT	9	--	9	--	--	9	9	--	
DIVISION 1 SUBTOTAL			2,133	214	1,919	635	794	1,125	1,918	793	
GRAND TOTAL			2,133	214	1,919	635	794	1,125	1,918	793	
TOTAL COMMON EXC			2,133								

## NOTES:

(1) SALVAGED/UNUSABLE PAVEMENT MATERIAL IS INCLUDED IN CUT.

(2) SALVAGED/UNUSABLE PAVEMENT MATERIAL

(3) AVAILABLE MATERIAL = CUT - SALVAGED/UNUSABLE PAVEMENT MATERIAL

(4) EXPANDED FILL FACTOR = 1.25

(5) THE MASS ORDINATE + OR - QTY CALCULATED FOR THE DIVISION. PLUS QUANTITY INDICATES AN EXCESS OF MATERIAL WITHIN THE DIVISION. MINUS INDICATES A SHORTAGE OF MATERIAL WITHIN THE DIVISION.

(6) FACTORS USED TO COMPUTE ANTICIPATED WASTE AND THE COMPUTED WASTE VOLUME IDENTIFIED ARE FOR GENERAL INFORMATION ONLY.

NOTE: ALL ITEMS ON THIS  
SHEET ARE CATEGORY 0010  
UNLESS OTHERWISE NOTED.

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EXCAVATION FOR STRUCTURES CULVERTS

206.2001.01  
EXCAVATION FOR  
STRUCTURES CULVERTS  
(STRUCTURE) 01. C-69-14

STRUCTURE	(EACH)
STH 152	
C-69-14	1
TOTALS	1

TEMPORARY LANE SHIFT DURING CULVERT WORK

208.1500.S  
TEMPORARY LANE SHIFT  
DURING CULVERT WORK

STATION	EACH	REMARKS
STH 152		
12+06	1	CULVERT REPLACEMENT
57+16	1	CULVERT REPLACEMENT
67+35	1	CULVERT REPLACEMENT
91+70	1	CULVERT REPLACEMENT
111+91	1	CULVERT REPLACEMENT
301+92	1	CULVERT REPLACEMENT
353+80	1	CULVERT REPLACEMENT
330+35	1	SLOPE STABILIZATION
TOTALS	8	

PREPARE FOUNDATION FOR ASPHALTIC PAVING

211.0101.01  
PREPARE FOUNDATION  
FOR ASPHALTIC PAVING  
(PROJECT) 01. 6866-06-70

PROJECT	(EACH)
STH 152	
6866-06-70	1
TOTALS	1

PREPARE FOUNDATION FOR ASPHALT SHOULDER

211.0400  
PREPARE  
FOUNDATION FOR  
ASPHALT SHOULDER

STATION TO STATION	LOCATION	(STA)
STH 152		
1+92 - 11+07	RT	10
1+92 - 152+78	LT	151
11+79 - 52+82	RT	42
53+71 - 83+34	RT	30
84+92 - 206+30	RT	122
153+57 - 233+99	LT	81
207+40 - 287+88	RT	81
234+95 - 358+83	LT	124
288+74 - 329+38	RT	41
331+39 - 333+32	RT	2
334+30 - 361+53	RT	28
359+74 - 361+30	LT	2
362+74 - 363+70	LT	1
TOTALS		715

BASE AGGREGATE DENSE 3/4-INCH

305.0110 624.0100*  
BASE AGGREGATE WATER  
DENSE 3/4-INCH

STATION TO STATION	TON	MGAL
STH 152		
1+92 - 11+54	24	0.5
11+54 - 12+59	12	0.2
12+59 - 53+21	98	2.0
53+21 - 56+63	8	0.2
56+63 - 57+69	13	0.3
57+69 - 66+82	22	0.4
66+82 - 67+87	13	0.3
67+87 - 83+34	37	0.7
83+34 - 91+17	20	0.4
91+17 - 92+21	13	0.3
92+21 - 111+39	46	0.9
111+39 - 112+43	13	0.3
112+43 - 153+26	99	2.0
153+26 - 205+88	127	2.5
205+88 - 233+97	69	1.4
233+97 - 287+43	131	2.6
287+43 - 301+40	34	0.7
301+40 - 302+44	13	0.3
302+44 - 333+73	74	1.5
333+73 - 353+28	47	0.9
353+28 - 354+32	12	0.2
354+32 - 359+30	12	0.2
359+30 - 373+13	64	1.3
UNDISTRIBUTED	150	3.0
TOTALS	1,151	23.0

* ADDITIONAL QUANTITY LISTED ELSEWHERE

BASE AGGREGATE DENSE 1 1/4-INCH

305.0120 624.0100*  
BASE AGGREGATE WATER  
DENSE 1 1/4-INCH

STATION TO STATION	TON	MGAL
STH 152		
11+54 - 12+59	166	3.3
56+62 - 57+69	160	3.2
66+82 - 67+87	157	3.1
91+17 - 92+21	157	3.1
111+39 - 112+43	167	3.3
301+40 - 302+44	157	3.1
329+38 RT - 331+31 RT	56	1.1
353+28 - 354+32	178	3.6
364+13 LT - 364+47 LT	4	0.1
366+10 RT - 366+75 RT	40	0.8
366+80 LT - 367+20 LT	10	0.2
UNDISTRIBUTED	188	3.8
TOTALS	1,440	28.8

* ADDITIONAL QUANTITY LISTED ELSEWHERE

NOTE: ALL ITEMS ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED.

3

**HMA PAVEMENT**

450.4000      460.5224      465.0110      455.0605  
HMA COLD WEATHER PAVING   4 LT 58-28 S   ASPHALTIC SURFACE PATCHING   TACK COAT

STATION TO STATION	TON	TON	TON	GAL	REMARKS
STH 152					
1+92 - 11+54	350	350	---	148	---
11+54 - 12+59	100	100	---	31	---
12+59 - 53+21	1,458	1,458	---	613	---
53+21 - 56+63	120	120	---	51	---
56+63 - 57+69	101	101	---	31	---
57+69 - 66+82	325	325	---	136	---
66+82 - 67+87	100	100	---	31	---
67+87 - 83+34	560	560	---	236	---
83+34 - 91+17	299	299	---	128	---
91+17 - 92+22	102	102	---	32	---
92+22 - 111+39	709	709	---	299	---
111+39 - 112+43	102	102	---	32	---
112+43 - 153+26	1,465	1,465	---	616	---
153+26 - 205+88	1,933	1,933	---	814	---
205+88 - 233+97	1,048	1,048	---	443	---
233+97 - 287+43	1,987	1,987	---	839	---
287+43 - 301+40	510	510	---	215	---
301+40 - 302+44	100	100	---	31	---
302+44 - 333+77	1,193	1,193	---	501	---
333+77 - 353+28	712	712	---	300	---
353+28 - 354+32	104	104	---	33	---
354+32 - 359+30	191	191	---	81	---
359+30 - 373+13	645	645	---	282	---
17TH LANE	23	23	---	11	---
LAKE RIDGE ROAD	29	29	---	14	---
CHICAGO AVENUE	91	91	---	42	---
PORTERS LAKE ROAD	30	30	---	14	---
BUTTERCUP AVENUE	50	50	---	23	---
PORTERS LAKE ROAD	46	46	---	21	---
CTH S	42	42	---	20	---
BLACKHAWK ROAD	32	32	---	15	---
BIGHORN LANE	30	30	---	14	---
UNDISTRIBUTED	---	---	130	---	PATCHING ITEM USED FOR MINOR REPAIRS PRIOR TO OVERLAY
TOTALS	14,587	14,587	130	6,097	

**PWL MIXTURE USE TABLE**

LOCATION	STATION TO STATION	MIXTURE USE	UNDERLYING SURFACE	BID ITEM	*TONS	THICKNESS	QUALITY MANAGEMENT PROGRAM TO BE USED:	
							MIXTURE ACCEPTANCE	DENSITY ACCEPTANCE
STH 152 11-FOOT DRIVING LANES	1+92 - 373+13	UPPER LAYER	MILLED EXISTING HMA SURFACE	4 LT 58-28 S	12,246	2.25"	PWL INCENTIVE AIR VOIDS HMA PAVEMENT (460.2010)	INCENTIVE DENSITY PWL HMA PAVEMENT (460.2005)
STH 152 SHOULDERS	1+92 - 373+13	UPPER LAYER	BASE AGGREGATE DENSE	4 LT 58-28 S	1,364	2.25"	PWL INCENTIVE AIR VOIDS HMA PAVEMENT (460.2010)	ACCEPTANCE TESTING BY THE DEPARTMENT; NOT ELIGIBLE FOR INCENTIVE
SIDEROADS		UPPER LAYER	MILLED EXISTING HMA SURFACE	4 LT 58-28 S	373	2.25"	PWL INCENTIVE AIR VOIDS HMA PAVEMENT (460.2010)	ACCEPTANCE TESTING BY THE DEPARTMENT; NOT ELIGIBLE FOR INCENTIVE
VARIOUS		CULVERT PATCHES	BASE AGGREGATE DENSE	4 LT 58-28 S	438	4.25"	PWL INCENTIVE AIR VOIDS HMA PAVEMENT (460.2010)	ACCEPTANCE TESTING BY THE DEPARTMENT; NOT ELIGIBLE FOR INCENTIVE
STH 152 SHOULDER AT GUARDRAIL REPLACEMENTS	364+13.20 - 364+46.10 366+10 - 366+75 366+79.85 - 367+19.84	SHOULDER	BASE AGGREGATE DENSE	4 LT 58-28 S	166	4"	PWL INCENTIVE AIR VOIDS HMA PAVEMENT (460.2010)	ACCEPTANCE TESTING BY THE DEPARTMENT; NOT ELIGIBLE FOR INCENTIVE

*QUANTITIES ARE APPROXIMATE

NOTE: ALL ITEMS ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED.



**CULVERT PIPES**

	522.0424 CULVERT PIPE REINFORCED CONCRETE CLASS IV 24-INCH (LF)	522.2314 CULVERT PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL CLASS HE-III 14X23-INCH (LF)	522.2324 CULVERT PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL CLASS HE-III 24X38-INCH (LF)	522.1024 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE 24-INCH (EA)	522.2614 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL 14X23-INCH (EA)	522.2624 APRON ENDWALLS FOR CULVERT PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL 24X38-INCH (EA)	633.5200 MARKERS CULVERT ENDS (EA)
STH 152							
12+06	30	---	---	2	---	---	2
57+16	---	---	34	---	---	2	2
67+35	37	---	---	2	---	---	2
91+70	28	---	---	2	---	---	2
111+91	---	29	---	---	2	---	2
301+92	36	---	---	2	---	---	2
353+80	35	---	---	2	---	---	2
TOTALS	166	29	34	10	2	2	14

**CONCRETE CURB AND GUTTER**

STATION	TO STATION	LOCATION	601.0411 30-INCH TYPE D (LF)
STH 152			
STA. 329+38	- STA. 331+31	RT	193
TOTALS			193

**RIPRAP AND GEOTEXTILE**

STATION TO STATION	LOCATION	606.0300 RIPRAP HEAVY (CY)	645.0120* GEOTEXTILE TYPE HR (SY)
STH 152			
329+38 - 331+31 RT	SLOPE STABILIZATION	156	385
TOTALS		156	385

* ADDITIONAL QUANTITY LISTED ELSEWHERE

**CONCRETE SURFACE DRAIN ITEMS**

STATION	LOCATION	416.1010 CONCRETE SURFACE DRAIN (CY)	606.0200 RIP RAP MEDIUM (CY)	645.0120* GEOTEXTILE TYPE HR (SY)
STH 152				
331+37	RT	1.5	2	40
TOTALS		1.5	2	40

* ADDITIONAL QUANTITY LISTED ELSEWHERE

**GUARDRAIL**

STATION	TO STATION	LOCATION	614.2300 MGS GUARDRAIL 3 (LF)	614.2310 MGS GUARDRAIL 3 HS (LF)	614.2330 MGS GUARDRAIL 3 K (LF)	614.2610 MGS GUARDRAIL TERMINAL EAT (EA)	614.8010 ANCHOR POST ASSEMBLY TOP MOUNT (EA)
STH 152							
STA. 365+05	- STA. 365+08	RT	---	---	---	---	1
STA. 365+08	- STA. 365+46	RT	---	37.5	---	---	3
STA. 365+46	- STA. 366+46	RT	100.0	---	---	---	---
STA. 364+80	- STA. 364+92	LT	12.5	---	---	---	---
STA. 364+92	- STA. 365+55	LT	---	62.5	---	---	5
STA. 365+55	- STA. 366+55	LT	---	---	100.0	---	---
STA. 364+27	-	LT	---	---	---	1	---
STA. 364+55	-	RT	---	---	---	1	---
STA. 366+99	-	RT	---	---	---	1	---
STA. 367+08	-	LT	---	---	---	1	---
TOTALS			112.5	100.0	100.0	4	9

**GUARDRAIL MOW STRIP EMULSIFIED ASPHALT**

STATION TO STATION	614.0397 GUARDRAIL MOW STRIP EMULSIFIED ASPHALT (SY)
STH 152	
364+55 - 365+18	27
TOTALS	27

NOTE: ALL ITEMS ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED.

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**LANDSCAPE SUMMARY**

STATION TO STAION	CULVERT LOCATION	625.0100 TOPSOIL (SY)	629.0210 FERTILIZER TYPE B (CWT)	630.0120 SEEDING MIXTURE NO.20 (LB)	630.0140 SEEDING MIXTURE NO.40 (LB)	630.0171 SEEDING MIXTURE NO.70A (LB)	630.0500 SEED WATER (4 WEEK TOTAL) (MGAL)
STH 152							
11+54 - 12+59	CULVERT REPLACEMENT	75	0.05	---	1.4	0.3	1.7
56+63 - 57+69	CULVERT REPLACEMENT	111	0.07	3.0	---	0.4	2.5
66+82 - 67+87	CULVERT REPLACEMENT	125	0.08	3.4	---	0.5	2.9
91+17 - 92+22	CULVERT REPLACEMENT	74	0.05	2.0	---	0.3	1.7
111+39 - 112+43	CULVERT REPLACEMENT	83	0.06	2.3	---	0.3	1.9
301+40 - 302+44	CULVERT REPLACEMENT	129	0.09	3.5	---	0.5	2.9
329+30 - 331+50	SLOPE STABILIZATION	815	0.52	22.1	---	3.0	18.4
353+28 - 354+32	CULVERT REPLACEMENT	107	0.07	2.9	---	0.4	2.5
364+29 - 367+17	GUARDRAIL REPLACEMENT	10	0.01	0.3	---	0.1	0.3
	UNDISTRIBUTED	382	0.25	9.9	0.4	1.5	---
	TOTALS	1,911	1.25	49.4	1.8	7.3	34.8

**TRAFFIC CONTROL SUMMARY**

LOCATION	DAYS IN PHASE	643.0300 TRAFFIC CONTROL DRUMS		643.0900 TRAFFIC CONTROL SIGNS		643.1000 SIGNS FIXED MESSAGE
		(NO.)	(DAYS)	(NO.)	(DAYS)	(SF)
STH 152						
ADVANCED WARNING MAINLINE	72	---	---	4	288	36
ADVANCE WARNING SIDEROADS	72	---	---	18	1,296	---
MILLING AND OVERLAY	72	---	---	28	2,016	---
GUARDRAIL REPLACEMENT	14	12	168	1	14	---
SLOPE STABILIZATION	12	10	120	1	12	---
STA. 12+06 CULVERT	2	8	16	4	8	---
STA. 57+16 CULVERT	2	8	16	4	8	---
STA. 67+35 CULVERT	2	8	16	4	8	---
STA. 91+70 CULVERT	2	8	16	4	8	---
STA. 111+91 CULVERT	2	8	16	4	8	---
STA. 301+92 CULVERT	2	8	16	4	8	---
STA. 353+80 CULVERT	2	8	16	4	8	---
	TOTALS	78	400	80	3,682	36

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**EROSION CONTROL ITEMS**

STATION TO STATION	LOCATION	628.1504 SILT FENCE (LF)	628.1520 SILT FENCE MAINTENANCE (LF)	628.2008 EROSION MAT URBAN CLASS I TYPE B (SY)	628.7555 CULVERT PIPE CHECKS (EA)	628.7570 ROCK BAGS (EA)
STH 152						
11+54 - 12+59	CULVERT REPLACEMENT	---	---	74	3	17
56+63 - 57+69	CULVERT REPLACEMENT	---	---	110	4	17
66+82 - 67+87	CULVERT REPLACEMENT	---	---	124	3	17
91+17 - 92+22	CULVERT REPLACEMENT	---	---	73	3	17
111+39 - 112+43	CULVERT REPLACEMENT	---	---	82	3	17
301+40 - 302+44	CULVERT REPLACEMENT	---	---	129	3	17
329+30 - 331+50	SLOPE STABILIZATION	268	268	815	---	---
353+28 - 354+32	CULVERT REPLACEMENT	---	---	107	3	17
364+29 - 367+17	GUARDRAIL REPLACEMENT	450	450	10	---	6
	UNDISTRIBUTED	180	180	381	---	---
	TOTALS	898	898	1,906	22	125

**EROSION CONTROL MOBILIZATION**

LOCATION	628.1905 MOBILIZATION EROSION CONTROL (EA)	628.1910 MOBILIZATION EMERGENCY EROSION CONTROL (EA)
	STH 152	
CULVERT REPLACEMENT	4	---
SLOPE STABILIZATION	2	---
GUARDRAIL REPLACEMENT	2	---
UNDISTRIBUTED	---	2
	TOTALS	8

NOTE: ALL ITEMS ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED.

**CONSTRUCTION STAKING**

STATION TO STATION	LOCATION	650.5500 CURB & GUTTER (LF)	650.6000 PIPE CULVERTS (EA)	650.8000 RESURFACING REFERENCE (LF)	650.9920 SLOPE STAKES (LF)	650.9911 SUPPLEMENTAL CONTROL (EA)
STH 152						
1+92 - 11+54	BEGINNING OF PROJECT TO 17th LN.	---	---	962	---	---
11+54 - 12+59	CULVERT REPLACEMENT AREA	---	1	105	105	---
12+59 - 53+24	STA. 12+59 TO LAKE RIDGE RD.	---	---	4,065	---	---
53+24 - 56+63	LAKE RIDGE RD. TO STA. 56+63	---	---	339	---	---
56+63 - 57+69	CULVERT REPLACEMENT AREA	---	1	106	106	---
57+69 - 66+82	STA. 57+69 TO STA. 66+82	---	---	913	---	---
66+82 - 67+87	CULVERT REPLACEMENT AREA	---	1	105	105	---
67+87 - 84+34	STA. 67+87 TO CHICAGO AVE.	---	---	1,647	---	---
84+34 - 91+17	CHICAGO AVE. TO STA. 91+17	---	---	683	---	---
91+17 - 92+22	CULVERT REPLACEMENT AREA	---	1	105	105	---
92+22 - 111+39	STA. 92+22 TO STA. 111+39	---	---	1,917	---	---
111+39 - 112+43	CULVERT REPLACEMENT AREA	---	1	104	104	---
112+43 - 153+26	STA. 112+43 TO PORTERS LAKE RD.	---	---	4,083	---	---
153+26 - 207+08	PORTERS LAKE RD. TO BUTTERCUP AVE.	---	---	5,382	---	---
207+08 - 234+45	BUTTERCUP AVE. TO PORTERS LAKE RD.	---	---	2,737	---	---
234+45 - 288+19	PORTERS LAKE RD. TO CTH S	---	---	5,374	---	---
288+19 - 301+40	CTH S TO STA. 301+40	---	---	1,321	---	---
301+40 - 302+44	CULVERT REPLACEMENT AREA	---	1	104	104	---
302+44 - 329+38	STA. 302+44 TO STA. 329+38	---	---	2,694	---	---
329+38 - 331+31	CONCRETE CURB & GUTTER 30-INCH	193	---	193	193	---
331+31 - 353+28	STA. 331+31 TO STA. 353+28	---	---	2,197	---	---
353+28 - 354+32	CULVERT REPLACEMENT AREA	---	1	104	104	---
354+32 - 359+30	STA. 354+32 TO BIGHORN LN.	---	---	498	---	---
359+30 - 373+13	BIGHORN LN. TO END OF PROJECT	---	---	1,383	270	---
6866-06-70	STH 152	---	---	---	---	1
TOTALS		193	7	37,121	1,196	1

NOTE: ALL ITEMS ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED.

**MARKING LINE**

STATION	TO	STATION	LOCATION	643.3105 TEMPORARY MARKING LINE PAINT 4-INCH		646.1020 MARKING LINE EPOXY 4-INCH		646.4520 MARKING LINE SAME DAY EPOXY 4-INCH		646.6464 COLD WEATHER MARKING EPOXY 4-INCH			
				YELLOW	YELLOW	WHITE	WHITE	YELLOW	YELLOW	WHITE	WHITE	YELLOW	YELLOW
				SOLID (LF)	DASHED (LF)	SOLID (LF)	DASHED (LF)	SOLID (LF)	DASHED (LF)	SOLID (LF)	DASHED (LF)	SOLID (LF)	DASHED (LF)
STH 152													
1+92	-	11+46	START OF PROJECT TO 17TH LN.	2,833	80	1,868	---	1,417	125.0	1,868	---	1,417	125.0
11+46	-	53+22	17TH LN. TO LAKE RIDGE RD.	3,455	616.0	8,274	---	1,727	963	8,274	---	1,727	962.5
53+22	-	84+34	LAKE RIDGE RD. TO CHICAGO AVE.	12,447	---	6,277	15	6,224	---	6,277	15	6,224	---
84+34	-	153+23	CHICAGO AVE. TO PORTERS LAKE RD.	20,964	528.0	13,613	15	10,482	825	13,613	15	10,482	825.0
153+23	-	207+08	PORTERS LAKE RD. TO BUTTERCUP AVE.	19,925	128.0	10,667	18	9,963	200	10,667	18	9,963	200.0
207+08	-	234+46	BUTTERCUP AVE. TO PORTERS LAKE RD.	10,951	---	5,399	18	5,476	---	5,399	18	5,476	---
234+46	-	288+19	PORTERS LAKE RD. TO CTH S	16,437	456.0	10,719	24	8,218	715	10,719	24	8,218	715.0
288+19	-	333+77	CTH S TO BLACKHAWK RD.	10,440	456.0	8,950	24	5,220	715	8,950	24	5,220	715.0
333+73	-	359+30	BLACKHAWK RD. TO BIGHORN LN.	10,211	---	5,006	12	5,106	---	5,006	12	5,106	---
359+30	-	373+13	BIGHORN LN. TO END OF PROJECT	5,403	---	2,696	---	2,702	---	2,696	---	2,702	---
---	---	---	SIDE ROADS	422	---	498	---	211	---	498	---	211	---
SUBTOTALS				113,488	2,264	73,967	126	56,744	3,543	73,967	126	56,744	3,543
TOTALS				115,752		74,093		60,287		74,093		60,287	

**SAWING ASPHALT**

STATION - STATION	LOCATION	690.0150 (LF)
STH 152		
11+54 - 12+59	CULVERT REPLACEMENT	71
56+63 - 57+69	CULVERT REPLACEMENT	44
66+82 - 67+87	CULVERT REPLACEMENT	46
91+17 - 92+22	CULVERT REPLACEMENT	48
111+39 - 112+43	CULVERT REPLACEMENT	48
301+40 - 302+44	CULVERT REPLACEMENT	46
353+28 - 354+32	CULVERT REPLACEMENT	52
329+38 - 331+39	SLOPE STABILIZATION	202
364+00 - 367+23	GUARDRAIL REPLACEMENT	543
TOTALS		1,100

**REESTABLISH SECTION CORNER MONUMENTS**

STATION	DESCRIPTION	TYPE	REESTABLISH SECTION CORNER MONUMENTS SPV.0060.01 (EA)
STH 152			
27+71	SEC 35/36 T19N R10E	BERNTSEN STEEL NAIL MARKER	1
80+46	SEC 36 T19N R10E/SEC 31 T19N R11E	BERNTSEN STEEL NAIL MARKER	1
126+75	SEC 30/31 T19N R11E	BERNTSEN STEEL NAIL MARKER	1
153+27	SEC 29/30/31/32 T19N R11E	BERNTSEN STEEL NAIL MARKER	1
179+37	SEC 29/32 T19N R11E	BERNTSEN STEEL NAIL MARKER	1
228+33	SEC 29/28 T19N R11E	BERNTSEN STEEL NAIL MARKER	1
306+62	SEC 21/22/27/28 T19N R11E	BERNTSEN STEEL NAIL MARKER	1
TOTALS			7

NOTE: ALL ITEMS ON THIS SHEET ARE CATEGORY 0010 UNLESS OTHERWISE NOTED.

# TRANSPORTATION PROJECT PLAT NO: 6866-06-20- 4.01

BEING PART OF THE NE 1/4 OF THE SE 1/4 OF SECTION 21, IN TOWNSHIP 19 NORTH, RANGE 11 EAST, TOWN OF MOUNT MORRIS, WAUSHARA COUNTY, WISCONSIN.

RELOCATION ORDER STH 152 WAUTOMA - MT MORRIS (NORTH TOWNLINE ROAD TO CTH G) WAUSHARA COUNTY

TO PROPERLY ESTABLISH, LAY OUT, WIDEN, ENLARGE, EXTEND, CONSTRUCT, RECONSTRUCT, IMPROVE, OR MAINTAIN A PORTION OF THE HIGHWAY DESIGNATED ABOVE, THE STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DEEMS IT NECESSARY TO RELOCATE OR CHANGE SAID HIGHWAY AND ACQUIRE CERTAIN LANDS AND INTERESTS OR RIGHTS IN LANDS FOR THE ABOVE PROJECT.

TO EFFECT THIS CHANGE, PURSUANT TO AUTHORITY GRANTED UNDER SECTION 84.02 (3), 84.09, AND 84.30, WISCONSIN STATUTES, THE DEPARTMENT OF TRANSPORTATION HEREBY ORDERS THAT:

- THAT PORTION OF SAID HIGHWAY AS SHOWN ON THIS PLAT IS LAID OUT AND ESTABLISHED TO THE LINES AND WIDTHS AS SO SHOWN FOR THE ABOVE PROJECT.
- THE LANDS OR INTERESTS OR RIGHTS IN LANDS AS SHOWN ON THIS PLAT ARE REQUIRED BY THE DEPARTMENT FOR THE ABOVE PROJECT AND SHALL BE ACQUIRED IN THE NAME OF THE STATE OF WISCONSIN, PURSUANT TO THE PROVISIONS OF SECTION 84.09 (1) OR (2), WISCONSIN STATUTES.

POSITIONS SHOWN ON THIS PLAT ARE WISCONSIN COORDINATE REFERENCE SYSTEM COORDINATES (WISCRS), WAUSHARA COUNTY, NAD83(2011), IN U.S. SURVEY FEET. VALUES ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES MAY BE USED AS GROUND DISTANCES.

ALL NEW RIGHT-OF-WAY MONUMENTS WILL BE TYPE 2 (TYPICALLY 1" X 24" IRON PIPESS), UNLESS OTHERWISE NOTED, AND WILL BE PLACED PRIOR TO THE COMPLETION OF THE PROJECT.

ALL RIGHT-OF-WAY LINES DEPICTED IN THE NON-ACQUISITION AREAS ARE INTENDED TO RE-ESTABLISH EXISTING RIGHT-OF-WAY LINES AS DETERMINED FROM PREVIOUS PROJECTS, OTHER RECORDED DOCUMENTS, OR FROM CENTERLINE OF EXISTING PAVEMENTS.

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

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

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

FOR THE CURRENT ACCESS/DRIVEWAY INFORMATION, CONTACT THE PLANNING UNIT OF THE WISCONSIN DEPARTMENT OF TRANSPORTATION OFFICE IN RHINELANDER, WISCONSIN.

PARCEL AND UTILITY IDENTIFICATION NUMBERS MAY NOT POINT TO ALL AREAS OF ACQUISITION, AS NOTED ON THE TTP DETAIL PAGES.

EXISTING HIGHWAY RIGHT-OF-WAY FOR STH 152 HERON IS BASED ON THE FOLLOWING POINTS OF REFERENCE:  
EXISTING HIGHWAY RIGHT-OF-WAY FOR STH 152 ESTABLISHED FROM THE EXISTING PAVEMENT CENTERLINE, CSM #622 AND CSM #2877.

EXISTING ROAD RIGHT-OF-WAY FOR BLACKHAWK ROAD ESTABLISHED FROM CSM #2877.

## CONVENTIONAL ABBREVIATIONS

ACCESS RIGHTS	AR	POINT OF COMPOUND CURVE	PCC
ACRES	AC	POINT OF INTERSECTION	PI
AHEAD	AH	PROPERTY LINE	PL
ALUMINUM	ALUM	RECORDED AS (100')	(100')
AND OTHERS	ET AL	REEL / IMAGE	R/I
BACK	BK	REFERENCE LINE	R/L
BLOCK	BK	REMAINING	REM
CENTERLINE	C/L	RESTRICTIVE DEVELOPMENT	RDE
CERTIFIED SURVEY MAP	CSM	EASEMENT	E
CONCRETE	CONC	RIGHT	RT
COUNTY	CO	RIGHT OF WAY	R/W
COUNTY TRUNK HIGHWAY	CTH	SECTION	SEC
DISTANCE	DIST	SEPTIC VENT	SEPV
CORNER	COR	SQUARE FEET	SF
DOCUMENT NUMBER	DOC	STATE TRUNK HIGHWAY	STH
EASEMENT	EASE	STATION	STA
EXISTING	EX	TELEPHONE PEDESTAL	TP
GAS VALVE	GV	TEMPORARY LIMITED	TLE
GRID NORTH	GN	EASEMENT	E
HIGHWAY EASEMENT	HE	TRANSPORTATION PROJECT PLAT	TPP
IDENTIFICATION	ID	UNITED STATES HIGHWAY	USH
LAND CONTRACT	LC	VOLUME	V
LEFT	LT		
MONUMENT	MON		
NATIONAL GEODETIC SURVEY	NGS		
NUMBER	NO		
OUTLOT	OL		
PAGE	P		
POINT OF TANGENCY	PT		
PERMANENT LIMITED EASEMENT	PLE		
POINT OF BEGINNING	POB		
POINT OF CURVATURE	PC		

## CONVENTIONAL SYMBOLS

SECTION LINE	---	SECTION CORNER	⊕	R/W MONUMENT (10 OR 30')	●
QUARTER LINE	---	NON-MONUMENTED R/W POINT	○		
SIXTEENTH LINE	---	FOUND IRON PIN (1-1/2" UNLESS NOTED)	IP		
NEW REFERENCE LINE	---	FOUND IRON REBAR (3/4" UNLESS NOTED)	IR		
NEW R/W LINE	---	GEODETIC SURVEY MONUMENT	⊕		
EXISTING R/W OR HE LINE	---	SIXTEENTH CORNER MONUMENT	⊕		
PROPERTY LINE	---	OFF-PREMISE SIGN	⊕		
LOT, TIE & OTHER MINOR LINES	---	COMPENSABLE	⊕		
SLOPE INTERCEPT	---	NON-COMPENSABLE	⊕		
CORPORATE LIMITS	---	ELECTRIC POLE	⊕		
UNDERGROUND FACILITY (COMMUNICATIONS, ELECTRIC, ETC.)	---	TELEPHONE POLE	⊕		
NEW R/W (FEE OR HE) (HATCHING VARIES BY OWNER)	---	PEDESTAL (LABEL TYPE) (TV, TEL, ELEC, ETC.)	⊕		
TEMPORARY LIMITED EASEMENT AREA	---	ACCESS RESTRICTED BY ACQUISITION	⊕		
EASEMENT AREA (PERMANENT LIMITED OR RESTRICTED DEVELOPMENT)	---	NO ACCESS (BY STATUTORY AUTHORITY)	⊕		
NO ACCESS (BY STATUTORY AUTHORITY)	---	ACCESS RESTRICTED (BY PREVIOUS PROJECT OR CONTROL)	⊕		
NO ACCESS (NEW HIGHWAY)	---	NO ACCESS (NEW HIGHWAY)	⊕		
TRANSMISSION STRUCTURES	---	TO BE REMOVED	⊕		
BUILDING	---	PARCEL NUMBER (25)	⊕		
CULVERT	---	UTILITY NUMBER (40)	⊕		
BRIDGE	---	PARALLEL OFFSETS	---		

## CURVE DATA ABBREVIATIONS

LONG CHORD	LCH
LONG CHORD BEARING	LCB
RADIUS	R
DEGREE OF CURVE	D
CENTRAL ANGLE	Δ/DELTA
LENGTH OF CURVE	L
TANGENT	T
DIRECTION AHEAD	DA
DIRECTION BACK	DB

## STATION & OFFSET TABLE

POINT #	STATION	OFFSET
PRW1	331+60.09	33.00' RT
PRW2	330+97.20	64.06' RT
PRW3	329+99.68	73.22' RT
PRW4	329+11.96	33.00' RT

## CURVE TABLE

CURVE #	LENGTH	RADIUS	CHORD
C1	142.43'	762.29'	N23°46'29"W, 142.23'
C2	69.51'	1351.20'	S05°18'25"E, 69.50'
C3	154.88'	762.29'	S12°36'04"E, 154.62'
C4	144.28'	1351.20'	N00°46'27"W, 144.21'

## R/W COURSE TABLE

POINT #	BEARING	DISTANCE
100-PRW1	N71°34'41"E	33.00'
PRW1-PRW2	S48°34'59"E	66.55'
PRW2-PRW3	S32°30'38"E	90.86'
PRW3-PRW4	S04°29'36"E	96.50'
PRW4-101	S60°52'21"W	33.00'
101-102	N29°07'39"W	105.70'

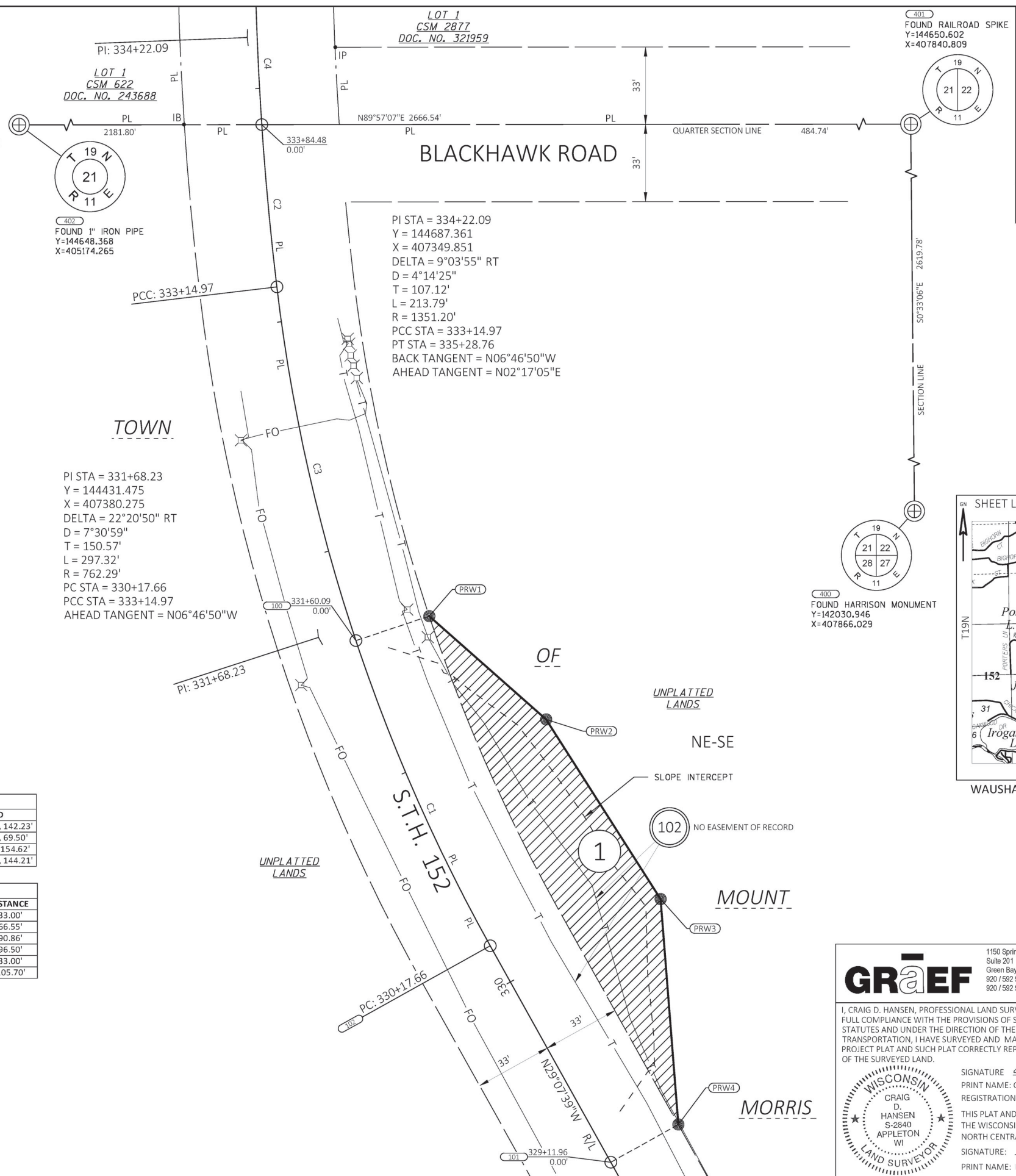
## UTILITY INTERESTS REQUIRED

UTILITY NUMBER	OWNER	INTERESTS REQUIRED
102	CENTURYLINK	RELEASE OF RIGHTS

## SCHEDULE OF LANDS & INTERSTS REQUIRED

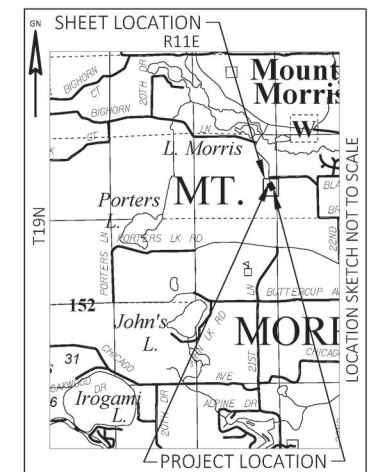
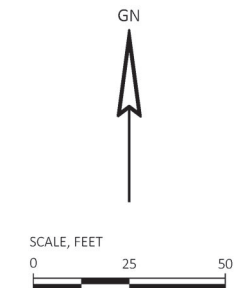
PARCEL NUMBER	OWNER(S)	INTEREST(S) REQUIRED	R/W REQUIRED (SQ. FT.)		
			NEW SQ. FT.	EXISTING SQ. FT.	TOTAL SQ. FT.
1	MT. MORRIS LUTHERAN HOLDEN CHURCH	FEE	6090	8087	14177

OWNER NAME IS SHOWN FOR REFERENCE PURPOSES ONLY AND ARE SUBJECT TO CHANGE PRIOR TO THE TRANSFER OF LAND INTERESTS TO THE DEPARTMENT.



Document Number: 539525  
Waushara County, Wisconsin  
Heather Schwesenska,  
Register of Deeds  
Recorded On:  
07/26/2022 01:11:19 PM  
Number of Pages: 1

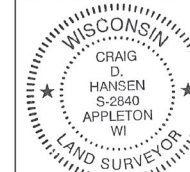
RESERVED FOR REGISTER OF DEEDS  
PROJECT NUMBER 6866-06-20 - 4.01  
AMENDMENT NO.:



**GRAEF**

1150 Springhurst Drive,  
Suite 201  
Green Bay, WI 54304-5950  
920 / 592 9440  
920 / 592 9445 fax

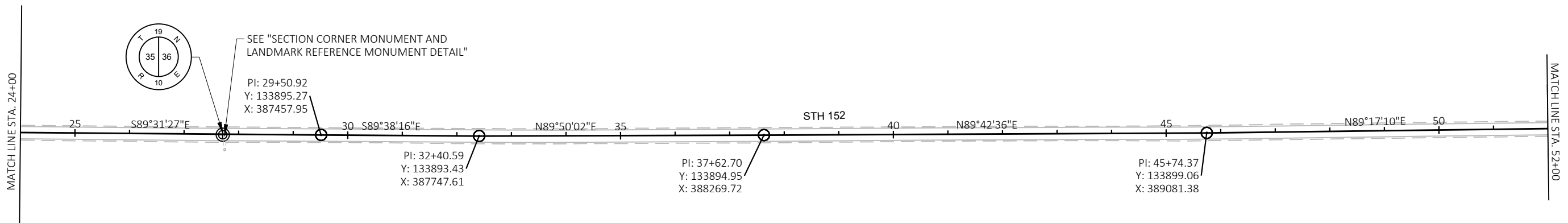
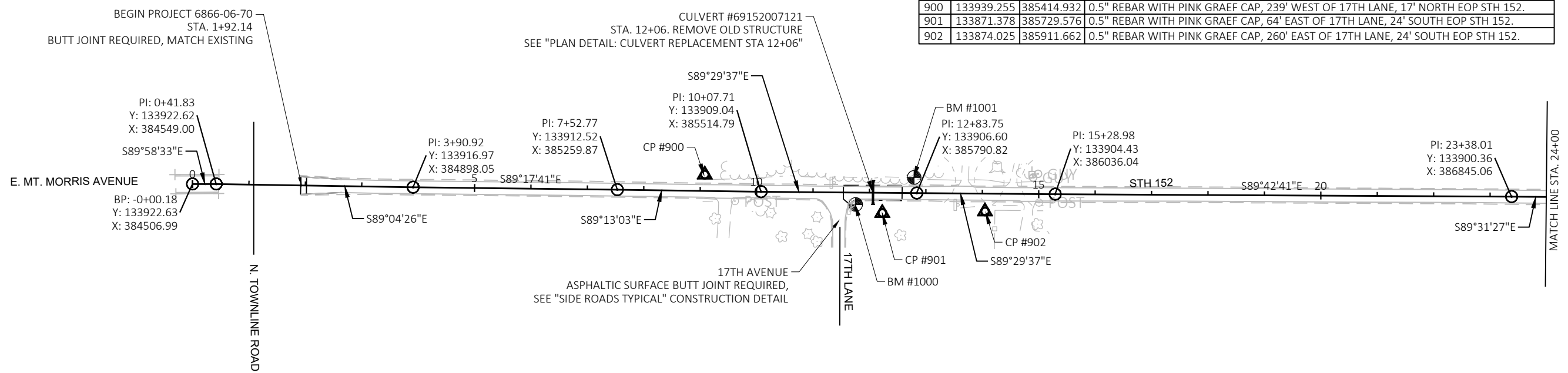
I, CRAIG D. HANSEN, PROFESSIONAL LAND SURVEYOR, HEREBY CERTIFY THAT IN FULL COMPLIANCE WITH THE PROVISIONS OF SECTION 84.095 OF THE WISCONSIN STATUTES AND UNDER THE DIRECTION OF THE DEPARTMENT OF TRANSPORTATION, I HAVE SURVEYED AND MAPPED THIS TRANSPORTATION PROJECT PLAT AND SUCH PLAT CORRECTLY REPRESENTS ALL EXTERIOR BOUNDARIES OF THE SURVEYED LAND.



SIGNATURE: *Craig Hansen* DATE: 07/21/2022  
PRINT NAME: CRAIG D. HANSEN  
REGISTRATION NUMBER: S-2840  
THIS PLAT AND RELOCATION ORDER ARE APPROVED FOR THE WISCONSIN DEPARTMENT OF TRANSPORTATION NORTH CENTRAL REGION.  
SIGNATURE: *Brent & Stella* DATE: 7/25/22  
PRINT NAME: BRENT STELLA

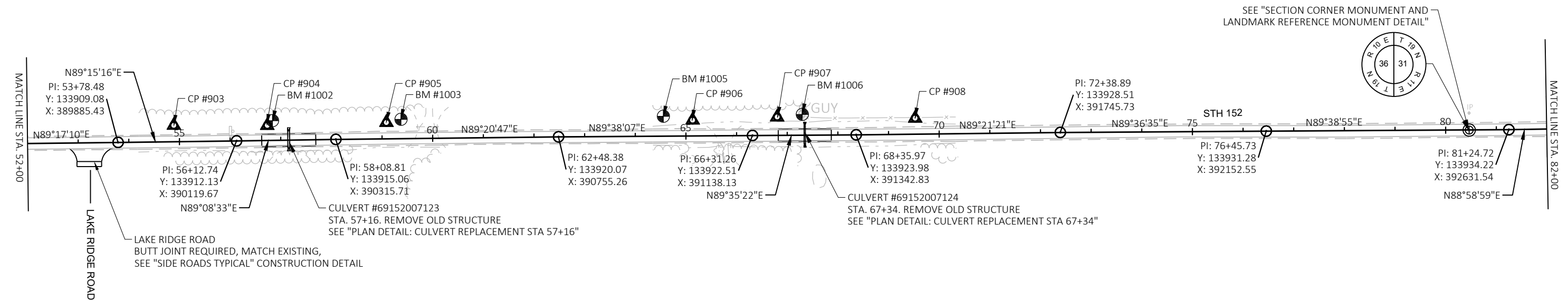
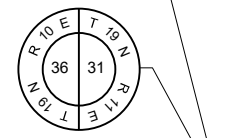
BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1000	11+76, 21' RT	874.73	EXISTING MAGNAIL IN POLE AT THE SE CORNER OF STH 12 AND 17TH LANE
1001	12+79, 28' LT	874.07	SPIK E IN S. FACE PP 19-10-35.2 23/0 NORTH SIDE OF STH 152.

CONTROL POINTS			
NO.	Y	X	DESCRIPTION
900	133939.255	385414.932	0.5" REBAR WITH PINK GRAEF CAP, 239' WEST OF 17TH LANE, 17' NORTH EOP STH 152.
901	133871.378	385729.576	0.5" REBAR WITH PINK GRAEF CAP, 64' EAST OF 17TH LANE, 24' SOUTH EOP STH 152.
902	133874.025	385911.662	0.5" REBAR WITH PINK GRAEF CAP, 260' EAST OF 17TH LANE, 24' SOUTH EOP STH 152.



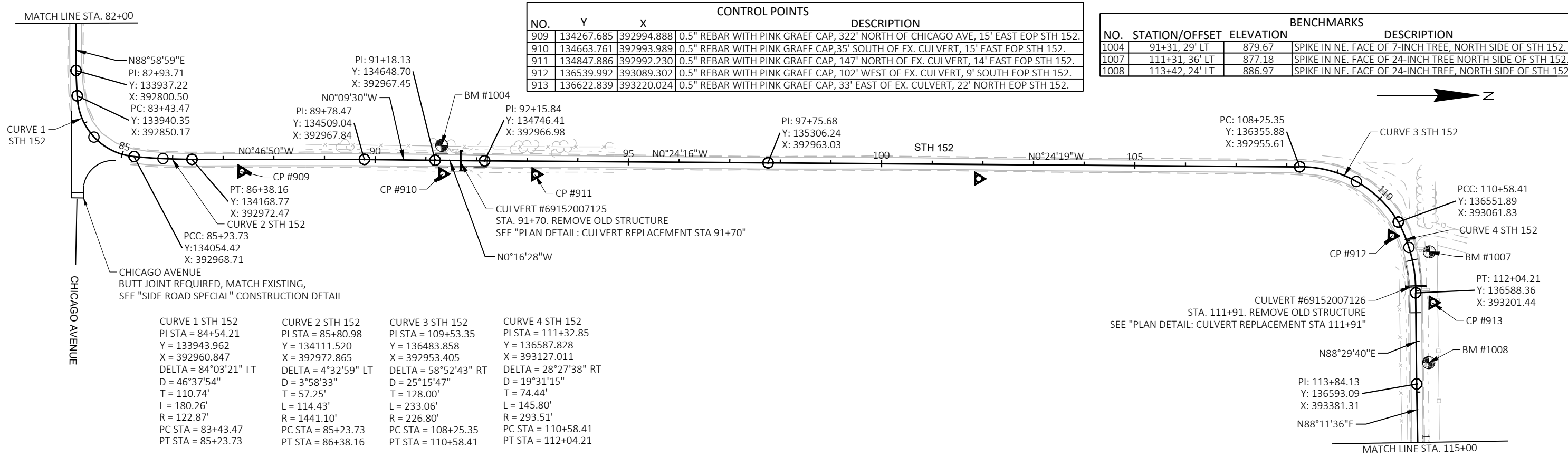
NO.	Y	X	CONTROL POINTS DESCRIPTION
903	133942.738	389995.687	0.5" REBAR WITH PINK GRAEF CAP, 165' EAST OF LAKE RIDGE ROAD, 22' NORTH EOP STH 152.
904	133942.499	390180.074	0.5" REBAR WITH PINK GRAEF CAP, 350' EAST OF LAKE RIDGE ROAD, 18' NORTH EOP STH 152.
905	133948.484	390415.308	0.5" REBAR WITH PINK GRAEF CAP, 264' WEST OF PE FOR W7441 STH 152, 21' NORTH EOP STH 152.
906	133953.039	391019.925	0.5" REBAR WITH PINK GRAEF CAP, 67' WEST OF PE FOR W7409 STH 152, 20' NORTH EOP STH 152.
907	133959.202	391186.757	0.5" REBAR WITH PINK GRAEF CAP, 103' EAST OF PE FOR W7409 STH 152, 25' NORTH EOP STH 152.
908	133956.834	391459.311	0.5" REBAR WITH PINK GRAEF CAP, 373' EAST OF PE FOR W7409 STH 152, 21' NORTH EOP STH 152.

NO.	STATION/OFFSET	ELEVATION	BENCHMARKS DESCRIPTION
1002	56+84, 39' LT	884.49	SPIKE IN S. FACE OF PP 831331, NORTH SIDE OF STH 152.
1003	59+38, 38' LT	888.13	SPIKE IN S FACE OF PP 831332, NORTH SIDE OF STH 152.
1005	64+56, 39' LT	891.32	SPIKE IN S FACE OF PP 831334, NORTH SIDE OF STH 152
1006	67+30, 41' LT	881.73	SPIKE IN S FACE OF PP 831335, NORTH SIDE OF STH 152.



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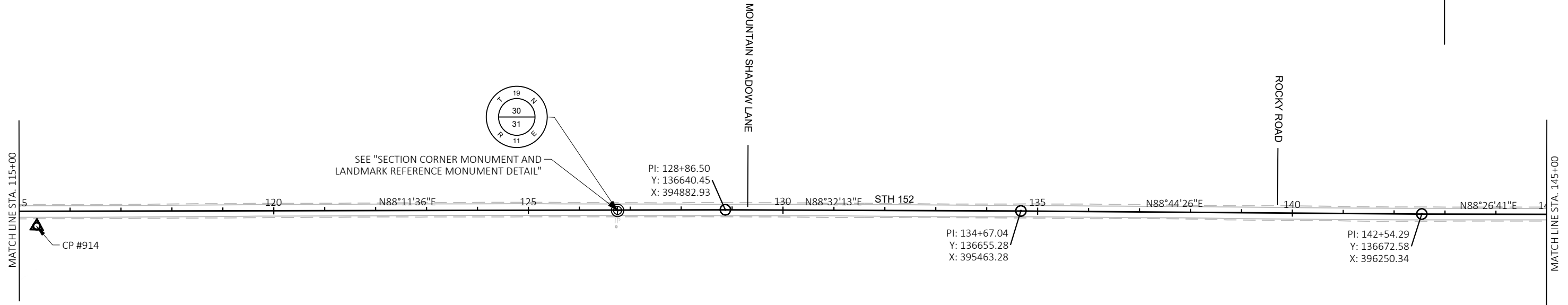


NO.	Y	X	CONTROL POINTS DESCRIPTION
909	134267.685	392994.888	0.5" REBAR WITH PINK GRAEF CAP, 322' NORTH OF CHICAGO AVE, 15' EAST EOP STH 152.
910	134663.761	392993.989	0.5" REBAR WITH PINK GRAEF CAP, 35' SOUTH OF EX. CULVERT, 15' EAST EOP STH 152.
911	134847.886	392992.230	0.5" REBAR WITH PINK GRAEF CAP, 147' NORTH OF EX. CULVERT, 14' EAST EOP STH 152.
912	136539.992	393089.302	0.5" REBAR WITH PINK GRAEF CAP, 102' WEST OF EX. CULVERT, 9' SOUTH EOP STH 152.
913	136622.839	393220.024	0.5" REBAR WITH PINK GRAEF CAP, 33' EAST OF EX. CULVERT, 22' NORTH EOP STH 152.

NO.	STATION/OFFSET	ELEVATION	BENCHMARKS DESCRIPTION
1004	91+31, 29' LT	879.67	SPIKE IN NE. FACE OF 7-INCH TREE, NORTH SIDE OF STH 152.
1007	111+31, 36' LT	877.18	SPIKE IN NE. FACE OF 24-INCH TREE NORTH SIDE OF STH 152.
1008	113+42, 24' LT	886.97	SPIKE IN NE. FACE OF 24-INCH TREE, NORTH SIDE OF STH 152

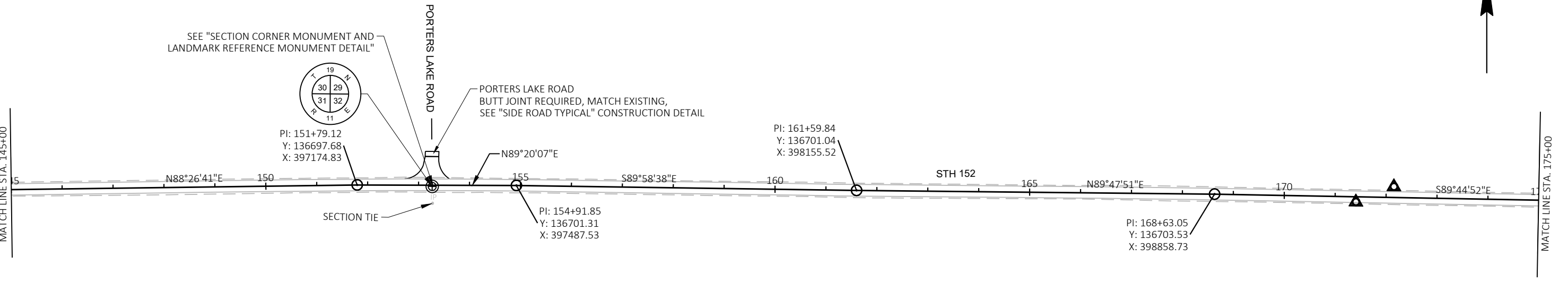


CONTROL POINTS			
NO.	Y	X	DESCRIPTION
914	136568.943	393532.270	0.5" REBAR WITH PINK GRAEF CAP, 343' EAST OF EX. CULVERT, 16' SOUTH EOP STH 152.



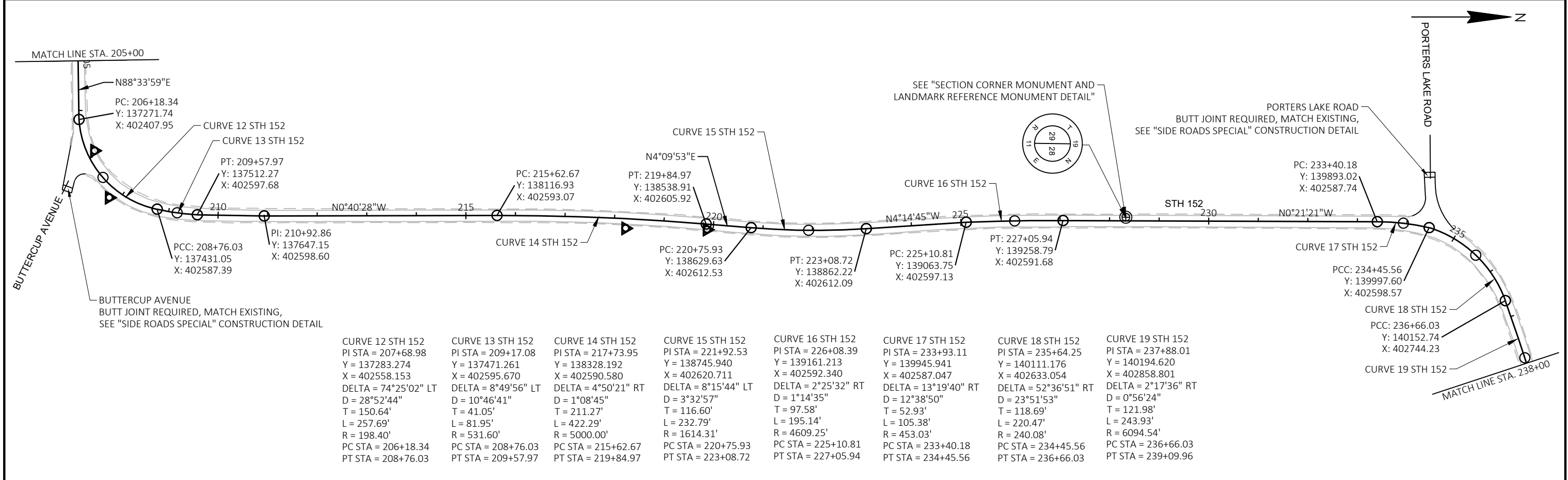
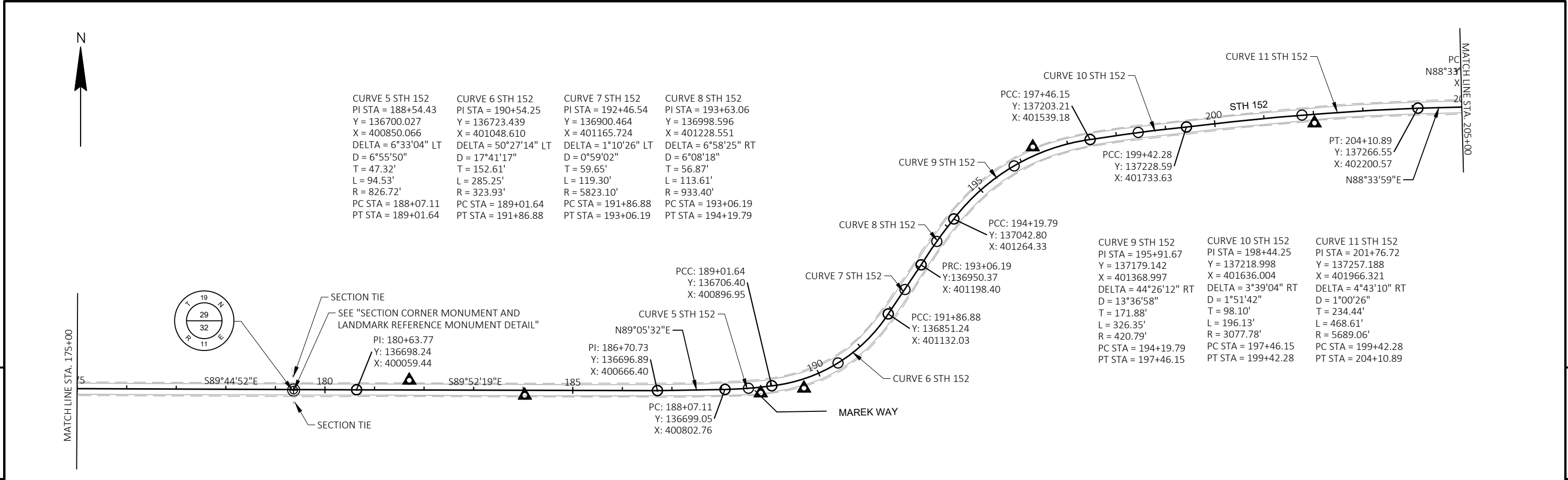
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PROJECT NO: 6866-06-70	HWY: STH 152	COUNTY: WAUSHARA	PLAN	SHEET	E
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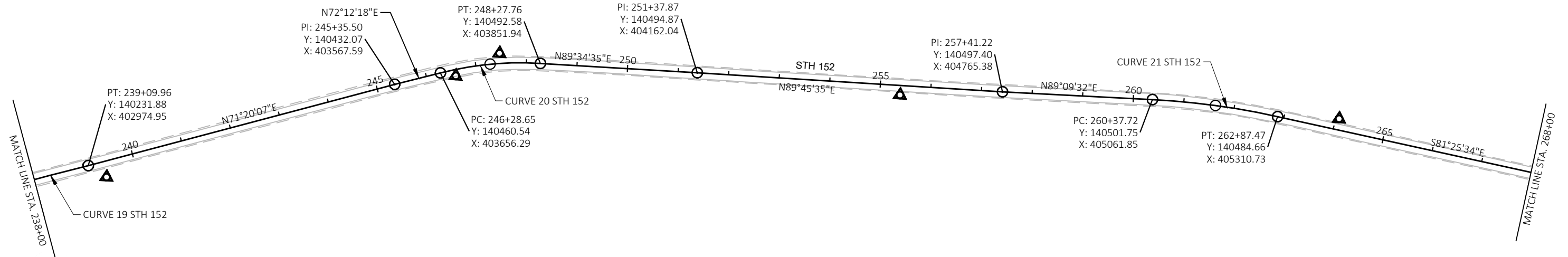




PROJECT NO: 6866-06-70      HWY: STH 152      COUNTY: WAUSHARA      PLAN      SHEET      E



CURVE 19 STH 152 PI STA = 237+88.01 Y = 140194.620 X = 402858.801 DELTA = 2°17'36" RT D = 0°56'24" T = 121.98' L = 243.93' R = 6094.54' PC STA = 236+66.03 PT STA = 239+09.96	CURVE 20 STH 152 PI STA = 247+29.07 Y = 140492.396 X = 403751.521 DELTA = 18°23'29" RT D = 9°14'12" T = 100.42' L = 199.11' R = 620.30' PC STA = 246+28.65 PT STA = 248+27.76	CURVE 21 STH 152 PI STA = 261+62.89 Y = 140503.590 X = 405187.006 DELTA = 9°32'23" RT D = 3°49'11" T = 125.17' L = 249.75' R = 1500.00' PC STA = 260+37.72 PT STA = 262+87.47
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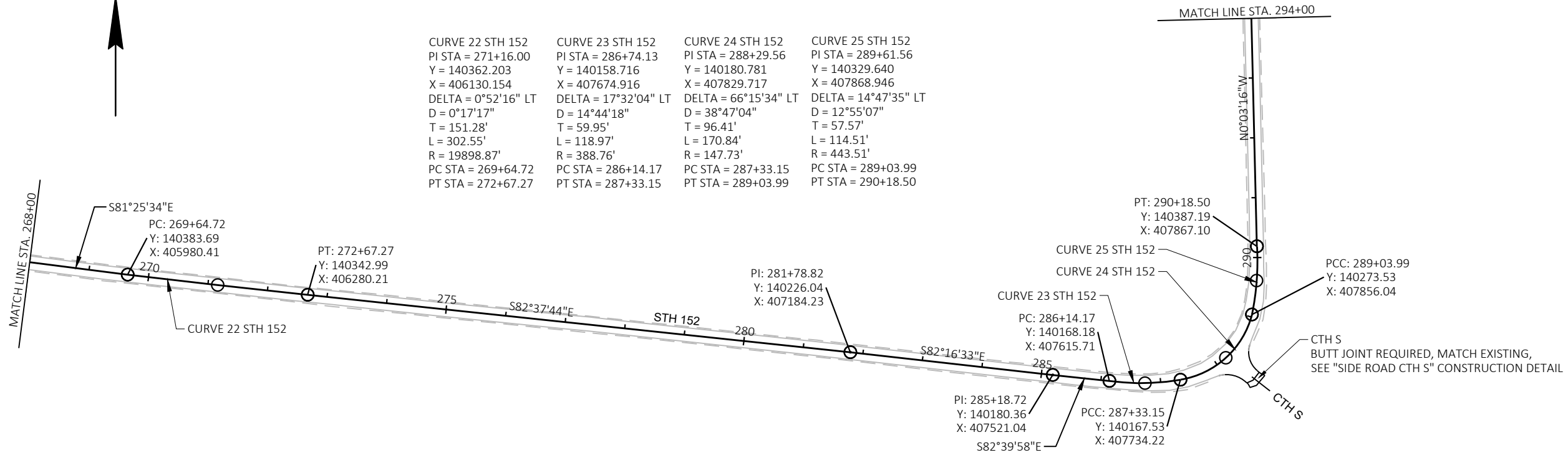


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CURVE 22 STH 152 PI STA = 271+16.00 Y = 140362.203 X = 406130.154 DELTA = 0°52'16" LT D = 0°17'17" T = 151.28' L = 302.55' R = 19898.87' PC STA = 269+64.72 PT STA = 272+67.27	CURVE 23 STH 152 PI STA = 286+74.13 Y = 140158.716 X = 407674.916 DELTA = 17°32'04" LT D = 14°44'18" T = 59.95' L = 118.97' R = 388.76' PC STA = 286+14.17 PT STA = 287+33.15	CURVE 24 STH 152 PI STA = 288+29.56 Y = 140180.781 X = 407829.717 DELTA = 66°15'34" LT D = 38°47'04" T = 96.41' L = 170.84' R = 147.73' PC STA = 287+33.15 PT STA = 289+03.99	CURVE 25 STH 152 PI STA = 289+61.56 Y = 140329.640 X = 407868.946 DELTA = 14°47'35" LT D = 12°55'07" T = 57.57' L = 114.51' R = 443.51' PC STA = 289+03.99 PT STA = 290+18.50
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CTH S  
BUTT JOINT REQUIRED, MATCH EXISTING,  
SEE "SIDE ROAD CTH S" CONSTRUCTION DETAIL

PROJECT NO: 6866-06-70

HWY: STH 152

COUNTY: WAUSHARA

PLAN

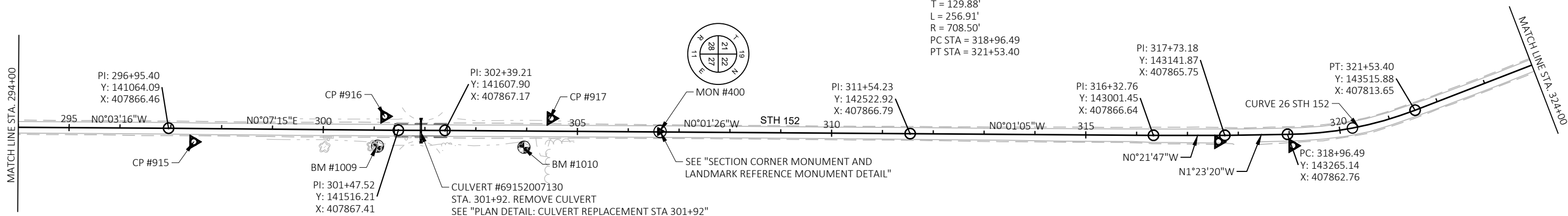
SHEET

E

BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1009	301+07, 32' RT	893.87	SPIKE SET IN 5" TREE
1010	303+95, 32' RT	893.18	SPIKE SET IN 4" TREE

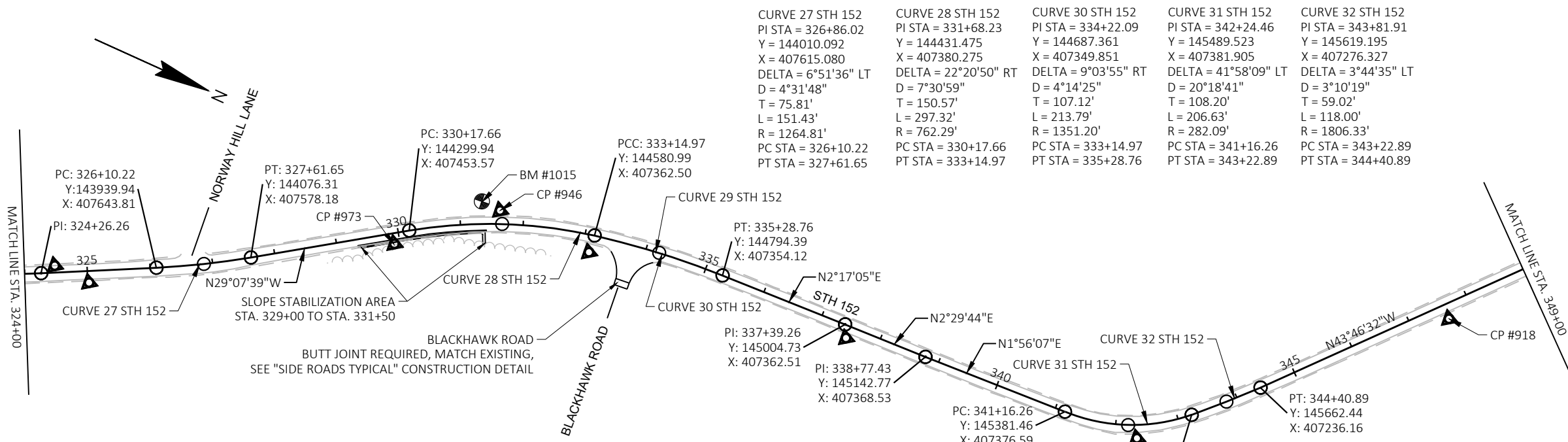
CONTROL POINTS			
NO.	Y	X	DESCRIPTION
915	141113.953	407892.898	0.5" REBAR WITH PINK GRAEF CAP, 446' SOUTH OF EX. CULVERT, 15' EAST EOP STH 152.
916	141489.476	407840.240	0.5" REBAR WITH PINK GRAEF CAP, 71' SOUTH OF EX. CULVERT, 16' WEST EOP STH 152.
917	141816.625	407841.795	0.5" REBAR WITH PINK GRAEF CAP, 26' NORTH OF EX. CULVERT, 13' WEST EOP STH 152.

CURVE 26 STH 152  
 PI STA = 320+26.37  
 Y = 143395.009  
 X = 407861.187  
 DELTA = 20°46'34" LT  
 D = 8°05'13"  
 T = 129.88'  
 L = 256.91'  
 R = 708.50'  
 PC STA = 318+96.49  
 PT STA = 321+53.40



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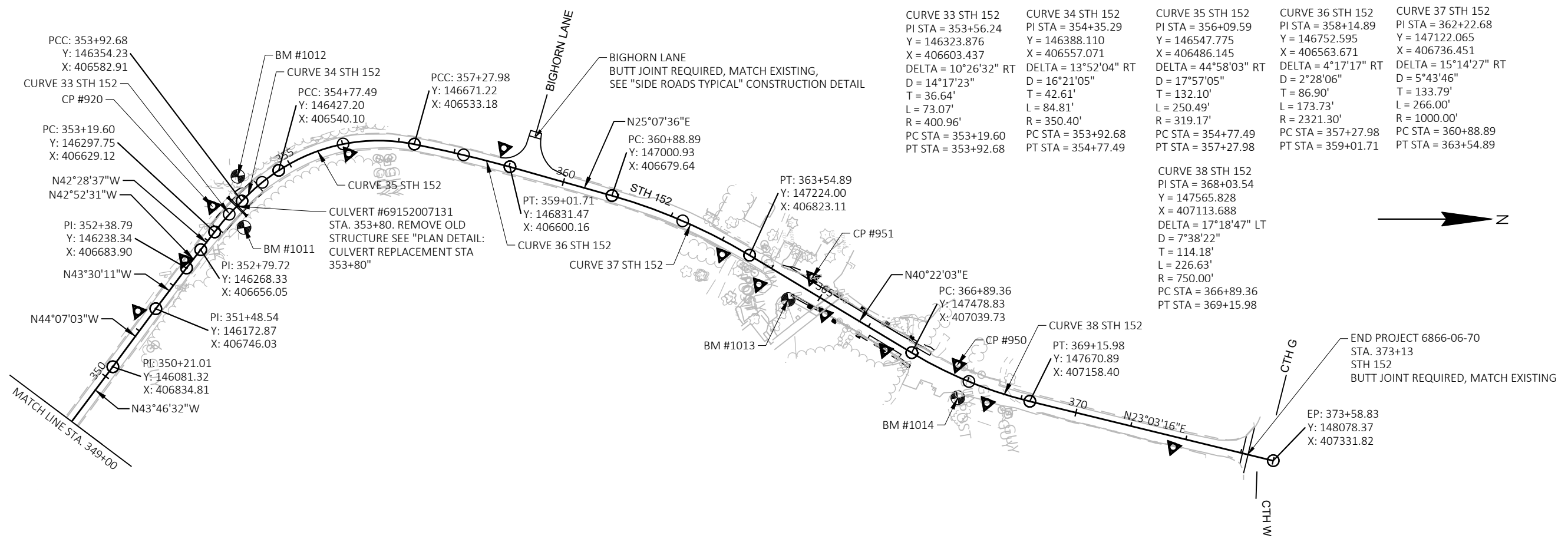
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CURVE 27 STH 152 PI STA = 326+86.02 Y = 144010.092 X = 407615.080 DELTA = 6°51'36" LT D = 4°31'48" T = 75.81' L = 151.43' R = 1264.81' PC STA = 326+10.22 PT STA = 327+61.65	CURVE 28 STH 152 PI STA = 331+68.23 Y = 144431.475 X = 407380.275 DELTA = 22°20'50" RT D = 7°30'59" T = 150.57' L = 297.32' R = 762.29' PC STA = 330+17.66 PT STA = 333+14.97	CURVE 30 STH 152 PI STA = 334+22.09 Y = 144687.361 X = 407349.851 DELTA = 9°03'55" RT D = 4°14'25" T = 107.12' L = 213.79' R = 1351.20' PC STA = 333+14.97 PT STA = 335+28.76	CURVE 31 STH 152 PI STA = 342+24.46 Y = 145489.523 X = 407381.905 DELTA = 41°58'09" LT D = 20°18'41" T = 108.20' L = 206.63' R = 282.09' PC STA = 341+16.26 PT STA = 343+22.89	CURVE 32 STH 152 PI STA = 343+81.91 Y = 145619.195 X = 407276.327 DELTA = 3°44'35" LT D = 3°10'19" T = 59.02' L = 118.00' R = 1806.33' PC STA = 343+22.89 PT STA = 344+40.89
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CONTROL POINTS			
NO.	Y	X	DESCRIPTION
918	145908.770	407032.536	0.5" REBAR WITH PINK GRAEF CAP, 615' SOUTH OF EX. CULVERT, AND 10' NORTH OF THE EOP STH 152.
946	144425.593	407375.273	HUB, 218' SOUTH OF BLACKHAWK RD. AND 10' NORTH OF THE EOP STH 152.
973	144284.720	407481.357	SPIKE, 375' SOUTH OF BLACKHAWK RD. AND 5' SOUTH OF THE EOP. STH 152.

BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1015	331+35, LT	905.51	RR SPIKE IN EAST FACE OF 30-INCH TREE, 250' SOUTH OF BLACKHAWK RD.



BENCHMARKS			
NO.	STATION/OFFSET	ELEVATION	DESCRIPTION
1011	353+60, 35' RT	894.99	SPIKE SET IN 9" TREE
1012	354+16, 36' LT	898.99	SPIKE SET IN 18" TREE
1013	364+54, 32' RT	869.55	SPIKE SET IN N. FACE OF PPOL 828317
1014	367+96, 34' RT	876.34	SPIKE SET IN SW. FACE OF PPOL 828310

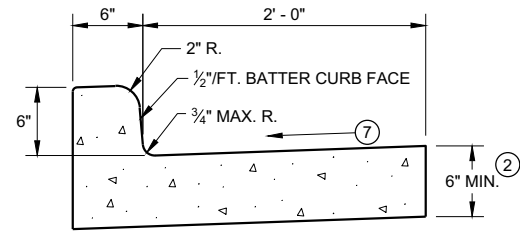
CONTROL POINTS			
NO.	Y	X	DESCRIPTION
920	146301.316	406583.244	0.5" REBAR WITH PINK GRAEF CAP, 31' SOUTH OF EX. CULVERT, 20' WEST EOP STH 152.
950	147555.874	407074.209	0.5" REBAR WITH PINK GRAEF CAP, NORTH END OF EX. GUARDRAIL ON WEST SIDE OF STH 152.
951	147327.138	406880.304	0.5" REBAR WITH PINK GRAEF CAP, SOUTH END OF EX. GUARDRAIL ON WEST SIDE OF STH 152.

CURVE 33 STH 152	CURVE 34 STH 152	CURVE 35 STH 152	CURVE 36 STH 152	CURVE 37 STH 152
PI STA = 353+56.24	PI STA = 354+35.29	PI STA = 356+09.59	PI STA = 358+14.89	PI STA = 362+22.68
Y = 146323.876	Y = 146388.110	Y = 146547.775	Y = 146752.595	Y = 147122.065
X = 406603.437	X = 406557.071	X = 406486.145	X = 406563.671	X = 406736.451
DELTA = 10°26'32" RT	DELTA = 13°52'04" RT	DELTA = 44°58'03" RT	DELTA = 4°17'17" RT	DELTA = 15°14'27" RT
D = 14°17'23"	D = 16°21'05"	D = 17°57'05"	D = 2°28'06"	D = 5°43'46"
T = 36.64'	T = 42.61'	T = 132.10'	T = 86.90'	T = 133.79'
L = 73.07'	L = 84.81'	L = 250.49'	L = 173.73'	L = 266.00'
R = 400.96'	R = 350.40'	R = 319.17'	R = 2321.30'	R = 1000.00'
PC STA = 353+19.60	PC STA = 353+92.68	PC STA = 354+77.49	PC STA = 357+27.98	PC STA = 360+88.89
PT STA = 353+92.68	PT STA = 354+77.49	PT STA = 357+27.98	PT STA = 359+01.71	PT STA = 363+54.89

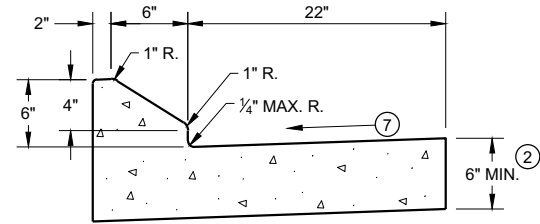
CURVE 38 STH 152
PI STA = 368+03.54
Y = 147565.828
X = 407113.688
DELTA = 17°18'47" LT
D = 7°38'22"
T = 114.18'
L = 226.63'
R = 750.00'
PC STA = 366+89.36
PT STA = 369+15.98

## Standard Detail Drawing List

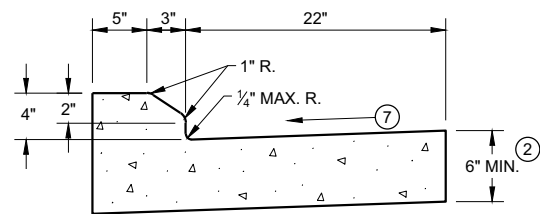
08D01-22A	CONCRETE CURB & GUTTER
08D01-22B	CONCRETE CURB, TIES AND CURB AND GUTTER APPLICATIONS
08D04-06	CONCRETE SURFACE DRAINS & ASPHALTIC FLUMES
08E09-06	SILT FENCE
08E15-01	CULVERT PIPE CHECK
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
08F02-01	APRON ENDWALLS FOR PIPE ARCH AND ELLIPTICAL PIPE
08F04-08	JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL
13C19-03	HMA LONGITUDINAL JOINTS
14B28-04A	GUARDRAIL MOW STRIP
14B28-04B	GUARDRAIL MOW STRIP
14B29-01	SAFETY EDGE
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)
14B51-02A	ANCHOR POST ASSEMBLY TOP-MOUNTED
14B51-02B	ANCHOR POST ASSEMBLY TOP-MOUNTED
14B51-02C	ANCHOR POST ASSEMBLY TOP-MOUNTED
15A03-02A	FLEXIBLE MARKER POST FOR CULVERT END
15A03-02B	FLEXIBLE MARKER POST FOR CULVERT END
15C04-05	TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45 M.P.H. OR GREATER TWO-WAY UNDIVIDED ROAD OPEN TO TRAFFIC
15C05-05	TRAFFIC CONTROL, ADVANCE WARNING SIGNS 40 M.P.H. OR LESS
15C08-22A	LONGITUDINAL MARKING (MAINLINE)
15C08-22B	TEMPORARY LONGITUDINAL PAVEMENT MARKING
15C11-10B	CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS
15C12-09A	TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION
15C12-09B	TRAFFIC CONTROL, LANE CLOSURE WITH AUTOMATED FLAGGER ASSISTANCE DEVICE
15C19-07A	MOVING PAVEMENT MARKING OPERATION TWO-LANE TWO-WAY ROADWAY
15C35-05A	PAVEMENT MARKING (INTERSECTIONS)
15D28-04	TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY
15D39-02	TRAFFIC CONTROL, DROP-OFF SIGNING
15D44-02	TRAFFIC CONTROL, SIGNING ON ROADWAYS WITH MILLED SURFACES
15D45-03	TRAFFIC CONTROL, SIGNING ON ROADWAYS WITH LOOSE GRAVEL
15D48-01	TRAFFIC CONTROL, LANE SHIFT IN FLAGGING OPERATION
15D51-01	TRAFFIC CONTROL, MOBILE OPERATIONS ON AN UNDIVIDED ROADWAY



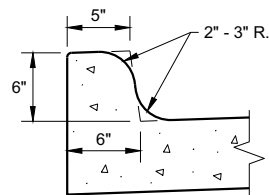
TYPES A^① & D



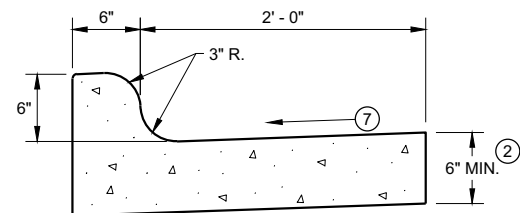
6" SLOPED CURB TYPES G^① & J



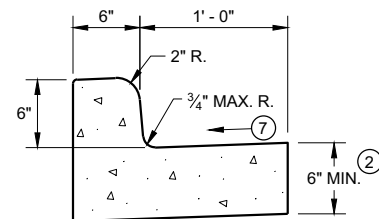
4" SLOPED CURB TYPES G^① & J



TYPES K^① & L  
(OPTIONAL CURB SHAPE)

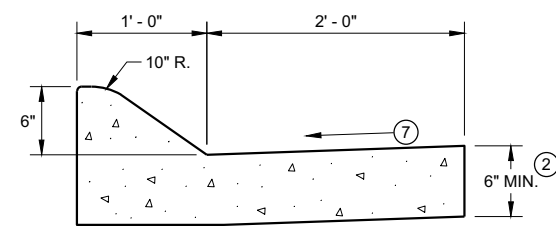


TYPES K^① & L  
CONCRETE CURB AND GUTTER 30"

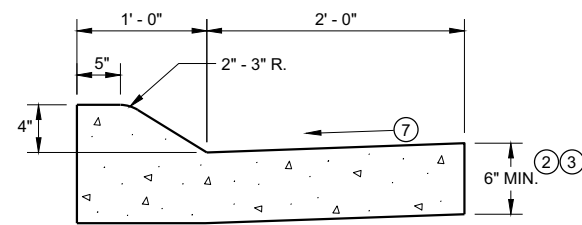


TYPES A^① & D

CONCRETE CURB AND GUTTER 18"

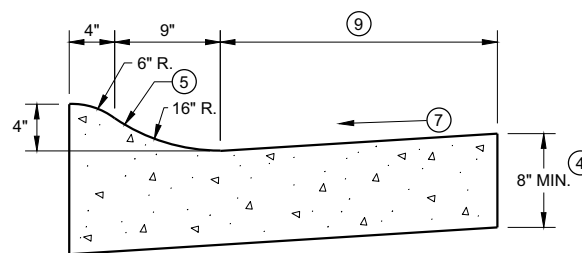


6" SLOPED CURB TYPES A^① & D



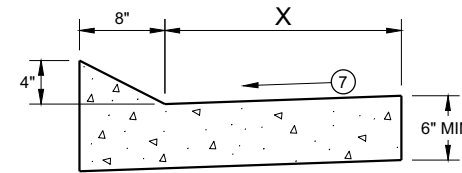
4" SLOPED CURB TYPES A^① & D

CONCRETE CURB AND GUTTER 36"



4" SLOPED CURB TYPES R^① & T

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

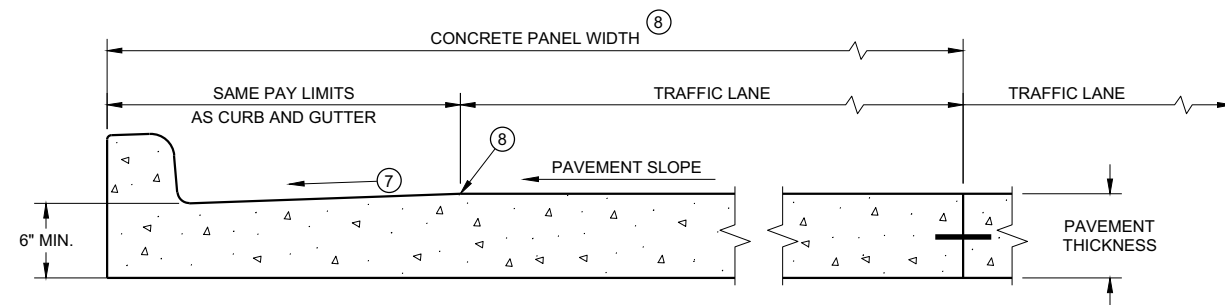


TYPES TBT & TBTT^①

CONCRETE CURB AND GUTTER

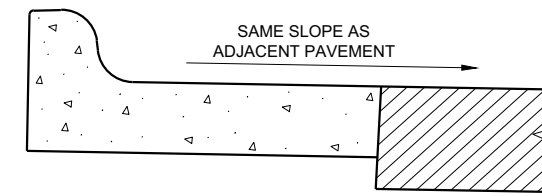
PAVEMENT THICKNESS  
AND MAXIMUM CONCRETE  
PANEL WIDTH TABLE

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

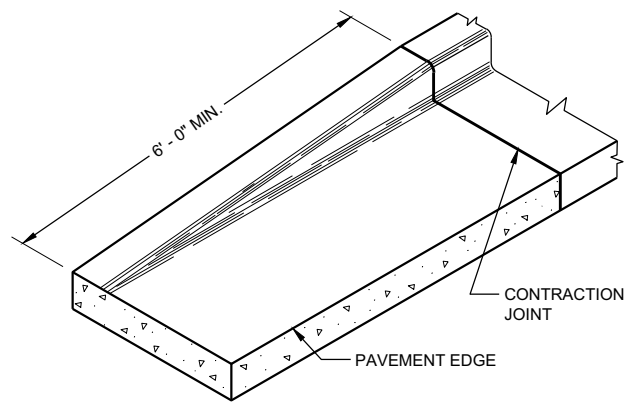
DETAILS OF CONSTRUCTION AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

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

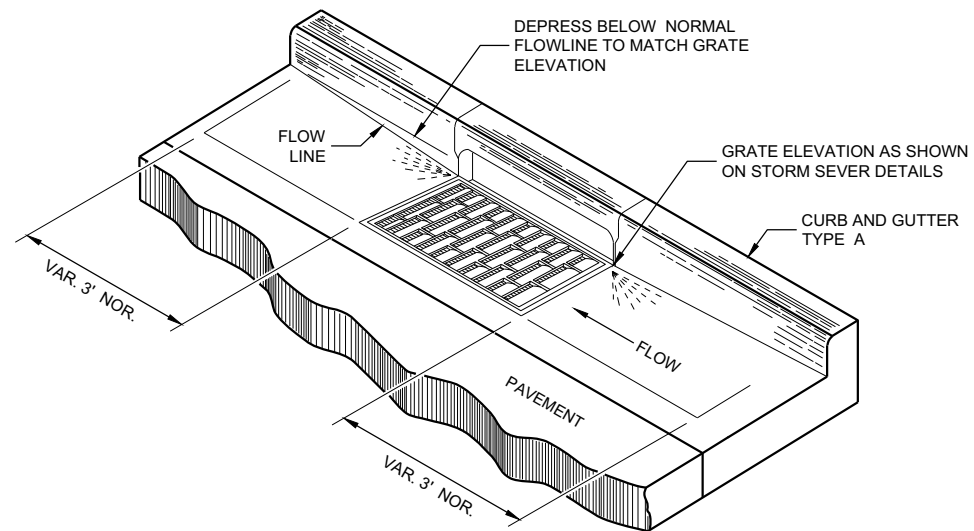
INTEGRAL CURB AND GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB AND GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE.

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)

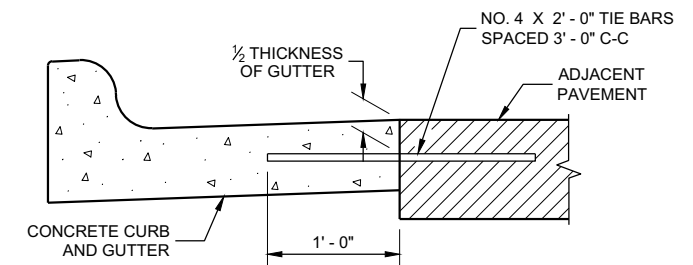
**GENERAL NOTES**

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

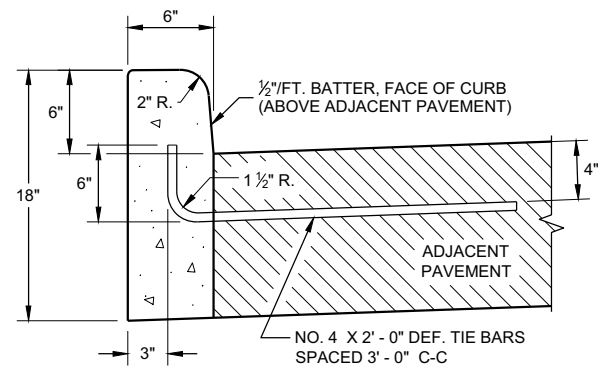
PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

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

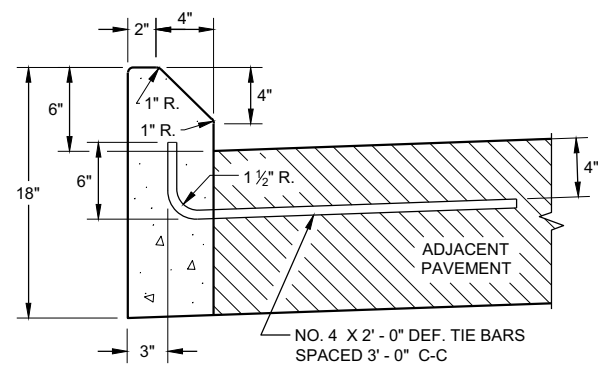
- ① TIE BARS ARE REQUIRED FOR CURB AND GUTTERS TYPES A, G, K, R, AND TBTT.
- ② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ⑨ REFER TO SDD 08D18 AND 08D19 FOR ADDITIONAL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



**TYPICAL TIE BAR LOCATION** ①

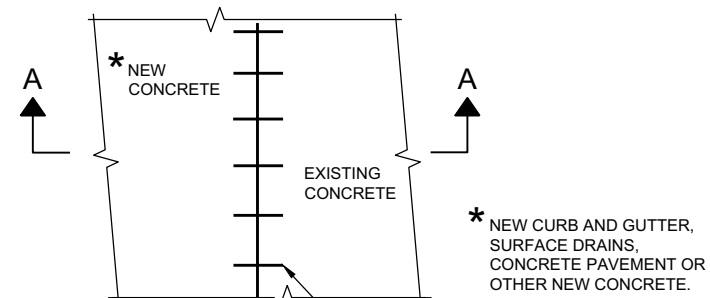


**TYPES A ① & D**

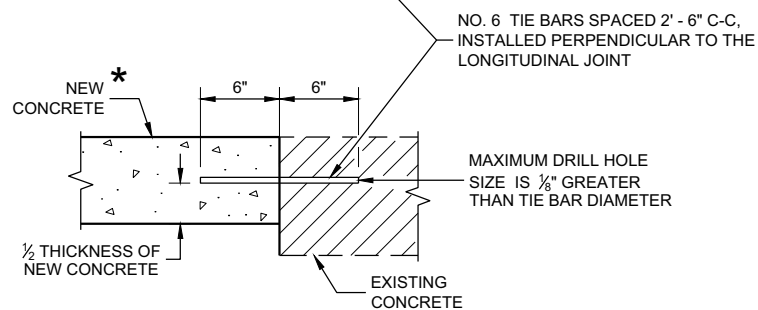


**TYPES G ① & J**

**CONCRETE CURB**

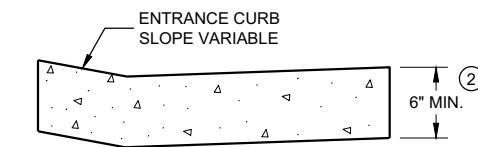


**PLAN VIEW**



**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**

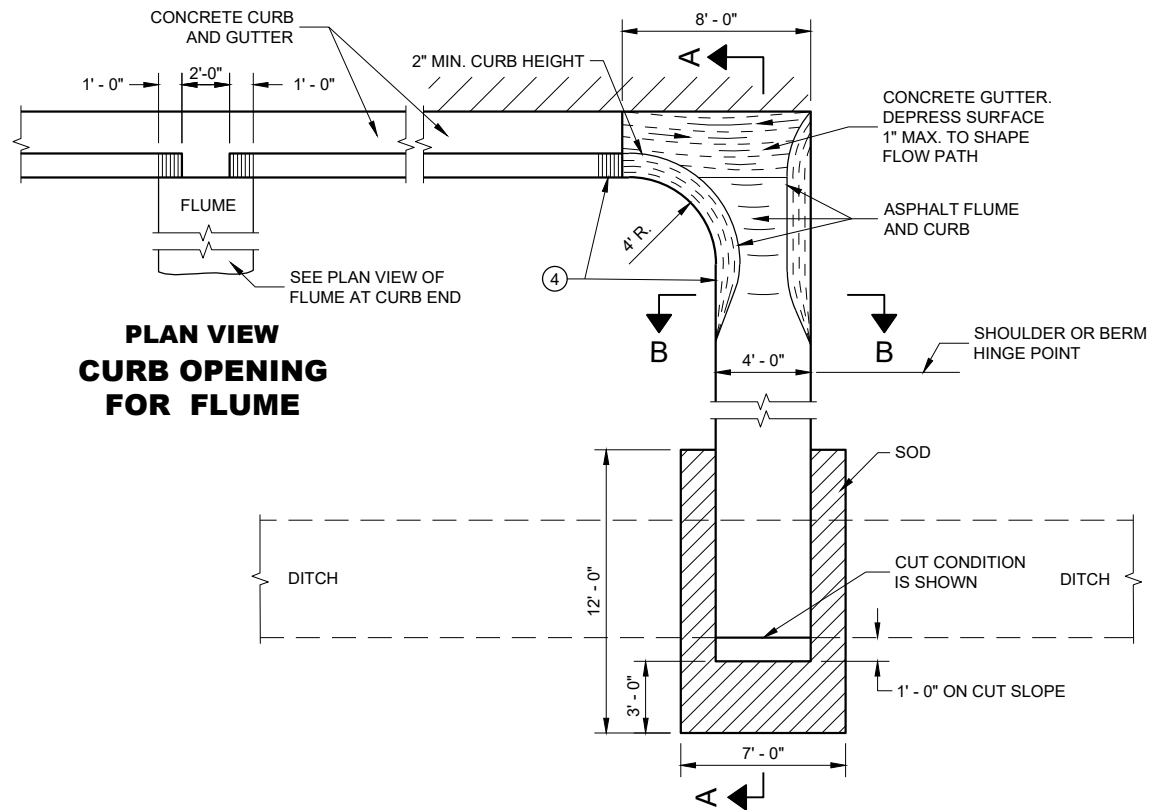
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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

FHWA

NOTE: TAPER CURB ENDS TO GUTTER IN 1' - 0"

### ASPHALTIC FLUME



**PLAN VIEW  
CURB OPENING  
FOR FLUME**

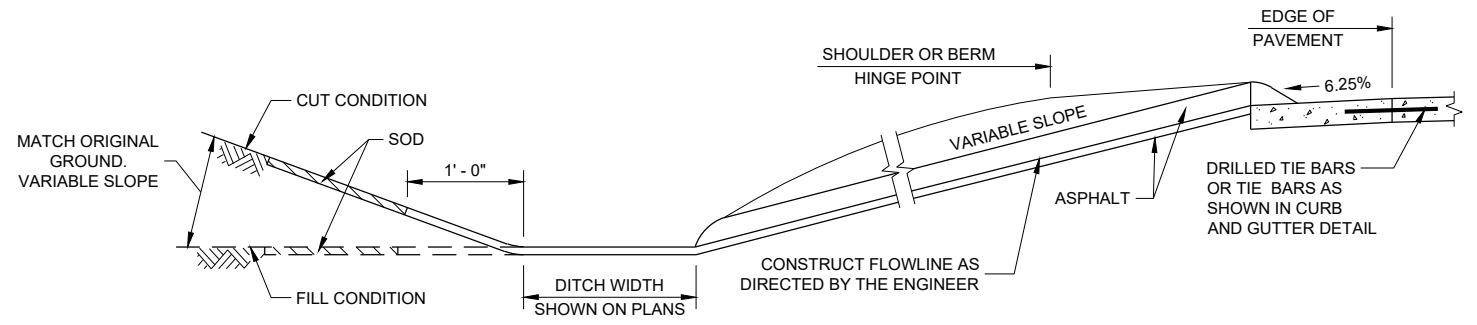
**PLAN VIEW  
FLUME AT CURB END**

### GENERAL NOTES

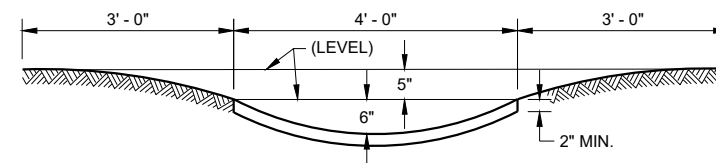
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

4" X 4" - W3.0 X W3.0 CONCRETE REINFORCEMENT SHALL BE IN ACCORDANCE WITH AASHTO SPECIFICATION M55.

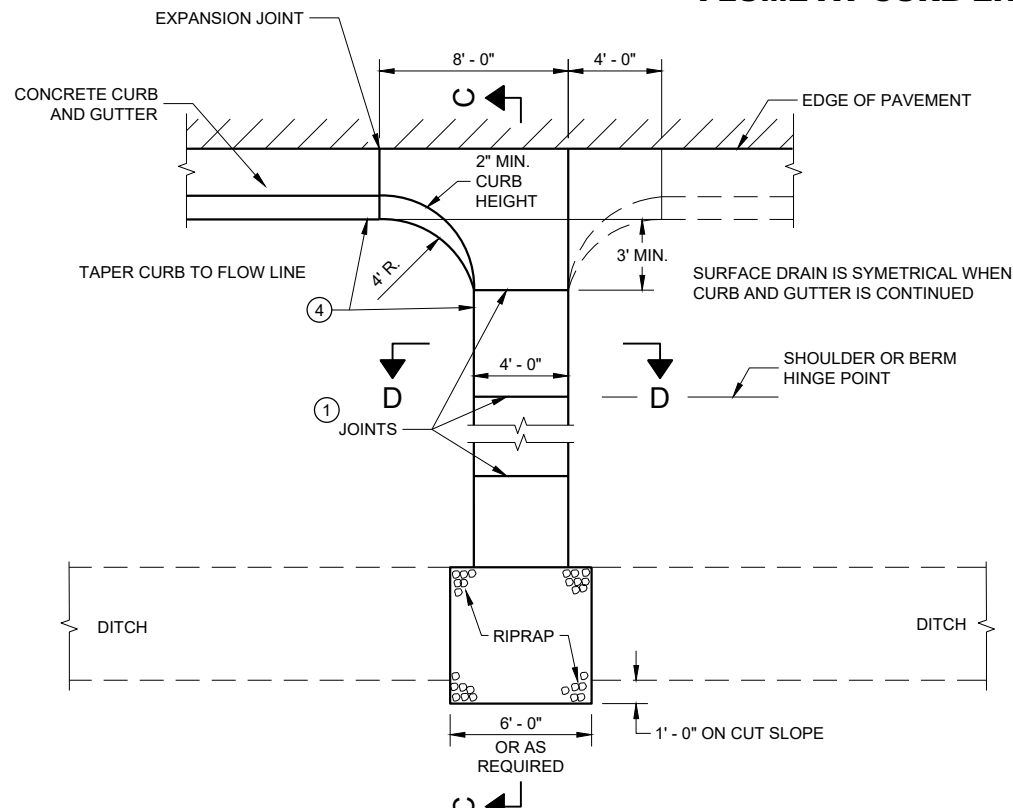
- ① JOINTS SHALL BE 1/8" TO 1/4" WIDE BY 1 1/2" DEEP AND SPACED AT UNIFORM INTERVALS OF APPROXIMATELY 4 FEET.
- ② GEOTEXTILE TYPE "R" SHALL UNDERLAY THE FULL LENGTH AND WIDTH OF THE CONCRETE SURFACE DRAIN AND RIPRAP.
- ③ CONCRETE SURFACE DRAIN WITHOUT CURB AND GUTTER MAY BE USED ON BACKSLOPES WHEN SPECIFIED.
- ④ ANGLE OF FLUME IN RELATION TO BACK OF CURB TO BE CONSTRUCTED PER THE PLAN DETAILS OR AS DIRECTED BY THE ENGINEER. ANGLE OF FLUME MAY BE OTHER THAN 90 DEGREES AS SHOWN.



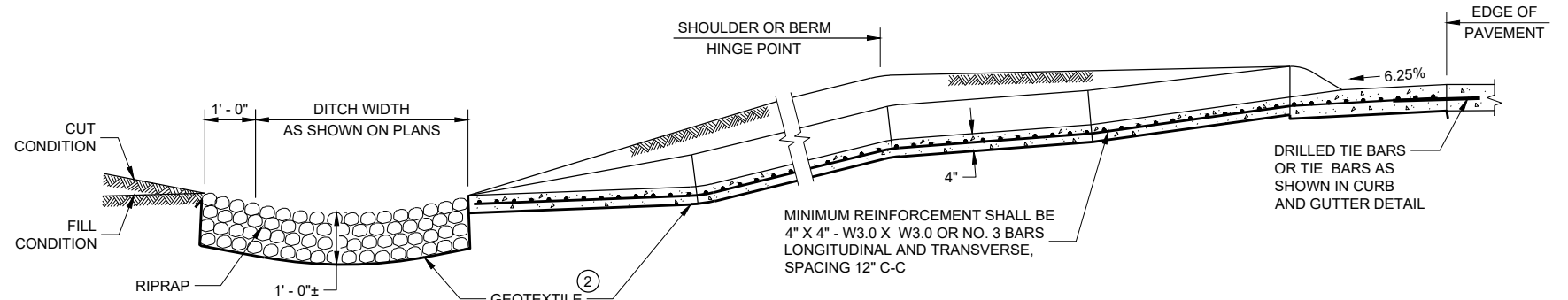
**SECTION A - A**



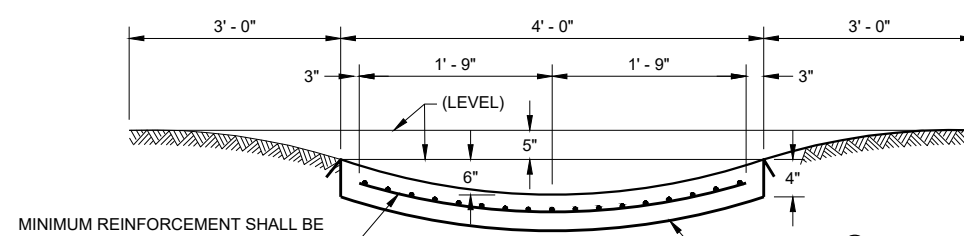
**SECTION B - B**



**PLAN VIEW  
CONCRETE SURFACE DRAIN**



**SECTION C - C**



**SECTION D - D**

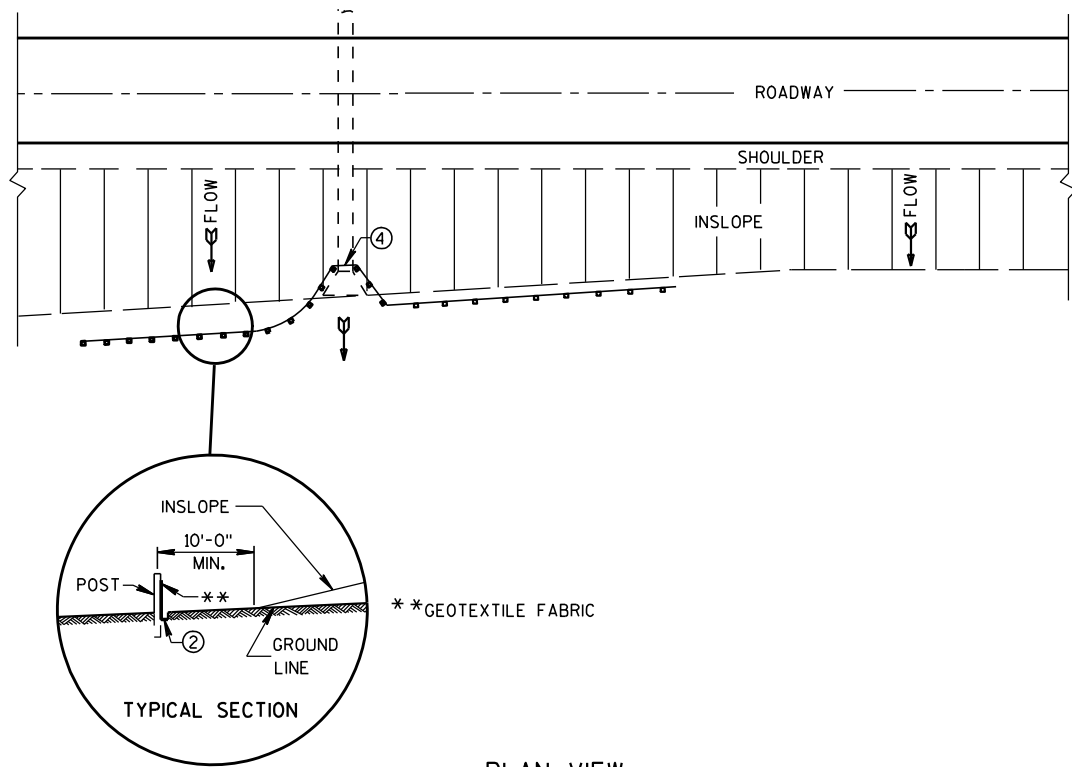
### CONCRETE SURFACE DRAINS AND ASPHALTIC FLUMES

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

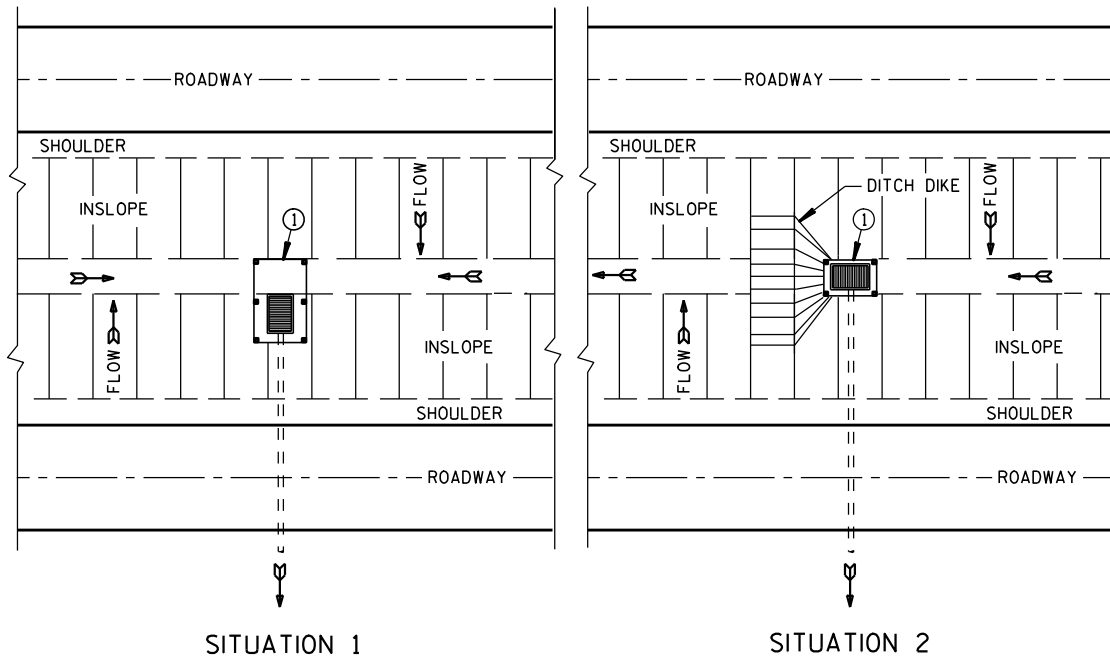
APPROVED  
November 2021 /S/ Rodney Taylor  
DATE ROADWAY STANDARDS DEVELOPMENT  
ENGINEER

FHWA





PLAN VIEW  
TYPICAL APPLICATION OF SILT FENCE

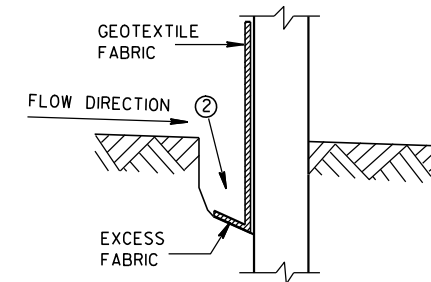


SITUATION 1 SITUATION 2  
PLAN VIEW  
SILT FENCE AT MEDIAN SURFACE DRAINS

**GENERAL NOTES**

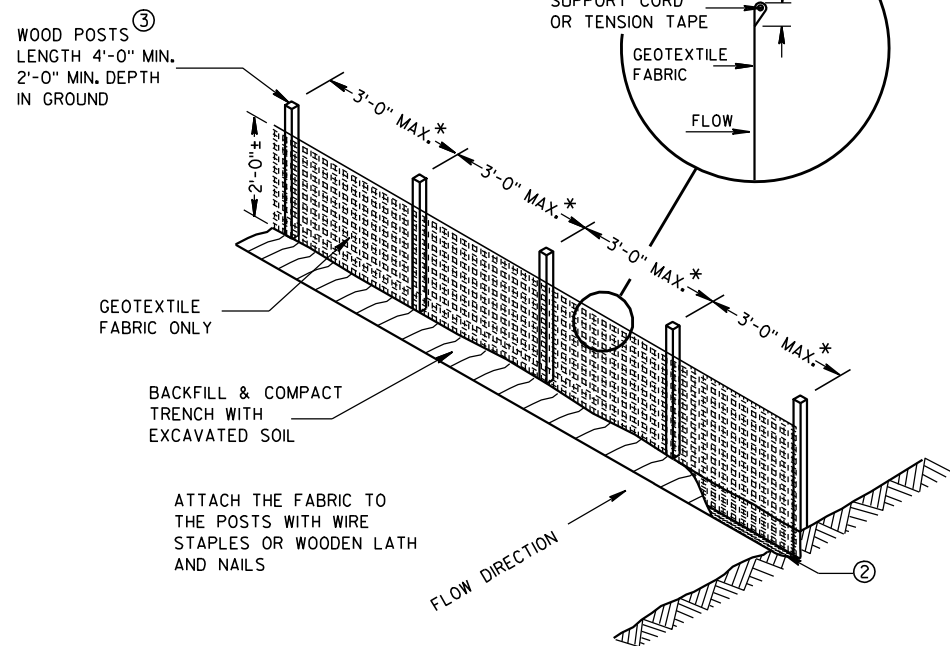
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

- 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.



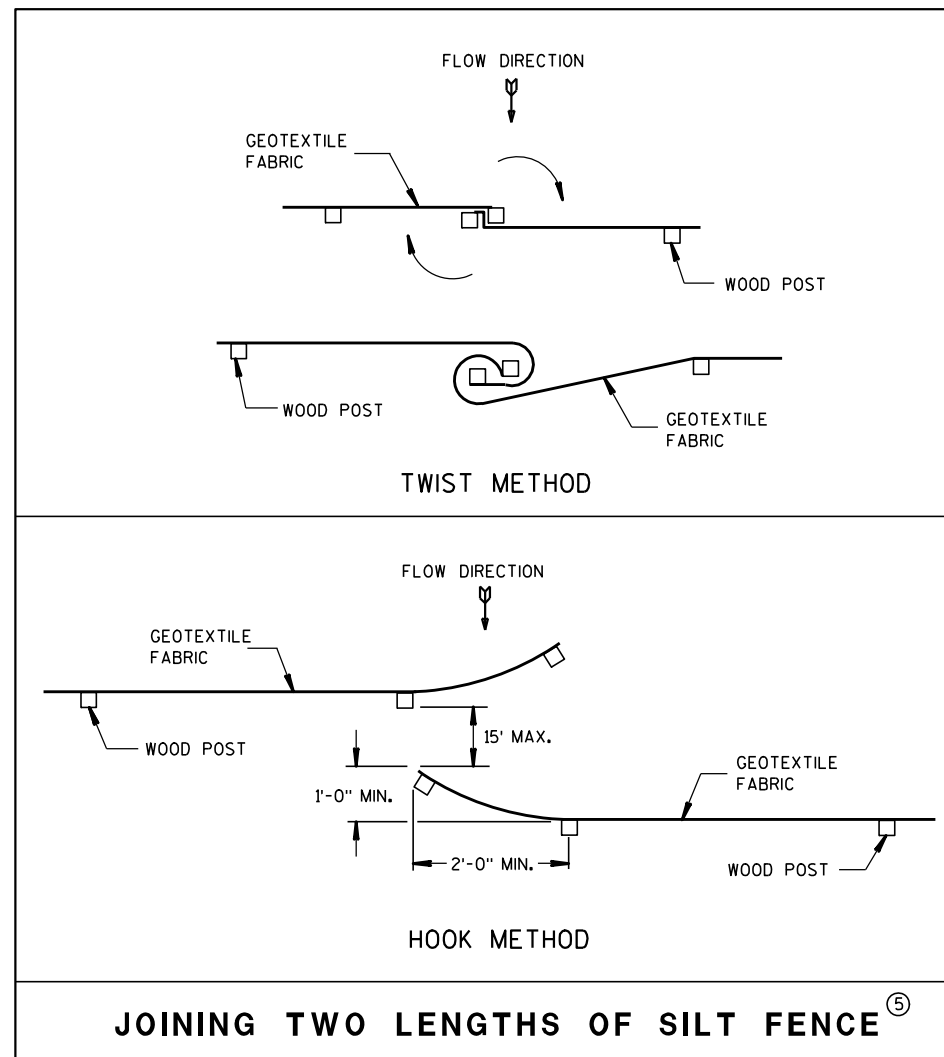
TRENCH DETAIL

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

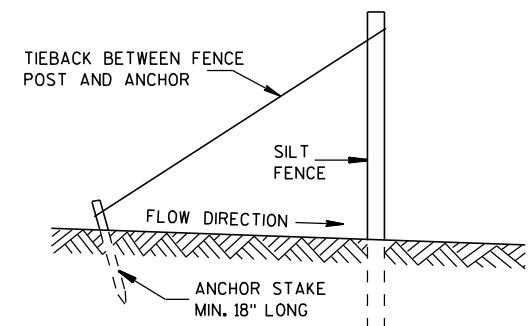


SILT FENCE

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



JOINING TWO LENGTHS OF SILT FENCE ⑤



SILT FENCE TIE BACK  
(WHEN REQUIRED BY THE ENGINEER)

**SILT FENCE**

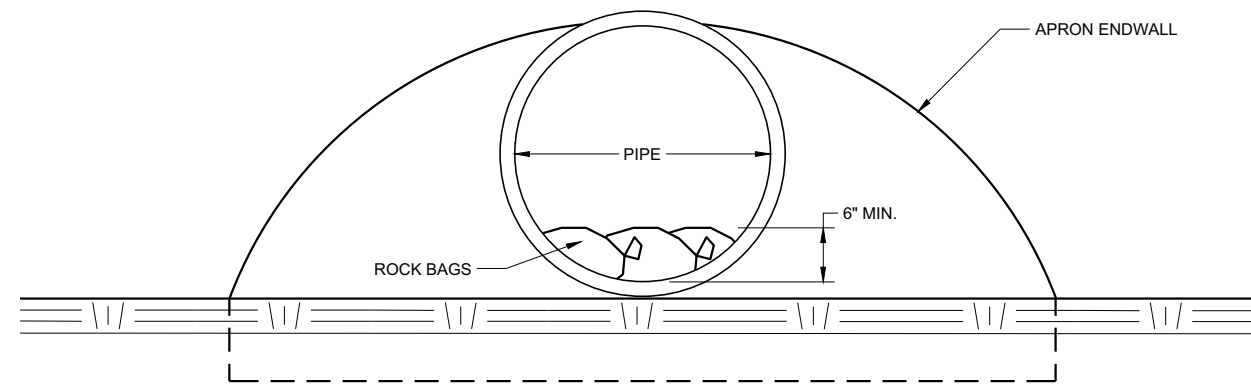
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

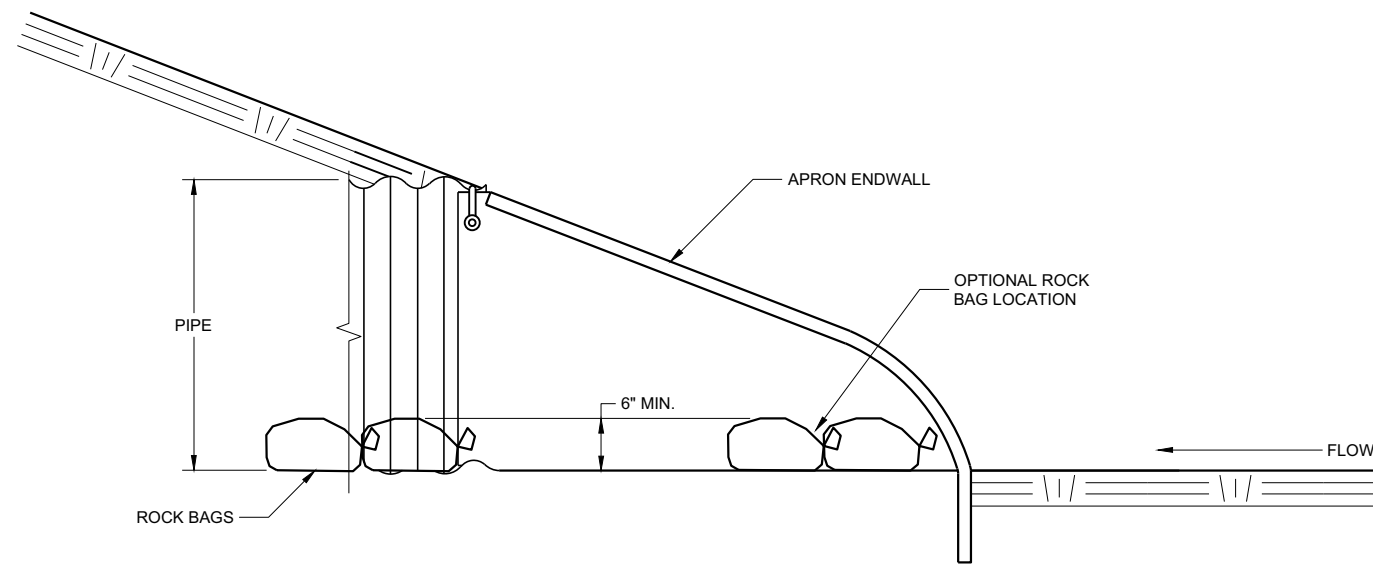
4-29-05  
DATE

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

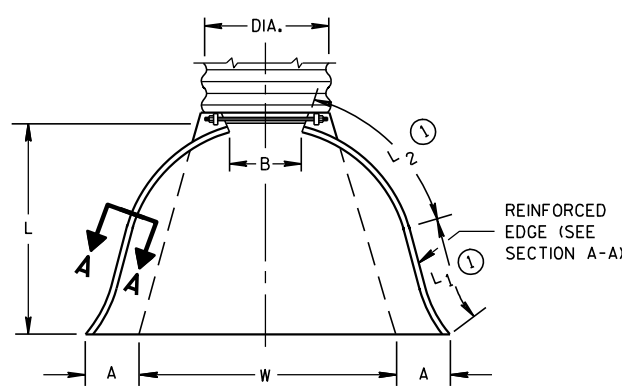
FHWA

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

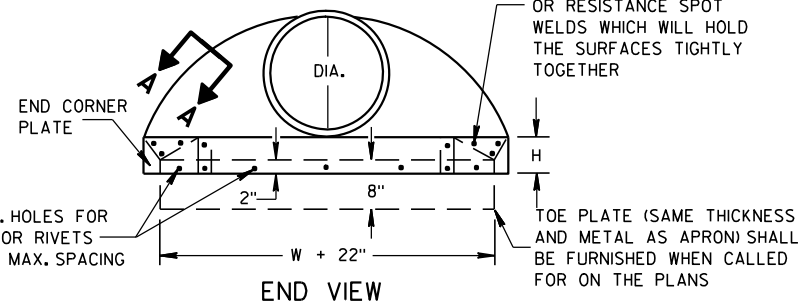
REINFORCED CONCRETE APRON ENDWALLS									
PIPE DIA. (IN.)	DIMENSIONS (Inches)							APPROX. SLOPE	
	T	A	B	C	D	E	G		
12	2	4	24	48 1/8	72 1/8	24	2	3 to 1	
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1	
18	2 1/2	9	27	46	73	36	2 1/2	3 to 1	
21	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	3 to 1	
24	3	9 1/2	43 1/2	30	73 1/2	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	24-30	72-78	21-27	99	102	5 1/2	2 to 1	
72	7	24-36	78	21	99	108	6	2 to 1	
78	7 1/2	24-36	78	21	99	114	6 1/2	2 to 1	
84	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1	
90	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	1 1/2 to 1	

* MINIMUM  
** MAXIMUM

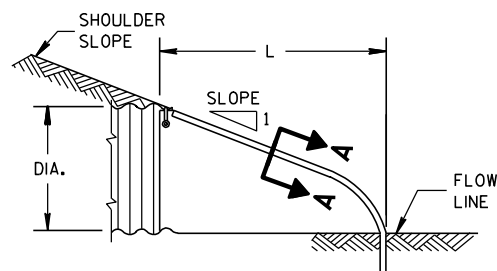


PLAN VIEW

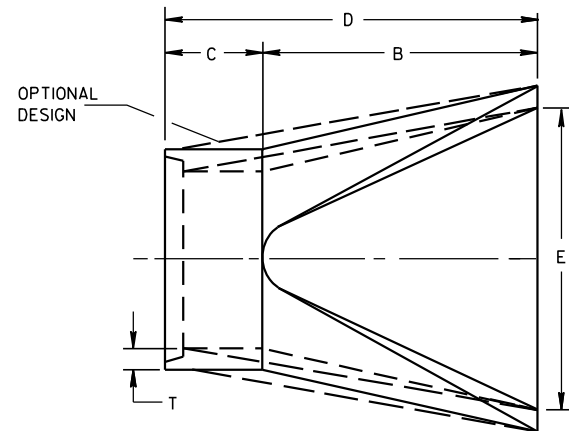
END CORNER PLATES MAY BE FASTENED TO APRON PROPER BY BOLTS, RIVETS, OR RESISTANCE SPOT WELDS WHICH WILL HOLD THE SURFACES TIGHTLY TOGETHER



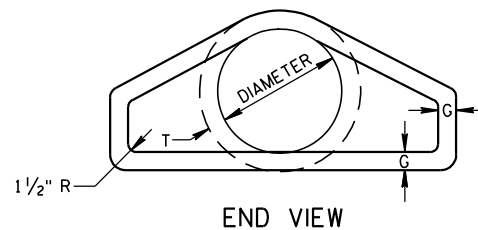
END VIEW



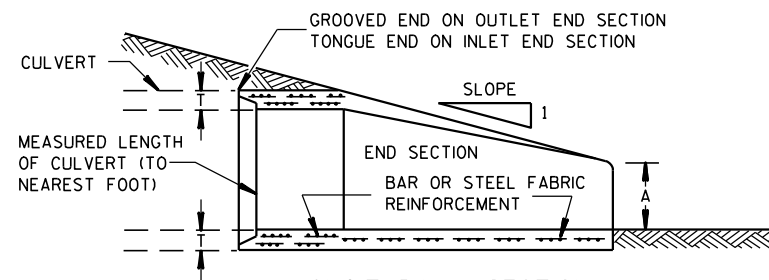
SIDE ELEVATION  
METAL ENDWALLS



PLAN

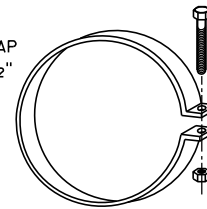


END VIEW



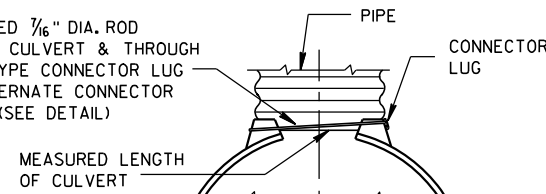
LONGITUDINAL SECTION  
CONCRETE ENDWALLS

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 3/16" DIA. ROD AROUND CULVERT & THROUGH TANK TYPE CONNECTOR LUG OR ALTERNATE CONNECTOR STRAP (SEE DETAIL)



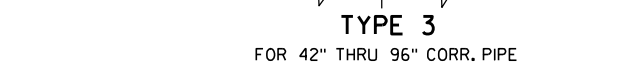
TYPE 1  
FOR 12" THRU 24" CORR. PIPE

THREADED 3/16" DIA. ROD OVER TOP OF APRON, SIDE LUGS TO BE RIVETED TO APRON



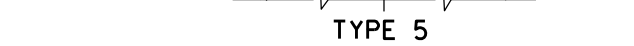
TYPE 2  
FOR 30" THRU 96" CORR. PIPE

MEASURED LENGTH OF CULVERT



TYPE 3  
FOR 42" THRU 96" CORR. PIPE

DIMPLED OR CORRUGATED COUPLING BAND



TYPE 5  
ALTERNATE FOR:  
ALL SIZES CORRUGATED CIRCULAR PIPE

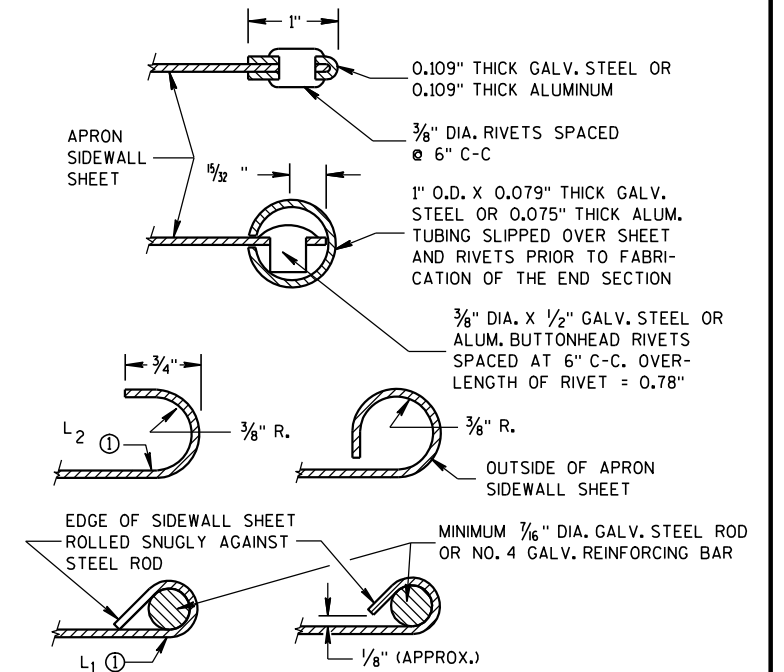
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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

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

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

CONNECTION DETAILS



SECTION A-A

### GENERAL NOTES

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

CONCRETE CULVERT ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR 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.

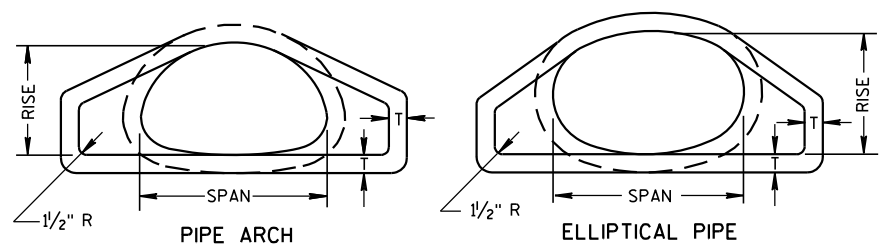
WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

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

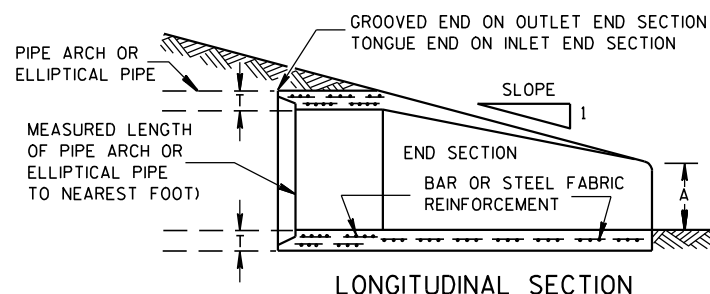
### APRON ENDWALLS FOR CULVERT PIPE

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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

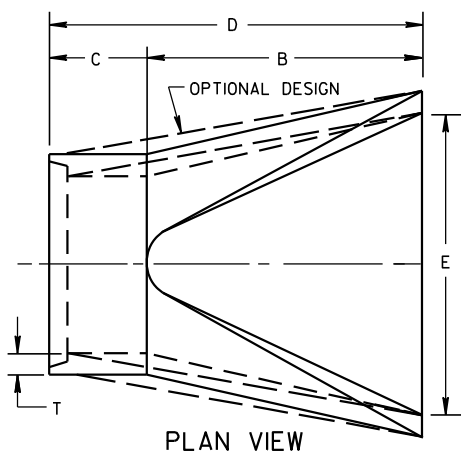


END VIEW



LONGITUDINAL SECTION

CONCRETE ENDWALLS



PLAN VIEW

2- 2/3" X 1/2" CORRUGATIONS													
EQUIV. DIA. (Inches)	(Inches)		MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	SPAN	RISE	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 (±1")	L2 (±1")	W (±2")		
15	17	13	.064	.060	7	9	6	19	14	16	30	2 1/2 to 1	1 Pc.
18	21	15	.064	.060	7	10	6	23	14	19 3/8	36	2 1/2 to 1	1 Pc.
21	24	18	.064	.060	8	12	6	28	18	21 3/4	42	2 1/2 to 1	1 Pc.
24	28	20	.064	.060	9	14	6	32	18	27 1/2	48	2 1/2 to 1	1 Pc.
30	35	24	.079	.075	10	16	6	39	18	37 5/8	60	2 1/2 to 1	1 Pc.
36	42	29	.079	.075	12	18	8	46	24	45 3/8	75	2 1/2 to 1	1 Pc.
42	49	33	.109	.105	13	21	9	53	24	54 3/4	85	2 1/2 to 1	2 Pc.
48	57	38	.109	.105	18	26	12	63	24	68	90	2 1/2 to 1	3 Pc.
54	64	43	.109	.105	18	30	12	70	24	72 3/4	102	2 1/4 to 1	3 Pc.
60	71	47	.109*	.105*	18	33	12	77	30	82 1/4	114	2 1/4 to 1	3 Pc.
66	77	52	.109*	.105*	18	36	12	77	—	—	126	2 to 1	3 Pc.
72	83	57	.109*	.105*	18	39	12	77	—	—	138	2 to 1	3 Pc.

3" X 1" CORRUGATIONS													
EQUIV. DIA. (Inches)	(Inches)		MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	SPAN	RISE	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 (±1")	L2 (±1")	W (±2")		
48	53	41	.109	.105	18	26	12	63	24	72 3/4	90	2 1/2 to 1	2 Pc.
54	60	46	.109	.105	18	30	12	70	30	82 1/4	102	2 to 1	2 Pc.
60	66	51	.109*	.105*	18	33	12	77	—	—	114	1 1/2 to 1	3 Pc.
66	73	55	.109*	.105*	18	36	12	77	—	—	126	1 1/2 to 1	3 Pc.
72	81	59	.109*	.105*	18	39	12	77	—	—	138	2 to 1	3 Pc.
78	87	63	.109*	.105*	22	38	12	77	—	—	148	1 1/2 to 1	3 Pc.
84	95	67	.109*	.105*	22	34	12	77	—	—	162	1 1/2 to 1	3 Pc.
90	103	71	.109*	.105*	22	38	12	77	—	—	174	1 1/2 to 1	3 Pc.
96	112	75	.109*	.105*	24	40	12	77	—	—	174	1 1/2 to 1	3 Pc.

NOTE: ALL SPLICES TO BE LAP RIVETED OR BOLTED. * EXCEPT CENTER PANEL SEE GENERAL NOTES

REINFORCED CONCRETE PIPE ARCH										
EQUIV. DIA. (Inches)	DIMENSIONS (Inches)									APPROX. SLOPE
	**SPAN	**RISE	T	A	B	C	D	E		
24	29	18	3	8 1/2	39	33	72	48	3 to 1	
30	36	22	3 1/2	9 1/2	50	46	96	60	3 to 1	
36	44	27	4	11 1/8	60	36	96	72	3 to 1	
42	51	31	4 1/2	15 1/8	60	36	96	78	3 to 1	
48	58	36	5	21	60	36	96	84	3 to 1	
54	65	40	5 1/2	25 1/2	60	36	96	90	3 to 1	
60	73	45	6	31	60	36	96	96	3 to 1	
72	88	54	7	31	60	39	99	120	2 to 1	
84	102	62	8	28 1/2	83	19	102	144	2 to 1	

REINFORCED CONCRETE ELLIPTICAL PIPE										
EQUIV. DIA. (Inches)	DIMENSIONS (Inches)									APPROX. SLOPE
	**SPAN	**RISE	T	A	B	C	D	E		
24	30	19	3 1/4	8 1/2	39	33	72	48	3 to 1	
30	38	24	3 3/4	9 1/2	54	18	72	60	3 to 1	
36	45	29	4 1/2	11 1/8	60	24	84	72	2 1/2 to 1	
42	53	34	5	15 3/4	60	36	96	78	2 1/2 to 1	
48	60	38	5 1/2	21	60	36	96	84	2 1/2 to 1	
54	68	43	6	25 1/2	60	36	96	90	2 1/2 to 1	
60	76	48	6 1/2	30	60	36	96	96	2 1/2 to 1	

**NOMINAL SIZE

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.

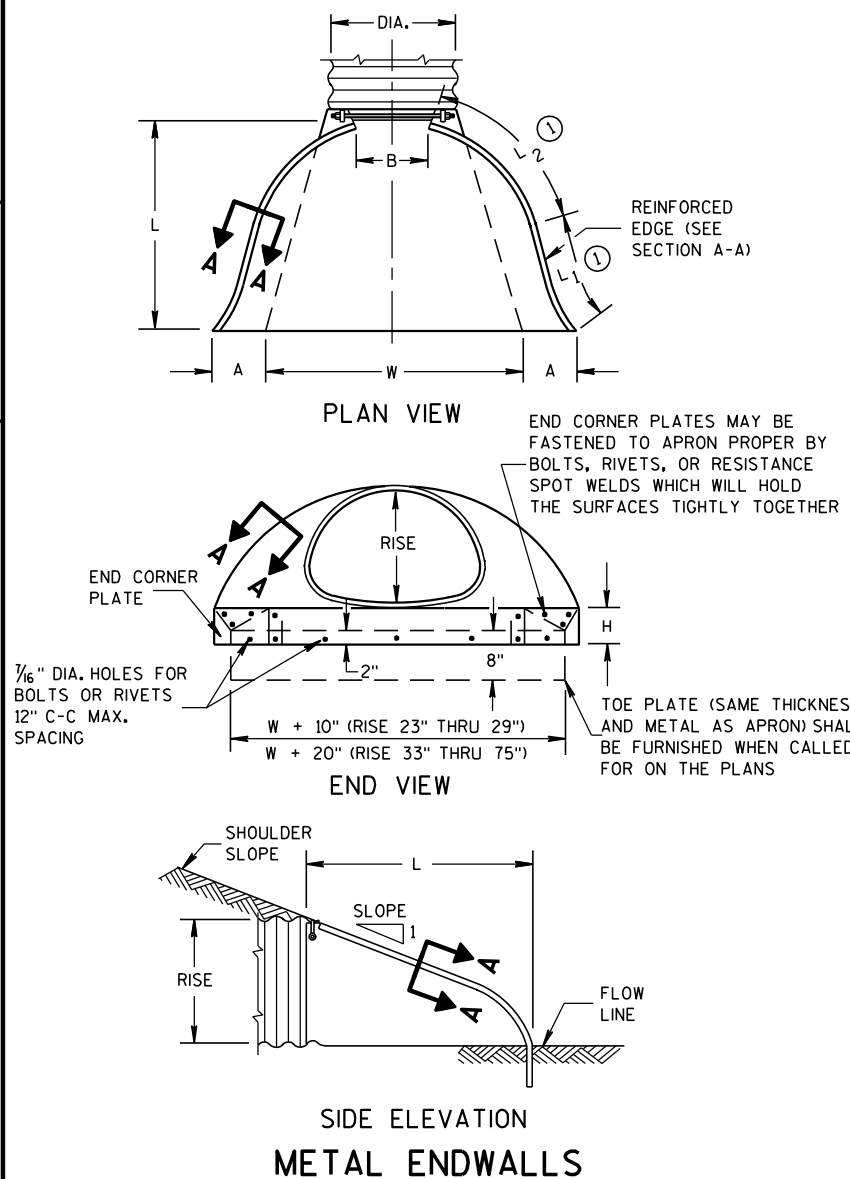
CONCRETE APRON ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VISE VERSA. GALVANIZED STEEL OR ALUMINUM APRON ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL.

ALL THREE PIECE STEEL APRON ENDWALLS FOR 66" X 51" PIPE ARCH AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 66" X 51" PIPE ARCH 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 ARCH PERIMETER.

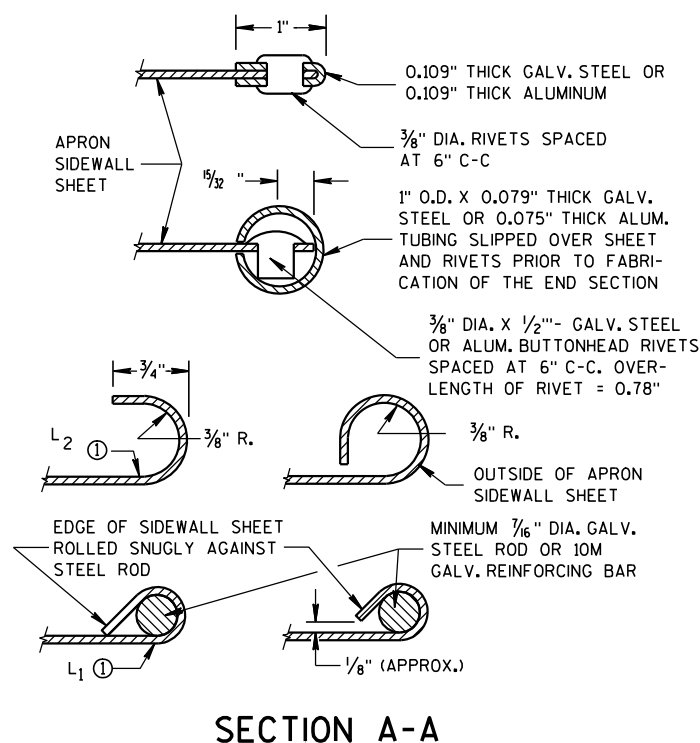
LAP SEAMS SHALL BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM RIVETS AND BOLTS FOR ALUMINUM UNITS. FOR THE 77" X 52" THROUGH 112" X 75" APRON ENDWALL SIZES, THE REINFORCED EDGES AND CENTER PANEL SEAMS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER 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 ARCH SIZES UP TO 73" X 55" A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.



SIDE ELEVATION METAL ENDWALLS

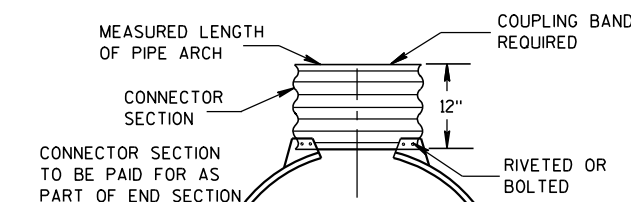


SECTION A-A



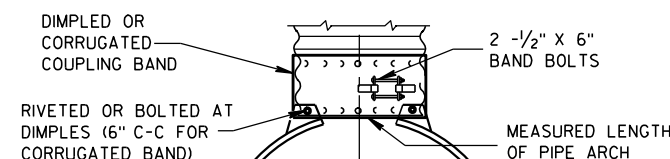
TYPE 2

FOR 17" X 13" THRU 112" X 75" PIPE ARCH



TYPE 3

FOR 64" X 43" THRU 112" X 75" PIPE ARCH



TYPE 5

ALTERNATE FOR: ALL SIZES CORRUGATED PIPE ARCHES

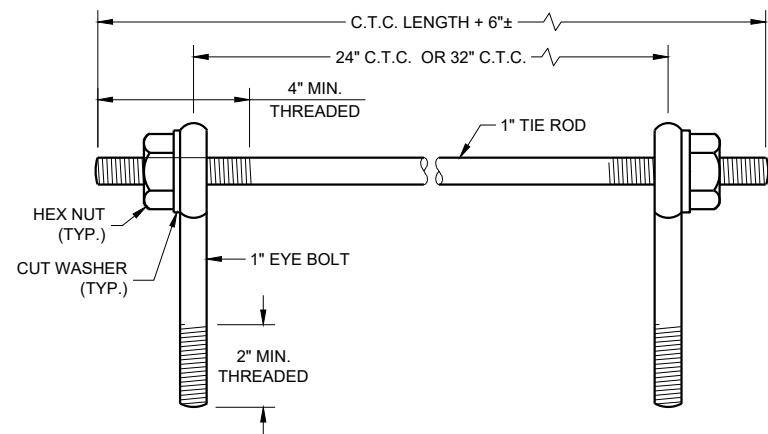
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL.

CONNECTION DETAILS

**APRON ENDWALLS FOR PIPE ARCH AND ELLIPTICAL PIPE**

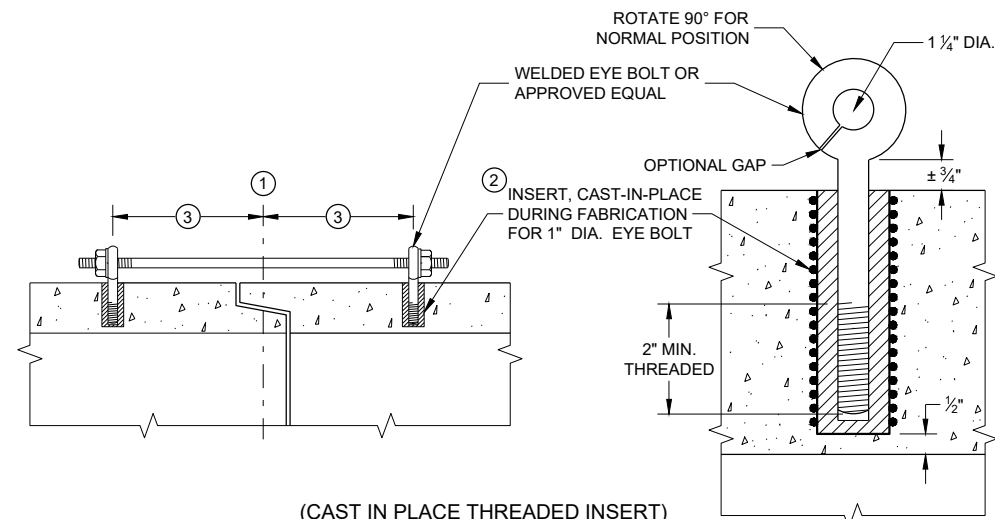
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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**

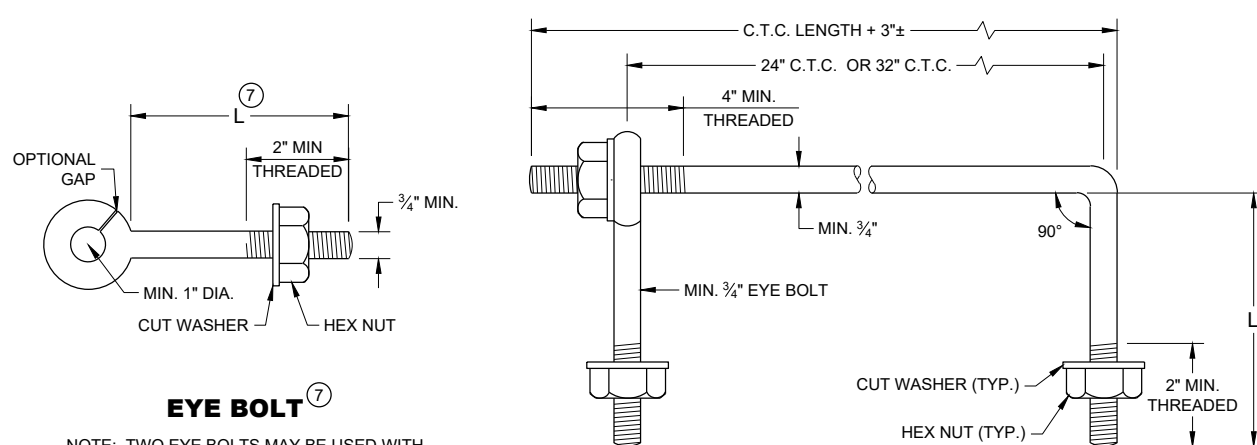
DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

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.

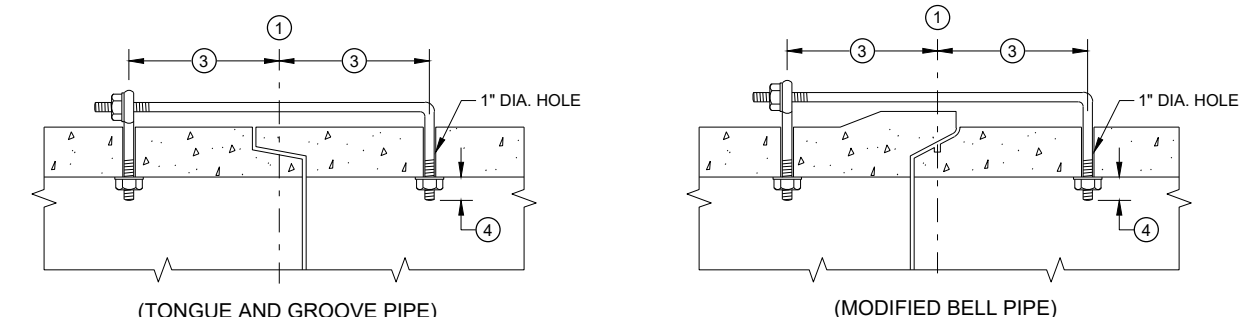
- ① CENTER LINE OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS.
- ② THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS.
- ③ HOLES SHALL BE CAST-IN-PLACE OR DRILLED PER THE APPLICABLE DETAIL, AND EQUAL DISTANCE FROM THE CENTERLINE OF THE JOINT.
- ④ BOLT PROJECTION 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**



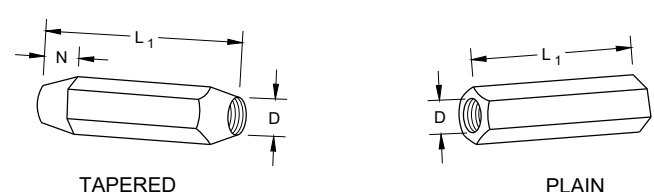
**LONGITUDINAL SECTION**  
(JOINT TIES FOR 18" TO 66" DIA. CONCRETE PIPE)

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

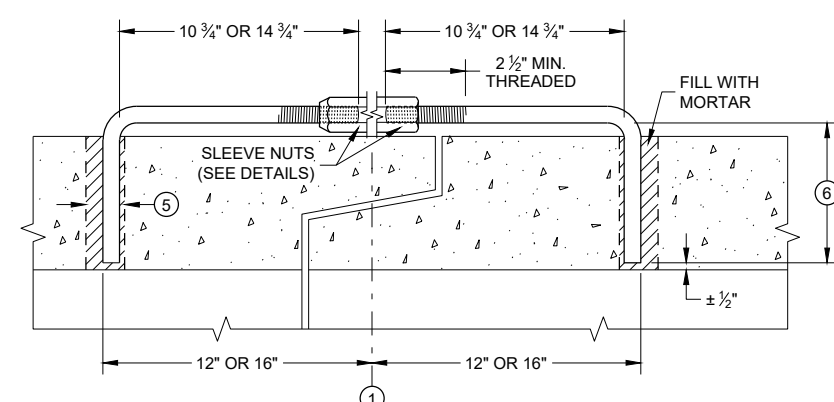
**ADJUSTABLE TIE ROD TABLE**

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 1/16

DIMENSIONS SHOWN ARE IN INCHES

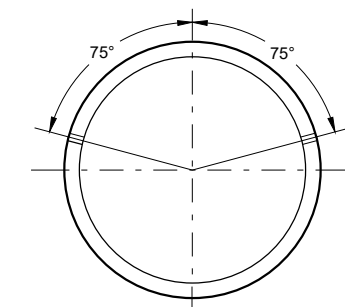


**RIGHT AND LEFT THREADS SLEEVE NUTS**



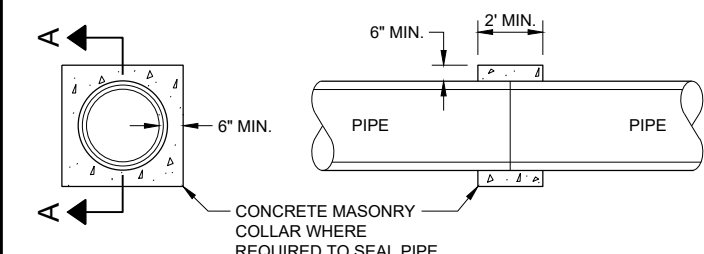
**LONGITUDINAL SECTION**

**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**

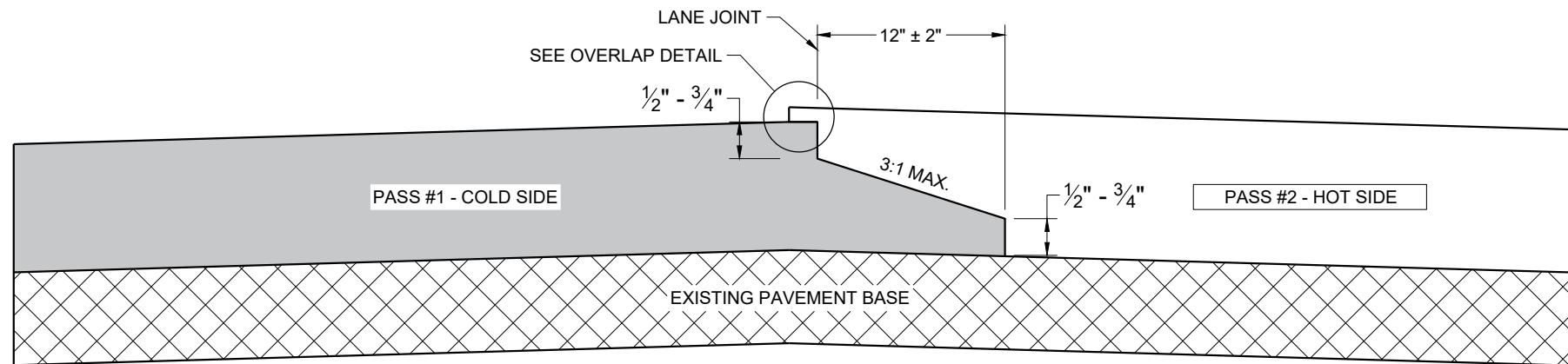


**SECTION A - A**  
**CONCRETE COLLAR DETAIL**

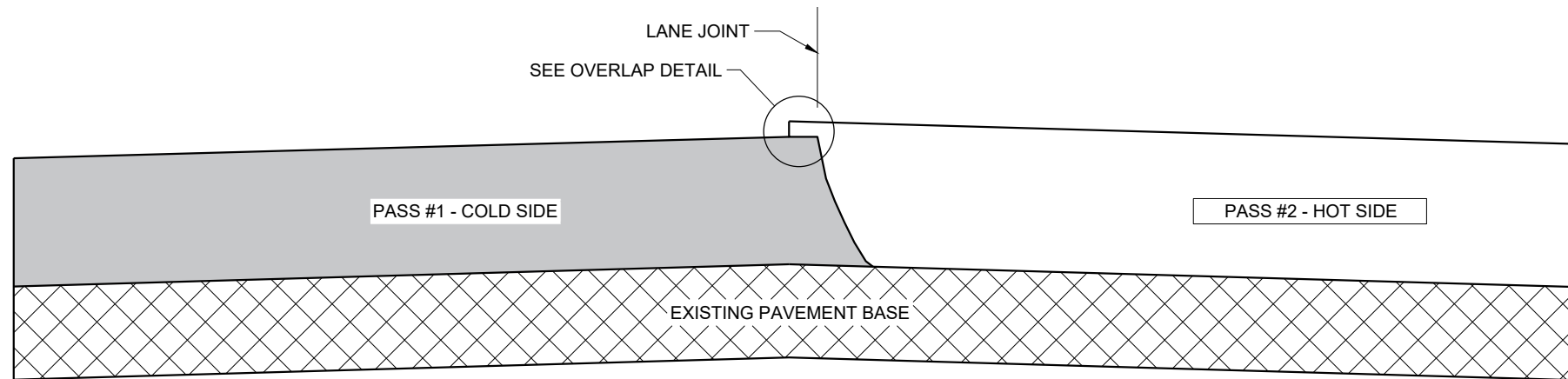
**JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

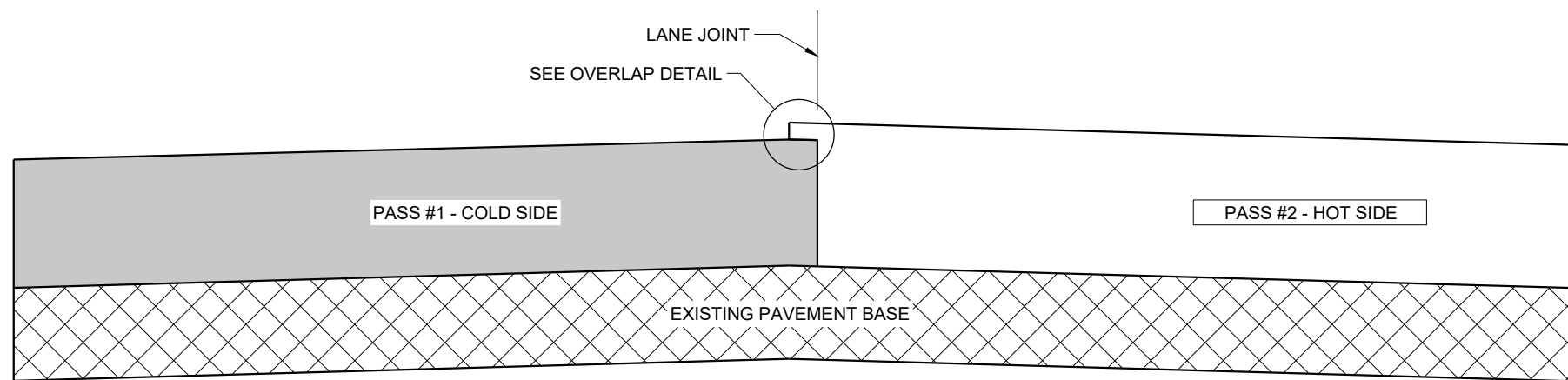
APPROVED  
November 2021 /S/ Rodney Taylor  
DATE ROADWAY STANDARDS DEVELOPMENT  
ENGINEER



**TYPICAL PAVEMENT CROSS SECTION  
NOTCHED WEDGE JOINT**



**TYPICAL PAVEMENT CROSS SECTION  
VERTICAL JOINT**



**TYPICAL PAVEMENT CROSS SECTION  
VERTICAL JOINT (MILLED)**

**GENERAL NOTES**

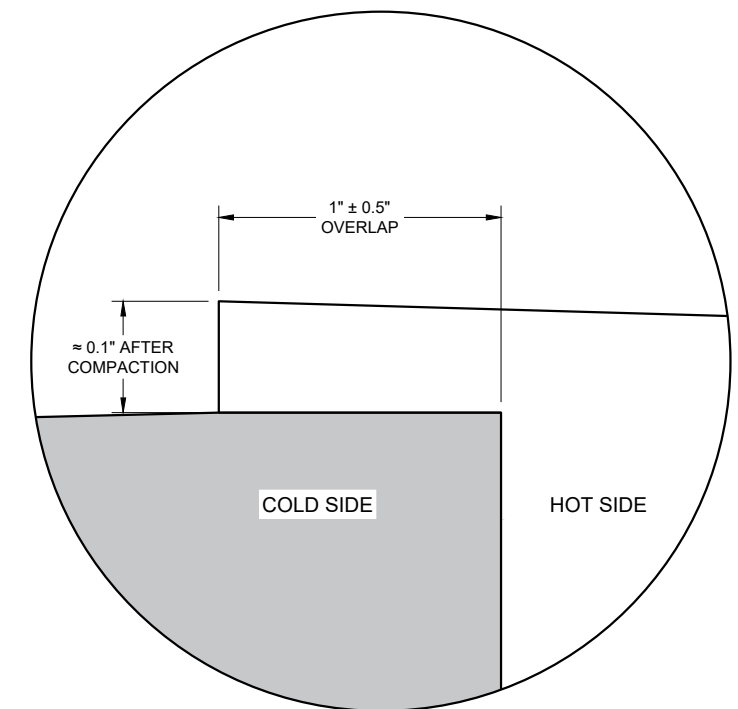
IN ADDITION TO THE DETAILS PROVIDED IN THIS DRAWING, CONFORM TO STANDARD SPECIFICATION 450.3.2.8 FOR WHEN A NOTCHED WEDGE JOINT IS REQUIRED AND FOR GENERAL JOINT CONSTRUCTION REQUIREMENTS.

FOR ALL LONGITUDINAL JOINTS, ENSURE THE PAVER SCREED OVERLAPS THE PREVIOUSLY PLACED PAVEMENT BY  $1" \pm 0.5"$  AND THE HOT SIDE OF THE JOINT REMAINS HIGHER THAN THE COLD SIDE BY APPROXIMATELY  $0.1"$  AFTER FINAL COMPACTION. (IT WILL BE FLUSH WHEN PAVING IN ECHELON.)

ONLY REMOVE THE LONGITUDINAL NOTCHED WEDGE JOINT FOR SMA PAVEMENT OR AS DIRECTED BY THE ENGINEER TO ADDRESS SPECIFIC LENGTHS OF JOINT DAMAGED BY TRAFFIC.

WHEN MILLING BACK OR REMOVING ANY LONGITUDINAL JOINT, LIMIT THE MATERIAL REMOVED TO  $2"$  FROM THE TOP NOTCH OR FROM THE VERTICAL JOINT EDGE ON THE COLD SIDE OF THE JOINT.

USE LONGITUDINAL MILLED JOINT AS PLANS SHOW OR THE AS THE ENGINEER DIRECTS.



**OVERLAP DETAIL (TYPICAL)**

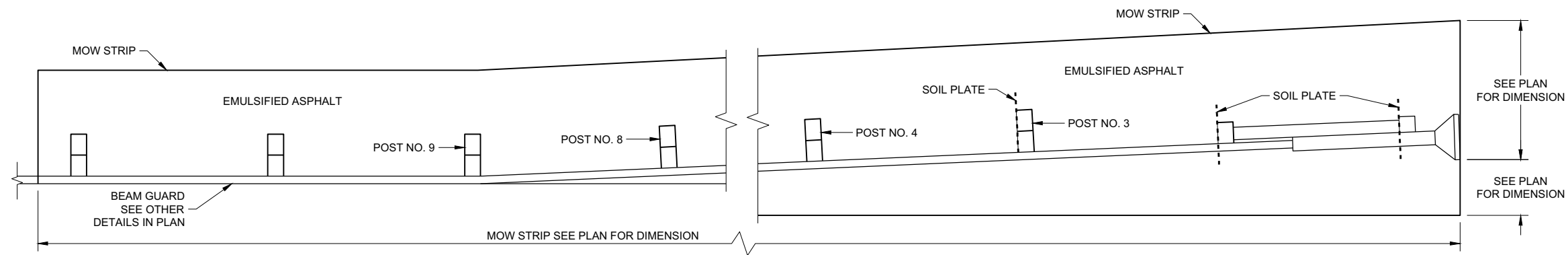
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SDD 13C19 - 03

SDD 13C19 - 03

<b>HMA LONGITUDINAL JOINTS</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED November 2020 DATE	/S/ Steven Hefel HMA PAVEMENT ENGINEER
FHWA	

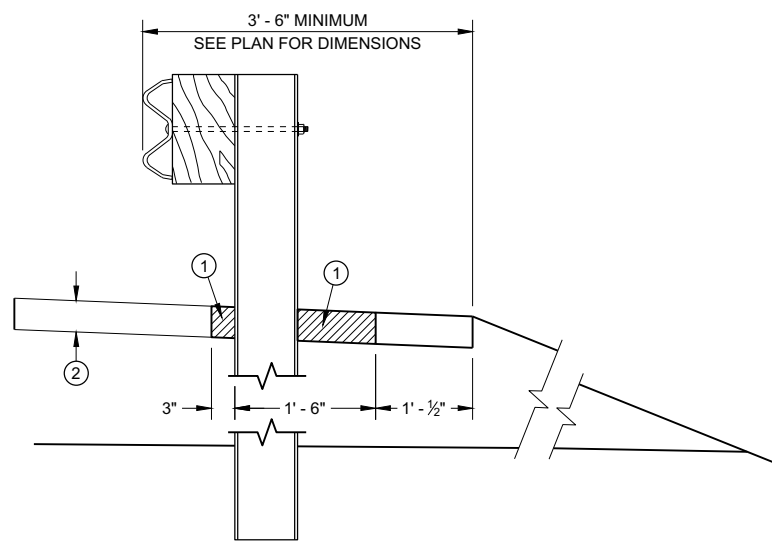


**PLAN VIEW**  
**MOW STRIP LAYOUT FOR ENERGY ABSORBING TERMINAL**

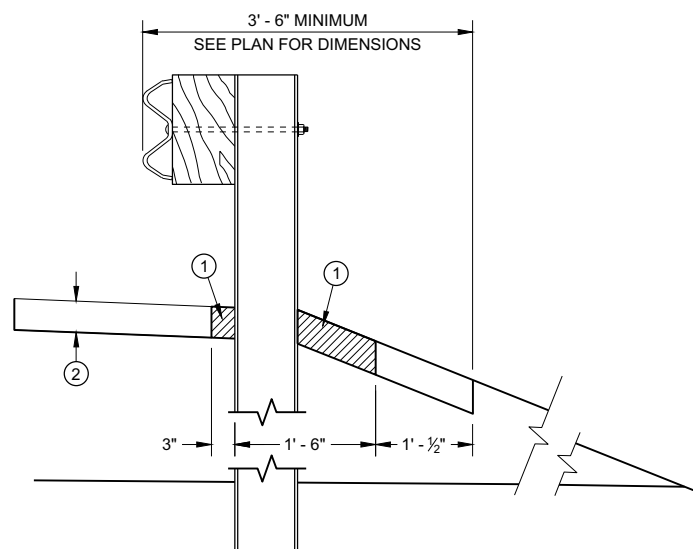
**GENERAL NOTES**

ONLY USE STEEL POSTS IN CONCRETE AND ASPHALT MOW STRIPS.

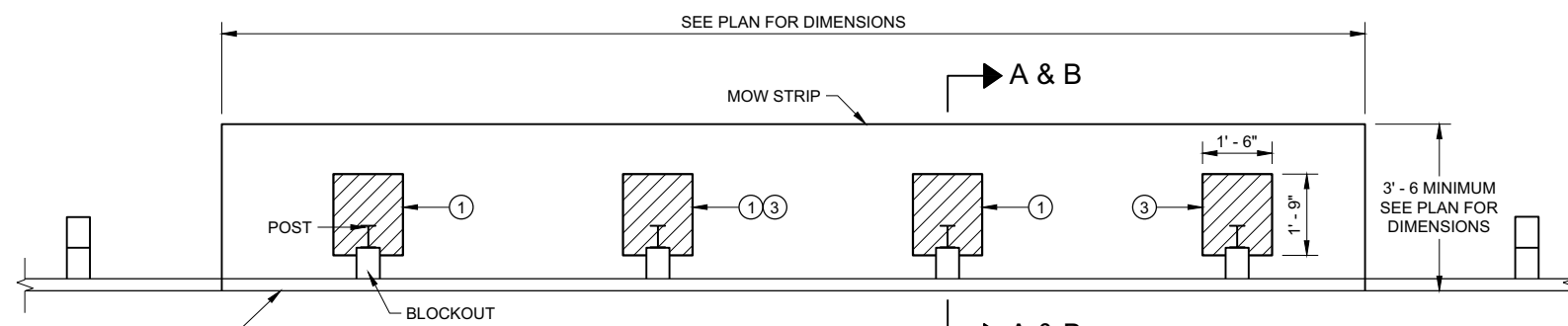
- ① CONTROLLED LOW-STRENGTH BACKFILL OR EMULSIFIED ASPHALT.
- ② DEPTH OF MOW STRIP:  
ASPHALT - 4"  
CONCRETE - 4"  
EMULSIFIED ASPHALT - 1" OR LESS
- ③ FOR EMULSIFIED ASPHALT, MOW STRIP STRIP LEAVE OUTS NOT REQUIRED. (TYPICAL FOR ALL POSTS)



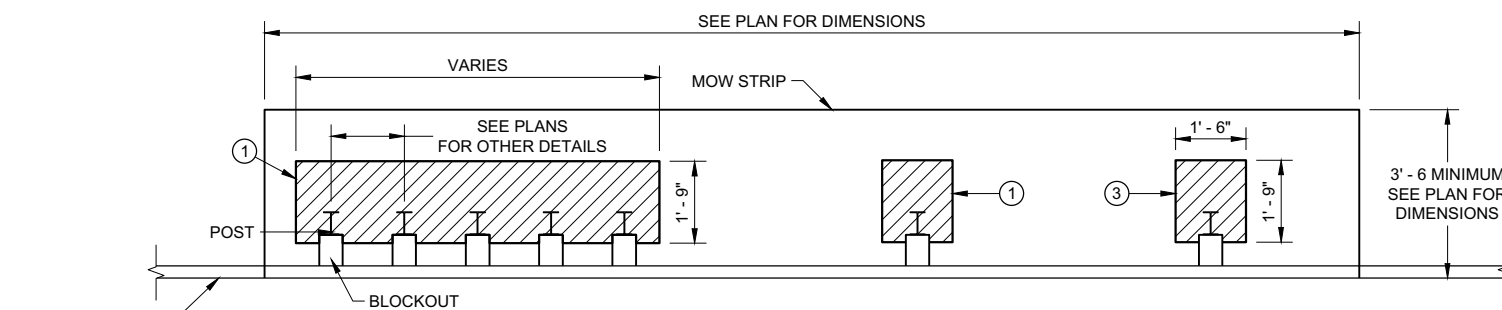
**SECTION A - A**



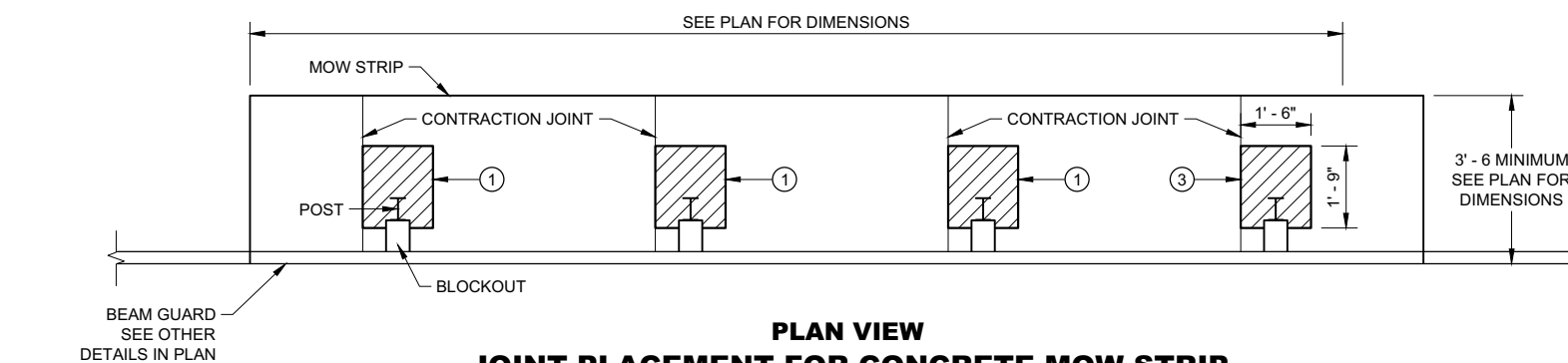
**SECTION B - B**



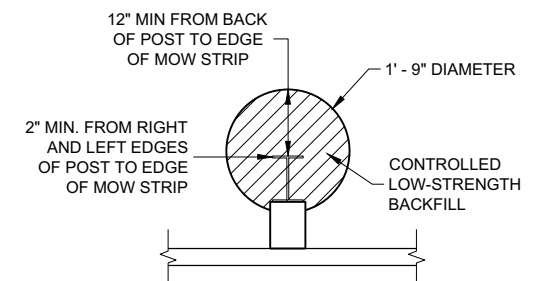
**PLAN VIEW**  
**MOW STRIP FOR TYPICAL BLOCKOUT LAYOUT**



**PLAN VIEW**  
**MOW STRIP FOR TIGHT SPACING LAYOUT**



**PLAN VIEW**  
**JOINT PLACEMENT FOR CONCRETE MOW STRIP**



**ALTERNATIVE HMA**  
**MOW STRIP DESIGN**

**GUARDRAIL MOW STRIP**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

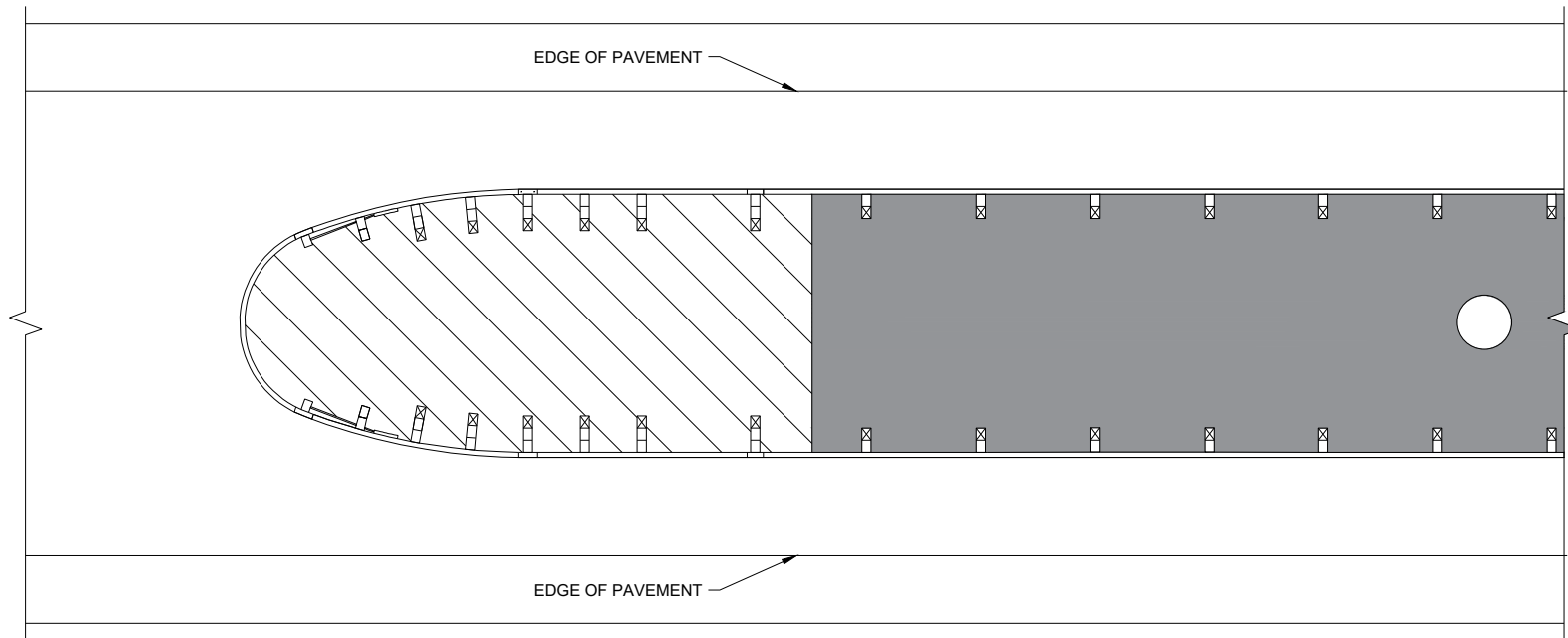
**LEGEND**

 CONCRETE, ASPHALT, OR EMULSIFIED ASPHALT MOW STRIP (SEE OTHER DETAILS)

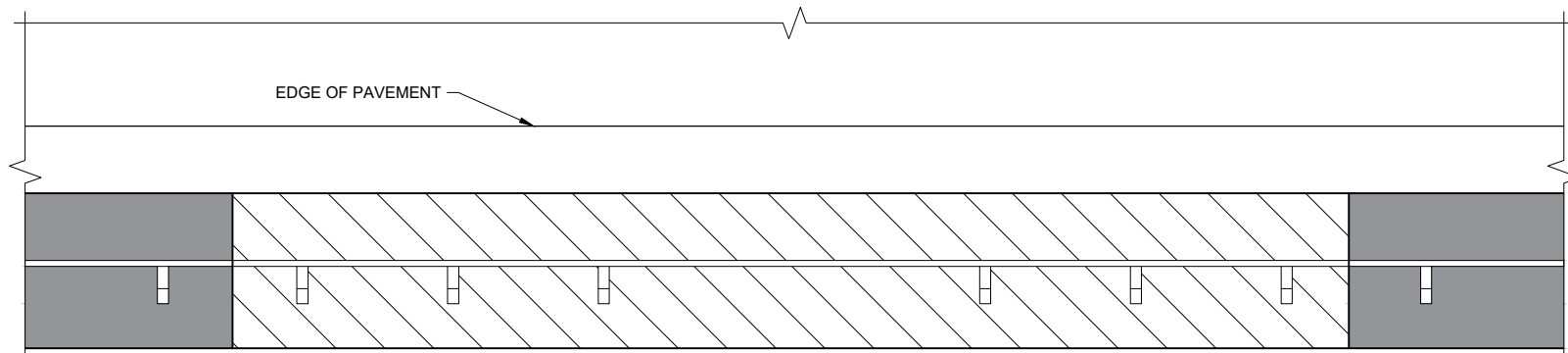
 EMULSIFIED ASPHALT MOW STRIP (SEE OTHER DETAILS)

**GENERAL NOTES**

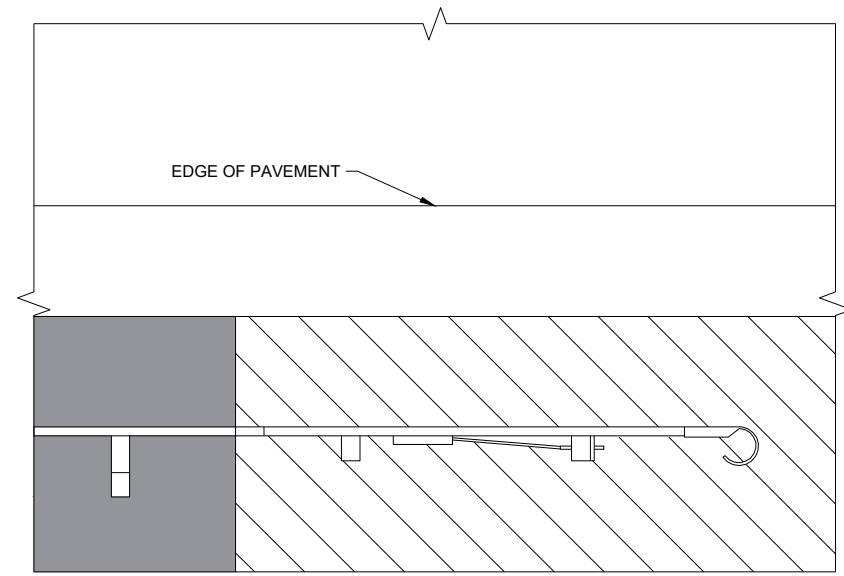
EXISTING THRIE BEAM BULLNOSES MAY HAVE WOOD POSTS. NEW THRIE BEAM BULLNOSE WILL HAVE STEEL POSTS.



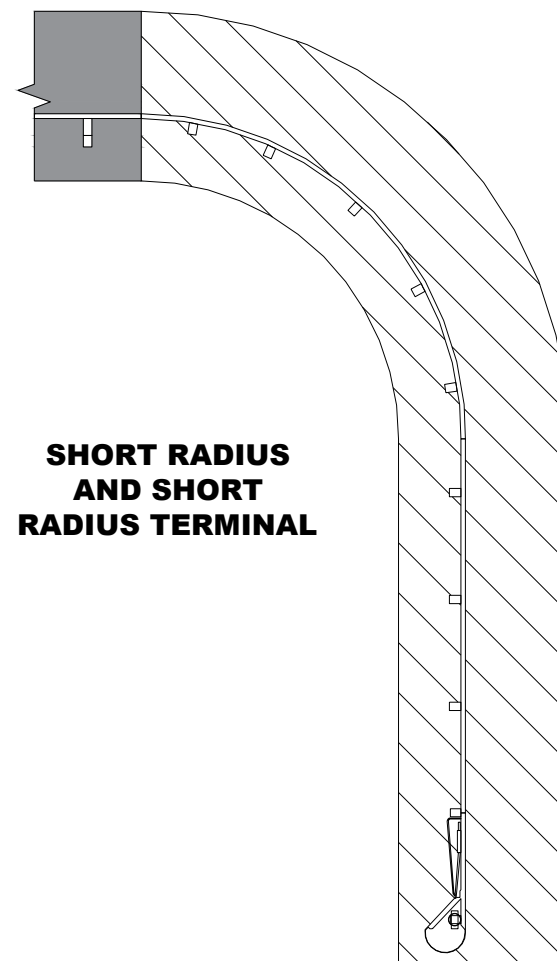
**THRIE BEAM BULLNOSE**



**LONG - SPAN**



**TYPE 2 TERMINAL**



**SHORT RADIUS  
AND SHORT  
RADIUS TERMINAL**

6

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SDD 14B28 - 04b

SDD 14B28 - 04b

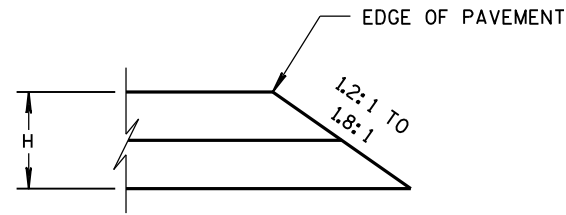
**GUARDRAIL MOW STRIP**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

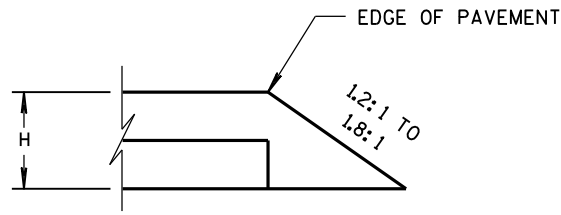
APPROVED  
August 2020 DATE /S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
ENGINEER

FHWA

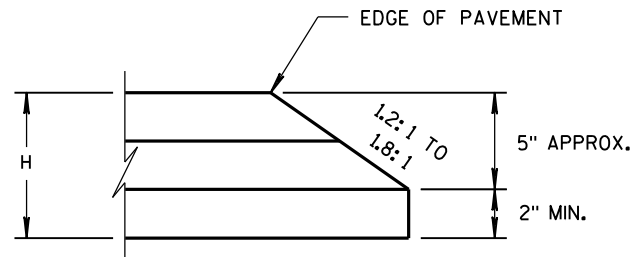




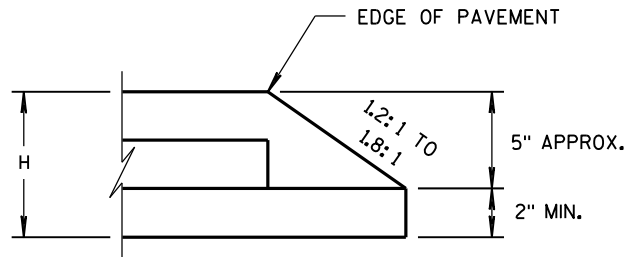
CONSTRUCTED WITH FINAL TWO LAYERS  
FOR H 5" OR LESS



CONSTRUCTED WITH FINAL LAYER  
FOR H 5" OR LESS

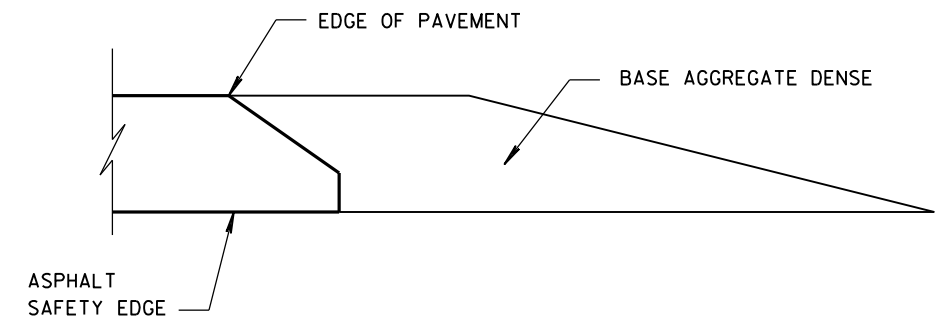


CONSTRUCTED WITH FINAL TWO LAYERS  
FOR H GREATER THAN 5"



CONSTRUCTED WITH FINAL LAYER  
FOR H GREATER THAN 5"

HMA PAVEMENT AND HMA OVERLAYS



FINISHED SHOULDER AGGREGATE PLACEMENT

6

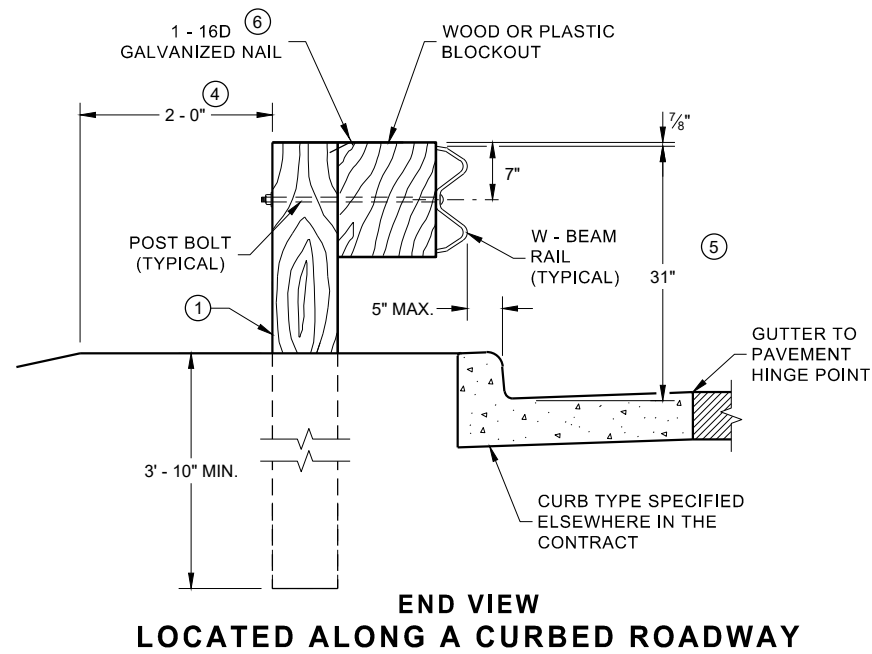
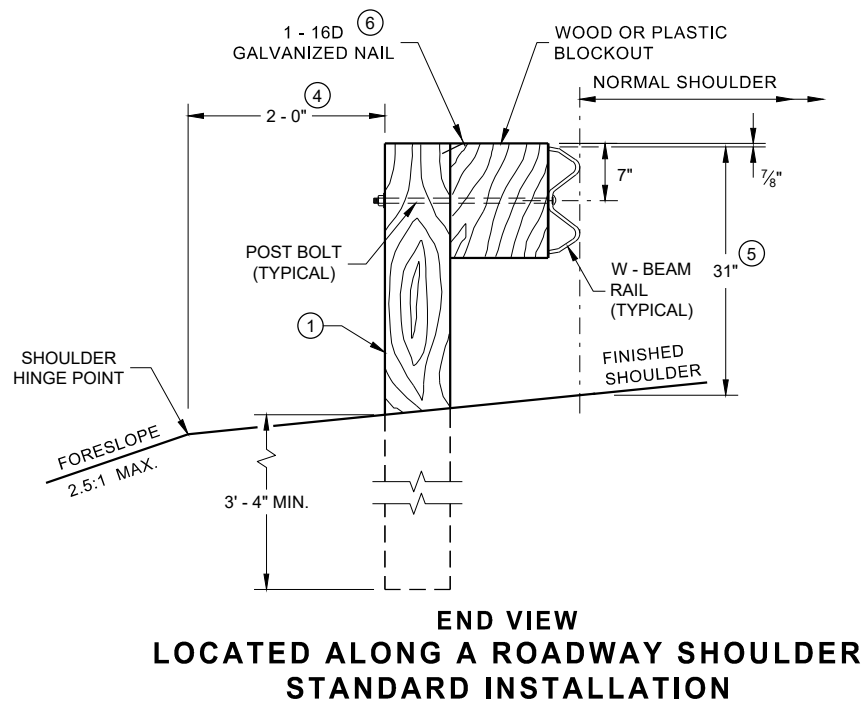
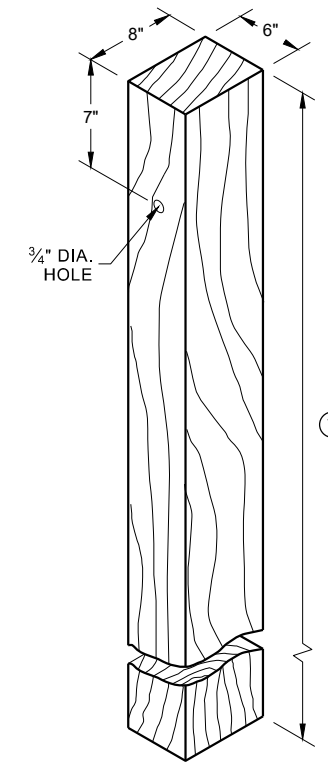
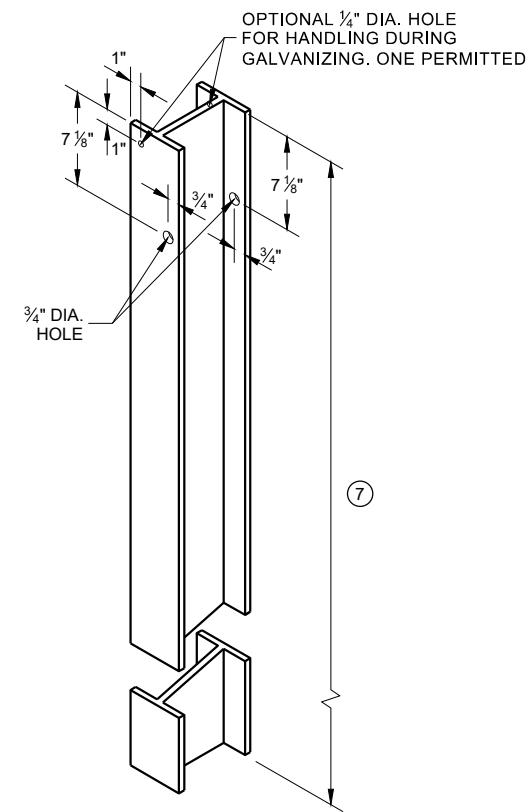
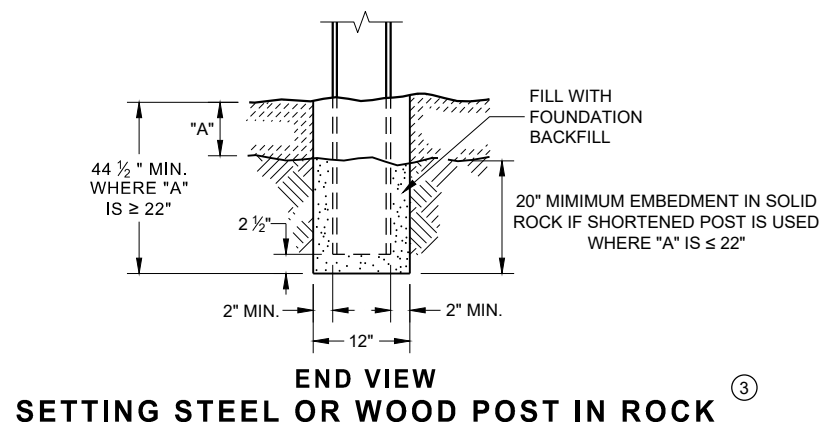
6

S.D.D. 14 B 29-1

S.D.D. 14 B 29-1

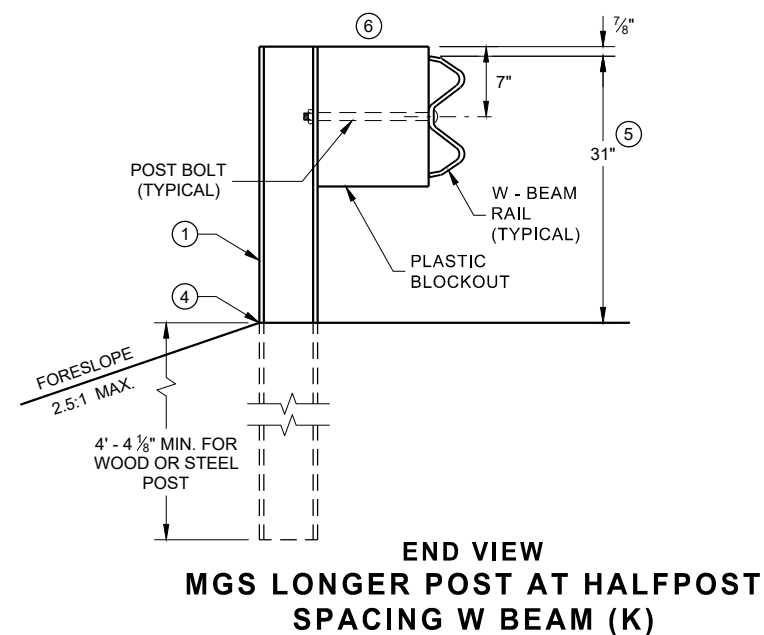
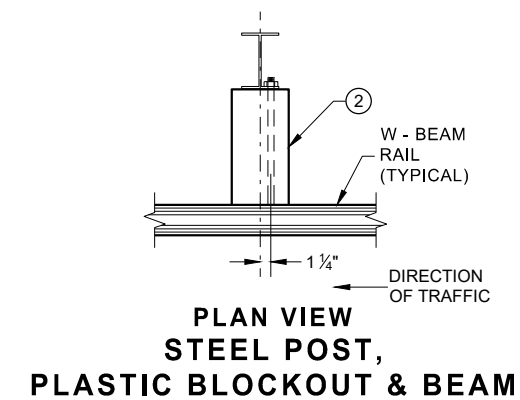
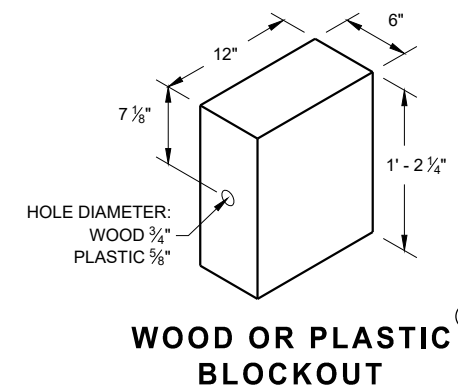
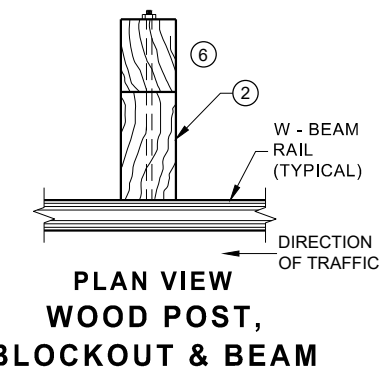
SAFETY EDGE _{SM}	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED DATE	/s/ Jerry H. Zogg ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA	

- ① WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- ② USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.
- ③ IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2 1/2" INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AND INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.
- ④ WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).
- ⑤ FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS  $\pm 1"$ . FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27 3/4" TO 32".
- ⑥ WHEN USING STEEL POST AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- ⑦ TOTAL POST LENGTH FOR TYPE K IS 7' - 0". TOTAL POST LENGTH FOR OTHER MGS TYPES IS 6' - 0".



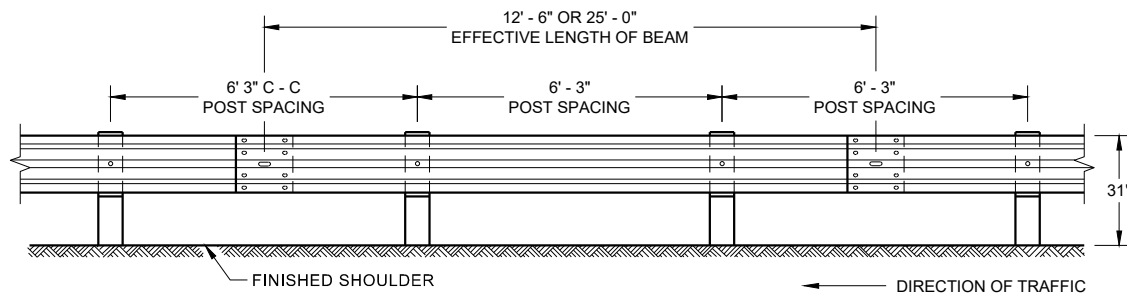
**STEEL POST & HOLE PUNCHING DETAIL (W 6 X 9)**

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

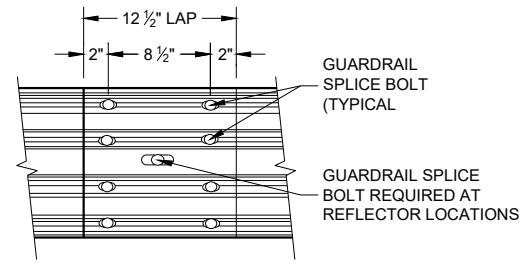


**MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



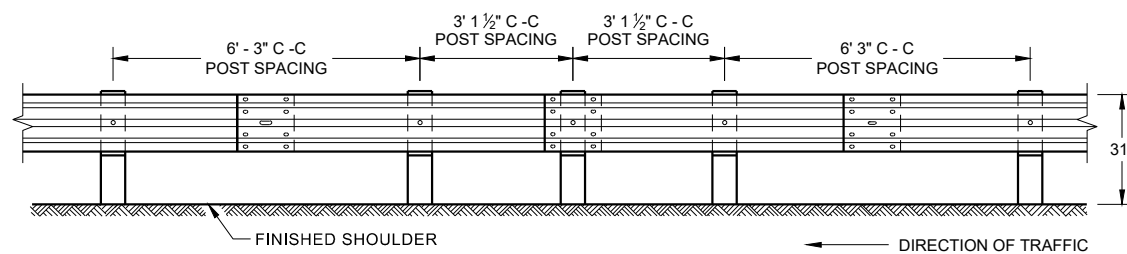
**FRONT VIEW  
POST SPACING STANDARD INSTALLATION**



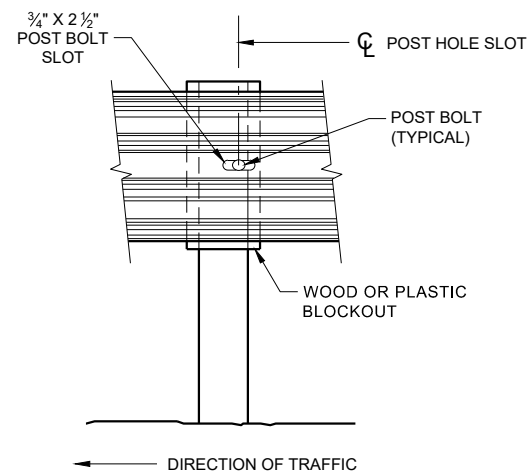
**FRONT VIEW  
MID-SPAN BEAM SPLICE**

**GENERAL NOTES**

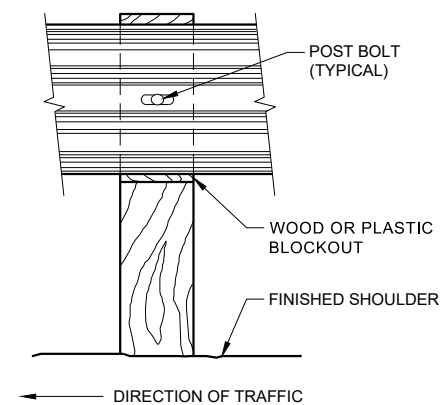
- ⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
  - ⑨ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.
- POST BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 5/8" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.
- GUARD RAIL SPLICE BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.



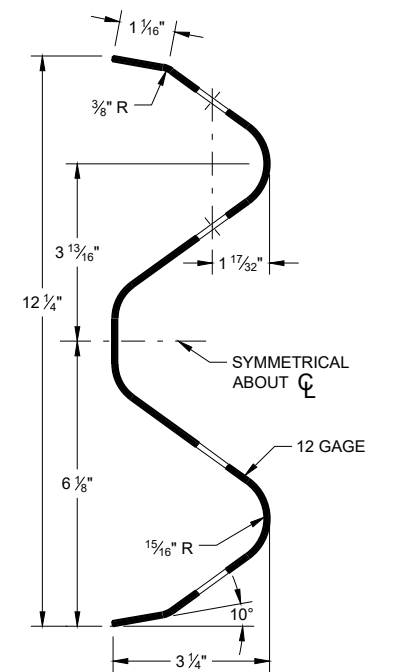
**FRONT VIEW  
HALF POST SPACING (HS) AND  
HALF POST SPACING WITH LONGER POSTS (K)**



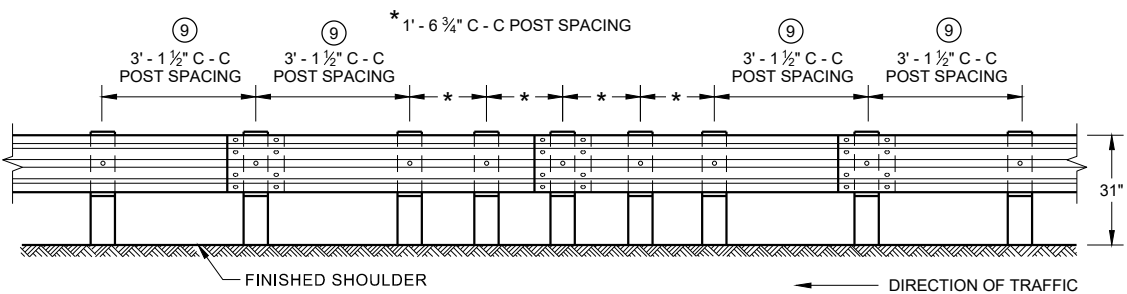
**FRONT VIEW AT STEEL POST**



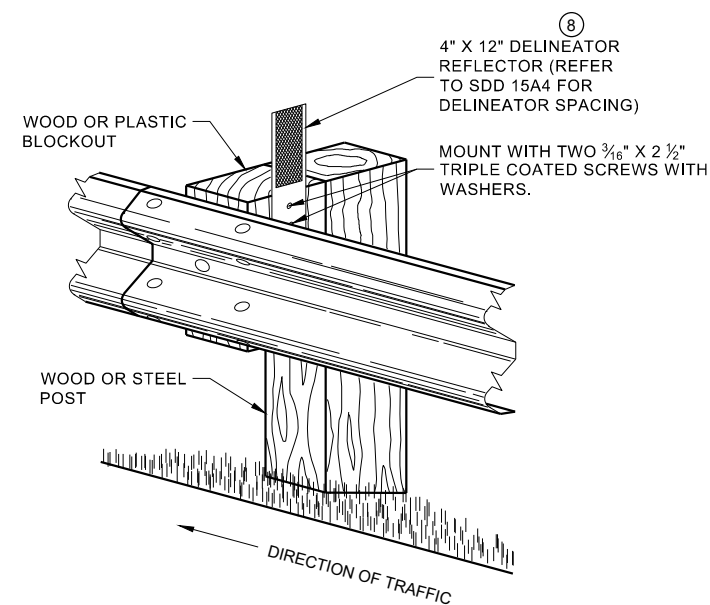
**FRONT VIEW AT WOOD POST**



**SECTION THRU W-BEAM RAIL**



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



**ONE SIDED REFLECTOR DETAIL  
AND TYPICAL INSTALLATION**

**MIDWEST GUARDRAIL SYSTEM  
(MGS) GUARDRAIL**

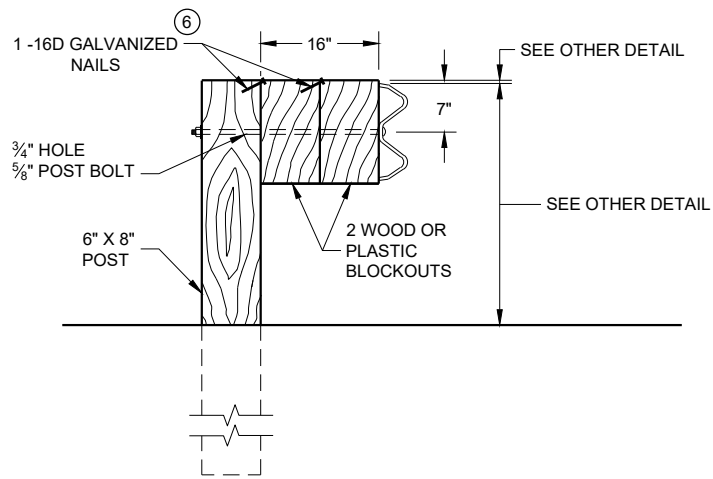
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

6

6

SDD 14B42 - 07b

SDD 14B42 - 07b

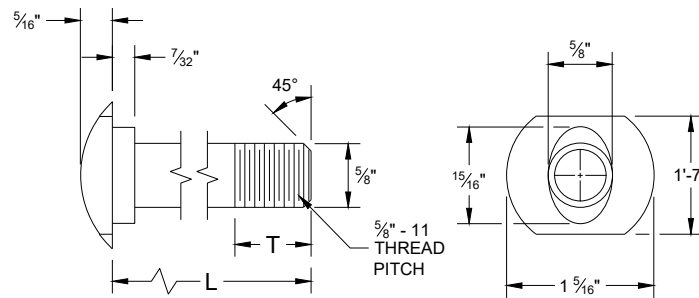


**DETAIL FOR 16" BLOCKOUT DEPTH**

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.

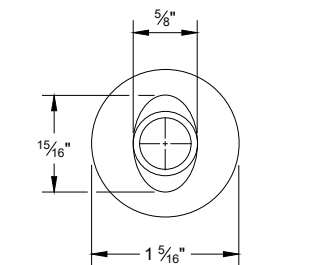
**NOTE:**

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.

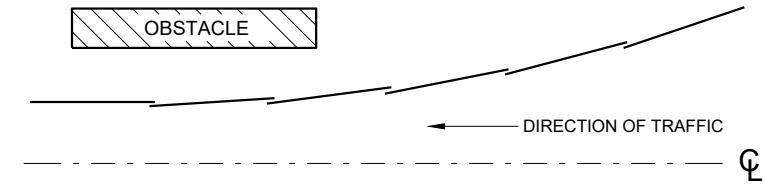


**POST BOLT TABLE**

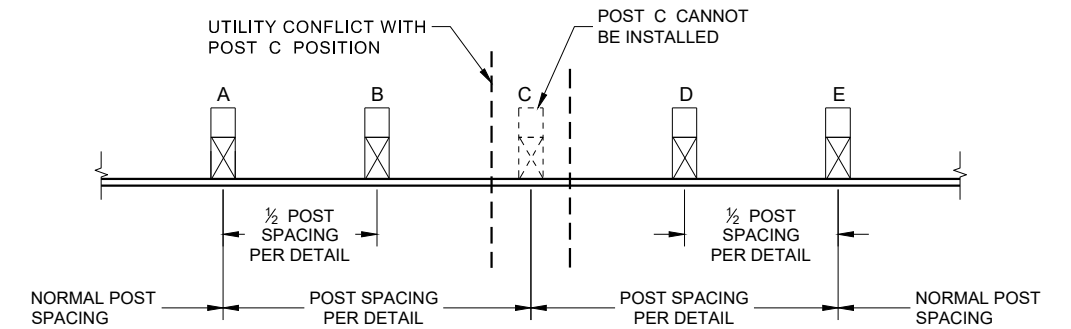
L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



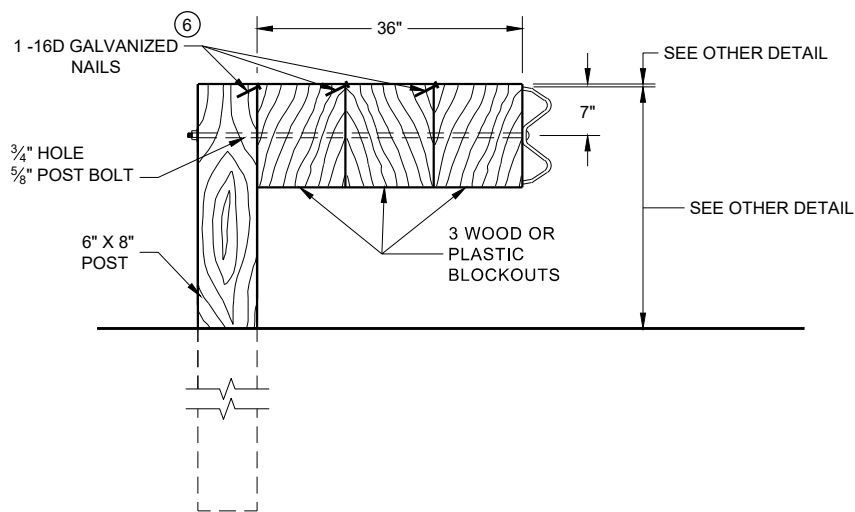
**ALTERNATE BOLT HEAD**



**PLAN VIEW  
BEAM LAPPING DETAIL**

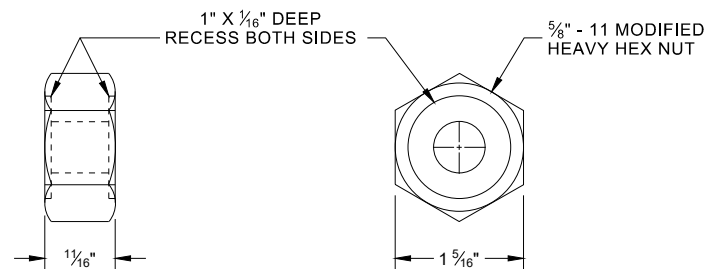


**POST DRIVING FOR CONTINUOUS  
UNDERGROUND OBSTRUCTION**

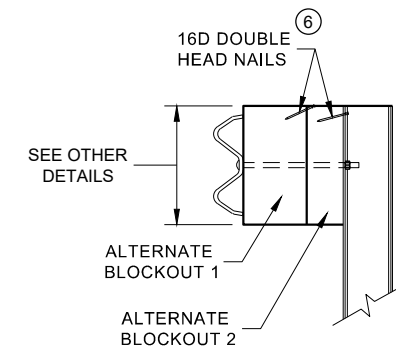


**DETAIL FOR 36" BLOCKOUT DEPTH**

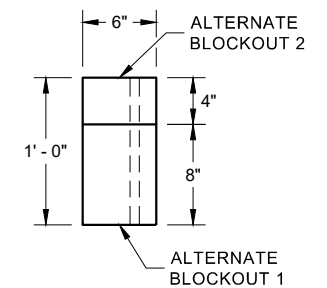
NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.  
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE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



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



**SIDE VIEW**



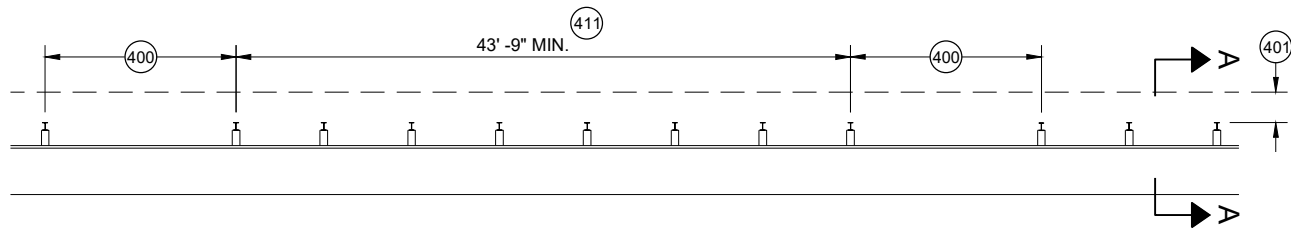
**PLAN VIEW**

**ALTERNATE WOOD  
BLOCKOUT DETAIL**

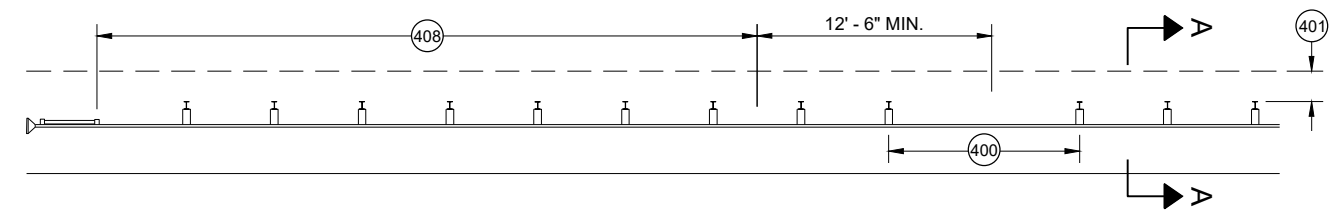
6 WHEN USING STEEL POST AND WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

**MIDWEST GUARDRAIL SYSTEM  
(MGS) GUARDRAIL**

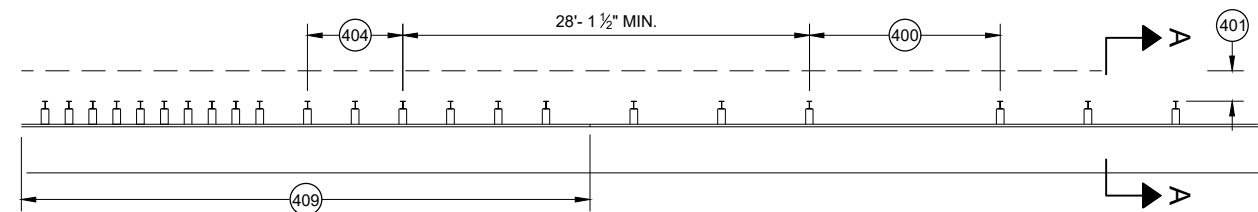
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



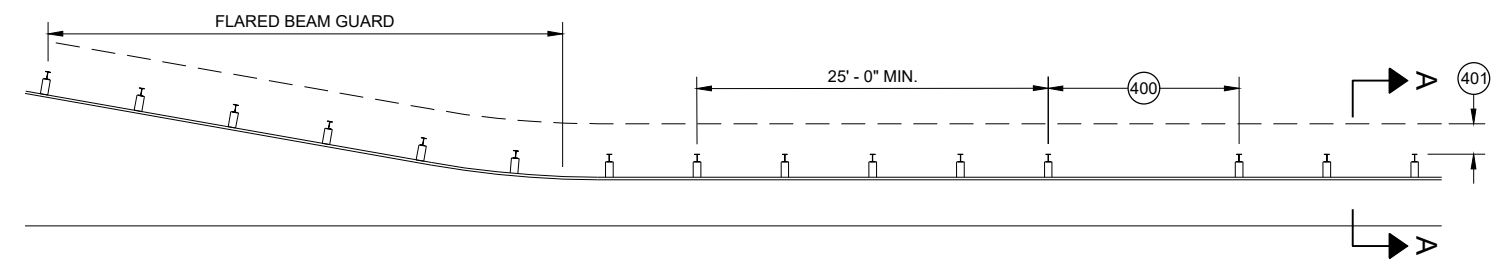
**MISSING POST IN MGS GUARDRAIL**



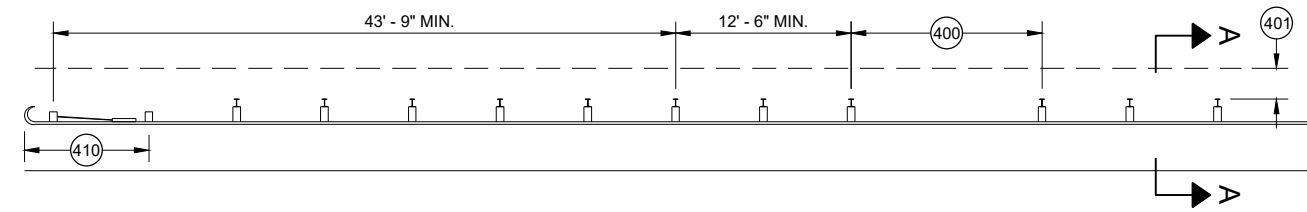
**MISSING POST IN MGS GUARDRAIL NEAR EAT**



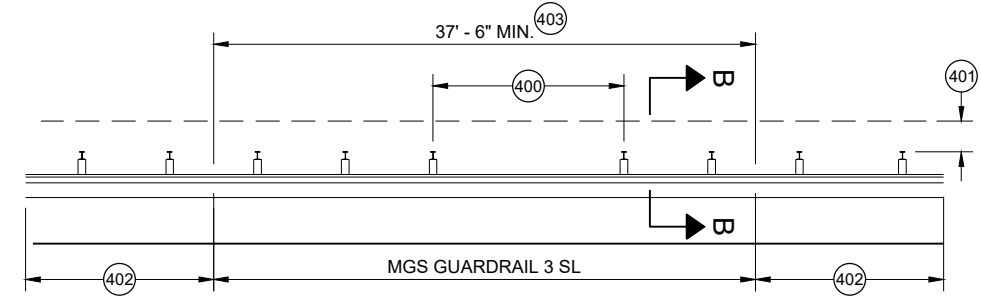
**MISSING POST IN MGS GUARDRAIL NEAR AN APPROACH TRANSITION**



**MISSING POST IN MGS GUARDRAIL NEAR FLARED BEAM GUARD**

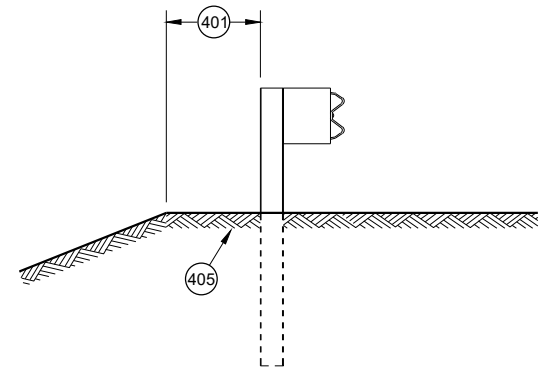


**MISSING POST IN MGS GUARDRAIL NEAR A TYPE 2 END TERMINAL**

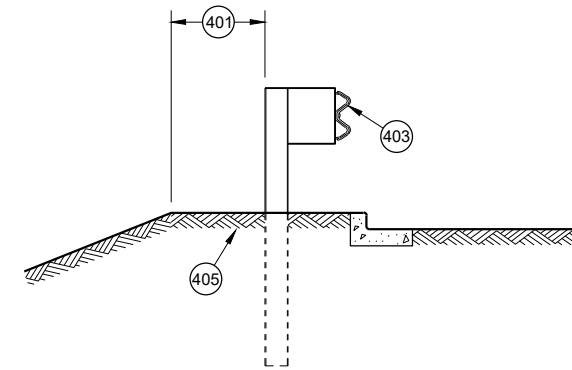


**MISSING POST IN SHORT SPAN MGS GUARDRAIL NEAR CURB (SL)**

- 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**

<b>MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED DATE May 2021	/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.

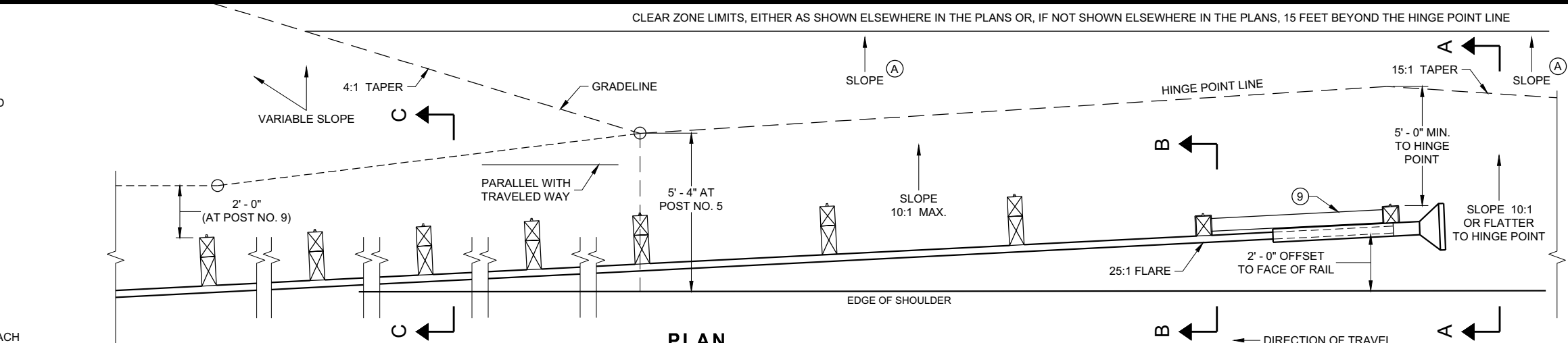
SEE SDD 14B42 FOR MORE INFORMATION.

* DO NOT ATTACH BLOCKOUTS TO POST 1 AND 2.

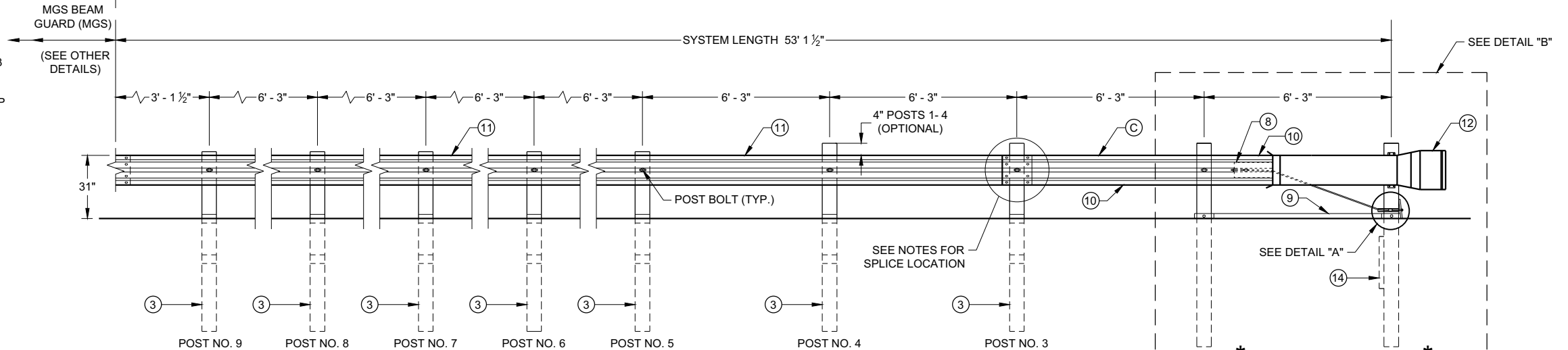
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

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

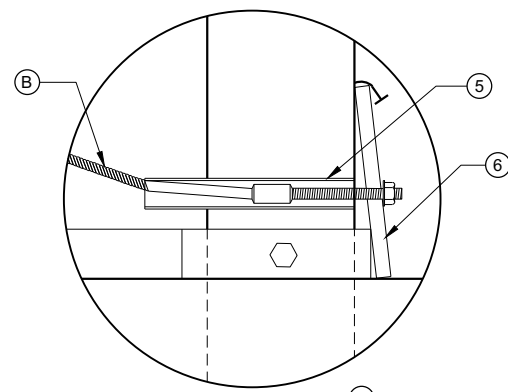
THE CENTER OF THE UPPER 3 1/2" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE. WOOD BLOCKS ON POSTS NUMBERED 3 THROUGH 9 MAY BE ADJUSTED UP TO 3" ABOVE THE TOP OF POST.



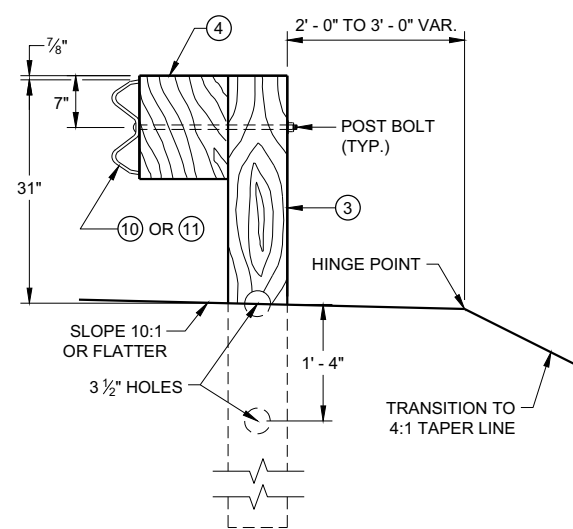
**PLAN**



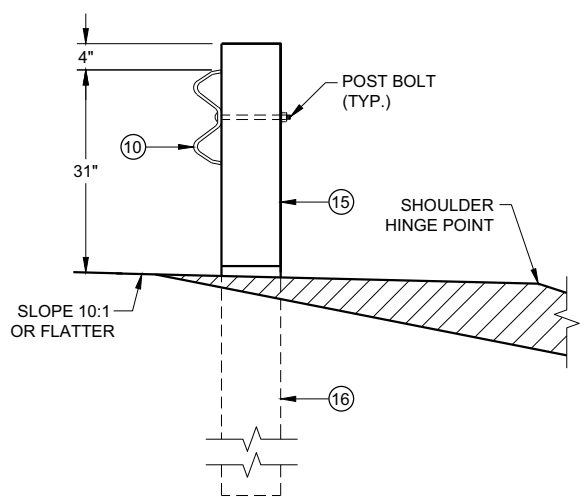
**ELEVATION**



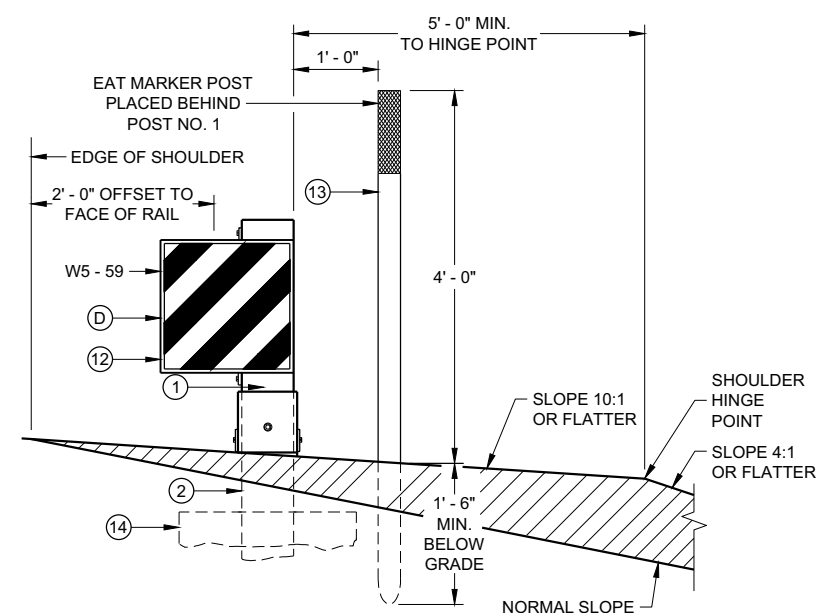
**DETAIL "A"**



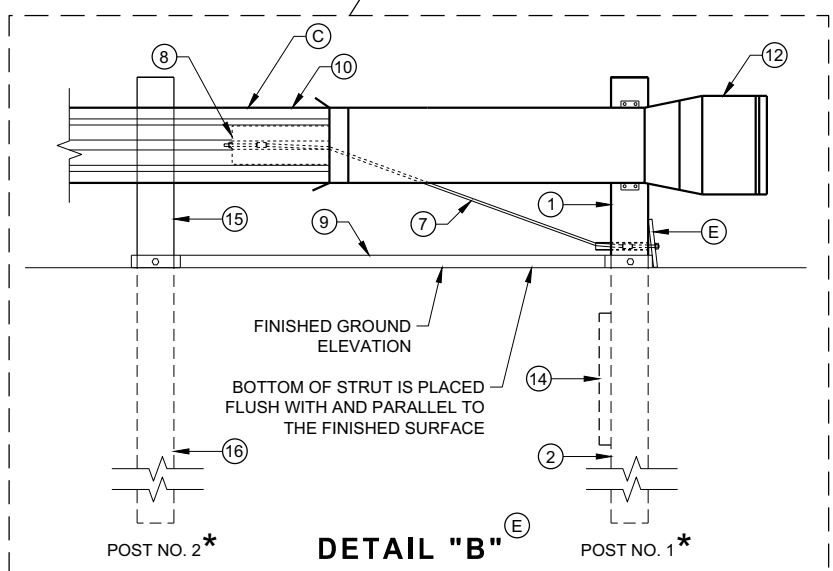
**SECTION C - C  
TYPICAL AT POST NOS. 3 - 9**



**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

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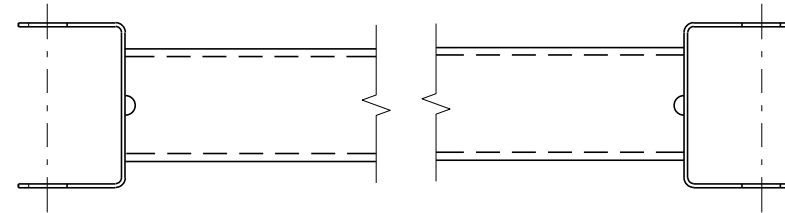
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SDD 14B44 - 04a

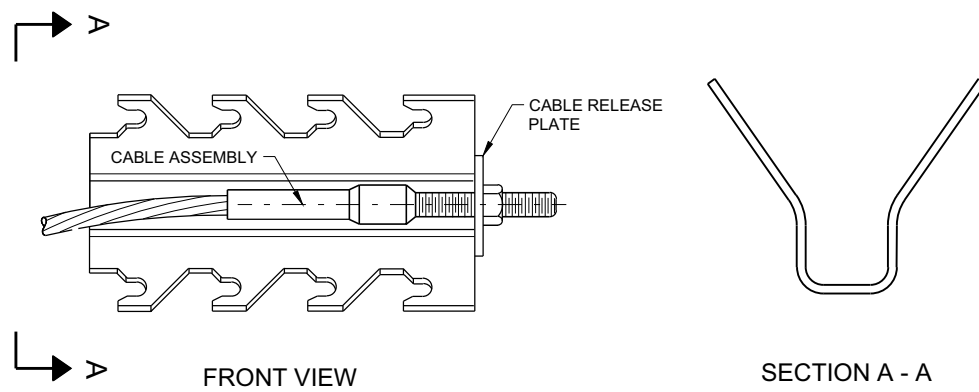
SDD 14B44 - 04a

**BILL OF MATERIALS**

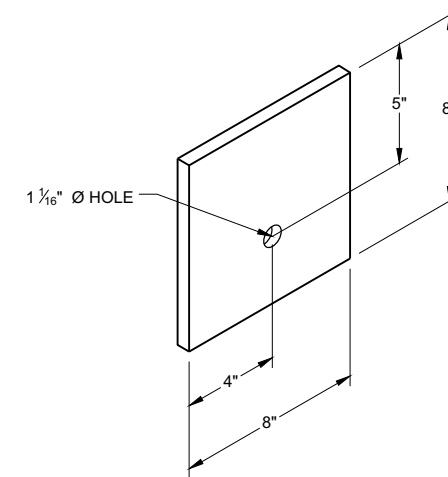
PART NO.	DESCRIPTION MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
①	UPPER POST NO. 1 6" X 6" TUBE
②	LOWER POST NO. 1
③	WOOD CRT
④	WOOD BLOCKOUT
⑤	PIPE SLEEVE
⑥	BEARING PLATE
⑦	BCT CABLE ASSEMBLY
⑧	ANCHOR CABLE BOX
⑨	GROUND STRUT
⑩	PERFORATED W-BEAM RAIL 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



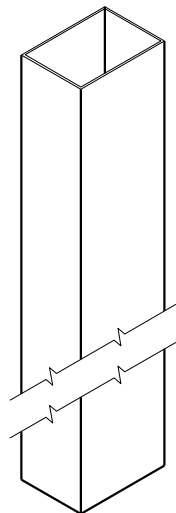
**GENERIC ANCHOR CABLE BOX** ⑨ ⑤



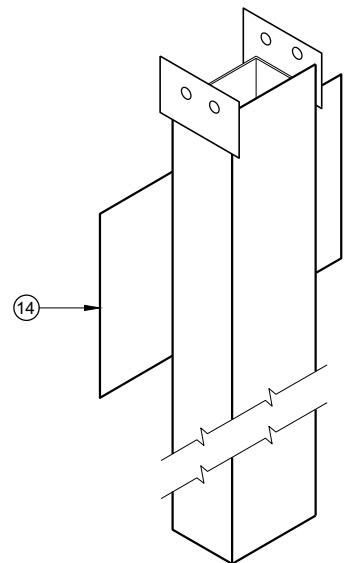
**BEARING PLATE** ⑥ ⑤

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

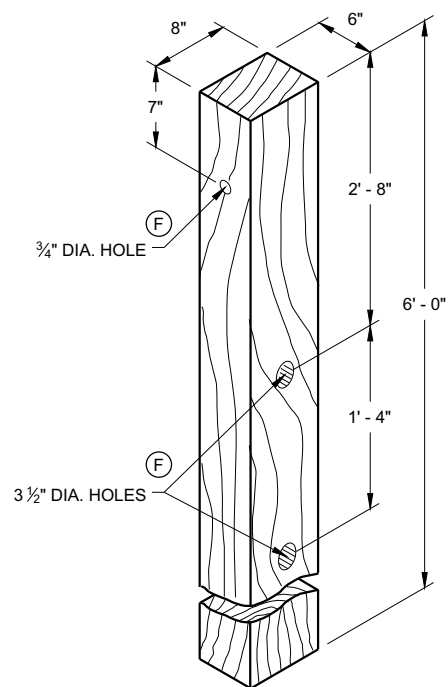
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



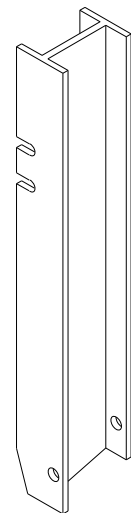
UPPER POST NO. 1 ⁽¹⁾ (E)



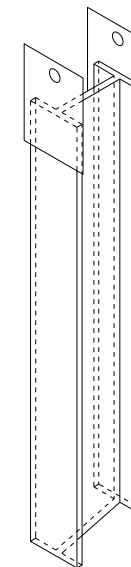
LOWER POST NO. 1 ⁽²⁾ (E)



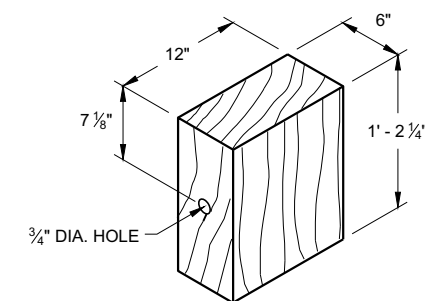
WOOD CRT POST ⁽³⁾ (E)  
POSTS NUMBER 3-9



UPPER POST NO. 2 ⁽¹⁵⁾ (E)

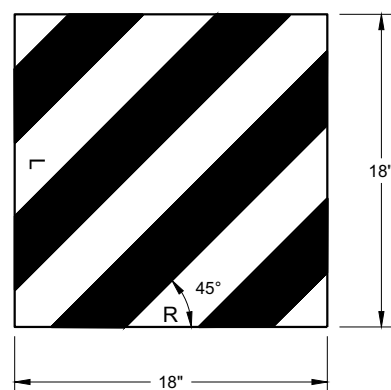


LOWER POST NO. 2 ⁽¹⁶⁾ (E)



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

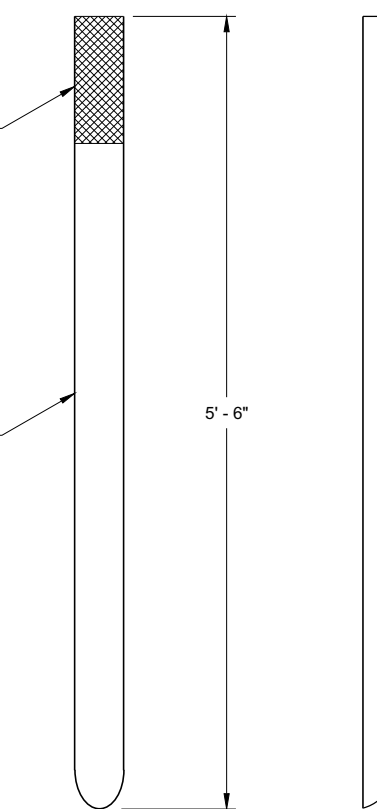
6



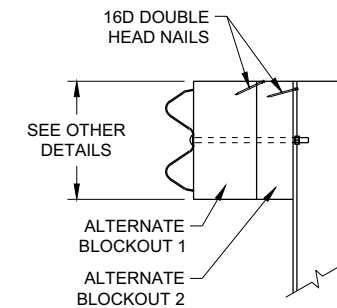
W5 - 59  
REFLECTIVE SHEETING DETAIL ^(E)

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

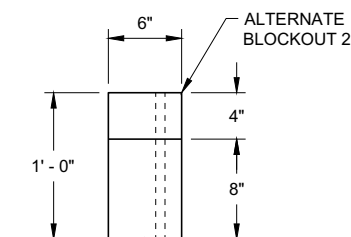
E.A.T. MARKER  
POST (YELLOW)



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

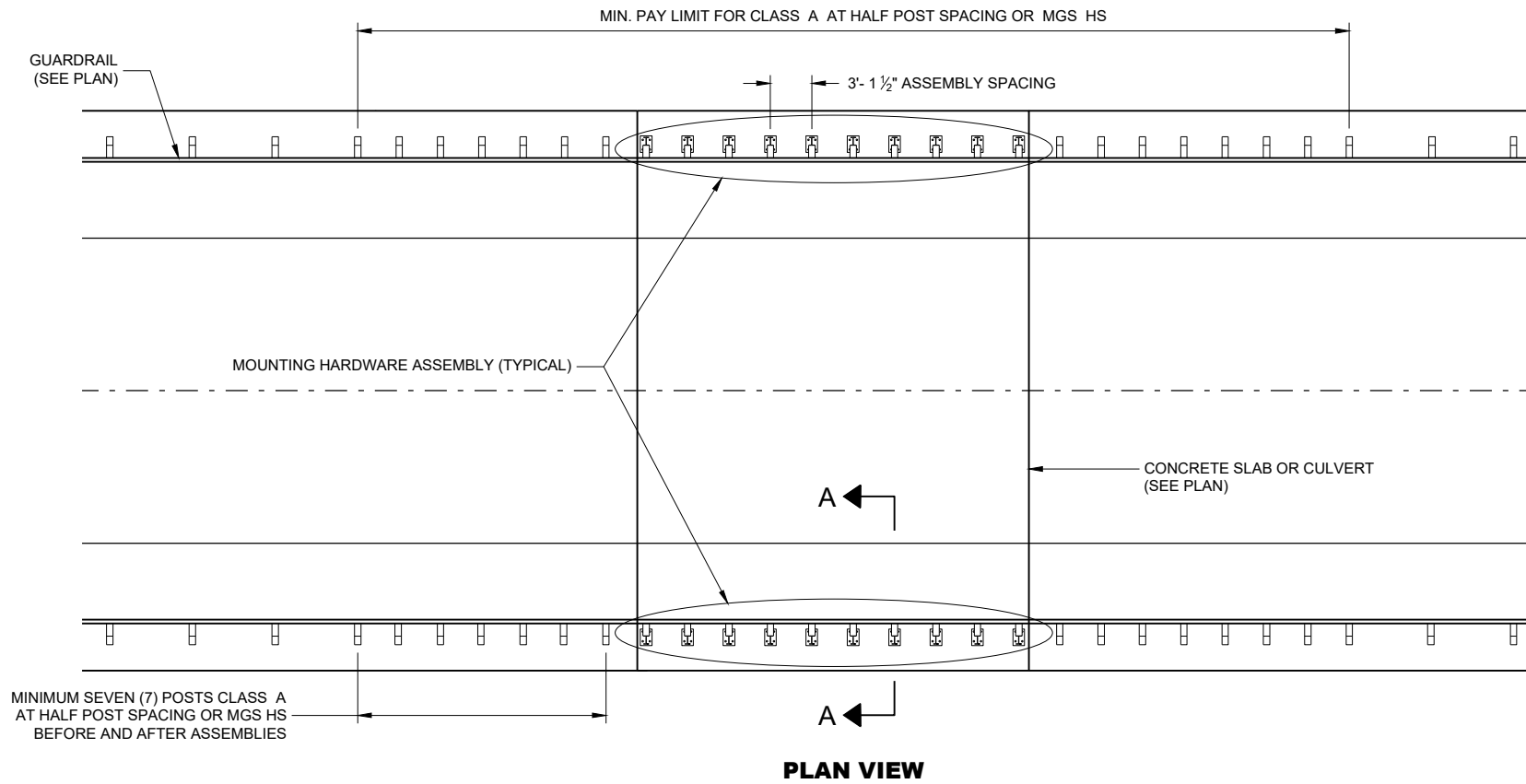
**MIDWEST GUARDRAIL SYSTEM  
ENERGY ABSORBING TERMINAL  
(MGS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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

FHWA





**GENERAL NOTES**

HOLES DRILLED INTO CONCRETE SLAB OR CULVERT ARE 1 1/8" DIAMETER.

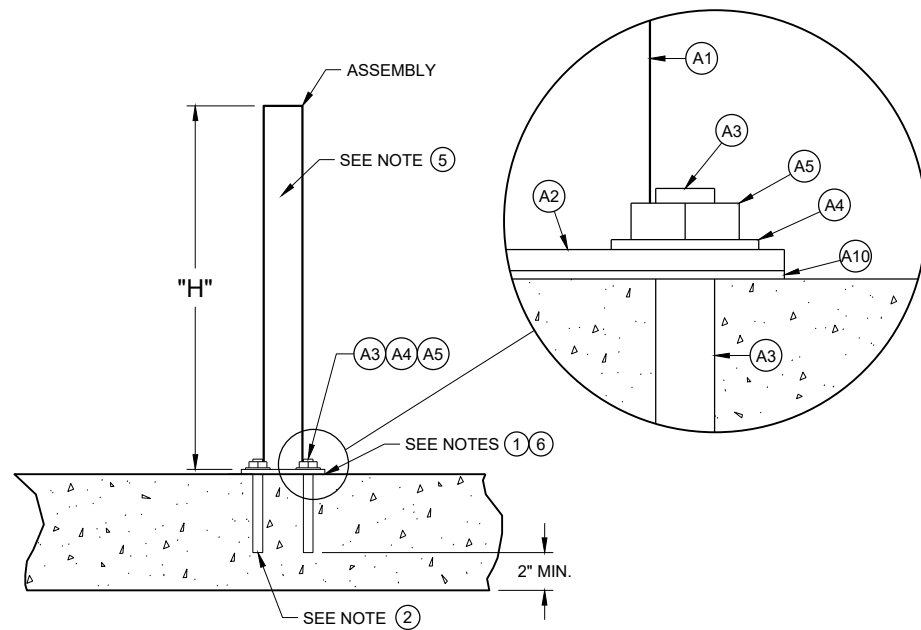
POST BASE PLATE (AND BOTTOM PLATES IF USED) SHALL BE FLAT WITH ALL SURFACES SMOOTH, AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS. CUT BOTTOM OF POST SO THAT POST WILL BE VERTICAL WHEN POST ASSEMBLY IS PLACED ON TOP OF CONCRETE. HEX BOLTS AND THREADED RODS ARE TO BE PLACED PERPENDICULAR TO THE BASE PLATE.

"H" DIMENSION WILL VARY. SEE PLAN FOR "H" DIMENSION. CONTRACTOR HAS OPTION OF INSTALLING POSTS THAT ARE TALLER THAN "H" DIMENSION AND CUT POSTS TO PROPER "H" DIMENSION IN THE FIELD. IF ELECTING TO FIELD CUT POSTS, DRILL HOLES AT APPROPRIATE LOCATIONS AND APPLY GALVANIZATION.

GALVANIZE STEEL COMPONENTS AFTER FABRICATION PER SECTION 614 OF THE WISCONSIN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

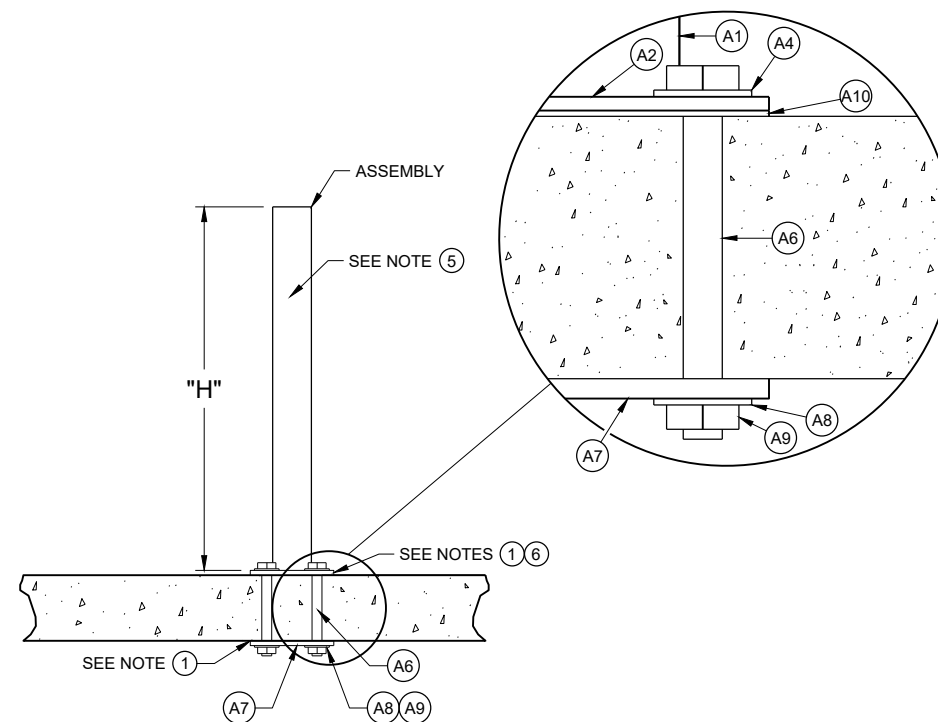
INSTALL 1 NUT AND 1 WASHER WHERE APPLICABLE. PROVIDE SUFFICIENT LENGTH OF BOLT OR THREADED ROD TO ALLOW FOR 1/4" TO 1/2" OF THREAD TO BEYOND THE NUT.

- ① PLACE NON-STAINING, GRAY NON-BITUMINOUS JOINT SEALER ON THE BOTTOM (A2) AND IN DRILL HOLES FOR BOLT THROUGH OPTION.
- ② BOND STRENGTH OF ADHESIVE IS 1,305 PSI OR GREATER WITH A MINIMUM EMBEDMENT DEPTH OF 8-INCHES. IF MINIMUM EMBEDMENT CANNOT BE ACHIEVED, BOLT THROUGH STRUCTURE.
- ③ USE GAS-METAL ARC WELDING (GMAW) PROCESS WITH ER70S-3 WELDING WIRE AND ARGON-OXYGEN OR CO₂ COVER GAS.
- ④ OTHER COMPONENT OF BARRIER SYSTEM NOT SHOWN. SEE SDD 14B15 OR SDD 14B42 FOR MORE DETAILS.
- ⑤ HOLES TO MOUNT BEAM GUARD AND BLOCK NOT SHOWN ON DRAWINGS. SEE SDD 14B15 OR SDD 14B42 FOR MORE DETAILS.
- ⑥ ADD AND ADJUST SHIM PLATES AS NECESSARY TO INSTALL POST PLUMB. SEE (A10) FOR DETAIL.



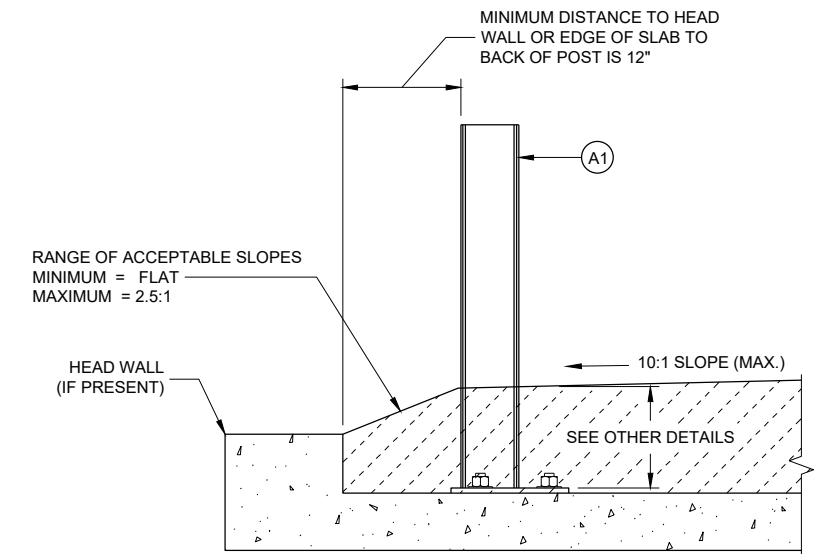
**ADHESIVE ANCHOR DETAIL**

SEE NOTE ④



**BOLT THROUGH DETAIL**

SEE NOTE ④

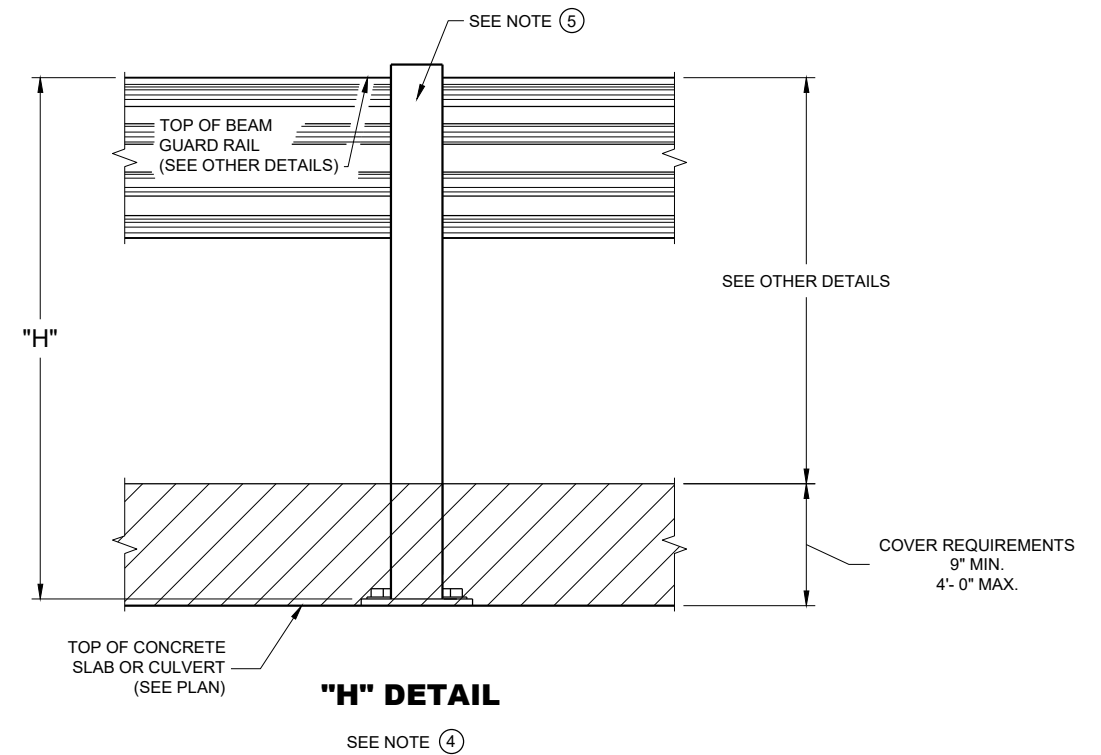
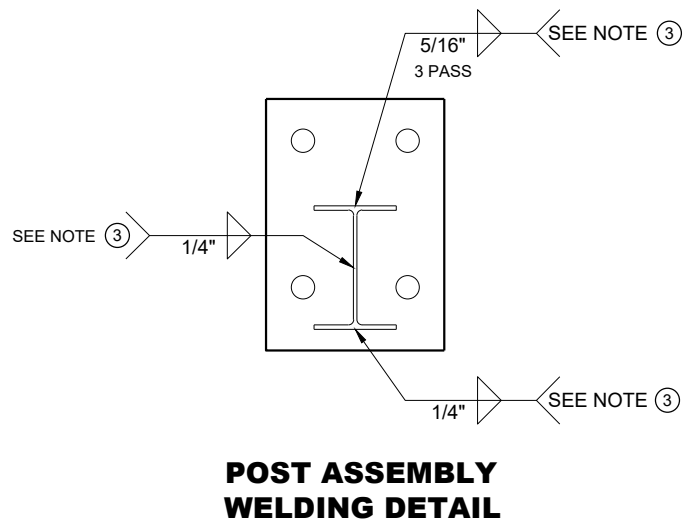
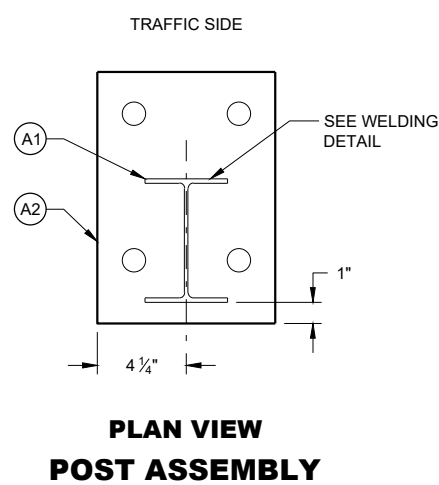
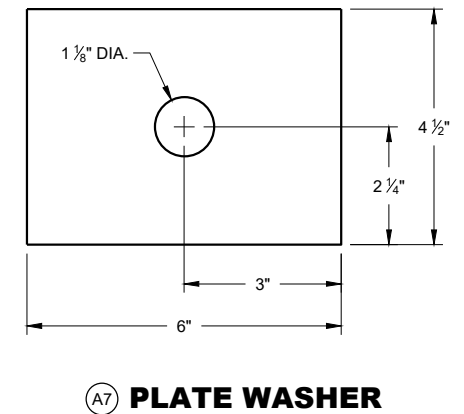
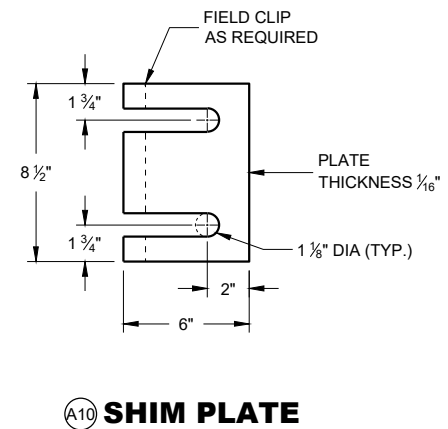
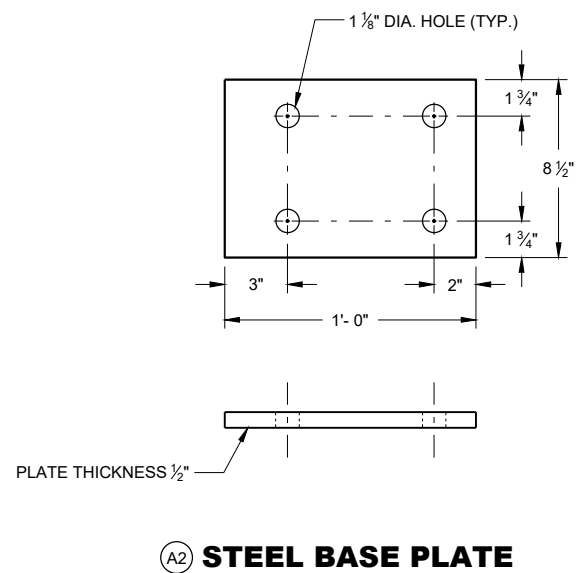
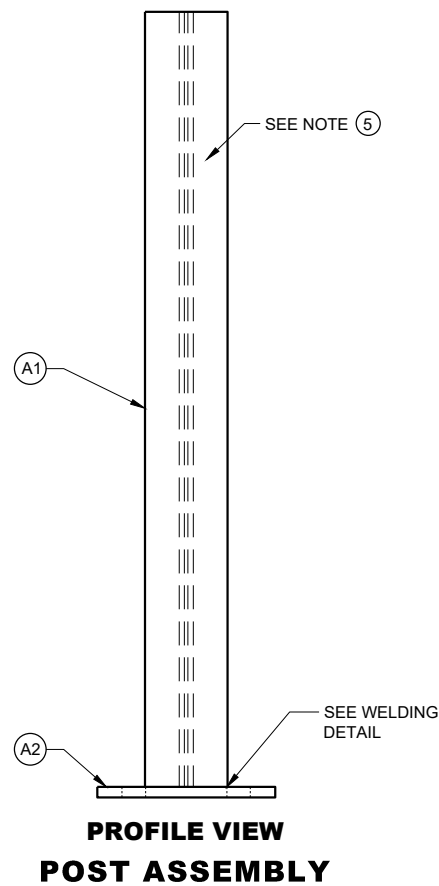


**SECTION A - A**

SEE NOTE ④

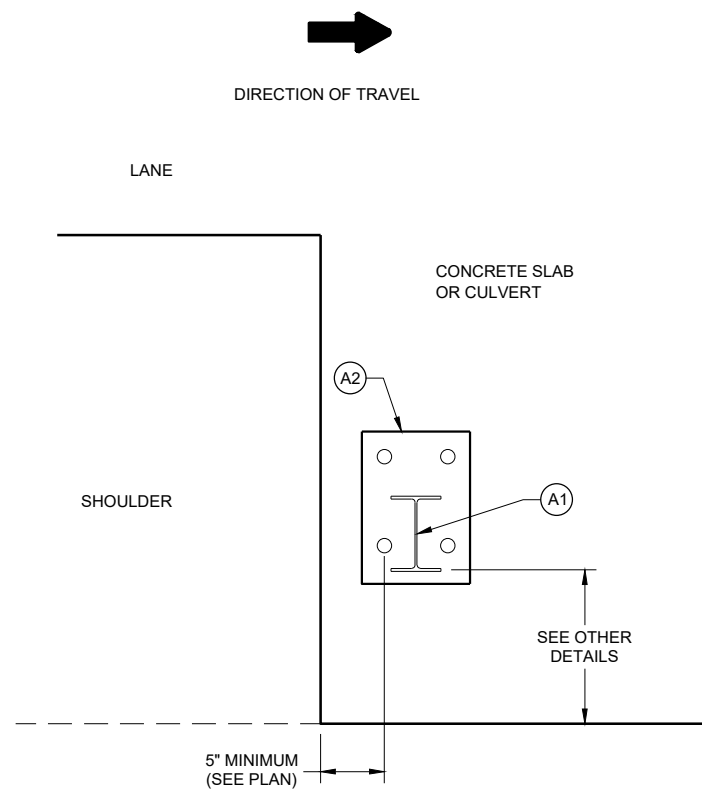
**ANCHOR POST ASSEMBLY  
TOP MOUNTED**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



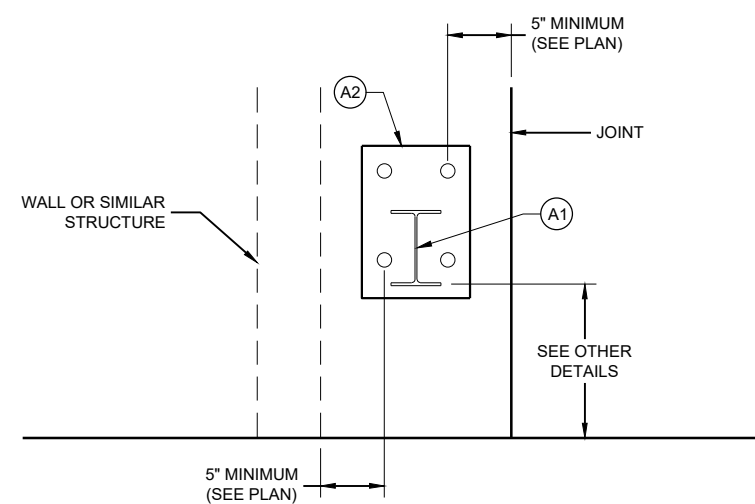
**ANCHOR POST ASSEMBLY  
TOP MOUNTED**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



**EDGE PLACEMENT**

SEE NOTE ④



**OBSTRUCTION AND JOINT PLACEMENT**

SEE NOTE ④

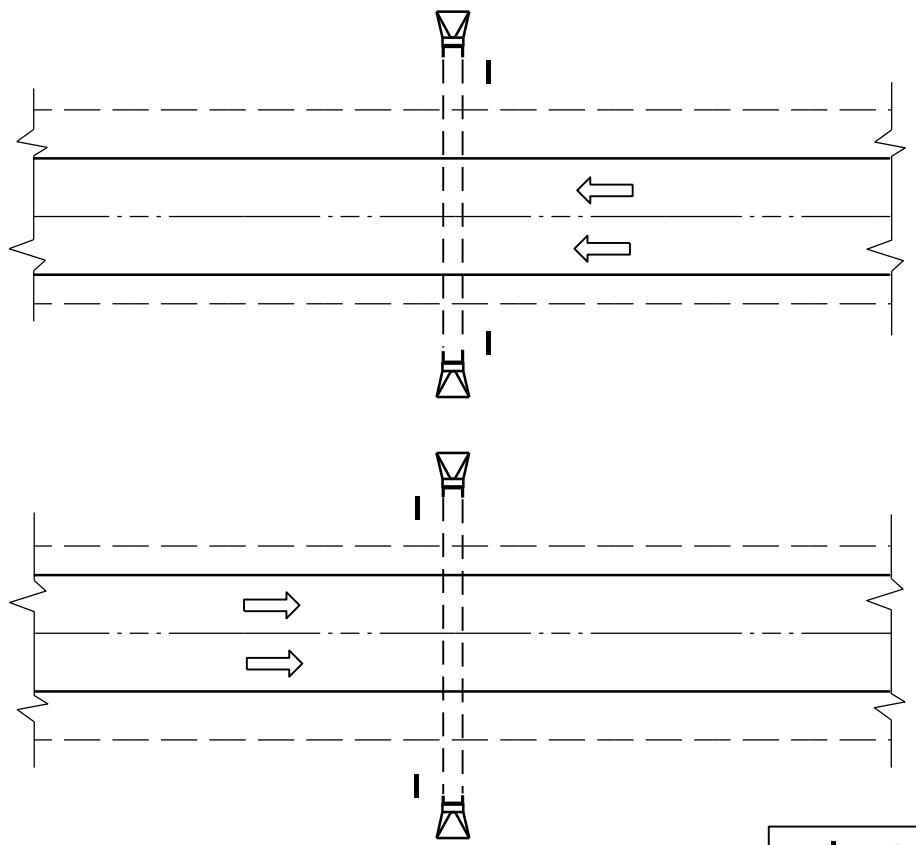
**BILL OF MATERIALS LIST**

ITEM	DESCRIPTION	MATERIAL SPECIFICATIONS	NOTES
(A1)	W6x9 or W6x8.5	ASTM A992 50 KSI MIN., ASTM A709 GRADE 50, OR ASTM A36	SEE SDD 14B15 OR 14B42 LENGTH WILL VARY
(A2)	STEEL BASE PLATE	ASTM A992 50 KSI MIN., ASTM A529 GRADE 50, ASTM A572 GRADE 50, OR ASTM A36	
(A3)	1" DIA. THREADED ROD	SAE J429 GRADE 2, ASTM A307 GRADE C, OR ASTM F1554 GRADE 36	LENGTH WILL VARY
(A4)	1" DIA. FLAT WASHER	ASTM F844	
(A5)	1" HEX NUT	ASTM A563A	
(A6)	1" DIA. HEX BOLT	ASTM A307	LENGTH WILL VARY
(A7)	PLATE WASHER	ASTM A992 50 KSI MIN., ASTM A529 GRADE 50, ASTM A572 GRADE 50, OR ASTM A36	
(A8)	1" DIA. FLAT WASHER	ASTM F844	
(A9)	1" DIA. HEX NUT	ASTM A563A	
(A10)	SHIM PLATE	SEE (A2)	4 MAX PER POST

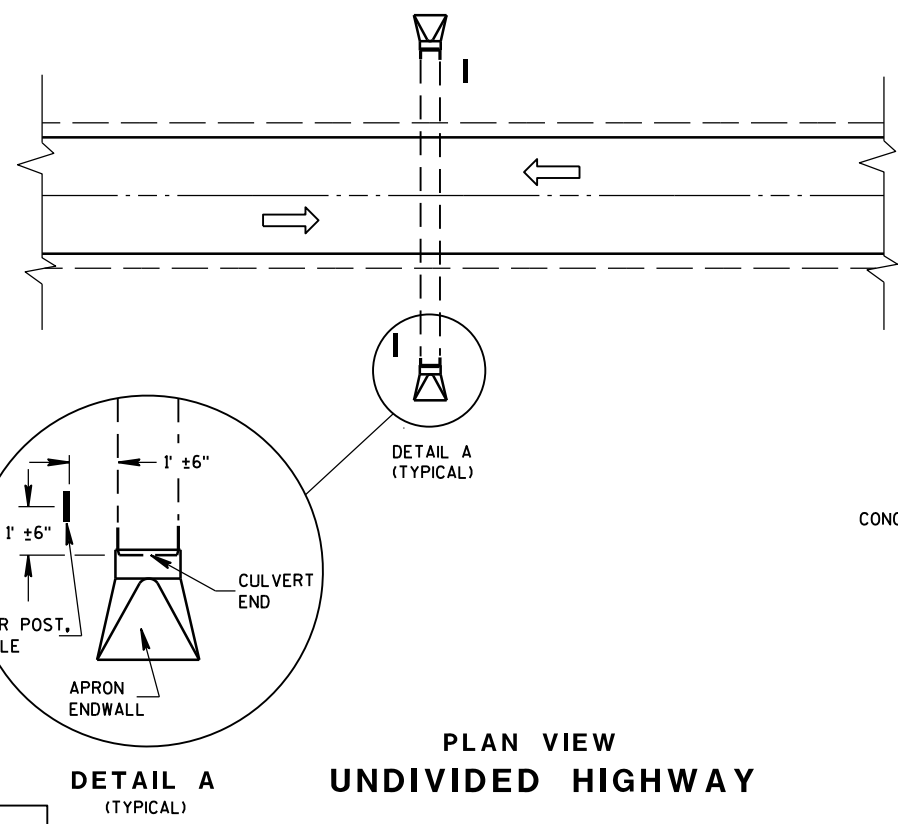
**ANCHOR POST ASSEMBLY  
TOP MOUNTED**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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



PLAN VIEW  
DIVIDED HIGHWAY

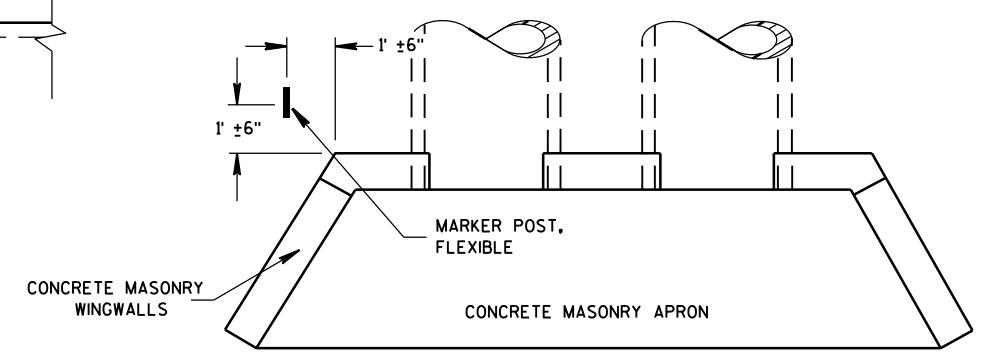


PLAN VIEW  
UNDIVIDED HIGHWAY

MARKER POST, FLEXIBLE  
 DIRECTION OF TRAFFIC FLOW

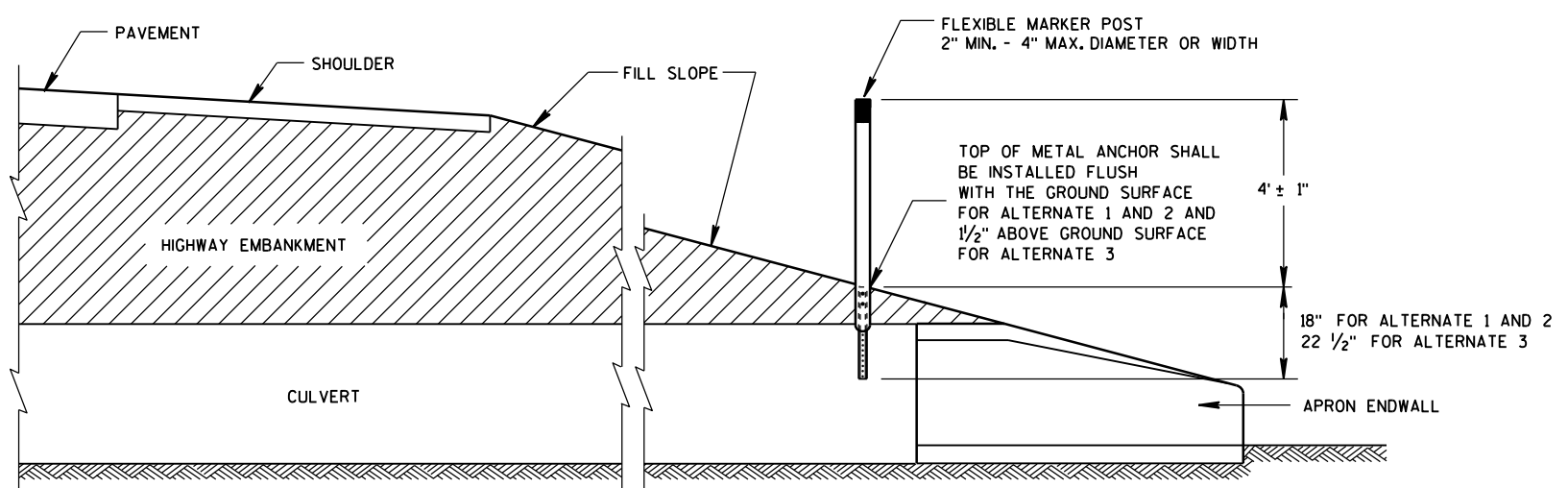
**GENERAL NOTES**

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



PLAN VIEW  
CONCRETE MASONRY ENDWALLS FOR  
CULVERT PIPE AND PIPE ARCH

**FLEXIBLE MARKER POST LOCATION**



CROSS SECTION  
FLEXIBLE MARKER POST

**FLEXIBLE MARKER POST  
FOR CULVERT END**

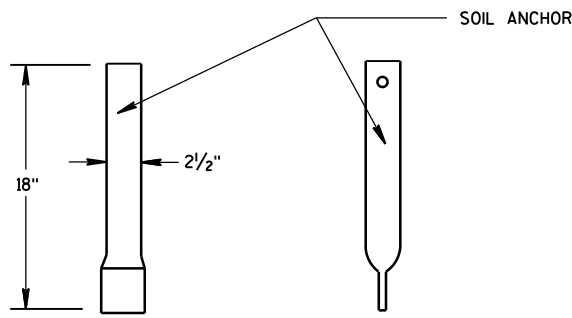
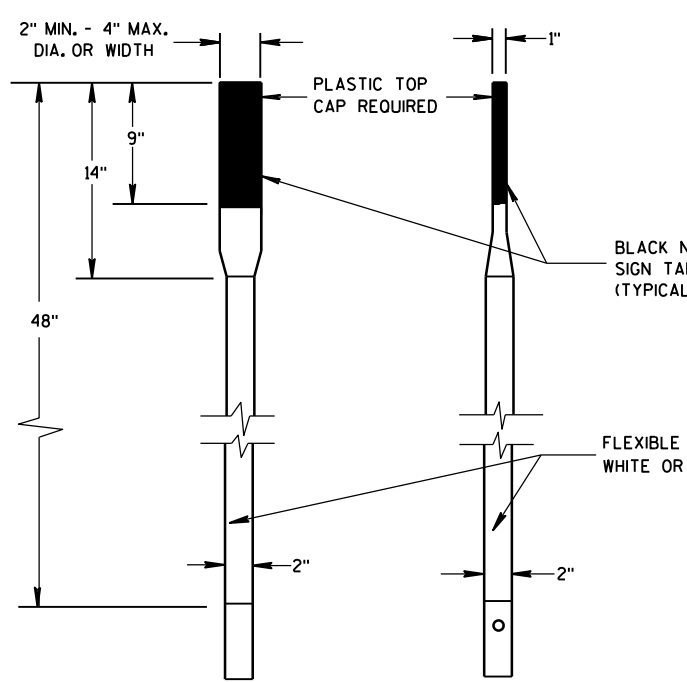
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

6

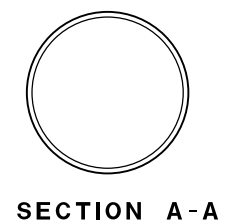
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S.D.D. 15 A 3-2a

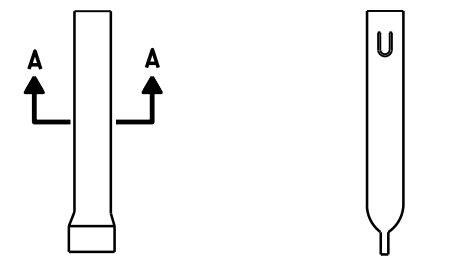
S.D.D. 15 A 3-2a



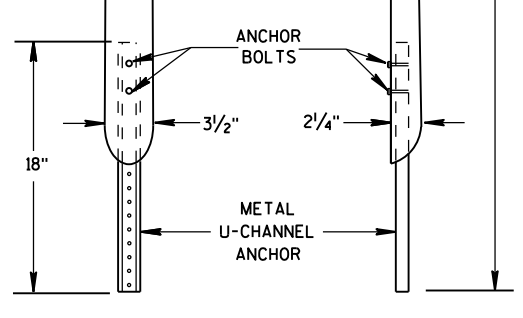
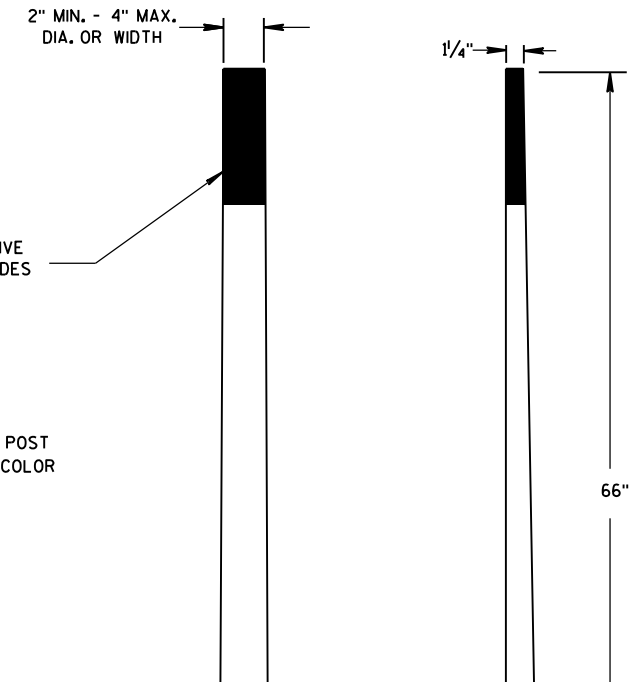
FRONT VIEW SIDE VIEW  
ALTERNATE 1



SECTION A-A

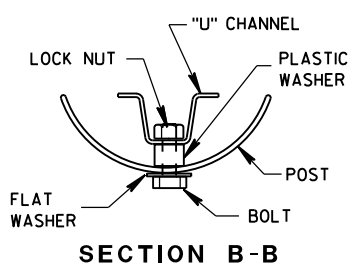


FRONT VIEW SIDE VIEW  
ALTERNATE 1

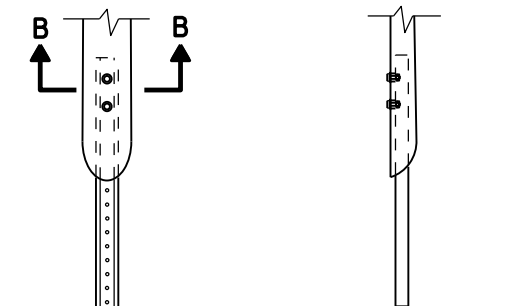


FRONT VIEW SIDE VIEW  
ALTERNATE 2

**FLEXIBLE MARKER POSTS**

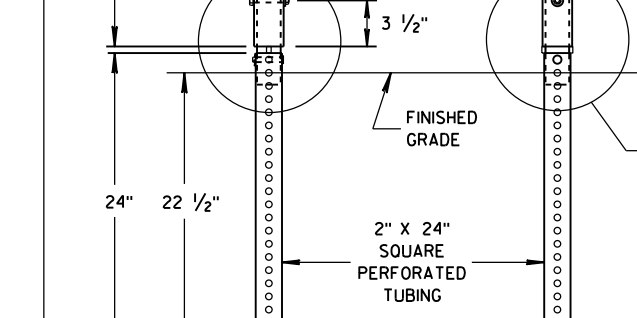
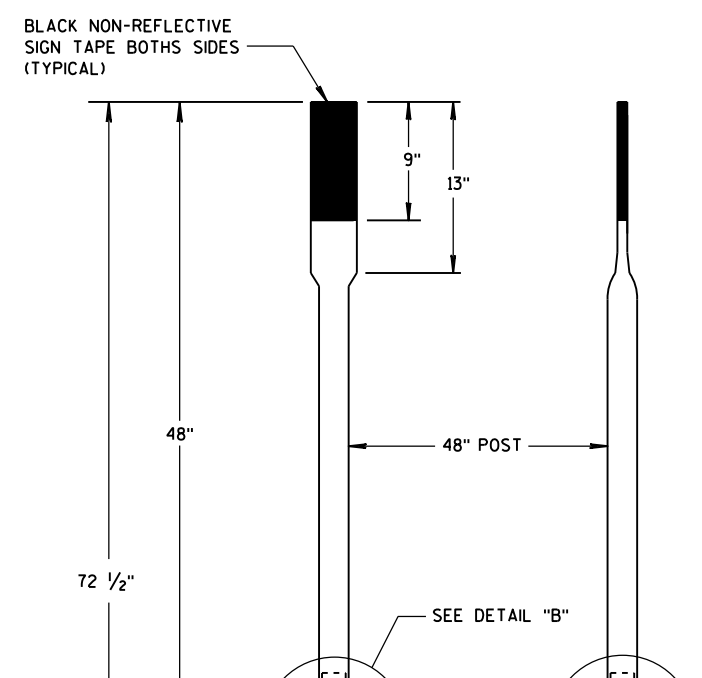


SECTION B-B

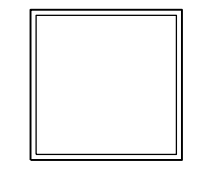


FRONT VIEW SIDE VIEW  
ALTERNATE 2

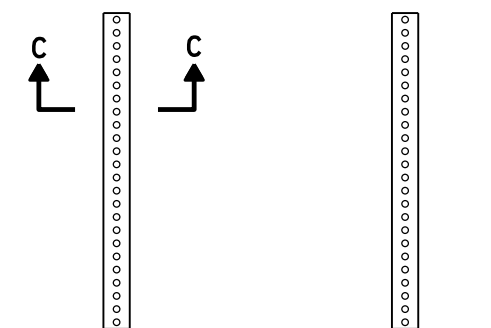
**FLEXIBLE MARKER POST ANCHORS**



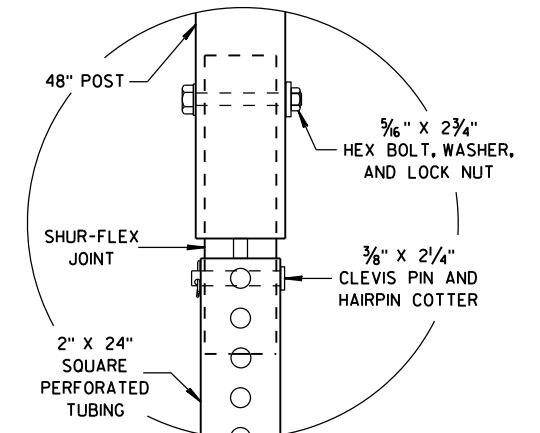
FRONT VIEW SIDE VIEW  
ALTERNATE 3



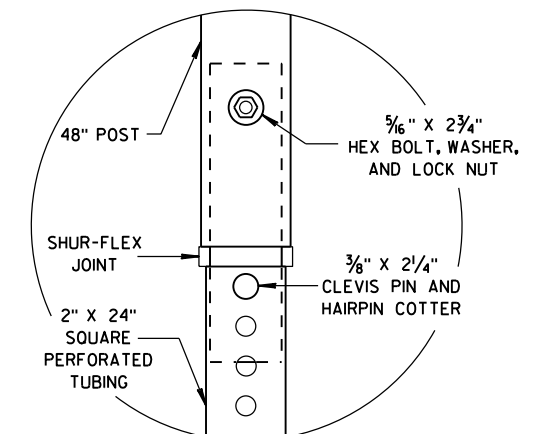
SECTION C-C



FRONT VIEW SIDE VIEW  
ALTERNATE 3



DETAIL B



DETAIL C

**FLEXIBLE MARKER POST FOR CULVERT END**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
10/1/2012 DATE /S/ Travis Feltes  
STATE TRAFFIC ENGINEER OF DESIGN  
FHWA

**GENERAL NOTES**

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

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A MINIMUM OF 200 FEET (500 FEET DESIRABLE) CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.




ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

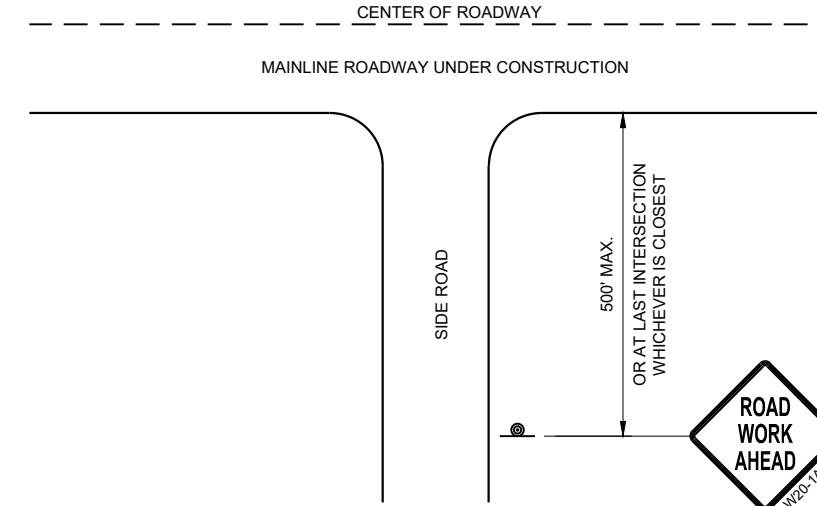
SIGNS THAT WILL BE IN PLACE LESS THAN SEVEN CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

IF A "STOP" SIGN MUST BE REMOVED FOR A WORK OPERATION, A TEMPORARY "STOP" SIGN SHALL BE PLACED PRIOR TO THE SIGN REMOVAL, OR A FLAGGER SHALL BE PROVIDED UNTIL THE SIGN IS REESTABLISHED.

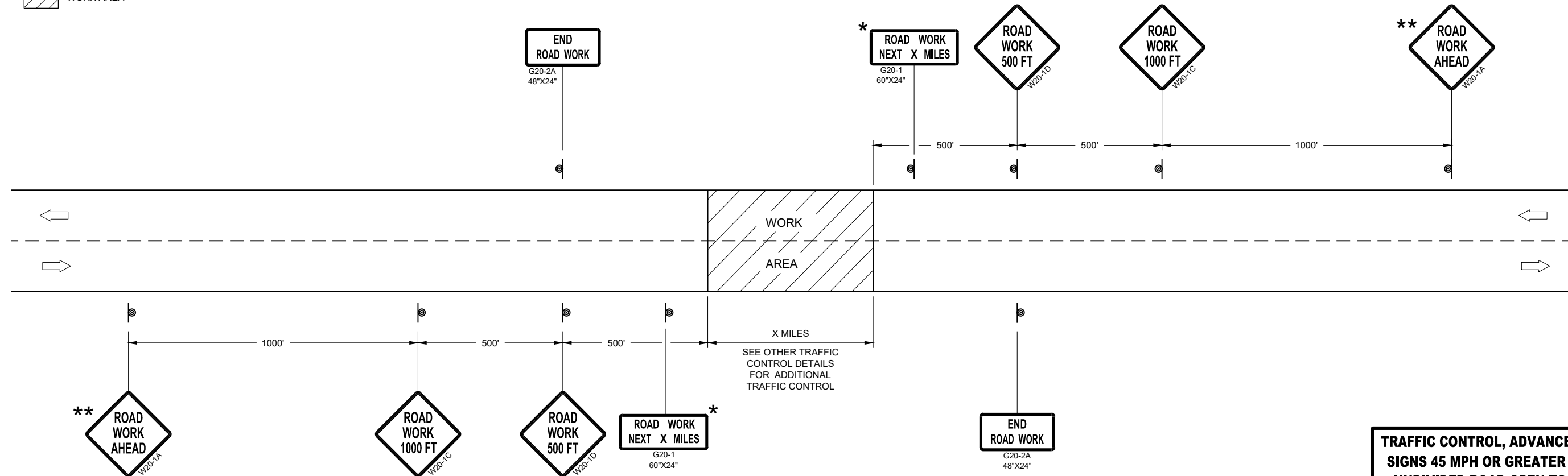
- * OMIT G20-1 SIGNS IF LENGTH OF WORK AREA IS 2 MILES OR LESS
- ** PLACE AN ADDITIONAL W20-1A "ROAD WORK AHEAD" SIGN IF WORK AREA WITHIN THE PROJECT IS SEPARATED BY MORE THAN 2 MILES FROM PREVIOUS WORK AREA.

**LEGEND**

-  SIGN ON PERMANENT SUPPORT
-  DIRECTION OF TRAFFIC
-  WORK AREA



**TYPICAL SIDE ROAD APPROACH WARNING SIGN DETAIL**



**TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45MPH OR GREATER**

**TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45 MPH OR GREATER TWO-WAY UNDIVIDED ROAD OPEN TO TRAFFIC**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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

FHWA

**GENERAL NOTES**

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

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A MINIMUM OF 200 FEET (500 FEET DESIRABLE) CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.




ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS, 36"X36" SIGNS MAY BE USED INSTEAD OF 48" X 48" SIGNS.

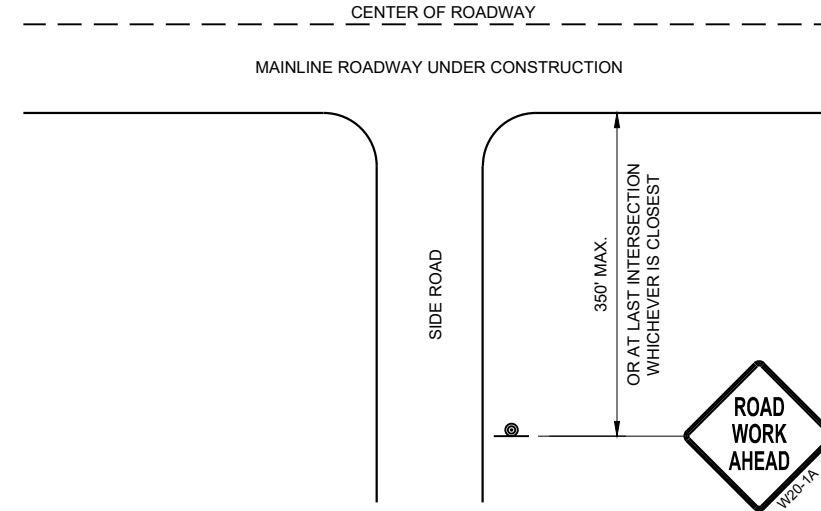
SIGNS THAT WILL BE IN PLACE LESS THAN SEVEN CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

IF A "STOP" SIGN MUST BE REMOVED FOR A WORK OPERATION, A TEMPORARY "STOP" SIGN SHALL BE PLACED PRIOR TO THE SIGN REMOVAL, OR A FLAGGER SHALL BE PROVIDED UNTIL THE SIGN IS REESTABLISHED.

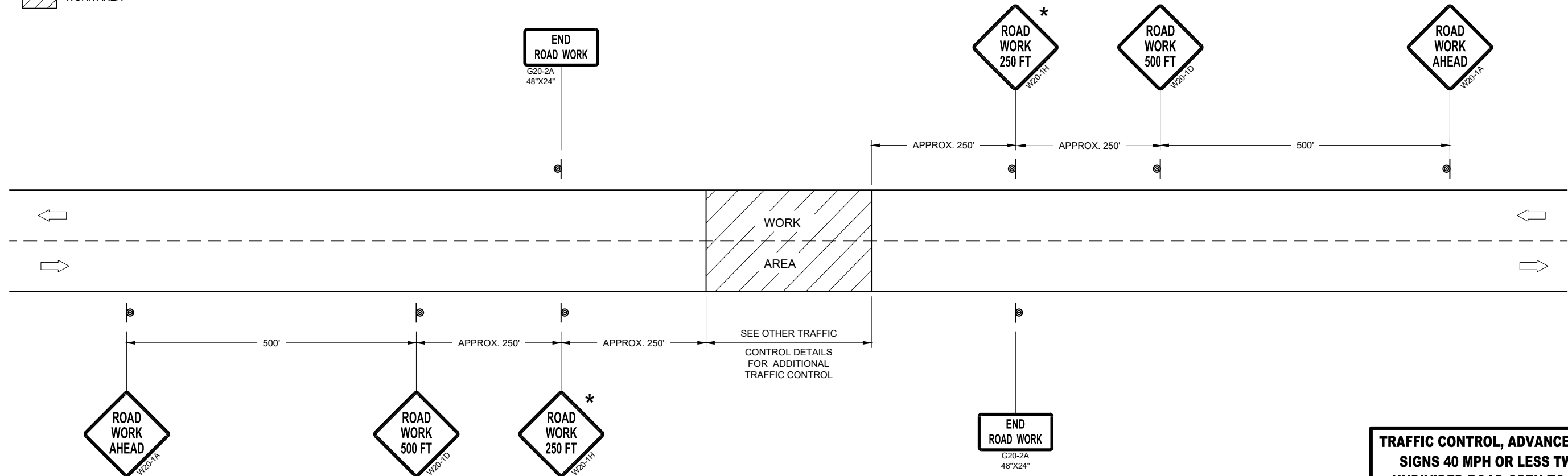
* THE THIRD W20-1 SIGN IS REQUIRED ONLY IF THERE IS AN INTERSECTION BETWEEN THE "ROAD WORK 500 FEET" SIGN AND THE WORK ZONE. ADJUST THE PLACEMENT OF THIS SIGN BASED ON INTERSECTION LOCATION AND OTHER FIELD CONDITIONS.

**LEGEND**

-  SIGN ON PERMANENT SUPPORT
-  DIRECTION OF TRAFFIC
-  WORK AREA



**TYPICAL SIDE ROAD APPROACH WARNING SIGN DETAIL**



**TRAFFIC CONTROL, ADVANCE WARNING SIGNS 40MPH OR LESS**

**TRAFFIC CONTROL, ADVANCE WARNING SIGNS 40 MPH OR LESS TWO-WAY UNDIVIDED ROAD OPEN TO TRAFFIC**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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




FHWA

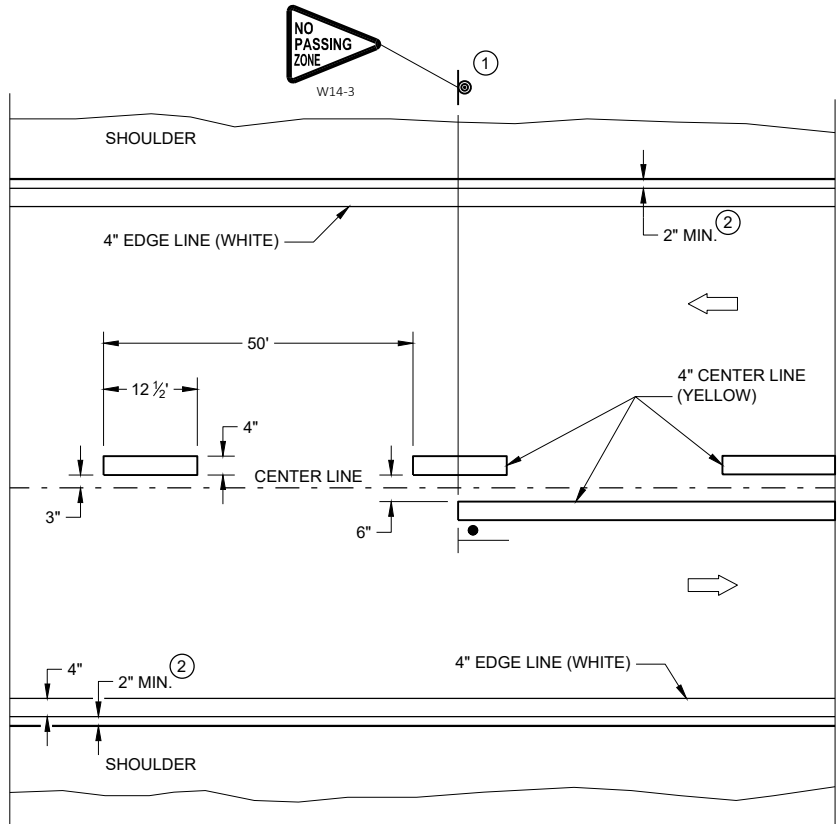
**GENERAL NOTES**

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

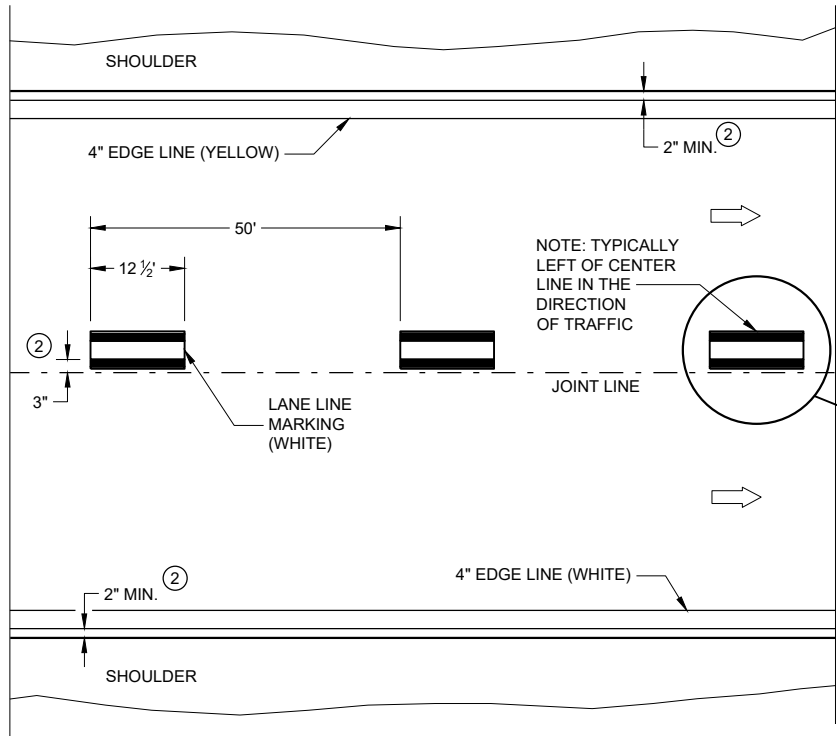
- ① LOCATE THE NO PASSING ZONE W14-3 SIGN WITHIN 50 FEET OF THE "T" MARKING
- ② MEASURE FROM EDGE OF MARKING TO JOINT LINE. THIS DOES NOT INCLUDE SPACE NEEDED FOR GROOVING OPERATIONS.

**LEGEND**

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

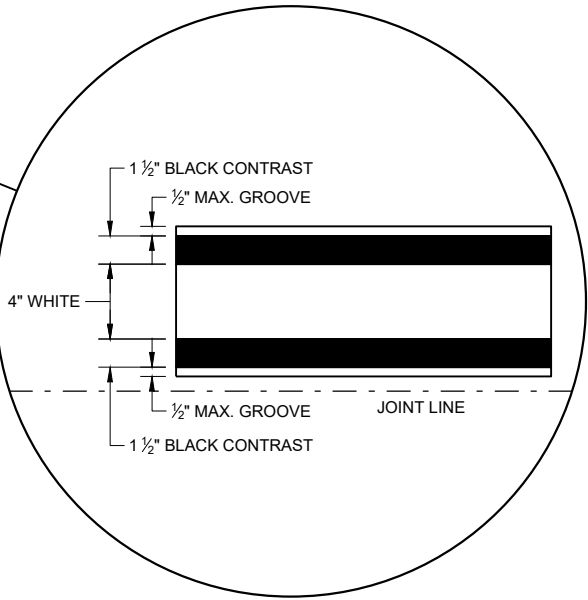


**TWO WAY TRAFFIC**



**ONE WAY TRAFFIC**

**PERMANENT PAVEMENT MARKING**



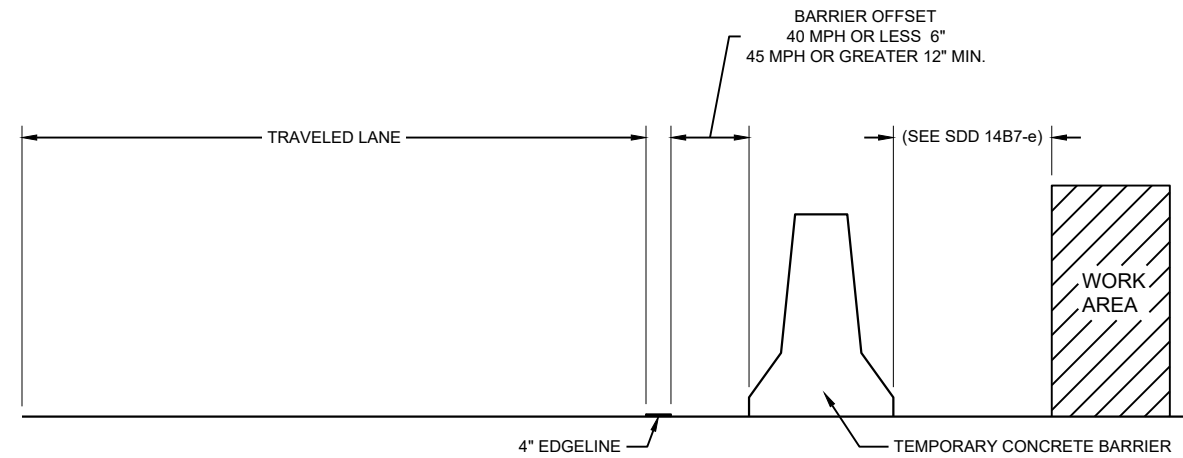
**PERMANENT LONGITUDINAL PAVEMENT MARKINGS**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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

FHWA





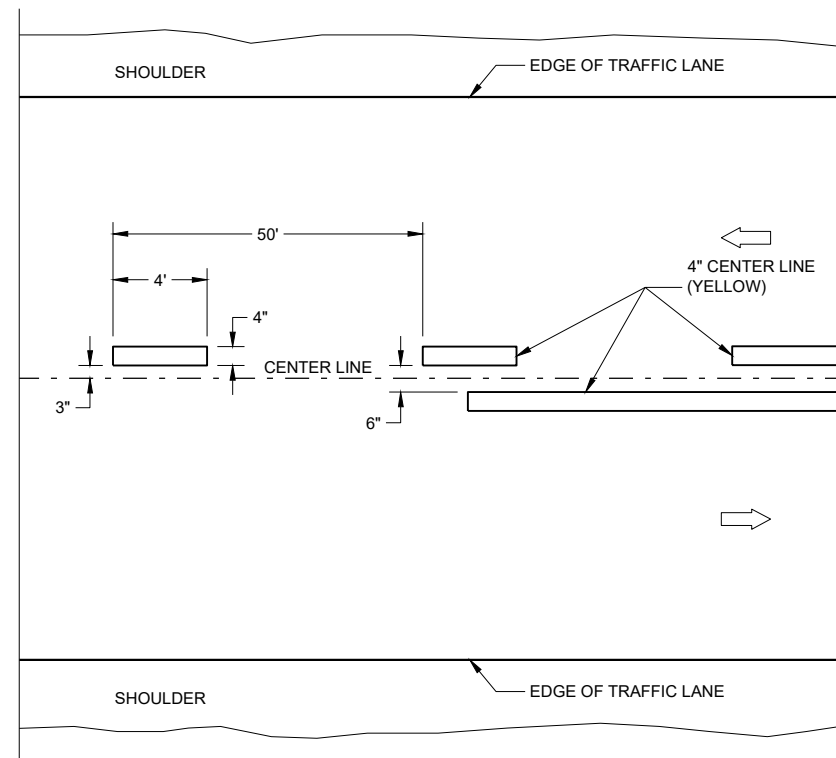
**TEMPORARY BARRIER OFFSET FROM EDGELINE**

**GENERAL NOTES**

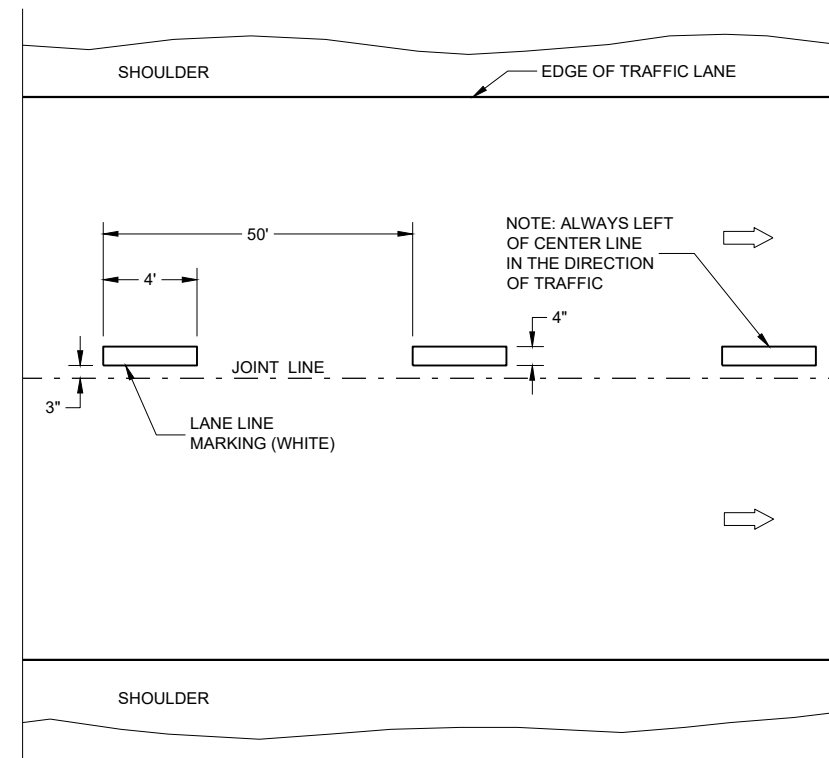
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

**LEGEND**

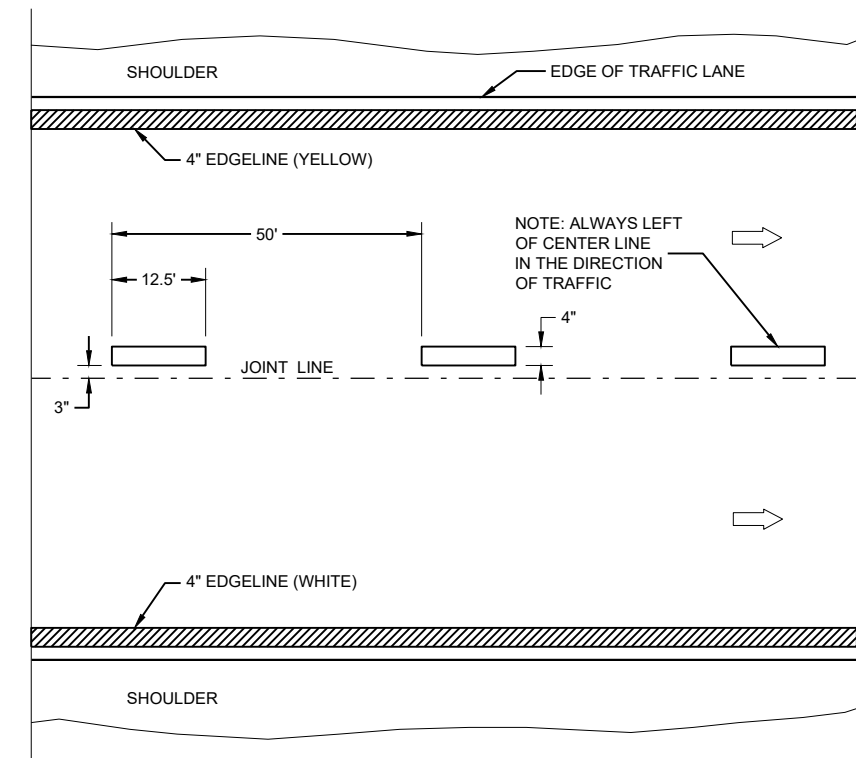
➡ DIRECTION OF TRAFFIC



**TWO WAY TRAFFIC**



**ONE WAY TRAFFIC**



**FREEWAYS AND EXPRESSWAYS**

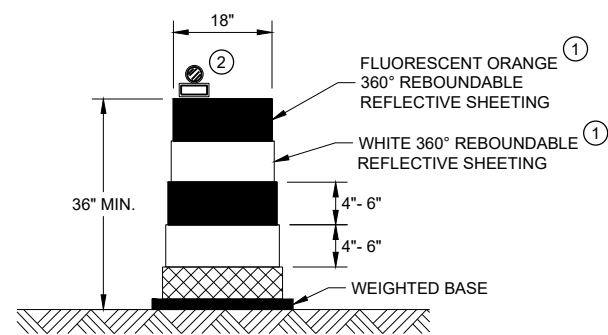
**TEMPORARY PAVEMENT MARKING**

**TEMPORARY LONGITUDINAL PAVEMENT MARKING**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

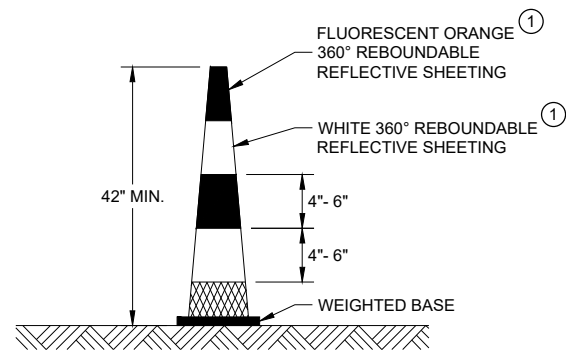
APPROVED  
May 2022 /S/ Jeannie Silver  
DATE STATEWIDE SIGNING AND MARKING  
ENGINEER

FHWA



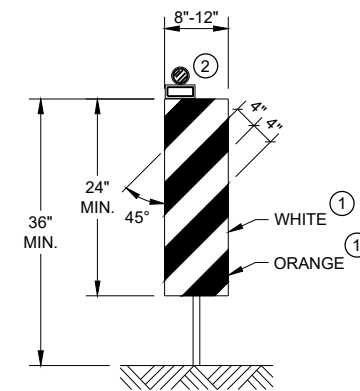
**DRUM**

BALLAST WIDTHS  
RANGE FROM 24"-36"



**42" CONE**

DO NOT USE IN TAPERS  
½ SPACING OF DRUMS  
BALLAST WIDTHS  
RANGE FROM 14"-20"

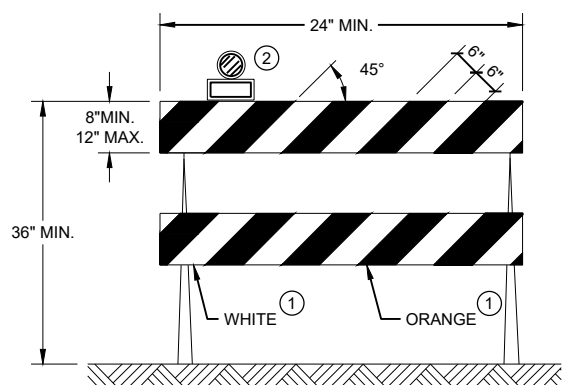


**VERTICAL PANEL**

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

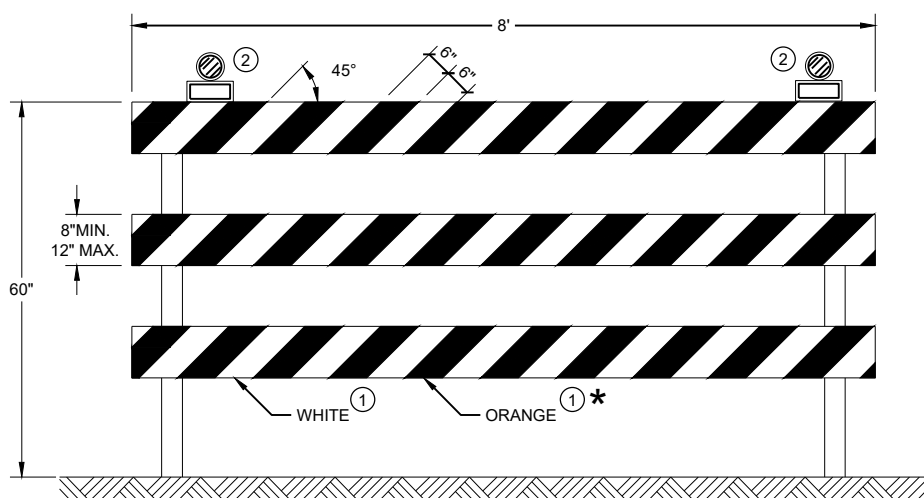
**GENERAL NOTES**

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



**TYPE II BARRICADE**

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








**TYPE III BARRICADE**

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

* IF USED FOR A PERMANENT APPLICATION USE RED SHEETING.

<b>CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED November 2022 DATE	/S/ Andrew Heidtke WORK ZONE ENGINEER
FHWA	

**LEGEND**

-  SIGN ON PORTABLE OR PERMANENT SUPPORT
-  TEMPORARY PORTABLE RUMBLE STRIP ARRAY
-  DIRECTION OF TRAFFIC
-  WORK AREA
-  FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF

**GENERAL NOTES**

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

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

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

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

THE FIRST ADVANCE WARNING SIGN SHOULD TYPICALLY BE LOCATED IN ADVANCE OF THE ANTICIPATED TRAFFIC BACKUP OR QUEUE.

WHEN A SIDE ROAD OR RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROLS SHALL BE PROVIDED AS SPECIFIED IN THE PLANS AND/OR THE SPECIAL PROVISIONS OR AS APPROVED BY THE ENGINEER.

**FLAGGING**

FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT REMOVE TEMPORARY PORTABLE RUMBLE STRIPS PRIOR TO COVERING OR REMOVING ALL ADVANCE SIGNING.

- ① FOR MOVING WORK OPERATIONS, POST ADDITIONAL W20-7A FLAGGER SIGNS AT APPROXIMATELY 3,500' INTERVALS IN THE MOVING WORK OPERATION OR AS APPROVED BY THE ENGINEER.
- ② SIGN NOT REQUIRED IF FLAGGING OPERATION OCCURS WITHIN A SIGNED ROAD WORK ZONE AREA.

WHEN THE DISTANCE BETWEEN FLAGGERS EXCEEDS 2 MILES, A PILOT CAR IS REQUIRED. WHEN CURVES REDUCE SIGHT DISTANCE BELOW 400', A PILOT CAR IS REQUIRED.

**TEMPORARY PORTABLE RUMBLE STRIPS**

UTILIZE TEMPORARY PORTABLE RUMBLE STRIPS ON ALL FLAGGING OPERATIONS.

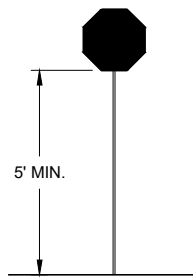
- ③ EACH TEMPORARY PORTABLE RUMBLE STRIP ARRAY CONSISTS OF THREE RUMBLE STRIPS PLACED TRANSVERSE ACROSS THE LANE AT THE LOCATIONS SHOWN. WITHIN EACH ARRAY, SPACING BETWEEN RUMBLE STRIPS SHALL BE 15 FEET ON CENTER

ONLY USE TEMPORARY PORTABLE RUMBLE STRIPS FROM THE APPROVED PRODUCTS LIST.

INSTALL TEMPORARY RUMBLE STRIPS PER MANUFACTURER'S RECOMMENDATIONS.

PLACE ADVANCE SIGNING PRIOR TO INSTALLING TEMPORARY RUMBLE STRIPS.

DO NOT INSTALL TEMPORARY PORTABLE RUMBLE STRIPS ON GRAVEL, MILLED SURFACES, OR ASPHALT THAT HAS BEEN PAVED LESS THAN 12 HOURS.



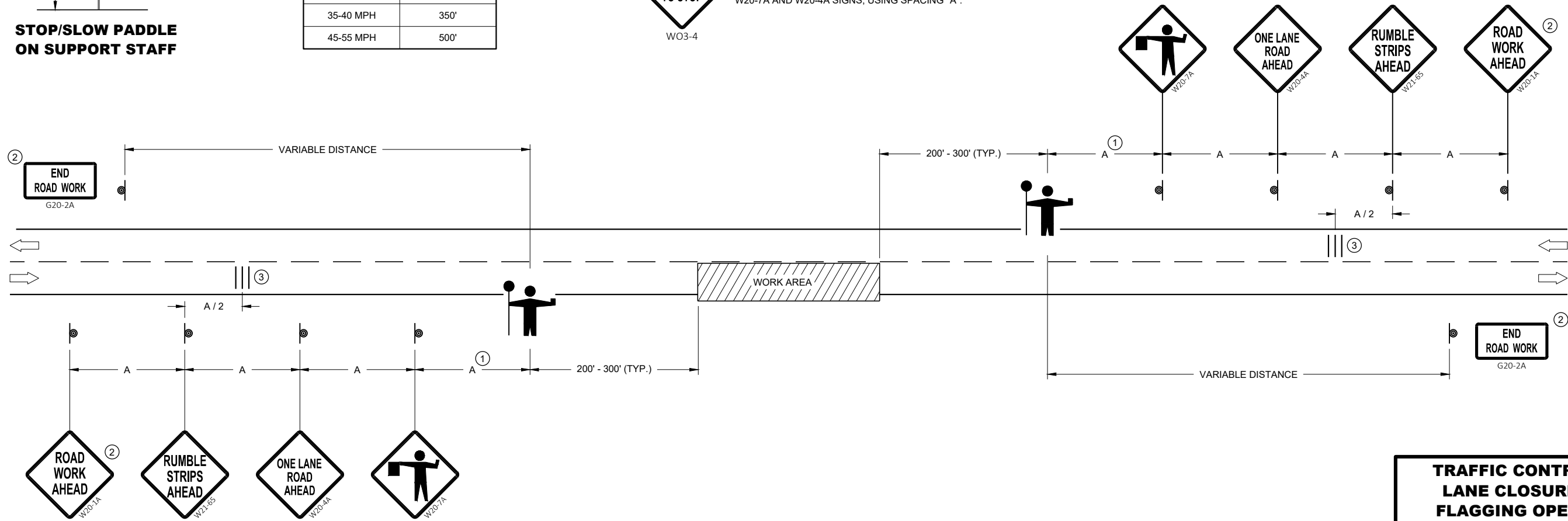
**STOP/SLOW PADDLE ON SUPPORT STAFF**

**SIGN AND TEMPORARY RUMBLE STRIP ARRAY SPACING TABLE**

SPEED LIMIT	SPACING "A"
25-30 MPH	200'
35-40 MPH	350'
45-55 MPH	500'



USE OF W03-4 SIGN IS OPTIONAL. WHEN USED, THIS SIGN SHALL BE LOCATED BETWEEN THE W20-7A AND W20-4A SIGNS, USING SPACING "A".










**TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
DATE: May 2022 /S/ Andrew Heidtke  
WORK ZONE ENGINEER

FHWA

**GENERAL NOTES**

-  SIGN ON PERMANENT SUPPORT
-  TRAFFIC CONTROL CONE 42-INCH
-  TRAFFIC CONTROL DRUM
-  TEMPORARY PORTABLE RUMBLE STRIP ARRAY
-  DIRECTION OF TRAFFIC
-  WORK AREA
-  AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD)

**GENERAL NOTES**

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

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

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

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

THE FIRST ADVANCE WARNING SIGN SHOULD TYPICALLY BE LOCATED IN ADVANCE OF THE ANTICIPATED TRAFFIC BACKUP OR QUEUE.

WHEN A SIDE ROAD OR RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROLS SHALL BE PROVIDED AS SPECIFIED IN THE PLANS AND/OR THE SPECIAL PROVISIONS OR AS APPROVED BY THE ENGINEER.

**FLAGGING**

IF THE AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD) STOPS WORKING, FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT REMOVE TEMPORARY PORTABLE RUMBLE STRIPS PRIOR TO COVERING OR REMOVING ALL ADVANCE SIGNING.

WHEN THE DISTANCE BETWEEN FLAGGERS EXCEEDS 2 MILES, A PILOT CAR IS REQUIRED. WHEN CURVES REDUCE SIGHT DISTANCE BELOW 400', A PILOT CAR IS REQUIRED.

- ① SIGN NOT REQUIRED IF FLAGGING OPERATION OCCURS WITHIN A SIGNED ROAD WORK ZONE AREA.
- ② IF FLAGGERS ARE PHYSICALLY NEEDED TO FLAG, REPLACE WO3-4 SIGNS WITH W20-7A SIGNS.

**TEMPORARY PORTABLE RUMBLE STRIPS**

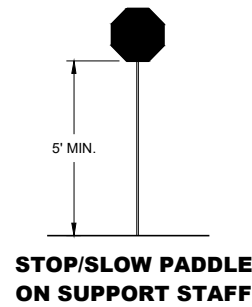
UTILIZE TEMPORARY PORTABLE RUMBLE STRIPS ON ALL FLAGGING OPERATIONS.

ONLY USE TEMPORARY PORTABLE RUMBLE STRIPS FROM THE APPROVED PRODUCTS LIST.

PLACE ADVANCE SIGNING PRIOR TO INSTALLING TEMPORARY RUMBLE STRIPS.

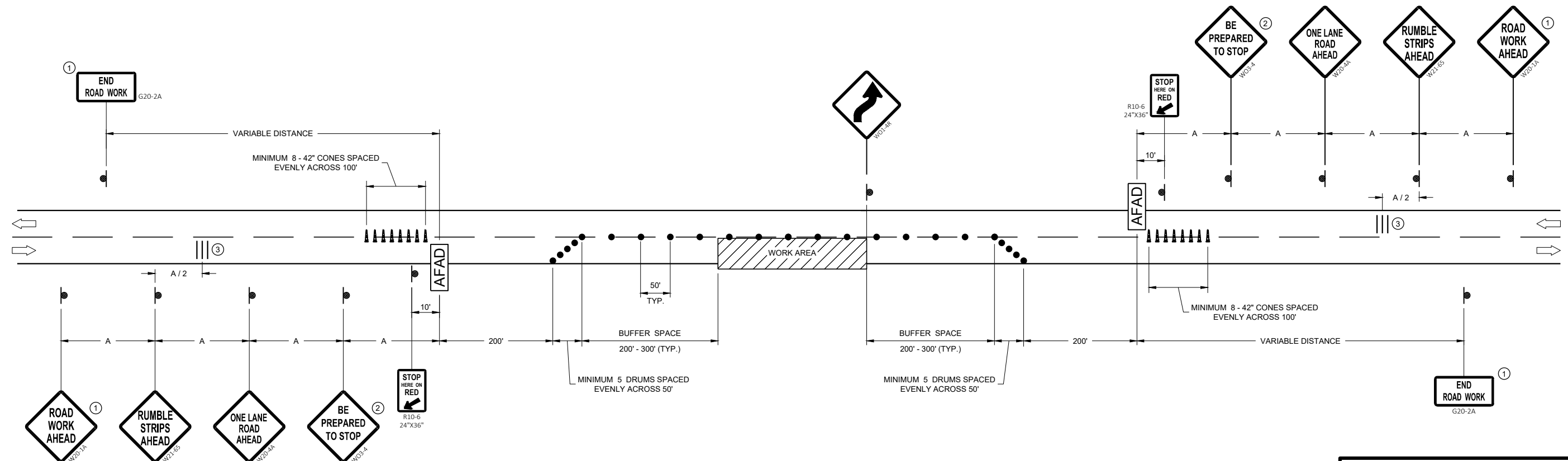
DO NOT INSTALL TEMPORARY PORTABLE RUMBLE STRIPS ON GRAVEL, MILLED SURFACES, OR ASPHALT THAT HAS BEEN PAVED LESS THAN 12 HOURS.

③ EACH TEMPORARY PORTABLE RUMBLE STRIP ARRAY CONSISTS OF THREE RUMBLE STRIPS PLACED TRANSVERSELY AT THE LOCATIONS SHOWN. WITHIN EACH ARRAY, SPACING BETWEEN RUMBLE STRIPS SHALL BE 15 FEET ON CENTER.



**SIGN AND TEMPORARY RUMBLE STRIP ARRAY SPACING TABLE**

SPEED LIMIT	SPACING "A"
25-30 MPH	200'
35-40 MPH	350'
45-55 MPH	500'



**TRAFFIC CONTROL, LANE CLOSURE WITH AUTOMATED FLAGGER ASSISTANCE DEVICE**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2022 /S/ Andrew Heidtke  
DATE WORK ZONE ENGINEER

FHWA





6

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SDD 15C12 - 09b

SDD 15C12 - 09b

**LEGEND**

- V1 LEAD VEHICLE
- V2 MARKING VEHICLE
- V3 SHADOW VEHICLE
-  TRUCK MOUNTED ATTENUATOR (TMA)
-  SIGN ON TEMPORARY SUPPORT
-  DIRECTION OF TRAFFIC
-  FLASHING ARROW PANEL (CAUTION)

**GENERAL NOTES**

ALL VEHICLES SHALL BE EQUIPPED WITH TWO 360 DEGREE HIGH INTENSITY YELLOW FLASHING LIGHTS OR STROBE LIGHTS AND OPERATED WITH HEADLIGHTS TURNED ON.

ALL VEHICLES SHALL BE EQUIPPED WITH REAR FACING TYPE B OR C FLASHING ARROW PANEL OPERATING IN CAUTION MODE. SIGNS PLACED ON VEHICLES MUST NOT OBSCURE THE ARROW PANEL.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE SPECIFIED.

DISTANCE BETWEEN VEHICLES MAY VARY ACCORDING TO TERRAIN, SIGHT DISTANCE, PAINT DRYING TIME, AND OTHER FACTORS. WHENEVER ADEQUATE STOPPING SIGHT DISTANCE EXISTS TO THE REAR, SHADOW VEHICLES SHOULD MAINTAIN THE MINIMUM DISTANCE FROM THE WORK VEHICLE AND PROCEED AT THE SAME SPEED AS THE WORK VEHICLE. SHADOW VEHICLES SHOULD SLOW DOWN IN ADVANCE OF VERTICAL AND HORIZONTAL CURVES THAT RESTRICT SIGHT DISTANCE.

THE WORK AND SHADOW VEHICLES SHOULD PULL OVER PERIODICALLY TO ALLOW TRAFFIC TO PASS.

WHEN NO WORK ACTIVITY IS TAKING PLACE, REMOVE OR LAY STATIONARY SIGNS AND SUPPORTS FLAT ON THE GRADE WITH UPRIGHTS ORIENTED PARALLEL TO AND DOWNSTREAM FROM TRAFFIC.

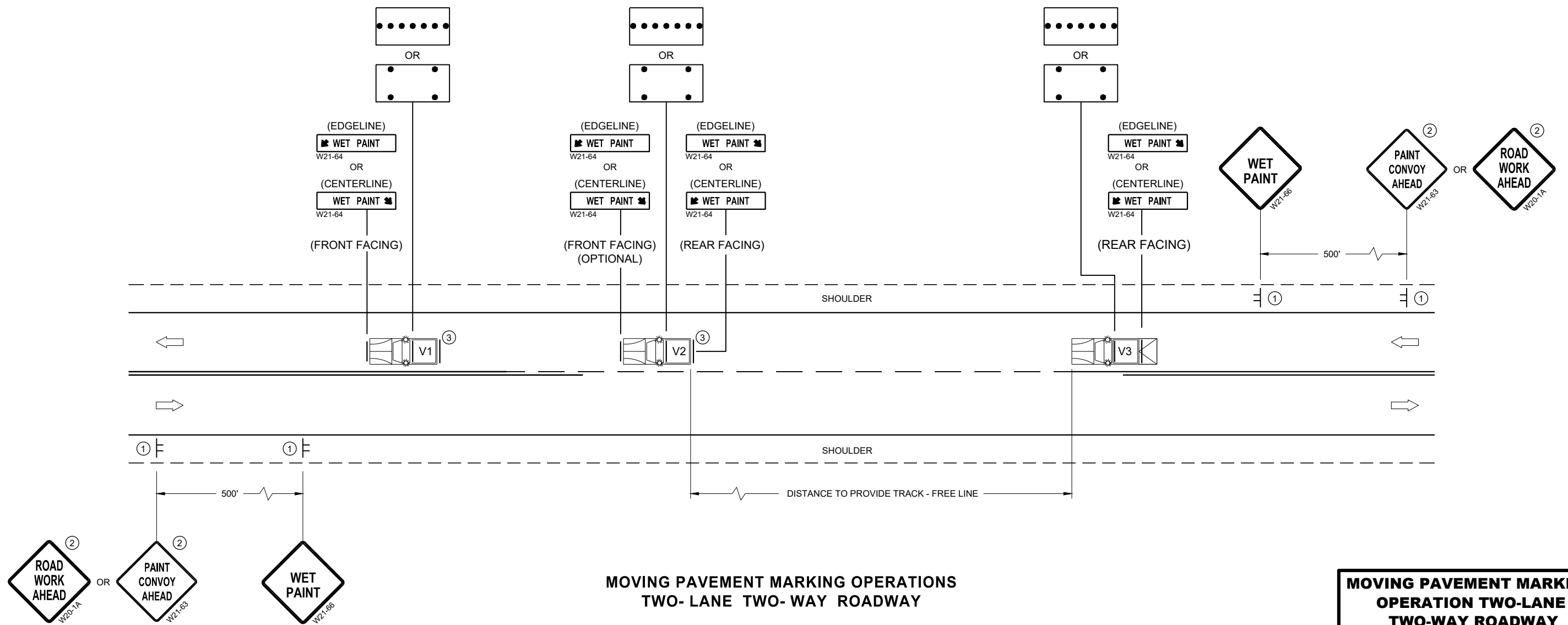
CONES SHOULD BE USED BETWEEN THE MARKING AND SHADOW VEHICLE AT 100 FOOT SPACING. CONES MAY BE OMITTED ON PAINTED LINE IF APPROVED BY THE ENGINEER. CONSIDER PAVEMENT MARKING DRY OR CURE TIMES AND TRAFFIC VOLUME.

CONES SHALL BE A MINIMUM OF 28" FOR WET PAVEMENT MARKING .

- ① SIGNS SHALL BE REPEATED APPROXIMATELY EVERY THREE MILES.
- ② IF CONSTRUCTION WORK ZONE SIGNS ARE IN PLACE, W20-1A OR W21-63 ARE NOT REQUIRED.
- ③ V1 AND V2 CAN BE SWITCHED SO THAT THE MARKER IS THE LEAD VEHICLE.

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**MOVING PAVEMENT MARKING OPERATIONS  
TWO-LANE TWO-WAY ROADWAY**

**MOVING PAVEMENT MARKING  
OPERATION TWO-LANE  
TWO-WAY ROADWAY**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
DATE: May 2022 /S/ Andrew Heidtke  
WORK ZONE ENGINEER

FHWA

SDD 15C19 - 07a

SDD 15C19 - 07a

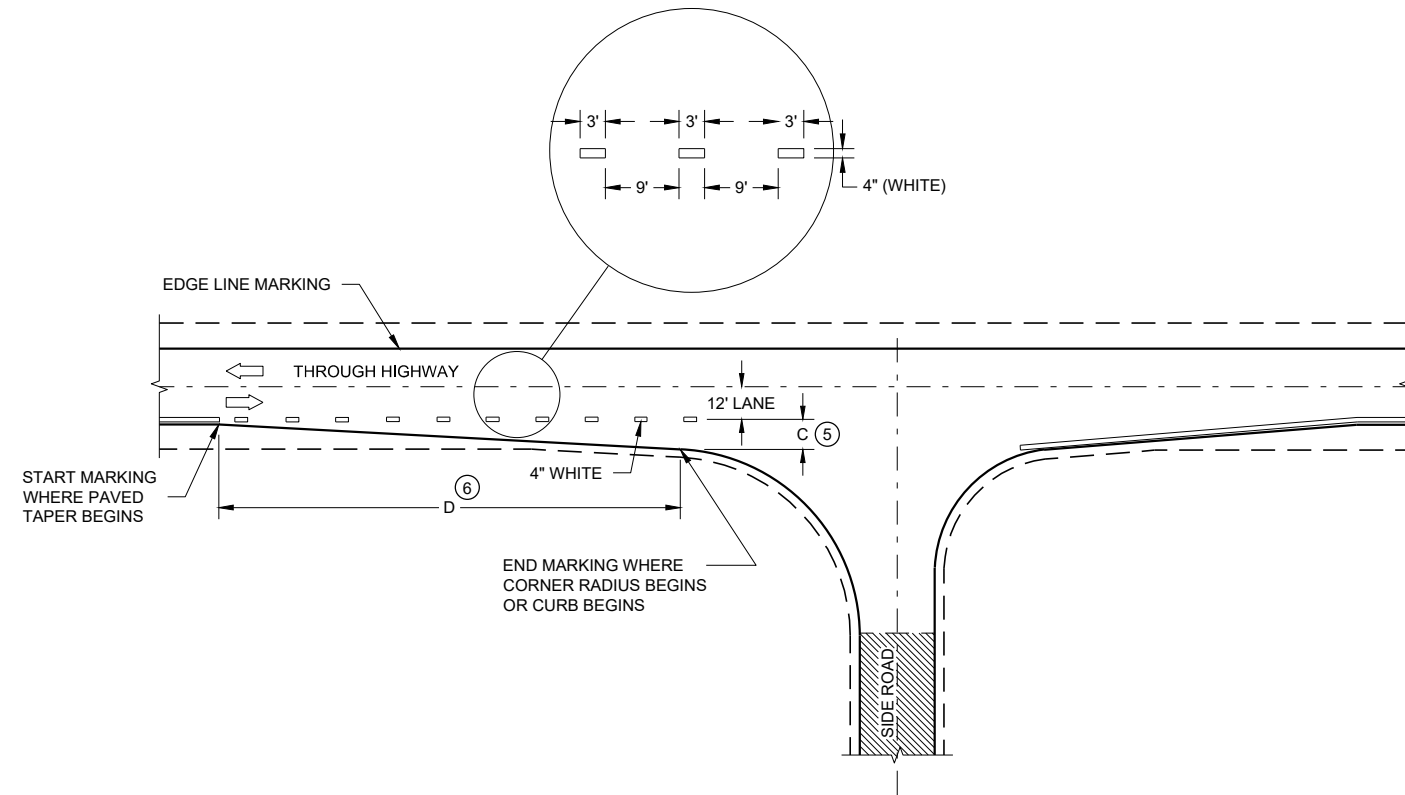
**GENERAL NOTES**

OMIT EDGE LINES THROUGH INTERSECTIONS. CONTINUE EDGE LINES THROUGH DRIVEWAYS.

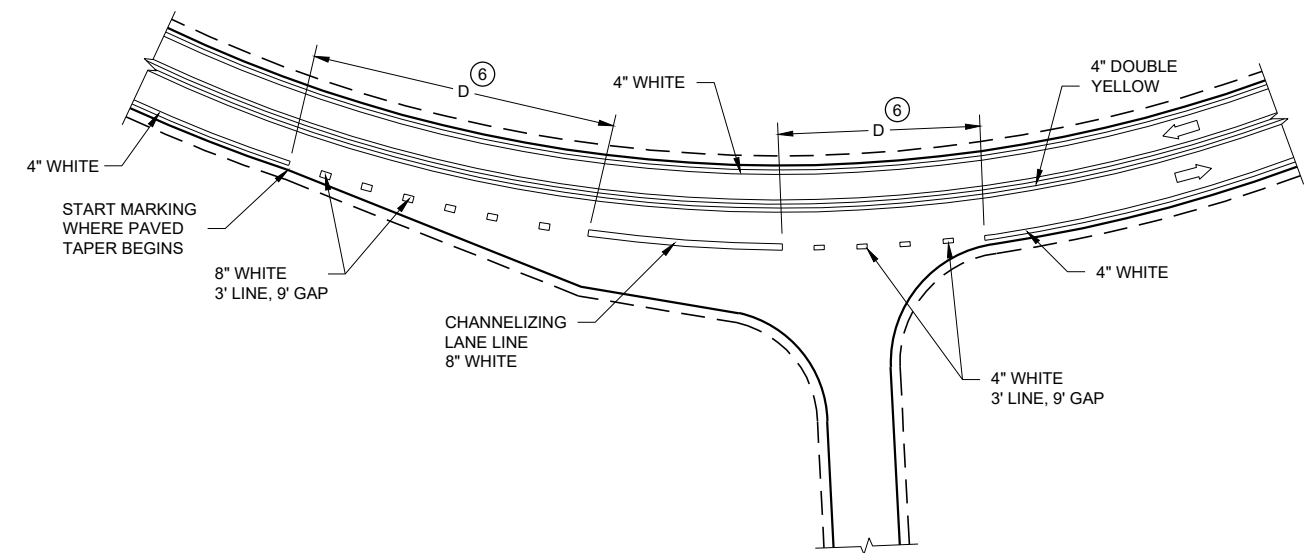
- ① WHEN DISTANCE "A" IS LESS THAN 250 FEET, OMIT LANE LINE.
- ② WHEN DISTANCE "B" IS LESS THAN 100 FEET, OMIT CHANNELIZING LANE LINE.
- ③ BARRIER LINE ENDS AT SIDE ROAD PAVEMENT / SURFACE EDGE EXTENSION.
- ④ BARRIER LINE STARTS 500 FEET PRIOR TO THE BYPASS TAPER.
- ⑤ WHEN DISTANCE "C" IS LESS THAN 4 FEET, OMIT DOTTED EXTENSION.
- ⑥ WHEN DISTANCE "D" IS LESS THAN 50 FEET, OMIT DOTTED EXTENSION.

**LEGEND**

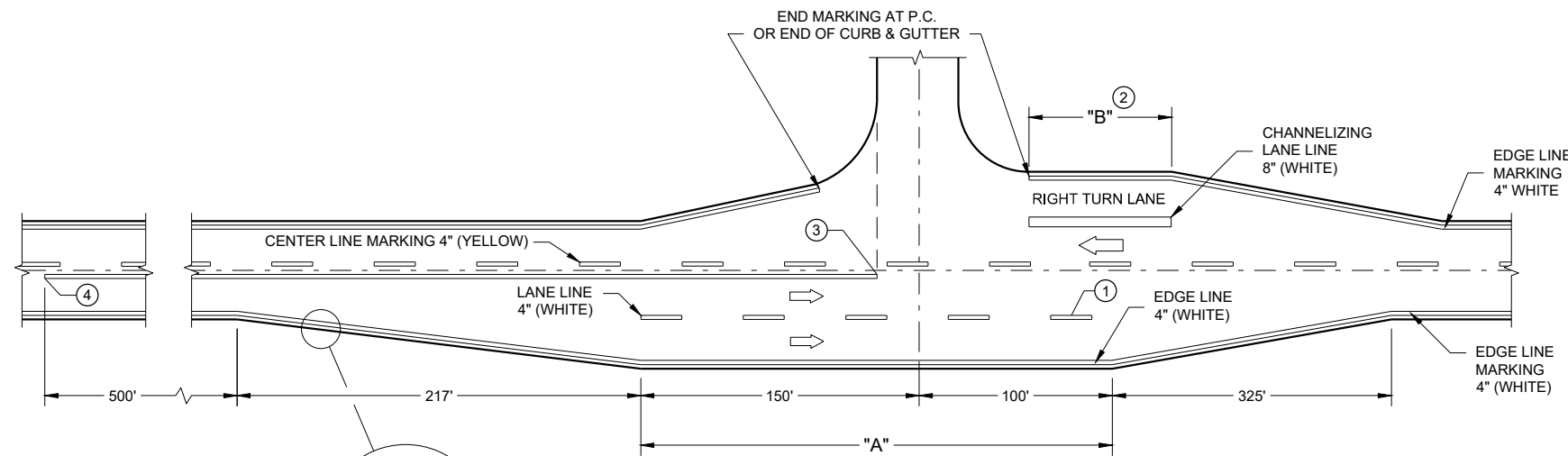
➡ DIRECTION OF TRAVEL



**MINOR INTERSECTION**

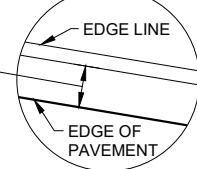


**INTERSECTION ON OUTSIDE OF CURVE**



**MAJOR INTERSECTIONS  
(INTERSECTION WITH FULL RIGHT TURN LANE OR BYPASS LANE)**





BYPASS LANE PAVED SHOULDER WIDTH (AS SHOWN ELSEWHERE IN PLANS) - PLUS 2 INCHES



**PAVEMENT MARKING  
(INTERSECTIONS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

**LEGEND**

-  SIGN ON PERMANENT SUPPORT
-  TRAFFIC CONTROL DRUM
-  DIRECTION OF TRAFFIC
-  WORK ZONE

**GENERAL NOTES**

ALL SIGNS ARE 48"X48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY THE REGIONAL TRAFFIC UNIT.

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

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

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

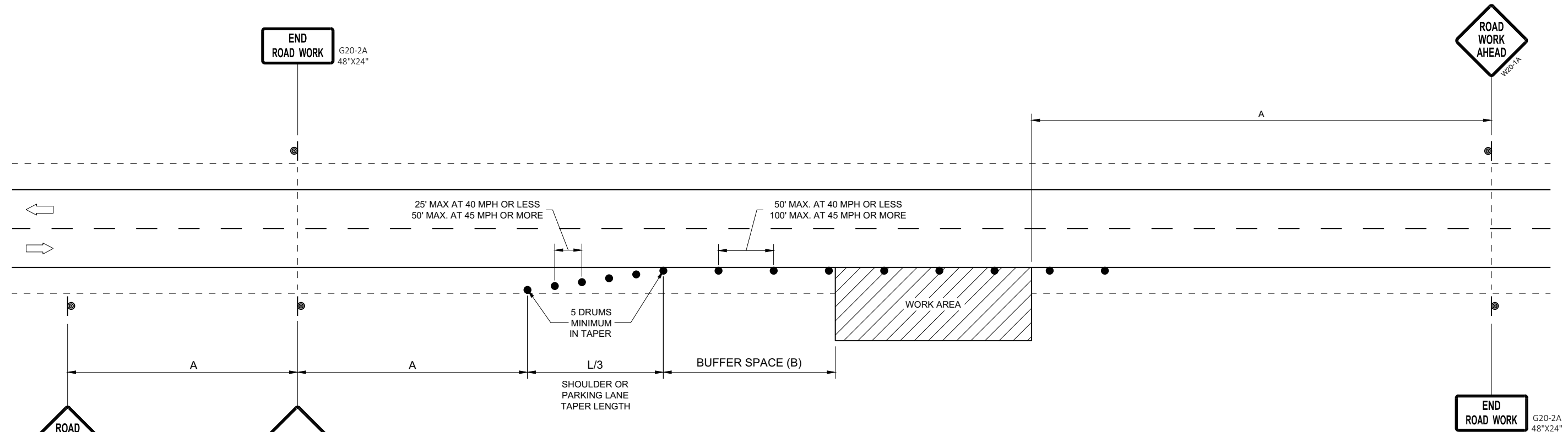
CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

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

W20-1A AND G20-2A SIGNS ARE NOT REQUIRED IF THE WORK AREA IS WITHIN A LARGER WORK ZONE WHERE THESE SIGNS ARE ALREADY PRESENT. G20-2A SIGNS MAY ALSO BE OMITTED IF DURATION OF WORK IS LESS THAN 7 CONTINUOUS DAYS AND NIGHTS.

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OR  
IF TRAFFIC CONTROL DEVICES  
ENCROACH ONTO TRAVELED WAY, USE

POSTED SPEED LIMIT PRIOR TO WORK STARTING (MPH)	ADVANCE WARNING SIGN SPACING (A) FEET	SHOULDER TAPER L / 3 W, LATERAL OFFSET (FT)						BUFFER SPACE (B) FEET
		3	4	5	6	7	8	
25	200'	10	14	17	21	24	28	55
30	200'	15	20	25	30	35	40	85
35	350'	20	27	34	40	47	54	120
40	350'	26	35	44	53	62	70	170
45	500'	45	59	74	89	104	119	220
50	500'	50	66	83	99	116	132	280
55	500'	54	73	91	109	127	145	335'

**TRAFFIC CONTROL, WORK ON  
SHOULDER OR PARKING LANE,  
UNDIVIDED ROADWAY**

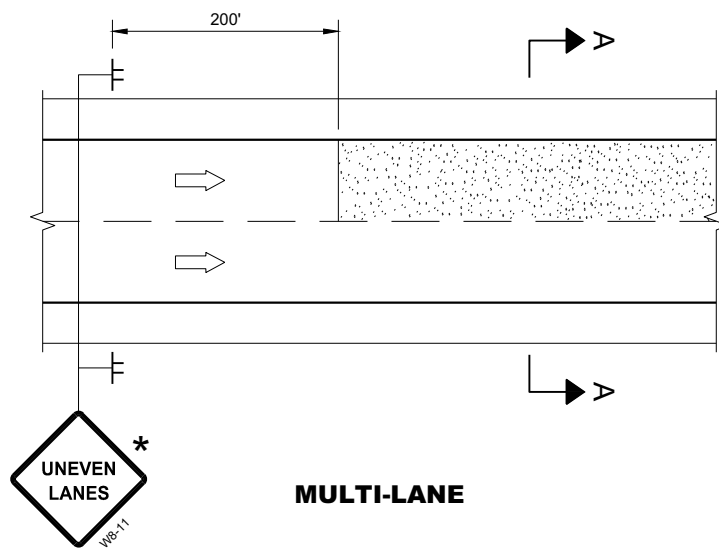
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2020 /S/ Andrew Heidtke  
DATE STATEWIDE WORK ZONE TRAFFIC  
SAFETY ENGINEER

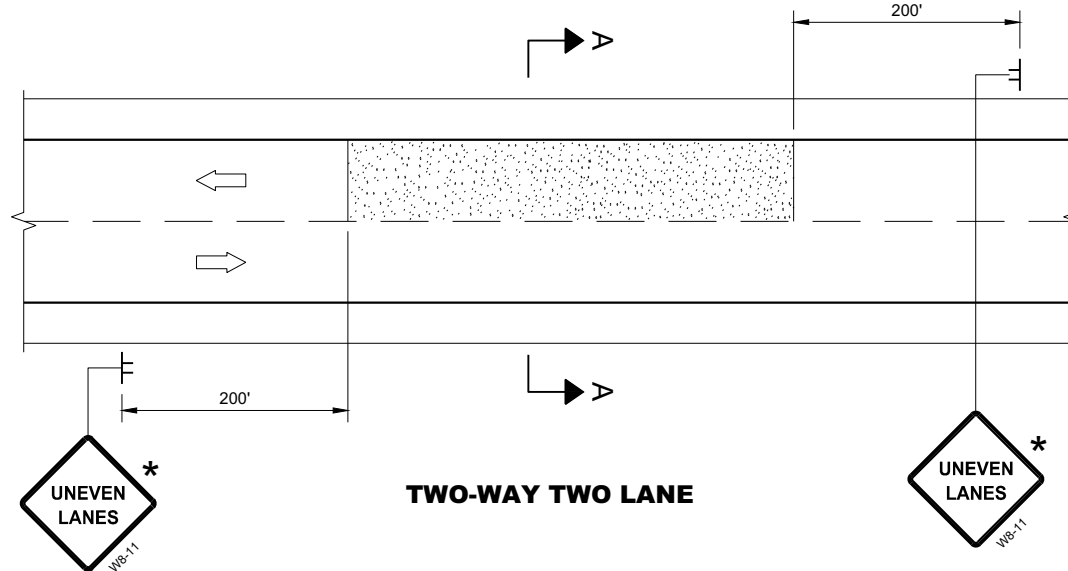
FHWA

SDD 15D28 - 04

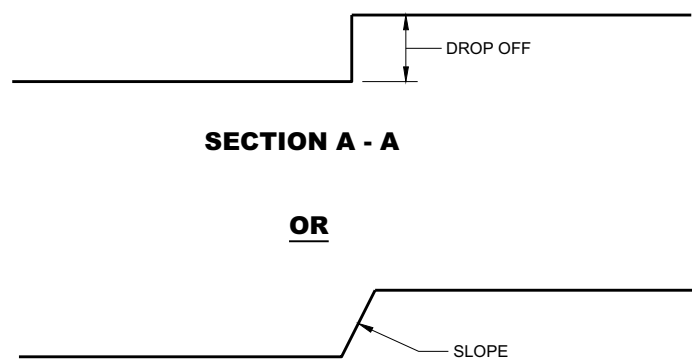
SDD 15D28 - 04



**MULTI-LANE**



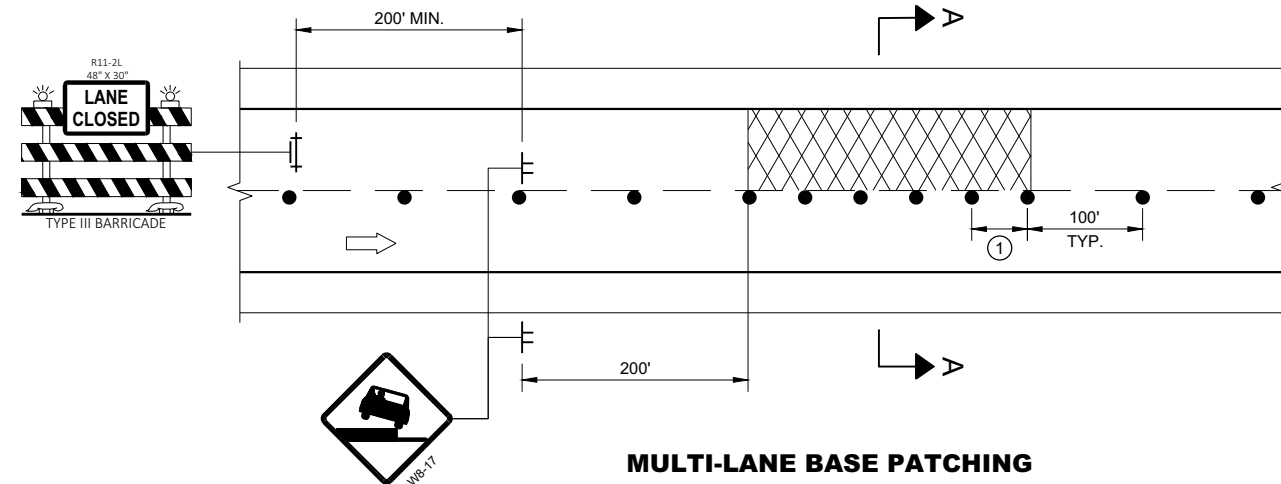
**TWO-WAY TWO LANE**



**SECTION A - A**

**OR**

**SECTION A - A**



**MULTI-LANE BASE PATCHING**

**ADJACENT LANE DROP-OFFS**

**GENERAL NOTES**

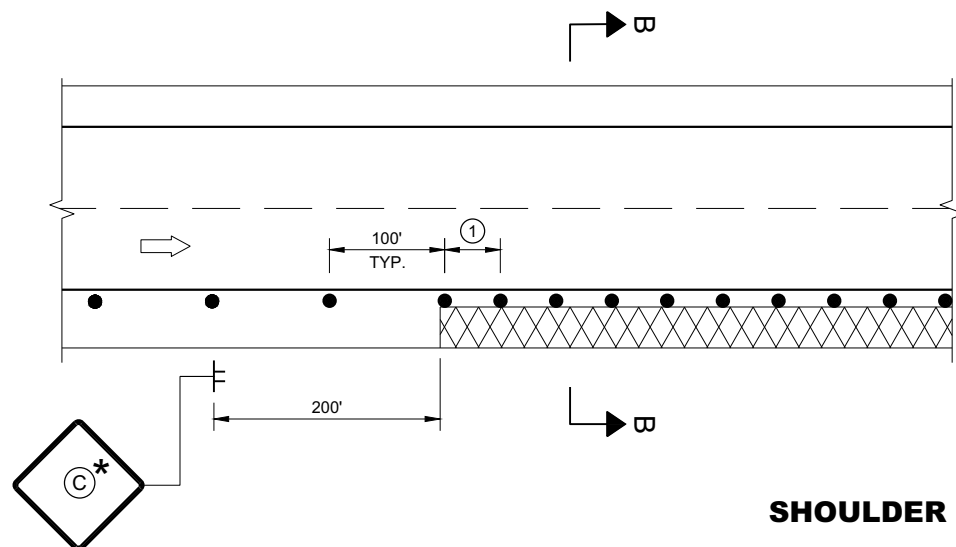
- FOR SPOT LOCATIONS USE ENGINEERING JUDGEMENT WHEN PLACING ADDITIONAL SIGNS.
- ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.
- "WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS ORANGE.
- WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.
- * IF THE DROP-OFF IS CONTINUOUS ALONG THE PROJECT, PLACE ADDITIONAL SIGNS EVERY 1 MILE AND AFTER EVERY ENTRANCE RAMP.
- ① USE CLOSER SPACING WHEN DELINEATING DROP-OFF.

**LEGEND**

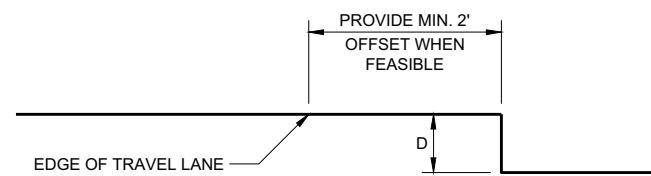
- SIGN ON TEMPORARY SUPPORT
- TRAFFIC CONTROL DRUM
- TYPE III BARRICADE WITH ATTACHED SIGN
- TYPE "A" WARNING LIGHT (FLASHING)
- DIRECTION OF TRAFFIC
- WORK AREA WITH DROP-OFF
- MILLED SURFACE

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**SHOULDER DROP-OFFS**



**SECTION B - B**

D	SIGN (C)
< 2" WITH A SLOPE STEEPER THAN 3:1	LOW SHOULDER WO8-9
2" < 6" WITH A SLOPE STEEPER THAN 3:1	SHOULDER DROP - OFF W8-9A PROVIDE A 3:1 OR FLATTER SLOPE OF MATERIAL ADJACENT TO THE PAVEMENT

SDD 15D39 - 02

SDD 15D39 - 02

**TRAFFIC CONTROL,  
DROP-OFF SIGNING**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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

FHWA



**GENERAL NOTES**

DRAWING NOT TO SCALE. ALL SIGNS AND POSTS ON THIS SHEET SHALL BE PAID FOR WITH 'TRAFFIC CONTROL SIGNS' BID ITEM. ALL SIDE ROADS WHICH ARE UNDER CONSTRUCTION OF CURB AND GUTTER AND/OR GRADING SHALL BE ADEQUATELY SIGNED.

ALL SIGNS AND DEVICES SHALL BE IN CONFORMANCE WITH THE WISCONSIN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (WMUTCD). SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE WISDOT STANDARD SIGN PLATES.

"WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THAT THE BACKGROUND IS ORANGE.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.



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

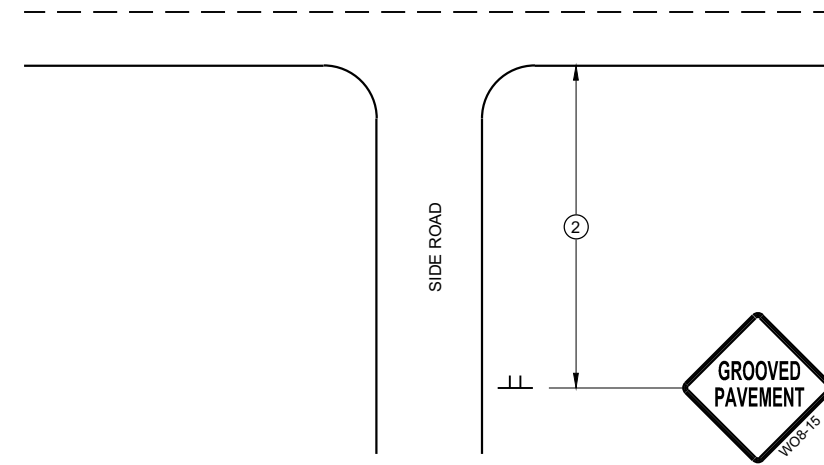
ALL SIGNS INAPPROPRIATE TO THE STATUS OF THE CONTROL ZONE, INCLUDING PRE-EXISTING SIGNS IN THE VICINITY, SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER.

SEE 15C34 FOR ADDITIONAL TRAFFIC CONTROL SIGNING WHEN CENTERLINE PAVEMENT MAKINGS ARE MISSING. 'DO NOT PASS' SIGNS MUST BE INSTALLED ON THE SAME DAY AS MILLING OPERATIONS.

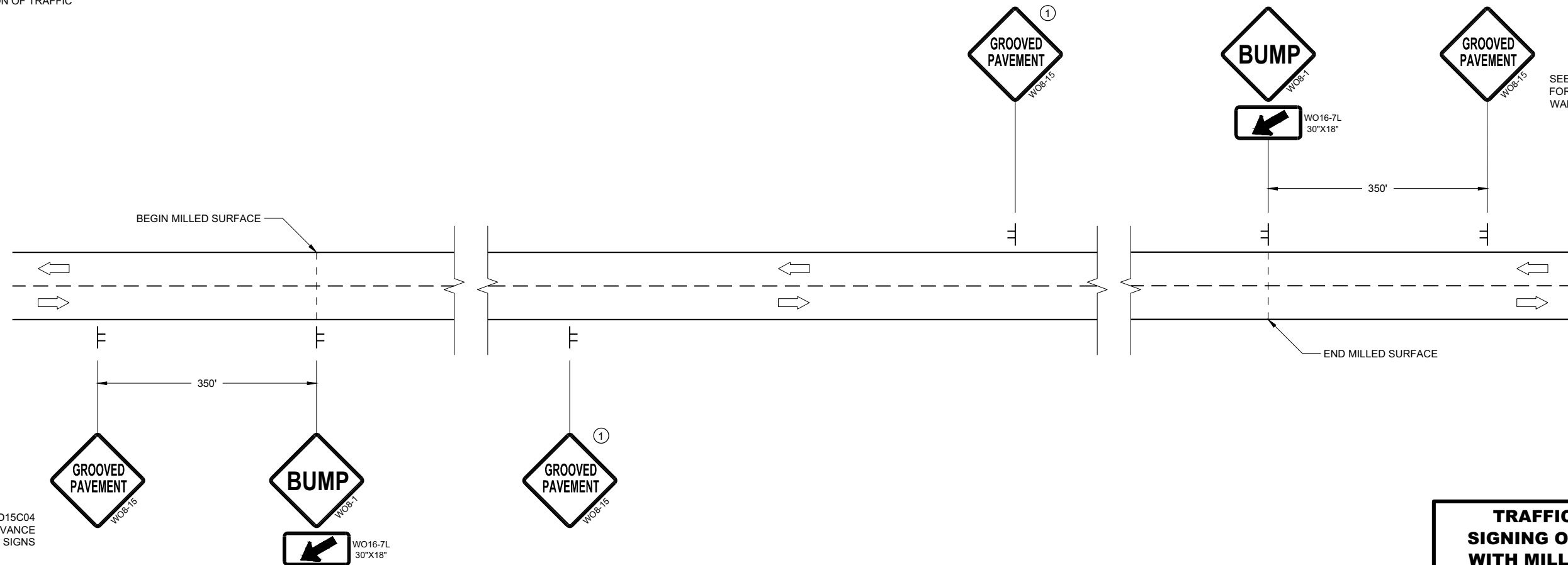
- ① PLACE SIGNS 350' IN ADVANCE OF MILLED SURFACES AND AT 1 MILE INTERVALS, OR AS DIRECTED BY THE ENGINEER.
- ② PLACE SIGN 200' MIN. FROM INTERSECTION AND 200' MIN. AFTER ADVANCE WARNING SIGN SHOWN IN SDD 15C04.

**LEGEND**

-  SIGN ON TEMPORARY SUPPORT
-  DIRECTION OF TRAFFIC



**TYPICAL SIDE ROAD APPROACH SIGN DETAIL**



**DETAIL FOR SIGNING ON MILLED SURFACES**

<b>TRAFFIC CONTROL, SIGNING ON ROADWAYS WITH MILLED SURFACES</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED February 2020 DATE	/s/ Andrew Heidtke WORK ZONE ENGINEER
FHWA	

**GENERAL NOTES**

DRAWING NOT TO SCALE. ALL SIGNS AND POSTS ON THIS SHEET SHALL BE PAID FOR WITH 'TRAFFIC CONTROL SIGNS' BID ITEM. ALL SIDE ROADS WHICH ARE UNDER CONSTRUCTION OF CURB AND GUTTER AND/OR GRADING SHALL BE ADEQUATELY SIGNED.

ALL SIGNS AND DEVICES SHALL BE IN CONFORMANCE WITH THE WISCONSIN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (WMUTCD). SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE WISDOT STANDARD SIGN PLATES.

"WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THAT THE BACKGROUND IS ORANGE.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.



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

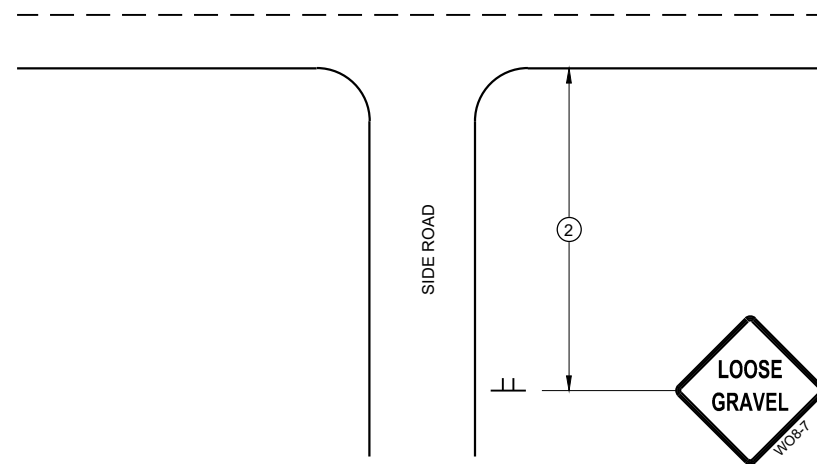
ALL SIGNS INAPPROPRIATE TO THE STATUS OF THE CONTROL ZONE, INCLUDING PRE-EXISTING SIGNS IN THE VICINITY, SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER.

SEE 15C34 FOR ADDITIONAL TRAFFIC CONTROL SIGNING WHEN CENTERLINE PAVEMENT MAKINGS ARE MISSING. 'DO NOT PASS' SIGNS MUST BE INSTALLED ON THE SAME DAY AS MILLING OPERATIONS.

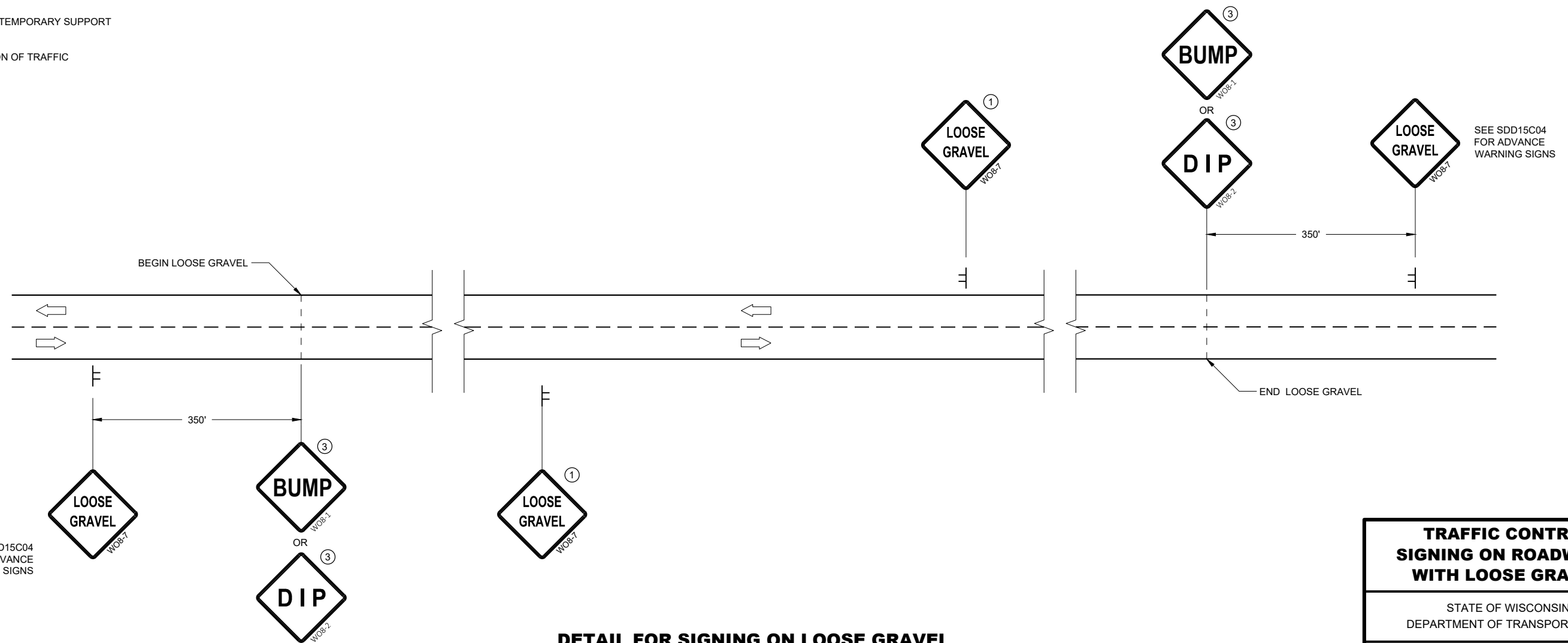
- ① PLACE SIGNS 350' IN ADVANCE OF CHIP SEALED OR LOOSE GRAVEL SURFACES AND AT 1 MILE INTERVALS, OR AS DIRECTED BY THE ENGINEER.
- ② PLACE SIGN 200' MIN. FROM INTERSECTION AND 200' MIN. AFTER ADVANCE WARNING SIGN SHOWN IN SDD 15C04.
- ③ ADD WO8-1 OR WO8-2 SIGN WHEN THE CONDITION IS PRESENT.

**LEGEND**

-  SIGN ON TEMPORARY SUPPORT
-  DIRECTION OF TRAFFIC



**TYPICAL SIDE ROAD APPROACH SIGN DETAIL**



**DETAIL FOR SIGNING ON LOOSE GRAVEL OR CHIP SEALED SURFACES**

SEE SDD15C04 FOR ADVANCE WARNING SIGNS

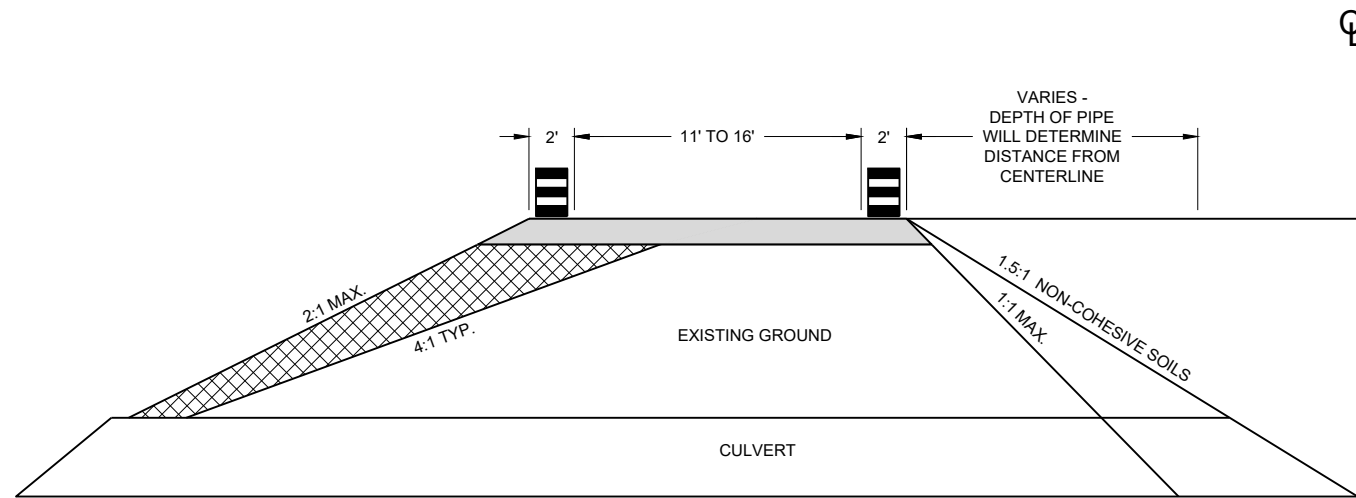
SEE SDD15C04 FOR ADVANCE WARNING SIGNS

**TRAFFIC CONTROL SIGNING ON ROADWAYS WITH LOOSE GRAVEL**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
February 2021 /S/ Andrew Heidtke  
DATE WORK ZONE ENGINEER

FHWA



**CROSS SECTION**

**GENERAL NOTES**

USE 1:1 FOR COHESIVE CLAYS AND SILTS, LOAMS, SANDY CLAYS AND ANGULAR GRAVEL SOILS.  
 USE 1.5:1 FOR NON-COHESIVE SOILS.

THE TAPER SHOULD EXTEND ACROSS THE SHOULDER UNLESS DOING SO WOULD GREATLY CONFLICT WITH THE WORK OPERATION.






ALL LANE CLOSURE SIGNS SHALL BE REMOVED OR COVERED AND ALL DEVICES REMOVED BEYOND THE SHOULDER WHEN WORK IS NOT IN PROGRESS AND THE LANE IS RESTORED TO A SAFE OPERATING CONDITION.

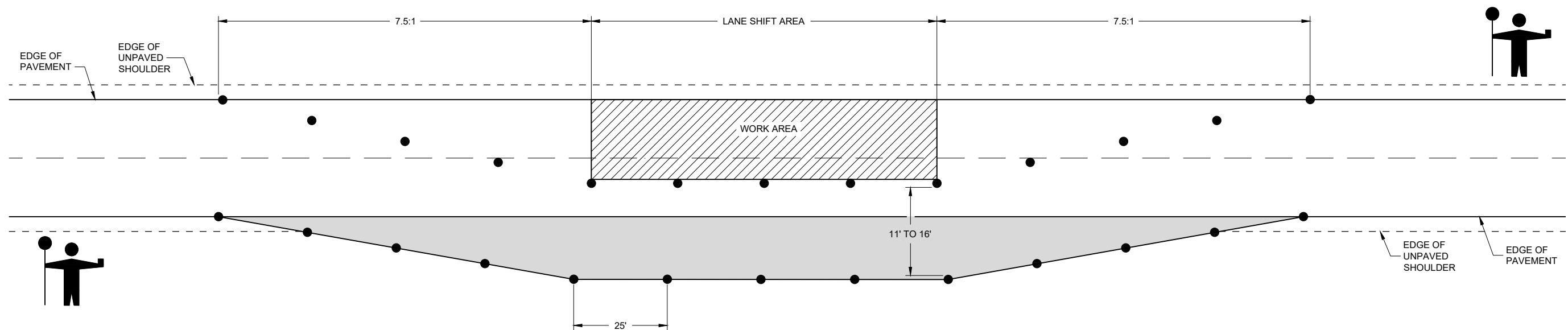
CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

USE WITH SDD 15C12 "TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATIONS"

USE WITH SDD 15D45 "SIGNING ON ROADWAYS WITH LOOSE GRAVEL"

**LEGEND**

-  DRUM WITHOUT WARNING LIGHT
-  6" BASE AGGREGATE DENSE 1 1/2" - INCIDENTAL TO LANE SHIFT ITEM
-  FILL - INCIDENTAL TO LANE SHIFT ITEM
-  WORK AREA
-  FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF



**LANE SHIFT IN FLAGGING OPERATION**





**TRAFFIC CONTROL,  
 TEMPORARY LANE SHIFT  
 DURING CULVERT WORK**

STATE OF WISCONSIN  
 DEPARTMENT OF TRANSPORTATION

APPROVED  
 February 2021 /S/ Andrew Heidtke  
 DATE WORK ZONE ENGINEER

FHWA

**LEGEND**

- V1 WORK VEHICLE
- V2 SHADOW VEHICLE
-  TRUCK MOUNTED ATTENUATOR (TMA)
-  FLASHING ARROW PANEL (CAUTION)
-  WORK AREA
-  DIRECTION OF TRAFFIC

POSTED SPEED PRIOR TO WORK STARTING (MPH)	DECISION SIGHT DISTANCE (D)
0 - 25	550'
30	550'
35	700'
40	700'
45	900'
50	900'
55	1200'

**GENERAL NOTES**

ALL SIGNS ARE 48"X48" UNLESS OTHERWISE NOTED.

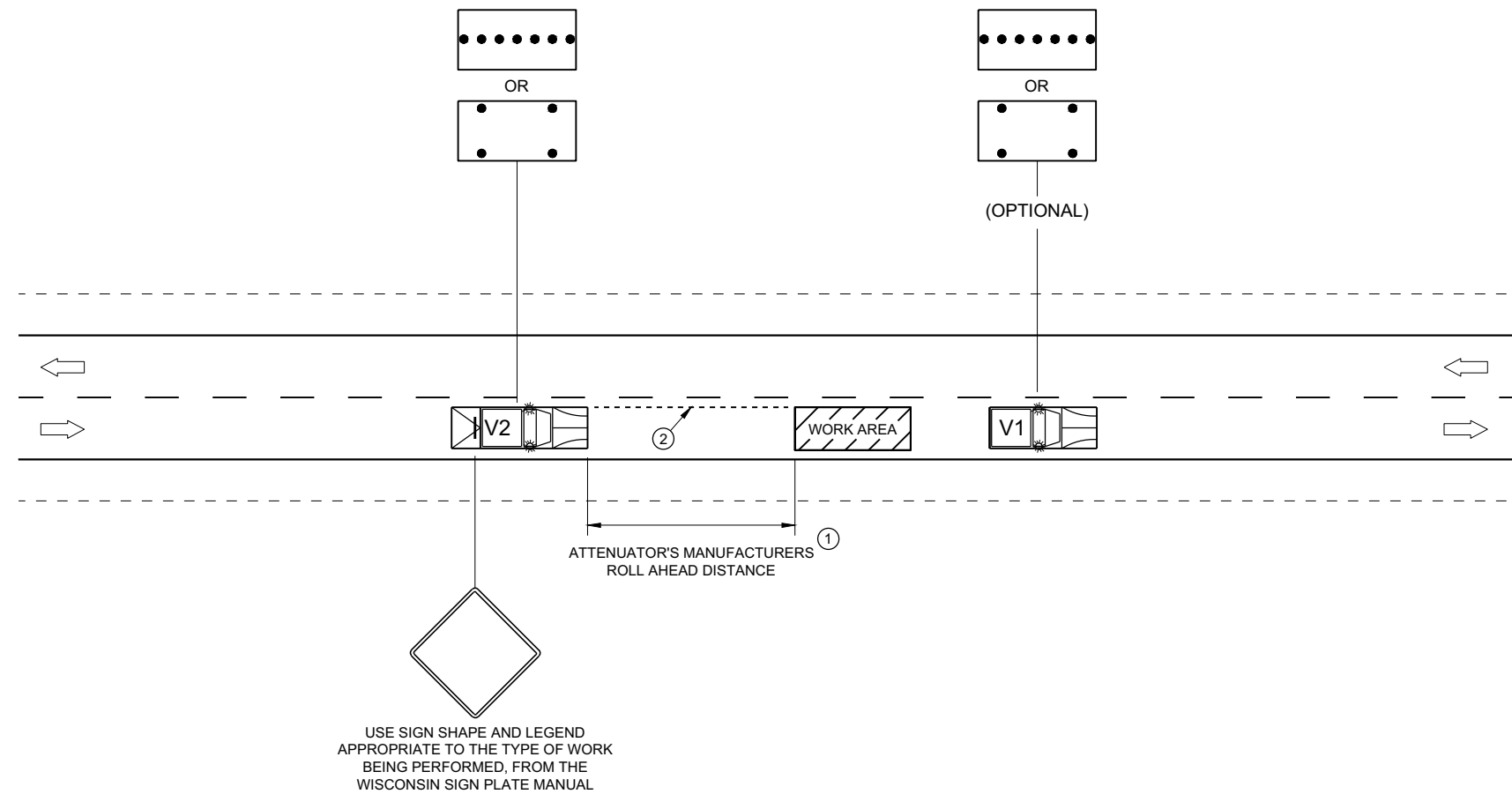
MOBILE IS WORK THAT MOVES CONTINUOUSLY OR MOVES AT LEAST THE DECISION SIGHT DISTANCE EVERY 15 MINUTES.

ALL VEHICLES SHALL BE EQUIPPED WITH TWO 360 DEGREE HIGH INTENSITY YELLOW FLASHING LIGHTS OR STROBE LIGHTS AND OPERATED WITH HEADLIGHTS TURNED ON.

ALL ARROW PANELS SHALL BE REAR FACING, TYPE "B" OR "C", AND DISPLAYING THE FLASHING CAUTION MODE. SIGNS PLACED ON VEHICLES MUST NOT OBSCURE THE ARROW PANEL.

USE AN ATTENUATOR ON THE REARMOST VEHICLE THAT BLOCKS ALL OR PART OF THE TRAFFIC LANE.

- ① DISTANCE BETWEEN VEHICLES MAY INCREASE FROM THE ATTENUATOR'S ROLL AHEAD BASED ON TERRAIN, SIGHT DISTANCE, AND OTHER FACTORS. WHENEVER ADEQUATE STOPPING SIGHT DISTANCE EXISTS TO THE REAR, SHADOW VEHICLES SHOULD MAINTAIN THE MINIMUM DISTANCE FROM THE WORK VEHICLE AND PROCEED AT THE SAME SPEED AS THE WORK VEHICLE. SHADOW VEHICLES SHOULD SLOW DOWN IN ADVANCE OF VERTICAL OR HORIZONTAL CURVES THAT RESTRICT SIGHT DISTANCE.
- ② ALIGN LEFT SIDE OF SHADOW VEHICLE WITH EDGE OF WORK AREA.



6

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SDD 15D51 - 01

SDD 15D51 - 01

**TRAFFIC CONTROL,  
MOBILE OPERATIONS ON  
AN UNDIVIDED ROADWAY**

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STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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APPROVED  
February 2021 DATE /S/ Andrew Heidtke  
STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER

FHWA

**NOTES**

DRAWING SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

DETAILS SHOWN FOR POSTS, PLATES, ANCHORAGE SYSTEM AND INSTALLATION, BLOCKS, AND GUARD RAIL ARE NOT PART OF THE STRUCTURE CONTRACT, BUT ARE BID PER THE ROADWAY DESIGN PLANS.

POST BASE PLATES (AND BOTTOM PLATES IF USED) SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.

CUT BOTTOM OF POST SO THAT POST WILL BE VERTICAL WHEN POST ASSEMBLY IS PLACED ON TOP OF THE CULVERT. ALONG THE ROADWAY THE POST WILL BE NORMAL TO GRADE LINE. HEX BOLTS AND THREADED RODS ARE TO BE PLACED PERPENDICULAR TO THE BASE PLATE.

POST, BASE PLATE, AND SHIMS SHALL BE GALVANIZED AFTER FABRICATION.

PRIOR TO GALVANIZING, ALL STEEL POSTS AND PLATES SHALL BE GIVEN A NO. 6 COMMERCIAL BLAST CLEANING BY SSPC SPECS.

ALL MATERIAL USED IN POSTS AND PLATES SHALL BE MADE FROM MATERIAL CONFORMING TO ASTM DESIGNATION A709 GRADE 50 OR 50S.

HEX BOLTS, THREADED RODS, HEX NUTS AND WASHERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 GRADE 36, AND SHALL BE GALVANIZED. RODS ARE TO BE FULLY THREADED AND BOLTS TO BE THREADED 3". CHAMFER TOP OF BOLTS AND RODS BEFORE THREADING.

★ ADHESIVE ANCHORS 1-INCH, EMBED IN CONCRETE AS DETAILED. CHARACTERISTIC BOND STRENGTH SHALL MEET OR EXCEED 1305 PSI FOR UNCRACKED CONCRETE.

STEEL SHIMS MAY BE USED BETWEEN PLATES AND SLAB WHERE REQUIRED FOR ALIGNMENT.

**DESIGN DATA**

**LIVE LOAD:**

DESIGN LOADING: HS-20 (TAKEN FROM HSI)  
 INVENTORY RATING: UNREPORTED  
 OPERATING RATING: UNREPORTED  
 WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV): 250(KIPS) (TAKEN FROM HSI)

**EARTH LOAD:**

DESIGNED FOR: UNREPORTED

**HYDRAULIC DATA**

**100-YEAR FREQUENCY:**

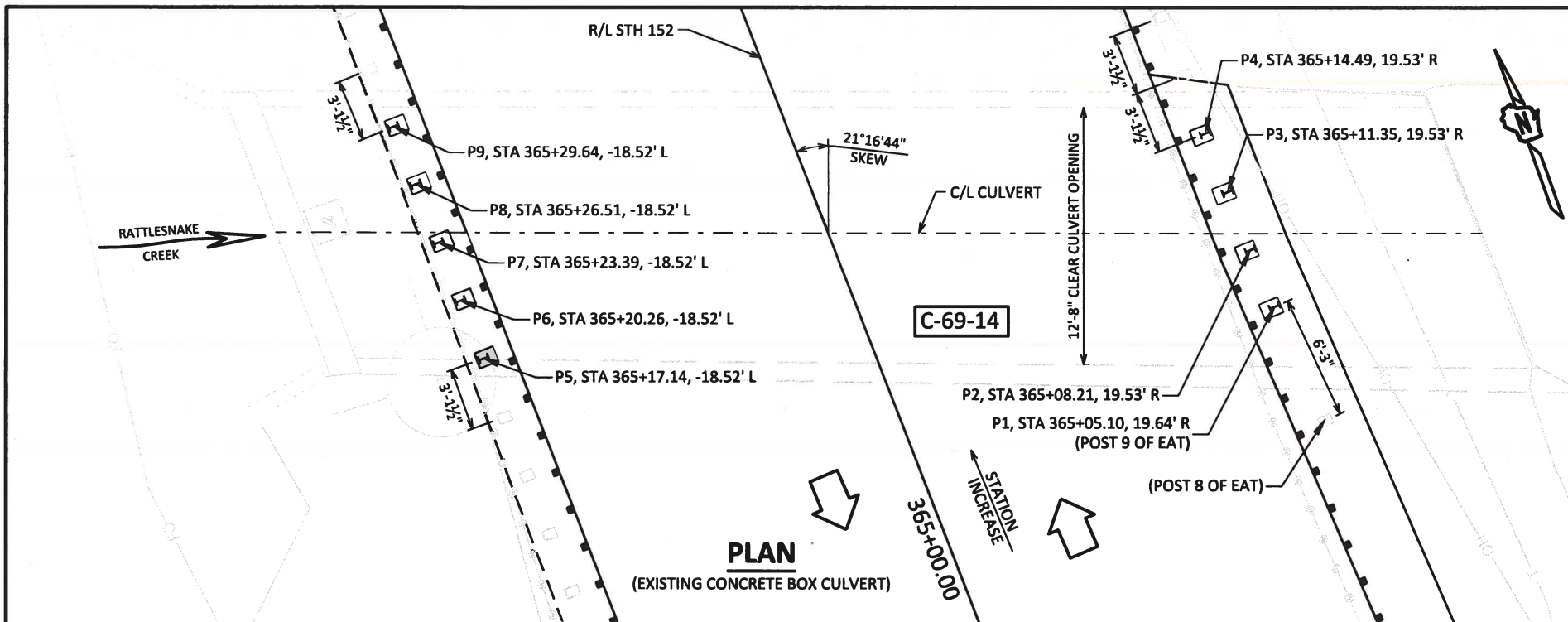
$Q_{100} = 716$  C.F.S. (TAKEN FROM HSI)  
 $V_{100} = 8.7$  F.P.S. (TAKEN FROM HSI)  
 $HW_{100} = EL. 868.0$   
 WATERWAY AREA = 82.3 SQ. FT.  
 DRAINAGE AREA = 8.9 SQ. MI. (TAKEN FROM HSI)  
 ROADWAY OVERTOPPING = N/A  
 SCOUR CRITICAL CODE = 6 (TAKEN FROM HSI)

**TRAFFIC DATA**

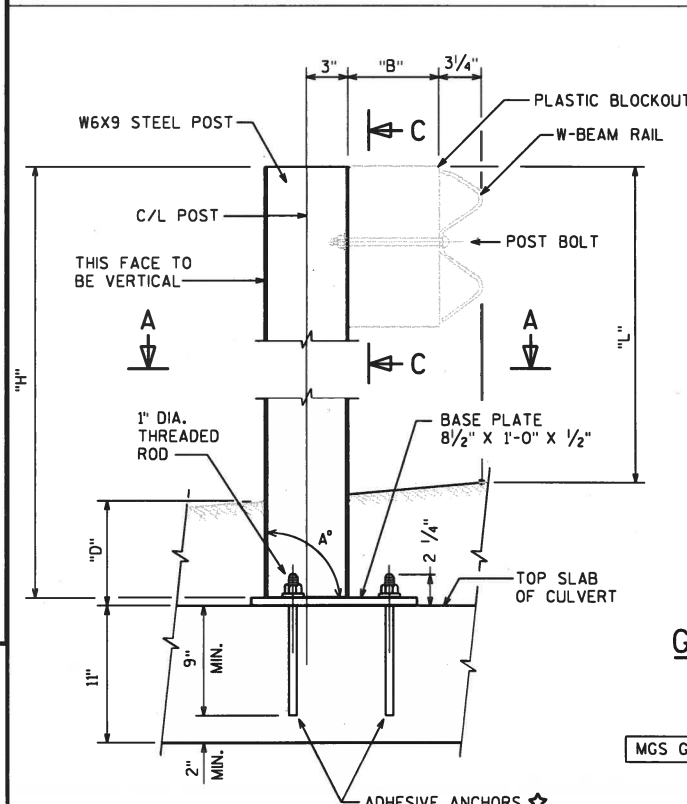
FEATURE ON: **STH 152**  
 ADT = 1160 (2042)  
 R.D.S. = 25MPH

**STRUCTURE DESIGN CONTACTS:**

KEVIN WOOD (414) 266-9144  
 AARON BONK (608) 261-0261

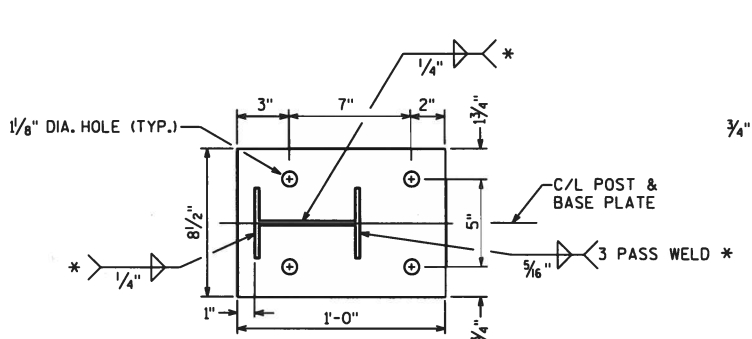


**PLAN**  
 (EXISTING CONCRETE BOX CULVERT)

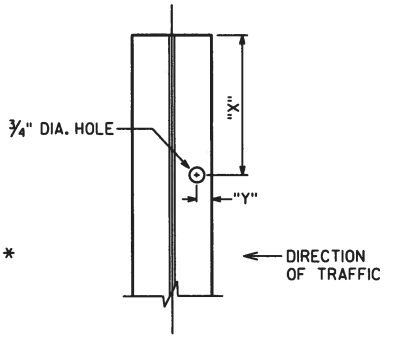


**ELEVATION**  
**GUARDRAIL POST ANCHORS TYPE 1**

* WELDING IS TO BE COMPLETED USING THE GAS-METAL ARC WELDING (GMAW) PROCESS WITH ER70S-3 WELDING WIRE AND ARGON-OXYGEN OR CO₂ COVER GAS.



**SECTION A-A**  
 POST & BASE PLATE

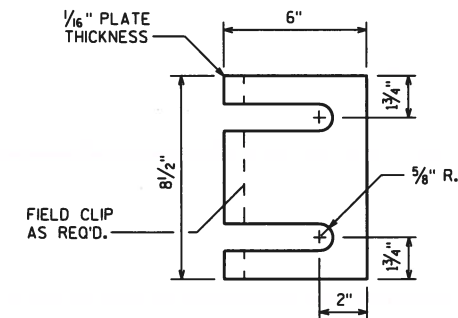


**SECTION C-C**  
 HOLE IN POST FLANGE ON APPROACHING TRAFFIC SIDE

**GUARDRAIL POST ANCHORAGE SYSTEM**

	"L"	"B"	"X"	"Y"	SOURCE
MCS GUARDRAIL	2'-7 7/8"	12"	7 7/8"	3/4"	SDD 14 B 42

POSTS	"D"	"H"	A°
P1	1'-6 1/4"	4'-2 1/4"	90.6°
P2	1'-5 1/2"	4'-1 1/2"	90.6°
P3	1'-5"	4'-1"	90.6°
P4	1'-4 1/2"	4'-0 1/2"	90.6°
P5	1'-4 3/8"	4'-0"	89.4°
P6	1'-4"	4'-0"	89.4°
P7	1'-3"	3'-10 3/4"	89.4°
P8	1'-2 3/8"	3'-10 3/8"	89.4°
P9	1'-1 5/8"	3'-9 1/2"	89.4°



**STEEL SHIM DETAIL**  
 4 PER POST



NO.	DATE	REVISION	BY

**GRAEF** 116 S. Adams Street, Suite 201, Green Bay, WI 54301, 920 / 592 9440, 920 / 592 9445 fax, www.graef-usa.com

STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

ACCEPTED: *[Signature]* SDR 04/17/23  
 CHIEF STRUCTURES DESIGN ENGINEER DATE

**STRUCTURE C-69-14**

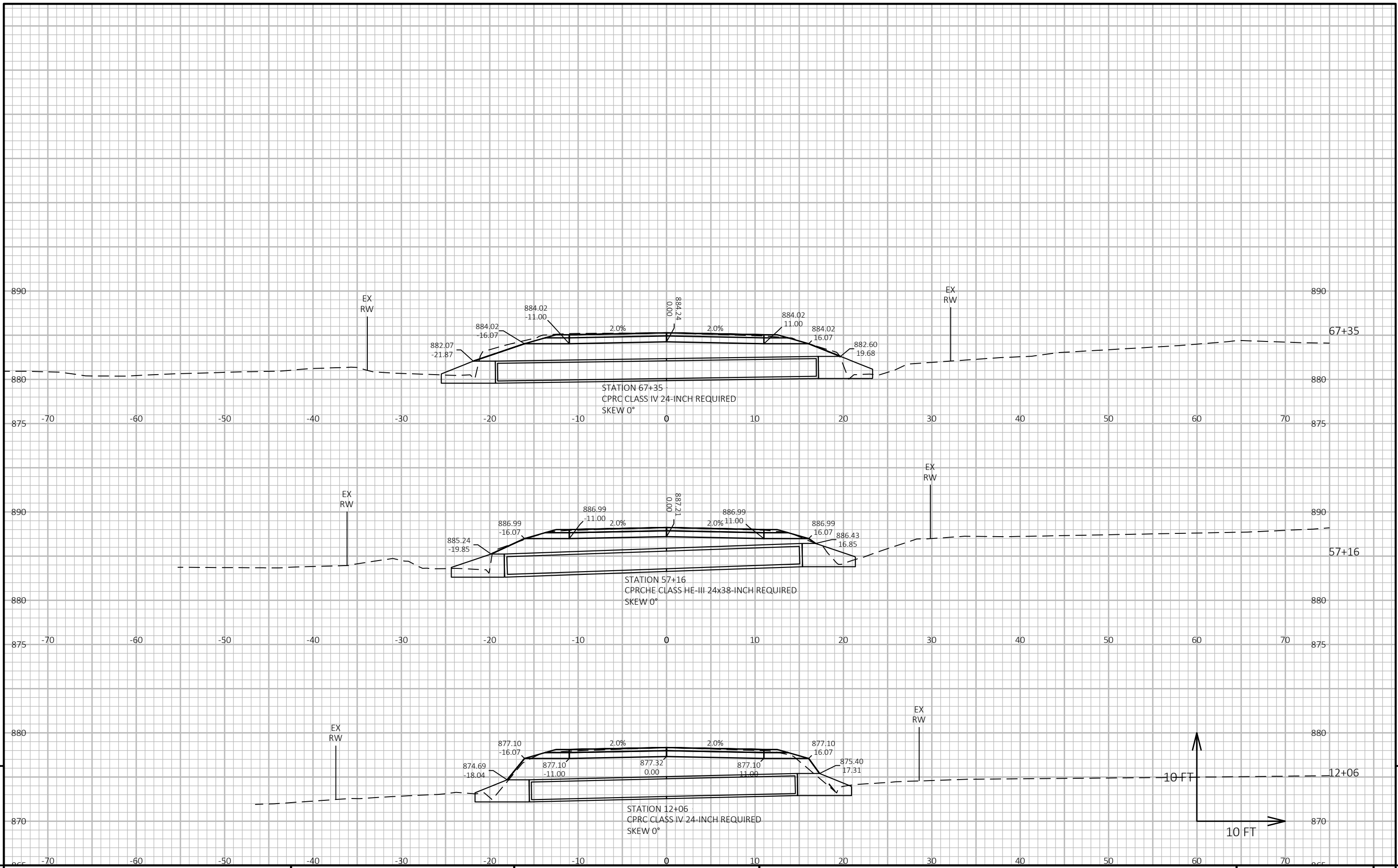
STH 152 OVER LITTLE RATTLESNAKE CREEK

COUNTY WAUSHARA VILLAGE MOUNT MORRIS

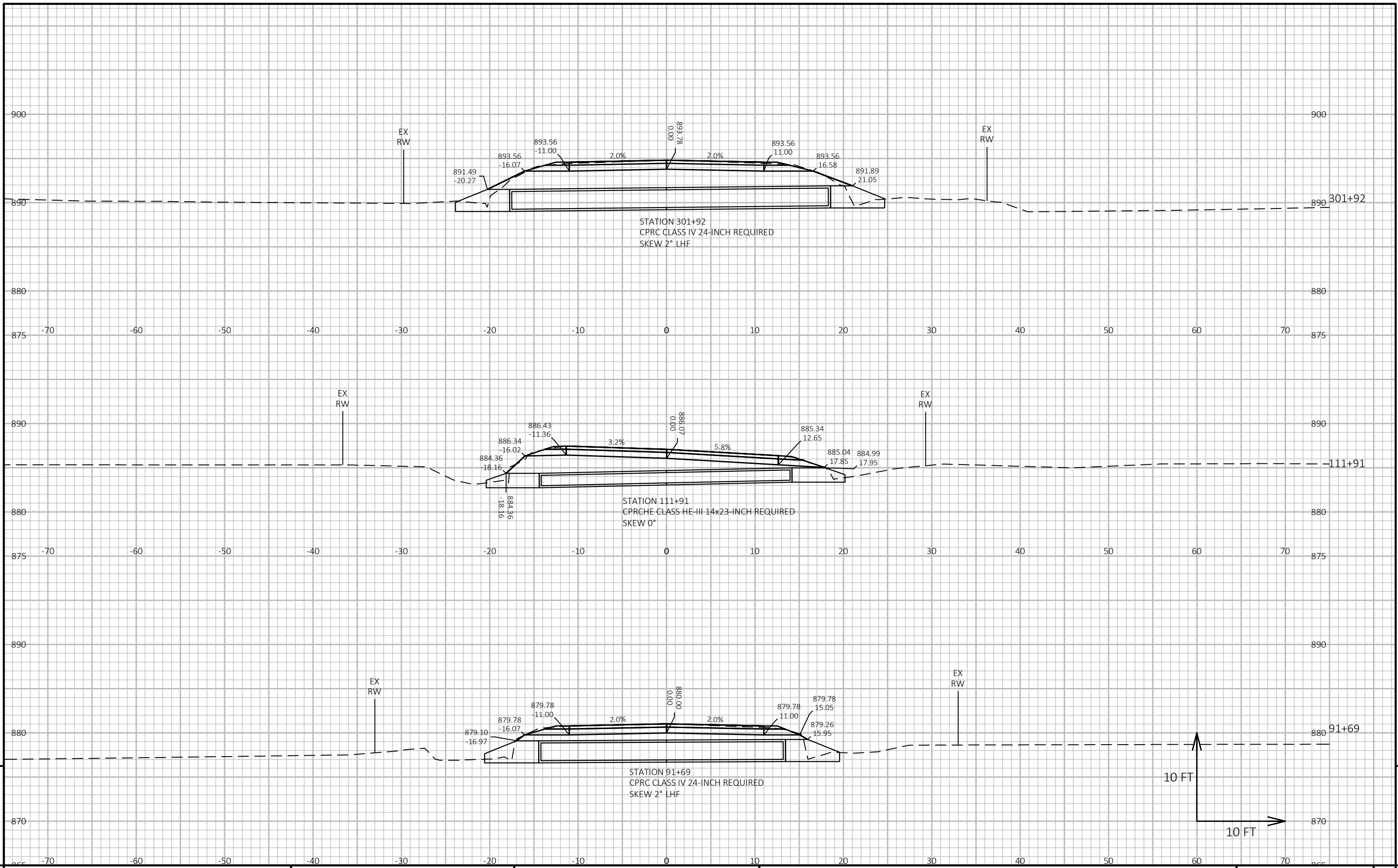
DESIGN SPEC. AASHTO LRFD BRIDGE DESIGN SPECIFICATION

DESIGNED BY AS	DESIGNED CK'D KGW	DRAWN BY CMW	PLANS CK'D KGW
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**GENERAL PLAN** SHEET 1 OF

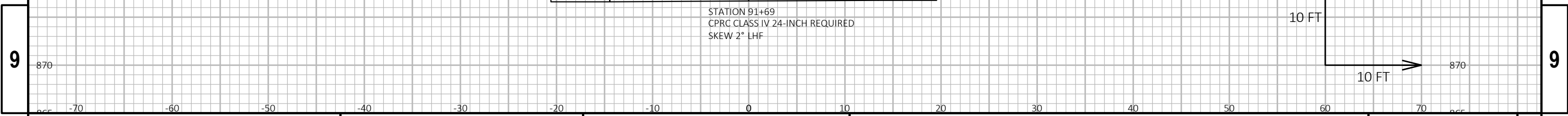


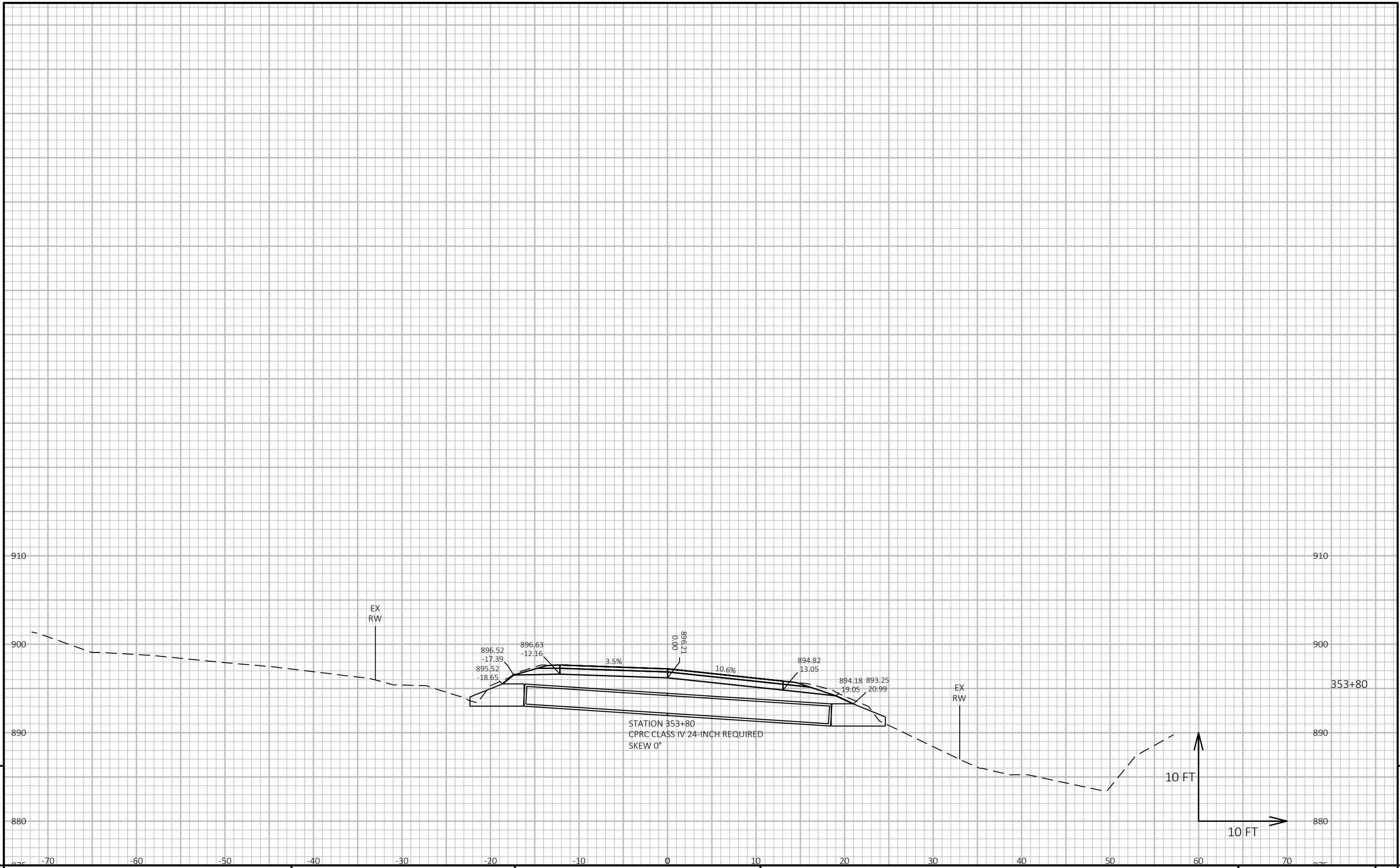
PROJECT NO: 6866-06-70      HWY: STH 152      COUNTY: WAUSHARA      CROSS SECTIONS: STH 152 CULVERT REPLACEMENT      SHEET      E



PROJECT NO: 6866-06-70      HWY: STH 152      COUNTY: WAUSHARA      CROSS SECTIONS: STH 152 CULVERT REPLACEMENT      SHEET      E

FILE NAME: X:\GB\2021\20210169\DESIGN\TRANSPORTATION\SHEETSPLAN\STH 152 CULVERT XS.DWG      PLOT DATE: 1/30/2023 10:30 AM      PLOT BY: ENGLER, BRIAN      PLOT NAME:      PLOT SCALE: 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.      WISDOT/CADD SHEET 49





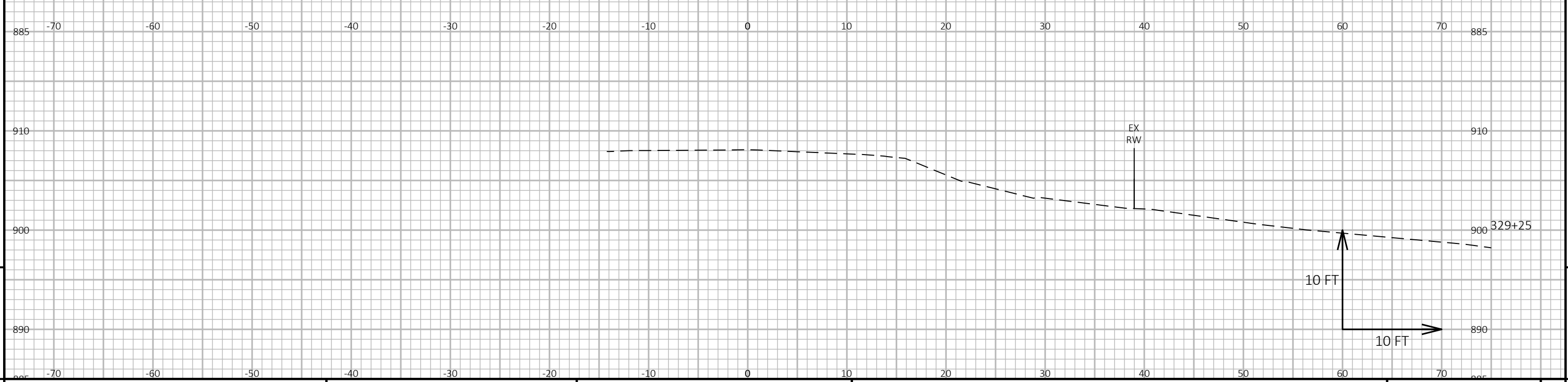
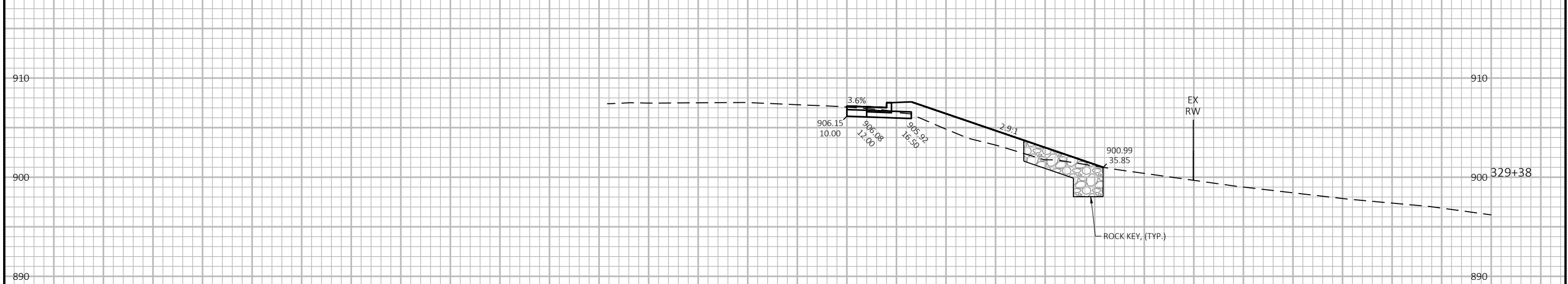
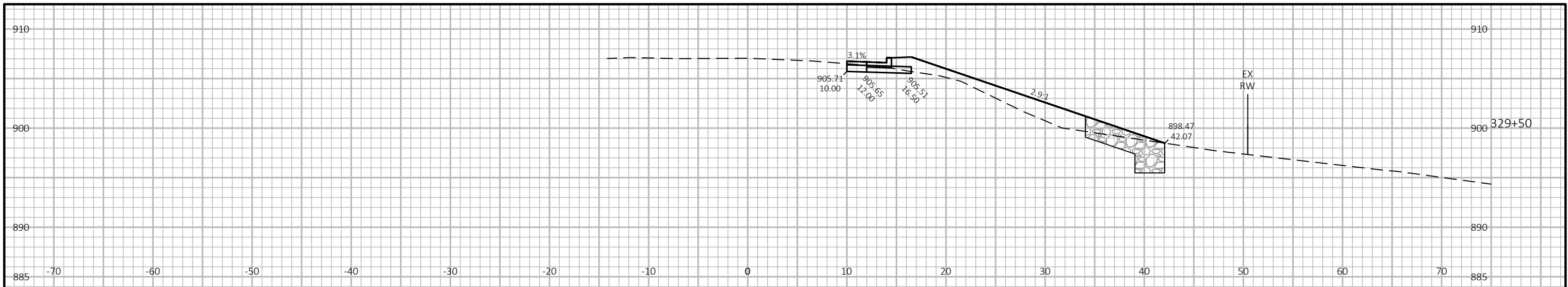
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PROJECT NO: 6866-06-70	HWY: STH 152	COUNTY: WAUSHARA	CROSS SECTIONS: STH 152 CULVERT REPLACEMENT	SHEET	E
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FILE NAME : X:\GB\2021\20210169\DESIGN\TRANSPORTATION\SHEETSPLAN\STH 152 CULVERT XS.DWG  
 LAYOUT NAME - 03  
 PLOT DATE : 1/30/2023 10:30 AM  
 PLOT BY : ENGLER, BRIAN  
 PLOT NAME :  
 PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.  
 WISDOT/CADD SHEET 49





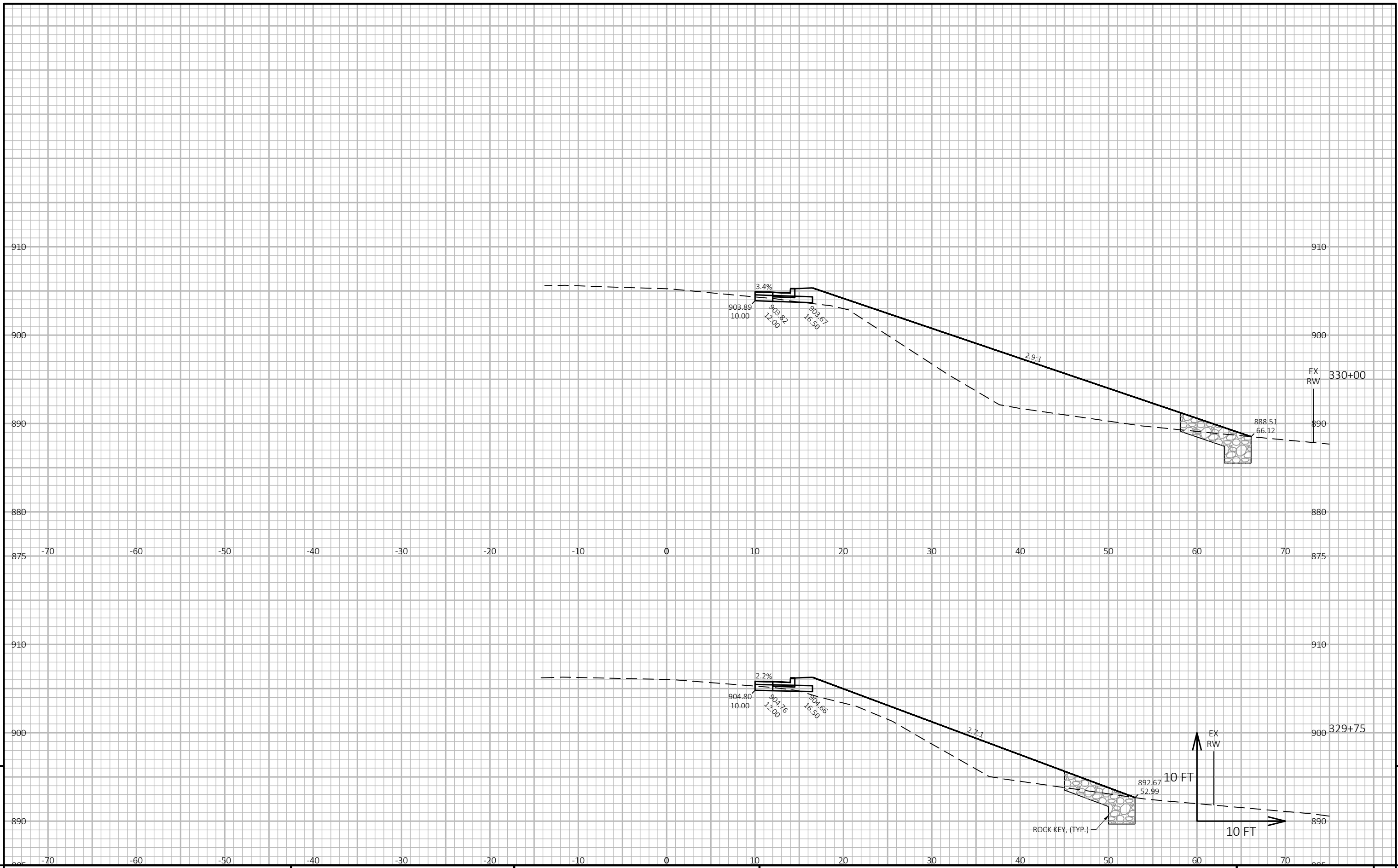
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PROJECT NO: 6866-00-70      HWY: STH 152      COUNTY: WAUSHARA      CROSS SECTIONS: CURB AND GUTTER SLOPE STABILIZATION      SHEET      E

FILE NAME: X:\GB\2021\20210169\DESIGN\TRANSPORTATION\DESIGN\CORRIDORS\CRDR-STH-152-SLPSTBCG.DWG      PLOT DATE: 1/30/2023 3:50 PM      PLOT BY: ENGLER, BRIAN      PLOT NAME:      PLOT SCALE: 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.      WISDOT/CADD SHEET 49

LAYOUT NAME - 01



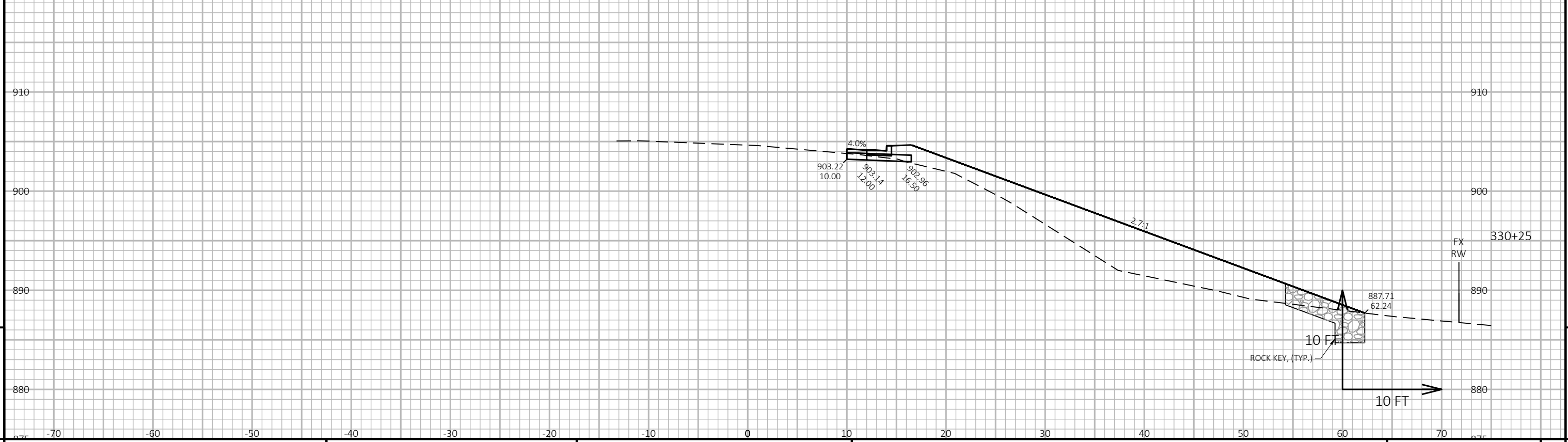
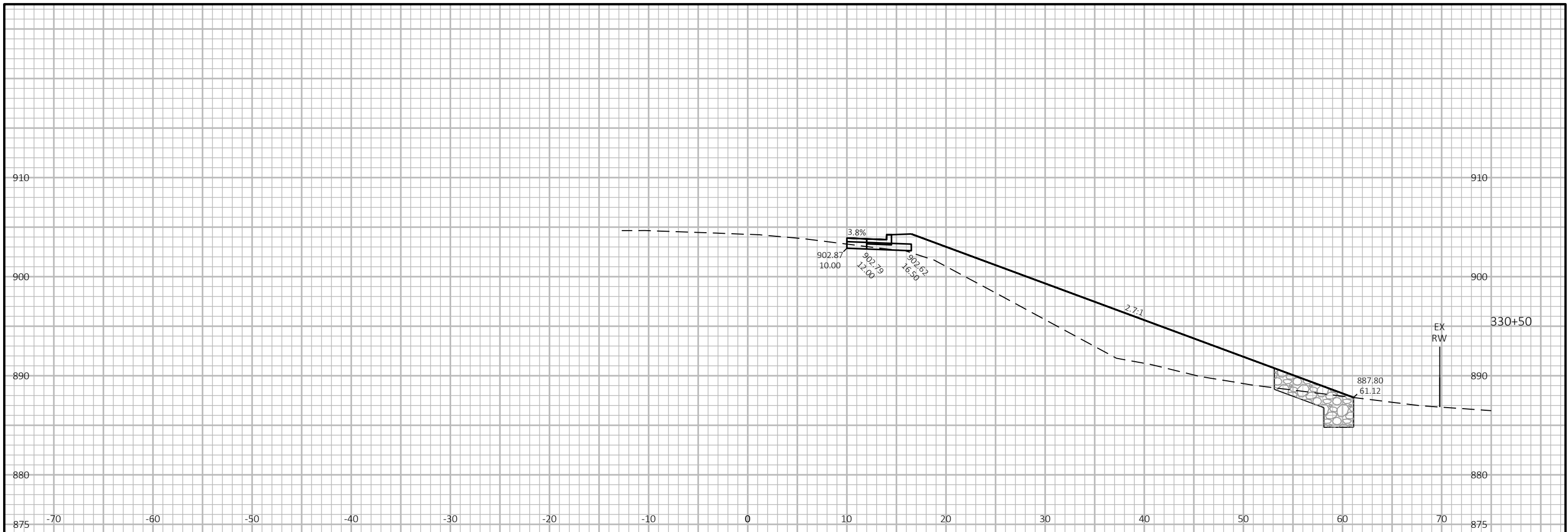
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PROJECT NO: 6866-00-70      HWY: STH 152      COUNTY: WAUSHARA      CROSS SECTIONS: CURB AND GUTTER SLOPE STABILIZATION      SHEET      E

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LAYOUT NAME - 02



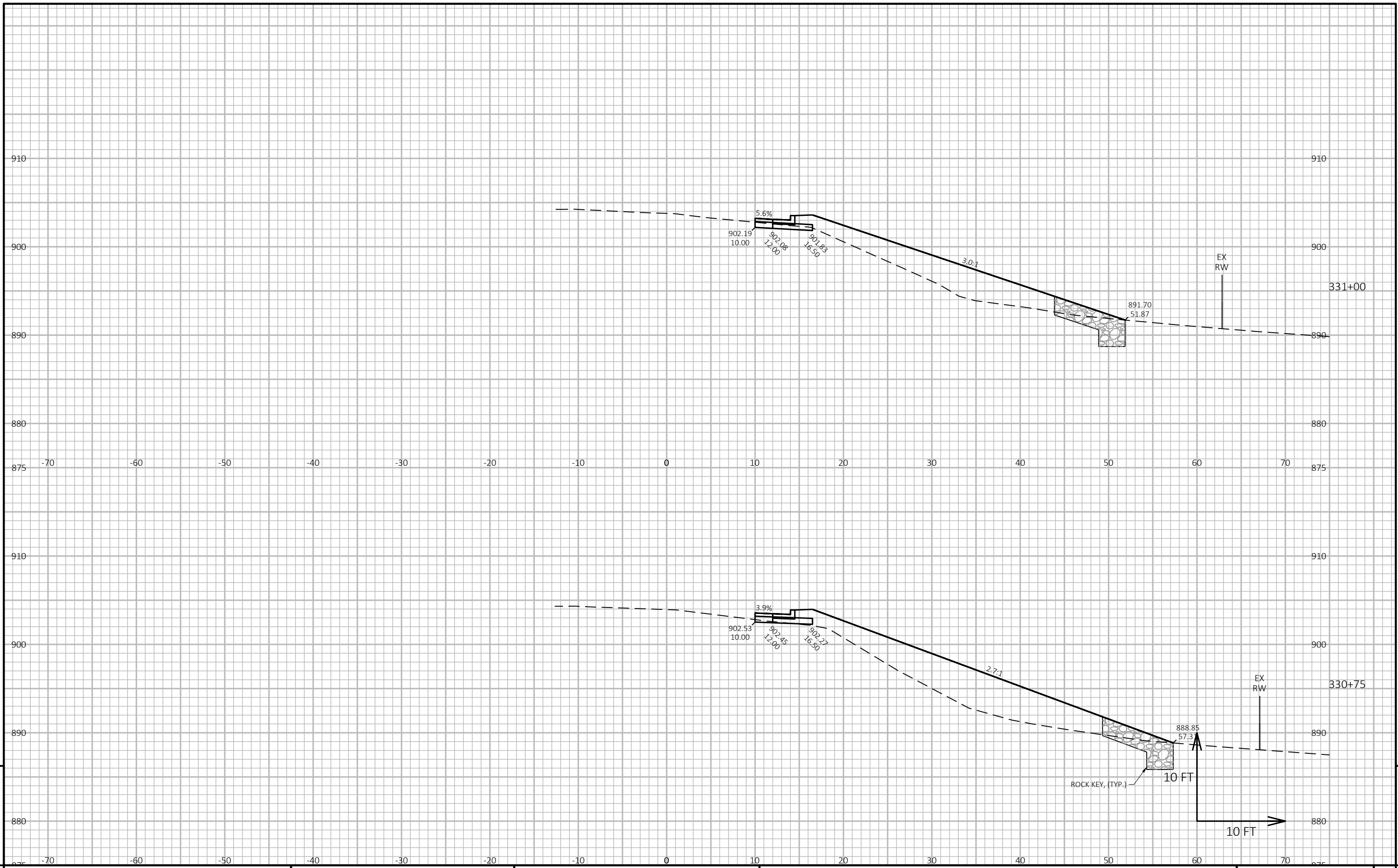
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PROJECT NO: 6866-00-70      HWY: STH 152      COUNTY: WAUSHARA      CROSS SECTIONS: CURB AND GUTTER SLOPE STABILIZATION      SHEET      E

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LAYOUT NAME - 03



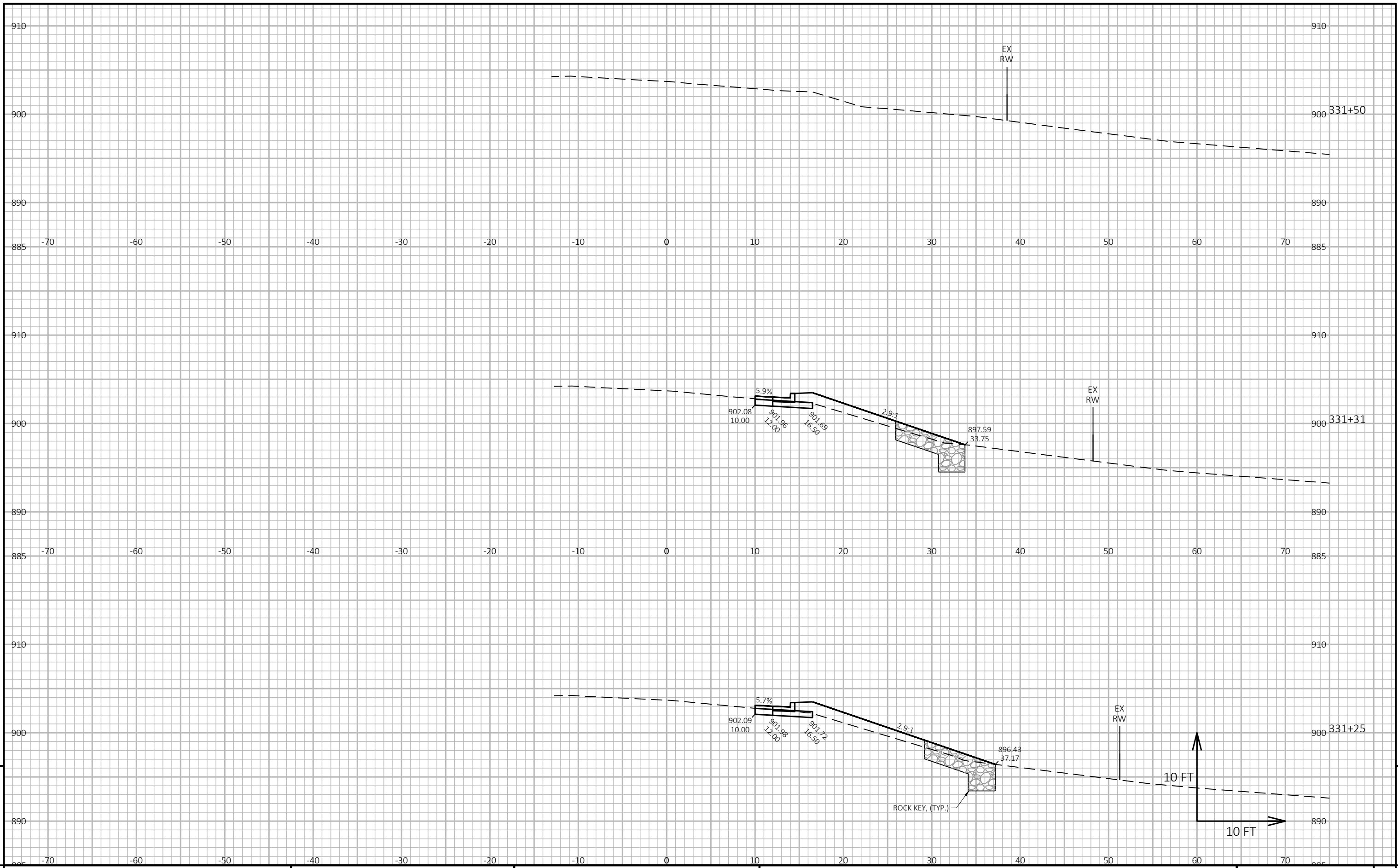
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PROJECT NO: 6866-00-70      HWY: STH 152      COUNTY: WAUSHARA      CROSS SECTIONS: CURB AND GUTTER SLOPE STABILIZATION      SHEET      E

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LAYOUT NAME - 04



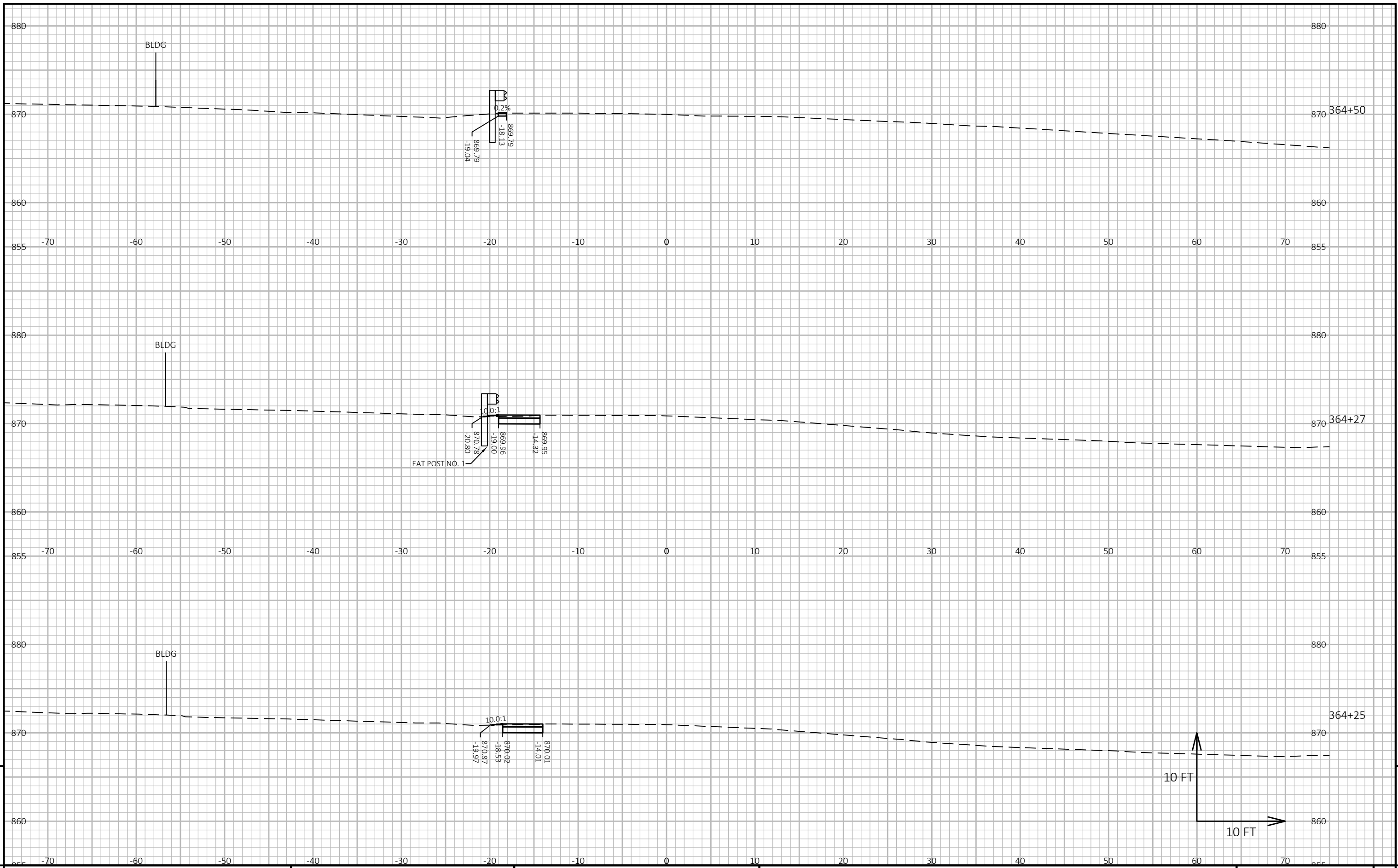
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PROJECT NO: 6866-00-70	HWY: STH 152	COUNTY: WAUSHARA	CROSS SECTIONS: CURB AND GUTTER SLOPE STABILIZATION	SHEET	E
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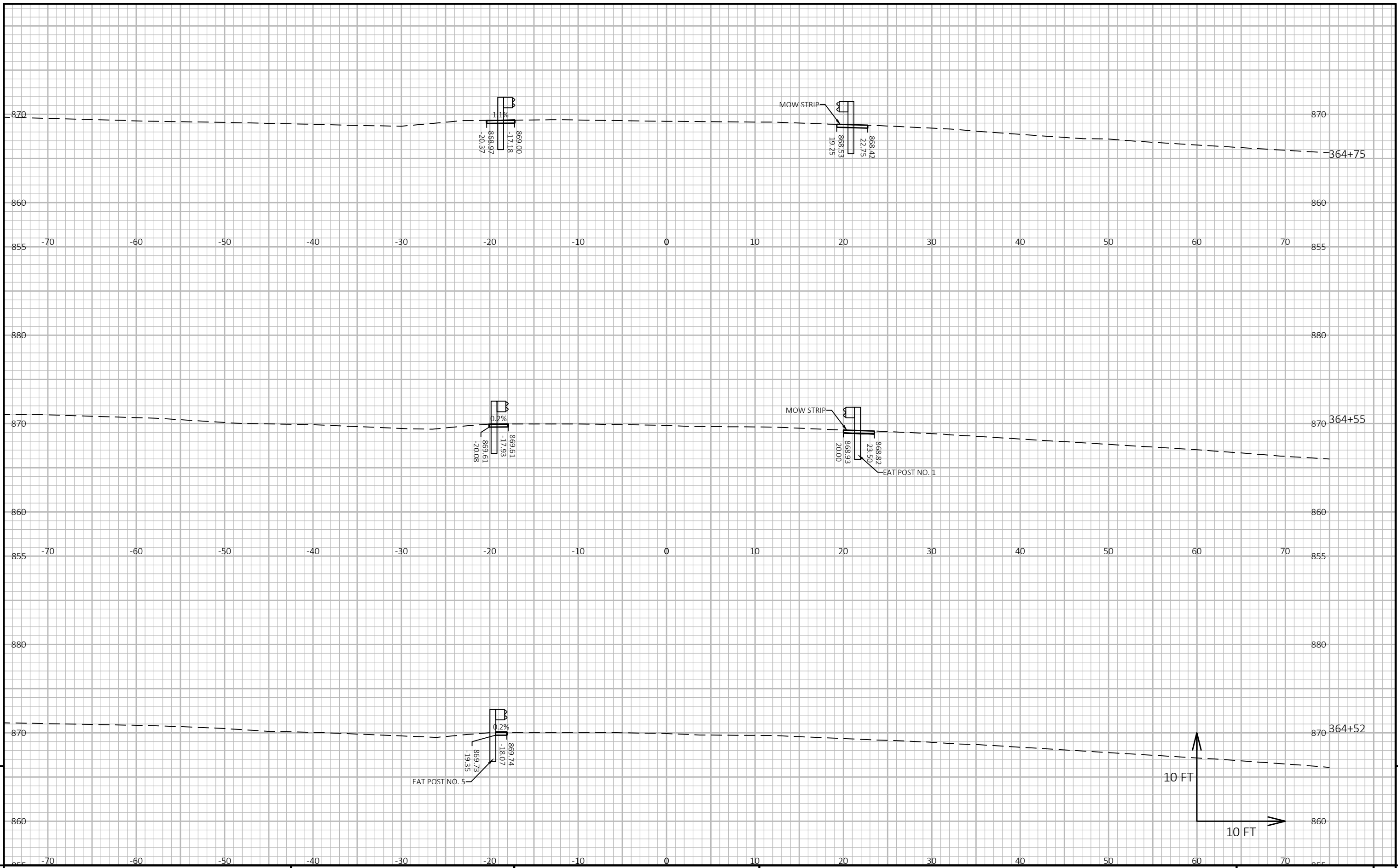
LAYOUT NAME - 05



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PROJECT NO: 6866-06-70	HWY: STH 152	COUNTY: WAUSHARA	CROSS SECTIONS: GUARDRAIL	SHEET	E
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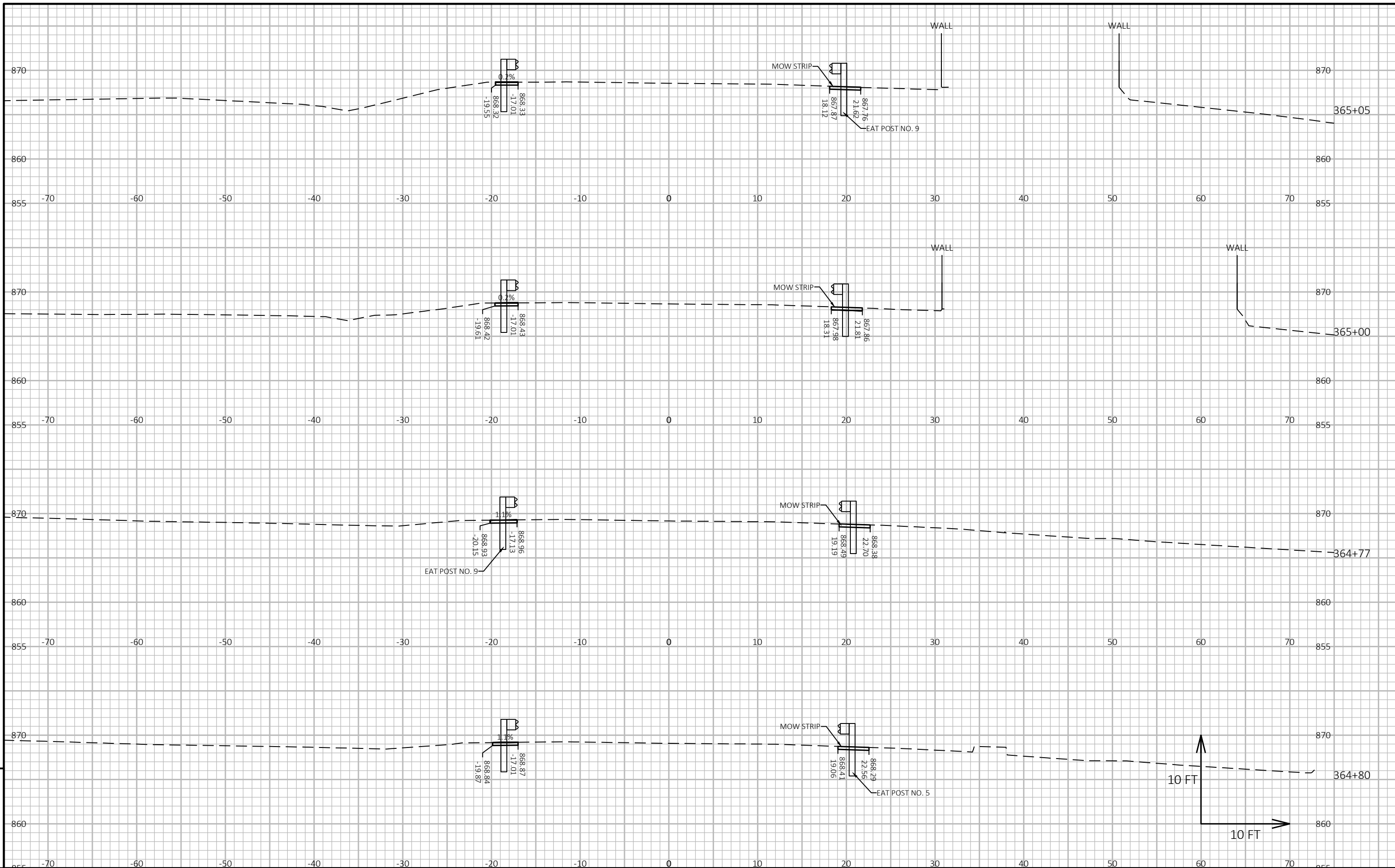
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PROJECT NO: 6866-06-70	HWY: STH 152	COUNTY: WAUSHARA	CROSS SECTIONS: GUARDRAIL	SHEET	E
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FILE NAME : X:\GB\2021\20210169\DESIGN\TRANSPORTATION\SHEETSPLAN\STH 125 MT MORRIS BG XS.DWG PLOT DATE : 1/30/2023 4:09 PM PLOT BY : ENGLER, BRIAN PLOT NAME : PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT. WISDOT/CADD SHEET 49

LAYOUT NAME - 02



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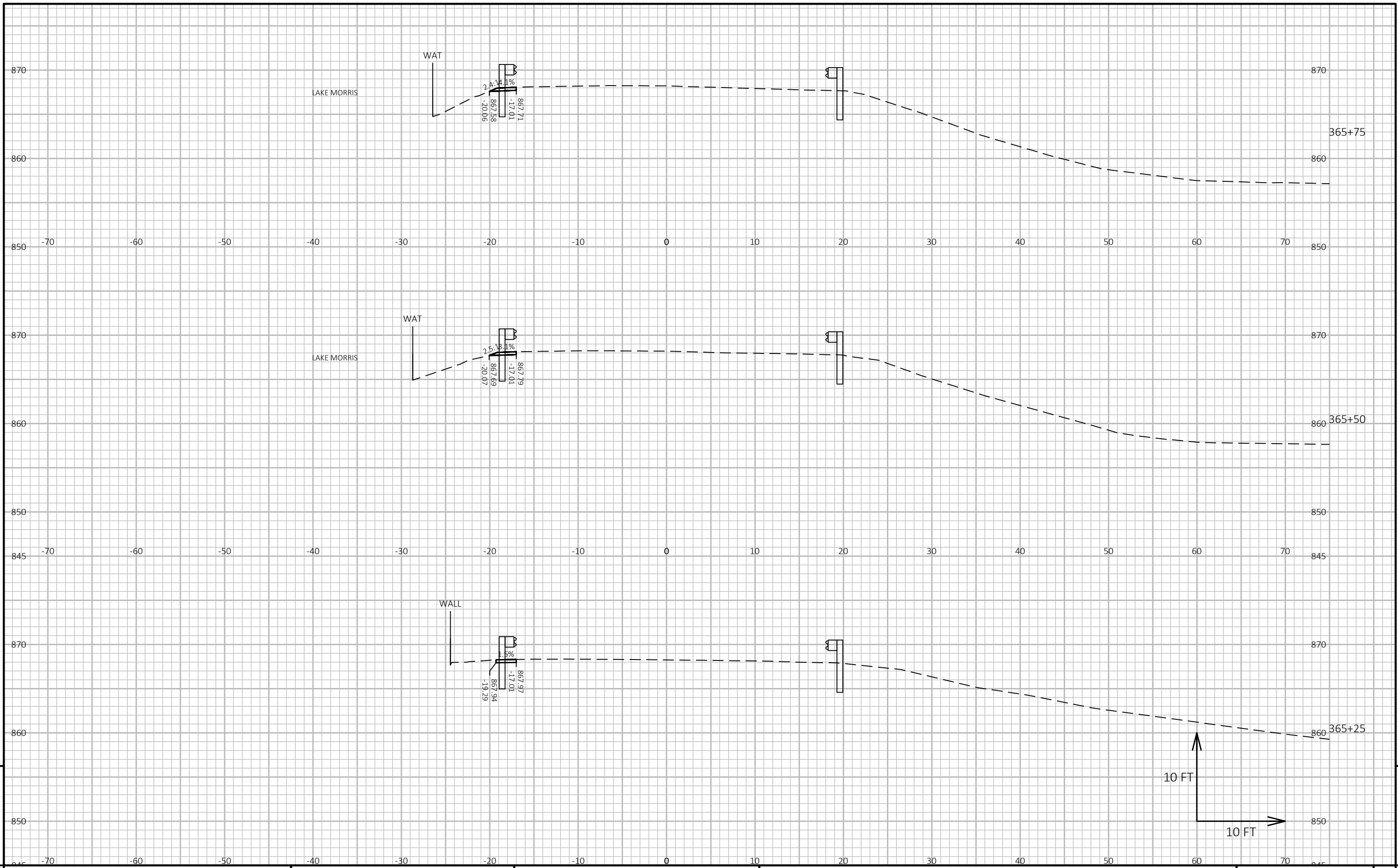
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PROJECT NO: 6866-06-70      HWY: STH 152      COUNTY: WAUSHARA      CROSS SECTIONS: GUARDRAIL      SHEET      E

FILE NAME : X:\GB\2021\20210169\DESIGN\TRANSPORTATION\SHEETSPLAN\STH 125 MT MORRIS BG XS.DWG      PLOT DATE : 1/30/2023 10:31 AM      PLOT BY : ENGLER, BRIAN      PLOT NAME :      PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.      WISDOT/CADD SHEET 49

LAYOUT NAME - 03





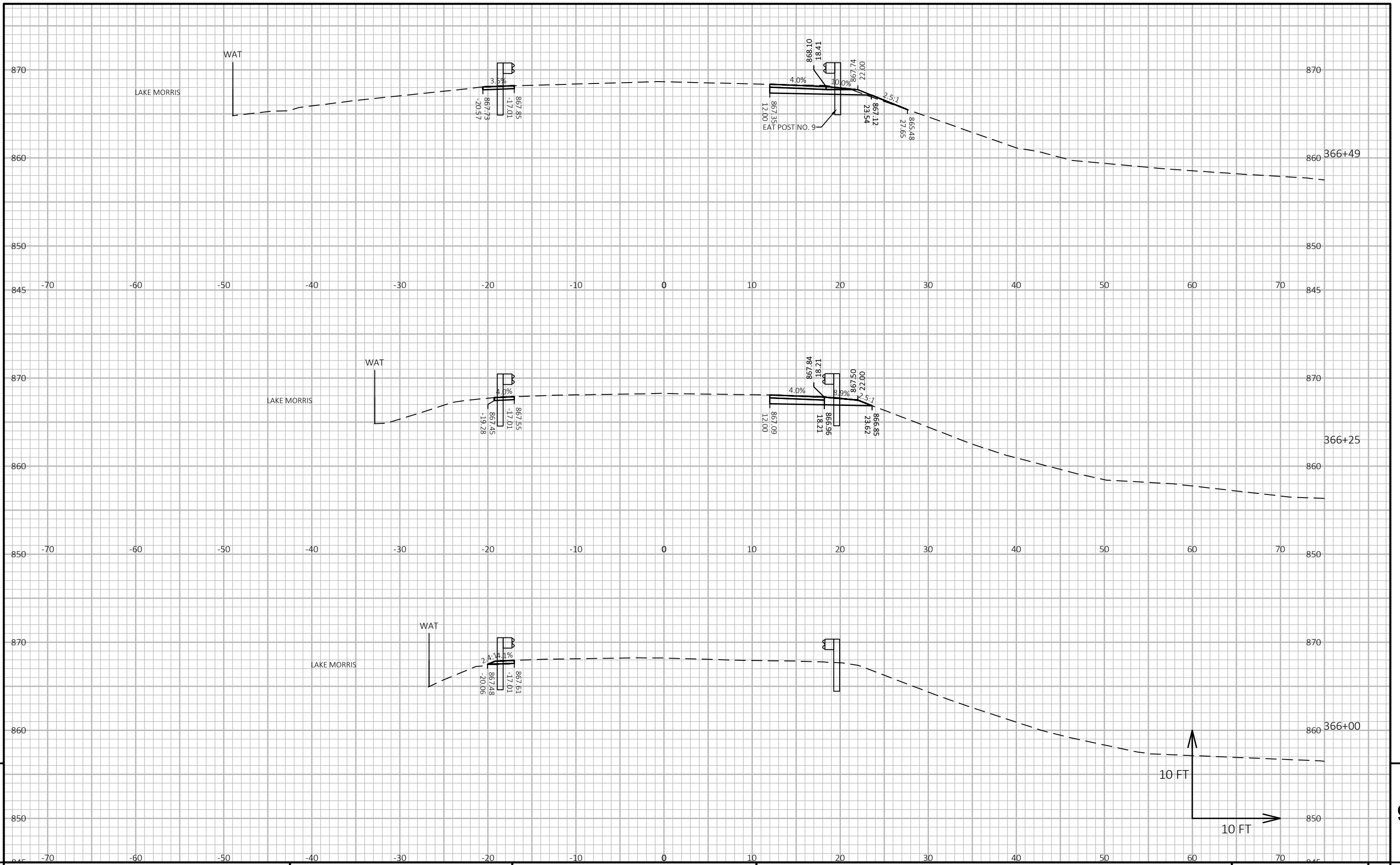
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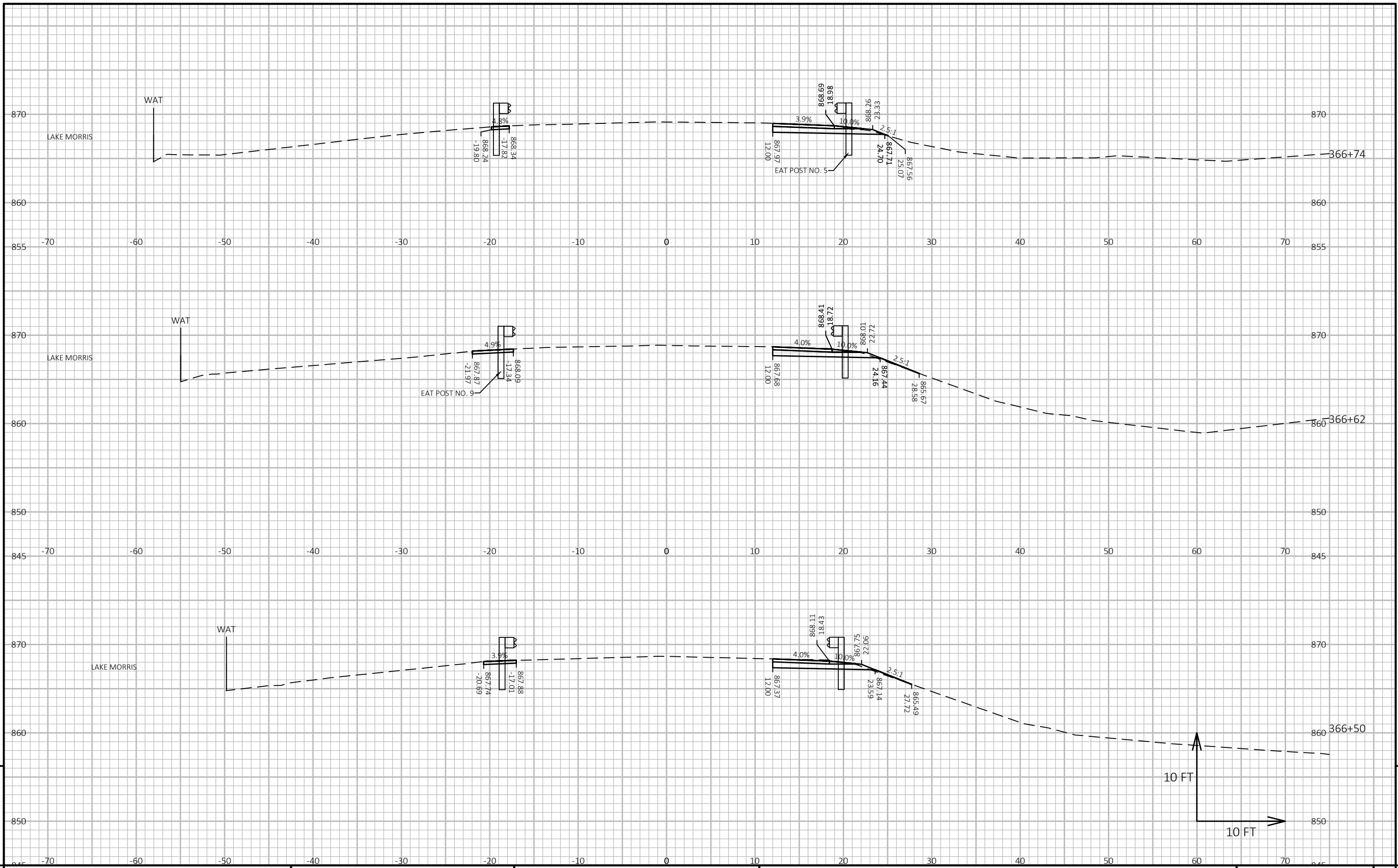
PROJECT NO: 6866-06-70	HWY: STH 152	COUNTY: WAUSHARA	CROSS SECTIONS: GUARDRAIL	SHEET	E
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FILE NAME : X:\GB\2021\20210169\DESIGN\TRANSPORTATION\SHEETSPLAN\STH 125 MT MORRIS BG XS.DWG PLOT DATE : 1/30/2023 10:31 AM PLOT BY : ENGLER, BRIAN PLOT NAME : PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT. WISDOT/CADD SHEET 49

LAYOUT NAME - 04



PROJECT NO: 6866-06-70      HWY: STH 152      COUNTY: WAUSHARA      CROSS SECTIONS: GUARDRAIL      SHEET 9



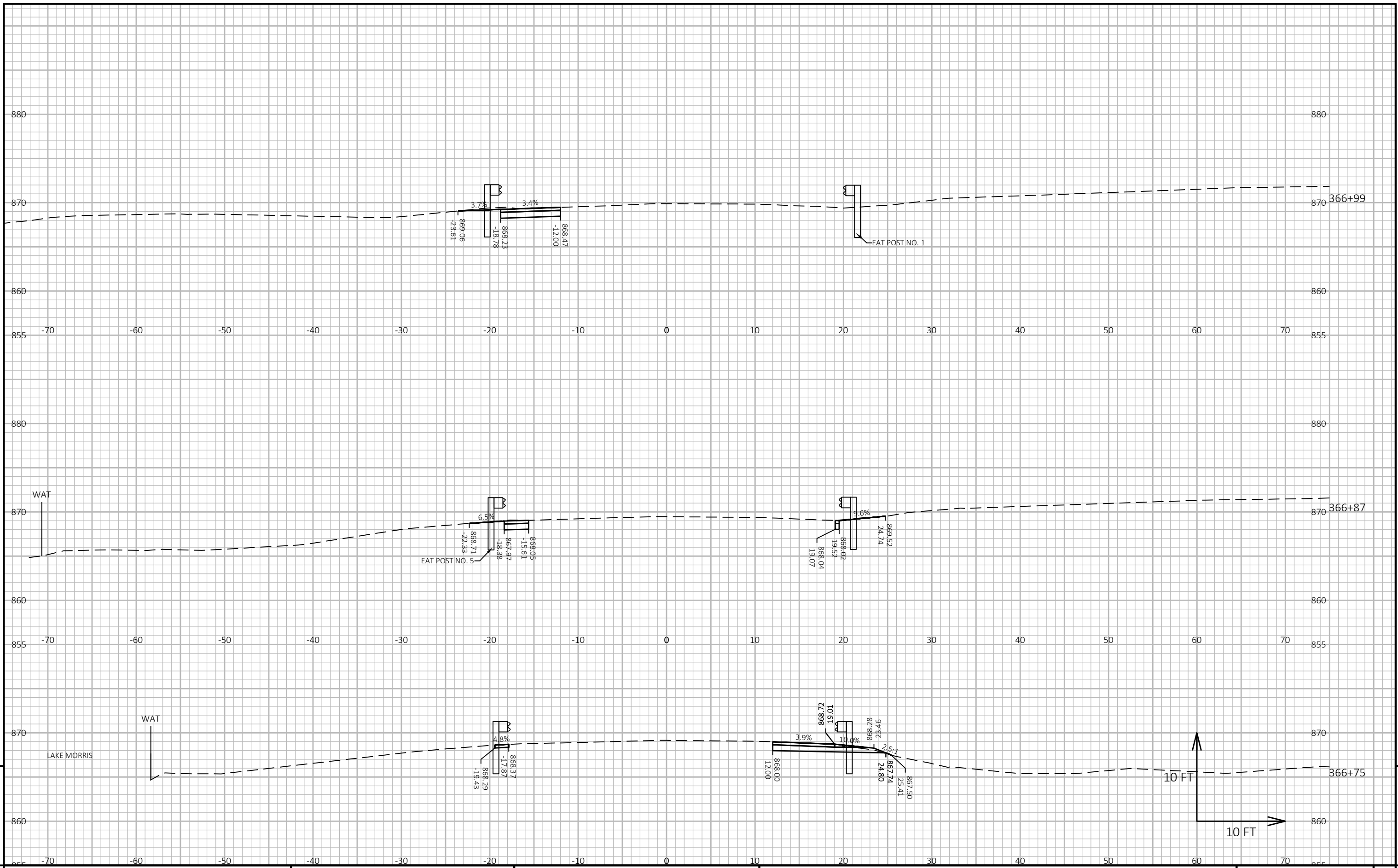
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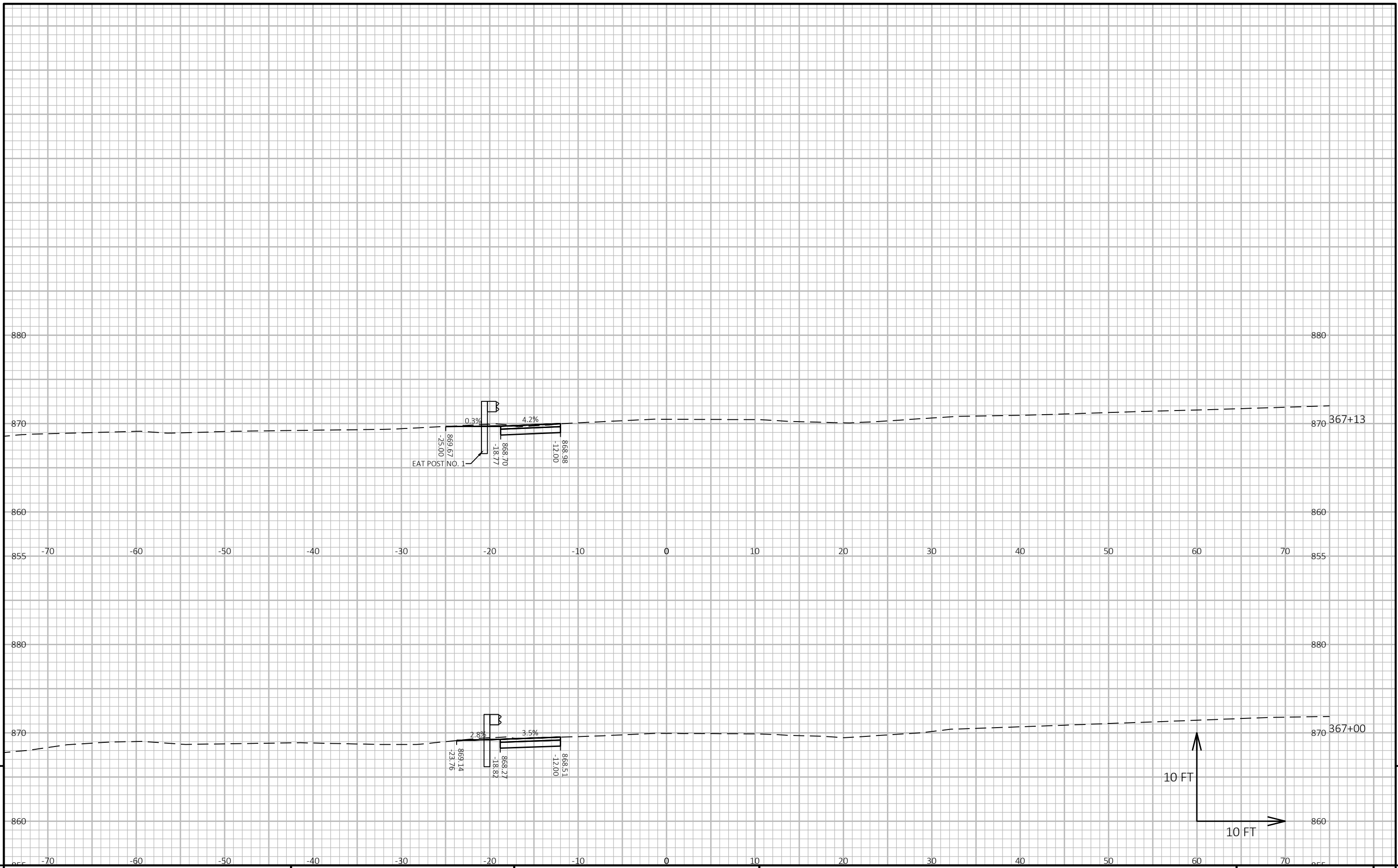
PROJECT NO: 6866-06-70      HWY: STH 152      COUNTY: WAUSHARA      CROSS SECTIONS: GUARDRAIL      SHEET      E

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LAYOUT NAME - 06



PROJECT NO: 6866-06-70      HWY: STH 152      COUNTY: WAUSHARA      CROSS SECTIONS: GUARDRAIL      SHEET 9



9

9

PROJECT NO: 6866-06-70      HWY: STH 152      COUNTY: WAUSHARA      CROSS SECTIONS: GUARDRAIL      SHEET      E

FILE NAME : X:\GB\2021\20210169\DESIGN\TRANSPORTATION\SHEETSPLAN\STH 125 MT MORRIS BG XS.DWG      PLOT DATE : 1/30/2023 10:31 AM      PLOT BY : ENGLER, BRIAN      PLOT NAME :      PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.      WISDOT/CADD SHEET 49

LAYOUT NAME - 08



## ***Wisconsin Department of Transportation***

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