

EAU

PROJECT ID:  
WITH: N/A

7080-01-73

COUNTY:

EAU CLAIRE

December 2024

ORDER OF SHEETS

|             |   |                                                         |
|-------------|---|---------------------------------------------------------|
| Section No. | 1 | Title                                                   |
| Section No. | 2 | Typical Sections and Details (Includes Erosion Control) |
| 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 = 162



DESIGN DESIGNATION

|              |        |   |           |
|--------------|--------|---|-----------|
| A.A.D.T.     | (2017) | = | 8,100     |
| A.A.D.T.     | (2045) | = | 8,100     |
| D.H.V.       |        | = | 12.4      |
| D.D.         |        | = | 59/41     |
| T.           |        | = | 14.4%     |
| DESIGN SPEED |        | = | 55 MPH    |
| ESALS        |        | = | 1,710,000 |

CONVENTIONAL SYMBOLS

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

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

EAU CLAIRE - FAIRCHILD

INDUSTRIAL DR TO FALL CREEK UNDER

USH 12

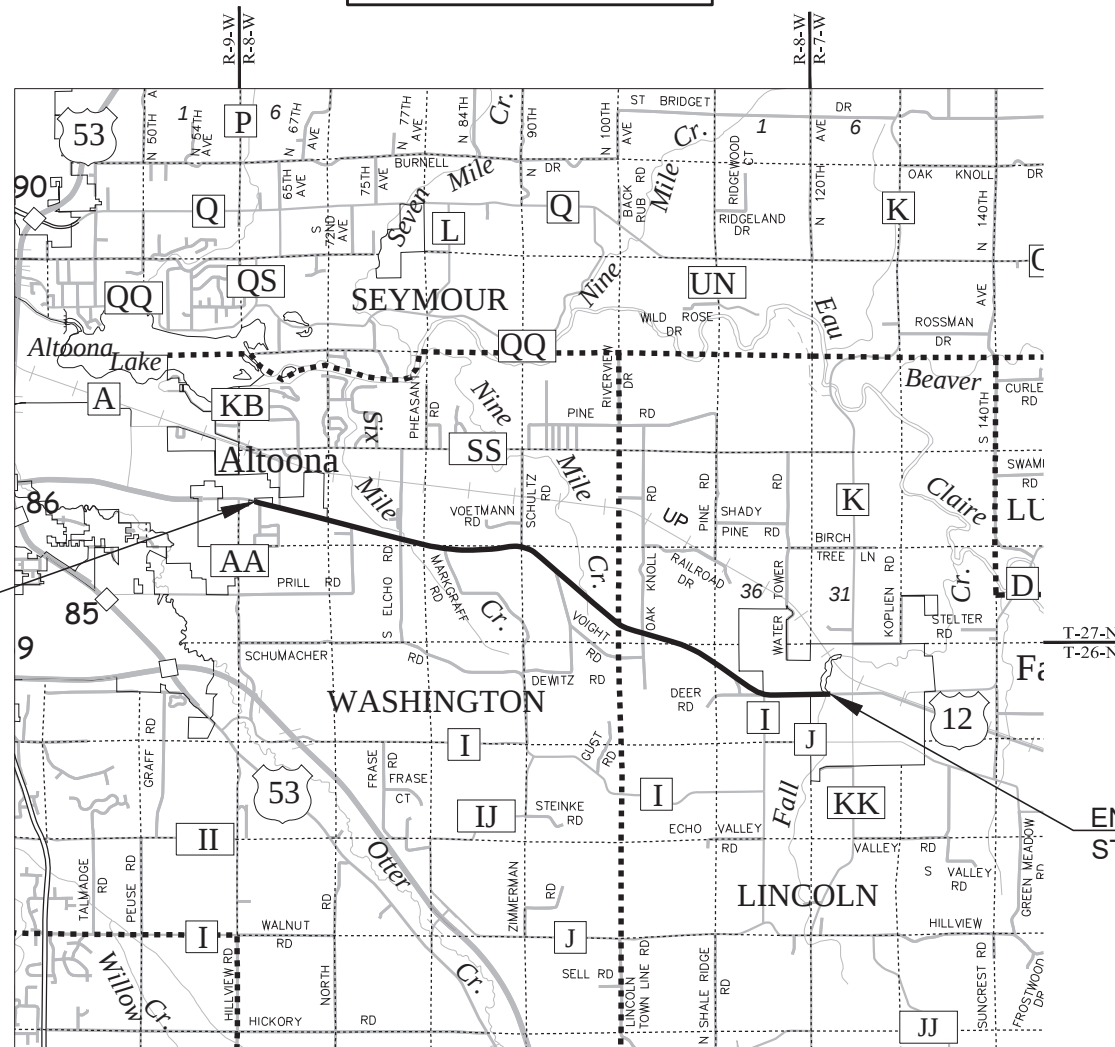
EAU CLAIRE COUNTY

STATE PROJECT NUMBER

7080-01-73

BEGIN PROJECT  
STA 157+18  
Y=271,631.51  
X=364,529.62

END PROJECT  
STA 496+71



LAYOUT  
SCALE 0 2 MI  
TOTAL NET LENGTH OF CENTERLINE = 6.430 MI

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COORDINATE REFERENCE SYSTEM (WISCRS), EAU CLAIRE 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 ).

STATE PROJECT

7080-01-73

FEDERAL PROJECT

PROJECT

WISC 2025125

CONTRACT

1



500 North 17th Avenue  
Wausau, WI 54401  
715.845.1081 Fax 715.845.1099



6/20/24 (Date) Stephanie G. Christensen (Signature)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

|                     |                  |
|---------------------|------------------|
| PREPARED BY         |                  |
| Surveyor            | EMCS, INC.       |
| Designer            | EMCS, INC.       |
| Project Manager     | JOSHUA LANG      |
| Regional Examiner   | NORTHEAST REGION |
| Regional Supervisor | ANDREW FULCER    |

APPROVED FOR THE DEPARTMENT  
DATE: 7/9/2024 Joshua J. Lang P.E. (Signature)

E

GENERAL NOTES

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

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

ORDER OF SECTION 2 SHEETS

- PROJECT OVERVIEW
- TYPICAL SECTIONS
- CONSTRUCTION DETAILS
- EROSION CONTROL
- TRAFFIC CONTROL

UTILITIES

COMMUNICATIONS

AT&T WISCONSIN  
RICK PODOLAK  
304 S DEWEY ST  
EAU CLAIRE, WI 54701  
MOBILE: (715) 410-0656  
RP4514@ATT.COM

BRIGHTSPEED OF CENTRAL WISCONSIN, LLC  
BRIAN HUHN  
425 ELLINGSON AVE  
HAWKINS, WI 54530  
PHONE: (608) 615-7347  
MOBILE: (715) 563-8294  
BRIAN.HUHN@BRIGHTSPEED.COM

SPECTRUM  
CURTIS MOORE  
1201 MCCANN DR  
ALTOONA, WI 54720  
PHONE: (715) 214-1172  
MOBILE: (715) 492-0353  
CURTIS.MOORE@CHARTER.COM

ELECTRIC

DAIRYLAND POWER COOPERTIVE  
MIKE LYDON  
3200 EAST AVENUE SOUTH, P.O. BOX 817  
LA CROSSE, WI 54602-0817  
PHONE: (608) 787-1381  
MICHAEL.LYDON@DAIRYLANDPOWER.COM

EAU CLAIRE ENERGY COOPERATIVE  
NATHAN KARNES  
8214 US HIGHWAY 12  
FALL CREEK, WI 54742  
PHONE: (715) 836-6486  
NKARNES@ECEC.COM

XCEL ENERGY (DISTRIBUTION)  
ROSS AUNA  
1400 WESTERN AVE  
EAU CLAIRE, WI 54701  
PHONE: (715) 737-1096  
MOBILE: (715) 492-1068  
ROSS.A.AUNA@XCELENERGY.COM

XCEL ENERGY (TRANSMISSION)  
MITCHELL DIENGER  
414 NICOLLET MALL 5TH FLOOR  
MINNEAPOLIS, MN 55401  
PHONE: (612) 321-3109  
MITCHELL.A.DIENGER@XCELENERGY.COM

GAS/PETROLEUM

XCEL ENERGY  
MELISSA GOETTL  
P.O.BOX 8  
EAU CLAIRE, WI 54702  
PHONE: (715) 737-6089  
MOBILE: (715) 271-6883  
MELISSA.A.EWINGS@XCELENERGY.COM

SEWER

ALTOONA MUN WATER & SEWER  
DAVID A. WALTER  
1303 LYNN AVENUE  
ALTOONA, WI 54720  
PHONE: (715) 839-6092  
MOBILE: (715) 577-3459  
DAVIDW@CI.ALTOONA.WI.US

WATER

ALTOONA MUN WATER & SEWER  
DAVID A. WALTER  
1303 LYNN AVENUE  
ALTOONA, WI 54720  
PHONE: (715) 839-6092  
MOBILE: (715) 577-3459  
DAVIDW@CI.ALTOONA.WI.US

FALL CREEK MUNICIPAL WATER UTILITY  
JARED MCKEE  
122 E LINCOLN AVE  
FALL CREEK, WI 54742  
PHONE: (715) 450-0117  
JARED.MCKEE@FALLCREEKWI.GOV

RUNOFF COEFFICIENT TABLE

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

TOTAL PROJECT AREA = 89 ACRES  
TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 2.6 ACRES



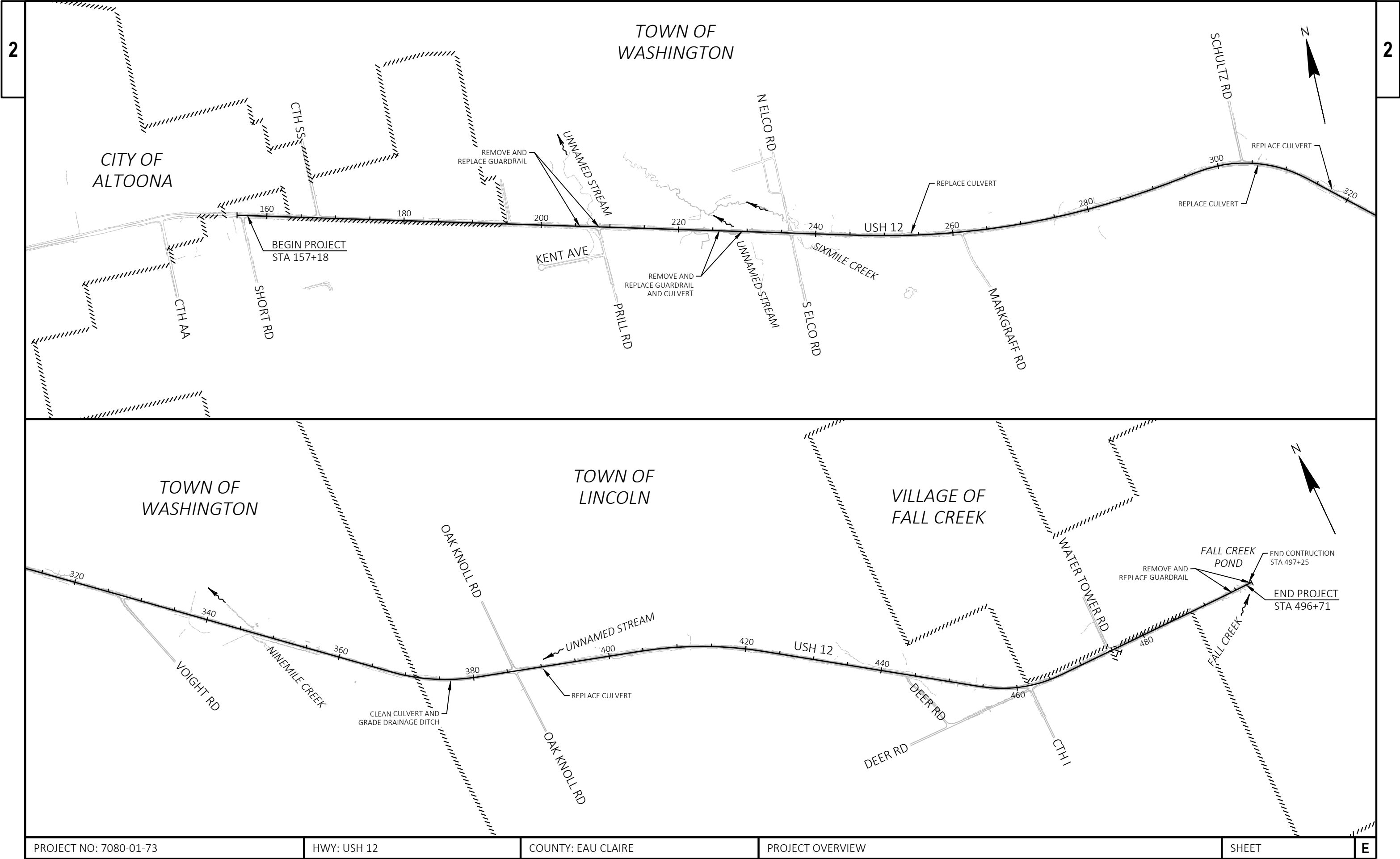
Dial **811** or (800)242-8511  
www.DiggersHotline.com

OTHER CONTACTS

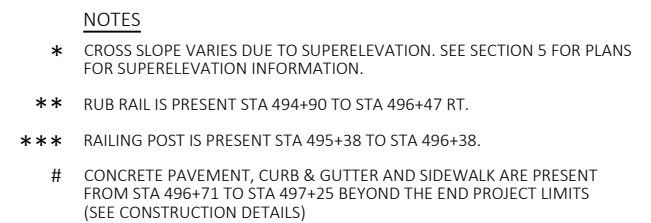
DNR LIAISON  
LEAH NICOL  
DNR WEST CENTRAL REGION HEADQUARTERS  
1300 WEST CLAIREMONT AVE  
EAU CLAIRE, WI 54701  
(715) 934-9014  
LEAH.NICOL@WISCONSIN.GOV

DESIGNER CONTACT

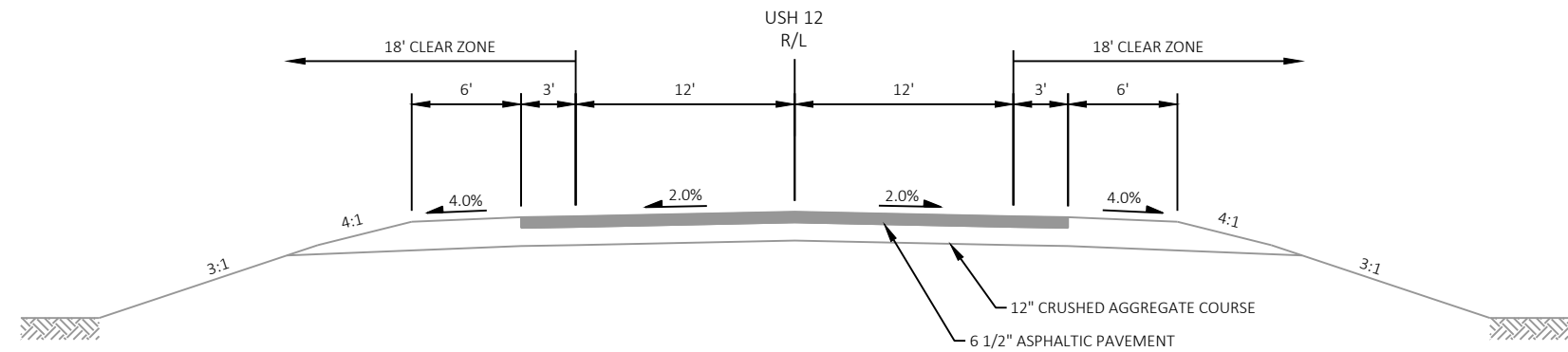
EMCS, INC.  
500 NORTH 17TH AVENUE  
WAUSAU, WI 54401  
OFFICE: 715-845-1081



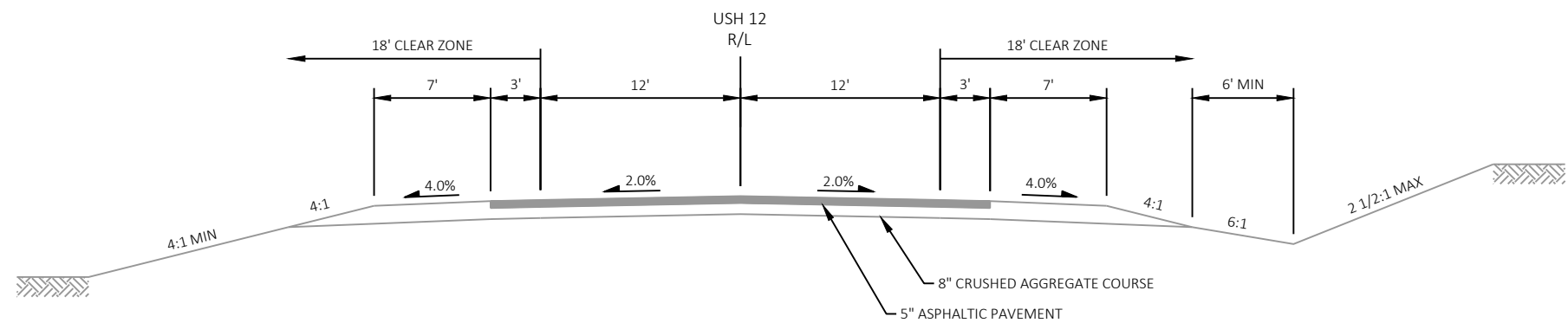
|                        |             |                    |                  |       |   |
|------------------------|-------------|--------------------|------------------|-------|---|
| PROJECT NO: 7080-01-73 | HWY: USH 12 | COUNTY: EAU CLAIRE | PROJECT OVERVIEW | SHEET | E |
|------------------------|-------------|--------------------|------------------|-------|---|



STA 157+18 - STA 237+11  
STA 238+61 - STA 320+50  
STA 330+30 - STA 346+00  
STA 348+28 - STA 496+71 #

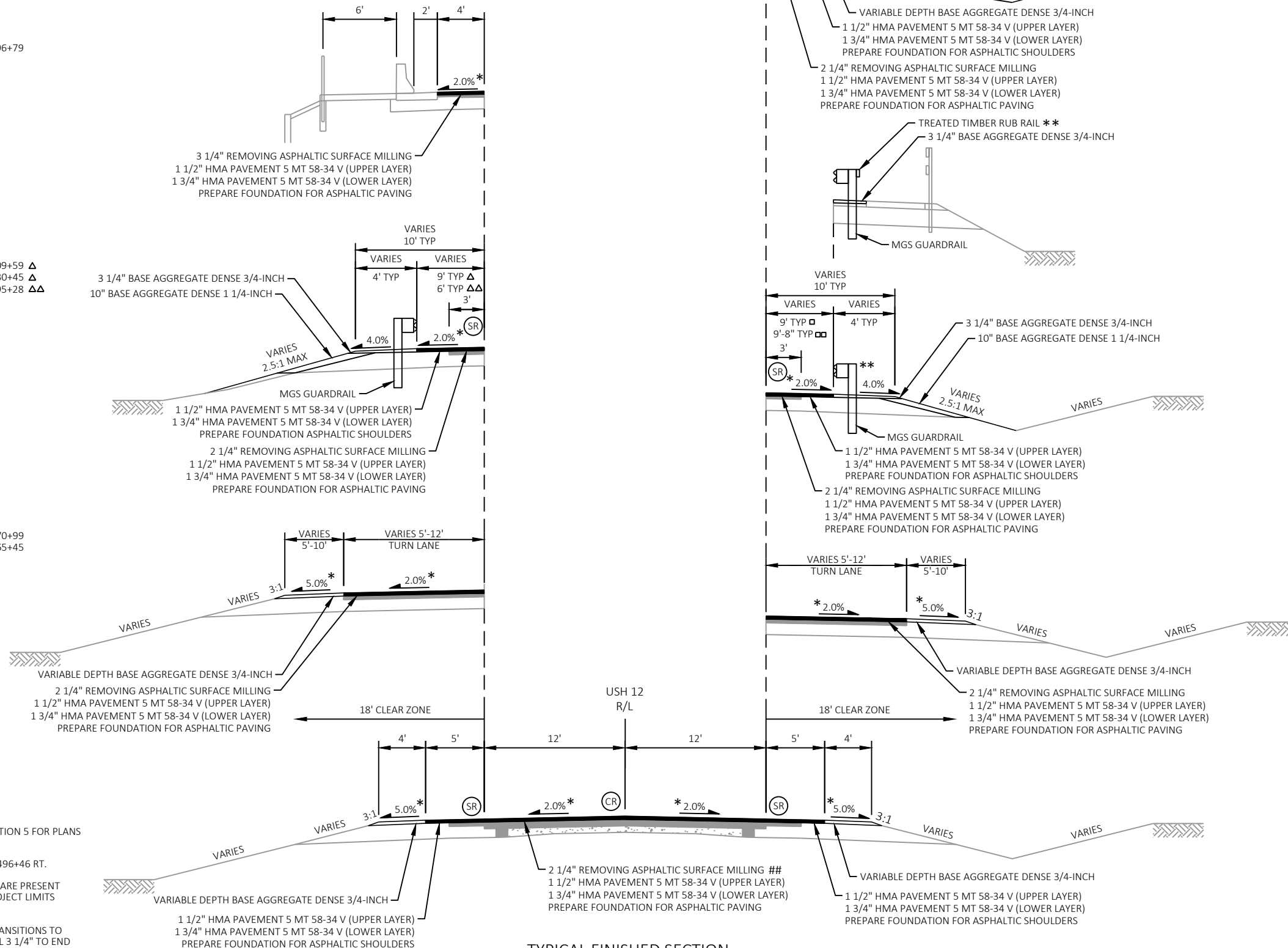


TYPICAL EXISTING SECTION  
USH 12  
STA 237+11 - STA 238+61  
STA 346+00 - STA 348+28



TYPICAL EXISTING SECTION  
USH 12  
STA 320+50 - STA 330+30

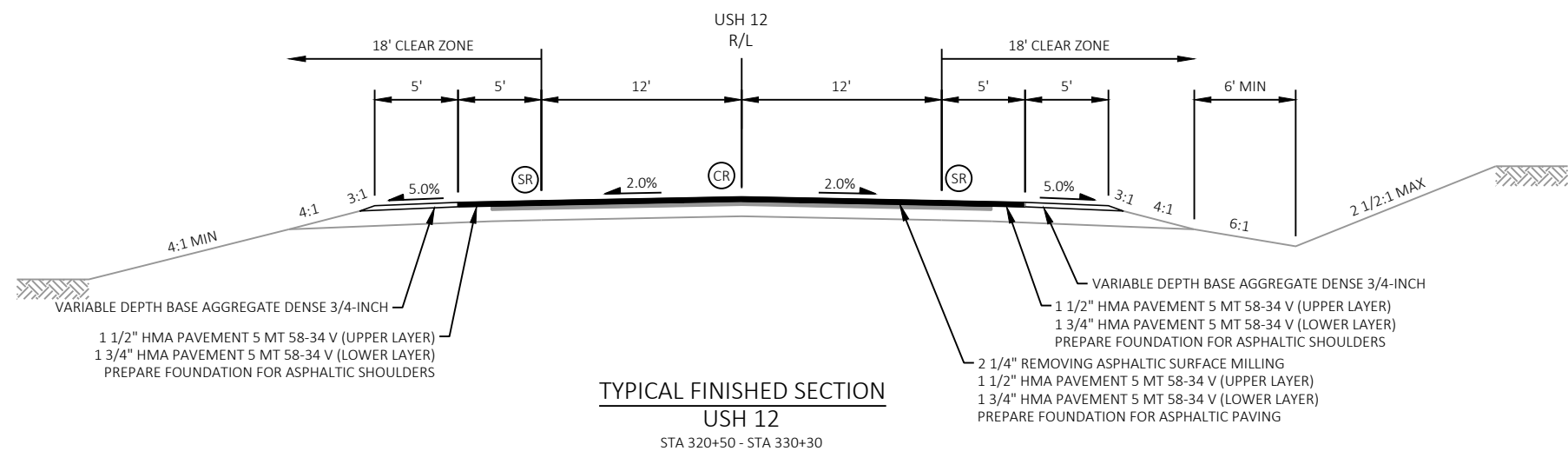
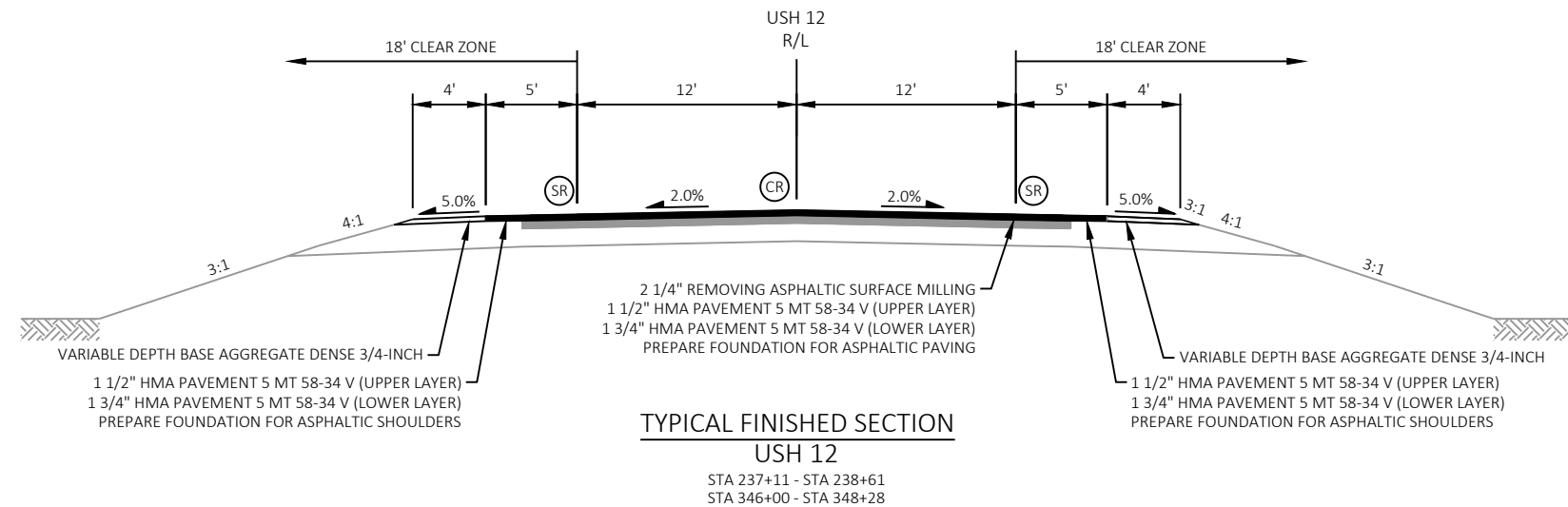
STA 165+00 - STA 170+99  
STA 233+15 - STA 237+11  
STA 299+24 - STA 300+75  
STA 306+47 - STA 307+60



TYPICAL FINISHED SECTION  
USH 12

STA 157+18 - STA 237+11  
STA 238+61 - STA 320+50  
STA 330+30 - STA 346+00  
STA 348+28 - STA 496+71 #

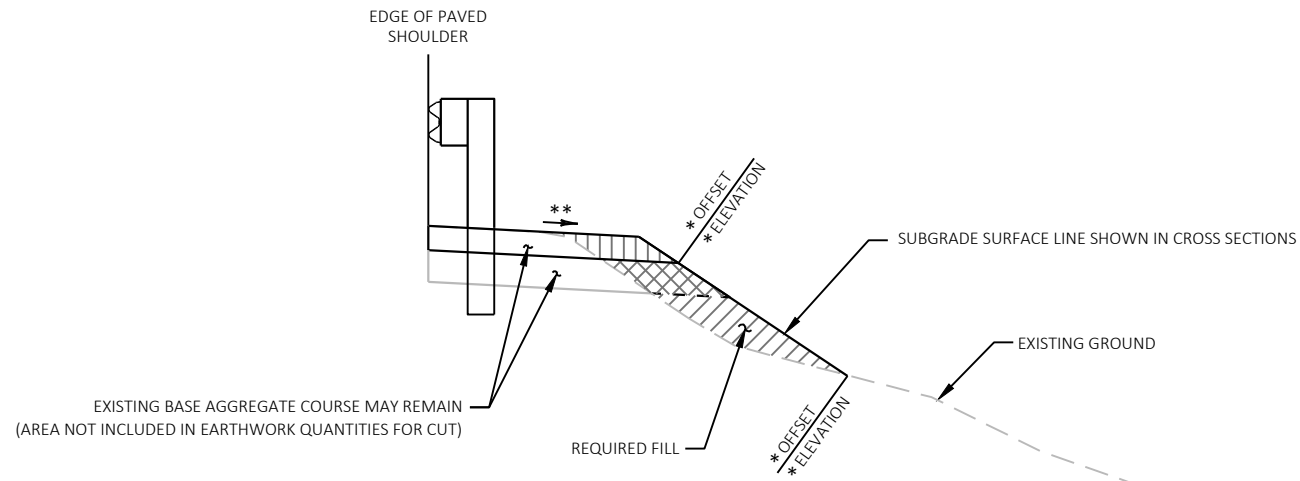
- ## NOTES
- \* CROSS SLOPE VARIES DUE TO SUPERELEVATION. SEE SECTION 5 FOR PLANS FOR SUPERELEVATION INFORMATION.
  - \*\* TREATED TIMBER RUB RAIL PLACED STA 494+90 TO STA 496+46 RT.
  - # CONCRETE PAVEMENT, CURB & GUTTER AND SIDEWALK ARE PRESENT FROM STA 496+71 TO STA 497+25 BEYOND THE END PROJECT LIMITS (SEE CONSTRUCTION DETAILS)
  - ## REMOVING ASPHALTIC PAVEMENT SURFACE MILLING TRANSITIONS TO 3 1/4" FROM STA 494+10 TO STA 495+10 AND THEN MILL 3 1/4" TO END PROJECT STA 496+71 (SEE CONSTRUCTION DETAILS)
  - (SR) ASPHALTIC RUMBLE STRIPS, SHOULDER. SEE SDD "SHOULDER RUMBLE STRIPS - ASPHALT" FOR ADDITIONAL INFORMATION.
  - (CR) ASPHALTIC RUMBLE STRIPS, CENTERLINE. SEE SDD "CENTERLINE RUMBLE STRIPS - ASPHALT" FOR ADDITIONAL INFORMATION.



## NOTES

- (SR) ASPHALTIC SHOULDER RUMBLE STRIPS 2-LANE RURAL (TYPE 1). SEE SDD "SHOULDER RUMBLE STRIPS - ASPHALT" FOR ADDITIONAL INFORMATION.
- (CR) ASPHALTIC RUMBLE STRIPS, CENTERLINE. SEE SDD "CENTERLINE RUMBLE STRIPS - ASPHALT" FOR ADDITIONAL INFORMATION.





### SHOULDER WIDENING EARTHWORK & BASE AGGREGATE FOR GUARDRAIL DETAIL

SEE SECTION 5 PLAN SHEETS, CROSS SECTIONS, AND TYPICAL SECTIONS FOR LOCATIONS

#### NOTES

BENCH FILL AS REQUIRED PER STANDARD SPECIFICATION 205.3.2(4).

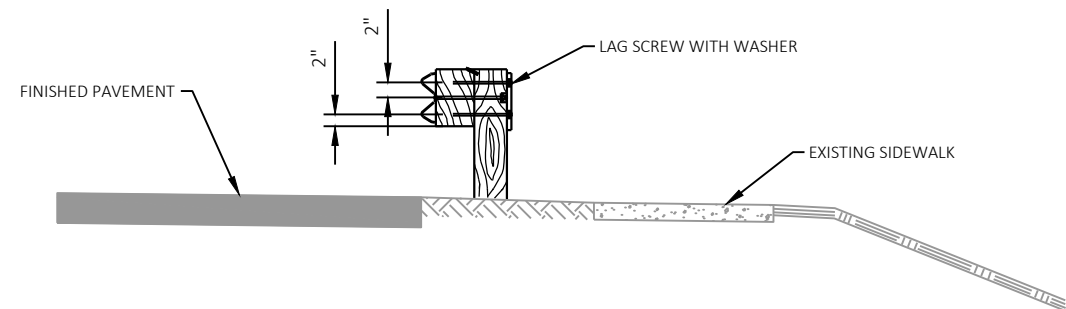
MATCH EXISTING BASE AGGREGATE DENSE DEPTH (12-INCH (MIN)).

\*OFFSET AND ELEVATION PROVIDED TO THESE POINTS ON THE CROSS SECTIONS.

\*\*SHOULDER SLOPE PROVIDED ON CROSS SECTIONS.

#### LEGEND

|  |                                                      |
|--|------------------------------------------------------|
|  | NEW BASE AGGREGATE DENSE 3/4-INCH                    |
|  | NEW BASE AGGREGATE DENSE 1 1/4-INCH IN WIDENING AREA |
|  | FILL                                                 |

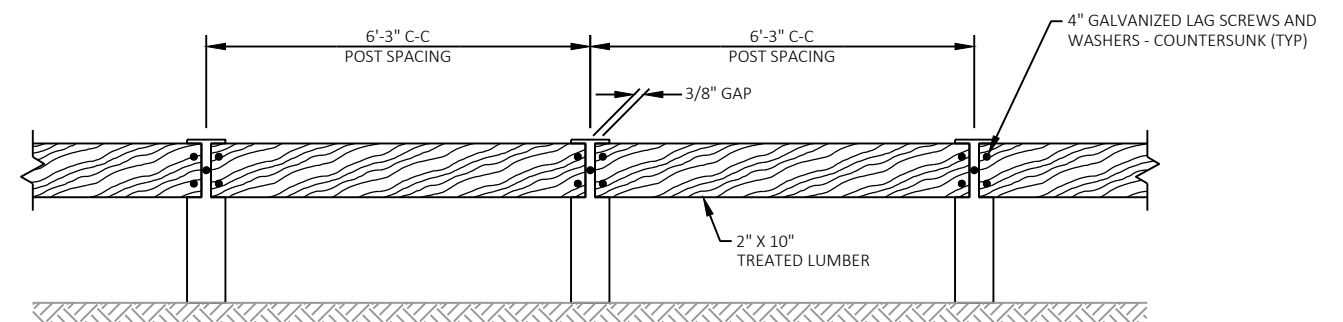


#### NOTES

ALL CARRIAGE BOLTS & LAG SCREWS USED IN CONSTRUCTION THAT ARE ADJACENT TO THE SIDEWALK SHALL BE COUNTERSUNK TO CLEAR SCREW HEAD OR BOLT NUT.

2"x10" TREATED TIMBER RUB RAIL REQUIRED WHERE GUARDRAIL IS ADJACENT TO SIDEWALK. DO NOT PLACE ON ENERGY ABSORBING TERMINAL.

SEE SDD "MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL" FOR DETAILS NOT SHOWN.

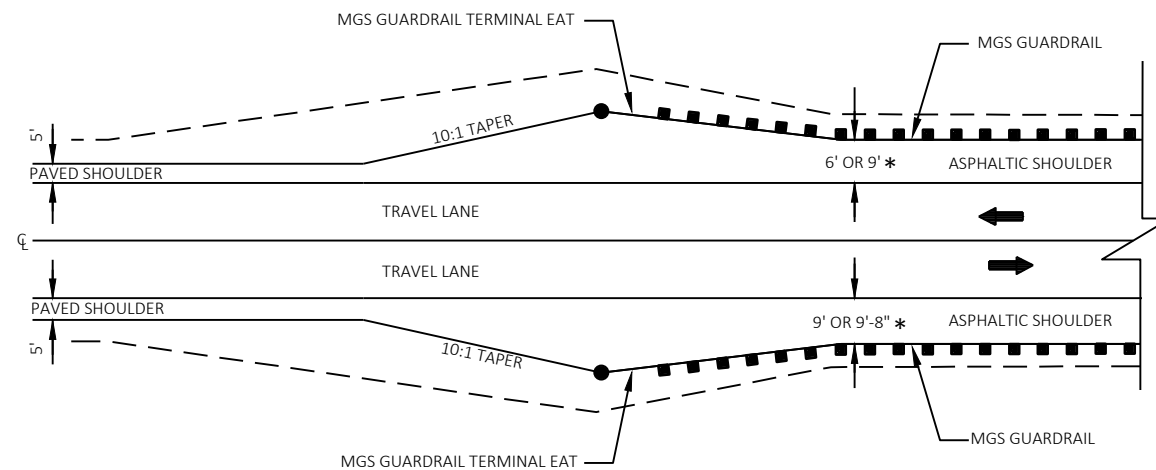


### TREATED TIMBER RUB RAIL DETAIL AT GUARDRAIL

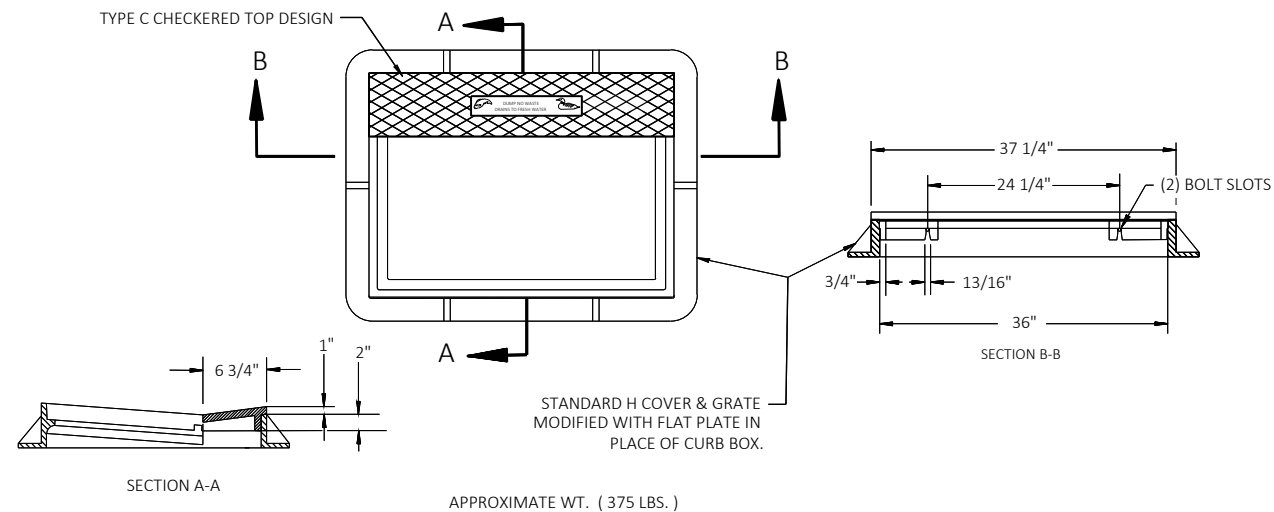
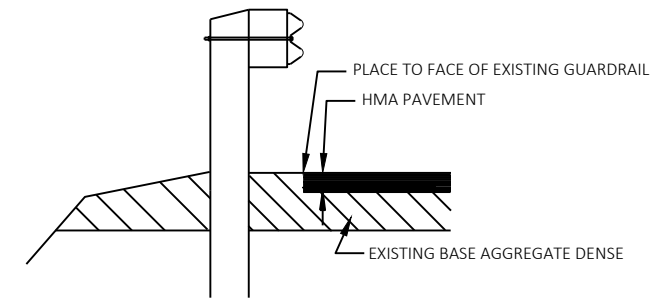
STA 494+90 - STA 496+46, RT

NOTES  
SEE PLAN SHEETS AND SDD "MIDWEST GUARDRAIL SYSTEM ENERGY  
ABSORBING TERMINAL (MGS)" FOR ADDITIONAL INFORMATION.

\* SEE TYPICAL SECTIONS FOR LOCATION OF PAVED SHOULDER AT  
GUARDRAIL WIDTH.

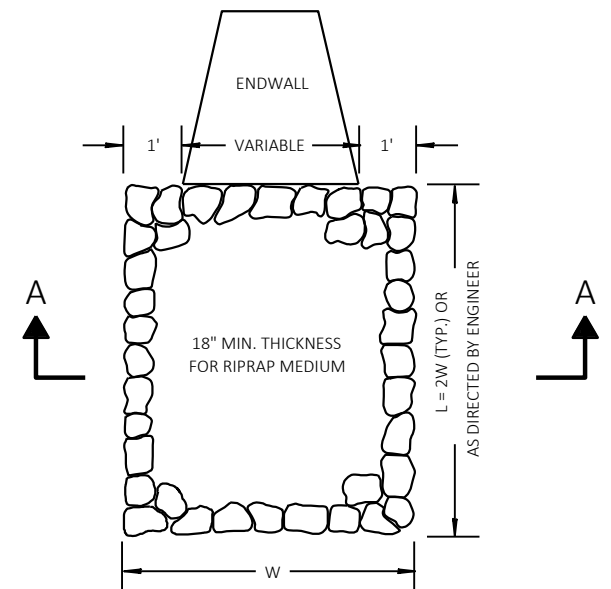
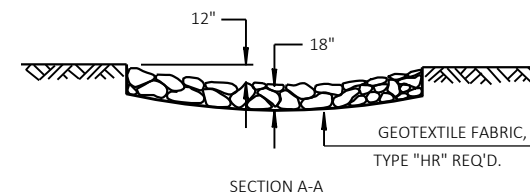


PAVED SHOULDER AT GUARDRAIL DETAIL



INLET COVER TYPE H-D DETAIL

(WITH MOUNTABLE CURB PLATE)  
STA 496+85, RT



RIPRAP MEDIUM TREATMENT AT CULVERTS

SEE EROSION CONTROL SHEETS FOR LOCATIONS

LEGEND

PROPOSED SURFACE (6" ASPHALTIC SURFACE)

PROPOSED BASE (12" BASE AGGREGATE DENSE 1 1/4-INCH)

TRENCH BACKFILL

TRENCH OR FOUNDATION BACKFILL

FOUNDATION BACKFILL

TRANSITION CUT

50' TRENCH WIDTH 50'

SAWING REQD

TOP OF SUBGRADE

10:1 OR FLATTER

10:1 OR FLATTER

CULVERT PIPE

DEPTH D < 6 FT

NOTES

TRANSITION CUT IS PAID AS EXCAVATION COMMON

TRANSITION CUT WIDTH IS FROM SUBGRADE SHOULDER POINT TO SUBGRADE SHOULDER POINT

BACKFILL THE TRANSITION CUT AREAS WITH FOUNDATION AND TRENCH BACKFILL AS SPECIFIED IN STANDARD SPEC 520

PERFORM CULVERT PIPE INSTALLATION BEFORE THE MILLING AND OVERLAY OPERATIONS

PLACE ASPHALTIC SURFACE AFTER CULVERT PIPE INSTALLATION AND BEFORE THE MILLING AND OVERLAY OPERATIONS

\* DEPTH IS MEASURED AT THE DEEPEST PORTION OF THE PIPE WITHIN THE SUBGRADE SHOULDER POINTS

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.

| ROUTE  | STA (CL) | DEPTH D (FT) * | PIPE DIA (IN) |
|--------|----------|----------------|---------------|
| USH 12 | 227+67   | 4.2'           | 36"           |
| USH 12 | 253+94   | 1.2'           | 24" X 38"     |
| USH 12 | 305+81   | 4.8'           | 30"           |
| USH 12 | 317+26   | 0.9'           | 30"           |
| USH 12 | 390+28   | 0.6'           | 34" X 53"     |

CULVERT PIPE TRANSITION DETAIL

PROJECT NO: 7080-01-73

HWY: USH 12

COUNTY: EAU CLAIRE

CONSTRUCTION DETAILS

SHEET

E

FILE NAME : P:\51XX\5196.DP.19.USH12.EAU\CADD\70800173\SHEETPLAN\021001-CD.DWG  
LAYOUT NAME - 04

PLOT DATE : 5/24/2024 10:59 AM

PLOT BY : NICK MENNINGA

PLOT NAME :

PLOT SCALE : 1 IN:10 FT

WISDOT/CADD SHEET 42

| LEGEND                                                                            |                                        |
|-----------------------------------------------------------------------------------|----------------------------------------|
|  | SLOPE INTERCEPT                        |
|  | GUARDRAIL MOW STRIP EMULSIFIED ASPHALT |

## NOTES

SEE CROSS SECTIONS FOR MORE INFORMATION  
ON CROSS SLOPES AT CULVERT AND DITCH  
CROSS SECTIONS.

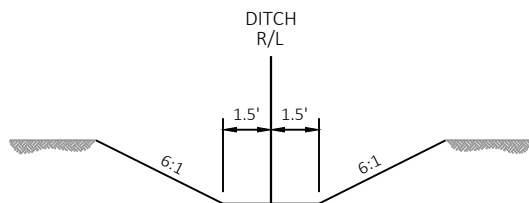
A=6' TOTAL SHOULDER WIDTH (PAVE 5')  
B=7.5' TOTAL SHOULDER WIDTH (PAVE 5')

STA 376+77  
EXISTING 42" X 72" CONCRETE CULVERT  
(CATTLE PASS) TO REMAIN  
CLEANING CULVERT PIPES REQ'D  
MARKERS CULVERT END REQ'D

STA 376+77 R/L USH 12 =  
STA 10+70 R/L CATTLE PASS  
Y=264,762.361  
X=384,590.291

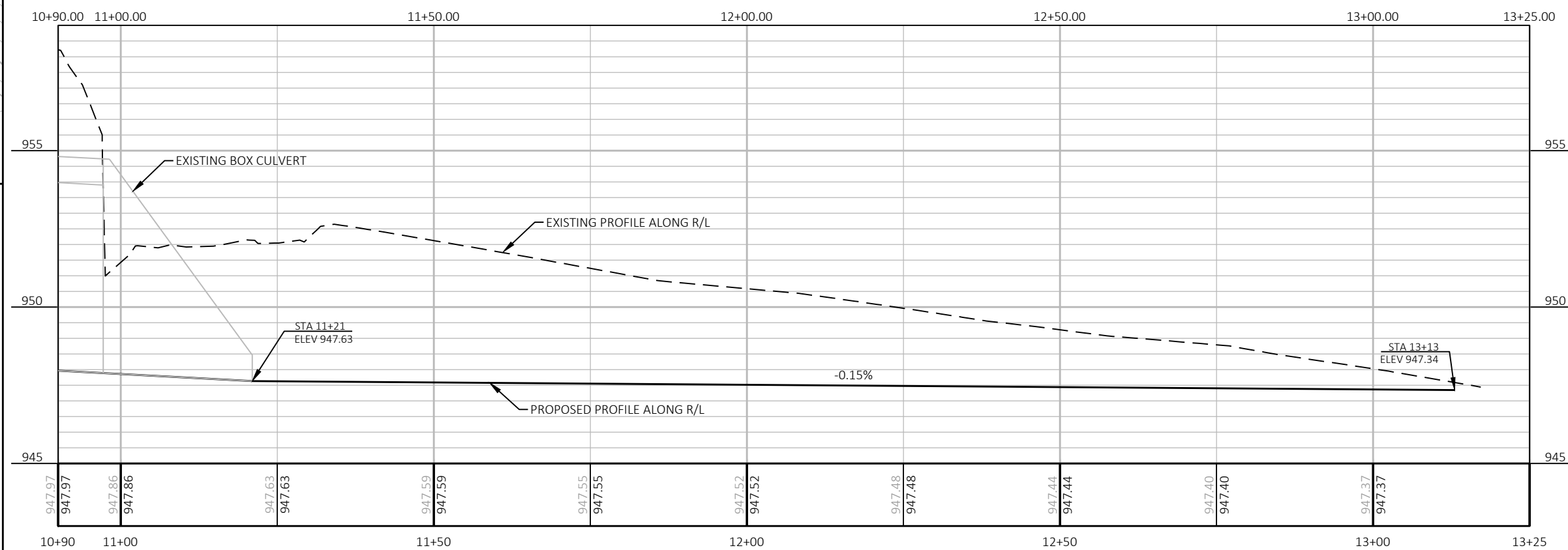
CURVE NO. 6  
PI STA = 11+33.56  
Y = 264704.42  
X = 384564.20  
PC STA = 11+19.18  
Y=264717.52  
X=384570.10  
PT STA = 11+44.90  
Y=264703.91  
X=384549.84  
DELTA = 63°42'15"  
D = 247°41'35"  
T = 14.37'  
L = 25.72'  
R = 23.13'

CURVE NO. 7  
PI STA = 12+47.42  
Y = 264700.23  
X = 384447.39  
PC STA = 12+06.90  
Y=264701.69  
X=384487.88  
PT STA = 12+86.00  
Y=264678.37  
X=384413.28  
DELTA = 30°35'59"  
D = 38°41'13"  
T = 40.52'  
L = 79.10'  
R = 148.10'



TYPICAL DITCH SECTION DETAIL

STA 11+20 - STA 13+23



PROJECT NO: 7080-01-73

HWY: USH 12

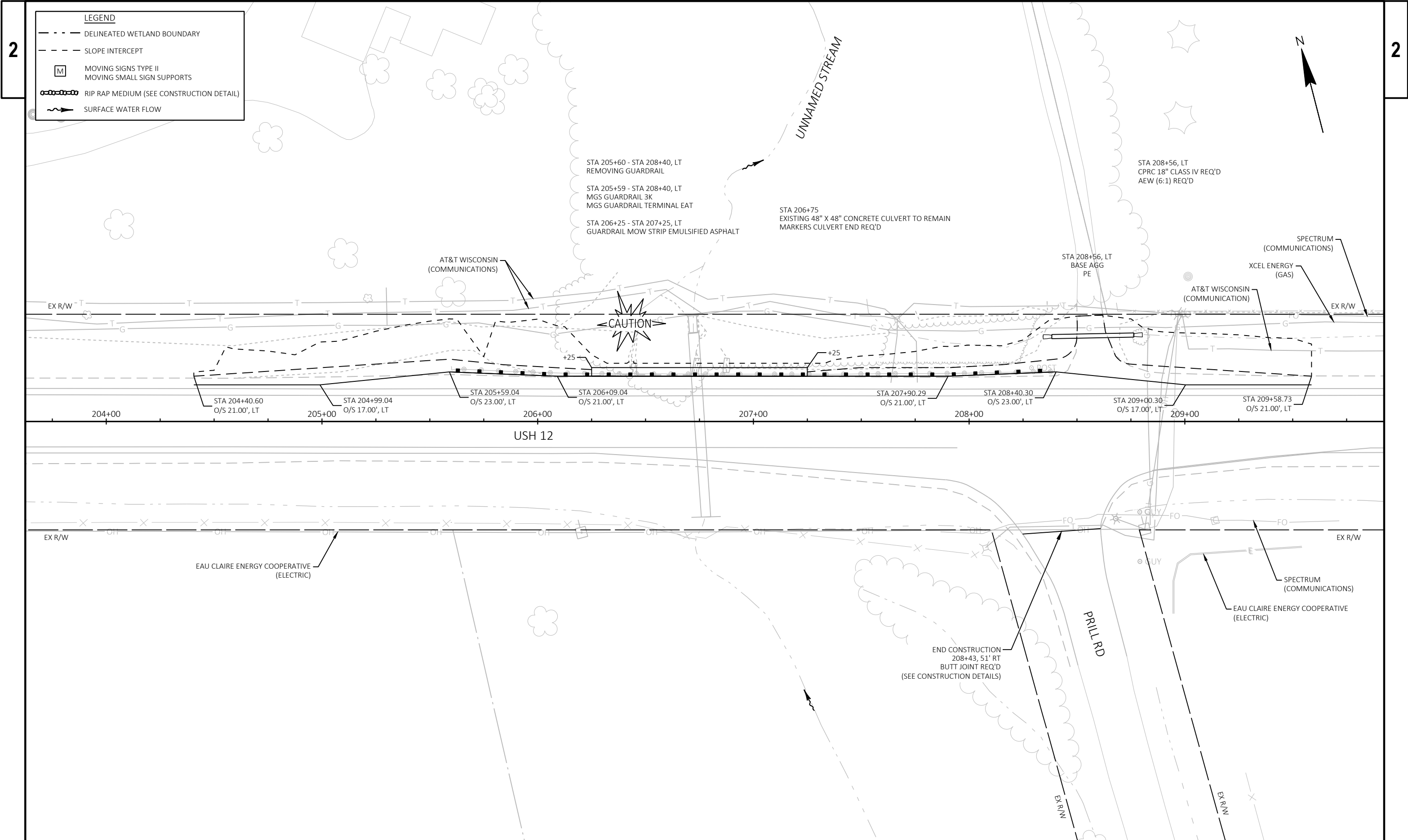
COUNTY: EAU CLAIRE

CONSTRUCTION DETAILS - DRAINAGE DITCH

SHEET

E





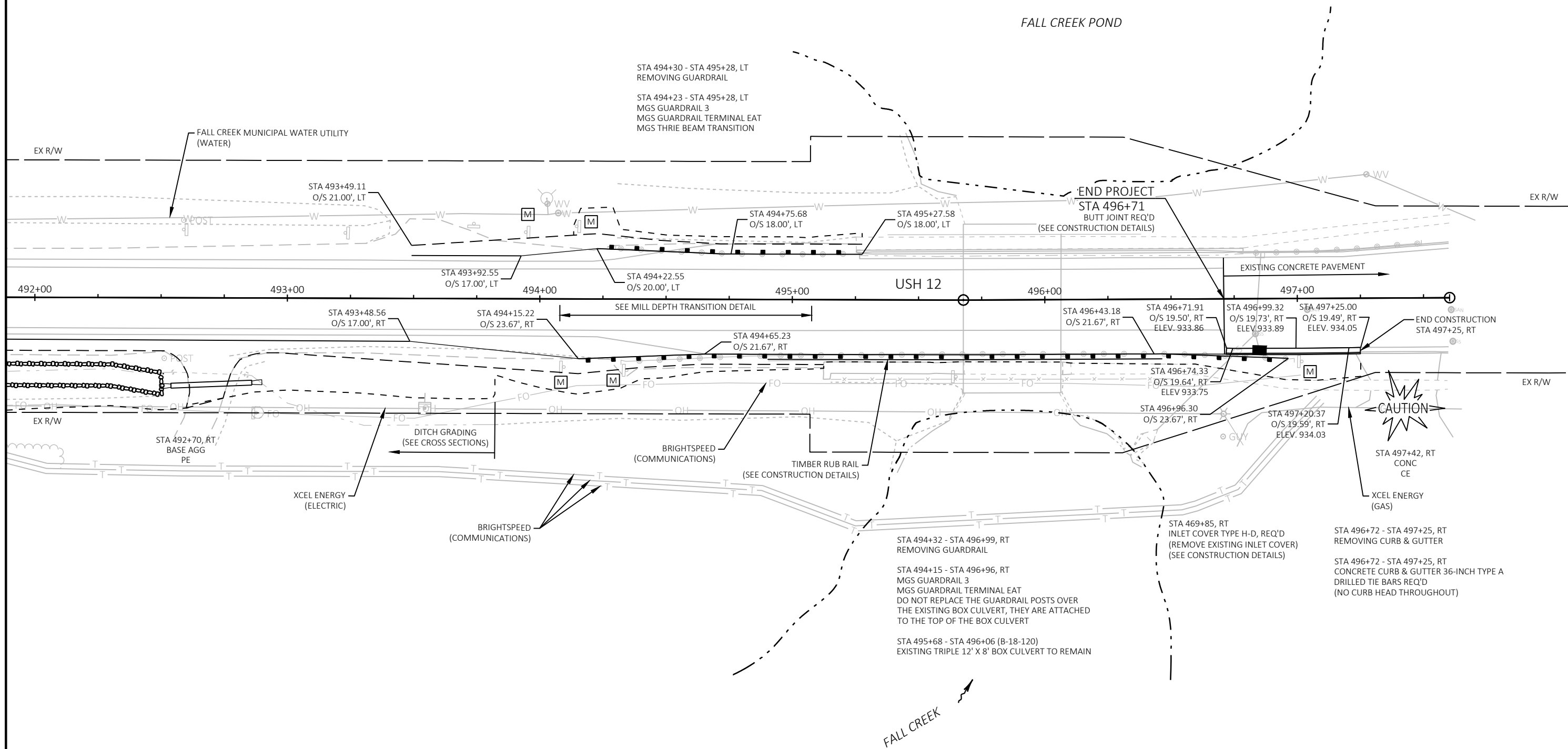
|           |                                                    |
|-----------|----------------------------------------------------|
| ---       | DELINEATED WETLAND BOUNDARY                        |
| - - -     | SLOPE INTERCEPT                                    |
| M         | MOVING SIGNS TYPE II<br>MOVING SMALL SIGN SUPPORTS |
| o-o-o-o-o | RIP RAP MEDIUM (SEE CONSTRUCTION DETAIL)           |
| ~>        | SURFACE WATER FLOW                                 |

THE NEW GUARDRAIL IS PROPOSED TO BE INSTALLED AFTER THE CULVERT REPLACEMENT UNDER TEMPORARY LANE SHIFTS. INSTALL THE GUARDRAIL BASED ON EXISTING PAVEMENT ELEVATION. ADJUST INSTALLED GUARDRAIL AFTER ROADWAY PROFILE INCREASES DUE TO PROPOSED MILL AND OVERLAY.

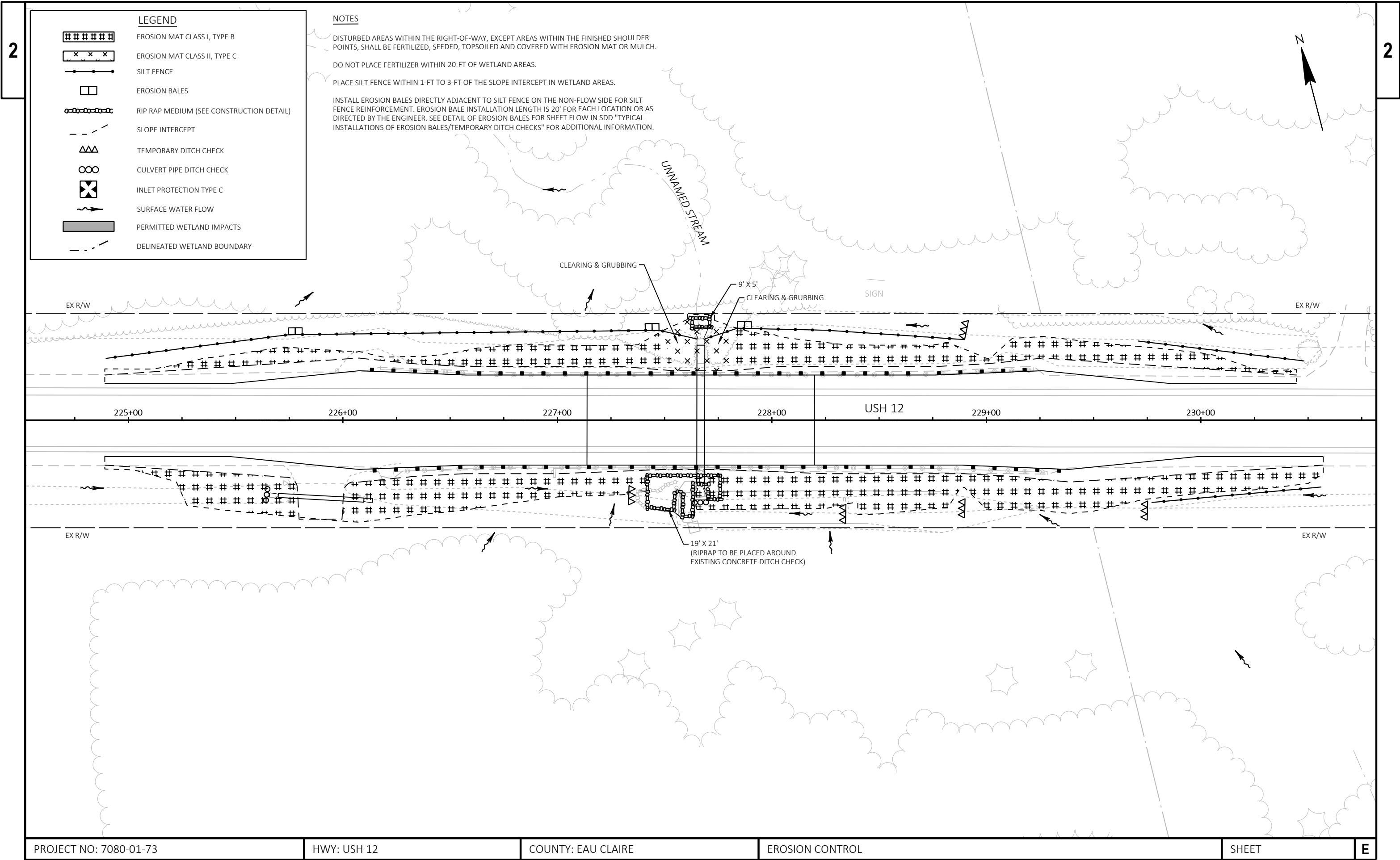


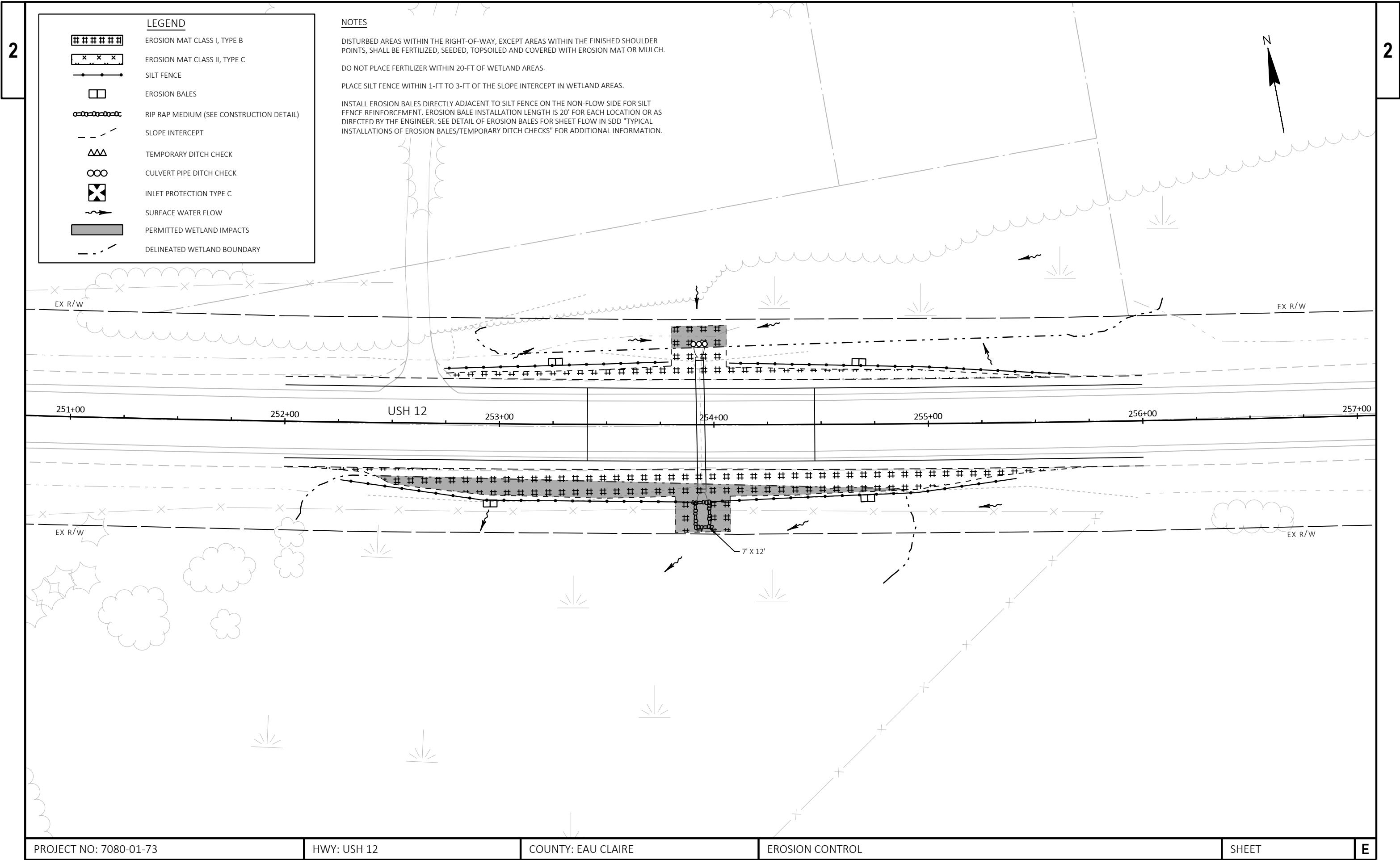
## LEGEND

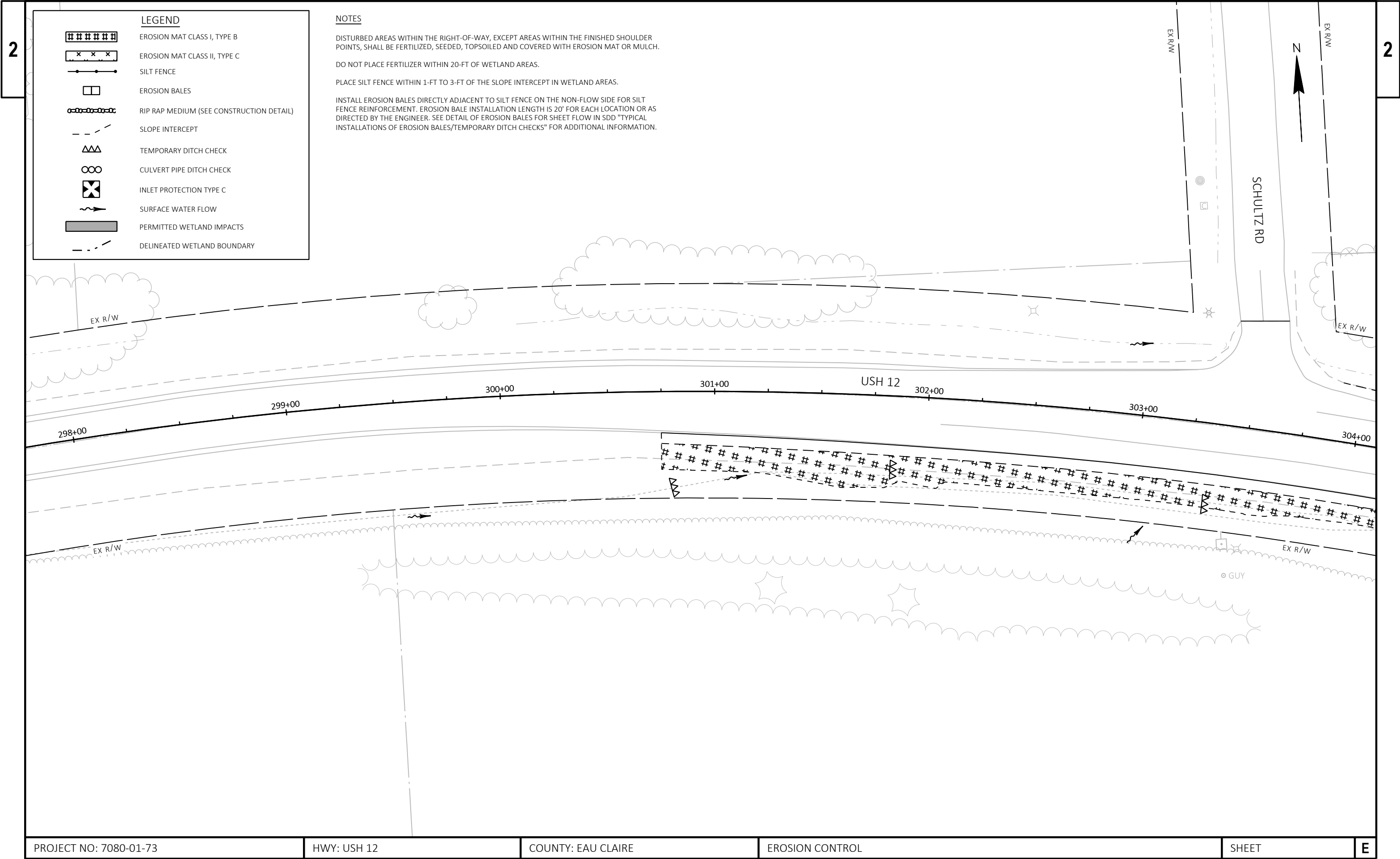
- DELINEATED WETLAND BOUNDARY  
--- SLOPE INTERCEPT  
[M] MOVING SIGNS TYPE II  
MOVING SMALL SIGN SUPPORTS  
--- RIP RAP MEDIUM (SEE CONSTRUCTION DETAIL)  
--- SURFACE WATER FLOW



|                        |             |                    |                 |       |          |
|------------------------|-------------|--------------------|-----------------|-------|----------|
| PROJECT NO: 7080-01-73 | HWY: USH 12 | COUNTY: EAU CLAIRE | EROSION CONTROL | SHEET | <b>E</b> |
|------------------------|-------------|--------------------|-----------------|-------|----------|







LEGEND

- EROSION MAT CLASS I, TYPE B
- EROSION MAT CLASS II, TYPE C
- SILT FENCE
- EROSION BALES
- RIP RAP MEDIUM (SEE CONSTRUCTION DETAIL)
- SLOPE INTERCEPT
- TEMPORARY DITCH CHECK
- CULVERT PIPE DITCH CHECK
- INLET PROTECTION TYPE C
- SURFACE WATER FLOW
- PERMITTED WETLAND IMPACTS
- DELINEATED WETLAND BOUNDARY

NOTES

DISTURBED AREAS WITHIN THE RIGHT-OF-WAY, EXCEPT AREAS WITHIN THE FINISHED SHOULDER POINTS, SHALL BE FERTILIZED, SEEDED, TOPSOILED AND COVERED WITH EROSION MAT OR MULCH.

DO NOT PLACE FERTILIZER WITHIN 20-FT OF WETLAND AREAS.

PLACE SILT FENCE WITHIN 1-FT TO 3-FT OF THE SLOPE INTERCEPT IN WETLAND AREAS.

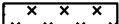
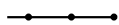
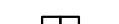
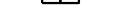
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2

2 |

### LEGEND

- |                                                                                   |                                          |
|-----------------------------------------------------------------------------------|------------------------------------------|
|  | EROSION MAT CLASS I, TYPE B              |
|  | EROSION MAT CLASS II, TYPE C             |
|  | SILT FENCE                               |
|  | EROSION BALES                            |
|  | RIP RAP MEDIUM (SEE CONSTRUCTION DETAIL) |
|  | SLOPE INTERCEPT                          |
|  | TEMPORARY DITCH CHECK                    |
|  | CULVERT PIPE DITCH CHECK                 |
|  | INLET PROTECTION TYPE C                  |
|  | SURFACE WATER FLOW                       |
|  | PERMITTED WETLAND IMPACTS                |
|  | DELINEATED WETLAND BOUNDARY              |

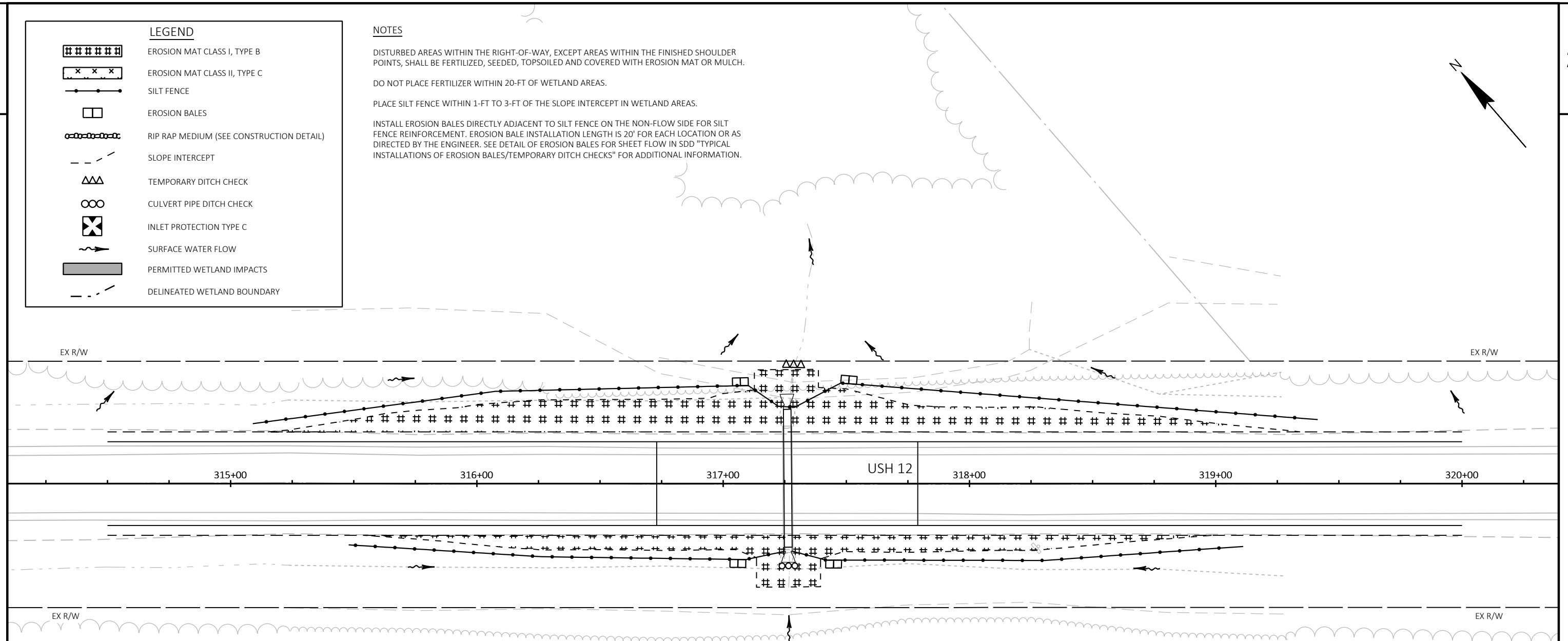
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PROJECT NO: 7080-01-73

HWY: USH 12

COUNTY: EAU CLAIRE

EROSION CONTROL

SHEET

3

FILE NAME : P:\51XX\5196.DP.19.USH12.EAU\CADD\70800173\SHEETSPLAN\022001-EC.DWG  
LAYOUT NAME - 06

PLOT DATE : 5/24/2024 10:56 AM

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PLOT BY :           NICK MENNINGA

PLOT NAME :

PLOT SCALE : 1 IN:40 FT

WISDOT/CADDS SHEET 44



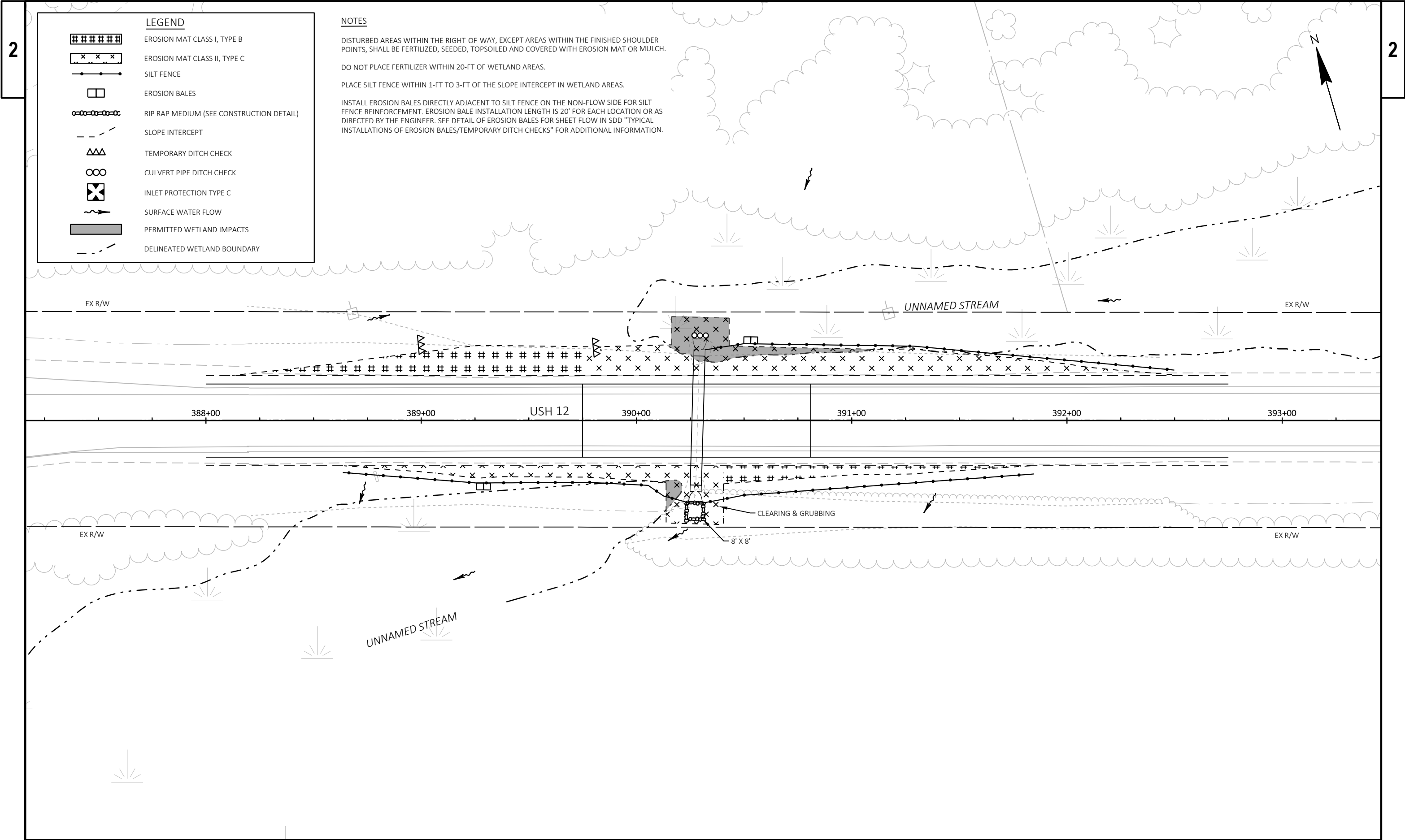
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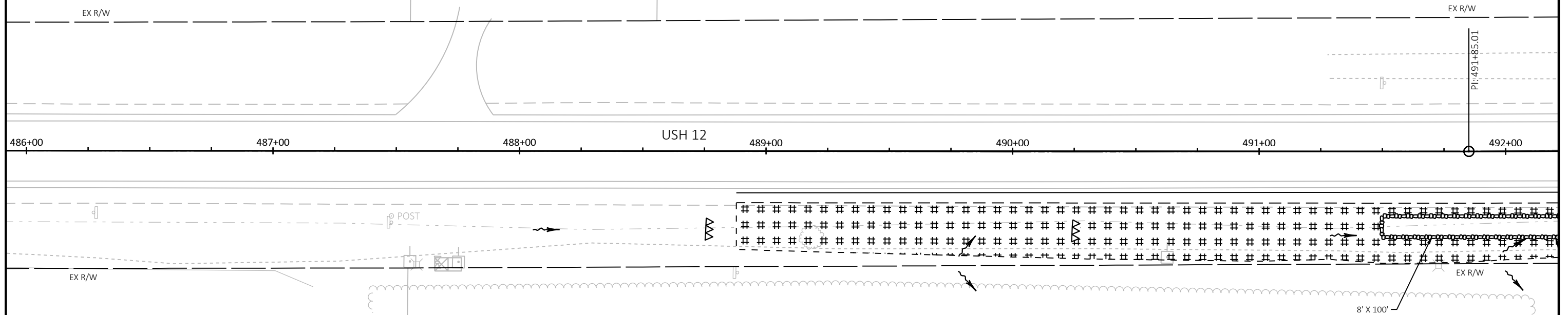
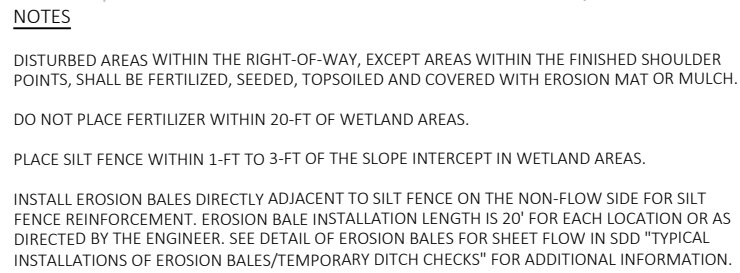
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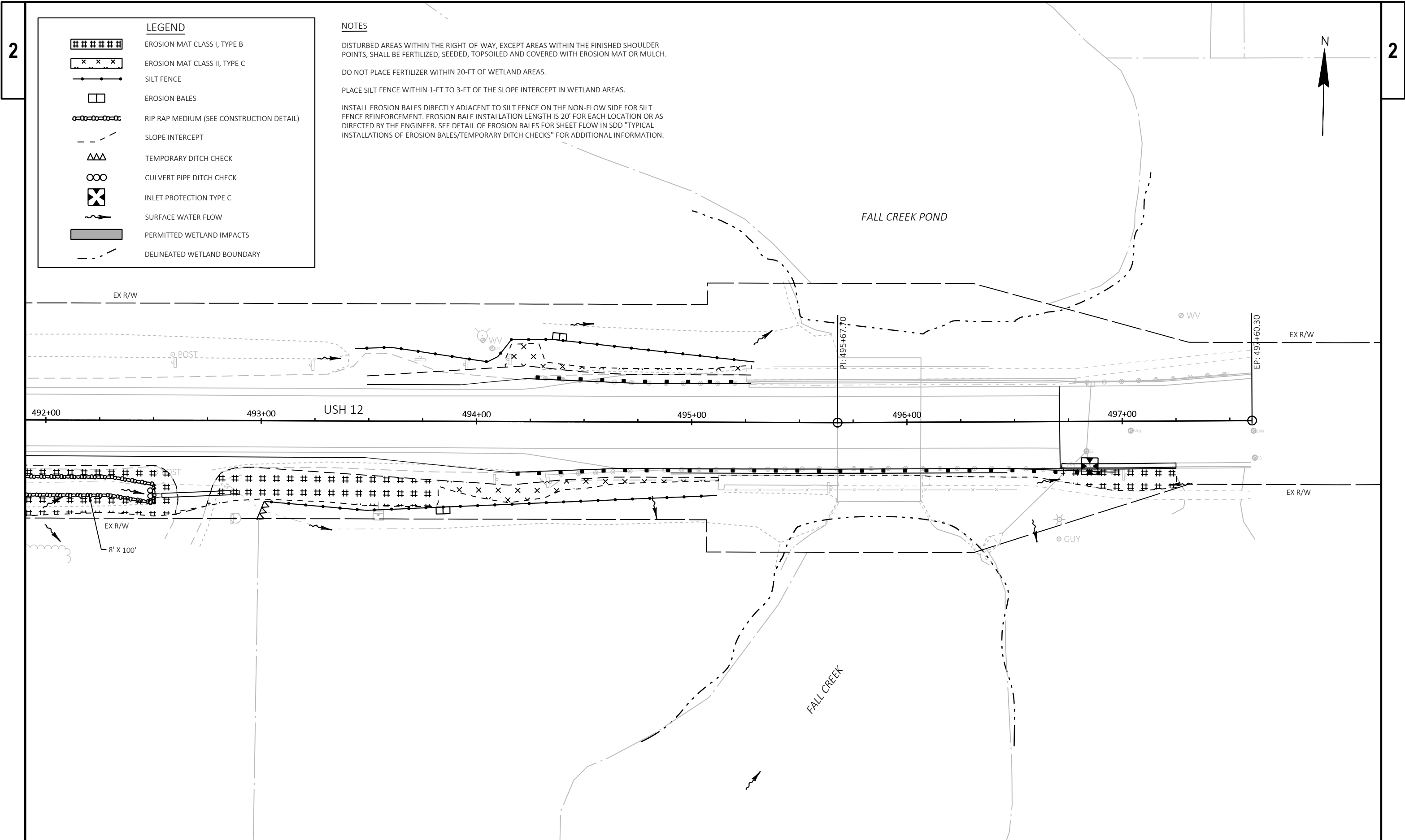
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NOTES

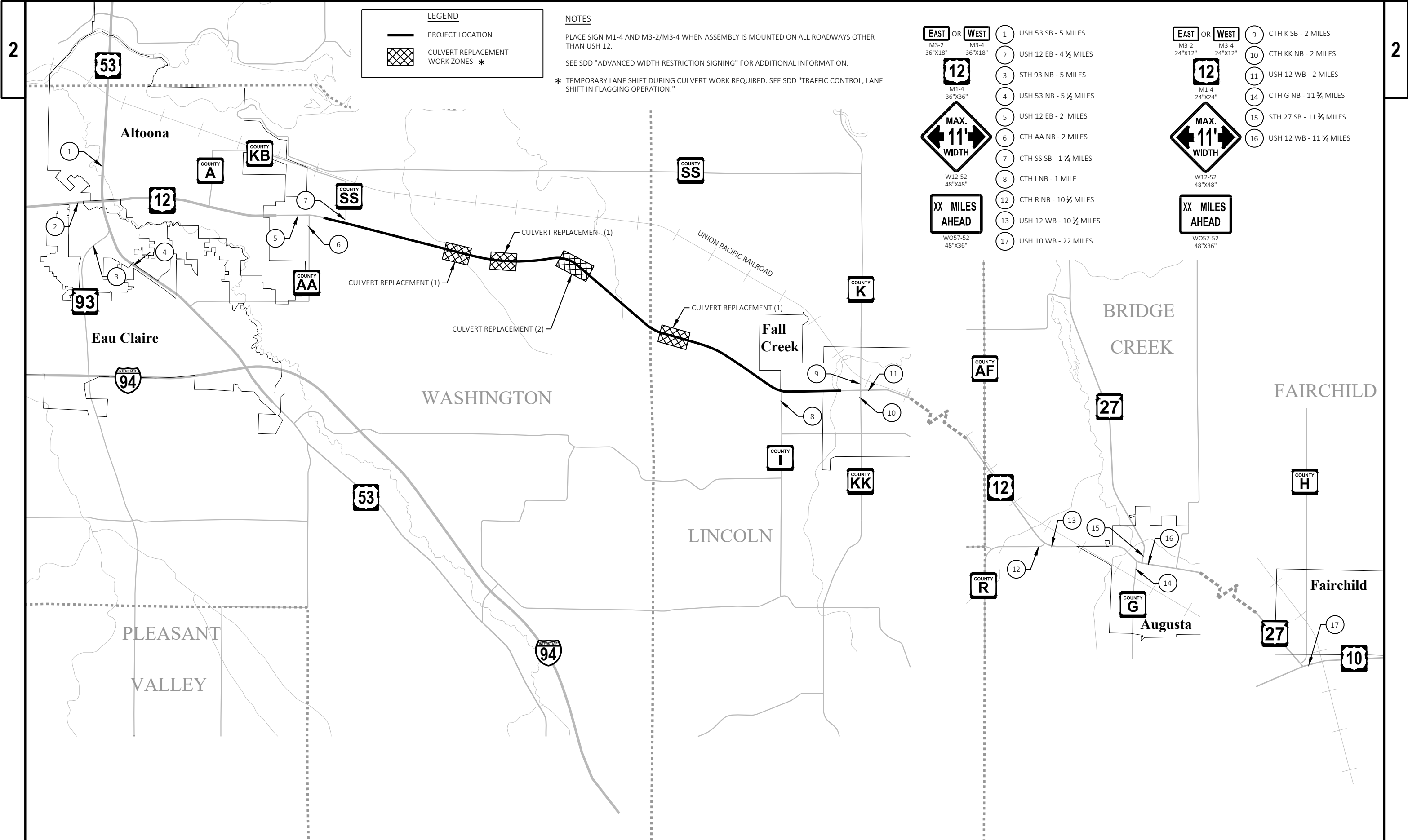
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PROJECT NO: 7080-01-73

HWY: USH 12

COUNTY: EAU CLAIRE

TRAFFIC CONTROL WIDTH RESTRICTION

SHEET

E

Estimate Of Quantities

7080-01-73

| Line | Item       | Item Description                                                                     | Unit | Total       | Qty         |
|------|------------|--------------------------------------------------------------------------------------|------|-------------|-------------|
| 0002 | 201.0105   | Clearing                                                                             | STA  | 8.000       | 8.000       |
| 0004 | 201.0205   | Grubbing                                                                             | STA  | 8.000       | 8.000       |
| 0006 | 202.0105   | Roadside Clearing                                                                    | STA  | 62.000      | 62.000      |
| 0008 | 203.0100   | Removing Small Pipe Culverts                                                         | EACH | 4.000       | 4.000       |
| 0010 | 203.0220   | Removing Structure (structure) 01. STA 227+67                                        | EACH | 1.000       | 1.000       |
| 0012 | 203.0220   | Removing Structure (structure) 02. STA 305+81                                        | EACH | 1.000       | 1.000       |
| 0014 | 203.0220   | Removing Structure (structure) 03. STA 317+26                                        | EACH | 1.000       | 1.000       |
| 0016 | 204.0100   | Removing Concrete Pavement                                                           | SY   | 1,420.000   | 1,420.000   |
| 0018 | 204.0110   | Removing Asphaltic Surface                                                           | SY   | 50.000      | 50.000      |
| 0020 | 204.0115   | Removing Asphaltic Surface Butt Joints                                               | SY   | 500.000     | 500.000     |
| 0022 | 204.0120   | Removing Asphaltic Surface Milling                                                   | SY   | 118,400.000 | 118,400.000 |
| 0024 | 204.0150   | Removing Curb & Gutter                                                               | LF   | 53.000      | 53.000      |
| 0026 | 204.0165   | Removing Guardrail                                                                   | LF   | 1,540.000   | 1,540.000   |
| 0028 | 204.0180   | Removing Delineators and Markers                                                     | EACH | 44.000      | 44.000      |
| 0030 | 205.0100   | Excavation Common                                                                    | CY   | 4,595.000   | 4,595.000   |
| 0032 | 208.1500.S | Temporary Lane Shift During Culvert Work                                             | EACH | 10.000      | 10.000      |
| 0034 | 209.1500   | Backfill Granular Grade 1                                                            | TON  | 3.000       | 3.000       |
| 0036 | 211.0101   | Prepare Foundation for Asphaltic Paving (project) 01. 7080-01-73                     | EACH | 1.000       | 1.000       |
| 0038 | 211.0400   | Prepare Foundation for Asphaltic Shoulders                                           | STA  | 635.000     | 635.000     |
| 0040 | 213.0100   | Finishing Roadway (project) 01. 7080-01-73                                           | EACH | 1.000       | 1.000       |
| 0042 | 305.0110   | Base Aggregate Dense 3/4-Inch                                                        | TON  | 4,500.000   | 4,500.000   |
| 0044 | 305.0120   | Base Aggregate Dense 1 1/4-Inch                                                      | TON  | 2,500.000   | 2,500.000   |
| 0046 | 416.0610   | Drilled Tie Bars                                                                     | EACH | 20.000      | 20.000      |
| 0048 | 455.0605   | Tack Coat                                                                            | GAL  | 15,760.000  | 15,760.000  |
| 0050 | 460.0105.S | HMA Percent Within Limits (PWL) Test Strip Volumetrics                               | EACH | 1.000       | 1.000       |
| 0052 | 460.0110.S | HMA Percent Within Limits (PWL) Test Strip Density                                   | EACH | 2.000       | 2.000       |
| 0054 | 460.2005   | Incentive Density PWL HMA Pavement                                                   | DOL  | 16,480.000  | 16,480.000  |
| 0056 | 460.2007   | Incentive Density HMA Pavement Longitudinal Joints                                   | DOL  | 13,600.000  | 13,600.000  |
| 0058 | 460.2010   | Incentive Air Voids HMA Pavement                                                     | DOL  | 24,320.000  | 24,320.000  |
| 0060 | 460.6645   | HMA Pavement 5 MT 58-34 V                                                            | TON  | 24,320.000  | 24,320.000  |
| 0062 | 460.9000.S | Material Transfer Vehicle                                                            | EACH | 1.000       | 1.000       |
| 0064 | 465.0105   | Asphaltic Surface                                                                    | TON  | 950.000     | 950.000     |
| 0066 | 465.0110   | Asphaltic Surface Patching                                                           | TON  | 250.000     | 250.000     |
| 0068 | 465.0120   | Asphaltic Surface Driveways and Field Entrances                                      | TON  | 340.000     | 340.000     |
| 0070 | 465.0520   | Asphaltic Rumble Strips, Shoulder                                                    | LF   | 59,750.000  | 59,750.000  |
| 0072 | 465.0560   | Asphaltic Rumble Strips, Centerline                                                  | LF   | 28,090.000  | 28,090.000  |
| 0074 | 520.2030   | Culvert Pipe Temporary 30-Inch                                                       | LF   | 30.000      | 30.000      |
| 0076 | 520.2036   | Culvert Pipe Temporary 36-Inch                                                       | LF   | 40.000      | 40.000      |
| 0078 | 520.8700   | Cleaning Culvert Pipes                                                               | EACH | 12.000      | 12.000      |
| 0080 | 521.1518   | Apron Endwalls for Culvert Pipe Sloped Side Drains Steel 18-Inch 6 to 1              | EACH | 6.000       | 6.000       |
| 0082 | 522.0130   | Culvert Pipe Reinforced Concrete Class III 30-Inch                                   | LF   | 74.000      | 74.000      |
| 0084 | 522.0136   | Culvert Pipe Reinforced Concrete Class III 36-Inch                                   | LF   | 64.000      | 64.000      |
| 0086 | 522.0418   | Culvert Pipe Reinforced Concrete Class IV 18-Inch                                    | LF   | 110.000     | 110.000     |
| 0088 | 522.0430   | Culvert Pipe Reinforced Concrete Class IV 30-Inch                                    | LF   | 56.000      | 56.000      |
| 0090 | 522.1030   | Apron Endwalls for Culvert Pipe Reinforced Concrete 30-Inch                          | EACH | 4.000       | 4.000       |
| 0092 | 522.1036   | Apron Endwalls for Culvert Pipe Reinforced Concrete 36-Inch                          | EACH | 2.000       | 2.000       |
| 0094 | 522.2424   | Culvert Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 24x38-Inch        | LF   | 60.000      | 60.000      |
| 0096 | 522.2434   | Culvert Pipe Reinforced Concrete Horizontal Elliptical Class HE-IV 34x53-Inch        | LF   | 60.000      | 60.000      |
| 0098 | 522.2624   | Apron Endwalls for Culvert Pipe Reinforced Concrete Horizontal Elliptical 24x38-Inch | EACH | 2.000       | 2.000       |

Estimate Of Quantities

7080-01-73

| Line | Item     | Item Description                                                                     | Unit | Total       | Qty         |
|------|----------|--------------------------------------------------------------------------------------|------|-------------|-------------|
| 0100 | 522.2634 | Apron Endwalls for Culvert Pipe Reinforced Concrete Horizontal Elliptical 34x53-Inch | EACH | 2.000       | 2.000       |
| 0102 | 601.0409 | Concrete Curb & Gutter 30-Inch Type A                                                | LF   | 53.000      | 53.000      |
| 0104 | 606.0200 | Riprap Medium                                                                        | CY   | 85.000      | 85.000      |
| 0106 | 614.0397 | Guardrail Mow Strip Emulsified Asphalt                                               | SY   | 93.000      | 93.000      |
| 0108 | 614.0400 | Adjusting Steel Plate Beam Guard                                                     | LF   | 438.000     | 438.000     |
| 0110 | 614.2300 | MGS Guardrail 3                                                                      | LF   | 663.000     | 663.000     |
| 0112 | 614.2330 | MGS Guardrail 3 K                                                                    | LF   | 138.000     | 138.000     |
| 0114 | 614.2500 | MGS Thrie Beam Transition                                                            | LF   | 39.000      | 39.000      |
| 0116 | 614.2610 | MGS Guardrail Terminal EAT                                                           | EACH | 9.000       | 9.000       |
| 0118 | 618.0100 | Maintenance and Repair of Haul Roads (project) 01. 7080-01-73                        | EACH | 1.000       | 1.000       |
| 0120 | 619.1000 | Mobilization                                                                         | EACH | 1.000       | 1.000       |
| 0122 | 624.0100 | Water                                                                                | MGAL | 50.000      | 50.000      |
| 0124 | 625.0100 | Topsoil                                                                              | SY   | 9,900.000   | 9,900.000   |
| 0126 | 627.0200 | Mulching                                                                             | SY   | 890.000     | 890.000     |
| 0128 | 628.1104 | Erosion Bales                                                                        | EACH | 160.000     | 160.000     |
| 0130 | 628.1504 | Silt Fence                                                                           | LF   | 4,320.000   | 4,320.000   |
| 0132 | 628.1520 | Silt Fence Maintenance                                                               | LF   | 4,320.000   | 4,320.000   |
| 0134 | 628.1905 | Mobilizations Erosion Control                                                        | EACH | 5.000       | 5.000       |
| 0136 | 628.1910 | Mobilizations Emergency Erosion Control                                              | EACH | 4.000       | 4.000       |
| 0138 | 628.2004 | Erosion Mat Class I Type B                                                           | SY   | 8,140.000   | 8,140.000   |
| 0140 | 628.2027 | Erosion Mat Class II Type C                                                          | SY   | 870.000     | 870.000     |
| 0142 | 628.7015 | Inlet Protection Type C                                                              | EACH | 1.000       | 1.000       |
| 0144 | 628.7504 | Temporary Ditch Checks                                                               | LF   | 460.000     | 460.000     |
| 0146 | 628.7555 | Culvert Pipe Checks                                                                  | EACH | 60.000      | 60.000      |
| 0148 | 629.0210 | Fertilizer Type B                                                                    | CWT  | 7.000       | 7.000       |
| 0150 | 630.0130 | Seeding Mixture No. 30                                                               | LB   | 450.000     | 450.000     |
| 0152 | 630.0500 | Seed Water                                                                           | MGAL | 170.000     | 170.000     |
| 0154 | 633.0100 | Delineator Posts Steel                                                               | EACH | 34.000      | 34.000      |
| 0156 | 633.0500 | Delineator Reflectors                                                                | EACH | 34.000      | 34.000      |
| 0158 | 633.5200 | Markers Culvert End                                                                  | EACH | 44.000      | 44.000      |
| 0160 | 634.0614 | Posts Wood 4x6-Inch X 14-FT                                                          | EACH | 5.000       | 5.000       |
| 0162 | 638.2102 | Moving Signs Type II                                                                 | EACH | 11.000      | 11.000      |
| 0164 | 638.3000 | Removing Small Sign Supports                                                         | EACH | 5.000       | 5.000       |
| 0166 | 638.4000 | Moving Small Sign Supports                                                           | EACH | 11.000      | 11.000      |
| 0168 | 642.5001 | Field Office Type B                                                                  | EACH | 1.000       | 1.000       |
| 0170 | 643.0300 | Traffic Control Drums                                                                | DAY  | 1,500.000   | 1,500.000   |
| 0172 | 643.0900 | Traffic Control Signs                                                                | DAY  | 4,795.000   | 4,795.000   |
| 0174 | 643.1000 | Traffic Control Signs Fixed Message                                                  | SF   | 64.000      | 64.000      |
| 0176 | 643.3165 | Temporary Marking Line Paint 6-Inch                                                  | LF   | 114,800.000 | 114,800.000 |
| 0178 | 643.5000 | Traffic Control                                                                      | EACH | 1.000       | 1.000       |
| 0180 | 644.1810 | Temporary Pedestrian Barricade                                                       | LF   | 24.000      | 24.000      |
| 0182 | 645.0120 | Geotextile Type HR                                                                   | SY   | 245.000     | 245.000     |
| 0184 | 646.2040 | Marking Line Grooved Wet Ref Epoxy 6-Inch                                            | LF   | 106,800.000 | 106,800.000 |
| 0186 | 646.4040 | Marking Line Grooved Wet Ref Epoxy 10-Inch                                           | LF   | 310.000     | 310.000     |
| 0188 | 650.4500 | Construction Staking Subgrade                                                        | LF   | 193.000     | 193.000     |
| 0190 | 650.5000 | Construction Staking Base                                                            | LF   | 2,759.000   | 2,759.000   |
| 0192 | 650.5500 | Construction Staking Curb Gutter and Curb & Gutter                                   | LF   | 53.000      | 53.000      |
| 0194 | 650.6000 | Construction Staking Pipe Culverts                                                   | EACH | 5.000       | 5.000       |
| 0196 | 650.8000 | Construction Staking Resurfacing Reference                                           | LF   | 33,953.000  | 33,953.000  |

Estimate Of Quantities

| 7080-01-73 |          |                                                                    |      |            |            |
|------------|----------|--------------------------------------------------------------------|------|------------|------------|
| Line       | Item     | Item Description                                                   | Unit | Total      | Qty        |
| 0198       | 650.9911 | Construction Staking Supplemental Control (project) 01. 7080-01-73 | EACH | 1.000      | 1.000      |
| 0200       | 650.9920 | Construction Staking Slope Stakes                                  | LF   | 2,952.000  | 2,952.000  |
| 0202       | 690.0150 | Sawing Asphalt                                                     | LF   | 2,320.000  | 2,320.000  |
| 0204       | 690.0250 | Sawing Concrete                                                    | LF   | 156.000    | 156.000    |
| 0206       | 740.0440 | Incentive IRI Ride                                                 | DOL  | 25,720.000 | 25,720.000 |
| 0208       | ASP.1T0A | On-the-Job Training Apprentice at \$5.00/HR                        | HRS  | 2,400.000  | 2,400.000  |
| 0210       | ASP.1T0G | On-the-Job Training Graduate at \$5.00/HR                          | HRS  | 990.000    | 990.000    |
| 0212       | SPV.0060 | Special 01. Inlet Covers Type H-D                                  | EACH | 1.000      | 1.000      |
| 0214       | SPV.0090 | Special 01. Concrete Curb and Gutter Cure and Seal Treatment       | LF   | 53.000     | 53.000     |
| 0216       | SPV.0090 | Special 02. Treated Timber Rub Rail                                | LF   | 160.000    | 160.000    |

3

CLEARING & GRUBBING ITEMS

| CATEGORY | STATION | TO | STATION | OFFSET  | 201.0105<br>CLEARING<br>STA | 201.0205<br>GRUBBING<br>STA | 202.0105<br>ROADSIDE CLEARING<br>STA |
|----------|---------|----|---------|---------|-----------------------------|-----------------------------|--------------------------------------|
| 0010     | 206+00  | -  | 209+00  | LT      | 3                           | 3                           | --                                   |
|          | 227+00  | -  | 228+00  | LT      | 1                           | 1                           | --                                   |
|          | 305+00  | -  | 308+00  | LT      | 3                           | 3                           | --                                   |
|          | 328+00  | -  | 343+00  | RT      | --                          | --                          | 15                                   |
|          | 354+00  | -  | 357+00  | RT      | --                          | --                          | 3                                    |
|          | 358+00  | -  | 360+00  | RT      | --                          | --                          | 2                                    |
|          | 390+00  | -  | 391+00  | RT      | 1                           | 1                           | --                                   |
|          | 401+00  | -  | 411+00  | RT      | --                          | --                          | 10                                   |
|          | 413+00  | -  | 432+00  | LT & RT | --                          | --                          | 19                                   |
|          | 432+00  | -  | 441+00  | RT      | --                          | --                          | 9                                    |
|          | 444+00  | -  | 448+00  | RT      | --                          | --                          | 4                                    |
| TOTALS   |         |    |         |         | 8                           | 8                           | 62                                   |

TEMPORARY LANE SHIFT ITEM

| CATEGORY | STATION | OFFSET  | 208.1500.S<br>TEMPORARY LANE SHIFT<br>DURING CULVERT WORK<br>EACH |
|----------|---------|---------|-------------------------------------------------------------------|
| 0010     | 227+67  | LT & RT | 2                                                                 |
|          | 253+94  | LT & RT | 2                                                                 |
|          | 305+81  | LT & RT | 2                                                                 |
|          | 317+26  | LT & RT | 2                                                                 |
|          | 390+28  | LT & RT | 2                                                                 |
| TOTAL    |         |         | 10                                                                |

3

REMOVAL ITEMS

| CATEGORY | STATION | TO | STATION | OFFSET  | 204.0100<br>REMOVING CONCRETE<br>PAVEMENT<br>SY | 204.0110<br>REMOVING ASPHALTIC<br>SURFACE<br>SY | 204.0115<br>REMOVING ASPHALTIC<br>SURFACE BUTT JOINTS<br>SY | 204.0120<br>REMOVING ASPHALTIC<br>SURFACE MILLING<br>SY | 204.0150<br>REMOVING CURB &<br>GUTTER<br>LF | 204.0165<br>REMOVING<br>GUARDRAIL<br>LF | COMMENTS                        |
|----------|---------|----|---------|---------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|-----------------------------------------|---------------------------------|
| 0010     | 157+18  | -  | 238+61  | LT & RT | 237                                             | --                                              | 195                                                         | 29,000                                                  | --                                          | --                                      | MAINLINE & CULVERT REPLACEMENT  |
|          | 205+60  | -  | 208+40  | LT      | --                                              | --                                              | --                                                          | --                                                      | --                                          | 280                                     | GUARDRAIL REPLACEMENT           |
|          | 226+18  | -  | 229+28  | LT & RT | 237                                             | --                                              | --                                                          | --                                                      | --                                          | 610                                     | GUARDRAIL & CULVERT REPLACEMENT |
|          | 238+61  | -  | 320+50  | LT & RT | 709                                             | --                                              | 50                                                          | 28,080                                                  | --                                          | --                                      | MAINLINE & CULVERT REPLACEMENT  |
|          | 320+50  | -  | 393+00  | LT & RT | 237                                             | --                                              | 105                                                         | 25,100                                                  | --                                          | --                                      | MAINLINE & CULVERT REPLACEMENT  |
|          | 393+00  | -  | 497+25  | LT & RT | --                                              | --                                              | 150                                                         | 36,220                                                  | --                                          | --                                      | MAINLINE                        |
|          | 448+22  | -  | 452+10  | RT      | --                                              | 50                                              | --                                                          | --                                                      | --                                          | 280                                     | GUARDRAIL REMOVAL               |
|          | 494+30  | -  | 497+25  | LT & RT | --                                              | --                                              | --                                                          | --                                                      | 53                                          | 370                                     | GUARDRAIL REPLACEMENT           |
| TOTALS   |         |    |         |         | 1,420                                           | 50                                              | 500                                                         | 118,400                                                 | 53                                          | 1,540                                   |                                 |

REMOVING CULVERT AND STRUCTURE ITEMS

| CATEGORY | STATION | OFFSET  | 203.0100<br>REMOVING SMALL<br>PIPE CULVERTS<br>EACH | 203.0220.01<br>REMOVING STRUCTURE<br>(STA 227+67)<br>EACH | 203.0220.02<br>REMOVING STRUCTURE<br>(STA 305+81)<br>EACH | 203.0220.03<br>REMOVING STRUCTURE<br>(STA 317+26)<br>EACH | COMMENTS                             |
|----------|---------|---------|-----------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|--------------------------------------|
| 0010     | 225+90  | RT      | 1                                                   | --                                                        | --                                                        | --                                                        | 18" POLYETHYLENE CULVERT PIPE        |
|          | 227+67  | LT & RT | --                                                  | 1                                                         | --                                                        | --                                                        | 42" X 72" CONCRETE CATTLE PASS       |
|          | 253+94  | LT & RT | 1                                                   | --                                                        | --                                                        | --                                                        | 30" CULVERT PIPE REINFORCED CONCRETE |
|          | 305+81  | LT & RT | --                                                  | --                                                        | 1                                                         | --                                                        | 42" X 72" CONCRETE CATTLE PASS       |
|          | 317+26  | LT & RT | --                                                  | --                                                        | --                                                        | 1                                                         | 48" X 24" CONCRETE BOX CULVERT       |
|          | 390+28  | LT & RT | 1                                                   | --                                                        | --                                                        | --                                                        | 36" CULVERT PIPE REINFORCED CONCRETE |
|          | 492+70  | RT      | 1                                                   | --                                                        | --                                                        | --                                                        | 18" CULVERT PIPE CORRUGATED STEEL    |
| TOTALS   |         |         | 4                                                   | 1                                                         | 1                                                         | 1                                                         |                                      |

| EARTHWORK SUMMARY |          |    |         |                                                                 |                                          |                                                            |                                   |                    |                           |                                  |
|-------------------|----------|----|---------|-----------------------------------------------------------------|------------------------------------------|------------------------------------------------------------|-----------------------------------|--------------------|---------------------------|----------------------------------|
| DIVISION          | STATION  | TO | STATION | LOCATION                                                        | 205.0100                                 | SALVAGED/UNUSABLE<br>PAVEMENT MATERIAL<br>(NOTE 2)<br>(CY) | AVAILABLE<br>MATERIAL<br>(NOTE 3) | UNEXPANDED<br>FILL | EXPANDED FILL<br>(NOTE 4) | MASS ORDINATE<br>+/-<br>(NOTE 5) |
|                   |          |    |         |                                                                 | EXCAVATION<br>COMMON<br>(NOTE 1)<br>(CY) |                                                            |                                   |                    | FACTOR<br>1.25            |                                  |
| 1                 | 227+14   | -  | 228+20  | CULVERT REPLACEMENT TRANSITION CUT                              | 653                                      | 227                                                        | 426                               | --                 | --                        | 426                              |
|                   | 253+41   | -  | 254+47  | CULVERT REPLACEMENT TRANSITION CUT                              | 402                                      | 207                                                        | 195                               | --                 | --                        | 195                              |
|                   | 305+28   | -  | 306+34  | CULVERT REPLACEMENT TRANSITION CUT                              | 596                                      | 207                                                        | 389                               | --                 | --                        | 389                              |
|                   | 316+73   | -  | 317+79  | CULVERT REPLACEMENT TRANSITION CUT                              | 379                                      | 207                                                        | 172                               | --                 | --                        | 172                              |
|                   | 389+75   | -  | 390+81  | CULVERT REPLACEMENT TRANSITION CUT                              | 371                                      | 207                                                        | 164                               | --                 | --                        | 164                              |
|                   | SUBTOTAL |    |         |                                                                 |                                          | 2,401                                                      | 1,057                             | 1,344              | --                        | --                               |
| 2                 | 227+14   | -  | 228+20  | CULVERT STAGING - TEMPORARY BASE REMOVAL AT PAVEMENT PATCH (6") | 60                                       | --                                                         | 60                                | --                 | --                        | 60                               |
|                   | 253+41   | -  | 254+47  | CULVERT STAGING - TEMPORARY BASE REMOVAL AT PAVEMENT PATCH (6") | 60                                       | --                                                         | 60                                | --                 | --                        | 60                               |
|                   | 305+28   | -  | 306+34  | CULVERT STAGING - TEMPORARY BASE REMOVAL AT PAVEMENT PATCH (6") | 70                                       | --                                                         | 70                                | --                 | --                        | 70                               |
|                   | 316+73   | -  | 317+79  | CULVERT STAGING - TEMPORARY BASE REMOVAL AT PAVEMENT PATCH (6") | 60                                       | --                                                         | 60                                | --                 | --                        | 60                               |
|                   | 389+75   | -  | 390+81  | CULVERT STAGING - TEMPORARY BASE REMOVAL AT PAVEMENT PATCH (6") | 60                                       | --                                                         | 60                                | --                 | --                        | 60                               |
|                   | SUBTOTAL |    |         |                                                                 |                                          | 310                                                        | --                                | 309                | --                        | --                               |
| 3                 | 158+80   | -  | 487+90  | DRIVEWAY REPLACEMENTS                                           | 585                                      | 195                                                        | 390                               | --                 | --                        | 390                              |
|                   | SUBTOTAL |    |         |                                                                 |                                          | 585                                                        | 195                               | 390                | --                        | --                               |
| 4                 | 204+41   | -  | 209+59  | GUARDRAIL, LT                                                   | 80                                       | 57                                                         | 23                                | 72                 | 90                        | -67                              |
|                   | 224+89   | -  | 230+45  | GUARDRAIL, LT                                                   | 83                                       | 68                                                         | 15                                | 111                | 139                       | -124                             |
|                   | 224+89   | -  | 230+57  | GUARDRAIL, RT                                                   | 142                                      | 70                                                         | 71                                | 120                | 149                       | -78                              |
|                   | 300+75   | -  | 306+47  | DITCH GRADING, RT                                               | 107                                      | 83                                                         | 24                                | 141                | 176                       | -151                             |
|                   | 488+88   | -  | 496+71  | DITCH GRADING AND GUARDRAIL, RT                                 | 393                                      | 136                                                        | 258                               | 141                | 176                       | 82                               |
|                   | 493+49   | -  | 495+25  | GUARDRAIL, LT                                                   | 38                                       | 29                                                         | 9                                 | 1                  | 1                         | 8                                |
|                   | 11+20    | -  | 13+13   | DITCH GRADING                                                   | 455                                      | --                                                         | 455                               | --                 | --                        | 455                              |
| SUBTOTAL          |          |    |         |                                                                 | 1,299                                    | 443                                                        | 856                               | 585                | 731                       | 125                              |
| PROJECT TOTAL     |          |    |         |                                                                 | 4,595                                    | 1,694                                                      | 2,900                             | 585                | 731                       | 2,169                            |

NOTES:  
1) SALVAGED/UNSUABLE PAVEMENT MATERIAL IS INCLUDED IN CUT  
2) SALVAGED/UNUSABLE PAVEMENT MATERIAL = (AREA OF PROJECT PAVEMENT) \* (TYPICAL DEPTH)  
3) AVAILABLE MATERIAL = CUT - SALVAGED/UNUSUABLE PAVEMENT MATERIAL  
4) EXPANDED FILL = (UNEXPANDED FILL) \* (FILL FACTOR)  
5) MASS ORDINATE = AVAILABLE MATERIAL - (EXPANDED FILL); POSITIVE INDICATES AN EXCESS OF MATERIAL

| BASE AGGREGATE ITEMS |         |    |         |         |                                     |                                         |                                           |                                           |
|----------------------|---------|----|---------|---------|-------------------------------------|-----------------------------------------|-------------------------------------------|-------------------------------------------|
| CATEGORY             | STATION | TO | STATION | OFFSET  | 209.1500                            | 305.0110                                | 305.0120                                  | COMMENTS                                  |
|                      |         |    |         |         | BACKFILL GRANULAR<br>GRADE 1<br>TON | BASE AGGREGATE<br>DENSE 3/4-INCH<br>TON | BASE AGGREGATE<br>DENSE 1 1/4-INCH<br>TON |                                           |
| 0010                 | 157+18  | -  | 238+61  | LT & RT | --                                  | 921                                     | 480                                       | MAINLINE SHOULDERS & CULVERT REPLACEMENT  |
|                      | 204+41  | -  | 209+59  | LT      | --                                  | 60                                      | 60                                        | GUARDRAIL REPLACEMENT                     |
|                      | 224+89  | -  | 230+57  | LT & RT | --                                  | 125                                     | 110                                       | GUARDRAIL REPLACEMENT                     |
|                      | 238+61  | -  | 320+50  | LT & RT | --                                  | 1,029                                   | 1,360                                     | MAINLINE SHOULDERS & CULVERT REPLACEMENTS |
|                      | 320+50  | -  | 393+00  | LT & RT | --                                  | 1,025                                   | 450                                       | MAINLINE SHOULDERS & CULVERT REPLACEMENT  |
|                      | 393+00  | -  | 497+25  | LT & RT | --                                  | 1,250                                   | --                                        | MAINLINE SHOULDERS                        |
|                      | 448+22  | -  | 452+10  | RT      | 3                                   | 40                                      | --                                        | GUARDRAIL REMOVAL                         |
|                      | 493+49  | -  | 497+25  | LT & RT | --                                  | 50                                      | 40                                        | GUARDRAIL REPLACEMENT                     |
|                      | TOTALS  |    |         |         | 3                                   | 4,500                                   | 2,500                                     |                                           |
|                      |         |    |         |         |                                     |                                         |                                           |                                           |

NOTES:  
CULVERT REPLACEMENTS INCLUDE ADDITIONAL QUANTITY TO PLACE TEMPORARY BASE AGGREGATE (6") LEVEL WITH EXISTING ASPHALT SURFACE DURING CULVERT STAGING OVERNIGHT OR UNTIL PAVED.  
REMOVAL OF THE TEMPORARY BASE AGGREGATE (6") AT THE CULVERT STAGING LOCATIONS IS PART OF THE EXCAVATION COMMON QUANTITIES.  
BACKFILL GRANULAR IS INCLUDED TO FILL EXISTING POST HOLES AFTER REMOVAL OF GUARDRAIL (SEE CONSTRUCTION DETAIL).

| WATER    |          |                  |
|----------|----------|------------------|
| CATEGORY | LOCATION | 624.0100<br>MGAL |
| 0010     | PROJECT  | 50               |
| TOTAL    |          | 50               |

| ASPHALTIC ITEMS      |                      |    |         |         |                                                              |                              |                                                                                    |                                                                                |                                                    |                                      |                                                  |                                                                          |                                                           |                                                            |
|----------------------|----------------------|----|---------|---------|--------------------------------------------------------------|------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------|
|                      |                      |    |         |         | 211.0400<br>PREPARE FOUNDATION<br>FOR ASPHALTIC<br>SHOULDERS | 455.0605<br>TACK COAT<br>GAL | 460.0105.S<br>HMA PERCENT WITHIN<br>LIMITS (PWL) TEST<br>STRIP VOLUMETRICS<br>EACH | 460.0110.S<br>HMA PERCENT<br>WITHIN LIMITS (PWL)<br>TEST STRIP DENSITY<br>EACH | 460.6645<br>HMA<br>PAVEMENT 5<br>MT 58-34 V<br>TON | 465.0105<br>ASPHALTIC SURFACE<br>TON | 465.0110<br>ASPHALTIC SURFACE<br>PATCHING<br>TON | 465.0120<br>ASPHALTIC SURFACE<br>DRIVEWAYS AND<br>FIELD ENTRANCES<br>TON | 465.0520<br>ASPHALTIC<br>RUMBLE STRIPS,<br>SHOULDER<br>LF | 465.0560<br>ASPHALTIC<br>RUMBLE STRIPS<br>CENTERLINE<br>LF |
| CATEGORY             | STATION              | TO | STATION | OFFSET  | STA                                                          |                              |                                                                                    |                                                                                |                                                    |                                      |                                                  |                                                                          |                                                           |                                                            |
| 0010                 | 157+18               | -  | 238+61  | LT & RT | --                                                           | 3,605                        | --                                                                                 | --                                                                             | 5,470                                              | 130                                  | --                                               | 184                                                                      | --                                                        | 5,696                                                      |
|                      | 238+61               | -  | 320+50  | LT & RT | --                                                           | 3,380                        | --                                                                                 | --                                                                             | 5,126                                              | 390                                  | --                                               | 74                                                                       | --                                                        | 7,190                                                      |
|                      | 320+50               | -  | 393+00  | LT & RT | --                                                           | 3,025                        | --                                                                                 | --                                                                             | 4,591                                              | 130                                  | --                                               | --                                                                       | --                                                        | 6,450                                                      |
|                      | 393+00               | -  | 497+25  | LT & RT | --                                                           | 4,370                        | --                                                                                 | --                                                                             | 6,633                                              | --                                   | --                                               | 82                                                                       | --                                                        | 8,754                                                      |
|                      | UNDISTRIBUTED        |    |         |         |                                                              | --                           | --                                                                                 | 1                                                                              | 2                                                  | --                                   | 300                                              | 250                                                                      | --                                                        | --                                                         |
| CATEGORY 0010 TOTALS |                      |    |         |         | --                                                           | 14,380                       | 1                                                                                  | 2                                                                              | 21,820                                             | 950                                  | 250                                              | 340                                                                      | --                                                        | 28,090                                                     |
| 0020                 | 157+18               | -  | 238+61  | LT & RT | 146                                                          | 291                          | --                                                                                 | --                                                                             | 524                                                | --                                   | --                                               | --                                                                       | 13,300                                                    | --                                                         |
|                      | 238+61               | -  | 320+50  | LT & RT | 156                                                          | 354                          | --                                                                                 | --                                                                             | 645                                                | --                                   | --                                               | --                                                                       | 14,730                                                    | --                                                         |
|                      | 320+50               | -  | 393+00  | LT & RT | 138                                                          | 305                          | --                                                                                 | --                                                                             | 554                                                | --                                   | --                                               | --                                                                       | 13,260                                                    | --                                                         |
|                      | 393+00               | -  | 497+25  | LT & RT | 195                                                          | 430                          | --                                                                                 | --                                                                             | 777                                                | --                                   | --                                               | --                                                                       | 18,460                                                    | --                                                         |
|                      | CATEGORY 0020 TOTALS |    |         |         |                                                              | 635                          | 1,380                                                                              | --                                                                             | --                                                 | 2,500                                | --                                               | --                                                                       | --                                                        | 59,750                                                     |
| TOTALS               |                      |    |         |         | 635                                                          | 15,760                       | 1                                                                                  | 2                                                                              | 24,320                                             | 950                                  | 250                                              | 340                                                                      | 59,750                                                    | 28,090                                                     |

NOTES:  
UNDISTRIBUTED ASPHALTIC SURFACE USED FOR WEDGING, LEVELING, AND SPOT LANE FAILURES AFTER MILLING.  
UNDISTRIBUTED ASPHALTIC SURFACE PATCHING USED FOR MISCELLANEOUS REPAIRS DESIGNATED BY THE ENGINEER.

ASPHALTIC MATERIAL/HMA ACCEPTANCE TABLE

| LOCATION                                                                  | STA     | TO STA   | MIXTURE USE                                                         | UNDERLYING SURFACE                               | BID ITEM                                                 | TONS  | THICKNESS | QUALITY MANAGEMENT PROGRAM TO BE USED FOR:       |                                                                        |
|---------------------------------------------------------------------------|---------|----------|---------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------|-------|-----------|--------------------------------------------------|------------------------------------------------------------------------|
|                                                                           |         |          |                                                                     |                                                  |                                                          |       |           | MIXTURE ACCEPTANCE                               | DENSITY ACCEPTANCE                                                     |
| 12 FOOT DRIVING LANE                                                      | 157+18  | - 496+71 | UPPER LAYER                                                         | 5 MT 58-34 V                                     | 5 MT 58-34 V                                             | 7,605 | 1 1/2"    | PWL INCENTIVE AIR VOIDS<br>HMA PAVEMENT 460.2010 | INCENTIVE DENSITY PWL<br>HMA PAVEMENT 460.2005                         |
| 12 FOOT DRIVING LANE                                                      | 157+18  | - 496+71 | LOWER LAYER                                                         | MILLED EXISTING HMA<br>SURFACE                   | 5 MT 58-34 V                                             | 8,873 | 1 3/4"    | PWL INCENTIVE AIR VOIDS<br>HMA PAVEMENT 460.2010 | INCENTIVE DENSITY PWL<br>HMA PAVEMENT 460.2005                         |
| SHOULDERS, SIDEROADS,<br>BEAMGUARD WIDENINGS,<br>BYPASS LANES, TURN LANES | VARIOUS |          | UPPER LAYER                                                         | 5 MT 58-34 V                                     | 5 MT 58-34 V                                             | 3,618 | 1 1/2"    | PWL INCENTIVE AIR VOIDS<br>HMA PAVEMENT 460.2010 | DEPARTMENT ACCEPTANCE<br>(SS 460.3.3.2); NOT ELIGIBLE<br>FOR INCENTIVE |
| SHOULDERS, SIDEROADS,<br>BEAMGUARD WIDENINGS,<br>BYPASS LANES, TURN LANES | VARIOUS |          | LOWER LAYER                                                         | MILLED EXISTING HMA<br>SURFACE<br>**             | 5 MT 58-34 V                                             | 4,223 | 1 3/4"    | PWL INCENTIVE AIR VOIDS<br>HMA PAVEMENT 460.2010 | DEPARTMENT ACCEPTANCE<br>(SS 460.3.3.2); NOT ELIGIBLE<br>FOR INCENTIVE |
| DRIVEWAYS                                                                 | VARIOUS |          | UPPER LAYER                                                         | BASE AGGREGATE                                   | ASPHALTIC<br>SURFACE<br>DRIVEWAYS AND<br>FIELD ENTRANCES | 330   | 3"        | SS 465                                           | ORDINARY COMPACTION<br>(SS 450.3.2.6.2)                                |
| VARIOUS                                                                   | VARIOUS |          | CULVERT PATCHES,<br>WEDGING, LEVELING,<br>AND SPOT LANE<br>FAILURES | MILLED EXISTING HMA<br>SURFACE/BASE<br>AGGREGATE | ASPHALTIC<br>SURFACE                                     | 950   | VARIES    | SS 465                                           | ORDINARY COMPACTION<br>(SS 450.3.2.6.2)                                |
| VARIOUS                                                                   | VARIOUS |          | MISCELLANEOUS<br>REPAIRS AFTER<br>MILLING                           | MILLED EXISTING HMA<br>SURFACE                   | ASPHALTIC<br>SURFACE PATCHING                            | 250   | VARIES    | SS 465                                           | ORDINARY COMPACTION<br>(SS 450.3.2.6.2)                                |

\*\* ANY RANDOM DENSITY SHOT OVER AGGREGATE WILL USE THE LOWER DENSITY REQUIREMENTS IN THE SPECIFICATIONS BOOK

| INLET COVERS TYPE H-D |         |        |                     |
|-----------------------|---------|--------|---------------------|
| CATEGORY              | STATION | OFFSET | SPV.0060.01<br>EACH |
| 0010                  | 496+85  | RT     | 1                   |
| TOTALS                |         |        | 1                   |

| TEMPORARY CULVERT ITEMS |         |        |                                               |                                               |
|-------------------------|---------|--------|-----------------------------------------------|-----------------------------------------------|
| CATEGORY                | STATION | OFFSET | 520.2030<br>CULVERT PIPE<br>TEMPORARY 30-INCH | 520.2036<br>CULVERT PIPE<br>TEMPORARY 36-INCH |
|                         |         |        | LF                                            | LF                                            |
| 0010                    | 227+67  | LT     | --                                            | 20                                            |
|                         | 227+67  | RT     | --                                            | 20                                            |
|                         | 305+81  | LT     | 10                                            | --                                            |
|                         | 305+81  | RT     | 20                                            | --                                            |
| TOTAL                   |         |        | 30                                            | 40                                            |

NOTES:  
ITEMS ARE PROPOSED FOR USE DURING TEMPORARY LANE SHIFTS FOR CULVERT PIPE INSTALLATION.  
FIELD FIT TO MAINTAIN DRAINAGE DURING TEMPORARY LANE SHIFT OR AS DIRECTED BY ENGINEER.

| CONCRETE CURB & GUTTER ITEMS |         |    |         |        |                                      |                                                               |                                                                         |
|------------------------------|---------|----|---------|--------|--------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------|
| CATEGORY                     | STATION | TO | STATION | OFFSET | 416.0610<br>DRILLED TIE BARS<br>EACH | 601.0409<br>CONCRETE CURB &<br>GUTTER 30-INCH TYPE<br>A<br>LF | SPV.0090.01<br>CONCRETE CURB &<br>GUTTER CURE & SEAL<br>TREATMENT<br>LF |
|                              |         |    |         |        | EACH                                 | LF                                                            | LF                                                                      |
| 0010                         | 496+72  | -  | 497+25  | RT     | 20                                   | 53                                                            | 53                                                                      |
| TOTALS                       |         |    |         |        | 20                                   | 53                                                            | 53                                                                      |

| CULVERT PIPE ITEMS |         |         |                                                |                                   |                                                                                          |                                                                |                                                                |                                                               |                                                               |                                                                           |                                                                           |                                                                                              |                                                                                              |                                                                                                       |                                                                                                       |                                |                                              |
|--------------------|---------|---------|------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------|
|                    |         |         | 204.0180                                       | 520.8700                          | 521.1518                                                                                 | 522.0130                                                       | 522.0136                                                       | 522.0418                                                      | 522.0430                                                      | 522.1030                                                                  | 522.1036                                                                  | 522.2424                                                                                     | 522.2434                                                                                     | 522.2624                                                                                              | 522.2634                                                                                              | 633.5200                       |                                              |
|                    |         |         | REMOVING<br>DELINEATORS<br>AND MARKERS<br>EACH | CLEANING<br>CULVERT PIPES<br>EACH | APRON ENDWALLS FOR<br>CULVERT PIPE SLOPED<br>SIDE DRAINS STEEL<br>18-INCH 6 TO 1<br>EACH | CULVERT PIPE REINFORCED<br>CONCRETE CLASS III<br>30-INCH<br>LF | CULVERT PIPE REINFORCED<br>CONCRETE CLASS III<br>36-INCH<br>LF | CULVERT PIPE REINFORCED<br>CONCRETE CLASS IV<br>18-INCH<br>LF | CULVERT PIPE REINFORCED<br>CONCRETE CLASS IV<br>30-INCH<br>LF | APRON ENDWALLS FOR CULVERT<br>PIPE REINFORCED CONCRETE<br>30-INCH<br>EACH | APRON ENDWALLS FOR CULVERT<br>PIPE REINFORCED CONCRETE<br>36-INCH<br>EACH | CULVERT PIPE REINFORCED<br>CONCRETE<br>HORIZONTAL ELLIPTICAL CLASS HE-IV<br>24X38-INCH<br>LF | CULVERT PIPE REINFORCED<br>CONCRETE<br>HORIZONTAL ELLIPTICAL CLASS HE-IV<br>34X53-INCH<br>LF | APRON ENDWALLS FOR CULVERT<br>PIPE REINFORCED CONCRETE<br>HORIZONTAL ELLIPTICAL<br>24X38-INCH<br>EACH | APRON ENDWALLS FOR CULVERT<br>PIPE REINFORCED CONCRETE<br>HORIZONTAL ELLIPTICAL<br>34X53-INCH<br>EACH | MARKERS<br>CULVERT END<br>EACH |                                              |
| CATEGORY           | STATION | OFFSET  |                                                |                                   |                                                                                          |                                                                |                                                                |                                                               |                                                               |                                                                           |                                                                           |                                                                                              |                                                                                              |                                                                                                       |                                                                                                       |                                | COMMENTS                                     |
| 0010               | 156+03  | LT & RT | 2                                              | --                                | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              |                                              |
|                    | 163+02  | LT & RT | 2                                              | 1                                 | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              | 42" X 72" CONCRETE CULVERT (CATTLE PASS)     |
|                    | 182+82  | LT & RT | 2                                              | 1                                 | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              |                                              |
|                    | 206+75  | LT & RT | 2                                              | --                                | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              | 42" X 72" CONCRETE CULVERT (CATTLE PASS)     |
|                    | 208+56  | LT      | --                                             | --                                | 2                                                                                        | --                                                             | --                                                             | 38                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | --                             |                                              |
|                    | 225+90  | RT      | --                                             | --                                | 2                                                                                        | --                                                             | --                                                             | 40                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | --                             |                                              |
|                    | 227+67  | LT & RT | 2                                              | --                                | --                                                                                       | --                                                             | 64                                                             | --                                                            | --                                                            | --                                                                        | 2                                                                         | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              |                                              |
|                    | 242+25  | LT & RT | 2                                              | 1                                 | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              | 30" CONCRETE CULVERT<br>30" CONCRETE CULVERT |
|                    | 244+94  | LT & RT | 2                                              | 1                                 | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              |                                              |
|                    | 253+94  | LT & RT | 2                                              | --                                | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | 60                                                                                           | --                                                                                           | 2                                                                                                     | --                                                                                                    | 2                              |                                              |
|                    | 275+71  | LT & RT | 2                                              | 1                                 | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              | 24" CONCRETE CULVERT                         |
|                    | 281+46  | LT & RT | 2                                              | 1                                 | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              | 42" X 72" CONCRETE CULVERT (CATTLE PASS)     |
|                    | 305+81  | LT & RT | 2                                              | --                                | --                                                                                       | 74                                                             | --                                                             | --                                                            | --                                                            | 2                                                                         | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              |                                              |
|                    | 317+26  | LT & RT | 2                                              | --                                | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | 56                                                                        | 2                                                                         | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              |                                              |
|                    | 337+42  | LT & RT | 2                                              | 1                                 | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              | 42" X 72" CONCRETE CULVERT (CATTLE PASS)     |
|                    | 376+77  | LT & RT | 2                                              | 1                                 | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              | 42" X 72" CONCRETE CULVERT (CATTLE PASS)     |
|                    | 390+28  | LT & RT | 2                                              | --                                | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | 60                                                                                           | --                                                                                                    | 2                                                                                                     | 2                              |                                              |
|                    | 400+42  | LT & RT | 2                                              | 1                                 | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              | 30" CONCRETE CULVERT                         |
|                    | 412+00  | LT & RT | 2                                              | 1                                 | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              | 42" X 72" CONCRETE CULVERT (CATTLE PASS)     |
|                    | 444+94  | LT & RT | 2                                              | --                                | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    | 2                              |                                              |
| 453+92             | LT & RT | 2       | --                                             | --                                | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | 2                                                                                                     |                                |                                              |
| 459+97             | LT & RT | 2       | 1                                              | --                                | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | 2                                                                                                     | 24" CONCRETE CULVERT           |                                              |
| 466+85             | LT & RT | 2       | --                                             | --                                | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | 2                                                                                                     |                                |                                              |
| 483+03             | LT & RT | 2       | 1                                              | --                                | --                                                                                       | --                                                             | --                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | 2                                                                                                     | 30" CONCRETE CULVERT           |                                              |
| 492+70             | RT      | --      | --                                             | 2                                 | --                                                                                       | --                                                             | 32                                                             | --                                                            | --                                                            | --                                                                        | --                                                                        | --                                                                                           | --                                                                                           | --                                                                                                    | --                                                                                                    |                                |                                              |
| TOTALS             |         |         | 44                                             | 12                                | 6                                                                                        | 74                                                             | 64                                                             | 110                                                           | 56                                                            | 4                                                                         | 2                                                                         | 60                                                                                           | 60                                                                                           | 2                                                                                                     | 2                                                                                                     | 44                             |                                              |

NOTE:  
CULVERT INVERT INFORMATION SHOWN IN THE SECTION 5 PLANS AND CROSS SECTIONS.

3

| RIPRAP ITEMS |         |        |                     |                          |
|--------------|---------|--------|---------------------|--------------------------|
| CATEGORY     | STATION | OFFSET | 606.0200            | 645.0120                 |
|              |         |        | RIPRAP MEDIUM<br>CY | GEOTEXTILE TYPE HR<br>SY |
| 0010         | 227+50  | RT     | 27                  | 72                       |
|              | 227+67  | LT     | 3                   | 10                       |
|              | 253+94  | RT     | 5                   | 16                       |
|              | 305+81  | LT     | 2                   | 8                        |
|              | 390+28  | RT     | 4                   | 12                       |
|              | 492+00  | RT     | 44                  | 127                      |
| TOTALS       |         |        | 85                  | 245                      |

| RESTORATION ITEMS |               |    |         |          |          |                     |                      |                   |                 |            |    |
|-------------------|---------------|----|---------|----------|----------|---------------------|----------------------|-------------------|-----------------|------------|----|
|                   |               |    |         | 625.0100 | 627.0200 | 628.2004            | 628.2027             | 629.0210          | 630.0130        | 630.0500   |    |
|                   |               |    |         | TOPSOIL  | MULCHING | EROSION MAT CLASS I | EROSION MAT CLASS II | FERTILIZER TYPE B | SEEDING MIXTURE |            |    |
| CATEGORY          | STATION       | TO | STATION | OFFSET   | SY       | TYPE B              | TYPE C               | CWT               | NO. 30          | SEED WATER |    |
|                   |               |    |         |          |          | SY                  | SY                   |                   | LB              | MGAL       |    |
| 0010              | 204+40        | -  | 209+59  | RT       | 580      | --                  | 580                  | --                | 0.4             | 27         | 10 |
|                   | 224+89        | -  | 230+57  | LT & RT  | 1,360    | --                  | 1,280                | 80                | 0.9             | 61         | 24 |
|                   | 252+06        | -  | 255+74  | LT & RT  | 590      | --                  | 590                  | --                | 0.4             | 28         | 10 |
|                   | 300+76        | -  | 308+21  | LT & RT  | 1,730    | --                  | 1,730                | --                | 1.1             | 78         | 30 |
|                   | 315+13        | -  | 319+34  | LT & RT  | 710      | --                  | 710                  | --                | 0.5             | 32         | 12 |
|                   | 376+54        | -  | 377+04  | LT & RT  | 800      | 710                 | 90                   | --                | 0.5             | 36         | 14 |
|                   | 388+12        | -  | 392+53  | LT & RT  | 730      | --                  | 230                  | 500               | 0.5             | 34         | 13 |
|                   | 448+23        | -  | 452+12  | RT       | 160      | --                  | 160                  | --                | 0.1             | 8          | 3  |
|                   | 488+88        | -  | 497+25  | LT & RT  | 1,260    | --                  | 1,140                | 120               | 0.8             | 57         | 22 |
|                   | UNDISTRIBUTED |    |         |          | 1,980    | 180                 | 1,630                | 170               | 1.8             | 89         | 32 |
| TOTALS            |               |    |         | 9,900    | 890      | 8,140               | 870                  | 7.0               | 450             | 170        |    |

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| EROSION CONTROL MOBILIZATION |          |                                          |                                                       |
|------------------------------|----------|------------------------------------------|-------------------------------------------------------|
| CATEGORY                     | LOCATION | 628.1905                                 | 628.1910                                              |
|                              |          | MOBILIZATIONS<br>EROSION CONTROL<br>EACH | MOBILIZATIONS<br>EMERGENCY EROSION<br>CONTROL<br>EACH |
| 0010                         | PROJECT  | 5                                        | 4                                                     |
| TOTALS                       |          | 5                                        | 4                                                     |

| EROSION CONTROL ITEMS |               |    |         |         |               |            |             |                  |                 |              |
|-----------------------|---------------|----|---------|---------|---------------|------------|-------------|------------------|-----------------|--------------|
|                       |               |    |         |         | 628.1104      | 628.1504   | 628.1520    | 628.7015         | 628.7504        | 628.7555     |
|                       |               |    |         |         | EROSION BALES | SILT FENCE | SILT FENCE  | INLET PROTECTION | TEMPORARY DITCH | CULVERT PIPE |
| CATEGORY              | STATION       | TO | STATION | OFFSET  | EACH          | LF         | MAINTENANCE | TYPE C           | CHECKS          | CHECKS       |
|                       |               |    |         |         |               |            | LF          | EACH             | LF              | EACH         |
| 0010                  | 204+40        | -  | 209+59  | LT      | --            | 340        | 340         | --               | 50              | 3            |
|                       | 224+89        | -  | 230+57  | LT & RT | 24            | 560        | 560         | --               | 63              | 9            |
|                       | 252+06        | -  | 255+74  | LT & RT | 32            | 620        | 620         | --               | --              | 5            |
|                       | 300+76        | -  | 308+21  | LT & RT | 8             | 200        | 200         | --               | 113             | 5            |
|                       | 315+13        | -  | 319+34  | LT & RT | 32            | 800        | 800         | --               | 13              | 5            |
|                       | 376+54        | -  | 377+04  | LT & RT | --            | --         | --          | --               | 63              | 12           |
|                       | 388+12        | -  | 392+53  | LT & RT | 16            | 540        | 540         | --               | 25              | 6            |
|                       | 448+23        | -  | 452+12  | RT      | --            | --         | --          | --               | --              | --           |
|                       | 488+88        | -  | 497+25  | LT & RT | 16            | 400        | 400         | 1                | 38              | 3            |
|                       | UNDISTRIBUTED |    |         |         | 32            | 860        | 860         | --               | 95              | 12           |
| TOTALS                |               |    |         | 160     | 4,320         | 4,320      | 1           | 460              | 60              |              |

TEMPORARY AND PERMANENT PAVEMENT MARKING ITEMS

| 643.3165                            |         |    |         |                            |                 |                                 |                 |                                           |                          |             |                                 |                 |                                               |
|-------------------------------------|---------|----|---------|----------------------------|-----------------|---------------------------------|-----------------|-------------------------------------------|--------------------------|-------------|---------------------------------|-----------------|-----------------------------------------------|
| TEMPORARY MARKING LINE PAINT 6-INCH |         |    |         |                            |                 |                                 |                 | 646.2040                                  |                          |             |                                 |                 | 646.4040                                      |
|                                     |         |    |         | 4' LINE 46' SKIP<br>YELLOW | SOLID<br>YELLOW | 12.5' LINE 37.5' SKIP<br>YELLOW | SOLID<br>YELLOW | MARKING LINE GROOVED WET REF EPOXY 6-INCH |                          |             |                                 |                 | MARKING LINE GROOVED<br>WET REF EPOXY 10-INCH |
|                                     |         |    |         | (NOTE 1)                   |                 | (NOTE 2)                        |                 | 12.5' LINE 37.5' SKIP<br>WHITE            | 3' LINE 9' SKIP<br>WHITE | SOLID WHITE | 12.5' LINE 37.5' SKIP<br>YELLOW | SOLID<br>YELLOW | SOLID WHITE                                   |
| CATEGORY                            | STATION | TO | STATION | LF                         | LF              | LF                              | LF              | LF                                        | LF                       | LF          | LF                              | LF              | LF                                            |
| 0010                                | 157+18  | -  | 238+61  | 990                        | 14,960          | 1,550                           | 7,475           | 50                                        | 72                       | 15,640      | 1,550                           | 7,475           | 310                                           |
|                                     | 238+61  | -  | 320+50  | 476                        | 22,850          | 750                             | 11,415          | 63                                        | 66                       | 15,989      | 750                             | 11,415          | --                                            |
|                                     | 320+50  | -  | 393+00  | 908                        | 12,250          | 1,425                           | 6,120           | --                                        | 114                      | 13,790      | 1,425                           | 6,120           | --                                            |
|                                     | 393+00  | -  | 497+25  | 1,216                      | 20,350          | 1,900                           | 10,165          | 88                                        | 129                      | 20,000      | 1,900                           | 10,165          | --                                            |
|                                     | TOTALS  |    |         | 3,590                      | 70,410          | 5,625                           | 35,175          | 200                                       | 381                      | 65,419      | 5,625                           | 35,175          | 310                                           |
|                                     |         |    |         | 74,000                     |                 | 40,800                          |                 | 66,000                                    |                          |             | 40,800                          |                 |                                               |
|                                     |         |    |         |                            |                 | 114,800                         |                 | 106,800                                   |                          |             |                                 |                 |                                               |

NOTES:  
1) TEMPORARY MARKING LINE PAINT INCLUDES QUANTITY FOR APPLICATION ON MILLED SURFACE AND THE LOWER LAYER OF HMA PAVEMENT.  
2) TEMPORARY MARKING LINE PAINT INCLUDES QUANTITY FOR APPLICATION ON UPPER LAYER OF HMA PAVEMENT PRIOR TO PLACING CENTERLINE RUMBLE STRIPS.

SIGNING ITEMS

|               |         |        |              | 638.2102                        | 638.4000                              | 638.3000                                | 634.0614                               |
|---------------|---------|--------|--------------|---------------------------------|---------------------------------------|-----------------------------------------|----------------------------------------|
|               |         |        |              | MOVING SIGNS<br>TYPE II<br>EACH | MOVING SMALL<br>SIGN SUPPORTS<br>EACH | REMOVING SMALL<br>SIGN SUPPORTS<br>EACH | POSTS WOOD<br>4X6-INCH X 14-FT<br>EACH |
| CATEGORY      | STATION | OFFSET | SIGN MESSAGE |                                 |                                       |                                         |                                        |
| 0010          | 452+04  | RT     | JCT / CTH I  | 1                               | 1                                     | --                                      | --                                     |
|               | 493+95  | LT     | NO PARKING   | 1                               | 1                                     | --                                      | --                                     |
|               | 494+09  | RT     | 30 MPH       | 1                               | 1                                     | --                                      | --                                     |
|               | 494+15  | LT     | 55 MPH       | 1                               | 1                                     | --                                      | --                                     |
|               | 494+34  | RT     | NO PARKING   | 1                               | 1                                     | --                                      | --                                     |
| UNDISTRIBUTED |         |        |              | 5                               | 5                                     | 5                                       | 5                                      |
| TOTALS        |         |        |              | 11                              | 11                                    | 5                                       | 5                                      |

NOTE: REMOVE AND INSTALL A NEW SMALL SIGN SUPPORT IF CONDITIONS DO NOT ALLOW INSTALLATION OF EXISTING POSTS AT THE CORRECT HEIGHT. USE UNDISTRIBUTED QUANTITIES SHOWN FOR THIS PURPOSE.

TRAFFIC CONTROL ITEMS

| 643.0300 |                                    |                   |                          |       |                          |       |                                      | 643.0900 | 644.1810 |
|----------|------------------------------------|-------------------|--------------------------|-------|--------------------------|-------|--------------------------------------|----------|----------|
|          |                                    | STAGE<br>DURATION | TRAFFIC CONTROL<br>DRUMS |       | TRAFFIC CONTROL<br>SIGNS |       | TEMPORARY<br>PEDESTRIAN<br>BARRICADE |          |          |
| CATEGORY | LOCATION                           | DAYS              | NO.                      | DAY   | NO.                      | DAY   | LF                                   |          |          |
| 0010     | PROJECT - ADVANCED WARNING         | 105               | --                       | --    | 29                       | 3,045 | --                                   |          |          |
|          | CULVERT AND GUARDRAIL REPLACEMENTS | 30                | 50                       | 1,500 | 30                       | 900   | --                                   |          |          |
|          | SIDWALK CLOSURE                    | 10                | --                       | --    | 3                        | 30    | 24                                   |          |          |
|          | MILL AND OVERLAY                   | 60                | --                       | --    | 8                        | 480   | --                                   |          |          |
|          | WIDTH RESTRICTIONS                 | 20                | --                       | --    | 17                       | 340   | --                                   |          |          |
| TOTALS   |                                    |                   |                          | 1,500 |                          | 4,795 | 24                                   |          |          |

TRAFFIC CONTROL SIGNS FIXED MESSAGE

|          |                    | SIGN SIZE<br>W X H<br>FT X FT | 643.1000 |                                    |
|----------|--------------------|-------------------------------|----------|------------------------------------|
| CATEGORY | LOCATION           |                               | SF       | SIGN MESSAGE                       |
| 0010     | WEST PROJECT LIMIT | 96" X 48"                     | 32.00    | HWY 12 / ROAD WORK / BEGINS XXX-XX |
|          | EAST PROJECT LIMIT | 96" X 48"                     | 32.00    | HWY 12 / ROAD WORK / BEGINS XXX-XX |
| TOTAL    |                    |                               | 64.00    |                                    |

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DELINEATOR ITEMS

|          |         |    |         |        | 633.0100    | 633.0500   |
|----------|---------|----|---------|--------|-------------|------------|
|          |         |    |         |        | DELINEATOR  | DELINEATOR |
| CATEGORY | STATION | TO | STATION | OFFSET | POSTS STEEL | REFLECTORS |
|          |         |    |         |        | EACH        | WHITE      |
|          |         |    |         |        | EACH        | EACH       |
| 0010     |         |    |         |        |             |            |
|          | 448+27  | -  | 448+91  | RT     | 9           | 9          |
|          | 449+60  | -  | 450+80  | RT     | 16          | 16         |
|          | 451+41  | -  | 452+05  | RT     | 9           | 9          |
| TOTALS   |         |    |         |        | 34          | 34         |

SAWING ITEMS

| CATEGORY | STATION | TO | STATION | OFFSET  | 690.0150             | 690.0250              | COMMENTS                  |
|----------|---------|----|---------|---------|----------------------|-----------------------|---------------------------|
|          |         |    |         |         | SAWING ASPHALT<br>LF | SAWING CONCRETE<br>LF |                           |
| 0010     | 227+14  | -  | 228+20  | LT & RT | 10                   | 20                    | CULVERT REPLACEMENT       |
|          | 253+41  | -  | 254+47  | LT & RT | 10                   | 20                    | CULVERT REPLACEMENT       |
|          | 305+28  | -  | 306+34  | LT & RT | 20                   | 20                    | CULVERT REPLACEMENT       |
|          | 316+73  | -  | 317+79  | LT & RT | 10                   | 20                    | CULVERT REPLACEMENT       |
|          | 389+75  | -  | 390+81  | LT & RT | 10                   | 20                    | CULVERT REPLACEMENT       |
|          | 448+22  | -  | 452+10  | RT      | 145                  | --                    | GUARDRAIL REMOVAL         |
|          | 496+71  | -  | 497+25  | RT      | --                   | 56                    | CURB & GUTTER REPLACEMENT |
|          | 158+80  | -  | 487+90  | LT & RT | 2,115                | --                    | DRIVEWAYS                 |
|          | TOTAL   |    |         |         | 2,320                | 156                   |                           |
|          |         |    |         |         |                      |                       |                           |

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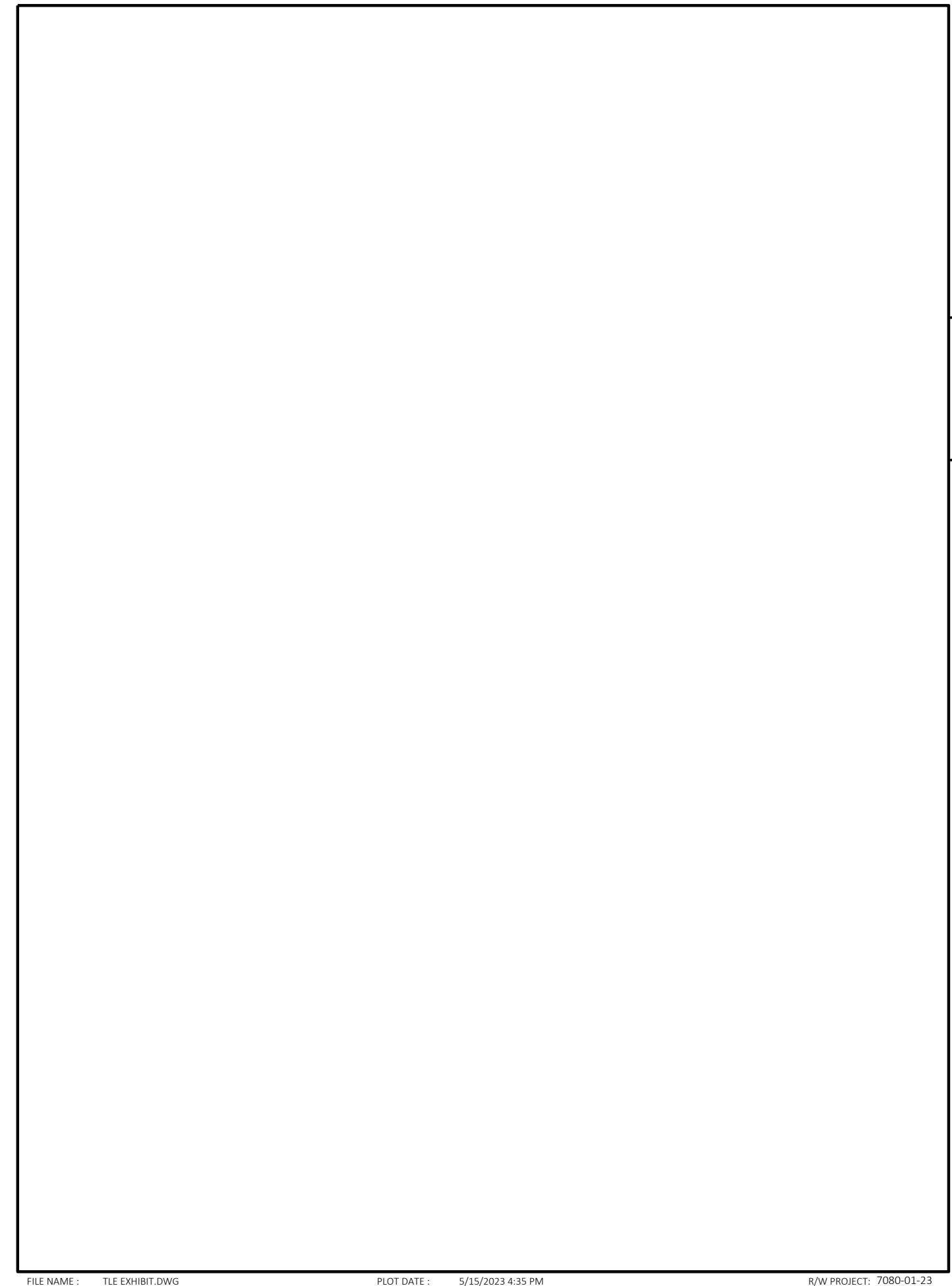
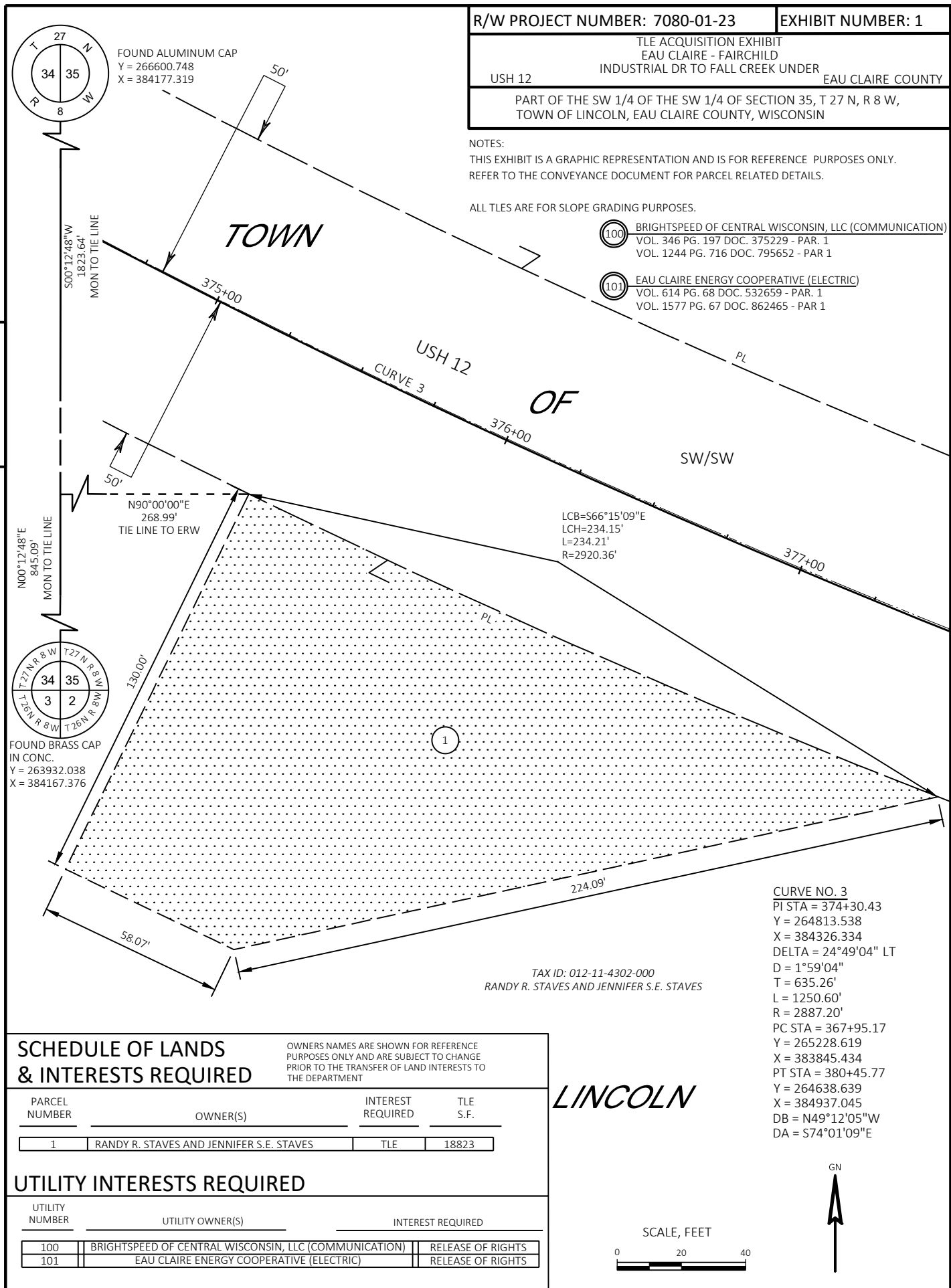
GUARDRAIL ITEMS

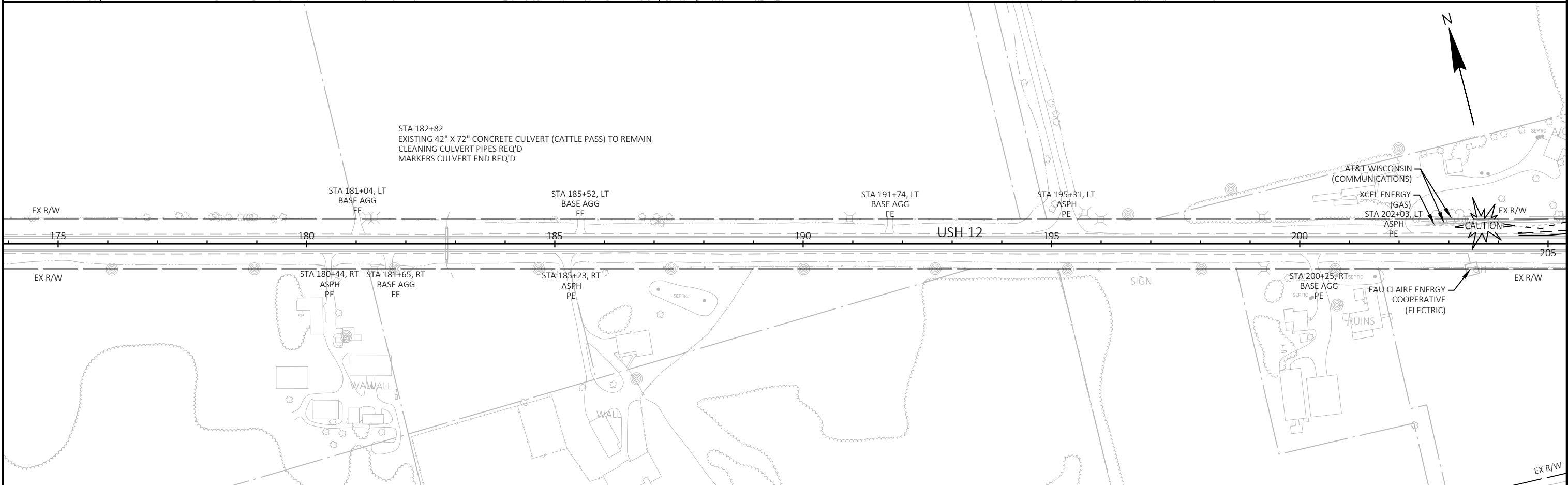
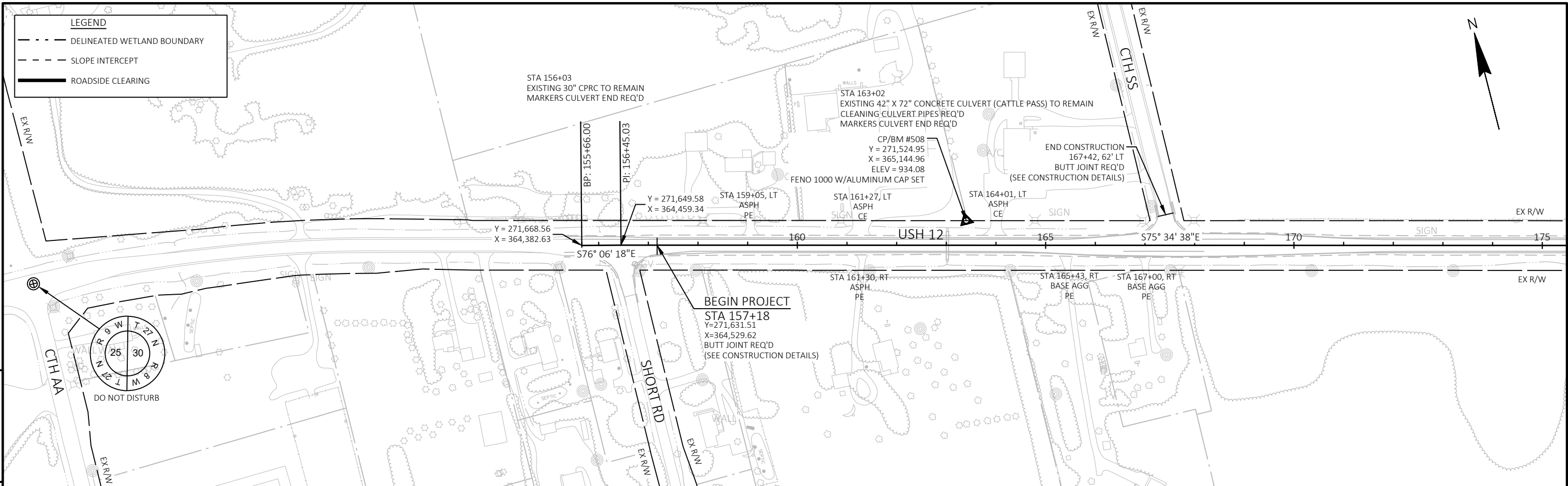
| CATEGORY | STATION | TO | STATION | OFFSET | 614.0397                                           | 614.0400                                  | 614.2300                 | 614.2330                   | 614.2500                           | 614.2610                              | SPV.0090.02                      |
|----------|---------|----|---------|--------|----------------------------------------------------|-------------------------------------------|--------------------------|----------------------------|------------------------------------|---------------------------------------|----------------------------------|
|          |         |    |         |        | GUARDRAIL MOW<br>STRIP EMULSIFIED<br>ASPHALT<br>SY | ADJUSTING STEEL<br>PLATE BEAM GUARD<br>LF | MGS GUARDRAIL<br>3<br>LF | MGS GUARDRAIL<br>3 K<br>LF | MGS THRIE BEAM<br>TRANSITION<br>LF | MGS GUARDRAIL<br>TERMINAL EAT<br>EACH | TREATED TIMBER<br>RUB RAIL<br>LF |
| 0010     | 205+60  | -  | 208+40  | LT     | 45                                                 | --                                        | 88                       | 88                         | --                                 | 2                                     | --                               |
|          | 226+24  | -  | 229+28  | RT     | --                                                 | 225                                       | 200                      | 25                         | --                                 | 2                                     | --                               |
|          | 226+18  | -  | 229+22  | LT     | --                                                 | 213                                       | 188                      | 25                         | --                                 | 2                                     | --                               |
|          | 376+59  | -  | 376+89  | RT     | 34                                                 | --                                        | --                       | --                         | --                                 | --                                    | --                               |
|          | 376+68  | -  | 376+93  | LT     | 14                                                 | --                                        | --                       | --                         | --                                 | --                                    | --                               |
|          | 494+32  | -  | 497+25  | RT     | --                                                 | --                                        | 175                      | --                         | --                                 | 2                                     | 160                              |
|          | 494+30  | -  | 495+28  | LT     | --                                                 | --                                        | 13                       | --                         | 39                                 | 1                                     | --                               |
|          | TOTALS  |    |         |        | 93                                                 | 438                                       | 663                      | 138                        | 39                                 | 9                                     | 160                              |
|          |         |    |         |        |                                                    |                                           |                          |                            |                                    |                                       |                                  |

NOTE: ADJUSTING STEEL PLATE BEAM GUARD ITEM USED TO ADJUST INSTALLED GUARDRAIL AFTER ROADWAY PROFILE INCREASES DUE TO MILL AND OVERLAY

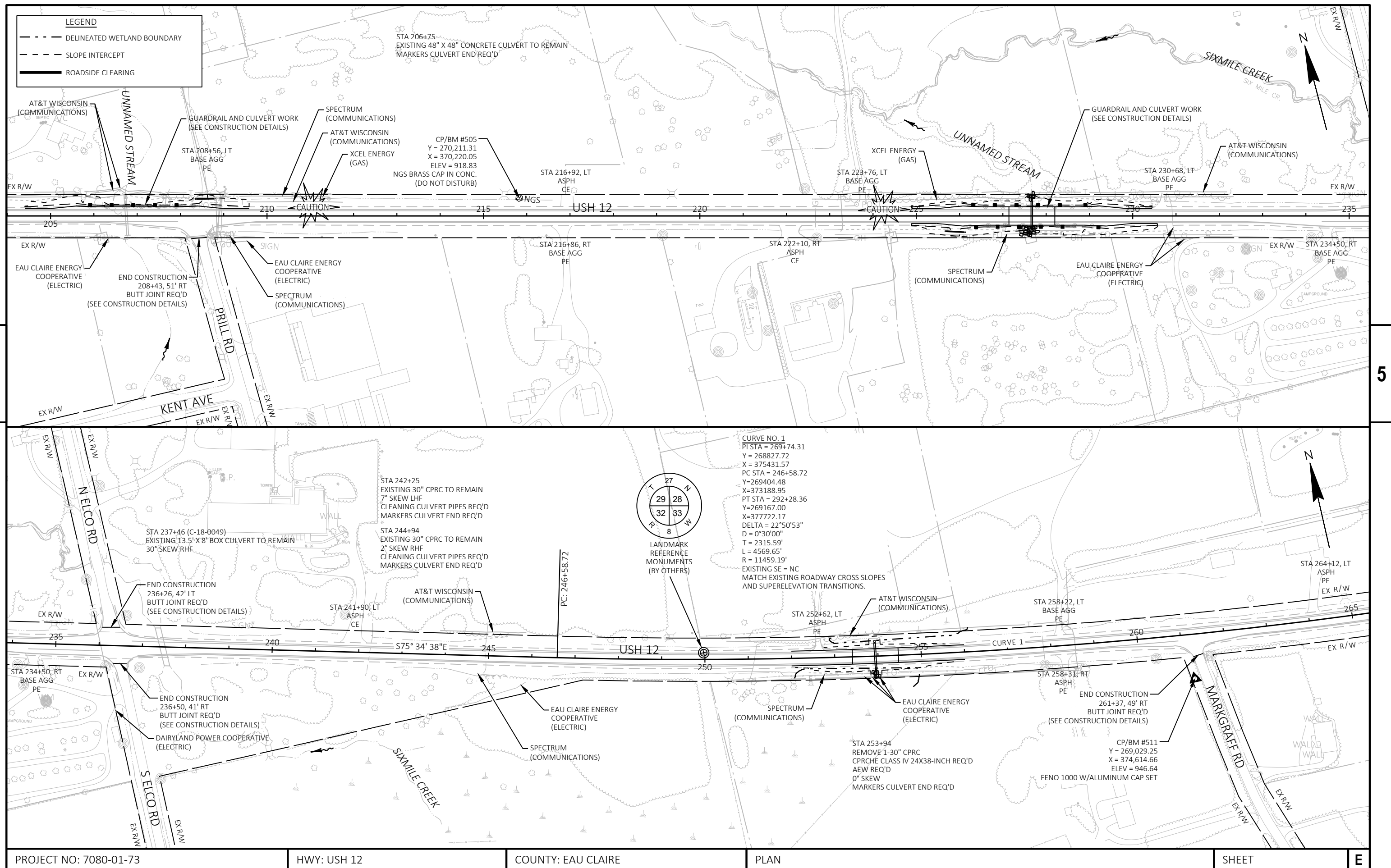
STAKING ITEMS

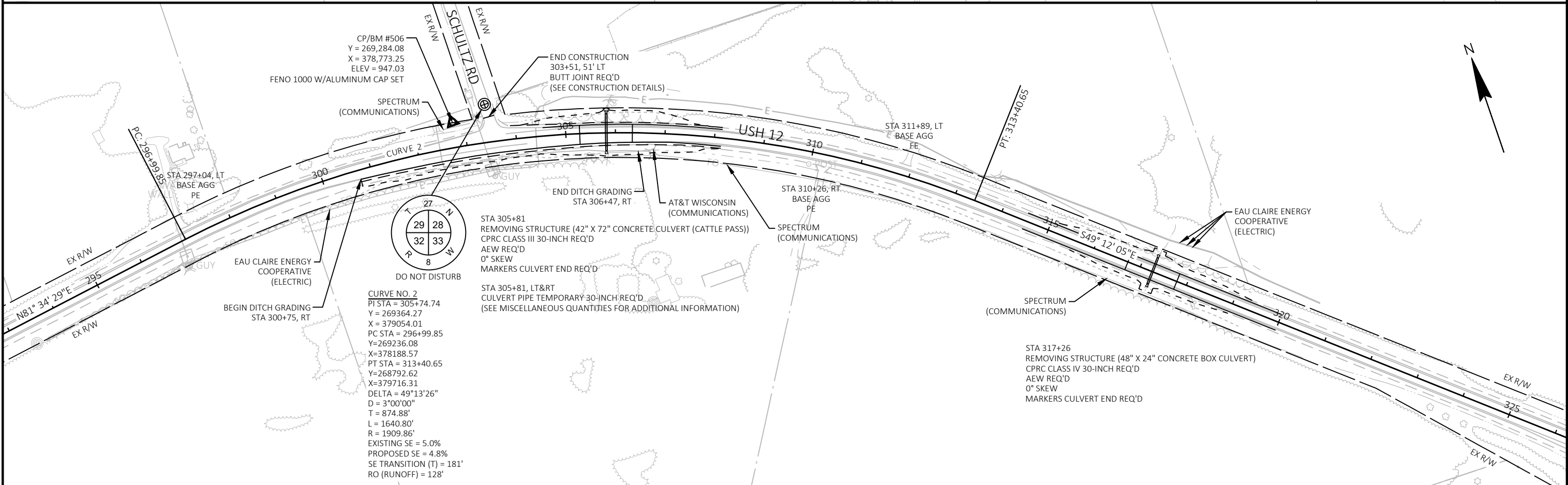
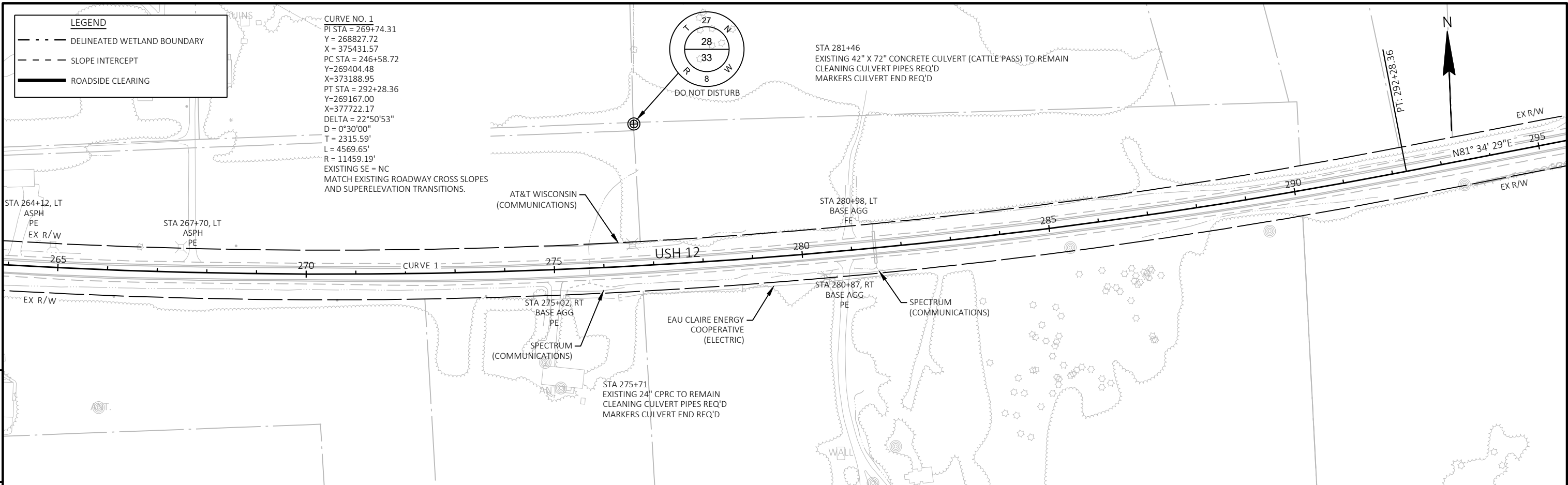
| CATEGORY | STATION | TO | STATION | OFFSET  | 650.4500                               | 650.5000                           | 650.5500                                                       | 650.6000                                      | 650.8000                                            | 650.9911.01                                                          | 650.9920                                      | COMMENTS                                                                                                                |
|----------|---------|----|---------|---------|----------------------------------------|------------------------------------|----------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|          |         |    |         |         | CONSTRUCTION STAKING<br>SUBGRADE<br>LF | CONSTRUCTION<br>STAKING BASE<br>LF | CONSTRUCTION STAKING<br>CURB GUTTER AND CURB &<br>GUTTER<br>LF | CONSTRUCTION STAKING PIPE<br>CULVERTS<br>EACH | CONSTRUCTION STAKING<br>RESURFACING REFERENCE<br>LF | CONSTRUCTION STAKING<br>SUPPLEMENTAL CONTROL<br>(7080-01-73)<br>EACH | CONSTRUCTION<br>STAKING SLOPE<br>STAKES<br>LF |                                                                                                                         |
| 0010     | 157+18  | -  | 496+71  | LT & RT | --                                     | --                                 | --                                                             | --                                            | 33,953                                              | --                                                                   | --                                            | GUARDRAIL<br>AND CULVERT REPLACEMENT<br>CULVERT REPLACEMENT<br>DITCH GRADING AND CULVERT REPLACEMENT                    |
|          | 204+41  | -  | 209+59  | LT      | --                                     | 518                                | --                                                             | --                                            | --                                                  | --                                                                   | 518                                           |                                                                                                                         |
|          | 224+89  | -  | 230+57  | LT & RT | --                                     | 568                                | --                                                             | 1                                             | --                                                  | --                                                                   | 568                                           |                                                                                                                         |
|          | 253+41  | -  | 254+47  | LT & RT | --                                     | 106                                | --                                                             | 1                                             | --                                                  | --                                                                   | 106                                           |                                                                                                                         |
|          | 300+75  | -  | 306+47  | LT & RT | --                                     | 572                                | --                                                             | 1                                             | --                                                  | --                                                                   | 572                                           | CULVERT REPLACEMENT<br>CULVERT REPLACEMENT<br>DITCH GRADING AND GUARDRAIL<br>CURB & GUTTER REPLACEMENT<br>DITCH GRADING |
|          | 316+73  | -  | 317+79  | LT & RT | --                                     | 106                                | --                                                             | 1                                             | --                                                  | --                                                                   | 106                                           |                                                                                                                         |
|          | 389+75  | -  | 390+81  | LT & RT | --                                     | 106                                | --                                                             | 1                                             | --                                                  | --                                                                   | 106                                           |                                                                                                                         |
|          | 488+88  | -  | 496+71  | LT & RT | --                                     | 783                                | --                                                             | --                                            | --                                                  | --                                                                   | 783                                           |                                                                                                                         |
|          | 496+72  | -  | 497+25  | LT & RT | --                                     | --                                 | 53                                                             | --                                            | --                                                  | --                                                                   | --                                            |                                                                                                                         |
|          | 11+20   | -  | 13+13   | LT & RT | 193                                    | --                                 | --                                                             | --                                            | --                                                  | --                                                                   | 193                                           |                                                                                                                         |
|          | PROJECT |    |         |         | --                                     | --                                 | --                                                             | --                                            | --                                                  | 1                                                                    | --                                            |                                                                                                                         |
|          | TOTALS  |    |         |         | 193                                    | 2,759                              | 53                                                             | 5                                             | 33,953                                              | 1                                                                    | 2,952                                         |                                                                                                                         |
|          |         |    |         |         |                                        |                                    |                                                                |                                               |                                                     |                                                                      |                                               |                                                                                                                         |



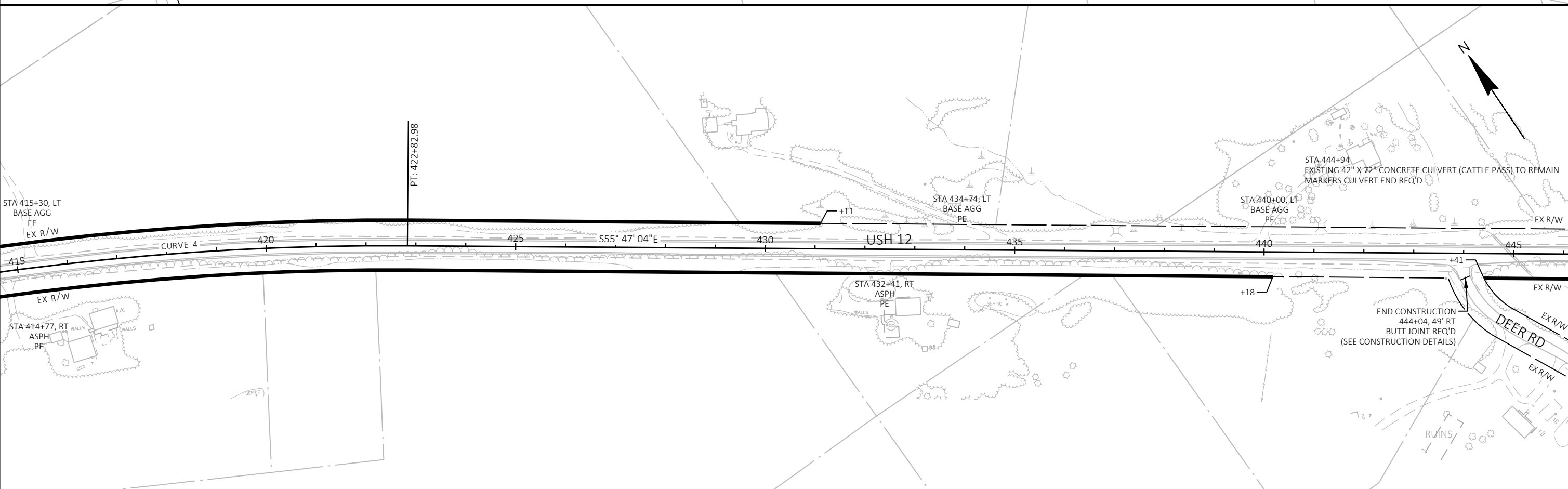
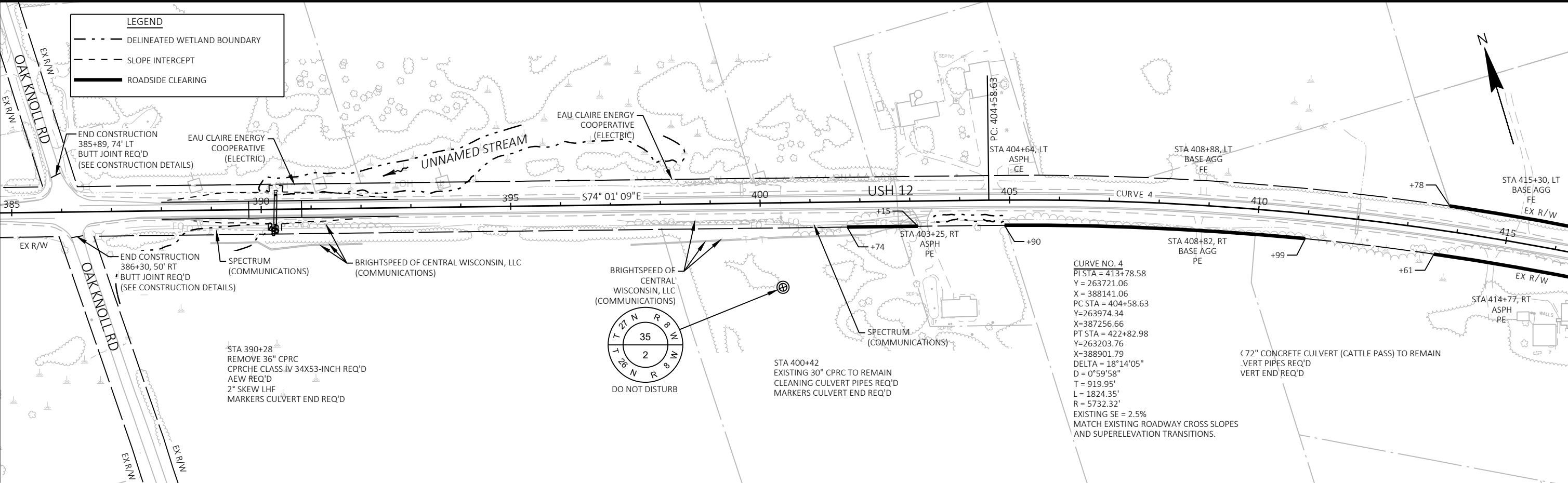


|                        |             |                    |      |       |   |
|------------------------|-------------|--------------------|------|-------|---|
| PROJECT NO: 7080-01-73 | HWY: USH 12 | COUNTY: EAU CLAIRE | PLAN | SHEET | E |
|------------------------|-------------|--------------------|------|-------|---|

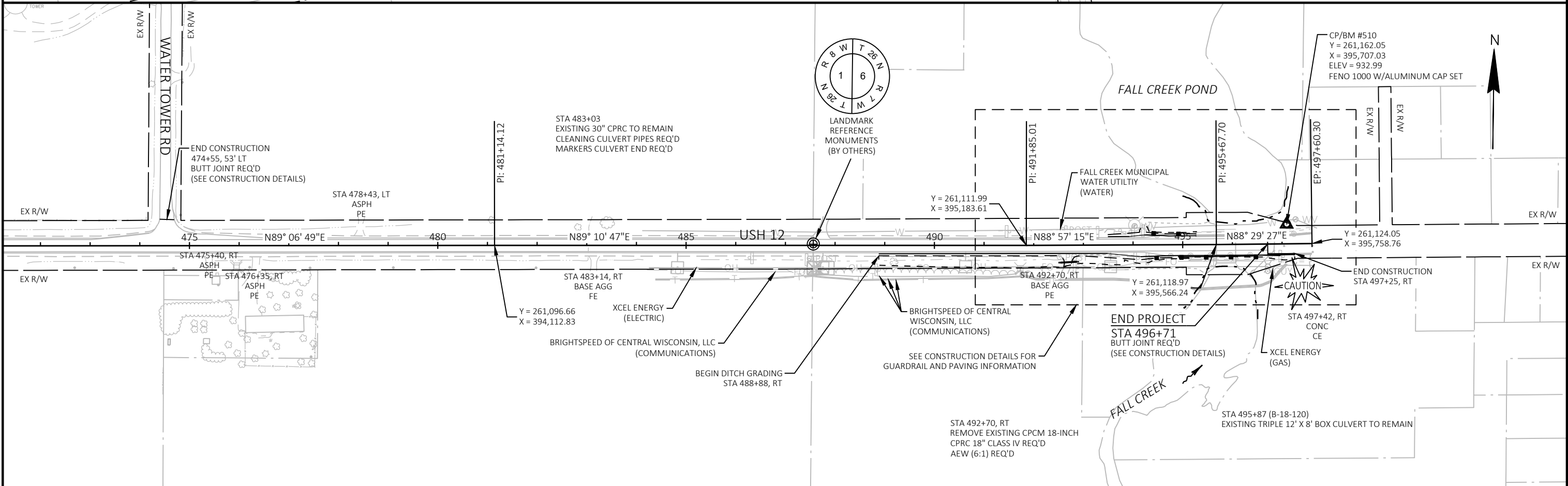
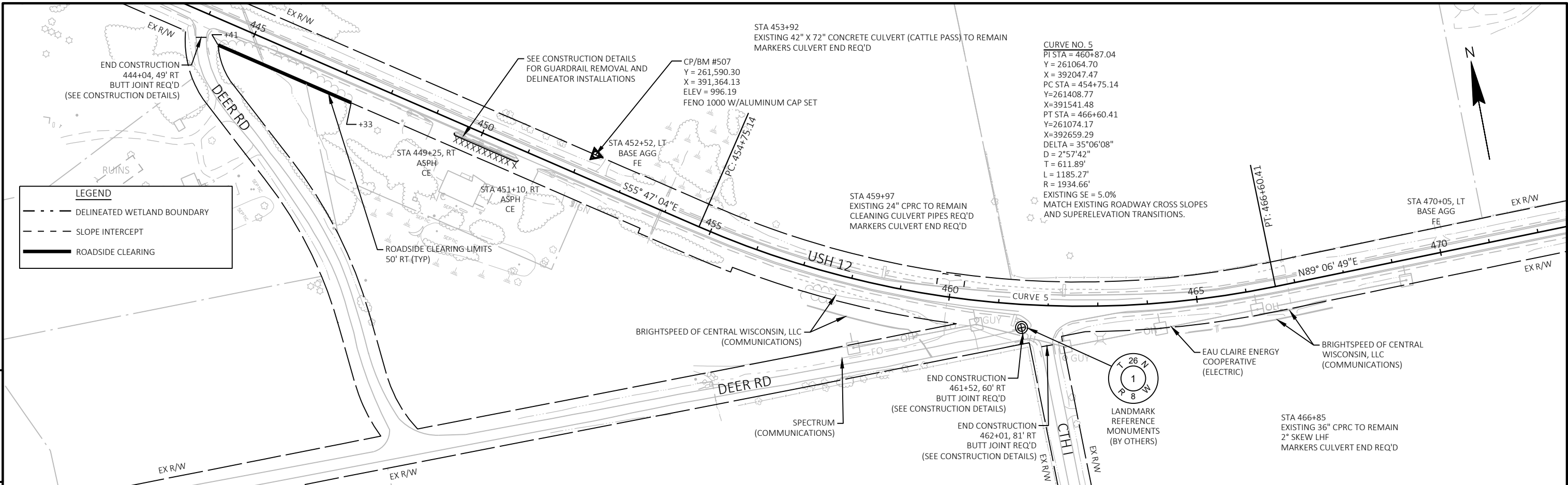






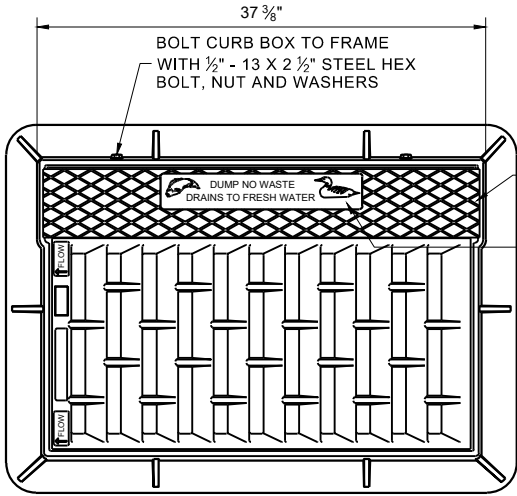


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| PROJECT NO: 7080-01-73 | HWY: USH 12 | COUNTY: EAU CLAIRE | PLAN | SHEET | E |
|------------------------|-------------|--------------------|------|-------|---|



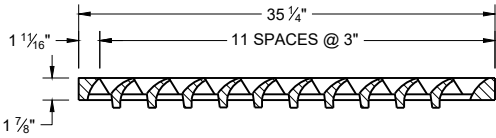
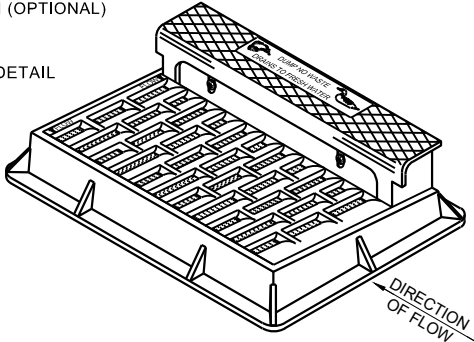
Standard Detail Drawing List

|           |                                                                                                    |
|-----------|----------------------------------------------------------------------------------------------------|
| 08A05-21A | INLET COVERS TYPE A, H, A-S, H-S & Z                                                               |
| 08D01-23A | CONCRETE CURB & GUTTER                                                                             |
| 08D01-23B | CONCRETE CURB, TIES AND CURB AND GUTTER APPLICATIONS                                               |
| 08D22-01  | DRIVEWAYS WITHOUT CURB & GUTTER RESURFACING PROJECTS RURAL                                         |
| 08E08-03  | TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS                                    |
| 08E09-06  | SILT FENCE                                                                                         |
| 08E10-02  | INLET PROTECTION TYPE A, B, C AND D                                                                |
| 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                                            |
| 08F07-05  | STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SLOPED SIDE DRAINS                             |
| 13A10-03A | SHOULDER RUMBLE STRIPS - ASPHALT                                                                   |
| 13A10-03G | SHOULDER AND EDGE LINE RUMBLE STRIPS - CROSSINGS, INTERSECTIONS, BRIDGES, DRIVEWAYS                |
| 13A10-03H | SHOULDER AND EDGE LINE RUMBLE STRIPS - RAILROAD, PASSING, CLIMBING AND BYPASS LANES                |
| 13A11-04A | CENTERLINE RUMBLE STRIPS - ASPHALT                                                                 |
| 13A11-04D | CENTERLINE RUMBLE STRIPS - INTERSECTIONS, DRIVEWAYS, BRIDGES, RAILROADS                            |
| 13C19-03  | HMA LONGITUDINAL JOINTS                                                                            |
| 14B28-04A | GUARDRAIL MOW STRIP                                                                                |
| 14B28-04B | GUARDRAIL MOW STRIP                                                                                |
| 14B42-07A | MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL                                                           |
| 14B42-07B | MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL                                                           |
| 14B42-07C | MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL                                                           |
| 14B42-07D | MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL                                                           |
| 14B44-04A | MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)                                           |
| 14B44-04B | MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)                                           |
| 14B44-04C | MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)                                           |
| 14B45-05A | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 14B45-05B | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 14B45-05C | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 14B45-05D | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 14B45-05E | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 14B45-05F | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 14B45-05G | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 14B45-05H | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 14B45-05I | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 14B45-05J | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 14B45-05K | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 14B45-05L | MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)                                               |
| 15A03-02A | FLEXIBLE MARKER POST FOR CULVERT END                                                               |
| 15A03-02B | FLEXIBLE MARKER POST FOR CULVERT END                                                               |
| 15A04-07C | DELINEATOR BRACKET WITH REFLECTIVE SHEETING                                                        |
| 15C02-09F | ADVANCED WIDTH RESTRICTION SIGNING                                                                 |
| 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                                           |
| 15C08-23A | PERMANENT LONGITUDINAL PAVEMENT MARKINGS                                                           |
| 15C08-23B | TEMPORARY LONGITUDINAL PAVEMENT MARKING                                                            |
| 15C08-23D | PAVEMENT MARKING (TURN LANES)                                                                      |
| 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                             |
| 15C19-09A | MOVING PAVEMENT MARKING OPERATION TWO-LANE TWO-WAY ROADWAY                                         |
| 15C35-06A | PAVEMENT MARKING (INTERSECTIONS)                                                                   |
| 15D28-04  | TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY                               |
| 15D30-09A | TRAFFIC CONTROL, PEDESTRIAN ACCOMMODATION                                                          |
| 15D30-09K | TRAFFIC CONTROL, PEDESTRIAN ACCOMMODATION                                                          |
| 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                                         |

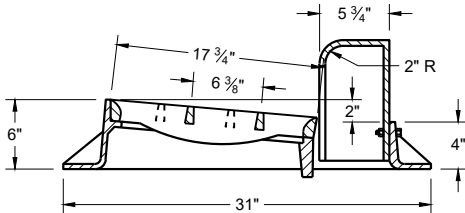
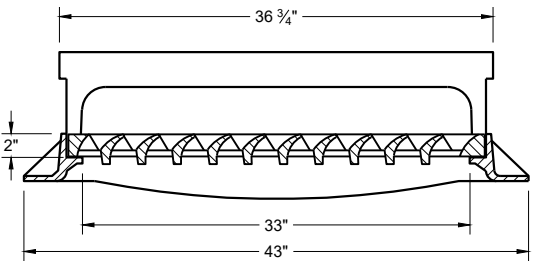
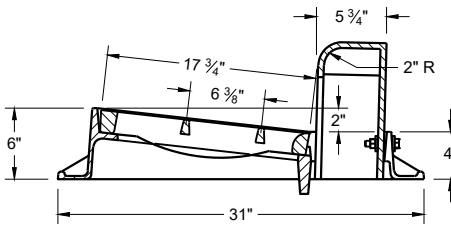
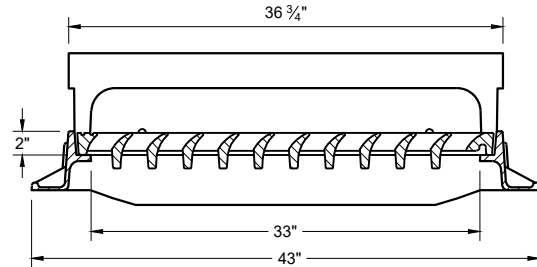


NOTE: EITHER CASTING IS ACCEPTABLE

TYPE "C" CHECKERED TOP DESIGN (OPTIONAL)  
SEE LOGO DETAIL

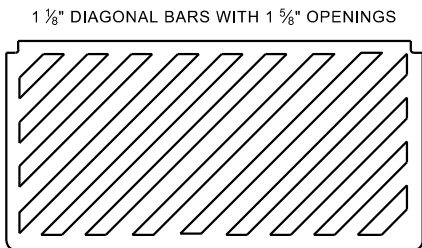


NOTE: CURB BOX HEIGHT ADJUSTABLE 6" - 9"

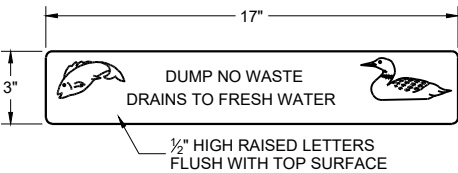


**TYPE "H"**

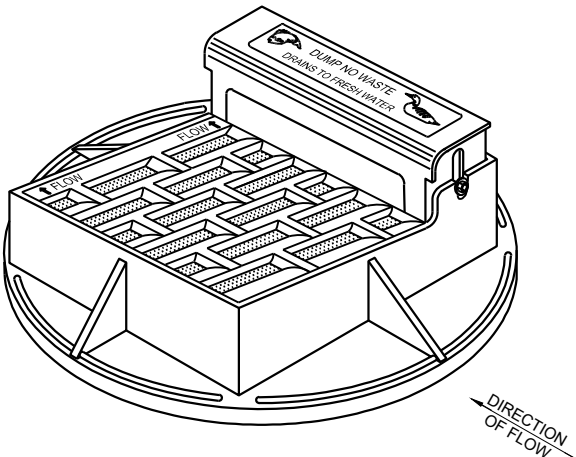
NOTE: EITHER CASTING IS ACCEPTABLE



**SPECIAL GRATE FOR TYPE "H" COVER**  
(MEASURES 35" X 17 3/4" X 2")  
(NOTED AS TYPE H-S ON DRAINAGE TABLE)

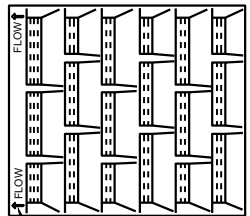


**LOGO DETAIL**

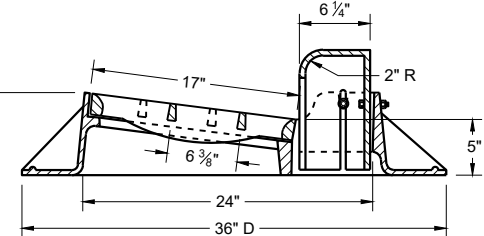
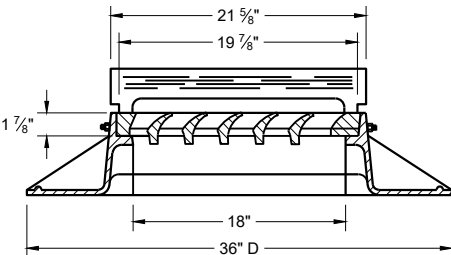
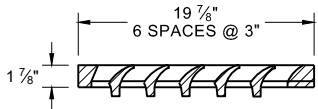


NOTE: CURB BOX HEIGHT ADJUSTABLE 6" - 9"

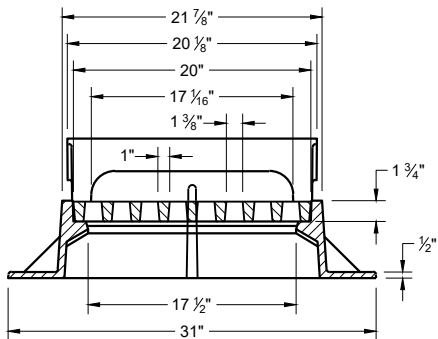
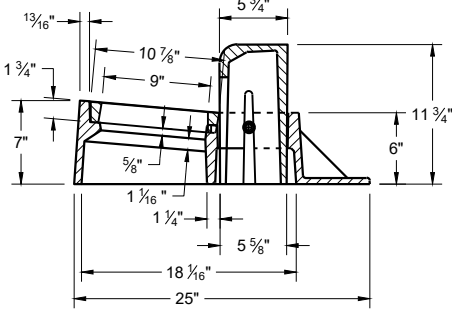
NOTE: EITHER CASTING IS ACCEPTABLE



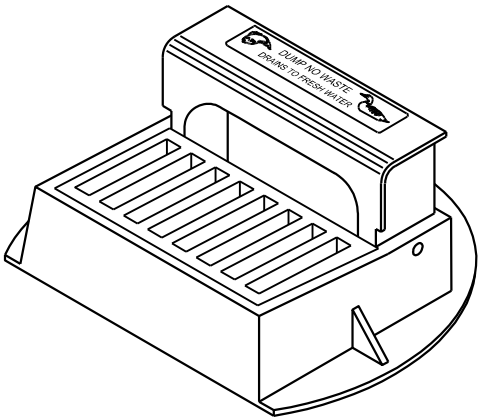
DIRECTION OF FLOW ARROWS



**TYPE "A"**



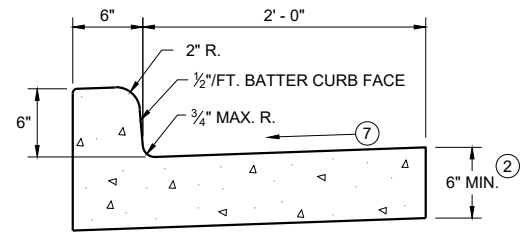
**TYPE "Z"**



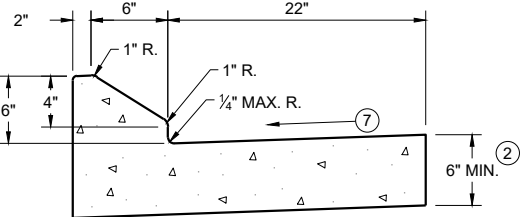
**INLET COVERS  
TYPES A, H, A-S, H-S AND Z**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

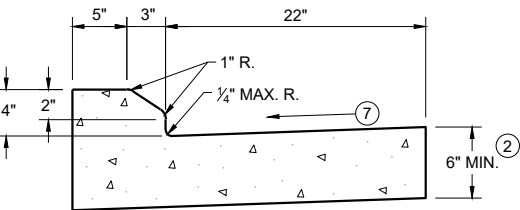
APPROVED  
December 2023 /S/ Rodney Taylor  
DATE ROADWAY STANDARDS DEVELOPMENT  
FHWA UNIT SUPERVISOR



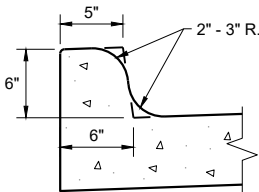
TYPES A<sup>①</sup> & D



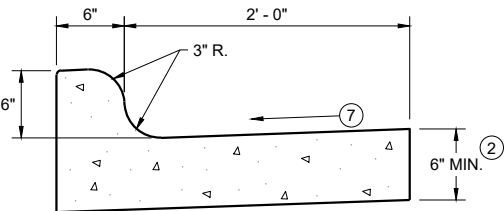
6" SLOPED CURB TYPES G<sup>①</sup> & J



4" SLOPED CURB TYPES G<sup>①</sup> & J

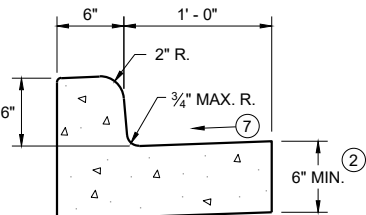


TYPES K<sup>①</sup> & L  
(OPTIONAL CURB SHAPE)



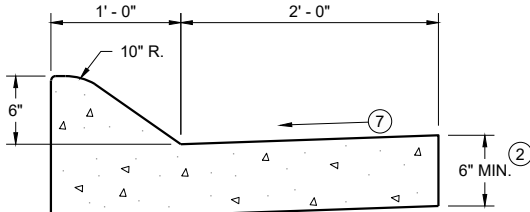
TYPES K<sup>①</sup> & L

CONCRETE CURB AND GUTTER 30"

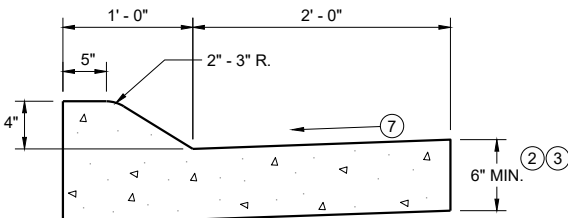


TYPES A<sup>①</sup> & D

CONCRETE CURB AND GUTTER 18"

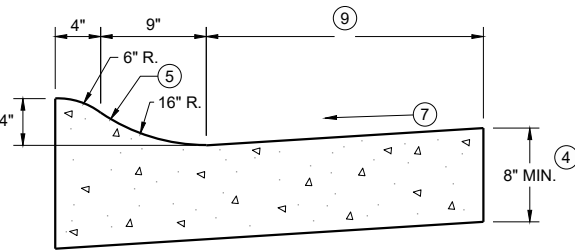


6" SLOPED CURB TYPES A<sup>①</sup> & D



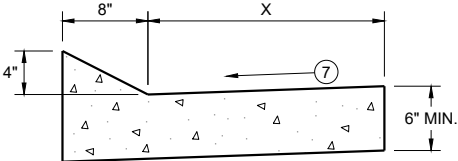
4" SLOPED CURB TYPES A<sup>①</sup> & D

CONCRETE CURB AND GUTTER 36"



4" SLOPED CURB TYPES R<sup>①</sup> & T

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

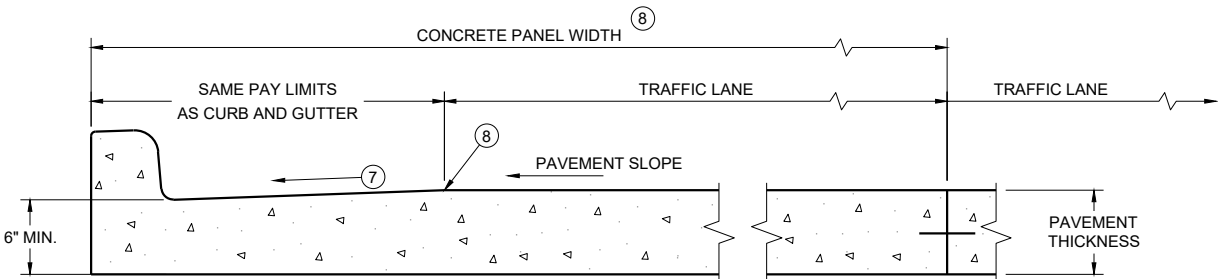


TYPES TBT & TBTT<sup>①</sup>

CONCRETE CURB AND GUTTER

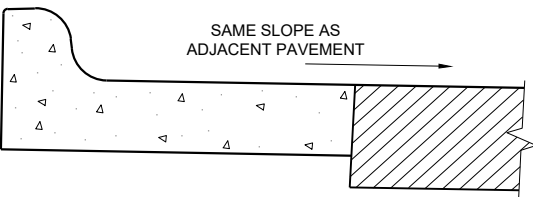
PAVEMENT THICKNESS  
AND MAXIMUM CONCRETE  
PANEL WIDTH TABLE

| 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<sup>⑥</sup>  
(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.

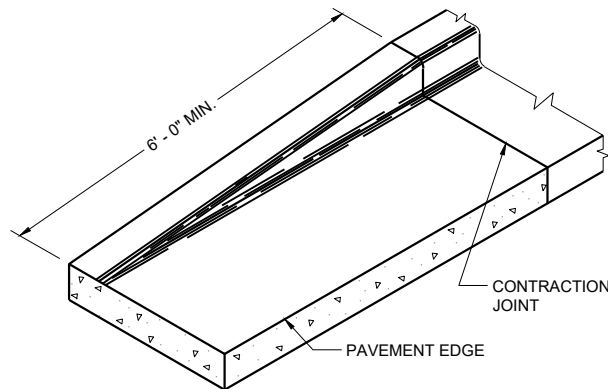
INTEGRAL CURB AND GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB AND GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE.

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

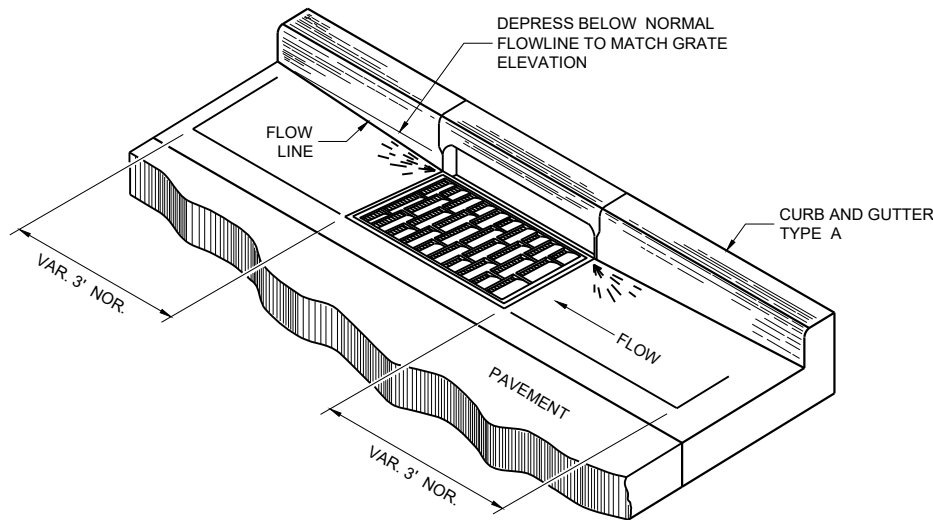
- ① TIE BARS ARE REQUIRED FOR CURB AND GUTTERS TYPES A, G, K, R, AND TBTT.
- ② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ③ USE 8" MINIMUM GUTTER THICKNESS WHEN USED WITH 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

CONCRETE CURB AND GUTTER

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

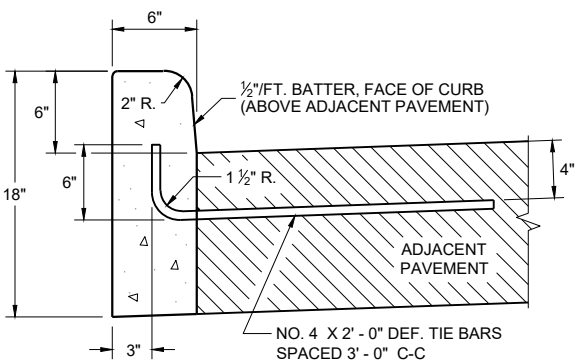


END SECTION CURB AND GUTTER

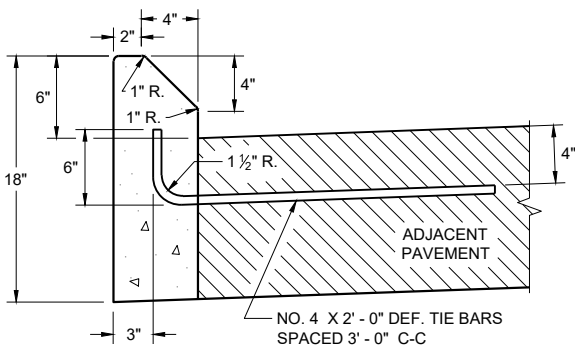


DETAIL OF CURB AND GUTTER AT INLETS

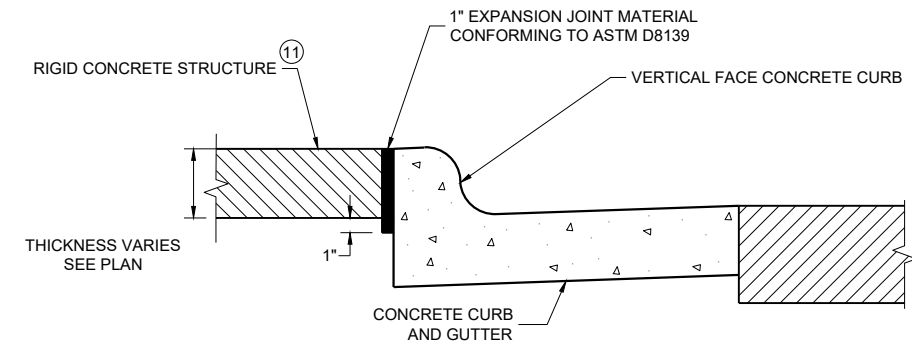
(TYPICAL H INLET COVER SHOWN)



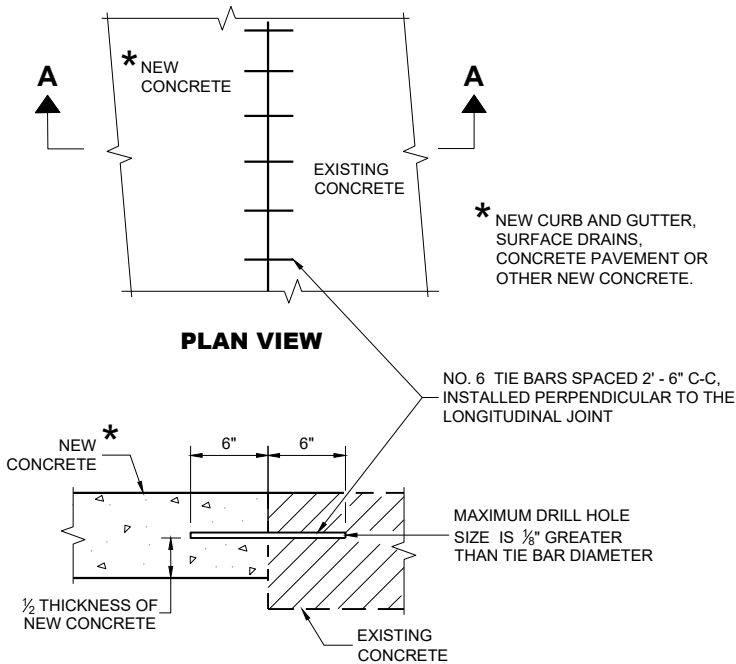
TYPES A<sup>①</sup> & D



TYPES G<sup>①</sup> & J  
CONCRETE CURB



EXPANSION JOINT DETAIL FOR VERTICAL CURB ABUTTING A RIGID STRUCTURE<sup>⑪</sup>



SECTION A - A  
TIE BARS DRILLED INTO EXISTING PAVEMENT

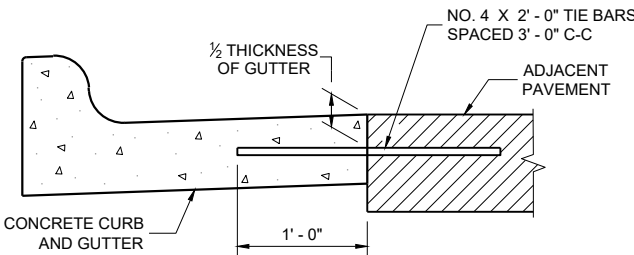
GENERAL NOTES

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

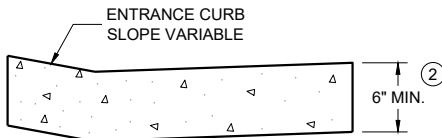
PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

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.
- ⑩ REFER TO SDD 08D18 AND 08D19 FOR ADDITIONAL DRIVEWAY ENTRANCE CURB DETAILS.
- ⑪ PLACE 1" THICK EXPANSION JOINT MATERIAL BETWEEN VERTICAL FACE CURB TYPES EXTENDING FROM THE TOP OF CURB TO 1 INCH BELOW THE ADJOINING CONCRETE SURFACE. RIGID CONCRETE STRUCTURES INCLUDE RAISED CONCRETE MEDIANS, CONCRETE SAFETY ISLANDS, SPLITTER ISLANDS, OR LOCATIONS IDENTIFIED ON THE PLANS.



TYPICAL TIE BAR LOCATION<sup>①</sup>



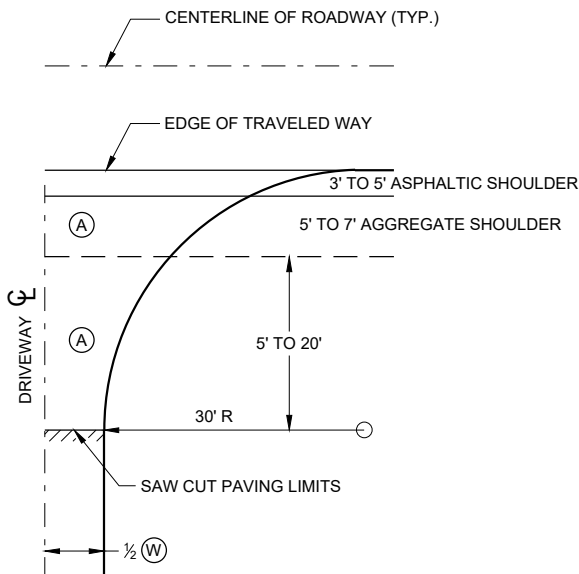
DRIVEWAY ENTRANCE CURB<sup>⑩</sup>  
(WHEN DIRECTED BY THE ENGINEER)

CONCRETE CURB, TIES  
AND CURB AND GUTTER  
APPLICATIONS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

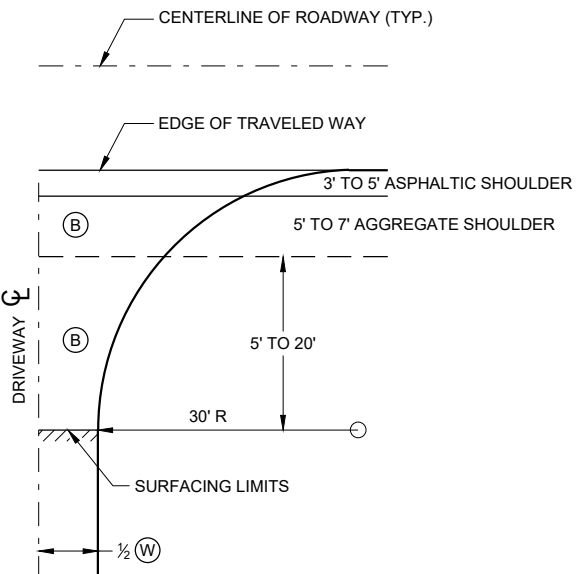
APPROVED  
May 2023  
DATE /S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR

FHWA

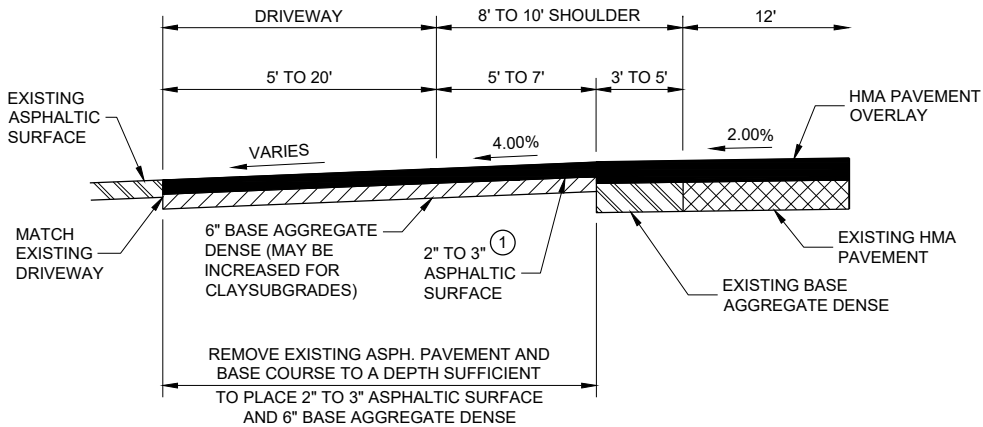


**PLAN VIEW  
HALF SECTION**

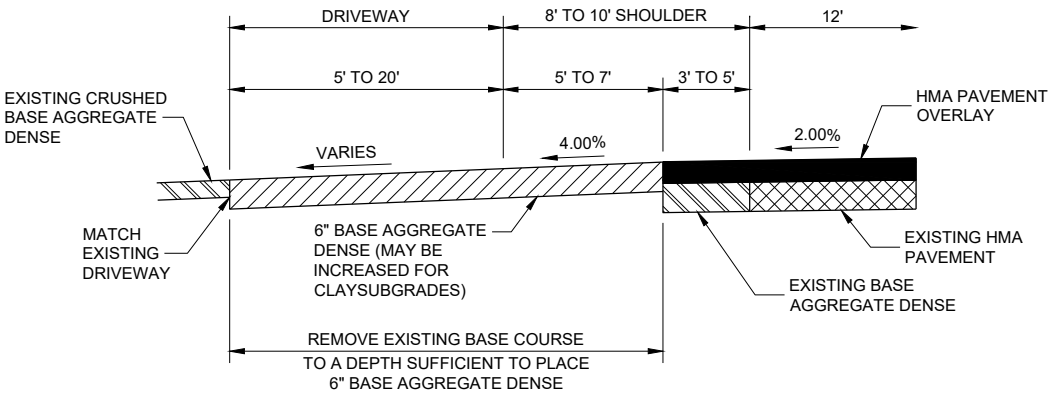
- (A) : PAID FOR AS ASPHALTIC SURFACE DRIVEWAYS  
AND FIELD ENTRANCES. (TON)
- (B) : PAID FOR AS BASE AGGREGATE DENSE 1 1/4" (TON)
- (W) : DRIVEWAY WIDTH 16' MIN. - 24' MAX.



**PLAN VIEW  
HALF SECTION**



**PROFILE VIEW  
RURAL ENTRANCE  
WITH ASPHALTIC SURFACE  
RESURFACING PROJECTS**



**PROFILE VIEW  
RURAL ENTRANCE  
WITH AGGREGATE SURFACE  
6" BASE AGGREGATE DENSE  
RESURFACING PROJECTS**

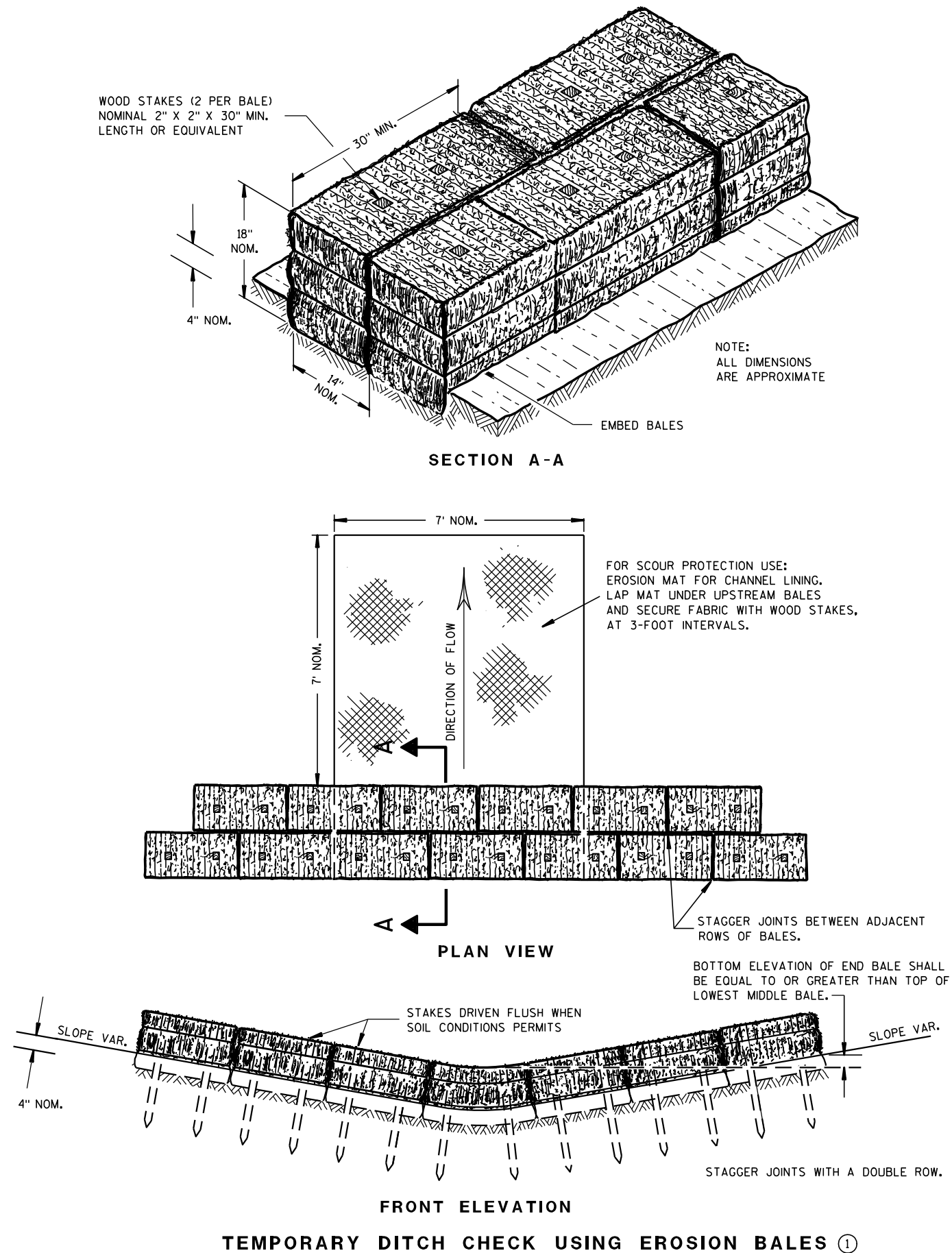
**GENERAL NOTES**

- ① DESIGN WILL DETERMINE FINAL DRIVEWAY ASPHALTIC THICKNESS  
BASED ON TYPE OF USAGE AND LOADINGS.

**DRIVEWAYS WITHOUT CURB  
AND GUTTER RESURFACING  
PROJECTS RURAL**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

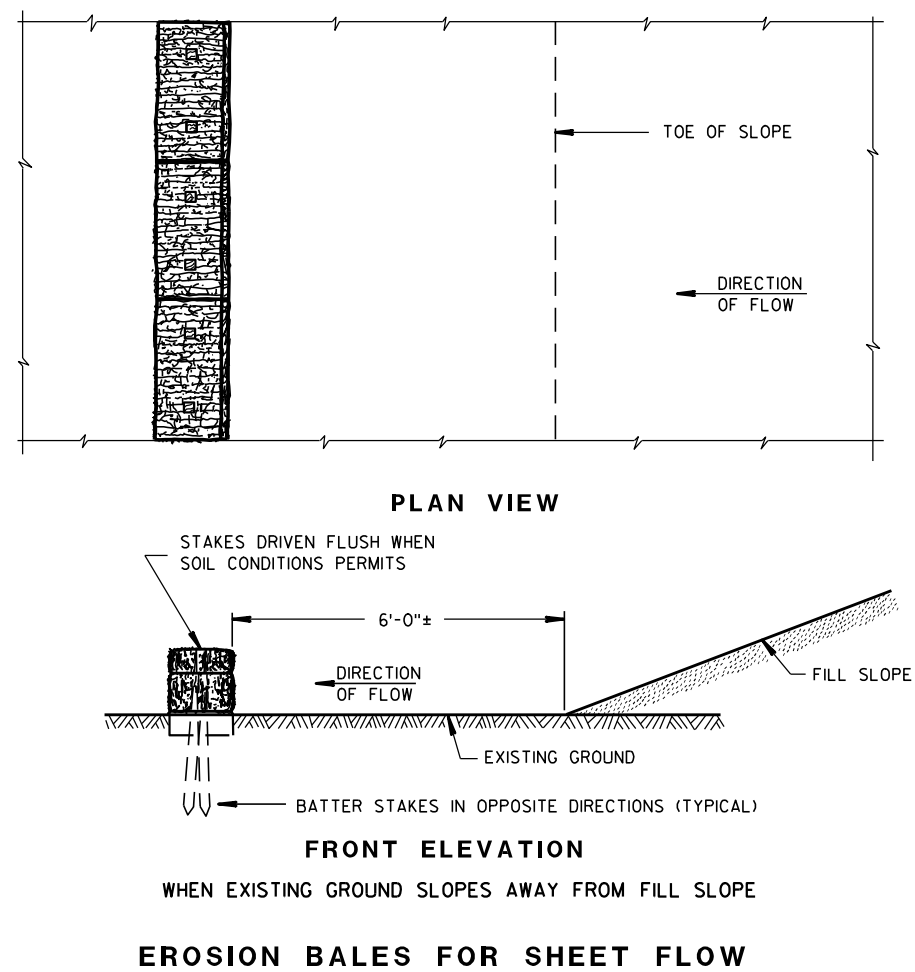
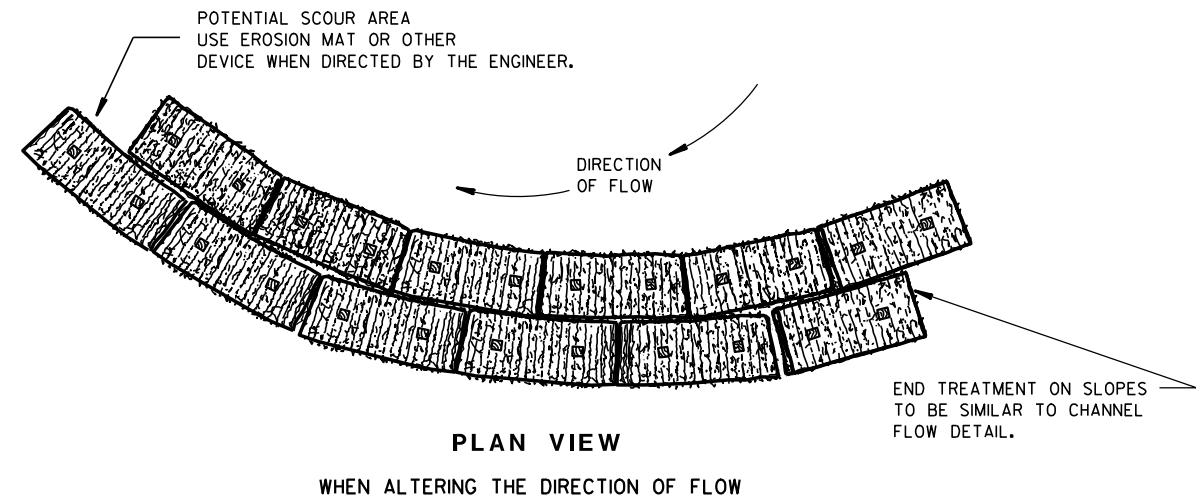
APPROVED  
December 2016 /S/ Rodney Taylor  
DATE ROADWAY STANDARDS DEVELOPMENT  
ENGINEER  
FHWA



## GENERAL NOTES

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

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

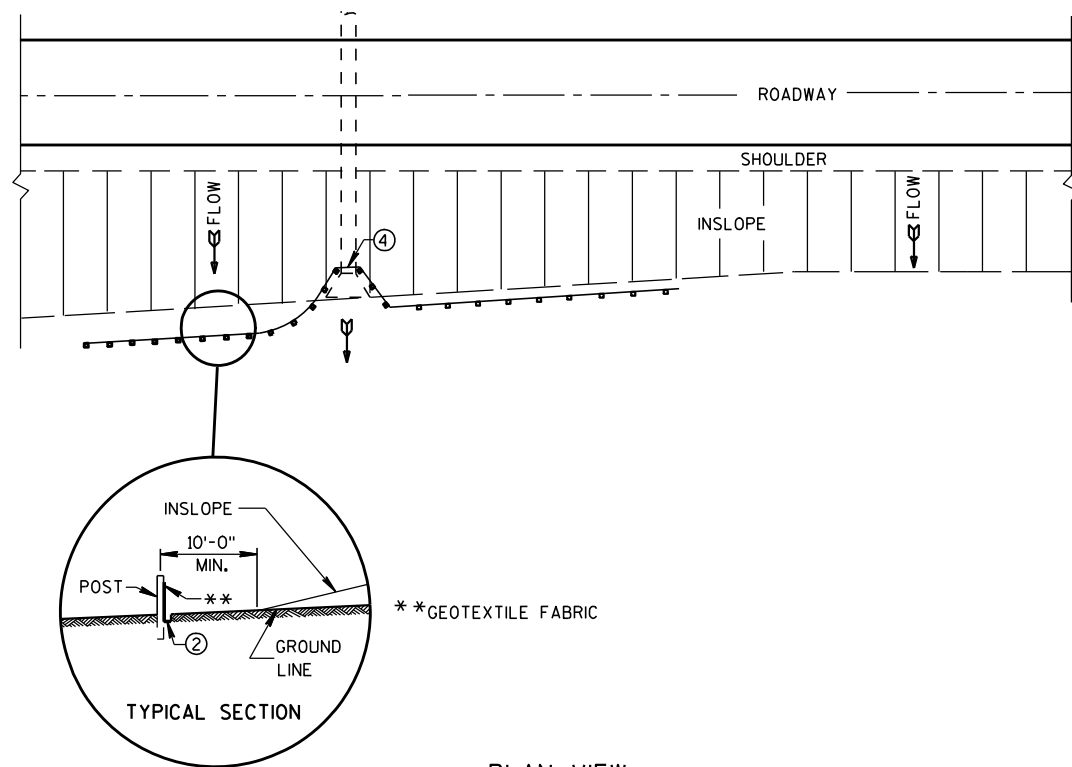
TYPICAL INSTALLATIONS OF  
EROSION BALES / TEMPORARY  
DITCH CHECKS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

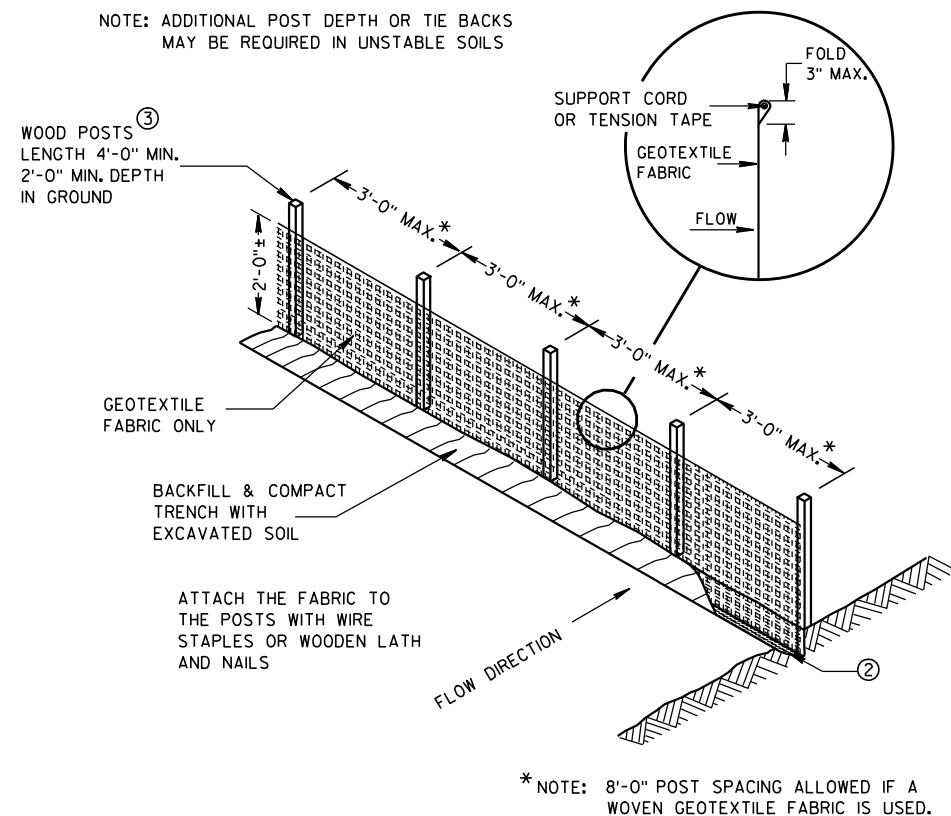
APPROVED

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

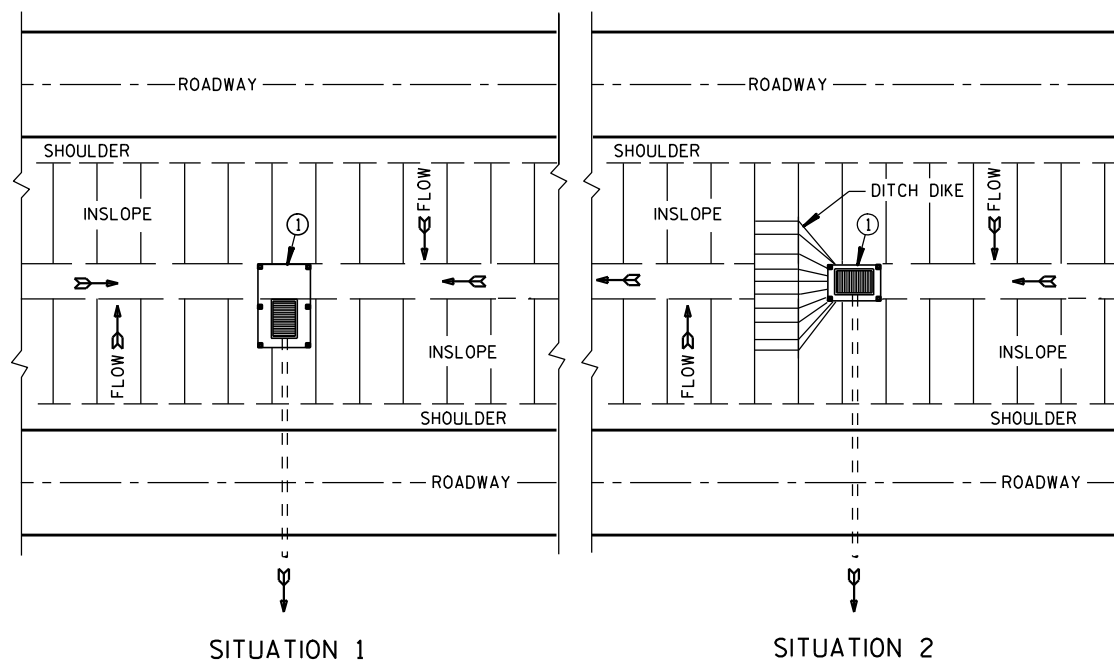
FHWA



TYPICAL APPLICATION OF SILT FENCE

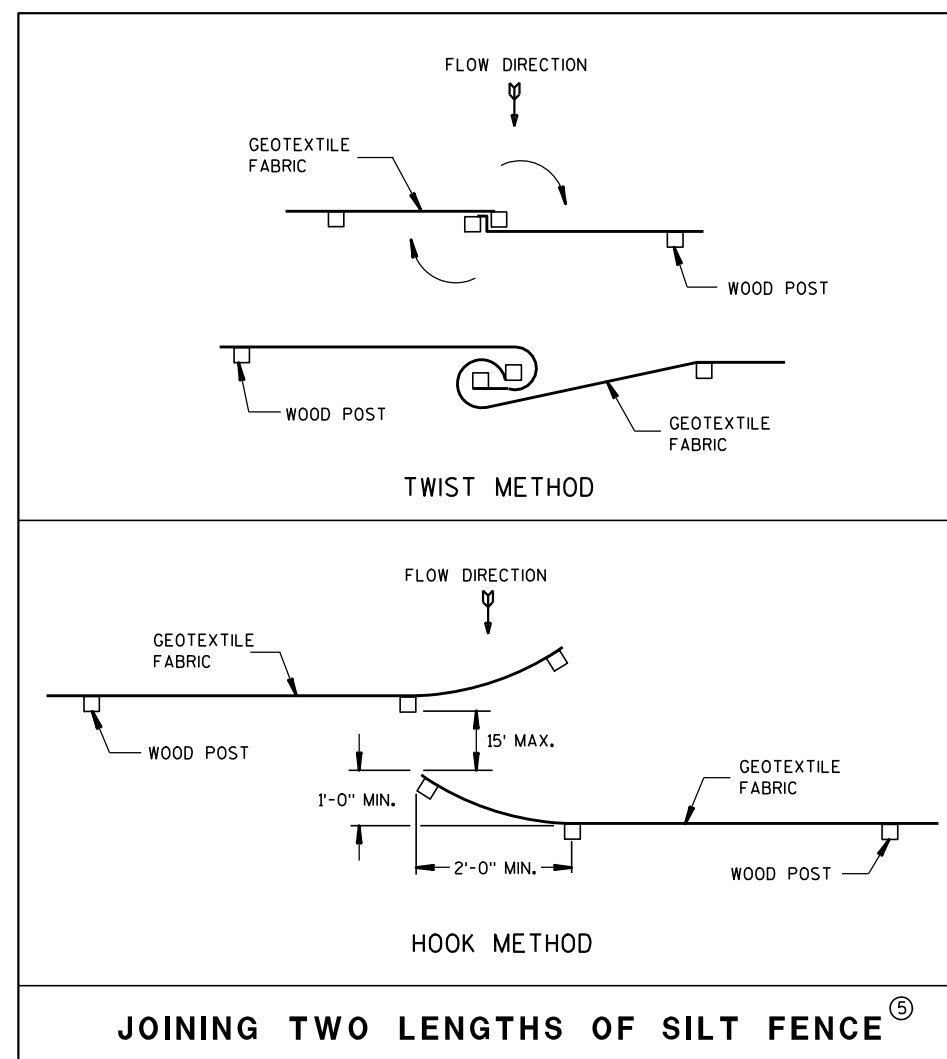


SILT FENCE



PLAN VIEW

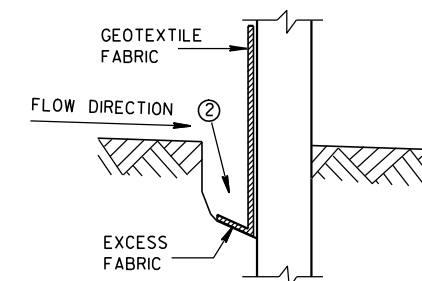
SILT FENCE AT MEDIAN SURFACE DRAINS



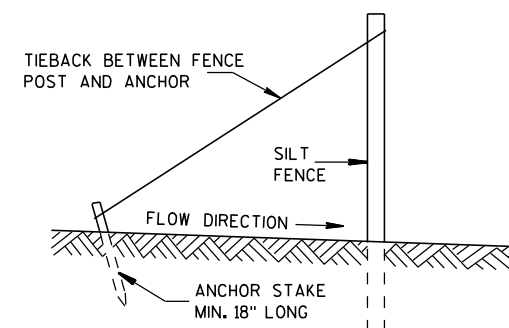
## GENERAL NOTES

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

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



SILT FENCE TIE BACK  
(WHEN REQUIRED BY THE ENGINEER)

## SILT FENCE

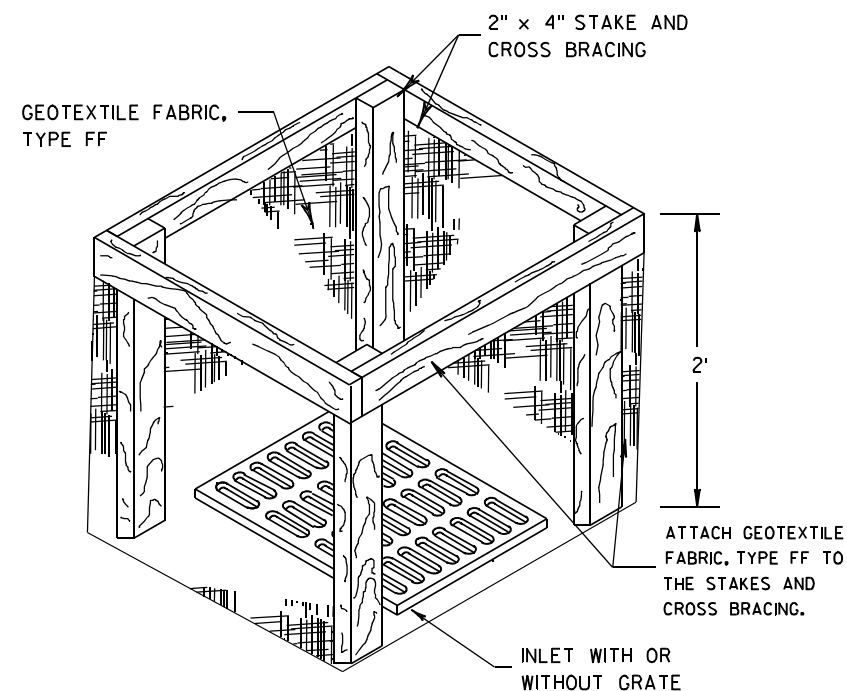
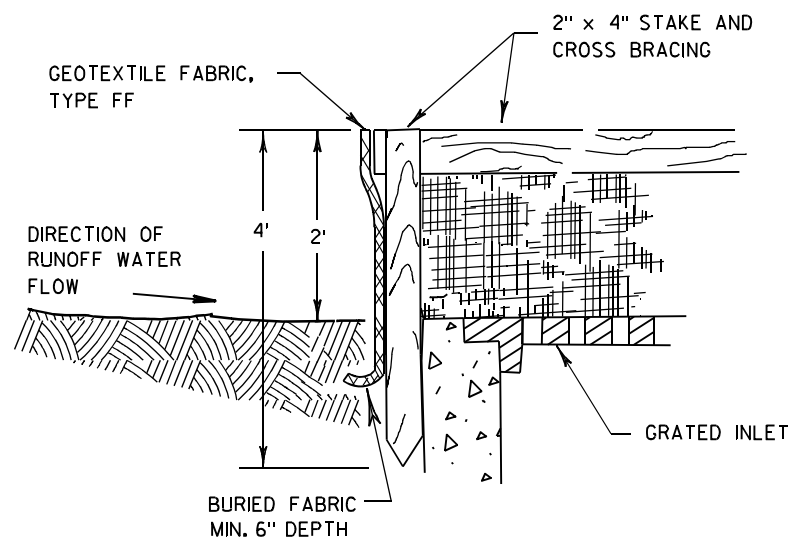
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

4-29-05  
DATE

FHWA

/S/ Beth Canestra  
CHIEF ROADWAY DEVELOPMENT ENGINEER



**INLET PROTECTION, TYPE A**

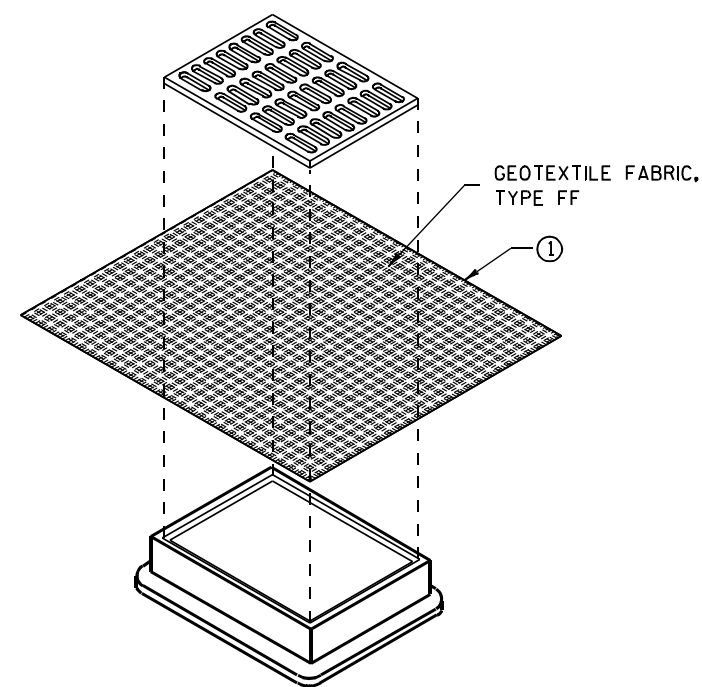
**GENERAL NOTES**

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

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

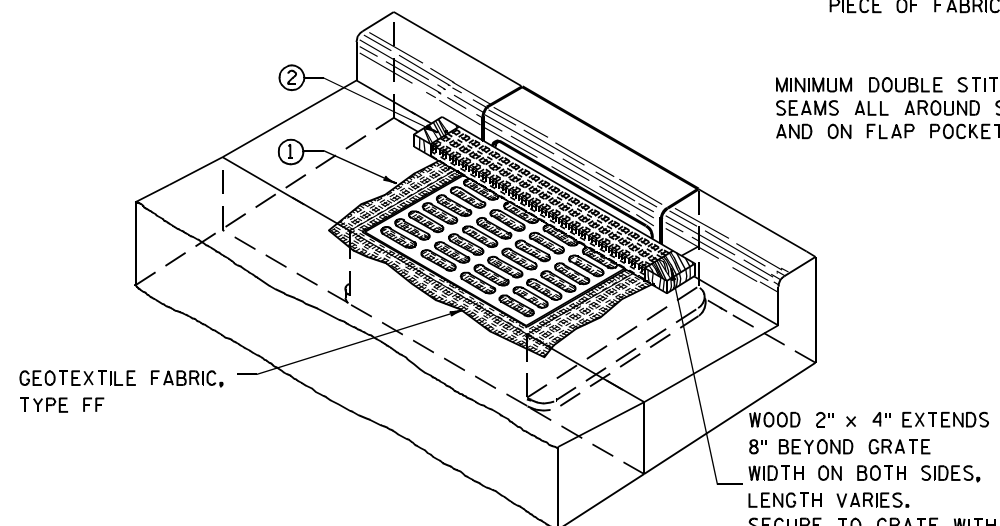
WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

- ① FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
- ② FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.
- ③ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.



**INLET PROTECTION, TYPE B  
(WITHOUT CURB BOX)**

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



**INLET PROTECTION, TYPE C (WITH CURB BOX)**

**INSTALLATION NOTES**

**TYPE B & C**

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

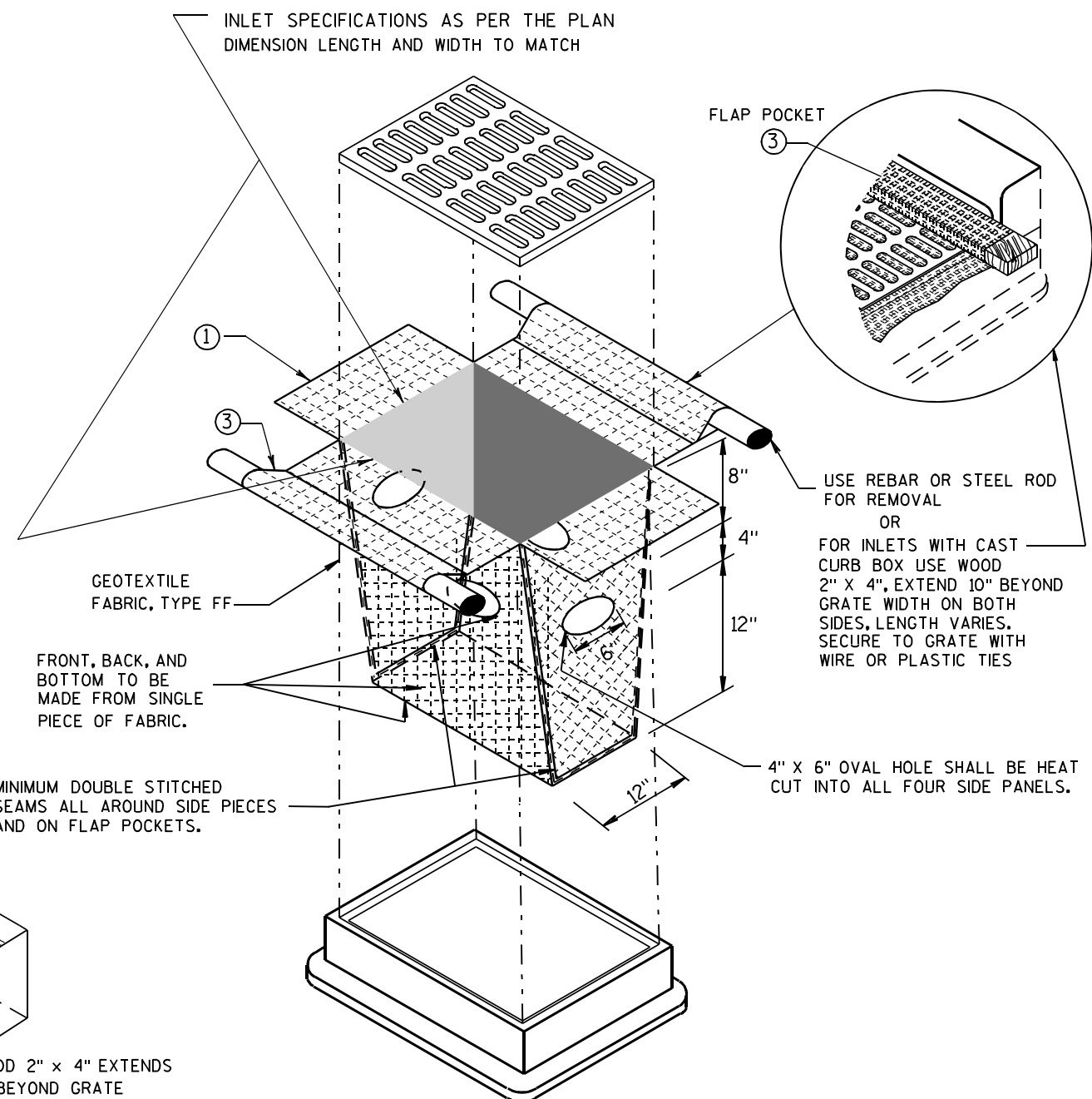
THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

**TYPE D**

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

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

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



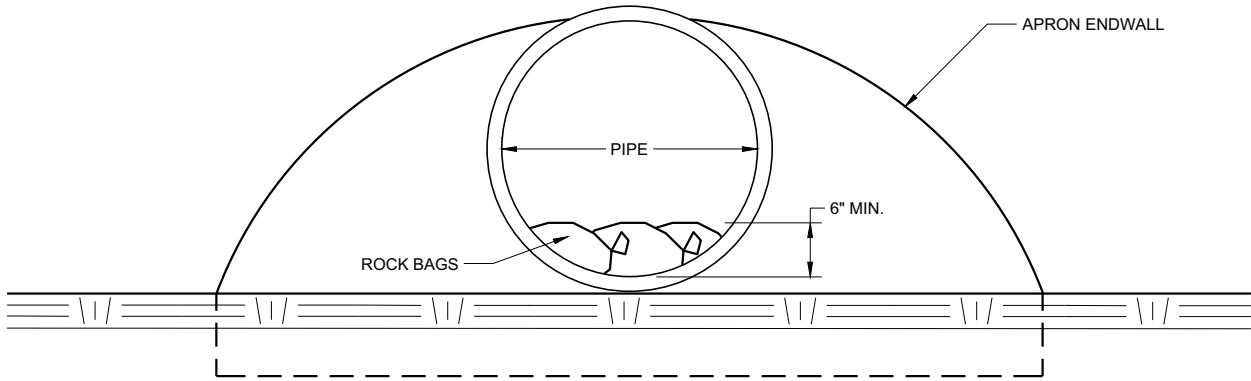
**INLET PROTECTION, TYPE D**

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

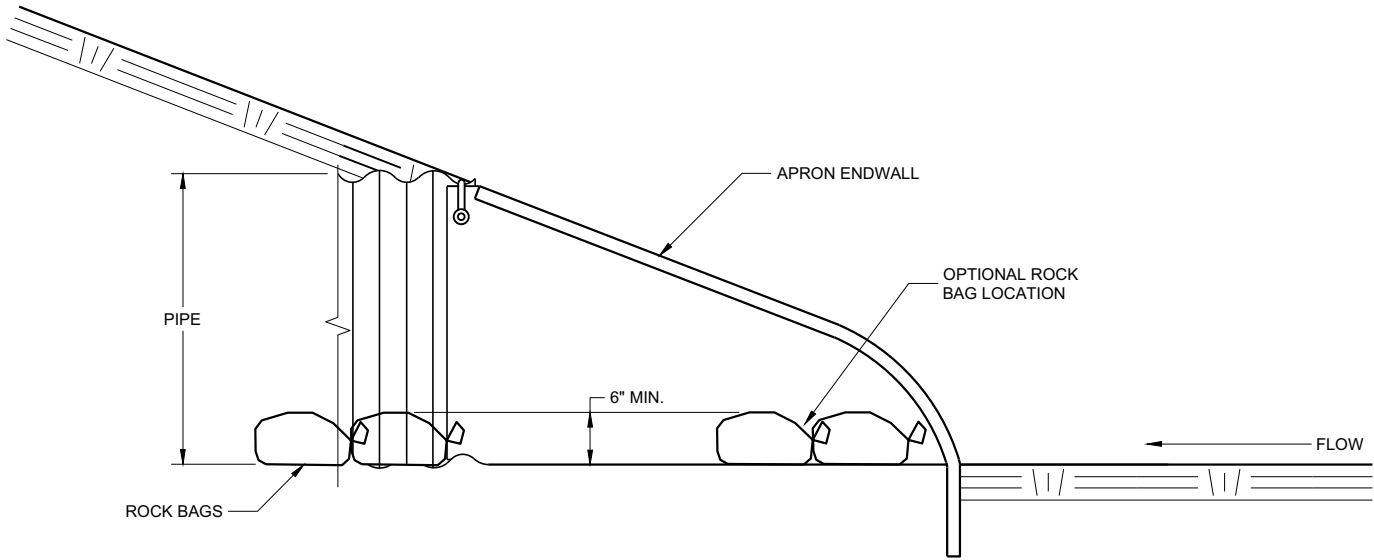
**INLET PROTECTION  
TYPE A, B, C, AND D**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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



END VIEW



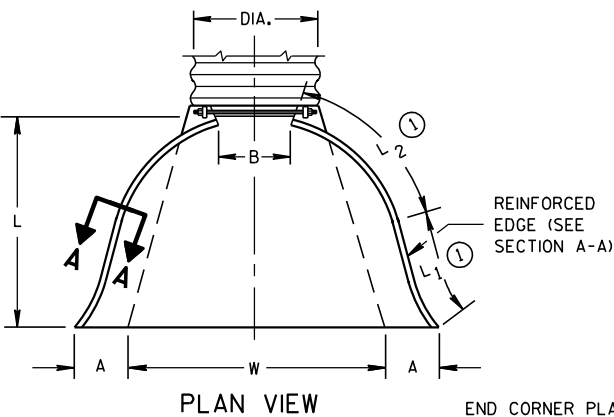
SIDE VIEW

**CULVERT PIPE CHECK**  
(INSTALL ON INLET END ONLY)

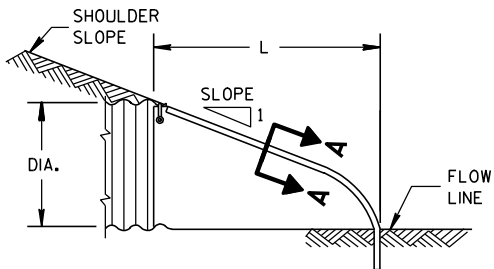
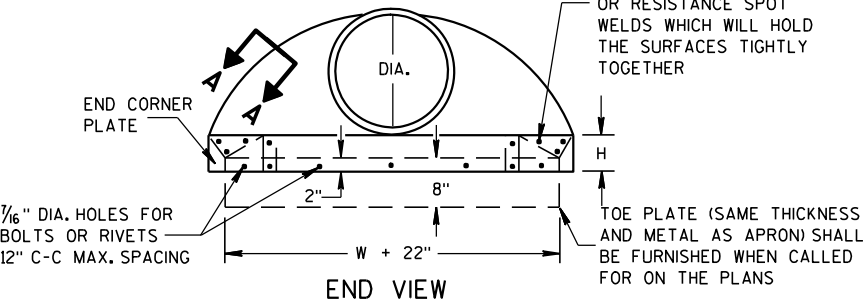
|                                                    |                                               |
|----------------------------------------------------|-----------------------------------------------|
| <b>CULVERT PIPE CHECK</b>                          |                                               |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |                                               |
| APPROVED<br>May 2019<br>DATE                       | /S/ Daniel Schave<br>EROSION CONTROL ENGINEER |
| FHWA                                               |                                               |

| METAL APRON ENDWALLS |                         |       |                     |             |            |                |         |         |            |                  |  |       |
|----------------------|-------------------------|-------|---------------------|-------------|------------|----------------|---------|---------|------------|------------------|--|-------|
| PIPE DIA.<br>(IN.)   | MIN. THICK.<br>(Inches) |       | DIMENSIONS (Inches) |             |            |                |         |         |            | APPROX.<br>SLOPE |  | BODY  |
|                      | STEEL                   | ALUM. | A<br>(±1")          | B<br>(MAX.) | H<br>(±1") | L<br>(±1 1/2") | L1<br>① | L2<br>① | W<br>(±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



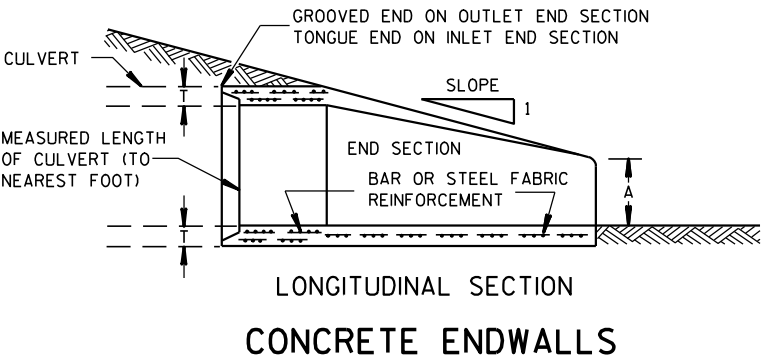
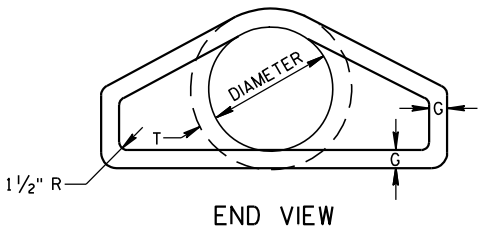
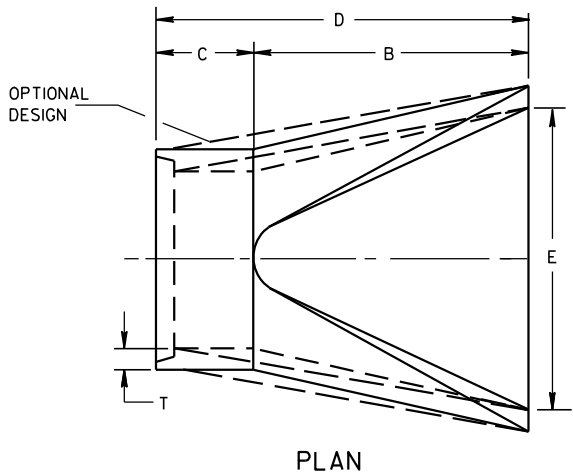
END CORNER PLATES MAY BE FASTENED TO APRON PROPER BY BOLTS, RIVETS, OR RESISTANCE SPOT WELDS WHICH WILL HOLD THE SURFACES TIGHTLY TOGETHER



SIDE ELEVATION  
METAL ENDWALLS

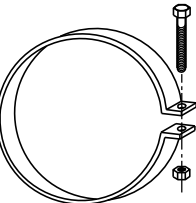
| REINFORCED CONCRETE APRON ENDWALLS |                     |        |        |           |            |     |       |                  |  |  |  |  |
|------------------------------------|---------------------|--------|--------|-----------|------------|-----|-------|------------------|--|--|--|--|
| PIPE DIA.<br>(IN.)                 | DIMENSIONS (Inches) |        |        |           |            |     |       | APPROX.<br>SLOPE |  |  |  |  |
|                                    | T                   | A      | B      | C         | D          | E   | G     |                  |  |  |  |  |
| 12                                 | 2                   | 4      | 24     | 48 7/8    | 72 7/8     | 24  | 2     | 3 to 1           |  |  |  |  |
| 15                                 | 2 1/4               | 6      | 27     | 46        | 73         | 30  | 2 1/4 | 3 to 1           |  |  |  |  |
| 18                                 | 2 1/2               | 9      | 27     | 46        | 73         | 36  | 2 1/2 | 3 to 1           |  |  |  |  |
| 21                                 | 2 3/4               | 9      | 36     | 37 1/2    | 73 1/2     | 42  | 2 3/4 | 3 to 1           |  |  |  |  |
| 24                                 | 3                   | 9 1/2  | 43 1/2 | 30        | 73 1/2     | 48  | 3     | 3 to 1           |  |  |  |  |
| 27                                 | 3 1/4               | 10 1/2 | 49 1/2 | 24        | 73 1/2     | 54  | 3 1/4 | 3 to 1           |  |  |  |  |
| 30                                 | 3 1/2               | 12     | 54     | 19 3/4    | 73 1/2     | 60  | 3 1/2 | 3 to 1           |  |  |  |  |
| 36                                 | 4                   | 15     | 63     | 34 3/4    | 97 3/4     | 72  | 4     | 3 to 1           |  |  |  |  |
| 42                                 | 4 1/2               | 21     | 63     | 35        | 98         | 78  | 4 1/2 | 3 to 1           |  |  |  |  |
| 48                                 | 5                   | 24     | 72     | 26        | 98         | 84  | 5     | 3 to 1           |  |  |  |  |
| 54                                 | 5 1/2               | 27     | 65     | 33 1/4-35 | 98 1/4-100 | 90  | 5 1/2 | 2 2/5 to 1       |  |  |  |  |
| 60                                 | 6                   | 30-35  | 60     | 39        | 99         | 96  | 5     | 2 to 1           |  |  |  |  |
| 66                                 | 6 1/2               | 24-30  | 72-78  | 21-27     | 99         | 102 | 5 1/2 | 2 to 1           |  |  |  |  |
| 72                                 | 7                   | 24-36  | 78     | 21        | 99         | 108 | 6     | 2 to 1           |  |  |  |  |
| 78                                 | 7 1/2               | 24-36  | 78     | 21        | 99         | 114 | 6 1/2 | 2 to 1           |  |  |  |  |
| 84                                 | 8                   | 36     | 90 1/2 | 21        | 111 1/2    | 120 | 6 1/2 | 1 1/2 to 1       |  |  |  |  |
| 90                                 | 8 1/2               | 41     | 87 1/2 | 24        | 111 1/2    | 132 | 6 1/2 | 1 1/2 to 1       |  |  |  |  |

\* MINIMUM  
\*\* MAXIMUM

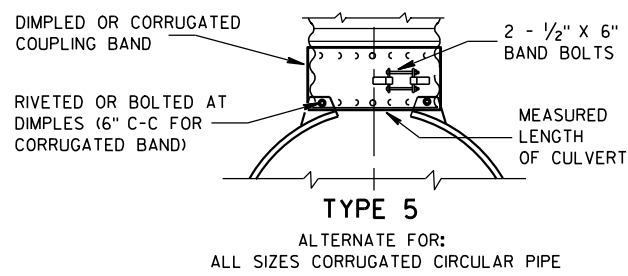
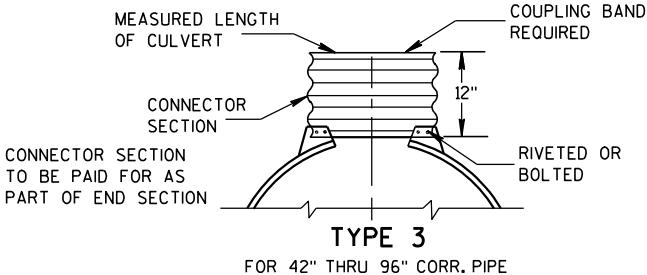
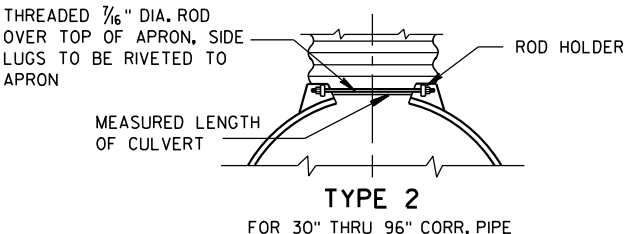
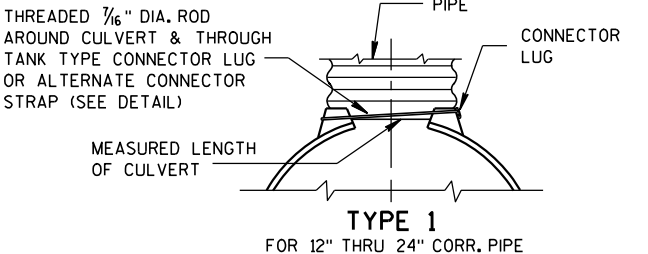


LONGITUDINAL SECTION  
CONCRETE ENDWALLS

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



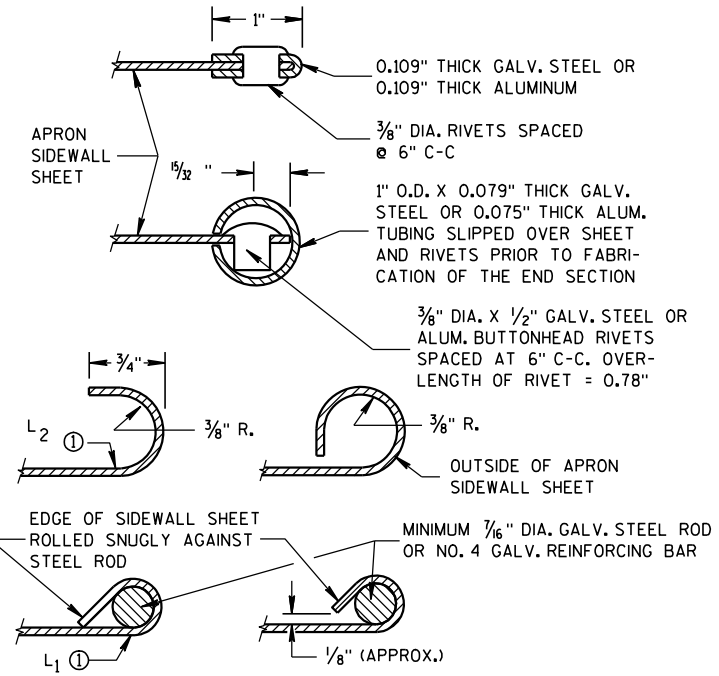
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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

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

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

CONNECTION DETAILS



SECTION A-A

GENERAL NOTES

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

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

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

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

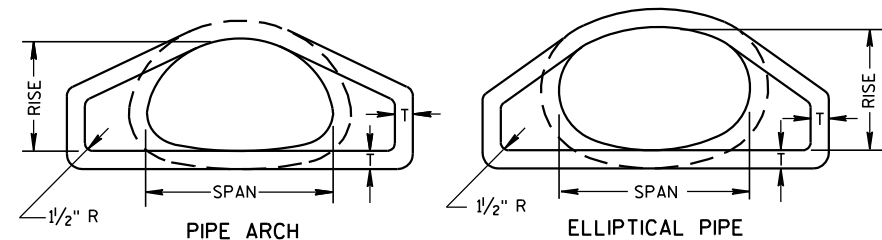
WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

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

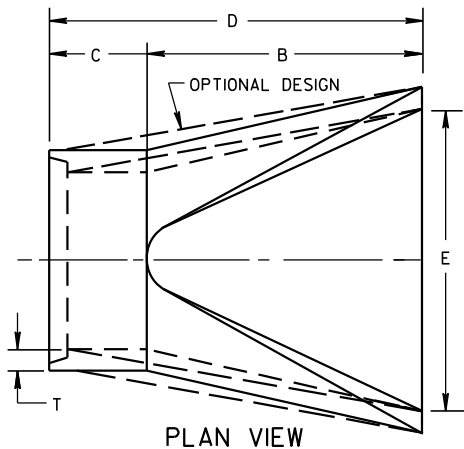
APRON ENDWALLS FOR  
CULVERT PIPE

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

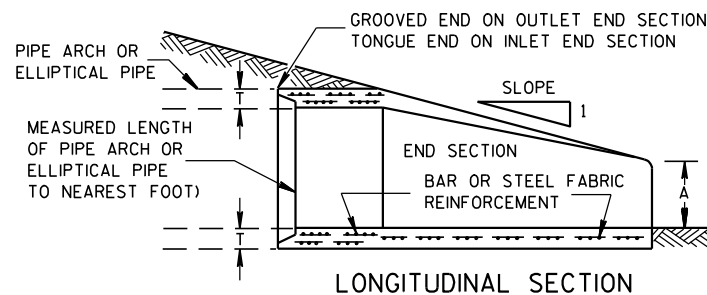
APPROVED  
11/30/94  
DATE  
/S/ Rory L. Rhinesmith  
CHIEF ROADWAY DEVELOPMENT ENGINEER  
FHWA



END VIEW

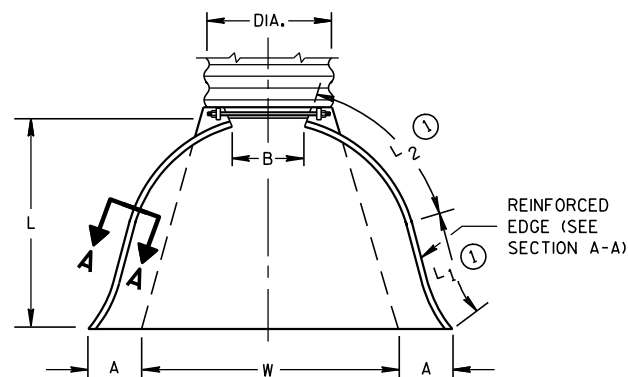


PLAN VIEW

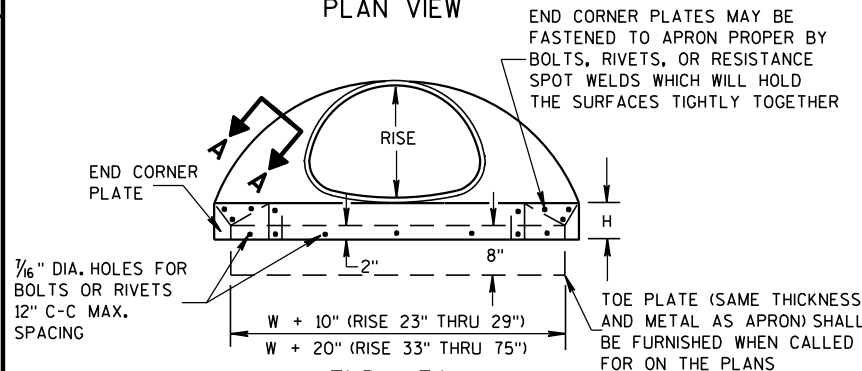


LONGITUDINAL SECTION

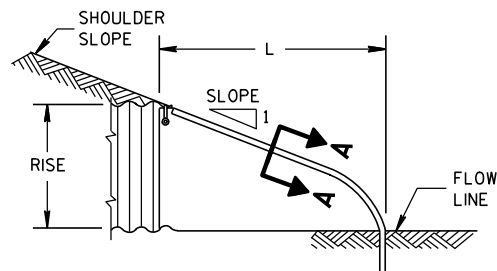
CONCRETE ENDWALLS



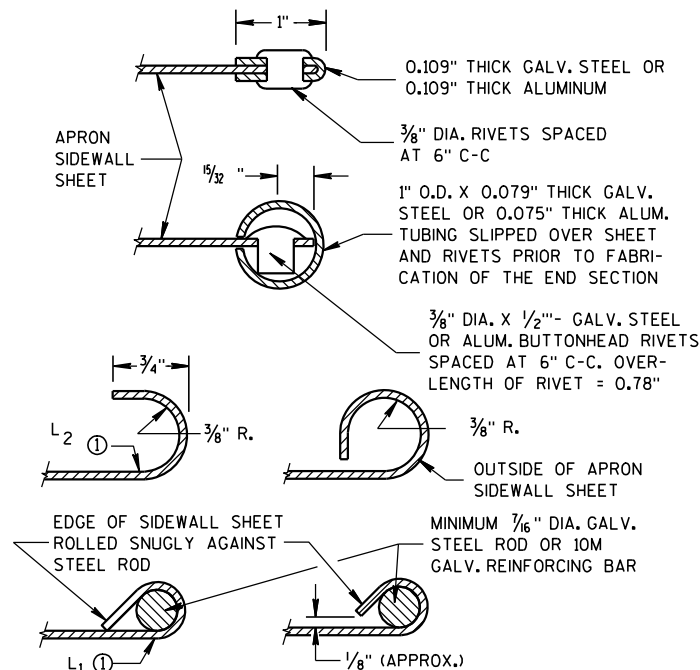
PLAN VIEW



END VIEW



SIDE ELEVATION  
METAL ENDWALLS



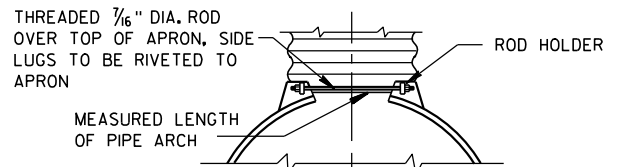
SECTION A-A

| 2- 2⅔" X ½" CORRUGATIONS   |          |      |                         |       |                     |        |       |        |    |     |       |                  |       |
|----------------------------|----------|------|-------------------------|-------|---------------------|--------|-------|--------|----|-----|-------|------------------|-------|
| EQUIV.<br>DIA.<br>(Inches) | (Inches) |      | MIN. THICK.<br>(Inches) |       | DIMENSIONS (Inches) |        |       |        |    |     |       | APPROX.<br>SLOPE | BODY  |
|                            | SPAN     | RISE | STEEL                   | ALUM. | A                   | B      | H     | L      | L1 | L 2 | W     |                  |       |
|                            |          |      |                         |       | (±1")               | (MAX.) | (±1") | (±1½") | ①  | ①   | (±2") |                  |       |
| 15                         | 17       | 13   | .064                    | .060  | 7                   | 9      | 6     | 19     | 14 | 16  | 30    | 2½ to 1          | 1 Pc. |
| 18                         | 21       | 15   | .064                    | .060  | 7                   | 10     | 6     | 23     | 14 | 19⅜ | 36    | 2½ to 1          | 1 Pc. |
| 21                         | 24       | 18   | .064                    | .060  | 8                   | 12     | 6     | 28     | 18 | 21¾ | 42    | 2½ to 1          | 1 Pc. |
| 24                         | 28       | 20   | .064                    | .060  | 9                   | 14     | 6     | 32     | 18 | 27½ | 48    | 2½ to 1          | 1 Pc. |
| 30                         | 35       | 24   | .079                    | .075  | 10                  | 16     | 6     | 39     | 18 | 37⅝ | 60    | 2½ to 1          | 1 Pc. |
| 36                         | 42       | 29   | .079                    | .075  | 12                  | 18     | 8     | 46     | 24 | 45⅝ | 75    | 2½ to 1          | 1 Pc. |
| 42                         | 49       | 33   | .109                    | .105  | 13                  | 21     | 9     | 53     | 24 | 54¾ | 85    | 2½ to 1          | 2 Pc. |
| 48                         | 57       | 38   | .109                    | .105  | 18                  | 26     | 12    | 63     | 24 | 68  | 90    | 2½ to 1          | 3 Pc. |
| 54                         | 64       | 43   | .109                    | .105  | 18                  | 30     | 12    | 70     | 24 | 72¾ | 102   | 2¼ to 1          | 3 Pc. |
| 60                         | 71       | 47   | .109*                   | .105* | 18                  | 33     | 12    | 77     | 30 | 82¼ | 114   | 2¼ 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.<br>DIA.<br>(Inches) | (Inches) |      | MIN. THICK.<br>(Inches) |       | DIMENSIONS (Inches) |        |       |           |                |                |       | APPROX.<br>SLOPE | BODY  |
|                            | SPAN     | RISE | STEEL                   | ALUM. | A                   | B      | H     | L         | L <sub>1</sub> | L <sub>2</sub> | W     |                  |       |
|                            |          |      |                         |       | (±1")               | (MAX.) | (±1") | (±1 1/2") | ①              | ①              | (±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. |

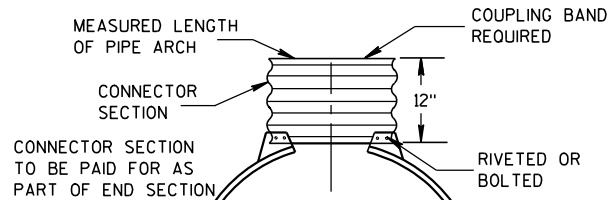
NOTE: ALL SPLICES TO BE LAP RIVETED OR BOLTED.

\* EXCEPT CENTER PANEL  
SEE GENERAL NOTES



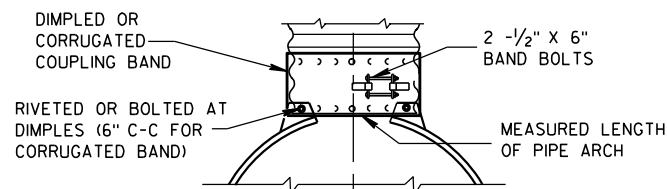
TYPE 2

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

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 1/16 | 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      | 3/4   | 8 1/2  | 39 | 33 | 72 | 48 | 3 to 1        |
| 30                   | 38                  | 24      | 3/4   | 9 1/2  | 54 | 18 | 72 | 60 | 3 to 1        |
| 36                   | 45                  | 29      | 4/2   | 11 1/8 | 60 | 24 | 84 | 72 | 2 1/2 to 1    |
| 42                   | 53                  | 34      | 5     | 15 1/4 | 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.

APRON ENDWALLS FOR  
PIPE ARCH AND  
ELLIPTICAL PIPE

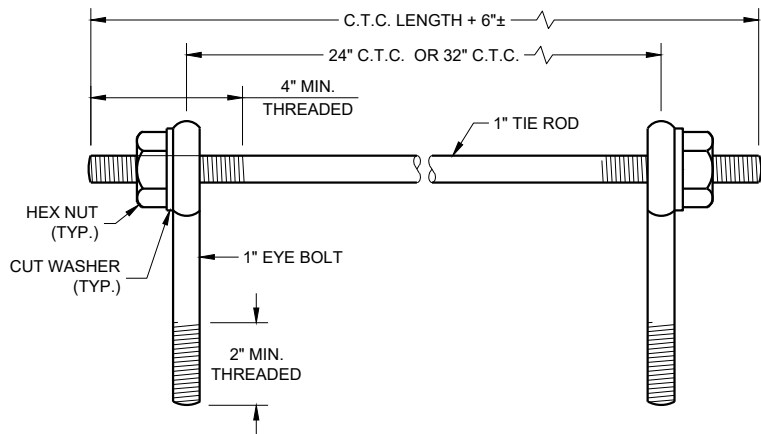
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

11/30/94  
DATE

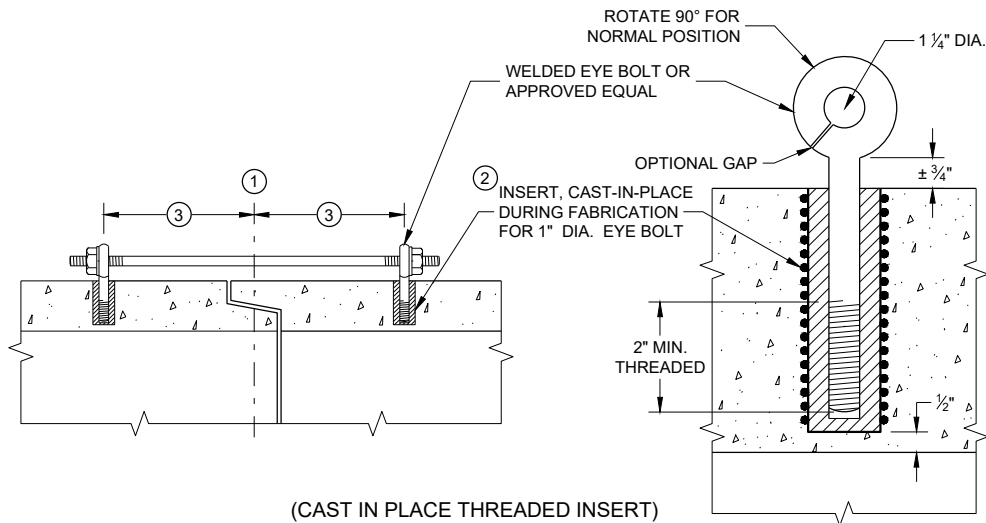
FHWA

/S/ Rory L. Rhinesmith  
CHIEF ROADWAY DEVELOPMENT ENGINEER



EYE BOLTS AND TIE ROD

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



(CAST IN PLACE THREADED INSERT)  
LONGITUDINAL SECTIONS

## GENERAL NOTES

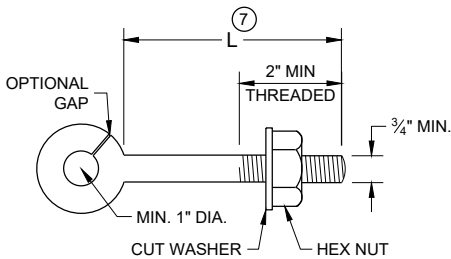
DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

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.

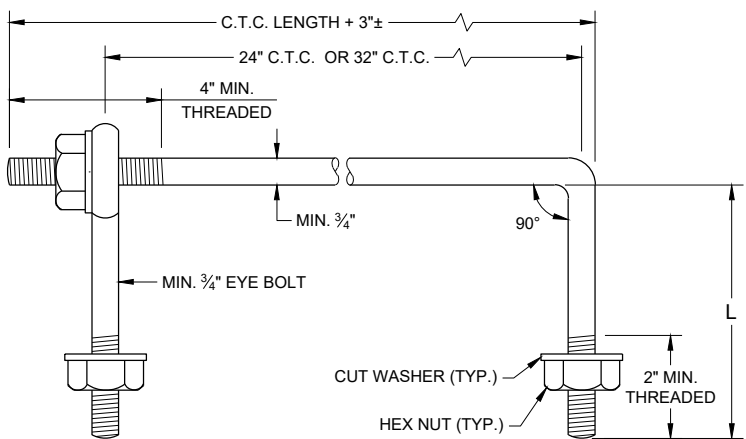
JOINT TIES TO BE HOT-DIP GALVANIZED PER ASTM A 153.

- 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.

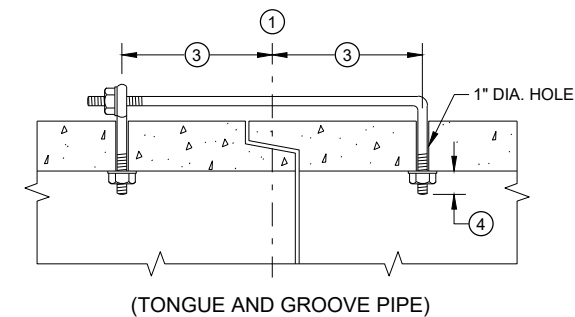


EYE BOLT 7

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



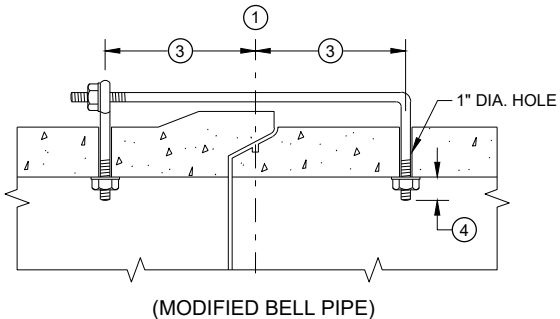
EYE BOLT AND TIE ROD



LONGITUDINAL SECTION

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

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

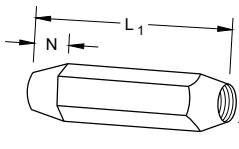


(MODIFIED BELL PIPE)

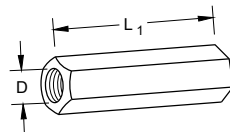
ADJUSTABLE TIE ROD TABLE

| PIPE DIAMETER | TIE ROD DIAMETER | D   | L <sub>1</sub> | 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

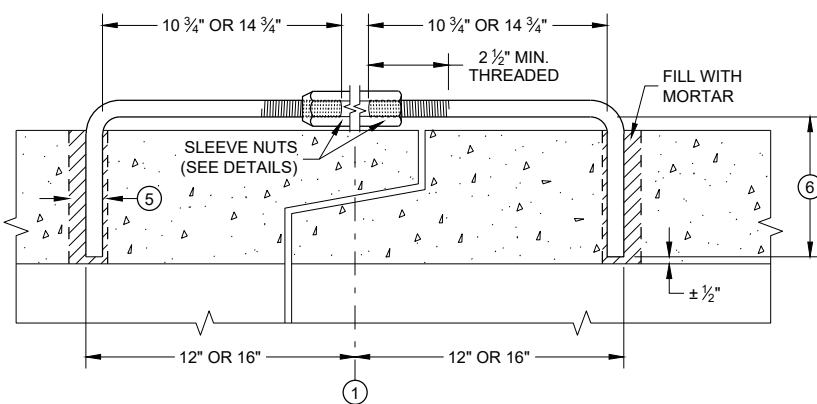


TAPERED



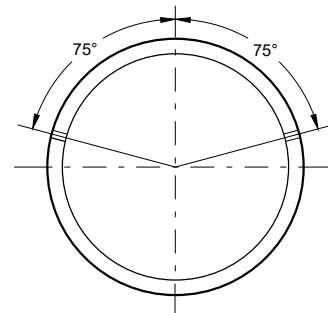
PLAIN

RIGHT AND LEFT THREADS  
SLEEVE NUTS



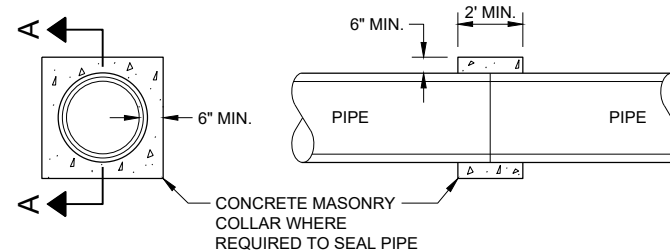
LONGITUDINAL SECTION

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



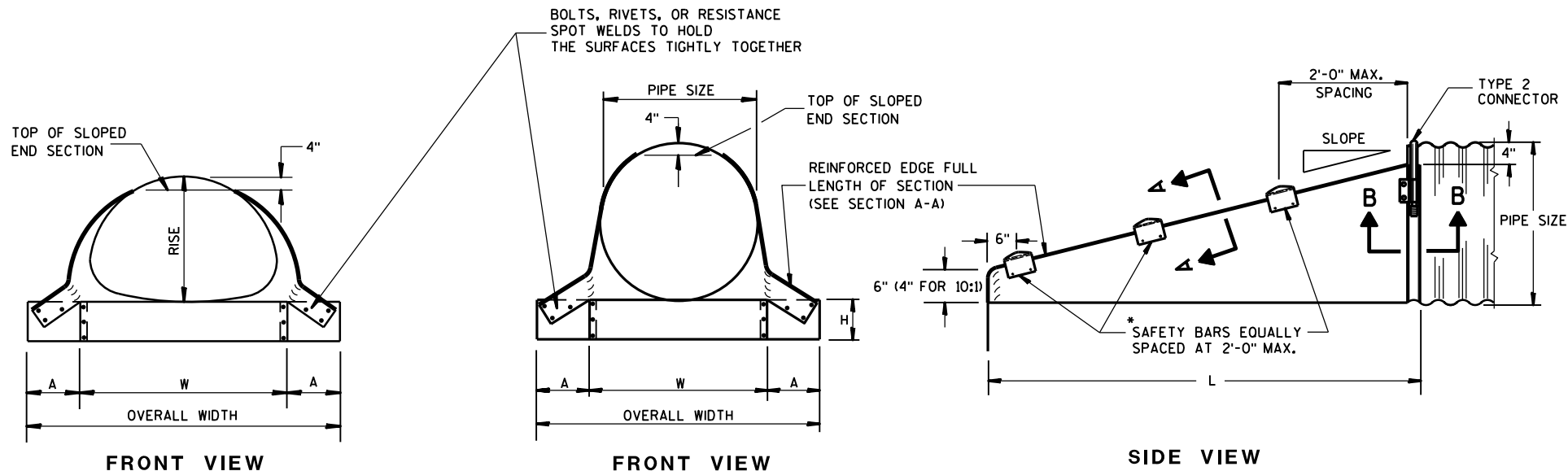
SECTION A - A

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  
FHWA



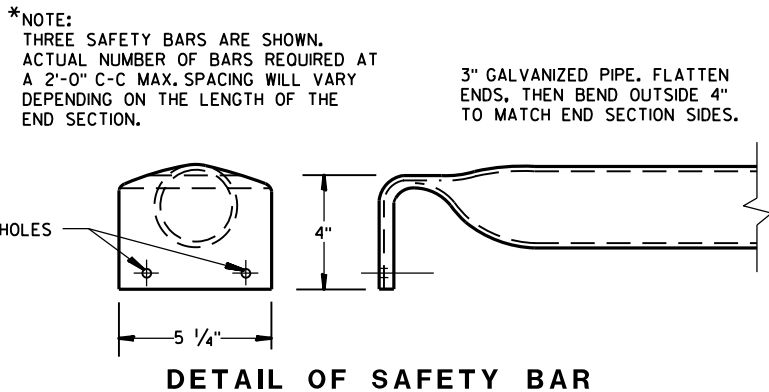
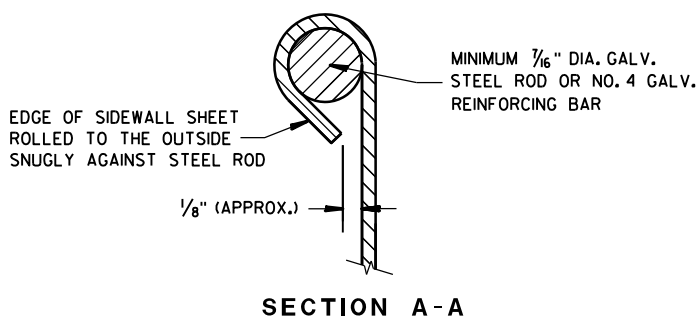
GENERAL NOTES

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

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

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

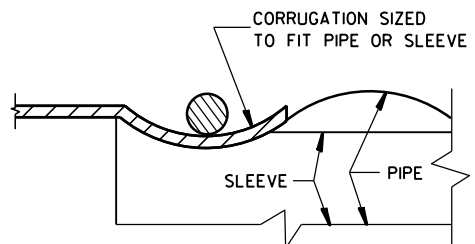
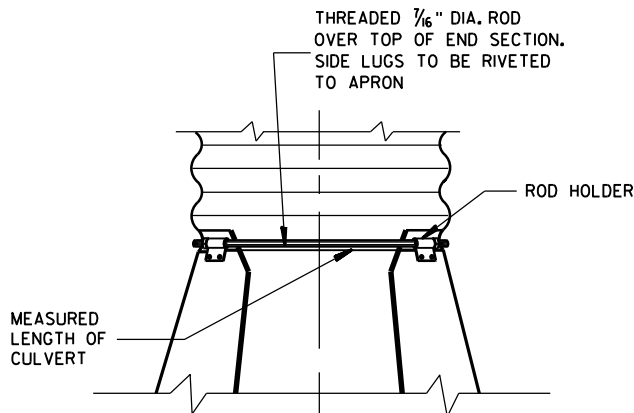
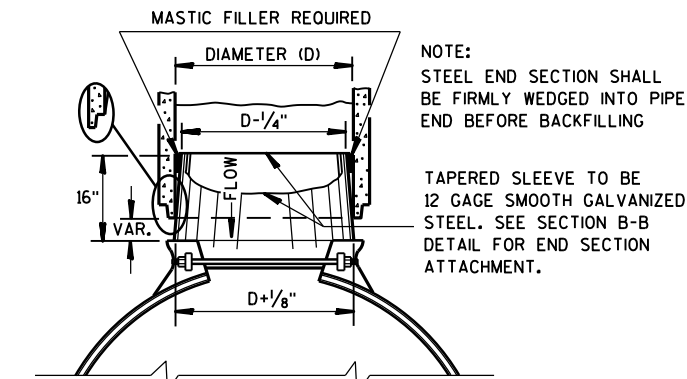
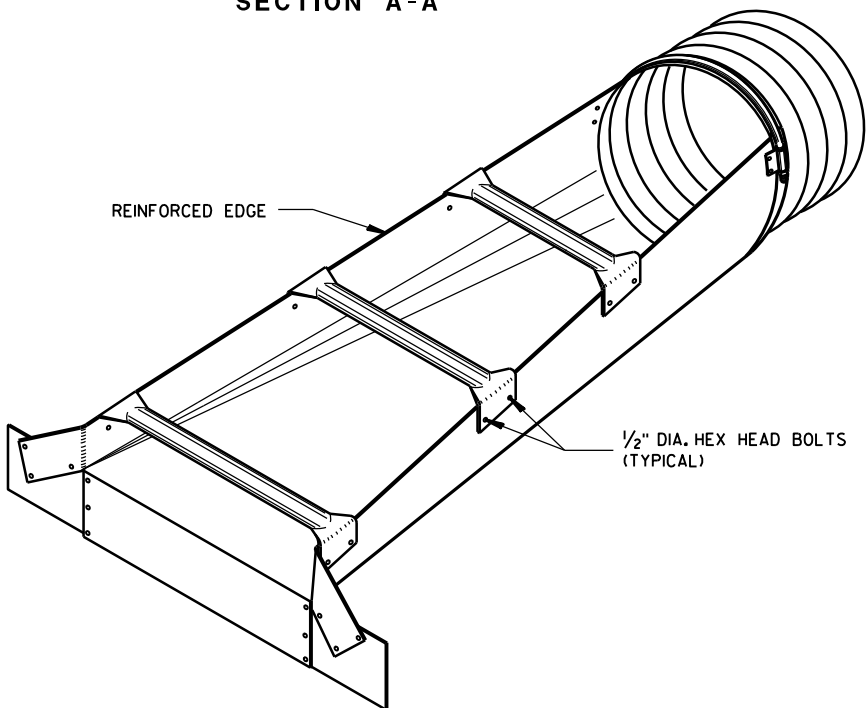
| STEEL APRON ENDWALLS FOR CULVERT PIPE SLOPED SIDE DRAINS |                      |                     |    |    |               |              |               |       |               |       |               |
|----------------------------------------------------------|----------------------|---------------------|----|----|---------------|--------------|-------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



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

① \* MINIMUM THICKNESS OF ALL 10:1 SLOPED SIDE DRAINS IS 0.109".

② ACTUAL SLOPE GREATER THAN 10:1.



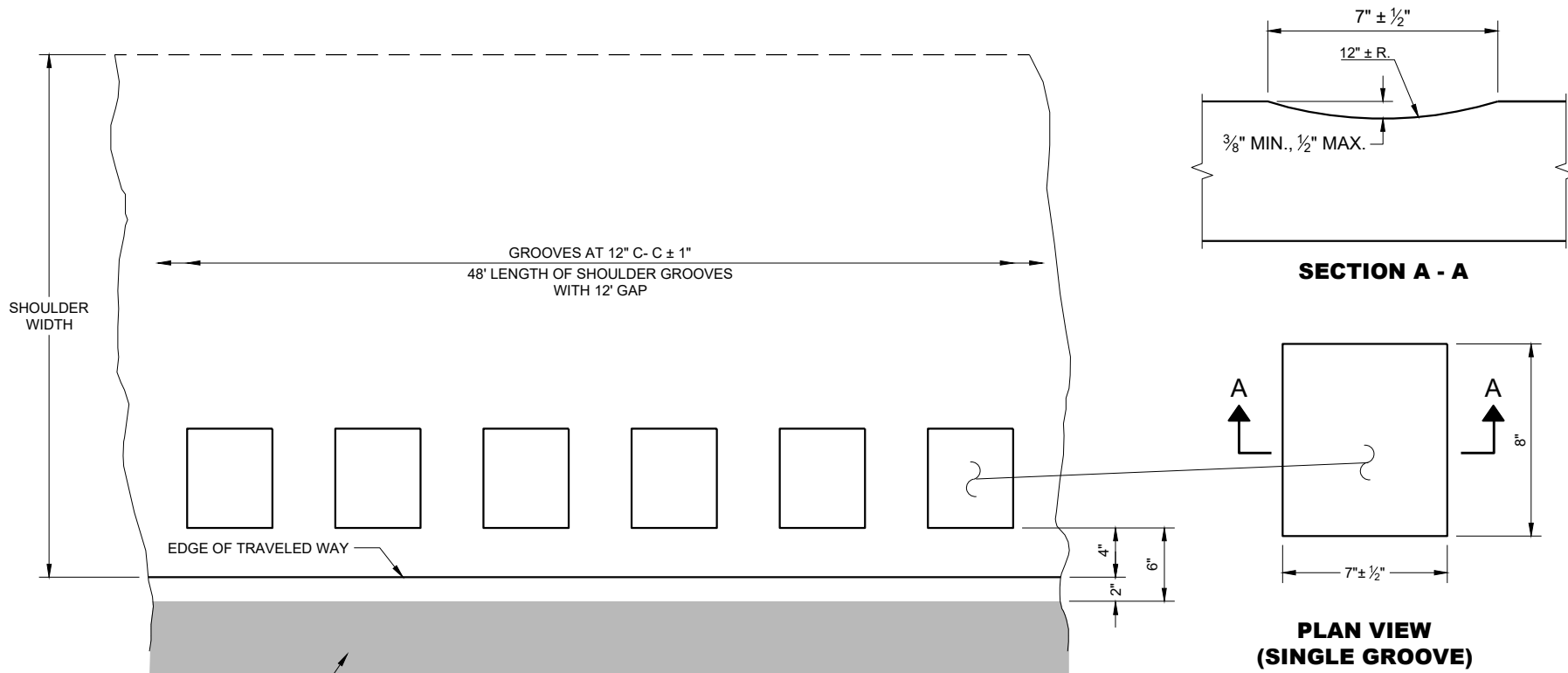
STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SLOPED SIDE DRAINS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
9/14/2012  
DATE

/S/ Jerry H. Zogg  
ROADWAY STANDARDS DEVELOPMENT  
ENGINEER

FHWA

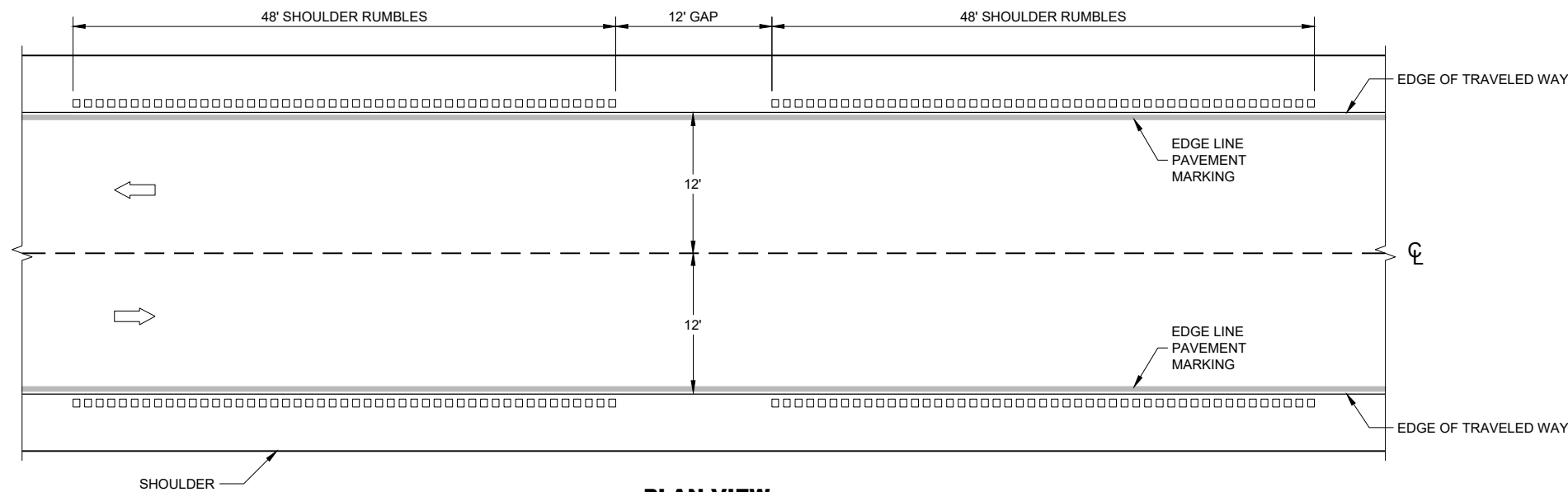
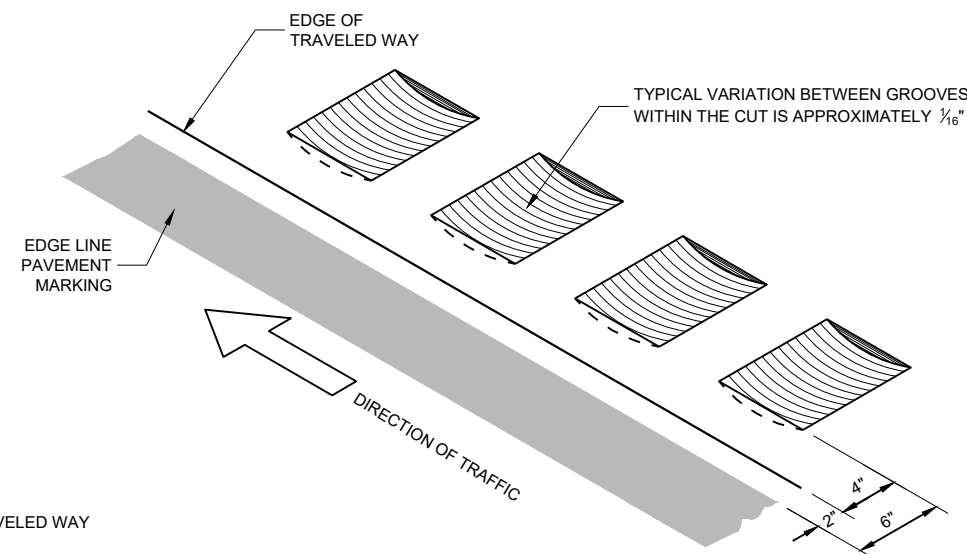


PLAN DETAIL VIEW  
SHOULDER WITH GROOVES

**GENERAL NOTES**

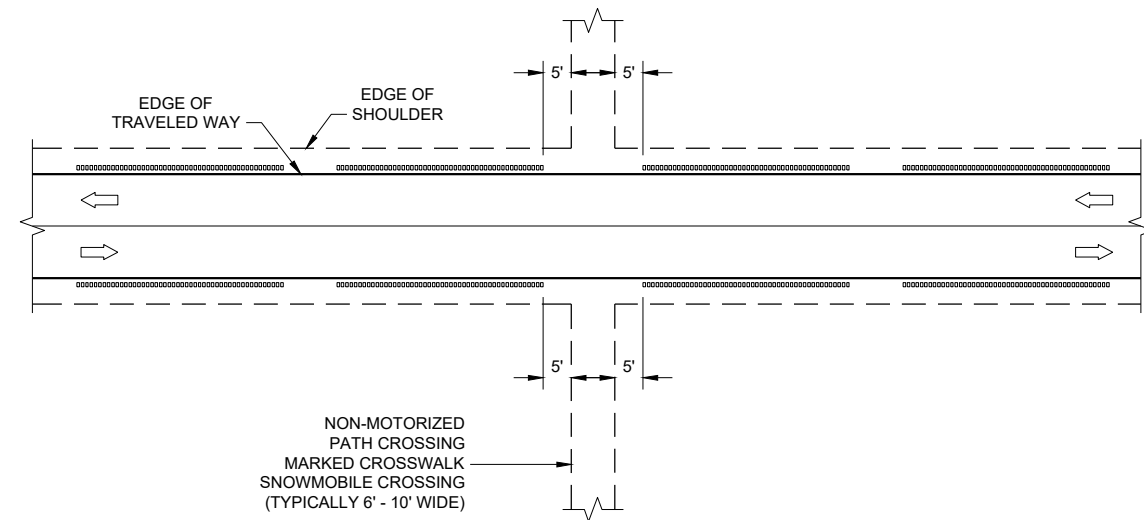
DO NOT MILL SHOULDER GROOVES THROUGH INTERSECTIONS, MARKED CROSSWALKS, NON-MOTORIZED PATH CROSSINGS, ETC. REFER TO SDD 13A10 SHEETS "g" AND "h".

SHOULDER GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS WHEN DIRECTED BY THE ENGINEER.

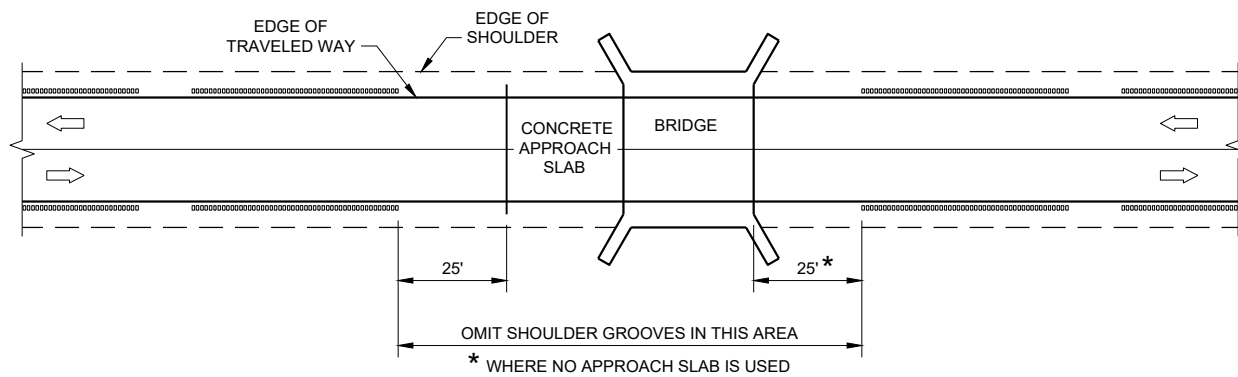


**SHOULDER RUMBLE  
STRIPS ASPHALT**

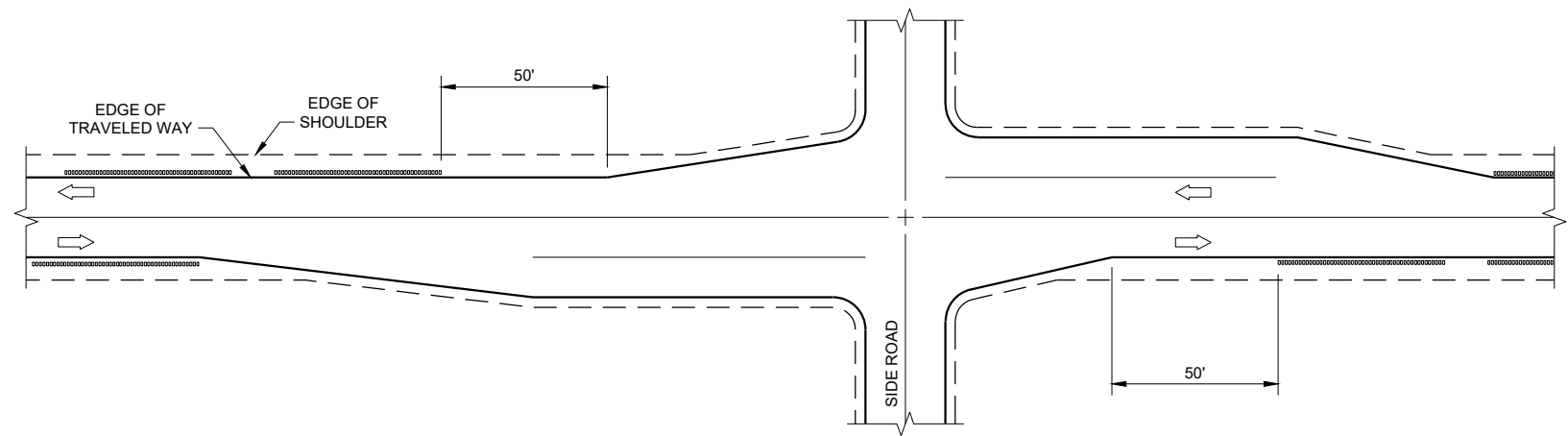
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



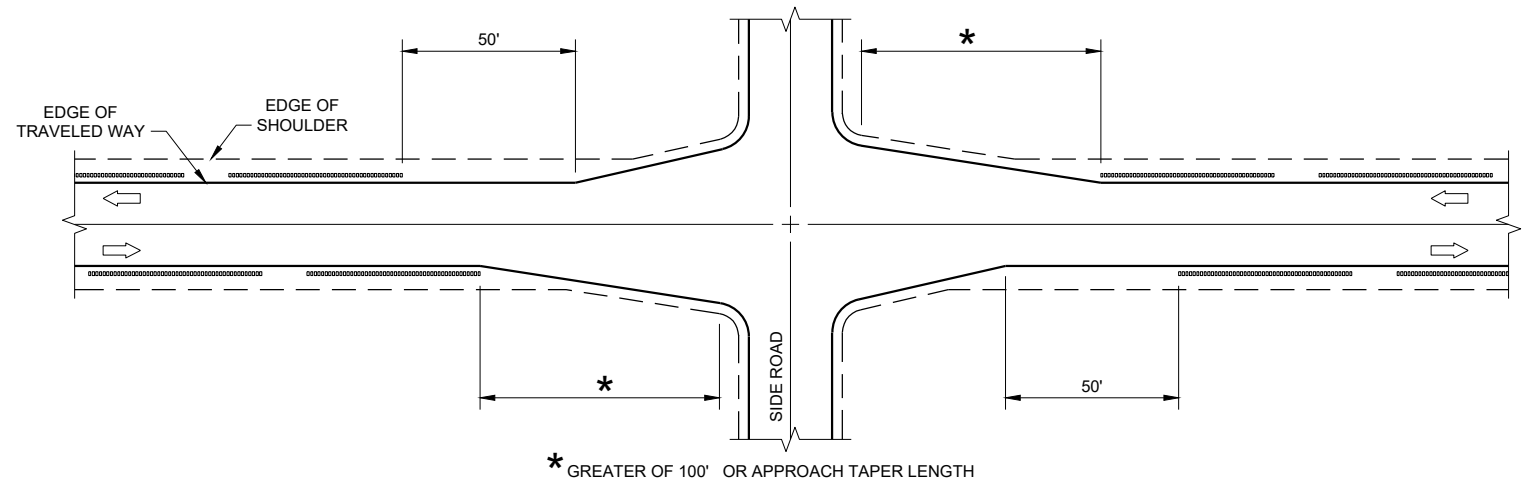
GROOVES AT MISCELLANEOUS CROSSINGS



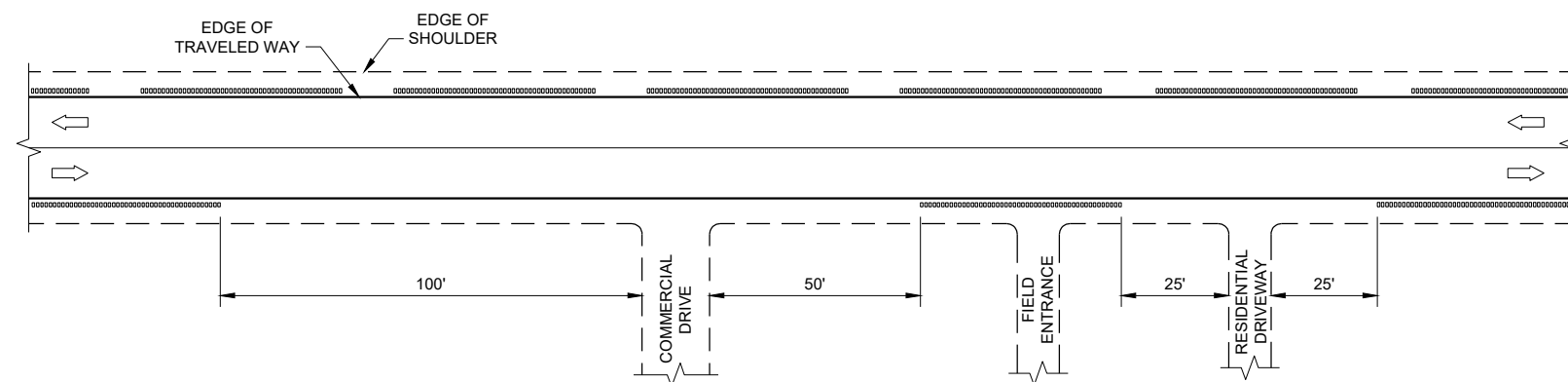
GROOVES AT BRIDGES



GROOVES AT RIGHT TURN LANE



GROOVES AT INTERSECTIONS WITH APPROACH TAPER



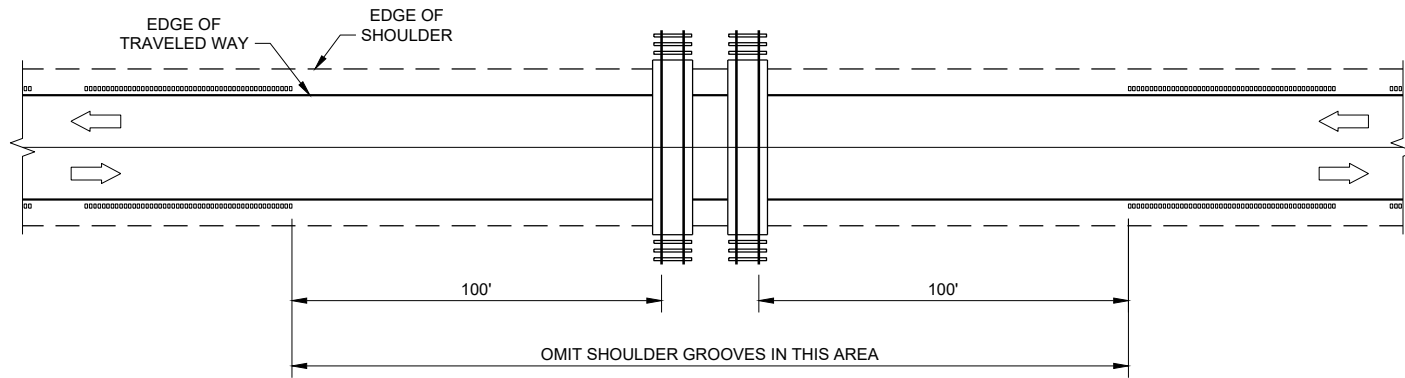
GROOVES AT DRIVEWAYS

## GENERAL NOTES

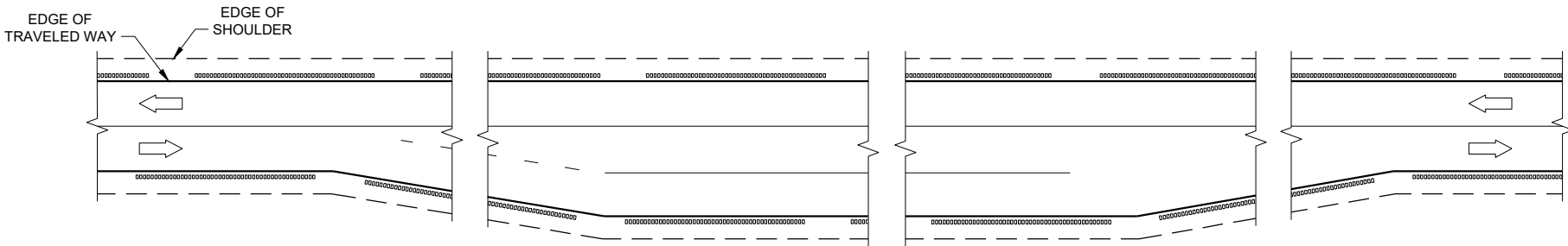
- ① SHOULDER GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS. WHEN DIRECTED BY THE ENGINEER.

**SHOULDER AND EDGE LINE  
RUMBLE STRIPS  
CROSSINGS, INTERSECTIONS,  
BRIDGES, DRIVEWAYS**

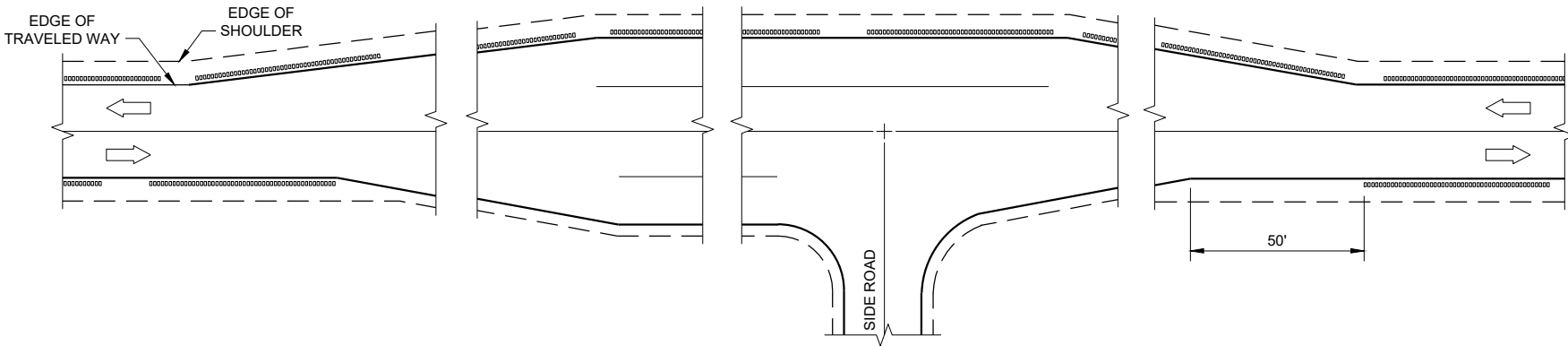
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



GROOVES AT RAILROADS



GROOVES AT PASSING AND CLIMBING LANES

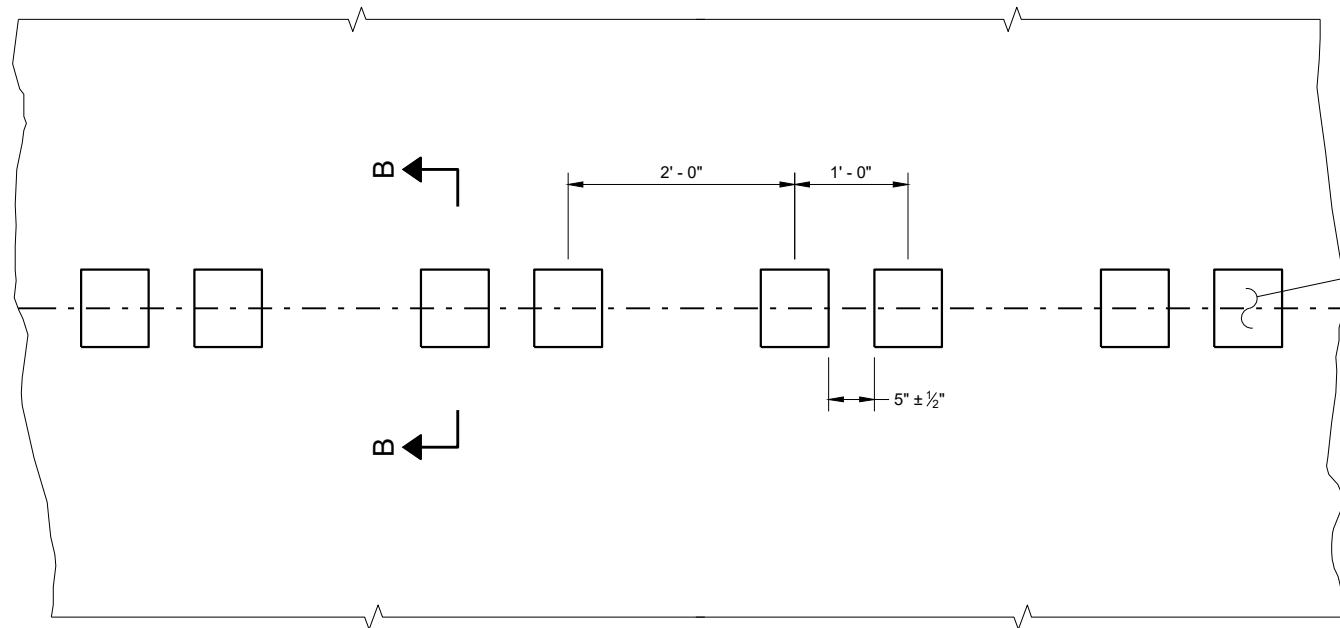


GROOVES AT BYPASS LANES

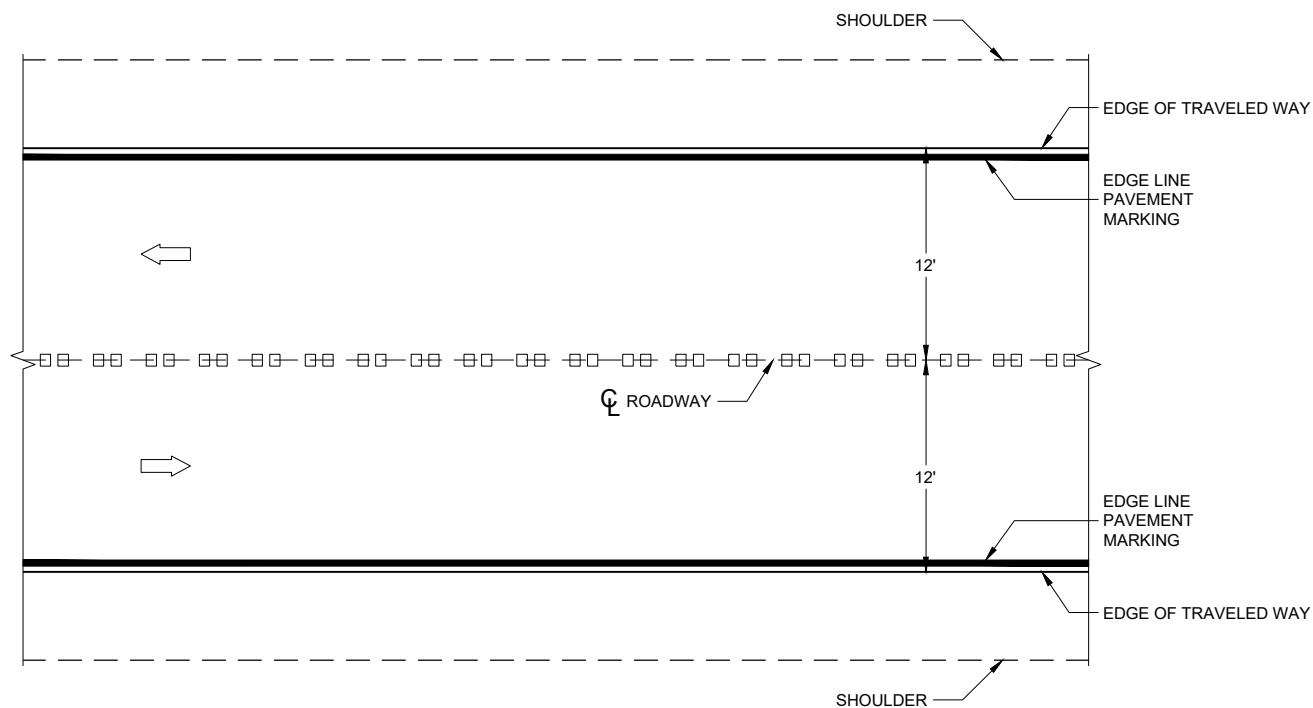
**SHOULDER AND EDGE LINE  
RUMBLE STRIPS -  
RAILROAD, PASSING,  
CLIMBING AND BYPASS LANES**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2023 /S/ John Jenkins  
DATE ROADWAY STANDARDS DEVELOPMENT  
ENGINEER  
FHWA

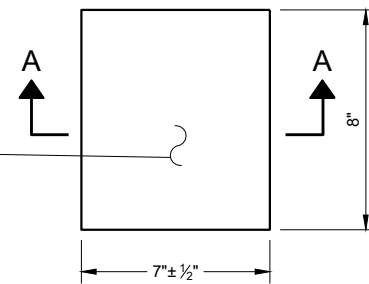


PLAN DETAIL VIEW

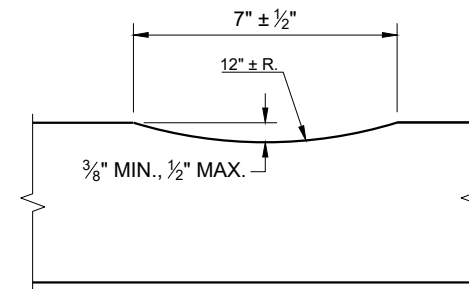


PLAN VIEW

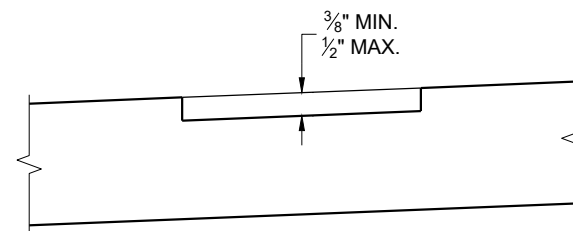
CENTERLINE RUMBLE STRIPS - ASPHALT



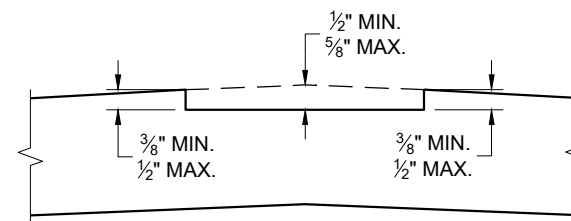
PLAN VIEW  
(SINGLE GROOVE)



SECTION A - A



SECTION B - B  
SUPERELEVATED ROADWAY

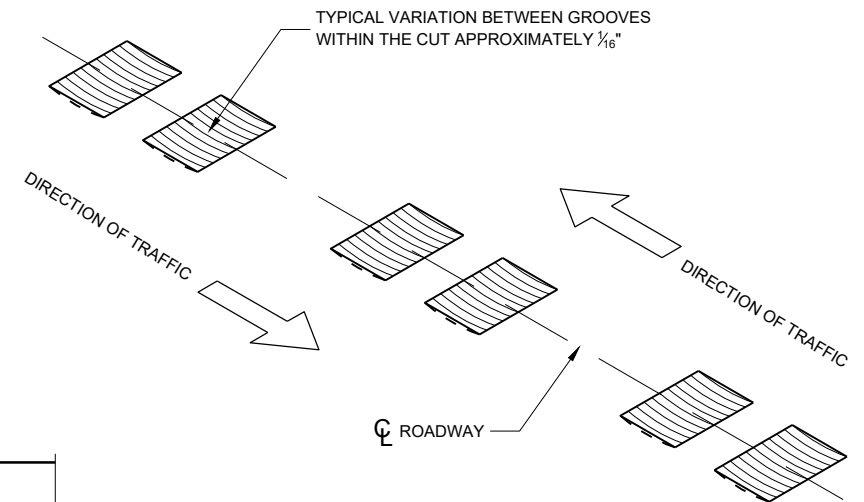


SECTION B - B  
CROWNED ROADWAY

GENERAL NOTES

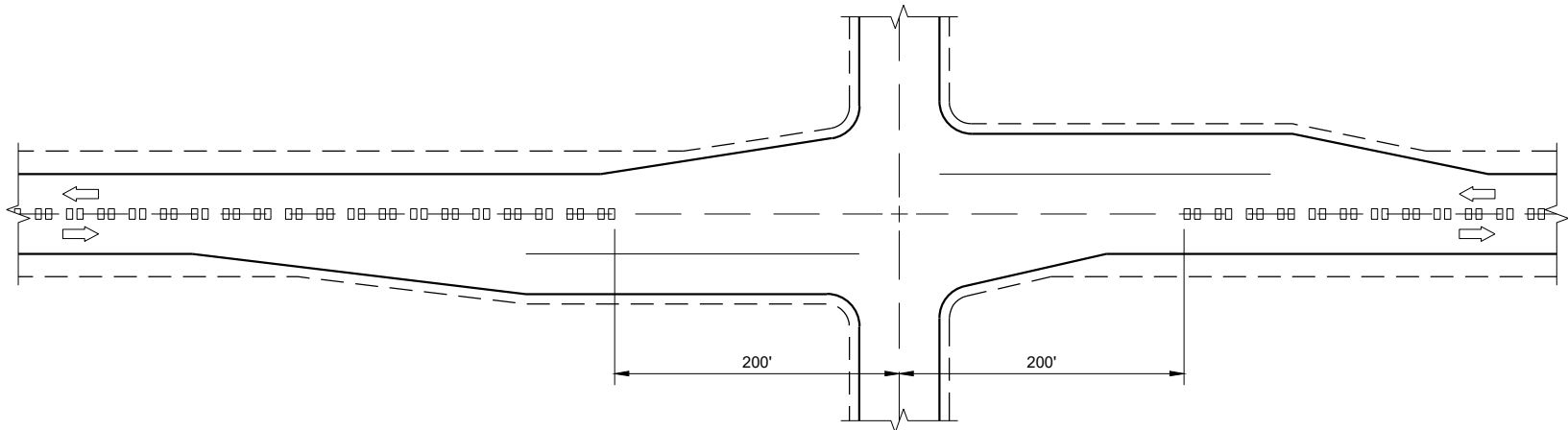
DO NOT MILL SHOULDER GROOVES THROUGH INTERSECTIONS, MARKED CROSSWALKS, NON-MOTORIZED PATH CROSSINGS, ETC. REFER TO SDD 13A11 SHEETS "d" AND "e".

CENTERLINE GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS WHEN DIRECTED BY THE ENGINEER.

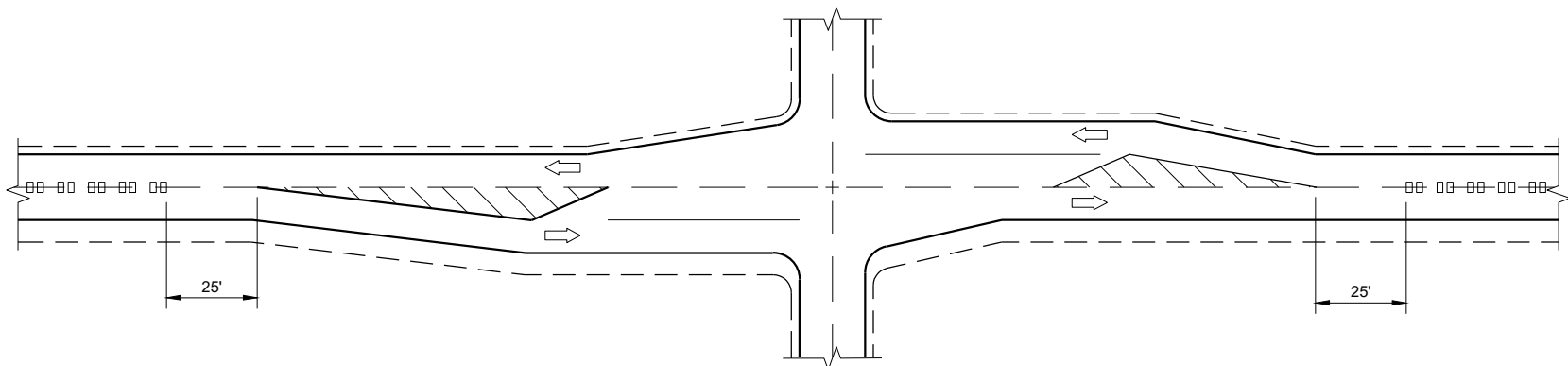


CENTERLINE RUMBLE STRIPS - ASPHALT

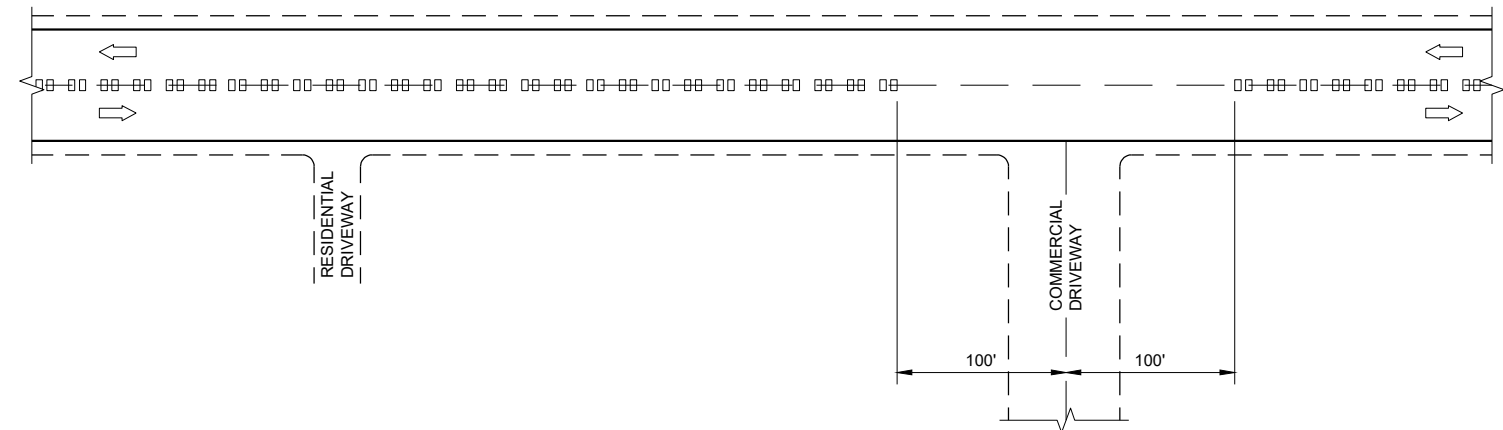
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



CENTERLINE GROOVES AT INTERSECTIONS



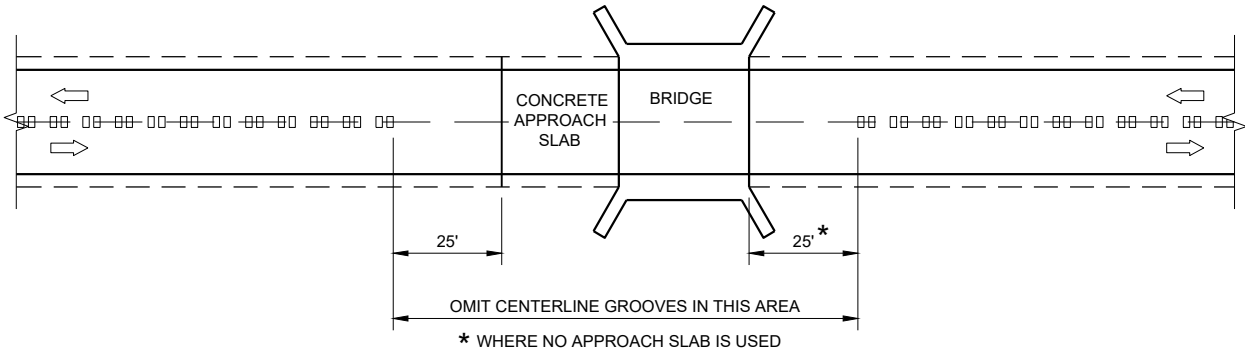
CENTERLINE GROOVES AT INTERSECTIONS  
(WITH LEFT TURN LANES)



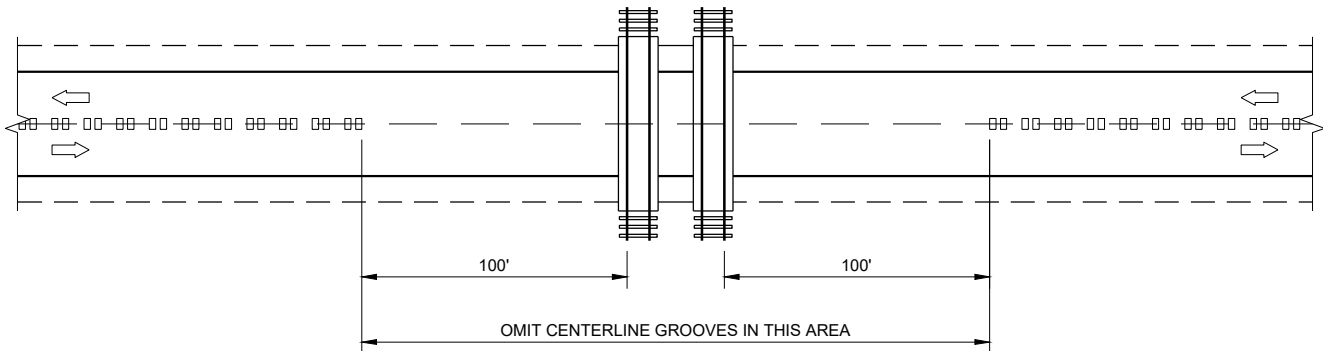
CENTERLINE GROOVES AT DRIVEWAYS<sup>①</sup>

GENERAL NOTES

- ① CENTERLINE GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS WHEN DIRECTED BY THE ENGINEER.



CENTERLINE GROOVES AT BRIDGES

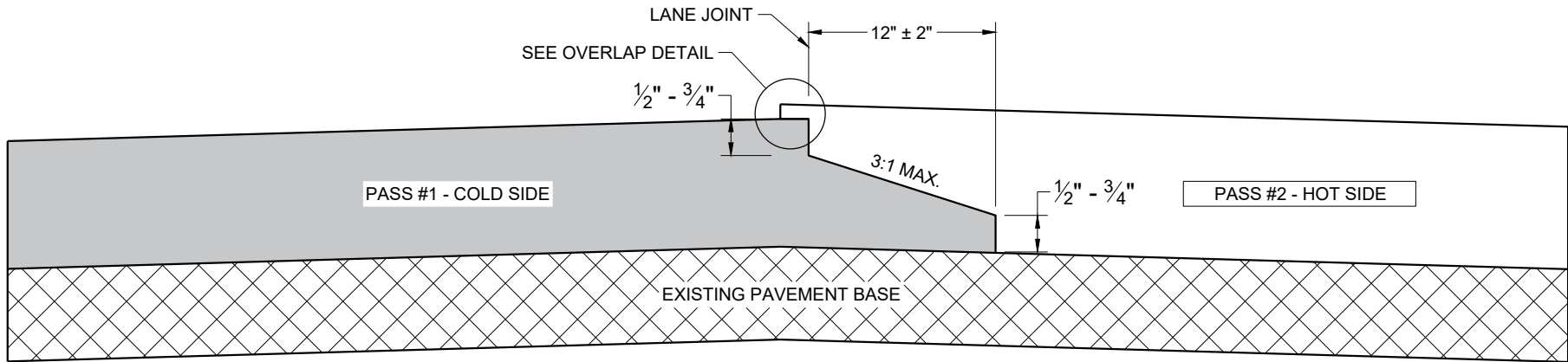


CENTERLINE GROOVES AT RAILROADS

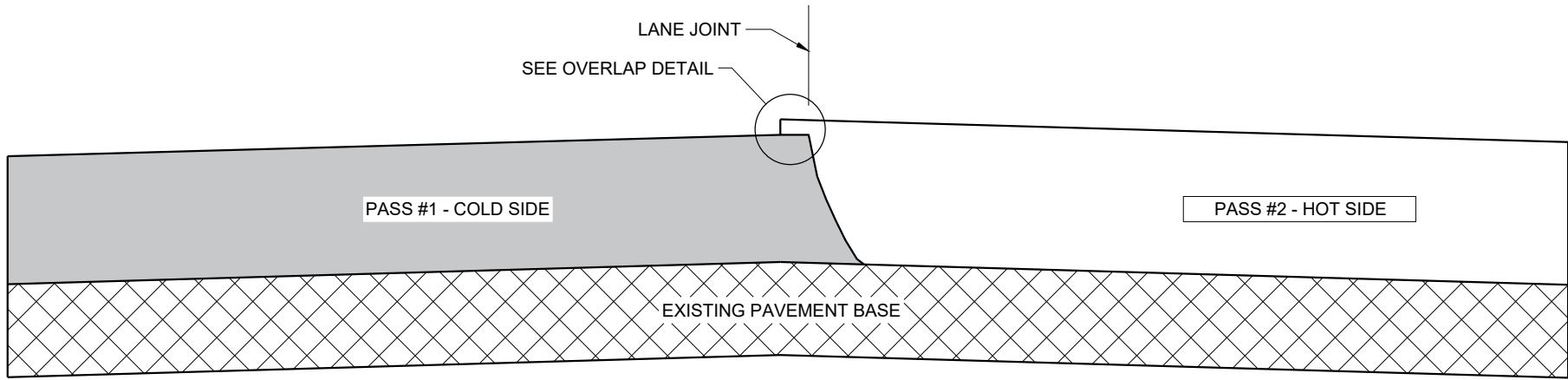
CENTER LINE  
RUMBLE STRIPS -  
INTERSECTIONS, DRIVEWAYS,  
BRIDGES, RAIL ROADS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

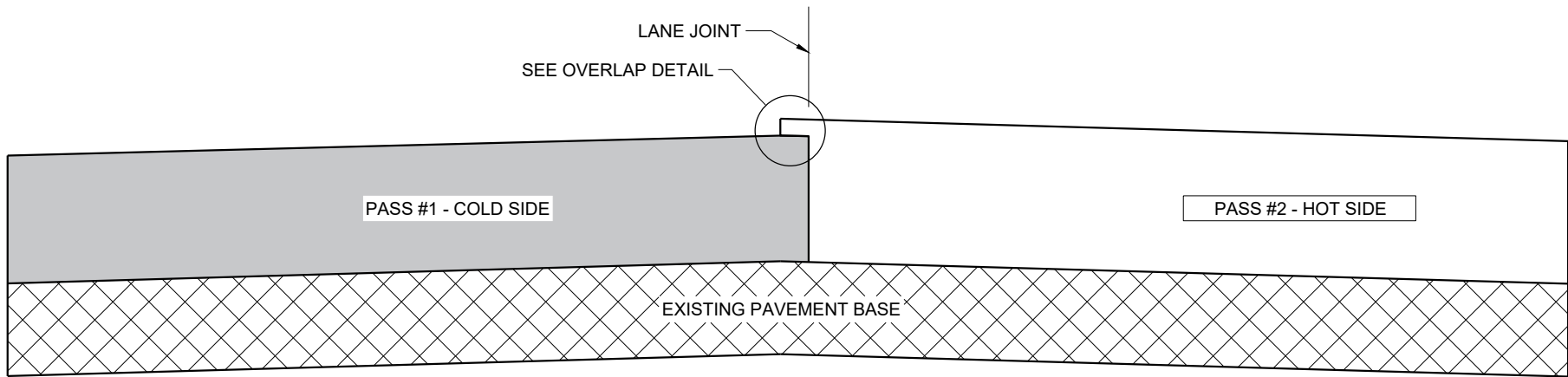
APPROVED  
May 2023  
DATE  
/S/ John Jenkins  
ROADWAY STANDARDS DEVELOPMENT  
ENGINEER  
FHWA



TYPICAL PAVEMENT CROSS SECTION  
NOTCHED WEDGE JOINT



TYPICAL PAVEMENT CROSS SECTION  
VERTICAL JOINT



TYPICAL PAVEMENT CROSS SECTION  
VERTICAL JOINT (MILLED)

GENERAL NOTES

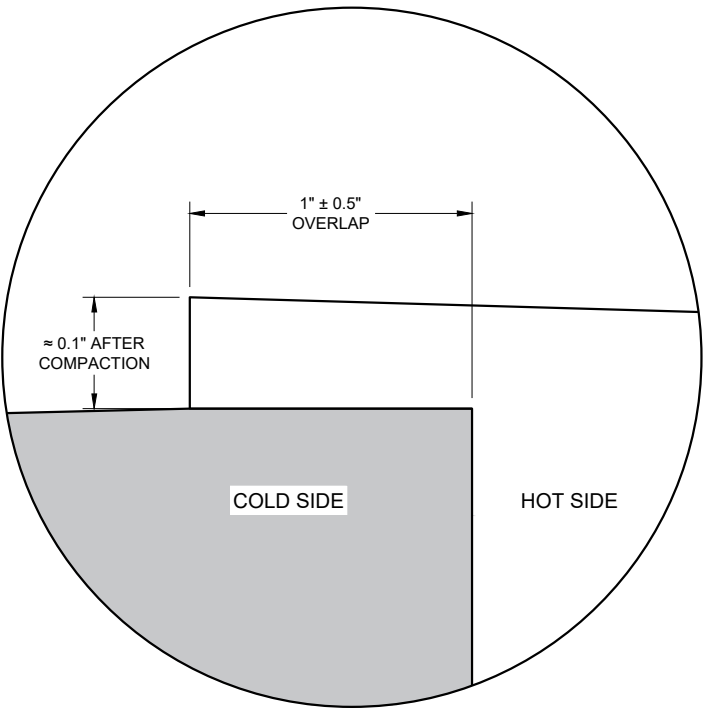
IN ADDITION TO THE DETAILS PROVIDED IN THIS DRAWING, CONFORM TO STANDARD SPECIFICATION 450.3.2.8 FOR WHEN A NOTCHED WEDGE JOINT IS REQUIRED AND FOR GENERAL JOINT CONSTRUCTION REQUIREMENTS.

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.

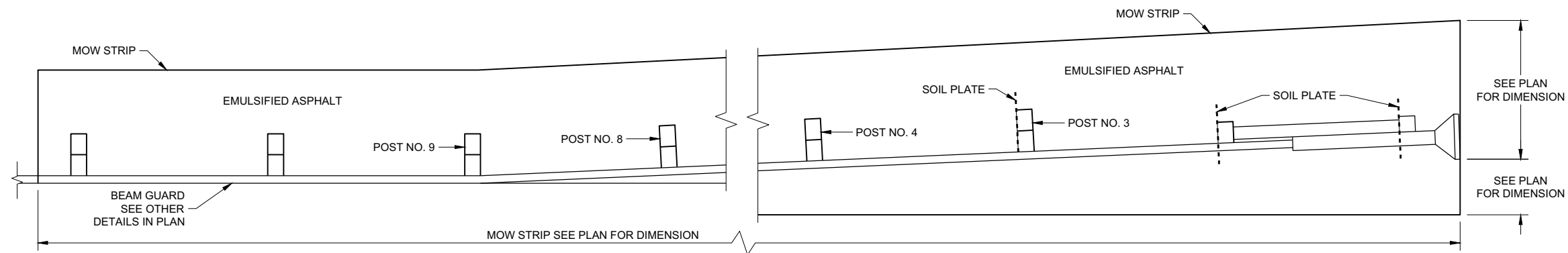


OVERLAP DETAIL (TYPICAL)

HMA LONGITUDINAL JOINTS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
November 2020 /S/ Steven Hefel  
DATE HMA PAVEMENT ENGINEER  
FHWA

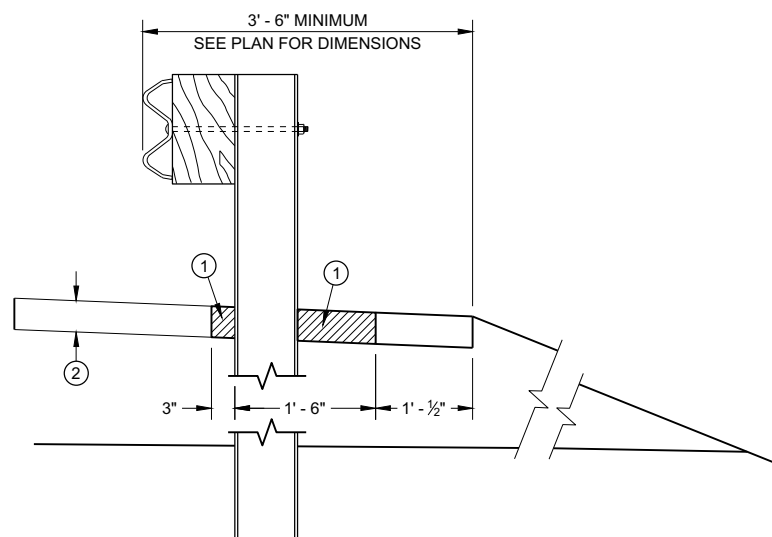


**PLAN VIEW**  
**MOW STRIP LAYOUT FOR ENERGY ABSORBING TERMINAL**

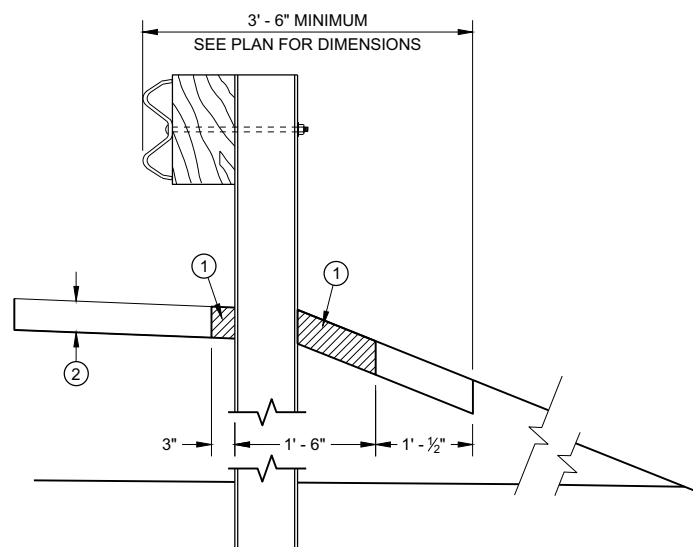
**GENERAL NOTES**

ONLY USE STEEL POSTS IN CONCRETE AND ASPHALT MOW STRIPS.

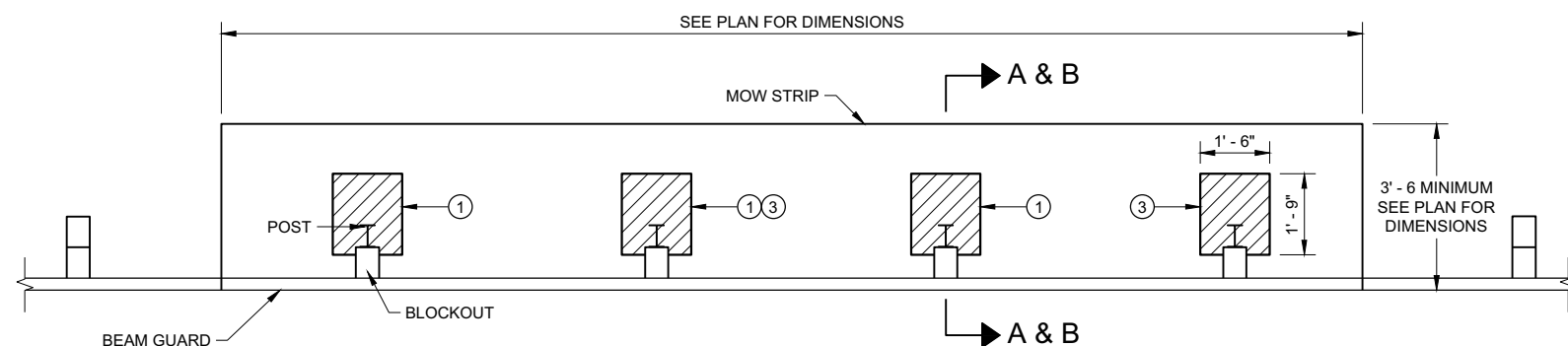
- ① CONTROLLED LOW-STRENGTH BACKFILL OR EMULSIFIED ASPHALT.
- ② DEPTH OF MOW STRIP:  
ASPHALT - 4"  
CONCRETE - 4"  
EMULSIFIED ASPHALT - 1" OR LESS
- ③ FOR EMULSIFIED ASPHALT, MOW STRIP STRIP LEAVE OUTS NOT REQUIRED. (TYPICAL FOR ALL POSTS)



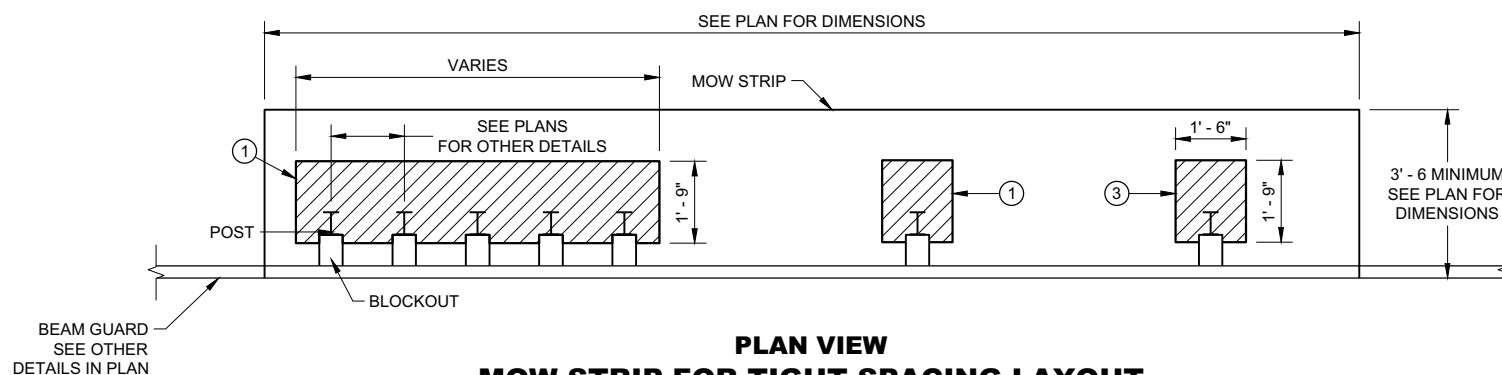
**SECTION A - A**



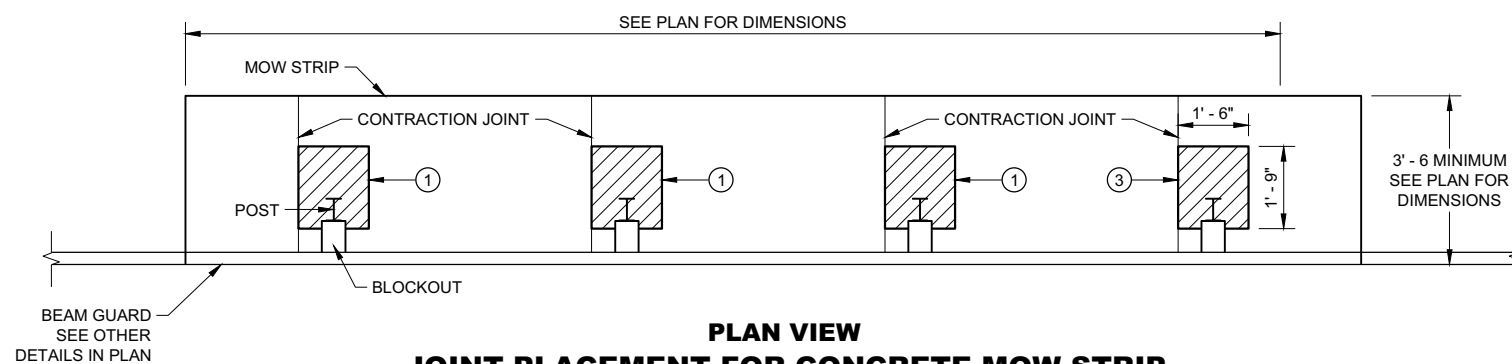
**SECTION B - B**



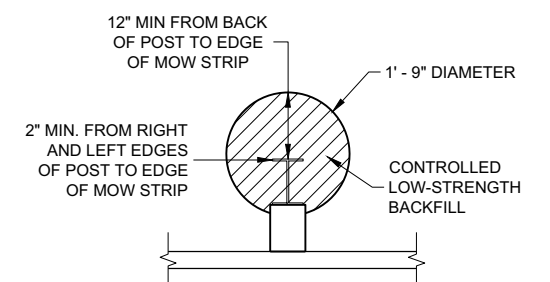
**PLAN VIEW**  
**MOW STRIP FOR TYPICAL BLOCKOUT LAYOUT**



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



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



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

**GUARDRAIL MOW STRIP**

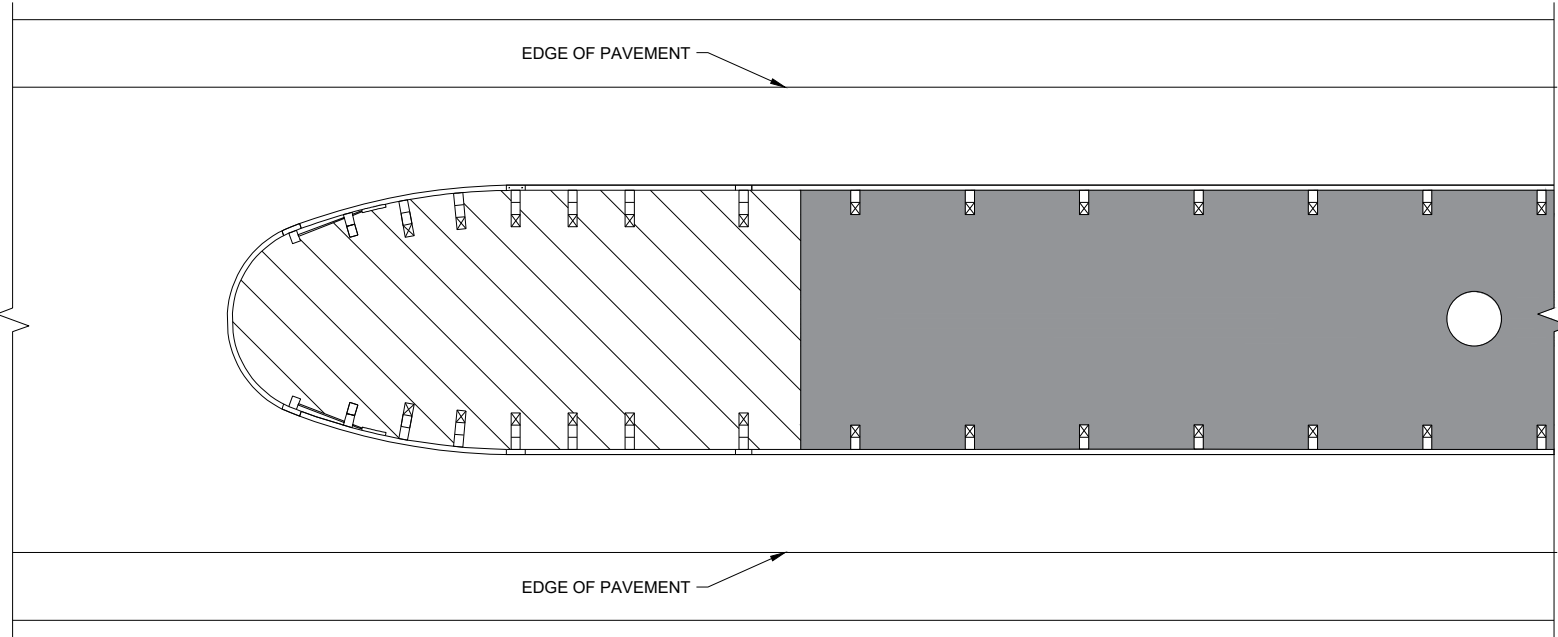
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

LEGEND

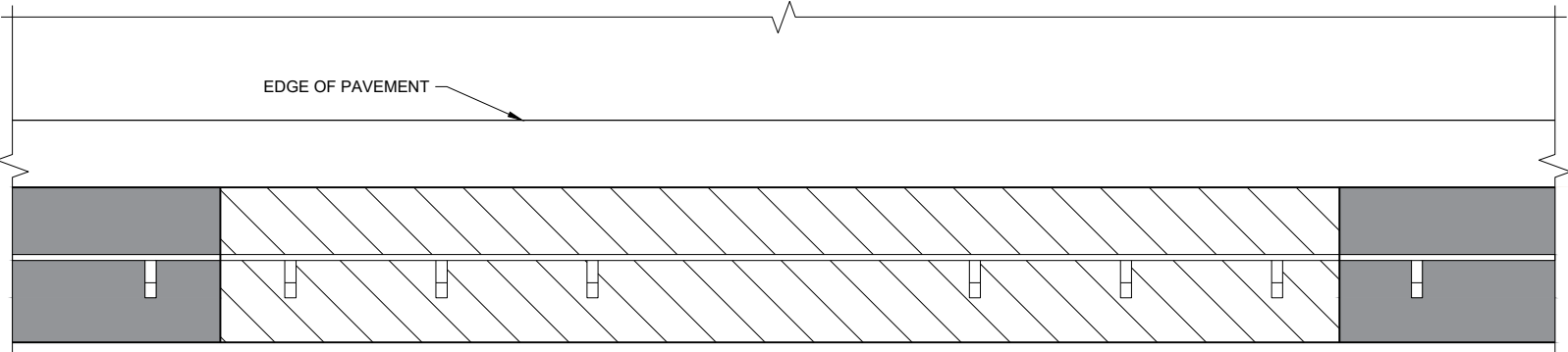
- CONCRETE, ASPHALT, OR EMULSIFIED ASPHALT MOW STRIP (SEE OTHER DETAILS)
- EMULSIFIED ASPHALT MOW STRIP (SEE OTHER DETAILS)

GENERAL NOTES

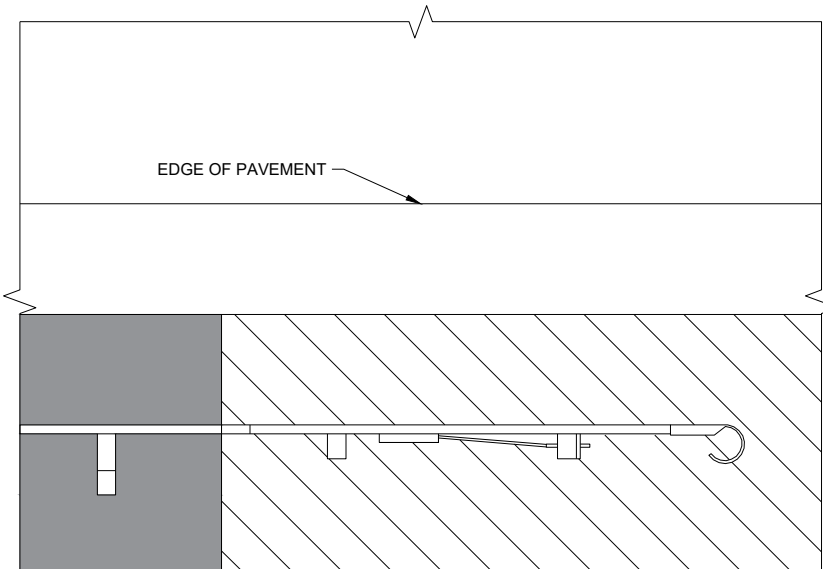
EXISTING THRIE BEAM BULLNOSES MAY HAVE WOOD POSTS. NEW THRIE BEAM BULLNOSE WILL HAVE STEEL POSTS.



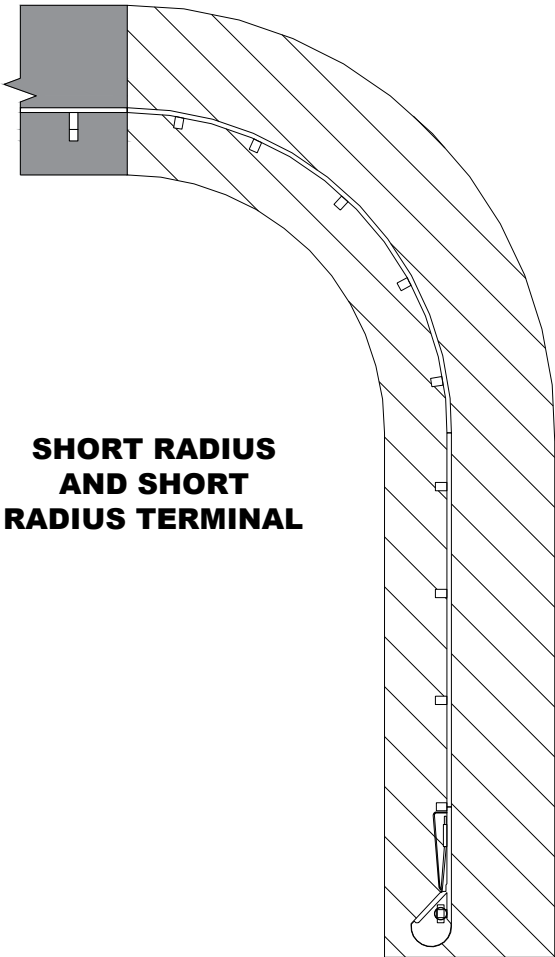
THRIE BEAM BULLNOSE



LONG - SPAN



TYPE 2 TERMINAL



SHORT RADIUS  
AND SHORT  
RADIUS TERMINAL

GUARDRAIL MOW STRIP

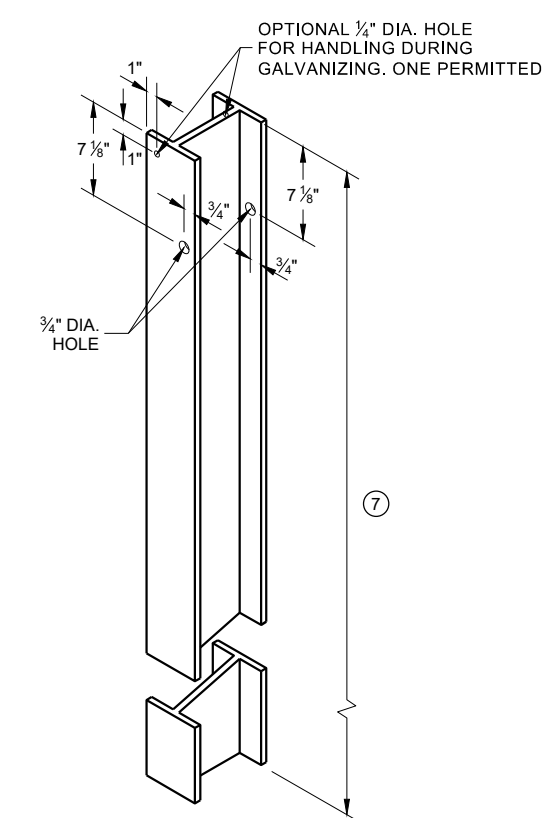
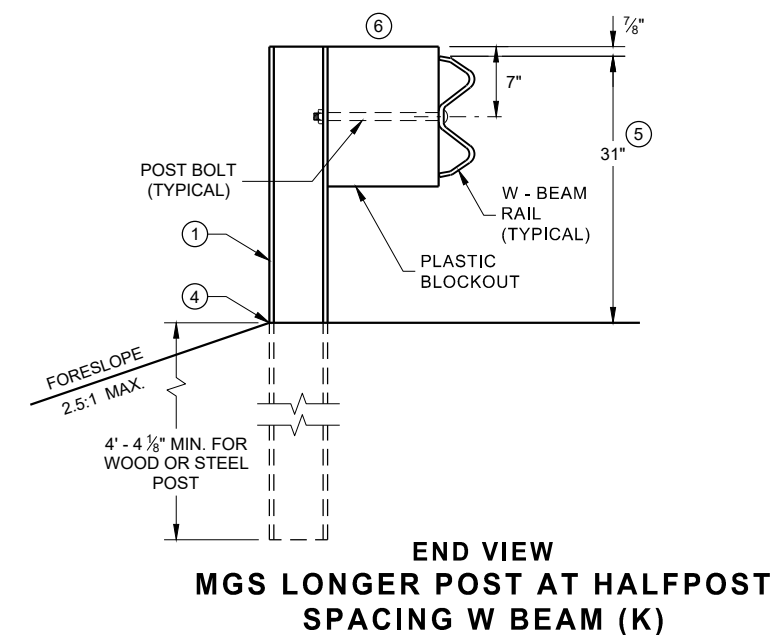
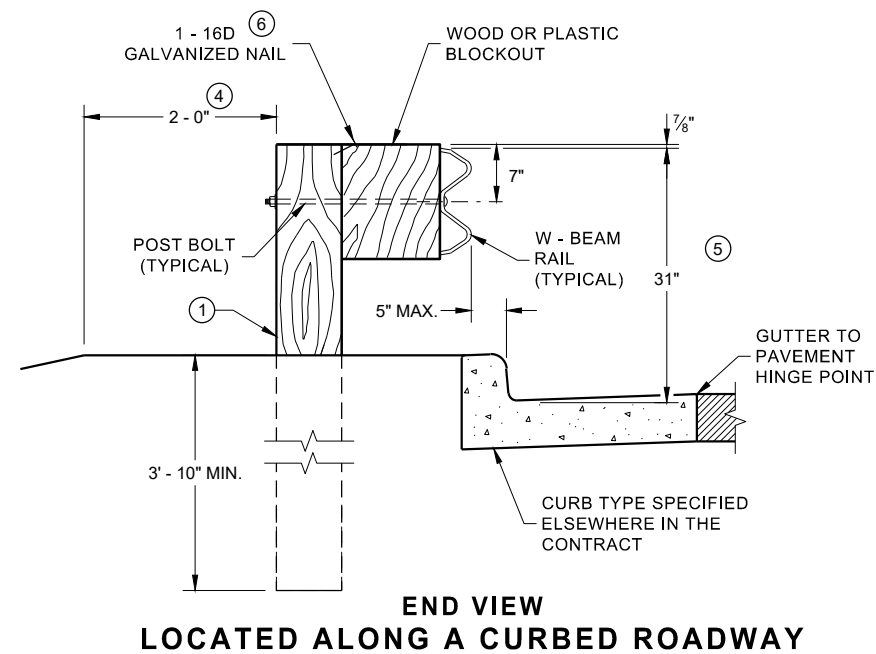
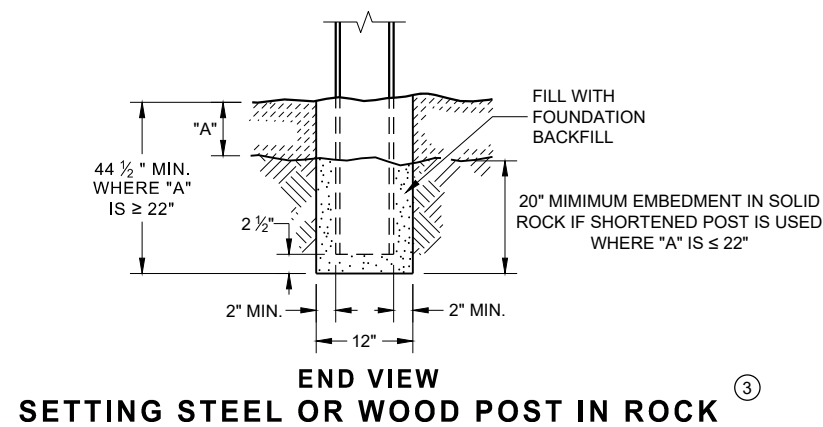
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
August 2020  
DATE

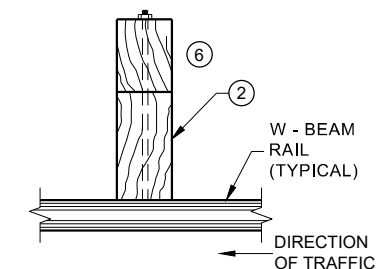
/S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
ENGINEER

FHWA

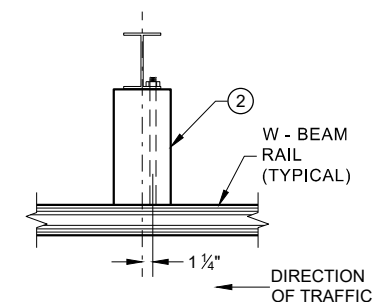
- WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.
- IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2 1/2" INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AMD INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.
- WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).
- 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".
- 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.
- TOTAL POST LENGTH FOR TYPE K IS 7' - 0".  
TOTAL POST LENGTH FOR OTHER MGS TYPES IS 6' - 0".



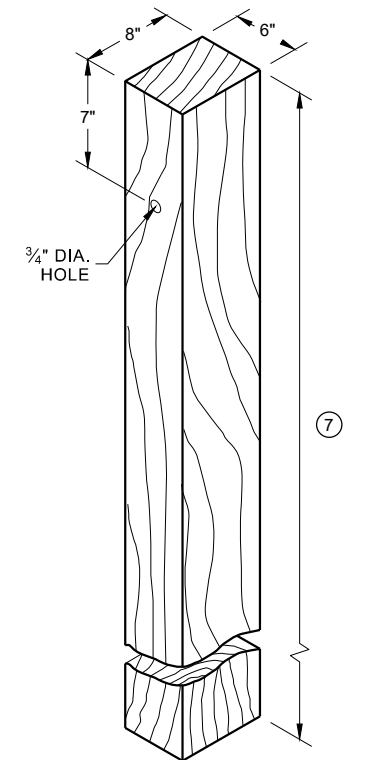
STEEL POST & HOLE PUNCHING DETAIL (W 6 X 9)



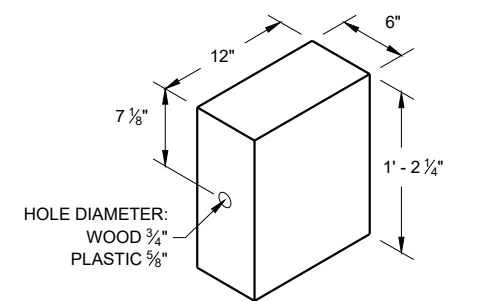
PLAN VIEW WOOD POST, BLOCKOUT & BEAM



PLAN VIEW STEEL POST, PLASTIC BLOCKOUT & BEAM



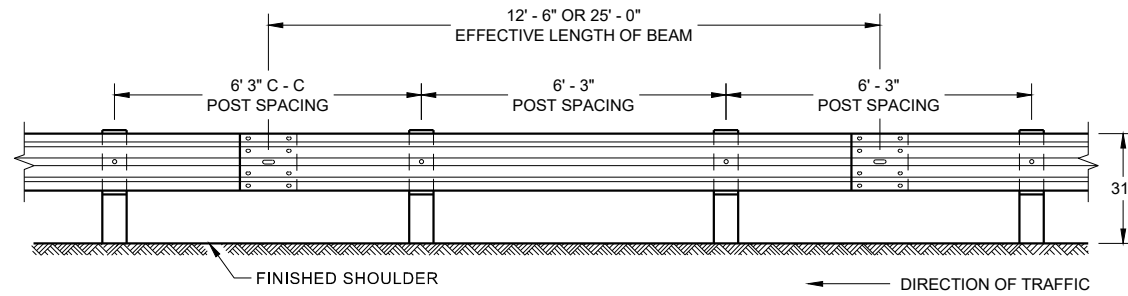
WOOD POST (6" X 8") NOMINAL



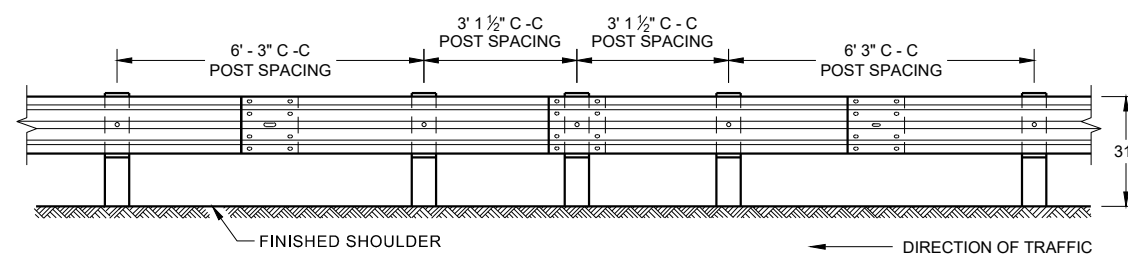
WOOD OR PLASTIC BLOCKOUT

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

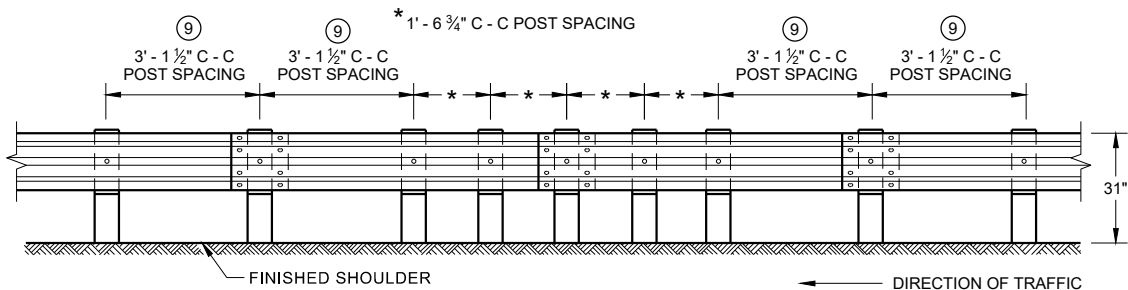
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



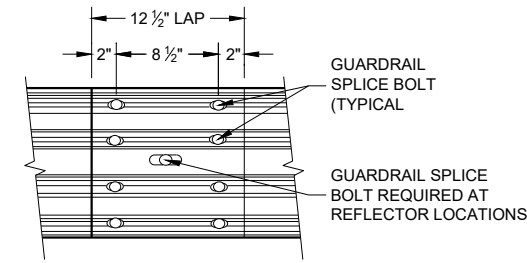
**FRONT VIEW  
POST SPACING STANDARD INSTALLATION**



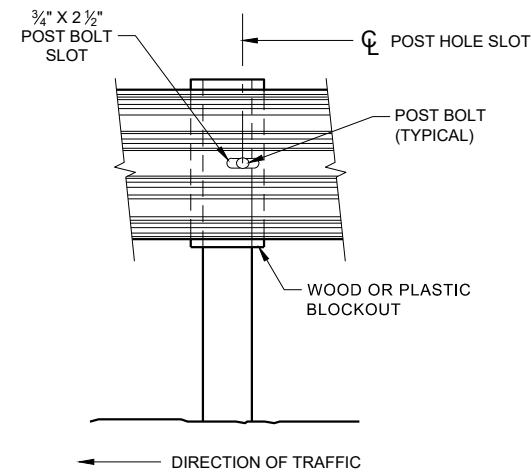
**FRONT VIEW  
HALF POST SPACING (HS) AND  
HALF POST SPACING WITH LONGER POSTS (K)**



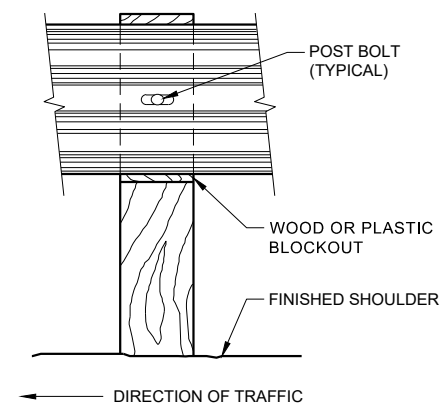
**FRONT VIEW  
QUARTER POST SPACING (QS)**



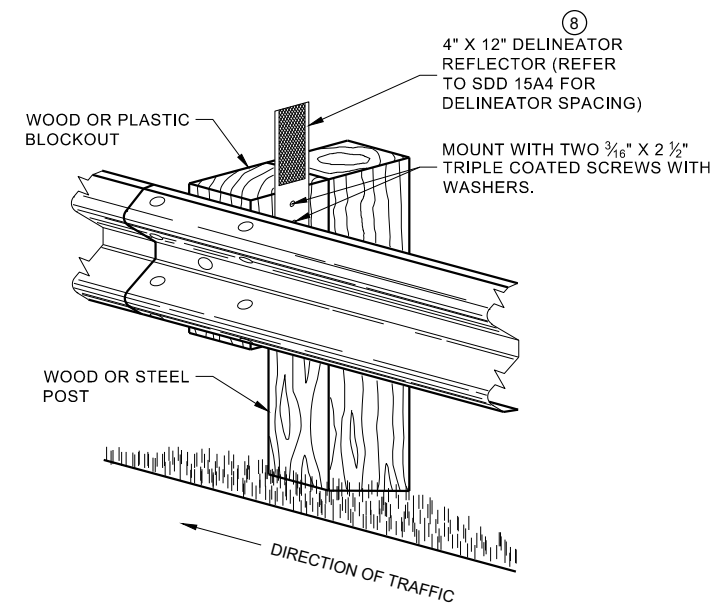
**FRONT VIEW  
MID-SPAN BEAM SPLICE**



**FRONT VIEW AT STEEL POST**



**FRONT VIEW AT WOOD POST**



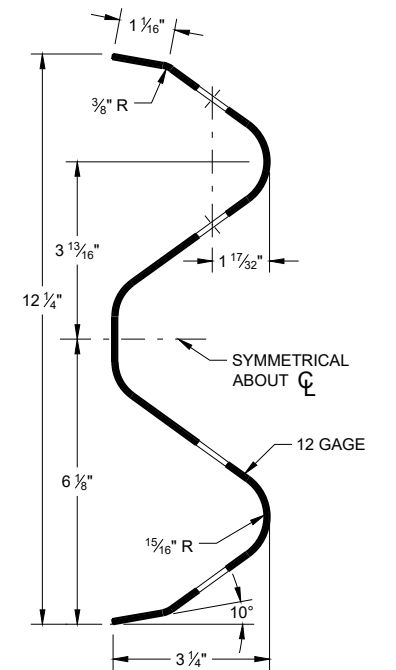
**ONE SIDED REFLECTOR DETAIL  
AND TYPICAL INSTALLATION**

## GENERAL NOTES

- 8 DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
- 9 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.

POST BOLTS ARE A 3/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 3/8" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.

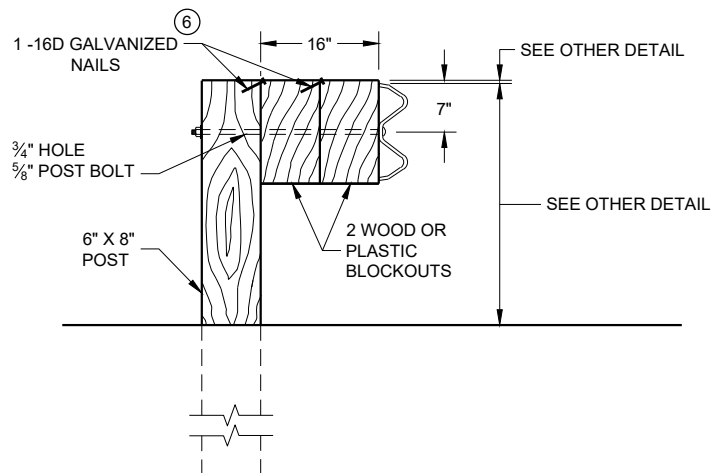
GUARD RAIL SPLICE BOLTS ARE A 3/8" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.



**SECTION THRU W-BEAM RAIL**

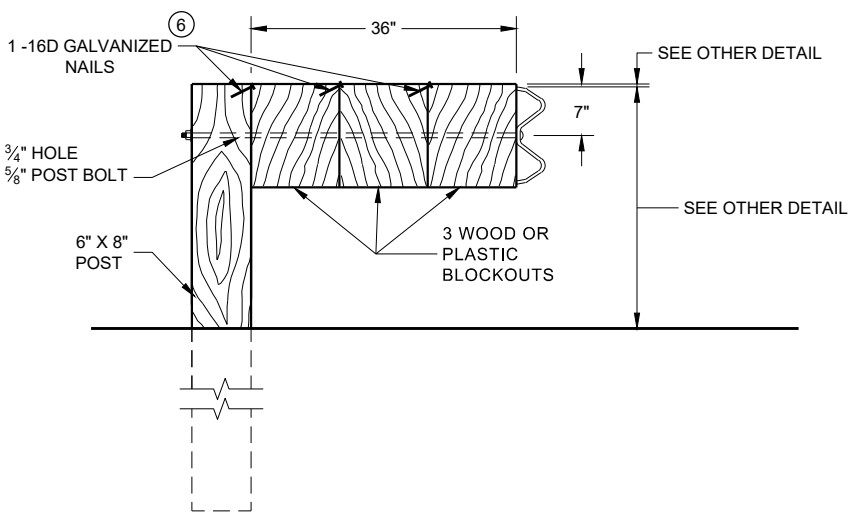
**MIDWEST GUARDRAIL SYSTEM  
(MGS) GUARDRAIL**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



DETAIL FOR 16" BLOCKOUT DEPTH

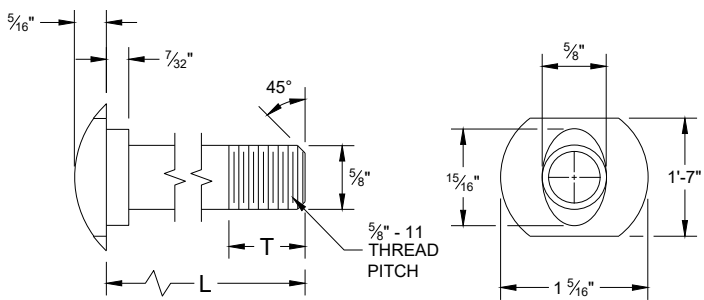
IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.



DETAIL FOR 36" BLOCKOUT DEPTH

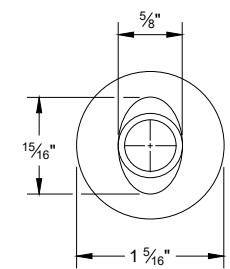
NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.  
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE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

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

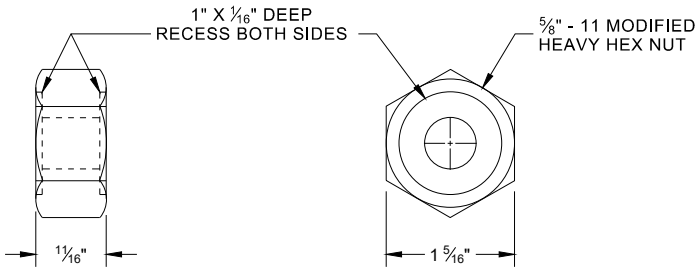


POST BOLT TABLE

| 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"       |

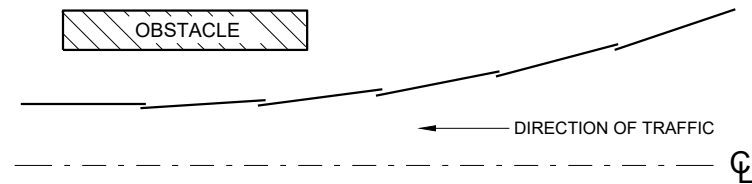


ALTERNATE BOLT HEAD

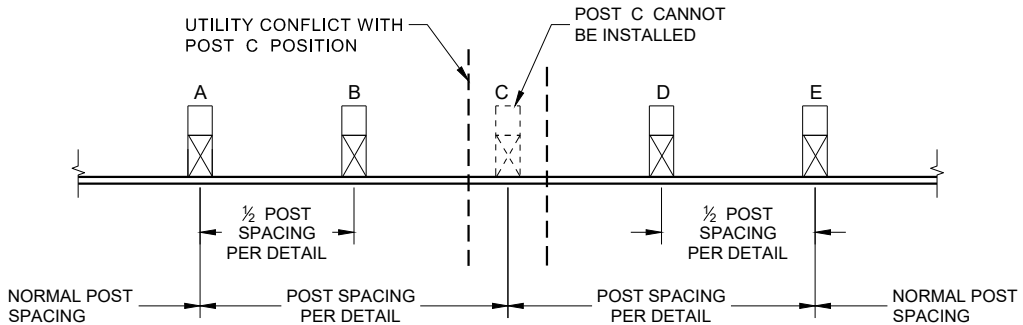


POST BOLT, SPLICE BOLT AND RECESS NUT

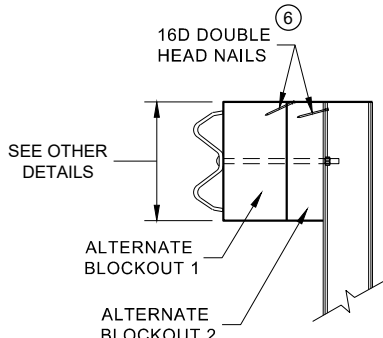
- 6 WHEN USING STEEL POST AD WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.



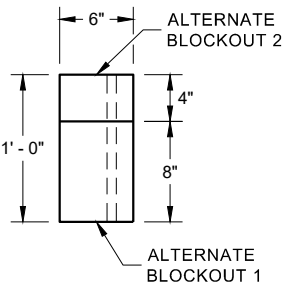
PLAN VIEW  
BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS  
UNDERGROUND OBSTRUCTION



SIDE VIEW

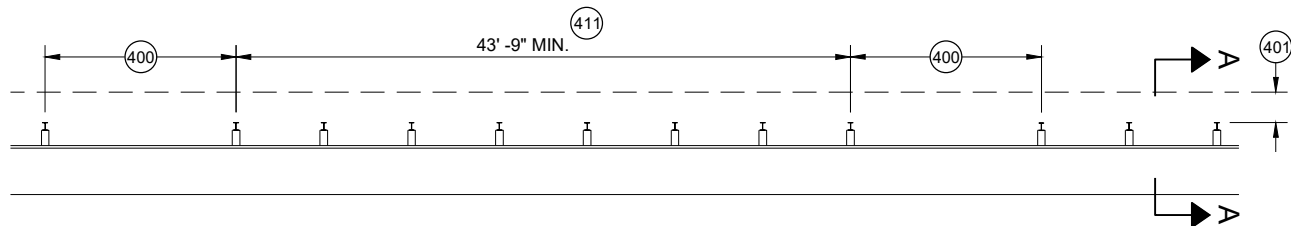


PLAN VIEW

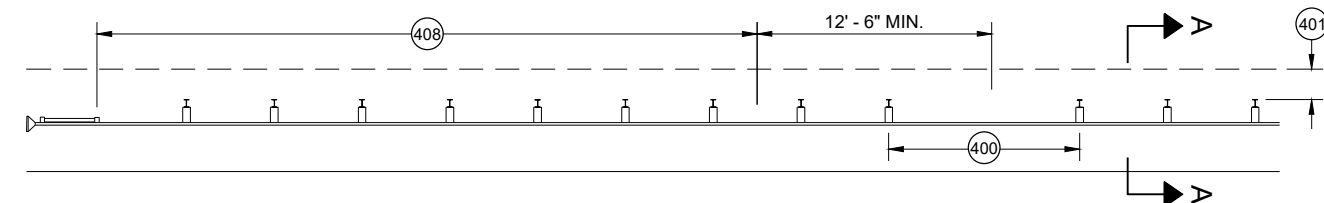
ALTERNATE WOOD  
BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM  
(MGS) GUARDRAIL

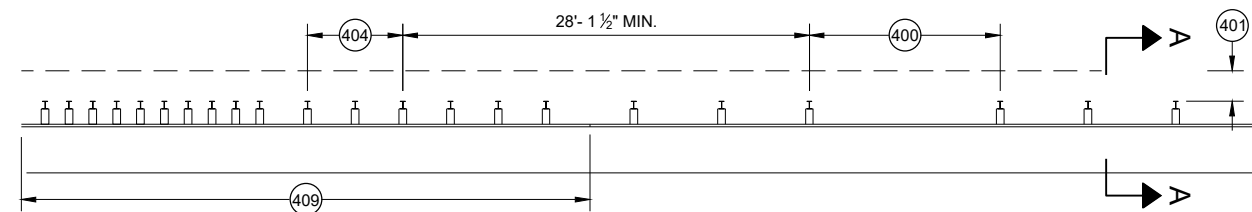
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



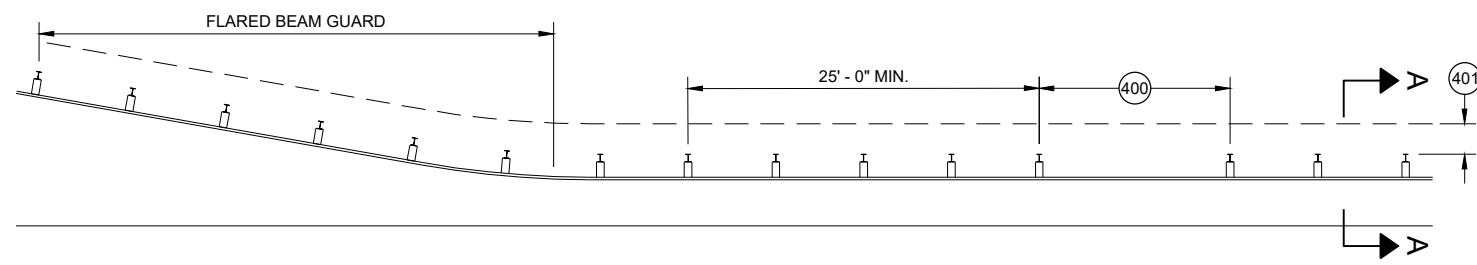
**MISSING POST IN MGS GUARDRAIL**



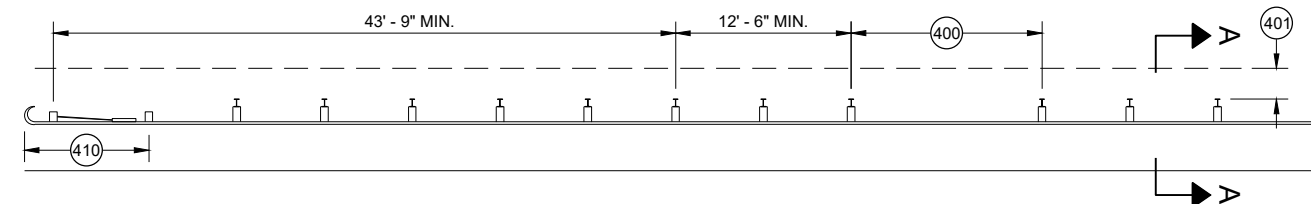
**MISSING POST IN MGS GUARDRAIL NEAR EAT**



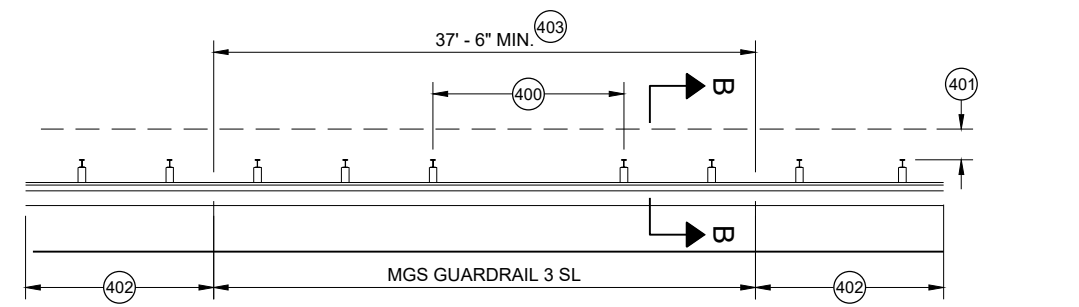
**MISSING POST IN MGS GUARDRAIL NEAR AN APPROACH TRANSITION**



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

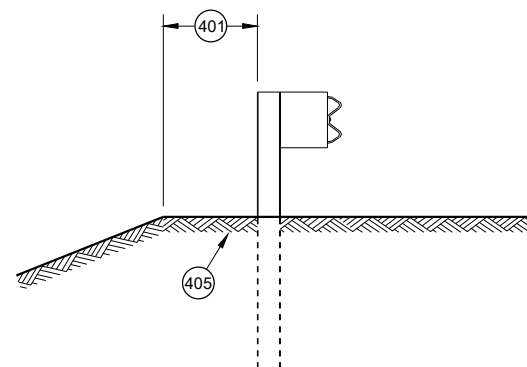


**MISSING POST IN MGS GUARDRAIL NEAR A TYPE 2 END TERMINAL**

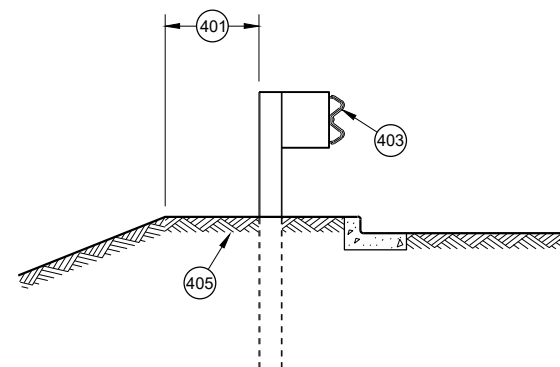


**MISSING POST IN SHORT SPAN MGS GUARDRAIL NEAR CURB (SL)**

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



**SECTION A - A**



**SECTION B - B**

**MIDWEST GUARDRAIL SYSTEM  
(MGS) GUARDRAIL**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2021  
DATE  
/S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR

FHWA

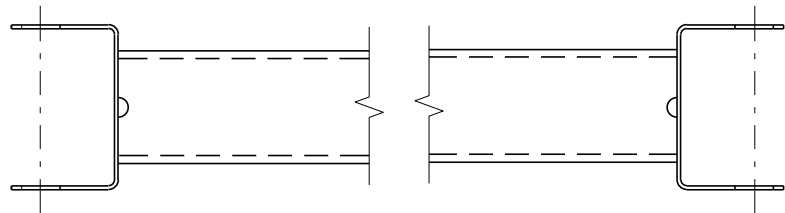
- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL) AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
- (B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED
- (C) DIFFERENT MANUFACTURERS REQUIRE DIFFERENT PERFORATED W - BEAM RAIL END PANELS.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

DIMENSIONS MAY VARY, MANUFACTURER'S INFORMATION.

THE CENTER OF THE UPPER 3½" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE. WOOD BLOCKS ON POSTS NUMBERED 3 THROUGH 9 MAY BE ADJUSTED UP TO 3" ABOVE THE TOP OF POST.

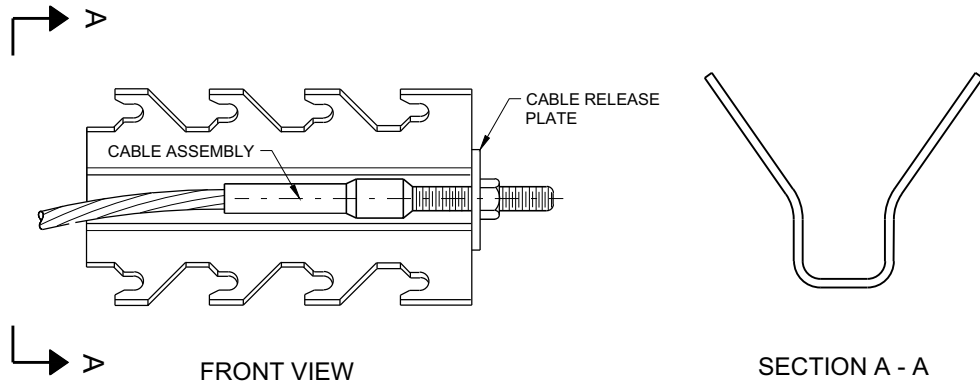


STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

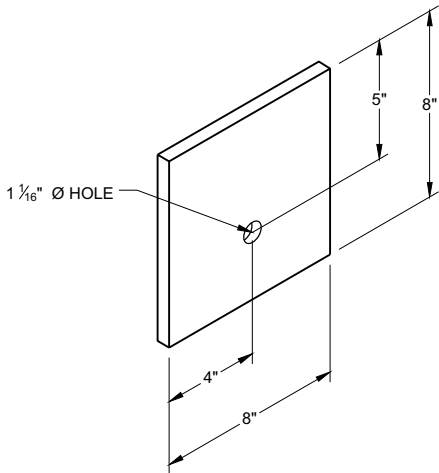


GENERIC GROUND STRUT<sup>⑨</sup> <sup>Ⓔ</sup>

| BILL OF MATERIALS |                                                                                                                |
|-------------------|----------------------------------------------------------------------------------------------------------------|
| PART NO.          | DESCRIPTION<br>MATERIALS PROVIDED BY MGS EAT MANUFACTURER.<br>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.<br>SECTIONS VARY IN LENGTH.                                  |
| ⑫                 | IMPACT HEAD                                                                                                    |
| ⑬                 | EAT MARKER POST - YELLOW<br>(SEE APPROVED PRODUCTS LIST)                                                       |
| ⑭                 | SOIL PLATE                                                                                                     |
| ⑮                 | UPPER POST NO. 2                                                                                               |
| ⑯                 | LOWER POST NO. 2                                                                                               |



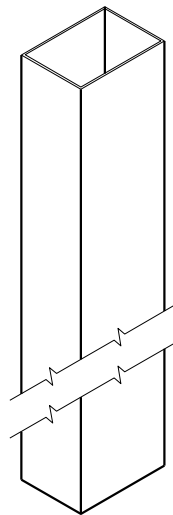
GENERIC ANCHOR CABLE BOX<sup>⑨</sup> <sup>Ⓔ</sup>



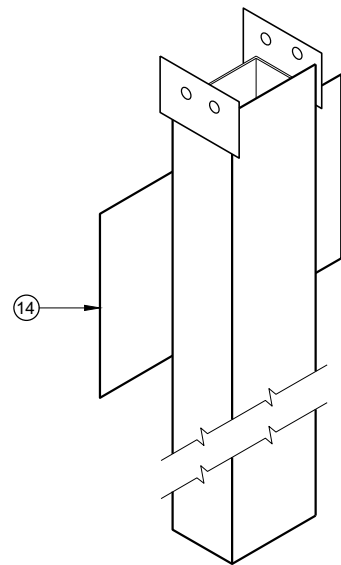
BEARING PLATE<sup>⑥</sup> <sup>Ⓔ</sup>

MIDWEST GUARDRAIL SYSTEM  
ENERGY ABSORBING TERMINAL  
(MGS)

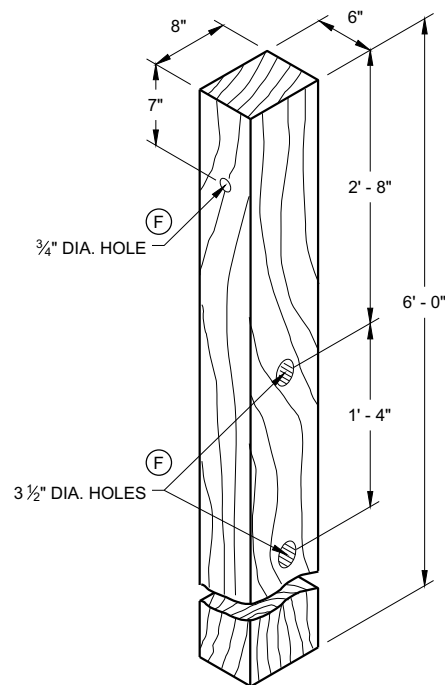
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



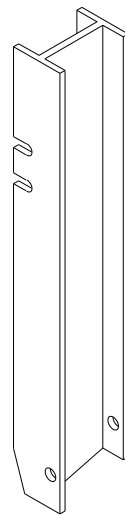
UPPER POST NO. 1<sup>(1) (E)</sup>



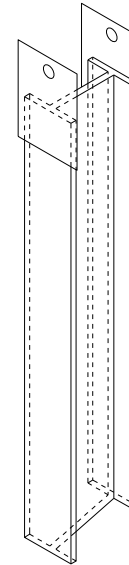
LOWER POST NO. 1<sup>(2) (E)</sup>



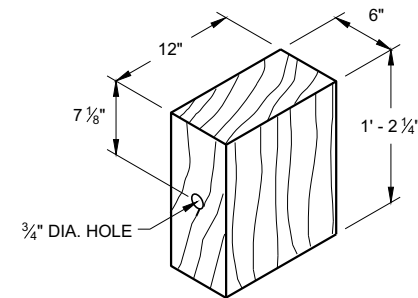
WOOD CRT POST<sup>(3) (E)</sup>  
POSTS NUMBER 3-9



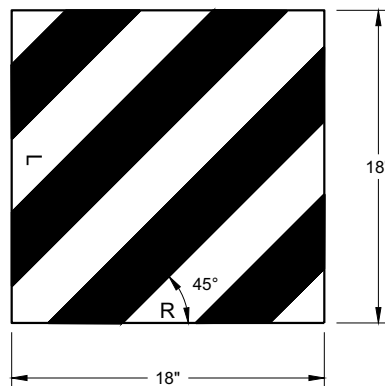
UPPER POST NO. 2<sup>(15) (E)</sup>



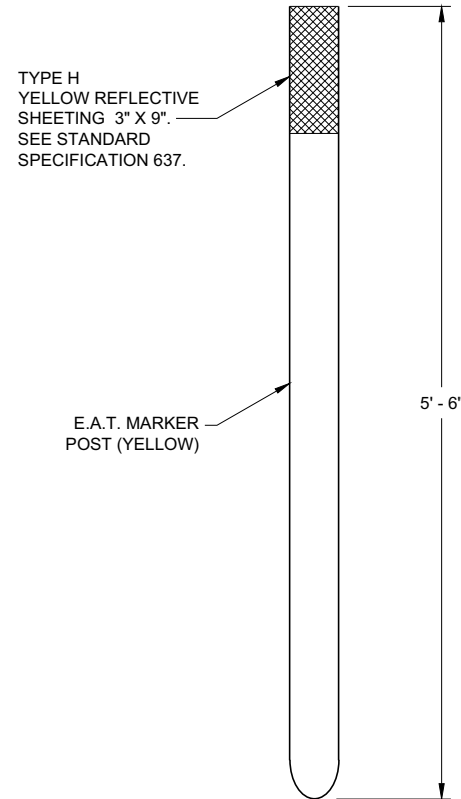
LOWER POST NO. 2<sup>(16) (E)</sup>



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



REFLECTIVE SHEETING DETAIL<sup>(E)</sup>

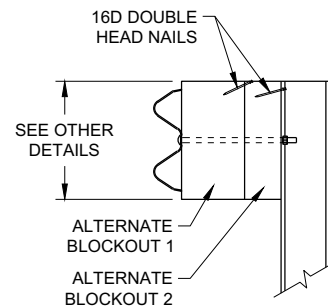


FRONT VIEW

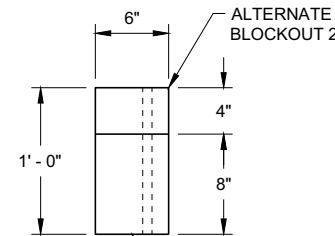


SIDE VIEW

E.A.T. MARKER POST<sup>(13)</sup>



SIDE VIEW



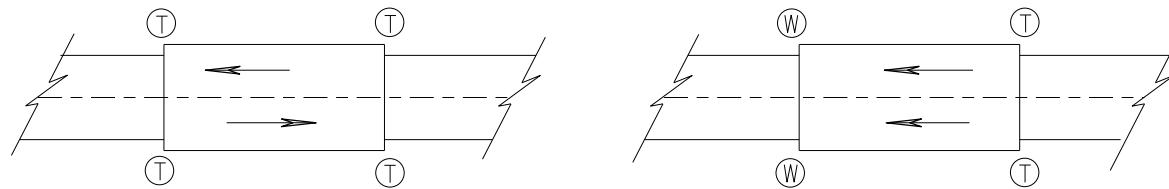
TOP VIEW

ALTERNATE WOOD  
BLOCKOUT DETAIL

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

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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



TWO WAY TRAFFIC

ONE WAY TRAFFIC

T THRIE BEAM CONNECTION

W W-BEAM CONNECTION WHEN REQUIRED

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

### GENERAL NOTES

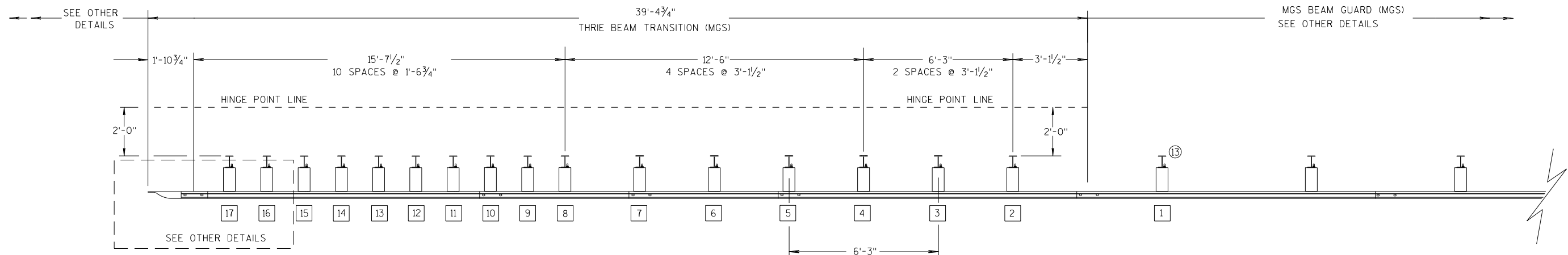
IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2", AND 12" DIAMETER AROUND POST. SEE 14B42 FOR MORE DETAILS.

TRANSITION USES STEEL POSTS ONLY.

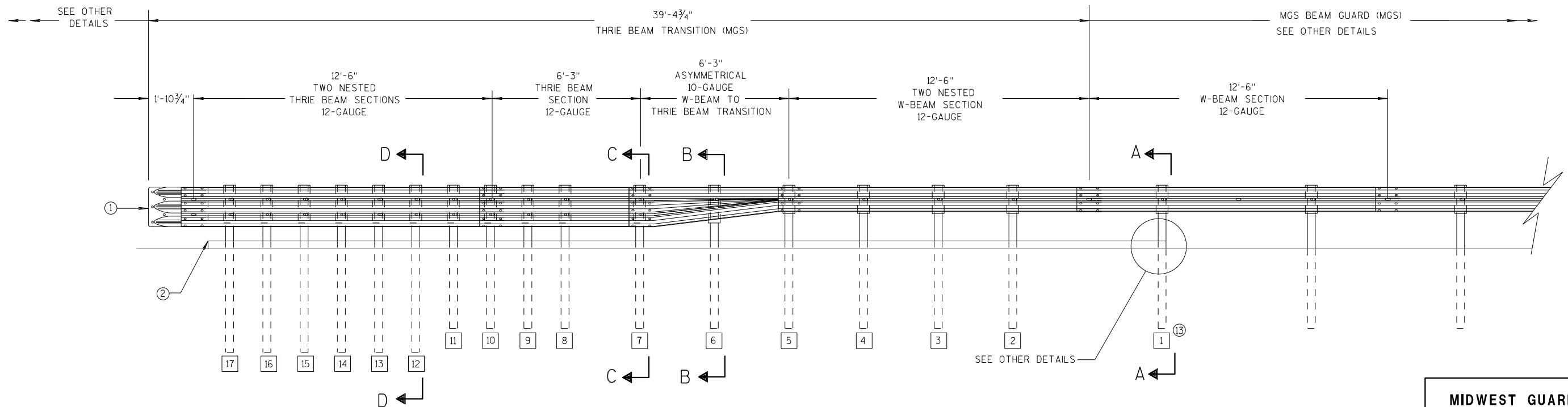
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

POST 2 THROUGH 17 USES STEEL POST ONLY

- ① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ⑬ STEEL OR WOOD POST IS ACCEPTABLE AT POST 1. SEE SDD14B42



PLAN VIEW



ELEVATION VIEW

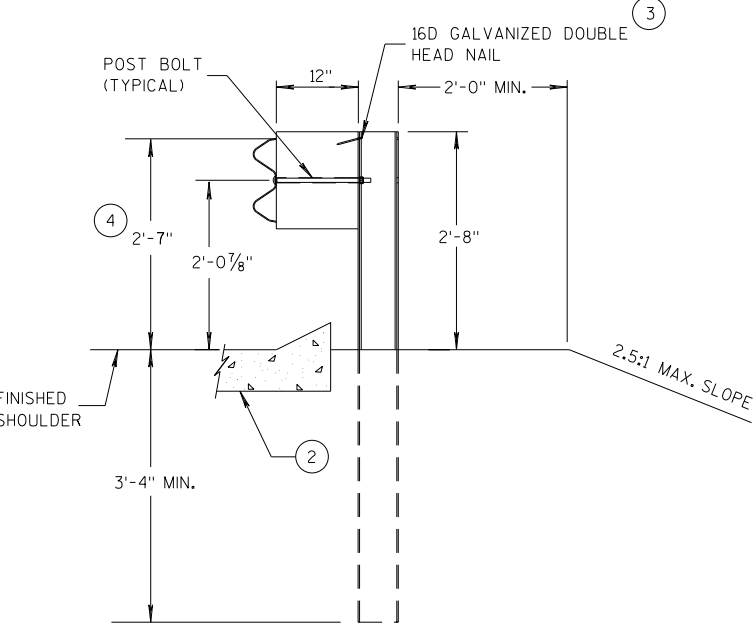
## MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

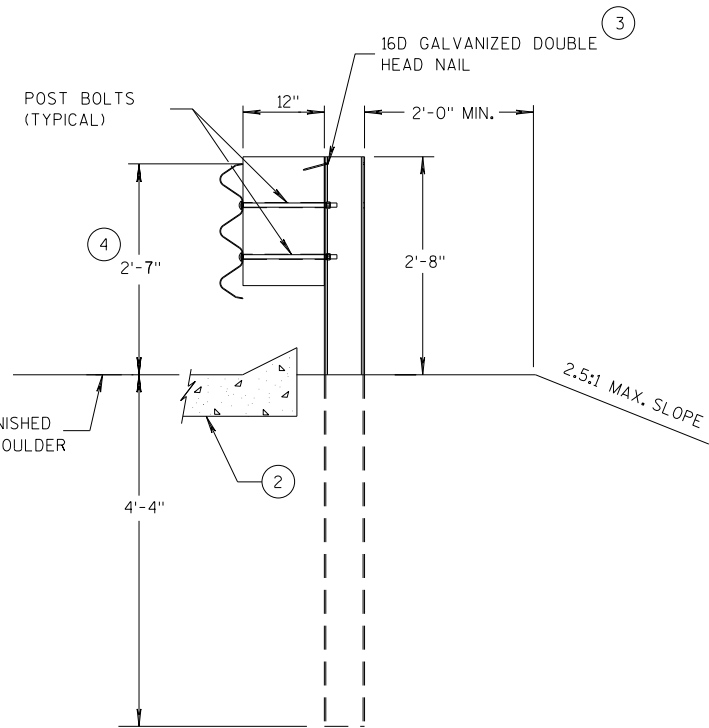
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

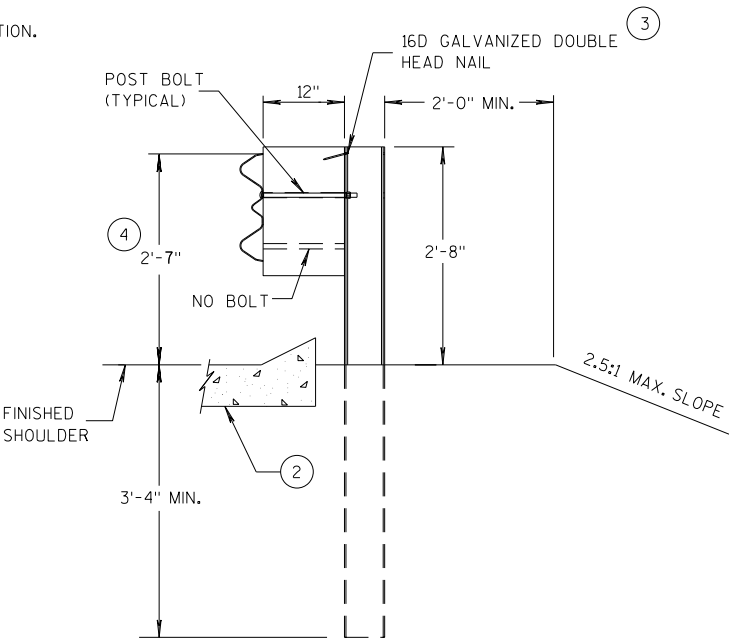
- 2 OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- 3 WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 10D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- 4 TOLERANCE FOR TOP OF W-BEAM RAIL IS  $\pm 1"$ .
- 13 STEEL OR WOOD POST IS ACCEPTABLE AT POST 1. SEE SDD 14B42



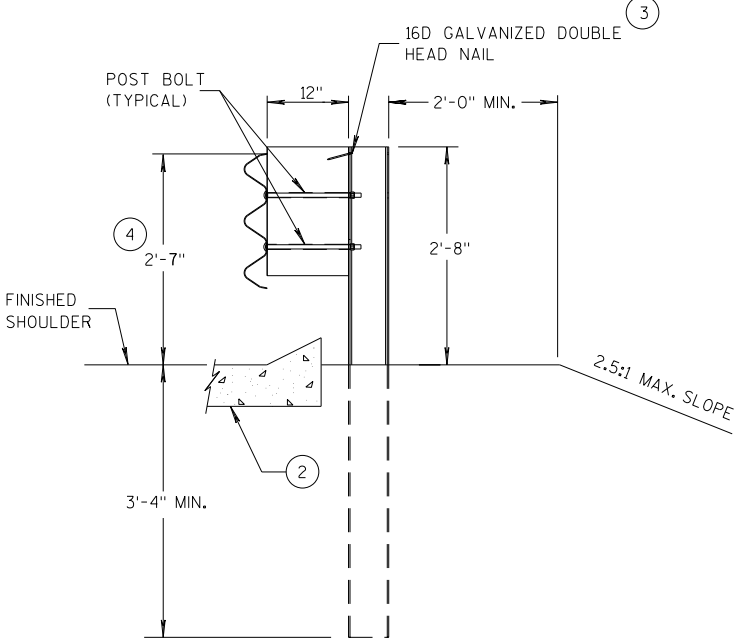
SECTION A-A  
POSTS 1-5



SECTION D-D  
POSTS 12-17



SECTION B-B  
POST 6



SECTION C-C  
POSTS 7-11

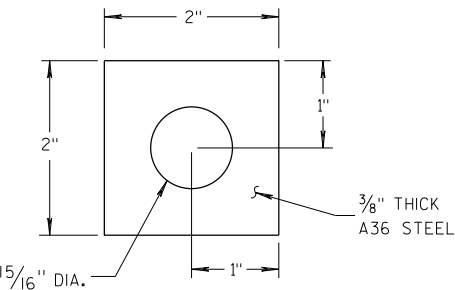
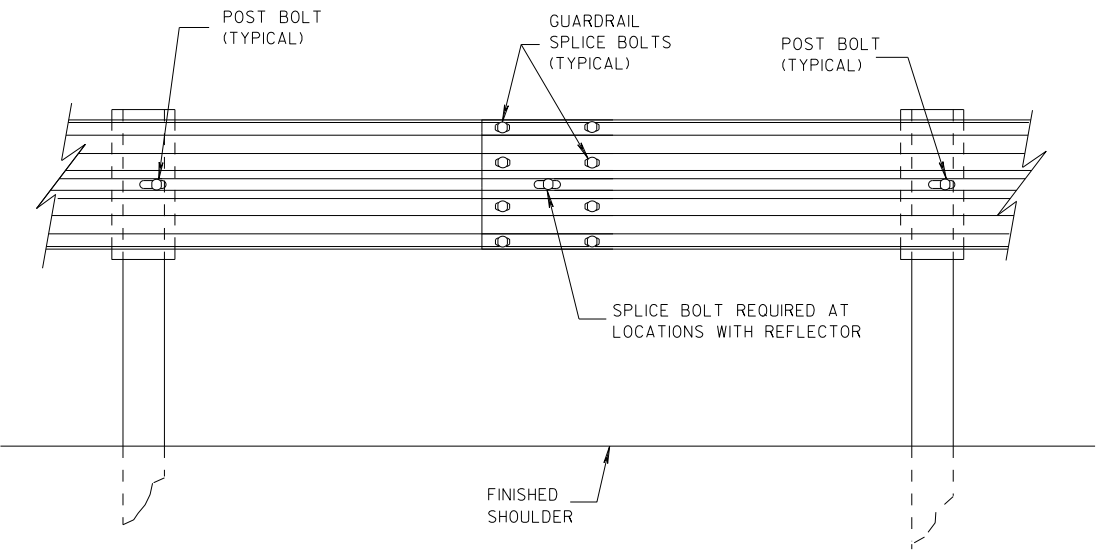
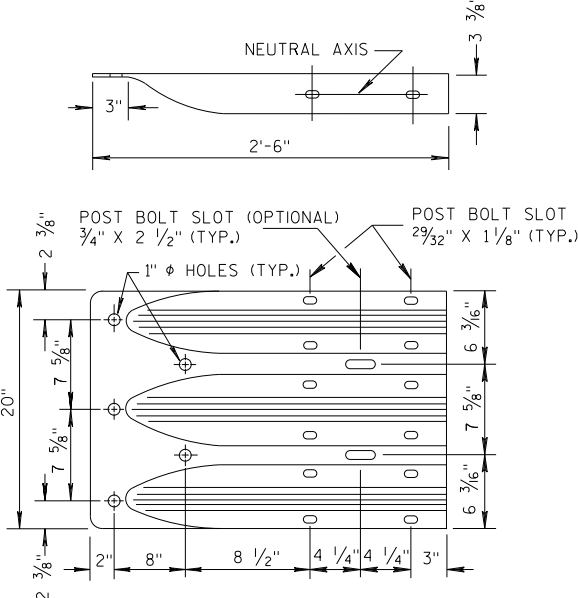


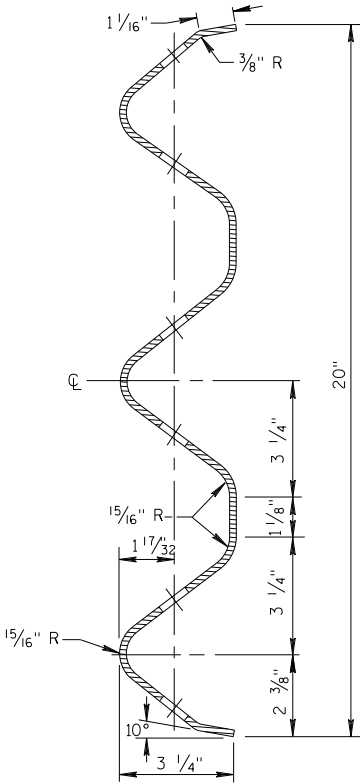
PLATE WASHER DETAIL



SPLICE DETAIL



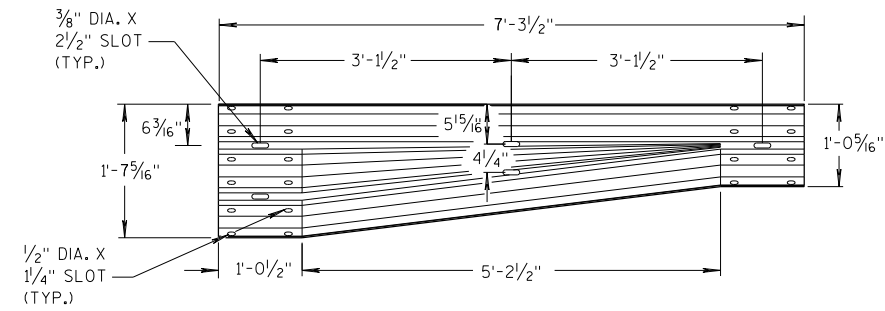
THRIE BEAM  
TERMINAL CONNECTOR



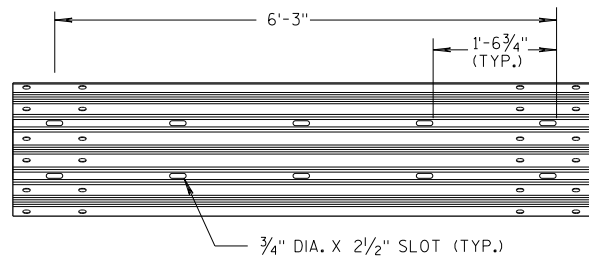
SECTION THRU THRIE  
BEAM RAIL ELEMENT

MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

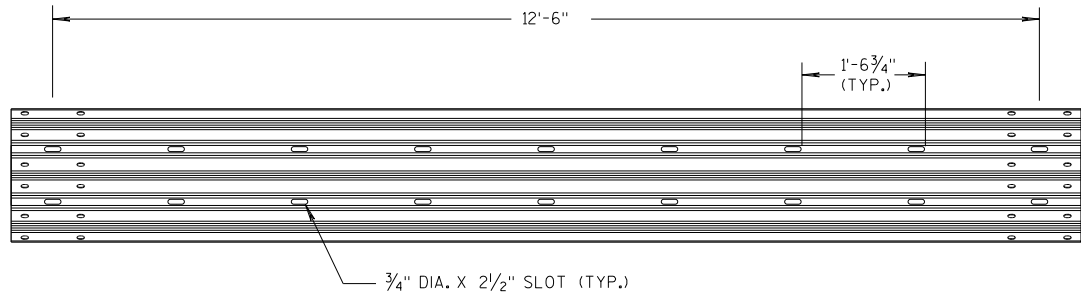
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



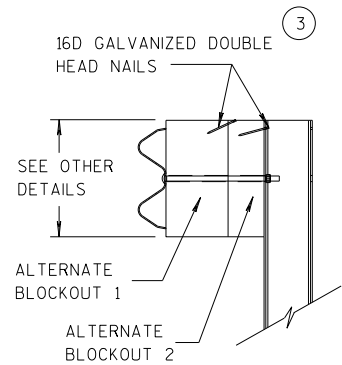
**W-BEAM TO THRIE BEAM TRANSITION SECTION**



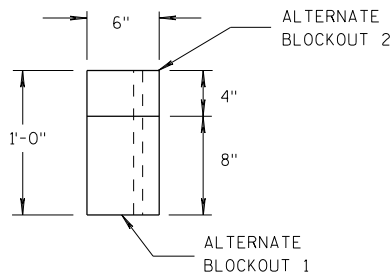
**6'-3" THRIE BEAM SECTION**



**12'-6" THRIE BEAM SECTION**

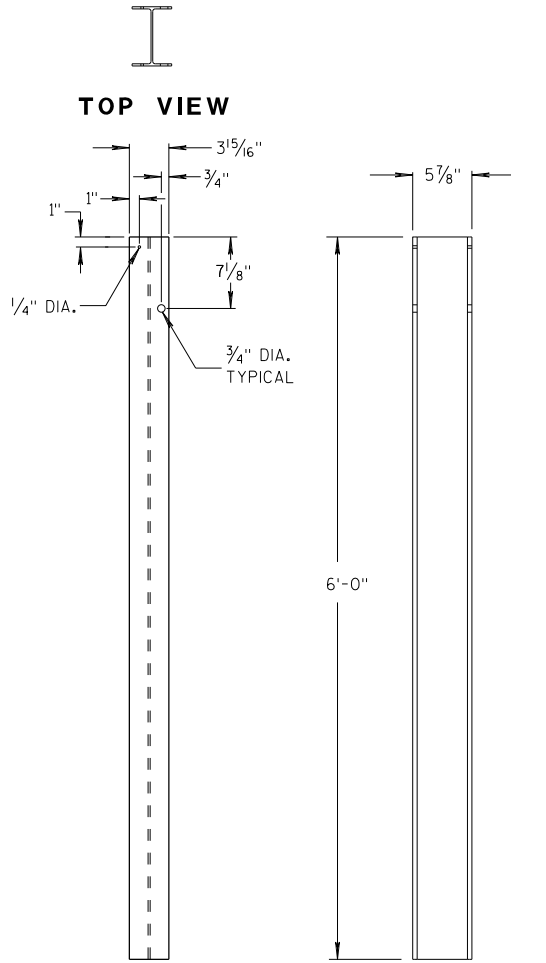


**SIDE VIEW**



**TOP VIEW**

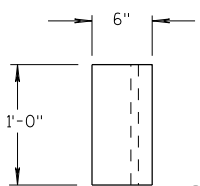
**ALTERNATE WOOD BLOCKOUT DETAIL**



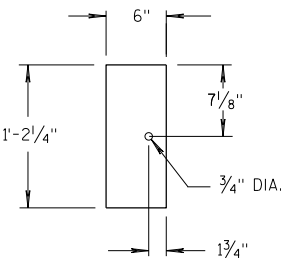
**FRONT VIEW**

**SIDE VIEW**

**STEEL POSTS 1-5**

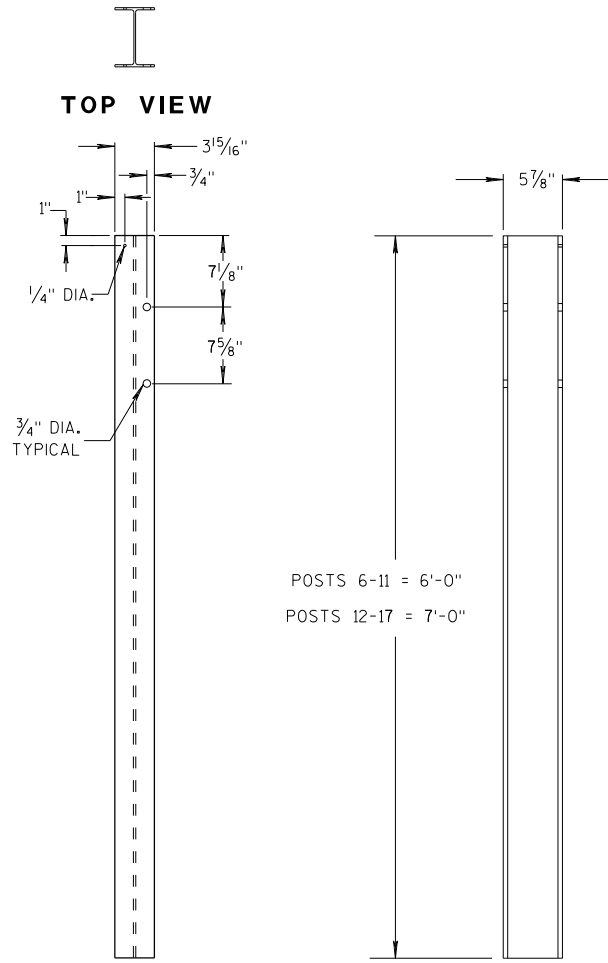


**TOP VIEW**



**FRONT VIEW**

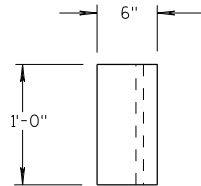
**BLOCKOUT POSTS 1-5**



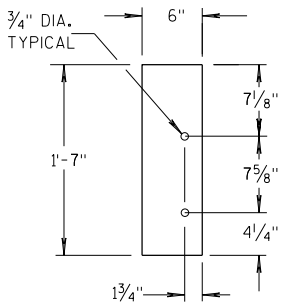
**FRONT VIEW**

**SIDE VIEW**

**STEEL POSTS 6-17**



**TOP VIEW**



**FRONT VIEW**

**BLOCKOUT POSTS 6-17**

**GENERAL NOTES**

STEEL POSTS ARE W6X9 OR W6X8.5.

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

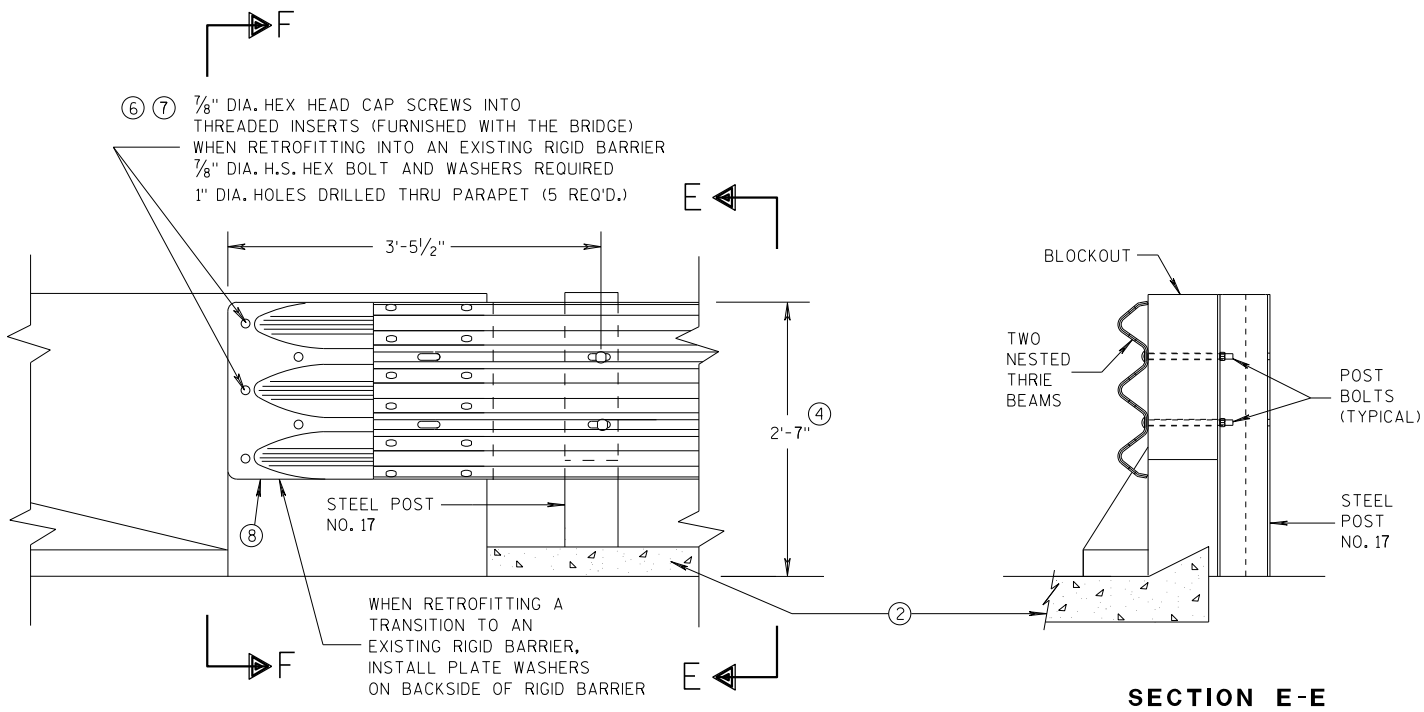
③ WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

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

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

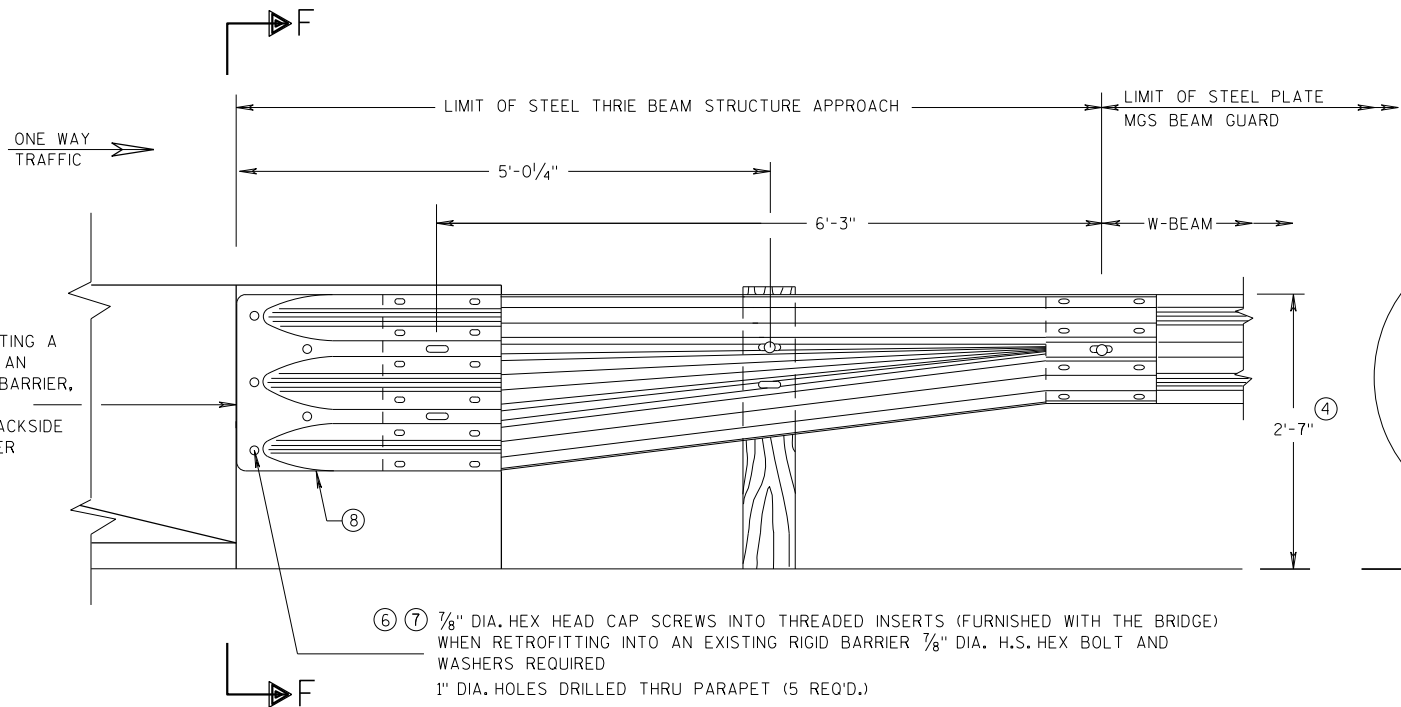
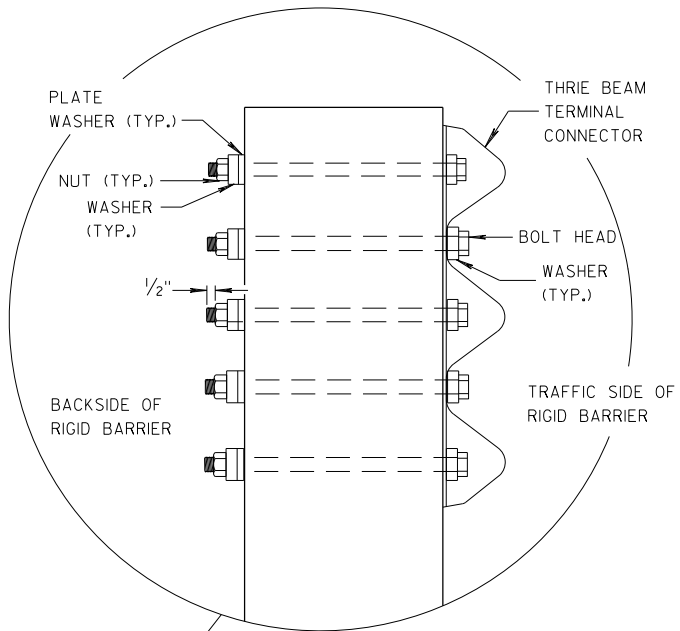
**MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

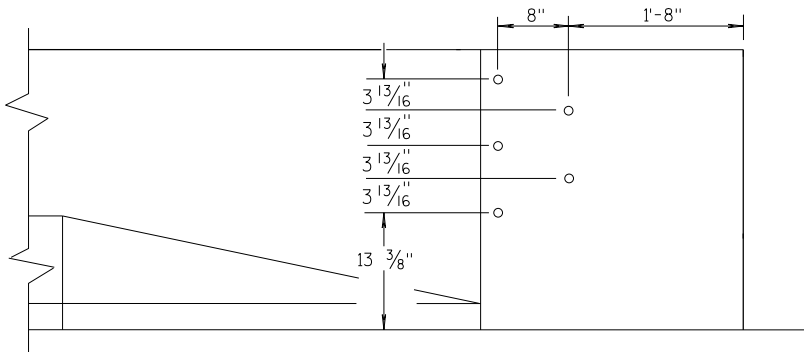


**GENERAL NOTES**

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



SECTION F-F



**MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

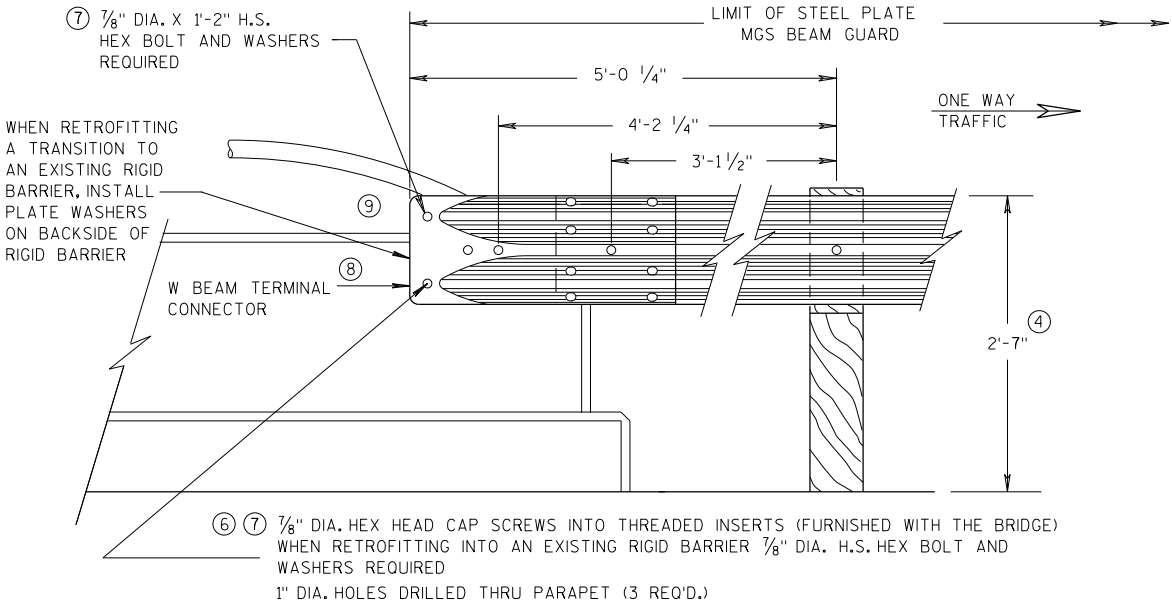
APPROVED  
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FHWA

/S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR

GENERAL NOTES

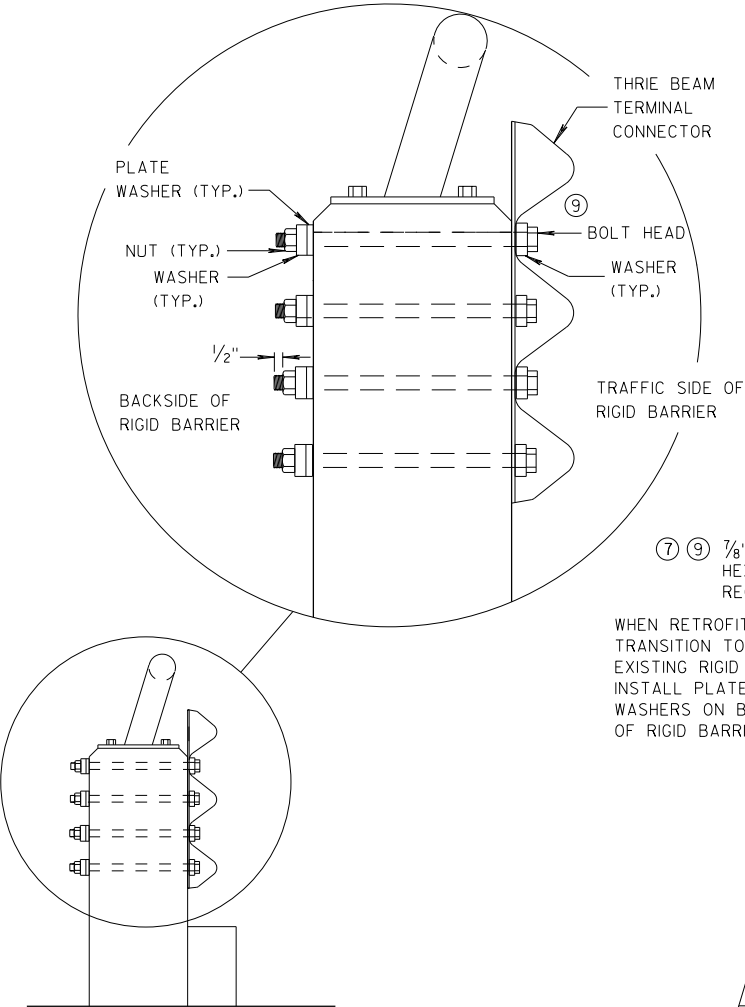
THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSTION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.

- ②
- OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ④
- TOLERANCE FOR TOP OF BEAM IS ± 1".
- ⑥
- DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑦
- BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/32" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ⑧
- THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".
- ⑨
- BOLT, NUT AND WASHERS NOT REQUIRED FOR THIS LOCATION WHEN RETROFITTING AN EXISTING PAPAPET AND THE HOLE IS EITHER ABOVE PARAPET OR WITHIN 4 INCHES OF THE EDGE OF PARAPET.

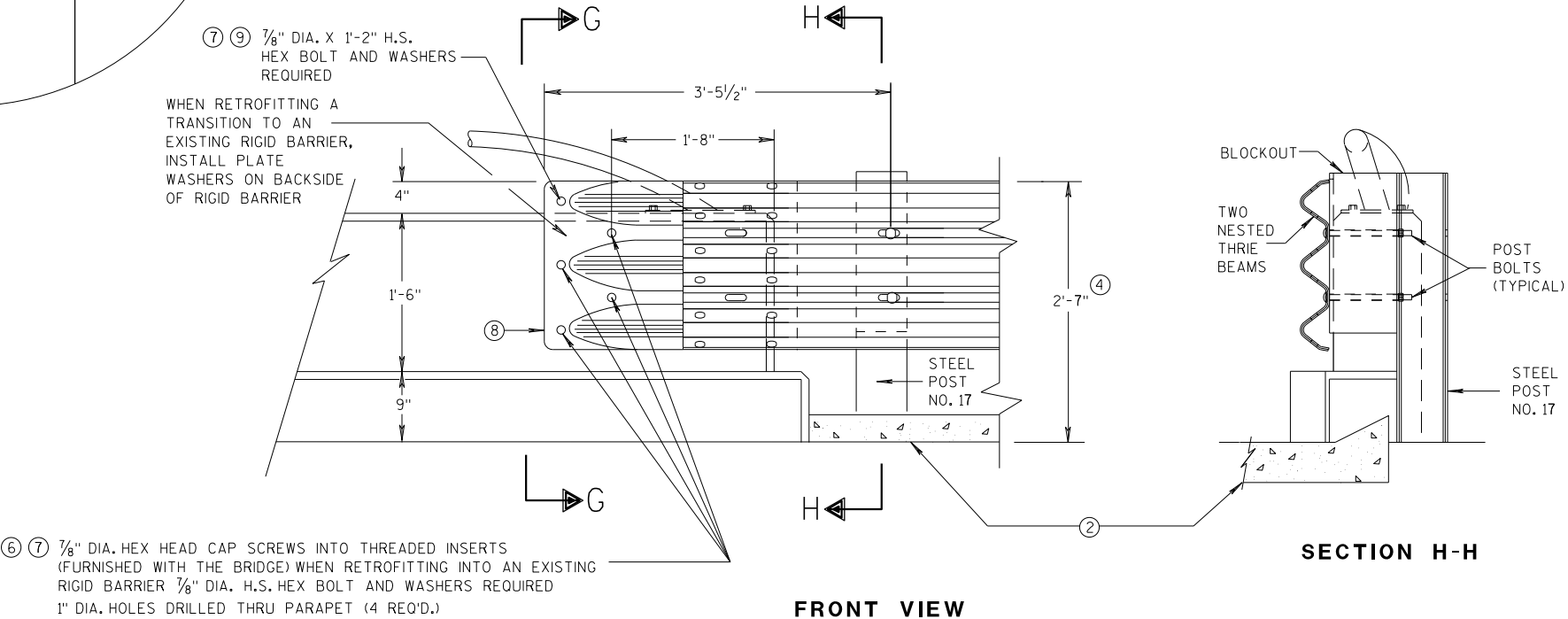


FRONT VIEW

W BEAM CONNECTION TO VERTICAL FACE PARAPET  
(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

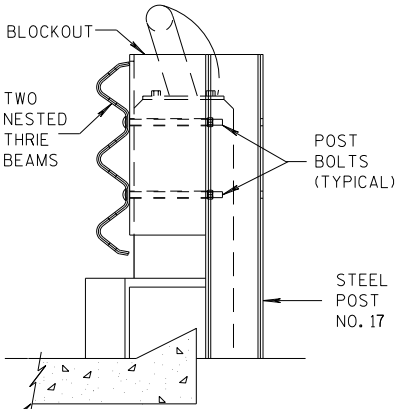


SECTION G-G



FRONT VIEW

THRIE BEAM CONNECTION TO VERTICAL FACED PARAPETS

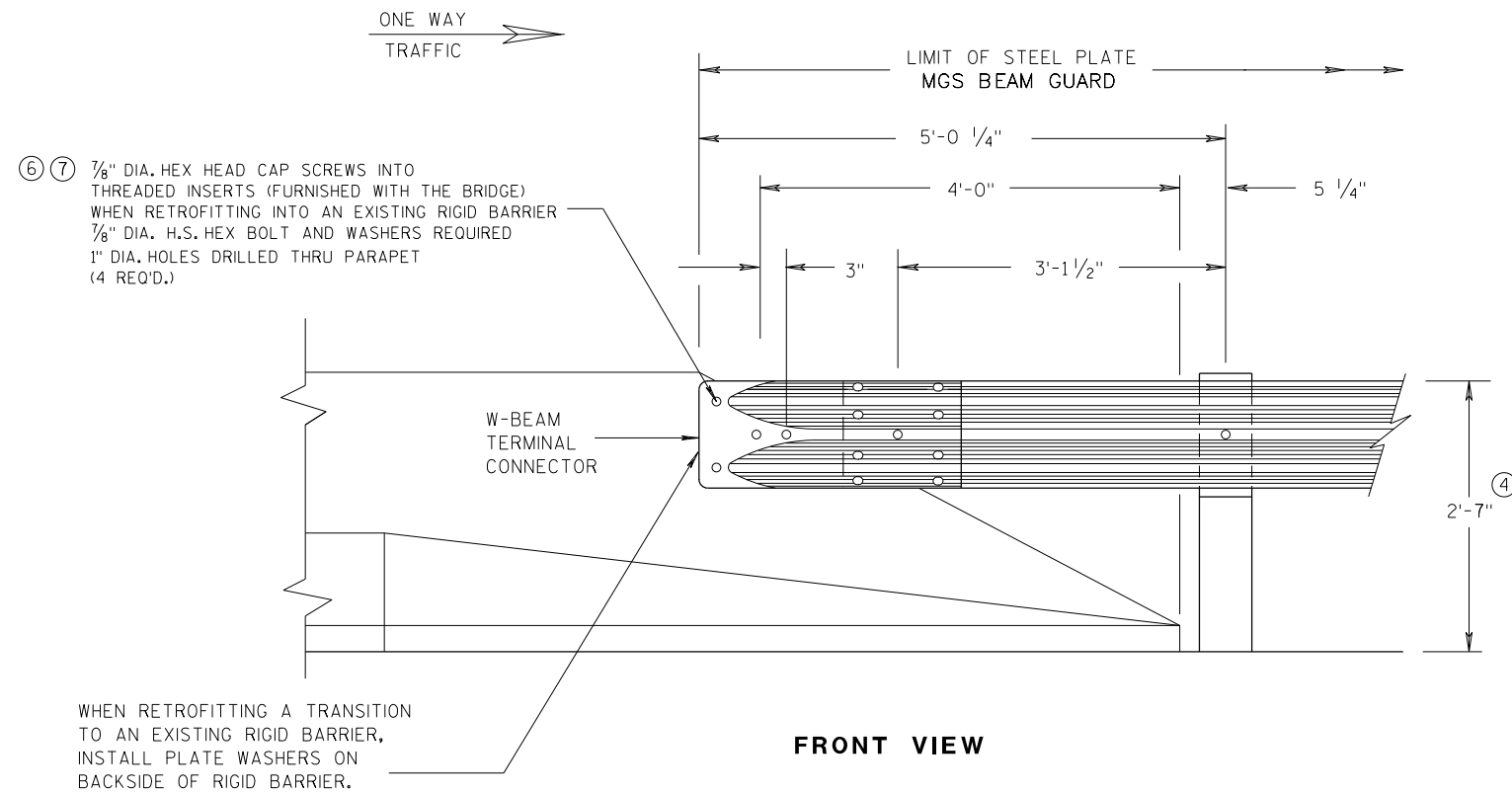


SECTION H-H

MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

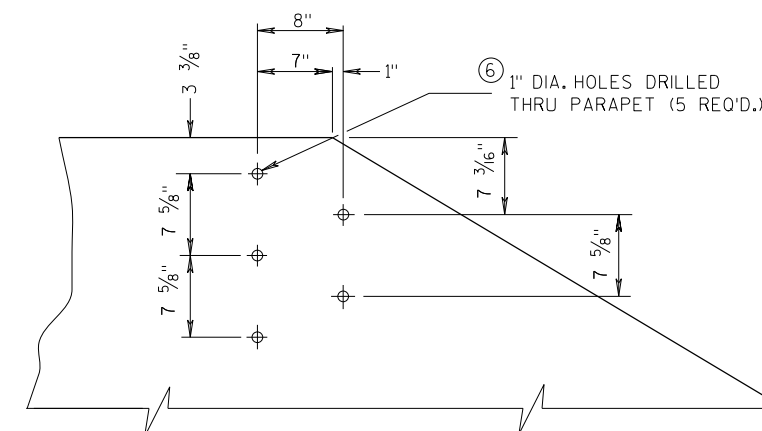
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UNIT SUPERVISOR  
FHWA



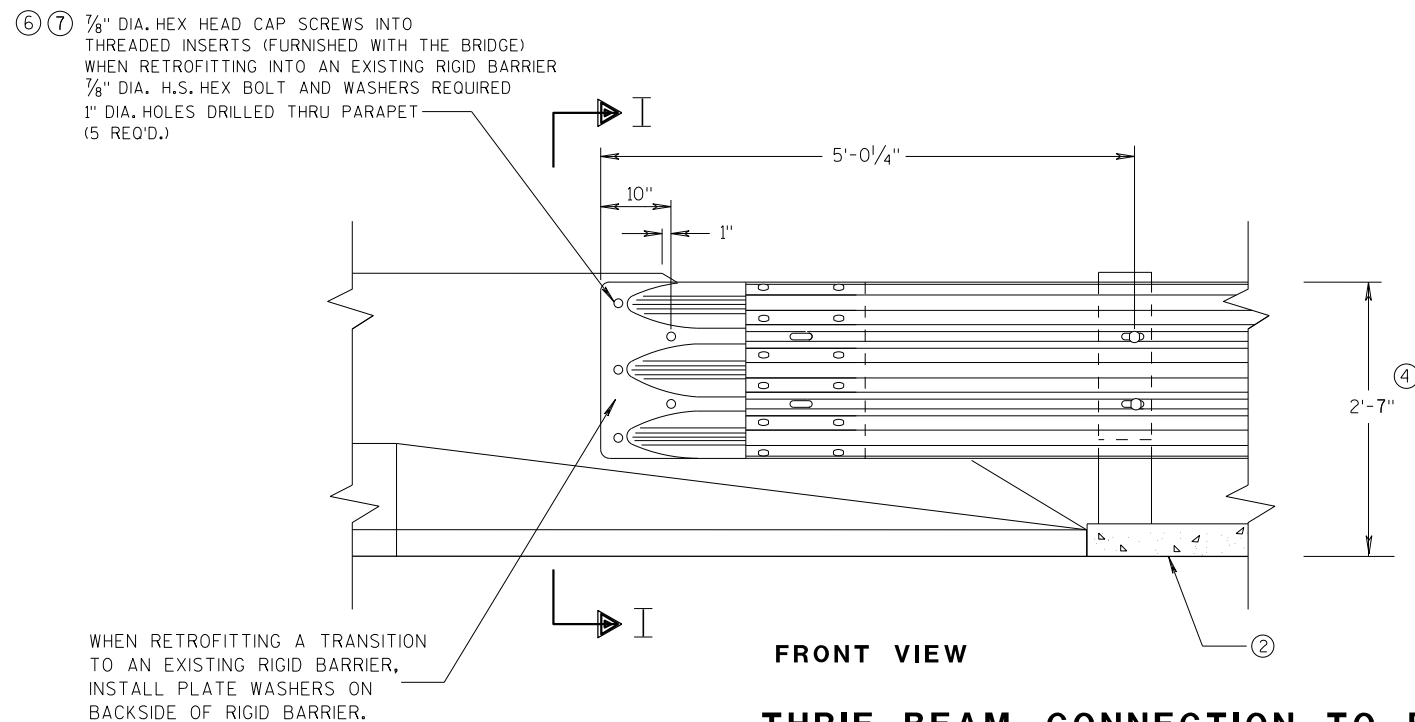
**W BEAM CONNECTION TO  
PARAPETS WITH SLOPED ENDS  
(USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)**

## GENERAL NOTES

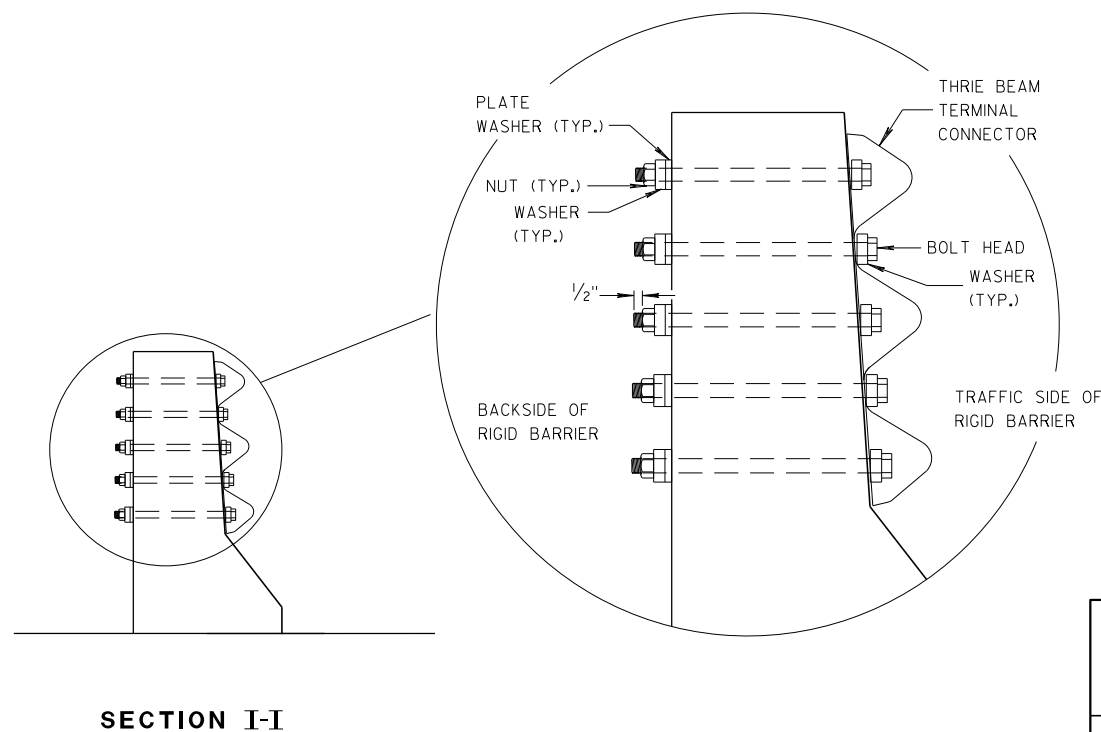
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
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**DRILL HOLE LOCATION AND PATTERN  
FOR THRIE BEAM CONNECTION**



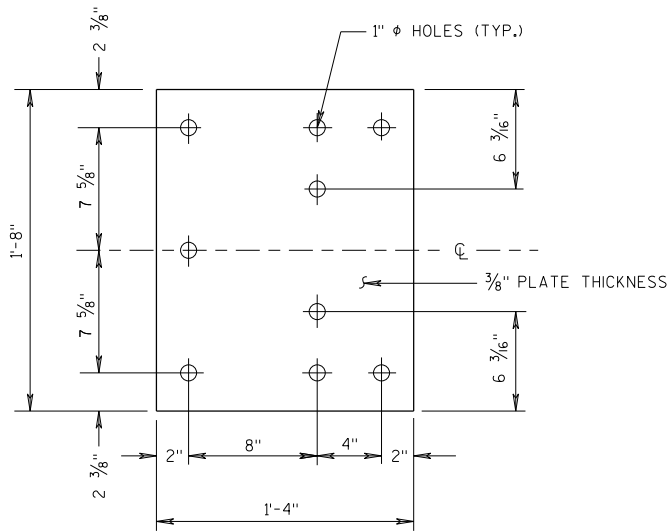
**THRIE BEAM CONNECTION TO BRIDGE  
PARAPETS WITH SLOPED ENDS**



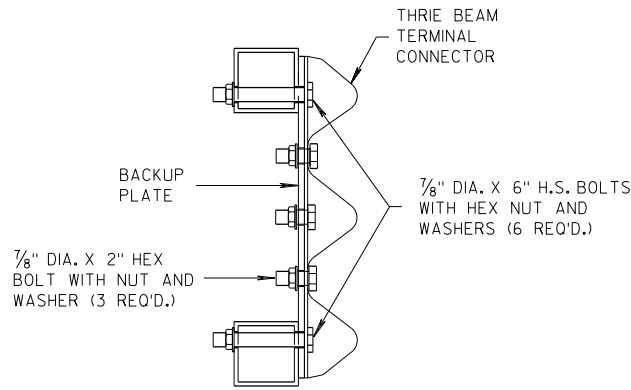
**MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

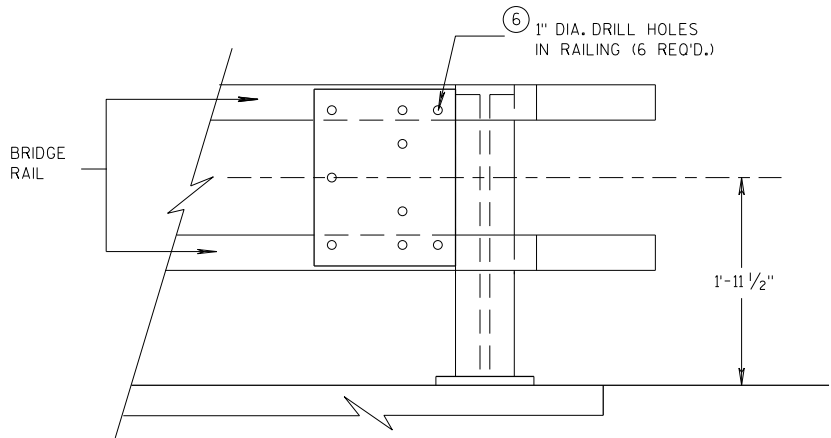
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ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR  
FHWA



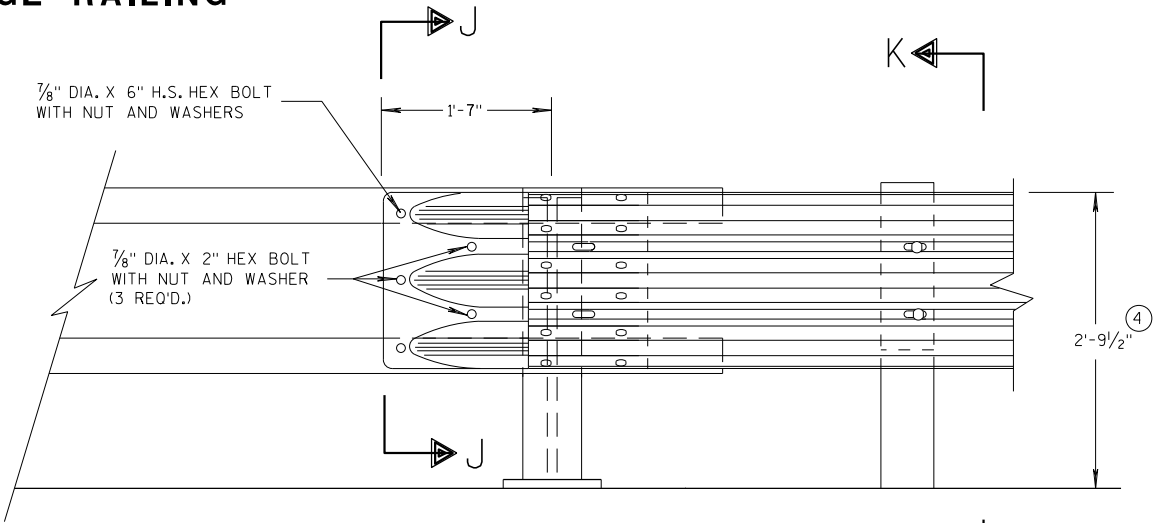
BACK-UP PLATE DETAIL



SECTION J-J

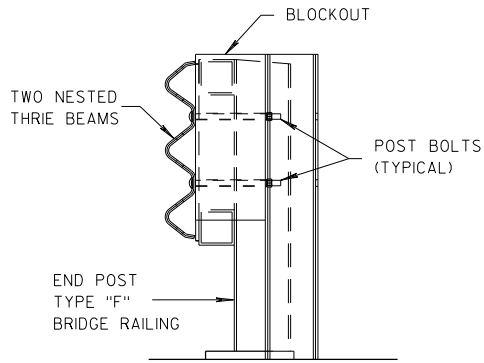


BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING



FRONT VIEW

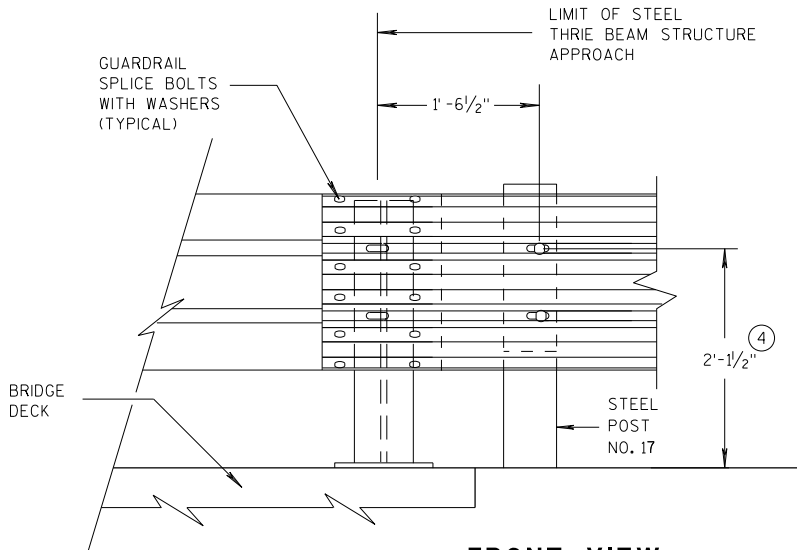
THRIE BEAM CONNECTION TO TUBULAR RAILING TYPE "F"



SECTION K-K

GENERAL NOTES

- ④ TOLERANCE FOR TOP OF BEAM IS  $\pm 1"$ .
- ⑥ DRILLING HOLES THROUGH THE PAPER, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.



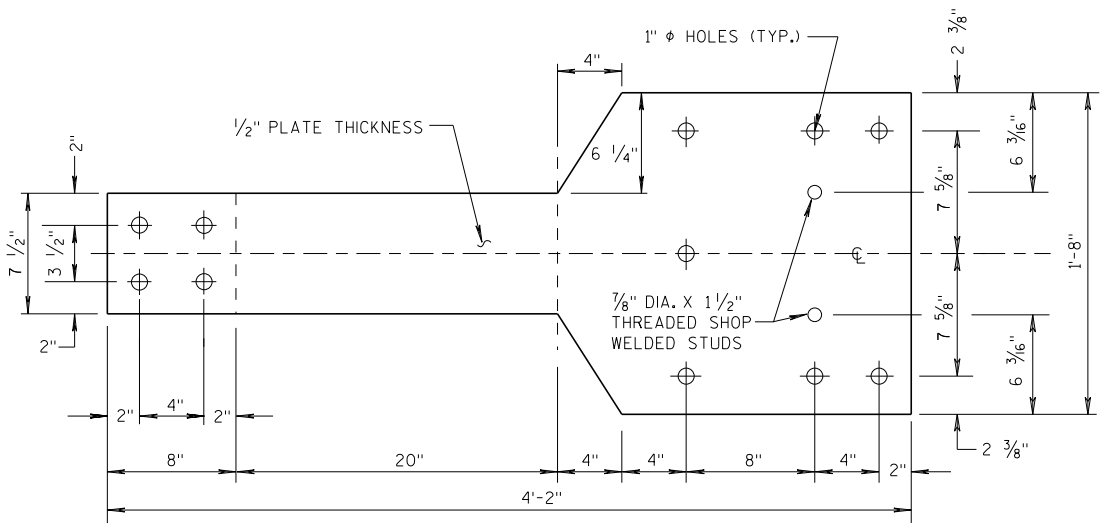
FRONT VIEW

THRIE BEAM CONNECTION TO STEEL RAILING TYPE "W"

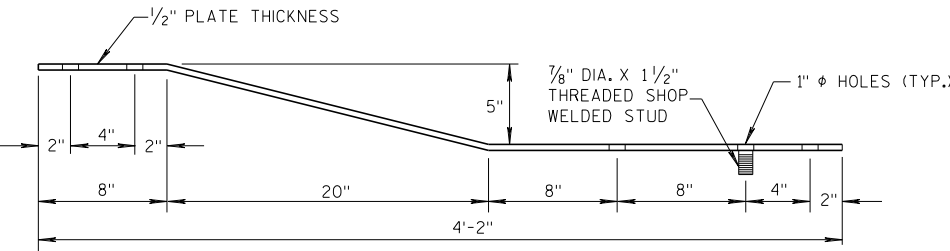
|                                                         |                                                  |
|---------------------------------------------------------|--------------------------------------------------|
| MIDWEST GUARDRAIL SYSTEM<br>THRIE BEAM TRANSITION (MGS) |                   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

GENERAL NOTES

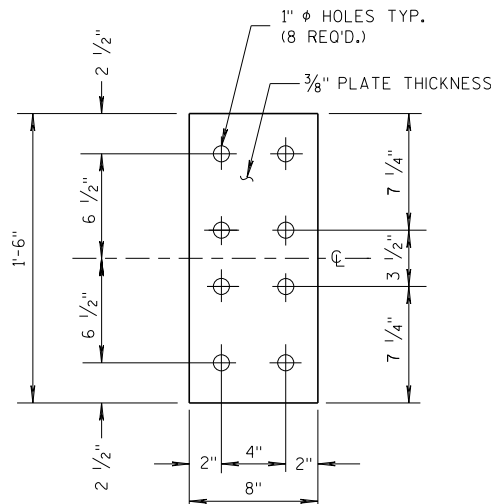
④ TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".



FRONT VIEW

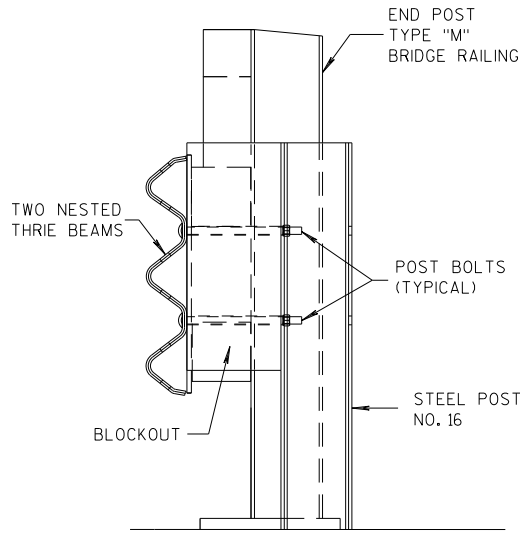


PLAN VIEW  
BACK-UP PLATE DETAIL, TYPE "M"

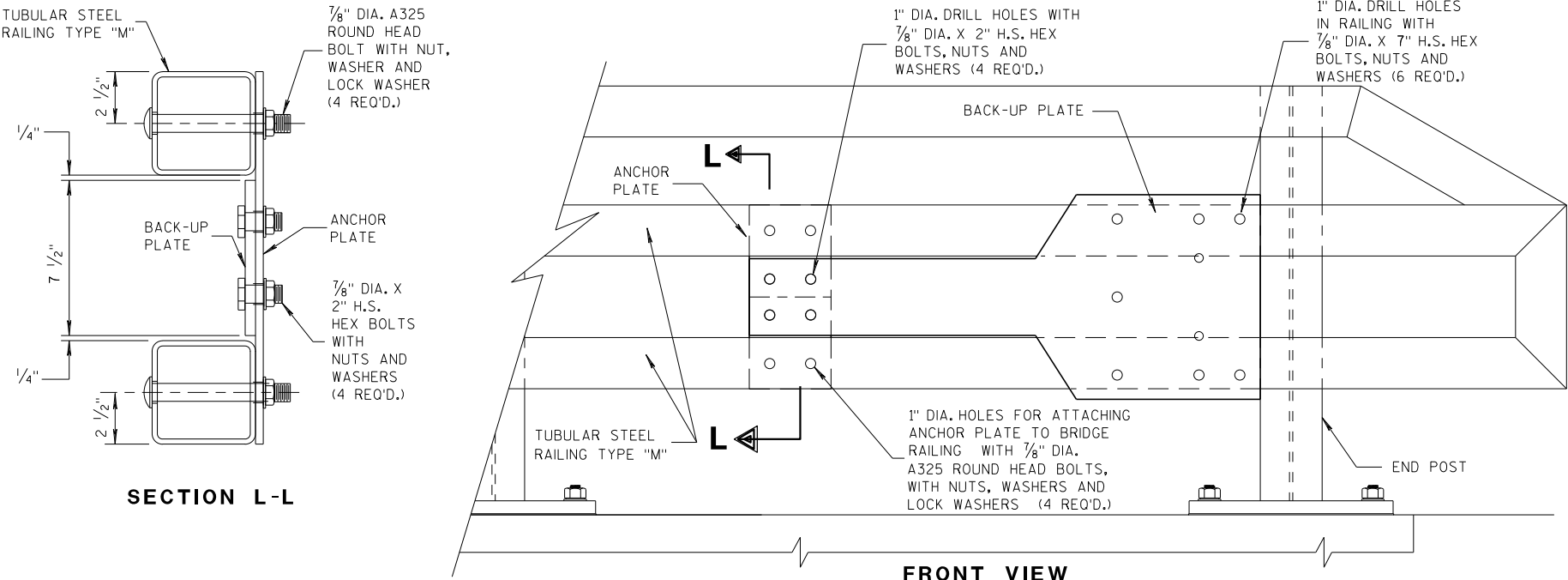


FRONT VIEW

ANCHOR  
PLATE DETAIL,  
TYPE "M"



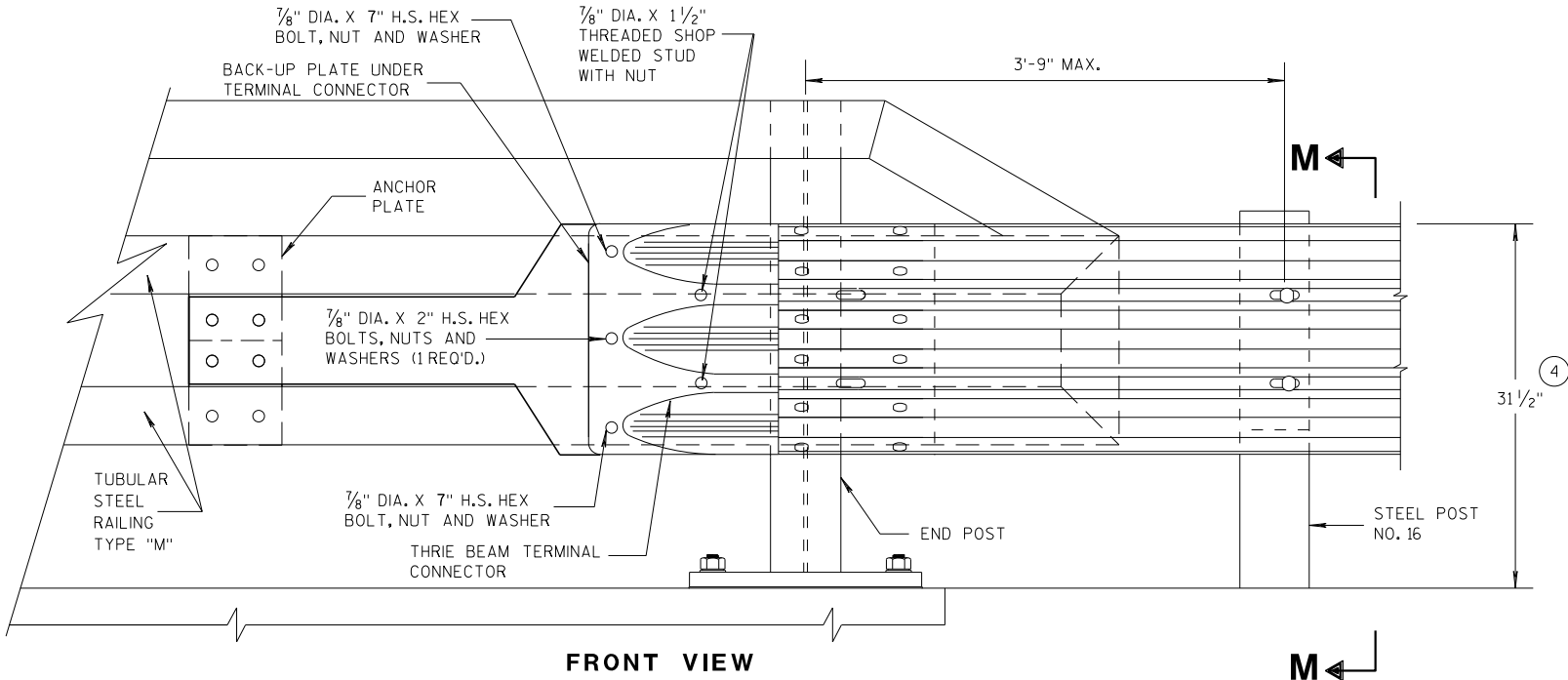
SECTION M-M



SECTION L-L

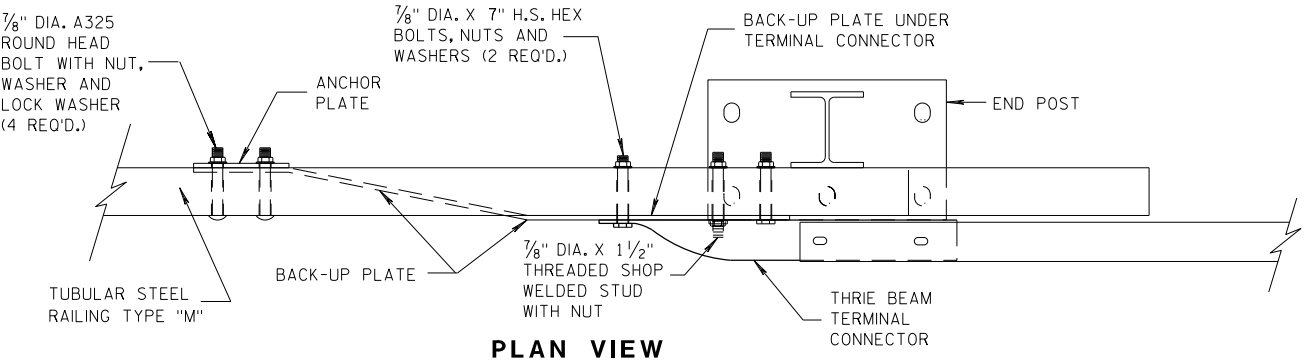
FRONT VIEW

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



FRONT VIEW

M



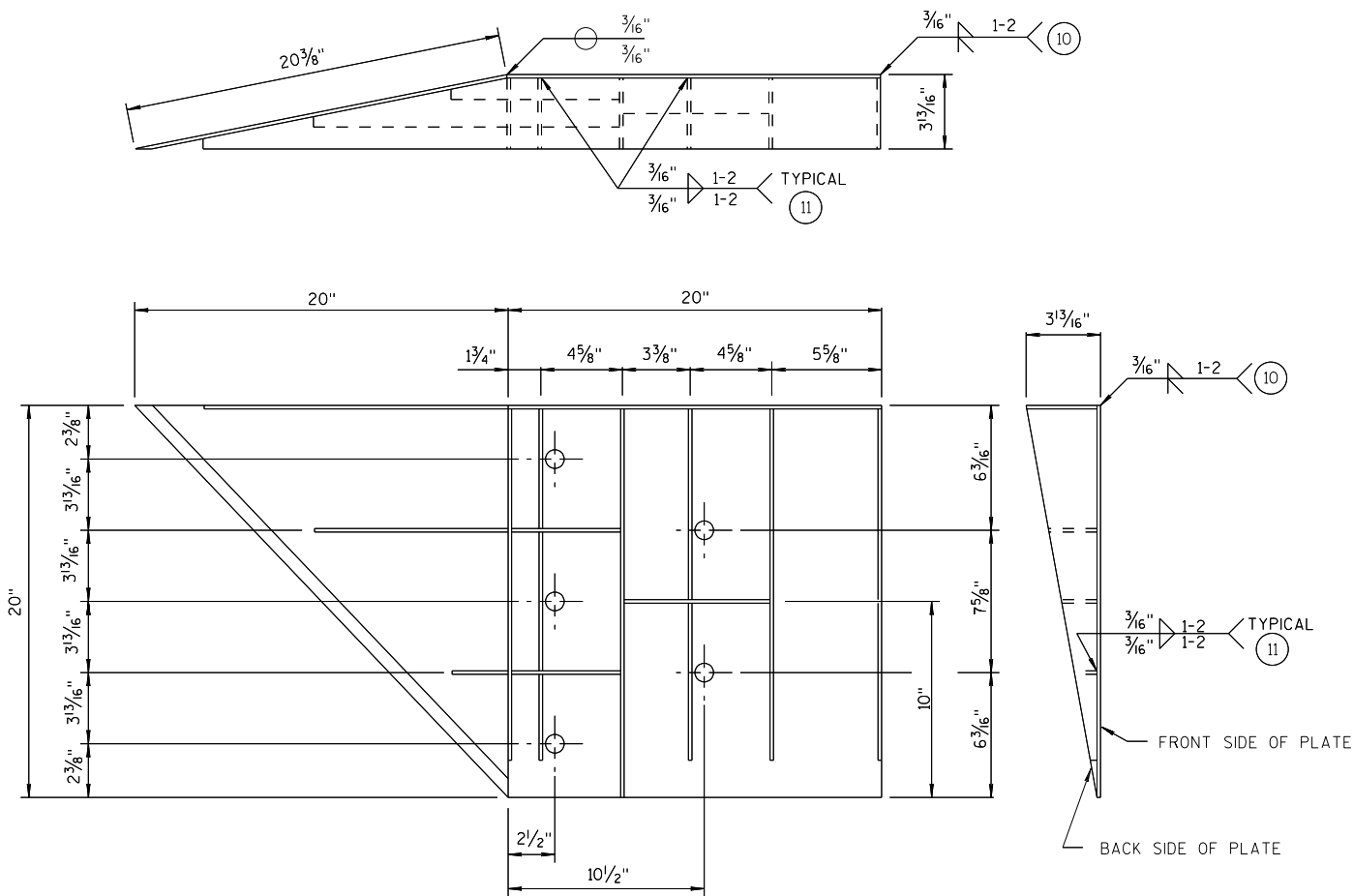
PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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



WELDING INSTRUCTION  
(VIEWED FROM BACK SIDE OF PLATE)

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

SINGLE SLOPE CONNECTION PLATE

GENERAL NOTES

- COVER PLATE PANELS ARE 3/16" THICK.
- ALL STIFFENERS ARE 1/4" THICK.
- CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.
- FOR GALVANIZED REQUIREMENTS, SEE SECTION 614 OF THE STANDARD SPECIFICATIONS.
- ALL HOLE DIAMETERS SHALL BE 1".
- FOR OPPOSITE SIDE INSTALLATION MIRROR DRAWINGS.

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

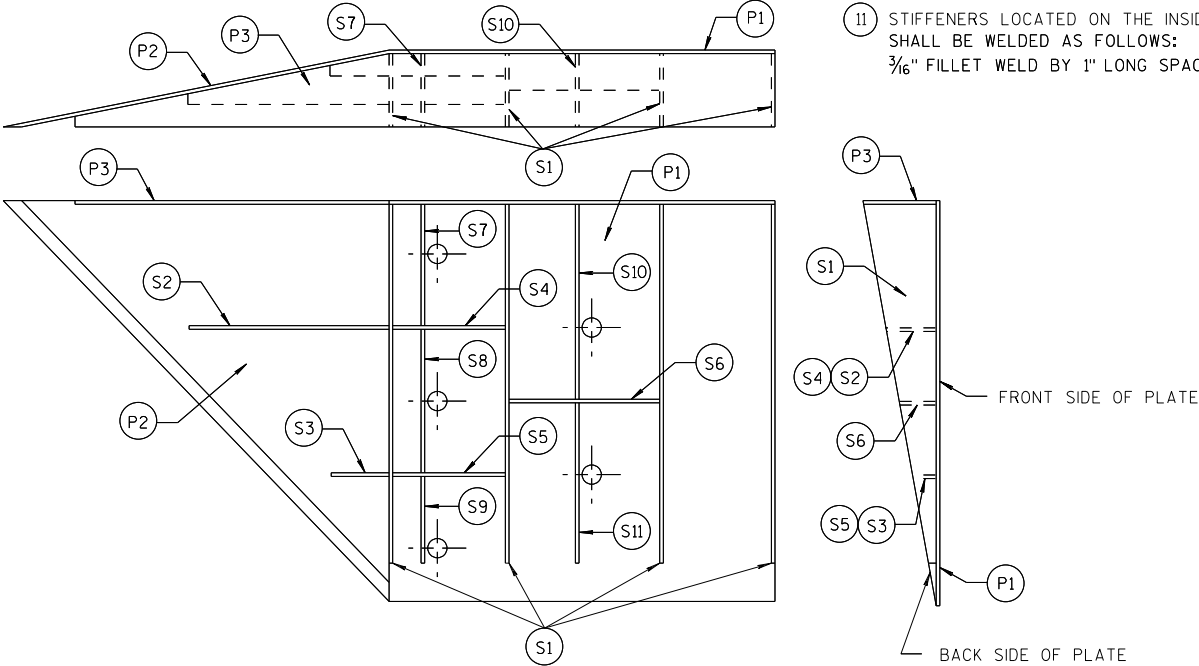


PLATE AND STIFFENER IDENTIFICATION  
(VIEWED FROM BACK SIDE OF PLATE)

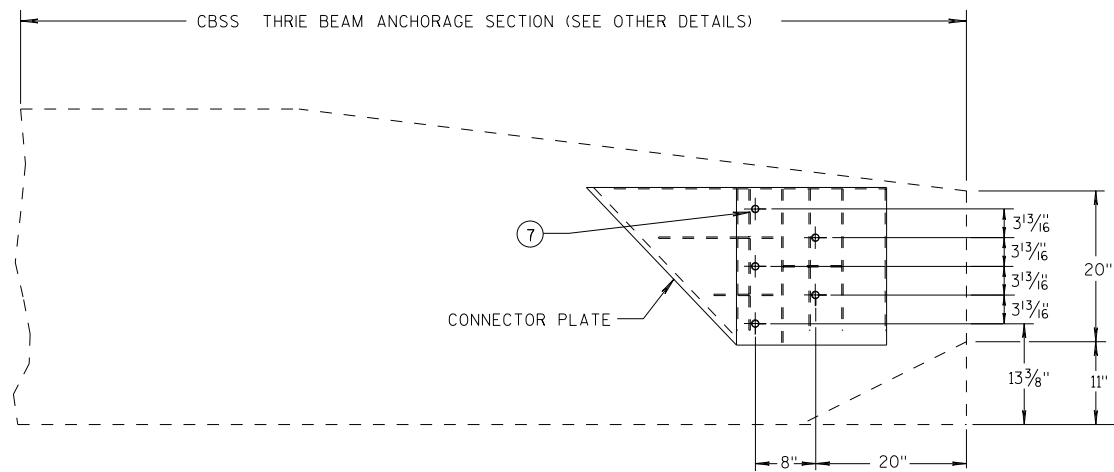
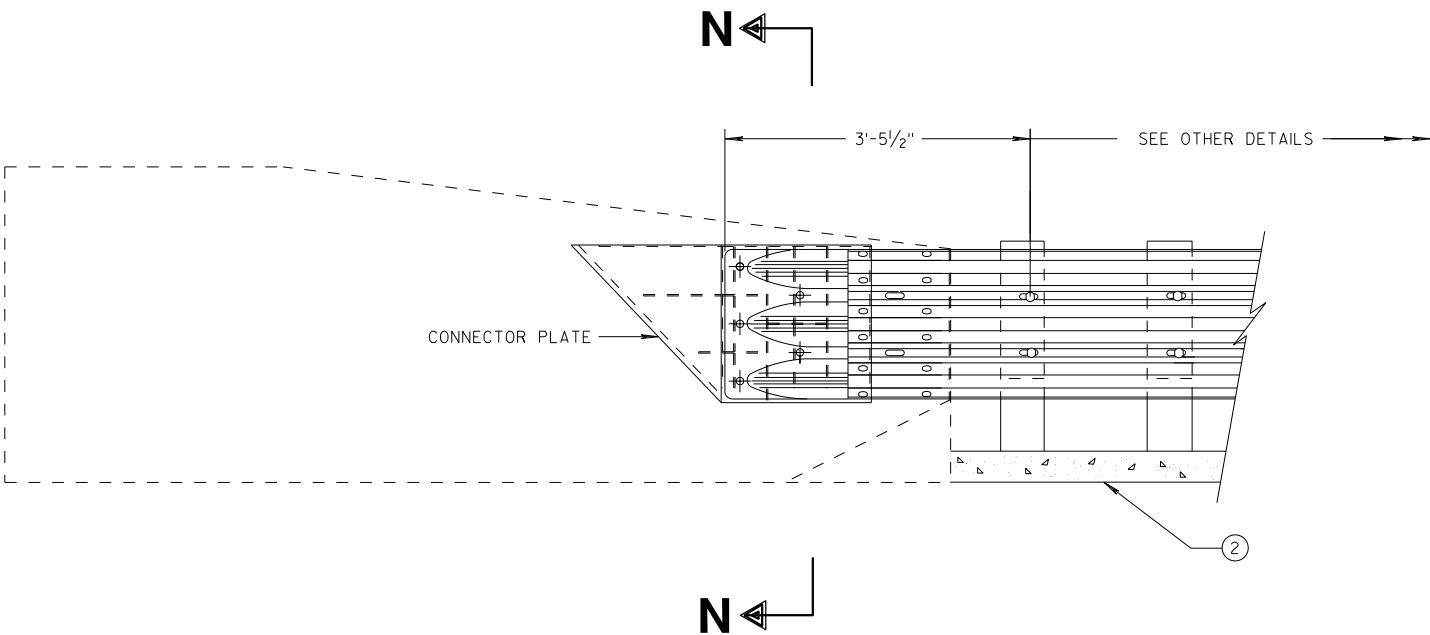
MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
7/2018  
DATE  
FHWA

/S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR

THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER



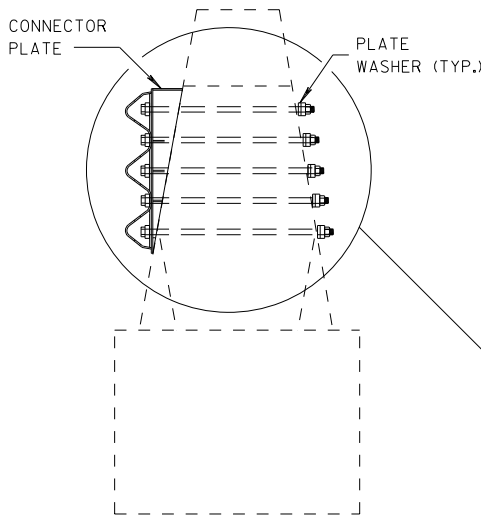
SINGLE SLOPE CONNECTION PLATE PLACEMENT

GENERAL NOTES

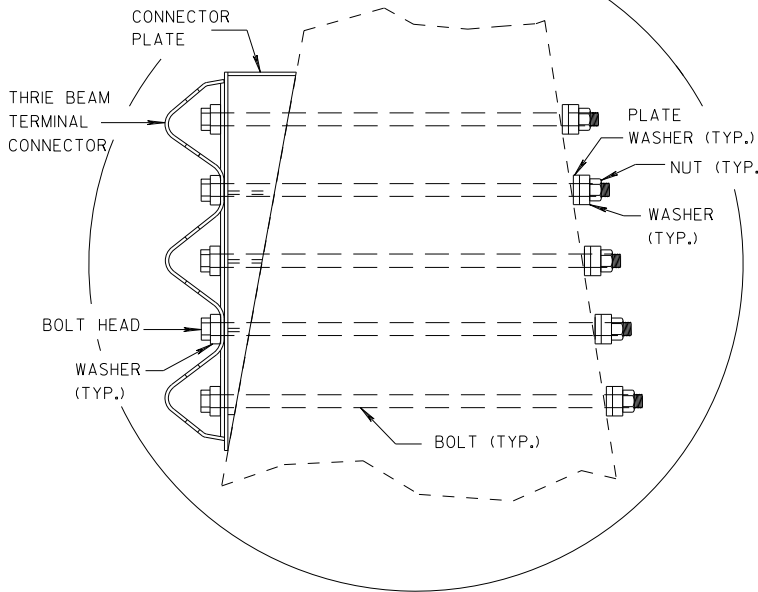
CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

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SECTION N-N



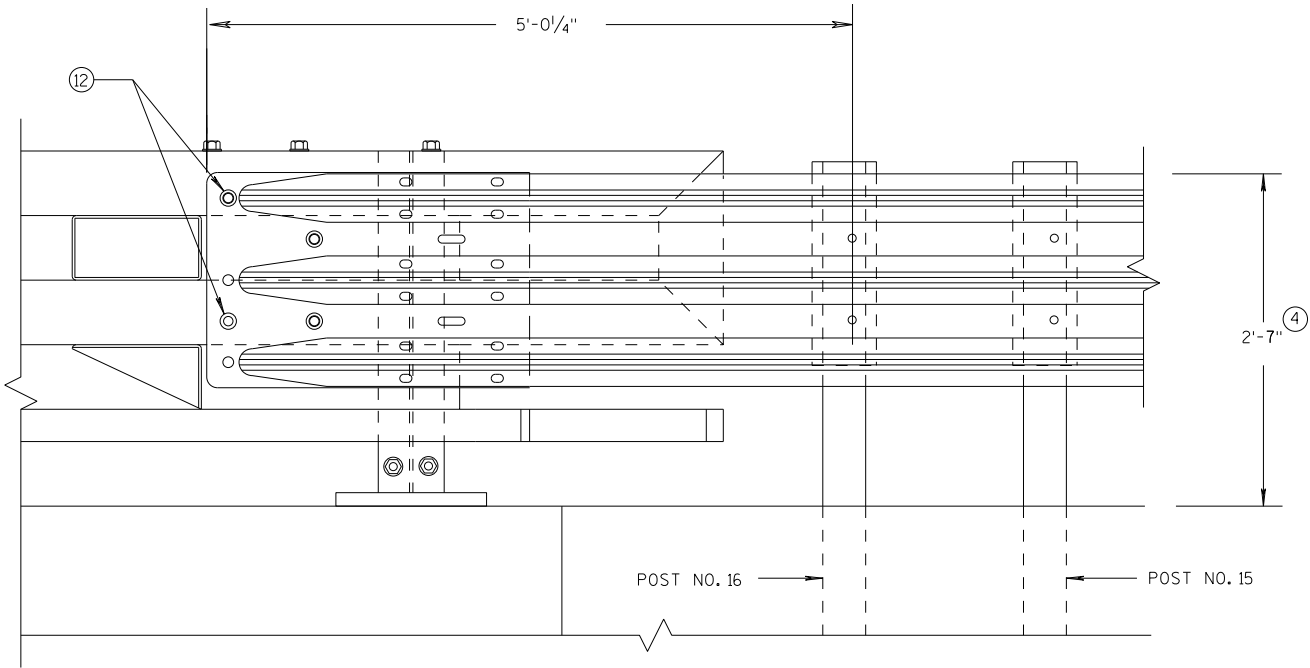
MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

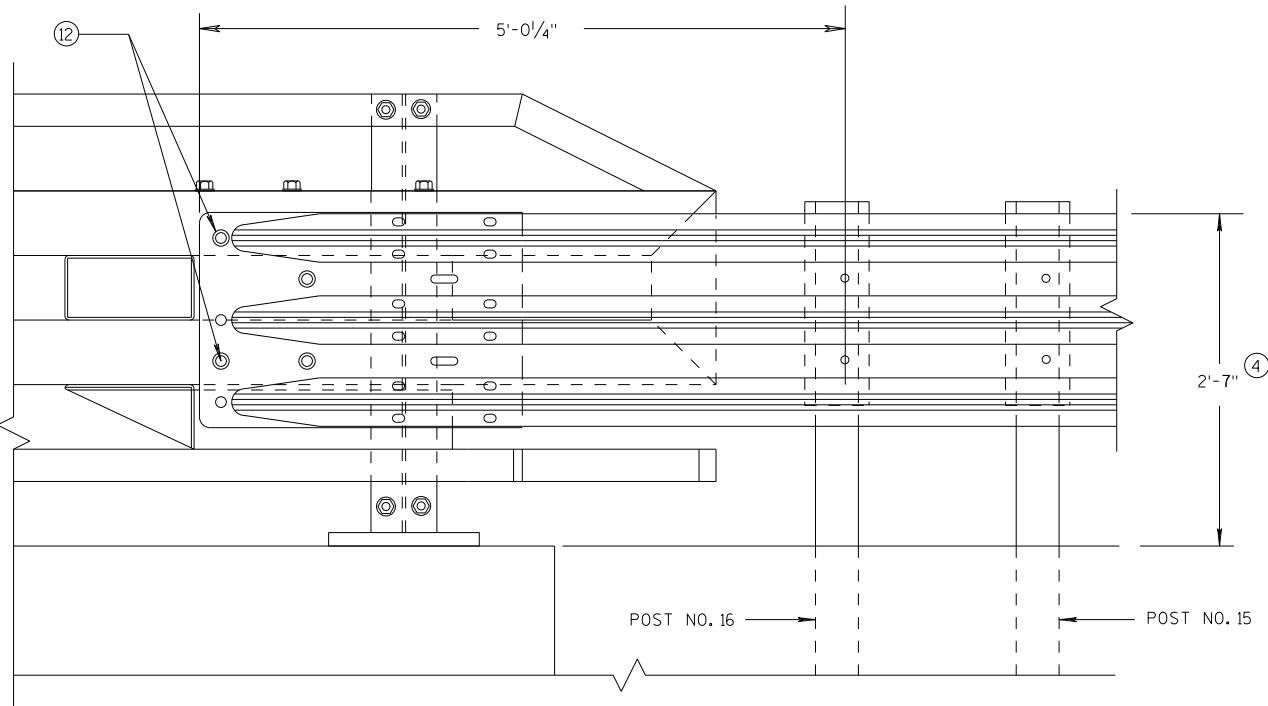
APPROVED  
7/2018  
DATE  
/S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR  
FHWA

GENERAL NOTES

- ④ TOLERANCE FOR TOP OF BEAM IS  $\pm 1"$ .
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ELEVATION OF DETAIL AT NY3 END POST  
THRIE BEAM RAIL ATTACHMENT

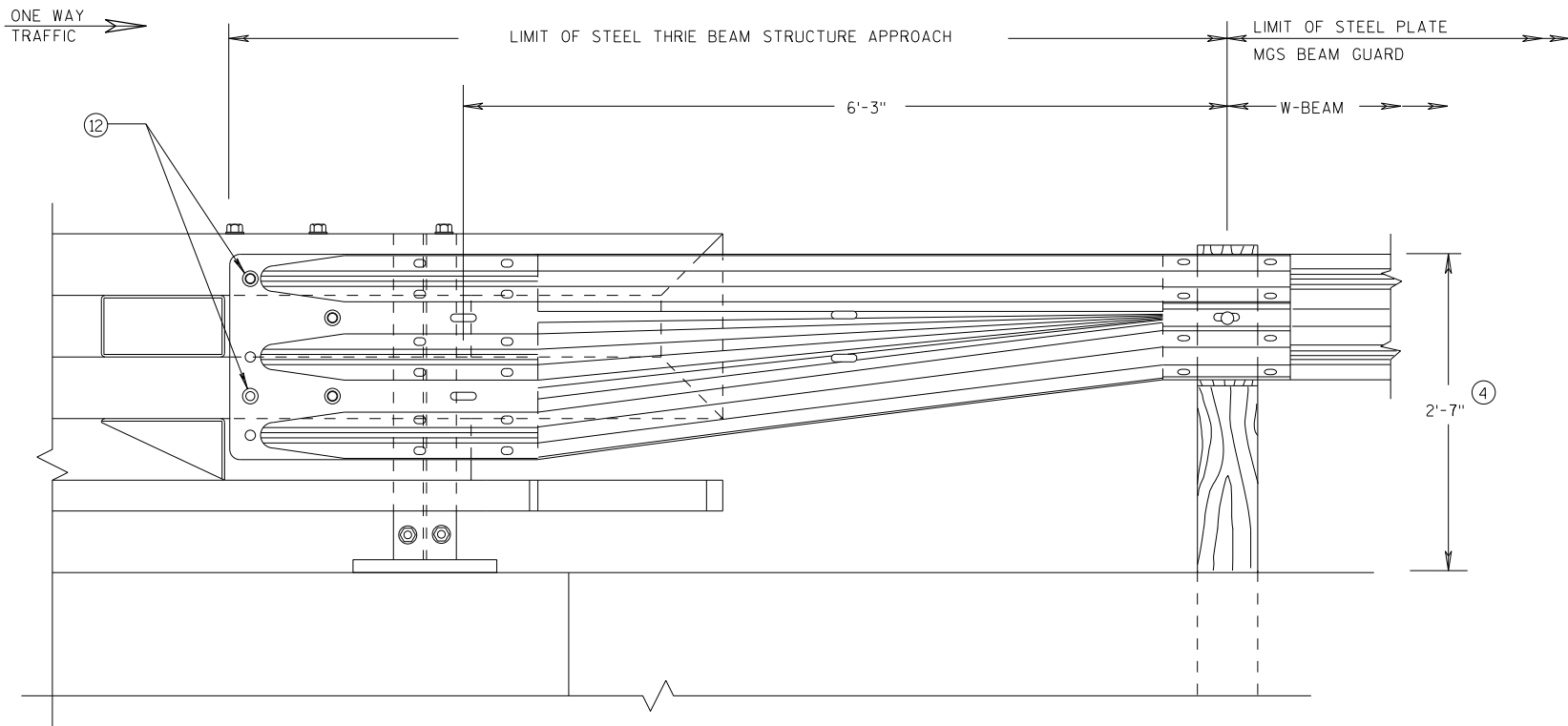


ELEVATION OF DETAIL AT NY4 END POST  
THRIE BEAM RAIL ATTACHMENT

MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

|          |                               |
|----------|-------------------------------|
| APPROVED | /S/ Rodney Taylor             |
| DATE     | ROADWAY STANDARDS DEVELOPMENT |
| FHWA     | UNIT SUPERVISOR               |



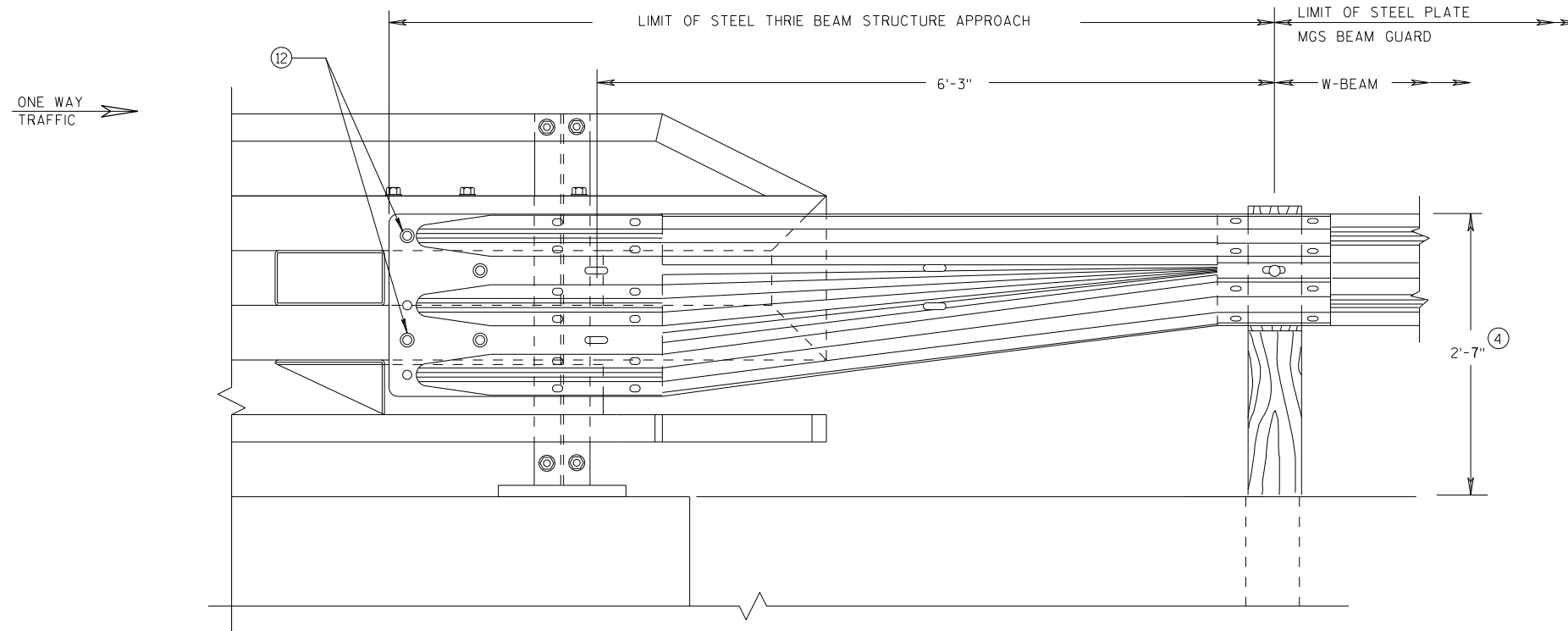
## GENERAL NOTES

(4) TOLERANCE FOR TOP OF BEAM IS  $\pm 1"$ .

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FRONT VIEW

### W BEAM TRANSITION AND CONNECTION TO BRIDGE RAILING TYPE "NY3" (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)



FRONT VIEW

### W BEAM TRANSITION AND CONNECTION TO BRIDGE RAILING TYPE "NY4" (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

7/2018

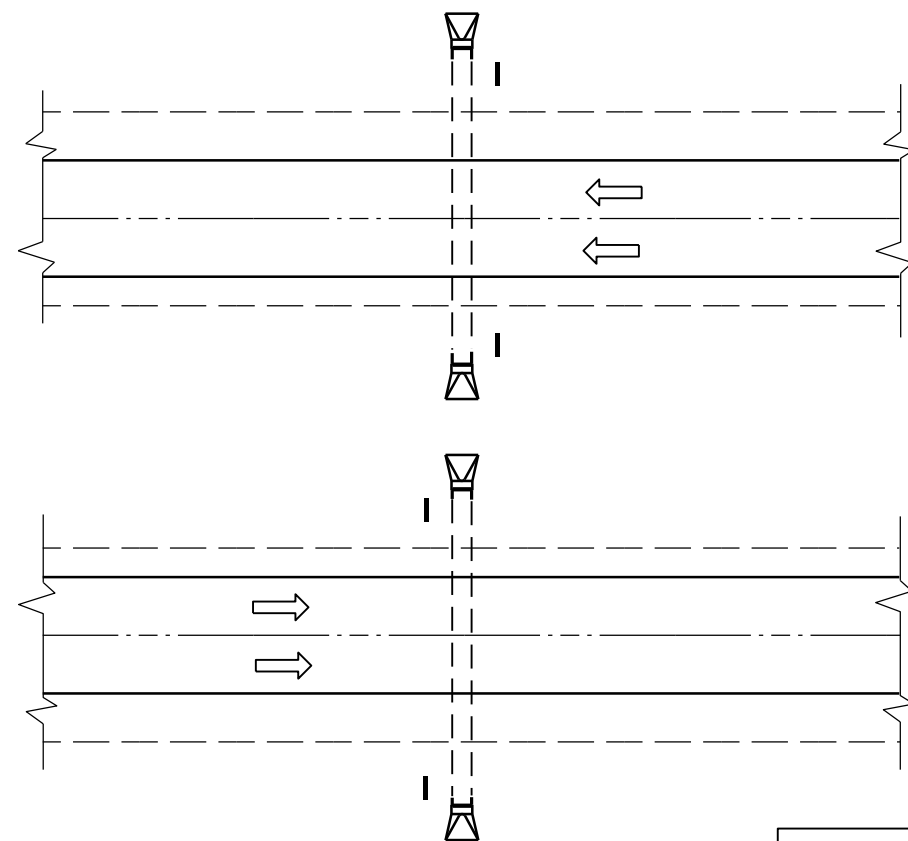
DATE

FHWA

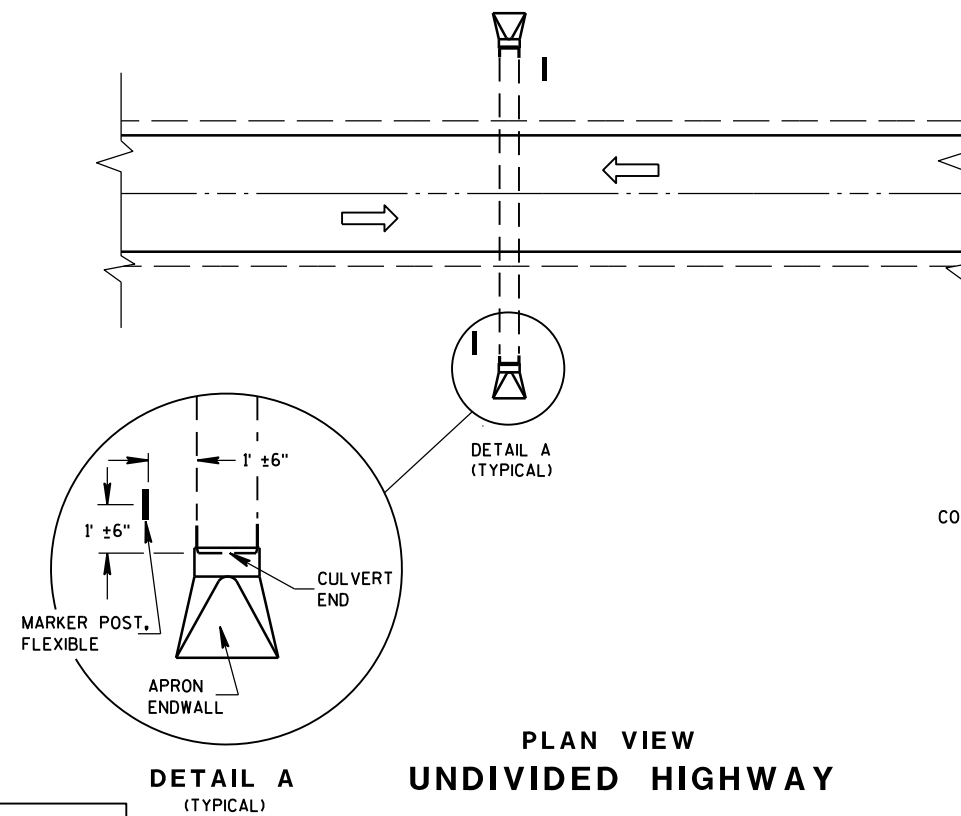
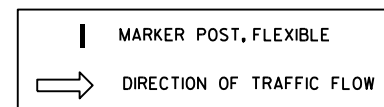
/S/ Rodney Taylor

ROADWAY STANDARDS DEVELOPMENT

UNIT SUPERVISOR



PLAN VIEW  
DIVIDED HIGHWAY

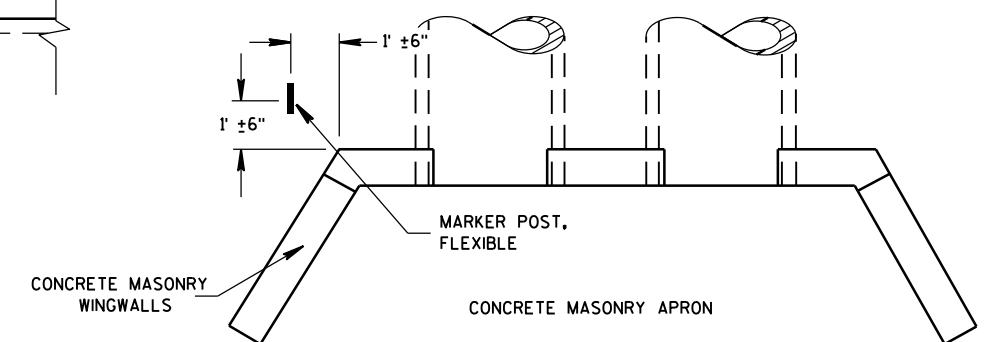


PLAN VIEW  
UNDIVIDED HIGHWAY

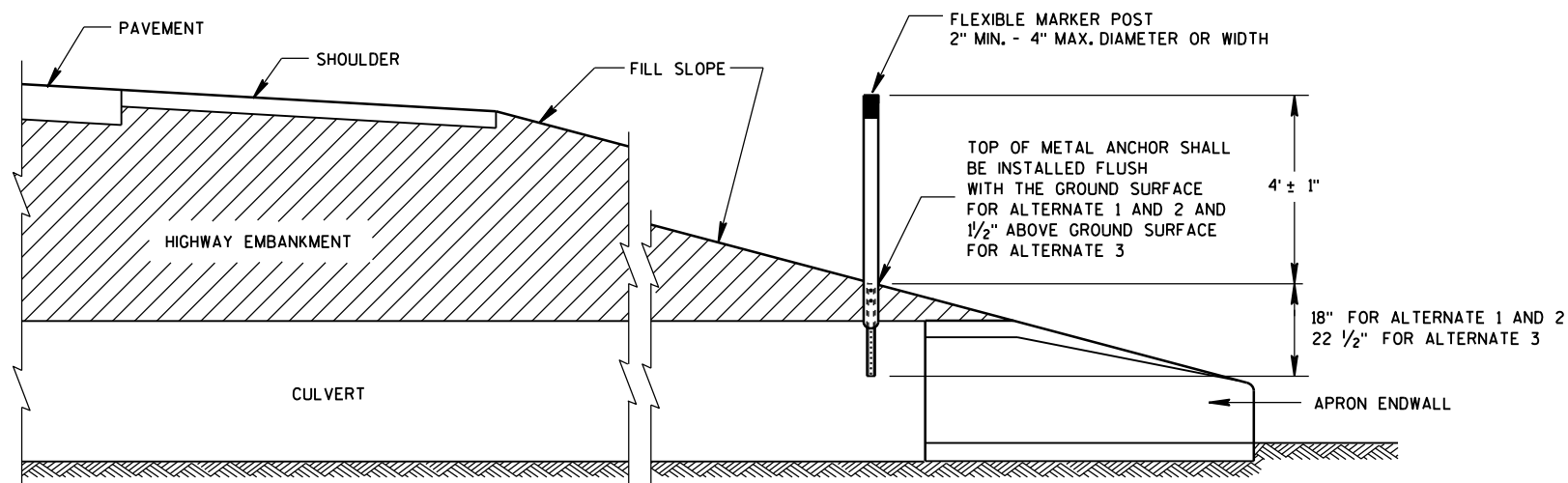
### FLEXIBLE MARKER POST LOCATION

### 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.



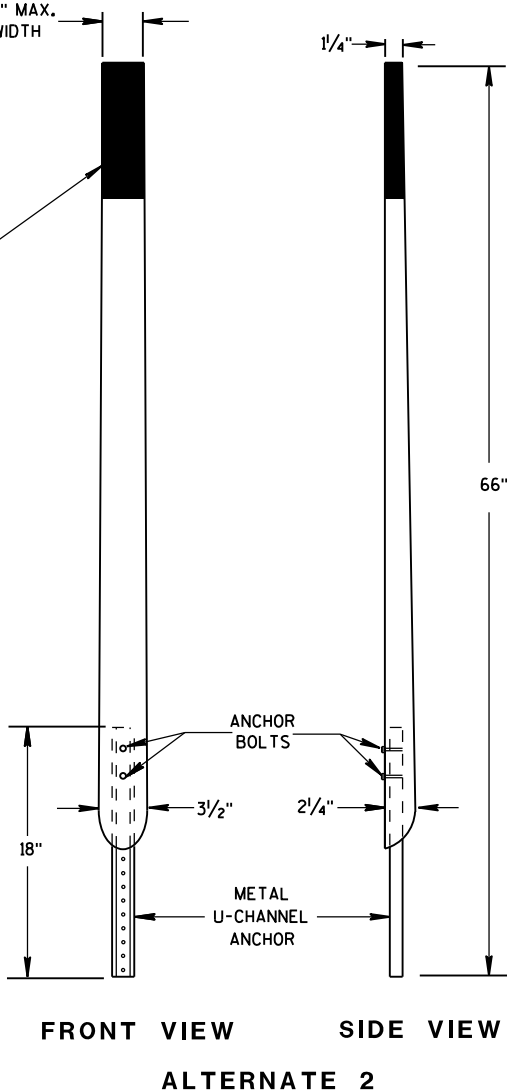
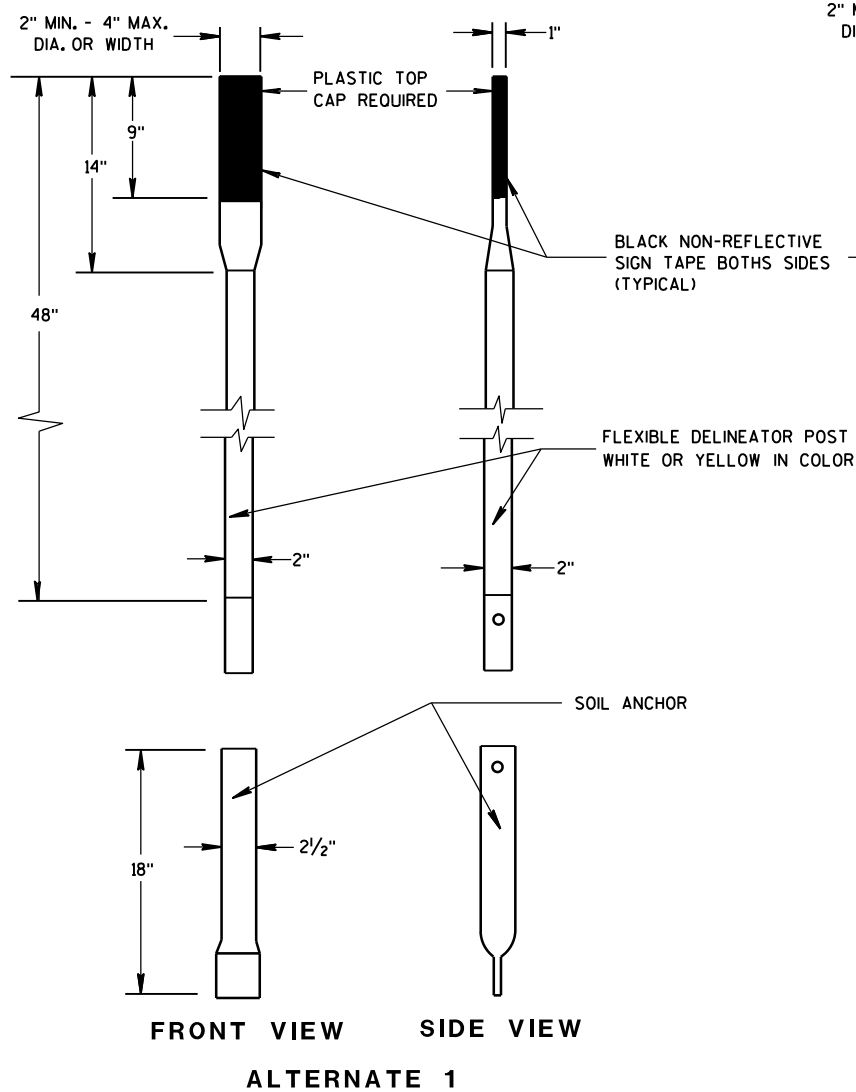
PLAN VIEW  
CONCRETE MASONRY ENDWALLS FOR  
CULVERT PIPE AND PIPE ARCH



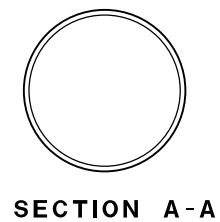
CROSS SECTION  
FLEXIBLE MARKER POST

FLEXIBLE MARKER POST  
FOR CULVERT END

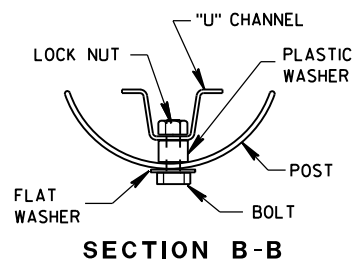
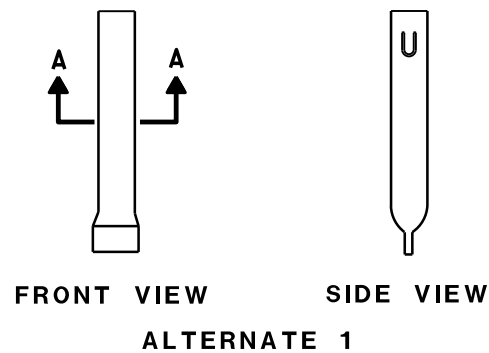
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



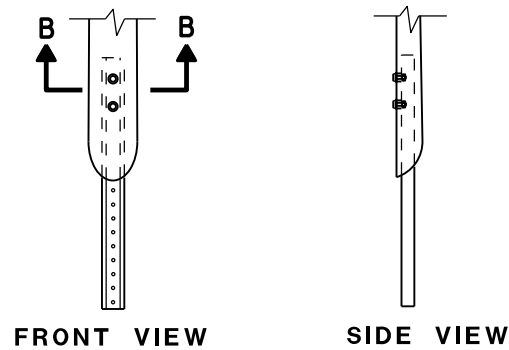
FLEXIBLE MARKER POSTS



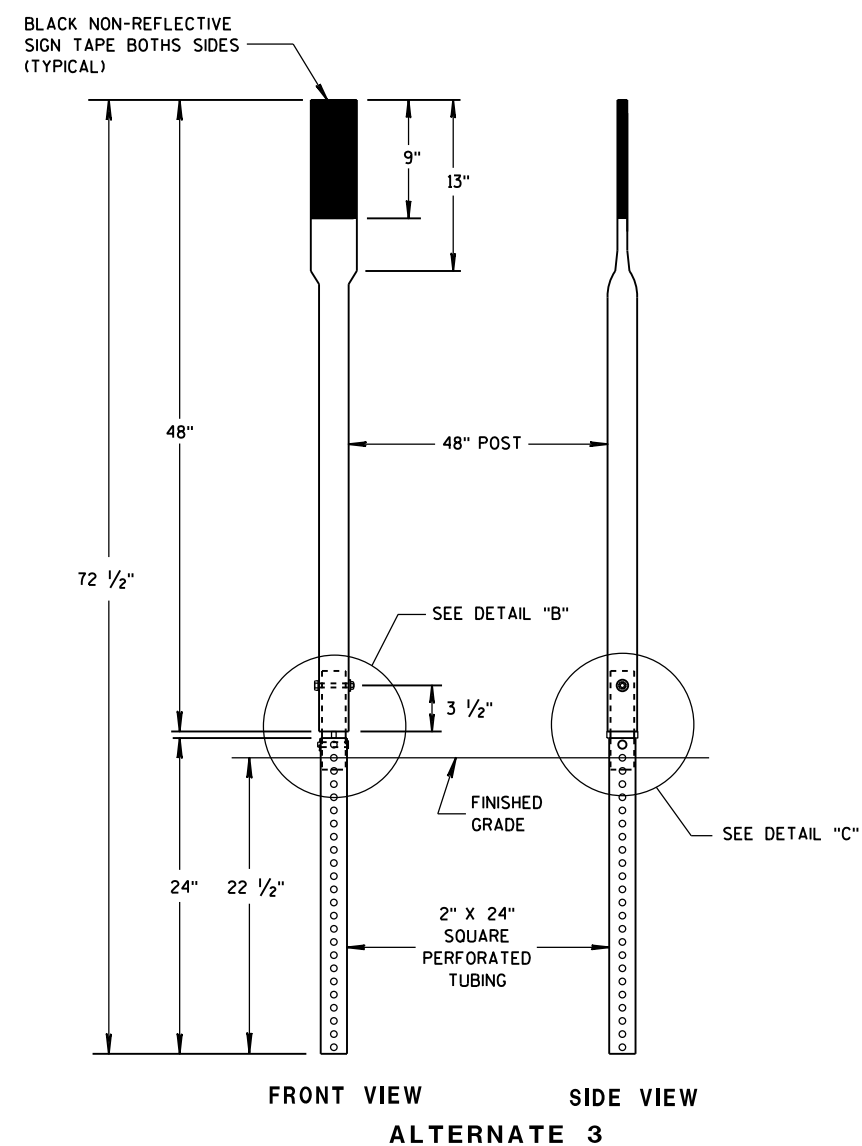
SECTION A-A



SECTION B-B

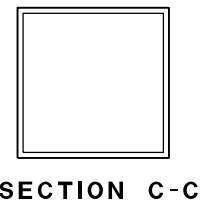


FLEXIBLE MARKER POST ANCHORS

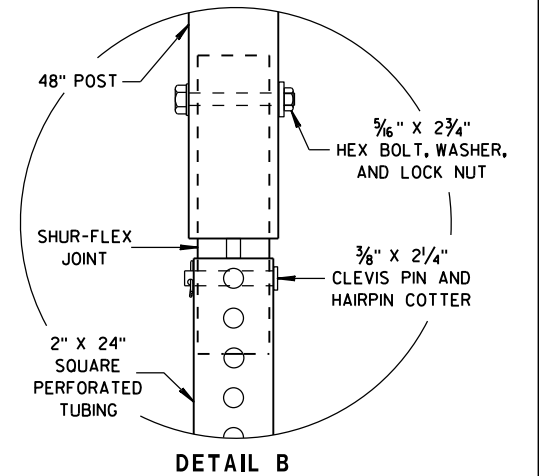
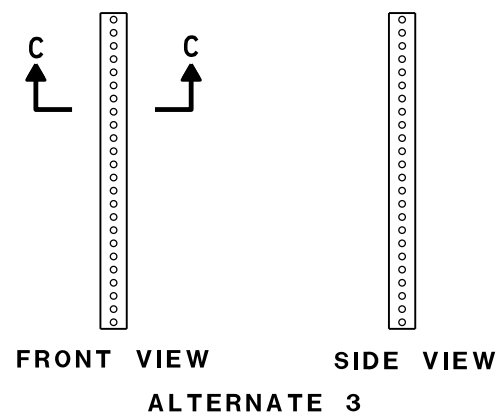


FRONT VIEW SIDE VIEW

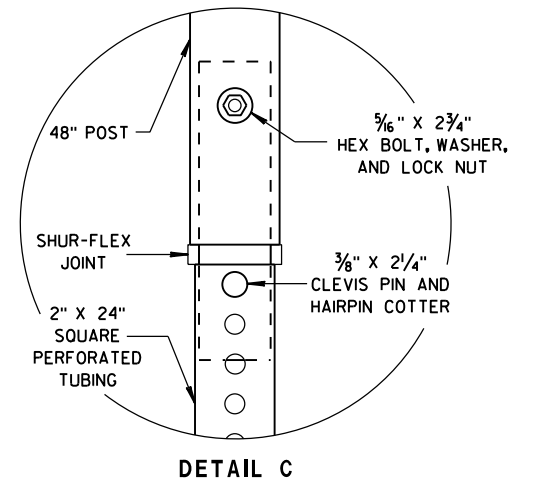
ALTERNATE 3



SECTION C-C



DETAIL B

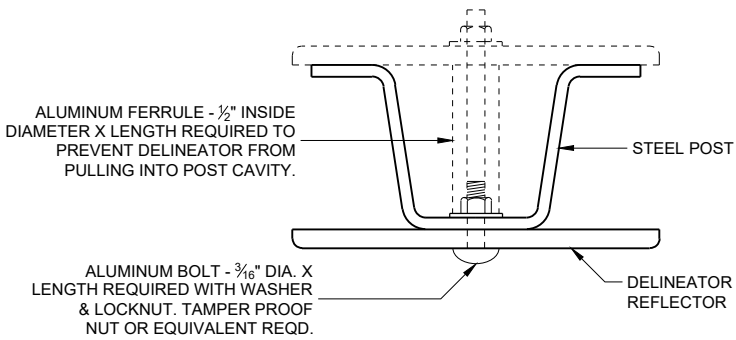


DETAIL C

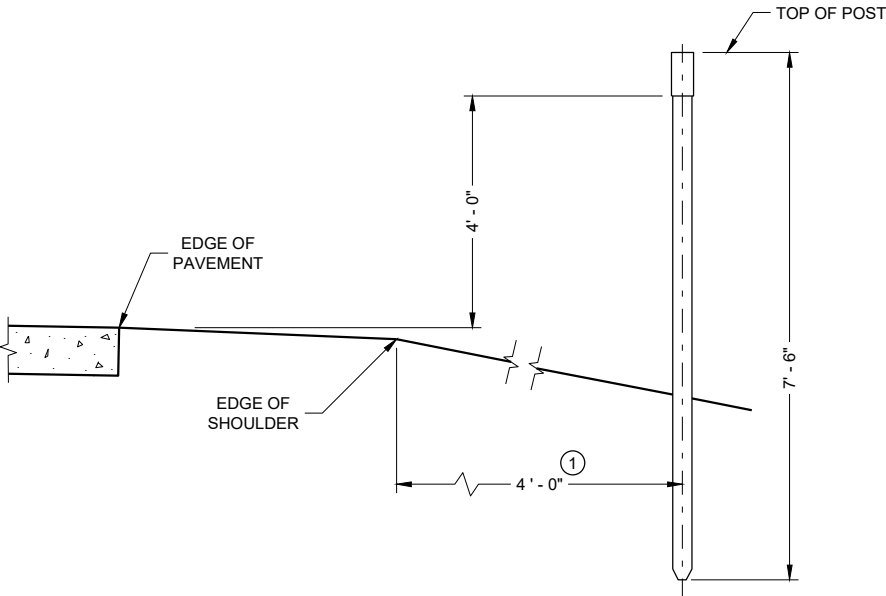
FLEXIBLE MARKER POST FOR CULVERT END

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

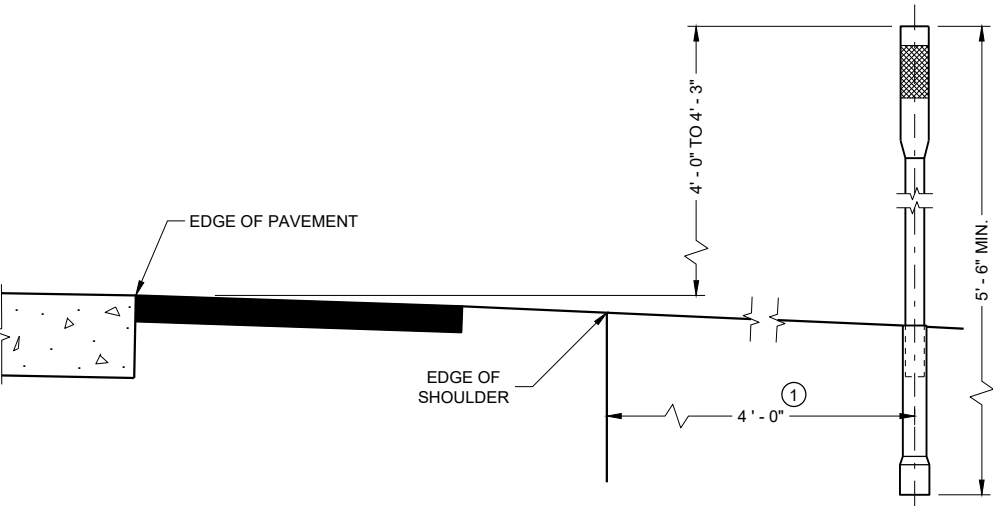
APPROVED  
10/1/2012 /S/ Travis Feltes  
DATE STATE TRAFFIC ENGINEER OF DESIGN  
FHWA



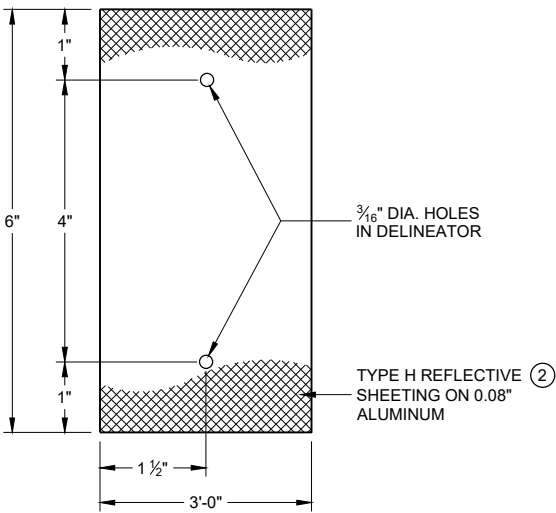
MOUNTING DETAIL FOR DELINEATOR REFLECTOR



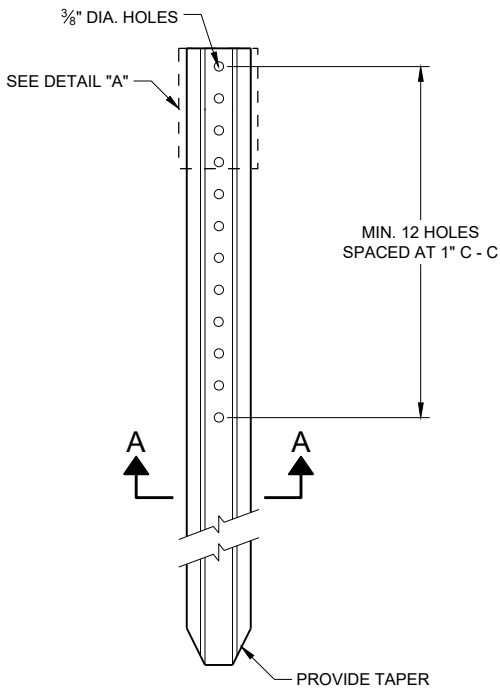
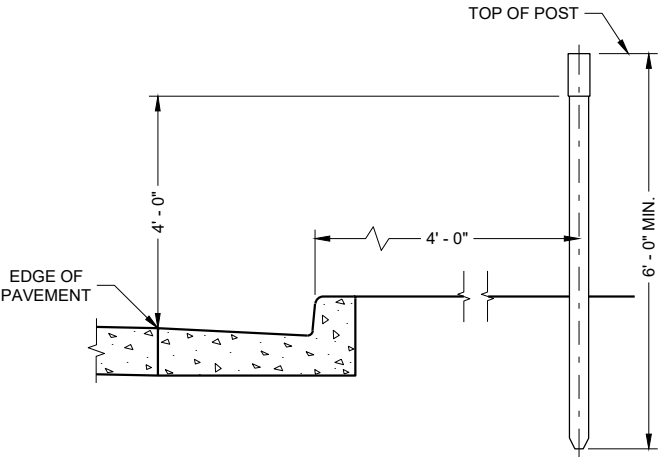
TYPICAL INSTALLATIONS OF DELINEATOR POSTS



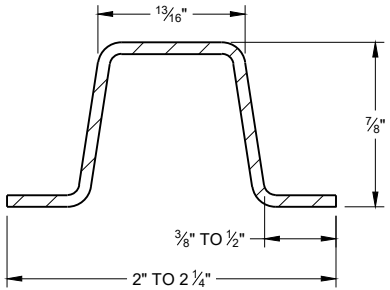
TYPICAL INSTALLATIONS OF FLEXIBLE DELINEATOR POSTS



DETAIL "A" 3" X 6" DELINEATOR REFLECTOR



DELINEATOR POST



SECTION A - A  
WEIGHT 1.12 LBS PER FT. \ 0.1 LB.

REFLECTOR SPACING TABLE

| REFLECTOR SPACING | LOCATION |
|-------------------|----------|
| * 100' C-C        | RAMPS    |
| 400' C-C          | MAINLINE |

\* START AT BEGINNING OF RAMP TAPER AND END AT END OF RAMP TAPER

GENERAL NOTES

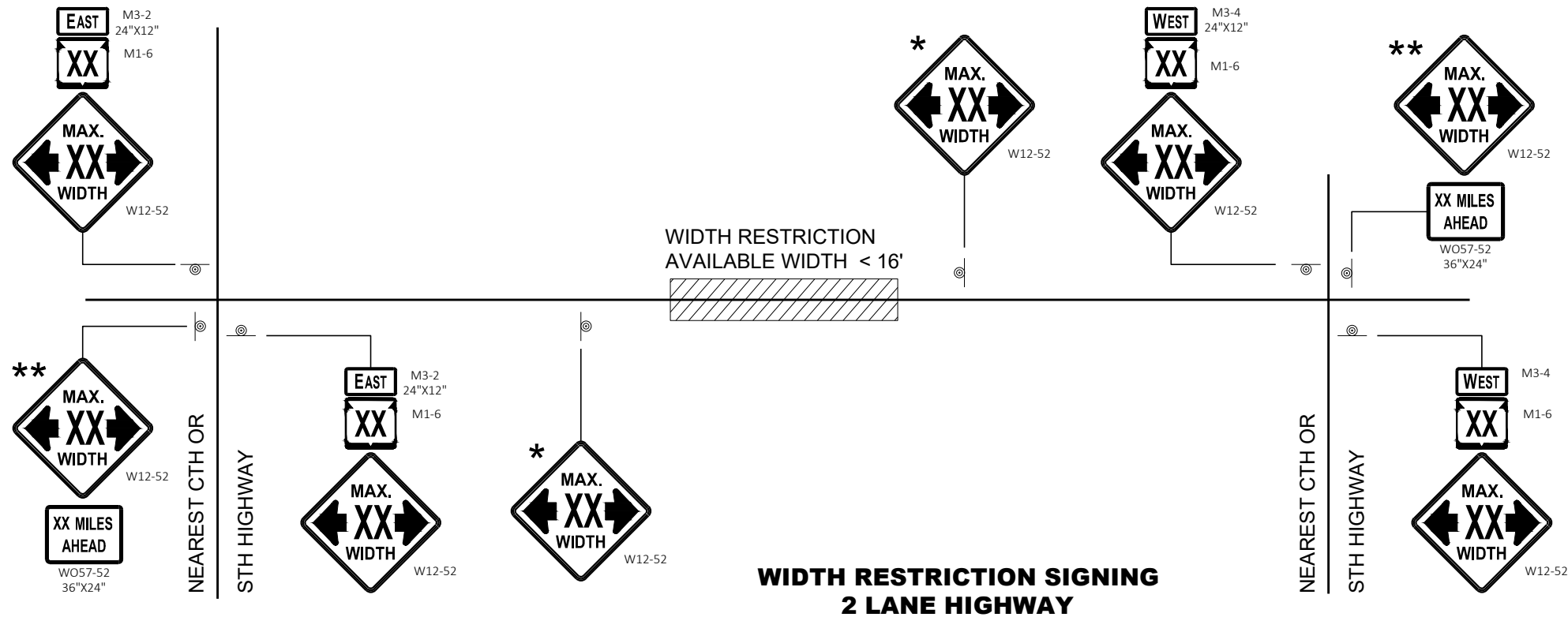
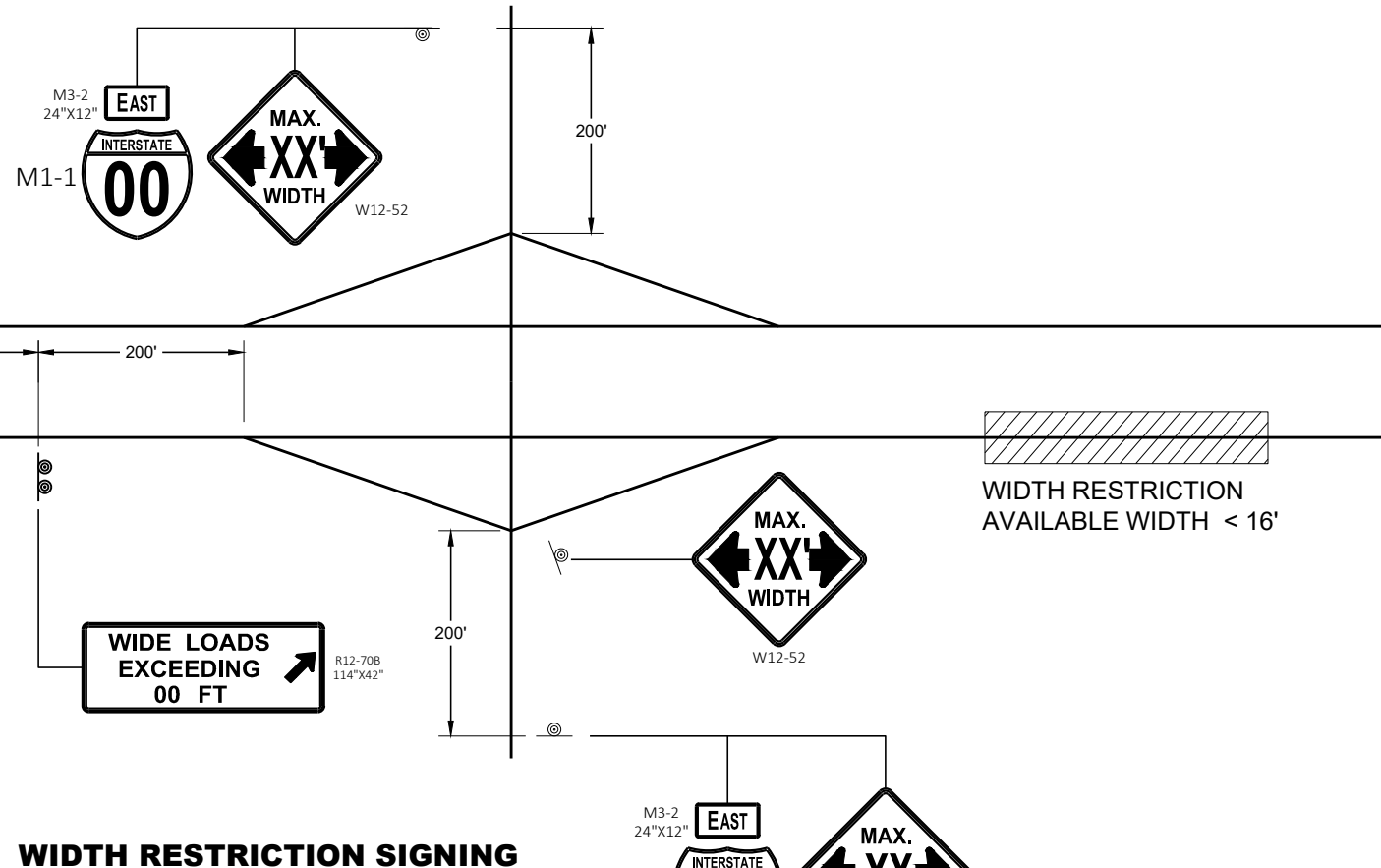
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF TEH STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- (1) DELINEATORS SHALL BE PLACED AT A CONSTANT DISTANCE FROM THE EDGE OF THE SHOULDER FOR THE LENGTH OF THE INSTALLATION.
- (2) FURNISH TYPE H SHEETING FROM THE APPROVED PRODUCTS LIST.

DELINEATOR POST  
WITH REFLECTIVE SHEETING

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
November 2021 /S/ Matthew Rauch  
DATE STATE SIGNING AND MARKING  
ENGINEER  
FHWA



## LEGEND

⊙ SIGN ON PERMANENT SUPPORT

## GENERAL NOTES

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

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

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

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

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

WIDTH ON SIGN TO BE APPROXIMATELY ONE FOOT LESS THAN AVAILABLE WIDTH.

\* PLACE 500 FEET AFTER THE W20 - 1A AND 500 FEET BEFORE ADDITIONAL SIGNS FOR ROADWAYS WITH A PRE - CONSTRUCTION SPEED LIMIT OF 45 MPH OR MORE. FOR 35-40 MPH, USE 350 FOOT TYPICAL SPACING. FOR 25-30 MPH, USE 200 FOOT TYPICAL SPACING.

\*\* SIGN SHALL BE VISIBLE FROM ROADWAY.

\*\*\* ADDITIONAL SIGNS NEEDED IF THERE IS AN ON RAMP BETWEEN SIGNS.



WIDTH ON SIGN TO BE APPROX. 1 - FOOT LESS THAN AVAILABLE WIDTH

## ADVANCED WIDTH RESTRICTION SIGNING

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2023  
DATE  
/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.

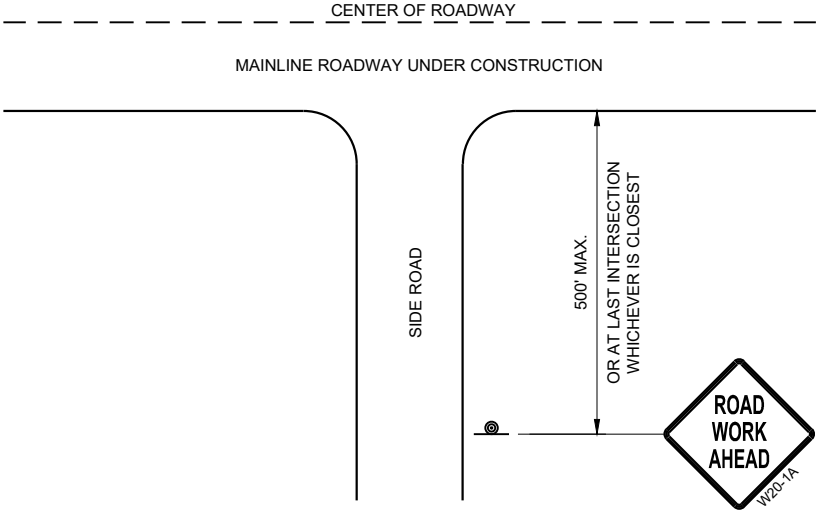
SIGNS THAT WILL BE IN PLACE LESS THAN SEVEN CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

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.

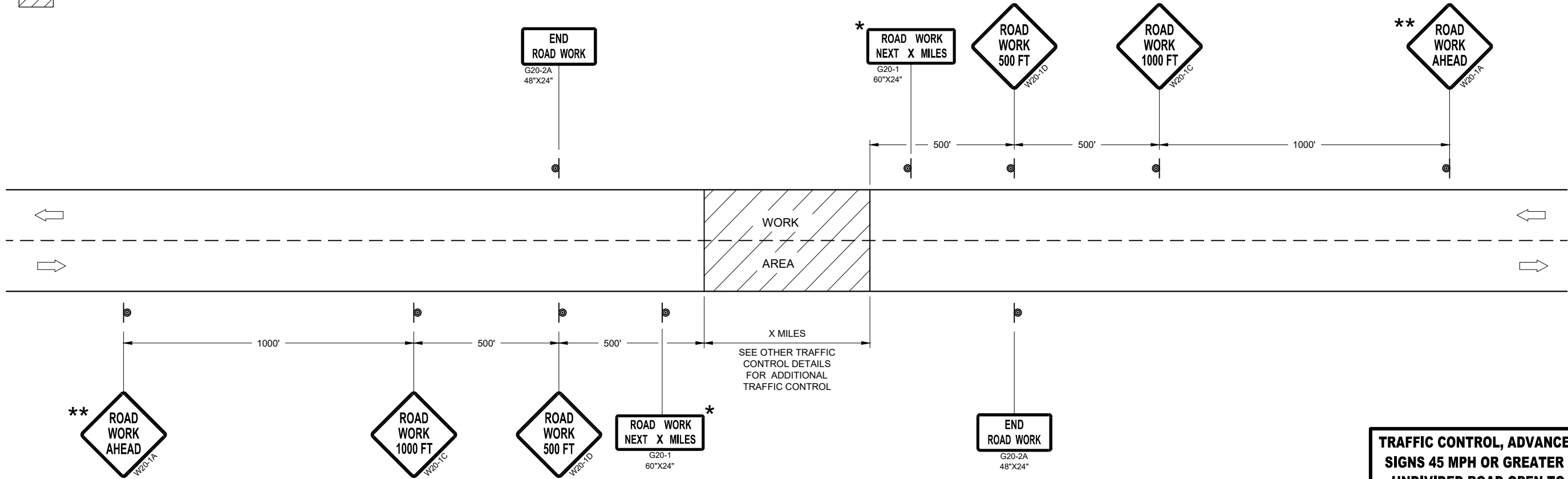
- \* OMIT G20-1 SIGNS IF LENGTH OF WORK AREA IS 2 MILES OR LESS
- \*\* PLACE AN ADDITIONAL W20-1A "ROAD WORK AHEAD" SIGN IF WORK AREA WITHIN THE PROJECT IS SEPARATED BY MORE THAN 2 MILES FROM PREVIOUS WORK AREA.

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  
July 2018 /S/ Andrew Heidtke  
DATE 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.

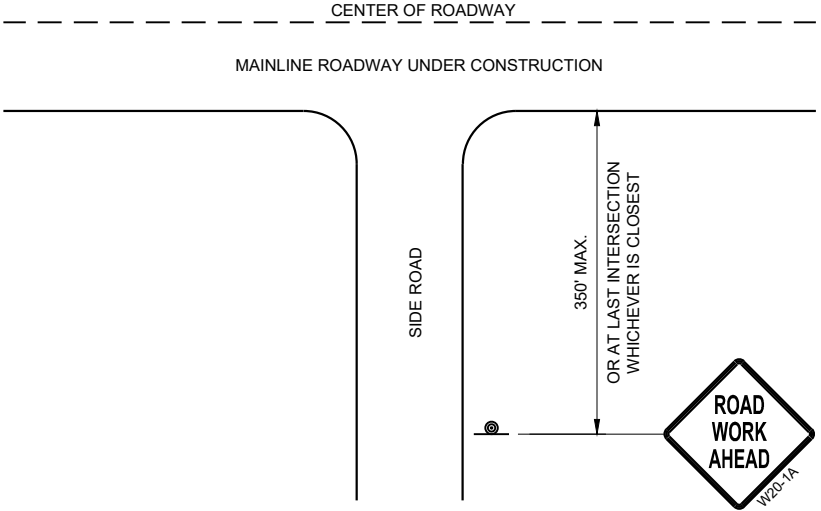
SIGNS THAT WILL BE IN PLACE LESS THAN SEVEN CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

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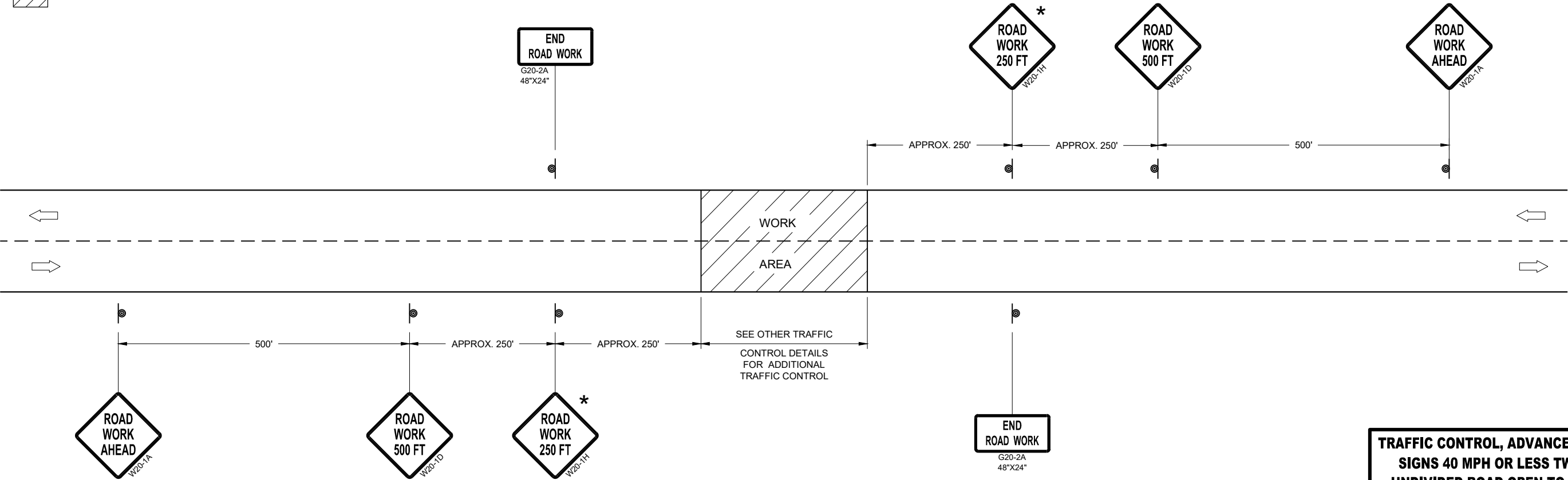
\* THE THIRD W20-1 SIGN IS REQUIRED ONLY IF THERE IS AN INTERSECTION BETWEEN THE "ROAD WORK 500 FEET" SIGN AND THE WORK ZONE. ADJUST THE PLACEMENT OF THIS SIGN BASED ON INTERSECTION LOCATION AND OTHER FIELD CONDITIONS.

LEGEND

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



TYPICAL SIDE ROAD APPROACH  
WARNING SIGN DETAIL

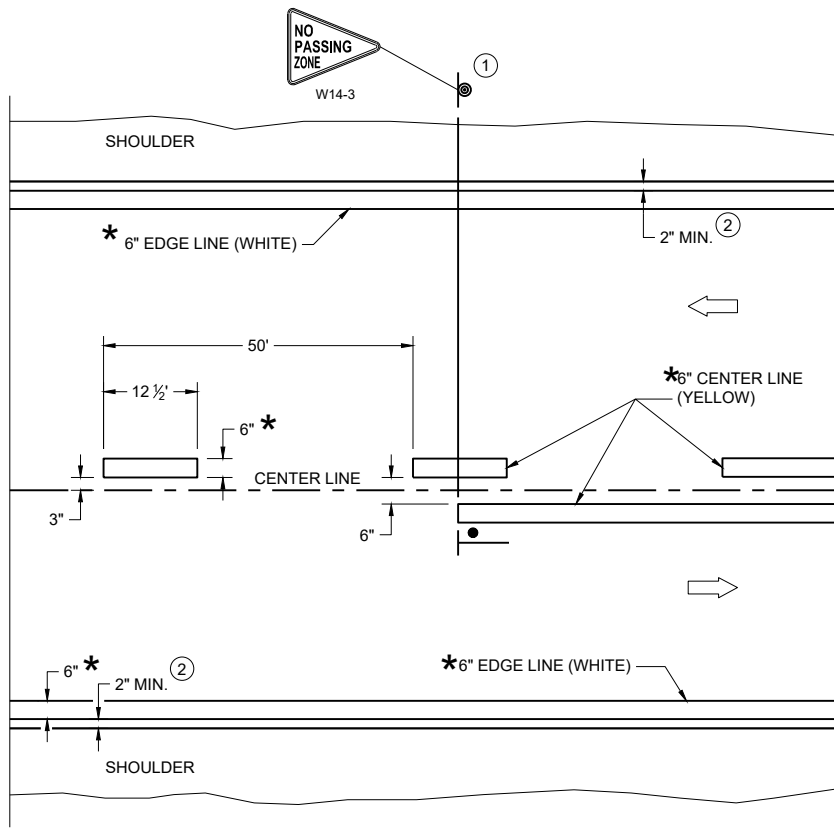


TRAFFIC CONTROL, ADVANCE WARNING SIGNS 40MPH OR LESS

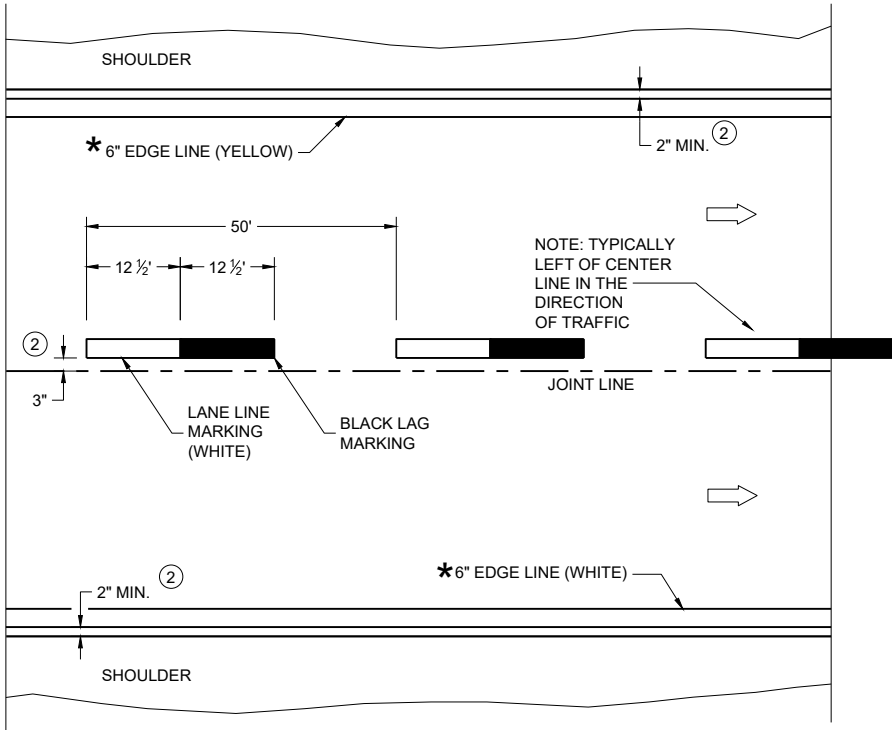
TRAFFIC CONTROL, ADVANCE WARNING  
SIGNS 40 MPH OR LESS TWO-WAY  
UNDIVIDED ROAD OPEN TO TRAFFIC

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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



TWO WAY TRAFFIC



ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING

\* CONFIRM MARKING LINE WIDTH WITH THE MISCELLANEOUS QUANTITIES

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

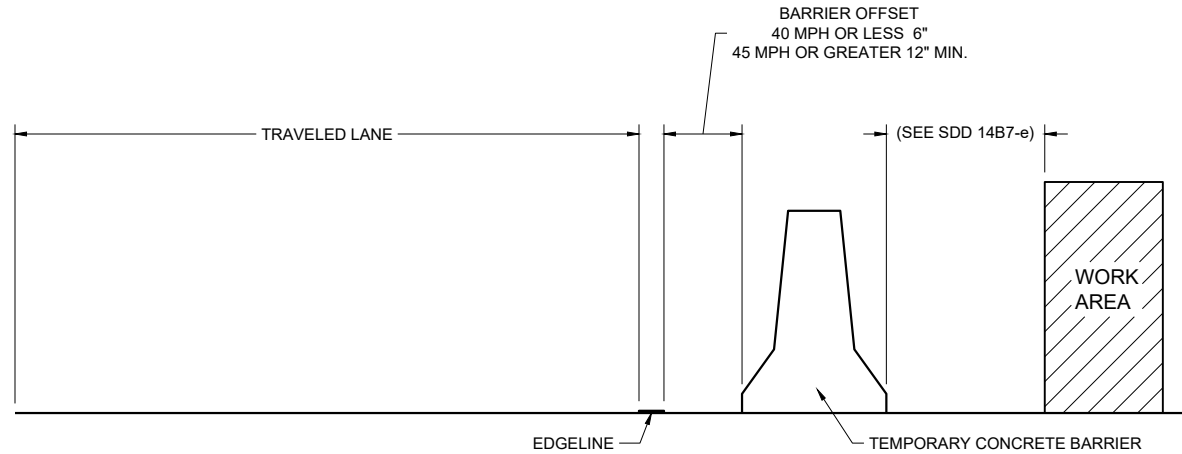
- "T" MARKING
- SIGN ON PERMANENT SUPPORT
- DIRECTION OF TRAFFIC

PERMANENT LONGITUDINAL PAVEMENT MARKINGS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2023 /S/ Jeannie Silver  
DATE Statewide Pavement Marking Engineer

FHWA



TEMPORARY BARRIER OFFSET FROM EDGE LINE

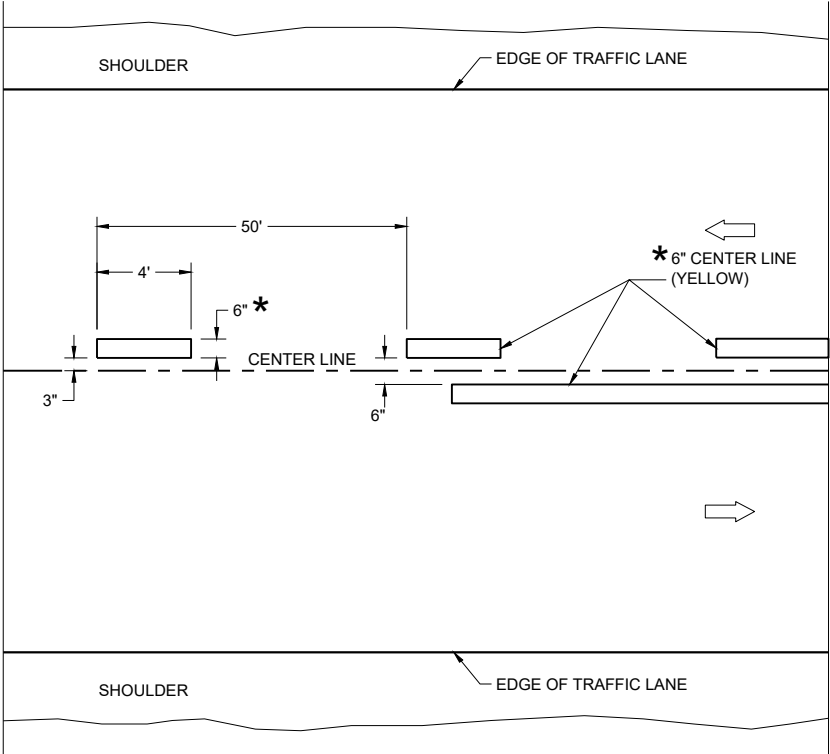
GENERAL NOTES

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

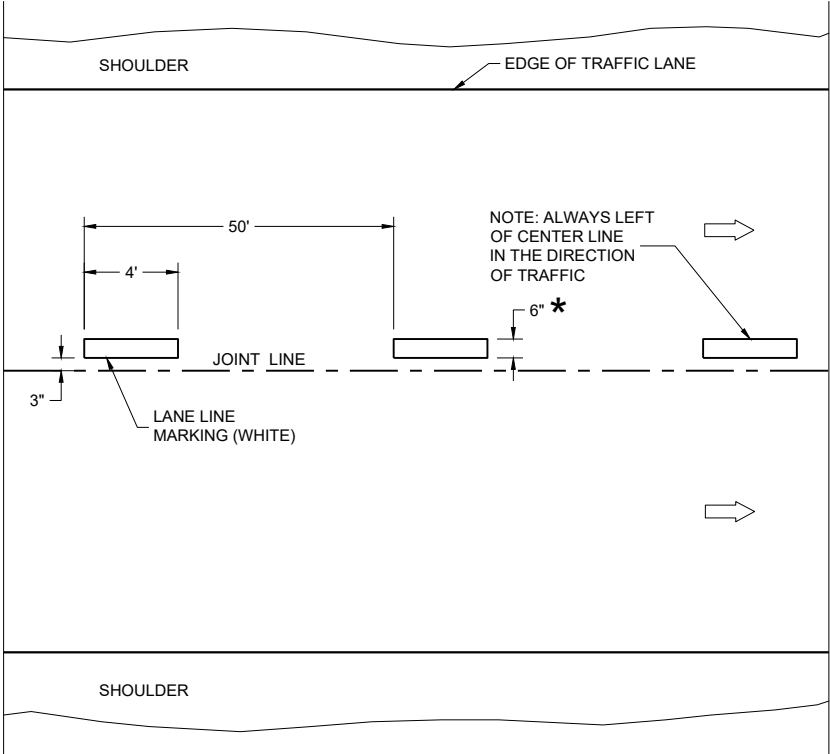
LEGEND

DIRECTION OF TRAFFIC

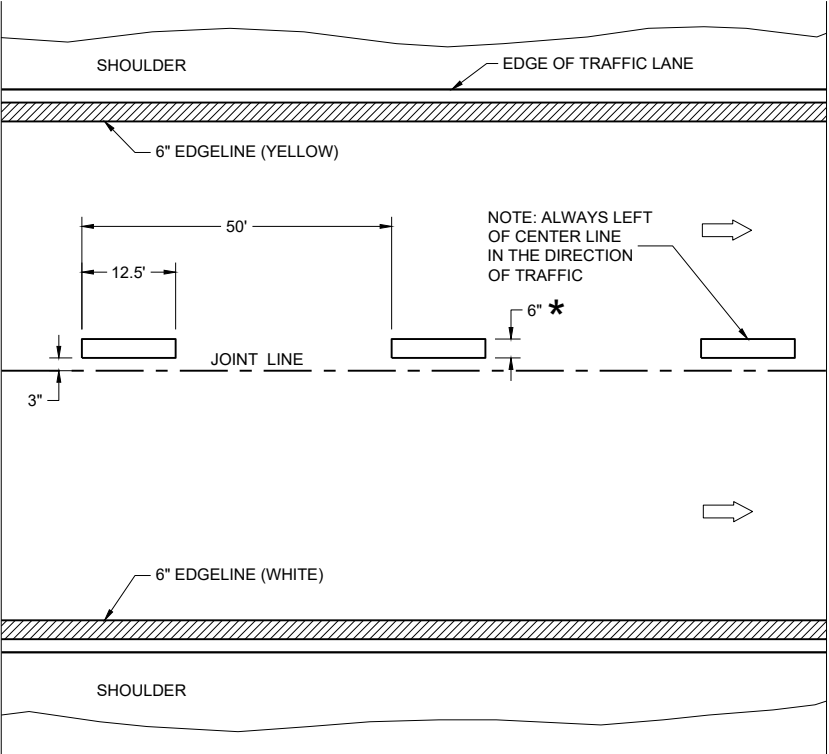
\* CONFIRM MARKING LINE WIDTH WITH THE MISCELLANEOUS QUANTITIES



TWO WAY TRAFFIC



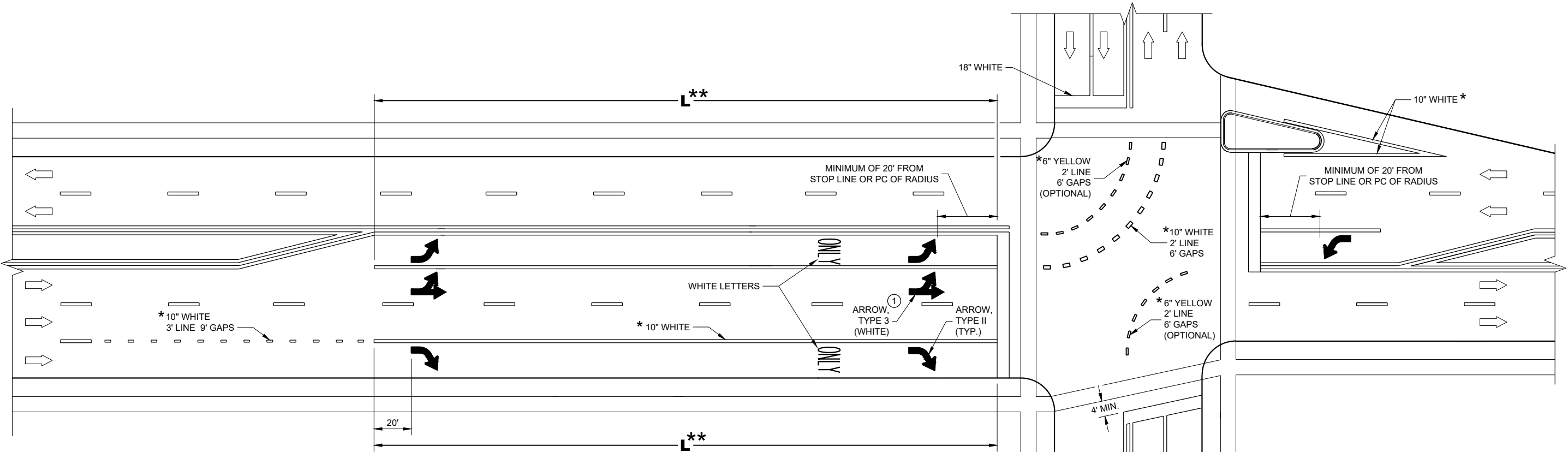
ONE WAY TRAFFIC



FREEWAYS AND EXPRESSWAYS

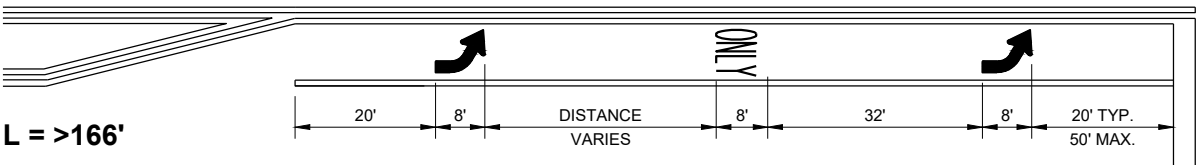
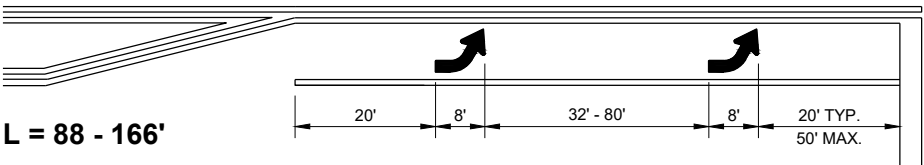
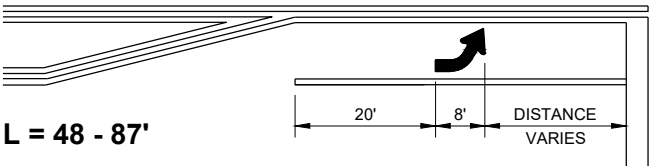
TEMPORARY PAVEMENT MARKING

| TEMPORARY LONGITUDINAL PAVEMENT MARKING            |                                                           |
|----------------------------------------------------|-----------------------------------------------------------|
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |                                                           |
| APPROVED<br>May 2023<br>DATE                       | /S/ Jeannie Silver<br>Statewide Pavement Marking Engineer |
| FHWA                                               |                                                           |



TURN LANE OPTIONS

LENGTH OF TURN BAY ( **L** ) OF 0 - 47' DOES NOT REQUIRE PAVEMENT MARKING ARROWS OR WORDS



\*\* (SEE TURN LANE OPTIONS FOR PLACEMENT OF PAVEMENT MARKING ARROWS AND WORDS)

GENERAL NOTES

① QUANTITY AND LOCATION OF TYPE 3 ARROWS ARE THE SAME AS THE TYPE II ARROWS IN THE ADJACENT TURN LANE. FOR TURN LANES WITH A PHYSICAL SEPARATION IN THE SAME DIRECTION OF TRAVEL, THE ARROWS AND "ONLY" MARKING MAY BE ELIMINATED.

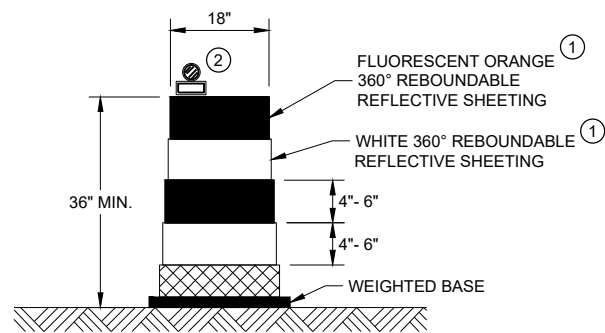
→ DIRECTION OF TRAFFIC

**L** = LENGTH OF TURN BAY

\* CONFIRM MARKING LINE WIDTH WITH THE MISCELLANEOUS QUANTITIES

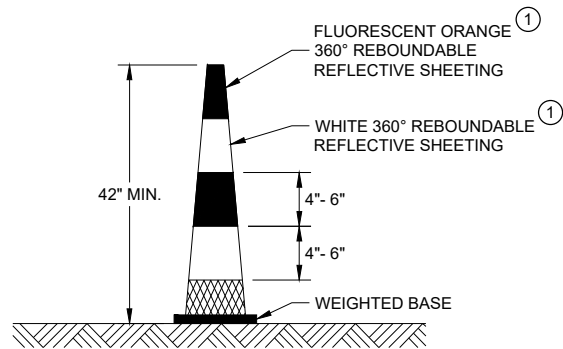
PAVEMENT MARKING  
(TURN LANES)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



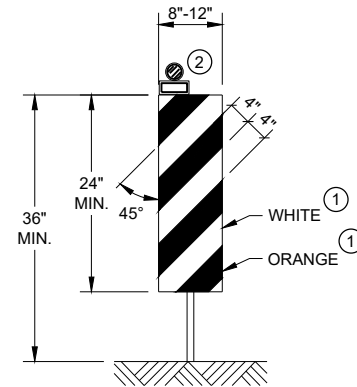
**DRUM**

BALLAST WIDTHS  
RANGE FROM 24"-36"



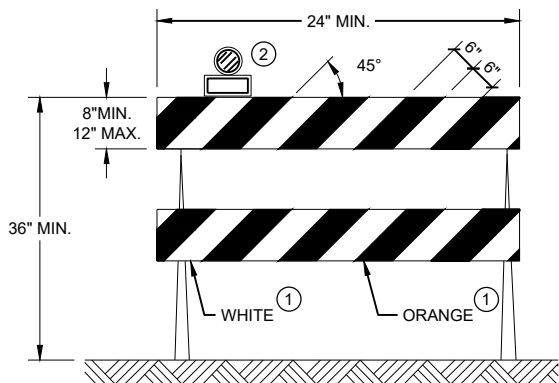
**42" CONE**

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



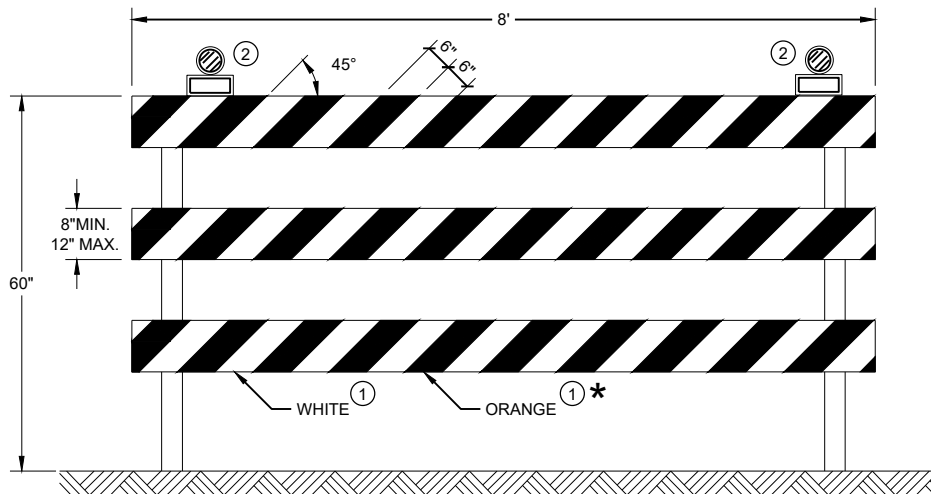
**VERTICAL PANEL**

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



**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.

**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.

**CHANNELIZING DEVICES  
DRUMS, CONES, BARRICADES  
AND VERTICAL PANELS**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
November 2022 /S/ Andrew Heidtke  
DATE 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

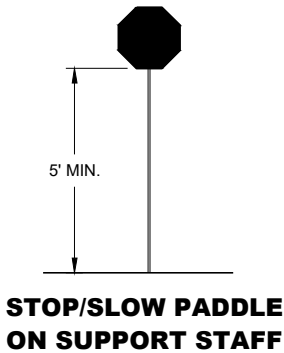
FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT REMOVE TEMPORARY PORTABLE RUMBLE STRIPS PRIOR TO COVERING OR REMOVING ALL ADVANCE SIGNING.

- 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.

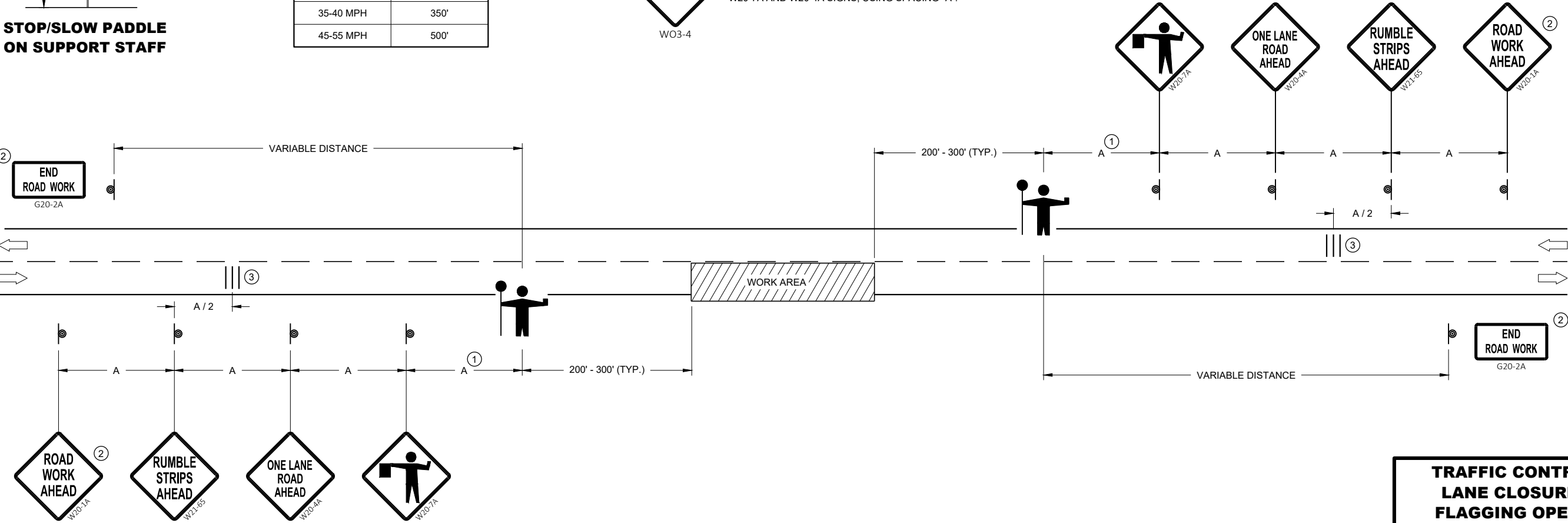


SIGN AND TEMPORARY RUMBLE STRIP ARRAY SPACING TABLE

| 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".



|                                                                         |                                          |
|-------------------------------------------------------------------------|------------------------------------------|
| <b>TRAFFIC CONTROL FOR<br/>LANE CLOSURE WITH<br/>FLAGGING OPERATION</b> |                                          |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION                      |                                          |
| APPROVED<br>May 2022<br>DATE                                            | /S/ Andrew Heidtke<br>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

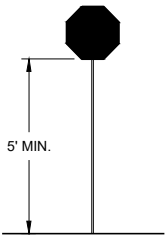
UTILIZE TEMPORARY PORTABLE RUMBLE STRIPS ON ALL FLAGGING OPERATIONS.

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.

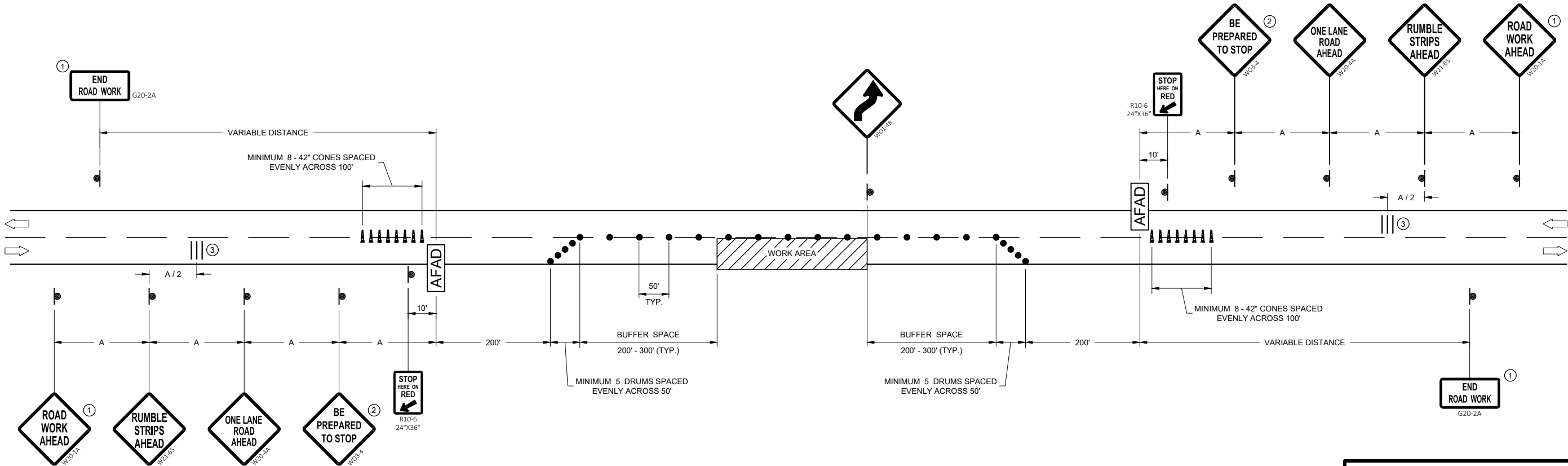
③ EACH TEMPORARY PORTABLE RUMBLE STRIP ARRAY CONSISTS OF THREE RUMBLE STRIPS PLACED TRANSVERSELY AT THE LOCATIONS SHOWN. WITHIN EACH ARRAY, SPACING BETWEEN RUMBLE STRIPS SHALL BE 15 FEET ON CENTER.



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'        |



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

LEGEND

- V1

LEAD VEHICLE
- V2

MARKING VEHICLE
- V3

SHADOW VEHICLE
- TRUCK MOUNTED ATTENUATOR (TMA)
- SIGN ON TEMPORARY SUPPORT
- DIRECTION OF TRAFFIC

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.

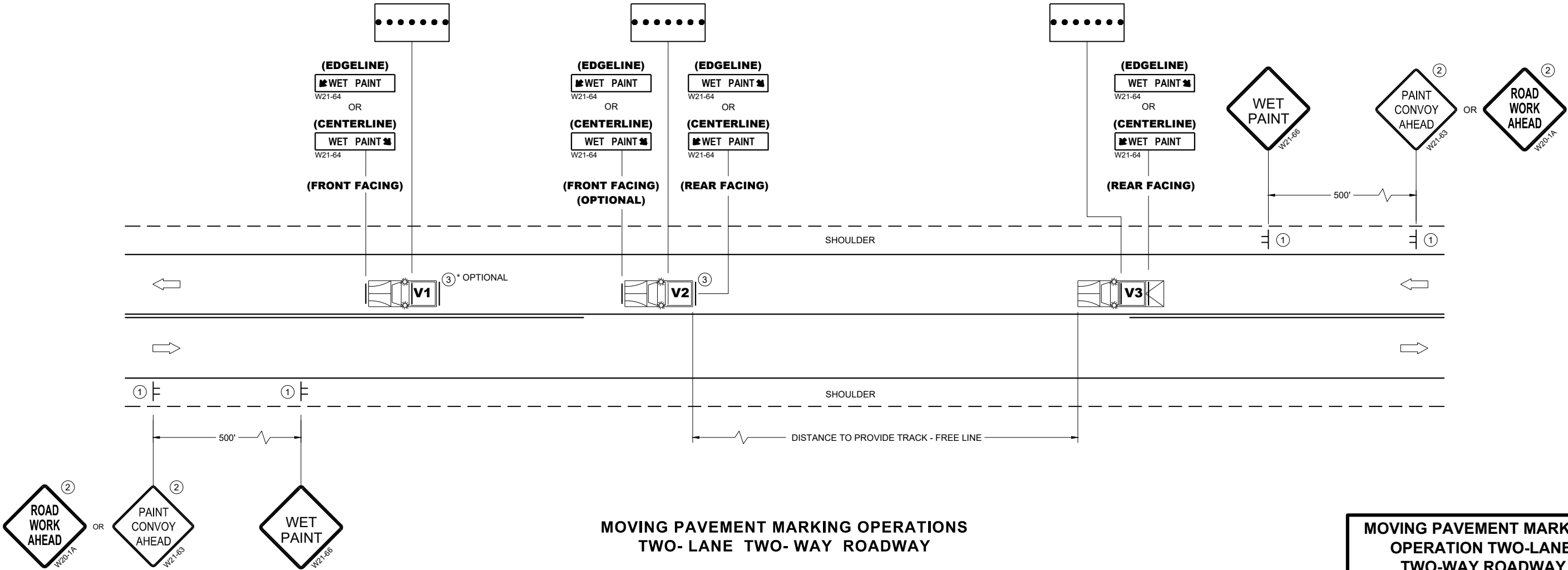
WHEN NO WORK ACTIVITY IS TAKING PLACE, REMOVE OR LAY STATIONARY SIGNS AND SUPPORTS FLAT ON THE GRADE WITH

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 AND AFTER EVERY MAJOR INTERSECTION.
- 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.



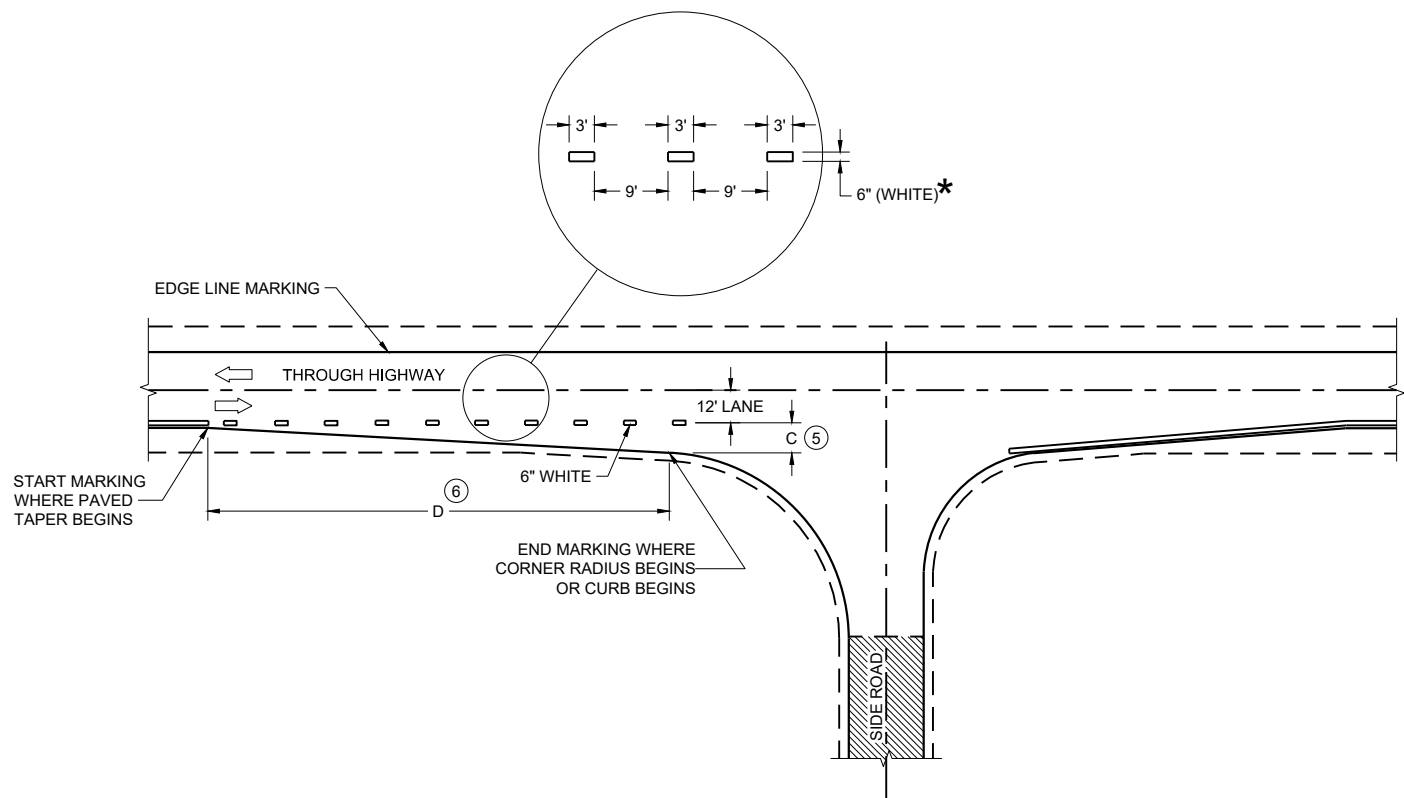
MOVING PAVEMENT MARKING OPERATIONS  
TWO- LANE TWO- WAY ROADWAY

MOVING PAVEMENT MARKING  
OPERATION TWO-LANE  
TWO-WAY ROADWAY

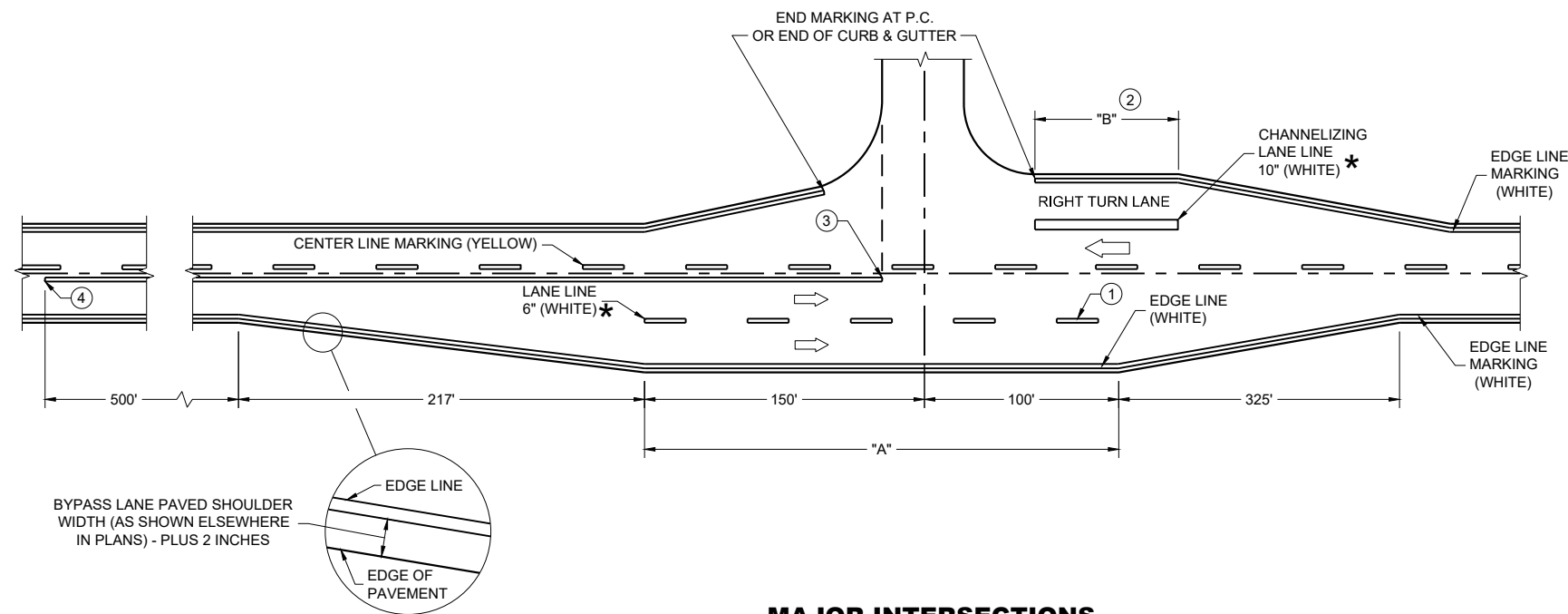
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
March 2024 /S/ Andrew Heidtke  
DATE WORK ZONE ENGINEER

FHWA



MINOR INTERSECTION



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

\*CONFIRM MARKING LINE WIDTH WITH THE MISCELLANEOUS QUANTITIES

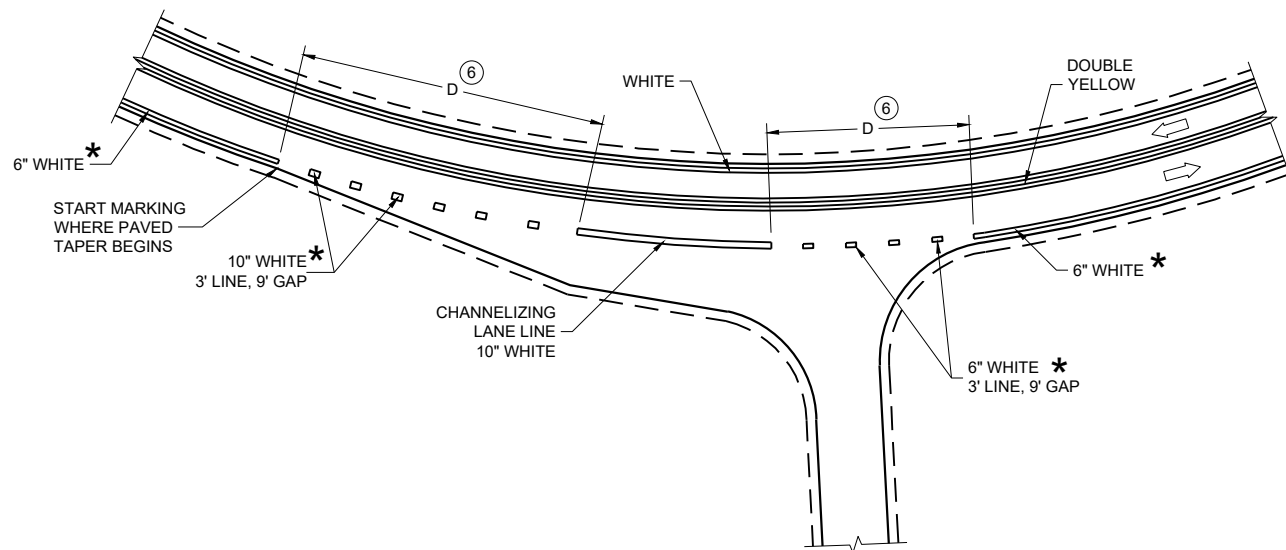
GENERAL NOTES

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



INTERSECTION ON OUTSIDE OF CURVE

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.

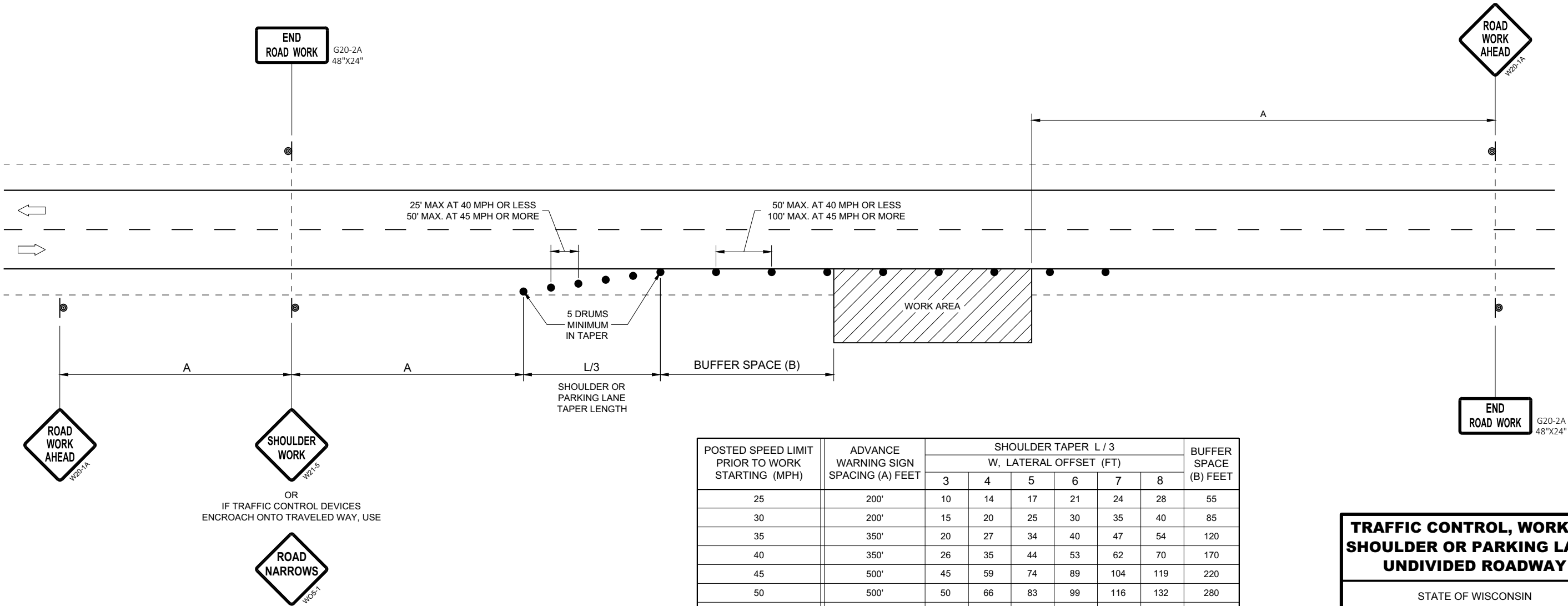
ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH THE TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

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.



| POSTED SPEED LIMIT<br>PRIOR TO WORK<br>STARTING (MPH) | ADVANCE<br>WARNING SIGN<br>SPACING (A) FEET | SHOULDER TAPER L / 3<br>W, LATERAL OFFSET (FT) |    |    |     |     |     | BUFFER<br>SPACE<br>(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'                        |

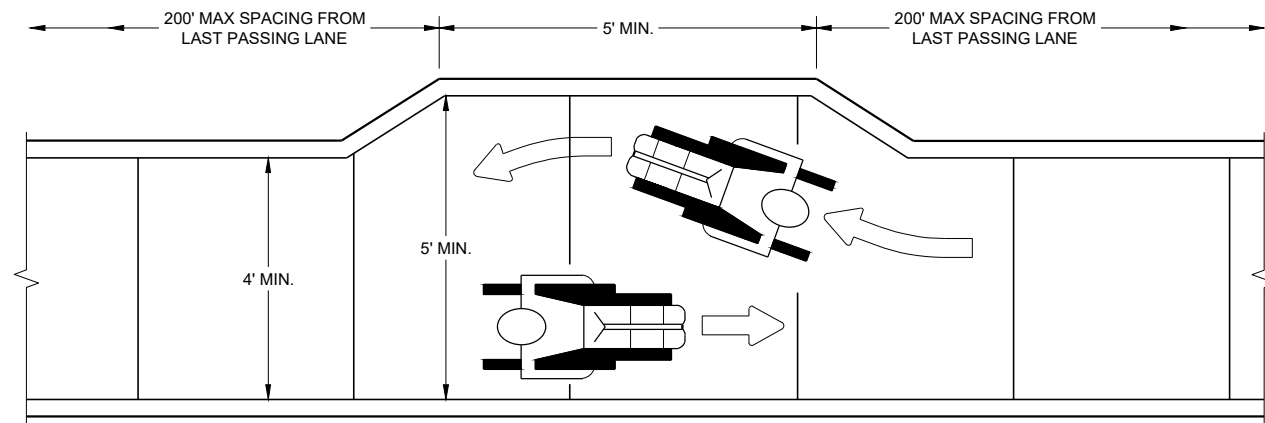
TRAFFIC CONTROL, WORK ON  
SHOULDER OR PARKING LANE,  
UNDIVIDED ROADWAY

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

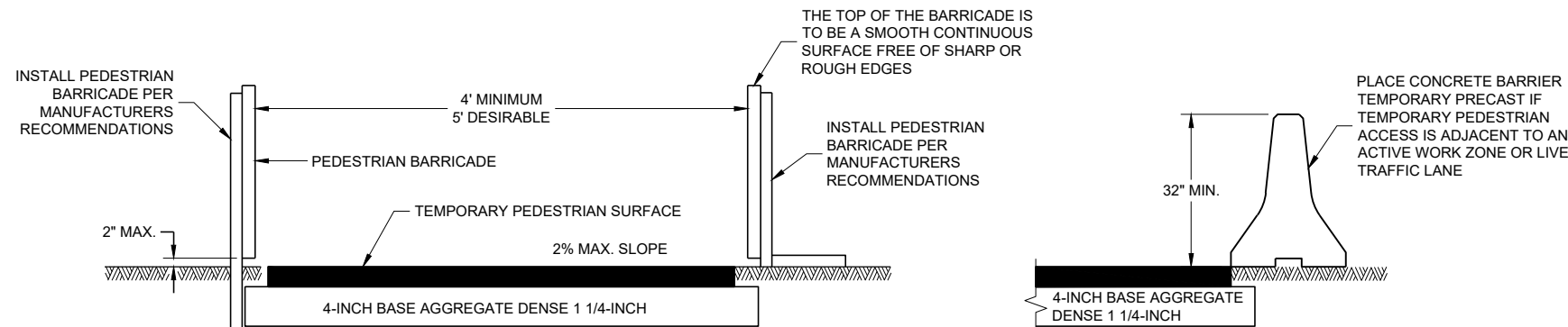
APPROVED  
May 2020  
DATE

/S/ Andrew Heidtke  
STATEWIDE WORK ZONE TRAFFIC  
SAFETY ENGINEER

FHWA



NARROW SIDEWALK PASSING DETAIL



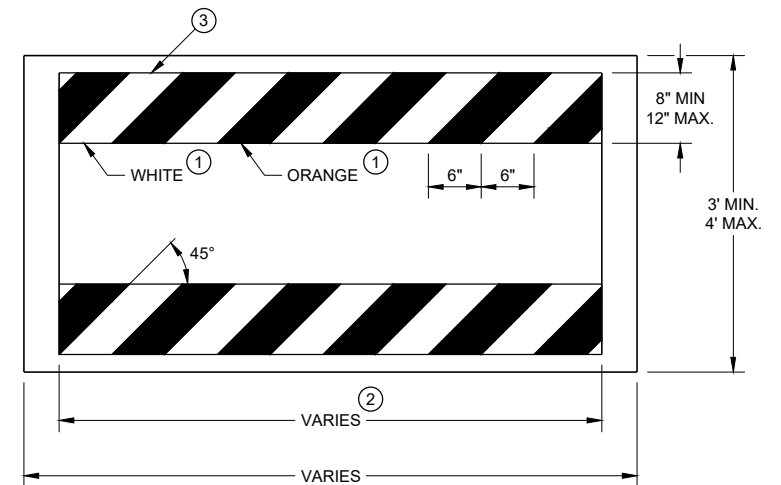
TEMPORARY PEDESTRIAN ACCESS

GENERAL NOTES

BARRICADE DEVICE SELECTED FROM APPROVED PRODUCT LIST

- ① REFLECTIVE SHEETING SHALL FOLLOW THE REQUIREMENTS IN THE APPROVED PRODUCTS LISTING FOR SIGN SHEETING.
- ② SHEETING REQUIRED ON MORE THAN 50% OF BARRICADE WIDTH.
- ③ PLACE SHEETING ON BOTH SIDES OF THE BARRICADE.

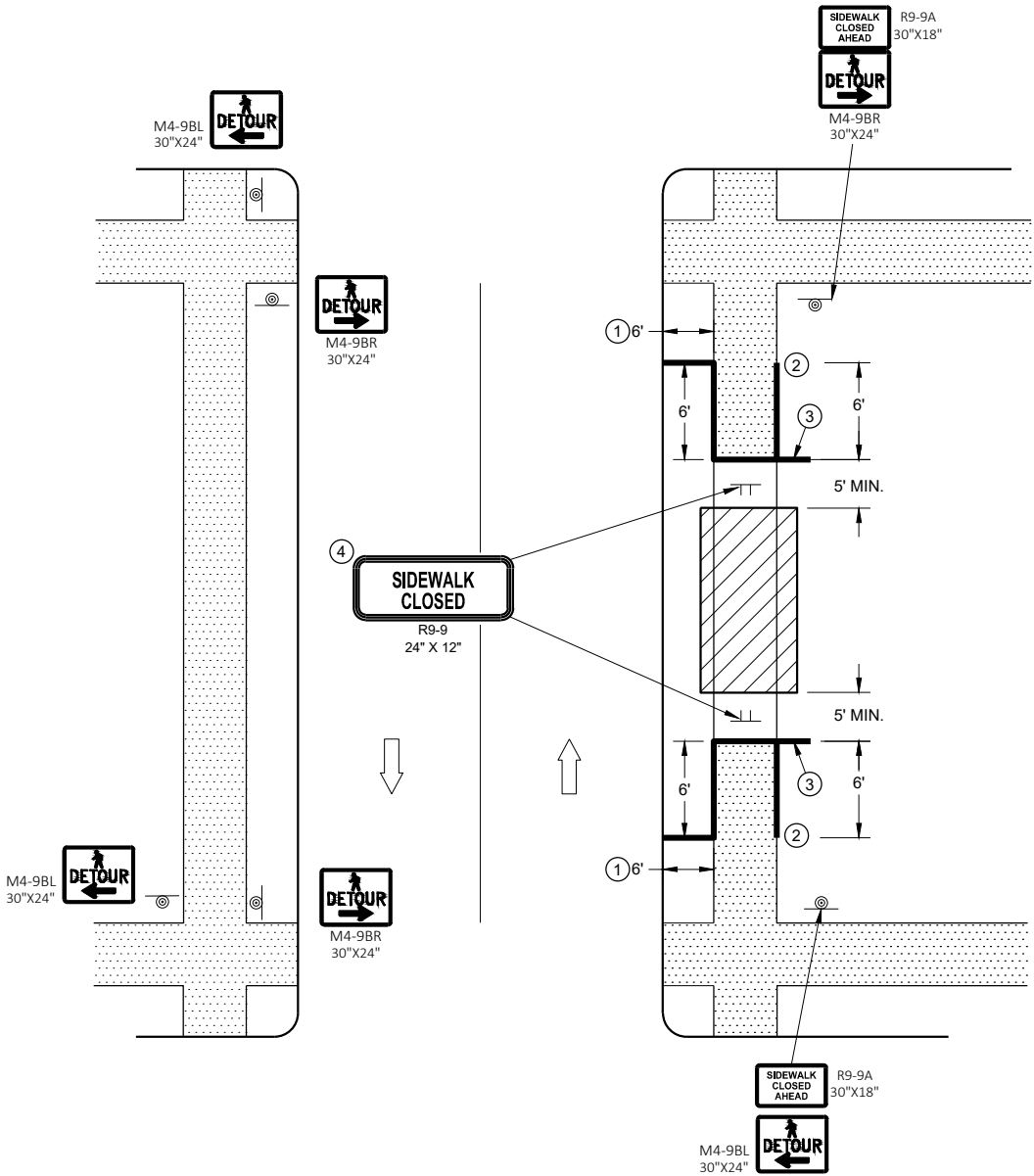
★ USE THIS DETAIL FOR SHEETING PLACEMENT REFERENCE.



TEMPORARY PEDESTRIAN BARRICADE\*

LEGEND

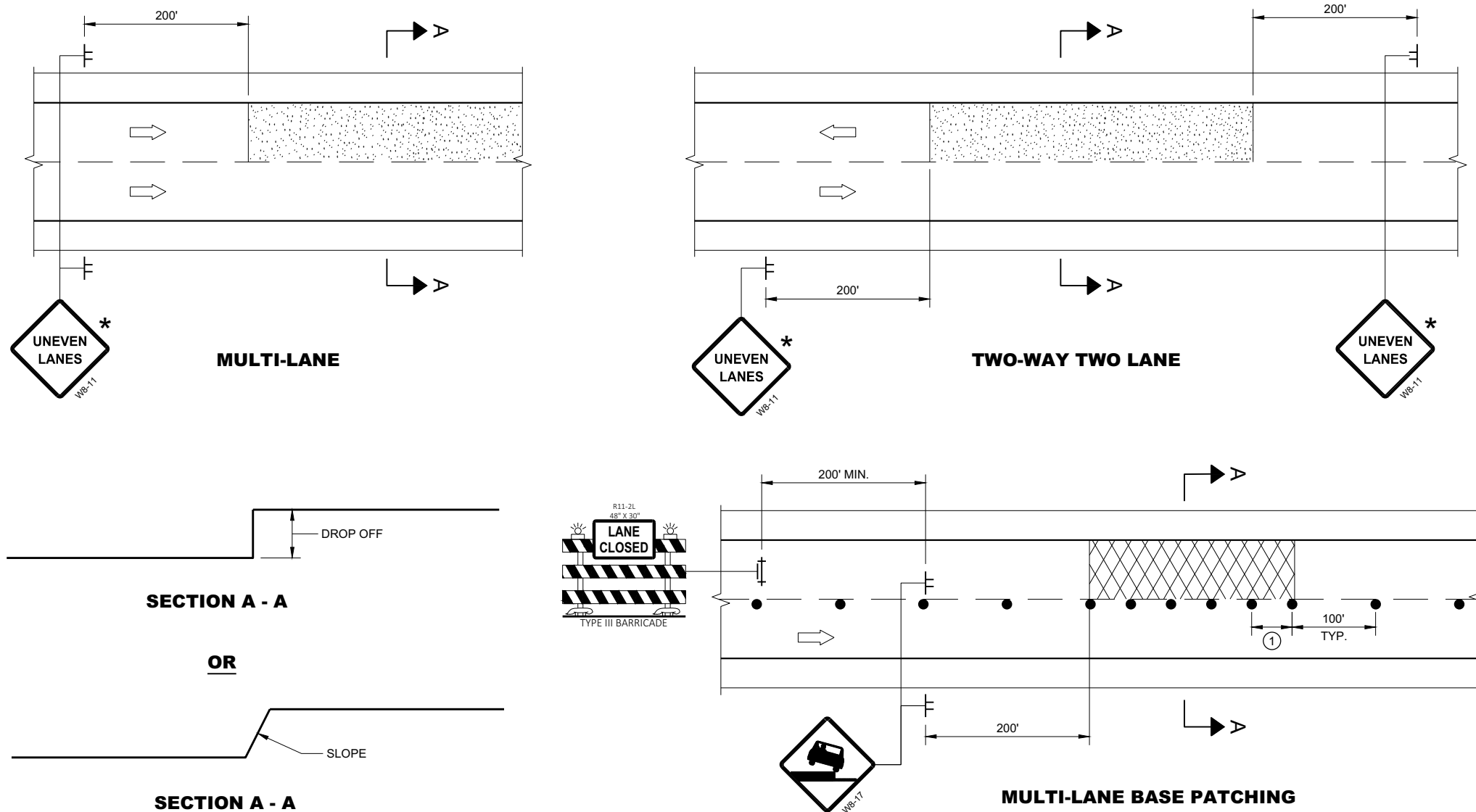
- SIGN ON PERMANENT SUPPORT
- SIGN ON TEMPORARY SUPPORT
- UNDER PEDESTRIAN TRAFFIC
- WORK AREA
- TEMPORARY PEDESTRIAN BARRICADE
- DIRECTION OF TRAFFIC



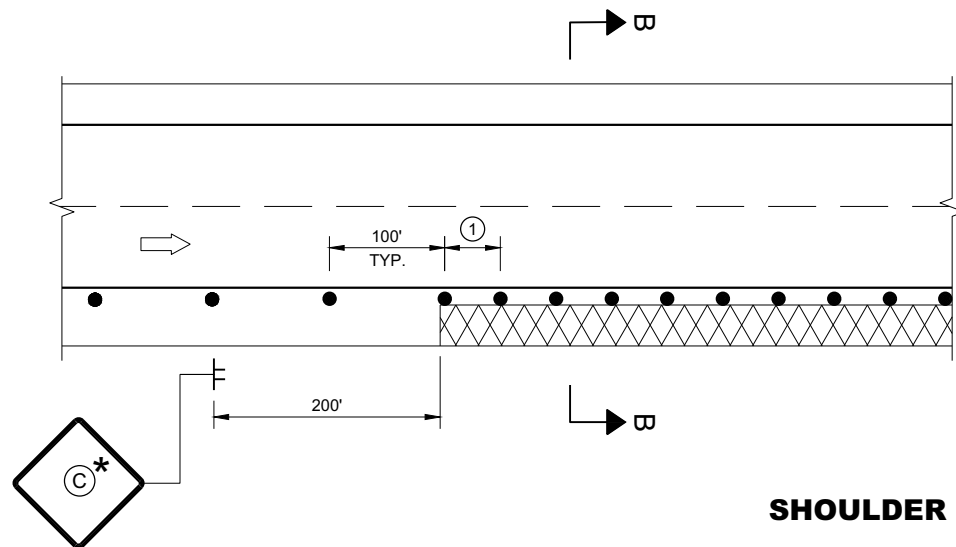
SIDEWALK DETOUR, SIDEWALK ON BOTH SIDES

GENERAL NOTES

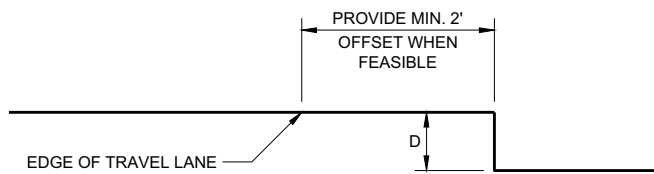
- SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE WISCONSIN STANDARD SIGN PLATES.
- WHERE TEMPORARY BARRICADE RUNS PARALLEL ALONG SIDEWALK, PLACE THE FACE OF THE BARRICADE AT THE EDGE OF THE SIDEWALK.
- SIGNS THAT REMAIN IN PLACE LESS THAN SEVEN CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.
- PLACE TEMPORARY PEDESTRIAN BARRICADE TO FIT FIELD CONDITIONS, AVOIDING CONFLICT WITH DRIVEWAYS AND OTHER EXISTING FEATURES.
- IF TERRACE IS LESS THAN 6 FEET WIDE, OMIT TEMPORARY PEDESTRIAN BARRICADE FROM THE SIDEWALK TO THE CURB.
  - PLACE BARRICADE CLOSURE SO THAT THE TEMPORARY PEDESTRIAN BARRICADE END IS AT THE LAST OPEN SIDEWALK ACCESS TO RESIDENCES OR BUSINESSES BEFORE THE SIDEWALK CLOSURE.
  - IF TEMPORARY PEDESTRIAN BARRICADE PANEL IS WIDER THAN THE SIDEWALK WIDTH, THE PORTION OF EXCESS PANEL SHOULD EXTEND INTO THE TERRACE.
  - MOUNTING HEIGHT OF 5 FEET FROM THE SURFACE TO THE BOTTOM OF SIGN.



ADJACENT LANE DROP-OFFS



SHOULDER DROP-OFFS



SECTION B - B

| D                                     | SIGN (C)                                                                         |
|---------------------------------------|----------------------------------------------------------------------------------|
| < 2" WITH A SLOPE STEEPER THAN 3:1    | <br>WB-9                                                                         |
| 2" < 6" WITH A SLOPE STEEPER THAN 3:1 | <br>WB-9A<br>PROVIDE A 3:1 OR FLATTER SLOPE OF MATERIAL ADJACENT TO THE PAVEMENT |

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

TRAFFIC CONTROL,  
DROP-OFF SIGNING

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
March 2018  
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.

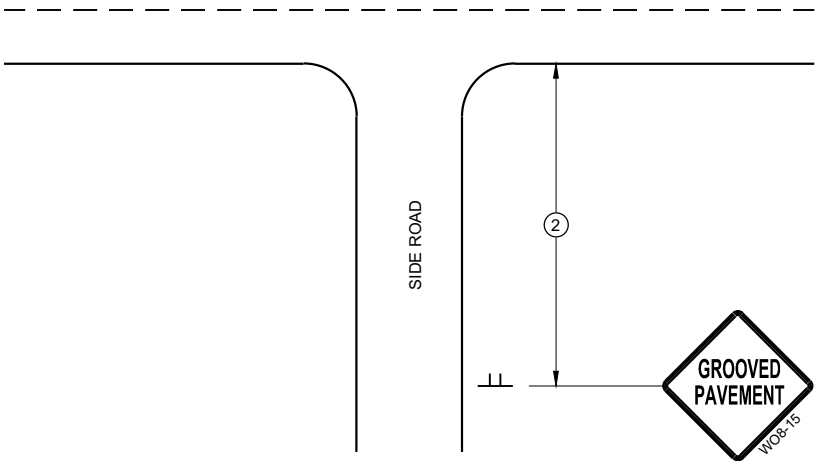
ALL SIGNS INAPPROPRIATE TO THE STATUS OF THE CONTROL ZONE, INCLUDING PRE-EXISTING SIGNS IN THE VICINITY, SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER.

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.

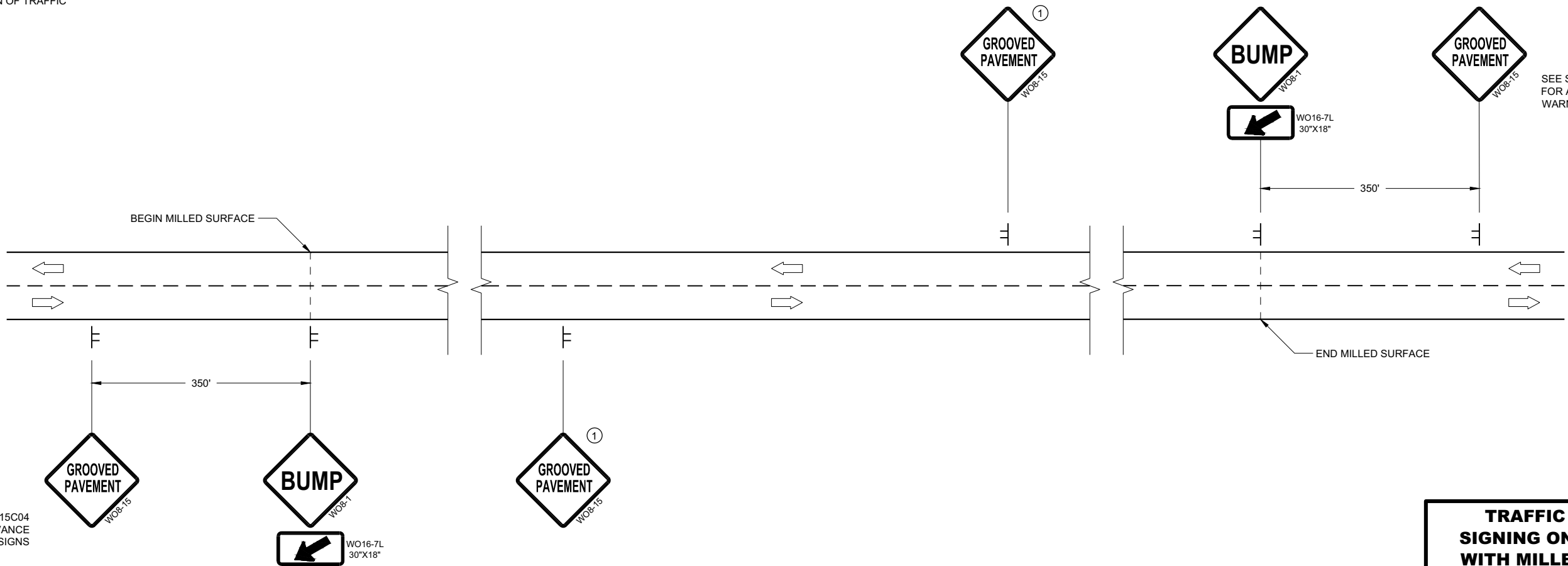
- ① PLACE SIGNS 350' IN ADVANCE OF MILLED SURFACES AND AT 1 MILE INTERVALS, OR AS DIRECTED BY THE ENGINEER.
- ② PLACE SIGN 200' MIN. FROM INTERSECTION AND 200' MIN. AFTER ADVANCE WARNING SIGN SHOWN IN SDD 15C04.

LEGEND

-  SIGN ON TEMPORARY SUPPORT
-  DIRECTION OF TRAFFIC



TYPICAL SIDE ROAD APPROACH  
SIGN DETAIL



SEE SDD15C04  
FOR ADVANCE  
WARNING SIGNS

SEE SDD15C04  
FOR ADVANCE  
WARNING SIGNS

DETAIL FOR SIGNING ON MILLED SURFACES

TRAFFIC CONTROL,  
SIGNING ON ROADWAYS  
WITH MILLED SURFACES

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
February 2020 /S/ Andrew Heidtke  
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.

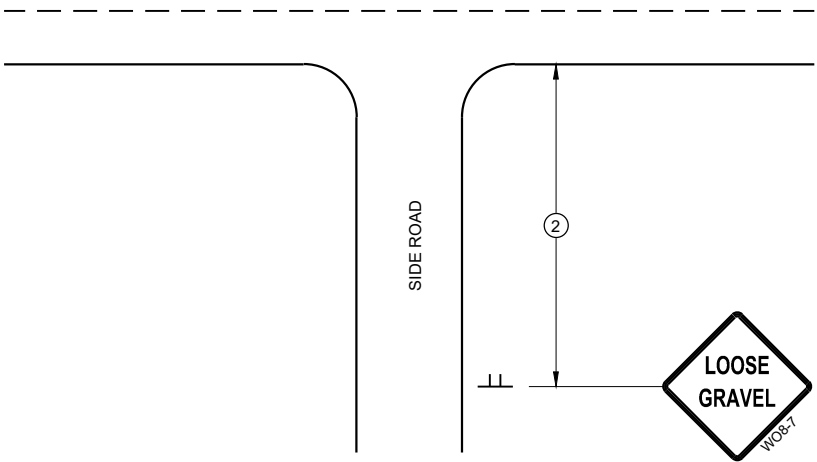
ALL SIGNS INAPPROPRIATE TO THE STATUS OF THE CONTROL ZONE, INCLUDING PRE-EXISTING SIGNS IN THE VICINITY, SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER.

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.

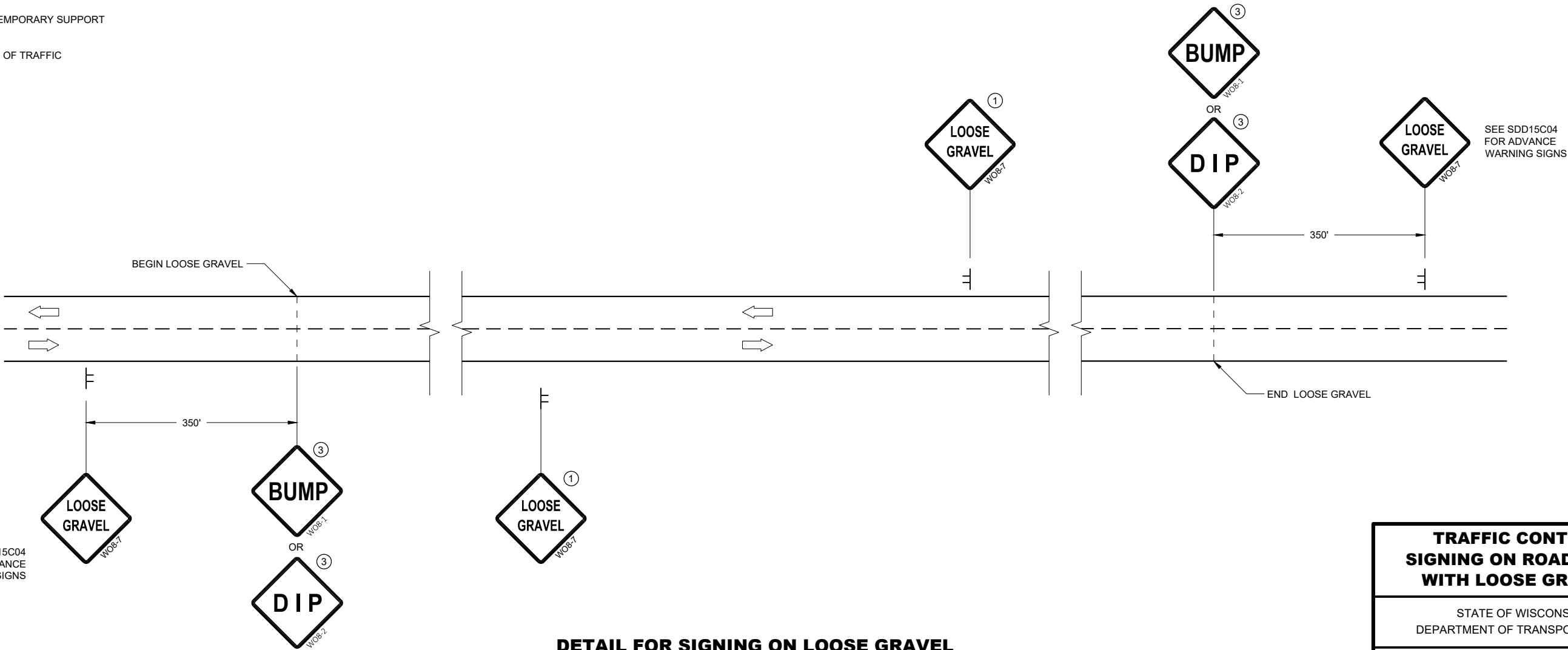
- 1 PLACE SIGNS 350' IN ADVANCE OF CHIP SEALED OR LOOSE GRAVEL SURFACES AND AT 1 MILE INTERVALS, OR AS DIRECTED BY THE ENGINEER.
- 2 PLACE SIGN 200' MIN. FROM INTERSECTION AND 200' MIN. AFTER ADVANCE WARNING SIGN SHOWN IN SDD 15C04.
- 3 ADD WO8-1 OR WO8-2 SIGN WHEN THE CONDITION IS PRESENT.

LEGEND

-  SIGN ON TEMPORARY SUPPORT
-  DIRECTION OF TRAFFIC



TYPICAL SIDE ROAD APPROACH  
SIGN DETAIL

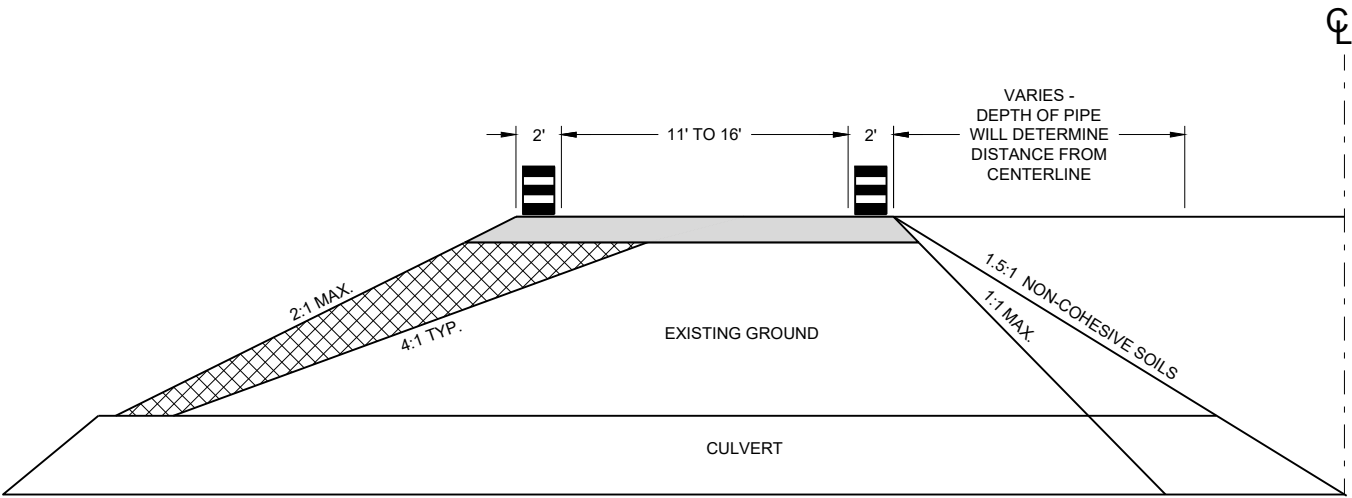


DETAIL FOR SIGNING ON LOOSE GRAVEL  
OR CHIP SEALED SURFACES

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.

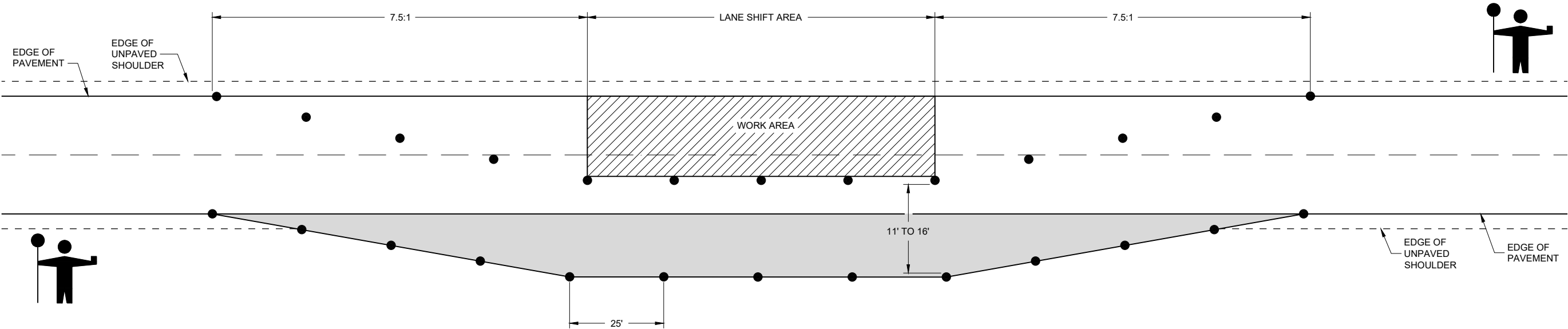
CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

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 1/4" - 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  
DATE /S/ Andrew Heidtke  
WORK ZONE ENGINEER

FHWA

LEGEND

- V1

WORK VEHICLE
- V2

SHADOW VEHICLE
- 

TRUCK MOUNTED ATTENUATOR (TMA)
- 

FLASHING ARROW PANEL (CAUTION)
- 

WORK AREA
- 

DIRECTION OF TRAFFIC

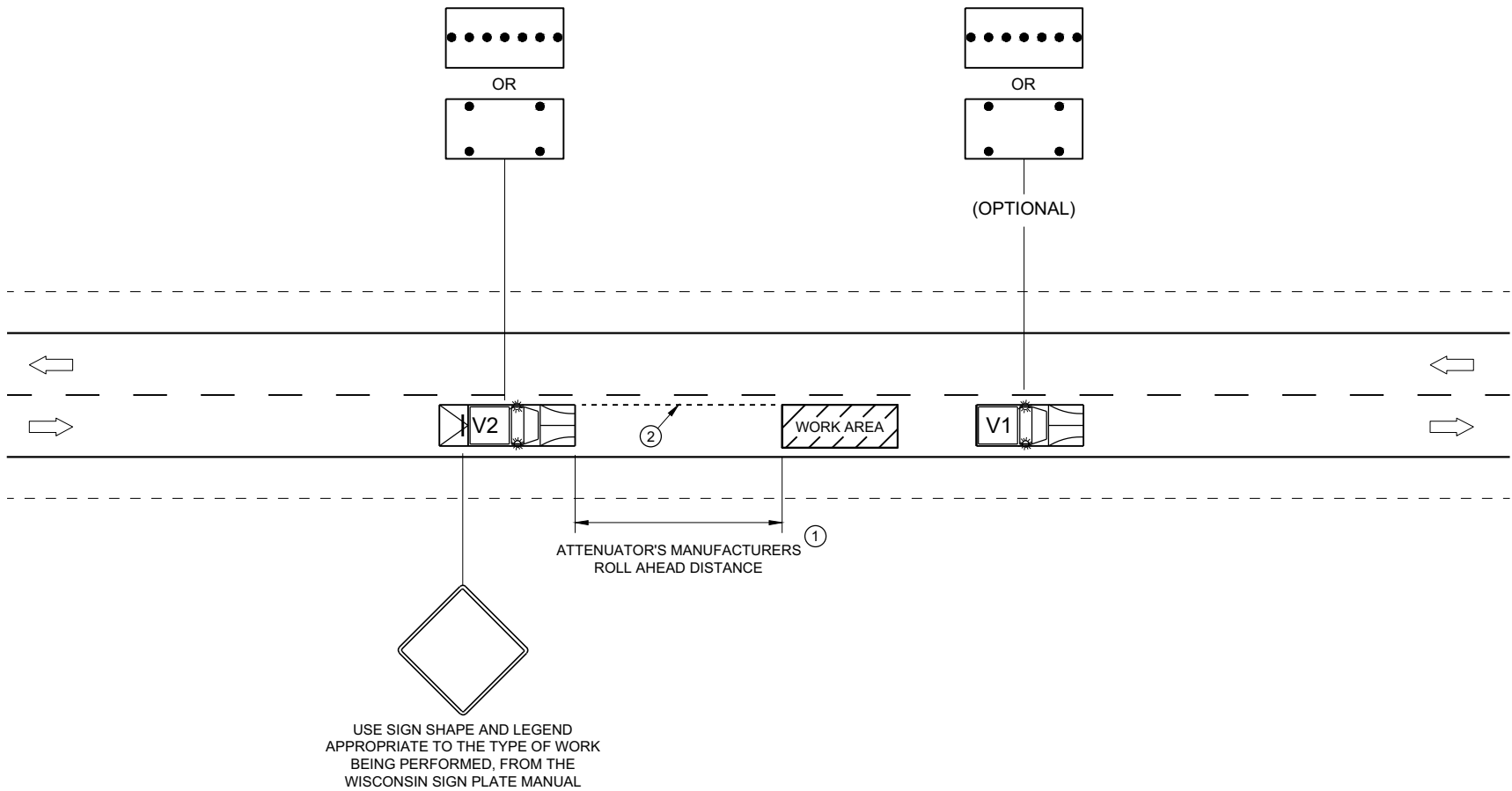
| POSTED SPEED PRIOR TO<br>WORK STARTING (MPH) | DECISION SIGHT<br>DISTANCE (D) |
|----------------------------------------------|--------------------------------|
| 0 - 25                                       | 550'                           |
| 30                                           | 550'                           |
| 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.



TRAFFIC CONTROL,  
MOBILE OPERATIONS ON  
AN UNDIVIDED ROADWAY

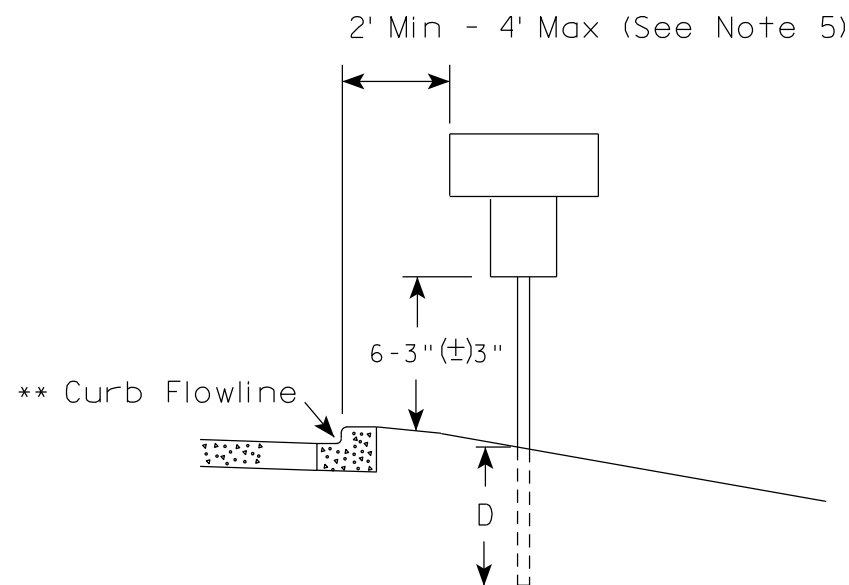
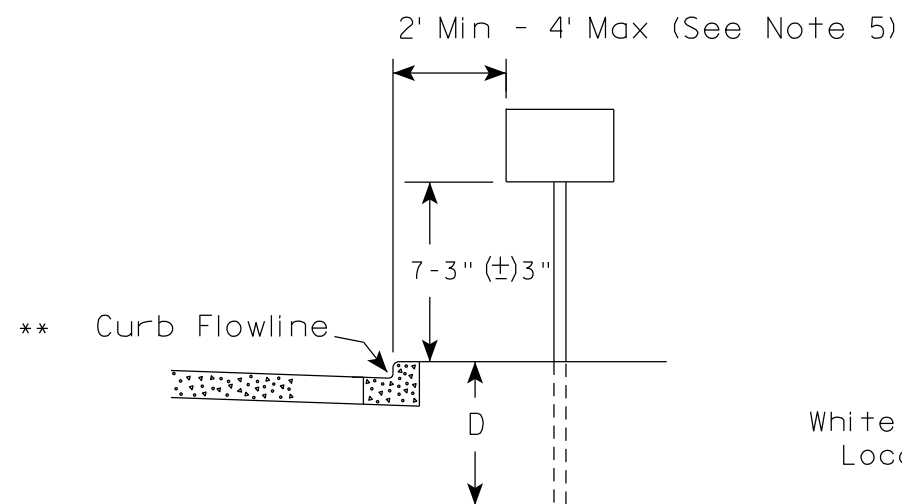
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
February 2021  
DATE

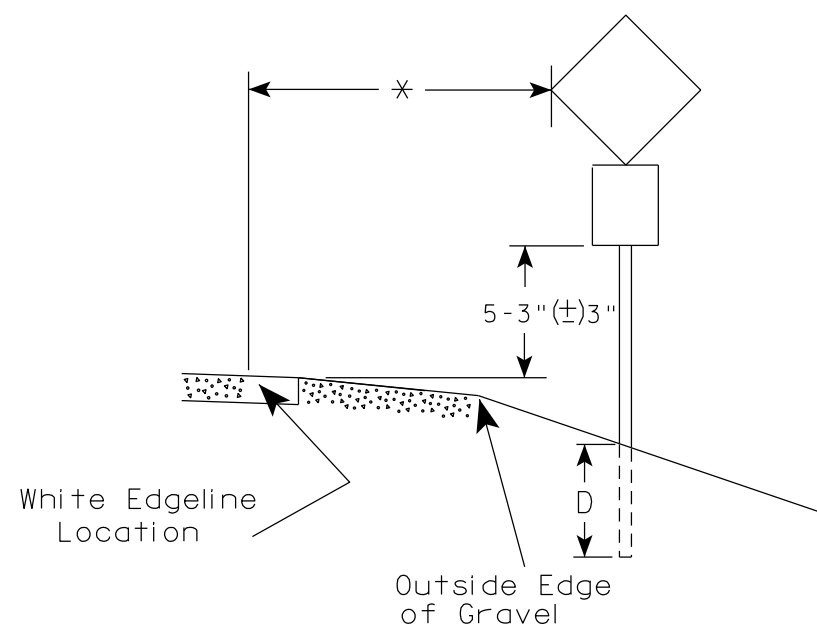
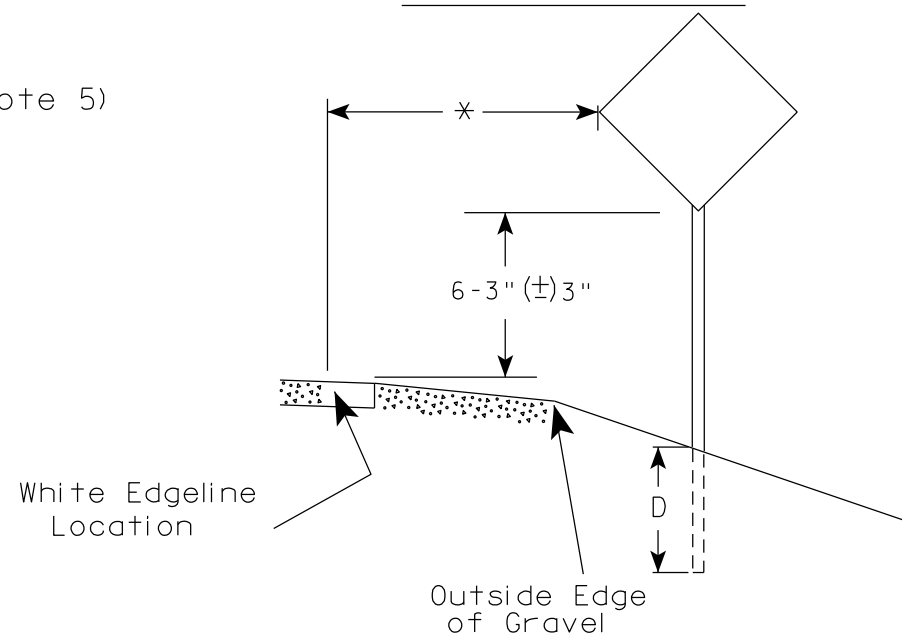
/S/ Andrew Heidtke  
STATEWIDE WORK ZONE TRAFFIC  
SAFETY ENGINEER

FHWA

## URBAN AREA



## RURAL AREA (See Note 2)



POST EMBEDMENT DEPTH

| Area of Sign Installation<br>( Sq. Ft. ) | D<br>( Min ) |
|------------------------------------------|--------------|
| 20 or Less                               | 4'           |
| Greater than 20                          | 5'           |

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

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

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

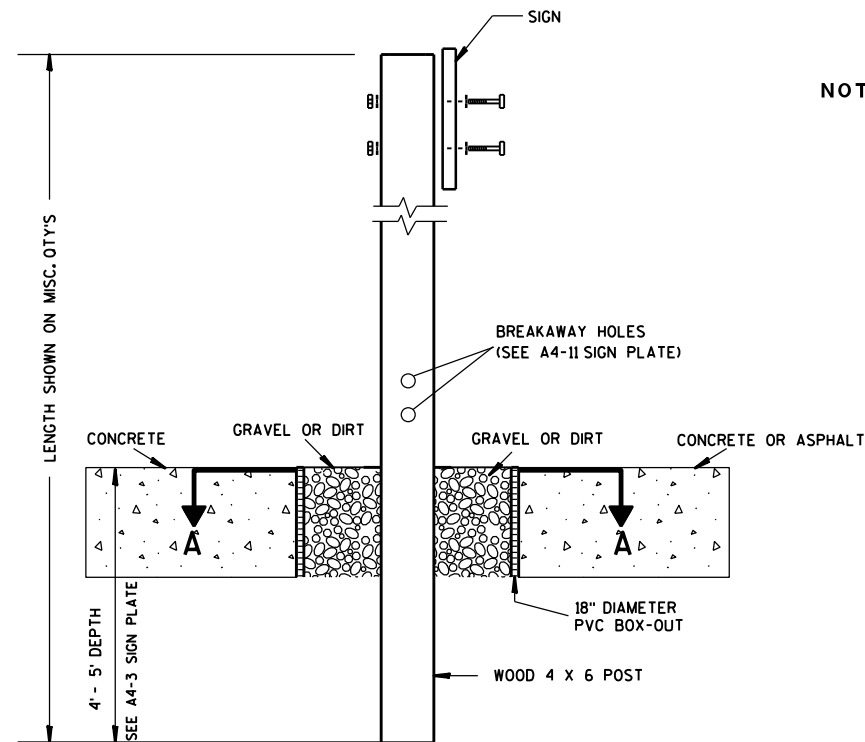
TYPICAL INSTALLATION  
OF PERMANENT TYPE II  
SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*  
for State Traffic Engineer

DATE 12/6/23 PLATE NO. A4-3.23

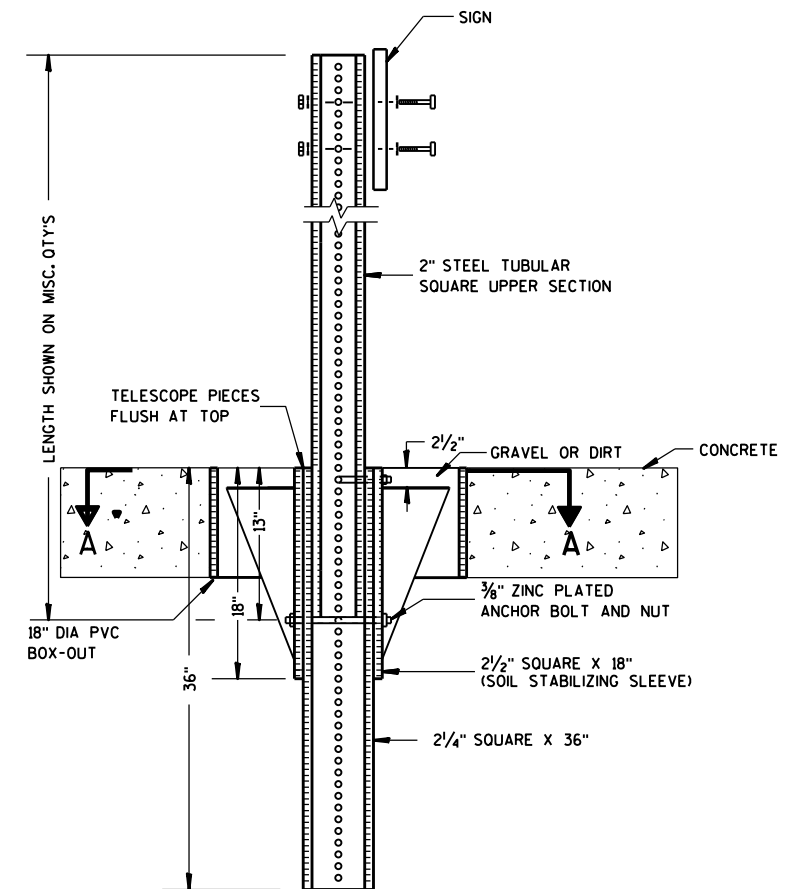
PROJECT NO: \_\_\_\_\_ HWY: \_\_\_\_\_ COUNTY: \_\_\_\_\_ SHEET NO: **E**



### ELEVATION VIEW

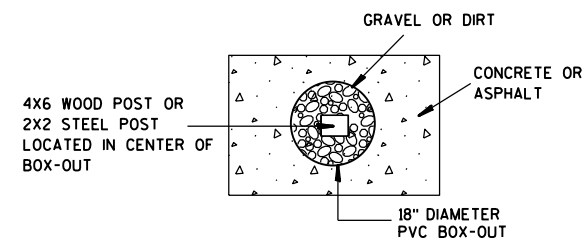
DETAIL OF WOOD 4 X 6 SIGN POST IN BOX-OUT

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



### ELEVATION VIEW

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



### PLAN VIEW

FOR NEW CONCRETE/ASPHALT INSTALLATIONS

SIGN POST  
BOX-OUTS  
A4-3B

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*  
for State Traffic Engineer

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

PROJECT NO:

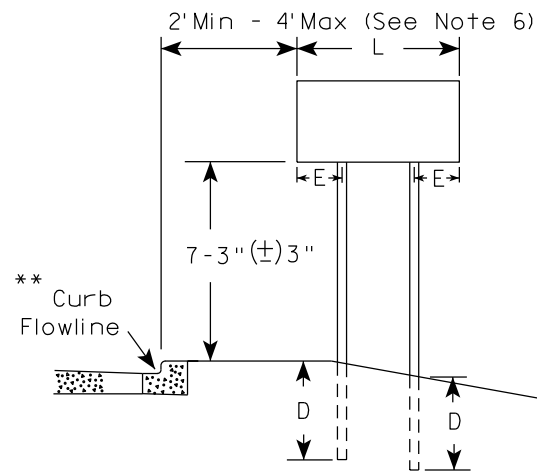
HWY:

COUNTY:

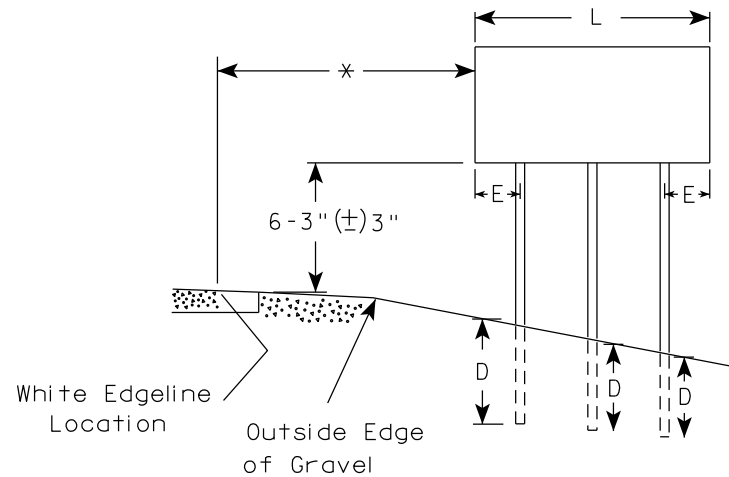
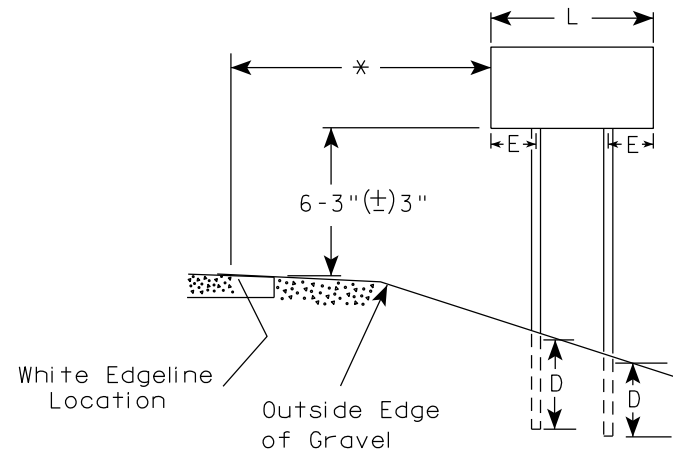
SHEET NO:

E

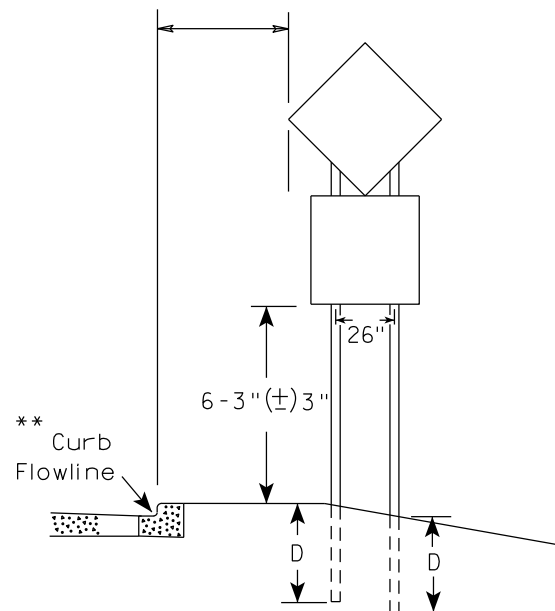
URBAN AREA



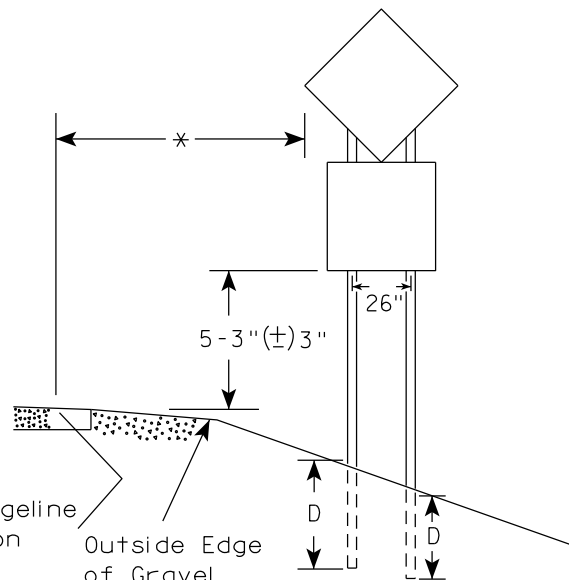
RURAL AREA (See Note 3)



2' Min - 4' Max (See Note 6)



48" DIAMOND WARNING SIGN



48" DIAMOND WARNING SIGN

\*\*\*

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

| SIGN SHAPE OTHER THAN DIAMOND<br>(THREE POSTS REQUIRED) |     |
|---------------------------------------------------------|-----|
| L                                                       | E   |
| Greater than 108"<br>to 144"                            | 12" |

POST EMBEDMENT DEPTH

| Area of Sign<br>Installation<br>( Sq.Ft. ) | D<br>( Min ) |
|--------------------------------------------|--------------|
| 20 or Less                                 | 4'           |
| Greater than 20                            | 5'           |

TYPICAL INSTALLATION  
OF TYPE II SIGNS  
ON MULTIPLE POSTS

|                                  |                                                       |
|----------------------------------|-------------------------------------------------------|
| WISCONSIN DEPT OF TRANSPORTATION |                                                       |
| APPROVED                         | <i>Matthew R. Rauch</i><br>for State Traffic Engineer |
| DATE 12/6/23                     | PLATE NO. A4-4.16                                     |

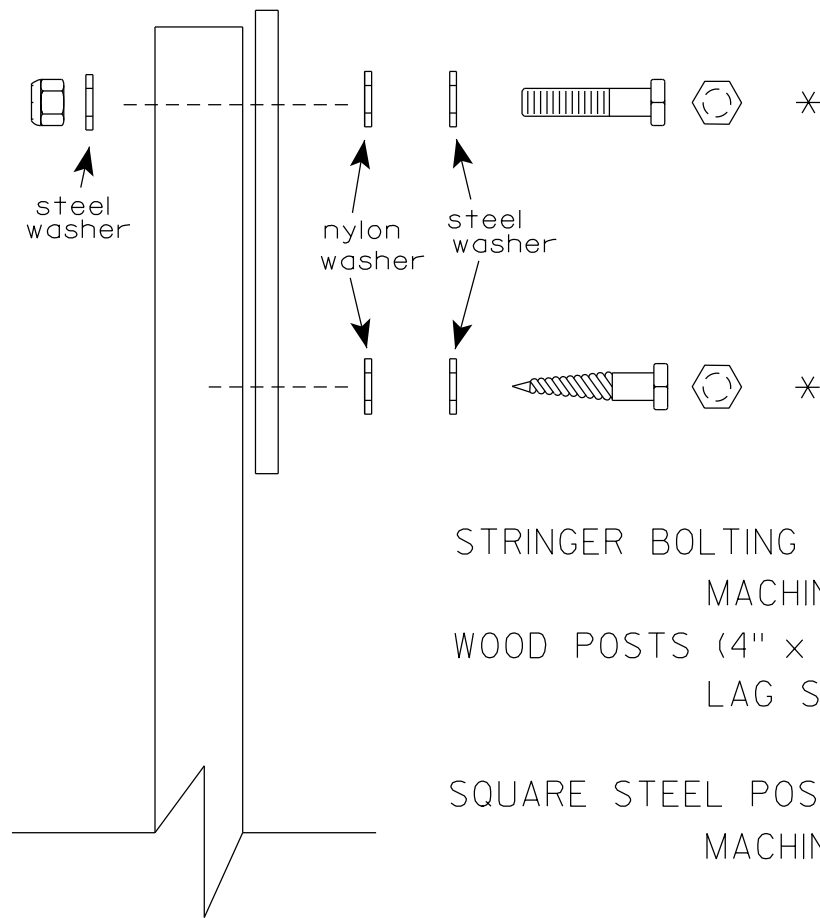
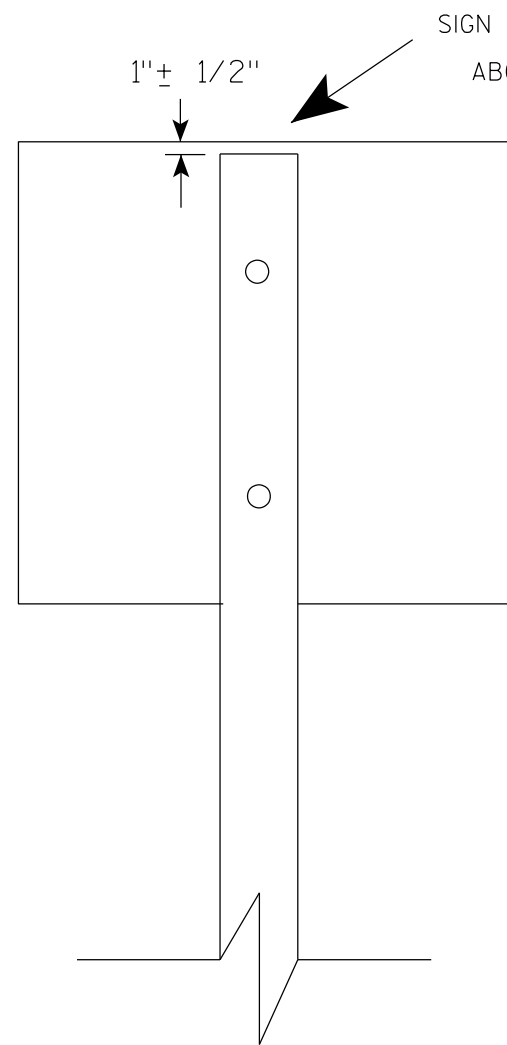
GENERAL NOTES

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

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

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

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



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

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

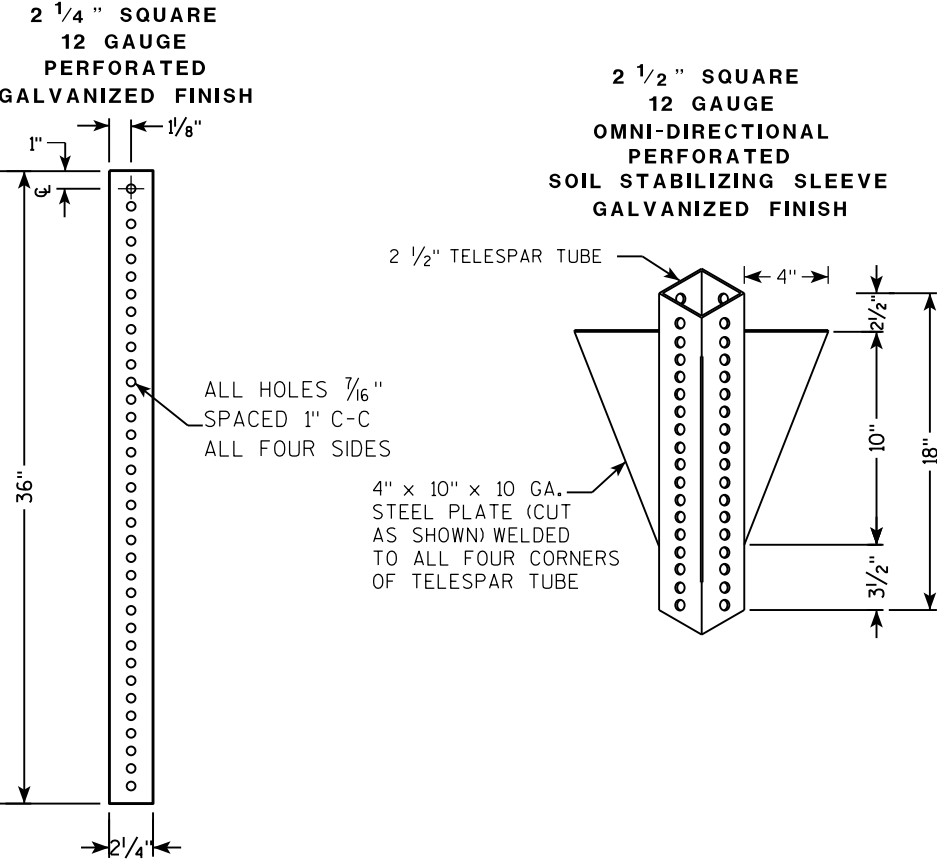
Threads on bolts and nuts shall be manufactured with sufficient allowance for the cadmium plate or galvanized coating to permit the nuts to run freely on the bolts.

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

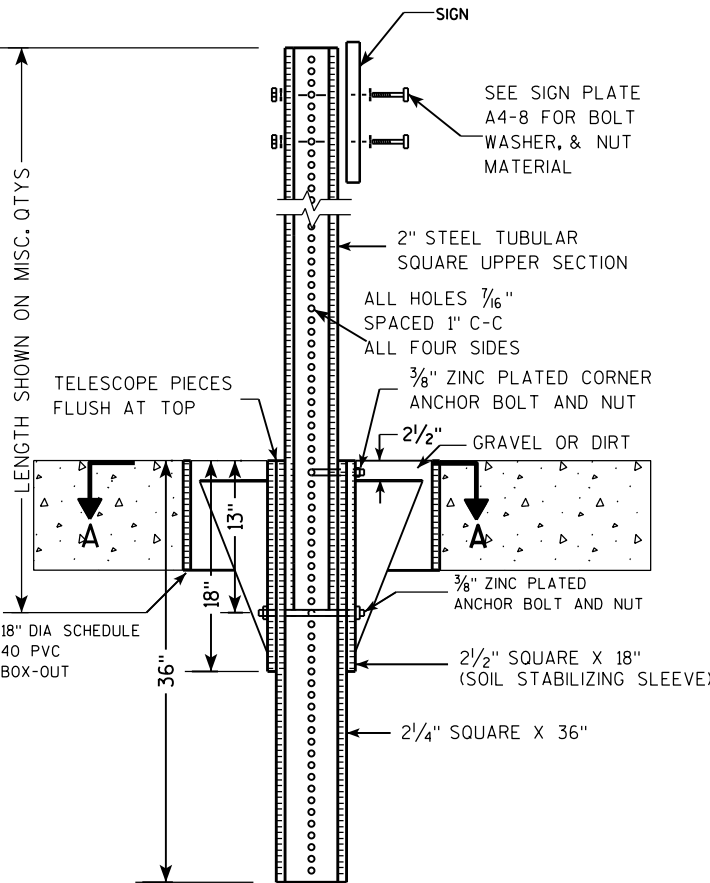
\* Two different fastening systems are shown for illustration purposes. On any individual sign, either one or the other system shall be used. Actual number of fasteners per sign varies with the sign area, but normally there are two. For a single post installation, all signs greater than 9 sq. ft. require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

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

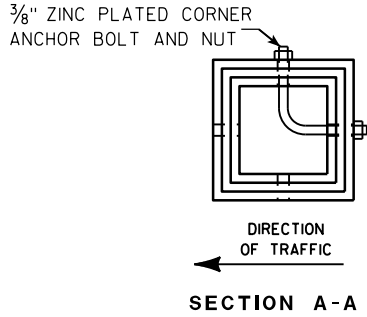
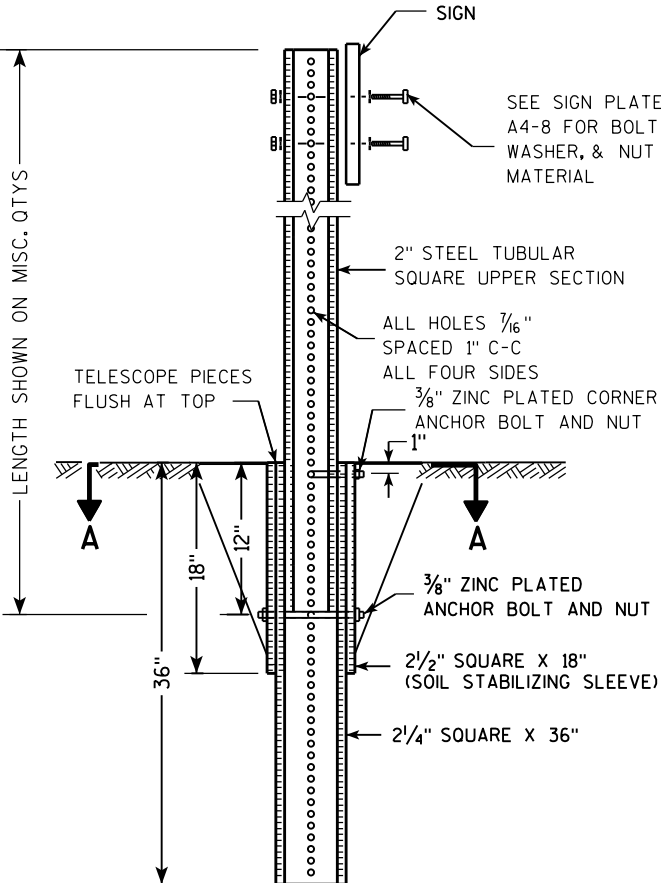
TELESCOPIC TUBING ANCHORS  
TWO PIECE SYSTEM



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



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



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

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

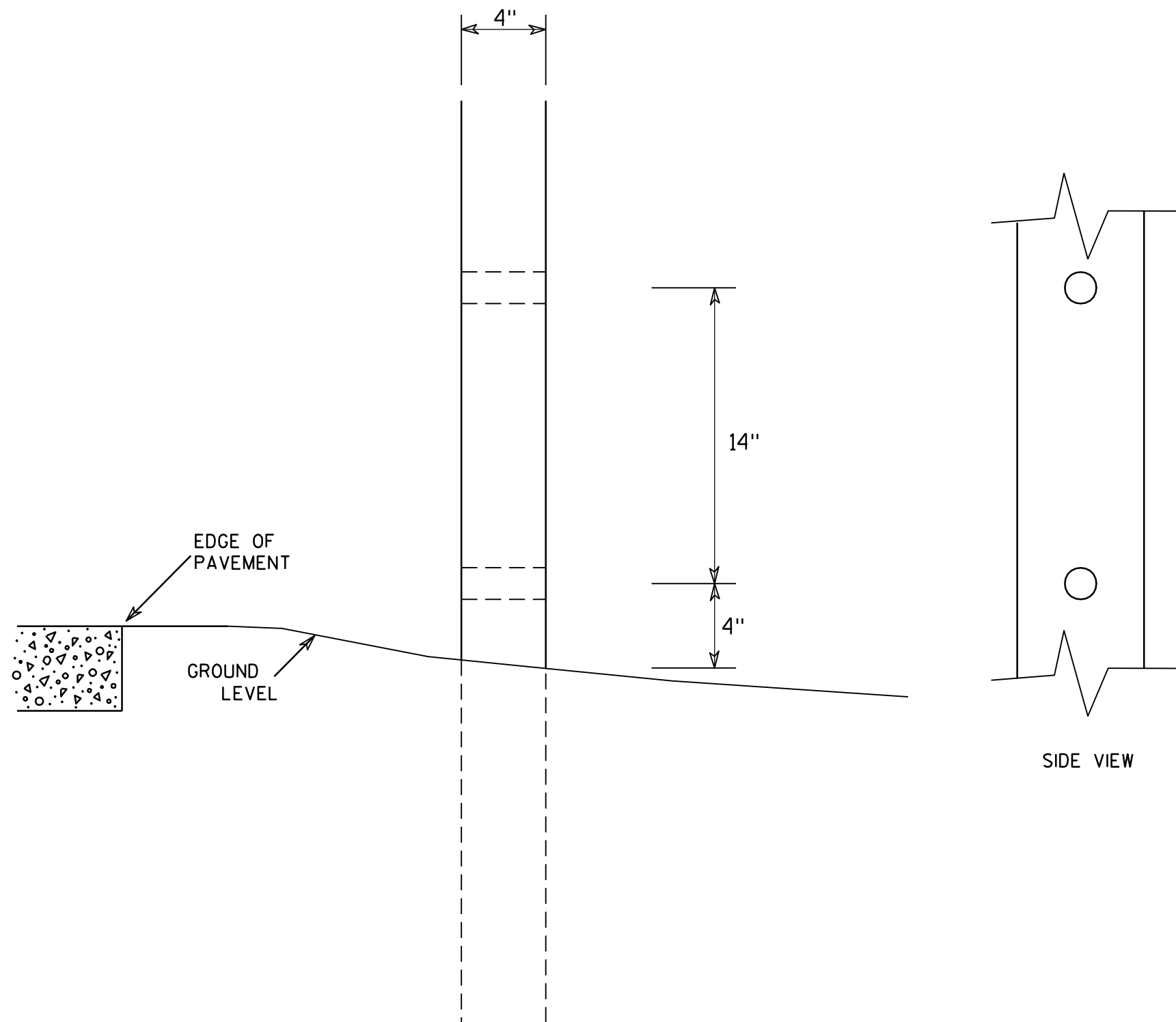
TUBULAR STEEL  
SIGN POST  
A4-9

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*  
for State Traffic Engineer

DATE 2/05/15 PLATE NO. A4-9.9

7



### GENERAL NOTES

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

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### 4 X 6 WOOD POST MODIFICATIONS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED

*Chester J. Spang*  
for State Traffic Engineer

DATE 3/27/97

PLATE NO. A4-11.2

PROJECT NO:

HWY:

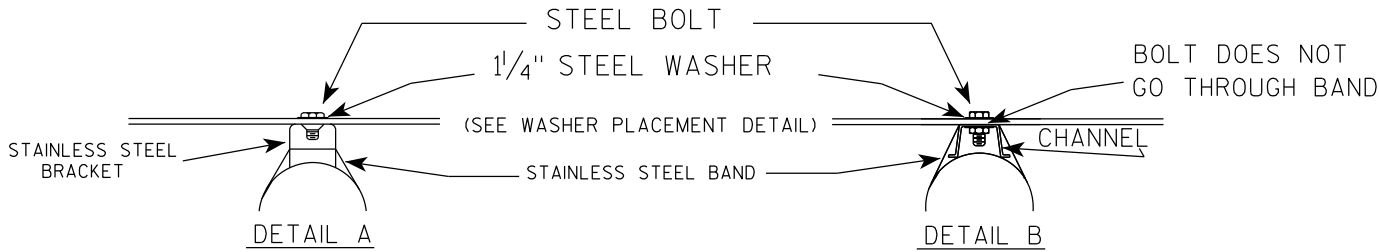
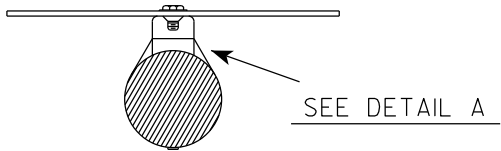
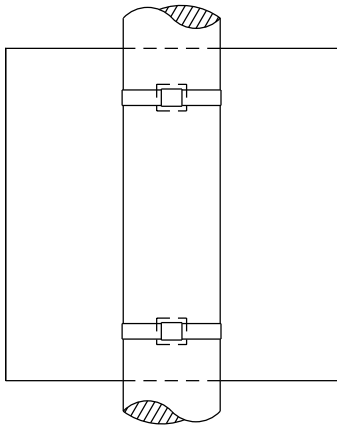
COUNTY:

SHEET NO:

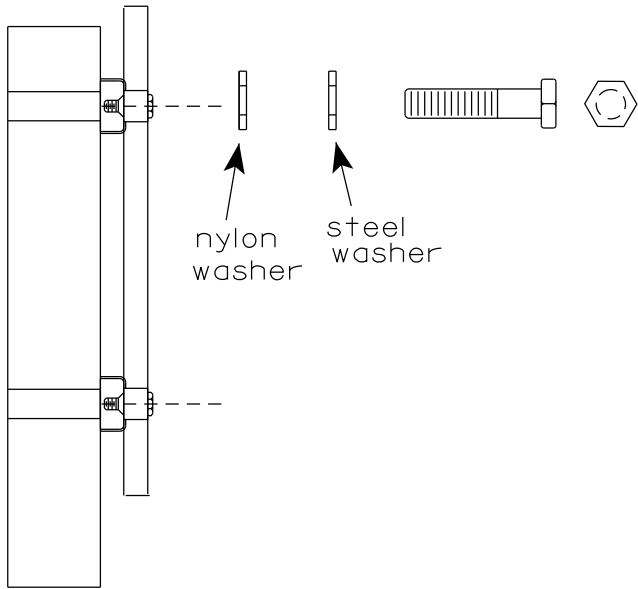
E

BANDING

SINGLE SIGN



WASHER PLACEMENT

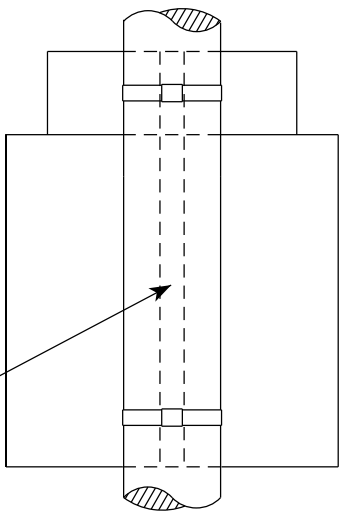


WASHERS (ALL POSTS) -  
1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL  
1-1/4" O.D. X 3/8" I.D. X .080 NYLON  
FOR ALL TYPE H SIGNS

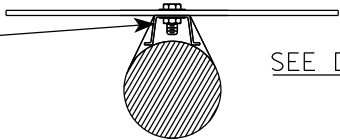
GENERAL NOTES

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

"J" ASSEMBLY



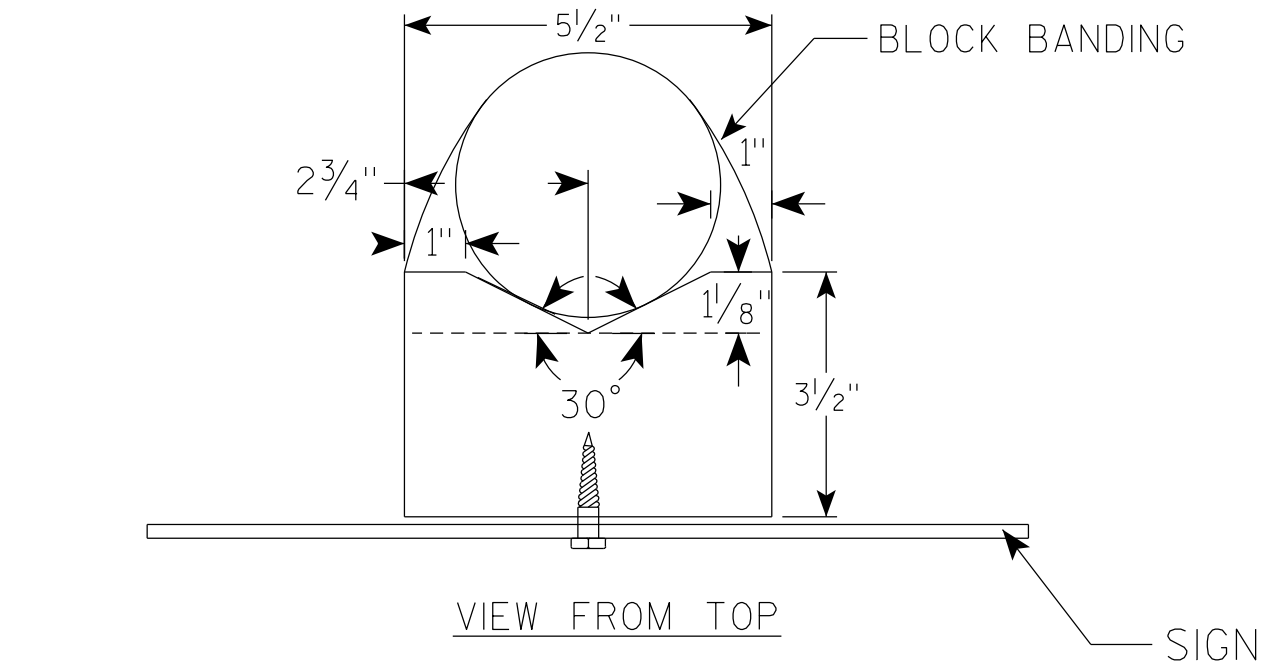
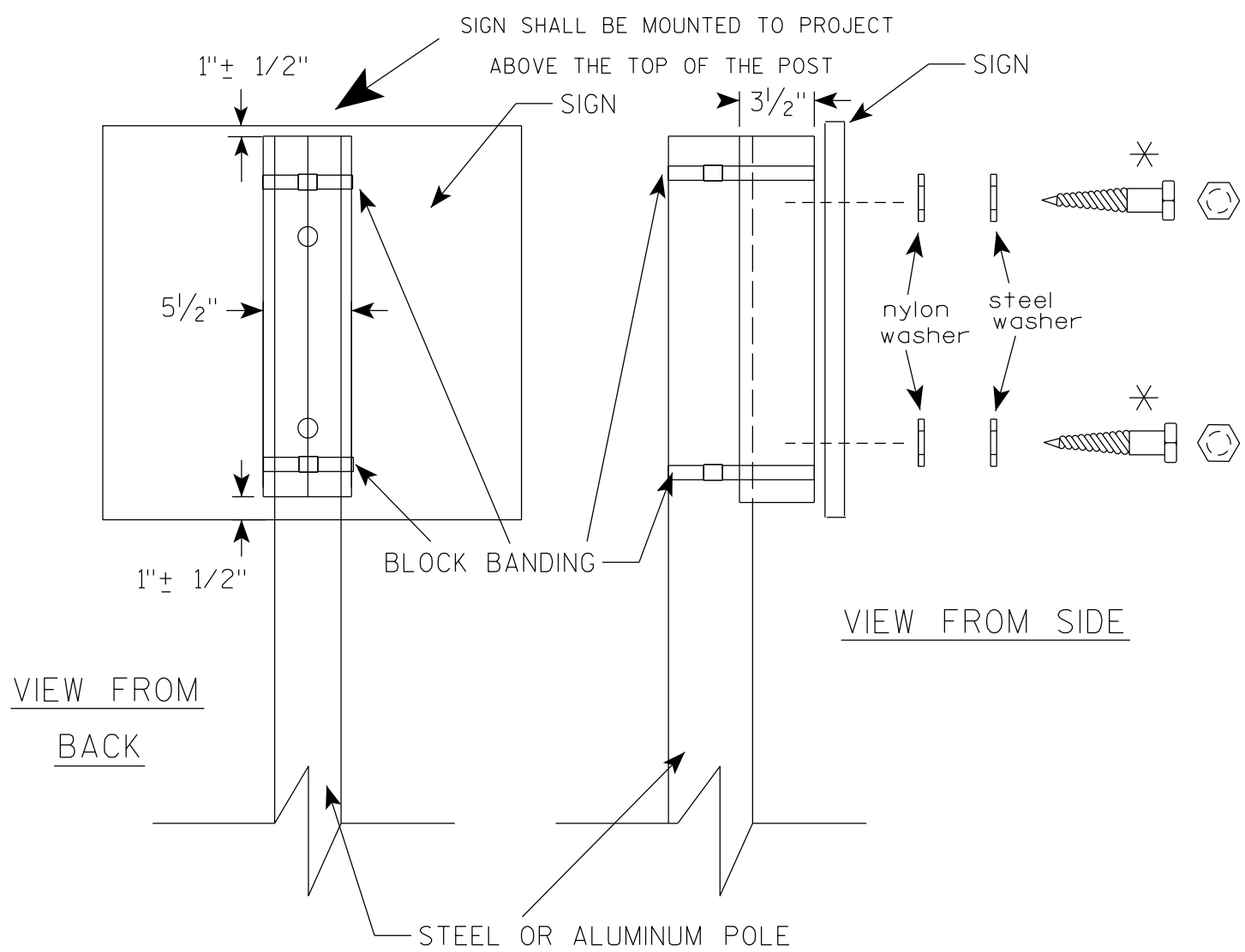
CHANNEL  
SEE TYPICAL PANEL  
INSTALLATION SHEET



STANDARD SIGN  
SIGN BANDING DETAILS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*  
for State Traffic Engineer  
DATE 6/10/19 PLATE NO. A5-9.4



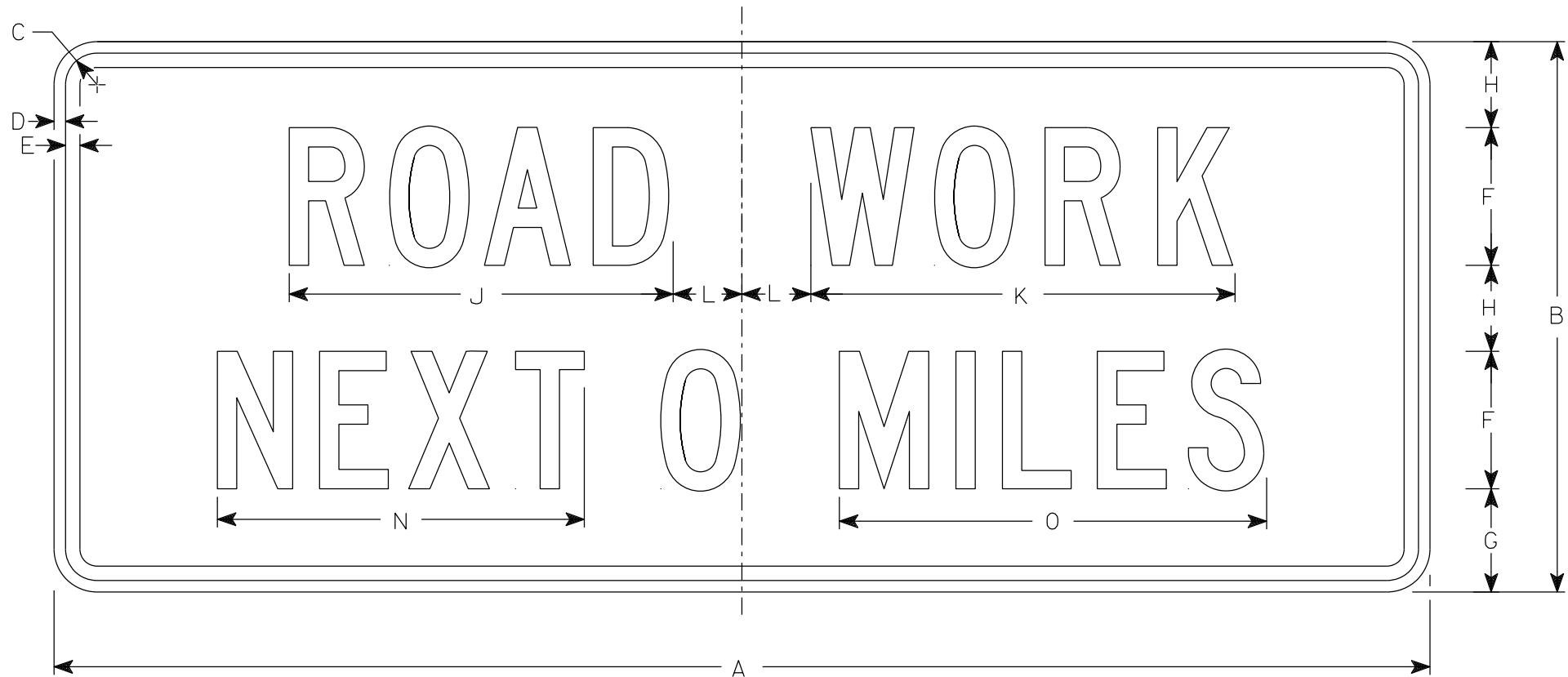
## GENERAL NOTES

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

✱ LAG BOLTS SHALL BE  $\frac{3}{8}$ " X  $2\frac{1}{2}$ "

|                                            |                                                       |
|--------------------------------------------|-------------------------------------------------------|
| BLOCK BANDING DETAIL<br>( V-BLOCK OPTION ) |                                                       |
| WISCONSIN DEPT OF TRANSPORTATION           |                                                       |
| APPROVED                                   | <i>Matthew R. Rauch</i><br>for State Traffic Engineer |
| DATE 4/19/2022                             | PLATE NO. A5-10.3                                     |

7



G20-1

NOTES

1. Sign is Type II - Type F Reflective
2. Color:  
Background - Orange  
Message - Black
3. Message Series - C
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
5. Round distance to nearest whole Mile and substitute appropriate numerals and optically adjust spacing to achieve proper balance

7

| SIZE | A  | B  | C     | D   | E   | F | G     | H     | I | J      | K      | L | M | N  | O      | P | Q | R | S | T | U | V | W | X | Y | Z | Area<br>sq. ft. |
|------|----|----|-------|-----|-----|---|-------|-------|---|--------|--------|---|---|----|--------|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| 1    |    |    |       |     |     |   |       |       |   |        |        |   |   |    |        |   |   |   |   |   |   |   |   |   |   |   |                 |
| 2S   | 60 | 24 | 1 7⁄8 | 1⁄2 | 5⁄8 | 6 | 4 1⁄2 | 3 3⁄4 |   | 16 3⁄4 | 18 1⁄2 | 3 |   | 16 | 18 5⁄8 |   |   |   |   |   |   |   |   |   |   |   | 10.0            |
| 2M   | 60 | 24 | 1 7⁄8 | 1⁄2 | 5⁄8 | 6 | 4 1⁄2 | 3 3⁄4 |   | 16 3⁄4 | 18 1⁄2 | 3 |   | 16 | 18 5⁄8 |   |   |   |   |   |   |   |   |   |   |   | 10.0            |
| 3    | 60 | 24 | 1 7⁄8 | 1⁄2 | 5⁄8 | 6 | 4 1⁄2 | 3 3⁄4 |   | 16 3⁄4 | 18 1⁄2 | 3 |   | 16 | 18 5⁄8 |   |   |   |   |   |   |   |   |   |   |   | 10.0            |
| 4    | 60 | 24 | 1 7⁄8 | 1⁄2 | 5⁄8 | 6 | 4 1⁄2 | 3 3⁄4 |   | 16 3⁄4 | 18 1⁄2 | 3 |   | 16 | 18 5⁄8 |   |   |   |   |   |   |   |   |   |   |   | 10.0            |
| 5    | 60 | 24 | 1 7⁄8 | 1⁄2 | 5⁄8 | 6 | 4 1⁄2 | 3 3⁄4 |   | 16 3⁄4 | 18 1⁄2 | 3 |   | 16 | 18 5⁄8 |   |   |   |   |   |   |   |   |   |   |   | 10.0            |

STANDARD SIGN

G20-1

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*  
for State Traffic Engineer

DATE 1/26/2023 PLATE NO. G20-1.9

NOTES

- 1. Sign is Type II - Type F Reflective
- 2. Color:
  - Background - Orange
  - Message - Black
- 3. Message Series - D
- 4. Substitute appropriate numeral and adjust spacing to achieve proper balance.



G20-57

| SIZE | A  | B  | C     | D   | E   | F | G     | H     | I      | J     | K | L      | M      | N     | O     | P      | Q | R      | S     | T     | U      | V | W | X | Y | Z | Area<br>sq. ft. |
|------|----|----|-------|-----|-----|---|-------|-------|--------|-------|---|--------|--------|-------|-------|--------|---|--------|-------|-------|--------|---|---|---|---|---|-----------------|
| 1    |    |    |       |     |     |   |       |       |        |       |   |        |        |       |       |        |   |        |       |       |        |   |   |   |   |   |                 |
| 2    |    |    |       |     |     |   |       |       |        |       |   |        |        |       |       |        |   |        |       |       |        |   |   |   |   |   |                 |
| 3    | 72 | 36 | 1 1/8 | 1/2 | 5/8 | 6 | 5     | 4     | 15 5/8 | 1 5/8 | 5 | 9 1/4  | 21 1/4 | 3 1/2 | 1 1/2 | 23 1/4 |   | 29 7/8 | 1 3/4 | 3 1/4 | 28 1/2 |   |   |   |   |   | 18.0            |
| 4    | 96 | 48 | 2 1/4 | 3/4 | 1   | 8 | 6 1/2 | 5 1/2 | 20 5/8 | 2 1/4 | 6 | 12 1/4 | 28 1/4 | 4 3/8 | 1 5/8 | 31     |   | 39 1/4 | 2     | 4     | 37 7/8 |   |   |   |   |   | 32.0            |
| 5    |    |    |       |     |     |   |       |       |        |       |   |        |        |       |       |        |   |        |       |       |        |   |   |   |   |   |                 |

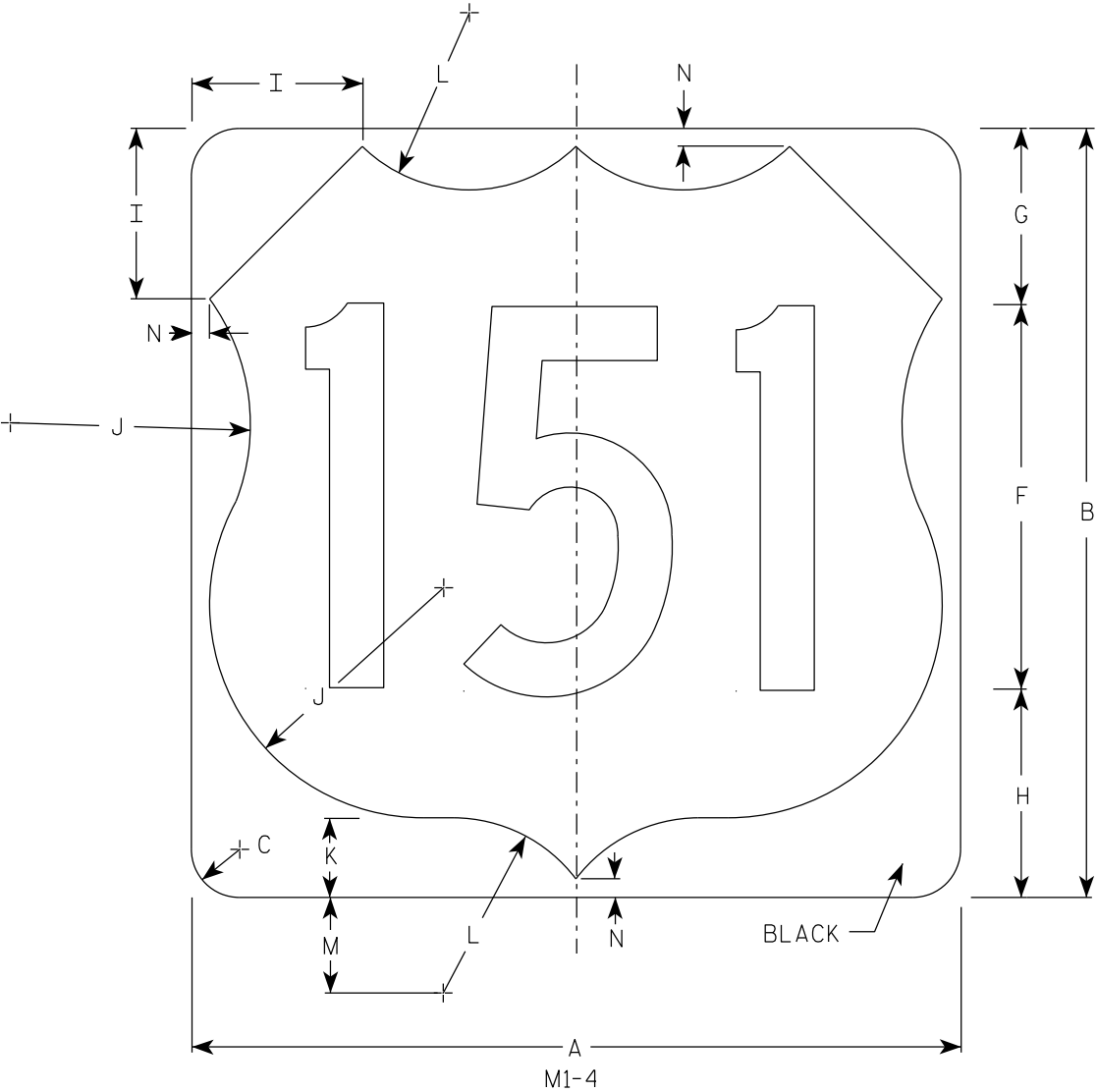
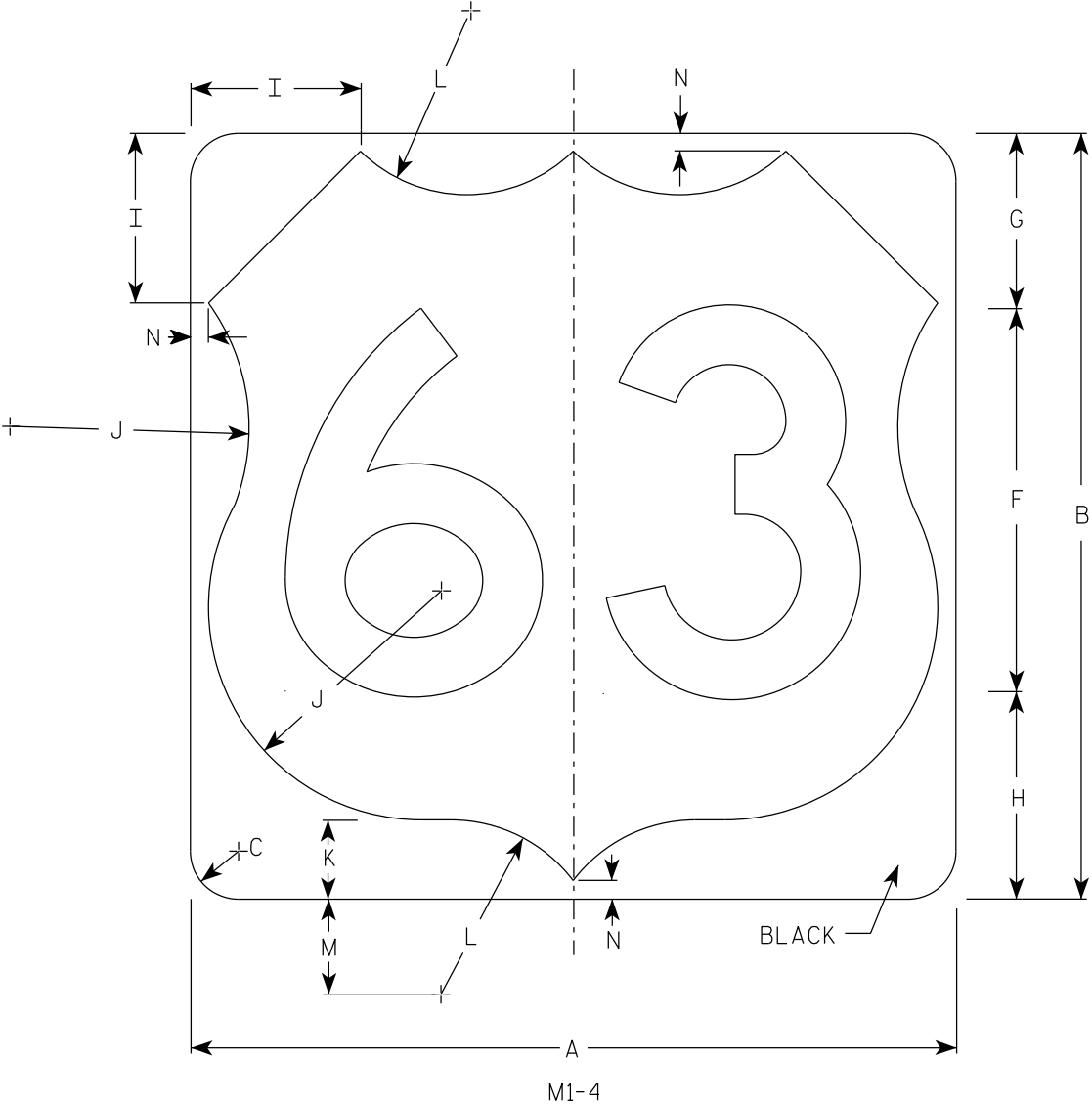
STANDARD SIGN  
G20-57

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*  
For State Traffic Engineer

DATE 1/22/19 PLATE NO. G20-57.3

SHEET NO: E



NOTES

- 1. Sign is Type II - Type H Reflective
- 2. Color:  
Background - White  
Message - Black
- 3. Message Series - D except 3 number signs Series C

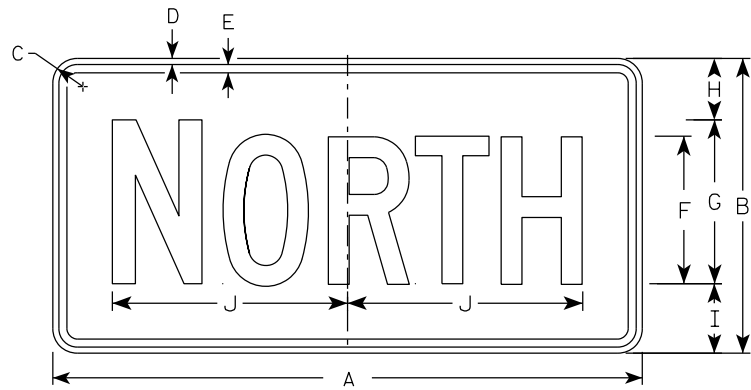
| SIZE | A  | B  | C     | D | E | F  | G     | H     | I     | J      | K     | L     | M     | N   | O | P | Q | R | S | T | U | V | W | X | Y | Z | Area<br>sq. ft. |
|------|----|----|-------|---|---|----|-------|-------|-------|--------|-------|-------|-------|-----|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| 1    |    |    |       |   |   |    |       |       |       |        |       |       |       |     |   |   |   |   |   |   |   |   |   |   |   |   |                 |
| 2    | 24 | 24 | 1 1/2 |   |   | 12 | 5 1/2 | 6 1/2 | 5     | 7 1/2  | 2 1/2 | 5 1/2 | 3     | 1/2 |   |   |   |   |   |   |   |   |   |   |   |   | 4.0             |
| 2M   | 24 | 24 | 1 1/2 |   |   | 12 | 5 1/2 | 6 1/2 | 5     | 7 1/2  | 2 1/2 | 5 1/2 | 3     | 1/2 |   |   |   |   |   |   |   |   |   |   |   |   | 4.0             |
| 3    | 36 | 36 | 2 1/4 |   |   | 18 | 8 1/4 | 9 1/4 | 7 1/4 | 11 1/4 | 3 3/4 | 8 1/4 | 4 1/2 | 3/4 |   |   |   |   |   |   |   |   |   |   |   |   | 9.0             |
| 4    | 36 | 36 | 2 1/4 |   |   | 18 | 8 1/4 | 9 1/4 | 7 1/4 | 11 1/4 | 3 3/4 | 8 1/4 | 4 1/2 | 3/4 |   |   |   |   |   |   |   |   |   |   |   |   | 9.0             |
| 5    | 36 | 36 | 2 1/4 |   |   | 18 | 8 1/4 | 9 1/4 | 7 1/4 | 11 1/4 | 3 3/4 | 8 1/4 | 4 1/2 | 3/4 |   |   |   |   |   |   |   |   |   |   |   |   | 9.0             |

USH MARKER  
M1-4 FOR ASSEMBLIES

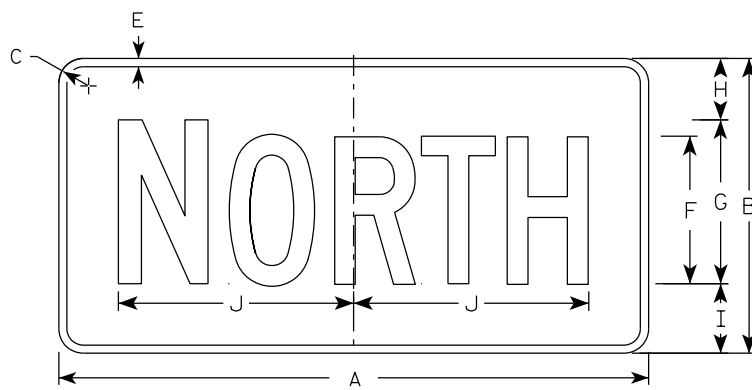
WISCONSIN DEPT OF TRANSPORTATION

APPROVED  
*Matthew R. Rauch*  
for State Traffic Engineer

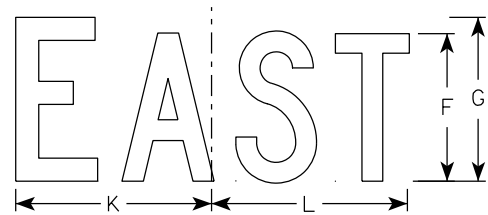
DATE 12/20/22 PLATE NO. M1-4.11



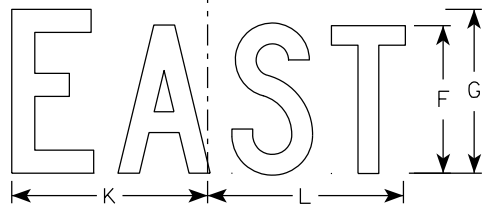
M3-1  
MM3-1  
MP3-1



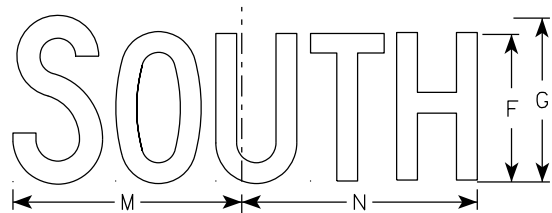
MB3-1  
MK3-1  
MN3-1



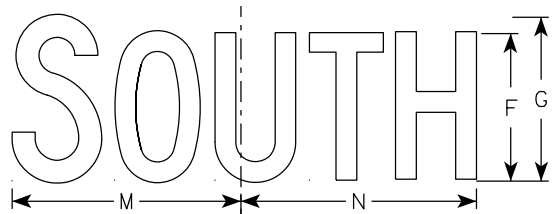
M3-2  
MM3-2  
MP3-2



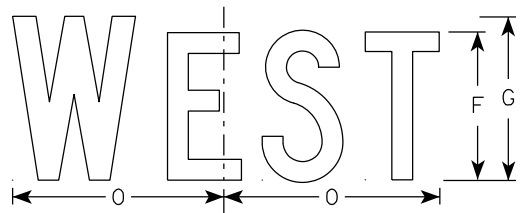
MB3-2  
MK3-2  
MN3-2



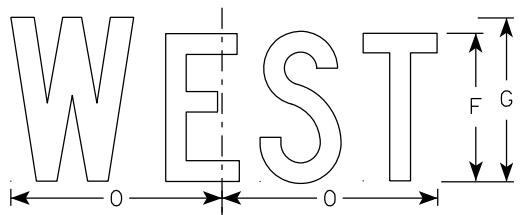
M3-3  
MM3-3  
MP3-3



MB3-3  
MK3-3  
MN3-3



M3-4  
MM3-4  
MP3-4



MB3-4  
MK3-4  
MN3-4

## NOTES

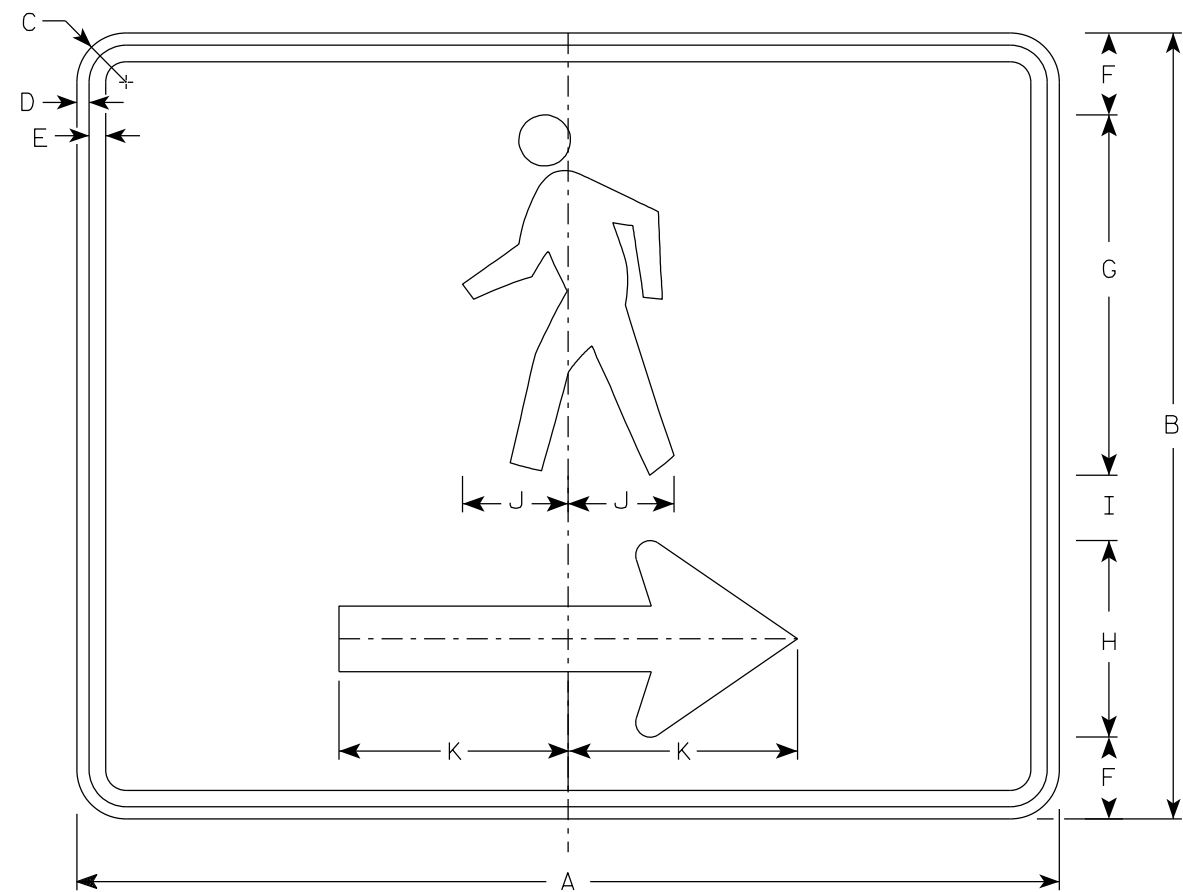
- All Signs Type II - Type H Reflective
- Color:
  - Background - See note 5
  - Message - See note 5
- Message Series - C
- Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
- M3-1 thru M3-4 Background - White  
Message - Black  
MB3-1 thru MB3-4 Background - Blue  
Message - White  
MK3-1 thru MK3-4 Background - Green  
Message - White  
MM3-1 thru MM3-4 Background - White  
Message - Green  
MN3-1 thru MN3-4 Background - Brown  
Message - White  
MP3-1 thru MP3-4 Background - White  
Message - Blue
- Note the first letter of each direction is larger than the remainder of the message.

7

7

| SIZE | A  | B  | C     | D   | E   | F | G  | H     | I     | J      | K     | L      | M      | N      | O     | P | Q | R | S | T | U | V | W | X | Y | Z | Area<br>sq. ft. |
|------|----|----|-------|-----|-----|---|----|-------|-------|--------|-------|--------|--------|--------|-------|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| 1    |    |    |       |     |     |   |    |       |       |        |       |        |        |        |       |   |   |   |   |   |   |   |   |   |   |   |                 |
| 2S   | 24 | 12 | 1 1/2 | 3/8 | 3/8 | 6 | 7  | 2 1/4 | 2 3/4 | 10 1/4 | 7 7/8 | 8 3/8  | 10 1/4 | 9 3/4  | 8 3/4 |   |   |   |   |   |   |   |   |   |   |   | 2.00            |
| 2M   | 24 | 12 | 1 1/2 | 3/8 | 3/8 | 6 | 7  | 2 1/4 | 2 3/4 | 10 1/4 | 7 7/8 | 8 3/8  | 10 1/4 | 9 3/4  | 8 3/4 |   |   |   |   |   |   |   |   |   |   |   | 2.00            |
| 3    | 36 | 18 | 1 1/2 | 3/8 | 1/2 | 9 | 10 | 3 3/4 | 4 1/4 | 14 3/8 | 12    | 12 1/8 | 14     | 14 1/8 | 13    |   |   |   |   |   |   |   |   |   |   |   | 4.5             |
| 4    | 36 | 18 | 1 1/2 | 3/8 | 1/2 | 9 | 10 | 3 3/4 | 4 1/4 | 14 3/8 | 12    | 12 1/8 | 14     | 14 1/8 | 13    |   |   |   |   |   |   |   |   |   |   |   | 4.5             |
| 5    | 36 | 18 | 1 1/2 | 3/8 | 1/2 | 9 | 10 | 3 3/4 | 4 1/4 | 14 3/8 | 12    | 12 1/8 | 14     | 14 1/8 | 13    |   |   |   |   |   |   |   |   |   |   |   | 4.5             |

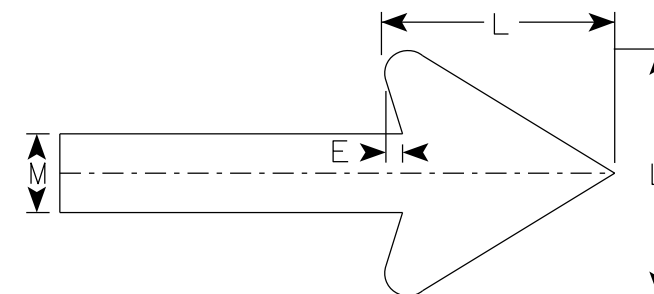
|             |      |         |           |   |
|-------------|------|---------|-----------|---|
| PROJECT NO: | HWY: | COUNTY: | SHEET NO: | E |
|-------------|------|---------|-----------|---|



M4-60R

NOTES

1. Sign is Type II- Type F Reflective
2. Color:  
Background - Orange  
Message - Black
3. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
4. M4-60L is the same as M4-60R except the arrow is reversed.

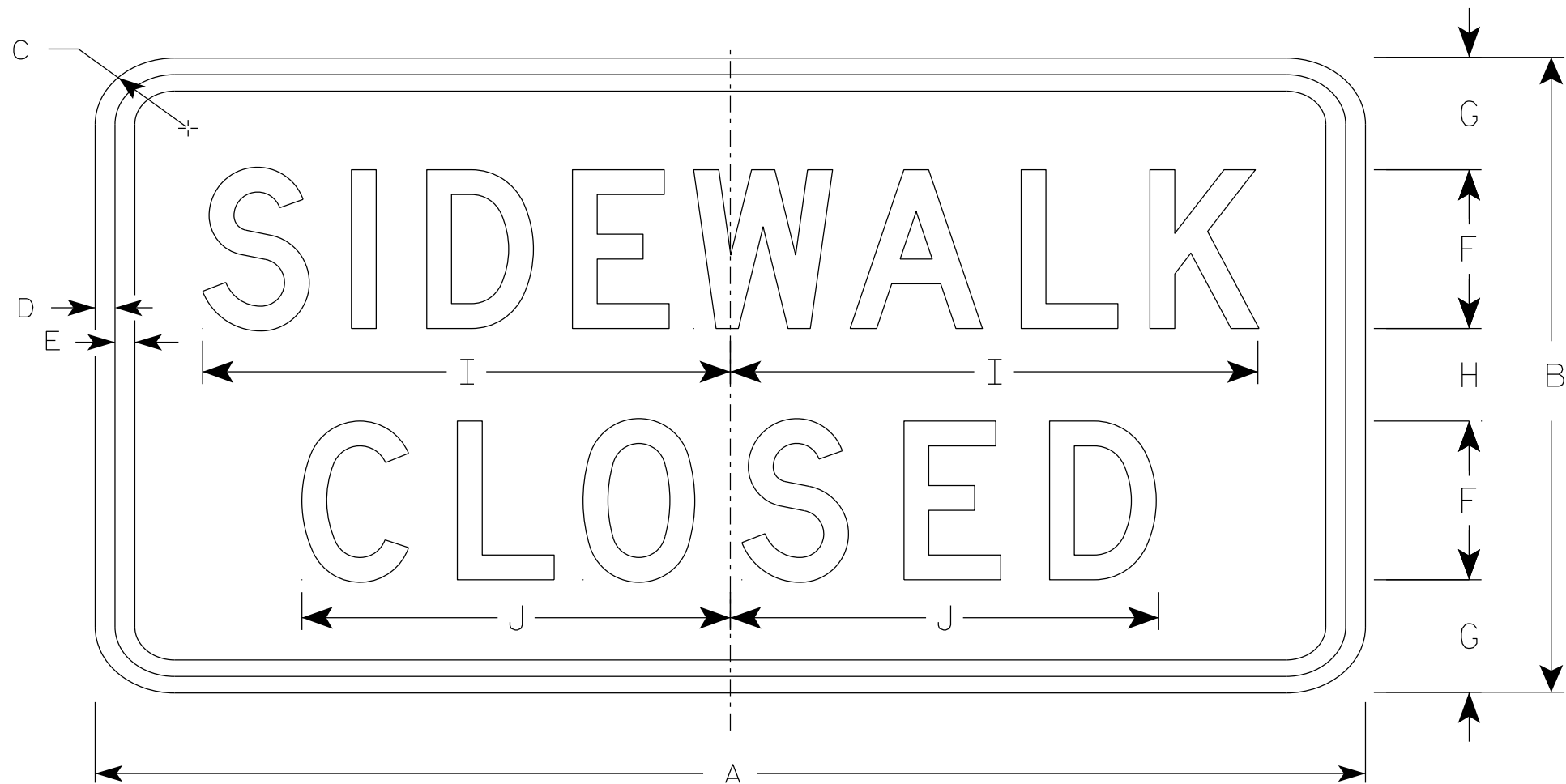


Arrow Detail

| SIZE | A  | B  | C     | D   | E   | F     | G  | H | I | J     | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | Area<br>sq. ft. |
|------|----|----|-------|-----|-----|-------|----|---|---|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| 1    |    |    |       |     |     |       |    |   |   |       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |
| 2S   | 30 | 24 | 1 1/2 | 3/8 | 1/2 | 2 1/2 | 11 | 6 | 2 | 3 1/4 | 7 | 6 | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   | 5.00            |
| 2M   | 30 | 24 | 1 1/2 | 3/8 | 1/2 | 2 1/2 | 11 | 6 | 2 | 3 1/4 | 7 | 6 | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   | 5.00            |
| 3    |    |    |       |     |     |       |    |   |   |       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |
| 4    |    |    |       |     |     |       |    |   |   |       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |
| 5    |    |    |       |     |     |       |    |   |   |       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |

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

7



R9-9

NOTES

- 1. Sign is Type II - Type H Reflective
- 2. Color:
  - Background - White
  - Message - Black
- 3. Message Series - C
- 4. Use Size 2 for Sidewalks. Use Size 3 for Paths and Trails.

7

| SIZE | A  | B  | C     | D   | E   | F | G     | H     | I      | J      | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | Area<br>sq. ft. |
|------|----|----|-------|-----|-----|---|-------|-------|--------|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| 1    |    |    |       |     |     |   |       |       |        |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |
| 2S   | 24 | 12 | 1 1/2 | 1/2 | 1/2 | 3 | 2 1/8 | 1 3/4 | 10     | 8 1/8  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2.0             |
| 2M   | 24 | 12 | 1 1/2 | 1/2 | 1/2 | 3 | 2 1/8 | 1 3/4 | 10     | 8 1/8  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2.0             |
| 3    | 30 | 18 | 1 1/2 | 1/2 | 1/2 | 4 | 3 1/2 | 3     | 12 1/2 | 10 1/4 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3.75            |
| 4    |    |    |       |     |     |   |       |       |        |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |
| 5    |    |    |       |     |     |   |       |       |        |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |

PROJECT NO:

HWY:

COUNTY:

SHEET NO:

E

STANDARD SIGN

R9-9

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*

For State Traffic Engineer

DATE 1/24/24

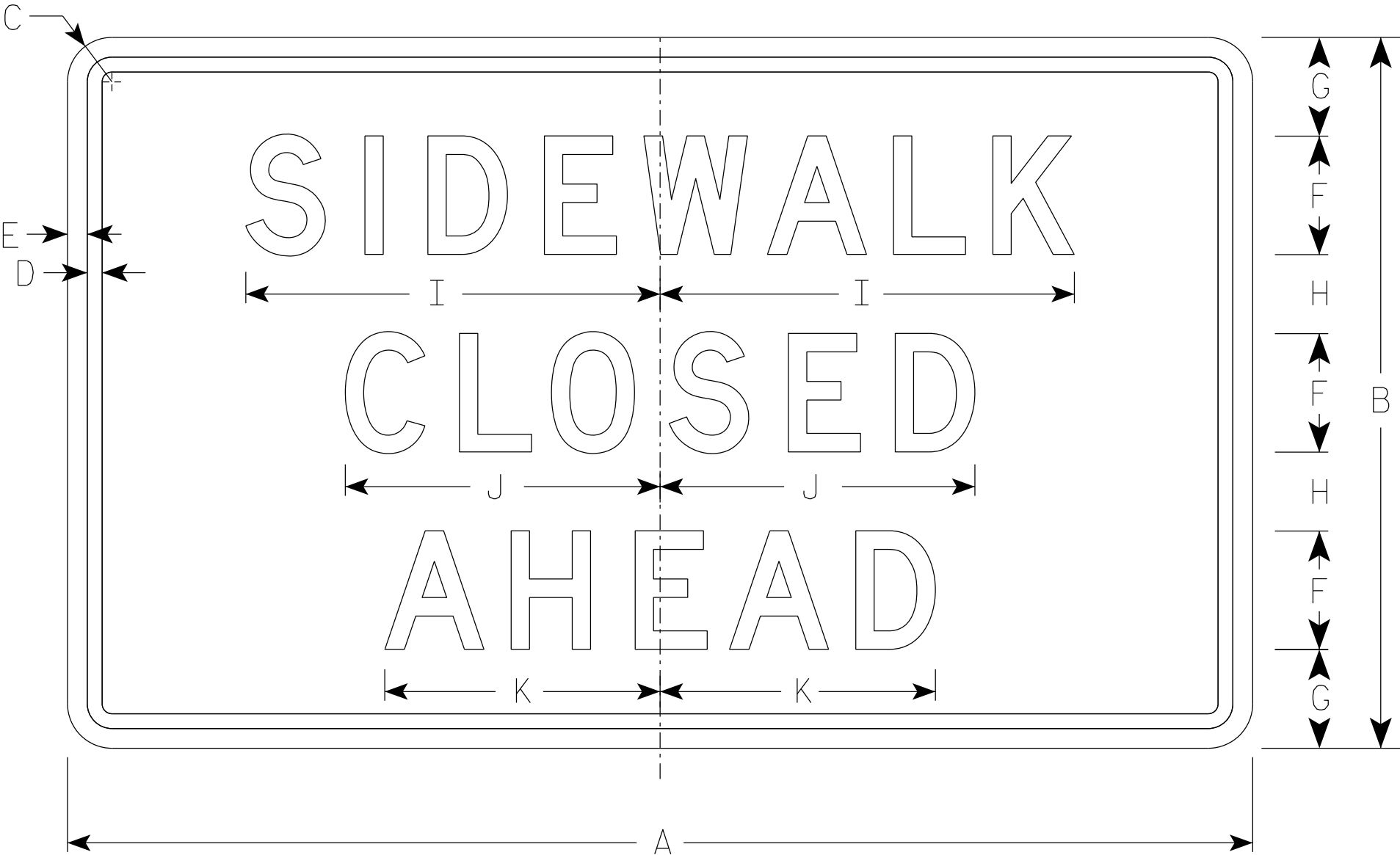
PLATE NO. R9-9.7

NOTES

1. Sign is Type II - Type H Reflective
2. Color:

Background - White

Message - Black
3. Message Series - D



R9-9A

| SIZE | A  | B  | C     | D   | E   | F | G     | H | I      | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | Area<br>sq. ft. |
|------|----|----|-------|-----|-----|---|-------|---|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| 1    |    |    |       |     |     |   |       |   |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |
| 2S   | 30 | 18 | 1 1/2 | 3/8 | 1/2 | 3 | 2 1/2 | 2 | 10 1/2 | 8 | 7 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3.75            |
| 2M   | 30 | 18 | 1 1/2 | 3/8 | 1/2 | 3 | 2 1/2 | 2 | 10 1/2 | 8 | 7 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3.75            |
| 3    |    |    |       |     |     |   |       |   |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |
| 4    |    |    |       |     |     |   |       |   |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |
| 5    |    |    |       |     |     |   |       |   |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |

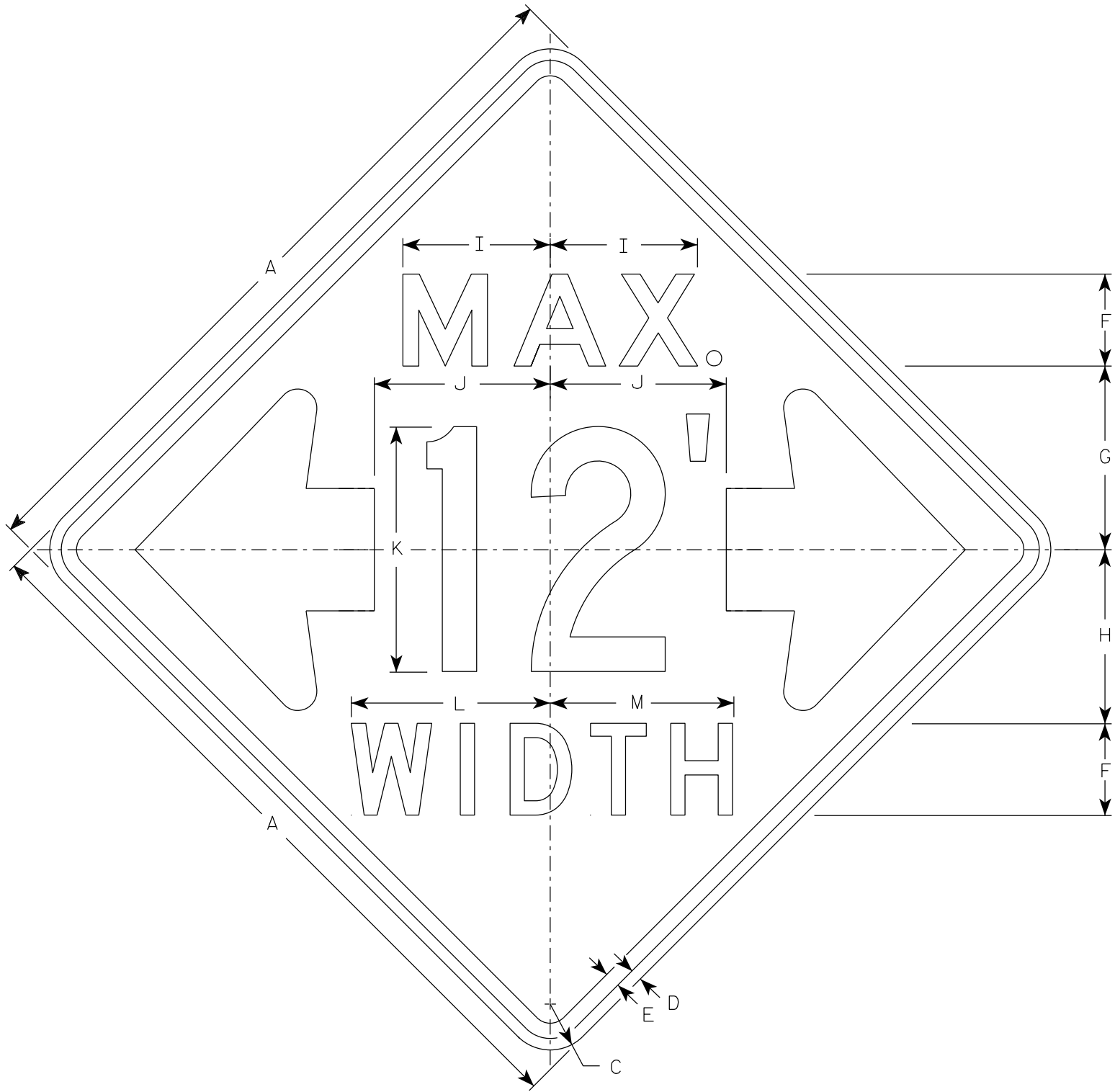
PROJECT NO:

HWY:

COUNTY:

SHEET NO:

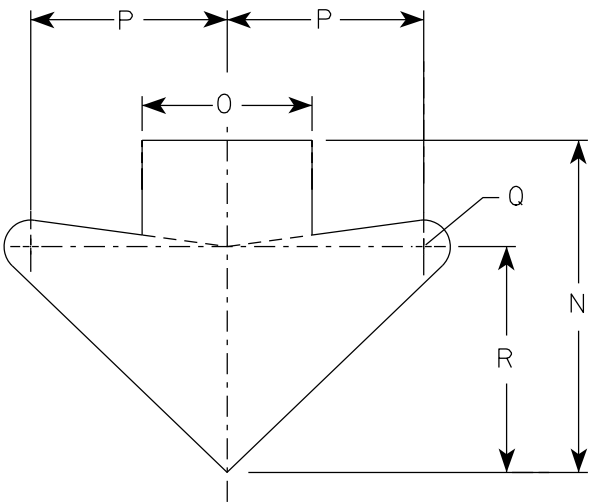
E



W12-52

NOTES

- 1. Sign is Type II - Type F Reflective
- 2. Color:  
Background - Orange  
Message - Black
- 3. Message Series - See note 5
- 4. The top line is series E, the numerals are series C, and the bottom line is series D.
- 5. Substitute appropriate numerals and adjust spacing as required.



ARROW DETAIL

| SIZE | A  | B | C | D | E | F | G  | H    | I   | J    | K  | L  | M  | N    | O | P   | Q   | R    | S | T | U | V | W | X | Y | Z | Area<br>sq. ft. |
|------|----|---|---|---|---|---|----|------|-----|------|----|----|----|------|---|-----|-----|------|---|---|---|---|---|---|---|---|-----------------|
| 1    |    |   |   |   |   |   |    |      |     |      |    |    |    |      |   |     |     |      |   |   |   |   |   |   |   |   |                 |
| 2S   | 48 |   | 3 | ¾ | 1 | 6 | 12 | 11 ⅜ | 9 ⅝ | 11 ½ | 16 | 13 | 12 | 15 ⅝ | 8 | 9 ¼ | 1 ¼ | 10 ⅝ |   |   |   |   |   |   |   |   | 16.0            |
| 2M   | 48 |   | 3 | ¾ | 1 | 6 | 12 | 11 ⅜ | 9 ⅝ | 11 ½ | 16 | 13 | 12 | 15 ⅝ | 8 | 9 ¼ | 1 ¼ | 10 ⅝ |   |   |   |   |   |   |   |   | 16.0            |
| 3    |    |   |   |   |   |   |    |      |     |      |    |    |    |      |   |     |     |      |   |   |   |   |   |   |   |   |                 |
| 4    |    |   |   |   |   |   |    |      |     |      |    |    |    |      |   |     |     |      |   |   |   |   |   |   |   |   |                 |
| 5    |    |   |   |   |   |   |    |      |     |      |    |    |    |      |   |     |     |      |   |   |   |   |   |   |   |   |                 |

STANDARD SIGN

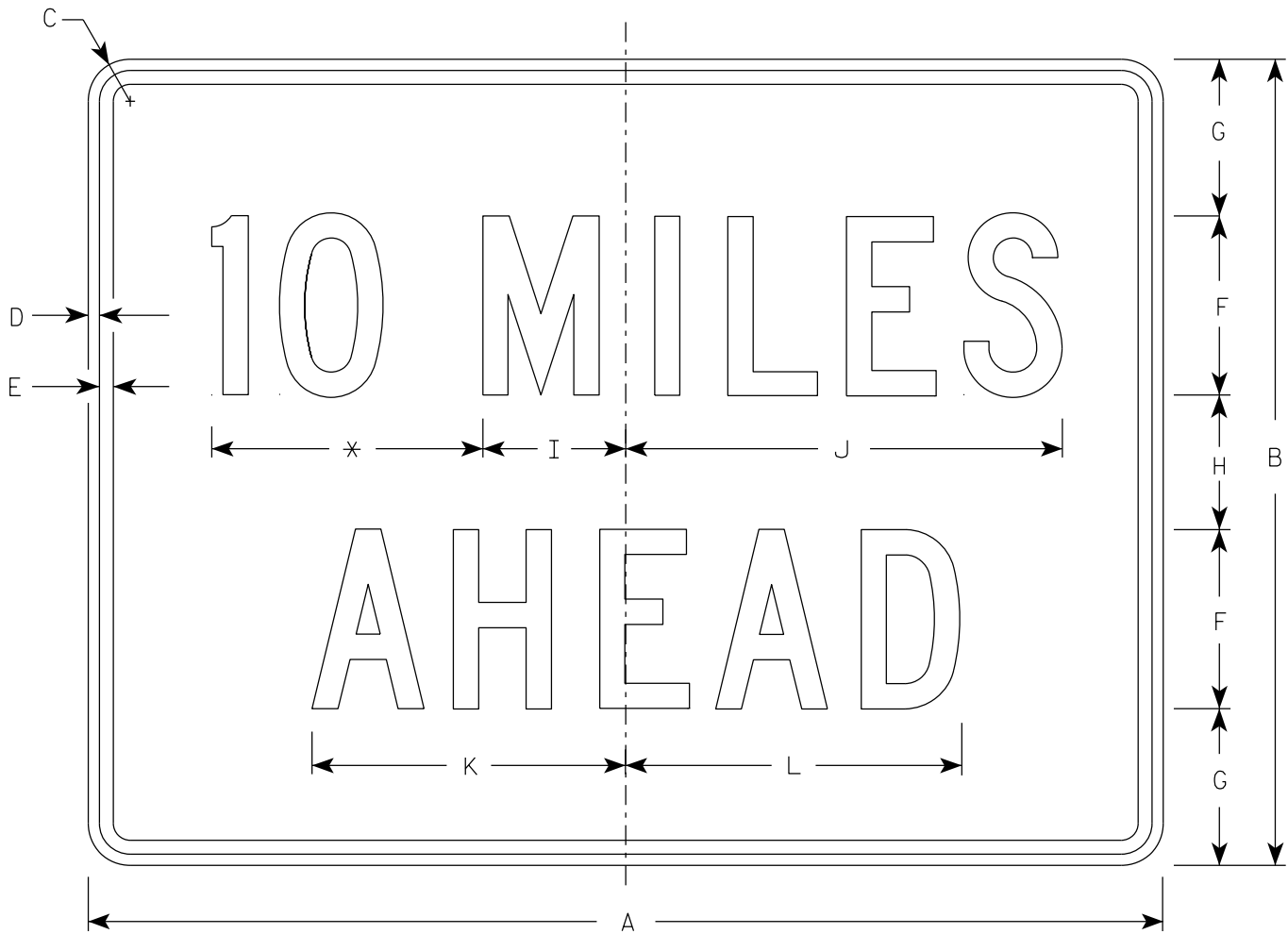
W12-52

WISCONSIN DEPT OF TRANSPORTATION

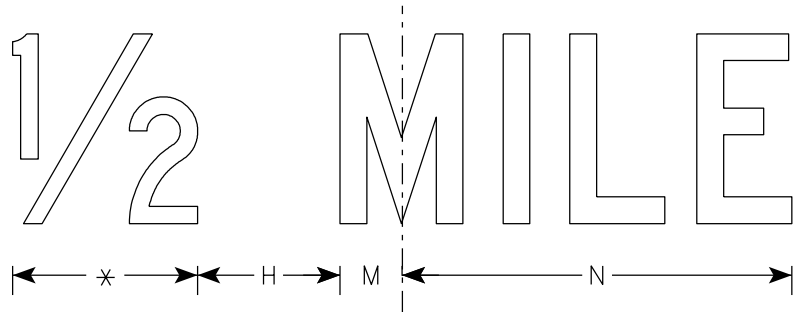
APPROVED *Matthew R. Rauch*  
For State Traffic Engineer

DATE 3/10/2024 PLATE NO. W12-52.8

7



W057-52



\* See note 5

NOTES

- 1. Sign is Type II - Type F Reflective
- 2. Color:  
Background - Orange  
Message - Black
- 3. Message Series - C
- 4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
- 5. Substitute appropriate numerals to the nearest quarter mile and optically adjust spacing to achieve proper balance.

7

| SIZE | A  | B  | C     | D   | E   | F | G     | H | I     | J      | K      | L      | M     | N      | O | P | Q | R | S | T | U | V | W | X | Y | Z | Area<br>sq. ft. |
|------|----|----|-------|-----|-----|---|-------|---|-------|--------|--------|--------|-------|--------|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| 1    | 36 | 24 | 1 1/2 | 3/8 | 1/2 | 6 | 4 1/2 | 3 | 4 3/4 | 14 5/8 | 10 5/8 | 11 3/8 | 2     | 12     |   |   |   |   |   |   |   |   |   |   |   |   | 6.0             |
| 2S   | 48 | 36 | 2 1/4 | 1/2 | 5/8 | 8 | 7     | 6 | 6 3/8 | 19 1/2 | 14     | 15     | 2 3/4 | 16 3/8 |   |   |   |   |   |   |   |   |   |   |   |   | 12.0            |
| 2M   | 48 | 36 | 2 1/4 | 1/2 | 5/8 | 8 | 7     | 6 | 6 3/8 | 19 1/2 | 14     | 15     | 2 3/4 | 16 3/8 |   |   |   |   |   |   |   |   |   |   |   |   | 12.0            |
| 3    | 48 | 36 | 2 1/4 | 1/2 | 5/8 | 8 | 7     | 6 | 6 3/8 | 19 1/2 | 14     | 15     | 2 3/4 | 16 3/8 |   |   |   |   |   |   |   |   |   |   |   |   | 12.0            |
| 4    | 48 | 36 | 2 1/4 | 1/2 | 5/8 | 8 | 7     | 6 | 6 3/8 | 19 1/2 | 14     | 15     | 2 3/4 | 16 3/8 |   |   |   |   |   |   |   |   |   |   |   |   | 12.0            |
| 5    | 48 | 36 | 2 1/4 | 1/2 | 5/8 | 8 | 7     | 6 | 6 3/8 | 19 1/2 | 14     | 15     | 2 3/4 | 16 3/8 |   |   |   |   |   |   |   |   |   |   |   |   | 12.0            |

STANDARD SIGN

W057-52

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*  
for State Traffic Engineer

DATE 2/1/2024 PLATE NO. W057-52.3

| DIVISION 4 - GUARDRAIL, LT |          |               |                                                         |                |                                      |                                                         |                |                        |                                                   |                         |                         |
|----------------------------|----------|---------------|---------------------------------------------------------|----------------|--------------------------------------|---------------------------------------------------------|----------------|------------------------|---------------------------------------------------|-------------------------|-------------------------|
|                            |          | AREA (SF)     |                                                         |                | INCREMENTAL VOLUME (CY) (UNADJUSTED) |                                                         |                | CUMULATIVE VOLUME (CY) |                                                   |                         |                         |
|                            |          | CUT<br>NOTE 1 | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1                        | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1          | SALVAGED/ UNUSABLE<br>PAVEMENT MATERIAL<br>NOTE 2 | EXPANDED FILL<br>NOTE 4 |                         |
| STATION                    | DISTANCE |               |                                                         |                |                                      |                                                         |                | 1.00                   | 1.00                                              | 1.25                    | MASS ORDINATE<br>NOTE 5 |
| 204+41 AH                  | 0        | 4             | 3                                                       | 0              | 0                                    | 0                                                       | 0              | 0                      | 0                                                 | 0                       | 0                       |
| 204+50                     | 9        | 3             | 3                                                       | 0              | 1                                    | 1                                                       | 0              | 1                      | 1                                                 | 0                       | 0                       |
| 204+79                     | 29       | 4             | 3                                                       | 1              | 4                                    | 4                                                       | 1              | 5                      | 5                                                 | 1                       | -1                      |
| 204+99                     | 20       | 3             | 3                                                       | 2              | 2                                    | 2                                                       | 1              | 7                      | 7                                                 | 2                       | -2                      |
| 205+00                     | 1        | 3             | 3                                                       | 3              | 0                                    | 0                                                       | 0              | 7                      | 7                                                 | 3                       | -2                      |
| 205+50                     | 50       | 3             | 3                                                       | 9              | 5                                    | 5                                                       | 11             | 13                     | 13                                                | 16                      | -13                     |
| 205+59                     | 9        | 3             | 3                                                       | 11             | 1                                    | 1                                                       | 3              | 14                     | 14                                                | 20                      | -16                     |
| 205+84                     | 25       | 2             | 2                                                       | 12             | 2                                    | 2                                                       | 11             | 16                     | 16                                                | 33                      | -27                     |
| 206+00                     | 16       | 3             | 3                                                       | 18             | 2                                    | 2                                                       | 9              | 18                     | 17                                                | 45                      | -36                     |
| 206+09                     | 9        | 3             | 3                                                       | 10             | 1                                    | 1                                                       | 5              | 19                     | 18                                                | 51                      | -40                     |
| 206+44                     | 35       | 2             | 2                                                       | 2              | 3                                    | 3                                                       | 8              | 22                     | 22                                                | 61                      | -48                     |
| 206+75                     | 31       | 3             | 3                                                       | 0              | 3                                    | 3                                                       | 1              | 25                     | 25                                                | 62                      | -50                     |
| 207+00                     | 25       | 3             | 3                                                       | 0              | 3                                    | 3                                                       | 0              | 27                     | 27                                                | 62                      | -50                     |
| 207+25                     | 25       | 3             | 3                                                       | 0              | 3                                    | 3                                                       | 0              | 30                     | 30                                                | 62                      | -50                     |
| 207+50                     | 25       | 3             | 3                                                       | 3              | 3                                    | 3                                                       | 1              | 32                     | 32                                                | 64                      | -51                     |
| 207+90                     | 41       | 3             | 3                                                       | 5              | 4                                    | 4                                                       | 6              | 37                     | 37                                                | 72                      | -57                     |
| 208+00                     | 10       | 3             | 3                                                       | 6              | 1                                    | 1                                                       | 2              | 38                     | 38                                                | 74                      | -59                     |
| 208+15                     | 15       | 4             | 4                                                       | 4              | 2                                    | 2                                                       | 3              | 40                     | 40                                                | 78                      | -62                     |
| 208+34                     | 19       | 22            | 3                                                       | 0              | 9                                    | 2                                                       | 2              | 49                     | 42                                                | 80                      | -57                     |
| 208+40                     | 6        | 29            | 3                                                       | 0              | 6                                    | 1                                                       | 0              | 54                     | 43                                                | 80                      | -52                     |
| 208+50                     | 10       | 6             | 3                                                       | 0              | 6                                    | 1                                                       | 0              | 61                     | 44                                                | 80                      | -47                     |
| 208+56                     | 6        | 5             | 3                                                       | 0              | 1                                    | 1                                                       | 0              | 62                     | 45                                                | 80                      | -47                     |
| 208+80                     | 24       | 9             | 3                                                       | 0              | 6                                    | 3                                                       | 0              | 68                     | 48                                                | 80                      | -43                     |
| 209+00                     | 20       | 4             | 3                                                       | 2              | 5                                    | 2                                                       | 1              | 73                     | 50                                                | 81                      | -42                     |
| 209+20                     | 20       | 3             | 3                                                       | 3              | 3                                    | 3                                                       | 2              | 76                     | 53                                                | 84                      | -44                     |
| 209+50                     | 30       | 3             | 3                                                       | 4              | 4                                    | 4                                                       | 4              | 79                     | 56                                                | 88                      | -48                     |
| 209+59 BK                  | 9        | 3             | 3                                                       | 3              | 1                                    | 1                                                       | 1              | 80                     | 57                                                | 90                      | -49                     |
|                            |          |               |                                                         |                | 80                                   | 57                                                      | 72             |                        |                                                   |                         |                         |

|                                                                                        |
|----------------------------------------------------------------------------------------|
| NOTES:                                                                                 |
| 1 - CUT INCLUDES SALVAGED/UNUSABLE PAVEMENT MATERIAL.                                  |
| 2 - SALVAGED/UNUSABLE PAVEMENT MATERIAL = (AREA OF PROJECT PAVEMENT) * (TYPICAL DEPTH) |
| 3 - FILL DOES NOT INCLUDE SALVAGED/UNUSABLE PAVEMENT AREA/VOLUME.                      |
| 4 - EXPANDED FILL = (UNEXPANDED MATERIAL)*(EXPANSION FACTOR)                           |
| 5 - MASS ORDINATE = CUT - (EXPANDED FILL); POSITIVE INDICATES AN EXCESS OF MATERIAL    |

| DIVISION 4 - GUARDRAIL, LT |          |               |                                                         |                |                                      |                                                         |                |                        |                                                         |                         |                         |
|----------------------------|----------|---------------|---------------------------------------------------------|----------------|--------------------------------------|---------------------------------------------------------|----------------|------------------------|---------------------------------------------------------|-------------------------|-------------------------|
| STATION                    | DISTANCE | AREA (SF)     |                                                         |                | INCREMENTAL VOLUME (CY) (UNADJUSTED) |                                                         |                | CUMULATIVE VOLUME (CY) |                                                         |                         | MASS ORDINATE<br>NOTE 5 |
|                            |          | CUT<br>NOTE 1 | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1                        | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1          | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | EXPANDED FILL<br>NOTE 4 |                         |
|                            |          |               |                                                         |                |                                      |                                                         |                |                        |                                                         |                         |                         |
| 224+89 AH                  | 0        | 4             | 3                                                       | 0              | 0                                    | 0                                                       | 0              | 0                      | 0                                                       | 0                       | 0                       |
| 225+00                     | 11       | 4             | 3                                                       | 0              | 2                                    | 1                                                       | 0              | 2                      | 1                                                       | 0                       | 0                       |
| 225+25                     | 25       | 4             | 3                                                       | 0              | 3                                    | 3                                                       | 0              | 5                      | 4                                                       | 0                       | 0                       |
| 225+47                     | 22       | 4             | 3                                                       | 2              | 3                                    | 3                                                       | 1              | 8                      | 7                                                       | 1                       | 0                       |
| 225+66                     | 18       | 4             | 3                                                       | 3              | 2                                    | 2                                                       | 2              | 11                     | 10                                                      | 4                       | -2                      |
| 225+90                     | 24       | 4             | 3                                                       | 2              | 4                                    | 3                                                       | 3              | 14                     | 13                                                      | 7                       | -4                      |
| 226+00                     | 10       | 5             | 3                                                       | 1              | 2                                    | 1                                                       | 1              | 16                     | 14                                                      | 8                       | -4                      |
| 226+07                     | 7        | 5             | 3                                                       | 1              | 1                                    | 1                                                       | 0              | 17                     | 15                                                      | 8                       | -4                      |
| 226+14                     | 6        | 5             | 3                                                       | 0              | 1                                    | 1                                                       | 0              | 18                     | 16                                                      | 8                       | -4                      |
| 226+32                     | 19       | 5             | 3                                                       | 0              | 4                                    | 2                                                       | 0              | 22                     | 18                                                      | 8                       | -3                      |
| 226+57                     | 25       | 5             | 3                                                       | 0              | 5                                    | 3                                                       | 0              | 26                     | 21                                                      | 9                       | -2                      |
| 227+00                     | 43       | 5             | 3                                                       | 2              | 7                                    | 5                                                       | 2              | 34                     | 26                                                      | 11                      | -1                      |
| 227+50                     | 50       | 5             | 3                                                       | 1              | 9                                    | 6                                                       | 3              | 42                     | 33                                                      | 14                      | -2                      |
| 227+67                     | 17       | 5             | 3                                                       | 70             | 3                                    | 2                                                       | 22             | 46                     | 35                                                      | 42                      | -23                     |
| 228+00                     | 33       | 5             | 3                                                       | 5              | 6                                    | 4                                                       | 46             | 52                     | 39                                                      | 100                     | -67                     |
| 228+50                     | 50       | 4             | 3                                                       | 3              | 8                                    | 6                                                       | 8              | 60                     | 45                                                      | 109                     | -73                     |
| 228+76                     | 26       | 3             | 3                                                       | 5              | 4                                    | 3                                                       | 4              | 63                     | 48                                                      | 114                     | -76                     |
| 228+89                     | 12       | 3             | 3                                                       | 3              | 2                                    | 2                                                       | 2              | 65                     | 50                                                      | 116                     | -78                     |
| 229+01                     | 13       | 4             | 3                                                       | 1              | 2                                    | 2                                                       | 1              | 66                     | 51                                                      | 117                     | -79                     |
| 229+14                     | 12       | 3             | 3                                                       | 1              | 2                                    | 2                                                       | 0              | 68                     | 53                                                      | 118                     | -79                     |
| 229+26                     | 13       | 2             | 2                                                       | 6              | 1                                    | 1                                                       | 2              | 69                     | 54                                                      | 120                     | -81                     |
| 229+39                     | 12       | 2             | 2                                                       | 7              | 1                                    | 1                                                       | 3              | 70                     | 55                                                      | 124                     | -84                     |
| 229+50                     | 11       | 3             | 3                                                       | 6              | 1                                    | 1                                                       | 3              | 71                     | 56                                                      | 127                     | -87                     |
| 229+86                     | 36       | 3             | 3                                                       | 3              | 4                                    | 4                                                       | 6              | 75                     | 60                                                      | 135                     | -93                     |
| 229+99                     | 12       | 3             | 3                                                       | 2              | 2                                    | 2                                                       | 1              | 77                     | 62                                                      | 137                     | -95                     |
| 230+45 BK                  | 46       | 4             | 3                                                       | 0              | 6                                    | 6                                                       | 2              | 83                     | 68                                                      | 139                     | -96                     |
|                            |          |               |                                                         |                | 83                                   | 68                                                      | 111            |                        |                                                         |                         |                         |

|                                                                                        |
|----------------------------------------------------------------------------------------|
| NOTES:                                                                                 |
| 1 - CUT INCLUDES SALVAGED/UNUSABLE PAVEMENT MATERIAL.                                  |
| 2 - SALVAGED/UNUSABLE PAVEMENT MATERIAL = (AREA OF PROJECT PAVEMENT) * (TYPICAL DEPTH) |
| 3 - FILL DOES NOT INCLUDE SALVAGED/UNUSABLE PAVEMENT AREA/VOLUME.                      |
| 4 - EXPANDED FILL = (UNEXPANDED MATERIAL)*(EXPANSION FACTOR)                           |
| 5 - MASS ORDINATE = CUT - (EXPANDED FILL); POSITIVE INDICATES AN EXCESS OF MATERIAL    |

| DIVISION 4 - GUARDRAIL, RT |          |               |                                                         |                |                                      |                                                         |                |                        |                                                         |                         |                         |
|----------------------------|----------|---------------|---------------------------------------------------------|----------------|--------------------------------------|---------------------------------------------------------|----------------|------------------------|---------------------------------------------------------|-------------------------|-------------------------|
| STATION                    | DISTANCE | AREA (SF)     |                                                         |                | INCREMENTAL VOLUME (CY) (UNADJUSTED) |                                                         |                | CUMULATIVE VOLUME (CY) |                                                         |                         | MASS ORDINATE<br>NOTE 5 |
|                            |          | CUT<br>NOTE 1 | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1                        | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1          | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | EXPANDED FILL<br>NOTE 4 |                         |
|                            |          |               |                                                         |                |                                      |                                                         |                | 1.00                   | 1.00                                                    | 1.25                    |                         |
| 224+89 AH                  | 0        | 4             | 3                                                       | 0              | 0                                    | 0                                                       | 0              | 0                      | 0                                                       | 0                       | 0                       |
| 225+00                     | 11       | 4             | 3                                                       | 0              | 2                                    | 1                                                       | 0              | 2                      | 1                                                       | 0                       | 0                       |
| 225+25                     | 25       | 4             | 3                                                       | 1              | 4                                    | 3                                                       | 1              | 6                      | 4                                                       | 1                       | 0                       |
| 225+47                     | 22       | 13            | 3                                                       | 4              | 7                                    | 3                                                       | 2              | 13                     | 7                                                       | 4                       | 3                       |
| 225+66                     | 18       | 18            | 3                                                       | 5              | 11                                   | 2                                                       | 3              | 23                     | 10                                                      | 7                       | 8                       |
| 225+90                     | 24       | 5             | 3                                                       | 2              | 10                                   | 3                                                       | 3              | 34                     | 13                                                      | 11                      | 12                      |
| 226+00                     | 10       | 4             | 3                                                       | 1              | 2                                    | 1                                                       | 0              | 35                     | 14                                                      | 11                      | 12                      |
| 226+07                     | 7        | 23            | 3                                                       | 5              | 4                                    | 1                                                       | 1              | 39                     | 15                                                      | 12                      | 14                      |
| 226+14                     | 6        | 20            | 3                                                       | 7              | 5                                    | 1                                                       | 1              | 44                     | 16                                                      | 14                      | 17                      |
| 226+32                     | 19       | 16            | 3                                                       | 2              | 13                                   | 2                                                       | 3              | 57                     | 18                                                      | 18                      | 24                      |
| 226+57                     | 25       | 9             | 3                                                       | 1              | 11                                   | 3                                                       | 2              | 68                     | 21                                                      | 20                      | 31                      |
| 227+00                     | 43       | 7             | 3                                                       | 2              | 12                                   | 5                                                       | 3              | 81                     | 26                                                      | 24                      | 35                      |
| 227+50                     | 50       | 6             | 3                                                       | 0              | 12                                   | 6                                                       | 2              | 92                     | 33                                                      | 26                      | 39                      |
| 227+67                     | 17       | 5             | 3                                                       | 63             | 3                                    | 2                                                       | 20             | 95                     | 35                                                      | 51                      | 20                      |
| 228+00                     | 33       | 6             | 3                                                       | 0              | 7                                    | 4                                                       | 39             | 102                    | 39                                                      | 99                      | -16                     |
| 228+50                     | 50       | 5             | 3                                                       | 0              | 10                                   | 6                                                       | 0              | 112                    | 45                                                      | 100                     | -13                     |
| 228+76                     | 26       | 4             | 3                                                       | 0              | 5                                    | 3                                                       | 0              | 117                    | 48                                                      | 100                     | -12                     |
| 228+89                     | 12       | 6             | 3                                                       | 0              | 2                                    | 2                                                       | 0              | 119                    | 50                                                      | 100                     | -11                     |
| 229+01                     | 13       | 4             | 3                                                       | 5              | 2                                    | 2                                                       | 1              | 121                    | 52                                                      | 101                     | -11                     |
| 229+14                     | 12       | 4             | 3                                                       | 5              | 2                                    | 2                                                       | 2              | 123                    | 53                                                      | 104                     | -13                     |
| 229+26                     | 13       | 3             | 3                                                       | 7              | 2                                    | 2                                                       | 3              | 125                    | 55                                                      | 108                     | -16                     |
| 229+39                     | 12       | 3             | 3                                                       | 16             | 2                                    | 2                                                       | 5              | 126                    | 56                                                      | 115                     | -22                     |
| 229+50                     | 11       | 4             | 3                                                       | 12             | 2                                    | 1                                                       | 6              | 128                    | 58                                                      | 122                     | -27                     |
| 229+86                     | 36       | 4             | 3                                                       | 6              | 5                                    | 5                                                       | 12             | 133                    | 62                                                      | 137                     | -39                     |
| 229+99                     | 12       | 4             | 3                                                       | 5              | 2                                    | 2                                                       | 3              | 135                    | 64                                                      | 140                     | -41                     |
| 230+45                     | 46       | 3             | 3                                                       | 2              | 6                                    | 6                                                       | 7              | 141                    | 69                                                      | 148                     | -47                     |
| 230+57 BK                  | 12       | 0             | 0                                                       | 1              | 1                                    | 1                                                       | 1              | 142                    | 70                                                      | 149                     | -48                     |
|                            |          |               |                                                         |                | 142                                  | 70                                                      | 120            |                        |                                                         |                         |                         |

NOTES:

1 - CUT INCLUDES SALVAGED/UNUSABLE PAVEMENT MATERIAL.

2 - SALVAGED/UNUSABLE PAVEMENT MATERIAL = (AREA OF PROJECT PAVEMENT) \* (TYPICAL DEPTH)

3 - FILL DOES NOT INCLUDE SALVAGED/UNUSABLE PAVEMENT AREA/VOLUME.

4 - EXPANDED FILL = (UNEXPANDED MATERIAL)\*(EXPANSION FACTOR)

5 - MASS ORDINATE = CUT - (EXPANDED FILL); POSITIVE INDICATES AN EXCESS OF MATERIAL

| DIVISION 4 - DITCH GRADING, RT |          |               |                                                         |                |                                      |                                                         |                |                        |                                                         |                         |                         |
|--------------------------------|----------|---------------|---------------------------------------------------------|----------------|--------------------------------------|---------------------------------------------------------|----------------|------------------------|---------------------------------------------------------|-------------------------|-------------------------|
| STATION                        | DISTANCE | AREA (SF)     |                                                         |                | INCREMENTAL VOLUME (CY) (UNADJUSTED) |                                                         |                | CUMULATIVE VOLUME (CY) |                                                         |                         | MASS ORDINATE<br>NOTE 5 |
|                                |          | CUT<br>NOTE 1 | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1                        | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1          | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | EXPANDED FILL<br>NOTE 4 |                         |
|                                |          |               |                                                         |                |                                      |                                                         |                | 1.00                   | 1.00                                                    | 1.25                    |                         |
| 300+75 AH                      | 0        | 6             | 4                                                       | 0              | 0                                    | 0                                                       | 0              | 0                      | 0                                                       | 0                       | 0                       |
| 301+00                         | 25       | 7             | 4                                                       | 0              | 6                                    | 4                                                       | 0              | 6                      | 4                                                       | 0                       | 2                       |
| 301+50                         | 50       | 8             | 4                                                       | 0              | 13                                   | 8                                                       | 0              | 19                     | 11                                                      | 1                       | 7                       |
| 302+00                         | 50       | 5             | 4                                                       | 0              | 12                                   | 8                                                       | 0              | 31                     | 19                                                      | 1                       | 11                      |
| 302+50                         | 50       | 6             | 4                                                       | 0              | 10                                   | 8                                                       | 0              | 41                     | 27                                                      | 2                       | 13                      |
| 303+00                         | 50       | 6             | 4                                                       | 1              | 11                                   | 8                                                       | 1              | 52                     | 34                                                      | 3                       | 15                      |
| 303+50                         | 50       | 7             | 4                                                       | 1              | 12                                   | 8                                                       | 2              | 64                     | 42                                                      | 6                       | 17                      |
| 304+00                         | 50       | 4             | 4                                                       | 1              | 10                                   | 7                                                       | 2              | 74                     | 49                                                      | 8                       | 18                      |
| 304+50                         | 50       | 4             | 4                                                       | 0              | 7                                    | 7                                                       | 1              | 81                     | 57                                                      | 10                      | 17                      |
| 305+00                         | 50       | 4             | 4                                                       | 4              | 7                                    | 7                                                       | 4              | 88                     | 64                                                      | 15                      | 12                      |
| 305+50                         | 50       | 3             | 3                                                       | 14             | 6                                    | 6                                                       | 17             | 95                     | 70                                                      | 37                      | -5                      |
| 305+81                         | 31       | 3             | 3                                                       | 65             | 4                                    | 4                                                       | 46             | 98                     | 74                                                      | 94                      | -51                     |
| 306+00                         | 19       | 3             | 3                                                       | 33             | 2                                    | 2                                                       | 34             | 101                    | 76                                                      | 136                     | -85                     |
| 306+47 BK                      | 47       | 4             | 4                                                       | 4              | 6                                    | 6                                                       | 32             | 107                    | 83                                                      | 176                     | -116                    |
|                                |          |               |                                                         |                | 107                                  | 83                                                      | 141            |                        |                                                         |                         |                         |

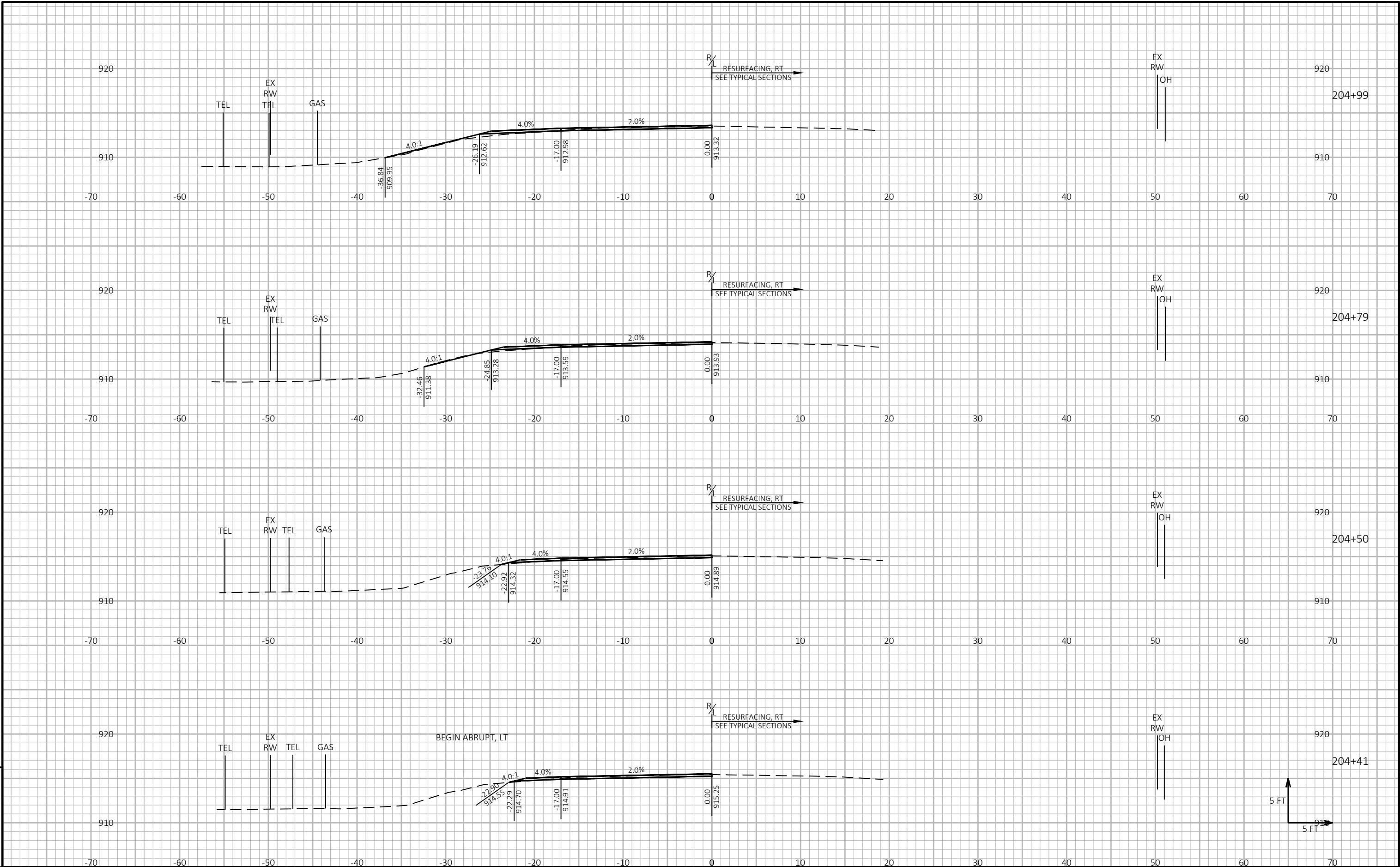
| DIVISION 4 - DITCH GRADING AND GUARDRAIL, RT |          |               |                                                         |                |                                      |                                                         |                |                        |                                                         |                         |                         |
|----------------------------------------------|----------|---------------|---------------------------------------------------------|----------------|--------------------------------------|---------------------------------------------------------|----------------|------------------------|---------------------------------------------------------|-------------------------|-------------------------|
| STATION                                      | DISTANCE | AREA (SF)     |                                                         |                | INCREMENTAL VOLUME (CY) (UNADJUSTED) |                                                         |                | CUMULATIVE VOLUME (CY) |                                                         |                         | MASS ORDINATE<br>NOTE 5 |
|                                              |          | CUT<br>NOTE 1 | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1                        | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1          | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | EXPANDED FILL<br>NOTE 4 |                         |
|                                              |          |               |                                                         |                |                                      |                                                         |                | 1.00                   | 1.00                                                    | 1.25                    |                         |
| 488+88 AH                                    | 0        | 7             | 5                                                       | 1              | 0                                    | 0                                                       | 0              | 0                      | 0                                                       | 0                       | 0                       |
| 489+00                                       | 12       | 8             | 5                                                       | 2              | 3                                    | 2                                                       | 1              | 3                      | 2                                                       | 1                       | 0                       |
| 489+50                                       | 50       | 12            | 5                                                       | 2              | 18                                   | 9                                                       | 4              | 21                     | 11                                                      | 5                       | 6                       |
| 490+00                                       | 50       | 18            | 5                                                       | 2              | 27                                   | 9                                                       | 4              | 48                     | 20                                                      | 10                      | 20                      |
| 490+50                                       | 50       | 22            | 5                                                       | 2              | 37                                   | 9                                                       | 4              | 85                     | 29                                                      | 15                      | 44                      |
| 491+00                                       | 50       | 23            | 5                                                       | 1              | 41                                   | 9                                                       | 2              | 126                    | 38                                                      | 18                      | 74                      |
| 491+50                                       | 50       | 28            | 5                                                       | 1              | 47                                   | 9                                                       | 2              | 173                    | 47                                                      | 20                      | 109                     |
| 492+00                                       | 50       | 31            | 5                                                       | 1              | 54                                   | 9                                                       | 2              | 227                    | 56                                                      | 23                      | 153                     |
| 492+50                                       | 50       | 30            | 5                                                       | 1              | 56                                   | 9                                                       | 1              | 284                    | 65                                                      | 24                      | 199                     |
| 492+70                                       | 20       | 3             | 3                                                       | 5              | 12                                   | 3                                                       | 2              | 296                    | 68                                                      | 27                      | 206                     |
| 492+90                                       | 20       | 7             | 5                                                       | 2              | 4                                    | 3                                                       | 2              | 300                    | 71                                                      | 30                      | 204                     |
| 493+00                                       | 10       | 12            | 5                                                       | 2              | 3                                    | 2                                                       | 1              | 303                    | 73                                                      | 31                      | 205                     |
| 493+49                                       | 49       | 12            | 5                                                       | 0              | 21                                   | 9                                                       | 2              | 324                    | 82                                                      | 33                      | 215                     |
| 493+49                                       | 1        | 12            | 5                                                       | 0              | 0                                    | 0                                                       | 0              | 324                    | 82                                                      | 33                      | 215                     |
| 493+93                                       | 43       | 3             | 3                                                       | 2              | 11                                   | 6                                                       | 2              | 336                    | 88                                                      | 35                      | 219                     |
| 494+00                                       | 7        | 3             | 3                                                       | 3              | 1                                    | 1                                                       | 1              | 336                    | 89                                                      | 36                      | 219                     |
| 494+15                                       | 15       | 3             | 3                                                       | 5              | 2                                    | 2                                                       | 2              | 338                    | 90                                                      | 39                      | 216                     |
| 494+23                                       | 7        | 3             | 3                                                       | 5              | 1                                    | 1                                                       | 1              | 339                    | 91                                                      | 41                      | 215                     |
| 494+40                                       | 18       | 5             | 5                                                       | 1              | 3                                    | 3                                                       | 2              | 341                    | 94                                                      | 43                      | 213                     |
| 494+48                                       | 7        | 5             | 5                                                       | 1              | 1                                    | 1                                                       | 0              | 343                    | 95                                                      | 43                      | 213                     |
| 494+65                                       | 18       | 6             | 5                                                       | 0              | 4                                    | 3                                                       | 0              | 346                    | 98                                                      | 43                      | 213                     |
| 494+73                                       | 7        | 6             | 5                                                       | 0              | 2                                    | 1                                                       | 0              | 348                    | 100                                                     | 43                      | 214                     |
| 495+00                                       | 27       | 6             | 5                                                       | 0              | 6                                    | 5                                                       | 0              | 354                    | 105                                                     | 44                      | 214                     |
| 495+25                                       | 25       | 6             | 5                                                       | 0              | 5                                    | 5                                                       | 0              | 359                    | 109                                                     | 44                      | 215                     |
| 496+00                                       | 75       | 6             | 5                                                       | 0              | 16                                   | 14                                                      | 0              | 375                    | 123                                                     | 44                      | 218                     |
| 496+46                                       | 46       | 8             | 5                                                       | 0              | 12                                   | 8                                                       | 0              | 387                    | 131                                                     | 44                      | 221                     |
| 496+71 BK                                    | 25       | 6             | 5                                                       | 0              | 6                                    | 5                                                       | 0              | 393                    | 136                                                     | 44                      | 223                     |
|                                              |          |               |                                                         |                | 393                                  | 136                                                     | 35             |                        |                                                         |                         |                         |

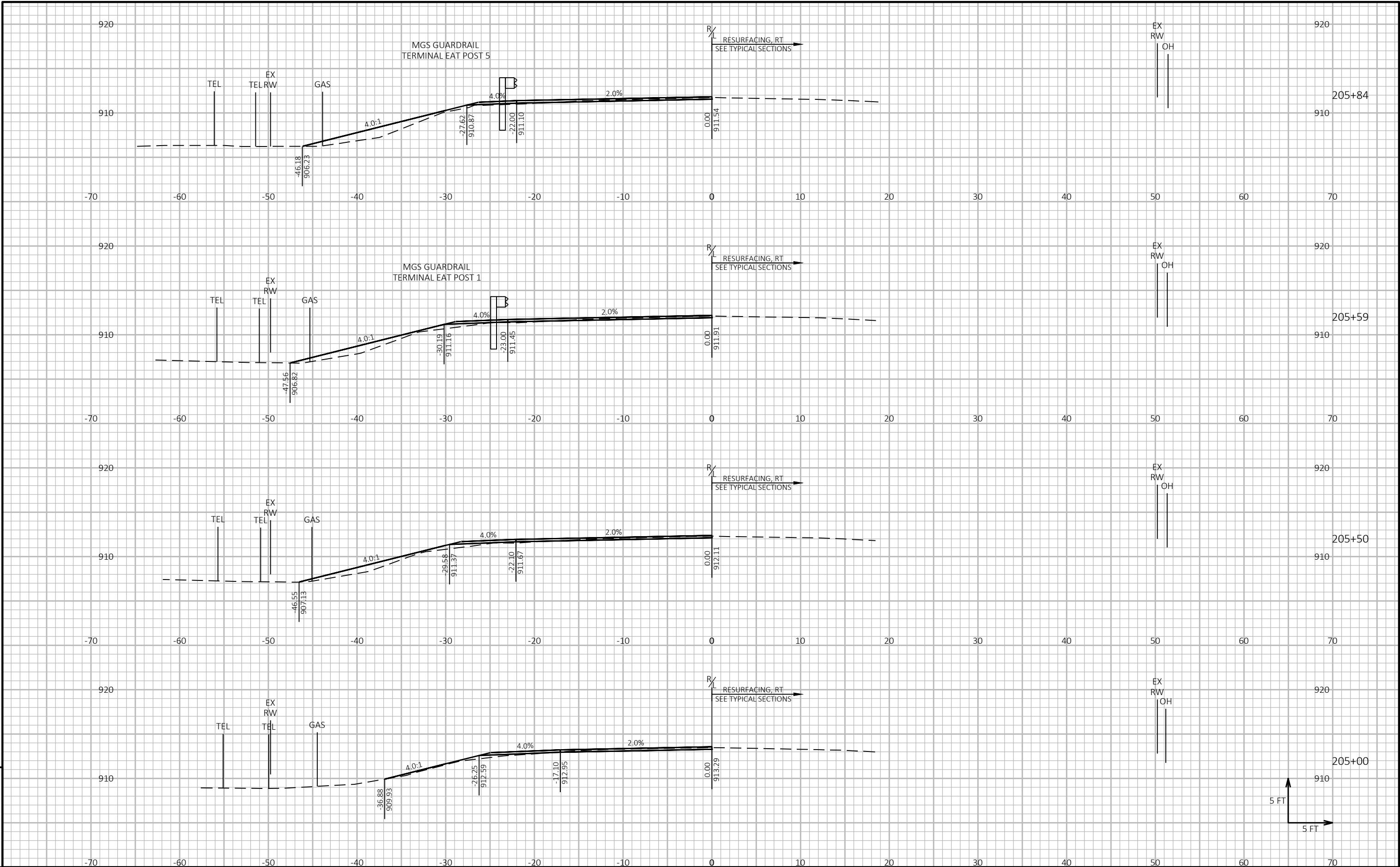
|                                                                                        |
|----------------------------------------------------------------------------------------|
| NOTES:                                                                                 |
| 1 - CUT INCLUDES SALVAGED/UNUSABLE PAVEMENT MATERIAL.                                  |
| 2 - SALVAGED/UNUSABLE PAVEMENT MATERIAL = (AREA OF PROJECT PAVEMENT) * (TYPICAL DEPTH) |
| 3 - FILL DOES NOT INCLUDE SALVAGED/UNUSABLE PAVEMENT AREA/VOLUME.                      |
| 4 - EXPANDED FILL = (UNEXPANDED MATERIAL)*(EXPANSION FACTOR)                           |
| 5 - MASS ORDINATE = CUT - (EXPANDED FILL); POSITIVE INDICATES AN EXCESS OF MATERIAL    |

| DIVISION 4 - GUARDRAIL, LT |          |               |                                                         |                |                                      |                                                         |                |                        |                                                         |                         |                         |
|----------------------------|----------|---------------|---------------------------------------------------------|----------------|--------------------------------------|---------------------------------------------------------|----------------|------------------------|---------------------------------------------------------|-------------------------|-------------------------|
| STATION                    | DISTANCE | AREA (SF)     |                                                         |                | INCREMENTAL VOLUME (CY) (UNADJUSTED) |                                                         |                | CUMULATIVE VOLUME (CY) |                                                         |                         | MASS ORDINATE<br>NOTE 5 |
|                            |          | CUT<br>NOTE 1 | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1                        | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1          | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | EXPANDED FILL<br>NOTE 4 |                         |
|                            |          |               |                                                         |                |                                      |                                                         |                | 1.00                   | 1.00                                                    | 1.25                    |                         |
| 493+49 AH                  | 0        | 5             | 5                                                       | 0              | 0                                    | 0                                                       | 0              | 0                      | 0                                                       | 0                       | 0                       |
| 493+93                     | 43       | 5             | 5                                                       | 0              | 8                                    | 7                                                       | 0              | 8                      | 7                                                       | 0                       | 1                       |
| 494+00                     | 7        | 5             | 5                                                       | 0              | 1                                    | 1                                                       | 0              | 10                     | 8                                                       | 0                       | 1                       |
| 494+15                     | 15       | 6             | 5                                                       | 0              | 3                                    | 3                                                       | 0              | 13                     | 11                                                      | 0                       | 2                       |
| 494+23                     | 7        | 5             | 5                                                       | 2              | 1                                    | 1                                                       | 0              | 14                     | 12                                                      | 0                       | 2                       |
| 494+40                     | 18       | 6             | 5                                                       | 0              | 4                                    | 3                                                       | 1              | 18                     | 15                                                      | 1                       | 2                       |
| 494+48                     | 7        | 6             | 5                                                       | 0              | 2                                    | 1                                                       | 0              | 20                     | 16                                                      | 1                       | 2                       |
| 494+65                     | 18       | 6             | 5                                                       | 0              | 4                                    | 3                                                       | 0              | 24                     | 19                                                      | 1                       | 3                       |
| 494+73                     | 7        | 6             | 5                                                       | 0              | 2                                    | 1                                                       | 0              | 25                     | 21                                                      | 1                       | 4                       |
| 495+00                     | 27       | 6             | 5                                                       | 0              | 6                                    | 5                                                       | 0              | 32                     | 25                                                      | 1                       | 6                       |
| 495+25 BK                  | 25       | 8             | 5                                                       | 0              | 7                                    | 4                                                       | 0              | 38                     | 29                                                      | 1                       | 8                       |
|                            |          |               |                                                         |                | 38                                   | 29                                                      | 1              |                        |                                                         |                         |                         |

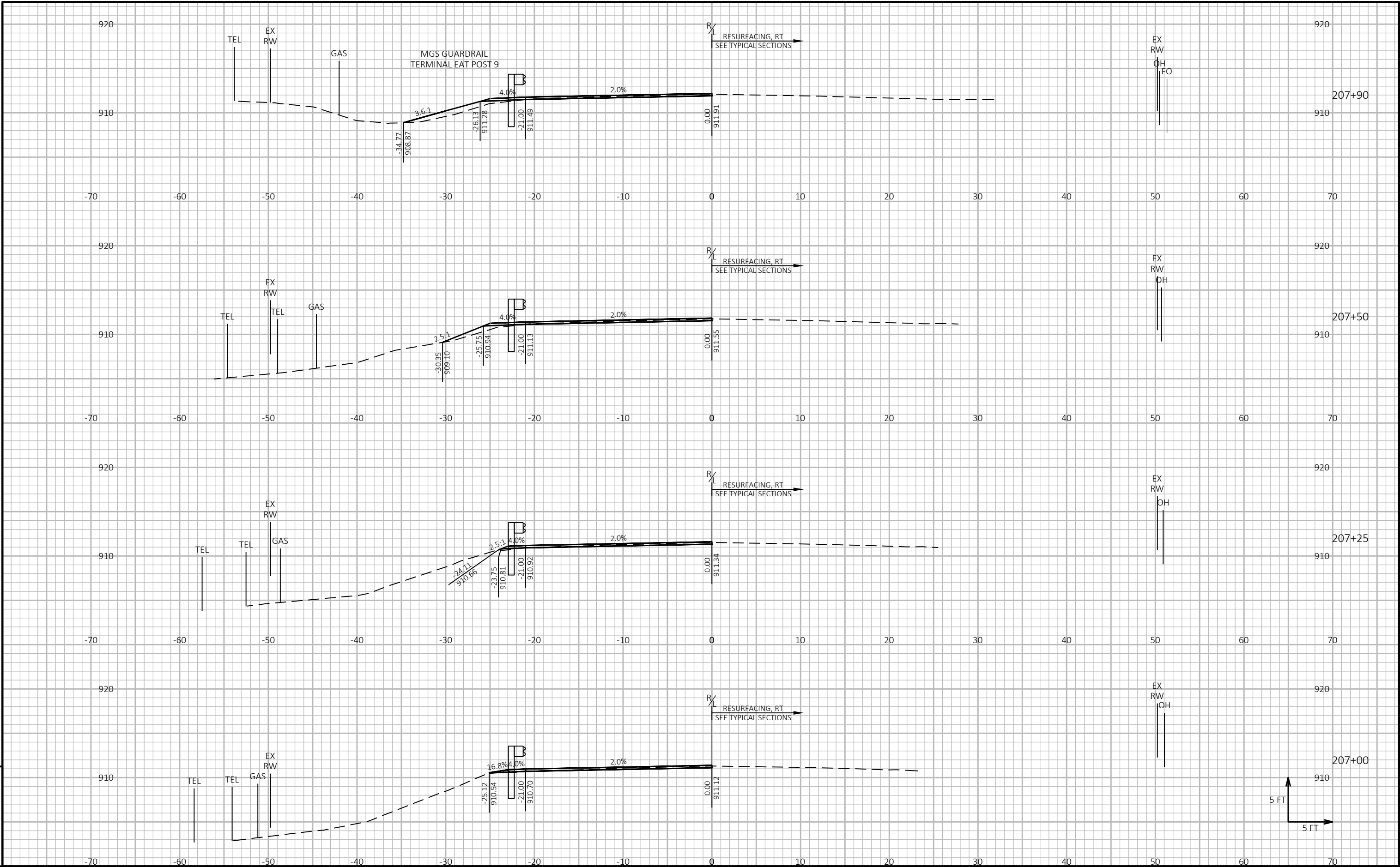
| DIVISION 4 - DITCH GRADING |          |               |                                                         |                |                                      |                                                         |                |                        |                                                         |                         |                         |
|----------------------------|----------|---------------|---------------------------------------------------------|----------------|--------------------------------------|---------------------------------------------------------|----------------|------------------------|---------------------------------------------------------|-------------------------|-------------------------|
| STATION                    | DISTANCE | AREA (SF)     |                                                         |                | INCREMENTAL VOLUME (CY) (UNADJUSTED) |                                                         |                | CUMULATIVE VOLUME (CY) |                                                         |                         | MASS ORDINATE<br>NOTE 5 |
|                            |          | CUT<br>NOTE 1 | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1                        | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | FILL<br>NOTE 3 | CUT<br>NOTE 1          | SALVAGED/<br>UNUSABLE<br>PAVEMENT<br>MATERIAL<br>NOTE 2 | EXPANDED FILL<br>NOTE 4 |                         |
|                            |          |               |                                                         |                |                                      |                                                         |                | 1.00                   | 1.00                                                    | 1.25                    |                         |
| 11+20 AH                   | 0        | 165           | 0                                                       | 0              | 0                                    | 0                                                       | 0              | 0                      | 0                                                       | 0                       | 0                       |
| 11+25                      | 5        | 159           | 0                                                       | 0              | 31                                   | 0                                                       | 0              | 31                     | 0                                                       | 0                       | 31                      |
| 11+50                      | 25       | 123           | 0                                                       | 0              | 130                                  | 0                                                       | 0              | 161                    | 0                                                       | 0                       | 161                     |
| 11+75                      | 25       | 98            | 0                                                       | 0              | 102                                  | 0                                                       | 0              | 263                    | 0                                                       | 0                       | 263                     |
| 12+00                      | 25       | 67            | 0                                                       | 0              | 76                                   | 0                                                       | 0              | 339                    | 0                                                       | 0                       | 339                     |
| 12+25                      | 25       | 46            | 0                                                       | 0              | 52                                   | 0                                                       | 0              | 391                    | 0                                                       | 0                       | 391                     |
| 12+50                      | 25       | 26            | 0                                                       | 0              | 34                                   | 0                                                       | 0              | 425                    | 0                                                       | 0                       | 425                     |
| 12+75                      | 25       | 16            | 0                                                       | 0              | 19                                   | 0                                                       | 0              | 445                    | 0                                                       | 0                       | 445                     |
| 13+00                      | 25       | 5             | 0                                                       | 0              | 9                                    | 0                                                       | 0              | 454                    | 0                                                       | 0                       | 454                     |
| 13+13 BK                   | 13       | 1             | 0                                                       | 0              | 1                                    | 0                                                       | 0              | 455                    | 0                                                       | 0                       | 455                     |
|                            |          |               |                                                         |                | 455                                  | 0                                                       | 0              |                        |                                                         |                         |                         |

|                                                                                        |
|----------------------------------------------------------------------------------------|
| NOTES:                                                                                 |
| 1 - CUT INCLUDES SALVAGED/UNUSABLE PAVEMENT MATERIAL.                                  |
| 2 - SALVAGED/UNUSABLE PAVEMENT MATERIAL = (AREA OF PROJECT PAVEMENT) * (TYPICAL DEPTH) |
| 3 - FILL DOES NOT INCLUDE SALVAGED/UNUSABLE PAVEMENT AREA/VOLUME.                      |
| 4 - EXPANDED FILL = (UNEXPANDED MATERIAL)*(EXPANSION FACTOR)                           |
| 5 - MASS ORDINATE = CUT - (EXPANDED FILL); POSITIVE INDICATES AN EXCESS OF MATERIAL    |

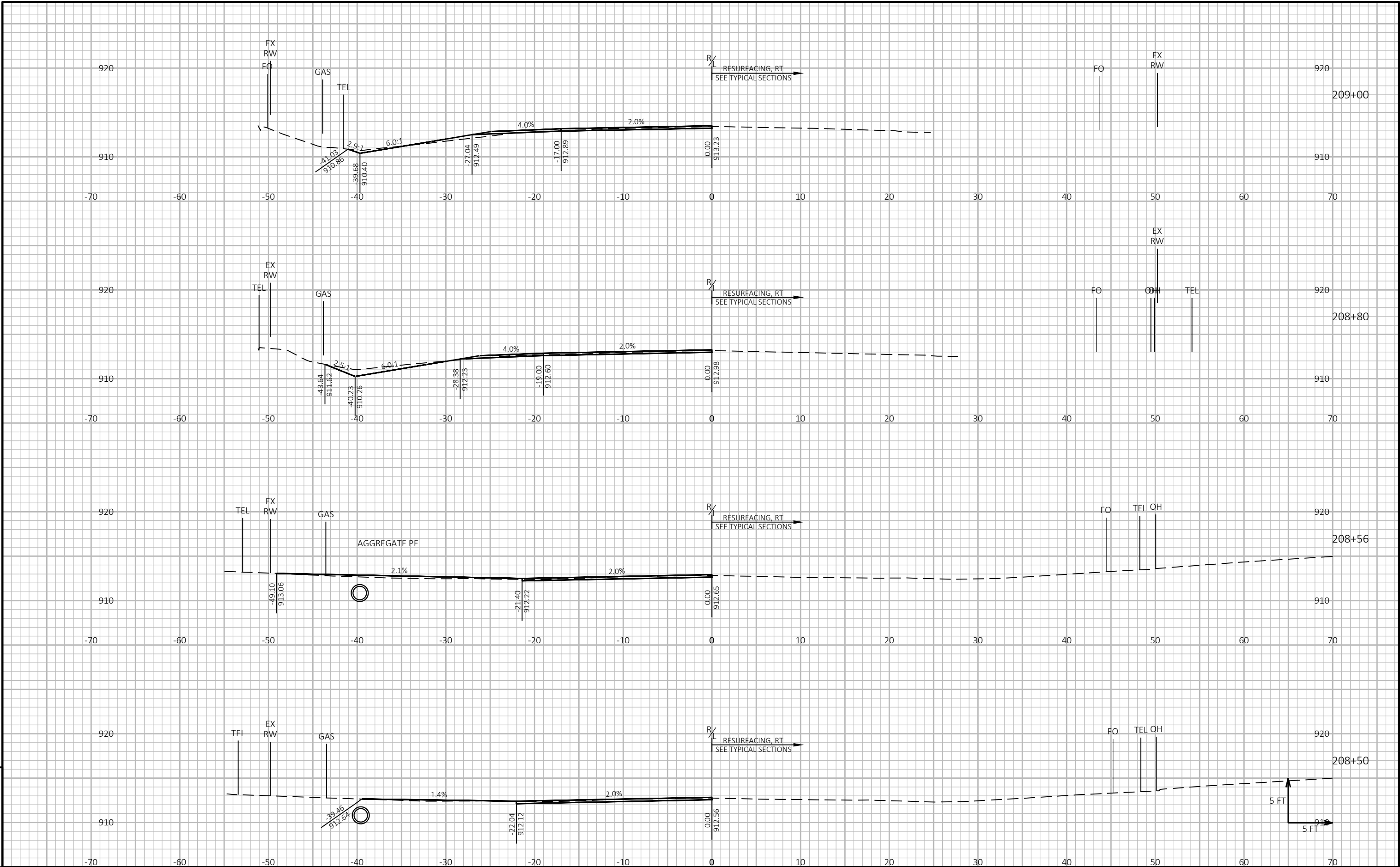




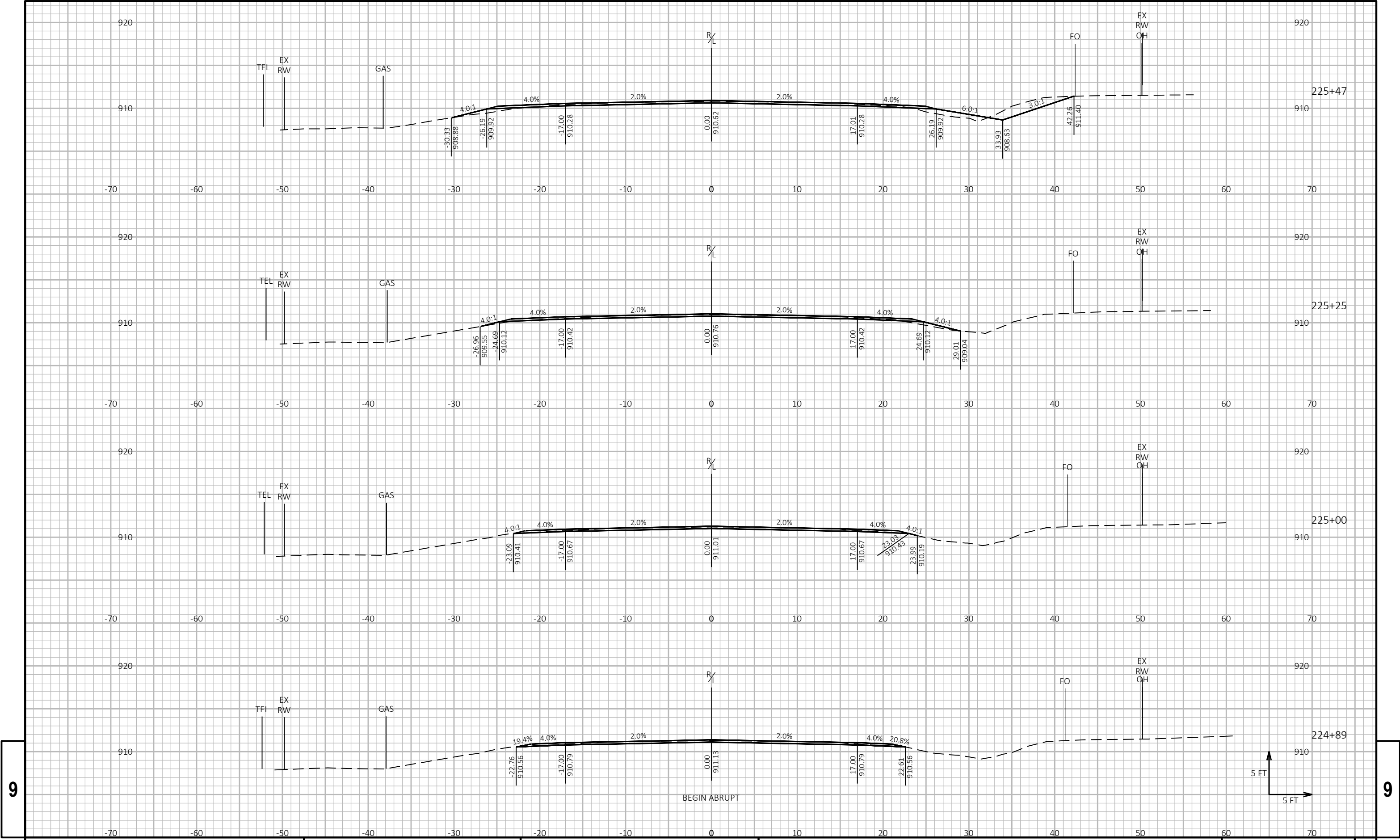








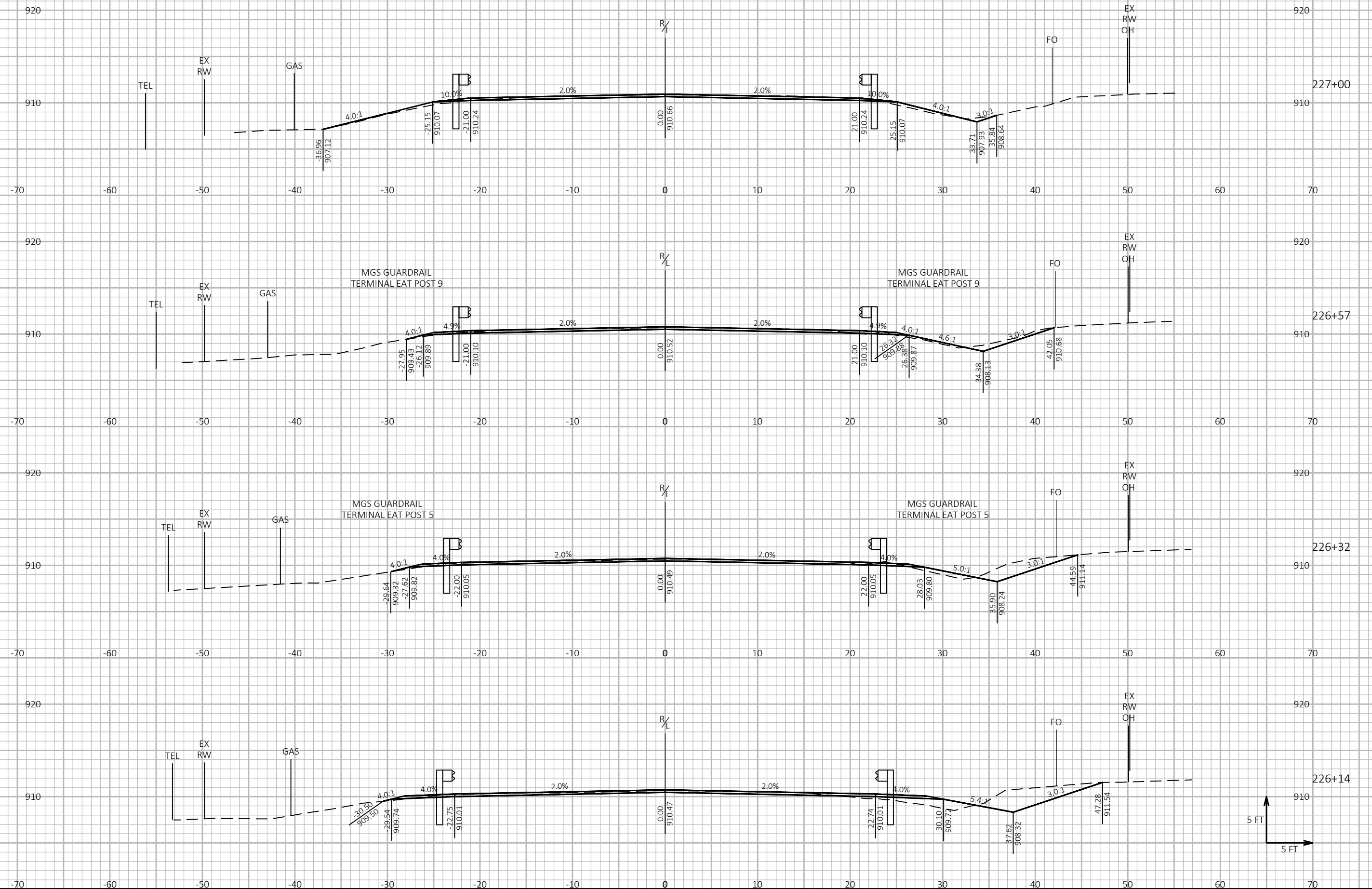




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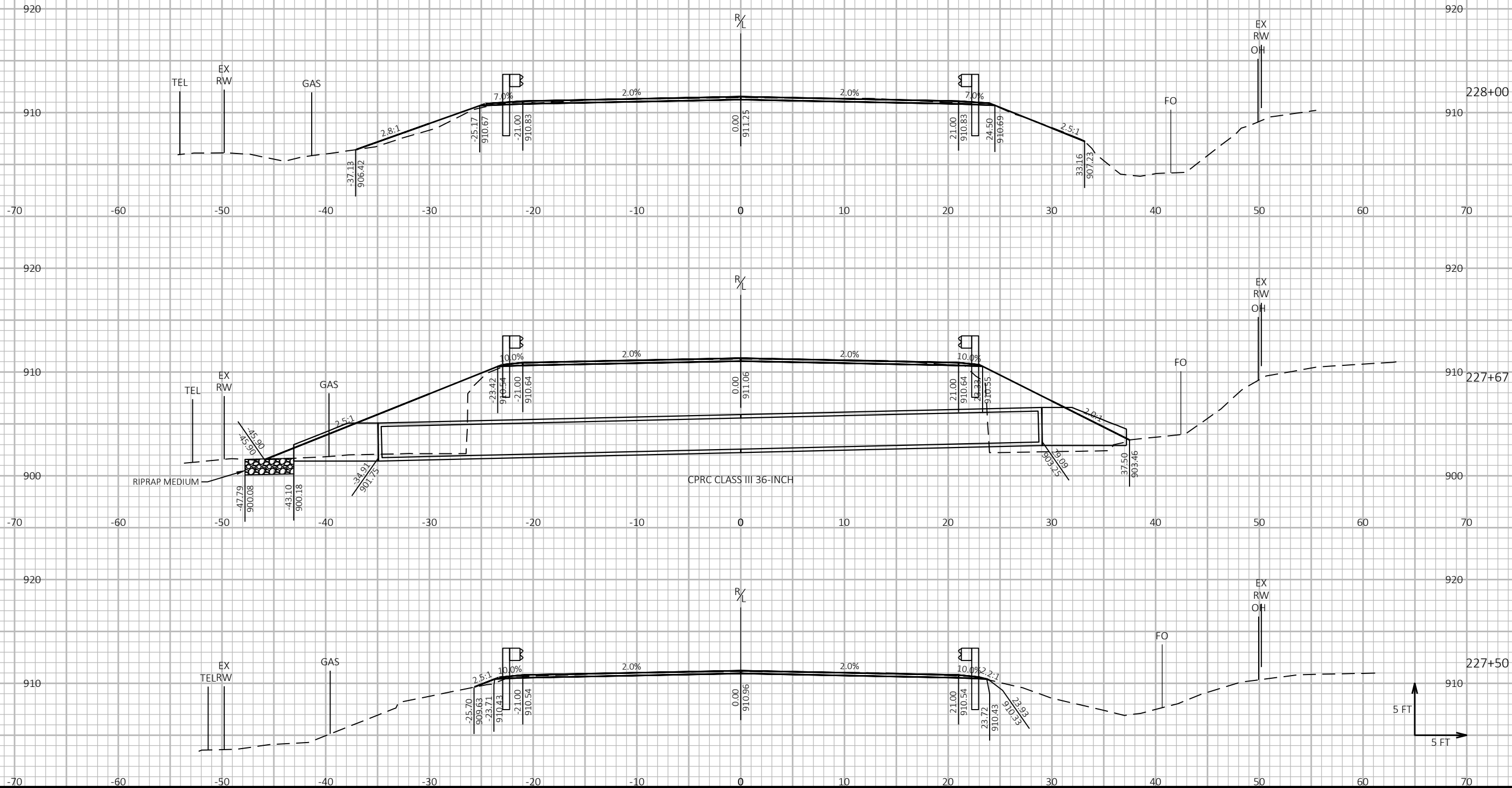
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PROJECT NO: 7080-01-73

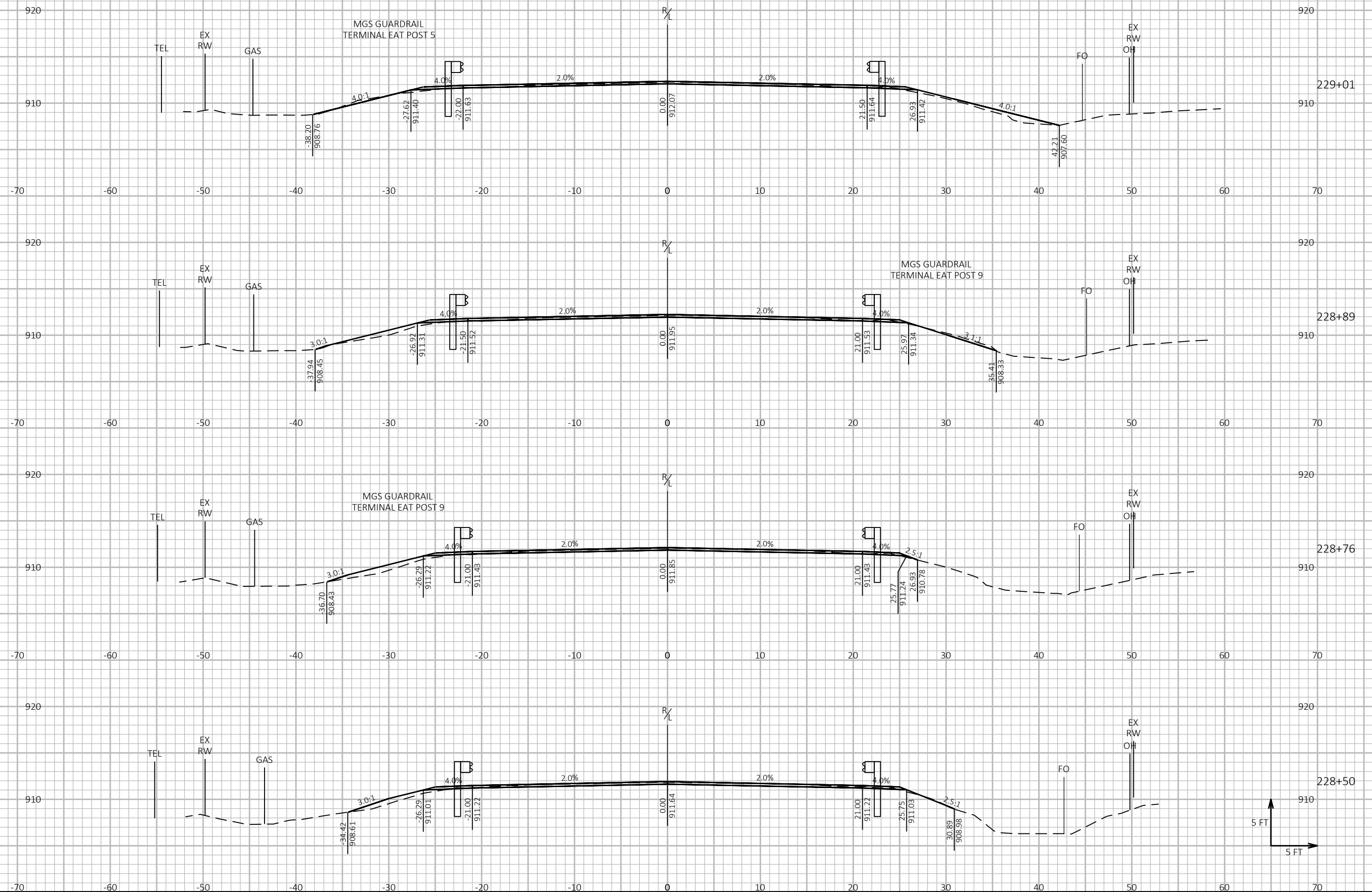
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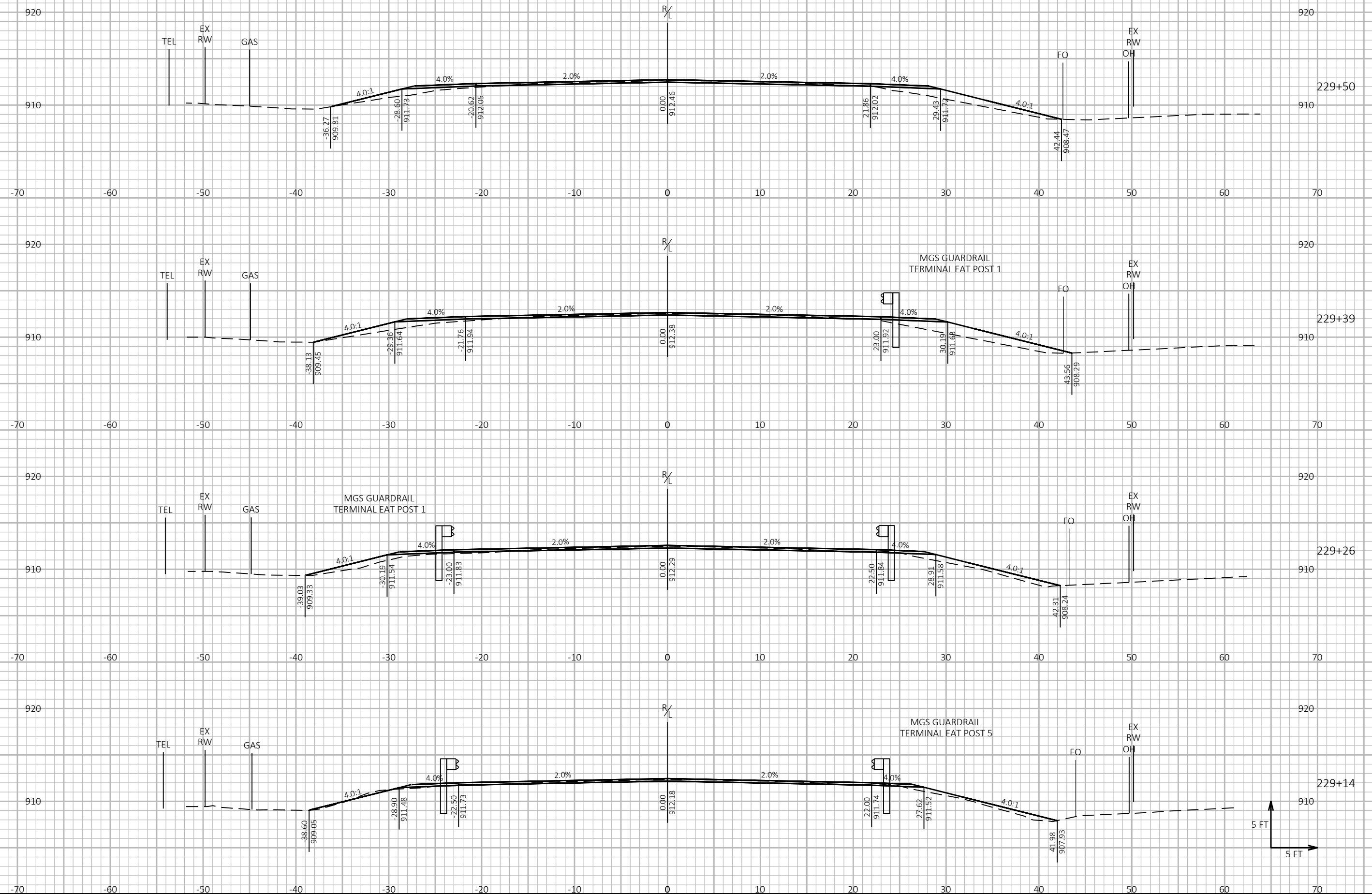
COUNTY: EAU CLAIRE

CROSS SECTIONS - GUARDRAIL & CULVERT REPLACEMENT

SHEET

E

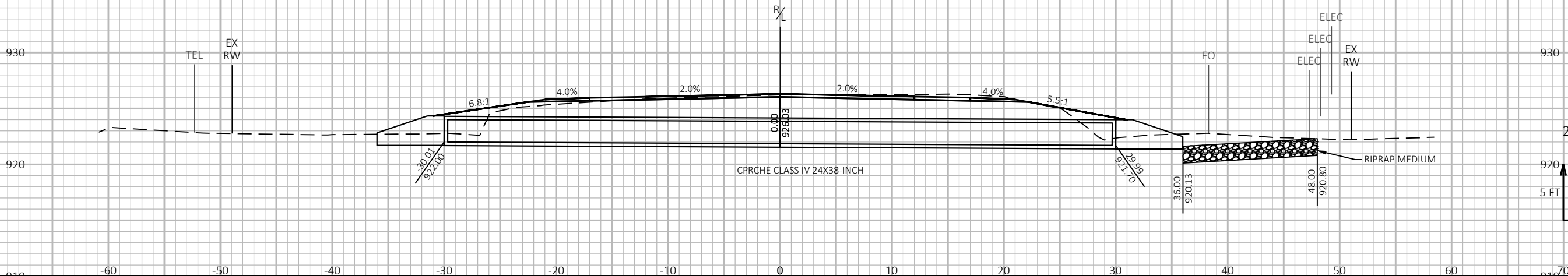






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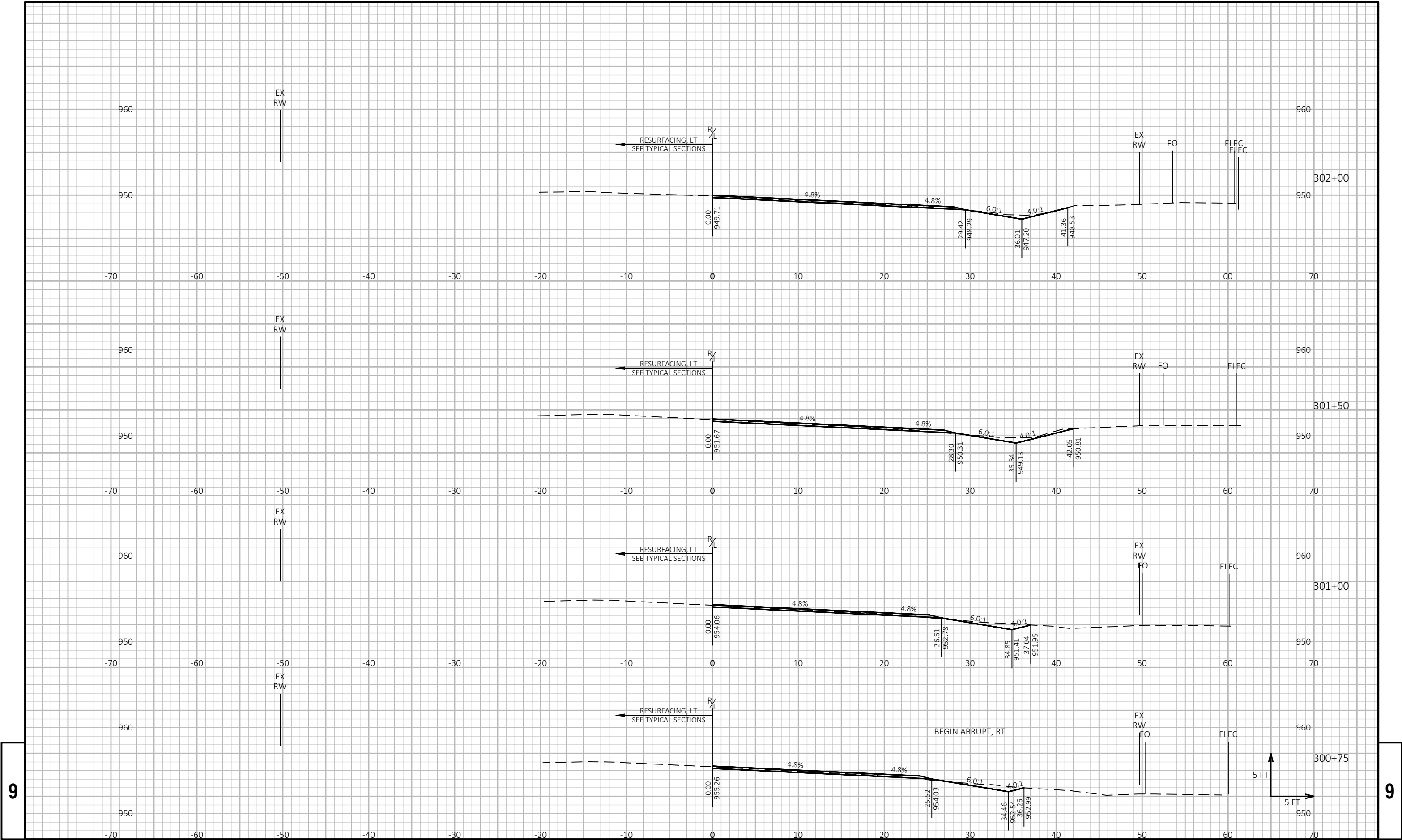
HWY: USH 12

COUNTY: EAU CLAIRE

CROSS SECTIONS - CULVERT REPLACEMENT

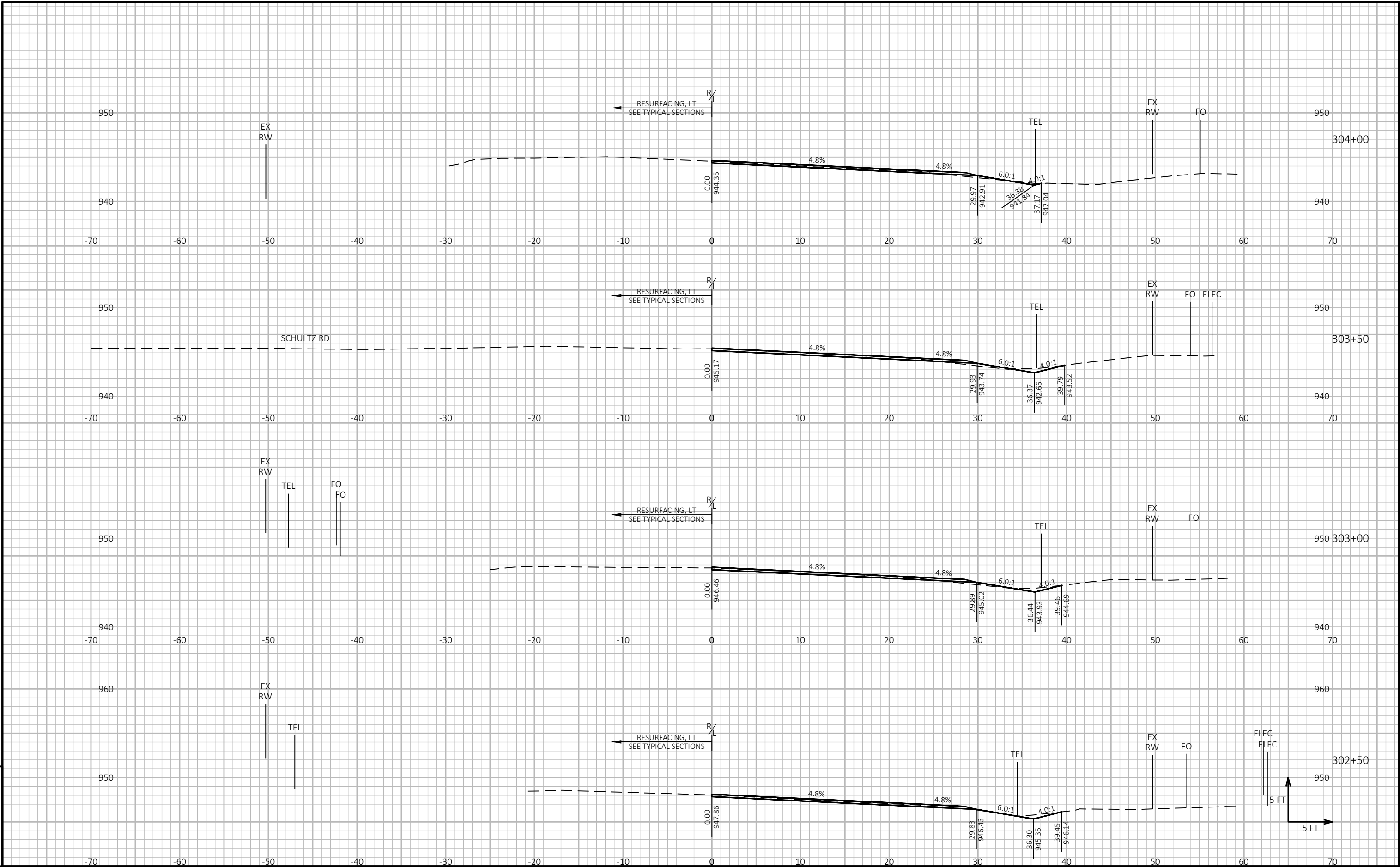
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E



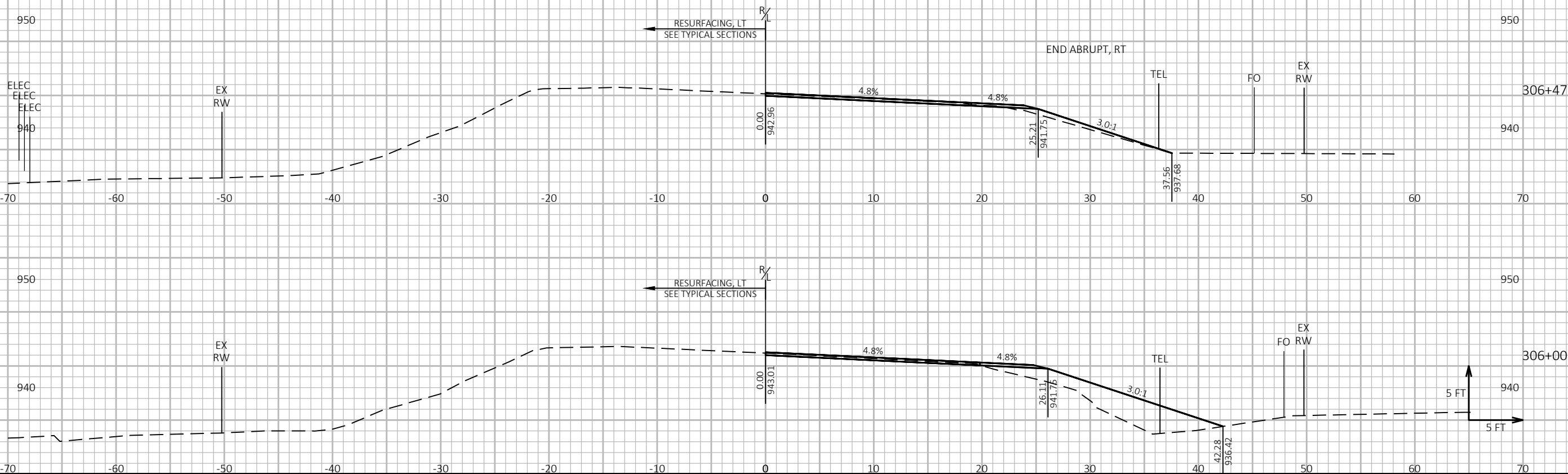
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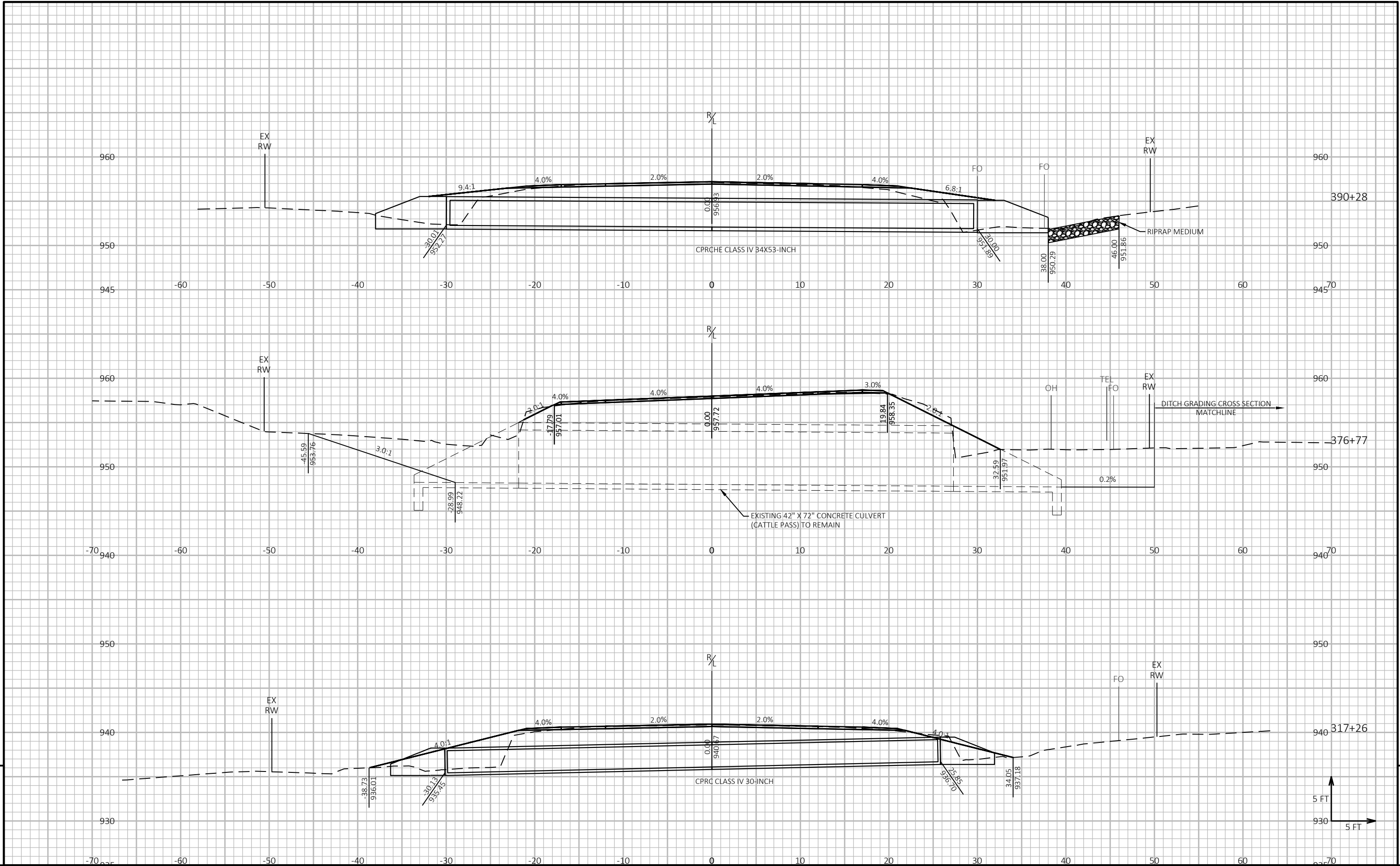
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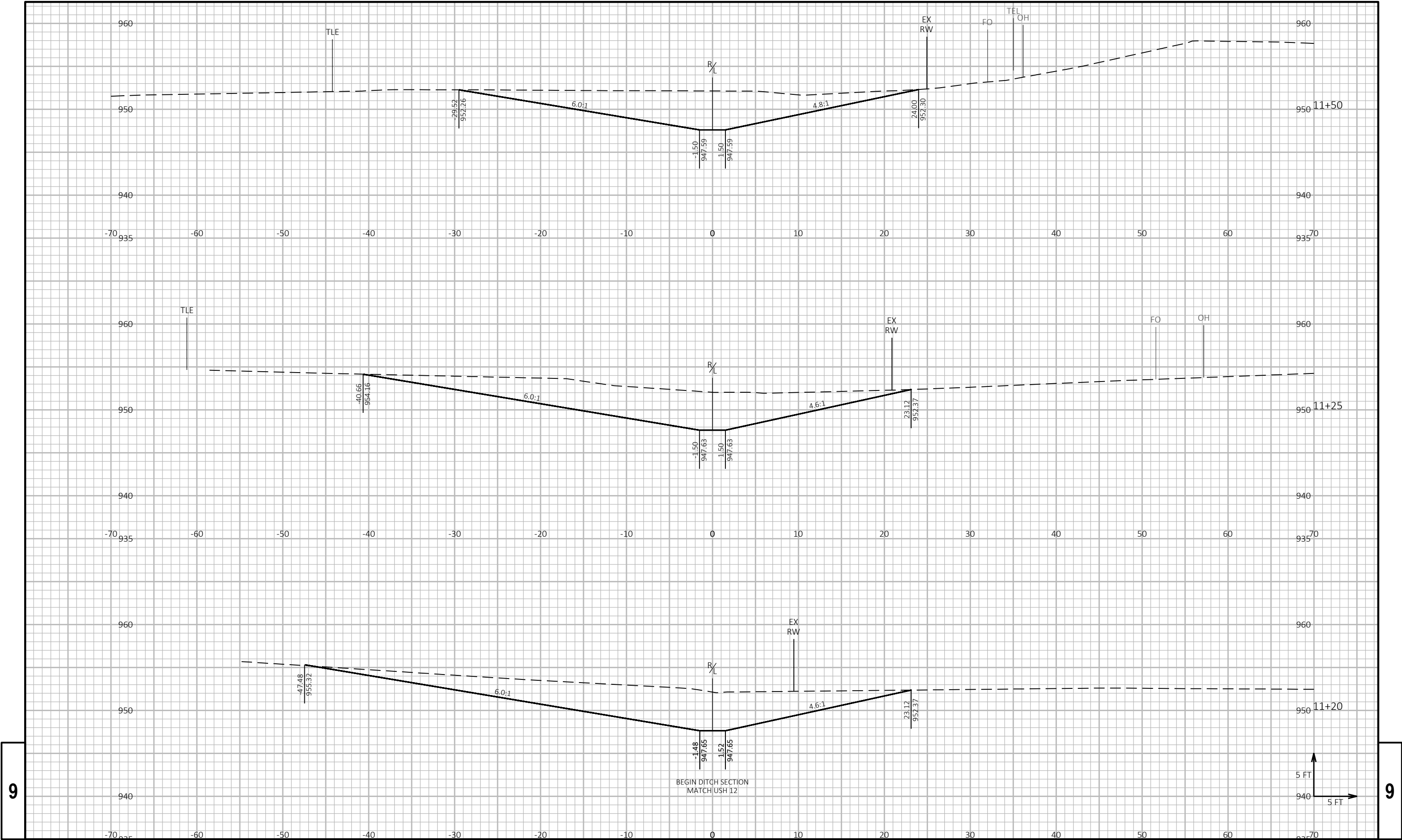
COUNTY: EAU CLAIRE

CROSS SECTIONS - DITCH GRADING & CULVERT REPLACEMENT

SHEET

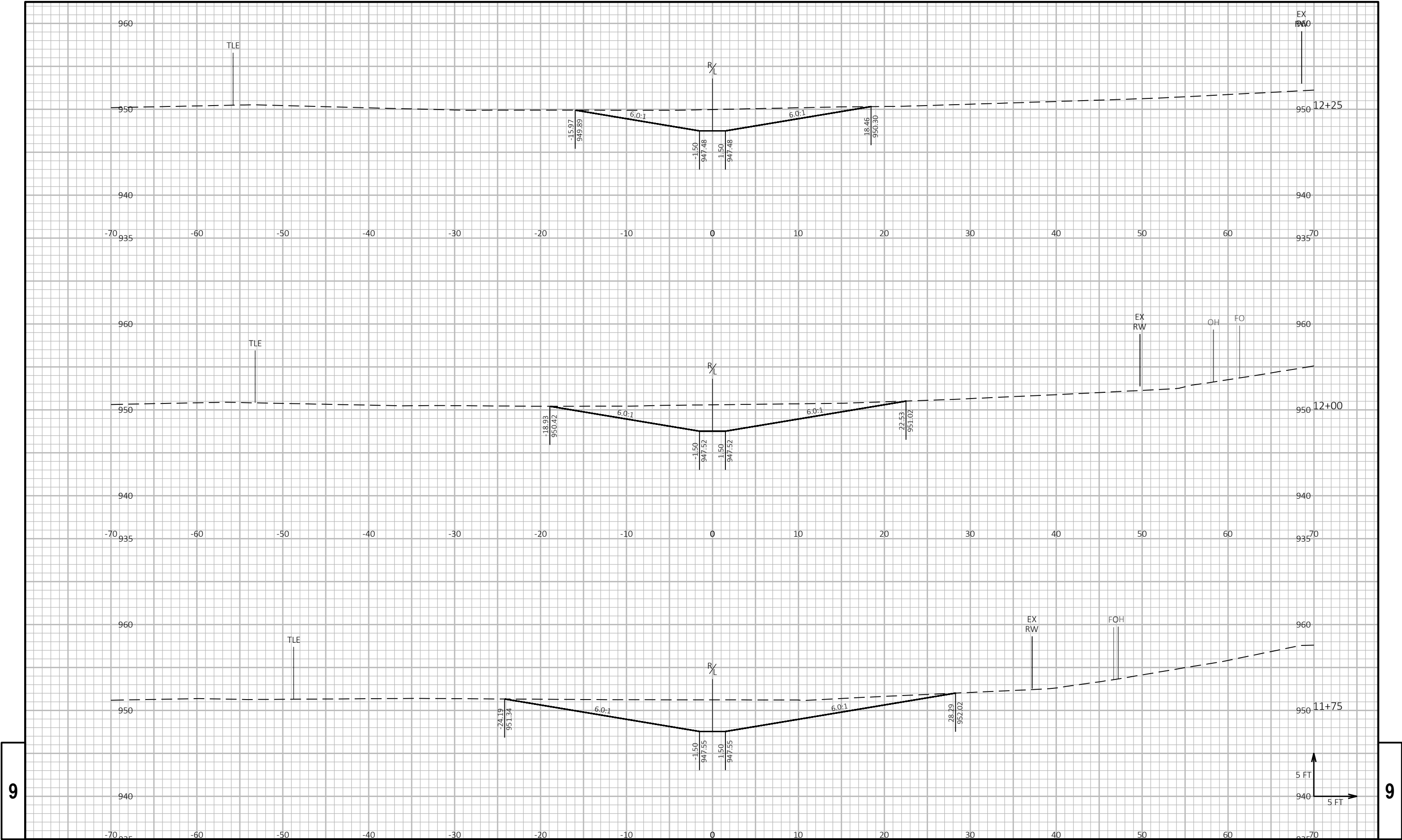
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PROJECT NO: 7080-01-73

HWY: USH 12

COUNTY: EAU CLAIRE

CROSS SECTIONS - DITCH GRADING

SHEET

E

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LAYOUT NAME - 04

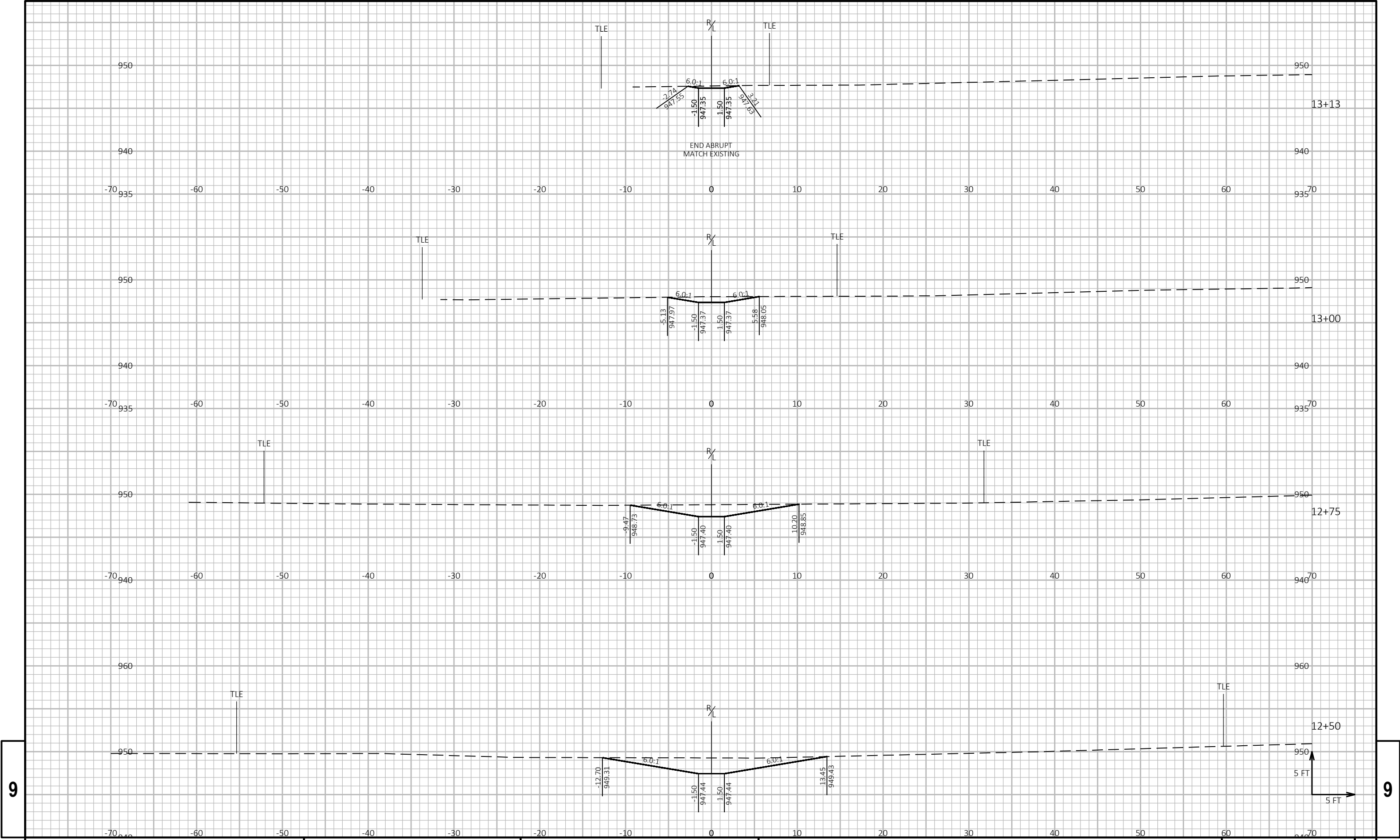
PLOT DATE : 2/29/2024 3:04 PM

PLOT BY : NICK MENNINGA

PLOT NAME :

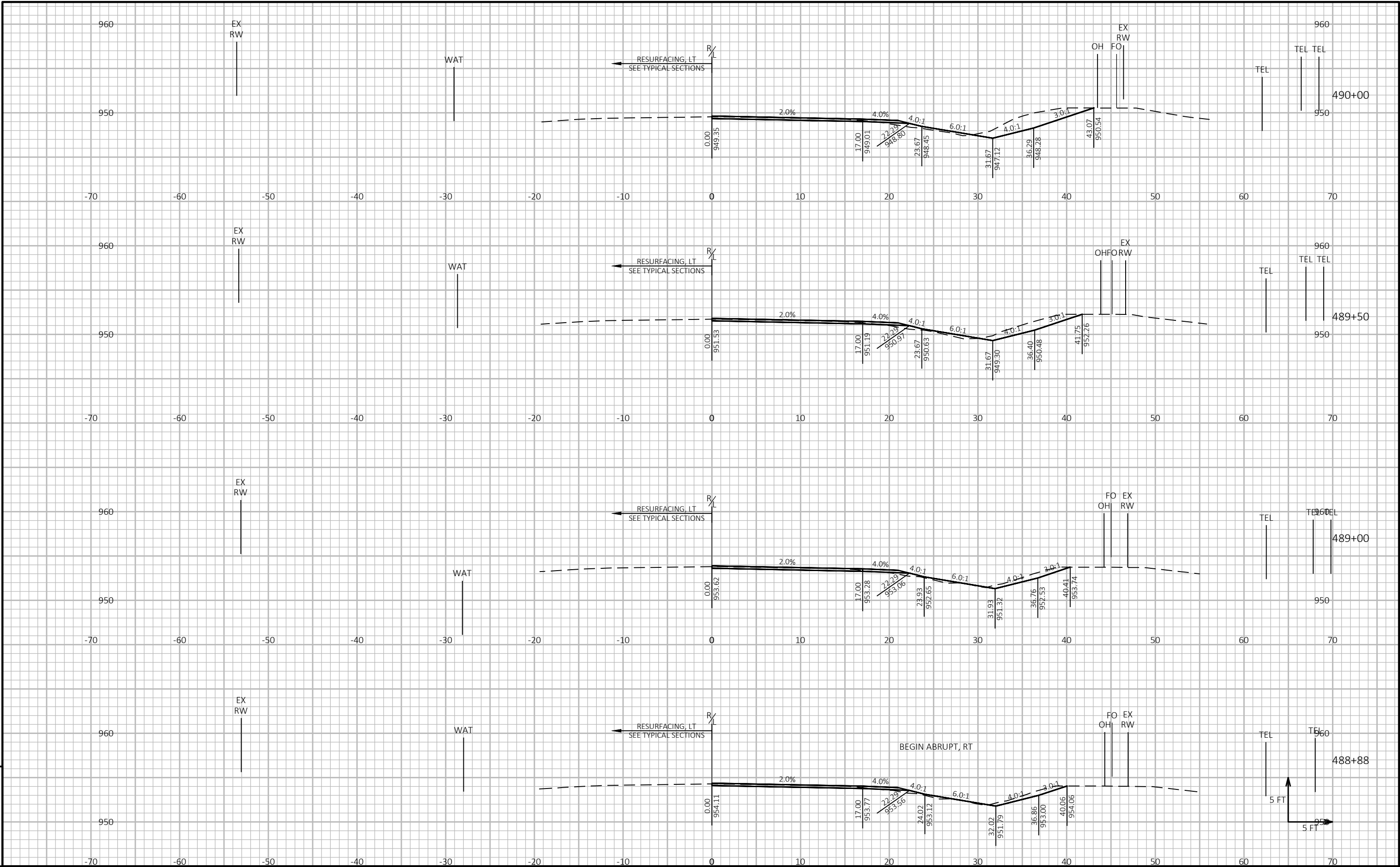
PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

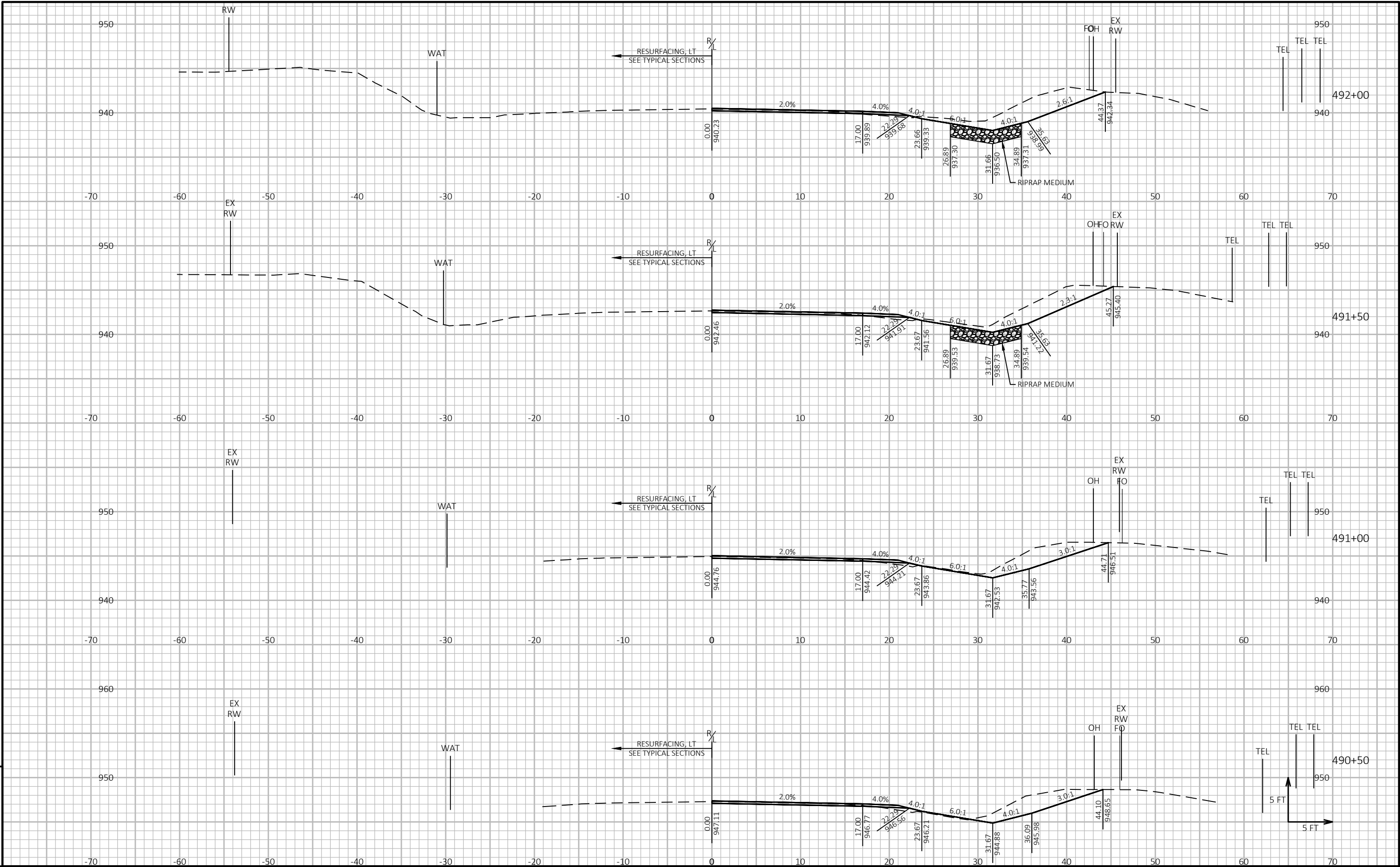
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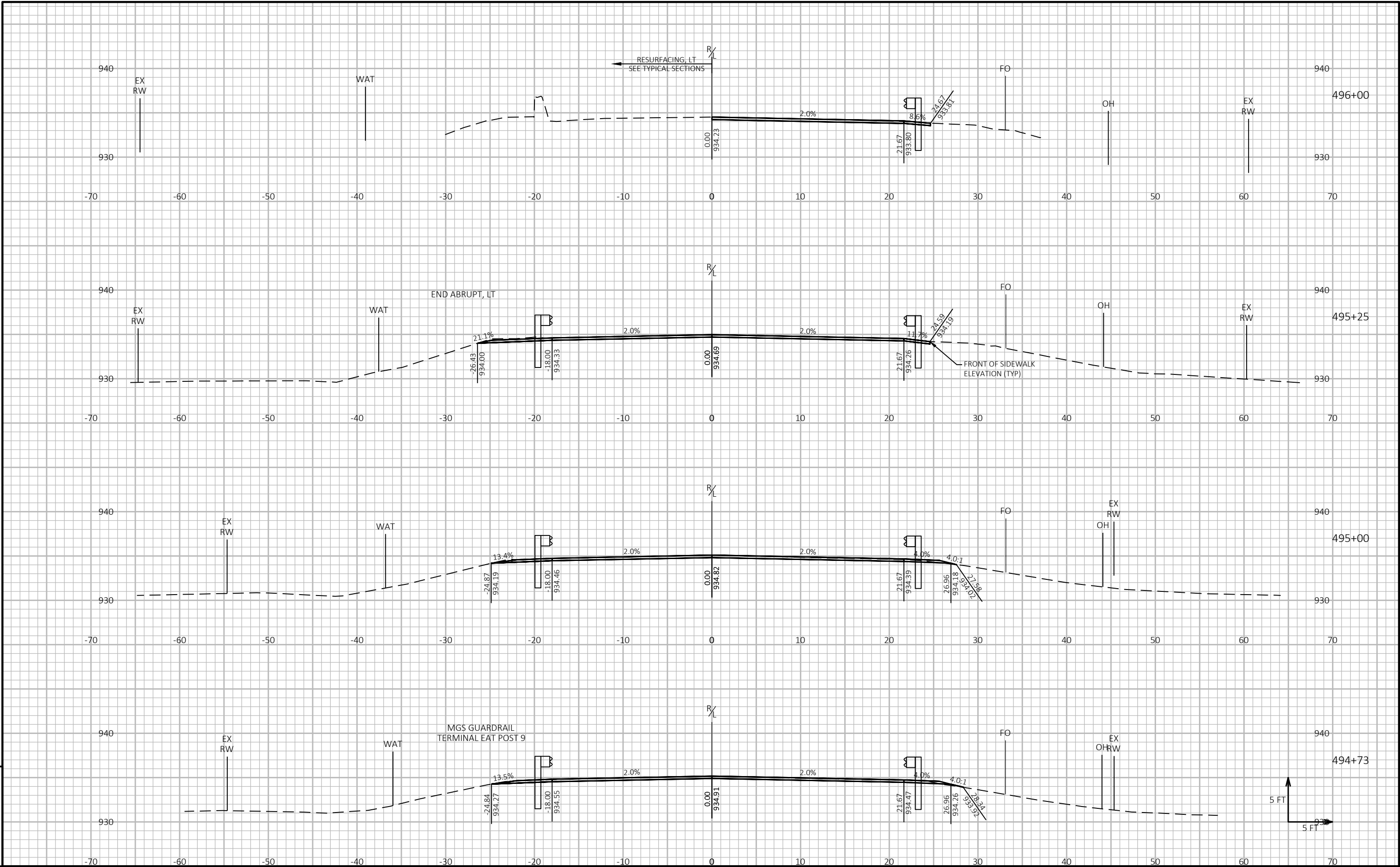
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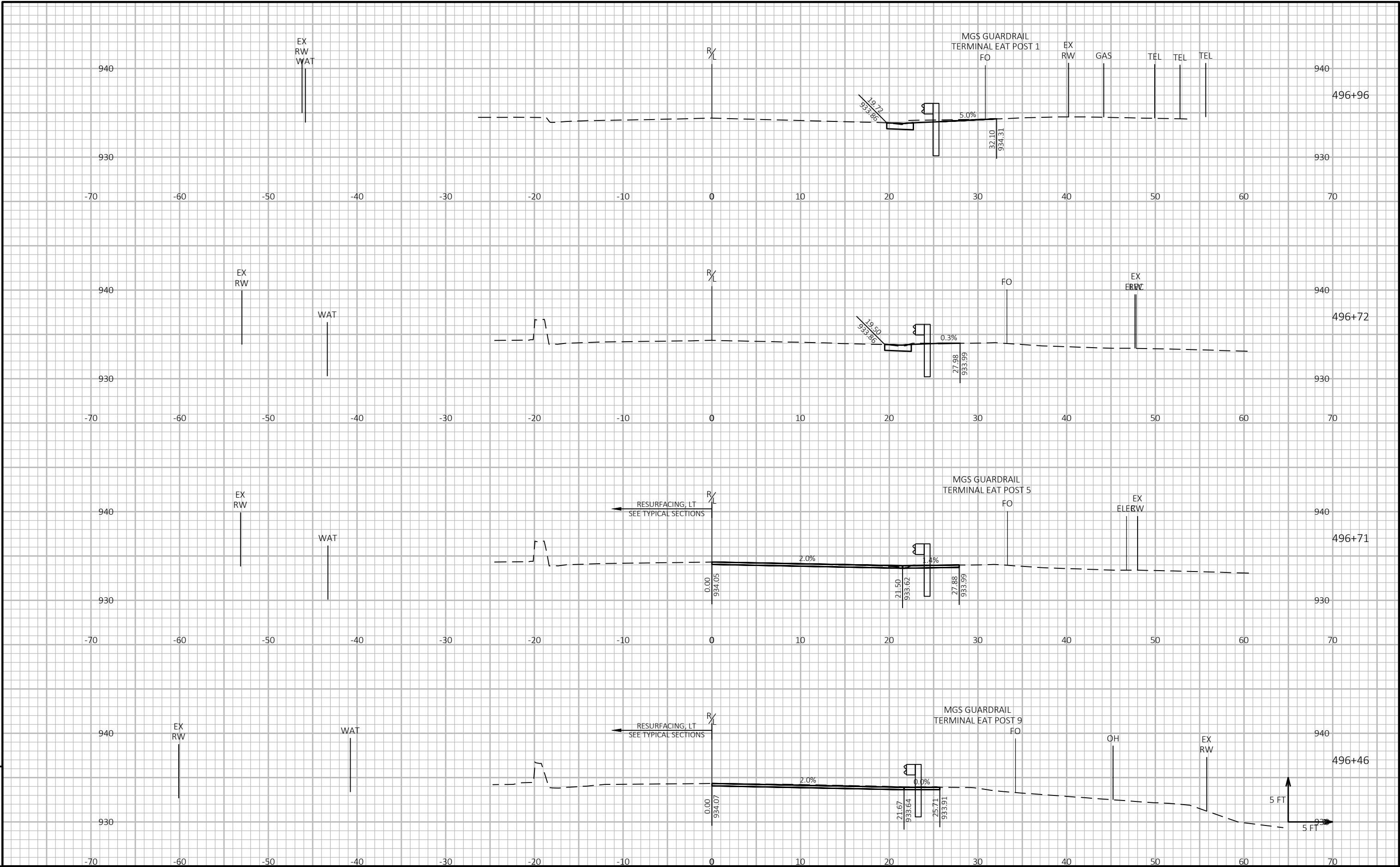
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|------------------------|-------------|--------------------|--------------------------------------------|-------|---|
| PROJECT NO: 7080-01-73 | HWY: USH 12 | COUNTY: EAU CLAIRE | CROSS SECTIONS - DITCH GRADING & GUARDRAIL | SHEET | E |
|------------------------|-------------|--------------------|--------------------------------------------|-------|---|







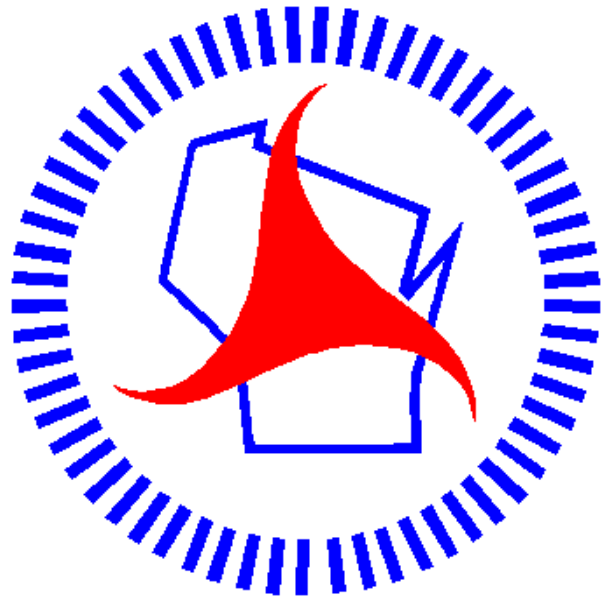




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