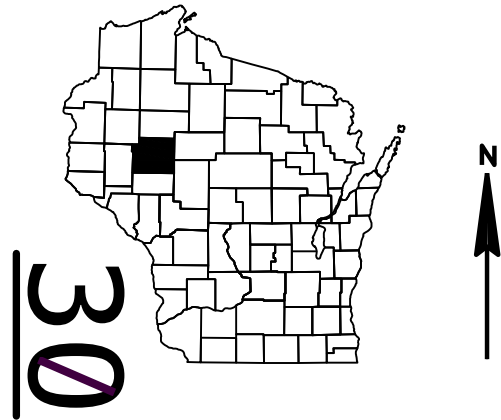


SEPTEMBER 2026

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                                |
| <del>Section No.</del> | <del>4</del> | <del>Right of Way Plat</del>                            |
| 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 = 116



| DESIGN DESIGNATION | STH 29         | 160TH STREET |
|--------------------|----------------|--------------|
| A.A.D.T.           | 2027 = 24,560  | 340          |
| A.A.D.T.           | 2047 = 28,610  | 340          |
| D.H.V.             | 2047 = UNKNOWN | UNKNOWN      |
| D.D.               | = UNKNOWN      | UNKNOWN      |
| T.                 | = 17.0%        | UNKNOWN      |
| DESIGN SPEED       | = 70 MPH       | 55 MPH       |
| ESALS              | = N/A          | N/A          |

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                                 |
| MARSH AREA                        | STORM SEWER                                    |
| WOODED OR SHRUB AREA              | TELEPHONE                                      |
|                                   | WATER                                          |
|                                   | UTILITY PEDESTAL                               |
|                                   | POWER POLE                                     |
|                                   | TELEPHONE POLE                                 |

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

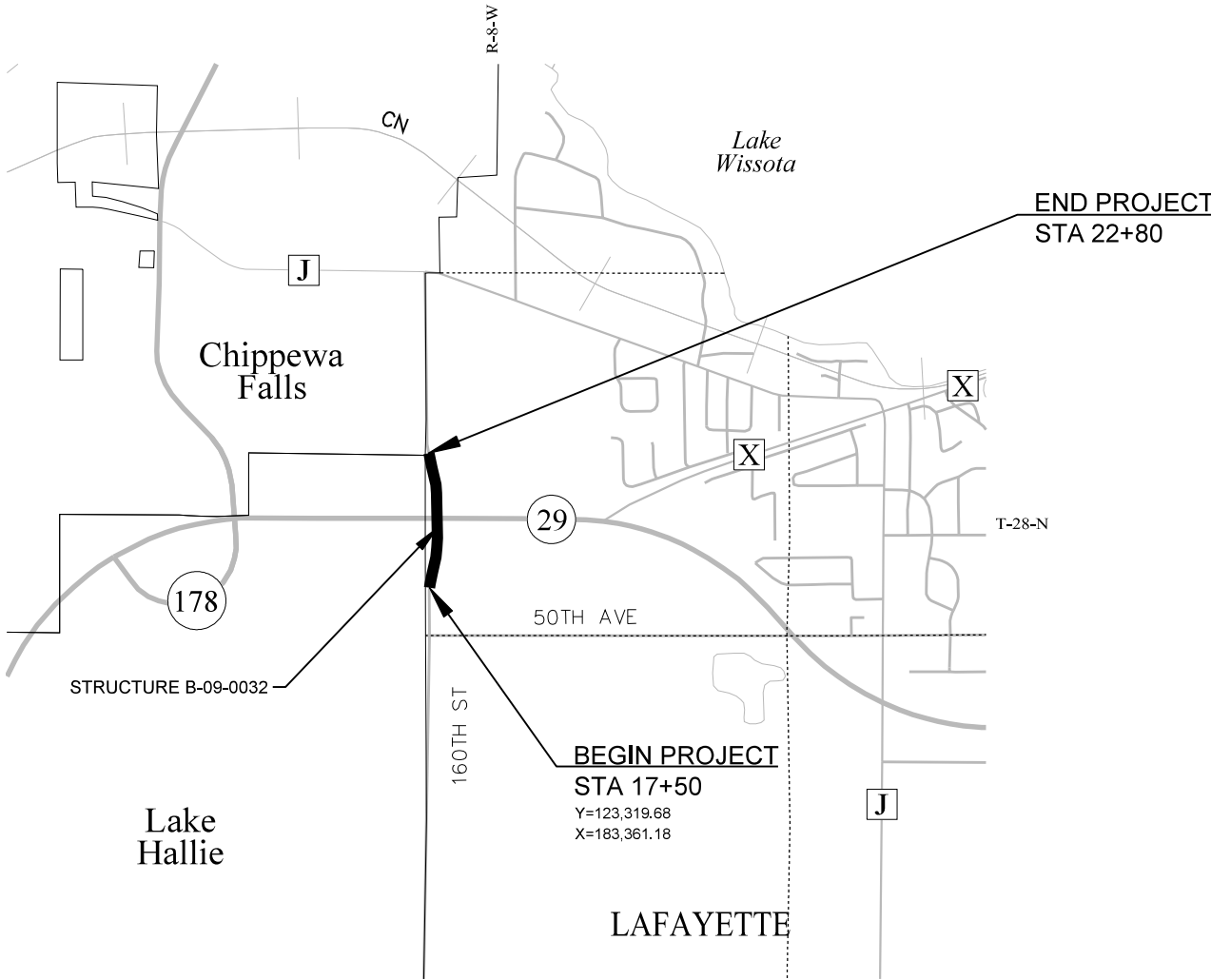
CHIPPEWA FALLS - THORP

160TH STREET BRIDGE B-09-0032

STH 29

CHIPPEWA COUNTY

| STATE PROJECT NUMBER |
|----------------------|
| 1050-01-83           |



LAYOUT

SCALE 0 0.5 MI

TOTAL NET LENGTH OF CENTERLINE = 0.100 MI

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COORDINATE REFERENCE SYSTEM (WISCRS), CHIPPEWA COUNTY NAD83 ( 2011 ), IN U.S. SURVEY FEET. POSITIONS SHOWN ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES ARE THE SAME AS GROUND DISTANCES.

ELEVATIONS ARE REFERENCED TO NAVD 88 ( 2012 ). GPS DERIVED ELEVATIONS ARE BASED ON GEOID 12B.

| STATE PROJECT | FEDERAL PROJECT |          |
|---------------|-----------------|----------|
|               | PROJECT         | CONTRACT |
| 1050-01-83    |                 |          |
|               |                 |          |
|               |                 |          |
|               |                 |          |



327 N 17th Avenue, Suite 304  
Wausau, WI 54401  
Phone: 715-845-1081  
Fax: 414-347-1347



4/8/2026  
(Date)

*Stephane G. Christensen*  
(Signature)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

|                     |                               |
|---------------------|-------------------------------|
| PREPARED BY         |                               |
| Surveyor            | WISDOT                        |
| Designer            | EMCS, INC.                    |
| Project Manager     | BILL BIESMANN, KL ENGINEERING |
| Regional Examiner   | REGIONAL EXAMINER             |
| Regional Supervisor | NICOLE PASSUELLO              |

APPROVED FOR THE DEPARTMENT

DATE: Nicole Passuello

Digitally signed by Nicole Passuello  
DN: E=nicole.passuello@dot.wis.gov, O=WisDOT,  
OU=FOIS Supervisor NW Region, CN=Nicole Passuello  
Date: 2026.04.08 09:58:36-0500

(Signature)

E

GENERAL NOTES

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

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

UTILITIES

COMMUNICATIONS

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

ELECTRIC

XCEL ENERGY  
JOHN KELSER  
1414 W HAMILTON AVE, PO BOX 8  
EAU CLAIRE, WI 54701  
(715)-737-6020  
JOHN.KELSER@XCELENERGY.COM

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 = 2.68 ACRES  
TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 0.81 ACRE

DIGGERSHOTLINE

Dial 811 or (800)242-8511

www.DiggersHotline.com

OTHER CONTACTS

WDNR LIAISON

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

DESIGNER CONTACT

EMCS, INC.  
327 N 17TH AVE, SUITE 304  
WAUSAU, WI 54401  
(715) 845-1081

WISDOT CONTACT

BILL BIESMANN  
KL ENGINEERING, INC.  
5400 KING JAMES WAY  
SUITE 200  
MADISON, WI 53719  
(608) 663-1218 EXT. 286  
BBIESMANN@KLENGINEERING.COM

2

2



|                        |             |                  |                  |       |          |
|------------------------|-------------|------------------|------------------|-------|----------|
| PROJECT NO: 1050-01-83 | HWY: STH 29 | COUNTY: CHIPPEWA | PROJECT OVERVIEW | SHEET | <b>E</b> |
|------------------------|-------------|------------------|------------------|-------|----------|

FILE NAME : P:\55XX\5506.DP.22.STH29-160TH.CHI\CADD\10500183\SHEETS\020201-PO.DWG  
LAYOUT NAME - 01

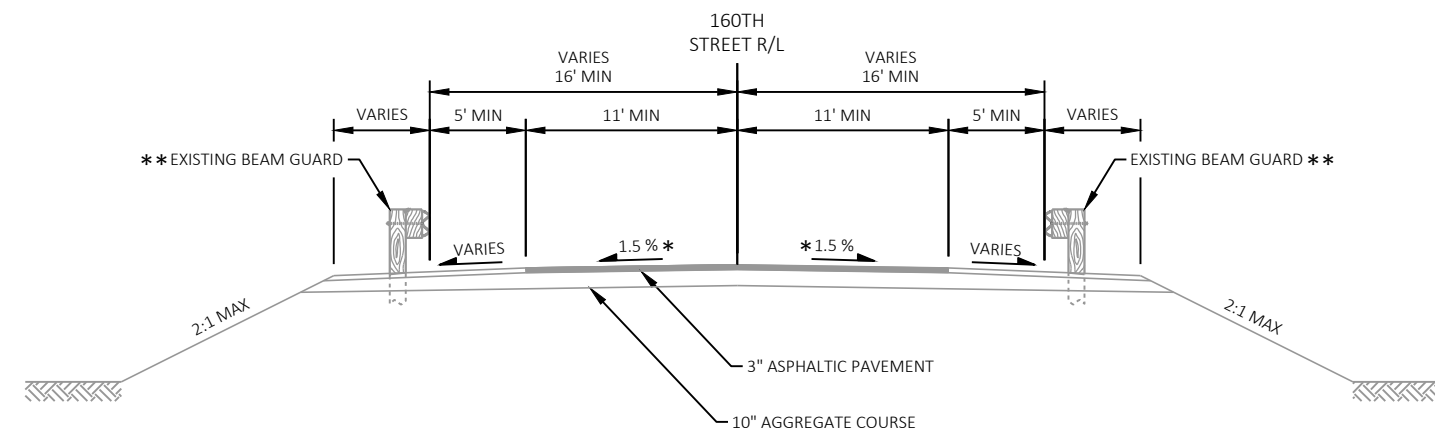
PLOT DATE : 4/1/2026 12:54 PM

PLOT BY : MITCH SYBERS

PLOT NAME :

PLOT SCALE : 1 IN:100 FT

WISDOT/CADDS SHEET 42



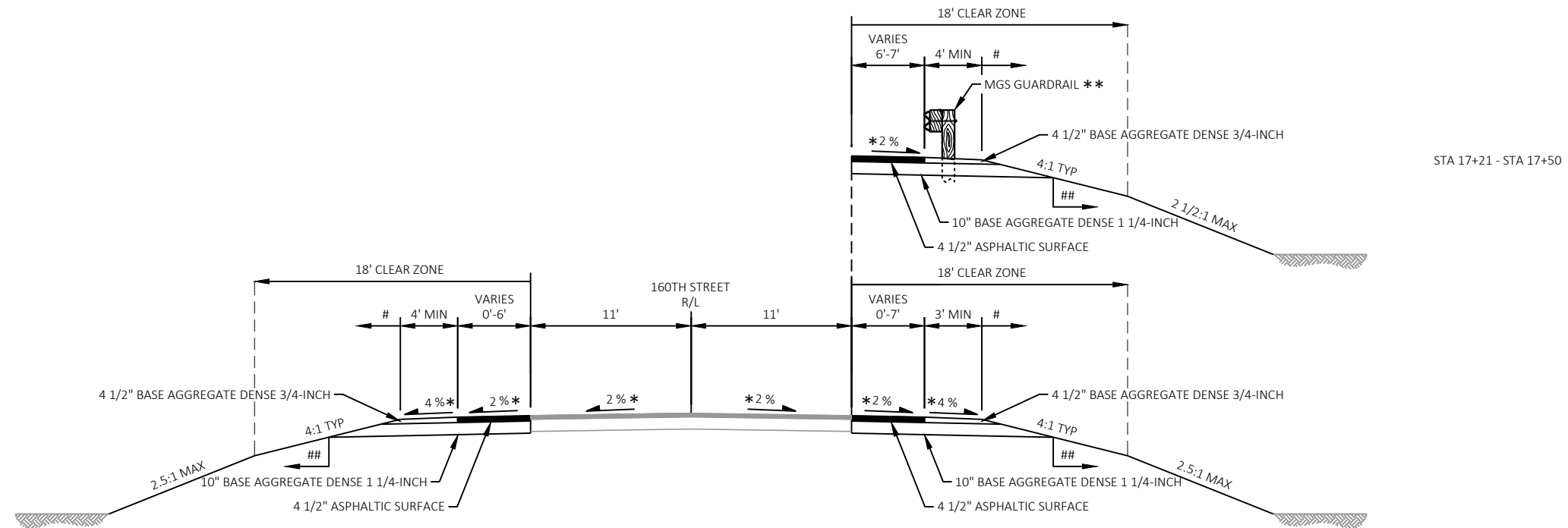
TYPICAL EXISTING SECTION  
160TH STREET

STA 15+73 - STA 18+70(B-09-0032)  
STA 20+57(B-09-0032) - STA 23+40

NOTES

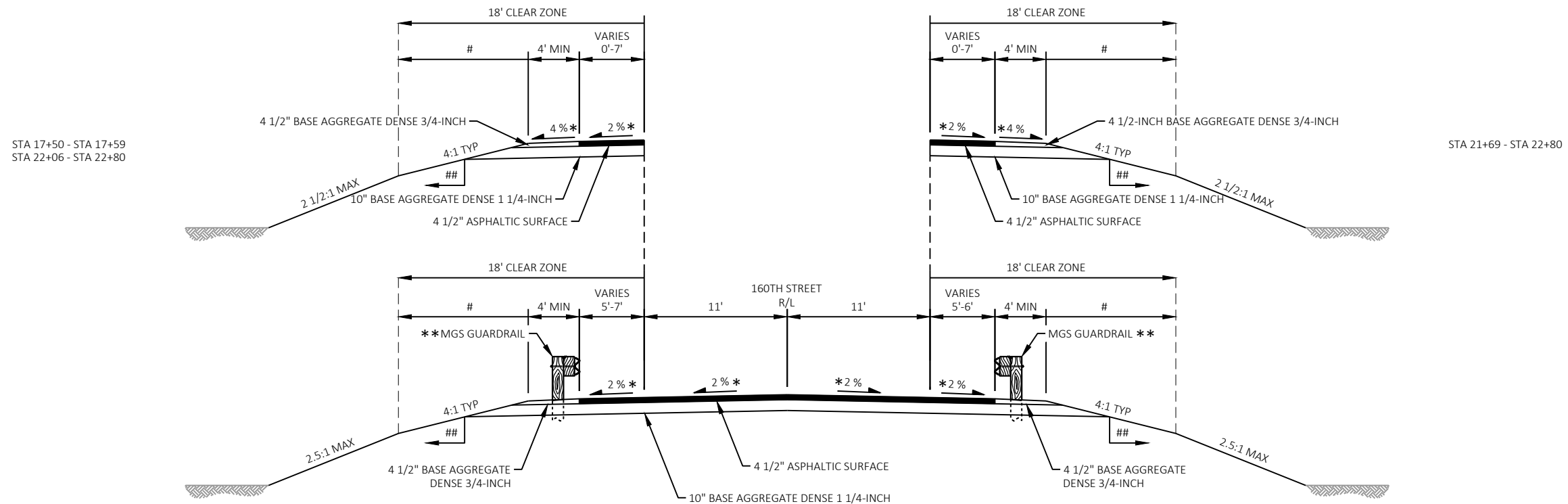
- \* CROSS SLOPE VARIES DUE TO SUPERELEVATION.
- \*\* SEE SECTION 5 PLAN SHEETS FOR LIMITS OF EXISTING BEAM GUARD.

EXISTING CLEAR ZONE DATA IS NOT AVAILABLE IN AS-BUILT PLANS AND EXISTING GRADING WITHIN THE PROJECT LIMITS IMPLIES THAT ORIGINAL CONSTRUCTION DID NOT MEET ANY PARTICULAR CLEAR ZONE REQUIREMENTS.



**TYPICAL FINISHED SECTION**  
**160TH STREET**

STA 15+73 - STA 17+50, RT  
STA 16+56 - STA 17+50, LT  
STA 22+80 - STA 23+40, LT

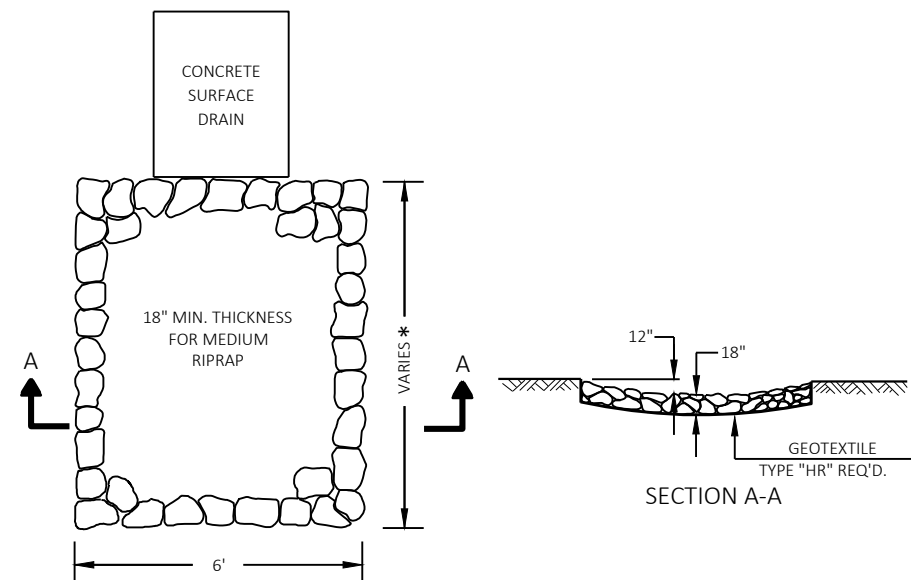


**NOTES**

- \* CROSS SLOPE VARIES DUE TO SUPERELEVATION AND MATCHES EXISTING TRANSITIONS. SEE CROSS SECTIONS.
- \*\* SEE SECTION 5 PLAN SHEETS FOR PROPOSED GUARDRAIL LAYOUT INFORMATION.
- # SEEDING AND FERTILIZER
- ## TOPSOIL AND EROSION MAT

**TYPICAL FINISHED SECTION**  
**160TH STREET**

STA 17+50 - STA 18+70(B-09-0032)  
STA 20+57(B-09-0032) - STA 22+80

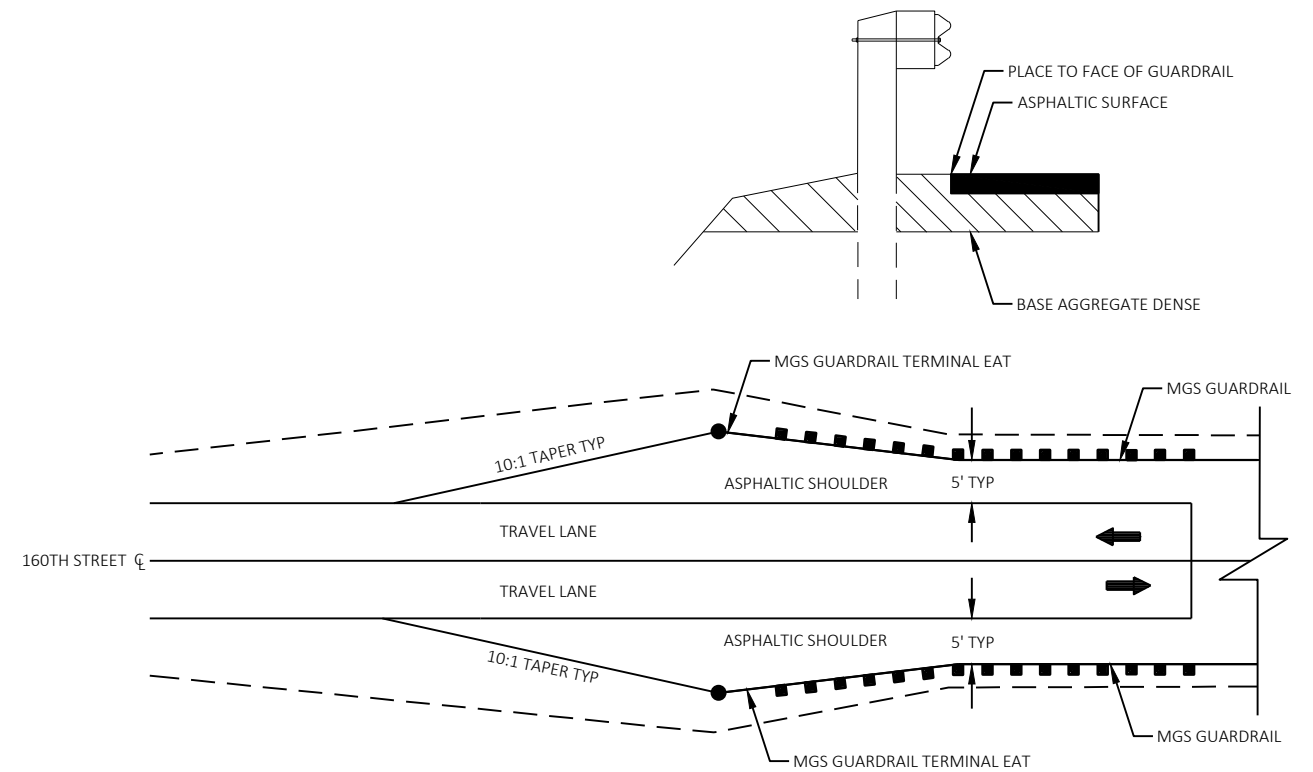


RIPRAP MEDIUM TREATMENT DETAIL

STA 21+10, LT & RT

NOTE

\* SEE EROSION CONTROL PLANS FOR LENGTH OF RIPRAP



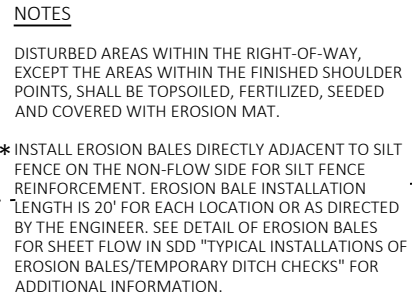
PAVED SHOULDER AT GUARDRAIL DETAIL

NOTES

SEE SECTION 5 PLAN SHEETS AND SDD "MIDWEST GUARDRAIL SYSTEM (MGS) EAT" FOR ADDITIONAL INFORMATION.

SEE TYPICAL SECTIONS FOR PAVEMENT STRUCTURE.









LEGEND

WORK AREA

NOTES

SEE SDD "BARRICADES AND SIGNS FOR MAINLINE CLOSURES, DETAIL C" FOR ADDITIONAL INFORMATION ON WHERE TO PLACE BARRICADES.

SIGN LOCATIONS ARE APPROXIMATE, SEE SDD "BARRICADES AND SIGNS FOR MAINLINE CLOSURES, DETAIL C" FOR ADDITIONAL INFORMATION.



- 1

ROAD  
CLOSED  
AHEAD

W20-3A
- 2

ROAD  
CLOSED  
1000 FT

W20-3C
- 3

ROAD  
CLOSED  
500 FT

W20-3D
- 4

BRIDGE  
OUT

R11-2B  
48"X30"
- 5A

5B

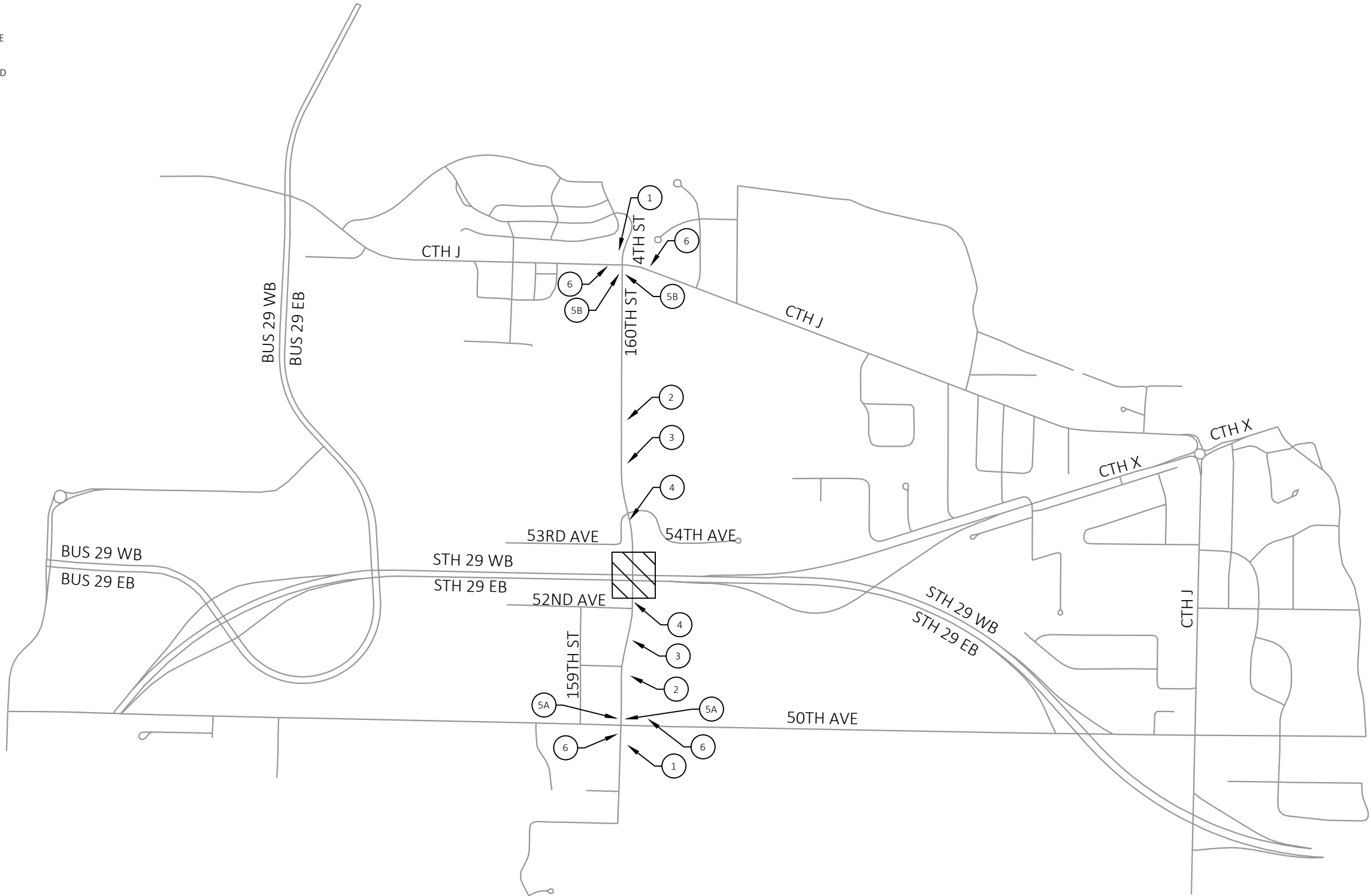
BRIDGE OUT  
MILES AHEAD

R11-3C  
60"X24"  
A - 1/3 MILE  
B - 7/10 MILE
- 160TH STREET

FMS  
30"X12"
- 6

ROAD  
CLOSED  
AHEAD

W20-3A



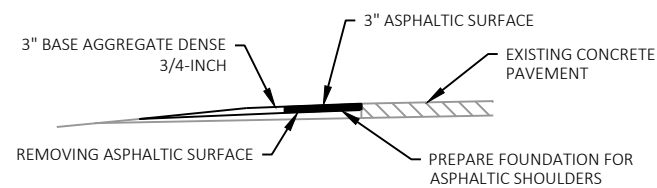
**NOTES**

SEE SDD "TRAFFIC CONTROL, LANE CLOSURE, DIGITAL SPEED REDUCTION SYSTEM" FOR SINGLE LANE CLOSURES ON STH 29.

SEE SDD "TRAFFIC CONTROL, PARTIAL LANE SHIFT MULTILANE DIVIDED 50 MPH AND GREATER" TO SHIFT TRAFFIC ONTO PAVED SHOULDERS FOR SHORT DURATIONS AS SHOWN IN THE TRAFFIC CONTROL TYPICAL SECTIONS. RETURN THE SINGLE LANE OF OPEN TRAFFIC TO THE NORMAL TRAVEL LANE WHEN WORK OPERATIONS DO NOT REQUIRE THE TRAFFIC SHIFT.

THE TRAFFIC CONTROL TYPICAL SECTIONS SHOW LANE CLOSURES OCCURRING ON STH 29 EB AND STH 29 WB AT THE SAME TIME AND ARE INTENDED TO SHOW MAXIMUM ALLOWED TRAFFIC SHIFTS DURING LANE CLOSURES. IMPLEMENT SINGLE LANE CLOSURES FOR ONE DIRECTION OR BOTH DIRECTIONS OF STH 29 TRAFFIC PER WORK OPERATIONS REQUIREMENTS WHILE FOLLOWING THE REQUIREMENTS PROVIDED IN THE SPECIAL PROVISIONS.

\* REPLACE ASPHALTIC SHOULDERS PRIOR TO SHIFTING TRAFFIC, SHOULDER REPLACEMENT AREAS ARE SIZED FOR A REDUCED SPEED OF 55 MPH..

**STH 29 SHOULDER REPLACEMENT DETAIL****WB LANE MEDIAN SHOULDER**

670' EAST OF STRUCTURE

280' WEST OF STRUCTURE

**EB LANE MEDIAN SHOULDER**

280' EAST OF STRUCTURE

670' WEST OF STRUCTURE

**WB LANE OUTSIDE SHOULDER**

780' EAST OF STRUCTURE

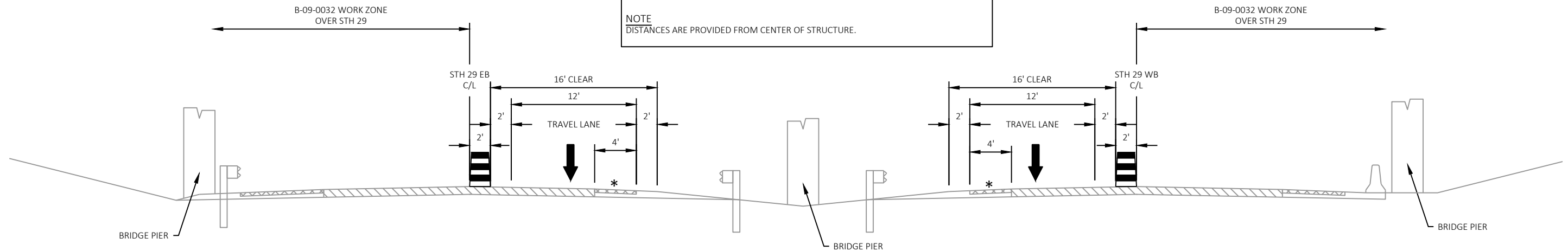
370' WEST OF STRUCTURE

**EB LANE OUTSIDE SHOULDER**

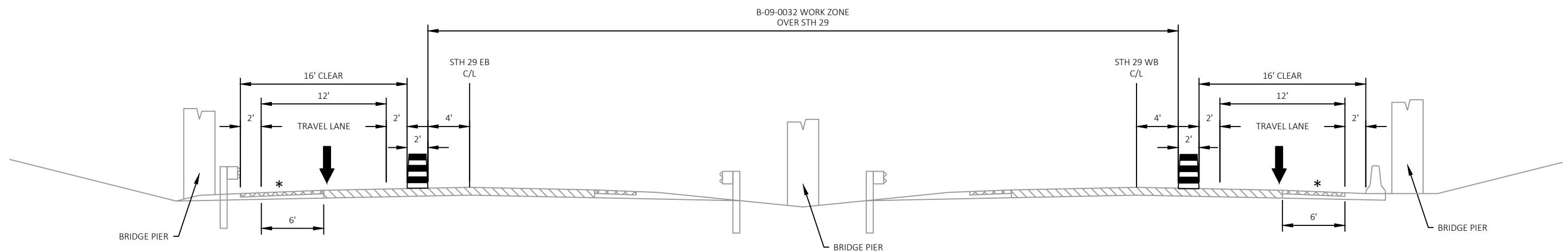
370' EAST OF STRUCTURE

780' WEST OF STRUCTURE

NOTE  
DISTANCES ARE PROVIDED FROM CENTER OF STRUCTURE.



**STH 29 TRAFFIC CONTROL TYPICAL SECTION  
OUTSIDE LANE CLOSURES**



**STH 29 TRAFFIC CONTROL TYPICAL SECTION  
MEDIAN LANE CLOSURES**

Estimate Of Quantities

1050-01-83

| Line | Item       | Item Description                                                 | Unit | Total      | Qty        |
|------|------------|------------------------------------------------------------------|------|------------|------------|
| 0002 | 201.0105   | Clearing                                                         | STA  | 7.000      | 7.000      |
| 0004 | 201.0205   | Grubbing                                                         | STA  | 7.000      | 7.000      |
| 0006 | 203.0100   | Removing Small Pipe Culverts                                     | EACH | 2.000      | 2.000      |
| 0008 | 203.0211.S | Abatement of Asbestos Containing Material (structure) 01. B-9-32 | EACH | 1.000      | 1.000      |
| 0010 | 203.0220   | Removing Structure (structure) 01. B-9-32                        | EACH | 1.000      | 1.000      |
| 0012 | 204.0110   | Removing Asphaltic Surface                                       | SY   | 2,290.000  | 2,290.000  |
| 0014 | 204.0165   | Removing Guardrail                                               | LF   | 400.000    | 400.000    |
| 0016 | 204.0170   | Removing Fence                                                   | LF   | 156.000    | 156.000    |
| 0018 | 204.0175   | Removing Concrete Slope Paving                                   | SY   | 335.000    | 335.000    |
| 0020 | 204.0180   | Removing Delineators and Markers                                 | EACH | 3.000      | 3.000      |
| 0022 | 204.0190   | Removing Surface Drains                                          | EACH | 2.000      | 2.000      |
| 0024 | 205.0100   | Excavation Common                                                | CY   | 473.000    | 473.000    |
| 0026 | 206.1001   | Excavation for Structures Bridges (structure) 01. B-9-32         | EACH | 1.000      | 1.000      |
| 0028 | 208.0100   | Borrow                                                           | CY   | 2,073.000  | 2,073.000  |
| 0030 | 210.1500   | Backfill Structure Type A                                        | TON  | 164.000    | 164.000    |
| 0032 | 211.0400   | Prepare Foundation for Asphaltic Shoulders                       | STA  | 44.000     | 44.000     |
| 0034 | 213.0100   | Finishing Roadway (project) 01. 1050-01-83                       | EACH | 1.000      | 1.000      |
| 0036 | 305.0110   | Base Aggregate Dense 3/4-Inch                                    | TON  | 335.000    | 335.000    |
| 0038 | 305.0120   | Base Aggregate Dense 1 1/4-Inch                                  | TON  | 1,020.000  | 1,020.000  |
| 0040 | 455.0605   | Tack Coat                                                        | GAL  | 180.000    | 180.000    |
| 0042 | 465.0105   | Asphaltic Surface                                                | TON  | 710.000    | 710.000    |
| 0044 | 465.0510   | Asphaltic Rumble Strips, Shoulder Divided Roadway                | LF   | 4,200.000  | 4,200.000  |
| 0046 | 502.0100   | Concrete Masonry Bridges                                         | CY   | 307.000    | 307.000    |
| 0048 | 502.3200   | Protective Surface Treatment                                     | SY   | 678.000    | 678.000    |
| 0050 | 502.3210   | Pigmented Surface Sealer                                         | SY   | 206.000    | 206.000    |
| 0052 | 502.4204   | Adhesive Anchors No. 4 Bar                                       | EACH | 20.000     | 20.000     |
| 0054 | 502.4205   | Adhesive Anchors No. 5 Bar                                       | EACH | 276.000    | 276.000    |
| 0056 | 505.0600   | Bar Steel Reinforcement HS Coated Structures                     | LB   | 67,980.000 | 67,980.000 |
| 0058 | 506.2605   | Bearing Pads Elastomeric Non-Laminated                           | EACH | 8.000      | 8.000      |
| 0060 | 506.4000   | Steel Diaphragms (structure) 01. B-9-32                          | EACH | 16.000     | 16.000     |
| 0062 | 506.7050.S | Removing Bearings (structure) 01. B-9-32                         | EACH | 8.000      | 8.000      |
| 0064 | 509.1500   | Concrete Surface Repair                                          | SF   | 55.000     | 55.000     |
| 0066 | 516.0500   | Rubberized Membrane Waterproofing                                | SY   | 20.000     | 20.000     |
| 0068 | 601.0588   | Concrete Curb & Gutter 4-Inch Sloped 36-Inch Type TBT            | LF   | 108.000    | 108.000    |
| 0070 | 602.3010   | Concrete Surface Drains                                          | CY   | 2.000      | 2.000      |
| 0072 | 604.0500   | Slope Paving Crushed Aggregate                                   | SY   | 335.000    | 335.000    |
| 0074 | 606.0200   | Riprap Medium                                                    | CY   | 28.000     | 28.000     |
| 0076 | 614.0150   | Anchor Assemblies for Steel Plate Beam Guard                     | EACH | 4.000      | 4.000      |
| 0078 | 614.2300   | MGS Guardrail 3                                                  | LF   | 125.000    | 125.000    |
| 0080 | 614.2500   | MGS Thrie Beam Transition                                        | LF   | 157.600    | 157.600    |
| 0082 | 614.2610   | MGS Guardrail Terminal EAT                                       | EACH | 4.000      | 4.000      |
| 0084 | 616.0100   | Fence Woven Wire (height) 01. 4-Foot                             | LF   | 156.000    | 156.000    |
| 0086 | 618.0100   | Maintenance and Repair of Haul Roads (project) 01. 1050-01-83    | EACH | 1.000      | 1.000      |
| 0088 | 619.1000   | Mobilization                                                     | EACH | 1.000      | 1.000      |
| 0090 | 624.0100   | Water                                                            | MGAL | 20.000     | 20.000     |
| 0092 | 625.0100   | Topsoil                                                          | SY   | 3,770.000  | 3,770.000  |
| 0094 | 628.1104   | Erosion Bales                                                    | EACH | 50.000     | 50.000     |
| 0096 | 628.1504   | Silt Fence                                                       | LF   | 1,600.000  | 1,600.000  |
| 0098 | 628.1520   | Silt Fence Maintenance                                           | LF   | 1,600.000  | 1,600.000  |

Estimate Of Quantities

1050-01-83

| Line | Item       | Item Description                                                   | Unit | Total     | Qty       |
|------|------------|--------------------------------------------------------------------|------|-----------|-----------|
| 0100 | 628.1905   | Mobilizations Erosion Control                                      | EACH | 4.000     | 4.000     |
| 0102 | 628.1910   | Mobilizations Emergency Erosion Control                            | EACH | 2.000     | 2.000     |
| 0104 | 628.2004   | Erosion Mat Class I Type B                                         | SY   | 3,770.000 | 3,770.000 |
| 0106 | 628.7504   | Temporary Ditch Checks                                             | LF   | 125.000   | 125.000   |
| 0108 | 629.0210   | Fertilizer Type B                                                  | CWT  | 3.000     | 3.000     |
| 0110 | 630.0120   | Seeding Mixture No. 20                                             | LB   | 85.000    | 85.000    |
| 0112 | 630.0130   | Seeding Mixture No. 30                                             | LB   | 90.000    | 90.000    |
| 0114 | 630.0500   | Seed Water                                                         | MGAL | 85.000    | 85.000    |
| 0116 | 633.0100   | Delineator Posts Steel                                             | EACH | 3.000     | 3.000     |
| 0118 | 633.0500   | Delineator Reflectors                                              | EACH | 3.000     | 3.000     |
| 0120 | 638.2102   | Moving Signs Type II                                               | EACH | 6.000     | 6.000     |
| 0122 | 642.5001   | Field Office Type B                                                | EACH | 1.000     | 1.000     |
| 0124 | 643.0300   | Traffic Control Drums                                              | DAY  | 4,850.000 | 4,850.000 |
| 0126 | 643.0370.S | Digital Speed Reduction System (DSRS)                              | DAY  | 80.000    | 80.000    |
| 0128 | 643.0420   | Traffic Control Barricades Type III                                | DAY  | 1,760.000 | 1,760.000 |
| 0130 | 643.0705   | Traffic Control Warning Lights Type A                              | DAY  | 2,560.000 | 2,560.000 |
| 0132 | 643.0715   | Traffic Control Warning Lights Type C                              | DAY  | 2,200.000 | 2,200.000 |
| 0134 | 643.0810   | Traffic Control Connected Arrow Boards                             | DAY  | 80.000    | 80.000    |
| 0136 | 643.0900   | Traffic Control Signs                                              | DAY  | 2,840.000 | 2,840.000 |
| 0138 | 643.1000   | Traffic Control Signs Fixed Message                                | SF   | 10.000    | 10.000    |
| 0140 | 643.1220   | Traffic Control Connected Work Zone Start and End Location Markers | DAY  | 80.000    | 80.000    |
| 0142 | 643.5000   | Traffic Control                                                    | EACH | 1.000     | 1.000     |
| 0144 | 645.0120   | Geotextile Type HR                                                 | SY   | 90.000    | 90.000    |
| 0146 | 646.1020   | Marking Line Epoxy 4-Inch                                          | LF   | 2,280.000 | 2,280.000 |
| 0148 | 650.4500   | Construction Staking Subgrade                                      | LF   | 580.000   | 580.000   |
| 0150 | 650.5000   | Construction Staking Base                                          | LF   | 580.000   | 580.000   |
| 0152 | 650.5500   | Construction Staking Curb Gutter and Curb & Gutter                 | LF   | 108.000   | 108.000   |
| 0154 | 650.6501   | Construction Staking Structure Layout (structure) 01. B-9-32       | EACH | 1.000     | 1.000     |
| 0156 | 650.9911   | Construction Staking Supplemental Control (project) 01. 1050-01-83 | EACH | 1.000     | 1.000     |
| 0158 | 650.9920   | Construction Staking Slope Stakes                                  | LF   | 580.000   | 580.000   |
| 0160 | 690.0150   | Sawing Asphalt                                                     | LF   | 204.000   | 204.000   |
| 0162 | 715.0502   | Incentive Strength Concrete Structures                             | DOL  | 1,500.000 | 1,500.000 |
| 0164 | SPV.0165   | Special 01. Fiber Wrap Reinforcing Structural                      | SF   | 513.000   | 513.000   |

CLEARING AND GRUBBING ITEMS

| CATEGORY | STATION | TO | STATION | OFFSET  | 201.0105<br>CLEARING<br>STA | 201.0205<br>GRUBBING<br>STA |
|----------|---------|----|---------|---------|-----------------------------|-----------------------------|
| 0010     | 16+20   | -  | 18+70   | LT & RT | 3                           | 3                           |
|          | 20+57   | -  | 23+40   | LT & RT | 4                           | 4                           |
|          | TOTALS  |    |         |         | 7                           | 7                           |

REMOVAL ITEMS

|          |           |    |         |        | 203.0100                        | 204.0190                   | 204.0110                         |                                   |
|----------|-----------|----|---------|--------|---------------------------------|----------------------------|----------------------------------|-----------------------------------|
|          |           |    |         |        | REMOVING SMALL<br>PIPE CULVERTS | REMOVING SURFACE<br>DRAINS | REMOVING<br>ASPHALTIC<br>SURFACE |                                   |
| CATEGORY | STATION   | TO | STATION | OFFSET | EACH                            | EACH                       | SY                               | COMMENTS                          |
| 0010     | 20+56     | -  | 20+72   | LT     | 1                               | 1                          | --                               | 12" CULVERT PIPE CORRUGATED STEEL |
|          | 20+57     | -  | 20+72   | RT     | 1                               | 1                          | --                               | 12" CULVERT PIPE CORRUGATED STEEL |
|          | STH 29 EB |    | LT & RT |        | --                              | --                         | 1,145                            | ASPHALT SHOULDER REPLACEMENTS     |
|          | STH 29 WB |    | LT & RT |        | --                              | --                         | 1,145                            | ASPHALT SHOULDER REPLACEMENTS     |
|          | TOTALS    |    |         |        |                                 | 2                          | 2                                | 2,290                             |

EARTHWORK SUMMARY

| DIVISION       | STATION | TO | STATION | LOCATION           | 205.0100<br>EXCAVATION<br>COMMON<br>(NOTE 1)<br>(CY) | 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) | 208.0100<br>BORROW<br>(CY) |
|----------------|---------|----|---------|--------------------|------------------------------------------------------|------------------------------------------------------------|-----------------------------------|--------------------|---------------------------|----------------------------------|----------------------------|
|                |         |    |         |                    |                                                      |                                                            |                                   |                    | FACTOR<br>1.25            |                                  |                            |
| 1              | 15+73   | -  | 18+70   | 160TH STREET SOUTH | 191                                                  | 31                                                         | 160                               | 353                | 441                       | -281                             | 281                        |
| SUBTOTALS      |         |    |         |                    | 191                                                  | 31                                                         | 160                               | 353                | 441                       | -281                             | 281                        |
| 2              | 20+57   | -  | 23+40   | 160TH STREET NORTH | 282                                                  | 50                                                         | 232                               | 1,619              | 2,024                     | -1,792                           | 1,792                      |
| SUBTOTALS      |         |    |         |                    | 282                                                  | 50                                                         | 232                               | 1,619              | 2,024                     | -1,792                           | 1,792                      |
| PROJECT TOTALS |         |    |         |                    | 473                                                  | 81                                                         | 392                               | 1,972              | 2,465                     | -2,073                           | 2,073                      |

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; NEGATIVE INDICATES A SHORTAGE OF MATERIAL

PREPARE FOUNDATION ITEMS

|          |           |     |                                                   | 211.0400<br>PREPARE FOUNDATION FOR<br>ASPHALTIC SHOULDERS |
|----------|-----------|-----|---------------------------------------------------|-----------------------------------------------------------|
| CATEGORY | LOCATION  | STA | COMMENTS                                          |                                                           |
| 0010     | STH 29 EB | 12  | LENGTH OF OUTSIDE SHOULDER REPLACEMENT = 1,150 LF |                                                           |
|          | STH 29 EB | 10  | LENGTH OF MEDIAN SHOULDER REPAIRS = 950 LF        |                                                           |
|          | STH 29 WB | 10  | LENGTH OF MEDIAN SHOULDER REPAIRS = 950 LF        |                                                           |
|          | STH 29 WB | 12  | LENGTH OF OUTSIDE SHOULDER REPLACEMENT = 1,150 LF |                                                           |
| TOTALS   |           | 44  |                                                   |                                                           |

| BASE AGGREGATE ITEMS |         |           |         |         |                                                     |                                                       |
|----------------------|---------|-----------|---------|---------|-----------------------------------------------------|-------------------------------------------------------|
| CATEGORY             | STATION | TO        | STATION | OFFSET  | 305.0110<br>BASE AGGREGATE<br>DENSE 3/4-INCH<br>TON | 305.0120<br>BASE AGGREGATE<br>DENSE 1 1/4-INCH<br>TON |
| 0010                 | 16+51   | -         | 18+70   | LT & RT | 60                                                  | 464                                                   |
|                      | 20+57   | -         | 22+80   | LT & RT | 57                                                  | 556                                                   |
|                      |         | STH 29 EB |         | LT & RT | 109                                                 | --                                                    |
|                      |         | STH 29 WB |         | LT & RT | 109                                                 | --                                                    |
|                      | TOTALS  |           |         |         | 335                                                 | 1,020                                                 |

| CONCRETE ITEMS |         |    |         |        |                                              |                                                                               |
|----------------|---------|----|---------|--------|----------------------------------------------|-------------------------------------------------------------------------------|
| CATEGORY       | STATION | TO | STATION | OFFSET | 602.3010<br>CONCRETE SURFACE<br>DRAINS<br>CY | 601.0588<br>CONCRETE CURB & GUTTER<br>4-INCH SLOPED 36-INCH<br>TYPE TBT<br>LF |
| 0010           | 20+66   | -  | 21+20   | LT     | 1                                            | 54                                                                            |
|                | 20+66   | -  | 21+20   | RT     | 1                                            | 54                                                                            |
|                | TOTAL   |    |         |        | 2                                            | 108                                                                           |

ASPHALTIC ITEMS

| CATEGORY | STATION | TO        | STATION | OFFSET  | 455.0605<br>TACK COAT<br>GAL | 465.0105<br>ASPHALTIC SURFACE<br>TON | 465.0510<br>ASPHALTIC RUMBLE STRIPS,<br>SHOULDER DIVIDED ROADWAY<br>LF |
|----------|---------|-----------|---------|---------|------------------------------|--------------------------------------|------------------------------------------------------------------------|
| 0010     | 16+51   | -         | 18+70   | LT & RT | 25                           | 128                                  | --                                                                     |
|          | 20+57   | -         | 22+80   | LT & RT | 37                           | 183                                  | --                                                                     |
|          |         | STH 29 EB |         | LT & RT | 59                           | 199                                  | 2,100                                                                  |
|          |         | STH 29 WB |         | LT & RT | 59                           | 199                                  | 2,100                                                                  |
|          | TOTALS  |           |         |         | 180                          | 710                                  | 4,200                                                                  |

RIPRAP ITEMS

| CATEGORY | STATION | OFFSET | 606.0200<br>RIPRAP MEDIUM<br>CY | 645.0120<br>GEOTEXTILE TYPE HR<br>SY |
|----------|---------|--------|---------------------------------|--------------------------------------|
| 0010     | 21+10   | LT     | 17                              | 54                                   |
|          | 21+10   | RT     | 11                              | 36                                   |
| TOTALS   |         |        | 28                              | 90                                   |





3

DELINEATOR REFLECTOR ITEMS

| CATEGORY | STATION | TO | STATION | OFFSET | 204.0180<br>REMOVING<br>DELINEATORS<br>AND MARKERS<br>EACH | 633.0100<br>DELINEATOR<br>POSTS STEEL<br>EACH | 633.0500<br>DELINEATOR<br>REFLECTORS<br>WHITE<br>EACH |
|----------|---------|----|---------|--------|------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------|
| 0010     | 21+69   | -  | 22+80   | RT     | 3                                                          | 3                                             | 3                                                     |
| TOTALS   |         |    |         |        | 3                                                          | 3                                             | 3                                                     |

646.1020  
MARKING LINE EPOXY 4-INCH

| CATEGORY | STATION | TO | STATION | SOLID<br>YELLOW<br>LF | SOLID WHITE<br>LF | COMMENTS    |
|----------|---------|----|---------|-----------------------|-------------------|-------------|
| 0010     | 17+50   | -  | 22+80   | 1,060                 | --                | CENTERLINE  |
|          | 16+51   | -  | 22+80   | --                    | 628               | RT EDGELINE |
|          | 16+89   | -  | 22+80   | --                    | 592               | LT EDGELINE |
| TOTALS   |         |    |         |                       | 2,280             |             |

3

GUARDRAIL ITEMS

| CATEGORY | STATION | TO | STATION | OFFSET | 204.0165<br>REMOVING<br>GUARDRAIL<br>LF | 614.2300<br>MGS GUARDRAIL<br>3<br>LF | 614.2500<br>MGS THRIE BEAM<br>TRANSITION<br>LF | 614.2610<br>MGS GUARDRAIL<br>TERMINAL EAT<br>EACH |
|----------|---------|----|---------|--------|-----------------------------------------|--------------------------------------|------------------------------------------------|---------------------------------------------------|
| 0010     | 17+21   | -  | 18+64   | RT     | 100                                     | 50.0                                 | 39.4                                           | 1                                                 |
|          | 17+59   | -  | 18+64   | LT     | 100                                     | 12.5                                 | 39.4                                           | 1                                                 |
|          | 20+64   | -  | 21+69   | RT     | 100                                     | 12.5                                 | 39.4                                           | 1                                                 |
|          | 20+64   | -  | 22+06   | LT     | 100                                     | 50.0                                 | 39.4                                           | 1                                                 |
| TOTALS   |         |    |         |        | 400                                     | 125.0                                | 157.6                                          | 4                                                 |

FENCING ITEMS

| CATEGORY | STATION | TO | STATION | OFFSET | 204.0170<br>REMOVING FENCE<br>LF | 616.0100.01<br>FENCE WOVEN<br>WIRE (4-FEET)<br>LF |
|----------|---------|----|---------|--------|----------------------------------|---------------------------------------------------|
| 0010     | 18+29   | -  | 18+69   | RT     | 45                               | 45                                                |
|          | 18+70   | -  | 18+71   | LT     | 14                               | 14                                                |
|          | 20+56   | -  | 20+65   | LT     | 56                               | 56                                                |
|          | 20+57   | -  | 20+65   | RT     | 41                               | 41                                                |
| TOTALS   |         |    |         |        | 156                              | 156                                               |

TRAFFIC CONTROL SIGNS FIXED MESSAGE

| CATEGORY | LOCATION            | NUMBER<br>REQUIRED | SIGN SIZE<br>W X H<br>FT X FT | 643.1000<br>SF | SIGN MESSAGE |
|----------|---------------------|--------------------|-------------------------------|----------------|--------------|
| 0010     | 50TH AVE & 160TH ST | 2                  | 2.5 x 1                       | 5.00           | 160TH ST     |
|          | CTH J & 160TH ST    | 2                  | 2.5 x 1                       | 5.00           | 160TH ST     |
| TOTAL    |                     |                    |                               | 10.00          |              |

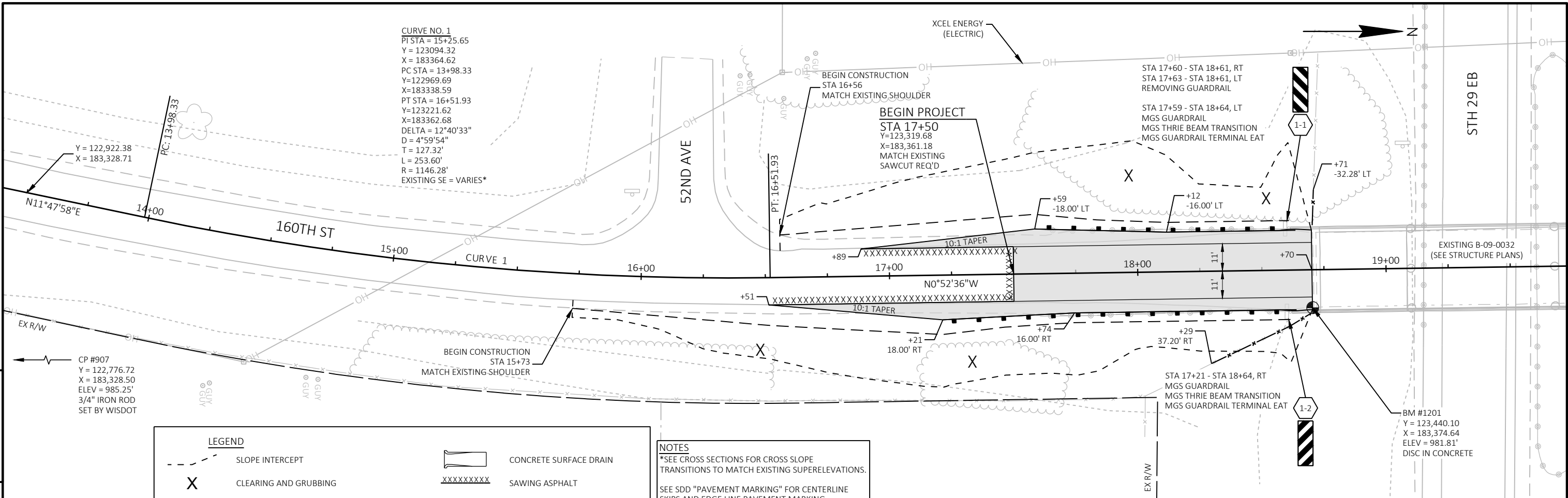
SAWING ITEMS

| CATEGORY | STATION | TO    | STATION | OFFSET  | 690.0150<br>SAWING ASPHALT<br>LF |
|----------|---------|-------|---------|---------|----------------------------------|
| 0010     | 16+51   | -     | 17+50   | LT & RT | 182                              |
|          |         | 22+80 |         | LT & RT | 22                               |
| TOTALS   |         |       |         |         | 204                              |

STAKING ITEMS

| CATEGORY | STATION | TO | STATION | OFFSET  | 650.4500<br>CONSTRUCTION<br>STAKING<br>SUBGRADE<br>LF | 650.5000<br>CONSTRUCTION<br>STAKING BASE<br>LF | 650.5500<br>CONSTRUCTION STAKING<br>CURB GUTTER AND CURB &<br>GUTTER<br>LF | 650.9920<br>CONSTRUCTION<br>STAKING SLOPE<br>STAKES<br>LF |
|----------|---------|----|---------|---------|-------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------|-----------------------------------------------------------|
| 0010     | 15+73   | -  | 18+70   | LT & RT | 297                                                   | 297                                            | --                                                                         | 297                                                       |
|          | 20+57   | -  | 23+40   | LT & RT | 283                                                   | 283                                            | 108                                                                        | 283                                                       |
| PROJECT  |         |    |         |         | --                                                    | --                                             | --                                                                         | --                                                        |
| TOTALS   |         |    |         |         | 580                                                   | 580                                            | 108                                                                        | 580                                                       |





**LEGEND**

|  |                                             |  |                                              |
|--|---------------------------------------------|--|----------------------------------------------|
|  | SLOPE INTERCEPT                             |  | CONCRETE SURFACE DRAIN                       |
|  | CLEARING AND GRUBBING                       |  | SAWING ASPHALT                               |
|  | 4 1/2-INCH ASPHALTIC SURFACE                |  | REMOVING FENCE AND FENCE WOVEN WIRE (4-FEET) |
|  | RIPRAP MEDIUM (SEE EROSION CONTROL DETAILS) |  | CONCRETE CURB & GUTTER                       |
|  |                                             |  | 4-INCH SLOPED 36-INCH TYPE TBT               |
|  |                                             |  | SIGN - MOVE                                  |

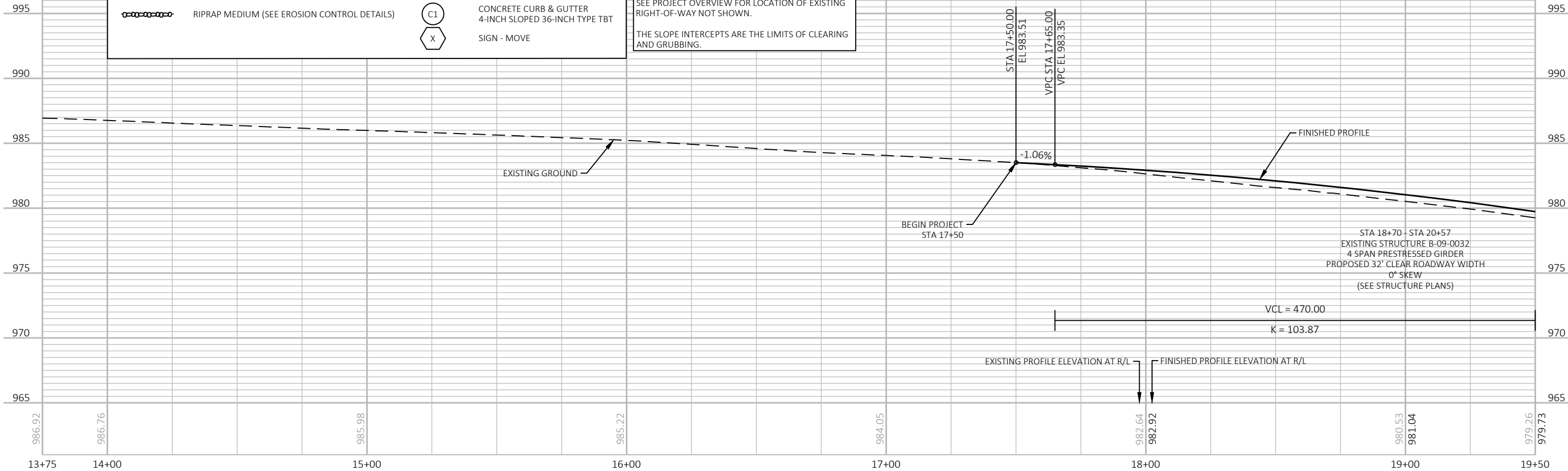
**NOTES**

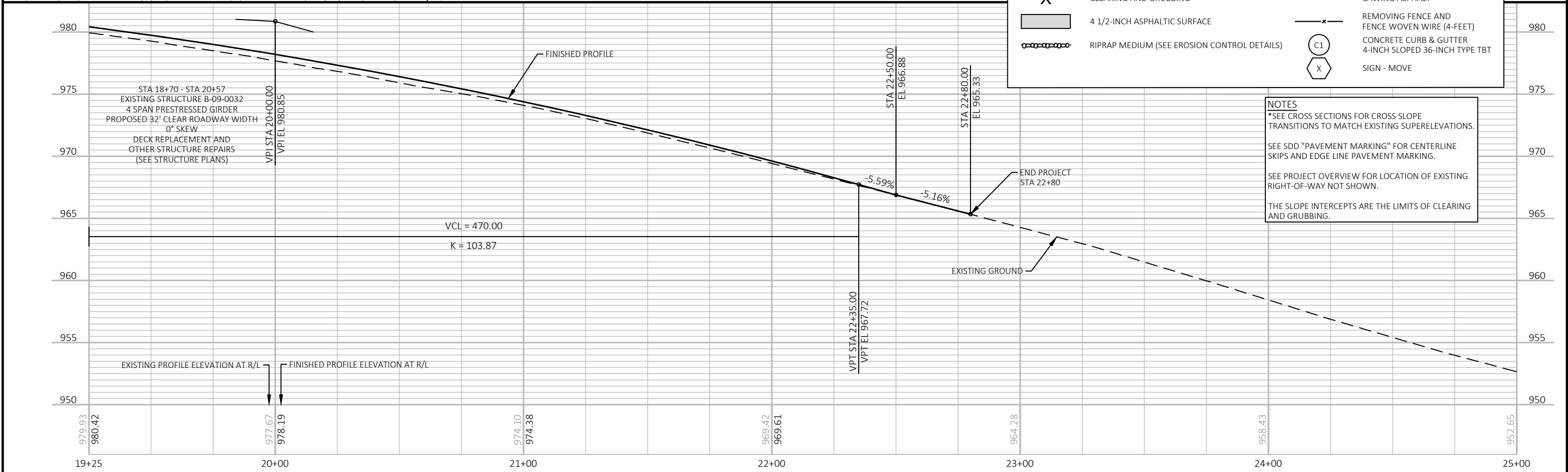
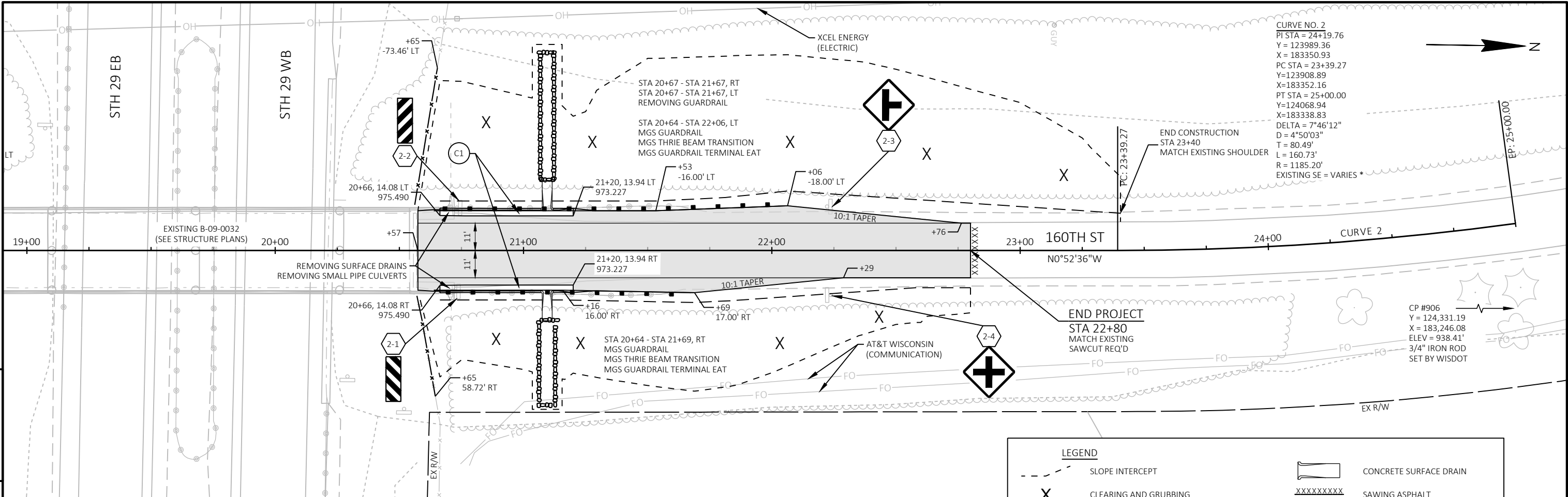
\*SEE CROSS SECTIONS FOR CROSS SLOPE TRANSITIONS TO MATCH EXISTING SUPERELEVATIONS.

SEE SDD "PAVEMENT MARKING" FOR CENTERLINE SKIPS AND EDGE LINE PAVEMENT MARKING.

SEE PROJECT OVERVIEW FOR LOCATION OF EXISTING RIGHT-OF-WAY NOT SHOWN.

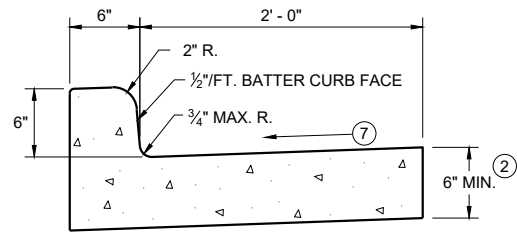
THE SLOPE INTERCEPTS ARE THE LIMITS OF CLEARING AND GRUBBING.



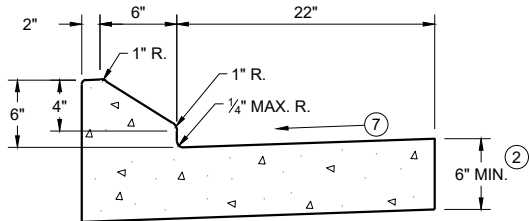


Standard Detail Drawing List

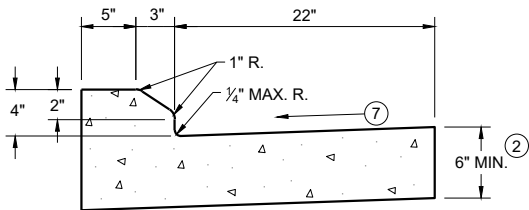
|           |                                                                                  |
|-----------|----------------------------------------------------------------------------------|
| 08D01-24A | CONCRETE CURB & GUTTER                                                           |
| 08D01-24B | CONCRETE CURB, TIES AND CURB AND GUTTER APPLICATIONS                             |
| 08D02-08A | CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES                                 |
| 08D02-08B | CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES                                 |
| 08D02-08C | CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES                                 |
| 08E08-03  | TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS                  |
| 08E09-06  | SILT FENCE                                                                       |
| 12A03-10  | NAME PLATE (STRUCTURES)                                                          |
| 13A05-06A | SHOULDER RUMBLE STRIPS, DIVIDED ROADWAY                                          |
| 13A05-06B | SHOULDER RUMBLE STRIPS, DIVIDED ROADWAY                                          |
| 13C19-03  | HMA LONGITUDINAL JOINTS                                                          |
| 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)                             |
| 15A04-08C | DELINEATOR POST WITH REFLECTIVE SHEETING                                         |
| 15B01-08A | FENCE WOVEN WIRE                                                                 |
| 15B01-08B | FENCE WOVEN WIRE                                                                 |
| 15C02-10A | BARRICADES AND SIGNS FOR MAINLINE CLOSURES                                       |
| 15C02-10B | BARRICADES AND SIGNS FOR VARIOUS CLOSURES                                        |
| 15C06-12  | SIGNING & MARKING FOR TWO LANE BRIDGES                                           |
| 15C08-24A | PERMANENT LONGITUDINAL PAVEMENT MARKINGS                                         |
| 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           |
| 15D12-16A | TRAFFIC CONTROL, LANE CLOSURE                                                    |
| 15D15-08B | TRAFFIC CONTROL, ENTRANCE RAMP WITHIN LANE CLOSURE                               |
| 15D15-08C | TRAFFIC CONTROL, TAPERED ENTRANCE RAMP WITHIN LANE CLOSURE                       |
| 15D15-08D | TRAFFIC CONTROL, TAPERED ENTRANCE RAMP WITHIN LANE CLOSURE                       |
| 15D27-05  | TRAFFIC CONTROL, SHOULDER CLOSURE ON DIVIDED ROADWAY, SPEEDS GREATER THAN 40 MPH |
| 15D40-07D | TRAFFIC CONTROL, PARTIAL LANE SHIFT MULTILANE DIVIDED 50 MPH AND GREATER         |



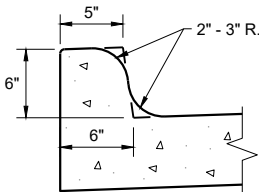
TYPES A<sup>①</sup> & D



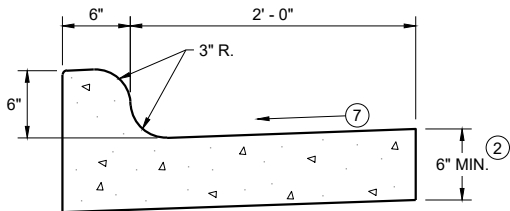
6" SLOPED CURB TYPES G<sup>①</sup> & J



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

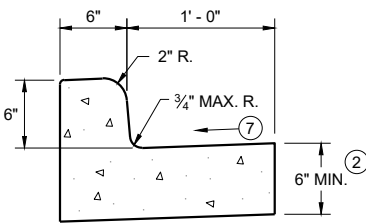


TYPES K<sup>①</sup> & L  
(OPTIONAL CURB SHAPE)



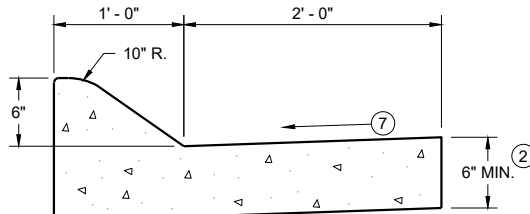
TYPES K<sup>①</sup> & L

CONCRETE CURB AND GUTTER 30"

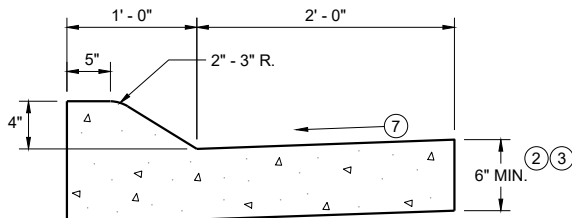


TYPES A<sup>①</sup> & D

CONCRETE CURB AND GUTTER 18"

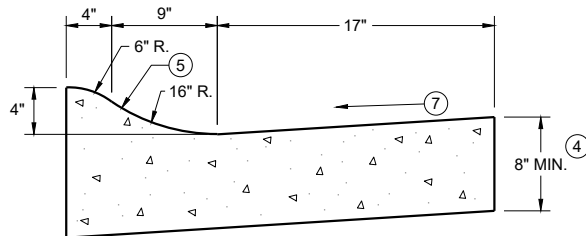


6" SLOPED CURB TYPES A<sup>①</sup> & D



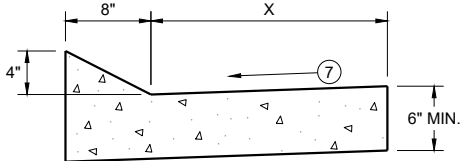
4" SLOPED CURB TYPES A<sup>①</sup> & D

CONCRETE CURB AND GUTTER 36"



4" SLOPED CURB TYPES R<sup>①</sup> & T  
CONCRETE CURB AND GUTTER 30"

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

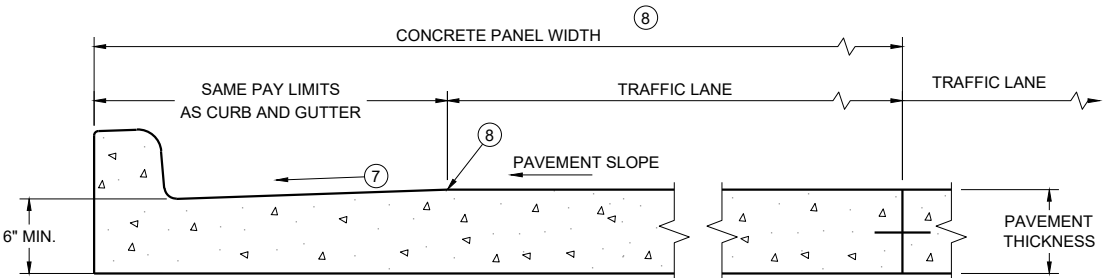


TYPES TBT & TBTT<sup>①</sup>

CONCRETE CURB AND GUTTER

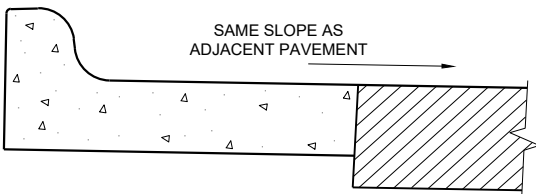
PAVEMENT THICKNESS  
AND MAXIMUM CONCRETE  
PANEL WIDTH TABLE

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

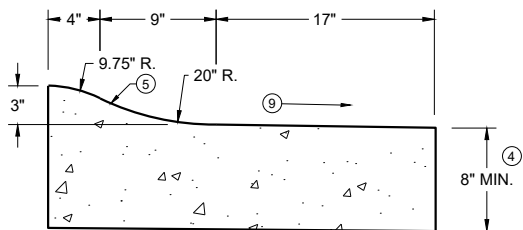


PARTIAL SECTION OF PAVEMENT  
WITH INTEGRAL CURB AND GUTTER

\* BIKE LANE IS NOT SHOWN



REVERSE SLOPE GUTTER<sup>⑥</sup>  
(TYPICAL FOR ALL CURB & GUTTER TYPES)



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

CONCRETE CURB AND GUTTER

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

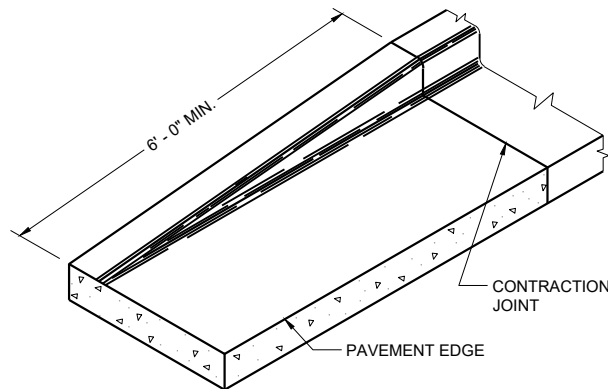
DETAILS OF CONSTRUCTION AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

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

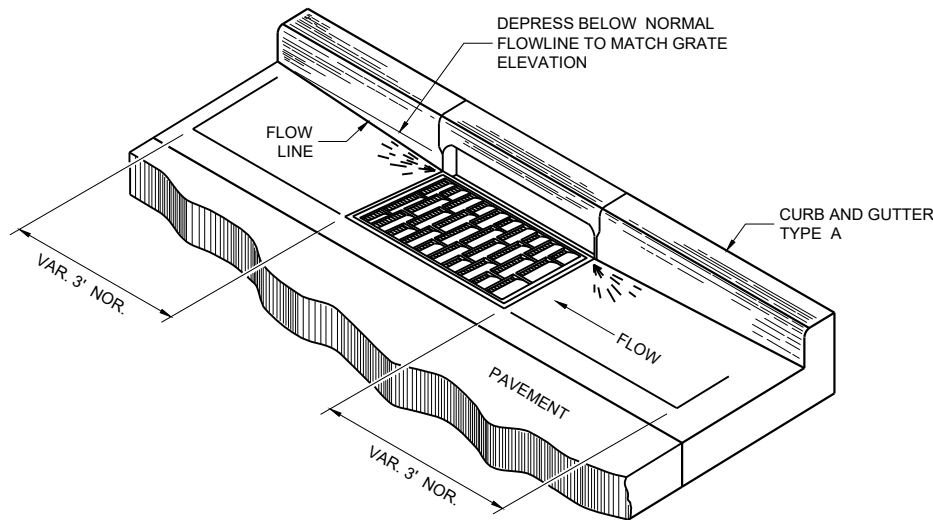
INTEGRAL CURB AND GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB AND GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE.

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 SLOPE TO BE REVERSE SLOPE MATCHING THE SLOPE OF THE PAVEMENT AND THE CIRCULATORY ROADWAY

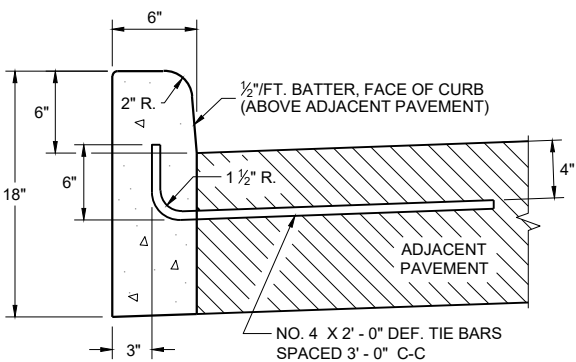


END SECTION CURB AND GUTTER

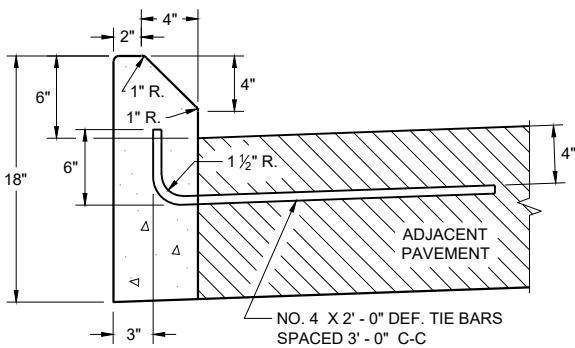


DETAIL OF CURB AND GUTTER AT INLETS

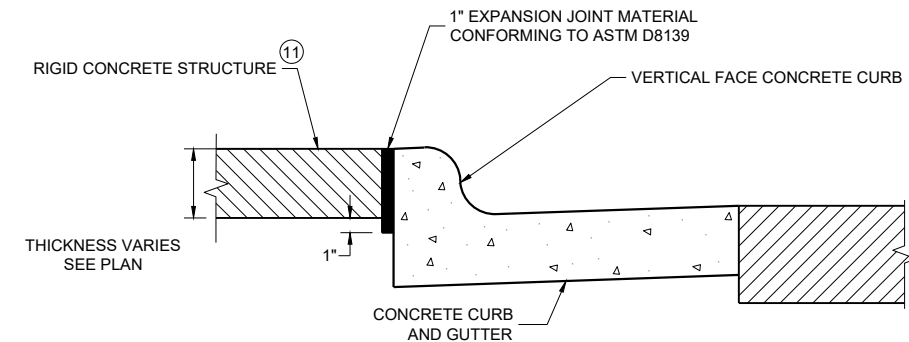
(TYPICAL H INLET COVER SHOWN)



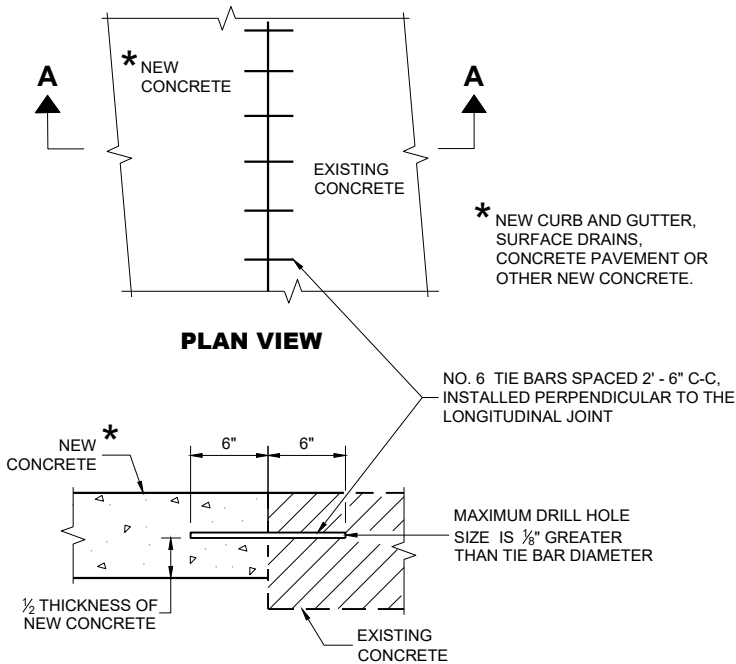
TYPES A<sup>①</sup> & D



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

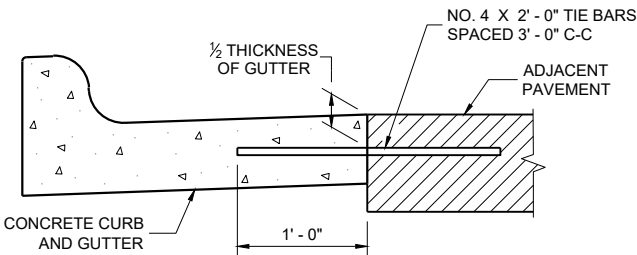
GENERAL NOTES

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

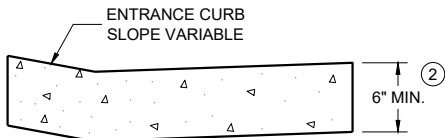
PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

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  
February 2025 DATE /S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR

FHWA

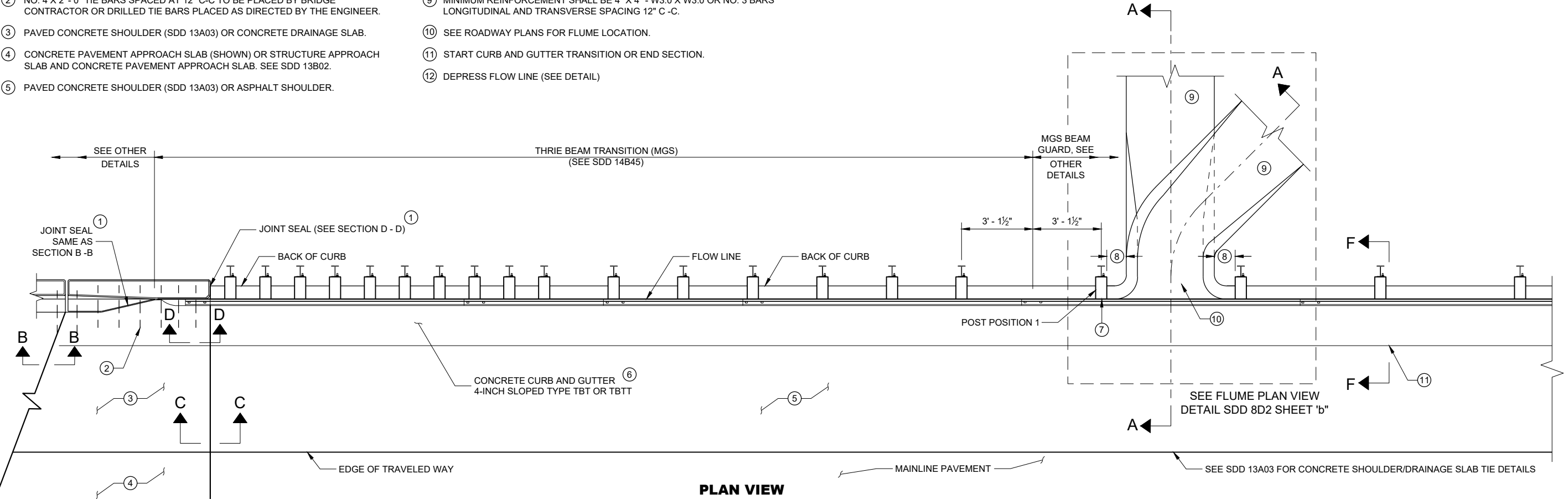
GENERAL NOTES

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

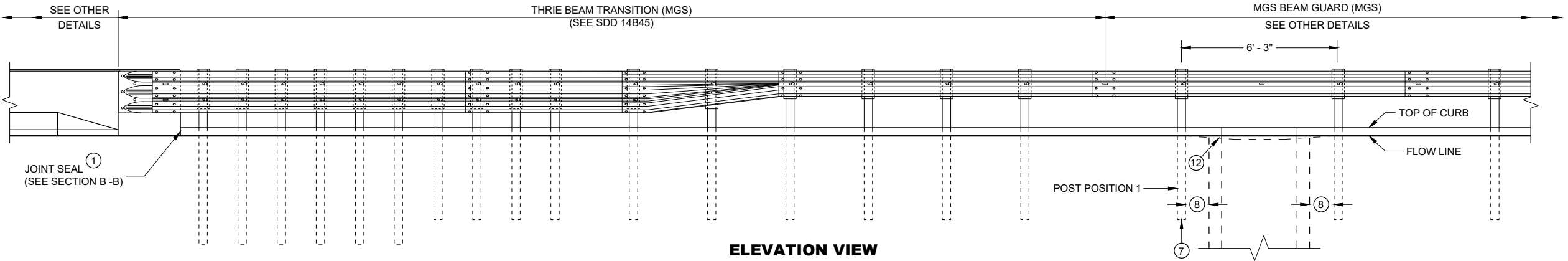
ALL STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

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

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



PLAN VIEW

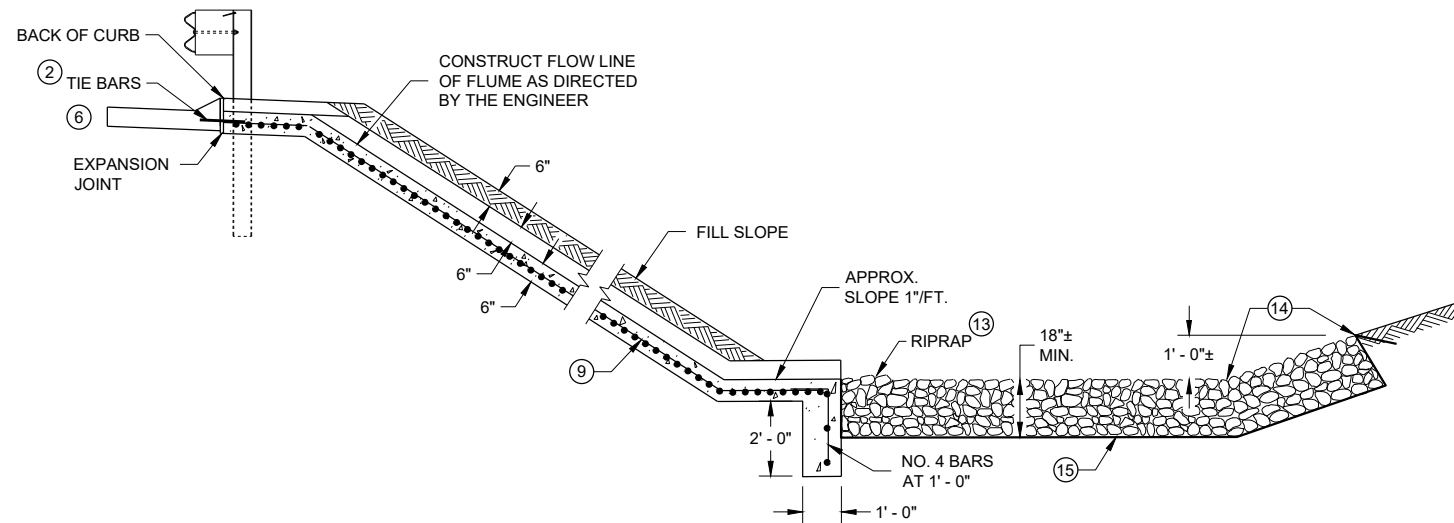


ELEVATION VIEW

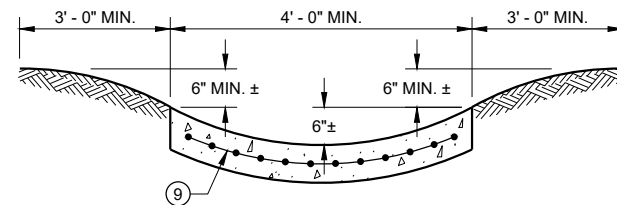
CONCRETE SURFACE  
DRAINS FLUME TYPE  
AT STRUCTURES

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

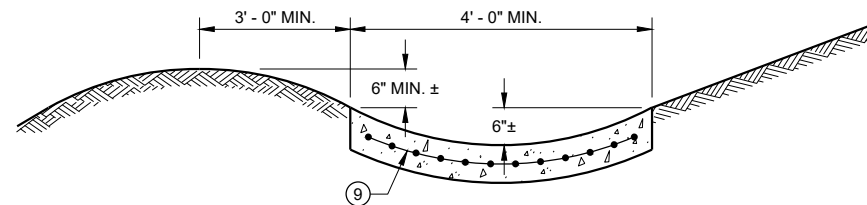




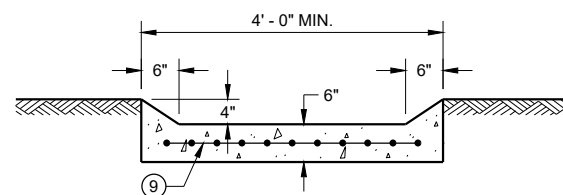
SECTION A - A



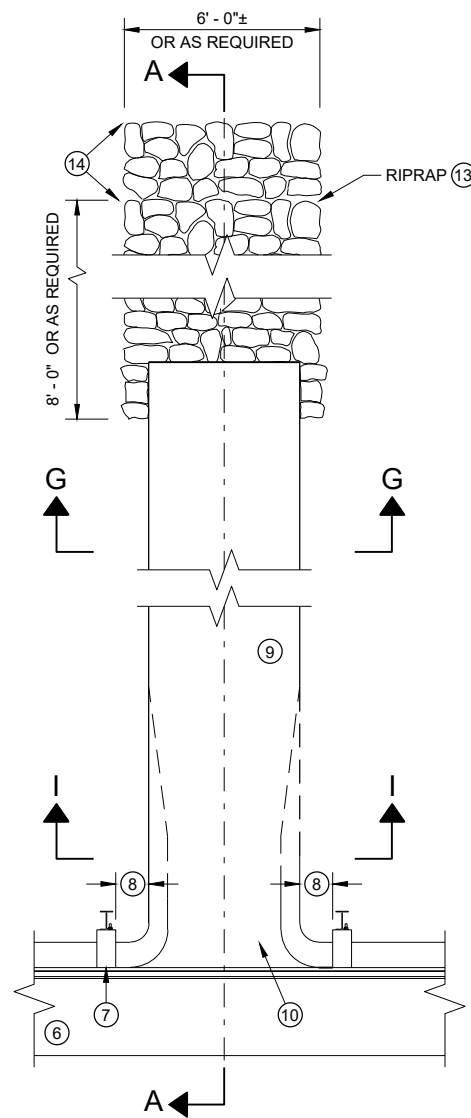
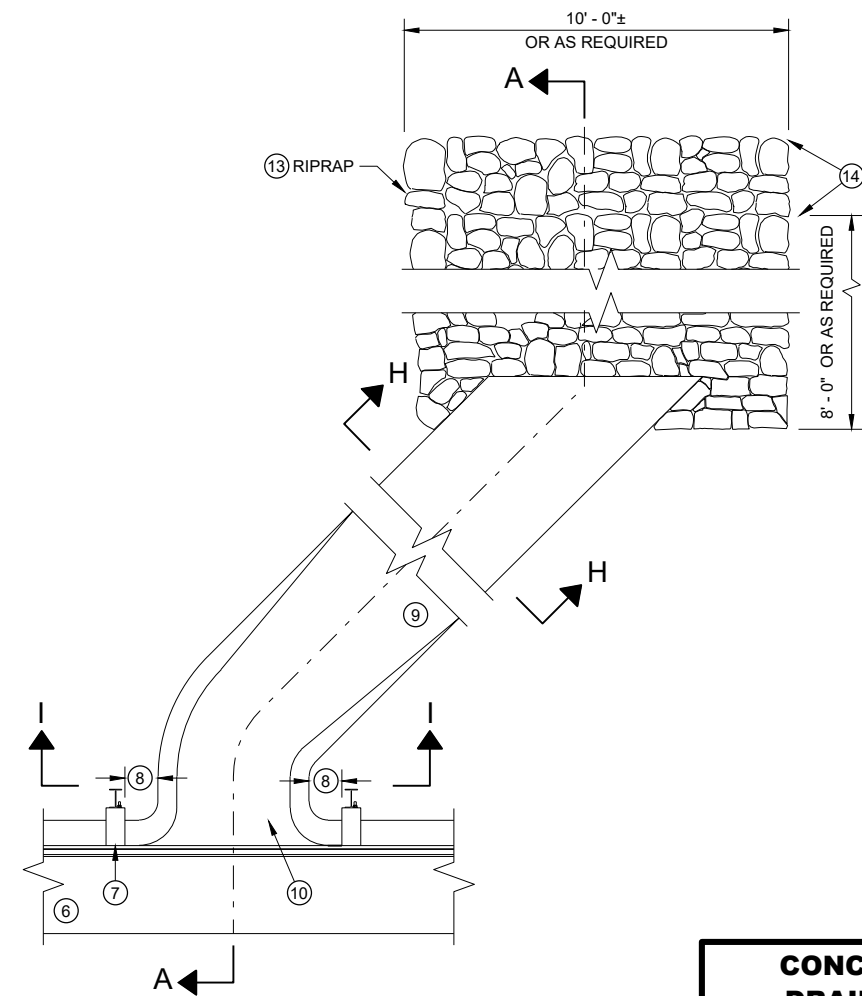
SECTION G - G



SECTION H - H



SECTION I - I

PLAN VIEW  
PERPENDICULAR FLUMEPLAN VIEW  
SKEWED FLUME

## GENERAL NOTES

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

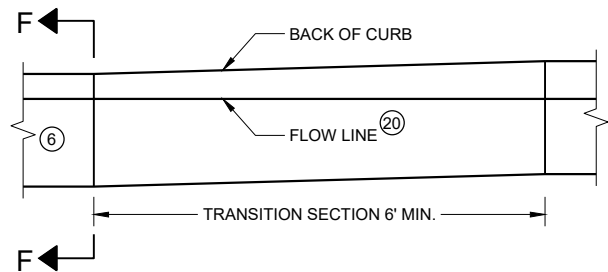
ALL STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

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- ④ CONCRETE PAVEMENT APPROACH SLAB (SHOWN) OR STRUCTURE APPROACH SLAB AND CONCRETE PAVEMENT APPROACH SLAB. SEE SDD 13B02 AND STRUCTURE PLANS.
- ⑤ PAVED CONCRETE SHOULDER (SDD 13A03) OR ASPHALT SHOULDER.
- ⑥ CONCRETE CURB AND GUTTER 4-INCH SLOPED 36-INCH TYPE TBT OR TBT. USE TYPE TBT CURB WITH NO. 4 X 2' - 0" TIE BARS SPACED AT 3' - 0" C-C ONLY WHEN ADJACENT TO CONCRETE PAVEMENTS.

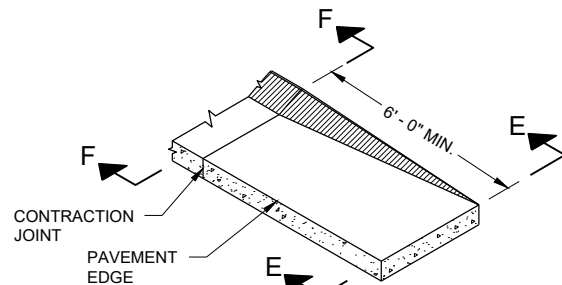
- ⑦ PLACE FLUME BEFORE MSG THRIE BEAM TRANSITION POST 1 (SEE SDD 14B45)
- ⑧ CENTER FLUME BETWEEN POSTS. 6-INCH MINIMUM SEPARATION FROM OUTSIDE EDGE OF FLUME TO POSTS.
- ⑨ MINIMUM REINFORCEMENT SHALL BE 4" X 4" - W3.0 X W3.0 OR NO. 3 BARS LONGITUDINAL AND TRANSVERSE SPACING 12" C - C.
- ⑩ SEE ROADWAY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

**CONCRETE SURFACE  
DRAINS FLUME TYPE  
AT STRUCTURES**

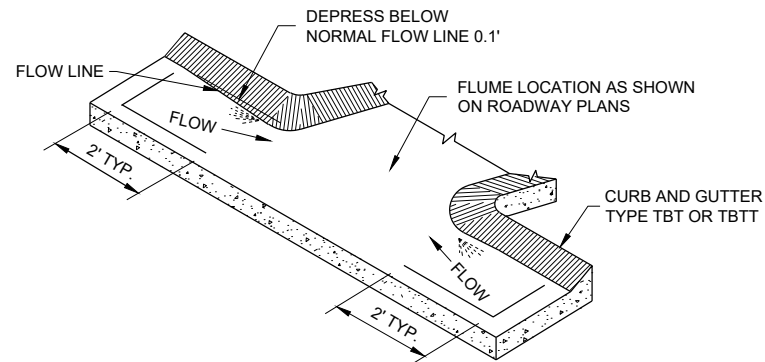
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



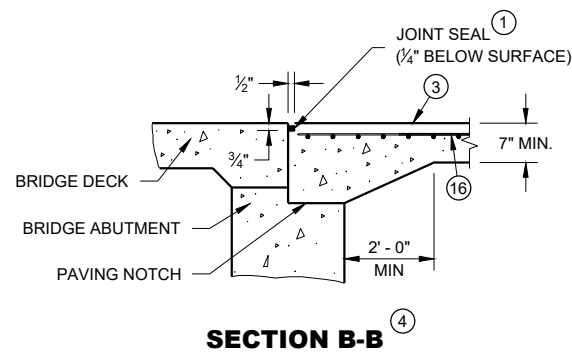
**CURB AND GUTTER TRANSITION SECTION  
CONCRETE CURB AND GUTTER 4-INCH SLOPED  
36 INCH TYPE TBT OR TBTT**



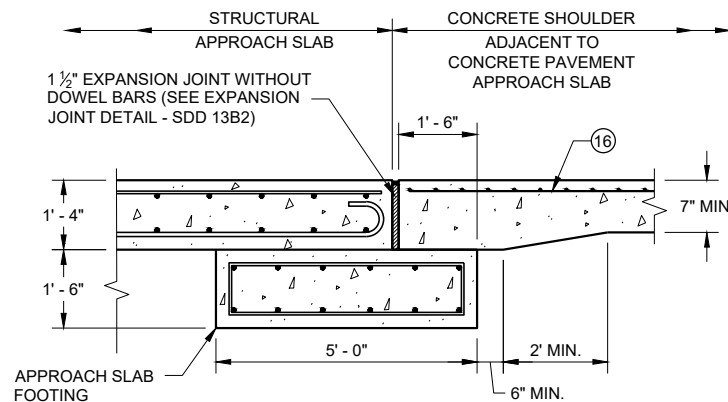
**CURB AND GUTTER END SECTION  
CONCRETE CURB AND GUTTER 4-INCH SLOPED  
36 INCH TYPE TBT OR TBTT**



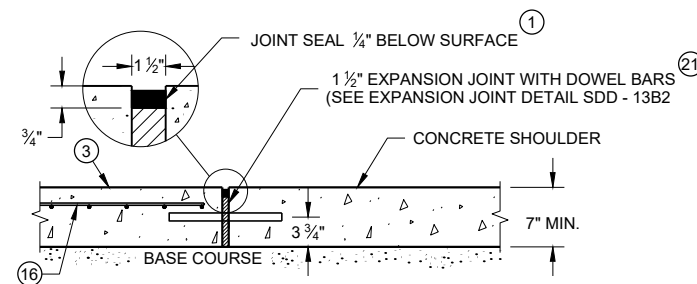
**CURB AND GUTTER FLOW LINE DEPRESSION  
AT FLUMES CONCRETE CURB AND GUTTER  
4-INCH SLOPED 36 INCH TYPE TBT OR TBTT**



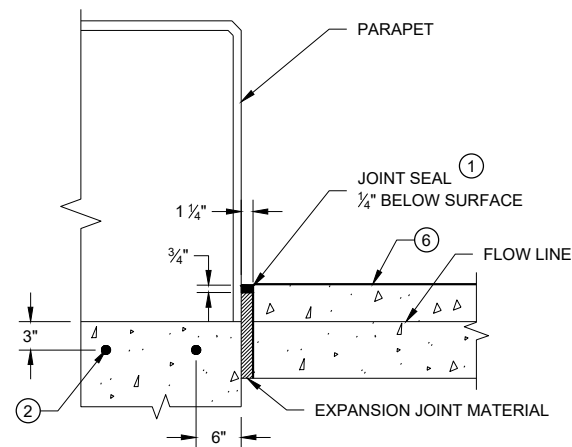
**SECTION B-B**



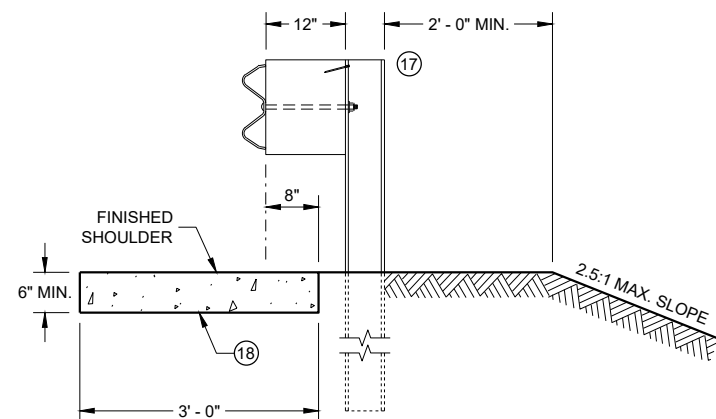
**SECTION C - C  
JOINT DETAIL FOR BRIDGE WITH STRUCTURAL  
APPROACH SLAB AND CONCRETE APPROACH SLAB**



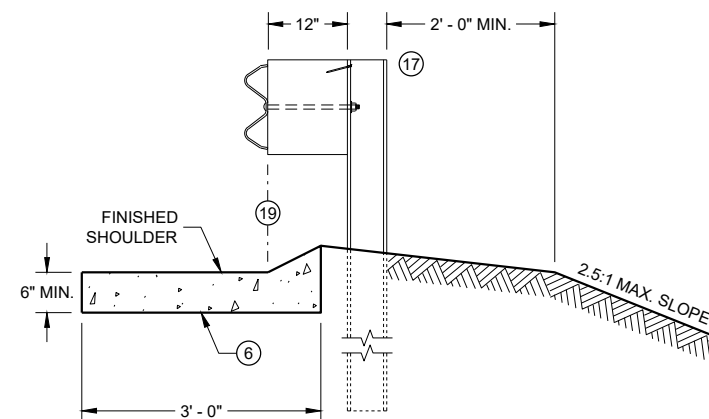
**SECTION C - C  
JOINT DETAIL FOR BRIDGE APPROACH  
WITH CONCRETE SHOULDERS**



**SECTION D - D**



**SECTION E - E**



**SECTION F - F**

## GENERAL NOTES

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

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

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

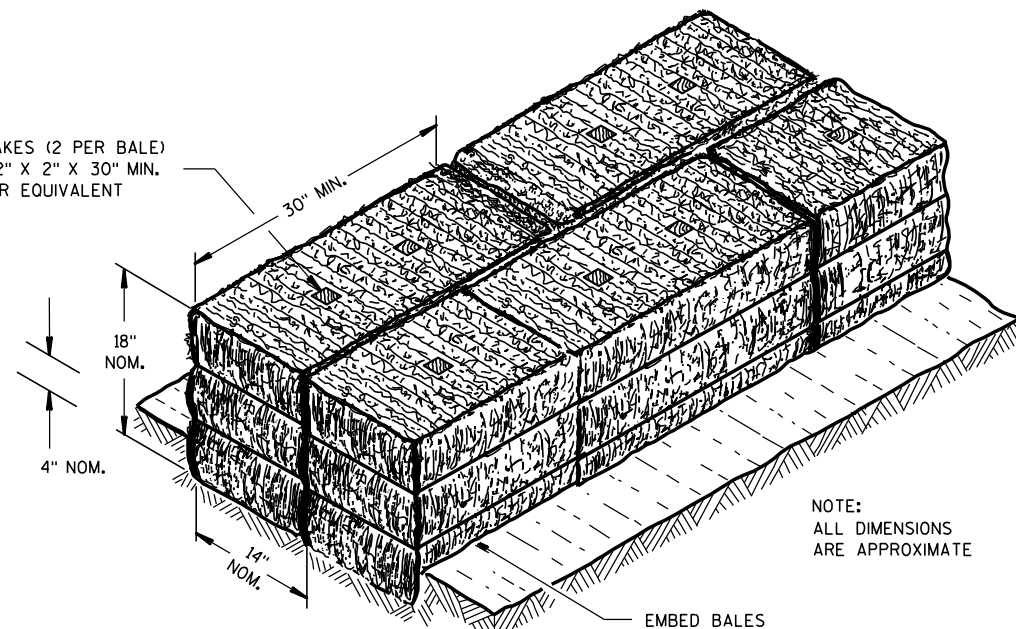
## CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2023 /S/ Rodney Taylor  
DATE ROADWAY STANDARDS DEVELOPMENT  
ENGINEER  
FHWA

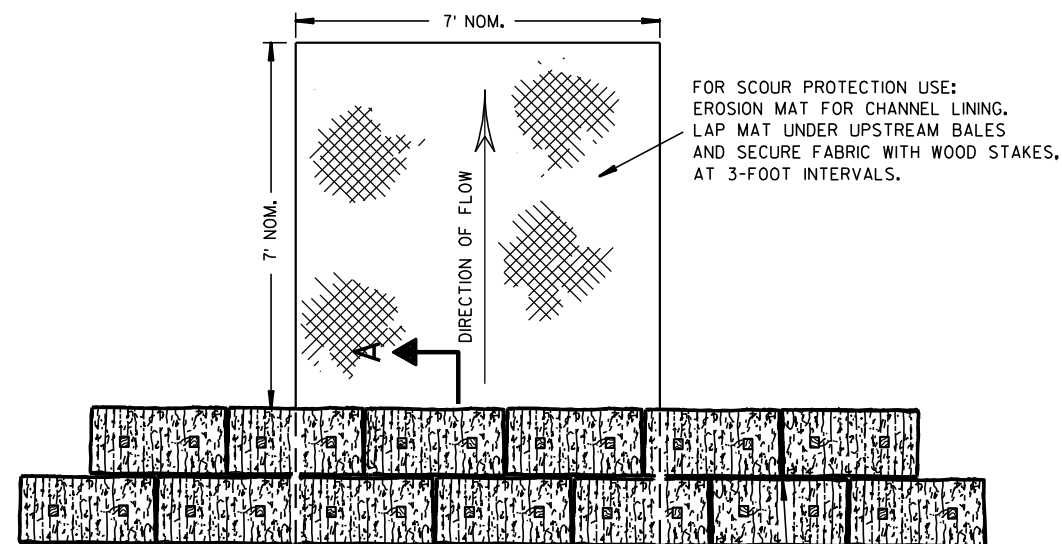


WOOD STAKES (2 PER BALE)  
NOMINAL 2" X 2" X 30" MIN.  
LENGTH OR EQUIVALENT



NOTE:  
ALL DIMENSIONS  
ARE APPROXIMATE

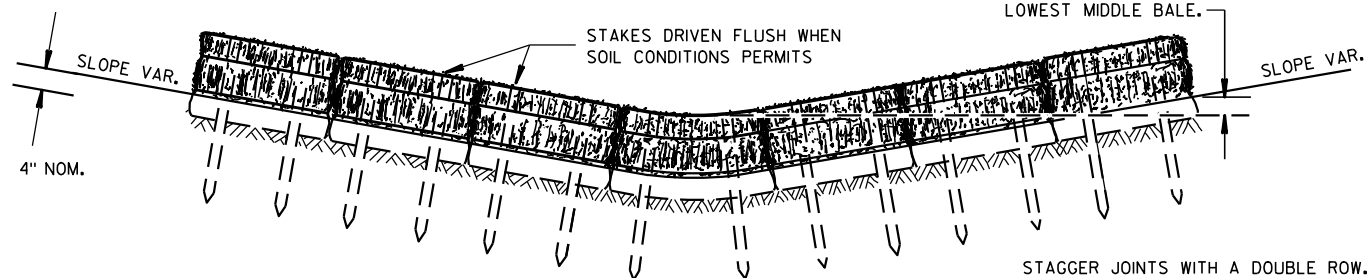
SECTION A-A



PLAN VIEW

STAGGER JOINTS BETWEEN ADJACENT  
ROWS OF BALES.

BOTTOM ELEVATION OF END BALE SHALL  
BE EQUAL TO OR GREATER THAN TOP OF  
LOWEST MIDDLE BALE.



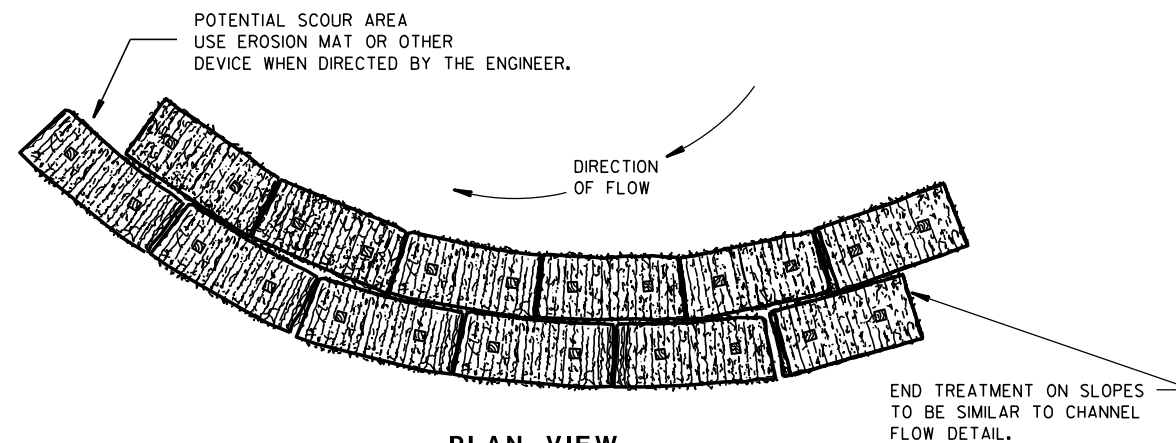
FRONT ELEVATION

TEMPORARY DITCH CHECK USING EROSION BALES ①

## GENERAL NOTES

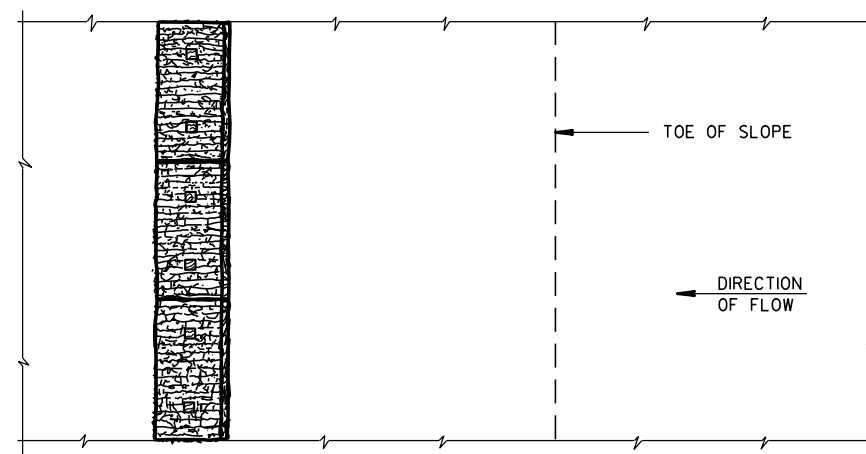
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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

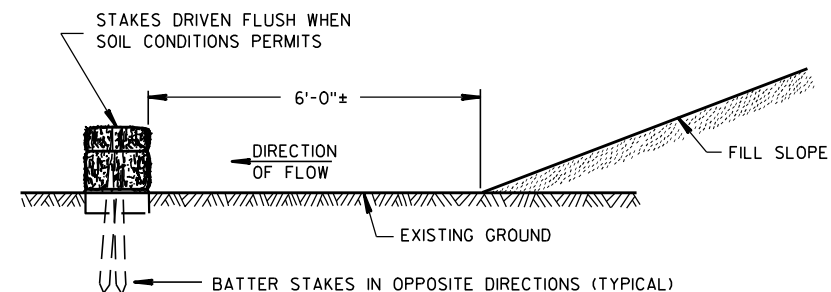


PLAN VIEW

WHEN ALTERING THE DIRECTION OF FLOW



PLAN VIEW



FRONT ELEVATION

WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE

EROSION BALES FOR SHEET FLOW

TYPICAL INSTALLATIONS OF  
EROSION BALES / TEMPORARY  
DITCH CHECKS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

6/04/02  
DATE

/S/ Beth Canestra  
CHIEF ROADWAY DEVELOPMENT ENGINEER

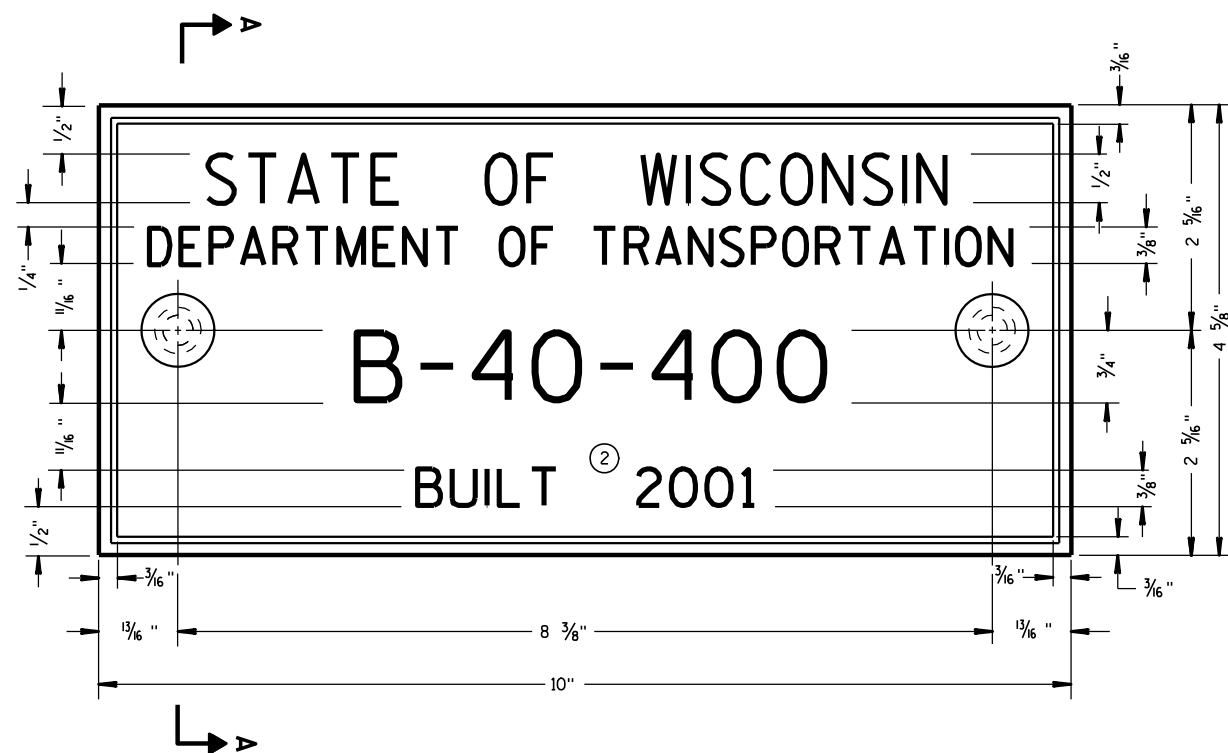
FHWA



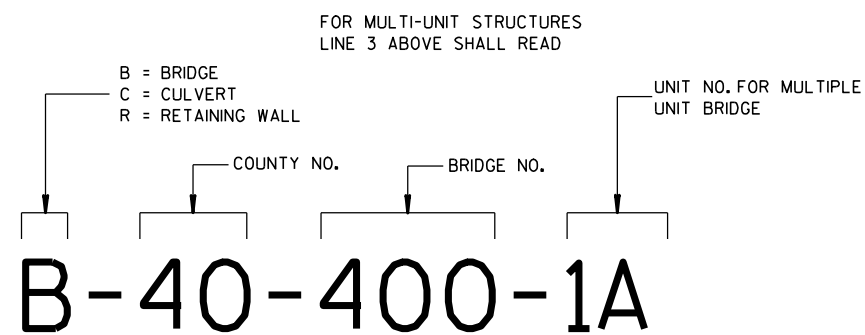
- ① HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
- ② FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
- ③ WOOD POSTS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



|                                                            |                                                                  |
|------------------------------------------------------------|------------------------------------------------------------------|
| <p>SILT FENCE</p>                                          |                                                                  |
| <p>STATE OF WISCONSIN<br/>DEPARTMENT OF TRANSPORTATION</p> |                                                                  |
| <p>APPROVED<br/>4-29-05<br/>DATE</p>                       | <p>/s/ Beth Cannestra<br/>CHIEF ROADWAY DEVELOPMENT ENGINEER</p> |



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



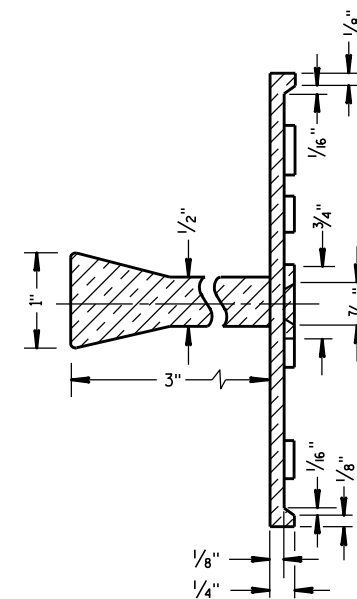
**NUMBERING DESIGNATION  
MULTI-UNIT STRUCTURES**

## GENERAL NOTES

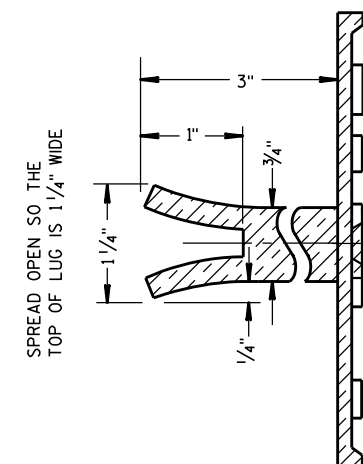
NAME PLATES TO BE INSTALLED ON BRIDGES, CULVERTS, AND RETAINING WALLS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS.

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

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

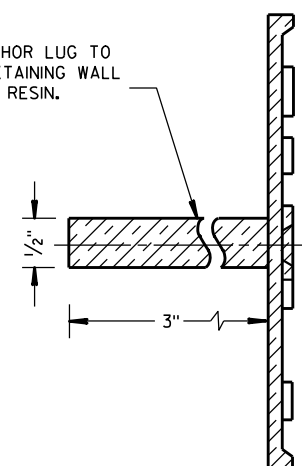


**SECTION A-A**



**ALTERNATE LUG**

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



**ALTERNATE LUG**  
(FOR ATTACHMENT TO PRECAST STRUCTURES)

**NAME PLATE  
(STRUCTURES)**

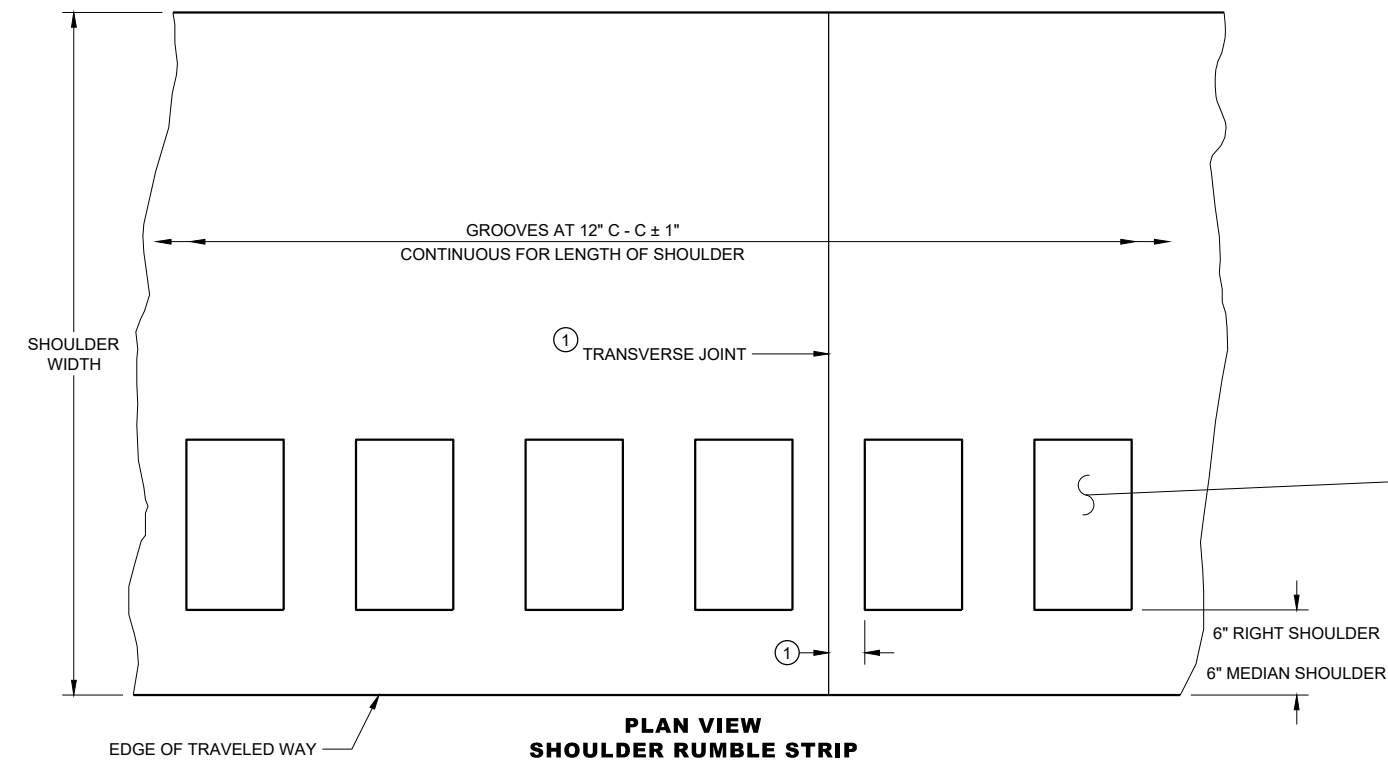
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

3/26/10  
DATE

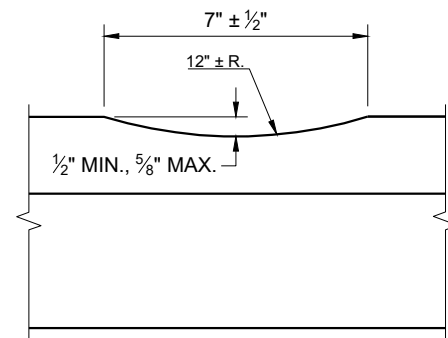
FHWA

/S/ Scot Becker  
CHIEF STRUCTURAL DEVELOPMENT ENGINEER

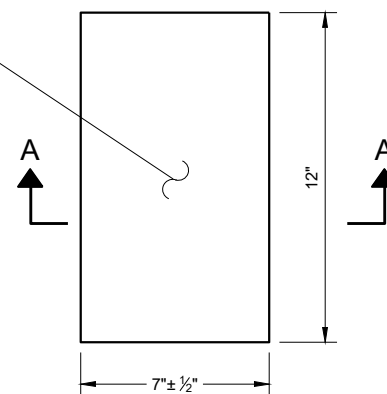


6

PLACEMENT DETAIL FOR RUMBLE STRIP



SECTION A - A



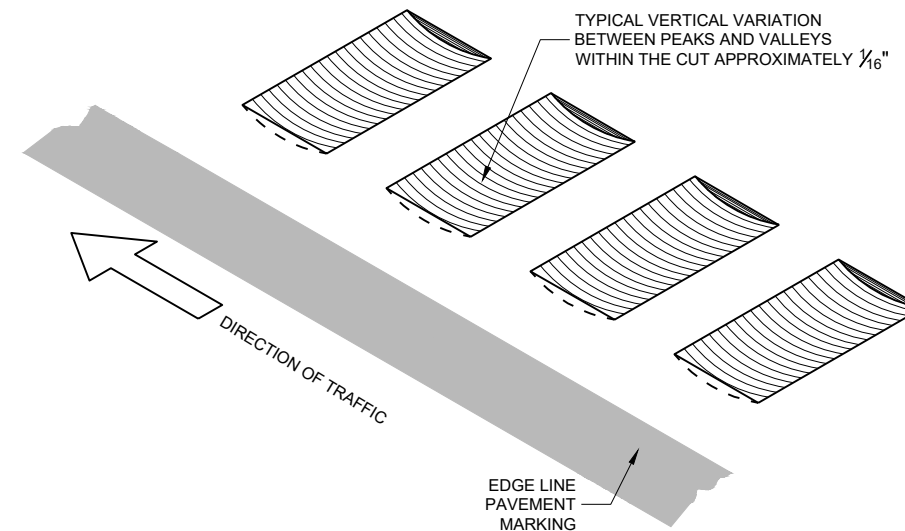
PLAN VIEW  
(SINGLE GROOVE)

GENERAL NOTES

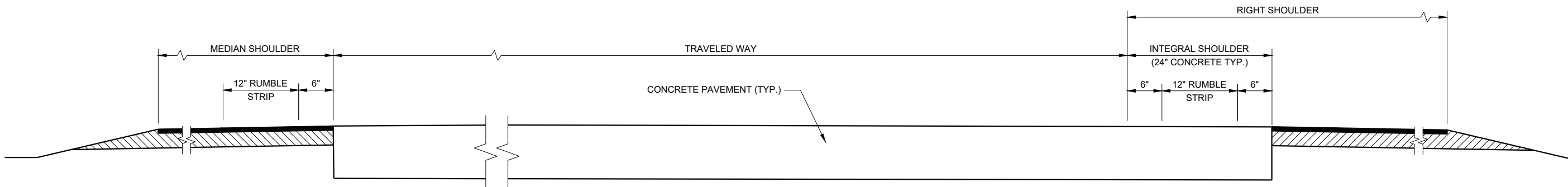
SDD 13A5, SHEET "b" SHOWS THE LOCATION OF THE RUMBLE STRIPS AT RAMP AND GORE LOCATIONS.

RUMBLE STRIPS ON EXPRESSWAYS:  
DO NOT INSTALL SHOULDER RUMBLE STRIPS ACROSS SIDE ROAD INTERSECTIONS, COMMERCIAL AND PRIVATE DRIVEWAYS, ADJACENT TO RIGHT TURN LANES, LEFT TURN LANES, TURN LANE TAPERS, 25' IN ADVANCE OF BRIDGE DECKS, 25' IN ADVANCE OF BRIDGE APPROACHES, OR 100 FEET IN ADVANCE OF RAILROAD CROSSINGS.

- ① CONCRETE PAVEMENT - RUMBLE STRIPS SHALL BE A MINIMUM OF 6 INCHES AWAY FROM TRANSVERSE JOINTS.



ISOMETRIC

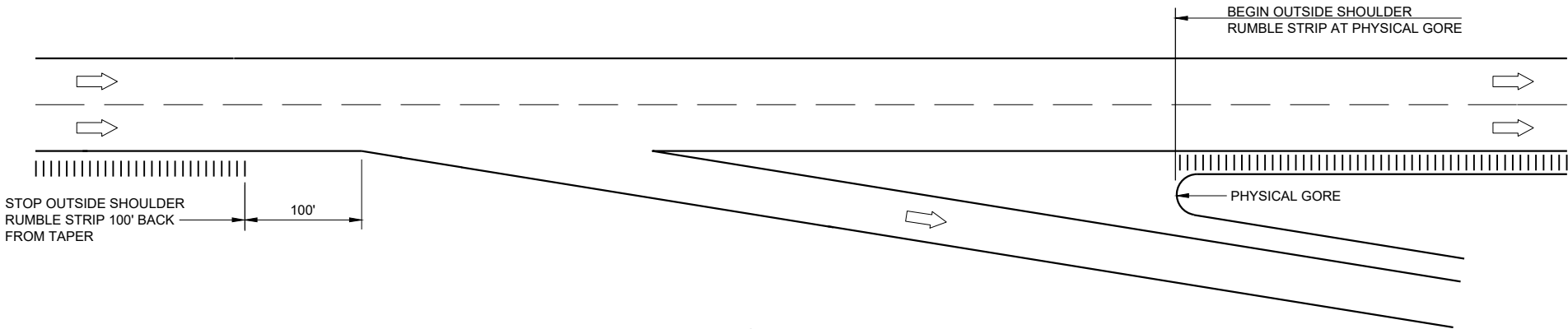


SECTION VIEW

TYPICAL SHOULDER RUMBLE STRIPS  
(ONE ROADWAY IS SHOWN)

SHOULDER RUMBLE STRIPS,  
DIVIDED ROADWAY

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



TYPICAL EXIT RAMP

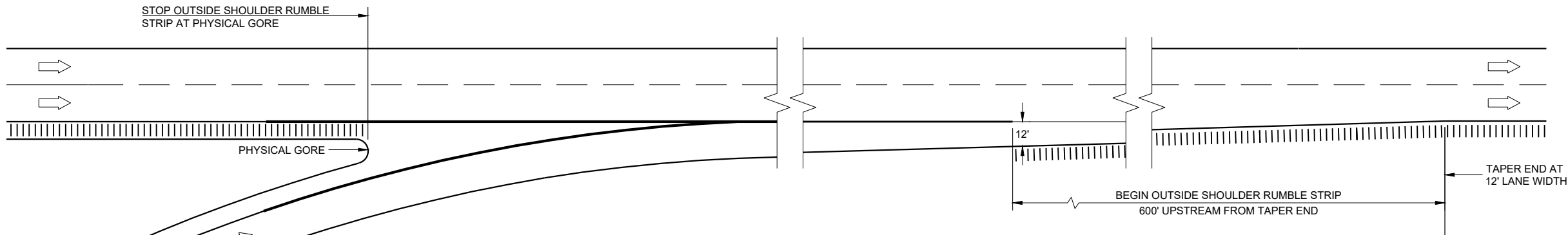
GENERAL NOTES

NO RUMBLE STRIP ON EXIT, DIRECTIONAL OR ENTRANCE RAMP, EXCEPT NEAR THE ENTRANCE TAPER END AND ALONG THE PARALLEL RAMP AREA AS SHOWN.

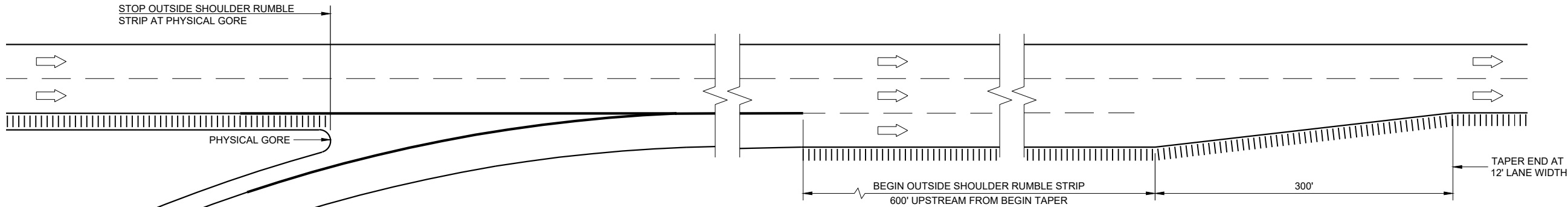
RUMBLE STRIPS ON EXPRESSWAYS:  
DO NOT INSTALL SHOULDER RUMBLE STRIPS ACROSS SIDE ROAD INTERSECTIONS, COMMERCIAL AND PRIVATE DRIVEWAYS, ADJACENT TO RIGHT TURN LANES, LEFT TURN LANES, TURN LANE TAPERS, 25' IN ADVANCE OF BRIDGE DECKS, 25' IN ADVANCE OF BRIDGE APPROACHES, OR 100 FEET IN ADVANCE OF RAILROAD CROSSINGS.

LEGEND

➡ DIRECTION OF TRAFFIC



TYPICAL TAPERED ENTRANCE RAMP  
RAMP AND GORE SHOULDER RUMBLE STRIP LOCATIONS

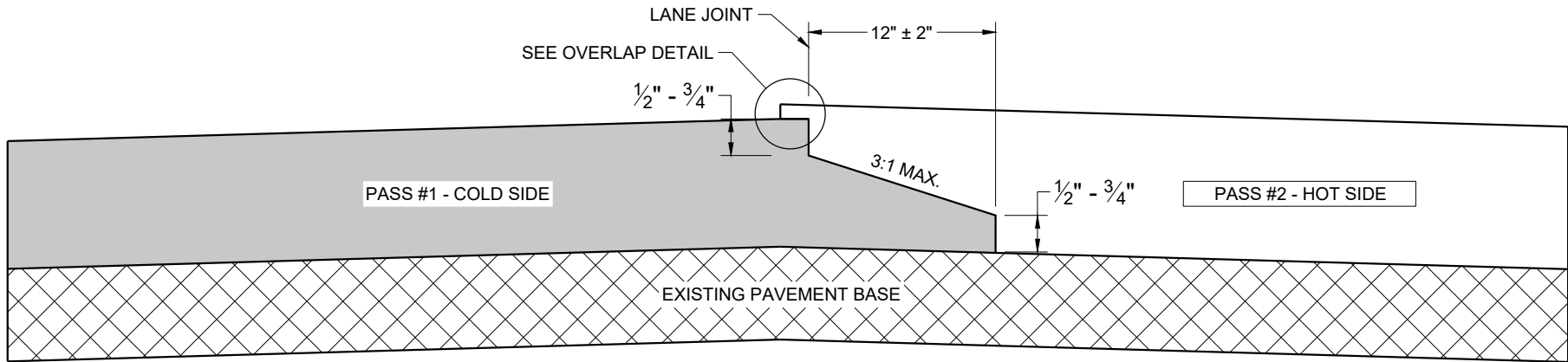


TYPICAL PARALLEL ENTRANCE RAMP  
RAMP AND GORE SHOULDER RUMBLE STRIP LOCATIONS

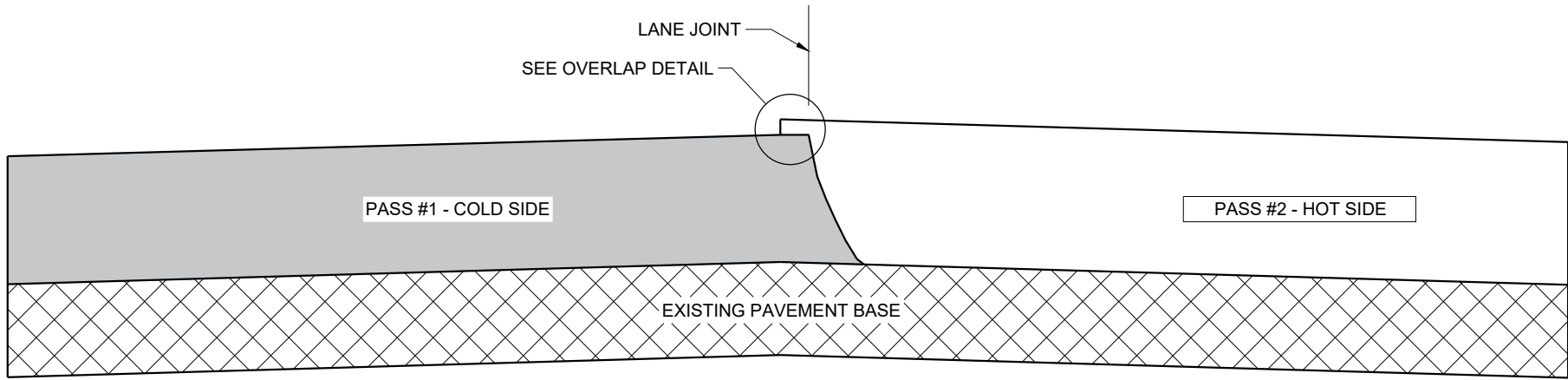
SHOULDER RUMBLE STRIPS,  
DIVIDED ROADWAY

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

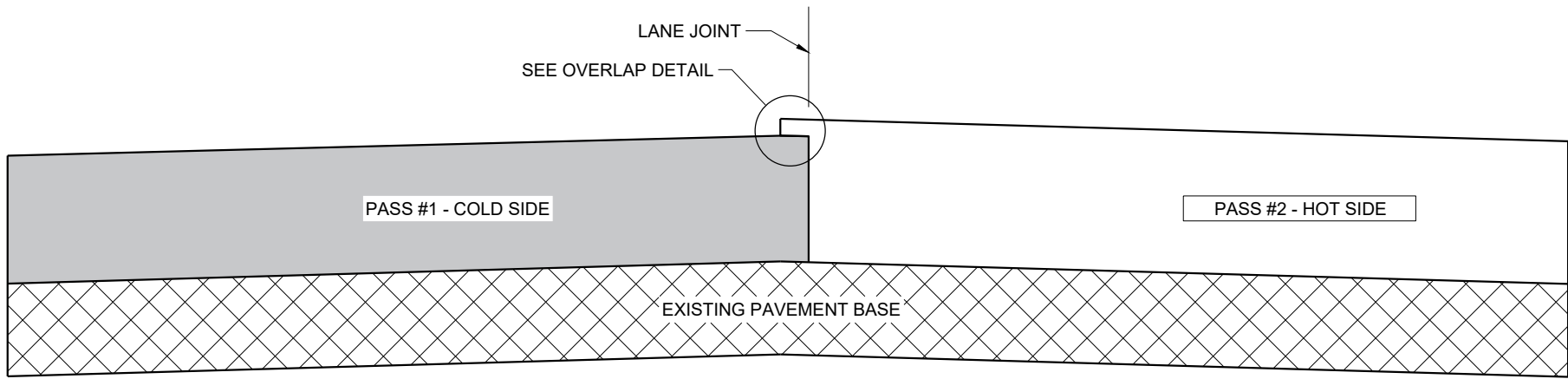
APPROVED  
May 2023  
DATE  
/S/ Rodney Taylor  
ROADWAY DESIGN STANDARDS  
UNIT SUPERVISOR  
FHWA



TYPICAL PAVEMENT CROSS SECTION  
NOTCHED WEDGE JOINT



TYPICAL PAVEMENT CROSS SECTION  
VERTICAL JOINT



TYPICAL PAVEMENT CROSS SECTION  
VERTICAL JOINT (MILLED)

GENERAL NOTES

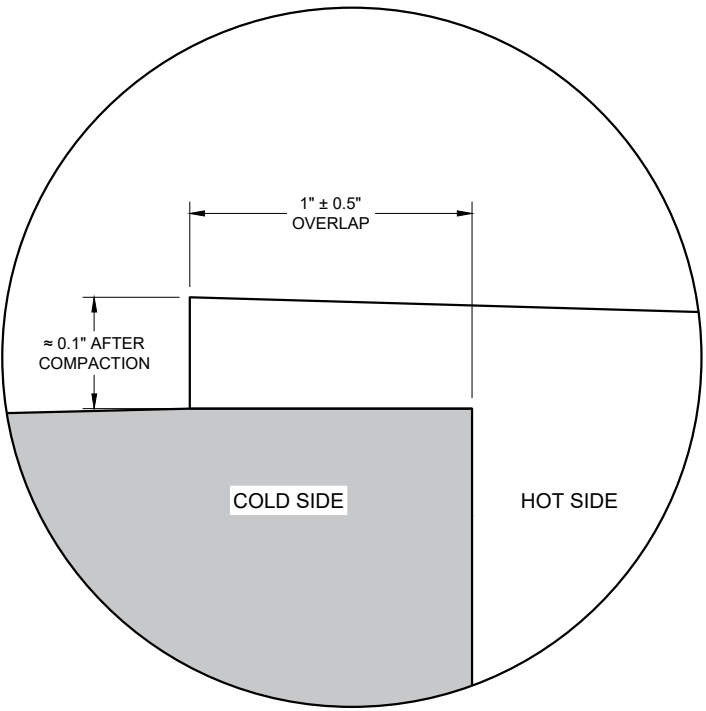
IN ADDITION TO THE DETAILS PROVIDED IN THIS DRAWING, CONFORM TO STANDARD SPECIFICATION 450.3.2.8 FOR WHEN A NOTCHED WEDGE JOINT IS REQUIRED AND FOR GENERAL JOINT CONSTRUCTION REQUIREMENTS.

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)

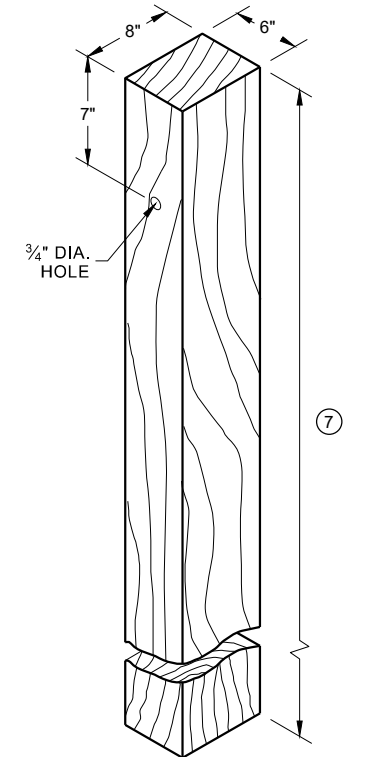
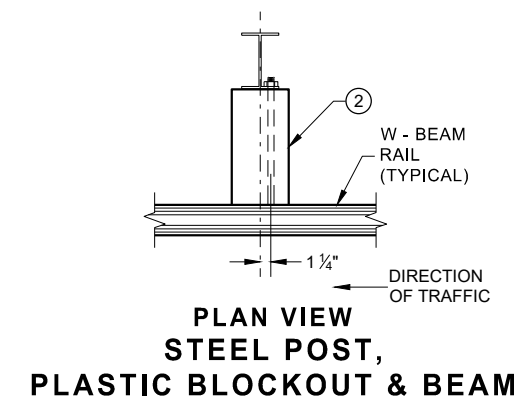
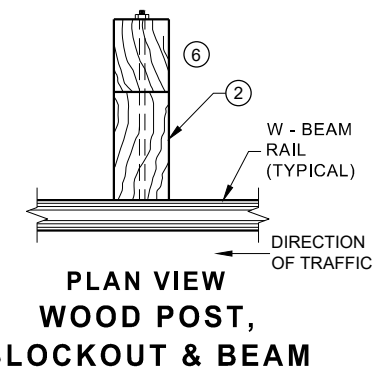
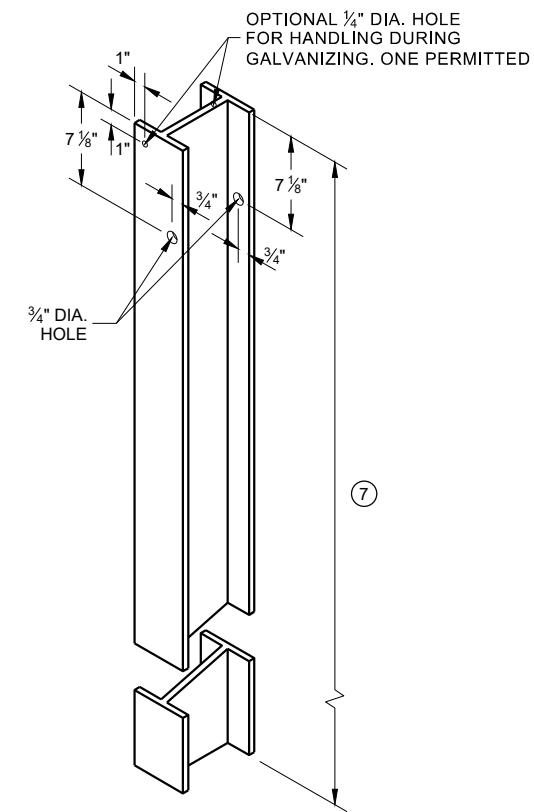
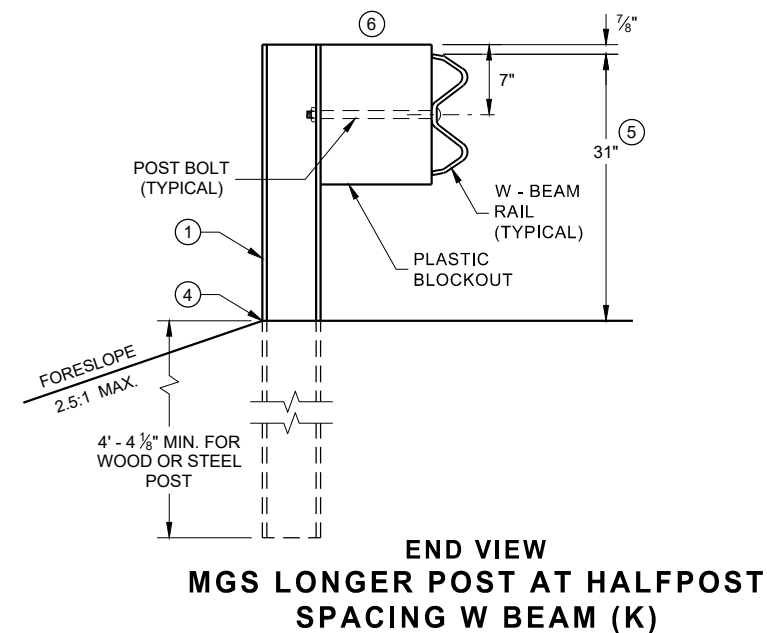
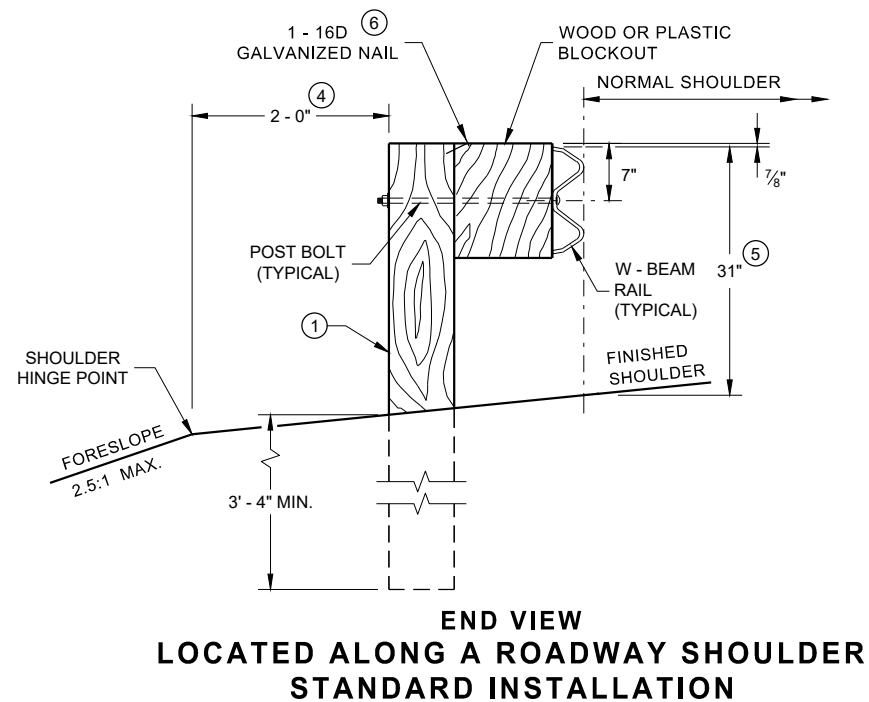
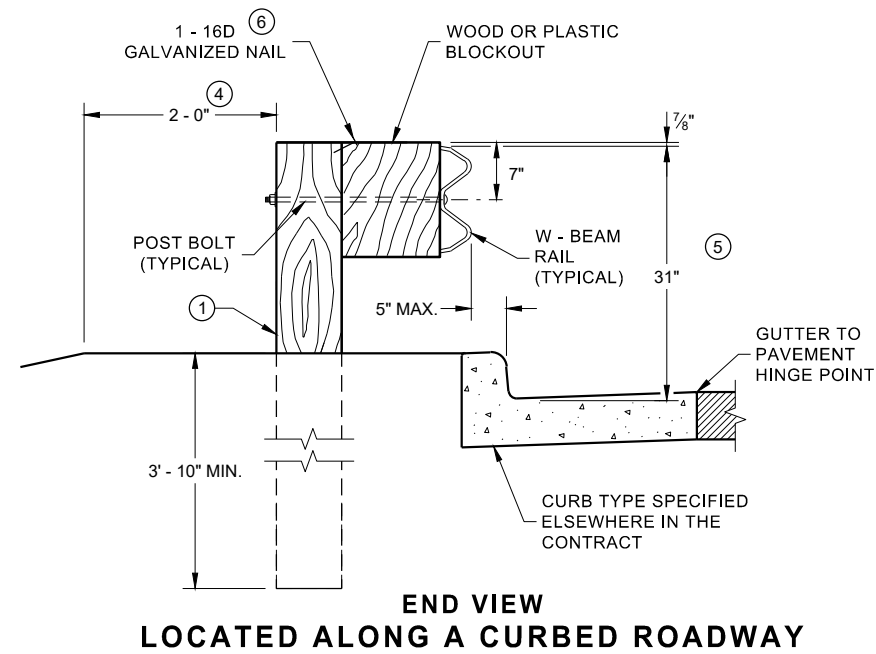
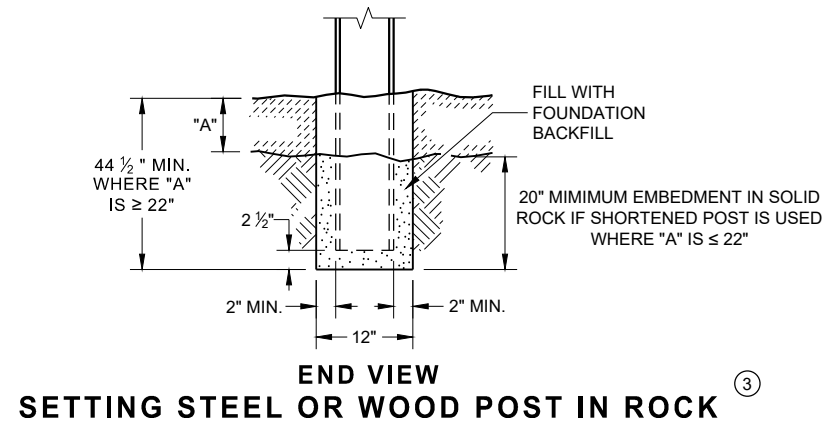
HMA LONGITUDINAL JOINTS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

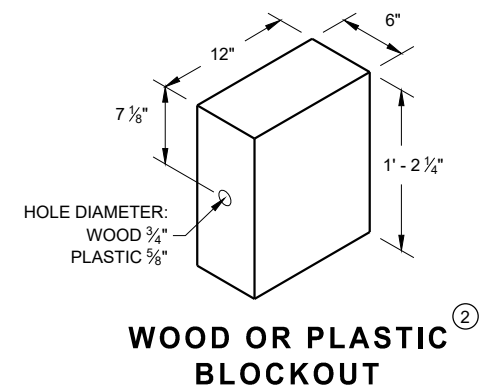
APPROVED  
November 2020 /S/ Steven Hefel  
DATE HMA PAVEMENT ENGINEER  
FHWA



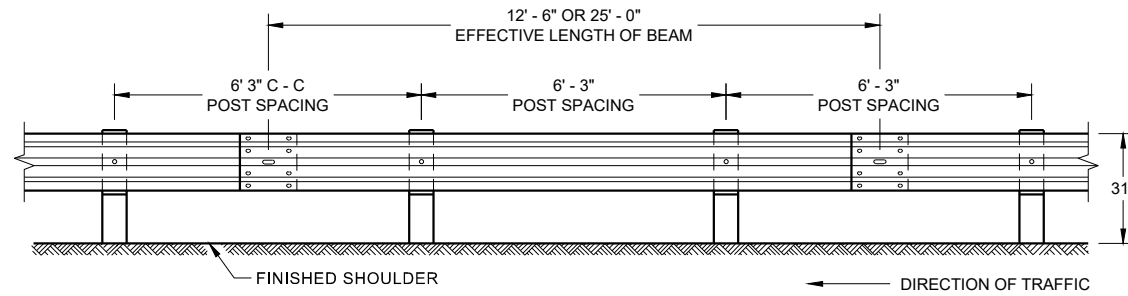
- ① WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- ② USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL.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



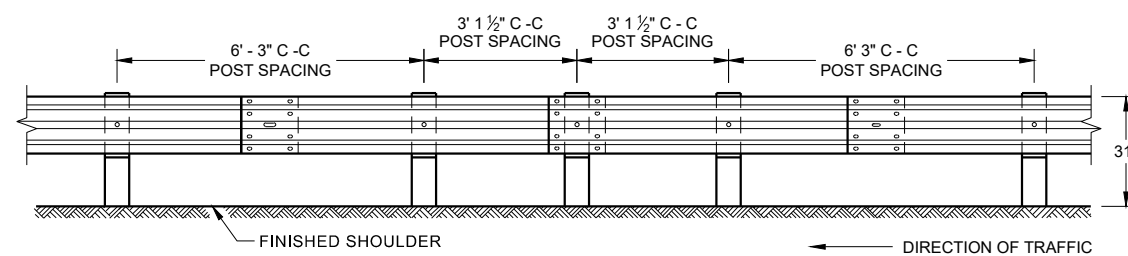
**WOOD POST (6" X 8") NOMINAL** <sup>①</sup>



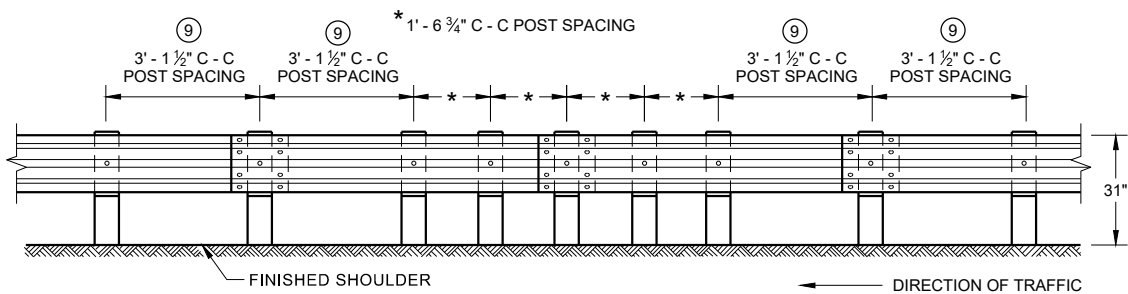
**WOOD OR PLASTIC  
BLOCKOUT**



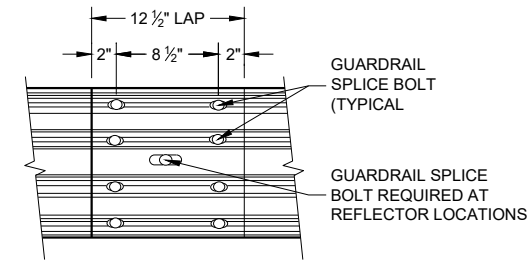
**FRONT VIEW  
POST SPACING STANDARD INSTALLATION**



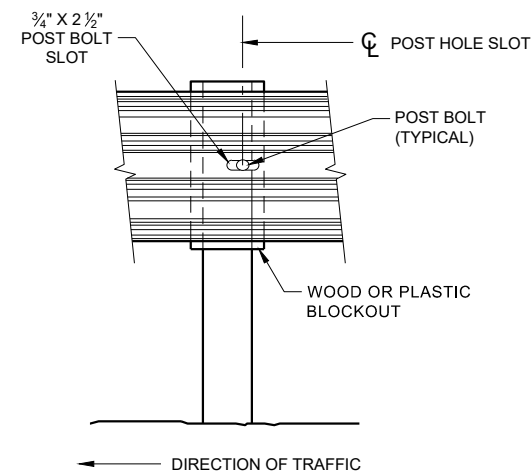
**FRONT VIEW  
HALF POST SPACING (HS) AND  
HALF POST SPACING WITH LONGER POSTS (K)**



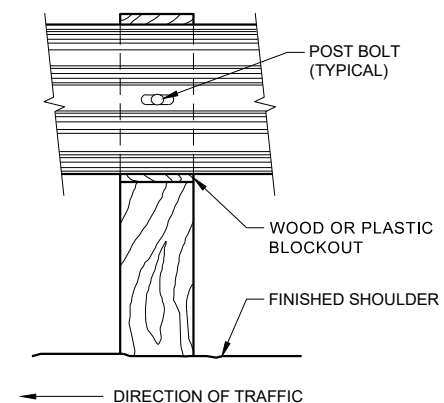
**FRONT VIEW  
QUARTER POST SPACING (QS)**



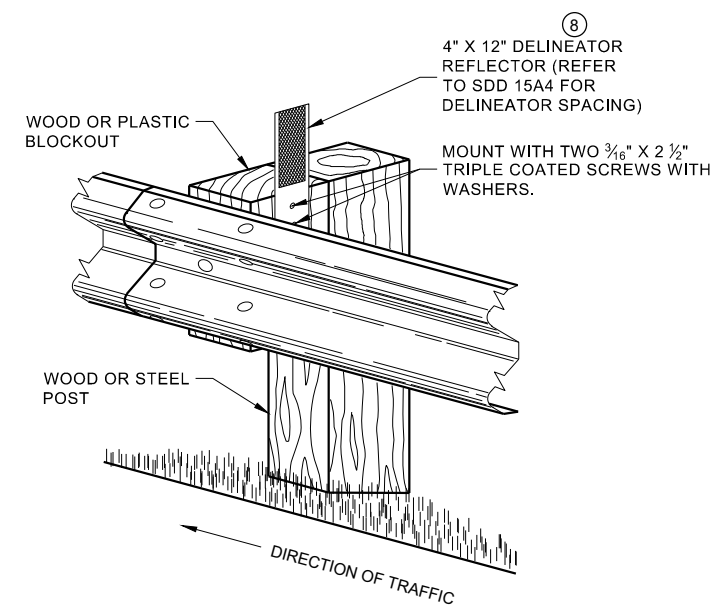
**FRONT VIEW  
MID-SPAN BEAM SPLICE**



**FRONT VIEW AT STEEL POST**



**FRONT VIEW AT WOOD POST**



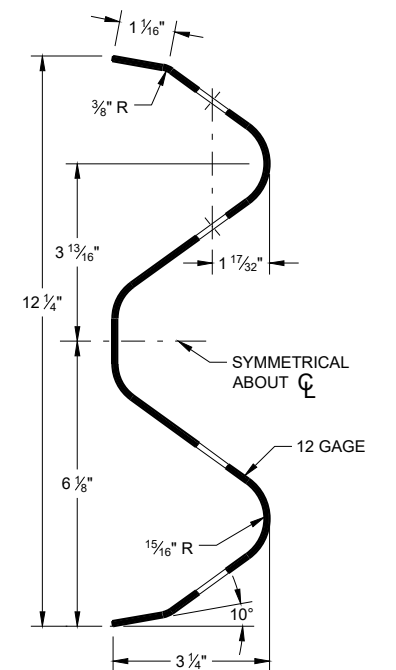
**ONE SIDED REFLECTOR DETAIL  
AND TYPICAL INSTALLATION**

## 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.

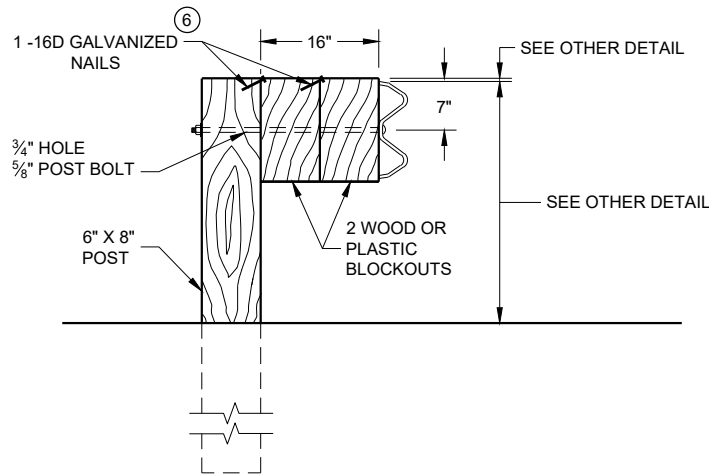


**SECTION THRU W-BEAM RAIL**

**MIDWEST GUARDRAIL SYSTEM  
(MGS) GUARDRAIL**

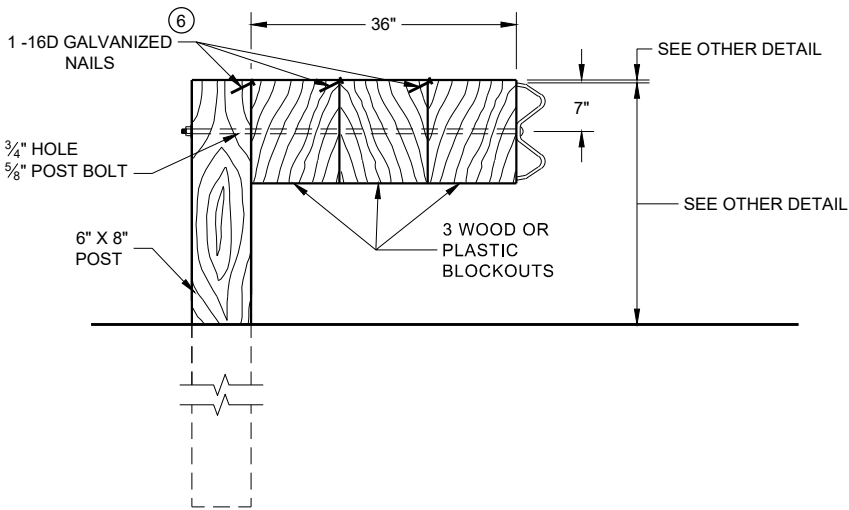
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION





DETAIL FOR 16" BLOCKOUT DEPTH

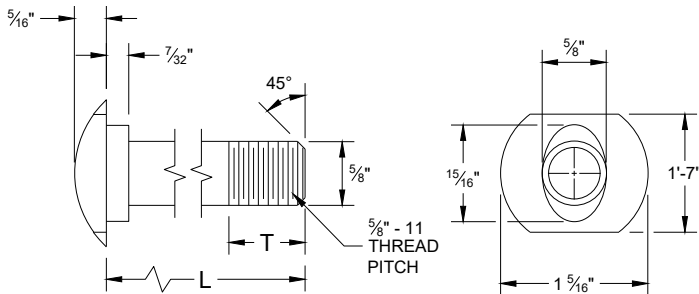
IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.



DETAIL FOR 36" BLOCKOUT DEPTH

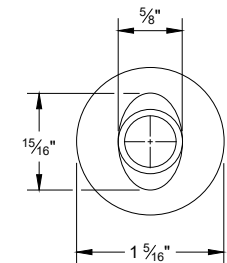
NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.  
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE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

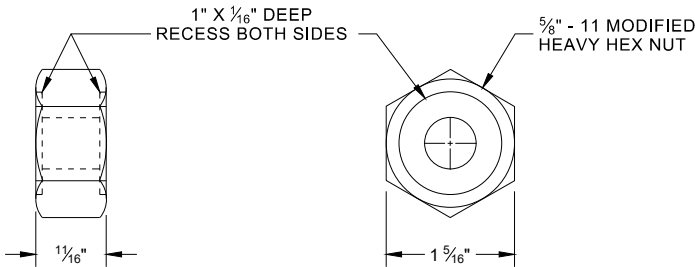


POST BOLT TABLE

| 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"       |

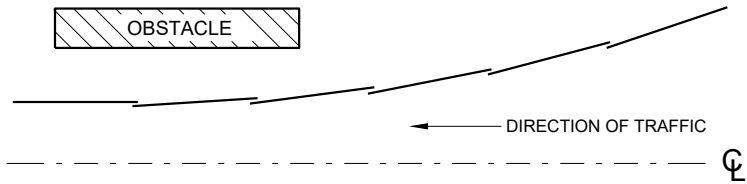


ALTERNATE BOLT HEAD

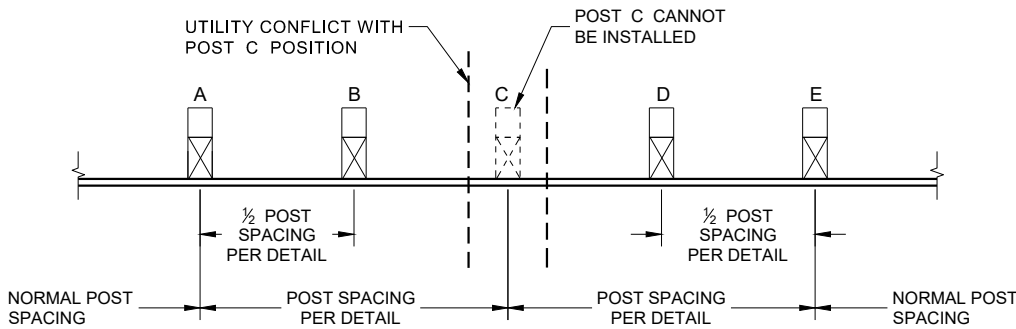


POST BOLT, SPLICE BOLT  
AND RECESS NUT

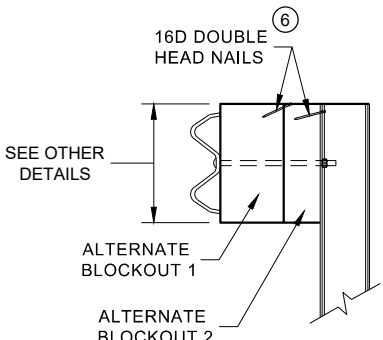
- 6 WHEN USING STEEL POST AD WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.



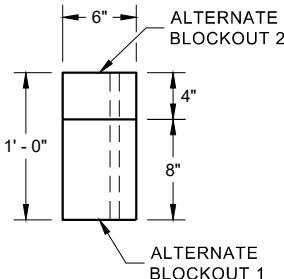
PLAN VIEW  
BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS  
UNDERGROUND OBSTRUCTION



SIDE VIEW

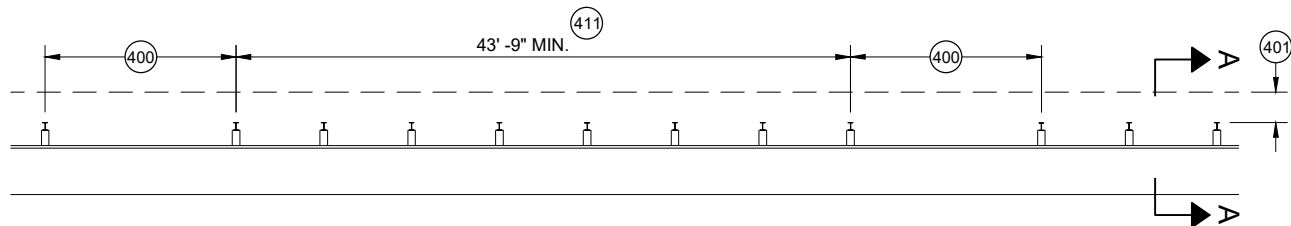


PLAN VIEW

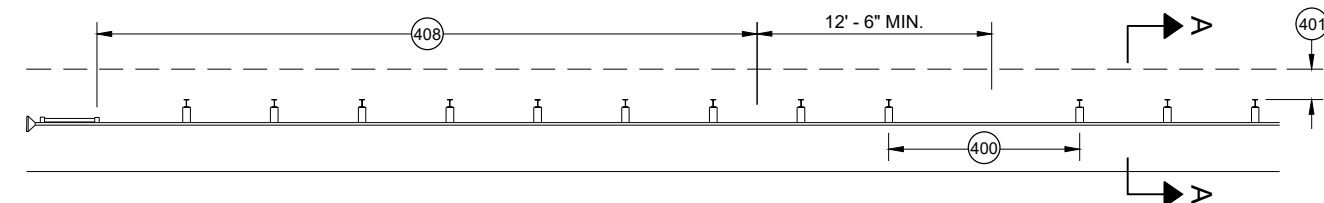
ALTERNATE WOOD  
BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM  
(MGS) GUARDRAIL

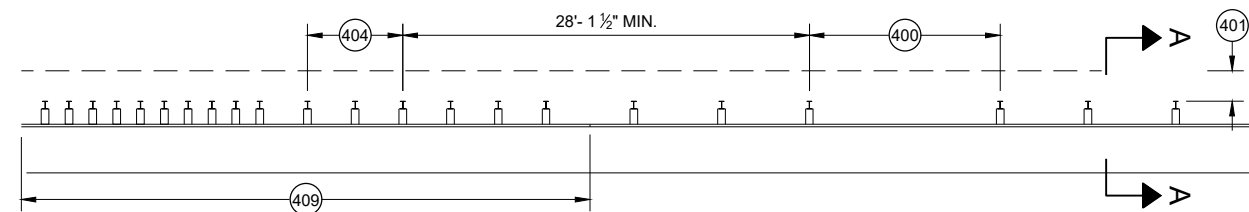
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



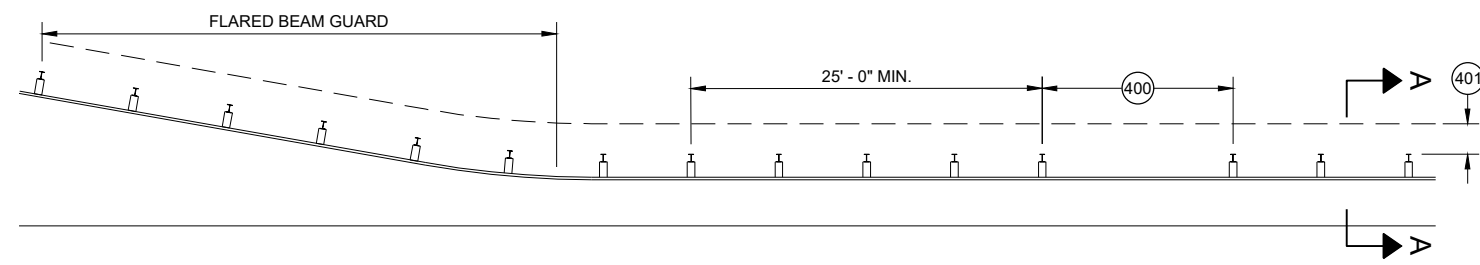
**MISSING POST IN MGS GUARDRAIL**



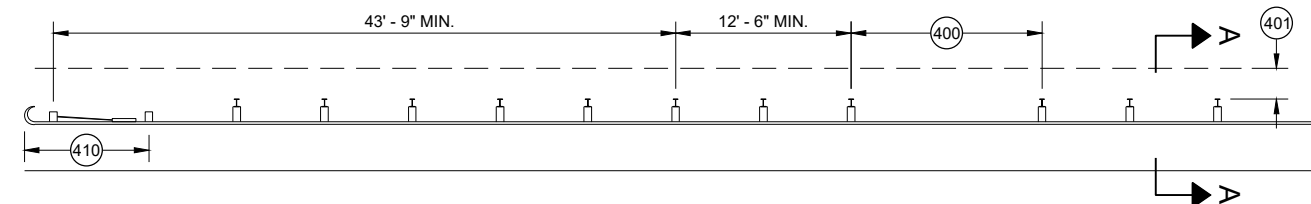
**MISSING POST IN MGS GUARDRAIL NEAR EAT**



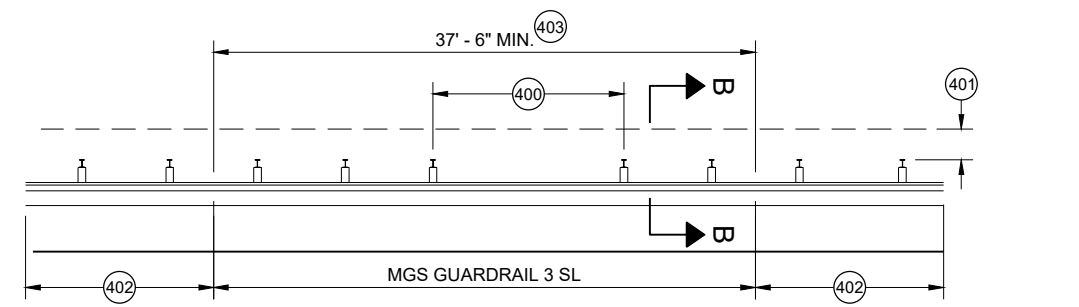
**MISSING POST IN MGS GUARDRAIL NEAR AN APPROACH TRANSITION**



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

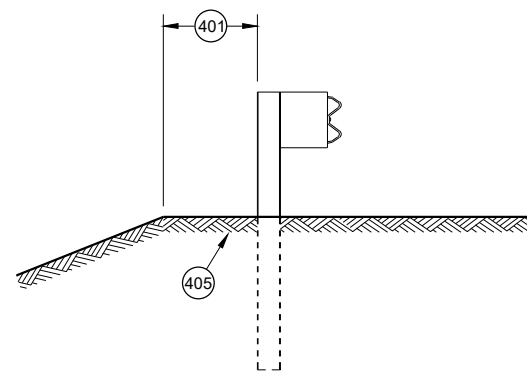


**MISSING POST IN MGS GUARDRAIL NEAR A TYPE 2 END TERMINAL**

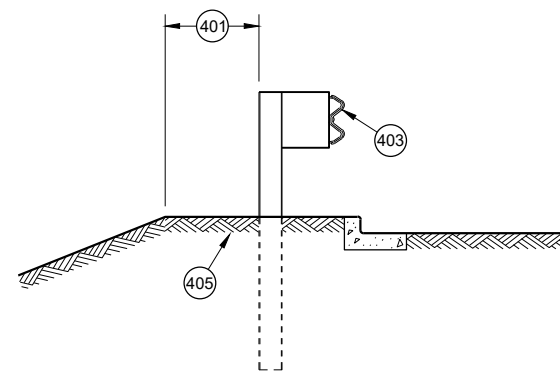


**MISSING POST IN SHORT SPAN MGS GUARDRAIL NEAR CURB (SL)**

- (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

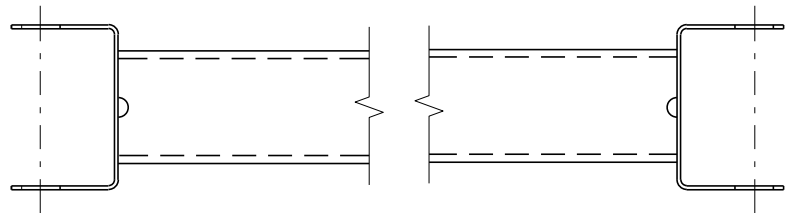
- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL) AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
- (B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED
- (C) DIFFERENT MANUFACTURERS REQUIRE DIFFERENT PERFORATED W - BEAM RAIL END PANELS. 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.

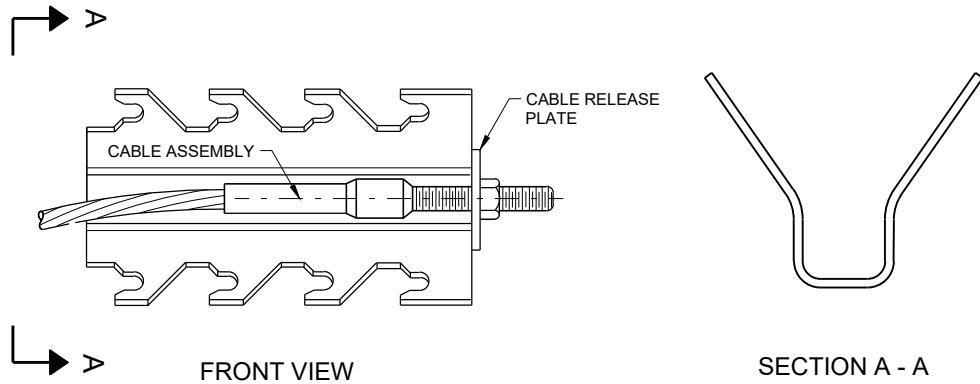


STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

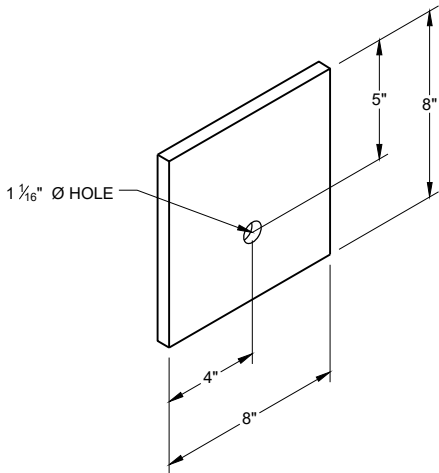


GENERIC GROUND STRUT<sup>⑨</sup> <sup>Ⓔ</sup>

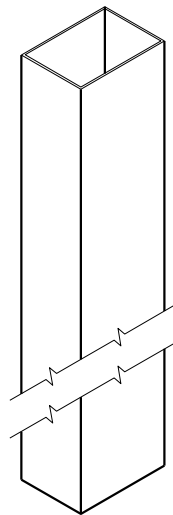
| BILL OF MATERIALS |                                                                                                                |
|-------------------|----------------------------------------------------------------------------------------------------------------|
| PART NO.          | DESCRIPTION<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                                                                                               |



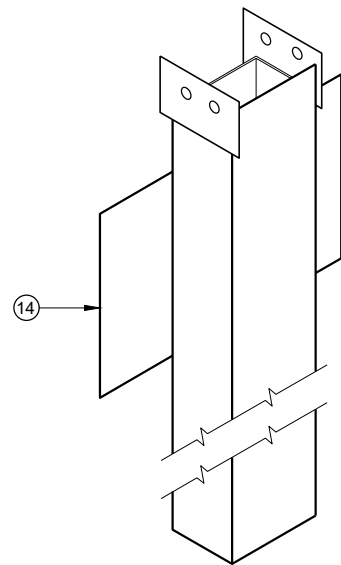
GENERIC ANCHOR CABLE BOX<sup>⑨</sup> <sup>Ⓔ</sup>



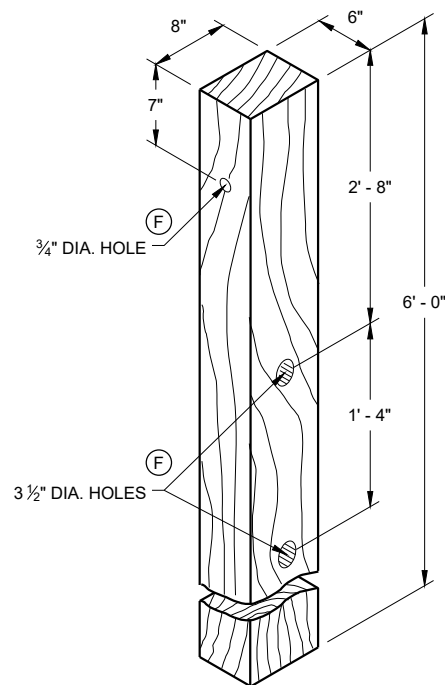
BEARING PLATE<sup>⑥</sup> <sup>Ⓔ</sup>



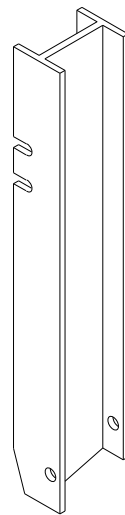
UPPER POST NO. 1 <sup>(1)</sup> (E)



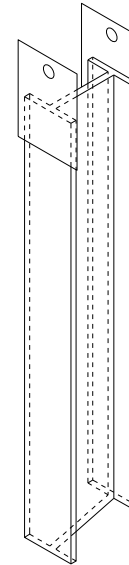
LOWER POST NO. 1 <sup>(2)</sup> (E)



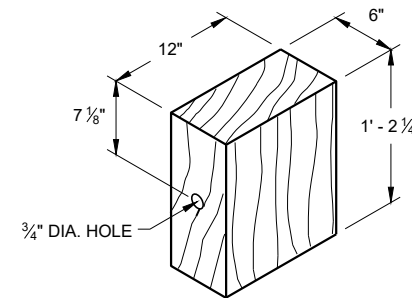
WOOD CRT POST <sup>(3)</sup> (E)  
POSTS NUMBER 3-9



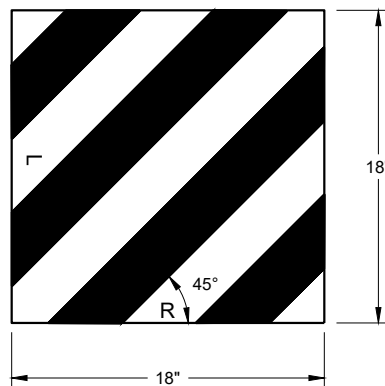
UPPER POST NO. 2 <sup>(15)</sup> (E)



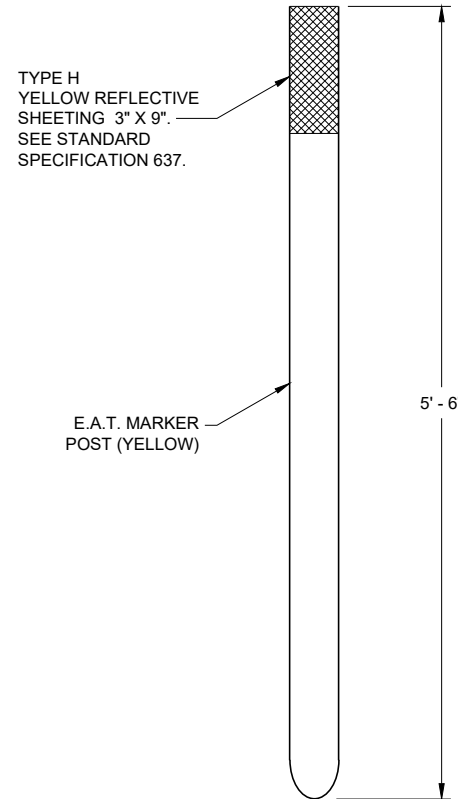
LOWER POST NO. 2 <sup>(16)</sup> (E)



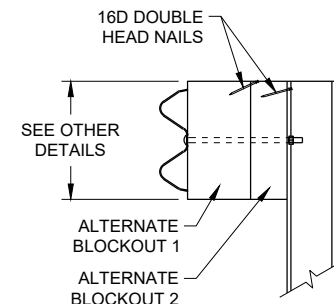
WOOD BLOCKOUT <sup>(4)</sup>  
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2



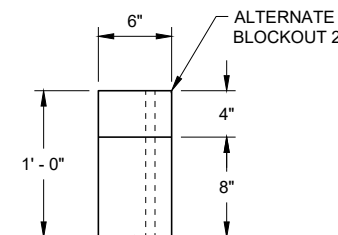
REFLECTIVE SHEETING DETAIL <sup>(E)</sup>



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



SIDE VIEW



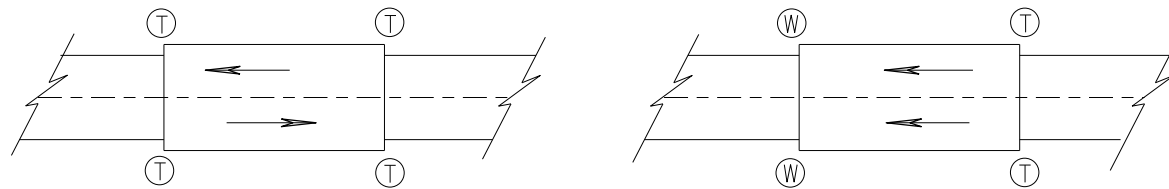
TOP VIEW

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**

Ⓣ THRIE BEAM CONNECTION

Ⓦ W-BEAM CONNECTION WHEN REQUIRED

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

**GENERAL NOTES**

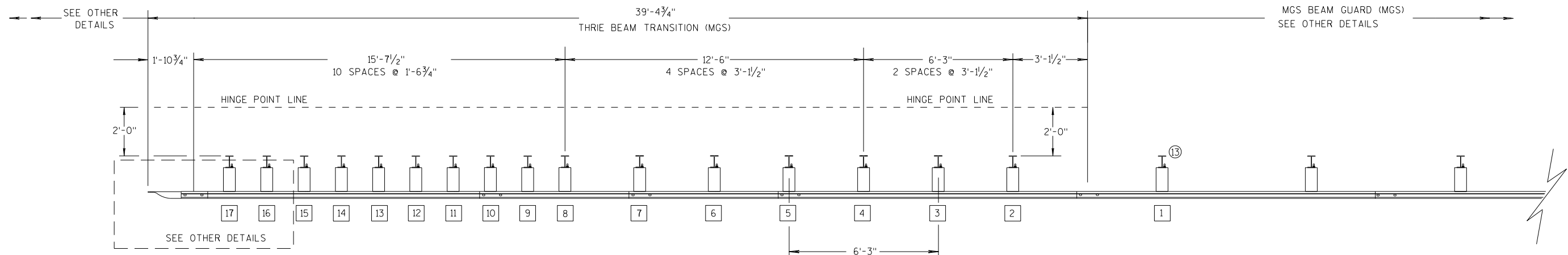
IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2½", AND 12" DIAMETER AROUND POST. SEE 14B42 FOR MORE DETAILS.

TRANSITION USES STEEL POSTS ONLY.

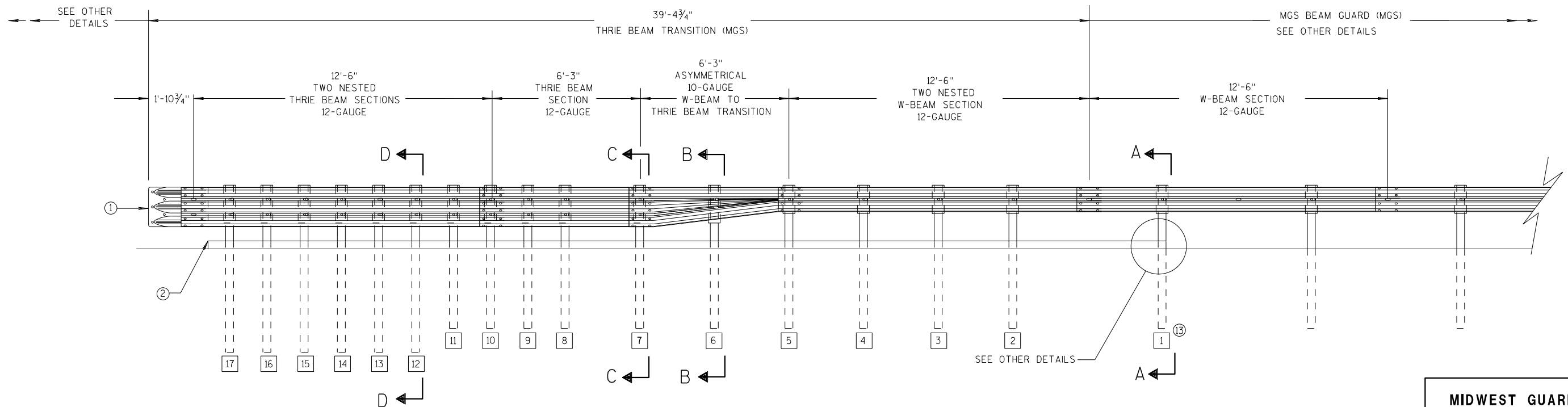
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

POST 2 THROUGH 17 USES STEEL POST ONLY

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



**PLAN VIEW**



**ELEVATION VIEW**

**MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION**

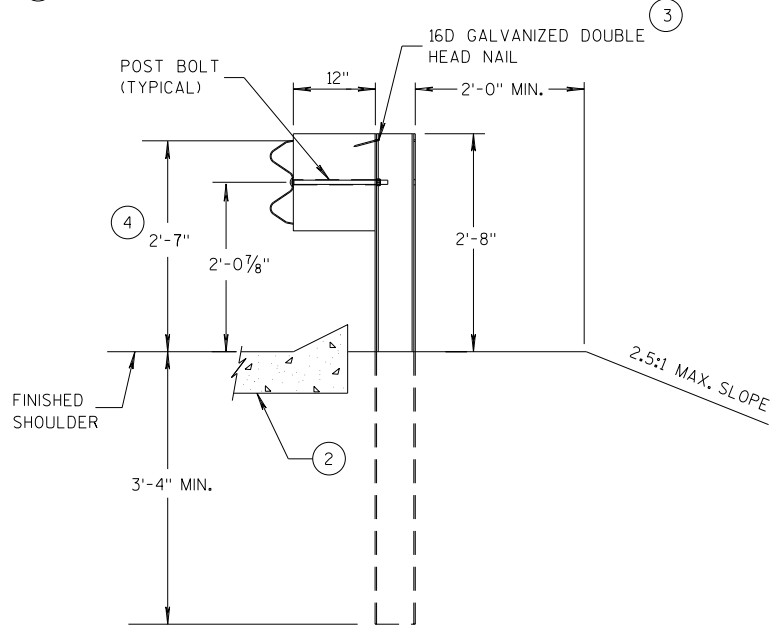
**MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

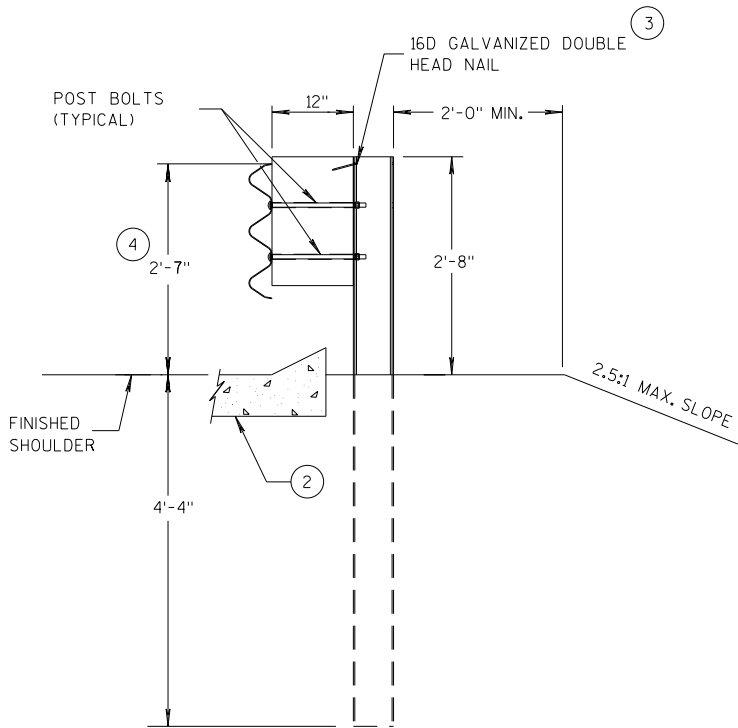


GENERAL NOTES

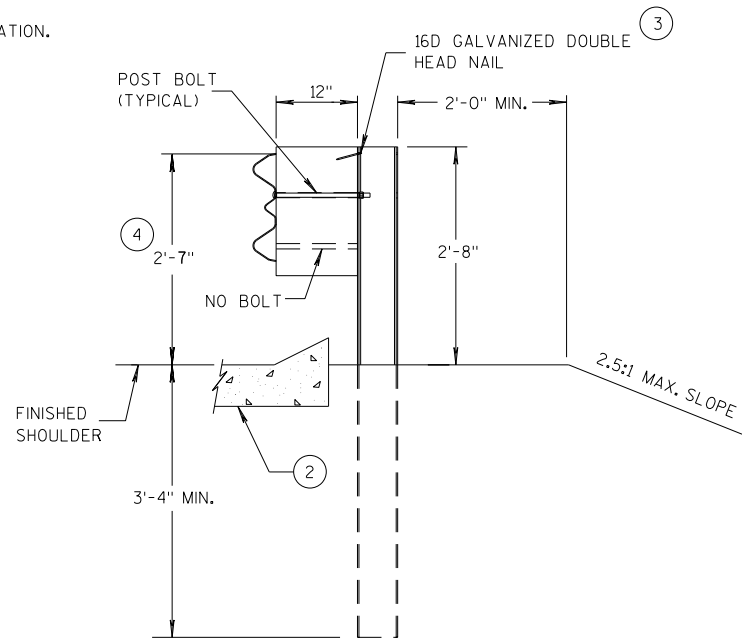
- 2 OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- 3 WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 10D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- 4 TOLERANCE FOR TOP OF W-BEAM RAIL IS  $\pm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



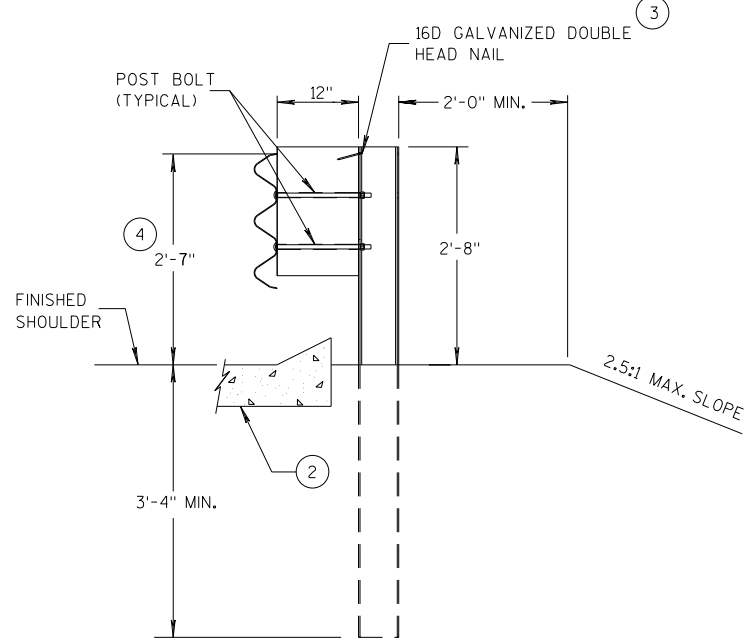
SECTION A-A  
POSTS 1-5



SECTION D-D  
POSTS 12-17



SECTION B-B  
POST 6



SECTION C-C  
POSTS 7-11

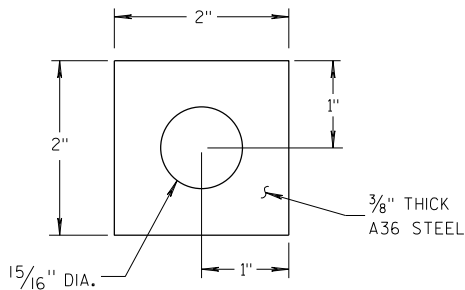
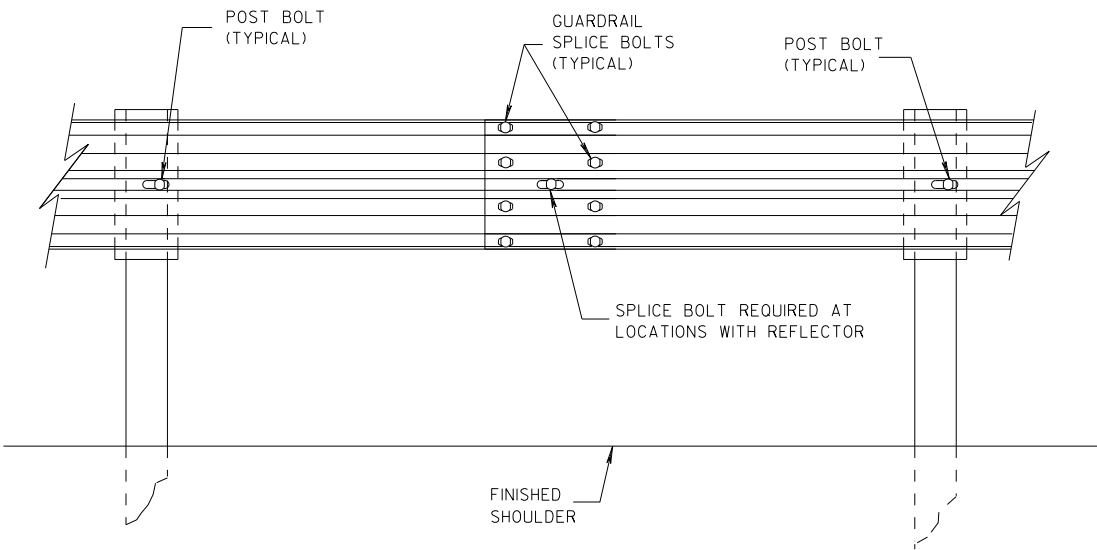
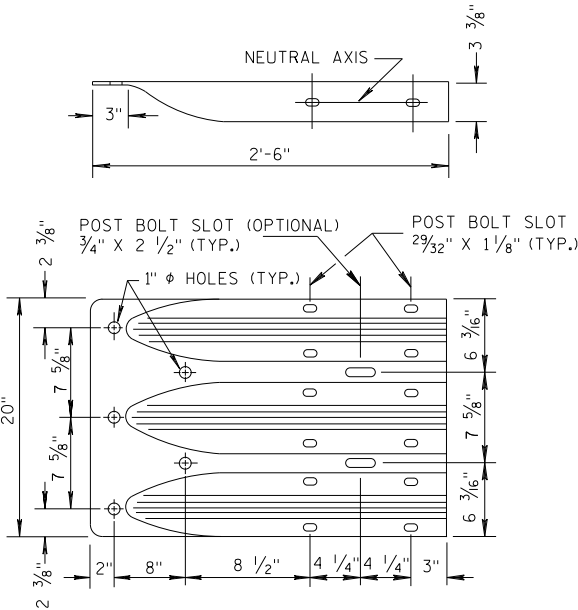


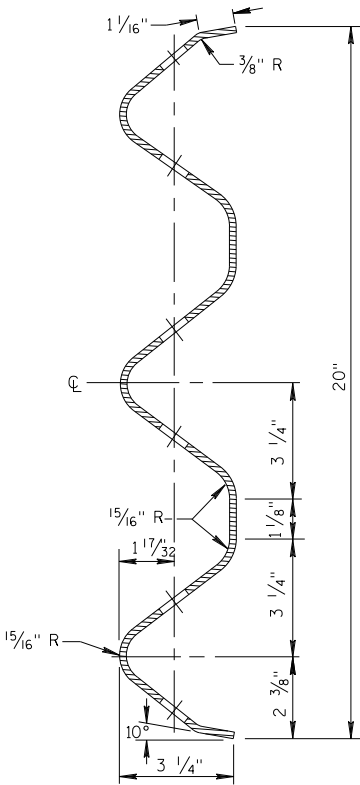
PLATE WASHER DETAIL



SPlice DETAIL



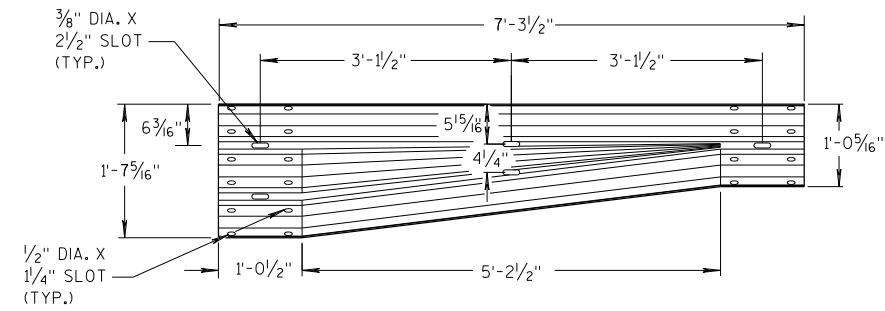
THRIE BEAM  
TERMINAL CONNECTOR



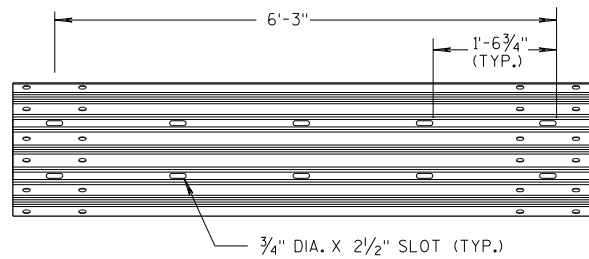
SECTION THRU THRIE  
BEAM RAIL ELEMENT

MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

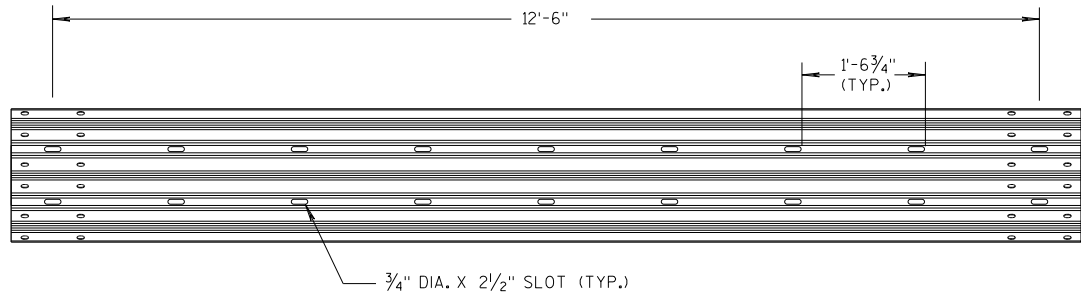
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



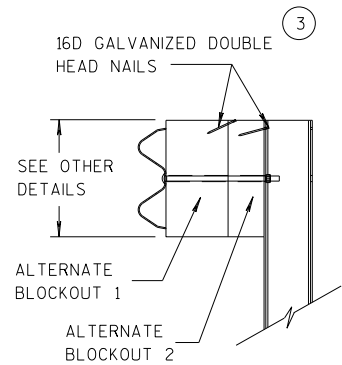
W-BEAM TO THRIE BEAM TRANSITION SECTION



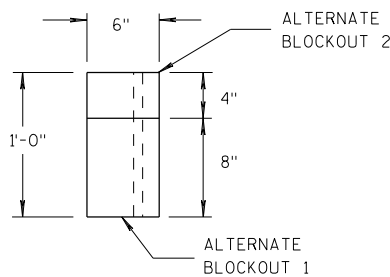
6'-3" THRIE BEAM SECTION



12'-6" THRIE BEAM SECTION

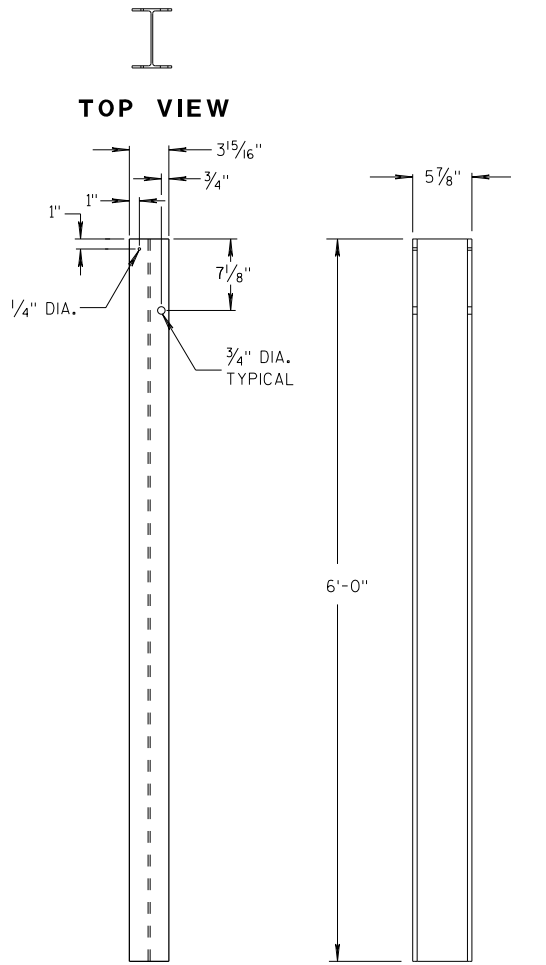


SIDE VIEW



TOP VIEW

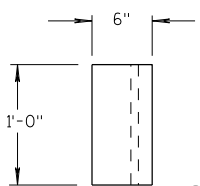
ALTERNATE WOOD BLOCKOUT DETAIL



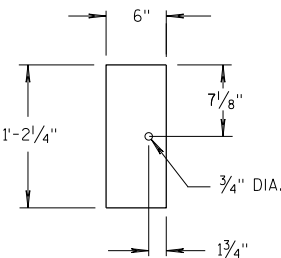
FRONT VIEW

SIDE VIEW

STEEL POSTS 1-5

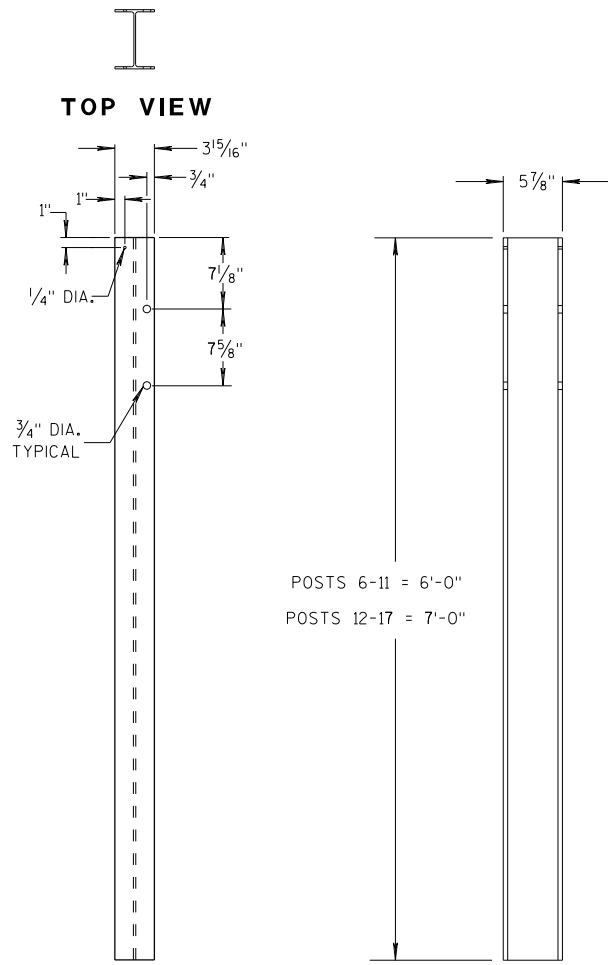


TOP VIEW



FRONT VIEW

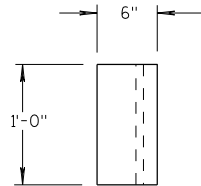
BLOCKOUT POSTS 1-5



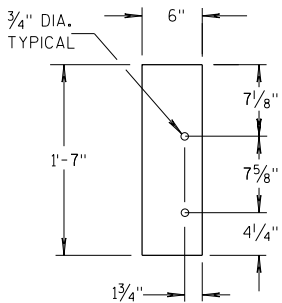
FRONT VIEW

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.

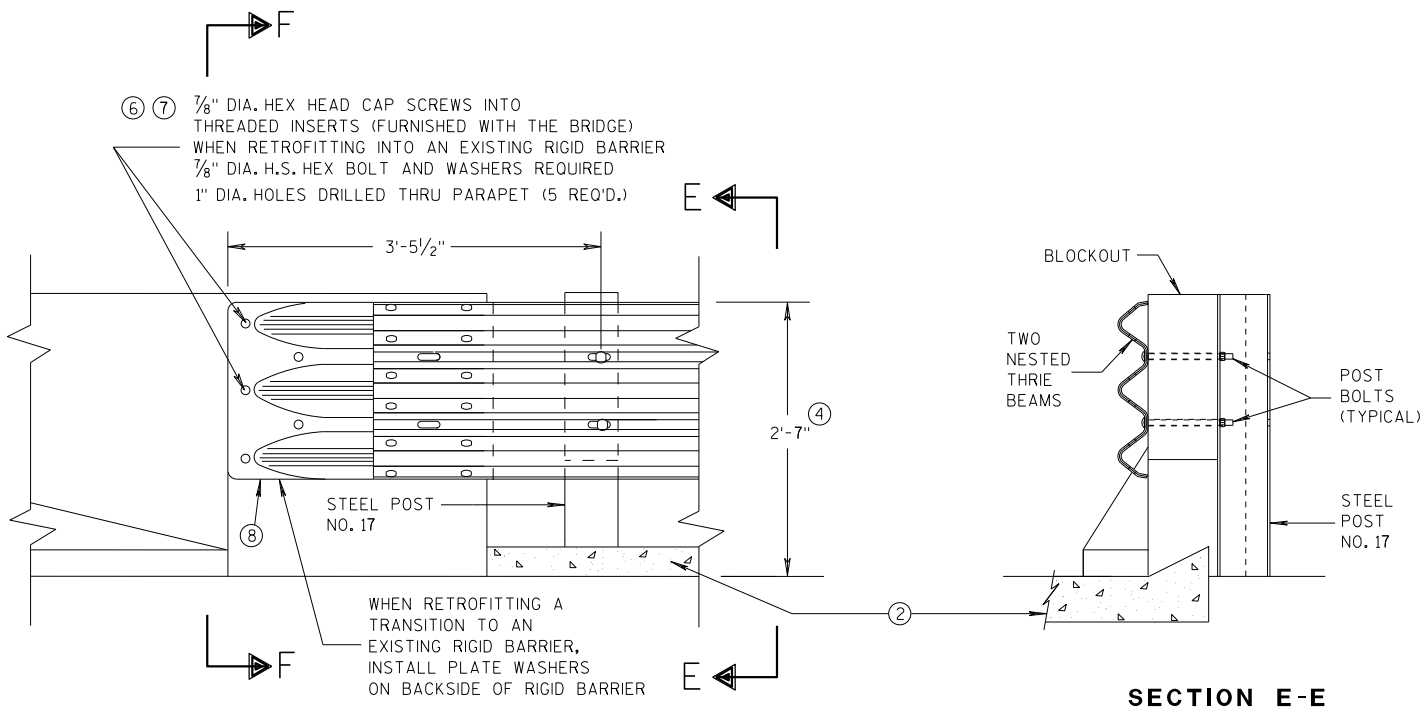
⑤ WOOD BLOCKS MAY BE CONSTRUCTED OUT OF 2 WOOD BLOCKS. SEE ALTERNATE WOOD BLOCK DETAIL.

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

MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

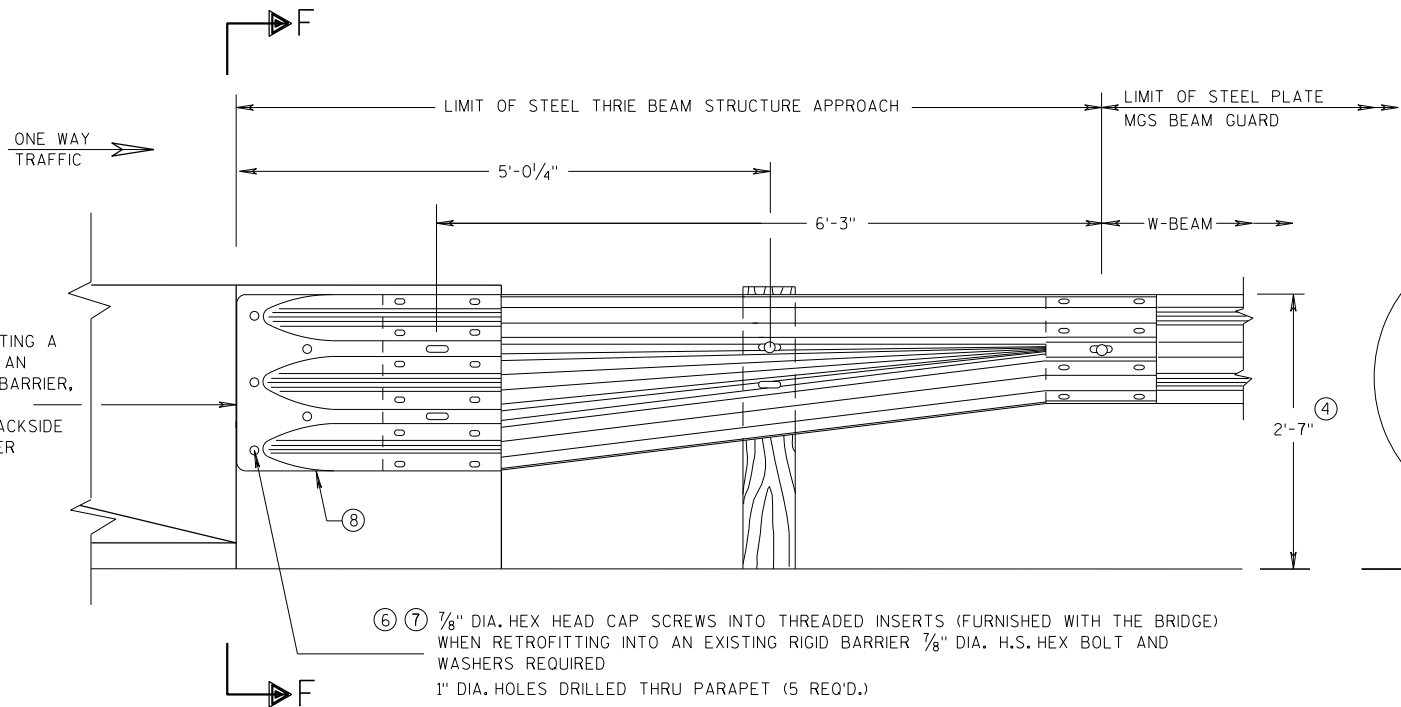
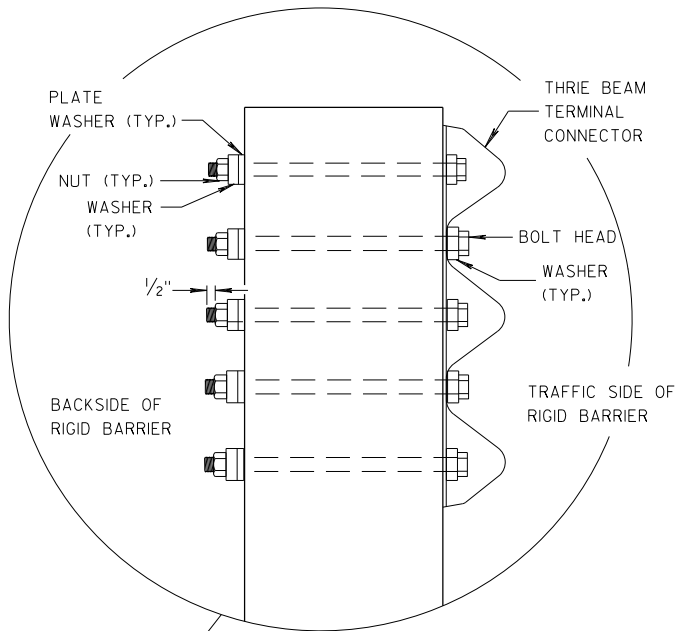
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



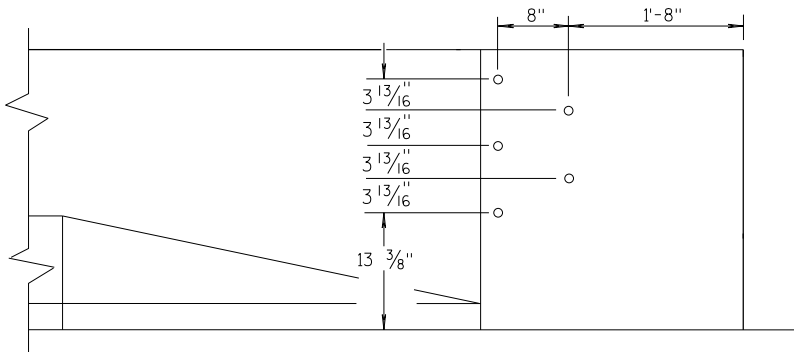


**GENERAL NOTES**

- 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**



**DRILL HOLE LOCATION**

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

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

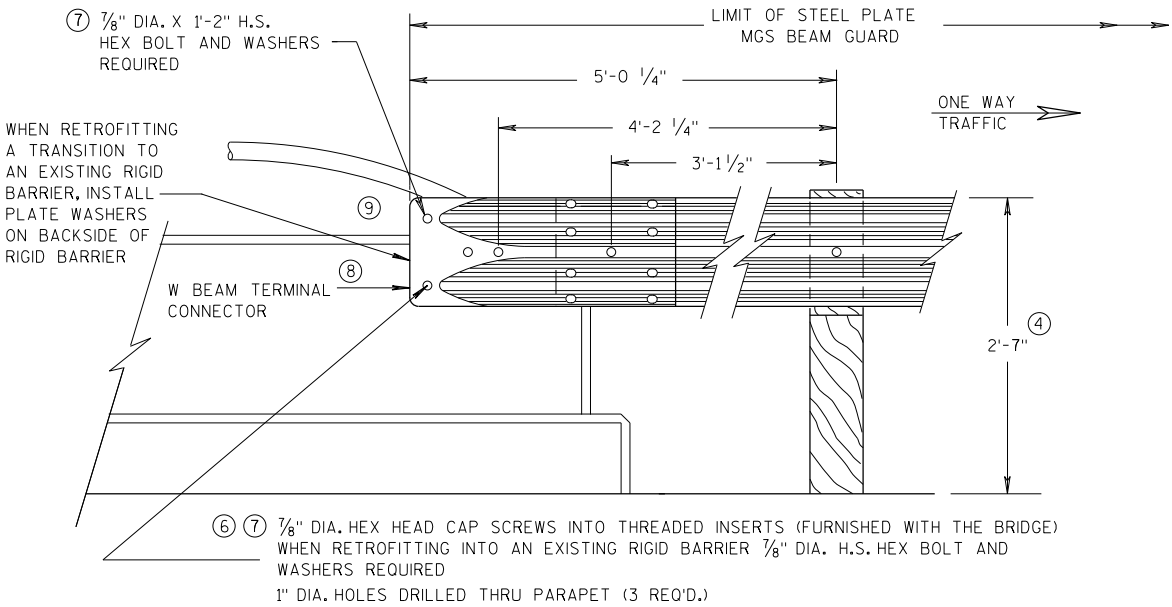
APPROVED  
07/2018  
DATE  
FHWA

/S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR

GENERAL NOTES

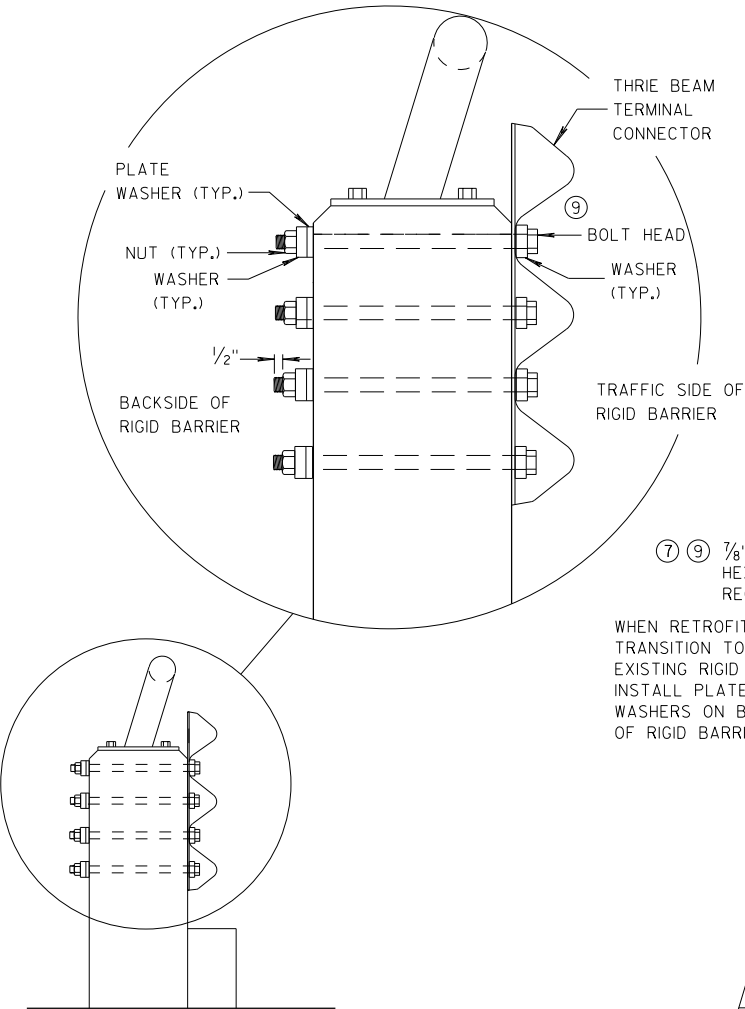
THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSTION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.

- OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- TOLERANCE FOR TOP OF BEAM IS  $\pm 1"$ .
- DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- 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  $\frac{5}{32}"$  THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- 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  $\frac{1}{2}"$ .
- 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.

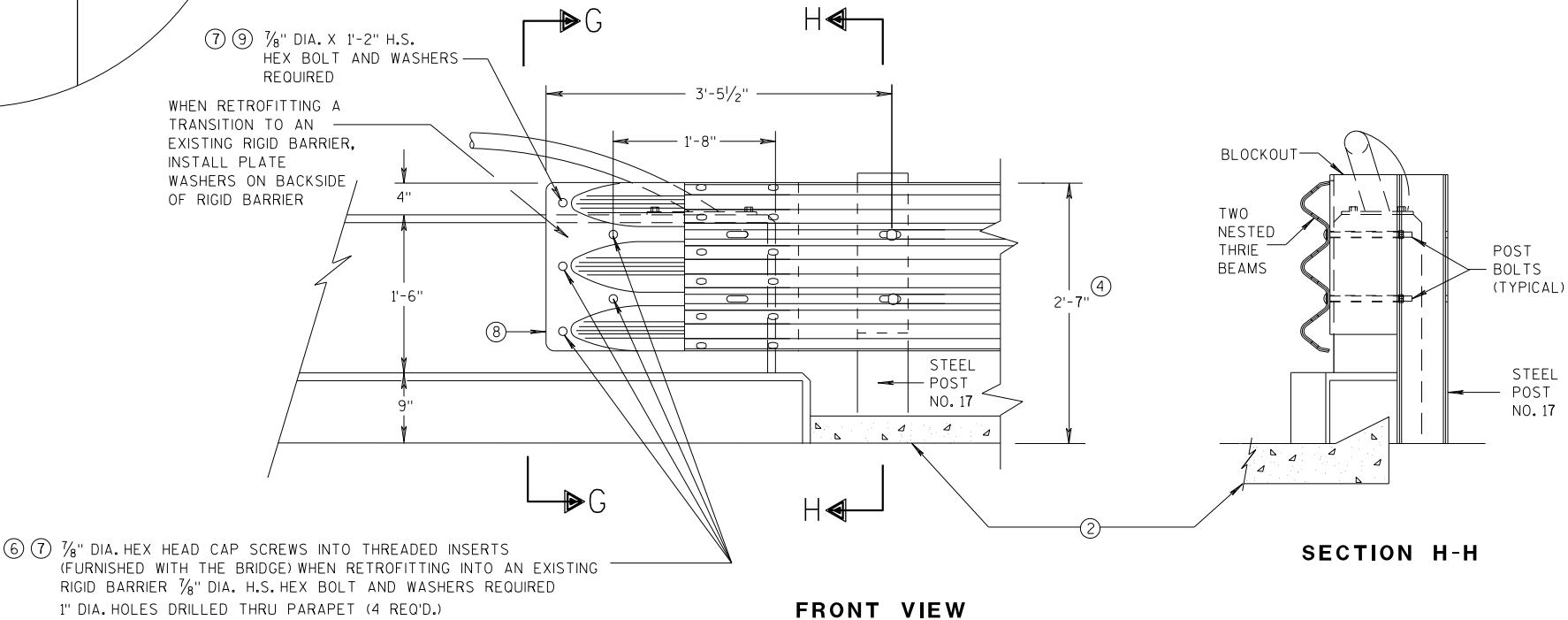


FRONT VIEW

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

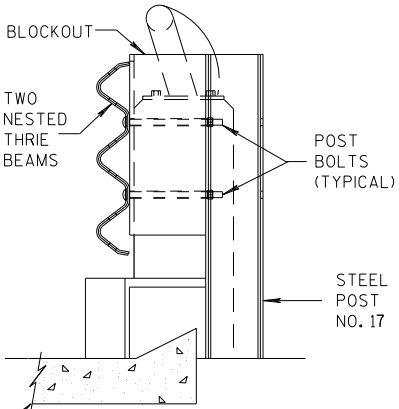


SECTION G-G



FRONT VIEW

THRIE BEAM CONNECTION TO VERTICAL FACED PARAPETS



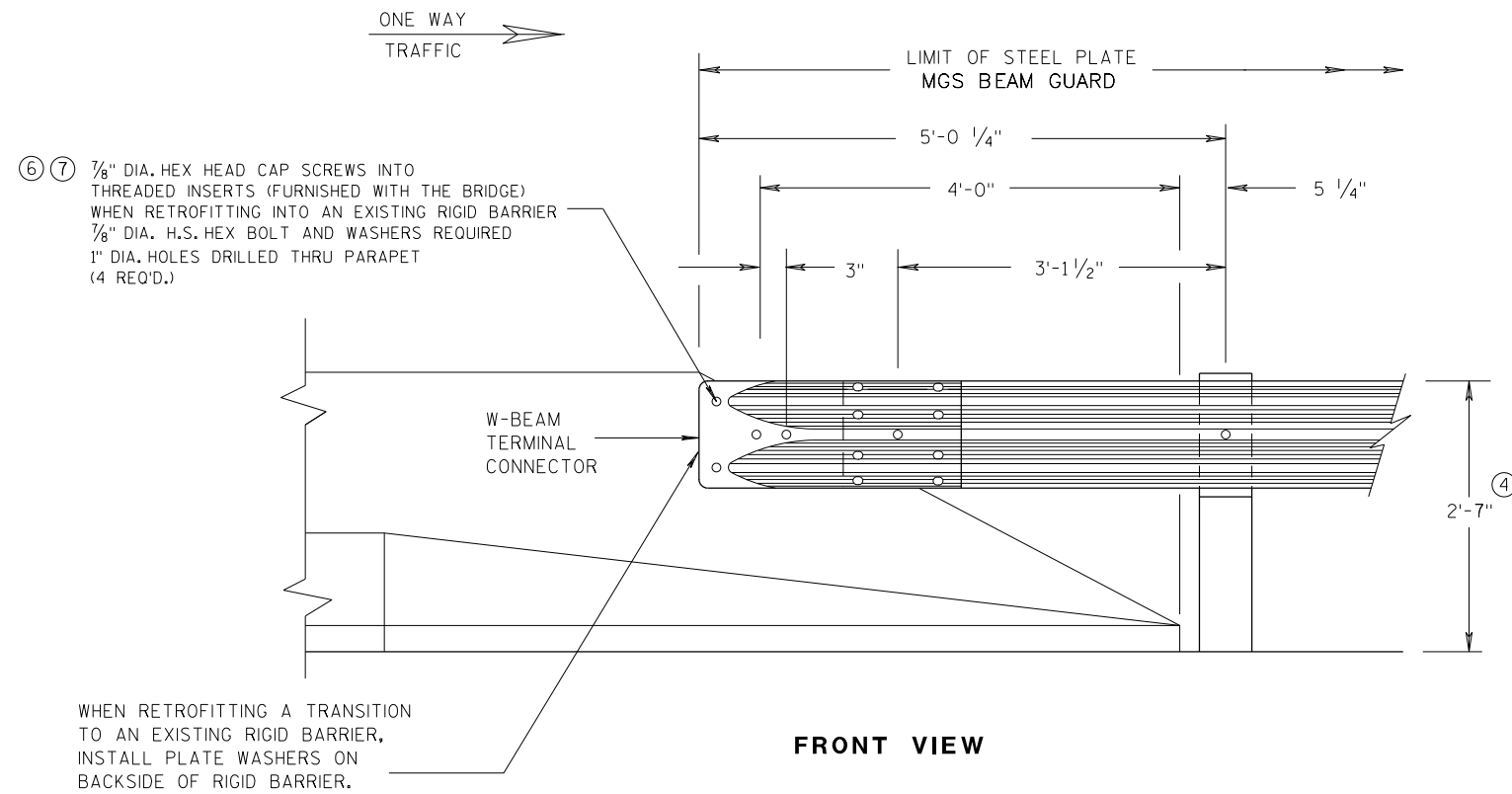
SECTION H-H

MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
07/2018  
DATE  
FHWA

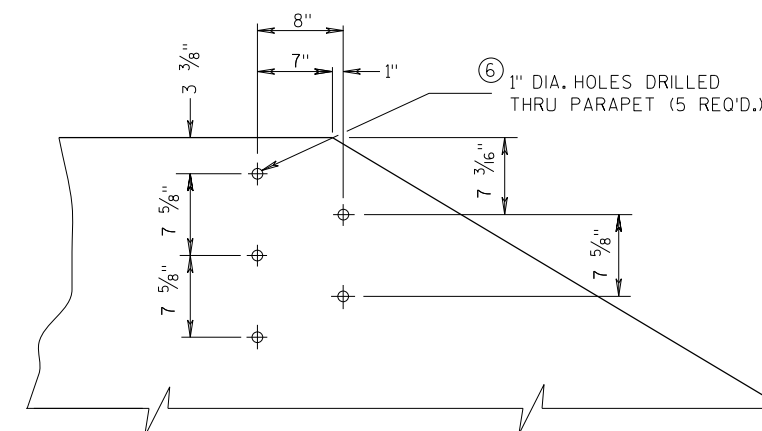
/S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR



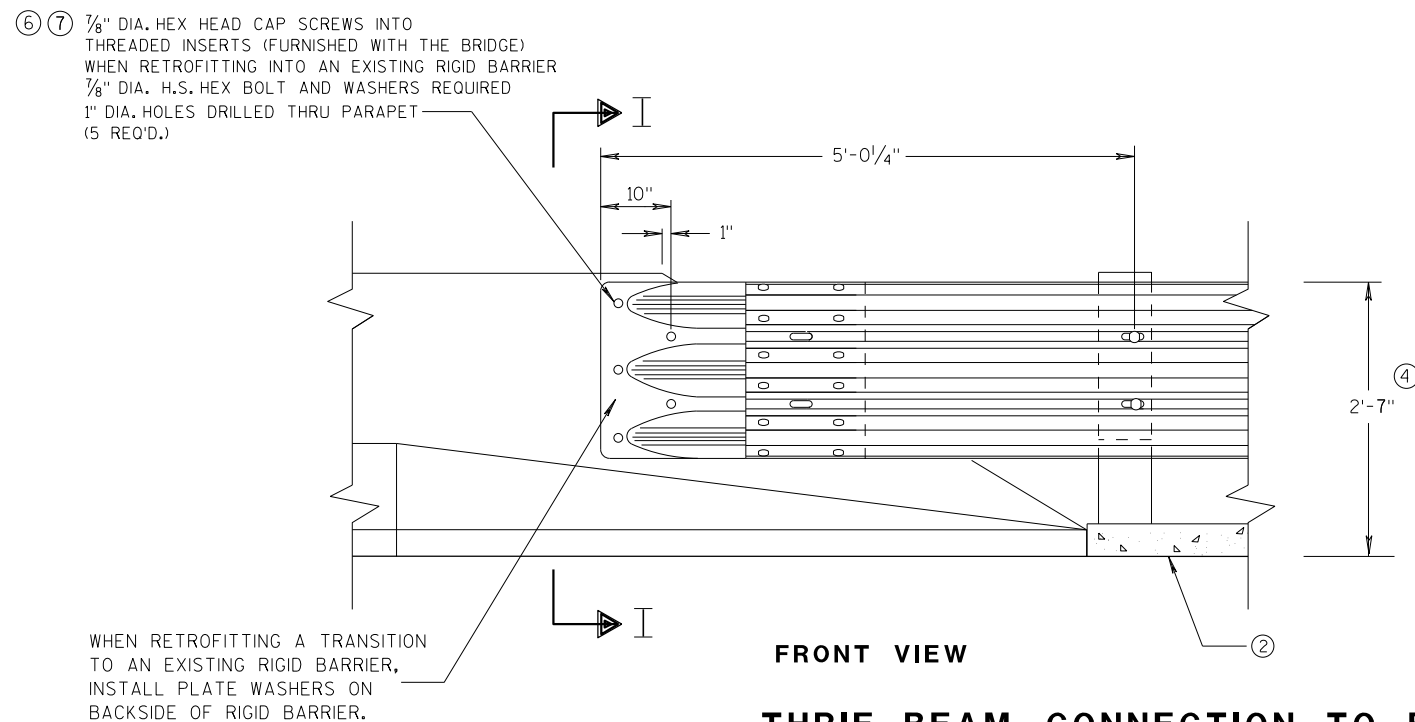
**W BEAM CONNECTION TO  
PARAPETS WITH SLOPED ENDS**  
(USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)

## GENERAL NOTES

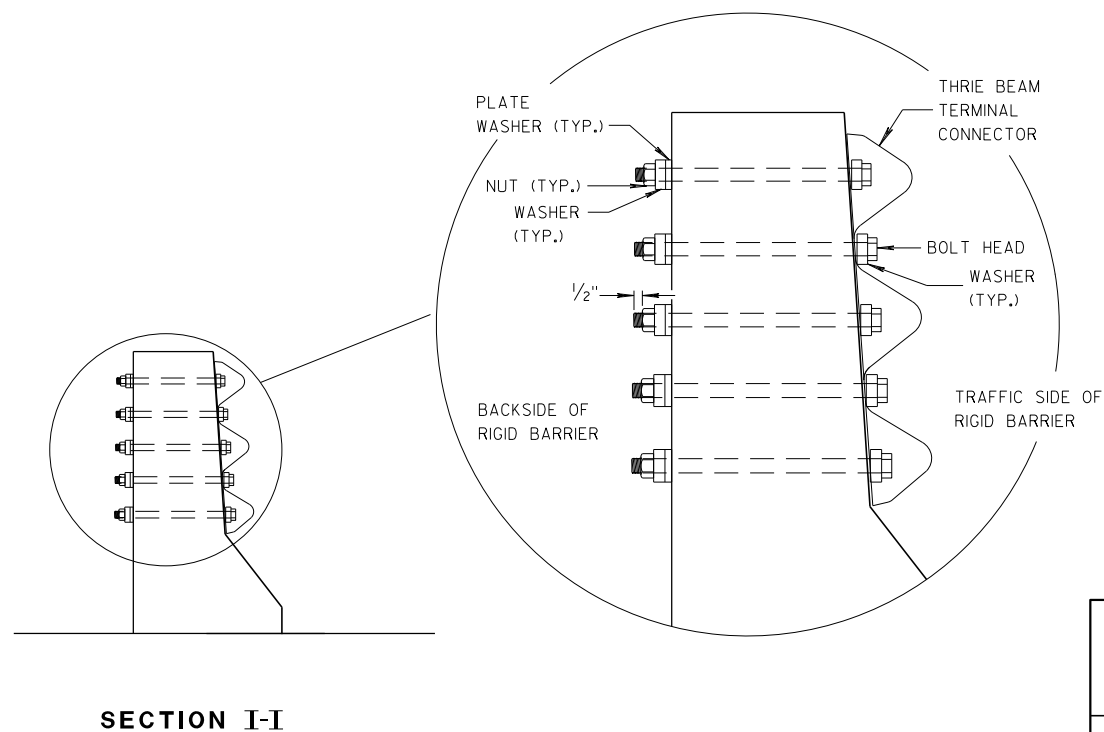
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ④ TOLERANCE FOR TOP OF BEAM IS  $\pm 1"$ .
- ⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH 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.



**DRILL HOLE LOCATION AND PATTERN  
FOR THRIE BEAM CONNECTION**



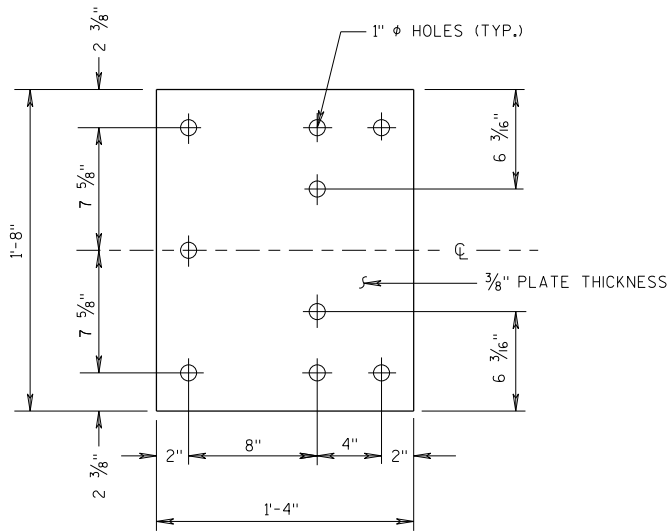
**THRIE BEAM CONNECTION TO BRIDGE  
PARAPETS WITH SLOPED ENDS**



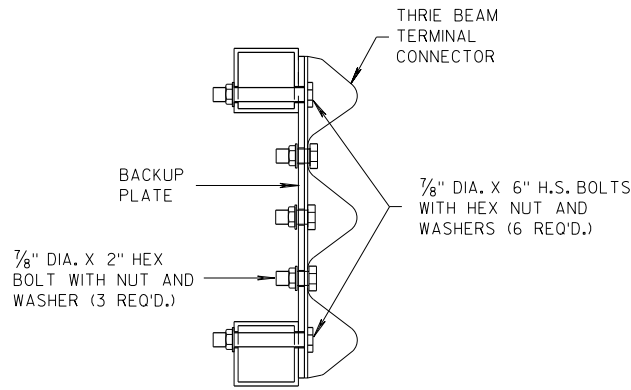
**MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

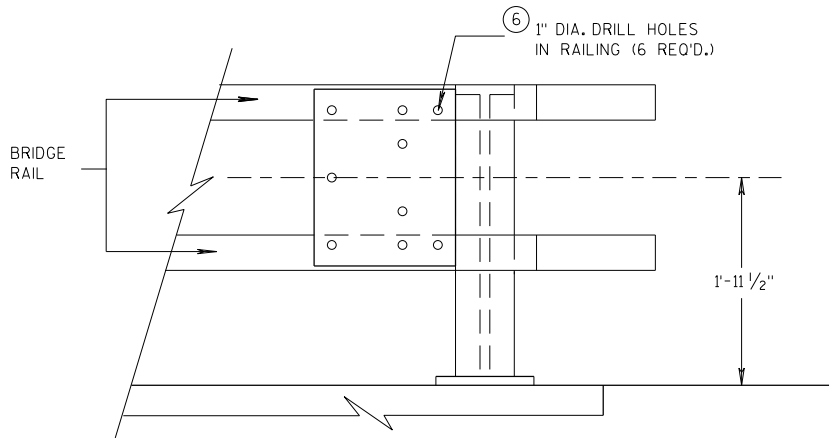
APPROVED  
07/2018  
DATE /S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR  
FHWA



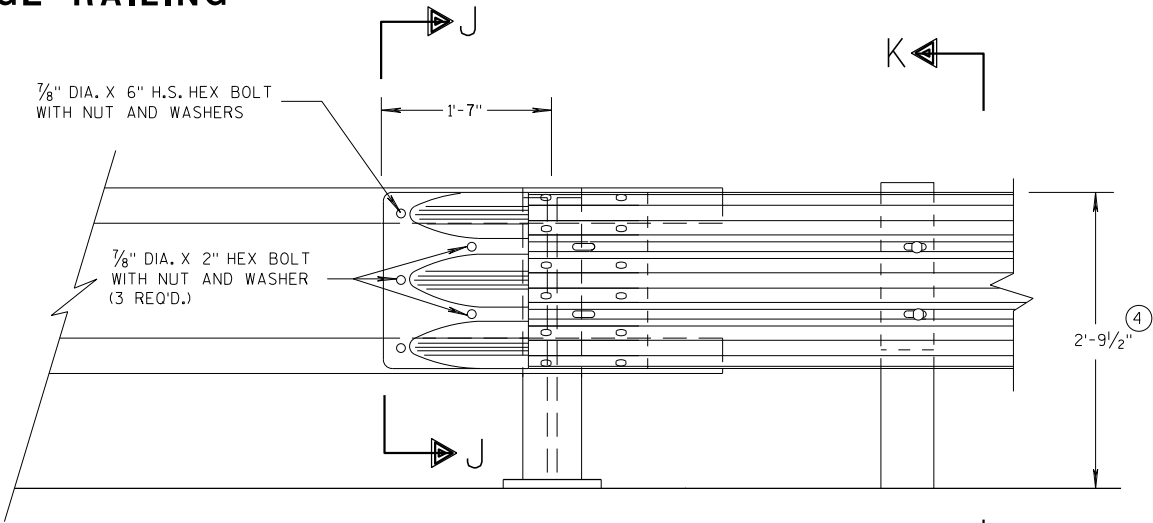
BACK-UP PLATE DETAIL



SECTION J-J

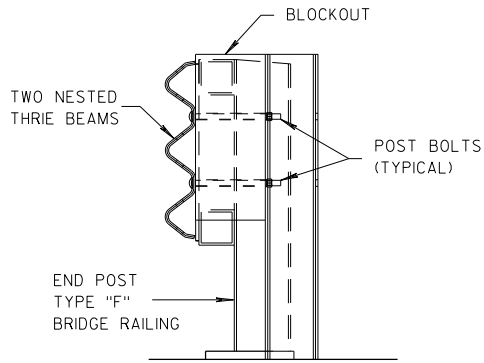


BACK-UP PLATE MOUNTING  
ONTO BRIDGE RAILING



FRONT VIEW

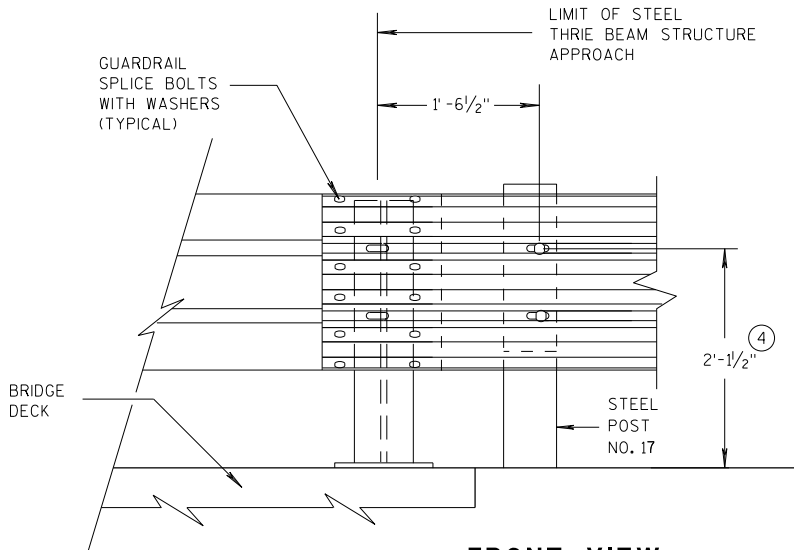
THRIE BEAM CONNECTION TO  
TUBULAR RAILING TYPE "F"



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<br>DATE                             | /S/ Rodney Taylor<br>ROADWAY STANDARDS DEVELOPMENT<br>UNIT SUPERVISOR |
| FHWA                                                    |                                                                       |

④ TOLERANCE FOR TOP OF W-BEAM RAIL IS  $\pm 1"$ .



6



**SECTION M-M**



**FRONT VIEW**



FHWA



COVER PLATE PANELS ARE  $\frac{3}{16}$ " THICK.

ALL STIFFENERS ARE  $\frac{1}{4}$ " 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  $\frac{3}{16}$ " 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:  
 $\frac{3}{16}$ " FILLET WELD BY 1" LONG SPACED AT 2".

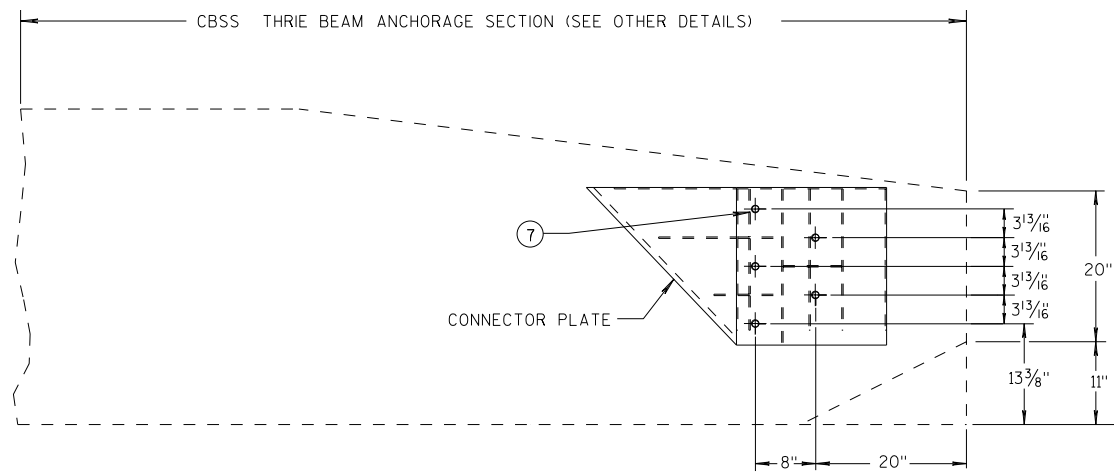
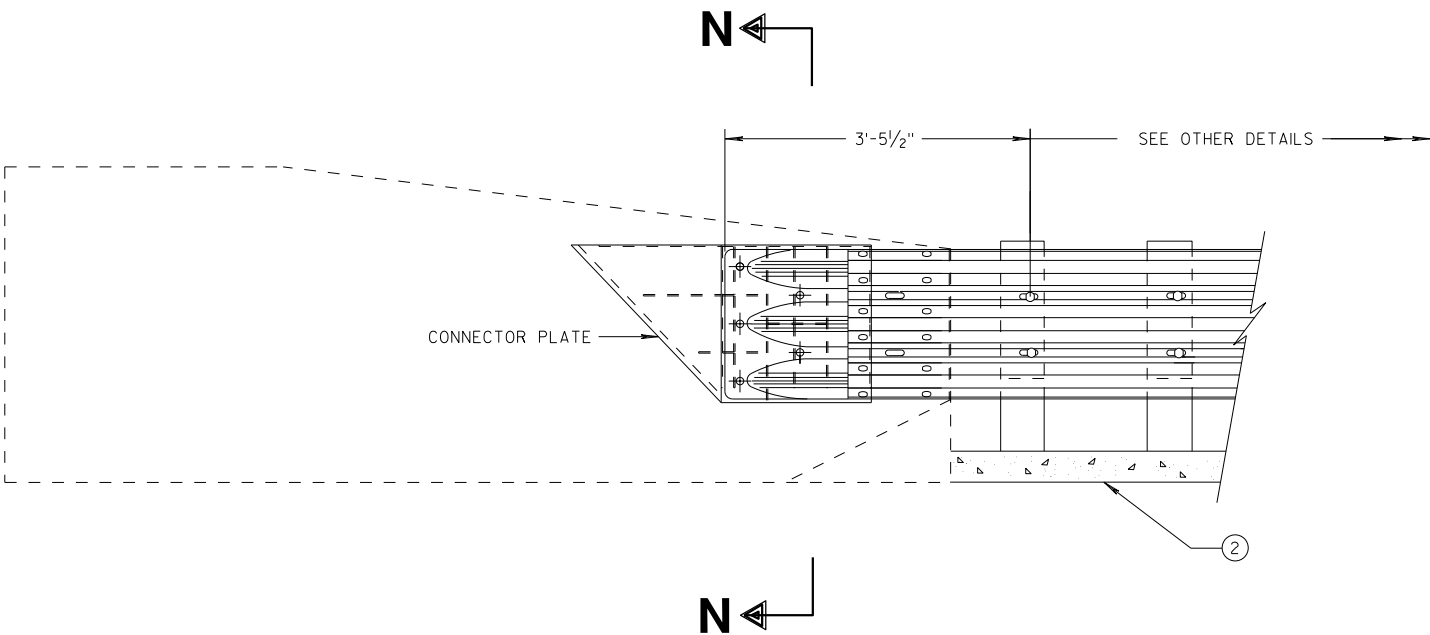
| CONNECTOR PLATE DIMENSION<br>(PER ASSEMBLY) |          |                                                                                       |                                    |           |
|---------------------------------------------|----------|---------------------------------------------------------------------------------------|------------------------------------|-----------|
| 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 9/16"               | 3/16"     |
| P3                                          | 1        |  | 39" x 3 5/8" x 20" x 19 5/16"      | 3/16"     |
| S1                                          | 4        |  | 18 1/16" 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 1/16"                   | 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 9/16" 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 1/8" x 9 7/8" x 3 5/8" x 9 1/16" | 1/4"      |
| S11                                         | 1        |  | 8 1/2" x 8 3/4" x 1 3/16"          | 1/4"      |

## SINGLE SLOPE CONNECTION PLATE

|                                                                 |                                                                              |
|-----------------------------------------------------------------|------------------------------------------------------------------------------|
| <b>MIDWEST GUARDRAIL SYSTEM<br/>THRIE BEAM TRANSITION (MGS)</b> |                                                                              |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION              |                                                                              |
| APPROVED<br><u>7/2018</u><br>DATE                               | <u>/S/ Rodney Taylor</u><br>ROADWAY STANDARDS DEVELOPMENT<br>UNIT SUPERVISOR |
| FHWA                                                            |                                                                              |



THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER



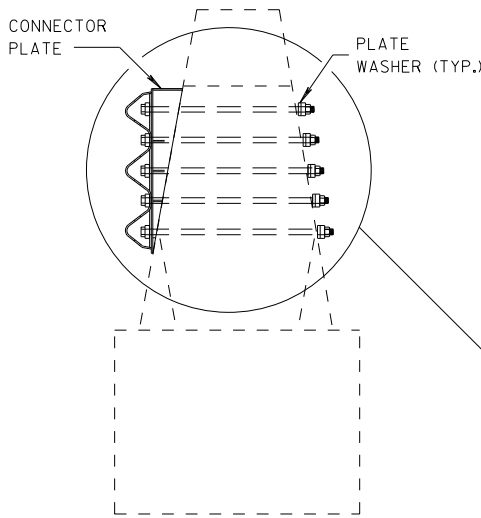
SINGLE SLOPE CONNECTION PLATE PLACEMENT

GENERAL NOTES

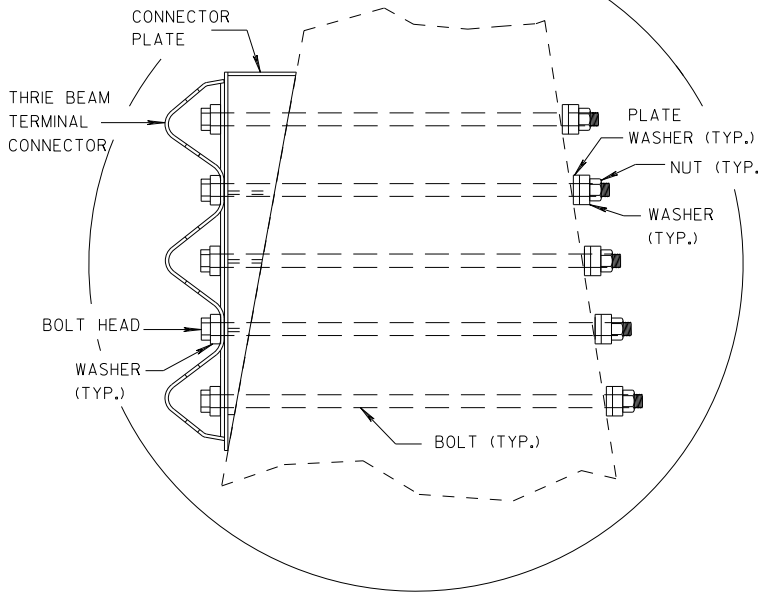
CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

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

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 CONNECTION 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.



SECTION N-N



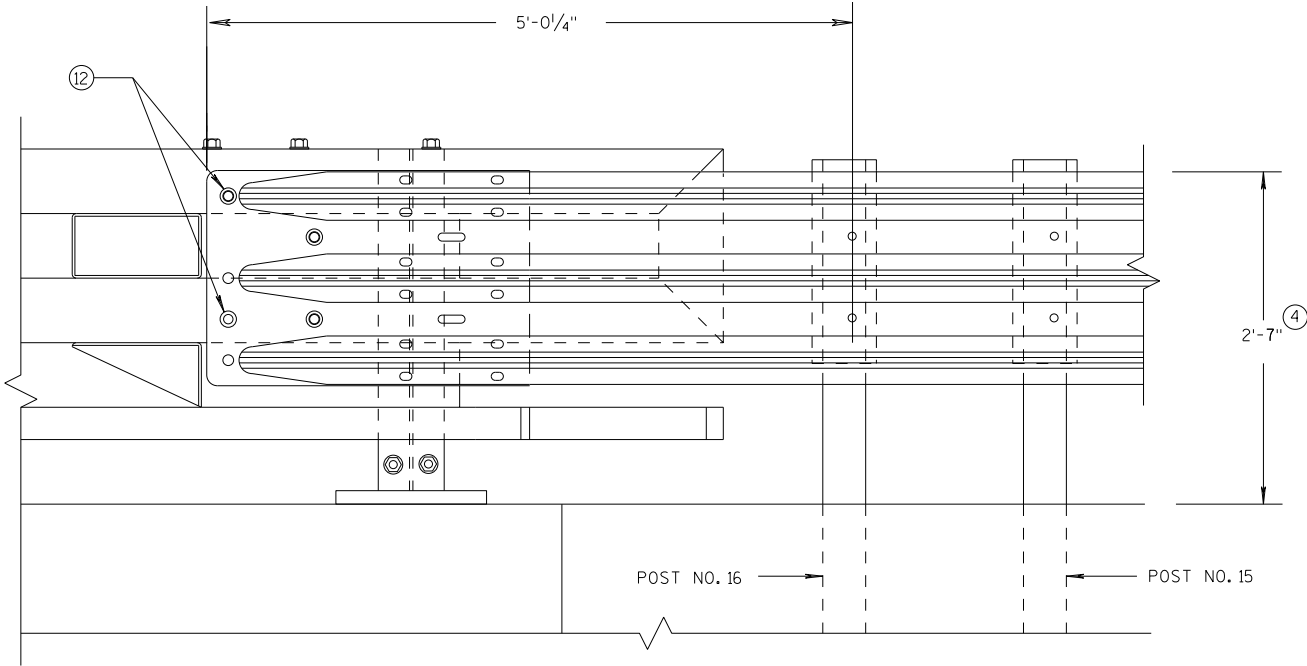
MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

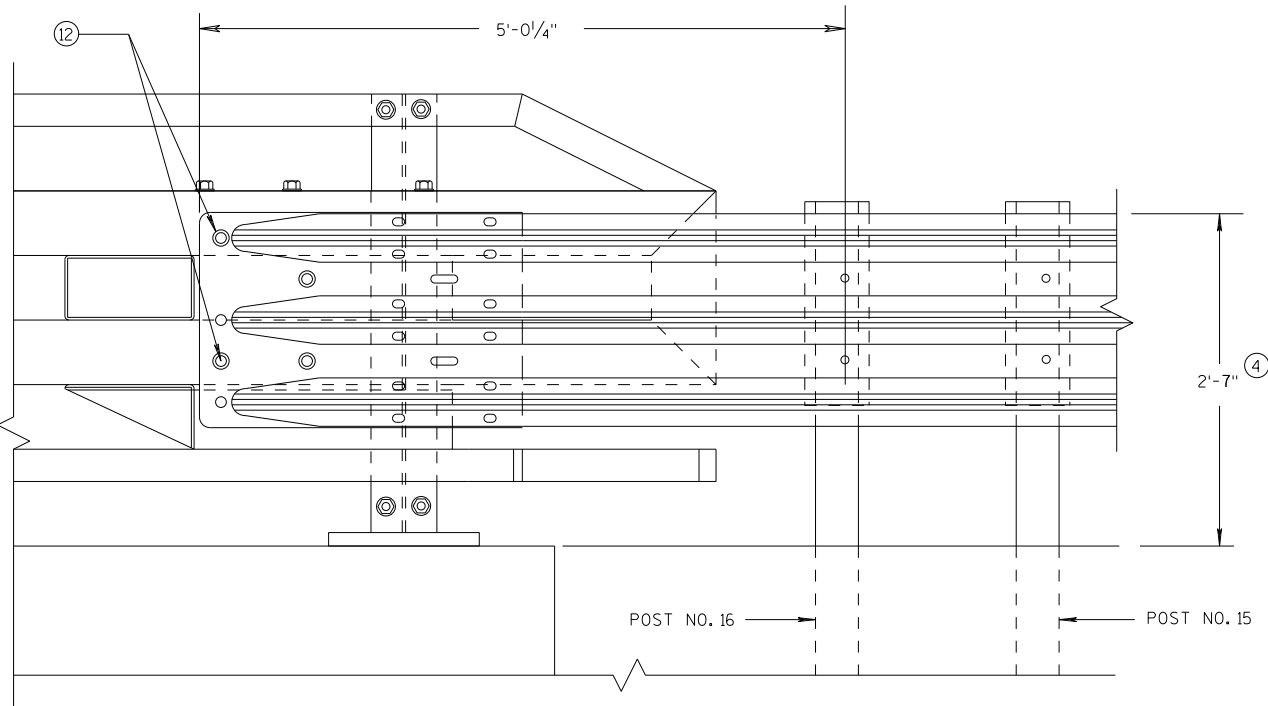
APPROVED  
7/2018  
DATE  
/S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR  
FHWA

GENERAL NOTES

- ④ TOLERANCE FOR TOP OF BEAM IS  $\pm 1"$ .
- ⑫ 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. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND  $\frac{1}{2}$ -INCH BEYOND NUT.



ELEVATION OF DETAIL AT NY3 END POST  
THRIE BEAM RAIL ATTACHMENT



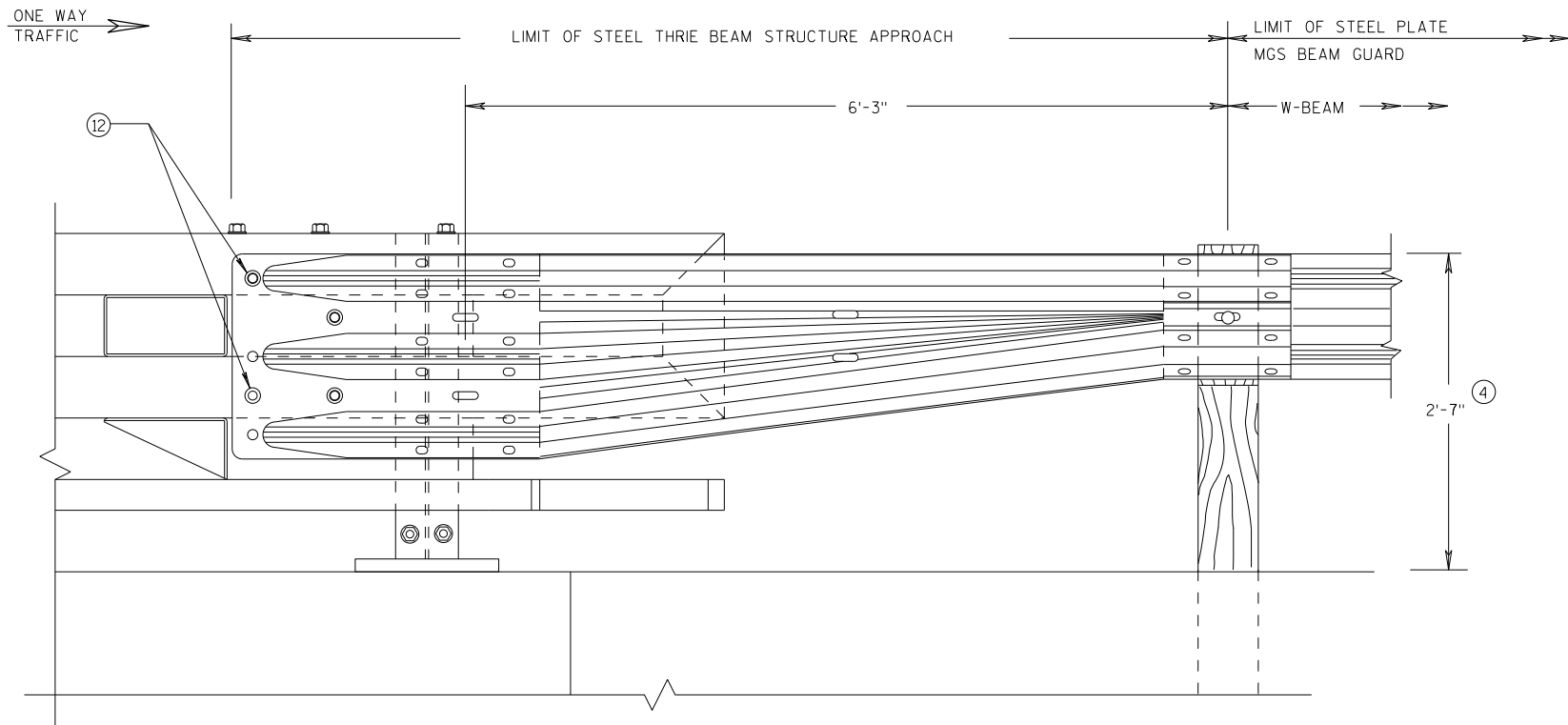
ELEVATION OF DETAIL AT NY4 END POST  
THRIE BEAM RAIL ATTACHMENT

MIDWEST GUARDRAIL SYSTEM  
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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

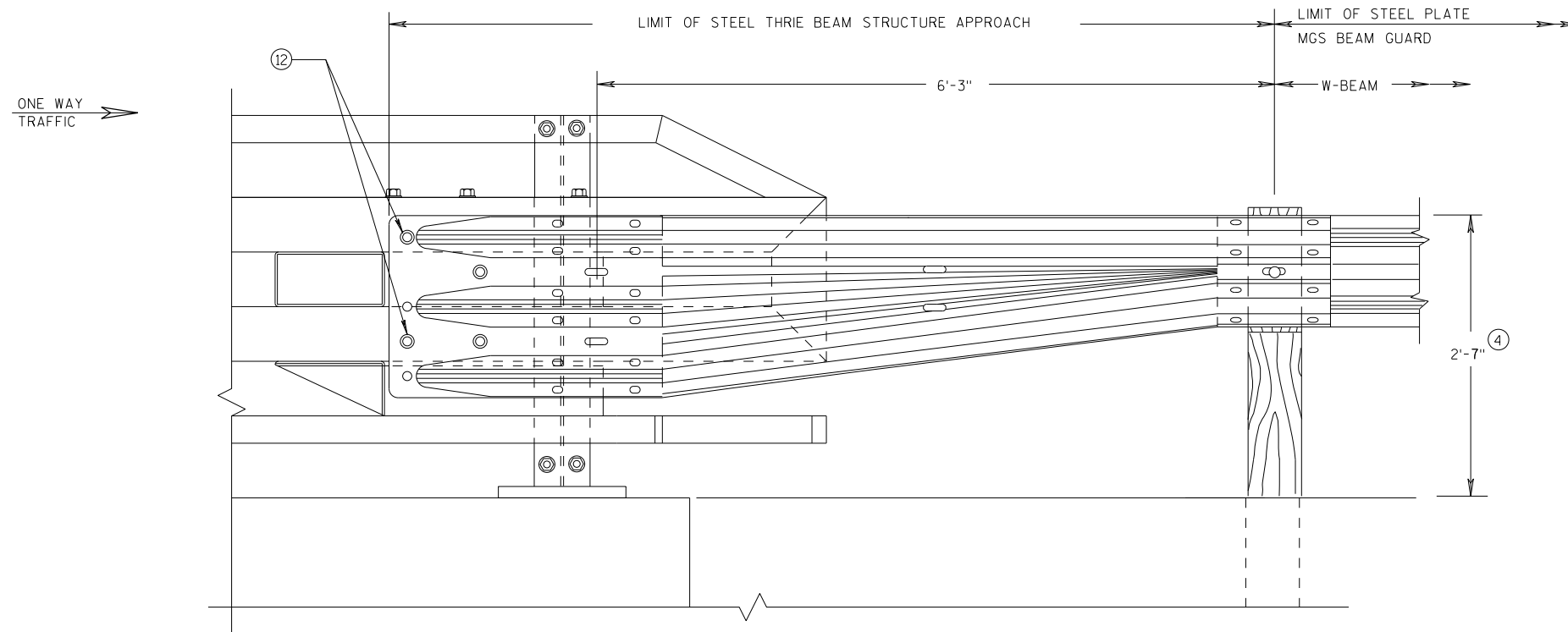




## GENERAL NOTES

- (4) TOLERANCE FOR TOP OF BEAM IS  $\pm 1"$ .
- (12) 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. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND  $\frac{1}{2}$ -INCH BEYOND NUT.

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

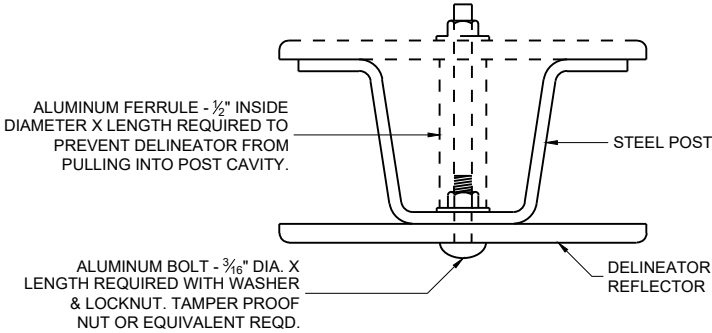


**FRONT VIEW**  
**W BEAM TRANSITION AND**  
**CONNECTION TO BRIDGE RAILING TYPE "NY4"**  
 (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

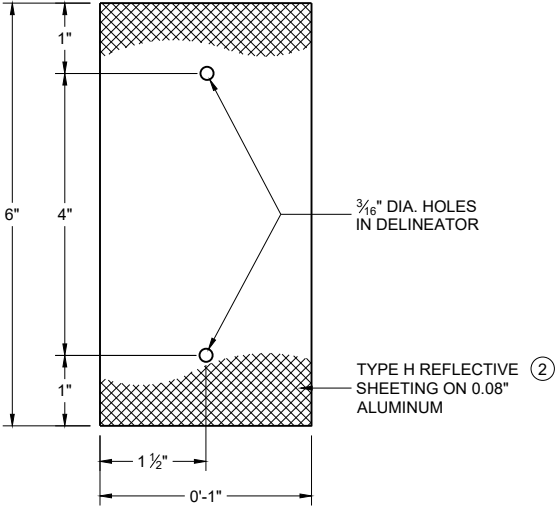
**MIDWEST GUARDRAIL SYSTEM**  
**THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN  
 DEPARTMENT OF TRANSPORTATION

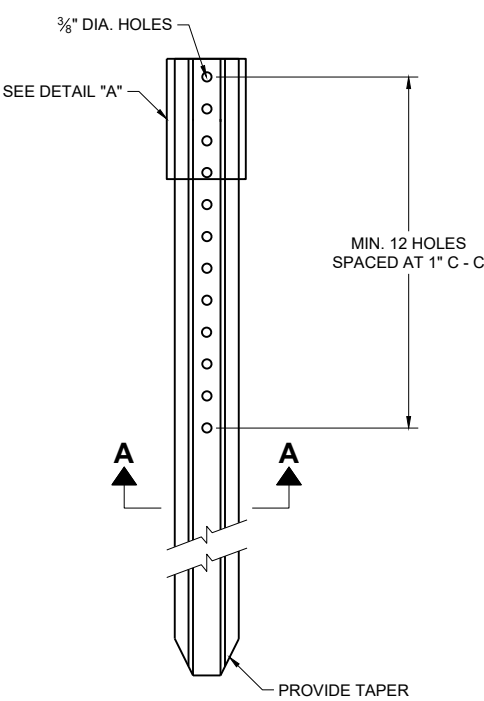
APPROVED  
 7/2018  
 DATE  
 /S/ Rodney Taylor  
 ROADWAY STANDARDS DEVELOPMENT  
 UNIT SUPERVISOR  
 FHWA



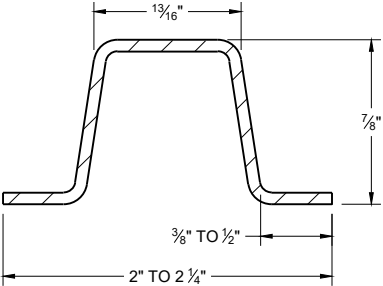
MOUNTING DETAIL FOR DELINEATOR REFLECTOR



DETAIL "A" 3" X 6" DELINEATOR REFLECTOR



DELINEATOR POST



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

REFLECTOR SPACING TABLE

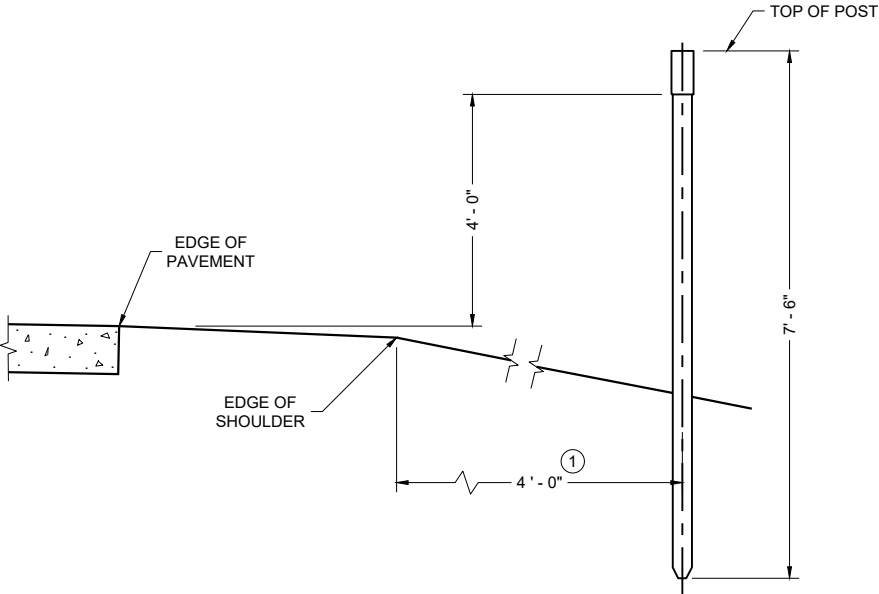
| REFLECTOR SPACING | LOCATION |
|-------------------|----------|
| * 100' C-C        | RAMPS    |
| 400' C-C          | MAINLINE |

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

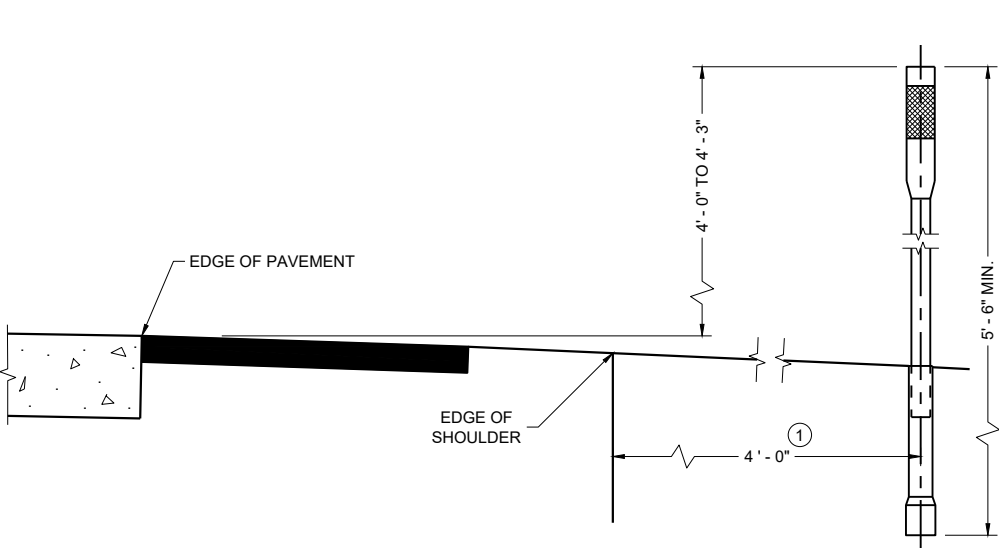
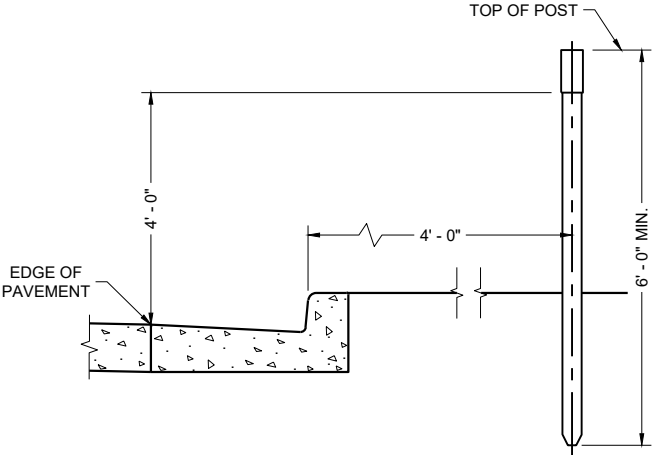
GENERAL NOTES

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

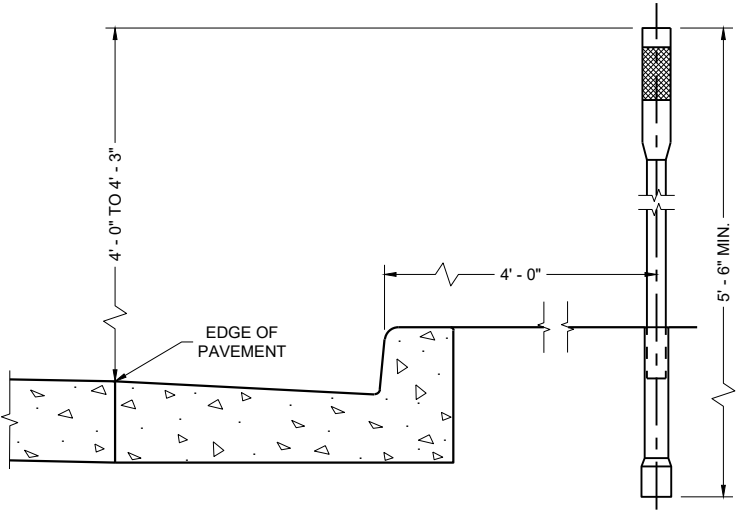
- ① DELINEATORS SHALL BE PLACED AT A CONSTANT DISTANCE FROM THE EDGE OF THE SHOULDER FOR THE LENGTH OF THE INSTALLATION.
- ② FURNISH TYPE H SHEETING FROM THE APPROVED PRODUCTS LIST.



TYPICAL INSTALLATIONS OF DELINEATOR POSTS



TYPICAL INSTALLATIONS OF FLEXIBLE DELINEATOR POSTS



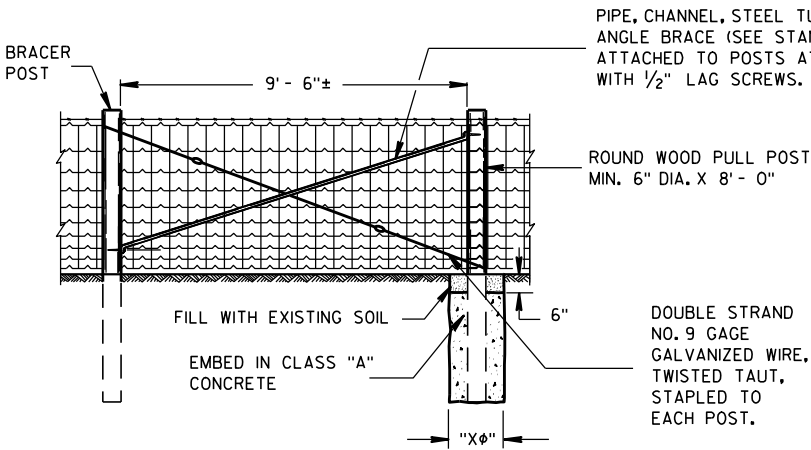
DELINEATOR POST  
WITH REFLECTIVE SHEETING

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

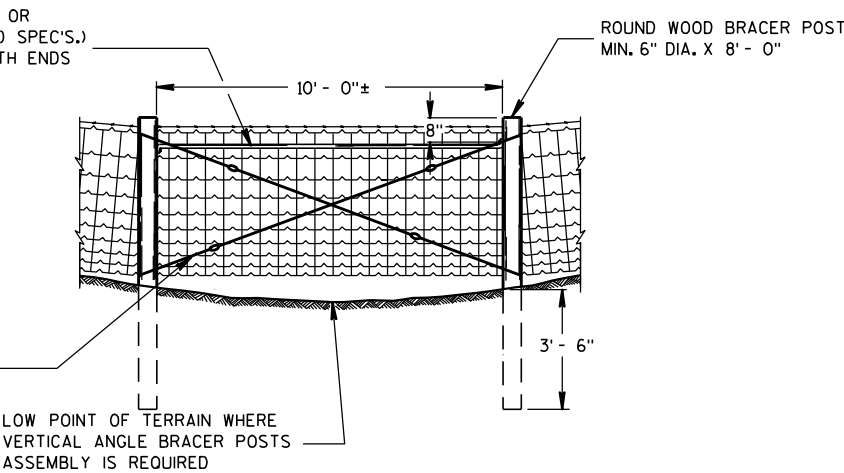
APPROVED  
March 2024 /S/ Jeannie Silver  
DATE Statewide Pavement Marking Engineer  
FHWA

NOTE: PULL OR STRETCHER POST ASSEMBLIES SHALL BE PLACED MIDWAY BETWEEN END POSTS AND CORNER POSTS WHERE A RUN OF FENCE EXCEEDS 660' BUT IS LESS THAN 1,320'. FOR RUNS OF FENCE IN EXCESS OF 1,320' MAXIMUM SPACING OF PULL OR STRETCHER POST ASSEMBLIES SHALL BE 660'± C-C.

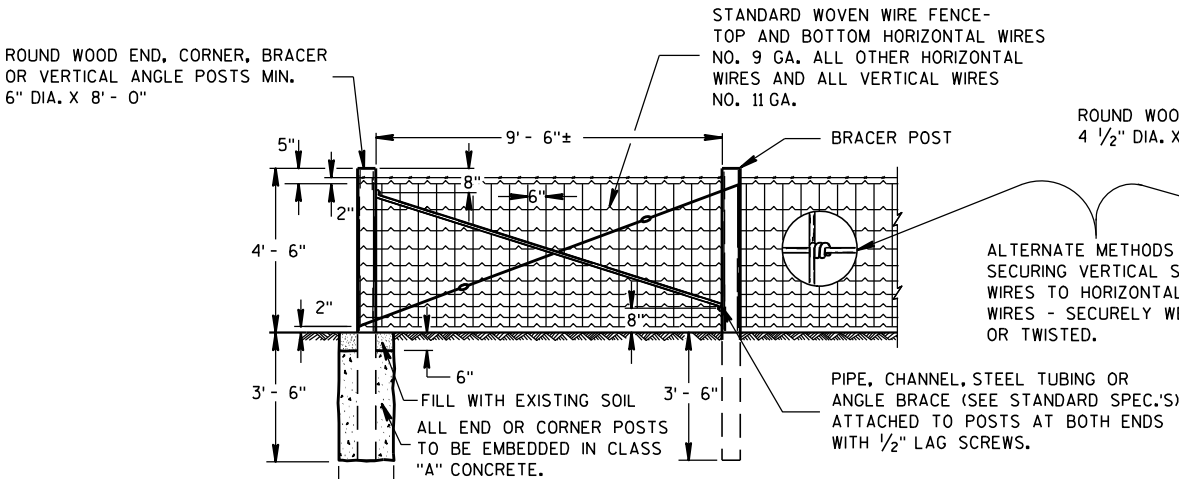
ILLUSTRATION SHOWS POSITION OF STANDARD STEEL BRACE, DOUBLE STRAND GALVANIZED WIRE, AND THE POST TO BE EMBEDDED IN CONCRETE WHEN WIRE FENCE IS INSTALLED FROM LEFT TO RIGHT. THE BRACES SHALL BE POSITIONED ON THE OPPOSITE DIAGONALS AND THE OPPOSITE POST SHALL BE EMBEDDED IN CONCRETE WHEN WIRE FENCE IS INSTALLED FROM RIGHT TO LEFT.



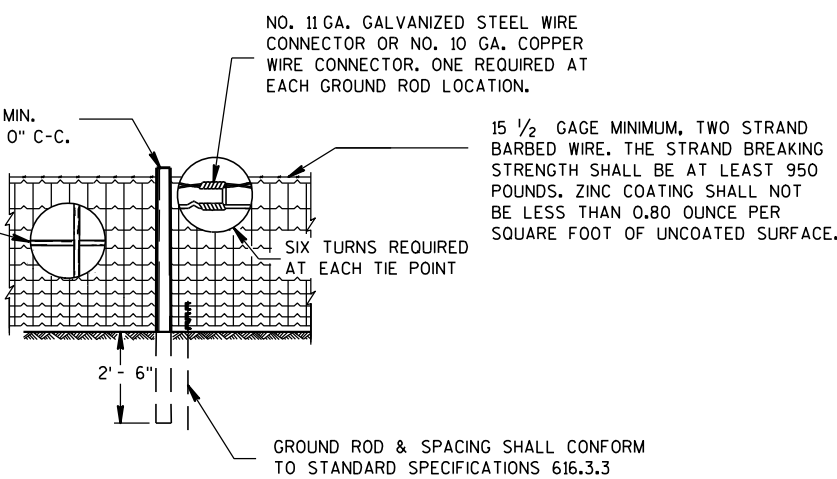
PULL OR STRETCHER POSTS ASSEMBLY



VERTICAL ANGLE BRACER POSTS ASSEMBLY

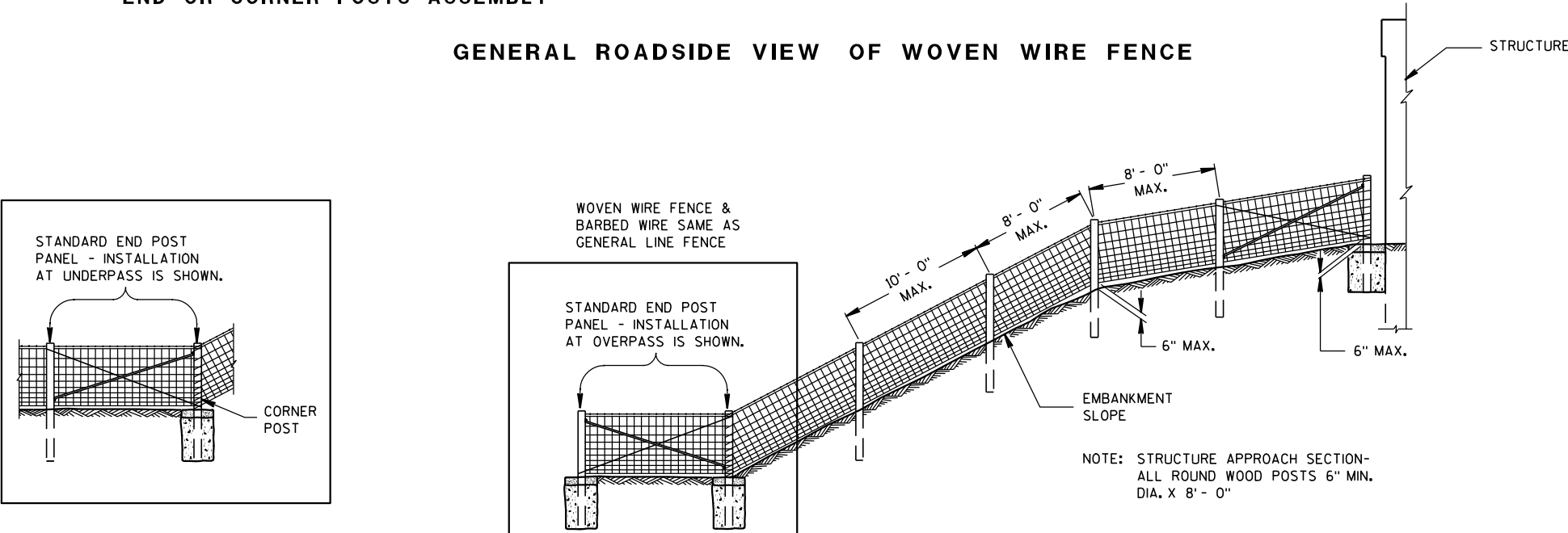


END OR CORNER POSTS ASSEMBLY



LINE FENCE CONSTRUCTION

GENERAL ROADSIDE VIEW OF WOVEN WIRE FENCE



FENCE DESIGN AT STRUCTURE APPROACH

GENERAL NOTES

"Xφ" = DIAMETER OF THE POST PLUS 12".

FENCE STAPLES SHOULD NEVER BE DRIVEN VERTICALLY INTO WOOD POSTS (WITH BOTH LEGS PARALLEL WITH THE WOOD GRAIN). DOING SO CAN SEPARATE THE GRAIN AND SIGNIFICANTLY REDUCE THE HOLDING POWER. ROTATING THE STAPLES SLIGHTLY OFF VERTICAL STRADDLES THE GRAIN AND PROVIDES MORE RESISTANCE TO PULL-OUT.

DO NOT STAPLE WIRE TIGHT TO THE LINE POSTS. ALLOW MOVEMENT OF WIRE FOR EXPANSION AND CONTRACTION. STAPLE ARRANGEMENT SHALL BE THE SAME FOR ALL OTHER POSTS EXCEPT THAT THEY SHALL BE DRIVEN TIGHT TO POSTS. ALL STAPLES SHALL BE 2" X 9 GAGE AND SHALL BE MANUFACTURED FROM GALVANIZED WIRE OR HOT DIP GALVANIZED AFTER FORMING. STAPLES SHALL HAVE SLASH-CUT POINTS.

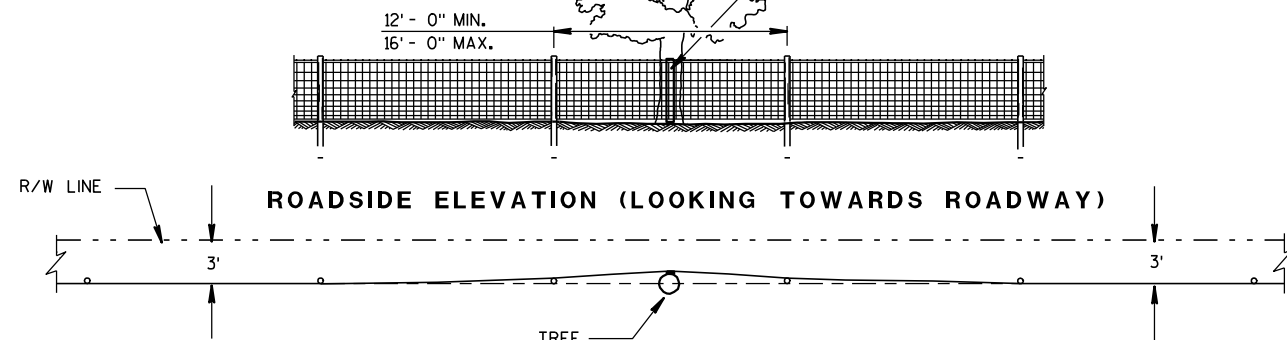
FENCE SHALL BE LOCATED 3'-0" INSIDE THE RIGHT OF WAY LINE UNLESS OTHERWISE INDICATED ON THE PLANS.

FENCE WOVEN WIRE

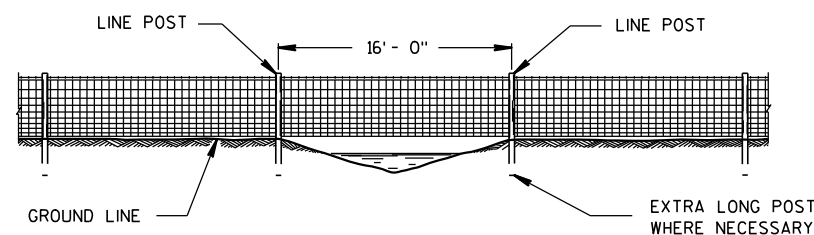
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

NOTE: TREE IN NORMAL FENCE LINE SPECIFICALLY ORDERED BY ENGINEER TO REMAIN IN PLACE.

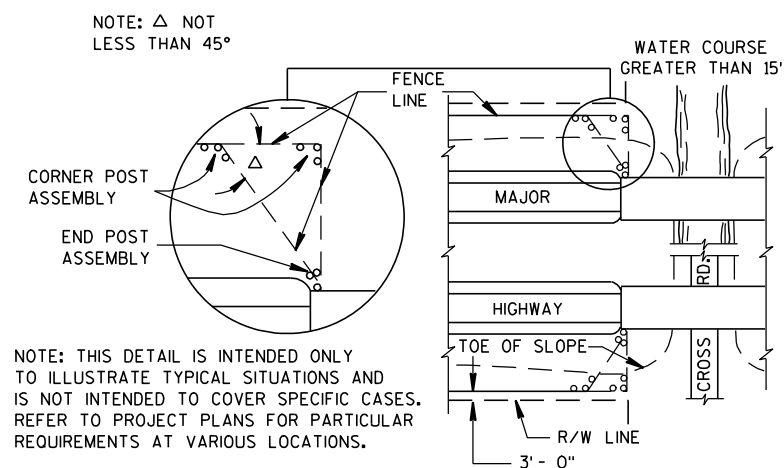
2" X 6" DOUGLAS FIR OR SO. YELLOW PINE PLACED BETWEEN TREE AND WOVEN WIRE FENCE. WOVEN WIRE FENCE AND BARBED WIRE TO BE STAPLED TO 2" X 6" LIKE AS TO LINE POST. 2" X 6" NOT FASTENED TO TREE.



PLAN VIEW  
FENCE DESIGN AT TREES REMAINING  
IN NORMAL FENCE LINE

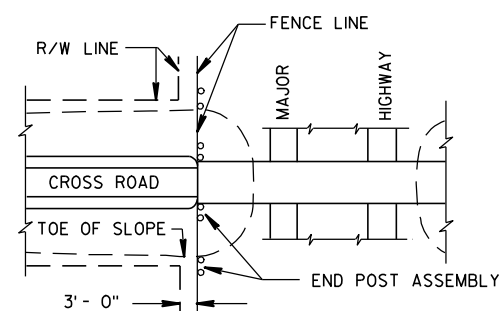


FENCE CONSTRUCTION OVER STREAM  
COURSES OF 15 FT. OR LESS IN WIDTH

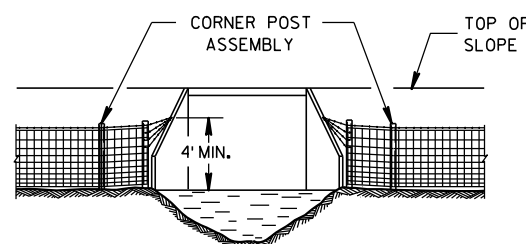


PLAN VIEW  
MAJOR HIGHWAY OVERPASS OR STREAM COURSE  
CROSSING OF GREATER THAN 15 FT. IN WIDTH

FENCE LOCATION AT STRUCTURES

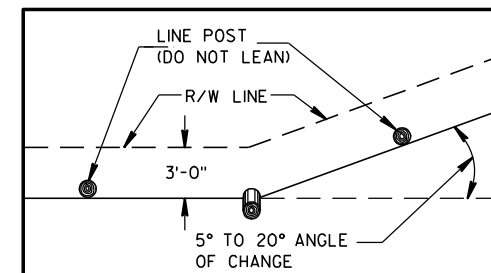
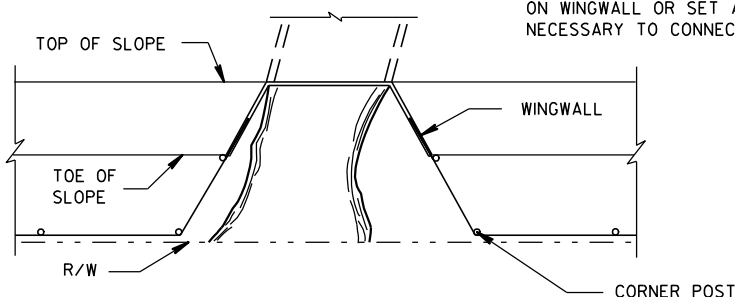


PLAN VIEW  
MAJOR HIGHWAY UNDERPASS

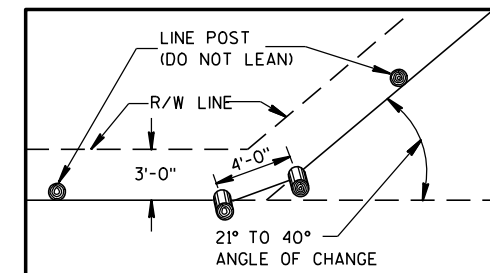


FENCE INSTALLATION TO WINGWALLS

NOTE: PLACE A MINIMUM OF 4 STRANDS OF BARBED WIRE, 6" MAXIMUM CENTERS IN FAN SHAPE CONNECTED TO AN EYE BOLT ON WINGWALL OR SET A LONE POST WHEN NECESSARY TO CONNECT BARBED WIRE.



PLAN VIEW  
SINGLE POST CORNER

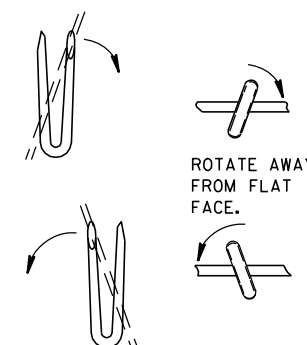


PLAN VIEW  
DOUBLE POST CORNER

## RIGHT OF WAY LINE CHANGE 40° AND LESS

NOTE: SINGLE AND DOUBLE POSTS SHALL BE A MIN. 6" DIA. X 8'-0" WITH A LEAN OF 4" TOWARD THE OUTSIDE OF THE CURVE.

WHEN THE RIGHT OF WAY LINE CHANGE IS MORE THAN 40° USE THE CORNER OR STRETCHER POSTS ASSEMBLY.



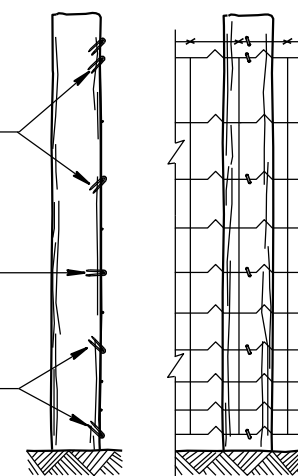
LINE POST

NOTE: WHEN POSTS ARE DRIVEN THE SMALL END SHALL BE DOWN.

STAPLES SLOPED DOWNWARD FOR SUSTAINED GRADES AND OVER KNOLLS.

STAPLES LEVEL FOR LEVEL GROUND.

SLOPE UPWARDS WHEN FENCE TENDS TO LIFT.



END ELEVATION  
FARM SIDE ELEVATION  
FENCE MOUNTING DETAIL

## FENCE WOVEN WIRE

STATE OF WISCONSIN  
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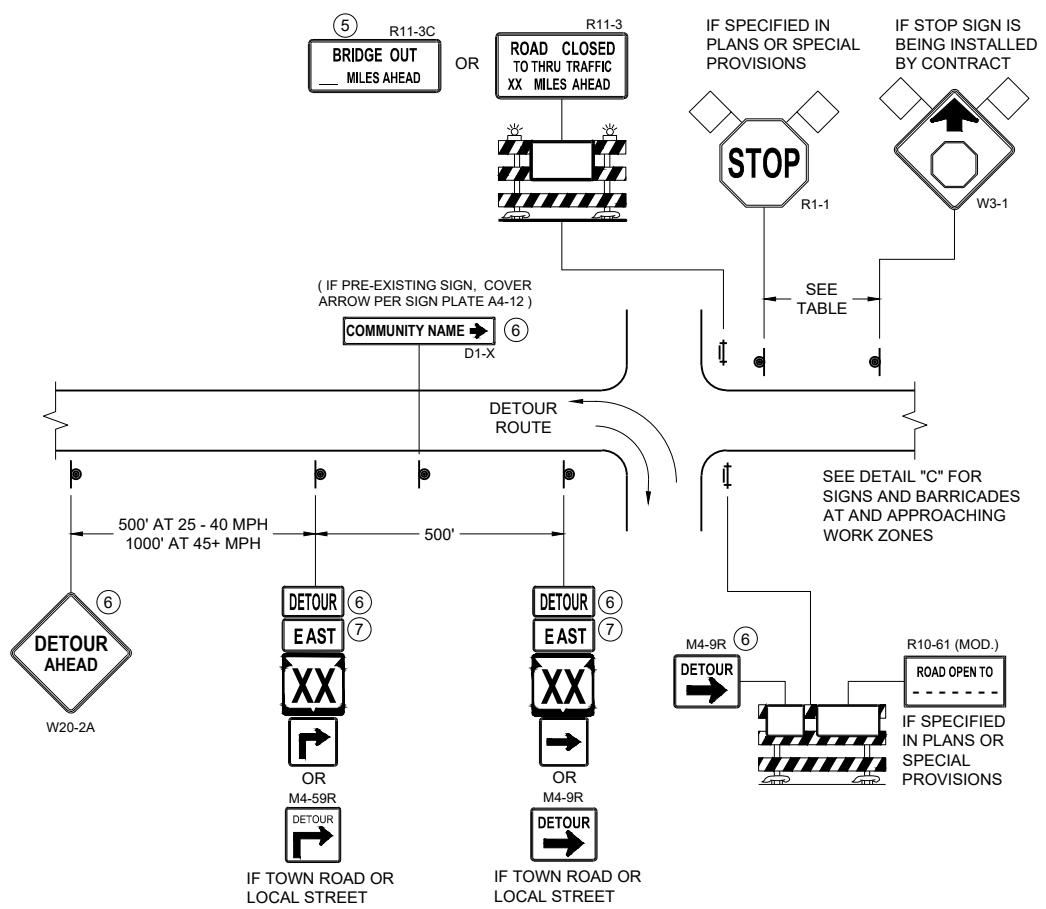
APPROVED

4/4/2008

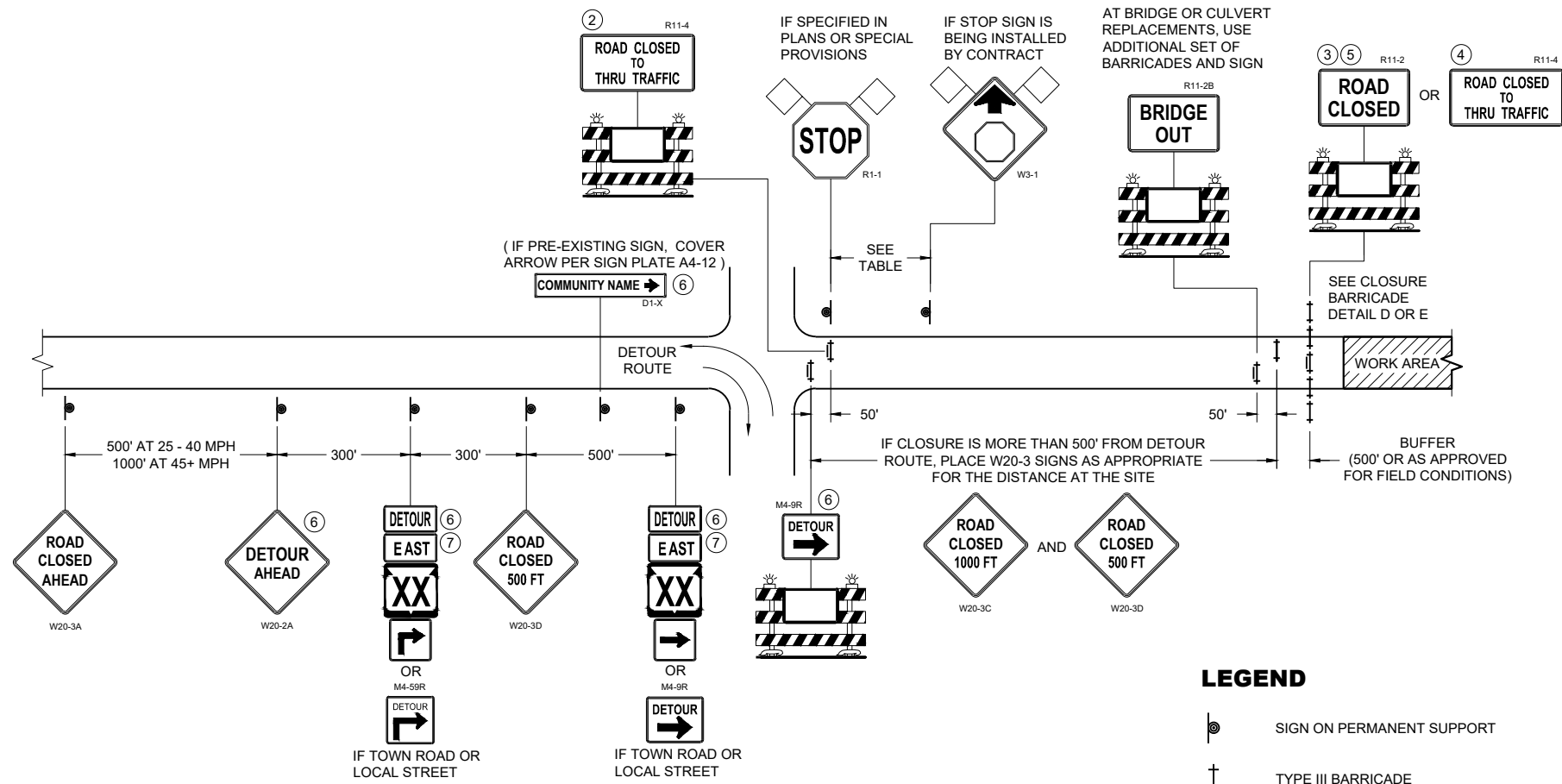
DATE

FHWA

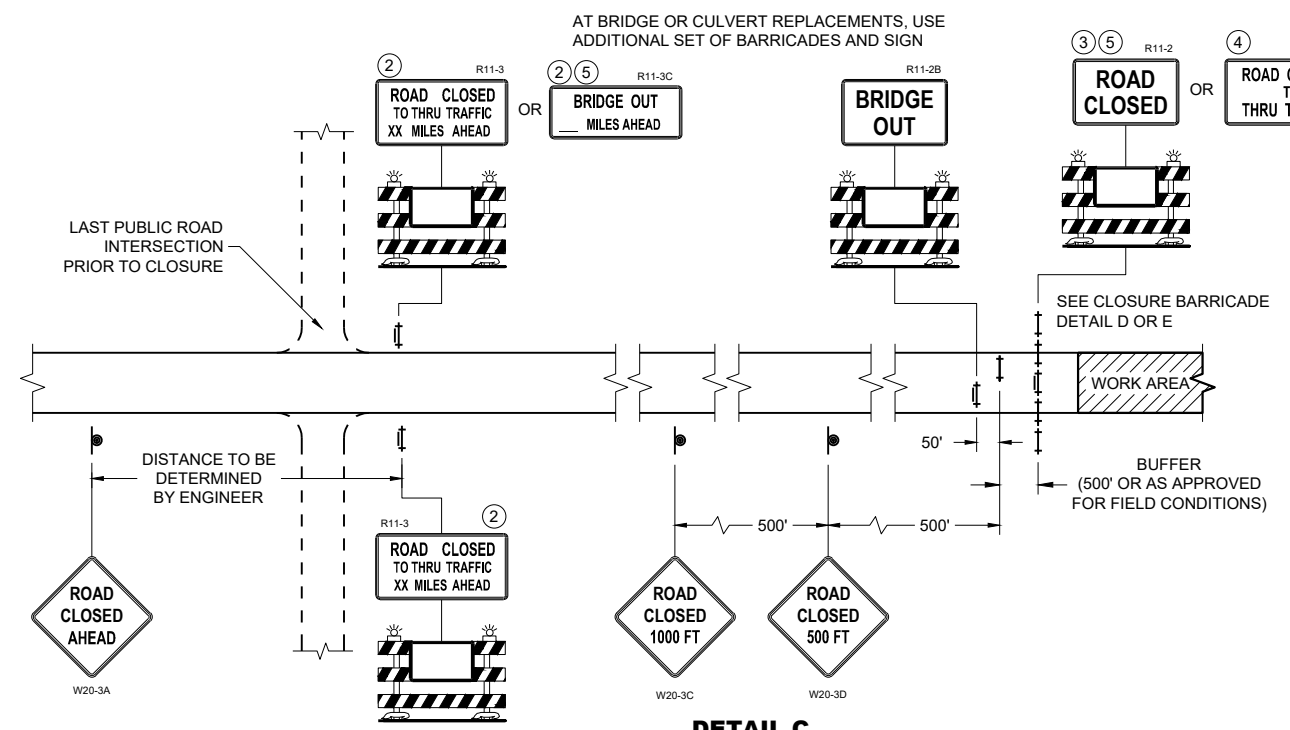
/S/ Jerry H. Zogg  
ROADWAY STANDARDS DEVELOPMENT  
ENGINEER



**DETAIL A**  
**MAINLINE CLOSURE WITH POSTED DETOUR**  
WORK ZONE GREATER THAN OR EQUAL TO ½ MILE FROM  
DETOUR ROUTE ( 1000 FEET IF URBAN )



**DETAIL B**  
**MAINLINE CLOSURE WITH POSTED DETOUR**  
WORK ZONE LESS THAN ½ MILE FROM  
DETOUR ROUTE ( 1000 FEET IF URBAN )



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

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

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

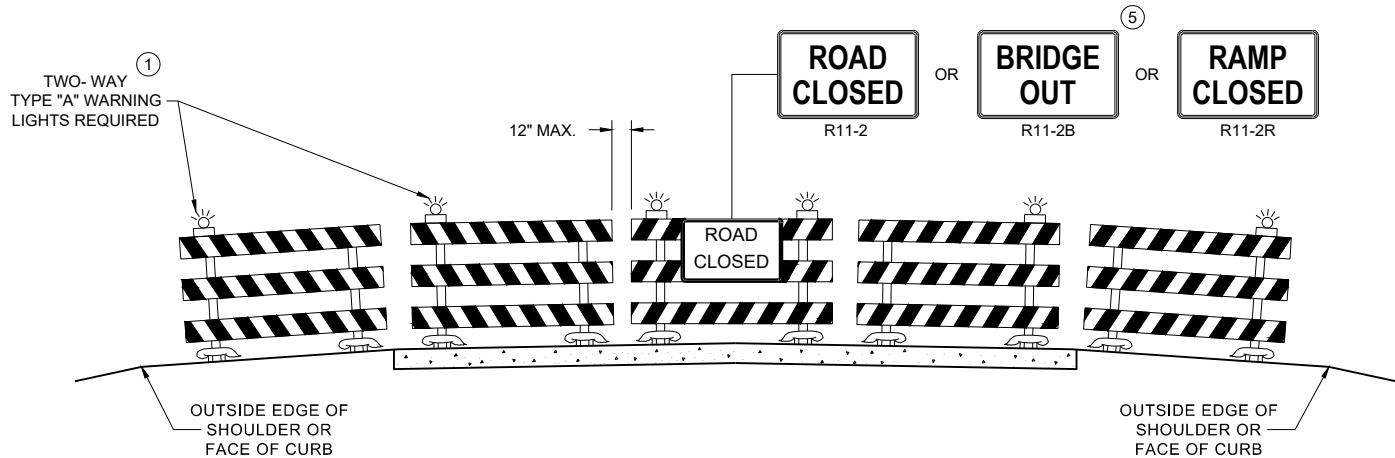
- LEGEND**
- SIGN ON PERMANENT SUPPORT
  - TYPE III BARRICADE
  - TYPE III BARRICADE WITH ATTACHED SIGN
  - TYPE "A" WARNING LIGHT (FLASHING)
  - WORK AREA
  - FLAGS, 16" X 16" MIN. (ORANGE)
- ⑥ DETOUR M4 - 8  
⑦ EAST M3 - X  
⑧ XX M1 - 4 OR XX M1 - 6 OR COUNTY M1 - 5A  
⑨ M05 - 1 OR M06 - 1

**BARRICADES AND SIGNS  
FOR MAINLINE CLOSURES**

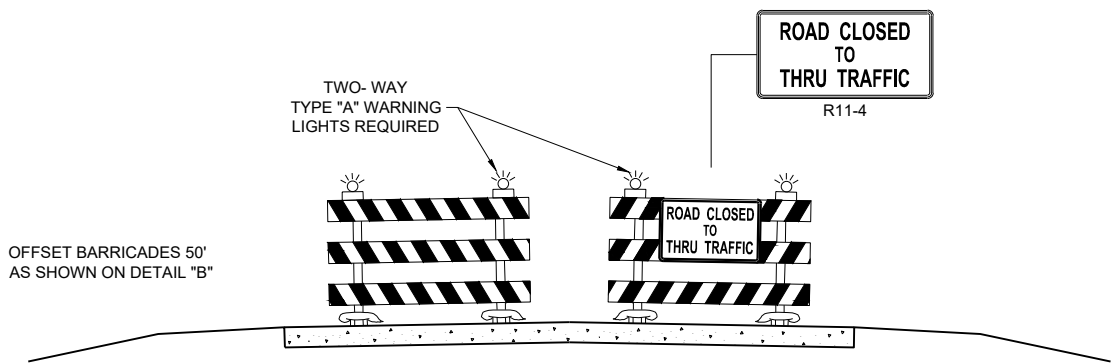
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
November 2025 /S/ Andrew Heidtke  
DATE WORK ZONE ENGINEER

FHWA



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



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

SEE SDD 15C2 - SHEET "a" FOR LEGEND

**GENERAL NOTES**

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

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

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

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

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

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

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

PARTIAL NUMBERS ON SIGNS SHALL BE DISPLAYED AS A WHOLE NUMBER(AS NEEDED) FOLLOWED BY A FRACTION. SIGNS SHALL NOT DISPLAY NUMBERS IN DECIMAL FORM.

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

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:

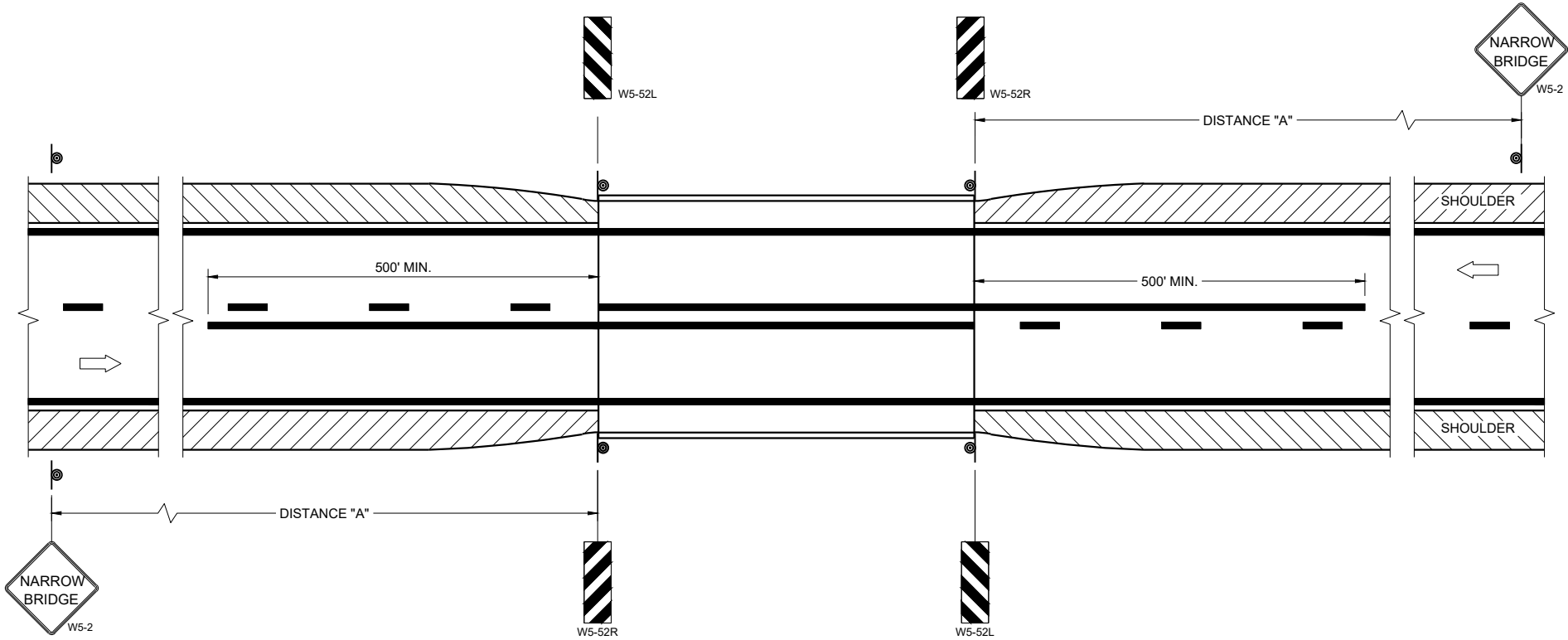
- R11 - 2 SHALL BE 48" X 30"
- R11 - 3 SHALL, R11 - 4 AND R10 - 61 SHALL BE 60 " X 30"
- M4 - 9 SHALL BE 30" X 24"
- M3 - X SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)
- M4 - 8 SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)
- M1 - 4, M1 - 5A AND M1 - 6 SHALL BE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

SIGNS PLACED ON TYPE III BARRICADES THAT ARE SIZES OTHER THAN 48"X30" SHALL HAVE A CORRUGATED POLYPROPYLENE OR POLYETHYLENE PLASTIC SIGN BASE.

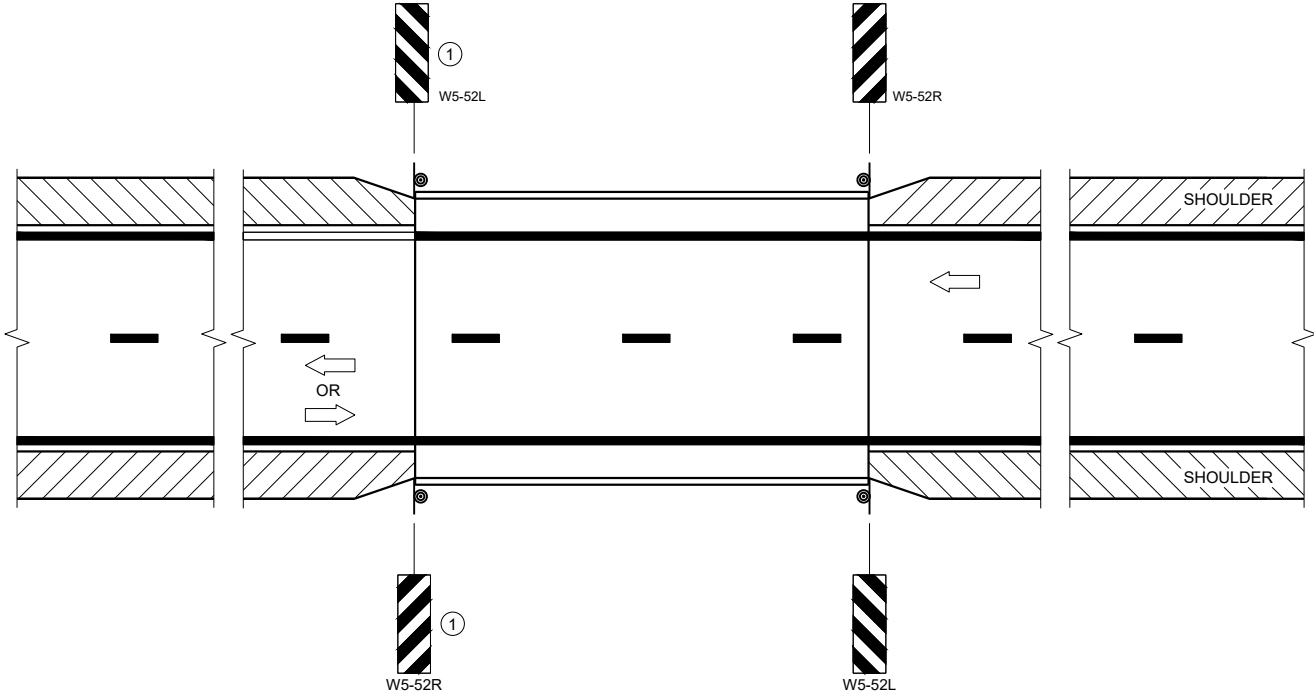
- ① TWO WARNING LIGHTS SHALL BE PROVIDED ON THE CENTER BARRICADE AND A MINIMUM OF ONE WARNING LIGHT SHALL BE PROVIDED ON EACH OF THE OTHER BARRICADES WITHIN THE ROADWAY LIMITS. SPACING OF THE WARNING LIGHTS SHALL BE UNIFORM TO THE EDGE OF ROADWAY AS SHOWN (APPROX. 8 FOOT LIGHT SPACING).
- ② THESE SIGNS AND BARRICADES ARE NOT REQUIRED IF ROAD CLOSURE BEGINS AT AN INTERSECTION.
- ③ FOR ROAD CLOSURE WITHOUT LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL "D".
- ④ FOR ROAD CLOSURE WITH LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL "E".
- ⑤ FOR BRIDGE OR CULVERT REPLACEMENTS, SUBSTITUTE "BRIDGE OUT" INSTEAD OF "ROAD CLOSED" ON R11 - 2 AND R11 - 3 SIGNS.
- ⑥ INSTALL DETOUR AND COMMUNITY GUIDE SIGNS AND ARROWS ONLY IF SPECIFIED IN THE CONTRACT. IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. MODIFY EXISTING SIGNS WHERE POSSIBLE. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. IF DETOUR SIGNS ARE BEING INSTALLED BY OTHERS, PLACE THE CONTRACTED TRAFFIC CONTROL SIGNS TO ALLOW FOR PLACEMENT OF ALL WARNING, DETOUR AND GUIDE SIGNS AS SHOWN.
- ⑦ "EAST" CARDINAL DIRECTION MARKERS AND RIGHT TURN ARROWS ARE SHOWN. USE OTHER CARDINAL DIRECTIONS AND ARROWS AS APPROPRIATE.

| BARRICADES AND SIGNS<br>FOR<br>VARIOUS CLOSURES    |                                          |
|----------------------------------------------------|------------------------------------------|
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |                                          |
| APPROVED<br>November 2025<br>DATE                  | /S/ Andrew Heidtke<br>WORK ZONE ENGINEER |
| FHWA                                               |                                          |





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



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

**GENERAL NOTES**

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

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

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

ON BRIDGE ONLY PROJECTS, PLACE 300 FEET OF EDGELINE.

OMIT EDGELINES ON ROADWAYS WITHOUT EXISTING EDGELINES.

① OMIT ON ONE-WAY TRAVELED WAYS.

**LEGEND**

⊙ SIGN ON PERMANENT SUPPORT

➡ DIRECTION OF TRAFFIC

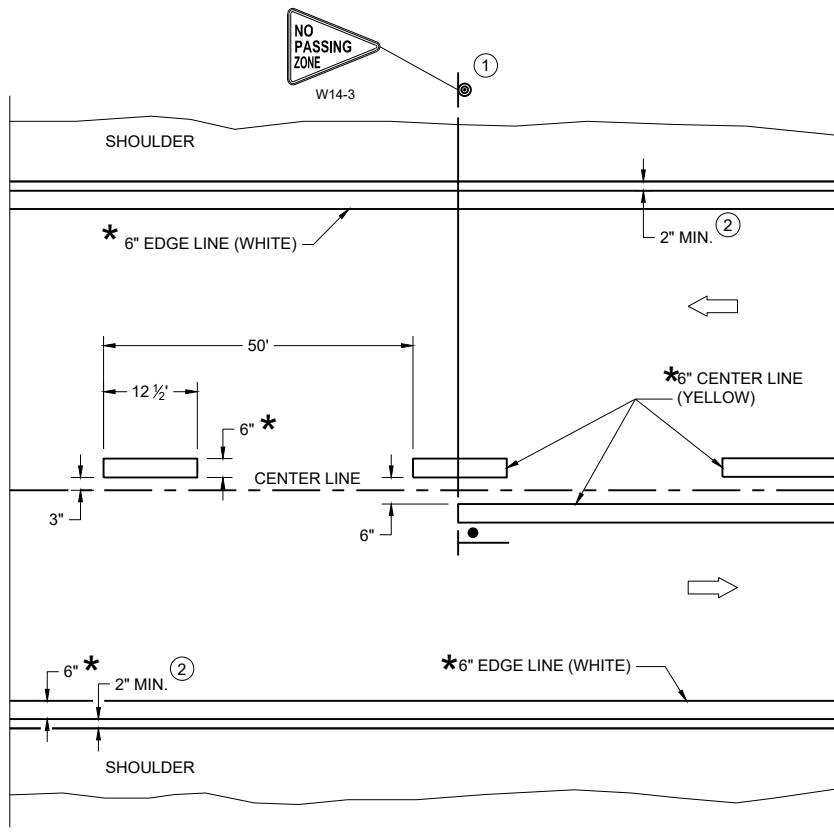
**DISTANCE TABLE**

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

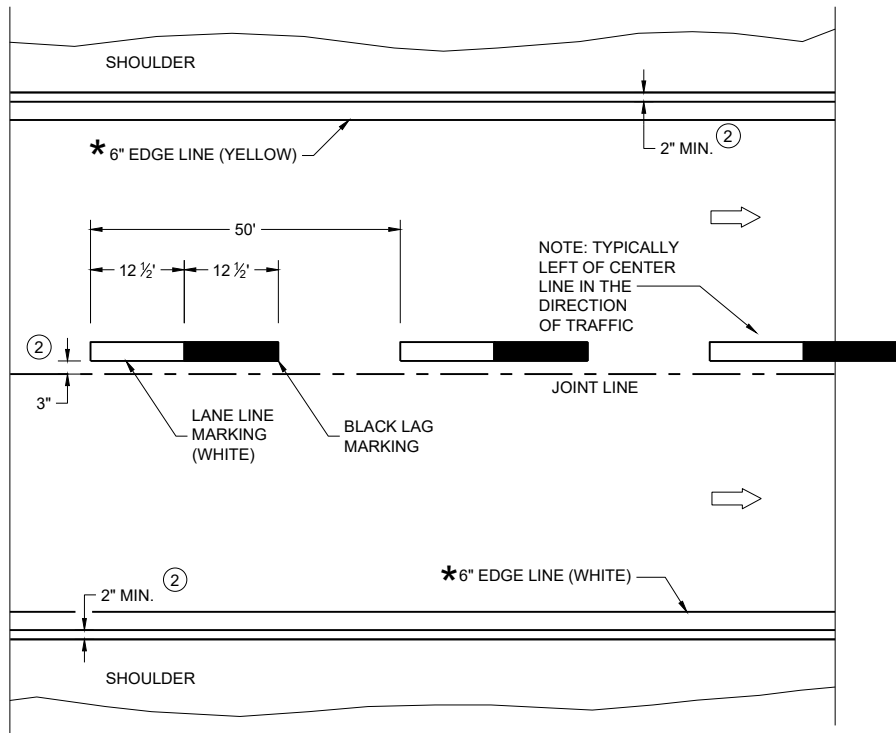
**SIGNING AND MARKING  
FOR TWO LANE BRIDGES**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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

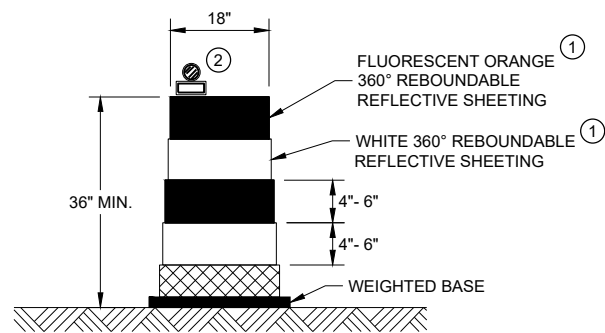
- "T" MARKING
- SIGN ON PERMANENT SUPPORT
- DIRECTION OF TRAFFIC

PERMANENT LONGITUDINAL PAVEMENT MARKINGS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

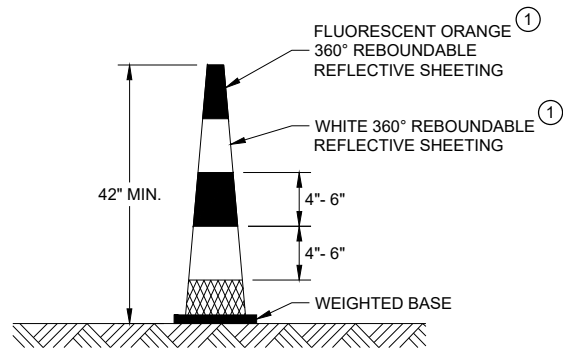
APPROVED  
December 2024 /S/ Jeannie Silver  
DATE Statewide Pavement Marking Engineer  
FHWA





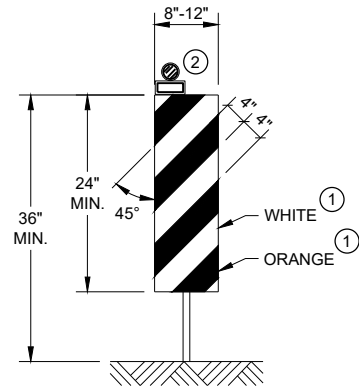
**DRUM**

BALLAST WIDTHS  
RANGE FROM 24"-36"



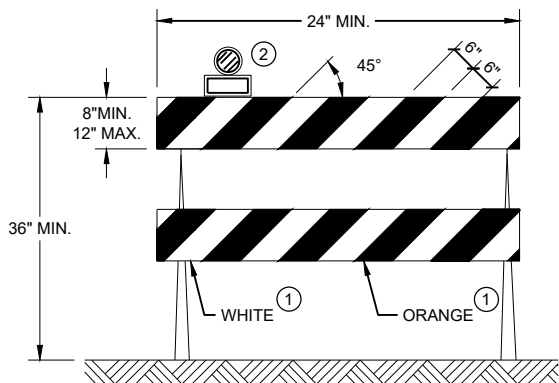
**42" CONE**

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



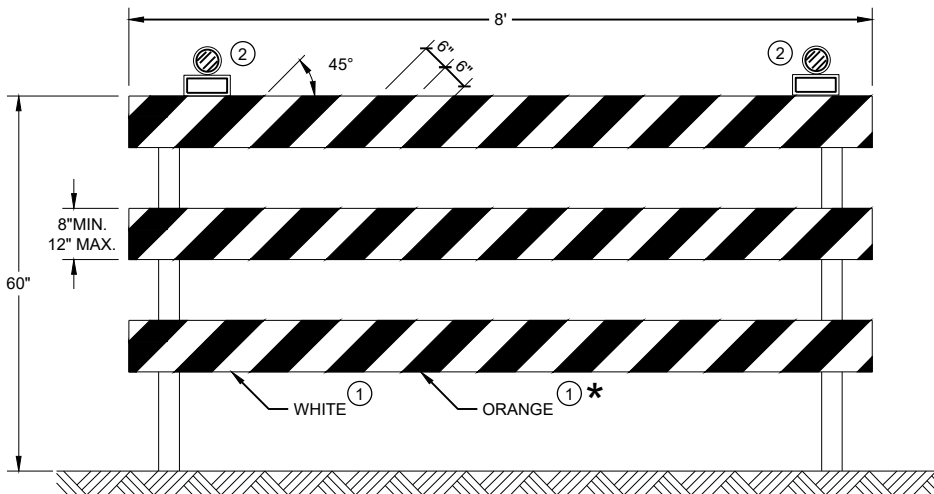
**VERTICAL PANEL**

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



**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

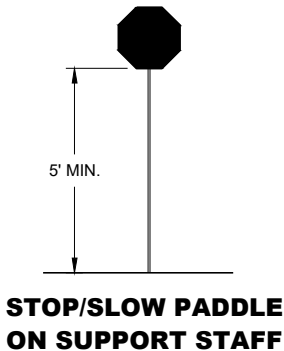
FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT REMOVE TEMPORARY PORTABLE RUMBLE STRIPS PRIOR TO COVERING OR REMOVING ALL ADVANCE SIGNING.

- 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.

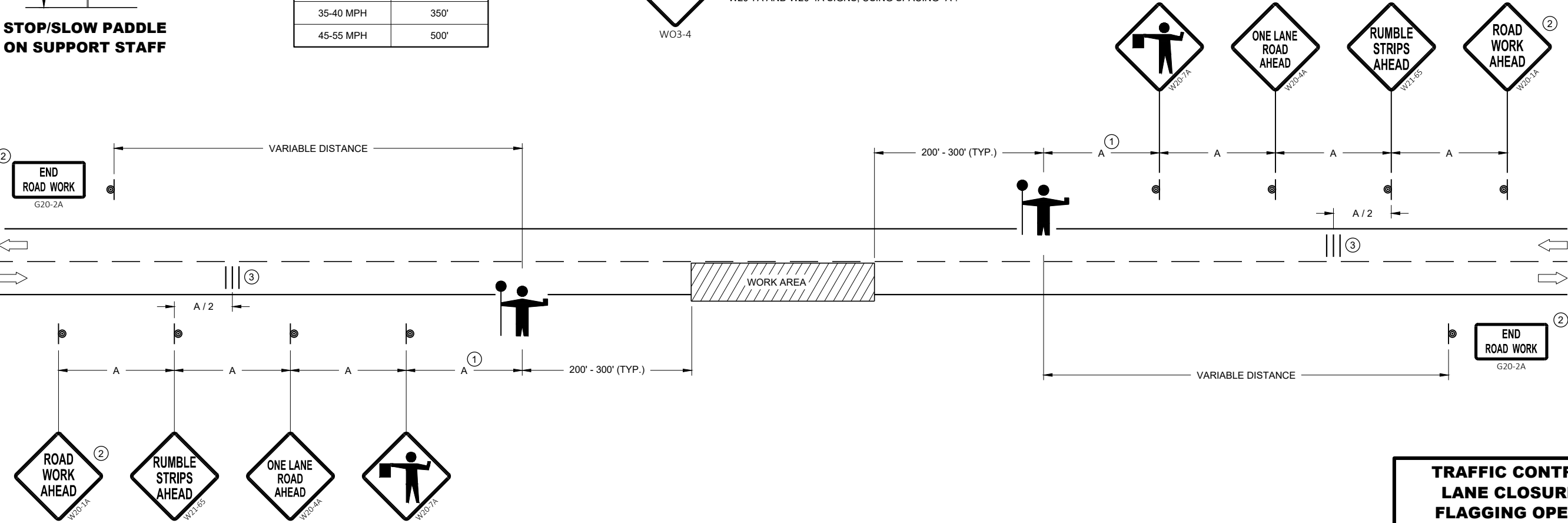


SIGN AND TEMPORARY RUMBLE STRIP ARRAY SPACING TABLE

| 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 LANE CLOSURE WITH 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

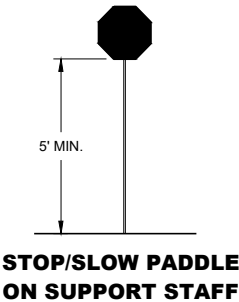
UTILIZE TEMPORARY PORTABLE RUMBLE STRIPS ON ALL FLAGGING OPERATIONS.

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

PLACE ADVANCE SIGNING PRIOR TO INSTALLING TEMPORARY RUMBLE STRIPS.

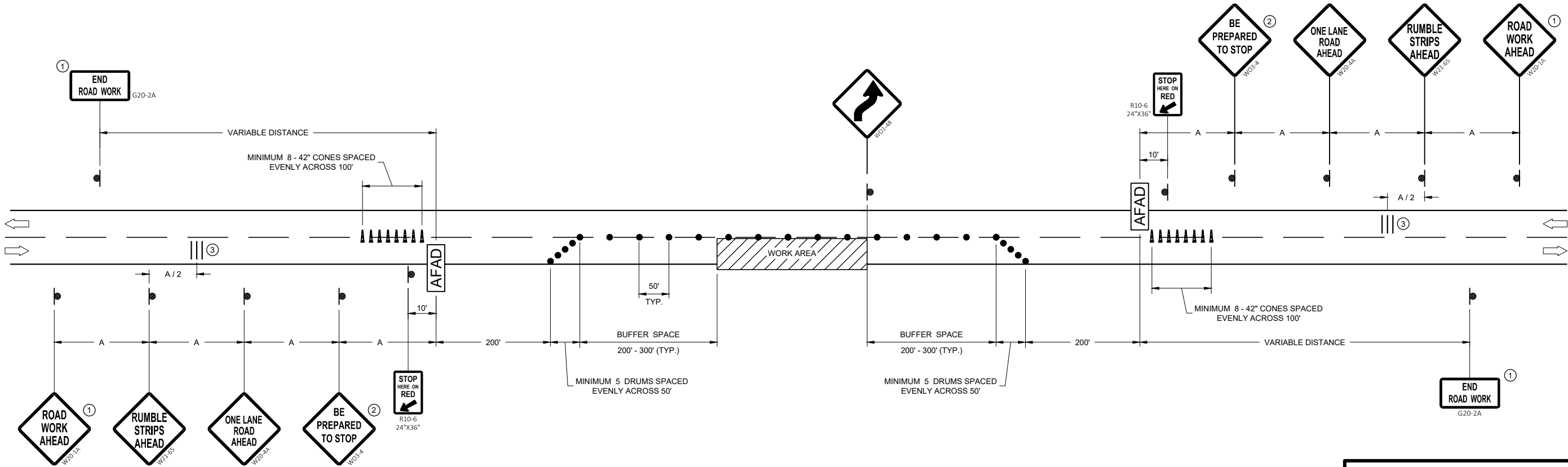
DO NOT INSTALL TEMPORARY PORTABLE RUMBLE STRIPS ON GRAVEL, MILLED SURFACES, OR ASPHALT THAT HAS BEEN PAVED LESS THAN 12 HOURS.

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.



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

GENERAL NOTES

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND DEVICES 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 MINIMUM OF 200 FEET (500 FEET DESIRABLE) CLEARANCE TO EXISTING SIGNS.

THIS LANE CLOSURE IS TYPICAL FOR CLOSING RIGHT LANE - REVERSE FOR CLOSING LEFT LANE.

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

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

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

FOR A LANE CLOSURE THAT IS IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS, THE ADVANCED WARNING SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS.

REMOVE PAVEMENT MARKINGS AND PLACE TEMPORARY PAVEMENT MARKING LINE IF LANE CLOSURE IS TO BE IN PLACE 4 OR MORE CONTINUOUS DAYS AND NIGHTS.

IF THE HORIZONTAL ALIGNMENT IS SUCH THAT A CURVE MAY REQUIRE ADDITIONAL DELINEATION, THE DEVICE SPACING MAY BE DECREASED TO 50 FEET.

WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.

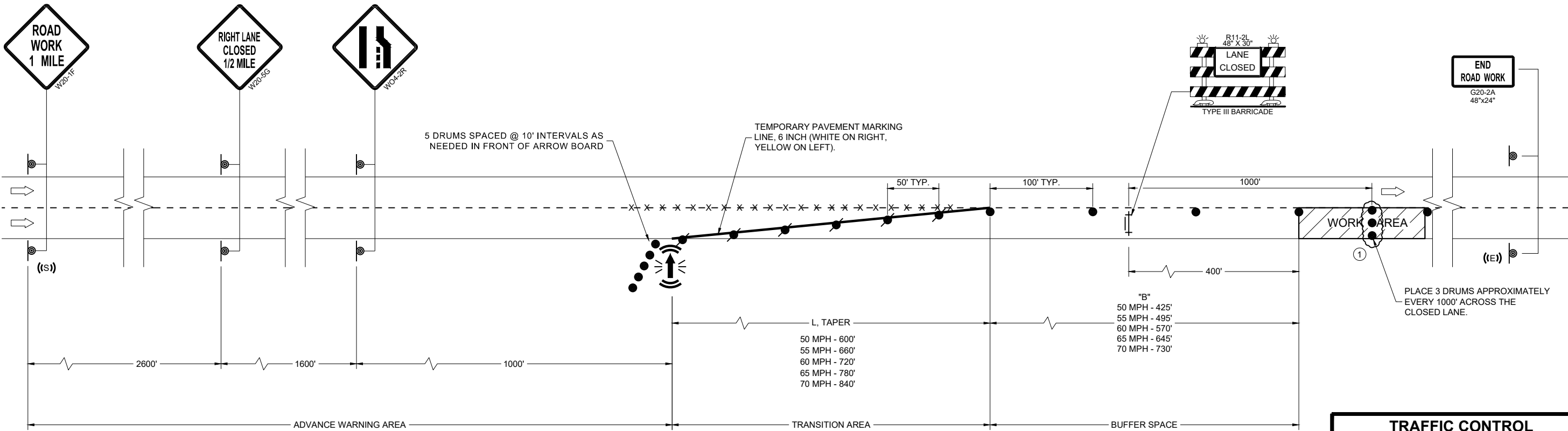
ADJUSTMENTS IN BUFFER SPACE NEED TO BE INCORPORATED WHEN THE LANE CLOSURE OCCURS NEAR AN INTERCHANGE EXIT OR ENTRANCE RAMP OR INTERSECTION. THE LANE CLOSURE MUST TAKE PLACE FAR ENOUGH IN ADVANCE OF AN EXIT OR ENTRANCE RAMP TO STILL ALLOW FOR ADEQUATE BUFFER SPACE. THE MINIMUM LENGTH OF THE BUFFER SPACE BEFORE AN EXIT RAMP SHOULD BE ONE HALF THE LENGTH OF THE TRANSITION AREA. THE ENTRANCE RAMP SHOULD BE FOLLOWED BY THE ORIGINAL BUFFER SPACE LENGTH OF 800 FEET DESIRABLE PRIOR TO ANOTHER TRAFFIC CONTROL CHANGE SUCH AS A CROSSOVER MANEUVER.

CONSIDER ROADWAY GEOMETRICS WHEN LOCATING SIGNS AND ARROW BOARD SO THE DRIVER HAS A CLEAR VIEW OF THE ARROW BOARD AND LANE CLOSURE DRUMS.

① DRUMS IN A CLOSED LANE THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY REESTABLISHED UPON COMPLETION OF THE OPERATION, OR FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

LEGEND

- SIGN ON PERMANENT SUPPORT
- TRAFFIC CONTROL DRUM
- TRAFFIC CONTROL DRUM WITH TYPE "C" STEADY BURN LIGHT
- TYPE III BARRICADE WITH ATTACHED SIGN
- TYPE "A" WARNING LIGHT (FLASHING)
- REMOVING PAVEMENT MARKINGS
- DIRECTION OF TRAFFIC
- WORK AREA
- CONNECTED ARROW BOARD
- WZ START LOCATION MARKER
- WZ END LOCATION MARKER



|                                                    |                                                                     |
|----------------------------------------------------|---------------------------------------------------------------------|
| TRAFFIC CONTROL<br>LANE CLOSURE                    |                                                                     |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |                                                                     |
| APPROVED<br>November 2025<br>DATE                  | /S/ Andrew Heidtke<br>ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR |
| FHWA                                               |                                                                     |

LEGEND

- SIGN ON PERMANENT SUPPORT
- SIGN ON TEMPORARY SUPPORT
- TRAFFIC CONTROL DRUM
- TRAFFIC CONTROL DRUM WITH TYPE "C" STEADY BURN LIGHT
- REMOVING PAVEMENT MARKING (SEE GENERAL NOTES)
- TYPE III BARRICADE WITH ATTACHED SIGN
- DIRECTION OF TRAFFIC

GENERAL NOTES

THE INSTALLATIONS SHOWN ON THIS SHEET ARE TYPICAL EXAMPLES AND ARE NOT INTENDED TO REPRESENT ANY PARTICULAR RAMP. AT SPECIFIC FIELD LOCATIONS, SIMILAR INSTALLATIONS SHALL BE USED AND ADJUSTED TO THE GEOMETRICS OF THE RAMP AS COORDINATED WITH 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.

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.

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

SEE SEPARATE LANE CLOSURE DETAIL FOR TYPICAL SPACING OF TYPE III BARRICADES AND R11-2L "LANE CLOSED" SIGNS.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONSECUTIVE DAYS AND NIGHTS OR THAT WILL BE PLACED IN A CLOSED LANE, MAY BE MOUNTED ON PORTABLE SUPPORTS.

IF INDICATED IN MISCELLANEOUS QUANTITIES, SUBSTITUTE FLEXIBLE TUBULAR MARKERS /OR DRUMS IN THE GORE BETWEEN THE EXIT RAMP AND MAINLINE TRAFFIC.

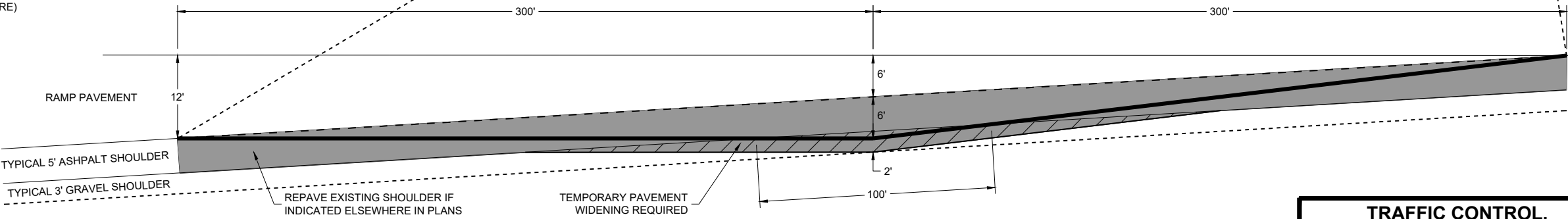
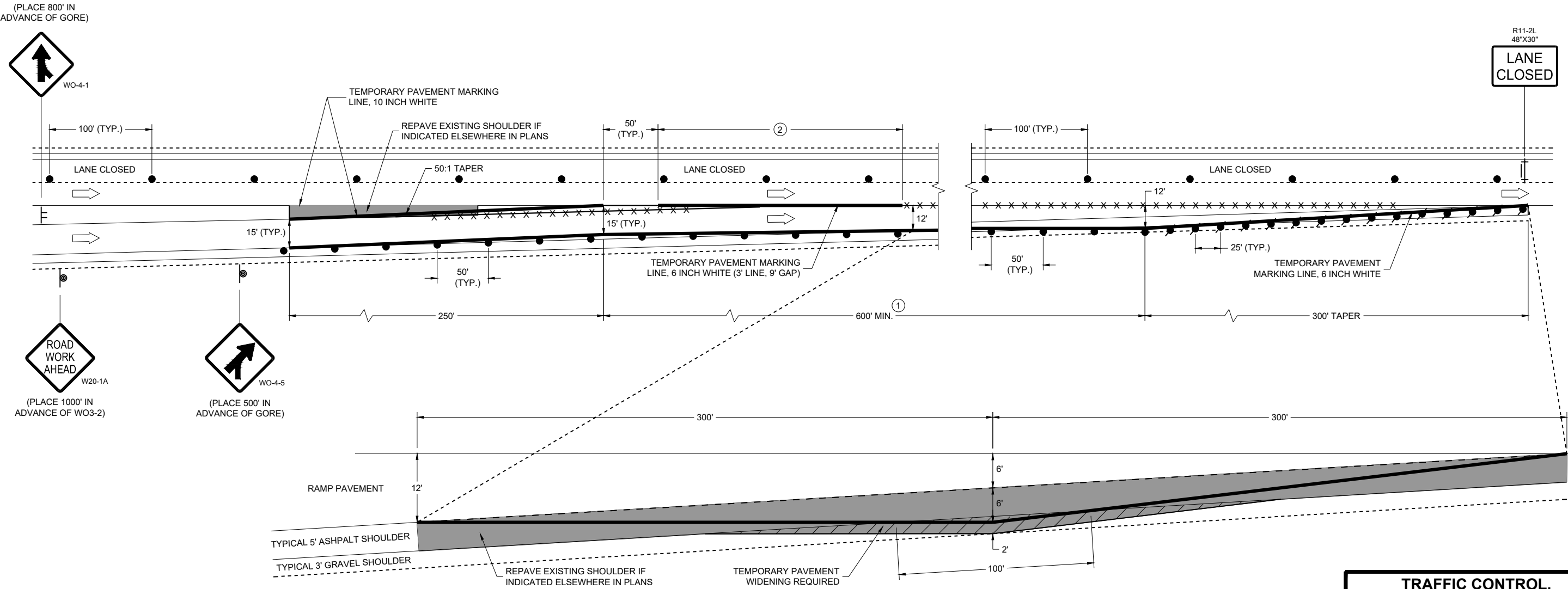
ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

REMOVE PAVEMENT MARKINGS AND PLACE TEMPORARY PAVEMENT MARKING LINES IF LANE CLOSURE IS TO BE IN PLACE FOR 4 OR MORE CONTINUOUS DAYS AND NIGHTS.

WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.

① EXTEND THE LENGTH OF THE MERGE AREA IF THE ENTERING (DESIGN) SPEED OF THE RAMP IS LESS THAN 50 MPH OR IF THE MAINLINE GRADE EXCEEDS ±2.2%.

② END TEMPORARY PAVEMENT MARKING LINE AT 1/2 THE LENGTH OF FULL WIDTH OF THE ACCELERATION LANE.



**TEMPORARY PAVEMENT DETAIL**  
(EXISTING RAMP DIMENSIONS MAY VARY, ADJUST TEMPORARY PAVEMENT ACCORDINGLY)

**TRAFFIC CONTROL,  
ENTRANCE RAMP  
WITHIN LANE CLOSURE**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
February 2025 /S/ Andrew Heidtke  
DATE WORK ZONE ENGINEER

FHWA

LEGEND

-  SIGN ON PERMANENT SUPPORT
-  SIGN ON TEMPORARY SUPPORT
-  TRAFFIC CONTROL DRUM
-  TRAFFIC CONTROL DRUM WITH TYPE "C" STEADY BURN LIGHT
-  REMOVING PAVEMENT MARKING (SEE GENERAL NOTES)
-  TYPE III BARRICADE WITH ATTACHED SIGN
-  FLAGS, 16" X 16" MIN., ORANGE
-  DIRECTION OF TRAFFIC

GENERAL NOTES

THE INSTALLATIONS SHOWN ON THIS SHEET ARE TYPICAL EXAMPLES AND ARE NOT INTENDED TO REPRESENT ANY PARTICULAR RAMP. AT SPECIFIC FIELD LOCATIONS, SIMILAR INSTALLATIONS SHALL BE USED AND ADJUSTED TO THE GEOMETRICS OF THE RAMP AS COORDINATED WITH 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.

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.

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

SEE SEPARATE LANE CLOSURE DETAIL FOR TYPICAL SPACING OF TYPE III BARRICADES AND R11-2L "LANE CLOSED" SIGNS.

YIELD SIGN AND WARNING SIGNS ON ENTRANCE RAMP ARE ALSO APPROPRIATE FOR CLOSURE OF THE MAINLINE LEFT LANE. OMIT THE YIELD SIGN IF MORE THAN ONE LANE REMAINS OPEN ON THE MAINLINE AND THE RAMP TAPER IS AT LEAST AS LONG AS THE NORMAL ENTRANCE RAMP TAPER AT THE SITE.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONSECUTIVE DAYS AND NIGHTS OR THAT WILL BE PLACED IN A CLOSED LANE, MAY BE MOUNTED ON PORTABLE SUPPORTS. USE SUPPORTS THAT PROVIDE A MINIMUM OF 5 FEET FROM THE BOTTOM OF THE SIGN TO THE PAVEMENT.

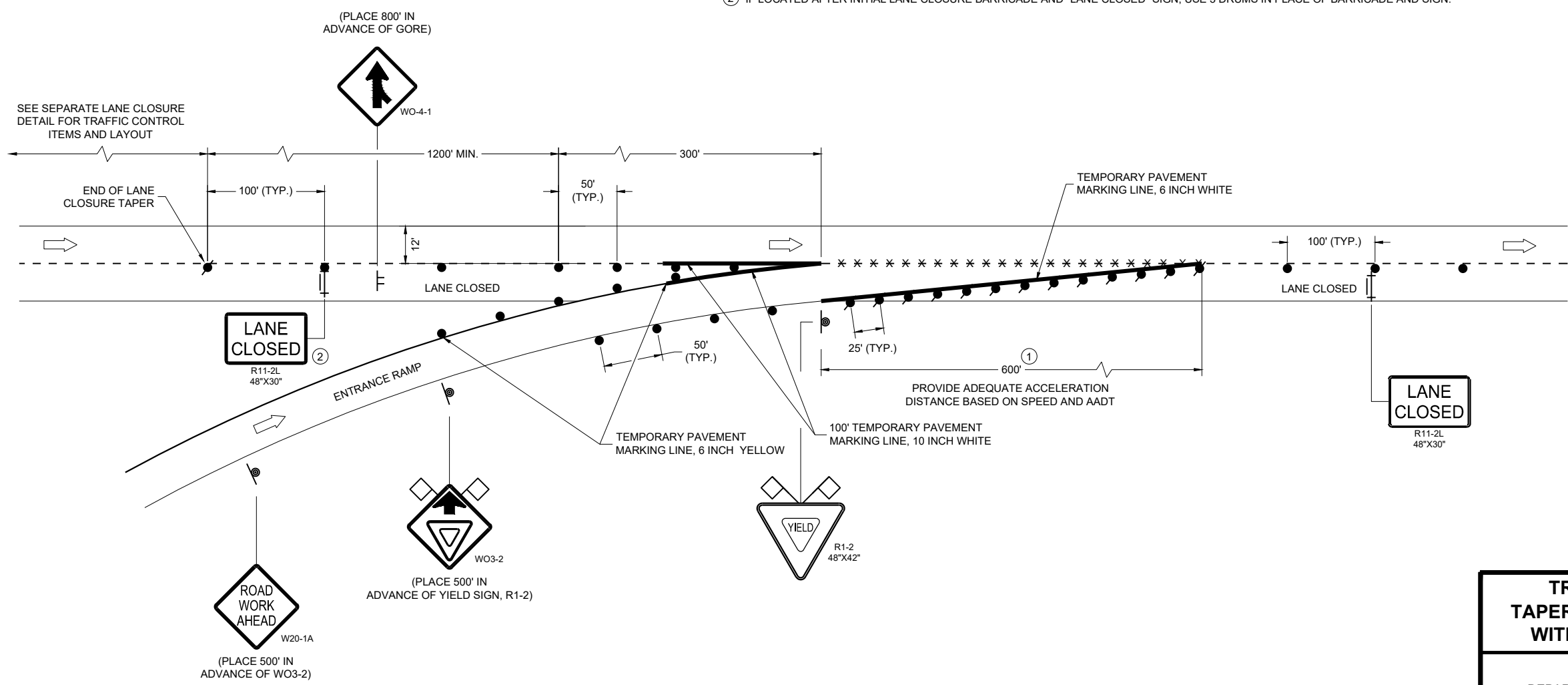
IF INDICATED IN MISCELLANEOUS QUANTITIES, SUBSTITUTE FLEXIBLE TUBULAR MARKERS FOR DRUMS IN THE GORE BETWEEN THE ENTRANCE RAMP AND MAINLINE TRAFFIC.

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.

REMOVE PAVEMENT MARKINGS AND PLACE TEMPORARY PAVEMENT MARKING LINES IF LANE CLOSURE IS TO BE IN PLACE FOR 4 OR MORE CONTINUOUS DAYS AND NIGHTS.

WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.

- ① CONSULT WITH REGIONAL WORK ZONE ENGINEER IF NEED TO REDUCE LENGTH EXISTS.
- ② IF LOCATED AFTER INITIAL LANE CLOSURE BARRICADE AND "LANE CLOSED" SIGN, USE 3 DRUMS IN PLACE OF BARRICADE AND SIGN.



TRAFFIC CONTROL,  
TAPERED ENTRANCE RAMP  
WITHIN LANE CLOSURE

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
February 2025 /S/ Andrew Heidtke  
DATE    
FHWA  <position>



LEGEND

-  SIGN ON PERMANENT SUPPORT
-  SIGN ON TEMPORARY SUPPORT
-  TRAFFIC CONTROL DRUM
-  TRAFFIC CONTROL DRUM WITH TYPE "C" STEADY BURN LIGHT
-  TYPE III BARRICADE WITH ATTACHED SIGN
-  FLAGS, 16" X 16" MIN., ORANGE
-  DIRECTION OF TRAFFIC

GENERAL NOTES

THE INSTALLATIONS SHOWN ON THIS SHEET ARE TYPICAL EXAMPLES AND ARE NOT INTENDED TO REPRESENT ANY PARTICULAR RAMP. AT SPECIFIC FIELD LOCATIONS, SIMILAR INSTALLATIONS SHALL BE USED AND ADJUSTED TO THE GEOMETRICS OF THE RAMP AS COORDINATED WITH 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.

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.

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

SEE SEPARATE LANE CLOSURE DETAIL FOR TYPICAL SPACING OF TYPE III BARRICADES AND R11-2L "LANE CLOSED" SIGNS.

YIELD SIGN AND WARNING SIGNS ON ENTRANCE RAMP ARE ALSO APPROPRIATE FOR CLOSURE OF THE MAINLINE LEFT LANE. OMIT THE YIELD SIGN IF MORE THAN ONE LANE REMAINS OPEN ON THE MAINLINE AND THE RAMP TAPER IS AT LEAST AS LONG AS THE NORMAL ENTRANCE RAMP TAPER AT THE SITE.

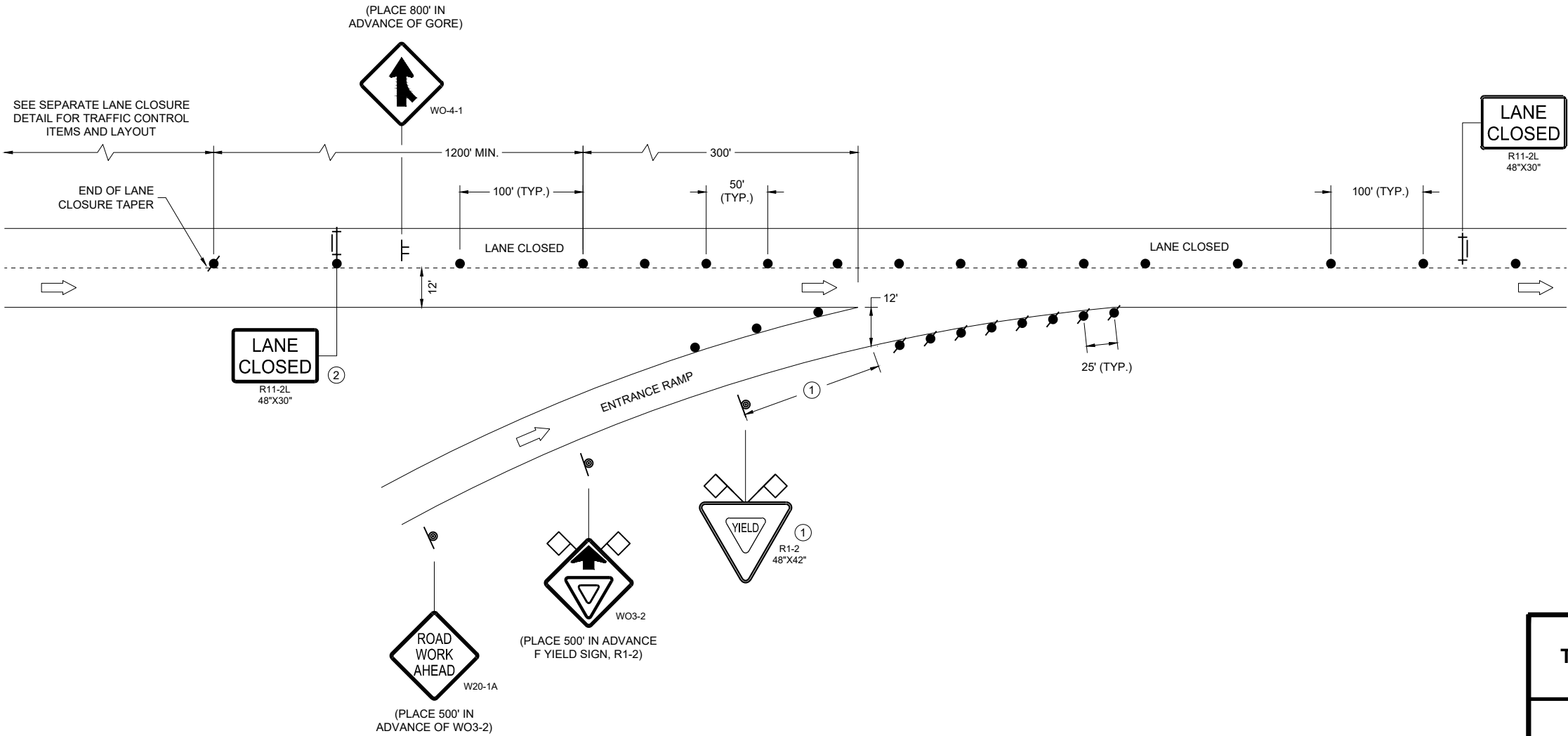
SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONSECUTIVE DAYS AND NIGHTS OR THAT WILL BE PLACED IN A CLOSED LANE, MAY BE MOUNTED ON PORTABLE SUPPORTS. USE SUPPORTS THAT PROVIDE A MINIMUM OF 5 FEET FROM THE BOTTOM OF THE SIGN TO THE PAVEMENT.

IF INDICATED IN MISCELLANEOUS QUANTITIES, SUBSTITUTE FLEXIBLE TUBULAR MARKERS FOR DRUMS IN THE GORE BETWEEN THE ENTRANCE RAMP AND MAINLINE TRAFFIC.

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.

WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.

- 1 PLACE YIELD SIGN TO PROVIDE ADEQUATE SIGHT DISTANCE AND ACCELERATION DISTANCE.
- 2 IF LOCATED AFTER INITIAL LANE CLOSURE BARRICADE AND "LANE CLOSED" SIGN, USE 3 DRUMS IN PLACE OF BARRICADE AND SIGN.



TRAFFIC CONTROL,  
TAPERED ENTRANCE RAMP  
WITHIN LANE CLOSURE

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
February 2025 /S/ Andrew Heidtke  
DATE WORK ZONE ENGINEER

FHWA

LEGEND

-  SIGN ON PERMANENT SUPPORT
-  TRAFFIC CONTROL DRUM
-  DIRECTION OF TRAFFIC
-  CONNECTED ARROW BOARD
-  WORK AREA
-  WZ START LOCATION MARKER
-  WZ END LOCATION MARKER

GENERAL NOTES

THIS DETAIL IS TYPICAL FOR CLOSING THE RIGHT SHOULDER. FOR CLOSING THE LEFT SHOULDER, REVERSE THE TRAFFIC CONTROL.

THIS DETAIL MAY BE USED FOR DIVIDED ROADWAYS WITH ANY NUMBER OF TRAVEL LANES.

ALL SIGNS ARE 48"X48" UNLESS OTHERWISE NOTED.

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.

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

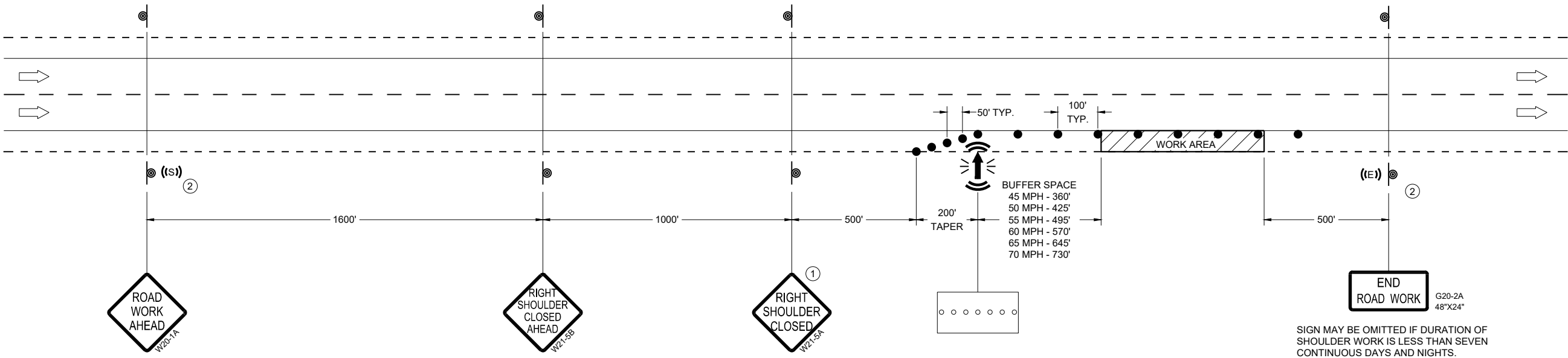
CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

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

SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE FHWA'S MANUAL OF STANDARD HIGHWAY SIGNS OR THE WISCONSIN STANDARD SIGN PLATES.

① FOR SHORT DURATION SHOULDER WORK OF LESS THAN ONE HOUR THE W21-5A SIGN MAY BE OMITTED.

② IF ALREADY PRESENT WITHIN PROJECT , DO NOT INCLUDE ADDITIONAL DEVICE.



TRAFFIC CONTROL,  
SHOULDER CLOSURE ON  
DIVIDED ROADWAY, SPEEDS  
GREATER THAN 40 MPH

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

November 2025  
DATE

FHWA

/S/ Andrew Heidtke  
STATEWIDE WORK ZONE TRAFFIC  
SAFETY ENGINEER



|                                                                                   |                                                      |
|-----------------------------------------------------------------------------------|------------------------------------------------------|
|  | TYPE III BARRICADE WITH ATTACHED SIGN                |
|  | SIGN ON PERMANENT SUPPORT                            |
|  | TRAFFIC CONTROL DRUM                                 |
|  | TRAFFIC CONTROL DRUM WITH TYPE "C" STEADY BURN LIGHT |
|  | TYPE "A" WARNING LIGHT (FLASHING)                    |
|  | DIRECTION OF TRAFFIC                                 |
|  | WORK AREA                                            |
|  | REMOVING PAVEMENT MARKING (SEE GENERAL NOTES)        |

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND DEVICES 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 MINIMUM OF 200 FEET, (500 FEET DESIRABLE) DISTANCE TO EXISTING SIGNS.

THIS LANE CLOSURE IS TYPICAL FOR LANE SHIFT LEFT - REVERSE FOR SHIFTING RIGHT.

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED.

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

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. NO WARNING LIGHTS SHALL BE WORKING ON ANY "COVERED" OR "DOWNED" SIGNS.

CONSIDER GEOMETRICS WHEN LOCATING SIGNS AND ARROW BOARDS SO THE DRIVER HAS A CLEAR VIEW OF THE ARROW BOARD AND LANE CLOSURE DRUMS FOR A MINIMUM 1500 FEET IN FRONT OF DRUMS.

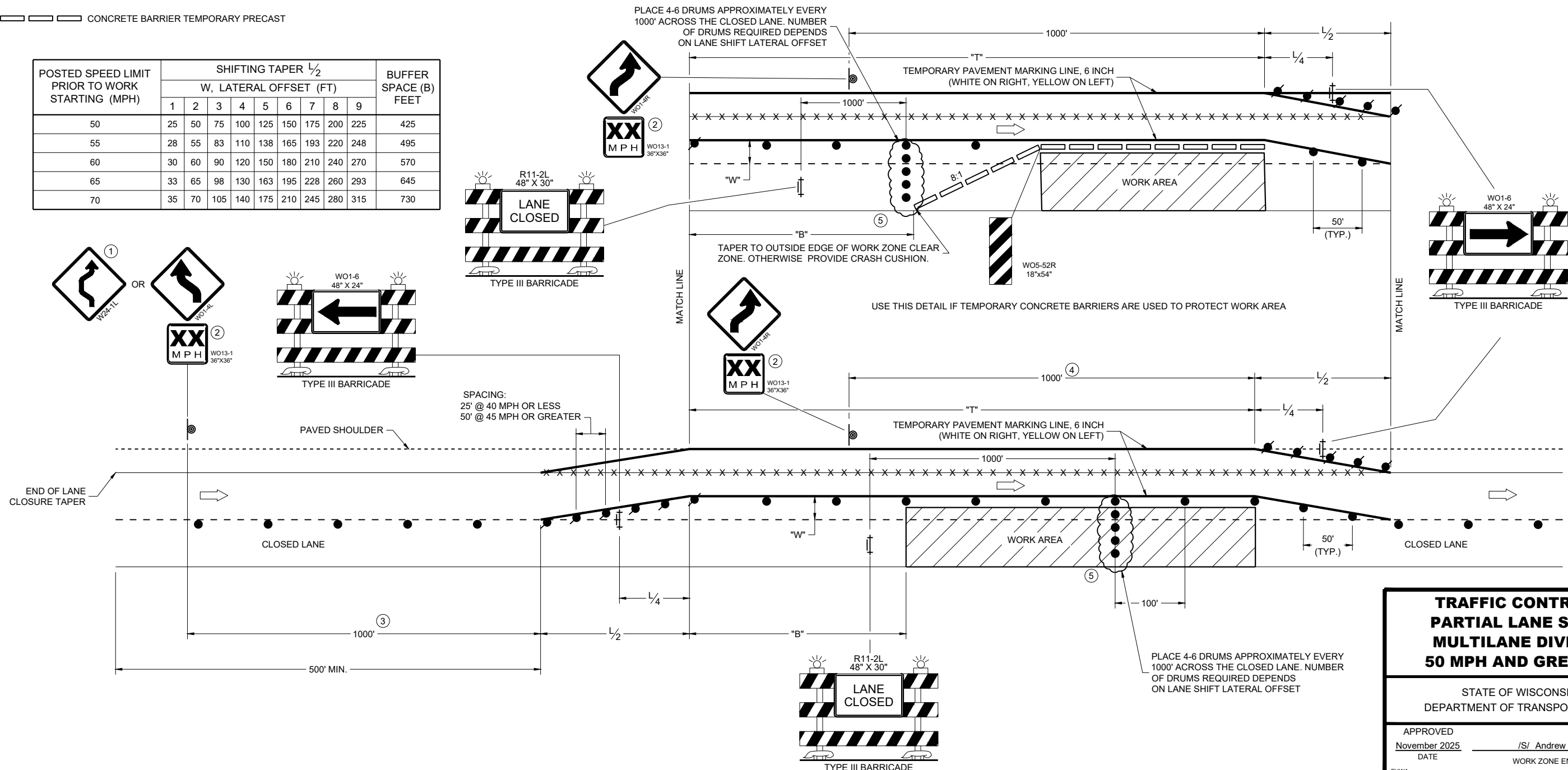
FOR A LANE CLOSURE THAT IS IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS, THE ADVANCED WARNING SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS.

REMOVE PAVEMENT MARKINGS AND PLACE TEMPORARY PAVEMENT MARKING LINES IF LANE CLOSURE IS TO BE IN PLACE FOR 4 OR MORE CONTINUOUS DAYS AND NIGHTS.

ADJUSTMENTS IN BUFFER SPACE NEED TO BE INCORPORATED WHEN THE LANE SHIFT OCCURS NEAR AN INTERCHANGE EXIT OR ENTRANCE RAMP. THE LANE SHIFT MUST TAKE PLACE FAR ENOUGH IN ADVANCE OF AN EXIT OR ENTRANCE RAMP TO STILL ALLOW FOR ADEQUATE BUFFER SPACE. THE MINIMUM LENGTH OF THE BUFFER SPACE BEFORE AN EXIT RAMP SHOULD BE 1/2 THE LENGTH OF THE TRANSITION AREA. THE ENTRANCE RAMP SHOULD BE FOLLOWED BY THE ORIGINAL BUFFER SPACE LENGTH OF 800 FEET DESIRABLE PRIOR TO ANOTHER TRAFFIC CONTROL CHANGE SUCH AS A CROSSOVER MANEUVER.

- ① USE ONLY WHEN T<600', OMIT WO1-4R.
- ② IF NEEDED, USE ONLY IF DESIGN SPEED IS 10 MPH BELOW POSTED SPEED.
- ③ IF THE BEGINNING OF LANE SHIFT TAPER IS 1200 FEET OR LESS FROM END OF LANE CLOSURE TAPER, PLACE THE WO1-4L SIGN 200 FEET AFTER THE END OF THE LANE CLOSURE TAPER.
- ④ IF THE BEGINNING OF THE SECOND LANE SHIFT TAPER IS 1200 FEET OR LESS FROM END OF THE FIRST LANE CLOSURE TAPER, PLACE THE WO1-4L SIGN 200 FEET AFTER THE END OF THE FIRST LANE CLOSURE TAPER.
- ⑤ DRUMS IN A CLOSED LANE THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY REESTABLISHED UPON COMPLETION OF THE OPERATION, OR FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

| POSTED SPEED LIMIT<br>PRIOR TO WORK<br>STARTING (MPH) | SHIFTING TAPER $\frac{1}{2}$ |    |     |     |     |     |     |     |     | BUFFER<br>SPACE (B)<br>FEET |
|-------------------------------------------------------|------------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----------------------------|
|                                                       | W, LATERAL OFFSET (FT)       |    |     |     |     |     |     |     |     |                             |
|                                                       | 1                            | 2  | 3   | 4   | 5   | 6   | 7   | 8   | 9   |                             |
| 50                                                    | 25                           | 50 | 75  | 100 | 125 | 150 | 175 | 200 | 225 | 425                         |
| 55                                                    | 28                           | 55 | 83  | 110 | 138 | 165 | 193 | 220 | 248 | 495                         |
| 60                                                    | 30                           | 60 | 90  | 120 | 150 | 180 | 210 | 240 | 270 | 570                         |
| 65                                                    | 33                           | 65 | 98  | 130 | 163 | 195 | 228 | 260 | 293 | 645                         |
| 70                                                    | 35                           | 70 | 105 | 140 | 175 | 210 | 245 | 280 | 315 | 730                         |



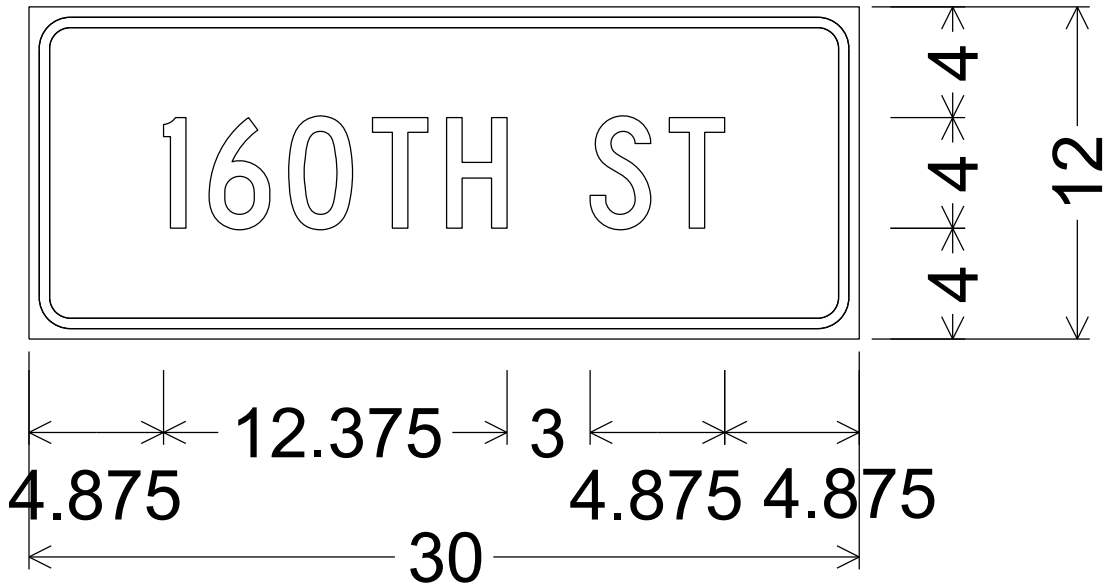
**TRAFFIC CONTROL,  
PARTIAL LANE SHIFT  
MULTILANE DIVIDED  
50 MPH AND GREATER**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
November 2025 /S/ Andrew Heidtke  
DATE WORK ZONE ENGINEER

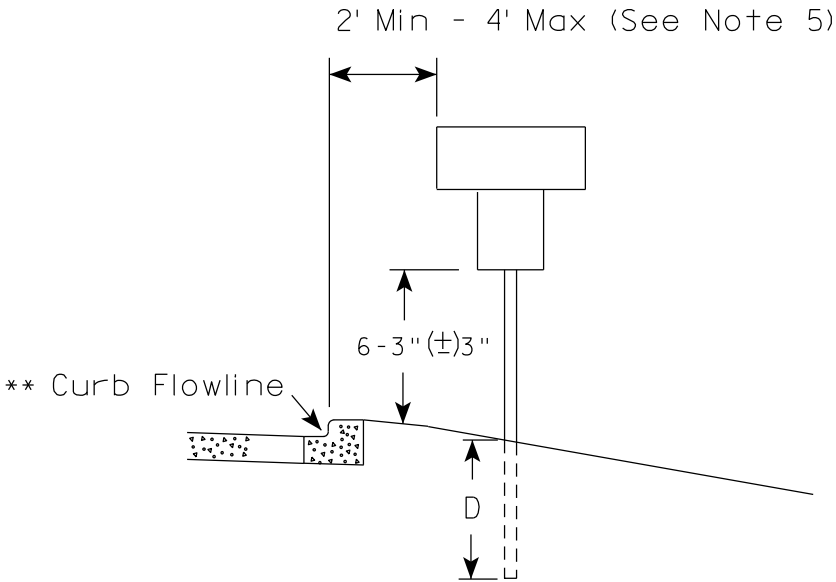
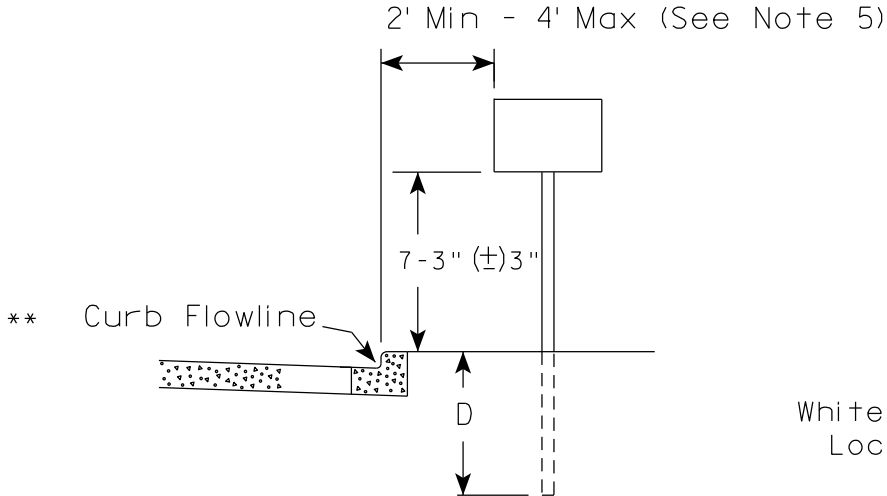
NOTES

- 1. FMS Sign Type II - Type F Reflective
- 2. Color:
  - Background - Orange
  - Message - Black
- 3. Message Series - C

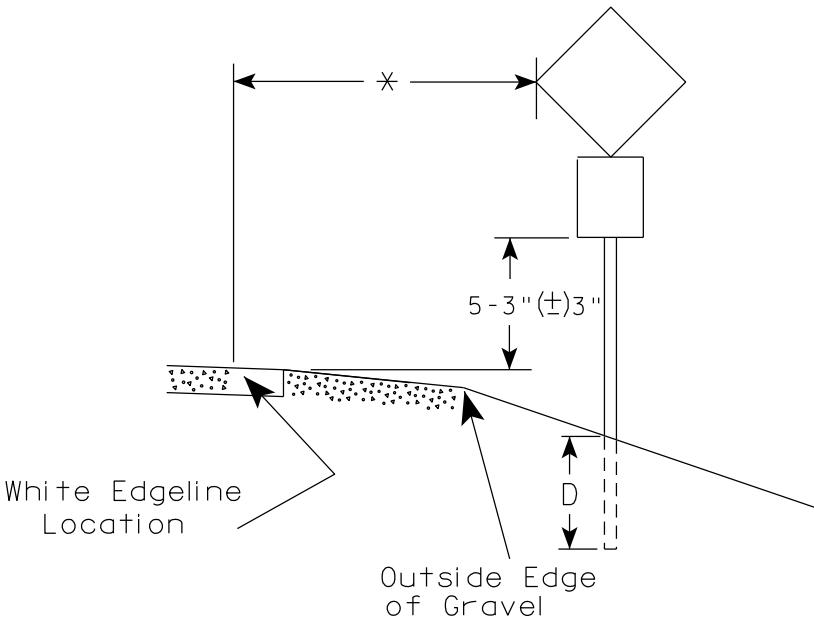
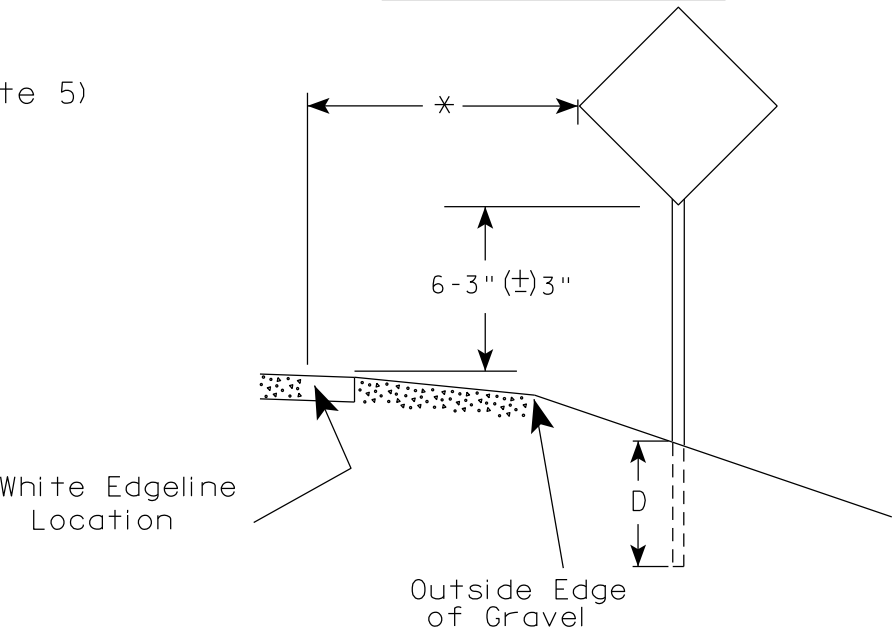


1.500" Radius, 0.375" Border, 0.375" Indent

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'           |

GENERAL NOTES

1. Signs wider than 4 feet or 20 sq.ft or larger, shall be mounted on multiple posts. Refer to plate A4-4.
2. If signs are mounted on or behind barrier wall, see A4-10 sign plate.  
The Double Arrow sign (W12-1D) shall be mounted at a height of 2'-3" (±) 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.

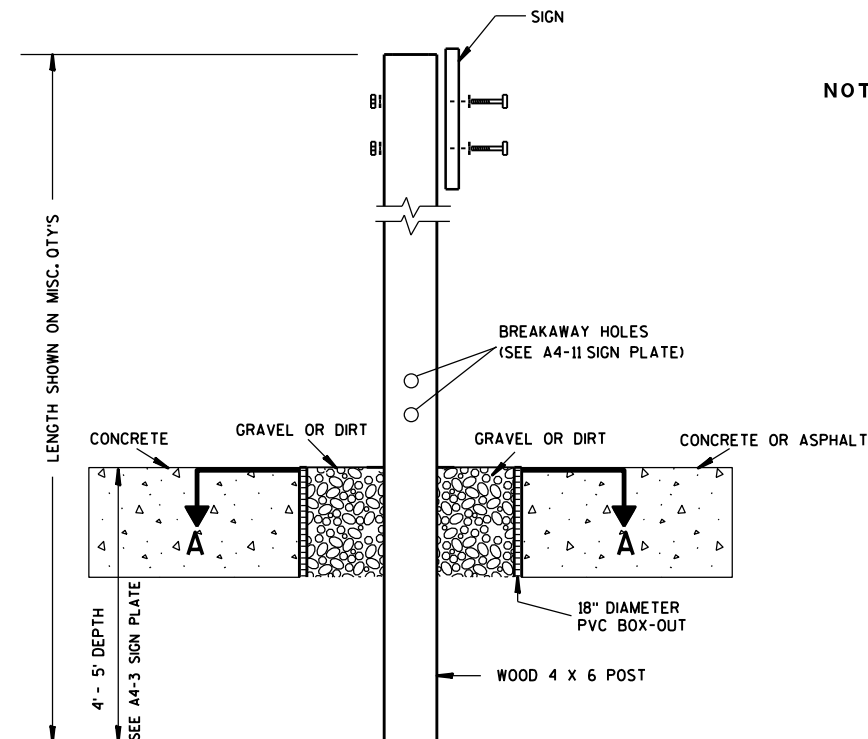
\* 6 feet from edge of a paved shoulder or 12 feet from the edge of pavement (edge line location) or 2 feet from outside edge of gravel, whichever is greater unless directed by project engineer.

TYPICAL INSTALLATION  
OF PERMANENT TYPE II  
SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*  
for State Traffic Engineer

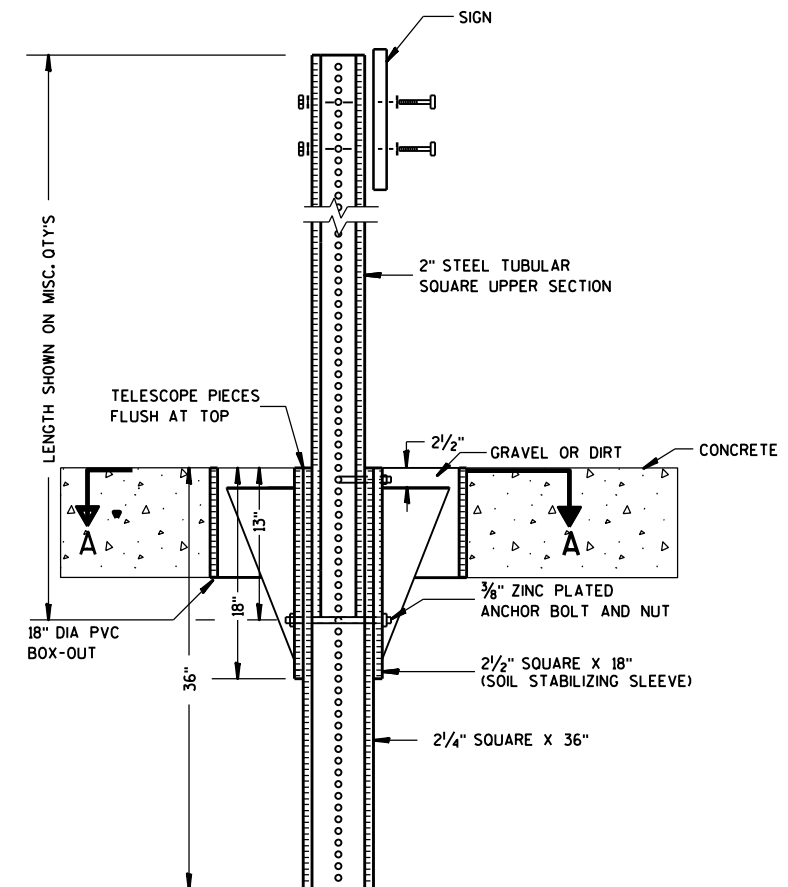
DATE 12/6/23 PLATE NO. A4-3.23



### ELEVATION VIEW

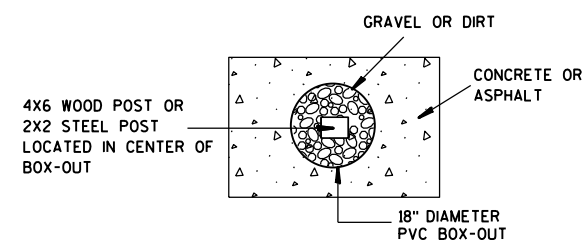
DETAIL OF WOOD 4 X 6 SIGN POST IN BOX-OUT

- 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

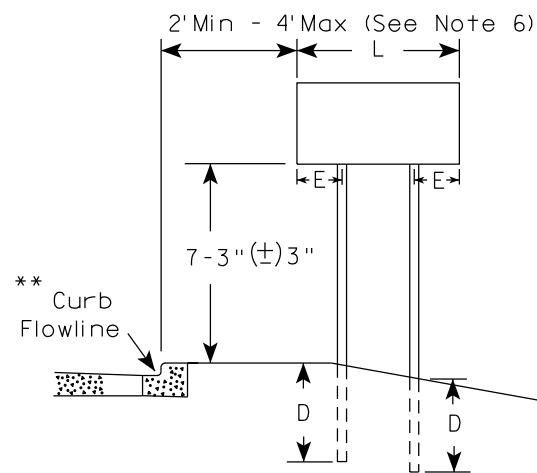
SIGN POST  
BOX-OUTS  
A4-3B

WISCONSIN DEPT OF TRANSPORTATION

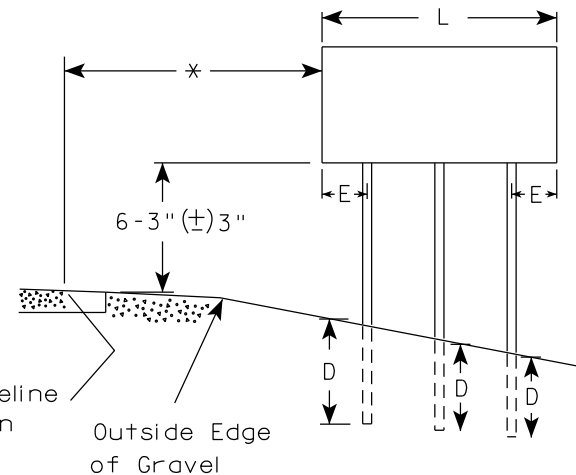
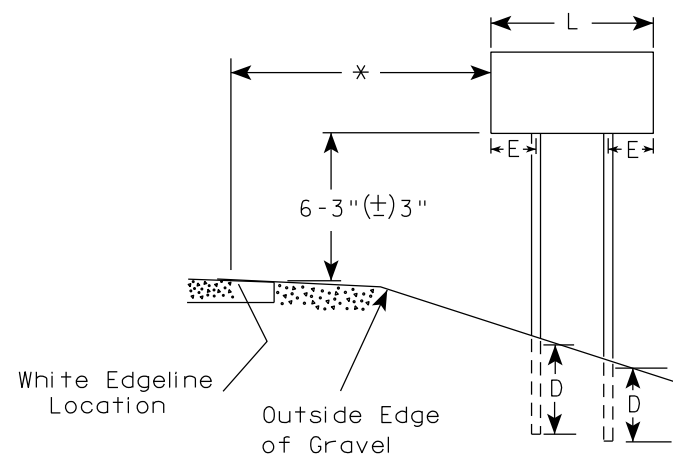
APPROVED *Matthew R. Rauch*  
for State Traffic Engineer

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

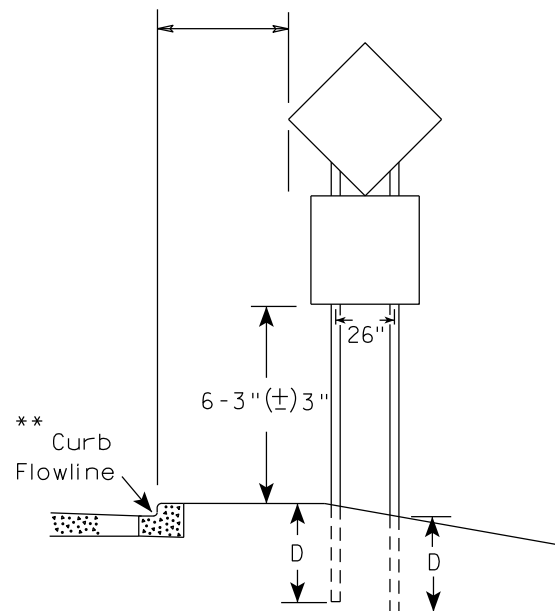
URBAN AREA



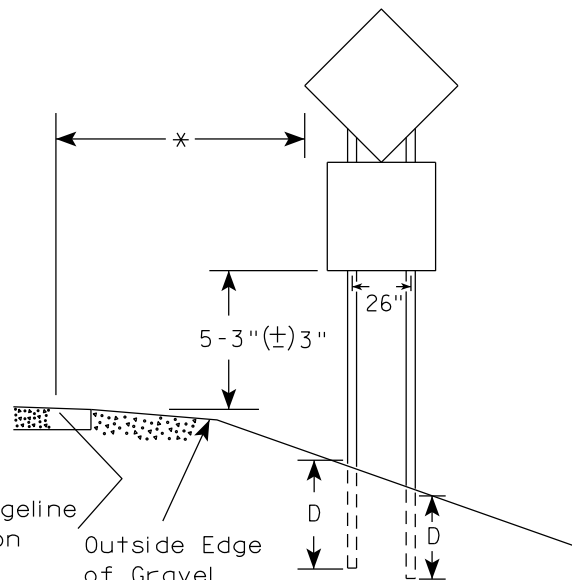
RURAL AREA (See Note 3)



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 *Matthew R. Rauch*  
for State Traffic Engineer  
DATE 12/6/23 PLATE NO. A4-4.16

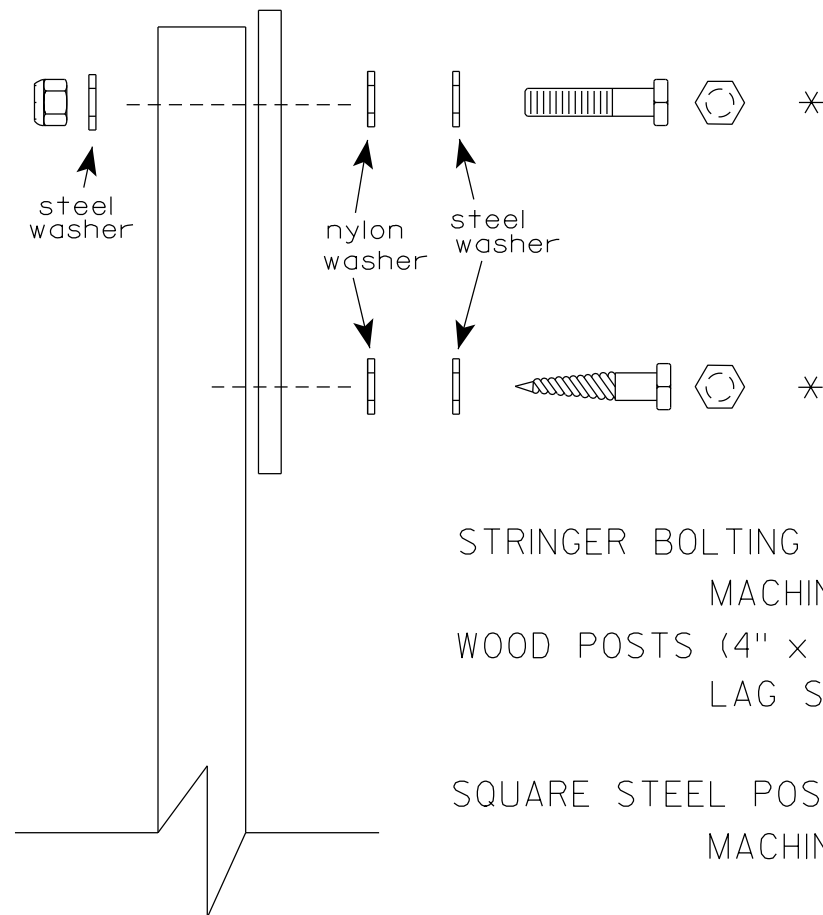
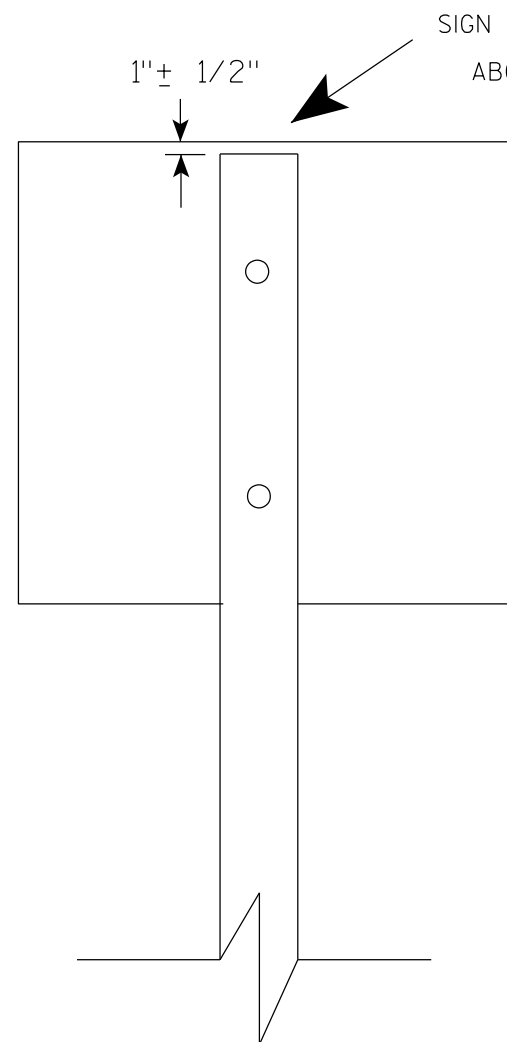
GENERAL NOTES

- 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                                      |



**2 1/4 " SQUARE  
12 GAUGE  
PERFORATED  
GALVANIZED FINISH**

1"

$\frac{1}{8}"$

ALL HOLES  $\frac{7}{16}"$   
SPACED 1" C-C  
ALL FOUR SIDES

4" x 10" x 10 GA. —   
STEEL PLATE (CUT  
AS SHOWN) WELDED  
TO ALL FOUR CORNERS  
OF TELESPAR TUBE

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

Diagram illustrating the construction of a vertical antenna assembly. The assembly consists of a central vertical structure with a top section labeled "2 1/2\" TELESPAR TUBE". The main body is a "4\" x 10\" x 10 GA. STEEL PLATE (CUT AS SHOWN) WELDED TO ALL FOUR CORNERS OF TELESPAR TUBE". The diagram shows the plate is cut into a V-shape at the top and bottom. Dimensions are indicated: the top section is 4\" wide and 2 1/2\" high; the main body is 10\" high; the bottom section is 3 1/2\" high. The total height of the assembly is 19\".

LENGTH SHOWN ON MISC. QTY'S  
 18" DIA SCHEDULE 40 PVC BOX-OUT  
 TELESCOPE PIECES FLUSH AT TOP  
 36"  
 18"  
 13"  
 2 1/2"  
 2 1/4" SQUARE X 36"  
 2 1/2" SQUARE X 18" (SOIL STABILIZING SLEEVE)  
 3/8" ZINC PLATED ANCHOR BOLT AND NUT  
 2 1/2" GRAVEL OR DIRT  
 3/8" ZINC PLATED CORNER ANCHOR BOLT AND NUT  
 ALL HOLES 7/16" SPACED 1" C-C ALL FOUR SIDES  
 2" STEEL TUBULAR SQUARE UPPER SECTION  
 SEE SIGN PLATE A4-8 FOR BOLT WASHER, & NUT MATERIAL  
 SIGN

LENGTH SHOWN ON MISC. QTY'S

SEE SIGN PLATE A4-8 FOR BOLT WASHER, & NUT MATERIAL

2" STEEL TUBULAR SQUARE UPPER SECTION

ALL HOLES  $\frac{7}{16}$ " SPACED 1" C-C ALL FOUR SIDES

$\frac{3}{8}$ " ZINC PLATED CORNER ANCHOR BOLT AND NUT

1"

TELESCOPE PIECES FLUSH AT TOP

18"

12"

36"

$\frac{3}{8}$ " ZINC PLATED ANCHOR BOLT AND NUT

2 1/2" SQUARE X 18" (SOIL STABILIZING SLEEVE)

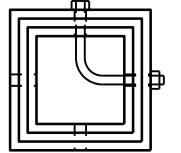
2 1/4" SQUARE X 36"

A

B

C

3/8" ZINC PLATED CORNER  
ANCHOR BOLT AND NUT



DIRECTION  
OF TRAFFIC

SECTION A-A

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

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

TUBULAR STEEL  
SIGN POST  
A4-9

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R. Rauch

for State Traffic Engineer

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

PROJECT NO:

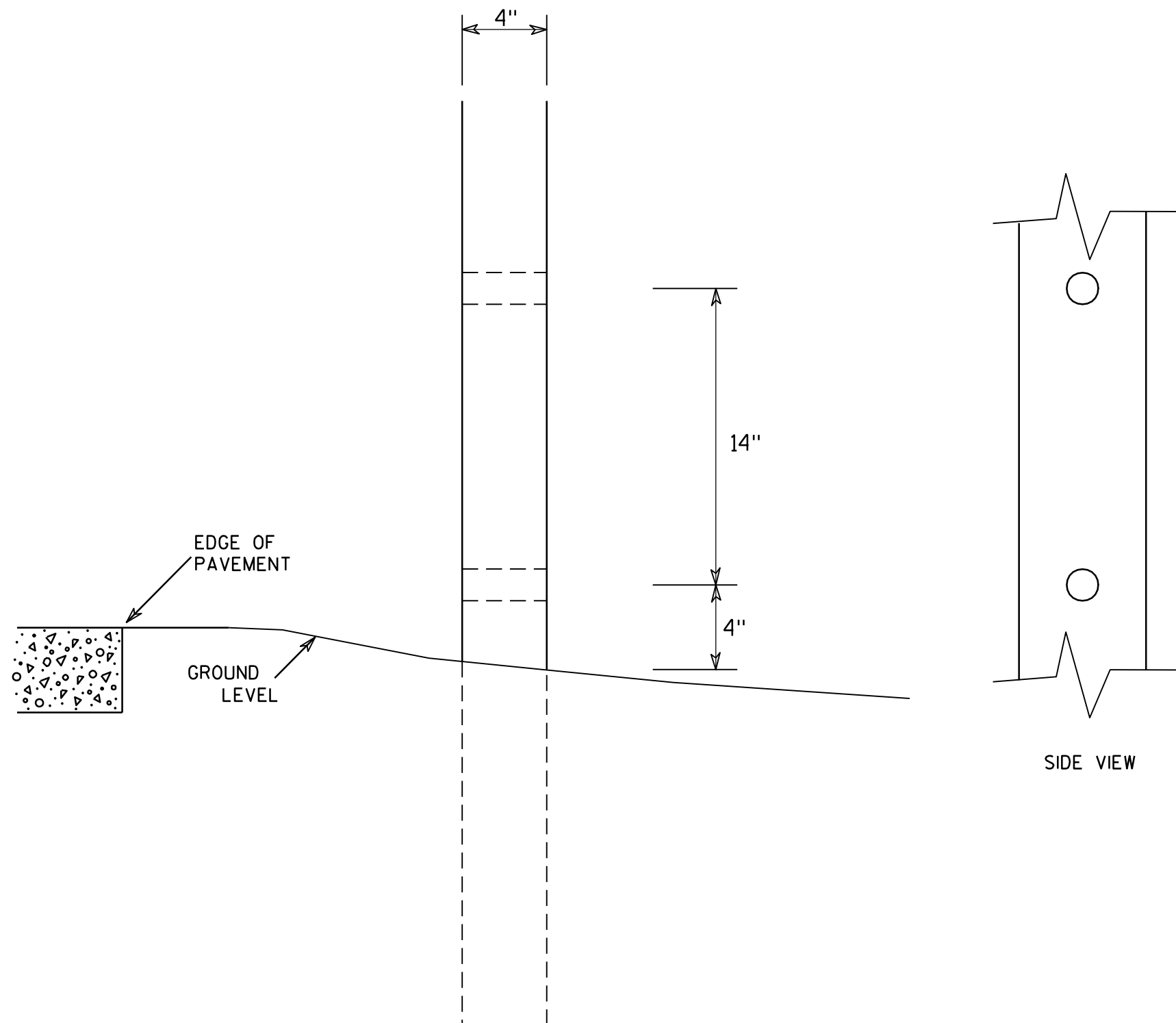
HWY:

COUNTY:

SHEET NO:

**E**

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.

7

## 4 X 6 WOOD POST MODIFICATIONS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED

*Chester J. Spang*  
for State Traffic Engineer

DATE 3/27/97

PLATE NO. A4-11.2

PROJECT NO:

HWY:

COUNTY:

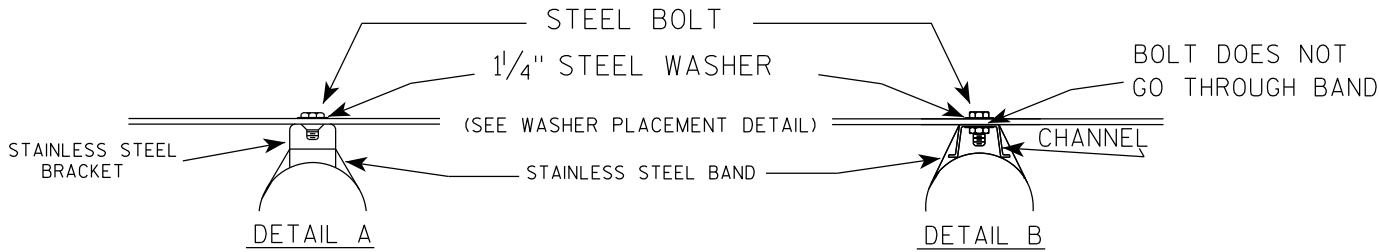
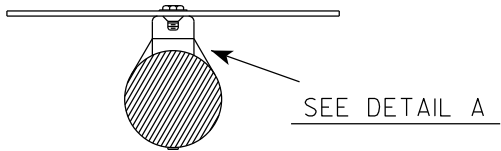
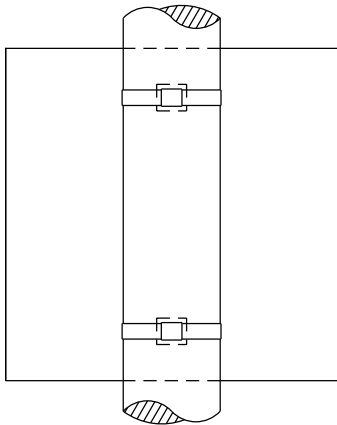
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E

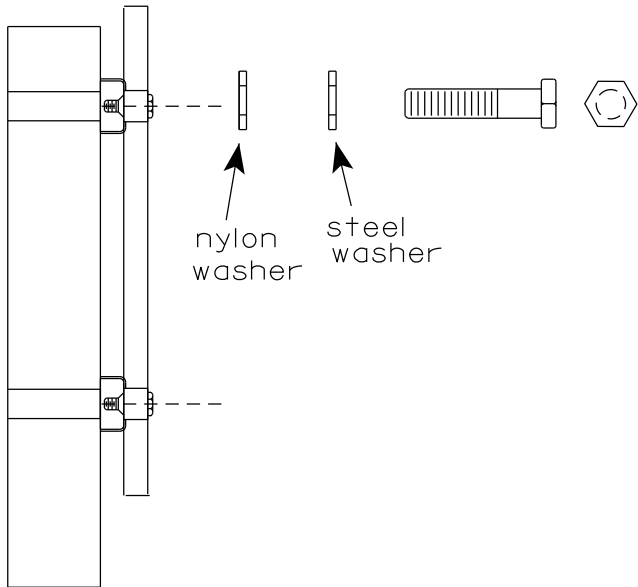


BANDING

SINGLE SIGN



WASHER PLACEMENT

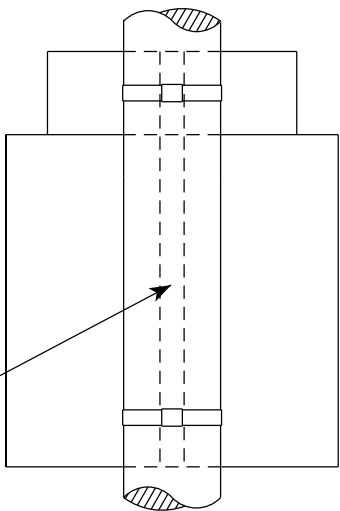


WASHERS (ALL POSTS) -  
1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL  
1-1/4" O.D. X 3/8" I.D. X .080 NYLON  
FOR ALL TYPE H SIGNS

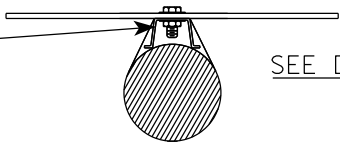
GENERAL NOTES

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



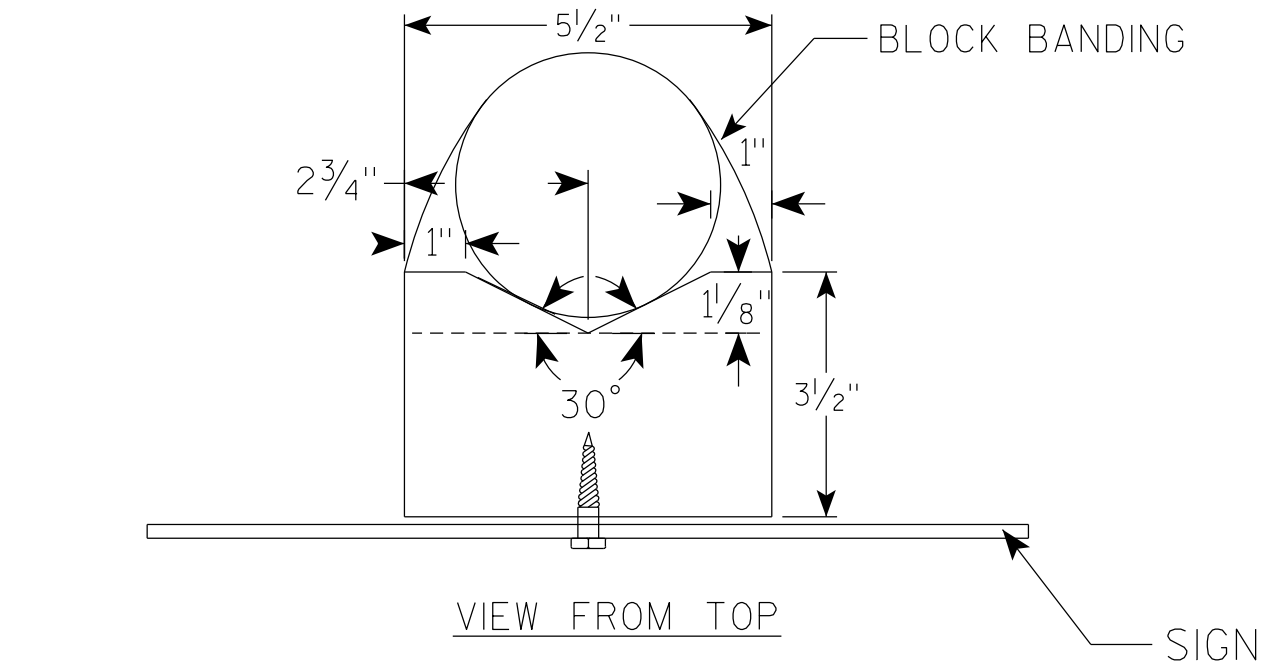
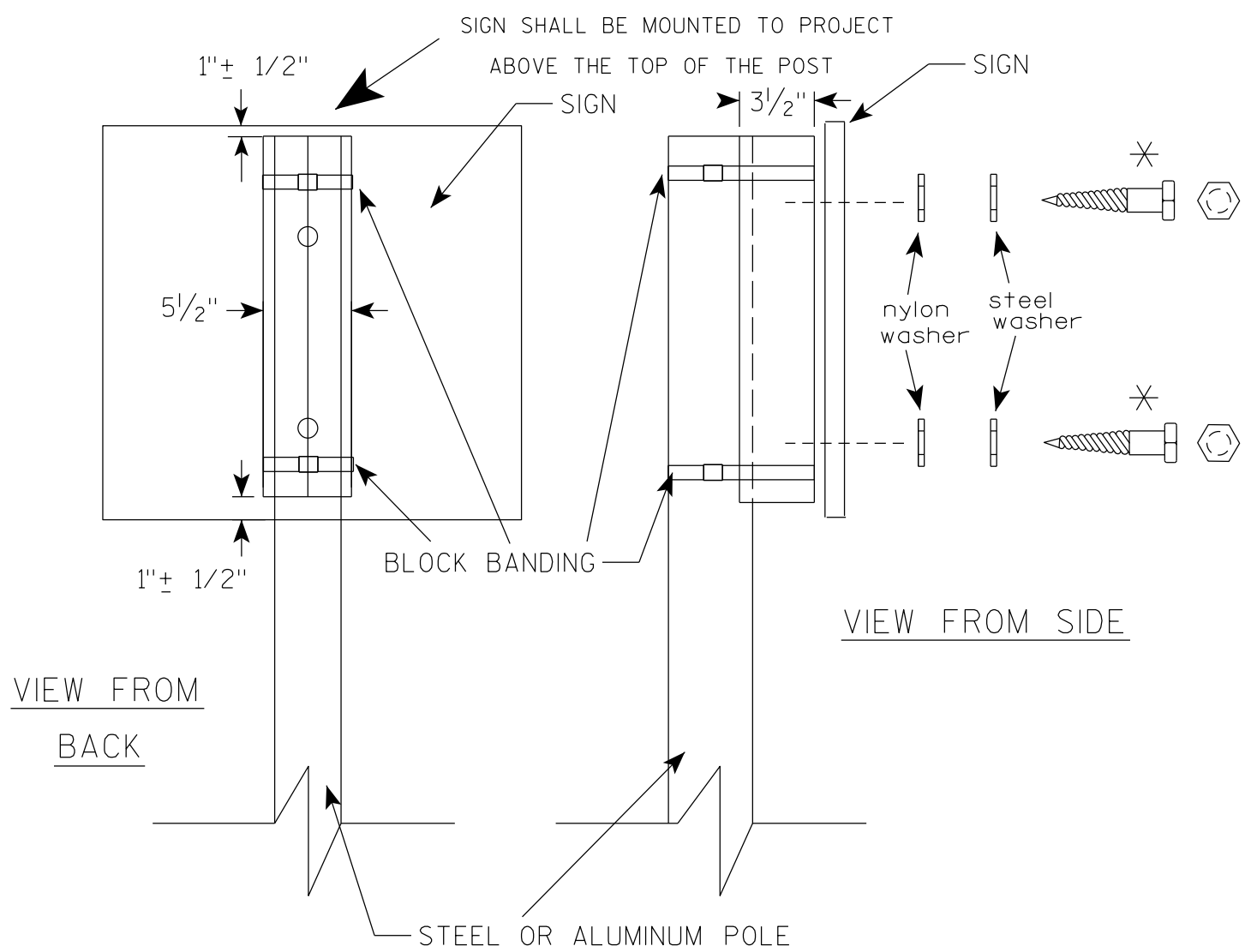
CHANNEL  
SEE TYPICAL PANEL  
INSTALLATION SHEET



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

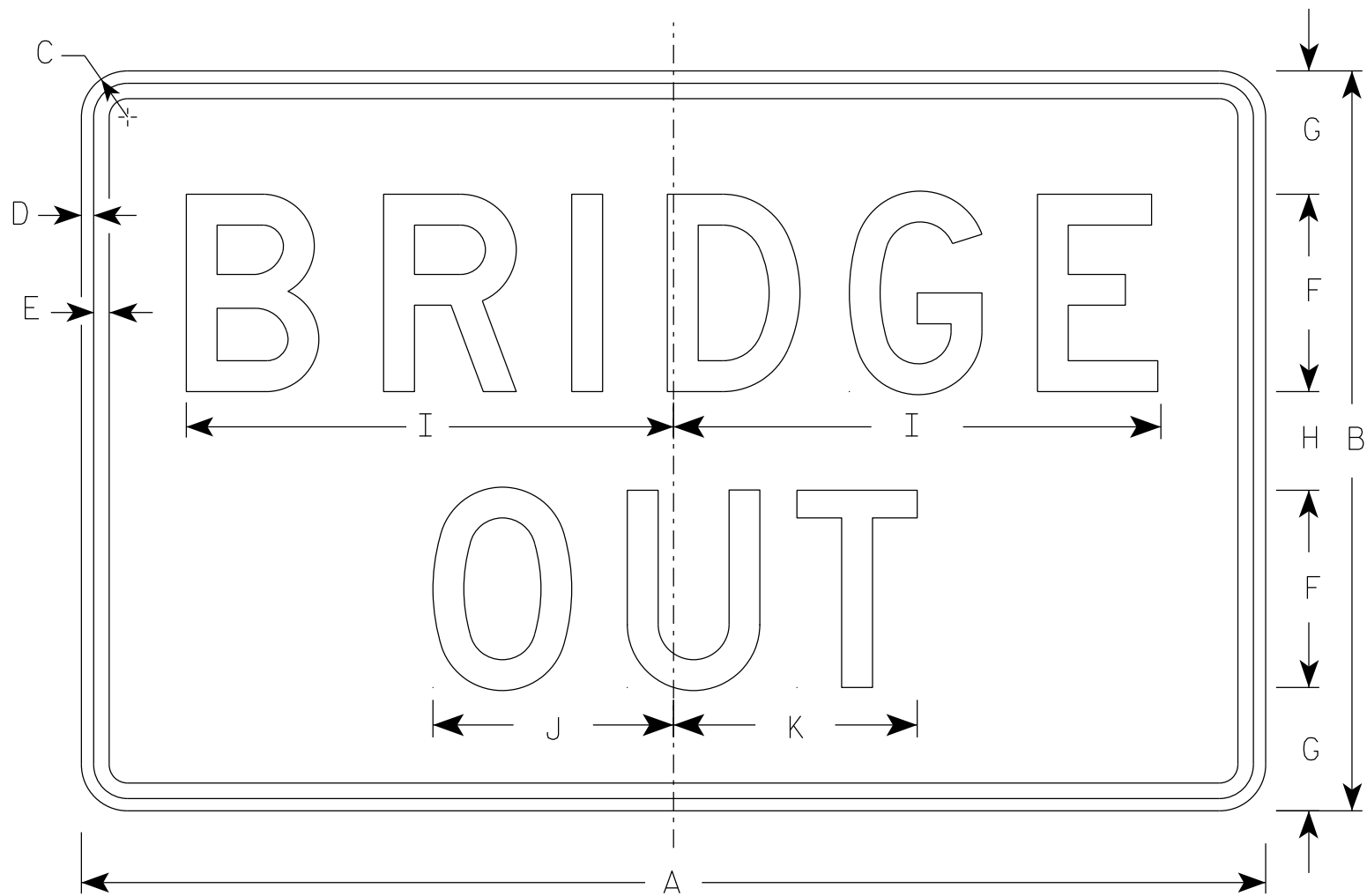


## GENERAL NOTES

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                                     |



R11-2B

NOTES

- 1. Sign is Type II - Type H Reflective
- 2. Color:
  - Background - White
  - Message - Black
- 3. Message Series - D
- 4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.

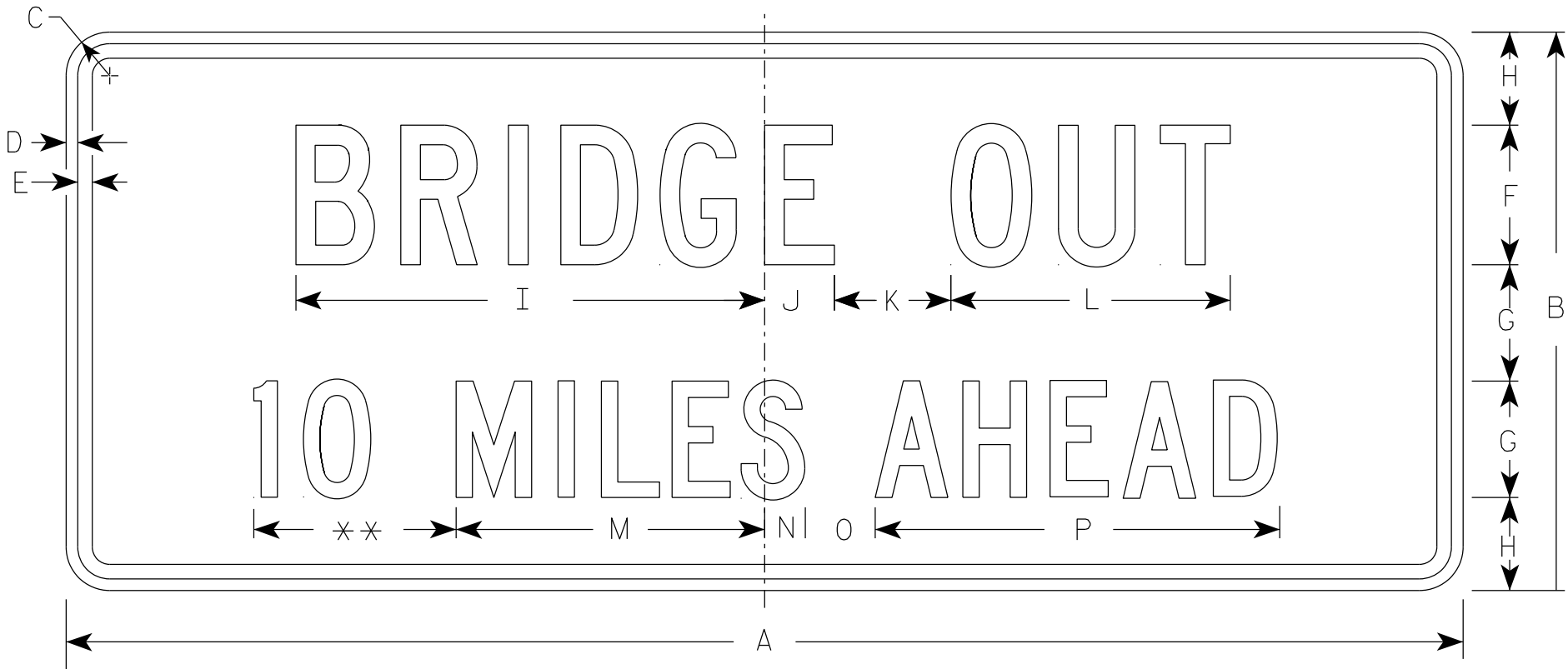
| SIZE | A  | B  | C     | D   | E   | F | G | H | I      | J     | K     | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | Area<br>sq. ft. |
|------|----|----|-------|-----|-----|---|---|---|--------|-------|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| 1    |    |    |       |     |     |   |   |   |        |       |       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |
| 2S   | 48 | 30 | 1 7/8 | 1/2 | 5/8 | 8 | 5 | 4 | 19 3/4 | 9 3/4 | 9 7/8 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 10.0            |
| 2M   | 48 | 30 | 1 7/8 | 1/2 | 5/8 | 8 | 5 | 4 | 19 3/4 | 9 3/4 | 9 7/8 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 10.0            |
| 3    | 48 | 30 | 1 7/8 | 1/2 | 5/8 | 8 | 5 | 4 | 19 3/4 | 9 3/4 | 9 7/8 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 10.0            |
| 4    | 48 | 30 | 1 7/8 | 1/2 | 5/8 | 8 | 5 | 4 | 19 3/4 | 9 3/4 | 9 7/8 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 10.0            |
| 5    | 48 | 30 | 1 7/8 | 1/2 | 5/8 | 8 | 5 | 4 | 19 3/4 | 9 3/4 | 9 7/8 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 10.0            |

NOTES

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

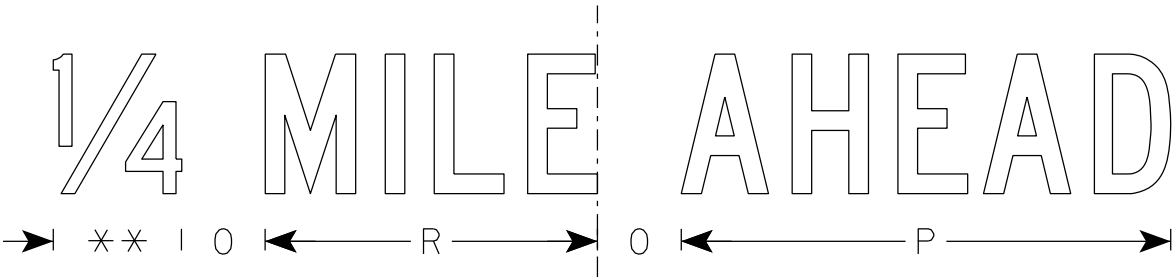
Background - White

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



R11-3C

\*\* See Note 5



| SIZE | A  | B  | C     | D   | E   | F | G | H     | I      | J     | K | L  | M      | N     | O | P      | Q | R      | S | T | U | V | W | X | Y | Z | Area<br>sq. ft. |
|------|----|----|-------|-----|-----|---|---|-------|--------|-------|---|----|--------|-------|---|--------|---|--------|---|---|---|---|---|---|---|---|-----------------|
| 1    | 36 | 15 | 1 1/2 | 1/2 | 5/8 | 4 | 3 | 2 1/2 | 13 1/4 | 2 1/4 | 3 | 8  | 8      | 1 1/2 | 2 | 10 3/4 |   | 7 1/8  |   |   |   |   |   |   |   |   | 3.75            |
| 2S   | 60 | 24 | 1 7/8 | 1/2 | 5/8 | 6 | 5 | 4     | 20 1/8 | 3     | 5 | 12 | 13 1/4 | 1 3/4 | 3 | 17 3/8 |   | 11 7/8 |   |   |   |   |   |   |   |   | 10.0            |
| 2M   | 60 | 24 | 1 7/8 | 1/2 | 5/8 | 6 | 5 | 4     | 20 1/8 | 3     | 5 | 12 | 13 1/4 | 1 3/4 | 3 | 17 3/8 |   | 11 7/8 |   |   |   |   |   |   |   |   | 10.0            |
| 3    |    |    |       |     |     |   |   |       |        |       |   |    |        |       |   |        |   |        |   |   |   |   |   |   |   |   |                 |
| 4    |    |    |       |     |     |   |   |       |        |       |   |    |        |       |   |        |   |        |   |   |   |   |   |   |   |   |                 |
| 5    |    |    |       |     |     |   |   |       |        |       |   |    |        |       |   |        |   |        |   |   |   |   |   |   |   |   |                 |

STANDARD SIGN  
R11-3C

WISCONSIN DEPT OF TRANSPORTATION

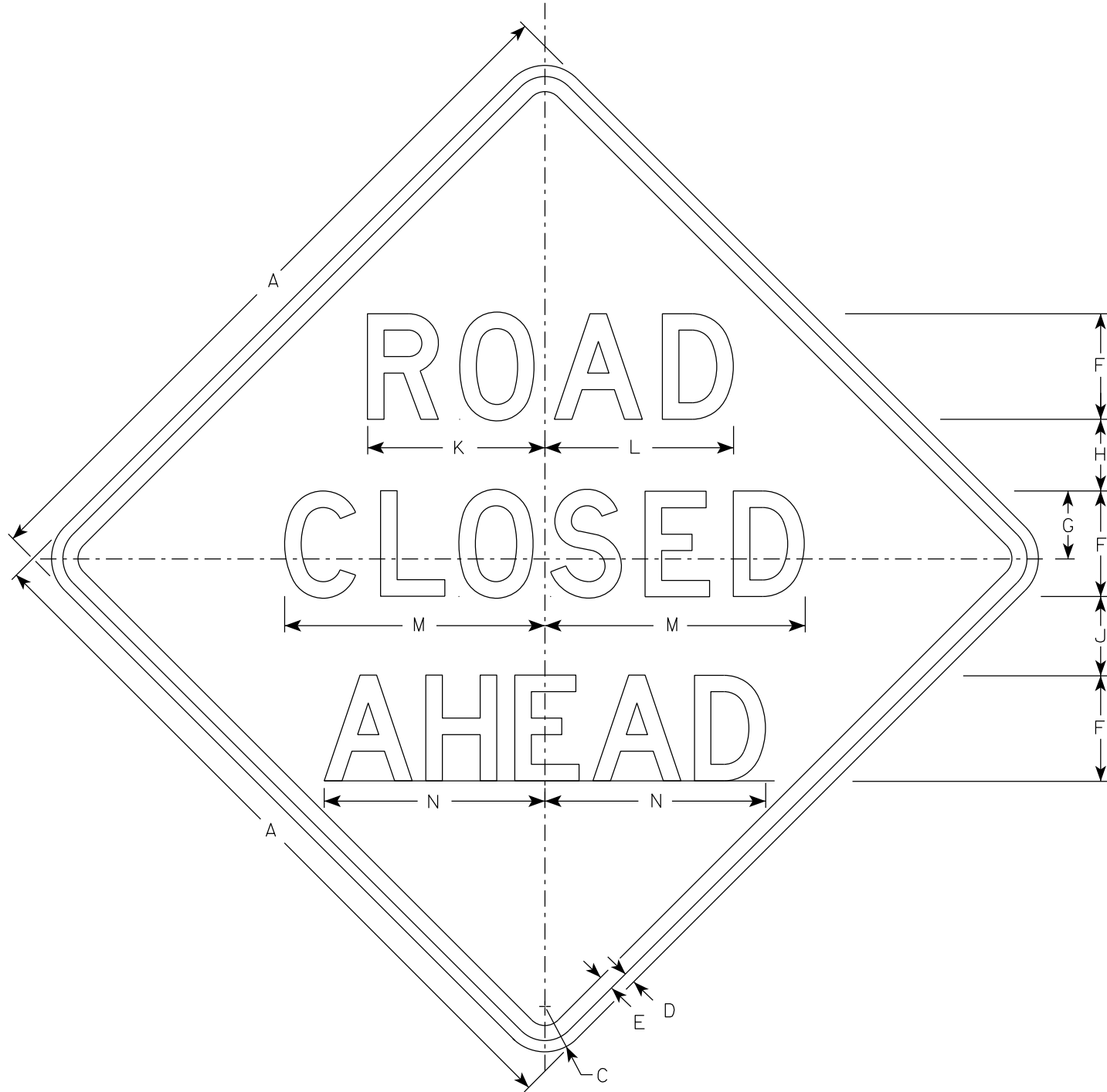
APPROVED  
*Matthew R. Rauch*  
for State Traffic Engineer

DATE 2/5/24 PLATE NO. R11-3C.4

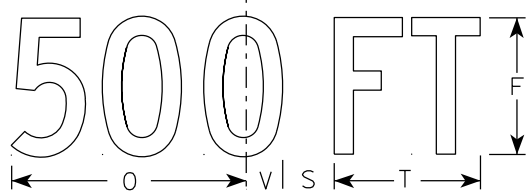
PROJECT NO:

SHEET NO:

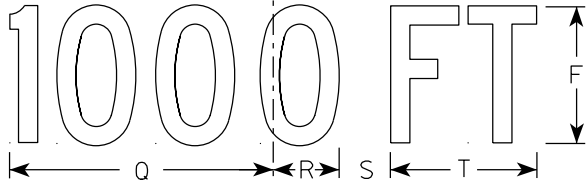
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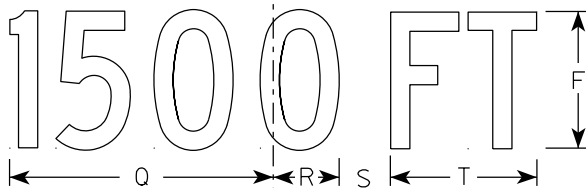
W20-3A



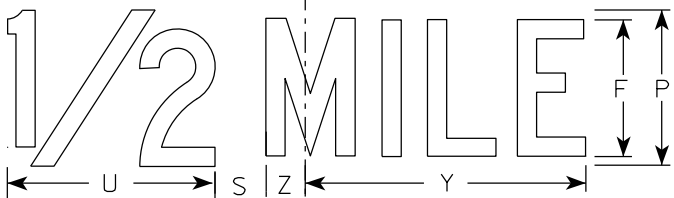
W20-3D



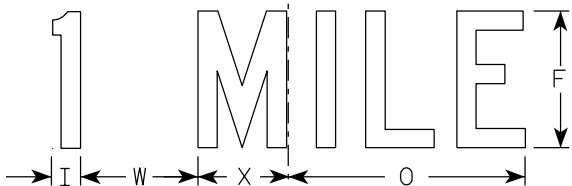
W20-3C



W20-3B



W20-3G



W20-3F

NOTES

- 1. Sign is Type II - Type F Reflective
- 2. Color:  
Background - Orange  
Message - Black
- 3. Message Series - see note 5
- 4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
- 5. Lines 1 and 2 are Series D.  
Line 3 is Series D for AHEAD and Series C for all other distances.

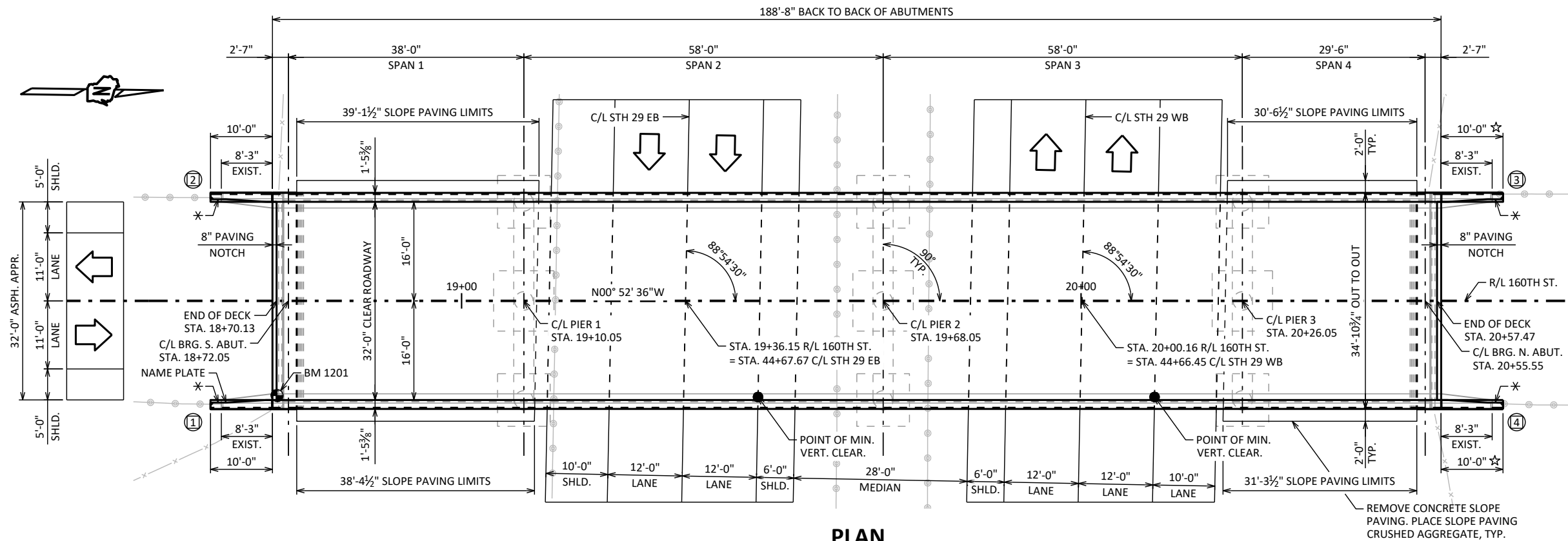
| SIZE | A  | B | C     | D   | E   | F | G     | H     | I     | J     | K      | L      | M      | N      | O  | P | Q      | R     | S     | T     | U      | v     | W     | X     | Y      | Z     | Area<br>sq. ft. |
|------|----|---|-------|-----|-----|---|-------|-------|-------|-------|--------|--------|--------|--------|----|---|--------|-------|-------|-------|--------|-------|-------|-------|--------|-------|-----------------|
| 1    | 36 |   | 2 1/4 | 5/8 | 3/4 | 5 | 3 3/8 | 3 1/2 | 1 1/8 | 4     | 8 3/8  | 8 7/8  | 12 1/2 | 11     | 9  | 6 | 10 1/8 | 2 1/2 | 1 7/8 | 5 5/8 | 8      | 1 3/8 | 4 1/2 | 3 1/2 | 10 3/4 | 1 3/4 | 9.0             |
| 2S   | 48 |   | 3     | 3/4 | 1   | 7 | 4 1/2 | 4 3/4 | 1 1/2 | 5 1/4 | 11 3/4 | 12 1/2 | 17 1/4 | 14 5/8 | 12 | 8 | 13 1/2 | 3 3/8 | 2 5/8 | 7 1/2 | 10 5/8 | 1 7/8 | 6     | 4 5/8 | 14 3/8 | 2 3/8 | 16.0            |
| 2M   | 48 |   | 3     | 3/4 | 1   | 7 | 4 1/2 | 4 3/4 | 1 1/2 | 5 1/4 | 11 3/4 | 12 1/2 | 17 1/4 | 14 5/8 | 12 | 8 | 13 1/2 | 3 3/8 | 2 5/8 | 7 1/2 | 10 5/8 | 1 7/8 | 6     | 4 5/8 | 14 3/8 | 2 3/8 | 16.0            |
| 3    | 48 |   | 3     | 3/4 | 1   | 7 | 4 1/2 | 4 3/4 | 1 1/2 | 5 1/4 | 11 3/4 | 12 1/2 | 17 1/4 | 14 5/8 | 12 | 8 | 13 1/2 | 3 3/8 | 2 5/8 | 7 1/2 | 10 5/8 | 1 7/8 | 6     | 4 5/8 | 14 3/8 | 2 3/8 | 16.0            |
| 4    | 48 |   | 3     | 3/4 | 1   | 7 | 4 1/2 | 4 3/4 | 1 1/2 | 5 1/4 | 11 3/4 | 12 1/2 | 17 1/4 | 14 5/8 | 12 | 8 | 13 1/2 | 3 3/8 | 2 5/8 | 7 1/2 | 10 5/8 | 1 7/8 | 6     | 4 5/8 | 14 3/8 | 2 3/8 | 16.0            |
| 5    | 48 |   | 3     | 3/4 | 1   | 7 | 4 1/2 | 4 3/4 | 1 1/2 | 5 1/4 | 11 3/4 | 12 1/2 | 17 1/4 | 14 5/8 | 12 | 8 | 13 1/2 | 3 3/8 | 2 5/8 | 7 1/2 | 10 5/8 | 1 7/8 | 6     | 4 5/8 | 14 3/8 | 2 3/8 | 16.0            |

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

WISCONSIN DEPT OF TRANSPORTATION

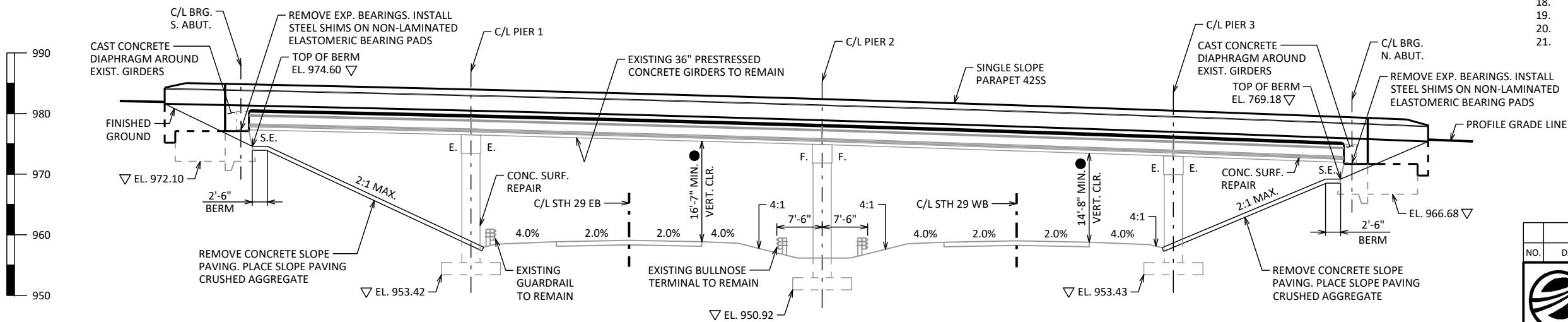
APPROVED *Matthew R. Rauch*  
for State Traffic Engineer

DATE 1/10/2024 PLATE NO. W20-3.8



## PLAN

DECK REPLACEMENT - 4 SPAN 36" PRESTRESSED CONCRETE GIRDER BRIDGE



## ELEVATION

LOOKING WEST  
NORMAL TO R/L 160TH STREET

## DESIGN DATA

## LIVE LOAD:

DESIGN LOADING: HS-20  
INVENTORY RATING: HS = 14  
OPERATING RATING: HS = 24  
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV): 190 (KIPS)

## MATERIAL PROPERTIES:

CONCRETE MASONRY:  $f'_c = 4,000$  PSI  
SUPERSTRUCTURE  $f'_c = 3,500$  PSI  
ALL OTHER

BAR STEEL REINFORCEMENT  
GRADE 60  $f_y = 60,000$  PSI

## TRAFFIC DATA

## 160TH STREET

ADT = 340 (2027)  
ADT = 340 (2047)  
R.D.S. = 55 MPH

## STH 29

ADT = 24,560 (2027)  
ADT = 28,610 (2047)  
R.D.S. = 70 MPH

## BENCH MARK

| NO.  | STATION             | DESCRIPTION      | ELEV.  |
|------|---------------------|------------------|--------|
| 1201 | 18+70.20, 15.3' RT. | DISK IN CONCRETE | 981.81 |

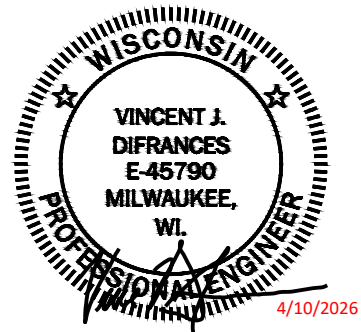
## LEGEND

- (X) INDICATED WING WALL NUMBER
- F. FIXED BEARING
- E. EXPANSION BEARING
- S.E. SEMI-EXPANSION BEARING
- \* PROVIDE FOR THREE BEAM GUARD RAIL ATTACHMENT.
- POINT OF MIN. VERT. CLEARANCE. CLEARANCE IS READ FROM CURRENT INSPECTION REPORT.
- ▽ ELEVATIONS ARE BASED ON THE ORIGINAL STRUCTURE PLANS.
- ☆ SURFACE DRAIN ANCHORS REQUIRED.

## LIST OF DRAWINGS:

1. GENERAL PLAN & ELEVATION
2. QUANTITIES, NOTES, & DETAILS
3. CROSS SECTIONS
4. REMOVAL DETAILS
5. REMOVAL DETAILS 2
6. SOUTH ABUTMENT
7. SOUTH ABUTMENT DETAILS
8. NORTH ABUTMENT
9. NORTH ABUTMENT DETAILS
10. ABUTMENT BILL OF BARS
11. SLOPE PAVING (CRUSHED AGGREGATE)
12. STEEL DIAPHRAGM
13. FRAMING PLAN
14. SUPERSTRUCTURE PLAN
15. SUPERSTRUCTURE CROSS SECTIONS
16. SUPERSTRUCTURE DETAILS 1
17. SUPERSTRUCTURE DETAILS 2
18. SUPERSTRUCTURE BILL OF BARS
19. SINGLE SLOPE PARAPET 42SS
20. PIER FRP STRENGTHENING
21. GIRDER FRP STRENGTHENING

| NO.                                                | DATE     | REVISION    | BY            |
|----------------------------------------------------|----------|-------------|---------------|
|                                                    |          |             |               |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |          |             |               |
| ACCEPTED                                           |          | 05/11/26    | DATE          |
| CHIEF STRUCTURES DESIGN ENGINEER                   |          |             |               |
| STRUCTURE B-9-32                                   |          |             |               |
| 160TH STREET OVER STH 29                           |          |             |               |
| COUNTY                                             | CHIPPEWA | TOWN        | HALLIE        |
| DESIGN SPEC.<br>REHABILITATION N/A                 |          |             |               |
| DESIGNED BY                                        | VJD      | DESIGN CK'D | JRM           |
| DRAWN BY                                           | VJD      | PLANS CK'D  | JRM           |
| GENERAL PLAN & ELEVATION                           |          |             | SHEET 1 OF 21 |



## STRUCTURE DESIGN CONTACTS:

CONSULTANT: VINCENT DIFRANCES 414-383-2644  
BRIDGE OFFICE: AARON BONK 608-261-0261



GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

ALL DIMENSIONS ARE IN FEET AND INCHES UNLESS OTHERWISE NOTED.

ALL STATIONS AND ELEVATIONS ARE IN FEET. ELEVATION ARE REFERENCED TO THE NAVD 88 DATUM (2011 ADJUSTMENT).

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURE B-9-32" SHALL BE THE EXISTING GROUNDLINE.

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

THE QUANTITY FOR BACKFILL STRUCTURE IS CALCULATED BASED ON THE DETAIL SHOWN IN THE PLANS.

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

THE SLOPE OF THE FILL IN FRONT OF THE ABUTMENTS SHALL BE COVERED WITH SLOPE PAVING MATERIAL TO THE EXTENT SHOWN ON THE SLOPE PAVING DETAIL SHEETS.

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

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

UTILIZE EXISTING REINFORCEMENT WHERE SHOWN AND EXTEND 24 BAR DIAMETERS INTO NEW WORK, UNLESS SPECIFIED OTHERWISE.

BEVEL EXPOSED EDGES OF CONCRETE 3/4" UNLESS OTHERWISE NOTED.

THE HAUNCH CONCRETE QUANTITY IS BASED ON AN AVERAGE HAUNCH THICKNESS OF 2.8".

VARIATIONS OF THE NEW GRADE LINE OVER 1/4" MUST BE SUBMITTED BY THE FIELD ENGINEER TO THE STRUCTURE DESIGN SECTION FOR REVIEW.

PROTECTIVE SURFACE TREATMENT TO BE APPLIED TO THE ENTIRE EXPOSED TOP OF DECK AND TO THE VERTICAL AND HORIZONTAL SURFACES OF THE PAVING NOTCHES AT ABUTMENT DIAPHRAGMS.

PIGMENTED SURFACE SEALER TO BE APPLIED TO THE FRONT FACE AND THE TOP OF THE PARAPETS, INCLUDING PARAPETS ON WING WALLS.

GRADING AND SHAPING REQUIRED TO INSTALL "SLOPE PAVING CRUSHED AGGREGATE" SHALL BE INCIDENTAL TO BID ITEM "SLOPE PAVING CRUSHED AGGREGATE".

REMOVAL LINES TO BE DEFINED BY A 1/2" DEEP SAWCUT. TAKE CARE AS TO NOT DAMAGE GIRDERS DURING REMOVAL. REPAIRS REQUIRED AFTER REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE COMPLETED AT NO COST TO THE DEPARTMENT.

EXISTING INTERMEDIATE CONCRETE DIAPHRAGMS ARE TIED TO THE EXISTING GIRDERS. TAKE CARE AS TO NOT DAMAGE GIRDERS DURING REMOVAL OF THE DIAPHRAGMS. CUT EXISTING REINFORCEMENT FLUSH WITH GIRDER CONCRETE AND PAINT WITH EPOXY PRIOR TO INSTALLATION OF STEEL DIAPHRAGMS. REPAIRS REQUIRED AFTER DIAPHRAGM REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE COMPLETED AT NO COST TO THE DEPARTMENT.

CONCRETE SURFACE REPAIR QUANTITIES ARE AN ESTIMATE ONLY. ACTUAL QUANTITIES TO BE DETERMINED IN THE FIELD AT THE DIRECTION OF THE ENGINEER IN THE FIELD.

THE CONTRACTOR SHALL SUPPLY A NEW NAME PLATE IN ACCORDANCE WITH SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS AND THE STANDARD DETAIL DRAWINGS. NAME PLATE TO SHOW ORIGINAL CONSTRUCTION YEAR 1966.

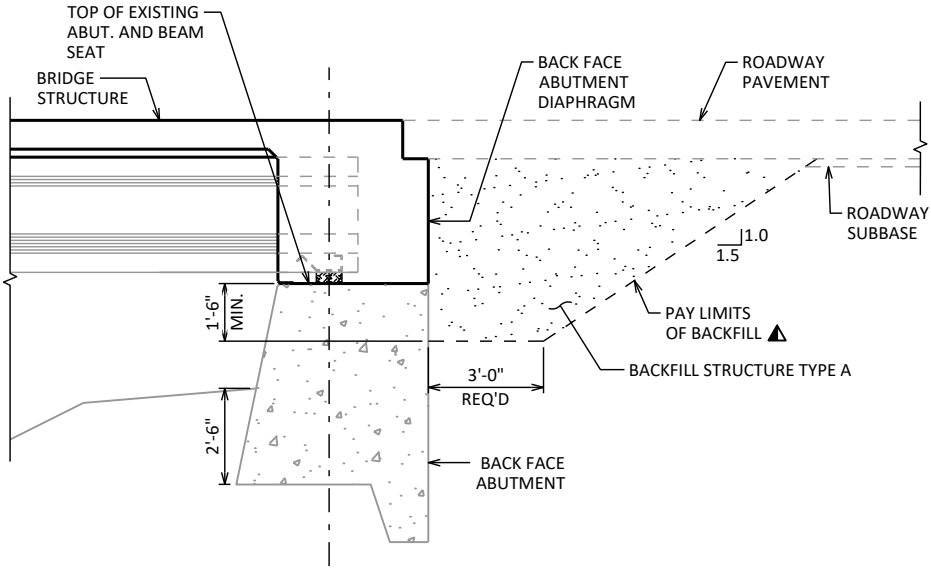
THE UTILITY INFORMATION SHOWN ON THE PLANS CONCERNING TYPE AND LOCATION OF UNDERGROUND AND OVERHEAD UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATIONS AS TO THE TYPE AND LOCATION OF UNDERGROUND OVERHEAD UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE.

TOTAL ESTIMATED QUANTITIES

| BID ITEM NUMBER | BID ITEMS                                        | UNIT | S. ABUT. | PIER 1 | PIER 2 | PIER 3 | N. ABUT. | SUPER. | TOTALS |
|-----------------|--------------------------------------------------|------|----------|--------|--------|--------|----------|--------|--------|
| 203.0211.S      | ABATEMENT OF ASBESTOS CONTAINING MATERIAL B-9-32 | EACH | ---      | ---    | ---    | ---    | ---      | ---    | 1      |
| 203.0220        | REMOVING STRUCTURE B-9-32                        | EACH | ---      | ---    | ---    | ---    | ---      | ---    | 1      |
| 204.0175        | REMOVING CONCRETE SLOPE PAVING                   | SY   | 186      | ---    | ---    | ---    | 149      | ---    | 335    |
| 206.1001        | EXCAVATION FOR STRUCTURES BRIDGES B-9-32         | EACH | ---      | ---    | ---    | ---    | ---      | ---    | 1      |
| 210.1500        | BACKFILL STRUCTURE TYPE A                        | TON  | 82       | ---    | ---    | ---    | 82       | ---    | 164    |
| 502.0100        | CONCRETE MASONRY BRIDGES                         | CY   | 8.1      | ---    | ---    | ---    | 7.5      | 291    | 307    |
| 502.3200        | PROTECTIVE SURFACE TREATMENT                     | SY   | ---      | ---    | ---    | ---    | ---      | 678    | 678    |
| 502.3210        | PIGMENTED SURFACE SEALER                         | SY   | 10       | ---    | ---    | ---    | 10       | 186    | 206    |
| 502.4204        | ADHESIVE ANCHORS NO. 4 BAR                       | EACH | 10       | ---    | ---    | ---    | 10       | ---    | 20     |
| 502.4205        | ADHESIVE ANCHORS NO. 5 BAR                       | EACH | 48       | ---    | ---    | ---    | 48       | 180    | 276    |
| 505.0600        | BAR STEEL REINFORCEMENT HS COATED STRUCTURES     | LB   | 1,390    | ---    | ---    | ---    | 1,390    | 65,200 | 67,980 |
| 506.2605        | BEARING PADS ELASTOMERIC NON-LAMINATED           | EACH | 4        | ---    | ---    | ---    | 4        | ---    | 8      |
| 506.4000        | STEEL DIAPHRAGMS B-9-32                          | EACH | ---      | ---    | ---    | ---    | ---      | 16     | 16     |
| 506.7050.S      | REMOVING BEARINGS B-9-32                         | EACH | 4        | ---    | ---    | ---    | 4        | ---    | 8      |
| 509.1500        | CONCRETE SURFACE REPAIR                          | SF   | ---      | 35     | ---    | 3      | ---      | 17     | 55     |
| 516.0500        | RUBBERIZED MEMBRANE WATERPROOFING                | SY   | 10       | ---    | ---    | ---    | 10       | ---    | 20     |
| 604.0500        | SLOPE PAVING CRUSHED AGGREGATE                   | SY   | 186      | ---    | ---    | ---    | 149      | ---    | 335    |
| 614.0150        | ANCHOR ASSEMBLIES FOR STEEL PLATE BEAM GUARD     | EACH | 2        | ---    | ---    | ---    | 2        | ---    | 4      |
| SPV.0165.01     | FIBER WRAP REINFORCING STRUCTURAL                | SF   | ---      | 96     | 77     | 96     | ---      | 244    | 513    |
|                 |                                                  |      |          |        |        |        |          |        |        |
|                 | NON-BID ITEMS                                    |      |          |        |        |        |          |        |        |
|                 | FILLER                                           | SIZE |          |        |        |        |          |        | 1/2"   |
|                 | NAME PLATE                                       | EACH |          |        |        |        |          |        | 1      |

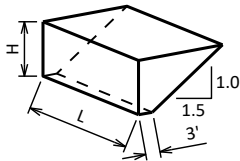
STATE PROJECT NUMBER

1050-01-83



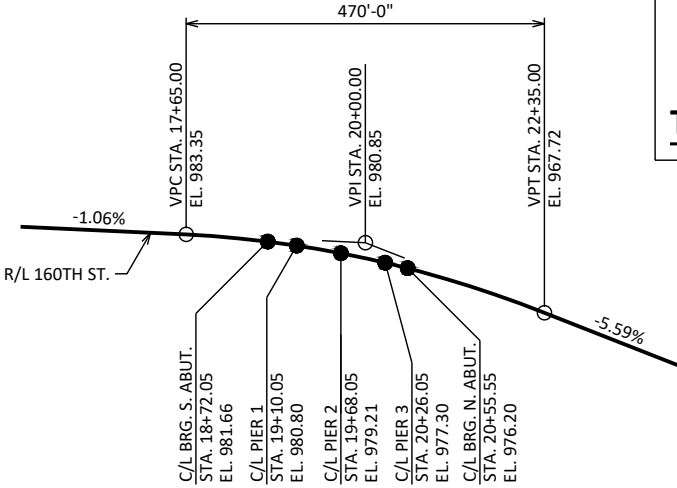
TYPICAL SECTION THRU ABUTMENT

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

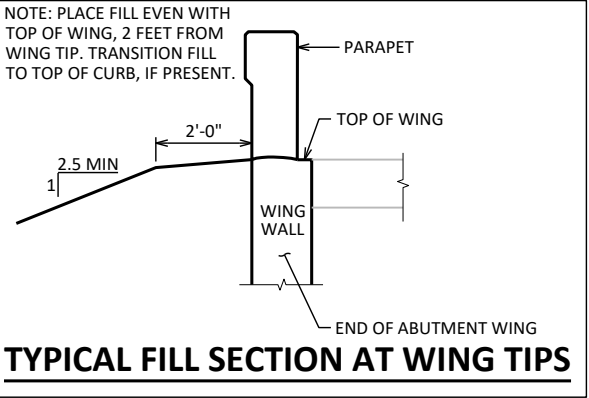


ABUTMENT BACKFILL DIAGRAM

L = OUT TO OUT OF ABUTMENT BODY INCLUDING WINGS (FT)  
H = AVERAGE ABUTMENT FILL HEIGHT (FT)  
EF = EXPANSION FACTOR (1.00 FOR TON BID ITEM)  
 $V_{CF} = (L)(3.0')(H) + (L)(0.5)(1.5H)(H)$   
 $V_{CY} = V_{CF}(EF)/27$   
 $V_{TON} = V_{CY}(2.0)$

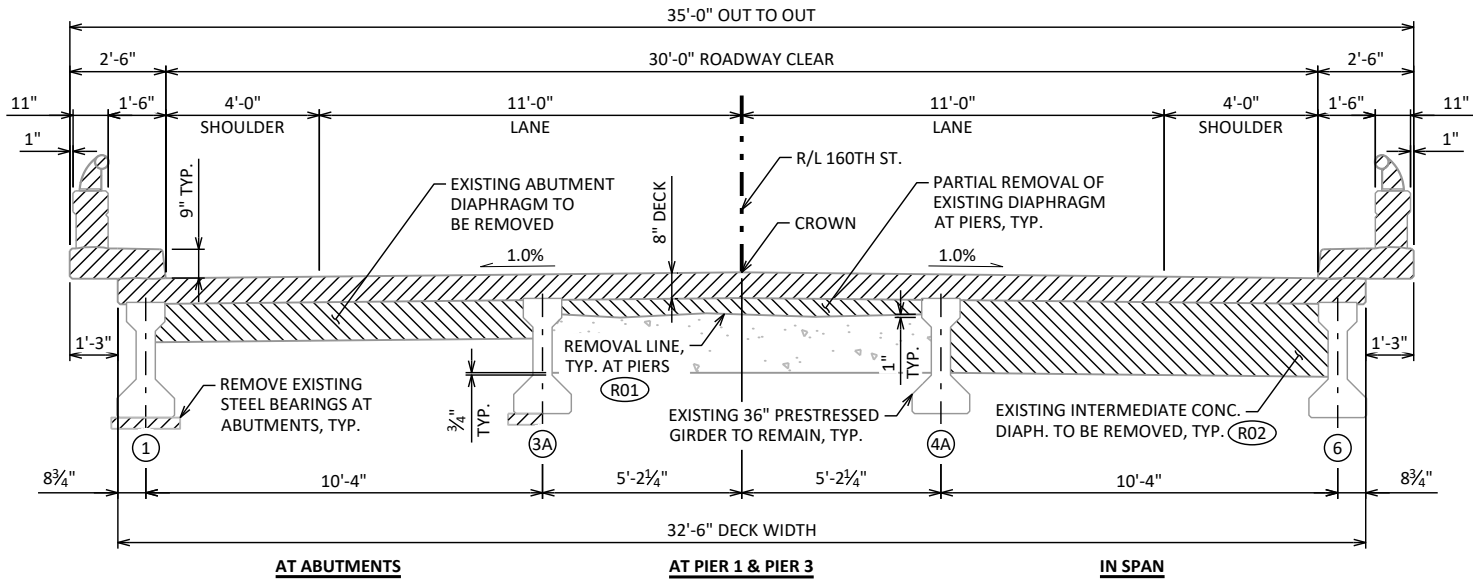


PROFILE GRADE LINE - 160TH ST.



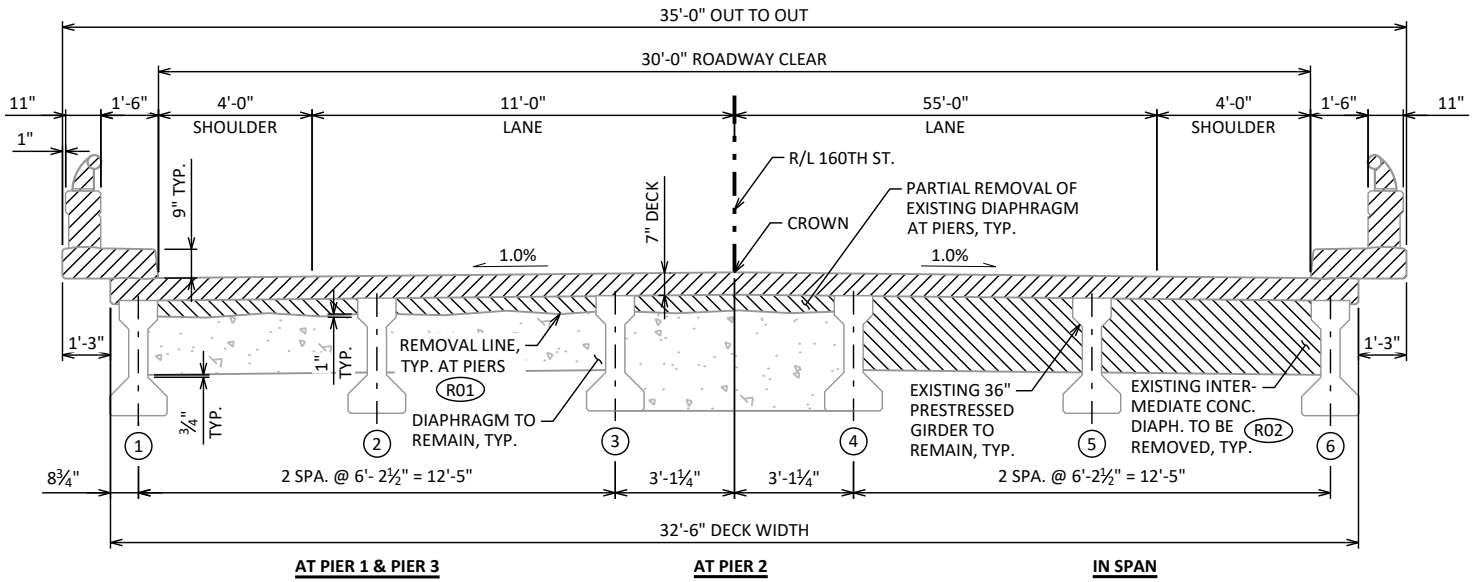
TYPICAL FILL SECTION AT WING TIPS

|                                                    |      |               |                |
|----------------------------------------------------|------|---------------|----------------|
|                                                    |      |               |                |
| NO.                                                | DATE | REVISION      | BY             |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |               |                |
| STRUCTURE B-9-32                                   |      |               |                |
| DRAWN BY                                           |      | VJD           | PLANS CK'D JRM |
| QUANTITIES,<br>NOTES, & DETAILS                    |      | SHEET 2 OF 21 |                |
|                                                    |      |               |                |



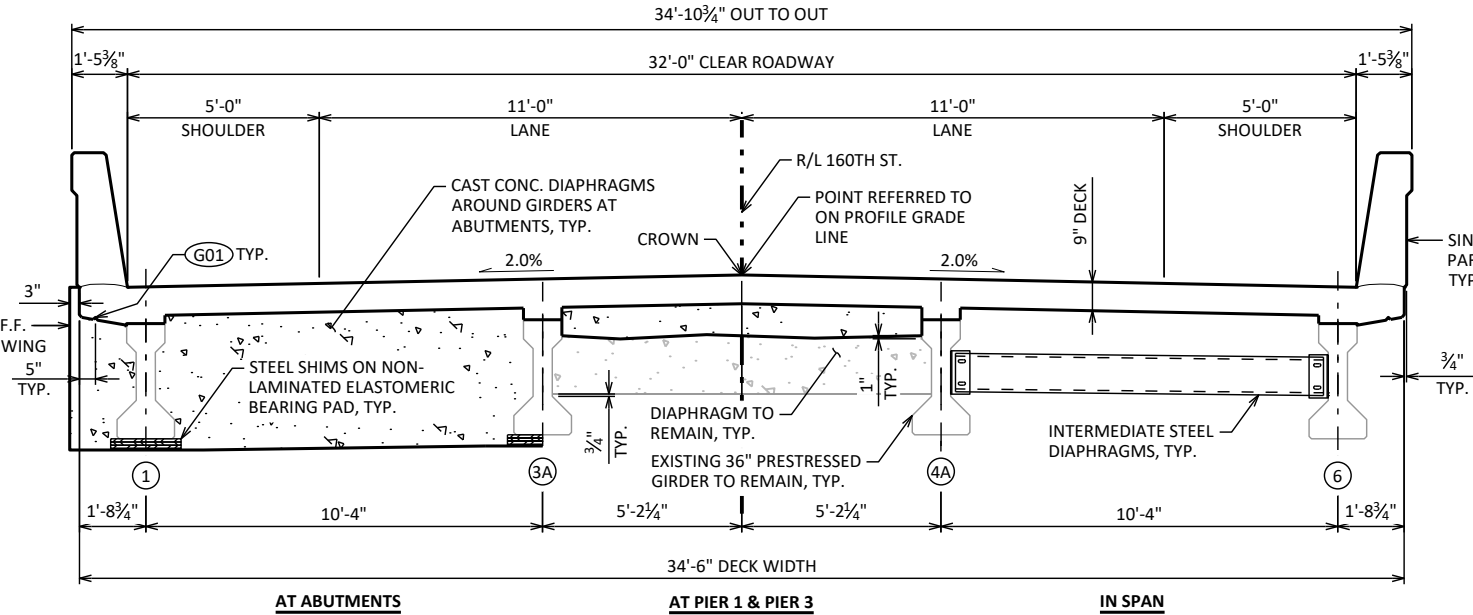
CROSS SECTION THRU EXISTING BRIDGE

SPAN 1 & SPAN 4  
LOOKING NORTH, SHOWING REMOVALS



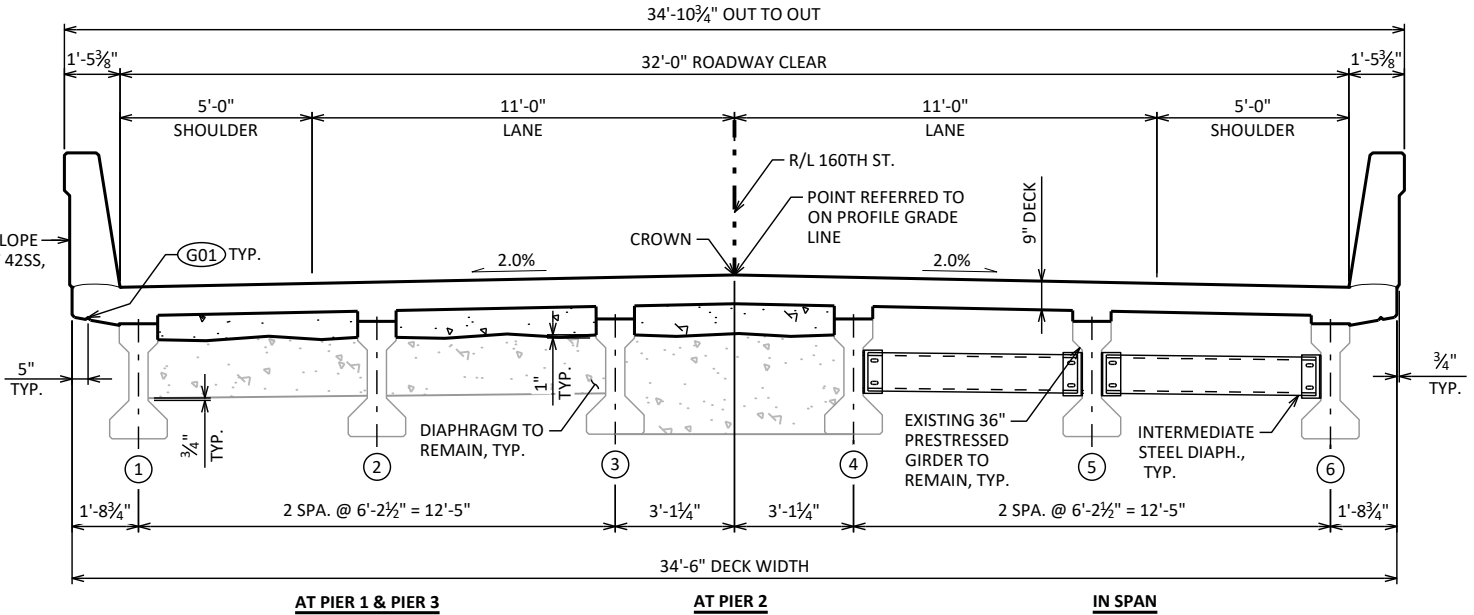
CROSS SECTION THRU EXISTING BRIDGE

SPAN 2 & SPAN 3  
LOOKING NORTH, SHOWING REMOVALS



CROSS SECTION THRU BRIDGE

SPAN 1 & SPAN 4  
LOOKING NORTH, SHOWING DECK REPLACEMENT



CROSS SECTION THRU BRIDGE

SPAN 2 & SPAN 3  
LOOKING NORTH, SHOWING DECK REPLACEMENT

LEGEND

- (R01) REMOVAL LINES TO BE DEFINED BY A 1/2" DEEP SAWCUT. TAKE CARE AS TO NOT DAMAGE GIRDERS DURING REMOVAL. REPAIRS REQUIRED AFTER REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE COMPLETED AT NO COST TO THE DEPARTMENT.
- (R02) EXISTING INTERMEDIATE CONCRETE DIAPHRAGMS ARE TIED TO THE EXISTING GIRDERS. TAKE CARE AS TO NOT DAMAGE GIRDERS DURING REMOVAL OF THE DIAPHRAGMS. CUT EXISTING REINFORCEMENT FLUSH WITH GIRDER CONCRETE AND PAINT WITH EPOXY PRIOR TO INSTALLATION OF STEEL DIAPHRAGMS. REPAIRS REQUIRED AFTER DIAPHRAGM REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE COMPLETED AT NO COST TO THE DEPARTMENT.
- (G01) 3/4" V-GROOVE REQUIRED. EXTEND V-GROOVE TO 6" FROM FRONT FACE OF ABUTMENT DIAPHRAGM.
- /// DENOTES LIMITS OF REMOVAL
- (X) INDICATES GIRDER NUMBER

NOTES

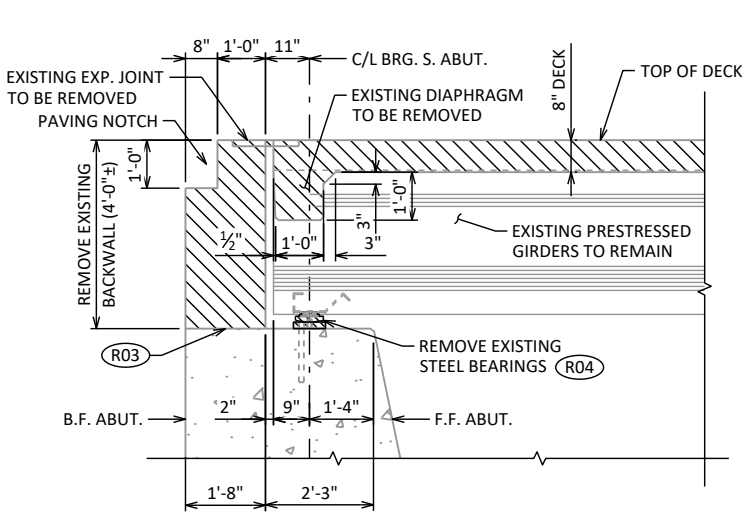
SEE "REMOVAL DETAILS" AND "REMOVAL DETAILS 2" SHEETS FOR ADDITIONAL REMOVAL DETAILS.

SEE "SOUTH ABUTMENT" AND "NORTH ABUTMENT" SHEETS FOR STEEL SHIM AND NON-LAMINATED ELASTOMERIC BEARING PAD DETAILS, AND ABUTMENT SURFACE PREPARATION DETAILS.

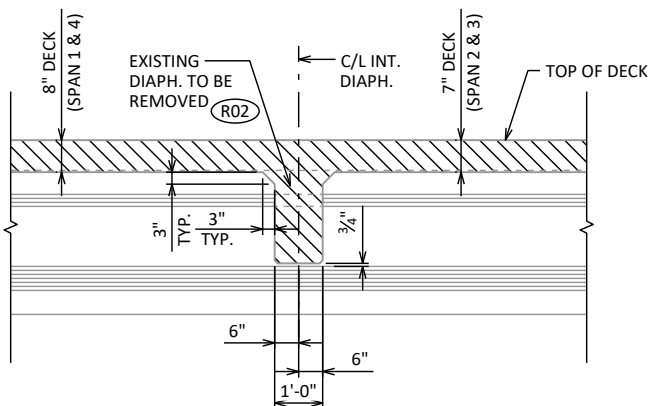
FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "STEEL DIAPHRAGM" SHEET.

| NO.                                                | DATE | REVISION      | BY             |
|----------------------------------------------------|------|---------------|----------------|
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |               |                |
| STRUCTURE B-9-32                                   |      |               |                |
| DRAWN BY                                           |      | VJD           | PLANS CK'D JRM |
| CROSS SECTIONS                                     |      | SHEET 3 OF 21 |                |

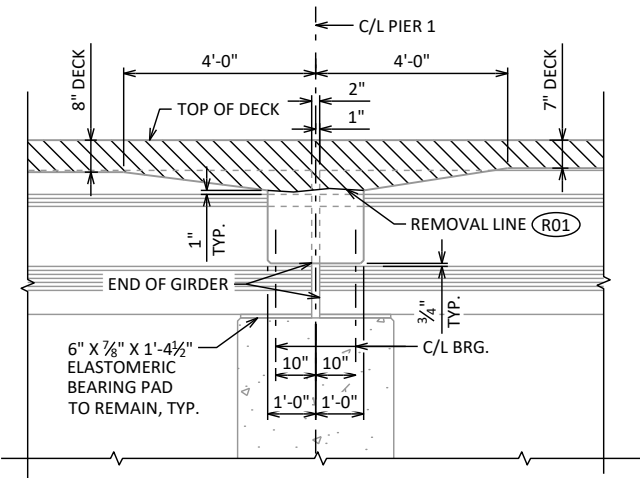




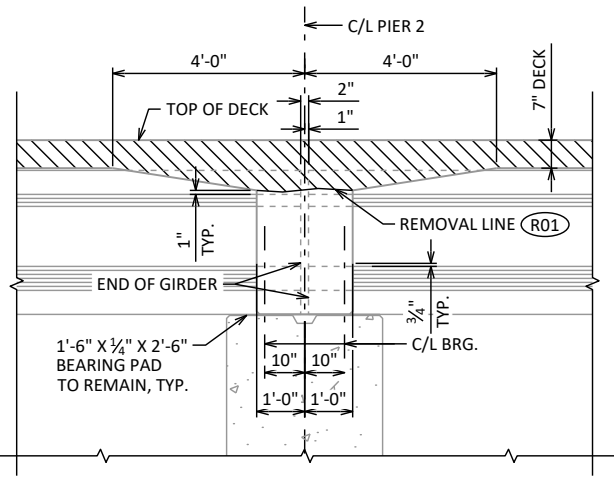
**ABUTMENT END DIAPHRAGMS**  
S. ABUT. SHOWN, N. ABUT. SIMILAR



**INTERMEDIATE DIAPHRAGMS**  
ALL LOCATIONS SIMILAR EXCEPT NOTED  
DECK THICKNESS



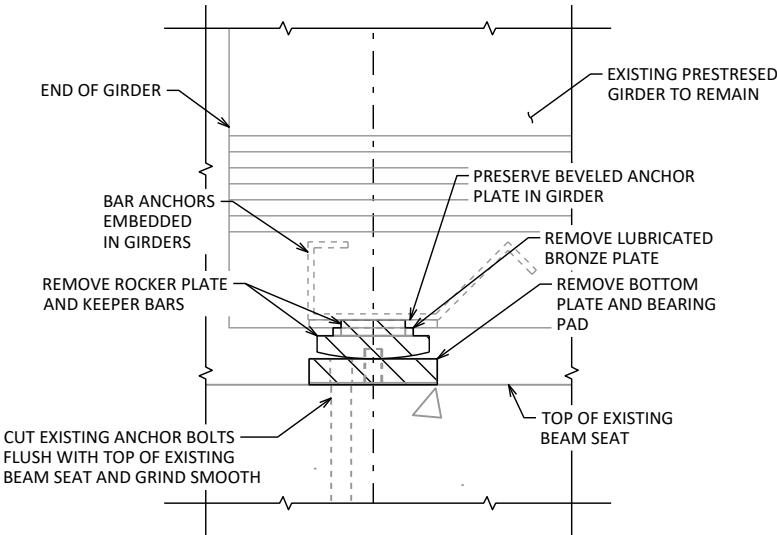
**PIER DIAPHRAGMS**  
PIER 1 SHOWN, PIER 3 SIMILAR  
OPPOSITE HAND



**PIER DIAPHRAGM**  
PIER 2 ONLY

**EXISTING LONGITUDINAL SECTION**

LOOKING WEST, SHOWING REMOVALS



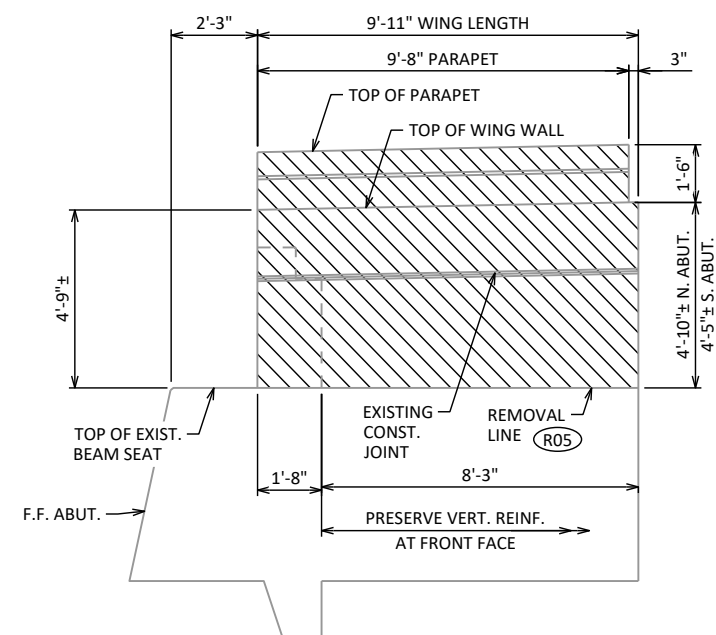
**BEARING REMOVAL DETAIL**

REMOVAL AND DISPOSAL OF EXISTING BEARINGS AS SHOWN, INCLUDING JACKING OF THE BRIDGE AS REQUIRED TO REMOVE AND INSTALL THE NEW SHIMS AND BEARING PADS, SHALL BE INCLUDED IN THE BID ITEM "REMOVING BEARINGS B-9-32".

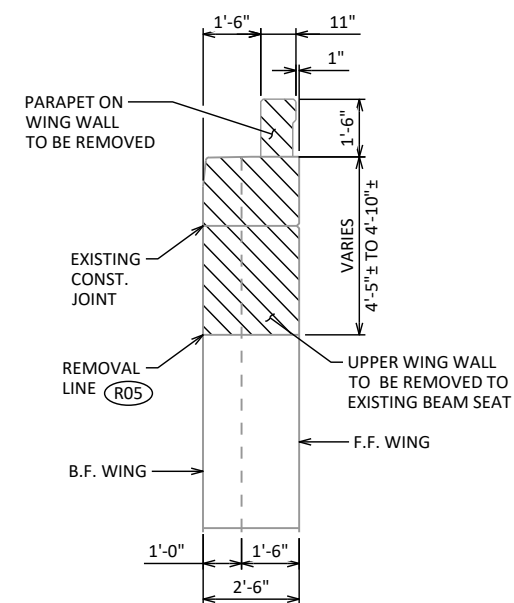
**LEGEND**

- (R01) REMOVAL LINES TO BE DEFINED BY A 1/2" DEEP SAWCUT. TAKE CARE AS TO NOT DAMAGE GIRDERS DURING REMOVAL. REPAIRS REQUIRED AFTER REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE COMPLETED AT NO COST TO THE DEPARTMENT.
  - (R02) EXISTING INTERMEDIATE CONCRETE DIAPHRAGMS ARE TIED TO THE EXISTING GIRDERS. TAKE CARE AS TO NOT DAMAGE GIRDERS DURING REMOVAL OF THE DIAPHRAGMS. CUT EXISTING REINFORCEMENT FLUSH WITH GIRDER CONCRETE AND PAINT WITH EPOXY PRIOR TO INSTALLATION OF STEEL DIAPHRAGMS. REPAIRS REQUIRED AFTER DIAPHRAGM REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE COMPLETED AT NO COST TO THE DEPARTMENT.
  - (R03) SAWCUT THROUGH EXISTING BACKWALL CONCRETE AND REINFORCEMENT. PAINT ENDS OF EXPOSED REINFORCEMENT WITH EPOXY CONFORMING TO AASHTO M-235, TYPE III, GRADE 2, CLASS B OR C.
  - (R04) ESTABLISH EXISTING BOTTOM OF GIRDER ELEVATION PRIOR TO REMOVAL OF THE EXISTING BEARINGS. BOTTOM OF GIRDER ELEVATION SHALL REMAIN UNCHANGED FOR THE PROPOSED CONDITION.
- /// DENOTES LIMITS OF REMOVAL

|                                                    |      |                |               |
|----------------------------------------------------|------|----------------|---------------|
| NO.                                                | DATE | REVISION       | BY            |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |                |               |
| STRUCTURE B-9-32                                   |      |                |               |
| DRAWN BY VJD                                       |      | PLANS CK'D JRM |               |
| REMOVAL DETAILS                                    |      |                | SHEET 4 OF 21 |



LOOKING AT FRONT FACE OF ABUT.  
SHOWING REMOVALS  
N. ABUT. SHOWN, S. ABUT. SIMILAR

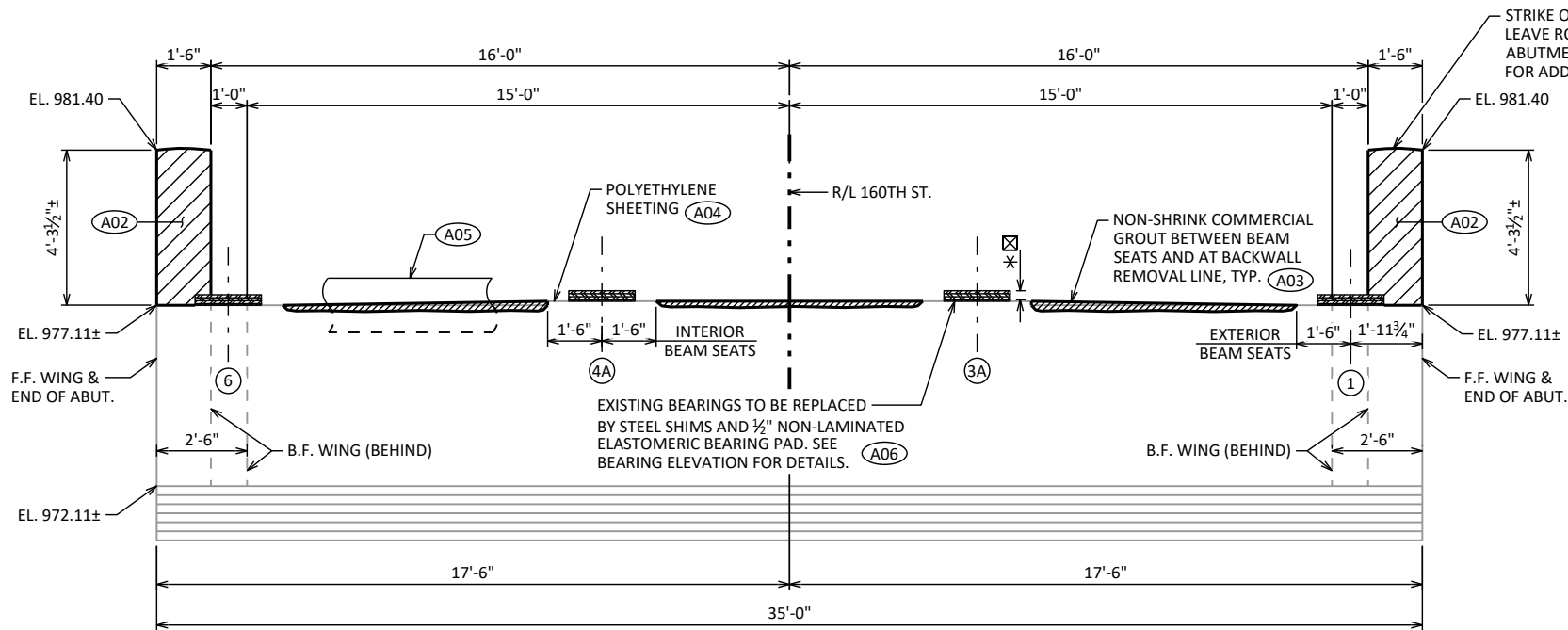


SHOWING REMOVALS  
ALL WING WALLS SIMILAR

|       |                                                                                                                                                                                                                                                                                                                         |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (X)   | <p> DENOTES EXISTING GIRDER NUMBER </p>                                                                                                                                                                                                                                                                                 |
| (R03) | <p> SAWCUT THROUGH EXISTING BACKWALL CONCRETE AND REINFORCEMENT. PAINT ENDS OF EXPOSED REINFORCEMENT WITH EPOXY CONFORMING TO AASHTO M-235, TYPE III, GRADE 2, CLASS B OR C. </p>                                                                                                                                       |
| (R04) | <p> ESTABLISH EXISTING BOTTOM OF GIRDER ELEVATION PRIOR TO REMOVAL OF THE EXISTING BEARINGS. BOTTOM OF GIRDER ELEVATION SHALL REMAIN UNCHANGED FOR THE PROPOSED CONDITION. </p>                                                                                                                                         |
| (R05) | <p> SAWCUT THROUGH EXISTING WINGWALL CONCRETE AND REINFORCEMENT EXCEPT PRESERVE, CLEAN, STRAIGHTEN, AND INCORPORATE VERTICAL REINFORCEMENT AT FRONT FACE INTO NEW WORK. PAINT ENDS OF EXPOSED REINFORCEMENT NOT INCORPORATED INTO NEW WORK WITH EPOXY CONFORMING TO AASHTO M-235, TYPE III, GRADE 2, CLASS B OR C. </p> |

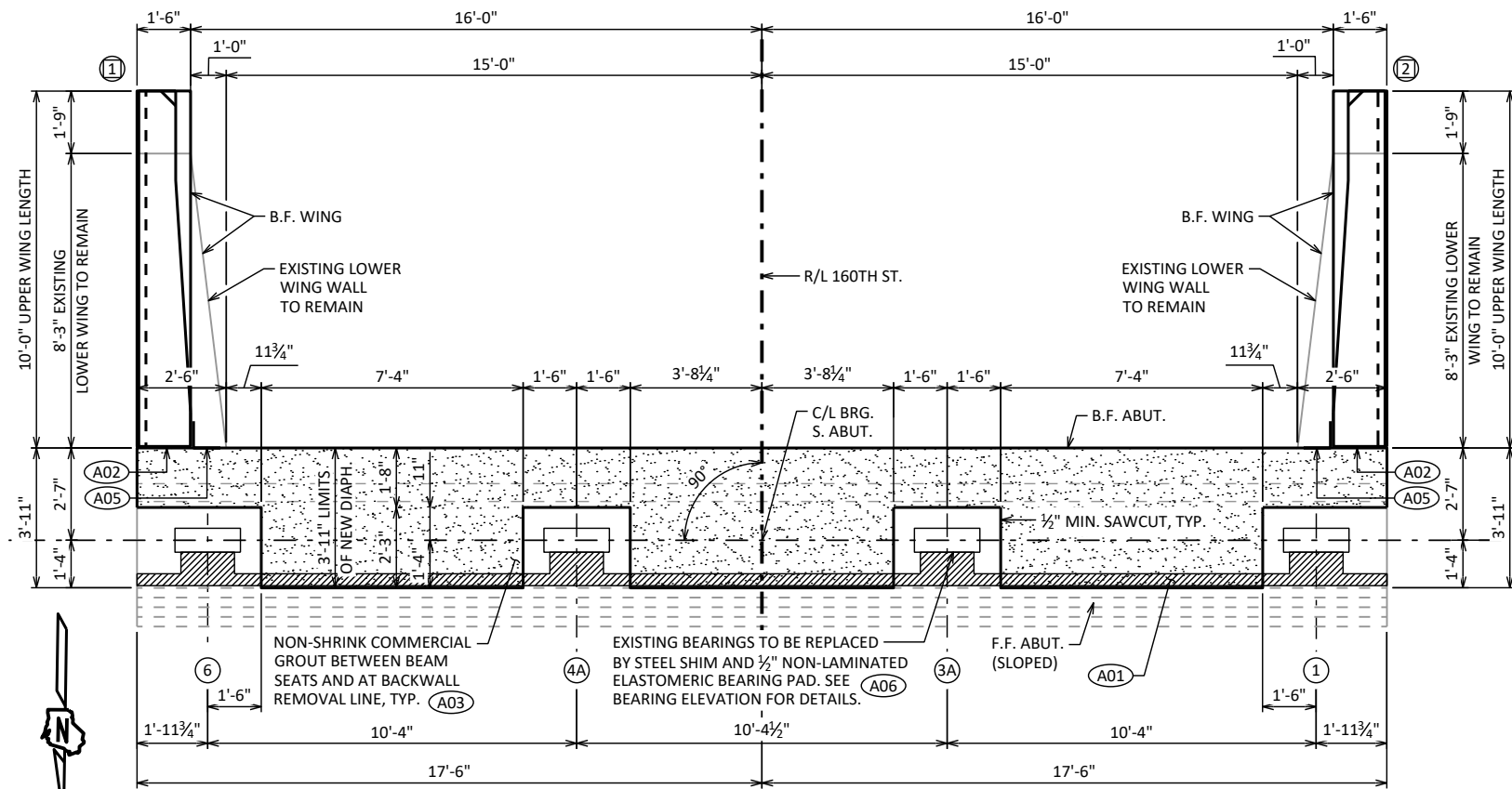
 DENOTES LIMITS OF REMOVAL

|                                                    |             |               |                   |
|----------------------------------------------------|-------------|---------------|-------------------|
|                                                    |             |               |                   |
| NO.                                                | DATE        | REVISION      | BY                |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |             |               |                   |
| <b>STRUCTURE</b>                                   |             | <b>B-9-32</b> |                   |
|                                                    | DRAWN<br>BY | VJD           | PLANS<br>CK'D JRM |
| <b>REMOVAL<br/>DETAILS 2</b>                       |             | SHEET 5 OF 21 |                   |
|                                                    |             |               |                   |

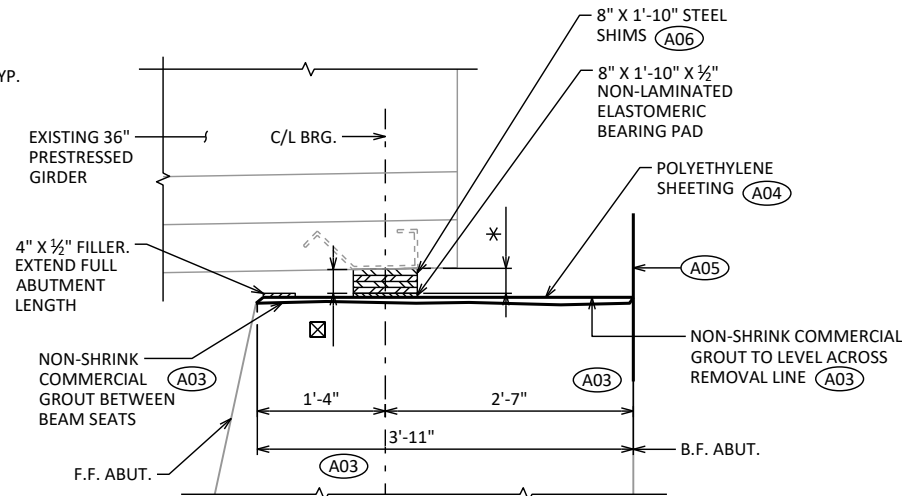


ELEVATION

LOOKING SOUTH AT FRONT FACE

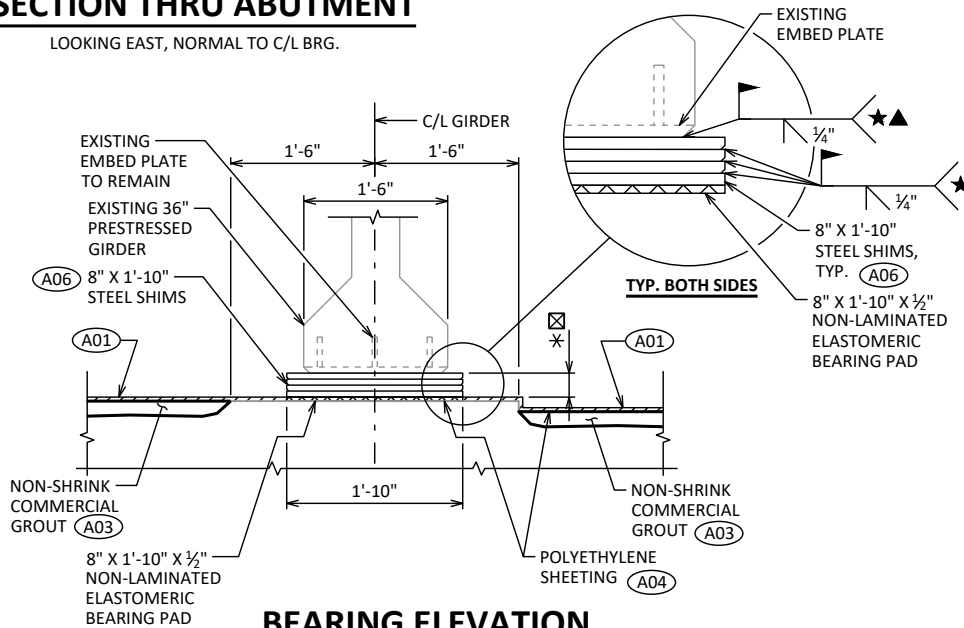


PLAN



SECTION THRU ABUTMENT

LOOKING EAST, NORMAL TO C/L BRG.



BEARING ELEVATION

LEGEND

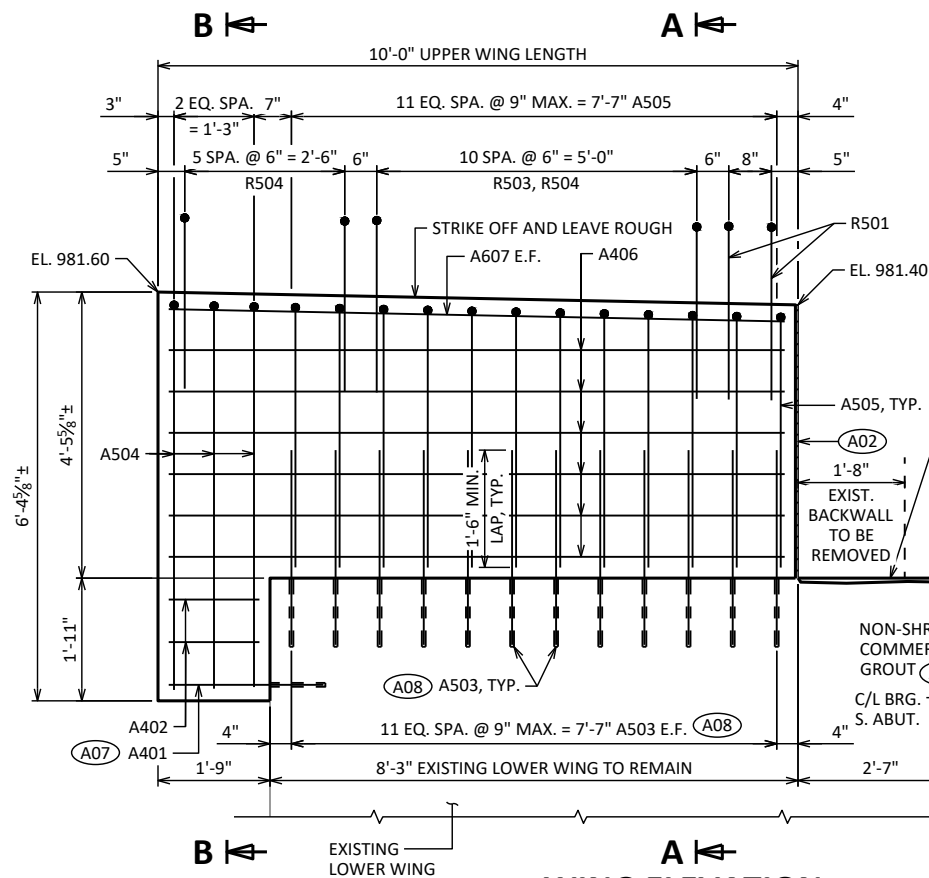
- (X) INDICATES WING NUMBER
- (X) DENOTES EXISTING GIRDER NUMBER
- (A01) 1/2" X 4" FILLER FULL LENGTH OF ABUTMENT AND UNDER GIRDER FLANGES.
- (A02) PLACE 1/2" FILLER BETWEEN NEW UPPER WING WALL AND NEW CONCRETE DIAPHRAGM. EXTEND 1/2" FILLER TO TOP OF PARAPET. PAINT ENDS OF EXPOSED REINFORCEMENT WITH EPOXY. FILLER IS INCLUDED IN WING LENGTH.
- (A03) PLACE A DEPARTMENT APPROVED NON-SHRINK COMMERCIAL GROUT OVER THE WIDTH OF THE ABUTMENT TOP BETWEEN EXISTING BEAM SEATS AND FULL ABUT. WIDTH AT THE BACKWALL REMOVAL LINE PRIOR TO PLACING POLYETHYLENE SHEETS. CHIP OUT CONCRETE AS REQUIRED TO PLACE GROUT TO A MINIMUM THICKNESS OF 1/2". PLACE GROUT AS REQUIRED TO PRODUCE A SMOOTH SLIDING SURFACE FREE OF PROTRUSIONS. REMOVE DELAMINATED OR LOOSE CONCRETE AND CLEAN THE SURFACE PRIOR TO PLACING GROUT. ADDITIONAL SURFACE PREPARATION MAY BE REQUIRED PER THE MANUFACTURER'S INSTRUCTION. MIX, PLACE, AND CURE NON-SHRINK COMMERCIAL GROUT PER THE MANUFACTURER'S RECOMMENDATIONS AND AS DIRECTED BY THE ENGINEER. DO NOT APPLY LOADS TO THE NON-SHRINK COMMERCIAL GROUT UNTIL A MINIMUM COMPRESSIVE STRENGTH OF 3,500 PSI IS ACHIEVED. NON-SHRINK COMMERCIAL GROUT AND SURFACE PREPARATION IS INCIDENTAL TO THE BID ITEM "CONCRETE MASONRY BRIDGES".
- (A04) PLACE MULTIPLE LAYERS OF POLYETHYLENE SHEETS OVER THE ENTIRE ABUTMENT TOP BEFORE PLACING STEEL SHIMS AND BEARING PADS. TOTAL THICKNESS OF SHEETS SHALL BE AT LEAST 0.03".
- (A05) 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS AT BACK FACE.
- (A06) STEEL PLATES AND SHIMS SHALL BE ASTM A709 GRADE 50W. STEEL PLATES AND SHIMS SHALL BE WELDED TO THE EXISTING EMBED PLATES IN THE GIRDER AND WELDED TOGETHER AS SHOWN. STEEL SHIMS INCLUDED IN BID ITEM "BEARING PADS ELASTOMERIC NON-LAMINATED". MINIMUM THICKNESS OF INDIVIDUAL SHIM PLATES SHALL BE 3/4".

- ★ WELD TYPICAL ON SHORT SIDES OF SHIM PLATES/SHIMS. PROVIDE BEVEL ON THE BOTTOM SIDE OF EACH PLATE/SHIM.
- ▲ USE E309 ELECTRODE BETWEEN TOP SHIM AND EXISTING STEEL GIRDER EMBED PLATE.
- \* TOTAL STEEL SHIM HEIGHT AT BACK = 3 1/2"
- ☒ TAPER TOP STEEL SHIM SUCH THAT TOTAL STEEL SHIM HEIGHT AT FRONT = 3"

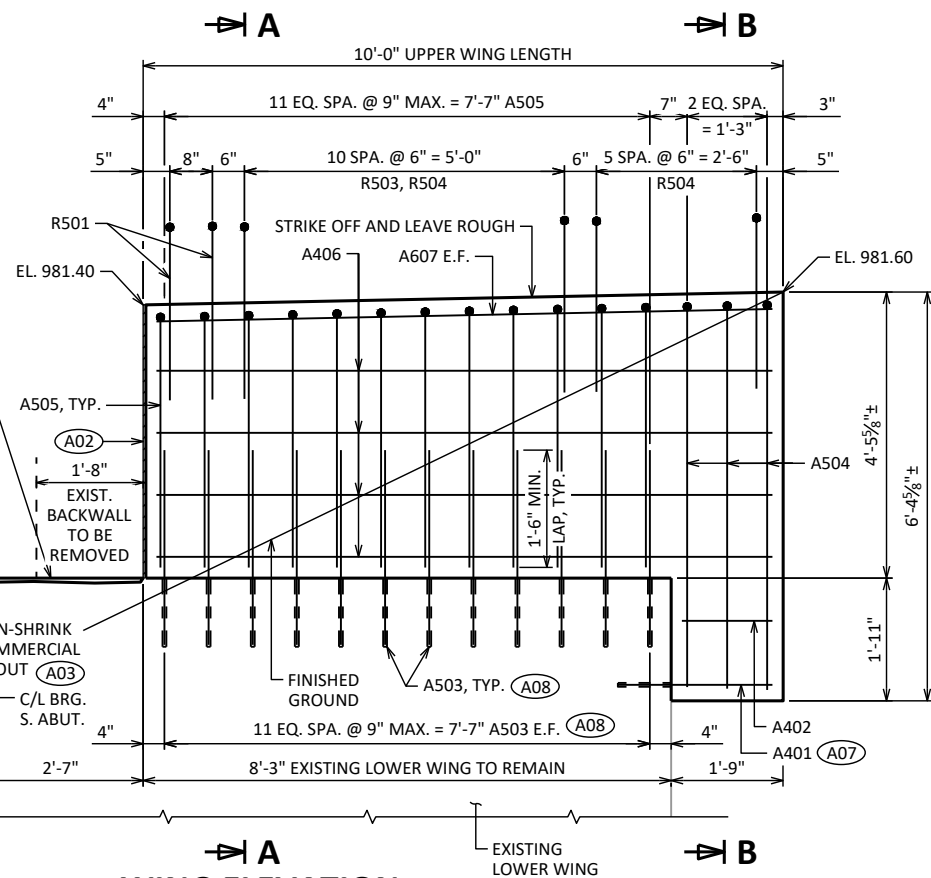
| NO.                                                | DATE | REVISION      | BY             |
|----------------------------------------------------|------|---------------|----------------|
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |               |                |
| STRUCTURE B-9-32                                   |      |               |                |
| DRAWN BY                                           |      | VJD           | PLANS CK'D JRM |
| SOUTH ABUTMENT                                     |      | SHEET 6 OF 21 |                |

**LEGEND**

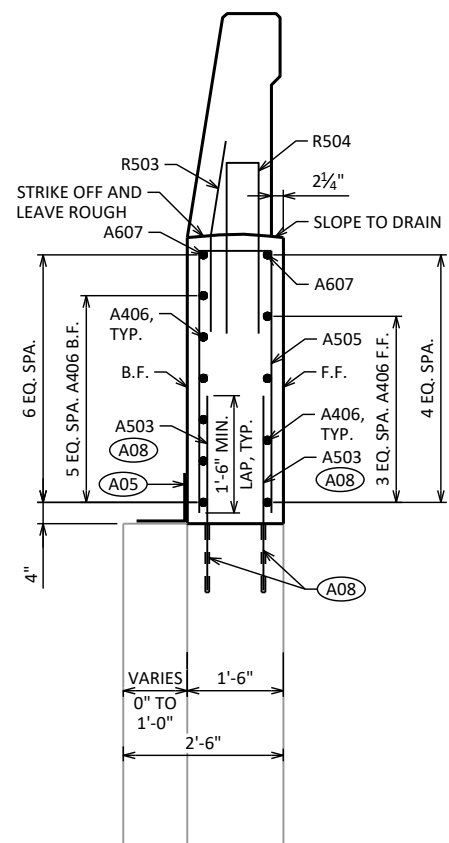
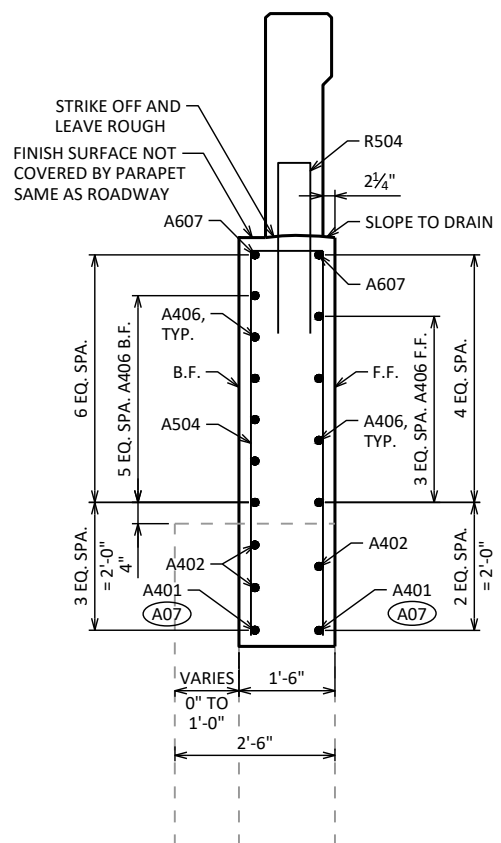
- (A01)  $\frac{1}{2}$ " X 4" FILLER FULL LENGTH OF ABUTMENT AND UNDER GIRDER FLANGES.
- (A02) PLACE  $\frac{1}{2}$ " FILLER BETWEEN NEW UPPER WING WALL AND NEW CONCRETE DIAPHRAGM. EXTEND  $\frac{1}{2}$ " FILLER TO TOP OF PARAPET. PAINT ENDS OF EXPOSED REINFORCEMENT WITH EPOXY. FILLER IS INCLUDED IN WING LENGTH.
- (A03) PLACE A DEPARTMENT APPROVED NON-SHRINK COMMERCIAL GROUT OVER THE WIDTH OF THE ABUTMENT TOP BETWEEN EXISTING BEAM SEATS AND FULL ABUT. WIDTH AT THE BACKWALL REMOVAL LINE PRIOR TO PLACING POLYETHYLENE SHEETS. CHIP OUT CONCRETE AS REQUIRED TO PLACE GROUT TO A MINIMUM THICKNESS OF  $\frac{1}{2}$ ". PLACE GROUT AS REQUIRED TO PRODUCE A SMOOTH SLIDING SURFACE FREE OF PROTRUSIONS. REMOVE DELAMINATED OR LOOSE CONCRETE AND CLEAN THE SURFACE PRIOR TO PLACING GROUT. ADDITIONAL SURFACE PREPARATION MAY BE REQUIRED PER THE MANUFACTURER'S INSTRUCTION. MIX, PLACE, AND CURE NON-SHRINK COMMERCIAL GROUT PER THE MANUFACTURER'S RECOMMENDATIONS AND AS DIRECTED BY THE ENGINEER. DO NOT APPLY LOADS TO THE NON-SHRINK COMMERCIAL GROUT UNTIL A MINIMUM COMPRESSIVE STRENGTH OF 3,500 PSI IS ACHIEVED. NON-SHRINK COMMERCIAL GROUT AND SURFACE PREPARATION IS INCIDENTAL TO THE BID ITEM "CONCRETE MASONRY BRIDGES".
- (A04) PLACE MULTIPLE LAYERS OF POLYETHYLENE SHEETS OVER THE ENTIRE ABUTMENT TOP BEFORE PLACING STEEL SHIMS AND BEARING PADS. TOTAL THICKNESS OF SHEETS SHALL BE AT LEAST 0.03".
- (A05) 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS AT BACK FACE.
- (A06) STEEL PLATES AND SHIMS SHALL BE ASTM A709 GRADE 50W. STEEL PLATES AND SHIMS SHALL BE WELDED TO THE EXISTING EMBED PLATES IN THE GIRDER AND WELDED TOGETHER AS SHOWN. STEEL SHIMS INCLUDED IN BID ITEM "BEARING PADS ELASTOMERIC NON-LAMINATED". MINIMUM THICKNESS OF INDIVIDUAL SHIM PLATES SHALL BE  $\frac{3}{4}$ ". SEE "NORTH ABUTMENT" SHEET FOR BEARING ELEVATION AND DETAILS.
- (A07) ADHESIVE ANCHORS NO. 4 BAR. EMBED 10" INTO EXISTING CONCRETE. SEE DETAILS ON THIS SHEET FOR ADHESIVE ANCHORS NO. 4. BAR LAYOUT.
- (A08) ADHESIVE ANCHORS NO. 5 BAR. EMBED 1'-0" INTO EXISTING CONCRETE. SEE DETAILS ON THIS SHEET FOR ADHESIVE ANCHORS NO. 5 BAR LAYOUT.

**WING ELEVATION**

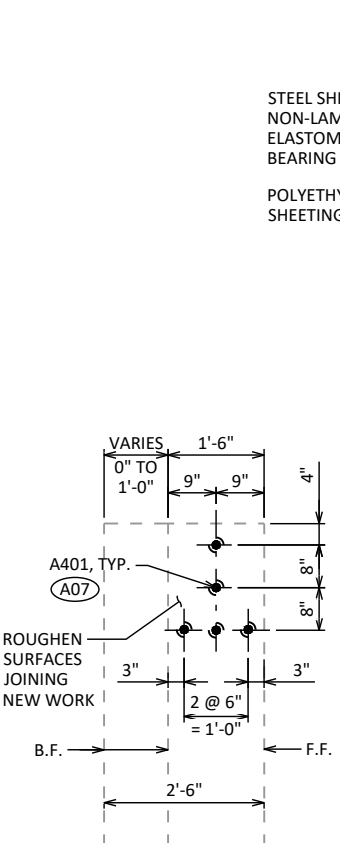
LOOKING AT BACK FACE  
WING 1 AND 2 SIMILAR

**WING ELEVATION**

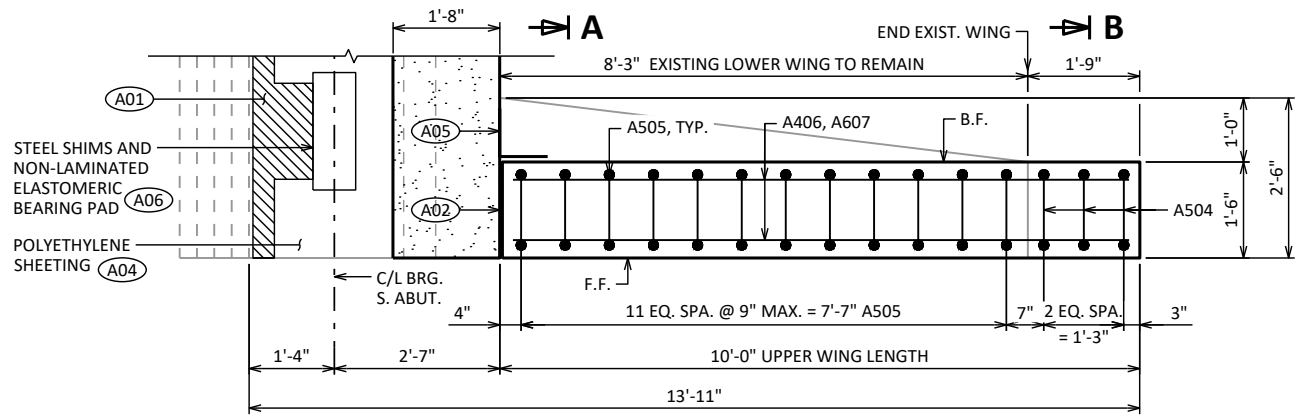
LOOKING AT FRONT FACE  
WING 1 AND 2 SIMILAR

**SECTION A-A****SECTION B-B**

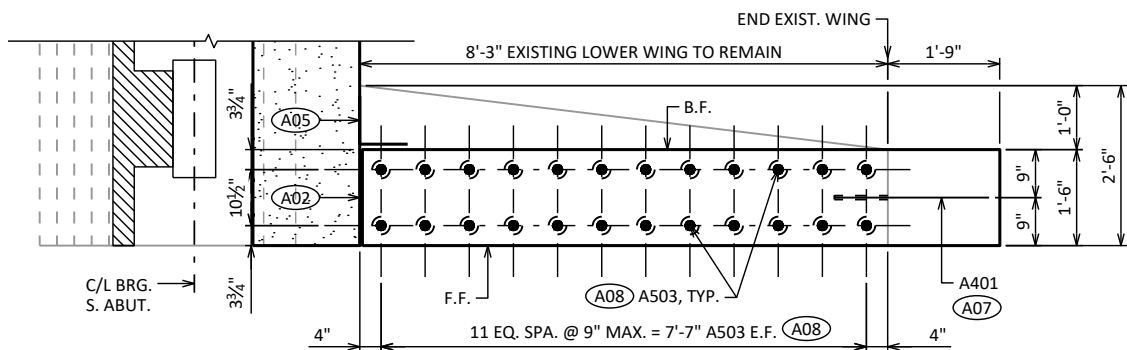
SHOWING REINFORCEMENT

**SECTION B-B**

SHOWING ADHESIVE ANCHOR LAYOUT  
AT END OF EXISTING WING

**WING PLAN**

SHOWING REINFORCEMENT  
WING 1 AND 2 SIMILAR

**WING PLAN**

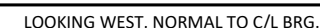
SHOWING ADHESIVE ANCHOR LAYOUT  
WING 1 AND 2 SIMILAR

**NOTES**

SEE BILL OF BARS ON "ABUTMENT DETAILS" SHEET.

FOR PARAPET REINFORCEMENT AND TRANSITION DETAILS, AND PARAPET BILL OF BARS, SEE "SINGLE SLOPE PARAPET 42SS" SHEET.

| NO.                                                | DATE | REVISION      | BY             |
|----------------------------------------------------|------|---------------|----------------|
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |               |                |
| <b>STRUCTURE B-9-32</b>                            |      |               |                |
| DRAWN BY                                           |      | VJD           | PLANS CK'D JRM |
| <b>SOUTH ABUTMENT DETAILS</b>                      |      | SHEET 7 OF 21 |                |



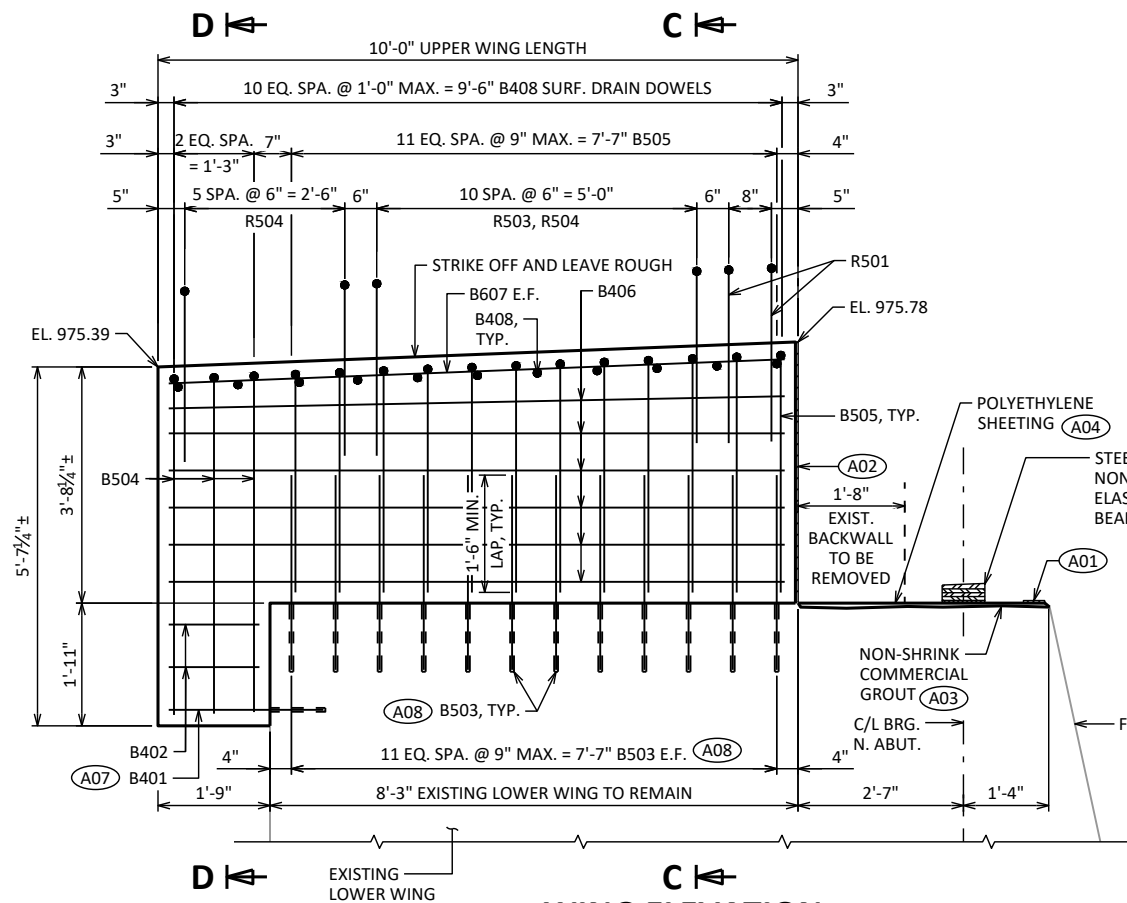
**A06** STEEL PLATES AND SHIMS SHALL BE ASTM A709 GRADE 50W. STEEL PLATES AND SHIMS SHALL BE WELDED TO THE EXISTING EMBED PLATES IN THE GIRDER AND WELDED TOGETHER AS SHOWN. STEEL SHIMS INCLUDED IN BID ITEM "BEARING PADS ELASTOMERIC NON-LAMINATED". MINIMUM THICKNESS OF INDIVIDUAL SHIM PLATES SHALL BE  $\frac{3}{4}$ ".

- ★ WELD TYPICAL ON SHORT SIDES OF SHIM PLATES/SHIMS. PROVIDE BEVEL ON THE BOTTOM SIDE OF EACH PLATE/SHIM.
- ▲ USE E309 ELECTRODE BETWEEN TOP SHIM AND EXISTING STEEL GIRDER EMBED PLATE.
- ✱ TOTAL SHIM HEIGHT AT BACK =  $2\frac{7}{8}$ "
- ☒ TAPER TOP STEEL SHIM SUCH THAT TOTAL STEEL SHIM HEIGHT AT FRONT =  $3\frac{3}{4}$ "

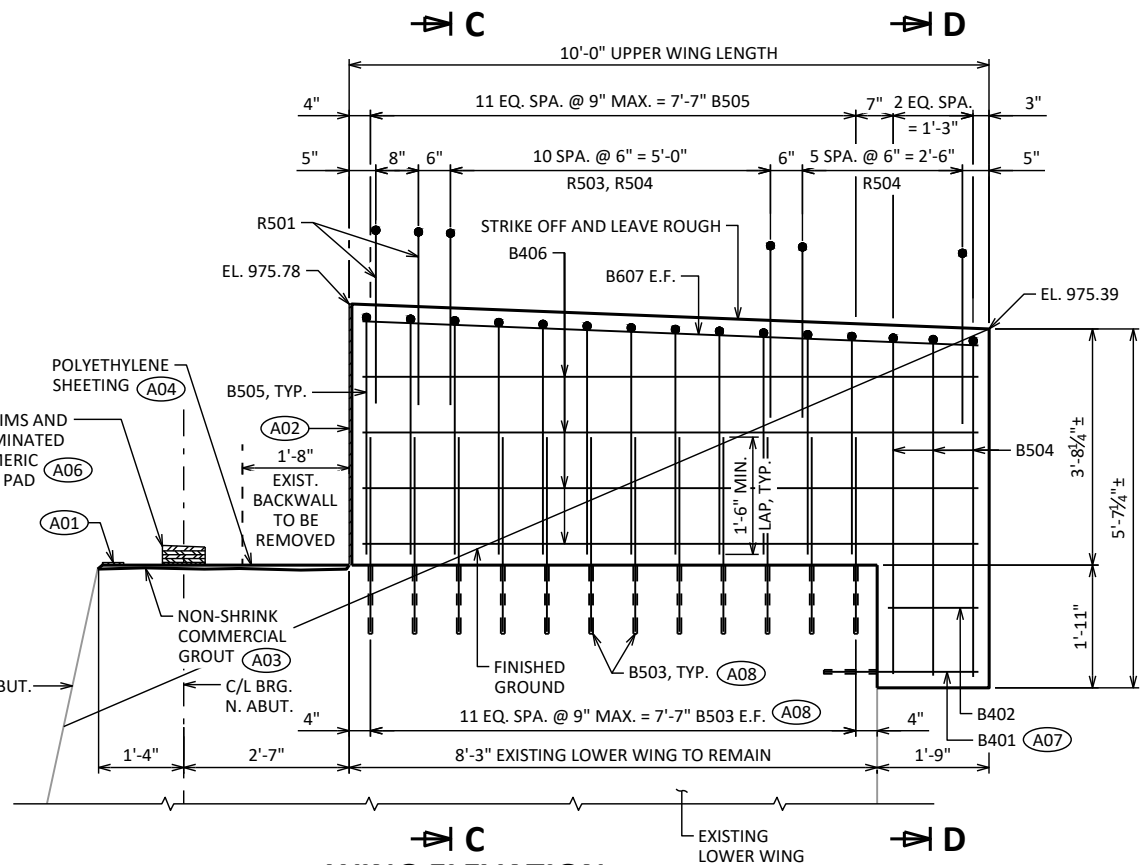
|                                                    |      |               |               |               |     |
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|                                                    |      |               |               |               |     |
| NO.                                                | DATE | REVISION      |               |               | BY  |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |               |               |               |     |
| <b>STRUCTURE</b>                                   |      | <b>B-9-32</b> |               |               |     |
|                                                    |      | DRAWN<br>BY   | VJD           | PLANS<br>CK'D | JRM |
| <b>NORTH<br/>ABUTMENT</b>                          |      |               | SHEET 8 OF 21 |               |     |
|                                                    |      |               |               |               |     |

## LEGEND

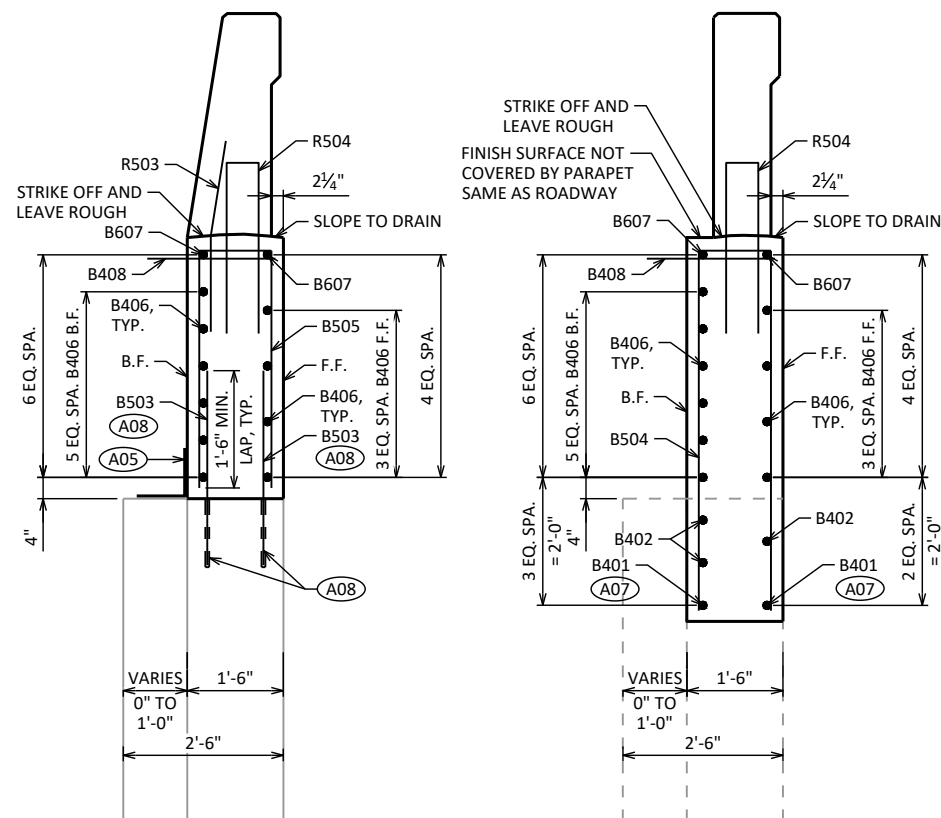
- (A01)  $\frac{1}{2}$ " X 4" FILLER FULL LENGTH OF ABUTMENT AND UNDER GIRDER FLANGES.
- (A02) PLACE  $\frac{1}{2}$ " FILLER BETWEEN NEW UPPER WING WALL AND NEW CONCRETE DIAPHRAGM. EXTEND  $\frac{1}{2}$ " FILLER TO TOP OF PARAPET. PAINT ENDS OF EXPOSED REINFORCEMENT WITH EPOXY. FILLER IS INCLUDED IN WING LENGTH.
- (A03) PLACE A DEPARTMENT APPROVED NON-SHRINK COMMERCIAL GROUT OVER THE WIDTH OF THE ABUTMENT TOP BETWEEN EXISTING BEAM SEATS AND FULL ABUT. WIDTH AT THE BACKWALL REMOVAL LINE PRIOR TO PLACING POLYETHYLENE SHEETS. CHIP OUT CONCRETE AS REQUIRED TO PLACE GROUT TO A MINIMUM THICKNESS OF  $\frac{1}{2}$ ". PLACE GROUT AS REQUIRED TO PRODUCE A SMOOTH SLIDING SURFACE FREE OF PROTRUSIONS. REMOVE DELAMINATED OR LOOSE CONCRETE AND CLEAN THE SURFACE PRIOR TO PLACING GROUT. ADDITIONAL SURFACE PREPARATION MAY BE REQUIRED PER THE MANUFACTURER'S INSTRUCTION. MIX, PLACE, AND CURE NON-SHRINK COMMERCIAL GROUT PER THE MANUFACTURER'S RECOMMENDATIONS AND AS DIRECTED BY THE ENGINEER. DO NOT APPLY LOADS TO THE NON-SHRINK COMMERCIAL GROUT UNTIL A MINIMUM COMPRESSIVE STRENGTH OF 3,500 PSI IS ACHIEVED. NON-SHRINK COMMERCIAL GROUT AND SURFACE PREPARATION IS INCIDENTAL TO THE BID ITEM "CONCRETE MASONRY BRIDGES".
- (A04) PLACE MULTIPLE LAYERS OF POLYETHYLENE SHEETS OVER THE ENTIRE ABUTMENT TOP BEFORE PLACING STEEL SHIMS AND BEARING PADS. TOTAL THICKNESS OF SHEETS SHALL BE AT LEAST 0.03".
- (A05) 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS AT BACK FACE.
- (A06) STEEL PLATES AND SHIMS SHALL BE ASTM A709 GRADE 50W. STEEL PLATES AND SHIMS SHALL BE WELDED TO THE EXISTING EMBED PLATES IN THE GIRDER AND WELDED TOGETHER AS SHOWN. STEEL SHIMS INCLUDED IN BID ITEM "BEARING PADS ELASTOMERIC NON-LAMINATED". MINIMUM THICKNESS OF INDIVIDUAL SHIM PLATES SHALL BE  $\frac{3}{4}$ ". SEE "NORTH ABUTMENT" SHEET FOR BEARING ELEVATION AND DETAILS.
- (A07) ADHESIVE ANCHORS NO. 4 BAR. EMBED 10" INTO EXISTING CONCRETE. SEE DETAILS ON THIS SHEET FOR ADHESIVE ANCHORS NO. 4. BAR LAYOUT.
- (A08) ADHESIVE ANCHORS NO. 5 BAR. EMBED 1'-0" INTO EXISTING CONCRETE. SEE DETAILS ON THIS SHEET FOR ADHESIVE ANCHORS NO. 5 BAR LAYOUT.



## WING ELEVATION

LOOKING AT BACK FACE  
WING 3 AND 4 SIMILAR

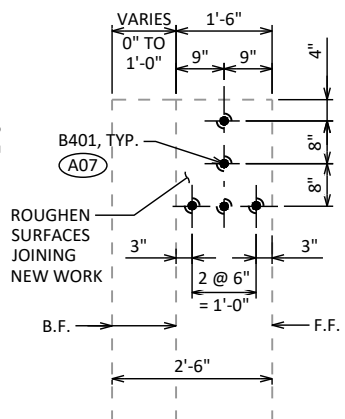
## WING ELEVATION

LOOKING AT FRONT FACE  
WING 3 AND 4 SIMILAR

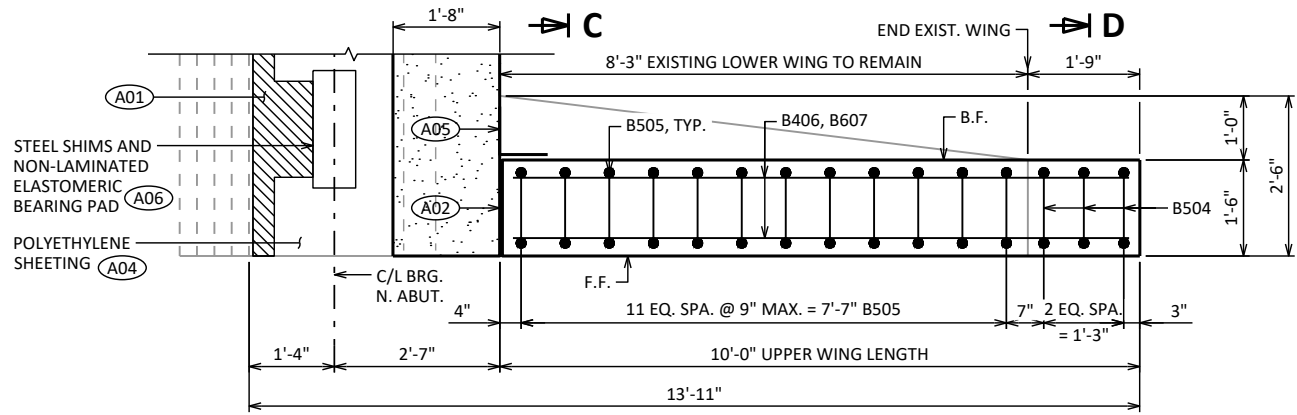
## SECTION C-C

## SECTION D-D

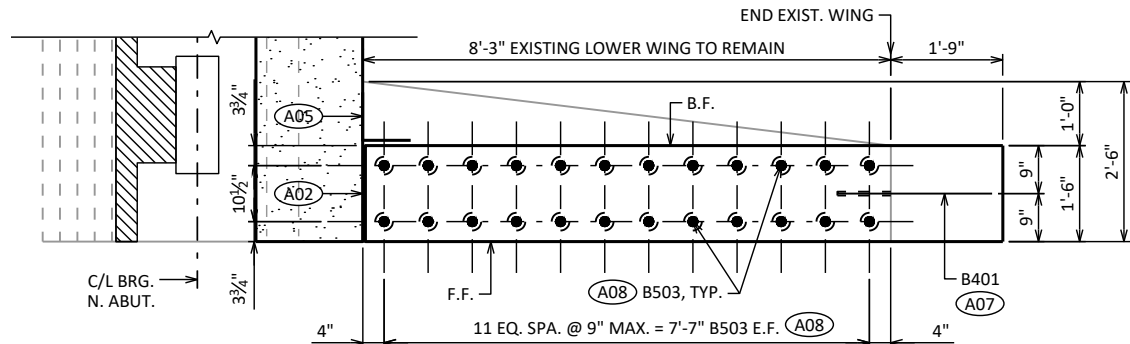
SHOWING REINFORCEMENT



## SECTION D-D

SHOWING ADHESIVE ANCHOR LAYOUT  
AT END OF EXISTING WING

## WING PLAN

SHOWING REINFORCEMENT  
WING 3 AND 4 SIMILAR

## WING PLAN

SHOWING ADHESIVE ANCHOR LAYOUT  
WING 3 AND 4 SIMILAR

## NOTES

SEE BILL OF BARS ON "ABUTMENT DETAILS" SHEET.

FOR PARAPET REINFORCEMENT AND TRANSITION DETAILS, AND PARAPET BILL OF BARS, SEE "SINGLE SLOPE PARAPET 42SS" SHEET.

| NO.                                                | DATE | REVISION | BY             |
|----------------------------------------------------|------|----------|----------------|
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |          |                |
| STRUCTURE B-9-32                                   |      |          |                |
| DRAWN BY                                           |      | VJD      | PLANS CK'D JRM |
| NORTH ABUTMENT DETAILS                             |      |          | SHEET 9 OF 21  |

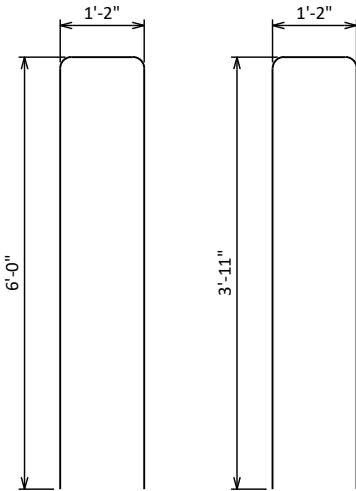


BILL OF BARS - SOUTH ABUTMENT

UNCOATED: 0 LB  
COATED: 680 LB

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

| BAR MARK | COAT | NO. REQ'D. | LENGTH  | BENT | BAR SERIES | LOCATION                                |
|----------|------|------------|---------|------|------------|-----------------------------------------|
| A401     | X    | 10         | 2'-5"   |      |            | WINGS 1 & 2 - HORIZ. - ADHESIVE ANCHORS |
| A402     | X    | 6          | 1'-5"   |      |            | WINGS 1 & 2 - HORIZ.                    |
| A503     | X    | 48         | 3'-3"   |      |            | WINGS 1 & 2 - VERT. - ADHESIVE ANCHORS  |
| A504     | X    | 6          | 12'-11" | X    |            | WINGS 1 & 2 - VERT.                     |
| A505     | X    | 24         | 8'-9"   | X    |            | WINGS 1 & 2 - VERT                      |
| A406     | X    | 20         | 9'-7"   |      |            | WINGS 1 & 2 - HORIZ. - EACH FACE        |
| A607     | X    | 4          | 9'-7"   |      |            | WINGS 1 & 2 - HORIZ. - EACH FACE - TOP  |



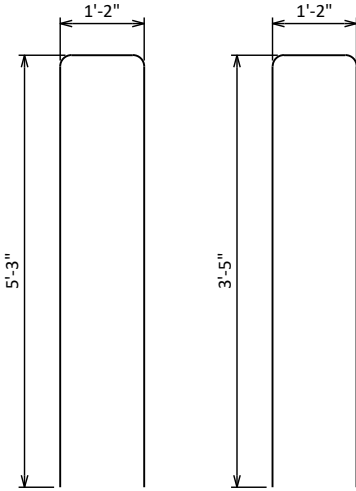
A504A505

BILL OF BARS - NORTH ABUTMENT

UNCOATED: 0 LB  
COATED: 680 LB

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

| BAR MARK | COAT | NO. REQ'D. | LENGTH | BENT | BAR SERIES | LOCATION                                |
|----------|------|------------|--------|------|------------|-----------------------------------------|
| B401     | X    | 10         | 2'-5"  |      |            | WINGS 3 & 4 - HORIZ. - ADHESIVE ANCHORS |
| B402     | X    | 6          | 1'-5"  |      |            | WINGS 3 & 4 - HORIZ.                    |
| B503     | X    | 48         | 3'-5"  |      |            | WINGS 3 & 4 - VERT. - ADHESIVE ANCHORS  |
| B504     | X    | 6          | 11'-5" | X    |            | WINGS 3 & 4 - VERT.                     |
| B505     | X    | 24         | 7'-9"  | X    |            | WINGS 3 & 4 - VERT.                     |
| B406     | X    | 20         | 9'-7"  |      |            | WINGS 3 & 4 - HORIZ. - EACH FACE        |
| B607     | X    | 4          | 9'-7"  |      |            | WINGS 3 & 4 - HORIZ. - EACH FACE - TOP  |
| B408     | X    | 22         | 2'-0"  |      |            | WINGS 3 & 4 - SURF. DRAIN DOWELS        |

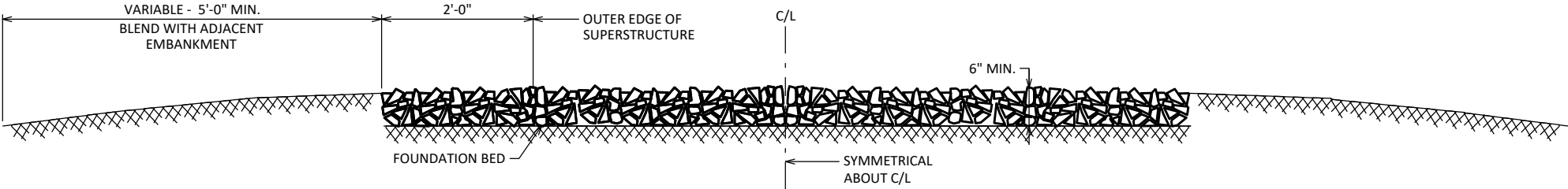


B504B505

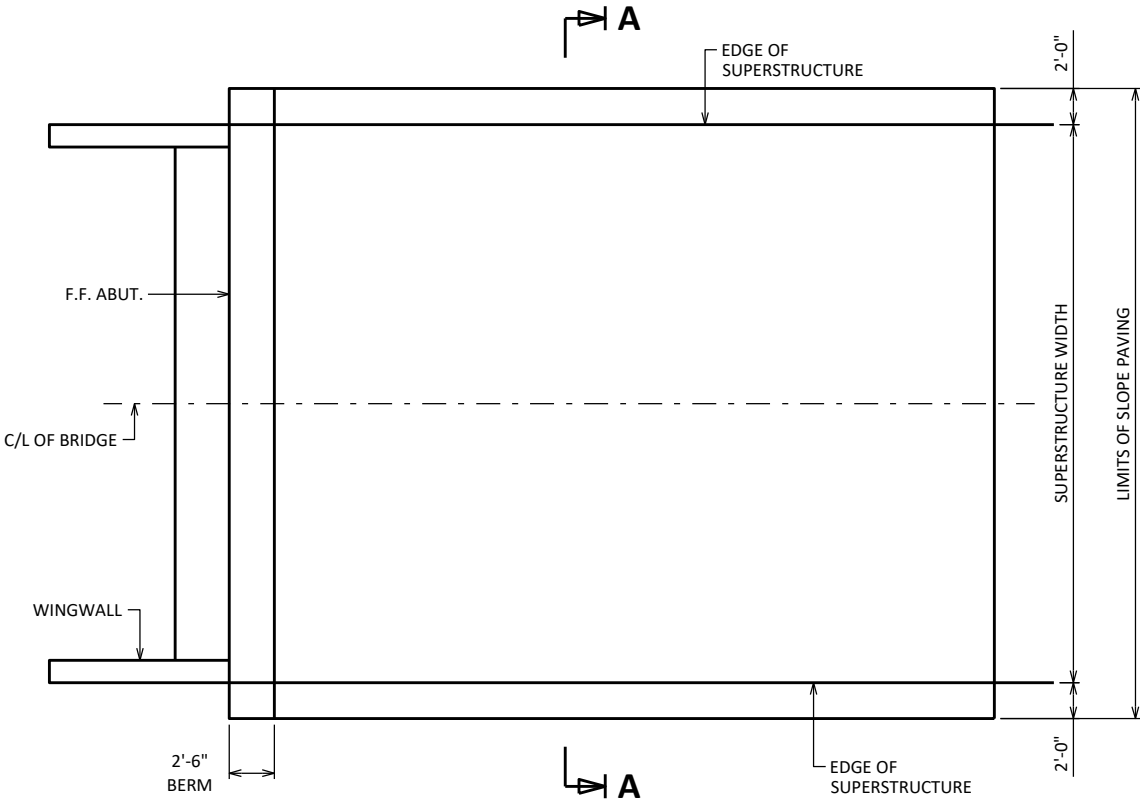
STATE PROJECT NUMBER

1050-01-83

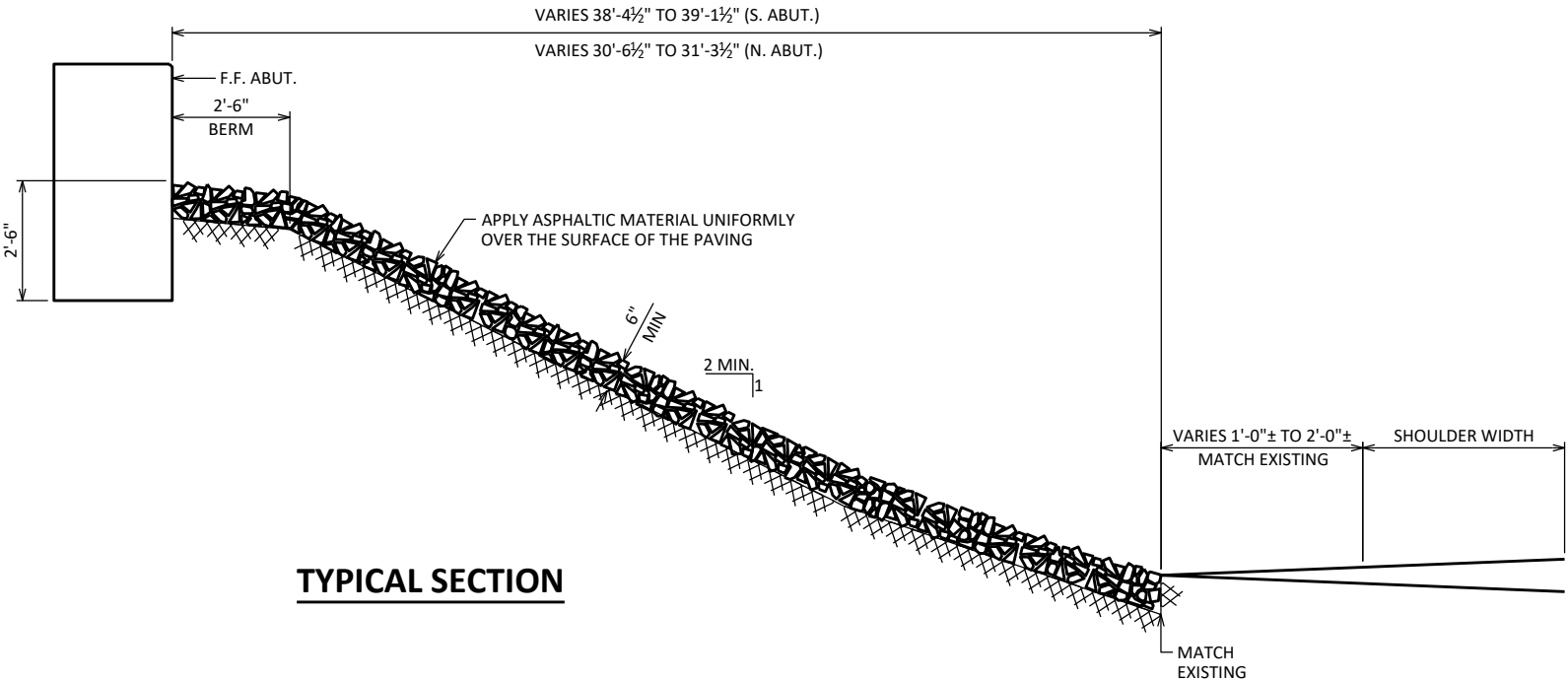
|                                                    |      |                |                |
|----------------------------------------------------|------|----------------|----------------|
|                                                    |      |                |                |
| NO.                                                | DATE | REVISION       | BY             |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |                |                |
| STRUCTURE B-9-32                                   |      |                |                |
| DRAWN BY                                           |      | VJD            | PLANS CK'D JRM |
| ABUTMENT<br>BILL OF BARS                           |      | SHEET 10 OF 21 |                |
|                                                    |      |                |                |



SECTION A-A



PLAN



TYPICAL SECTION

NOTES

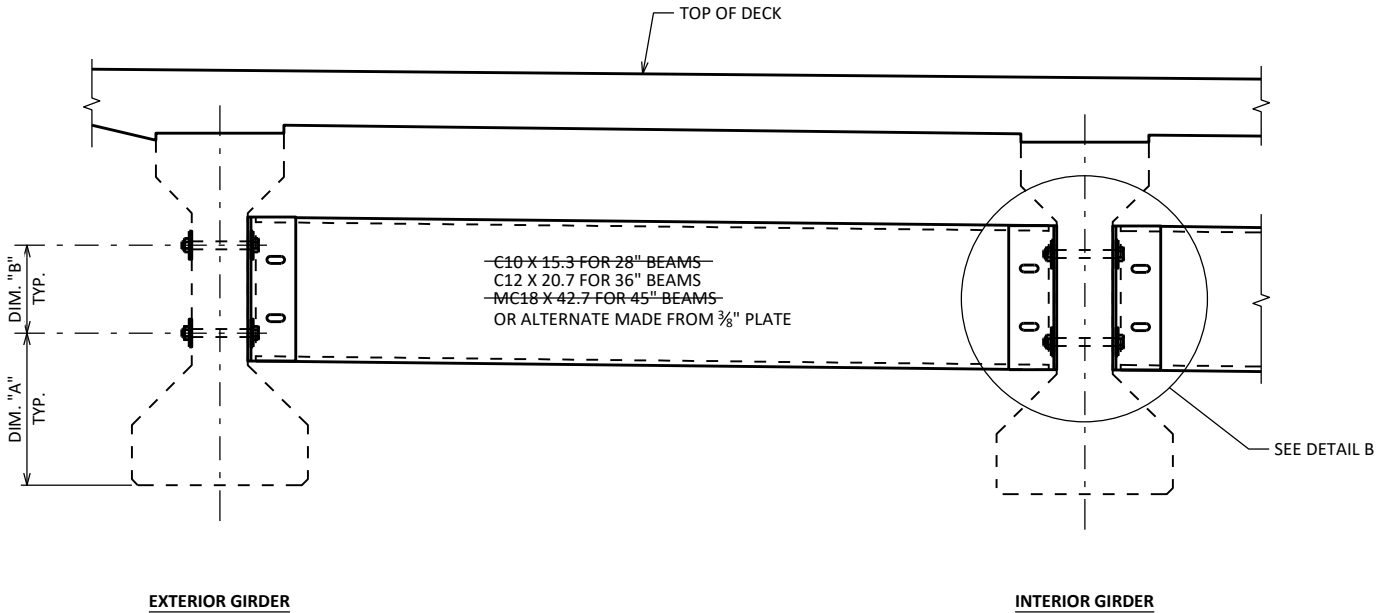
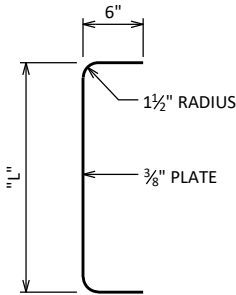
BID ITEM SHALL BE "SLOPE PAVING CRUSHED AGGREGATE".  
WOOD FORMS MAY BE LEFT IN PLACE WHEN OF A QUALITY ACCEPTABLE TO THE ENGINEER.

|                                                    |      |                |                |
|----------------------------------------------------|------|----------------|----------------|
| NO.                                                | DATE | REVISION       | BY             |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |                |                |
| STRUCTURE B-9-32                                   |      |                |                |
| DRAWN BY                                           |      | VJD            | PLANS CK'D JRM |
| SLOPE PAVING<br>(CRUSHED AGGREGATE)                |      | SHEET 11 OF 21 |                |



TABLE

| GIRDER HEIGHT | DIM. "A"                           | DIM. "B"                           | DIM. "L"                           | * DIM. "X"                      |
|---------------|------------------------------------|------------------------------------|------------------------------------|---------------------------------|
| 28"           | 1'-0 <sup>7</sup> / <sub>8</sub> " | 5 <sup>7</sup> / <sub>8</sub> "    | 9 <sup>1</sup> / <sub>2</sub> "    | 2 <sup>1</sup> / <sub>4</sub> " |
| 36"           | 1'-2 <sup>7</sup> / <sub>8</sub> " | 9 <sup>7</sup> / <sub>8</sub> "    | 1'-1 <sup>1</sup> / <sub>2</sub> " | 3 <sup>3</sup> / <sub>4</sub> " |
| 45"           | 1'-5 <sup>3</sup> / <sub>8</sub> " | 1'-1 <sup>1</sup> / <sub>8</sub> " | 1'-5 <sup>1</sup> / <sub>2</sub> " | 2 <sup>3</sup> / <sub>4</sub> " |
| 45W"          | 1'-9 <sup>1</sup> / <sub>8</sub> " | 8 <sup>7</sup> / <sub>8</sub> "    | 1'-0 <sup>1</sup> / <sub>2</sub> " | 2 <sup>3</sup> / <sub>4</sub> " |
| 54"           | 1'-7 <sup>1</sup> / <sub>8</sub> " | 1'-5 <sup>1</sup> / <sub>8</sub> " | 1'-9 <sup>1</sup> / <sub>2</sub> " | 4 <sup>1</sup> / <sub>4</sub> " |
| 54W"          | 1'-9 <sup>1</sup> / <sub>8</sub> " | 1'-5 <sup>7</sup> / <sub>8</sub> " | 1'-9 <sup>1</sup> / <sub>2</sub> " | 4 <sup>1</sup> / <sub>4</sub> " |



NOTES

ALL DIAPHRAGM MATERIAL NOT EMBEDDED IN THE CONCRETE GIRDER SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "STEEL DIAPHRAGMS B-9-32", EACH.

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36.

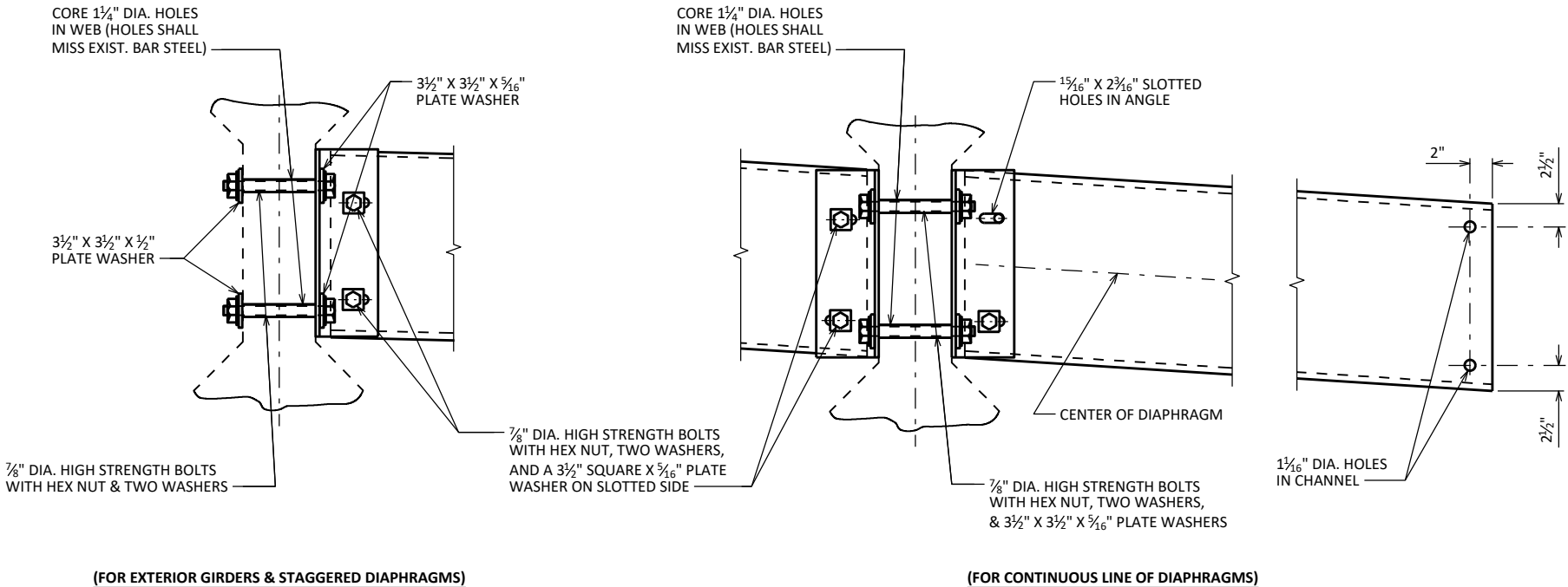
ALL DIAPHRAGM MATERIAL INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION.

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

SECTION THRU ALTERNATE DIAPHRAGM

\*DIM "X" = 2<sup>1</sup>/<sub>2</sub>" FOR ALTERNATE PLATE DIAPHRAGM

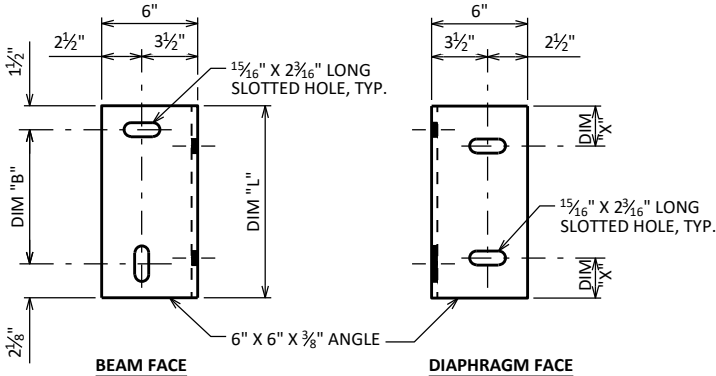
PART TRANSVERSE SECTION AT DIAPHRAGM



(FOR EXTERIOR GIRDERS & STAGGERED DIAPHRAGMS)

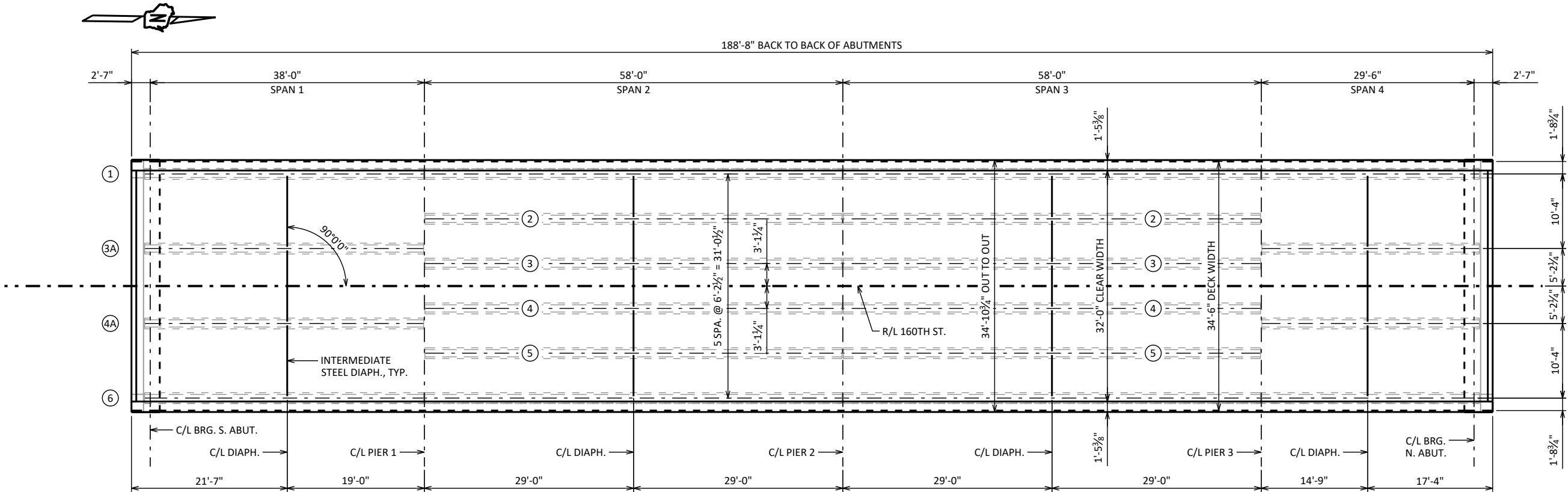
(FOR CONTINUOUS LINE OF DIAPHRAGMS)

DETAIL B

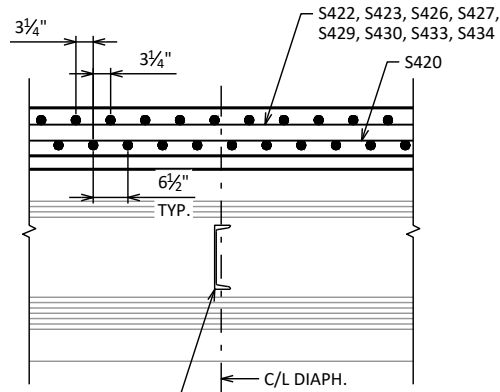


DIAPHRAGM SUPPORT

|                                                    |      |                |                |
|----------------------------------------------------|------|----------------|----------------|
| NO.                                                | DATE | REVISION       | BY             |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |                |                |
| STRUCTURE B-9-32                                   |      |                |                |
| DRAWN BY                                           |      | VJD            | PLANS CK'D JRM |
| STEEL DIAPHRAGM                                    |      | SHEET 12 OF 21 |                |



FRAMING PLAN

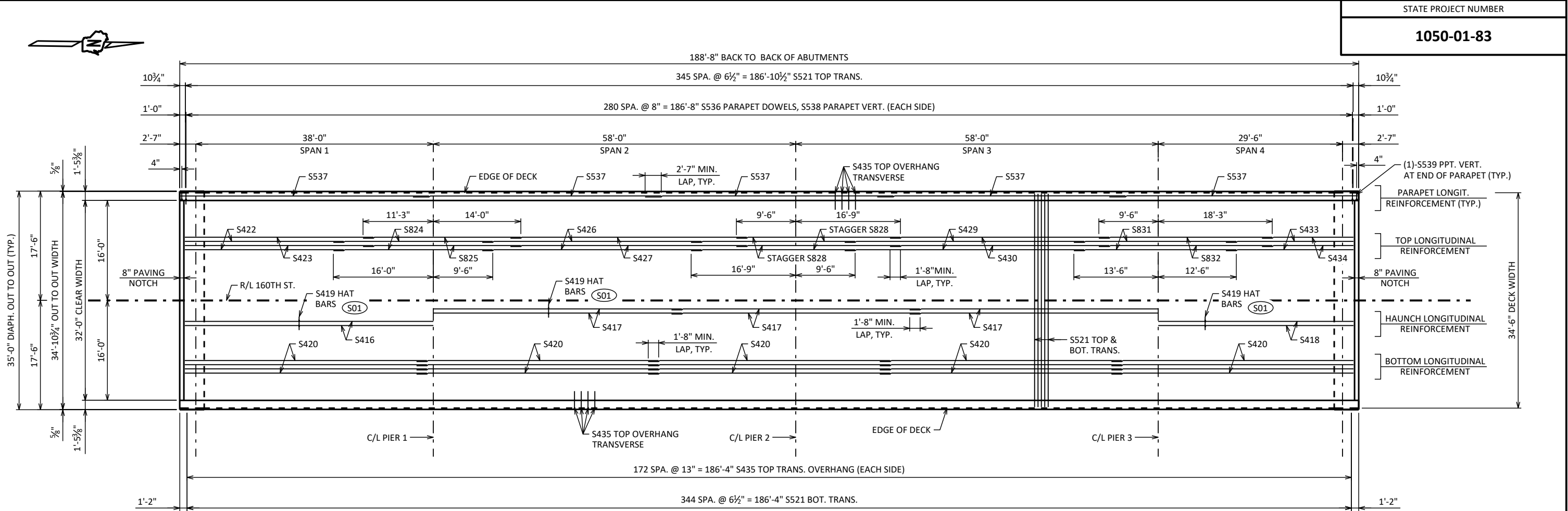


INTERMEDIATE STEEL DIAPHRAGM  
TO REPLACE EXISTING CONCRETE  
DIAPHRAGMS. SEE "STEEL DIAPHRAGM"  
SHEET FOR DETAILS.

LONGIT. SECTION

TYP. AT INTERMEDIATE DIAPHRAGMS

|                                                    |      |                |                      |
|----------------------------------------------------|------|----------------|----------------------|
| NO.                                                | DATE | REVISION       | BY                   |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |                |                      |
| STRUCTURE B-9-32                                   |      |                |                      |
| DRAWN<br>BY                                        |      | VJD            | PLANS<br>CK'D<br>JRM |
| FRAMING<br>PLAN                                    |      | SHEET 13 OF 21 |                      |



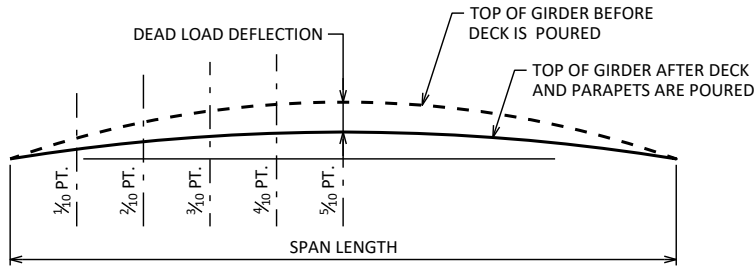
STATE PROJECT NUMBER

1050-01-83

TOP OF DECK ELEVATIONS

| LOCATION        | C/L BRG. S. ABUT. | SPAN 1 |        |        |        |        |        |        |        |        | C/L PIER 1 | SPAN 2 |        |        |        |        |        |        |        |        | C/L PIER 2 |
|-----------------|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------------|
|                 |                   | 0.1    | 0.2    | 0.3    | 0.4    | 0.5    | 0.6    | 0.7    | 0.8    | 0.9    |            | 0.1    | 0.2    | 0.3    | 0.4    | 0.5    | 0.6    | 0.7    | 0.8    | 0.9    |            |
| W. FLOW LINE    | 981.34            | 981.26 | 981.18 | 981.10 | 981.01 | 980.93 | 980.84 | 980.75 | 980.66 | 980.57 | 980.48     | 980.33 | 980.19 | 980.04 | 979.88 | 979.73 | 979.56 | 979.40 | 979.23 | 979.06 | 978.89     |
| GIRDER 1        | 981.35            | 981.27 | 981.19 | 981.11 | 981.02 | 980.94 | 980.85 | 980.76 | 980.67 | 980.58 | 980.49     | 980.34 | 980.20 | 980.05 | 979.89 | 979.73 | 979.57 | 979.41 | 979.24 | 979.07 | 978.90     |
| GIRDER 2        | ---               | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | 980.61     | 980.47 | 980.32 | 980.17 | 980.02 | 979.86 | 979.70 | 979.53 | 979.37 | 979.20 | 979.02     |
| GIRDER 3        | ---               | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | 980.74     | 980.59 | 980.44 | 980.29 | 980.14 | 979.98 | 979.82 | 979.66 | 979.49 | 979.32 | 979.15     |
| GIRDER 3A       | 981.56            | 981.48 | 981.40 | 981.31 | 981.23 | 981.14 | 981.06 | 980.97 | 980.88 | 980.79 | 980.69     | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---        |
| REF. LINE/CROWN | 981.66            | 981.58 | 981.50 | 981.42 | 981.33 | 981.25 | 981.16 | 981.07 | 980.98 | 980.89 | 980.80     | 980.65 | 980.51 | 980.36 | 980.20 | 980.05 | 979.88 | 979.72 | 979.55 | 979.38 | 979.21     |
| GIRDER 4A       | 981.56            | 981.48 | 981.40 | 981.31 | 981.23 | 981.14 | 981.06 | 980.97 | 980.88 | 980.79 | 980.69     | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---        |
| GIRDER 4        | ---               | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | 980.74     | 980.59 | 980.44 | 980.29 | 980.14 | 979.98 | 979.82 | 979.66 | 979.49 | 979.32 | 979.15     |
| GIRDR 5         | ---               | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | 980.61     | 980.47 | 980.32 | 980.17 | 980.02 | 979.86 | 979.70 | 979.53 | 979.37 | 979.20 | 979.02     |
| GIRDER 6        | 981.35            | 981.27 | 981.19 | 981.11 | 981.02 | 980.94 | 980.85 | 980.76 | 980.67 | 980.58 | 980.49     | 980.34 | 980.20 | 980.05 | 979.89 | 979.73 | 979.57 | 979.41 | 979.24 | 979.07 | 978.90     |
| E. FLOW LINE    | 981.34            | 981.26 | 981.18 | 981.10 | 981.01 | 980.93 | 980.84 | 980.75 | 980.66 | 980.57 | 980.48     | 980.33 | 980.19 | 980.04 | 979.88 | 979.73 | 979.56 | 979.40 | 979.23 | 979.06 | 978.89     |

| LOCATION        | C/L PIER 2 | SPAN 3 |        |        |        |        |        |        |        |        | C/L PIER 3 | SPAN 4 |        |        |        |        |        |        |        |        | C/L BRG. N. ABUT. |
|-----------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------------|
|                 |            | 0.1    | 0.2    | 0.3    | 0.4    | 0.5    | 0.6    | 0.7    | 0.8    | 0.9    |            | 0.1    | 0.2    | 0.3    | 0.4    | 0.5    | 0.6    | 0.7    | 0.8    | 0.9    |                   |
| W. FLOW LINE    | 978.89     | 978.71 | 978.53 | 978.35 | 978.16 | 977.98 | 977.78 | 977.59 | 977.39 | 977.18 | 976.98     | 976.87 | 976.77 | 976.66 | 976.55 | 976.44 | 976.33 | 976.22 | 976.11 | 976.00 | 975.88            |
| GIRDER 1        | 978.90     | 978.72 | 978.54 | 978.36 | 978.17 | 977.98 | 977.79 | 977.60 | 977.40 | 977.19 | 976.99     | 976.88 | 976.78 | 976.67 | 976.56 | 976.45 | 976.34 | 976.23 | 976.12 | 976.00 | 975.89            |
| GIRDER 2        | 979.02     | 978.85 | 978.67 | 978.48 | 978.30 | 978.11 | 977.92 | 977.72 | 977.52 | 977.32 | 977.11     | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---               |
| GIRDER 3        | 979.15     | 978.97 | 978.79 | 978.61 | 978.42 | 978.23 | 978.04 | 977.84 | 977.65 | 977.44 | 977.24     | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---               |
| GIRDER 3A       | ---        | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | 977.20     | 977.09 | 976.98 | 976.87 | 976.77 | 976.66 | 976.55 | 976.44 | 976.32 | 976.21 | 976.10            |
| REF. LINE/CROWN | 979.21     | 979.03 | 978.85 | 978.67 | 978.48 | 978.30 | 978.10 | 977.91 | 977.71 | 977.50 | 977.30     | 977.19 | 977.09 | 976.98 | 976.87 | 976.76 | 976.65 | 976.54 | 976.43 | 976.32 | 976.20            |
| GIRDER 4A       | ---        | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | 977.20     | 977.09 | 976.98 | 976.87 | 976.77 | 976.66 | 976.55 | 976.44 | 976.32 | 976.21 | 976.10            |
| GIRDER 4        | 979.15     | 978.97 | 978.79 | 978.61 | 978.42 | 978.23 | 978.04 | 977.84 | 977.65 | 977.44 | 977.24     | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---               |
| GIRDR 5         | 979.02     | 978.85 | 978.67 | 978.48 | 978.30 | 978.11 | 977.92 | 977.72 | 977.52 | 977.32 | 977.11     | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---    | ---               |
| GIRDER 6        | 978.90     | 978.72 | 978.54 | 978.36 | 978.17 | 977.98 | 977.79 | 977.60 | 977.40 | 977.19 | 976.99     | 976.88 | 976.78 | 976.67 | 976.56 | 976.45 | 976.34 | 976.23 | 976.12 | 976.00 | 975.89            |
| E. FLOW LINE    | 978.89     | 978.71 | 978.53 | 978.35 | 978.16 | 977.98 | 977.78 | 977.59 | 977.39 | 977.18 | 976.98     | 976.87 | 976.77 | 976.66 | 976.55 | 976.44 | 976.33 | 976.22 | 976.11 | 976.00 | 975.88            |



DEAD LOAD DEFLECTION DIAGRAM

NOTE: DEAD LOAD DEFLECTIONS ARE THEORETICAL AND MAY VARY FROM ACTUAL FIELD CONDITIONS

TO DETERMINE 'T', ELEVATION OF TOP OF GIRDERS AT C/L OF SUBSTRUCTURE UNITS AND 1/10 POINTS OF EACH SPAN SHALL BE TAKEN. THEN FOLLOW THIS PROCESS:

NOTE: AN AVERAGE HAUNCH ('T') OF 2.8" WAS USED IN THE QUANTITY OF "CONCRETE MASONRY BRIDGES"

TOP OF DECK ELEV. AT FINAL GRADE  
- TOP GIRDER ELEVATION  
+ DEAD LOAD DEFLECTION  
- DECK THICKNESS

= HAUNCH HEIGHT 'T'

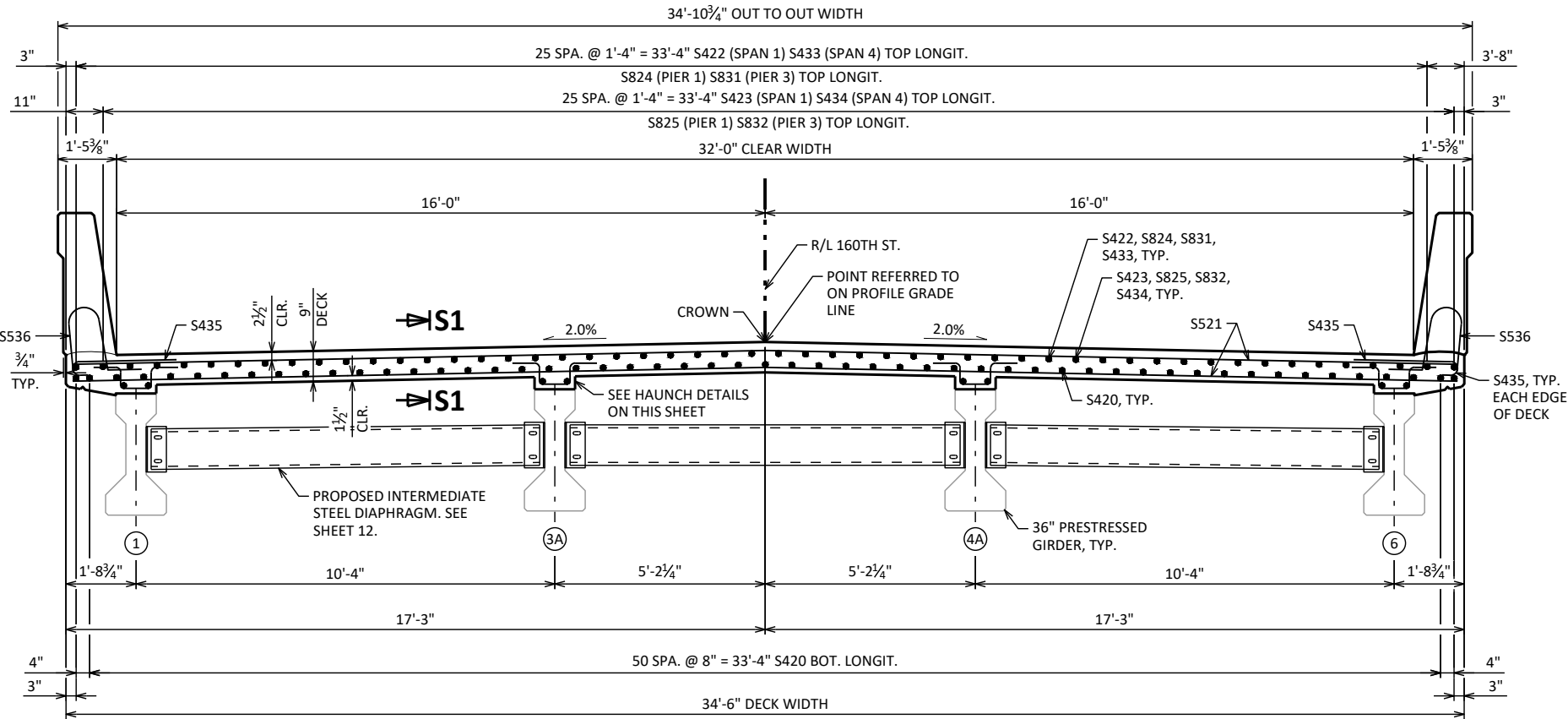
LEGEND

(S01) PLACE WITH EXISTING SHEAR STEEL (SPACING VARIES 3 1/2" TO 1'-9") OR 1'-0" MAX. SPACING.

| SPAN | GIRDER | DEAD LOAD DEFLECTION (IN.) |      |      |      |      |
|------|--------|----------------------------|------|------|------|------|
|      |        | 1/10                       | 2/10 | 3/10 | 4/10 | 5/10 |
| 1    | 1,6    | 0.1                        | 0.1  | 0.1  | 0.2  | 0.2  |
| 1    | 3A,4A  | 0.1                        | 0.1  | 0.2  | 0.2  | 0.2  |
| 2    | 1,6    | 0.2                        | 0.3  | 0.4  | 0.5  | 0.6  |
| 2    | 2-5    | 0.2                        | 0.4  | 0.5  | 0.6  | 0.7  |
| 3    | 1,6    | 0.2                        | 0.3  | 0.4  | 0.5  | 0.6  |
| 3    | 2-5    | 0.2                        | 0.4  | 0.5  | 0.6  | 0.7  |
| 4    | 1,6    | 0.0                        | 0.0  | 0.1  | 0.1  | 0.1  |
| 4    | 3A,4A  | 0.0                        | 0.1  | 0.1  | 0.1  | 0.1  |

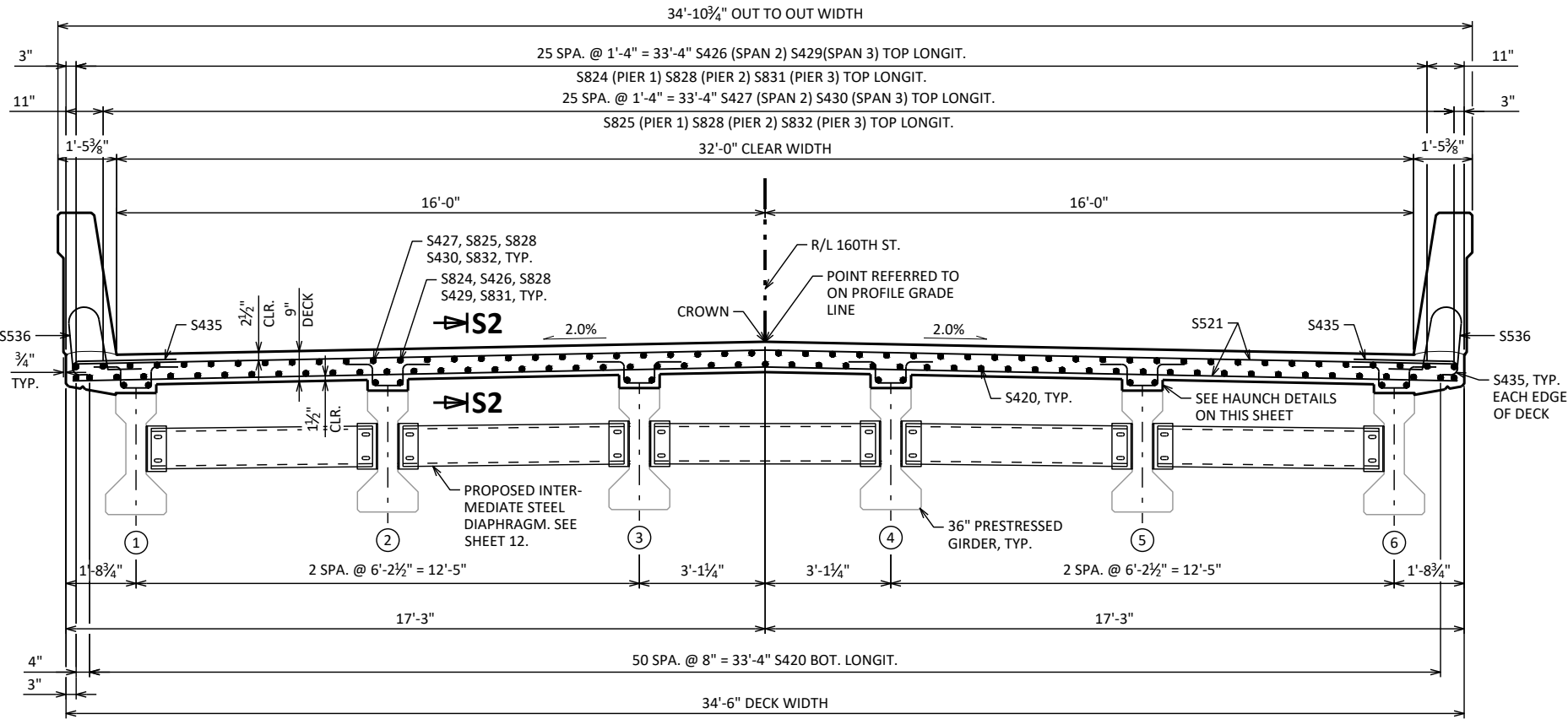
DEFLECTION IS SYMMETRICAL ABOUT THE 1/10 POINT

| NO.                                                | DATE | REVISION | BY             |
|----------------------------------------------------|------|----------|----------------|
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |          |                |
| STRUCTURE B-9-32                                   |      |          |                |
| DRAWN BY                                           |      | VJD      | PLANS CK'D JRM |
| SUPERSTRUCTURE PLAN                                |      |          | SHEET 14 OF 21 |



REINFORCEMENT CROSS SECTION

LOOKING NORTH  
THRU SPAN 1 AND SPAN 4

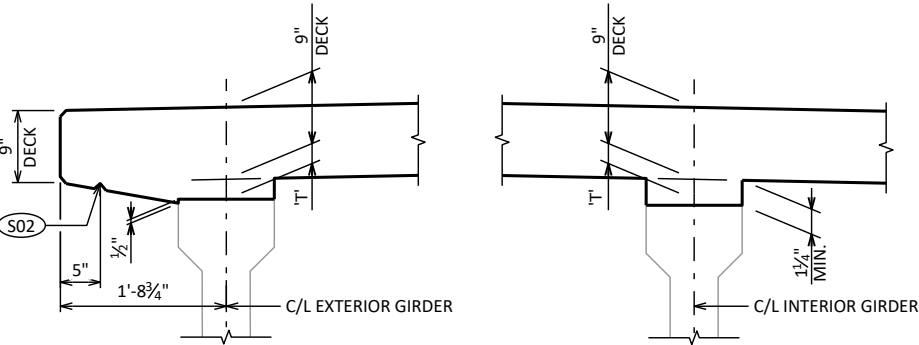


REINFORCEMENT CROSS SECTION

LOOKING NORTH  
THRU SPAN 2 AND SPAN 3

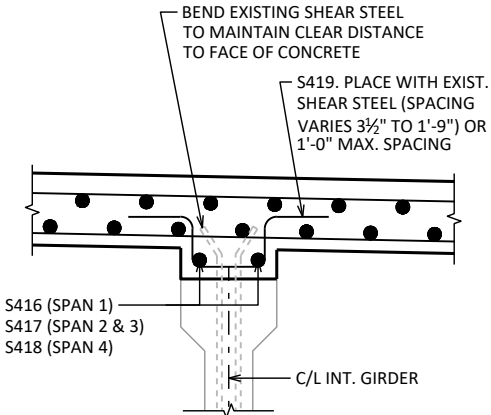
LEGEND

- (X) DENOTES EXISTING GIRDER NUMBER
- (S02) 3/4" V-GROOVE REQUIRED. EXTEND V-GROOVE TO 6" FROM FRONT FACE OF ABUTMENT DIAPHRAGM.



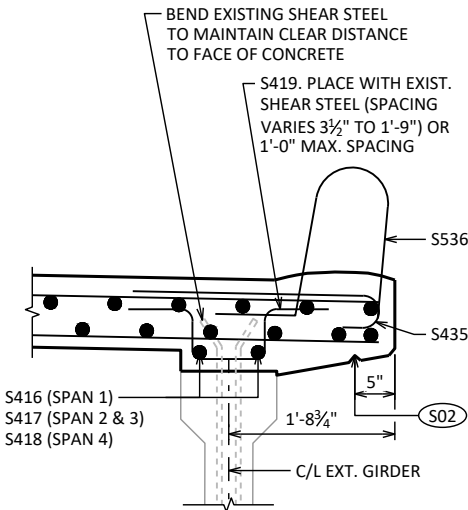
DECK HAUNCH DETAIL

IF 1 1/4" MINIMUM HAUNCH HEIGHT AT EDGE OF GIRDER CANNOT BE MAINTAINED, THE GRADE LINE MAY BE REVISED BY THE ENGINEER AT THE OPTION OF THE CONTRACTOR. THE PLAN DECK THICKNESS SHALL BE HELD. NOTIFY THE STRUCTURES SECTION IF THE GRADE LINE IS RAISED FROM THE PLAN PROFILE BY MORE THAN 1/2" OR, \*\* IF 3" MINIMUM DECK EMBEDMENT OF THE HAT BAR CANNOT BE OBTAINED.



SECTION THRU INTERIOR GIRDER

LOOKING NORTH  
SHOWING REINFORCEMENT



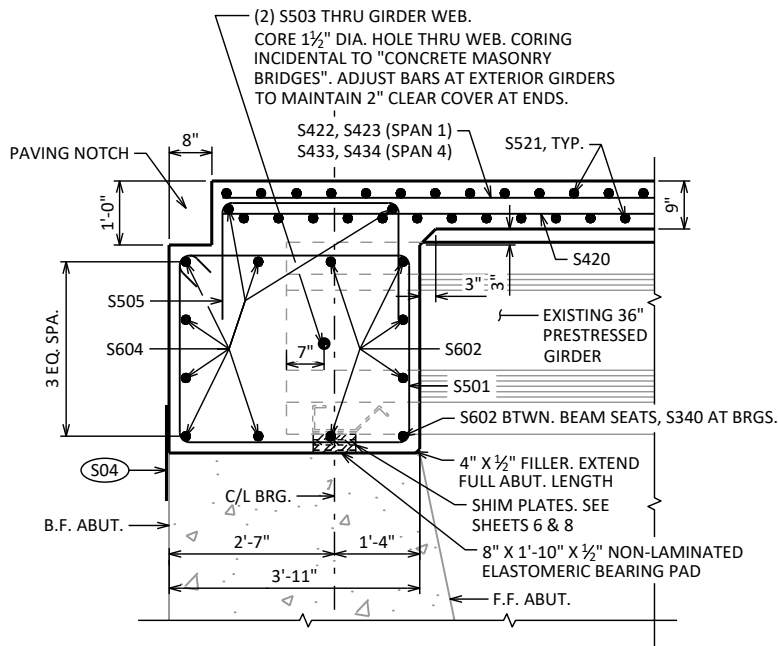
SECTION THRU EXTERIOR GIRDER

LOOKING NORTH  
SHOWING REINFORCEMENT

STATE PROJECT NUMBER

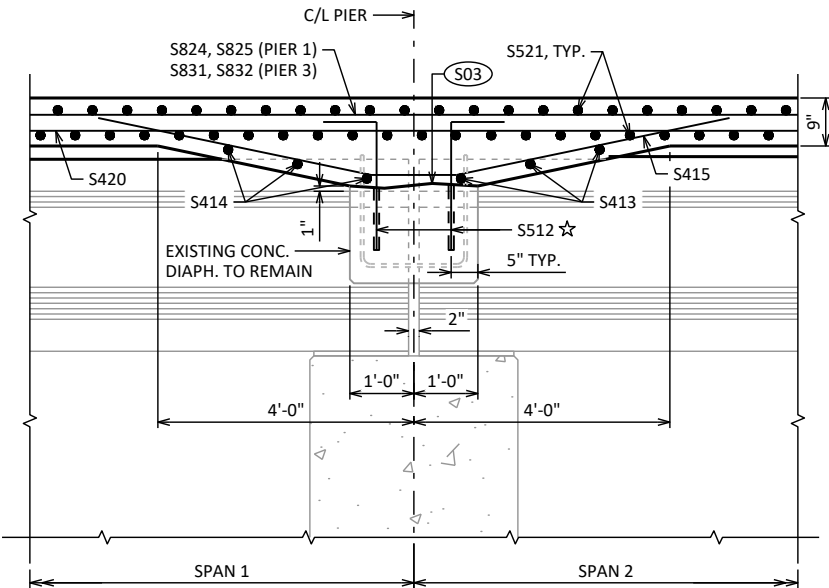
1050-01-83

|                                                    |      |                   |    |
|----------------------------------------------------|------|-------------------|----|
| NO.                                                | DATE | REVISION          | BY |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |                   |    |
| STRUCTURE B-9-32                                   |      |                   |    |
| DRAWN BY<br>VJD                                    |      | PLANS CK'D<br>JRM |    |
| SUPERSTRUCTURE CROSS SECTIONS                      |      | SHEET 15 OF 21    |    |



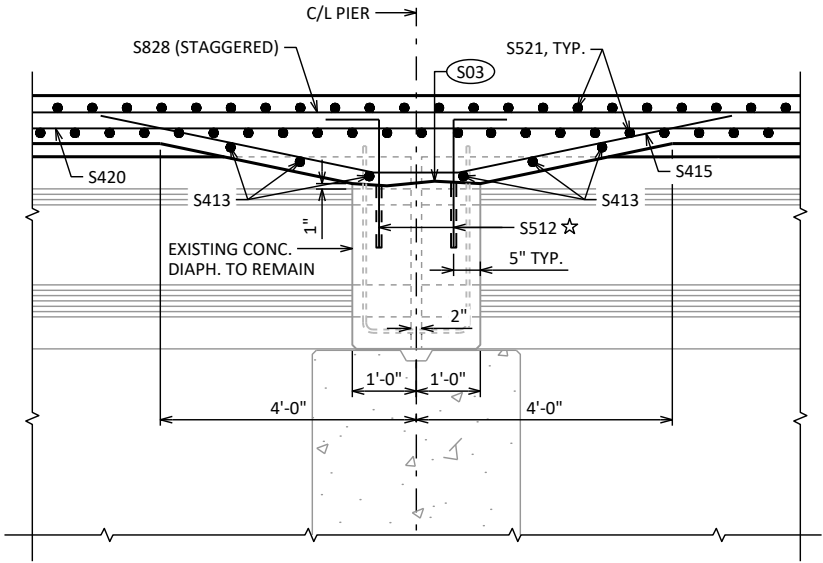
LONGIT. SECTION THRU ABUT. DIAPRAGM

LOOKING WEST AT S. ABUT.  
N. ABUT. SIMILAR, OPPOSITE HAND



LONGIT. SECTION THRU PIER DIAPRAGM

LOOKING WEST AT PIER 1  
PIER 3 SIMILAR, OPPOSITE HAND

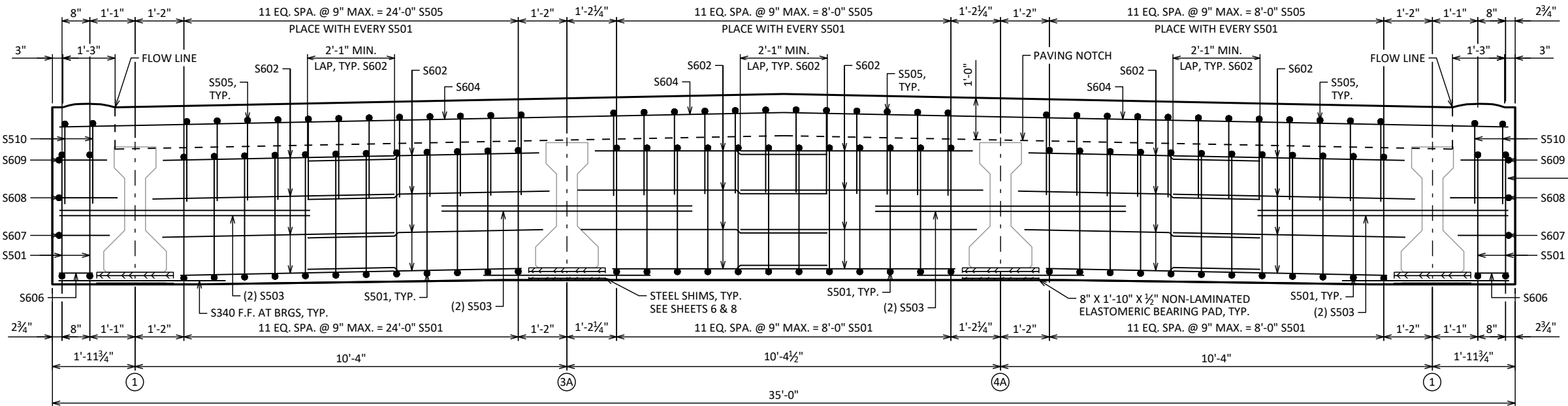


LONGIT. SECTION THRU PIER DIAPRAGM

LOOKING WEST AT PIER 2

LEGEND

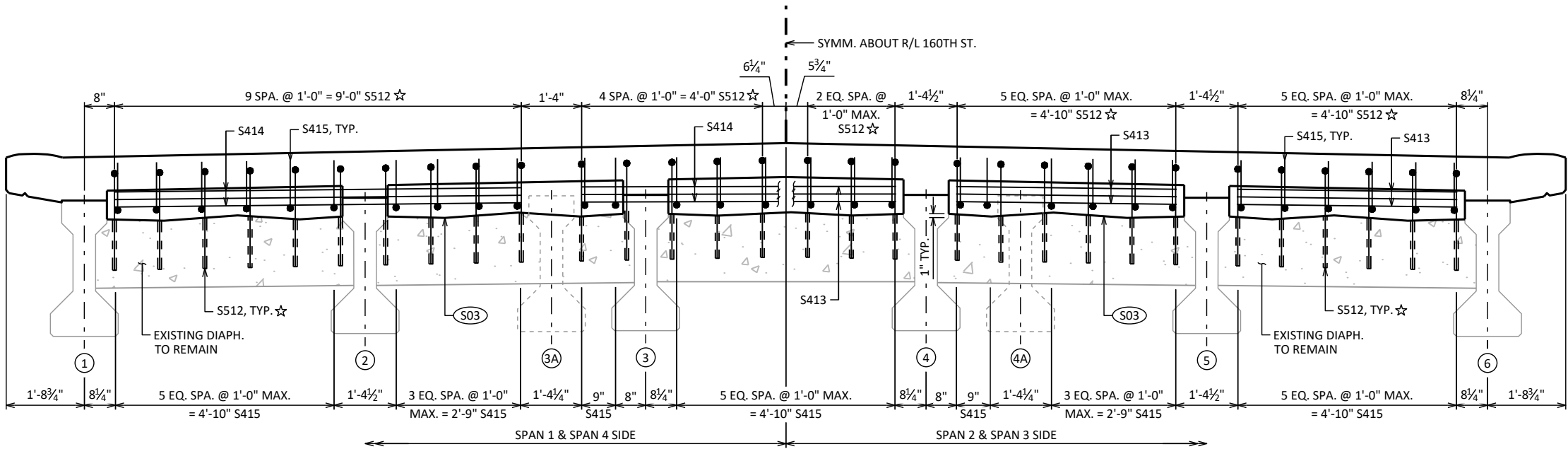
- (X) DENOTES EXISTING GIRDER NUMBER
- ☆ ADHESIVE ANCHORS NO. 5 BAR. EXTEND 1'-0" INTO EXISTING CONCRETE.
- (S03) REMOVAL LINES TO BE DEFINED BY A 1/2" DEEP SAWCUT. TAKE CARE AS TO NOT DAMAGE GIRDERS DURING REMOVAL. REPAIRS REQUIRED AFTER REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE COMPLETED AT NO COST TO THE DEPARTMENT.
- (S04) 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS AT BACK FACE.



ABUT. DIAPHRAGM ELEVATION

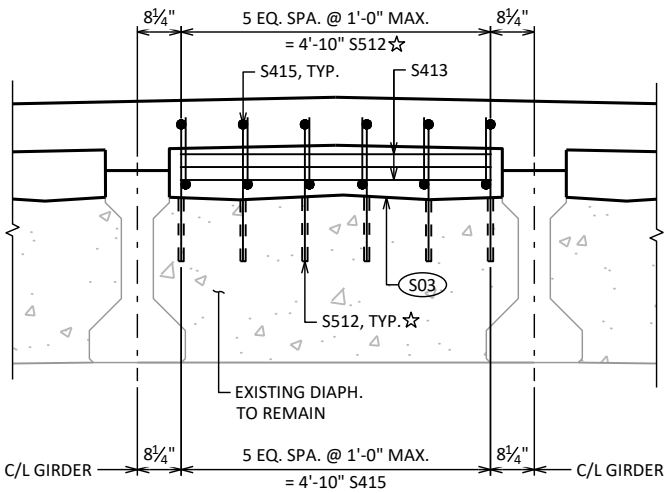
SHOWING DIAPHRAGM REINFORCEMENT  
LOOKING NORTH AT FRONT FACE N. ABUT.  
S. ABUT. SIMILAR, OPPOSITE HAND  
PARAPETS NOT SHOWN FOR CLARITY

|                                                    |  |                |  |
|----------------------------------------------------|--|----------------|--|
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |  |                |  |
| STRUCTURE B-9-32                                   |  |                |  |
| DRAWN BY VJD                                       |  | PLANS CK'D JRM |  |
| SUPERSTRUCTURE DETAILS 1                           |  | SHEET 16 OF 21 |  |



PIER DIAPHRAGM ELEVATION

LOOKING NORTH  
PARAPETS NOT SHOWN FOR CLARITY  
REINFORCEMENT TYPICAL AT PIER 1 AND PIER 3



PIER DIAPHRAGM ELEVATION

AT PIER 2  
REINFORCEMENT TYPICAL BETWEEN GIRDERS

LEGEND

- (X) DENOTES EXISTING GIRDER NUMBER
- ☆ ADHESIVE ANCHORS NO. 5 BAR REQ'D. EXTEND 1'-0" INTO EXISTING CONCRETE.
- (S03) REMOVAL LINES TO BE DEFINED BY A ½" DEEP SAWCUT. TAKE CARE AS TO NOT DAMAGE GIRDERS DURING REMOVAL. REPAIRS REQUIRED AFTER REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE COMPLETED AT NO COST TO THE DEPARTMENT.

| NO.                                                | DATE | REVISION       | BY |
|----------------------------------------------------|------|----------------|----|
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |                |    |
| STRUCTURE B-9-32                                   |      |                |    |
| DRAWN BY VJD                                       |      | PLANS CK'D JRM |    |
| SUPERSTRUCTURE<br>DETAILS 2                        |      | SHEET 17 OF 21 |    |

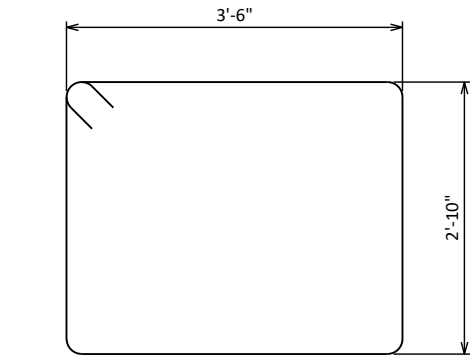


BILL OF BARS

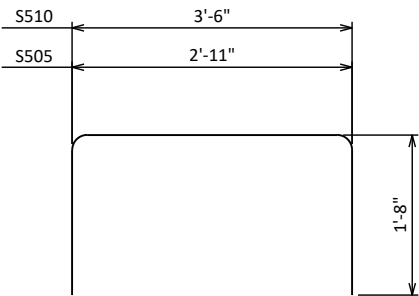
UNCOATED: 0 LB  
COATED: 65,200 LB

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

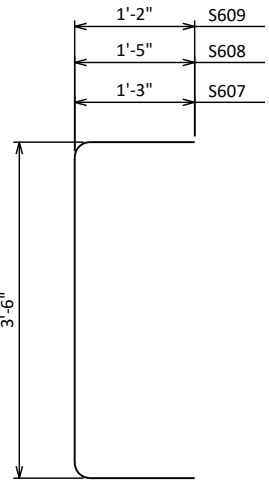
| BAR MARK | COAT | NO. REQ'D. | LENGTH  | BENT | BAR SERIES | LOCATION                                          |
|----------|------|------------|---------|------|------------|---------------------------------------------------|
| S501     | X    | 80         | 13'-4"  | X    |            | ABUT. DIAPH. - STIRRUPS                           |
| S602     | X    | 72         | 5'-10"  |      |            | ABUT. DIAPH. - HORIZ.                             |
| S503     | X    | 16         | 6'-0"   |      |            | ABUT. DIAPH. - HORIZ. - THRU GIRDERS              |
| S604     | X    | 16         | 34'-8"  |      |            | ABUT. DIAPH. - HORIZ.                             |
| S505     | X    | 72         | 6'-0"   | X    |            | ABUT. DIAPH. - VERT.                              |
| S606     | X    | 4          | 0'-8"   |      |            | ABUT. DIAPH. - HORIZ. - ENDS                      |
| S607     | X    | 4          | 5'-8"   | X    |            | ABUT. DIAPH. - HORIZ. - ENDS                      |
| S608     | X    | 4          | 6'-0"   | X    |            | ABUT. DIAPH. - HORIZ. - ENDS                      |
| S609     | X    | 4          | 5'-6"   | X    |            | ABUT. DIAPH. - HORIZ. - ENDS                      |
| S510     | X    | 8          | 6'-7"   | X    |            | ABUT DIAPH. - VERT. - ENDS AT PAVING NOTCH        |
| S411     | X    | 8          | 4'-2"   |      |            | ABUT. DIAPH. - VERT. - ENDS                       |
| S512     | X    | 180        | 2'-9"   | X    |            | PIER DIAPH. - VERT. - DOWELS                      |
| S413     | X    | 60         | 4'-10"  |      |            | PIER HAUNCH - HORIZ.                              |
| S414     | X    | 18         | 9'-0"   |      |            | PIER HAUNCH - HORIZ.                              |
| S415     | X    | 90         | 10'-7"  | X    |            | PIER HAUNCH - VERT.                               |
| S416     | X    | 8          | 39'-9"  |      |            | DECK - GIRDER HAUNCH - HORIZ. - SPAN 1            |
| S417     | X    | 36         | 39'-10" |      |            | DECK - GIRDER HAUNCH - HORIZ. - SPAN 2 & 3        |
| S418     | X    | 8          | 31'-3"  |      |            | DECK - GIRDER HAUNCH - HORIZ. - SPAN 4            |
| S419     | X    | 1,104      | 2'-8"   | X    |            | DECK - GIRDER HAUNCH - VERT. - HAT BARS           |
| S420     | X    | 265        | 38'-10" |      |            | DECK - BOTTOM LONGIT.                             |
| S521     | X    | 691        | 34'-2"  |      |            | DECK - TOP & BOT. TRANSVERSE                      |
| S422     | X    | 26         | 25'-6"  |      |            | DECK - TOP LONGIT. - SPAN 1                       |
| S423     | X    | 26         | 30'-3"  |      |            | DECK - TOP LONGIT. - SPAN 1                       |
| S824     | X    | 26         | 25'-6"  |      |            | DECK - TOP LONGIT. - OVER PIER 1                  |
| S825     | X    | 26         | 25'-3"  |      |            | DECK - TOP LONGIT. - OVER PIER 1                  |
| S426     | X    | 26         | 35'-2"  |      |            | DECK - TOP LONGIT. - SPAN 2                       |
| S427     | X    | 26         | 37'-11" |      |            | DECK - TOP LONGIT. - SPAN 2                       |
| S828     | X    | 52         | 26'-3"  |      |            | DECK - TOP LONGIT. - OVER PIER 2                  |
| S429     | X    | 26         | 38'-5"  |      |            | DECK - TOP LONGIT. - SPAN 3                       |
| S430     | X    | 26         | 35'-2"  |      |            | DECK - TOP LONGIT. - SPAN 3                       |
| S831     | X    | 26         | 26'-0"  |      |            | DECK - TOP LONGIT. - OVER PIER 3                  |
| S832     | X    | 26         | 27'-9"  |      |            | DECK - TOP LONGIT. - OVER PIER 3                  |
| S433     | X    | 26         | 20'-6"  |      |            | DECK - TOP LONGIT. - SPAN 4                       |
| S434     | X    | 26         | 14'-9"  |      |            | DECK - TOP LONGIT. - SPAN 4                       |
| S435     | X    | 346        | 3'-2"   | X    |            | DECK - TOP TRANS. - OVERHANG                      |
| S536     | X    | 562        | 4'-5"   | X    |            | DECK - PARAPET DOWELS                             |
| S537     | X    | 80         | 39'-9"  |      |            | PARAPET - HORIZ.                                  |
| S538     | X    | 562        | 6'-8"   | X    |            | PARAPET - VERT.                                   |
| S539     | X    | 4          | 5'-10"  | X    |            | PARAPET - VERT. - ENDS                            |
| S340     | X    | 8          | 4'-0"   |      |            | ABUT. DIAPH. - HORIZ. - F.F. UNDER GIRDER AT BRGS |



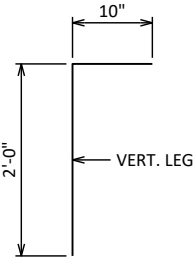
S501



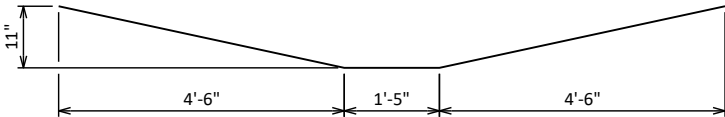
S505, S510



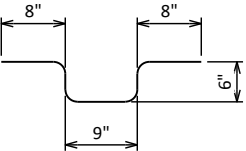
S607, S608, S609



S512

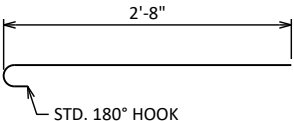


S415

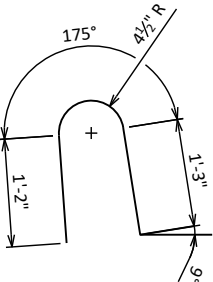


S419

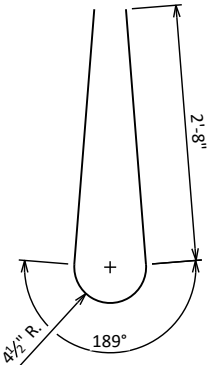
NOTE: THE CONTRACTOR MAY ADJUST THE VERTICAL ORIENTATION OF S419 TO FIT. MAINTAIN A 3" MINIMUM DECK EMBEDMENT AND 2½" CLEAR FROM TOP OF DECK.



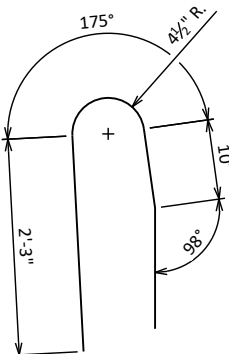
S435



S536



S538



S539

STATE PROJECT NUMBER

1050-01-83

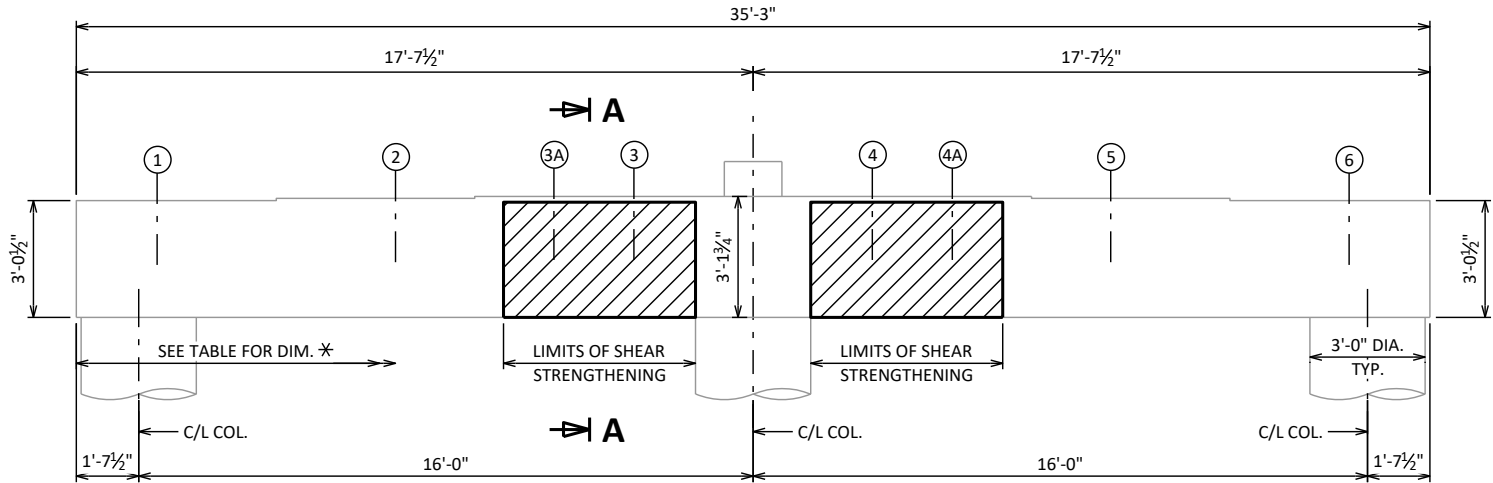
|                                                    |      |                |    |
|----------------------------------------------------|------|----------------|----|
| NO.                                                | DATE | REVISION       | BY |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |                |    |
| STRUCTURE B-9-32                                   |      |                |    |
| DRAWN BY VJD                                       |      | PLANS CK'D JRM |    |
| SUPERSTRUCTURE<br>BILL OF BARS                     |      | SHEET 18 OF 21 |    |

| BAR<br>MARK | COAT | S.<br>ABUT. | N.<br>ABUT. | LENGTH | BENT | BAR<br>SERIES | LOCATION       |
|-------------|------|-------------|-------------|--------|------|---------------|----------------|
| R501        | X    | 4           | 4           | 5'-10" | X    |               | PARAPET VERT.  |
| R502        | X    | 4           | 4           | 6'-8"  | X    |               | PARAPET VERT.  |
| R503        | X    | 24          | 24          | 3'-0"  | X    |               | PARAPET VERT.  |
| R504        | X    | 34          | 34          | 5'-7"  | X    |               | PARAPET VERT.  |
| R505        | X    | 10          | 10          | 6'-5"  | X    |               | PARAPET VERT.  |
| R506        | X    | 12          | 12          | 6'-6"  | X    |               | PARAPET VERT.  |
| R507        | X    | 2           | 2           | 9'-8"  | X    |               | PARAPET HORIZ. |
| R508        | X    | 10          | 10          | 9'-8"  |      |               | PARAPET HORIZ. |
| R509        | X    | 12          | 12          | 5'-5"  | X    | ▲             | PARAPET VERT.  |
| R510        | X    | 4           | 4           | 9'-9"  | X    |               | PARAPET HORIZ. |
|             |      |             |             |        |      |               |                |
|             |      |             |             |        |      |               |                |
|             |      |             |             |        |      |               |                |

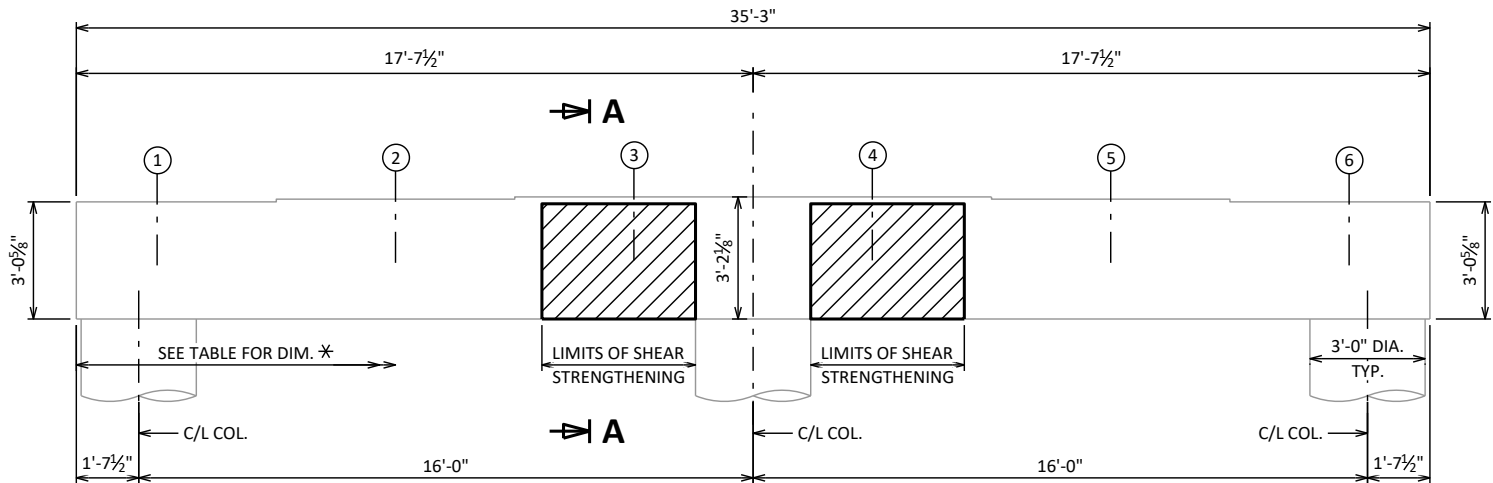
| BAR MARK | NO. REQ'D.    | LENGTH         |
|----------|---------------|----------------|
| R509     | 4 SERIES OF 6 | 4'-9" TO 6'-1" |

|                                                    |      |                |                   |
|----------------------------------------------------|------|----------------|-------------------|
|                                                    |      |                |                   |
| NO.                                                | DATE | REVISION       | BY                |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |                |                   |
| <b>STRUCTURE</b>                                   |      | <b>B-9-32</b>  |                   |
| DRAWN<br>BY                                        |      | VJD            | PLANS<br>CK'D JRM |
| <b>SINGLE SLOPE<br/>PARAPET 42SS</b>               |      | SHEET 19 OF 21 |                   |
|                                                    |      |                |                   |

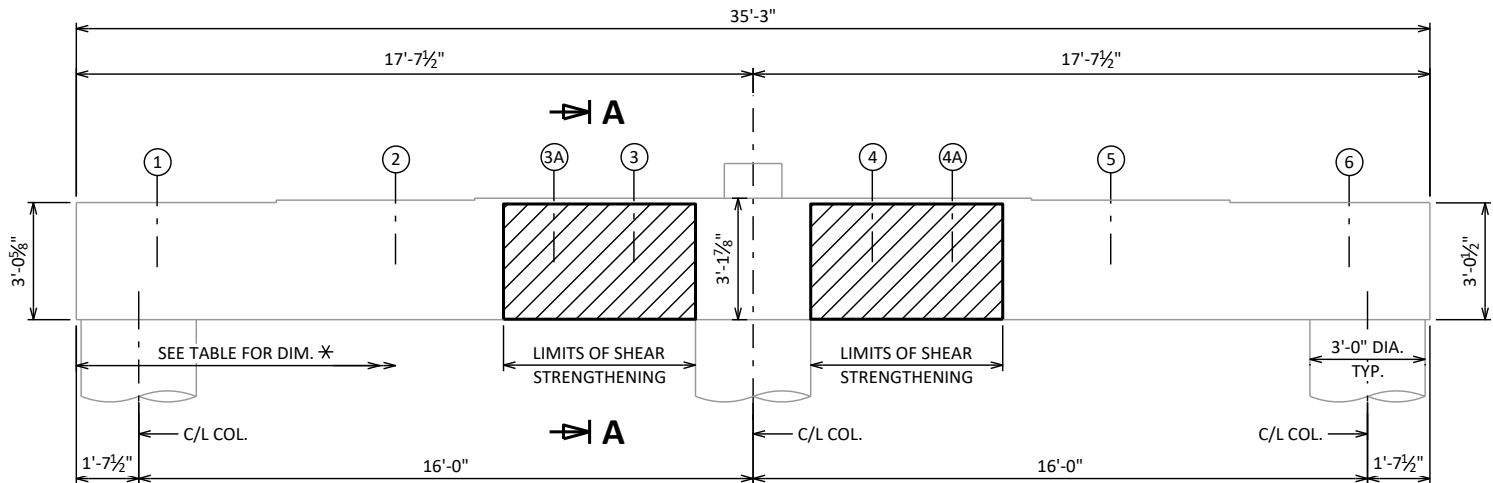




CAP ELEVATION - PIER 1  
LOOKING NORTH



CAP ELEVATION - PIER 2  
LOOKING NORTH



CAP ELEVATION - PIER 3  
LOOKING NORTH

FRP SHEAR STRENGTHENING

| PIER   | LOCATION *               | REQUIRED FACTORED SHEAR CAPACITY (KIPS) | EXISTING FACTORED SHEAR CAPACITY (KIPS) | MIN. ADD'L FACTORED SHEAR CAPACITY REQ'D (KIPS) |
|--------|--------------------------|-----------------------------------------|-----------------------------------------|-------------------------------------------------|
| PIER 1 | 11'-1 1/2" TO 16'-1 1/2" | 202.1                                   | 131.4                                   | 70.7                                            |
|        | 19'-1 1/2" TO 24'-1 1/2" | 202.1                                   | 131.4                                   | 70.7                                            |
| PIER 2 | 12'-1 1/2" TO 16'-1 1/2" | 268.9                                   | 196.4                                   | 72.5                                            |
|        | 19'-1 1/2" TO 23'-1 1/2" | 268.9                                   | 196.4                                   | 72.5                                            |
| PIER 3 | 11'-1 1/2" TO 16'-1 1/2" | 205.1                                   | 131.4                                   | 73.7                                            |
|        | 19'-1 1/2" TO 24'-1 1/2" | 205.1                                   | 131.4                                   | 73.7                                            |

\* LOCATION IS MEASURED FROM WEST END OF PIER CAP

NOTES

FRP = FIBER REINFORCED POLYMER

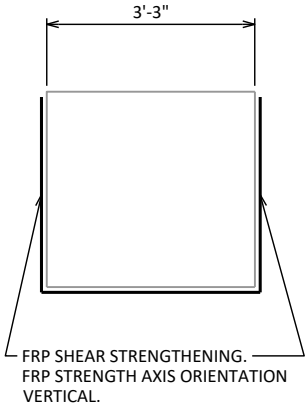
IN REGIONS WHERE FRP IS TO BE APPLIED, THE FIELD ENGINEER TO DETERMINE LOCATIONS WHERE "CONCRETE SURFACE REPAIR" IS REQUIRED. WORK TO BE DONE BEFORE FIBER WRAP IS APPLIED, IF NEEDED.

ONLY THE THEORETICAL LIMITS OF FRP REPAIR ARE GIVEN. ANY ADDITIONAL FRP LENGTH FOR CONSTRUCTABILITY, DEVELOPMENT, OR OFFSET IS TO BE DETERMINED BY THE FRP MANUFACTURER. THE FRP IS TO BE UNIFORMLY DISTRIBUTED ON THE PIER CAP SIDES.

THE ADDITIONAL FACTORED SHEAR CAPACITY REQUIRED SHOWN IN THE TABLE IS THE FACTORED SHEAR FORCE, IN KIPS, TO BE PROVIDED BY THE FRP FABRIC INSTALLATION.

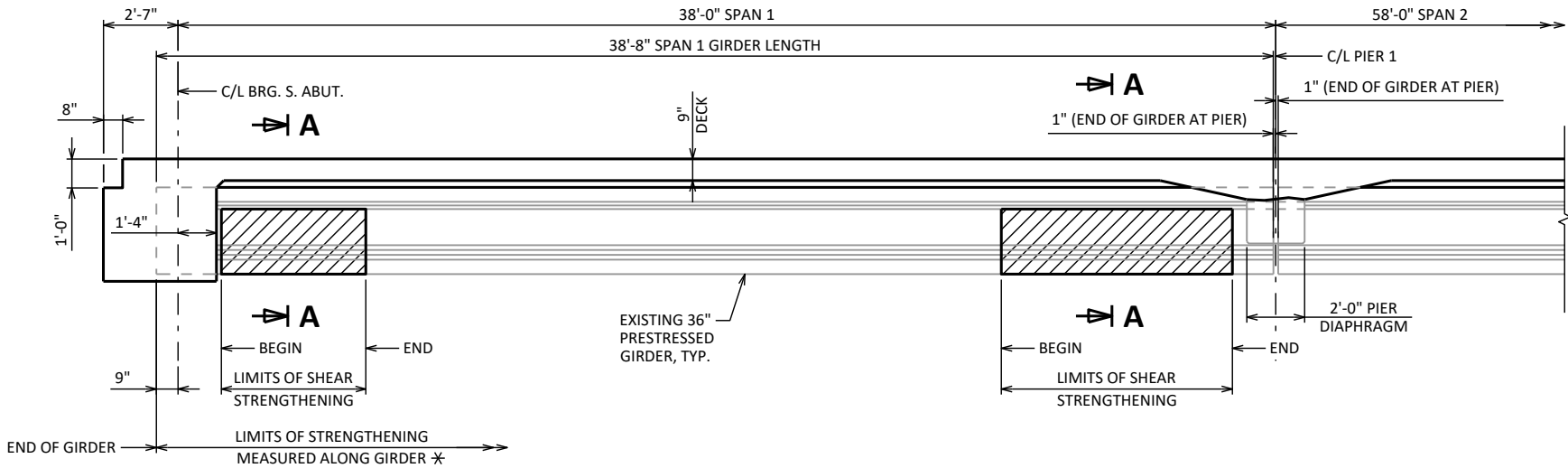
EXISTING FACTORED SHEAR CAPACITY IS BASED ON REINFORCEMENT SHOWN IN THE ORIGINAL CONSTRUCTION PLANS.

EXISTING MATERIAL STRENGTHS:  
CONCRETE: f'c = 3.5 KSI  
REINFORCING STEEL: fy = 40 KSI



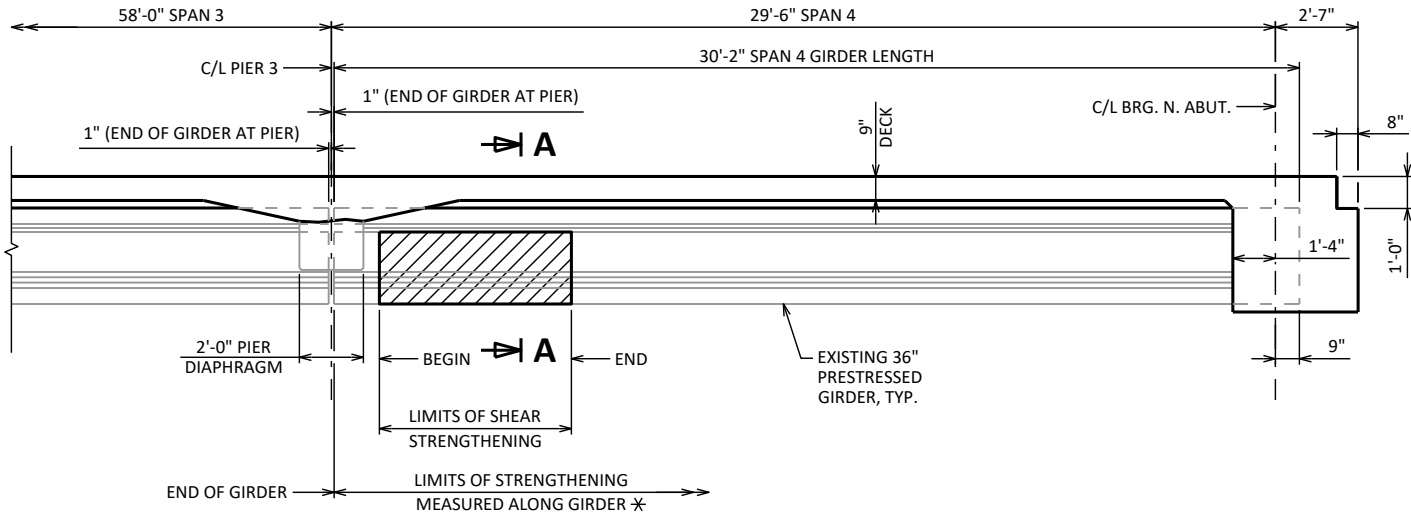
SECTION A-A

|                                                    |      |                |    |
|----------------------------------------------------|------|----------------|----|
| NO.                                                | DATE | REVISION       | BY |
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |                |    |
| STRUCTURE B-9-32                                   |      |                |    |
| DRAWN BY VJD                                       |      | PLANS CK'D AJC |    |
| PIER FRP STRENGTHENING                             |      | SHEET 20 OF 21 |    |



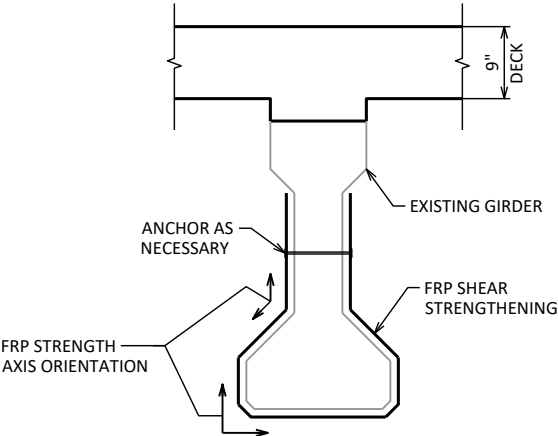
**PART LONGITUDINAL SECTION**

LOOKING WEST AT SPAN 1  
SHOWING FIBER WRAP REINFORCING LIMITS

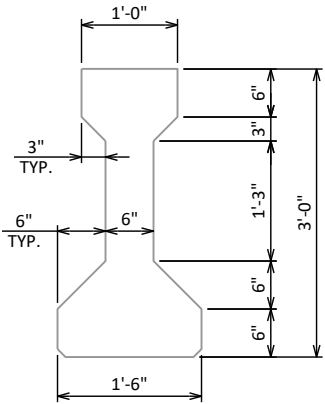


**PART LONGITUDINAL SECTION**

LOOKING WEST AT SPAN 4  
SHOWING FIBER WRAP REINFORCING LIMITS



**SECTION A-A**



**EXISTING GIRDER SECTION**

**LEGEND**

✱ LIMITS OF STRENGTHENING MEASURED FROM  
SOUTH END OF GIRDER

**NOTES**

FRP = FIBER REINFORCED POLYMER

FRP STRENGTHENING TO BE IN ACCORDANCE WITH THE "FIBER  
WRAP REINFORCING STRUCTURAL" SPECIAL PROVISION.

IN REGIONS WHERE FRP IS TO BE APPLIED, THE FIELD ENGINEER TO  
DETERMINE LOCATIONS WHERE "CONCRETE SURFACE REPAIR" IS  
REQUIRED. WORK TO BE DONE BEFORE FIBER WRAP IS APPLIED, IF  
NEEDED.

ONLY THE THEORETICAL LIMITS OF FRP REPAIR ARE GIVEN. ANY  
ADDITIONAL FRP LENGTH FOR CONSTRUCTABILITY, DEVELOPMENT,  
OR OFFSET IS TO BE DETERMINED BY THE FRP MANUFACTURER. THE  
FRP IS TO BE UNIFORMLY DISTRIBUTED ON EACH SIDE AND OVER  
THE BOTTOM FLANGE OF THE GIRDER.

THE ADDITIONAL FACTORED SHEAR CAPACITY REQUIRED SHOWN IN  
THE TABLE IS THE FACTORED SHEAR FORCE, IN KIPS, TO BE  
PROVIDED BY THE FRP FABRIC INSTALLATION.

EXISTING FACTORED SHEAR CAPACITY IS BASED ON REINFORCEMENT  
SHOWN IN THE ORIGINAL CONSTRUCTION PLANS.

EXISTING GIRDER MATERIAL STRENGTHS:  
CONCRETE:  $f'_c = 5.0$  KSI  
REINFORCING STEEL:  $f_y = 40$  KSI

**FRP SHEAR STRENGTHENING**

| SPAN | GIRDER NO. | BEGIN (FT.)<br>✱ | END (FT.)<br>✱ | EXIST. FACTORED<br>SHEAR CAPACITY<br>(KIPS) | MIN. ADD'L<br>FACTORED<br>SHEAR CAPACITY<br>(KIPS) |
|------|------------|------------------|----------------|---------------------------------------------|----------------------------------------------------|
| 1    | 3A, 4A     | 2.25             | 7.25           | 111.3                                       | 11.0                                               |
|      |            | 29.25            | 37.25          | 122.2                                       | 33.5                                               |
| 4    | 3A, 4A     | 1.58             | 7.58           | 121.4                                       | 24.5                                               |

| NO.                                                | DATE | REVISION          | BY |
|----------------------------------------------------|------|-------------------|----|
| STATE OF WISCONSIN<br>DEPARTMENT OF TRANSPORTATION |      |                   |    |
| STRUCTURE B-9-32                                   |      |                   |    |
| DRAWN<br>BY VJD                                    |      | PLANS<br>CK'D AJC |    |
| GIRDER FRP<br>STRENGTHENING                        |      | SHEET 21 OF 21    |    |

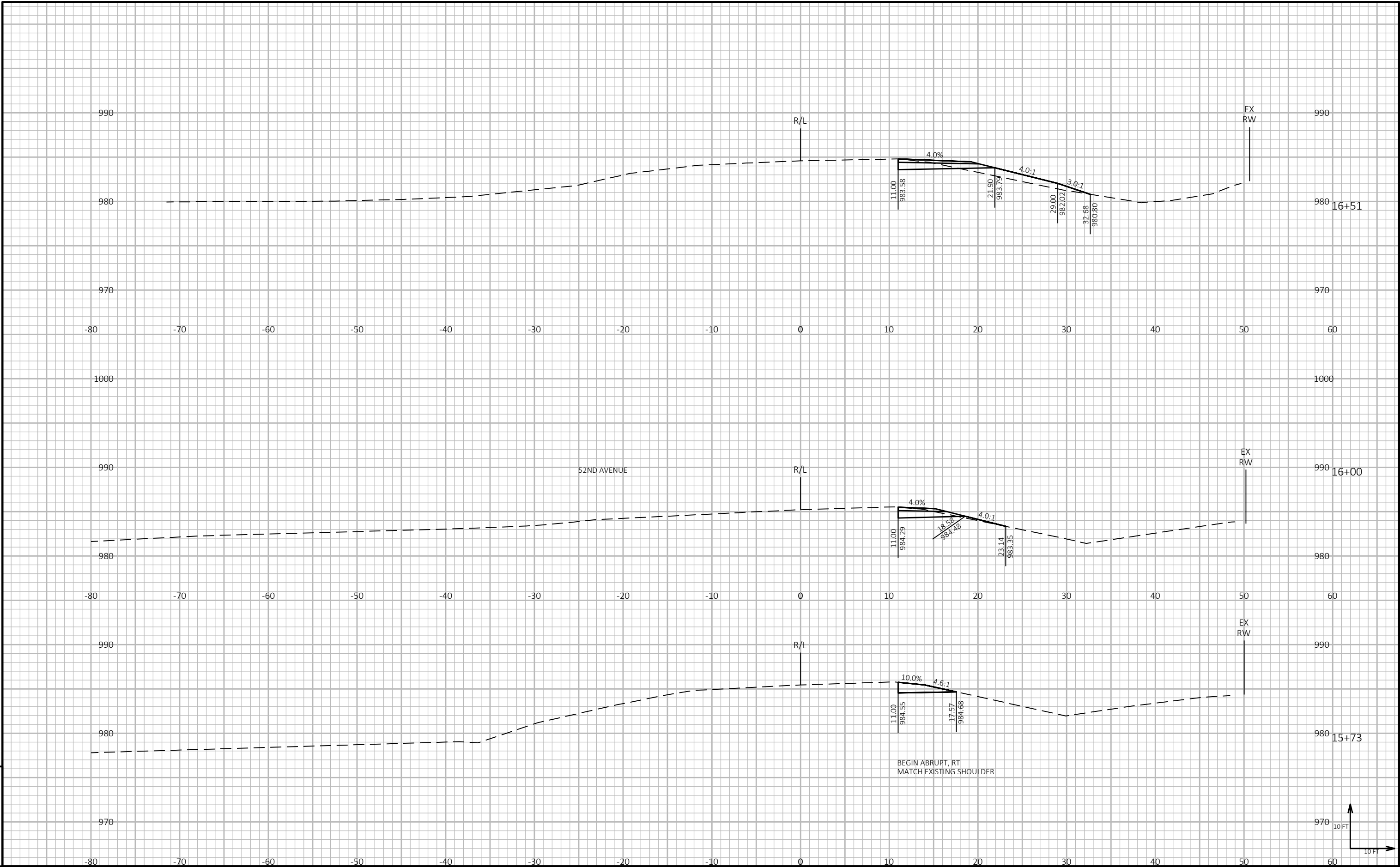
NOTES:  
1 - CUT  
2 - FILL  
3 - EXPANDED FILL  
4 - MASS ORDINATE

CUT INCLUDES SALVAGED/UNUSABLE PAVEMENT MATERIAL. SALVAGED/UNUSABLE PAVEMENT MATERIAL IS CALCULATED ON THE SECTION 3 SUMMARY SHEET.  
FILL DOES NOT INCLUDE UNUSABLE PAVEMENT AREA/VOLUME. SALVAGED/UNUSABLE PAVEMENT MATERIAL IS CALCULATED ON THE SECTION 3 SUMMARY SHEET.  
(UNEXPANDED MATERIAL)\*(EXPANSION FACTOR)  
CUT - (EXPANDED FILL); POSITIVE INDICATES AN EXCESS OF MATERIAL; NEGATIVE INDICATES A SHORTAGE OF MATERIAL

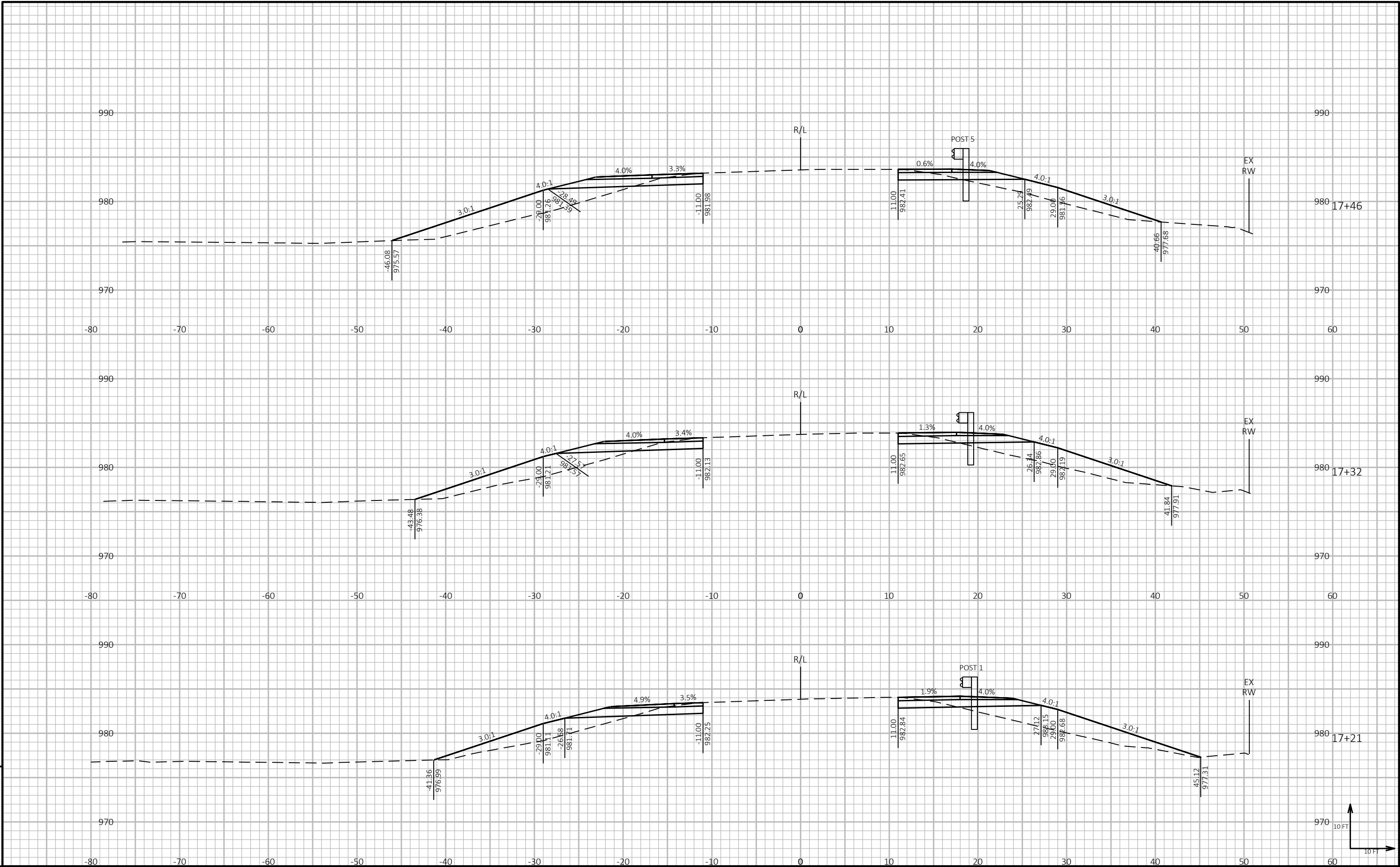
| DIVISION 1 - 160TH STREET SOUTH |          |           |      |                         |      |                        |               |               |
|---------------------------------|----------|-----------|------|-------------------------|------|------------------------|---------------|---------------|
| STATION                         | DISTANCE | AREA (SF) |      | INCREMENTAL VOLUME (CY) |      | CUMULATIVE VOLUME (CY) |               | MASS ORDINATE |
|                                 |          | CUT       | FILL | CUT                     | FILL | CUT                    | EXPANDED FILL |               |
|                                 |          |           |      |                         |      |                        | 1.25          |               |
|                                 |          |           |      |                         |      |                        | NOTE 1        |               |
| 15+73                           | 0        | 5         | 0    | 0                       | 0    | 0                      | 0             | 0             |
| 16+00                           | 27       | 5         | 0    | 5                       | 0    | 5                      | 0             | 5             |
| 16+51                           | 51       | 5         | 8    | 9                       | 8    | 14                     | 10            | 4             |
| 16+56                           | 5        | 12        | 9    | 1                       | 2    | 15                     | 13            | 3             |
| 16+89                           | 33       | 11        | 32   | 13                      | 24   | 28                     | 43            | -15           |
| 17+00                           | 11       | 11        | 44   | 4                       | 16   | 32                     | 63            | -31           |
| 17+21                           | 21       | 11        | 62   | 9                       | 42   | 41                     | 115           | -74           |
| 17+32                           | 11       | 11        | 63   | 4                       | 25   | 45                     | 146           | -101          |
| 17+46                           | 14       | 11        | 65   | 6                       | 34   | 51                     | 189           | -138          |
| 17+50                           | 4        | 38        | 67   | 3                       | 9    | 54                     | 200           | -146          |
| 17+59                           | 9        | 39        | 66   | 13                      | 22   | 67                     | 228           | -161          |
| 17+71                           | 13       | 37        | 64   | 18                      | 30   | 85                     | 265           | -180          |
| 17+79                           | 8        | 35        | 65   | 10                      | 18   | 95                     | 288           | -193          |
| 17+84                           | 5        | 33        | 60   | 6                       | 11   | 101                    | 301           | -200          |
| 17+89                           | 5        | 33        | 54   | 7                       | 12   | 108                    | 316           | -208          |
| 18+00                           | 11       | 31        | 37   | 13                      | 18   | 121                    | 339           | -218          |
| 18+04                           | 4        | 31        | 34   | 4                       | 5    | 125                    | 345           | -220          |
| 18+09                           | 5        | 30        | 32   | 5                       | 6    | 130                    | 353           | -223          |
| 18+14                           | 6        | 29        | 31   | 6                       | 7    | 136                    | 361           | -225          |
| 18+39                           | 25       | 27        | 16   | 26                      | 22   | 162                    | 389           | -227          |
| 18+61                           | 22       | 25        | 63   | 21                      | 32   | 183                    | 429           | -246          |
| 18+70                           | 9        | 26        | 0    | 8                       | 10   | 191                    | 441           | -250          |
|                                 |          |           |      | 191                     | 353  |                        |               |               |

DIVISION 2 - 160TH STREET NORTH

| STATION | DISTANCE | AREA (SF) |        | INCREMENTAL VOLUME (CY) |      | CUMULATIVE VOLUME (CY) |               | MASS ORDINATE |
|---------|----------|-----------|--------|-------------------------|------|------------------------|---------------|---------------|
|         |          | CUT       | FILL   | CUT                     | FILL | CUT                    | EXPANDED FILL |               |
|         |          |           |        |                         |      |                        | 1.25          |               |
|         |          |           |        |                         |      |                        | NOTE 3        |               |
| NOTE 1  | NOTE 2   | 1.00      | NOTE 3 | NOTE 4                  |      |                        |               |               |
| 20+57   | 0        | 26        | 0      | 0                       | 0    | 0                      | 0             | 0             |
| 20+66   | 9        | 27        | 99     | 9                       | 16   | 9                      | 20            | -11           |
| 20+88   | 21       | 31        | 86     | 23                      | 72   | 32                     | 110           | -78           |
| 21+00   | 12       | 31        | 90     | 14                      | 41   | 46                     | 161           | -115          |
| 21+13   | 13       | 31        | 100    | 14                      | 44   | 60                     | 216           | -156          |
| 21+19   | 6        | 30        | 88     | 7                       | 22   | 67                     | 244           | -177          |
| 21+20   | 1        | 30        | 83     | 1                       | 4    | 68                     | 249           | -181          |
| 21+24   | 4        | 30        | 81     | 4                       | 11   | 72                     | 263           | -191          |
| 21+44   | 20       | 29        | 200    | 22                      | 105  | 94                     | 394           | -300          |
| 21+49   | 5        | 27        | 238    | 5                       | 39   | 99                     | 443           | -344          |
| 21+56   | 8        | 28        | 254    | 8                       | 70   | 107                    | 530           | -423          |
| 21+69   | 13       | 29        | 278    | 13                      | 123  | 120                    | 684           | -564          |
| 21+81   | 12       | 30        | 291    | 14                      | 132  | 134                    | 849           | -715          |
| 22+00   | 19       | 31        | 284    | 21                      | 198  | 155                    | 1096          | -941          |
| 22+06   | 6        | 32        | 283    | 7                       | 66   | 162                    | 1179          | -1017         |
| 22+24   | 18       | 35        | 253    | 22                      | 176  | 184                    | 1399          | -1215         |
| 22+29   | 5        | 36        | 246    | 6                       | 45   | 190                    | 1455          | -1265         |
| 22+40   | 11       | 37        | 227    | 15                      | 97   | 205                    | 1576          | -1371         |
| 22+64   | 24       | 38        | 156    | 33                      | 170  | 238                    | 1789          | -1551         |
| 22+76   | 12       | 37        | 119    | 17                      | 61   | 255                    | 1865          | -1610         |
| 22+80   | 4        | 37        | 107    | 5                       | 16   | 260                    | 1885          | -1625         |
| 23+00   | 20       | 5         | 62     | 15                      | 62   | 275                    | 1963          | -1688         |
| 23+40   | 40       | 5         | 4      | 7                       | 49   | 282                    | 2024          | -1742         |
|         |          |           |        | 282                     | 1619 |                        |               |               |



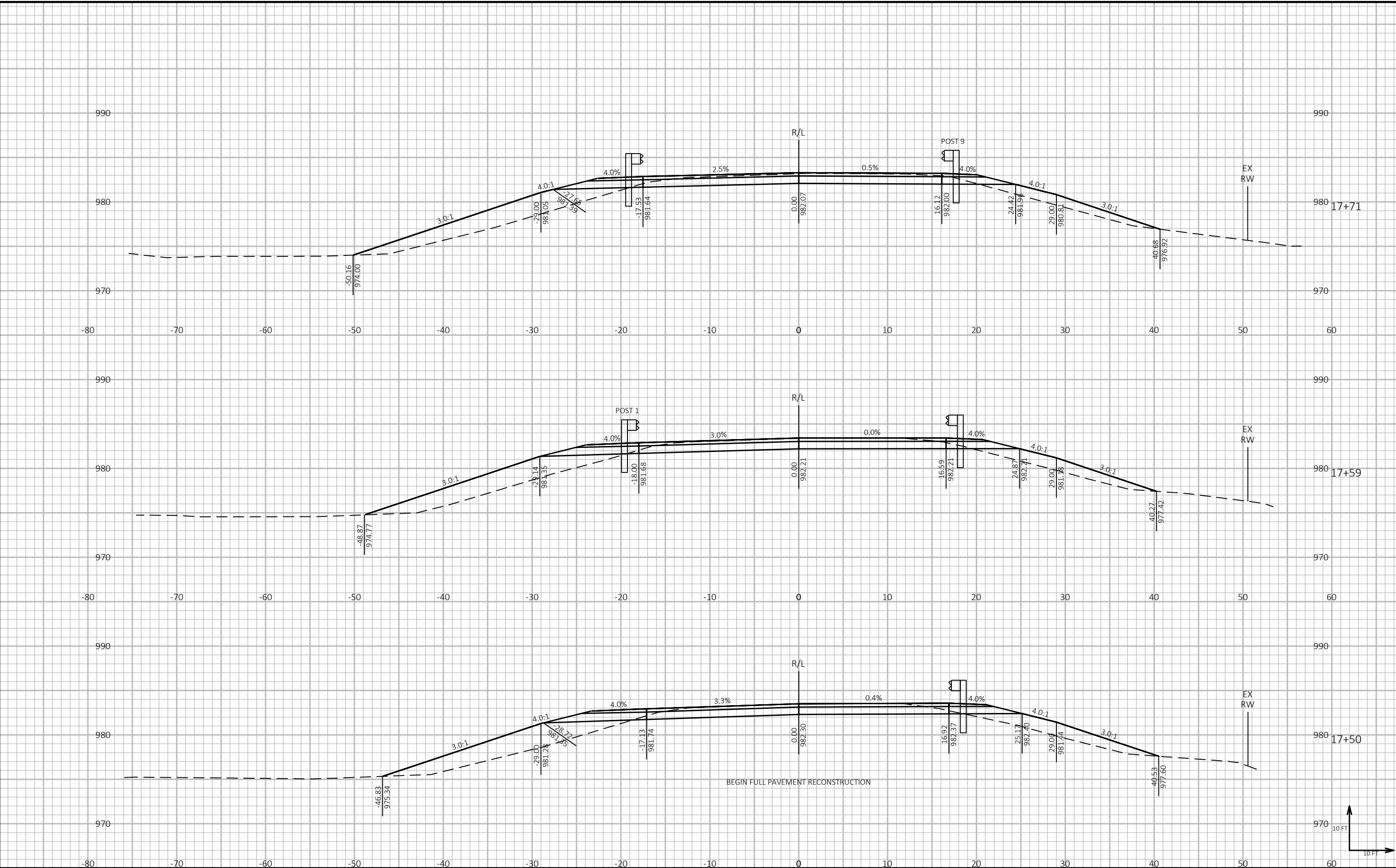


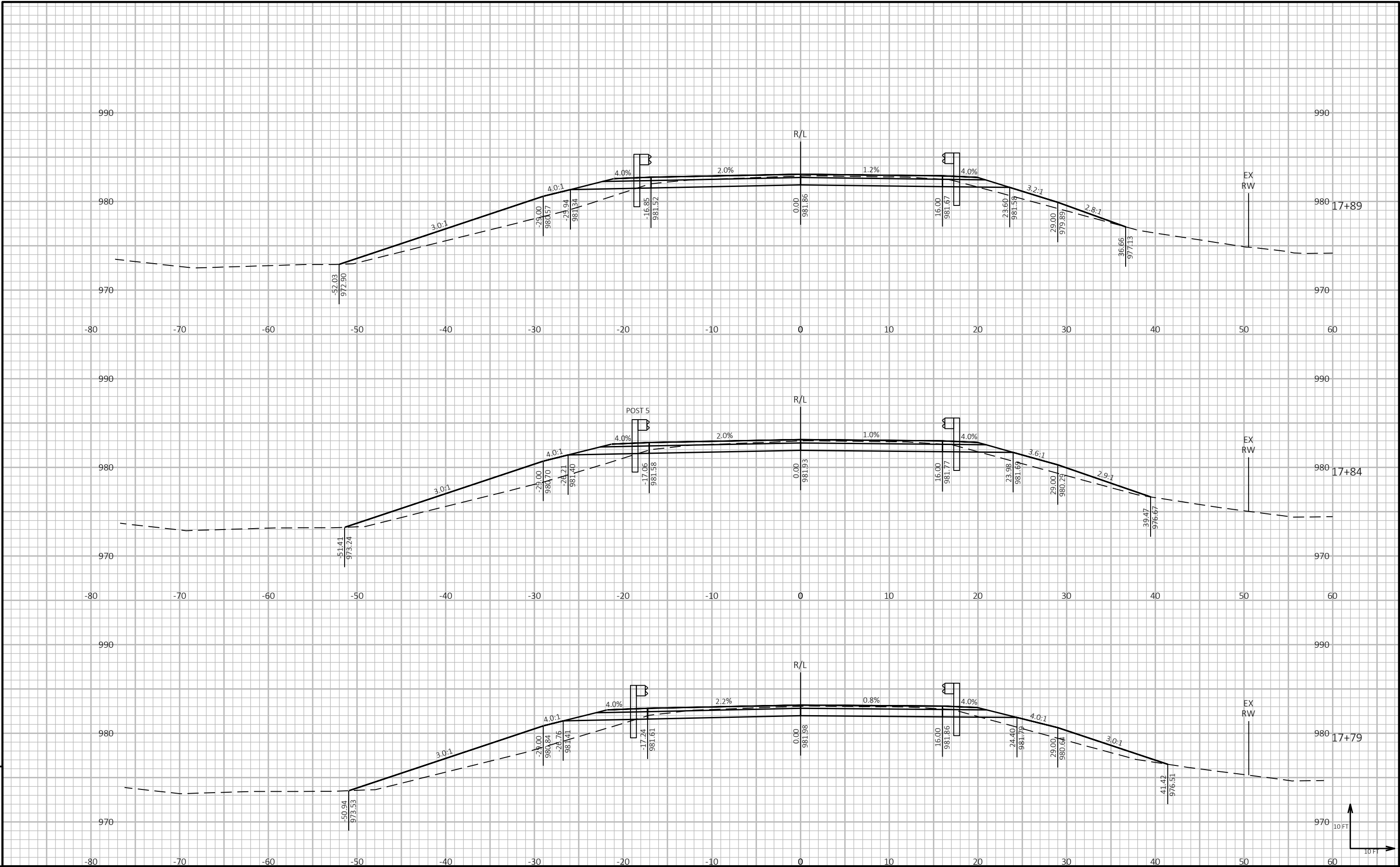


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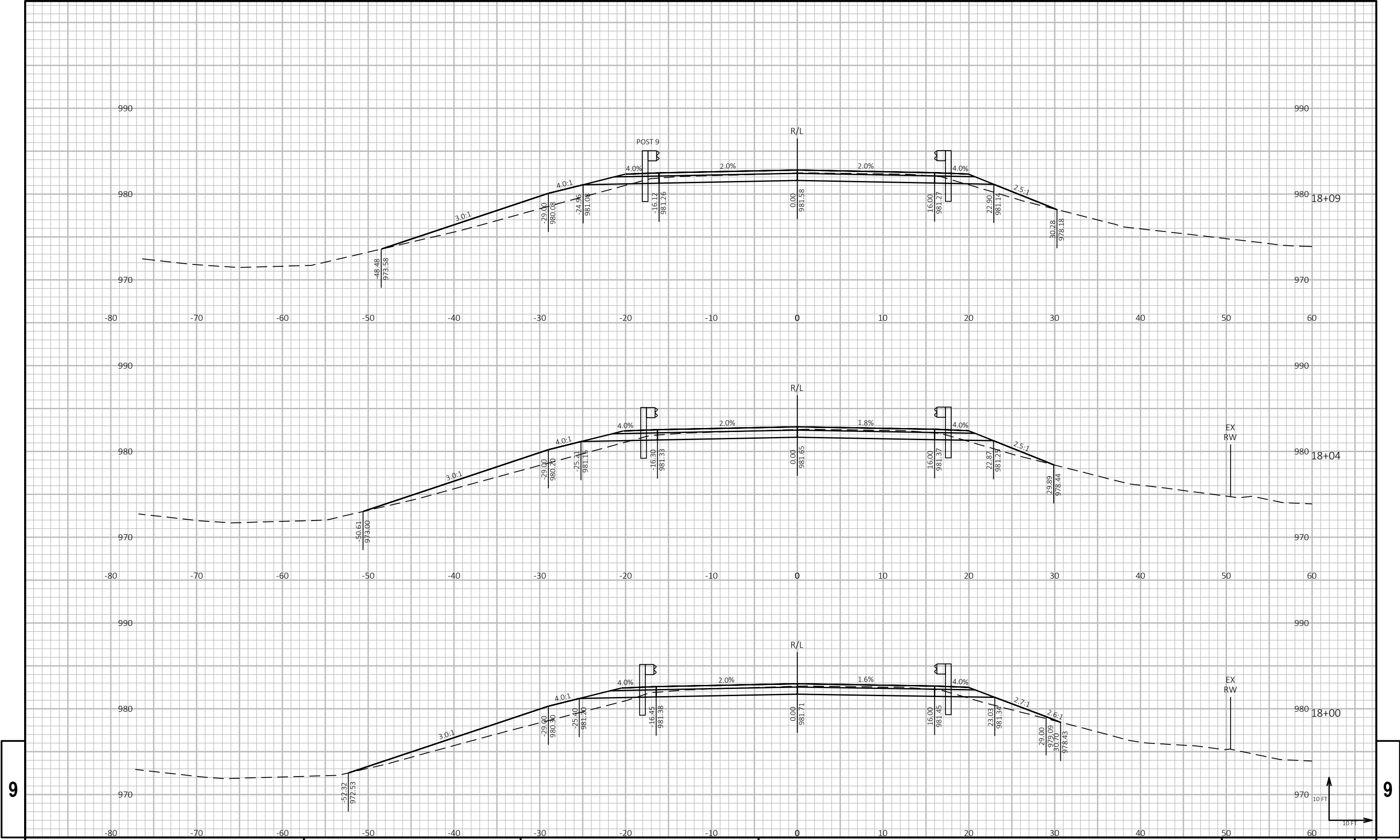
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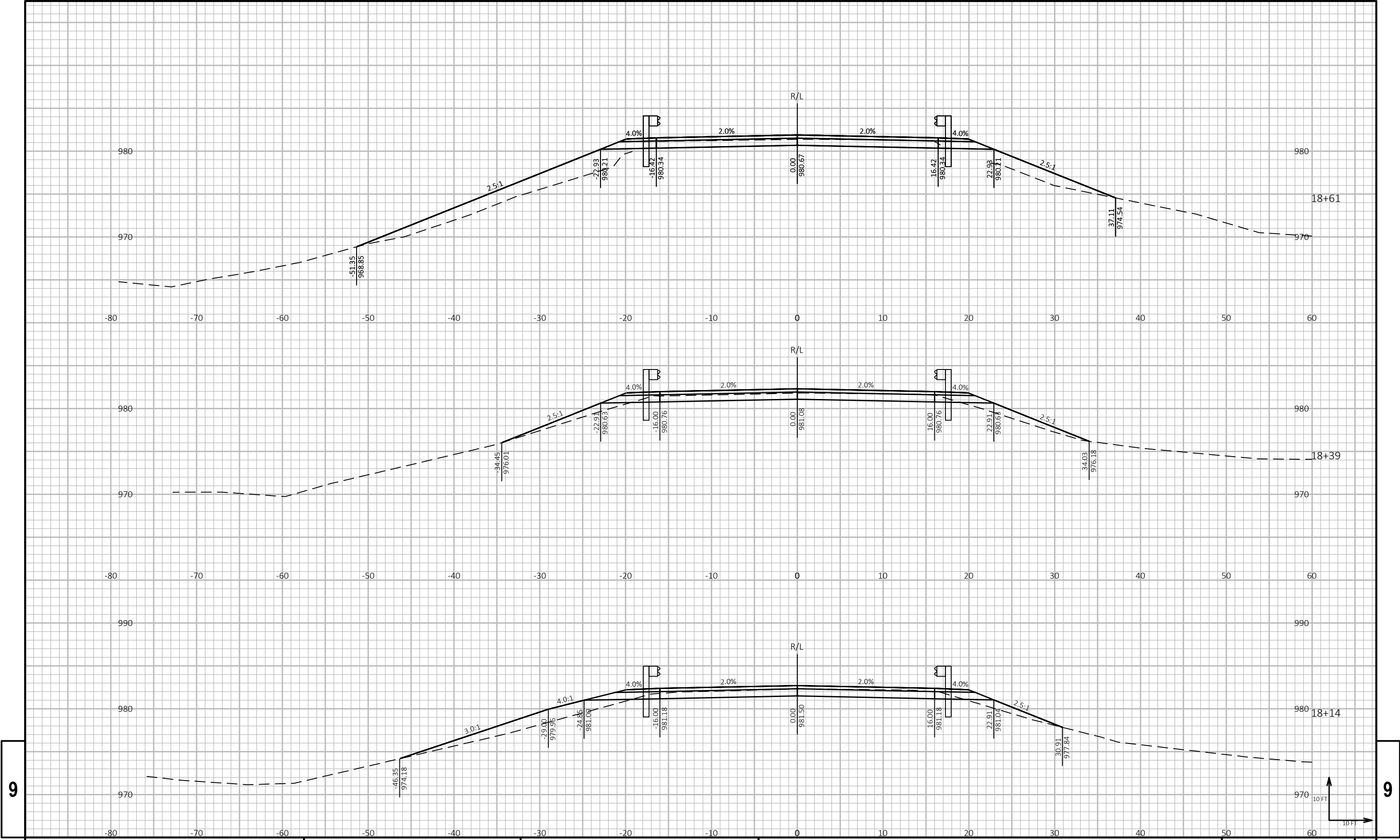






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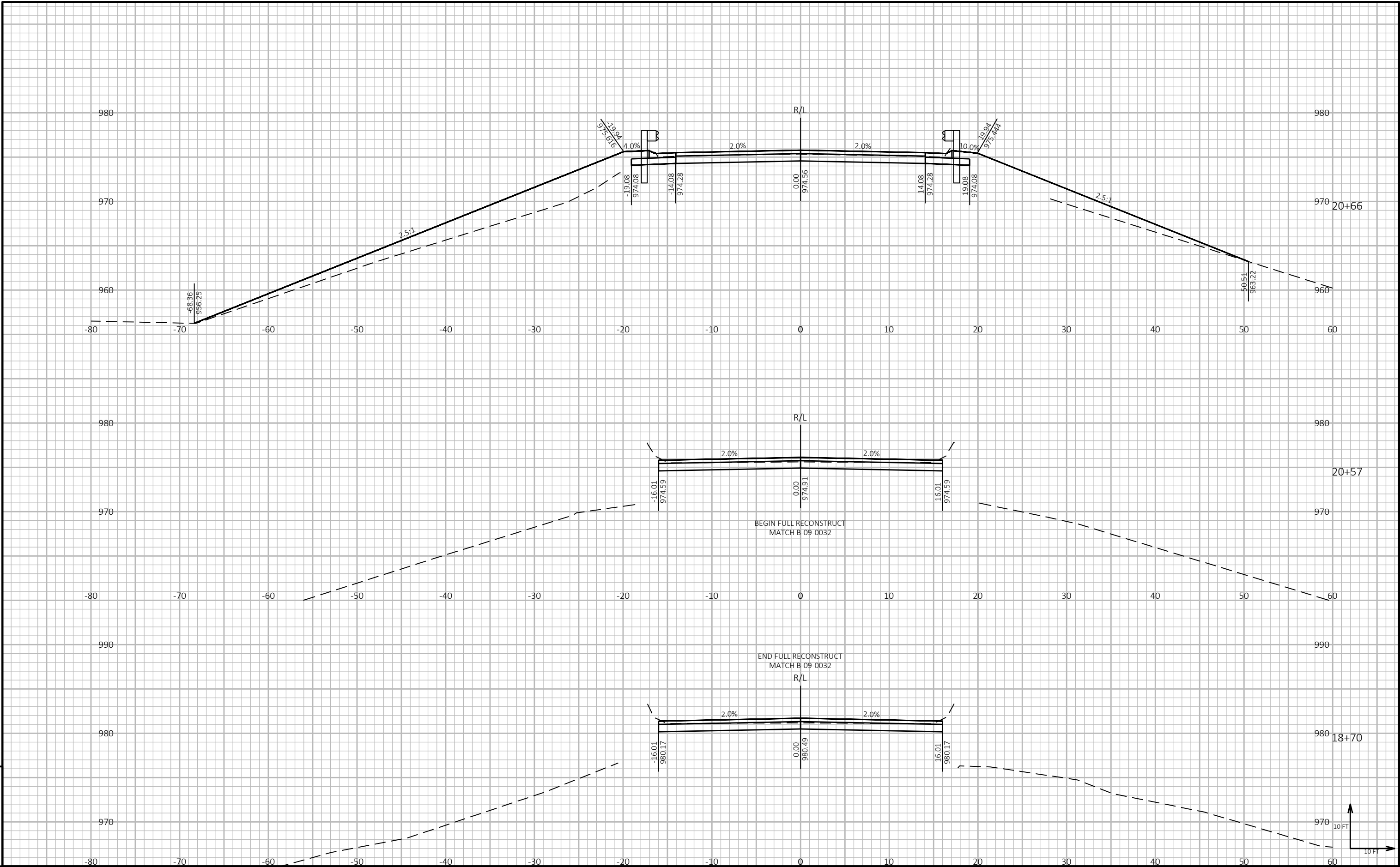
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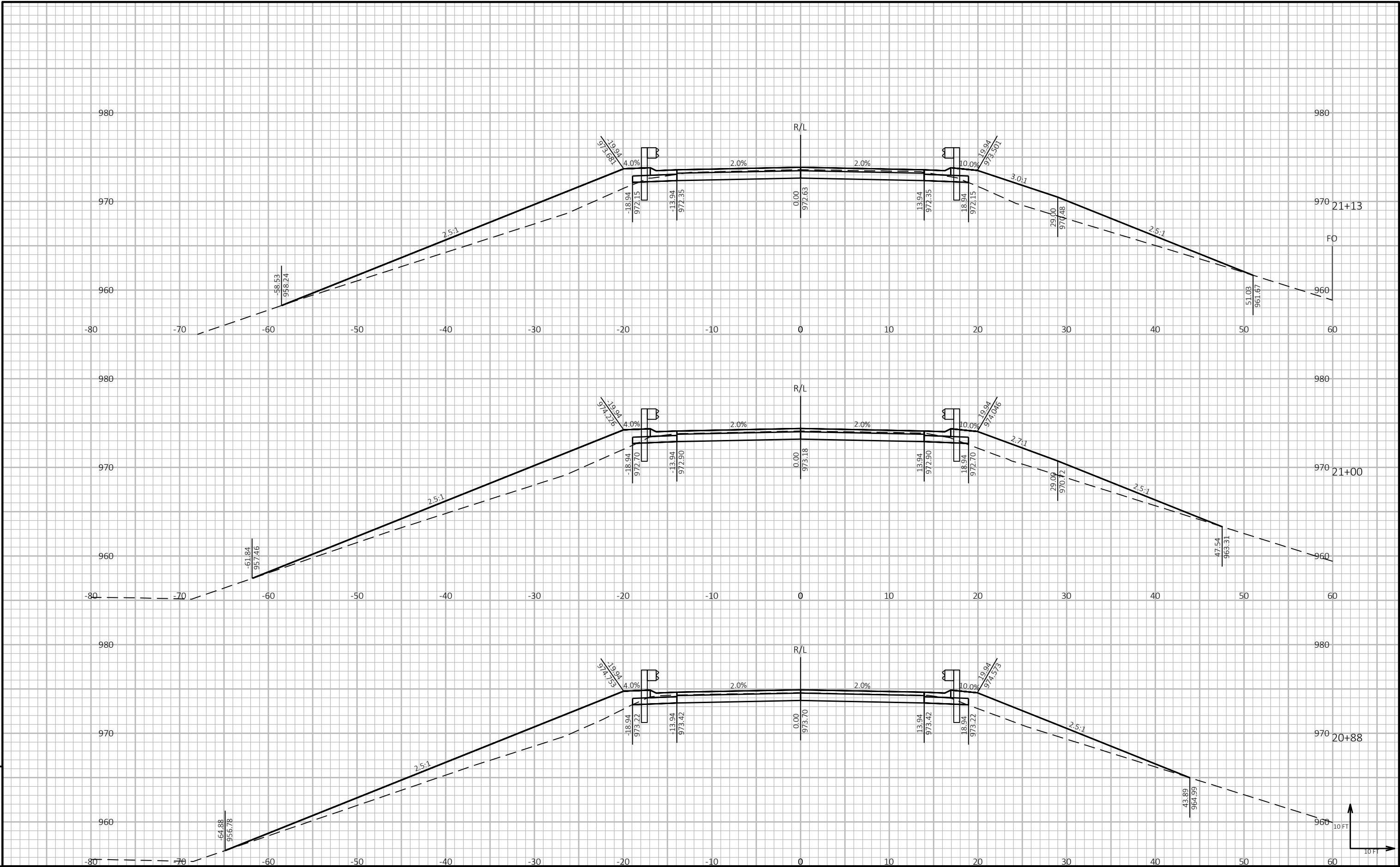


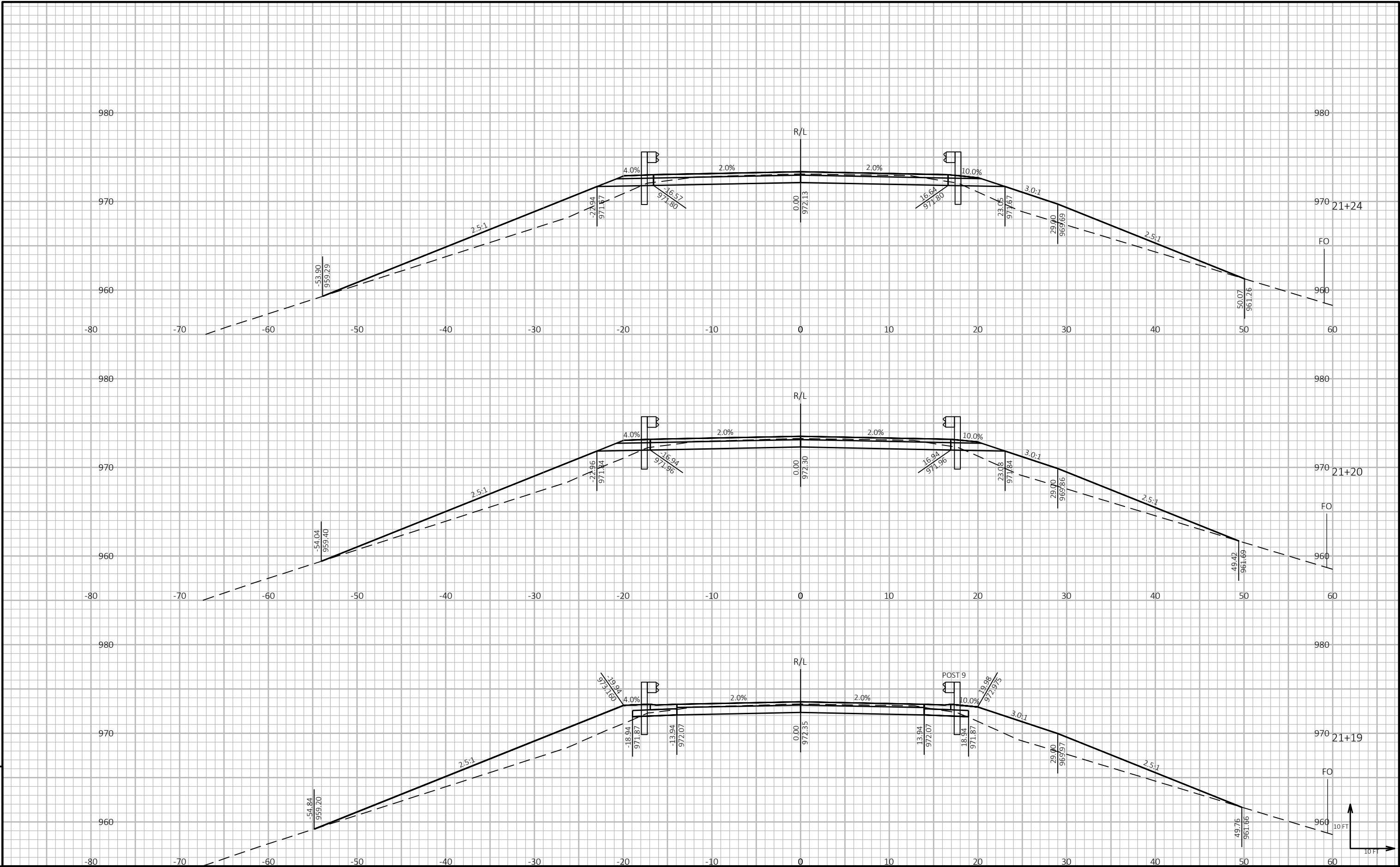
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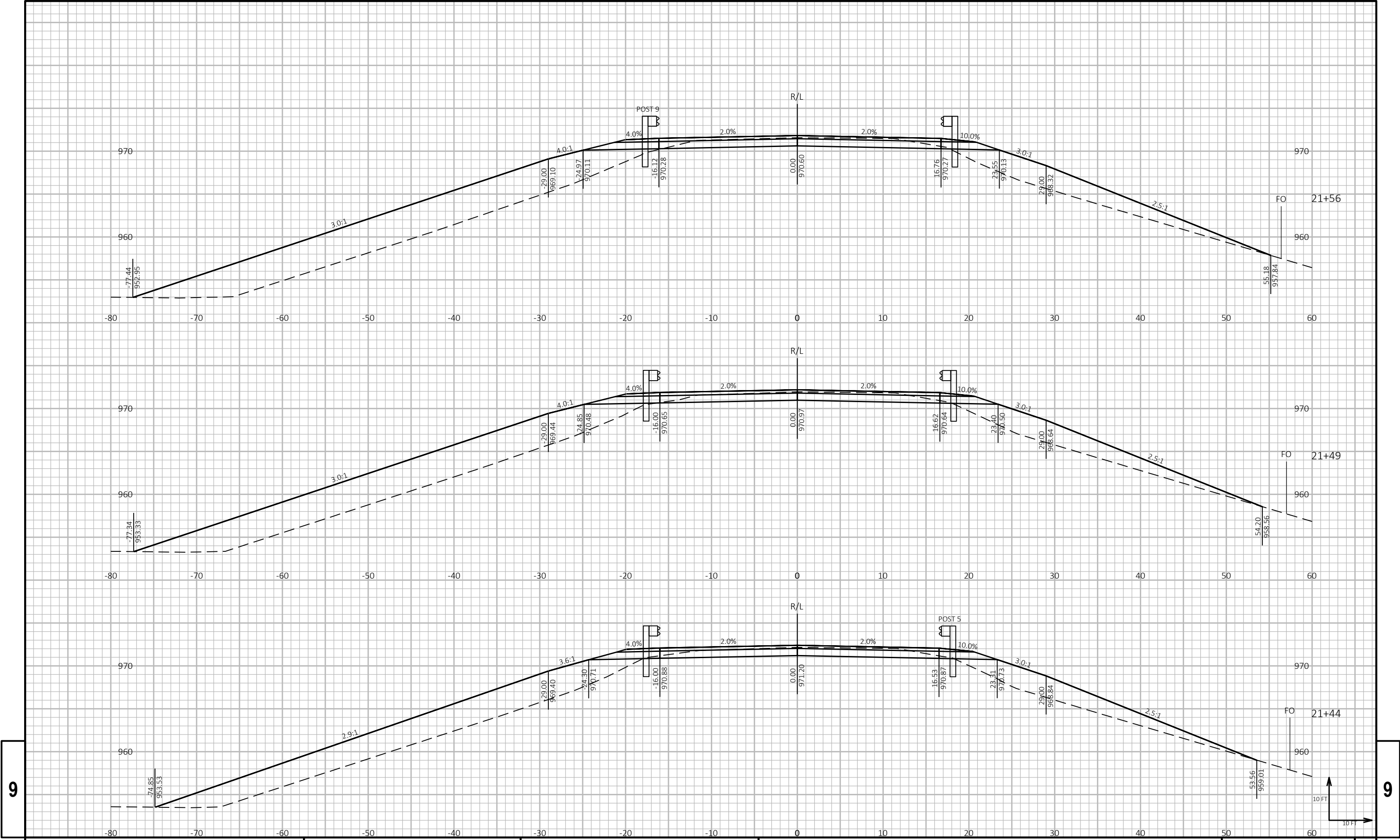
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|                        |             |                  |                          |       |   |
|------------------------|-------------|------------------|--------------------------|-------|---|
| PROJECT NO: 1050-01-83 | HWY: STH 29 | COUNTY: CHIPPEWA | CROSS SECTIONS: 160TH ST | SHEET | E |
|------------------------|-------------|------------------|--------------------------|-------|---|





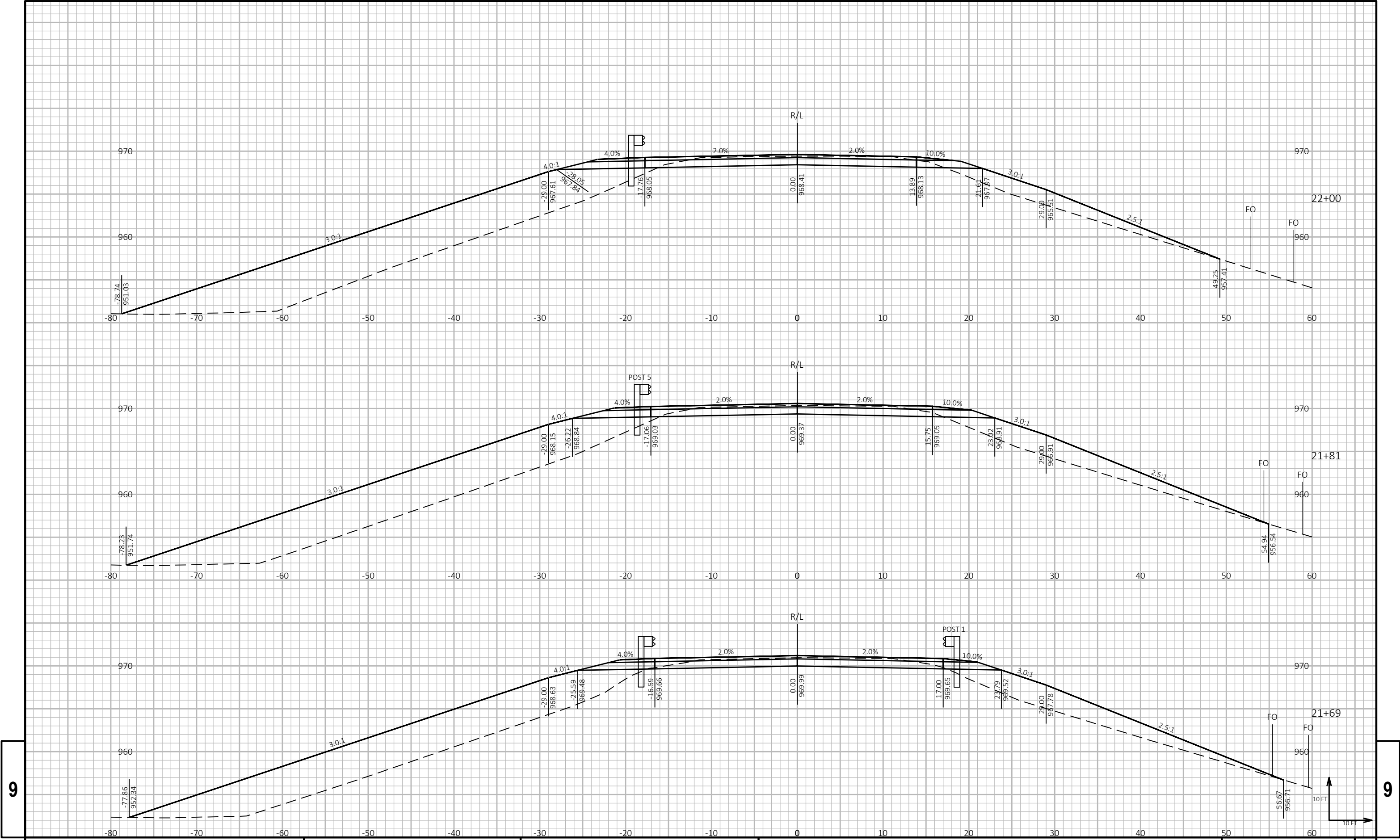




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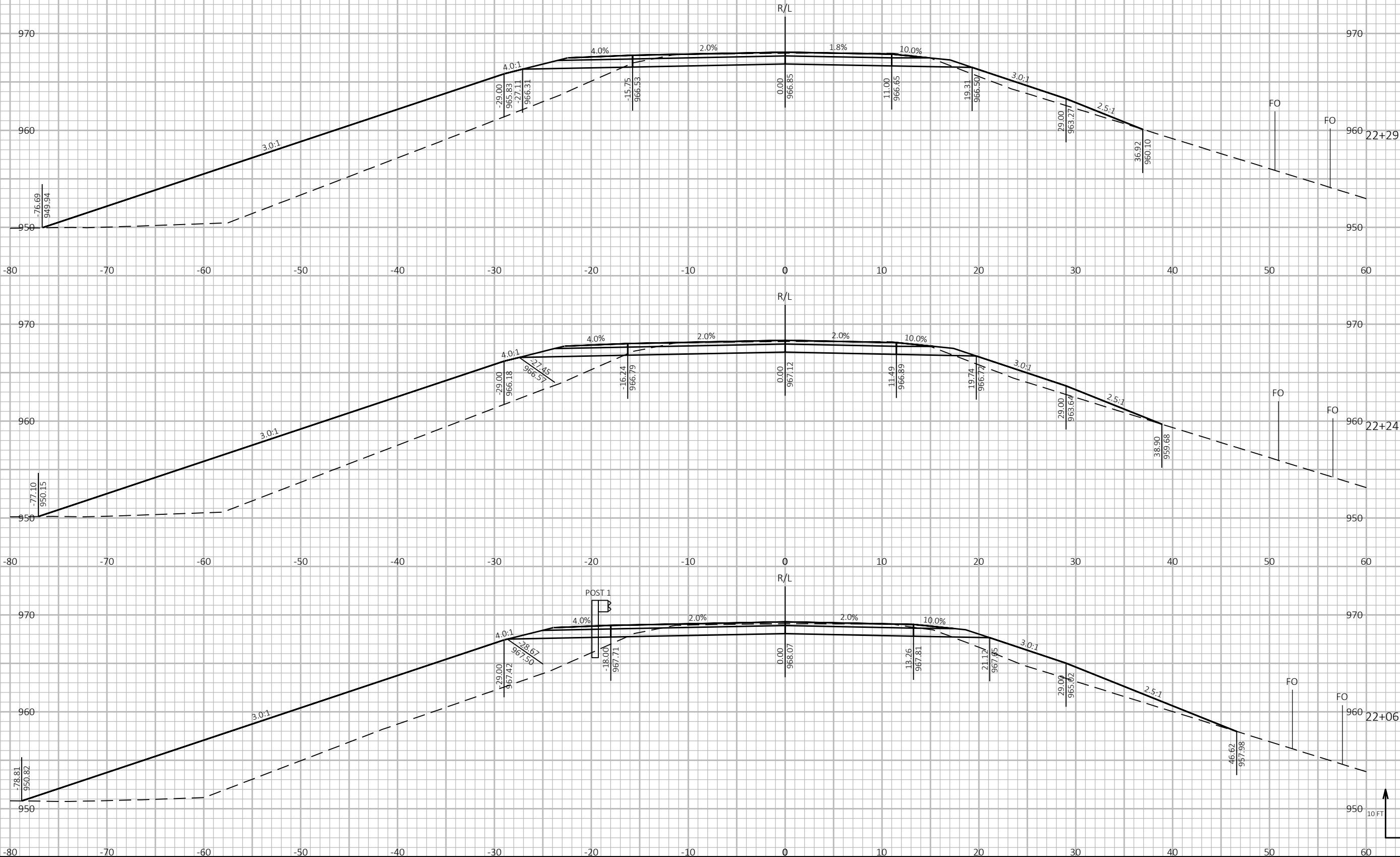
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PROJECT NO: 1050-01-83

HWY: STH 29

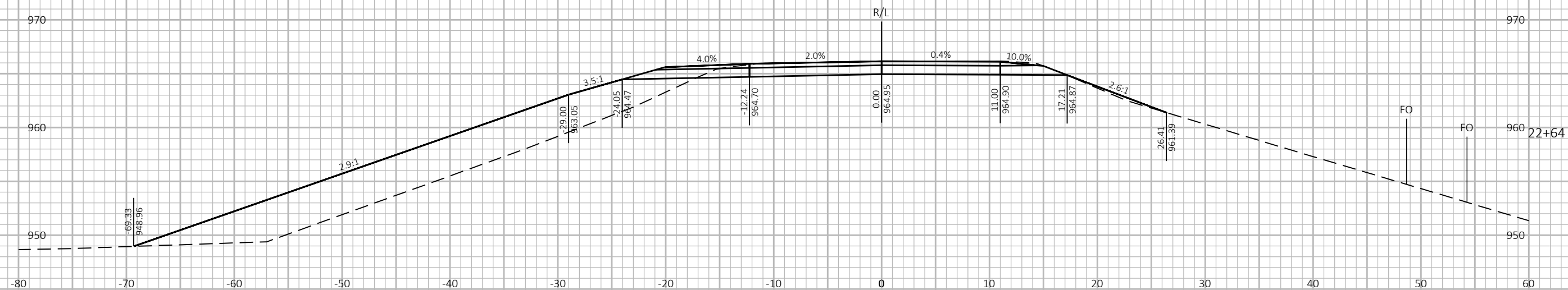
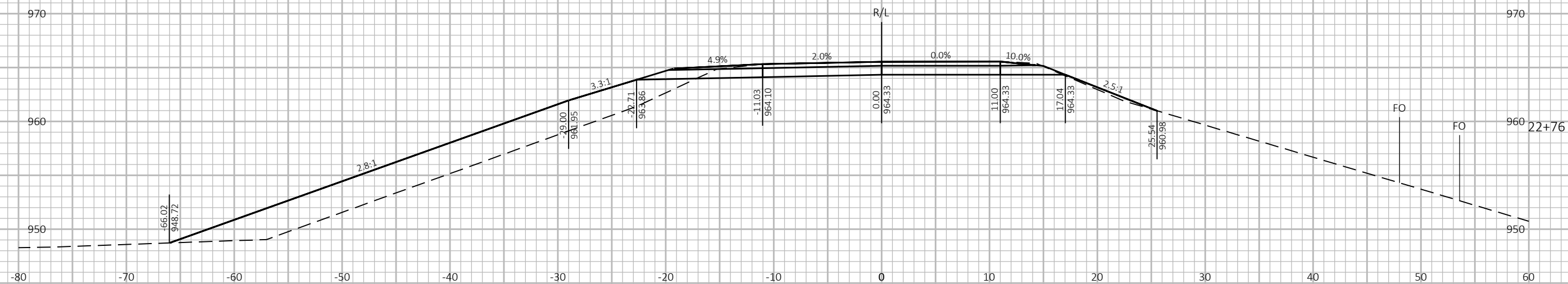
COUNTY: CHIPPEWA

CROSS SECTIONS: 160TH ST

SHEET

E





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PROJECT NO: 1050-01-83

HWY: STH 29

COUNTY: CHIPPEWA

CROSS SECTIONS: 160TH ST

SHEET

**E**

FILE NAME : P:\55XX\5506.DP.22.STH29-160TH.CHI\CADD\10500183\SHEETS\090201-XS.DWG  
LAYOUT NAME - 14

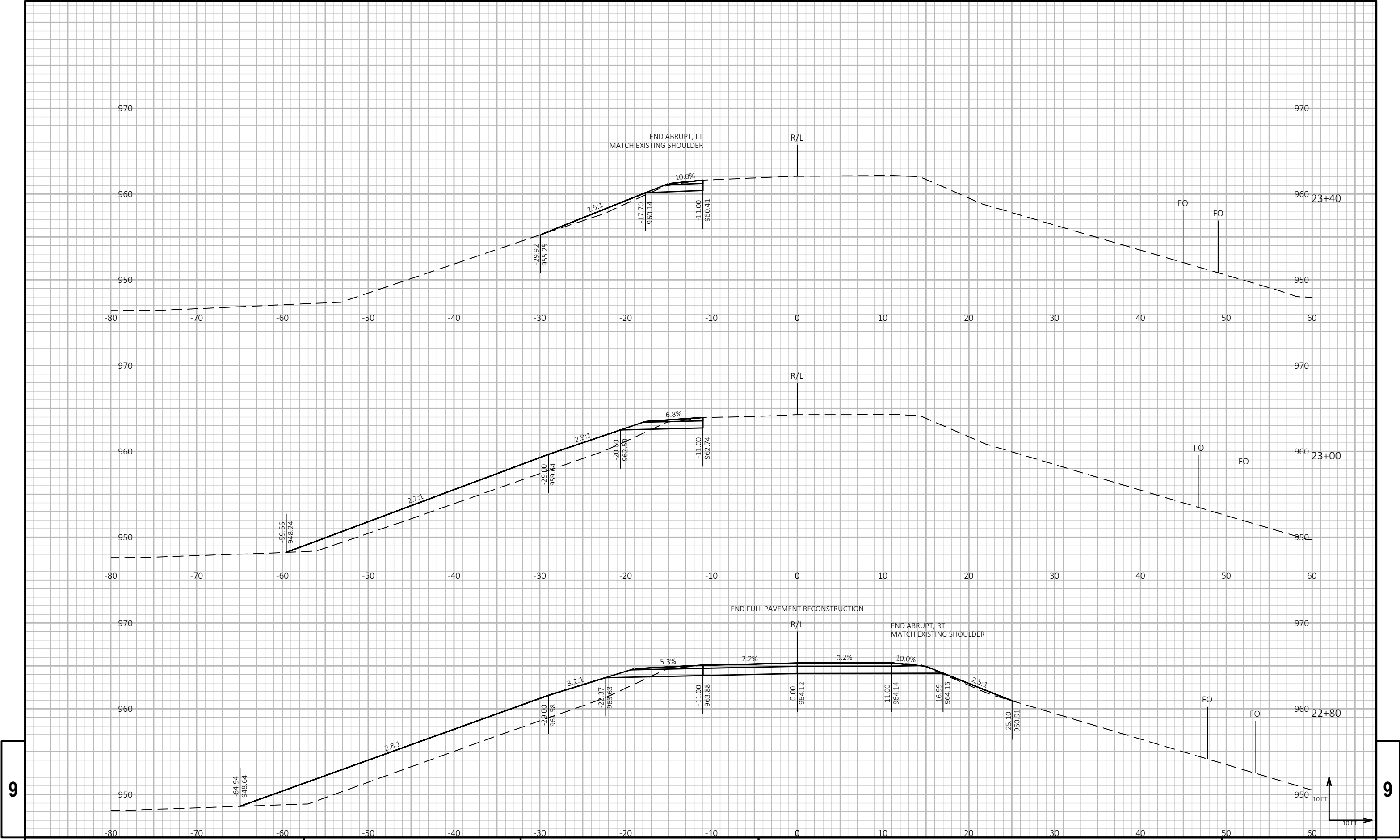
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PLOT BY : MITCH SYBERS

PLOT NAME :

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

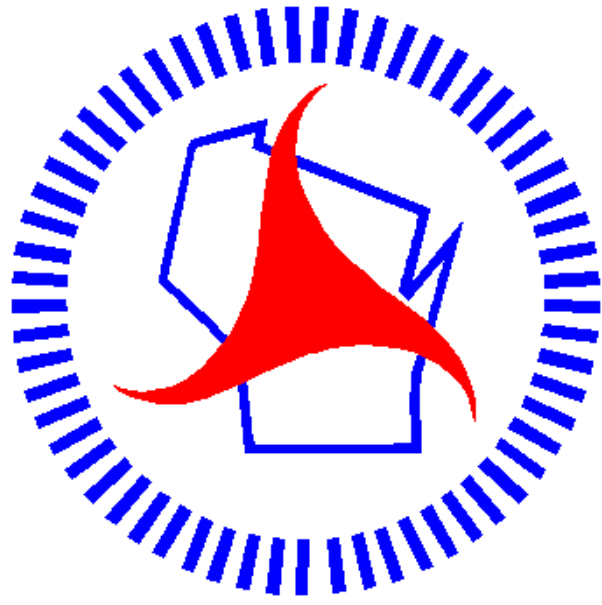
WISDOT/CADDS SHEET 49



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## Notes



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