LAX

JUNE 2022

PROJECT ID: 5339-00-72

WITH: N/A

COUNTY: CRAWFORD

ORDER OF SHEETS

TOTAL SHEETS = 88

N

DESIGN DESIGNATION 5339-00-72

A.A.D.T.	(2022)	=	100
A.A.D.T.	(2042)	=	105
D.H.V.	(2042)	=	27
D.D.		=	60/40
T.		=	8%
DESIGN SPEED		=	45MPH
ESALS		=	47,000

CONVENTIONAL SYMBOLS

PLAN

- CORPORATE LIMITS
- PROPERTY LINE
- LOT LINE
- LIMITED HIGHWAY EASEMENT
- EXISTING RIGHT OF WAY
- PROPOSED OR NEW R/W LINE
- SLOPE INTERCEPT
- REFERENCE LINE (300'EB)
- EXISTING CULVERT
- PROPOSED CULVERT (Box or Pipe)
- COMBUSTIBLE FLUIDS (CAUTION)
- MARSH AREA
- WOODED OR SHRUB AREA

PROFILE

- GRADE LINE
- ORIGINAL GROUND
- MARSH OR ROCK PROFILE (To be noted as such) (ROCK)
- SPECIAL DITCH (LABEL)
- GRADE ELEVATION (95.36)
- CULVERT (Profile View)

UTILITIES

- ELECTRIC (E)
- FIBER OPTIC (FO)
- GAS (G)
- SANITARY SEWER (SAN)
- STORM SEWER (SS)
- TELEPHONE (T)
- WATER (W)
- UTILITY PEDESTAL
- POWER POLE
- TELEPHONE POLE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

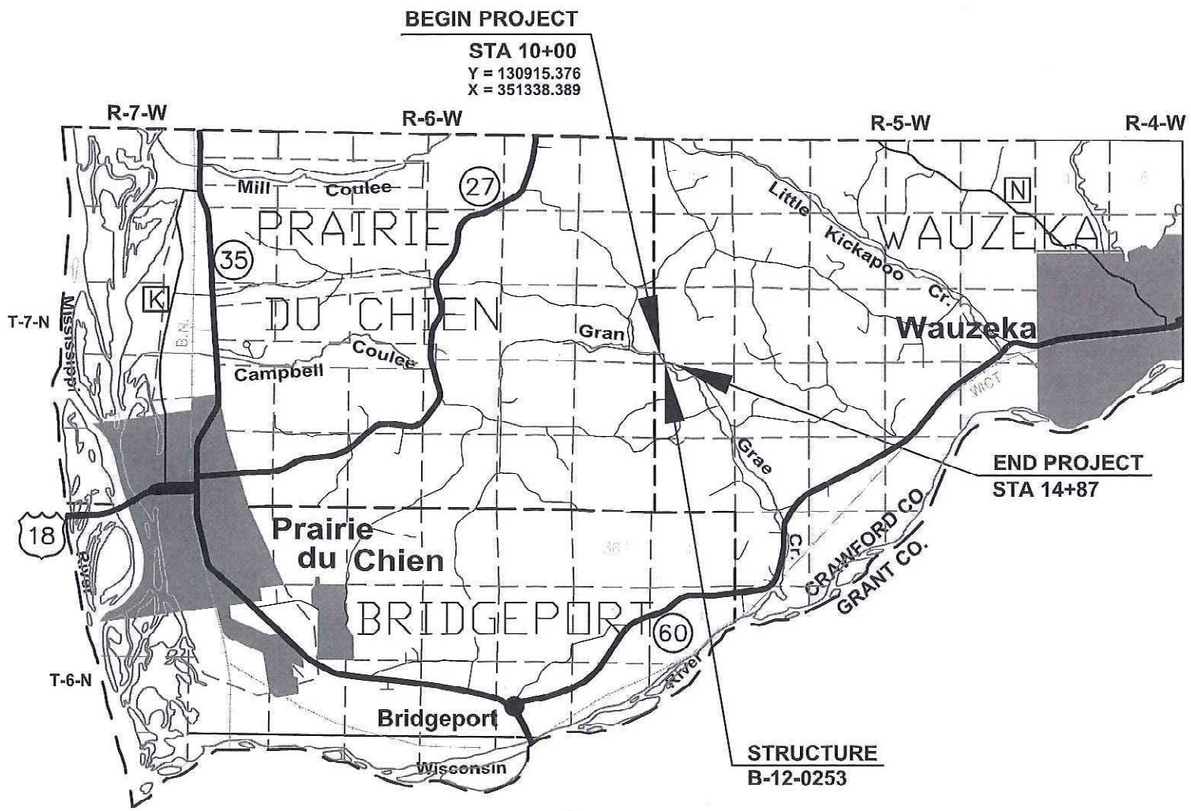
T OF WAUZEKA, GRAN GRAE ROAD

(GRAN GRAE CREEK, B-12-0253)

LOC STR
CRAWFORD

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
5339-00-72	WISC 2022072	1

STATE PROJECT NUMBER
5339-00-72



LAYOUT

SCALE 0 1 MI. 2 MI.

TOTAL NET LENGTH OF CENTERLINE = 0.092 MI.

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COORDINATE REFERENCE SYSTEM (WISCRS), CRAWFORD 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 12A.

ACCEPTED FOR

TOWN OF WAUZEKA

6-22-21 (Date) TOWN CHAIRPERSON

ACCEPTED FOR

COUNTY OF CRAWFORD

6/22/2021 (Date) HIGHWAY COMMISSIONER

ORIGINAL PLANS PREPARED BY

TEAM ENGINEERING
Transportation | Environmental | Agricultural | Municipal and Land Surveying

WISCONSIN
JEREMY F. KRACHEY
E-37258
WAUZEKA
WIS.
PROFESSIONAL ENGINEER

DATE: 6-22-2021 (Signature)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor	TEAM ENGINEERING
Designer	TEAM ENGINEERING
Regional Examiner	ALEIGHA BURG
Regional Supervisor	IAN WINGER

APPROVED FOR THE DEPARTMENT

DATE: Aleigha Burg, P.E. Digitally signed by Aleigha Burg, P.E. Date: 2021.06.22 14:07:18-05'00' (Signature)

E

FILE NAME : T:\PROJECTS\2019\19-1770-1 CRAWFORD CTY GRAN GRAE RD (P-12-0124) 5339-00-02_72\DRAWINGS\FINAL\1770_TITLE.DWG PLOT DATE : 2/24/2021 7:08 AM PLOT BY : REID SHOWERS PLOT NAME :

LIST OF STANDARD ABBREVATIONS

ABUT.	Abutment
AC	Acre
AGG.	Aggregate
AH	Ahead
<	Angle
ASPH	Asphaltic
AVG.	Average
A.D.T.	Average Daily Traffic
BAD	Base Aggregate Dense
BK.	Back
BF	Back Face
B.M	Bench Mark
BR.	Bridge
C/L	Center Line
CC	Center to Center
CTH	County Trunk Highway
CR.	Creek
CY OR CU YD	Crushed
CP	Cubic Yard
C & G	Culvert Pipe
D	Curb and Gutter
DHV	Degree of Curve
DIA	Design Hour Volume
E	Diameter
X	East
ELEC	East Grid Coordinate
EL OR ELEV	Electric
ESALS	Elevation
EBS	Equivalent Single Axle Loads
FF	Excavation Below Subgrade
FE	Face to Face
F	Field Entrance
FG	Fill
FL OR F/L	Finished Grade
FT	Flow Line
FTG	Foot
GN	Footing
HT	Grid North
CWT	Height
HYD	Hundredweight
INL	Hydrant
ID	Inlet
INV	Inside Diameter
IP	Invert
IRS	Iron Pipe or Pin
	Iron Rod Set

JT	Joint
JCT	Junction
LHF	Left–Hand Forward
L	Length of Curve
LIN FT OR LF	Linear Foot
LC	Long Chord of Curve
MH	Manhole
MB	Mailbox
ML OR M/L	Match Line
N	North
Y	North Grid Coordiante
OAL	Overall Length
OD	Outside Diameter
PLE	Permanent Limited Easement
PT	Point
PC	Point of Curvature
PI	Point of Intersection
PRC	Point of Reverse Curvature
PT	Point of Tangency
POC	Point on curve
POT	Point on Tangent
PVC	Polyvinyl Chloride
PCC	Portland Cement Concrete
LB	Pound
PSI	Pounds Per Square Inch
PE	Private Entrance
R	Radius
RR	Railroad
RL OR R/L	Reference Line
RP	Reference Point
RCCP	Reinforced Concrete Culvert Pipe
REQD	Required
RES	Residence or Residential
RW	Retaining Wall
RT	Right
RHF	Right–Hand Forward
R/W	Right–of–Way
R	River
RD	Road
RDWY	Roadway
SALV	Salvaged
SAN S	Sanitary Sewer

SEC	Section
SHLDR	Shoulder
SHR	Shrinkage
SW	Sidewalk
S	South
SQ	Square
SF OR SQ FT	Square feet
SY OR SQ YD	Square Yard
STD	Standard
SDD	Standard Detail Drawings
STH	State Trunk Highways
STA	Station
SS	Storm Sewer
SG	Subgrade
SE	Superelevation
SL OR S/L	Survey Line
SV	Septic Vent
T	Tangent
TEL	Telephone
TEMP	Temporary
TI	Temporary Interest
TLE	Temporary Limited Easement
t	Ton
T OR TN	Town
TRANS	Transition
TL OR T/L	Transit Line
T	Trucks (percent of)
TYP	Typical
UNCL	Unclassified
UG	Underground Cable
USH	United States Highway
VAR	Variable
V	Velocity or Design Speed
VERT	Vertical
VC	Vertical Curve
VOL	Volume
WM	Water Main
WV	Water Valve
W	West
WB	Westbound
YD	Yard

DESIGNER

TEAM ENGINEERING, INC.
210 GUARD STREET
WAUZEKA, WI 53826
ATTN: JEREMY KRACHY, P.E.
PH: (608) 875–5075
jkrachey@teamenginc.com

DNR CONTACT

DEPARTMENT OF NATURAL RESOURCES
3550 MORMON COULEE ROAD
LA CROSSE, WI 54601
ATTN: KAREN KALVELAGE
ENVIRONMENTAL ANALYSIS & REVIEW SPECIALIST
PH: (608) 785–9115
karen.kalvelage@wisconsin.gov

MUNICIPALITY CONTACT

CRAWFORD COUNTY HIGHWAY DEPARTMENT
21515 STATE HWY 27
SENECA, WI 54654
ATTN: KYLE KOZELKA, COMMISSIONER
PH: (608) 734–9500
kkozelka@crawfordcountywi.org

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

UTILITIES

SCENIC RIVERS ENERGY COOPERATIVE
231 N. SHERIDAN ST.
LANCASTER, WI 53813
ATTN: ANDY KILCOYNE
PH: (608) 723–2121 EXT. 568
akilcoyne@srec.net

* – NOT A MEMBER OF DIGGER'S HOTLINE.

GENERAL NOTES

NO TREES OR SHRUBS ARE TO BE REMOVED UNLESS SUCH TREES OR SHRUBS HAVE FIRST BEEN INDICATED FOR REMOVAL BY THE ENGINEER IN THE FIELD.

EXCAVATION BELOW SUBRGRADE (EBS) IS NOT USED TO BALANCE YARDAGE AND IS NOT SHOWN ON THE CROSS SECTIONS, BUT IS MEASURED AND PAID FOR AS EXCAVATION COMMON. THE LOCATION OF EBS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.

FILL EXPANSION IS ESTIMATED AT 30%.

DISTURBED AREAS SHOWN WITHIN THE RIGHT–OF–WAY, EXCEPT THE AREAS WITHIN THE FINISHED SHOULDER POINTS, ARE TO BE FERTILIZED (TYPE B), SEEDED (USE SEEDING MIXTURE #20), EROSION MAT, AND MULCHED AS DIRECTED BY THE ENGINEER IN THE FIELD.

THE LOCATIONS OF SILT FENCE, SALVAGED TOPSOIL, SEEDING MIX #20, SEEDING TEMPORARY, EROSION MAT, MULCH AND TEMPORARY DITCH CHECKS ARE APPROXIMATE. LOCATIONS ARE TO BE DETERMINED BY THE ENGINEER IN THE FIELD.

REMOVAL OF ASPHALTIC SURFACES WHERE AN ABUTTING ASPHALTIC SURFACE IS TO REMAIN IN PLACE SHALL REQUIRE A SAWCUT MEETING THE APPROVAL OF THE ENGINEER IN THE FIELD.

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

ELEVATIONS SHOWN ON THE PLAN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 2012 (NAVD88).

BEARINGS ON THE PLAN ARE REFERENCED TO THE WISCONSIN COUNTY COORDINATE SYSTEM, CRAWFORD COUNTY.

EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO STAGE 1. EROSION CONTROL ITEMS ON THE PLAN ARE AT SUGGESTED LOCATIONS. EXACT LOCATIONS AND DIMENSIONS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD. ALL EROSION CONTROL DEVICES SHALL BE MAINTAINED UNTIL SUCH TIME AS THE ENGINEER IN THE FIELD DEEMS THE DEVICES NO LONGER NECESSARY.

4–INCH ASPHALTIC SURFACE SHALL BE PLACED WITH A 2 1/4–INCH LOWER LAYER AND A 1 3/4–INCH UPPER LAYER. THE NOMINAL SIZE OF AGGREGATE USED FOR THE LOWER LAYER SHALL BE 19.0 MM AND THE UPPER LAYER SHALL BE 12.5 MM.

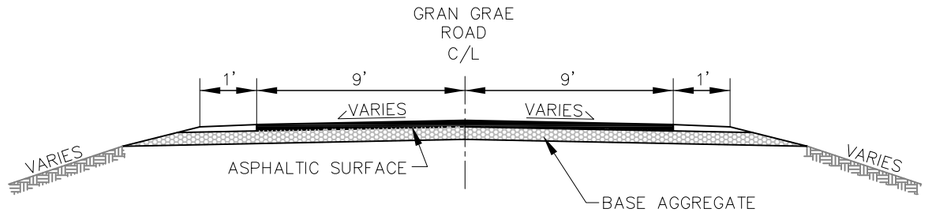
EXACT DIMENSIONS OF ANY PART ITEM CONTAINING THE WORK "RIPRAP" SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.

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 .22	.16 .30	.22 .38	.12 .26	.20 .34	.27 .44	.15 .30	.24 .37	.33 .50	.19 .34	.28 .41	.38 .56
MEDIAN STRIP–TURF	.19 .24	.20 .26	.24 .30	.19 .25	.22 .28	.26 .33	.20 .26	.23 .30	.30 .37	.20 .27	.25 .32	.30 .40
SIDE SLOPE–TURF			.25 .32			.27 .34			.28 .36			.30 .38
PAVEMENT:												
ASPHALT	.70 – .95											
CONCRETE	.80 – .95											
BRICK	.70 – .80											
DRIVES,WALKS	.75 – .85											
ROOFS	.75 – .95											
GRAVEL ROADS SHOULDERS	.40 – .60											

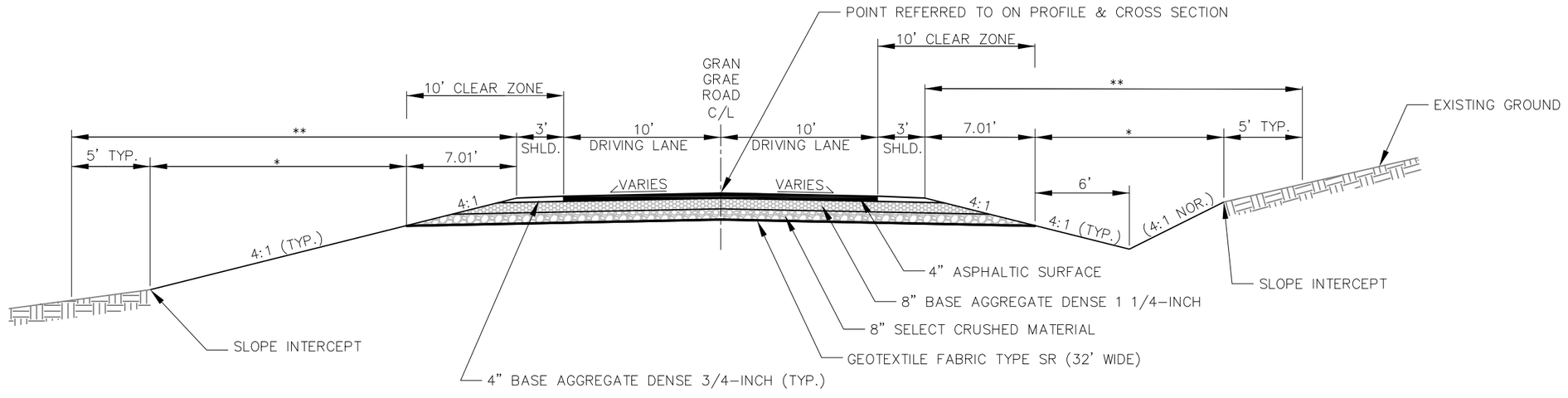
TOTAL PROJECT AREA = 1.37 ACRES
TOTAL AREA EXPECTED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES = 1.02 ACRES

2



TYPICAL EXISTING SECTION

GRAN GRAE ROAD



FILL

TYPICAL FINISHED SECTION

GRAN GRAE ROAD
STA 10+00 – STA. 14+87

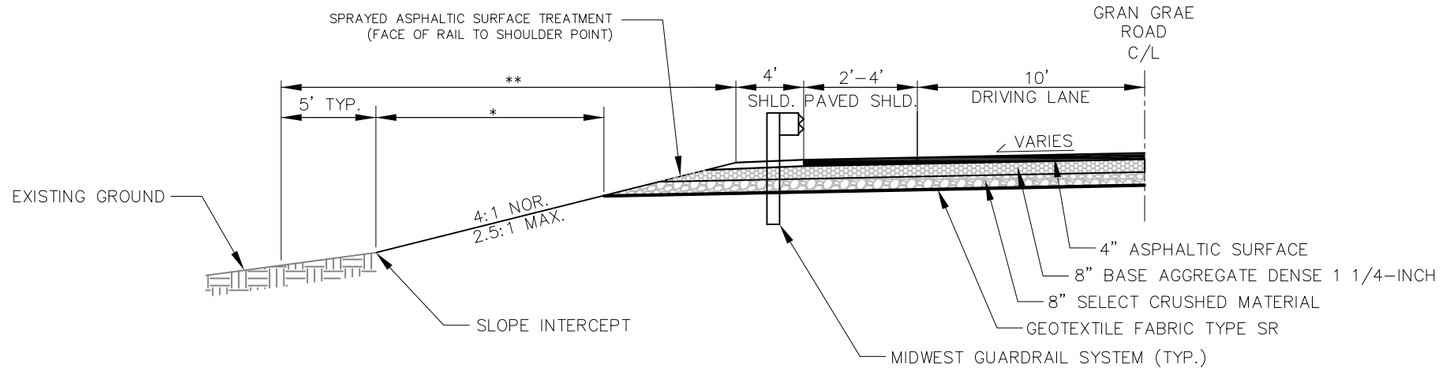
CUT

** LIMITS OF SEEDING, FERTILIZER, & EROSION MAT OR MULCH

* LIMITS OF SALVAGED TOPSOIL

PROJECT NO: 5339-00-72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	TYPICAL SECTIONS	SHEET 3	E

FILE NAME : T:\PROJECTS\2019\19-1770-1 CRAWFORD CTY GRAN GRAE RD (P-12-0124) 5339-00-02_72\DRAWINGS\FINAL\1770_TYPICALSECTIONS.DWG PLOT DATE : 2/24/2021 9:50 AM PLOT BY : BRAD SCHROEDER PLOT NAME :

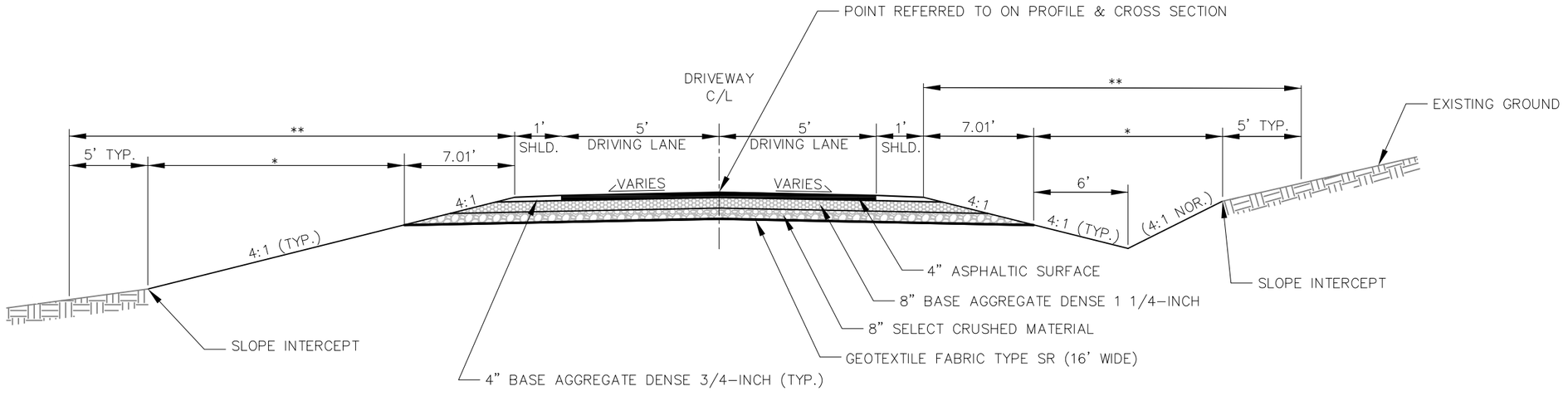


TYPICAL FINISHED BEAM GUARD HALF SECTION

GRAN GRAE ROAD
STA 10+67 – STA. 11+63, LT
STA 11+18 – STA 11+78, RT
STA 12+15 – STA. 13+05, LT
STA 12+28 – STA 13+21, RT

** LIMITS OF SEEDING, FERTILIZER, & EROSION MAT OR MULCH

* LIMITS OF SALVAGED TOPSOIL



FILL

TYPICAL FINISHED SECTION

DRIVEWAY

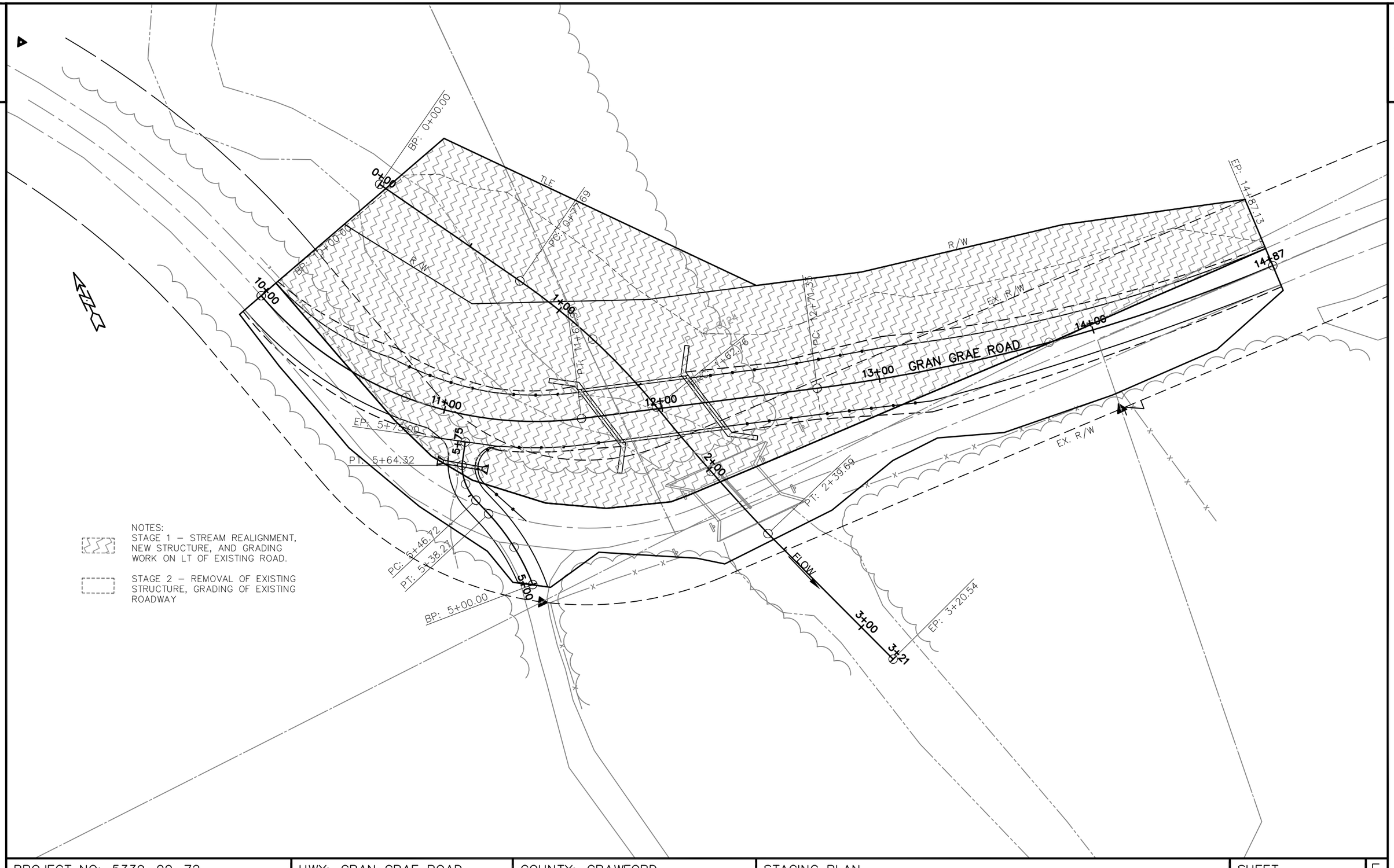
CUT

** LIMITS OF SEEDING, FERTILIZER, & EROSION MAT OR MULCH

* LIMITS OF SALVAGED TOPSOIL

PROJECT NO: 5339–00–72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	TYPICAL SECTIONS	SHEET 4	E

2



NOTES:
STAGE 1 – STREAM REALIGNMENT, NEW STRUCTURE, AND GRADING WORK ON LT OF EXISTING ROAD.

STAGE 2 – REMOVAL OF EXISTING STRUCTURE, GRADING OF EXISTING ROADWAY

PROJECT NO: 5339–00–72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	STAGING PLAN	SHEET 5	E

SEE CREEK STAGING DETAIL
FOR ADDITIONAL
EROSION CONTROL ITEMS

DRAINAGE ARROW
SILT FENCE
EROSION MAT
CLASS I TYPE B URBAN
HEAVY RIPRAP
TEMPORARY DITCH CHECKS

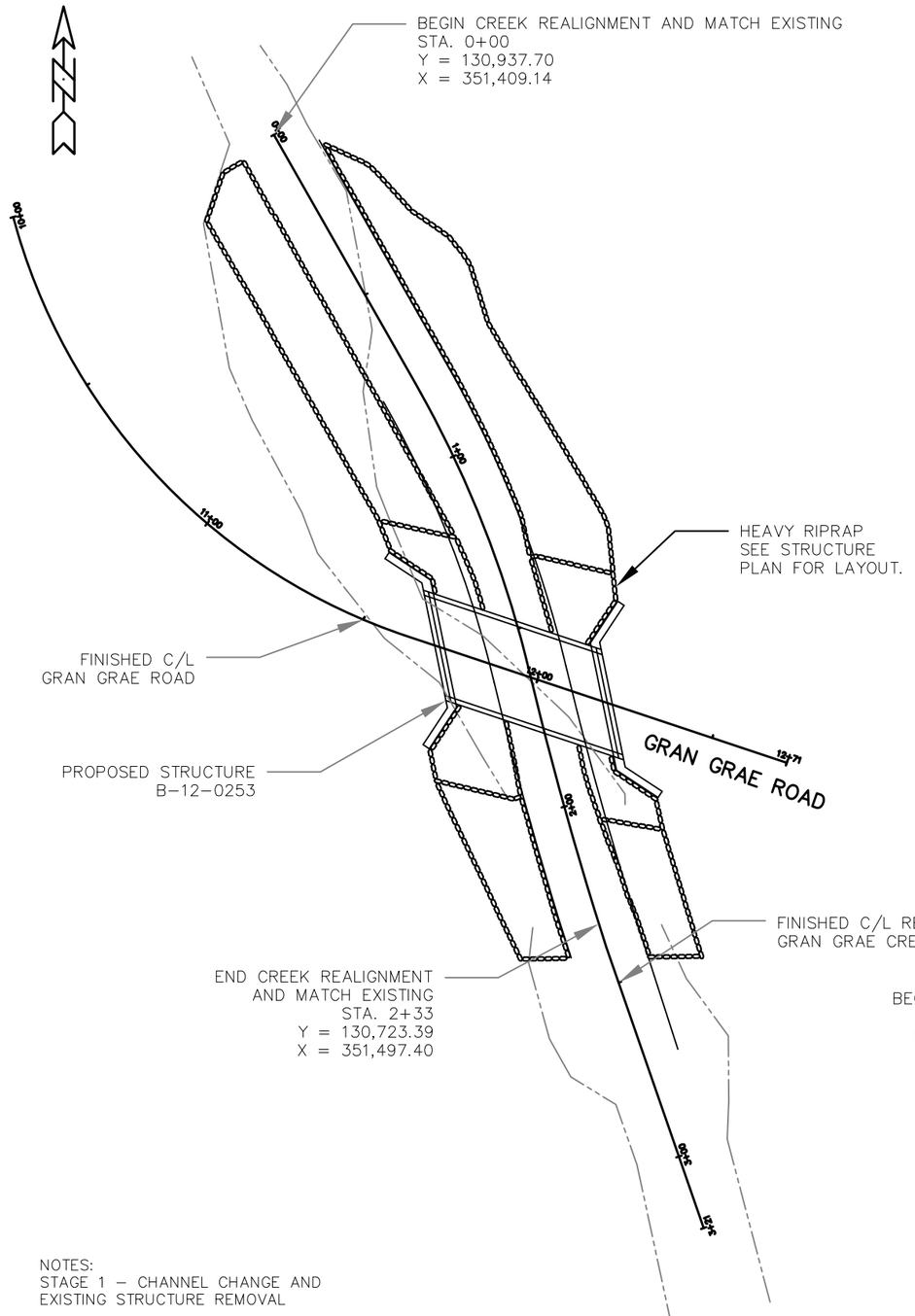
NOTES:
STAGE 1 – CHANNEL CHANGE AND
EXISTING STRUCTURE REMOVAL

STAGE 2 – PROPOSED STRUCTURE
AND ROADWAY WORK

GRAN GRAE ROAD

PROJECT NO: 5339–00–72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	EROSION CONTROL PLAN	SHEET 6 E

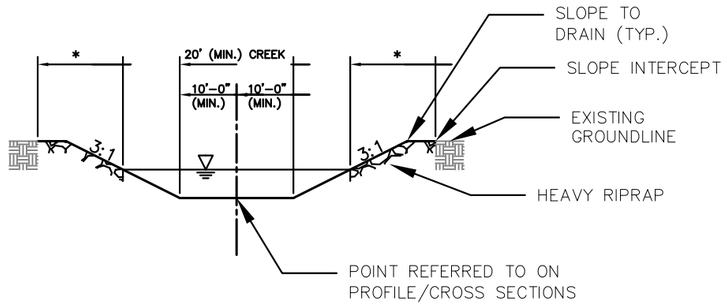
2



CREEK REALIGNMENT – PLAN VIEW

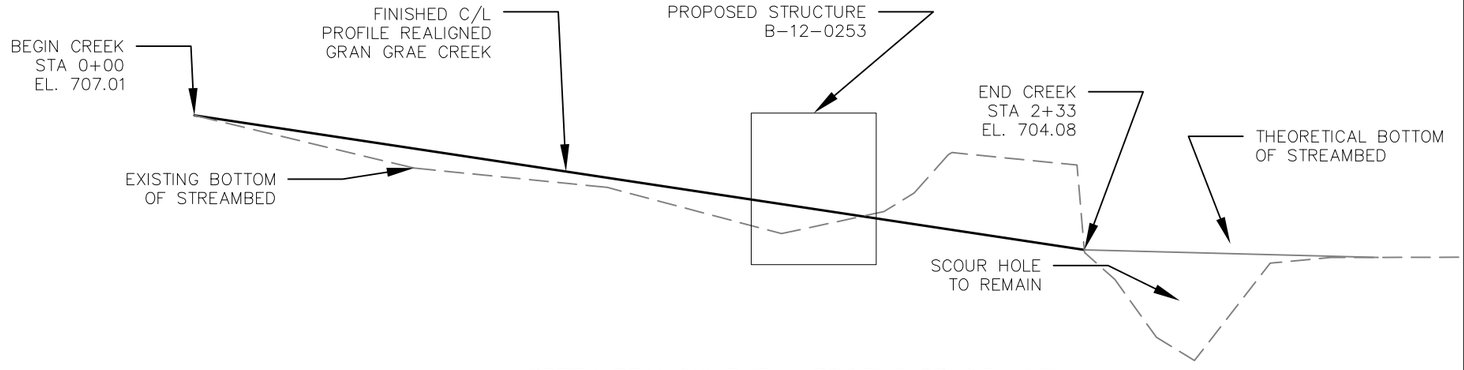
CURVE 1
PI STA. = 1+20.51
Y = 130,832.96
X = 351,468.75
R = 300.00
D = 19°5'55"
DELTA = 16°14'46"
L = 85.06
T = 42.82
C = 84.78
PC STA. = 0+77.69
Y = 130,870.17
X = 351,447.57
PT STA. = 1+62.76
Y = 130,791.30
X = 351,478.67

CURVE 2
PI STA. = 2+01.24
Y = 130,753.87
X = 351,487.59
R = 1000.00
D = 5°43'47"
DELTA = 4°24'29"
L = 76.94
T = 38.49
C = 76.92
PC STA. = 1+62.76
Y = 130,791.30
X = 351,478.67
PT STA. = 2+39.69
Y = 130,717.22
X = 351,499.36



*LIMITS OF HEAVY RIPRAP

TYPICAL CREEK REALIGNMENT SECTION



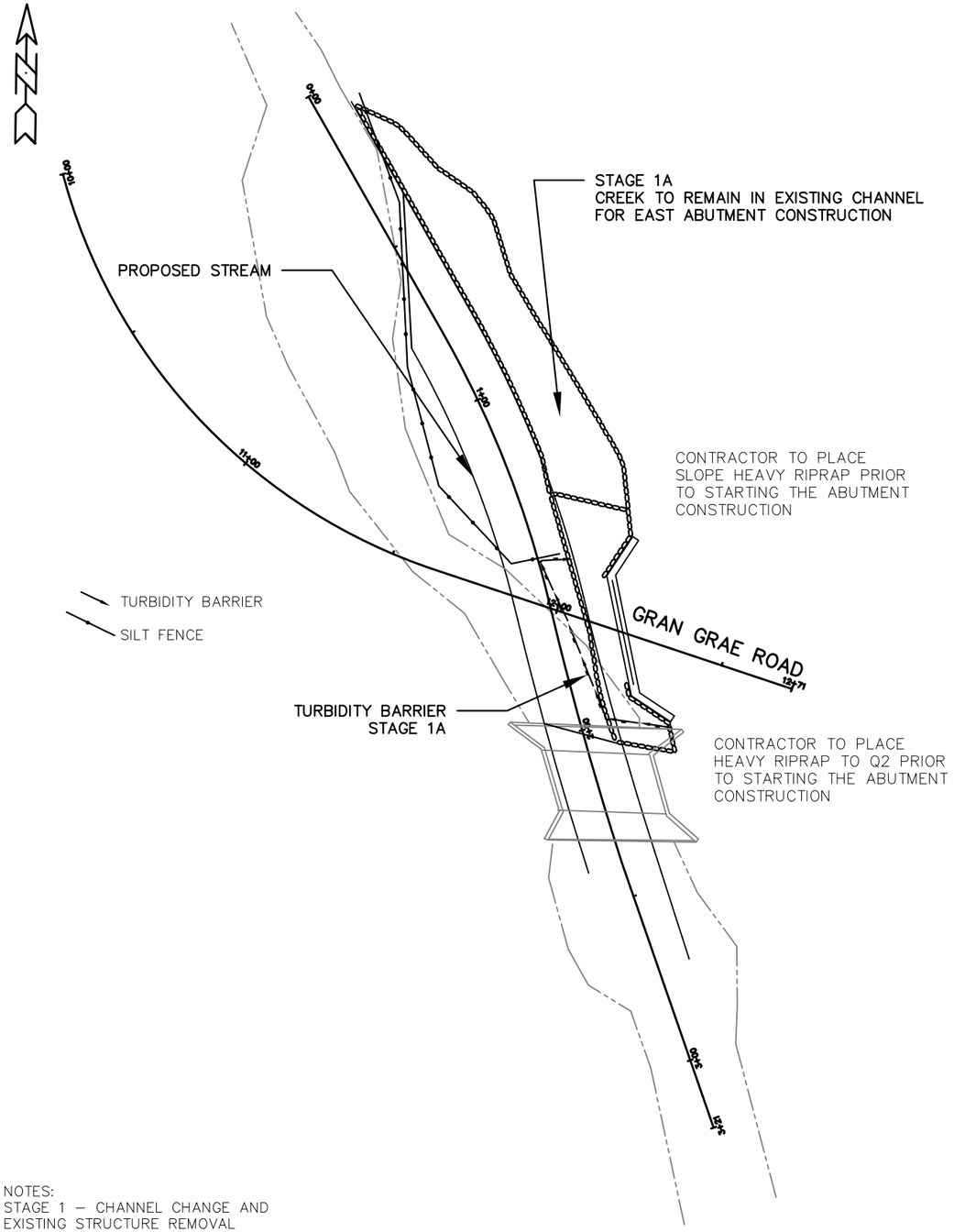
CREEK REALIGNMENT – PROFILE GRADE LINE
SEE PLAN & PROFILE CHANNEL
REALIGNMENT FOR ADDITIONAL INFORMATION.

NOTES:
STAGE 1 – CHANNEL CHANGE AND EXISTING STRUCTURE REMOVAL

STAGE 2 – PROPOSED STRUCTURE AND ROADWAY WORK

CHANNEL REALIGNMENT DETAILS

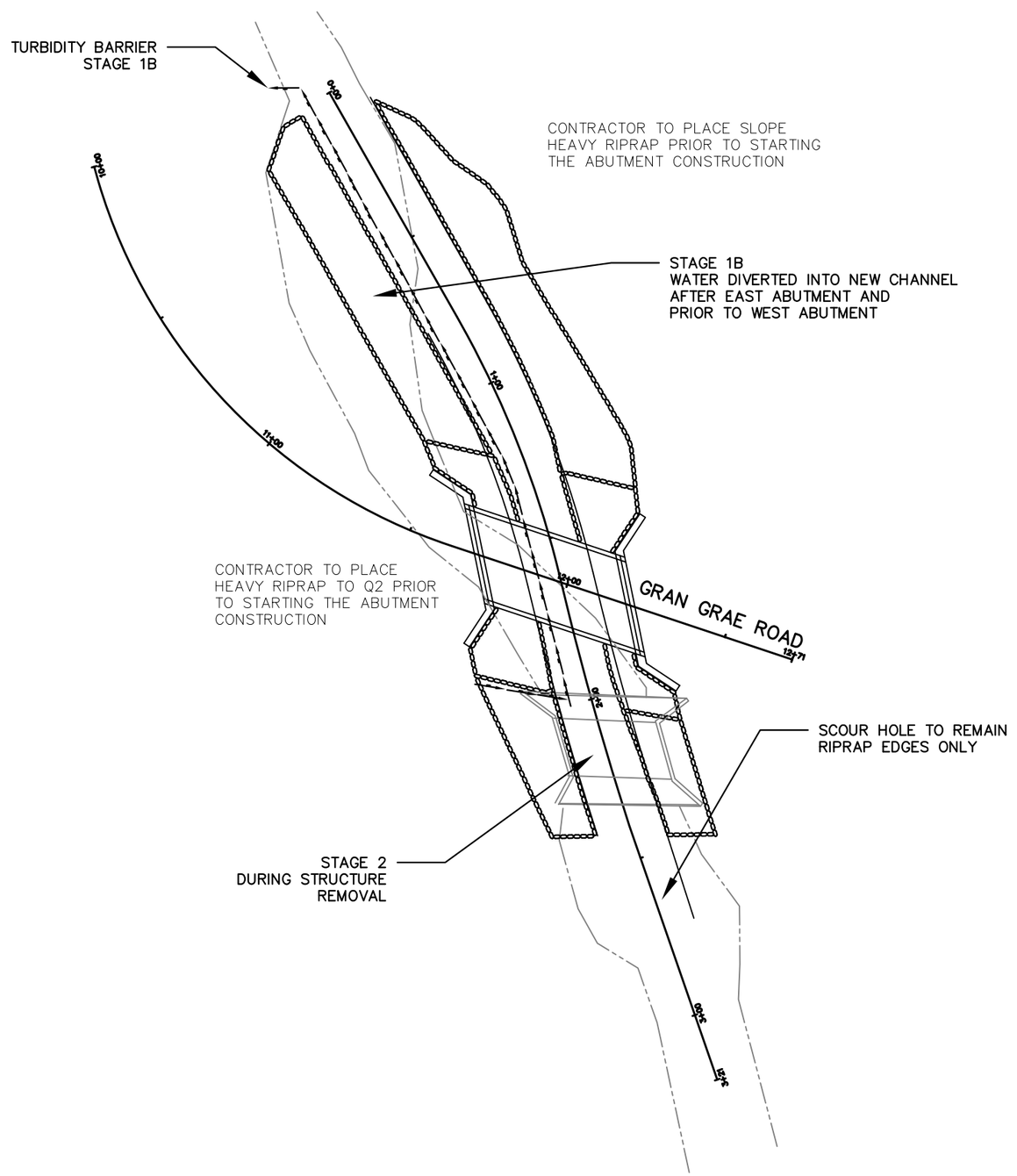
PROJECT NO: 5339-00-72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CONSTRUCTION DETAIL	SHEET 7	E



NOTES:
STAGE 1 – CHANNEL CHANGE AND EXISTING STRUCTURE REMOVAL

STAGE 2 – PROPOSED STRUCTURE AND ROADWAY WORK

STAGE 1A

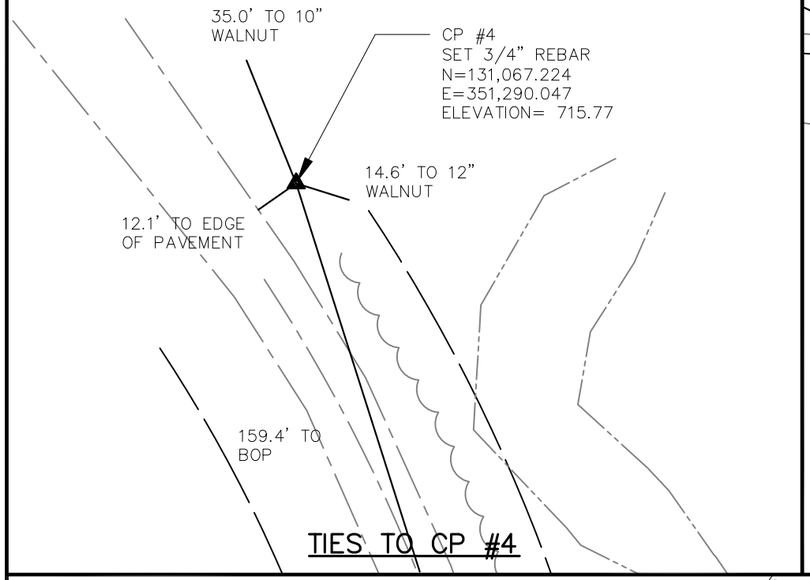


STAGE 1B & 2

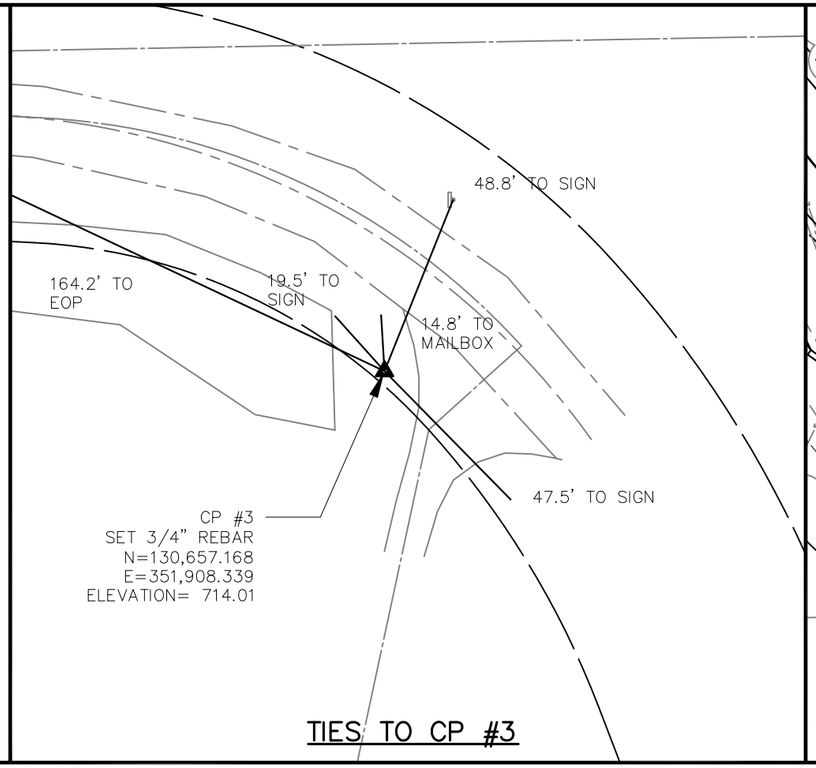
CREEK STAGING DETAIL

PROJECT NO: 5339–00–72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CONSTRUCTION DETAIL	SHEET 8	E

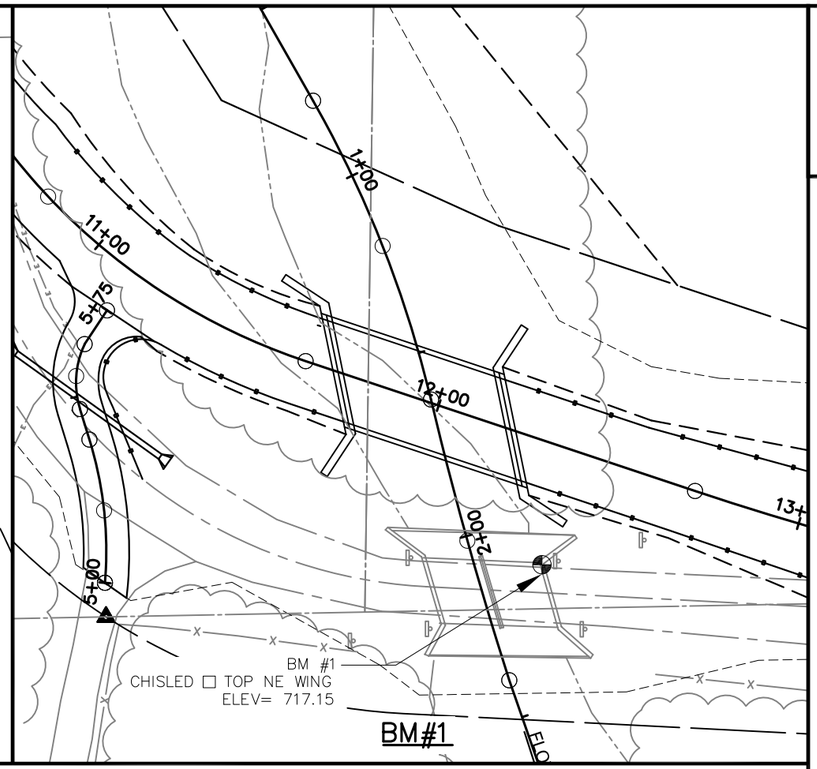
2



TIES TO CP #4



TIES TO CP #3



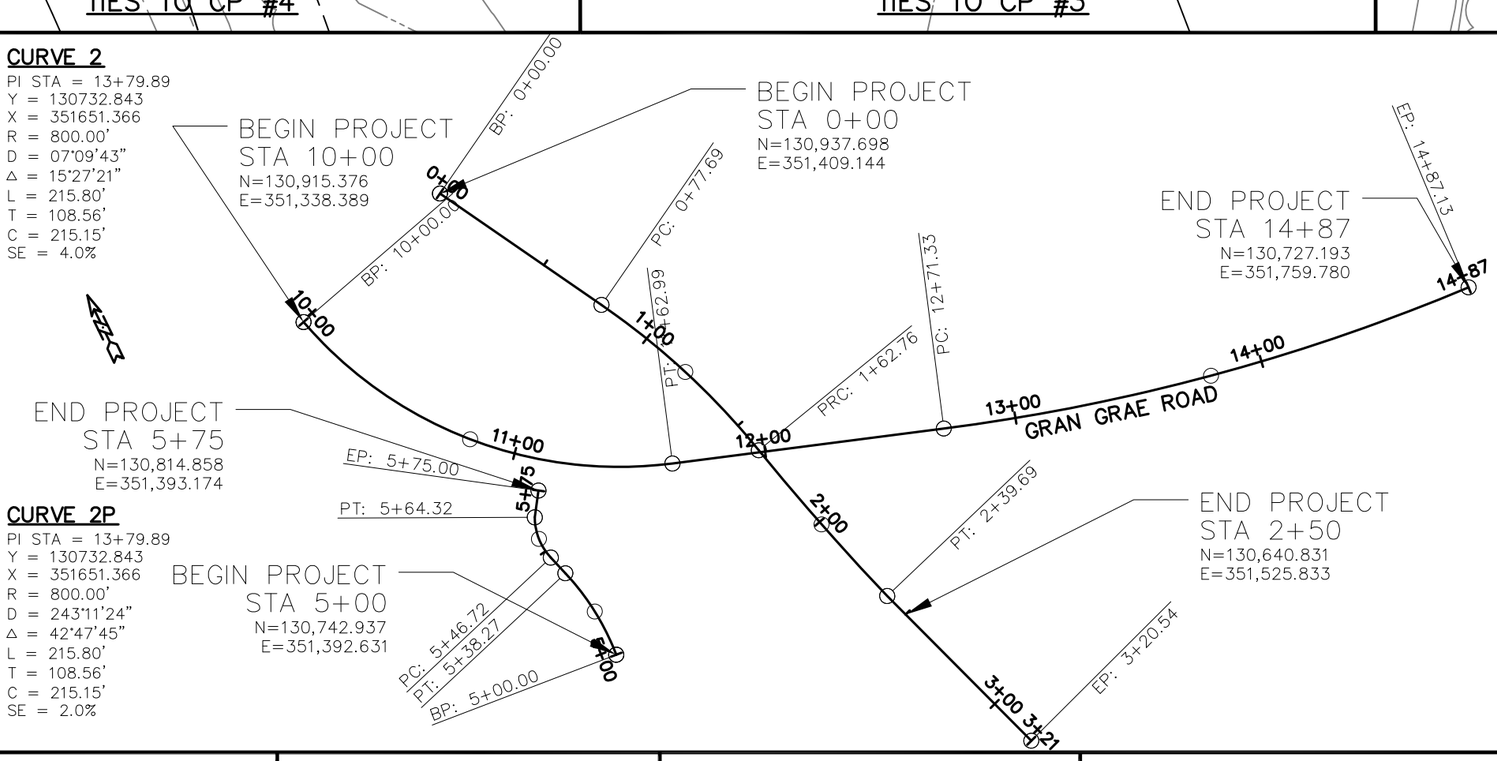
BM#1

CURVE 1
PI STA = 10+88.84
Y = 130829.548
X = 351361.326
R = 165.00'
D = 34°43'29"
Δ = 56°35'54"
L = 162.99'
T = 88.84'
C = 156.45'
SE = 4.0%

CURVE 2
PI STA = 13+79.89
Y = 130732.843
X = 351651.366
R = 800.00'
D = 07°09'43"
Δ = 15°27'21"
L = 215.80'
T = 108.56'
C = 215.15'
SE = 4.0%

CURVE 1P
PI STA = 5+19.37
Y = 130762.241
X = 351394.276
R = 99.134'
D = 57°47'46"
Δ = 22°06'59"
L = 38.27'
T = 19.37'
C = 38.03'
SE = 2.0%

CURVE 2P
PI STA = 13+79.89
Y = 130732.843
X = 351651.366
R = 800.00'
D = 243°11'24"
Δ = 42°47'45"
L = 215.80'
T = 108.56'
C = 215.15'
SE = 2.0%



CURVE 1C
PI STA = 1+20.51
Y = 130832.959
X = 351468.750
R = 300.00'
D = 19°05'55"
Δ = 16°14'46"
L = 85.06'
T = 42.82'
C = 84.78'
SE = 0.0%

CURVE 2C
PI STA = 2+01.24
Y = 130753.866
X = 351487.589
R = 1000.00'
D = 05°43'47"
Δ = 4°24'29"
L = 76.94'
T = 38.49'
C = 76.92'
SE = 0.0%

Estimate Of Quantities

5339-00-72

Line	Item	Item Description	Unit	Total	Qty
0002	201.0105	Clearing	STA	3.000	3.000
0004	201.0205	Grubbing	STA	3.000	3.000
0006	203.0260	Removing Structure Over Waterway Minimal Debris (structure) 01. P-12-124	EACH	1.000	1.000
0008	205.0100	Excavation Common	CY	2,110.000	2,110.000
0010	206.1000	Excavation for Structures Bridges (structure) 01. B-12-0253	LS	1.000	1.000
0012	208.0100	Borrow	CY	542.000	542.000
0014	210.1500	Backfill Structure Type A	TON	680.000	680.000
0016	213.0100	Finishing Roadway (project) 01. 5339-00-72	EACH	1.000	1.000
0018	305.0110	Base Aggregate Dense 3/4-Inch	TON	124.000	124.000
0020	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	950.000	950.000
0022	312.0110	Select Crushed Material	TON	1,000.000	1,000.000
0024	455.0605	Tack Coat	GAL	72.000	72.000
0026	465.0105	Asphaltic Surface	TON	293.000	293.000
0028	502.0100	Concrete Masonry Bridges	CY	206.000	206.000
0030	502.3200	Protective Surface Treatment	SY	183.000	183.000
0032	505.0400	Bar Steel Reinforcement HS Structures	LB	4,830.000	4,830.000
0034	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	23,790.000	23,790.000
0036	513.4061	Railing Tubular Type M	LF	105.000	105.000
0038	516.0500	Rubberized Membrane Waterproofing	SY	14.000	14.000
0040	520.1018	Apron Endwalls for Culvert Pipe 18-Inch	EACH	2.000	2.000
0042	520.3318	Culvert Pipe Class III-A 18-Inch	LF	48.000	48.000
0044	550.0500	Pile Points	EACH	18.000	18.000
0046	550.1100	Piling Steel HP 10-Inch X 42 Lb	LF	900.000	900.000
0048	606.0300	Riprap Heavy	CY	622.000	622.000
0050	612.0406	Pipe Underdrain Wrapped 6-Inch	LF	210.000	210.000
0052	614.2300	MGS Guardrail 3	LF	29.000	29.000
0054	614.2350	MGS Guardrail Short Radius	LF	25.000	25.000
0056	614.2500	MGS Thrie Beam Transition	LF	160.000	160.000
0058	614.2610	MGS Guardrail Terminal EAT	EACH	3.000	3.000
0060	614.2630	MGS Guardrail Short Radius Terminal	EACH	1.000	1.000
0062	618.0100	Maintenance And Repair of Haul Roads (project) 01. 5339-00-72	EACH	1.000	1.000
0064	619.1000	Mobilization	EACH	1.000	1.000
0066	624.0100	Water	MGAL	20.000	20.000
0068	625.0500	Salvaged Topsoil	SY	1,900.000	1,900.000
0070	627.0200	Mulching	SY	1,000.000	1,000.000
0072	628.1504	Silt Fence	LF	850.000	850.000
0074	628.1520	Silt Fence Maintenance	LF	1,700.000	1,700.000
0076	628.1905	Mobilizations Erosion Control	EACH	4.000	4.000
0078	628.1910	Mobilizations Emergency Erosion Control	EACH	3.000	3.000
0080	628.2008	Erosion Mat Urban Class I Type B	SY	2,960.000	2,960.000
0082	628.6005	Turbidity Barriers	SY	180.000	180.000
0084	628.7504	Temporary Ditch Checks	LF	72.000	72.000
0086	629.0210	Fertilizer Type B	CWT	2.000	2.000
0088	630.0120	Seeding Mixture No. 20	LB	80.000	80.000
0090	630.0200	Seeding Temporary	LB	80.000	80.000
0092	630.0500	Seed Water	MGAL	75.000	75.000
0094	633.5100	Markers ROW	EACH	12.000	12.000
0096	633.5200	Markers Culvert End	EACH	2.000	2.000
0098	634.0614	Posts Wood 4x6-Inch X 14-FT	EACH	4.000	4.000

5339-00-72

Line	Item	Item Description	Unit	Total	Qty
0100	637.2230	Signs Type II Reflective F	SF	12.000	12.000
0102	638.2602	Removing Signs Type II	EACH	6.000	6.000
0104	638.3000	Removing Small Sign Supports	EACH	6.000	6.000
0106	642.5001	Field Office Type B	EACH	1.000	1.000
0108	643.0300	Traffic Control Drums	DAY	1,340.000	1,340.000
0110	643.0420	Traffic Control Barricades Type III	DAY	520.000	520.000
0112	643.0705	Traffic Control Warning Lights Type A	DAY	1,040.000	1,040.000
0114	643.0900	Traffic Control Signs	DAY	880.000	880.000
0116	643.5000	Traffic Control	EACH	1.000	1.000
0118	645.0111	Geotextile Type DF Schedule A	SY	112.000	112.000
0120	645.0220	Geogrid Type SR	SY	1,700.000	1,700.000
0122	650.4500	Construction Staking Subgrade	LF	712.000	712.000
0124	650.5000	Construction Staking Base	LF	512.000	512.000
0126	650.6000	Construction Staking Pipe Culverts	EACH	1.000	1.000
0128	650.6500	Construction Staking Structure Layout (structure) 01. B-12-0253	LS	1.000	1.000
0130	650.9910	Construction Staking Supplemental Control (project) 01. 5339-00-72	LS	1.000	1.000
0132	650.9920	Construction Staking Slope Stakes	LF	712.000	712.000
0134	690.0150	Sawing Asphalt	LF	38.000	38.000
0136	715.0502	Incentive Strength Concrete Structures	DOL	1,236.000	1,236.000
0138	999.2000.S	Installing and Maintaining Bird Deterrent System (station) 01. 12+28	EACH	1.000	1.000
0140	ASP.1T0A	On-the-Job Training Apprentice at $5.00/HR	HRS	600.000	600.000
0142	ASP.1T0G	On-the-Job Training Graduate at $5.00/HR	HRS	1,040.000	1,040.000
0144	SPV.0070	Special 01. Sprayed Asphaltic Surface Treatment	GAL	50.000	50.000

3

CLEARING & GRUBBING

CATEGORY	STATION–STATION	LOCATION	(201.0105) CLEARING (STA)	(201.0205) GRUBBING (STA)
0010	11+21 – 12+71	LT & RT	1.5	1.5
		0010 TOTALS	1.5	1.5
0030	10+00 – 11+21	LT & RT	1.2	1.2
	12+71 – 13+00	LT & RT	0.3	0.3
		0030 TOTALS	1.5	1.5
		PROJECT TOTALS	3.0	3.0

BASE AGGREGATE DENSE

CATEGORY	STATION–STATION	LOCATION	(305.0110) 3/4–INCH (TON)	(305.0120) 1 1/4–INCH (TON)
0010	11+21 – 11+71	GRAN GRAE RD	13	105
	12+21 – 12+71	GRAN GRAE RD	15	110
	5+00 – 5+75	P.E.	6	79
		0010 TOTALS	34	294
0030	10+00 – 11+21	GRAN GRAE RD	27	229
	12+71 – 14+87	GRAN GRAE RD	63	427
		0030 TOTALS	90	656
		PROJECT TOTALS	124	950

SELECT CRUSHED MATERIALS

CATEGORY	STATION–STATION	LOCATION	(312.0110) (TON)
0010	11+21 – 11+71	GRAN GRAE RD	110
	12+21 – 12+71	GRAN GRAE RD	113
	5+00 – 5+75	P.E.	98
		0010 TOTAL	321
0030	10+00 – 11+21	GRAN GRAE RD	237
	12+71 – 14+87	GRAN GRAE RD	442
		0030 TOTAL	679
		PROTJECT TOTAL	1,000

WATER

CATEGORY	LOCATION	(624.0100) (MGAL)
0010	GRAN GRAE ROAD	20
	0010 TOTAL	20

EARTHWORK SUMMARY

CATEGORY	STATION–STATION	LOCATION	(205.0100) EXCAVATION COMMON (1) (CY)	(208.0100) BORROW (CY)	UNEXPANDED FILL (CY)	EXPANDED FILL (2) (20%) (CY)	MASS ORDINATE +/– (3) (CY)
0010	11+21 – 12+71	GRAN GRAE RD.	94	542	530	636	0
	0+00 – 2+34	CHANNEL REALIGNMENT	1,170	–	750	900	270
	5+00 – 5+75	DRIVEWAY	260	–	20	24	236
		0010 TOTALS	1,524	–	1,300	1,560	–36
0030	10+00 – 11+21	GRAN GRAE RD.	191	–	395	474	–283
	12+71 – 14+87	GRAN GRAE RD.	395	–	70	84	311
		0030 TOTALS	586	–	465	558	28
		PROJECT TOTALS	2,110	542	1,765	2,118	526

NOTES:
1.) SALVAGED/UNUSABLE PAVEMENT IS INCLUDED IN CUT
2.) AVAILABLE MATERIAL = CUT
3.) EXPANDED FILL FACTOR 1.20: EXPANDED FILL =(UNEXPANDED FILL)*1.20
4.) THE MASS ORDINATE +OR– QTY CALCULATED FOR THE DIVISION. PLUS QUANTITY INDICATED AN EXCESS OF MATERIAL WITHIN THE CATEGORY. MINUS INDICATES A SHORTAGE OF MATERIAL WITHIN THE CATEGORY.

ASPHALTIC ITEMS

CATEGORY	STATION–STATION	LOCATION	(455.0605) TACK COAT (GAL)	(465.0105) ASPHALTIC SURFACE (TON)
0010	11+21 – 11+71	GRAN GRAE RD	8	35
	12+21 – 12+71	GRAN GRAE RD	9	37
	5+00 – 5+75	P.E.	7	27
		0010 TOTALS	24	99
0030	10+00 – 11+21	GRAN GRAE RD	17	71
	12+71 – 14+87	GRAN GRAE RD	31	123
		0030 TOTALS	48	194
		PROJECT TOTALS	72	293

TRAFFIC CONTROL

CATEGORY	LOCATION	SIGN CODE	MESSAGE	SERVICE PERIOD DAYS	(643.000) DRUMS (DAY)	(643.0420) BARRICADES (DAY)	(643.0705) LIGHTS TYPE A (DAY)	(643.0900) SIGNS (DAY)
0010	GRAN GRAE RD	R11–2B	BARRICADES/SIGNS	67	–	268	536	134
	GRAN GRAE RD	W20–1A	ROAD WORK AHEAD	67	–	–	–	134
	GRAN GRAE RD	W20–1C	ROAD WORK 1000 FT	67	–	–	–	134
	GRAN GRAE RD	W20–1D	ROAD WORK 500 FT	67	–	–	–	134
	GRAN GRAE RD	G20–2A	END ROAD WORK	67	–	–	–	134
	GRAN GRAE RD	–	DRUMS	67	1,340	–	–	–
			SUB TOTAL STAGE 1		1,340	268	536	670
	GRAN GRAE RD	R11–4	BARRICADES/SIGNS	21	–	210	420	42
	GRAN GRAE RD	W20–3A	ROAD WORK AHEAD	21	–	–	–	42
	GRAN GRAE RD	W20–3C	ROAD WORK 1000 FT	21	–	–	–	42
	GRAN GRAE RD	W20–3D	ROAD WORK 500 FT	21	–	–	–	42
	GRAN GRAE RD	R11–3	BARRICADES/SIGNS	21	–	42	84	42
			SUB TOTAL STAGE 2		–	252	504	210
			0010 TOTALS		1,340	520	1,040	880

REMOVING SIGNS TYPE II & REMOVING SMALL SIGN SUPPORTS

CATEGORY	STATION	LOCATION	DESCRIPTION	(638.2602) (EACH)	(638.3000) (EACH)
0010	11+98	RT	8 TON	1	1
	12+05	RT	W5-52	1	1
	12+16	RT	W5-52	1	1
	12+43	RT	W5-52	1	1
	12+55	RT	W5-52	1	1
	12+63	RT	8 TON	1	1
			0010 TOTALS	6	6

MGS GUARDRAIL ITEMS

CATEGORY	STATION – STATION	LOCATION	(614.2300) MGS GUARDRAIL 3 (LF)	(614.2350) SHORT RADIUS (LF)	(614.2500) THRIE BEAM TRANSITION (LF)	(614.2610) TERMINAL EAT (EACH)	(614.2630) SHORT RADIUS TERMINAL (EACH)
0010	10+68 – 11+22	LT	–	–	–	1	–
	11+22 – 11+64	LT	–	–	40	–	–
	11+28 – 11+78	RT	–	–	40	–	–
	12+15 – 12+55	LT	–	–	40	–	–
	12+28 – 12+68	RT	–	–	40	–	–
	12+55 – 13+05	LT	–	–	–	1	–
	12+68 – 13+21	RT	–	–	–	1	–
	P.E.	RT	29	25	–	–	1
		0010 TOTALS	29	25	160	3	1

CONSTRUCTION STAKING

CATEGORY	STATION–STATION	LOCATION	(650.4500) SUBGRADE (LF)	(650.5000) BASE (LF)	(650.6000) PIPE CULVERT (EACH)	(650.9910) SUPPLEMENTAL CONTROL (LS)	(650.9920) SLOPE STAKING (LF)
0010	10+00 – 11+71	GRAN GRAE RD	171	171	–	–	171
	12+21 – 14+87	GRAN GRAE RD	266	266	–	–	266
	0+00 – 2+00	CHANNEL REALIGNMENT	200	–	–	–	200
	5+00 – 5+75	P.E.	75	75	1	–	75
		0010 TOTALS	712	512	1	1	712

TURBIDITY BARRIER

CATEGORY	LOCATION	(628.6005) (SY)
0010	WEST ABUTMENT	50
	EAST ABUTMENT	130
	0010 TOTAL	180

RIPRAP HEAVY

CATEGORY	STATION–STATION	LOCATION	(606.0300) (CY)
0010	11+23 – 11+80	GRAN GRAE RD, RT	40
	0+05 – 1+30	CHANNEL REALIGNMENT	340
	2+00 – 2+45	CHANNEL REALIGNMENT	50
		0010 TOTAL	430*

*THERE IS ADDITIONAL QUANTITY IN THE STRUCTURE PLANS.

PERMANENT SIGNING

CATEGORY	STATION	LOCATION	SIGN CODE	(634.0614) POSTS WOOD 4X6-INCH X 14-FT (EACH)	(637.2230) SIGNS TYPE II REFLECTIVE TYPE F (SF)
0010	11+61	LT	W5-52	1	3
	11+77	RT	W5-52	1	3
	12+13	LT	W5-52	1	3
	13+30	RT	W5-52	1	3
	0010 TOTALS			4	12.00

GEOGRID TYPE SR

CATEGORY	STATION–STATION	LOCATION	(645.0220) (SY)
0010	11+21 – 11+71	GRAN GRAE RD	185
	12+21 – 12+71	GRAN GRAE RD	180
	5+00 – 5+75	P.E.	134
		0010 TOTAL	499
0030	10+00 – 11+21	GRAN GRAE RD	428
	12+71 – 14+87	GRAN GRAE RD	773
		0030 TOTAL	1,201
		PROJECT TOTAL	1,700

SAWING ASPHALT

CATEGORY	STATION	LOCATION	(690.0150) (LF)
0010	10+00	GRAN GRAE ROAD	19
	14+87	GRAN GRAE ROAD	19
		0010 TOTAL	38

CULVERT PIPE

CATEGORY	LOCATION	(520.1018) APRON ENDWALL 18–INCH (EACH)	(520.3318) CULVERT PIPE CLASS III–A 18–INCH (LF)
0010	P.E.	2	48
	0010 TOTALS	2	48

SPRAYED ASPHALTIC SURFACE TREATMENT

CATEGORY	STATION–STATION	LOCATION	(SPV.0070) (GAL)
0010	10+68 – 11+71	RT & LT	25
	12+21 – 13+21	RT & LT	25
		0010 TOTAL	50

ROADWAY MARKERS

CATEGORY	R/W POINT #	STATION	OFFSET	(633.5100) MARKER POSTS ROW (EACH)	(633.5200) MARKERS CULVERT END (EACH)
0010	101	10+64.45	50.71' RT	1	–
	102	10+00	33.52' RT	1	–
	103	10+00	50.00' LT	1	–
	105	12+49.75	50.00' LT	1	–
	106	13+00	49.52' LT	1	–
	107	14+00	50.00' LT	1	–
	108	14+87	32.76' LT	1	–
	109	14+87	33.24' RT	1	–
	110	14+01.89	38.15' RT	1	–
	111	12+16.86	80.08' RT	1	–
	112	12+00	50.00' LT	1	–
	113	11+00	50.00' LT	1	–
		5+32	16.00' RT	–	1
		5+61	16.00' LT	–	1
		0010 TOTALS		12	2

SILT FENCE & SILT FENCE MAINTENANCE

CATEGORY	STATION–STATION	LOCATION	(628.1504) (LF)	(628.1520) (LF)
0010	10+00 – 11+50	GRAN GRAE RD, LT	124	248
	11+51 – 12+20	GRAN GRAE RD, RT	154	308
	12+10 – 14+87	GRAN GRAE RD, LT	277	554
	12+25 – 14+87	GRAN GRAE RD, RT	295	590
		0010 TOTALS	850	1,700

TEMPORARY DITCH CHECKS

CATEGORY	STATION	LOCATION	(628.7504) TEMPORARY DITCH CHECKS (LF)
0010	10+50	RT	12
	10+90	RT	12
	13+00	LT	12
	13+50	LT	12
	14+00	LT	12
	14+50	LT	12
		0010 TOTAL	72

FINISHING ITEMS

CATEGORY	STATION–STATION	LOCATION	(625.0500) SALVAGED TOPSOIL (SY)	(627.0200) MULCHING (SY)	(628.2008) EROSION MAT URBAN CLASS I TYPE B (SY)	(629.0210) FERTILIZER TYPE B (CWT)	(630.0120) SEEDING MIXTURE NO. 20 (LB)	(630.0200) SEEDING TEMPORARY (LB)	(630.0500) SEED WATER (MGAL)	(628.1905) MOBILIZATION EROSION CONTROL (LB)	(628.1910) MOBILIZATION EMERGENCY EROSION CONTROL (MGAL)
0010	10+00 – 11+71	GRAN GRAE RD. LT & RT	907	–	1,166	0.8	32	32	30	–	–
	12+21 – 14+87	GRAN GRAE RD. LT & RT	993	–	1,794	1.2	48	48	45	–	–
		UNDISTRIBUTED	–	1,000	–	–	–	–	–	4	3
		0010 TOTALS	1,900	1,000	2,960	2.0	80	80	75	4	3

CONVENTIONAL SYMBOLS

SECTION LINE
QUARTER LINE
SIXTEENTH LINE
NEW REFERENCE LINE
NEW R/W LINE
EXISTING R/W LINE
PROPERTY LINE
LOT, TIE, AND OTHER MINOR LINES
SLOPE INTERCEPT
CORPORATE LIMITS
UNDERGROUND FACILITY (COMMUNICATIONS, ELECTRIC, ETC)
FEE ACQUISITION AREA (HATCHING VARIES BY OWNER)
TEMP. LIMITED EASEMENT AREA
EASEMENT AREA (HIGHWAY, PERMANENT LIMITED, OR RESTRICTED DEVELOPMENT)
TRANSMISSION STRUCTURES
BUILDING
BUILDING (TO BE REMOVED)
BRIDGE

PARCEL NUMBER (25)
SECTION CORNER
NOTATION FOR COMBUSTABLE FLUIDS (CAUTION)
NOTATION FOR HIGH VOLTAGE TRANSMISSION LINES (CAUTION)

UTILITY NUMBER (40)
R/W MONUMENT
NON-MONUMENTED R/W POINT
FOUND IRON PIN
VALVE (GAS, WATER, ETC.)
SIGN
OFF-PREMISE SIGN

ACCESS CONTROLLED BY ACQUISITION
NO ACCESS (BY STATUTORY AUTHORITY)
ACCESS RESTRICTED (BY PREVIOUS PROJECT OR CONTROL)
NO ACCESS (NEW HIGHWAY)
NATIONAL GEODETIC SURVEY MONUMENT
SIXTEENTH CORNER MONUMENT
PARALLEL OFFSETS

CONVENTIONAL ABBREVIATIONS

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

CONVENTIONAL UTILITY SYMBOLS

		NON-COMPENSABLE	COMPENSABLE
WATER	W		
GAS	G		
TELEPHONE	T		
OVERHEAD TRANSMISSION LINES	OH		
ELECTRIC	E		
CABLE TELEVISION	TV		
FIBER OPTIC	FO		
SANITARY SEWER	SAN		
STORM SEWER	SS		
ELECTRIC TOWER			
POWER POLE			
TELEPHONE POLE			
TELEPHONE PEDESTAL			

CURVE DATA ABBREVIATIONS

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

NOTES:

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

RIGHT-OF-WAY MONUMENTS WILL BE TYPE 2 (TYPICALLY 3/4" X 24" IRON REBARS), UNLESS OTHERWISE NOTED, AND WILL BE PLACED PRIOR TO THE COMPLETION OF THE PROJECT.

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

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

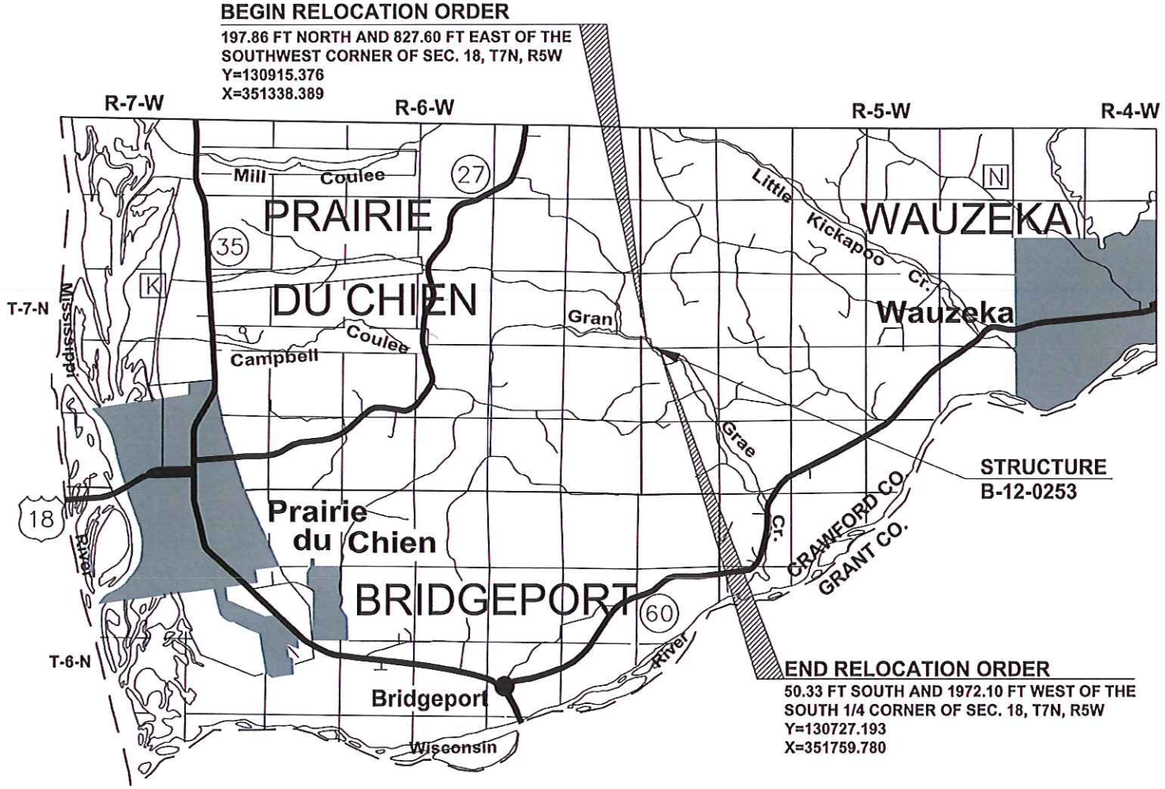
THIS PLAT IS A GRAPHIC REPRESENTATION AND IS FOR REFERENCE PURPOSE ONLY. DEEDS MUST BE CHECKED TO DETERMINE PROPERTY BOUNDARIES AND ACCESS RIGHTS.

FOR CURRENT ACCESS/DRIVEWAY INFORMATION, CONTACT THE CRAWFORD COUNTY HIGHWAY DEPARTMENT.

A PERMANENT LIMITED EASEMENT (PLE) IS A RIGHT FOR CONSTRUCTION AND MAINTENANCE PURPOSES, AS DEFINED HEREIN, INCLUDING THE RIGHT TO OPERATE NECESSARY EQUIPMENT THEREON AND THE RIGHT OF INGRESS AND EGRESS, AS LONG AS REQUIRED FOR SUCH PUBLIC PURPOSE, INCLUDING THE RIGHT TO PRESERVE, PROTECT, REMOVE, OR PLANT THEREON ANY VEGETATION THAT THE HIGHWAY AUTHORITIES MAY DEEM DESIRABLE, BUT WITHOUT PREJUDICE TO THE OWNER'S RIGHT TO MAKE OR CONSTRUCT IMPROVEMENTS ON SAID LANDS OR TO FLATTEN THE SLOPES, PROVIDING SAID ACTIVITIES WILL NOT IMPAIR OR OTHERWISE ADVERSELY AFFECT THE HIGHWAY FACILITIES.

INFORMATION FOR THE BASIS OF EXISTING HIGHWAY RIGHT-OF-WAY POINTS OR REFERENCE AND ACCESS CONTROL ARE LISTED ON THE DETAIL SHEET.

BEGIN RELOCATION ORDER
197.86 FT NORTH AND 827.60 FT EAST OF THE SOUTHWEST CORNER OF SEC. 18, T7N, R5W
Y=130915.376
X=351338.389



STRUCTURE
B-12-0253

END RELOCATION ORDER
50.33 FT SOUTH AND 1972.10 FT WEST OF THE SOUTH 1/4 CORNER OF SEC. 18, T7N, R5W
Y=130727.193
X=351759.780

LAYOUT
SCALE 0 2mi

TOTAL NET LENGTH OF CENTERLINE = 0.092 MILES

R/W PROJECT NUMBER 5339-00-02	SHEET NUMBER	TOTAL SHEETS
FEDERAL PROJECT NUMBER	4.01	2

PLAT OF RIGHT OF WAY REQUIRED FOR

TOWN OF WAUZEKA, GRAN GRAE ROAD (GRAN GRAE CREEK BRIDGE, B-12-0253)

LOC STR	CRAWFORD COUNTY
CONSTRUCTION PROJECT NUMBER	5339-00-72

THIS PLAT IS A GRAPHICAL REPRESENTATION AND IS FOR REFERENCE PURPOSES ONLY. DEEDS MUST BE CHECKED TO DETERMINE PROPERTY BOUNDARIES AND ACCESS RIGHTS.

ORIGINAL PLAT PREPARED BY

TEAM ENGINEERING
Transportation | Environmental | Agricultural | Municipal and Land Surveying

I HEREBY CERTIFY THAT THIS PLAT WAS MADE FOR THE COUNTY OF CRAWFORD, WISCONSIN AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

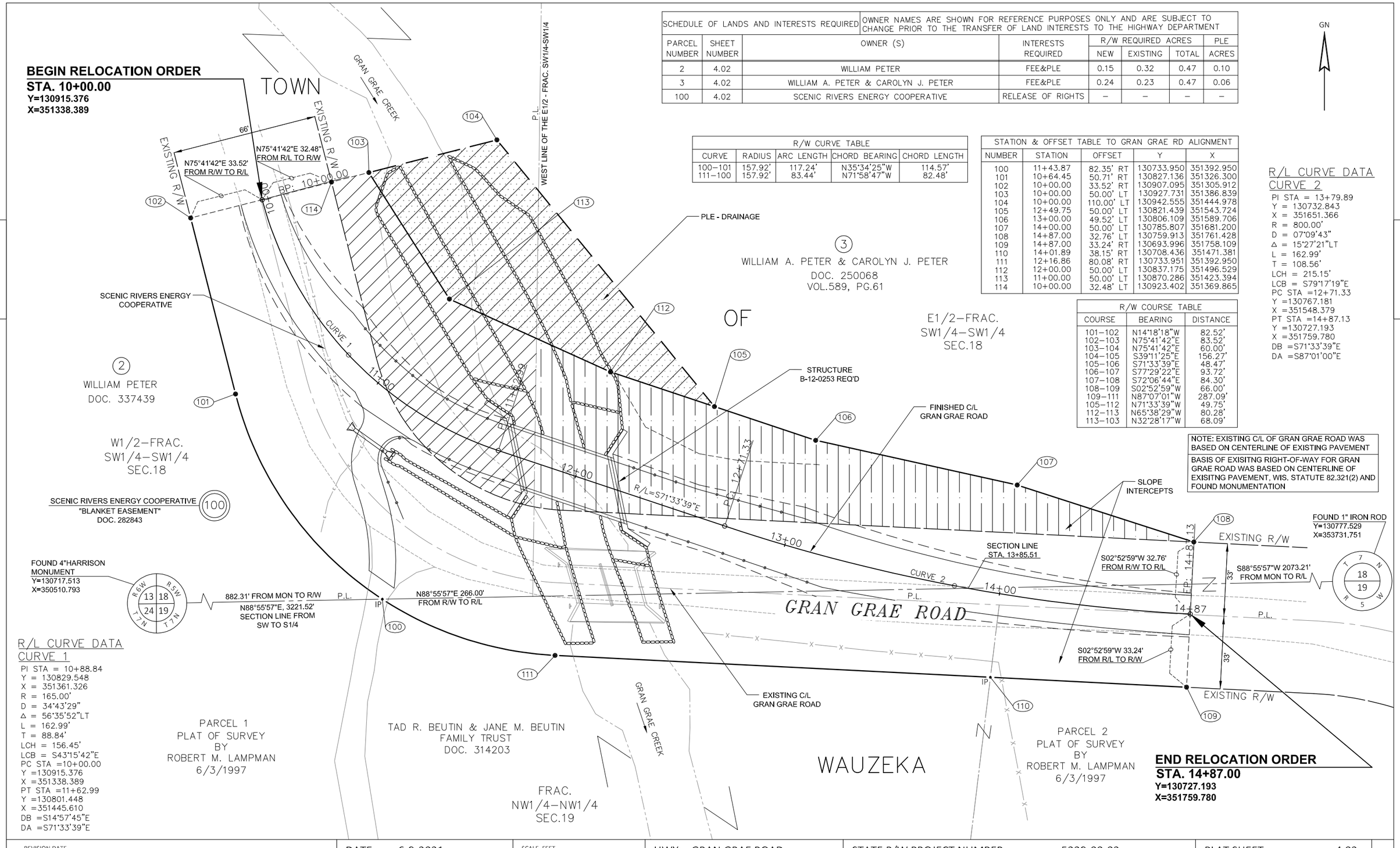
WISCONSIN
STEVEN A. ALT
S-3061
LONE ROCK WIS.
LAND SURVEYOR

REVISION DATE: 6-9-21

CRAWFORD COUNTY HIGHWAY DEPARTMENT

APPROVED FOR THE HIGHWAY DEPARTMENT
DATE: 6/14/2021 HIGHWAY COMMISSIONER

FILE NAME : T:\PROJECTS\2019\19-1770-1 CRAWFORD CTY GRAN GRAE RD (P-12-0124) 5339-00-02_72\DRAWINGS\GRAN GRAE RW\TITLE SHEET 4.01.DWG
PLOT DATE : 6/9/2021 11:30 AM
PLOT BY : STEVE ALT
PLOT NAME :



SCHEDULE OF LANDS AND INTERESTS REQUIRED		OWNER NAMES ARE SHOWN FOR REFERENCE PURPOSES ONLY AND ARE SUBJECT TO CHANGE PRIOR TO THE TRANSFER OF LAND INTERESTS TO THE HIGHWAY DEPARTMENT					
PARCEL NUMBER	SHEET NUMBER	OWNER (S)	INTERESTS REQUIRED	R/W REQUIRED ACRES NEW	R/W REQUIRED ACRES EXISTING	R/W REQUIRED ACRES TOTAL	PLE ACRES
2	4.02	WILLIAM PETER	FEE&PLE	0.15	0.32	0.47	0.10
3	4.02	WILLIAM A. PETER & CAROLYN J. PETER	FEE&PLE	0.24	0.23	0.47	0.06
100	4.02	SCENIC RIVERS ENERGY COOPERATIVE	RELEASE OF RIGHTS	–	–	–	–

R/W CURVE TABLE				
CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
100–101	157.92'	117.24'	N35°34'25"W	114.57'
111–100	157.92'	83.44'	N71°58'47"W	82.48'

STATION & OFFSET TABLE TO GRAN GRAE RD ALIGNMENT				
NUMBER	STATION	OFFSET	Y	X
100	11+43.87	82.35' RT	130733.950	351392.950
101	10+64.45	50.71' RT	130827.136	351326.300
102	10+00.00	33.52' RT	130907.095	351305.912
103	10+00.00	50.00' LT	130927.731	351386.839
104	10+00.00	110.00' LT	130942.555	351444.978
105	12+49.75	50.00' LT	130821.439	351543.724
106	13+00.00	49.52' LT	130806.109	351589.706
107	14+00.00	50.00' LT	130785.807	351681.200
108	14+87.00	32.76' LT	130759.913	351761.428
109	14+87.00	33.24' RT	130693.996	351758.109
110	14+01.89	38.15' RT	130708.436	351471.381
111	12+16.86	80.08' RT	130733.951	351392.950
112	12+00.00	50.00' LT	130837.175	351496.529
113	11+00.00	50.00' LT	130870.286	351423.394
114	10+00.00	32.48' LT	130923.402	351369.865

R/W COURSE TABLE		
COURSE	BEARING	DISTANCE
101–102	N14°18'18"W	82.52'
102–103	N75°41'42"E	83.52'
103–104	N75°41'42"E	60.00'
104–105	S39°11'25"E	156.27'
105–106	S71°33'39"E	48.47'
106–107	S77°29'22"E	93.72'
107–108	S72°06'44"E	84.30'
108–109	S02°52'59"W	66.00'
109–111	N87°07'01"W	287.09'
105–112	N71°33'39"W	49.75'
112–113	N65°38'29"W	80.28'
113–103	N32°28'17"W	68.09'

NOTE: EXISTING C/L OF GRAN GRAE ROAD WAS BASED ON CENTERLINE OF EXISTING PAVEMENT

BASIS OF EXISITNG RIGHT-OF-WAY FOR GRAN GRAE ROAD WAS BASED ON CENTERLINE OF EXISITNG PAVEMENT, WIS. STATUTE 82.321(2) AND FOUND MONUMENTATION

R/L CURVE DATA
CURVE 2
PI STA = 13+79.89
Y = 130732.843
X = 351651.366
R = 800.00'
D = 07°09'43"
Δ = 15°27'21"LT
L = 162.99'
T = 108.56'
LCH = 215.15'
LCB = S79°17'19"E
PC STA =12+71.33
Y =130767.181
X =351548.379
PT STA =14+87.13
Y =130727.193
X =351759.780
DB =S71°33'39"E
DA =S87°01'00"E

R/L CURVE DATA
CURVE 1
PI STA = 10+88.84
Y = 130829.548
X = 351361.326
R = 165.00'
D = 34°43'29"
Δ = 56°35'52"LT
L = 162.99'
T = 88.84'
LCH = 156.45'
LCB = S43°15'42"E
PC STA =10+00.00
Y =130915.376
X =351338.389
PT STA =11+62.99
Y =130801.448
X =351445.610
DB =S14°57'45"E
DA =S71°33'39"E

REVISION DATE	DATE	SCALE, FEET	HWY: GRAN GRAE ROAD	STATE R/W PROJECT NUMBER 5339-00-02	PLAT SHEET 4.02	
6-9-21	6-9-2021	0 20 40	COUNTY: CRAWFORD	CONSTRUCTION PROJECT NUMBER 5339-00-72	PS&E SHEET — 16	E
	GRID FACTOR N/A					

FILE NAME : DETAIL SHEET 4.02 - REVISED 6-9-21.DWG
LAYOUT NAME - Layout1

PLOT DATE : 6/9/2021 11:28 AM PLOT BY : STEVE ALT PLOT NAME : PLOT SCALE : 1 IN:40 FT

WISDOT/CADDS SHEET 75

EXISTING GRAN GRAE CREEK

WILLIAM & CAROLYN PETER

TLE

BP: 10+00.00

GRAN GRAE CREEK
PROPOSED ALIGNMENT

PROPOSED C/L GRAN GRAE RD.

R/W

13+05, 14' LT

12+52, 12' LT

13+55, 10' LT

EX. R/W

PC: 12+71.35

PT: 11+62.65

10+68, 14' LT

11+21, 12' LT

GRAN GRAE ROAD

WILLIAM PETER

BEGIN PROJECT
STA. 10+00

10+95, 10' RT

13+21, 14' RT

12+68, 12' RT

13+71, 10' RT

SLOPE INTERCEPT

END PROJECT
STA. 14+87

SCENIC RIVERS ENERGY COOP

11+28, 12' RT

PROPOSED DRIVEWAY C/L

STA. 11+12, RT
CONSTRUCT P.E. (ASPH.)
SEE DRIVEWAY P&P

EXISTING C/L GRAN GRAE RD.

FLOW

BEUTIN FAMILY TRUST

CURVE 1
PI STA = 10+88.84
Y = 130829.548
X = 351361.326
R = 165.00'
D = 34°43'29"
Δ = 56°35'54"
L = 162.99'
T = 88.84'
C = 156.45'
SE = 4.0%

STA. 5+50
1-CP CLASS III-A 18-INCH REQ'D
2-AECP 18-INCH REQ'D
SKEW 45°00'20" L.H.F.

CURVE 2
PI STA = 13+79.89
Y = 130732.843
X = 351651.366
R = 800.00'
D = 07°09'43"
Δ = 15°27'21"
L = 215.80'
T = 108.56'
C = 215.15'
SE = 4.0%

PI STA = 10+00
ELEV = 717.96

VPC STA = 11+50
VPC EL = 717.25

PI STA = 12+25
EL = 716.90
K = 117.60
L = 150.00

VPT STA = 13+00
VPT EL = 715.59

VPC STA = 13+25
VPC EL = 715.15

PI STA = 14+00
EL = 713.84
K = 77.16
L = 150.00

VPT STA = 14+75
VPT EL = 713.99

PI STA = 14+87
ELEV = 714.01

-0.47%

-1.75%

0.20%

PROPOSED C/L PROFILE GRAN GRAE RD.

STA 11+96 STRUCTURE B-12-253 REQ'D
SINGLE SPAN CONCRETE FLAT SLAB BRIDGE
24' CLEAR ROADWAY WIDTH 48'-0" O.A.L.

REMOVING OLD STRUCTURE STA 12+28
STRUCTURE P-12-124

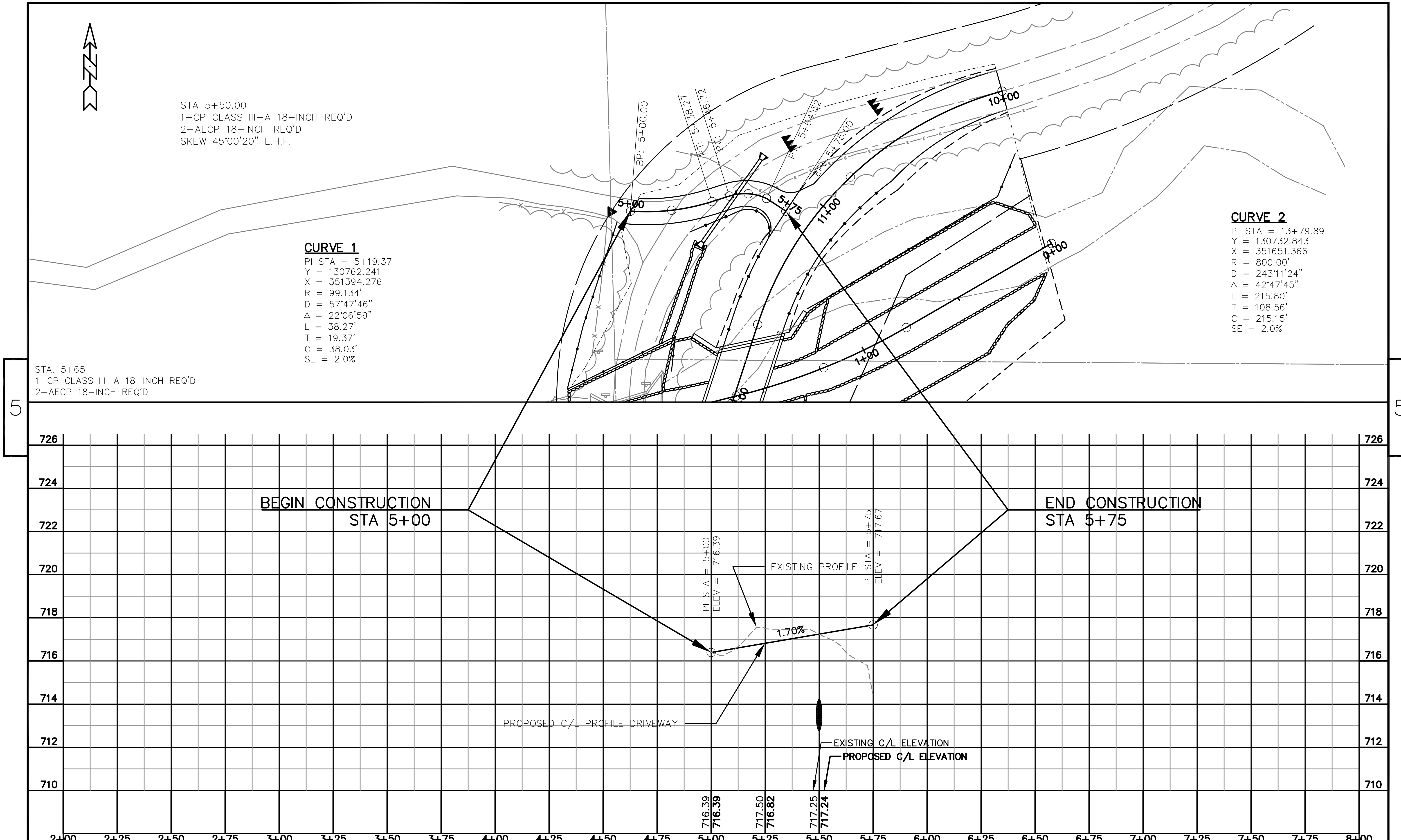
EXISTING C/L PROFILE
GRAN GRAE RD.

EXISTING C/L ELEVATION

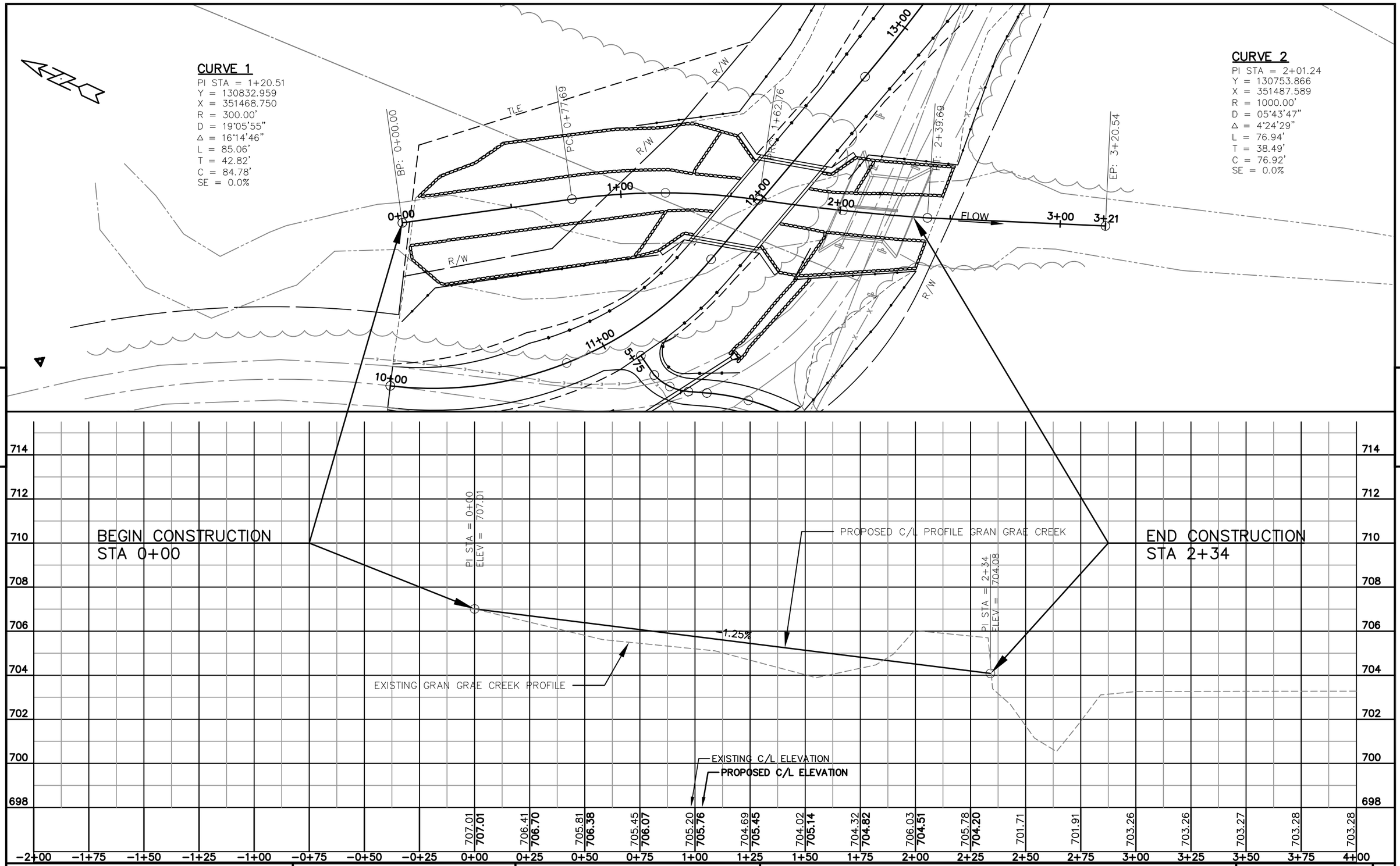
PROPOSED C/L ELEVATION

9+50	9+75	10+00	10+25	10+50	10+75	11+00	11+25	11+50	11+75	12+00	12+25	12+50	12+75	13+00	13+25	13+50	13+75	14+00	14+25	14+50	14+75	15+00	15+25	15+50
EXISTING		717.96	717.86	717.59	715.64	713.81	713.11	707.27	704.42	707.07	710.04	710.56	711.54	712.45	713.61	713.42	713.61	713.61	713.70	713.84	713.96			
PROPOSED		717.96	717.85	717.73	717.61	717.49	717.37	717.25	717.11	716.91	716.66	716.36	716.00	715.59	715.15	714.75	714.44	714.20	714.05	713.98	713.99			

PROJECT NO: 5339-00-72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	PLAN & PROFILE	SHEET	E



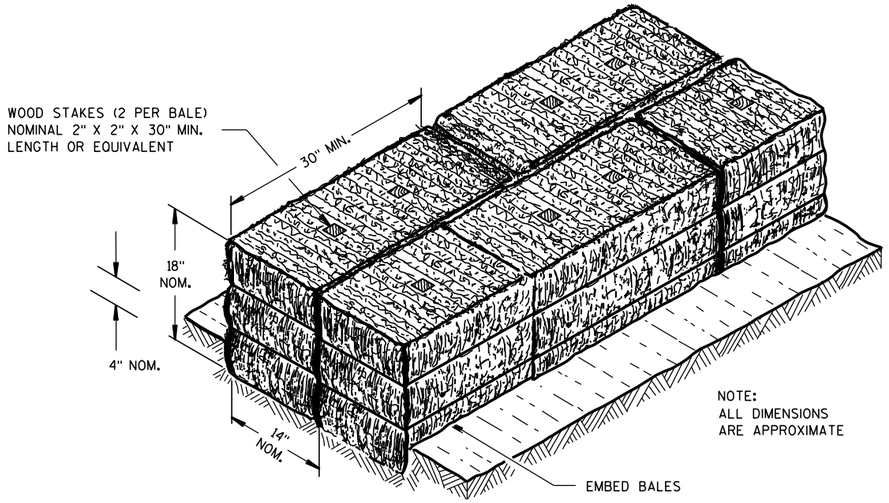
PROJECT NO: 5339-00-72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	PLAN & PROFILE DRIVEWAY	SHEET 18	E



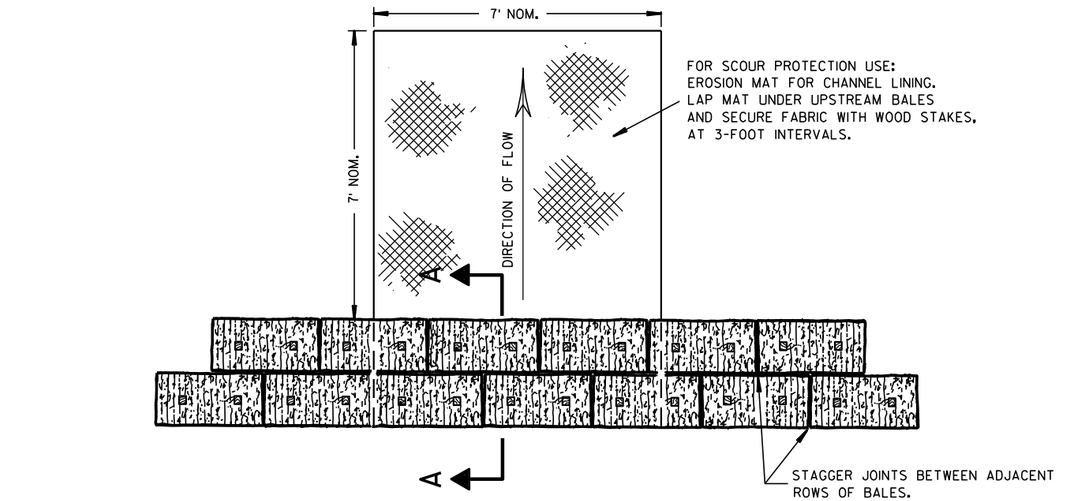
PROJECT NO: 5339-00-72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	PLAN & PROFILE CHANNEL REALIGNMENT	SHEET 19	E

Standard Detail Drawing List

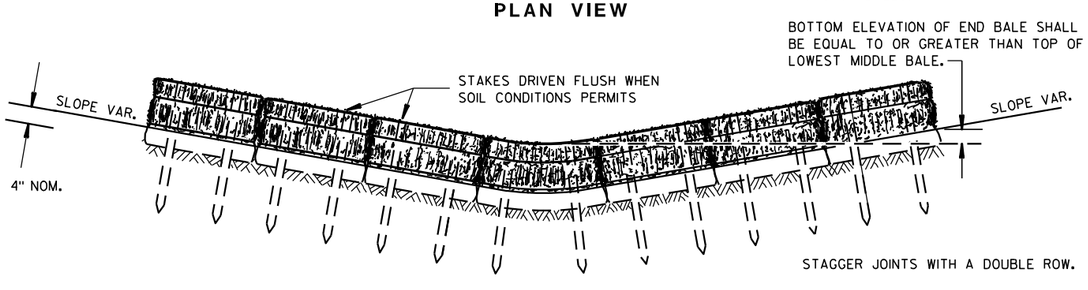
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E11-02	TURBIDITY BARRIER
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
12A03-10	NAME PLATE (STRUCTURES)
14B42-07A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-07B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-07C	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)
14B45-05H	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B53-01A	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01B	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01C	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01D	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01E	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01F	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01G	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01H	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-01I	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
15A01-13A	MARKER POST FOR RIGHT-OF-WAY
15A03-02A	FLEXIBLE MARKER POST FOR CULVERT END
15C02-08A	BARRICADES AND SIGNS FOR MAINLINE CLOSURES
15C02-08B	BARRICADES AND SIGNS FOR VARIOUS CLOSURES
15C06-09	SIGNING & MARKING FOR TWO LANE BRIDGES
15D28-04	TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY



SECTION A-A



PLAN VIEW



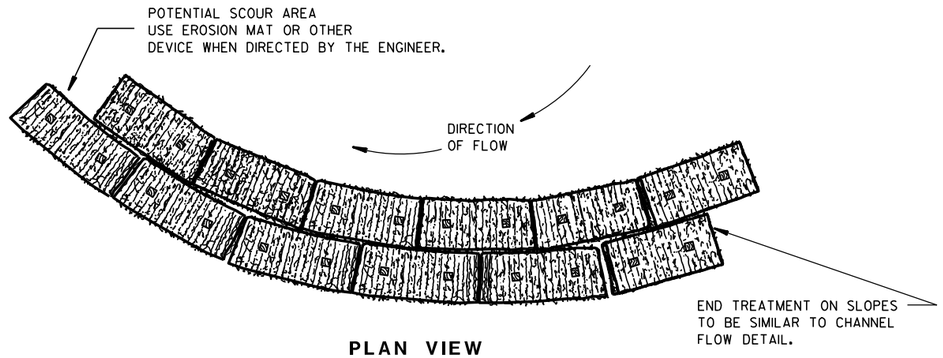
FRONT ELEVATION

TEMPORARY DITCH CHECK USING EROSION BALES ①

GENERAL NOTES

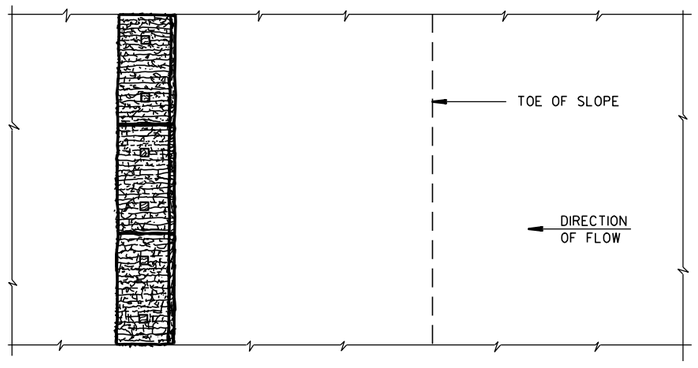
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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

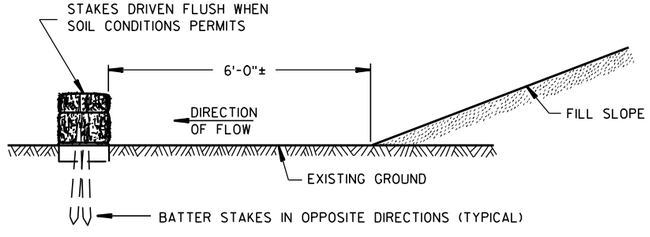


PLAN VIEW

WHEN ALTERING THE DIRECTION OF FLOW



PLAN VIEW



FRONT ELEVATION

WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE

EROSION BALES FOR SHEET FLOW

TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

6/04/02 — DATE

/S/ Beth Cannestra — CHIEF ROADWAY DEVELOPMENT ENGINEER

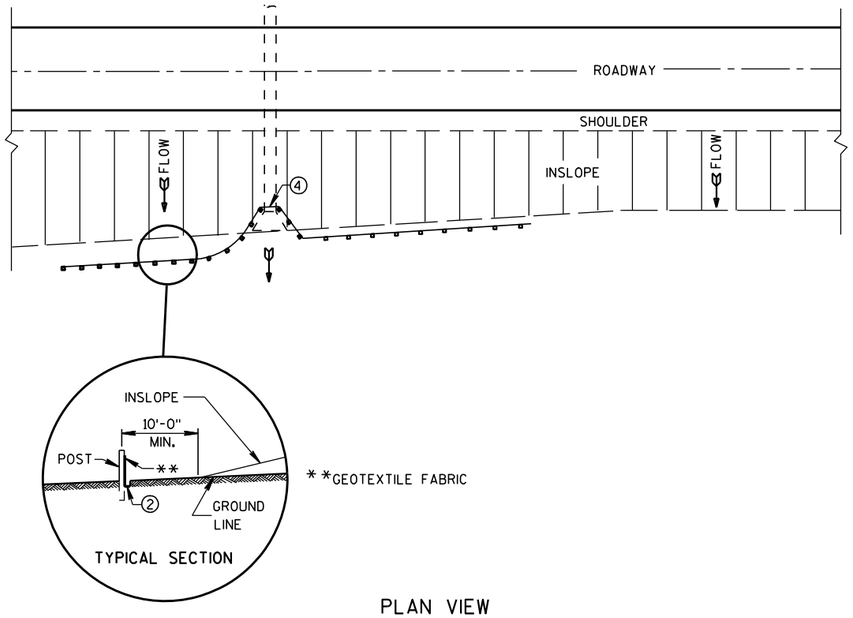
FHWA

6

S.D.D. 8 E 8-3

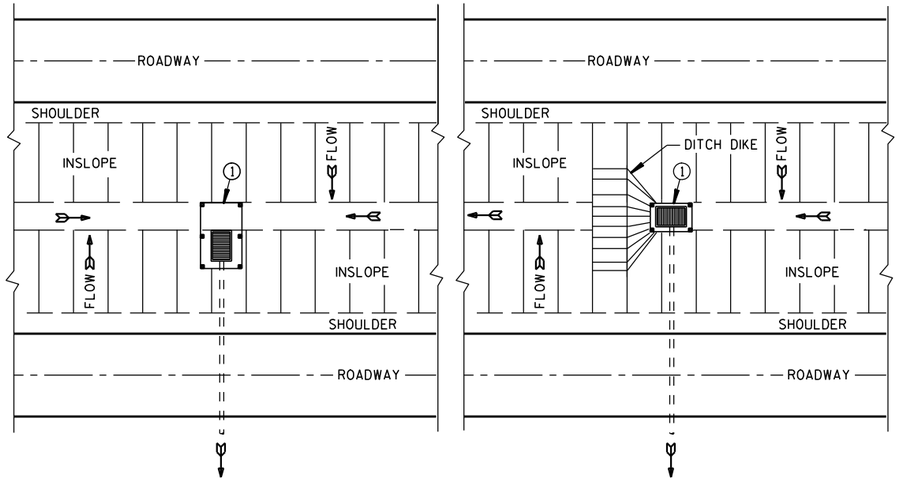
6

S.D.D. 8 E 8-3



PLAN VIEW

TYPICAL APPLICATION OF SILT FENCE



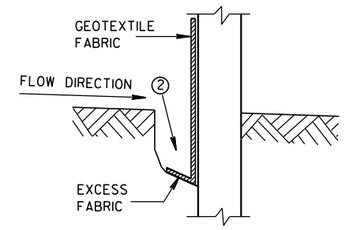
PLAN VIEW

SILT FENCE AT MEDIAN SURFACE DRAINS

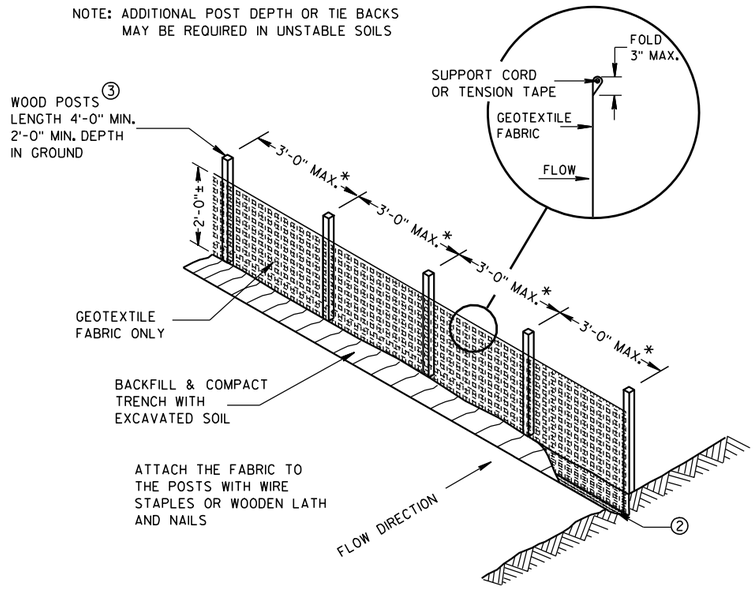
GENERAL NOTES

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

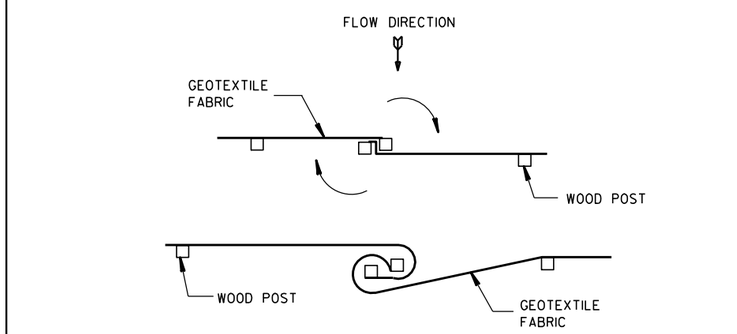
1. HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
2. FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
3. WOOD POSTS SHALL BE A MINIMUM SIZE OF 1⅛" X 1⅛" OF OAK OR HICKORY.
4. SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.
5. CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.



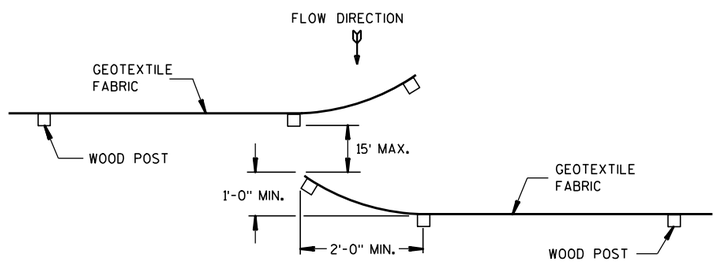
TRENCH DETAIL



SILT FENCE

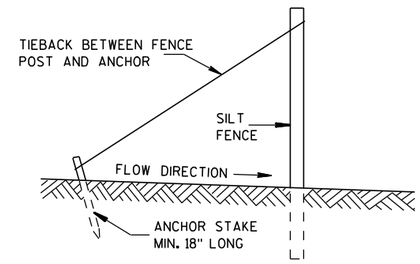


TWIST METHOD



HOOK METHOD

JOINING TWO LENGTHS OF SILT FENCE 5



SILT FENCE TIE BACK

(WHEN REQUIRED BY THE ENGINEER)

SILT FENCE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

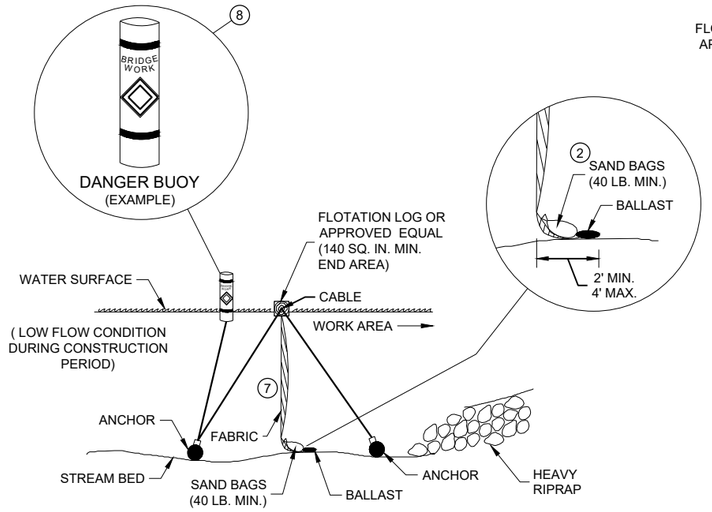
APPROVED
4-29-05 DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

6

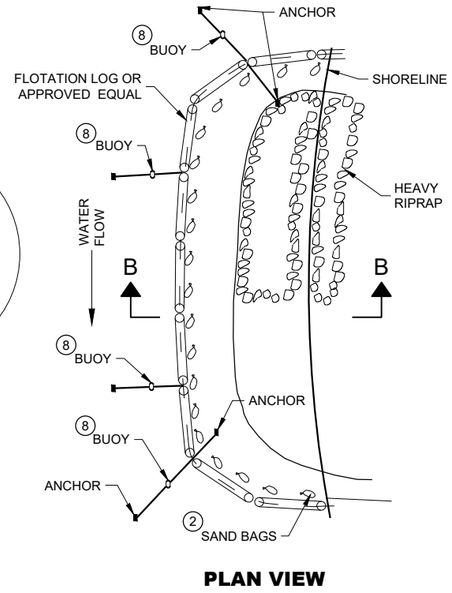
S.D.D. 8 E 9-6

6

S.D.D. 8 E 9-6

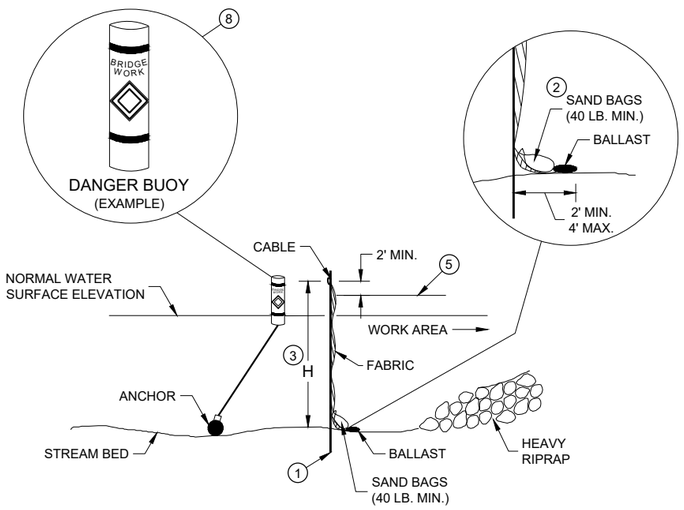


SECTION B - B

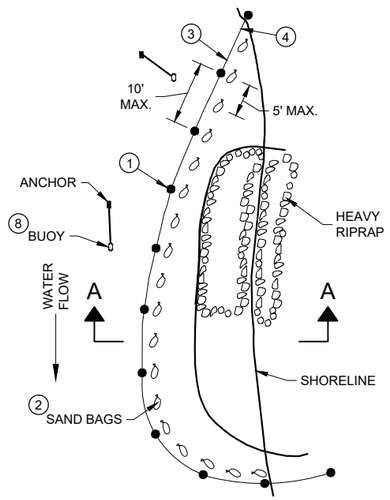


PLAN VIEW

TURBIDITY BARRIER - FLOAT ALTERNATIVE
CAUTION - SEE NOTE 6



SECTION A - A



PLAN VIEW

TURBIDITY BARRIER - STANDARD POST INSTALLATION

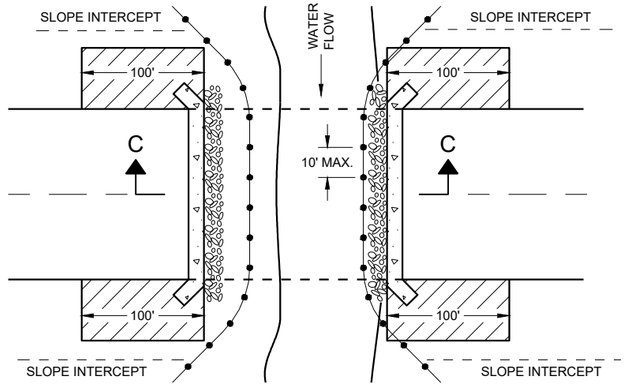
TURBIDITY BARRIER PLACEMENT DETAILS

GENERAL NOTES

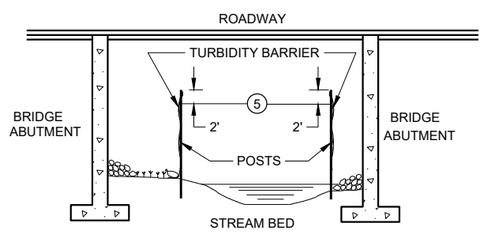
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

TURBIDITY BARRIER MAY BE REMOVED AT THE ENGINEERS DISCRETION, WHEN PERMANENT EROSION CONTROL MEASURES HAVE BEEN ESTABLISHED.

1. DRIVEN STEEL POSTS, PIPES, OR CHANNELS. LENGTH SHALL BE SUFFICIENT TO SECURELY SUPPORT BARRIER AT HIGH WATER ELEVATIONS.
2. SAND BAGS TO BE USED AS ADDITIONAL BALLAST WHEN ORDERED BY THE ENGINEER TO MEET ADVERSE FIELD CONDITIONS. SPACE AS APPROPRIATE FOR SITE CONDITIONS.
3. WHEN BARRIER HEIGHT "H" EXCEEDS 8 FEET, POST SPACING MAY NEED TO BE DECREASED.
4. IN WATERWAYS SUBJECT TO FLUCTUATING WATER ELEVATIONS, PROVISIONS SHOULD BE MADE TO ALLOW THE WATER TO EQUALIZE ON EACH SIDE OF THE BARRIER. THIS MAY BE ACCOMPLISHED BY LEAVING A PORTION OF THE BARRIER OPEN ON THE UPSTREAM END.
5. ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION PERIOD. MINIMUM BARRIER HEIGHT SHALL BE 2' GREATER THAN EITHER THE Q2 ELEVATION OR THE ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION, WHICHEVER IS GREATER.
6. FLOAT ALTERNATIVE WILL ONLY BE ALLOWED WITH WRITTEN APPROVAL OF THE ENGINEER, AND IS MEANT FOR LOCATIONS WHERE BEDROCK PREVENTS THE INSTALLATION OF POSTS.
7. ALLOW SUFFICIENT SLACK VERTICALLY AND HORIZONTALLY SO THAT SEDIMENT BUILD UP WILL NOT SEPARATE OR LOWER THE TURBIDITY BARRIER.
8. USE AS DIRECTED BY COAST GUARD OR DNR PERMIT WHEN WORKING IN NAVIGABLE WATERWAYS.



PLAN VIEW



SECTION C - C

TURBIDITY BARRIER DETAIL SHOWING TYPICAL PLACEMENT AT STRUCTURES

TURBIDITY BARRIER

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
6/4/02
DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOI
ENGINEER

FHWA

6
SDD 08E11 - 02

METAL APRON ENDWALLS

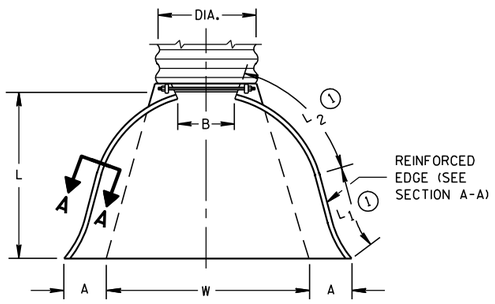
PIPE DIA. (IN.)	MIN. THICK. (Inches) STEEL	MIN. THICK. (Inches) ALUM.	DIMENSIONS (Inches) A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 ①	L2 ①	W (±2")	APPROX. SLOPE	BODY
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4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

× EXCEPT CENTER PANEL SEE GENERAL NOTES

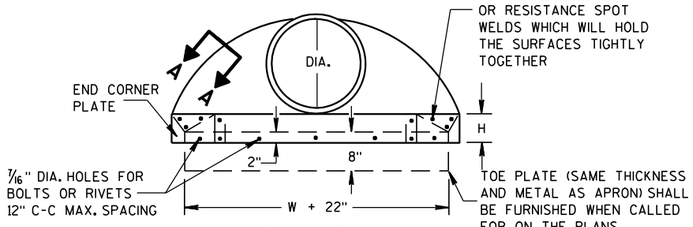
REINFORCED CONCRETE APRON ENDWALLS

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

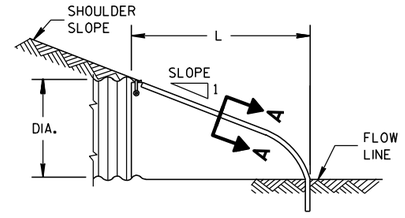
*MINIMUM
**MAXIMUM



PLAN VIEW

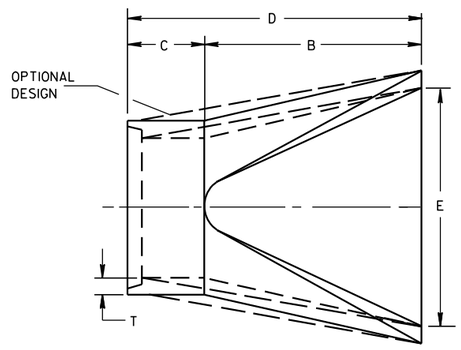


END VIEW

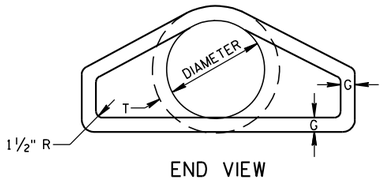


SIDE ELEVATION

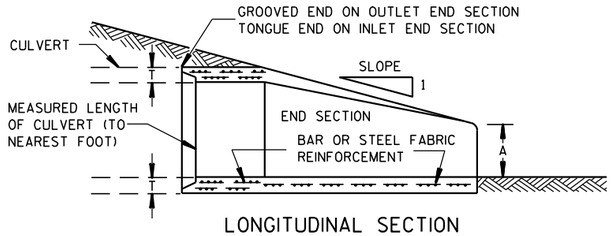
METAL ENDWALLS



PLAN

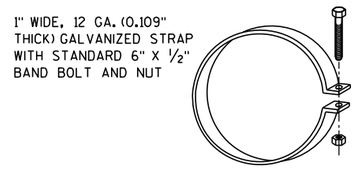


END VIEW



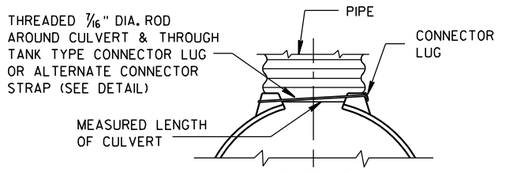
LONGITUDINAL SECTION

CONCRETE ENDWALLS

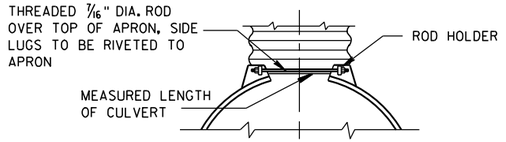


ALTERNATE FOR TYPE 1 CONNECTION

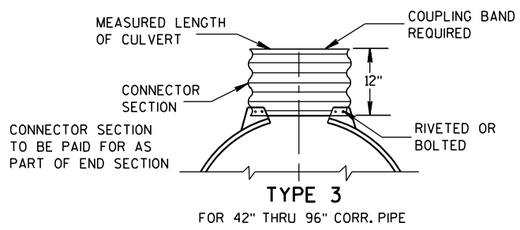
END SECTION CONNECTOR STRAP



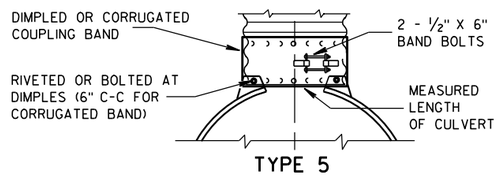
TYPE 1
FOR 12" THRU 24" CORR. PIPE



TYPE 2
FOR 30" THRU 96" CORR. PIPE



TYPE 3
FOR 42" THRU 96" CORR. PIPE



TYPE 5
ALTERNATE FOR:
ALL SIZES CORRUGATED CIRCULAR PIPE

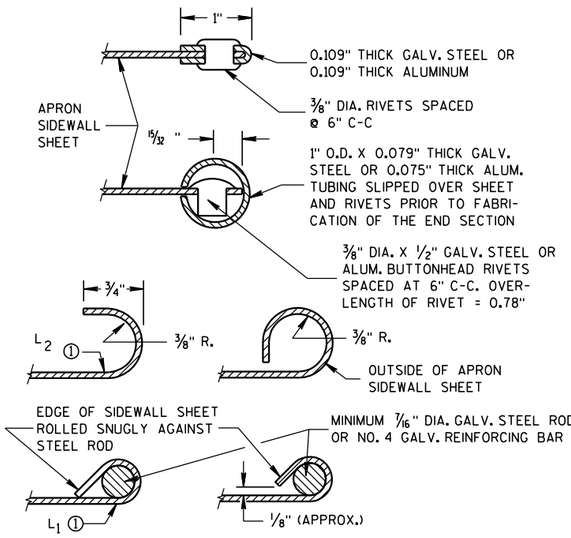
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL. AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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

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

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

CONNECTION DETAILS



SECTION A-A

GENERAL NOTES

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

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

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

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

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

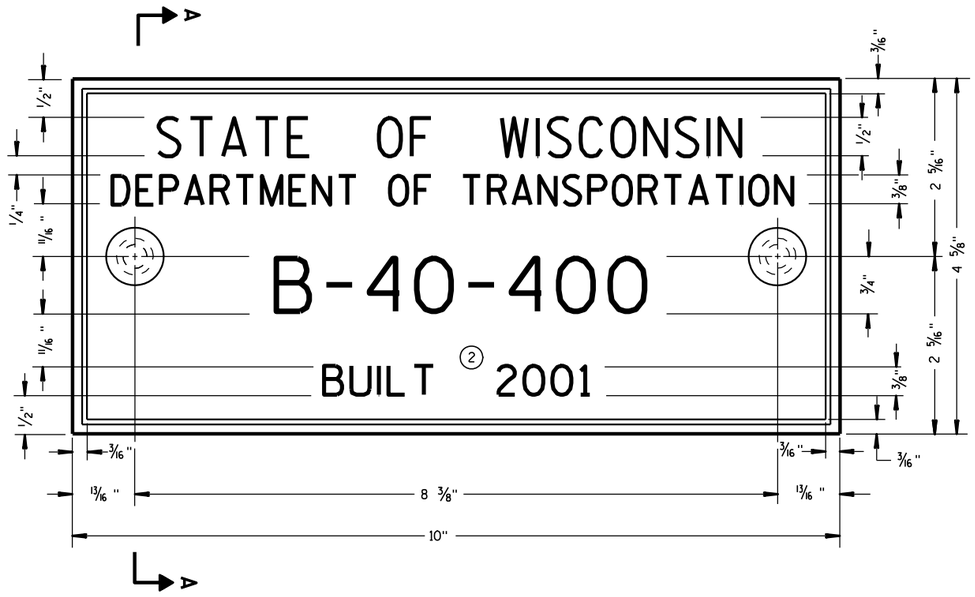
① FOR PIPE SIZES UP TO 60" DIAMETER, A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.

APRON ENDWALLS FOR CULVERT PIPE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

6
S.D.D. 8 F 1-11



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

FOR MULTI-UNIT STRUCTURES
LINE 3 ABOVE SHALL READ

B = BRIDGE
C = CULVERT
R = RETAINING WALL

COUNTY NO.

BRIDGE NO.

UNIT NO. FOR MULTIPLE UNIT BRIDGE

B-40-400-1A

NUMBERING DESIGNATION
MULTI-UNIT STRUCTURES

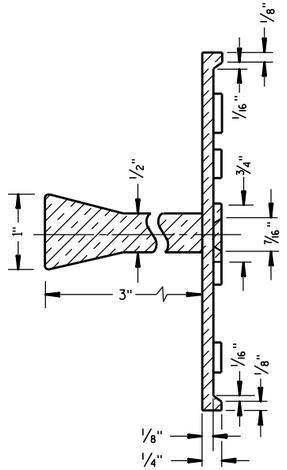
GENERAL NOTES

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

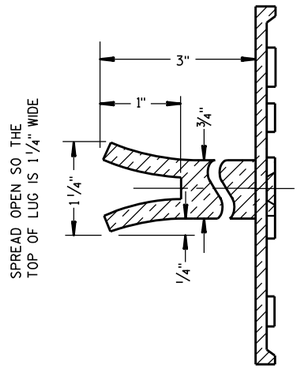
THE BRIDGE NUMBER AND YEAR BUILT SHOWN ON THIS DRAWING ARE EXAMPLES ONLY. SEE CONSTRUCTION PLANS FOR INDIVIDUAL NUMBERING AND YEAR BUILT.

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

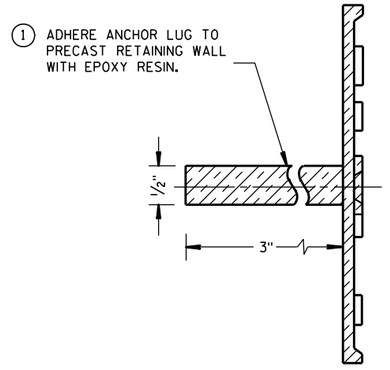
(2) REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.



SECTION A-A



ALTERNATE LUG



ALTERNATE LUG
(FOR ATTACHMENT TO PRECAST STRUCTURES)

NAME PLATE (STRUCTURES)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

3/26/10 DATE

/S/ Scot Beck CHIEF STRUCTURAL DEVELOPMENT ENGINEER

FHWA

6

S.D.D. 12 A 3-10

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

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

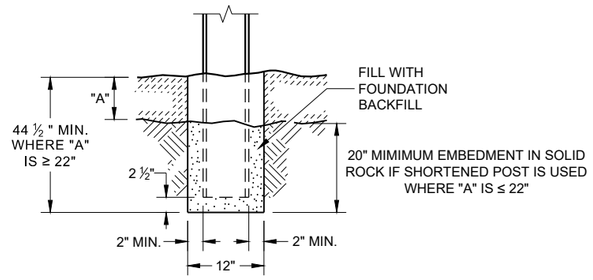
(3) IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2 1/2" INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AMD INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL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

(4) WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).

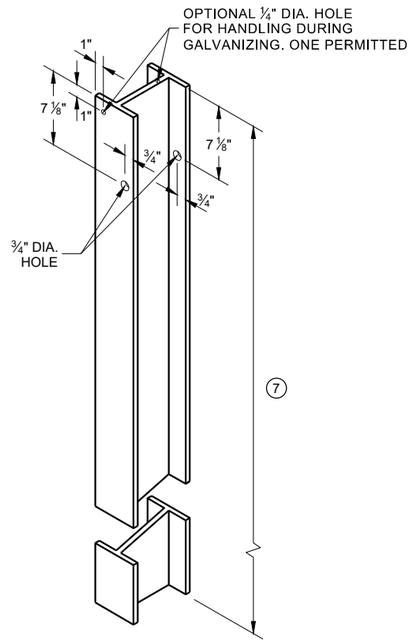
(5) FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS ±1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27 ¾" TO 32".

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

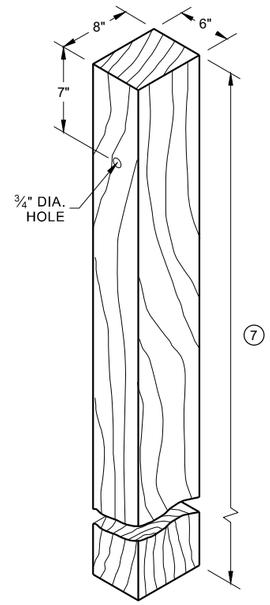
(7) TOTAL POST LENGTH FOR TYPE K IS 7' - 0".
TOTAL POST LENGTH FOR OTHER MGS TYPES IS 6' - 0".



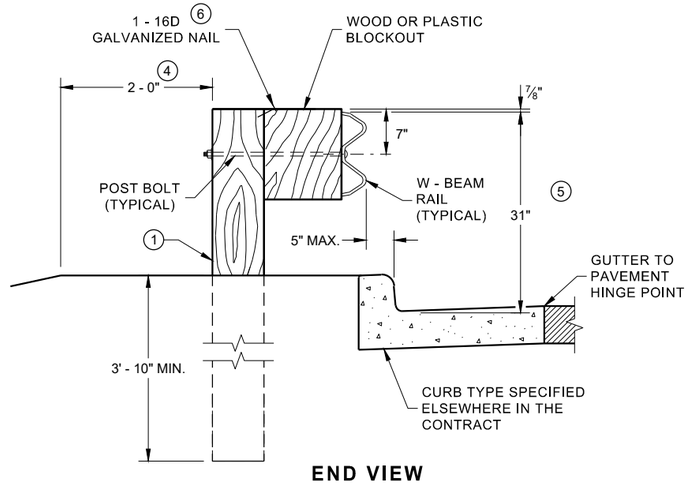
END VIEW
SETTING STEEL OR WOOD POST IN ROCK (3)



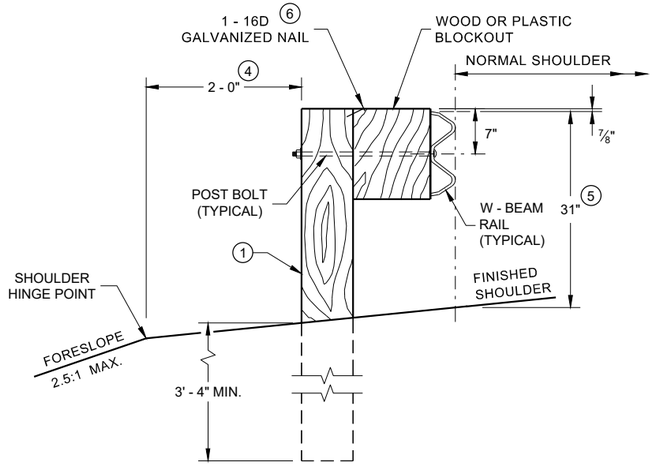
STEEL POST & HOLE PUNCHING DETAIL (W 6 X 9) (1)



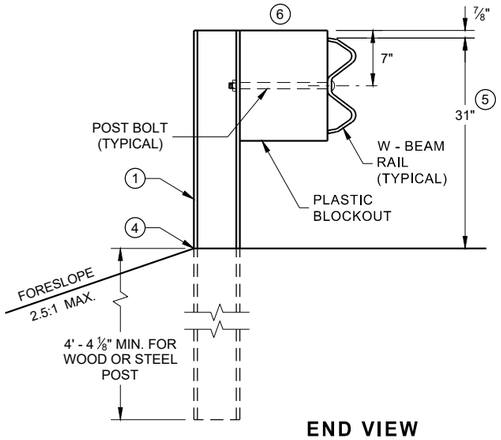
WOOD POST (6" X 8") NOMINAL (1)



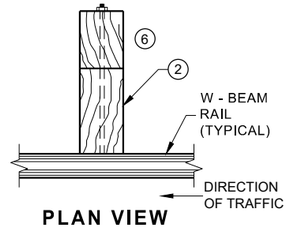
END VIEW
LOCATED ALONG A CURBED ROADWAY



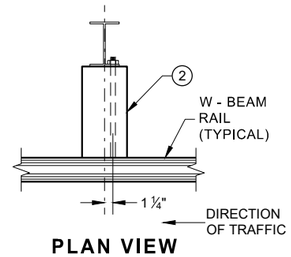
END VIEW
LOCATED ALONG A ROADWAY SHOULDER STANDARD INSTALLATION



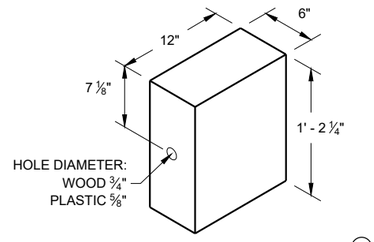
END VIEW
MGS LONGER POST AT HALFPOST SPACING W BEAM (K)



PLAN VIEW
WOOD POST, BLOCKOUT & BEAM



PLAN VIEW
STEEL POST, PLASTIC BLOCKOUT & BEAM



WOOD OR PLASTIC BLOCKOUT (2)

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

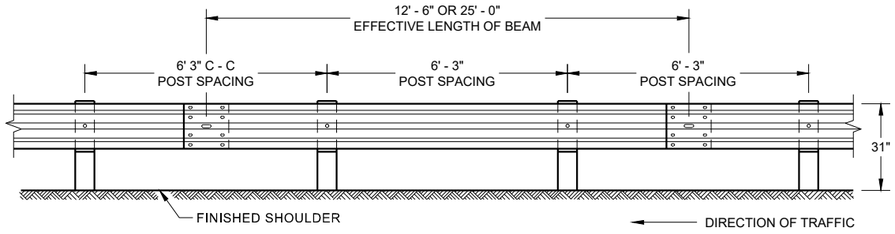
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

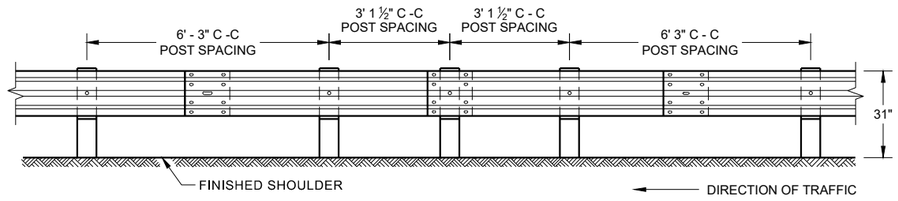
SDD 14B42 - 07a

6

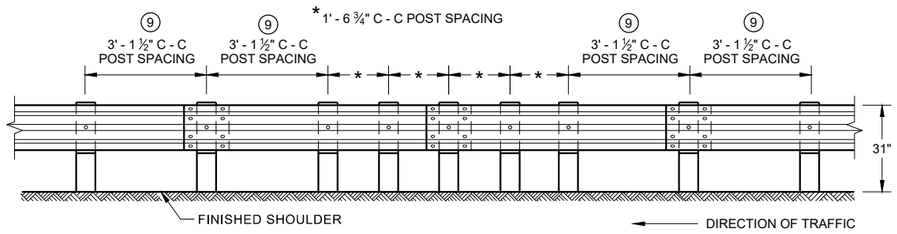
SDD 14B42 - 07a



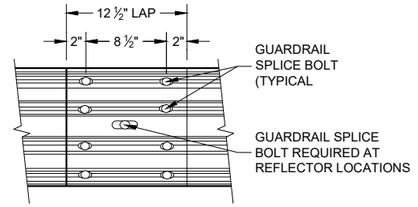
FRONT VIEW
POST SPACING STANDARD INSTALLATION



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

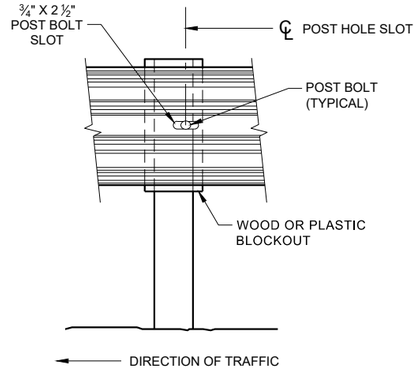
GENERAL NOTES

⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

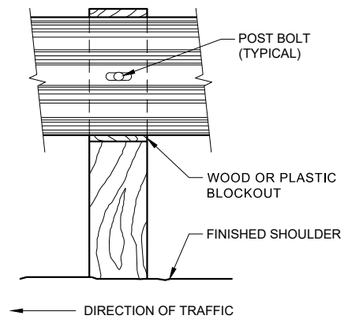
⑨ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.

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

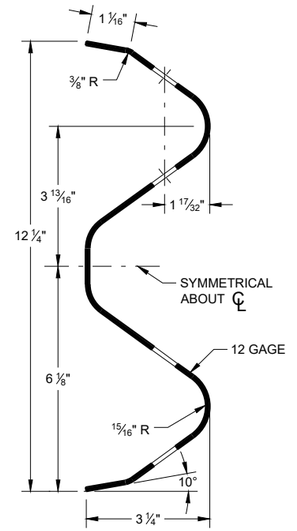
GUARD RAIL SPLICE BOLTS ARE A ⅝" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES ⅝" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.



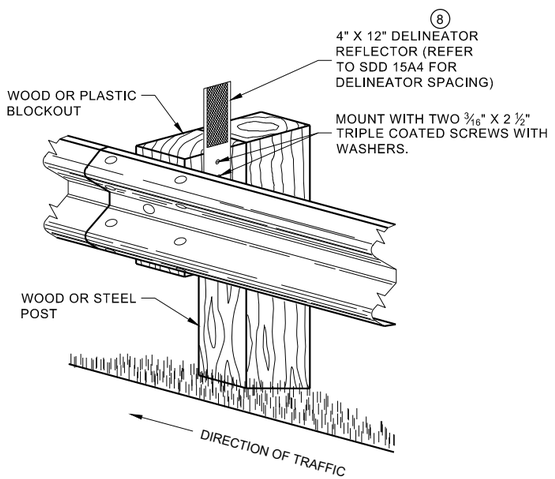
FRONT VIEW AT STEEL POST



FRONT VIEW AT WOOD POST



SECTION THRU W-BEAM RAIL

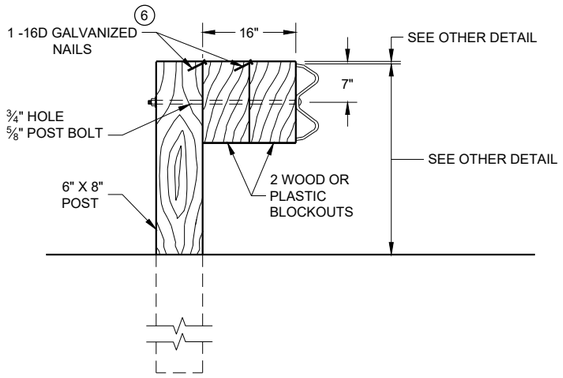


ONE SIDED REFLECTOR DETAIL
AND TYPICAL INSTALLATION

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6
SDD 14B42 - 07b

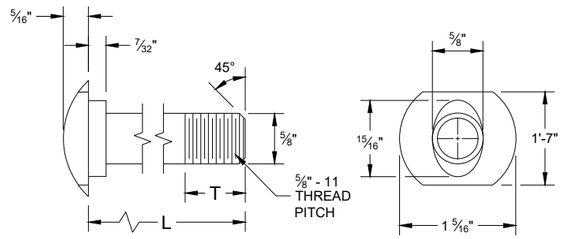


DETAIL FOR 16" BLOCKOUT DEPTH

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

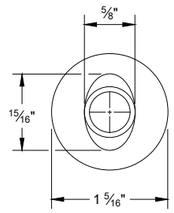
NOTE:

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

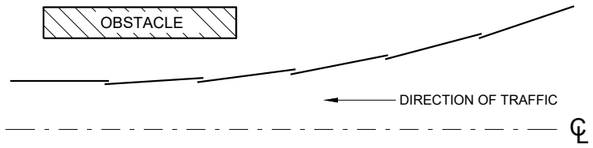


POST BOLT TABLE

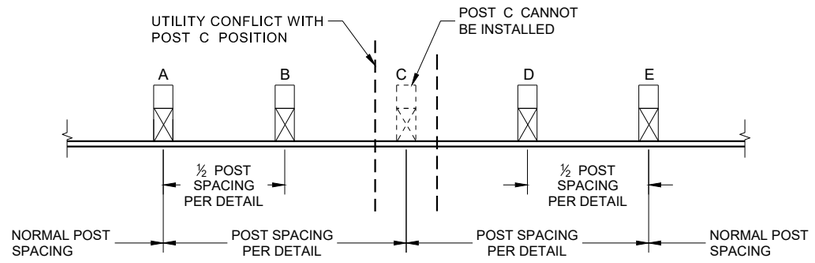
L	T (MIN.)
1 ¼"	1 ⅛"
2"	1 ¾"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



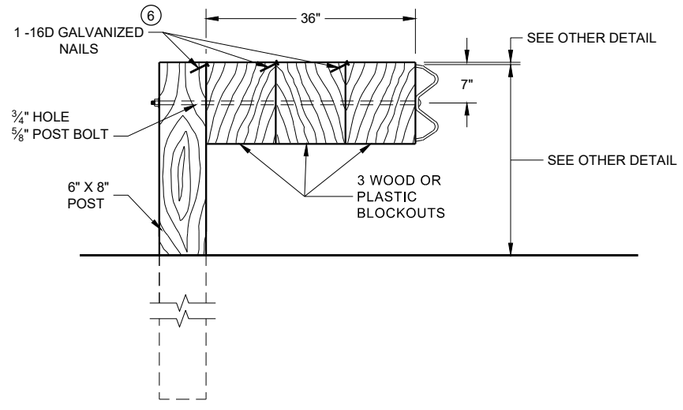
ALTERNATE BOLT HEAD



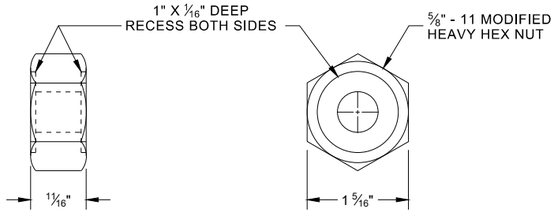
PLAN VIEW
BEAM LAPPING DETAIL



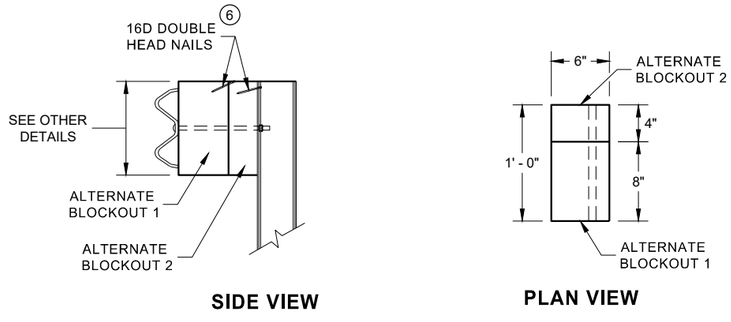
POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION



DETAIL FOR 36" BLOCKOUT DEPTH



POST BOLT, SPLICE BOLT AND RECESS NUT



SIDE VIEW

PLAN VIEW

ALTERNATE WOOD BLOCKOUT DETAIL

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

DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.

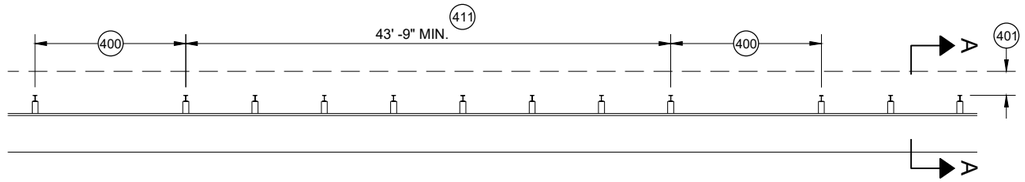
(6) WHEN USING STEEL POST AD WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

6

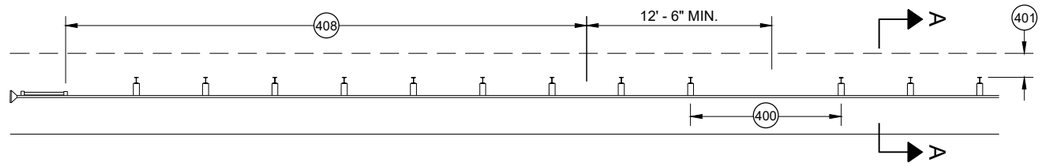
MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

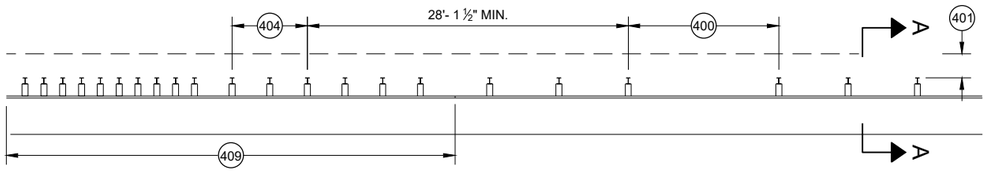
SDD 14B42 - 07c



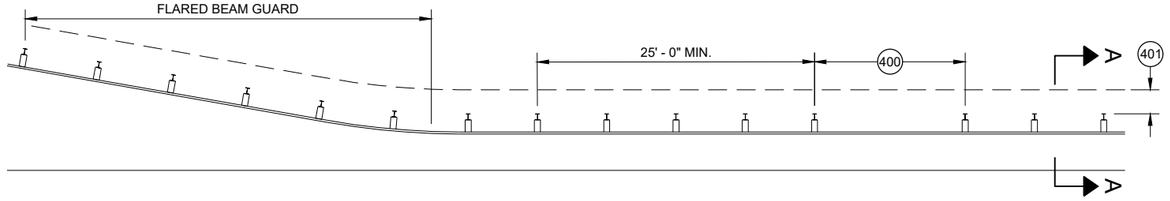
MISSING POST IN MGS GUARDRAIL



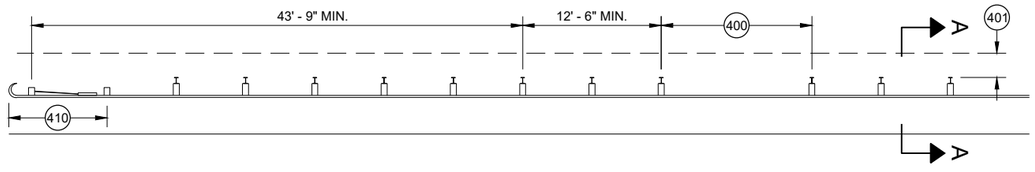
MISSING POST IN MGS GUARDRAIL NEAR EAT



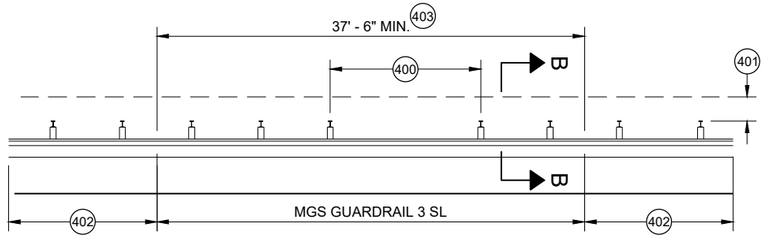
MISSING POST IN MGS GUARDRAIL NEAR AN APPROACH TRANSITION



MISSING POST IN MGS GUARDRAIL NEAR FLARED BEAM GUARD

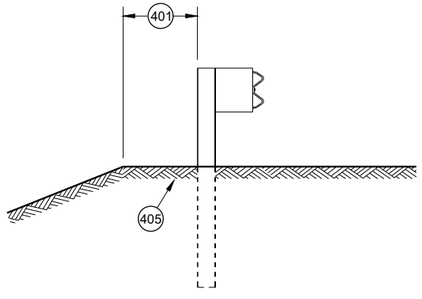


MISSING POST IN MGS GUARDRAIL NEAR A TYPE 2 END TERMINAL

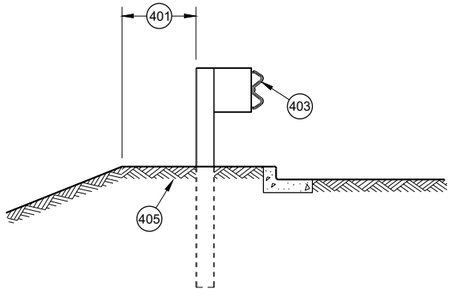


MISSING POST IN SHORT SPAN MGS GUARDRAIL NEAR CURB (SL) 407

(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 406



SECTION B - B 406

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

FHWA

SDD 14B42 - 07d

GENERAL NOTES

(A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL) AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.

(B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED

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

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

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

DIMENSIONS MAY VARY, MANUFACTURER'S INFORMATION.

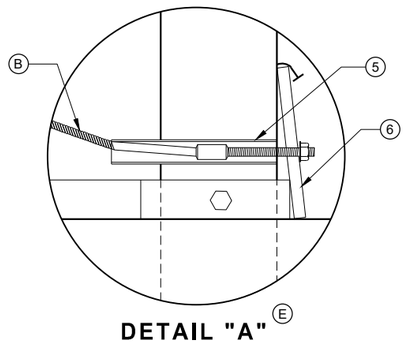
SEE SDD 14B42 FOR MORE INFORMATION.

* DO NOT ATTACH BLOCKOUTS TO POST 1 AND 2.

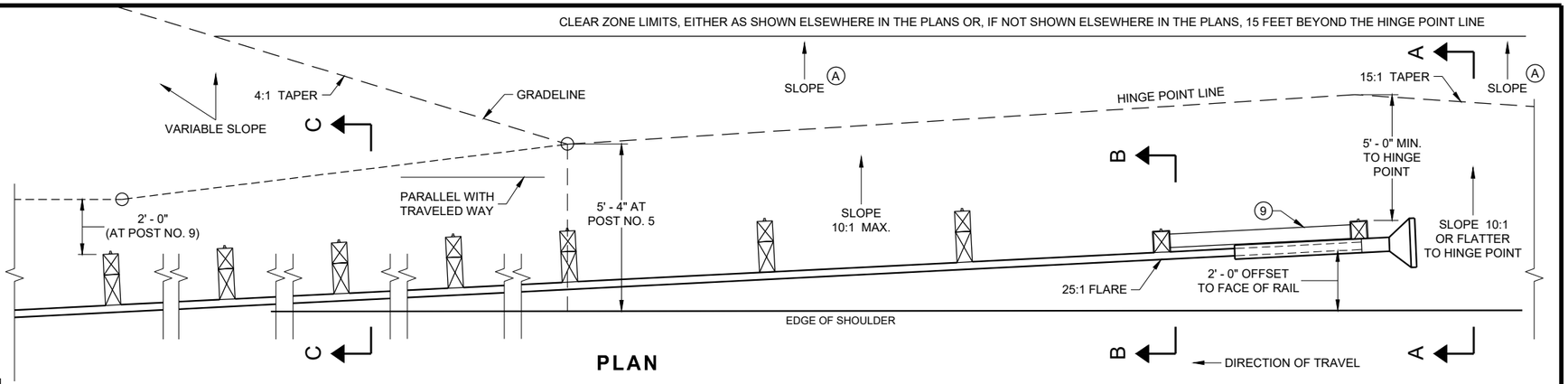
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

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

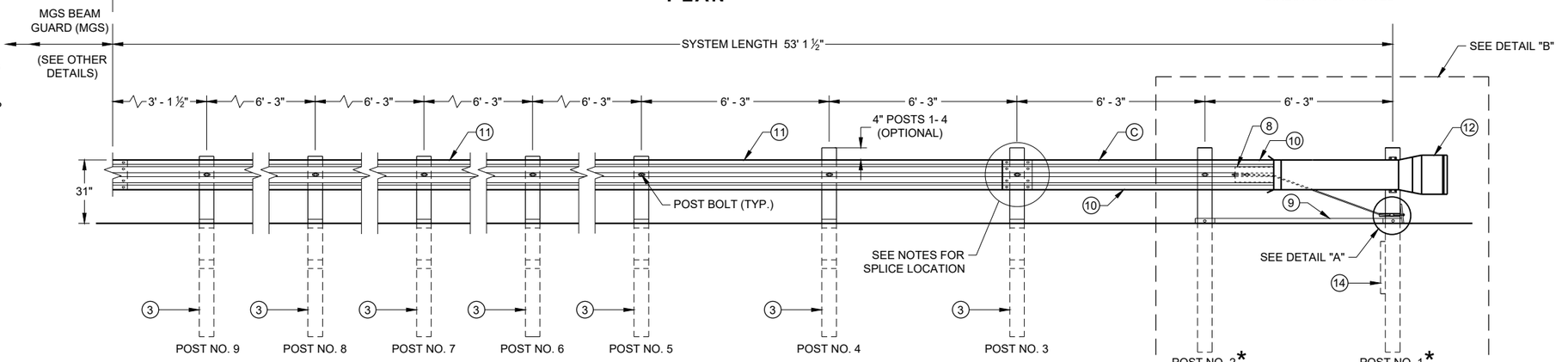
THE CENTER OF THE UPPER 3 ½" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE. WOOD BLOCKS ON POSTS NUMBERED 3 THROUGH 9 MAY BE ADJUSTED UP TO 3" ABOVE THE TOP OF POST.



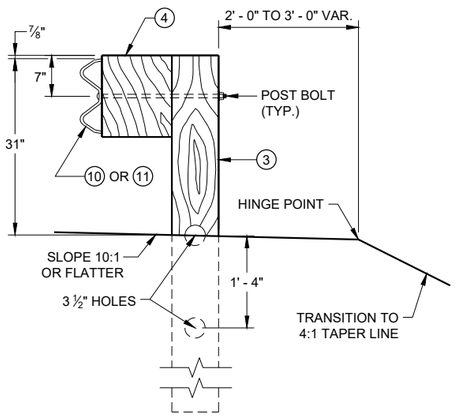
DETAIL "A" (E)



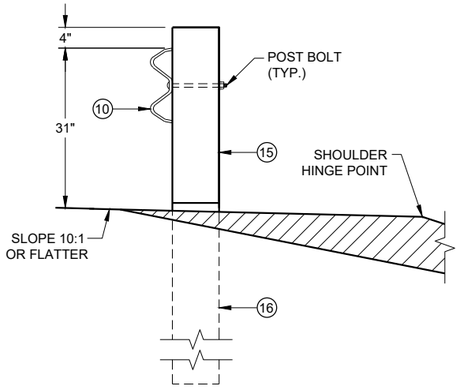
PLAN



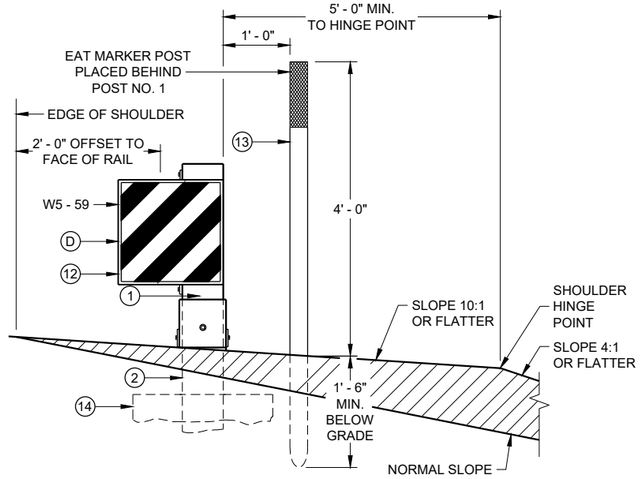
ELEVATION



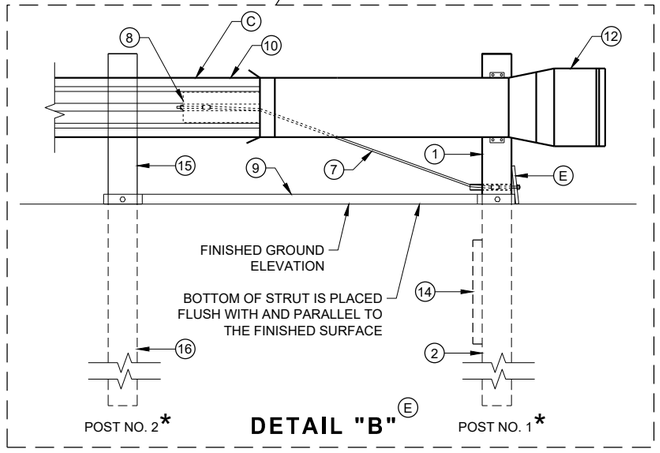
SECTION C - C
TYPICAL AT POST NOS. 3 - 9



SECTION B - B
TYPICAL AT POST NO. 2*



SECTION A - A
TYPICAL AT POST NO. 1*



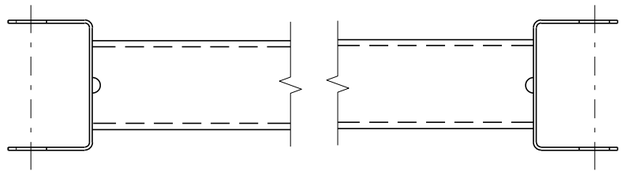
DETAIL "B" (E)

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

SDD 14B44 - 04a

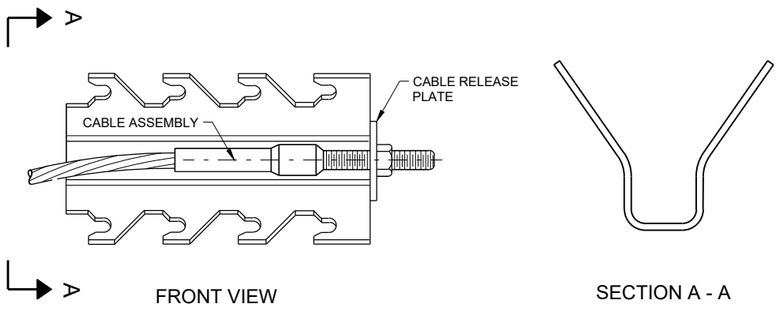
SDD 14B44 - 04a



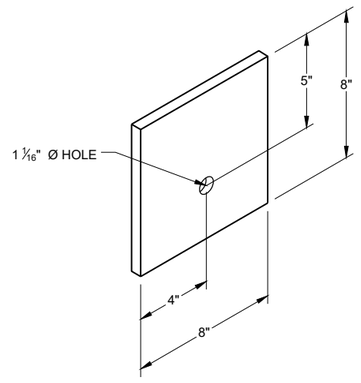
GENERIC GROUND STRUT ⑨ Ⓔ

BILL OF MATERIALS

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



GENERIC ANCHOR CABLE BOX ⑧ Ⓔ



BEARING PLATE ⑥ Ⓔ

6

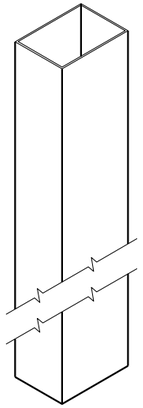
6

SDD 14B44 - 04b

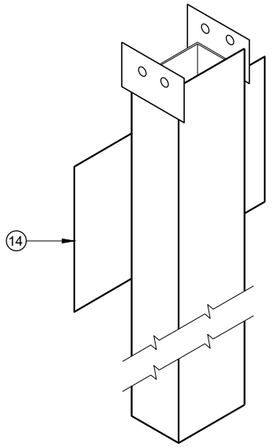
SDD 14B44 - 04b

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

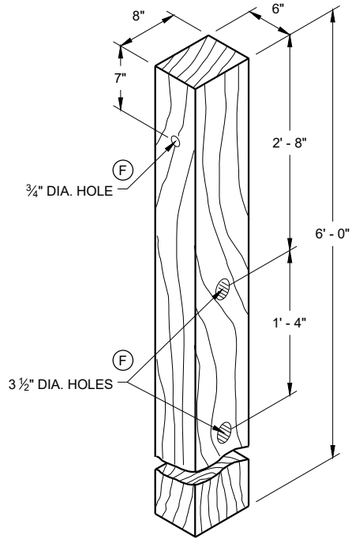
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



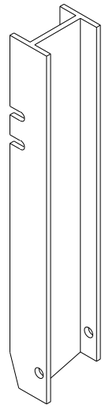
UPPER POST NO. 1 (1) (E)



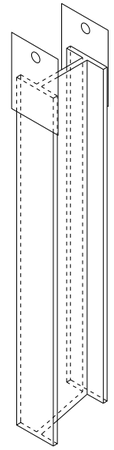
LOWER POST NO. 1 (2) (E)



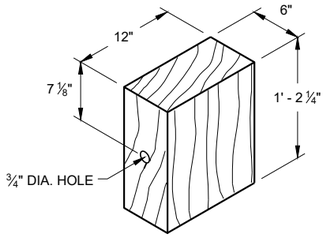
WOOD CRT POST (3) (E)
POSTS NUMBER 3-9



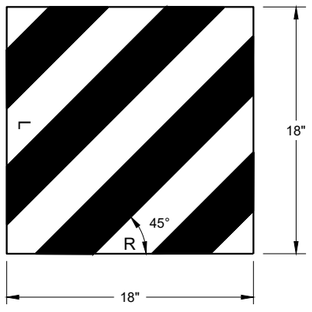
UPPER POST NO. 2 (15) (E)



LOWER POST NO. 2 (16) (E)

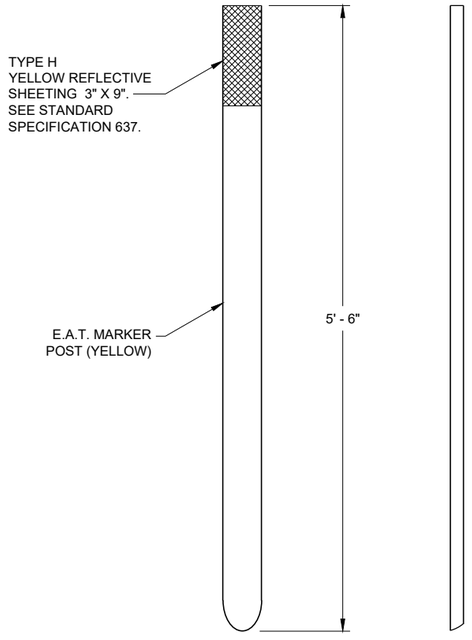


WOOD BLOCKOUT (4)
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2



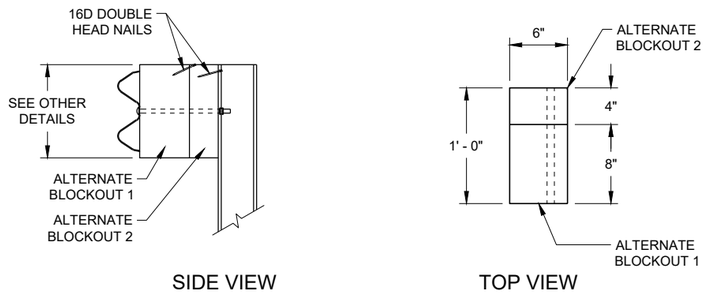
W5 - 59

REFLECTIVE SHEETING DETAIL (E)



FRONT VIEW SIDE VIEW

E.A.T. MARKER POST (13)



SIDE VIEW TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)

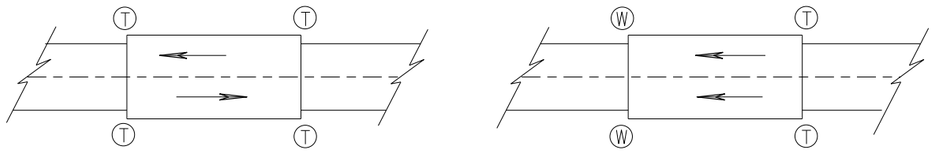
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

FHWA

6

SDD 14B44 - 04c



TWO WAY TRAFFIC

ONE WAY TRAFFIC

(T) THRIE BEAM CONNECTION

(W) W-BEAM CONNECTION WHEN REQUIRED

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

GENERAL NOTES

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

TRANSITION USES STEEL POSTS ONLY.

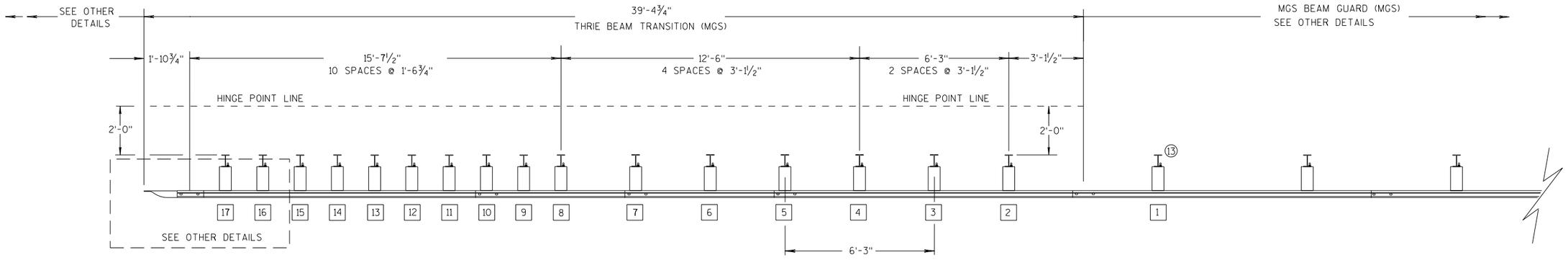
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

POST 2 THROUGH 17 USES STEEL POST ONLY

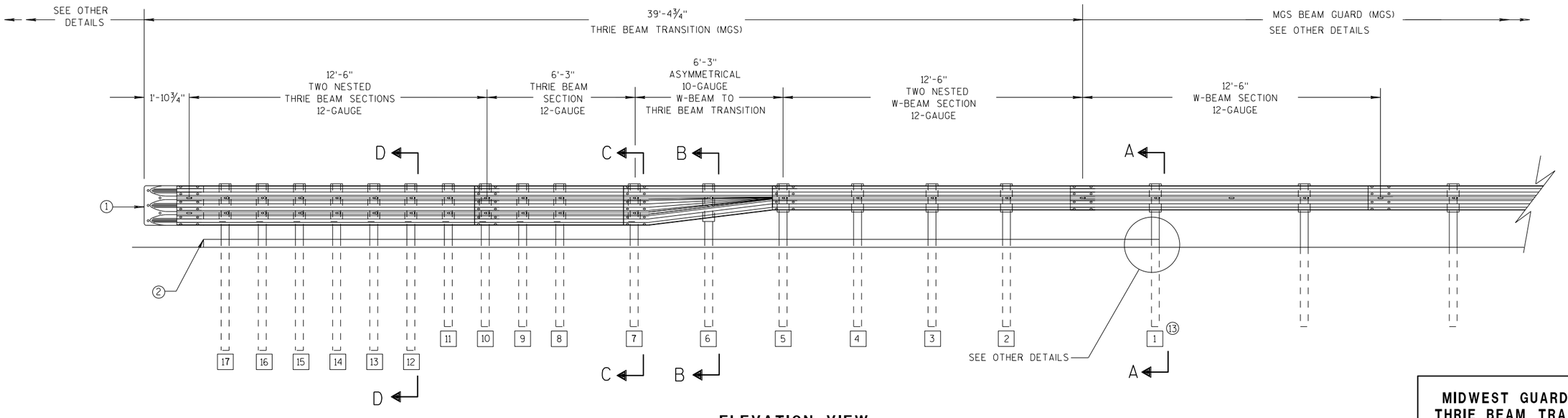
(1) BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.

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

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



PLAN VIEW



ELEVATION VIEW

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

6

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

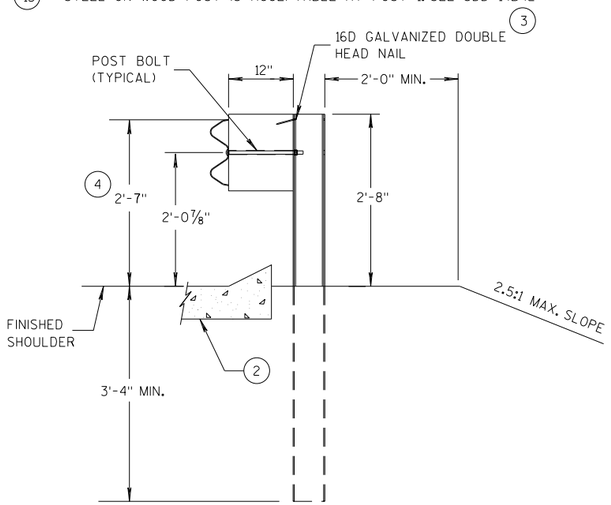
GENERAL NOTES

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

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

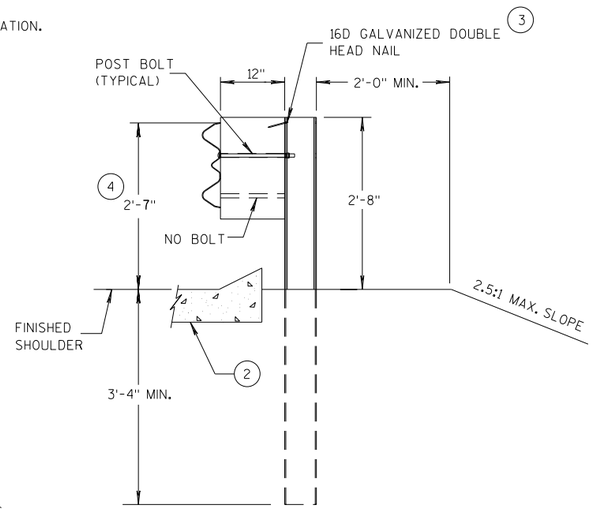
(4) TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".

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



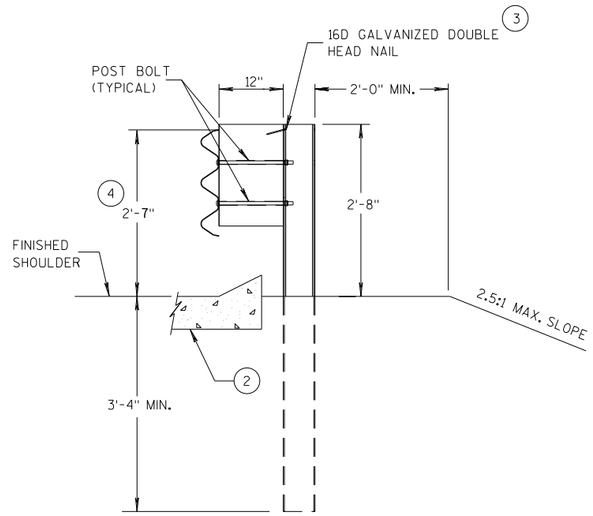
SECTION A-A (13)

POSTS 1-5



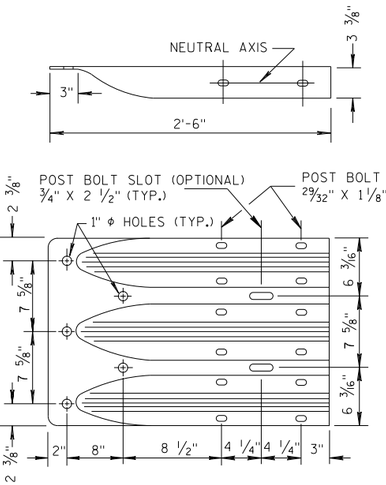
SECTION B-B

POST 6

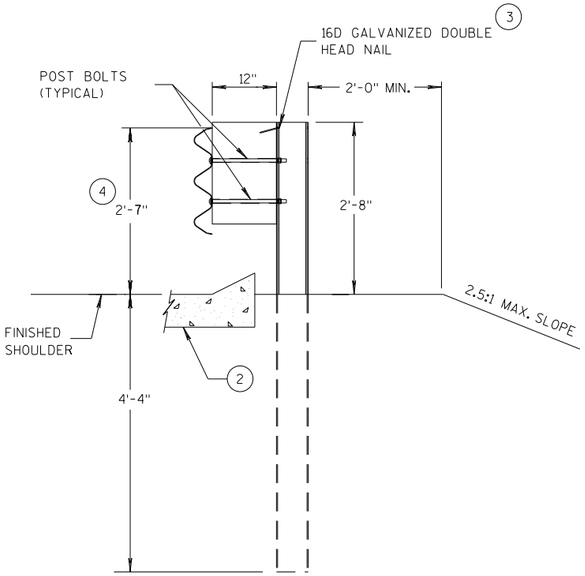


SECTION C-C

POSTS 7-11

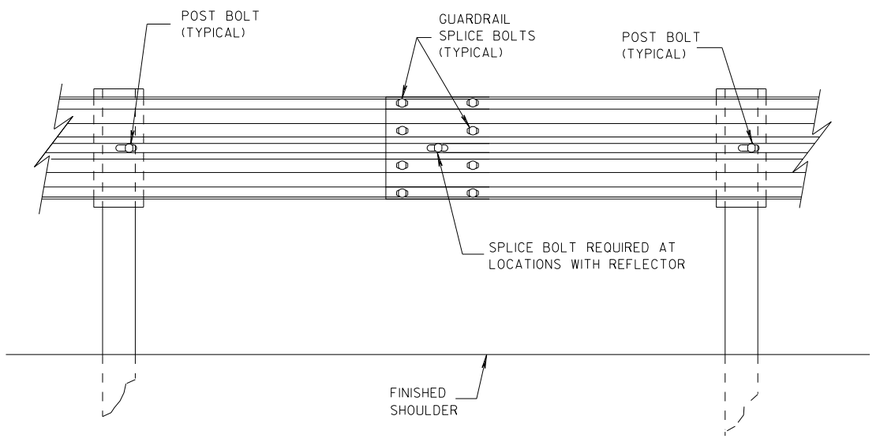


THRIE BEAM TERMINAL CONNECTOR



SECTION D-D

POSTS 12-17



SPLICE DETAIL

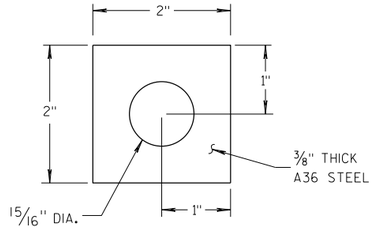
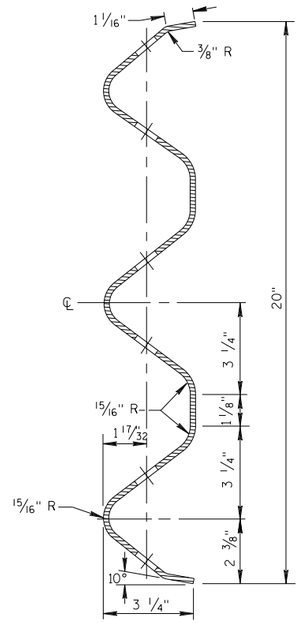


PLATE WASHER DETAIL



SECTION THRU THRIE BEAM RAIL ELEMENT

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOF

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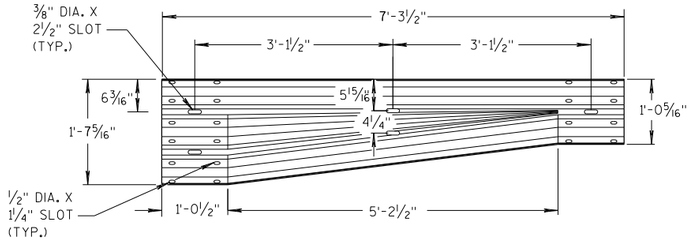
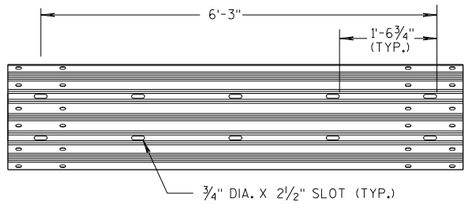
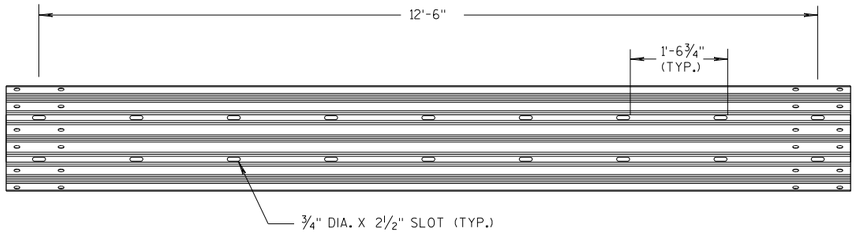


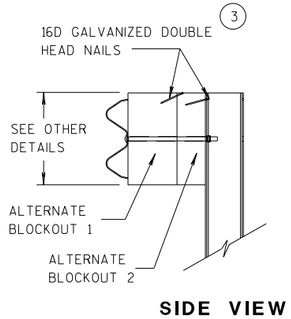
W-BEAM TO THRIE BEAM TRANSITION SECTION



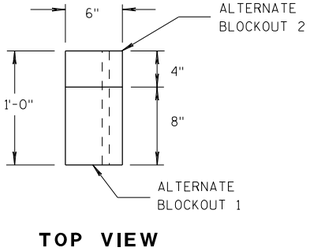
6'-3" THRIE BEAM SECTION



12'-6" THRIE BEAM SECTION

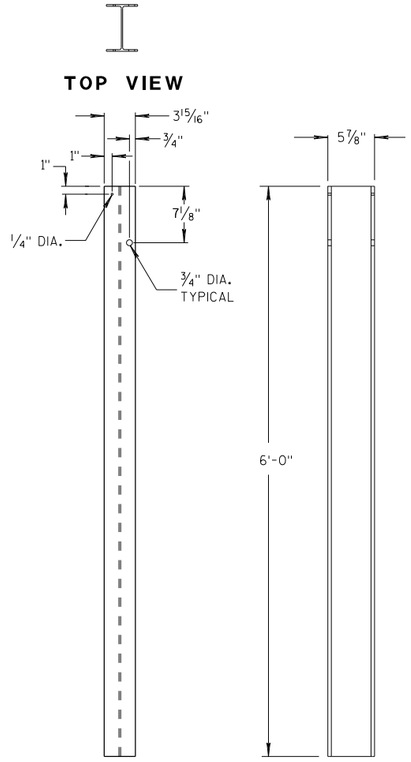


SIDE VIEW



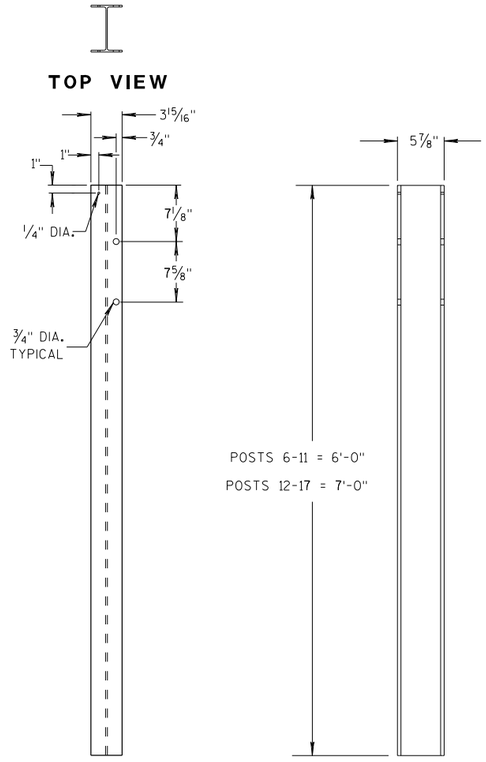
TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL



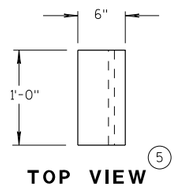
FRONT VIEW SIDE VIEW

STEEL POSTS 1-5 (13)

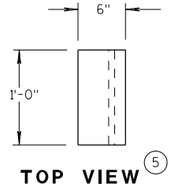


FRONT VIEW SIDE VIEW

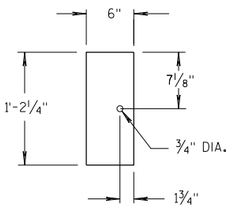
STEEL POSTS 6-17



TOP VIEW (5)

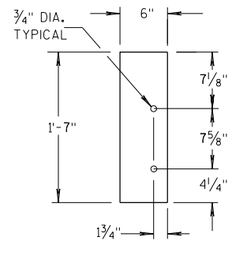


TOP VIEW (5)



FRONT VIEW

BLOCKOUT POSTS 1-5



FRONT VIEW

BLOCKOUT POSTS 6-17

GENERAL NOTES

STEEL POSTS ARE W6X9 OR W6X8.5.

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

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

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

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

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

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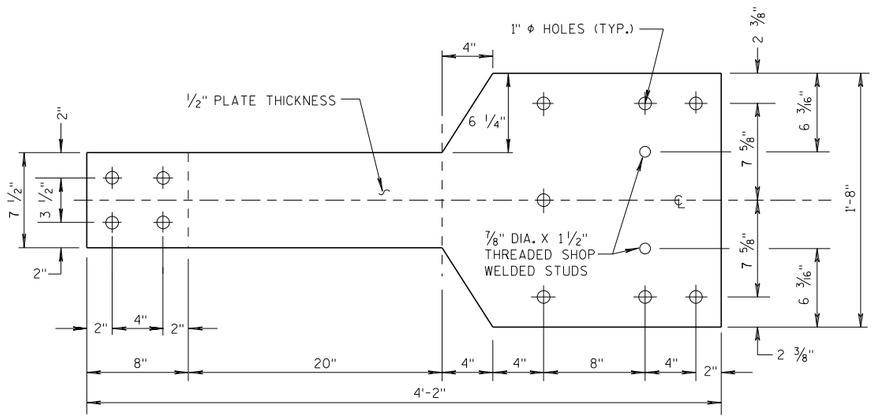
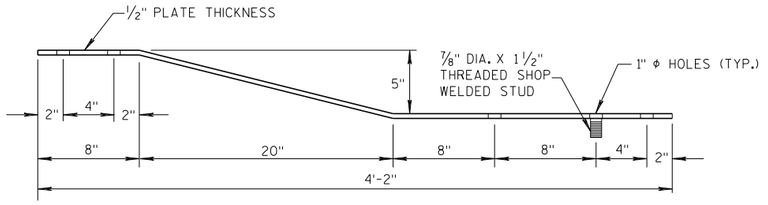
GENERAL NOTES

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

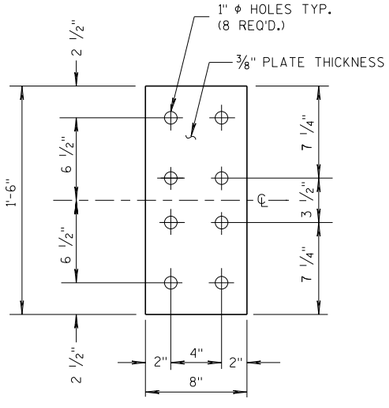


FRONT VIEW



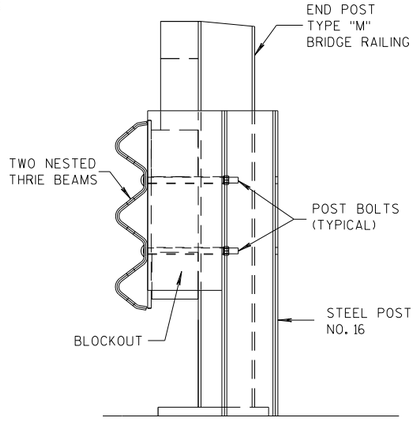
PLAN VIEW

BACK-UP PLATE DETAIL, TYPE "M"

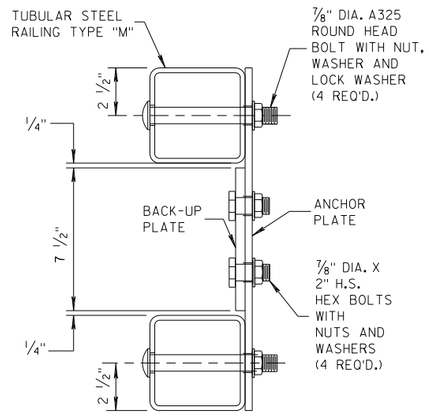


FRONT VIEW

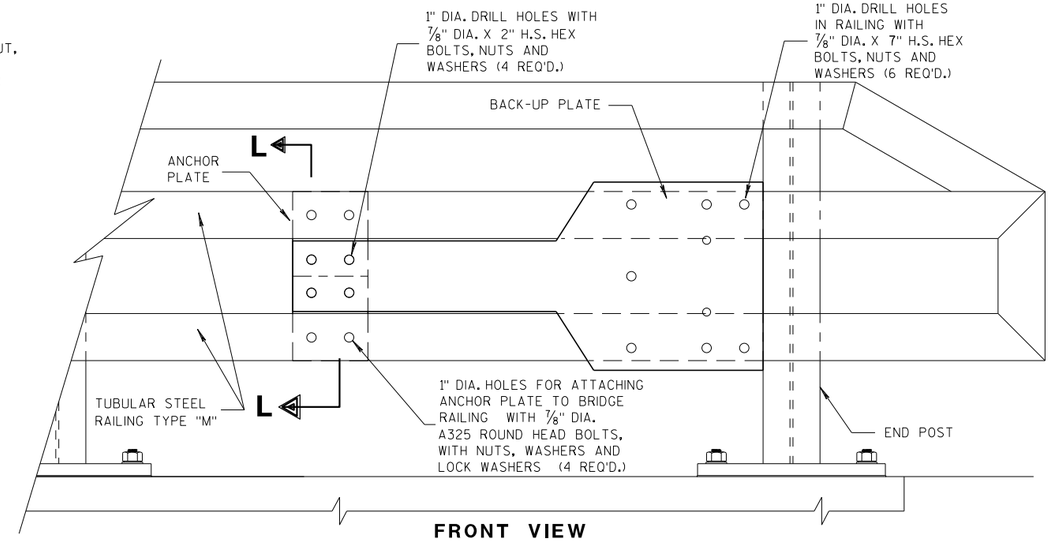
ANCHOR PLATE DETAIL, TYPE "M"



SECTION M-M

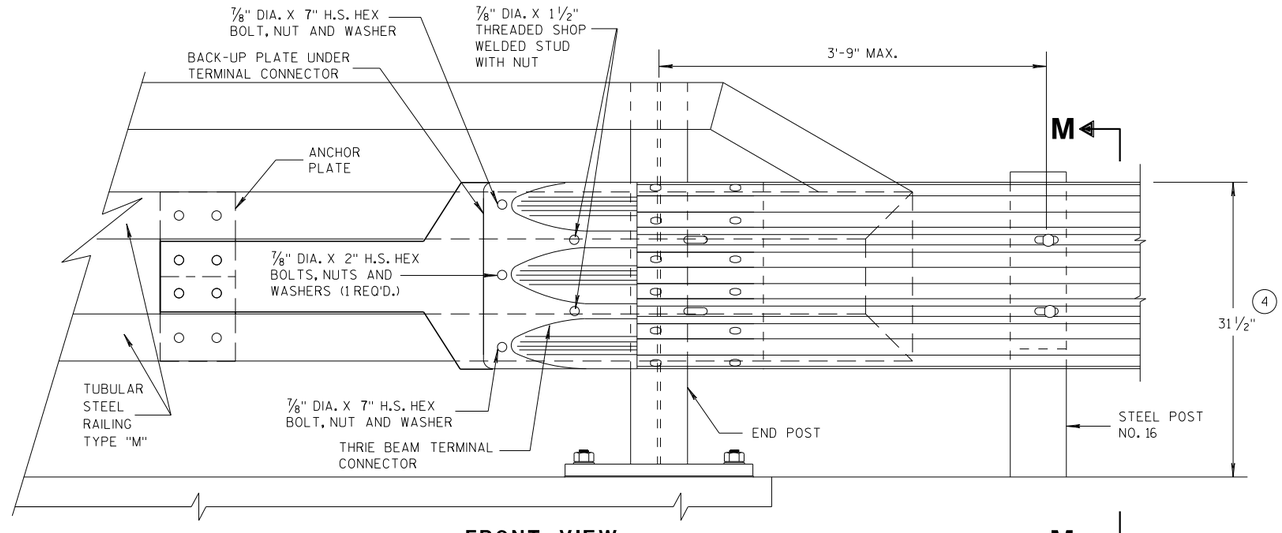


SECTION L-L

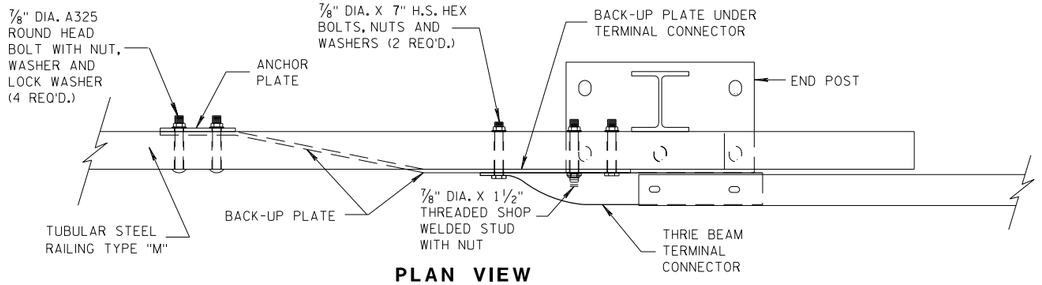


FRONT VIEW

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



FRONT VIEW



PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

6

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

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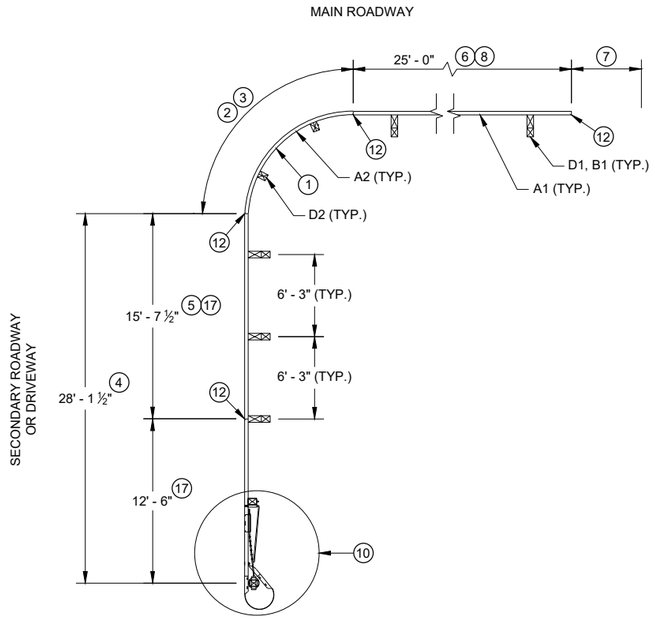
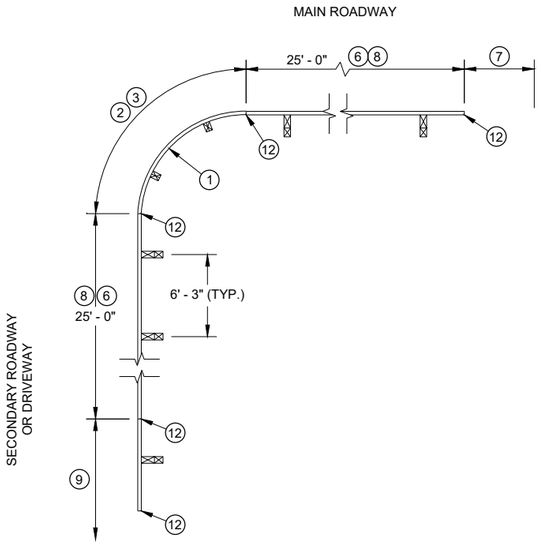
S.D.D. 14 B 45-5h



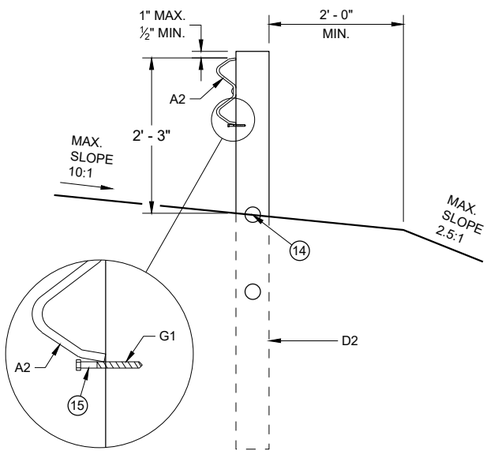
PLAN VIEW

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

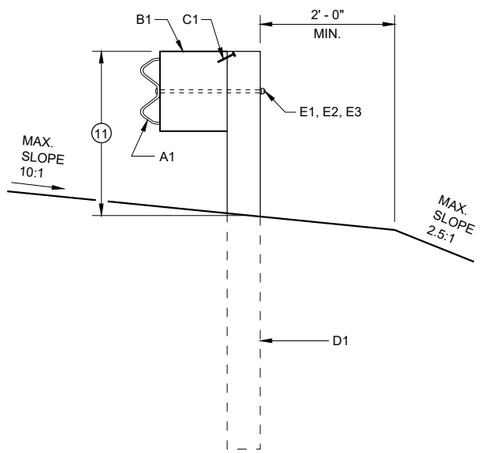


PLAN VIEW

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



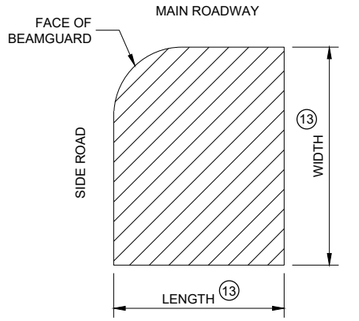
CONTROLLED RELEASE TERMINAL POST (CRT) IN RADIUS



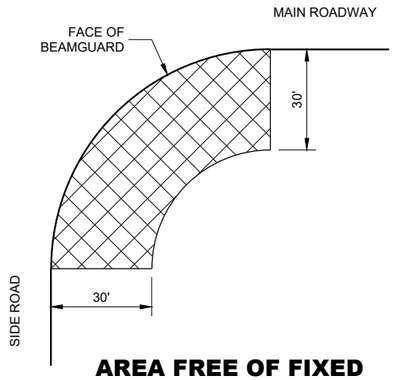
BEAM GUARD POSTS IN HEIGHT TRANSITION

TABLE FOR RADIUS OF 32' AND LESS

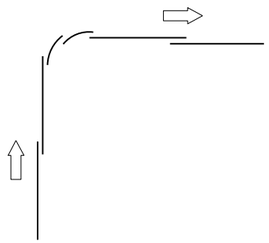
RADIUS (FT)	LENGTH (FT)	WIDTH (FT)
8	25	15
16	30	15
24	40	20
32	50	30



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



AREA FREE OF FIXED OBJECTS FOR RADIUS GREATER THAN 32'



LAP SPLICE DETAIL

GENERAL NOTES

SEE PLANS FOR OTHER BARRIER SYSTEM AND LOCATION SPECIFICS.

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

GALVANIZE PARTS AFTER FABRICATION.

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

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

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

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

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

DRAWINGS ARE NOT TO SCALE.

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

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

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

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

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

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

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

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

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

(10) SHORT RADIUS TERMINAL (SEE OTHER DETAILS).

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

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

(13) SEE TABLE FOR VALUES.

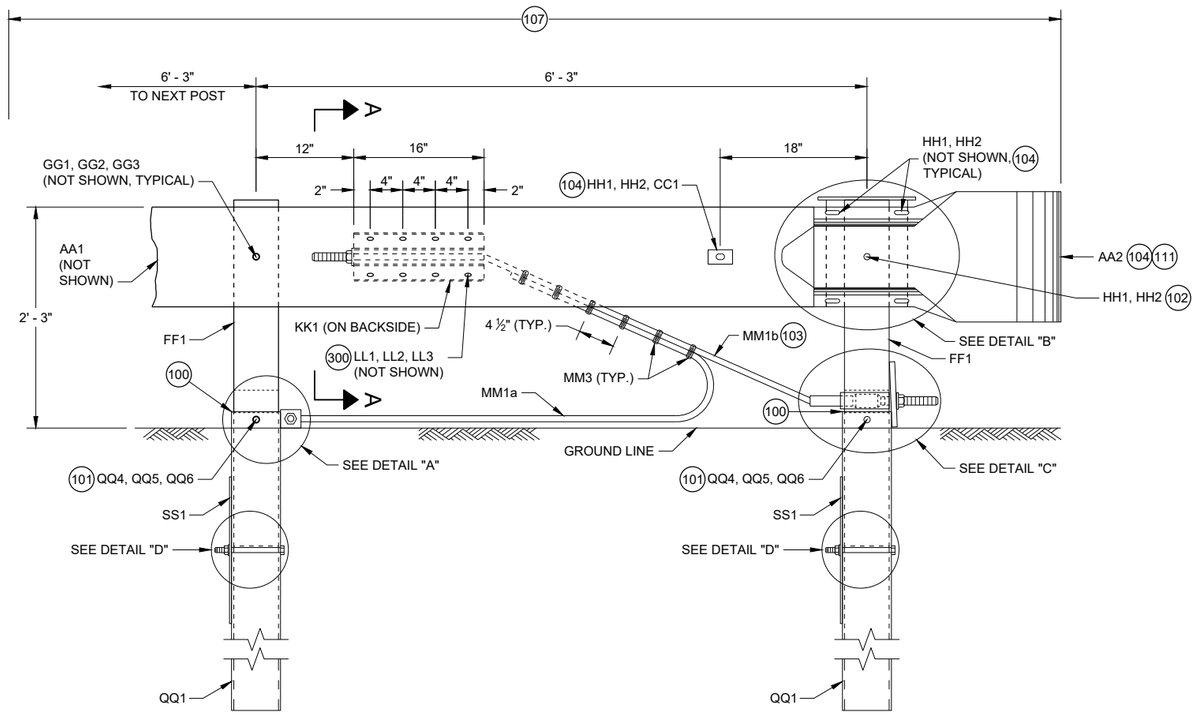
(14) MAXIMUM HEIGHT FOR CENTER OF HOLE IS ¾" ABOVE FINISHED GROUND ±1".

(15) DRILL POST $^{15}/_{64}$" DIA. PILOT HOLE. DO NOT HAMMER LAG SCREW INTO POST.

(16) SMALL SIGNS ON BREAKAWAY HARDWARE ARE ACCEPTABLE.

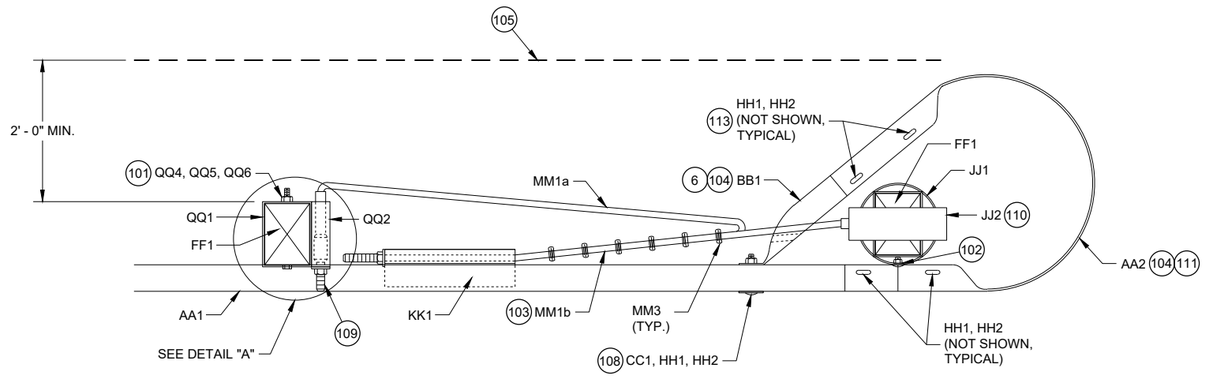
(17) TOP OF RAIL HEIGHT IS 27" WHEN USING A SHORT RADIUS TERMINAL (CRT).

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



PROFILE VIEW

SHORT RADIUS TERMINAL



TOP VIEW

SHORT RADIUS TERMINAL

GENERAL NOTES

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

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

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

103 CABLE IS TAUT.

104 ADJUST AA2 AND BB1 TO FIT.

105 BREAK POINT OF SHOULDER.

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

107 PAY LIMIT FOR BEAM GUARD.

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

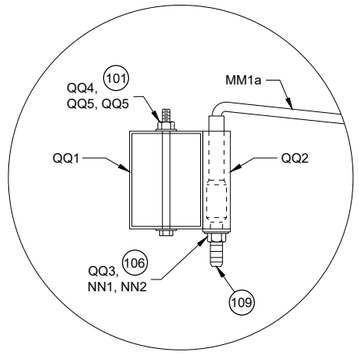
109 CUT OR PROVIDE THREADED STUD THAT IS FLUSH WITH FACE OF BEAM GUARD RAIL KK1 (PLUS OR MINUS ½" TOLERANCE). DEBURR AFTER CUTTING.

110 SEE STEEL PIPE ASSEMBLY DETAILS.

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

112 FOUR (4) HH1 AND HH2 REQUIRED TO ATTACH AA1 TO AA2.

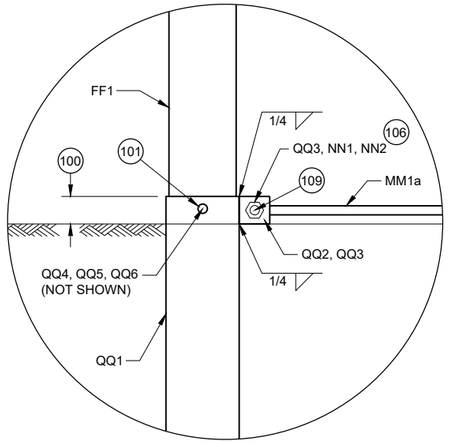
113 FOUR (4) HH1 AND HH2 REQUIRED TO ATTACH AA2 TO BB1.



TOP VIEW

DETAIL "A"

(WOOD BREAKAWAY AND BEAM GUARD RAIL POSTS NOT SHOWN)



PROFILE VIEW

DETAIL "A"

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

STATE OF WISCONSIN
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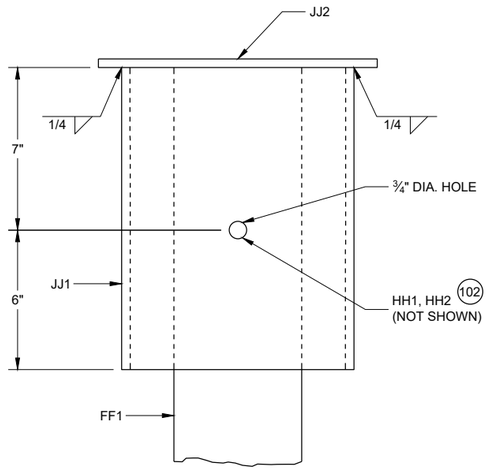
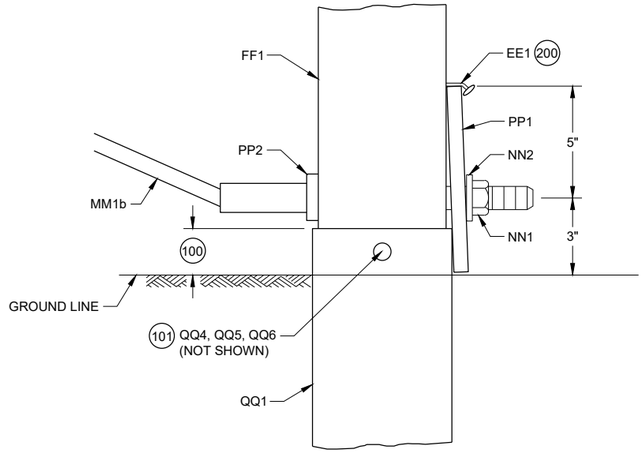
GENERAL NOTES

(200) TWO (2) NAILS SPACED 4 INCHES CENTER TO CENTER.



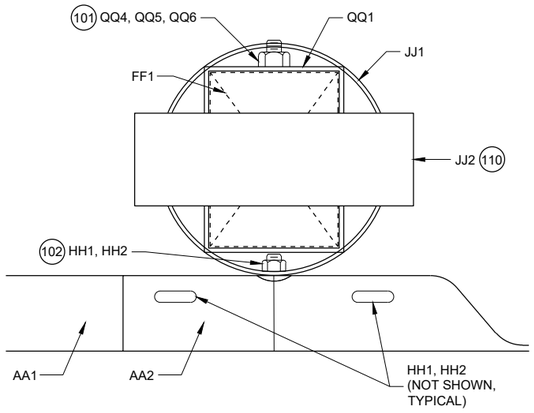
PROFILE VIEW

DETAIL "B"
STEEL PIPE ASSEMBLY
(BEAM GUARD AND W BEAM END SECTION NOT SHOWN)



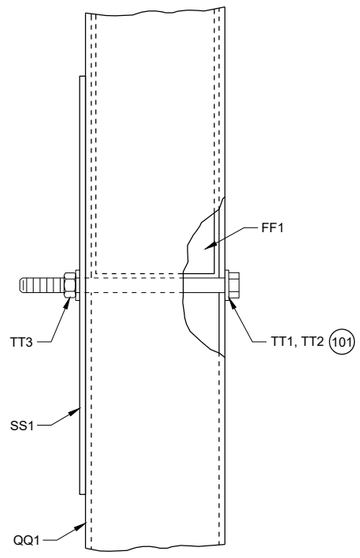
PROFILE VIEW

DETAIL "C"



PLAN VIEW

DETAIL "B"
STEEL PIPE ASSEMBLY



PROFILE VIEW

DETAIL "D"

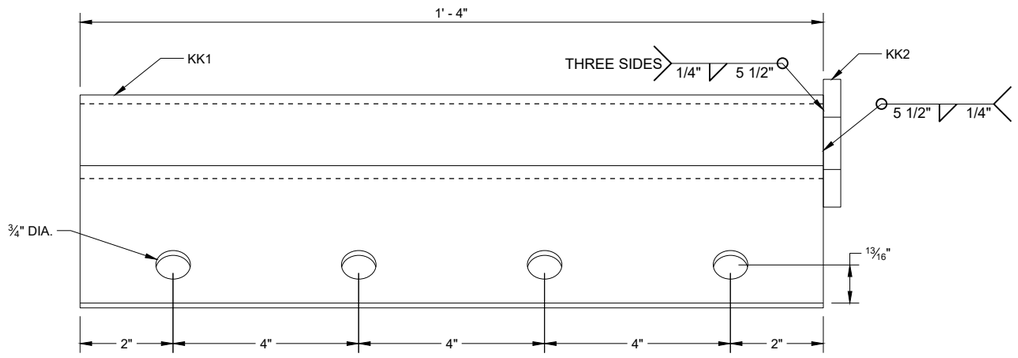
SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)

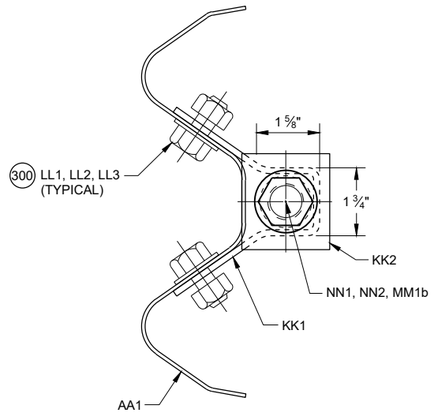
6

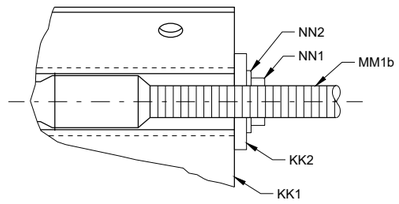
SDD 14B53 - 01c

GENERAL NOTES

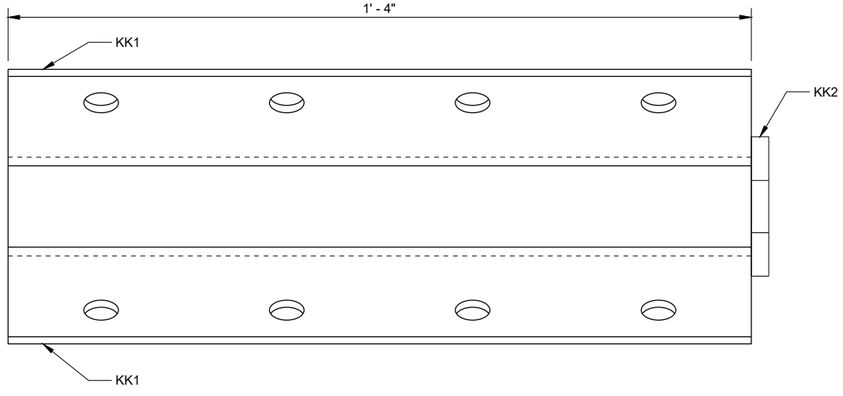
(300) WASHERS REQUIRED BETWEEN BOLT HEAD AND BEAM GUARD RAIL AND BETWEEN NUT AND ANCHOR BRACKET. EIGHT (8) LL1 AND LL3 REQUIRED. SIXTEEN (16) LL2 REQUIRED.

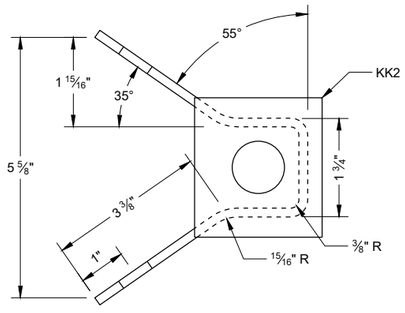




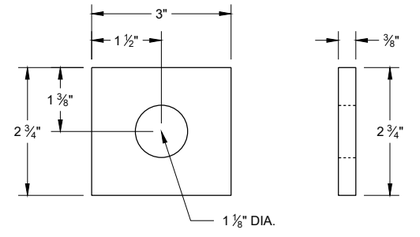


SECTION A - A





ANCHOR BRACKET (KK1, KK2)



ANCHOR BRACKET BEARING PLATE (KK2)

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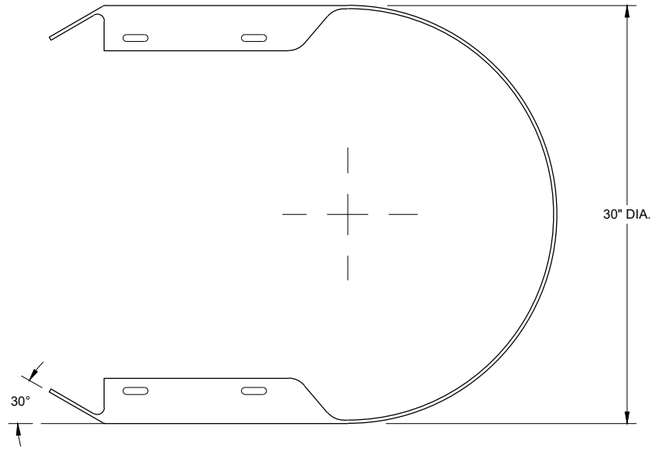
SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)

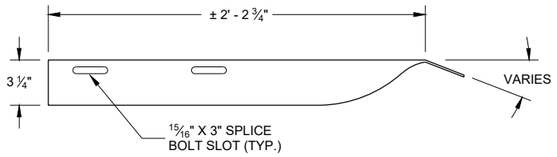
GENERAL NOTES

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

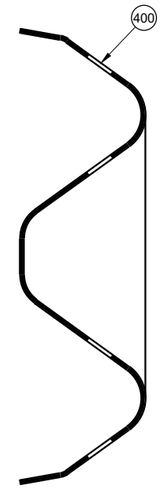
(401) CROSS SECTION OF PART IS TO FIT OVER OR UNDER AA1 .



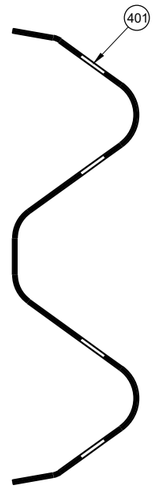
TOP VIEW



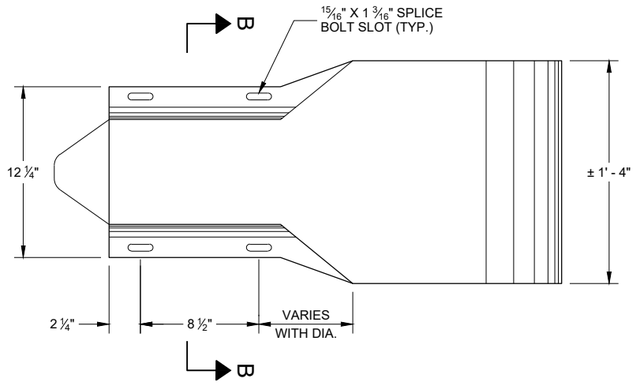
TOP VIEW



SECTION B -B

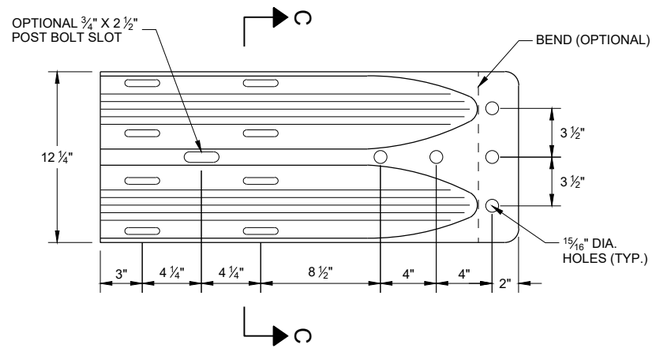


SECTION C -C



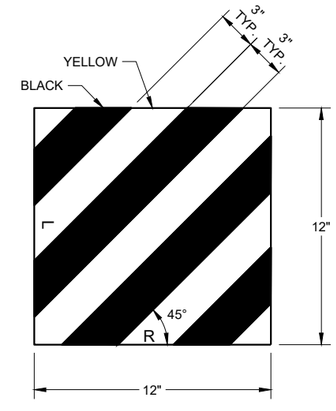
PROFILE VIEW

W BEAM
END SECTION BUFFER (AA2)



PROFILE VIEW

W BEAM
TERMINAL CONNECTOR (BB1)



REFLECTIVE SHEETING (UU1, UU2)

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

STATE OF WISCONSIN
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SDD 14B53 - 01e

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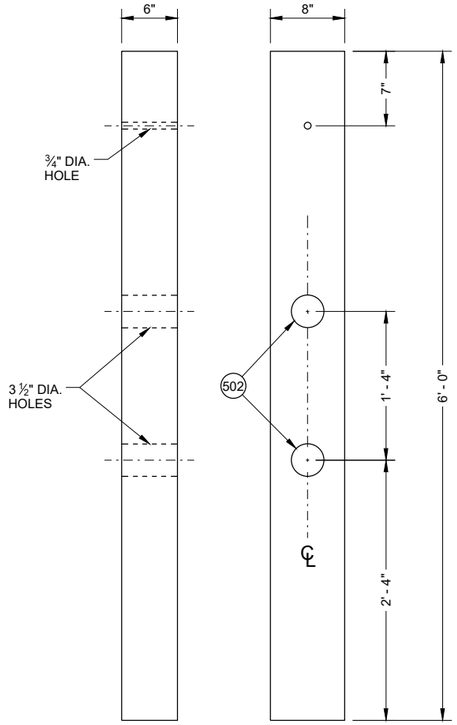
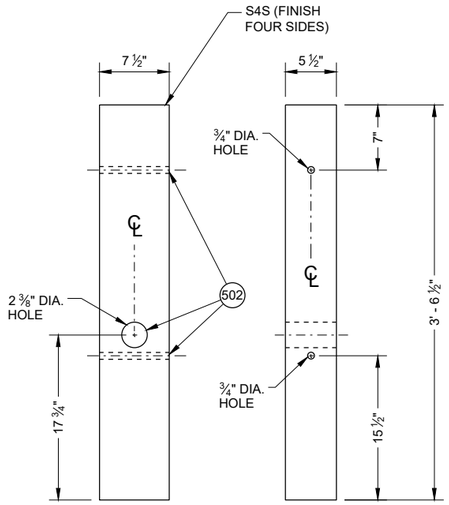


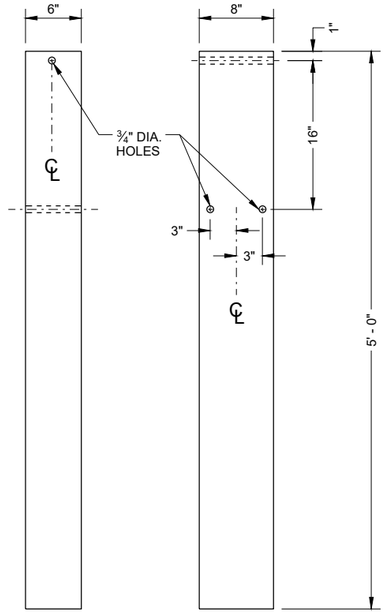
FRONT VIEW SIDE VIEW

CONTROLLED RELEASE POST (CRT) (DD2)



FRONT VIEW SIDE VIEW

WOOD BREAKAWAY POST (FF1)



FRONT VIEW SIDE VIEW

FOUNDATION TUBE (QQ1) 500

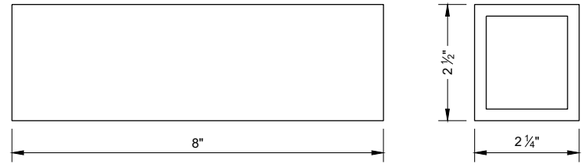
GENERAL NOTES

500 SEE DETAIL "D" FOR LOCATION AND ATTACHMENT OF SS1.

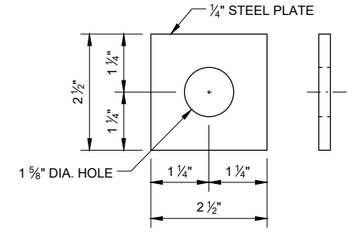
501 FOR MM1a THREADED STUD ONLY REQUIRED ON ONE END. SWAGED FITTING REQUIRED.

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

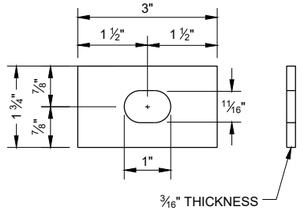
503 MM1a MAY HAVE ONE THREADED STUD 4 INCHES LONG. SEE NOTE 109.



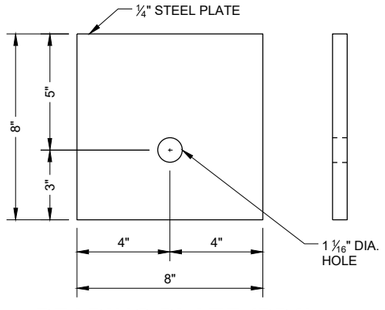
FOUNDATION TUBE - ANCHOR CABLE TUBE (QQ2)



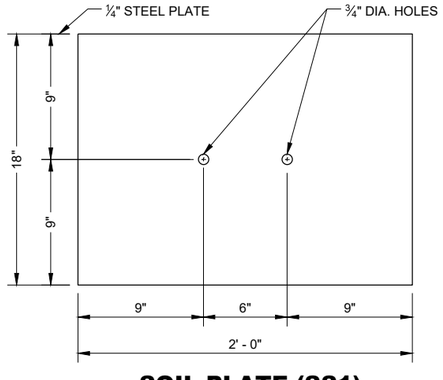
ANCHOR CABLE TUBE END PLATE (QQ3)



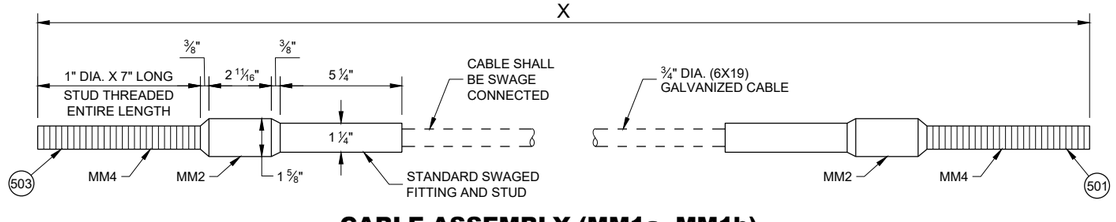
RECTANGULAR PLATE WASHER (CC1)



BEARING PLATE (PP1)



SOIL PLATE (SS1)



CABLE ASSEMBLY (MM1a, MM1b)

"X" LENGTH

MM1b	9' - 0"
MM1b	6' - 8"

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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SDD 14B53 - 01f

BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)

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

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
F2	SPLICE BOLT - NUT	ASTM A563 GRADE A	5/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C/ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
G1	LAG SCREW	ASTM A308 GRADE A ASTM A153 CLASS D	1/2" DIA. 6" LONG
H1	DELINEATOR - BEAM GUARD		SEE SDD 14B42 FOR MORE INFORMATION
H2	DELINEATION - SHEETING	YELLOW OR WHITE	
		WISDOT SPEC 637 TYPE SH	
		APPROVED PRODUCT LIST	
J1	FOUNDATION BACKFILL	STANDARD SPEC. 614	
AA1	BEAM GUARD RAIL - PUNCHED	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
AA2	BEAM GUARD RAIL - END SECTION BUFFER	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
BB1	BEAM GUARD RAIL - TERMINAL CONNECTOR MODIFIED	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
CC1	SHORT RADIUS - SQUARE WASHER	AASHTO M180	
		GALV. AASHTO M111 / ASTM A123	
EE1	NAIL	ASTM A153 HOT DIP CLASS D	
		ASTM F1667 TYPE 1 STYLE 12 (16 DOUBLE HEADED)	
FF1	POST - BCT - WOOD	S4S FINISH ON 4 SIDES	
		WISDOT SPEC. 614	
GG1	POST BOLT	ASTM A307 GRADE A OR SAE J429 GRADE 2	3/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C/ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		UNC	
GG2	POST BOLT - WASHER	ASTM F436 TYPE 1 (HARDEN TYPICALLY USED WITH STEEL) OR ASTM F844 (UNHARDENED TYPICALLY WITH WOOD)	3/8" DIA.
		GALV. AASHTO M111 / ASTM A 123 OR GALV. HOT DIP. TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329	

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

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SDD 14B53 - 01g

BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
GG3	POST BOLT - NUT	ASTM A563 GRADE A	⅜" DIA. SEE 14B42 FOR GEOMETRY
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		ASTM A563 GRADE A HEAVY HEX HEAD	
HH1	SPLICE BOLT	GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	⅜" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		ASTM A307 GRADE A OR SAE J429 GRADE 2	
		UNC	
		AASHTO M180 HEAD GEOMETRY	
HH2	SPLICE BOLT - NUT	ASTM A563 GRADE A	⅜" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
JJ1	PIPE - STEEL	ASTM A53 GALVANIZED GRADE B SCHEDULE 40	10" O.D.
JJ2	TOP PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	DIMENSIONS ⅜" X 4" X 1' - 0"
		GALV. AASHTO M111 / ASTM A123	
KK1	ANCHOR BRACKET	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
KK2	ANCHOR BRACKET - BEARING PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
LL1	ANCHOR BRACKET - BOLT	ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	⅝" DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
LL2	ANCHOR BRACKET - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	⅝" DIA.
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
LL3	ANCHOR BRACKET - NUT	ASTM A563 GRADE A	⅝" DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
MM1a	ANCHOR CABLE	AASHTO M30 / ASTM A741 INDEPENDENT WIRE CORE (IWRC) OR WIRE STRAND CORE (WCS), IMPROVED PLOW STEEL (IPS), 6X19, TYPE II OR IIc CLASS C ZINC COATED	
MM1b	ANCHOR CABLE	AASHTO M30 / ASTM A741 INDEPENDENT WIRE CORE (IWRC) OR WIRE STRAND CORE (WCS), IMPROVED PLOW STEEL (IPS), 6X19, TYPE II OR IIc CLASS C ZINC COATED	
MM2	ANCHOR CABLE - SWAGE FITTING	ASTM A576 GRADE 1035	
		SWAGE FITTINGS ARE TO BE FACTORY SWEDGED. WITH A BREAKING STRENGTH 40,000 LBS.	
		GALV. AASHTO M111 / ASTM A123	
		ASME B30.26 FORGED, CAST, OR DIE STAMPED WITH THE FOLLOWING INTO CONNECTION: NAME OF MANUFACTURER OR TRADEMARK OF CONNECTION'S MANUFACTURER, SIZE OR RATED LOAD, GRADE.	
MM3	WIRE ROPE CABLE CLAMPS	FF-C-450D TYPE 1 CLASS 1	¾"
		ASTM A153 HOT DIP CLASS D	
MM4	ANCHOR CABLE - SWAGE FITTING - STUD	ASTM F3125 GRADE A325 TYPE 1 OR SAE GRADE 5 OR ASTM A449 TYPE 1 HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
NN1	ANCHOR CABLE - NUT	ASTM A563 GRADE A	1" DIA.
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
NN2	ANCHOR CABLE - NUT - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	1" DIA.
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	

BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
PP1	BEARING PLATE AT POST	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
PP2	PIPE - STEEL	ASTM A53 GALVANIZED GRADE B SCHEDULE 40	2" DIA. x 6" LONG
QQ1	FOUNDATION TUBE	ASTM A500 GRADE B	8" X 6" X 3/16"
		GALV. AASHTO M111 / ASTM A123	
QQ2	SHORT RADIUS - FOUNDATION TUBE - ANCHOR CABLE - TUBE	ASTM A500 GRADE B	DIMENSIONS 2 1/2" X 2 1/4" X 1/4" X 8"
		GALV. AASHTO M111 / ASTM A123	
QQ3	SHORT RADIUS - SOIL TUBE - ANCHOR CABLE - TUBE - END PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	DIMENSIONS 2 1/2" X 2 1/2" X 1/4"
		GALV. AASHTO M111 / ASTM A123	
QQ4	GROUND STRUT AND YOKE - BOLT	GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	5/8 DIA.
		ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	
		UNC	
QQ5	GROUND PLATE AND YOKE - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	5/8 DIA.
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
QQ6	GROUND STRUT AND YOKE - NUT	HEAVY HEX	5/8 DIA.
		UNC	
		ASTM A563 GRADE A	
		OVER TAPPED NUTS AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
SS1	SOIL PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / A123	
TT1	SOIL PLATE - BOLT	ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	5/8 DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
TT2	SOIL PLATE - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	5/8 DIA.
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
TT3	SOIL PLATE - NUT	GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	5/8 DIA.
UU1	OBJECT MARKER - SHEETING	MUTCD / WISDOT OBJECT MARKER TYPE 3	PATTERN AND COLOR FOR SHEETING. SHEETING TYPE FOR MARKER.
		WISDOT SPEC 637 TYPE F	
		APPROVED PRODUCT LIST	
UU2	OBJECT MARKER - ALUMINUM PLATE	WISDOT SPEC 637 ALUMINUM PLATE	MATERIAL AND THICKNESS OF MATERIALS
UU3	OBJECT MARKER - SCREWS	STAINLESS SELF-TAPPING SCREWS	
VV1	FOUNDATION BACKFILL	WISDOT SPEC 614	

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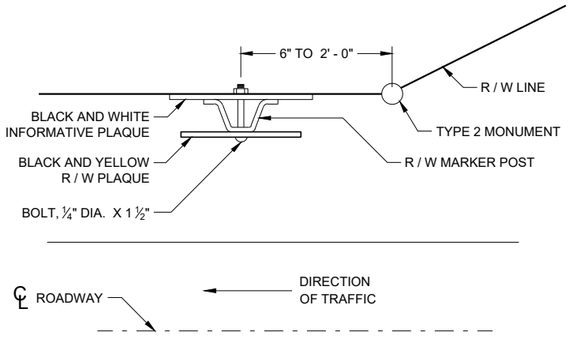
SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

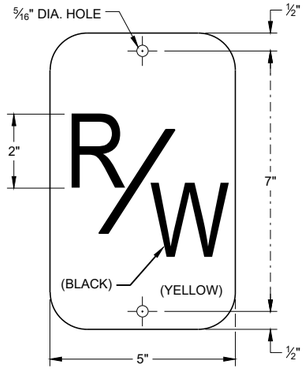
APPROVED
June 2017 — DATE
/S/ Rodney Taylor — ROADWAY STANDARDS DEVE ENGINEER

FHWA

SDD 14B53 - 01i

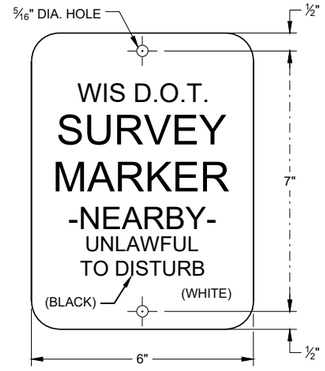


PLAN VIEW
STEEL MARKER POST



R / W PLAQUE

THE RIGHT-OF-WAY PLAQUE AND INFORMATIVE PLAQUE WILL BE FURNISHED BY THE WISCONSIN DEPARTMENT OF TRANSPORTATION.



INFORMATIVE PLAQUE

GENERAL NOTES

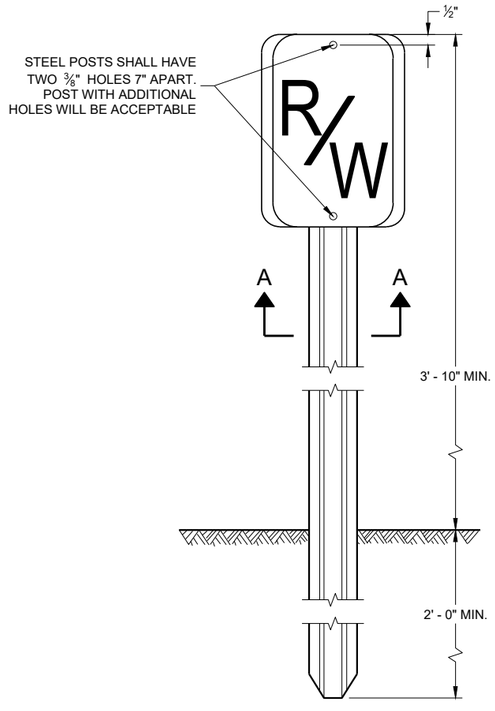
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

A STEEL MARKER POST FOR RIGHT -OF-WAY SHALL BE PLACED IN THE RIGHT-OF-WAY WITH THE BACK OF THE POST ON THE LONGER RIGHT-OF-WAY TANGENT, 6 INCHES TO 24 INCHES FROM EACH TYPE 2 MONUMENT TO SERVE AS A GUARD POST, AND AT OTHER LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

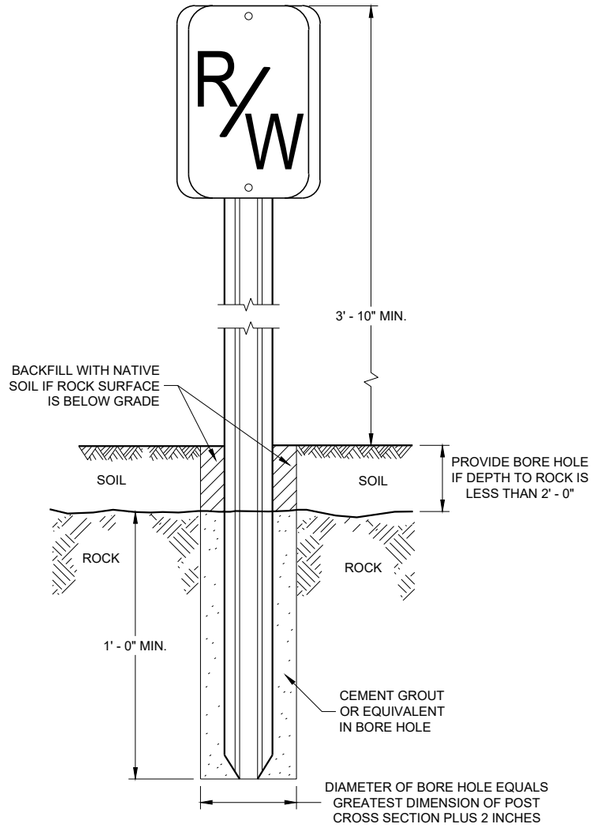
THE "R/W" PLAQUE SHALL FACE THE ROADWAY AND THE INFROMATIVE PLAQUE SHALL FACE AWAY FROM THE ROADWAY. "R/W" AND INFORMATIVE PLAQUES WILL BE FURNISHED BY THE WISCONSIN DEPARTMENT OF TRANSPORTATION.

STEEL MARKER POSTS SHALL MEET THE MINIMUM MATERIAL REQUIREMENTS FOR STEEL DELINEATOR POSTS; EXCEPT POSTS PAINTED WITH FEDERAL YELLOW ENAMEL NEED NOT BE ZINC COATED.

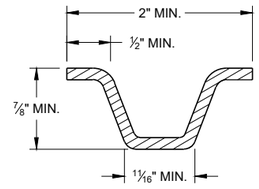
(1) IN AREAS OF SOLID ROCK, DRILL A BORE HOLE 2" GREATER THAN THE WIDEST DIMENSION OF THE POST CROSS SECTION INTO THE ROCK A MINIMUM DEPTH OF 12 INCHES. CUT OR SPLICE THE POST SO THAT A MINIMUM LENGTH OF 3' - 10" PROTRUDES ABOVE THE GROUND. BLOW OUT THE BORE HOLE IN THE ROCK USING COMPRESSED AIR. FILL THE BORE HOLE WITH CEMENT GROUT OR EQUIVALENT, DEPENDING ON THE STABILITY OF THE ROCK.



FRONT VIEW
STEEL MARKER POST

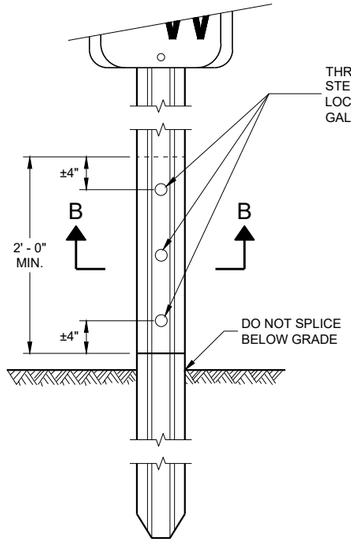


FRONT VIEW
ROCK INSTALLATION (1)

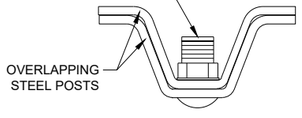


MIN. WEIGHT 1.12 LB./FT.

SECTION A - A



FRONT VIEW
SPLICE DETAIL



SECTION B - B

MARKER POST
FOR RIGHT - OF - WAY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
2/18/2016
DATE
/S/ Ray Kumapayi
CHIEF SURVEYING AND MA
ENGINEER

FHWA

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SDD 15A01 - 13a

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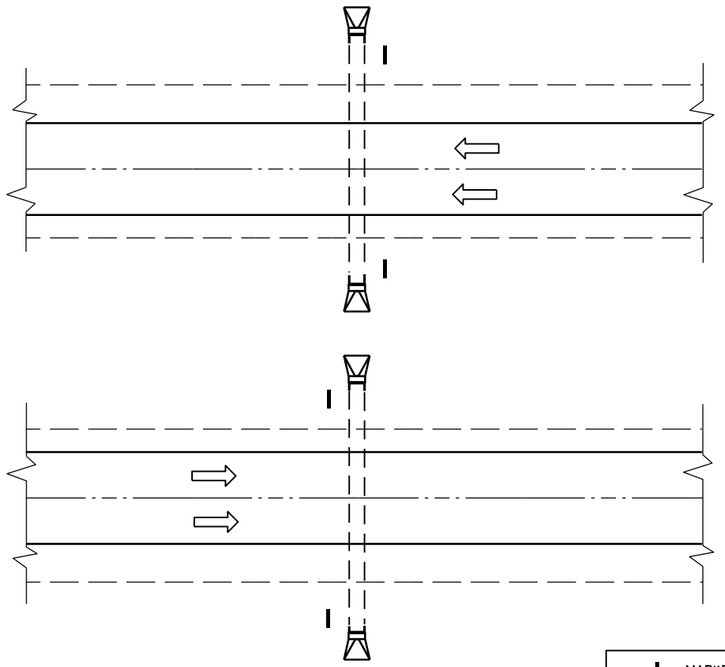
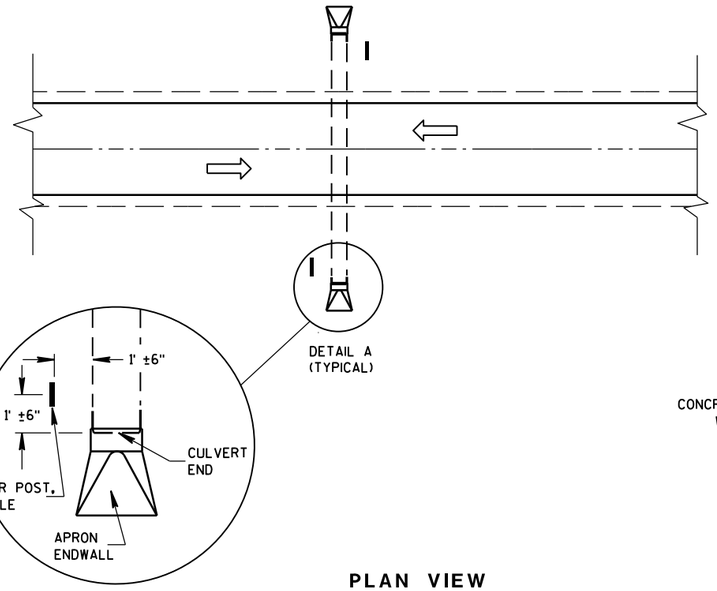
SDD15A01 - 13a



PLAN VIEW

DIVIDED HIGHWAY



DETAIL A
(TYPICAL)

PLAN VIEW

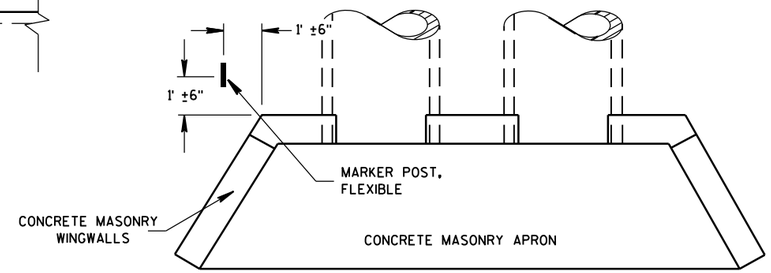
UNDIVIDED HIGHWAY

MARKER POST, FLEXIBLE

DIRECTION OF TRAFFIC FLOW

GENERAL NOTES

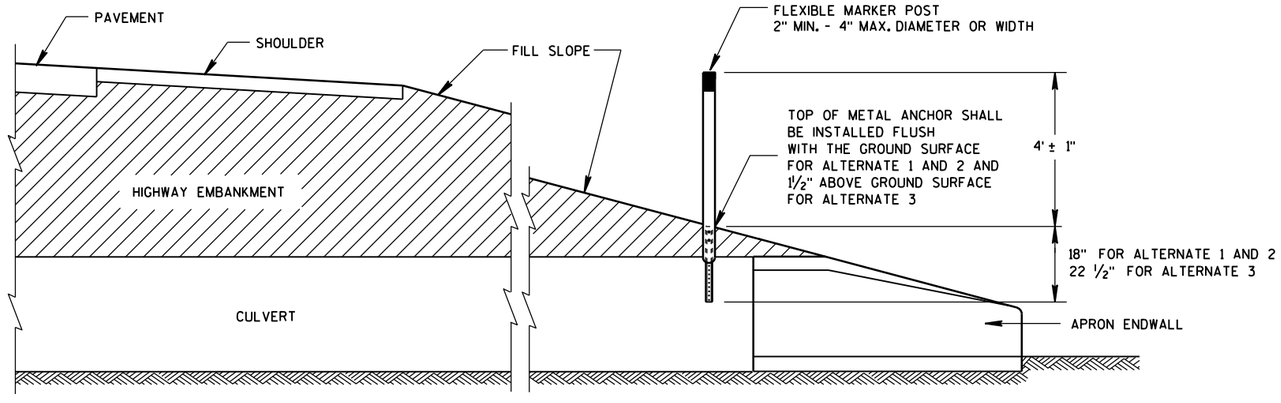
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.



PLAN VIEW

CONCRETE MASONRY ENDWALLS FOR CULVERT PIPE AND PIPE ARCH

FLEXIBLE MARKER POST LOCATION



CROSS SECTION

FLEXIBLE MARKER POST

FLEXIBLE MARKER POST FOR CULVERT END

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOI

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

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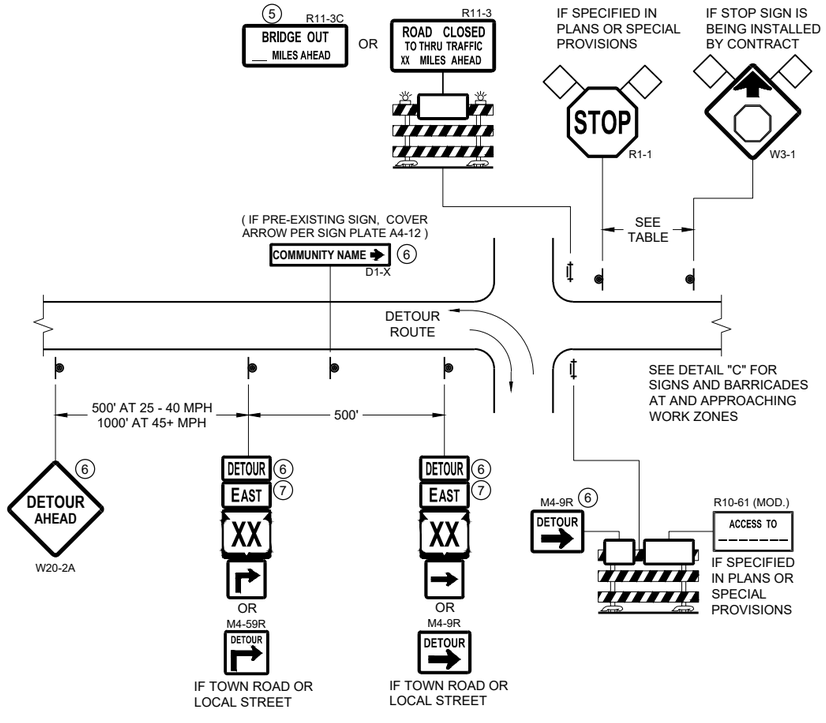
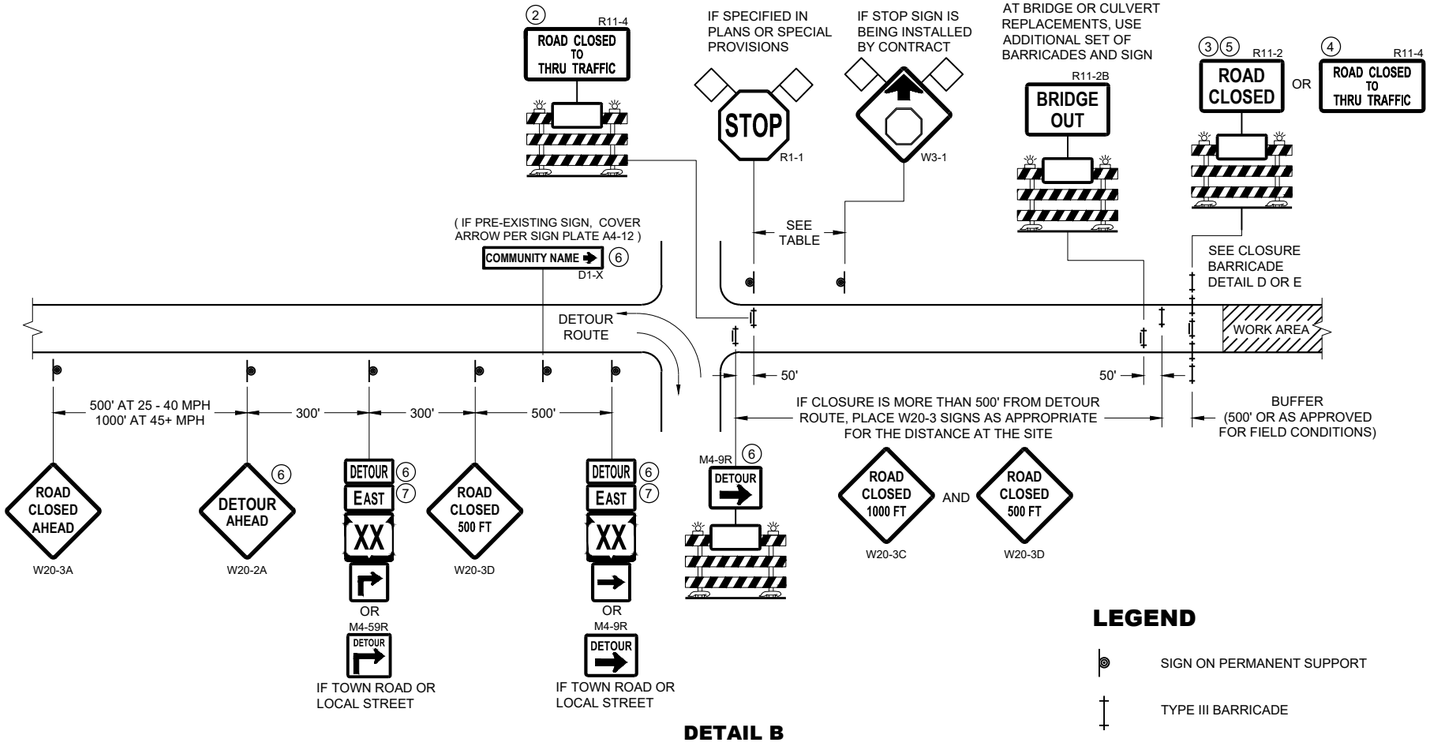
S.D.D. 15 A 3-2a



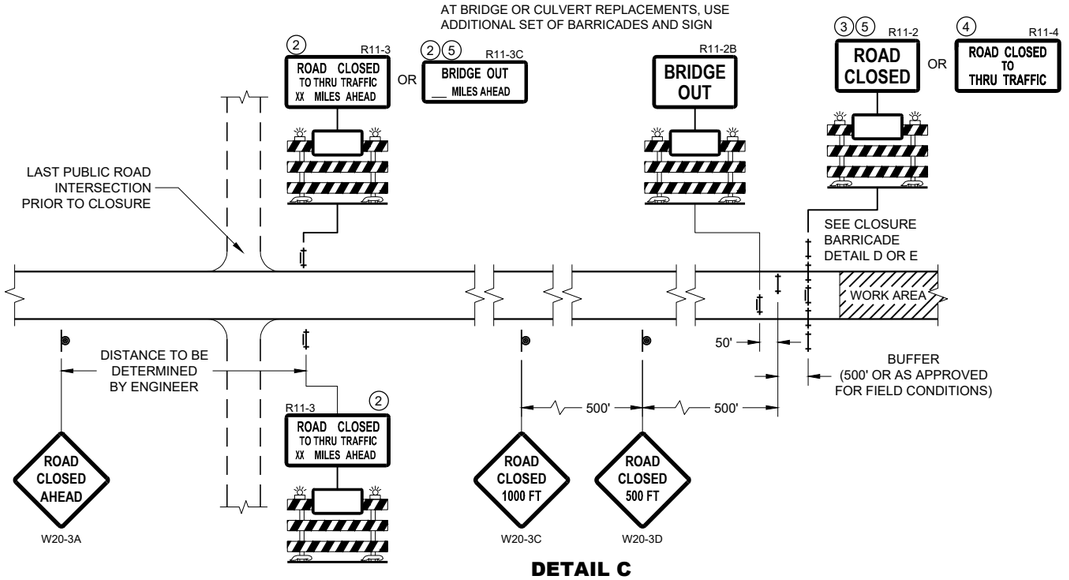
DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR

WORK ZONE GREATER THAN OR EQUAL TO ½ MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)



DETAIL B
MAINLINE CLOSURE WITH POSTED DETOUR

WORK ZONE LESS THAN ½ MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)



DETAIL C
MAINLINE CLOSURE, NO POSTED DETOUR

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

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

LEGEND

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

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

BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

FHWA

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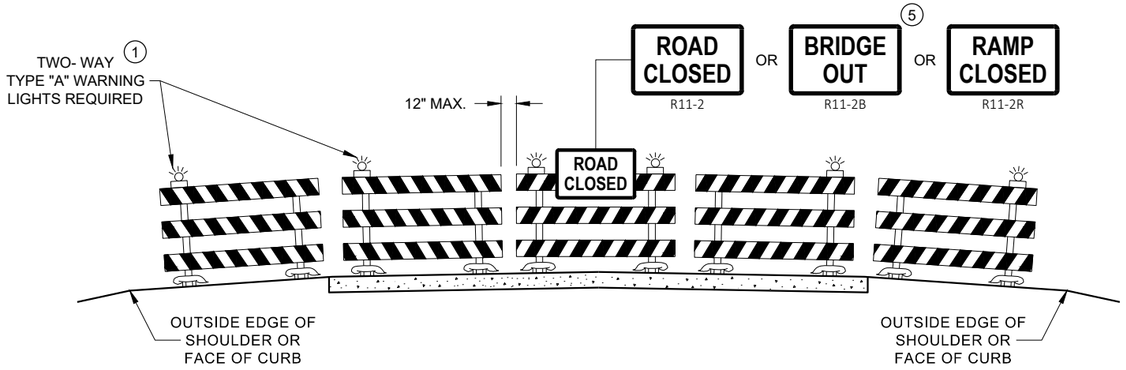
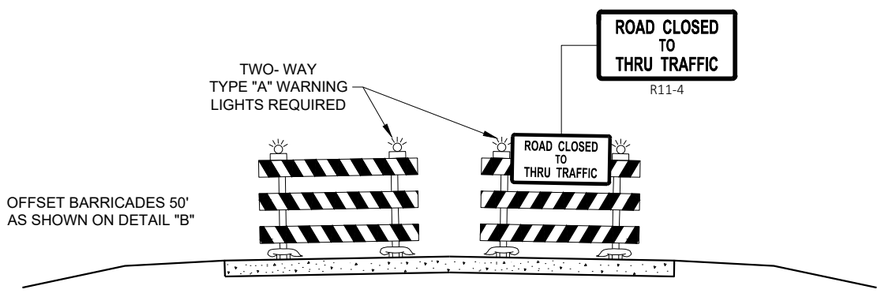
SDD 15C02 - 08a



DETAIL D
ROAD CLOSURE BARRICADE DETAIL
APPROACH VIEW



DETAIL E
LANE CLOSURE BARRICADE DETAIL
APPROACH VIEW

SEE SDD 15C2 - SHEET "a" FOR LEGEND

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

BARRICADES AND SIGNS FOR VARIOUS CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

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SDD 15C02 - 08b

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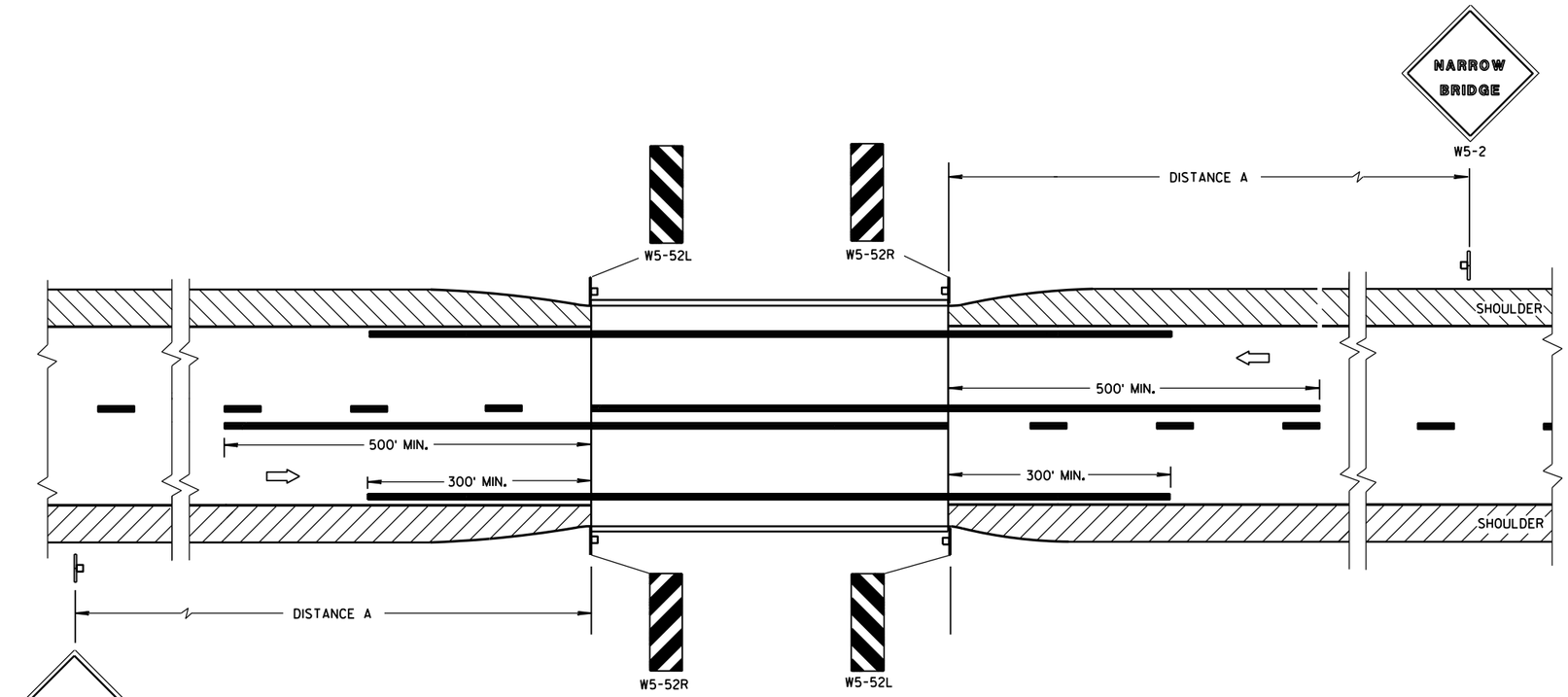
SDD 15C02 - 08b



SITUATION 1

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

DISTANCE TABLE

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

GENERAL NOTES

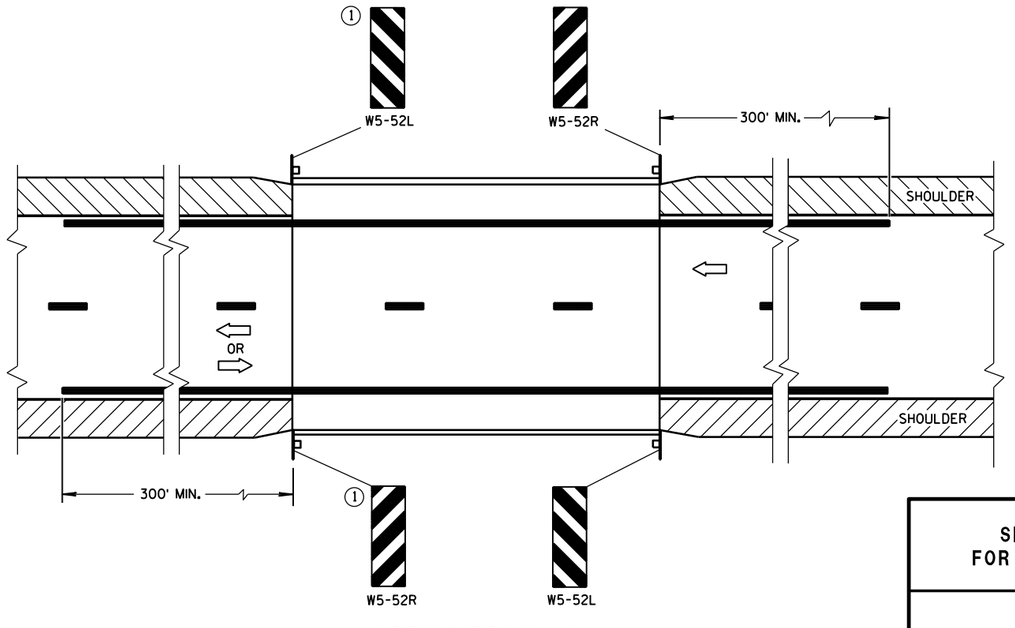
DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

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

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

(1) OMIT ON ONE-WAY TRAVELLED WAYS.

⇨ DIRECTION OF TRAFFIC



SITUATION 2

WARRANTING CRITERIA:

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

SIGNING & MARKING FOR TWO LANE BRIDGES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017 — DATE
/S/ Matthew R. Rauch — STATE SIGNING AND MARKING ENGINEER
FHWA

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S.D.D. 15 C 6-9

6

S.D.D. 15 C 6-9

LEGEND

SIGN ON PERMANENT SUPPORT

TRAFFIC CONTROL DRUM

DIRECTION OF TRAFFIC

WORK ZONE

GENERAL NOTES

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

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

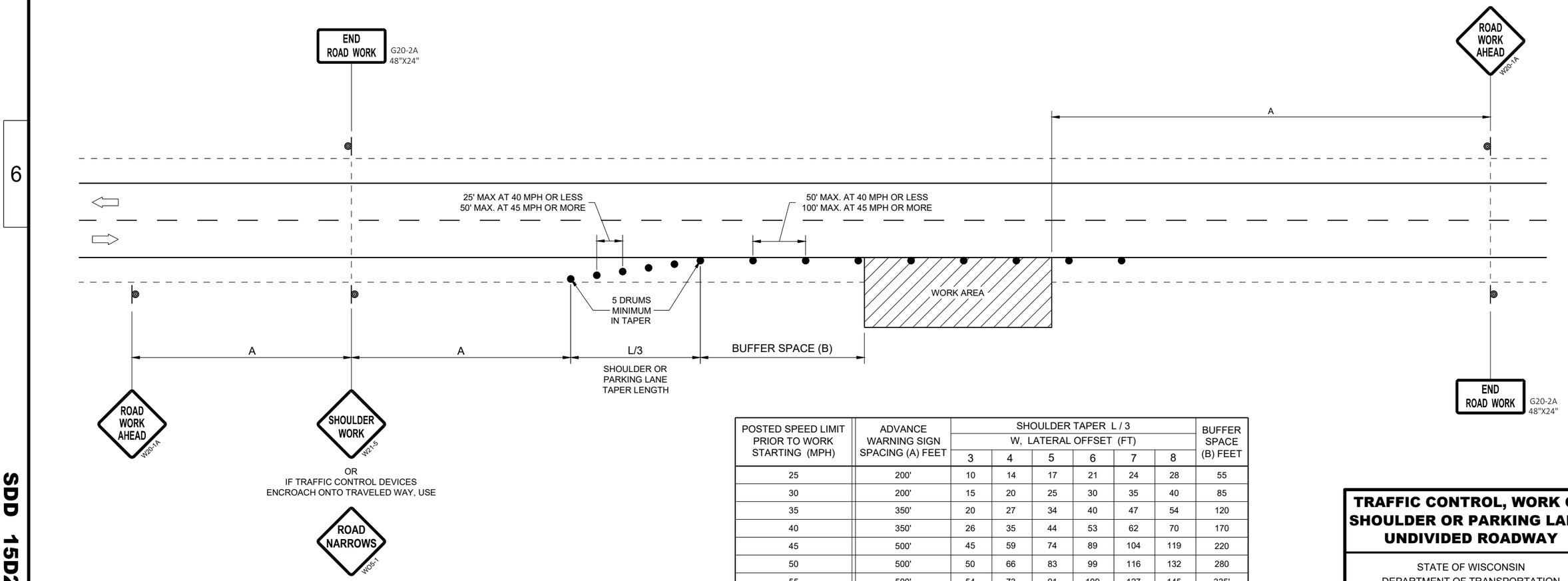
ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH THE TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

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

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

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

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



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

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
May 2020
DATE

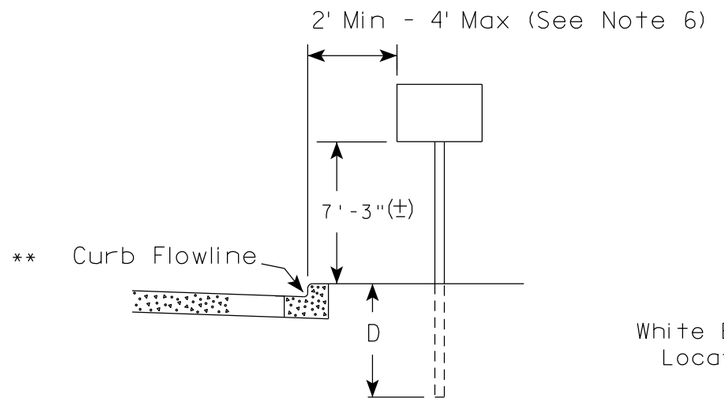
/S/ Andrew Heidtke
STATEWIDE WORK ZONE T SAFETY ENGINEER

FHWA

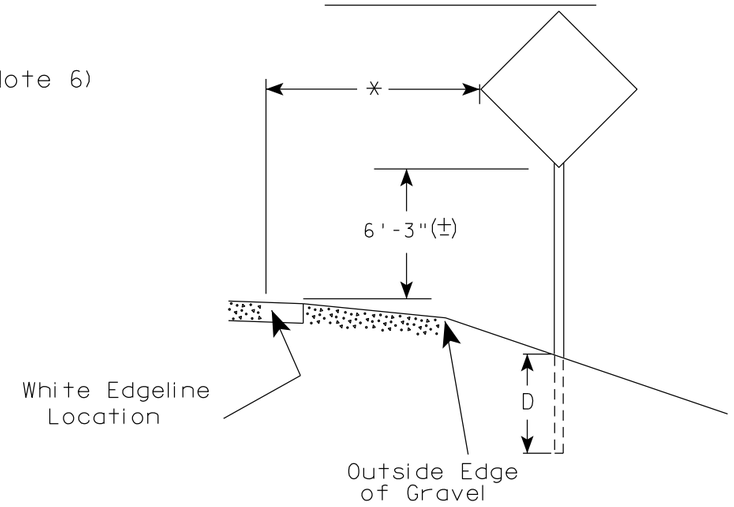
SDD 15D28 - 04

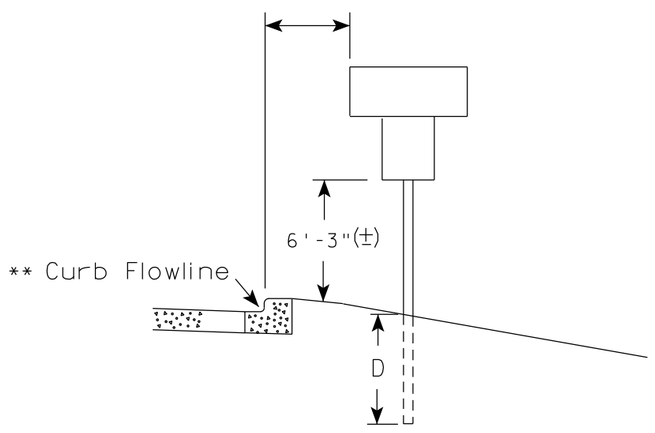
SDD 15D28 - 04

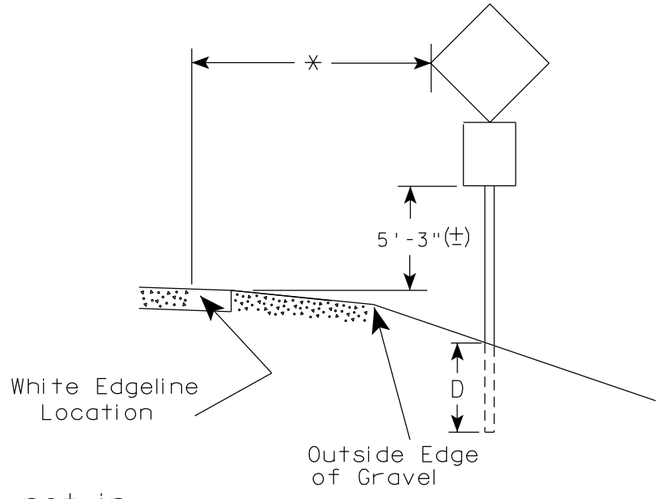
URBAN AREA



RURAL AREA (See Note 2)







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

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

POST EMBEDMENT DEPTH

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

GENERAL NOTES

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

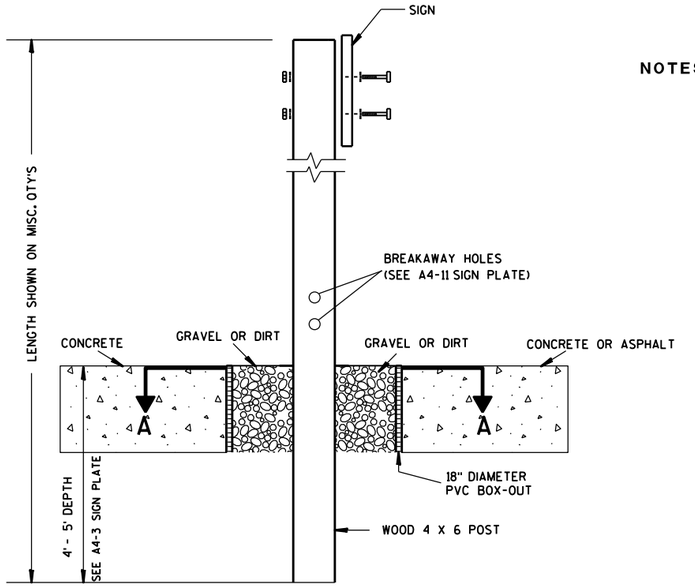
TYPICAL INSTALLATION OF PERMANENT TYPE II SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

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

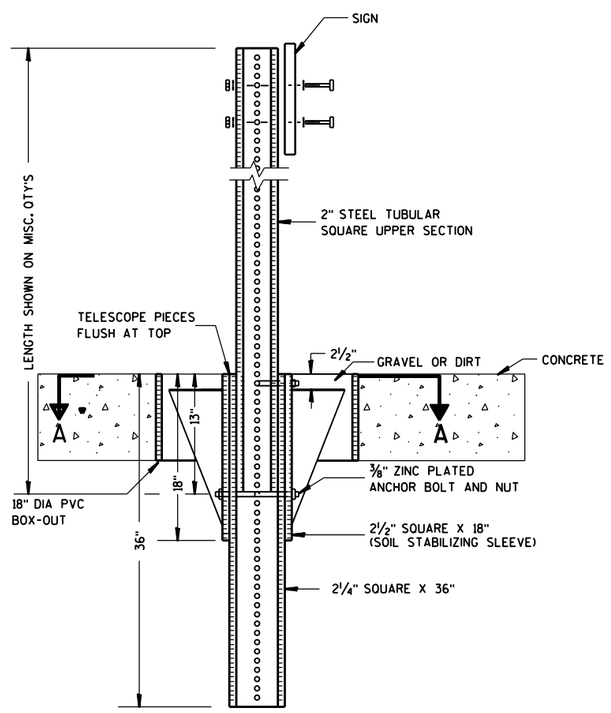
PROJECT NO:	HWY:	COUNTY:		SHEET NO: 52	E



ELEVATION VIEW

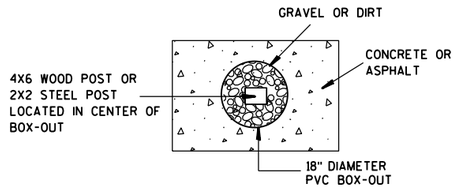
DETAIL OF WOOD 4 X 6 SIGN POST IN BOX-OUT

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



ELEVATION VIEW

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



PLAN VIEW

FOR NEW CONCRETE/ASPHALT INSTALLATIONS

SIGN POST BOX-OUTS A4-3B

WISCONSIN DEPT OF TRANSPORTATION

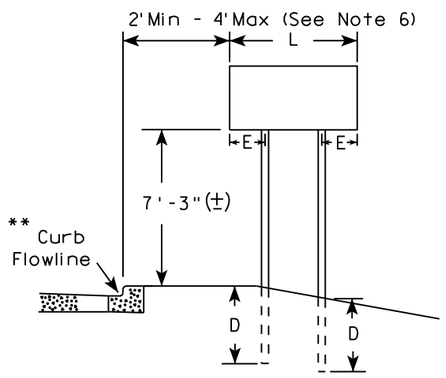
APPROVED Matthew R Rauch
for State Traffic Engineer

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

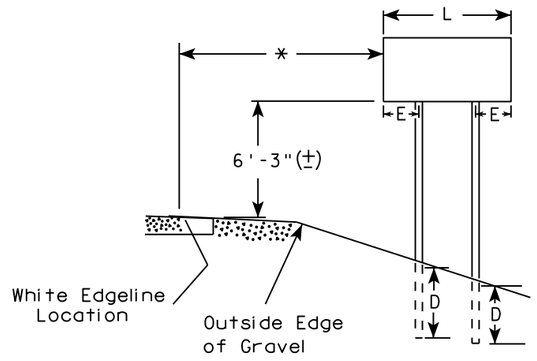
PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E

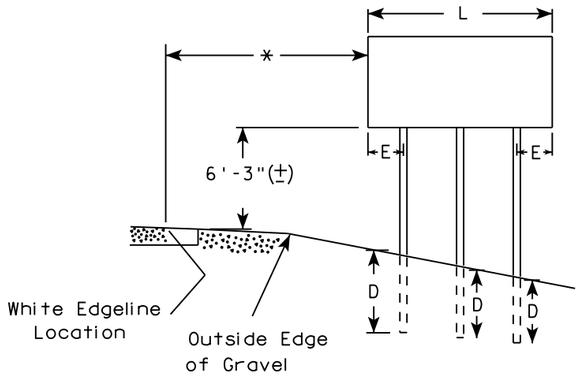
FILE NAME : C:\CAEFiles\Projects\tr_stdplate\A43B.DGN PLOT DATE : 27-JAN-2014 09:48 PLOT BY : mscsja PLOT NAME : PLOT SCALE : 13.659812:1.000000 WISDOT/CADDS SHEET 42

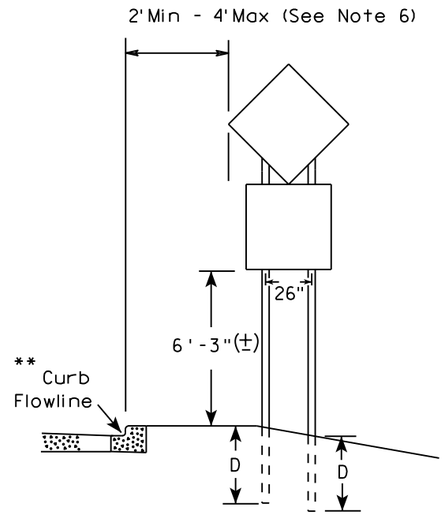
URBAN AREA



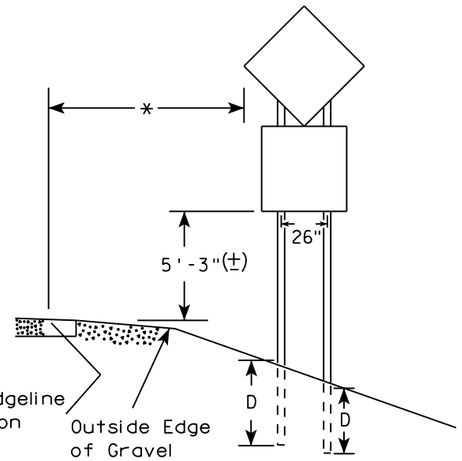
RURAL AREA (See Note 3)







48" DIAMOND WARNING SIGN



48" DIAMOND WARNING SIGN

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

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

GENERAL NOTES

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

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

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

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

POST EMBEDMENT DEPTH

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

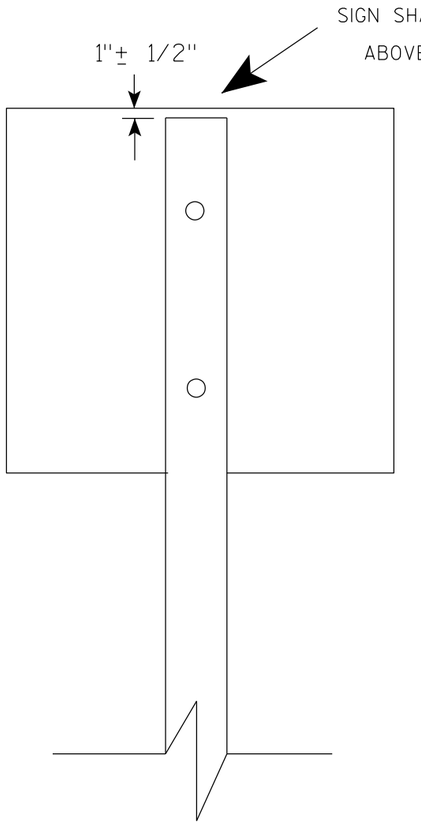
TYPICAL INSTALLATION OF TYPE II SIGNS ON MULTIPLE POSTS

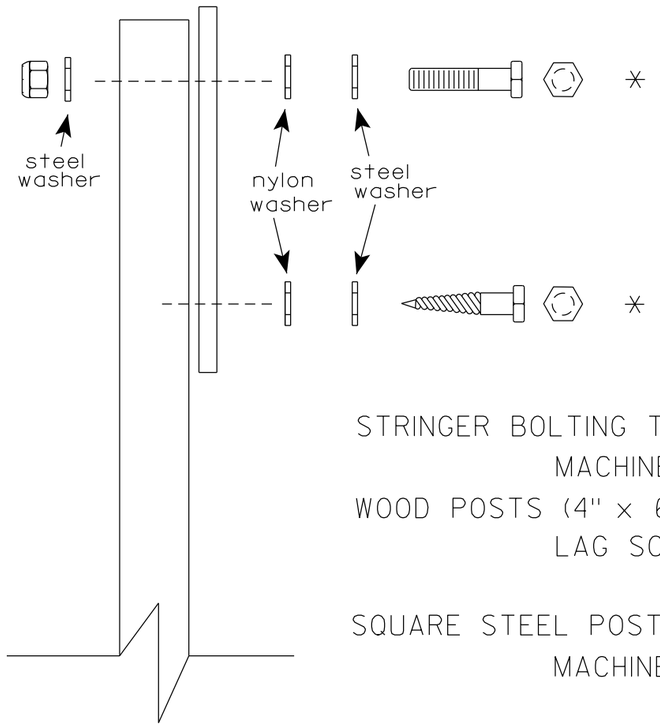
WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
For State Traffic Engineer

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

PROJECT NO:	HWY:	COUNTY:		SHEET NO: 54	E





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

a. Hot dip galvanized in accordance with ASTM Designation: A 153, Class D, or SC 3

b. Electro-galvanized in accordance with ASTM Designation : B 633, TYPE III, SC 3.

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

STRINGER BOLTING TO ALUMINUM SIGNS (SEE SIGN PLATE A4-18)

MACHINE BOLTS - 5/16" X 1-3/4" Length w/ lock nuts

WOOD POSTS (4" x 6")

LAG SCREWS - 3/8" X 3" (NO STRINGERS ON BACK OF SIGN)
3/8" X 4" (STRINGERS ON BACK OF SIGN)

SQUARE STEEL POSTS (2" x 2")

MACHINE BOLTS - 3/8" X 3-1/4" Length w/ nuts (NO STRINGER ON BACK OF SIGN)
3/8" X 5" Length w/ nuts (STRINGERS ON BACK OF SIGN)

RIVETS - 9/32" (6605-9-6) BULB-TITE, TRI-FOLD, ALUMINUM BODY/MANDREL
O.D. FLANGE .720-.765 INCH, GRIP RANGE .042-.375 INCH

WASHERS (ALL POSTS) -

1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL
1-1/4" O.D. X 3/8" I.D. X .080 NYLON

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

ATTACHMENT OF SIGNS TO POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 4/1/2020 PLATE NO. A4-8.9

PROJECT NO:

SHEET NO: 55 E

FILE NAME : C:\CAEFiles\Projects\tr_stdplate\A48.DGN PLOT DATE : 01-APRIL-2020 PLOT BY : dotc4c

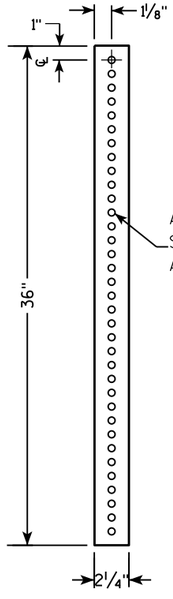
WISDOT/CADDS SHEET 42

7

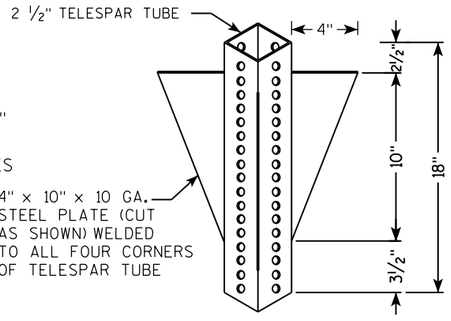
7

TELESCOPIC TUBING ANCHORS
TWO PIECE SYSTEM

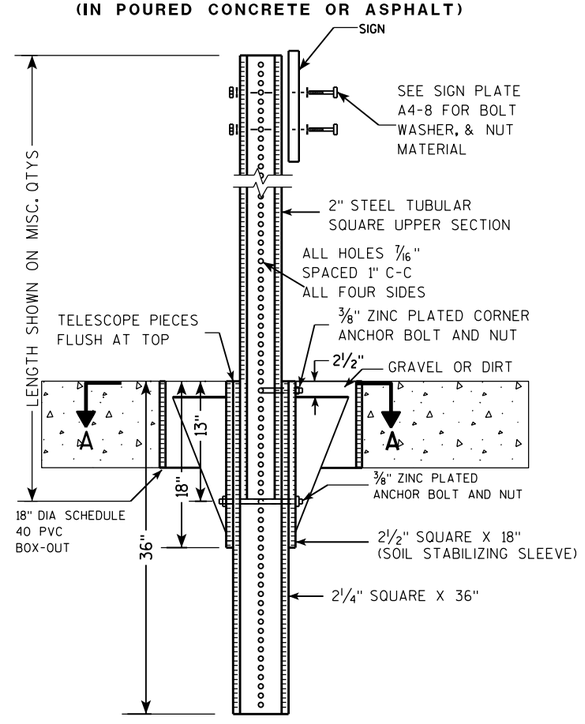
2 1/4 " SQUARE
12 GAUGE
PERFORATED
GALVANIZED FINISH



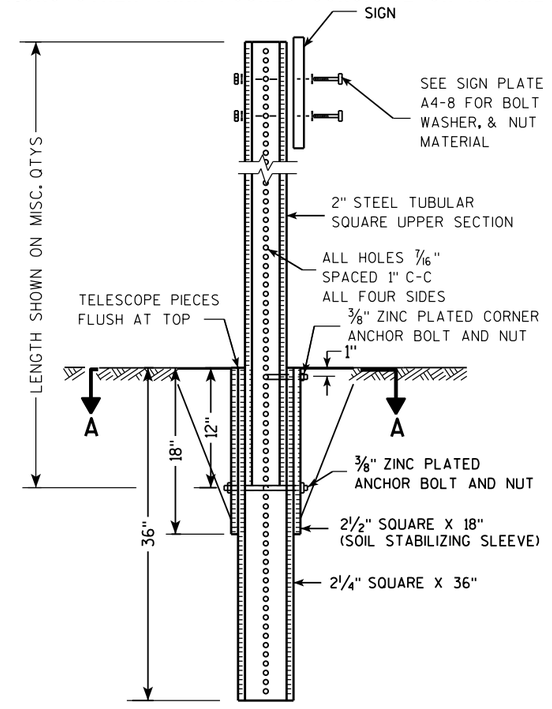
2 1/2 " SQUARE
12 GAUGE
OMNI-DIRECTIONAL
PERFORATED
SOIL STABILIZING SLEEVE
GALVANIZED FINISH

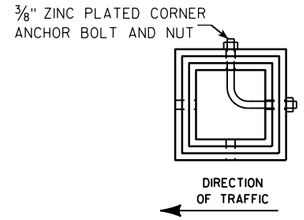


DETAIL OF TUBULAR STEEL SIGN POST
(IN POURED CONCRETE OR ASPHALT)



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





SECTION A-A

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

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

TUBULAR STEEL
SIGN POST
A4-9

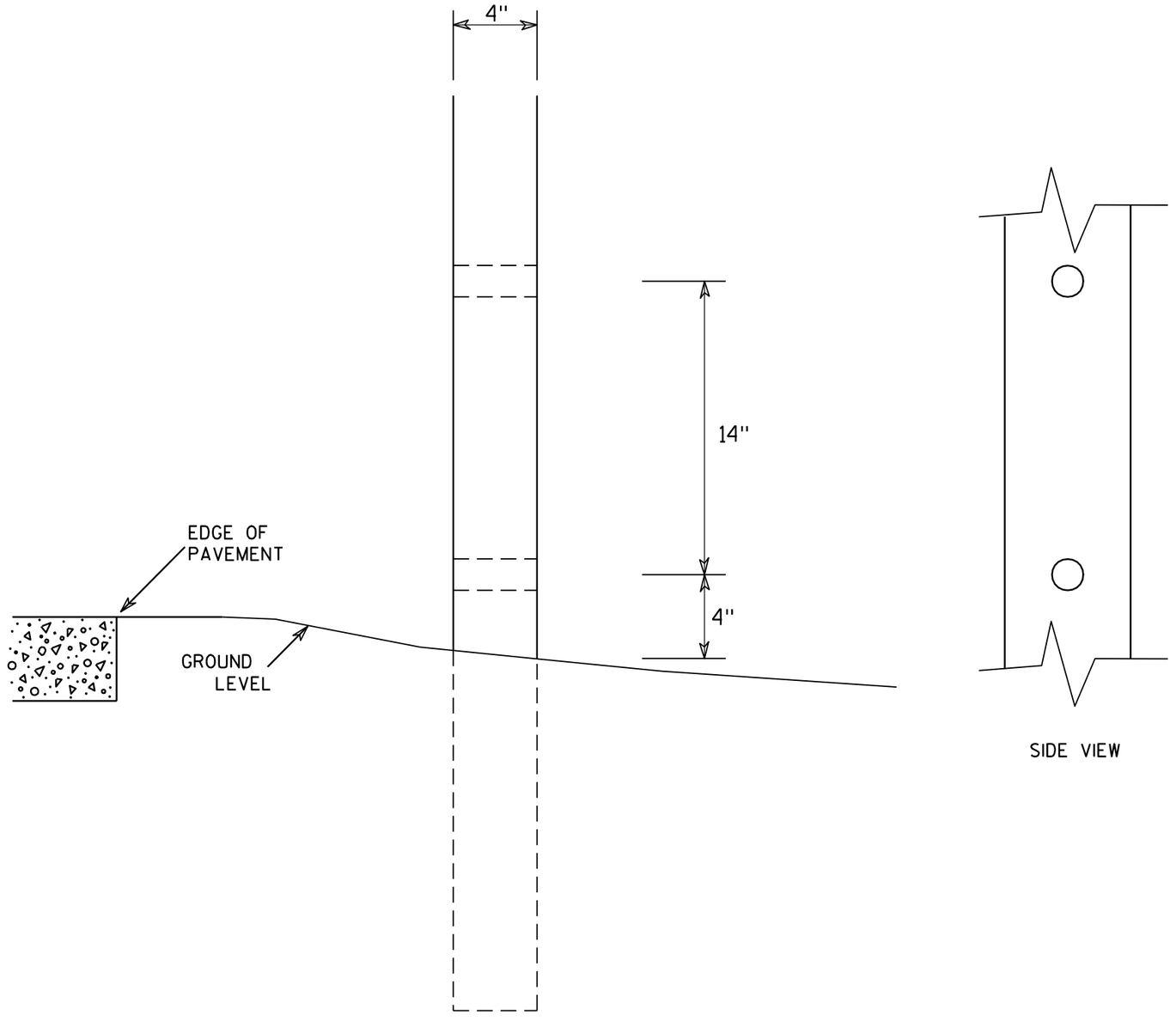
WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 2/05/15 PLATE A4-9.9

PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E

FILE NAME : C:\CAEFiles\Projects\tr_stdplate\A49.DGN PLOT DATE : 05-FEB-2015 17:09 PLOT BY : mscsja PLOT NAME : PLOT SCALE : 13.659812:1.000000
WISDOT/CADDS SHEET 42



SIDE VIEW

GENERAL NOTES

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

7

7

4 X 6 WOOD POST MODIFICATIONS

WISCONSIN DEPT OF TRANSPORTATION

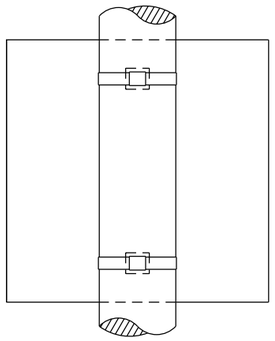
APPROVED Chester J Spang for State Traffic Engineer

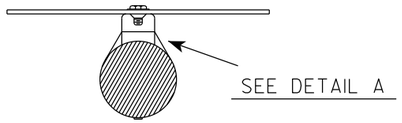
DATE 3/27/97 PLATE NO. A4-11.2

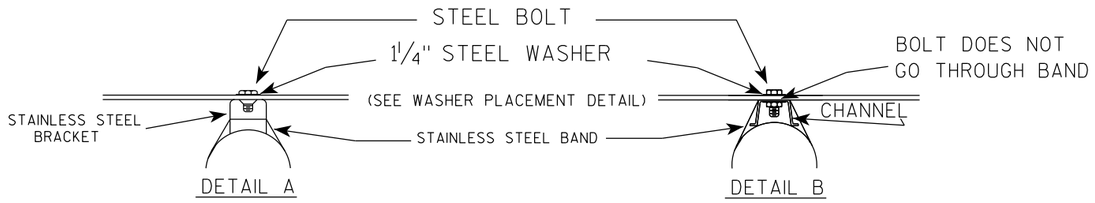
PROJECT NO:	HWY:	COUNTY:		SHEET NO: 57	E

BANDING

SINGLE SIGN



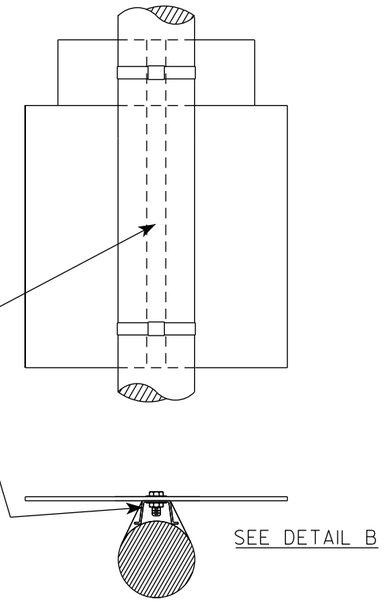




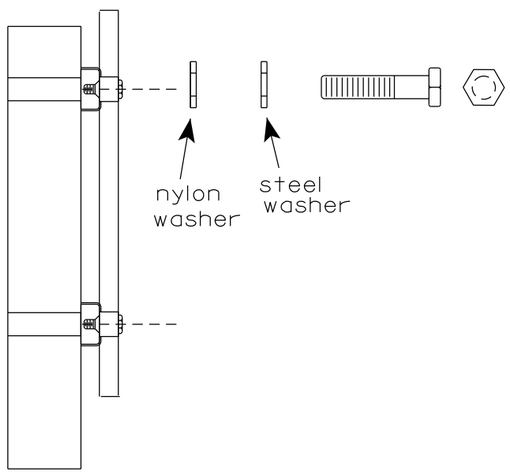
GENERAL NOTES

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

"J" ASSEMBLY



WASHER PLACEMENT



WASHERS (ALL POSTS) -
1-1/4" O.D. X ⅜" I.D. X 1/16" STEEL
1-1/4" O.D. X ⅜" I.D. X .080 NYLON
FOR ALL TYPE H SIGNS

STANDARD SIGN
SIGN BANDING DETAILS

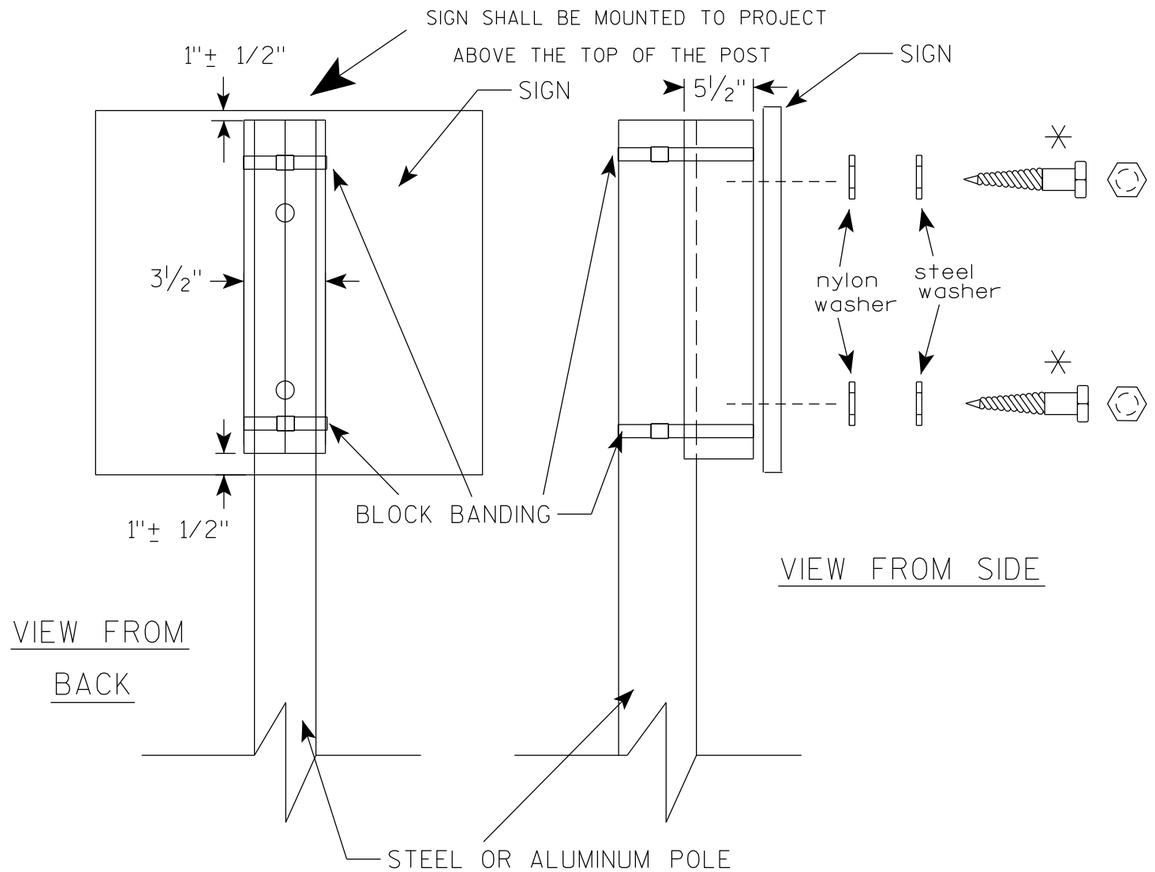
WISCONSIN DEPT OF TRANSPORTATION

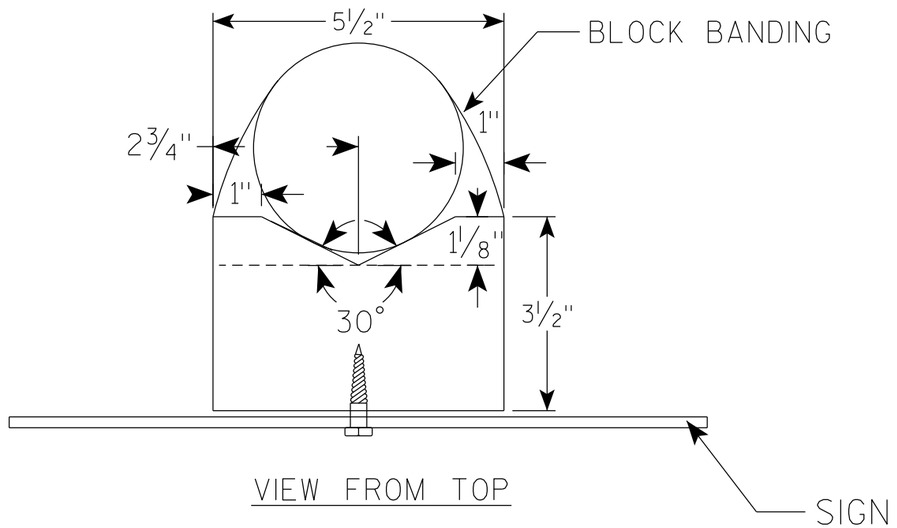
APPROVED Matthew R Rauch
for State Traffic Engineer

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

PROJECT NO:	HWY:	COUNTY:		SHEET NO: 58	E

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





GENERAL NOTES

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

✳ LAG BOLTS SHALL BE ⅜" X 2½"

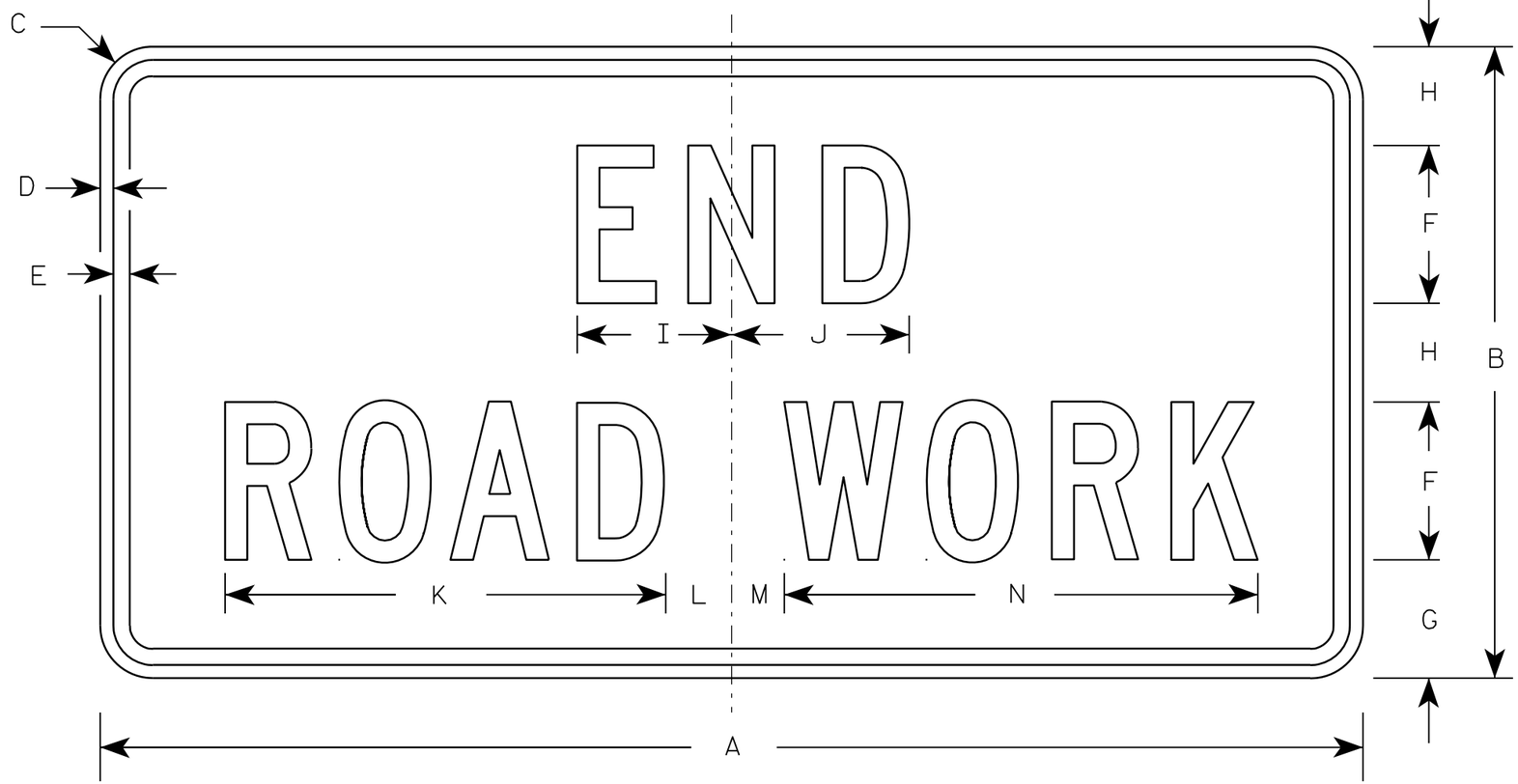
BLOCK BANDING DETAIL (V-BLOCK OPTION)

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
For State Traffic Engineer

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

PROJECT NO:				SHEET NO: 59	E



G20-2A

NOTES

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

Metric equivalent for this sign is:

SIZE	
1	900 mm X 450 mm
2	1200 mm X 600 mm
3	1200 mm X 600 mm
4	1200 mm X 600 mm
5	1200 mm X 600 mm

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.	Area m2
1	36	18	1 1/8	3/8	1/2	4	3 3/4	2 1/2	4 1/8	4 1/8	11 1/8	2	1	12 1/8													4.5	0.41
2	48	24	1 1/2	1/2	5/8	6	4 1/2	3 3/4	5 7/8	6 3/4	16 3/4	2 1/2	1 3/4	18 1/2													8.0	0.72
3	48	24	1 1/2	1/2	5/8	6	4 1/2	3 3/4	5 7/8	6 3/4	16 3/4	2 1/2	1 3/4	18 1/2													8.0	0.72
4	48	24	1 1/2	1/2	5/8	6	4 1/2	3 3/4	5 7/8	6 3/4	16 3/4	2 1/2	1 3/4	18 1/2													8.0	0.72
5	48	24	1 1/2	1/2	5/8	6	4 1/2	3 3/4	5 7/8	6 3/4	16 3/4	2 1/2	1 3/4	18 1/2													8.0	0.72

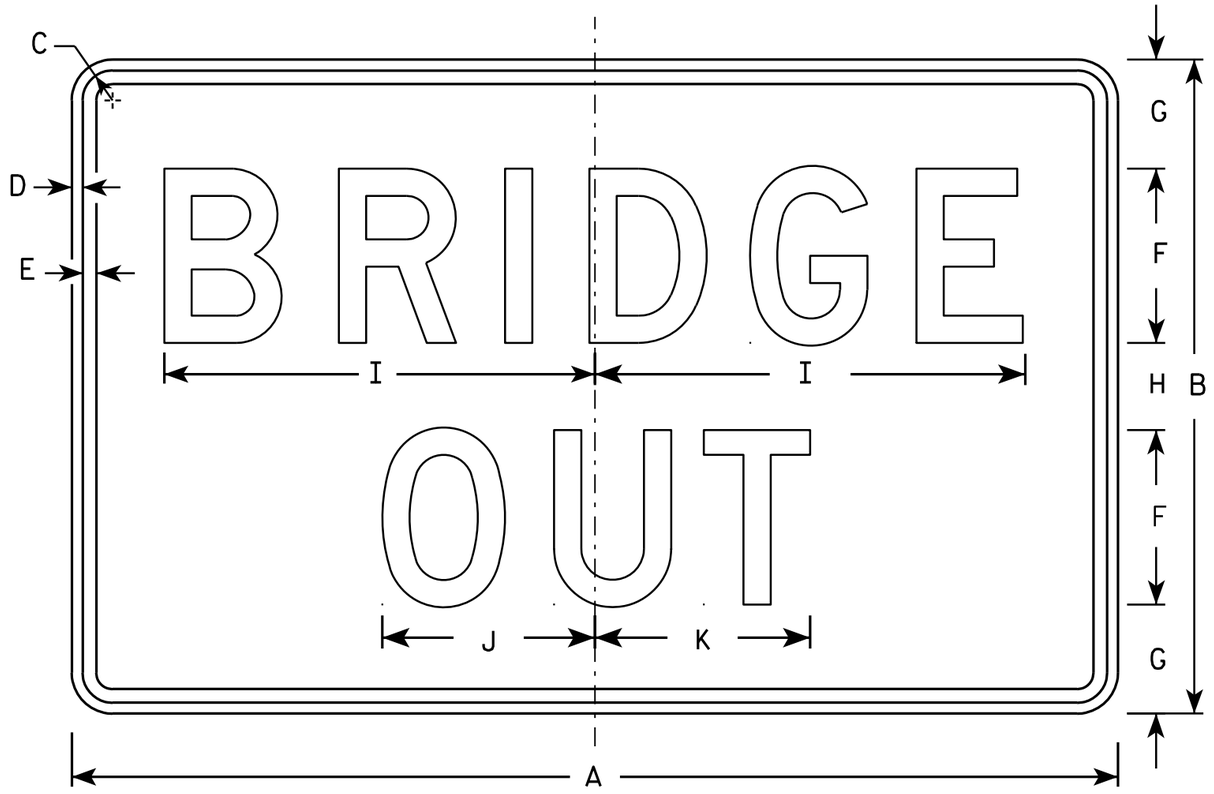
STANDARD SIGN
G20-2A

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 9/30/09 PLATE NO. G20-2A.8

PROJECT NO:	HWY:	COUNTY:		SHEET NO: 60	E



R11-2B

NOTES

1. Sign is Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
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 sq. ft.
1																											
2S	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
2M	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
3	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
4	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0
5	48	30	1 3/8	1/2	5/8	8	5	4	19 3/4	9 3/4	9 7/8																10.0

STANDARD SIGN
R11-2B

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
For State Traffic Engineer

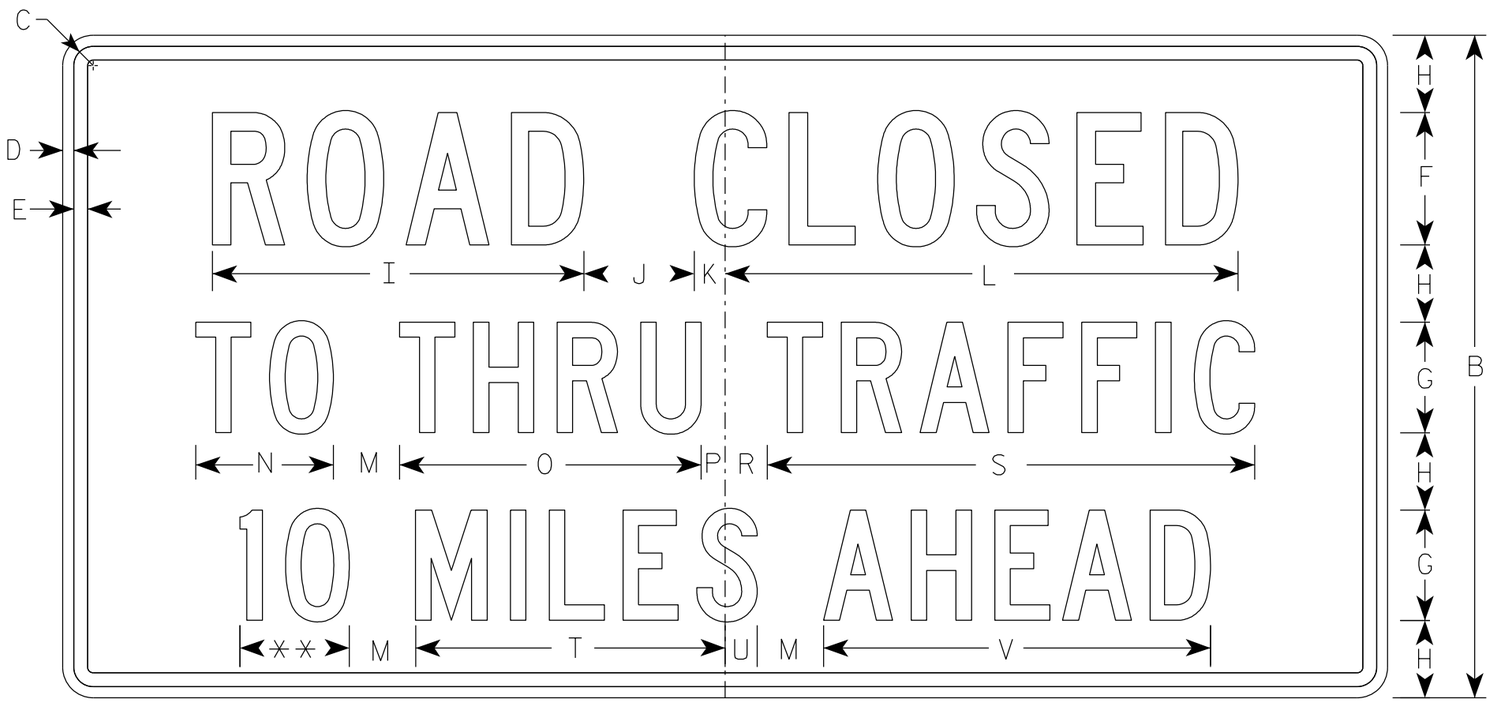
DATE 4/1/11 PLATE NO. R11-2B.2

PROJECT NO:

SHEET NO: 61 E

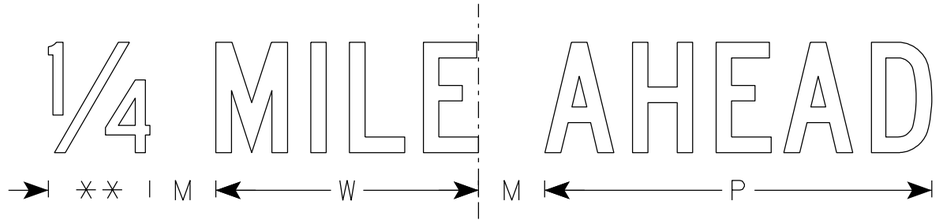
NOTES

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.



R11-3

** See Note 5



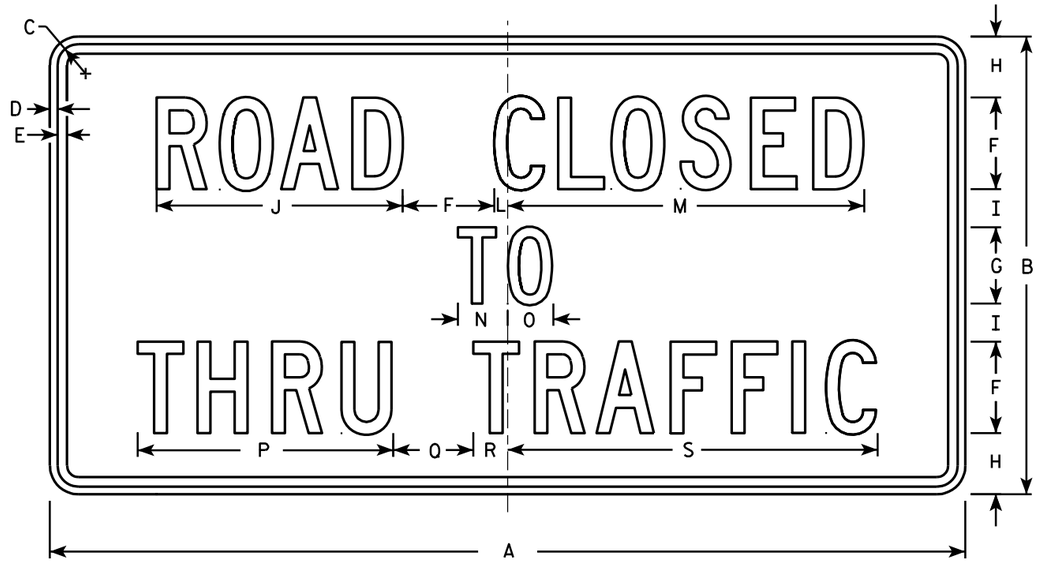
SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	36	18	1 1/4	3/8	3/8	4	3	2	11 1/4	3	1 1/8	15 3/8	2	3 3/4	8 1/4	5/8		1 3/8	13 1/4	8 3/8	7/8	10 1/2	7 1/8				4.5
2S	60	30	1 3/8	1/2	5/8	6	5	3 1/2	16 7/8	5	1 3/8	23 1/4	3	6 1/4	13 5/8	1 1/8		1 7/8	22 1/8	14	1 1/2	17 1/2	11 7/8				12.5
2M	60	30	1 3/8	1/2	5/8	6	5	3 1/2	16 7/8	5	1 3/8	23 1/4	3	6 1/4	13 5/8	1 1/8		1 7/8	22 1/8	14	1 1/2	17 1/2	11 7/8				12.5
3																											
4																											
5																											

STANDARD SIGN
R11-3

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer
DATE 6/14/2021 PLATE NO. R11-3.9

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



R11-4

NOTES

1. Sign is Type II - Type H Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
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.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1																											
2S	60	30	1 3/8	1/2	5/8	6	5	4	2 1/2	16 1/8		7/8	23 3/8	3 1/4	3	16 3/4	5 1/4	2 1/4	24 1/4								12.5
2M	60	30	1 3/8	1/2	5/8	6	5	4	2 1/2	16 1/8		7/8	23 3/8	3 1/4	3	16 3/4	5 1/4	2 1/4	24 1/4								12.5
3																											
4																											
5																											

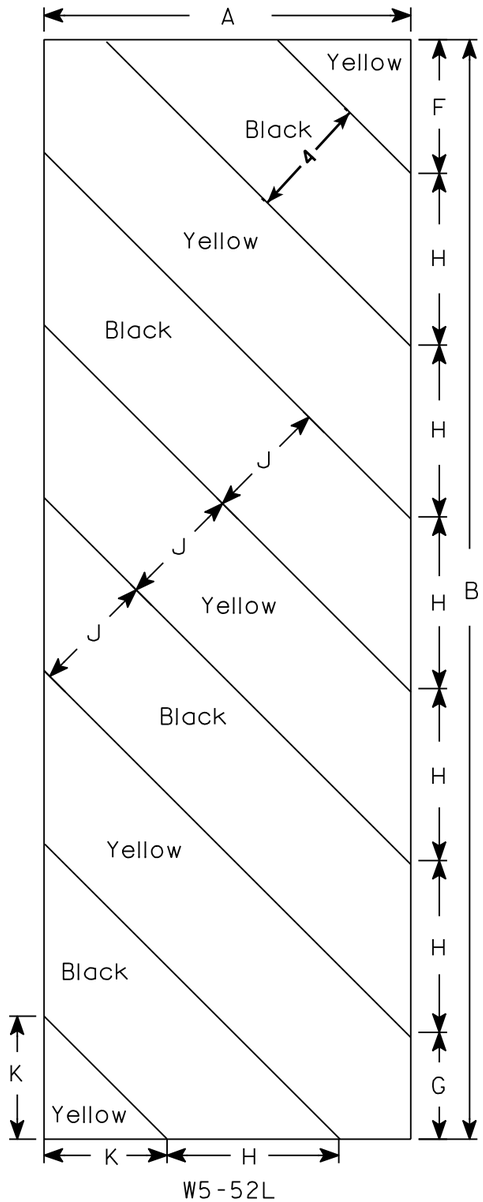
STANDARD SIGN
R11 - 4

WISCONSIN DEPT OF TRANSPORTATION

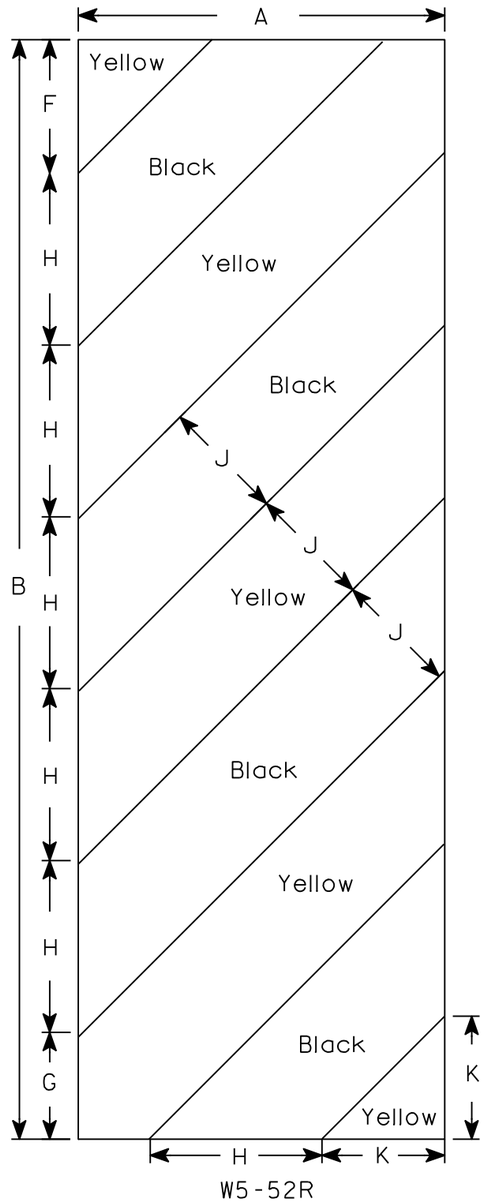
APPROVED Matthew R Rauch for State Traffic Engineer

DATE 4/1/11 PLATE NO. R11-4.3

PROJECT NO: | HWY: | COUNTY: | SHEET NO: 63 | E



W5-52L



W5-52R

NOTES

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

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

STANDARD SIGN

W5-52L & W5-52R

WISCONSIN DEPT OF TRANSPORTATION

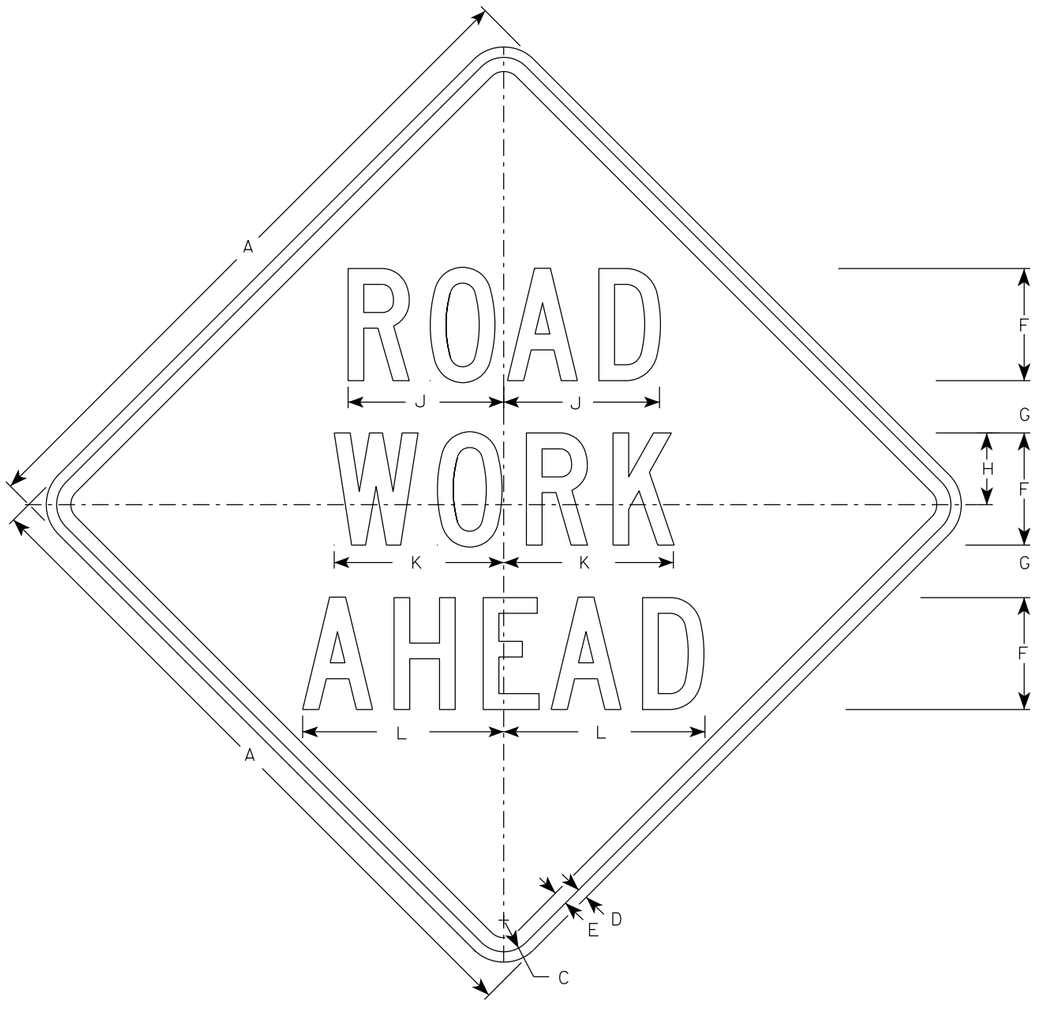
APPROVED Matthew R Rauch
for State Traffic Engineer

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

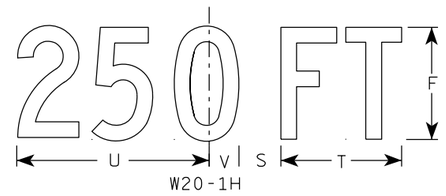
PROJECT NO: | HWY: | COUNTY: | SHEET NO: 64 | E

NOTES

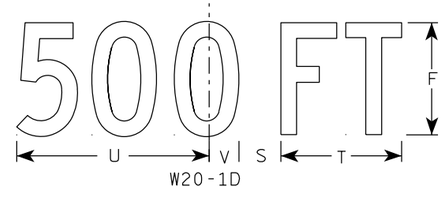
1. Sign is Type II - Type F Reflective
2. Color:
   Background - Orange
   Message - Black
3. Message Series - C
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.



W20-1A

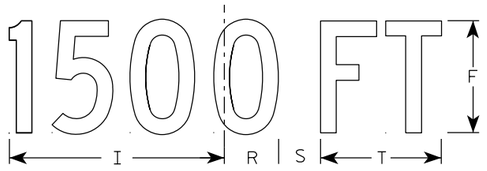


W20-1H

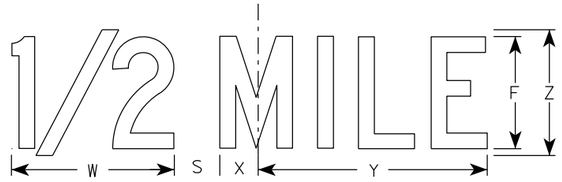


W20-1D

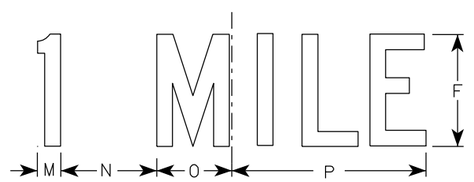
W20-1C



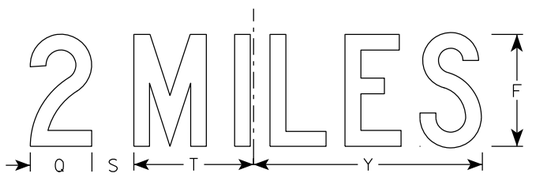
W20-1B



W20-1G



W20-1F



W20-1E

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	36		1 5/8	5/8	3/4	5	2 5/8	3 1/4	10 1/8	7	7 5/8	8 7/8	1 1/8	4 1/2	3 1/2	9	3 1/4	2 1/2	2 1/4	5 5/8	9	1 3/8	8	1 3/4	10 3/4	6	9.0
2S	48		2 1/4	3/4	1	8	3 3/4	5 1/8	15 3/8	11 1/8	12 1/8	14 3/8	1 5/8	6 7/8	5 3/8	13 7/8	4 3/8	3 7/8	3	8 5/8	13 3/4	2 1/8	11 7/8	2 3/4	16 3/8	9	16.0
2M	48		2 1/4	3/4	1	8	3 3/4	5 1/8	15 3/8	11 1/8	12 1/8	14 3/8	1 5/8	6 7/8	5 3/8	13 7/8	4 3/8	3 7/8	3	8 5/8	13 3/4	2 1/8	11 7/8	2 3/4	16 3/8	9	16.0
3	48		2 1/4	3/4	1	8	3 3/4	5 1/8	15 3/8	11 1/8	12 1/8	14 3/8	1 5/8	6 7/8	5 3/8	13 7/8	4 3/8	3 7/8	3	8 5/8	13 3/4	2 1/8	11 7/8	2 3/4	16 3/8	9	16.0
4	48		2 1/4	3/4	1	8	3 3/4	5 1/8	15 3/8	11 1/8	12 1/8	14 3/8	1 5/8	6 7/8	5 3/8	13 7/8	4 3/8	3 7/8	3	8 5/8	13 3/4	2 1/8	11 7/8	2 3/4	16 3/8	9	16.0
5	48		2 1/4	3/4	1	8	3 3/4	5 1/8	15 3/8	11 1/8	12 1/8	14 3/8	1 5/8	6 7/8	5 3/8	13 7/8	4 3/8	3 7/8	3	8 5/8	13 3/4	2 1/8	11 7/8	2 3/4	16 3/8	9	16.0

STANDARD SIGN
W20-1A, B, C, D, E, F, G & H

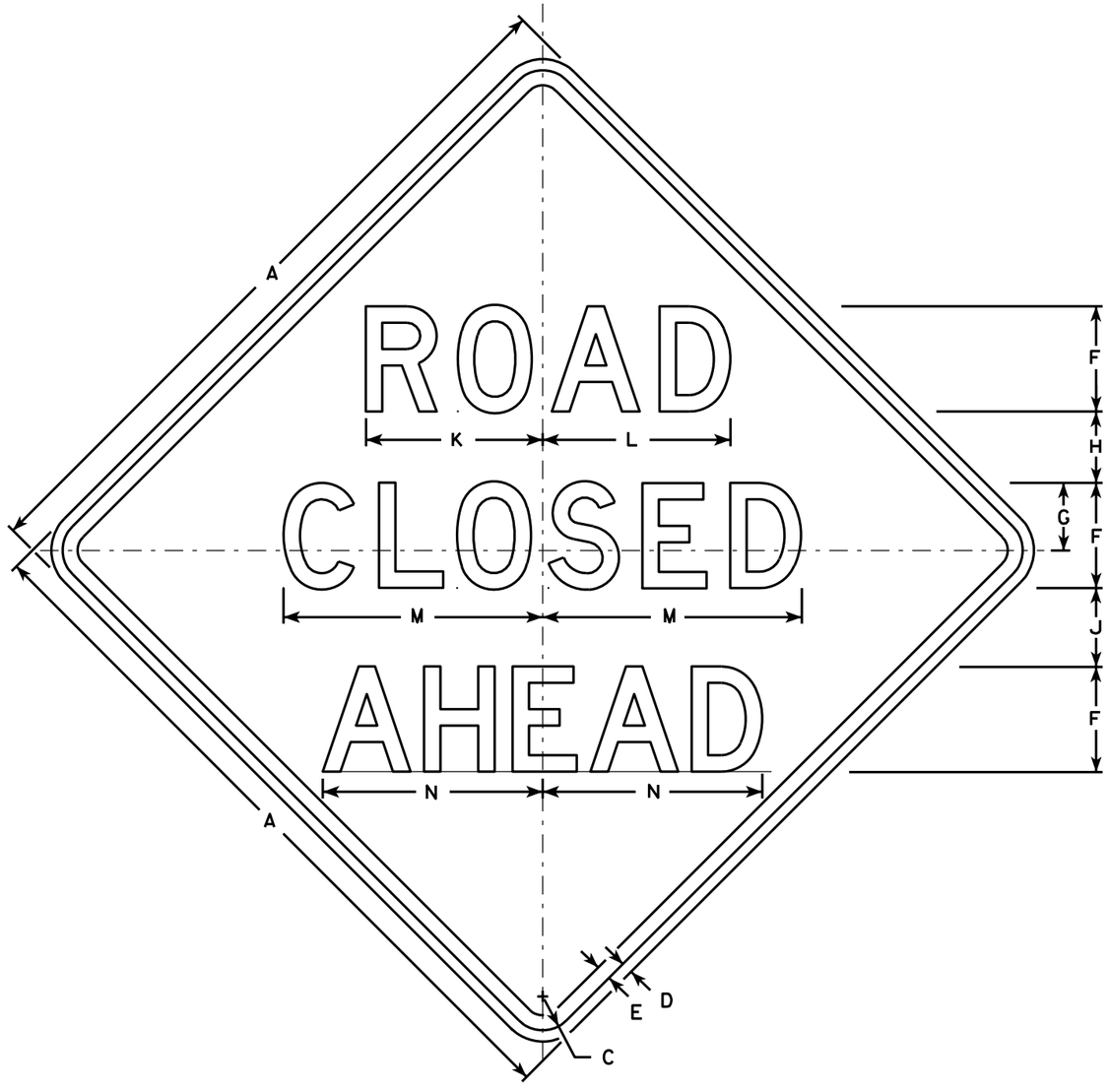
WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

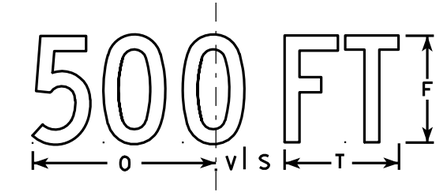
DATE 3/25/2020 PLATE NO. W20-1.11

PROJECT NO:

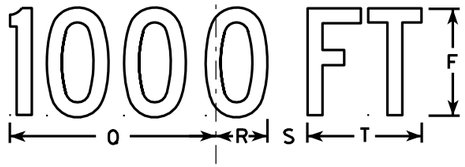
SHEET NO: 65 E



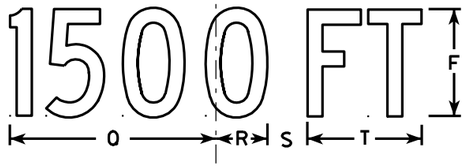
W20-3A



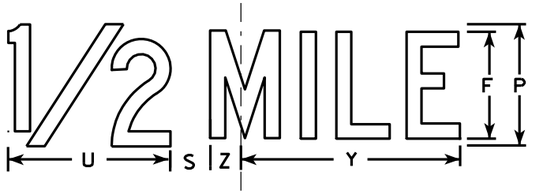
W20-3D



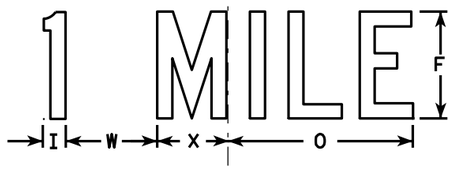
W20-3C



W20-3B



W20-3G



W20-3F

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
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.

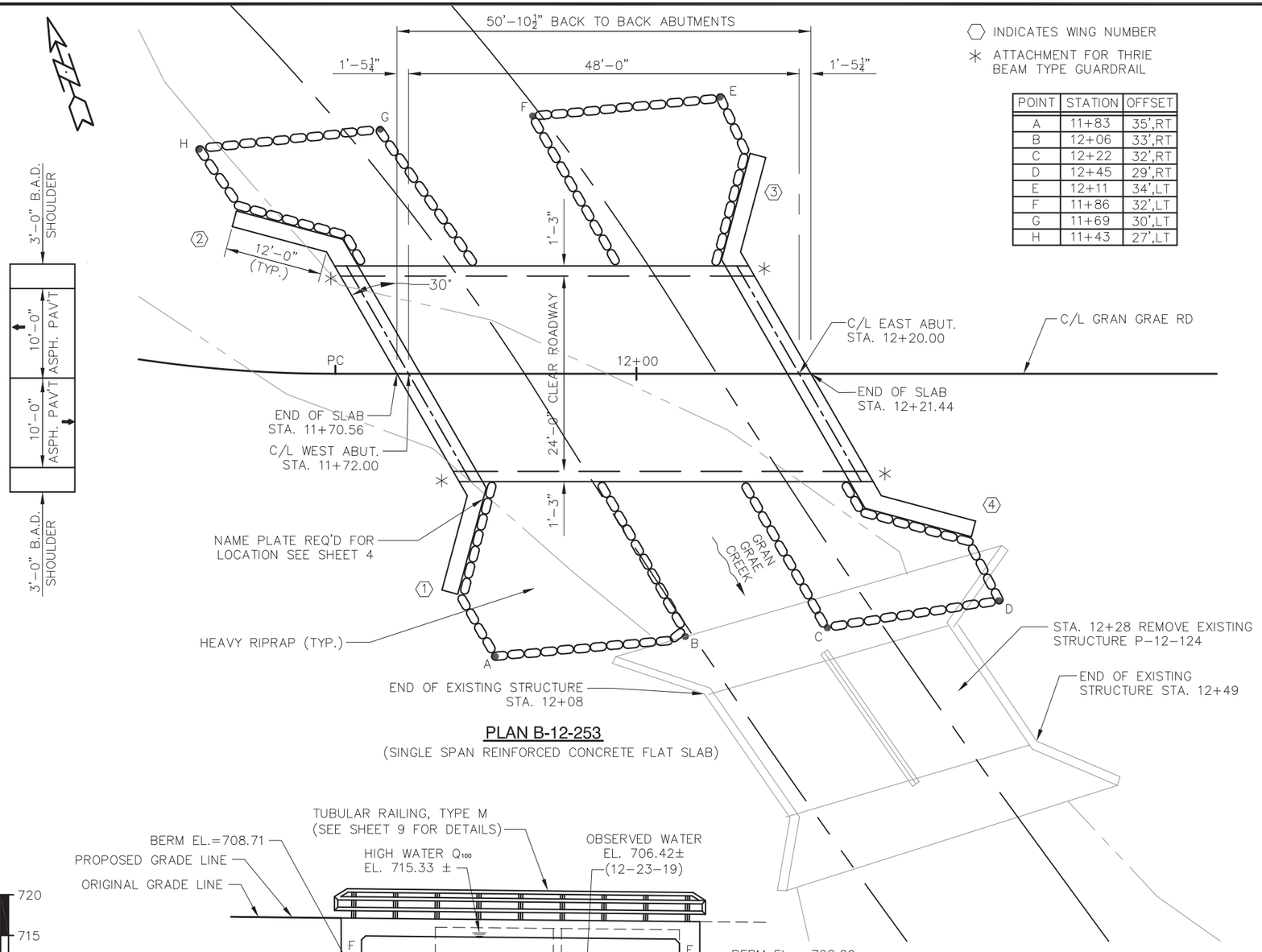
SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	36		1 5/8	5/8	3/4	5	3 3/8	3 1/2	1 1/8	4	8 3/8	8 7/8	12 1/2	11	9	6	10 1/8	2 1/2	1 7/8	5 5/8	8	1 3/8	4 1/2	3 1/2	10 3/4	1 3/4	9.0
2S	48		2 1/4	3/4	1	7	4 1/2	4 3/4	1 1/2	5 1/4	11 3/4	12 1/2	17 1/4	14 5/8	12	8	13 1/2	3 3/8	2 5/8	7 1/2	10 5/8	1 7/8	6	4 5/8	14 3/8	2 3/8	16.0
2M	48		2 1/4	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		2 1/4	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		2 1/4	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		2 1/4	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 3/18/11 PLATE NO. W20-3.7

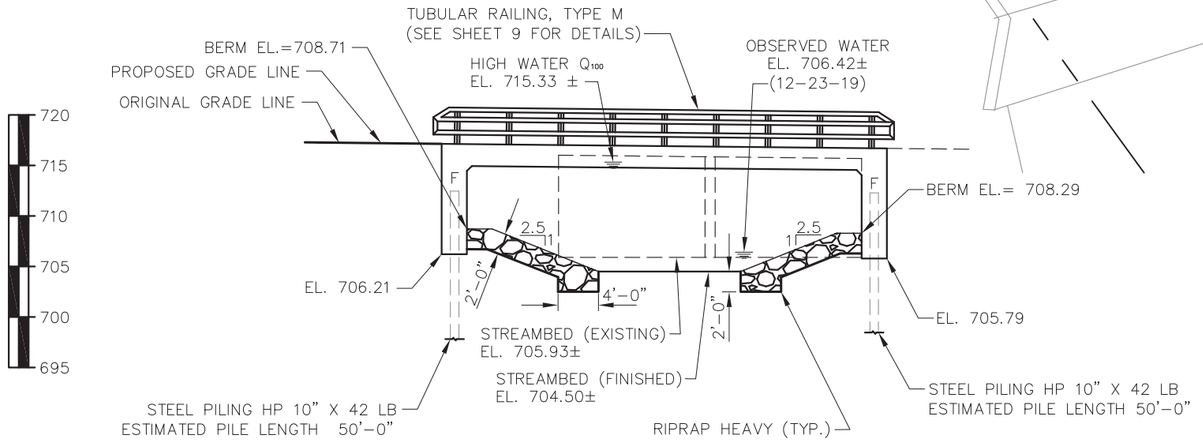
PROJECT NO: | HWY: | COUNTY: | SHEET NO: 66 | E



POINT	STATION	OFFSET
A	11+83	35',RT
B	12+06	33',RT
C	12+22	32',RT
D	12+45	29',RT
E	12+11	34',LT
F	11+86	32',LT
G	11+69	30',LT
H	11+43	27',LT

PLAN B-12-253

(SINGLE SPAN REINFORCED CONCRETE FLAT SLAB)



ELEVATION

(NORMAL TO GRAN GRAE CREEK)

DESIGN DATA

LIVE LOAD:
- DESIGN LOAD — HL-93
- INVENTORY RATING FACTOR — 1.19
- OPERATING RATING FACTOR — 1.54
- WISCONSIN STANDARD PERMIT VEHICLE (WisSPV) — 250 KIPS

STRUCTURE IS DESIGNED FOR A FUTURE WEARING SURFACE OF 20 POUNDS PER SQUARE FOOT.

MATERIAL PROPERTIES:
- CONCRETE MASONRY, SUPERSTRUCTURE — f'c = 4,000 p.s.i
- ALL OTHER — f'c = 3,500 p.s.i
- HIGH STRENGTH BAR STEEL REINFORCEMENT — fy = 60,000 p.s.i

FOUNDATION DATA:

ABUTMENTS SHALL BE SUPPORTED ON PILING STEEL 10-INCH X 42 LB. ABUTMENT BODY PILES SHALL BE DRIVEN TO A REQUIRED DRIVING RESISTANCE OF 140 TONS** AND WING PILES SHALL BE DRIVEN TO A REQUIRED DRIVING RESISTANCE OF 90 TONS** AS DETERMINED BY THE MODIFIED GATES DYNAMIC FORMULA. ESTIMATE 50 FT PILE LENGTHS AT BOTH ABUTMENTS.

**THE FACTORED AXIAL RESISTANCE OF PILES IN COMPRESSION USED FOR DESIGN IS THE REQUIRED DRIVING RESISTANCE MULTIPLIED BY A RESISTANCE FACTOR OF 0.5 USING THE MODIFIED GATES DYNAMIC FORMULA TO DETERMINE THE DRIVEN PILE CAPACITY.

TRAFFIC DATA:
- A.A.D.T (2021) — 100
- A.A.D.T (2041) — 105
- DESIGN SPEED — 45 M.P.H.

HYDRAULIC DATA:
- Q_{100} — 2950 c.f.s.
- Q_{100} (THRU BRIDGE) — 2182 c.f.s.
- Q_{100} (ROAD) — 768 c.f.s.
- DRAINAGE AREA — 11.1 SQ. MI.
- WATERWAY AREA @ Q_{100} — 309 SQ. FT.
- VELOCITY — 7.07 FT/S
- HIGH WATER $_{100}$ ELEVATION — 715.33 FT.
- SCOUR CRITICAL CODE — 5
- Q_2 — 330 c.f.s.
- Q_2 ELEVATION — 708.19 FT.
- VELOCITY Q_2 — 6.1 FT/S

ROAD OVERTOPPING FREQUENCY:
- FREQUENCY — 45 YEARS
- Qovertopping — 2200 c.f.s.
- OVERTOPPING ELEVATION — 713.39

LIST OF DRAWINGS

WISCONSIN PROFESSIONAL ENGINEER
JEREMY F. KRACHEY
E-37258
WAUZEKA
WIS.

3-15-2021

CONSULTANT CONTACT:
JEREMY KRACHEY, P.E.
(608) 768-5075

BRIDGE OFFICE CONTACT:
AARON M. BONK
(608) 261-0261

STATE PROJECT NUMBER

5339-00-72

NO	DATE	REVISION	BY

ORIGINAL PLANS PREPARED BY: TEAM ENGINEERING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORATION

ACCEPTED SDR 08/02/21
CHIEF STRUCTURES DESIGN ENGINEER — DATE

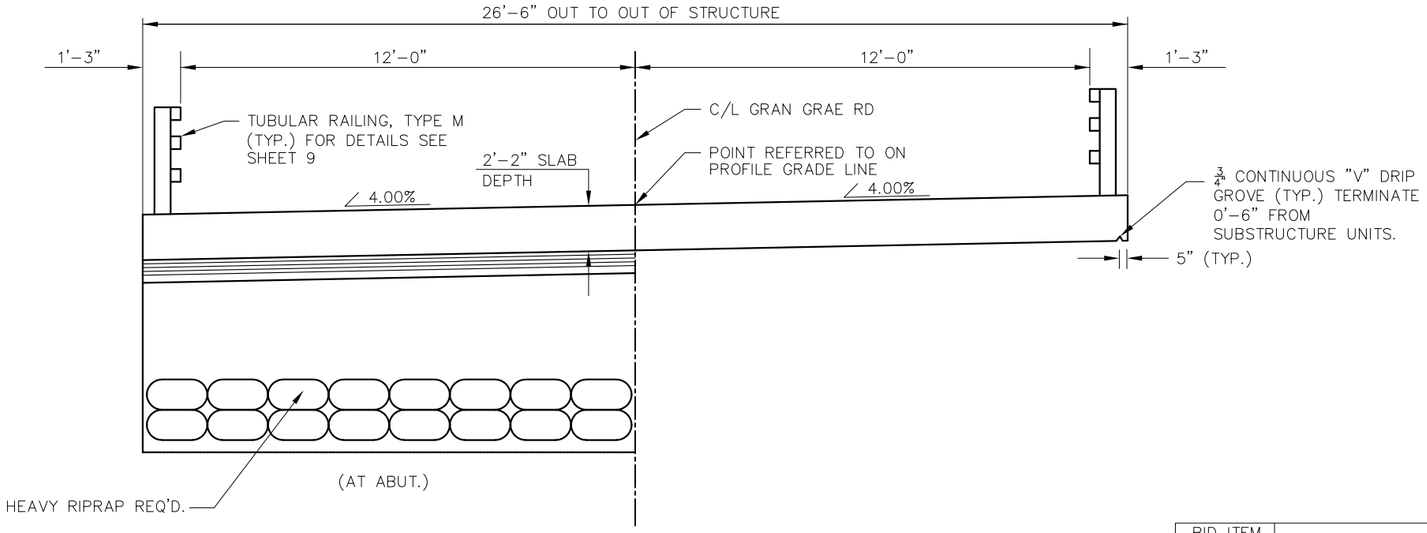
STRUCTURE B-12-253

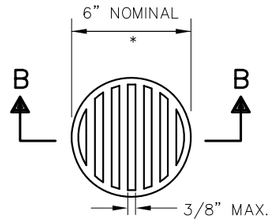
GRAN GRAE ROAD OVER GRAN GRAE CREEK

COUNTY CRAWFORD	TOWN WAUZEKA
DESIGN SPEC. AASHTO LRFD BRIDGE DESIGN SPEC.	
DESIGNED BY JFK	DESIGN CHECKED TJK
DRAWN BY BAS	PLANS CHECKED JLB

GENERAL PLAN

SHEET 1 OF 10





RODENT SHIELD

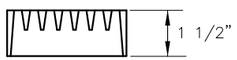
* NOTE: DIMENSIONS ARE APPROXIMATE. THE GRATE IS SIZED TO FIT INTO A PIPE COUPLING, ORIENT SO SLOTS ARE VERITCAL.

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

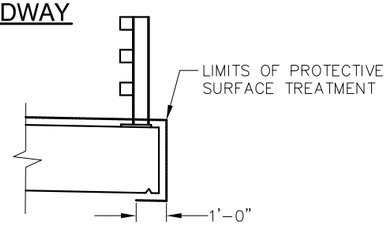
THE RODENT SHIELD SHALL BE A PVC GRATE SIMILAR TO THIS DETAIL. THE GRATE IS COMMERCIALLY AVAILABLE AS A FLOOR STRAINER. A PIPE COUPLING IS REQUIRED FOR THE ATTACHMENT OF THIS SHIELD TO THE EXPOSED END OF THE PIPE UNDERDRAIN. THE SHIELD SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO. 10 X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

CROSS SECTION THRU ROADWAY

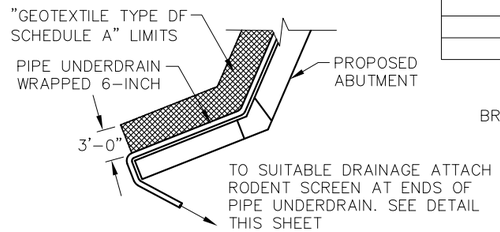
(LOOKING NORTH)



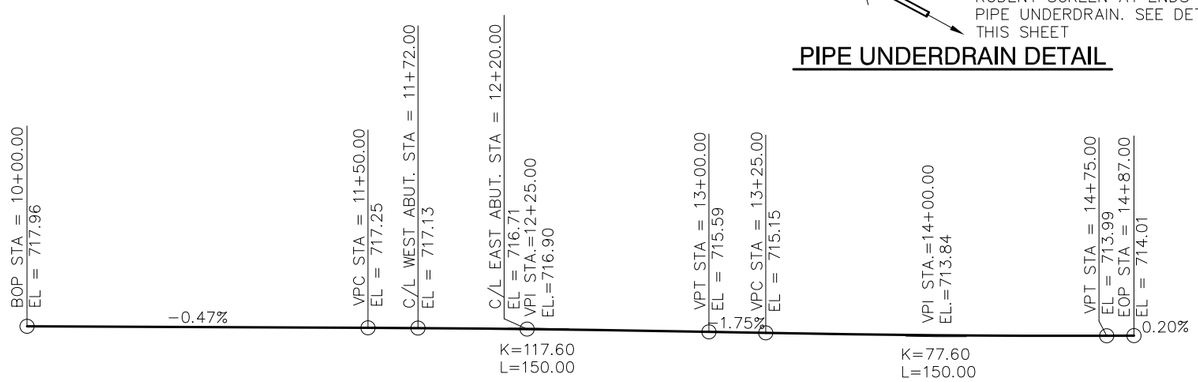
SECTION B-B



PROTECTIVE SURFACE TREATMENT DETAIL



PIPE UNDERDRAIN DETAIL



PROFILE GRADE LINE, C/L GRAN GRAE ROAD

GENERAL NOTES

DRAWING SHALL NOT BE SCALED.

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

SLAB FALSEWORK SHALL BE SUPPORTED ON PILES OR SUBSTRUCTURE UNLESS AN ALTERNATE METHOD IS APPROVED BY THE ENGINEER.

ELEVATIONS SHOWN ON THE PLAN ARE REFERENCED TO THE NORTH AMERICA VERTICAL DATUM OF 2012 (NAVD 88).

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

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

THE EXISTING GROUND LINE SHALL BE THE UPPER LIMITS OF EXCAVATION FOR STRUCTURES.

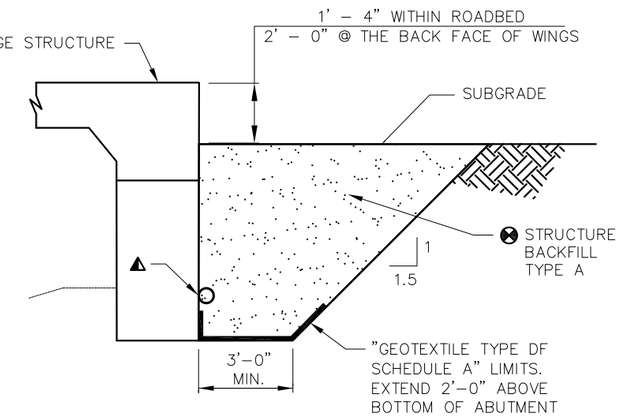
AT THE BACKFACE OF THE ABUTMENT ALL VOLUME WHICH CANNOT BE PLACED BEFORE ABUTMENT CONSTRUCTION AND IS NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH BACKFILL STRUCTURE.

THE EXISTING STRUCTURE (P-12-124) IS A TWO CELL CONCRETE BOX CULVERT WITH CONCRETE WINGS & APRONS. THE OVERALL LENGTH IS 32.5' AND THE OVERALL WIDTH IS 17.0'.

STATE PROJECT NUMBER
5339-00-72

TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	W. ABUT.	E. ABUT.	SUPER.	TOTALS
203.0260	REMOVING STRUCTURE OVER WATERWAY MINIMAL DEBRIS (P-12-124)	EA	–	–	–	1
206.1000	EXCAVATION FOR STRUCTURES BRIDGES B-12-253	LS	–	–	–	1
210.1500	BACKFILL STRUCTURE TYPE A	TON	340	340	–	680
502.0100	CONCRETE MASONRY BRIDGES	CY	46.5	46.5	113	206
502.3200	PROTECTIVE SURFACE TREATMENT	SY	–	–	183	183
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	2,415	2,415	–	4,830
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	1,910	1,910	19,970	23,790
513.4061	RAILING TUBULAR TYPE M	LF	–	–	–	105
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	7	7	–	14
550.0500	PILE POINTS	EA	9	9	–	18
550.1100	PILING STEEL HP 10-INCH X 42 LB	LF	450	450	–	900
606.0300	RIPRAP HEAVY	CY	99	93	–	192
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	LF	105	105	–	210
645.0111	GEOTEXTILE TYPE DF SCHEDULE A	SY	56	56	–	112
	NON-BID ITEMS					
	FILLER	SIZE				½" & ¾"



STRUCTURE BACKFILL DETAIL

(TYPICAL AT BOTH ABUTMENTS)

▲ PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN.

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

NO	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORATION

STRUCTURE B-12-253

DRAWN BY BAS | PLANS CHECKED JFK

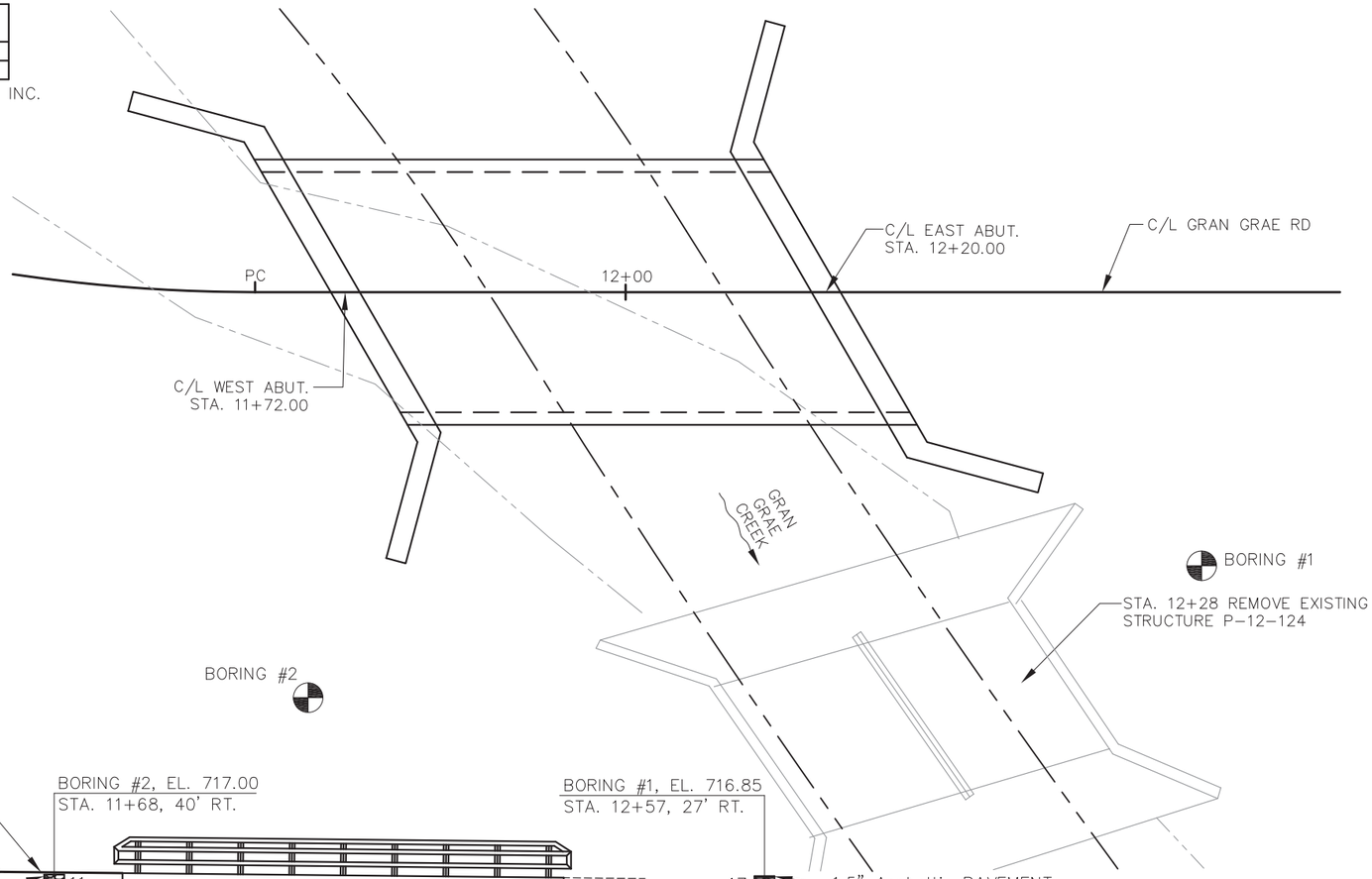
CROSS SECTION & QUANTITIES

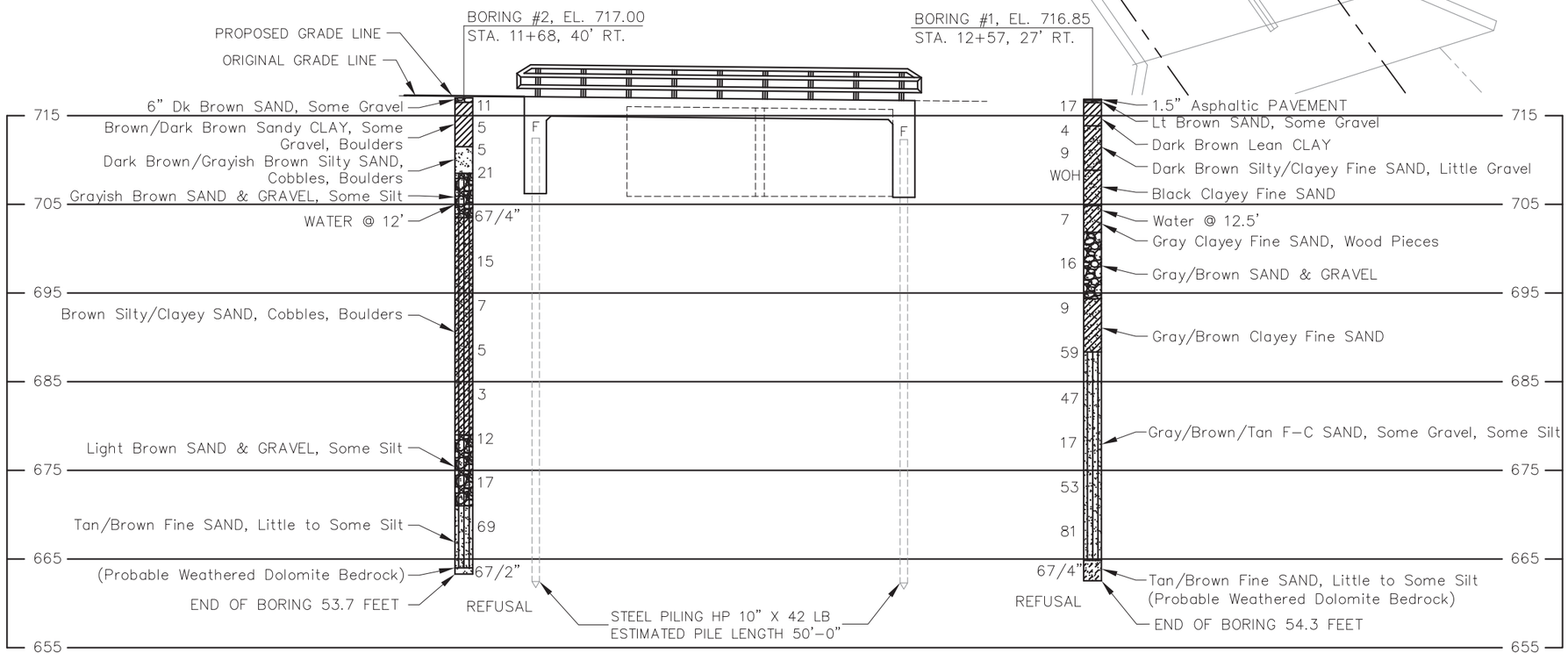
SHEET 2 OF 10

BORING NUMBER	DATE COMPLETED	NORTHING (Y)	EASTING (X)
1	06/10/2020	130,745.62	351,526.63
2	06/10/2020	130,761.33	351,437.80

BORINGS AND REPORT COMPLETED BY: NUMMELIN TESTING SERVICES, INC.
5620 WOODLAND DRIVE
WAUNAKEE, WI 53597

ALL COORDINATES REFERENCED TO WCCS
NAD83 (2019) CRAWFORD COUNTY





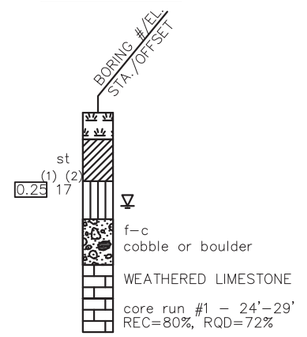
STATE PROJECT NUMBER

5339-00-72

MATERIAL SYMBOLS

ASPHALT	TOPSOIL	PEAT
CONCRETE	FILL	GRAVEL
SAND	CLAY	SILT
boulders or cobbles	LIMESTONE	BEDROCK (unknown)
shale	SANDSTONE	IGNEOUS/ meta

LEGEND OF BORING



Unconfined STRENGTH, as determined by a pocket penetrometer (tsf)

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

ground water elevation

- at time of drilling
- end of drilling
- after drilling

ABBREVIATIONS

F-Fine M-Medium C-Coarse st-shelby tube

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

Borings were completed at points approximately as indicated on this drawing to obtain information concerning the character of subsurface materials found at the site. Because the investigated depths are limited and the area of the borings is very small in relation to the entire site, the Wisconsin Department of Transportation does not warrant similar subsurface conditions below, between, or beyond these borings. Variations in soil conditions should be expected and fluctuations in groundwater levels may occur.

NO	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORATION

STRUCTURE B-12-253

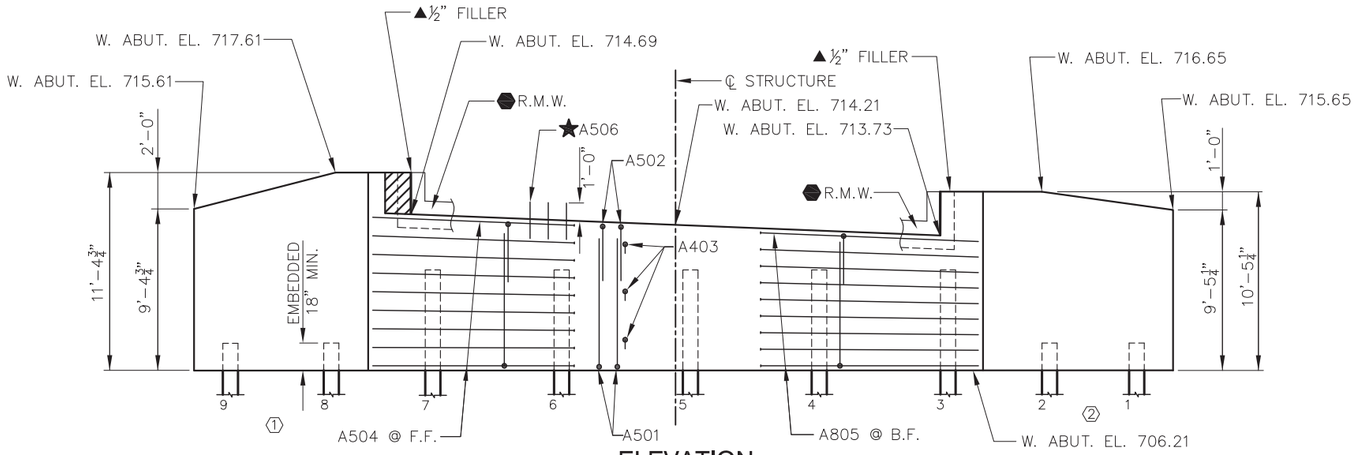
DRAWN BY BAS | PLANS CHECKED JFK

SUBSURFACE EXPLORATION

SHEET 3 OF 10

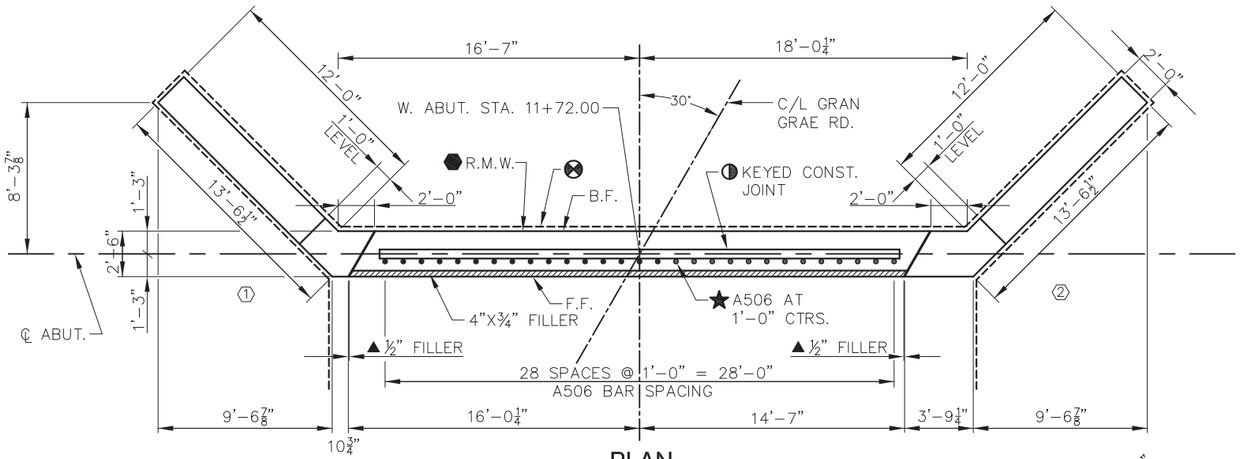
69

STATE PROJECT NUMBER
5339-00-72

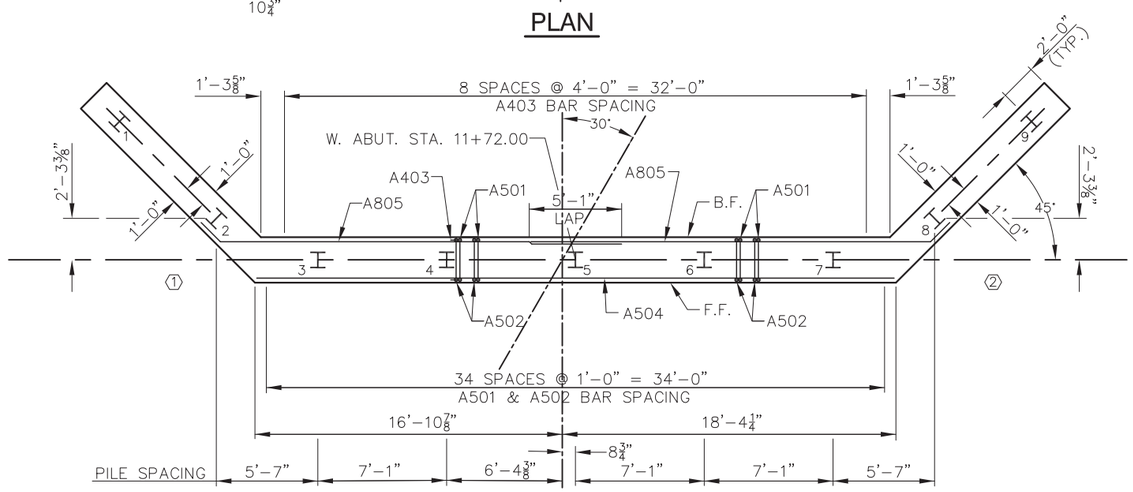


ELEVATION

(W. ABUT. – LOOKING WEST)

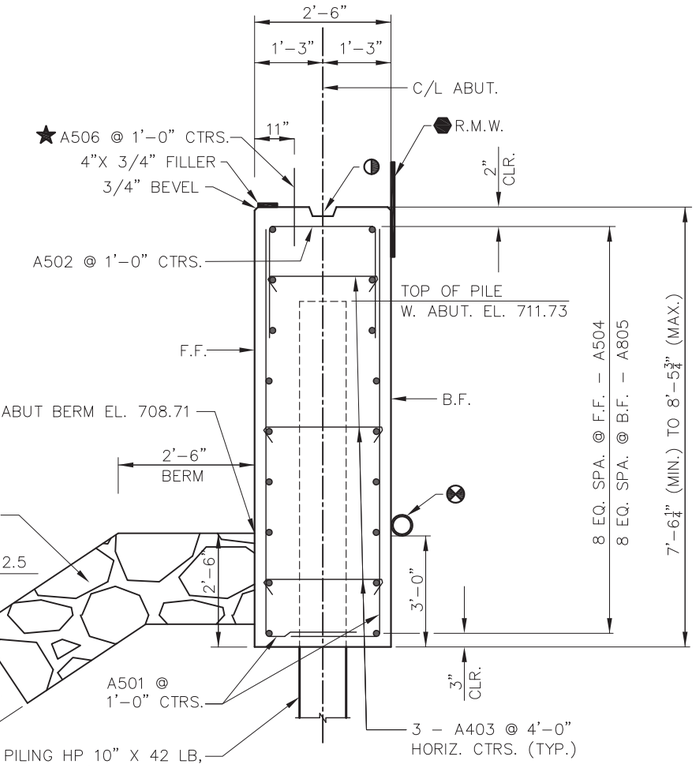


PLAN



LAYOUT

- ◑ KEYED CONSTRUCTION JOINT FORMED BY A SURFACED, BEVELED 2"X6"
- ⬢ 18" RUBBERIZED MEMBRANE WATERPROOFING (HORIZONTAL & VERTICAL)
- ▲ 1/2" FILLER EXTEND AS SHOWN. SEAL ALL EXPOSED HORIZ. & VERT. SURFACES OF FILLER WITH NON-STAINING GRAY, NON-BITUMINUOS JOINT SEALER. (1" DEEP & HOLD 1/8" BELOW SURFACE OF CONCRETE)
- ★ A506 BARS MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE IT HAS TAKEN ITS INITIAL SET. EMBED BAR 1'-0".
- ⊗ PIPE UNDERDRAIN WRAPPED (6-INCH). EXTEND THRU GEOTEXTILE FABRIC AT FACE OF RIPRAP HEAVY. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. PROVIDE RODENT PROTECTION AT ENDS OF PIPE. (SEE DETAIL ON SHEET 2)



TYPICAL SECTION THROUGH ABUTMENT BODY

NO	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORATION

STRUCTURE B-12-253

DRAWN BY BAS | PLANS CHECKED JFK

WEST ABUTMENT

SHEET 4 OF 10

STATE PROJECT NUMBER
5339-00-72

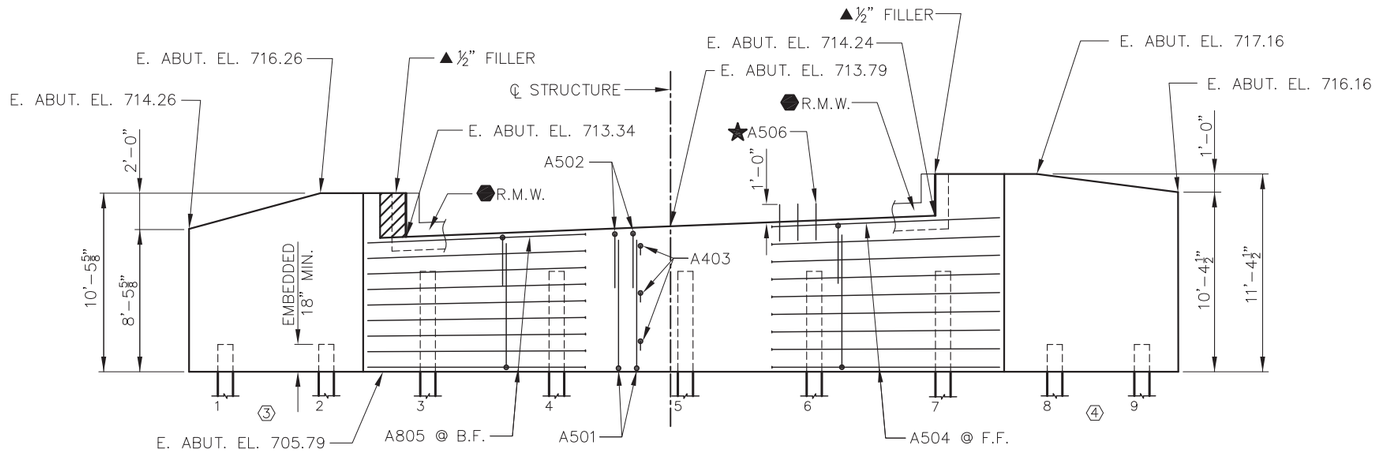
◑ KEYED CONSTRUCTION JOINT FORMED BY A SURFACED, BEVELED 2"X6"

⬣ 18" RUBBERIZED MEMBRANE WATERPROOFING (HORIZONTAL & VERTICAL)

▲ 1/2" FILLER EXTEND AS SHOWN. SEAL ALL EXPOSED HORIZ. & VERT. SURFACES OF FILLER WITH NON-STAINING GRAY, NON-BITUMINUOS JOINT SEALER. (1" DEEP & HOLD 1/8" BELOW SURFACE OF CONCRETE)

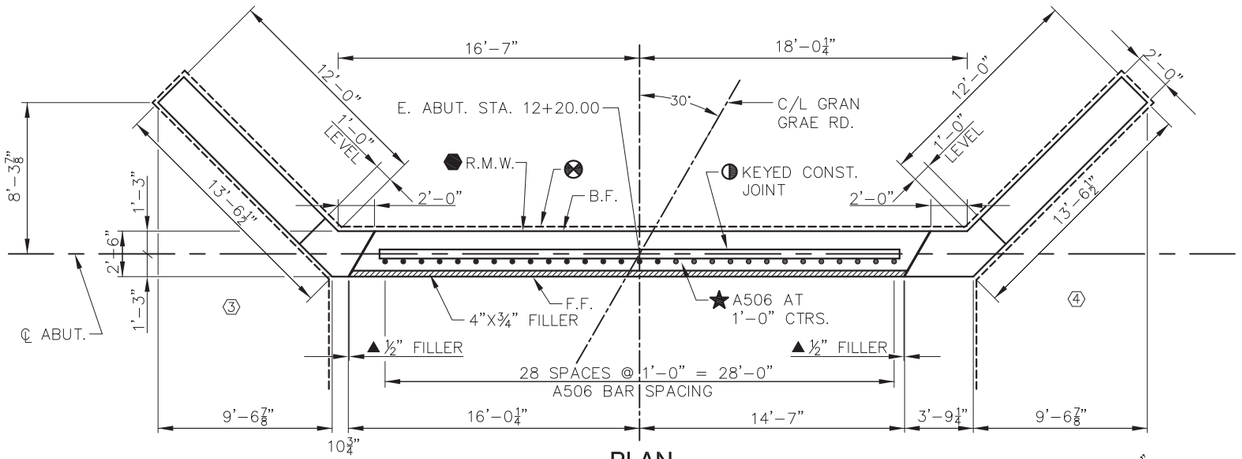
★ A506 BARS MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE IT HAS TAKEN ITS INITIAL SET. EMBED BAR 1'-0".

⊗ PIPE UNDERDRAIN WRAPPED (6-INCH). EXTEND THRU GEOTEXTILE FABRIC AT FACE OF RIPRAP HEAVY. SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. PROVIDE RODENT PROTECTION AT ENDS OF PIPE. (SEE DETAIL ON SHEET 2)

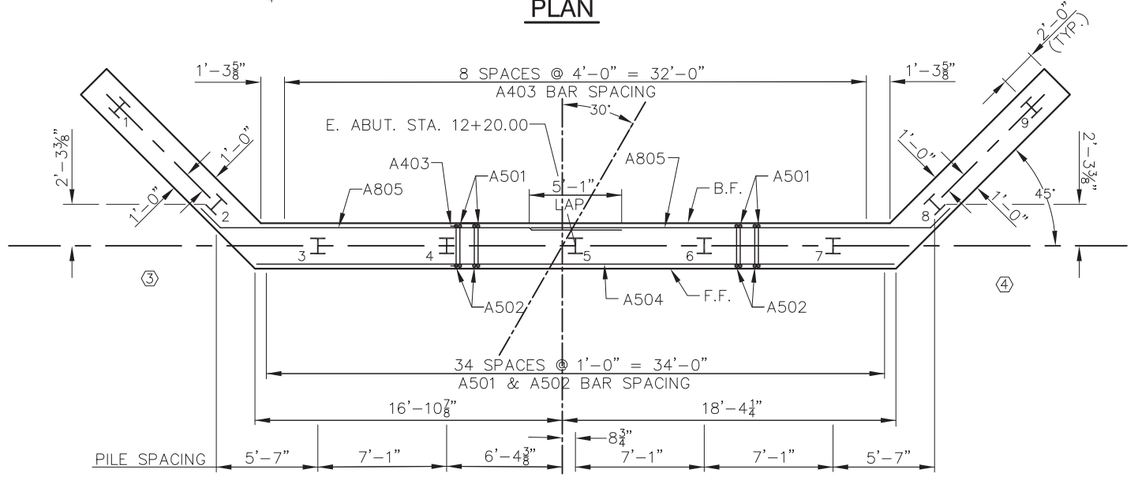


ELEVATION

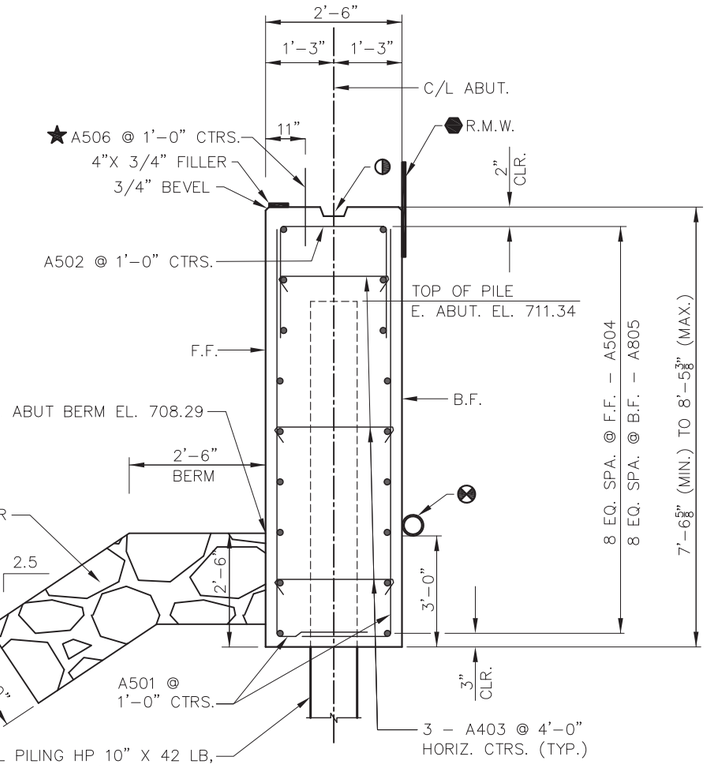
(E. ABUT. – LOOKING EAST)



PLAN



LAYOUT



TYPICAL SECTION THROUGH ABUTMENT BODY

NO	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORATION

STRUCTURE B-12-253

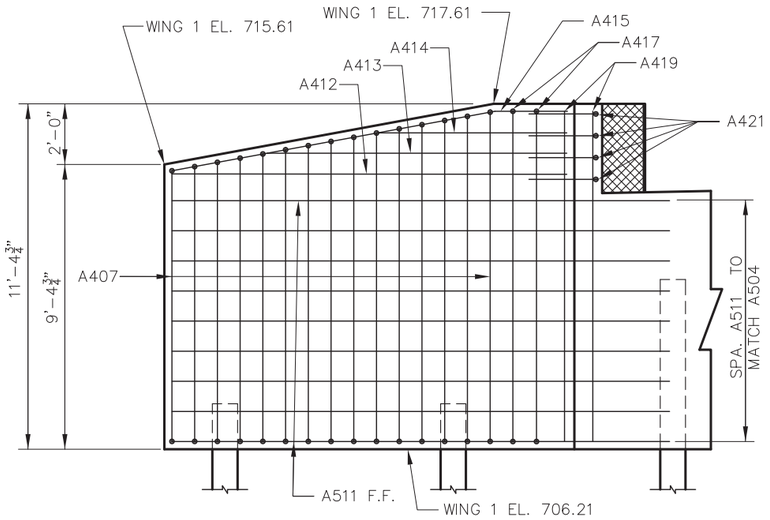
DRAWN BY BAS | PLANS CHECKED JFK

EAST ABUTMENT

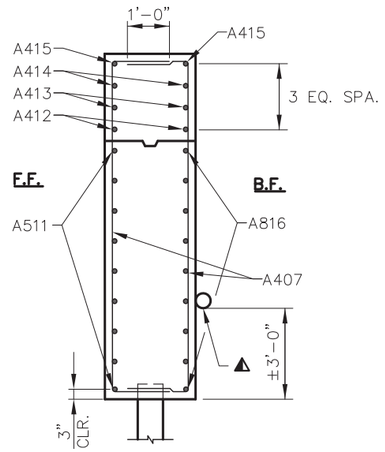
SHEET 5 OF 10

STATE PROJECT NUMBER

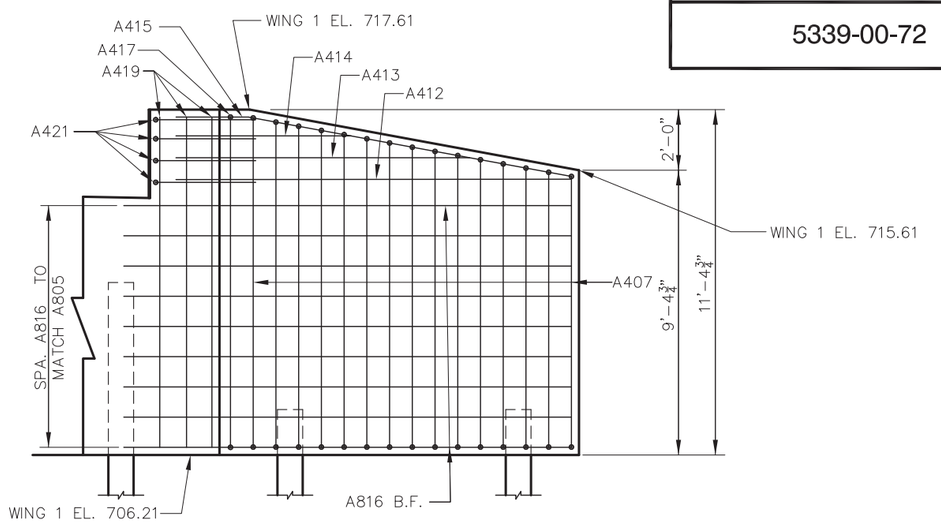
5339-00-72



F.F. ELEVATION - WING 1



SECTION A-A
WING 1



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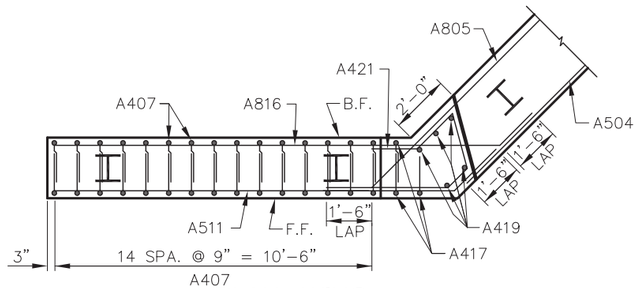
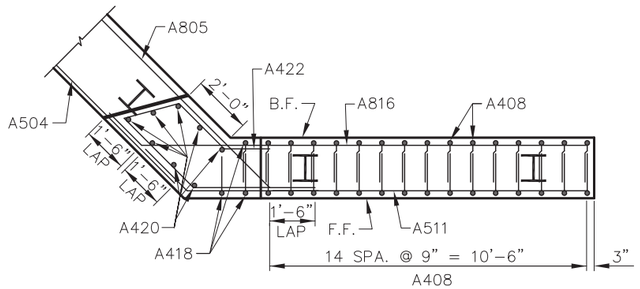
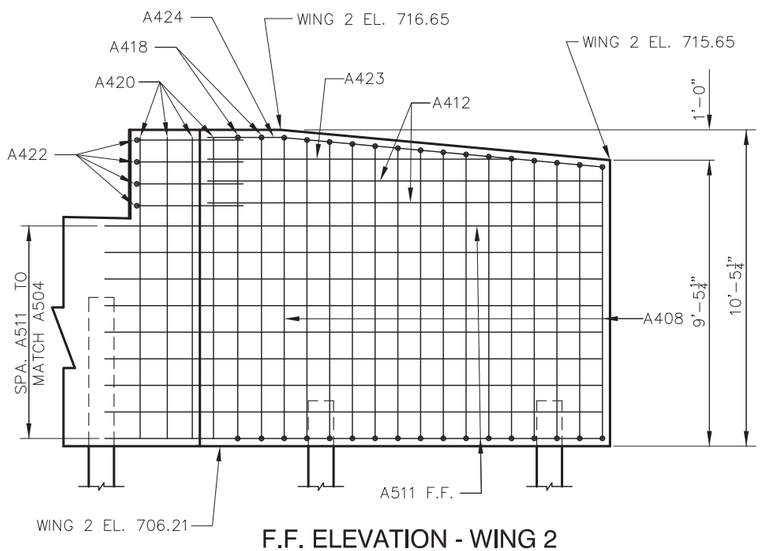


PLAN - WING 1



PLAN - WING 2



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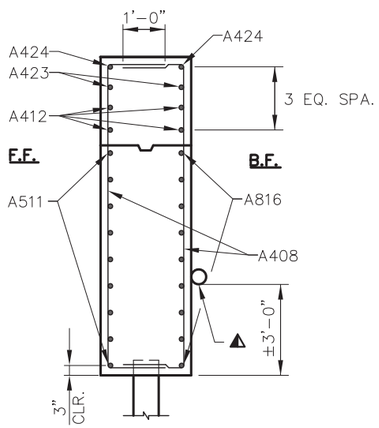
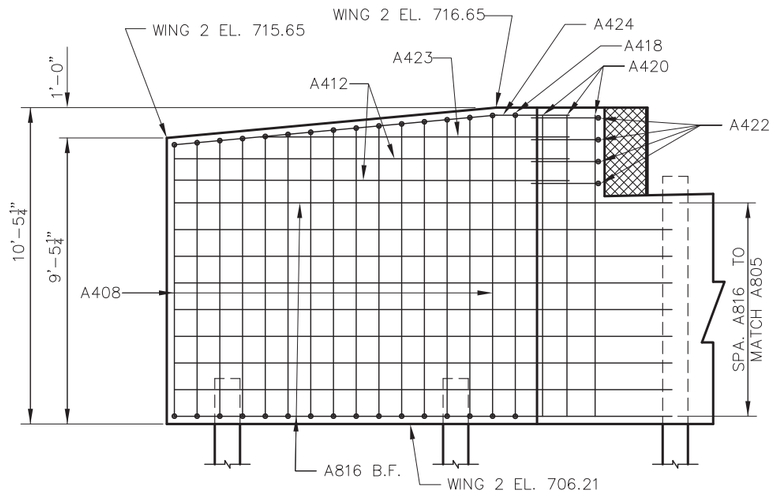


SECTION A-A
WING 2



B.F. ELEVATION - WING 2

⚠ PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. (SEE DETAIL ON SHEET 2)

NO	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORATION

STRUCTURE B-12-253

DRAWN BY BAS | PLANS CHECKED JFK

ABUTMENT DETAILS

SHEET 6 OF 10

STATE PROJECT NUMBER

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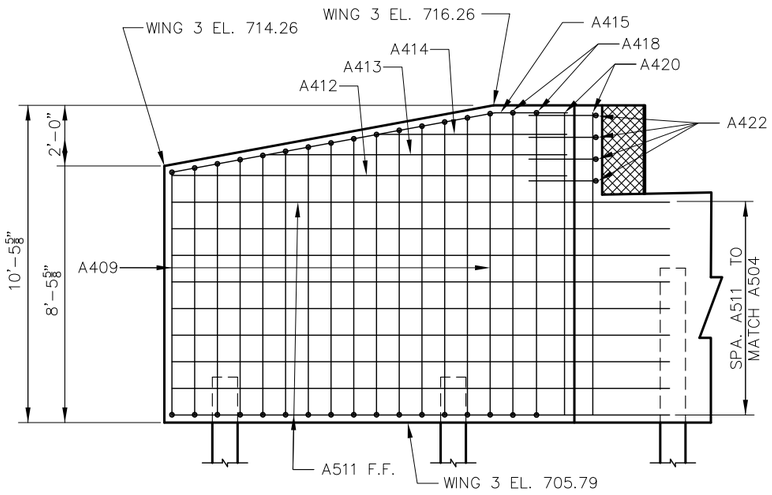

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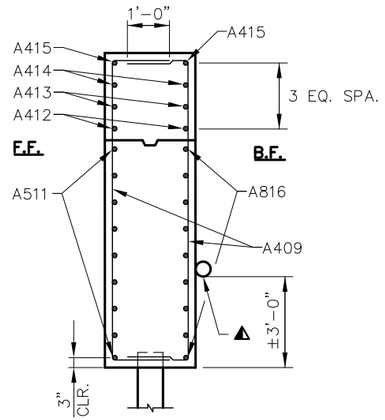
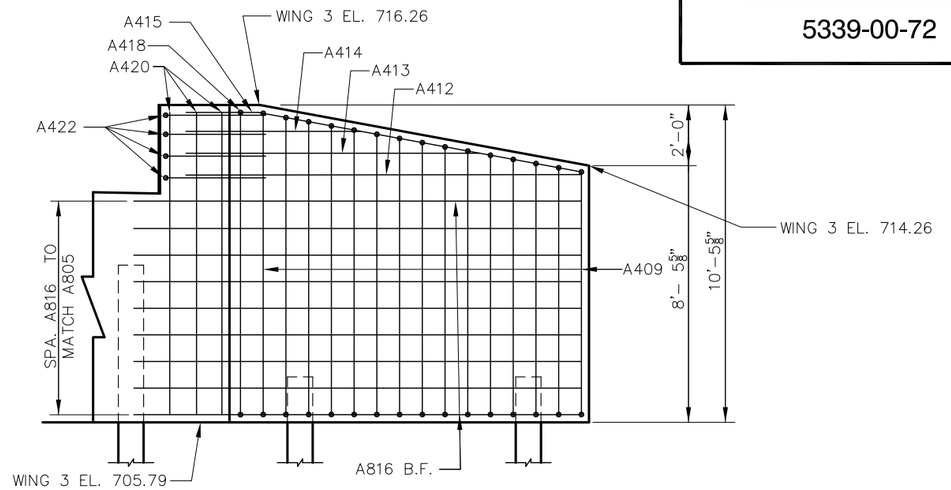


SECTION A-A
WING 3



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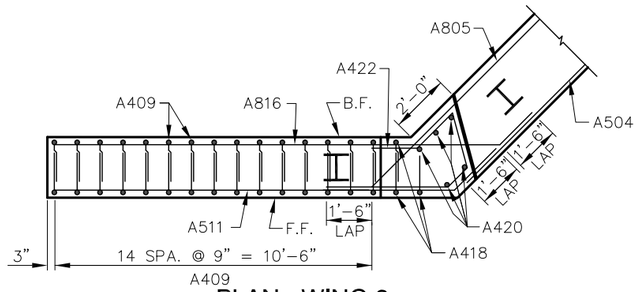
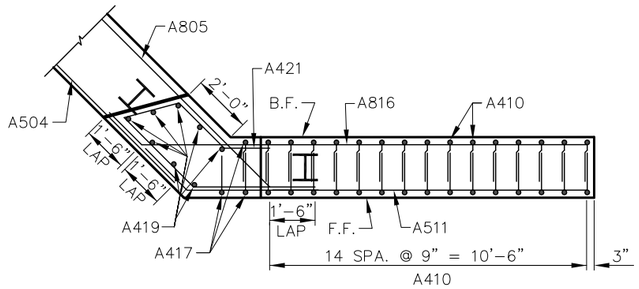
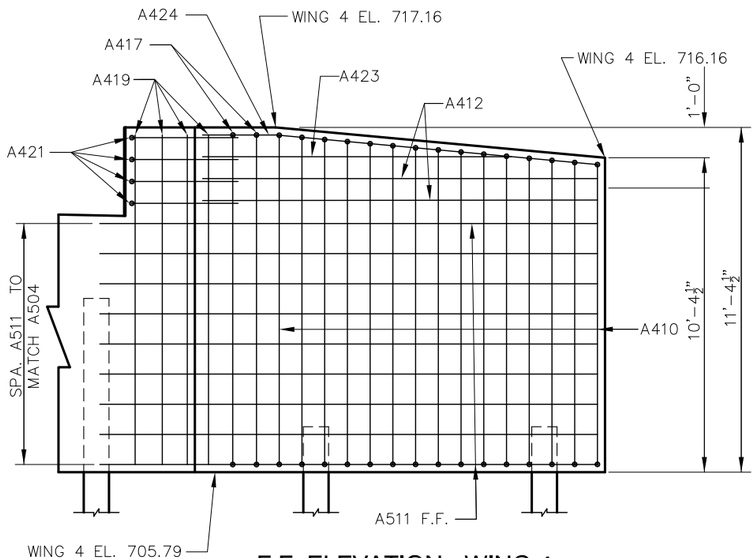


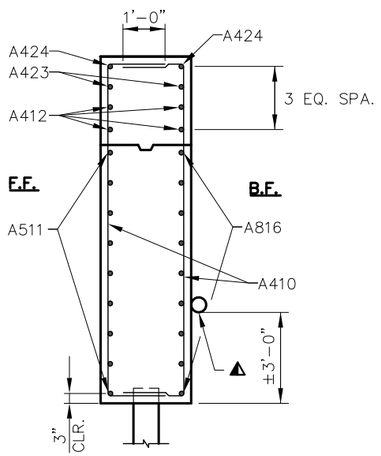
PLAN - WING 3



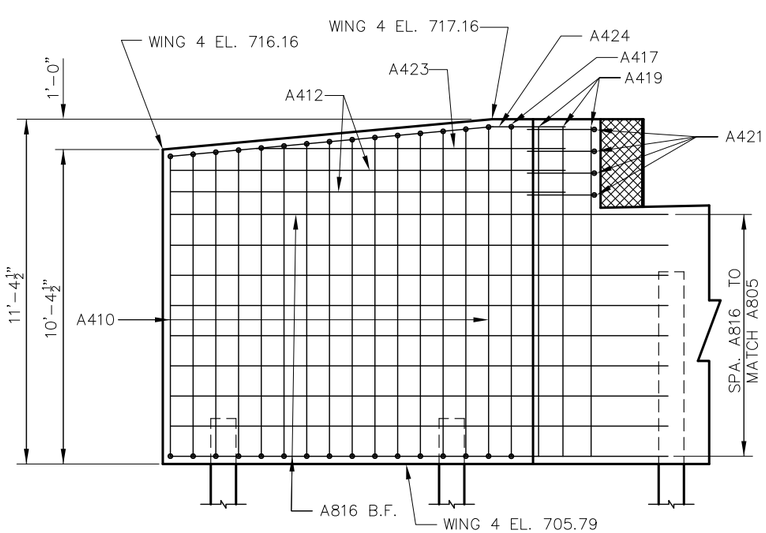
PLAN - WING 4



F.F. ELEVATION - WING 4



SECTION A-A
WING 4



B.F. ELEVATION - WING 4

▲ PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. (SEE DETAIL ON SHEET 2)

NO	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORATION

STRUCTURE B-12-253

DRAWN BY BAS | PLANS CHECKED JFK

ABUTMENT DETAILS

SHEET 7 OF 10

THE FIRST DIGIT OF A 3 DIGIT MARK SIGNIFIES THE BAR SIZE

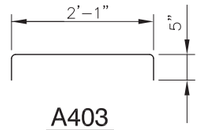
ALL BAR BEND DIMENSIONS ARE OUT TO OUT OF BAR.

BILL OF BARS (ABUTMENTS)

COATED 3,820 LBS.
UNCOATED 4,830 LBS.

MARK	NO. REQ'D	COAT	LENGTH	BENT	LENGTH
A501	140		8'–6"	X	BODY F.F. & B.F. – VERT.
A502	70		7'–10"	X	BODY TIES @ TOP. – VERT.
A403	54		2'–9"	X	BODY TIES – HORIZ.
A504	18		35'–0"		BODY F.F. – HORIZ.
A805	36		23'–6"	X	BODY B.F. – HORIZ.
A506	58	X	2'–0"		BODY – F.F. – DOWELS – VERT.
◨ A407	30	X	12'–4"	X	WING 1 – STIRRUPS – VERT.
◨ A408	30	X	11'–10"	X	WING 2 – STIRRUPS – VERT.
◨ A409	30	X	11'–5"	X	WING 3 – STIRRUPS – VERT.
◨ A410	30	X	12'–9"	X	WING 4 – STIRRUPS – VERT.
A511	36	X	14'–8"	X	WINGS 1 THRU 4 – F.F. – HORIZ.
A412	12	X	13'–0"		WINGS 1 THRU 4 – F.F. & B.F. – HORIZ.
A413	4	X	9'–10"		WINGS 1 & 3 – F.F. & B.F. – HORIZ.
A414	4	X	6'–3"		WINGS 1 & 3 – F.F. & B.F. – HORIZ.
A415	4	X	13'–1"	X	WINGS 1 & 3 – F.F. & B.F. – HORIZ.
A816	36	X	16'–2"	X	WINGS 1 THRU 4 – B.F. – HORIZ.
A417	6	X	13'–3"	X	WINGS 1 & 4 – F.F. & B.F. – VERT.
A418	6	X	12'–4"	X	WINGS 2 & 3 – F.F. & B.F. – VERT.
A419	13	X	10'–10"		WINGS 1 & 4 – VERT.
A420	13	X	9'–11"		WINGS 2 & 3 – VERT.
A421	8	X	8'–3"	X	WINGS 1 & 4 – HORIZ.
A422	8	X	11'–0"	X	WINGS 2 & 3 – HORIZ.
A423	4	X	10'–2"		WINGS 2 & 4 – F.F & B.F HORIZ.
A424	4	X	13'–0"	X	WINGS 2 & 4 – F.F & B.F. HORIZ.

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



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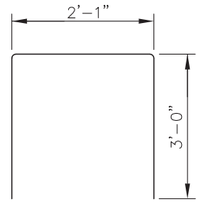

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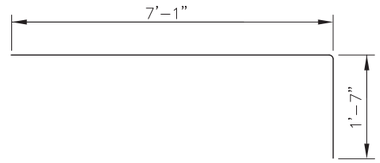

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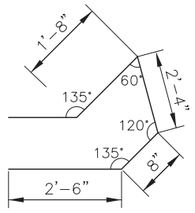

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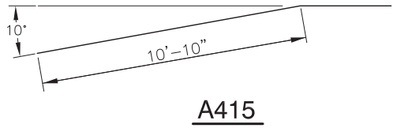
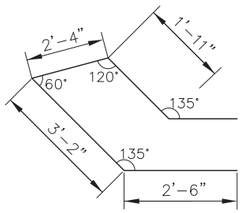


A415

A805, A511, A816



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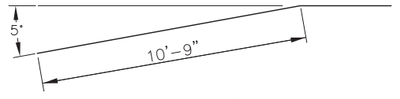

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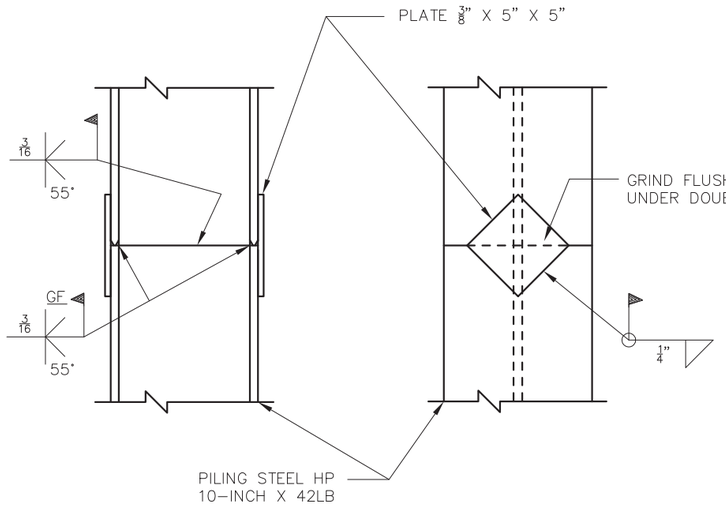
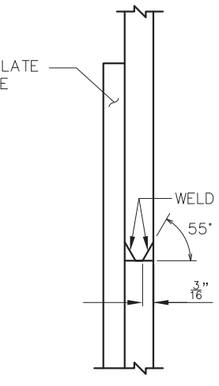
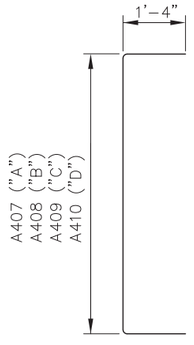


PILE SPLICE DETAIL



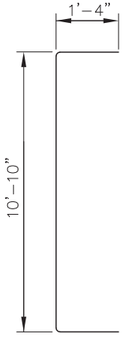
HP WELD DETAIL

FLANGE SHOWN, WEB SIMILAR



MARK	"A"	"B"	"C"	"D"
A407 A408 A409 A410	8'–11"	8'–11"	8'–0"	9'–10"
	9'–0"	9'–0"	8'–1"	9'–11"
	9'–2"	9'–0"	8'–3"	9'–11"
	9'–4"	9'–1"	8'–5"	10'–0"
	9'–5"	9'–2"	8'–6"	10'–1"
	9'–7"	9'–3"	8'–8"	10'–2"
	9'–9"	9'–4"	8'–10"	10'–3"
	9'–10"	9'–5"	8'–11"	10'–4"
	10'–0"	9'–6"	9'–1"	10'–5"
	10'–2"	9'–6"	9'–3"	10'–5"
	10'–3"	9'–7"	9'–4"	10'–6"
	10'–5"	9'–8"	9'–6"	10'–7"
	10'–6"	9'–9"	9'–7"	10'–8"
	10'–8"	9'–10"	9'–9"	10'–9"
	10'–10"	9'–11"	9'–11"	10'–10"

A407, A408, A409, A410



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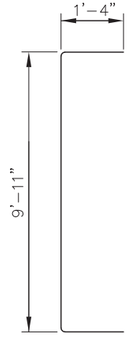


A418

BAR SERIES TABLE

MARK	NO. REQ'D	LENGTH
A407	2 SERIES OF 15	11'–4" TO 13'–3"
A408	2 SERIES OF 15	11'–4" TO 12'–4"
A409	2 SERIES OF 15	10'–5" TO 12'–4"
A410	2 SERIES OF 15	12'–3" TO 13'–3"

STATE PROJECT NUMBER

5339-00-72

NO	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORATION

STRUCTURE B-12-253

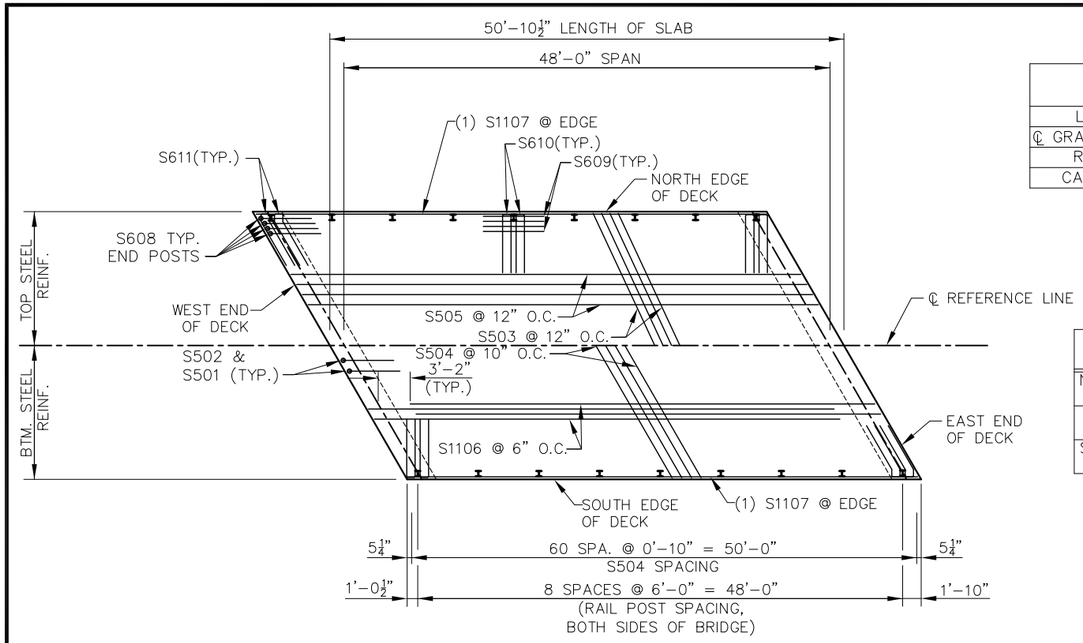
DRAWN BY BAS | PLANS CHECKED JFK

ABUTMENT DETAILS

SHEET 8 OF 10

STATE PROJECT NUMBER

5339-00-72



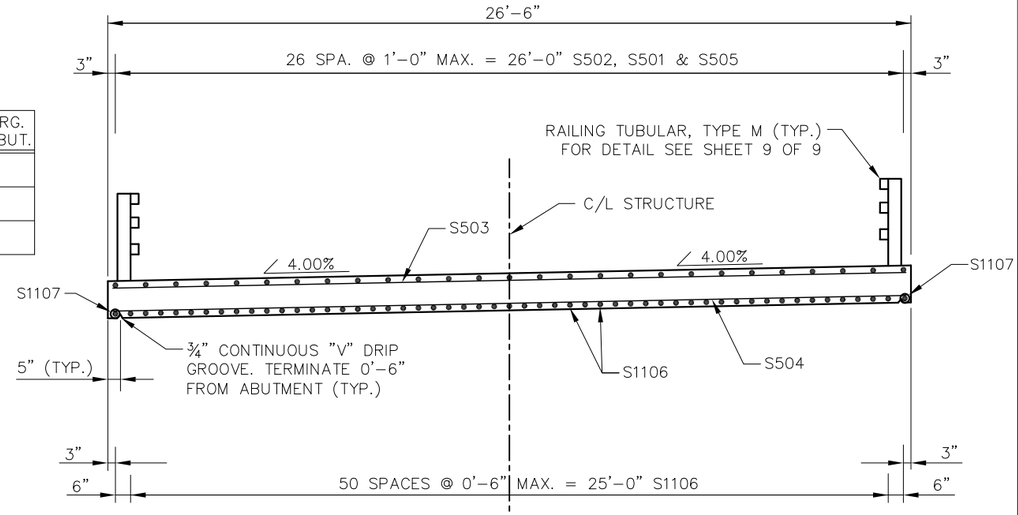
PLAN

TOP OF DECK ELEVATIONS

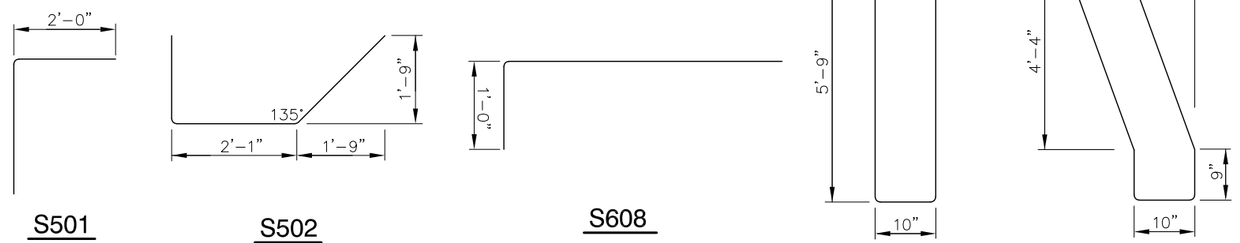
	℄ BRG. W. ABUT.	0.1 PT.	0.2 PT.	0.3 PT.	0.4 PT.	0.5 PT.	0.6 PT.	0.7 PT.	0.8 PT.	0.9 PT.	℄ BRG. E. ABUT.
L/E.O.D.	716.65	716.62	716.59	716.55	716.52	716.48	716.44	716.40	716.36	716.31	716.26
℄ GRAN GRAE RD	717.13	717.10	717.06	717.03	716.99	716.95	716.90	716.86	716.81	716.77	716.71
R/E.O.D.	717.61	717.57	717.53	717.49	717.45	717.41	717.36	717.32	717.27	717.21	717.16
CAMBER(IN.)	0	5/8"	1 3/16"	1 5/8"	1 15/16"	2"	1 15/16"	1 5/8"	1 3/16"	5/8"	0

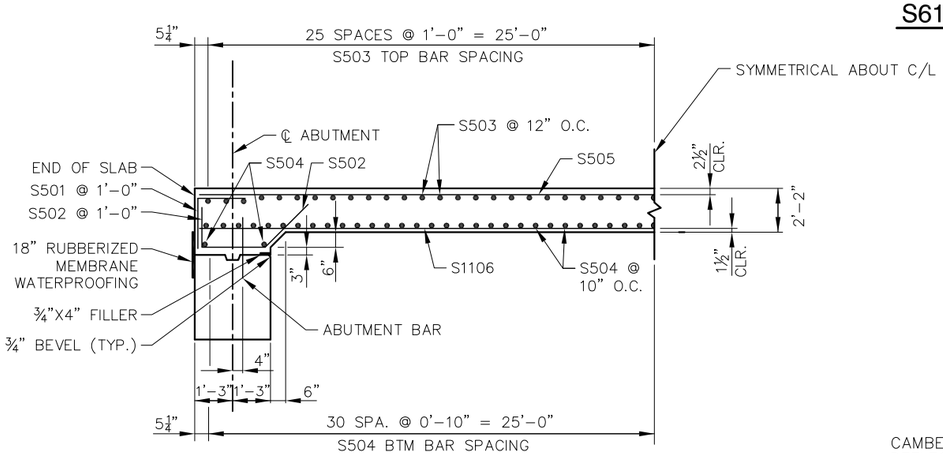
SURVEY TOP OF DECK ELEVATIONS

	℄ BRG. W. ABUT.	5/10 PT.	℄ BRG. E. ABUT.
NORTH DECK EDGE			
CROWN			
SOUTH DECK EDGE			

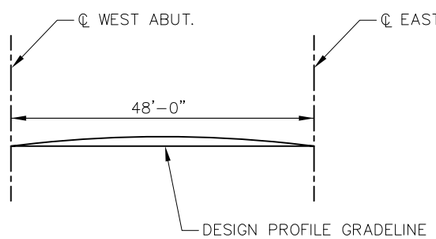


CROSS SECTION THRU ROADWAY





PARTIAL LONGITUDINAL SECTION



SLAB CAMBER DIAGRAM

CAMBER SPAN AS SHOWN TO PROVIDE FOR DEAD LOAD DEFLECTION AND FUTURE CREEP. CAMBER DOES NOT INCLUDE ALLOWANCE FOR FORM SETTLEMENT.

BILL OF BARS (SUPERSTRUCTURE) COATED 19,970 LBS.

MARK	NO. REQ'D	LENGTH	BENT	DESCRIPTION
S501	54	4'-5"	X	SLAB AT END OF DECK
S502	54	5'-10"	X	SLAB AT END OF DECK
S503	51	30'-2"		SLAB TOP TRANSVERSE
S504	65	30'-2"		SLAB BOTTOM TRANSVERSE
S505	27	50'-5"		SLAB TOP LONGIT.
S1106	51	46'-1"		SLAB BOTTOM LONGIT.
S1107	2	50'-5"		SLAB BOTTOM LONGIT. EDGE
S608	16	6'-0"	X	AT END RAIL POSTS
S609	56	6'-0"		AT INTERIOR RAIL POSTS
S610	32	12'-0"	X	AT INTERIOR RAIL POSTS
S611	4	12'-0"	X	AT END RAIL POSTS

THE FIRST DIGIT OF A 3 DIGIT MARK OR THE FIRST TWO DIGITS OF A 4 DIGIT MARK SIGNIFIES THE BAR SIZE

ALL BAR BEND DIMENSIONS ARE OUT TO OUT OF BAR.

TOP TRANSVERSE BARS IN SLAB SHALL BE SUPPORTED BY INDIVIDUAL BAR CHAIRS AT APPROXIMATELY 3'-0" CENTERS.

BOTTOM LONGITUDINAL BARS SHALL BE SUPPORTED BY CONTINUOUS BAR CHAIRS AT APPROXIMATELY 4'-0" CENTERS.

ALL SLAB THICKNESS DIMENSIONS ARE MINIMUM ANY TOLERANCES NECESSARY TO CORRECT CONSTRUCTION DISCREPENCES ARE TO BE PLUS (+).

PRIOR TO RELEASING SLAB FALSEWORK, TAKE TOP OF SLAB ELEVATIONS AT THE C/L OF ABUTMENTS AND AT 5/10 PTS. TO VERIFY CAMBER. TAKE ELEVATIONS ALONG GUTTER LINES AND CROWN OR C/L.

NO	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORATION

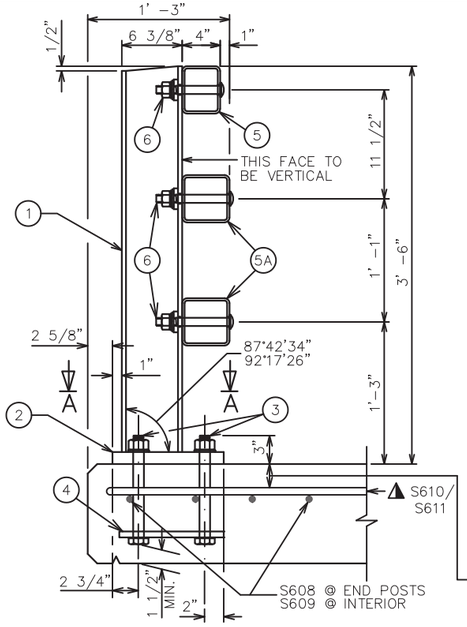
STRUCTURE B-12-253

DRAWN BY BAS | PLANS CHECKED JFK

SUPERSTRUCTURE

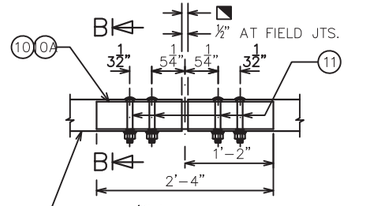
SHEET 9 OF 10

STATE PROJECT NUMBER
5339-00-72

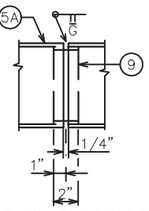


SECTION THRU RAILING ON DECK

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

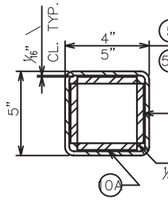


FIELD ERECTION JOINT DETAIL

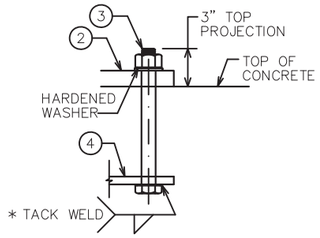


SHOP RAIL SPLICE DETAIL

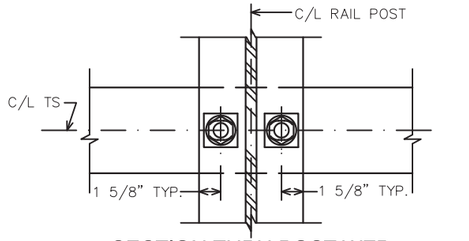
LOCATION MUST BE SHOWN ON SHOP DRAWINGS



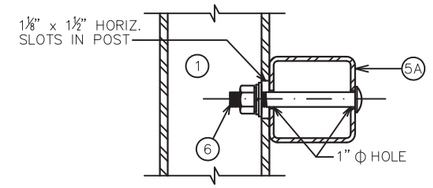
SECTION B-B



ANCHOR BOLTS



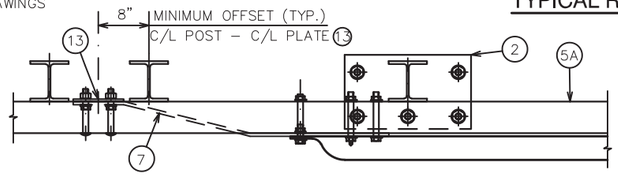
SECTION THRU POST WEB



SECTION THRU RAIL

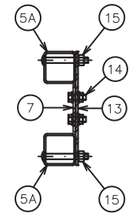
NOTE: CONNECTIONS AT LOWER RAILS SHOWN. CONNECTIONS AT TOP RAIL SIMILAR.

TYPICAL RAIL TO POST CONNECTIONS

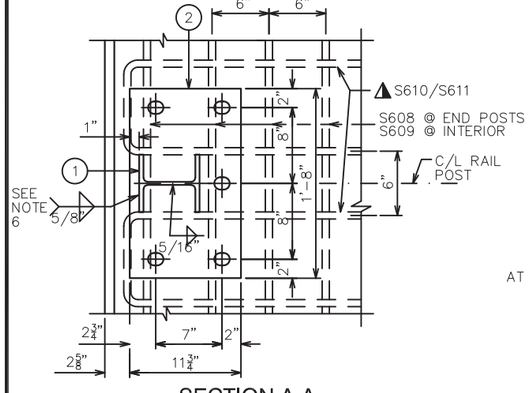


TOP VIEW AT END POST

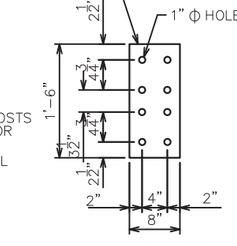
THRIE BEAM RAIL ATTACHMENT



SECTION C-C

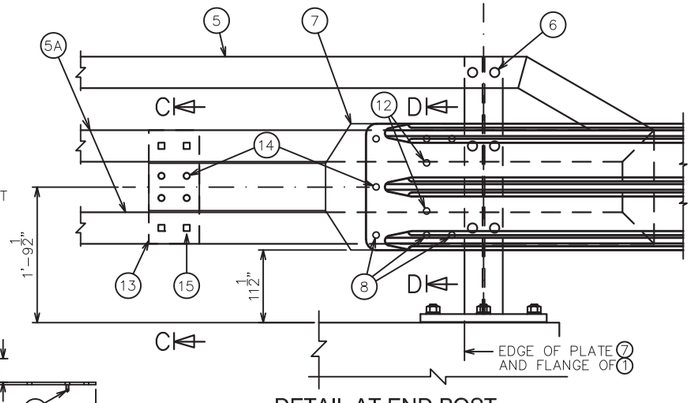


SECTION A-A



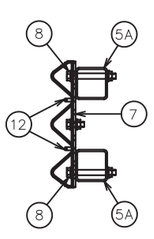
ANCHOR PLATE

AT BEAM GUARD ATTACHMENT



DETAIL AT END POST

THRIE BEAM RAIL ATTACHMENT



SECTION D-D

GENERAL NOTES

1. BID ITEM SHALL BE "RAILING TUBULAR TYPE M" WHICH INCLUDES ALL ITEMS SHOWN.
2. RAIL POST AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 50. HOLLOW RAILING STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B OR C WITH A CERTIFIED FY = 50 ksi. ANCHOR PLATES, AND SPLICE TUBE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 36.
3. THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ⅛ TURN.
4. RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF THREE (3) POSTS WITHOUT SPLICES WHERE POSSIBLE. RAILS SHALL BE SPLICED IN A PANEL OVER EXPANSION JOINTS.
5. ENDS OF TUBE SECTIONS SHALL BE SAWED. GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.
6. WELD IS THE SAME ON BOTH FLANGES. FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING.
7. FILL BOLT SLOT OPENINGS IN POST SHIMS AND PLATE NO. 2 AND CAULK AROUND PERIMETER OF PLATE NO. 2 WITH NON–STAINING GRAY NON–BITUMINOUS JOINT SEALER. STEEL POST SHIMS MAY BE USED UNDER POSTS WHERE REQ'D. FOR ALIGNMENT.
8. POST BASE PLATES SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUT.
9. ALL MATERIAL SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, ALL STEEL RAILING POSTS & STEEL TUBING SHALL BE GIVEN A NO. 6 BLAST CLEANING BY SSPC SPECIFICATIONS.
10. THIS RAILING MEETS NCHRP REPORT 350 EVALUATION CRITERIA FOR TEST LEVEL 4 (TL–4).
11. PLACE FIRST BOTTOM LONGITUDINAL BAR CLEAR OF DRIP GROOVE.

LEGEND

(1) W6 x 25 WITH 1⅛" X 1½" HORIZ. SLOTS ON EACH SIDE OF POST FOR BOLT NO. 6. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY. PLACE POST VERTICAL. PLACE POSTS NORMAL TO GRADE LINE.

(2) PLATE 1¼" x 11¾" x 1'–8" WITH 1⅜" X 1⅝" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1 AS SHOWN. SLOTS PARALLEL TO SHORT SIDE OF PLATE.

(3) ASTM A449 – 1⅛" DIA. ANCHOR BOLTS WITH NUT AND HARDENED WASHER (ALL GALVANIZED). 5 REQ'D. PER POST. THREAD 3" AND PLACE NORMAL TO PLATE NO. 2. CHAMFER TOP OF BOLTS BEFORE THREADING. USE 1'–9" LONG IN ABUTMENT WINGS. AT POSTS ON CONCRETE SLAB SUPERSTRUCTURES WHERE THE SLAB THICKNESS IS > 16" USE 1'–3" LONG. USE 10¾" LONG AT ALL OTHER LOCATIONS. (AN EQUIVALENT THREADED ROD WITH NUTS AND HARDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINGS IF REQ'D. FOR CONSTRUCTIBILITY.)

(4) ⅝" x 11" x 1'–8" ANCHOR PLATE (GALVANIZED) WITH 1³⁄₁₆" DIA. HOLES FOR ANCHOR BOLTS NO. 3

(5) TS 5 x 4 x 0.25 STRUCTURAL TUBING. ATTACH TO NO. 1 WITH NO. 6.

(5A) TS 5 x 5 x 0.25 STRUCTURAL TUBING. ATTACH TO NO. 1 WITH NO. 6.

(6) ⅞" DIA. A325 SLOTTED ROUND HEAD BOLT WITH NUT, ³⁄₁₆" X 1⅝" X 1⅝" WASHER, AND LOCK WASHER (2 REQ'D. AT EACH RAIL TO POST LOCATION.)

(7) ½" THK. BACK–UP PLATE WITH 2 – ⅞" X 1½" THREADED SHOP WELDED STUDS (NO. 12). BOLT TO RAIL AS SHOWN IN DETAIL. REQUIRED AT THRIE BEAM GUARD RAIL ATTACHMENTS ONLY. PLACE SYMMETRICALLY ABOUT TUBES NO. 5A.

(8) 1" DIA. HOLES IN PLATE NO. 7 & TUBES NO. 5A FOR ⅞" DIA. A325 BOLTS WITH HEX NUTS AND WASHERS. 6 HOLES IN TUBES AND PLATE NO. 7.

(9) SPLICE SLEEVE FABRICATED FROM ¼" PLATE. PROVIDE "SLIDING FIT".

(10) ⅜" X 3⅝" X 2'–4" PLATE. 2 PER RAIL. USED IN NO. 5 & 5A.

(10A) ⅜" X 2⅝" X 2'–4" PLATE USED IN NO. 5A. 2 PER RAIL. ⅜" X 3⅝" X 2'–4" PLATE USED IN NO. 5.

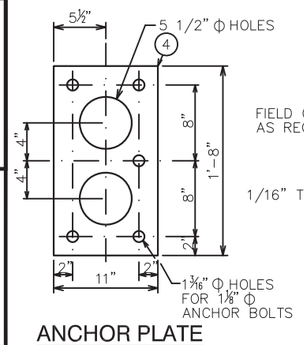
(11) ⅞" DIA. A325 ROUND HEAD BOLT WITH NUT, WASHER, AND LOCK WASHER. USE 1⁵⁄₁₆" X 1¼" LONGIT. SLOTTED HOLES AT FIELD JOINTS AND 1⁵⁄₁₆" X 2¼" MIN. LONGIT. SLOTTED HOLES AT EXP. JOINTS IN PLATE NO. 10A.

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

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

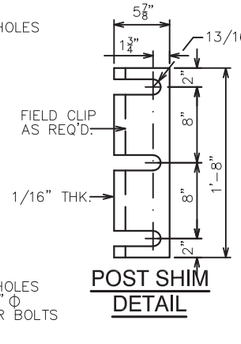
(14) ⅞" DIA. X 2" LONG A325 HEX BOLT WITH NUT AND WASHER (5 REQ'D.).

(15) 1" DIA. HOLES IN TUBES NO. 5A FOR 7/8" DIA. A325 ROUND HEAD BOLT WITH NUT, WASHER AND LOCK WASHER (4 REQ'D.). 4 HOLES IN TUBES.

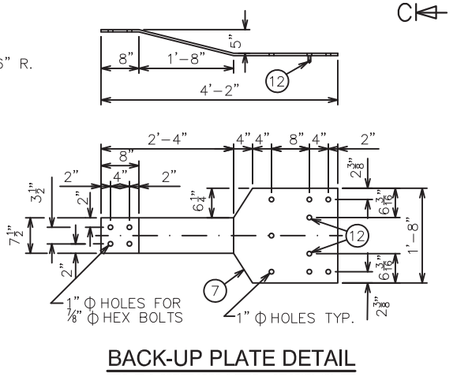


ANCHOR PLATE

AT RAIL TO DECK CONNECTION

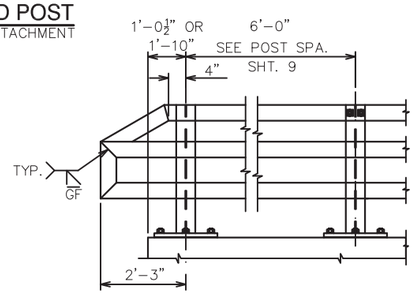


POST SHIM DETAIL



BACK-UP PLATE DETAIL

AT BEAM GUARD ATTACHMENT



PART ELEVATION OF RAILING

▲ TIE TO TOP MAT OF STEEL.

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

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

NO	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORATION

STRUCTURE B-12-253

DRAWN BY BAS | PLANS CHECKED JFK

TUBULAR STEEL RAILING TYPE M

SHEET 10 OF 10

GRAN GRAE ROAD

STATION		AREA (SF)		INCREMENTAL VOL (CY)		CUMULATIVE VOL (CY)		MASS HAUL
	FEET	COMMON	FILL	COMMON	FILL	COMMON	FILL*	
10+00		45.6	0.0					
	50.0			86.5	16.3	86.5	19.6	66.9
10+50		47.8	17.6					
	18.0			32.1	16.1	118.6	38.9	79.7
10+68		48.5	30.7					
	54.0			72.7	296.4	191.3	394.6	-203.3
11+22		24.2	265.7					
	28.0			35.3	322.4	226.5	781.4	-554.9
11+50		43.8	356.0					
	13.0			16.9	122.1	243.5	927.9	-684.4
11+63		26.5	151.1					
	8.0			3.9	22.4	247.4	954.7	707.4
11+71		0	0.0					
				247.4	795.6			

GRAN GRAE ROAD

STATION		AREA (SF)		INCREMENTAL VOL (CY)		CUMULATIVE VOL (CY)		MASS HAUL
	FEET	COMMON	FILL	COMMON	FILL	COMMON	FILL*	
12+23		0.0	88.7					
	27.0			11.1	101.7	11.1	122.0	-110.9
12+50		22.2	114.6					
	18.0			22.0	59.8	33.1	193.8	-160.6
12+68		43.9	64.9					
	32.0			43.4	48.1	76.5	251.5	-175.0
13+00		39.3	16.3					
	5.0			6.1	2.9	82.6	254.9	-172.3
13+05		36.6	14.5					
	16.0			18.7	5.3	101.3	261.3	-160.0
13+21		26.6	3.4					
	29.0			36.4	1.8	137.8	263.5	-125.8
13+50		41.2	0.0					
	50.0			89.4	0.0	227.2	263.5	-36.3
14+00		55.4	0.0					
	50.0			119.6	0.0	346.8	263.5	83.3
14+50		73.8	0.0					
	37.0			80.9	0.0	427.7	263.5	164.2
14+87		44.3	0.0					
				427.7	219.6			

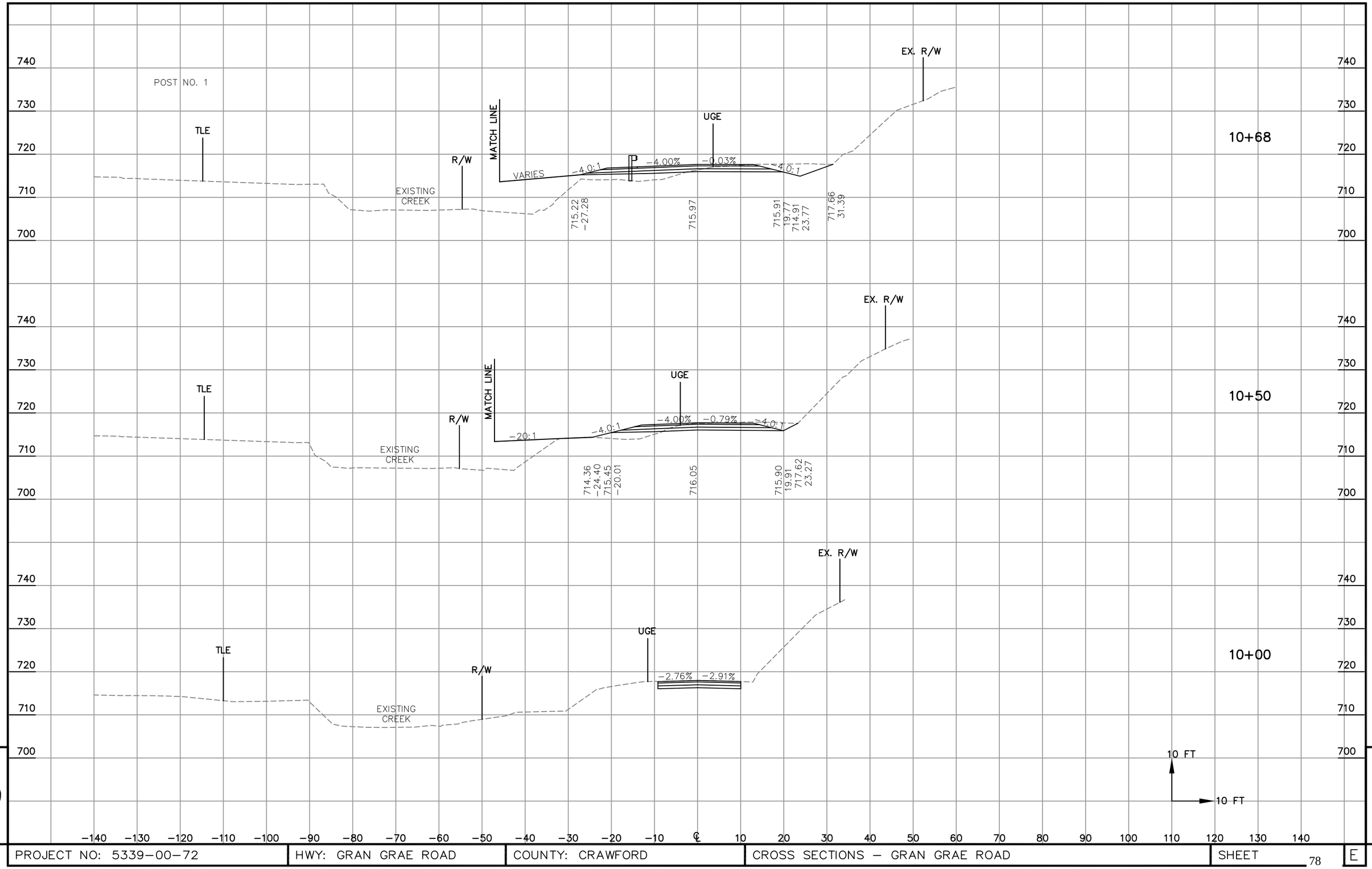
* EXPANDED FILL FACTOR = 1.20

PRIVATE ENTERANCE

STATION		AREA (SF)		INCREMENTAL VOL (CY)		CUMULATIVE VOL (CY)		MASS HAUL
	FEET	COMMON	FILL	COMMON	FILL	COMMON	FILL*	
5+00		115.8	0.0					
	25.0			113.1	0.0	113.1	0.0	113.1
5+25		128.4	0.0					
	25.0			99.4	0.0	212.5	0.0	212.5
5+50		86.3	0.0					
	25.0			45.2	19.1	257.6	22.9	234.7
5+75		11.3	41.3					
				257.6	19.1			

CREEK REALIGNMENT

STATION		AREA (SF)		INCREMENTAL VOL (CY)		CUMULATIVE VOL (CY)		MASS HAUL
	FEET	COMMON	FILL	COMMON	FILL	COMMON	FILL*	
0+00		0.0	0.0					
	50.0			105.0	151.5	105.0	181.8	-76.8
0+50		113.4	163.6					
	50.0			290.5	340.6	395.5	590.6	-195.1
1+00		200.3	204.3					
	50.0			296.6	215.6	692.0	849.3	-157.3
1+50		120.0	28.6					
	50.0			328.5	34.4	1020.6	890.6	130.0
2+00		234.8	8.5					
	34.0			147.8	5.4	1168.4	897.0	271.4
2+34		0.0	0.0					
				1168.4	747.5			



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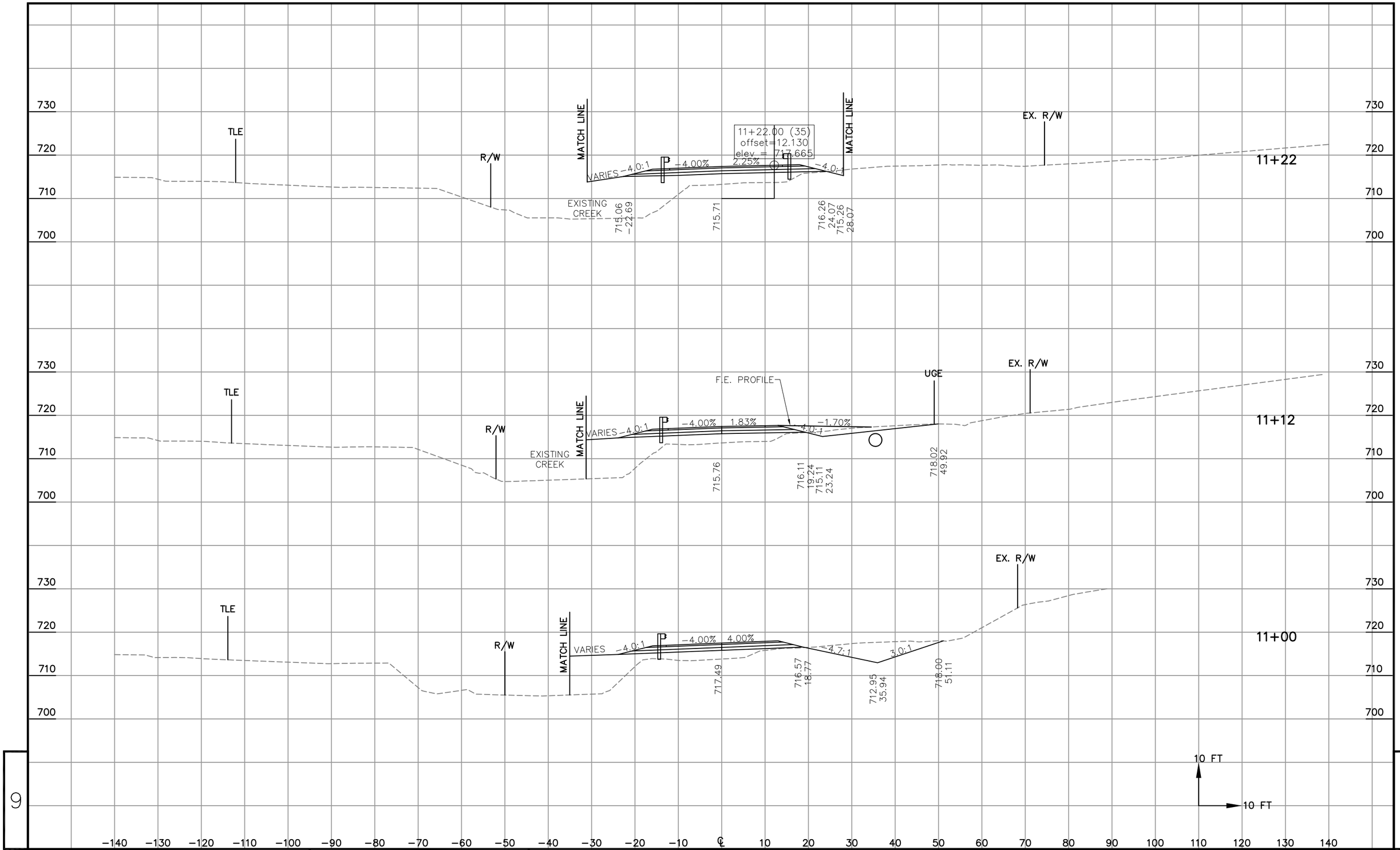
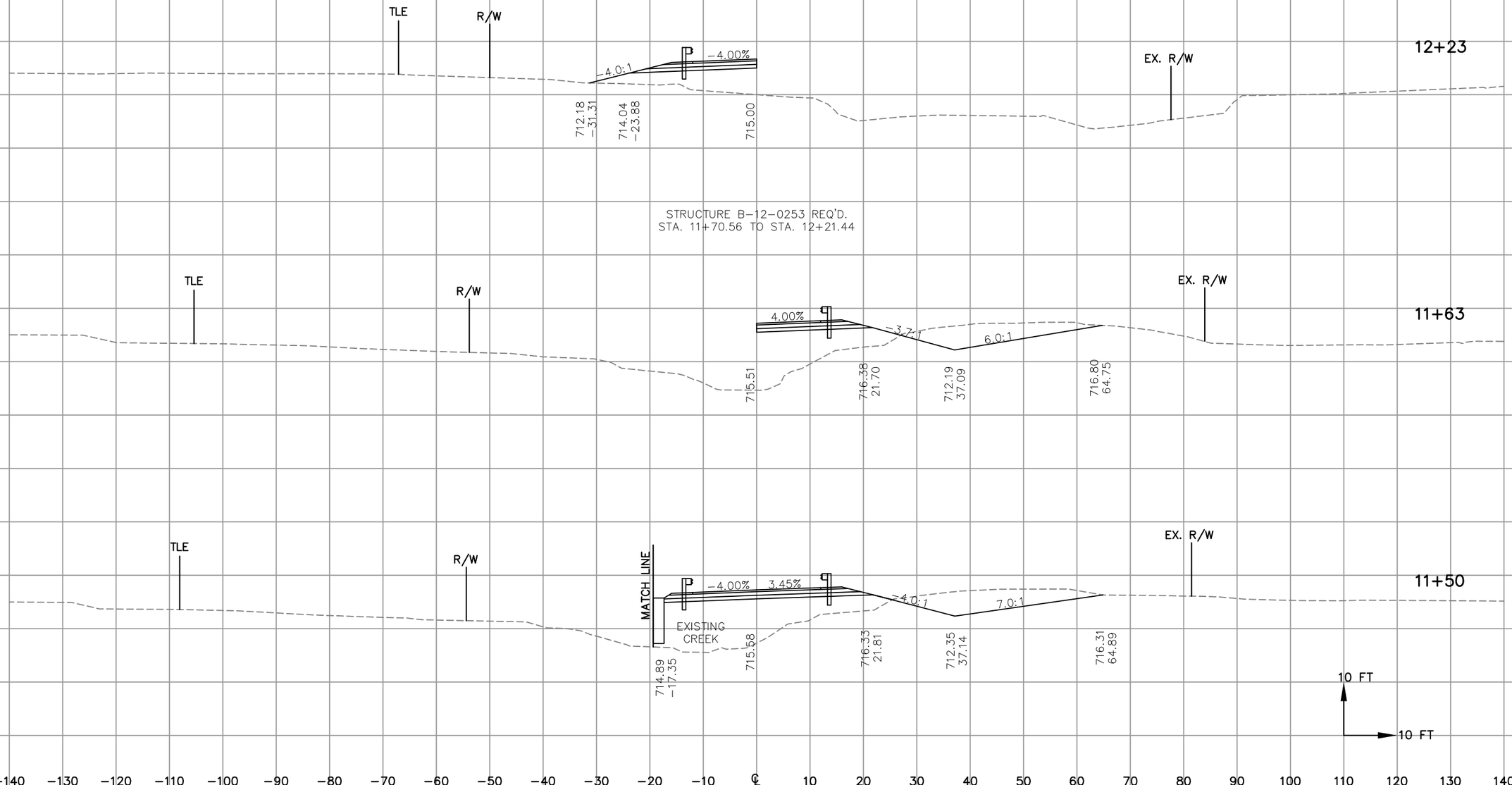
9

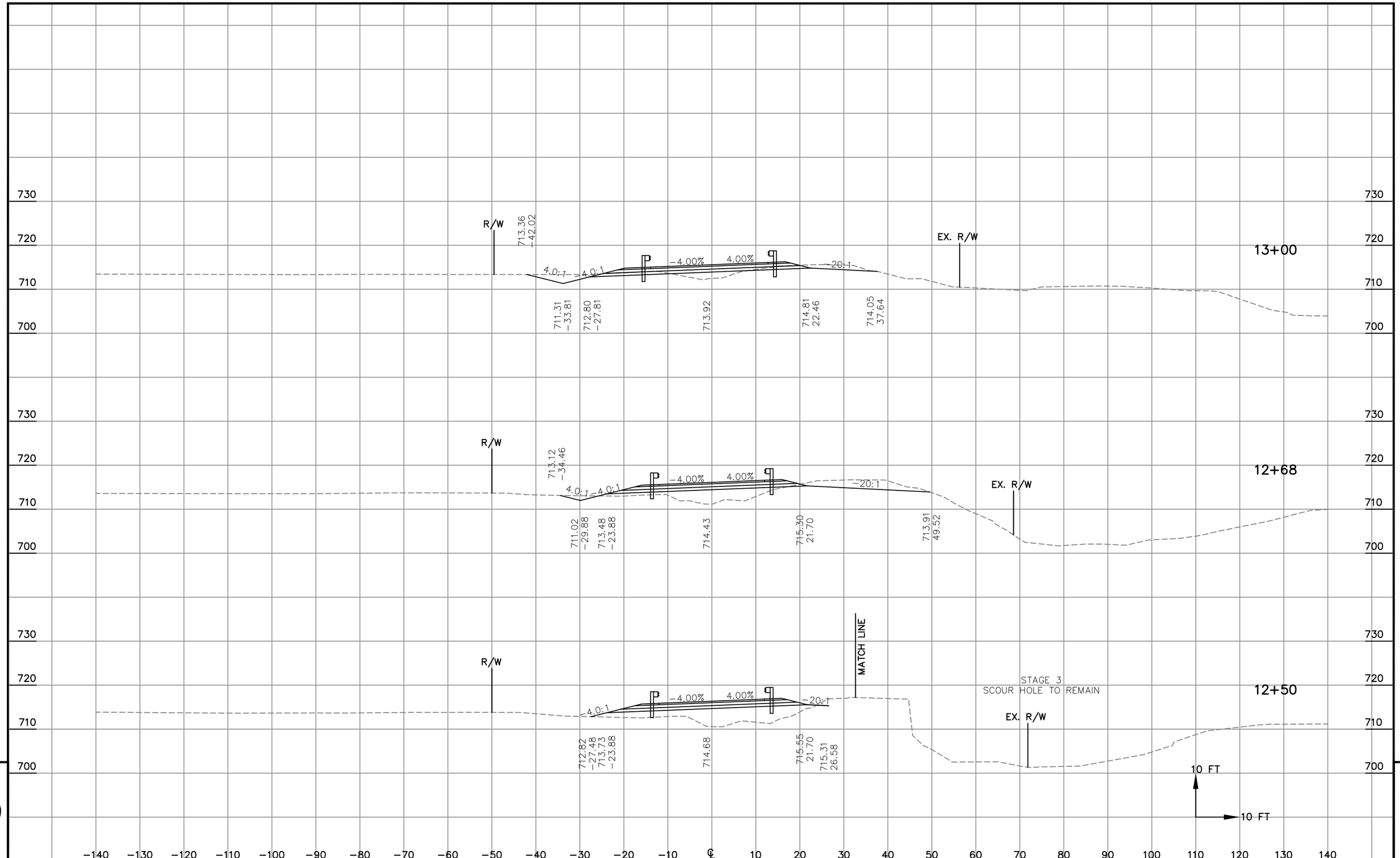
PROJECT NO: 5339-00-72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CROSS SECTIONS – GRAN GRAE ROAD	SHEET 78	E



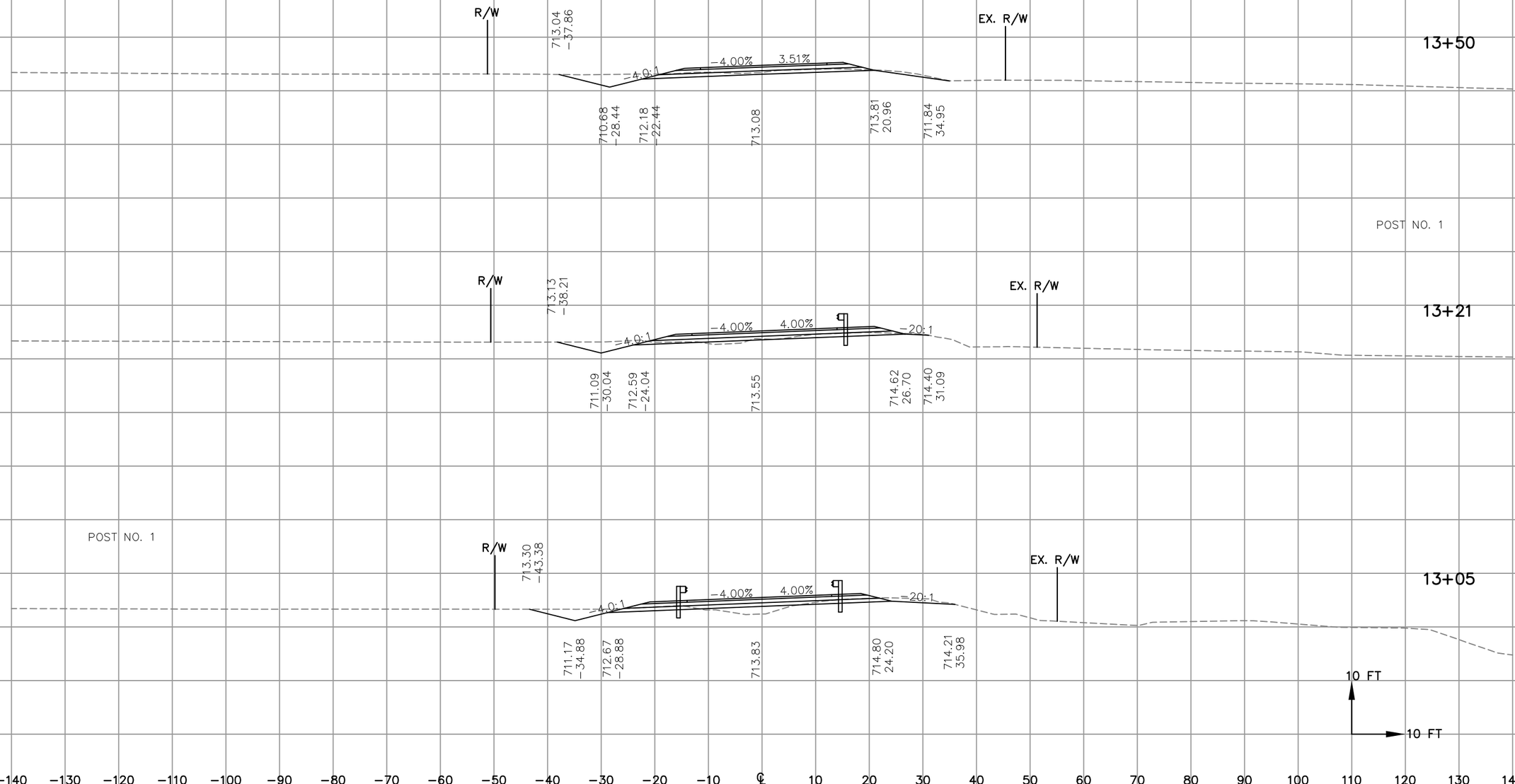
PROJECT NO: 5339-00-72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CROSS SECTIONS – GRAN GRAE ROAD	SHEET 79	E



PROJECT NO: 5339-00-72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CROSS SECTIONS – GRAN GRAE ROAD	SHEET 80	E

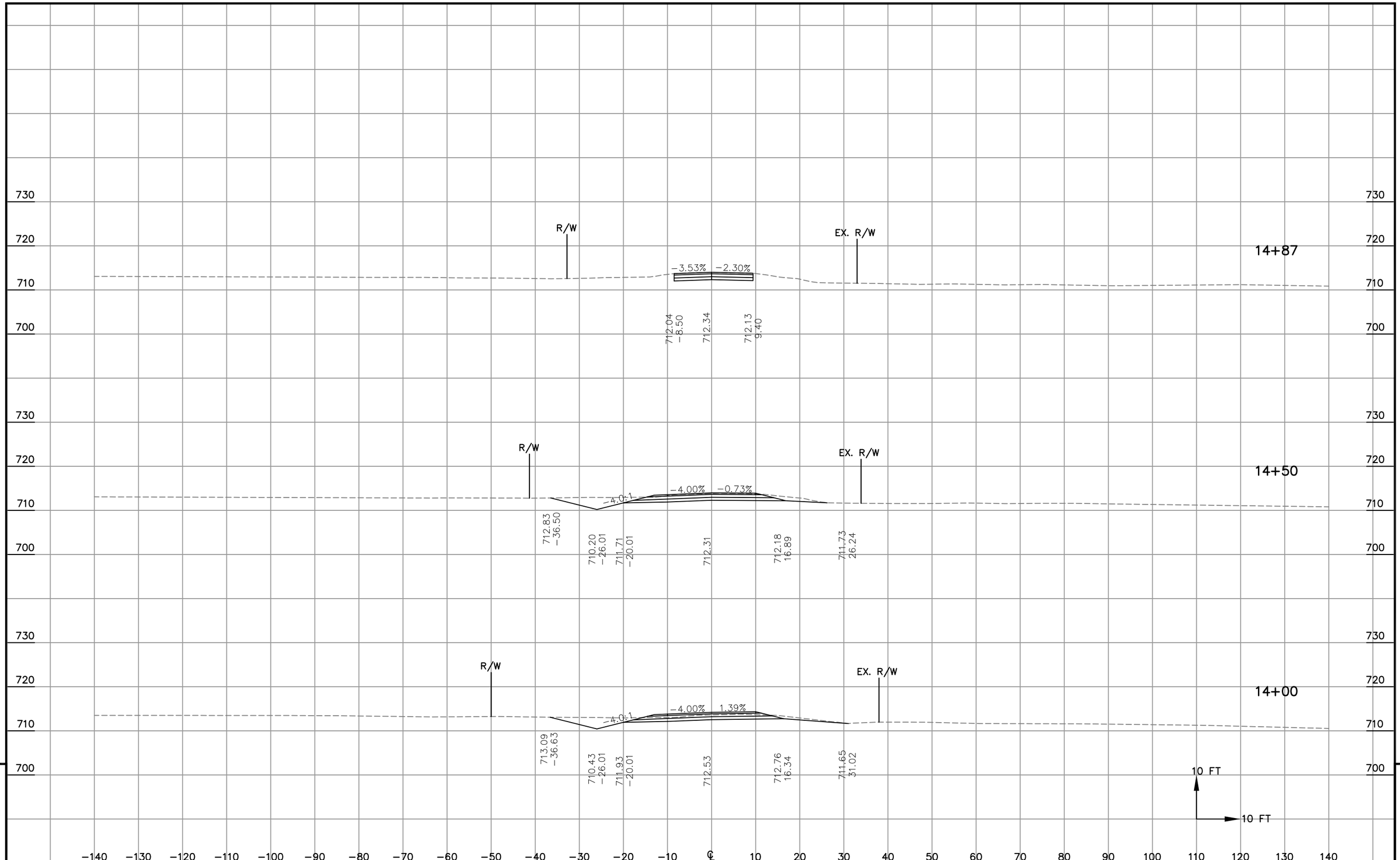


PROJECT NO: 5339-00-72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CROSS SECTIONS – GRAN GRAE ROAD	SHEET 81 E



PROJECT NO: 5339−00−72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CROSS SECTIONS − GRAN GRAE ROAD	SHEET 82 E

9 9

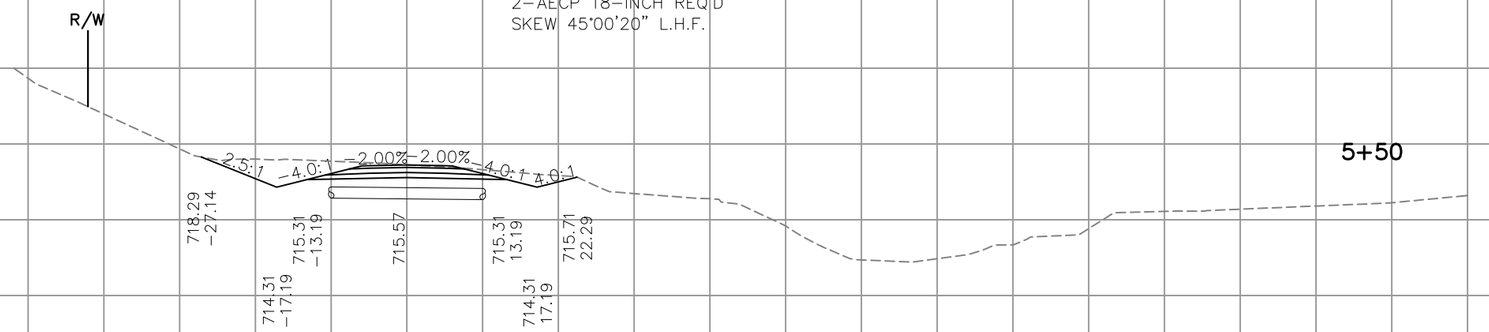


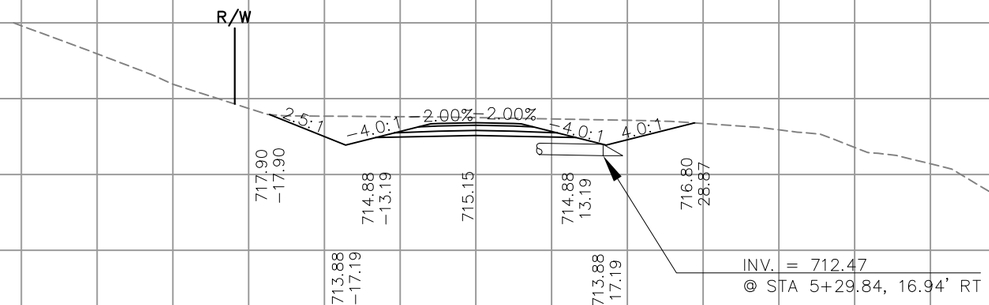
PROJECT NO: 5339-00-72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CROSS SECTIONS – GRAN GRAE ROAD	SHEET 83 E

9

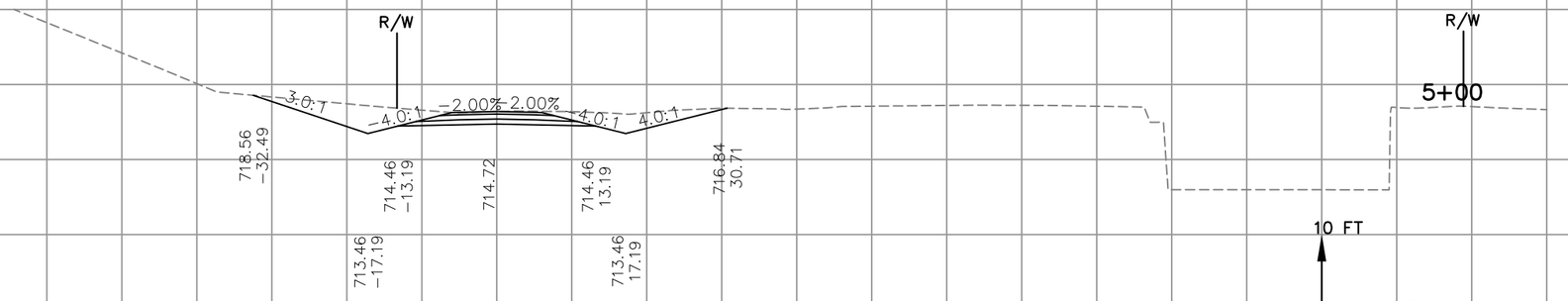
9

STA 5+50
48 LF OF CP CLASS III–A 18–INCH REQ'D
2–AECP 18–INCH REQ'D
SKEW 45°00'20" L.H.F.





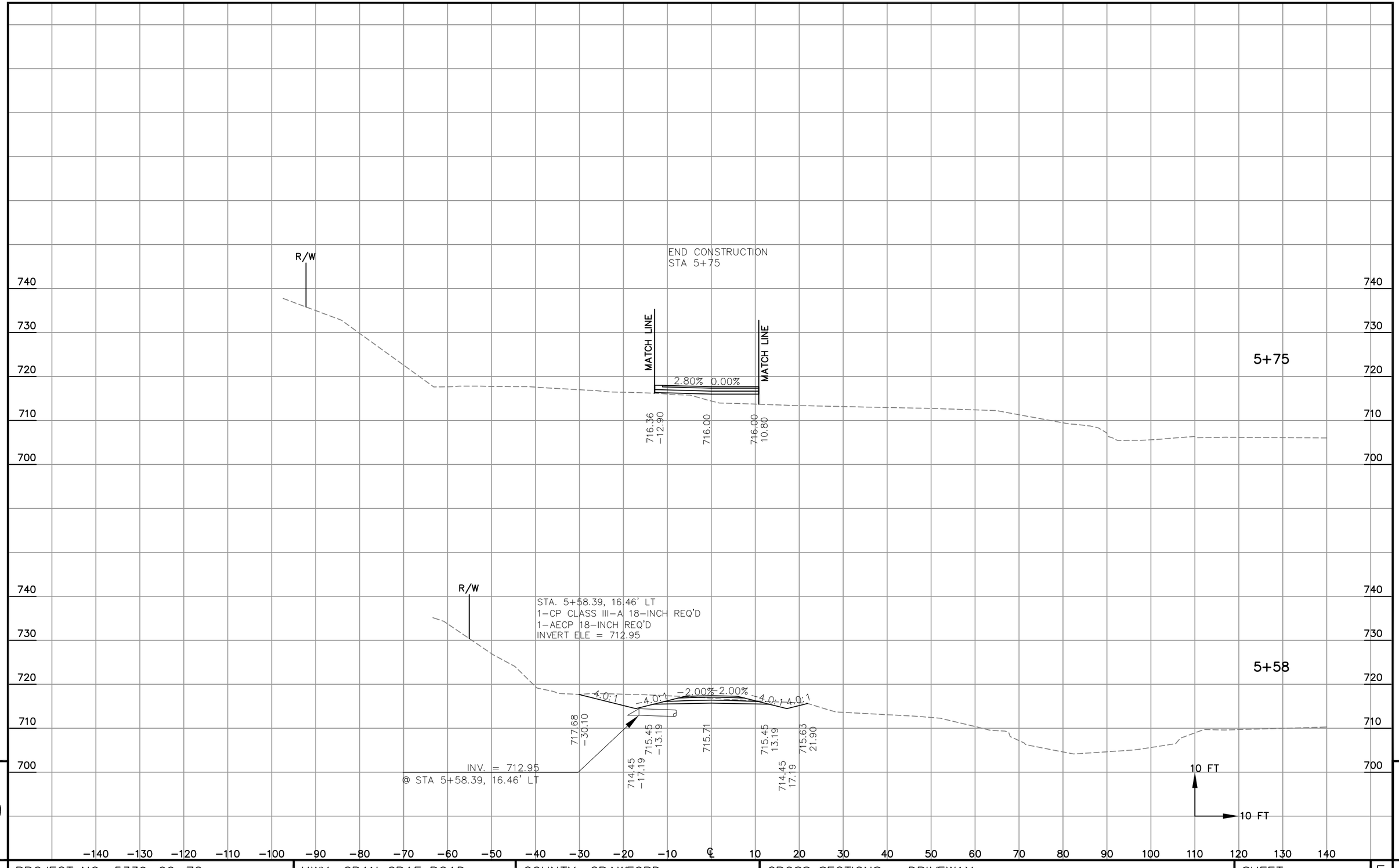
BEGIN CONSTRUCTION
STA 5+00



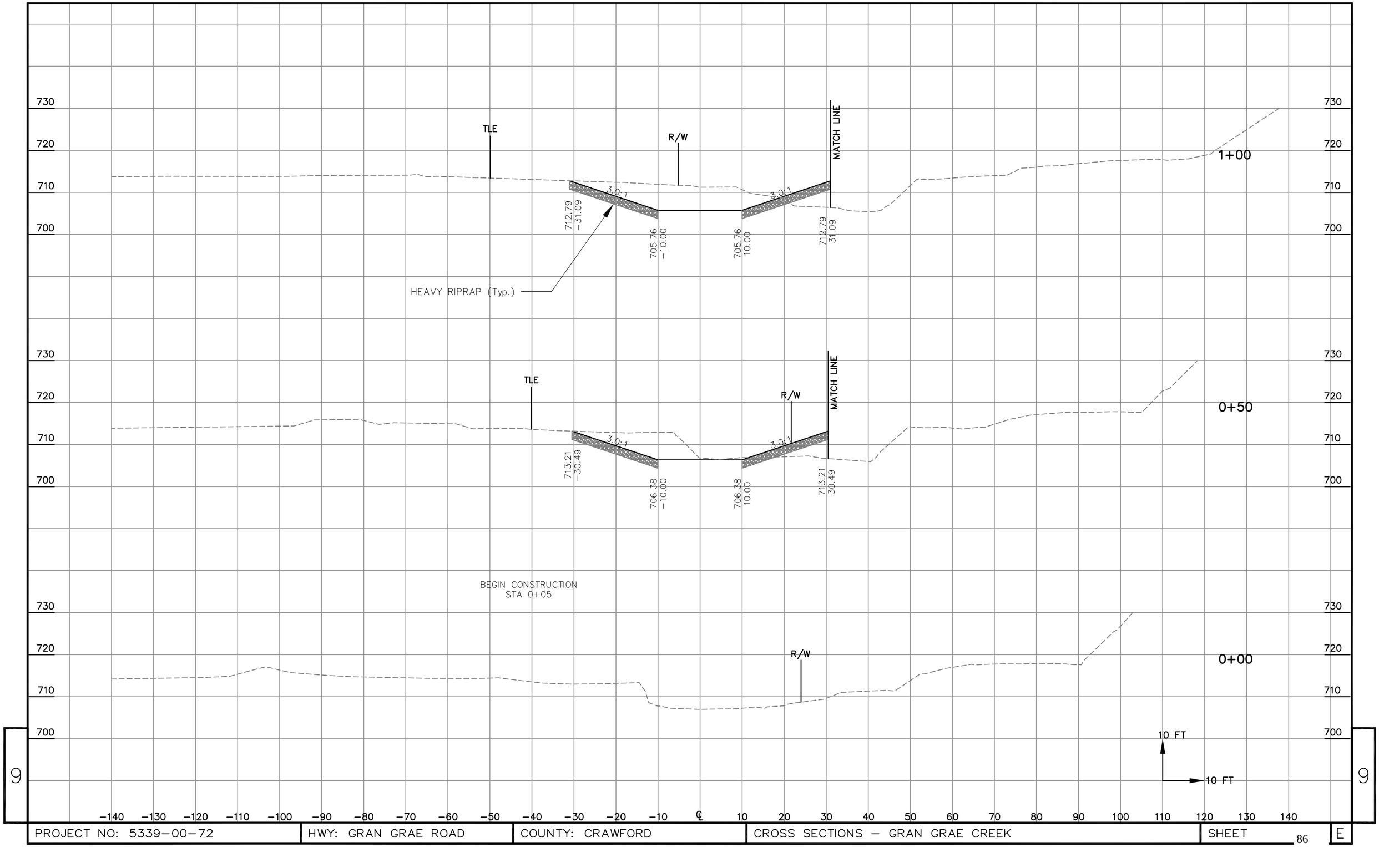
730
720
710
700

–140 –130 –120 –110 –100 –90 –80 –70 –60 –50 –40 –30 –20 –10 ℄ 10 20 30 40 50 60 70 80 90 100 110 120 130 140

PROJECT NO: 5339–00–72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CROSS SECTIONS – DRIVEWAY	SHEET 84	E



PROJECT NO: 5339-00-72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CROSS SECTIONS – DRIVEWAY	SHEET 85 E



PROJECT NO: 5339−00−72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CROSS SECTIONS − GRAN GRAE CREEK	SHEET 86	E

730
720
710
700

2+50

R/W

730
720
710
700

R/W

2+00

720
710
700

3.0:1

3.0:1

717.35
48.50

704.51
−7.00

704.51
10.00

HEAVY RIPRAP (Typ.)

730
720
710
700

TLE

R/W

R/W

1+50

730
720
710
700

3.0:1

2.5:1

705.14
−7.00

705.14
6.07

709.30
16.48

10 FT

10 FT

−140 −130 −120 −110 −100 −90 −80 −70 −60 −50 −40 −30 −20 −10 ℄ 10 20 30 40 50 60 70 80 90 100 110 120 130 140

9

9

PROJECT NO: 5339−00−72	HWY: GRAN GRAE ROAD	COUNTY: CRAWFORD	CROSS SECTIONS − GRAN GRAE CREEK	SHEET 87	E

Wisconsin Department of Transportation

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