MAD JUL 2013

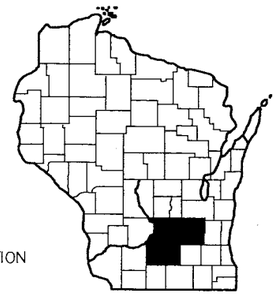
PROJECT ID: 1111-06-71
WITH: N/A

COUNTY: DANE, COLUMBIA, & DODGE

ORDER OF SHEETS

Section No.	1	Title
Section No.	2	Typical Sections & Details
Section No.	3	Estimate of Quantities
Section No.	3	Miscellaneous Quantities
~~Section No.~~	~~4~~	~~Right of Way Plat~~
Section No.	5	Plan and Profile
Section No.	6	Standard Detail Drawings
~~Section No.~~	~~7~~	~~Signs Plates~~
~~Section No.~~	~~8~~	~~Structure Plans~~
~~Section No.~~	~~9~~	~~Computer Earthwork~~
~~Section No.~~	~~9~~	~~Cross Sections~~

TOTAL SHEETS = 88



04

DESIGN DESIGNATION

A.D.T.	(2010) =	22,156
A.D.T.	=	N/A
D.H.V.	=	N/A
D.D.	=	N/A
T.	=	N/A
DESIGN SPEED	=	70 MPH
ESAL'S	=	N/A

CONVENTIONAL SYMBOLS

COUNTY LINE
CORPORATE LIMITS
PROPERTY LINE
LOT LINE
LIMITED EASEMENT
EXISTING RIGHT OF WAY
NEW RIGHT OF WAY
REFERENCE LINE
SLOPE INTERCEPT
ORIGINAL GROUND
MARSH OR ROCK PROFILE
CULVERT IN PLACE
CULVERT REQUIRED
CULVERT REQUIRED (Profile)
COMBUSTIBLE FLUIDS (UNDER PRESSURE) — CAUTION
UNDERGROUND UTILITIES
GAS — G
ELECTRIC — E
TELEPHONE — T
SERVICE PEDESTAL
CABLE MARKER
POWER POLE
TELEPHONE POLE
RAILROADS
MARSH
WOODED AREA

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

MADISON - FOND DU LAC

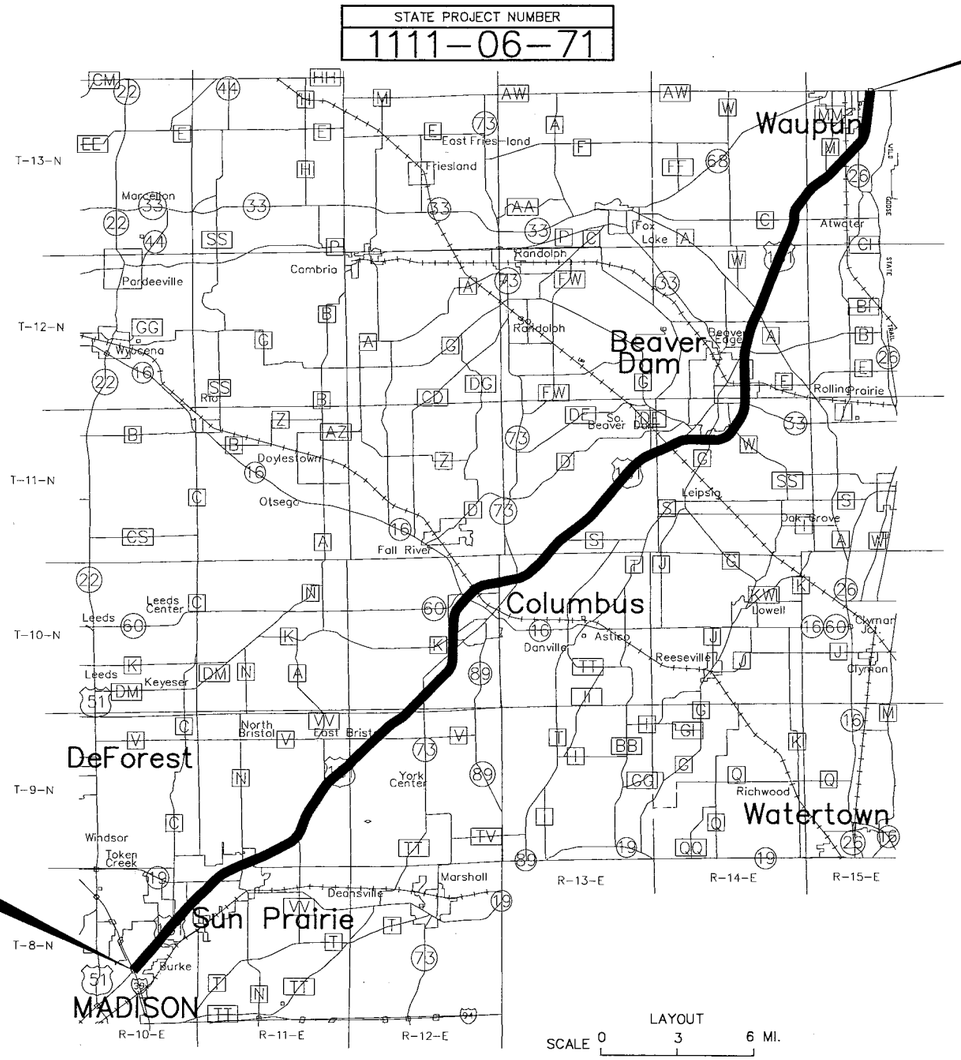
IH 39 TO FOND DU LAC COUNTY LINE

USH 151

DANE, COLUMBIA, AND DODGE COUNTY

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
1111-06-71	WISC 2013330	1

STATE PROJECT NUMBER
1111-06-71



LAYOUT
SCALE 0 3 6 MI.

TOTAL NET LENGTH OF CENTERLINE = 0.00 MI.

COORDINATES ON THIS PLAN ARE REFERENCED TO THE WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), DANE, COLUMBIA, DODGE COUNTY.

ORIGINAL PLANS PREPARED BY

WESTBROOK ASSOCIATED ENGINEERS, INC.
SPRING GREEN, WISCONSIN 53588

WISCONSIN
ALEX M. BROMLEY
E-37718
PRAIRIE DU SAC, WI
PROFESSIONAL ENGINEER

5-13-13 (Date)
(Signature)

WESTBROOK Associated Engineers, Inc.
619 EAST HOXIE STREET
P.O. BOX 429
SPRING GREEN, WI 53588
PHONE (608) 588-7866
FAX (608) 588-7954

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY
Surveyor
Designer — WESTBROOK ASSOCIATED ENGINEERS
Project Manager — MAHESH SHRESTHA
Regional Examiner
Regional Supervisor — SCOTT LAWRY
C.O. Examiner

APPROVED FOR THE DEPARTMENT
DATE 1-16-13 (SIGNATURE)

E

STANDARD ABBREVIATIONS

AADT	AVERAGE ANNUAL DAILY TRAFFIC	L	LENGTH OF CURVE	REINF.	REINFORCED
AGG.	AGGREGATE	L.F.	LINEAR FEET	REQ'D.	REQUIRED
B.A.D.	BASE AGGREGATE DENSE	L.H.F.	LEFT HAND FORWARD	RT.	RIGHT
B.M.	BENCH MARK	L.S.	LUMP SUM	R/W	RIGHT-OF-WAY
℄ OR CL	CENTERLINE	LT.	LEFT	RD.	ROAD
CR.	CRUSHED	MAX.	MAXIMUM	RDWY.	ROADWAY
C.T.H.	COUNTY TRUNK HIGHWAY	MIN.	MINIMUM	S.	SOUTH
CWT.	HUNDREDWEIGHT	N.	NORTH	SE	SOUTHEAST
C.Y.	CUBIC YARD	NOR.	NORMAL	SHRK.	SHRINKAGE
D.H.	DOUBLE HEADED	PAV'T.	PAVEMENT	S.R.	SIDE ROAD
D.H.V.	DESIGN HOURLY VOLUME	P.C.	POINT OF CURVE	STD.	STANDARD
DIR.	DIRECTED	P.I.	POINT OF INTERSECTION	S.T.H.	STATE TRUNK HIGHWAY
E.	EAST	P.E.	PRIVATE ENTRANCE	STA.	STATION
COR.	CORNER	P.K.	PARKER-KALON NAIL	S.Y.	SQUARE YARD
EL. OR ELEV.	ELEVATION	ℙ OR PL	PROPERTY LINE	T	TANGENT LENGTH OF CURVE
F.E.	FIELD ENTRANCE	P.P.	POWER POLE	℡	TRANSIT LINE
FT.	FOOT (FEET)	PROJ.	PROJECT	V	DESIGN SPEED
GAL.	GALLON	P.T.	POINT OF TANGENCY	V.C.	VERTICAL CURVE
H.W.	HIGH WATER	PVMT.	PAVEMENT	VAR.	VARIABLE
IN.	INCHES	R.	RADIUS	W.	WEST
K	SIGHT DISTANCE	R.R.	RAILROAD		

WisDNR LIAISON

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
3911 FISH HATCHERY ROAD
FITCHBURG, WI 53711

ATTN: ERIC HEGGELUND
PHONE: (608) 275-3301
Eric.Heggelund@wisconsin.gov

CONSULTANT LIAISON

WESTBROOK ASSOCIATED ENGINEERS, INC.
619 E. HOXIE STREET
P.O. BOX 429
SPRING GREEN, WI 53588

ATTN: Alex Bromley, P.E.
PHONE: (608) 219-0718
abromley@westbrookeng.com

GENERAL NOTES

MULCH ALL SLOPES AS DIRECTED BY THE ENGINEER.

SILT FENCE TO BE PLACED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. SILT FENCE SHALL BE IN PLACE PRIOR TO CONSTRUCTION.

DISTURBED AREAS WITHIN THE RIGHT-OF-WAY, EXCEPT THE DRIVING LANES AND THE SHOULDERS, ARE TO BE FERTILIZED, SEEDED AND MULCHED.

THE CONTRACTOR SHALL CONTACT DIGGERS HOTLINE TO LOCATE ALL UTILITIES DISCUSSED IN THE SPECIAL PROVISIONS BEFORE STARTING ANY WORK. THERE MAY BE OTHER UTILITIES WITHIN THE PROJECT AREA THAT NOT ARE IDENTIFIED WITHIN THE CONTRACT.

BEARINGS ORIENTED TO THE WISCONSIN COUNTY COORDINATES SYSTEM.

EROSION CONTROL FEATURES AS SHOWN ON THE PLANS ARE SUGGESTED LOCATIONS. EXACT LOCATIONS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.

LOCATION, NUMBER AND SPACING OF SIGNS AND DEVICES, AS SHOWN ON THE PLANS, SHALL BE ADJUSTED TO FIT FIELD CONDITIONS.

NO TREES OR SHRUBS SHALL BE REMOVED UNLESS SUCH TREES OR SHRUBS HAVE BEEN DESIGNATED FOR REMOVAL BY THE ENGINEER.

PRIOR TO LANE CLOSURE THE CONTRACTOR SHALL PROVIDE THE ENGINEER, THE SHERIFF AND THE STATE HIGHWAY PATROL WITH THE NAME AND NUMBER OF A LOCAL PERSON TO CONTACT IN CASE OF EMERGENCY.

PRIOR TO PLACEMENT OF STEEL PLATE BEAM GUARD, THE SHOULDERS SHALL BE IN PLACE, SHAPED AND COMPACTED.

ALL ACCESS ONTO AND OFF OF THE PROJECT LIMITS IS THE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE AT THE CONTRACTOR'S EXPENSE.

COMPACT ASPHALTIC SURFACE SAFETY ISLANDS TO MATCH EXISTING COMPACTION.

UTILITIES

ANR Pipeline Company - Gas/Petroleum
W3925 Pipeline Ln
Eden, WI 53019
ATTN: Lawrence Huber
(920) 477-2235
lawrence_huber@transcanada.com

AT&T Legacy - Communication Line
866 Rock Creek Rd.
Plano, IL 60545
ATTN: Carl Donahue
(715) 833-2054
cdonahue@att.com

Adams-Columbia Electric Cooperative-Electricity
W6290 HWY 33
Pardeeville, WI 53954
ATTN: Jon Congdon
(608) 429-2882
jcongdon@acecwi.com

Burnett Sanitary District #1-Sewer
P.O. Box 112
Burnett, WI 53922
ATTN: Don Peachey
(920) 689-2211

Charter Communications-Communication Line
165 Knights Way
Fond Du Lac, WI 54935
ATTN: Bruce Henry
(920) 907-7720
bruce.henry@chartercom.com

Wisconsin Power and Light
Suite 1000
4902 N Biltmore Lane
Madison, WI 53718
ATTN: Jason Hogan
(608) 458-4871
jasonhogan@alliantenergy.com

ATC Management, Inc.-Electricity
801 O'keefe Rd.
De Pere, WI 54115-6113
ATTN: Mike Olsen
(920) 338-6582
molsen@atcllc.com

City of Beaver Dam-Water
205 S Lincoln Ave.
Beaver Dam, WI 53916
ATTN: Ritchie Piltz
(920) 887-4600

City of Madison Engineering - Sewer
210 Martin Luther King Jr. Blvd, Rm 115
Madison, WI 53703
ATTN: Rob Phillips
(608) 266-4751
rphillips@cityofmadison.com

Enbridge Energy - Gas/Petroleum
1500 W Main St.
Griffith, IN 46319
ATTN: Mike Price
(219) 922-7015
mike.price@enbridge.com

We-Energies
333 W. Everett St, A299
Milwaukee, WI 53203
ATTN: Dan Sande
(414) 221-4578
Dan.Sande@we-energies.com

Koch Pipeline Company L.P. - Gas/Petroleum
P.O. Box 64596
St. Paul, MN 55164-0596
ATTN: Julie Maher
(651) 438-1563
julie.maher@kochpipeline.com

Lake Windsor Sanitary District - Sewer
6696 Chestnut Circle
Windsor, WI 53598
ATTN: Larry Kampe
(608) 846-3798

Madison Gas and Electric Company
P.O. Box 1231
Madison, WI 53701-1231
ATTN: Tim Statz
(608) 252-4727
tstatz@mge.com

Madison Water Utility - Water
119 E. Olin Ave.
Madison, WI 53713-1431
ATTN: Dennis Cawley
(608) 266-4651
dcawley@cityofmadison.com

Wisconsin Department of Transportation
Ste. 300
433 W. St. Paul Ave.
Milwaukee, WI 53203-3007
ATTN: Jeff Madson
(414) 225-3723
Jeffrey.Madson@dot.wi.gov

Sun Prairie Utilities
125 W. Main St.
Sun Prairie, WI 53590
ATTN: Rick Wicklund
(608) 837-5500
rwicklund@sunprairieutilities.com

DIGGERS HOTLINE

Call 811 3 Work Days Before You Dig
or Toll Free (800) 242-8511
Hearing Impaired TDD (800) 542-2289
www.DiggersHotline.com

** DENOTES UTILITIES THAT ARE NOT DIGGERS HOTLINE MEMBERS

SITE	INTERSECTION	CONSTRUCTION DESCRIPTION
SB 1	STH 26	BRIDGE APPROACH OUTSIDE
SB 2	STH 26	BRIDGE APPROACH MED.
SB 3	N. OF CTH M	BULLNOSE
SB 4, 5 & 6	CTH A	BRIDGE APPROACHES
SB 7	INDUSTRIAL DR	BARRIER WALL & BULLNOSE
SB 8	S. CENTER RD.	BARRIER WALL & BULLNOSE
SB 9 & 10	STH 73	BRIDGE APPROACHES
SB 11	DUAL RAMPS	BRIDGE APPROACHES
SB 12	AMERICAN PARKWAY	BRIDGE APPROACHES

SB 1 & 2
M.L. 46.1

SB 3
M.L. 45.2

SB 4, 5 & 6
M.L. 38.2

SB 7
M.L. 36.0

SB 8
M.L. 31.8

SB 9 & 10
M.L. 16.1

SB 11 & 12
M.L 1.1

BEGIN PROJECT
M.L. 0.0

END PROJECT

NB 32 & 33
M.L. 45.9

NB 31
M.L. 43.9

NB 29 & 30
M.L. 38.1

NB 28
M.L. 36.7

NB 26 & 27
M.L. 35.9

NB 25
M.L. 35.2

NB 23 & 24
M.L. 33.3

NB 22
M.L. 31.7

NB 21
M.L. 22.5

NB 19 & 20
M.L. 22.1

NB 18
M.L. 21.9

NB 16 & 17
M.L. 20.7

NB 14 & 15
M.L. 20.3

NB 12 & 13
M.L. 19.8

NB 11
M.L. 19.1

NB 9 & 10
M.L. 16.0

NB 8
M.L. 14.7

NB 7
M.L. 13.5

NB 6
M.L. 8.4

NB 2, 3, 4, & 5
M.L. 0.6, 0.7, 0.9, & 1.0

NB 1
M.L. 0.0

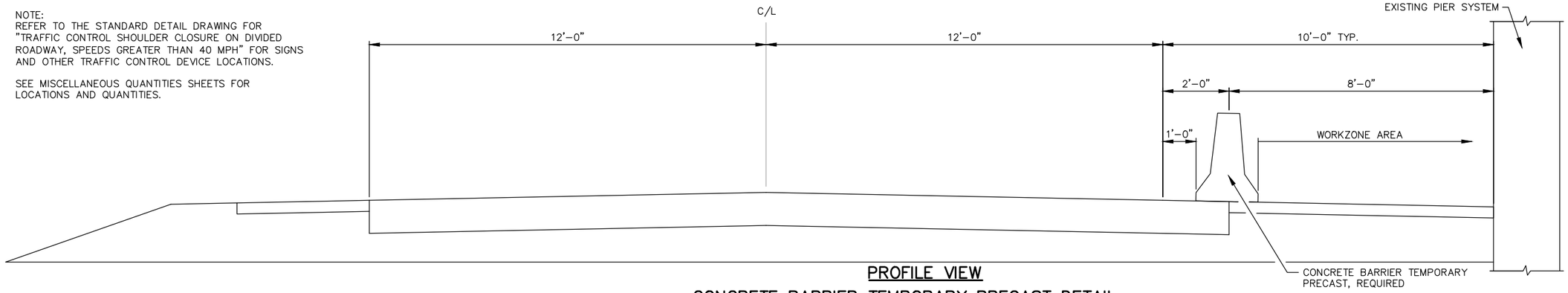
SITE	INTERSECTION	CONSTRUCTION DESCRIPTION
NB 1	IH 39/90/94	BULLNOSE
NB 2, 3 & 4	AMERICAN PARKWAY	BRIDGE APPROACHES
NB 5	DUAL RAMPS	BRIDGE APPROACHES
NB 6	CTH VV	BULLNOSE
NB 7	CTH V	BULLNOSE
NB 8	DEANSVILLE ROAD	BULLNOSE
NB 9 & 10	STH 73	BRIDGE APPROACHES
NB 11	CTH K	BULLNOSE
NB 12 & 13	MAPLE AVE.	BRIDGE APPROACHES
NB 14 & 15	STH 16/60	BRIDGE APPROACHES
NB 16 & 17	R.R. TRACKS	BRIDGE APPROACHES
NB 18	OLD HWY 73	BULLNOSE
NB 19 & 20	CRAWFISH RIVER	BRIDGE APPROACHES
NB 21	HIGHWAY 73	BULLNOSE
NB 22	S. CENTER RD.	BARRIER WALL
NB 23 & 24	CTH W	BRIDGE APPROACHES
NB 25	CHT E	BULLNOSE
NB 26 & 27	INDUSTRIAL DR.	BARRIER WALL & BULLNOSE
NB 28	CTH B	BULLNOSE
NB 29 & 30	CTH A	BRIDGE APPROACHES
NB 31	S. OF CTH M	BULLNOSE
NB 32 & 33	STH 26	BRIDGE APPROACHES

PROJECT NO: 1111-06-71	HWY: USH 151	COUNTY: DANE, COLUMBIA, & DODGE	PROJECT OVERVIEW	SHEET	E

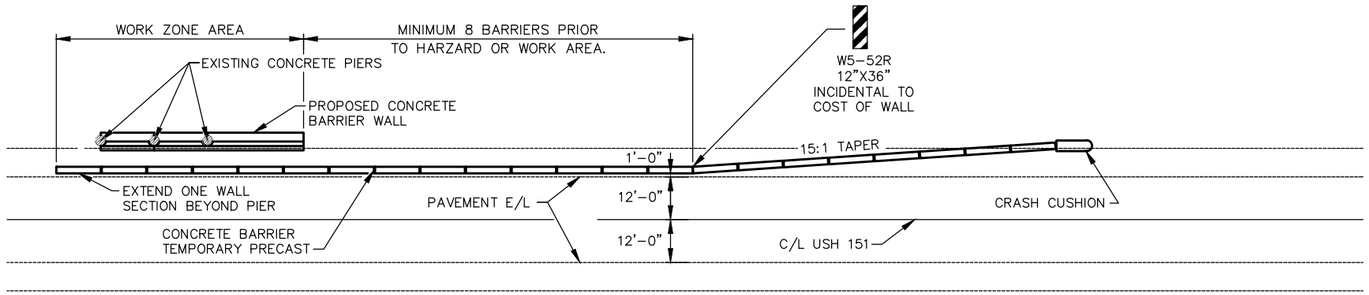
FILE NAME: G:\00-PROJECT FILES\2012\12035 USH 151\CAD\12035_201 po.dwg PLOT DATE: Jan 23, 2013 PLOT BY: andyc0 PLOT SCALE: ROTATION:

NOTE:
REFER TO THE STANDARD DETAIL DRAWING FOR "TRAFFIC CONTROL SHOULDER CLOSURE ON DIVIDED ROADWAY, SPEEDS GREATER THAN 40 MPH" FOR SIGNS AND OTHER TRAFFIC CONTROL DEVICE LOCATIONS.

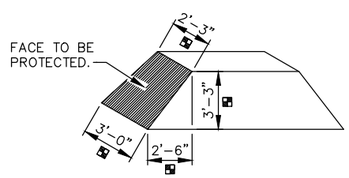
SEE MISCELLANEOUS QUANTITIES SHEETS FOR LOCATIONS AND QUANTITIES.



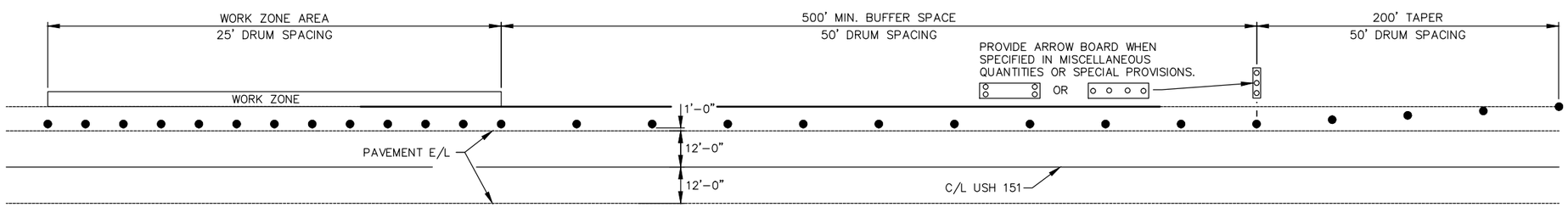
PROFILE VIEW
CONCRETE BARRIER TEMPORARY PRECAST DETAIL
FOR INSTALLATION OF PROPOSED CONCRETE BARRIER 'VERTICAL FACE' AT PIER LOCATIONS.



PLAN VIEW
CONCRETE BARRIER TEMPORARY PRECAST DETAIL
FOR INSTALLATION OF PROPOSED CONCRETE BARRIER 'VERTICAL FACE' AT PIER LOCATIONS.
(CONCRETE BARRIER TEMPORARTY PRECAST LOCATIONS: NB 22, SB 8, NB 26, AND SB 7. ADDITIONAL INFORMATION PROVIDED ON STRUCTURE SHEETS.)



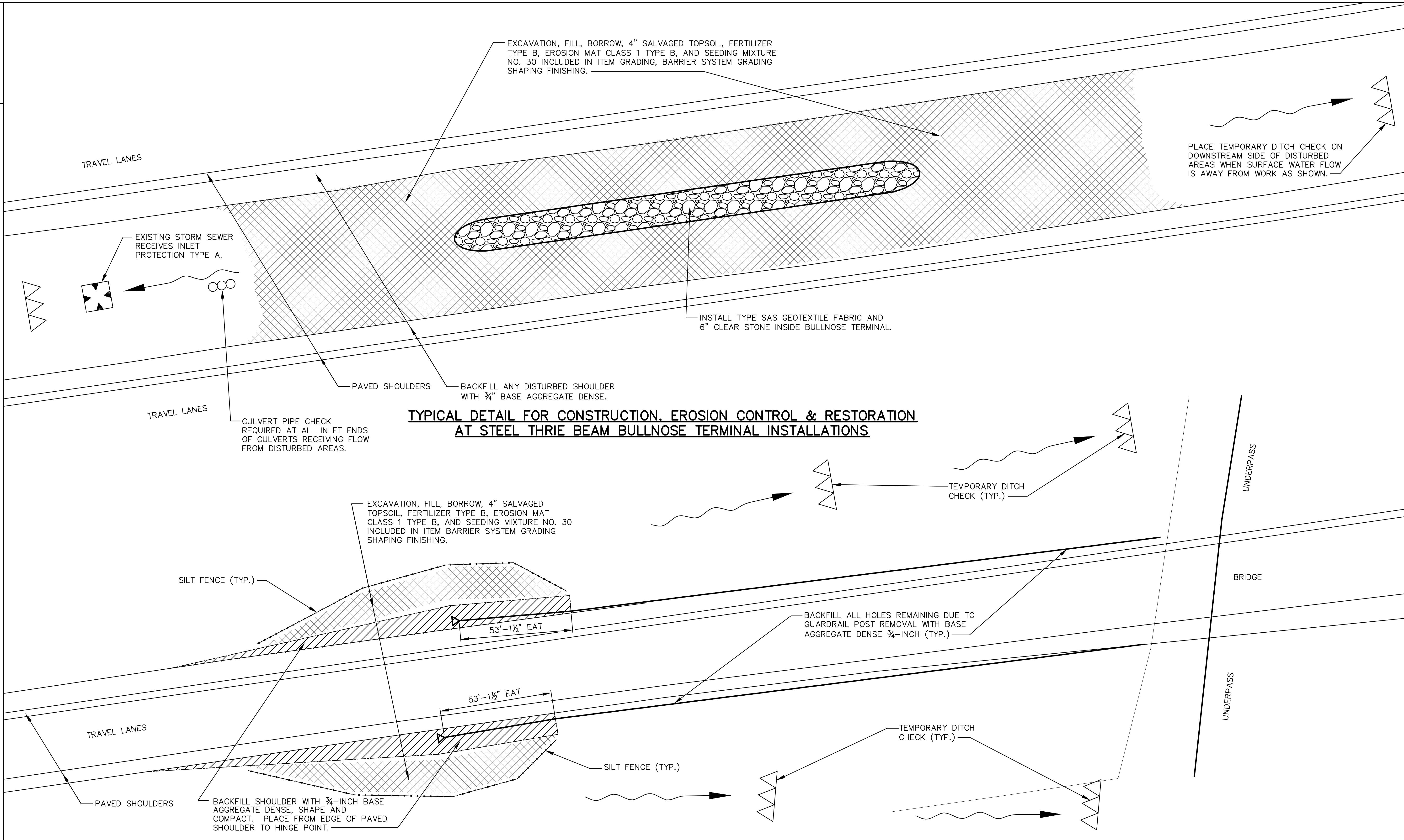
CONCRETE BASE
(NB 2)
FIELD VERIFY DIMENSION.



PLAN VIEW
SHOULDER CLOSURE FOR INCOMPLETE GUARDRAIL SYSTEMS
(TO BE USED ANY TIME A GUARDRAIL SYSTEM IS INCOMPLETE DIRECTLY ADJACENT TO A LIVE LANE)

PROJECT NO: 1111–06–71	HWY: USH 151	COUNTY: DANE, COLUMBIA & DODGE	CONSTRUCTION DETAILS	SHEET	E

FILE NAME: G:\00–PROJECT FILES\2012\12035 USH 151\CAD\12035_203 constr_details.dwg PLOT DATE: Jan 23, 2013 PLOT BY: andyc0 PLOT SCALE: ROTATION:

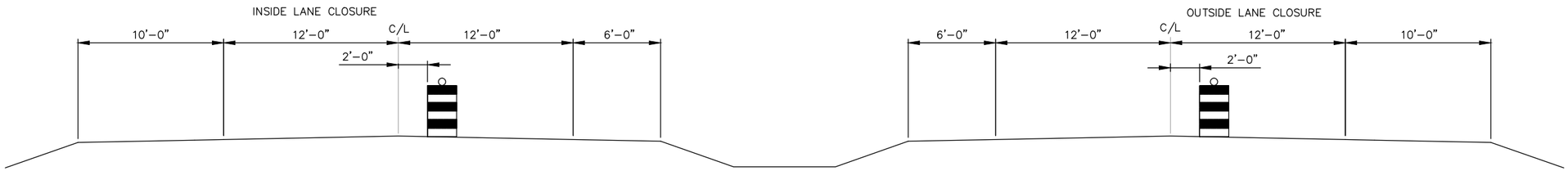


EXCAVATION, FILL, BORROW, 4" SALVAGED TOPSOIL, FERTILIZER TYPE B, EROSION MAT CLASS 1 TYPE B, AND SEEDING MIXTURE NO. 30 INCLUDED IN ITEM GRADING, BARRIER SYSTEM GRADING SHAPING FINISHING.
TRAVEL LANES
PLACE TEMPORARY DITCH CHECK ON DOWNSTREAM SIDE OF DISTURBED AREAS WHEN SURFACE WATER FLOW IS AWAY FROM WORK AS SHOWN.
EXISTING STORM SEWER RECEIVES INLET PROTECTION TYPE A.
INSTALL TYPE SAS GEOTEXTILE FABRIC AND 6" CLEAR STONE INSIDE BULLNOSE TERMINAL.
PAVED SHOULDERS
BACKFILL ANY DISTURBED SHOULDER WITH ¾" BASE AGGREGATE DENSE.
TRAVEL LANES
CULVERT PIPE CHECK REQUIRED AT ALL INLET ENDS OF CULVERTS RECEIVING FLOW FROM DISTURBED AREAS.
TYPICAL DETAIL FOR CONSTRUCTION, EROSION CONTROL & RESTORATION AT STEEL THRIE BEAM BULLNOSE TERMINAL INSTALLATIONS
TEMPORARY DITCH CHECK (TYP.)
UNDERPASS
EXCAVATION, FILL, BORROW, 4" SALVAGED TOPSOIL, FERTILIZER TYPE B, EROSION MAT CLASS 1 TYPE B, AND SEEDING MIXTURE NO. 30 INCLUDED IN ITEM BARRIER SYSTEM GRADING SHAPING FINISHING.
SILT FENCE (TYP.)
BRIDGE
53'-1½" EAT
BACKFILL ALL HOLES REMAINING DUE TO GUARDRAIL POST REMOVAL WITH BASE AGGREGATE DENSE ¾-INCH (TYP.)
53'-1½" EAT
UNDERPASS
TRAVEL LANES
TEMPORARY DITCH CHECK (TYP.)
SILT FENCE (TYP.)
PAVED SHOULDERS
BACKFILL SHOULDER WITH ¾-INCH BASE AGGREGATE DENSE, SHAPE AND COMPACT. PLACE FROM EDGE OF PAVED SHOULDER TO HINGE POINT.

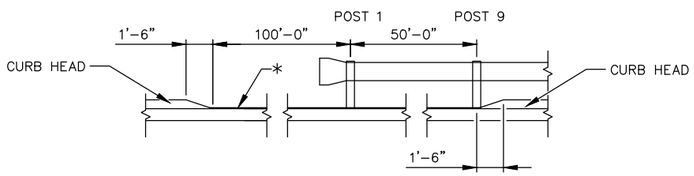
TYPICAL DETAIL FOR CONSTRUCTION, EROSION CONTROL & RESTORATION AT STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL INSTALLATIONS

PROJECT NO: 1111-06-71	HWY: USH 151	COUNTY: DANE, COLUMBIA & DODGE	CONSTRUCTION DETAILS	SHEET	E

2

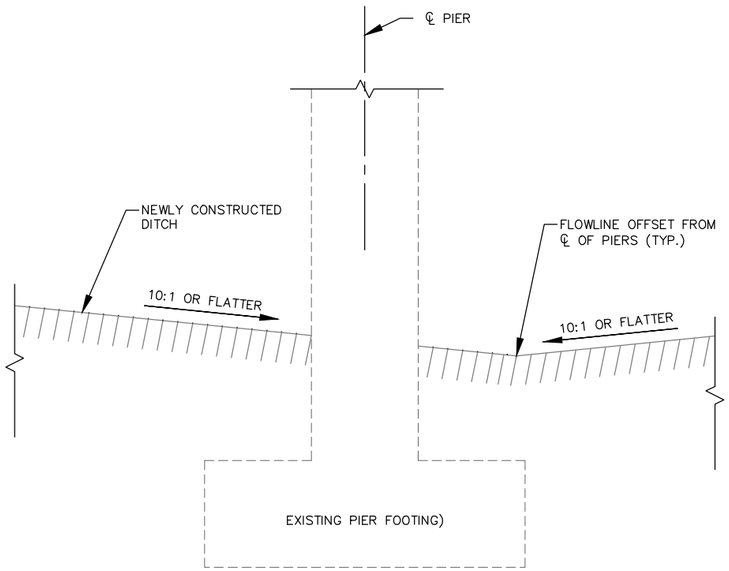


LANE CLOSURE DETAIL

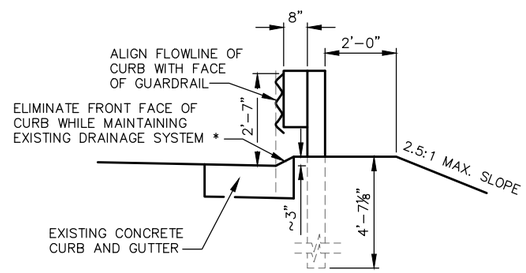


PROFILE CURB CUT AT EAT & CRASH CUSHION LOCATIONS

*MAINTAIN EXISTING DRAINAGE PATTERNS.



TYPICAL GRADING AT PIER SYSTEMS FOR BULLNOSE INSTALLATIONS.



PROFILE CURB CUT THROUGH THRIE BEAM LOCATIONS

*CURB MODIFICATIONS SHALL BE CONSTRUCTED TO MAINTAIN SMOOTH TRANSITIONS THROUGHOUT CURB LENGTH INCLUDING START/STOP POINTS

DATE 15MAY13 — E S T I M A T E O F Q U A N T I T I E S

LINE NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	1111-06-71 QUANTITY
0010	204.0110	REMOVING ASPHALTIC SURFACE	SY	100.000	100.000
0020	204.0157	REMOVING CONCRETE BARRIER	LF	200.000	200.000
0030	213.0100	FINISHING ROADWAY (PROJECT) 01. 1111-06-71	EACH	1.000	1.000
0040	305.0110	BASE AGGREGATE DENSE 3/4-INCH	TON	665.000	665.000
0050	305.0120	BASE AGGREGATE DENSE 1 1/4-INCH	TON	40.000	40.000
0060	312.0110	SELECT CRUSHED MATERIAL	TON	80.000	80.000
0070	465.0105	ASPHALTIC SURFACE	TON	12.000	12.000
0080	465.0305	ASPHALTIC SURFACE SAFETY ISLANDS	TON	40.000	40.000
0090	521.0118	CULVERT PIPE CORRUGATED STEEL 18-INCH	LF	60.000	60.000
0100	521.1618	APRON ENDWALLS FOR CULVERT PIPE SLOPED SIDE DRAINS STEEL 18-INCH 10 TO 1	EACH	3.000	3.000
0110	603.8000	CONCRETE BARRIER TEMPORARY PRECAST DELIVERED	LF	1,650.000	1,650.000
0120	603.8125	CONCRETE BARRIER TEMPORARY PRECAST INSTALLED	LF	1,650.000	1,650.000
0130	604.0500	SLOPE PAVING CRUSHED AGGREGATE	SY	100.000	100.000
0140	612.0206	PIPE UNDERDRAIN UNPERFORATED 6-INCH	LF	300.000	300.000
0150	614.0010	BARRIER SYSTEM GRADING SHAPING FINISHING	EACH	51.000	51.000
0160	614.0220	STEEL THRIE BEAM BULLNOSE TERMINAL	EACH	21.000	21.000
0170	614.0230	STEEL THRIE BEAM	LF	2,425.000	2,425.000
0180	614.0805	CRASH CUSHIONS PERMANENT LOW MAINTENANCE	EACH	1.000	1.000
0190	614.0905	CRASH CUSHIONS TEMPORARY	EACH	5.000	5.000
0200	614.0920	SALVAGED RAIL	LF	15,150.000	15,150.000
0210	614.0925	SALVAGED GUARDRAIL END TREATMENTS	EACH	31.000	31.000
0220	614.2300	MGS GUARDRAIL 3	LF	8,975.000	8,975.000
0230	614.2500	MGS THRIE BEAM TRANSITION	LF	1,240.000	1,240.000
0240	614.2610	MGS GUARDRAIL TERMINAL EAT	EACH	31.000	31.000
0250	614.2620	MGS GUARDRAIL TERMINAL TYPE 2	EACH	2.000	2.000
0260	619.1000	MOBILIZATION	EACH	1.000	1.000
0270	628.1504	SILT FENCE	LF	6,800.000	6,800.000
0280	628.1520	SILT FENCE MAINTENANCE	LF	6,800.000	6,800.000
0290	628.7005	INLET PROTECTION TYPE A	EACH	10.000	10.000
0300	628.7504	TEMPORARY DITCH CHECKS	LF	1,056.000	1,056.000
0310	628.7555	CULVERT PIPE CHECKS	EACH	3.000	3.000
0320	633.0500	DELINEATOR REFLECTORS	EACH	12.000	12.000
0330	633.1000	DELINEATOR BRACKETS	EACH	12.000	12.000
0340	642.5001	FIELD OFFICE TYPE B	EACH	1.000	1.000
0350	643.0200	TRAFFIC CONTROL SURVEILLANCE AND MAINTENANCE (PROJECT) 01. 1111-06-71	DAY	61.000	61.000
0360	643.0300	TRAFFIC CONTROL DRUMS	DAY	22,092.000	22,092.000
0370	643.0420	TRAFFIC CONTROL BARRICADES TYPE III	DAY	1,440.000	1,440.000
0380	643.0715	TRAFFIC CONTROL WARNING LIGHTS TYPE C	DAY	1,440.000	1,440.000
0390	643.0800	TRAFFIC CONTROL ARROW BOARDS	DAY	308.000	308.000
0400	643.0900	TRAFFIC CONTROL SIGNS	DAY	1,352.000	1,352.000
0410	643.1050	TRAFFIC CONTROL SIGNS PCMS	DAY	14.000	14.000
0420	645.0140	GEOTEXTILE FABRIC TYPE SAS	SY	2,780.000	2,780.000
0430	690.0150	SAWING ASPHALT	LF	400.000	400.000
0440	SPV.0090	SPECIAL 01. PROFILE CURB CUT	LF	510.000	510.000
0450	SPV.0090	SPECIAL 02. 51-INCH VERTICAL CONCRETE BARRIER	LF	154.000	154.000
0460	SPV.0090	SPECIAL 03. 51-INCH VERTICAL CONCRETE BARRIER TRANSITION	LF	88.000	88.000
0470	SPV.0195	SPECIAL 01. CLEAR STONE	TON	870.000	870.000

3

LOCATION	ITEM NO.		
	521.0118	612.0206	521.1618
	CULVERT PIPE CORRUGATED STEEL 18–INCH	PIPE UNDERDRAIN UNPERFORATED 6–INCH	APRON ENDWALLS FOR CULVERT PIPE SLOPED SIDE DRAINS STEEL 18–INCH 10 TO 1
	LF	LF	EACH
NB 7		100	
NB 21	30		2
SB 3	30		1
UNDISTRIBUTED		200	
TOTALS	60	300	3

MINIMUM THICKNESS TABLE

SIZE (INCHES)	STEEL (INCH)	ALUMINUM (INCH)
18	0.064	0.060

LOCATION	ITEM NO.		
	204.0110	465.0105	465.0305
	REMOVING ASPHALTIC SURFACE	ASPHALTIC SURFACE	ASPHALTIC SURFACE SAFETY ISLANDS
	SY	TON	TONE
NB 1	100		40
NB 22		3	
NB 26		3	
SB 7		3	
SB 8		3	
TOTALS	100	12	40

LOCATION	ITEM NO.
	SPV.0090 SPECIAL 01.
	PROFILE CURB CUT
	LF
NB 2	150
NB 3	40
NB 5	20
NB 13	10
NB 17	10
NB 23	20
NB 29	10
NB 30	20
NB 32	20
NB 33	20
SB 11	190
TOTALS	510

LOCATION								
	305.0120	312.0110	603.8000	603.8125	614.0905	633.0500	633.100	690.0150
	BASE AGGREGATE DENSE 1¼–INCH	SELECT CRUSHED MATERIAL	CONCRETE BARRIER TEMPORARY PRECAST DELIVERED	CONCRETE BARRIER TEMPORARY PRECAST INSTALLED	CRASH CUSHIONS TEMPORARY	DELINEATOR REFLECTORS	DELINEATOR BRACKETS	SAWING ASPHALT
	TON	TON	LF	LF	EACH	EACH	EACH	LF
NB 2			250	250	1			
NB 22	10	20	350	350	1	3	3	100
SB 8	10	20	350	350	1	3	3	100
NB 26	10	20	350	350	1	3	3	100
SB 7	10	20	350	350	1	3	3	100
TOTALS	40	80	1650	1650	5	12	12	400

* NOTE: SEE TABLE 'ESTIMATED INCIDENTAL QUANTITIES FOR BARRIER SYSTEM GRADING SHAPING FINISHING' FOR INCIDENTAL ITEMS.

** NOTE: THE CRASH TEST CONDITION IS TL–3, THE OBJECT MARKING PATTERN IS OM–3R, AND THE AREA REQUIREMENTS ARE: N=6, L–28, F=2.

LOCATION	ITEM NO.										
	305.0110	* 614.0010	614.0220	614.0230	** 614.0805	614.0920	614.0925	614.2300	614.2500	614.2610	614.2620
	BASE AGGREGATE DENSE ¾–INCH	BARRIER SYSTEM GRADING SHAPING FINISHING	STEEL THRIE BEAM BULLNOSE TERMINAL	STEEL THRIE BEAM	CRASH CUSHIONS PERMANENT LOW MAINTENANCE	SALVAGED RAIL	SALVAGED GUARDRAIL END TREATMENTS	MGS GUARDRAIL 3	MGS THRIE BEAM TRANSITION	MGS GUARDRAIL TERMINAL EAT	MGS GUARDRAIL TERMINAL TYPE 2
	TON	EACH	EACH	LF	EACH	LF	EACH	LF	LF	EACH	EACH
NB 1			2	675		920					
NB 2		1			1	100	2				
NB 3	20	1				490	1	387.5	39.5	1	
NB 4	5					110	2	325	8.15		1
NB 5	20	1				110	1	225	39.5	1	
NB 6		2	2	125		350					
NB 7		2	2	275		450					
NB 8		2	2	150		350					
NB 9	20	1				370	1	225	39.5	1	
NB 10	20	1				330	1	225	39.5	1	
NB 11		2	2	175		375					
NB 12	20	1				355	1	275	39.5	1	
NB 13	20	1				375	1	275	39.5	1	
NB 14	20	1				335	1	225	39.5	1	
NB 15	20	1				375	1	275	39.5	1	
NB 16	20	1				375	1	225	39.5	1	
NB 17	20	1				375	1	275	39.5	1	
NB 18		2	2	125		350					
NB 19	20	1				375	1	225	39.5	1	
NB 20	20	1				350	1	225	39.5	1	
NB 21		2	2	175		400					
NB 22	20	1				395	2	225	39.5	1	
NB 23	20	1				330	1	225	39.5	1	
NB 24	20	1				225		225	39.5	1	
NB 25		2	2	150		370					
NB 26	20	1				400	2	225	39.5	1	
NB 27		2	2	150		370					
NB 28		2	2	200		420					
NB 29	20	1				300	1	225	39.5	1	
NB 30	20	1				330	1	275	39.5	1	
NB 31	20	1				225		225	39.5	1	
NB 32	20	1				490	1	425	39.5	1	
NB 33	20	1				250		275	39.5	1	
SB 1	20	1				550	1	475	39.5	1	
SB 2	20	1				250		225	39.5	1	
SB 3		1	1	225		225					
SB 4	20	1				300	1	225	39.5	1	
SB 5	20	1				330	1	225	39.5	1	
SB 6	40					110	1	700	8.15		1
SB 7	20	1				330	1	225	39.5	1	
SB 8	20	1				350		225	39.5	1	
SB 9	20	1				370		225	39.5	1	
SB 10	20	1				350		225	39.5	1	
SB 11	20	1				100	1	225	39.5	1	
SB 12	20	1				160	1	287.5	39.5	1	
TOTALS	665	51	21	2,425	1	15,150	31	8,975	1,241	31	2

PROJECT NO: 1111–06–71	HWY: USH 151	COUNTY: DANE, COLUMBIA & DODGE	MISCELLANEOUS QUANTITIES	SHEET	E

FILE NAME: G:\00–PROJECT FILES\2012\12035 USH 151\CAD\12035_300mq.dwg PLOT DATE: May 10, 2013 PLOT BY: Jim0 PLOT SCALE: 1:2 ROTATION:

TIME SPAN	ITEM NO.						
	643.0200	643.0300	643.0420	643.0715	643.0800	643.0900	643.1050
	TRAFFIC CONTROL SURVEILLANCE AND MAINTENANCE (PROJECT) 01. 1111-06-71	TRAFFIC CONTROL DRUMS	TRAFFIC CONTROL BARRICADES TYPE III	TRAFFIC CONTROL WARNING LIGHTS TYPE C	TRAFFIC CONTROL ARROW BOARDS	TRAFFIC CONTROL SIGNS	Traffic Control Signs PCMS
	DAY	DAY	DAY	DAY	DAY	DAY	DAY
Pre-Project 5 Days							10
Weekend #1							4
Week #1 (Mon-Thur)	4	1936	128	128	32	152	
Week #1 (Fri)	1	510	32	32	6	26	
Weekend #2	2	52			4	20	
Week #2 (Mon-Thur)	4	1936	128	128	32	152	
Week #2 (Fri)	1	510	32	32	6	26	
Weekend #3	2	52			4	20	
Week #3 (Mon-Thur)	4	1936	128	128	32	152	
Week #3 (Fri)	1	510	32	32	6	26	
Weekend #4	2	52			4	20	
Week #4 (Mon-Thur)	4	1936	128	128	32	152	
Week #4 (Fri)	1	510	32	32	6	26	
Weekend #5	2	52			4	20	
Week #5 (Mon-Thur)	4	1936	128	128	24	96	
Week #5 (Fri)	1	484	32	32	4	16	
Weekend #6	2						
Week #6 (Mon-Thur)	4	1936	128	128	24	96	
Week #6 (Fri)	1	484	32	32	4	16	
Weekend #7	2						
Week #7 (Mon-Thur)	4	1936	128	128	24	96	
Week #7 (Fri)	1	484	32	32	4	16	
Weekend #8	2						
Week #8 (Mon-Thur)	4	1936	128	128	24	96	
Week #8 (Fri)	1	484	32	32	4	16	
Weekend #9	2						
Week #9 (Mon-Thur)	4	1936	128	128	24	96	
Week #9 (Fri)	1	484	32	32	4	16	
PROJECT TOTAL	61	22,092	1,440	1,440	308	1,352	14

LOCATION	ITEM NO.						
	SPV.0195 SPECIAL 01.	645.0140	628.1504	628.1520	628.7005	628.7504	628.7555
	CLEAR STONE	GEOTEXTILE FABRIC TYPE SAS	SILT FENCE	SILT FENCE MAINTENANCE	INLET PROTECTION TYPE A	TEMPORARY DITCH CHECKS	CULVERT PIPE CHECKS
	TON	SY	LF	LF	EACH	LF	EACH
NB 1							
NB 2			200	200		24	
NB 3			200	200		24	
NB 4			200	200		24	
NB 5			200	200		24	
NB 6	75	240			2	24	
NB 7	110	350			2	24	
NB 8	85	280			2	24	
NB 9			200	200		24	
NB 10			200	200		24	
NB 11	90	280				24	
NB 12			200	200		24	
NB 13			200	200		24	
NB 14			200	200		24	
NB 15			200	200		24	
NB 16			200	200		24	
NB 17			200	200		24	
NB 18	75	240				24	
NB 19			200	200		24	
NB 20			200	200		24	
NB 21	75	240				24	
NB 22			200	200		24	
NB 23			200	200		24	
NB 24			200	200		24	
NB 25	90	290			1	24	
NB 26			200	200		24	
NB 27	80	260			1	24	
NB 28	95	300			2	24	
NB 29			200	200		24	
NB 30			200	200		24	
NB 31			200	200		24	
NB 32			200	200		24	
NB 33			200	200		24	
SB 1			200	200		24	
SB 2			200	200		24	
SB 3	95	300				24	3
SB 4			200	200		24	
SB 5			200	200		24	
SB 6			200	200		24	
SB 7			200	200		24	
SB 8			200	200		24	
SB 9			200	200		24	
SB 10			200	200		24	
SB 11			200	200		24	
SB 12			200	200		24	
TOTALS	870	2780	6800	6800	10	1056	3

3

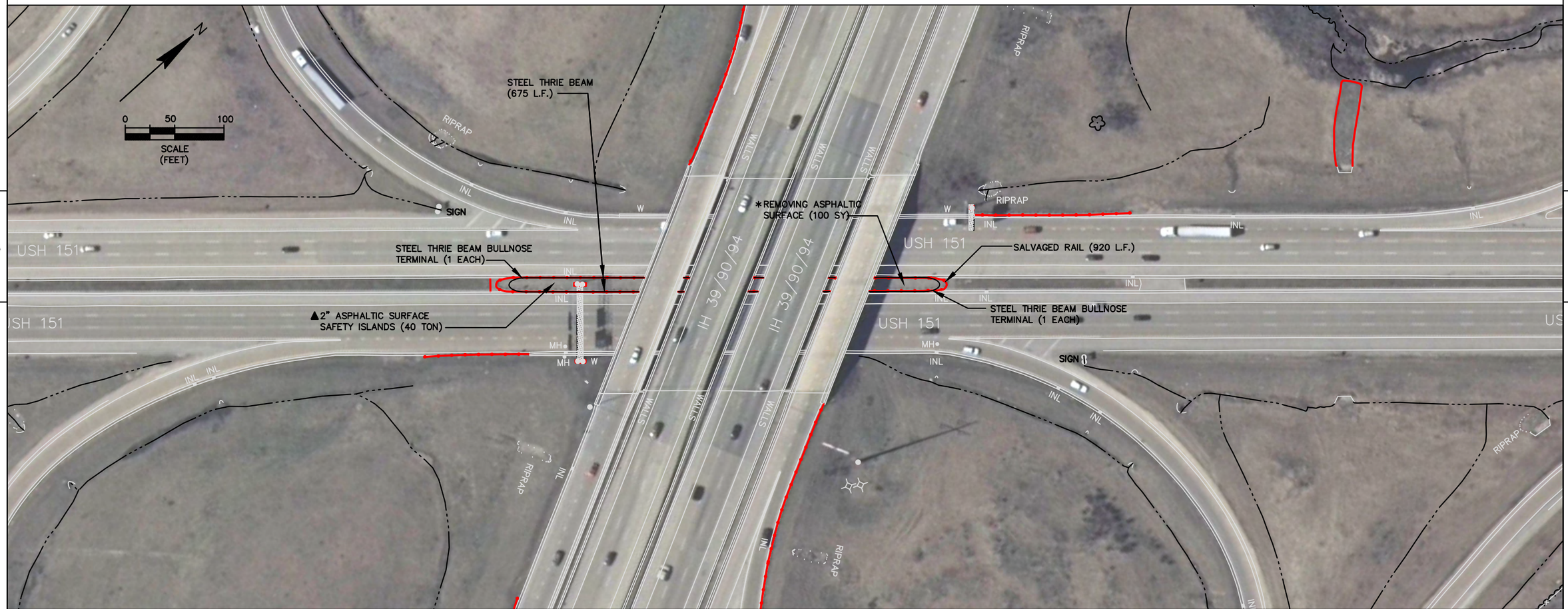
3

3

ESTIMATED INCIDENTAL QUANTITIES FOR BARRIER SYSTEM GRADING SHAPING FINISHING.

LOCATION	*WASTE	* FILL	* SALVAGED TOPSOIL	* FERTILIZER TYPE B	* SEEDING NO. 30	* TEMPORARY SEEDING	* EROSION MAT CLASS I, TYPE B	ESTIMATED GRADING AREA
	CY	CY	SY	CWT	LB	LB	SY	SF
NB 2	20		1,111	0.7	20.0	30.0	1,111	10,000
NB 3		30	167	0.1	3.0	4.5	208	1,500
NB 5		30	167	0.1	3.0	4.5	208	1,500
NB 6		40	2,160	1.4	38.9	58.3	2,700	19,440
NB 7		180	1,773	1.1	31.9	47.9	2,217	15,960
NB 8		180	1,970	1.2	35.5	53.2	2,463	17,731
NB 9		30	167	0.1	3.0	4.5	208	1,500
NB 10		30	167	0.1	3.0	4.5	208	1,500
NB 11		1,000	3,844	2.4	69.2	103.8	4,805	34,598
NB 12		30	167	0.1	3.0	4.5	208	1,500
NB 13		30	167	0.1	3.0	4.5	208	1,500
NB 14		30	167	0.1	3.0	4.5	208	1,500
NB 15		30	167	0.1	3.0	4.5	208	1,500
NB 16		30	167	0.1	3.0	4.5	208	1,500
NB 17		30	167	0.1	3.0	4.5	208	1,500
NB 18		40	2,671	1.7	48.1	72.1	3,338	24,035
NB 19		30	167	0.1	3.0	4.5	208	1,500
NB 20		30	167	0.1	3.0	4.5	208	1,500
NB 21		90	4,729	3.0	85.1	127.7	5,911	42,560
NB 22		30	167	0.1	3.0	4.5	208	1,500
NB 23		30	167	0.1	3.0	4.5	208	1,500
NB 24		30	167	0.1	3.0	4.5	208	1,500
NB 25		40	1,680	1.1	30.2	45.4	2,100	15,120
NB 26		30	167	0.1	3.0	4.5	208	1,500
NB 27		40	1,680	1.1	30.2	45.4	2,100	15,120
NB 28		40	1,680	1.1	30.2	45.4	2,100	15,120
NB 29		30	167	0.1	3.0	4.5	208	1,500
NB 30		30	167	0.1	3.0	4.5	208	1,500
NB 31		30	167	0.1	3.0	4.5	208	1,500
NB 32		30	167	0.1	3.0	4.5	208	1,500
NB 33		30	167	0.1	3.0	4.5	208	1,500
SB 1		30	167	0.1	3.0	4.5	208	1,500
SB 2		30	167	0.1	3.0	4.5	208	1,500
SB 3		500	140	0.1	2.5	3.8	175	1,260
SB 4		30	167	0.1	3.0	4.5	208	1,500
SB 5		30	167	0.1	3.0	4.5	208	1,500
SB 7		30	167	0.1	3.0	4.5	208	1,500
SB 8		30	167	0.1	3.0	4.5	208	1,500
SB 9		30	167	0.1	3.0	4.5	208	1,500
SB 10		30	167	0.1	3.0	4.5	208	1,500
SB 11		30	167	0.1	3.0	4.5	208	1,500
SB 12		30	167	0.1	3.0	4.5	208	1,500
TOTALS	20	3,080	28,605	18	515	772	35,478	257,444

*APPROXIMATE QUANTITIES FOR INFORMATIONAL PURPOSES ONLY. ITEMS INCIDENTAL TO 614.0010 BARRIER SYSTEM GRADING SHAPING FINISHING.

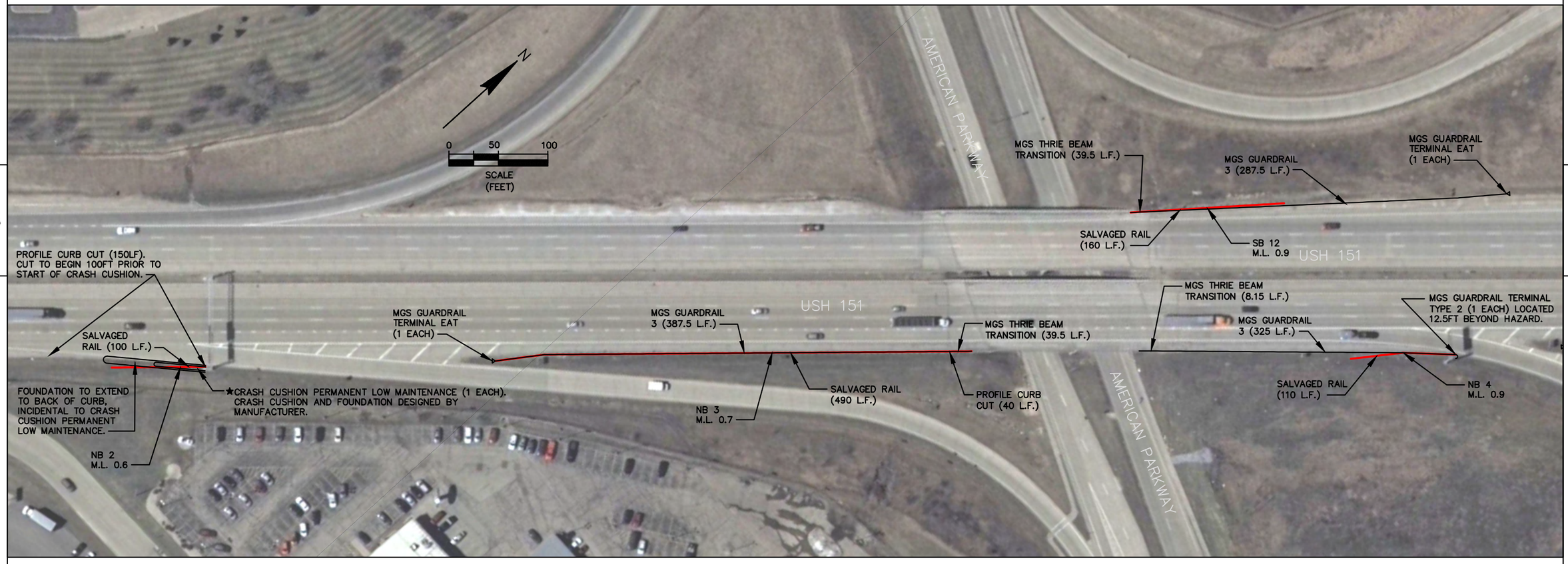


*REMOVAL IS AS NEEDED TO PERFORM WORK. SAW CUTS MAYBE NECESSARY PENDING FIELD CONDITIONS TO PERFORM REMOVING ASPHALTIC SURFACE.

▲COMPACT ASPHALTIC SURFACE SAFETY ISLANDS TO MATCH EXISTING COMPACTION. MAINTAIN EXISTING DRAINAGE PATTERNS.

STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DANE	SITE NUMBER: NB 1(M.L. 0.0)	SHEET NO:	E

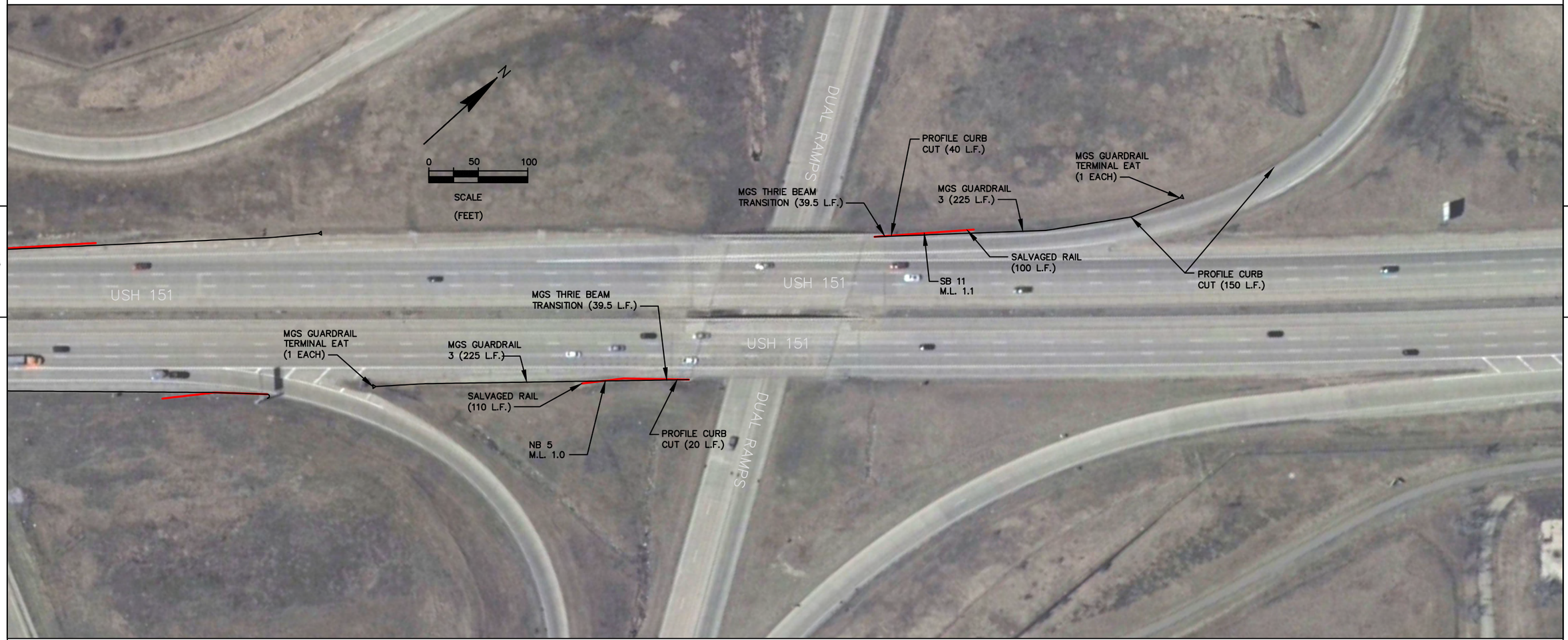
FILE NAME: G:\00-PROJECT FILES\2012\12035 USH 151\CAD\12035_dane.dwg PLOT DATE: Jan 23, 2013 PLOT BY: andyc0 PLOT SCALE: ROTATION:



★CRASH CUSHION SPECIFICATIONS:
- –MEETS NCHRP 350 TEST LEVEL 3.
- –PROTECTS EXISTING SIGN BASE. SEE CONSTRUCTION DETAIL 'CONCRETE BASE' FOR DIMENSIONS.
- –MODIFICATION OF THE SIGN BASE DIMENSION MAY BE NECESSARY AND IS SUBJECT TO CHANGE TO MEET THE MANUFACTURER'S REQUIREMENTS.
- –INCLUDE THE COST OF MODIFICATION TO THE SIGN BASE IN THE BID ITEM OF CRASH CUSHIONS PERMANENT LOW MAINTENANCE.

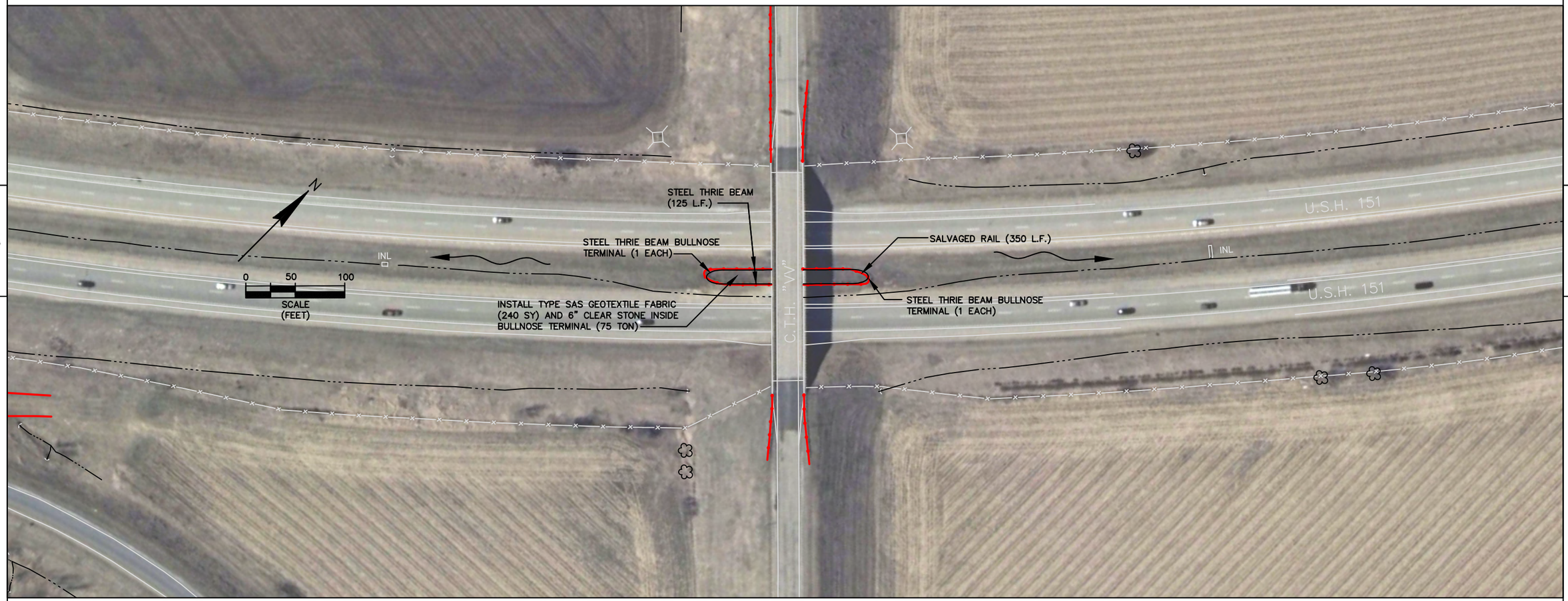
STATE PROJECT NUMBER: 1111–06–71	HWY: USH 151	COUNTY: DANE	SITE NUMBER: NB 2(M.L. 0.6), 3(M.L. 0.7), 4(M.L. 0.9), SB 12(M.L. 1.0)	SHEET NO:	E

FILE NAME: G:\00–PROJECT FILES\2012\12035 USH 151\CAD\12035_dane.dwg PLOT DATE: Feb 01, 2013 PLOT BY: andyc0 PLOT SCALE: ROTATION:



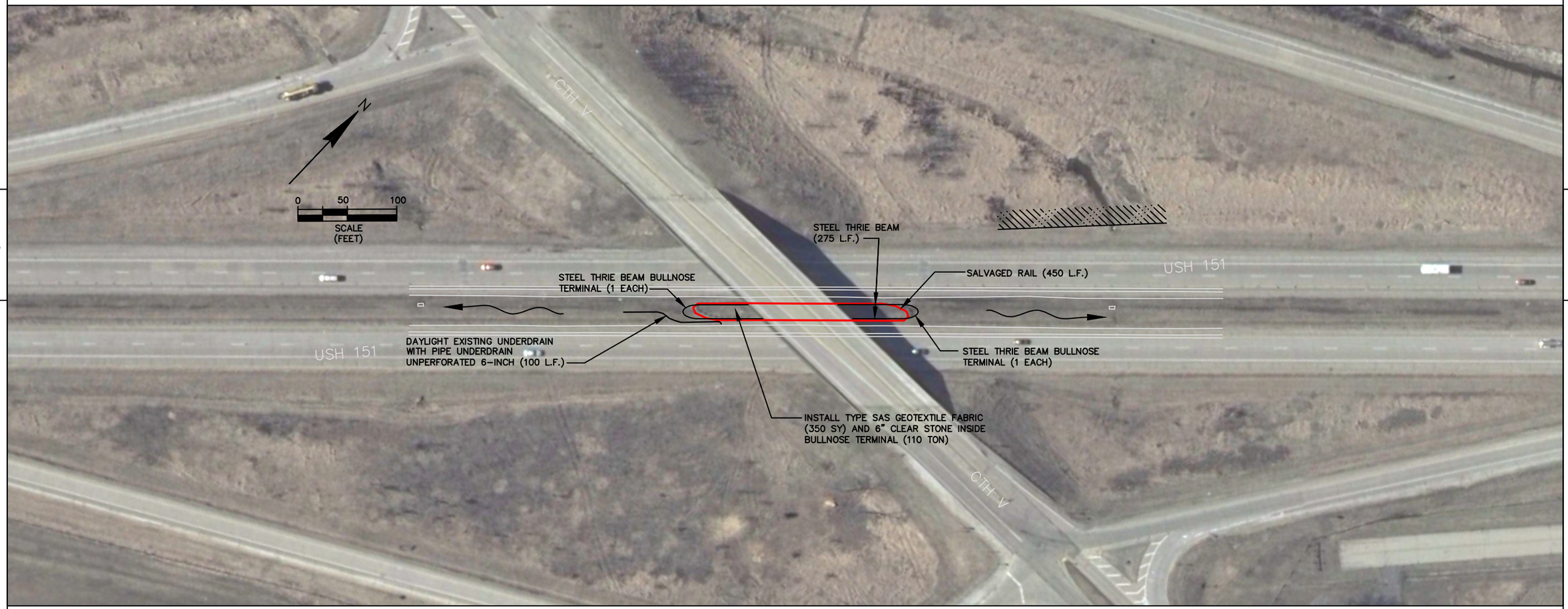
STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DANE	SITE NUMBER: NB 5(M.L. 1.0) SB 11(M.L. 1.1)	SHEET NO: E

FILE NAME: G:\00-PROJECT FILES\2012\12035 USH 151\CAD\12035_dane.dwg PLOT DATE: Jan 23, 2013 PLOT BY: andyc0 PLOT SCALE: ROTATION:



STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DANE	SITE NUMBER: NB 6(M.L. 8.4)	SHEET NO:	E

FILE NAME: G:\00-PROJECT FILES\2012\12035 USH 151\CAD\12035_dane.dwg | PLOT DATE: Jan 23, 2013 | PLOT BY: andyc0 | PLOT SCALE: | ROTATION:



STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DANE	SITE NUMBER: NB 7(M.L. 13.5)	SHEET NO:	E

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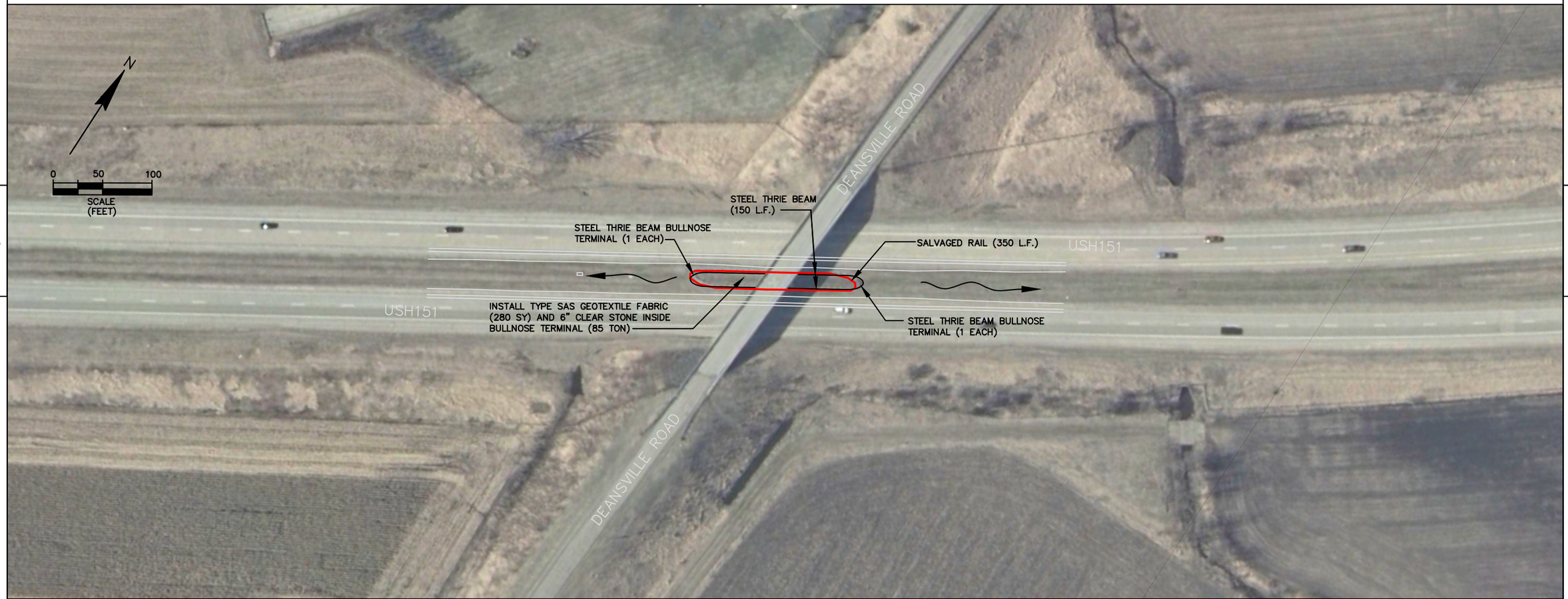

STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DANE	SITE NUMBER: NB 8(M.L. 14.7)	SHEET NO:	E

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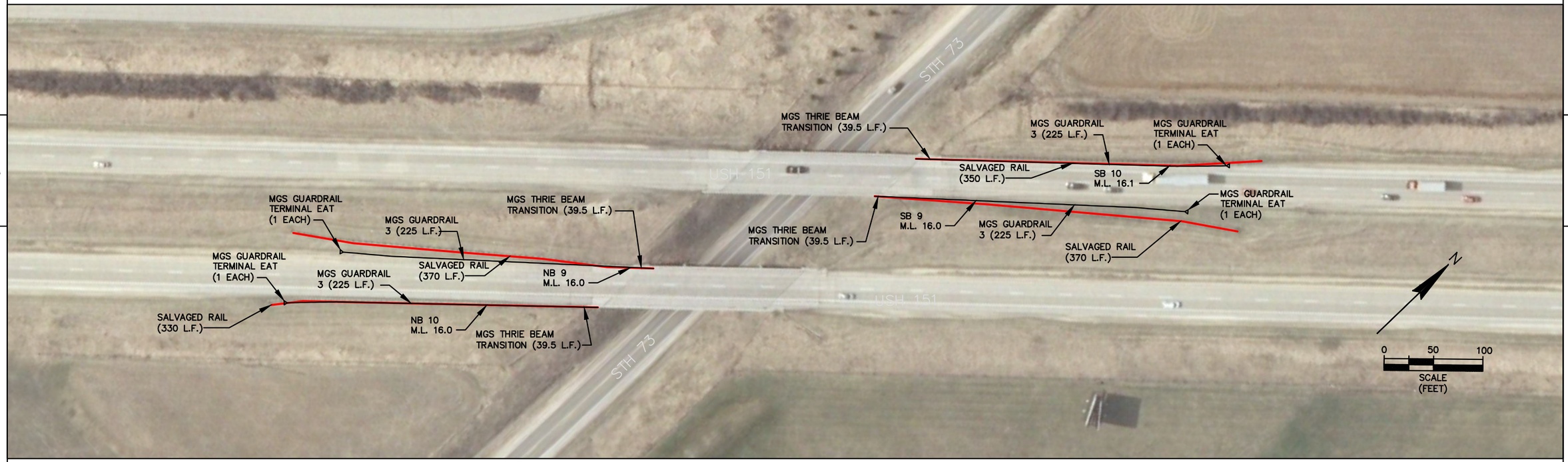
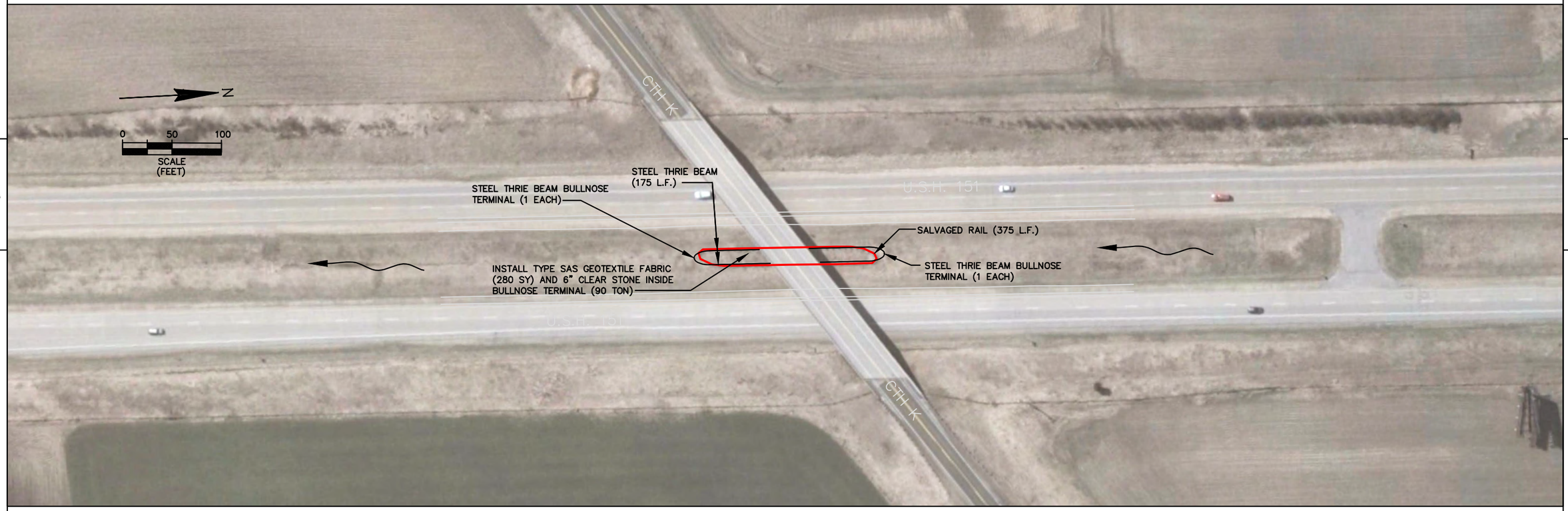


STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: COLUMBIA	SITE NUMBER: NB 9 & 10(M.L. 16.0) SB 9 & 10(M.L. 16.1)	SHEET NO:	E

FILE NAME: G:\00-PROJECT FILES\2012\12035 USH 151\CAD\12035_columbia.dwg PLOT DATE: Jan 23, 2013 PLOT BY: andyc0 PLOT SCALE: ROTATION:



STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: COLUMBIA	SITE NUMBER: NB 11(M.L. 19.1)	SHEET NO:	E

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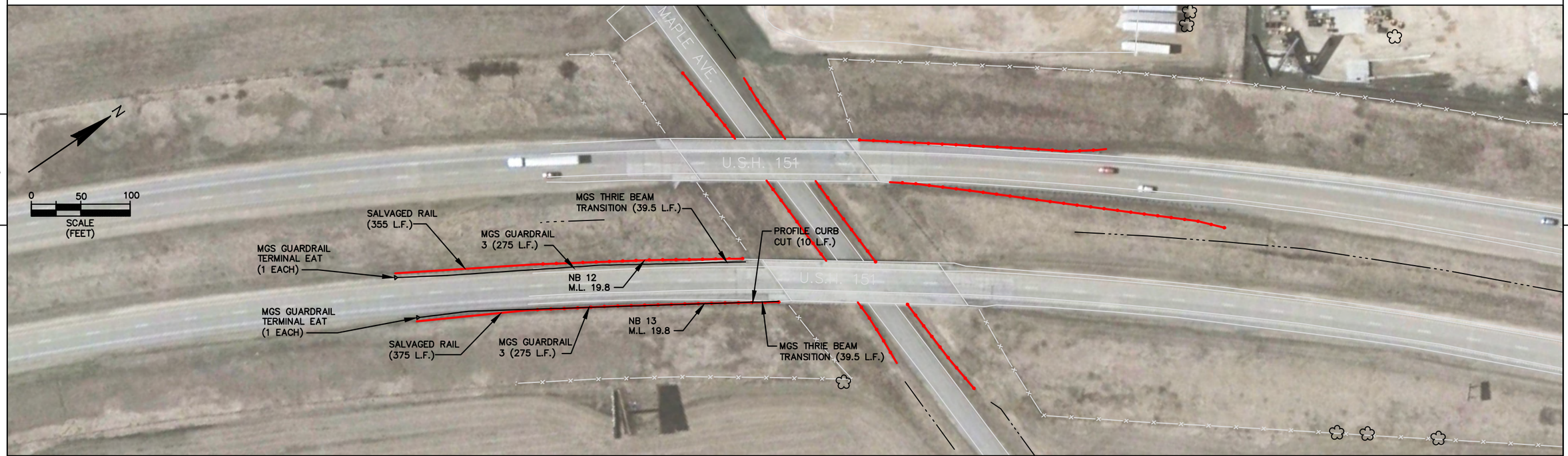
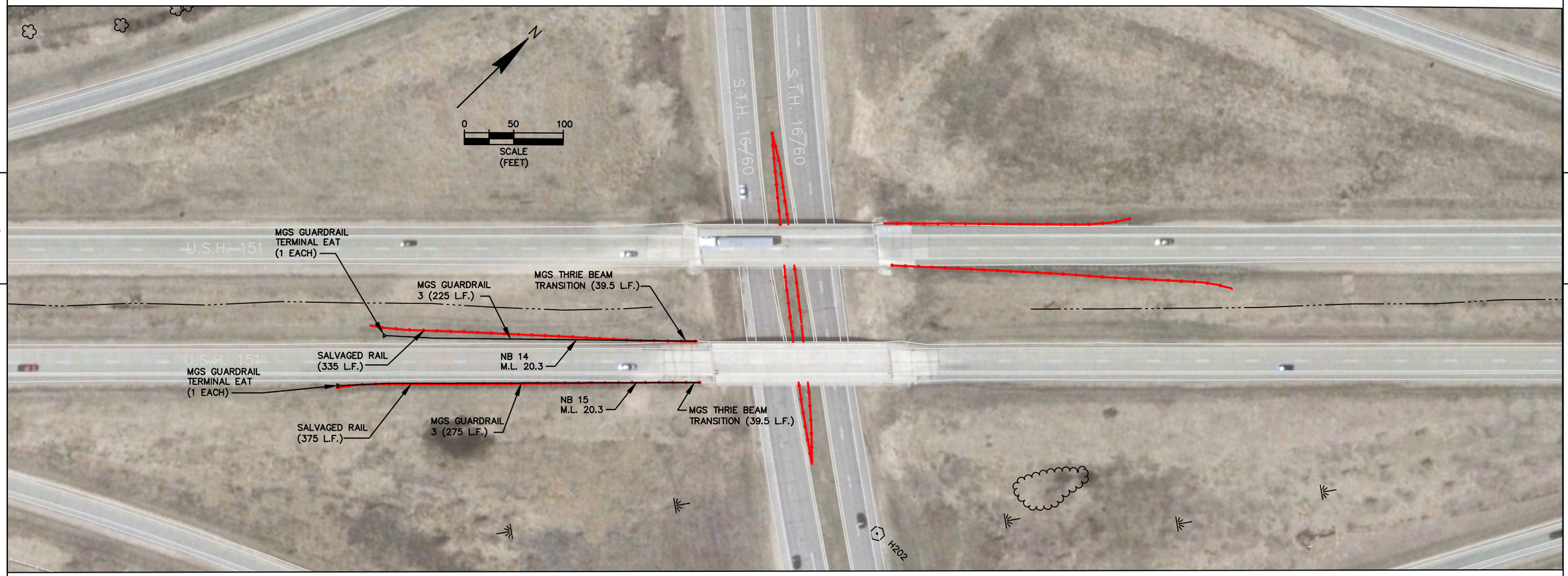


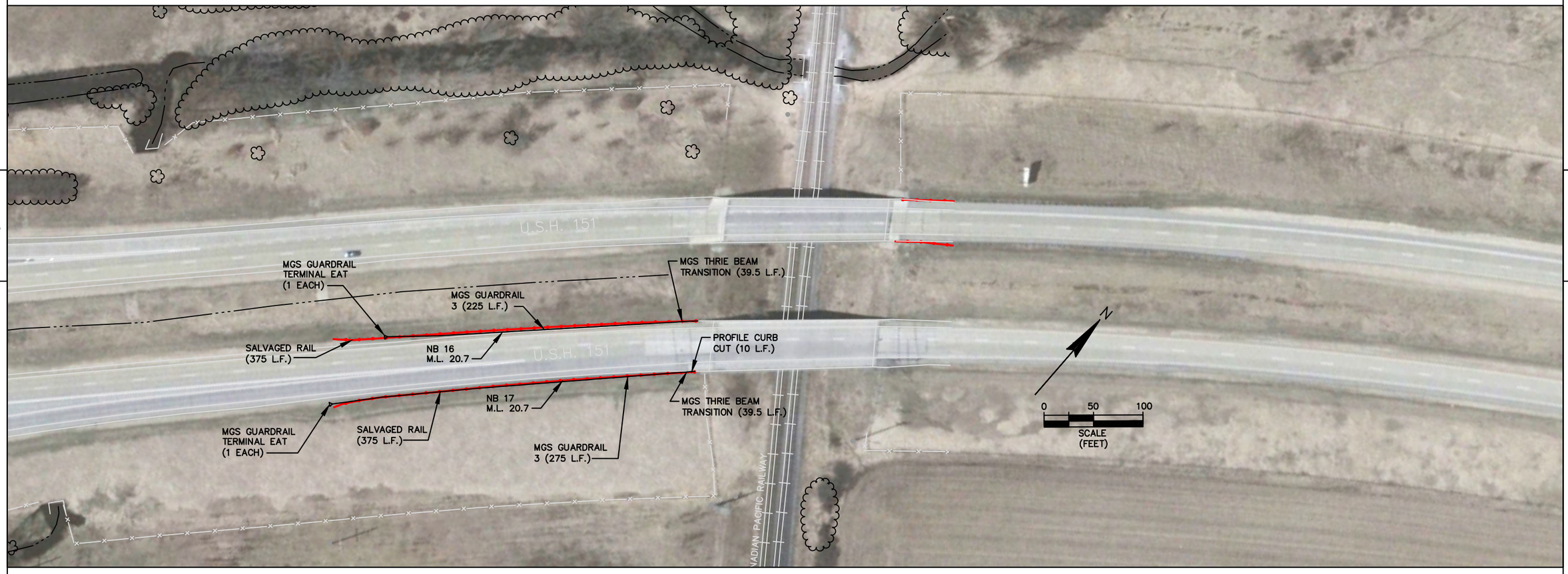
STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: COLUMBIA	SITE NUMBER: NB 12 & 13(M.L. 19.8)	SHEET NO:	E

FILE NAME: G:\00-PROJECT FILES\2012\12035 USH 151\CAD\12035_columbia.dwg PLOT DATE: Jan 23, 2013 PLOT BY: andyc0 PLOT SCALE: ROTATION:



STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: COLUMBIA	SITE NUMBER: NB 14 & 15(M.L. 20.3)	SHEET NO:	E

FILE NAME: G:\00-PROJECT FILES\2012\12035 USH 151\CAD\12035_columbia.dwg PLOT DATE: Jan 23, 2013 PLOT BY: andyc0 PLOT SCALE: ROTATION:



STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: COLUMBIA	SITE NUMBER: NB 16 & 17(M.L. 20.7)	SHEET NO:	E

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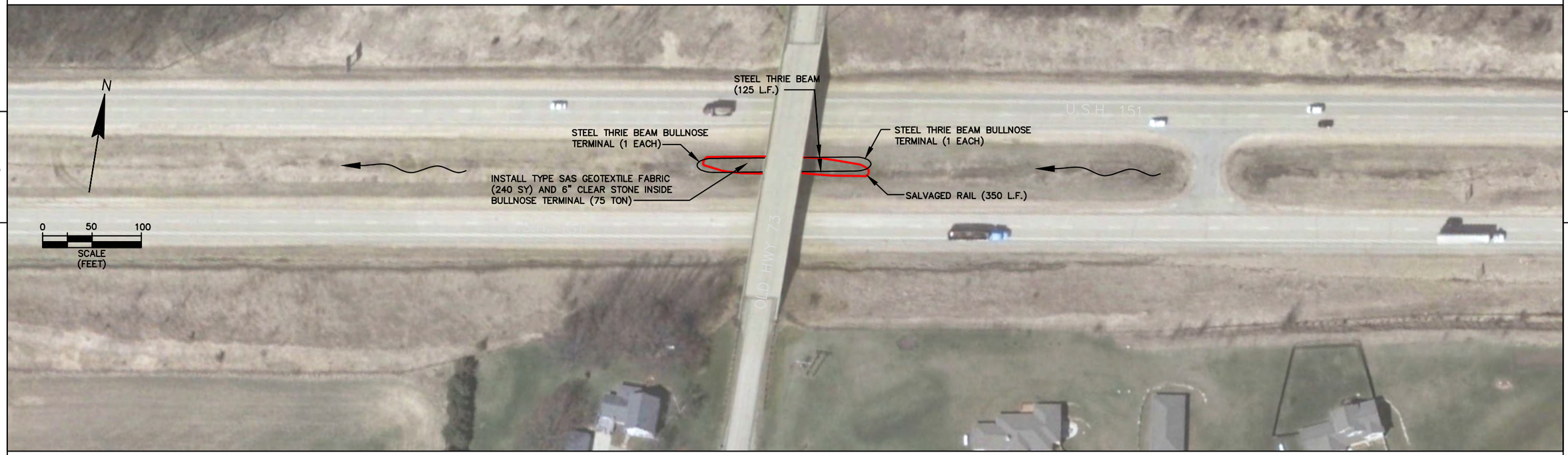

STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: COLUMBIA	SITE NUMBER: NB 18(M.L. 21.9)	SHEET NO:	E

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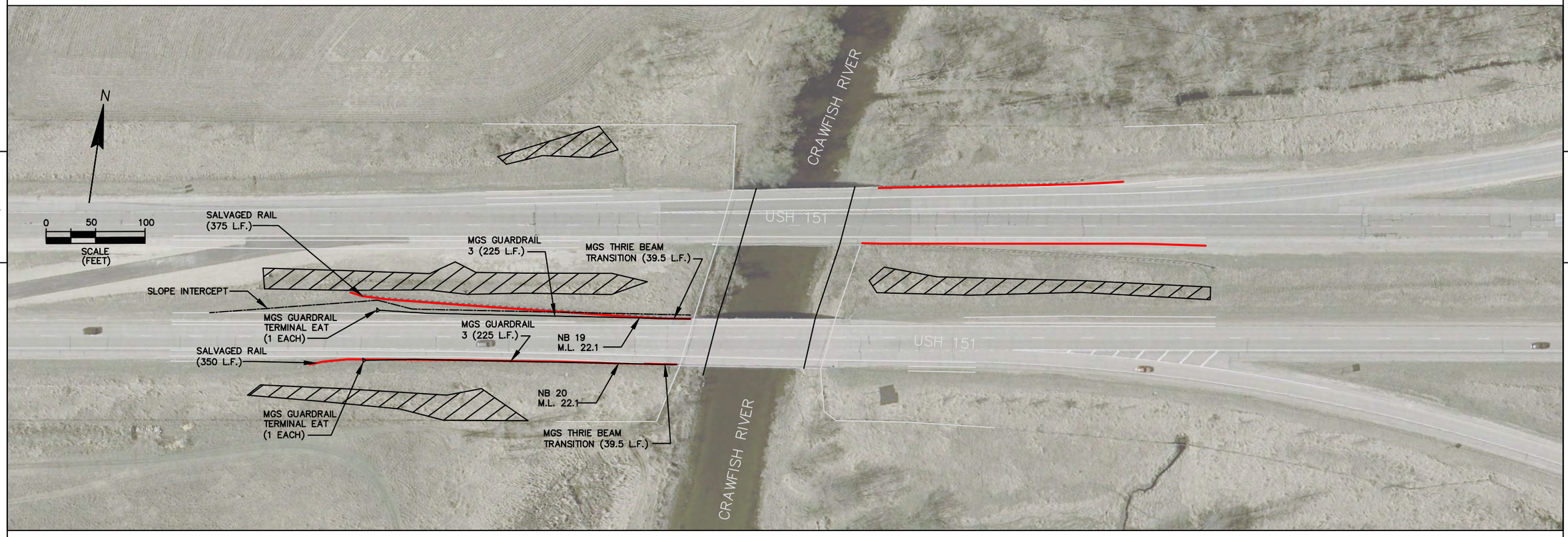

WETLANDS

STATE PROJECT NUMBER: 111-06-71	HWY: USH 151	COUNTY: DODGE	SITE NUMBER: NB 19 & 20(M.L. 22.1)	SHEET NO:	E

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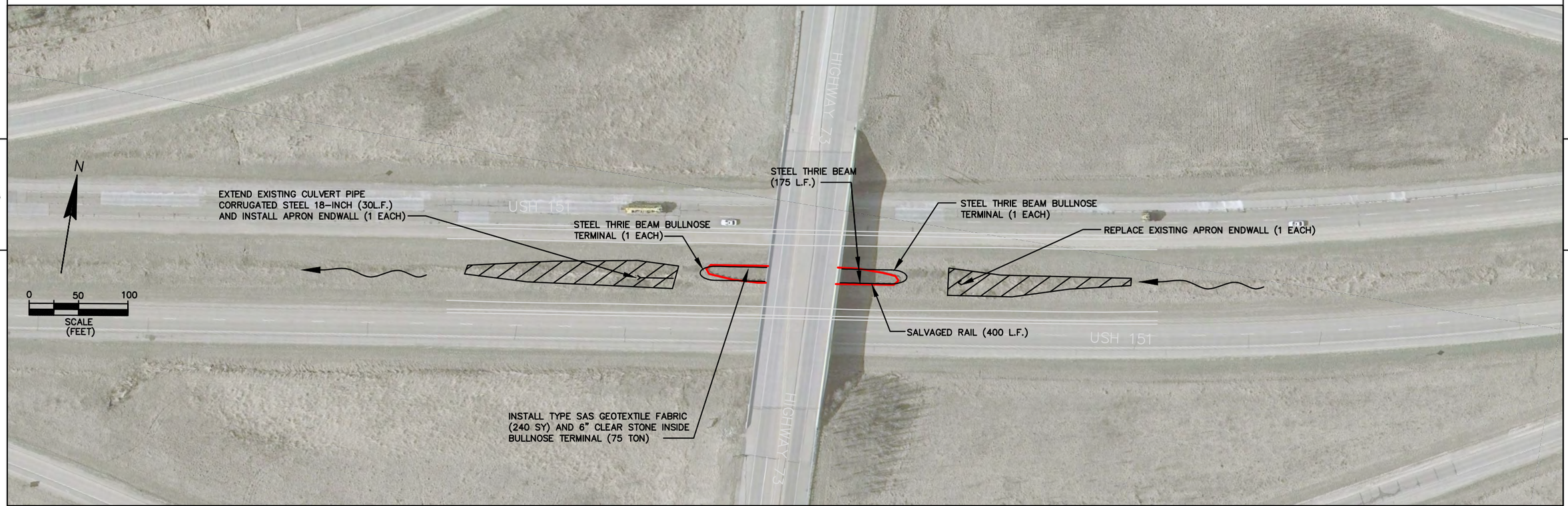

WETLANDS

STATE PROJECT NUMBER: 1111–06–71	HWY: USH 151	COUNTY: DODGE	SITE NUMBER: NB 21(M.L. 22.5)	SHEET NO:	E

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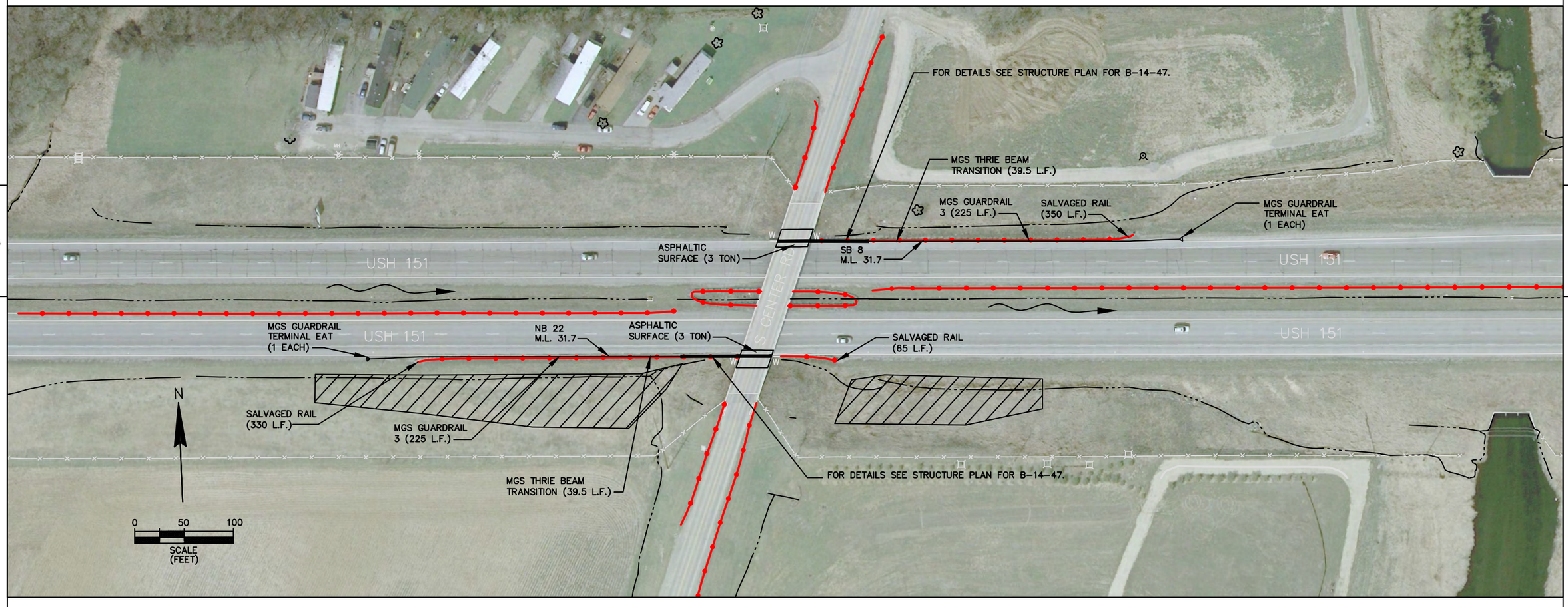
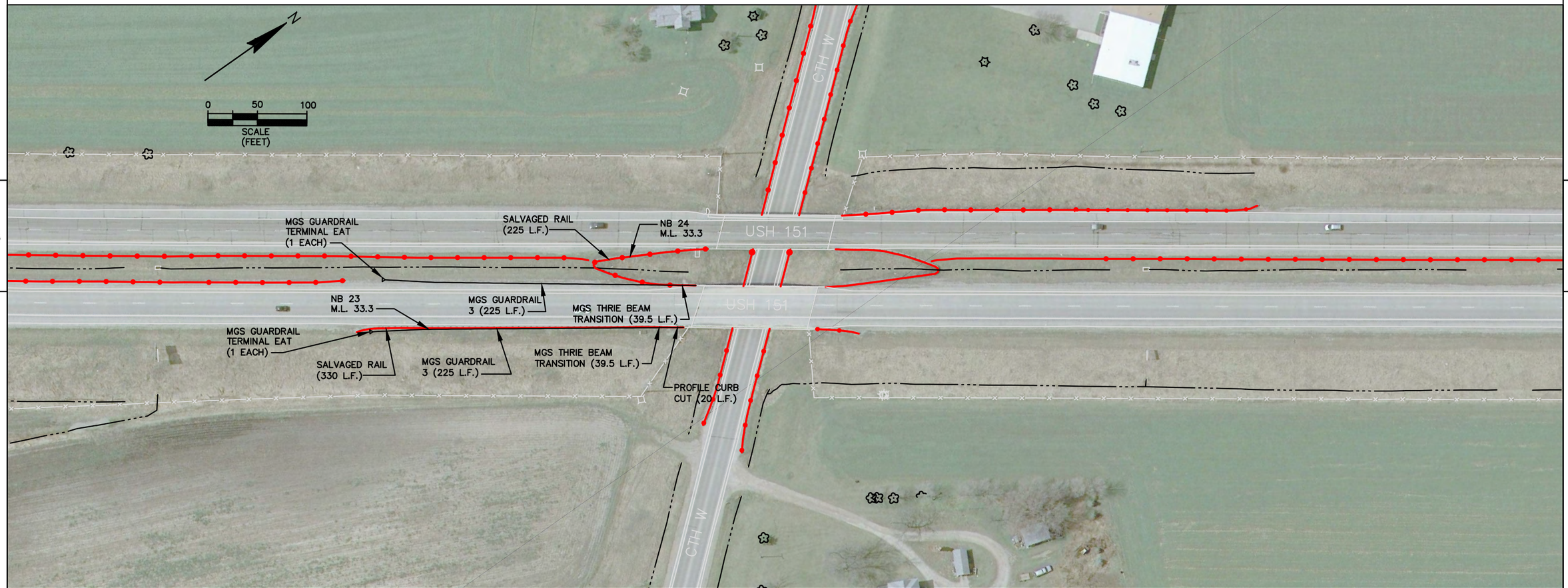


WETLANDS

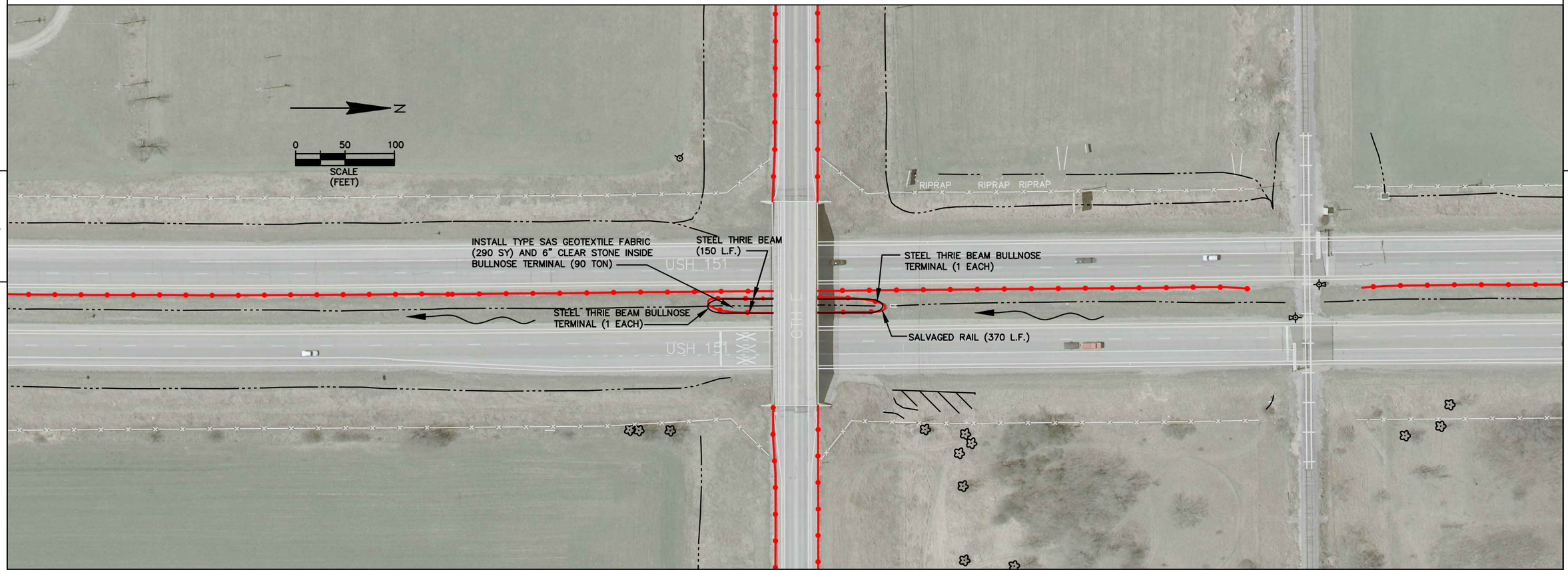
STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DODGE	SITE NUMBER: NB 22(M.L. 31.7) SB 8(M.L. 31.8)	SHEET NO:	E

FILE NAME: G:\00-PROJECT FILES\2012\12035 USH 151\CAD\12035_dodge.dwg | PLOT DATE: Jan 28, 2013 | PLOT BY: andyc0 | PLOT SCALE: | ROTATION:



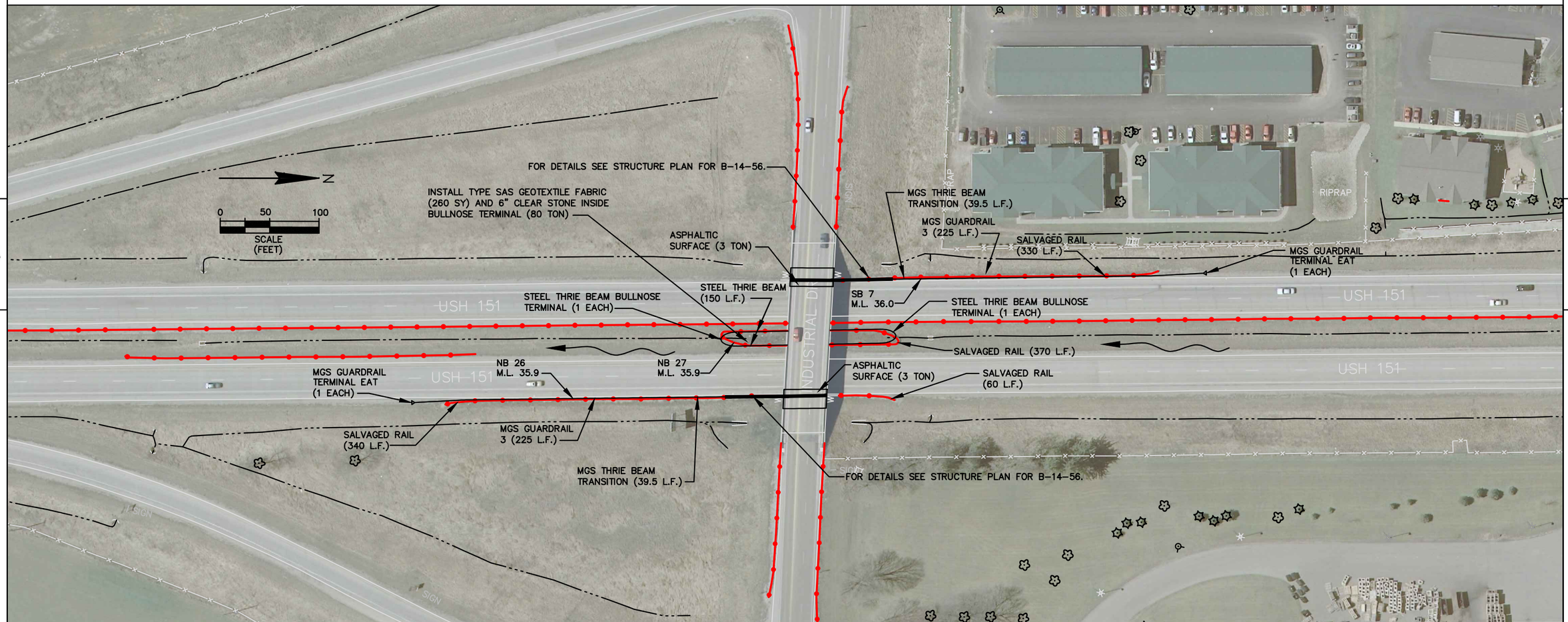
STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DODGE	SITE NUMBER: NB 23 & 24 (M.L. 33.3)	SHEET NO:	E

FILE NAME: G:\00-PROJECT FILES\2012\12035 USH 151\CAD\12035_dodge.dwg
PLOT DATE: Jan 23, 2013
PLOT BY: andyc0
PLOT SCALE:
ROTATION:



STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DODGE	SITE NUMBER: NB 25(M.L. 35.2)	SHEET NO:	E

FILE NAME: G:\00-PROJECT FILES\2012\12035 USH 151\CAD\12035_dodge.dwg | PLOT DATE: Jan 23, 2013 | PLOT BY: andyc0 | PLOT SCALE: | ROTATION:



STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DODGE	SITE NUMBER: NB 26 & 27(M.L. 35.9) SB 7(M.L. 36)	SHEET NO:	E

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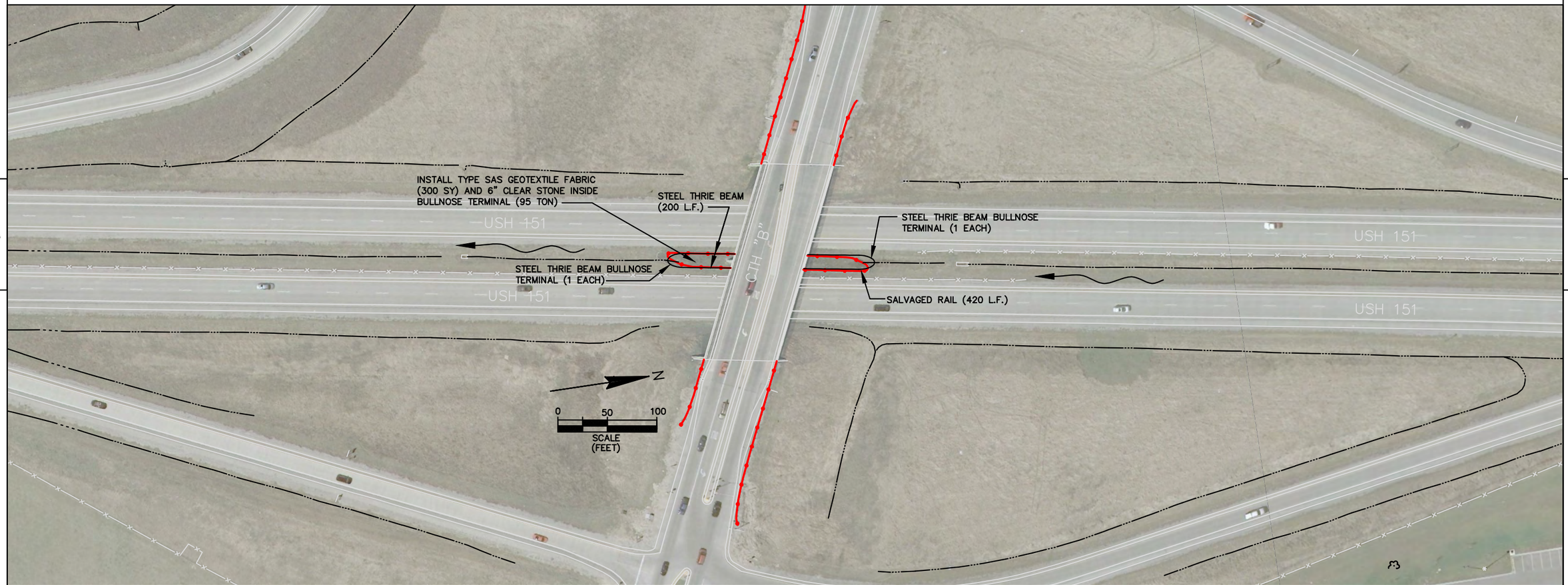

STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DODGE	SITE NUMBER: NB 28 (M.L. 36.7)	SHEET NO:	E

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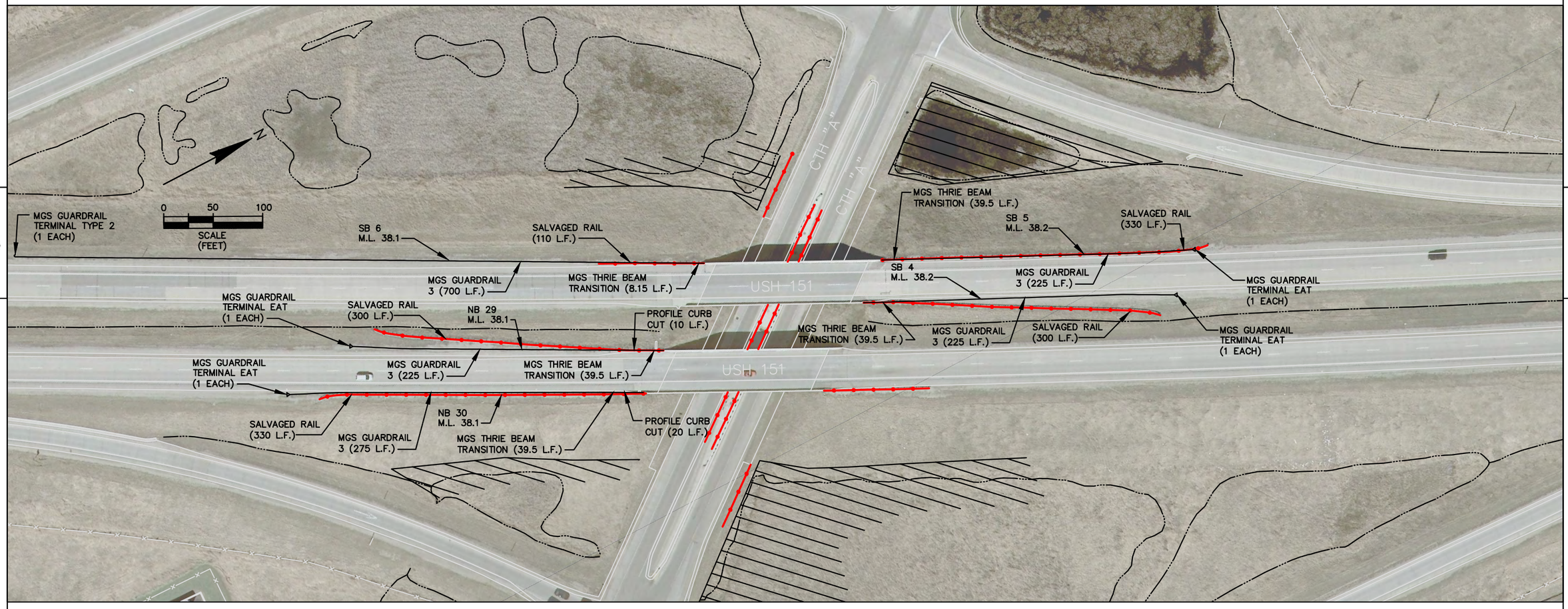

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STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DODGE	SITE NUMBER: NB 29 & 30(M.L. 38.1) SB 4, 5 & 6(M.L. 38.2)	SHEET NO:	E

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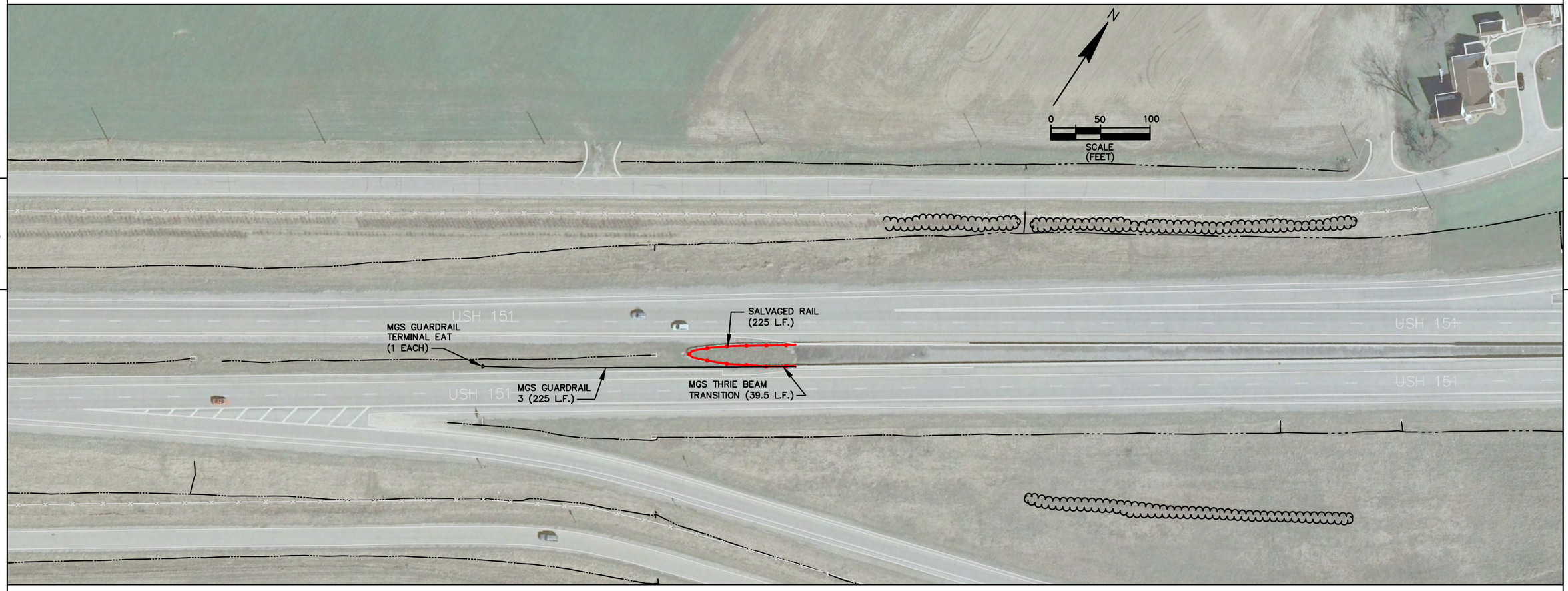

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STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DODGE	SITE NUMBER: NB 31(M.L. 43.9)	SHEET NO:	E

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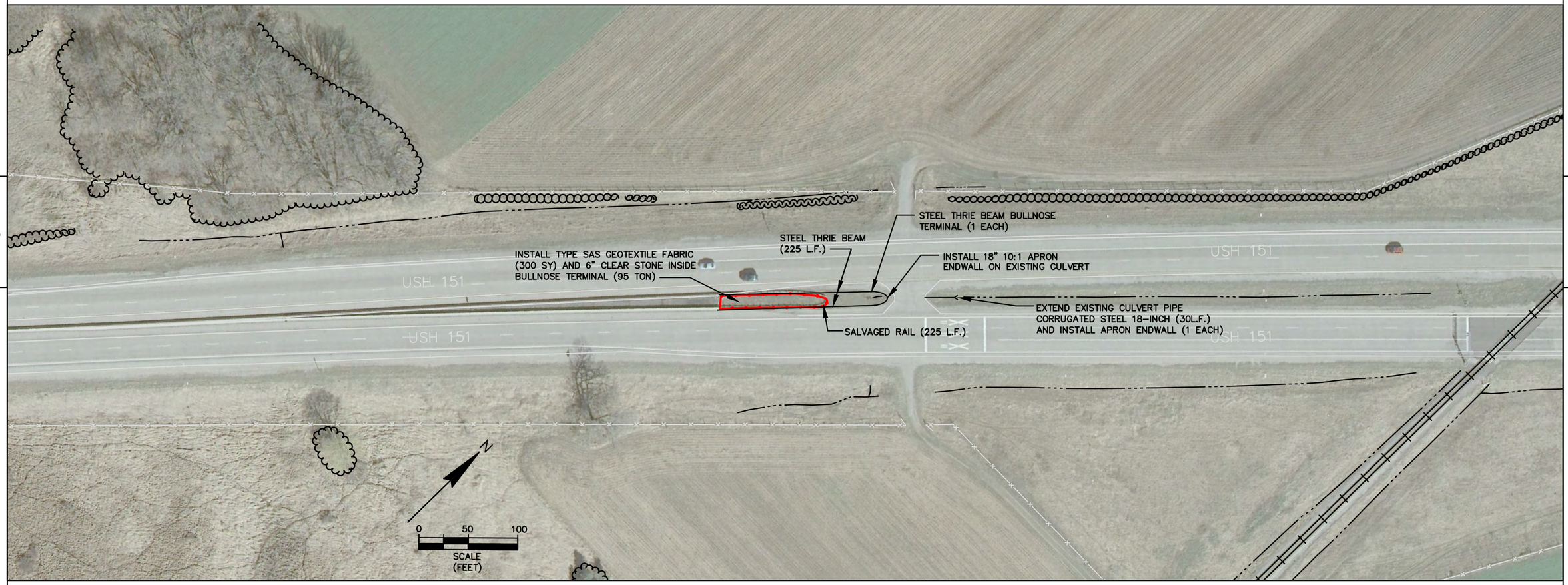

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STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DODGE	SITE NUMBER: SB 3(M.L. 45.2)	SHEET NO:	E

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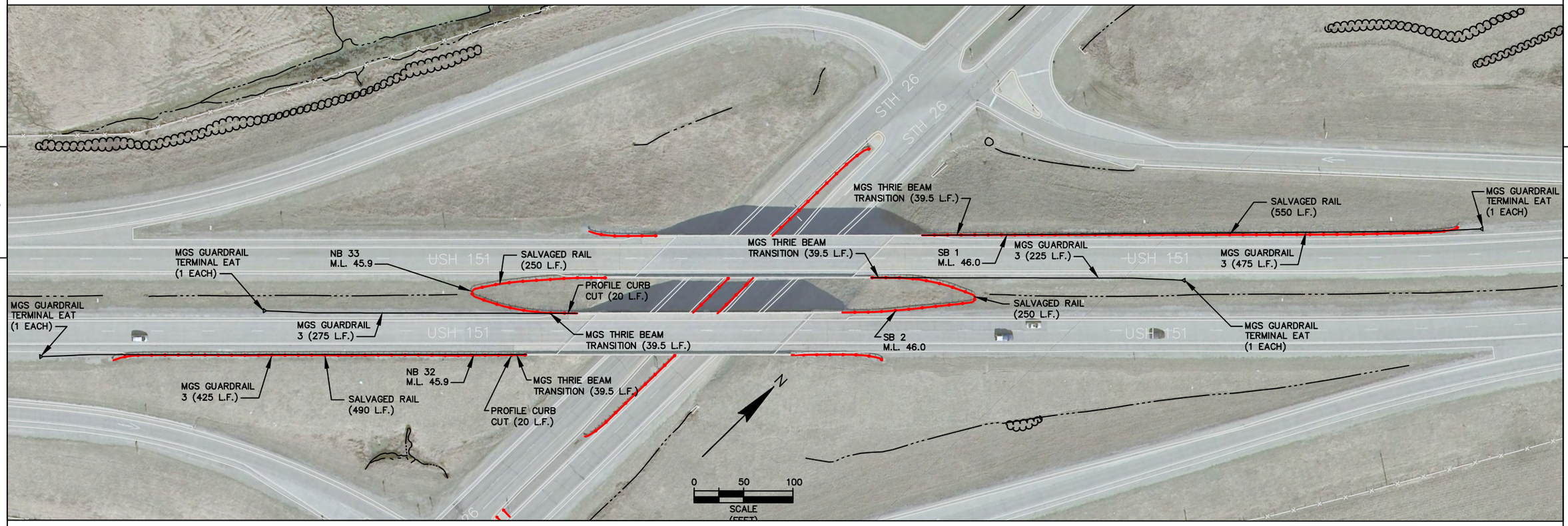
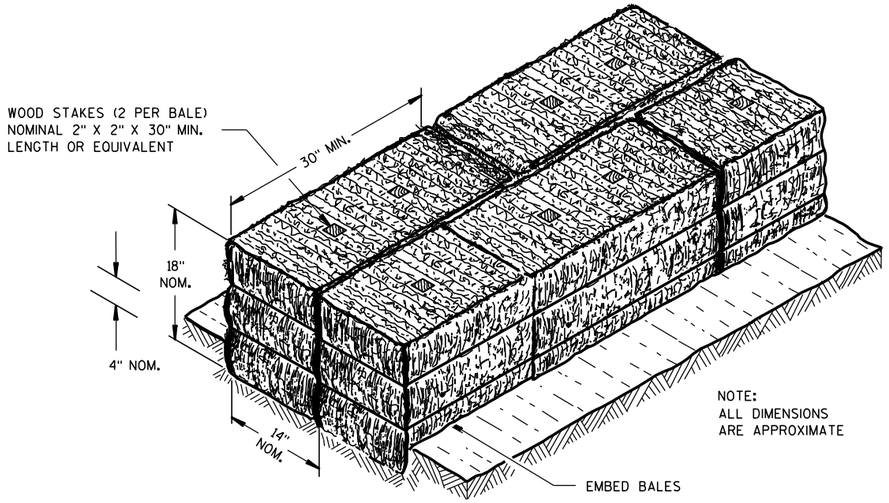


STATE PROJECT NUMBER: 1111-06-71	HWY: USH 151	COUNTY: DODGE	SITE NUMBER: NB 32 & 33(M.L. 45.9) SB 1 & 2(M.L. 46.1)	SHEET NO:	E

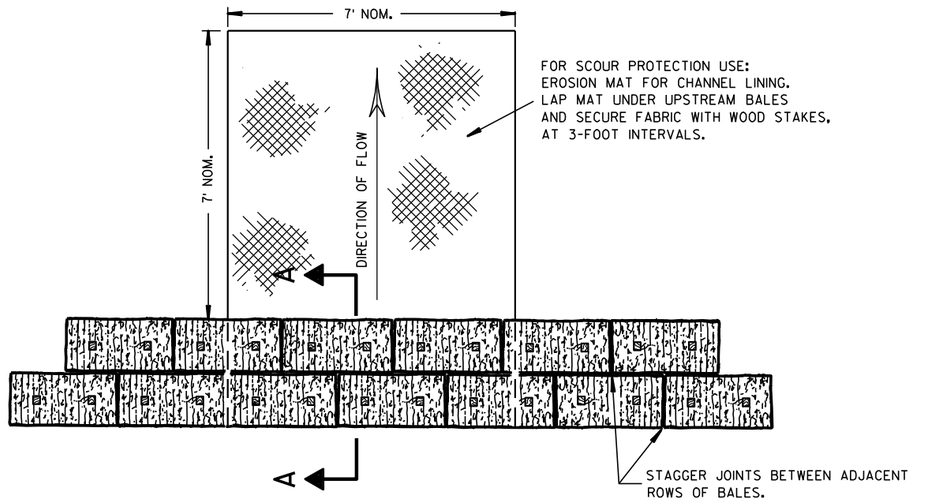
FILE NAME: G:\00-PROJECT FILES\2012\12035 USH 151\CAD\12035_dodge.dwg PLOT DATE: Jan 23, 2013 PLOT BY: andyc0 PLOT SCALE: ROTATION:

Standard Detail Drawing List

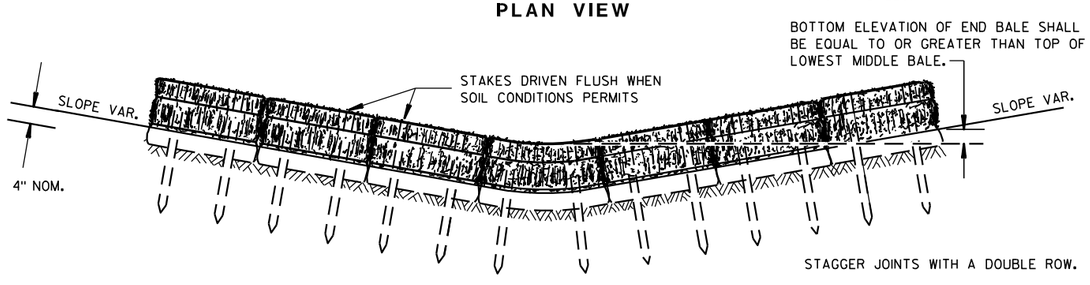
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E10-02	INLET PROTECTION TYPE A, B, C AND D
08F07-05	STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SLOPED SIDE FRAINS
14B07-13A	CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"
14B07-13B	CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"
14B07-13C	CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"
14B07-13D	CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"
14B07-13E	CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"
14B07-13F	CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"
14B07-13G	CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"
14B07-13H	CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"
14B08-01A	CRASH CUSHION/SAND BARREL ARRAY AND OTHER TEMPORARY BARRIER LAYOUT DETAILS
14B08-01B	CRASH CUSHION/SAND BARREL ARRAY AND OTHER TEMPORARY BARRIER LAYOUT DETAILS
14B08-01C	CRASH CUSHION/SAND BARREL ARRAY AND OTHER TEMPORARY BARRIER LAYOUT DETAILS
14B08-01D	CRASH CUSHION/SAND BARREL ARRAY AND OTHER TEMPORARY BARRIER LAYOUT DETAILS
14B26-02A	STEEL THRIE BEAM BULLNOSE TERMINAL
14B26-02B	STEEL THRIE BEAM BULLNOSE TERMINAL
14B26-02C	STEEL THRIE BEAM BULLNOSE TERMINAL
14B26-02D	STEEL THRIE BEAM BULLNOSE TERMINAL
14B26-02E	STEEL THRIE BEAM BULLNOSE TERMINAL
14B42-02A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-02B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-02C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B44-01A	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-01B	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-01C	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B45-03A	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03B	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03C	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03D	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03E	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03F	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03G	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03H	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03I	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03J	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B47-01A	MIDWEST GUARDRAIL SYSTEM (MGS) TYPE 2 TERMINAL
14B47-01B	MIDWEST GUARDRAIL SYSTEM (MGS) TYPE 2 TERMINAL
14B47-01C	MIDWEST GUARDRAIL SYSTEM (MGS) TYPE 2 TERMINAL
15A02-07	DELINEATOR POST, DELINEATOR BRACKET AND DELINEATOR
15D12-02	TRAFFIC CONTROL, LANE CLOSURE, SPEEDS GREATER THAN 40 M.P.H.
15D15-01	TRAFFIC CONTROL, EXIT AND ENTRANCE RAMP WITHIN LANE CLOSURE
15D16-01	TRAFFIC CONTROL, EXIT RAMP CLOSURE
15D21-01	TRAFFIC CONTROL, INTERSECTION WITHIN SINGLE LANE CLOSURE
15D27-01	TRAFFIC CONTROL, SHOULDER CLOSURE ON DIVIDED ROADWAY, SPEEDS GREATER THAN 40 MPH



SECTION A-A



PLAN VIEW



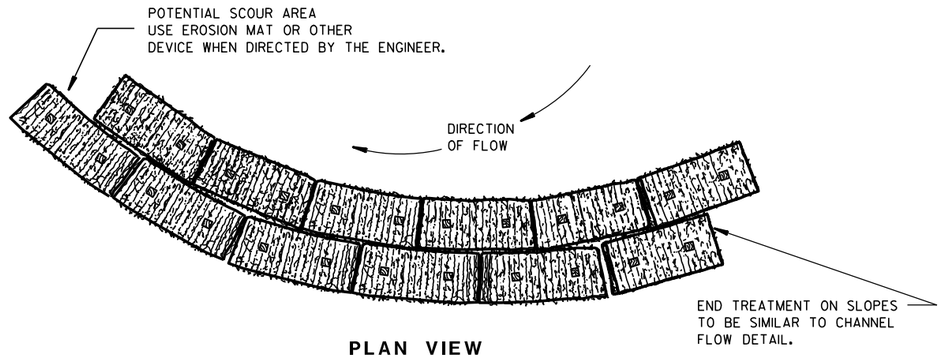
FRONT ELEVATION

TEMPORARY DITCH CHECK USING EROSION BALES ①

GENERAL NOTES

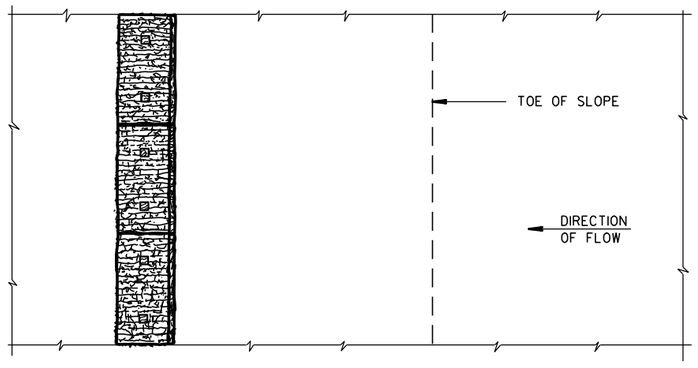
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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.

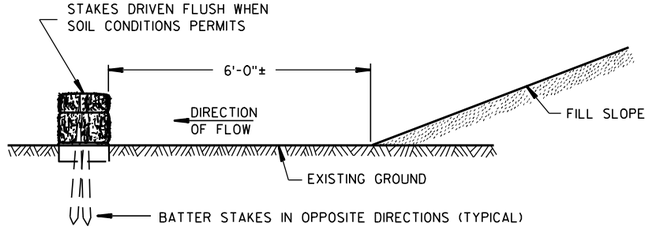


PLAN VIEW

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

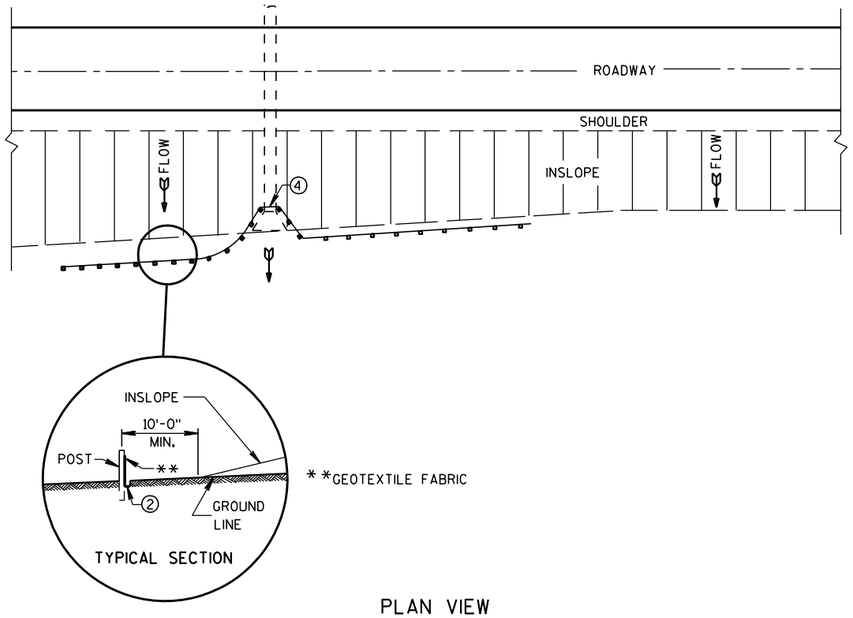
APPROVED
6/04/02 DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

6

S.D.D. 8 E 8-3

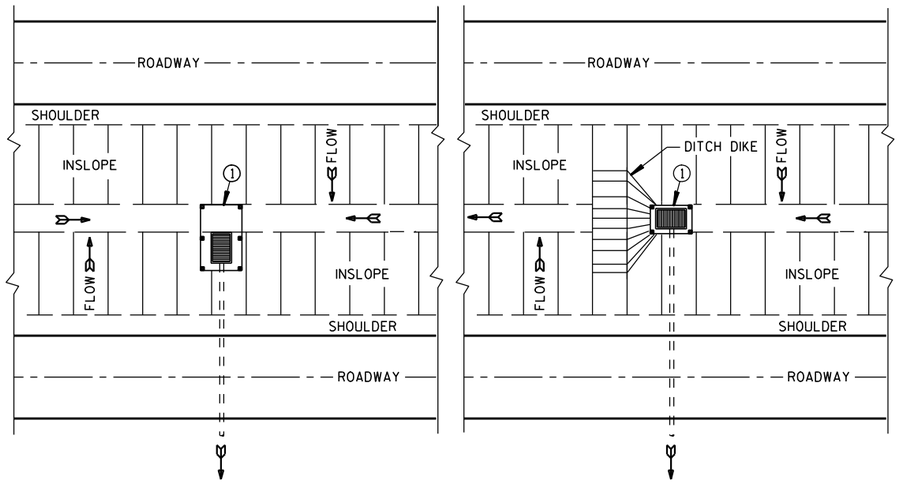
6

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.

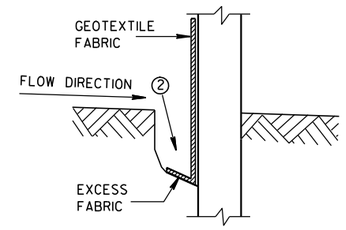
(1) HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.

(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.

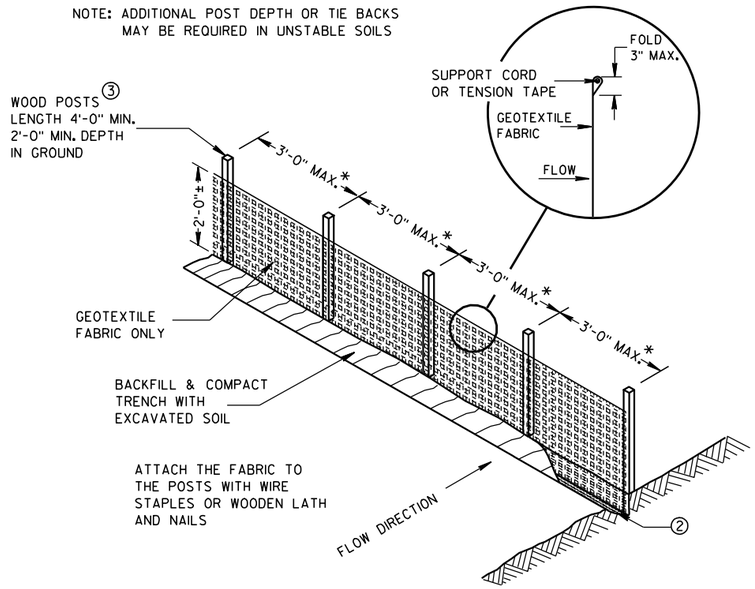
(3) WOOD POSTS SHALL BE A MINIMUM SIZE OF 1⅛" X 1⅛" OF OAK OR HICKORY.

(4) SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.

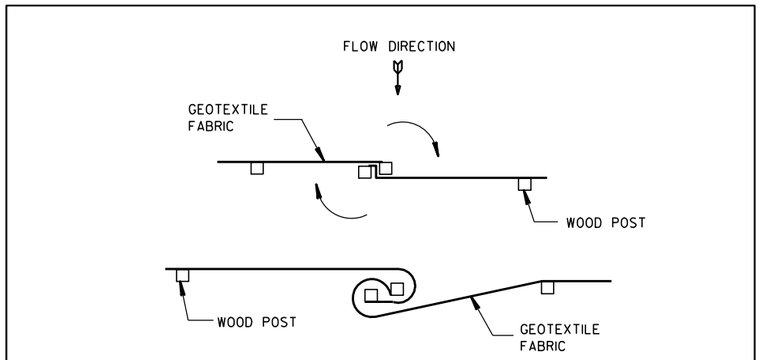
(5) CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.



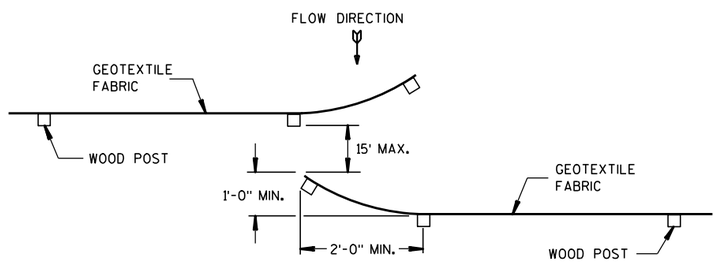
TRENCH DETAIL



SILT FENCE

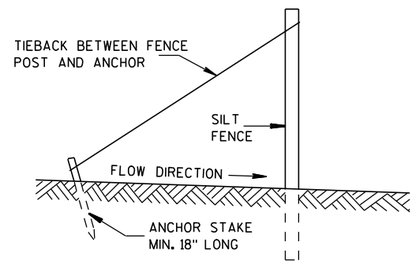


TWIST METHOD



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

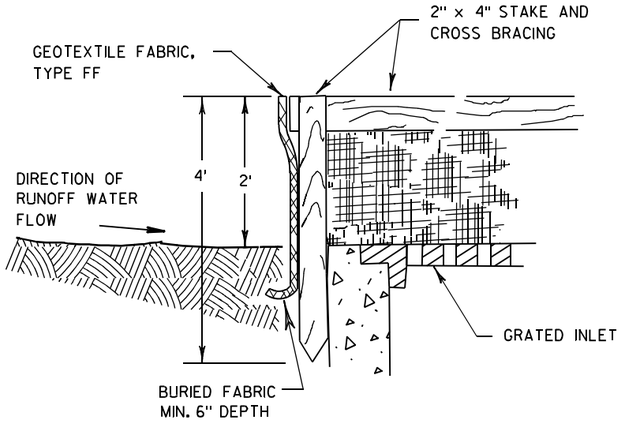
APPROVED
4-29-05 DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

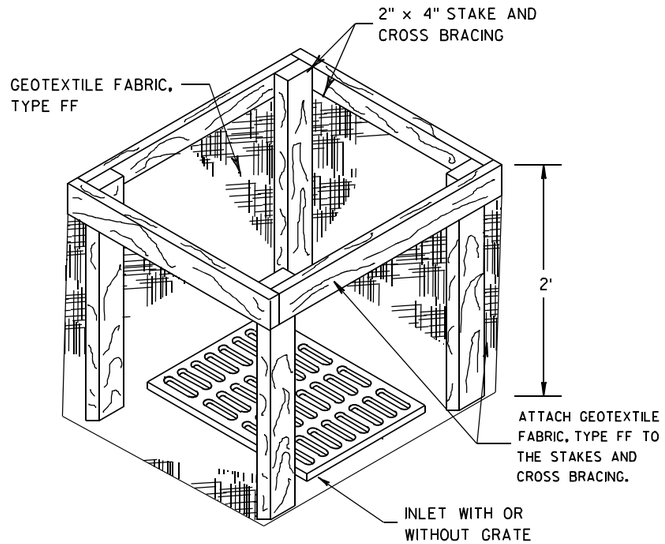
6

S.D.D. 8 E 9-6

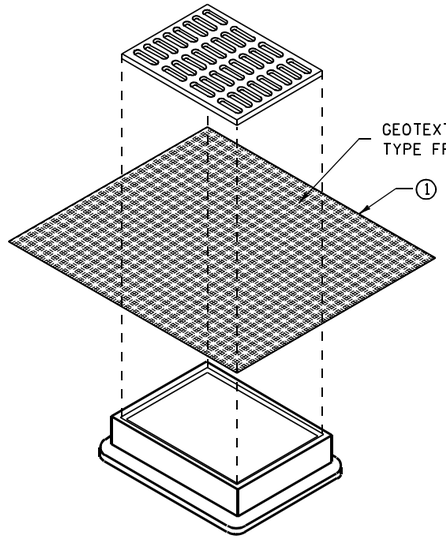
6

S.D.D. 8 E 9-6



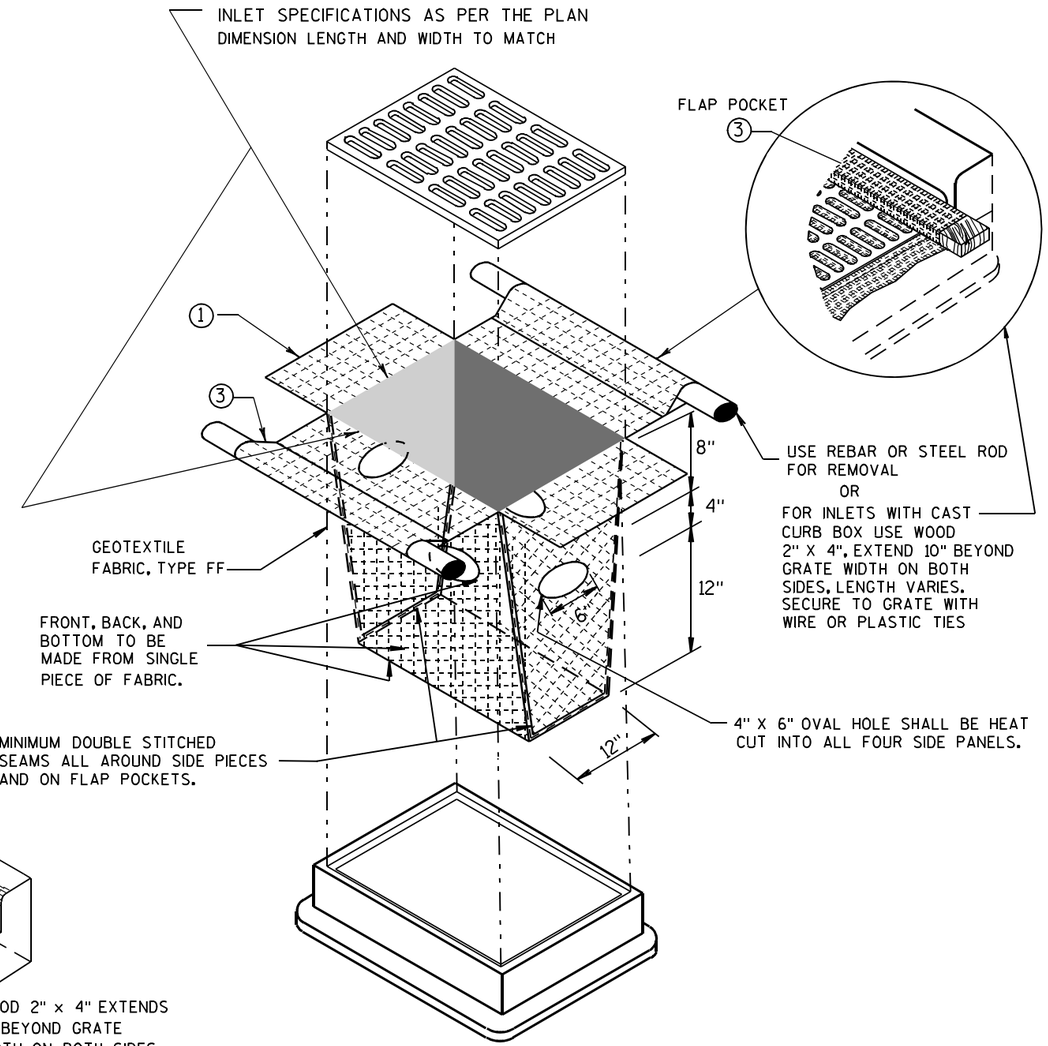


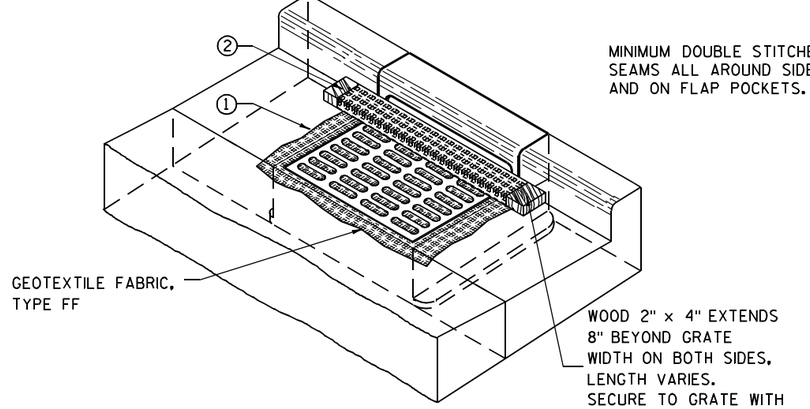
INLET PROTECTION, TYPE A



INLET PROTECTION, TYPE B
(WITHOUT CURB BOX)

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





INLET PROTECTION, TYPE C (WITH CURB BOX)

INLET PROTECTION, TYPE D

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

GENERAL NOTES

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

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

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

① FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

② FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.

③ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.

INSTALLATION NOTES

TYPE B & C

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

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

TYPE D

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

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

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

INLET PROTECTION
TYPE A, B, C, AND D

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

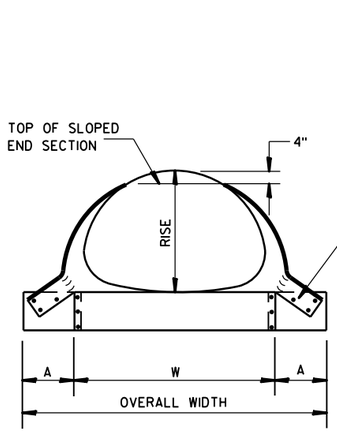
APPROVED

10/16/02
DATE

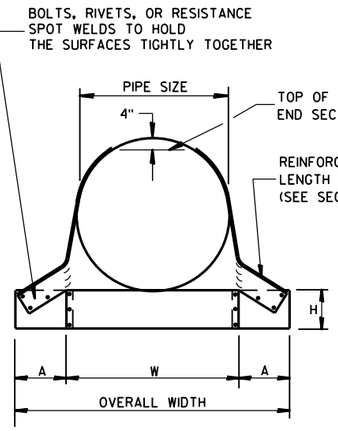
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER

FHWA

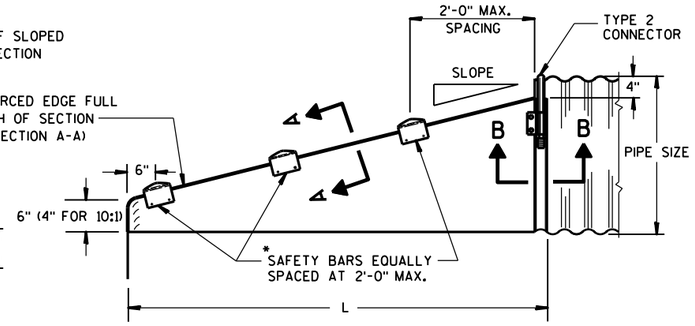
6
S.D.D. 8 E 10-2



FRONT VIEW



FRONT VIEW



SIDE VIEW

GENERAL NOTES

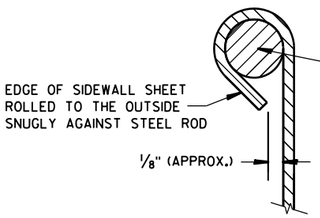
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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

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

STEEL APRON ENDWALLS FOR CULVERT PIPE
SLOPED SIDE DRAINS

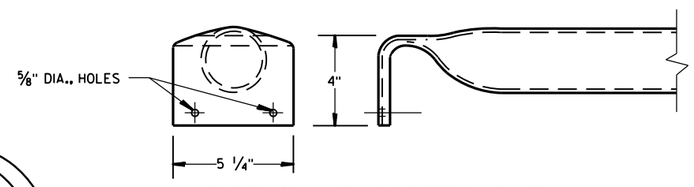
PIPE DIA. (IN.)	MIN. THICK. (Inches)	DIMENSIONS (Inches)				L DIMENSIONS					
		A	H	W	OVERALL WIDTH	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES
15	.064	8	6	21	37	4:1	20	6:1	30	10:1	70
18	.064	8	6	24	40	4:1	32	6:1	48	10:1	100
21	.064	8	6	27	43	4:1	44	6:1	66	10:1	130
24	.064	8	6	30	46	4:1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



SECTION A-A

*NOTE:
THREE SAFETY BARS ARE SHOWN. ACTUAL NUMBER OF BARS REQUIRED AT A 2'-0" C-C MAX. SPACING WILL VARY DEPENDING ON THE LENGTH OF THE END SECTION.

3" GALVANIZED PIPE. FLATTEN ENDS, THEN BEND OUTSIDE 4" TO MATCH END SECTION SIDES.

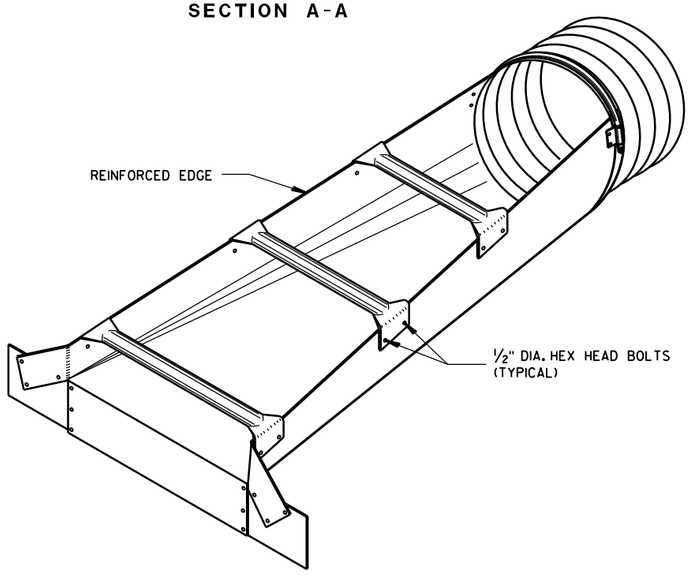


DETAIL OF SAFETY BAR

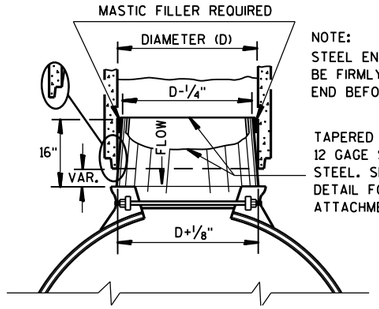
STEEL APRON ENDWALLS FOR PIPE ARCH
SLOPED SIDE DRAINS

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

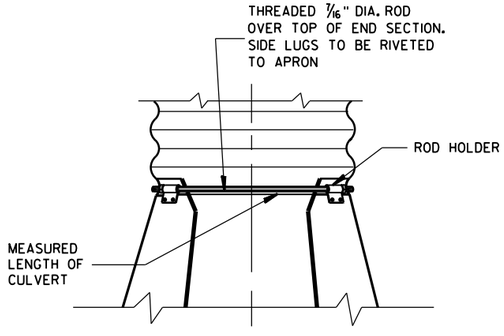
① * MINIMUM THICKNESS OF ALL 10:1 SLOPED SIDE DRAINS IS 0.109".
② ACTUAL SLOPE GREATER THAN 10:1.



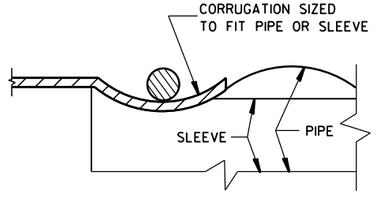
ISOMETRIC VIEW



STEEL ADAPTER SLEEVE FOR CONCRETE PIPE



TYPE 2
CONNECTION DETAIL



SECTION B-B

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
9/14/2012 — DATE
/S/ Jerry H. Zoda — ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

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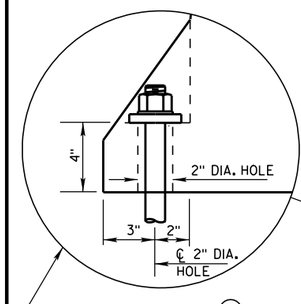
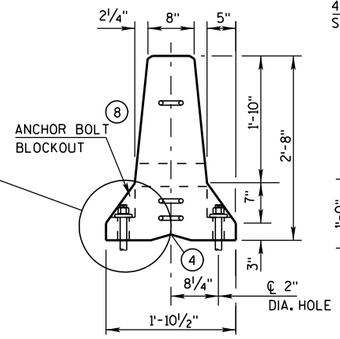
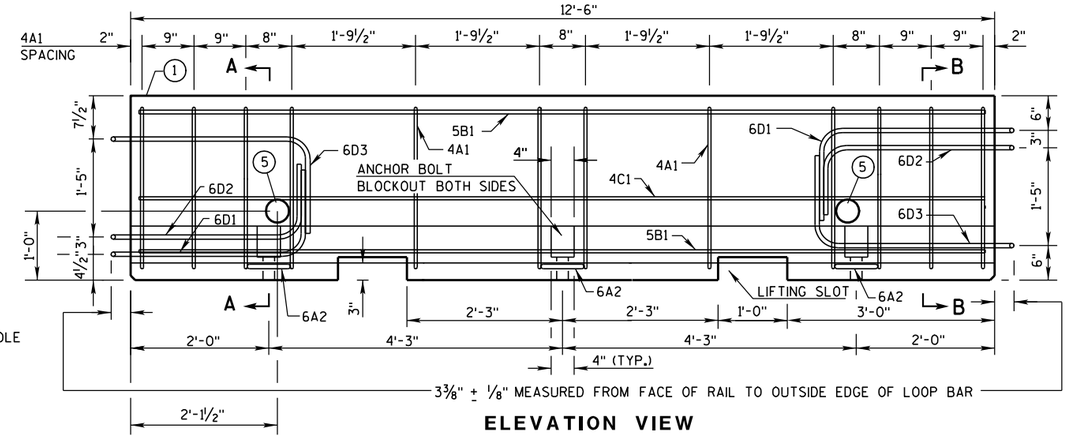
S.D.D. 8 F 7-5



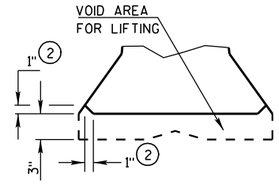
ANCHOR ON TRAFFIC SIDE (8) ONLY WHEN REQUIRED (SEE SHEET D FOR ADDITIONAL ANCHOR DETAIL)



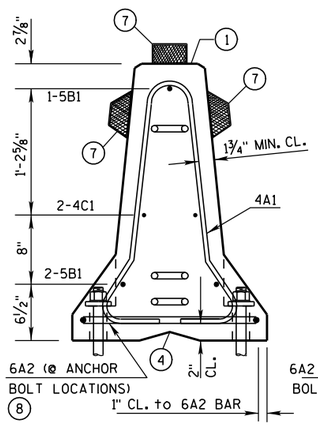
END VIEW



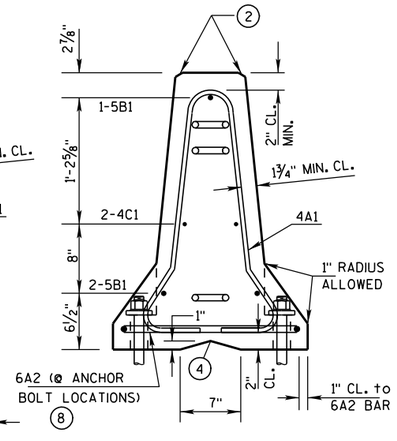
ELEVATION VIEW



DETAIL "B" LIFTING SLOT DETAIL



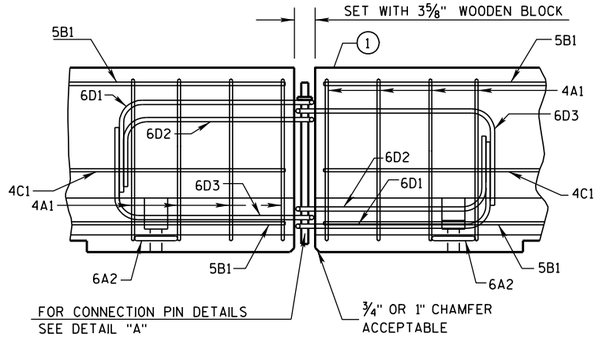
SECTION A-A
(STIRRUP PLACEMENT)



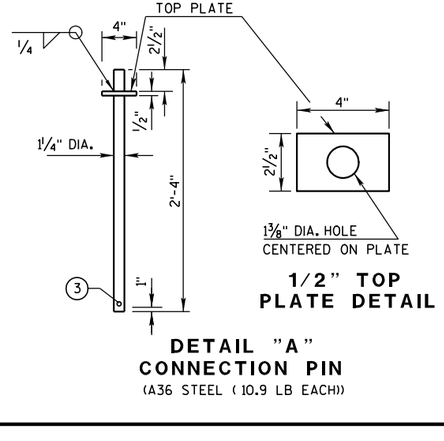
SECTION B-B
(STIRRUP PLACEMENT)

PLAN VIEW

DETAILS OF BARRIER SECTION

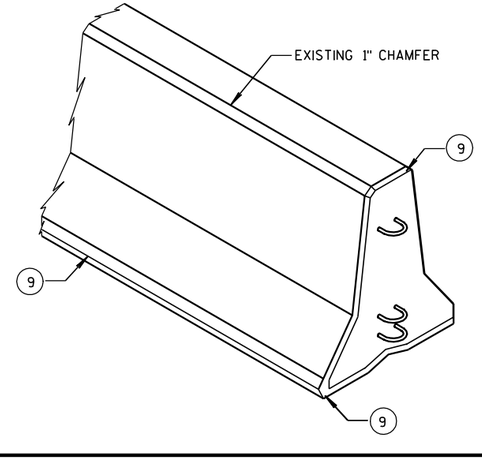


DETAILS OF BARRIER CONNECTION



1/2" TOP PLATE DETAIL

DETAIL "A" CONNECTION PIN
(A36 STEEL (10.9 LB EACH))



GENERAL NOTES

THESE GENERAL NOTES APPLY TO SHEETS 14B7-13(a) THRU 14B7-13(h).

DO NOT INTERMIX CONCRETE BARRIER TEMPORARY PRCAST, 12'-6" (CBTP12.5) WITH OTHER TEMPORARY CONCRETE BARRIERS.

USE ASTM A-615, GRADE 60, DEFORMED STEEL BARS FOR BARS 4A1, 6A2, 5B1 AND 4C1 IN THE BARRIER SECTION AND FOR 4V1, 4V2, 4V3, 4V4, 4V5, 4V6, 4F1, 4F2 AND 5F3 IN THE BARRIER TAPER SECTION.

LOOP BARS 6D1, 6D2 AND 6D3 SHALL BE ¾" SMOOTH STEEL BARS WITH A MINIMUM YIELD STRENGTH OF 60 KSI, A TENSILE STRENGTH OF NOT LESS THAN 1.25 TIMES THE YIELD STRENGTH BUT A MINIMUM OF 80 KSI, A MINIMUM 14% ELONGATION IN 8 INCHES AND PASSING A 180 DEGREE BEND TEST USING A 3-½" PIN BEND DIAMETER FOR BEND TESTS. THE LOOPS SHALL BE INSTALLED WITHIN ⅛" OF THE PLAN DIMENSION.

CONSTRUCT LIFTING SLOTS AS SPECIFIED ON THE PLANS TO FACILITATE THE DRAINAGE OF WATER AFTER INSTALLATION.

PLACE BARRIER ON A PAVED SURFACE. REMOVE ALL LOOSE DIRT AND SAND FROM THE ROADWAY SURFACE PRIOR TO PLACEMENT OF THE BARRIER.

INSTALL MECHANICAL OR EPOXY ANCHORS PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE MANUFACTURER'S INFORMATION TO PROJECT ENGINEER.

(1) MARK ONE END OF EACH BARRIER PERMANENTLY BY FORMING INTO THE BARRIER THE FOLLOWING INFORMATION:
- a. TYPE: WICBTP
- b. MANUFACTURER
- c. DATE MANUFACTURED (MONTH AND YEAR)

(2) 1" CHAMFER TO PREVENT SPALLING.

(3) A ⅜" HOLE IN THE CONNECTION PIN, AT THE LOCATION SHOWN, IS ACCEPTABLE, BUT NOT REQUIRED..

(4) "V" NOTCH IS OPTIONAL.

(5) THE 4" DIAMETER, 11 GAUGE STEEL, ROUND MECHANICAL TUBING SLEEVE FOR LIFTING (OPTIONAL).

(6) NEVER USE LOOP BARS (6D1, 6D2 OR 6D3) TO LIFT, MOVE OR REPOSITION THE BARRIER.

(7) USE DELINEATORS CONFORMING TO SECTION 633 OF THE STANDARD SPECIFICATIONS. CONTRACTOR MAY USE ALTERNATE SHAPES AND HOUSING. INSTALL DELINEATORS ACCORDING TO MANUFACTURES INSTRUCTION. INSTALL YELLOW REFLECTORS WHEN BARRIER IS LOCATED TO THE LEFT OF TRAFFIC AND WHITE REFLECTORS WHEN BARRIER IS LOCATED TO THE RIGHT OF TRAFFIC. SPACE DELINEATORS A MAXIMUM OF 25 FEET APART. PROVIDE TOP MOUNTED DELINEATORS IN ADDITION TO THE SIDE MOUNTED DELINEATORS ON ALL BARRIER INSTALLATIONS LOCATED ON A CURVED ALIGNMENT LONGER THAN 200 FEET AND ON BARRIERS USED TO SEPARATE OPPOSING TRAFFIC.

(8) SEE SHEET D FOR ANCHORING CRITERIA.

(9) 1" CHAMFER OPTIONAL.

CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN
DEPARTMENT OF TRANSPO...

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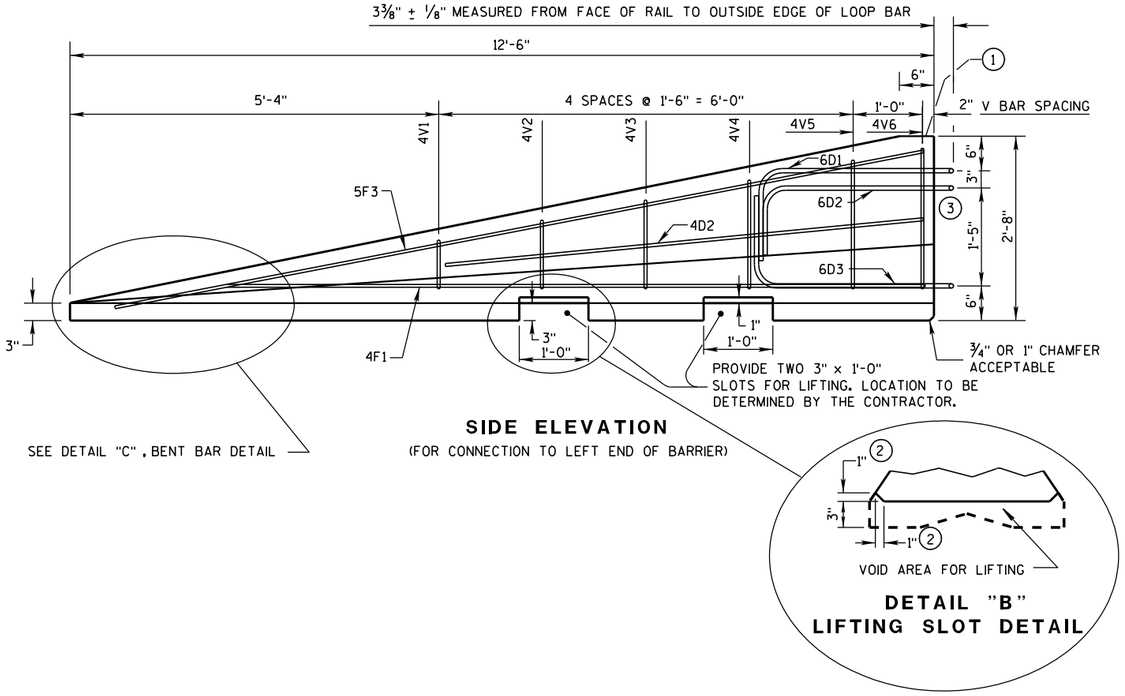
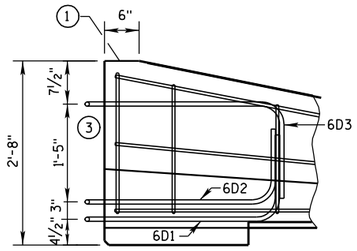
S.D.D. 14 B 7-13a



SIDE ELEVATION
(FOR CONNECTION TO LEFT END OF BARRIER)

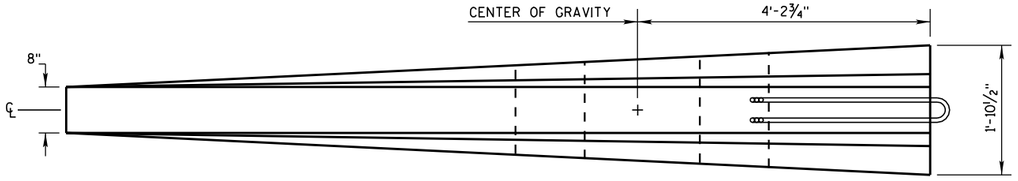
DETAIL "B"
LIFTING SLOT DETAIL



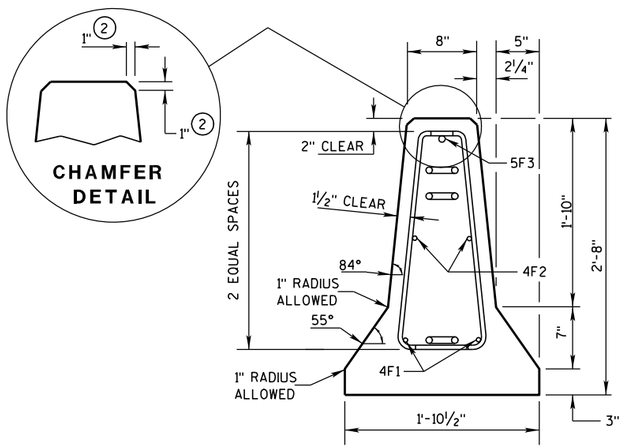
SIDE ELEVATION
LOOP BAR ASSEMBLY INVERTED
FOR OPPOSITE END.
(FOR CONNECTION TO RIGHT END OF BARRIER)

GENERAL NOTES

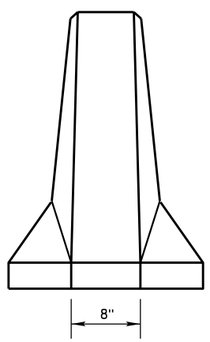
1. MARK ONE END OF EACH BARRIER PERMANENTLY BY FORMING INTO THE BARRIER THE FOLLOWING INFORMATION:
   a. TYPE WICBTP
   b. MANUFACTURER
   c. DATE MANUFACTURED (MONTH AND YEAR)
2. 1" CHAMFER TO PREVENT SPALLING.
3. NEVER USE LOOP BARS (6D1, 6D2 OR 6D3) TO LIFT, MOVE OR REPOSITION THE BARRIER.



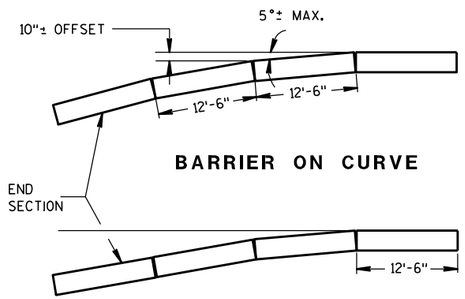
PLAN VIEW



END SECTION



FRONT ELEVATION



BARRIER ON CURVE

FLARE AT BARRIER END

POSTED SPEED, (MPH)	FLARE RATE
40 OR LESS	6:1
45 OR GREATER	8:1

DETAILS OF BARRIER TAPER SECTION

CONCRETE BARRIER
TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

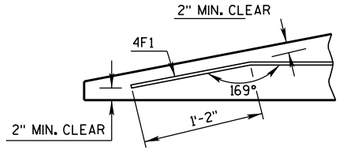
6

S.D.D. 14 B 7-13b

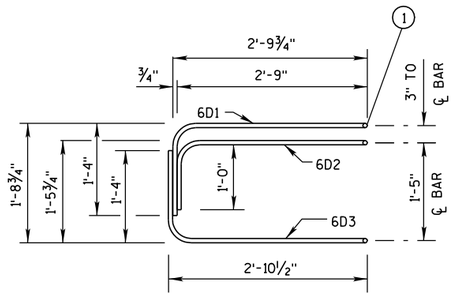
BARRIER TAPER SECTION BILL OF MATERIALS

(PER 12'-6" BARRIER TAPER SECTION)

BAR	BAR SIZE	NO. OF BARS	LENGTH FT.
4V1	4	2	1'-11"
4V2	4	2	2'-2"
4V3	4	2	2'-6"
4V4	4	2	2'-9"
4V5	4	2	3'-2"
4V6	4	2	3'-4"
4F1	4	2	12'-0"
4F2	4	2	7'-6"
5F3	5	1	11'-9"
LOOP ASSEMBLY			
6D1	6	1	8'-5"
6D2	6	1	7'-7"
6D3	6	1	8'-6"



DETAIL "C"
BENT BAR DETAIL



ELEVATION
LOOP BAR ASSEMBLY

BAR	a	b
V1	10"	1"
V2	1'-1"	1¼"
V3	1'-5"	1⅝"
V4	1'-8"	1⅞"
V5	2'-0½"	2⅜"
V6	2'-3"	2¾"

4V BARS
2 AT EACH SIZE REQUIRED
FOR STIRRUP ASSEMBLY

TAPER BARRIER SECTION

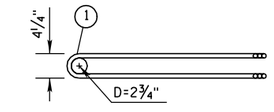
GENERAL NOTES

(1) NEVER USE LOOP BARS (6D1, 6D2 OR 6D3) TO LIFT, MOVE OR REPOSITION THE BARRIER.

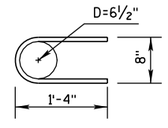
BARRIER SECTION BILL OF MATERIALS

(PER 12'-6" BARRIER SECTION)

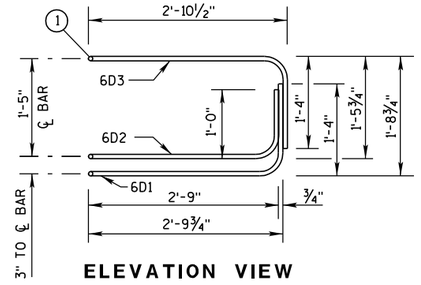
BAR	BAR SIZE	NO. OF BARS	LENGTH FT.
4A1	4	12	6'-0"
6A2	6	6	2'-11"
5B1	5	3	12'-2"
4C1	4	2	12'-2"
LOOP ASSEMBLY			
6D1	6	2	8'-5"
6D2	6	2	7'-7"
6D3	6	2	8'-6"



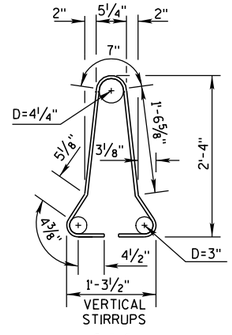
PLAN VIEW
LOOP BAR ASSEMBLY
(MARKED END SHOWN, INVERT FOR OTHER END)



6A2



ELEVATION VIEW



4A1

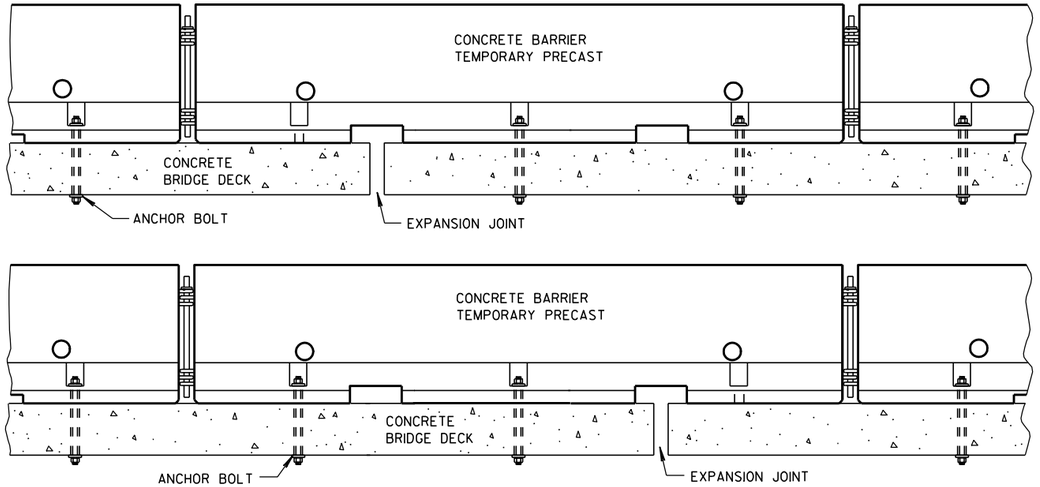
BARRIER SECTION

CONCRETE BARRIER
TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

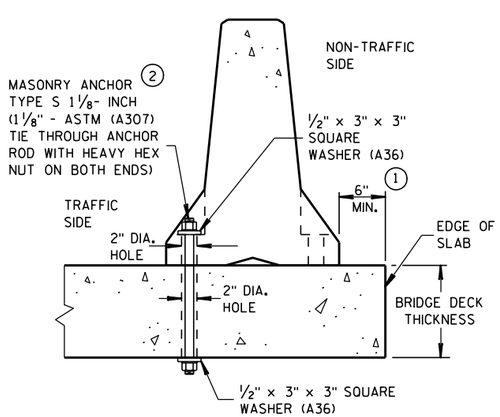
6

S.D.D. 14 B 7-13c



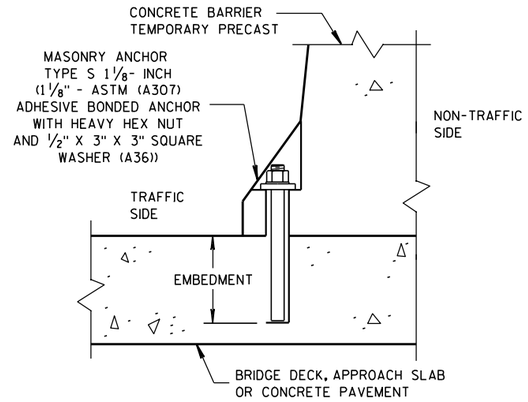
TREATMENT AT BRIDGE DECK EXPANSION JOINTS

(NO SINGLE CONCRETE BARRIER SECTION SHALL BE ANCHORED TO BOTH THE BRIDGE DECK AND THE APPROACH SLAB. ALL ANCHOR BOLT LOCATIONS SHALL BE ANCHORED TO THE DECK IN ACCORDANCE WITH THE DETAIL. NO MORE THAN ONE ANCHOR BOLT SHALL BE ELIMINATED FROM A BARRIER SECTION WHEN SPANNING AN EXPANSION JOINT.)



THROUGH BOLTED ANCHOR INSTALLATION ON BRIDGE DECK

(DO NOTUSE ON CONCRETE BRIDGE DECK WITH ASPHALT OVERLAY)



REMOVABLE ADHESIVE BONDED ANCHOR INSTALLATION ON CONCRETE BRIDGE DECK, CONCRETE APPROACH SLAB, OR CONCRETE PAVEMENT

(DO NOT USE ON CONCRETE WITH AN ASPHALTIC OVERLAY)

GENERAL NOTES

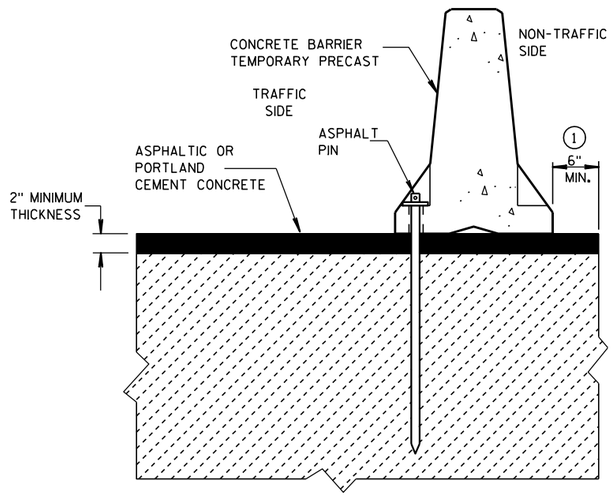
1. CONCRETE BARRIER TEMPORARY PRECAST, 12'-6" SHALL BE ANCHORED IF:
   THE DISTANCE TO A 2 FOOT OR GREATER DROPOFF THAT IS STEEPER THAN 3H : 1V, FOR EXAMPLE THE EDGE OF A BRIDGE DECK OR A DROPOFF AT THE EDGE OF PAVEMENT, IS LESS THAN 4 FEET FROM THE SIDE OF THE BARRIER CLOSEST TO THE DROPOFF AND THE POSTED SPEED IS 45 MPH OR GREATER, OR

   THE DISTANCE TO A 2 FOOT OR GREATER DROPOFF THAT IS STEEPER THAN 3H : 1V, FOR EXAMPLE THE EDGE OF A BRIDGE DECK OR A DROPOFF AT THE EDGE OF PAVEMENT. IS LESS THAN 2 FEET FROM THE SIDE OF THE BARRIER CLOSEST TO THE DROPOFF AND THE POSTED SPEED IS 40 MPH OR LESS.

2. ANCHORING IS INCIDENTAL TO CONCRETE BARRIER TEMPORARY PRECAST.

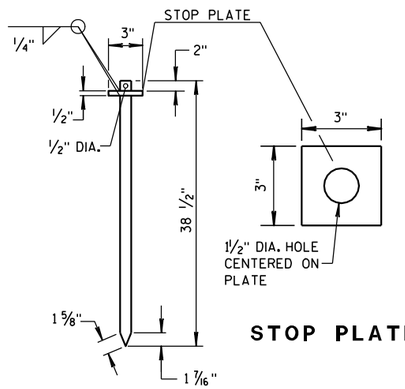
   WITH THE APPROVAL OF THE ENGINEER, REMOVABLE ADHESIVE BONDED (EPOXY) ANCHOR BOLT INSTALLATION MAY BE USED IN LIEU OF THROUGH BOLTED ANCHOR INSTALLATION. THE ADHESIVE BONDED ANCHOR BOLT MUST BE REMOVABLE. USE ASTM (A307) MASONRY ANCHORS TYPE S 1⅛-INCH, EMBEDDED TO A DEPTH SUFFICIENT TO DEVELOP THE ULTIMATE CAPACITY OF THE ANCHOR BOLT AND PROVIDE DOCUMENTATION TO CONFIRM THIS.

   UPON REMOVAL OR RELOCATION OF THE BARRIER UNITS, REMOVE ALLANCHOR BOLTS AND COMPLETELY FILL IN THE REMAINING HOLES IN CONCRETE BRIDGE DECKS, CONCRETE APPROACH SLABS AND CONCRETE PAVEMENTS THAT ARE TO REMAIN, WITH A NON-SHRINK COMMERICAL GROUT OR EPOXY MATERIAL IDENTIFIED ON THE CURRENT WISDOT APPROVED PRODUCTS LIST.



STAKE DOWN INSTALLATION FOR ASPHALTIC OR PORTLAND CEMENT CONCRETE SURFACE

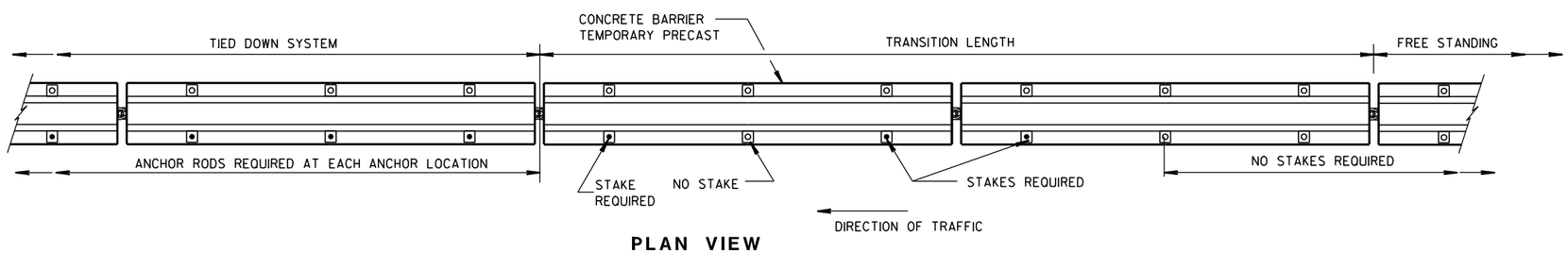
(STAKING IS INCIDENTAL TO CONCRETE BARRIER TEMPORARY PRECAST)



ASPHALT PIN

(ASTM A36 STEEL)

STOP PLATE



PLAN VIEW

FREE STANDING TRANSITION TO TIED-DOWN SYSTEM

(PLACE TRANSITION IN A TANGENT SECTION OF BARRIER PARALLEL TO THE ROADWAY. IF TRANSITION OCCURS ON STRUCTURAL SLAB, ANCHOR AS SHOWN.)

CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN
DEPARTMENT OF TRANSPO...

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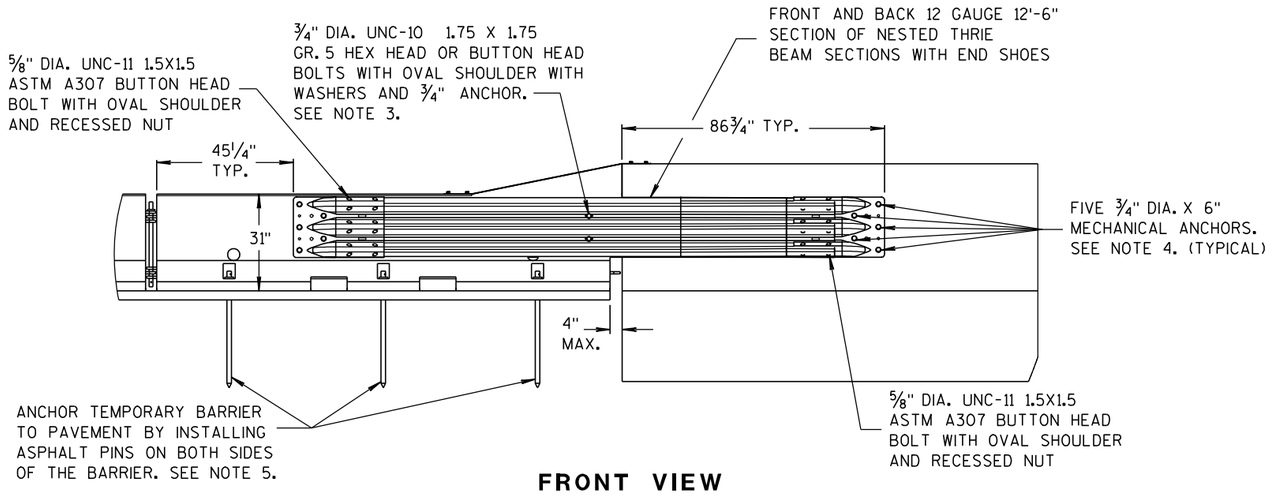
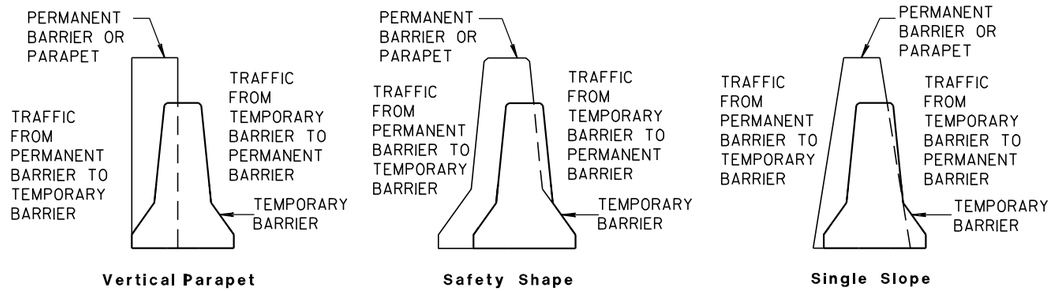
S.D.D. 14 B 7-13d



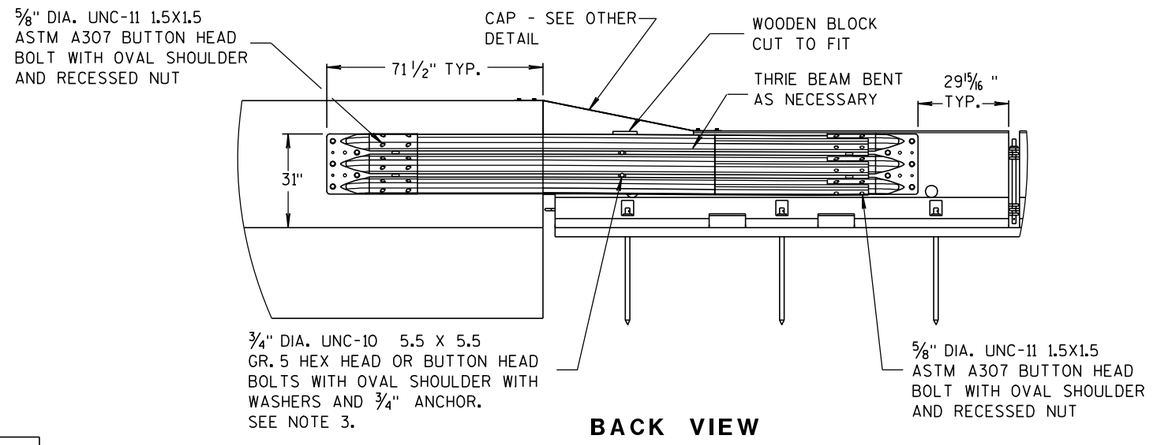
FRONT VIEW

NOTES

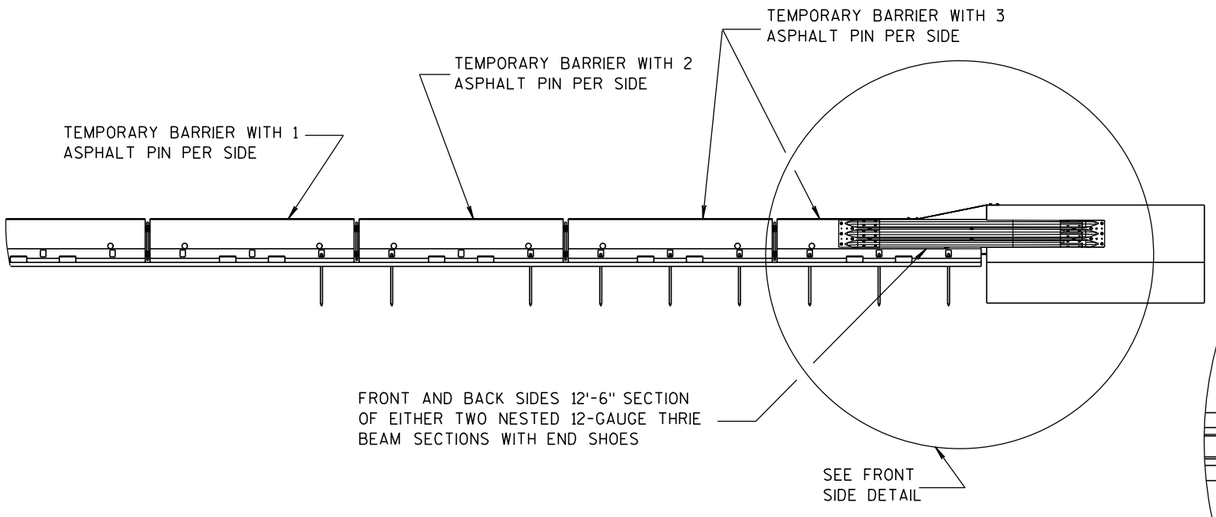
1. CAP END PLATE PLACED FLUSH WITH UPSTREAM END OF PERMANENT BARRIER OR PARAPET.
2. THRIE BEAM PIECES ARE OFFSET 15 1/4" TO PREVENT INTERFERENCE FROM THE ANCHORS ON OPPOSING SIDES.
3. MINIMUM MECHANICAL OR EPOXY ANCHOR STRENGTH REQUIREMENTS: ULTIMATE TENSILE LOAD 9.48 KIPS AND ULTIMATE SHEAR LOAD 10.48 KIPS.
4. MINIMUM MECHANICAL OR EPOXY ANCHOR STRENGTH REQUIREMENTS: ULTIMATE TENSILE LOAD 17.9 KIPS AND ULTIMATE SHEAR LOAD 21.96 KIPS.
5. MAY BE USED ON CONCRETE OR ASPHALT PAVEMENTS. ASPHALT OPTION SHOWN. FOR CONCRETE OPTION SEE OTHER DETAILS.
6. MINIMUM MECHANICAL OR EPOXY ANCHOR STRENGTH REQUIREMENTS: ULTIMATE TENSILE LOAD 12.14 KIPS AND ULTIMATE SHEAR LOAD 17.5 KIPS.



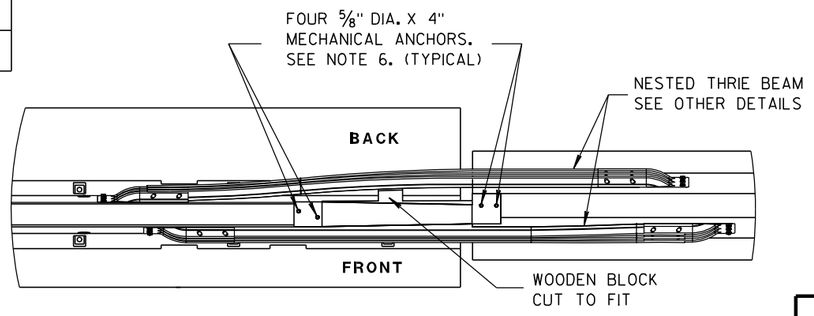
TEMPORARY BARRIER PLACEMENT FOR BI-DIRECTIONAL TRANSITION TO TIED-DOWN SYSTEM



BACK VIEW



FRONT VIEW



PLAN VIEW

BI-DIRECTIONAL TRANSITION TO TIED-DOWN SYSTEM

CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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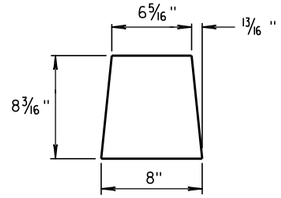
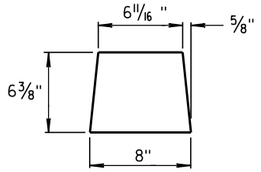
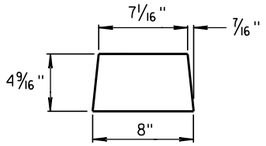
S.D.D. 14 B 7-13e



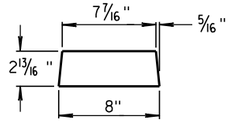
GUSSET 1



GUSSET 2

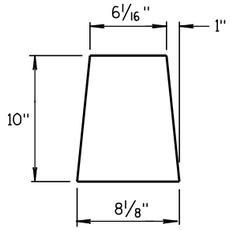


GUSSET 3

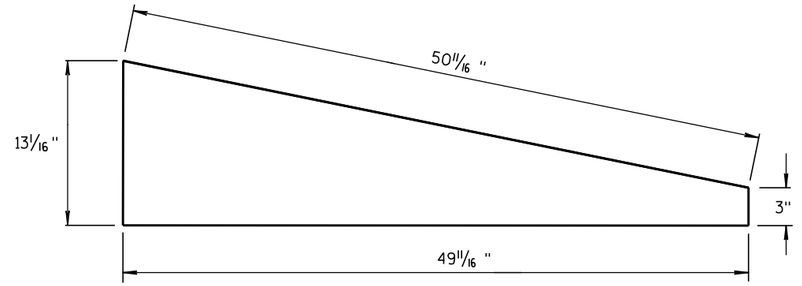


GUSSET 4

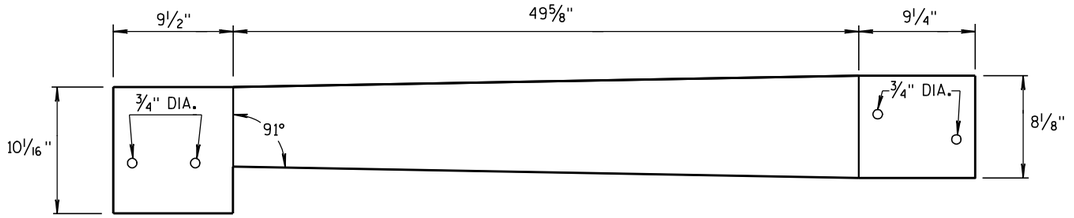
GUSSETS

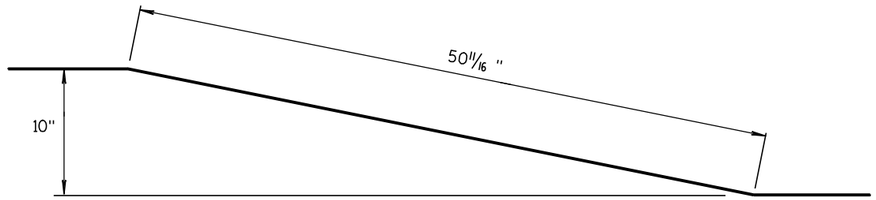


END PLATE

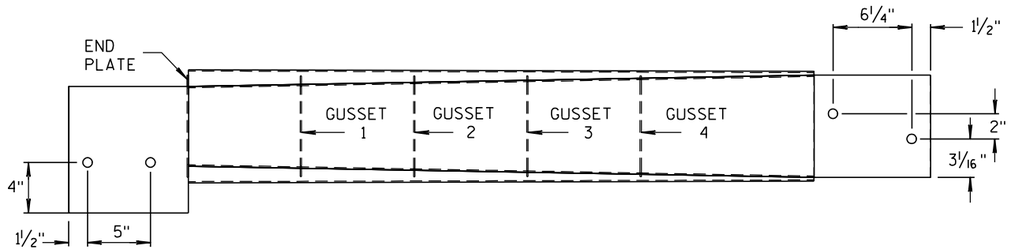


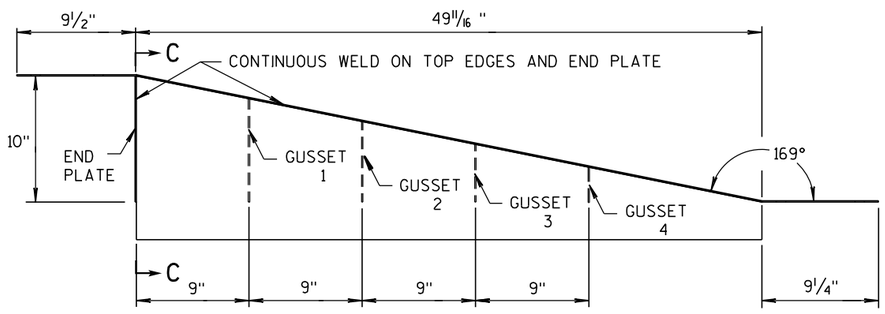
SIDE PLATE

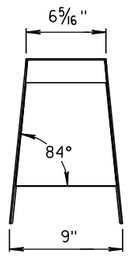




TOP PLATE







SECTION C-C

NOTES

1. FOUR GUSSETS AND END PLATE ARE STITCH WELDED ON THREE SIDES.
2. TWO TRIANGULAR SIDE PLATES ARE STITCH WELDED TO TOP PLATE, END PLATE, AND GUSSETS.

CAP DETAILS FOR TEMPORARY CONCRETE BARRIER TO 42" PERMANENT CONCRETE BARRIER

SIDE, TOP AND END PLATES FOR CAP FROM TEMPORARY CONCRETE BARRIER TO 42" PERMANENT CONCRETE BARRIER

SIDE PLATES, TOP PLATE, END PLATE AND GUSSETS ARE 12 GAUGE ASTM A36 GALVANIZED STEEL.

CONCRETE BARRIER
TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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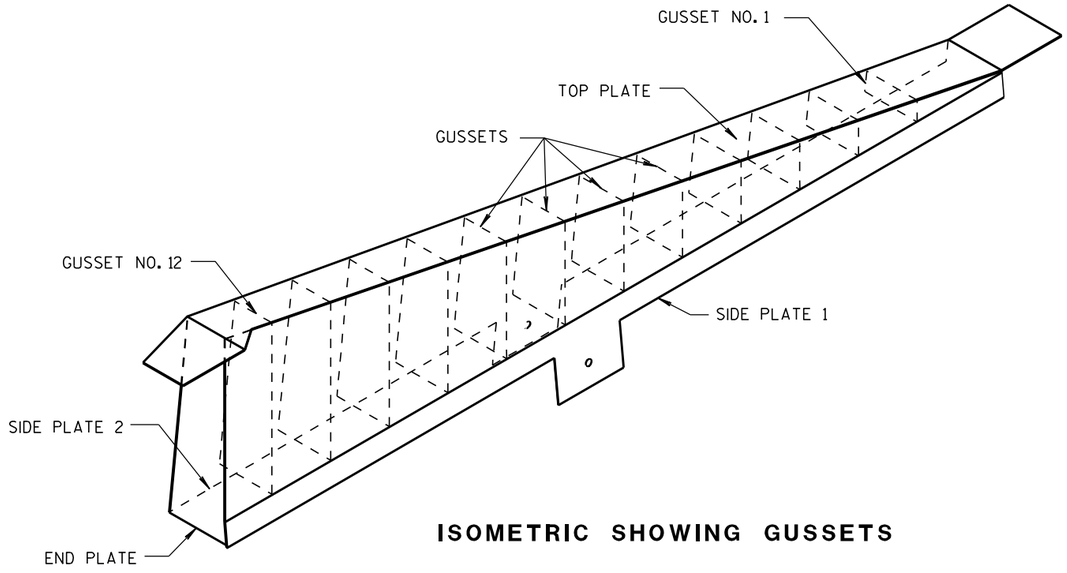
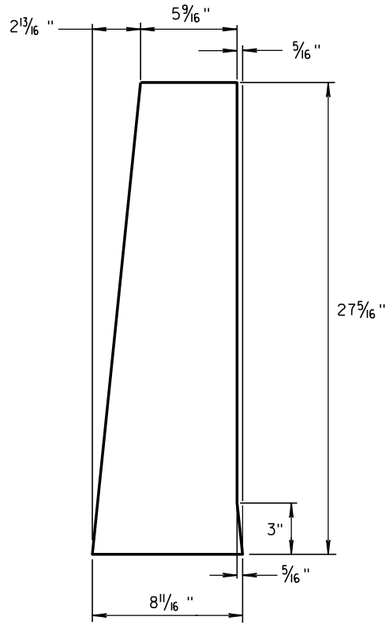
S.D.D. 14 B 7-13f

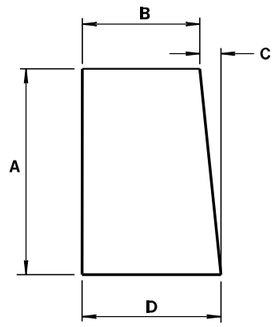


ISOMETRIC SHOWING GUSSETS



END PLATE

1/8" STEEL PLATE



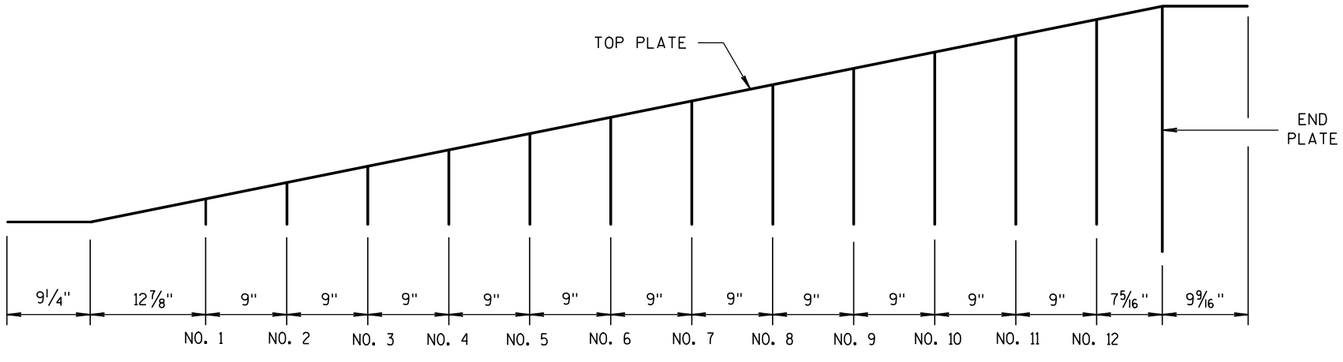
GUSSETS 1 - 12

ALL GUSSETS 1/8" STEEL PLATE

GUSSET DIMENSIONS				
GUSSET NO.	A	B	C	D
1	2 7/8"	7 3/4"	1/4"	8
2	4 11/16 "	7 9/16 "	1/2"	8
3	6 1/2"	7 3/8"	11/16 "	8 1/16 "
4	8 5/16 "	7 3/16 "	7/8"	8 1/16 "
5	10 1/8"	7"	1 1/16 "	8 1/16 "
6	11 15/16 "	6 13/16 "	1 1/4"	8 1/16 "
7	13 3/4"	6 5/8"	1 7/16 "	8 1/16 "
8	15 9/16 "	6 7/16 "	1 9/16 "	8 1/16 "
9	17 3/8"	6 1/4"	1 13/16 "	8 1/16 "
10	19 3/16 "	6 1/16 "	1 15/16 "	8 1/16 "
11	21"	5 7/8"	2 3/16 "	8 1/16 "
12	22 13/16 "	5 11/16 "	2 5/16 "	8 1/16 "

SIDE PLATES, TOP PLATE, END PLATE AND GUSSETS ARE 12 GAUGE ASTM A36 STEEL AND GALVANIZED.

GUSSETS AND END PLATE ARE STITCH WELDED ON 3 SIDES. TWO TRIANGULAR SIDE PLATES ARE STITCH WELDED TO TOP PLATE, END PLATE AND GUSSETS.



GUSSET LOCATION

CAP DETAILS FOR TEMPORARY CONCRETE BARRIER TO 56" PERMANENT CONCRETE BARRIER

CONCRETE BARRIER TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN
DEPARTMENT OF TRANSPO.....T

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S.D.D. 14 B 7-13g

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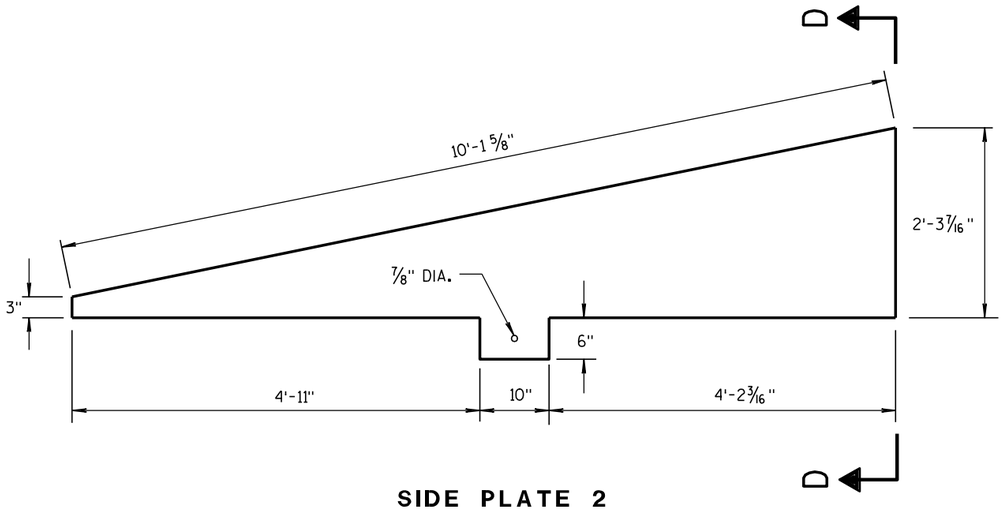
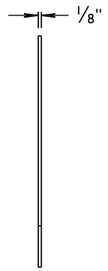
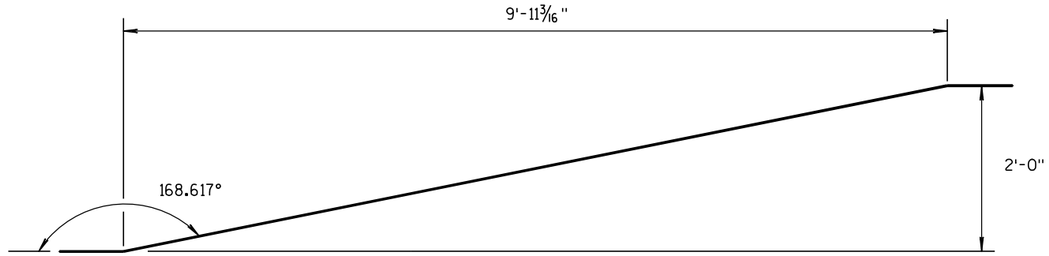
S.D.D. 14 B 7-13g



SIDE PLATE 2

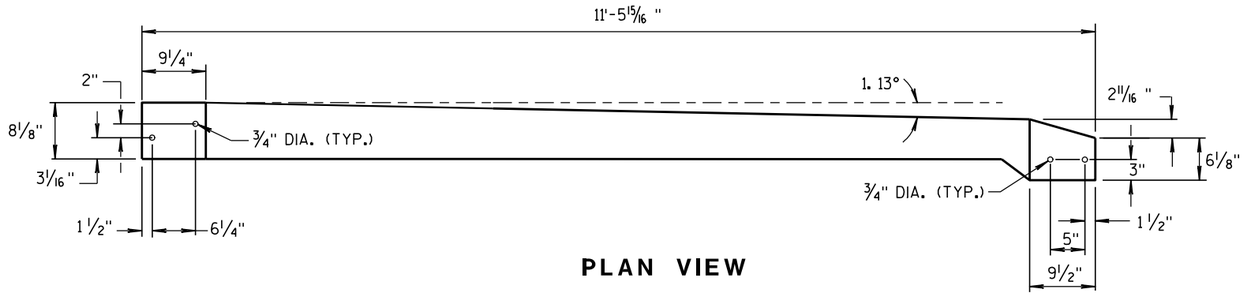


END VIEW



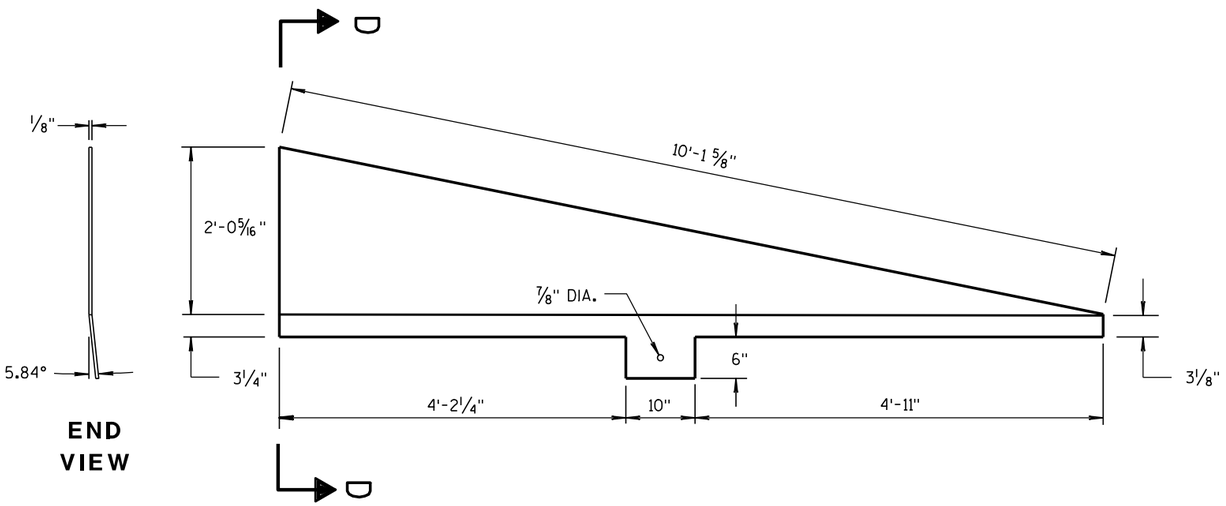
SIDE VIEW

TOP PLATE



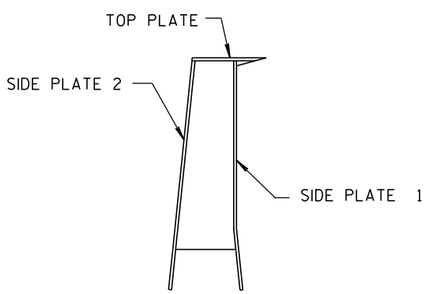
PLAN VIEW

TOP PLATE



END VIEW

SIDE PLATE 1



SECTION D-D

CAP DETAILS FOR TEMPORARY CONCRETE BARRIER TO 56" PERMANENT CONCRETE BARRIER

CONCRETE BARRIER
TEMPORARY PRECAST, 12'-6"

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/31/2012 DATE
/S/ Jerry H. ROADWAY STANDARDS ENGINEER
ENT
FHWA

6

S.D.D. 14 B 7-13h

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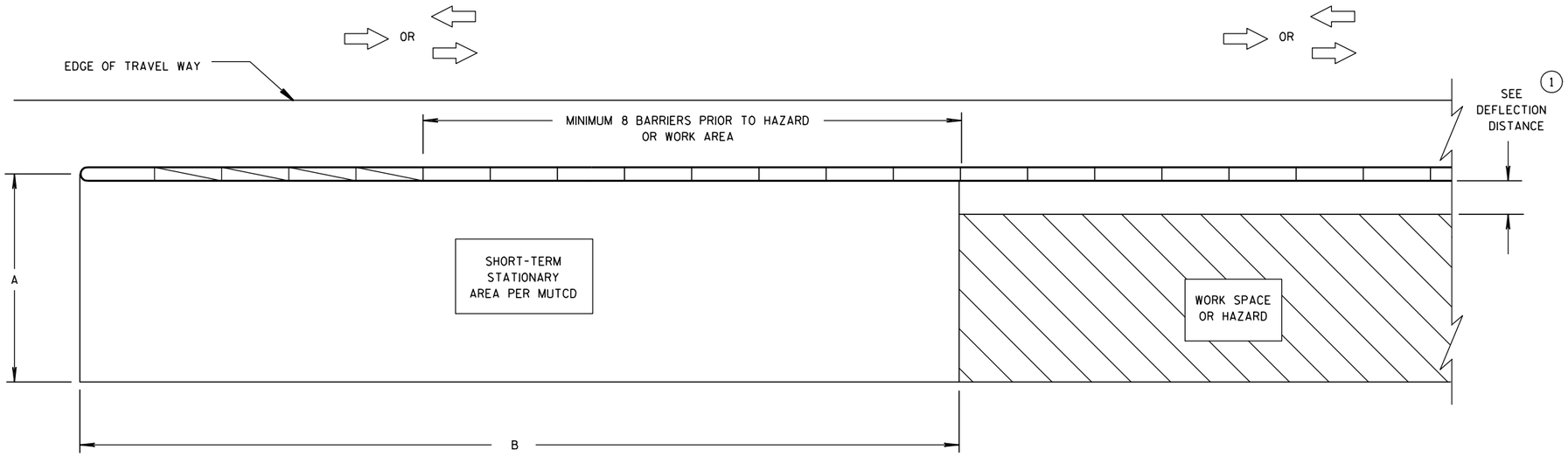
S.D.D. 14 B 7-13h



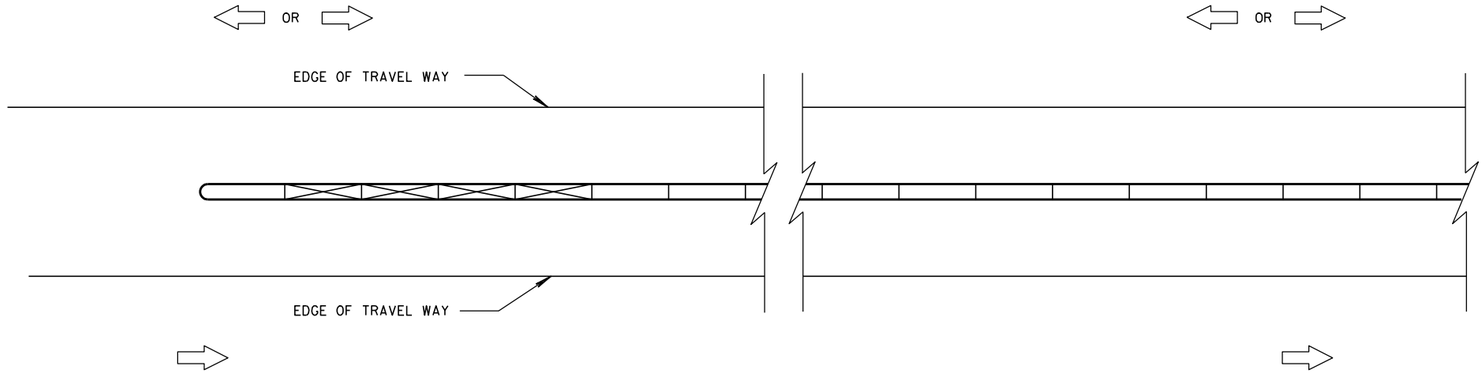
CRASH CUSHION/SAND BARREL ARRAY AND TEMPORARY BARRIER INSTALLATION FOR TRAFFIC ON ONE SIDE OF BARRIER

DIMENSION A TABLE (2)

FACILITY	POSTED SPEED MPH	DIMENSION A	
		MIN. FT	MAX. FT
FREEWAY/EXPRESSWAY	ALL	15	20
NON-FREEWAY/EXPRESSWAY	GREATER THAN OR EQUAL TO 45	10	15
NON-FREEWAY/EXPRESSWAY	LESS THAN 45	8	10
AADT LESS THAN 1,500	ALL	8	10

DIMENSION B TABLE (2)

POSTED SPEEDS MPH	DIMENSION B FT
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645



CRASH CUSHION/SAND BARREL ARRAY AND TEMPORARY BARRIER INSTALLATION FOR TRAFFIC ON BOTH SIDES OF BARRIER

LEGEND

DIRECTION OF TRAVEL

CRASH CUSHION OR SAND BARREL ARRAY

SEE FREE STANDING TRANSITION TO TIED-DOWN SYSTEM DETAILS

SEE BI-DIRECTIONAL TRANSITION TO TIED-DOWN SYSTEM DETAILS

3 PINS PLACED ON TRAFFIC SIDE OF BARRIER

PERMANENT CONCRETE BARRIER OR CONCRETE PARAPET

FREE STANDING TEMPORARY BARRIER

GENERAL NOTES

SEE STANDARD DETAIL DRAWING 14B7 FOR MORE INFORMATION.

DETAILS PROVIDE A GENERAL LAYOUT OF TEMPORARY CONCRETE BARRIER, CRASH CUSHIONS, SAND BARREL ARRAYS AND TIE DOWN TRANSITIONS. DETAILS PROVIDED MAY NOT FIT ALL POSSIBLE SITUATIONS OR SITE CONDITIONS. SEE OTHER SECTIONS OF THE CONTRACT OR PROJECT ENGINEER FOR MORE DETAILS.

ADDITIONAL TEMPORARY BARRIER MAY BE REQUIRED TO PROTECT TRAVELING PUBLIC FROM HAZARDS, CONTRACTOR'S OPERATIONS OR TO CONTROL TRAFFIC.

TEMPORARY BARRIER MAY BE REQUIRED TO BE ANCHORED TO PAVEMENT OR BRIDGE DECK.

FOR DETAILS ON CRASH CUSHION OR SAND BARREL ARRAYS SEE OTHER SECTIONS OF THE PLAN AND MANUFACTURE'S DETAILS.

SLOPES LEADING TO TEMPORARY BARRIER, CRASH CUSHION OR SAND BARREL ARRAY ARE 10:1 OR LESS.

(1) FOR DEFLECTION INFORMATION SEE STANDARD DETAIL DRAWING 14B7.

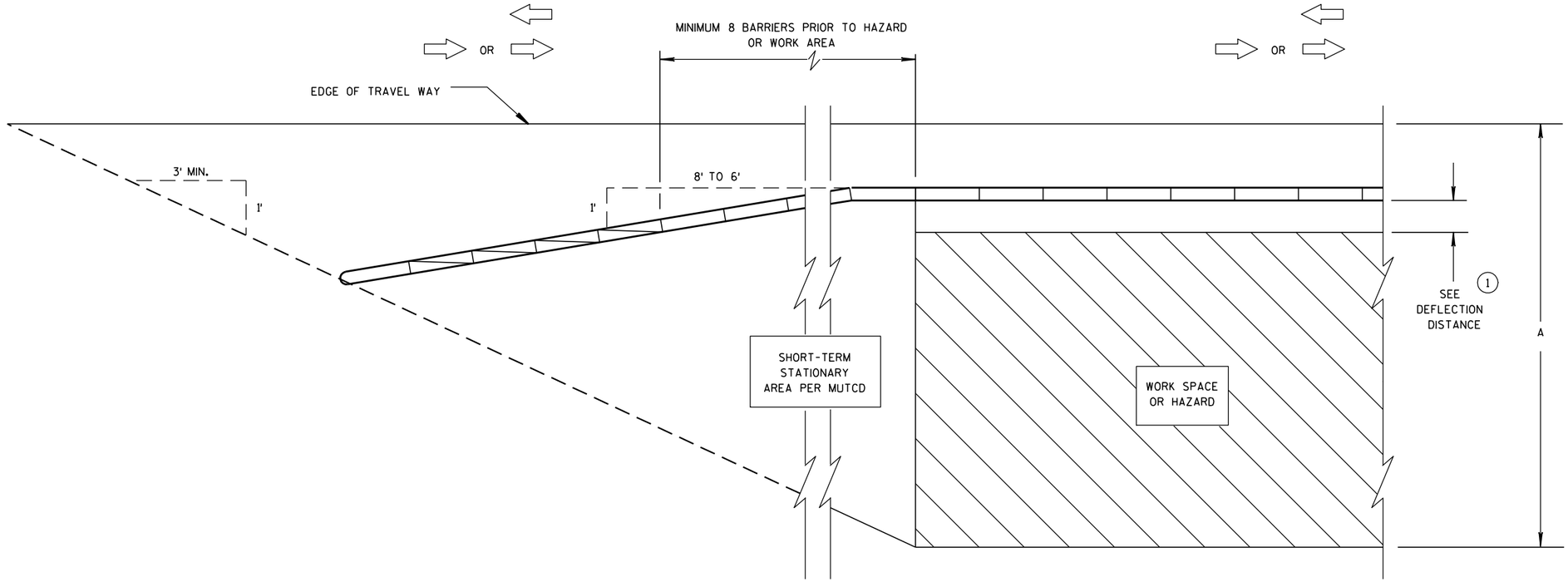
(2) VALUES PROVIDED MAY NOT FIT ALL POSSIBLE SITUATIONS OR SITE CONDITIONS. SEE OTHER SECTIONS OF THE CONTRACT OR PROJECT ENGINEER FOR MORE DETAILS.

CRASH CUSHION/SAND BARREL ARRAY AND OTHER TEMPORARY BARRIER LAYOUT DETAILS

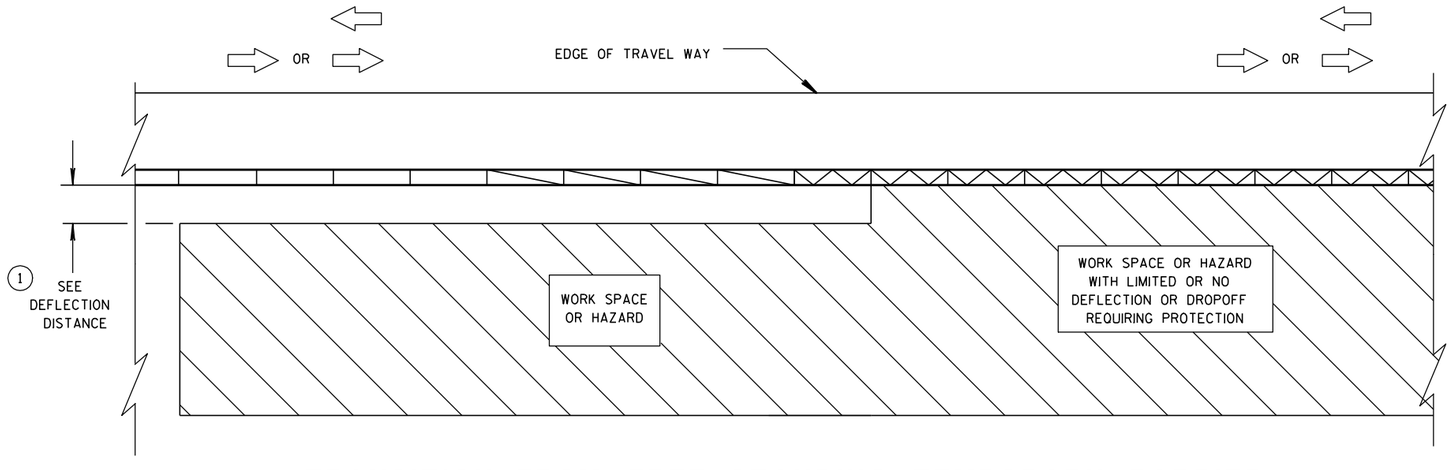
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

S.D.D. 14 B 8-1a



CRASH CUSHION/SAND BARREL ARRAY AND TEMPORARY BARRIER INSTALLATION FOR TRAFFIC ON ONE SIDE - FLARED INSTALLATION



TRANSITION FROM FREE STANDING TEMPORARY BARRIER TO ANCHORED BARRIER

LEGEND

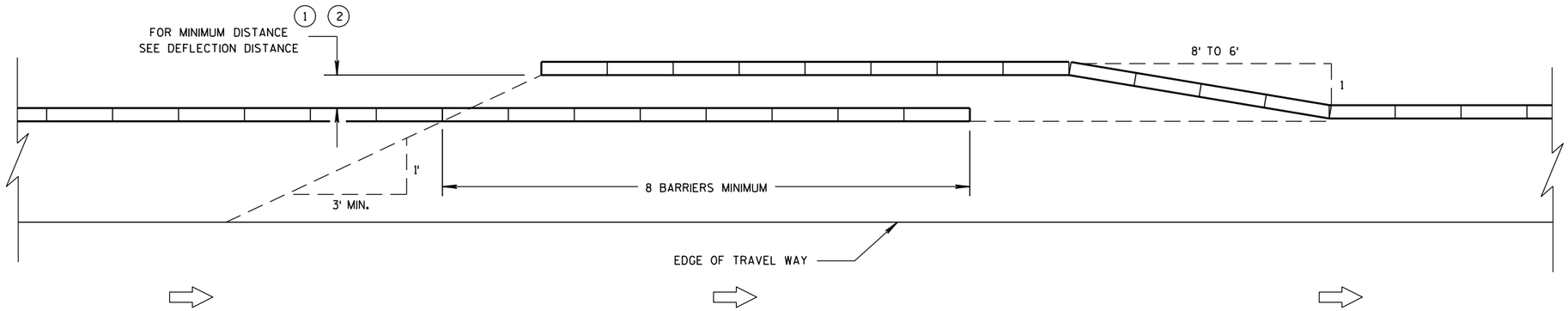
- DIRECTION OF TRAVEL
- CRASH CUSHION OR SAND BARREL ARRAY
- SEE FREE STANDING TRANSITION TO TIED-DOWN SYSTEM DETAILS
- SEE BI-DIRECTIONAL TRANSITION TO TIED-DOWN SYSTEM DETAILS
- 3 PINS PLACED ON TRAFFIC SIDE OF BARRIER
- PERMANENT CONCRETE BARRIER OR CONCRETE PARAPET
- FREE STANDING TEMPORARY BARRIER

CRASH CUSHION/SAND BARREL ARRAY AND OTHER TEMPORARY BARRIER LAYOUT DETAILS

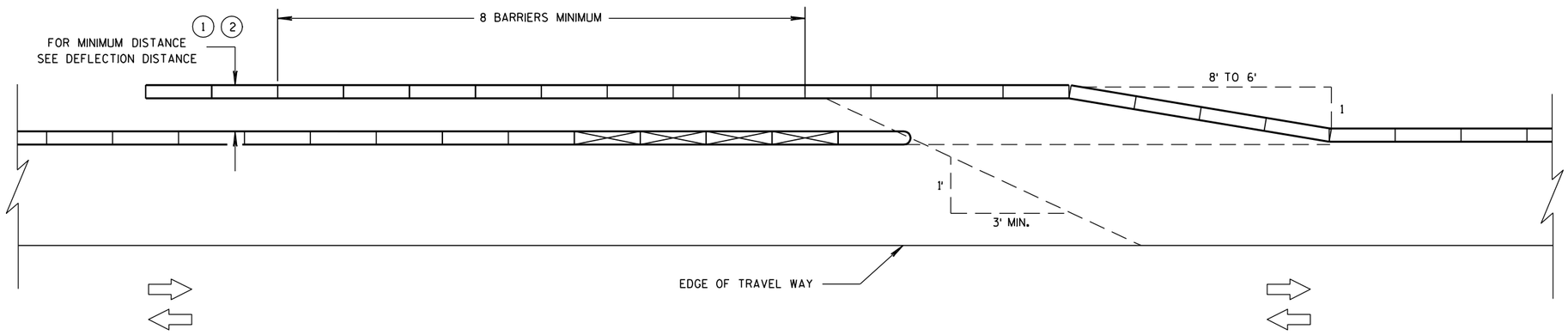
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

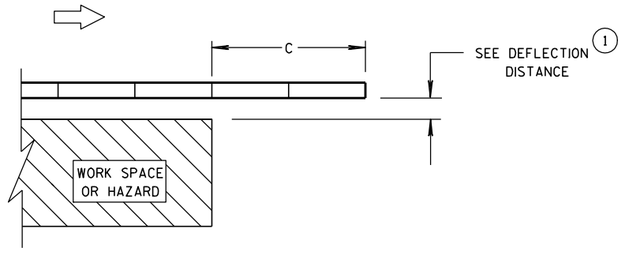
S.D.D. 14 B 8-1b



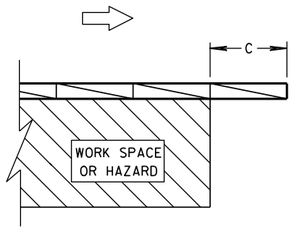
TEMPORARY BARRIER OVERLAP - ONE-WAY TRAFFIC



TEMPORARY BARRIER OVERLAP - TWO-WAY TRAFFIC



ENDING TEMPORARY BARRIER DOWNSTREAM - UNANCHORED



ENDING TEMPORARY BARRIER DOWNSTREAM - ANCHORED

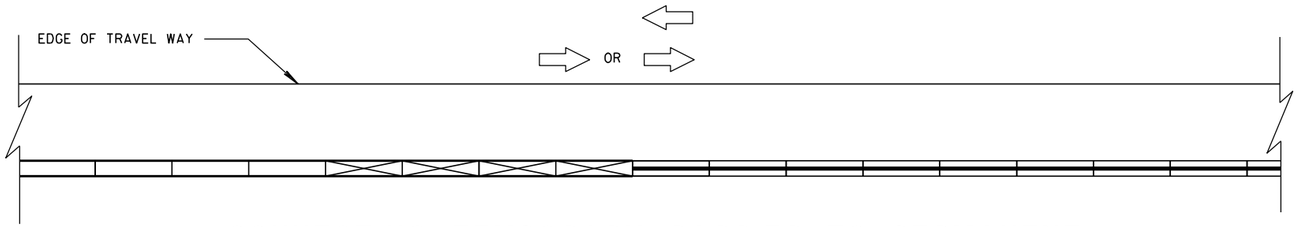
LEGEND

- DIRECTION OF TRAVEL
- CRASH CUSHION OR SAND BARREL ARRAY
- SEE FREE STANDING TRANSITION TO TIED-DOWN SYSTEM DETAILS
- SEE BI-DIRECTIONAL TRANSITION TO TIED-DOWN SYSTEM DETAILS
- 3 PINS PLACED ON TRAFFIC SIDE OF BARRIER
- PERMANENT CONCRETE BARRIER OR CONCRETE PARAPET
- FREE STANDING TEMPORARY BARRIER

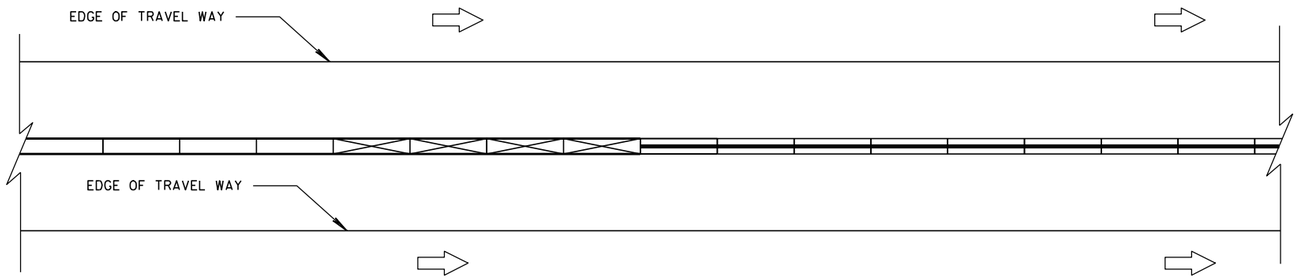
CRASH CUSHION/SAND BARREL ARRAY AND OTHER TEMPORARY BARRIER LAYOUT DETAILS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6
S.D.D. 14 B 8-1c



CONNECTING TEMPORARY BARRIER TO PERMANENT
CONCRETE BARRIER-TRAFFIC ON ONE SIDE



CONNECTING TEMPORARY BARRIER TO PERMANENT
CONCRETE BARRIER-TRAFFIC ON BOTH SIDES

LEGEND

DIRECTION OF TRAVEL

CRASH CUSHION OR
SAND BARREL ARRAY

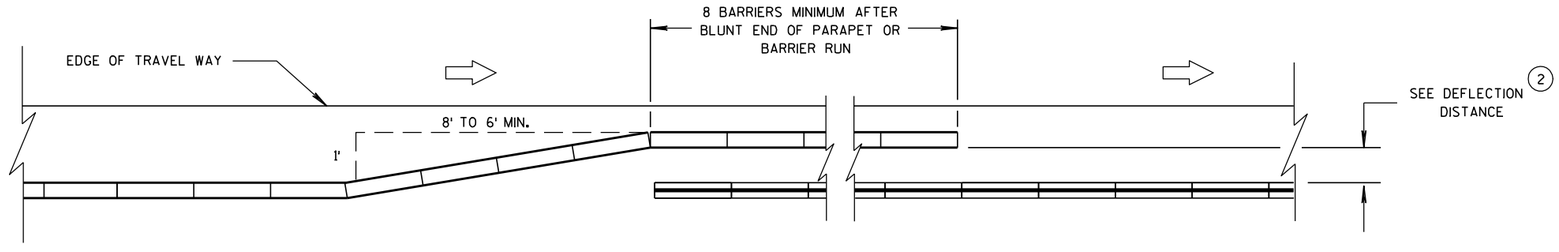
SEE FREE STANDING TRANSITION
TO TIED-DOWN SYSTEM DETAILS

SEE BI-DIRECTIONAL TRANSITION
TO TIED-DOWN SYSTEM DETAILS

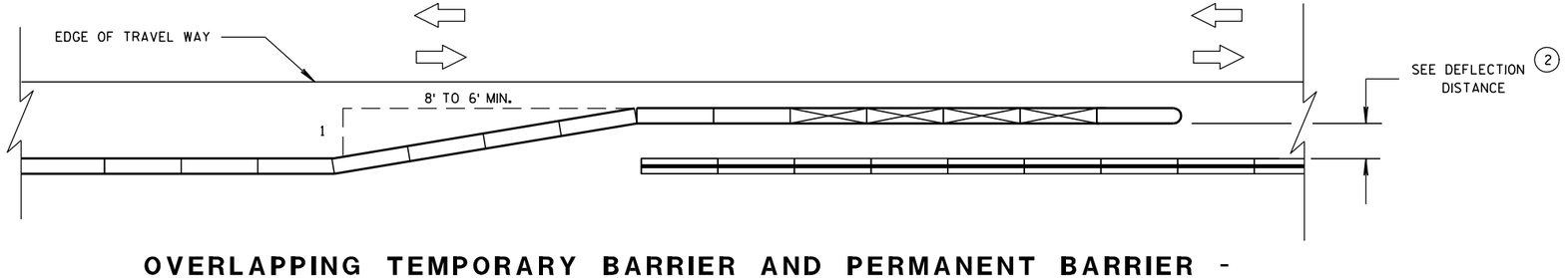
3 PINS PLACED ON
TRAFFIC SIDE OF BARRIER

PERMANENT CONCRETE BARRIER
OR CONCRETE PARAPET

FREE STANDING TEMPORARY
BARRIER



OVERLAPPING TEMPORARY BARRIER AND PERMANENT BARRIER -
ONE WAY TRAFFIC



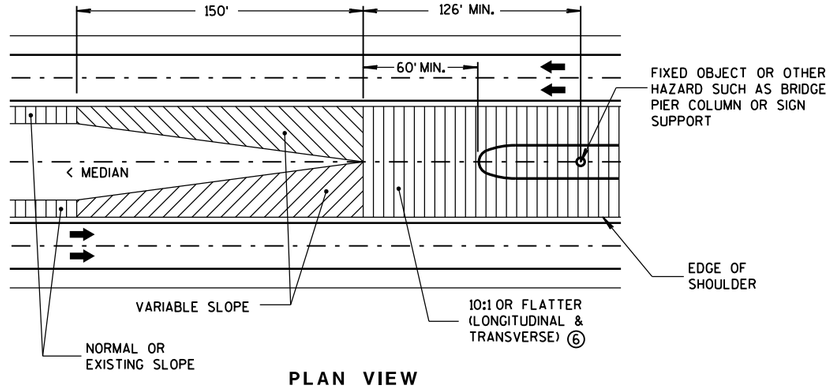
OVERLAPPING TEMPORARY BARRIER AND PERMANENT BARRIER -
TWO WAY TRAFFIC

CRASH CUSHION/SAND BARREL
ARRAY AND OTHER TEMPORARY
BARRIER LAYOUT DETAILS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPO.....T

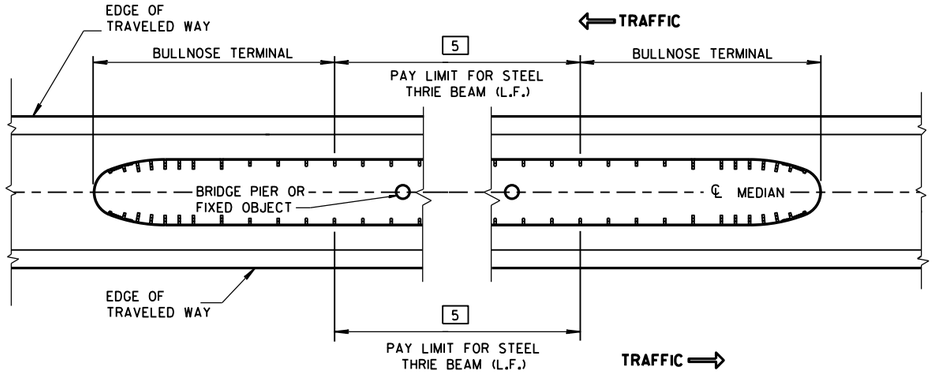
6

S.D.D. 14 B 8-1d

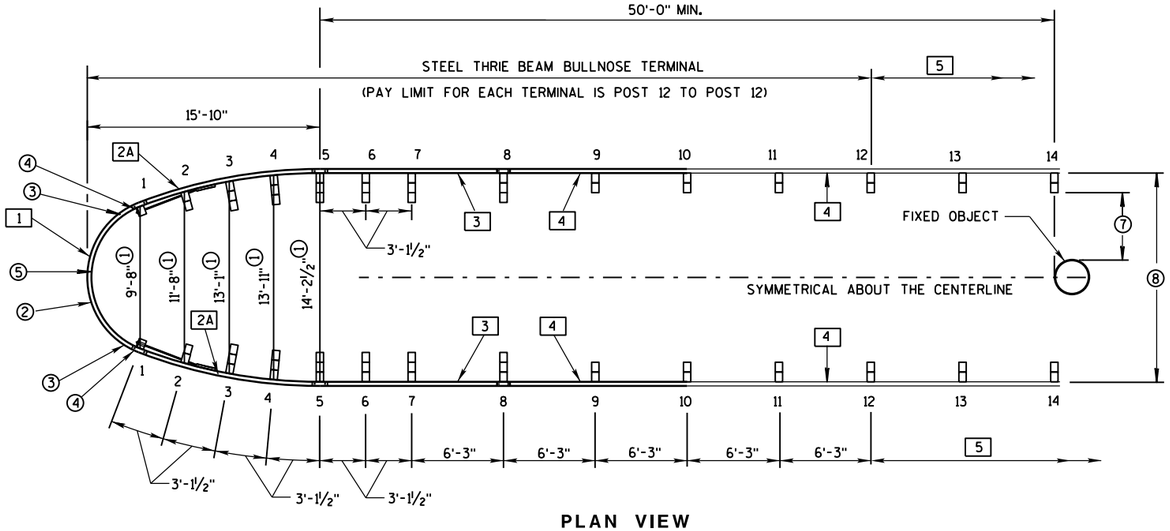


PLAN VIEW

GRADING AT BULLNOSE
(ALL INSTALLATIONS)

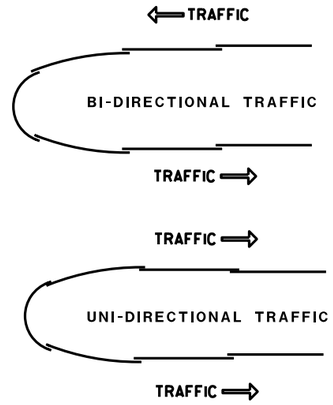


MEDIAN HAZARD PROTECTION PAY LIMITS



PLAN VIEW

TYPICAL BULLNOSE LAYOUT



LAPPING DETAIL
(ALL INSTALLATIONS)

GENERAL NOTES

SEE STANDARD DETAIL DRAWINGS 14 B 26a-e.

PUNCHING, DRILLING, CUTTING OR WELDING IS NOT PERMITTED ON ANY GALVANIZED THRIE BEAM ACCESSORY OR TERMINAL ACCESSORY.

OTHER ANCHOR CABLE ASSEMBLIES HAVING 40,000 LBS. MIN. BREAKING STRENGTH MAY BE USED.

FOR POSTS 2 THROUGH 14, IF POST CANNOT BE INSTALLED AT SPECIFIED LOCATION 1 EXTRA STANDARD WOOD BLOCK MAY BE ADDED.

THE USE OF STEEL POSTS ON THE BULLNOSE IS NOT ALLOWED.

BOLTS AND ALL NECESSARY HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 153.

ALL THRIE BEAM SHALL BE 12-GAUGE.

[1] SLOTTED THRIE BEAM RAIL NO. 1. (POST 1 TO POST 1)

[2A] SLOTTED THRIE BEAM RAIL NO. 2A. (POST 1 TO POST 5)

[3] SLOTTED THRIE BEAM RAIL NO. 3. (POST 5 TO POST 8)

[4] UNBENT STANDARD THRIE-BEAM RAIL NO.4. (POST 8 TO POST 10 & POST 10 TO POST 12)

[5] BEYOND POST 12: CONSTRUCT STEEL THRIE BEAM - USE UNBENT STANDARD THRIE BEAM RAIL NO. 5.

① DIMENSIONS ARE FROM BACK OF RAIL TO BACK OF RAIL WHERE RAIL IS BOLTED TO POST OR BLOCK.

② U-BOLT CABLE CLIPS (3 PER CABLE) SPACED OUT ON NOSE, TO HOLD CABLE TO BACKSIDE OF THE RAIL.

③ NOSE CABLE W/SWAGGED END BUTTONS.

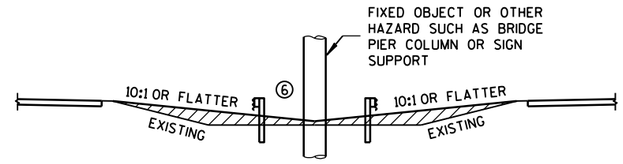
④ NOSE CABLE ANCHOR PLATE (BACKSIDE OF SPLICE).

⑤ THE SLACK IN THE NOSE CABLES SHALL BE EVENLY DISTRIBUTED BETWEEN THE CABLE CLIP FASTENERS AND POST NO. 1 ON EITHER SIDE OF THE NOSE.

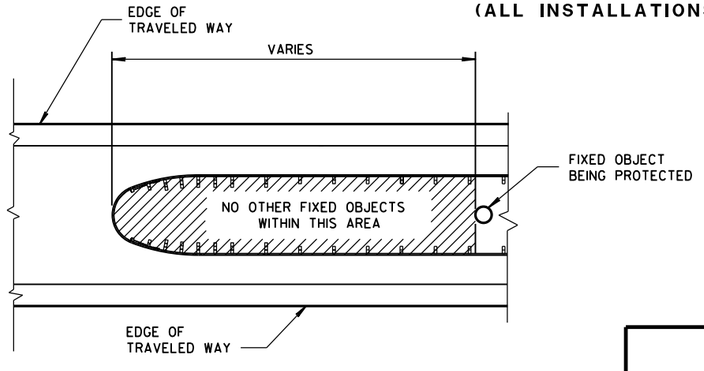
⑥ PROVIDE SUITABLE DRAINAGE WHEN MEDIAN GRADING IMPEDES NORMAL FLOW.

⑦ 2'-6" MINIMUM LATERAL DISTANCE BETWEEN BACK OF POST AND FACE OF FIXED OBJECT.

⑧ MAXIMUM WIDTH OF SYSTEM IS 14'-2½" MEASURED FROM BACK OF RAIL TO BACK OF RAIL WHERE RAIL IS BOLTED TO A POST OR BLOCK.



MEDIAN GRADING SECTION
(ALL INSTALLATIONS)

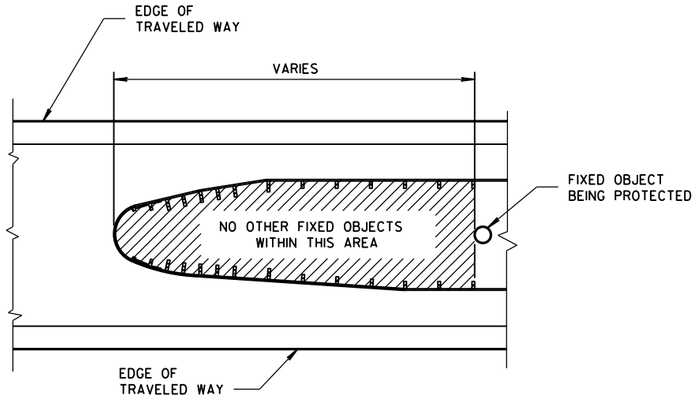


HAZARD FREE AREA INSIDE BULLNOSE

STEEL THRIE BEAM BULLNOSE TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

6
S.D.D. 14 B 26-2a



HAZARD FREE
AREA INSIDE BULLNOSE

GENERAL NOTES

SEE STANDARD DETAIL DRAWINGS 14 B 26a-e.

FOR POSTS 2 THROUGH 14, IF POST CANNOT BE INSTALLED AT SPECIFIED LOCATION 1 EXTRA STANDARD WOOD BLOCK MAY BE ADDED.

[1] SLOTTED THRIE BEAM RAIL NO. 1. (POST 1 TO POST 1)

[2A] SLOTTED THRIE BEAM RAIL NO. 2A, (POST 1 TO POST 5)

[2B] SLOTTED THRIE BEAM RAIL NO. 2B, (POST 1 TO POST 5)

[3] SLOTTED THRIE BEAM RAIL NO. 3. (POST 5 TO POST 8)

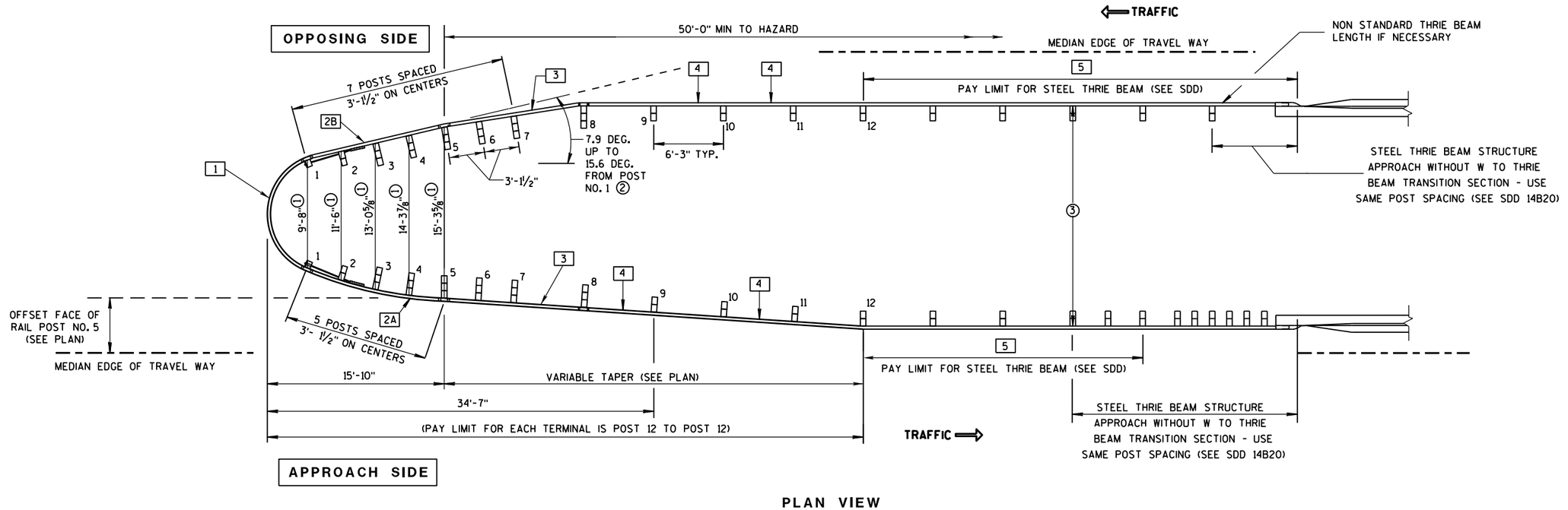
[4] UNBENT STANDARD THRIE-BEAM RAIL NO. 4, (POST 8 TO POST 10 & POST 10 TO POST 12)

[5] BEYOND POST 12: CONSTRUCT STEEL THRIE BEAM - USE UNBENT STANDARD THRIE BEAM RAIL NO. 5.

① DIMENSIONS ARE FROM BACK OF RAIL TO BACK OF RAIL WHERE RAIL IS BOLTED TO POST.

② TAPER BEGINNING AT POST NO. 1 MUST CONTINUE TO POST NO. 5. PAST POST NO. 5 TAPER MAY END OR BE EXTENDED UP TO 15.6 DEGREES TO FIT VARIABLE MEDIAN WIDTHS. (SEE PLAN)

③ FOR MEDIANS WIDER THAN 14'-2½" MEASURED FROM BACK OF RAIL TO BACK OF RAIL WHERE RAIL IS BOLTED TO A POST OR BLOCK.



PLAN VIEW

WIDENED BULLNOSE DESIGN

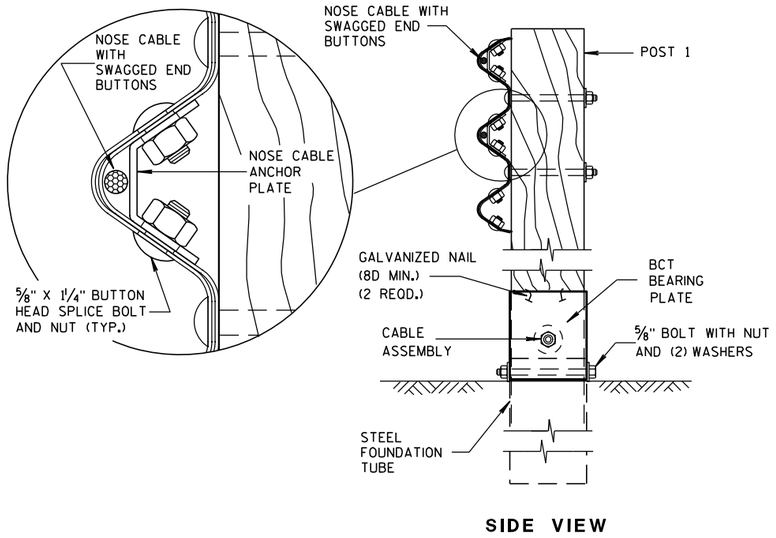
(INSTALLATION AT TWIN BRIDGES WITH BI-DIRECTIONAL TRAFFIC SHOWN)

STEEL THRIE BEAM
BULLNOSE TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOI

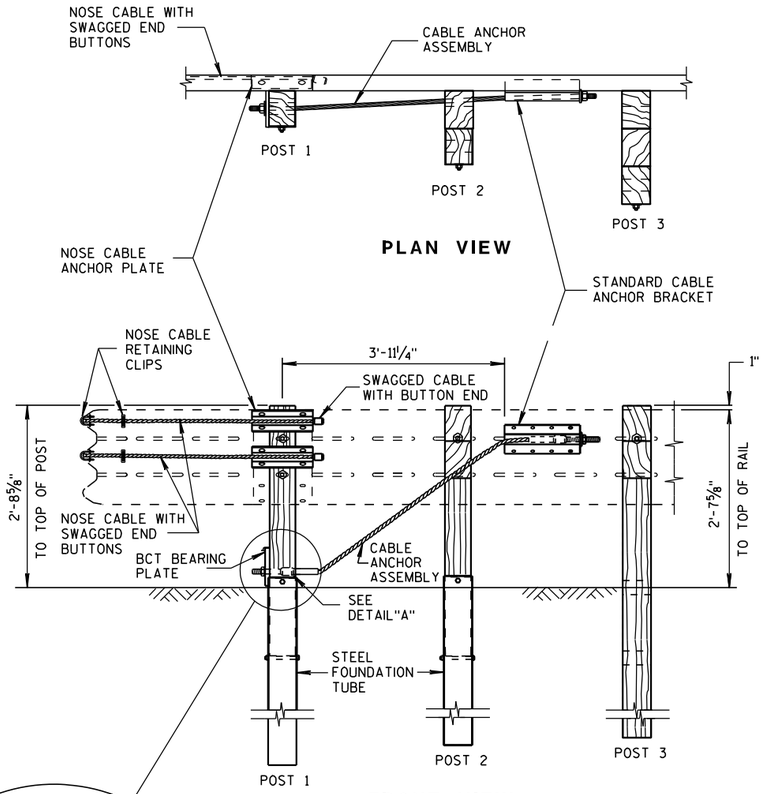
6

S.D.D. 14 B 26-2b



SIDE VIEW

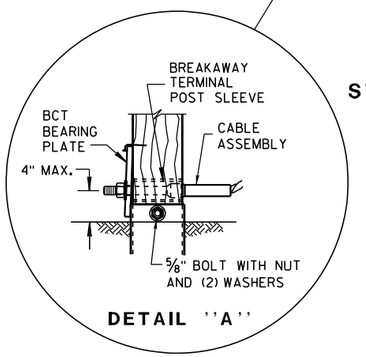
NOSE CABLE ASSEMBLY AT POST NO. 1



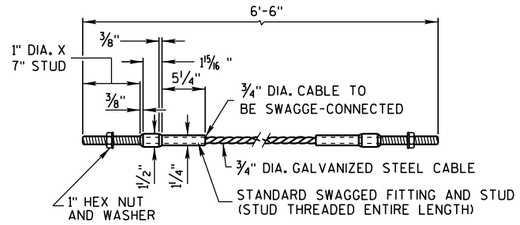
PLAN VIEW

FRONT VIEW

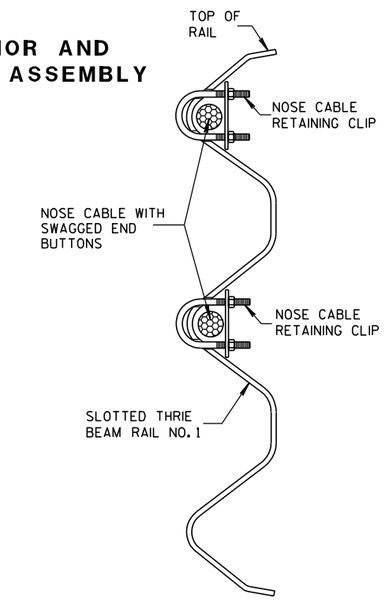
NOSE CABLE ANCHOR AND STANDARD BRACKET ASSEMBLY



DETAIL ''A''



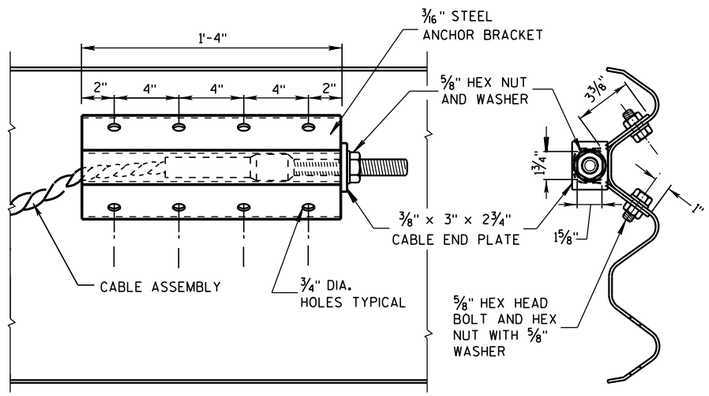
DETAILS OF CABLE ANCHOR ASSEMBLY



PLACEMENT OF NOSE CABLE RETAINING CLIP

GENERAL NOTES

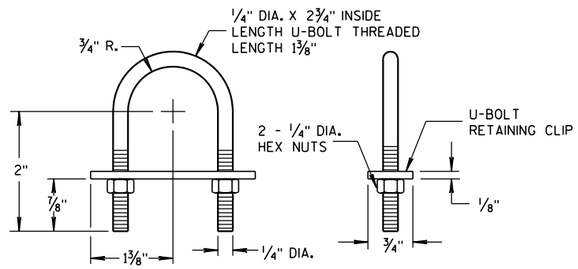
SEE STANDARD DETAIL DRAWINGS 14 B 26a-e.



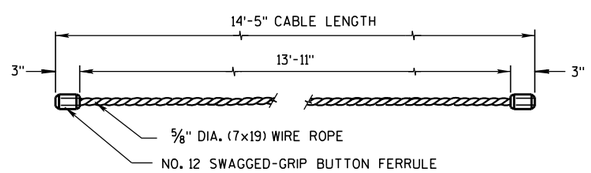
FRONT VIEW

END VIEW

DETAILS OF CABLE ANCHOR BRACKET

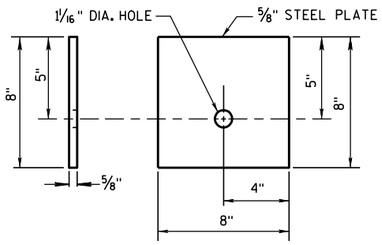


NOSE CABLE RETAINING CLIP

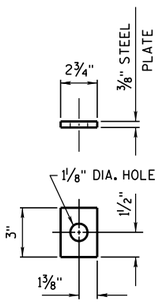


NOSE CABLE WITH SWAGGED END BUTTONS

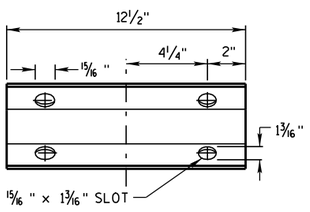
TO PULL OFF SWAGGED GRIP BUTTON FERRULE FROM WIRE ROPE REQUIRES A FORCE EQUAL TO 98% OF THE WIRE ROPE'S BREAKING STRENGHT.



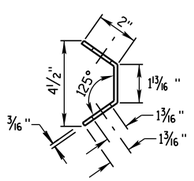
BCT BEARING PLATE



CABLE END PLATE



ELEVATION VIEW



END VIEW

NOSE CABLE ANCHOR PLATE

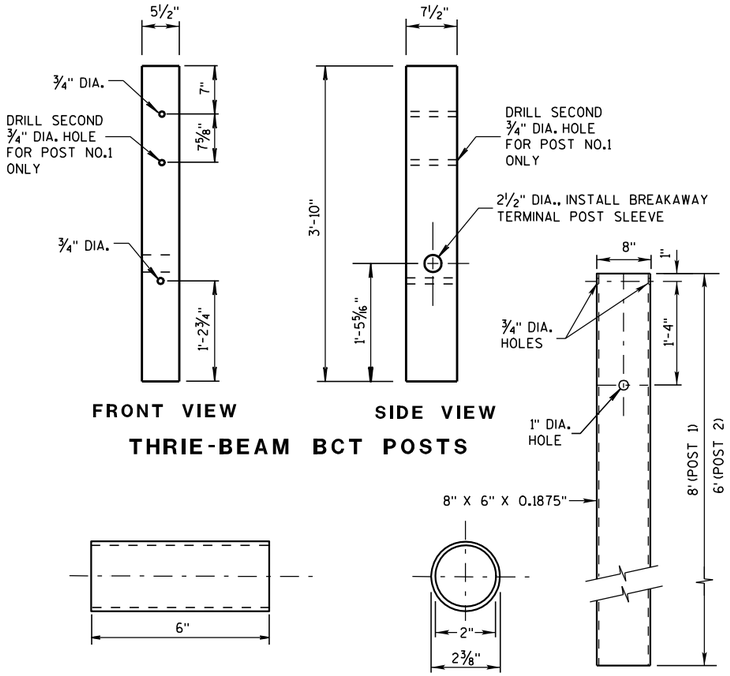
NOTE: 12 1/2" x 5 13/16" x 3/16" STEEL PLATE (A306)

STEEL THRIE BEAM BULLNOSE TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

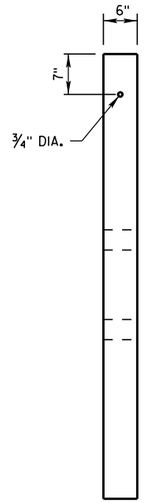
S.D.D. 14 B 26-2c

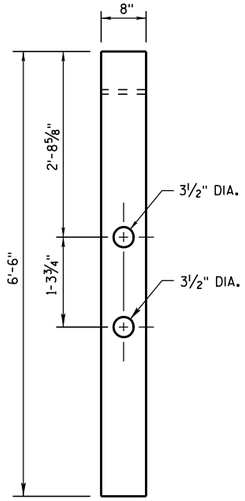


THRIE-BEAM BCT POSTS

BREAKAWAY TERMINAL POST SLEEVE

STEEL FOUNDATION TUBE

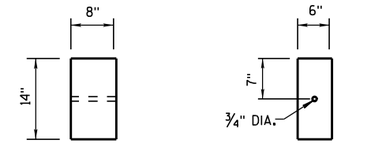




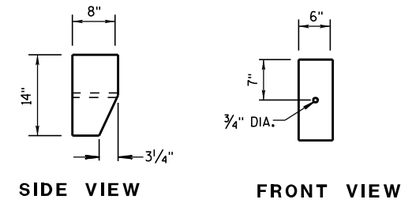
THRIE-BEAM CRT WOOD POSTS

GENERAL NOTES

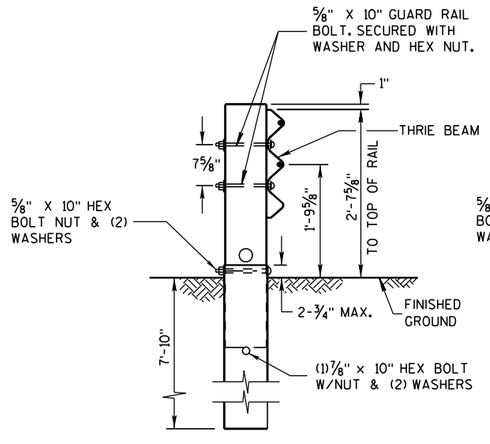
SEE STANDARD DETAIL DRAWINGS 14 B 26a-e.



STANDARD WOOD BLOCK

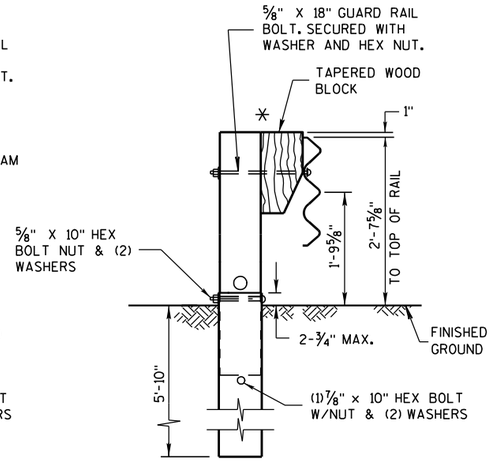


TAPERED WOOD BLOCK



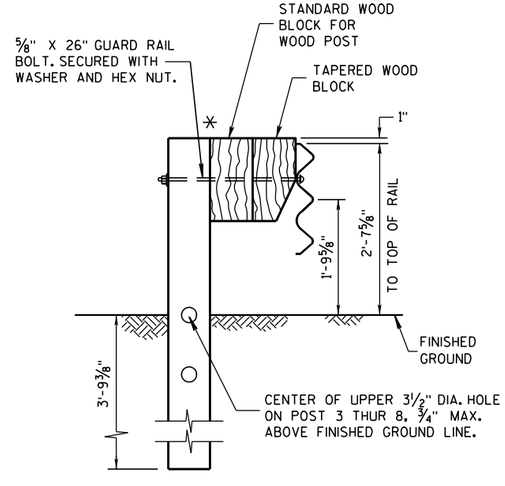
THRIE-BEAM BCT POST
(WITH 8'-0" FOUNDATION TUBE)

POST NO. 1



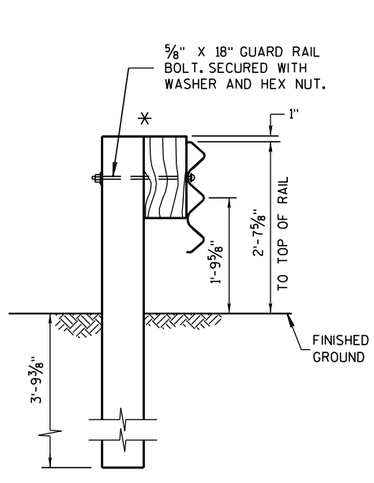
THRIE-BEAM BCT POST
(WITH 6'-0" FOUNDATION TUBE AND 1'-2" TAPERED BLOCK)

POST NO. 2



THRIE-BEAM CRT POST
(6'-6" LONG POST WITH 1'-2" BLOCK AND 1'-2" TAPERED BLOCK)

POST NO. 3,4,5,6,7, & 8



THRIE-BEAM POST
(6'-6" LONG POST WITH 1'-2" BLOCK)

POST NO. 9,10,11,& 12

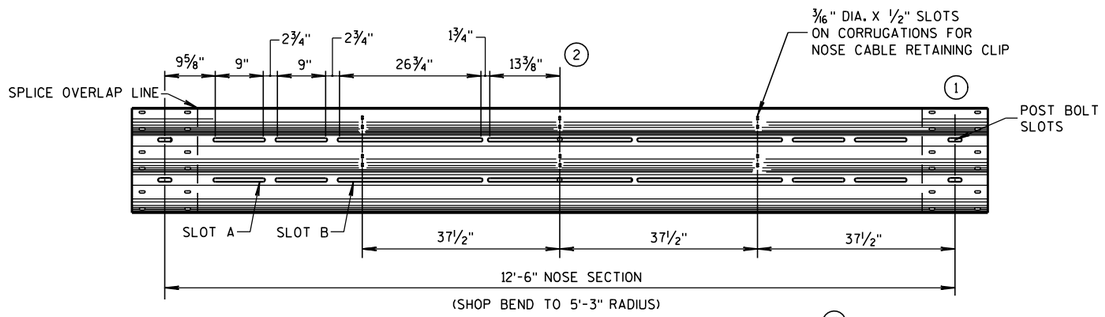
(ALSO USE FOR STEEL THRIE BEAM BEYOND POST 12)

✳ IF NEEDED DUE TO AN UNDERGROUND OBSTACLE ADD 1 ADDITIONAL STANDARD BLOCKOUT TO POST.

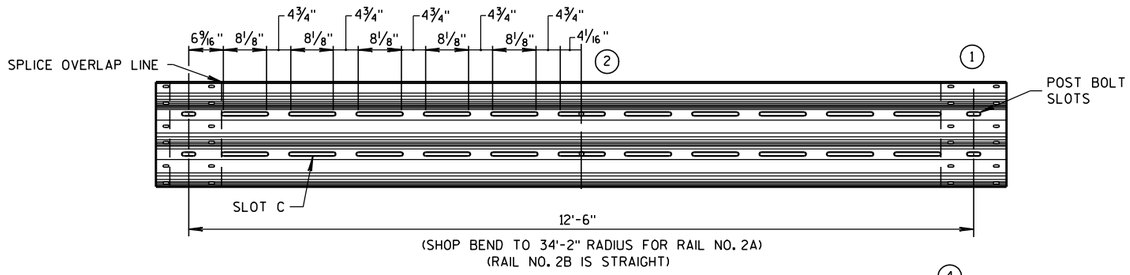
STEEL THRIE BEAM BULLNOSE TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

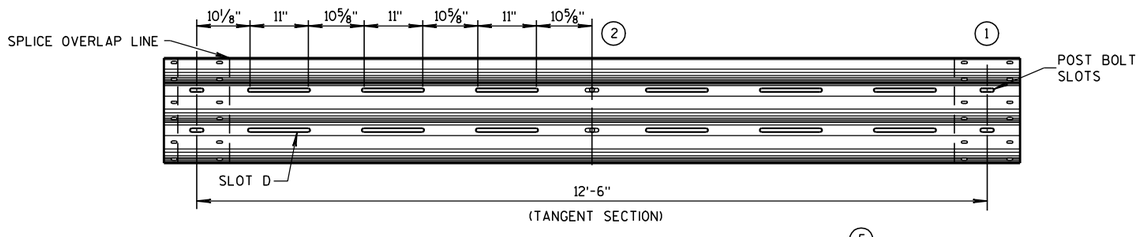
6
S.D.D. 14 B 26-2d



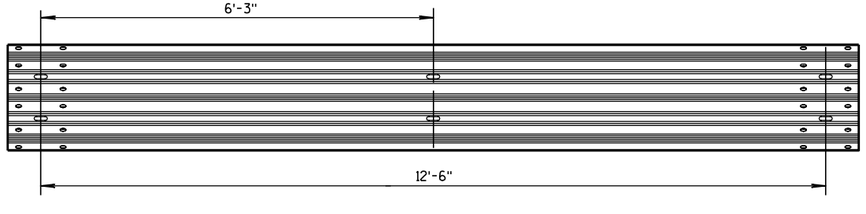
SLOTTED THRIE BEAM RAIL NO. 1 (3)



SLOTTED THRIE BEAM RAILS NO. 2A AND NO. 2B (4)



SLOTTED THRIE BEAM RAIL NO. 3 (5)



UNBENT STANDARD THRIE BEAM RAIL NO. 4 AND NO. 5

GENERAL NOTES

SEE STANADRD DETAIL DRAWINGS 14 B 26a-e.

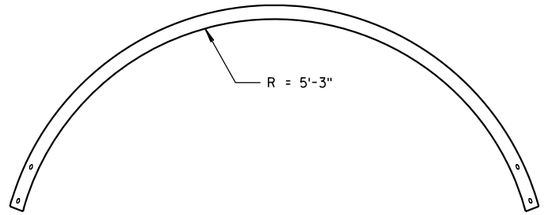
(1) SLOTTED THRIE BEAM RAIL DIMENSIONS SHOWN ARE BEFORE BENDING TO THE RADIUS SHOWN.

(2) SLOT SIZE AND SPACING SYMMETRIC.

(3) SLOTTED THRIE BEAM RAIL NO. 1, 12'-6", SHOP BEND TO R=5'-3".

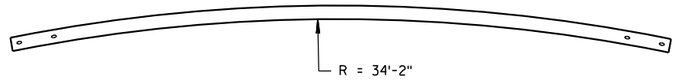
(4) SLOTTED THRIE BEAM RAIL NO. 2A, 12'-6", SHOP BEND TO R=34'-2".
SLOTTED THRIE BEAM RAIL NO. 2B, 12'-6", RAIL IS STRAIGHT.

(5) SLOTTED THRIE BEAM RAIL NO. 3, 12'-6", TANGENT.



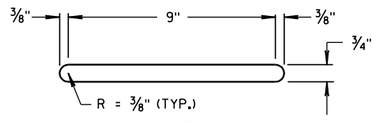
PLAN VIEW

SLOTTED THRIE BEAM RAIL NO. 1

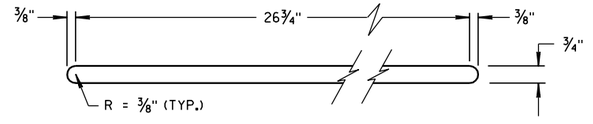


PLAN VIEW

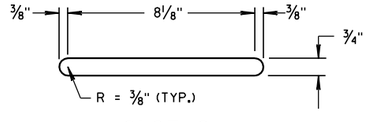
SLOTTED THRIE BEAM RAIL NO. 2A



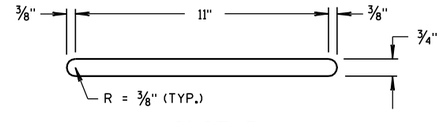
SLOT A



SLOT B



SLOT C



SLOT D

SLOT DETAILS

STEEL THRIE BEAM BULLNOSE TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

9-16-2010
DATE

/S/ Jerry H. [illegible]
ROADWAY STANDARDS ENGINEER

FHWA

GENERAL NOTES

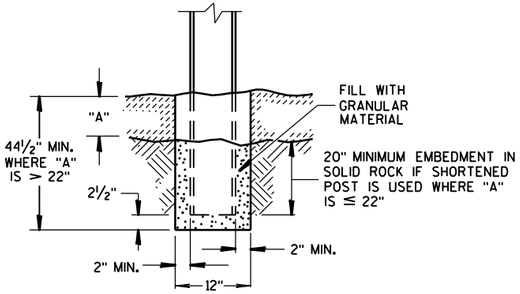
1. WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.

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.

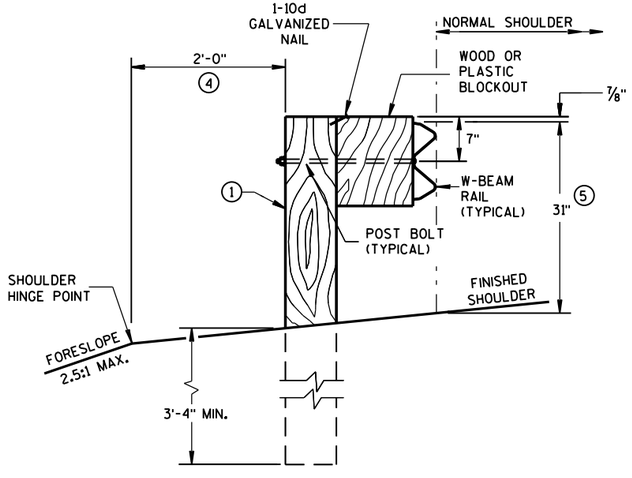
3. IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2½ INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AMD INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO 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 27¾" TO 32".

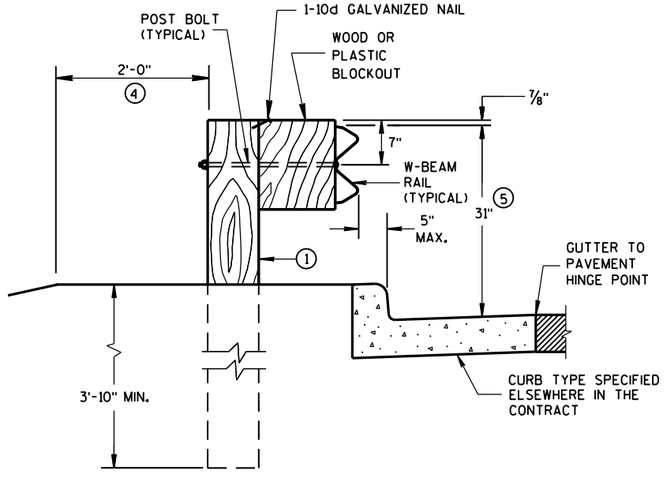


END VIEW
SETTING STEEL OR WOOD POST IN ROCK ③



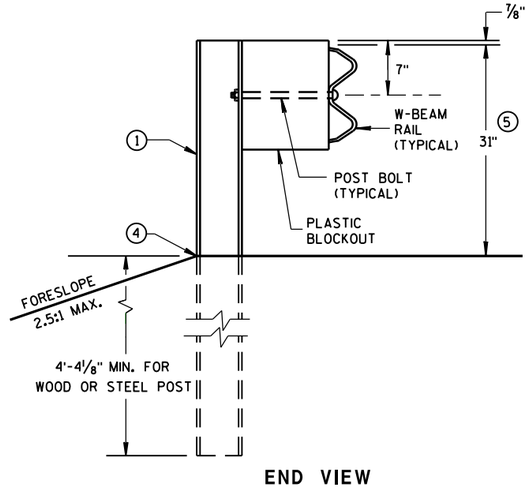
END VIEW

LOCATED ALONG A ROADWAY SHOULDER
STANDARD INSTALLATION



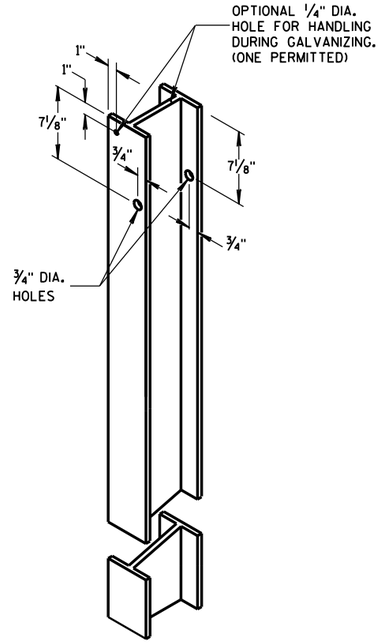
END VIEW

LOCATED ALONG A CURBED ROADWAY

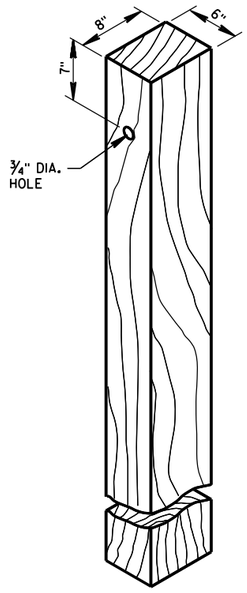


END VIEW

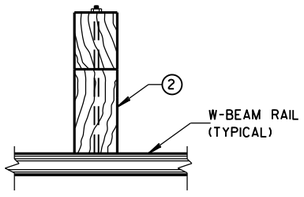
MGS LONGER POST AT HALFPOST SPACING W BEAM (K)



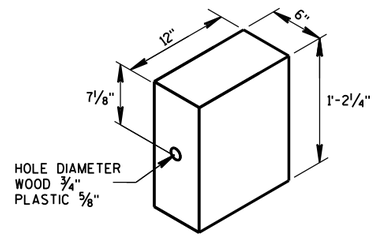
STEEL POST &
HOLE PUNCHING DETAIL
(w6X9) ①



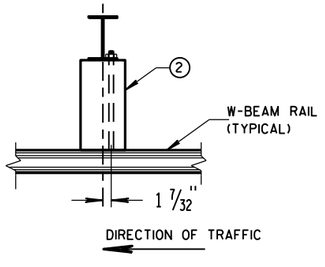
WOOD POST
(6" X 8") NOMINAL ①



PLAN VIEW
WOOD POST,
BLOCKOUT & BEAM



WOOD OR
PLASTIC BLOCKOUT ②

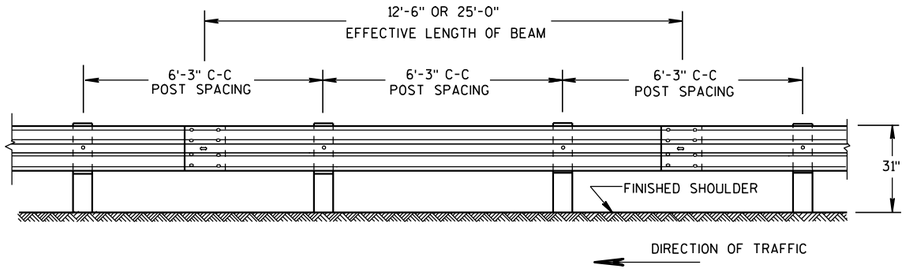


PLAN VIEW
STEEL POST,
PLASTIC BLOCKOUT & BEAM

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

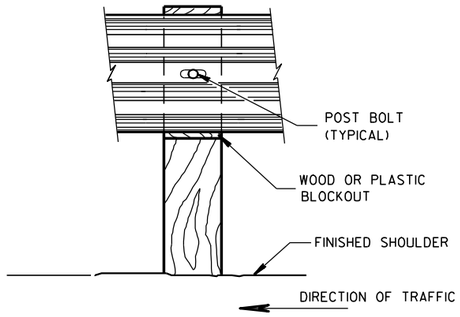
STATE OF WISCONSIN
DEPARTMENT OF TRANSPOR

6
S.D.D. 14 B 42-2a



FRONT VIEW

POST SPACING STANDARD INSTALLATION



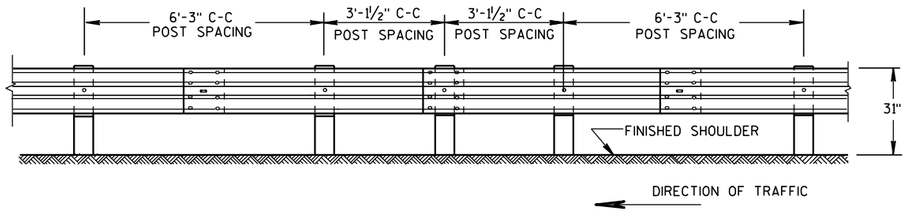
FRONT VIEW AT WOOD POST

GENERAL NOTES

1. PROVIDE TYPE "H" SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH TYPE "H" YELLOW REFLECTIVE SHEETING.
2. DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPLICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.
3. REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.
4. PROVIDE AN ANGLE OF BEND OF 90° ± 1° FOR TWO-SIDED REFLECTORS.
5. 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.

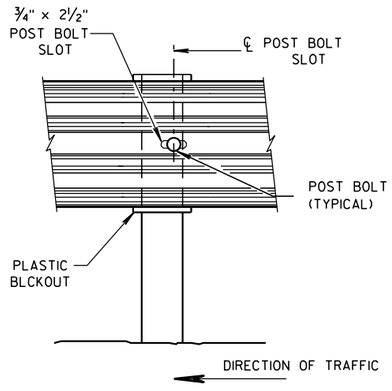
POST BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 5/8" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.

GUARD RAIL SPLICE BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.

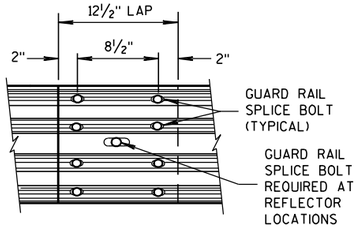


FRONT VIEW

HALF POST SPACING (HS) AND HALF POST SPACING WITH LONGER POSTS (K)

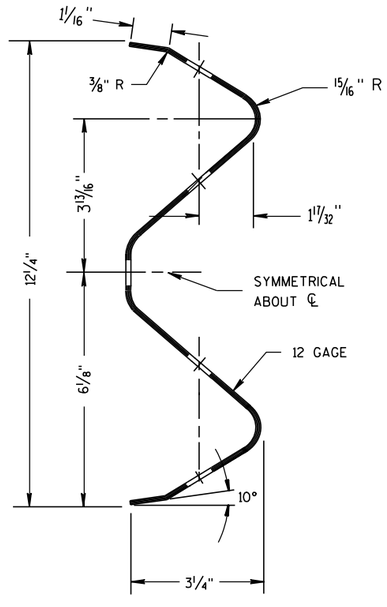


FRONT VIEW AT STEEL POST

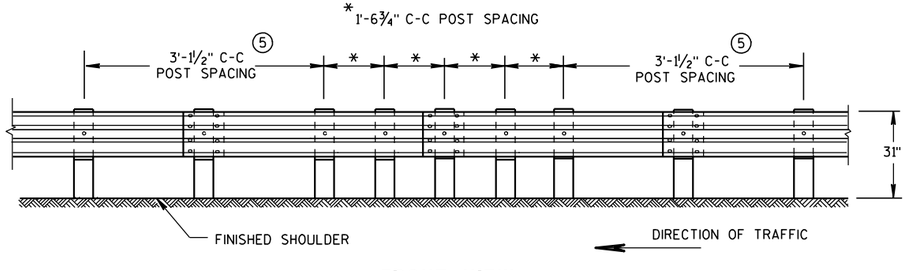


FRONT VIEW

MID-SPAN BEAM SPLICE

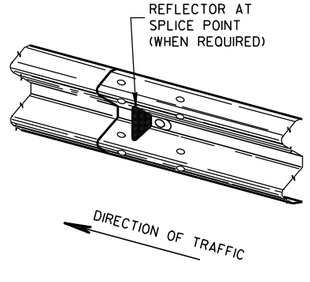


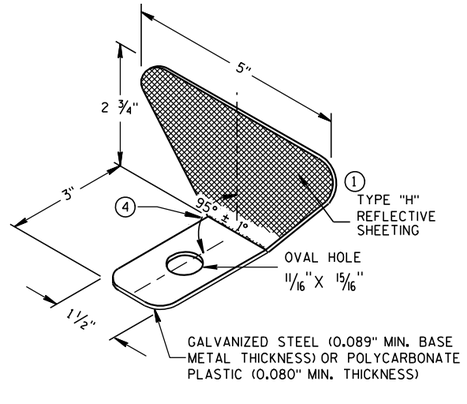
SECTION THRU W-BEAM RAIL



FRONT VIEW

QUARTER POST SPACING (QS)





ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION ①

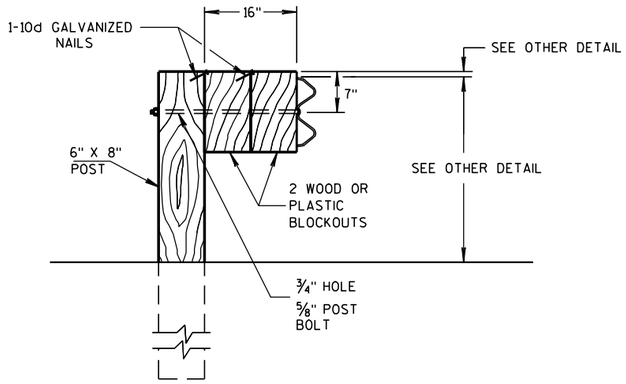
REFLECTOR SPACING ②

	BEAM GUARD LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200' > 200'	50' C-C 100' C-C	1 1	3
TWO WAY TRAFFIC	< 200' > 200'	25' C-C 50' C-C	1 1 ③	6
TWO WAY TRAFFIC	< 200' > 200'	50' C-C 100' C-C	2 2 ④	3

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

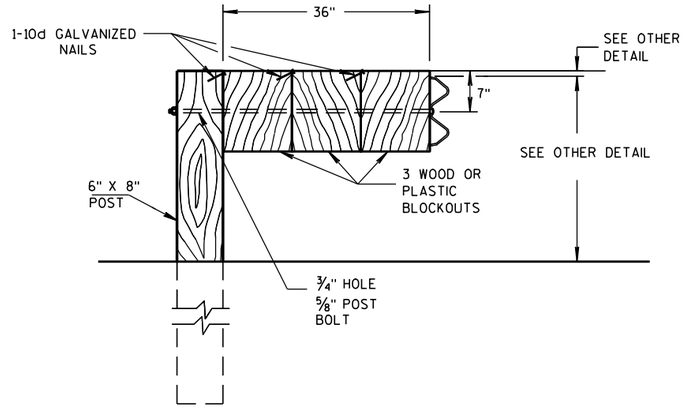
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6
S.D.D. 14 B 42-2b



DETAIL FOR 16" BLOCKOUT DEPTH

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

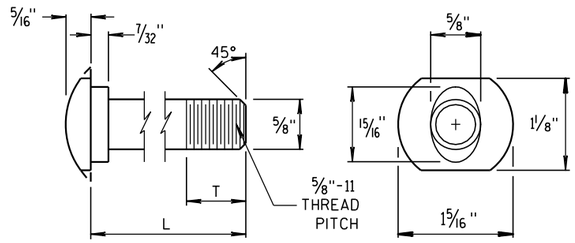


DETAIL FOR 36" BLOCKOUT DEPTH

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

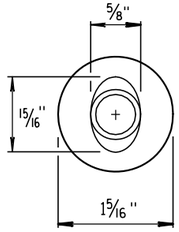
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.

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

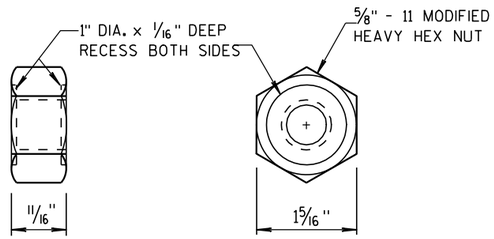


POST BOLT TABLE

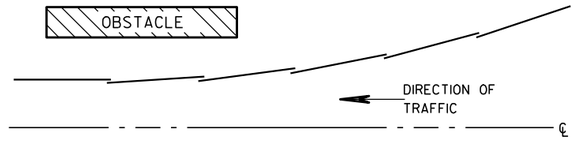
L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



ALTERNATE BOLT HEAD

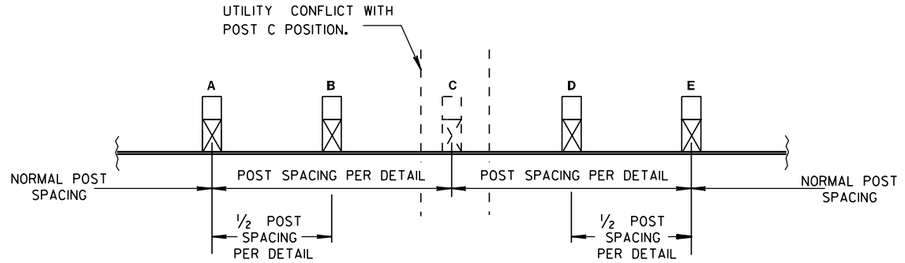


POST BOLT AND RECESS NUT

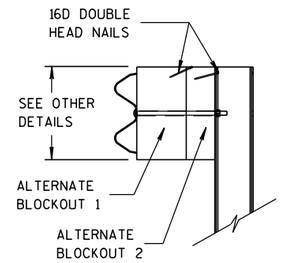


PLAN VIEW

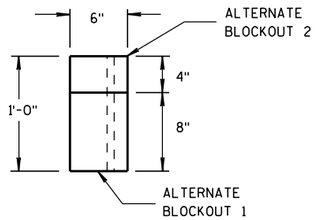
BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION



SIDE VIEW



TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

11/15/2011
DATE

/S/ Jerry H. [illegible]
ROADWAY STANDARDS ENGINEER

FHWA

ENT

6

S.D.D. 14 B 42-2c

6

S.D.D. 14 B 42-2c

GENERAL NOTES

(A) THE SLOPE IN THE AREA BOUNDED BY THE EXTENDED VEHICLE RUNOUT PATH (EVRP), 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 MANUFACTURES REQUIRE DIFFERENT PERFORATED W-BEAM RAIL END PANELS. SEE MANUFACTURES INFORMATION.

(D) THE TOP OF THE STEEL TUBE ON POST 1 AND POST 2 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.

(F) SHEETING IS ATTACHED TO 0.040 ALUMINUM SHEET AND ATTACHED TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS. ONE SCREW PER CORNER OF E.A.T.

(G) ½" DIAMETER X 3" LONG LAG BOLT AND WASHER.

(H) HARDWARE VARIES BETWEEN DIFFERENT MANUFACTURES. SEE MANUFACTURE'S DRAWING FOR INFORMATION.

(I) DIMENSIONS MAY VARY. SEE MANUFACTURE'S INFORMATION.

SEE SDD 14B42 FOR MORE INFORMATION.

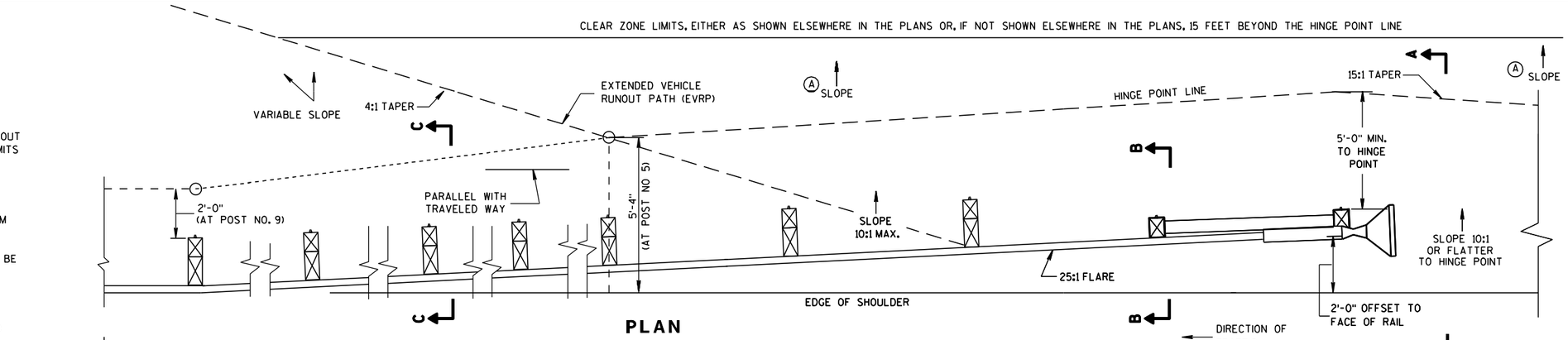
* DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.

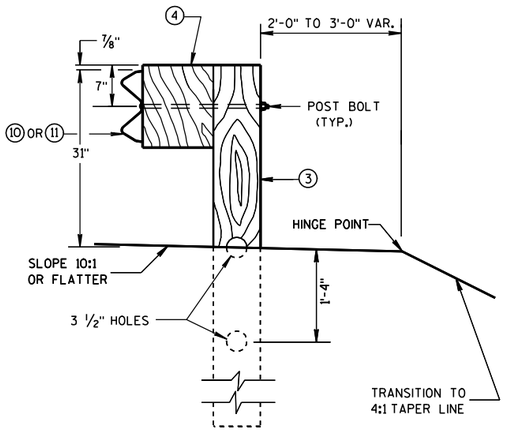
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

W-BEAM RAIL SPLICES ARE LOCATED AT POST NUMBER 3, AND BETWEEN POST 5 AND 6, BETWEEN POSTS 7 AND 8, AND MIDDLE OF THE SPAN AFTER POST 9.

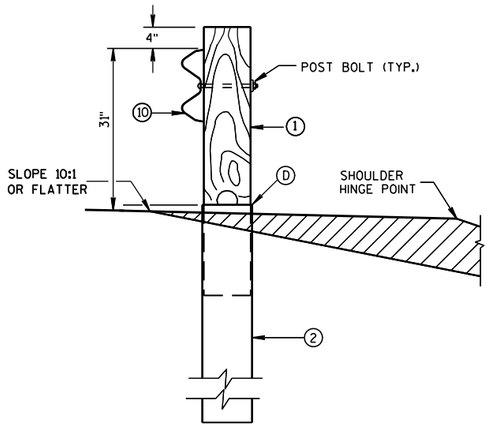
PATTERN AND COLORS ON REFLECTIVE SHEETING TYPE H ARE TO CONFORM TO OM3-L OR OM3-R OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

THE CENTER OF THE UPPER 3½" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE (± ¾")

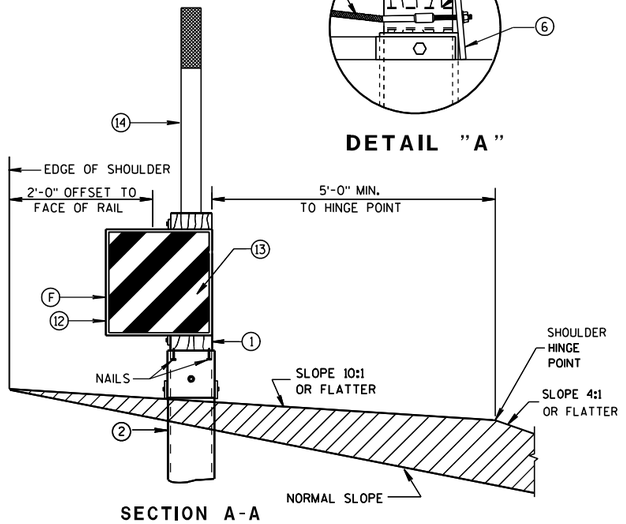




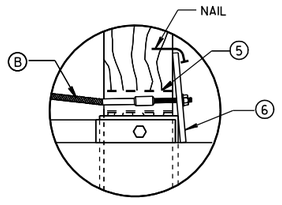
SECTION C-C
TYPICAL AT POST NOS. 3-9



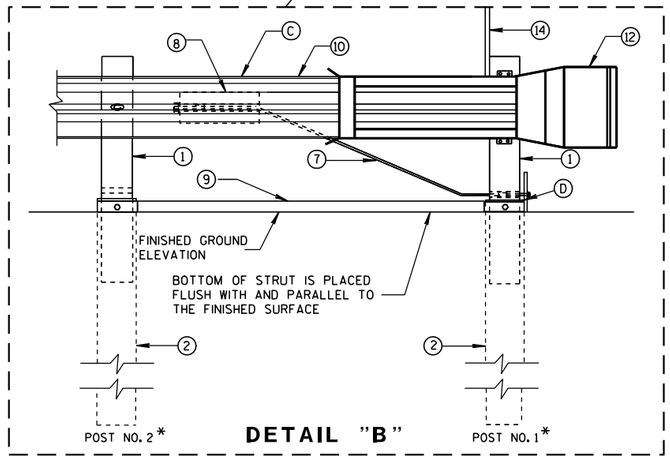
SECTION B-B
TYPICAL AT POST NO. 2*



SECTION A-A
TYPICAL AT POST NO. 1*



DETAIL "A"

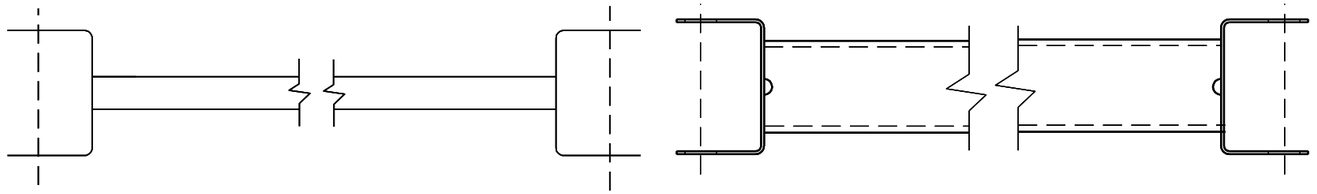


DETAIL "B"

MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

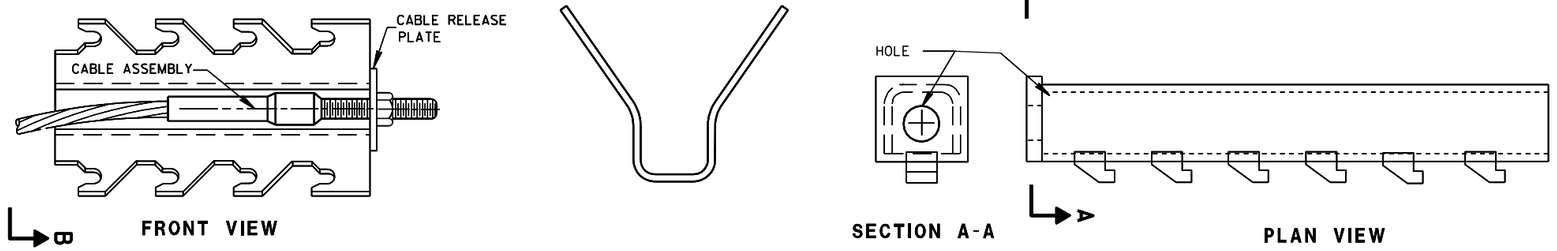
6
S.D.D. 14 B 44-1a



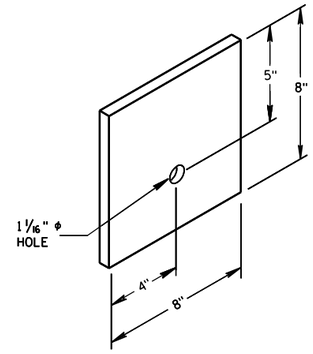
GENERIC GROUND STRUT (9) (H)

BILL OF MATERIALS

PART NO.	DESCRIPTION MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
(1)	WOOD BREAKAWAY POST
(2)	6" X 8" X 0.188", 6'-0" LONG FOUNDATION TUBE AT POSTS 1 AND 2
(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)	END SECTION EAT
(13)	0.040" ALUMINUM SHEET WITH REFLECTIVE SHEETING TYPE H (ONLY THE SHEETING IS SUPPLIED BY THE MANUFACTURER)
(14)	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)



GENERIC ANCHOR CABLE BOX (8) (H)



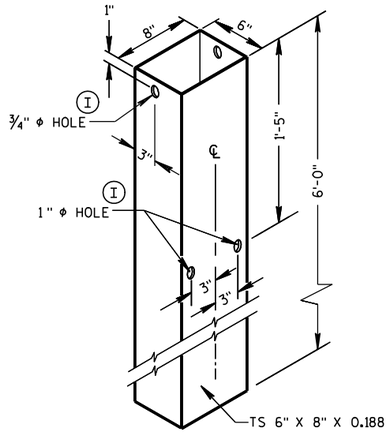
BEARING PLATE (6)

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

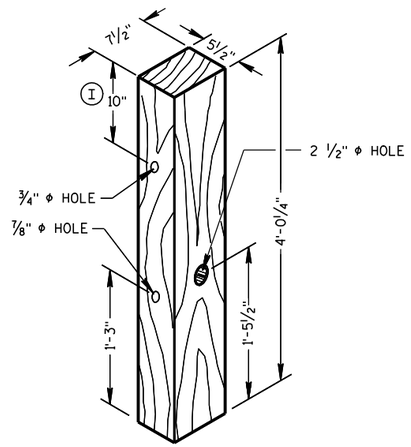
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

S.D.D. 14 B 44-1b

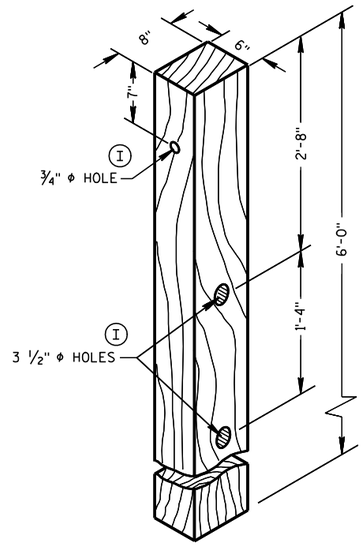


FOUNDATION TUBE (2)



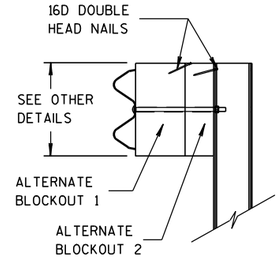
POSTS NUMBER 1 AND 2

WOOD BREAKAWAY POST (1)

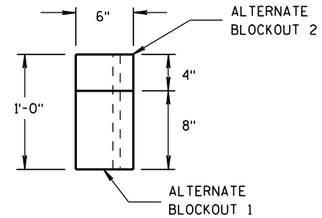


POSTS NUMBER 3-9

WOOD CRT POST (3)

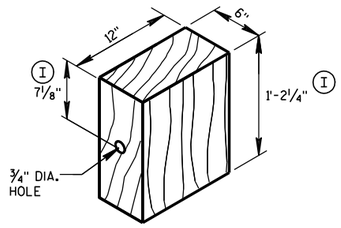


SIDE VIEW



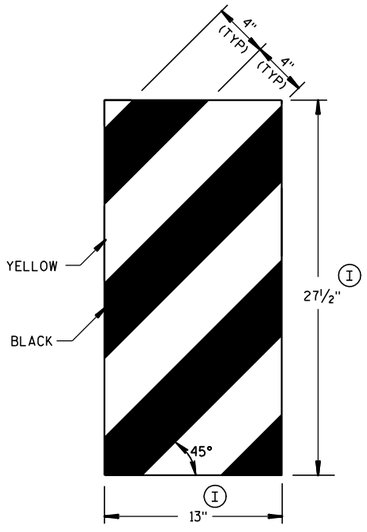
TOP VIEW

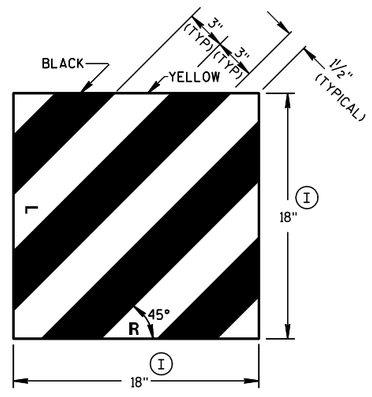
ALTERNATE WOOD BLOCKOUT DETAIL



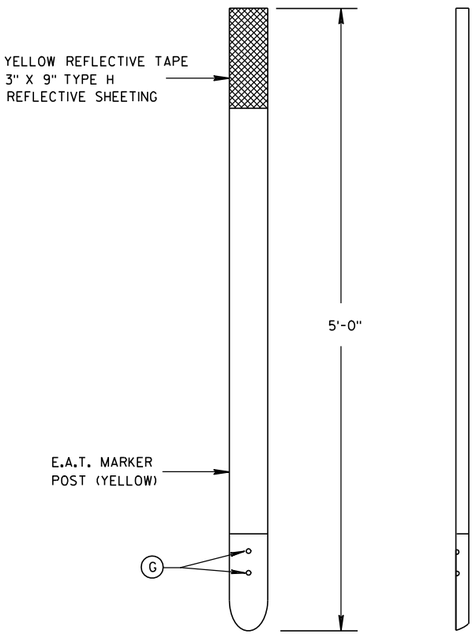
WOOD BLOCKOUT (4)

REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2



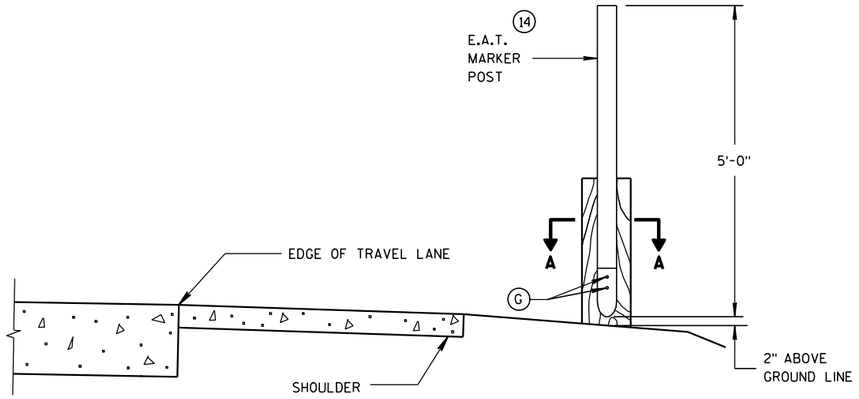


GENERIC REFLECTIVE SHEETING (13) (H)



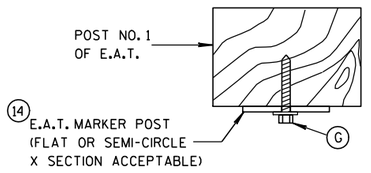
FRONT VIEW **SIDE VIEW**

E.A.T. MARKER POST (14)



TYPICAL INSTALLATION OF E.A.T. MARKER POST BACKSIDE OF POST NO. 1

(E.A.T. AND RAIL REMOVED FOR CLARITY)



SECTION A-A

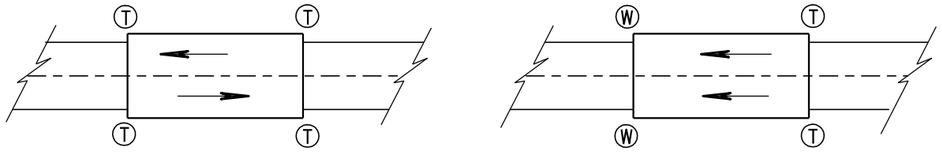
MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
5/23/2011 — DATE
/S/ Jerry H. [illegible] — ROADWAY STANDARDS ENGINEER
FHWA

6

S.D.D. 14 B 44-1c



TWO WAY TRAFFIC

ONE WAY TRAFFIC

Ⓣ THRIE BEAM CONNECTION

Ⓦ W-BEAM CONNECTION WHEN REQUIRED

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

GENERAL NOTES

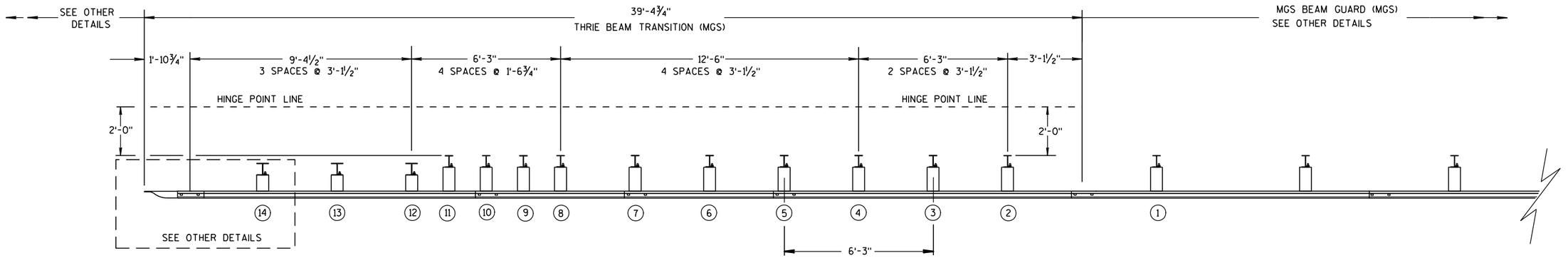
BOLT THE THRIE BEAM TO ALL POSTS AND BLOCKOUTS. DRILL OR PUNCH BOLT HOLES IN THE BEAM IF THE POST SPACING IS LESS THAN 6'-3.

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

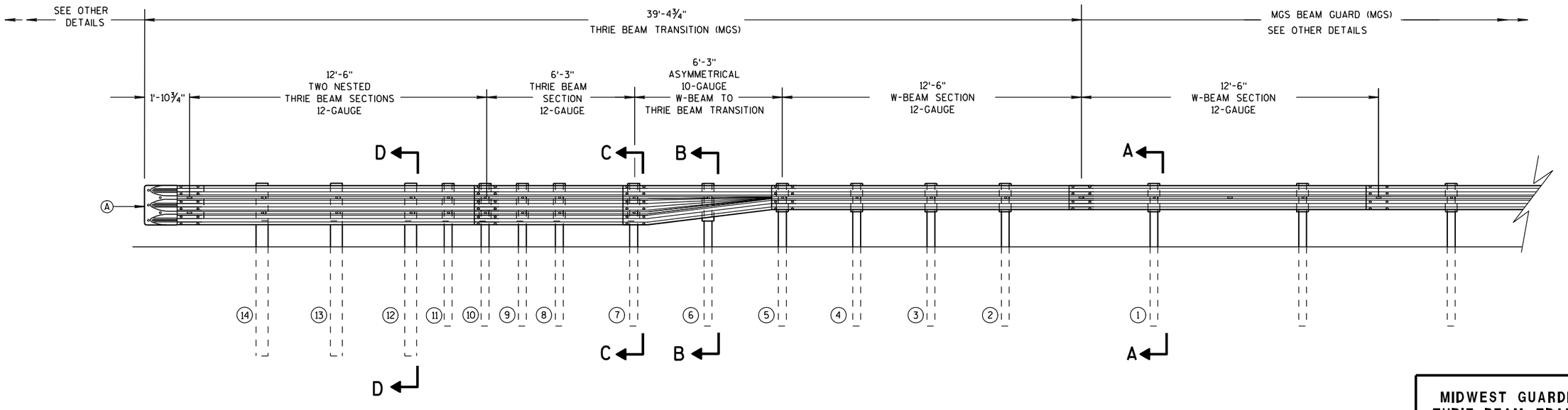
TRANSITION USES STEEL POSTS ONLY.

SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

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



PLAN VIEW



ELEVATION VIEW

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

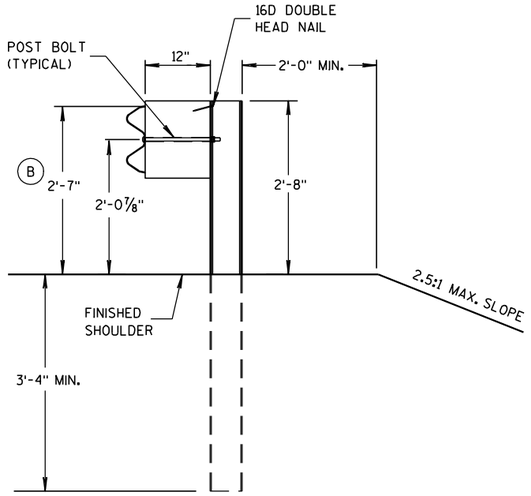
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPO.....T

6
S.D.D. 14 B 45-3a

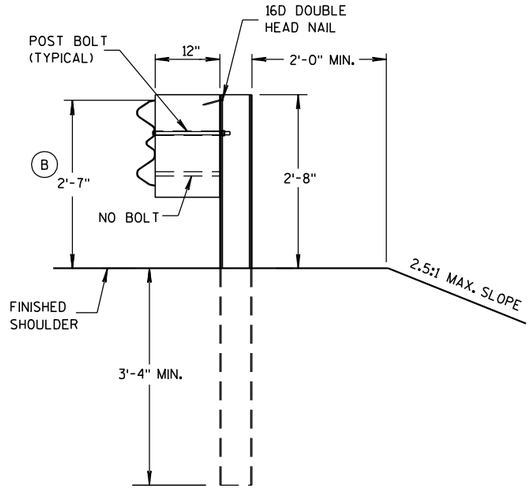
GENERAL NOTES

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



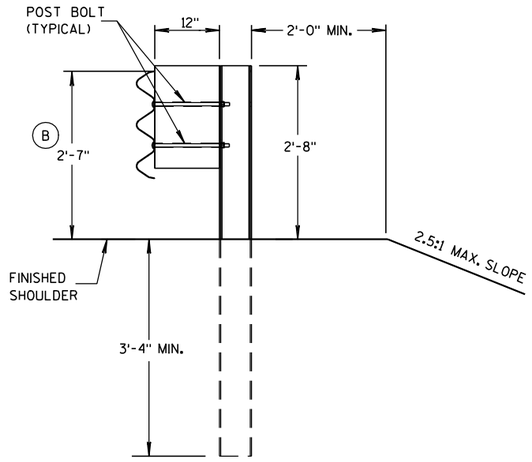
SECTION A-A

POSTS 1-5



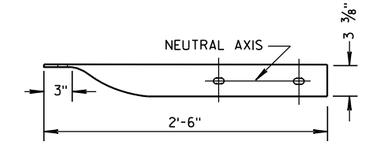
SECTION B-B

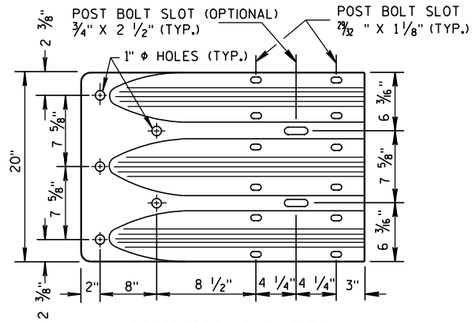
POST 6



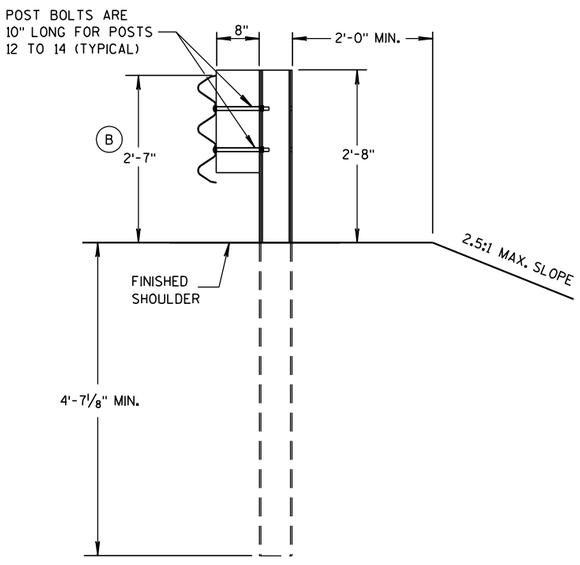
SECTION C-C

POSTS 7-11



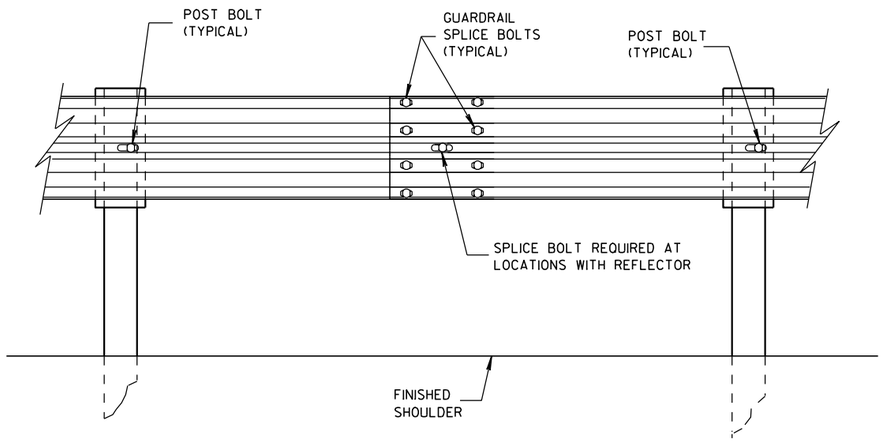


THRIE BEAM TERMINAL CONNECTOR



SECTION D-D

POSTS 12-14



SPLICE DETAIL

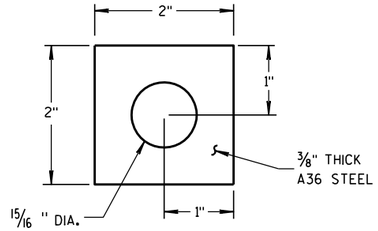
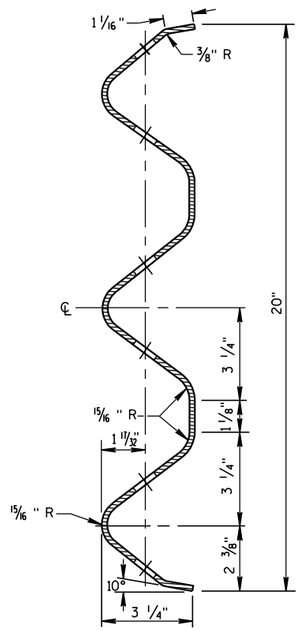


PLATE WASHER DETAIL

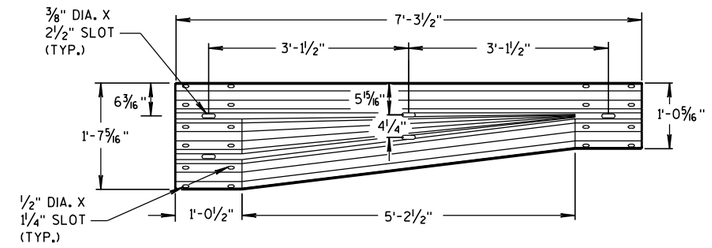


SECTION THRU THRIE BEAM RAIL ELEMENT

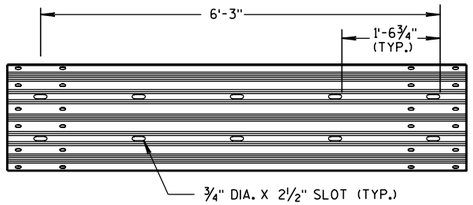
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

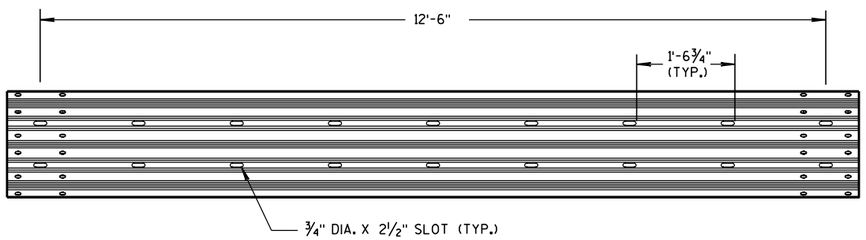
6
S.D.D. 14 B 45-3b



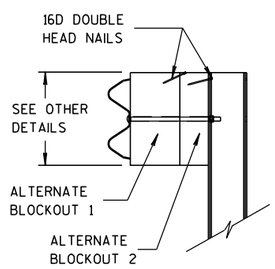
W-BEAM TO THRIE BEAM TRANSITION SECTION



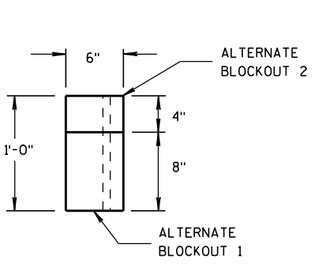
6'-3" THRIE BEAM SECTION



12'-6" THRIE BEAM SECTION

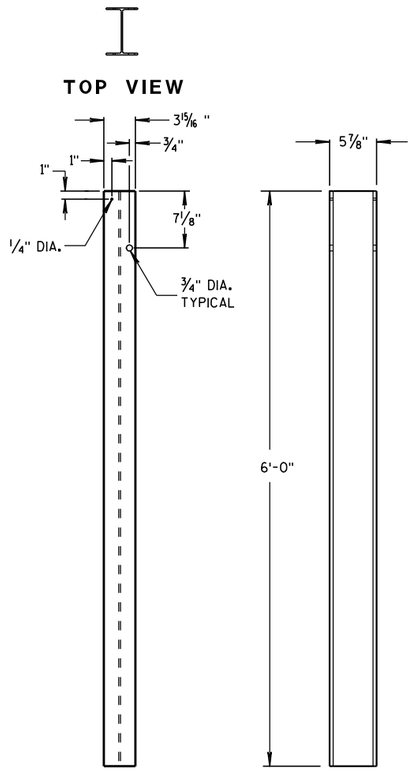


SIDE VIEW

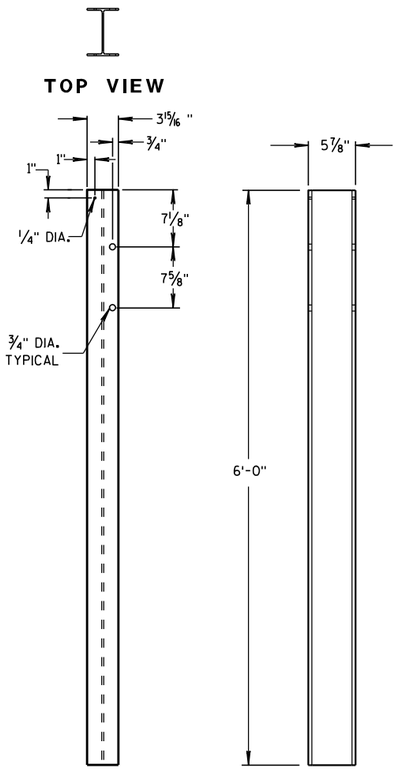


TOP VIEW

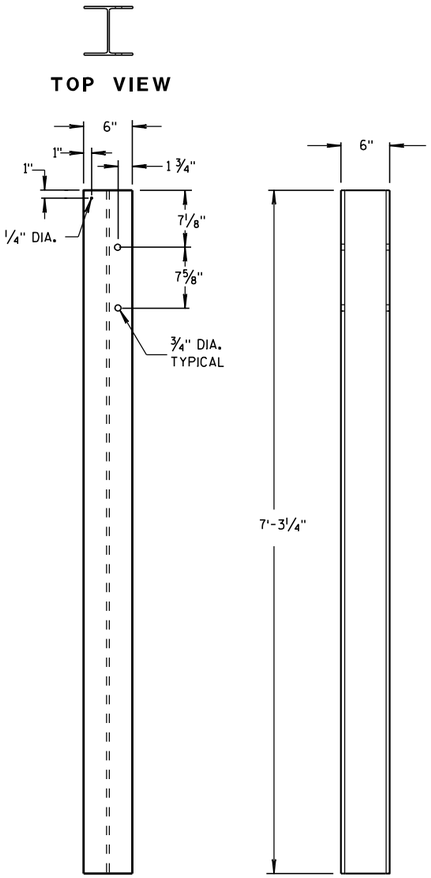
ALTERNATE WOOD BLOCKOUT DETAIL



STEEL POSTS 1-5

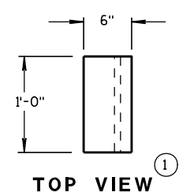


STEEL POSTS 6-11

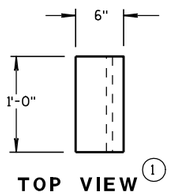


STEEL POSTS 12-14

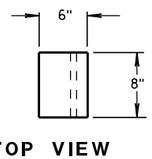
1 WOOD BLOCKS MAY BE CONSTRUCTED OUT OF 2 WOOD BLOCKS. SEE ALTERNATE WOOD BLOCK DETAIL.



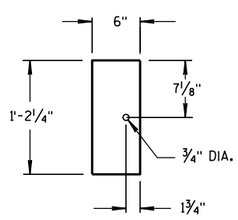
TOP VIEW (1)



TOP VIEW (1)

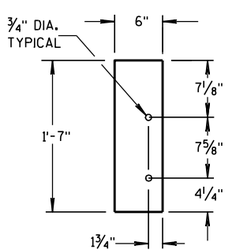


TOP VIEW



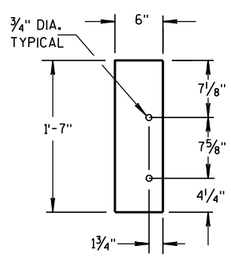
FRONT VIEW

BLOCKOUT POSTS 1-5



FRONT VIEW

BLOCKOUT POSTS 6-11



FRONT VIEW

BLOCKOUT POSTS 12-14

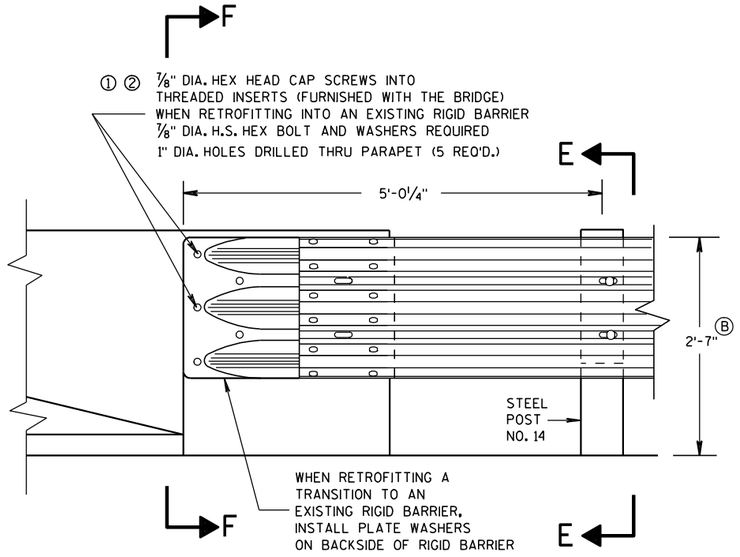
STEEL POST SIZES

POST NUMBER	SECTION TYPE	LENGTH
1	W6x9	72"
2	W6x9	72"
3	W6x9	72"
4	W6x9	72"
5	W6x9	72"
6	W6x9	72"
7	W6x9	72"
8	W6x9	72"
9	W6x9	72"
10	W6x9	72"
11	W6x9	72"
12	W6x15	87 1/8"
13	W6x15	87 1/8"
14	W6x15	87 1/8"

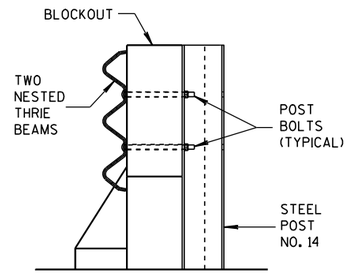
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6
S.D.D. 14 B 45-3c



FRONT VIEW



SECTION E-E

GENERAL NOTES

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

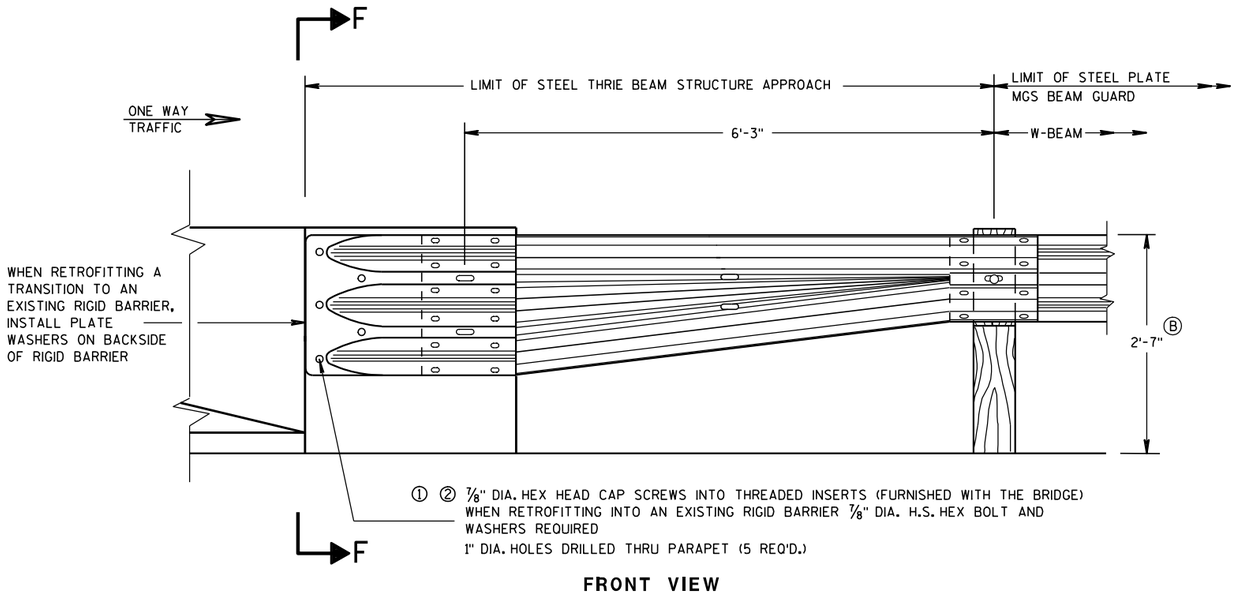
① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.

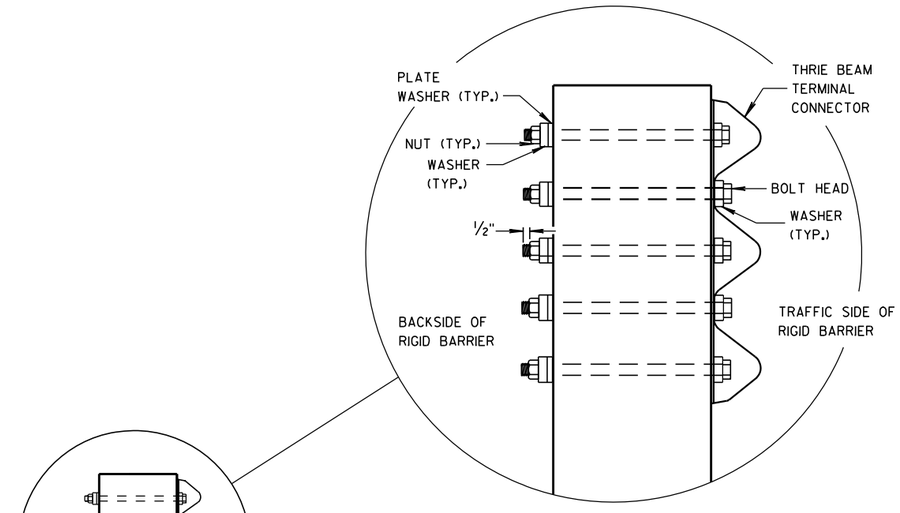
③ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".

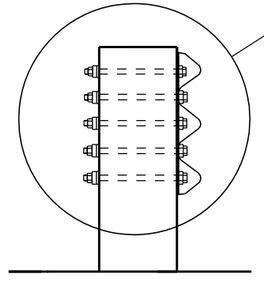
Ⓑ TOLERANCE FOR TOP OF BEAM IS ± 1".

THRIE BEAM CONNECTION TO BRIDGE PARAPET WITH SQUARE ENDS



FRONT VIEW





SECTION F-F

W BEAM TRANSITION AND CONNECTION TO BRIDGE PARAPETS WITH SQUARE ENDS

(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8/31/2012 — DATE

/S/ Jerry H. [illegible] — ROADWAY STANDARDS DEVELOPMENT ENGINEER

FHWA

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S.D.D. 14 B 45-3d

GENERAL NOTES

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

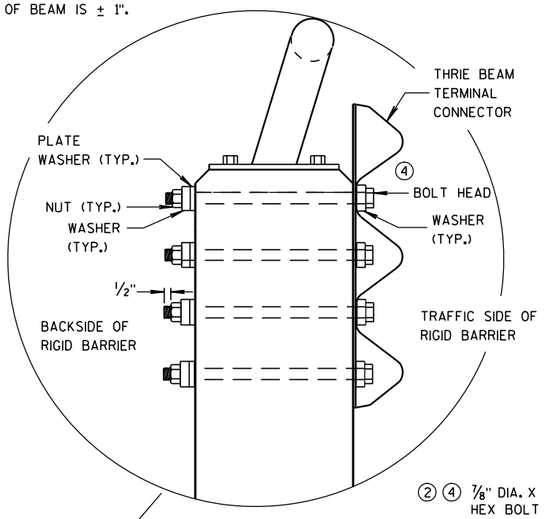
① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

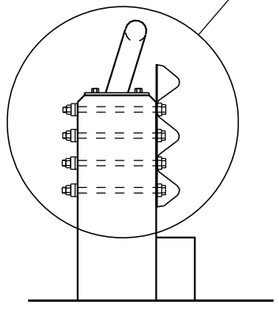
② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.

③ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2". BLOCK IS INCIDENTAL TO THE CONTRACT.

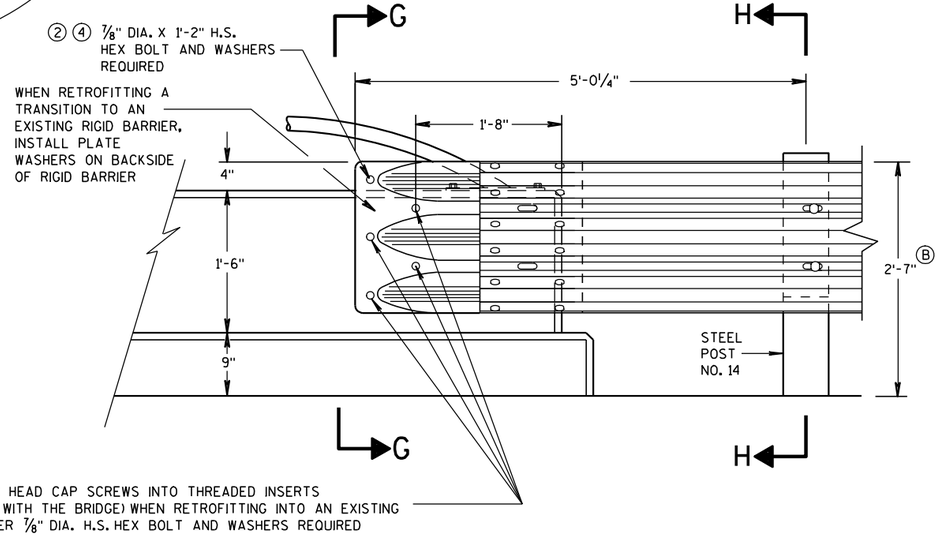
④ BOLT, NUT AND WASHERS NOT REQUIRED FOR THIS LOCATION WHEN RETROFITTING AN EXISTING PAPAPET AND THE HOLE IS EITHER ABOVE PARAPET OR WITHIN 4 INCHES OF THE EDGE OF PARAPET.

Ⓑ TOLERANCE FOR TOP OF BEAM IS ± 1".

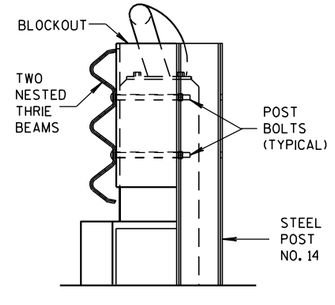




SECTION G-G

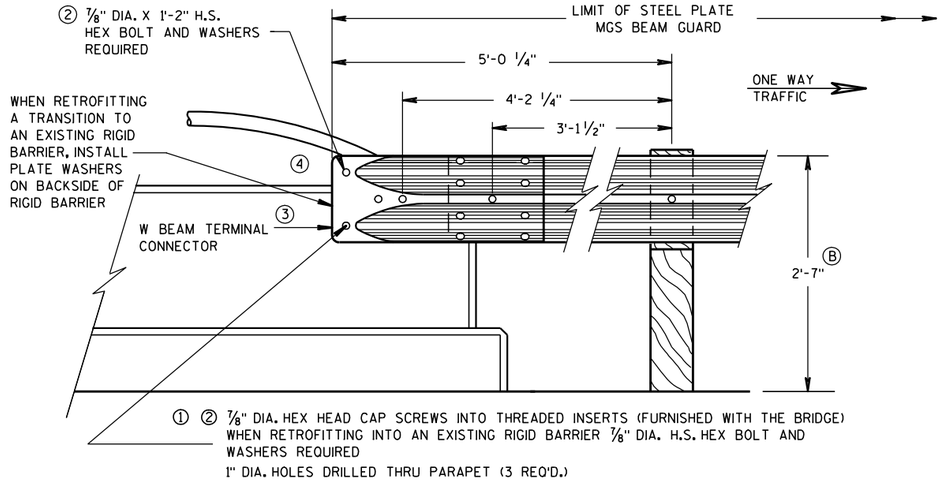


FRONT VIEW



SECTION H-H

THRIE BEAM CONNECTION TO VERTICAL FACED PARAPETS



FRONT VIEW

W BEAM CONNECTION TO VERTICAL FACE PARAPET

(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)	
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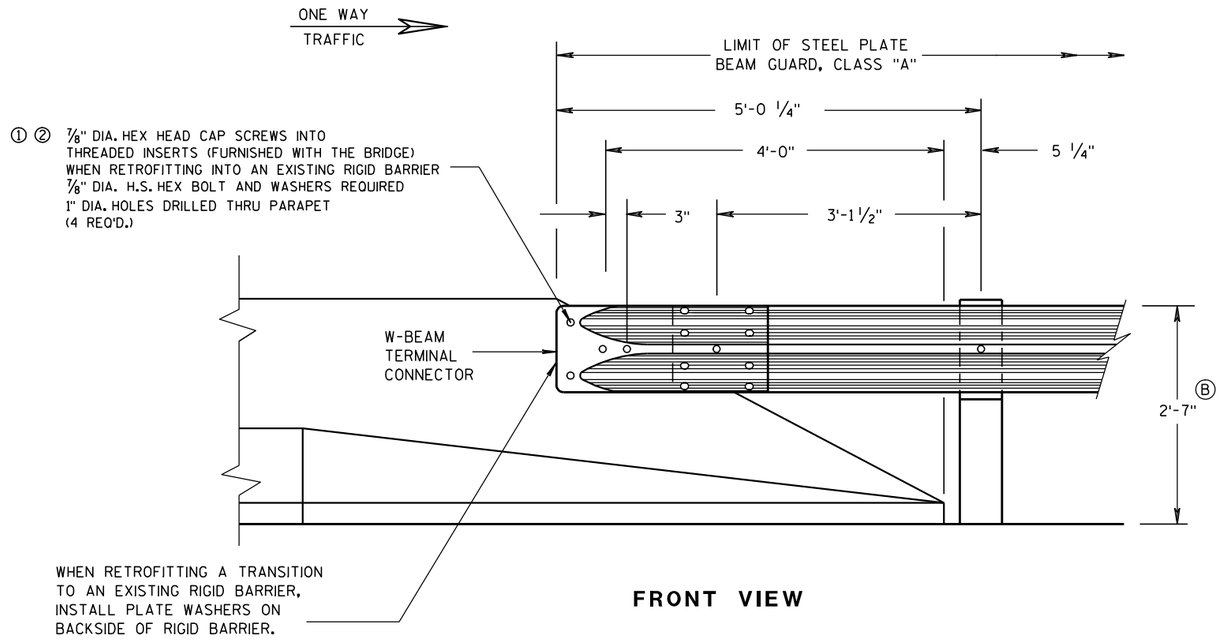


FRONT VIEW

W BEAM CONNECTION TO PARAPETS WITH SLOPED ENDS

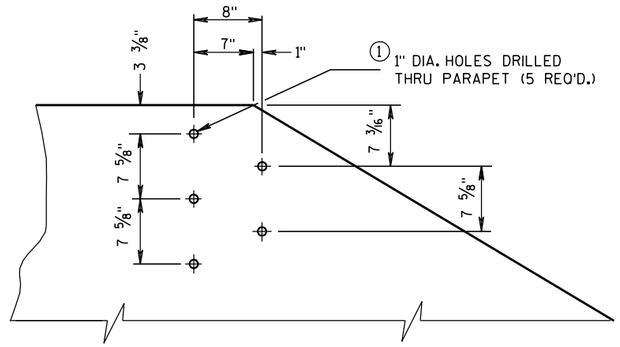
(USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)

GENERAL NOTES

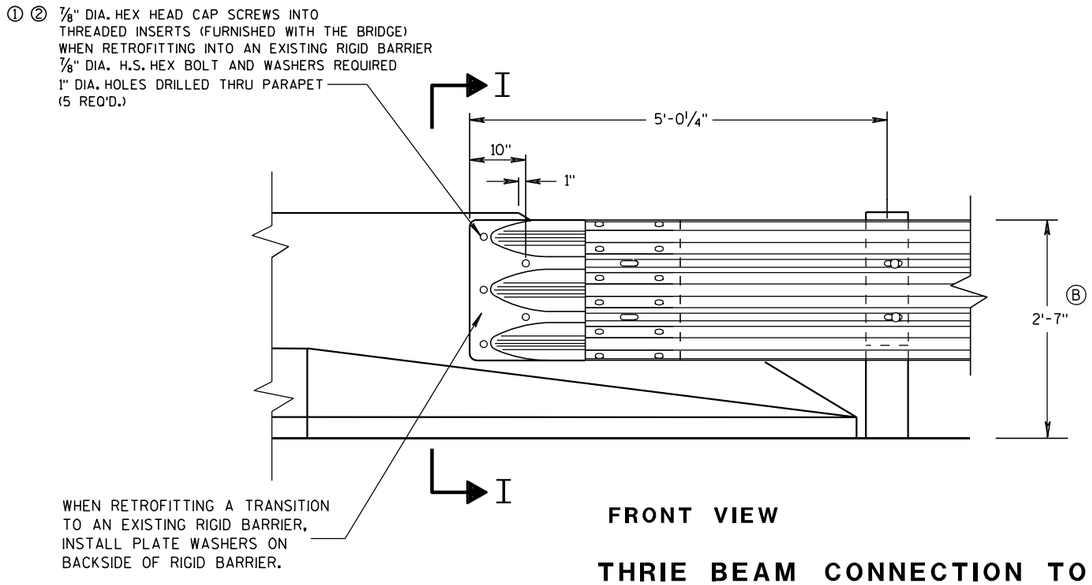
① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.

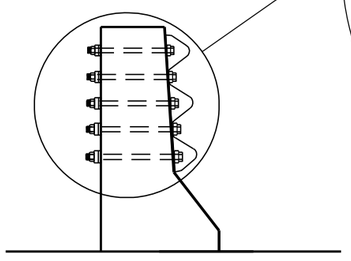
Ⓑ TOLERANCE FOR TOP OF BEAM IS ± 1".



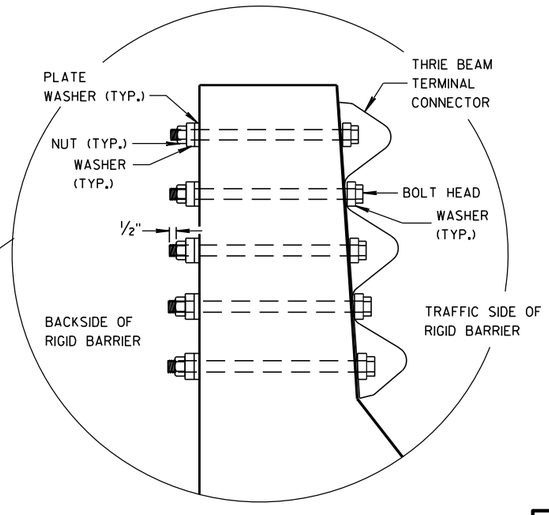
DRILL HOLE LOCATION AND PATTERN FOR THRIE BEAM CONNECTION



FRONT VIEW



SECTION I-I



THRIE BEAM CONNECTION TO BRIDGE PARAPETS WITH SLOPED ENDS

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

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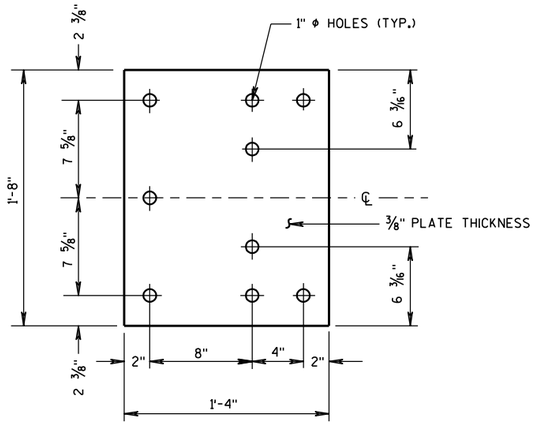
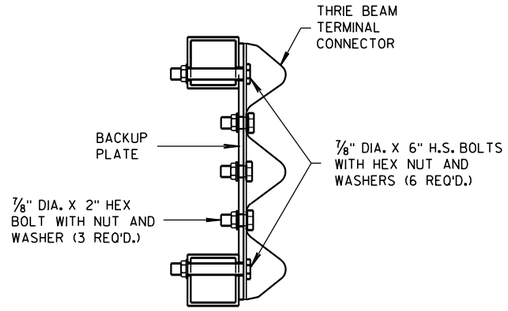


BACK-UP PLATE DETAIL

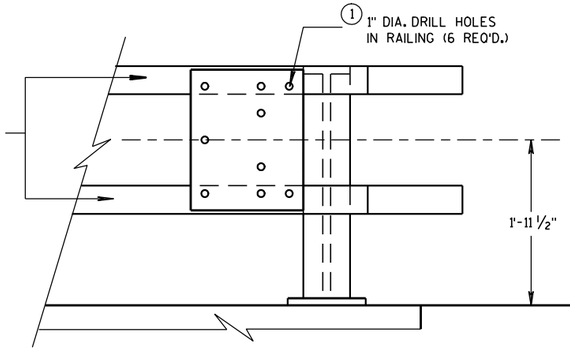


SECTION J-J

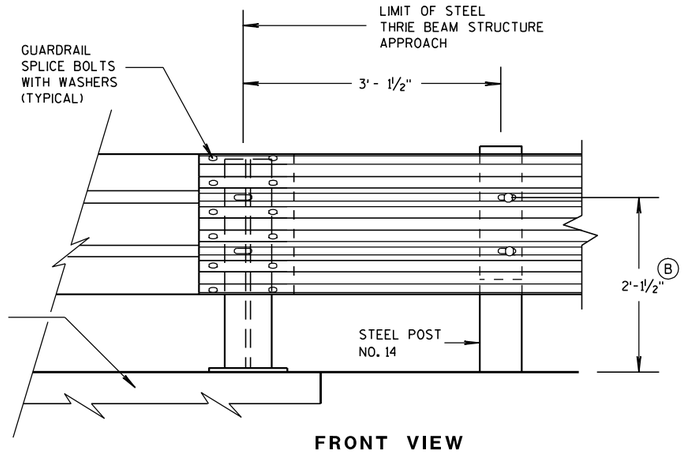
GENERAL NOTES

(1) DRILLING HOLES THROUGH THE PAPRPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

(B) TOLERANCE FOR TOP OF BEAM IS ± 1".

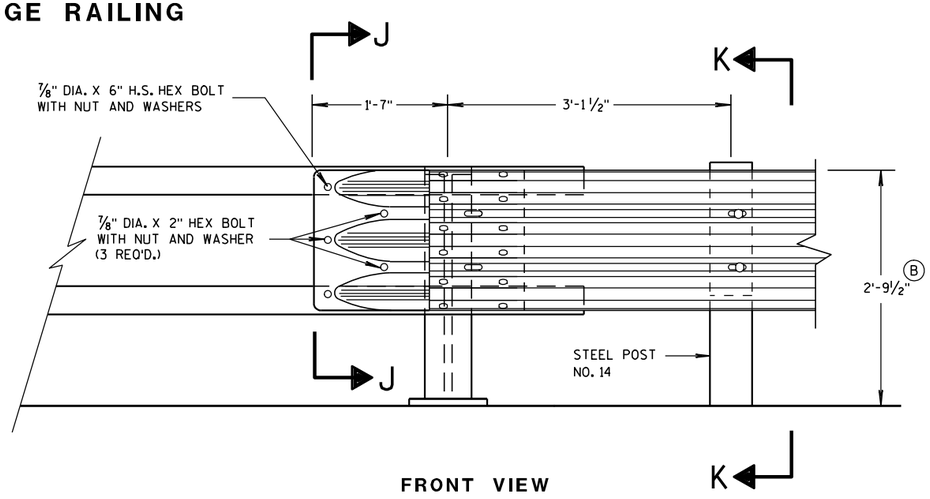


BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING

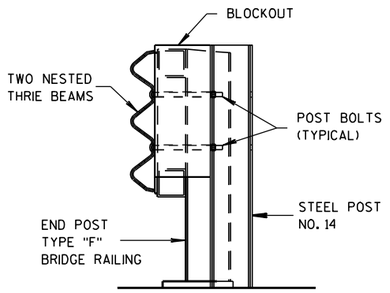


FRONT VIEW

THRIE BEAM CONNECTION TO STEEL RAILING TYPE "W"



FRONT VIEW



SECTION K-K

THRIE BEAM CONNECTION TO TUBULAR RAILING TYPE "F"

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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8/31/2012 — DATE
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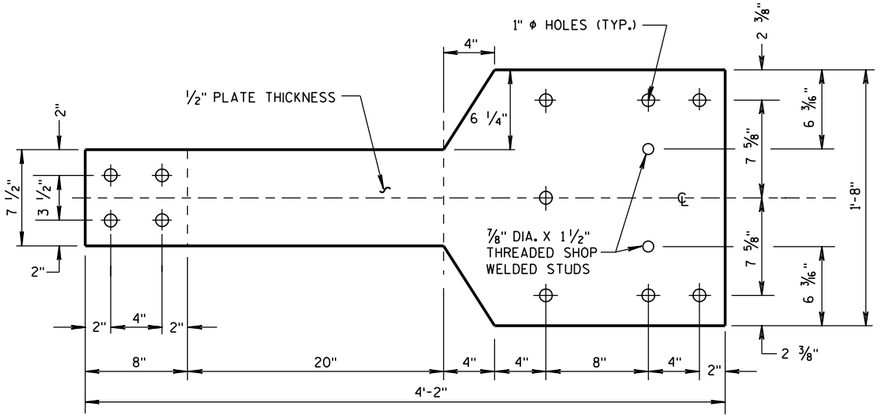
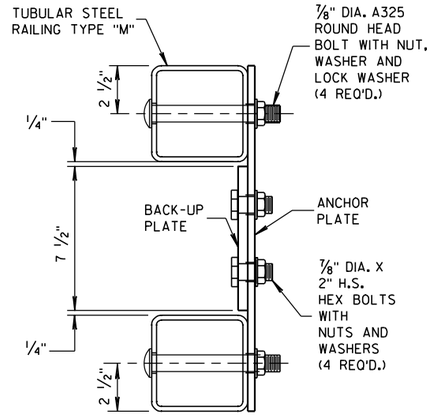
GENERAL NOTES

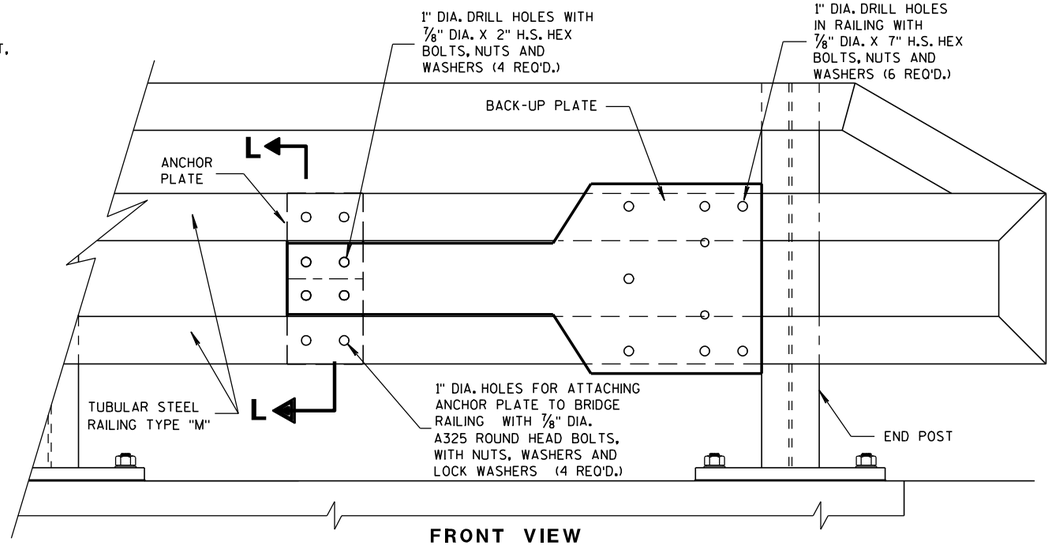
(B) TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".



FRONT VIEW

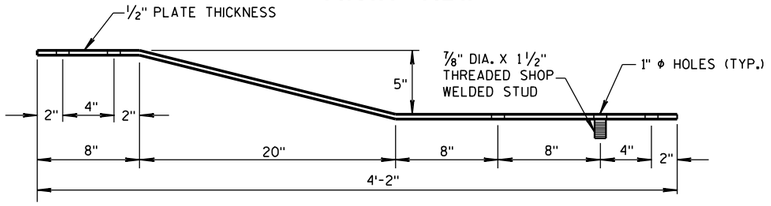


SECTION L-L



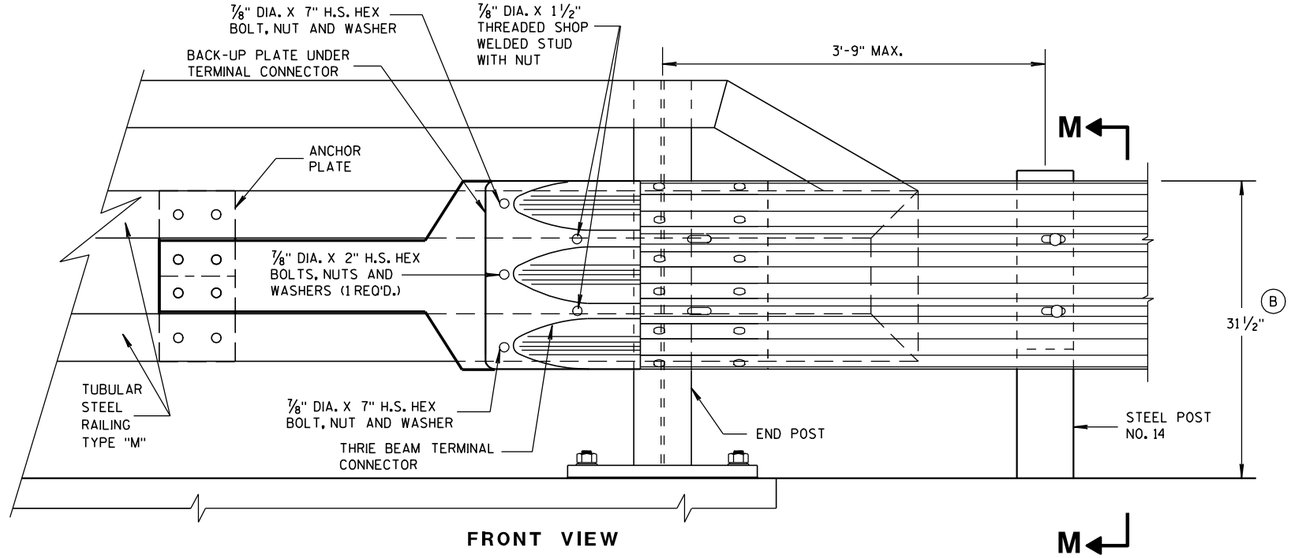
FRONT VIEW

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

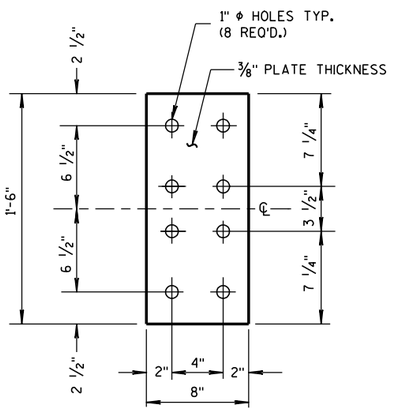


PLAN VIEW

BACK-UP PLATE DETAIL, TYPE "M"

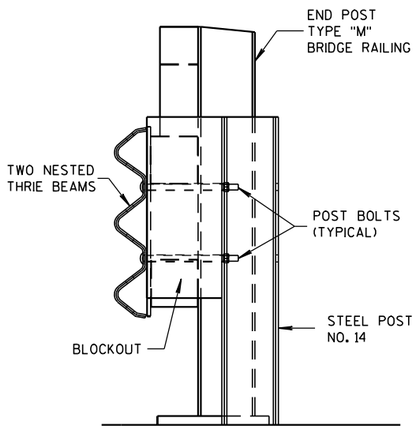


FRONT VIEW

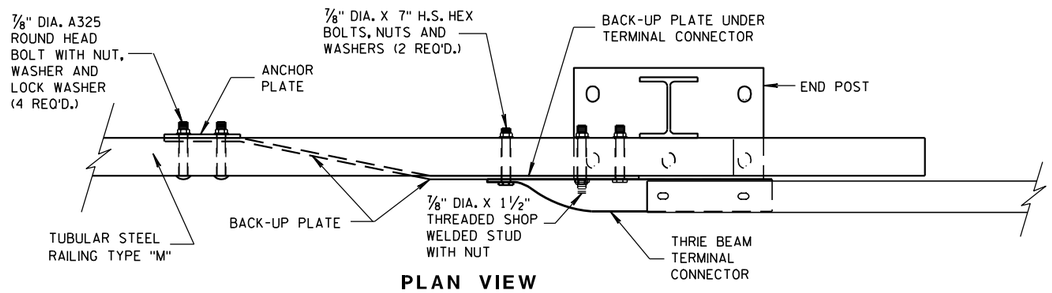


FRONT VIEW

ANCHOR PLATE DETAIL, TYPE "M"



SECTION M-M



PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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GENERAL NOTES

COVER PLATE PANELS ARE 3/16" THICK.

ALL STIFFENERS ARE 1/4" THICK.

CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.

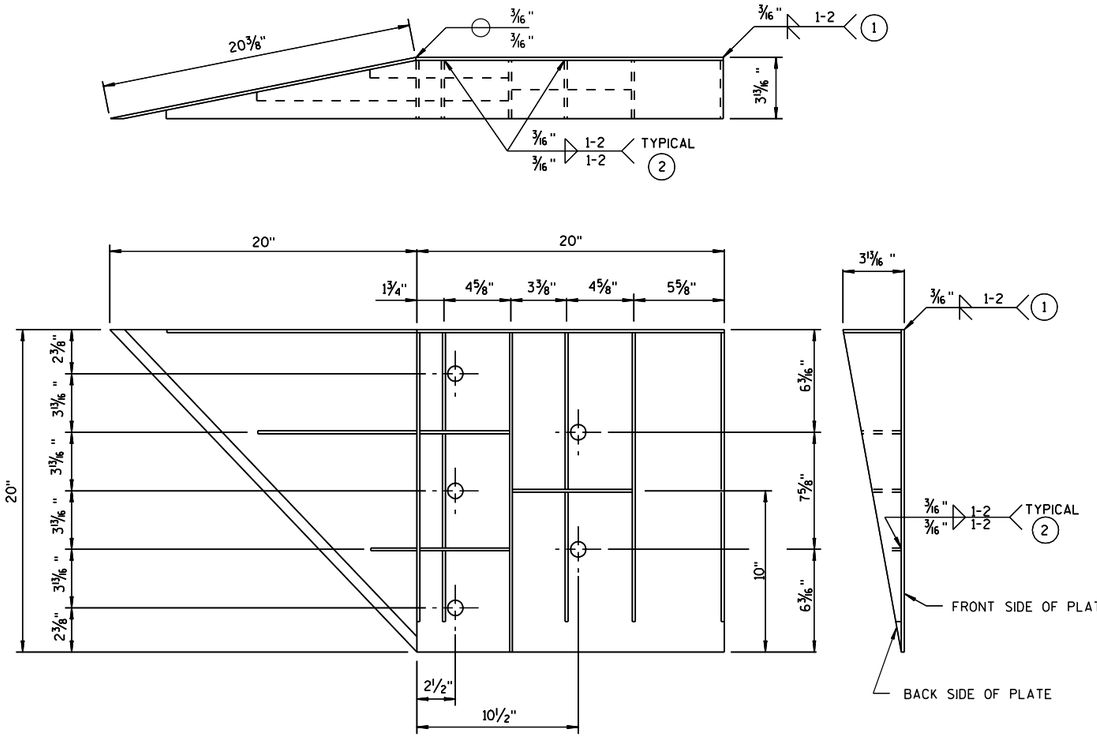
FOR GALVANIZED REQUIREMENTS, SEE SECTION 614 OF THE STANDARD SPECIFICATIONS.

ALL HOLE DIAMETERS SHALL BE 1".

FOR OPPOSITE SIDE INSTALLATION MIRROR DRAWINGS.

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

(2) STIFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:
3/16" FILLET WELD BY 1" LONG SPACED AT 2".



WELDING INSTRUCTION

(VIEWED FROM BACK SIDE OF PLATE)

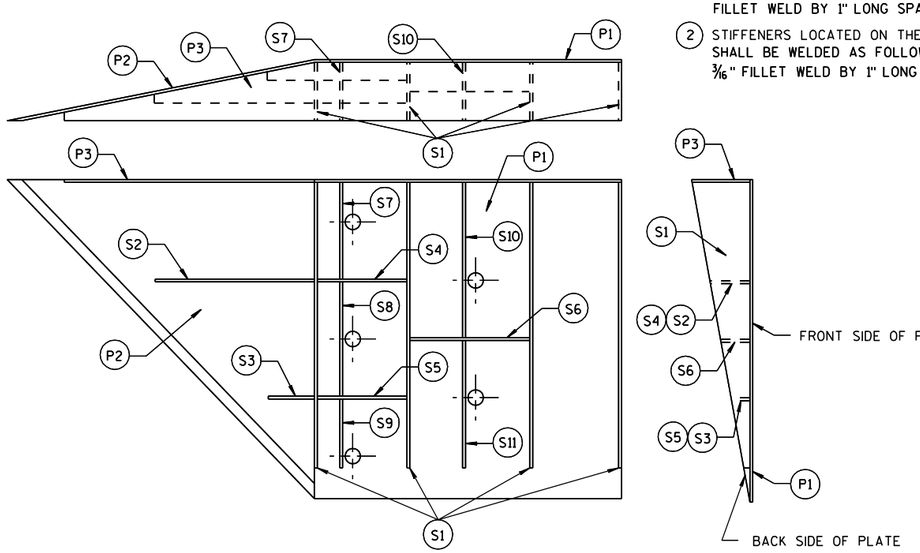


PLATE AND STIFFENER IDENTIFICATION

(VIEWED FROM BACK SIDE OF PLATE)

CONNECTOR PLATE DIMENSION (PER ASSEMBLY)

PLATE	QUANTITY	SHAPE	SIZE (A x B x C x D)	THICKNESS
P1	1		20" x 20"	3/16"
P2	1		20" x 20" x 28 9/16"	3/16"
P3	1		39" x 3 5/8" x 20" x 19 5/16"	3/16"
S1	4		18 7/16" x 3 5/8" x 18 3/4"	1/4"
S2	1		10 1/4" x 2 7/16" x 10 3/8" x 1/2"	1/4"
S3	1		3" x 1 1/16" x 3 1/8" x 1/2"	1/4"
S4	1		6 1/8" x 2 7/16"	1/4"
S5	1		6 1/8" x 1 1/16"	1/4"
S6	1		7 3/4" x 1 3/4"	1/4"
S7	1		2 9/16" x 6" x 3 5/8" x 5 7/8"	1/4"
S8	1		1 5/32" x 7 1/2" x 2 1/2" x 7 3/8"	1/4"
S9	1		6 1/16" x 6 3/16" x 1 3/32"	1/4"
S10	1		1 7/8" x 9 7/8" x 3 5/8" x 9 11/16"	1/4"
S11	1		8 1/2" x 8 3/4" x 1 13/16"	1/4"

SINGLE SLOPE CONNECTION PLATE

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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S.D.D. 14 B 45-3i

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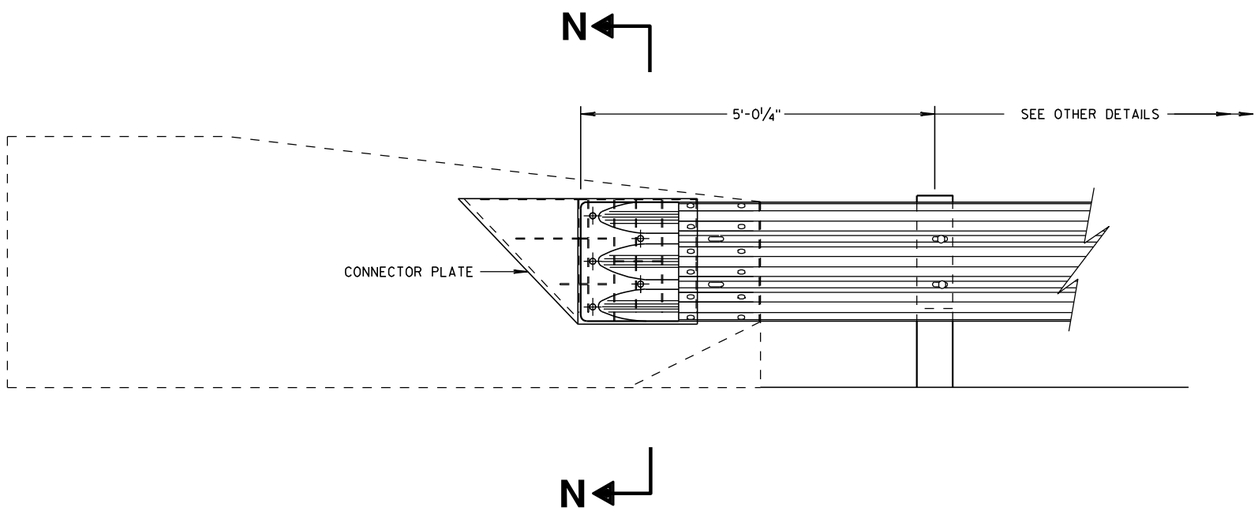
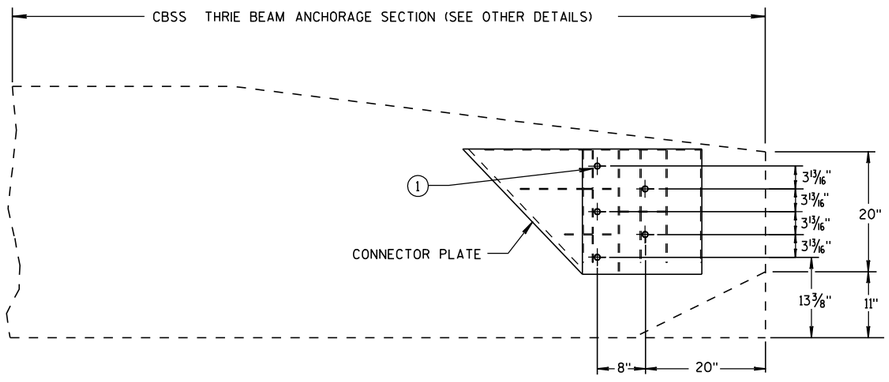


THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER

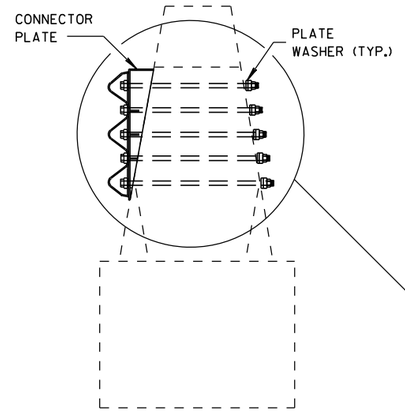


SINGLE SLOPE CONNECTION PLATE PLACEMENT

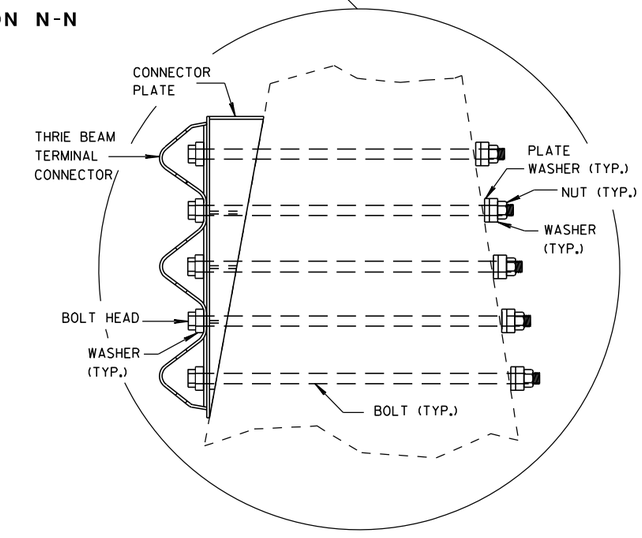
GENERAL NOTES

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

(1) BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X ⅝" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.



SECTION N-N



MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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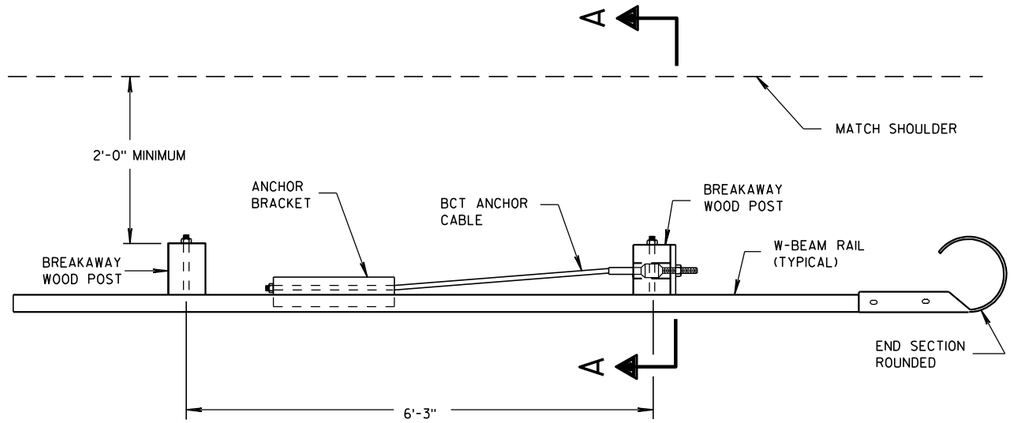
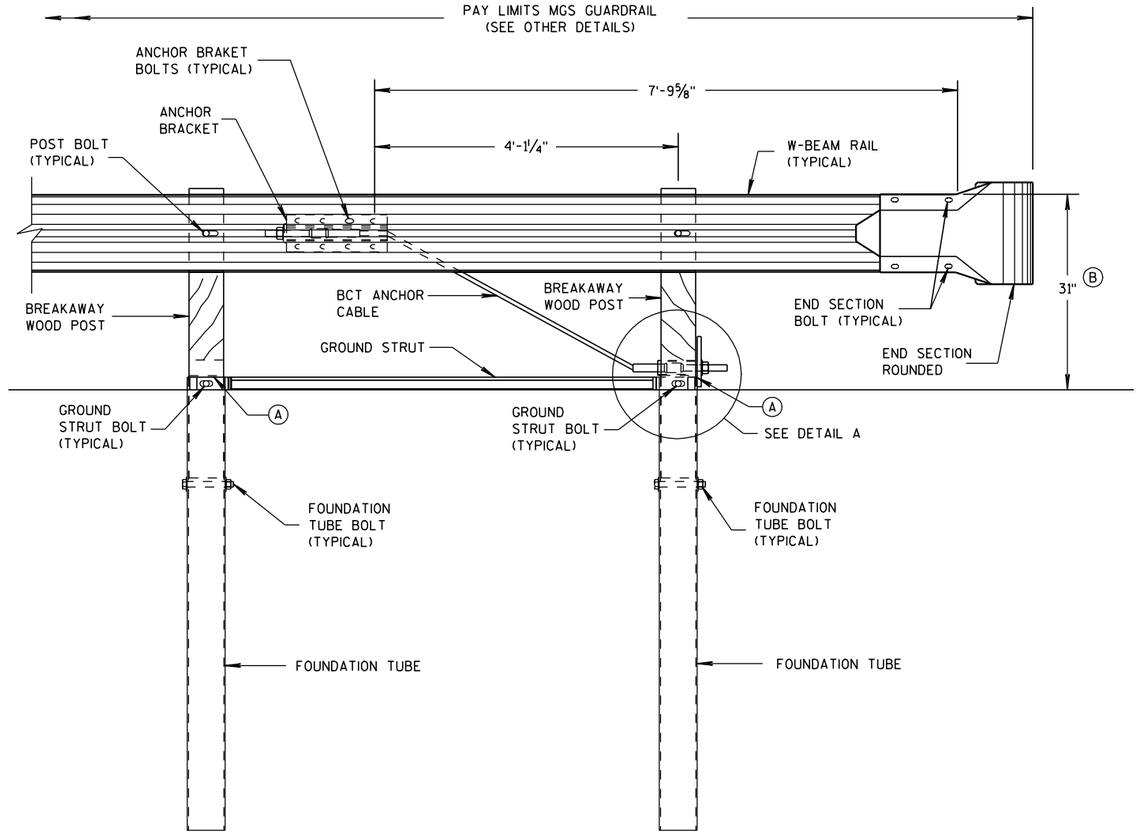
S.D.D. 14 B 45-3j

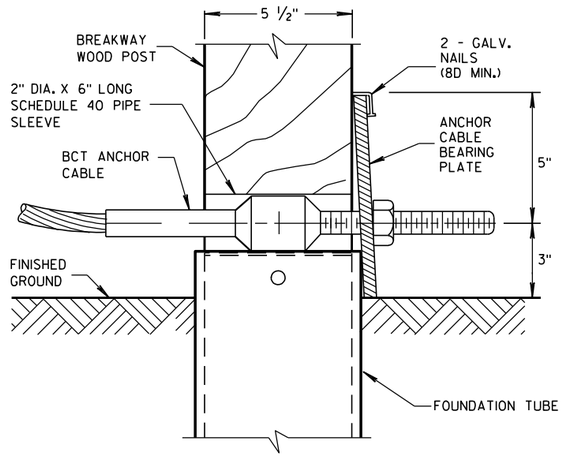


PLAN VIEW



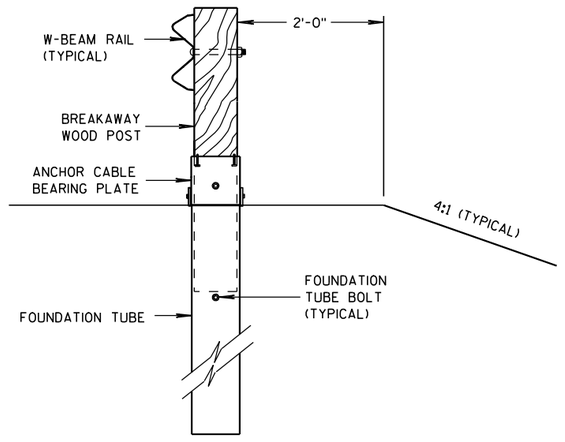
FRONT VIEW

END RAIL DETAIL



DETAIL A

POST NO. 1
GROUNG STRUT NOT SHOWN FOR CLARITY.



SECTION A-A

GENERAL NOTES

SEE SDD 14 B 42 FOR MORE INFORMATION.

POST BOLTS ARE A ⅝" DIAMETER X 10" LONG GUARDRAIL BOLT. A POST BOLT REQUIRES A ⅝" DIAMETER DH MODIFIED (RECESSED) HEAVY HEX NUT AND ⅝" DIAMETER FLAT WASHER.

FOUNDATION TUBE BOLTS ARE A ⅞" DIAMETER X 7½" LONG HEAVY HEX HEAD BOLT. A FOUNDATION TUBE BOLT REQUIRES A ⅞" DIAMETER DH HEAVY HEX NUT AND A ⅝" DIAMETER FLAT WASHER.

GROUND STRUT BOLTS ARE A ⅝" DIAMETER X 10" LONG HEAVY HEX HEAD BOLT. A GROUND STRUT BOLT REQUIRES A ⅝" DIAMETER DH HEAVY HEX NUT AND A ⅝" DIAMETER FLAT WASHER.

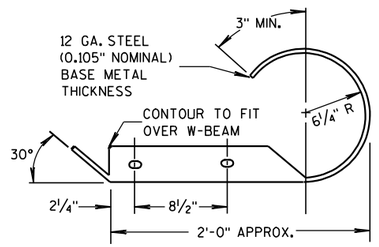
ANCHOR BRAKET BOLTS ARE A ⅝" DIAMETER X 1½" LONG HEAVY HEX HEAD BOLT. AN ANCHOR BRAKET BOLT REQUIRES A ⅝" DIAMETER DH HEAVY HEX NUT AND A FLAT WASHER.

END SECTION BOLTS ARE A ⅝" DIAMETER X 1½" HEAVY HEX HEAD BOLT. AN END SECTION BOLT REQUIRES ⅝" DIAMETER DH HEAVY HEX NUT AND A ⅝" DIAMETER FLAT WASHER.

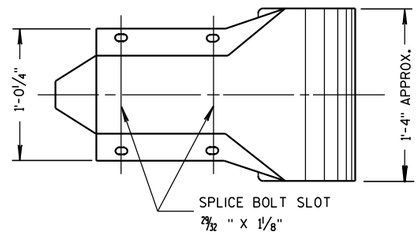
W-BEAM END SECTION ROUNDED HAS THE SAME MATERIAL PROPERTIES AS STANDARD STEEL RAIL.

(A) TOP OF FOUNDATION TUBE SHALL BE NO MORE THAN 3" ABOVE FINISHED GROUND.

(B) FOR NEW CONSTRUCTION TOP OF RAIL IS 31" ± 1".
FOR EXISTING INSTALLATIONS TOP OF RAIL IS BETWEEN 27¾" TO 32" ± 1".



PLAN VIEW



FRONT VIEW

W BEAM END SECTION ROUNDED

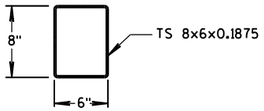
MIDWEST GUARDRAIL SYSTEM (MGS) TYPE 2 TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

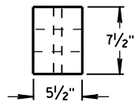
6
S.D.D. 14 B 47-1a

GENERAL NOTES

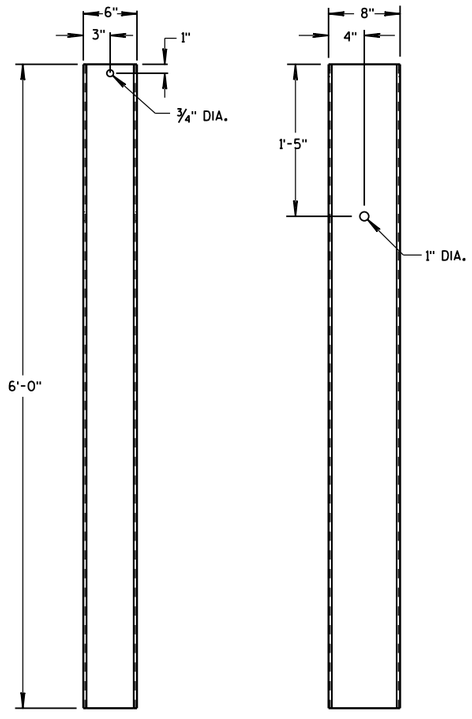
BCT ANCHOR CABLE IS A ⅜" DIAMETER 6X19 IWRC IPS GALVANIZED WIRE ROPE. THE SWAGED FITTINGS AND STUD ARE REQUIRED. THE END FITTING SHALL BE MACHINED FROM HOT-ROLLED CARBON STEEL CONFORMING TO ASTM A576 GRADE 1035 AND GALVANIZED ACCORDING TO ASTM A123. THE TREADED STUD SHOULD CONFORM TO ASTM A325 OR SAE GRADE 5. MINIMUM BREAKING STRENGTH OF WIRE ROPE IS 43,000 LB. WIRE ROPE IS TO BE TAUT.



PLAN VIEW

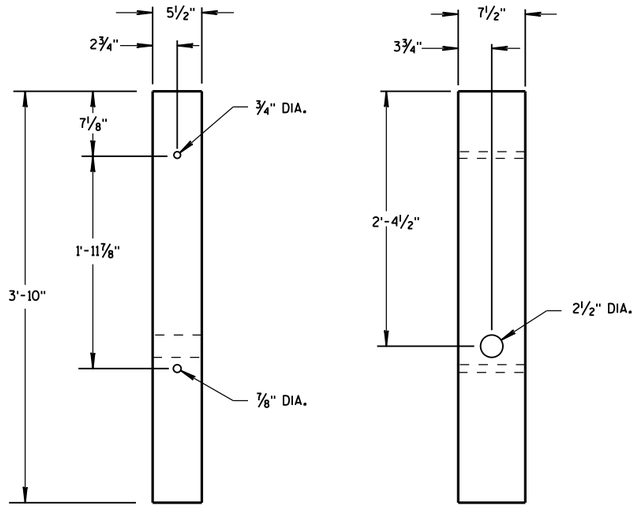


PLAN VIEW



FRONT VIEW SIDE VIEW

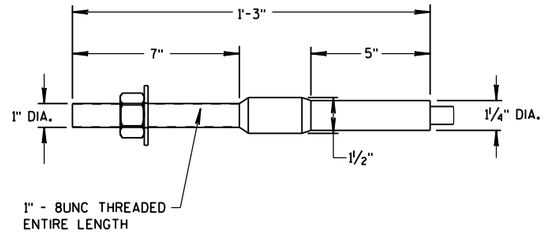
FOUNDATION TUBE



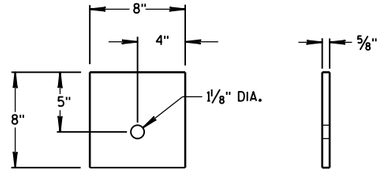
FRONT VIEW SIDE VIEW

BREAKAWAY WOOD POST

BCT ANCHOR CABLE



DETAIL B



SIDE VIEW FRONT VIEW

ANCHOR CABLE
BEARING PLATE

MIDWEST GUARDRAIL
SYSTEM (MGS) TYPE 2 TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPOI

6

S.D.D. 14 B 47-1b

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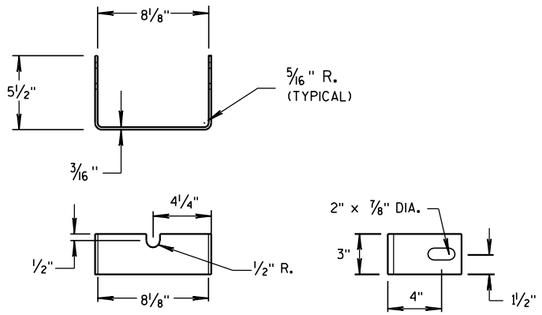
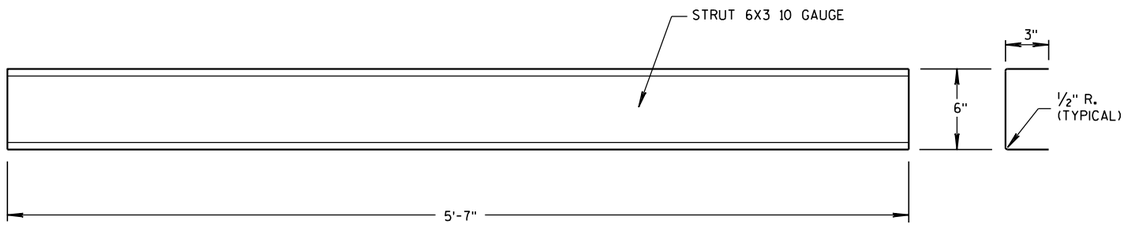
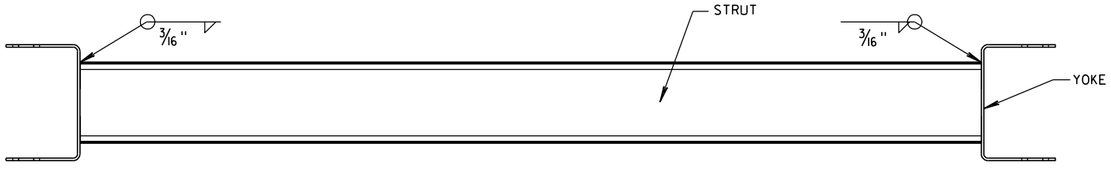
S.D.D. 14 B 47-1b



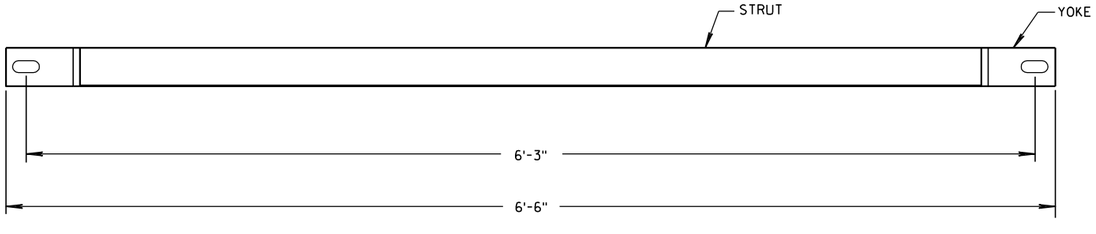
YOKE DETAIL



STRUT DETAIL

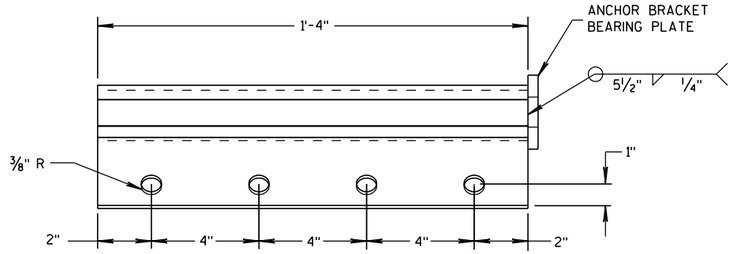


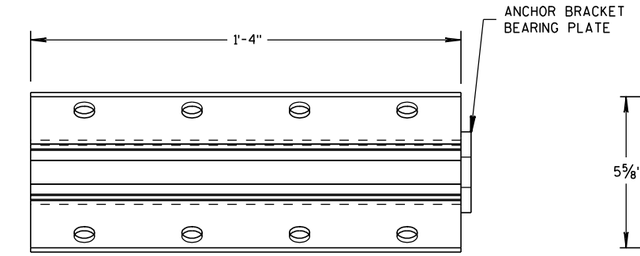
PLAN VIEW

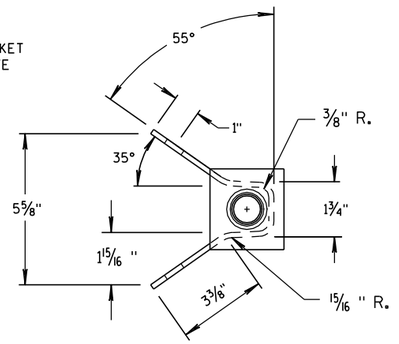


FRONT VIEW

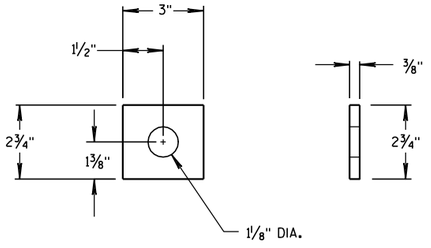
GROUND STRUT DETAIL







ANCHOR BRACKET



ANCHOR BRACKET BEARING PLATE

MIDWEST GUARDRAIL SYSTEM (MGS) TYPE 2 TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

5/23/2011
DATE

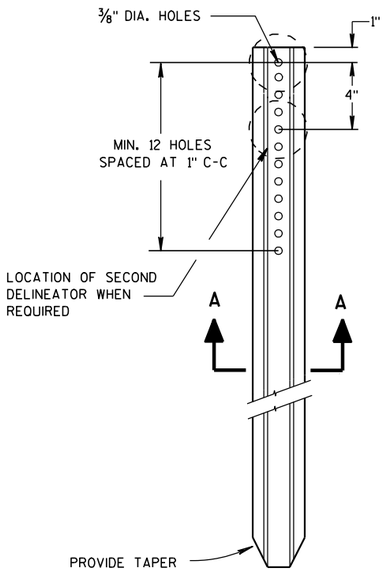
/S/ Jerry H. [illegible]
ROADWAY STANDARDS ENGINEER

[illegible]

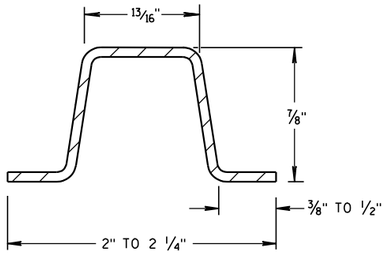
FHWA

6

S.D.D. 14 B 47-1c

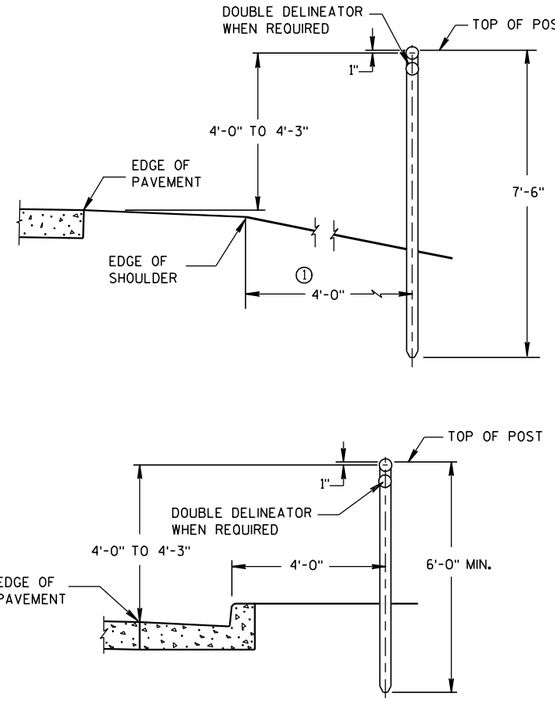


DELINEATOR POST



SECTION A-A

WEIGHT 1.12 LBS PER FT. ± 0.1 LB.

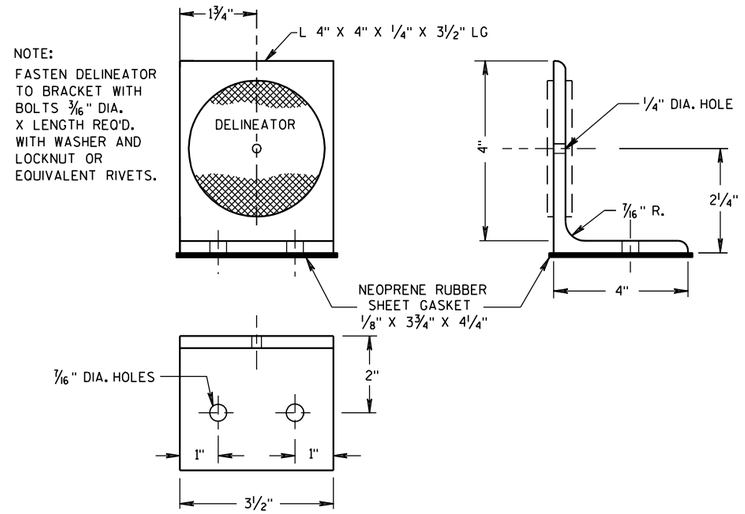


TYPICAL INSTALLATIONS OF DELINEATOR POSTS

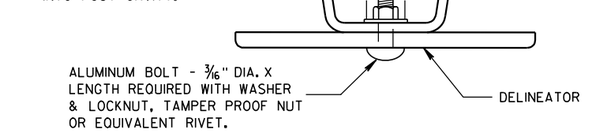
GENERAL NOTES

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

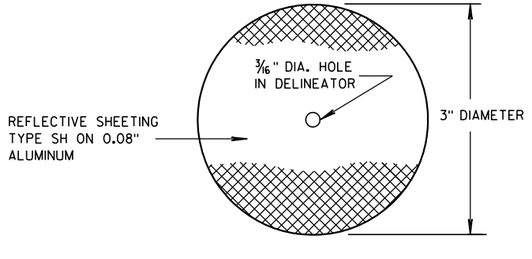
① DELINEATORS SHALL BE PLACED AT A CONSTANT DISTANCE FROM THE EDGE OF THE SHOULDER FOR THE LENGTH OF THE INSTALLATION.



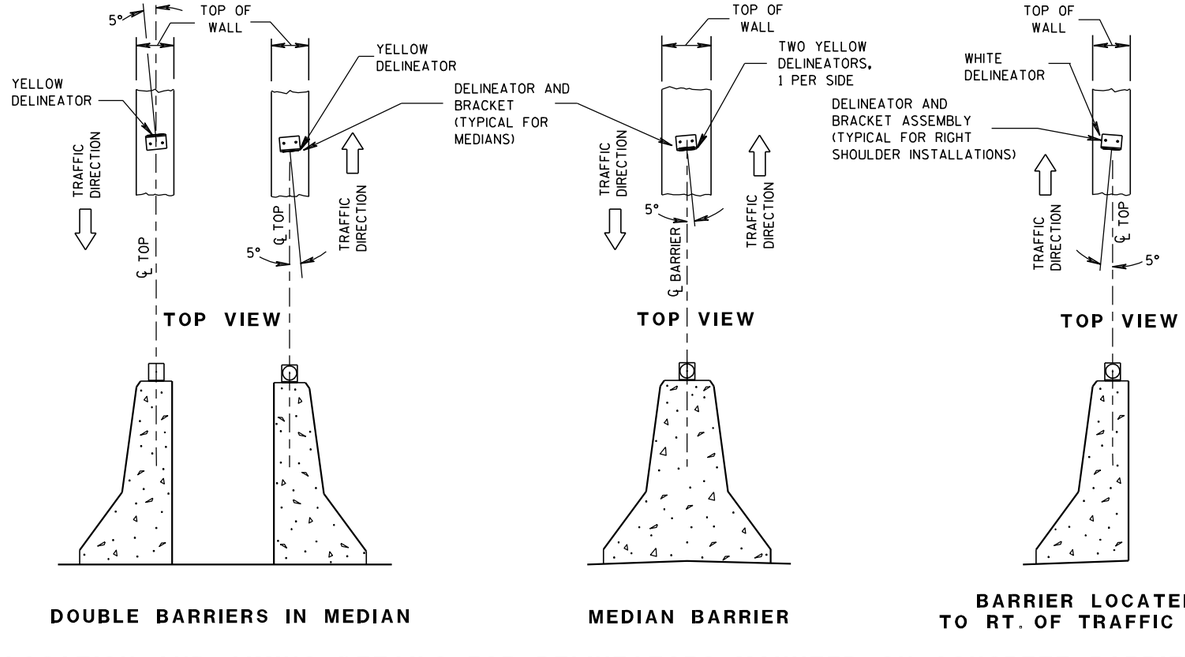
DELINEATOR BRACKET



MOUNTING DETAIL FOR DELINEATOR



DELINEATOR

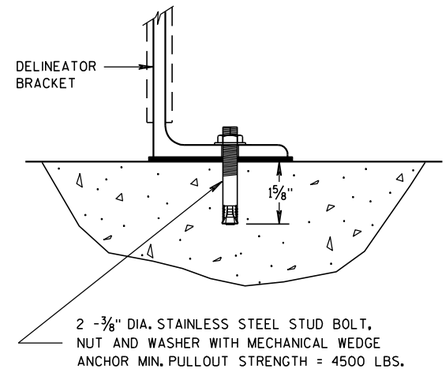


DOUBLE BARRIERS IN MEDIAN

MEDIAN BARRIER

BARRIER LOCATED TO RT. OF TRAFFIC FLOW

LOCATION AND AIMING DETAILS FOR DELINEATORS MOUNTED ON CONCRETE BARRIERS



DELINEATOR BRACKET MOUNTING DETAIL

DELINEATOR POST, DELINEATOR BRACKET AND DELINEATOR

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
1/25/2011
DATE
/S/ Thomas N. Nothdurft
STATE TRAFFIC ENGINEER
DESIGN
FHWA

6

S.D.D. 15 A 2-7

6

S.D.D. 15 A 2-7

LEGEND

- POST WITH ATTACHED SIGN
- POST WITH ATTACHED SIGN IN DRUM
- DRUM WITH WARNING LIGHT (TYPE C)
- DRUM
- ARROW BOARD
- 8' TYPE III BARRICADE
- REMOVING PAVEMENT MARKING
- DIRECTION OF TRAFFIC

GENERAL NOTES :

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

THE SPACING BETWEEN SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 200 FEET, (500 FEET DESIREABLE) DISTANCE TO EXISTING SIGNS.

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

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED.

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

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER. NO WARNING LIGHTS SHALL BE WORKING ON "COVERED" OR "DOWNED" SIGNS.

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

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

GENERAL NOTES CONTINUED:

REMOVE PAVEMENT MARKINGS IF LANE CLOSURE IS TO BE IN PLACE FOR LONGER THAN 7 CONTINUOUS DAYS AND NIGHTS.

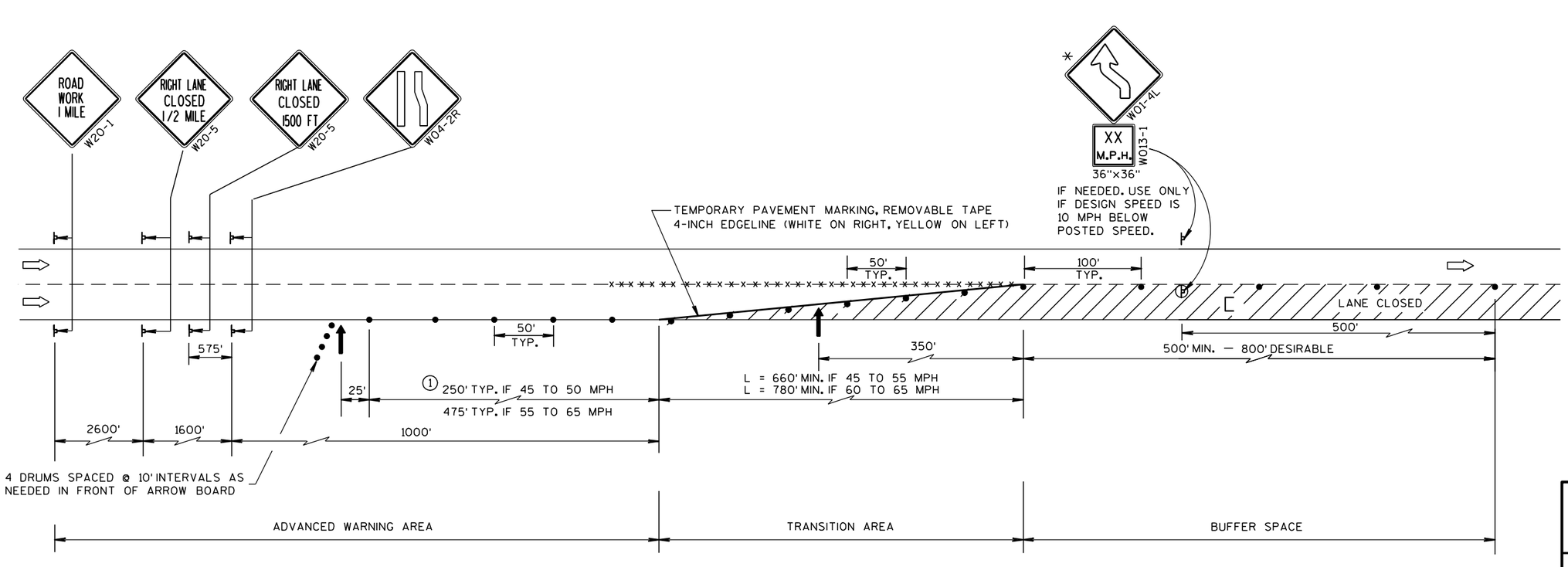
WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.

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

IF LANE CLOSURE IS MORE THAN 1 MILE, PLACE A TYPE III BARRICADE APPROXIMATELY EVERY 1/4 MILE ACROSS THE CLOSED LANE TO HELP ENFORCE THE DRUM LINE.

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

* THE LEFT REVERSE CURVE SIGN (WO1-4L) IS ONLY REQUIRED WHEN THIS DETAIL IS USED IN COMBINATION WITH "SINGLE LANE CROSSOVER" DETAIL.



TRAFFIC CONTROL, LANE CLOSURE, SPEEDS GREATER THAN 40 M.P.H.

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8-7-95 DATE
/S/ Chester J. [illegible]
DIRECTOR, OFFICE O
FHWA

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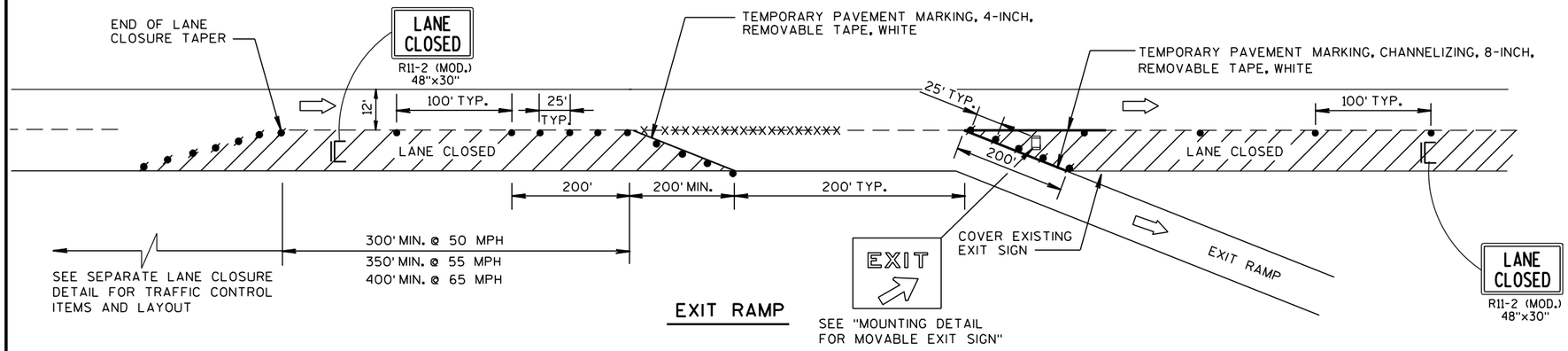
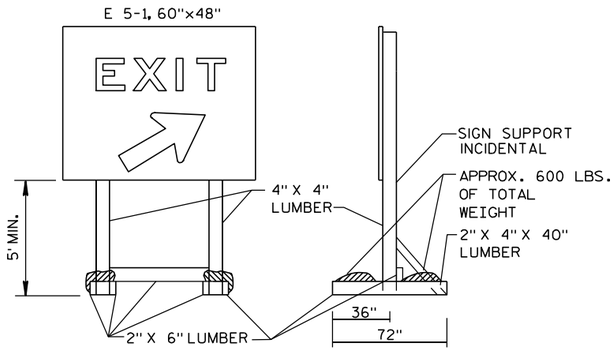
S.D.D. 15 D 12-2

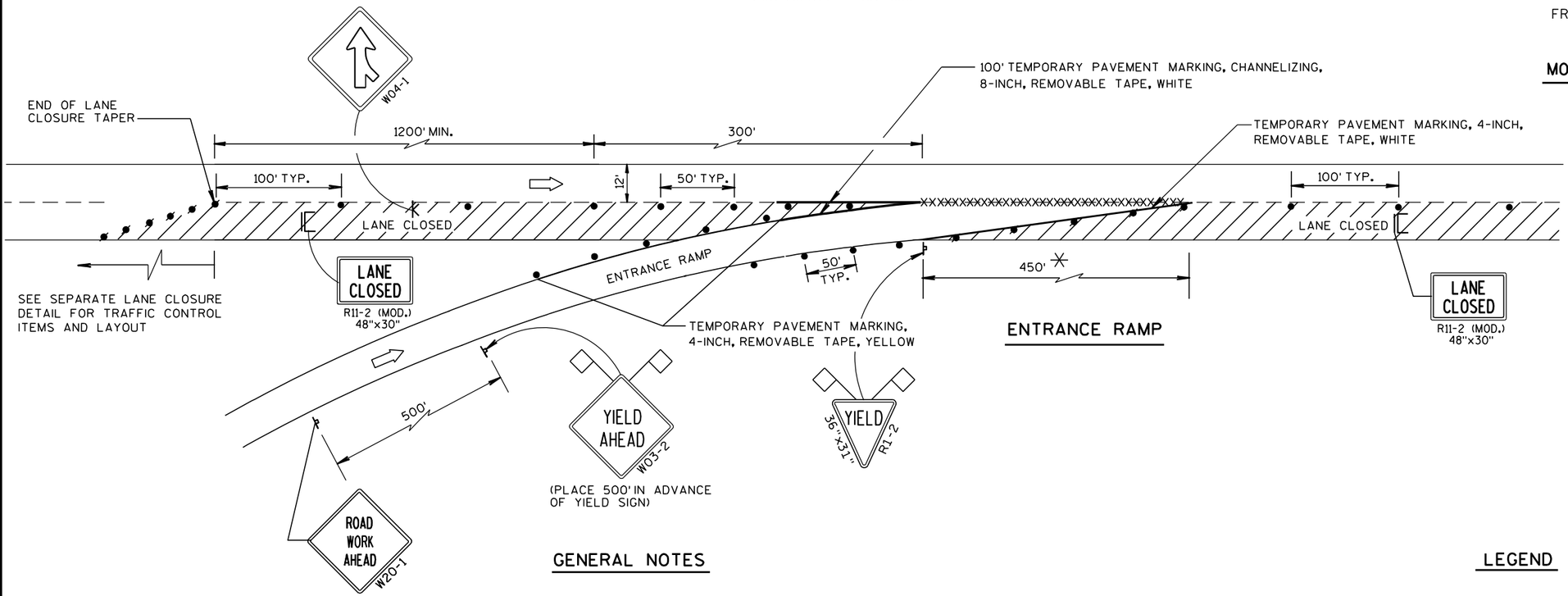


EXIT RAMP



NOTE: ALL LUMBER DIMENSIONS ARE NOMINAL

MOUNTING DETAIL FOR MOVABLE EXIT SIGN



ENTRANCE RAMP

GENERAL NOTES

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

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

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

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED.

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

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

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

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

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

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

REMOVE PAVEMENT MARKINGS AND PLACE TEMPORARY PAVEMENT MARKING, REMOVABLE TAPE IF LANE CLOSURE IS TO BE IN PLACE FOR 7 OR MORE CONTINUOUS DAYS AND NIGHTS.

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

✳ LENGTH OF OPENING MAY BE REDUCED TO 150 FEET DURING STAGING OF WORK IN IMMEDIATE AREA OF RAMP TAPER.

LEGEND

- POST MOUNTED SIGN
- SIGN ON PORTABLE SUPPORT
- TRAFFIC CONTROL, DRUM
- TRAFFIC CONTROL, DRUM WITH WARNING LIGHT, TYPE C (STEADY-BURN)
- REMOVING PAVEMENT MARKING (SEE GENERAL NOTES)
- TYPE III BARRICADE (8' EQUIVALENT) WITH SIGN
- FLAGS, 16"x16" MIN., ORANGE
- DIRECTION OF TRAFFIC FLOW

TRAFFIC CONTROL, EXIT AND ENTRANCE RAMP WITHIN LANE CLOSURE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
5/24/2000 DATE
/S/ Chester J. [illegible] CHIEF SIGNS AND MARKINGS ENGINEER
FHWA

S.D.D. 15 D 15-1

SYMBOLS

IC/C	TYPE III BARRICADE (8' EQUIVALENT) WITH/WITHOUT SIGN
•	DRUM
⊢	POST MOUNTED SIGN
(A)	WARNING LIGHT, TYPE A (FLASHING)
⇨	DIRECTION OF TRAFFIC

GENERAL NOTES

THIS RAMP CLOSURE DETAIL IS TYPICAL FOR CLOSING A RIGHT SIDE EXIT RAMP. FOR A LEFT SIDE EXIT RAMP, REVERSE THE TRAFFIC CONTROL.

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

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

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

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

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.

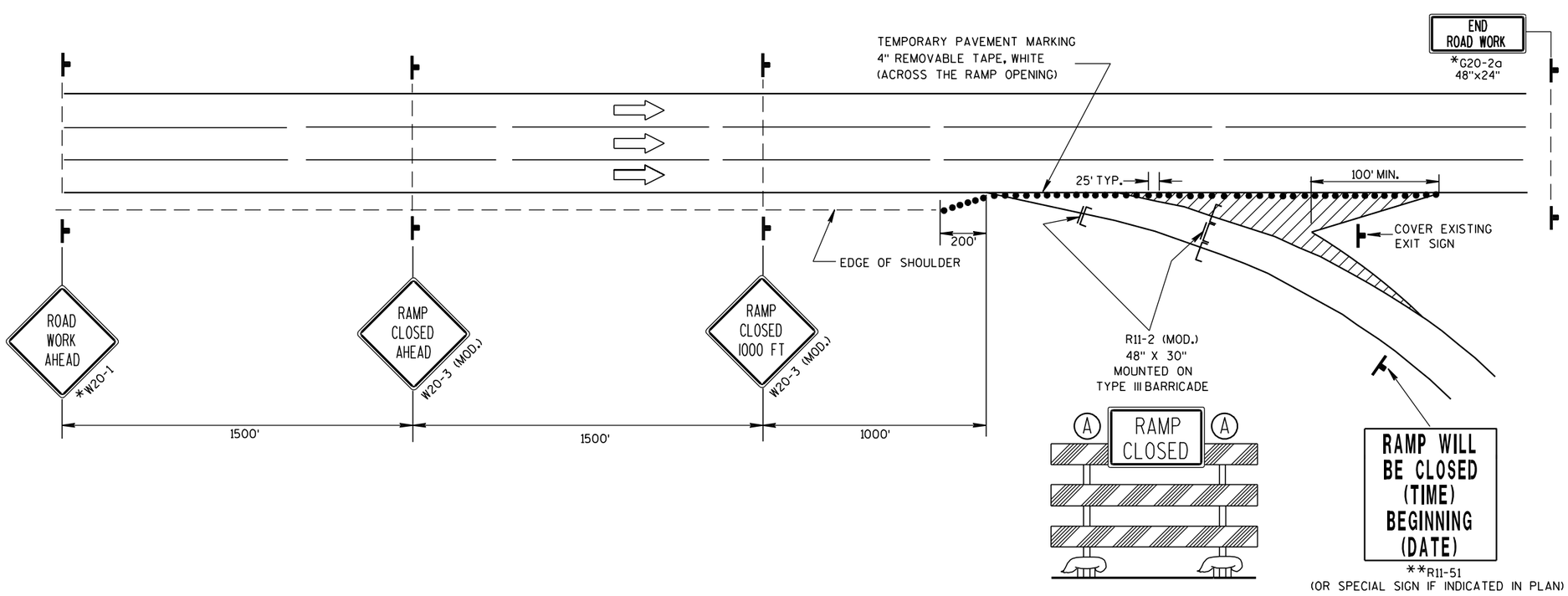
PLACE TEMPORARY PAVEMENT MARKING, REMOVABLE TAPE IF RAMP CLOSURE IS TO BE IN PLACE FOR 7 OR MORE CONTINUOUS DAYS AND NIGHTS.

WORK AREAS WITH A DROPOFF ALONG THE EDGE OF AN OPEN TRAVEL LANE SHALL BE LEVELED WITH TEMPORARY FILL WHEN THE CONTRACTOR IS NOT WORKING ADJACENT TO THE TRAVEL LANE. DRUMS SHALL BE PLACED ENTIRELY OUTSIDE THE TRAVEL LANE, ALLOWING THE FULL UNOBSTRUCTED LANE WIDTH, WHEN THE WORK IS NOT IN PROGRESS.

WHERE MEDIAN BARRIER IS IN PLACE, SIGNS SHOWN ON LEFT SIDE OF ROADWAY MAY BE OMITTED FOR RIGHT SIDE RAMP CLOSURES OF LESS THAN 12-HOUR DURATION.

*W20-1 AND G20-2A SIGNS ARE NOT REQUIRED IF THE RAMP CLOSURE IS WITHIN A LARGER WORK ZONE WHERE THESE SIGNS ARE ALREADY PRESENT.

**USE THE "RAMP WILL BE CLOSED" SIGN IF INDICATED IN MISCELLANEOUS QUANTITIES. PLACE 10 CALENDAR DAYS PRIOR TO CLOSURE OR AS DIRECTED BY THE ENGINEER. SEE WISCONSIN STANDARD SIGN PLATES FOR SIGN LAYOUT.



TRAFFIC CONTROL,
EXIT RAMP CLOSURE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

5/23/2000
DATE

/S/ Chester J. [illegible]
CHIEF SIGNS AND MARKINGS ENGINEER

FHWA

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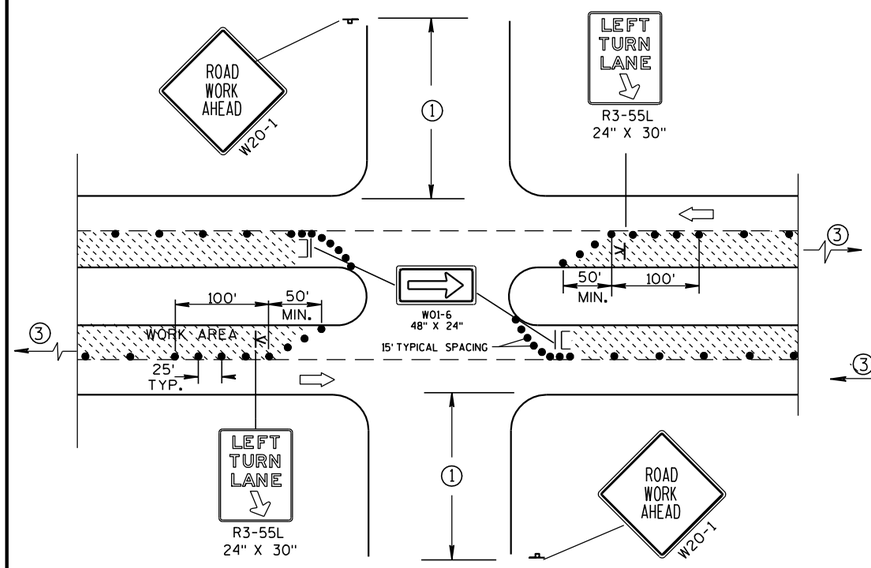
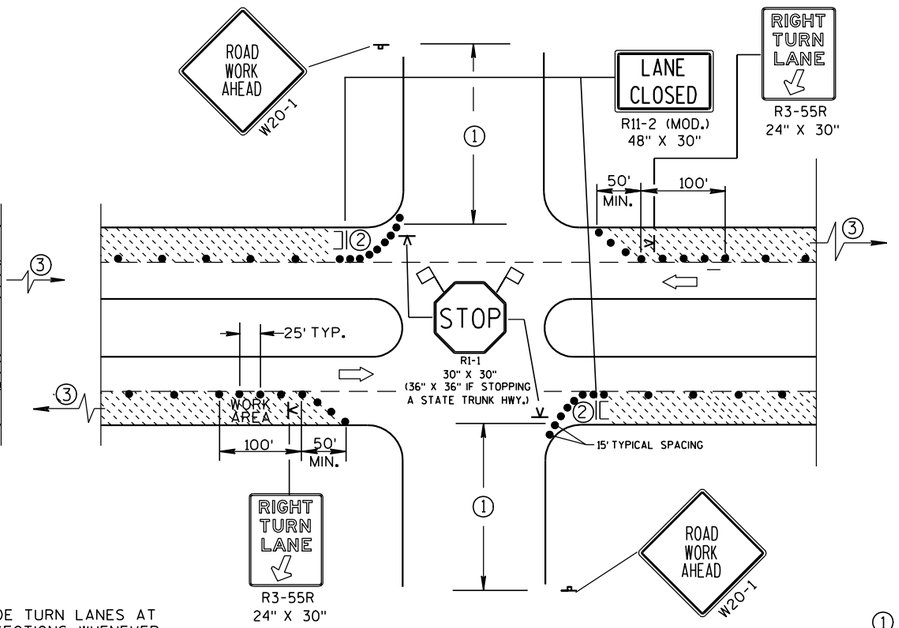
S.D.D. 15 D 16-1



DETAIL A

FOR LEFT LANE CLOSURE AT INTERSECTION OR MEDIAN OPENING

PROVIDE TURN LANES AT INTERSECTIONS WHENEVER STAGING OF WORK ALLOWS. TAPER AND TURN LANE LENGTHS BASED ON FIELD CONDITIONS AS APPROVED BY THE ENGINEER.



DETAIL B

FOR RIGHT LANE CLOSURE AT INTERSECTION

GENERAL NOTES

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

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

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 DISTRICT TRAFFIC UNIT.

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

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

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

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.

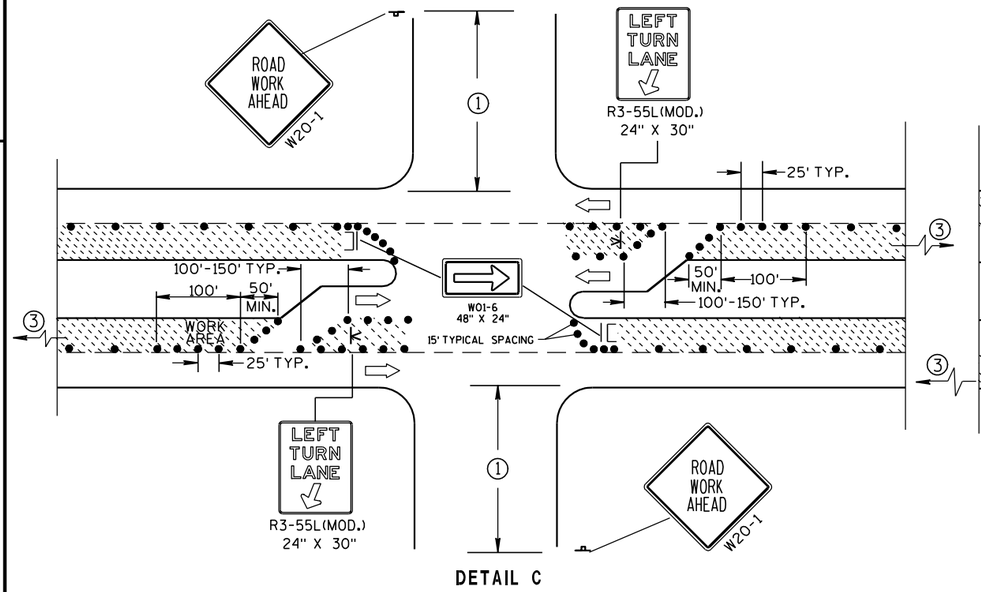
CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

BARRICADES IN A CLOSED LANE 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.

① 500' TYPICAL OR AT LAST INTERSECTION, WHICHEVER IS CLOSER.
350' IF 35-40 MPH.
200' IF 25-30 MPH.

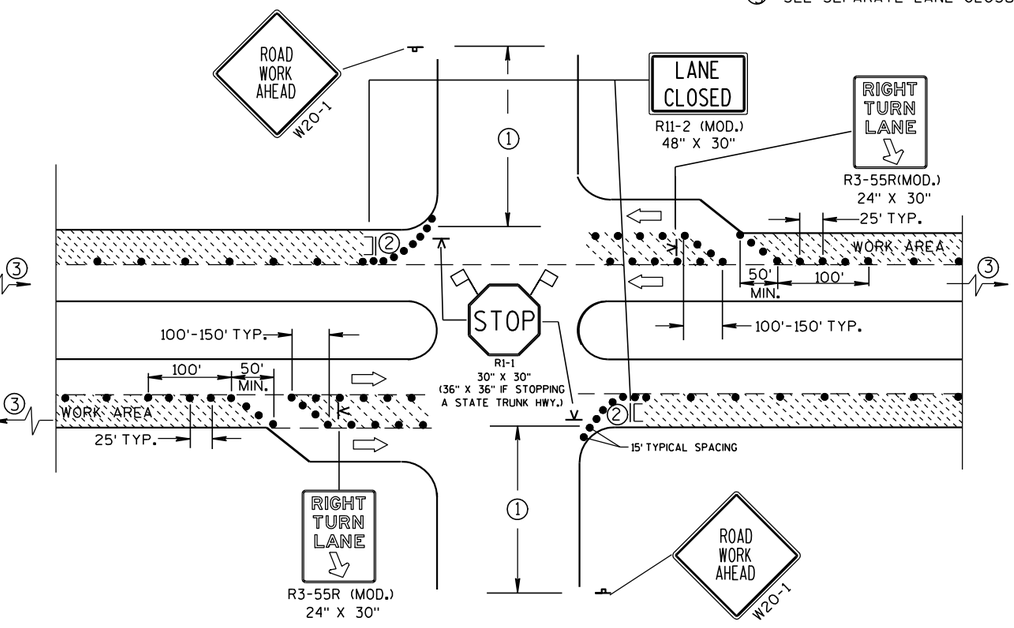
② ALSO USE BARRICADE AND 15' TYPICAL DRUM SPACING AT COMMERCIAL DRIVEWAYS.

③ SEE SEPARATE LANE CLOSURE DETAIL FOR ADDITIONAL TRAFFIC CONTROL.



DETAIL C

FOR LEFT LANE CLOSURE AT INTERSECTION OR MEDIAN OPENING (WITH LEFT TURN BAY OPEN)



DETAIL D

FOR RIGHT LANE CLOSURE AT INTERSECTION (WITH RIGHT TURN BAY OPEN)

LEGEND

- DRUM
- POST MOUNTED SIGN
- SIGN ON PORTABLE SUPPORT (5' MIN. MOUNTING HEIGHT)
- TYPE III BARRICADE (8' EQUIVALENT) AND WARNING LIGHT, TYPE A (FLASHING) WITH SIGN
- DIRECTION OF TRAFFIC FLOW
- FLAGS, 16" X 16" MIN., ORANGE

TRAFFIC CONTROL, INTERSECTION WITHIN SINGLE LANE CLOSURE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
5/23/00 DATE
/S/ Chester J. Spang
CHIEF SIGNS AND MARKINGS ENGINEER
FHWA

SYMBOLS

- TRAFFIC CONTROL DRUM
- POST MOUNTED SIGN
- DIRECTION OF TRAFFIC FLOW
- ARROW BOARD IN CAUTION MODE

GENERAL NOTES

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

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

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

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

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

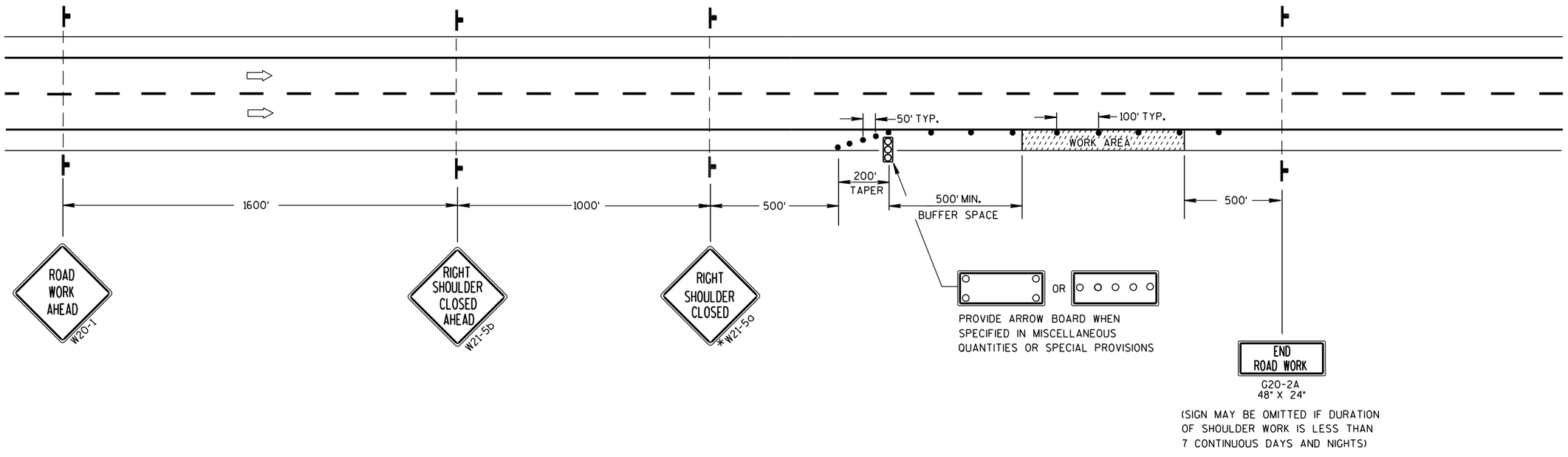
SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

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.

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

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

*FOR SHORT DURATION SHOULDER WORK OF LESS THAN ONE HOUR, THE W21-5a SIGN MAY BE OMITTED.



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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

5/23/00
DATE

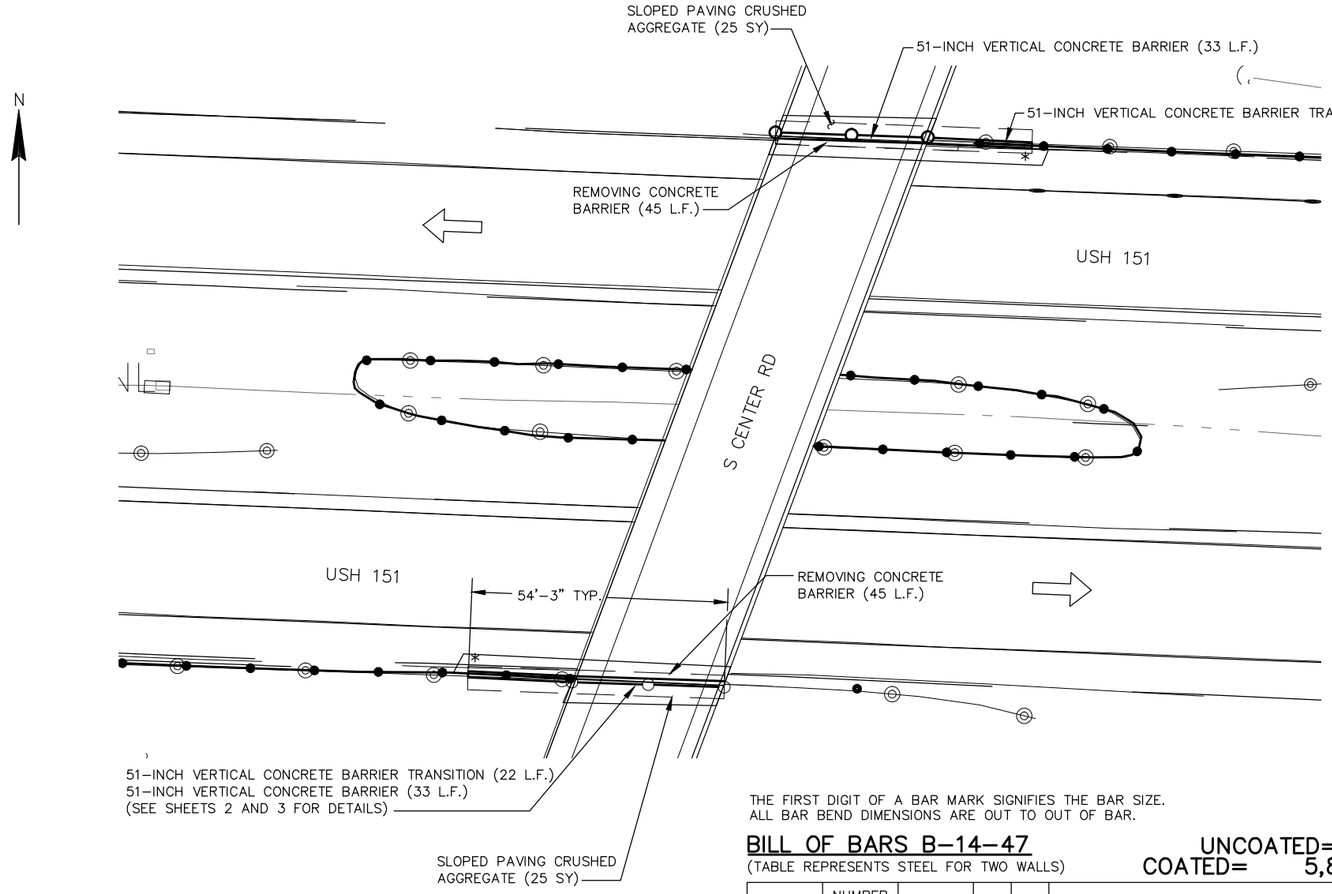
/S/ Chester J Sapas
CHIEF SIGNS AND MARKING ENGINEER

FHWA

6

S.D.D. 15 D 27-1

STATE PROJECT NUMBER
1111-06-71



*ANCHOR ASSEMBLY FOR STEEL PLATE BEAM GUARD. SEE ROAD PLAN FOR BEAM GUARD DETAILS.

ULTIMATE DESIGN STRESSES:

CONCRETE MASONRY, WALL ——— $f'c$ = 4,000 p.s.i.

HIGH-STRENGTH BAR STEEL REINFORCEMENT ——— fy = 60,000 p.s.i.

FOUNDATION DATA:

BARRIER WALL TO BE SUPPORTED BY 6" BASE AGGREGATE DENSE 1¼" AND 12" SELECT CRUSHED. 12" SELECT CRUSHED MATERIAL MAY BE ELIMINATED IF IT IS DETERMINED BY THE ENGINEER THAT THE EXISTING MATERIAL IS COMPACTED GRANULAR MATERIAL.

TRAFFIC DATA (USH 151)

A.A.D.T.(2010) ——— 22,156

A.A.D.T.(2030) ——— N/A

DESIGN SPEED ——— 70 M.P.H.

GENERAL NOTES

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

BARRIER AND FOOTING SHALL CONSIST OF CAST IN PLACE CONSTRUCTION. NO JOINTS SHALL BE ALLOWED IN THE BARRIER. CONSTRUCTION JOINTS WILL ONLY BE ALLOWED IN THE FOOTING AT LOCATIONS SHOWN ON THE PLAN VIEW, SEE SHEET 2.

DO NOT CUT OR DRILL INTO EXISTING COLUMN BAR STEEL.

ALL REINFORCEMENT SHALL BE EPOXY-COATED.

USE 2-INCH MINIMUM BAR CLEARANCE, EXCEPT AT FOOTINGS PROVIDE 3-INCH BAR CLEARANCE FROM BOTTOM OF FOOTING TO BOTTOM OF TRANSVERSE REINFORCEMENT.

PLACE REINFORCEMENT SUCH THAT IT WILL NOT CONFLICT WITH THE ANCHOR ASSEMBLY FOR THRIE BEAM ATTACHMENT.

PROVIDE ¾" BEVEL OR 1" RADIUS ON BARRIER EDGES, TOP AND ENDS.

EXISTING GROUND LINE SHALLL BE USED AS THE UPPER LIMITS OF EXCAVATION.

TOTAL ESTIMATED QUANTITIES

LOCATION	ITEM NO. 204.0157 REMOVING CONCRETE BARRIER	604.0500 SLOPE PAVING CRUSHED AGGREGATE	SPV.0090.02 51-INCH VERTICAL CONCRETE BARRIER	SPV.0090.03 51-INCH VERTICAL CONCRETE BARRIER TRANSITION	(NON-BID ITEM) FILLER
	L.F.	SY	L.F.	L.F.	SIZE
NB 22	45	25	33	22	---
SB 8	45	25	33	22	---
TOTALS	90	50	66	44	½"

THE FIRST DIGIT OF A BAR MARK SIGNIFIES THE BAR SIZE.
ALL BAR BEND DIMENSIONS ARE OUT TO OUT OF BAR.

BILL OF BARS B-14-47

(TABLE REPRESENTS STEEL FOR TWO WALLS)

UNCOATED= 0 LBS
COATED= 5,800 LBS

	MARK	NUMBER COATED	NUMBER UNCOATED	LENGTH	BENT	BAR SERIES	LOCATION	
	A401	8		25-8			TRANSITION - F.F.	HORIZ.
	A402	8		25-2			TRANSITION - B.F.	HORIZ.
	A403	4		21-10			TRANSITION - TOP	HORIZ.
	A404	2		17-3			TRANSITION - F.F.	HORIZ.
	A405	2		16-9			TRANSITION - B.F.	HORIZ.
	A406	2		6-3	X		TRANSITION - F.F.	HORIZ.
	A407	2		5-9	X		TRANSITION - B.F.	HORIZ.
	A408	24		11-11			BARRIER - F.F.	HORIZ.
	A409	24		10-11			BARRIER - B.F.	HORIZ.
◥	A610	60		3-2	X		MASONRY ANCHORS	HORIZ.
▲	A511	34		13-5	X	X	TRANSITION - STIRRUPS	VERT.
▲	A512	40		14-11	X	X	TRANSITION - STIRRUPS	VERT.
	A513	80		16-0	X		BARRIER - STIRRUPS	VERT.
	A514	154		4-8			TRANSVERSE STEEL IN FOOTING	HORIZ.
	A515	16		26-5			FOOTING TRANSITION	HORIZ.
	A516	12		25-2			FOOTING TRANSITION	HORIZ.
	A517	32		16-4			FOOTING BARRIER WALL	HORIZ.
	A518	24		10-11			FOOTING BARRIER WALL	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.

FOR BAR BEND DIAGRAMS, SEE "51" CONCRETE INTEGRAL BARRIER DETAILS"

F.F. = FRONT FACE
B.F. = BACK FACE

BAR SERIES TABLE

MARK	NUMBER	LENGTH
A511	2 SERIES OF 17	12-10 TO 14-0
A512	2 SERIES OF 20	14-0 TO 15-10

LIST OF DRAWINGS

1. GENERAL PLAN
2. 51" CONCRETE INTEGRAL BARRIER
3. 51" CONCRETE INTEGRAL BARRIER DETAILS

WISCONSIN
ALEX M. BROMLEY
E-37718
PRAIRIE DU SAC, WI
PROFESSIONAL ENGINEER
2-1-13

BRIDGE OFFICE CONTACT
BILL DREHER, P.E.
(608) 266-8489

CONSULTANT CONTACT
ALEX BROMLEY, P.E.
(608) 588-7866

NO.	DATE	REVISION	BY

WESTBROOK Associated Engineers, Inc.
619 EAST HOXIE STREET
P.O. BOX 429
SPRING GREEN, WI 53588
PHONE (608) 588-7866
FAX (608) 588-7954

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

ACCEPTED William C. Dreher KAR 05/06/13
CHIEF STRUCTURES DESIGN ENGINEER DATE

STRUCTURE B-14-47

SOUTH CENTER RD. OVER USH 151

COUNTY: DODGE
~~TOWN~~/CITY/~~VILLAGE~~: BEAVER DAM

DESIGN SPEC.: AASHTO LRFD DESIGN SPEC.

DESIGNED BY	DESIGN CK'D.	DRAWN BY	PLANS CK'D.
APC	AMB	APC	AMB

GENERAL PLAN

SHEET 1 OF 3

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8

8

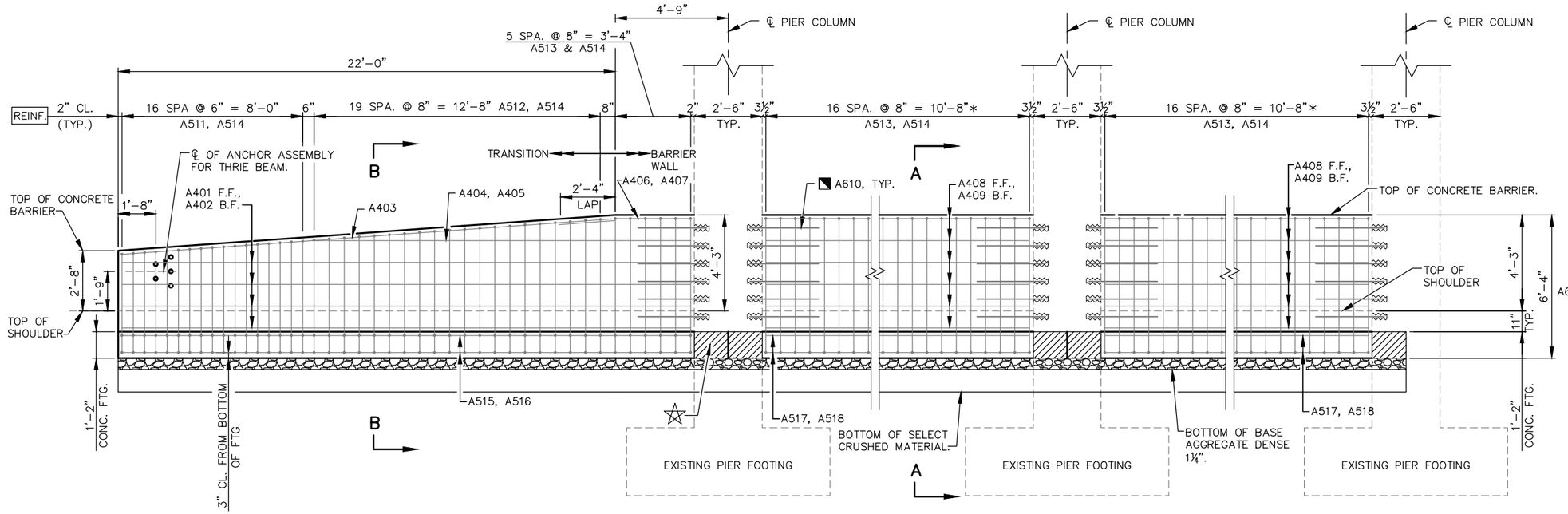
I.D. 1111-06-71

PLOT DATE: Feb 01, 2013

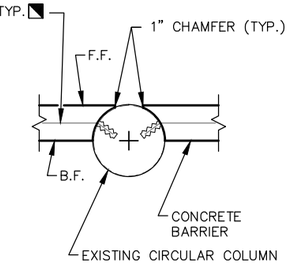
FILE: 12035_800_recover.dwg
PLOT SCALE: None

STATE PROJECT NUMBER

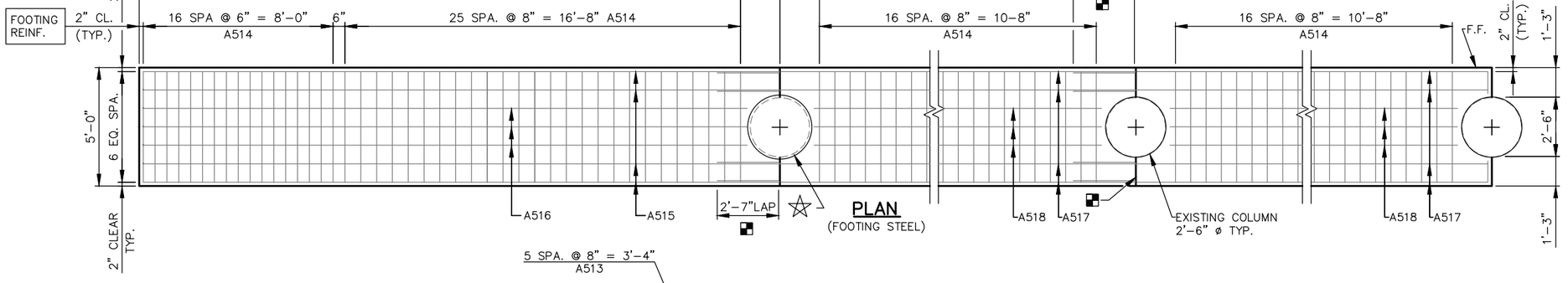
1111-06-71



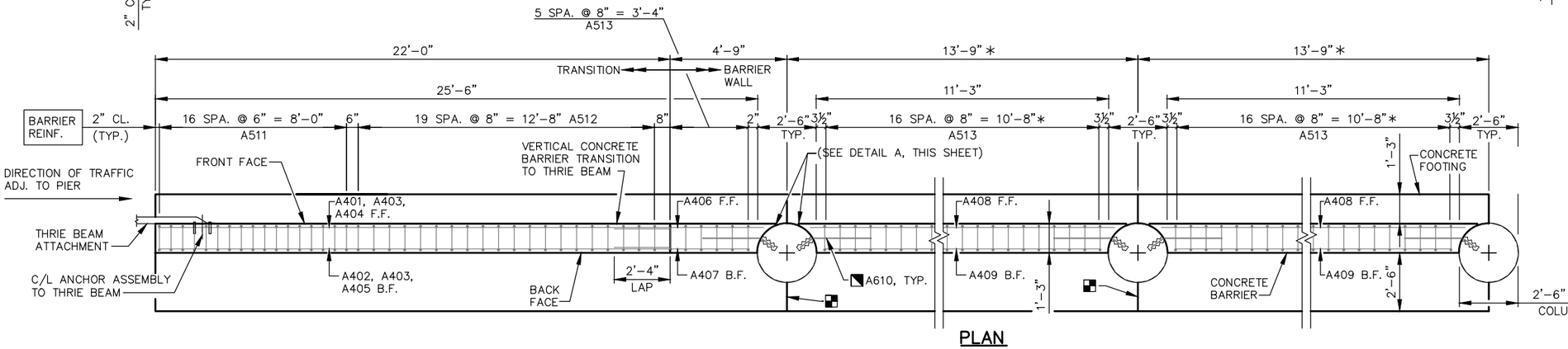
ELEVATION
(B.F. OF BARRIER)



DETAIL A
F.F. OF BARRIER IS FLUSH WITH FACE OF COLUMN



PLAN
(FOOTING STEEL)



PLAN
(CONCRETE BARRIER STEEL, FOOTING STEEL NOT SNOWN FOR CLARITY)

NOTE: 51-INCH BARRIER REFERS TO THE DISTANCE FROM THE TOP OF THE SHOULDER TO THE TOP OF THE BARRIER.

☆ PLACE ½" FILLER BETWEEN COLUMN AND CONCRETE FOOTING (TYP.)

◥ MASONRY ANCHORS, TYPE S ¾-INCH, #6 BARS, HAVING A MINIMUM PULLOUT CAPACITY OF 26 KIPS. EMBED A MINIMUM OF 8" INTO CONCRETE COLUMN.

◪ OPTIONAL CONSTRUCTION JOINTS IN FOOTINGS PLACED ALONG ℄ OF COLUMN, IF USED. LAP LONGITUDINAL REINFORCEMENT 2'-7" IN ADJACENT POUR.

* DIMENSIONS ACCORDING TO AS-BUILT; FIELD VERIFY.

F.F. = FRONT FACE
B.F. = BACK FACE

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-14-47

DRAWN BY APC | PLANS CK'D AMB

51" CONCRETE INTEGRAL BARRIER

SHEET 2 OF 3

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I.D. 1111-06-71

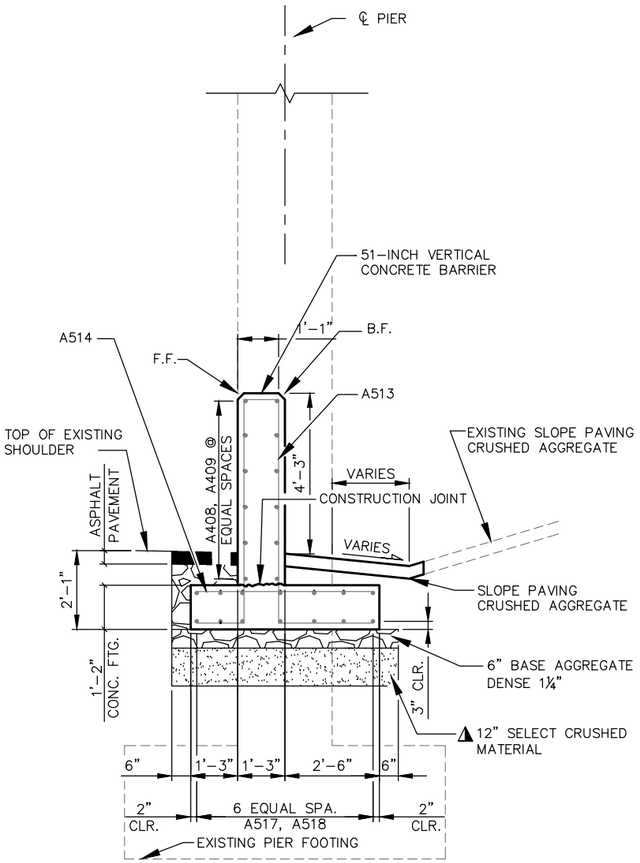
PLOT DATE: Feb 01, 2013

FILE: 12035_800_recover.dwg
PLOT SCALE: None

8

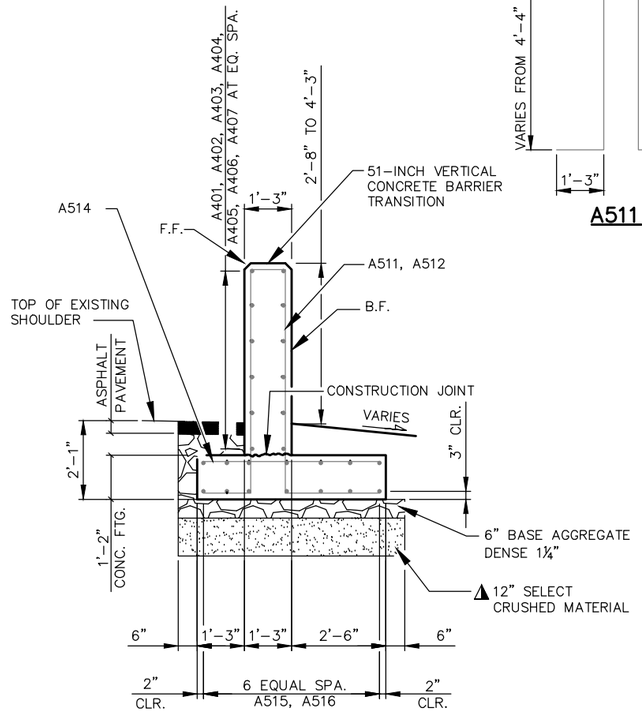
8

STATE PROJECT NUMBER
1111–06–71



SECTION A–A

SECTION THROUGH 51–INCH VERTICAL CONCRETE BARRIER IN BETWEEN COLUMNS.



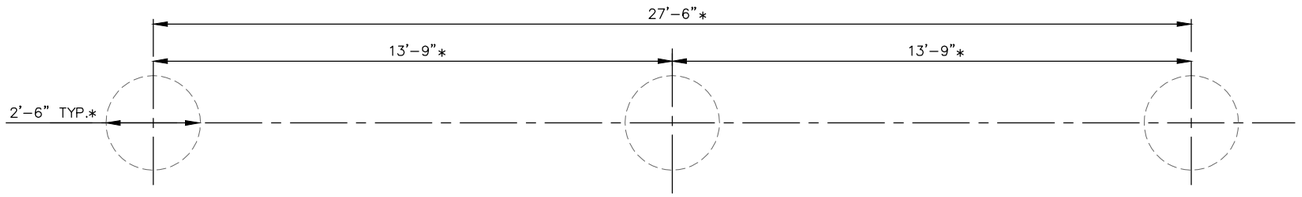
SECTION B–B

SECTION THROUGH 51–INCH VERTICAL CONCRETE BARRIER TRANSITION.

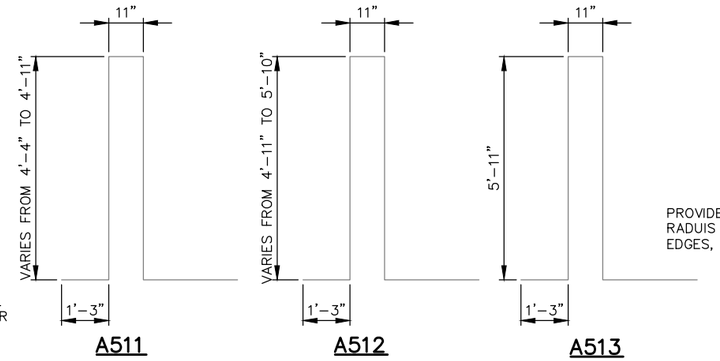
▲ 12" SELECT CRUSHED MATERIAL MAY BE ELIMINATED IF IT IS DETERMINED BY THE ENGINEER THAT THE EXISTING MATERIAL IS COMPACTED GRANULAR MATERIAL.

* DIMENSIONS ACCORDING TO AS–BUILTS; FIELD VERIFY.

F.F. = FRONT FACE
B.F. = BACK FACE

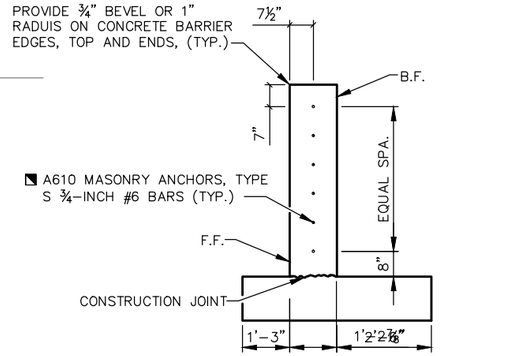


B–14–47 (S. CENTER RD.)



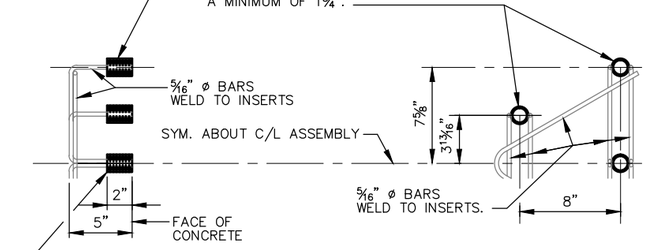
BAR BENDING DIAGRAMS

BAR DIMENSIONS ARE OUT TO OUT OF BAR.



MASONRY ANCHOR, TYPE S LAYOUT

▲ MASONRY ANCHORS, TYPE S ¾–INCH, #6 BARS, HAVING A MINIMUM PULLOUT CAPACITY OF 26 KIPS. EMBED A MINIMUM OF 8" INTO CONCRETE COLUMN.



DETAIL OF ANCHOR ASSEMBLY

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

ASSEMBLY SHALL BE INCIDENTAL TO 51–INCH VERTICAL CONCRETE BARRIER TRANSITION.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B–14–47

DRAWN BY APC | PLANS CK'D AMB

51" CONCRETE INTEGRAL BARRIER DETAILS

SHEET 3 OF 3

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8

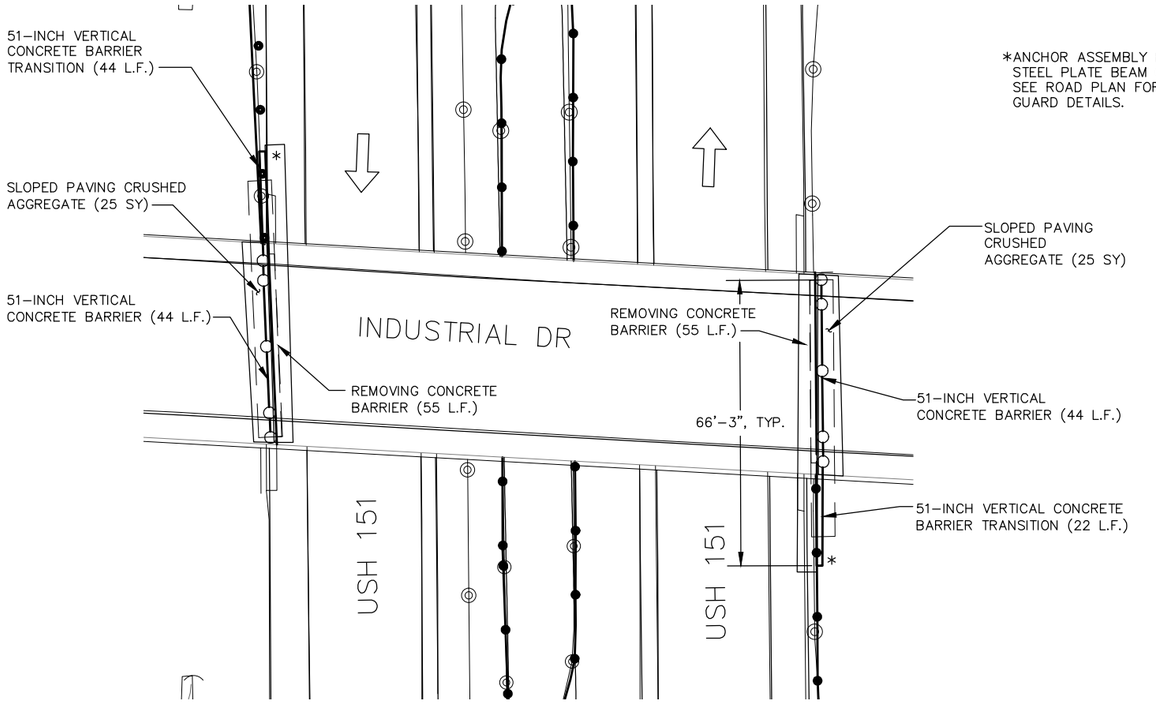
8

FILE: 12035_800_recover.dwg
PLOT SCALE: None

I.D. 1111–06–71

PLOT DATE: Feb 01, 2013

STATE PROJECT NUMBER
1111–06–71



PLAN

51–INCH VERTICAL CONCRETE BARRIERS AND TRANSITIONS.

ULTIMATE DESIGN STRESSES:

CONCRETE MASONRY, WALL —— $f'c$ = 4,000 p.s.i.

HIGH–STRENGTH BAR STEEL REINFORCEMENT —— fy = 60,000 p.s.i.

FOUNDATION DATA:

BARRIER WALL TO BE SUPPORTED BY 6" BASE AGGREGATE DENSE 1¼" AND 12" SELECT CRUSHED. 12" SELECT CRUSHED MATERIAL MAY BE ELIMINATED IF IT IS DETERMINED BY THE ENGINEER THAT THE EXISTING MATERIAL IS COMPACTED GRANULAR MATERIAL.

TRAFFIC DATA (USH 151)

A.A.D.T.(2010)	22,156
A.A.D.T.(2030)	N/A
DESIGN SPEED	70 M.P.H.

GENERAL NOTES

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

BARRIER AND FOOTING SHALL CONSIST OF CAST IN PLACE CONSTRUCTION. NO JOINTS SHALL BE ALLOWED IN THE BARRIER. CONSTRUCTION JOINTS WILL ONLY BE ALLOWED IN THE FOOTING AT LOCATIONS SHOWN ON THE PLAN VIEW, SEE SHEET 2.

DO NOT CUT OR DRILL INTO EXISTING COLUMN BAR STEEL.

ALL REINFORCEMENT SHALL BE EPOXY–COATED.

USE 2–INCH MINIMUM BAR CLEARANCE, EXCEPT AT FOOTINGS PROVIDE 3–INCH BAR CLEARANCE FROM BOTTOM OF FOOTING TO BOTTOM OF TRANSVERSE REINFORCEMENT.

PLACE REINFORCEMENT SUCH THAT IT WILL NOT CONFLICT WITH THE ANCHOR ASSEMBLY FOR THRIE BEAM ATTACHMENT.

PROVIDE ¾" BEVEL OR 1" RADIUS ON BARRIER EDGES, TOP AND ENDS.

EXISTING GROUND LINE SHALL BE USED AS THE UPPER LIMITS OF EXCAVATION.

THE FIRST DIGIT OF A BAR MARK SIGNIFIES THE BAR SIZE.
ALL BAR BEND DIMENSIONS ARE OUT TO OUT OF BAR.

BILL OF BARS B–14–56

(TABLE REPRESENTS STEEL FOR TWO WALLS)

UNCOATED= 0 LBS
COATED= 6,940 LBS

MARK	NUMBER COATED	NUMBER UNCOATED	LENGTH	BENT	BAR SERIES	LOCATION	
A401	8		25–8			TRANSITION – F.F.	HORIZ.
A402	8		25–2			TRANSITION – B.F.	HORIZ.
A403	4		21–10			TRANSITION – TOP	HORIZ.
A404	2		17–3			TRANSITION – F.F.	HORIZ.
A405	2		16–9			TRANSITION – B.F.	HORIZ.
A406	2		6–3	X		TRANSITION – F.F.	HORIZ.
A407	2		5–9	X		TRANSITION – B.F.	HORIZ.
A610	108		3–2	X		MASONRY ANCHORS	HORIZ.
▲A511	34		13–5	X	X	TRANSITION – STIRRUPS	VERT.
▲A512	40		15–11	X	X	TRANSITION – STIRRUPS	VERT.
A513	100		16–0	X		TRANSITION – STIRRUPS	VERT.
A514	174		4–8			TRANSVERSE STEEL IN FOOTING	HORIZ.
A515	16		26–7			FOOTING TRANSITION	HORIZ.
A516	12		25–2			FOOTING TRANSITION	HORIZ.
A421	24		3–3			BARRIER – F.F.	HORIZ.
A422	24		2–2			BARRIER – B.F.	HORIZ.
A423	24		12–6			BARRIER – F.F.	HORIZ.
A424	24		11–0			BARRIER – B.F.	HORIZ.
A525	32		7–10			FOOTING BARRIER WALL	HORIZ.
A526	24		2–5			FOOTING BARRIER WALL	HORIZ.
A527	32		16–7			FOOTING BARRIER WALL	HORIZ.
A528	24		11–2			FOOTING BARRIER WALL	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.

FOR BAR BEND DIAGRAMS, SEE "51" CONCRETE INTEGRAL BARRIER DETAILS."

F.F. = FRONT FACE
B.F. = BACK FACE

TOTAL ESTIMATED QUANTITIES

LOCATION	ITEM NO. 204.0157	604.0500	SPV.0090.02	SPV.0090.03	(NON–BID ITEM)
	REMOVING CONCRETE BARRIER	SLOPE PAVING CRUSHED AGGREGATE	51–INCH VERTICAL CONCRETE BARRIER	51–INCH VERTICAL CONCRETE BARRIER TRANSITION	FILLER
	L.F.	SY	L.F.	L.F.	SIZE
NB 26	55	25	44	22	–––
SB 7	55	25	44	22	–––
TOTALS	110	50	88	44	½"

LIST OF DRAWINGS

1. GENERAL PLAN
2. 51" CONCRETE INTEGRAL BARRIER
3. 51" CONCRETE INTEGRAL BARRIER DETAILS

BAR SERIES TABLE

MARK	NUMBER	LENGTH
A511	2 SERIES OF 17	13–2 TO 14–4
A512	2 SERIES OF 20	14–4 TO 16–4

WISCONSIN
ALEX M. BROMLEY
E-37718
PRAIRIE DU SAC, WI
PROFESSIONAL ENGINEER
2-1-13

BRIDGE OFFICE CONTACT
BILL DREHER, P.E.
(608) 266–8489

CONSULTANT CONTACT
ALEX BROMLEY, P.E.
(608) 588–7866

NO.	DATE	REVISION	BY

WESTBROOK Associated Engineers, Inc.
619 EAST HOXIE STREET
P.O. BOX 429
SPRING GREEN, WI 53588
PHONE (608) 588–7866
FAX (608) 588–7954

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

ACCEPTED William C. Duchac KAR 05/06/13
CHIEF STRUCTURES DESIGN ENGINEER DATE

STRUCTURE B–14–56

INDUSTRIAL DR. OVER USH 151

COUNTY	~~TOWN~~/CITY/~~VILLAGE~~
DODGE	BEAVER DAM

DESIGN SPEC.
AASHTO LRFD DESIGN SPEC.

DESIGNED BY	DESIGN CK'D.	DRAWN BY	PLANS CK'D.
APC	AMB	APC	AMB

GENERAL PLAN

SHEET 1 OF 3

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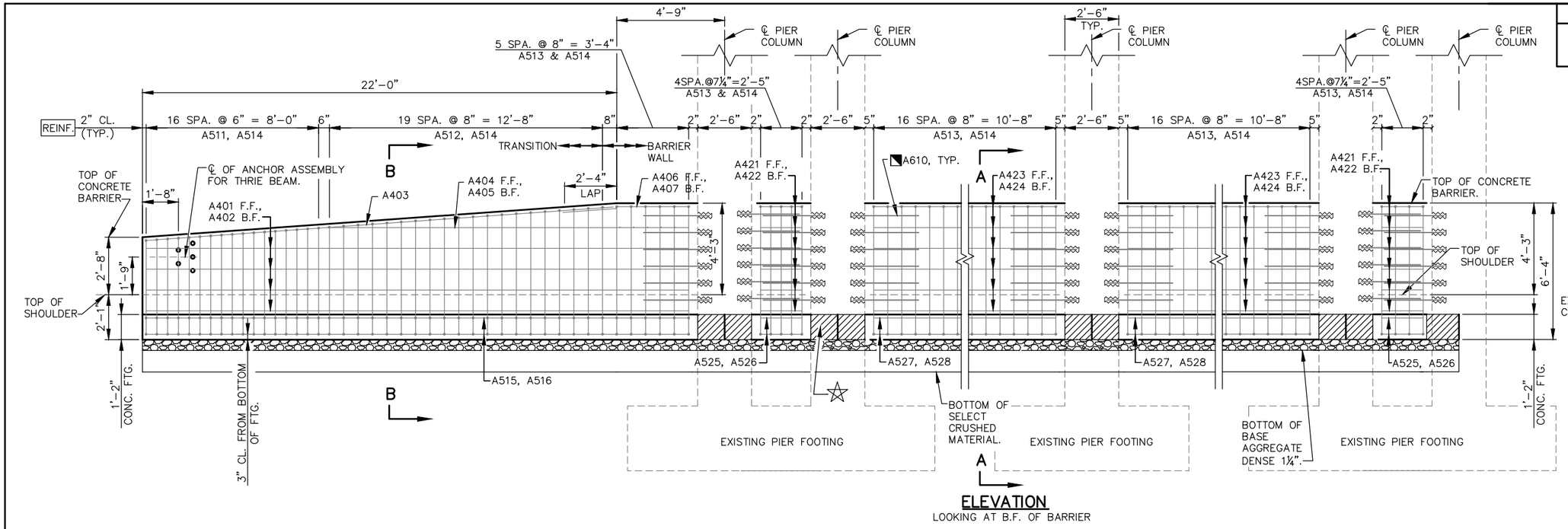
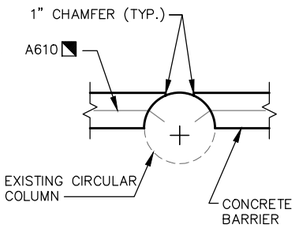
FILE: 12035_800_recover.dwg
PLOT SCALE: None

STATE PROJECT NUMBER
1111-06-71

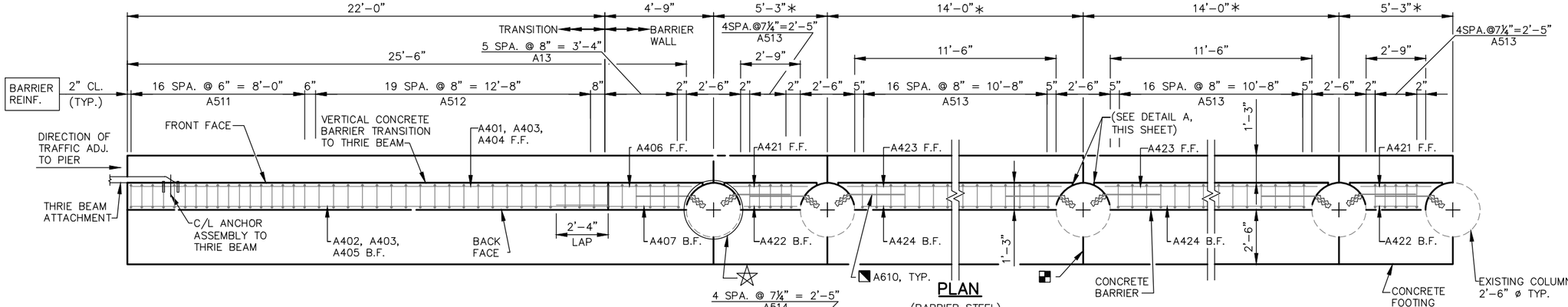


ELEVATION
LOOKING AT B.F. OF BARRIER

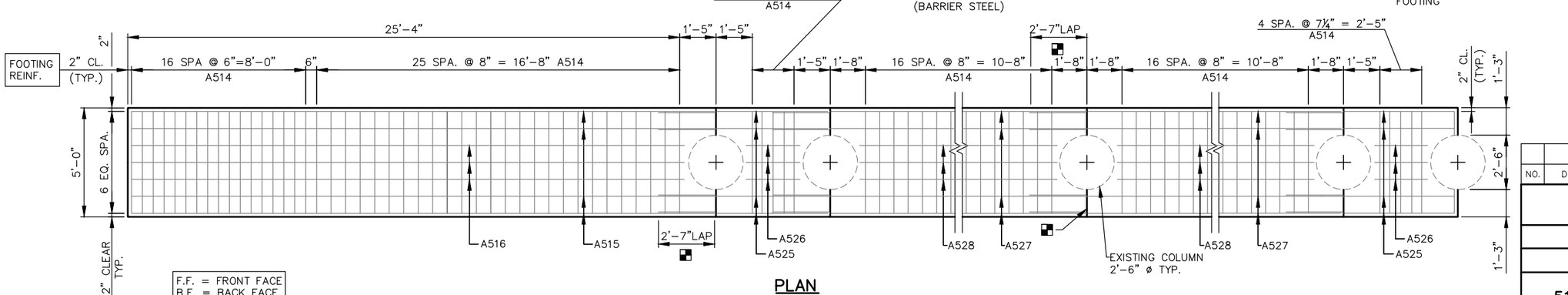


DETAIL A
F.F. OF BARRIER IS FLUSH WITH FACE OF COLUMN

NOTE: 51-INCH BARRIER REFERS TO THE DISTANCE FROM THE TOP OF THE SHOULDER TO THE TOP OF THE BARRIER.



PLAN
(BARRIER STEEL)



F.F. = FRONT FACE
B.F. = BACK FACE

PLAN
(FOOTING STEEL, FOOTING STEEL NOT SHOWN FOR CLARITY)

★ PLACE ½" FILLER BETWEEN COLUMN AND CONCRETE FOOTING (TYP.)

◥ MASONRY ANCHORS, TYPE S ¾", #6 BARS, HAVING A MINIMUM PULLOUT CAPACITY OF 26 KIPS. EMBED A MINIMUM OF 8" INTO CONCRETE COLUMN.

◪ OPTIONAL CONSTRUCTION JOINTS IN FOOTINGS PLACED ALONG ℄ OF COLUMN, IF USED. LAP LONGITUDINAL REINFORCEMENT 2'-7" IN ADJACENT POUR.

* DIMENSIONS ACCORDING TO AS-BUILT; FIELD VERIFY.

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-14-56

DRAWN BY APC | PLANS CK'D AMB

51" CONCRETE INTEGRAL BARRIER

SHEET 2 OF 3

85

I.D. 1111-06-71

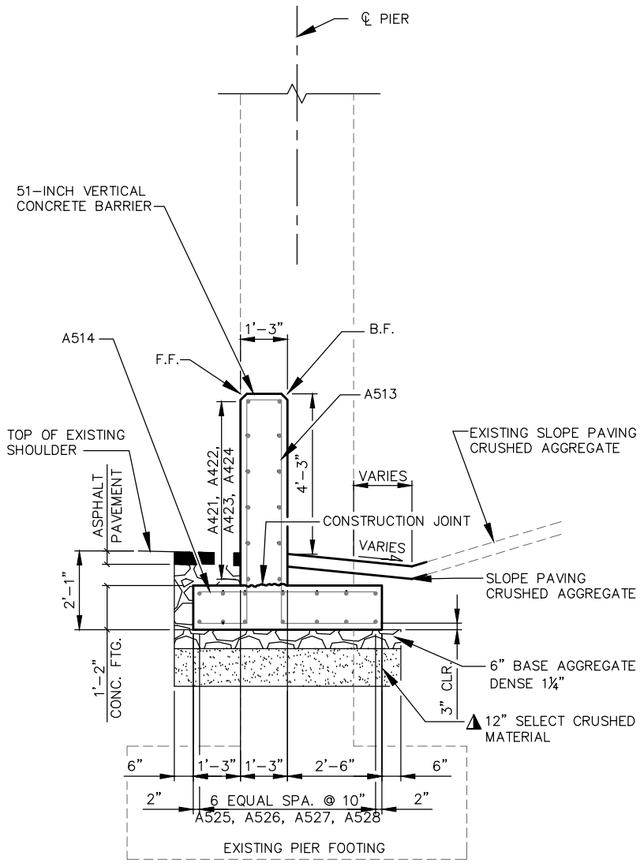
PLOT DATE: Feb 01, 2013

FILE: 12035_800_recover.dwg
PLOT SCALE: None

8

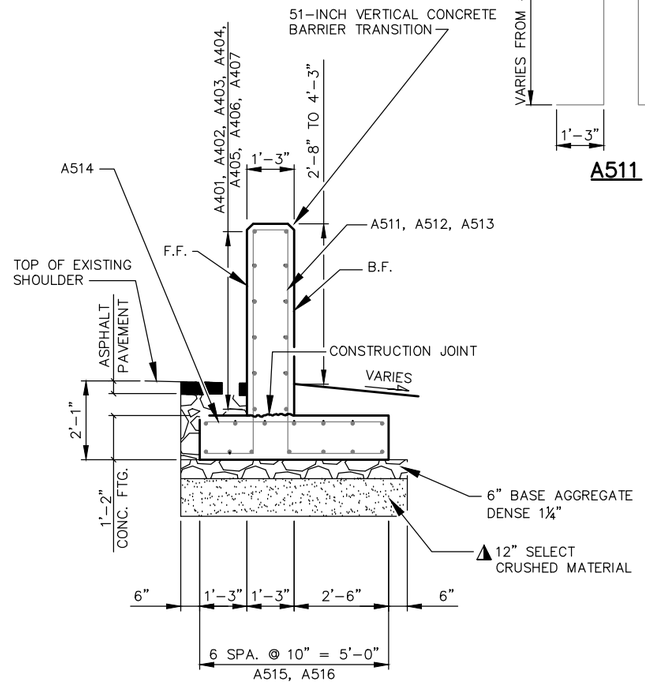
8

STATE PROJECT NUMBER
1111–06–71



SECTION A–A

SECTION THROUGH 51–INCH VERTICAL CONCRETE BARRIER IN BETWEEN COLUMNS.

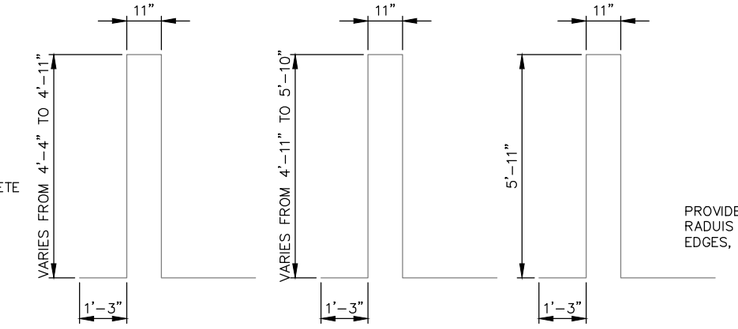


SECTION B–B

SECTYION THROUGH 51–INCH VERTICAL CONCRETE BARRIER TRANSITION.

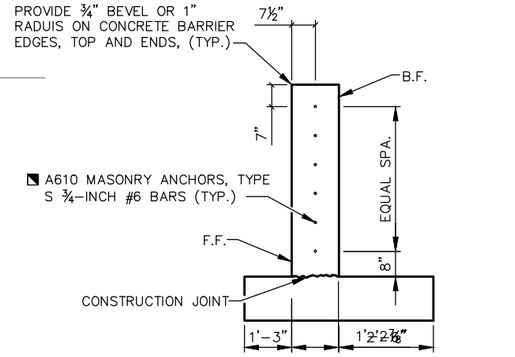
⚠ 12" SELECT CRUSHED MATERIAL MAY BE ELIMINATE IF IT IS DETERMINED BY THE ENGINEER THAT THE EXISTING MATERIAL IS COMPACTED GRANULAR MATERIAL.

* DIMENSIONS ACCORDING TO AS–BUILTS; FIELD VERIFY.



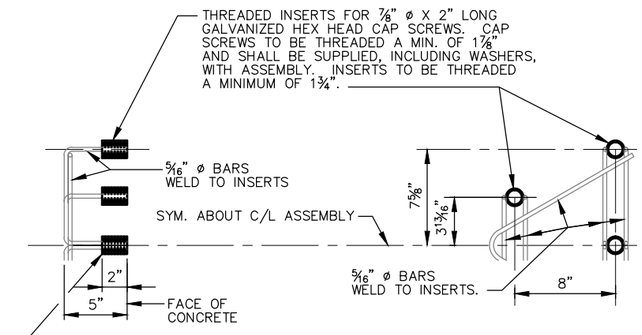
BAR BENDING DIAGRAMS

BAR DIMENSIONS ARE OUT TO OUT OF BAR.



MASONRY ANCHOR, TYPE S LAYOUT

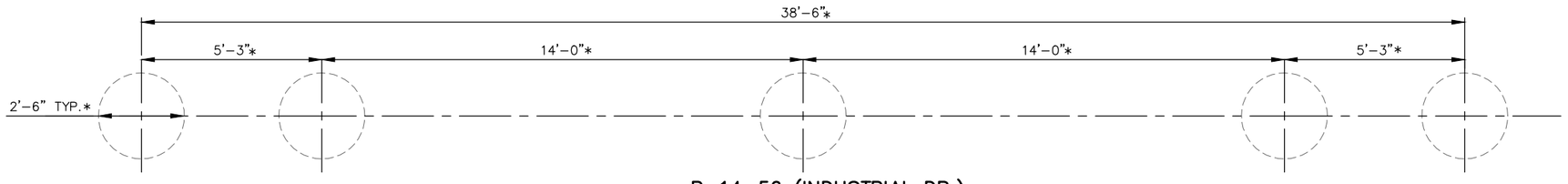
⬔ MASONRY ANCHORS, TYPE S ¾–INCH, #6 BARS, HAVING A MINIMUM PULLOUT CAPACITY OF 26 KIPS. EMBED A MINIMUM OF 8" INTO CONCRETE COLUMN.



DETAIL OF ANCHOR ASSEMBLY

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

ASSEMBLY SHALL BE INCIDENTAL TO 51–INCH VERTICAL CONCRETE BARRIER TRANSITION.



B–14–56 (INDUSTRIAL DR.) DETAIL B

F.F. = FRONT FACE
B.F. = BACK FACE

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B–14–56

DRAWN BY APC | PLANS CK'D AMB

51" CONCRETE INTEGRAL BARRIER DETAILS

SHEET 3 OF 3

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I.D. 1111–06–71

PLOT DATE: Feb 01, 2013

FILE: 12035_800_recover.dwg
PLOT SCALE: None

8

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Notes

Wisconsin Department of Transportation

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