

Wisconsin Department of Transportation

January 9, 2017

Division of Transportation Systems Development

Bureau of Project Development
4802 Sheboygan Avenue, Rm 601
P O Box 7916
Madison, WI 53707-7916

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Facsimile (FAX): (608) 266-8459

NOTICE TO ALL CONTRACTORS:

Proposal: #07: 3766-00-70, WISC 2017 006
CTH E
Bridge over Pike River (B-30-0137)
CTH E
Kenosha County

Letting of January 10, 2017

This is Addendum No. 02, which provides for the following:

Plan Sheets

Added Plan Sheets – SDD's	
Plan Sheet	Plan Sheet Title (brief description of changes to sheet)
29A	INLET COVERS TYPE A, H, A-S, H-S & Z
29B	CATCH BASINS 3-FT, 4-FT, 5-FT AND 6-FT DIAMETER
29C	CATCH BASINS 2X3-FT AND 2.5X3-FT
29D	CONCRETE CURB, CONCRETE CURB AND GUTTER AND TIES
29E	SILT FENCE
29F	INLET PROTECTION TYPE A, B, C AND D
29G	TURBIDITY BARRIER
29H	APRON ENDWALLS FOR CULVERT PIPE
29I	JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL
29J	NAME PLATE (STRUCTURES)
29K	CONCRETE PAVEMENT APPROACH SLAB
29L	STRUCTURAL APPROACH SLAB AND CONCRETE PAVEMENT APPROACH SLAB
29M	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
29N	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
29O	STEEL PLATE BEAM GUARD, CLASS "A", INSTALLATION & ELEMENTS
29P	ANCHORAGE FOR STEEL PLATE BEAM GUARD TYPE 2
29Q	STEEL PLATE BEAM GUARD, CLASS "A" (AT BRIDGES, OBSTACLES AND SIDEROADS/DRIVEWAYS)
29R	STEEL THRIE BEAM STRUCTURE APPROACH
29S	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO SQUARE END PARAPETS
29T	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO VERTICAL FACED PARAPETS
29U	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO SLOPED END PARAPETS

29V	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO BRIDGE RAILING TYPES "F" AND "W"
29W	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO BRIDGE RAILING TYPE "M"
29X	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTOR PLATE DETAIL
29Y	STEEL THRIE BEAM STRUCTURE APPROACH, SINGLE SLOPE ATTACHMENT
29Z	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
29AA	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
29AB	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
29AC	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
29AD	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
29AE	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
29AF	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
29AG	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
29AH	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
29AI	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
29AJ	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
29AK	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AL	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AM	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AN	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AO	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AP	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AQ	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AR	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AS	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AT	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AU	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AV	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
29AW	PAVEMENT MARKING FOR BIKE LANES
29AX	SIGNING AND MARKING FOR TWO LANE TO FOUR LANE DIVIDED TRANSITIONS
29AY	BICYCLE LANE MARKING
29AZ	BICYCLE LANE MARKING
29BA	PAVEMENT MARKING FOR BIKE LANES
29BB	BICYCLE LANE MARKING

Plan Sheets

The following 8 ½ x 11-inch sheets are attached and made part of the plans for this proposal:

Added: 29A – 29BB

The responsibility for notifying potential subcontractors and suppliers of these changes remains with the prime contractor.

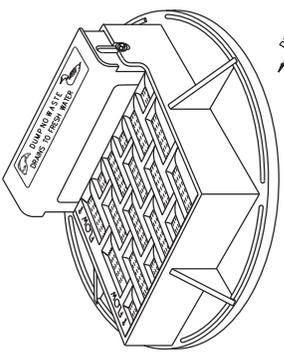
Sincerely,

Mike Coleman

Proposal Development Specialist
Proposal Management Section

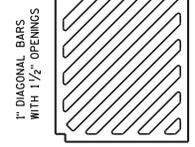
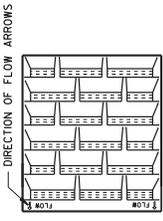
END OF ADDENDUM

GENERAL NOTES
 DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.
 DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR CATCH BASIN, MANHOLE AND INLET COVERS SHALL SUBMITTED TO THE ENGINEER FOR APPROVAL. PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH. ROUND FRAMES AND COVERS SHALL HAVE CONTINUOUSLY MACHINED BEARING SURFACES TO PREVENT ROCKING AND RATTLING.

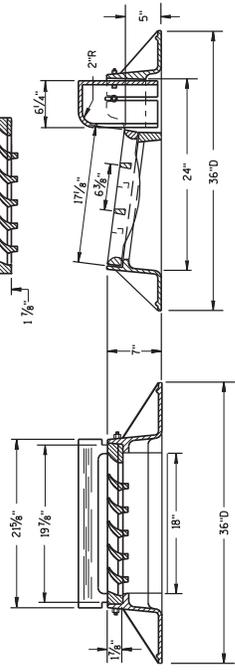


NOTE: CURB BOX ADJUSTABLE 4" TO 9"
 DIRECTION OF FLOW

NOTE: GRATE IS REVERSIBLE.

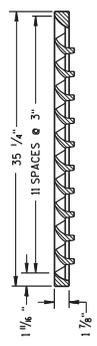
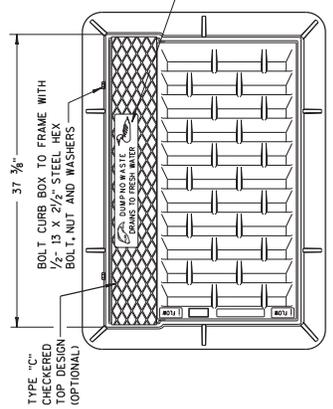


SPECIAL GRATE FOR TYPE "A" COVER
 (MEASURES 19 3/4" X 17" X 1 7/8")
 (NOTED AS TYPE A-S ON DRAINAGE TABLE)

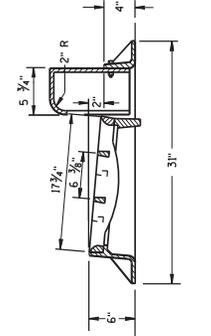
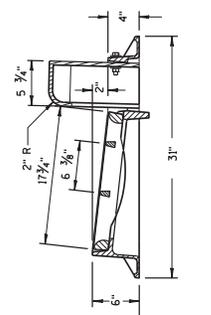


TYPE "A"

NOTE: GRATE IS REVERSIBLE.

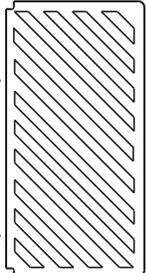


NOTE: CURB BOX HEIGHT ADJUSTABLE 6" TO 9"
 DIRECTION OF FLOW

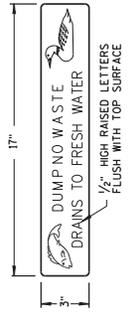


TYPE "H"
 NOTE: EITHER CASTING IS ACCEPTABLE

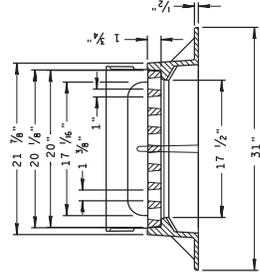
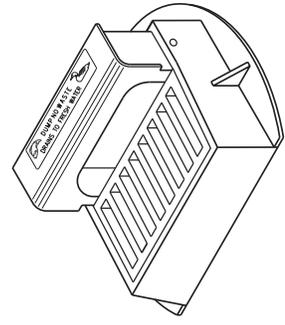
NOTE: EITHER CASTING IS ACCEPTABLE



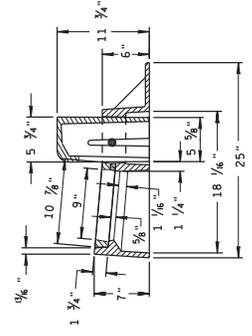
SPECIAL GRATE FOR TYPE "H" COVER
 (MEASURES 35 1/4" X 17 3/4" X 2")
 (NOTED AS TYPE H-S ON DRAINAGE TABLE)



LOGO DETAIL



TYPE "Z"



INLET COVERS TYPE A, H, A-S, H-S & Z	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED	DATE
/s/ Jerry H. Zoog	11-27-15
ROADWAY STANDARDS DEVELOPMENT ENGINEER	
FHWA	

Addendum No. 02
 ID 3766-00-70
 Added Sheet 29A
 January 9, 2017

Addendum No. 02
 ID 3766-00-70
 Added Sheet 29B
 January 9, 2017

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, UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE ENGINEER. THE CONTRACTOR SHALL NOT ORDER AND DELIVER PRECAST CATCH BASIN UNITS REQUIRED FOR THE PROJECT UNTIL A LIST OF SIZES IS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ALL DRAINAGE STRUCTURES ARE DESIGNATED ON THE PLANS AS "MANHOLES 3X3-1", "CATCH BASINS 4'-8", "INLETS 2X3-4", ETC. THE FIRST NUMBERS DESIGNATE THE SIZE OF THE STRUCTURE, AND THE FOLLOWING LETTER DESIGNATES THE TYPE OF COVER TO BE USED TO COMPRISE THE COMPLETE UNIT.

BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS OF GRANULAR BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

PRECAST REINFORCED CONCRETE CONE TOPS (ECCENTRIC OR CONCENTRIC) OR PRECAST REINFORCED CONCRETE FLAT SLAB TOPS MAY BE USED ON CONCRETE BLOCK STRUCTURES. THE TOPS SHALL BE INSTALLED ON A BED OF MORTAR.

ECCENTRIC CONE TOPS MAY BE USED ON ALL STRUCTURES, AND CONCENTRIC CONE TOPS SHALL BE USED ONLY ON STRUCTURES 5 FEET OR LESS IN DEPTH, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

STEPS MEETING AASHTO M199 AND THE FOLLOWING REQUIREMENTS SHALL BE INSTALLED IN ALL STRUCTURES OVER 5 FEET IN DEPTH; 16 INCH C-C MAXIMUM SPACING; PROJECT A MINIMUM CLEAR DISTANCE OF 4 INCHES FROM THE WALL AT THE POINT OF EMBEDMENT; MINIMUM LENGTH OF 10 INCHES; MINIMUM WALL EMBEDMENT OF 3 INCHES; FERROUS METAL STEPS NOT PAINTED OR TREATED TO RESIST CORROSION SHALL HAVE A MINIMUM CROSS SECTIONAL DIMENSION OF 1 INCH.

STEPS OF APPROVED POLYPROPYLENE PLASTIC COATED REINFORCEMENT BAR ARE ACCEPTABLE. REINFORCING BAR MUST BE A MINIMUM OF 1/2 INCH AND MEET THE REQUIREMENTS OF ASTM A615. CERTIFICATION SHALL BE PROVIDED THAT INSTALLED STEPS WHEN TESTED IN ACCORDANCE WITH SECTION 10 OF AASHTO T280 CAN WITHSTAND A VERTICAL LOAD OF 800 LBS. AND A HORIZONTAL LOAD OF 400 LBS.

ALL BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED. ALL PRECAST INLET UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF AASHTO DESIGNATION M199.

PRECAST REINFORCED RISERS SHALL HAVE A TONGUE AND GROOVE JOINT WITH TONGUE UP OR DOWN. CONCRETE BLOCK WILL NOT BE PERMITTED FOR STRUCTURES GREATER THAN 4 FEET IN DIAMETER.

4" OVERHANGING BASES ARE REQUIRED FOR ALL CONCRETE BLOCK INSTALLATIONS. 4" OVERHANG IS REQUIRED WHEN SEPARATE PRECAST BASE IS PROVIDED. OVERHANG IS NOT REQUIRED ON PRECAST STRUCTURES WITH AN INTEGRAL OR MONOLITHIC BASE.

FOR ADDITIONAL CONFIGURATIONS, MAINTAIN A MINIMUM OF 12 INCHES AS MEASURED FROM THE INSIDE OF THE STRUCTURE WALL BETWEEN THE OUTSIDE PIPE WALLS OF ADJACENT PIPES; SEE DETAIL "C".

- MINIMUM WALL THICKNESS SHALL BE 4 INCHES FOR 3-FT, 5 INCHES FOR 4-FT, 6 INCHES FOR 5-FT AND 7 INCHES FOR 6-FT DIAMETER PRECAST CATCH BASINS.
- FOR PRECAST CATCH BASINS PROVIDE REINFORCING STEEL IN ACCORDANCE TO AASHTO M199.
- PRECAST FLAT SLAB TOPS AND BASES WITH A DIAMETER OF 48" AND LESS SHALL HAVE A MINIMUM THICKNESS OF 6". PRECAST FLAT SLAB TOPS AND BASES WITH A DIAMETER LARGER THAN 48" SHALL HAVE A MINIMUM THICKNESS OF 8".
- 1" CONCRETE KEY POURED AFTER INSTALLATION, 2" SLUMP MEASURED FROM TOP OF KEY.

CATCH BASIN COVER OPENING MATRIX

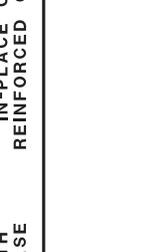
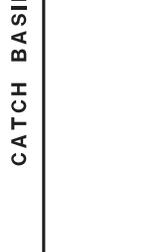
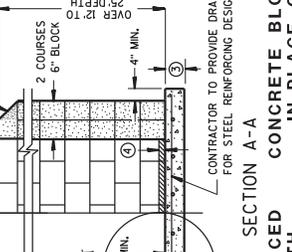
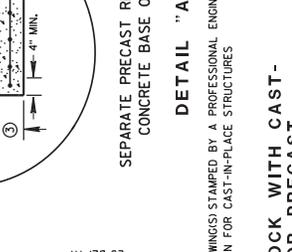
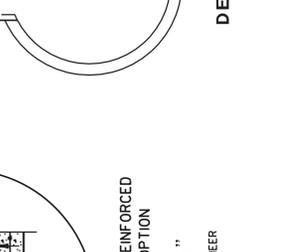
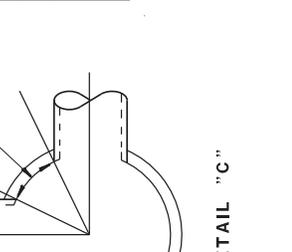
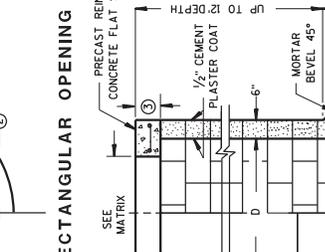
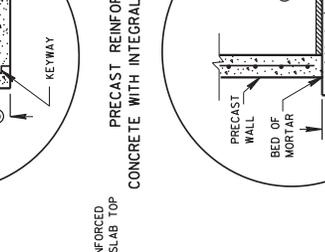
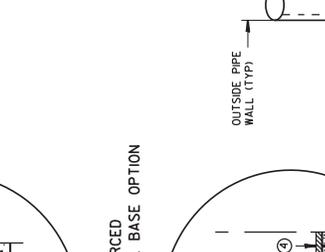
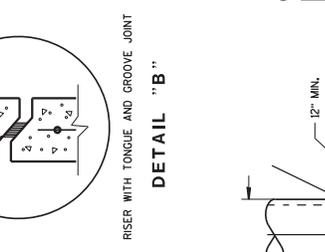
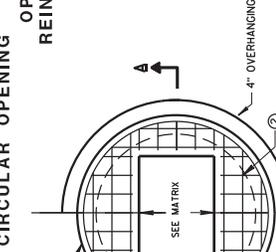
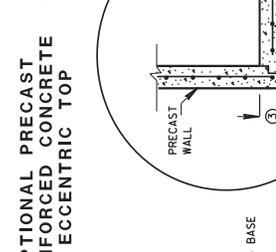
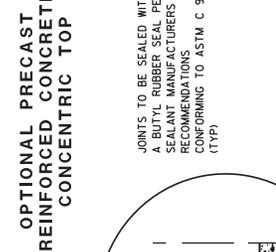
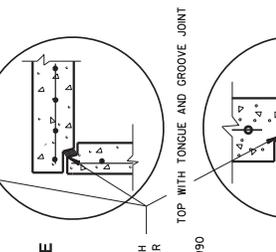
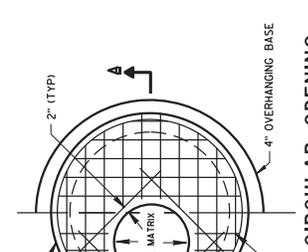
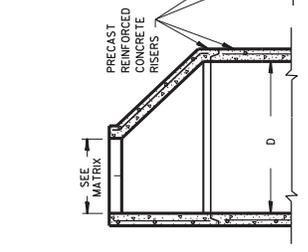
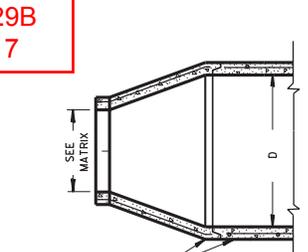
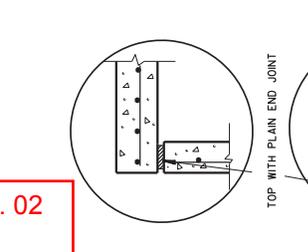
CATCH BASIN SIZE	INLET COVER TYPE	ALL A'S	ALL B'S	BW	C	F	ALL H'S	S	T	V	WM	Z
3-FT	2X2	X	X									
4-FT	2 DIA.	X		X				X		X		X
6-FT	2X2.5	X		X				X	X	X		X
	2 DIA.				X							X
	2.5X3						X					

PIPE MATRIX

CATCH BASIN SIZE	MAXIMUM INSIDE PIPE DIAMETER FOR TWO PIPES		
	180° SEPARATION (IN)	90° SEPARATION (IN)	12" SEPARATION (IN)
4-FT	15	12	12
5-FT	24	18	18
6-FT	42	30	30

CATCH BASINS 3-FT, 4-FT, 5-FT AND 6-FT DIAMETER

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 APPROVED
 DATE 6/25/2002
 ENGINEER /S/ JEFFRY H. ZOGG
 ROADWAY STANDARDS DEVELOPMENT ENGINEER
 FHW



CONTRACTOR TO PROVIDE DRAWINGS STAMPED BY A PROFESSIONAL ENGINEER FOR STEEL REINFORCING DESIGN FOR CAST-IN-PLACE STRUCTURES

SECTION A-A
 PRECAST REINFORCED CONCRETE BLOCK WITH CAST-IN-PLACE OR PRECAST REINFORCED CONCRETE MONOLITHIC BASE

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. UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE ENGINEER, THE CONTRACTOR SHALL NOT ORDER AND DELIVER PRECAST CATCH BASIN UNITS REQUIRED FOR THE PROJECT UNTIL A LIST OF SIZES IS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ALL PRECAST CATCH BASIN UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF ASTM C 913.

ALL DRAINAGE STRUCTURES ARE DESIGNATED ON THE PLANS AS "MANHOLES 3X3-L", "CATCH BASINS 4-B", "INLETS 2X3-H", ETC. THE FIRST NUMBERS DESIGNATES THE SIZE OF THE STRUCTURE, AND THE FOLLOWING LETTER DESIGNATES THE TYPE OF COVER TO BE USED TO COMPRISE THE COMPLETE UNIT.

BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS OF GRANULAR BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

ALL BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED. PRECAST REINFORCED RISERS SHALL HAVE A TONGUE AND GROOVE JOINT WITH TONGUE UP OR DOWN.

4" OVERHANGING BASES ARE REQUIRED FOR CAST-IN-PLACE REINFORCED CONCRETE AND CONCRETE BLOCK INSTALLATIONS. 4" OVERHANG IS REQUIRED WHEN SEPARATE PRECAST BASE IS PROVIDED.

OVERHANG IS NOT REQUIRED ON PRECAST STRUCTURES WITH AN INTEGRAL OR MONOLITHIC BASE.

MAXIMUM INSIDE PIPE DIAMETER DETERMINED BY 3" CLEARANCE ON EACH SIDE OF THE OUTSIDE WALL OF THE PIPE. SEE DETAIL "A", ASSUMES PIPE ENTERS PERPENDICULAR TO THE STRUCTURE.

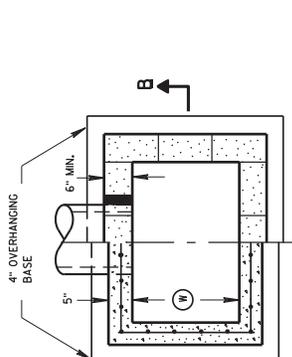
- ① FOR PRECAST CATCH BASINS PROVIDE REINFORCING STEEL IN ACCORDANCE TO ASTM C 913.
- ② CONTRACTOR TO PROVIDE DRAWING(S) STAMPED BY A PROFESSIONAL ENGINEER FOR STEEL REINFORCING DESIGN FOR CAST-IN-PLACE STRUCTURES.
- ③ 1" CONCRETE KEY POURED AFTER INSTALLATION. 2" SUMP MEASURED FROM TOP OF KEY.

CATCH BASIN COVER MATRIX

CATCH BASIN SIZE	INLET COVER TYPE	F	ALL HS
WIDTH (Ø) (FT)	LENGTH (L) (FT)		
2X3-FT	2	3	X
2.5X3-FT	2.5	3	X

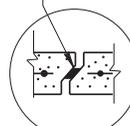
PIPE MATRIX

CATCH BASIN SIZE	MAXIMUM INSIDE PIPE DIAMETER FOR TWO PIPES	
	WIDTH (IN)	LENGTH (IN)
2X3-FT	12	24
2.5X3-FT	18	24

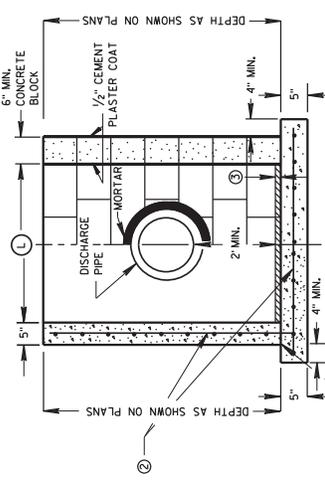


PLAN VIEW

RISER JOINTS TO BE SEALED WITH A BUTYL RUBBER SEAL PER SEALANT MANUFACTURERS RECOMMENDATIONS CONFORMING TO ASTM C 950 (TYP)



SECTION A-A



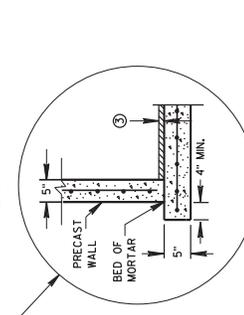
SECTION B-B

CONSTRUCTION JOINT

CAST-IN-PLACE REINFORCED CONCRETE

PRECAST REINFORCED CONCRETE

CONCRETE BLOCK ON CAST-IN-PLACE WITH PRECAST REINFORCED CONCRETE BASE ①



SEPARATE PRECAST REINFORCED CONCRETE BASE OPTION

Addendum No. 02
ID 3766-00-70
Added Sheet 29C
January 9, 2017

CATCH BASINS 2X3-FT AND 2.5X3-FT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE 6/5/2012
/s/ JEFFY H. ZOGG
ROADWAY STANDARDS DEVELOPMENT ENGINEER
P.H.W.A.

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT. PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

INTEGRAL CURB & GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB & GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE. A LONGITUDINAL CONSTRUCTION JOINT IS NOT REQUIRED WITH INTEGRAL CURB AND GUTTER.

WHERE THE TRANSVERSE JOINTS IN THE PAVEMENT ARE REQUIRED TO BE SEALED, THE JOINTS IN THE INTEGRAL CURB AND GUTTER SHALL BE SEALED TO THE FACE OF CURB WITH THE SAME TYPE OF SEALANT. THE COST OF FURNISHING AND INSTALLING THIS SEALANT SHALL BE INCIDENTAL TO THE ITEM CONCRETE CURB AND GUTTER.

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

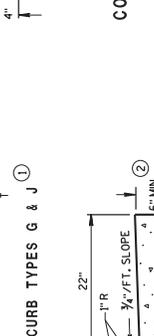
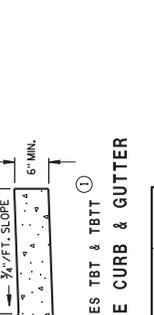
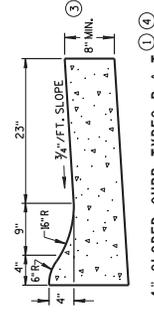
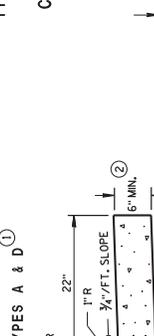
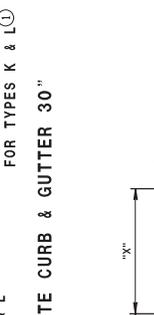
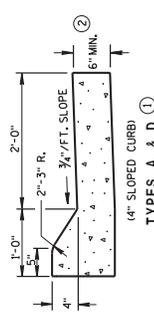
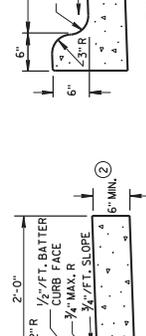
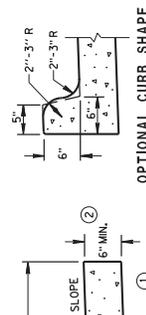
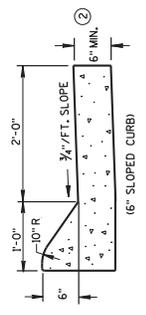
① TIE BARS ARE REQUIRED FOR CURB AND GUTTER TYPES A, G, K, R, AND TBT.

② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.

③ THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.

④ THE FACE OF CURB IS 6" FROM THE BACK OF CURB.

⑤ WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATIONS WILL BE SHOWN ELSEWHERE IN THE PLAN.



6" SLOPED CURB

4" SLOPED CURB

4" SLOPED CURB

CONCRETE CURB & GUTTER 36"

CONCRETE CURB & GUTTER

CONCRETE CURB & GUTTER 30"



4" SLOPED CURB TYPES R & T

CONCRETE CURB & GUTTER 36"

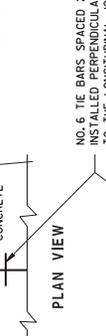
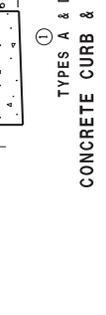
CONCRETE CURB & GUTTER 30"



REVERSE SLOPE GUTTER

CONCRETE CURB & GUTTER 18"

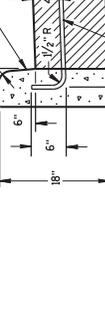
CONCRETE CURB & GUTTER 18"



DRIVEWAY ENTRANCE CURB

CONCRETE CURB & GUTTER 18"

CONCRETE CURB & GUTTER 18"



CONCRETE CURB & GUTTER 18"

CONCRETE CURB & GUTTER 18"

CONCRETE CURB & GUTTER 18"

CONCRETE CURB

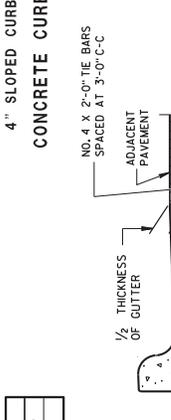
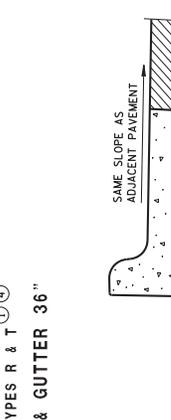
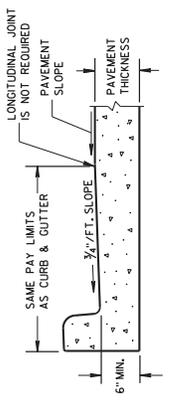
CONCRETE CURB

CONCRETE CURB

CONCRETE CURB

CONCRETE CURB

CONCRETE CURB

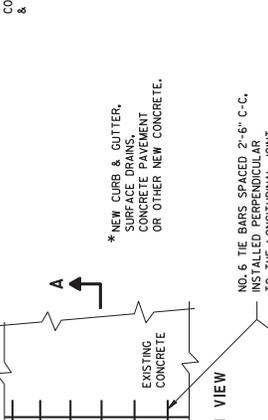
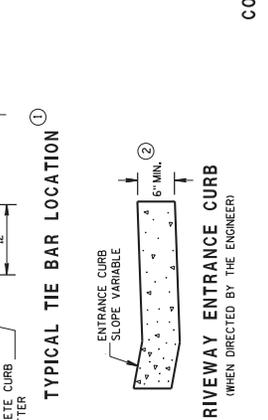
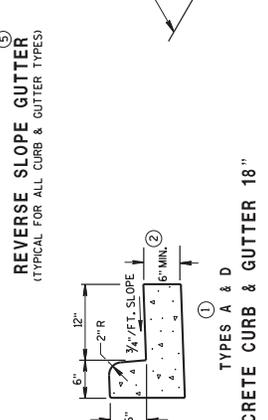
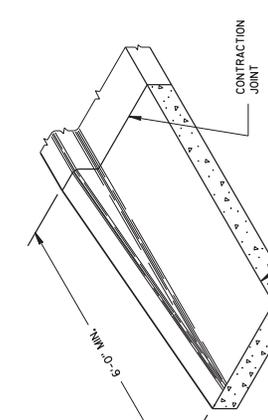


PARTIAL SECTION OF PAVEMENT WITH INTEGRAL CURB & GUTTER

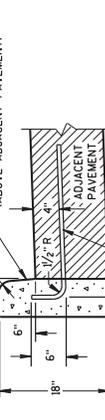
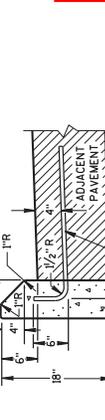
PARTIAL SECTION OF PAVEMENT WITH INTEGRAL CURB & GUTTER

PARTIAL SECTION OF PAVEMENT WITH INTEGRAL CURB & GUTTER

PARTIAL SECTION OF PAVEMENT WITH INTEGRAL CURB & GUTTER



END SECTION CURB & GUTTER

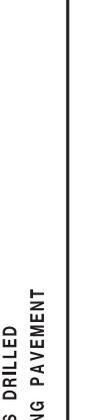
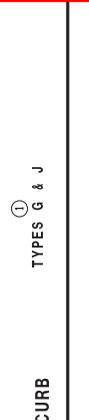
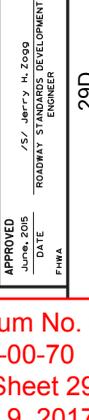


PLAN VIEW

PLAN VIEW

PLAN VIEW

PLAN VIEW



SECTION A-A

SECTION A-A

SECTION A-A

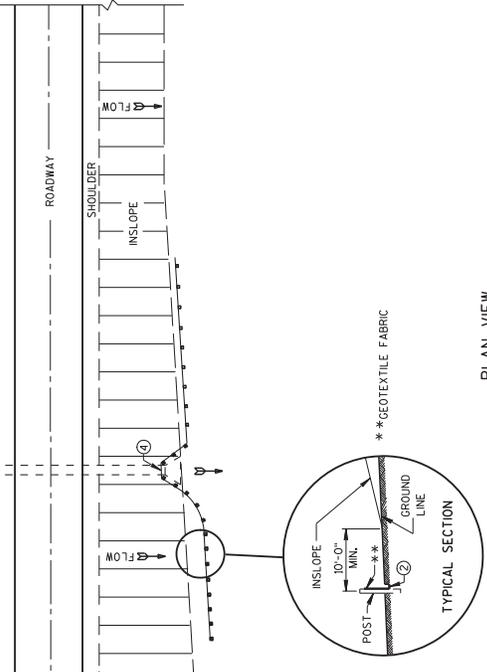
SECTION A-A

Addendum No. 02
ID 3766-00-70
Added Sheet 29D
January 9, 2017

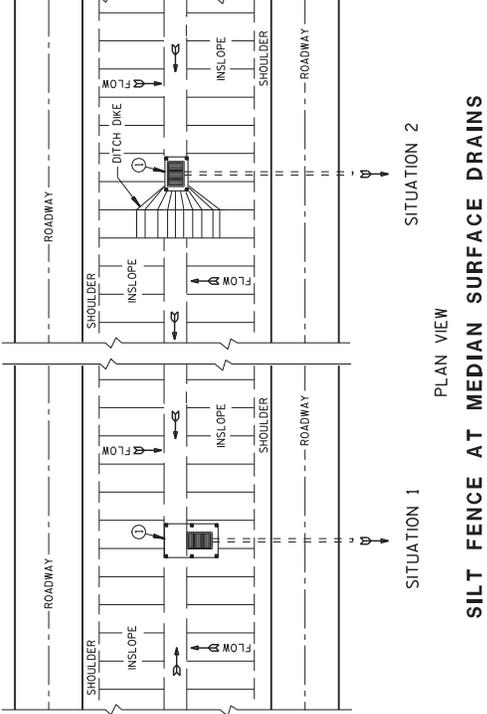
APPROVED
DATE: June, 2005
P.H.W.A.
/S/ Jerry H. Zoeg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

CONCRETE CURB, CONCRETE
CURB & GUTTER AND TIES

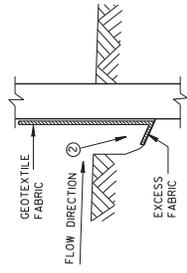


TYPICAL APPLICATION OF SILT FENCE

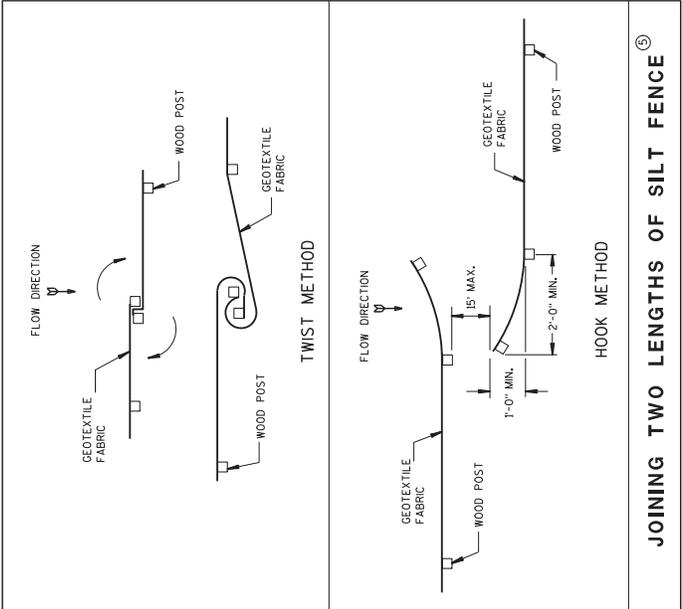


SILT FENCE AT MEDIAN SURFACE DRAINS

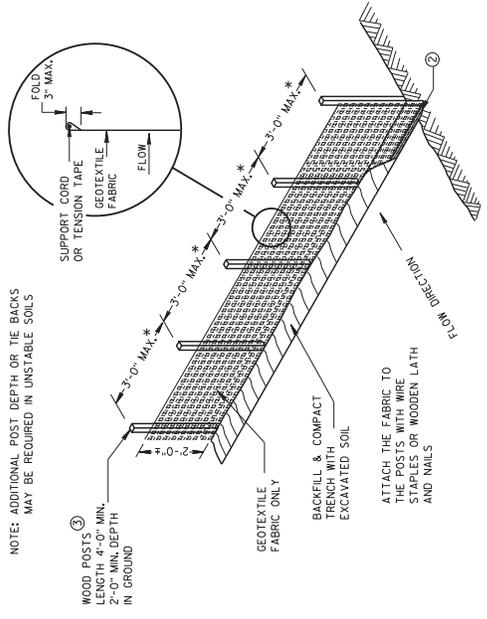
- GENERAL NOTES**
- DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.
- HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
 - FOR MANUAL INSTALLATIONS THE TRENCH 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.
 - WOOD POSTS SHALL BE A MINIMUM SIZE OF 1/8" X 1/2" OF OAK OR HICKORY.
 - SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.
 - CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING FOLDS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS: OVERLAP THE END POSTS AND TWIST OR HOOK THEM; AT LEAST 180 DEGREES; BY HOOK THE END OF EACH SILT FENCE LENGTH.



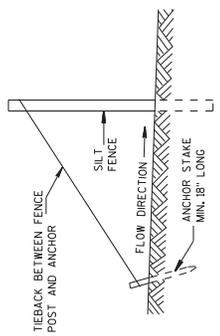
TRENCH DETAIL



JOINING TWO LENGTHS OF SILT FENCE



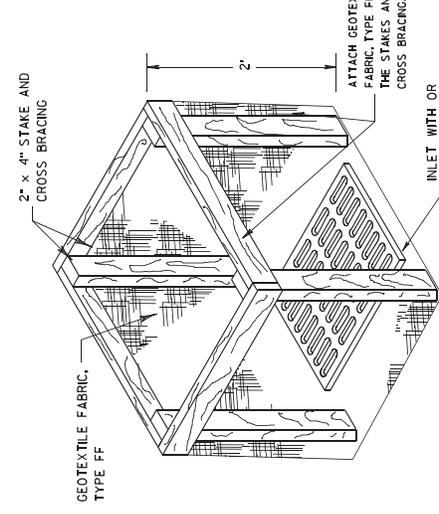
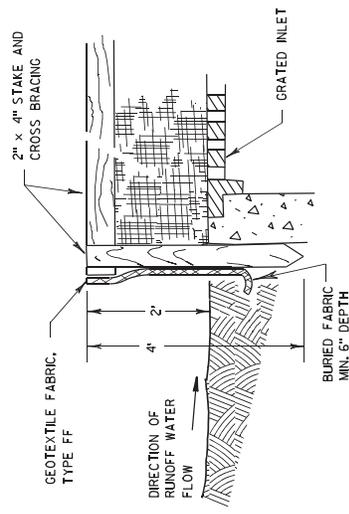
SILT FENCE



SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)

Addendum No. 02
ID 3766-00-70
Added Sheet 29E
January 9, 2017

SILT FENCE	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 4-29-05	/s/ Beth Connors, P.E. DATE: _____ CHEF ROADWAY DEVELOPMENT ENGINEER PHWA



INLET PROTECTION, TYPE A

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

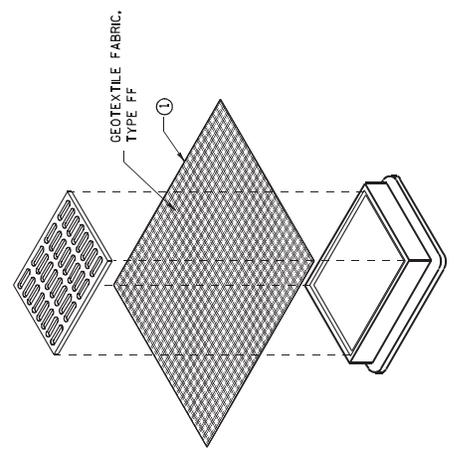
MANUFACTURED ALTERNATIVES, APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.

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

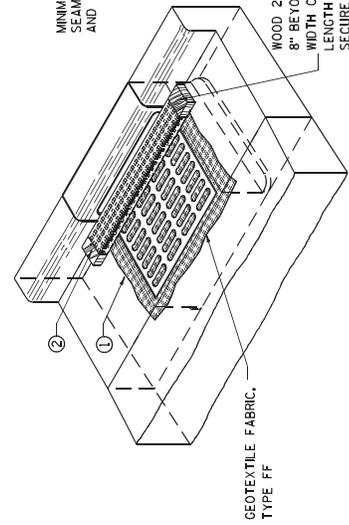
① FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

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

③ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2x4.



INLET PROTECTION, TYPE B (WITHOUT CURB BOX)
 (CAN BE INSTALLED IN ANY INLET WITHOUT A CURB BOX)



INLET PROTECTION, TYPE C (WITH CURB BOX)

INSTALLATION NOTES

TYPE B & C

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE. THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

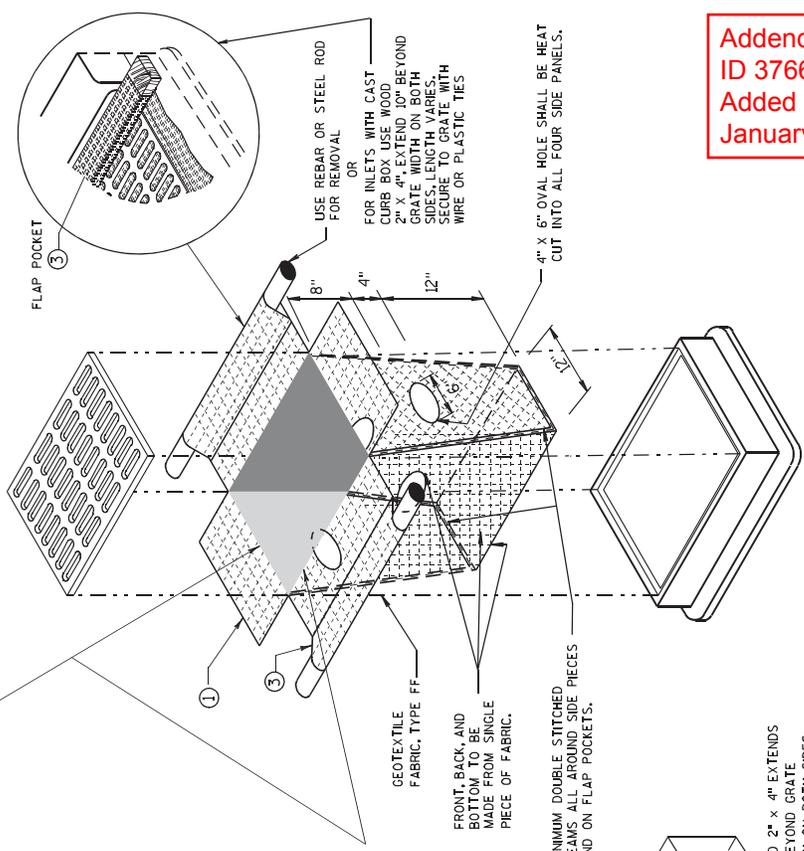
TYPE D

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

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

THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL SNIP 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 SPECIFICATIONS AS PER THE PLAN DIMENSION LENGTH AND WIDTH TO MATCH



INLET PROTECTION, TYPE D

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

Addendum No. 02
 ID 3766-00-70
 Added Sheet 29F
 January 9, 2017

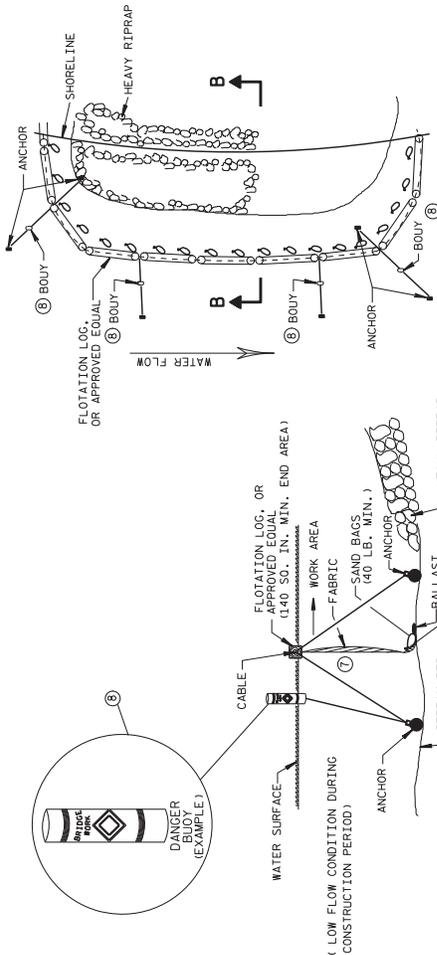
INLET PROTECTION TYPE A, B, C, AND D	
STATE OF WISCONSIN	
DEPARTMENT OF TRANSPORTATION	
APPROVED	DATE
10/16/02	/s/ Beth Connestra
PHWA CMEF ROADWAY DEVELOPMENT ENGINEER	

GENERAL NOTES

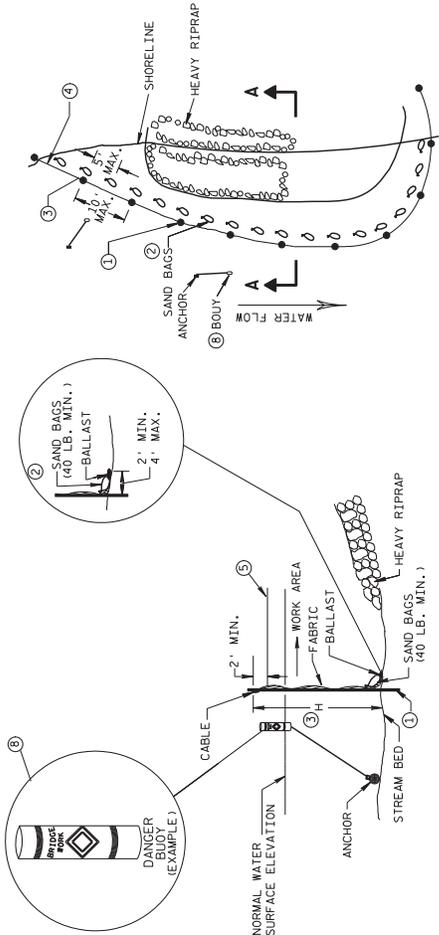
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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

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

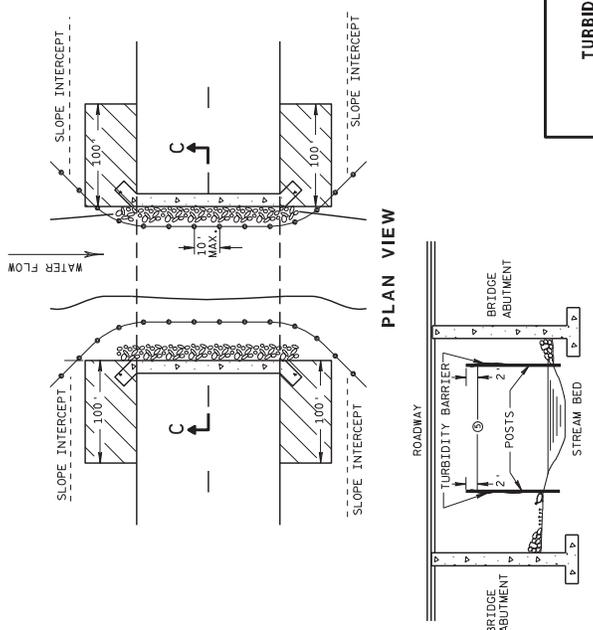


TURBIDITY BARRIER FLOAT ALTERNATIVE
CAUTION - SEE NOTE 6



TURBIDITY BARRIER STANDARD POST INSTALLATION

Addendum No. 02
ID 3766-00-70
Added Sheet 29G
January 9, 2017



TURBIDITY BARRIER DETAIL SHOWING TYPICAL PLACEMENT AT STRUCTURES

TURBIDITY BARRIER	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 6/04/02 DATE	/s/ Beth Connors CHIEF ROADWAY DEVELOPMENT ENGINEER PHWA

REINFORCED CONCRETE APRON ENDWALLS

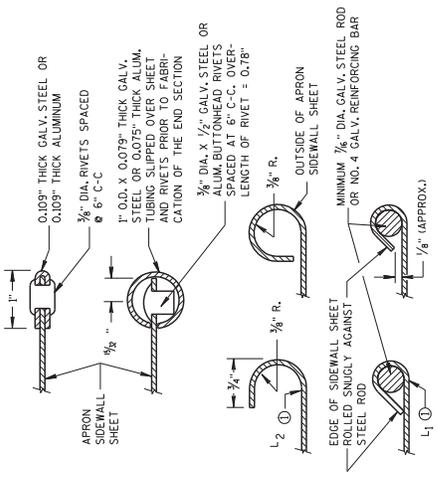
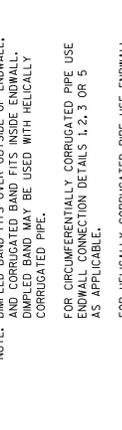
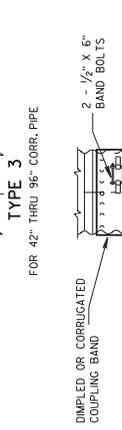
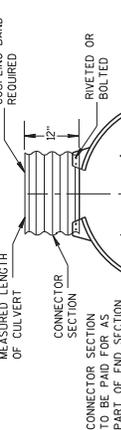
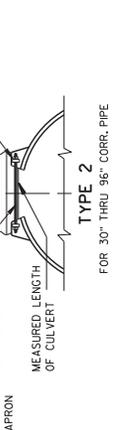
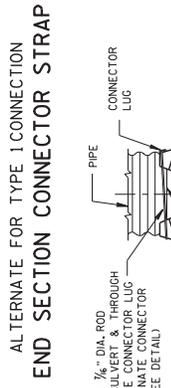
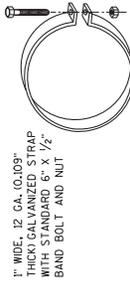
PIPE DIA. (IN.)	DIMENSIONS (inches)							APPROX. SLOPE
	T	A	B	C	D	E	G	
12	2	4	24	48 1/2	72 1/2	24	2	3 to 1
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1
18	2 1/2	8	31	46	73	35	2 1/2	3 to 1
21	2 3/4	9 1/2	37 1/2	46	73	40	2 3/4	3 to 1
24	3	11	43 1/2	46	73	46	3	3 to 1
27	3 1/4	12 1/2	49 1/2	46	73	52	3 1/4	3 to 1
30	3 1/2	14	54	46	73	58	3 1/2	3 to 1
36	4	18	63	46	73	68	4	3 to 1
42	4 1/2	21	72	46	73	78	4 1/2	3 to 1
48	5	24	81	46	73	88	5	3 to 1
54	5 1/2	27	90	46	73	98	5 1/2	2 1/2 to 1
60	6	30	99	46	73	108	6	2 to 1
66	6 1/2	33	108	46	73	117	6 1/2	2 to 1
72	7	36	117	46	73	126	7	2 to 1
78	7 1/2	39	126	46	73	135	7 1/2	2 to 1
84	8	42	135	46	73	144	8	2 to 1
90	8 1/2	45	144	46	73	153	8 1/2	2 to 1

*MINIMUM
**MAXIMUM

METAL APRON ENDWALLS

PIPE DIA. (IN.)	DIMENSIONS (inches)							APPROX. SLOPE	BODY SLOPE	
	A	B	H	L	L1	L2	W			
15	.064	.060	6	6	21	17 1/2	24	2 1/2 to 1	1 P.C.	
18	.064	.060	7	8	26	14	28 1/4	30	2 1/2 to 1	1 P.C.
21	.064	.060	8	10	31	15	28 1/4	36	2 1/2 to 1	1 P.C.
24	.064	.060	9	12	36	18	29 1/2	42	2 1/2 to 1	1 P.C.
27	.064	.075	10	13	41	18	31 1/4	48	2 1/2 to 1	1 P.C.
30	.079	.075	12	16	48	21	33 1/4	54	2 1/2 to 1	1 P.C.
36	.079	.105	14	19	57	24	35 3/4	60	2 1/2 to 1	1 P.C.
42	.079	.105	16	22	66	24	38 1/4	66	2 1/2 to 1	1 P.C.
48	.079	.105	18	24	75	24	41	72	2 1/2 to 1	1 P.C.
54	.079	.105	18	30	84	30	44	78	2 1/2 to 1	1 P.C.
60	.079	.105	18	33	93	30	47	84	2 1/2 to 1	1 P.C.
66	.079	.105	18	36	102	30	50	90	2 1/2 to 1	1 P.C.
72	.079	.105	18	39	111	30	53	96	2 1/2 to 1	1 P.C.
78	.079	.105	18	42	120	30	56	102	2 1/2 to 1	1 P.C.
84	.079	.105	18	45	129	30	59	108	2 1/2 to 1	1 P.C.
90	.079	.105	18	48	138	30	62	114	2 1/2 to 1	1 P.C.
96	.079	.105	18	51	147	30	65	120	2 1/2 to 1	1 P.C.

x EXCEPT CENTER PANEL
SEE GENERAL NOTES



GENERAL NOTES

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

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

ALL THREE PIECE STEEL APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.109" THICK GALV. STEEL AND 0.109" THICK ALUM. SHEETS. ALL LARGER SHALL HAVE 0.109" THICK GALV. STEEL AND 0.109" THICK ALUM. SHEETS. CENTER PANELS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER ANGLES. THE ANGLES SHALL BE ATTACHED BY GALVANIZED NUTS AND BOLTS FOR STEEL UNITS AND ALUMINUM NUTS AND BOLTS FOR ALUMINUM UNITS.

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

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

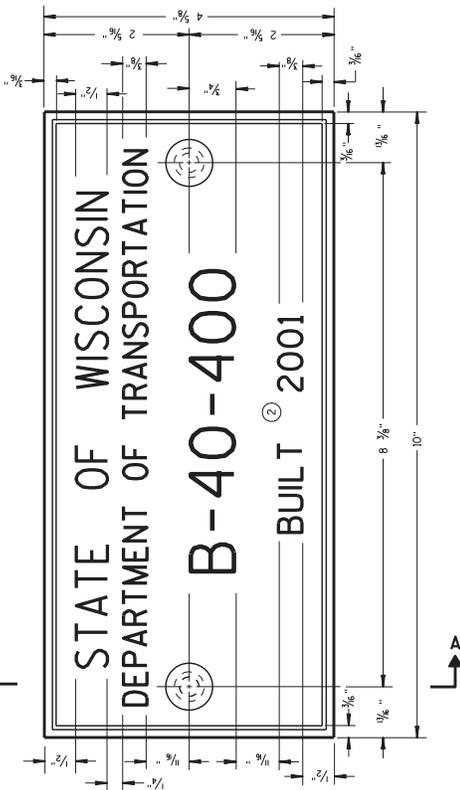
Addendum No. 02
ID 3766-00-70
Added Sheet 29H
January 9, 2017

APRON ENDWALLS FOR CULVERT PIPE
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED DATE: 11/30/94 P.H.M.A.
/s/ Roy L. Rinesmith CHIEF ROADWAY DEVELOPMENT ENGINEER

GENERAL NOTES

NAME PLATES TO BE INSTALLED ON BRIDGES, CULVERTS, AND RETAINING WALLS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS. THE BRIDGE NUMBER AND YEAR BUILT SHOWN ON THIS DRAWING ARE EXAMPLES ONLY. SEE CONSTRUCTION PLANS FOR INDIVIDUAL NUMBERING AND YEAR BUILT.

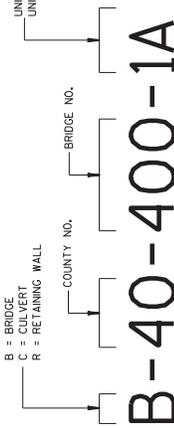
- ① EPOXY RESIN SHALL BE FROM AN APPROVED MANUFACTURER AND USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ② REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.



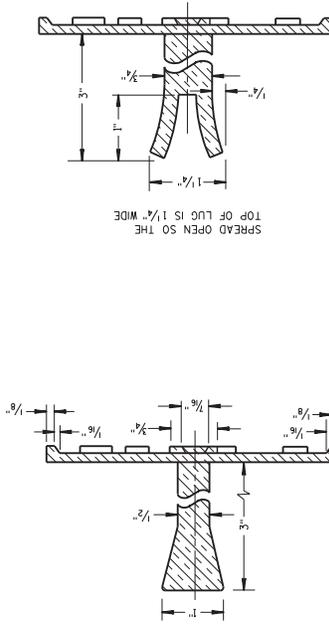
TYPICAL NAME PLATE
(BRIDGES, CULVERTS, AND RETAINING WALLS)

FOR MULTI-UNIT STRUCTURES
LINE 3 ABOVE SHALL READ

B = BRIDGE
C = CULVERT
R = RETAINING WALL

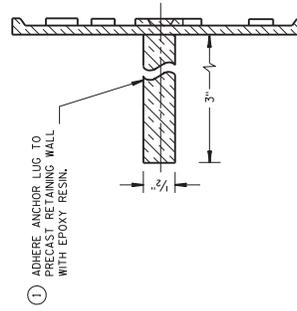


**NUMBERING DESIGNATION
MULTI-UNIT STRUCTURES**



SECTION A-A

ALTERNATE LUG



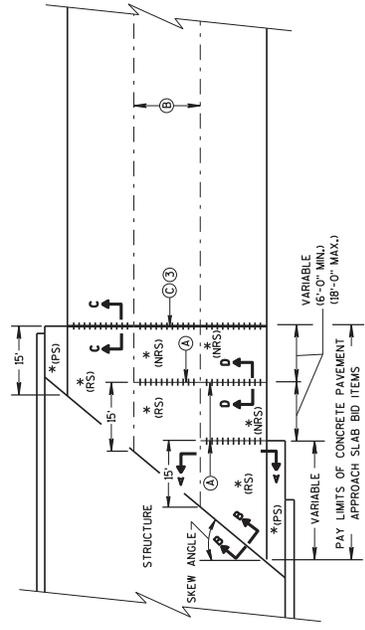
ALTERNATE LUG
(FOR ATTACHMENT TO PRECAST STRUCTURES)

Addendum No. 02
ID 3766-00-70
Added Sheet 29J
January 9, 2017

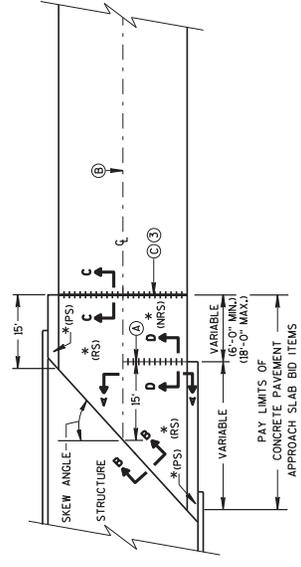
NAME PLATE
(STRUCTURES)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

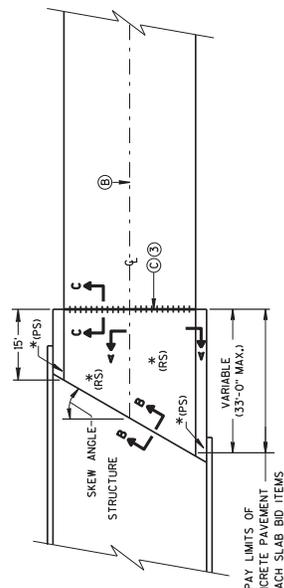
APPROVED
DATE: 3/26/10
/s/ Scot. Becker
CHIEF STRUCTURAL DEVELOPMENT ENGINEER
PHWA



**SKEWED APPROACH
(PAVEMENT MORE THAN 2 LANES)**



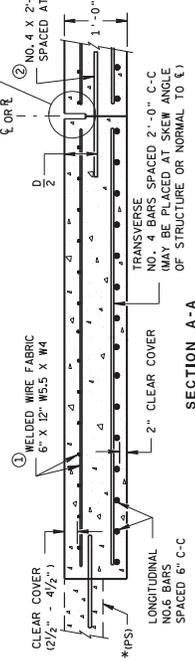
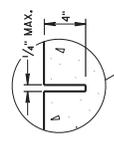
**SKEWS > 20°
(PAVEMENT WIDTH ≤ 30')**



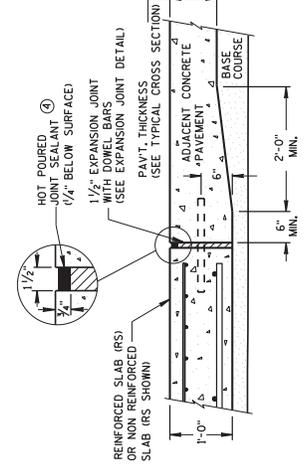
**APPROACH SLAB AND ADJACENT PAVEMENT
(PAVEMENT WIDTH ≤ 30')**

- *(RS) = REINFORCED CONCRETE SLAB
- *(PS) = PAVED CONCRETE SHOULDER OR CONCRETE DRAINAGE SLAB (SEE DETAILS ELSEWHERE IN THE PLAN)
- *(NRS) = NON-REINFORCED CONCRETE SLAB
- ***STANDARD DOWEL BAR DIAMETER (SEE SDD 15C11 & SDD 15C13)

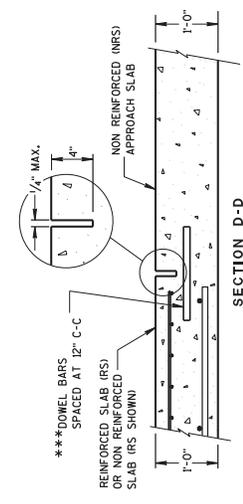
- Ⓐ STANDARD CONTRACTION JOINT NORMAL TO R̄ OR ξ (SEE DETAILS ELSEWHERE IN THE PLAN)
- Ⓑ STANDARD LONGITUDINAL JOINT WITH TIE BARS.
- Ⓒ 1/2" EXPANSION JOINT WITH DOWEL BARS NORMAL TO R̄ OR ξ



**SECTION A-A
REINFORCEMENT POSITIONING DETAIL**



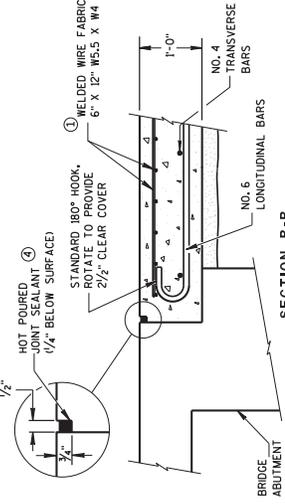
**SECTION C-C
TRANSITION DETAIL
APPROACH SLAB TO ADJACENT PAVEMENT**



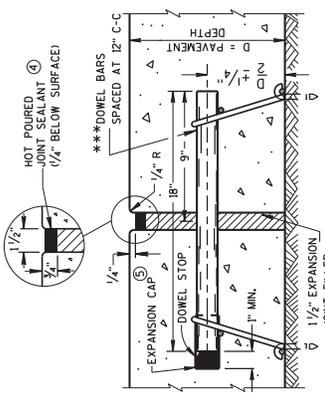
**SECTION D-D
CONTRACTION JOINT**

GENERAL NOTES

- 1 THE CONTRACTOR MAY USE NO. 6 BARS IN THE APPROACH SLAB FOR SKEWED STRUCTURES ONLY. STAGGER SPICES WITH A MAXIMUM OF ONE SPICE PER BAR. THE LENGTH OF LAP IS 20 INCHES.
- TACK WELD DOWEL BARS TO THE BASKETS ON ALTERNATE ENDS.
- 2 THE CONTRACTOR MAY USE NO. 4 BARS SPACED AT 2'-0" C-C IN BOTH THE LONGITUDINAL AND TRANSVERSE DIRECTIONS FOR TOP REINFORCEMENT AS AN ALTERNATIVE TO THE WELDED WIRE FABRIC.
- 3 THE CONTRACTOR MAY OMIT TIE BARS BETWEEN REINFORCED SLABS WHERE SLAB REINFORCEMENT BARS EXTEND ACROSS THE CENTERLINE OR REFERENCE LINE.
- 4 DO NOT CONSTRUCT AN EXPANSION JOINT OR INSTALL DOWEL BARS WHEN ABUTTING AN HMA PAVEMENT.
- 5 USE A JOINT SEALANT MEETING THE REQUIREMENTS OF ASTM D6690.
- 6 PLACE EXPANSION CAP ON THE END OF THE DOWEL THAT IS NOT TACK WELDED TO THE BASKET. DO NOT FORCE DOWEL BAR PAST THE DOWEL STOP.



**SECTION B-B
BEND DETAIL
BOTTOM REINFORCEMENT**



EXPANSION JOINT DETAIL

Addendum No. 02
 ID 3766-00-70
 Added Sheet 29K
 January 9, 2017

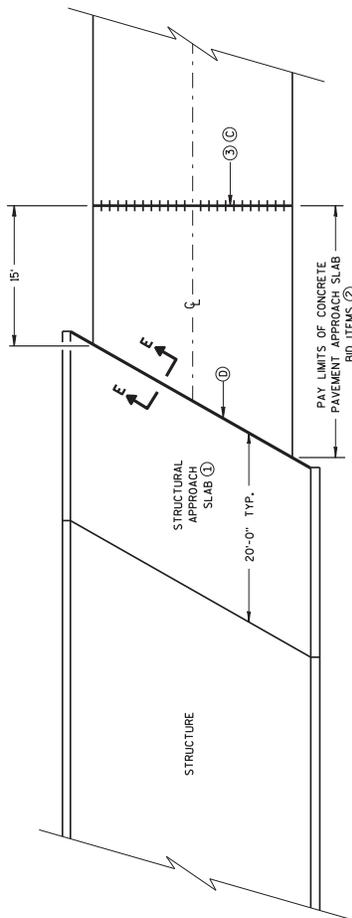
CONCRETE PAVEMENT APPROACH SLAB
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED June, 2015 DATE
/s/ Peter Kemp, P.E. PAVEMENT SUPERVISOR PHWA

GENERAL NOTES

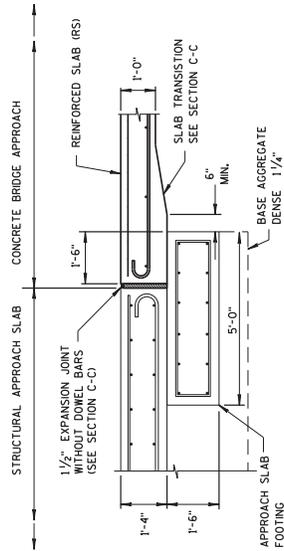
ALL PROJECTS THAT INVOLVE A STRUCTURAL APPROACH SLAB WILL ALSO HAVE A CONCRETE PAVEMENT APPROACH SLAB.

- ① SEE BRIDGE PLAN.
- ② CONFORM TO SHEET 13 B 2(A) FOR CONCRETE PAVEMENT APPROACH SLAB DETAILS.
- ③ DO NOT CONSTRUCT AN EXPANSION JOINT OR INSTALL DOWEL BARS WHEN ABUTTING AN HMA PAVEMENT.

- ④ 1/2" EXPANSION JOINT WITH DOWEL BARS NORMAL TO R₁ OR ζ
- ⑤ 1/2" EXPANSION JOINT (NO DOWELS)



BRIDGE APPROACHES

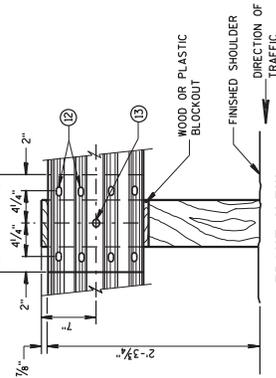


Addendum No. 02
ID 3766-00-70
Added Sheet 29L
January 9, 2017

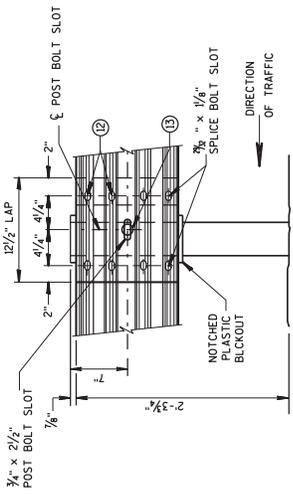
STRUCTURAL APPROACH SLAB AND CONCRETE PAVEMENT APPROACH SLAB	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June, 2015 DATE	/s/ Peter Kemp, P.E. PAVEMENT SUPERVISOR

GENERAL NOTES

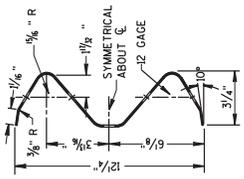
- ① PROVIDE SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH YELLOW REFLECTIVE SHEETING. SHEETING IS TYPE H, SEE STANDARD SPECIFICATION 637.
- ② DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
- 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 8 - 3/8" x 2" BUTTON HEAD BOLTS WITH OVAL SHOULDERS & RECESS NUTS.
- ⑥ 3/8" DIA. BUTTON HEAD BOLT AND RECESS NUT WITH 3/8" DIA. F844 FLAT WASHER UNDER NUT.



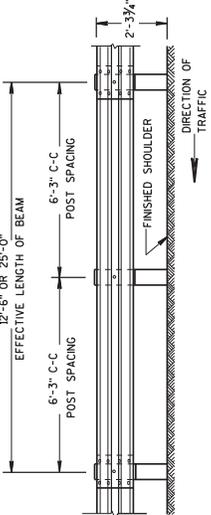
**FRONT VIEW
BEAM SPLICE AT WOOD POST
AND POST MOUNTING DETAIL**



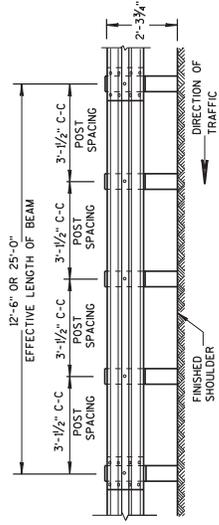
**FRONT VIEW
BEAM SPLICE AT STEEL POST
TYPICAL SPLICING DETAILS
OF STEEL PLATE BEAM GUARD**



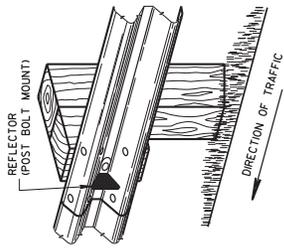
SECTION THRU W BEAM



**FRONT VIEW
POST SPACING STANDARD INSTALLATION**

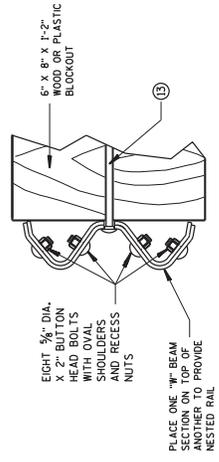


**FRONT VIEW
POST SPACING FOR LONGER POST
AT HALF POST SPACING W BEAM (LHW)**



ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION

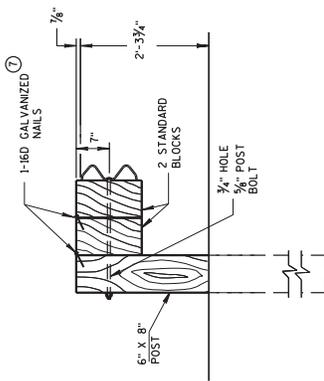
BEAM GUARD LENGTH	REFLECTOR SPACING	REFLECTOR SPACING	
		NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	50' C-C	1	3
	100' C-C	1	3
TWO WAY TRAFFIC	25' C-C	1	6
	50' C-C	2	3
TWO WAY TRAFFIC	50' C-C	2	3
	100' C-C	2	3



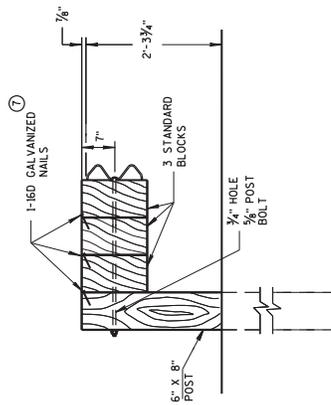
NESTED W BEAM (NW)
USE ALL OTHER STANDARD BEAM GUARD DETAILS FOR CONSTRUCTING NESTED W BEAM (NW)

Addendum No. 02
ID 3766-00-70
Added Sheet 29N
January 9, 2017

STEEL PLATE BEAM GUARD,
CLASS "A"
INSTALLATION & ELEMENTS
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

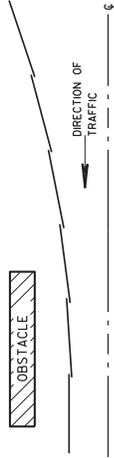


DETAIL FOR DOUBLE BLOCKS
 THE NUMBER OF DOUBLE BLOCK POSTS WITHIN A BARRIER RUN IS UNLIMITED

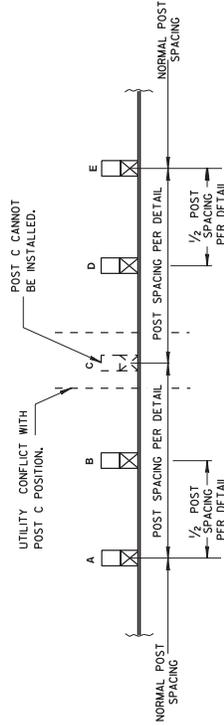


DETAIL FOR TRIPLE BLOCKS
 TRIPLE BLOCK DETAIL IS LIMITED TO ONE LOCATION WITHIN A BEAM GUARD RUN.

NOTES: USE DOUBLE OR TRIPLE BLOCKS WHEN UNDERGROUND OBSTACLES PREVENT THE POST FROM BEING INSTALLED.
 DO NOT USE EXTRA BLOCKS 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.



**PLAN VIEW
 BEAM LAPPING DETAIL**



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION

Addendum No. 02
 ID 3766-00-70
 Added Sheet 290
 January 9, 2017

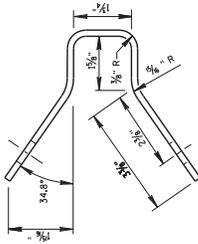
STEEL PLATE BEAM GUARD, CLASS "A", INSTALLATION & ELEMENTS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June 2014	/S/ Jerry H. Zogg ROADWAY STABILIZATION DEVELOPMENT ENGINEER
FHWA	

GENERAL NOTES

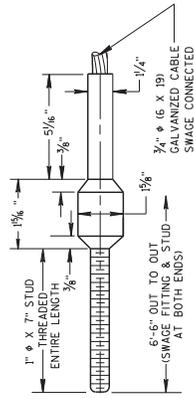
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.
STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-500 GRADE B OR ASTM A-501.

POST NO.1 SHALL BE WOOD BREAKAWAY POST INSERTED AND BOLTED INTO STEEL TUBE.

TYPE 2 ANCHORAGE SHALL CONSIST OF A STEEL TUBE, SOIL PLATE, WOOD BREAKAWAY POST, BEARING PLATE, ANCHOR PLATE, CABLE ASSEMBLY AND ALL ASSOCIATED HARDWARE. ALL STEEL PARTS SHALL BE GALVANIZED.

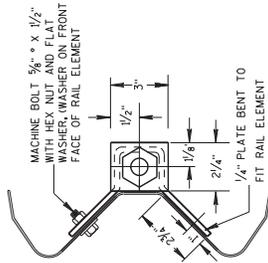


END VIEW OF BRACKET



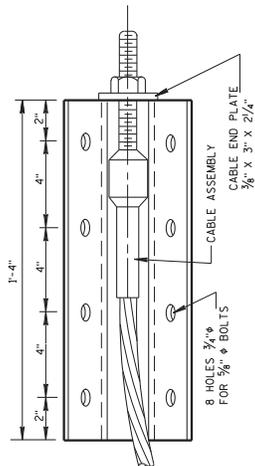
CABLE ASSEMBLY

CABLE SWAGE FITTING, STUD AND NUT SHALL DEVELOP A MINIMUM BREAKING STRENGTH OF 40,000 LB. (TIGHTEN UNTIL TAUT)

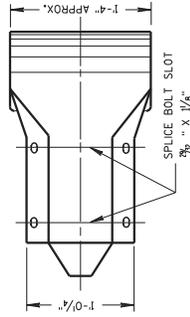


END VIEW

ANCHOR PLATE DETAIL

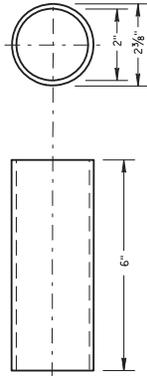


FRONT VIEW



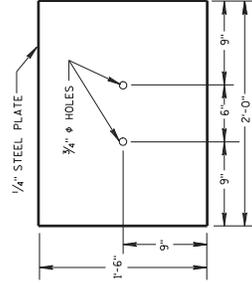
PLAN VIEW

**FRONT VIEW
W BEAM END SECTION ROUNDED**

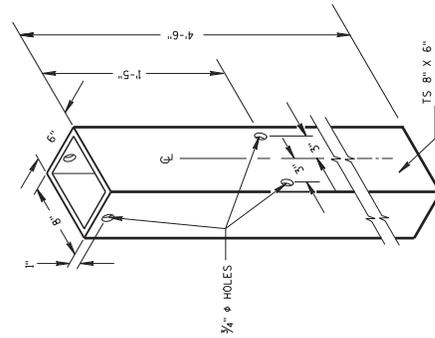


BREAKAWAY TERMINAL POST SLEEVE

GALVANIZED STANDARD STRENGTH STEEL PIPE, ASTM 53 GRADE "B"

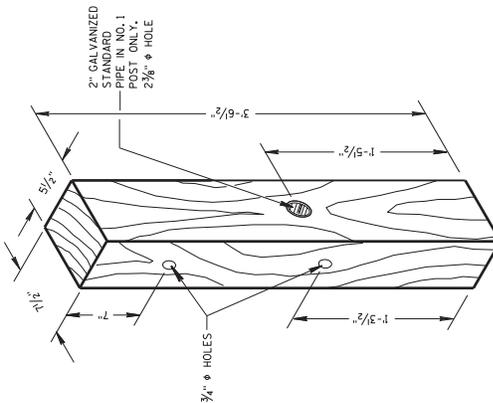


SOIL PLATE



STEEL TUBE

STEEL TUBE SHALL CONFORM TO REQUIREMENTS OF ASTM A500



WOOD BREAKAWAY POST

Addendum No. 02
ID 3766-00-70
Added Sheet 29P
January 9, 2017

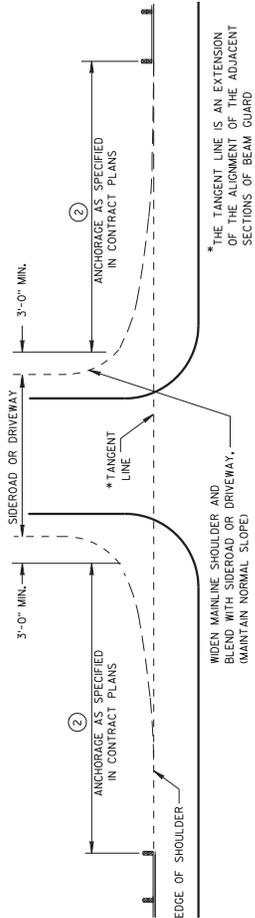
ANCHORAGE FOR STEEL PLATE BEAM GUARD TYPE 2	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED	/S/ JBF.C.Y. H. ZOGG ROADWAY STANDARDS DEVELOPMENT ENGINEER
DATE	8/21/2007
PHWA	

GENERAL NOTES

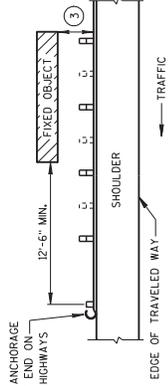
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE PERTINENT STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.
 W6 X 9 OR W6 X 8.5 STEEL POSTS WITH NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POSTS WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS. THE LOCATIONS AND LENGTHS OF BEAM GUARD ARE SHOWN ELSEWHERE IN THE PLAN.

- ① STEEL THREE BEAM STRUCTURAL APPROACH (STBSA) - SEE CURRENT SDD 14B20.
- ② USE AN APPROVED END TREATMENT FOR THE TRAFFIC APPROACH SIDE OF OPEN ENDED OBSTACLES. USE TYPE 2 ANCHORAGE ONLY ON THE DOWNSTREAM ENDS OF BEAM GUARD LOCATED ALONG ROADWAYS WITH ONE WAY TRAFFIC.
- ③

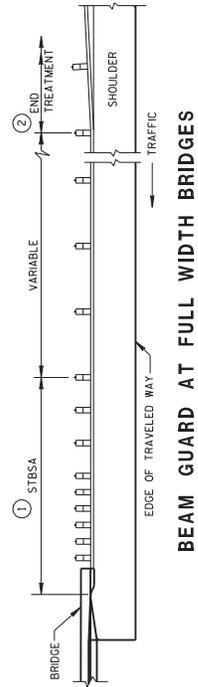
MINIMUM LATERAL DISTANCE FROM FACE OF BEAM GUARD TO FIXED OBJECT	POST SPACING
3'-6"	3' - 1/2"
4'-6"	6' - 3"



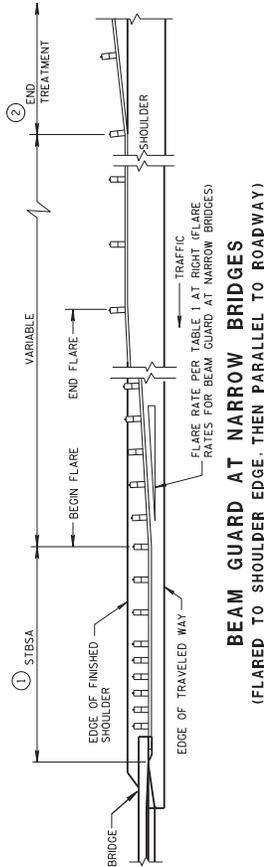
BEAM GUARD AT SIDEROADS OR DRIVEWAYS



**BEAM GUARD AT OBSTACLES
EXIT END - ONE WAY TRAFFIC**



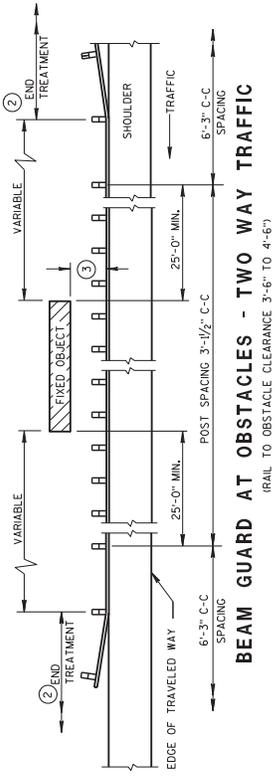
BEAM GUARD AT FULL WIDTH BRIDGES



**BEAM GUARD AT NARROW BRIDGES
(FLARED TO SHOULDER EDGE, THEN PARALLEL TO ROADWAY)**

**TABLE 1
FLARE RATES FOR BEAM
GUARD AT NARROW BRIDGES**

POSTED FLARE RATE (MPH)	FLARE RATE
25	13:1
30	15:1
35	16:1
40	18:1
45	21:1
50	24:1
55	26:1
65	30:1



BEAM GUARD AT OBSTACLES - TWO WAY TRAFFIC

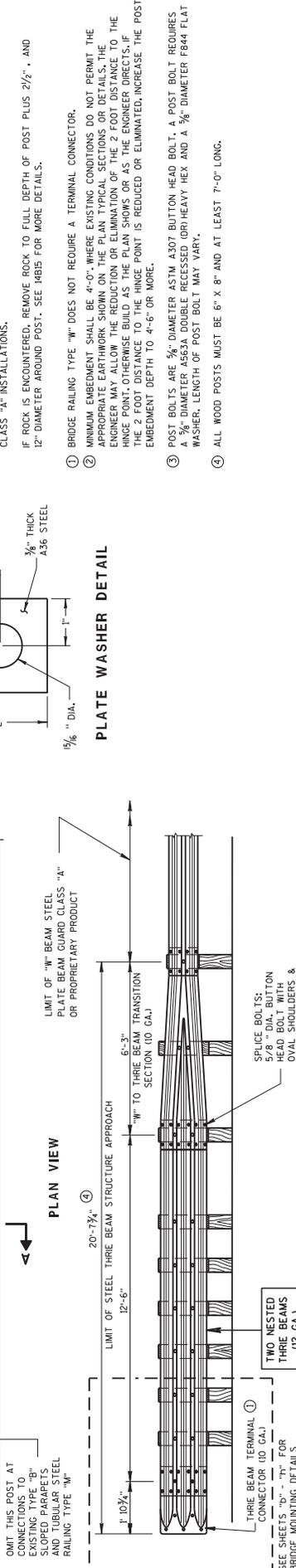
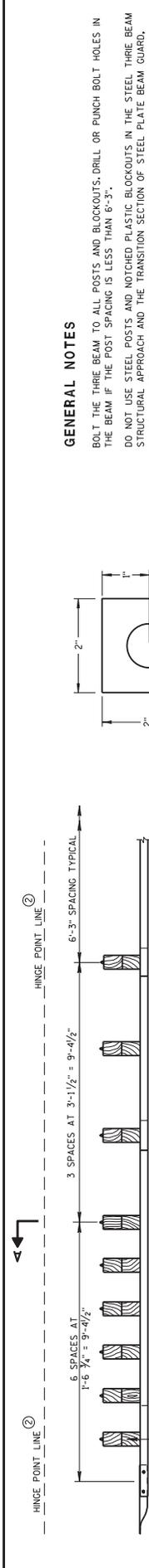
(RAIL TO OBSTACLE CLEARANCE 3'-6" TO 4'-6")

**Addendum No. 02
 ID 3766-00-70
 Added Sheet 29Q
 January 9, 2017**

**STEEL PLATE BEAM GUARD
CLASS "A"
AT BRIDGES, OBSTACLES
AND SIDEROADS/DRIVEWAYS**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED _____ /S/ Jerry H. Zoog
ENGINEER
DATE 8-21-07
ROADWAY STANDARDS DEVELOPMENT
PHWA



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".
- DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.
- IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2", AND 12" DIAMETER AROUND POST. SEE HB15 FOR MORE DETAILS.
- BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.
- MINIMUM EMBEDMENT SHALL BE 4'-0" WHERE EXISTING CONDITIONS DO NOT PERMIT THE APPROPRIATE EARTHWORK SHOWN ON THE PLAN TYPICAL SECTIONS OR DETAILS; THE EMBEDMENT SHALL BE 4'-0" FOR ALL OTHER CASES.
- THE HINGE POINT OF REVERSE BUILDING SHALL BE SHOWN AS THE ENGINEER'S OBJECTS. IF THE HINGE POINT DISTANCE TO THE HINGE POINT IS REDUCED OR ELIMINATED, INCREASE THE EMBEDMENT DEPTH TO 4'-6" OR MORE.
- POST BOLTS ARE 3/4" DIAMETER ASTM A307 BUTTON HEAD BOLT, A POST BOLT REQUIRES A 3/8" DIAMETER A563A DOUBLE RECESSED (OR) HEAVY HEX AND A 3/8" DIAMETER F844 FLAT WASHER, LENGTH OF POST BOLT MAY VARY.
- ALL WOOD POSTS MUST BE 6" X 8" AND AT LEAST 7'-0" LONG.

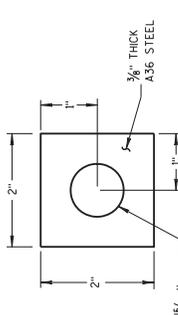
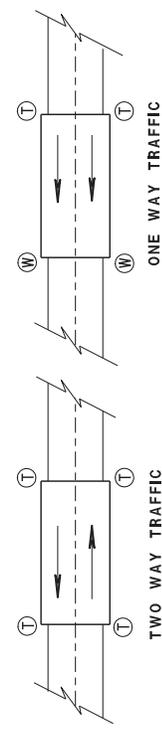
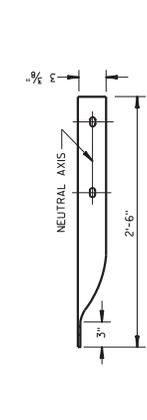


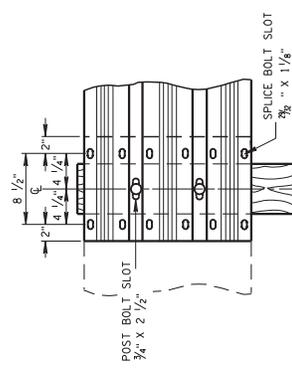
PLATE WASHER DETAIL



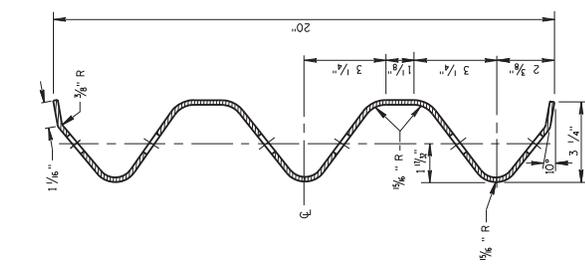
TYPICAL LOCATIONS OF THRIE BEAM AND W-BEAM CONNECTIONS TO BRIDGE



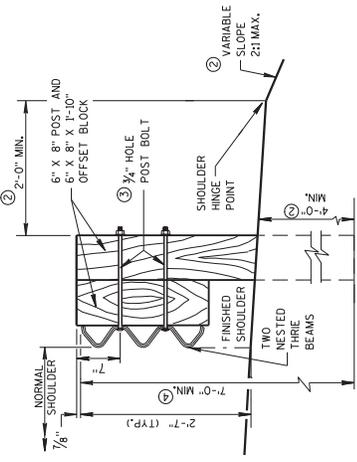
THRIE BEAM TERMINAL CONNECTOR



THRIE BEAM SPLICE



SECTION THRU THRIE BEAM RAIL ELEMENT

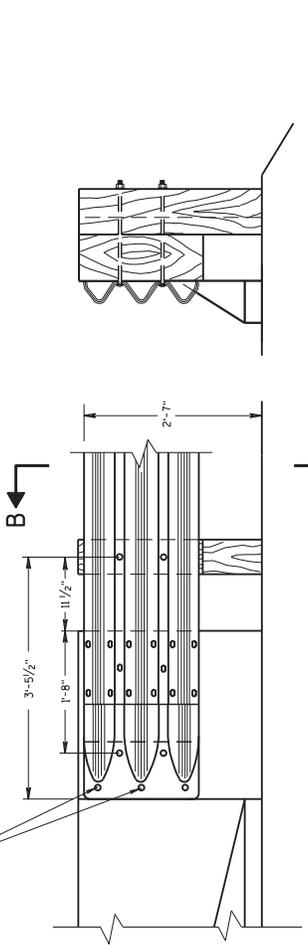


SECTION A-A

Addendum No. 02
ID 3766-00-70
Added Sheet 29R
January 9, 2017

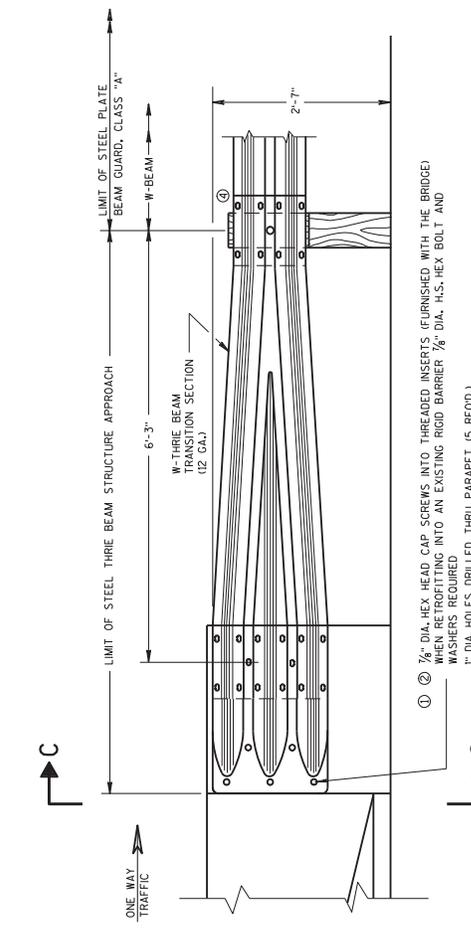
STEEL THRIE BEAM STRUCTURE APPROACH	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 8/31/2012 DATE	/s/ Jeffry H. Zoog ENGINEER ROADWAY STANDARDS DEVELOPMENT

- ① ② 3/8" DIA. HEX HEAD CAP SCREWS INTO THREADED INSERTS (FURNISHED WITH THE BRIDGE) WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER
- 3/8" DIA. H.S. HEX BOLT AND WASHERS REQUIRED
- 1" DIA. HOLES DRILLED THRU PARAPET (5 RECD.)



FRONT VIEW
THREE BEAM CONNECTION TO BRIDGE PARAPET WITH SQUARE ENDS

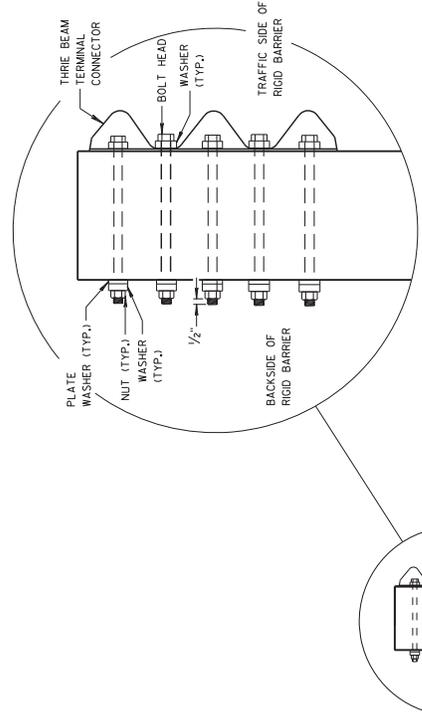
SECTION B-B



FRONT VIEW
W BEAM TRANSITION AND CONNECTION TO BRIDGE PARAPETS WITH SQUARE ENDS (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

GENERAL NOTES

- THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSITION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.
- BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A325, A449 AND GALVANIZED PER STANDARD SPECIFICATIONS 614.
- 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 THREE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THREE BEAM TERMINAL CONNECTOR. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDED ROUND STEEL WASHER THAT IS 2" O.D. X 3/8" 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".
- ④ W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POST WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS. DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THREE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.



SECTION C-C

Addendum No. 02
ID 3766-00-70
Added Sheet 29S
January 9, 2017

STEEL THREE BEAM STRUCTURE APPROACH CONNECTION TO SQUARE END PARAPETS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED	/s/ Jerry H. Zogg ROADWAY STANDARDS DEVELOPMENT ENGINEER
DATE	8/31/2012
FHWA	

GENERAL NOTES

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

BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A325, A449 AND GALVANIZED PER STANDARD SPECIFICATIONS 604.

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 RECESS TO BE MADE IN THE PARAPET. VERIFY BOLT LENGTH AND THREADING LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THE BEAM TERMINAL CONNECTOR. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 3/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.

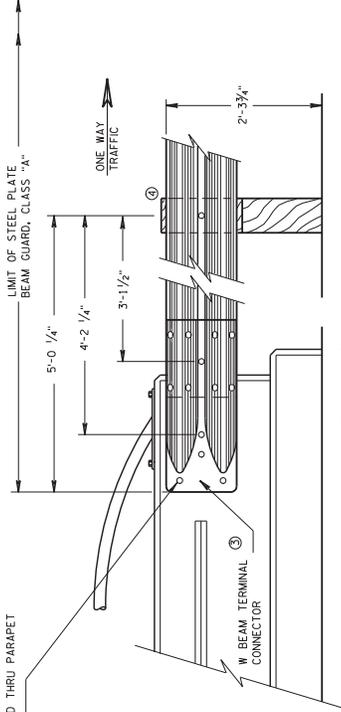
③ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".

④ W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE TO BE USED FOR ALL PLATE BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.

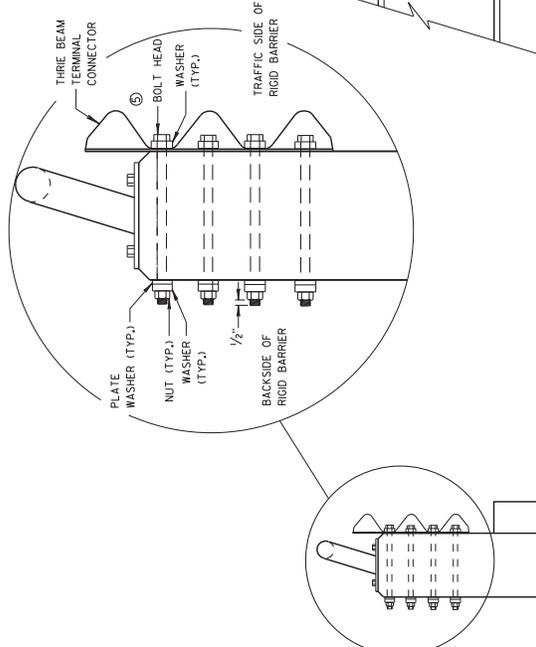
⑤ BOLT, NUT AND WASHERS NOT REQUIRED FOR THIS LOCATION WHEN RETROFITTING AN EXISTING PARAPET AND THE HOLE IS EITHER ABOVE PARAPET OR WITHIN 4 INCHES OF THE EDGE OF PARAPET.

DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THREE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.

- ① 3/8" DIA. HEX HEAD CAP SCREWS INTO THE BRIDGE DECK WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER
- 3/4" DIA. H.S. HEX BOLT AND WASHERS REQUIRED
- 1" DIA. HOLES DRILLED THRU PARAPET (4 REQ'D.)

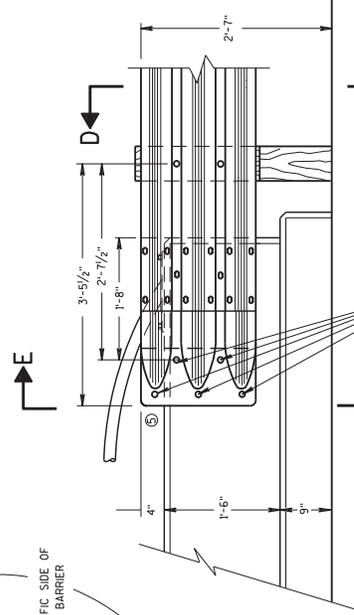


FRONT VIEW
W BEAM CONNECTION TO VERTICAL FACE PARAPET
 (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)



SECTION E-E

- ① 3/8" DIA. HEX HEAD CAP SCREWS INTO THREADED INSERTS (FURNISHED WITH THE BRIDGE) WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER
- 3/4" DIA. H.S. HEX BOLT AND WASHERS REQUIRED
- 1" DIA. HOLES DRILLED THRU PARAPET (4 REQ'D.)



FRONT VIEW

SECTION D-D

THREE BEAM CONNECTION TO VERTICAL FACED PARAPETS

Addendum No. 02
 ID 3766-00-70
 Added Sheet 29T
 January 9, 2017

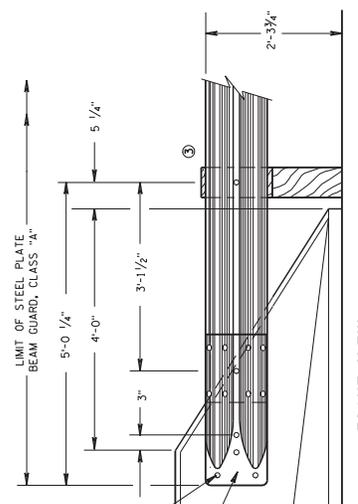
STEEL THREE BEAM STRUCTURE APPROACH, CONNECTION TO VERTICAL FACED PARAPETS

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

APPROVED
 DATE 8/31/2012
 /s/ Jerry H. Zoogg
 ROADWAY STANDARDS DEVELOPMENT ENGINEER
 FHWA

ONE WAY TRAFFIC

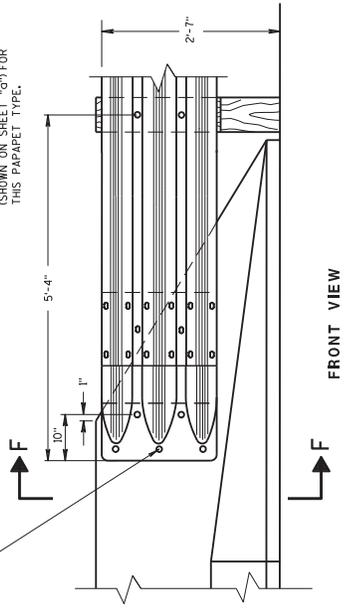
- ① ② 3/4" DIA. HEX HEAD CAP SCREWS INTO THREADED INSERTS (FURNISHED WITH THE BRIDGE) WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER
- 3/8" DIA. HS.-HEX BOLT AND WASHERS REQUIRED
- 1" DIA. HOLES DRILLED THRU PARAPET (4 REQ'D.)



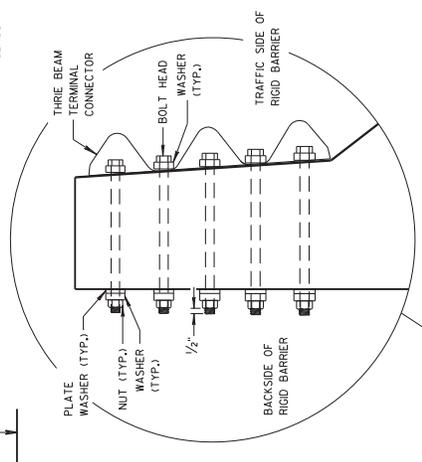
FRONT VIEW
W BEAM CONNECTION TO
PARAPETS WITH SLOPED ENDS
 (USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)

- ① ② 3/8" DIA. HS.-HEX BOLT AND WASHERS REQUIRED
- 1" DIA. HOLES DRILLED THRU PARAPET (5 REQ'D.)

NOTE:
 OMIT THE FIRST POST (SHOWN ON SHEET "01") FOR THIS PARAPET TYPE.



FRONT VIEW
THREE BEAM CONNECTION TO BRIDGE
PARAPETS WITH SLOPED ENDS

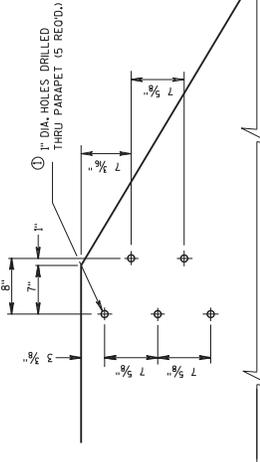


SECTION F-F

GENERAL NOTES

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

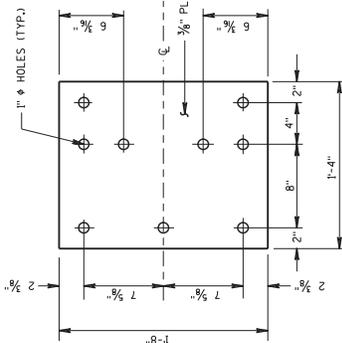
- ① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THREE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH, ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THREE BEAM TERMINAL CONNECTOR. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 3/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ③ W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATES FOR WOOD BLOCKOUTS WITH WOOD PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS. DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THREE BEAM CONNECTION APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.



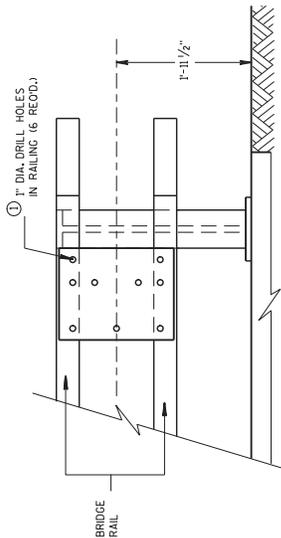
DRILL HOLE LOCATION AND PATTERN
FOR THREE BEAM CONNECTION

Addendum No. 02
 ID 3766-00-70
 Added Sheet 29U
 January 9, 2017

STEEL THREE BEAM STRUCTURE APPROACH CONNECTION TO SLOPED END PARAPETS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	APPROVED 8/31/2012 DATE
/S/ JEFFY H. ZOOB ROADWAY STANDARDS DEVELOPMENT ENGINEER	



BACK-UP PLATE DETAIL



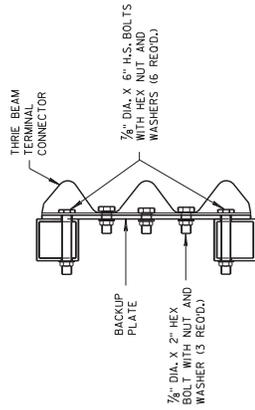
BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING

GENERAL NOTES

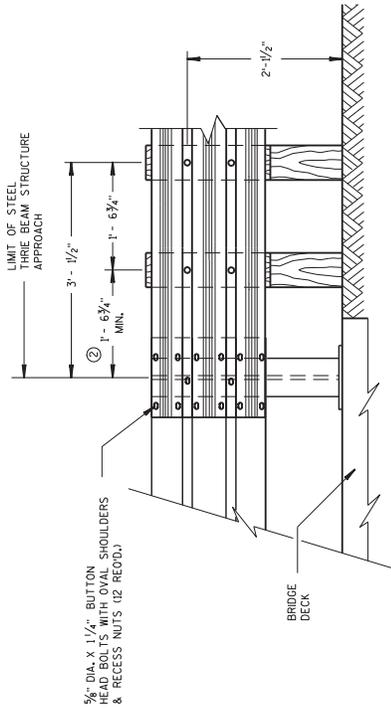
BOLTS, PLATES, NUTS AND WASHERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A 325 AND BE GALVANIZED IN ACCORDANCE WITH ASTM A 153.

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

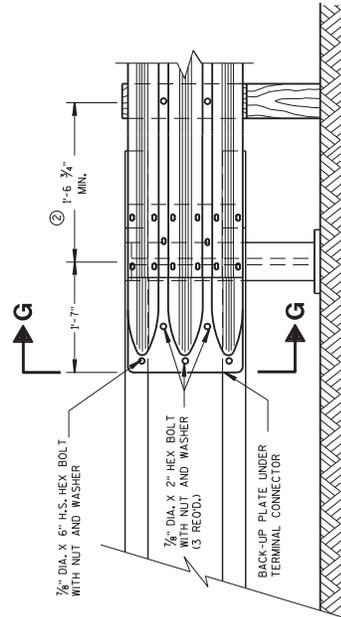
② VARY THIS DIMENSION DEPENDING ON ABUTMENT TYPE, MINOR DETAIL, AND ANGLE OF SHEAR. THE FIRST WOOD POST OFF THE BRIDGE SHALL AS CLOSE AS FEASIBLE TO THE STEEL END POST.



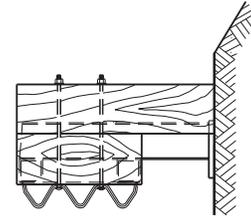
SECTION G-G



FRONT VIEW THRIE BEAM CONNECTION TO STEEL RAILING TYPE "W"



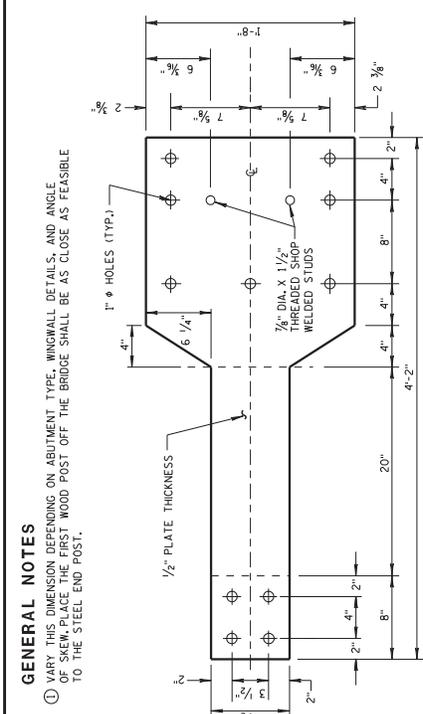
FRONT VIEW THRIE BEAM CONNECTION TO TUBULAR RAILING TYPE "F"



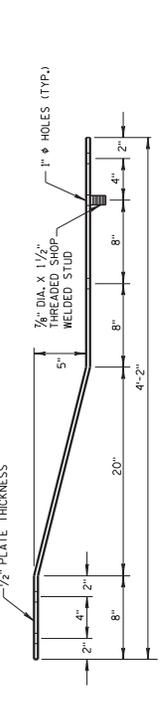
END VIEW THRIE BEAM CONNECTION TO TUBULAR RAILING TYPE "F"

Addendum No. 02
ID 3766-00-70
Added Sheet 29V
January 9, 2017

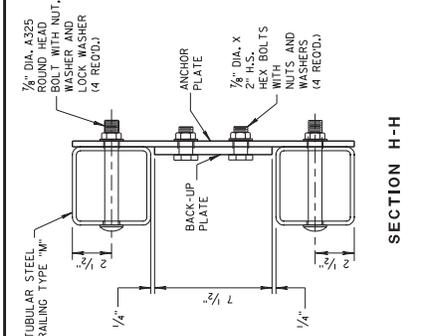
STEEL THRIE BEAM STRUCTURE APPROACH CONNECTION TO BRIDGE RAILING TYPES "F" AND "W"
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED 8/31/2012 DATE
/s/ JEFF Y. H. ZOGG ROADWAY STANDARDS DEVELOPMENT ENGINEER
PHWA



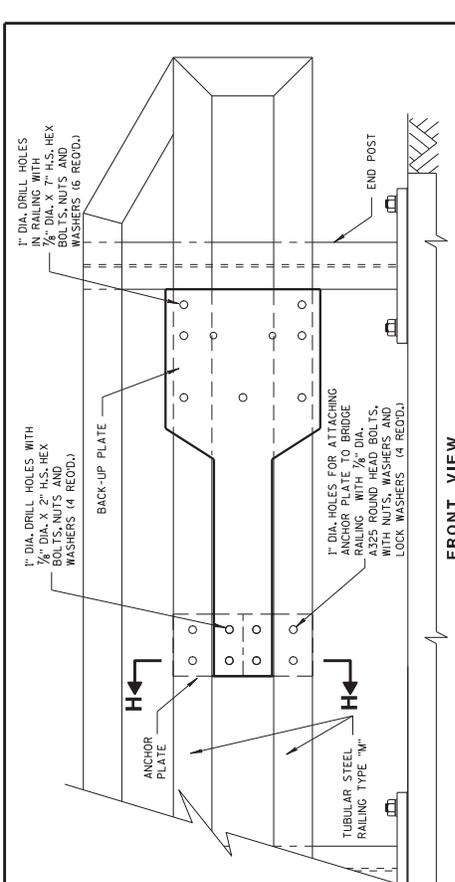
FRONT VIEW



PLAN VIEW



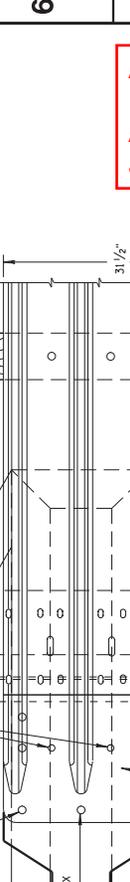
SECTION H-H



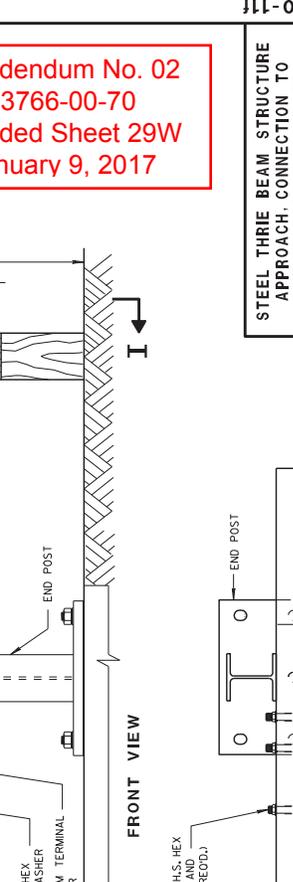
FRONT VIEW



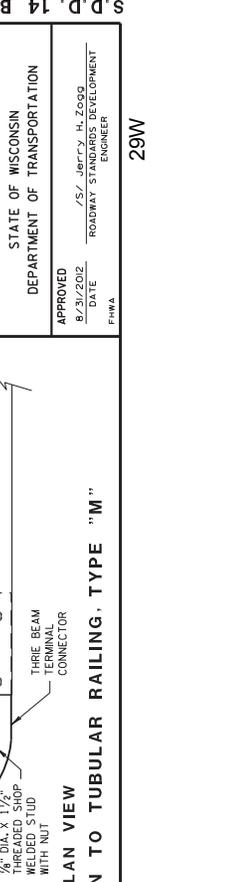
FRONT VIEW



PLAN VIEW



SECTION I-I



FRONT VIEW

GENERAL NOTES

1 VARY THIS DIMENSION DEPENDING ON ABUTMENT TYPE, WINGWALL DETAILS, AND ANGLE OF SKEW; PLACE THE FIRST WOOD POST OFF THE BRIDGE SHALL BE AS CLOSE AS FEASIBLE TO THE STEEL END POST.

Addendum No. 02
ID 3766-00-70
Added Sheet 29W
January 9, 2017

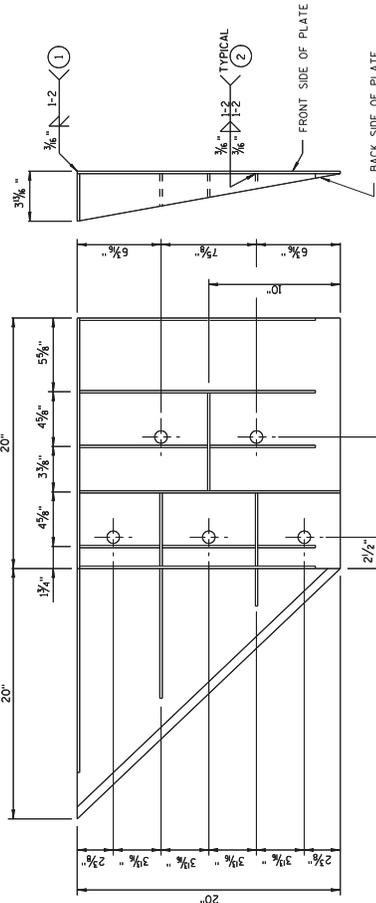
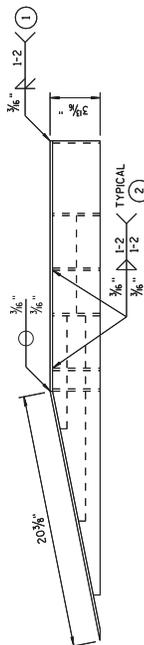
STEEL THRIE BEAM STRUCTURE APPROACH CONNECTION TO BRIDGE RAILING TYPE "M"
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED DATE 8/31/2012
/s/ Jerry H. Zogg ROADWAY STANDARDS DEVELOPMENT ENGINEER

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

GENERAL NOTES

- COVER PLATE PANELS ARE 3/8" 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 3/8" 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:
3/8" FILLET WELD BY 1" LONG SPACED AT 2".



WELDING INSTRUCTION

(VIEWED FROM BACK SIDE OF PLATE)

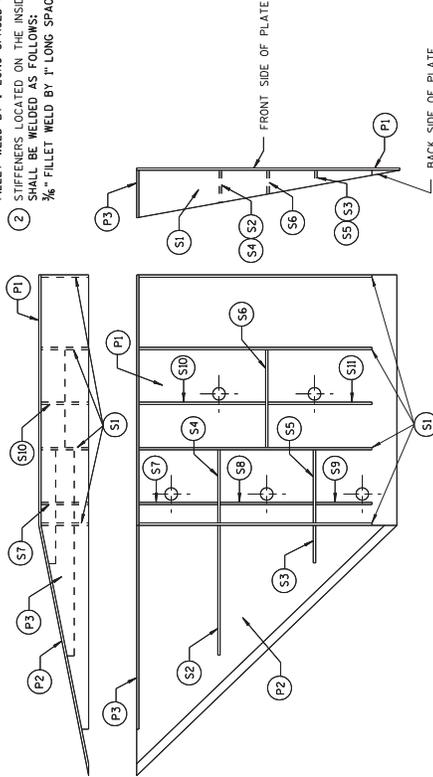


PLATE AND STIFFENER IDENTIFICATION

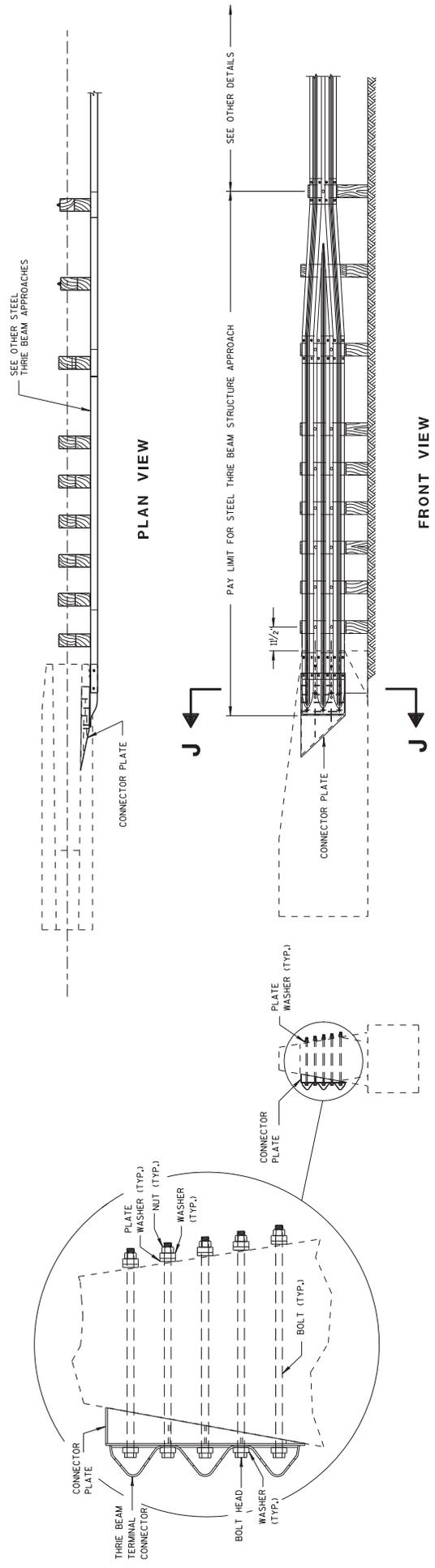
(VIEWED FROM BACK SIDE OF PLATE)

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

Addendum No. 02
ID 3766-00-70
Added Sheet 29X
January 9, 2017

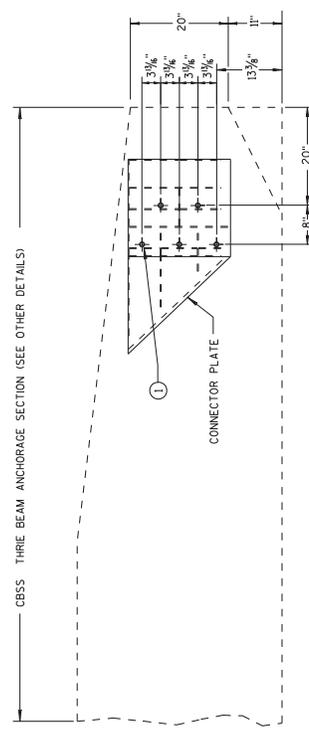
STEEL THRIE BEAM STRUCTURE APPROACH

STEEL THRIE BEAM STRUCTURE APPROACH CONNECTOR PLATE DETAIL	
APPROVED	STATE OF WISCONSIN
DATE	DEPARTMENT OF TRANSPORTATION
8/31/2012	
	/S/ Jerry H. Zogg
	ROADWAY STANDARDS DEVELOPMENT ENGINEER
	PHWA



GENERAL NOTES

- CONSTRUCT PER STANDARD SPECIFICATION 614.
- CONNECTOR PLATE, DRILLING HOLES THROUGH PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM TERMINAL CONNECTOR. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 7/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.



CONNECTOR PLATE LOCATION

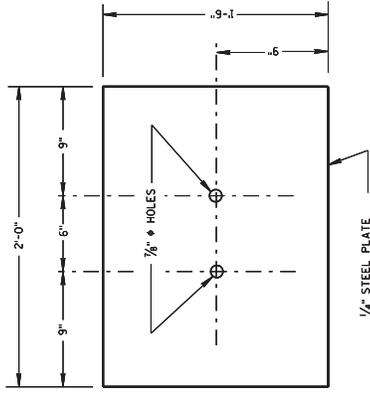
STEEL THRIE BEAM STRUCTURE APPROACH

**STEEL THRIE BEAM
STRUCTURE APPROACH
SINGLE SLOPE ATTACHMENT**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/31/2012
DATE
/S/ JERRY H. ZOGG
ROADWAY STANDARDS DEVELOPMENT
ENGINEER
FHWA

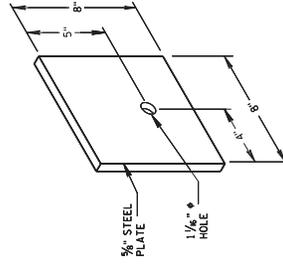
Addendum No. 02
ID 3766-00-70
Added Sheet 29Y
January 9, 2017



1/4" STEEL PLATE

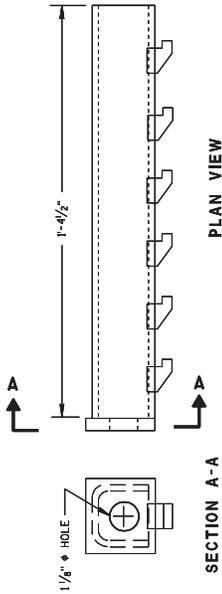
③ SOIL PLATE

(SKT-350, ET-2000/ET-2000 PLUS)



⑦ STEEL BEARING PLATE

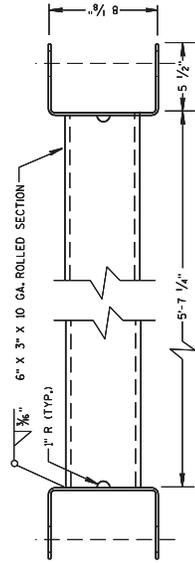
(SKT-350, ET-2000/ET-2000 PLUS)



PLAN VIEW

SECTION A-A

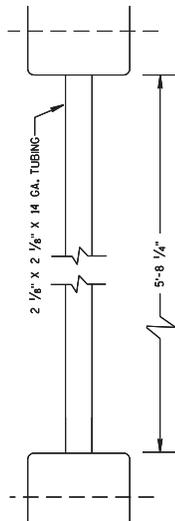
⑨ CABLE ANCHOR BOX (ET-2000/ET-2000 PLUS)



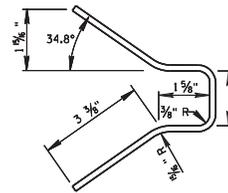
⑩ STRUT DETAIL (ET-2000/ET-2000 PLUS)

(ET-2000/ET-2000 PLUS)

Addendum No. 02
 ID 3766-00-70
 Added Sheet 29Z
 January 9, 2017



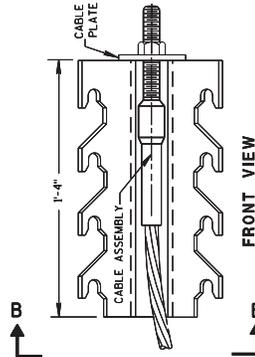
⑪ STRUT DETAIL (SKT-350)



SECTION B-B

⑨ CABLE ANCHOR BOX (SKT-350)

(SKT-350)



FRONT VIEW

STEEL PLATE BEAM GUARD
 ENERGY ABSORBING TERMINAL

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

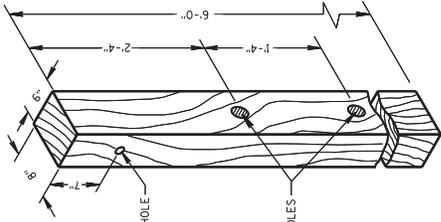
STEEL PLATE BEAM GUARD, ENERGY ABSORBING TERMINAL SHALL BE PAID FOR BY THE CONTRACTOR. SEE SECTION 2900 FOR SHIELDING HARDWARE. STEEL PLATE BEAM GUARD, POSTS, REFLECTIVE SHEETING AND INSTALLATION AS SHOWN.

WHEN ROCK IS ENCOUNTERED DURING EXCAVATION, A 12 INCH DIA. POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK MAY BE USED IF APPROVED BY THE ENGINEER. GRANULAR MATERIAL SHALL BE PLACED IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 1/2" INCHES DEEP TO PROVIDE DRAINAGE. THE SOIL TUBES SHALL BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH ADEQUATELY COMPACTED MATERIAL EXCAVATED FROM THE HOLE.

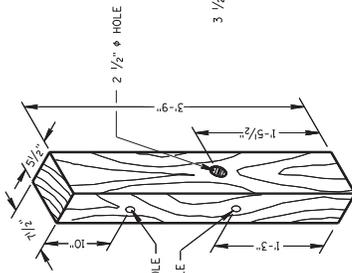
SEE APPROVED PRODUCTS LIST FOR ACCEPTABLE E. A. T. MARKER POST.

ⓐ 1/2" DIA. X 3" LAG BOLT WITH WASHER.

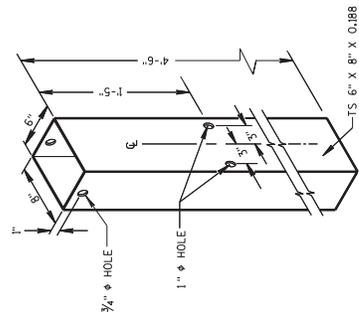
Addendum No. 02
ID 3766-00-70
Added Sheet 29AA
January 9, 2017



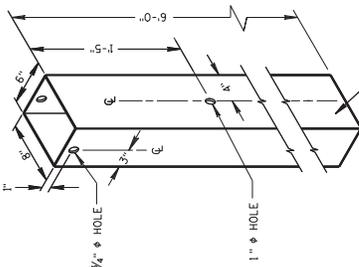
④ CRT POST
(POSTS NOS 5-6)



① TERMINAL POST
(POSTS NO. 1-4)

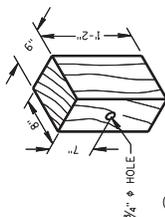


② 54" STEEL TUBE
(POSTS NO. 1-4)

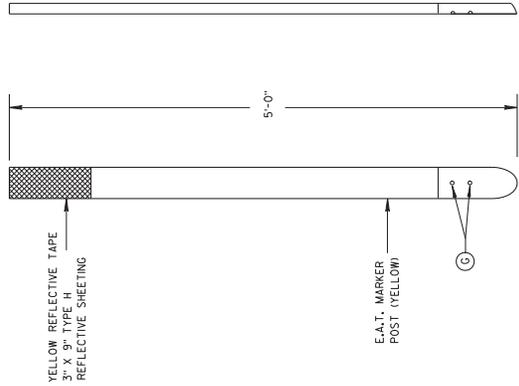


② 72" STEEL TUBE
(POSTS NO. 1-4)

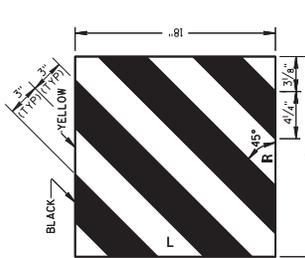
WOOD BREAKAWAY POSTS



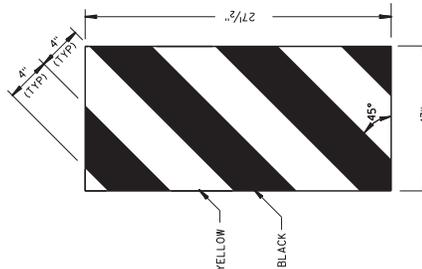
⑤ WOOD OFFSET BLOCK
REQD. AT ALL POSTS EXCEPT POST NOS 1 & 2



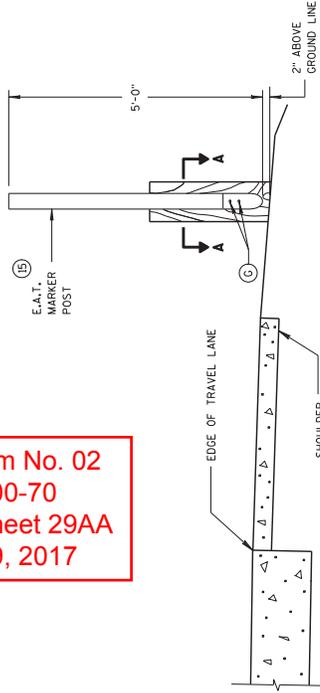
⑮ E.A.T. MARKER POST
FRONT VIEW
SIDE VIEW



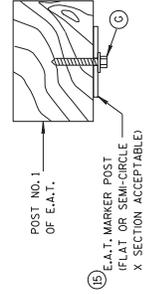
ET-2000 AND SKT-350
REFLECTIVE SHEETING DETAILS



ET-2000 PLUS ONLY
REFLECTIVE SHEETING DETAILS



TYPICAL INSTALLATION OF E.A.T. MARKER POST BACKSIDE OF POST NO. 1
(E.A.T. AND RAIL REMOVED FOR CLARITY)

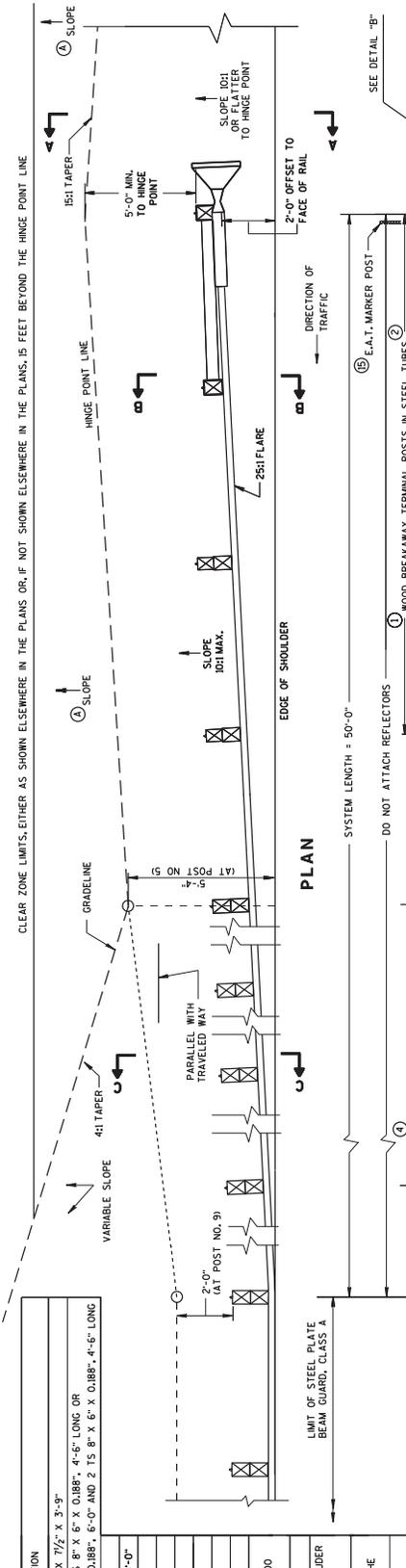


SECTION A-A

STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED _____ DATE 4-12-10 P.H.M.A.
/S/ JERRY H. ZOGG ROADWAY STANDARDS DEVELOPMENT ENGINEER

BILL OF MATERIALS

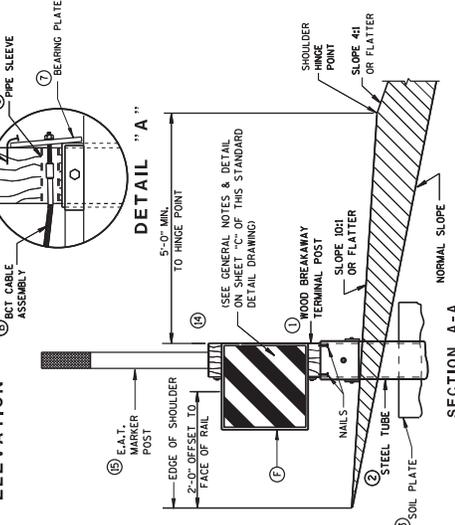
NOTE NO. / QTY.	DESCRIPTION
1	WOOD BREAKAWAY TERMINAL POST: 5/2" x 7/2" x 3'-9"
2	STEEL TUBE: OPTION 1 - QUANTITY OF 4 15 8" x 6" x 0.188", 4'-6" LONG OR OPTION 2 - QUANTITY OF 2 15 8" x 6" x 0.188", 6'-0" AND 2 15 8" x 6" x 0.188", 4'-6" LONG
3	SOIL PLATE: 2'-0" x 1'-6" x 1/2" **
4	WOOD BREAKAWAY CRT POST: 6" x 8" x 6'-0"
5	WOOD OFFSET BLOCKS: 6" x 8" x 1'-2"
6	PPE SLEEVE: 2" x 5 1/2" STANDARD PIPE
7	BEARING PLATE
8	1 BCT CABLE ASSEMBLY
9	CABLE ANCHOR BOX
10	STRUT & YOKE
11	STEEL PLATE BEAM END PANEL
12	1 ET-2000/ET-2000 PLUS GUARDRAIL EXTRUDER OR SKT-350 IMPACT HEAD: AS FURNISHED BY MANUFACTURER
13	1 6000' ALUMINUM SHEET WITH REFLECTIVE SURFACE: SECTION G37 OF THE STANDARD SPECIFICATIONS
14	1 E.A.T. MARKER POST



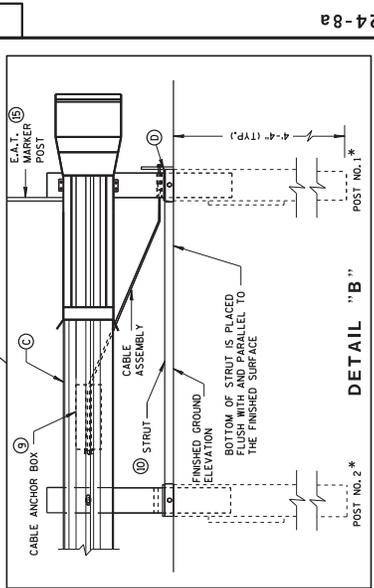
GENERAL NOTES

- FOLLOW MANUFACTURER'S BOLTING RECOMMENDATIONS, IF NONE ARE AVAILABLE, INSTALL 3/8" x 1'-6" BUTTON HEAD BOLTS AT ALL POSTS EXCEPT FOR POST 1.
- THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (H.P.L.), AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
- AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED.
- THE 13 SLOT FIRST RAIL PANEL MAY BE USED IN LIEU OF THE 3 SLOT RAIL PANEL ON SKT-350 ONLY.
- THE TOP OF THE STEEL TUBE ON POSTS 1 THROUGH 4 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.
- THE CENTER OF THE UPPER 3/2" DIAMETER HOLE ON POST 5 THROUGH 8 SHALL BE 7/2" ABOVE THE FINISH GROUND ELEVATION.
- ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS, ONE SCREW PER CORNER.
- STEEL POSTS SHALL NOT BE ALLOWED FOR USE WITH ENERGY ABSORBING TERMINALS.
- INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
- DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.
- SDD SHOWS 4 - 54 INCH STEEL TUBES WITH SOIL PLATES INSTALLED ON POST 1 THROUGH 4. THE ALTERNATIVE INSTALLATION WOULD CONSIST OF 2 - 72 INCH STEEL TUBES ON POST 1 AND POST 2 AND 54 INCH SOIL TUBES ON POSTS 3 AND 4. THE ALTERNATIVE INSTALLATION DOES NOT REQUIRE SOIL PLATES.

ELEVATION



6



6



TYPICAL AT POST NO. 1 *

TYPICAL AT POST NO. 2 *

TYPICAL AT POST NOS. 6, 8

TYPICAL AT POST NO. 9

TYPICAL AT POST NO. 10

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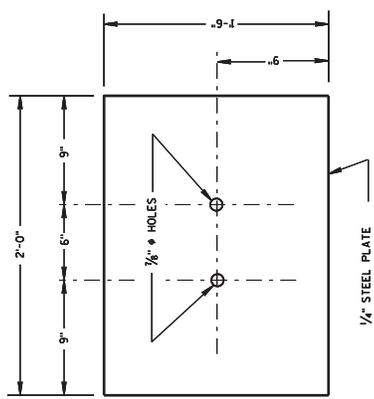
TYPICAL AT POST NO. 228

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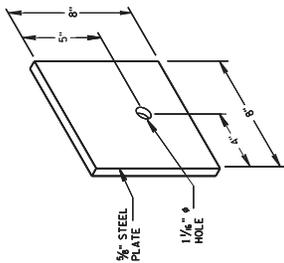
TYPICAL AT POST NO. 2



1/4" STEEL PLATE

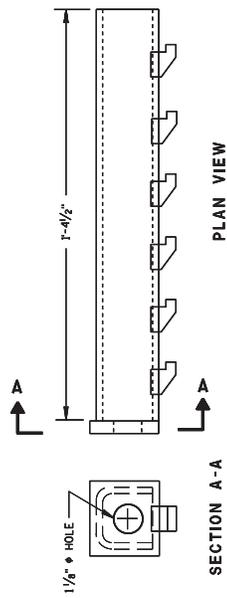
③ SOIL PLATE

(SKT-350, ET-2000/ET-2000 PLUS)



7 STEEL BEARING PLATE

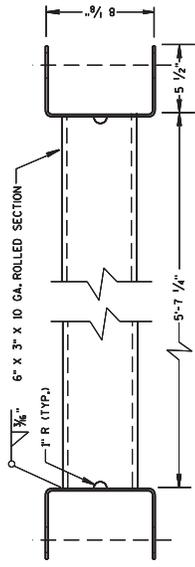
(SKT-350, ET-2000/ET-2000 PLUS)



PLAN VIEW

SECTION A-A

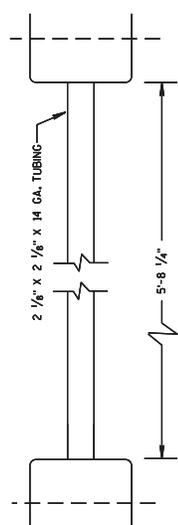
⑨ CABLE ANCHOR BOX (ET-2000/ET-2000 PLUS)



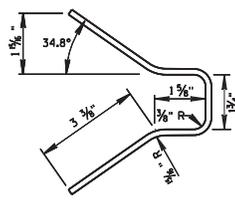
⑩ STRUT DETAIL (ET-2000/ET-2000 PLUS)

(ET-2000/ET-2000 PLUS)

Addendum No. 02
 ID 3766-00-70
 Added Sheet 29AC
 January 9, 2017



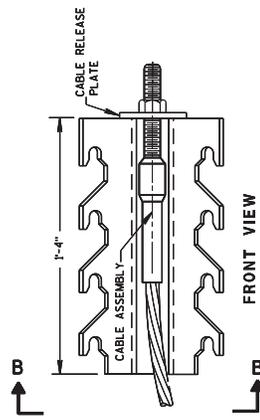
⑩ STRUT DETAIL (SKT-350)



SECTION B-B

⑨ CABLE ANCHOR BOX (SKT-350)

(SKT-350)



FRONT VIEW

STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

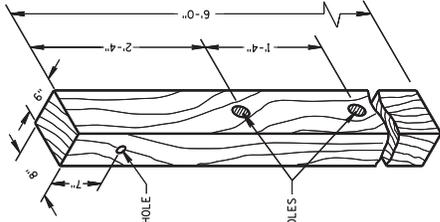
GENERAL NOTES

WHEN ROCK IS ENCOUNTERED DURING EXCAVATION A 12 INCH DIA. POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK MAY BE USED IF APPROVED BY THE ENGINEER. GRANULAR MATERIAL SHALL BE PLACED IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 1/2 INCHES DEEP TO PROVIDE DRAINAGE. THE SOIL TUBES SHALL BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH ADEQUATELY COMPACTED MATERIAL EXCAVATED FROM THE HOLE.

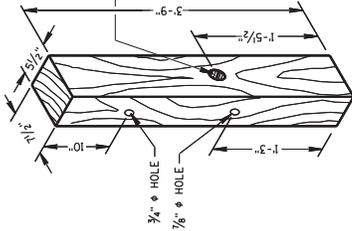
SEE APPROVED PRODUCTS LIST FOR ACCEPTABLE E. A. T. MARKER POST.

(G) 1/2" DIA. X 3" LAG BOLT WITH WASHER.

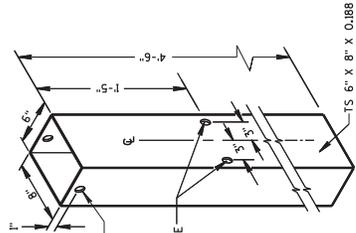
Addendum No. 02
ID 3766-00-70
Added Sheet 29AD
January 9, 2017



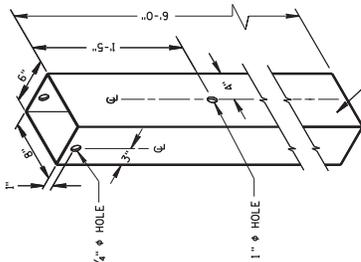
(4) CRT POST
(POSTS NOS 5-8)



(1) TERMINAL POST
(POSTS NO. 1-4)

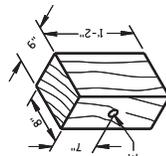


(2) 54" STEEL TUBE
(POSTS NO. 1-4)

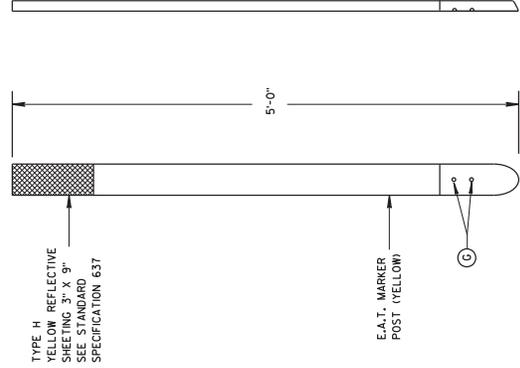


(2) 72" STEEL TUBE
(POSTS NO. 1-4)

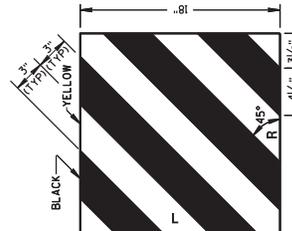
WOOD BREAKAWAY POSTS



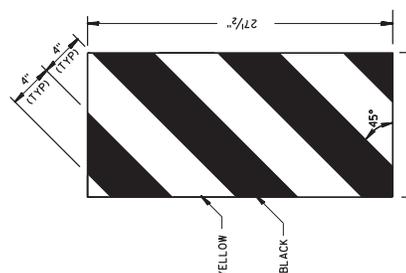
(5) WOOD OFFSET BLOCK
REDD. AT ALL POSTS EXCEPT POST NOS 1 & 2



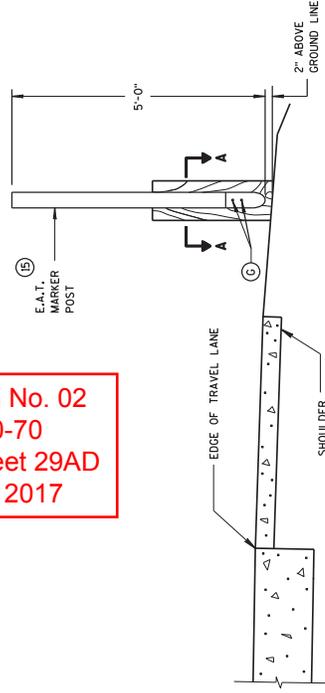
FRONT VIEW
SIDE VIEW
(15) E.A.T. MARKER POST



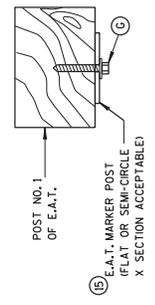
ET-2000 AND SKT-350
REFLECTIVE SHEETING DETAILS



ET-2000 PLUS ONLY
REFLECTIVE SHEETING DETAILS



TYPICAL INSTALLATION OF E.A.T. MARKER POST BACKSIDE OF POST NO. 1
(E.A.T. AND RAIL REMOVED FOR CLARITY)

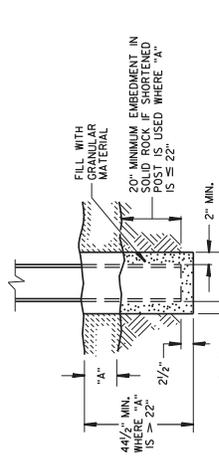


SECTION A-A

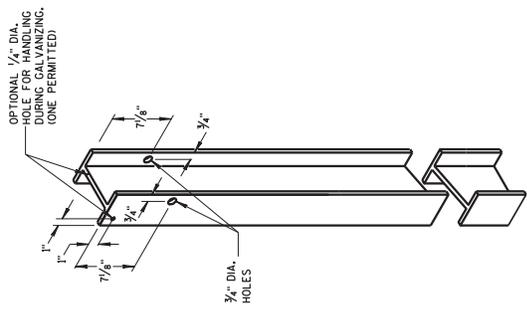
STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED JUNE 2014 DATE
/S/ JEFFRY H. ZOOB ROADWAY STANDARDS DEVELOPMENT ENGINEER

GENERAL NOTES

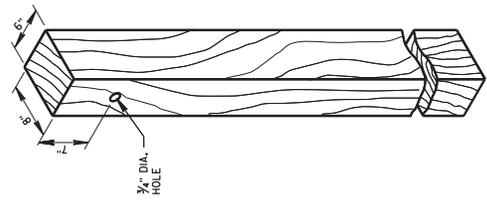
- 1 WOOD OR STEEL POSTS (W6X9 OR W6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- 2 USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF WOOD OR WOOD BLOCKOUTS SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.
- 3 IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2 1/2 INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS TO THE LENGTH AND INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.
- 4 WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).
- 5 FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS ± 1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 2 1/4" TO 3 1/2".
- 6 WHEN USING STEEL POST AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.



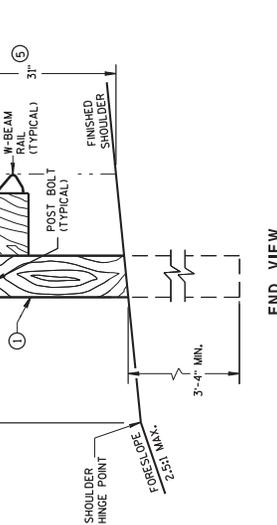
SETTING STEEL OR WOOD POST IN ROCK



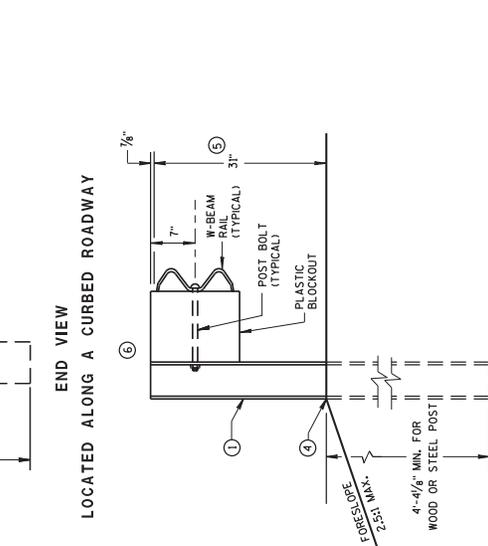
STEEL POST & HOLE PUNCHING DETAIL
(W6X9)



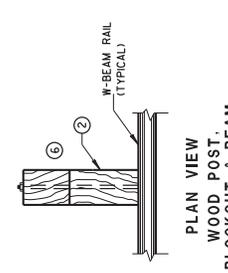
WOOD POST
(6" X 8") NOMINAL



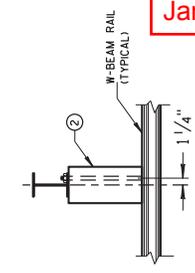
LOCATED ALONG A ROADWAY SHOULDER
STANDARD INSTALLATION



END VIEW
LOCATED ALONG A CURBED ROADWAY



PLAN VIEW
WOOD POST,
BLOCKOUT & BEAM



WOOD OR PLASTIC BLOCKOUT

PLAN VIEW
STEEL POST,
BLOCKOUT & BEAM

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

Addendum No. 02
ID 3766-00-70
Added Sheet 29AE
January 9, 2017

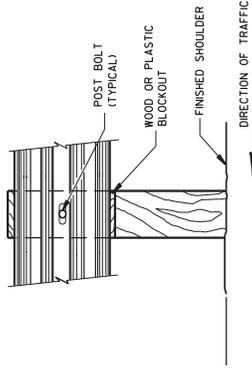
MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

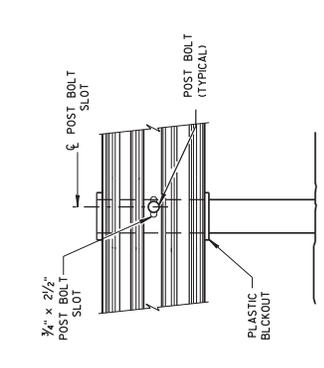
- ⑦ PROVIDE SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH YELLOW REFLECTIVE SHEETING. SHEETING IS TYPE H, SEE STANDARD SPECIFICATION 637.
- ⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.
- ⑨ REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.
- ⑩ PROVIDE AN ANGLE OF BEND OF 90° ± 1° FOR TWO-SIDED REFLECTORS.
- ⑪ 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.

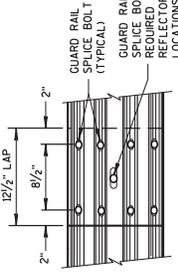
GUARD RAIL SPICE BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPICE BOLT REQUIRES 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.



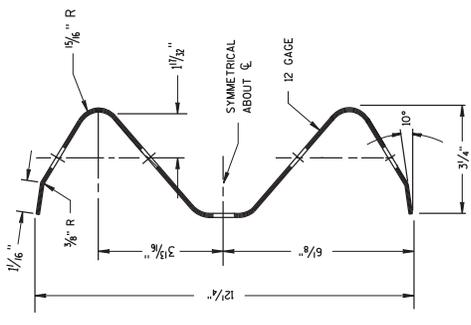
FRONT VIEW AT WOOD POST



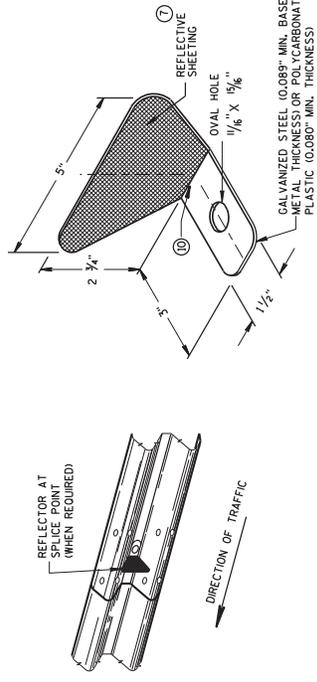
FRONT VIEW AT STEEL POST



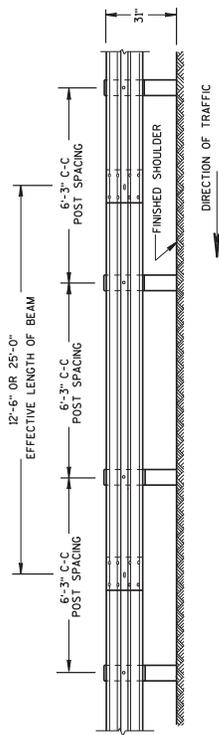
FRONT VIEW MID-SPAN BEAM SPICE



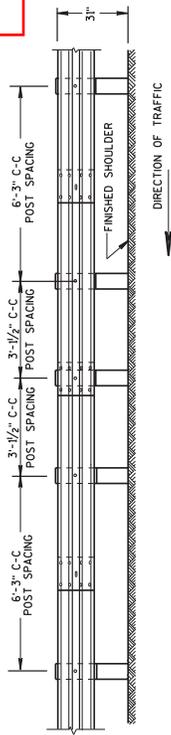
SECTION THRU W-BEAM RAIL



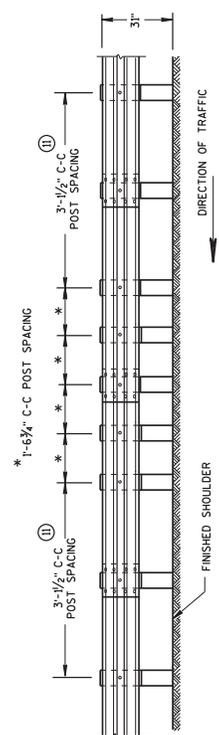
ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION



POST SPACING STANDARD INSTALLATION



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

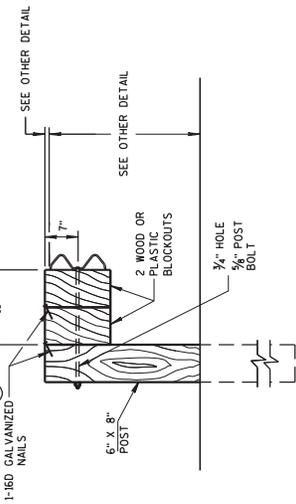


QUARTER POST SPACING (QS)

BEAM GUARD LENGTH	REFLECTOR SPACING	MIN. NO. REFLECTORS
< 200'	50' C-C	1
> 200'	100' C-C	3
< 200'	25' C-C	1
> 200'	50' C-C	6
< 200'	50' C-C	2
> 200'	100' C-C	3

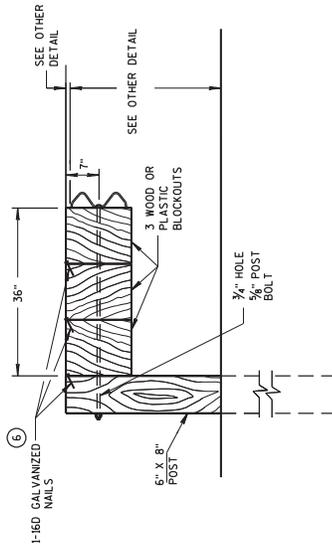
MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

Addendum No. 02
ID 3766-00-70
Added Sheet 29AF
January 9, 2017



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.

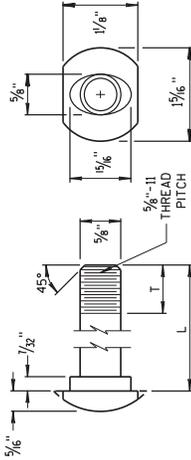


DETAIL FOR 36" BLOCKOUT DEPTH

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.

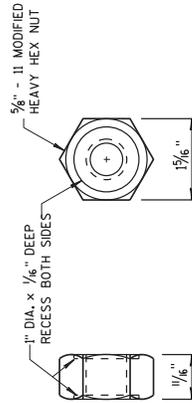
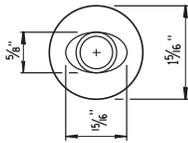
NOTE: 1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 1/8".
2. IF THE BOLT EXTENDS MORE THAN 1/4" FROM THE NUT THE BOLT SHOULD BE TRIMMED BACK.



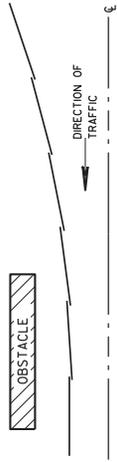
POST BOLT TABLE

L	T (MIN.)
1/4"	1/8"
2"	1 3/4"
10"	4"
14"	4 1/2"
18"	4"
21"	4 1/6"
25"	4"

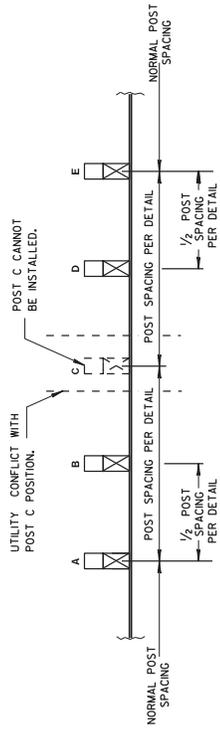
ALTERNATE BOLT HEAD



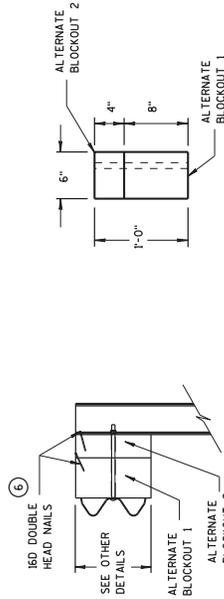
POST BOLT AND RECESS NUT



PLAN VIEW BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION

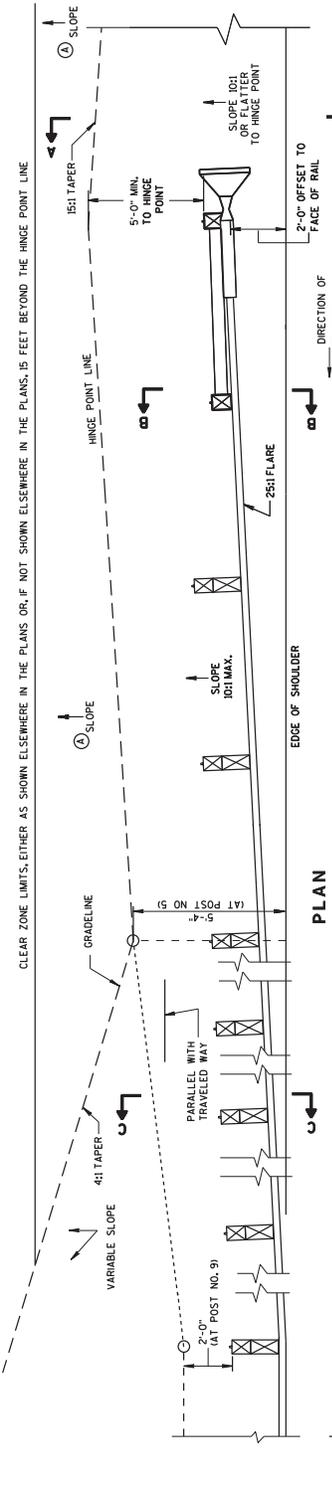


SIDE VIEW TOP VIEW
ALTERNATE WOOD
BLOCKOUT DETAIL

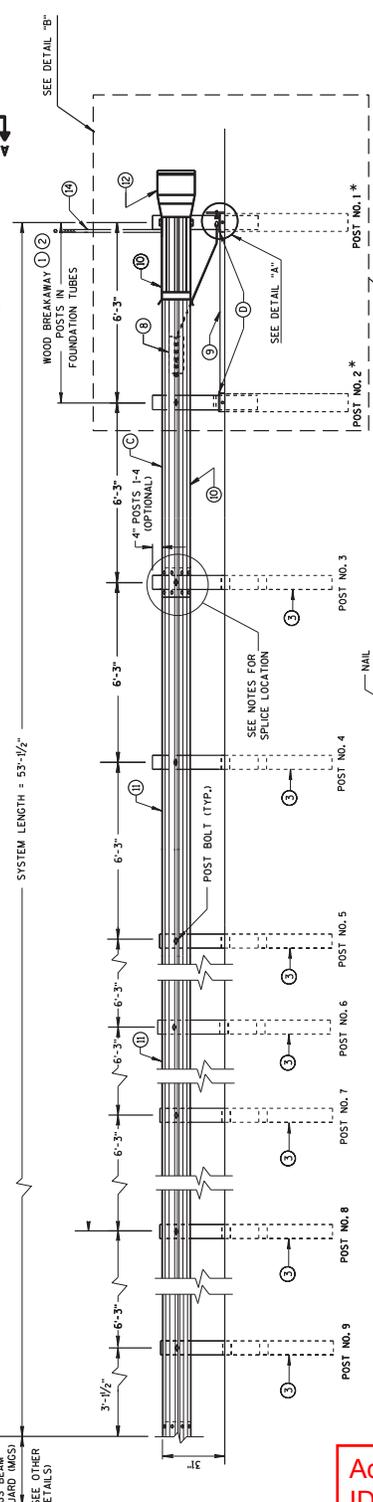
MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED DATE: June 2014
/S/ JERRY H. ZOGG ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

Addendum No. 02
ID 3766-00-70
Added Sheet 29AG
January 9, 2017

CLEAR ZONE LIMITS, EITHER AS SHOWN ELSEWHERE IN THE PLANS OR, IF NOT SHOWN ELSEWHERE IN THE PLANS, IS FEET BEYOND THE HINGE POINT LINE

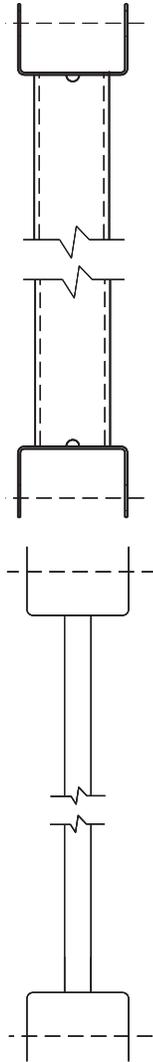


PLAN

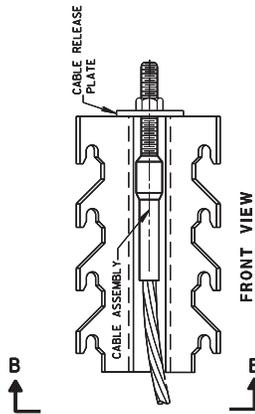


BILL OF MATERIALS

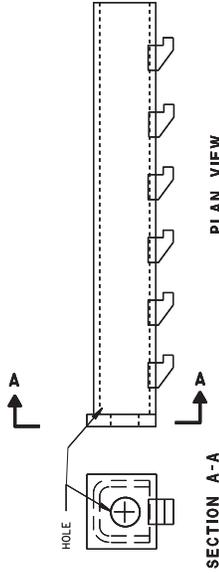
PART NO.	DESCRIPTION
1	MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
2	WOOD BREAKAWAY POST
3	6" X 8" X 0.188", 6'-0" LONG FOUNDATION TUBE AT POSTS 1 AND 2
4	WOOD CRT
5	WOOD BLOCKOUT
6	PIPE SLEEVE
7	BEARING PLATE
8	BCT CABLE ASSEMBLY
9	ANCHOR CABLE BOX
10	GROUND STRUT
11	PERFORATED W-BEAM RAIL END PANEL, 12'-6" LONG. STANDARD W-BEAM RAIL, MULTIPLE SECTIONS REQUIRED. SECTIONS VARY IN LENGTH.
12	END SECTION EAT
13	0.040" ALUMINUM SHEET WITH REFLECTIVE SHEETING TYPE F PER SECTION 637 OF THE STANDARD SPECIFICATIONS
14	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)



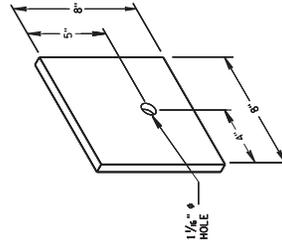
⑨ ④
GENERIC GROUND STRUT



SECTION B-B



⑧ ⑤ ⑥ ④
GENERIC ANCHOR CABLE BOX

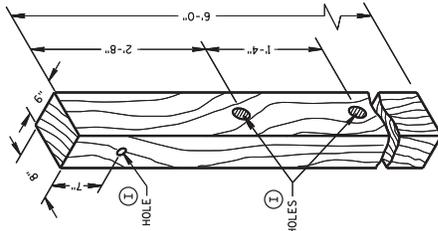


⑥
BEARING PLATE

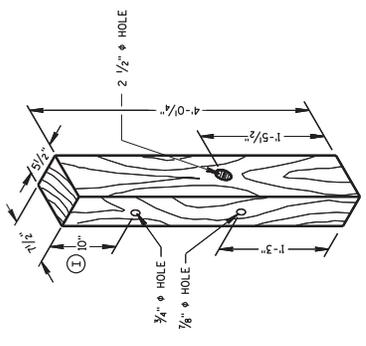
Addendum No. 02
ID 3766-00-70
Added Sheet 29AI
January 9, 2017

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

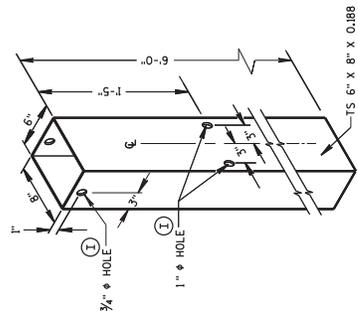
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



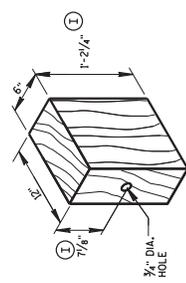
WOOD CRT POST
POSTS NUMBER 3-9



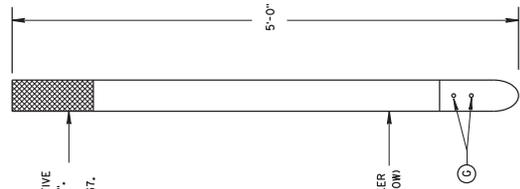
WOOD BREAKAWAY POST
POSTS NUMBER 1 AND 2



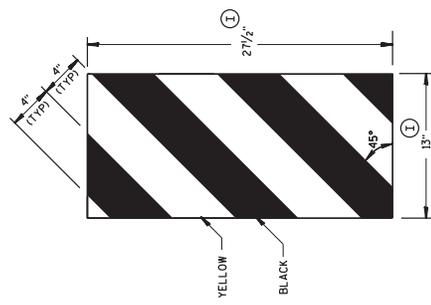
FOUNDATION TUBE
TS 6" X 8" X 0.088



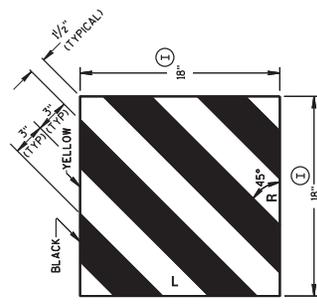
WOOD BLOCKOUT
REDD. AT ALL POSTS EXCEPT POST NOS 1 & 2



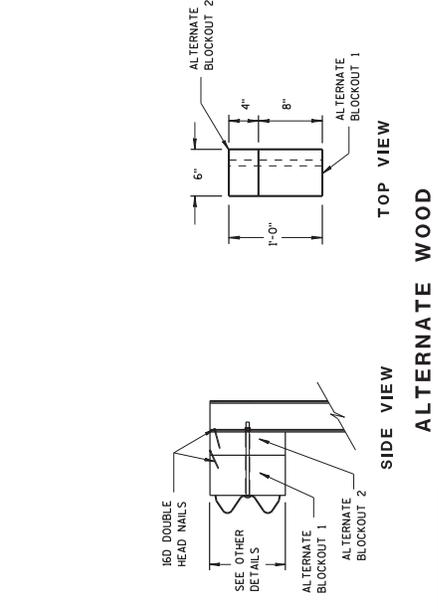
E.A.T. MARKER POST
SIDE VIEW



GENERIC REFLECTIVE SHEETING
REDD. AT ALL POSTS EXCEPT POST NOS 1 & 2

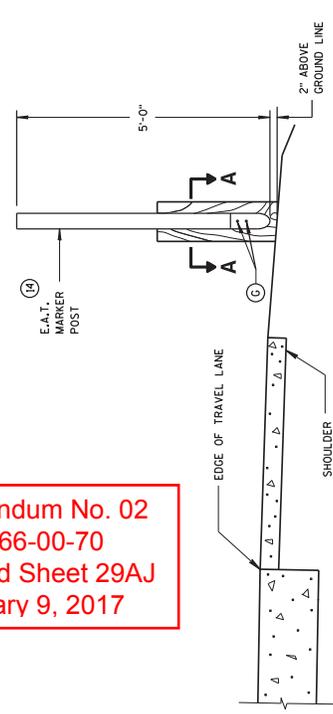


E.A.T. MARKER POST
FRONT VIEW

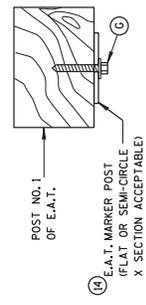


ALTERNATE WOOD BLOCKOUT DETAIL
TOP VIEW
SIDE VIEW

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ID 3766-00-70
Added Sheet 29AJ
January 9, 2017



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 /S/ JERRY H. ZOGG DATE June 2014 P.174
ENGINEER ROADWAY STANDARDS DEVELOPMENT

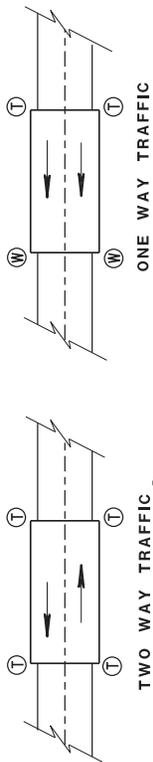
GENERAL NOTES

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

SEE STANDARD DETAIL DRAWING M B 42 FOR MORE INFORMATION.

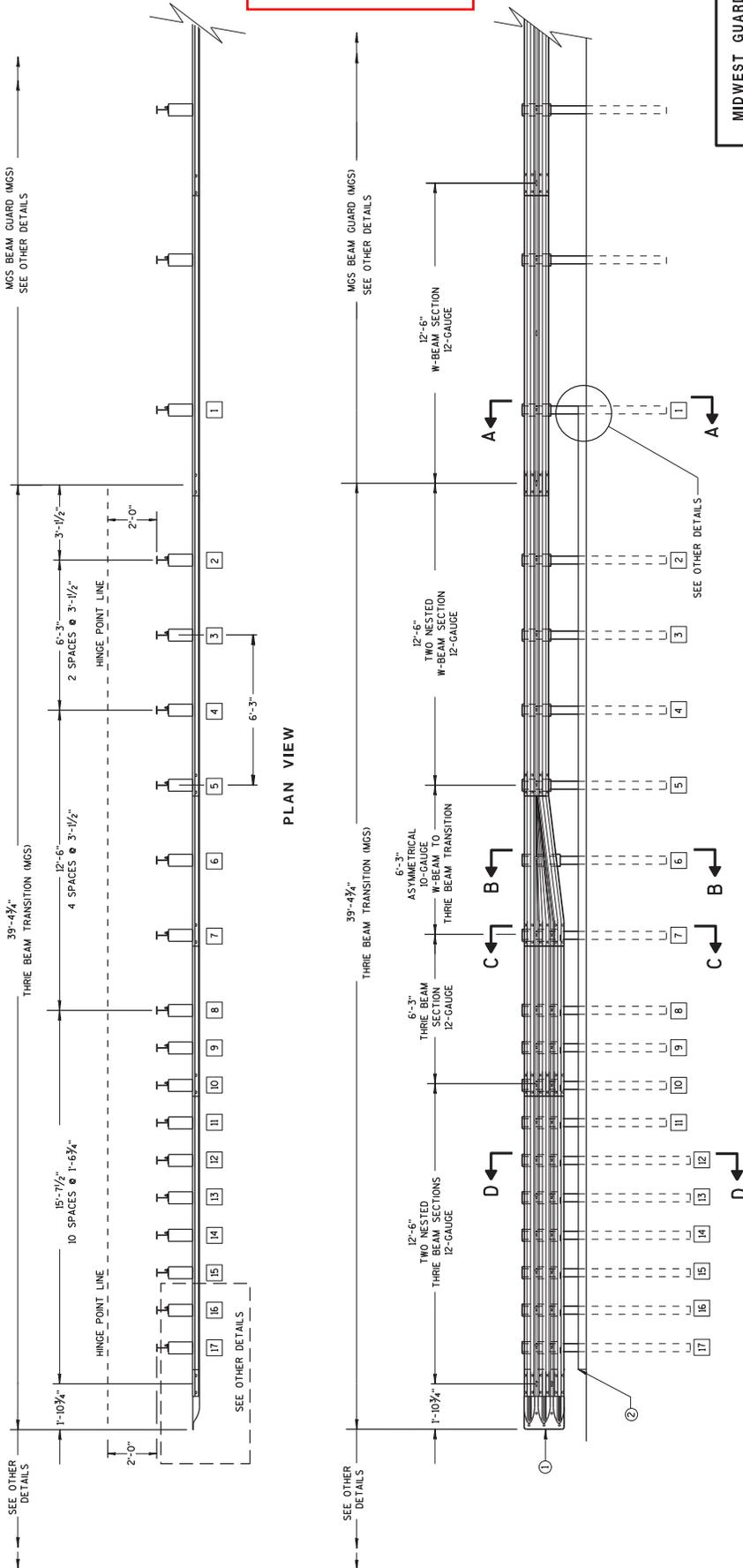
① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.

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



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

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



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ID 3766-00-70
Added Sheet 29AK
January 9, 2017

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

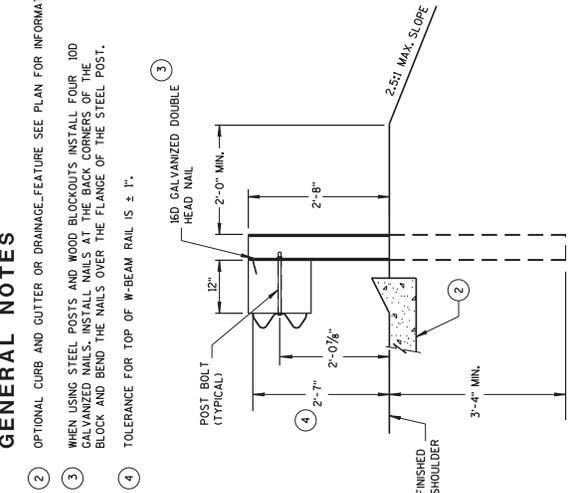
29AK

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

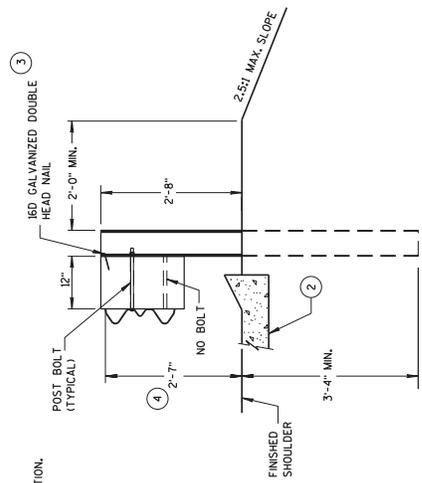
ELEVATION VIEW

GENERAL NOTES

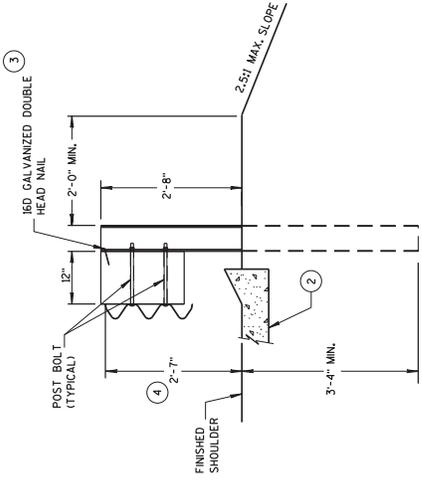
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ③ WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 100 GALVANIZED NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- ④ TOLERANCE FOR TOP OF W-BEAM RAIL IS $\pm 1"$.



**SECTION A-A
POSTS 1-5**



**SECTION B-B
POST 6**



**SECTION C-C
POSTS 7-11**

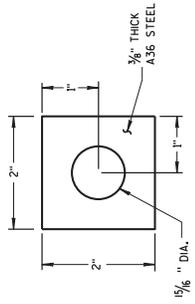
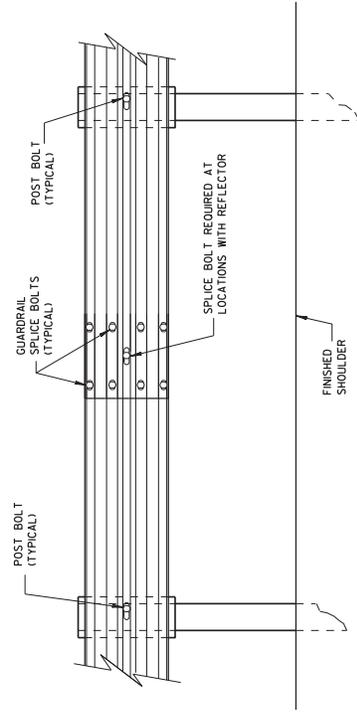
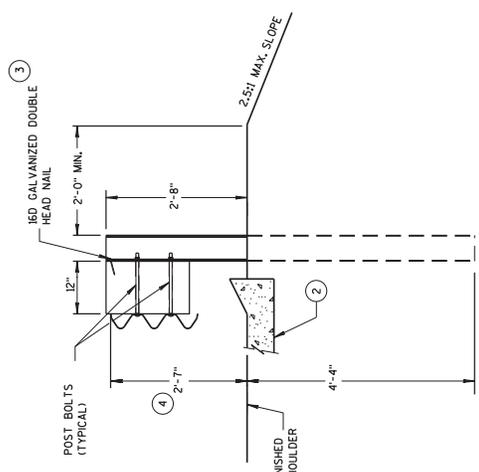


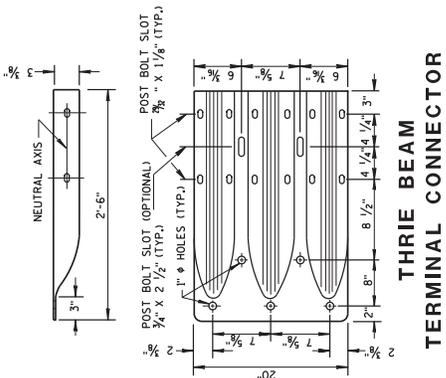
PLATE WASHER DETAIL



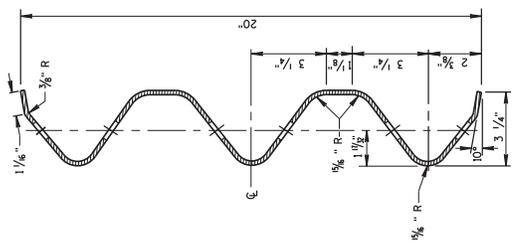
SPLICE DETAIL



**SECTION D-D
POSTS 12-17**



**THRIE BEAM
TERMINAL CONNECTOR**



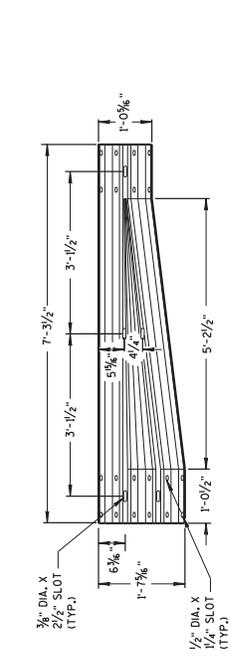
**SECTION THRU THRIE
BEAM RAIL ELEMENT**

**Addendum No. 02
 ID 3766-00-70
 Added Sheet 29AL
 January 9, 2017**

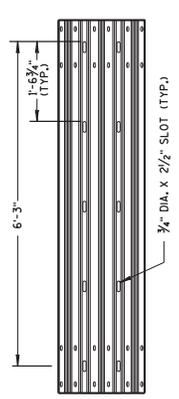
**MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

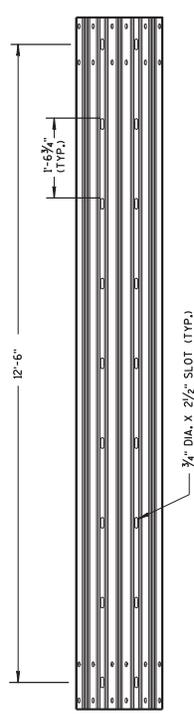
Addendum No. 02
 ID 3766-00-70
 Added Sheet 29AM
 January 9, 2017



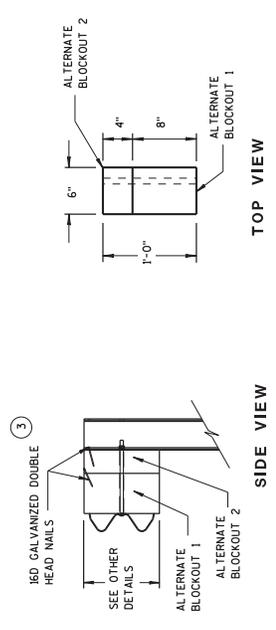
W-BEAM TO THRIE BEAM TRANSITION SECTION



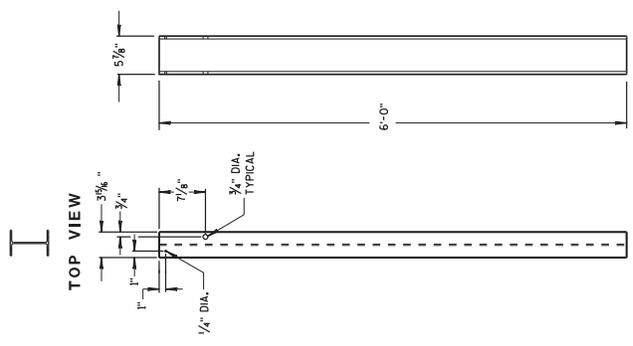
6'-3" THRIE BEAM SECTION



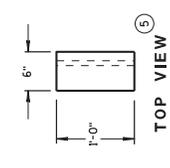
12'-6" THRIE BEAM SECTION



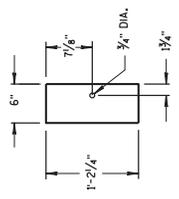
ALTERNATE WOOD BLOCKOUT DETAIL



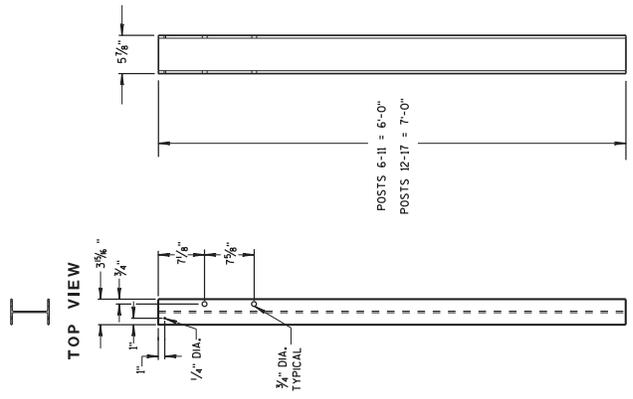
STEEL POSTS 1-5



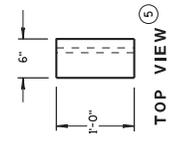
TOP VIEW



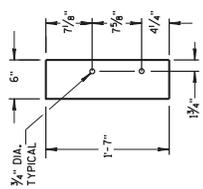
FRONT VIEW
 BLOCKOUT
 POSTS 1-5



STEEL POSTS 6-17



TOP VIEW



FRONT VIEW
 BLOCKOUT
 POSTS 6-17

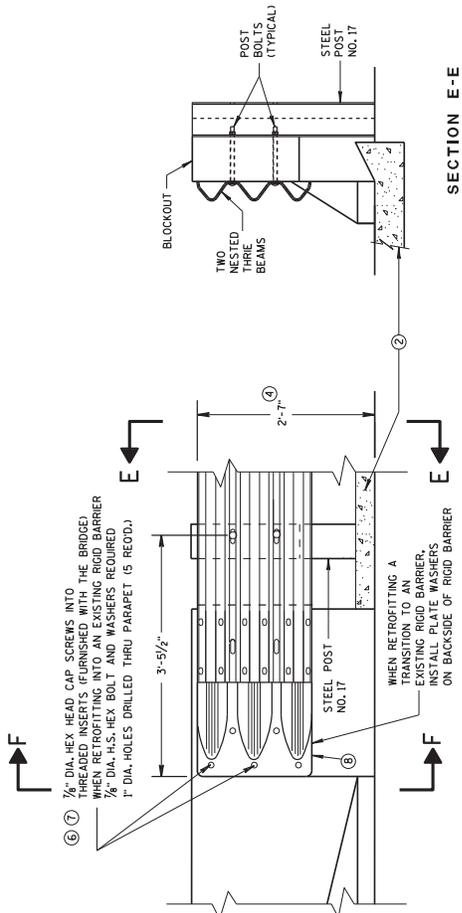
GENERAL NOTES

- STEEL POSTS ARE W6X9 OR W6X8.5.
- BOLT HOLES FOR POST ARE ON FRONT AND OF SIDE OF POST.
- WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- WOOD BLOCKS MAY BE CONSTRUCTED OUT OF 2 WOOD BLOCKS. SEE ALTERNATE WOOD BLOCK DETAIL.

MIDWEST GUARDRAIL SYSTEM
 THRIE BEAM TRANSITION (MGS)
 STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

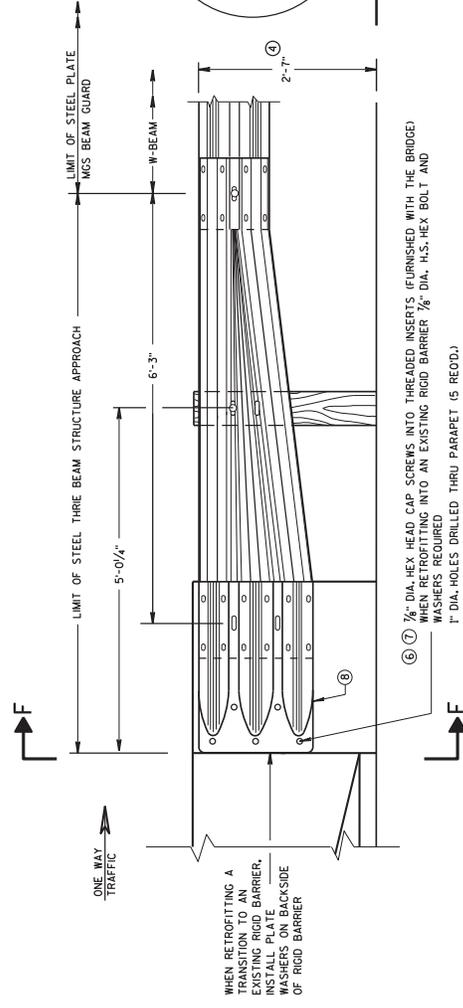
GENERAL NOTES

- ① THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSITION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ③ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ④ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑤ BOLTS MAY BE L30S BOLTS OR A499 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THREE BEAM CONNECTION PLATE. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THREE BEAM CONNECTION PLATE. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THREE BEAM CONNECTION PLATE. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THREE BEAM CONNECTION PLATE.
- ⑥ 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".

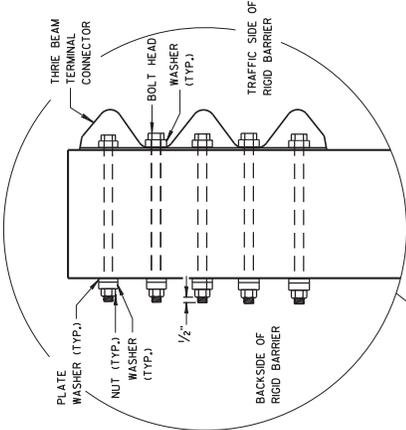
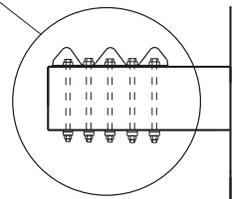


THREE BEAM CONNECTION TO BRIDGE PARAPET WITH SQUARE ENDS

FRONT VIEW



SECTION F-F



DRILL HOLE LOCATION

MIDWEST GUARDRAIL SYSTEM THREE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED	DATE
JUNE, 2005	/S/ JEFFRY H. ZOGG ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA	

Addendum No. 02
ID 3766-00-70
Added Sheet 29AN
January 9, 2017

W BEAM TRANSITION AND CONNECTION TO BRIDGE PARAPETS WITH SQUARE ENDS
(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

FRONT VIEW

GENERAL NOTES

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

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

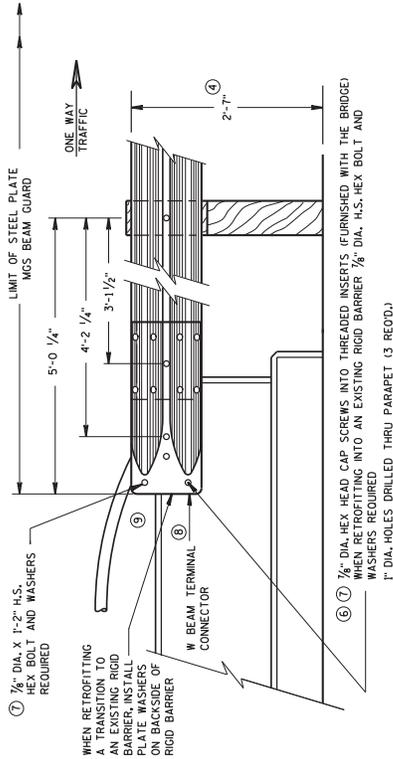
④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.

⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THREE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THREE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X $\frac{3}{8}"$ THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.

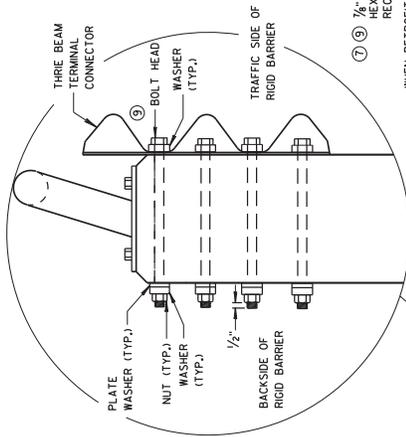
⑧ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 $\frac{1}{2}"$.

⑨ BOLT, NUT AND WASHERS NOT REQUIRED FOR THIS LOCATION WHEN RETROFITTING AN EXISTING PAPAPET AND THE HOLE IS EITHER ABOVE PARAPET OR WITHIN 4 INCHES OF THE EDGE OF PARAPET.

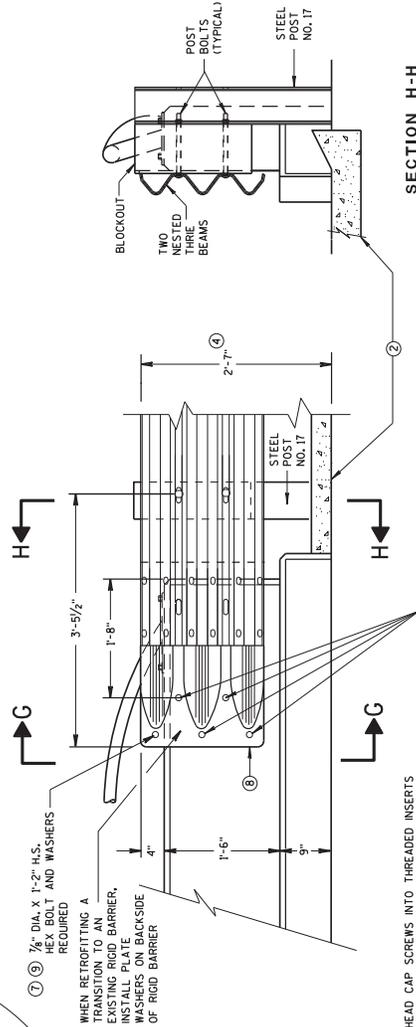


FRONT VIEW

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



SECTION G-G



FRONT VIEW

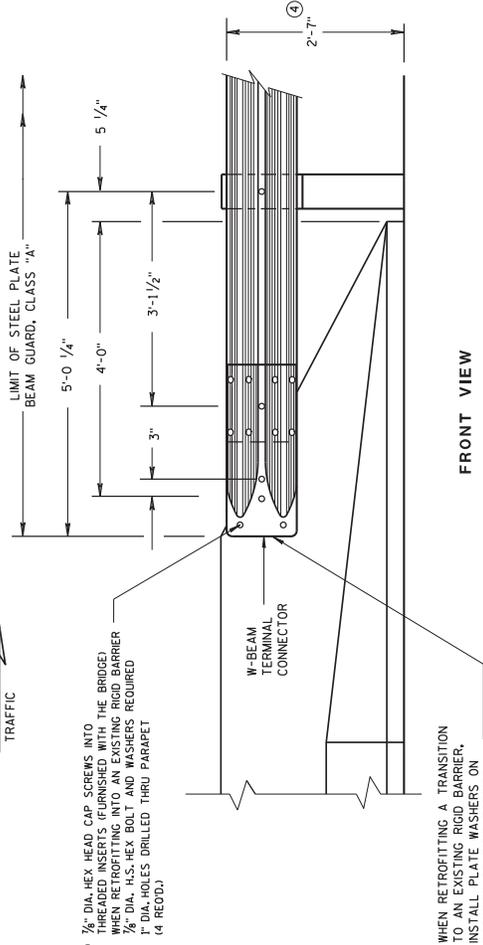
THREE BEAM CONNECTION TO VERTICAL FACED PARAPETS

SECTION H-H

Addendum No. 02
ID 3766-00-70
Added Sheet 29AO
January 9, 2017

MIDWEST GUARDRAIL SYSTEM THREE BEAM TRANSITION (MGS)
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED June, 2015
DATE /s/ Jeffrey H. Zoog ROADWAY STANDARDS DEVELOPMENT ENGINEER
FWHA

ONE WAY TRAFFIC



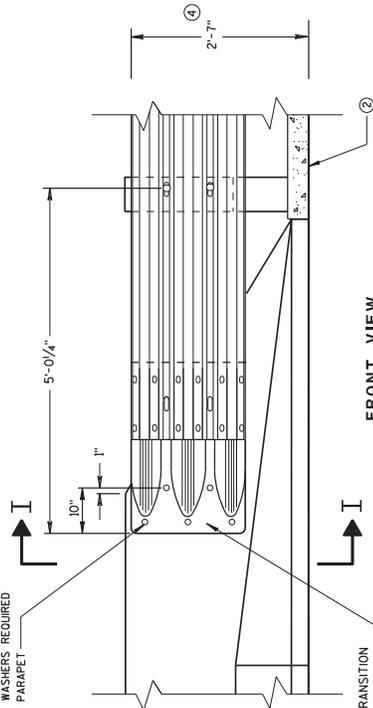
FRONT VIEW

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

⑥ ⑦ 7/8" DIA. HEX HEAD CAP SCREWS INTO THREADED INSERTS (FURNISHED WITH THE BRIDGE) WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER. 3/8" DIA. H.S. HEX BOLT AND WASHERS REQUIRED (4 REQ'D.)

WHEN RETROFITTING A TRANSITION TO AN EXISTING RIGID BARRIER, INSTALL PLATE WASHERS ON BACKSIDE OF RIGID BARRIER.

⑥ ⑦ 7/8" DIA. HEX HEAD CAP SCREWS INTO THREADED INSERTS (FURNISHED WITH THE BRIDGE) WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER. 3/8" DIA. H.S. HEX BOLT AND WASHERS REQUIRED (4 REQ'D.)



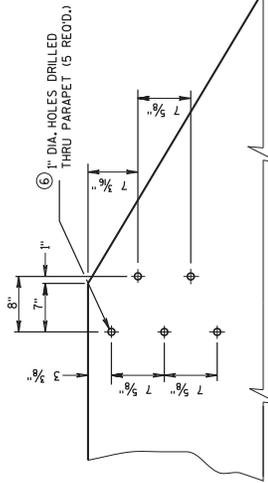
FRONT VIEW

THREE BEAM CONNECTION TO BRIDGE PARAPETS WITH SLOPED ENDS

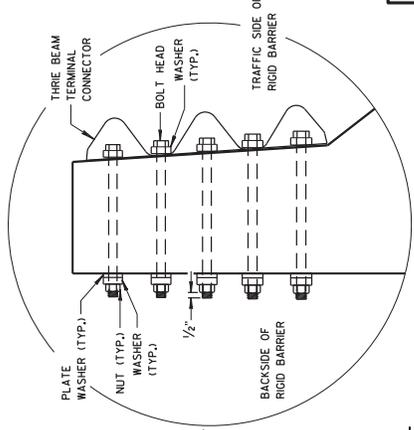
WHEN RETROFITTING A TRANSITION TO AN EXISTING RIGID BARRIER, INSTALL PLATE WASHERS ON BACKSIDE OF RIGID BARRIER.

GENERAL NOTES

- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ④ TOLERANCE FOR TOP OF BEAM IS ± 1".
- ⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THREE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THREE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE PLATE WASHERS THAT ARE 2" O.D. X 3/8" THICK AND ONE PLATE WASHER, REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.



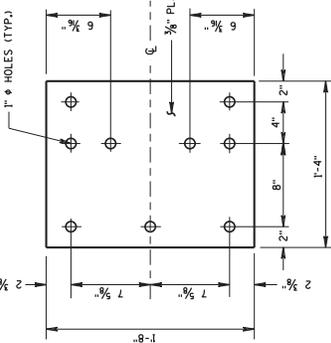
DRILL HOLE LOCATION AND PATTERN FOR THREE BEAM CONNECTION



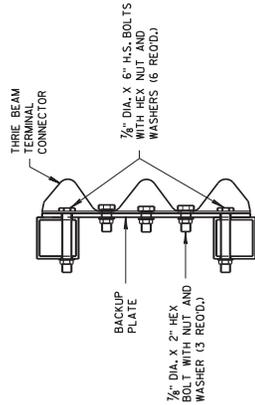
SECTION I-I

Addendum No. 02
ID 3766-00-70
Added Sheet 29AP
January 9, 2017

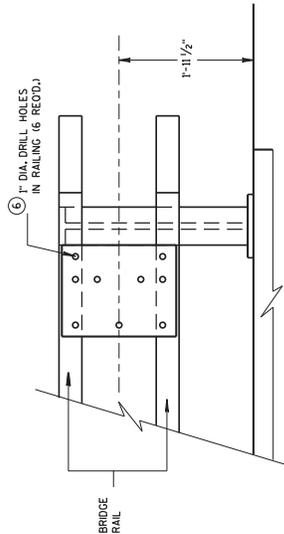
MIDWEST GUARDRAIL SYSTEM THREE BEAM TRANSITION (MGS)
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED June 8, 2015
DATE /S/ Jerry H. Zogg ROADWAY STAIRCASE DEVELOPMENT ENGINEER FHWA



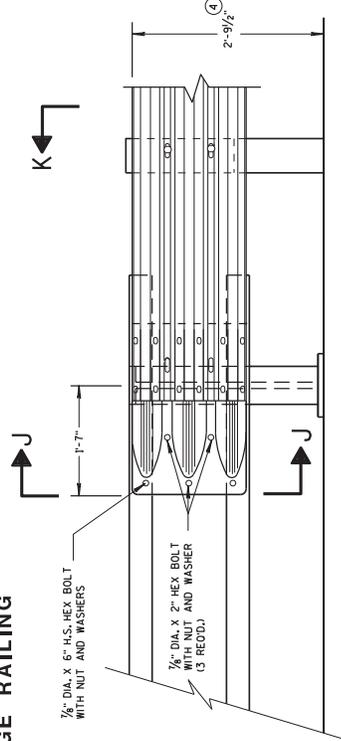
BACK-UP PLATE DETAIL



SECTION J-J



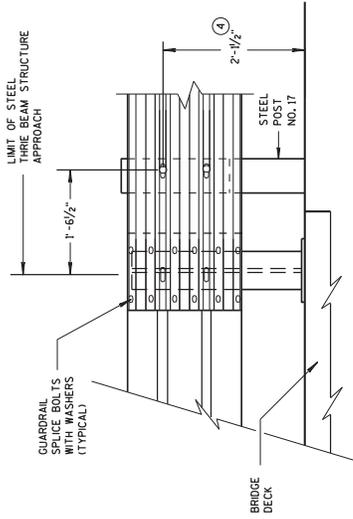
BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING



**FRONT VIEW
THREE BEAM CONNECTION TO
TUBULAR RAILING TYPE "F"**

GENERAL NOTES

- (4) TOLERANCE FOR TOP OF BEAM IS ± 1".
- (6) DRILLING HOLES THROUGH THE PAPPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.



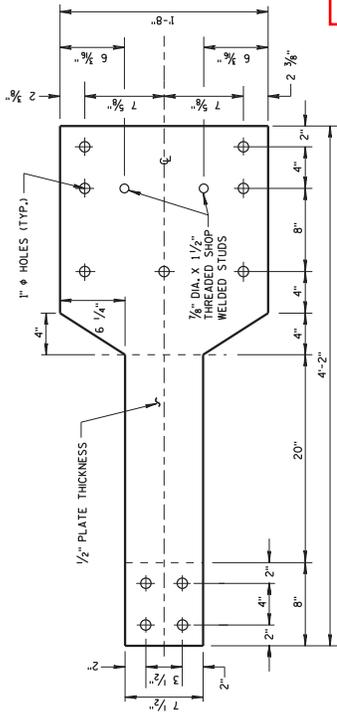
**FRONT VIEW
THREE BEAM CONNECTION TO
STEEL RAILING TYPE "W"**

Addendum No. 02
ID 3766-00-70
Added Sheet 29AQ
January 9, 2017

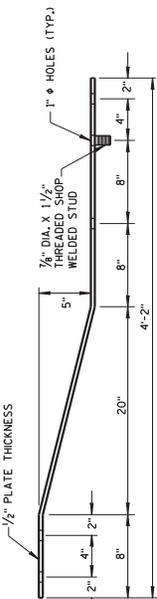
MIDWEST GUARDRAIL SYSTEM THREE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED JUN 6, 2015	/s/ JERRY H. ZOGG DATE ROADWAY STANDARDS DEVELOPMENT ENGINEER

GENERAL NOTES

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

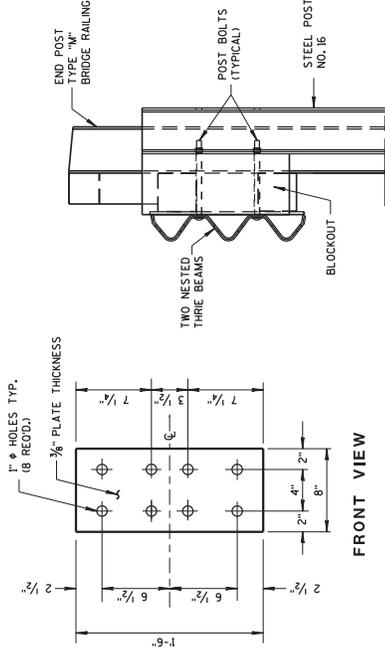


FRONT VIEW



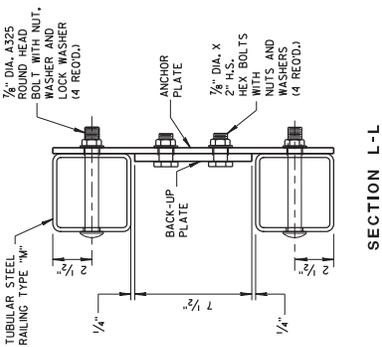
PLAN VIEW

BACK-UP PLATE DETAIL, TYPE "M"

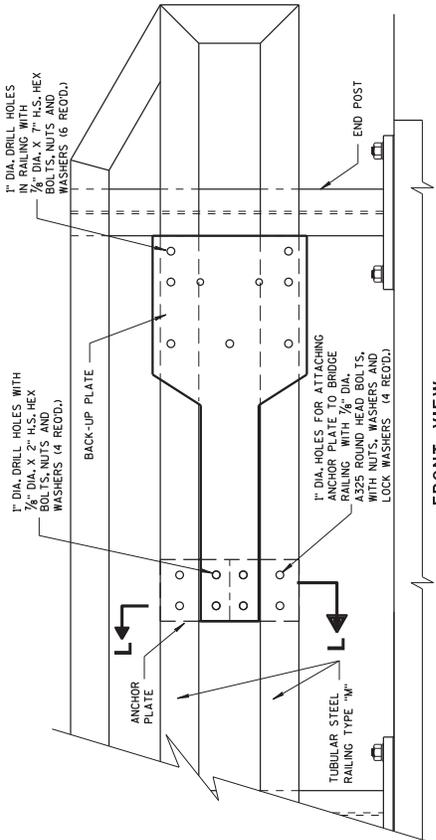


FRONT VIEW

ANCHOR PLATE DETAIL, TYPE "M"

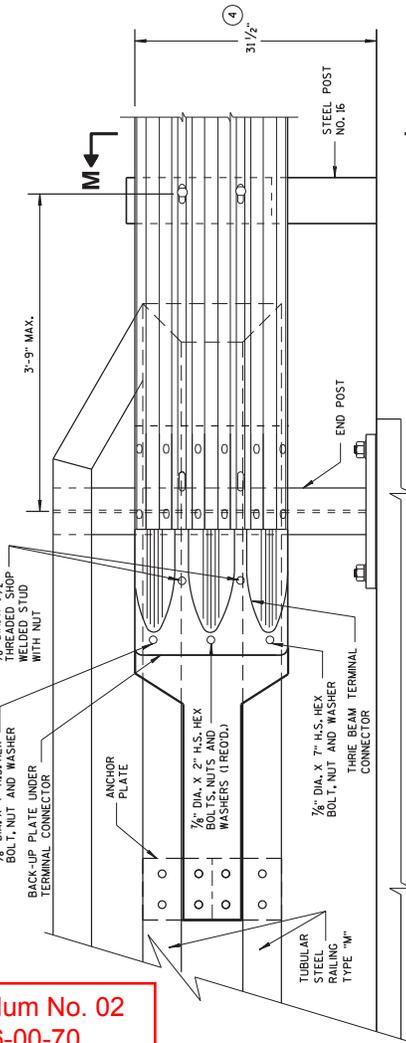


SECTION L-L

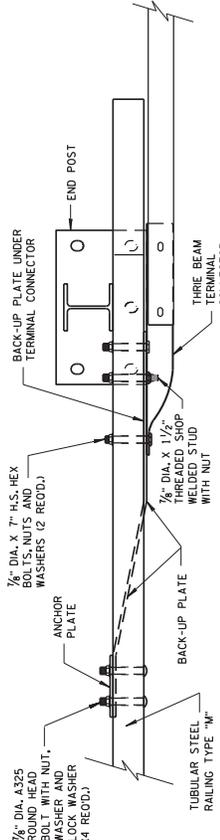


FRONT VIEW

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



FRONT VIEW



PLAN VIEW

THRE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

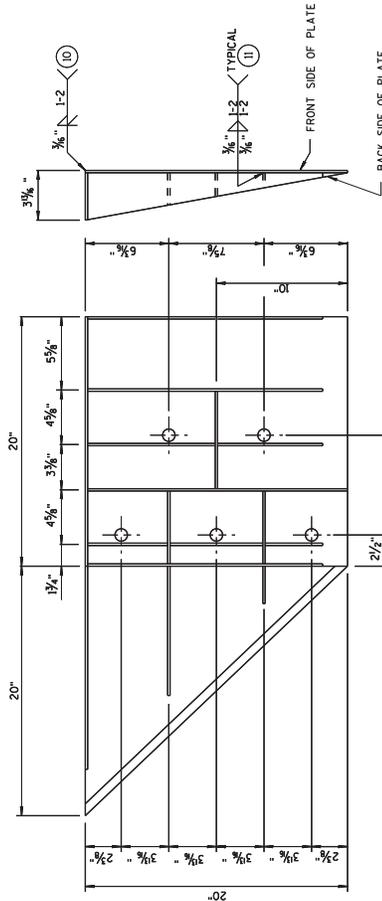
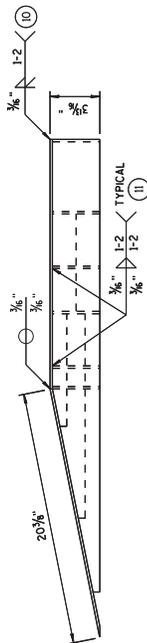
Addendum No. 02
ID 3766-00-70
Added Sheet 29AR
January 9, 2017

MIDWEST GUARDRAIL SYSTEM THRE BEAM TRANSITION (MGS)	
APPROVED June, 2005	STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
DATE June, 2005	ENGINEER /s/ Jerry H. Zogg ROADWAY STANDARDS DEVELOPMENT ENGR

GENERAL NOTES

- COVER PLATE PANELS ARE 3/8" THICK.
- ALL STIFFENERS ARE 1/4" THICK.
- CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.
- FOR GALVANIZED REQUIREMENTS, SEE SECTION 614 OF THE STANDARD SPECIFICATIONS.
- ALL HOLE DIAMETERS SHALL BE 1".
- FOR OPPOSITE SIDE INSTALLATION MIRROR DRAWINGS.

- (10) STIFFENERS LOCATED AT THE OUTSIDE EDGES OF THE COVER PLATES SHALL BE WELDED AS FOLLOWS:
SINGLE BEVEL GROOVE WELD ON EXTERNAL SIDES AND 3/8" FILLET WELD BY 1" LONG SPACED AT 2" ON INTERNAL SIDES.
- (11) STIFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:
3/8" FILLET WELD BY 1" LONG SPACED AT 2".



WELDING INSTRUCTION

(VIEWED FROM BACK SIDE OF PLATE)

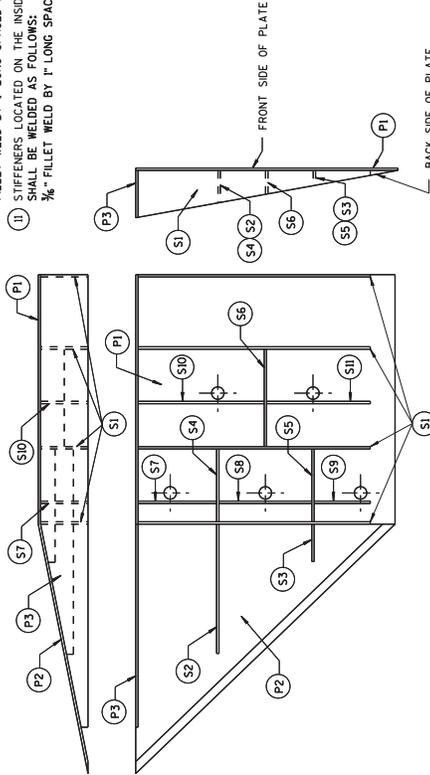


PLATE AND STIFFENER IDENTIFICATION

(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"	3/8"
P2	1	20" x 20" x 28 3/8"	3/8"
P3	1	39" x 3 1/2" x 20" x 19 3/8"	3/8"
S1	4	10 1/4" x 3 3/8" x 18 3/4"	1/4"
S2	1	10 1/4" x 2 1/8" x 10 3/8" x 1 1/2"	1/4"
S3	1	3" x 3 1/8" x 3 1/4" x 1/2"	1/4"
S4	1	6 1/8" x 2 1/8"	1/4"
S5	1	6 1/8" x 1 1/4"	1/4"
S6	1	7 3/4" x 1 3/4"	1/4"
S7	1	2 3/8" x 6" x 3 3/8" x 5 3/4"	1/4"
S8	1	1 3/8" x 7 1/2" x 2 1/2" x 1 7/8"	1/4"
S9	1	6 1/8" x 6 3/8" x 1 3/8"	1/4"
S10	1	1 1/8" x 9 1/2" x 3 3/8" x 9 1/8"	1/4"
S11	1	8 1/2" x 8 3/4" x 1 1/8"	1/4"

SINGLE SLOPE CONNECTION PLATE

Addendum No. 02
ID 3766-00-70
Added Sheet 29AS
January 9, 2017

MIDWEST GUARDRAIL SYSTEM
THREE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

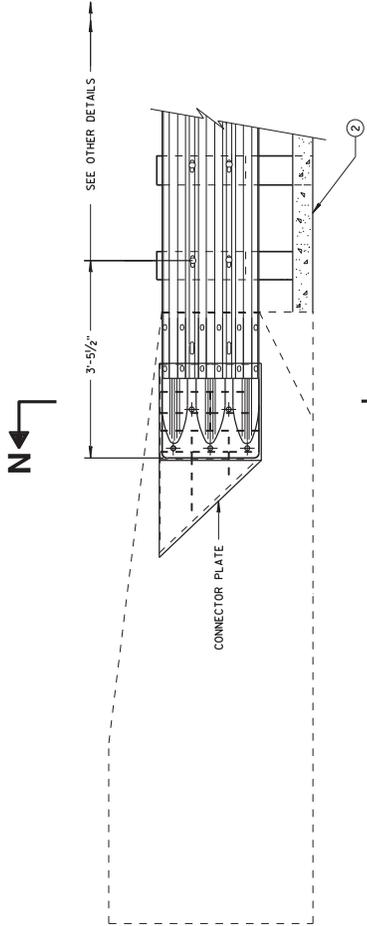
APPROVED
June, 2005
DATE
/s/ Jerry H. Zoog
ROADWAY STANDARDS DEVELOPMENT
ENGINEER
FHWA

GENERAL NOTES

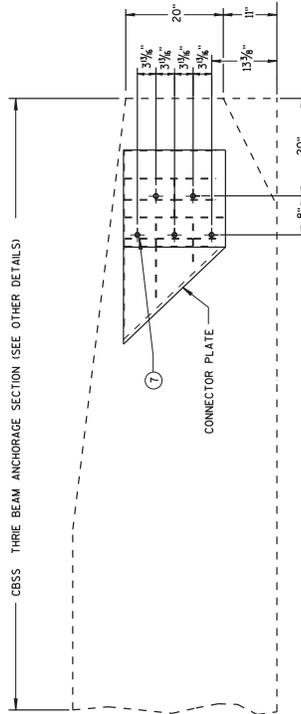
CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

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

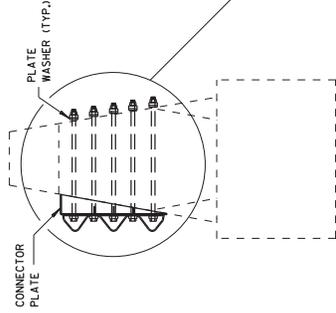
① BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A CONNECTOR PLATE BEING USED BETWEEN THE BEAM AND CONNECTOR PLATE. THE CONNECTOR PLATE FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THREE BEAM CONNECTOR PLATE. BOLTS 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.



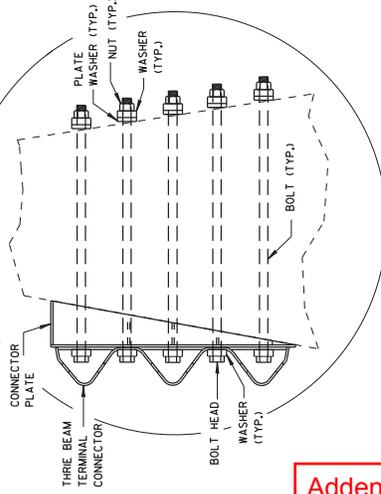
THREE BEAM CONNECTION TO SINGLE SLOPE BARRIER



SINGLE SLOPE CONNECTION PLATE PLACEMENT



SECTION N-N



Addendum No. 02
ID 3766-00-70
Added Sheet 29AT
January 9, 2017

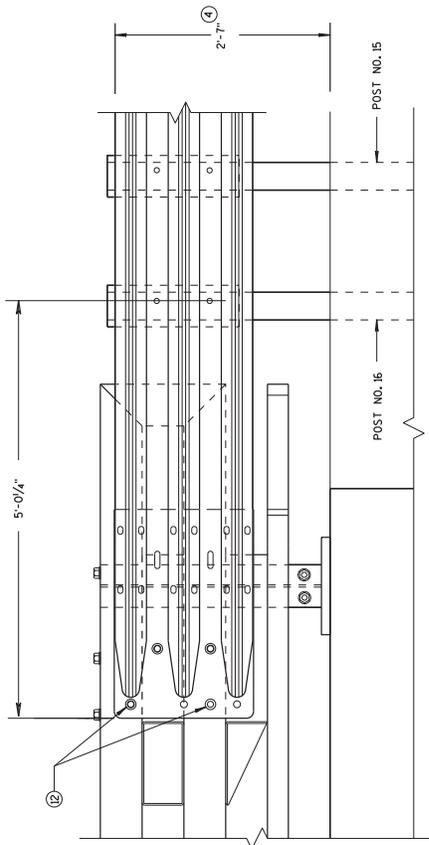
MIDWEST GUARDRAIL SYSTEM
THREE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

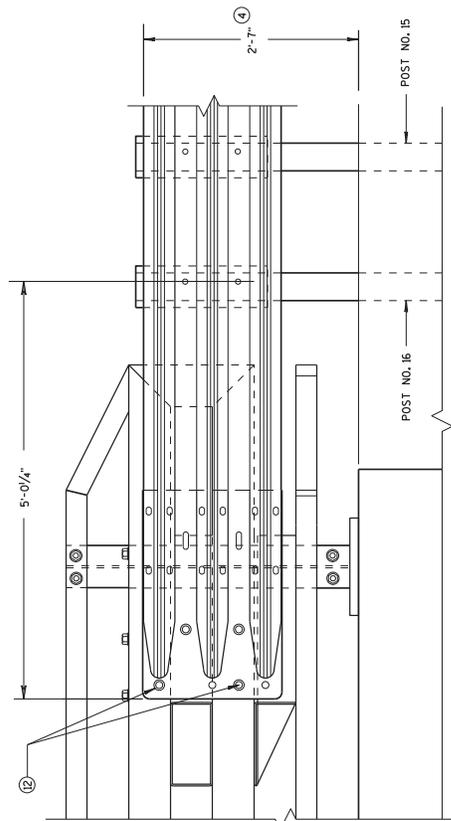
APPROVED
June, 2015
DATE
/S/ Jeffrey H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER
FHWA

GENERAL NOTES

- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑫ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THREE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THREE BEAM CONNECTOR PLATE. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND $\frac{1}{2}$ -INCH BEYOND NUT.



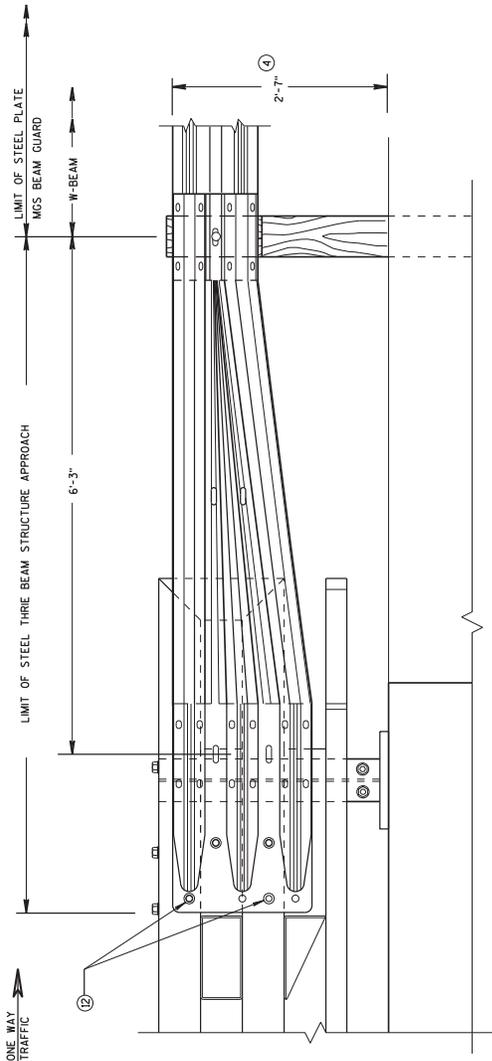
ELEVATION OF DETAIL AT NY3 END POST
THREE BEAM RAIL ATTACHMENT



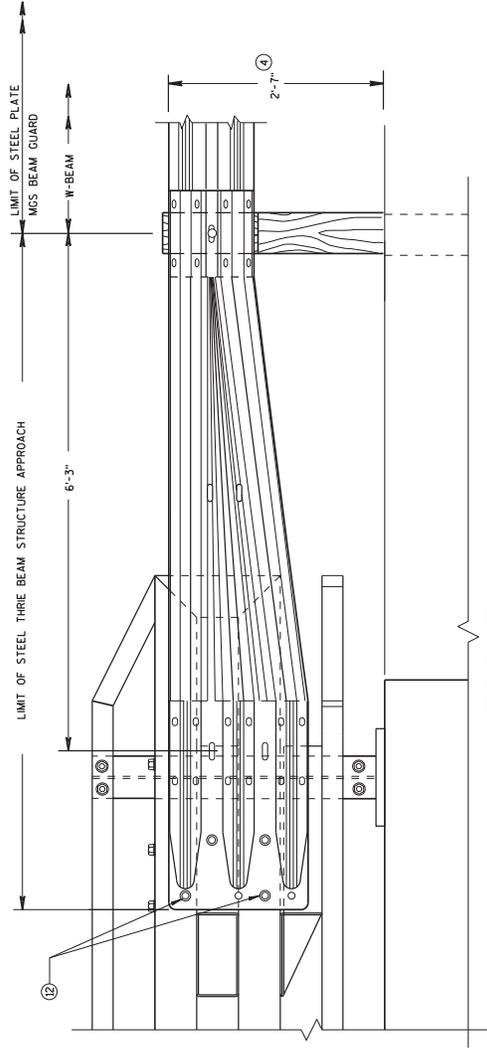
ELEVATION OF DETAIL AT NY4 END POST
THREE BEAM RAIL ATTACHMENT

Addendum No. 02
ID 3766-00-70
Added Sheet 29AU
January 9, 2017

MIDWEST GUARDRAIL SYSTEM THREE BEAM TRANSITION (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June, 2015	/s/ Jerry H. Zoog ROADWAY STANDARDS DEVELOPMENT ENGINEER
DATE	PHWA



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



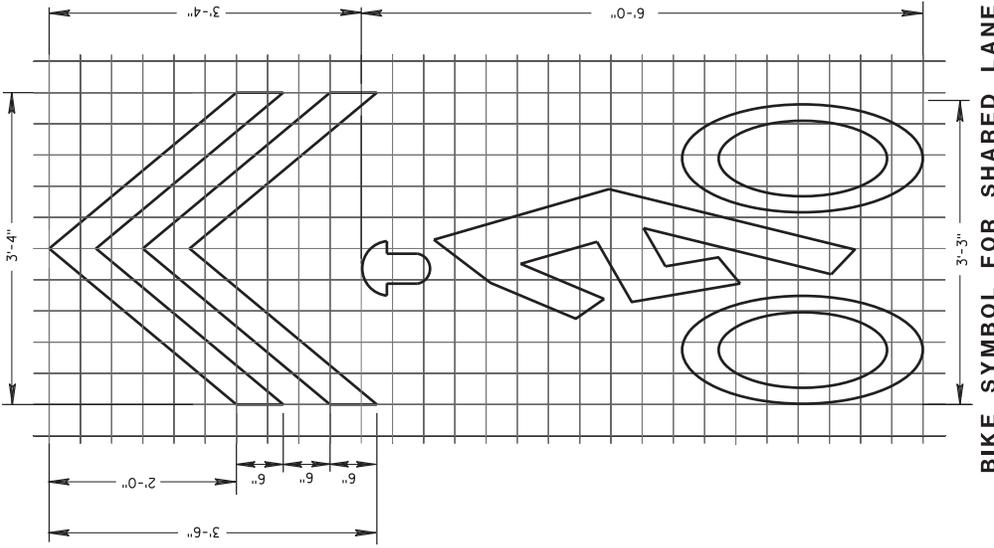
FRONT VIEW
W BEAM TRANSITION AND
CONNECTION TO BRIDGE RAILING TYPE "NY4"
 (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

GENERAL NOTES

- ④ TOLERANCE FOR TOP OF BEAM IS ± 1".
- ⑫ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARBER AND THREE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THREE BEAM CONNECTOR PLATE. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND 1/2-INCH BEYOND NUT.

Addendum No. 02
 ID 3766-00-70
 Added Sheet 29AV
 January 9, 2017

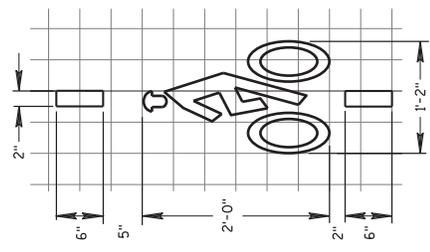
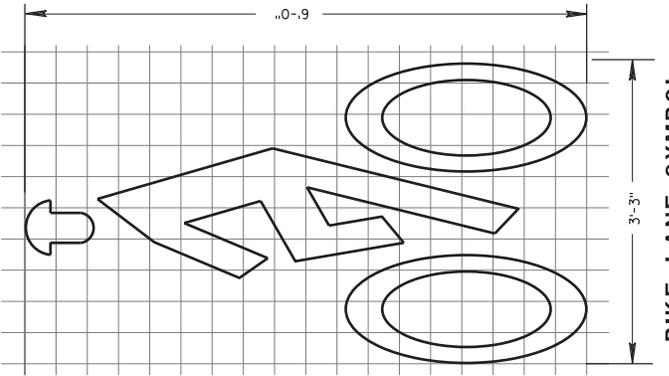
MIDWEST GUARDRAIL SYSTEM THREE BEAM TRANSITION (MGS)
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED June, 2015 DATE /S/ Jerry H. Zoog ROADWAY STANDARDS DEVELOPMENT ENGINEER FHWA



PAVEMENT MARKING FOR BIKE LANES
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED DATE: 4-18-2016 BY: /S/ Matthew R. Roult STATE SIGNING AND MARKING ENGINEER P1WA

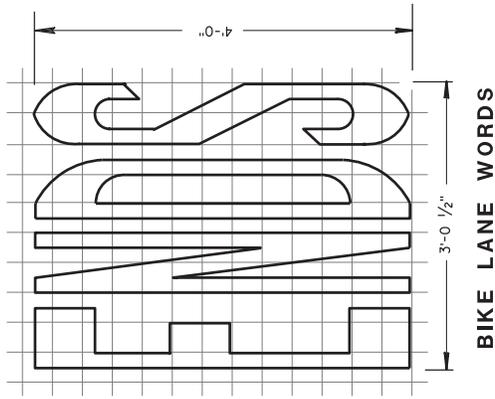
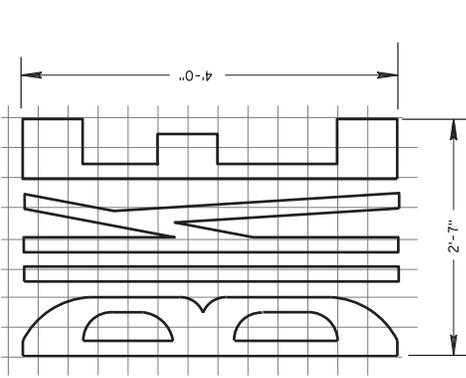
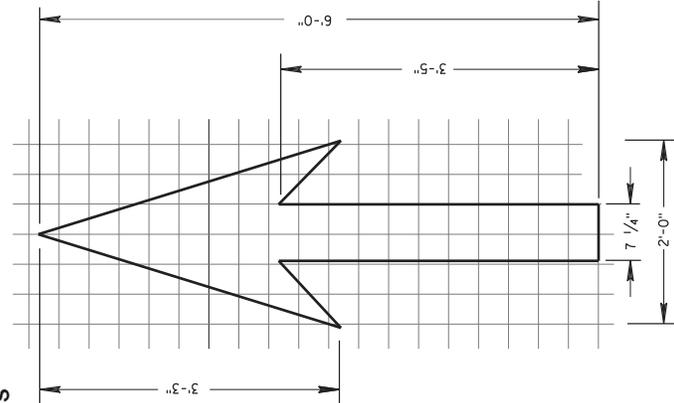
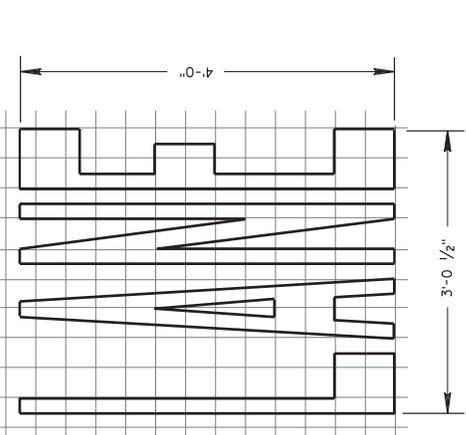
Addendum No. 02
ID 3766-00-70
Added Sheet 29AW
January 9, 2017

29AW



BIKE LANE SYMBOL

BIKE LANE ARROW



GENERAL NOTES

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

GENERAL NOTES

SIGNING AND MARKING IS SHOWN AS TYPICAL PLACEMENT. FIELD CONDITIONS MAY DICTATE CHANGES IN SIGNING AND MARKING PLACEMENT.

A DISTANCE DEPENDENT ON SPEED (SEE TABLE)

① WRONG WAY PREVENTION SIGNS ARE DISCUSSED IN T.C.M. 2-15-12

② OPTIONAL - USED ONLY WHEN APPROVED BY REGION TRAFFIC ENGINEER.

SYMBOLS

- * OPTIONAL SIGNS
- ** SIGNS MAY BE OMITTED IF SPACE DOES NOT PERMIT
- *** IF POSTED SPEED 45 MPH OR GREATER, PLACE W5-54 SIGN UNDER R4-7 SIGN, MOUNT W5-54 SIGN AT 4' MOUNTING HEIGHT (TOP OF ROADWAY TO BOTTOM OF SIGN)
- † POST MOUNTED SIGN
- ⇌ DIRECTION OF TRAFFIC FLOW

WRONG WAY (OPTIONAL SIZE 3)

DO NOT ENTER (SIZE 3)

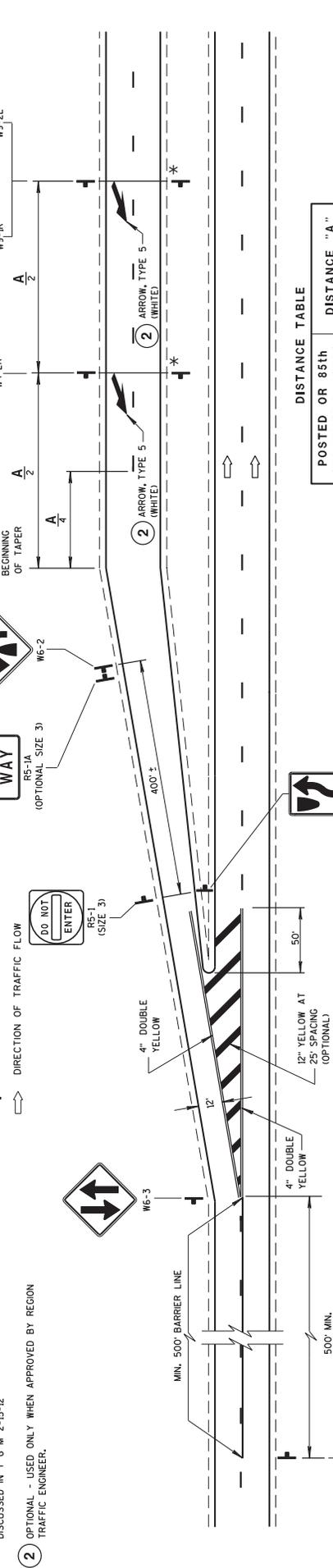
W6-2

W4-2R

W9-1R OR W9-2L

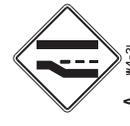
W9-2L

W6-1



DISTANCE TABLE

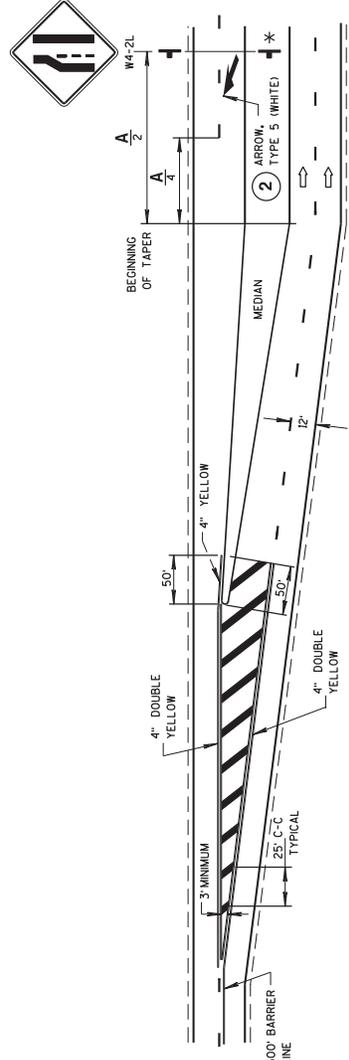
POSTED OR 85th PERCENTILE SPEED	DISTANCE "A"
25	325
30	460
35	565
40	670
45	775
50	885
55	990



USE W4-2L IF : OR

(1) THE LEFT LANE IS PUSHED TO THE RIGHT:

(2) THERE IS A VERY PROMINENT CONSTRUCTION JOINT ENDING THE LEFT LANE.



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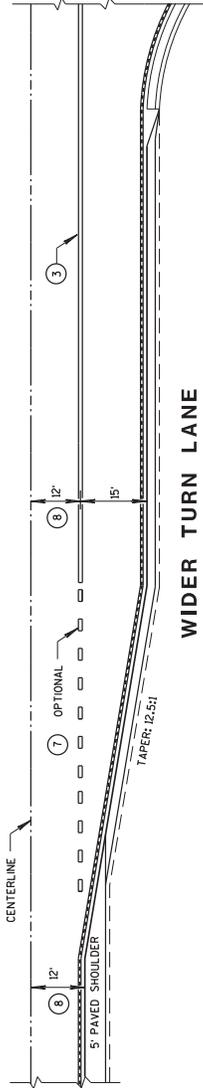
SIGNING AND MARKING
TWO LANE TO FOUR LANE
DIVIDED TRANSITIONS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

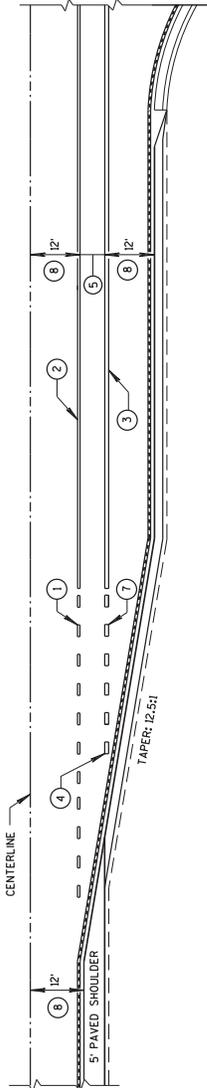
APPROVED
June, 2005
DATE
/s/ Travis Feires
STATE TRAFFIC ENGINEER OF DESIGN
PWMA

GENERAL NOTES

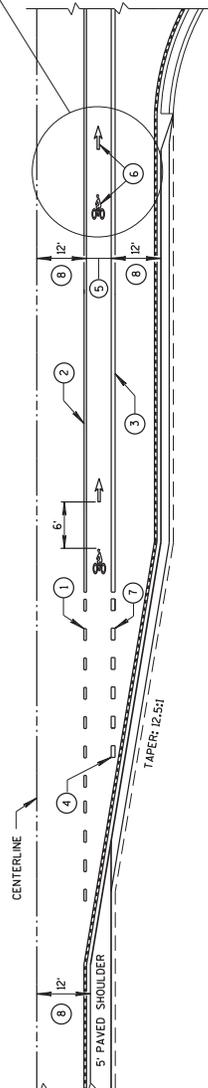
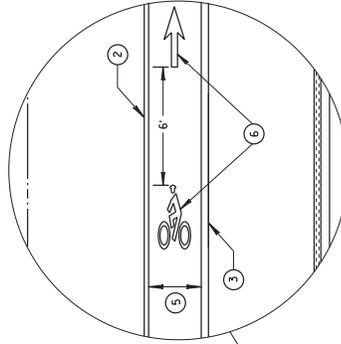
- ① 3" LINE, 9" GAP - 4-INCH WIDE, WHITE.
- ② 4-INCH, WHITE.
- ③ 8-INCH, WHITE.
- ④ IF SIGNED AND/OR MARKED AS A BICYCLE FACILITY, INCLUDE SECOND LINE OF LINE-SPACE MARKING, OTHERWISE DO NOT.
- ⑤ BIKE ACCOMMODATION FOR CONCRETE PAVEMENT IS 5' WIDE. BIKE ACCOMMODATION FOR ASPHALT PAVEMENT IS A MINIMUM OF 4', 5' AT ≥ 45 MPH.
- ⑥ REQUIRED ONLY WHEN SPECIFIED IN THE CONTRACT.
- ⑦ 3" LINE, 9" GAP - 8-INCH WIDE, WHITE.
- ⑧ REFER TO CONTRACT PLANS.



WIDER TURN LANE



BIKE SLIP LANE ONLY WITHOUT SYMBOLS



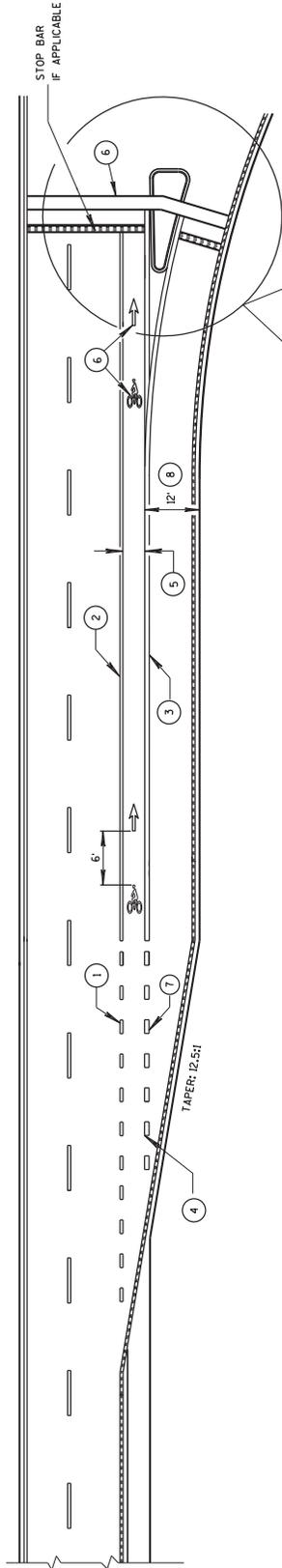
BIKE LANE WITH SYMBOLS

Addendum No. 02
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January 9, 2017

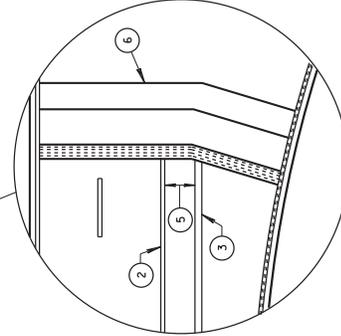
BICYCLE LANE MARKING
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED _____ /S/ T. COVILS, F.B.T.S.S. DATE 4/30/2013 STATE TRAFFIC ENGINEER P.H.W.A.

GENERAL NOTES

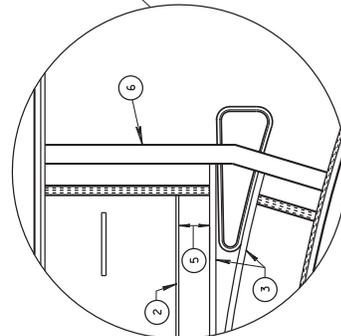
- ① 3' LINE, 9' GAP - 4-INCH WIDE, WHITE.
- ② 4-INCH, WHITE.
- ③ 8-INCH, WHITE.
- ④ IF SIGNED AND/OR MARKED AS A BICYCLE FACILITY INCLUDE SECOND LINE OF LINE-SPACE MARKING, OTHERWISE DO NOT.
- ⑤ 5' TYPICAL.
- ⑥ REQUIRED ONLY WHEN SPECIFIED IN THE CONTRACT.
- ⑦ 3' LINE, 9' GAP - 8-INCH WIDE, WHITE.
- ⑧ REFER TO CONTRACT PLANS.



BIKE LANE - 4-LANE DIVIDED WITH RIGHT TURN LANE



4 LANE DIVIDED WITHOUT ISLAND



4 LANE DIVIDED WITH ISLAND

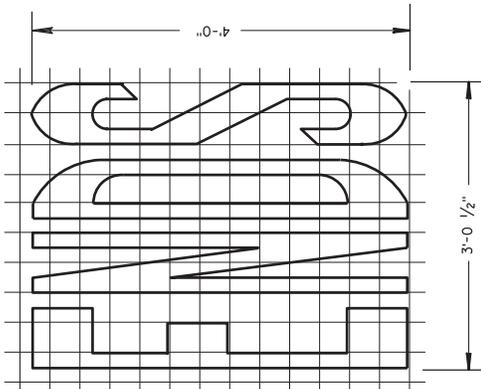
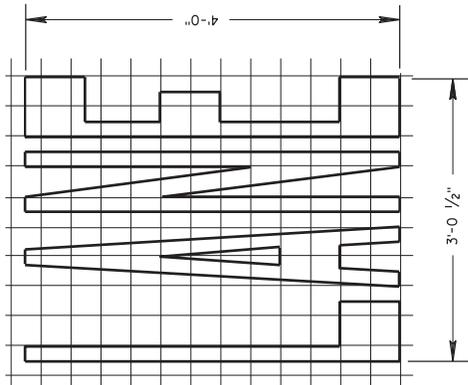
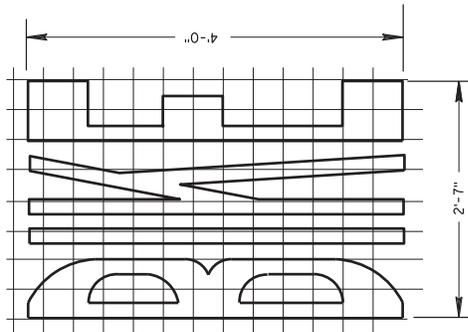
Addendum No. 02
 ID 3766-00-70
 Added Sheet 29AZ
 January 9, 2017

BICYCLE LANE MARKING
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED _____ DATE 4/30/2013 /S/ Travis Feites STATE TRAFFIC ENGINEER <small>PHWA</small>

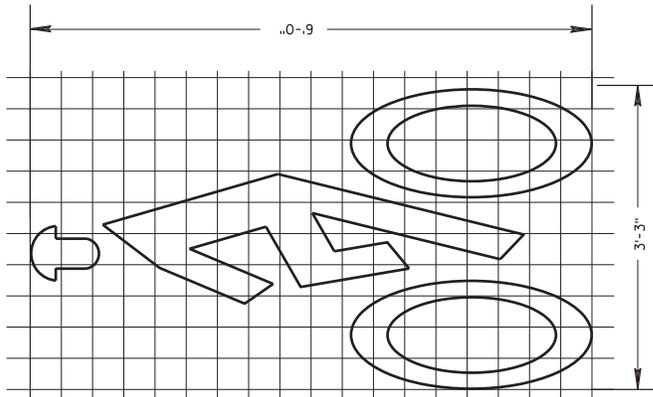
GENERAL NOTES

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

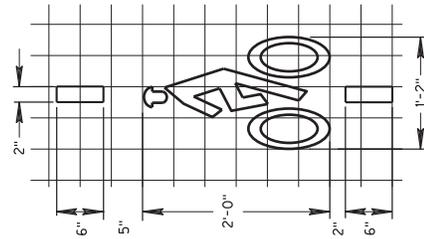
ALL LETTERS, ARROWS AND SYMBOLS SHALL BE IN CONFORMANCE WITH REQUIREMENTS INCLUDED IN "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKING" BOOK BY THE FEDERAL HIGHWAY ADMINISTRATION. ALL LETTERS, ARROWS AND SYMBOLS SHALL BE WHITE AND REFLECTORIZED. SMALL DIFFERENCES IN DIMENSIONS WITHIN THE TOLERANCES OF THAT BOOK ARE ACCEPTABLE.



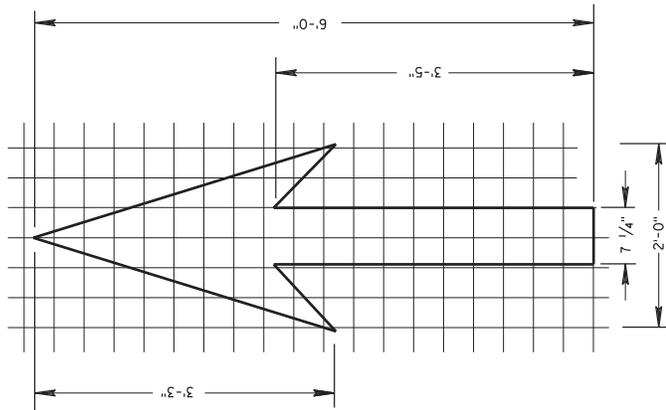
BIKE LANE WORDS



BIKE LANE SYMBOL



BICYCLE DETECTOR PAVEMENT MARKING



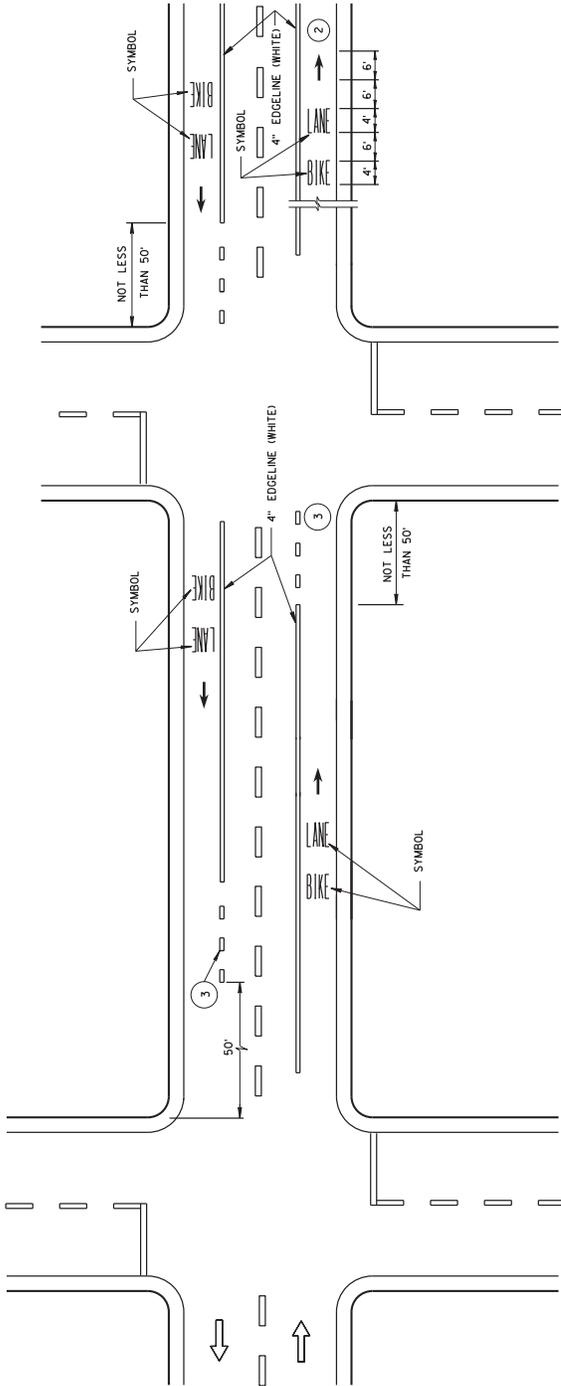
BIKE LANE ARROW

Addendum No. 02
ID 3766-00-70
Added Sheet 29BA
January 9, 2017

PAVEMENT MARKING FOR BIKE LANES
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED 4-30-2013 DATE
/s/ Travis Feites STATE TRAFFIC ENGINEER PWMA

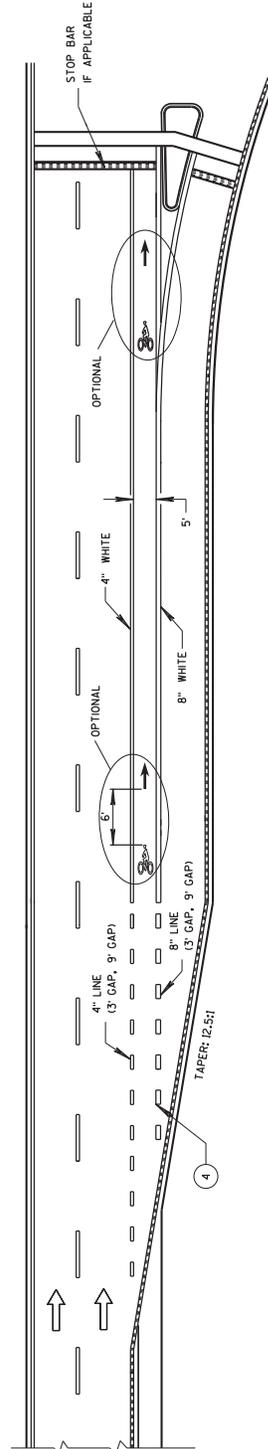
GENERAL NOTES

- 1 DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
- 2 MINIMUM OF ONE PER BLOCK. MAXIMUM OF 250 FEET.
- 3 DOTTED LINES (3" LINE, 9" GAP) SHOULD BE USED 50 FEET TO 200 FEET IN ADVANCE OF AN INTERSECTION WHERE THERE IS NO RIGHT TURN ONLY LANE AND THERE IS HEAVY RIGHT TURN TRAFFIC. DOTTED LINES (3" LINE, 9" GAP) SHOULD BE USED 50 FEET TO 200 FEET IN ADVANCE OF AN INTERSECTION WHERE THERE IS HEAVY RIGHT TURN TRAFFIC OR LIGHT TO MODERATE. A SOLID LINE CAN BE USED UP TO THE INTERSECTION.
- 4 IF SIGNED AND/OR MARKED AS A BICYCLE FACILITY INCLUDE SECOND LINE OF LINE-SPACE MARKING, OTHERWISE DO NOT.



**DESIGNATED BICYCLE LANE
NO PARKING**

Addendum No. 02
ID 3766-00-70
Added Sheet 29BB
January 9, 2017



BIKE LANE - 4-LANE DIVIDED WITH RIGHT TURN LANE

BICYCLE LANE MARKING
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVED _____ DATE 4-18-2016 /S/ Matthew R. Rouch STATE SIGNING AND MARKING ENGINEER FHWA