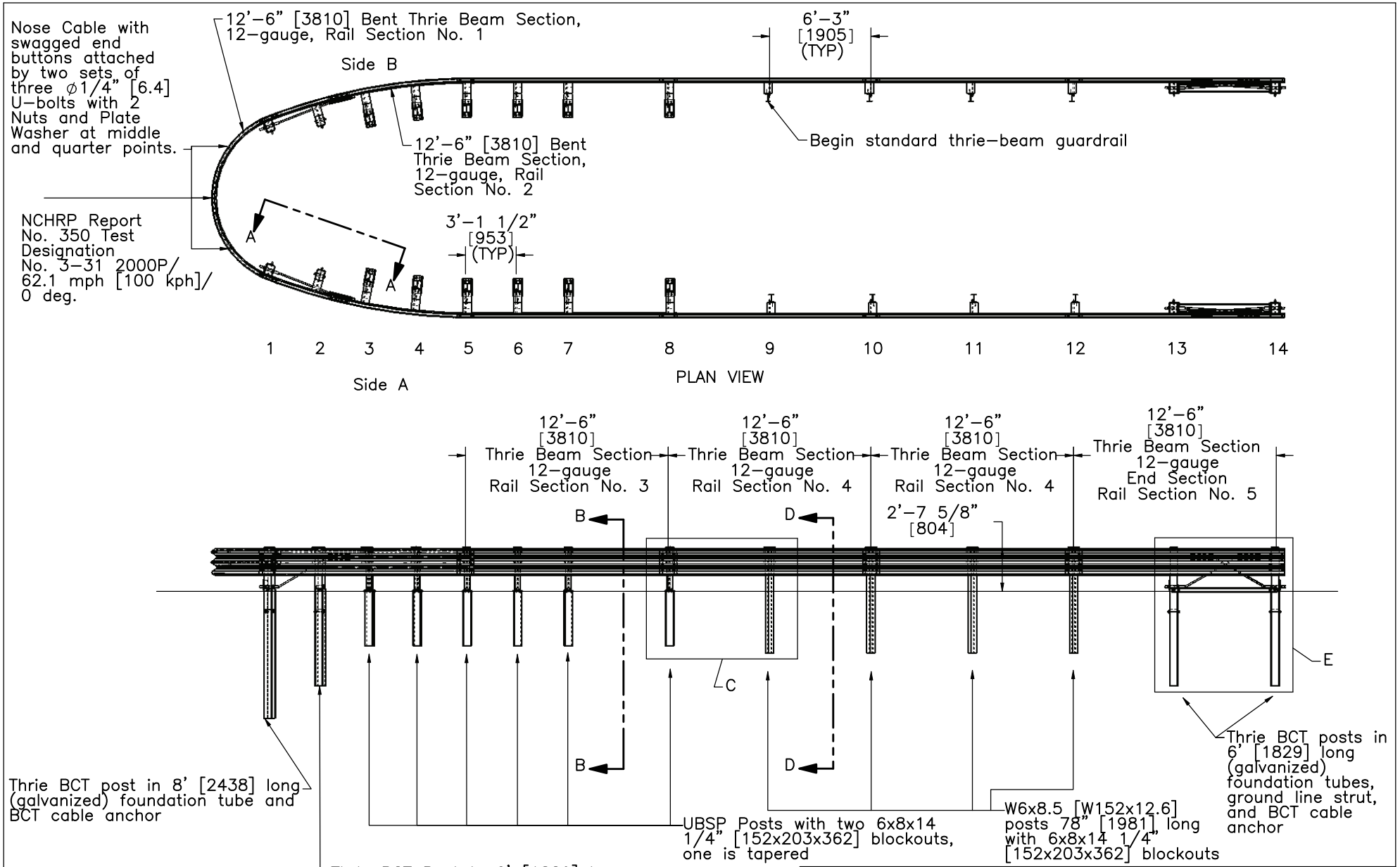


Notes: (1) Due to the initial project date and acquisition for some of the construction materials, mill certifications and material specifications are not required in each case but should be obtained when possible.

(2) All posts are to be installed using ∅2' [610] augered holes with the HE8 compaction method.

MwRSF

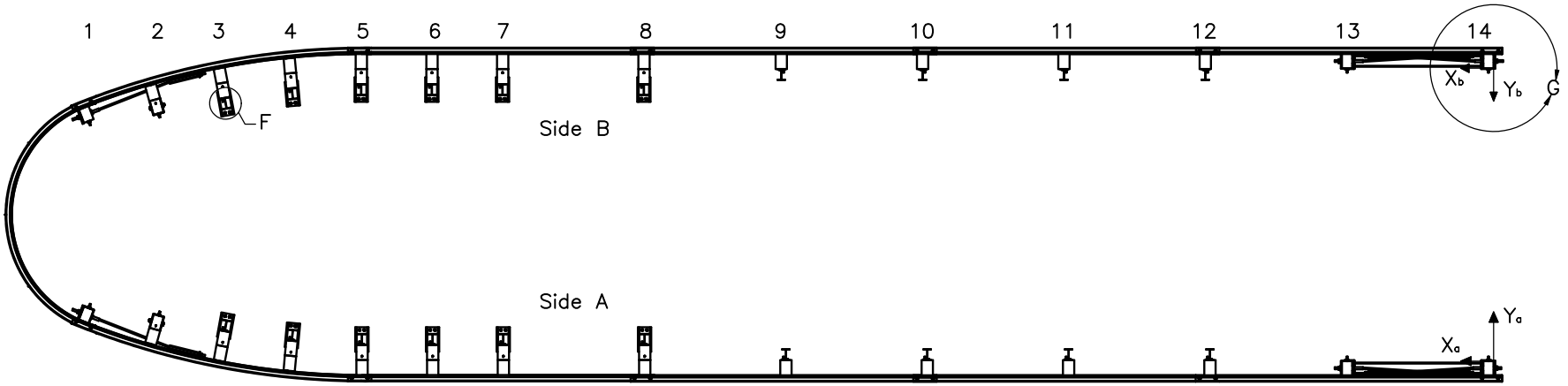
Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

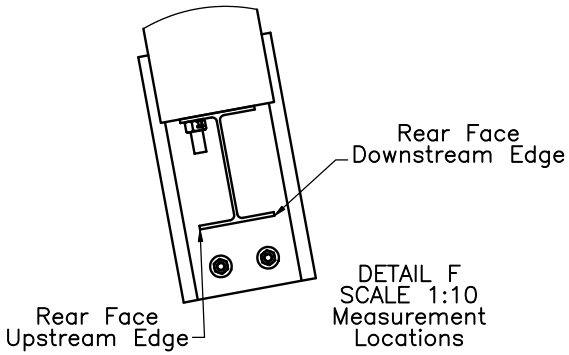
System Layout

SHEET:	1 of 22
DATE:	8/24/2010
DRAWN BY:	MJW/RJT
REV. BY:	RWB
DWG. NAME.	USPBN–4 Bullnose_R0
SCALE:	1:100
UNITS:	Inches [mm]

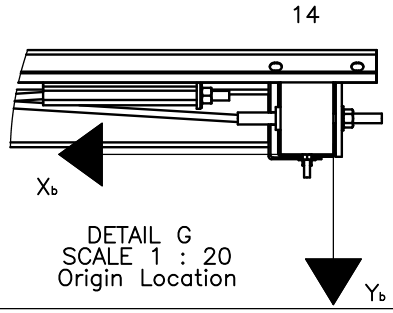
Post No.	Side A				Side B			
	Rear Face–D.S. Edge		Rear Face–U.S. Edge		Rear Face–D.S. Edge		Rear Face–U.S. Edge	
	X	Y	X	Y	X	Y	X	Y
1	61'–10 7/8"	2'–3 1/8"	62'–4"	2'–5"	61'–10 7/8"	2'–3 1/8"	62'–4"	2'–5"
2	58'–9 3/4"	1'–11 1/4"	59'–3"	2'–0 3/4"	58'–9 3/4"	1'–11 1/4"	59'–3 1/8"	2'–0 3/4"
3	55'–10 3/8"	1'–9 1/8"	56'–2 1/4"	1'–9 7/8"	55'–10 3/8"	1'–9 1/8"	56'–2 1/4"	1'–9 7/8"
4	52'–11 1/4"	1'–4 1/4"	53'–3 1/8"	1'–4 3/4"	52'–11 1/4"	1'–4 1/4"	53'–3 1/8"	1'–4 3/4"
5	49'–10 1/2"	1'–2 3/8"	50'–2 1/2"	1'–2 3/8"	49'–10 7/8"	1'–2 3/8"	50'–2 7/8"	1'–2 3/8"
6	46'–9"	1'–2 3/8"	47'–1"	1'–2 3/8"	46'–9 3/8"	1'–2 3/8"	47'–1 3/8"	1'–2 3/8"
7	43'–9"	1'–2 3/8"	44'–2 1/2"	1'–2 3/8"	43'–9"	1'–2 3/8"	44'–2 1/2"	1'–2 3/8"
8	37'–6"	1'–2 3/8"	37'–11 1/2"	1'–2 3/8"	37'–6"	1'–2 3/8"	37'–11 1/2"	1'–2 3/8"
9	31'–3"	6 3/8"	31'–8 1/2"	6 3/8"	31'–3"	6 3/8"	31'–8 1/2"	6 3/8"
10	25'–0"	6 3/8"	25'–5 1/2"	6 3/8"	25'–0"	6 3/8"	25'–5 1/2"	6 3/8"
11	18'–9"	6 3/8"	19'–2 1/2"	6 3/8"	18'–9"	6 3/8"	19'–2 1/2"	6 3/8"
12	12'–6"	6 3/8"	12'–11 1/2"	6 3/8"	12'–6"	6 3/8"	12'–11 1/2"	6 3/8"
13	6'–3"	0"	6'–8 1/2"	0"	6'–3"	0"	6'–8 1/2"	0"
14	0"	0"	5 1/2"	0"	0"	0"	5 1/2"	0"



Notes: (1) All dimensions measured from the intersection of the rear face and downstream edge of post no. 14 of each respective side.



DETAIL F
SCALE 1:10
Measurement
Locations



DETAIL G
SCALE 1 : 20
Origin Location

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

Layout for Post Locations

SHEET: 2 of 22

DATE: 8/24/2010

DRAWN BY: MJW/RJT

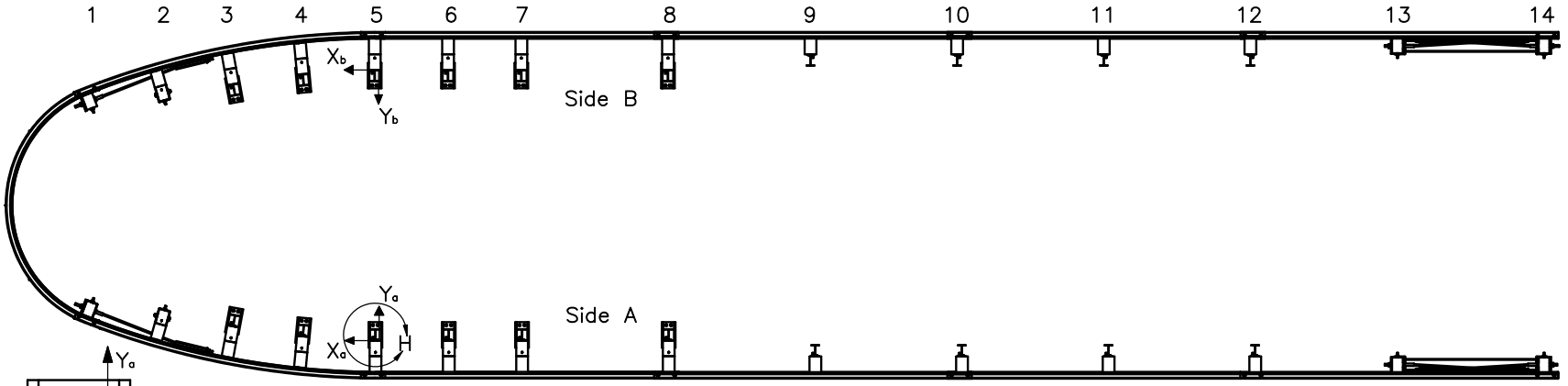
DWG. NAME. USPBN–4 Bullnose_R0

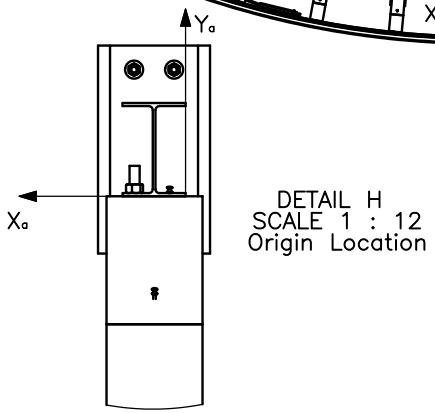
SCALE: 1:90

UNITS: Inches [mm]

REV. BY: RWB

Post No.	Rear Face—D.S. Edge		Rear Face—U.S. Edge	
	X_a and X_b	Y_a and Y_b	X_a and X_b	Y_a and Y_b
1	12'–0"	1'–6 5/8"	12'–5 1/8"	1'–8 1/2"
2	8'–10 7/8"	1'–2 3/4"	9'–4 1/8"	1'–4 1/4"
3	5'–11 3/8"	1'–0 5/8"	6'–3 1/4"	1'–1 3/8"
4	3'–0 1/4"	7 3/4"	3'–4 1/4"	8 1/8"
5	0"	5 7/8"	4"	5 7/8"





DETAIL H
SCALE 1 : 12
Origin Location

Notes: (1) All dimensions measured from the intersection of the front face and downstream edge of post no. 5 to each respective side.

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

Alternate Coordinate System for the Layout of Post Locations

SHEET: 3 of 22

DATE: 8/24/2010

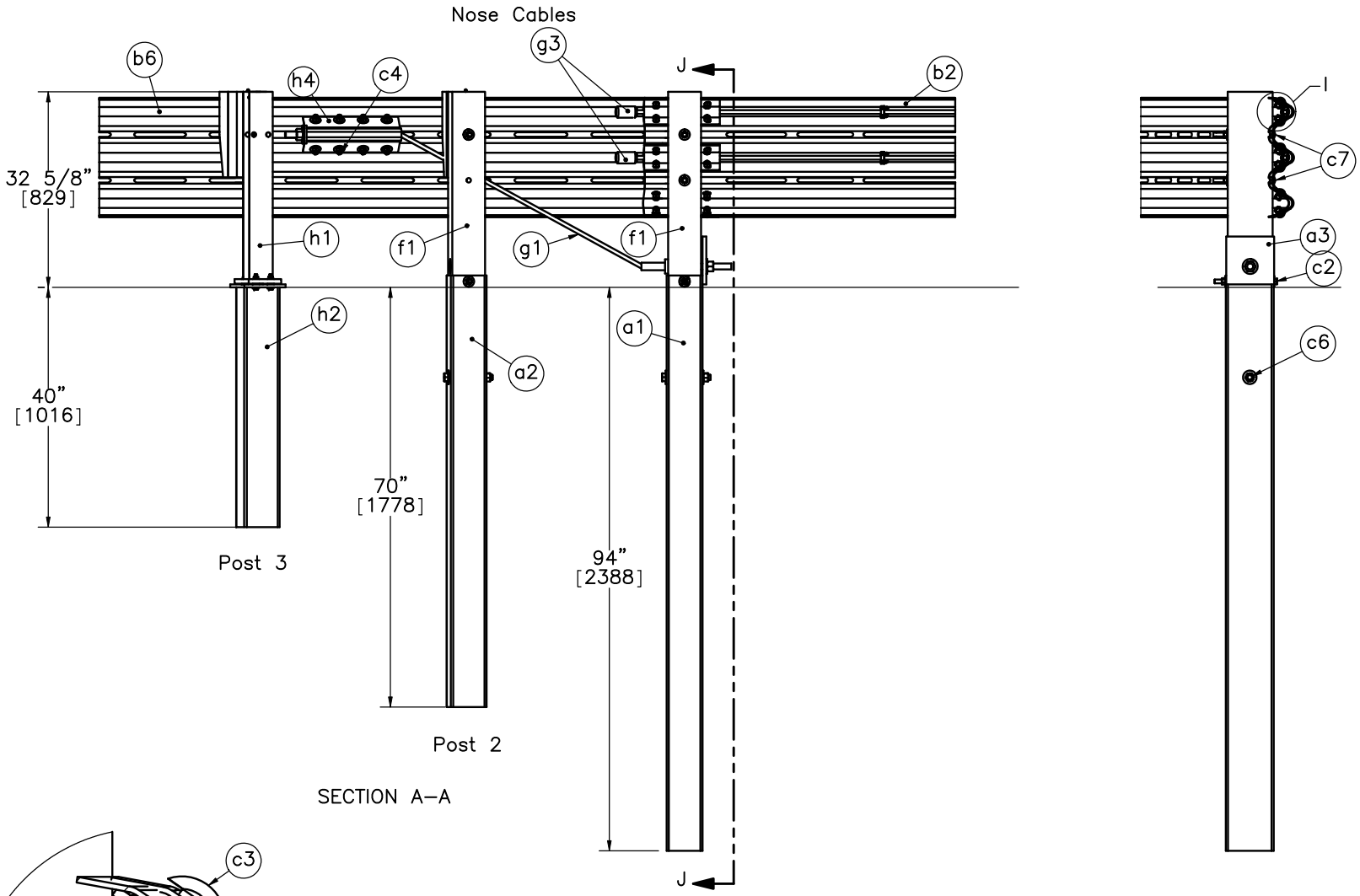
DRAWN BY: MJW/RJT

DWG. NAME. USPBN–4 Bullnose_R0

SCALE: 1:90

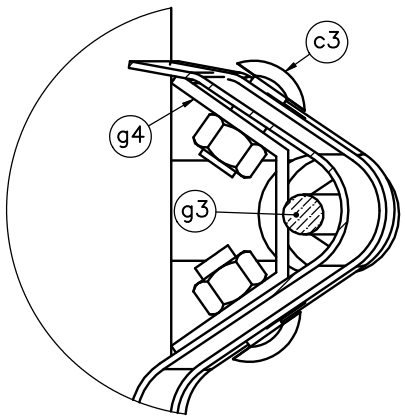
UNITS: Inches [mm]

REV. BY: RWB



SECTION A–A

SECTION J–J



DETAIL I
SCALE 1 : 3

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

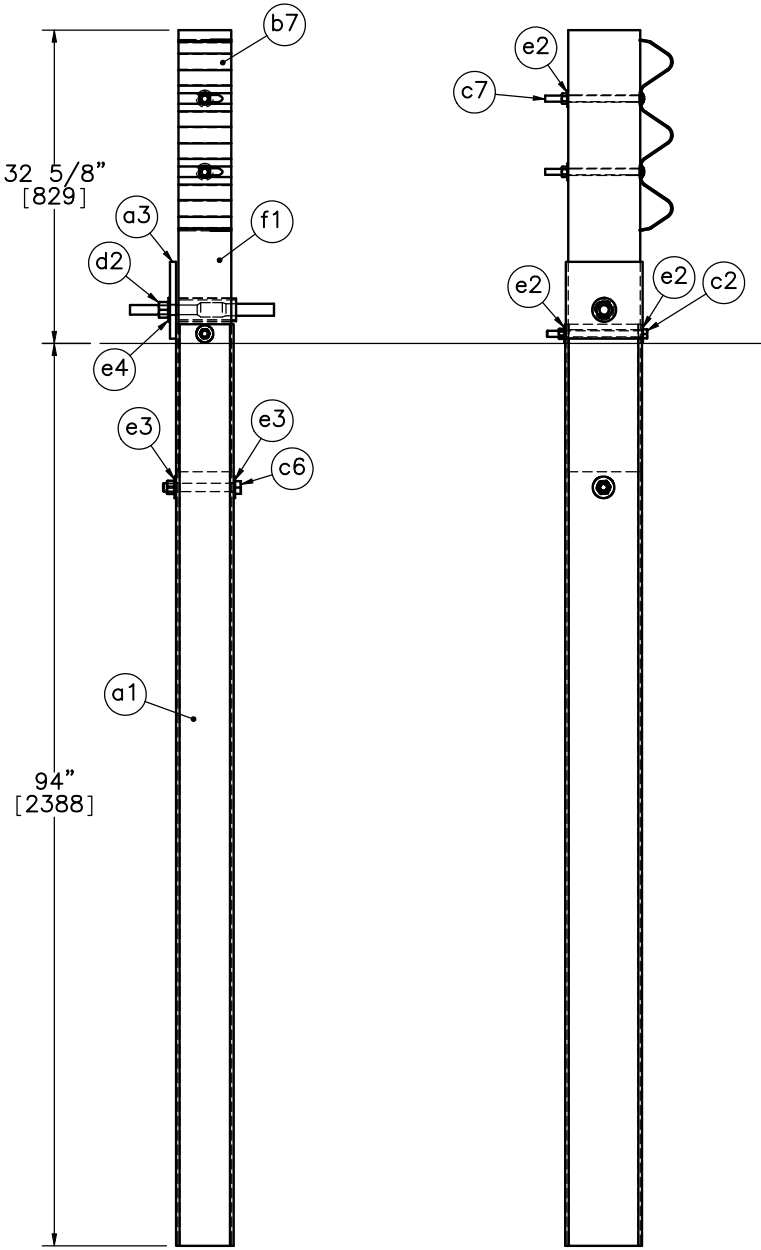
Nose Section Detail

SHEET:	4 of 22
DATE:	8/24/2010
DRAWN BY:	MJW/RJT
REV. BY:	RWB

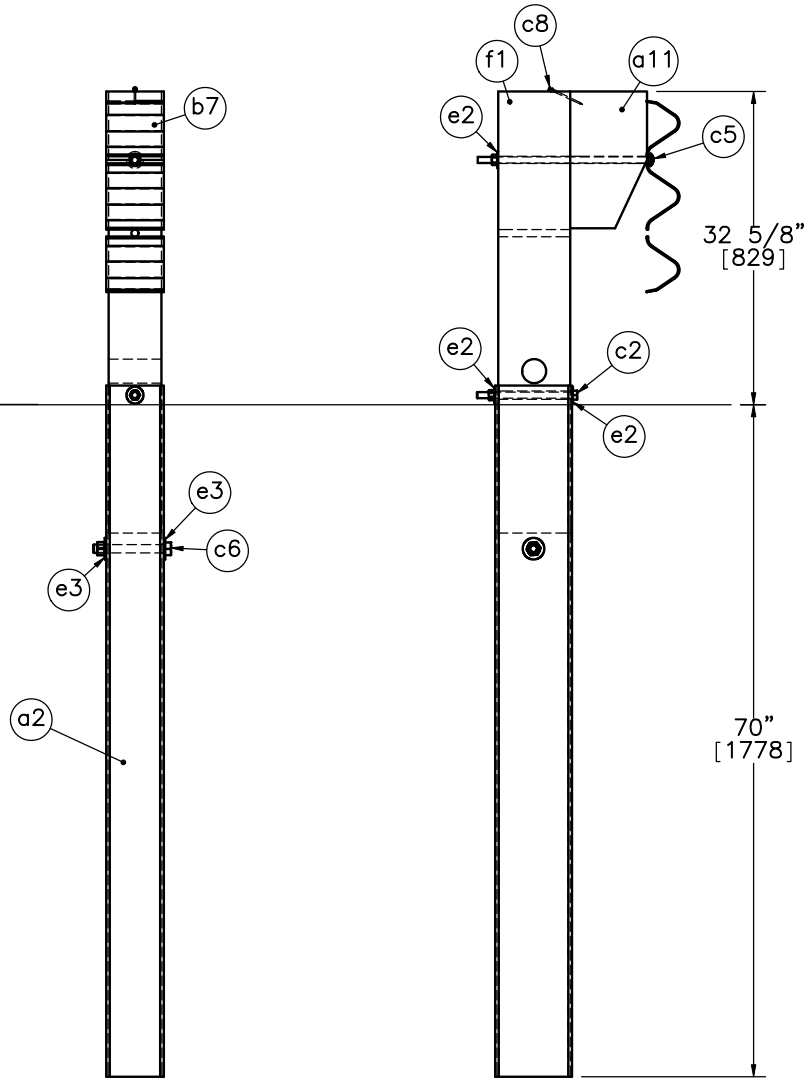
DWG. NAME. USPBN–4 Bullnose_R0

SCALE: 1:27

UNITS: Inches [mm]



Post 1



Post 2

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN-4]

Post Nos. 1 and 2 Details

SHEET: 5 of 22

DATE: 8/24/2010

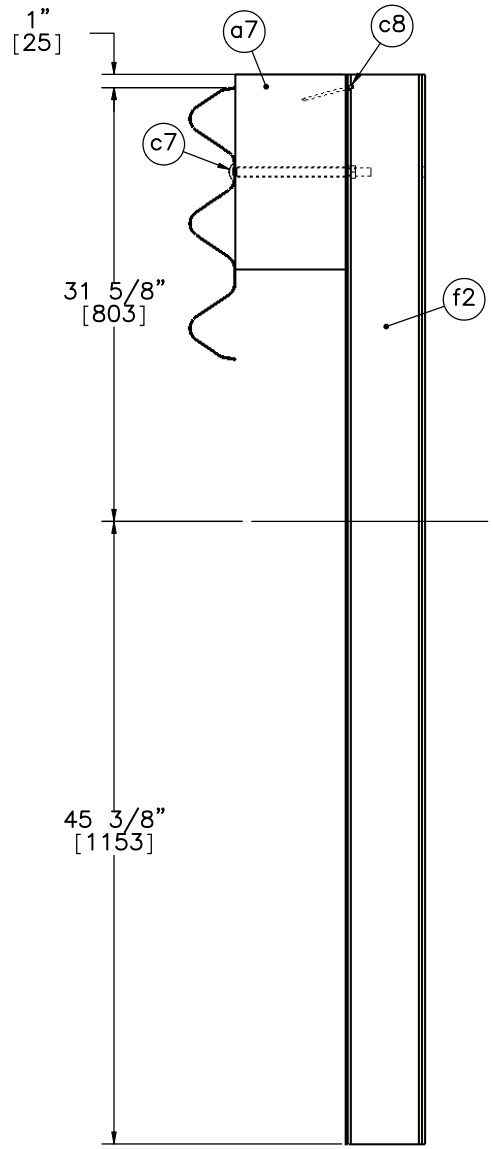
DRAWN BY: MJW/RJT

DWG. NAME. USPBN-4 Bullnose_R0

SCALE: 1:20

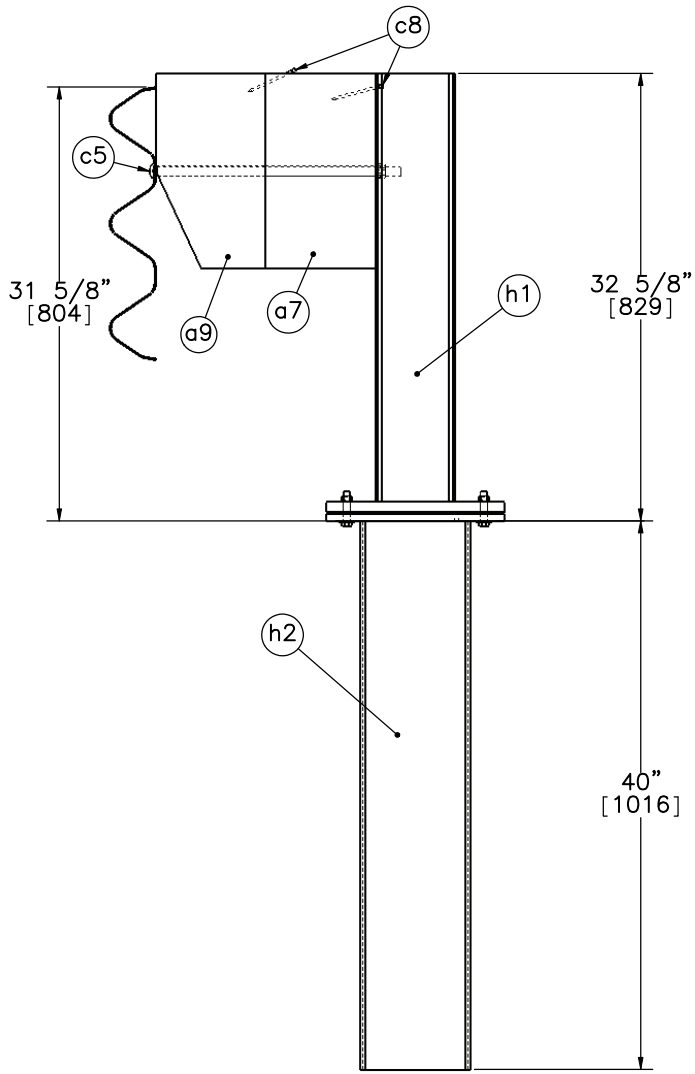
UNITS: Inches [mm]

REV. BY: RWB



Post Nos. 9–12

SECTION D–D



Post Nos. 3–8

SECTION B–B

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

Post Nos. 3–8 and 9–12 Details

DWG. NAME. USPBN–4 Bullnose_R0

SCALE: 1:14

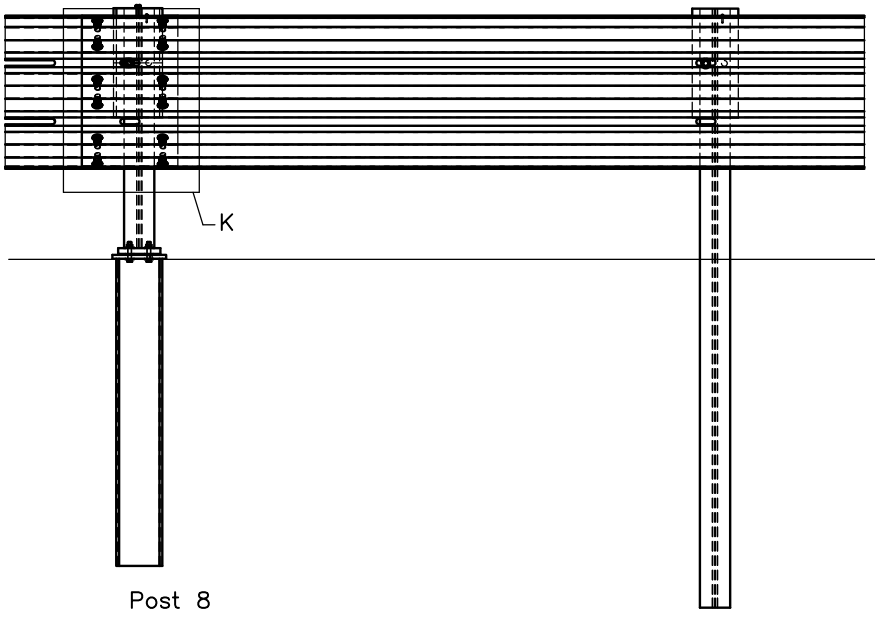
UNITS: Inches [mm]

SHEET: 6 of 22

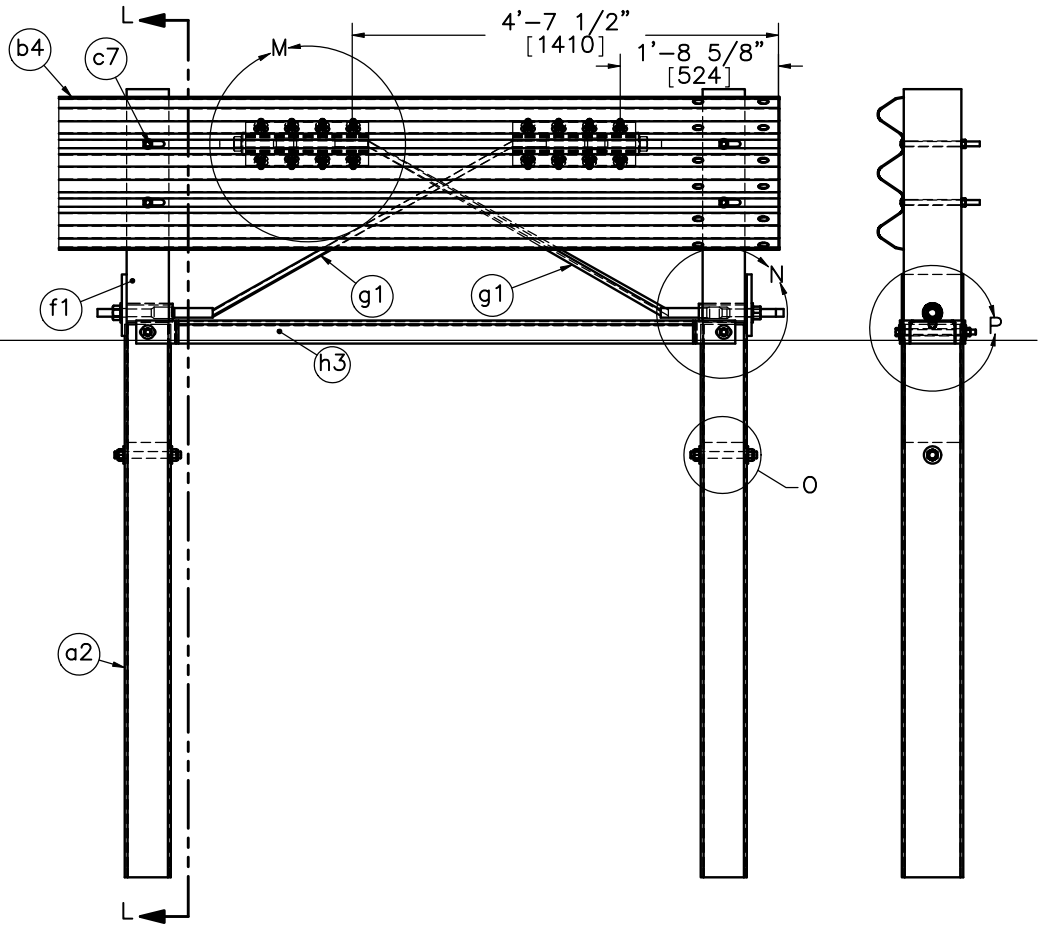
DATE: 8/24/2010

DRAWN BY: MJW/RJT

REV. BY: RWB

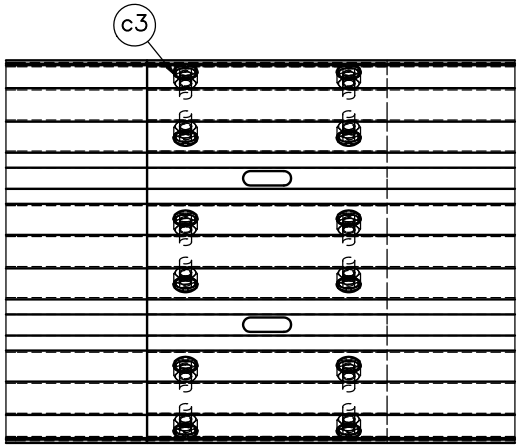


DETAIL C



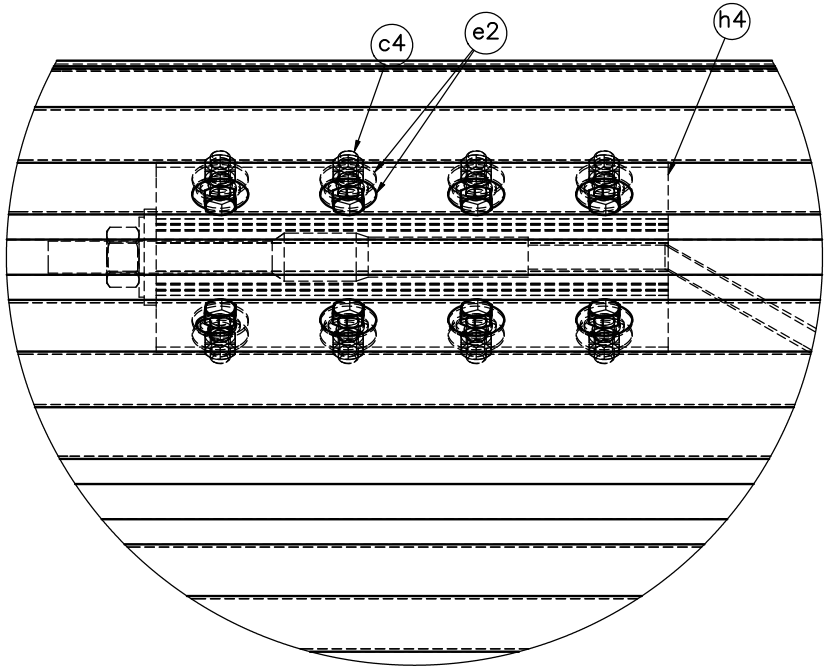
DETAIL E

SECTION L–L

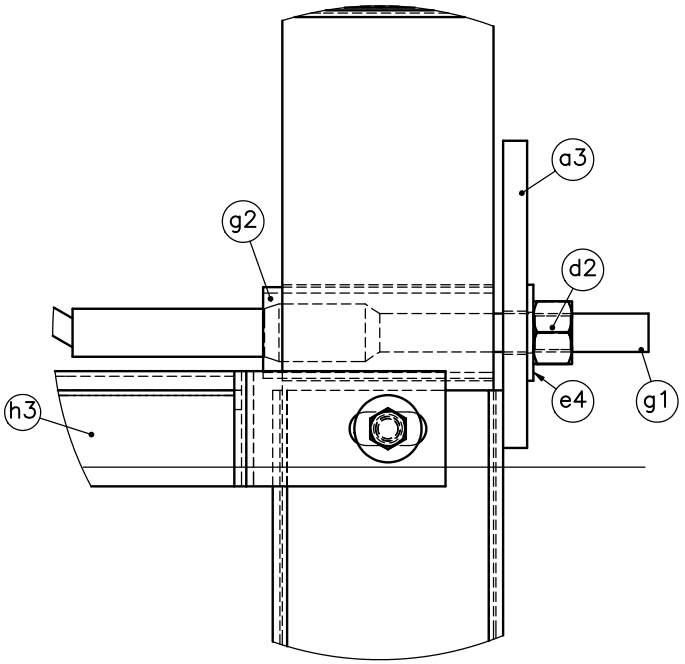


DETAIL K
SCALE 1 : 15

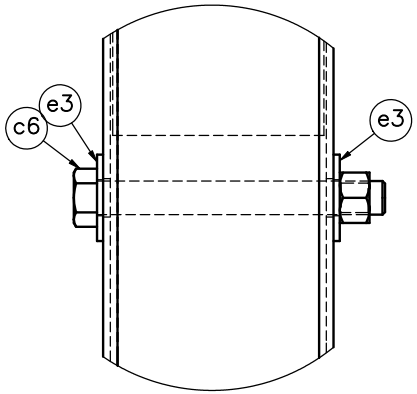
Midwest Roadside Safety Facility	Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4] End Rail Detail Splice Detail	SHEET: 7 of 22 DATE: 8/24/2010 DRAWN BY: MJW/RJT
	DWG. NAME. USPBN–4 Bullnose_R0 SCALE: 1:25 UNITS: Inches [mm]	REV. BY: RWB



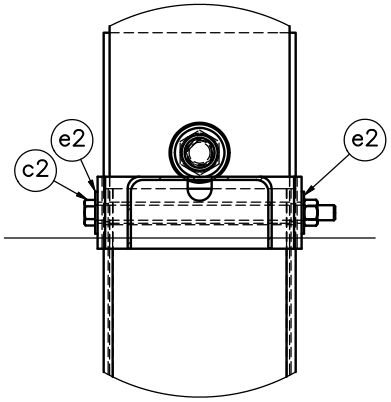
DETAIL M
SCALE 1 : 6



DETAIL N



DETAIL O



DETAIL P
SCALE 1 : 8

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN-4]

Anchor Details

DWG. NAME. USPBN-4 Bullnose_R0

SCALE: 1:5

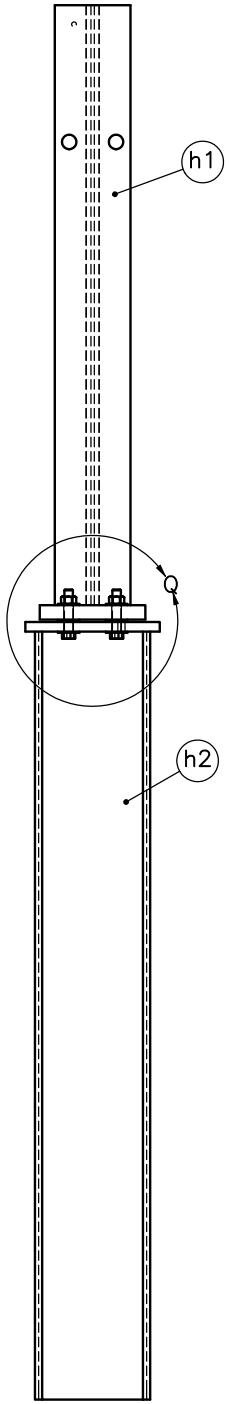
UNITS: Inches [mm]

SHEET: 8 of 22

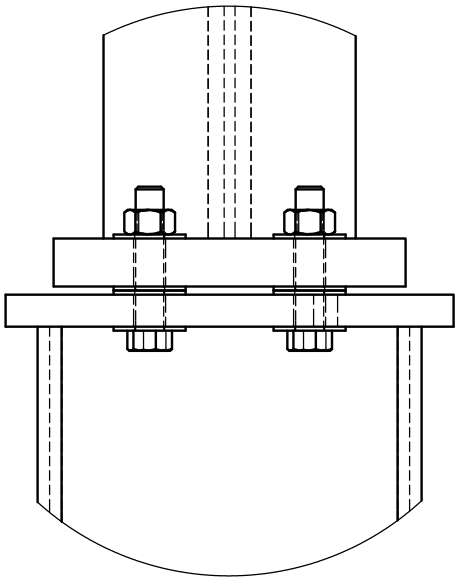
DATE: 8/24/2010

DRAWN BY: MJW/RJT

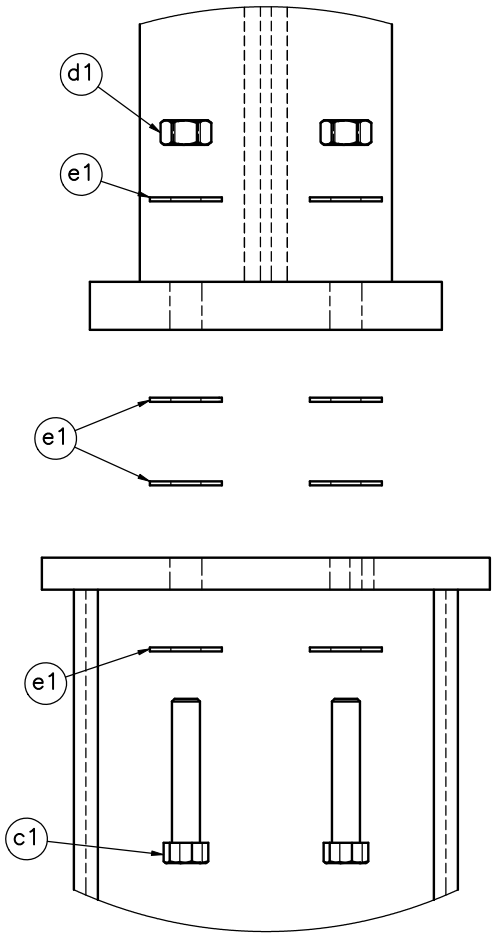
REV. BY: RWB



Universal Breakaway Steel Post
Post Nos. 3 – 8



DETAIL Q
SCALE 1 : 3



DETAIL Q
(EXPLODED)
SCALE 1 : 3

Note: (1) Vertical through–bolts are to be torqued to approximately 60–75 ft–lbs [81.3–101.7 N–m] for ASTM A325 grade bolts.

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

UBSP Post and Component Details

SHEET: 9 of 22

DATE: 8/24/2010

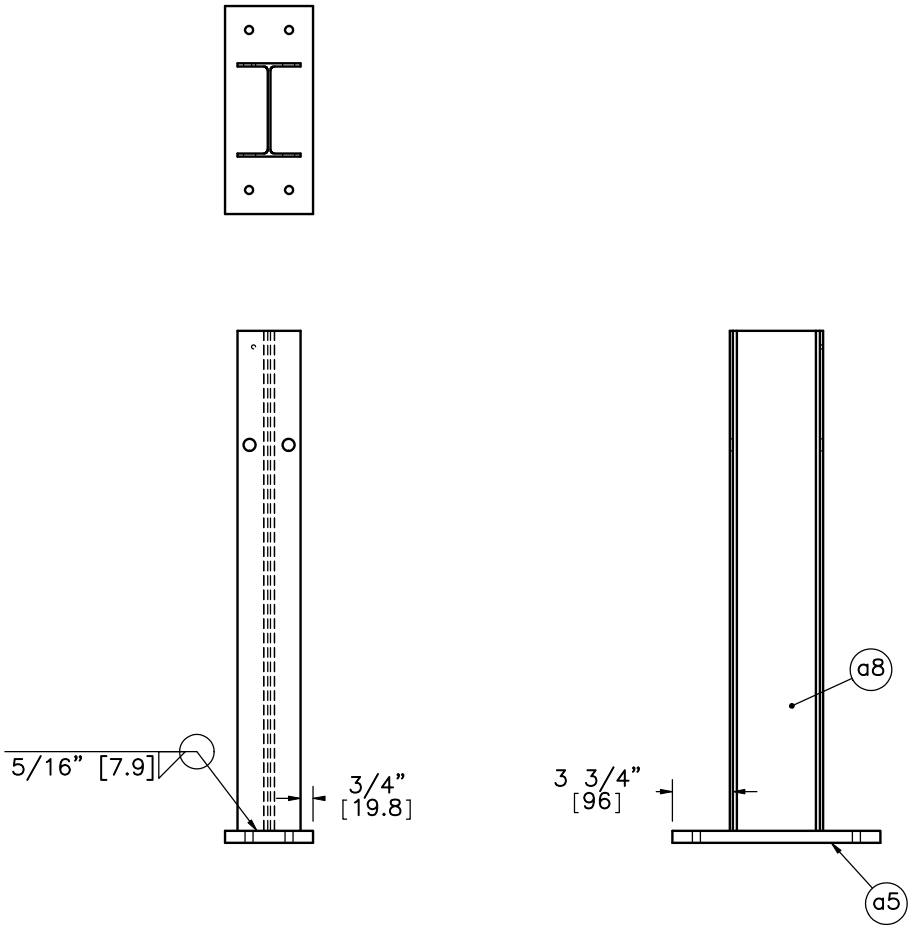
DRAWN BY: MJW/RJT

DWG. NAME. USPBN–4 Bullnose_R0

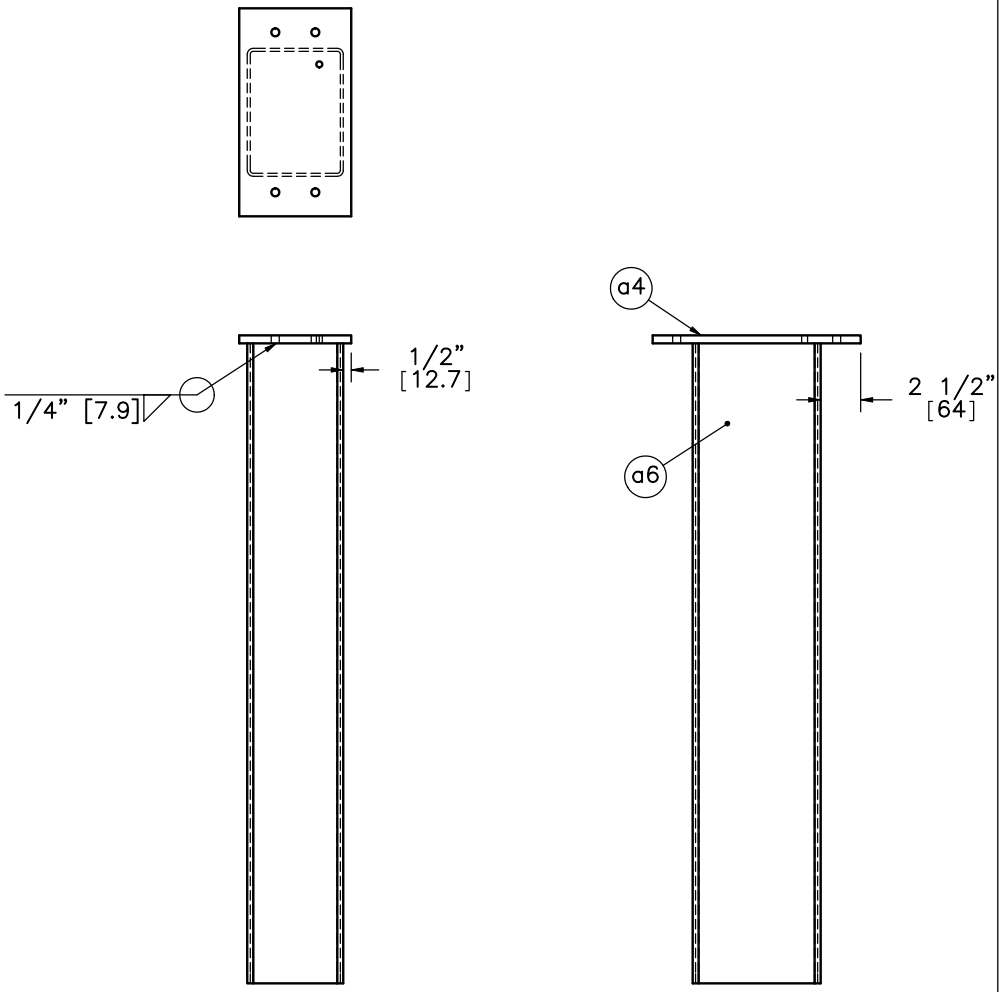
SCALE: 1:10

UNITS: Inches [mm]

REV. BY: RWB



Universal Breakaway Steel Post
Upper Post Assembly
Assembly No. h1



Universal Breakaway Steel Post
Lower Post Assembly
Assembly No. h2

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN-4]

Upper and Lower Post Assembly Details

SHEET: 10 of 22

DATE: 8/24/2010

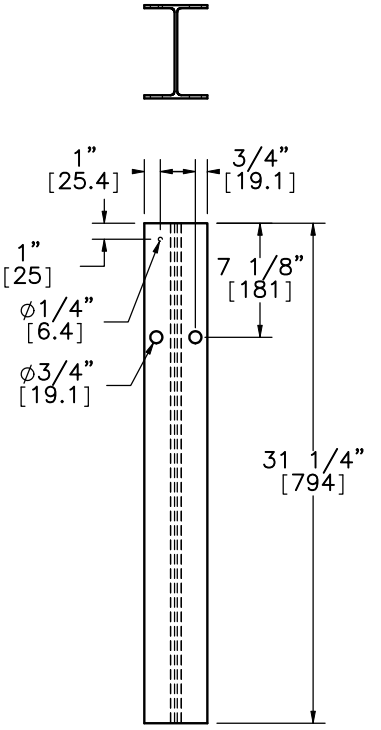
DRAWN BY: MJW/RJT

REV. BY: RWB

DWG. NAME. USPBN-4 Bullnose_R0

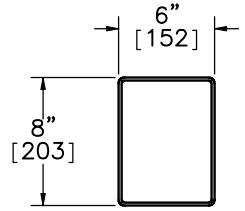
SCALE: 1:12

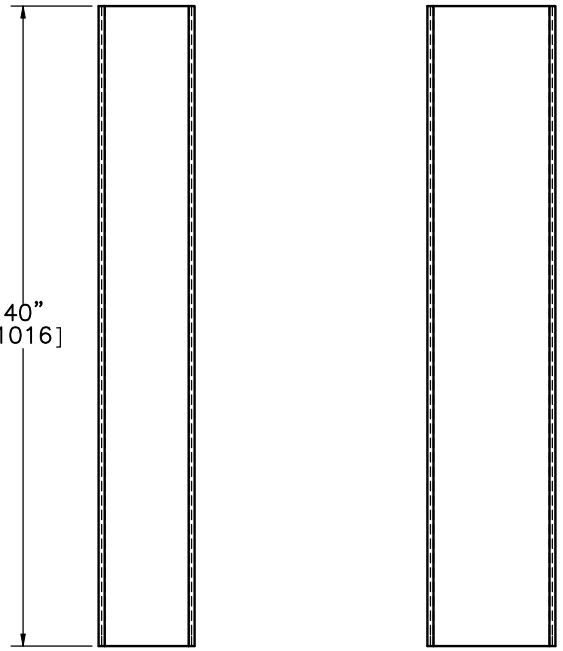
UNITS: Inches [mm]



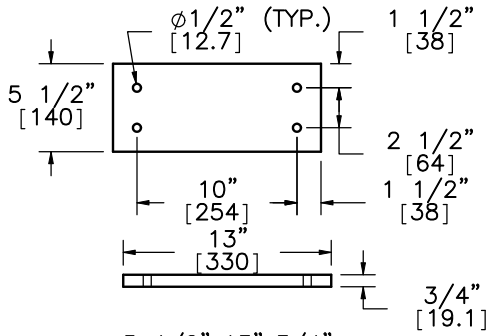
W6x8.5
[W152x12.6]
Part a8

Note: (1) ϕ3/8" [9.5] Weep Hole is to be drilled in the steel plate (Part a4) to allow for draining of the hot zinc coating during the galvanization process.

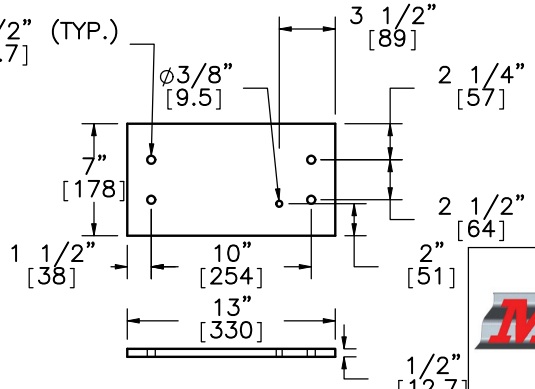




TS 6x8x3/16" [152x203x4.8]
Tube
Part a6



5 1/2"x13"x3/4"
[140x330x19.1]
Upper Shear Plate
Part a5



7"x13"x1/2"
[178x330x12.7]
Lower Shear Plate
Part a4

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN-4]

UBSP Component Details

SHEET: 11 of 22

DATE: 8/24/2010

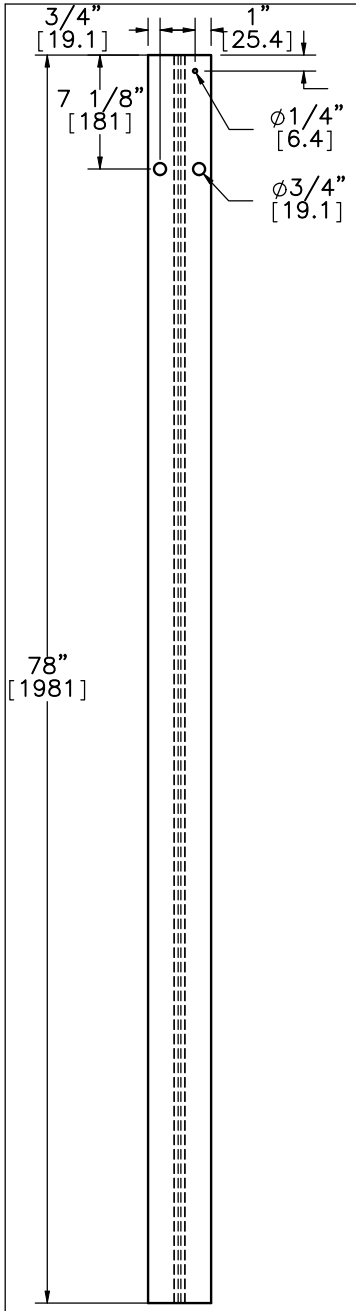
DRAWN BY: MJW/RJT

DWG. NAME. USPBN-4 Bullnose_R0

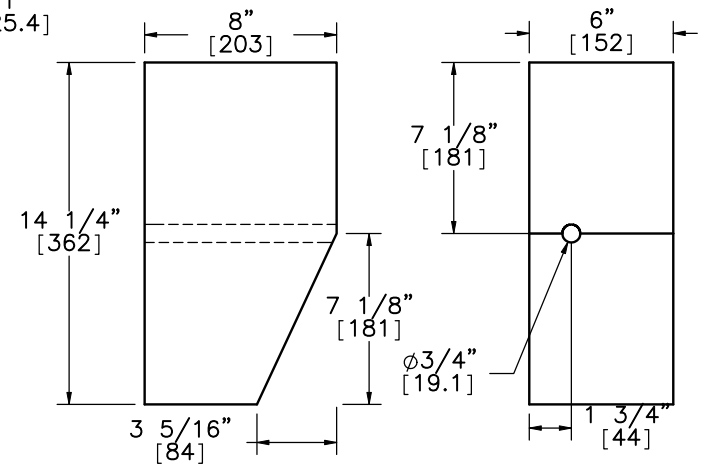
SCALE: 1:12

UNITS: Inches [mm]

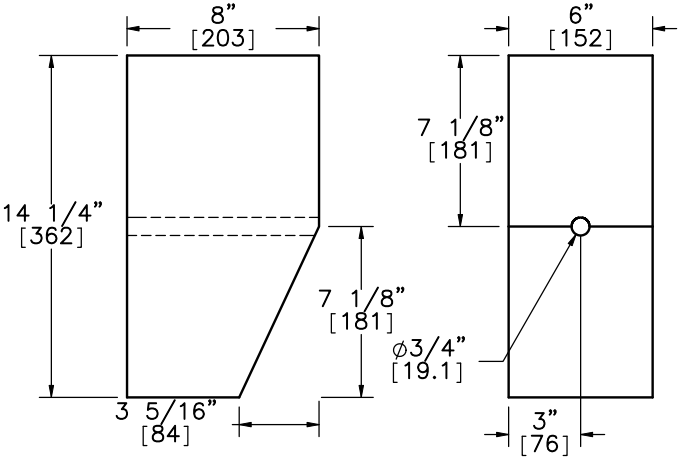
REV. BY: RWB



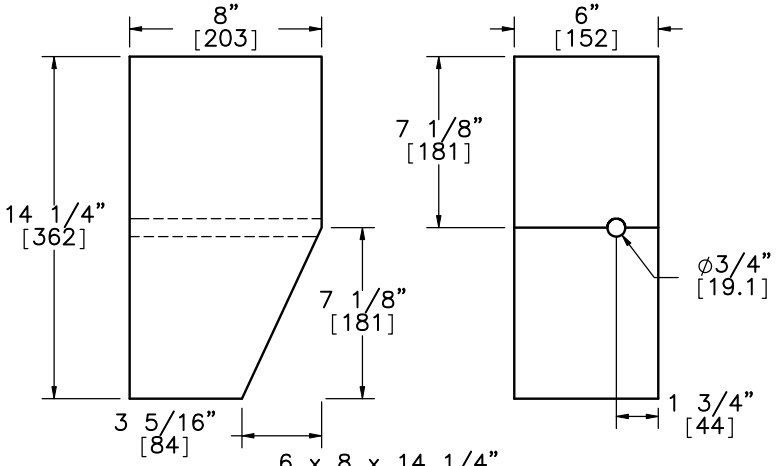
W6x8.5 [W152x12.6] Part f2
SCALE 1 : 12



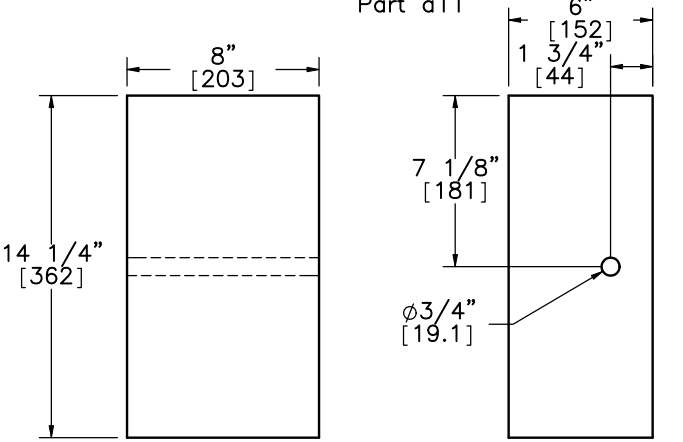
6 x 8 x 14 1/4" [152x203x362] Tapered Blockout – Side A
Part a9



6 x 8 x 14 1/4" [152x203x362] Tapered Blockout – Post 2
Part a11



6 x 8 x 14 1/4" [152x203x362] Tapered Blockout – Side B
Part a10



6 x 8 x 14 1/4" [152x203x362] Blockout
Part a7

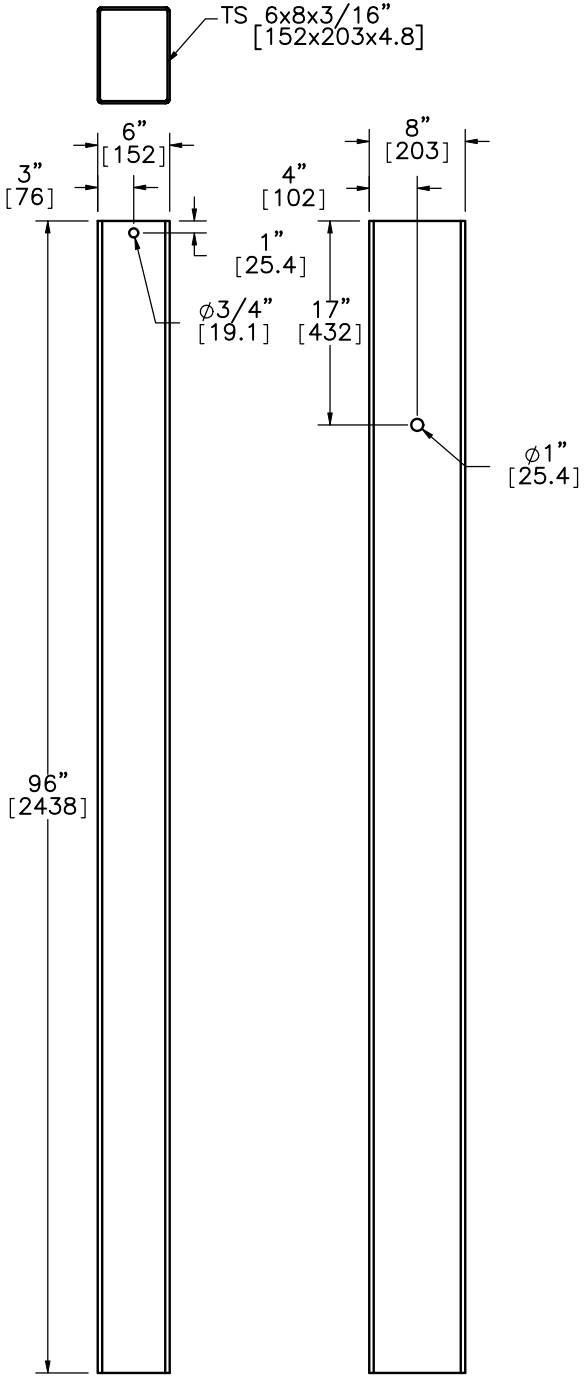
Note: (1) W6x9 [W152x13.4] posts may be substituted for the W6x8.5 [W152x12.6] posts.

Midwest Roadside Safety Facility

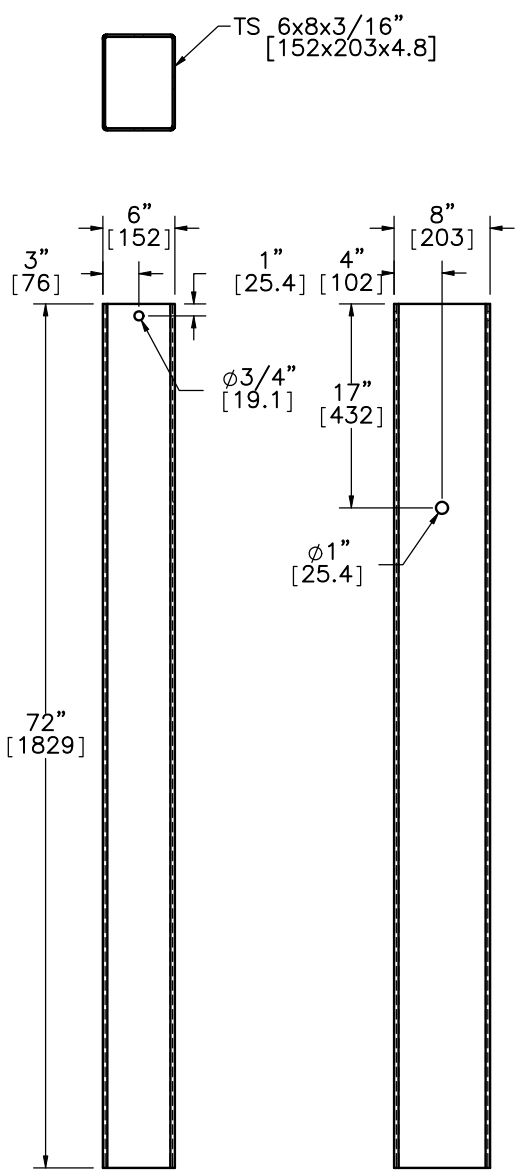
Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

W6x9 Post and Blockout Details

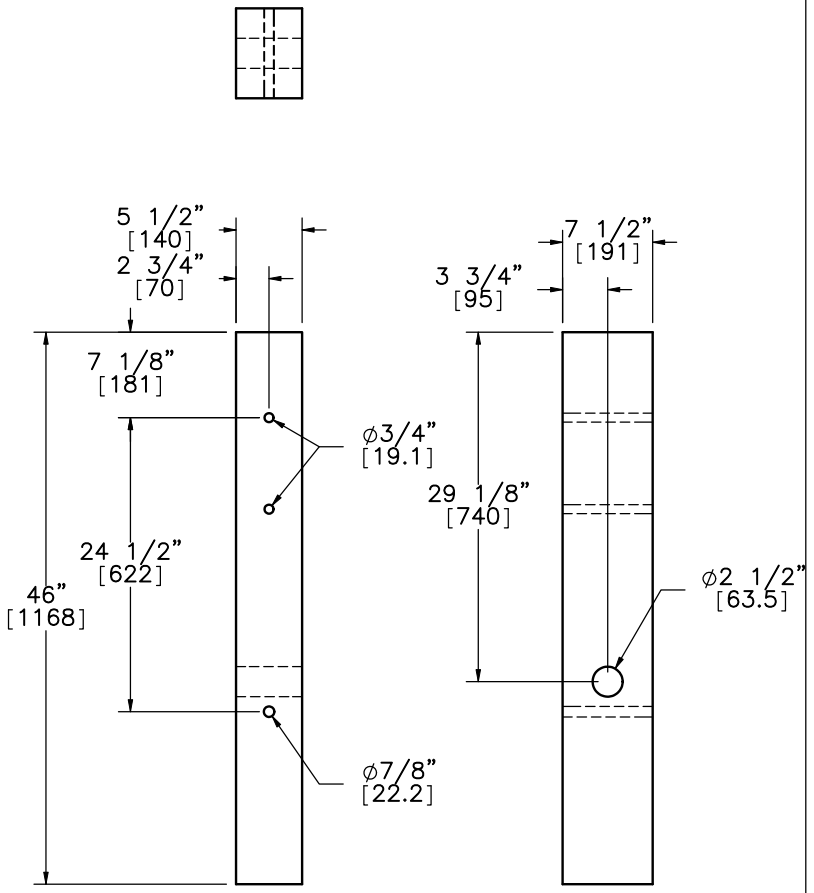
SHEET:	12 of 22
DATE:	8/24/2010
DRAWN BY:	MJW/RJT
REV. BY:	RWB
DWG. NAME.	USPBN–4 Bullnose_R0
SCALE:	1:8
UNITS:	Inches [mm]



8 ft [2438] Foundation Tube
Part a1



6 ft [1829] Foundation Tube
Part a2



BCT (Thrie) Timber Post
Part f1

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN-4]

BCT Timber Posts and Foundation Tube Details

DWG. NAME. USPBN-4 Bullnose_R0

SCALE: 1:16

UNITS: Inches [mm]

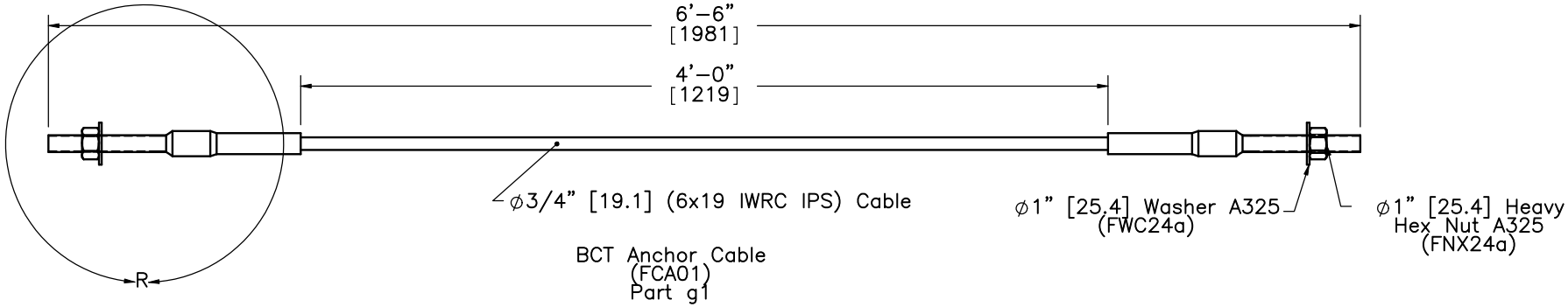
SHEET: 13 of 22

DATE: 8/24/2010

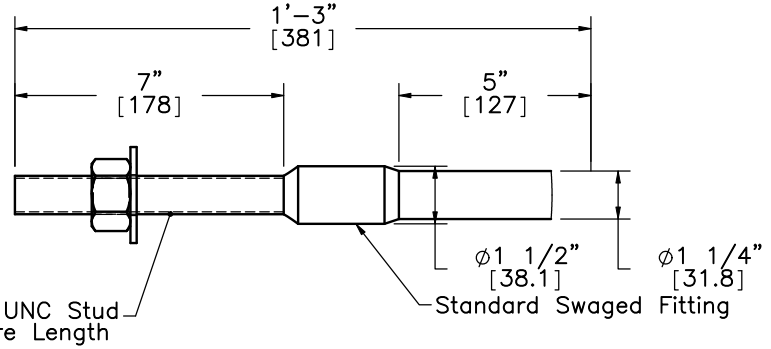
DRAWN BY: MJW/RJT

REV. BY: RWB

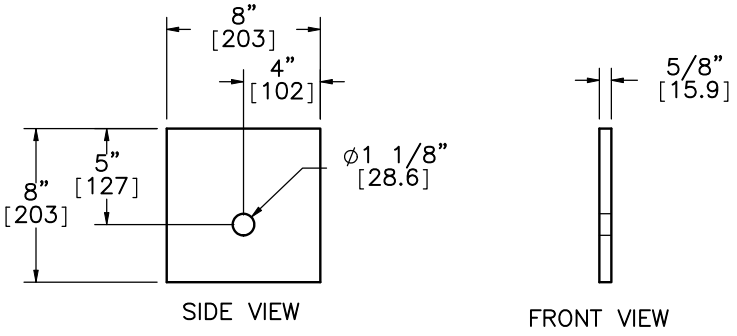
Note: (1) 6x19 and 6x25 IWRC cables are equivalent.



BCT Anchor Cable
(FCA01)
Part g1

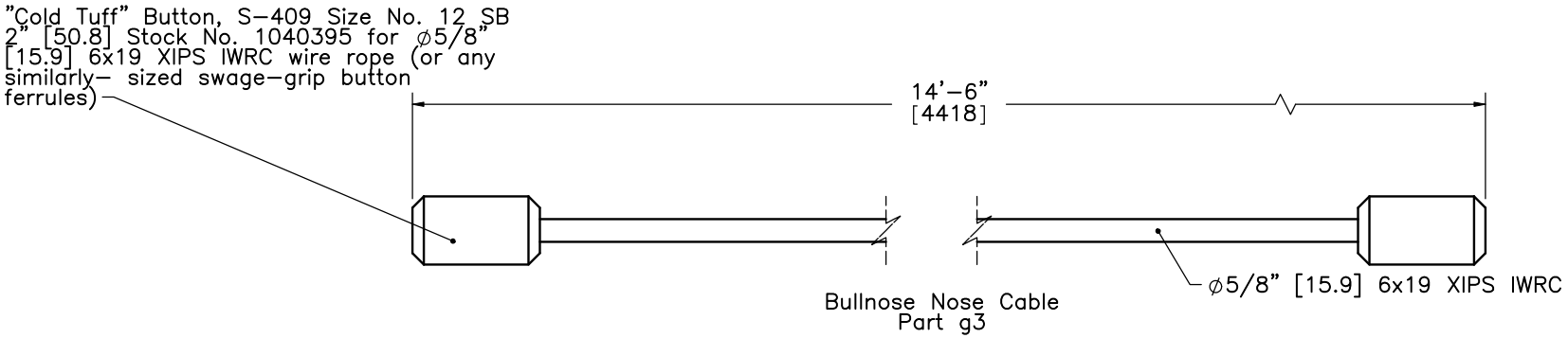


DETAIL R
SCALE 1 : 5

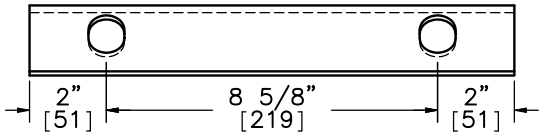


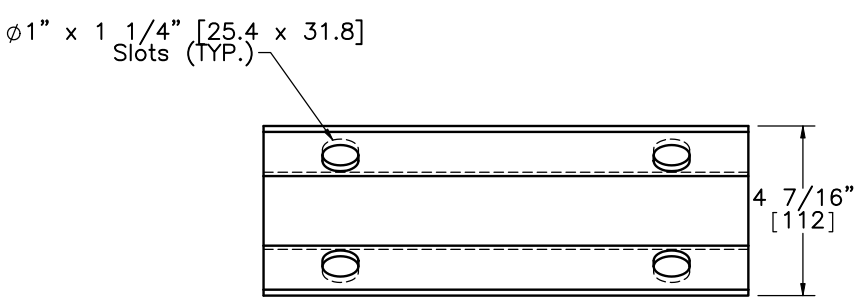
Anchor Cable Bearing Plate
(FPB01)
Part a3

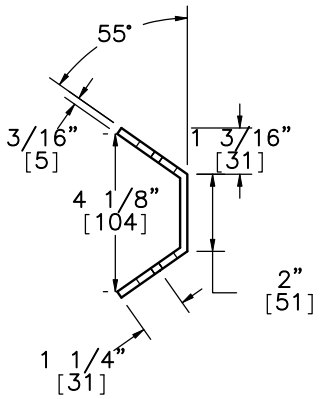
Midwest Roadside Safety Facility	Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4] BCT Anchor Cable Detail	SHEET: 14 of 22 DATE: 8/24/2010 DRAWN BY: MJW/RJT
	DWG. NAME. USPBN–4 Bullnose_R0 SCALE: 1:10 UNITS: Inches [mm]	REV. BY: RWB



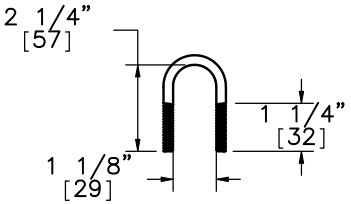
Bullnose Nose Cable
Part g3



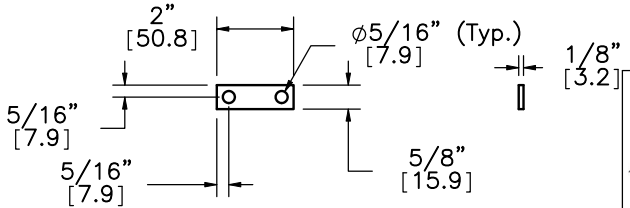




Nose Cable Anchor Plate
Part g4



∅1/4" [6.4] U-Bolt
Galvanized A307
Part g6



∅1/4" [6.4] Plate Washer
Galvanized A307
Part g5

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN-4]

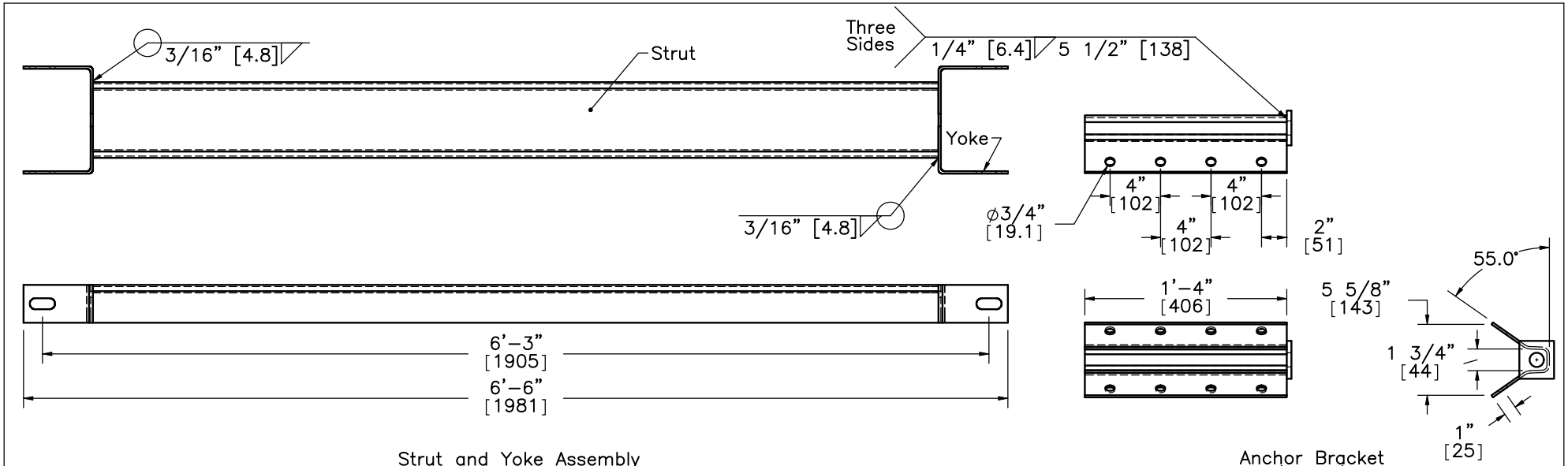
Nose Cable Detail

SHEET:	15 of 22
DATE:	8/24/2010
DRAWN BY:	MJW/RJT
REV. BY:	RWB

DWG. NAME. USPBN-4 Bullnose_R0

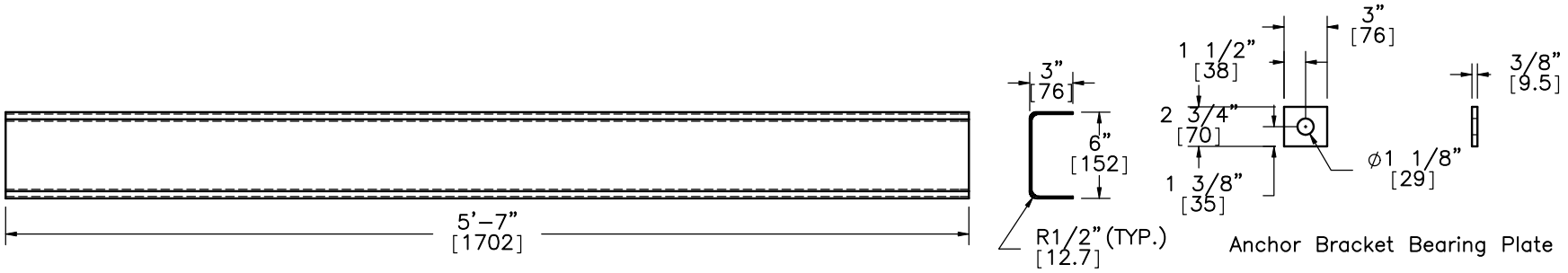
SCALE: 1:5

UNITS: Inches [mm]



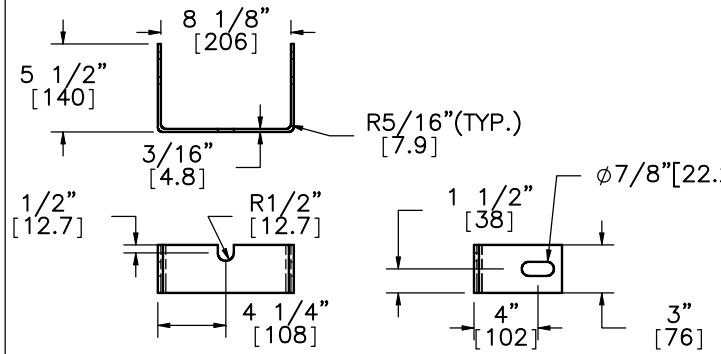
Strut and Yoke Assembly
Assembly h3

Anchor Bracket
(FPA01)
Assembly h4

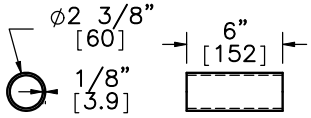


Strut
C.R. Channel 6x3 [152x76] 10 Gauge

Anchor Bracket Bearing Plate



Yoke



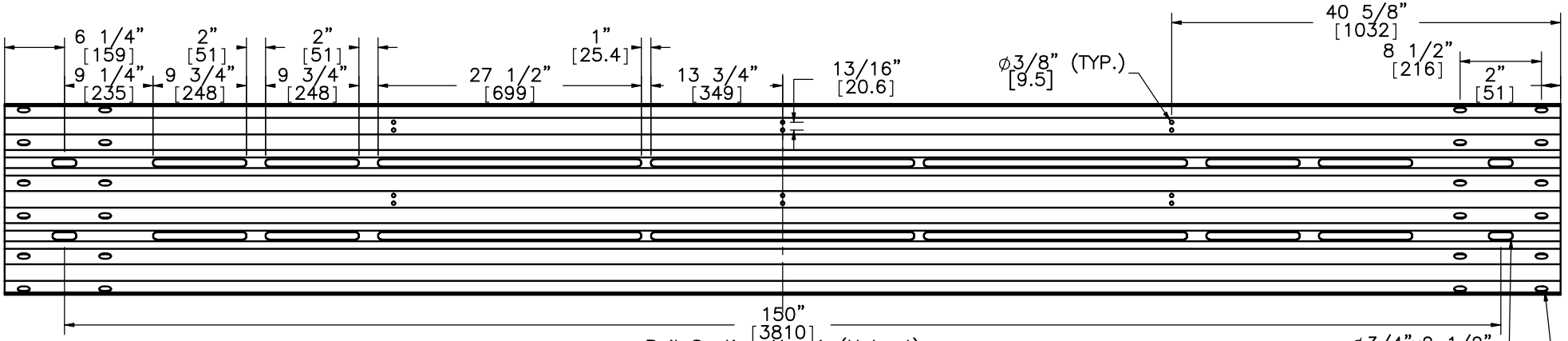
BCT Post Sleeve
Part g2

Midwest Roadside Safety Facility

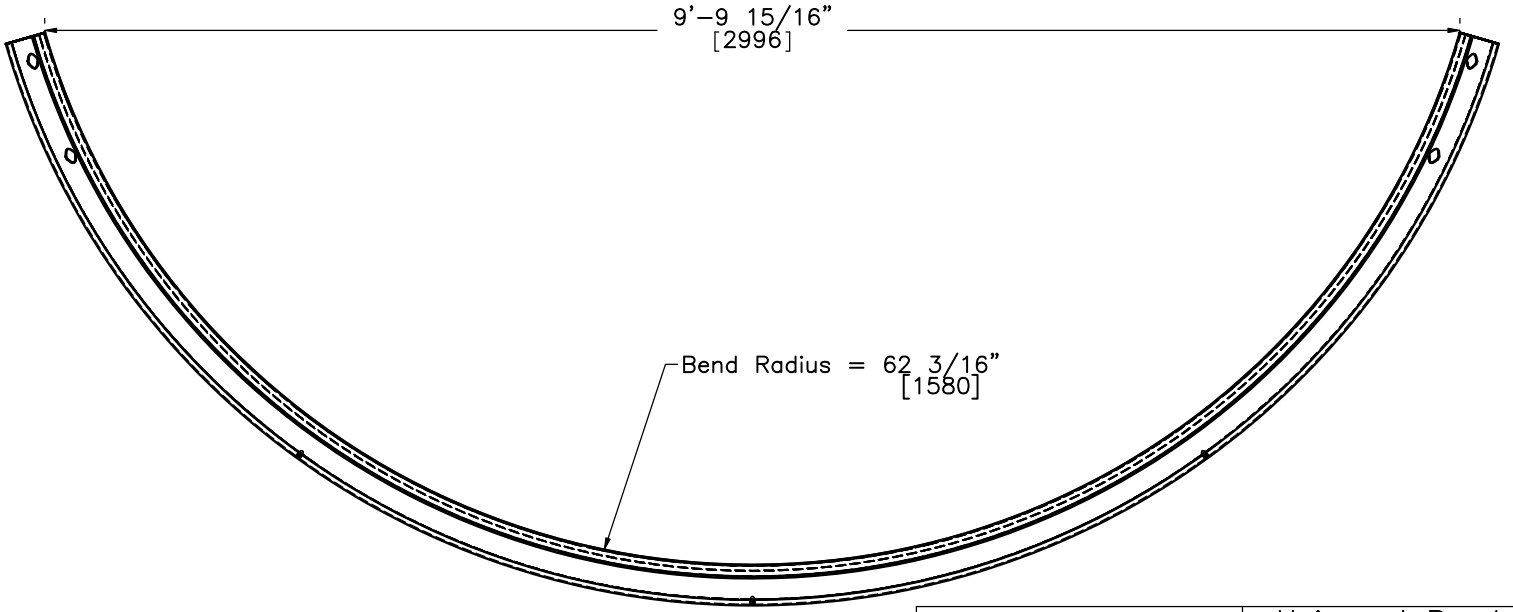
Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

BCT Anchorage Detail

SHEET:	16 of 22
DATE:	8/24/2010
DRAWN BY:	MJW/RJT
DWG. NAME.	USPBN–4 Bullnose_R0
SCALE:	1:12
UNITS:	Inches [mm]
REV. BY:	RWB



Rail Section No. 1 (Unbent)
RTM07a Slot Pattern



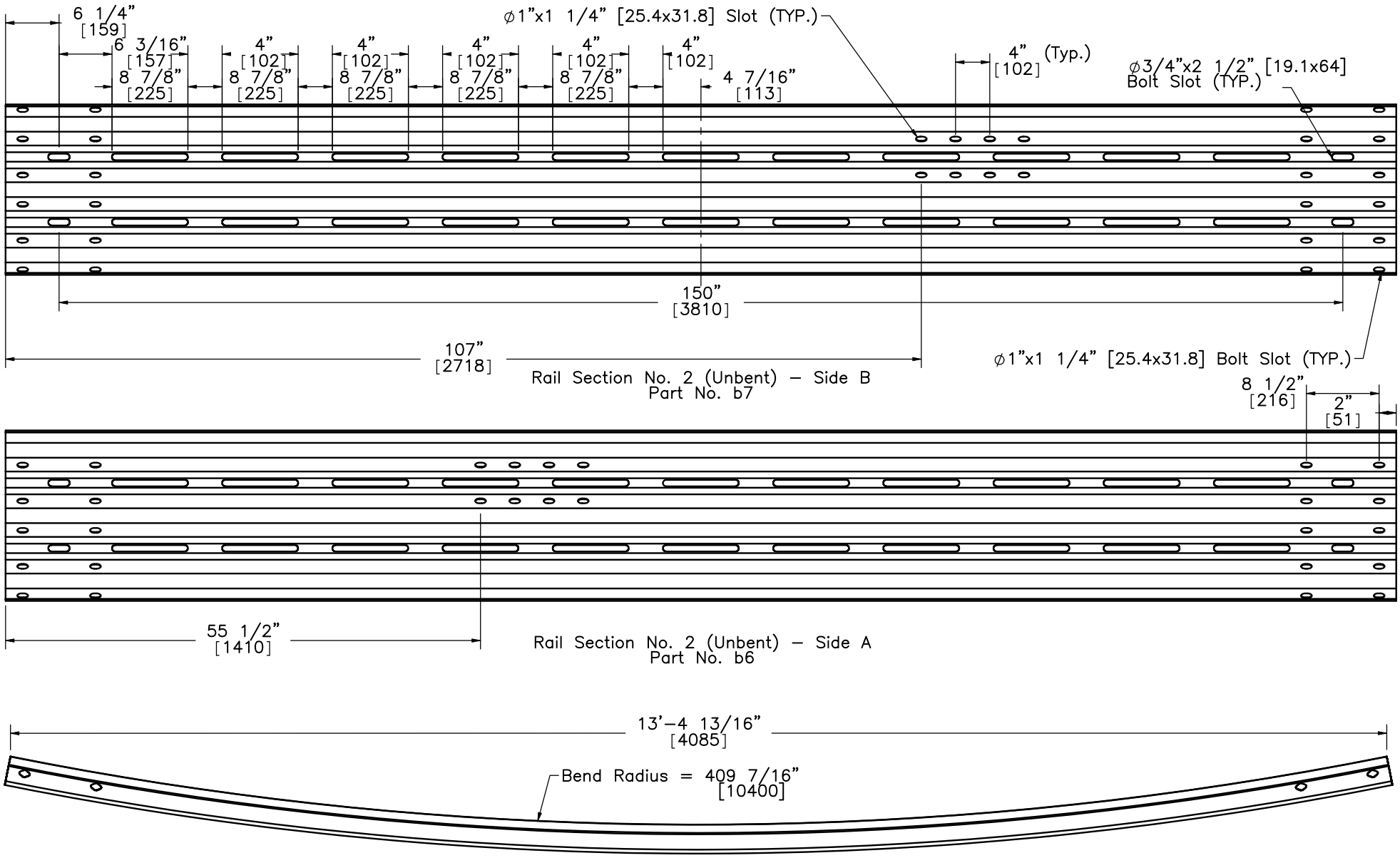
Rail Section No. 1
Part No. b2

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN-4]

Rail Section Details
Section No. 1

SHEET:	17 of 22
DATE:	8/24/2010
DRAWN BY:	MJW/RJT
REV. BY:	RWB
DWG. NAME.	USPBN-4 Bullnose_R0
SCALE:	1:16
UNITS:	Inches [mm]



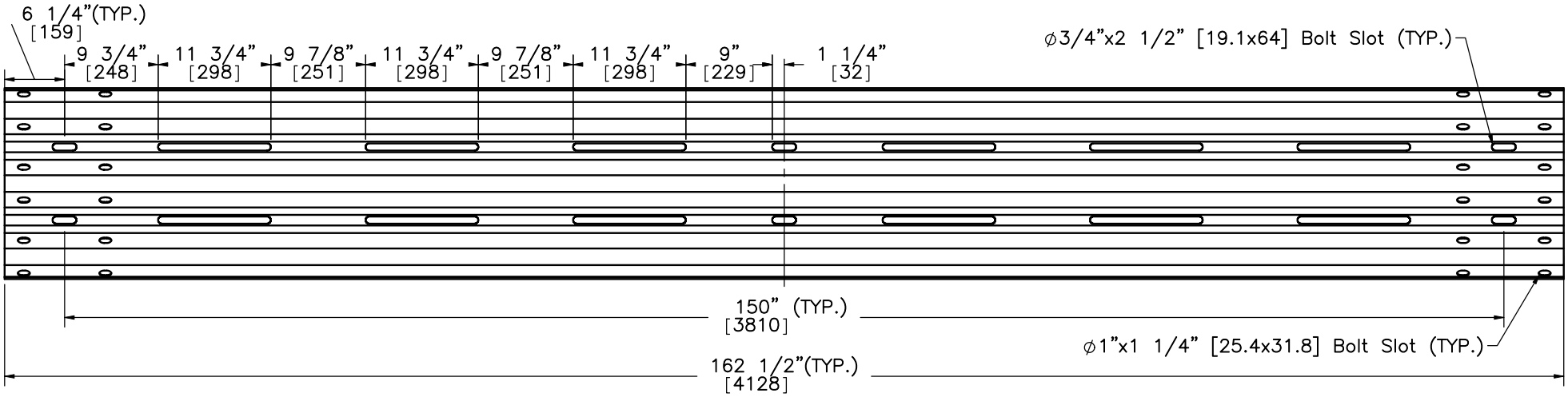
Rail Section No. 2
RTM07d Slot Pattern

Midwest Roadside Safety Facility

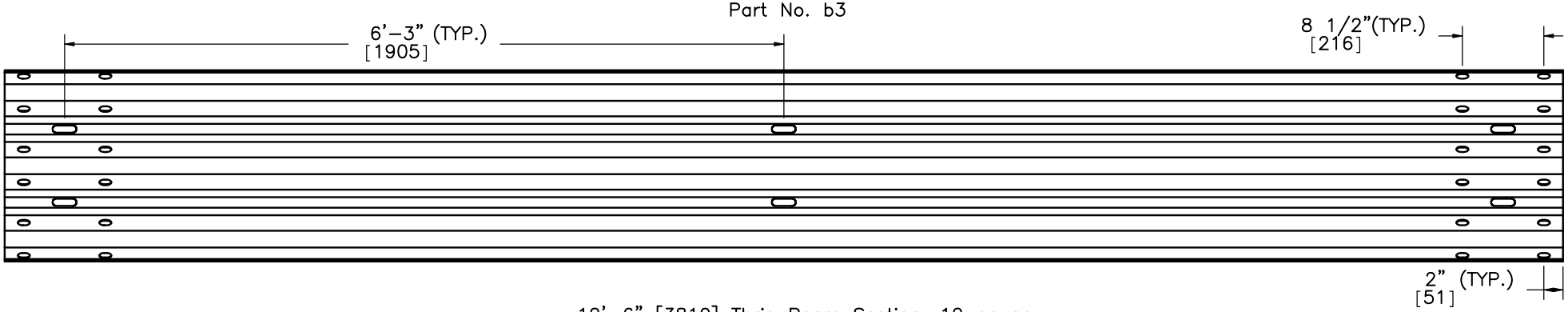
Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

Rail Section Details
Section No. 2

SHEET:	18 of 22
DATE:	8/24/2010
DRAWN BY:	MJW/RJT
REV. BY:	RWB
DWG. NAME.	USPBN–4 Bullnose_R0
SCALE:	1:16
UNITS:	Inches [mm]



12'–6" [3810] Thrie Beam Section, 12 gauge
Rail Section No. 3
RTM07e Slot Pattern
Part No. b3



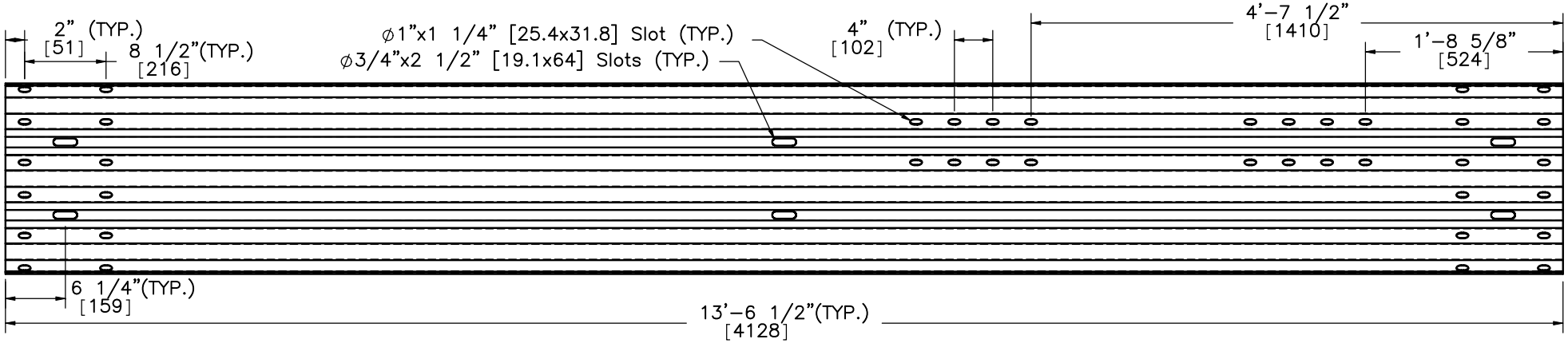
12'–6" [3810] Thrie Beam Section, 12 gauge
Rail Section No. 4
Part No. b1

Midwest Roadside Safety Facility

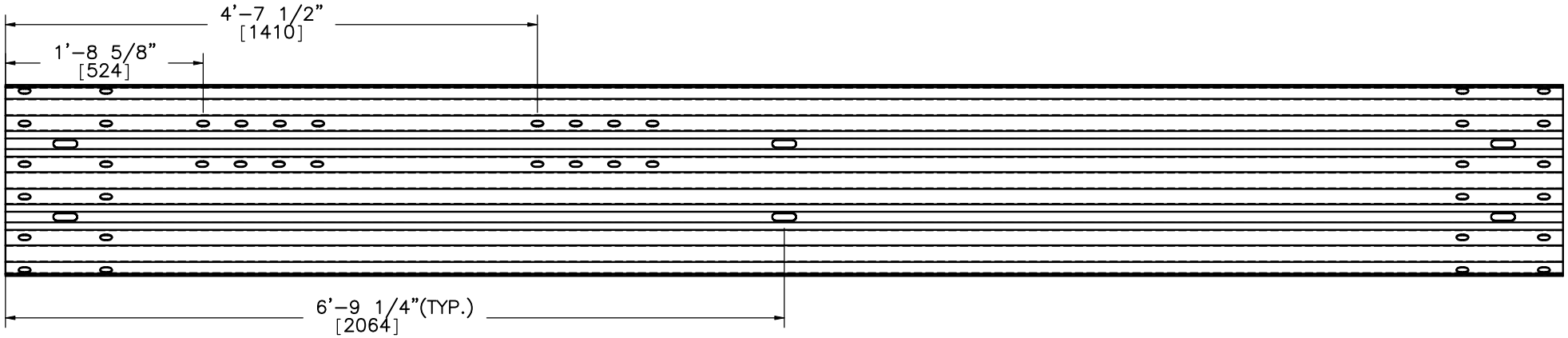
Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

Rail Section Details
Section Nos. 3 and 4

SHEET:	19 of 22
DATE:	8/24/2010
DRAWN BY:	MJW/RJT
REV. BY:	RWB
DWG. NAME.	USPBN–4 Bullnose_R0
SCALE:	1:16
UNITS:	Inches [mm]



12'-6" [3810] Thrie Beam End Section, 12 gauge
Rail Section No. 5 – Side A
Part No. b4



12'-6" [3810] Thrie Beam End Section, 12 gauge
Rail Section No. 5 – Side B
Part No. b5

MWRSF Midwest Roadside Safety Facility	Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN-4] Rail Section Details Section No. 5	SHEET: 20 of 22 DATE: 8/24/2010 DRAWN BY: MJW/RJT
DWG. NAME. USPBN-4 Bullnose_R0	SCALE: 1:16 UNITS: Inches [mm]	REV. BY: RWB

UBSP–4 Bullnose				
Item No.	QTY.	Description	Material Specification	Hardware Guide
a1	2	96" [2438] Foundation Tube	ASTM A500 Grade B	PTE07
a2	6	72" [1829] Foundation Tube	ASTM A500 Grade B	PTE06
a3	6	8 x 8 x 5/8" [203 x 203 x 15.9] Anchor Bearing Plate	ASTM A36	FPB01
a4	12	13 x 7 x 1/2" [330 x 178 x 13] Lower Shear Plate	ASTM A36	–
a5	12	13 x 5 1/2 x 3/4" [330 x 140 x 19] Upper Shear Plate	ASTM A36	–
a6	12	6 x 8 x 3/16" [152 x 203 x 5] x 40" [1016] Foundation Tube	ASTM A500 Grade B	–
a7	20	6 x 8 x 14 1/4" [152 x 203 x362] Blockout	SYP Grade No.1 or better	PDB09
a8	12	W6x8.5 [W152 x 12.6] x 31 1/4" [794] (W6x9 [W152 x 13.4] can be substituted)	ASTM A36 (ASTM A992)	–
a9	6	6 x 8 x 14 1/4" [152 x 203 x 362] Tapered Blockout – Side A	SYP Grade No.1 or better	Blockout with Offset Holes
a10	6	6 x 8 x 14 1/4" [152 x 203 x 362] Tapered Blockout – Side B	SYP Grade No.1 or better	Blockout with Offset Holes
a11	2	6 x 8 x 14 1/4" [152 x 203 x 362] Tapered Blockout – Post 2	SYP Grade No.1 or better	PDB12
b1	4	12'–6" [3810] Thrie Beam Section No. 4	12 gauge AASHTO M180	RTM02a
b2	1	Bent 12'–6" [3810] Thrie Beam Section No. 1 – Radius 62 3/16" [1580]	12 gauge AASHTO M180	RTM07a
b3	2	12'–6" [3810] Thrie Beam Section No. 3 with Extra Slots	12 gauge AASHTO M180	RTM07e
b4	1	12'–6" [3810] Thrie Beam End Section No. 5 – Side A	12 gauge AASHTO M180	–
b5	1	12'–6" [3810] Thrie Beam End Section No. 5 – Side B	12 gauge AASHTO M180	–
b6	1	Bent 12'–6" [3810] Thrie Beam Section No. 2 – Radius 409 7/16" [10400] – Side A	12 gauge AASHTO M180	RTM07d
b7	1	Bent 12'–6" [3810] Thrie Beam Section No. 2 – Radius 409 7/16" [10400] – Side B	12 gauge AASHTO M180	RTM07d
c1	48	7/16" Dia. [11.1] UNC–14 x 2 1/2" [64] long Hex Tap Bolts (Fully Threaded)	SAE Grade 5/ASTM A325	–
c2	8	5/8" [15.9] Dia. x 10" [254] long Hex Head Bolt	Grade A307	FBX16a
c3	120	5/8" Dia. [15.9] x 1 1/2" [38] long Guardrail Bolt and Nut	ASTM A307	FBB01
c4	48	5/8" Dia. [15.9] x 1 1/2" [38]long Hex Head Bolt	ASTM A307	FBX16a
c5	14	5/8" Dia. [15.9] x 18" [457] long Guardrail Bolt and Nut	ASTM A307	FBB04
c6	8	7/8" [22.2] Dia. x 7 1/2" [191] long Hex Head Bolt and Nut	Grade A307	FBX22a
c7	20	5/8" Dia. [15.9] x 10" [254] long Guardrail Bolt and Nut	ASTM A307	FBB03
c8	34	16D Double Head Nail	–	–

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

Bill of Materials

SHEET: 21 of 22

DATE: 8/24/2010

DRAWN BY: MJW/RJT

DWG. NAME. USPBN–4 Bullnose_R0

SCALE: None

UNITS: Inches [mm]

REV. BY: RWB

UBSP–4 Bullnose				
Item No.	QTY.	Description	Material Specification	Hardware Guide
d1	48	7/16" Dia. [11.1] Hex Nut	ASTM A563DH Galvanized	–
d2	12	1" Dia. [25.4] Hex Nut	ASTM A563DH	–
e1	192	7/16" Dia. [11.1] Flat Washer	ASTM F436 Gr. 1 Galvanized	–
e2	118	5/8" [15.9] Dia. Flat Washer	Grade A307	FWC16a
e3	16	7/8" [22.2] Dia. Flat Washer	Grade A307	FWC22a
e4	12	1" Dia. [25.4] Flat Washer	ASTM F436 Gr. 1	FWC24a
f1	8	BCT Thrie Post	SYP Grade No. 1 or better (No knots, 18" [457] above or below ground line and on tension face)	PDF04
f2	8	W6x8.5 [W152x12.6] x 78" [1981] long (W6x9 [W152 x 13.4] can be substituted)	ASTM A36 (ASTM A992)	–
g1	6	BCT Cable 6'–6" [1981] Long	6x19 or 6x25 Cable IWRC IPS	FCA01
g2	6	2 3/8" [60] O.D. x 6" [152] long BCT Post Sleeve	ASTM A53 Grade B Schedule 40	FMM02
g3	2	Bullnose Nose Cable 5/8" Dia. [15.9] x 14.4' [4389] Long	"Cold Tuff" Button, S–409 Size No. 12 SB 2 7/8" [73] Stock No. 1040395 for 5/8" [16] Dia. (6x25) wire rope (or any similarly sized swage–grip button ferrules)	–
g4	4	Nose Cable Anchor Plates 12 5/8" [321] x 5 13/16" [148]	ASTM A36	–
g5	6	1/4" Dia. [6.4] U–Bolt Plate Washer	Zinc Coated or Galvanized ASTM A307	–
g6	6	1/4" Dia. [6.4] U–Bolt	Zinc Coated or Galvanized ASTM A307	–
g7	12	1/4" Dia. [6.4] Hex Nut	Zinc Coated or Galvanized ASTM A307	–
h1	12	UBSP Post – Top Assembly	–	–
h2	12	UBSP Post – Bottom Assembly	–	–
h3	2	Strut and Yoke Assembly	ASTM A36 Galvanized	–
h4	6	Anchor Bracket Assembly	ASTM A36	FPA01

MWRSF

Midwest Roadside Safety Facility

Universal Breakaway Steel Post for Thrie Beam Bullnose Median Barrier System [Test No. USPBN–4]

Bill Of Materials

SHEET: 22 of 22

DATE: 8/24/2010

DRAWN BY: MJW/RJT

REV. BY: RWB

DWG. NAME. USPBN–4 Bullnose_R0

SCALE: None

UNITS: Inches [mm]