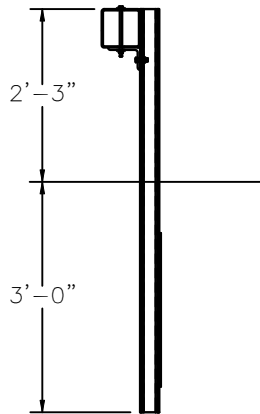



SECTION A-A
SCALE 1 : 30

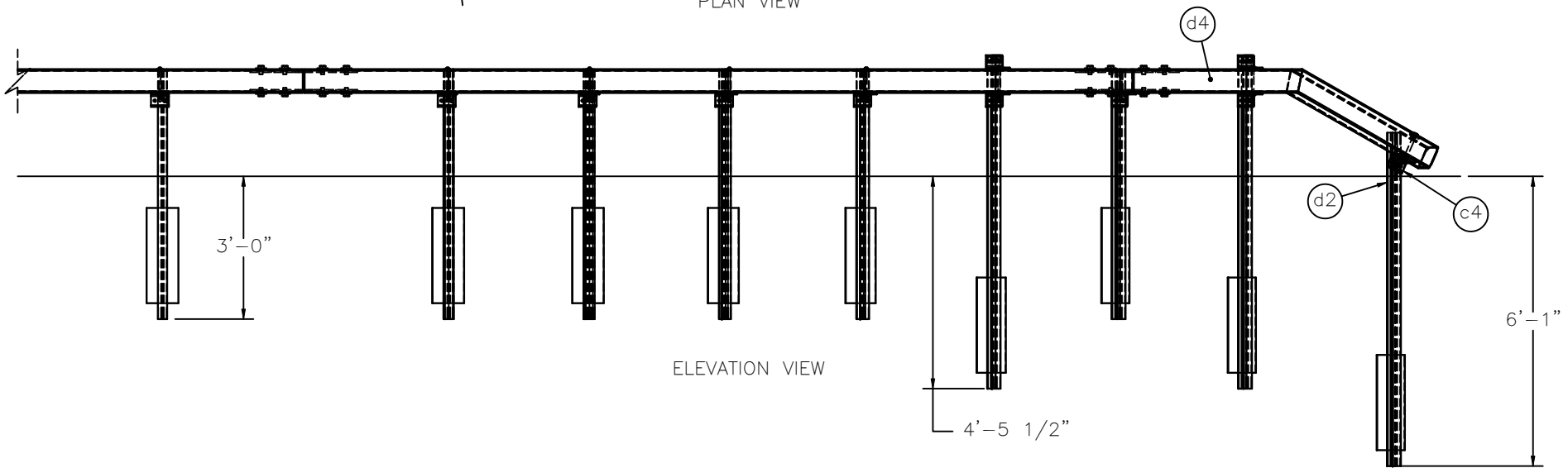
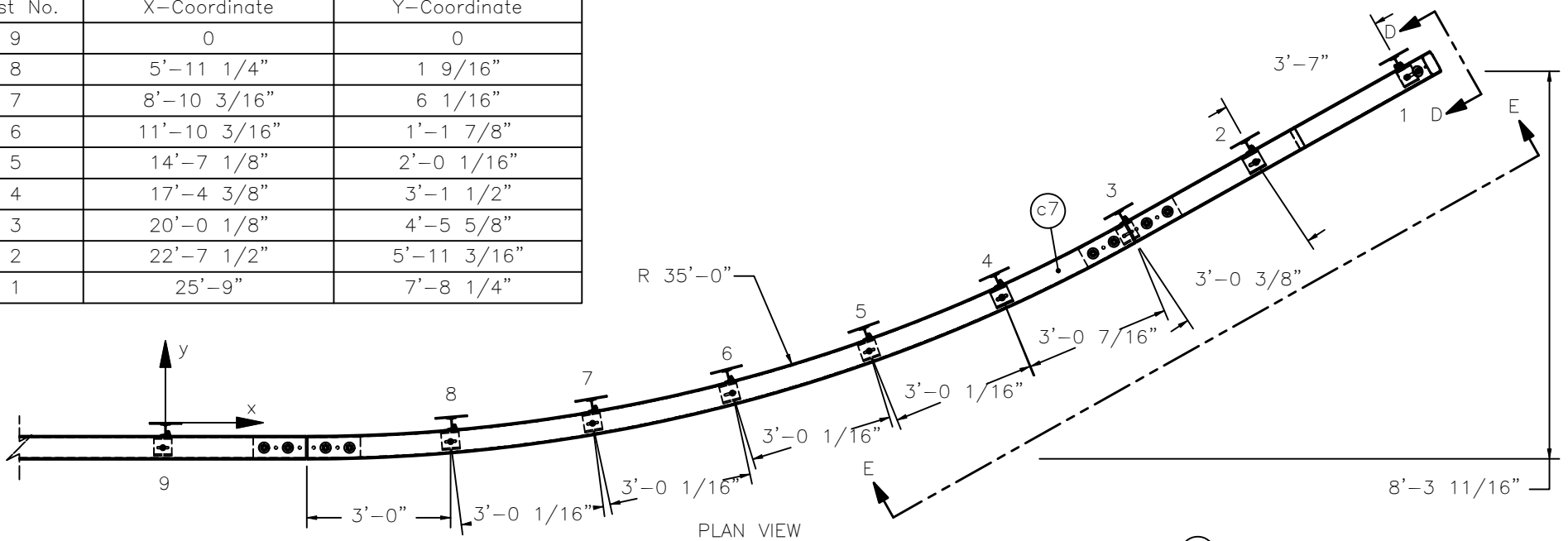


SECTION C-C
SCALE 1 : 30

Note: (1) Modified test no. 3-35 conducted at 100 kph and 25 degrees with the tangent and the right side of the 2270P vehicle aligned with the vertical bolt located at the midpoint of the rail and supported by post no. 5 (NYBBT-9).

	Type IIA Box Beam Terminal (Test No. NYBBT-9)		SHEET: 1 of 16
	System Layout		DATE: 7/17/2009
Midwest Roadside Safety Facility	DWG. NAME: NYBBT-9_R1	SCALE: 1:175 UNITS: Inches	DRAWN BY: RJT/CSS/EMA
			REV. BY: KAP/RKF

Post No.	X-Coordinate	Y-Coordinate
9	0	0
8	5'-11 1/4"	1 9/16"
7	8'-10 3/16"	6 1/16"
6	11'-10 3/16"	1'-1 7/8"
5	14'-7 1/8"	2'-0 1/16"
4	17'-4 3/8"	3'-1 1/2"
3	20'-0 1/8"	4'-5 5/8"
2	22'-7 1/2"	5'-11 3/16"
1	25'-9"	7'-8 1/4"



Note: (1) All coordinates dimensioned from the centerline of post no. 9 to the centerline of each post.



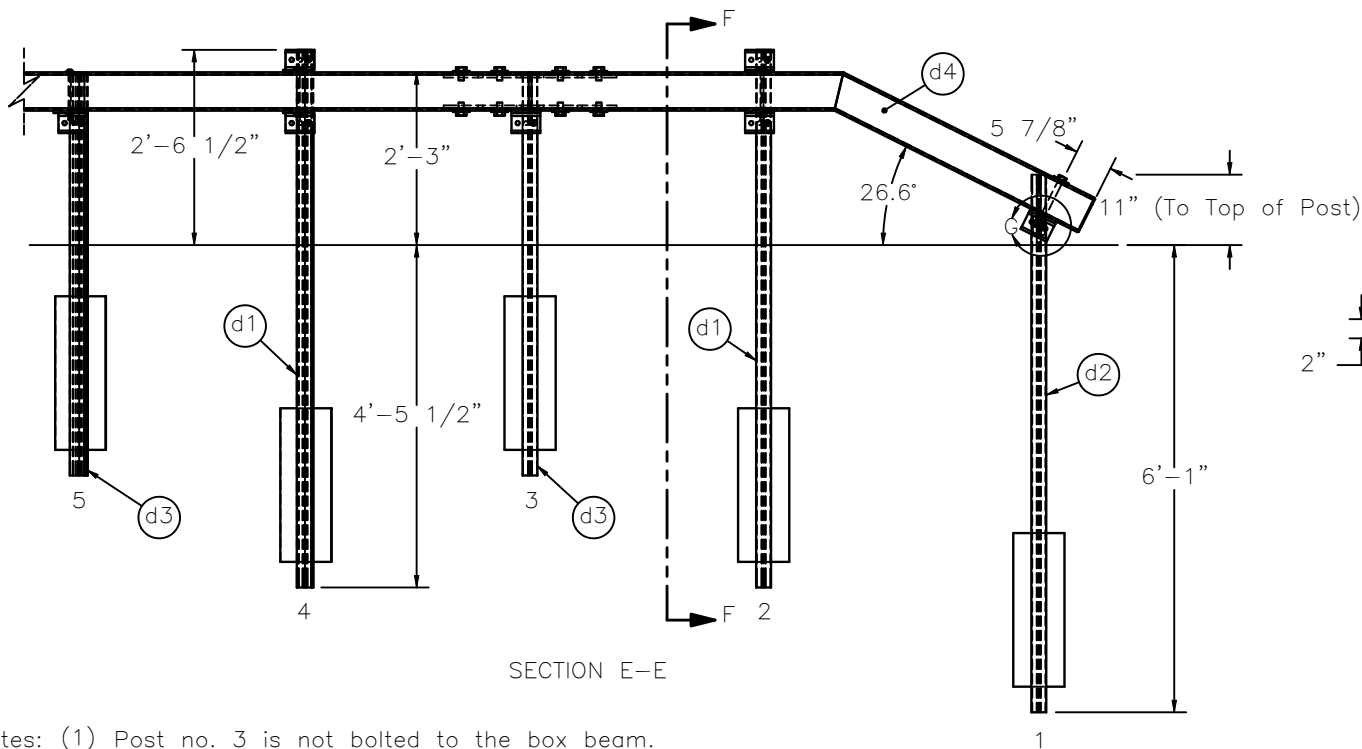
Midwest Roadside Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)
End Assembly

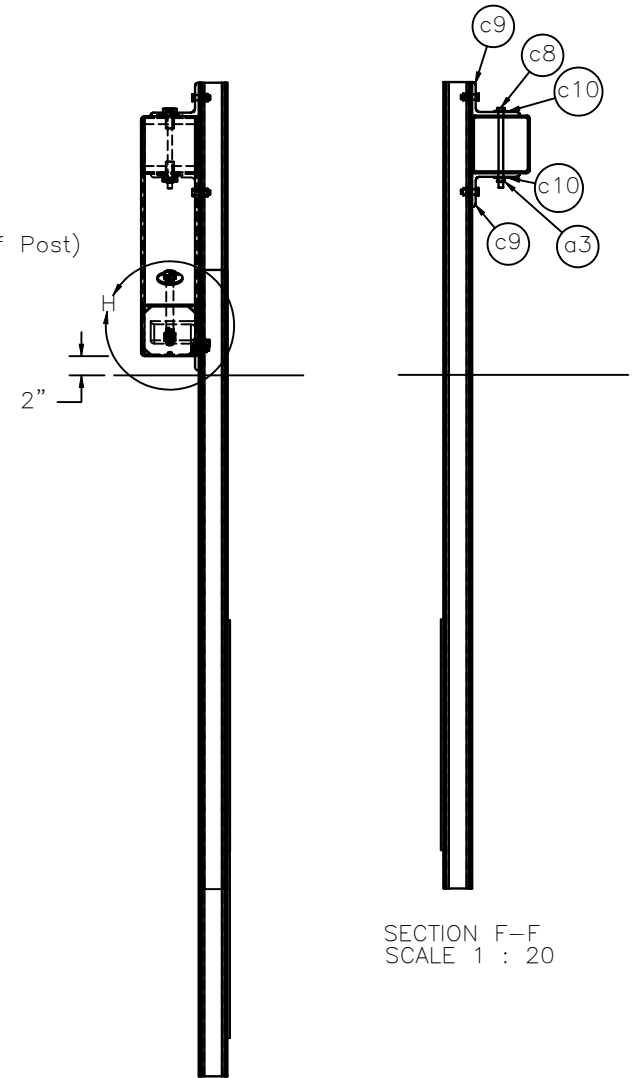
DWG. NAME:
NYBBT-9_R1

SCALE: 1:40
UNITS: Inches

SHEET:
2 of 16
DATE:
7/17/2009
DRAWN BY:
RJT/CSS/
EMA
REV. BY:
KAP/RKF



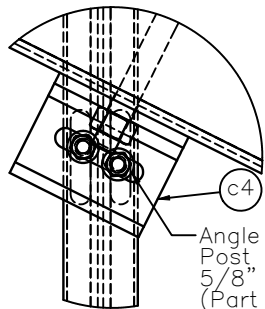
SECTION E-E



SECTION F-F
SCALE 1 : 20

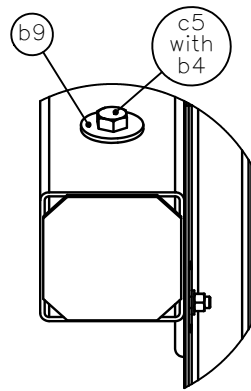
SECTION D-D
SCALE 1 : 20

- Notes: (1) Post no. 3 is not bolted to the box beam.
 (2) Section view D-D encompasses the end terminal section only up to the first splice.
 (3) Section view F-F extends 2' and only provides details for post no. 2.
 (4) Post components and hardware in Section view F-F pertain to post nos. 2 and 4.
 (5) Ground line not shown in Detail G for clarity.



DETAIL G
SCALE 1 : 6

Angle Clip Connected to Post with Two $\phi 1/2$ " x 1 5/8" ASTM A307 Hex Bolts (Part No. a2) with One Nut (Part No. a3) and Two Washers (Part No. a5) Per Bolt



DETAIL H
SCALE 1 : 8



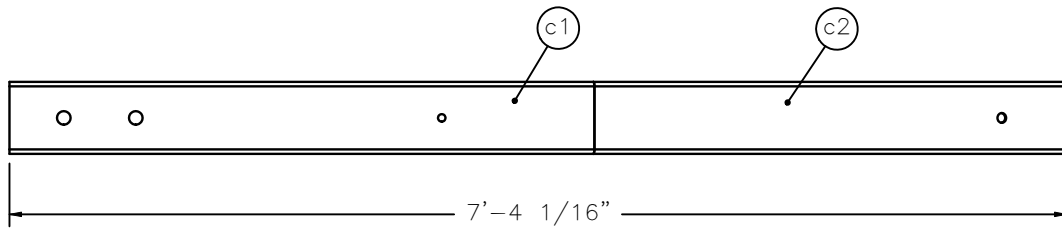
Midwest Roadside Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)
End Section - Non-Ditch
Detail

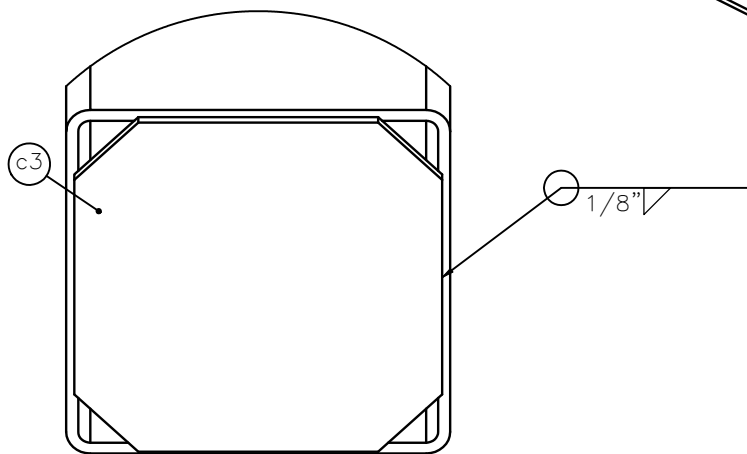
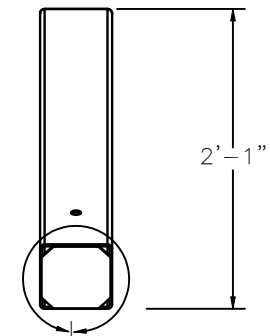
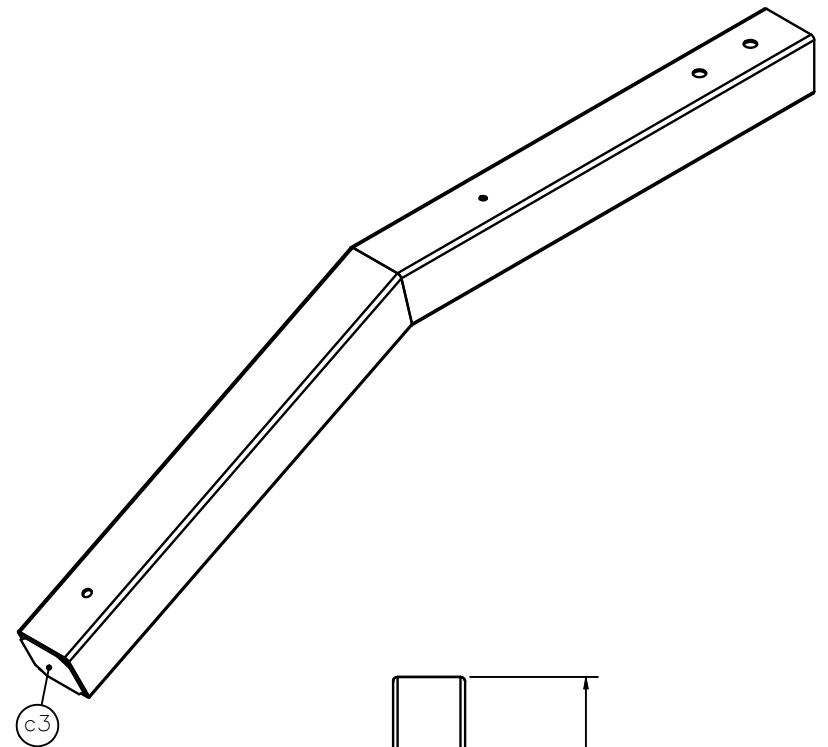
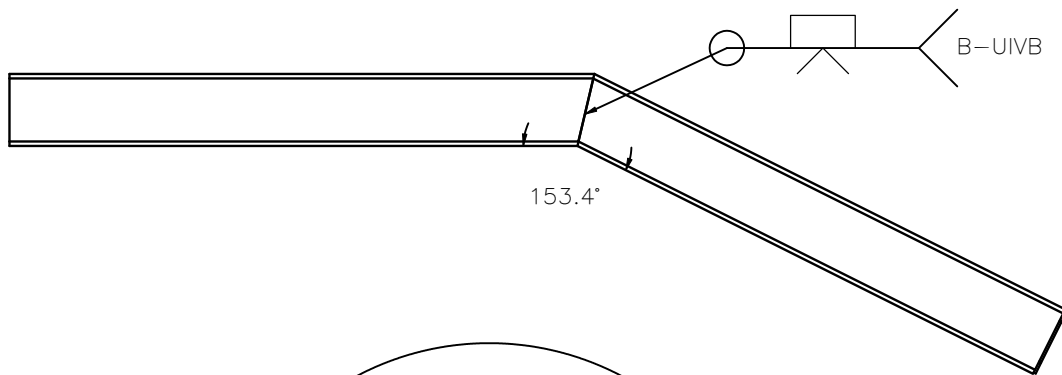
DWG. NAME:
NYBBT-9_R1

SCALE: 1:30
UNITS: Inches

SHEET:
3 of 16
DATE:
7/17/2009
DRAWN BY:
RJT/CSS/
EMA
REV. BY:
KAP/RKF



Box Beam End Terminal Assembly
Assembly d4



DETAIL I
SCALE 1 : 3



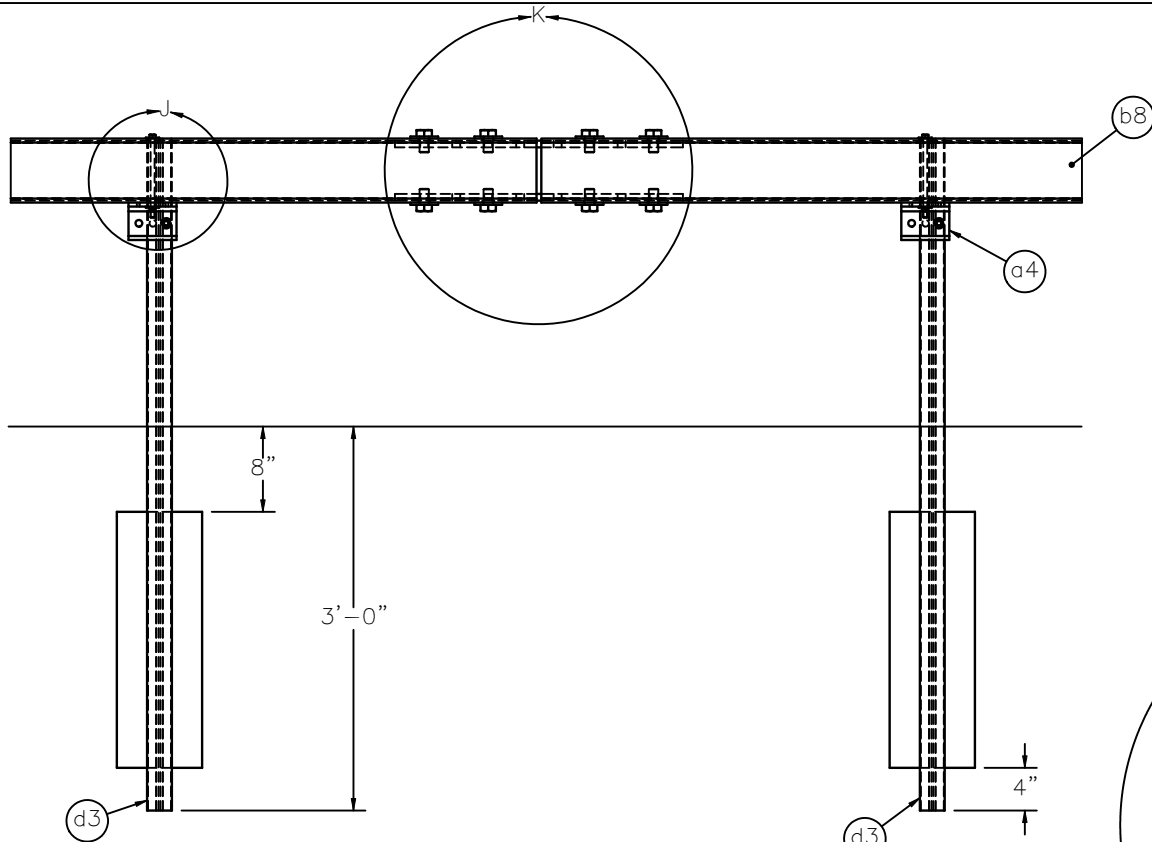
Midwest Roadside
Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)
Bent Box Beam Assembly

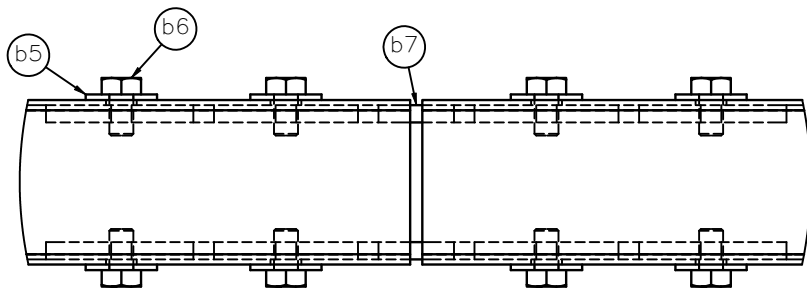
DWG. NAME.
NYBBT-9_R1

SCALE: 1:16
UNITS: Inches

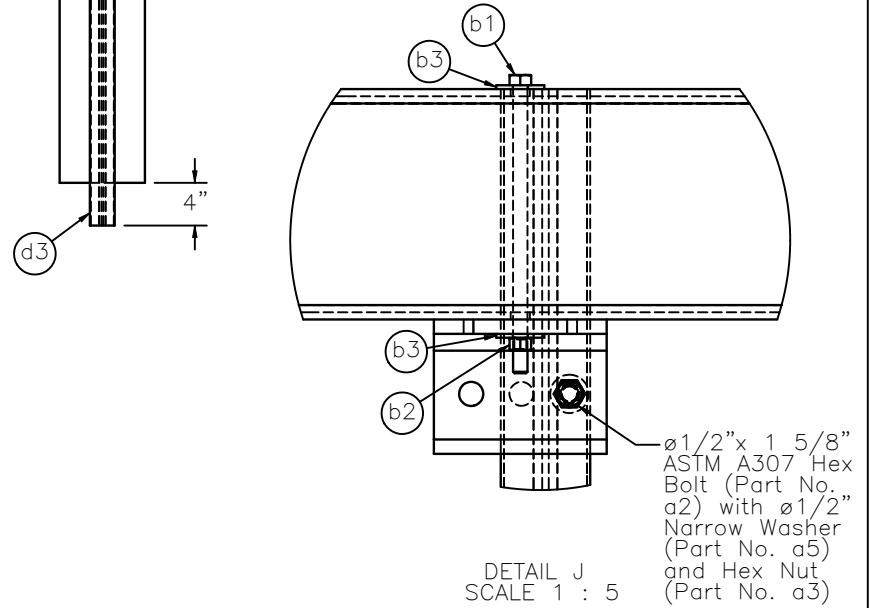
SHEET:
4 of 16
DATE:
7/17/2009
DRAWN BY:
RJT/CSS/
EMA
REV. BY:
KAP/RKF



DETAIL B



DETAIL K
SCALE 1 : 7
Traffic-Side View



DETAIL J
SCALE 1 : 5

ø1/2" x 1 5/8"
ASTM A307 Hex
Bolt (Part No.
a2) with ø1/2"
Narrow Washer
(Part No. a5)
and Hex Nut
(Part No. a3)



Midwest Roadside
Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)

Splice Specifications

DWG. NAME.
NYBBT-9_R1

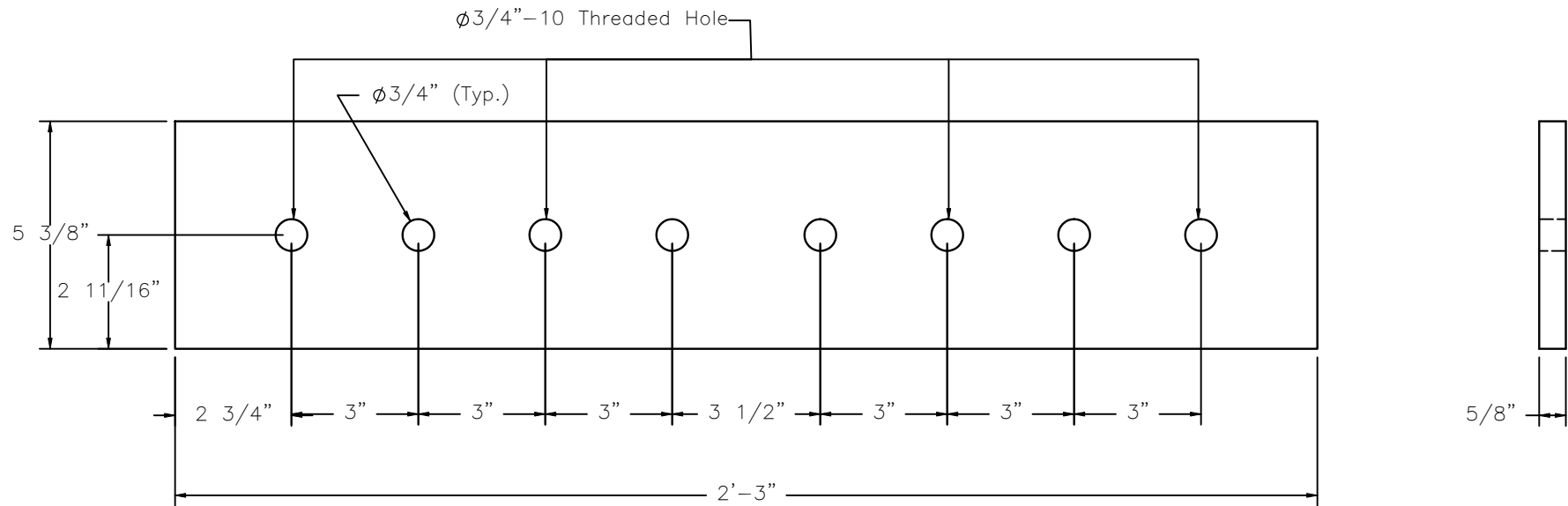
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UNITS: Inches

SHEET:
5 of 16

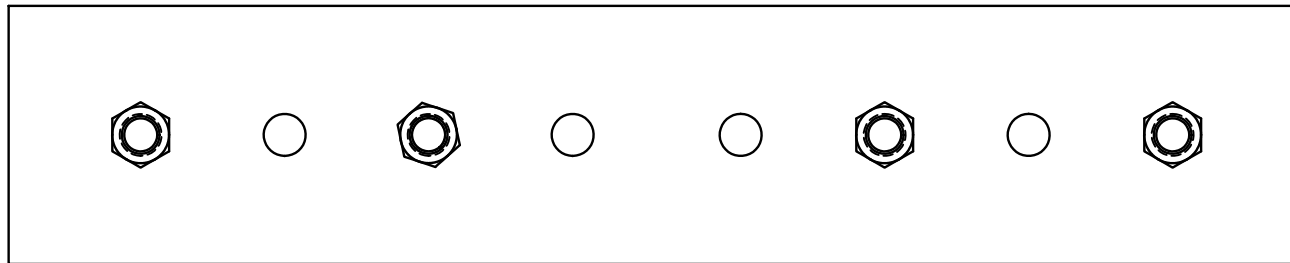
DATE:
7/17/2009

DRAWN BY:
RJT/CSS/
EMA

REV. BY:
KAP/RKF



Splice Plate with Tapped Holes
Part b7



Splice Plate with Tack-Welded Nuts

Tack Weld All Nuts
to Splice Plates
Prior to Assembly

Note: (1) Splice plates with tack-welded nuts may be substituted for the splice plate with tapped holes.



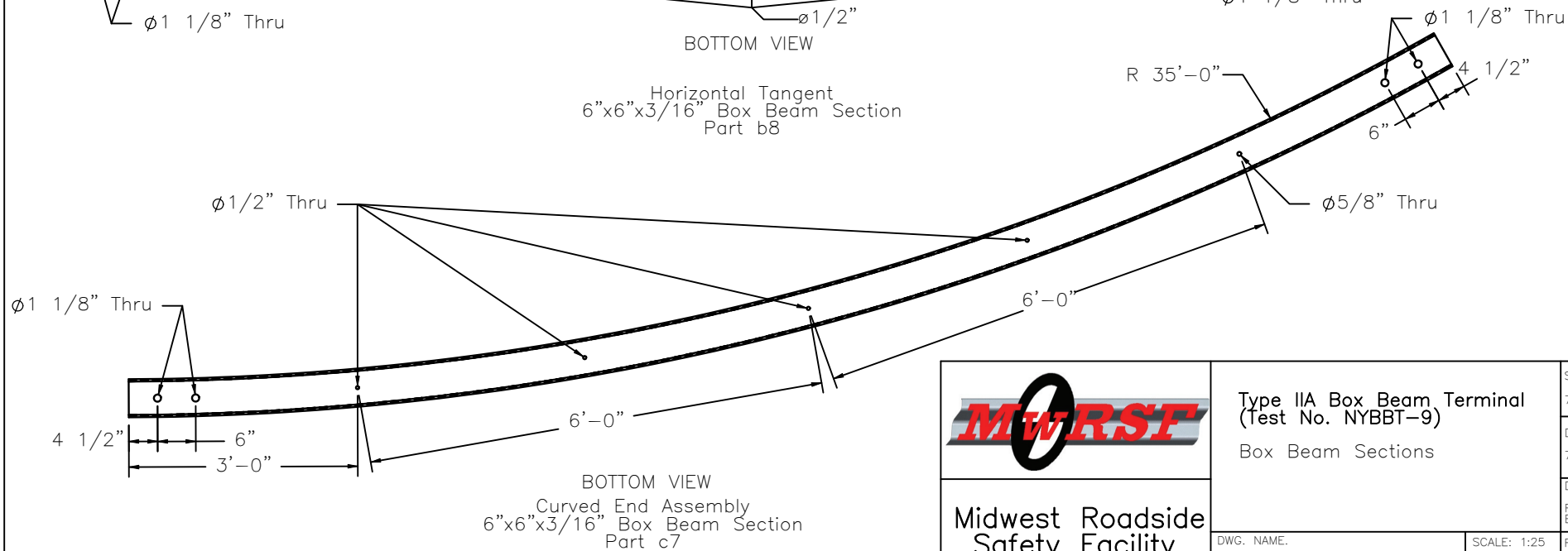
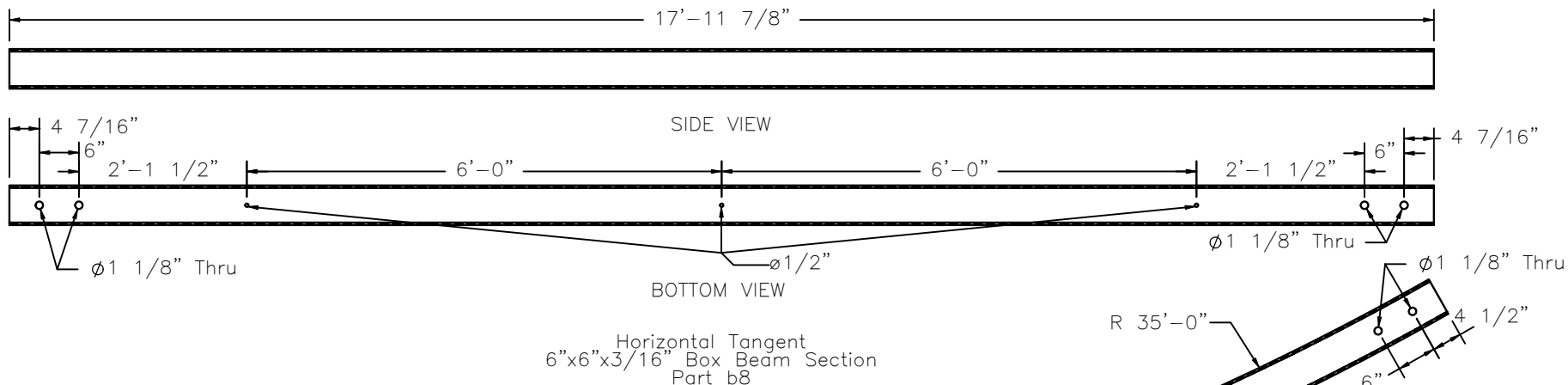
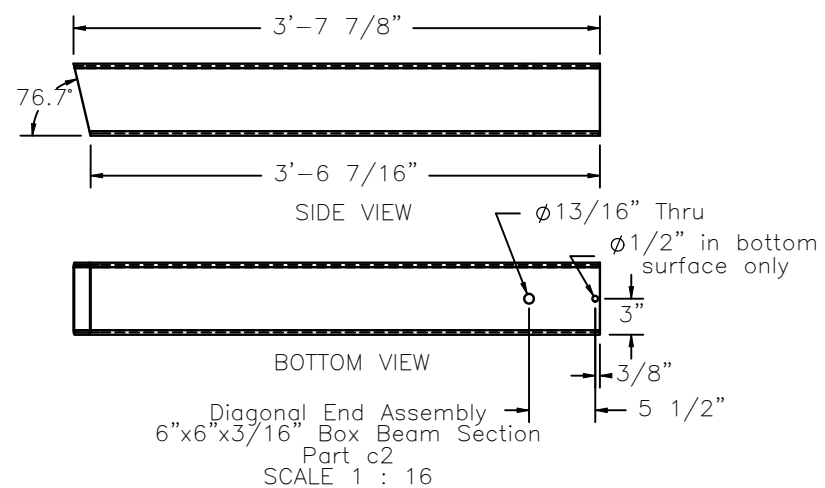
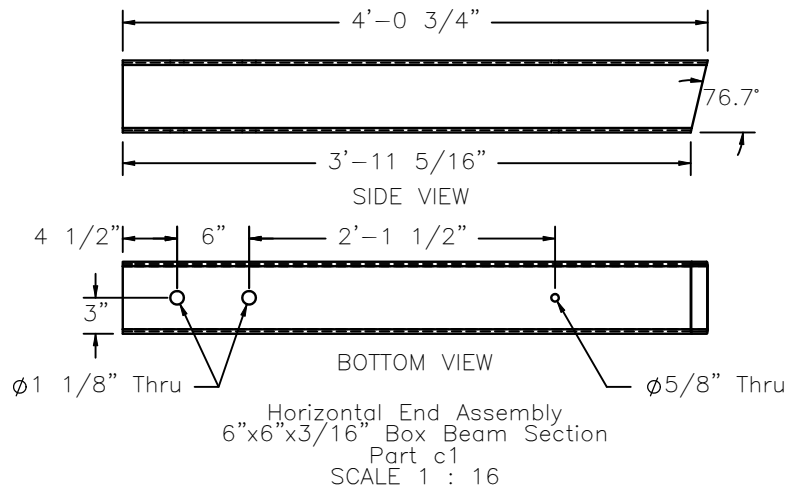
Midwest Roadside
Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)
Splice Plate Details

DWG. NAME.
NYBBT-9_R1

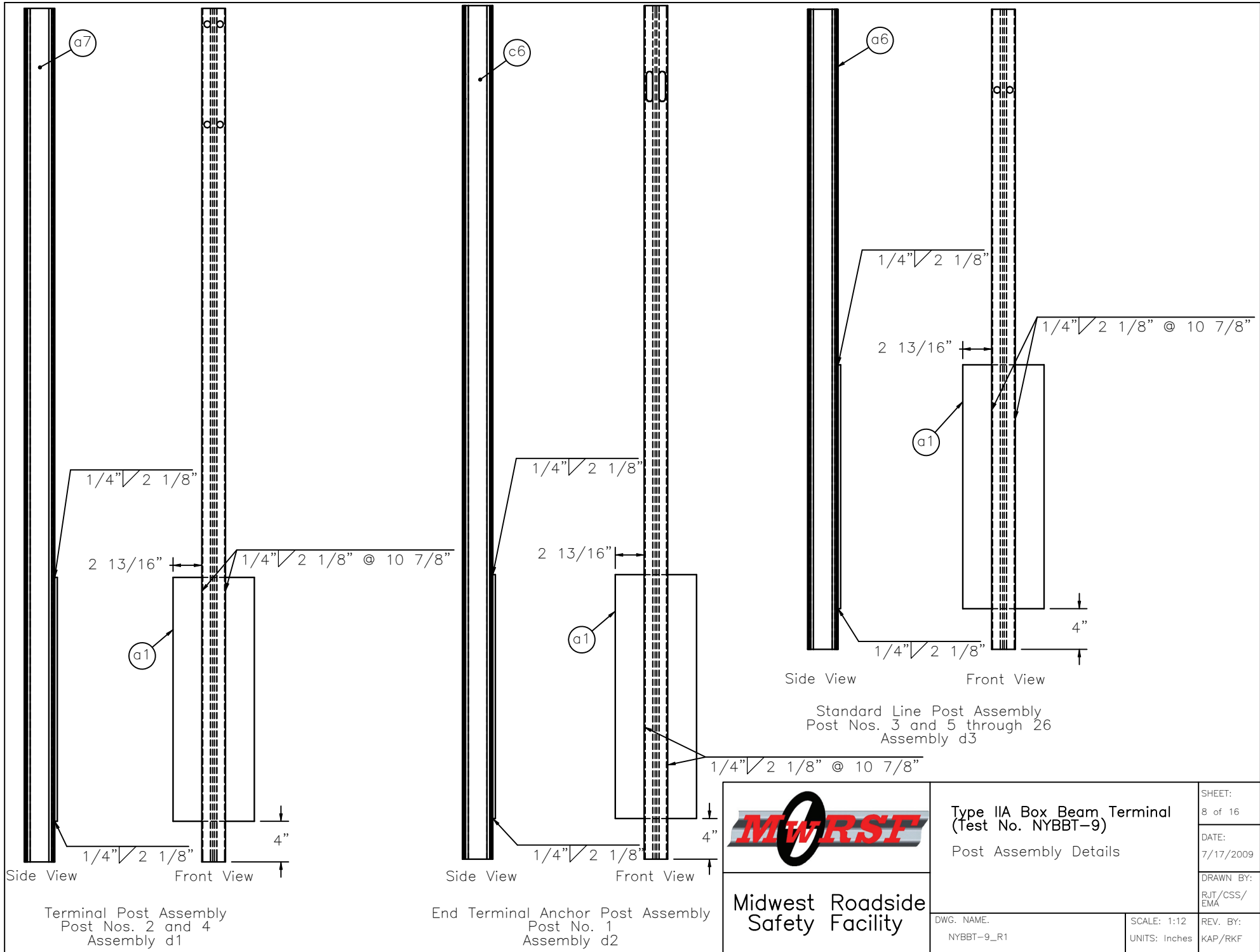
SCALE: 1:4
UNITS: Inches

SHEET:
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DATE:
7/17/2009
DRAWN BY:
RJT/CSS/
EMA
REV. BY:
KAP/RKF



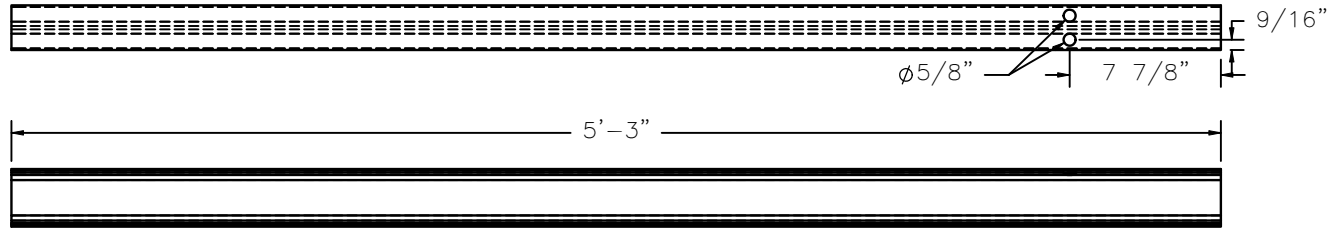
Midwest Roadside
Safety Facility

Type IIA Box Beam Terminal (Test No. NYBBT-9)		SHEET: 7 of 16
Box Beam Sections		DATE: 7/17/2009
DWG. NAME: NYBBT-9_R1		DRAWN BY: RJT/CSS/ EMA
SCALE: 1:25 UNITS: Inches	REV. BY: KAP/RKF	

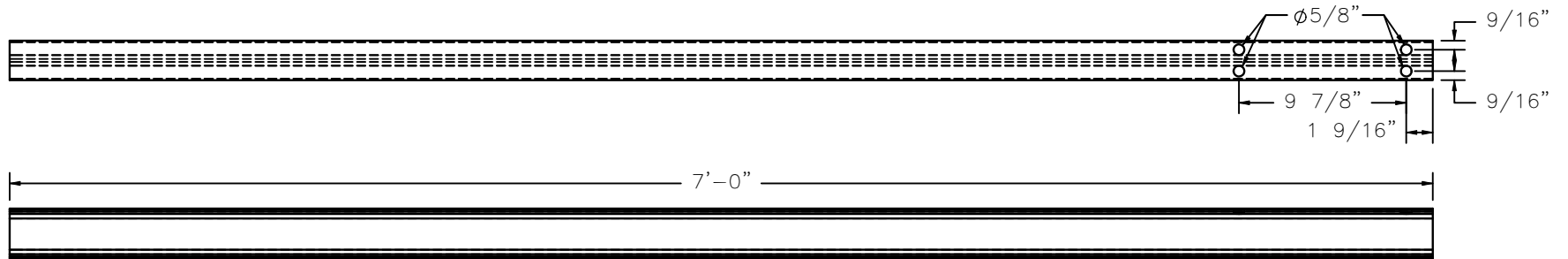


Midwest Roadside Safety Facility

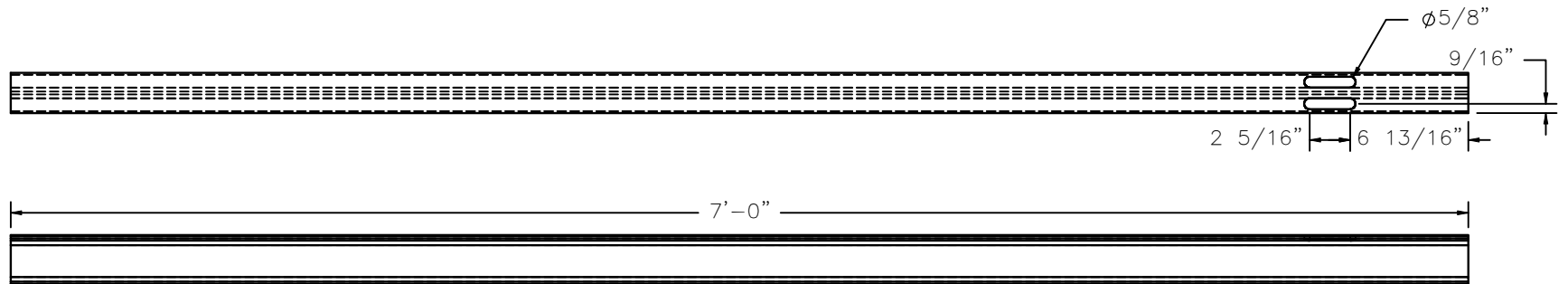
Type IIA Box Beam Terminal (Test No. NYBBT-9) Post Assembly Details		SHEET: 8 of 16
		DATE: 7/17/2009
		DRAWN BY: RJT/CSS/ EMA
DWG. NAME: NYBBT-9_R1	SCALE: 1:12 UNITS: Inches	REV. BY: KAP/RKF



S3x5.7 Line Post without Soil Plate
Part a6



S3x5.7 Post Nos. 2 and 4 without Soil Plate
Part a7



S3x5.7 Anchor Post without Soil Plate
Part c6



Midwest Roadside
Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)

General Post Details without
Soil Plates

DWG. NAME.
NYBBT-9_R1

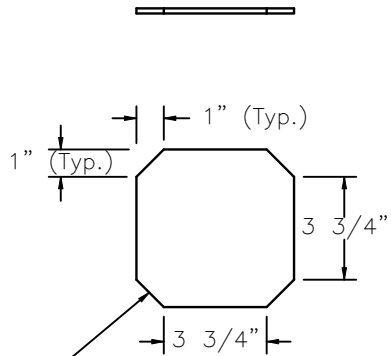
SCALE: 1:10
UNITS: Inches

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DATE:
7/17/2009

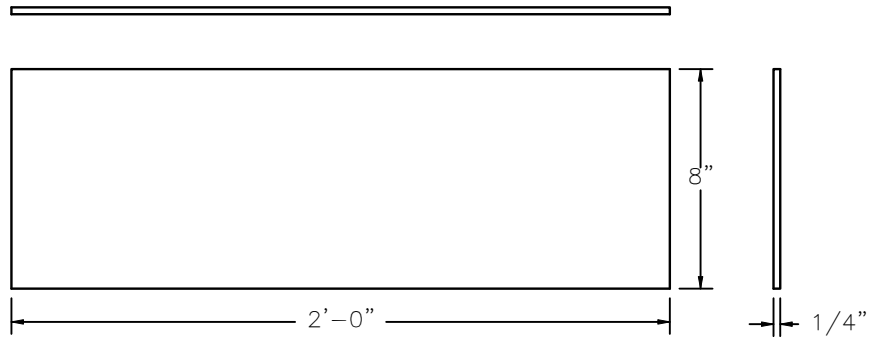
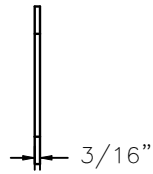
DRAWN BY:
RJT/CSS/
EMA

REV. BY:
KAP/RKF



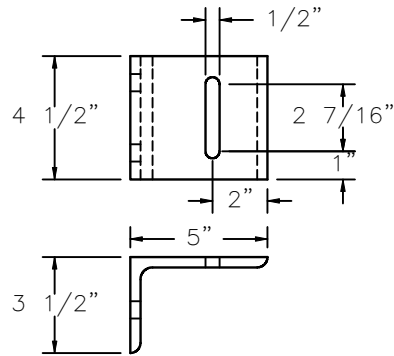
See Note 1

End Assembly Cover Plate
Part c3

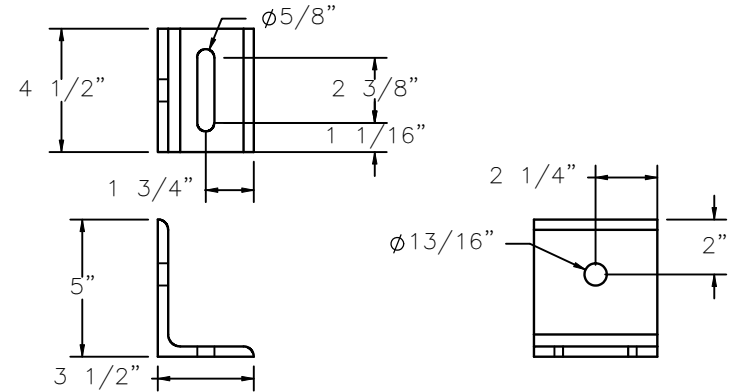
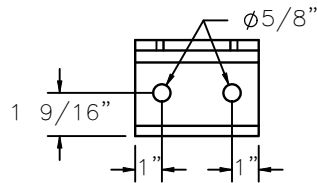


Soil Plate
Part a1

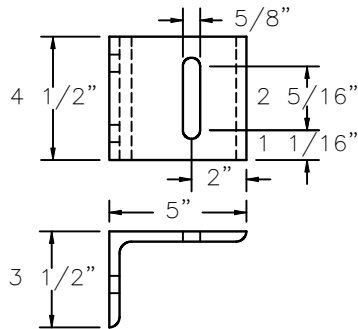
Note: (1) Corners of cover plate may be chamfered to assist drainage.



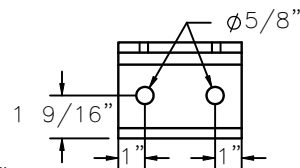
5"x3 1/2"x3/8"
Box Beam Shelf Angle - Post Nos. 3 and 5 through 26
Part a4



5"x3 1/2"x3/8"
End Assembly Box Beam Shelf Angle
Part c4



5"x3 1/2"x3/8"
Box Beam Shelf Angle - Post Nos. 2 and 4
Part c9



Midwest Roadside
Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)
Terminal Component Details

SHEET:
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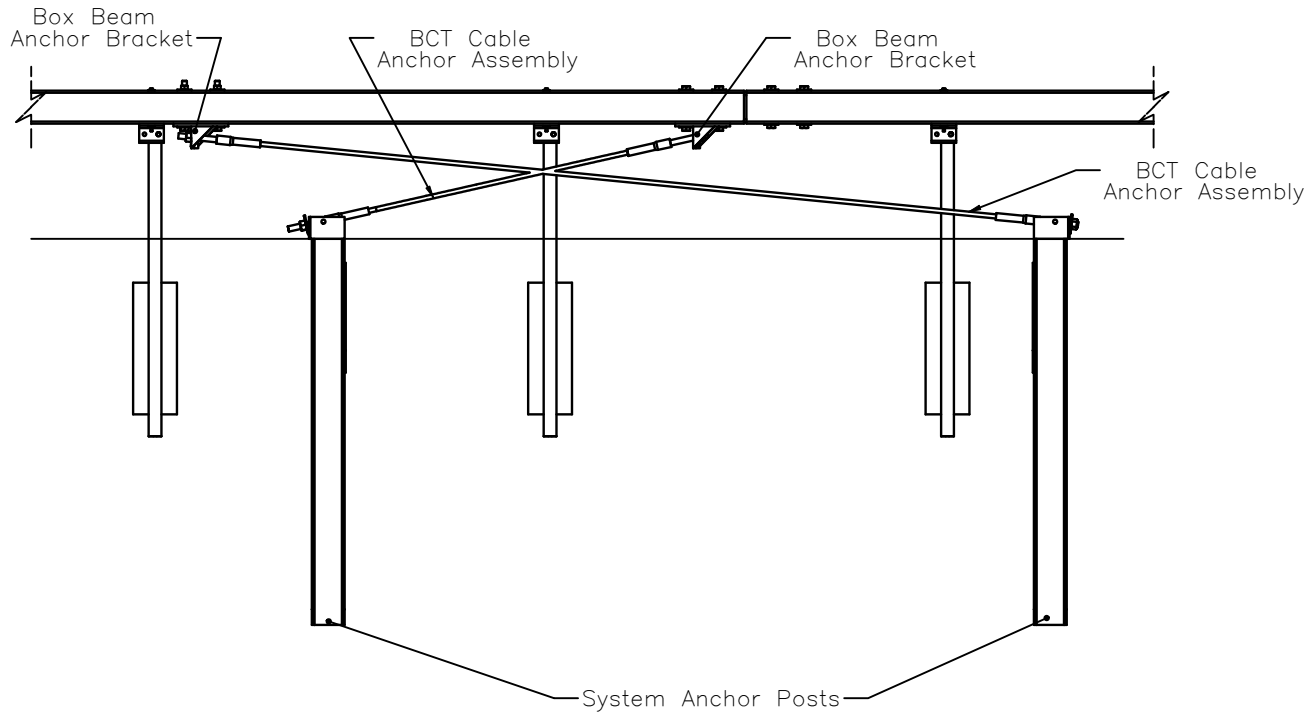
DATE:
7/17/2009

DRAWN BY:
RJT/CSS/
EMA

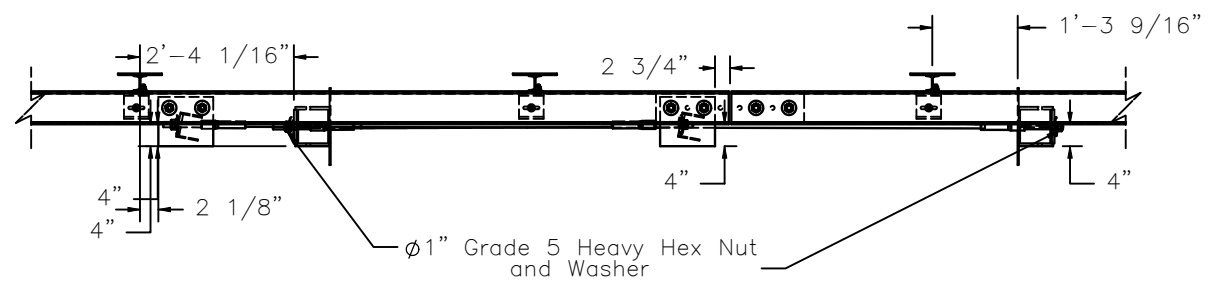
REV. BY:
KAP/RKF

DWG. NAME:
NYBBT-9_R1


SCALE: 1:7
UNITS: Inches

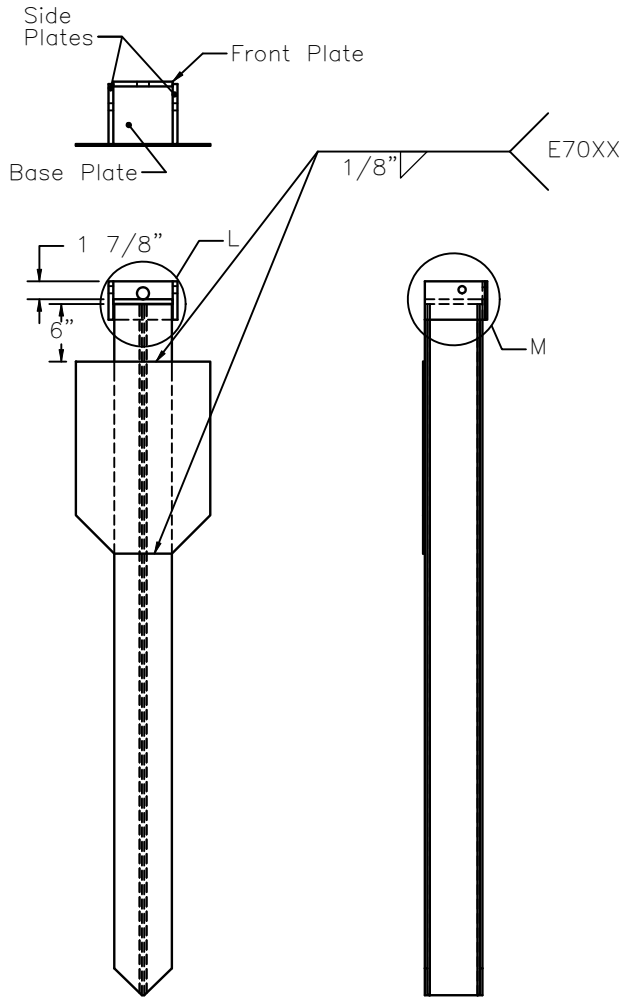


ELEVATION VIEW

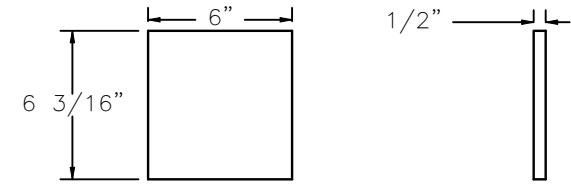
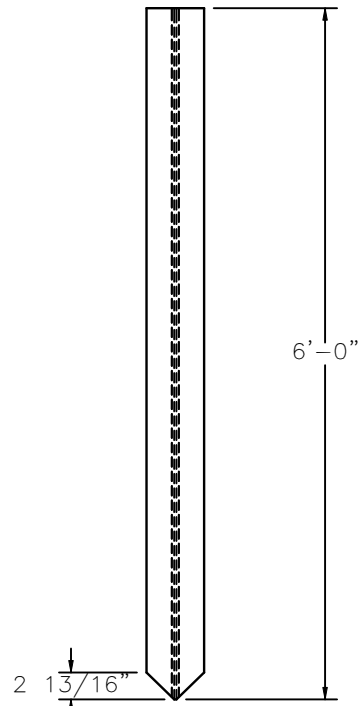
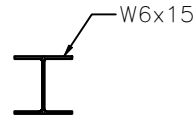


PLAN VIEW

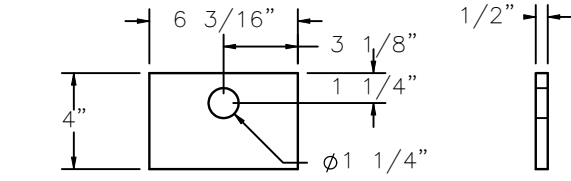
 Midwest Roadside Safety Facility	Type IIA Box Beam Terminal (Test No. NYBBT-9) Downstream Anchorage Systems		SHEET: 11 of 16
	DWG. NAME: NYBBT-9_R1		DATE: 7/17/2009
		SCALE: 1:35 UNITS: Inches	DRAWN BY: RJT/CSS/ EMA REV. BY: KAP/RKF



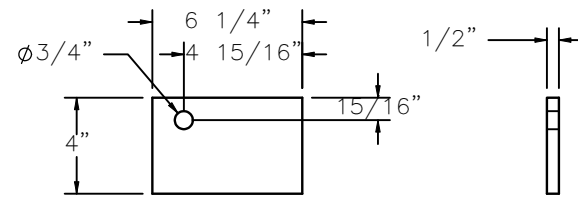
Anchor Post Assembly



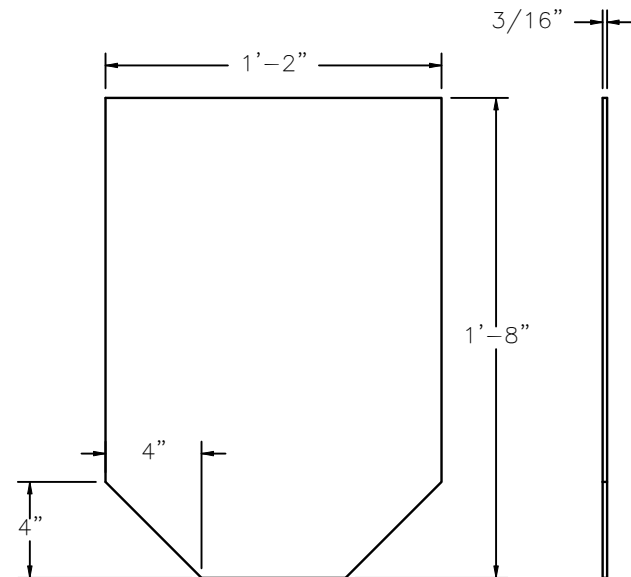
Base Plate
SCALE 1:8



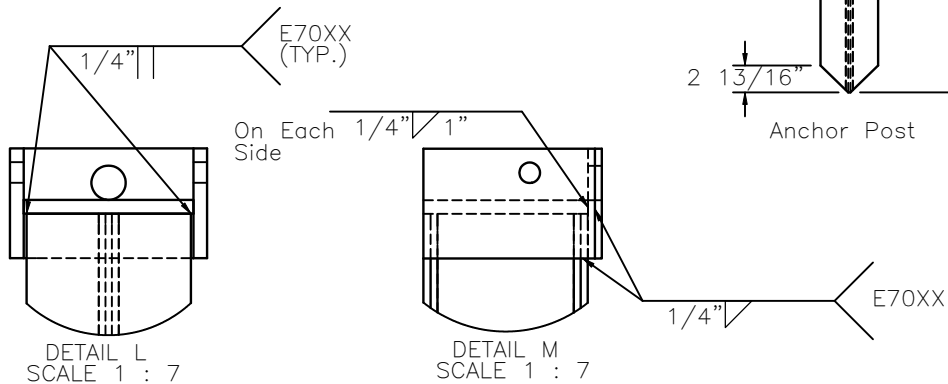
Front Plate
SCALE 1:8



Side Plate
SCALE 1:8



Soil Plate
SCALE 1:8



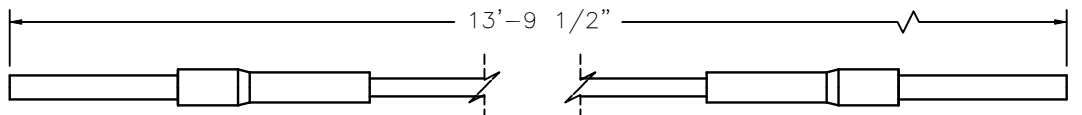
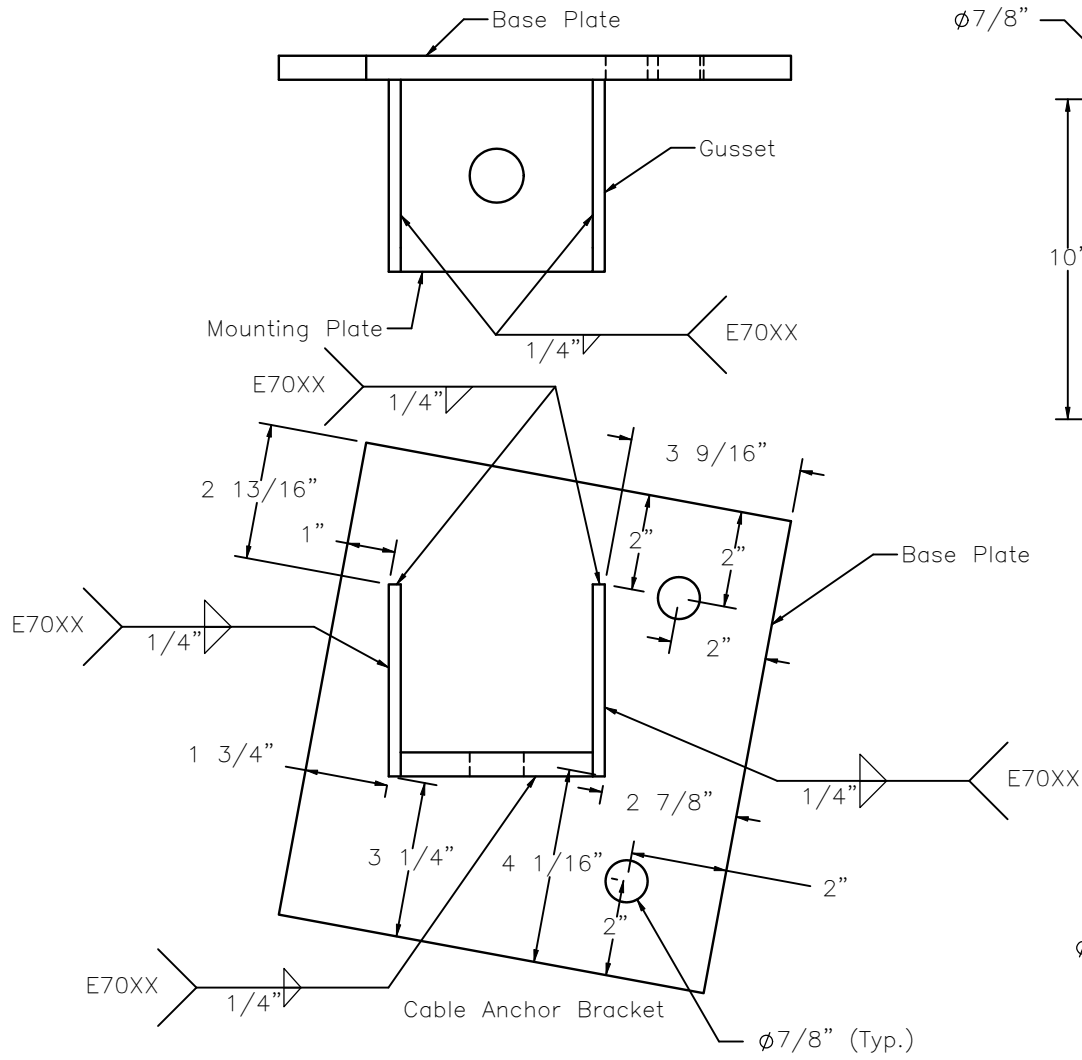
Midwest Roadside
Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)
System Anchorage Assembly

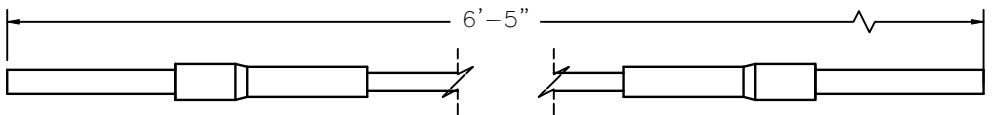
DWG. NAME.
NYBBT-9_R1

SCALE: 1:20
UNITS: Inches

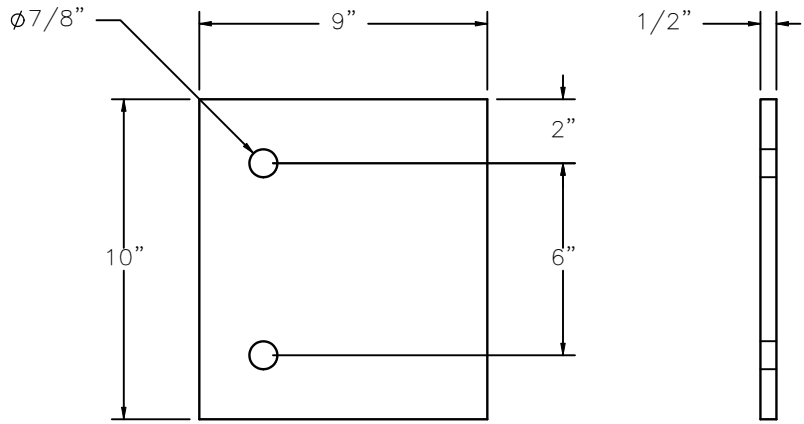
SHEET:
12 of 16
DATE:
7/17/2009
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RJT/CSS/
EMA
REV. BY:
KAP/RKF



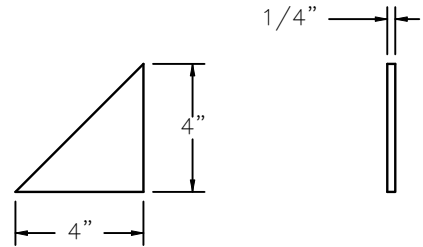
BCT Cable Anchor Assembly
SCALE 1 : 8



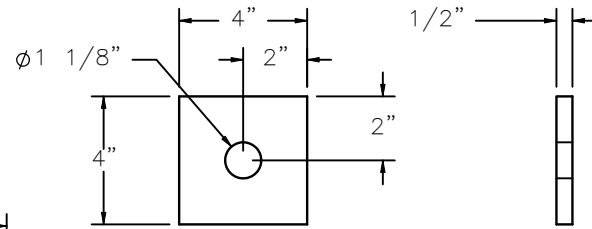
BCT Cable Anchor Assembly (FCA01)
SCALE 1 : 8



Base Plate
SCALE 1 : 6



Gusset
SCALE 1 : 6



Mounting Plate
SCALE 1 : 6



Midwest Roadside
Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)

Cable Anchor Bracket and
Anchor Cable Details

DWG. NAME.
NYBBT-9_R1

SCALE: 1:4
UNITS: Inches

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DATE:
7/17/2009

DRAWN BY:
RJT/CSS/
EMA

REV. BY:
KAP/RKF

Test No. NYBBT-9

Item No.	Quantity	Description	Material Specifications
a1	26	1/4" x 8" x 2' steel soil plate	A36 Steel
a2	29	∅ 1/2" coarse thread, 1 5/8" long hex bolt	ASTM A307
a3	31	∅ 1/2" hex nut	ASTM A307
a4	23	5" x 3 1/2" x 3/8" box beam shelf angle	A36 Steel
a5	31	∅ 1/2" narrow washer	ASTM A307
a6	23	S3 x 5.7, 63" long post	A36 Steel
a7	2	S3 x 5.7, 84" long post	A36 Steel
b1	22	∅ 3/8" coarse thread, 7 1/2" long hex bolt	ASTM A307
b2	22	∅ 3/8" hex nut	ASTM A307
b3	44	∅ 3/8" wide washer	ASTM A307
b4	1	∅ 3/4" hex nut	ASTM A307
b5	56	∅ 3/4" wide washer	ASTM A325
b6	56	∅ 3/4" coarse thread, 1 1/2" long hex bolt	ASTM A325
b7	14	27" x 5 3/8" x 5/8" splice plate	A36 Steel
b8	6	6" x 6" x 3/16" by 17'-11 7/8" long box beam	ASTM A500 Grade B
b9	1	∅ 3/4" wide washer	ASTM A307
c1	1	End assembly bent 6" x 6" x 3/16" box beam	ASTM A500 Grade B
c2	1	End assembly diagonal 6" x 6" x 3/16" box beam	ASTM A500 Grade B
c3	1	End assembly 3/16" thick cover plate	A36 Steel
c4	1	5" x 3 1/2" x 3/8" box beam anchor post shelf angle	A36 Steel
c5	1	∅ 3/4" coarse thread, 8" long hex bolt	ASTM A307
c6	1	S3 x 5.7, 84" long post anchor post	A36 Steel
c7	1	6" x 6" x 3/16", R 35' Curved Box Beam	ASTM A500 Grade B
c8	2	∅ 1/2" coarse thread, 8" long hex bolt	ASTM A307
c9	4	5" x 3 1/2" x 3/8" box beam shelf angle with ∅ 5/8" slot	A36 Steel
c10	4	∅ 1/2" wide washer	ASTM A307
d1	2	Terminal Post Assembly	-
d2	1	Terminal Anchor Post Assembly	-
d3	23	Line Post Assembly	-
d4	1	Box Beam End Terminal Assembly	-



Midwest Roadside
Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)

Bill of Materials

SHEET:
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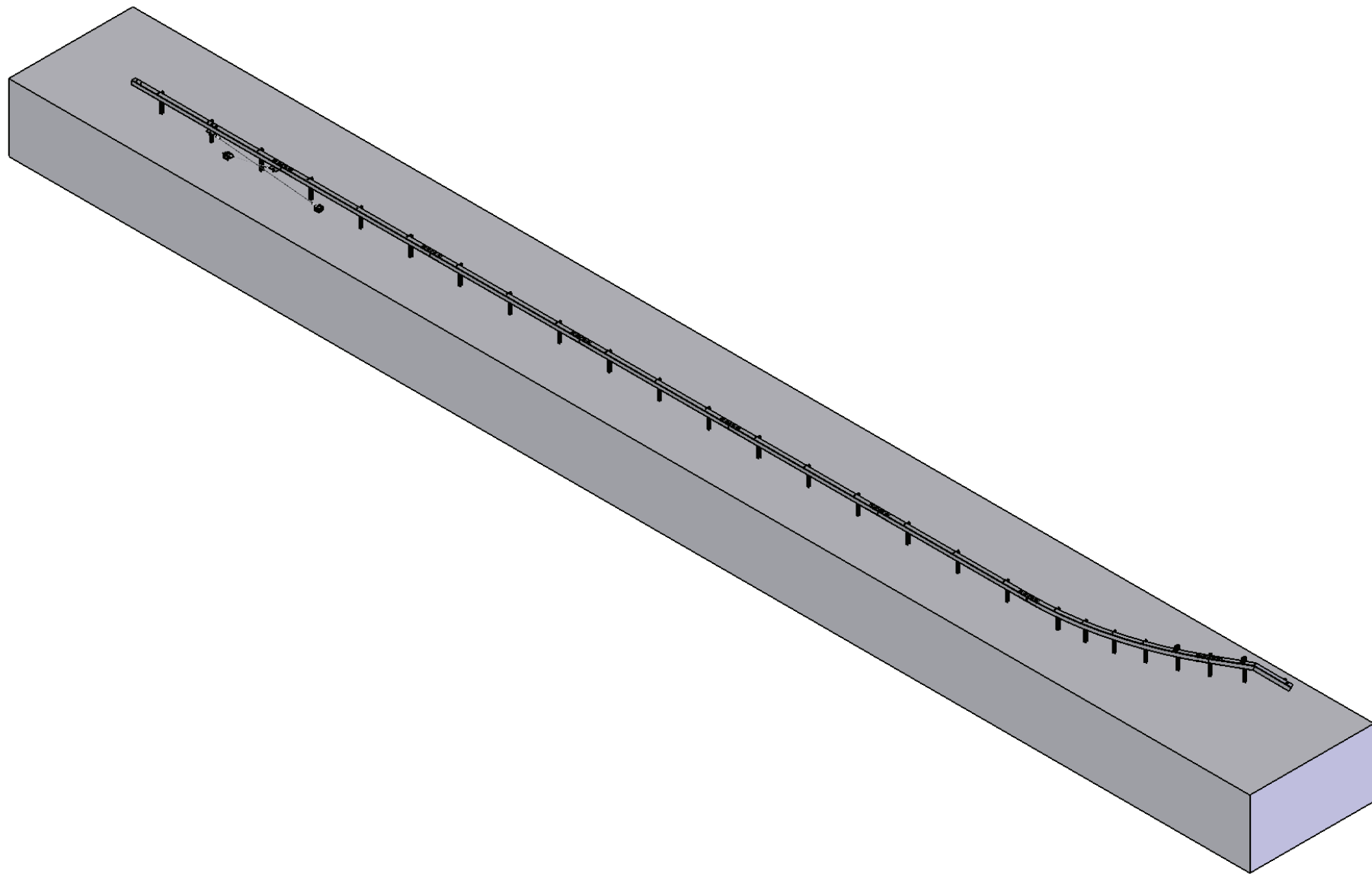
DATE:
7/17/2009

DRAWN BY:
RJT/CSS/
EMA

DWG. NAME:
NYBBT-9_R1

SCALE: None
UNITS: Inches

REV. BY:
KAP/RKF



Midwest Roadside
Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)

System Isometric

DWG. NAME:
NYBBT-9_R1

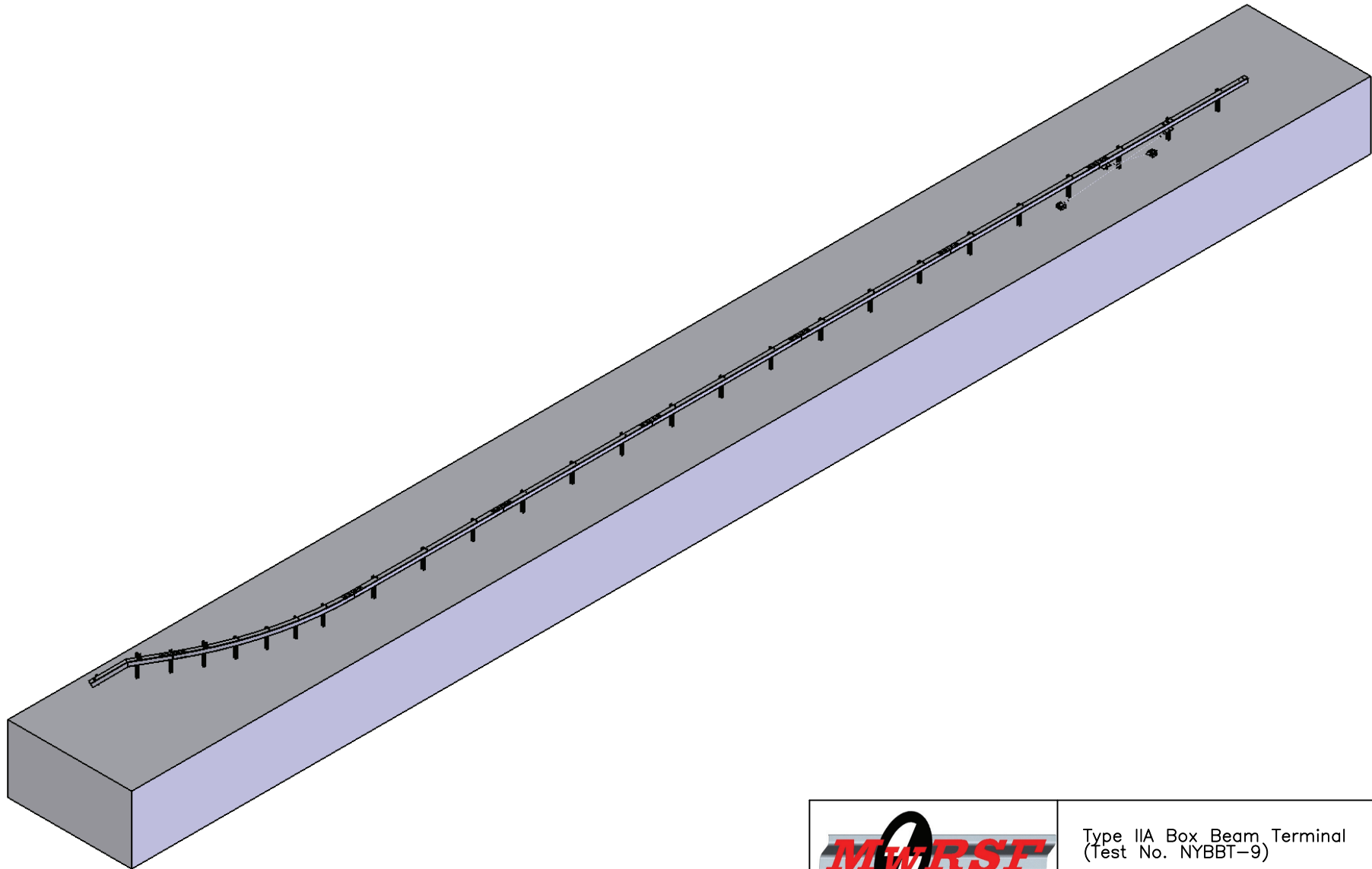
SCALE: 1:150
UNITS: Inches

SHEET:
15 of 16

DATE:
7/17/2009

DRAWN BY:
RJT/CSS/
EMA

REV. BY:
KAP/RKF



Midwest Roadside
Safety Facility

Type IIA Box Beam Terminal
(Test No. NYBBT-9)

System Isometric - As Built

DWG. NAME:
NYBBT-9_R1

SCALE: 1:150
UNITS: Inches

SHEET:
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DATE:
7/17/2009

DRAWN BY:
RJT/CSS/
EMA

REV. BY:
KAP/RKF