

PLAN VIEW OF FOOTING

SIZE	DEPTH (IN.)	FLANGE WIDTH (IN.)
W12 x 26	12	6 $\frac{1}{2}$
W10 x 26	10	5 $\frac{3}{4}$
W10 x 22	10	5 $\frac{3}{4}$
W8 x 21	8	5 $\frac{1}{4}$
W8 x 18	8	5 $\frac{1}{4}$
W6 x 15	6	6
W6 x 12	6	4

STEEL SHAPES

A (LATERAL SPACING OF ANCHORS)

- 3 IN. FOR B-525 USED ON 6 IN. AND 8 IN. WIDE FLANGE POSTS
- 4 IN. FOR B-650 USED ON 10 IN., 12 IN., 14 IN.
- 16 IN., 18 IN. AND 21 IN. WIDE FLANGE POSTS

B (LONGITUDINAL SPACING OF ANCHORS)

- BRACKET #1 - DEPTH OF POST SECTION PLUS 7 $\frac{1}{16}$ IN.
- BRACKET #2 - DEPTH OF POST SECTION PLUS 8 $\frac{1}{16}$ IN.
- BRACKET #3 - DEPTH OF POST SECTION PLUS 8 $\frac{1}{8}$ IN.

NOTES:

1. FOOTING SIZE:
TYPE 1 TO TYPE 6 FOOTINGS SHOWN ON S-614-6 REQUIRE A 6 IN. INCREASE IN DIAMETER ("D") TO ACCOMMODATE ANCHORS SHOWN ON THIS DETAIL. HORIZONTAL REINFORCING HOOPS SHALL BE INCREASED TO PROVIDE A 2 IN. CLEARANCE FROM OUTSIDE THE FOOTING. REINFORCING AND OTHER STRUCTURAL DATA REMAIN THE SAME. TYPE 7 REQUIRES NO CHANGE.
2. A RIGID STEEL TEMPLATE IS RECOMMENDED FOR ANCHOR INSTALLATION. THE ANCHOR SPACING FOR TEMPLATE IS DEPENDENT ON THE SIZE OF THE REQUIRED POSTS AND BRACKETS. SEE "PLAN VIEW OF FOOTING" FOR DETAILS.

Computer File Information		Sheet Revisions		Colorado Department of Transportation		MULTI-DIRECTIONAL BREAK-AWAY DETAIL FOR ANCHOR INSTALLATIONS		PROJECT DETAIL NO.	
Creation Date: 10/06/06	Initials: KCM	Date:	Comments	 4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9820	Project Development Branch KCM/KEN	Issued By: Traffic Engineering Unit October 28, 2002		DS-614-5	
Last Modification Date: 02/15/11	Initials: KEN	02/15/11	CORRECTED CALLOUTS AND DIMENSIONS					Sheet No. 1 of 3	
Full Path: www.dot.state.co.us/DesignSupport/									
Drawing File Name: Sheet_DS-614-5_1of3.dgn									
CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English							

BILL OF MATERIALS

ITEM #	DESCRIPTION	QTY/ POST	PART NO.
1	BRACKET, TYPE B525, 6061-T6 ALUMINUM (SEE BRACKET SELECTION TABLE FOR BRACKET NO. 1 THROUGH NO. 3)	2	SBK525-1A, 2A, 3A
2	BRACKET HARDWARE ASSEMBLY, TYPE B525, INCLUDES:	1	SB-B525LPH
2a	BOLT 1/2 IN. - 13UNC x 2 1/2 IN., HEX HEAD, ASTM A325, GALVANIZED ASTM A153	4	
2b	BOLT 1/2 IN. - 13UNC x 2 3/4 IN., HEX HEAD, ASTM A325, GALVANIZED ASTM A153	4	
2c	BOLT 1/2 IN. - 13UNC x 3 IN., HEX HEAD, ASTM A325, GALVANIZED ASTM A153	4	
2d	CAP SCREW 1/2 IN. - 13UNC x 1 1/4 IN., HEX HEAD, ASTM A307, GALVANIZED ASTM A153	16	
2e	LOCK WASHER 1/2 IN. ANSI B18-21-1, GALVANIZED ASTM A153	12	
2f	NUT 1/2 IN. - 13UNC, HEAVY HEX, ASTM A563 GR. DH, GALVANIZED ASTM A153	1	SB-CBLP
3	COUPLING & SPECIAL BOLT ASSEMBLY, TYPE B, INCLUDES:	4	
3a	SPECIAL BOLT 1 IN. - 8UNC, ASTM A449, GALVANIZED ASTM A153/B695	4	
3b	COUPLING 1 IN. - 8UNC, LF, AMS 63780*, GALVANIZED ASTM A153, POLYESTER COAT**	2	
3c	SHIM 1 IN. HORSESHOE, 14 GAUGE, GALVANIZED STEEL SHEET	2	
3d	SHIM 1 IN. HORSESHOE, 18 GAUGE, GALVANIZED STEEL SHEET	2	
4	HINGE ASSEMBLY, TYPE B525, INCLUDES:	4	
4a	HINGE PLATE, TYPE B525, AISI 4130 STEEL, GALVANIZED ASTM A123	1	SB-HB1
5	HINGE HARDWARE ASSEMBLY, TYPE B, INCLUDES:	1	SB-HHB
5a	BOLT 3/4 IN. - 10UNC x 2 1/4 IN., HEX HEAD, ASTM A325, GALVANIZED ASTM A153	8	
5b	LOCK WASHER 3/4 IN. ANSI B18-21-1, GALVANIZED ASTM A153	8	
5c	NUT 3/4 IN. - 10UNC, HEAVY HEX, ASTM A563 GR. DH, GALVANIZED ASTM A153	8	
6	ANCHOR ASSEMBLY, TYPE B, INCLUDES:	1	SBABPK
6a	ANCHOR 1 IN. - 8UNC, 304 S.S. FERRULE, AISI 1045 ROD, AISI 1008 COIL	4	

* WITH EXCEPTION TO DECARBURIZATION AND MACROSTRUCTURE CLAUSES.
 ** 2-4 MIL. THICK MORTON POWDER COATINGS 20-7037 POLYESTER POWDER COAT.

GENERAL NOTES:

- BREAK-AWAY SUPPORT SYSTEM SHALL MEET ALL REQUIREMENTS OF "AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS".
- ALL HARDWARE SHALL BE AMERICAN STANDARD SIZES AND SHALL BE HOT DIP GALVANIZED PER ASTM A153, OR MECHANICALLY GALVANIZED PER ASTM B695.
- FASTENERS, EXCEPT FOR SPECIAL BOLT AND COUPLING, SHALL BE INSTALLED WITH LOCK WASHERS OR LOCKNUTS AND DO NOT HAVE SPECIFIC TORQUE REQUIREMENTS. FASTENERS SHOULD BE MADE AS TIGHT AS POSSIBLE WITH CONVENTIONAL WRENCHES, UNLESS NOTED OTHERWISE.
- SQUARE AND LEVEL INDIVIDUAL COMPONENTS TO MINIMIZE NEED FOR SHIMMING.
- STRUCTURAL STEEL TO BE HOT DIP GALVANIZED PER ASTM A123 AFTER FABRICATION.
- NO MORE THAN TWO SHIMS SHALL BE PLACED BENEATH ANY ONE COUPLING AND NO MORE THAN THREE SHIMS BENEATH ANY PAIR OF COUPLINGS.
- SELECT PROPER POST SIZE BY REFERRING TO POST SELECTION TABLES FOR MEDIUM AND LARGE SIGNS.
- SEE BELOW FOR COMPLETE INSTALLATION INSTRUCTIONS.

SELECT CORRECT BRACKET NUMBER FROM BRACKET SELECTION TABLE USING THE "L" VALUE, AS SHOWN IN THE ADJACENT FIGURE.

$L = L_1 - H/2$

POST WIDTH	BRACKET #1		BRACKET #2		BRACKET #3	
	MIN. 'L'	MAX. 'L'	MIN. 'L'	MAX. 'L'	MIN. 'L'	MAX. 'L'
6 IN.	12 FT.	29 FT.	9 FT.	12 FT.	-	9 FT.
8 IN.	14 FT.	29 FT.	10 FT.	14 FT.	-	10 FT.

INSTALLATION NOTES

WRENCH SIZES REQUIRED: 3/8 IN., 7/8 IN., 1 1/8 IN., 1 1/4 IN., 1 1/2 IN., 1 3/4 IN., 1 7/8 IN., 1 5/8 IN.

BRACKET ASSEMBLY:

- ASSEMBLE BRACKET TO POST WITH BOLTS PROVIDED.
- SQUARE AND TIGHTEN ITEMS (1), (2a), (2b), (2c), (2d), (2e) & (2f)

ANCHOR ASSEMBLY:

- ASSEMBLE COUPLING ANCHORS (ITEM (6a)) TO INSTALLATION TEMPLATE (NOT SHOWN). RIGID STEEL TEMPLATE IS RECOMMENDED.
- LOWER ENTIRE ANCHOR ASSEMBLY INTO FRESH CONCRETE, AND VIBRATE INTO POSITION SO THAT THE TOPS OF THE INDIVIDUAL ANCHORS (ITEM (6a)) ARE FLUSH WITH THE FINISHED TOP SURFACE OF THE FOOTING.

COUPLING ASSEMBLY:

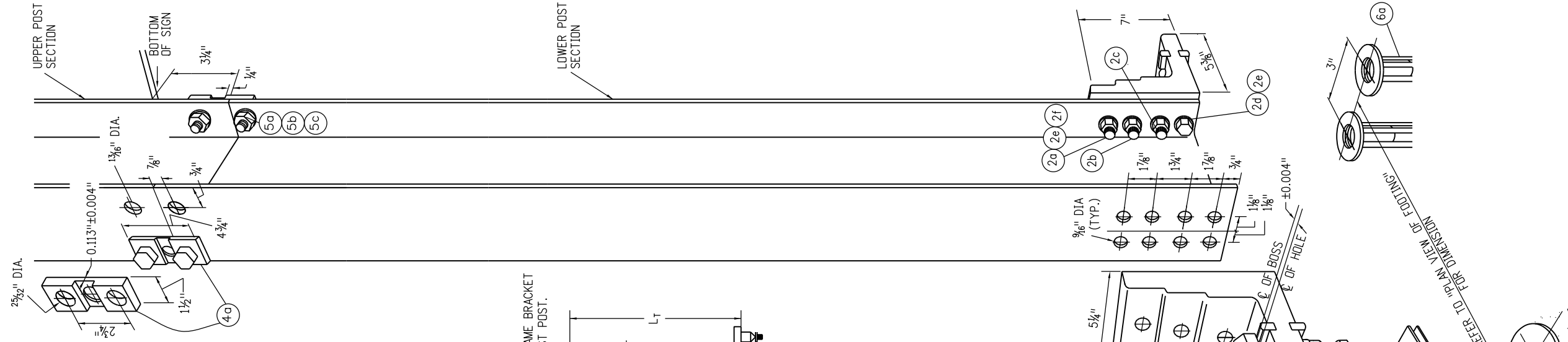
- SUSPEND POST OVER FOOTING, AND INSERT SPECIAL BOLTS (ITEM (3a)) THROUGH BRACKET (ITEM (1)).
- BELOW BRACKET, THREAD COUPLINGS (ITEM (3b)) INTO ANCHORS (ITEM (6a)), BUT LEAVE LOOSE.
- LOWER POST WITH SPECIAL BOLTS (ITEM (3a)) ONTO LOOSE COUPLINGS (ITEM (3b)), AND THREAD BOLTS INTO COUPLINGS.
- THREAD COUPLINGS ALL THE WAY INTO ANCHORS (ITEM (6a)).
- TIGHTEN SPECIAL BOLTS (ITEM (3a)).

NOTE! DO NOT PLACE TORQUE ACROSS NECKED-DOWN PORTION OF COUPLING -- WRENCH FLATS ARE PROVIDED ON EITHER SIDE FOR PROPER TIGHTENING.

- IF POST IS NOT PLUMB, INSERT SHIMS (ITEMS (3c) AND (3d)) BETWEEN COUPLINGS (ITEM (3b)), AND ANCHOR (ITEM (6a)).

HINGE ASSEMBLY:

- BUTT UPPER AND LOWER POSTS TOGETHER ON FLAT SURFACE.
- PLACE HINGE PLATES (ITEM (4a)) ON OUTER FLANGES, AND SECURE WITH BOLTS (ITEMS (4b), (4c), AND (4d)) - SNUG, BUT DO NOT TIGHTEN.
- MAKE SURE UPPER AND LOWER POSTS ARE IN ALIGNMENT; THEN TIGHTEN ALL NUTS (ITEM (5c)) TO PROOF LOAD -- 1/2 TURN BEYOND SNUG.



Computer File Information

Creation Date: 10/06/06	Initials: KCM
Last Modification Date: 02/15/11	Initials: KEN
FullPath: www.dot.state.co.us/DesignSupport/	
Drawing File Name: Sheet_DS-614-5_2of3.dgn	
CAD Ver.: MicroStation V8	Scale: Not to Scale Units: English

R-1	
R-X	
R-X	
R-X	

Sheet Revisions

Date:	Comments
02/15/11	CORRECTED CALLOUTS AND DIMENSIONS

Colorado Department of Transportation

4201 East Arkansas Avenue
 Denver, Colorado 80222
 Phone: (303) 757-9543
 Fax: (303) 757-9820

Project Development Branch KCM/KEN

**MULTI-DIRECTIONAL
 BREAK-AWAY DETAIL**

FOR 6-INCH & 8-INCH WF SIGN POST

Issued By: Traffic Engineering Unit October 28, 2002

PROJECT DETAIL NO.

DS-614-5

Sheet No. 2 of 3

BILL OF MATERIALS

ITEM #	DESCRIPTION	QTY/ POST	PART NO.
1	BRACKET, TYPE B650 6061-T6 ALUMINUM (SEE BRACKET SELECTION TABLE FOR BRACKET NO. 1 THROUGH NO. 3)	2	SBBK650-1A, 2A, 3A
2	BRACKET HARDWARE ASSEMBLY, TYPE B650, INCLUDES:	1	SB-B650LPH
2a	BOLT ½ IN. - 11UNC x 2¼ IN., HEX HEAD, ASTM A325, GALVANIZED ASTM A153	4	
2b	BOLT ½ IN. - 11UNC x 3 IN., HEX HEAD, ASTM A325, GALVANIZED ASTM A153	4	
2c	BOLT ½ IN. - 11UNC x 3¼ IN., HEX HEAD, ASTM A325, GALVANIZED ASTM A153	4	
2d	CAP SCREW ½ IN. - 13UNC x 1¼ IN., HEX HEAD, ASTM A307, GALVANIZED ASTM A153	4	
2e	LOCK WASHER ½ IN., ANSI B18-21-1, GALVANIZED ASTM A153	16	
2f	NUT ½ IN. - 11UNC, HEAVY HEX, ASTM A563 GR. DH, GALVANIZED ASTM A153	12	
3	COUPLING & SPECIAL BOLT ASSEMBLY, TYPE B, INCLUDES:	1	SB-CBLP
3a	SPECIAL BOLT 1 IN. - 8UNC, ASTM A449, GALVANIZED ASTM A153/B695	4	
3b	COUPLING 1 IN. - 8UNC, LP, AMS 63780*, GALVANIZED ASTM A153, POLYESTER COAT**	4	
3c	SHIM 1 IN. HORSESHOE, 14 GAUGE, GALVANIZED STEEL SHEET	2	
3d	SHIM 1 IN. HORSESHOE, 18 GAUGE, GALVANIZED STEEL SHEET	2	
4	HINGE ASSEMBLY, TYPE B650, INCLUDES:	1	SB-HB2
4a	HINGE PLATE TYPE B650, AISI 4130 STEEL, GALVANIZED ASTM A123	4	
5	HINGE HARDWARE ASSEMBLY, TYPE B, INCLUDES:	1	SB-HHB
5a	BOLT ¾ IN. - 10UNC x 2¼ IN., HEX HEAD, ASTM A325, GALVANIZED ASTM A153	8	
5b	LOCK WASHER ¾ IN., ANSI B18-21-1, GALVANIZED ASTM A153	8	
5c	NUT ¾ IN. - 10UNC, HEAVY HEX, ASTM A563 GR. DH, GALVANIZED ASTM A153	8	
6	ANCHOR ASSEMBLY, TYPE B, INCLUDES:	1	SBABPK
6a	ANCHOR 1 IN. - 8UNC, 304 S.S. FERRULE, AISI 1045 ROD, AISI 1008 COIL	4	

* WITH EXCEPTION TO DECARBURIZATION AND MACROSTRUCTURE CLAUSES.
 ** 2-4 MIL. THICK MORTON POWDER COATINGS 20-7037 POLYESTER POWDER COAT.

GENERAL NOTES:

- BREAK-AWAY SUPPORT SYSTEM SHALL MEET ALL REQUIREMENTS OF AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS!.
- ALL HARDWARE SHALL BE AMERICAN STANDARD SIZES AND SHALL BE HOT DIP GALVANIZED PER ASTM A153, OR MECHANICALLY GALVANIZED PER ASTM B695.
- FASTENERS, EXCEPT FOR SPECIAL BOLT AND COUPLING, SHALL BE INSTALLED WITH LOCK WASHERS OR LOCKNUTS, AND DO NOT HAVE SPECIFIC TORQUE REQUIREMENTS. FASTENERS SHOULD BE MADE AS TIGHT AS POSSIBLE WITH CONVENTIONAL WRENCHES, UNLESS OTHERWISE NOTED.
- SQUARE AND LEVEL INDIVIDUAL COMPONENTS TO MINIMIZE NEED FOR SHIMMING.
- STRUCTURAL STEEL TO BE HOT DIP GALVANIZED PER ASTM A123 AFTER FABRICATION..
- NO MORE THAN TWO SHIMS SHALL BE PLACED BENEATH ANY ONE COUPLING AND NO MORE THAN THREE SHIMS BENEATH ANY PAIR OF COUPLINGS.
- SELECT PROPER POST SIZE BY REFERRING TO POST SELECTION TABLES FOR MEDIUM AND LARGE SIGNS.
- SEE BELOW FOR COMPLETE INSTALLATION INSTRUCTIONS.

SELECT CORRECT BRACKET NUMBER FROM BRACKET SELECTION TABLE USING THE "L" VALUE, AS SHOWN IN THE ADJACENT FIGURE
 L = L₁ - H/2

BRACKET SELECTION TABLE

POST WIDTH	BRACKET #1	MIN. 'L'	MAX. 'L'	BRACKET #2	MIN. 'L'	MAX. 'L'	BRACKET #3	MIN. 'L'	MAX. 'L'
10 IN.		16 FT.	29 FT.		11 FT.	16 FT.			11 FT.
12 IN.		18 FT.	29 FT.		13 FT.	18 FT.			13 FT.
14 IN.		19 FT.	29 FT.		14 FT.	19 FT.			14 FT.
16 IN.		21 FT.	29 FT.		16 FT.	21 FT.			15 FT.
18 IN.		23 FT.	29 FT.		16 FT.	23 FT.			16 FT.
21 IN.		25 FT.	29 FT.		18 FT.	26 FT.			18 FT.

INSTALLATION NOTES

WRENCH SIZES REQUIRED: ¾ IN., 7/8 IN., 1½ IN., 1¼ IN., 1¼ IN., 1¼ IN., 1¼ IN., 1¼ IN.

BRACKET ASSEMBLY:

- ASSEMBLE BRACKET TO POST WITH BOLTS PROVIDED.
- SQUARE AND TIGHTEN ITEMS (1), (2), (3), (4), (5), (6), (7), (8), (9), (10), (11) & (12)

ANCHOR ASSEMBLY:

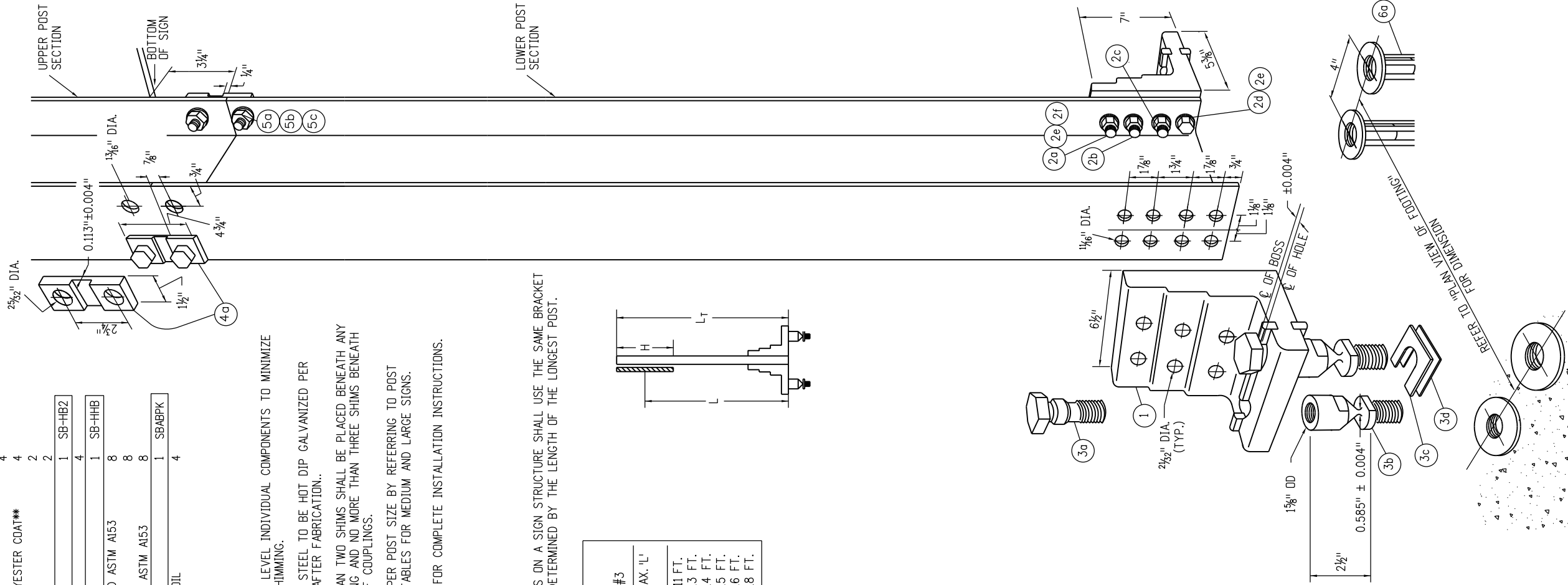
- ASSEMBLE COUPLING ANCHORS (ITEM 69) TO INSTALLATION TEMPLATE (NOT SHOWN). RIGID STEEL TEMPLATE IS RECOMMENDED.
- LOWER ENTIRE ANCHOR ASSEMBLY INTO FRESH CONCRETE, AND VIBRATE INTO POSITION SO THAT THE TOPS OF THE INDIVIDUAL ANCHORS (ITEM 69) ARE FLUSH WITH THE FINISHED TOP SURFACE OF THE FOOTING.

COUPLING ASSEMBLY:

- SUSPEND POST OVER FOOTING, AND INSERT SPECIAL BOLTS (ITEM 39) THROUGH BRACKET (ITEM 1).
 - BELOW BRACKET, THREAD COUPLINGS (ITEM 38) INTO ANCHORS (ITEM 69), BUT LEAVE LOOSE.
 - LOWER POST WITH SPECIAL BOLTS (ITEM 39) ONTO LOOSE COUPLINGS (ITEM 38), AND THREAD BOLTS INTO COUPLINGS.
 - THREAD COUPLINGS ALL THE WAY INTO ANCHORS (ITEM 69).
 - TIGHTEN SPECIAL BOLTS (39).
- NOTE! DO NOT PLACE TORQUE ACROSS NECKED DOWN PORTION OF COUPLING -- WRENCH FLATS ARE PROVIDED ON EITHER SIDE FOR PROPER TIGHTENING.
- IF POST IS NOT PLUMB, INSERT SHIMS (ITEMS 34 AND 34) BETWEEN COUPLINGS (ITEM 38), AND ANCHOR (ITEM 69).

HINGE ASSEMBLY:

- BUTT UPPER AND LOWER POSTS TOGETHER ON FLAT SURFACE.
- PLACE HINGE PLATES (ITEM 49) ON OUTER FLANGES, AND SECURE WITH BOLTS (ITEMS 49, 50, AND 50) -- SNUG BUT DO NOT TIGHTEN.
- MAKE SURE UPPER AND LOWER POSTS ARE IN ALIGNMENT; THEN TIGHTEN ALL NUTS (ITEM 55) TO PROOF LOAD -- ½ TURN BEYOND SNUG.



Computer File Information

Creation Date: 10/06/06 Initials: KCM
 Last Modification Date: 02/15/11 Initials: KEN
 Full Path: www.dot.state.co.us/DesignSupport/
 Drawing File Name: Sheet_DS-614-5_3of3.dgn
 CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English

- (R-X)
- (R-X)
- (R-X)
- (R-X)

Sheet Revisions

Date:	Comments
02/15/11	CALLOUTS AND DIMENSIONS CORRECTED

Colorado Department of Transportation

4201 East Arkansas Avenue
 Denver, Colorado 80222
 Phone: (303) 757-9543
 Fax: (303) 757-9820

Project Development Branch KCM/KEN

**MULTI-DIRECTIONAL
 BREAK-AWAY DETAIL**

FOR 10-INCH, 12-INCH, 14-INCH, 16-INCH,
 18-INCH AND 21-INCH WF SIGN POST

Issued By: Traffic Engineering Unit October 28, 2002

PROJECT DETAIL NO.

DS-614-5

Sheet No. 3 of 3