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Joe McInnes
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MAINTENANCE BUREAU SPECIFICATION 2008 – 2 PI

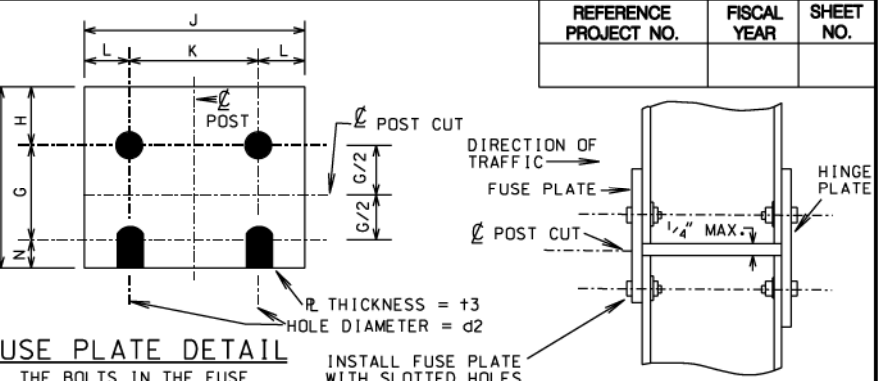
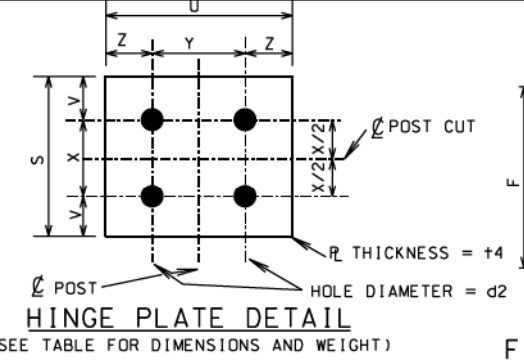
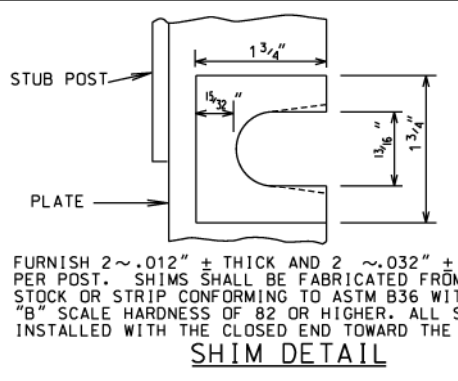
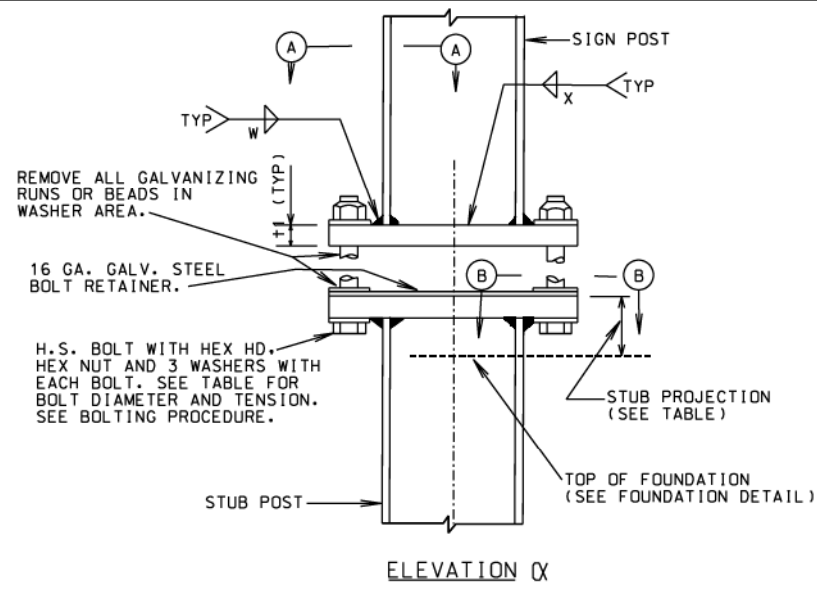
FURNISH & INSTALL SIGN POSTS

(July 2008)

Post Installation: The Department shall be responsible for providing drawings including post length, type, and location to be used by Contractor for installation, when specified by contract. LF price includes the cost of all labor, equipment, and material to fabricate, coat/galvanize, inspect, package, and ship to jobsite. LF price also includes footing or stub/anchor; break away connection (if required), installation, erection of posts, inspection, clean-up and redressing of right-of-way as needed.

Removal and Disposal of Old Signs: The Contractor shall be responsible for removal and disposal of old signs and sign structures at no additional expense to the Department. Unless directed otherwise, the contractor shall salvage all posts removed and deliver to ALDOT district or division specified.

Unless otherwise specified herein, applicable Maintenance Bureau specifications, or special drawings, ALL work must conform to section 710 & 880 of ALDOT standard specifications and any applicable special provisions of the Alabama Department of Transportation.



PROCEDURE FOR ASSEMBLY OF BASE CONNECTION

1. ASSEMBLE POST TO STUB WITH BOLTS AND BOLT RETAINER WITH ONE FLAT WASHER ON EACH BOLT BETWEEN PLATES.
2. SHIM AS REQUIRED TO PLUMB POST.
3. TIGHTEN ALL BOLTS THE MAXIMUM POSSIBLE WITH 12" TO 15" WRENCH TO BED WASHERS AND SHIMS AND TO CLEAN BOLT THREADS. THEN LOOSEN EACH BOLT IN TURN AND RETIGHTEN IN A SYSTEMATIC ORDER TO THE PRESCRIBED TENSION (SEE TABLE) IN A SYSTEMATIC ORDER TO THE PRESCRIBED TENSION (SEE TABLE).
4. BURR THREADS AT JUNCTION WITH NUT USING A CENTER PUNCH TO PREVENT NUT LOOSENING.

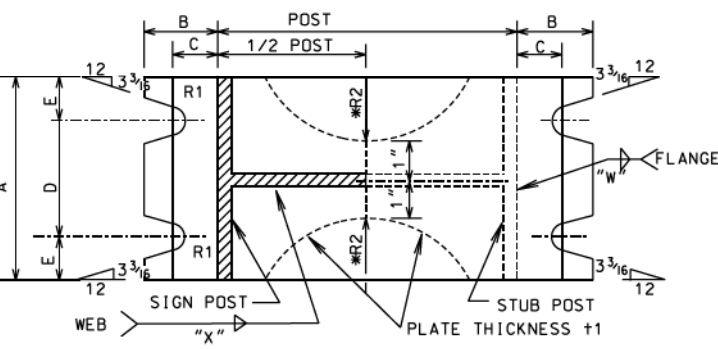
GENERAL NOTES

1. ALL BOLTS, NUTS AND WASHERS OTHER THAN HIGH STRENGTH SHALL CONFORM TO ASTM A307, GRADE A.
2. ALL STRUCTURAL STEEL, BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A153, CLASS C.
3. STRUCTURAL STEEL SHALL CONFORM WITH THE REQUIREMENTS OF ASTM SPECS A441, A588 OR A572 GRADE 50.
4. ALL HIGH STRENGTH BOLTS, NUTS & WASHERS SHALL CONFORM TO ASTM A325.
5. ALL HOLES IN THE FUSE PLATES, HINGE PLATES & BASE PLATES SHALL DRILLED AND/OR SAWED.
6. EACH SIGN POST SHALL BE FABRICATED FROM A CONTINUOUS PIECE OF MATERIAL. THE HOLES FOR THE FUSE AND HINGE PLATES SHALL BE DRILLED AND POST SECTIONS MATCH MARKED BEFORE CUTTING AND GALVANIZING. THE MATCH MARKS SHALL BE VISIBLE AFTER GALVANIZING.
7. FOR PROPER FUNCTIONING OF THE BREAKAWAY FEATURE OF THE SUPPORTS, IT IS NECESSARY FOR THE INTERIOR WASHERS OF THE BASE PLATE BOLTS TO TRANSFER THE BEARING PRESSURES EQUALLY. THEREFORE, THE BEARING PLATE SURFACES SHALL AFTER ASSEMBLY HAVE A CLEARANCE BETWEEN THEM OF AT LEAST 0.1 INCH, BUT NOT IN EXCESS OF 0.25 INCHES.
8. SUPPORTS (POSTS AND STUBS) SHALL BE FABRICATED AND SHOP ASSEMBLED TO INSURE PROPER ALIGNMENT AND MATCHING OF BASE PLATES. ANY DISMANTLING REQUIRED FOR SHIPMENT TO THE JOB SITE WILL REQUIRE THE MATCH MARKINGS OF THE PLATES, ETC. TO INSURE THAT REASSEMBLY WILL BE IN THE SAME MANNER AS WAS SHOP ASSEMBLY.
9. IT SHALL BE REQUIRED THAT EACH POST BE PREASSEMBLED AND INSTALLED AS A UNIT TO INSURE PROPER ALIGNMENT OF THE POST AND STUB ASSEMBLIES.
10. THE NUTS AND WASHERS REQUIRED FOR THE FUSE PLATES AND HINGE PLATES ON THE S3 x 5.7 AND S4 x 7.7 POSTS MAY BE PLACED ON THE OUTSIDE OF THE POST FLANGE.

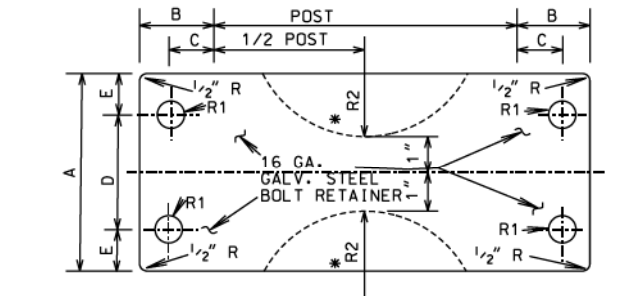
NOTE: THE FOLLOWING ALTERNATES MAY BE USED FOR THE POST SIZES SHOWN

| POST SIZE SHOWN | * ALTERNATE POST SIZE |
|-----------------|-----------------------|
| W6 x 8.5 | W6 x 9 |
| W6 x 15.5 | W6 x 15 |
| W8 x 17 | W8 x 18 |
| W8 x 20 | W8 x 21 |
| W10 x 21 | W10 x 22 |
| W10 x 25 | W10 x 26 |
| W12 x 27 | W12 x 26 |

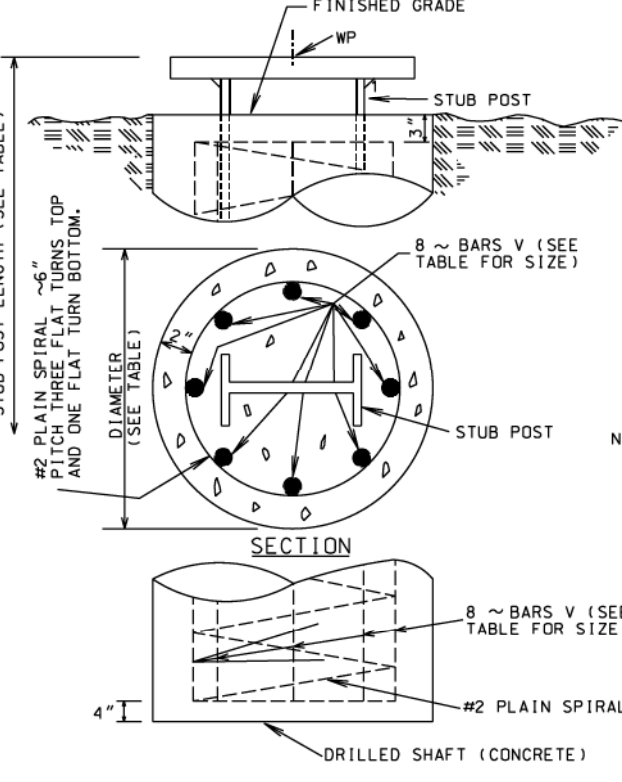
POSTS WITHIN A 7 FEET SPAN CANNOT WEIGH MORE THAN 18 POUNDS PER LINEAR FEET. THE TOTAL WEIGHT OF THE POSTS FROM THE HINGE TO THE BASE SHALL NOT EXCEED 600 POUNDS. IF EITHER CONDITION CANNOT BE MET, THE SIGN SUPPORT SHALL BE PLACED BEHIND GUARDRAIL.



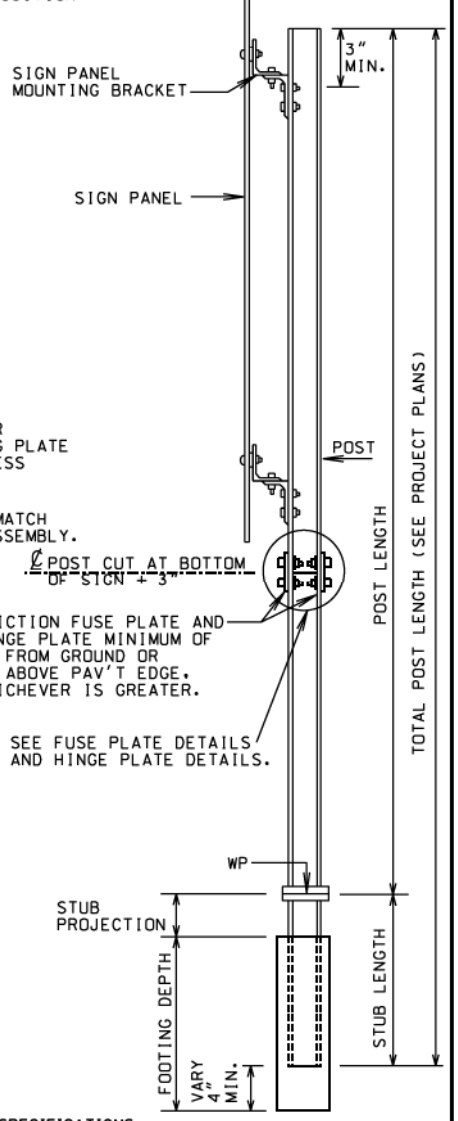
SECTION A-A SECTION B-B
SIGN POST AND STUB POST



BOLT RETAINER FOR BASE CONNECTION
* R2 WHEN REQ'D. (SEE TABLE BELOW FOR DIMENSIONS)



FOUNDATION DETAIL



--SPECIFICATIONS--
CURRENT ALABAMA DEPARTMENT OF TRANSPORTATION

| * DIMENSION POST SIZE | BOLT SIZE & CLAMPING FORCE | BASE CONNECTION DATA TABLE | | | | | | | | | |
|-----------------------|--|----------------------------|--------|--------|--------|--------|------|--------|-------|-------|--------|
| | | A | B | C | D | E | +1 | R2 | W | X | R1 |
| W6 x 8.5 | 5/8" x 2 3/4" 1740 | 5" | 2" | 1 1/4" | 2 1/4" | 1 3/8" | 3/4" | - | 1/4" | 3/16" | 1 1/2" |
| W6 x 12 | 5/8" x 3" 2660 LBS. (226 -) | 5" | 2" | 1 1/4" | 2 1/4" | 1 3/8" | 3/4" | - | 5/16" | 1/4" | 1 1/2" |
| W6 x 15.5 | 3/4" x 3 1/2" 345 IN.-LBS SLIP BASE TORQUE | 6" | 2" | 1 1/4" | 2 1/4" | 1 7/8" | 3/4" | - | 5/16" | 1/4" | 1 1/2" |
| W8 x 17 | 3/4" x 3 1/2" 2400 | 5 1/4" | 2" | 1 1/4" | 2 1/4" | 1 1/2" | 3/4" | 3" | 3/8" | 1/4" | 1 1/2" |
| W8 x 20 | 3/4" x 3 1/2" 2400 | 5 1/4" | 2" | 1 1/4" | 2 1/4" | 1 1/2" | 3/4" | 3" | 3/8" | 1/4" | 1 1/2" |
| W10 x 21 | 3/4" x 3 1/2" 3600 LBS. (1369) | 5 3/4" | 2 1/4" | 1 3/8" | 2 3/4" | 1 1/2" | 1" | 4 1/2" | 3/8" | 5/16" | 1 3/2" |
| W10 x 25 | 3/4" x 3 1/2" 554 IN.-LBS SLIP BASE TORQUE | 5 3/4" | 2 1/4" | 1 3/8" | 2 3/4" | 1 1/2" | 1" | 4 1/2" | 3/8" | 5/16" | 1 3/2" |
| W12 x 27 | 3/4" x 3 1/2" 554 IN.-LBS SLIP BASE TORQUE | 6 1/2" | 2 1/4" | 1 3/8" | 2 3/4" | 1 1/2" | 1" | 4 1/2" | 3/8" | 5/16" | 1 3/2" |
| S3 x 5.7 | 1/2" x 2 1/2" 920 | 3 1/2" | 2" | 1 1/4" | 2" | 3/4" | 5/8" | - | 5/16" | 3/16" | 9/32" |
| S4 x 7.7 | 1/2" x 2 1/2" 1380 LBS. (195) | 3 1/2" | 2" | 1 1/4" | 2" | 3/4" | 5/8" | - | 3/8" | 1/4" | 9/32" |

| FUSE PLATE DATA TABLE | | | | | | | | | | | | | |
|-----------------------|--------|--------|--------|--------|--------|--------|--------|------|----------|---------------|-----------------------|--|--|
| F | G | H | J | K | L | N | d1 | +3 | BOLT DIA | MIN BOLT LGTH | WT OF EACH FUSE PLATE | | |
| 3 5/8" | 2" | 1 1/8" | 4" | 2 1/4" | 7/8" | 1 1/2" | 3/16" | 1/4" | 1 1/2" | 1 1/2" | 0.94# | | |
| 3 5/8" | 2" | 1 1/8" | 4" | 2 1/4" | 7/8" | 1 1/2" | 3/16" | 1/4" | 1 1/2" | 1 1/2" | 0.94# | | |
| 4 3/8" | 2 1/2" | 1 1/4" | 6" | 3 1/2" | 1 1/4" | 5/8" | 11/16" | 3/8" | 5/8" | 1 1/2" | 2.58# | | |
| 4 3/8" | 2 1/2" | 1 1/4" | 5 1/4" | 2 3/4" | 1 1/4" | 5/8" | 11/16" | 3/8" | 5/8" | 1 1/2" | 2.24# | | |
| 4 3/8" | 2 1/2" | 1 1/4" | 5 1/4" | 2 3/4" | 1 1/4" | 5/8" | 11/16" | 3/8" | 5/8" | 1 1/2" | 2.95# | | |
| 5 1/4" | 3" | 1 1/2" | 5 3/4" | 2 3/4" | 1 1/2" | 3/4" | 13/16" | 1/2" | 3/4" | 1 3/4" | 3.88# | | |
| 5 1/4" | 3" | 1 1/2" | 5 3/4" | 2 3/4" | 1 1/2" | 3/4" | 13/16" | 1/2" | 3/4" | 1 7/8" | 3.88# | | |
| 5 1/4" | 3" | 1 1/2" | 5 3/4" | 2 3/4" | 1 1/2" | 3/4" | 13/16" | 1/2" | 3/4" | 1 7/8" | 4.44# | | |
| 3 1/8" | 1 1/2" | 1 1/8" | 2 5/8" | 1 3/8" | 5/8" | 1 1/2" | 3/16" | 1/4" | 1 1/2" | 1 1/2" | 0.49# | | |
| 3 1/8" | 1 1/2" | 1 1/8" | 2 5/8" | 1 3/8" | 5/8" | 1 1/2" | 3/16" | 1/4" | 1 1/2" | 1 1/2" | 0.49# | | |

| HINGE PLATE DATA TABLE | | | | | | | | | | | | | |
|------------------------|--------|--------|--------|--------|--------|--------|--------|----------|---------------|------------------|--|--|--|
| S | U | V | X | Y | Z | T4 | D2 | BOLT DIA | MIN BOLT LGTH | WT OF EACH HINGE | | | |
| 4 1/4" | 4" | 1 1/8" | 2" | 2 1/4" | 7/8" | 1 1/4" | 3/16" | 1/2" | 1 1/2" | 1.13# | | | |
| 4 1/4" | 4" | 1 1/8" | 2" | 2 1/4" | 7/8" | 5/16" | 3/16" | 1/2" | 1 1/2" | 1.42# | | | |
| 5" | 6" | 1 1/4" | 2 1/2" | 3 1/2" | 1 1/4" | 5/16" | 11/16" | 5/8" | 1 1/2" | 3.86# | | | |
| 5" | 5 1/4" | 1 1/4" | 2 1/2" | 2 3/4" | 1 1/4" | 5/16" | 11/16" | 5/8" | 1 1/2" | 2.94# | | | |
| 5" | 5 1/4" | 1 1/4" | 2 1/2" | 2 3/4" | 1 1/4" | 5/16" | 11/16" | 5/8" | 1 1/2" | 3.82# | | | |
| 6" | 5 3/4" | 1 1/2" | 3" | 2 3/4" | 1 1/2" | 3/8" | 13/16" | 3/4" | 1 3/4" | 5.04# | | | |
| 6" | 5 3/4" | 1 1/2" | 3" | 2 3/4" | 1 1/2" | 7/16" | 13/16" | 3/4" | 1 7/8" | 5.78# | | | |
| 6" | 6 1/2" | 1 1/2" | 3" | 3 1/2" | 1 1/2" | 7/16" | 13/16" | 3/4" | 1 7/8" | 7.44# | | | |
| 3 3/4" | 2 5/8" | 1 1/8" | 1 1/2" | 1 3/8" | 5/8" | 1 1/2" | 3/16" | 1/2" | 1 1/2" | 0.73# | | | |
| 3 3/4" | 2 5/8" | 1 1/8" | 1 1/2" | 1 3/8" | 5/8" | 1 1/2" | 3/16" | 1/2" | 1 1/2" | 0.73# | | | |

| FOUNDATION DATA | | | | |
|-----------------|--------------|--------------|--------|------|
| STUB LENGTH | STUB PROJECT | DR SHAFT DIA | BARS V | SIZE |
| 2'-0" | 3" | 2'-0" | #5 | |
| 2'-0" | 3" | 2'-0" | #5 | |
| 2'-6" | 3" | 2'-0" | #6 | |
| 2'-6" | 3" | 2'-0" | #7 | |
| 2'-6" | 3" | 2'-0" | #8 | |
| 3'-0" | 2 1/2" | 2'-0" | #9 | |
| 3'-0" | 2 1/2" | 2'-0" | #10 | |
| 3'-0" | 2 1/2" | 2'-0" | #11 | |
| 1'-6" | 3 1/2" | 1'-6" | #5 | |
| 1'-6" | 3 1/2" | 1'-6" | #5 | |

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REVISIONS
1. Added to CADD on 10-20-00 by J.F.T.



ALABAMA DEPARTMENT OF TRANSPORTATION
1409 COLISEUM BOULEVARD
MONTGOMERY, AL 36130-3050

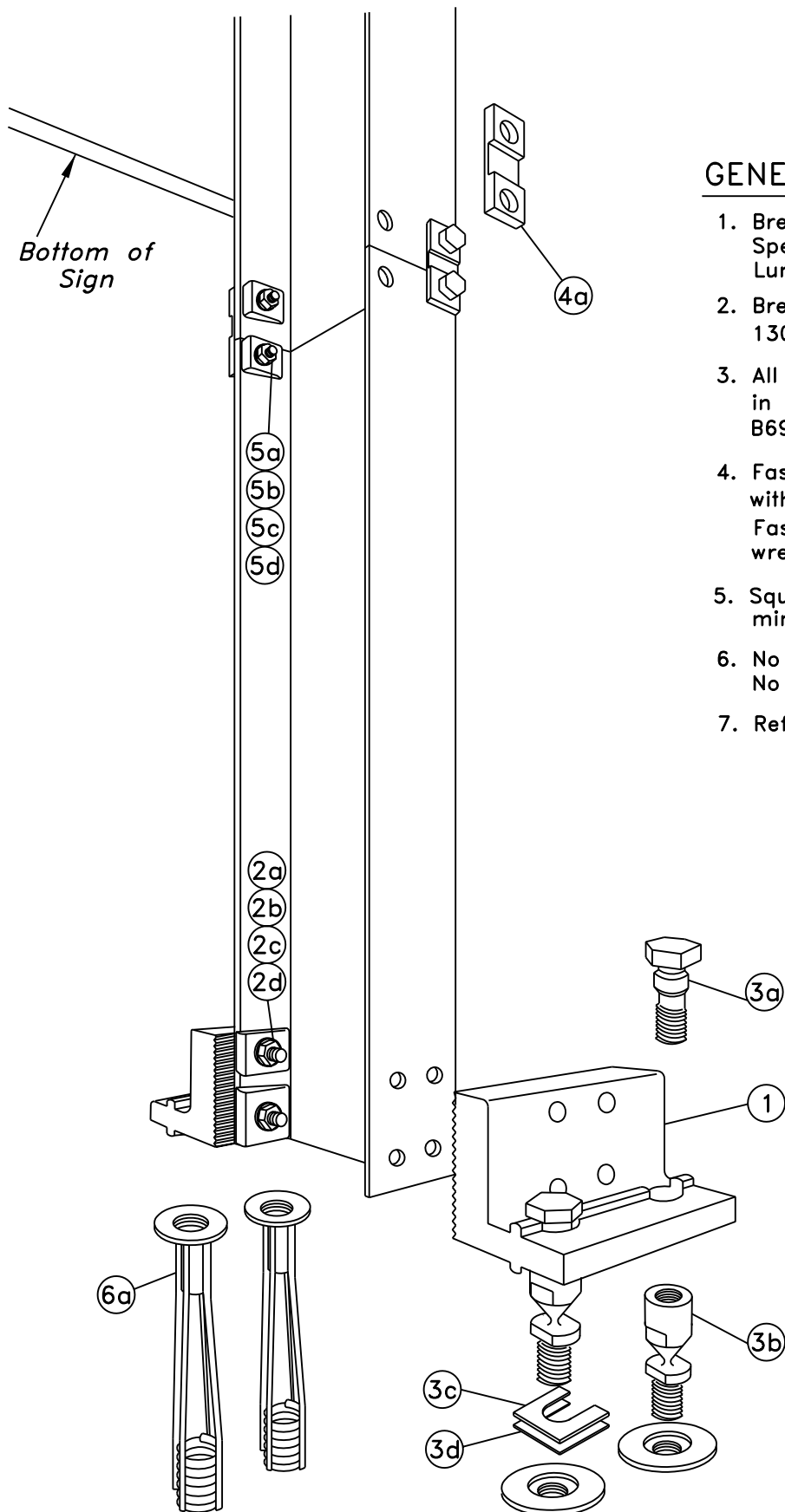
DESIGN BUREAU SPECIAL DRAWING
BEAM POST DETAILS
BASE CONNECTION TYPE-1
FUSE PLATE AND HINGE FOR POST
66" OR GREATER APART

DRAWN BY: _____
DATE DRAWN: 7-8-92

SPECIAL DRAWING NO. IHS-710-2
INDEX NO. 1203

PARTS LIST

| ITEM | DESCRIPTION | SIZE/SPECIFICATIONS | QTY/ POST | PART NUMBER |
|------|---|---|--------------|-------------|
| 1 | Bracket, Type AI4 | 6061-T6 Aluminum | 2 | SBAK6117 |
| 2 | Bracket Hardware Assembly, Type AI4, includes: | | 1 | SB-AI4H |
| 2a | Bolt | 12.7mm(1/2")-13UNCx57.2mm(2-1/4"), Hex Head, ASTM A325, Galv. ASTM A153 | 8 | |
| 2b | LockWasher | 12.7mm(1/2"), ANSI B18-21-1, Galv. ASTM A153 | 8 | |
| 2c | Nut | 12.7mm(1/2")-13UNC, Heavy Hex, ASTM A563 Gr. DH, Galv. ASTM A153 | 8 | |
| 2d | Bevel Washer | 12.7mm(1/2"), Clipped, ASTM F436, Galv. ASTM A153 | 8 | |
| 3 | Coupling & Special Bolt Assembly, Type A, includes: | | 1 | SB-CALP |
| 3a | Special Bolt | 15.9mm(5/8")-11UNC, ASTM A449, Galv. ASTM A153/B695 | 4 | |
| 3b | Coupling | 15.9mm(5/8")-11UNC, LP, AMS 6378D, Galv. ASTM A153, Polyester Coat | 4 | |
| 3c | Shim | 15.9mm(5/8") Horseshoe, 14 Gauge, Galv. Steel Sheet | 2 | |
| 3d | Shim | 15.9mm(5/8") Horseshoe, 18 Gauge, Galv. Steel Sheet | 2 | |
| 4 | Hinge Assembly, Type A, includes: | | 1 | SB-HB3 |
| 4a | Hinge Plate | Type A, AISI 4130 Steel, Galv. ASTM A123 | 4 | |
| 5 | Hinge Hardware Assembly, Type A, includes: | | 1 | SB-HHA |
| 5a | Bolt | 12.7mm(1/2")-13UNCx37.2mm(1-1/2"), Hex Head, ASTM A325, Galv. ASTM A153 | 8 | |
| 5b | LockWasher | 12.7mm(1/2"), ANSI B18-21-1, Galv. ASTM A153 | 8 | |
| 5c | Nut | 12.7mm(1/2")-13UNC, Heavy Hex, ASTM A563 Gr. DH, Galv. ASTM A153 | 8 | |
| 5d | Bevel Washer | 12.7mm(1/2"), Clipped, ASTM F436, Galv. ASTM A153 | 8 | |
| 6 | Anchor Assembly, Type A, includes: | | 1 | SBAAPK |
| 6a | Anchor | 15.9mm(5/8")-11UNC, 304 S.S. Ferrule, AISI 1045 Rod, AISI 1008 Coil | 4 | |



GENERAL NOTES:

1. Break-Safe meets all requirements of "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals."
2. Break-Safe Model AI4/AI5 is designed to fit 100mm (4") and 130mm (5") Standard S-Shaped Steel I-Beam signposts.
3. All hardware items are American Standard sizes, galvanized in accordance with ASTM A153 (hot dipped) or ASTM B695 (mechanically applied).
4. Fasteners, except for special bolt and coupling, are installed with lockwashers, and do not have specific torque requirements. Fasteners should be secured as tight as possible with conventional wrenches, unless noted otherwise.
5. Square-up and level individual components, particularly Anchors to minimize the need for shimming between the Couplings and Anchors.
6. No more than two shims shall be placed under any one coupling. No more than three shims underneath any pair of couplings.
7. Refer to other side of page for complete installation instructions.

*Break-Safe Model AI4/AI5
Breakaway Support System for Sign Posts*

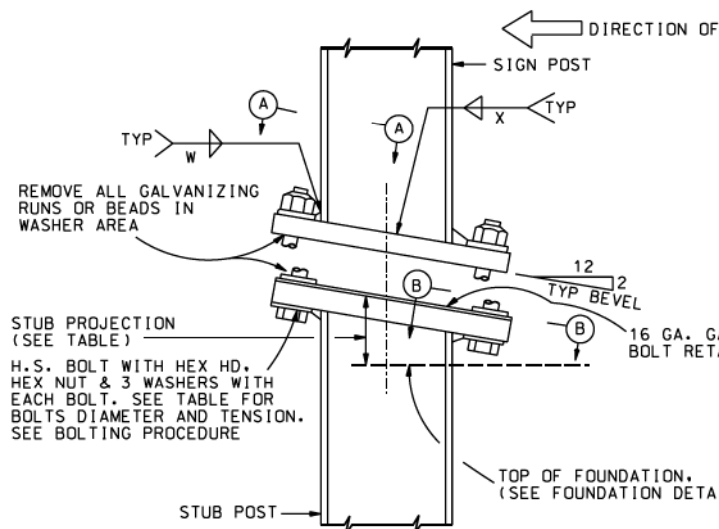
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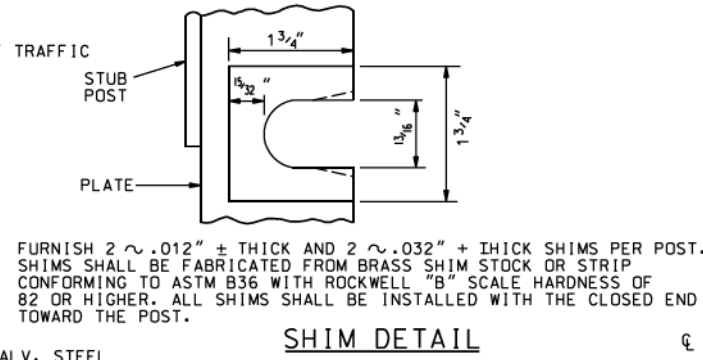
Drawing No. BS-AI4/AI5-1

Sheet: 1 of 2

Patent Nos. 4,528,786 and 5,596,845



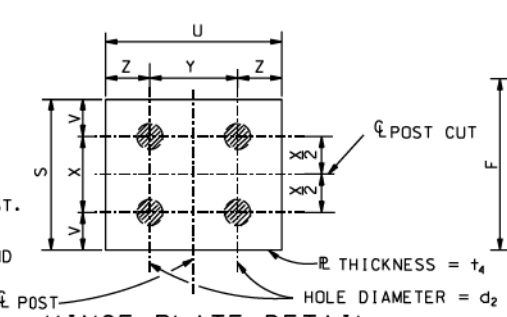
ELEVATION α



SHIM DETAIL

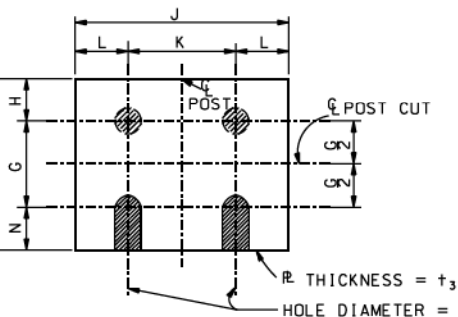
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4. BURR THREADS AT JUNCTION WITH NUT USING A CENTER PUNCH TO PREVENT NUT LOOSENING.



HINGE PLATE DETAIL

(SEE TABLES FOR DIMENSIONS AND WEIGHT)
USE H.S. BOLTS WITH HEX HD & HEX NUT ONE FLAT WASHER UNDER EACH BOLT HEAD AND BEVEL OR FLAT WASHER (WHERE REQUIRED) UNDER NUT.



FUSE PLATE DETAIL

THE BOLTS IN THE FUSE AND HINGE PLATES SHALL BE TIGHTENED TO SUCH A DEGREE AS TO OBTAIN THE FOLLOWING MINIMUM RESIDUAL TENSION IN EACH BOLT.

| BOLT SIZE | MINIMUM RESIDUAL BOLT TENSION |
|-------------|-------------------------------|
| 1/2" ϕ | 12050 LBS. |
| 3/8" ϕ | 19200 LBS. |
| 3/4" ϕ | 28400 LBS. |
| 7/8" ϕ | 39250 LBS. |

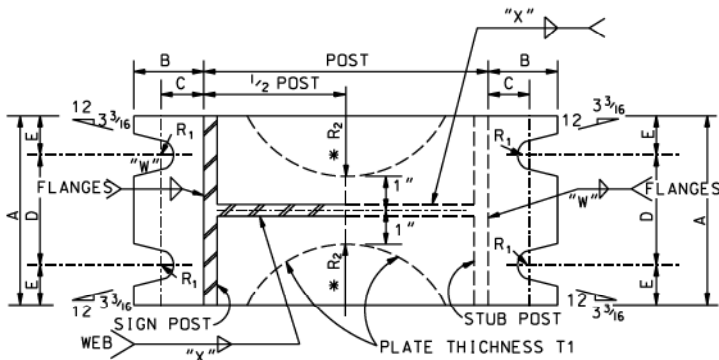
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8. SUPPORTS (POSTS AND STUBS) SHALL BE FABRICATED AND SHOP ASSEMBLED TO INSURE PROPER ALIGNMENT AND MATCHING OF BASE PLATES. ANY DISMANTLING REQUIRED FOR SHIPMENT TO THE JOB SITE WILL REQUIRE THE MATCH MARKING OF THE PLATES, ETC. TO INSURE THAT REASSEMBLY WILL BE IN THE SAME MANNER AS WAS SHOP ASSEMBLY.
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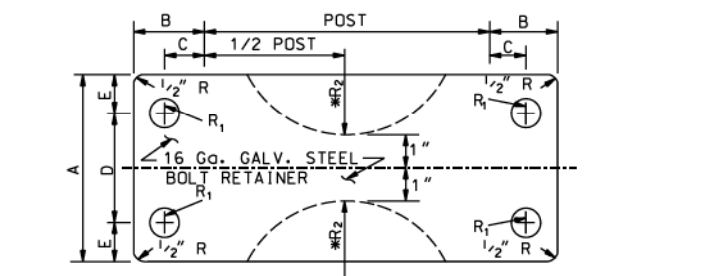
NOTE: THE FOLLOWING ALTERNATES MAY BE USED FOR THE POST SIZES SHOWN

| POST SIZE SHOWN | * ALTERNATE POST SIZE |
|-----------------|-----------------------|
| W6 x 8.5 | W6 x 9 |
| W6 x 12 | W6 x 12 |
| W6 x 15.5 | W6 x 15 |
| W8 x 17 | W8 x 18 |

NOTE: POST WITHIN A 7 FOOT SPAN CANNOT WEIGH MORE THAN 18 POUNDS PER LIN. FT. THE TOTAL WEIGHT OF THE POSTS FROM THE HINGE TO THE BASE SHALL NOT EXCEED 600 POUNDS. IF EITHER CONDITION CANNOT BE MET, THE SUN SUPPORT SHALL BE PLACED BEHIND GUARDRAIL.



SECTION A-A SECTION B-B
SIGN POST AND STUB POST

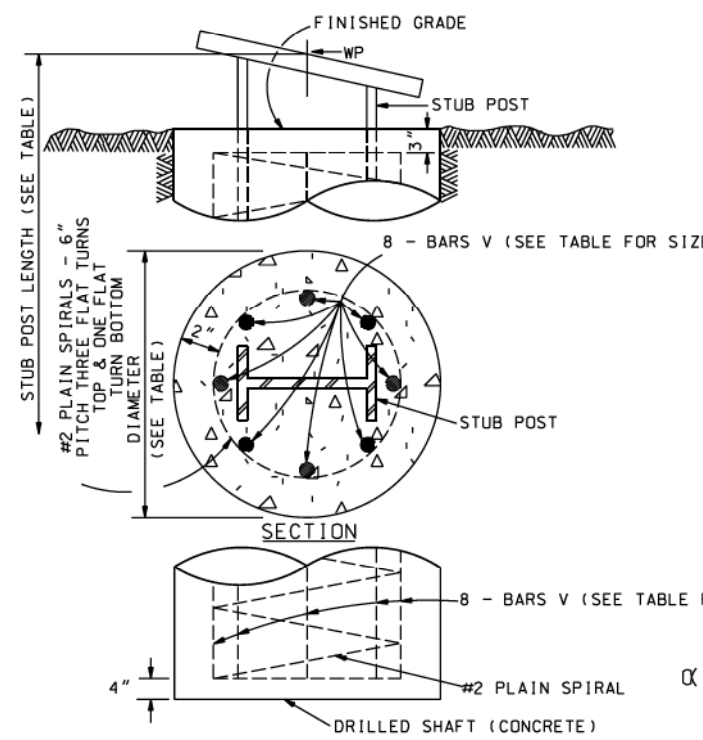


BOLT RETAINER FOR BASE CONNECTION

* R2 WHEN REQ'D. (SEE TABLE BELOW FOR DIMENSIONS)

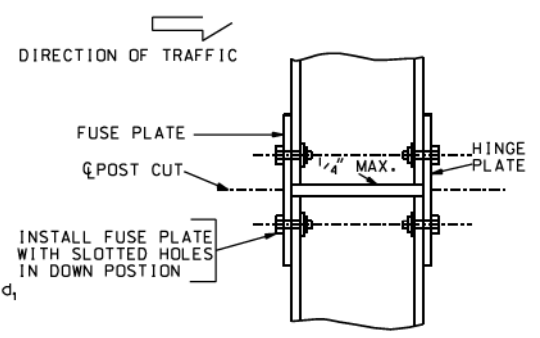
BASE CONNECTION DATA TABLE

| DIMENSION * POST SIZE | BOLT SIZE & CLAMPING FORCE | FUSE PLATE DATA TABLE | | | | | | | | | | | | | | | HINGE PLATE DATA TABLE | | | | | | FOUNDATION DATA | | | | | | | | | | | | | |
|-----------------------|--|-----------------------|----|--------|--------|--------|------|--------|-------|--------|--------|--------|--------|--------|--------|--------|------------------------|--------|--------|--------|----------|-----------------|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|------------------------|-------------|------------|
| | | A | B | C | D | E | t1 | R2 | W | X | R1 | F | G | H | J | K | L | N | d1 | t3 | BOLT DIA | MIN BOLT LENGTH | WT OF EACH FUSE PLATE | S | U | V | X | Y | Z | t4 | d2 | BOLT DIA | MIN BOLT LENGTH | WT OF EACH HINGE PLATE | STUB LENGTH | STUB PROJ. |
| W6 x 8.5 | 5/8" ϕ x 2 3/4" (226 - 2660 LBS. TORQUE) | 5" | 2" | 1 1/4" | 2 1/4" | 1 3/8" | 3/4" | 1 1/4" | 3/16" | 1 1/2" | 3 5/8" | 2" | 1 1/8" | 4" | 2 1/4" | 7/8" | 1 1/2" | 9/16" | 1 1/4" | 1 1/2" | 1 1/2" | 0.94# | 4 1/4" | 4" | 1 1/8" | 2" | 2 1/4" | 7/8" | 1 1/4" | 9/16" | 1 1/2" | 1.13# | 2'-0" | 3" | 2'-0" | #5 |
| W6 x 12 | 1740 - 2660 LBS. (226 - 345 IN.-LBS. SLIP BASE TORQUE) | 5" | 2" | 1 1/4" | 2 1/4" | 1 3/8" | 3/4" | 1 1/4" | 1/4" | 1 1/2" | 3 5/8" | 2" | 1 1/8" | 4" | 2 1/4" | 7/8" | 1 1/2" | 9/16" | 1 1/4" | 1 1/2" | 1 1/2" | 0.94# | 4 1/4" | 4" | 1 1/8" | 2" | 2 1/4" | 7/8" | 5/16" | 9/16" | 1 1/2" | 1.42# | 2'-0" | 3" | 2'-0" | 5" |
| W6 x 15.5 | 1740 - 2660 LBS. (226 - 345 IN.-LBS. SLIP BASE TORQUE) | 6" | 2" | 1 1/4" | 2 1/4" | 1 1/8" | 3/4" | 1 1/4" | 1/4" | 1 1/2" | 4 3/8" | 2 1/2" | 1 1/4" | 6" | 3 1/2" | 1 1/4" | 5/8" | 1 1/2" | 1 1/4" | 3/8" | 5/8" | 2.58# | 5" | 6" | 1 1/4" | 2 1/2" | 3 1/2" | 1 1/4" | 5/16" | 1 1/2" | 3.86# | 2'-6" | 3" | 2'-0" | #6 | |
| W8 x 17 | 1740 - 2660 LBS. (226 - 345 IN.-LBS. SLIP BASE TORQUE) | 5 1/4" | 2" | 1 1/4" | 2 1/4" | 1 1/2" | 3/4" | 3/8" | 1/4" | 1 1/2" | 4 3/8" | 2 1/2" | 1 1/4" | 5 1/4" | 2 3/4" | 1 1/4" | 5/8" | 1 1/2" | 1 1/4" | 3/8" | 5/8" | 2.24# | 5" | 5 1/4" | 1 1/4" | 2 1/2" | 2 3/4" | 1 1/4" | 5/16" | 1 1/2" | 2.94# | 2'-6" | 3" | 2'-0" | #6 | |
| S3 x 5.7 | 1/2" ϕ x 2 1/2" (920-1380 LBS. TORQUE) | 3 1/2" | 2" | 1 1/4" | 2" | 3/4" | 5/8" | 1 1/4" | 3/16" | 9/32" | 3 1/8" | 1 1/2" | 1 1/8" | 2 5/8" | 1 3/8" | 5/8" | 1 1/2" | 9/16" | 1 1/4" | 1 1/2" | 1 1/2" | 0.49# | 3 3/4" | 2 5/8" | 1 1/8" | 1 1/2" | 1 3/8" | 5/8" | 5/16" | 9/16" | 1 1/2" | 0.73# | 1'-6" | 3 1/2" | 1'-6" | #5 |
| S4 x 7.7 | 920-1380 LBS. (95-142 IN.-LBS. SLIP BASE TORQUE) | 3 1/2" | 2" | 1 1/4" | 2" | 3/4" | 5/8" | 1 1/4" | 3/16" | 9/32" | 3 1/8" | 1 1/2" | 1 1/8" | 2 5/8" | 1 3/8" | 5/8" | 1 1/2" | 9/16" | 1 1/4" | 1 1/2" | 1 1/2" | 0.49# | 3 3/4" | 2 5/8" | 1 1/8" | 1 1/2" | 1 3/8" | 5/8" | 5/16" | 9/16" | 1 1/2" | 0.73# | 1'-6" | 3 1/2" | 1'-6" | #5 |



FOUNDATION DETAIL

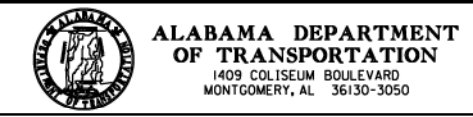
α OR APPROVED EQUAL FROM THE "LISTING OF FHWA ACCEPTED BREAKAWAY SIGN SUPPORTS" AND THE STATE OF ALABAMA DEPARTMENT OF TRANSPORTATION PRODUCT EVALUATION BOARD.



TYPICAL SIDE VIEW

THIS DRAWING REPRESENTS DESIGNS PREPARED FOR USE BY THE ALABAMA DEPARTMENT OF TRANSPORTATION AND IS NOT TO BE COPIED, REPRODUCED, ALTERED, OR USED BY ANYONE, OR ANY ORGANIZATION, WITHOUT THE EXPRESSED WRITTEN CONSENT OF THE ALABAMA DEPARTMENT OF TRANSPORTATION REPRESENTATIVE AUTHORIZED TO CONSENT TO THIS USE. ANYONE MAKING UNAUTHORIZED USE OF THIS DRAWING MAY BE PROSECUTED TO THE FULLEST EXTENT OF THE LAW.

REVISIONS
1. Added to CADD ON 10-26-00 by J.F.T.



DESIGN BUREAU SPECIAL DRAWING
BEAM POST DETAILS BASE CONNECTION
TYPE-2 FUSE PLATE AND HINGE FOR
POST 66" OR LESS APART

DRAWN BY: _____
DATE DRAWN: 7-08-92

SPECIAL DRAWING NO. IHS-710-3
INDEX NO. 1204

--SPECIFICATIONS--
CURRENT ALABAMA DEPARTMENT OF TRANSPORTATION

INSTALLATION INSTRUCTIONS

ANCHOR ASSEMBLY:

Note: Precise positioning of the anchors is critical to proper assembly of the system. It is recommended that actual posts be used to locate the correct position of the anchors.

1. Fabricate a flat, rigid template with four (4) 16mm (5/8") diameter holes located to match the specified anchor pattern of the Break-Safe Brackets attached to the signpost. See diagram below.
2. Attach four (4) Type A Female Anchors to the template using four (4) 16mm (5/8") diameter bolts. Ensure that each Anchor Washer is snug against the bottom of the template.
3. Lower Anchor Assembly into fresh concrete foundation, and vibrate into position such that the tops of the Anchor Washers are flush with the finished top surface of the foundation. Support the template such that all Anchors are level and in their proper locations.
4. Allow concrete to cure, and then remove the bolts and template from the top of the foundation.

HINGE ASSEMBLY:

1. Butt upper and lower post sections together on a flat surface.
2. Drill eight (8) 14.3mm (9/16") holes in the flanges of the post sections as shown.
3. Place Hinge Plates on outer surface of the post flanges and secure with bolts, bevel washers, lock washers, and nuts. Ensure that upper and lower post sections are in alignment, and then tighten all nuts 1/2 turn beyond snug.

BRACKET ASSEMBLY:

1. Drill eight (8) 14.3mm (9/16") diameter holes in the flanges of the lower post section as shown.
2. Place Brackets squarely on outer surface of the post flanges, and secure with bolts, bevel washers, lock washers, and nuts. Then, tighten all 1/2 turn beyond snug.

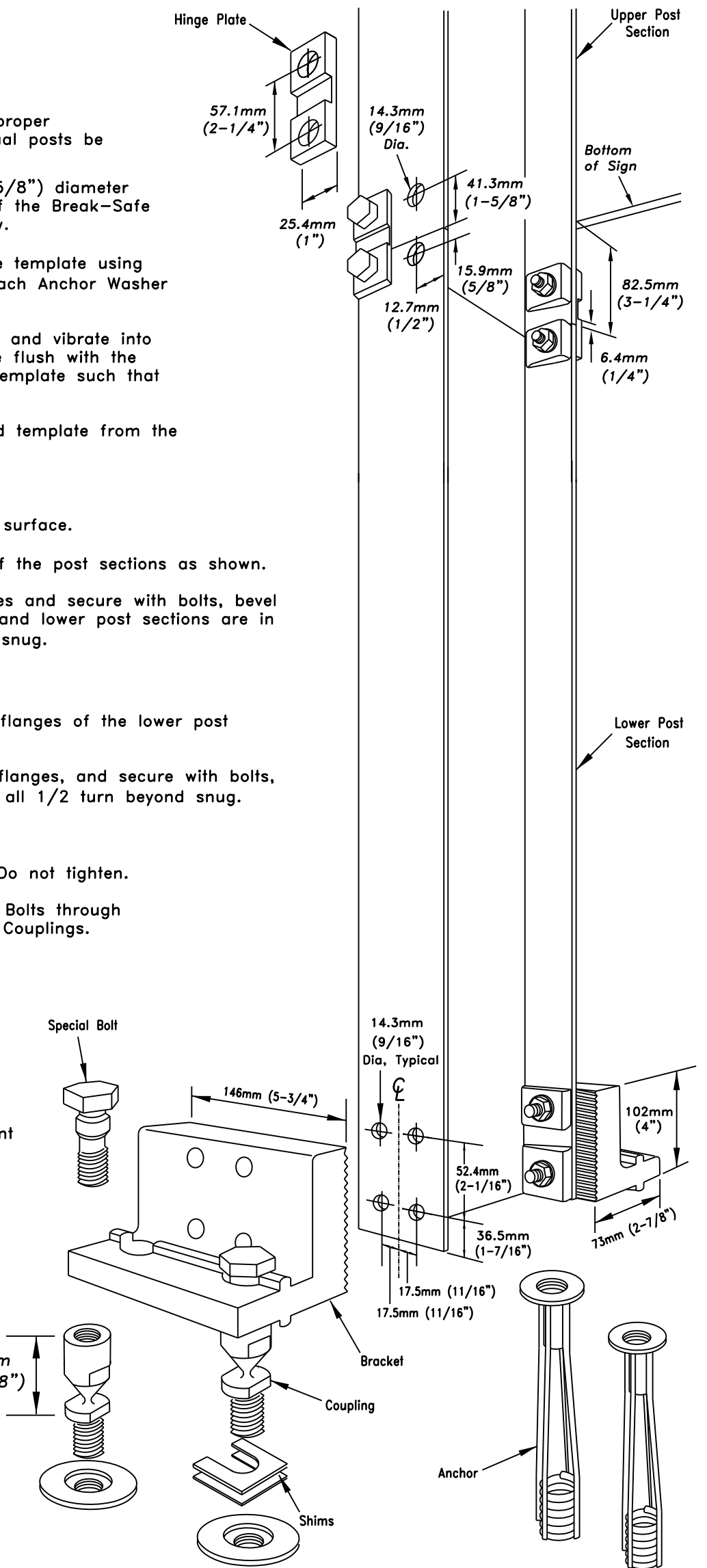
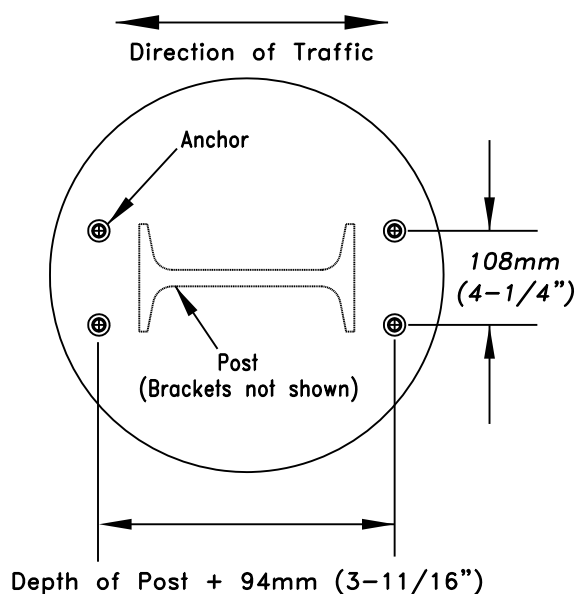
COUPLING ASSEMBLY:

1. Thread four (4) Break-Safe Couplings into Anchors. Do not tighten.
2. Suspend post assembly over foundation, insert Special Bolts through holes in the Brackets, and thread them snug into the Couplings.
3. If post is not plumb, insert Shims (14g and/or 18g) between the Couplings and Anchors, where needed.
4. Use lower wrench flats to tighten Couplings into Anchors as tight as possible using a conventional wrench. Do not use a pipe wrench. Couplings must be seated squarely.
5. Tighten Special Bolts while holding Couplings by the upper wrench flats with an additional wrench to prevent an induced torque stress across the necked portion of the Coupling. All Special Bolts shall also be tightened as tight as possible using conventional wrenches.

SIGN PANEL ASSEMBLY:

1. After all signposts are secured in place, attach sign panel assembly to posts in accordance with the sign manufacturer's recommendations.

PLAN VIEW OF TYPICAL FOUNDATION



*Break-Safe Model AI4/AI5
Breakaway Support System for Sign Posts*

Scale: Not To Scale

Date: July 2000

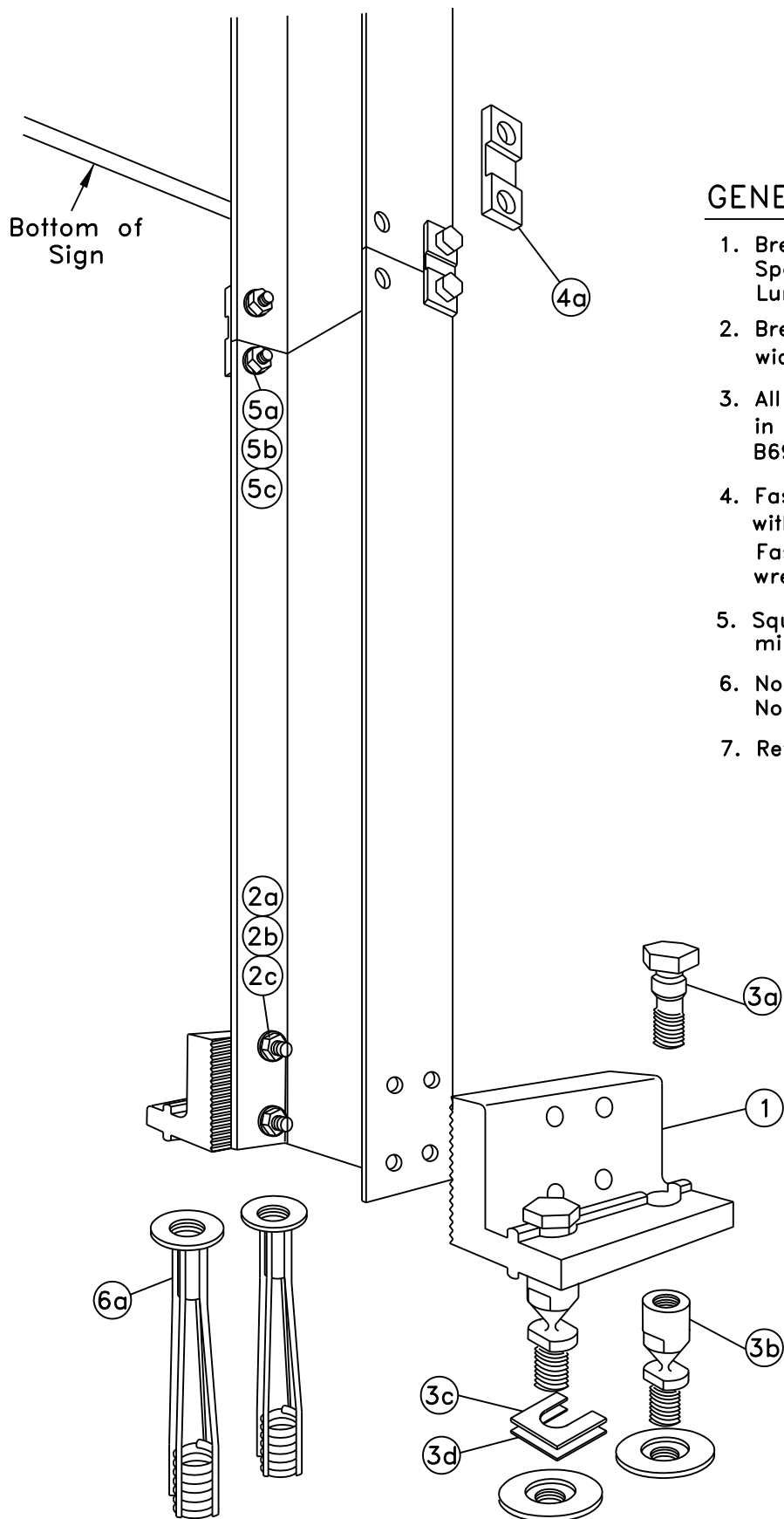
Patent Nos. 4,528,786 and 5,596,845

Drawing No. BS-AI4/AI5-2

Sheet: 2 of 2

PARTS LIST

| ITEM | DESCRIPTION | SIZE/SPECIFICATIONS | QTY/ POST | PART NUMBER |
|------|---|---|--------------|-------------|
| 1 | Bracket, Type A16 | 6061-T6 Aluminum | 2 | SBAK6117 |
| 2 | Bracket Hardware Assembly, Type A16, includes: | | 1 | SB-A16H |
| 2a | Bolt | 12.7mm(1/2")-13UNCx57.2mm(2-1/4"), Hex Head, ASTM A325, Galv. ASTM A153 | 8 | |
| 2b | LockWasher | 12.7mm(1/2"), ANSI B18-21-1, Galv. ASTM A153 | 8 | |
| 2c | Nut | 12.7mm(1/2")-13UNC, Heavy Hex, ASTM A563 Gr. DH, Galv. ASTM A153 | 8 | |
| 3 | Coupling & Special Bolt Assembly, Type A, includes: | | 1 | SB-CALP |
| 3a | Special Bolt | 15.9mm(5/8")-11UNC, ASTM A449, Galv. ASTM A153/B695 | 4 | |
| 3b | Coupling | 15.9mm(5/8")-11UNC, LP, AMS 6378D, Galv. ASTM A153, Polyester Coat | 4 | |
| 3c | Shim | 15.9mm(5/8") Horseshoe, 14 Gauge, Galv. Steel Sheet | 2 | |
| 3d | Shim | 15.9mm(5/8") Horseshoe, 18 Gauge, Galv. Steel Sheet | 2 | |
| 4 | Hinge Assembly, Type A, includes: | | 1 | SB-HB3 |
| 4a | Hinge Plate | Type A, AISI 4130 Steel, Galv. ASTM A123 | 4 | |
| 5 | Hinge Hardware Assembly, Type A, includes: | | 1 | SB-HHA |
| 5a | Bolt | 12.7mm(1/2")-13UNCx37.2mm(1-1/2"), Hex Head, ASTM A325, Galv. ASTM A153 | 8 | |
| 5b | LockWasher | 12.7mm(1/2"), ANSI B18-21-1, Galv. ASTM A153 | 8 | |
| 5c | Nut | 12.7mm(1/2")-13UNC, Heavy Hex, ASTM A563 Gr. DH, Galv. ASTM A153 | 8 | |
| 6 | Anchor Assembly, Type A, includes: | | 1 | SBAAPK |
| 6a | Anchor | 15.9mm(5/8")-11UNC, 304 S.S. Ferrule, AISI 1045 Rod, AISI 1008 Coil | 4 | |



GENERAL NOTES:

1. Break-Safe meets all requirements of "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals."
2. Break-Safe Model A16 is designed to fit W150x14 (W6x9) wide-flange steel I-Beam signposts.
3. All hardware items are American Standard sizes, galvanized in accordance with ASTM A153 (hot dipped) or ASTM B695 (mechanically applied).
4. Fasteners, except for special bolt and coupling, are installed with lockwashers, and do not have specific torque requirements. Fasteners should be secured as tight as possible with conventional wrenches, unless noted otherwise.
5. Square-up and level individual components, particularly Anchors to minimize the need for shimming between the Couplings and Anchors.
6. No more than two shims shall be placed under any one coupling. No more than three shims underneath any pair of couplings.
7. Refer to other side of page for complete installation instructions.

Break-Safe Model A16
Breakaway Support System for Sign Posts

Scale: Not To Scale

Date: July 2000

Drawing No. BS-A16-1

Sheet: 1 of 2

Patent Nos. 4,528,786 and 5,596,845

INSTALLATION INSTRUCTIONS

ANCHOR ASSEMBLY:

Note: Precise positioning of the anchors is critical to proper assembly of the system. It is recommended that actual posts be used to locate the correct position of the anchors.

1. Fabricate a flat, rigid template with four (4) 16mm (5/8") diameter holes located to match the specified anchor pattern of the Break-Safe Brackets attached to the signpost. See diagram below.
2. Attach four (4) Type A Female Anchors to the template using four (4) 16mm (5/8") diameter bolts. Ensure that each Anchor Washer is snug against the bottom of the template.
3. Lower Anchor Assembly into fresh concrete foundation, and vibrate into position such that the tops of the Anchor Washers are flush with the finished top surface of the foundation. Support the template such that all Anchors are level and in their proper locations.
4. Allow concrete to cure, and then remove the bolts and template from the top of the foundation.

HINGE ASSEMBLY:

1. Butt upper and lower post sections together on a flat surface.
2. Drill eight (8) 14.3mm (9/16") holes in the flanges of the post sections as shown.
3. Place Hinge Plates on outer surface of the post flanges and secure with bolts, lock washers, and nuts. Ensure that upper and lower post sections are in alignment, and then tighten all nuts 1/2 turn beyond snug.

BRACKET ASSEMBLY:

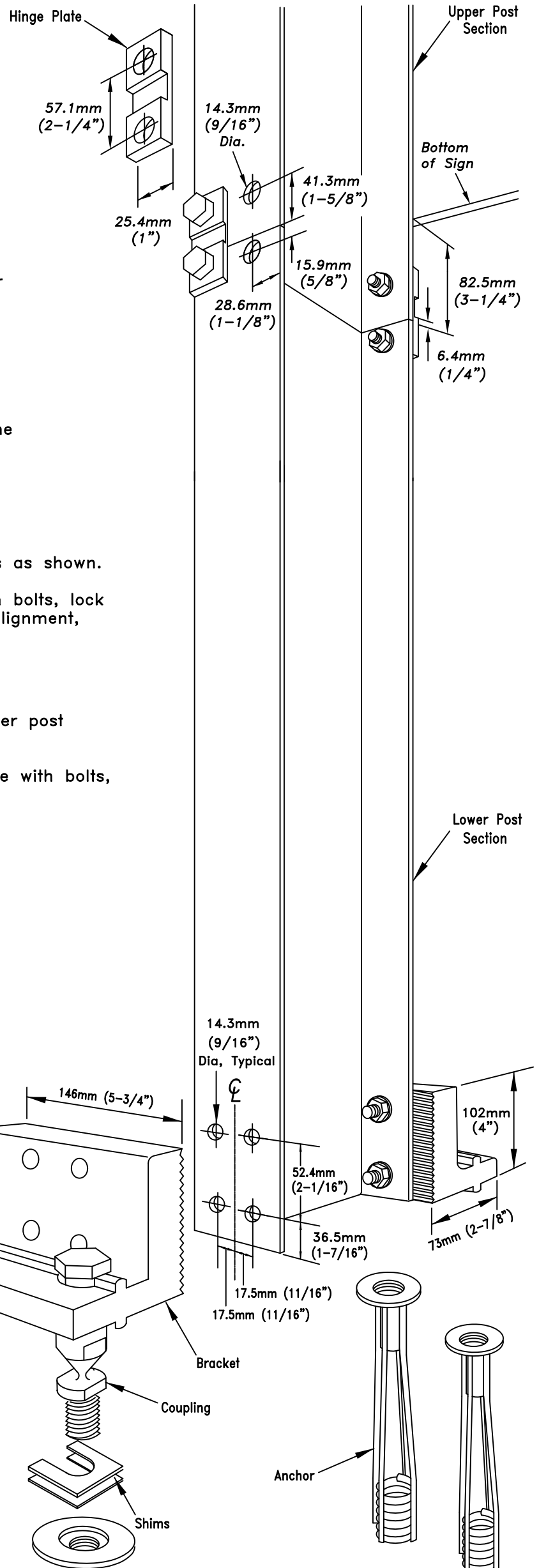
1. Drill eight (8) 14.3mm (9/16") diameter holes in the flanges of the lower post section as shown.
2. Place Brackets squarely on outer surface of the post flanges, and secure with bolts, lock washers, and nuts. Then, tighten all 1/2 turn beyond snug.

COUPLING ASSEMBLY:

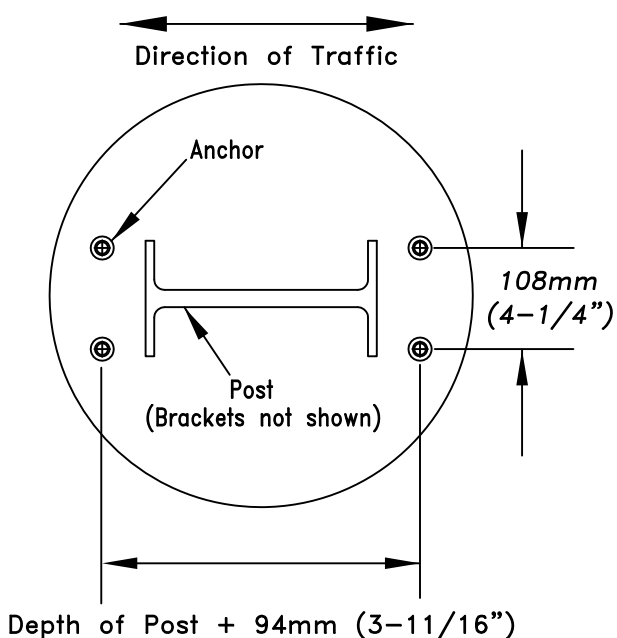
1. Thread four (4) Break-Safe Couplings into Anchors. Do not tighten.
2. Suspend post assembly over foundation, insert Special Bolts through holes in the Brackets, and thread them snug into the Couplings.
3. If post is not plumb, insert Shims (14g and/or 18g) between the Couplings and Anchors, where needed.
4. Use lower wrench flats to tighten Couplings into Anchors as tight as possible using a conventional wrench. Do not use a pipe wrench. Couplings must be seated squarely.
5. Tighten Special Bolts while holding Couplings by the upper wrench flats with an additional wrench to prevent an induced torque stress across the necked portion of the Coupling. All Special Bolts shall also be tightened as tight as possible using conventional wrenches.

SIGN PANEL ASSEMBLY:

1. After all signposts are secured in place, attach sign panel assembly to posts in accordance with the sign manufacturer's recommendations.



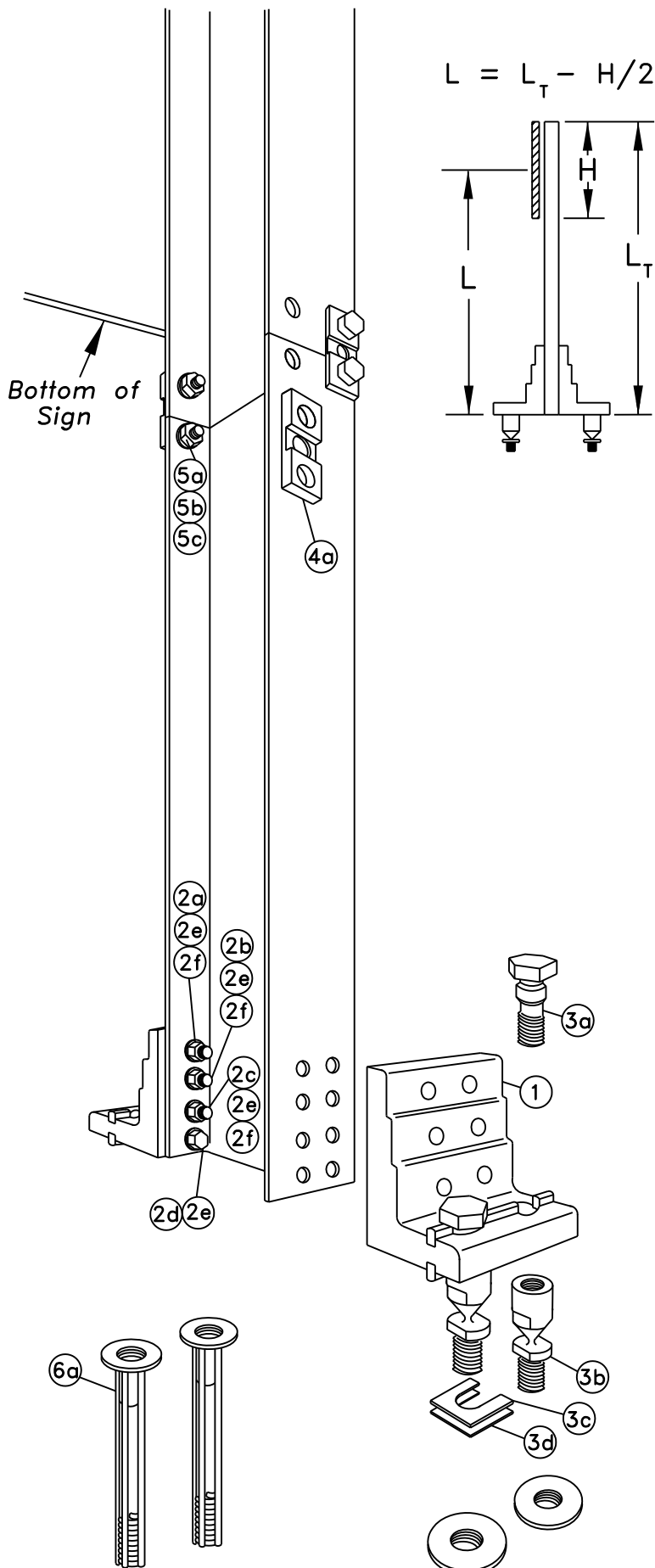
PLAN VIEW OF TYPICAL FOUNDATION



| | |
|--|----------------|
| Break-Safe Model AI6 | |
| <i>Breakaway Support System for Sign Posts</i> | |
| Scale: Not To Scale | Date: May 2007 |
| Drawing No. BS-AI6-2 | Sheet: 2 of 2 |

PARTS LIST

| ITEM | DESCRIPTION | SIZE/SPECIFICATIONS | QTY/ POST | PART NUMBER |
|------|---|---|--------------|--------------------|
| 1 | Bracket, Type B525 | 6061-T6 Aluminum (see Bracket Selection Table for -Number) | 2 | SBBK525-1A,-2A,-3A |
| 2 | Bracket Hardware Assembly, Type B525, includes: | | 1 | SB-B525LPH |
| 2a | Bolt | 12.7mm(1/2")-13UNCx63.5mm(2-1/2"), Hex Head, ASTM A325, Galv. ASTM A153 | 4 | |
| 2b | Bolt | 12.7mm(1/2")-13UNCx69.8mm(2-3/4"), Hex Head, ASTM A325, Galv. ASTM A153 | 4 | |
| 2c | Bolt | 12.7mm(1/2")-13UNCx76.2mm(3"), Hex Head, ASTM A325, Galv. ASTM A153 | 4 | |
| 2d | Cap Screw | 12.7mm(1/2")-13UNCx31.7mm(1-1/4"), Hex Head, ASTM A307, Galv. ASTM A153 | 4 | |
| 2e | LockWasher | 12.7mm(1/2"), ANSI B18-21-1, Galv. ASTM A153 | 16 | |
| 2f | Nut | 12.7mm(1/2")-13UNC, Heavy Hex, ASTM A563 Gr. DH, Galv. ASTM A1531 | 12 | |
| 3 | Coupling & Special Bolt Assembly, Type B, includes: | | 1 | SB-CBLP |
| 3a | Special Bolt | 25.4mm(1")-8UNC, ASTM A449, Galv. ASTM A153/B695 | 4 | |
| 3b | Coupling | 25.4mm(1")-8UNC, LP, AMS 6378D, Galv. ASTM A153, Polyester Coat | 4 | |
| 3c | Shim | 25.4mm(1") Horseshoe, 14 Gauge, Galv. Steel Sheet | 2 | |
| 3d | Shim | 25.4mm(1") Horseshoe, 18 Gauge, Galv. Steel Sheet | 2 | |
| 4 | Hinge Assembly, Type B525, includes: | | 1 | SB-HB1 |
| 4a | Hinge Plate | Type B525, AISI 4130 Steel, Galv. ASTM A123 | 4 | |
| 5 | Hinge Hardware Assembly, Type B, includes: | | 1 | SB-HHB |
| 5a | Bolt | 19.0mm(3/4")-10UNCx57.1mm(2-1/4"), Hex Head, ASTM A325, Galv. ASTM A153 | 8 | |
| 5b | LockWasher | 19.0mm(3/4"), ANSI B18-21-1, Galv. ASTM A153 | 8 | |
| 5c | Nut | 19.0mm(3/4")-10UNC, Heavy Hex, ASTM A563 Gr. DH, Galv. ASTM A153 | 8 | |
| 6 | Anchor Assembly, Type B, includes: | | 1 | SBABPK |
| 6a | Anchor | 25.4mm(1")-8UNC, 304 S.S. Ferrule, AISI 1045 Rod, AISI 1008 Coil | 4 | |



BRACKET SELECTION TABLE

Select correct Break-Safe bracket number from table, using 'L' value from the longest post. Use figure to the left to determine 'L'.

| POST SIZE | BRACKET No. 1 | | BRACKET No. 2 | | BRACKET No. 3 | |
|------------|---------------|-----------|---------------|-----------|---------------|-----------|
| | Min. 'L' | Max. 'L' | Min. 'L' | Max. 'L' | Min. 'L' | Max. 'L' |
| 152mm (6") | 3.6m(12') | 8.8m(29') | 2.7m(9') | 3.6m(12') | 0 | 2.7m(9') |
| 203mm (8") | 4.3m(14') | 8.8m(29') | 3.0m(10') | 4.3m(14') | 0 | 3.0m(10') |

GENERAL NOTES:

1. Break-Safe meets all requirements of "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals."
2. Break-Safe Model B525 is designed to fit 150mm (6") and 200mm (8") Wide Flange I-Beam, and 127mm (5") and 150mm (6") Square Tube signposts.
2. Select proper Bracket Number by referring to Bracket Selection Table.
3. All hardware items are American Standard sizes, galvanized in accordance with ASTM A153 (hot dipped) or ASTM B695 (mechanically applied).
4. Fasteners, except for special bolt and coupling, are installed with lockwashers, and do not have specific torque requirements. Fasteners should be secured as tight as possible with conventional wrenches, unless noted otherwise.
5. Square-up and level individual components, particularly Anchors to minimize the need for shimming between the Couplings and Anchors.
6. No more than two shims shall be placed under any one coupling. No more than three shims underneath any pair of couplings.
7. Refer to other side of page for complete installation instructions.

*Break-Safe Model B525
Breakaway Support System for Sign Posts*

Scale: Not To Scale

Date: July 2000

Drawing No. BS-B525-1, -2, -3

Sheet: 1 of 2

Patent Nos. 4,528,786 and 5,596,845

INSTALLATION INSTRUCTIONS

ANCHOR ASSEMBLY:

Note: Precise positioning of the anchors is critical to proper assembly of the system. It is recommended that actual posts be used to locate the correct position of the anchors.

1. Determine proper Break-Safe Bracket Number from the Bracket Selection Table. All posts within a sign structure shall use the same Bracket Number, determined by the length of the longest post.
2. Fabricate a flat, rigid template with four (4) 25mm (1") diameter holes located to match the specified anchor pattern of the Break-Safe Brackets attached to the signpost. See diagram below.
3. Attach four (4) Type B Female Anchors to the template using four (4) 25mm (1") diameter bolts. Ensure that each Anchor Washer is snug against the bottom of the template.
4. Lower Anchor Assembly into fresh concrete foundation, and vibrate into position such that the tops of the Anchor Washers are flush with the finished top surface of the foundation. Support the template such that all Anchors are level and in their proper locations.
5. Allow concrete to cure, and then remove the bolts and template from the top of the foundation.

HINGE ASSEMBLY:

1. Butt upper and lower post sections together on a flat surface.
2. Drill eight (8) 20.6mm (13/16") holes in the flanges of the post sections as shown.
3. Place Hinge Plates on outer surface of the post flanges and secure with bolts, lock washers, and nuts. Ensure that upper and lower post sections are in alignment, and then tighten all nuts 1/2 turn beyond snug.

BRACKET ASSEMBLY:

1. Drill sixteen (16) 14.3mm (9/16") diameter holes in the flanges of the lower post section as shown.
2. Place Brackets squarely on outer surface of the post flanges, and secure with bolts, lock washers, nuts, and cap screws. Then, tighten all 1/2 turn beyond snug.

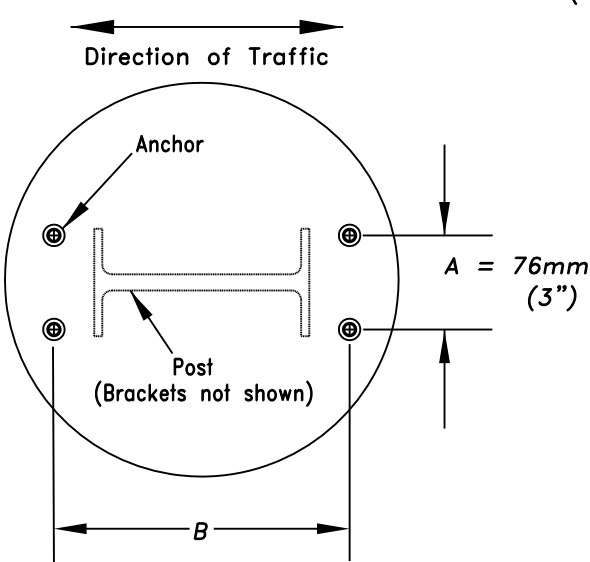
COUPLING ASSEMBLY:

1. Thread four (4) Break-Safe Couplings into Anchors. Do not tighten.
2. Suspend post assembly over foundation, insert Special Bolts through holes in the Brackets, and thread them snug into the Couplings.
3. If post is not plumb, insert Shims (14g and/or 18g) between the Couplings and Anchors, where needed.
4. Use lower wrench flats to tighten Couplings into Anchors as tight as possible using a conventional wrench. Do not use a pipe wrench. Couplings must be seated squarely.
5. Tighten Special Bolts while holding Couplings by the upper wrench flats with an additional wrench to prevent an induced torque stress across the necked portion of the Coupling. All Special Bolts shall also be tightened as tight as possible using conventional wrenches.

SIGN PANEL ASSEMBLY:

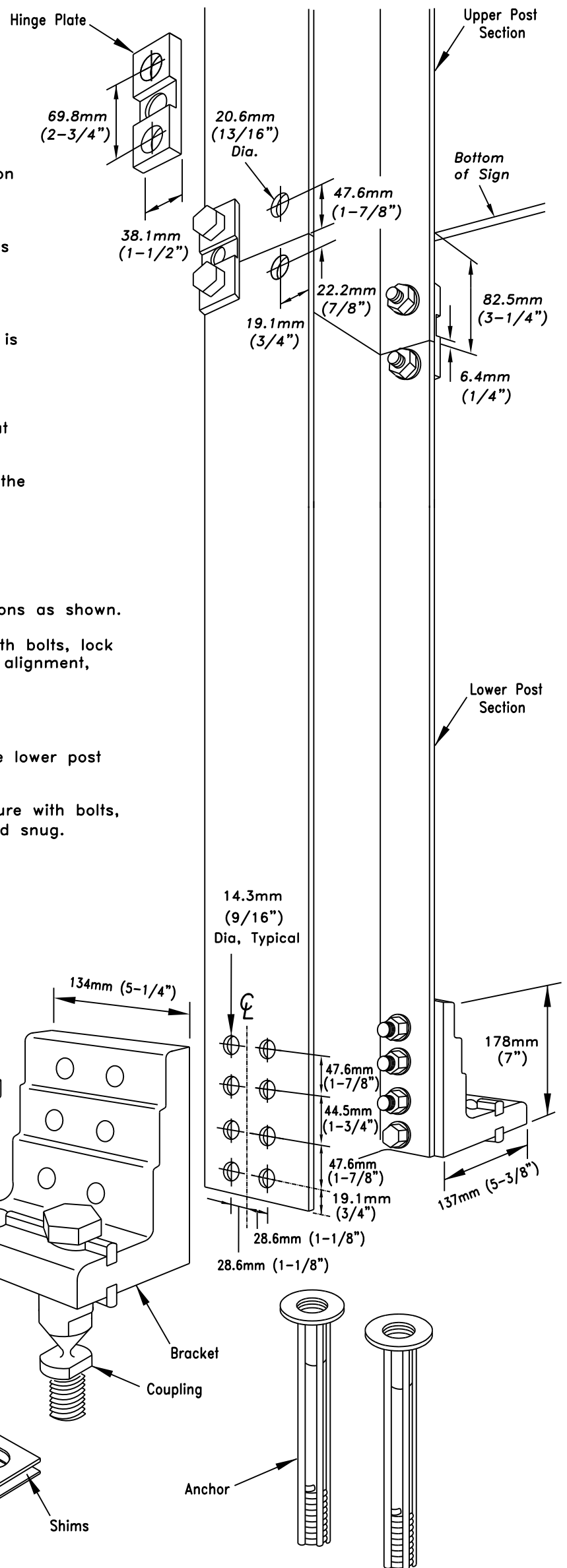
1. After all signposts are secured in place, attach sign panel assembly to posts in accordance with the sign manufacturer's recommendations.

PLAN VIEW OF TYPICAL FOUNDATION



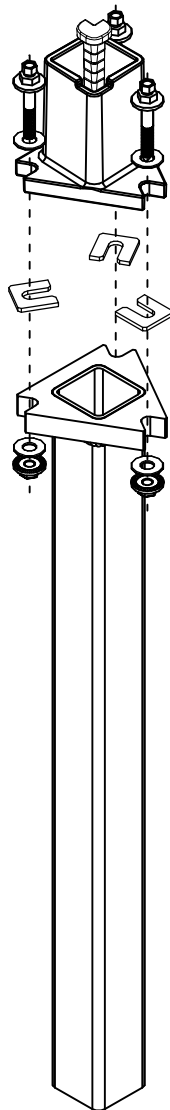
- B (Bracket No. 1) = Depth of Post + 202mm (7-15/16")
- B (Bracket No. 2) = Depth of Post + 205mm (8-1/16")
- B (Bracket No. 3) = Depth of Post + 207mm (8-1/8")

Patent Nos. 4,528,786 and 5,596,845

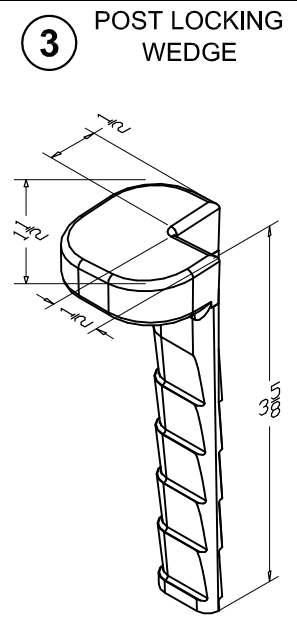
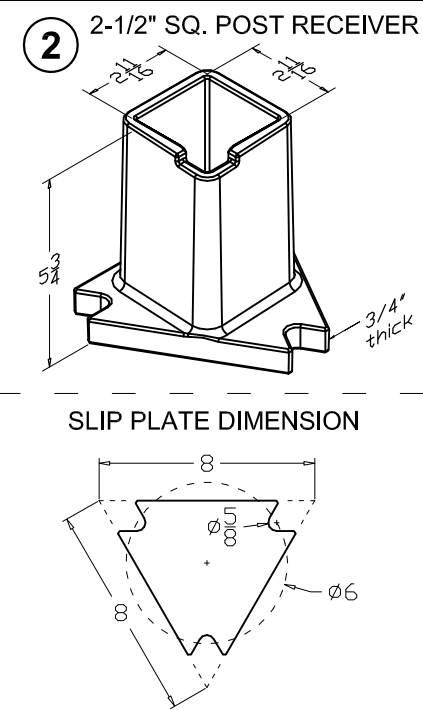
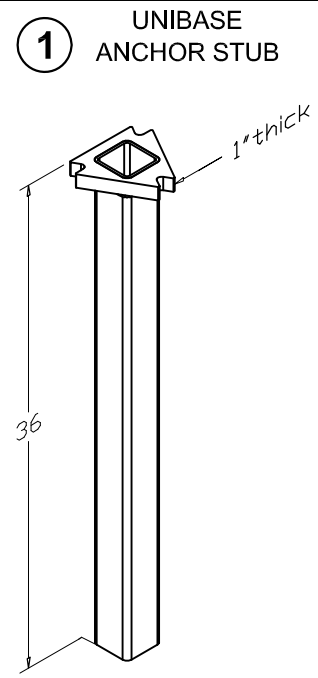


| | |
|---|-----------------|
| Break-Safe Model B525 Breakaway Support System for Sign Posts | |
| Scale: Not To Scale | Date: July 2000 |
| Drawing No. BS-B525-1, -2, -3 | Sheet: 2 of 2 |

| | | | | | | | | | | | | | |
|---------------|---------------------------------|-----------------------|---|-----------------|--|---------------|---------|-----------------|----------|-------------|---------|--------------------------------|--------------------------------|
| FINISH | Hot Dip Galvanize per ASTM A153 | DESCR. IPTION | Redi-Torque Model 280 slip base for 2-1/2" sq. post; concrete installations | DRAWN BY | | WEIGHT | 42 lbs. | Revision | Original | Date | 5-29-08 | Description of Revision | (Supersedes Previous Drawings) |
| DWG# | | RT8UX-25C36C-G | | | | | | | | | | | |

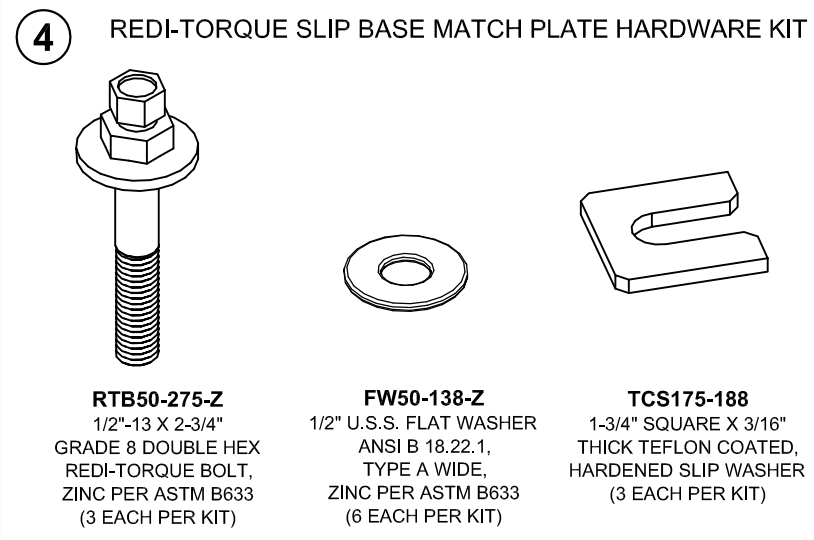


complete assembly
P/N: RT8UX-25C36C-G



*Do not scale drawing- work to dimensions
*All tolerances +/- 1/64" unless otherwise noted
*Unit of Measure - Inches

**PREPARED FOR:
AL DOT**



BILL OF MATERIALS

| | | | |
|----------|-------------|--------|---|
| 1 | SB8-CTA36-G | 1 each | A500 GR. B TUBE; A572 PLATE ZINC A153 |
| 2 | SB8C-250A-G | 1 each | Duct. Iron Class 65-45-12, gal. ASTM A153 |
| 3 | LWX35-G | 1 each | Duct. Iron Class 65-45-12, gal. ASTM A153 |
| 4 | RTSB-MPHDW | 1 kit | 1/2"-13 GRADE 8 HARDWARE ZINC B633 |

- A. MINIMUM OF 12" DIAMETER X 30" CONCRETE FOOTING.
- B. SECURE SIGN SUPPORT TO POST RECEIVER WITH USE OF DRIVEABLE LOCKING WEDGE, WHICH SHALL ELIMINATE ALL TOLERANCE BETWEEN POST AND COUPLER WITHOUT THE NEED FOR THREADED FASTENERS.
- C. ALL COMPONENTS OF ORIGINAL INSTALLATION SHALL BE REUSABLE WITH THE EXCEPTION OF THE REDI-TORQUE BOLT.
- D. BRASS SHIMS MAY BE USED BETWEEN SLIP PLATES TO LEVEL THE UPPER SLIP PLANE.
- E. MUST BE FHWA ACCEPTED, MEETING CURRENT AASHTO & NCHRP 350 REQUIREMENTS.