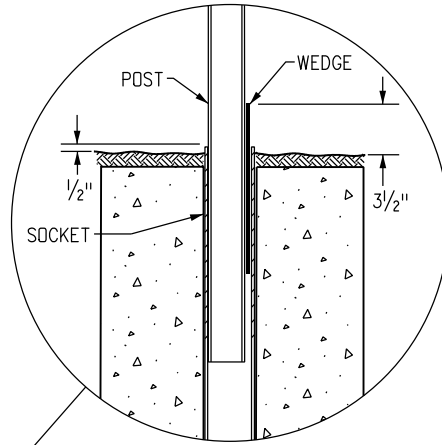
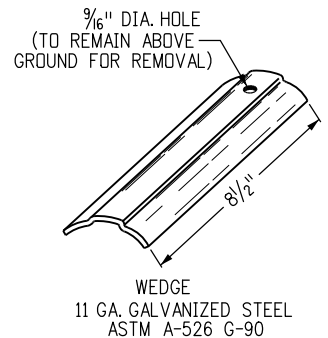
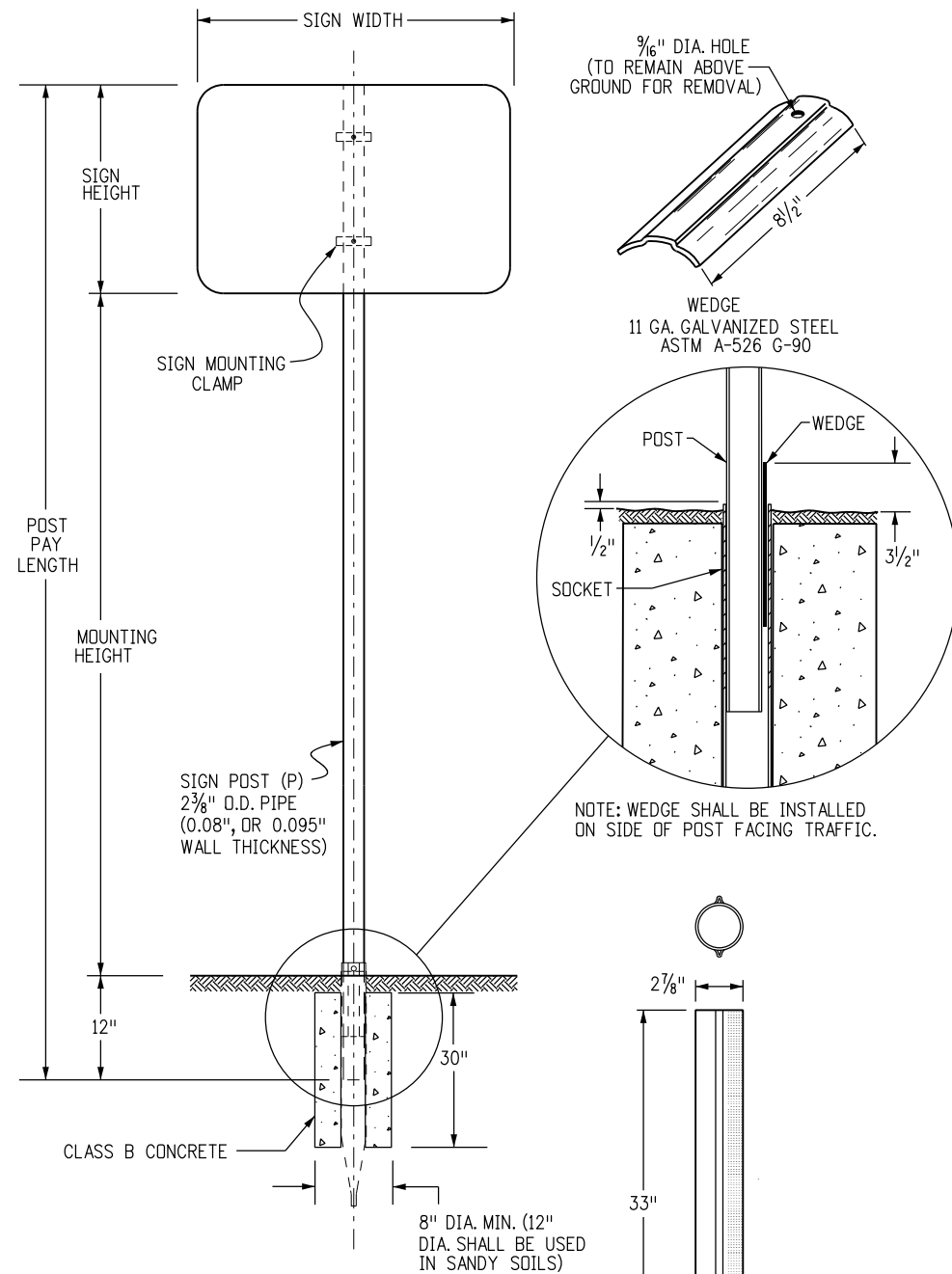


**TUBULAR STEEL POSTS
(SOCKET SYSTEM) (FOR USE WITH ALL P-POST INSTALLATIONS)
(SEE SHEET 2 FOR P1 AND P2 POST INSTALLATIONS)**

**SIGNPOST SELECTION GUIDE (90 MPH WIND LOAD DESIGN)
(FOR SOCKET SYSTEM AND SLIPBASE INSTALLATIONS USING P, P1 OR P2 POSTS)**



		7' MOUNTING HEIGHT										
		SIGN WIDTH (FT)										
		1	2	2.5	3	4	5	6	7	8	9	
SIGN HEIGHT (FT)	1	P	P	P	P	P	P1	SIZES NOT USED				
	2	P	P	P	P	P	P1	TWO P1'S				
	2.5	P	P	P	P	P1	P1					
	3	P	P	P	P1	P1	P1					
	4	P	P1	P1	P1	P1	P1					
	5	SIZES NOT USED		P1	P1	P1	P1					
	6	SIZES NOT USED		P1	P1	P1	P2	TWO P2'S				
7	SIZES NOT USED		P1	P1	P2	TWO P1'S	TWO P2'S	SIZES NOT USED				

		8' MOUNTING HEIGHT										
		SIGN WIDTH (FT)										
		1	2	2.5	3	4	5	6	7	8	9	
SIGN HEIGHT (FT)	1	P	P	P	P	P	P1	SIZES NOT USED				
	2	P	P	P	P	P1	P1	TWO P1'S				
	2.5	P	P	P	P1	P1	P1					
	3	P	P	P1	P1	P1	P1					
	4	P	P1	P1	P1	P1	P1					
	5	SIZES NOT USED		P1	P1	P1	P2	TWO P2'S				
	6	SIZES NOT USED		P1	P1	P1	P2	TWO P2'S				
7	SIZES NOT USED		P1	P1	TWO P1'S	TWO P1'S	TWO P2'S	SIZES NOT USED				

		9' MOUNTING HEIGHT										
		SIGN WIDTH (FT)										
		1	2	2.5	3	4	5	6	7	8	9	
SIGN HEIGHT (FT)	1	P	P	P	P	P	P1	SIZES NOT USED				
	2	P	P	P	P	P1	P1	TWO P1'S				
	2.5	P	P	P	P1	P1	P1					
	3	P	P	P1	P1	P1	P1					
	4	P	P1	P1	P1	P1	P1					
	5	SIZES NOT USED		P1	P1	P1	P2	TWO P2'S				
	6	SIZES NOT USED		P1	P1	P2	TWO P1'S	TWO P2'S				
7	SIZES NOT USED		P1	P2	TWO P1'S	TWO P1'S	TWO P2'S	SIZES NOT USED				

SEE CHART NOTE 4.

CHART NOTES

- TYPICAL POST MOUNTING HEIGHTS FROM GROUND TO BOTTOM OF SIGN PANEL ARE 7, 8 OR 9 FEET. OTHER HEIGHTS MAY BE REQUIRED WHEN SIGNS ARE MOUNTED ON STEEPER FILL OR CUT SLOPES.
- FOR SIGNS MOUNTED ON TWO POSTS, THE MINIMUM DISTANCE BETWEEN POSTS SHALL BE 2 FEET AND THE MAXIMUM DISTANCE SHALL BE 8 FEET. DISTANCE FROM POST TO EDGE OF SIGN PANEL(S) SHALL BE 0 TO 4 INCHES. WHEN BACKING ZEES ARE USED, POSTS SHALL BE INSTALLED WITH A MINIMUM OF 2 INCHES TO THE EDGE OF THE BACKING ZEE.
- ALL SIGN PANELS GREATER THAN 60 INCHES IN WIDTH MUST BE MOUNTED ON TWO POSTS TO PREVENT TURNING.
- THE POST SIZES SHOWN ARE THE MINIMUM SIZES REQUIRED. TWO P1 POSTS MAY BE SUBSTITUTED WHERE ONE P2 POST IS INDICATED. P2 POSTS MAY BE SUBSTITUTED FOR P1 POSTS WHEN DIRECTED BY THE ENGINEER.

GENERAL NOTES

- SIGNS BETWEEN 37 IN. AND 60 IN. WIDTH WITH ONE POST INSTALLATION REQUIRE A T OR U SIGN SUPPORT BRACKET IN ADDITION TO THE BACKING ZEE REQUIREMENTS. WHEN DIRECTED BY THE ENGINEER, SIGN PANELS LESS THAN 48 IN. IN WIDTH MAY ATTACHED DIRECTLY TO T OR U BRACKETS WITHOUT ZEES.
- U-BRACKETS MAY BE USED FOR MULTIPLE SIGN INSTALLATIONS.
- FOR BACKING ZEE REQUIREMENTS AND DETAILS, SEE STANDARD PLANS S-614-3 AND S-614-4.

POST NOTES

THE POST MAY BE PRE-PUNCHED WITH 3/8" DIA. HOLES AND THE SIGN MOUNTED DIRECTLY TO THE POST, OR AN APPROVED MOUNTING CLAMP MAY BE USED TO MOUNT THE SIGN TO THE POST. IF THE POST IS PRE-PUNCHED, THE HOLES SHALL BE SPACED THE FOLLOWING DISTANCES FROM THE TOP:

- 1", 3", 10", 16", 21", 23", 24", 27", 33", 37", 39", AND 45"

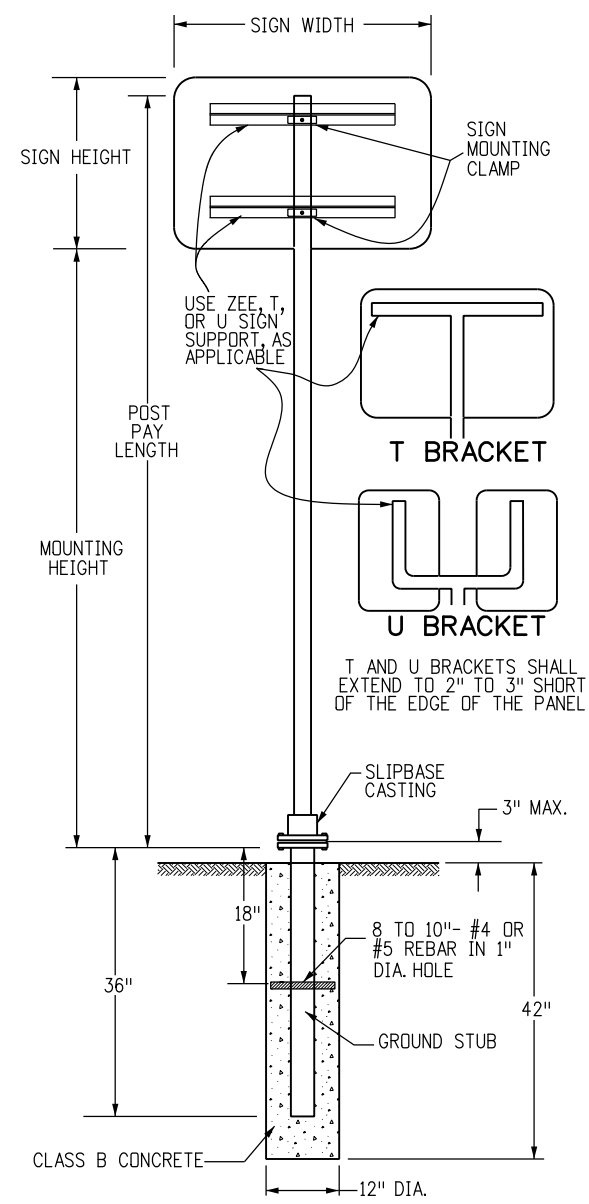
TUBULAR CONCRETE FOOTING
12 GA. GALVANIZED STEEL ASTM - 787

POST SPECIFICATIONS

POST SIZE	OUTSIDE DIAMETER	WALL THICKNESS	MATERIAL	** COATING	MAX ALLOW MOMENT	PAID FOR AS:
P	2.375"	.080"	ASTM-513	ASTM A-653 G-210 WITH 3.0 MIL	1.47 KIP FT	STEEL SIGN SUPPORT (2 INCH ROUND)
P1	2.875"	.160"	ASTM-513	POLYMER COATING PER ASTM A123 CLEAR COATING	4.02 KIP FT	STEEL SIGN SUPPORT (2 1/2 INCH ROUND NP-40)
P2	2.875"	.276"	ASTM-500	GC HOT DIPPED PER ASTM-123	5.13 KIP FT	STEEL SIGN SUPPORT (2 1/2 INCH ROUND SCH 80)

** COLOR POWDER COATING MAY BE ADDED ACCORDING TO MANUFACTURER SPECIFICATIONS FOR SPECIAL LOCATIONS WHEN SHOWN ON THE PLANS.

Computer File Information		Sheet Revisions		<p>4201 East Arkansas Avenue Denver, Colorado 80222 Phone: 303-757-9543 FAX: 303-757-9219</p>	<p>TUBULAR STEEL SIGN SUPPORT DETAILS</p> <p>Issued By: Safety & Traffic Engineering Branch July 4, 2012</p>	<p>STANDARD PLAN NO.</p> <p>S-614-8</p> <p>Sheet No. 1 of 6</p>
Creation Date: 07/04/12	Initials: KEN	Date:	Comments:			
Last Modification Date: 08/05/16	Initials: NNC	03/05/13	SHTS 1 & 2 - UPDATED DETAIL TITLES			
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans		10/23/14	SHT 2 - MOVED SLIPBASE DETAILS TO SHEET 3, AND ADDED 4" BASE PLATE DETAIL TO NEW SHEET 3	Safety & Traffic Engineering		KCM
Drawing File Name: S-614-08.dgn						
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English						



**TUBULAR STEEL POST
(WITH SLIPBASE)
(FOR USE WITH ALL P1 AND
P2 POST INSTALLATIONS)
(SEE SHEET 1 FOR P-POST INSTALLATIONS)**

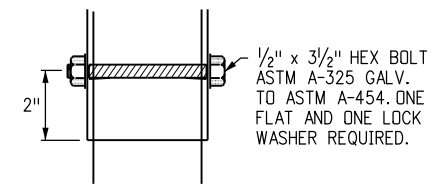
GENERAL NOTE

THE CONTRACTOR SHALL INSTALL THE POSTS PER THE MANUFACTURER'S RECOMMENDATIONS WITHOUT ADDITIONAL COMPENSATION.

DIMENSIONS FOR MOUNTING CLAMP (ALL DIMENSION ARE IN INCHES)

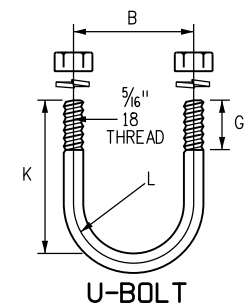
STANDARD PIPE SIZE	A	B	C	D	E	F	G	K	L	R ₁	R ₂
2	3 3/4	2 3/4	1 1/2	1 1/8	1/2	3/16	1	2 1/16	1 1/32	1/4	1 3/16
2 1/2	4 1/4	3 1/4	2	1 1/4	1/2	1/4	1	3 3/16	1 5/32	1/2	1 7/16

T AND U BRACKET ATTACHMENT



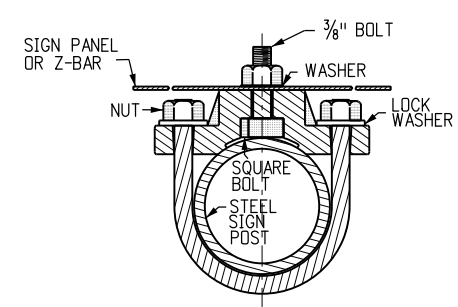
PIPE CLAMP CASTING

PIPE CLAMP CASTING SHALL BE ASTM B26 OR B108 ALUMINUM ALLOY A444.0-T4 OR 356.0-F. ALL SIGN MOUNTING CLAMP PARTS NOT MADE FROM ALUMINUM SHALL BE GALVANIZED STEEL IN CONFORMANCE WITH ASTM A153 OR STAINLESS STEEL.

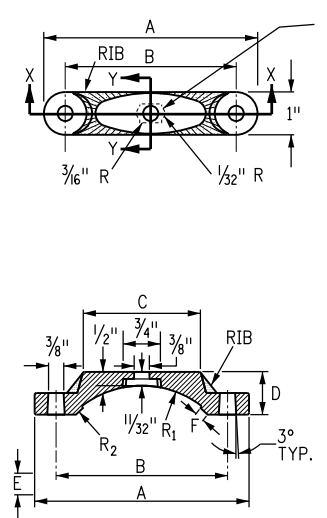
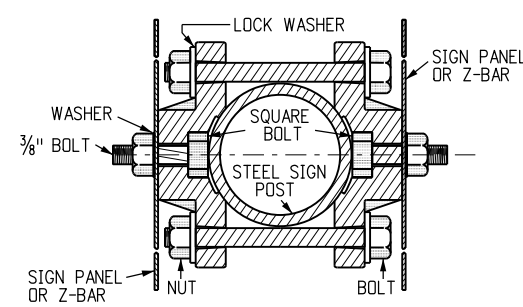


U-BOLT TO BE MADE IN ACCORDANCE WITH STANDARD MANUFACTURING PROCEDURE. 1/4" OR 5/18" DIAMETER STOCK IS PERMISSIBLE. AMERICAN STANDARD REGULAR SEMI-FINISHED HEX NUTS AND SPRING LOCKWASHERS.

TYPICAL SINGLE BRACKET



TYPICAL BACK TO BACK



SLOT TO HOLD HEAD OF 3/8" HEX HEAD BOLT. THE BOLT SHALL BE 1/4" LONG, WITH FULL THREADS, A MEDIUM WASHER, AND GALVANIZED STEEL OR ALUMINUM SELF-LOCKING HEX HEAD NUT. THE BOLT HEAD MUST NOT TURN IN THE SLOT.


DETAILS FOR SIGN PANEL ATTACHMENT

MOUNTING CLAMP FOR SOCKET OR SLIPBASE

Computer File Information	
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Last Modification Date: 10/23/14	Initials: KEN
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CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English	

Sheet Revisions	
Date:	Comments
03/05/13	UPDATED DETAIL TITLES
10/23/14	MOVED SLIPBASE DETAILS TO SHEET 3

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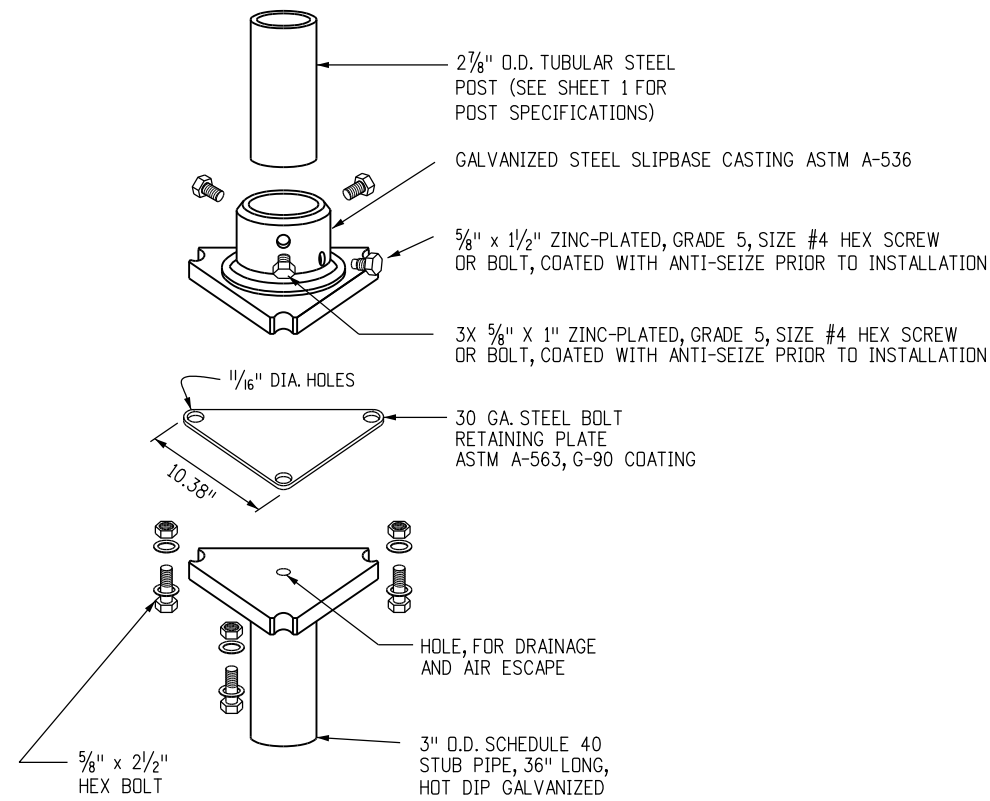
**TUBULAR STEEL SIGN
SUPPORT DETAILS**

Issued By: Safety & Traffic Engineering Branch July 4, 2012

STANDARD PLAN NO.

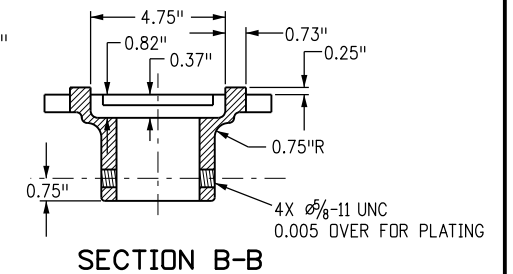
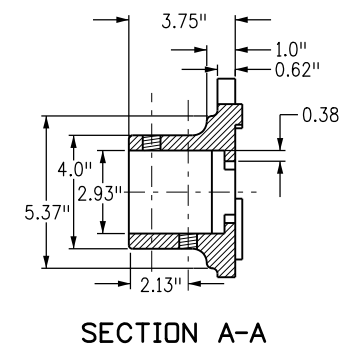
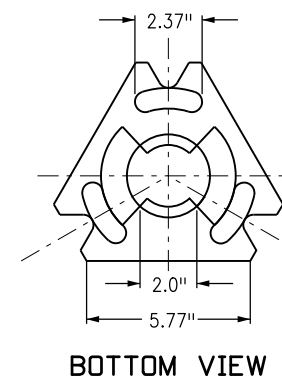
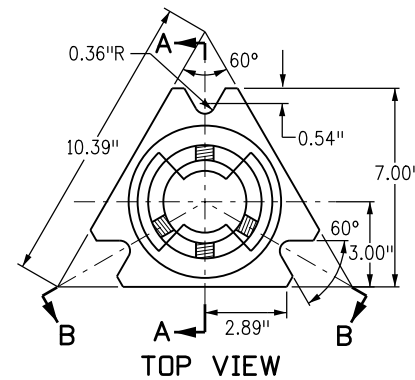
S-614-8

Sheet No. 2 of 6



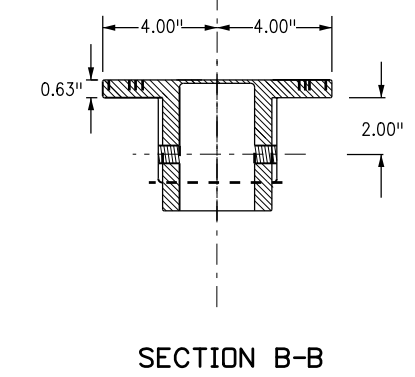
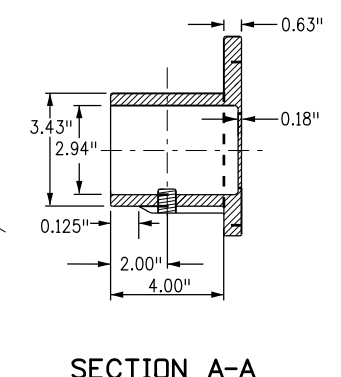
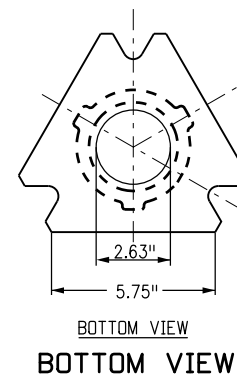
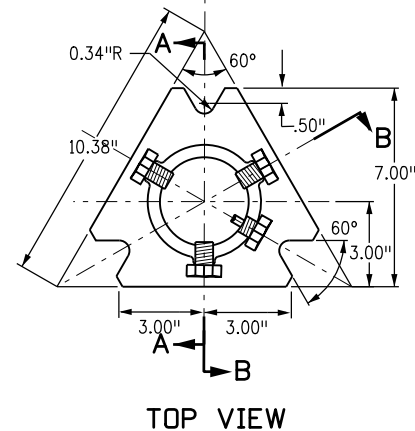
TYPICAL ASSEMBLY

CAST-IN-PLACE SLIPBASE INSTALLATION



SLIPBASE CASTING 1

DIRECTION OF TRAVEL



SLIPBASE CASTING 2

SURFACE MOUNT SLIPBASE TUBULAR STEEL SIGN BASE REQUIREMENTS

FOR 2-7/8 INCH POSTS (P1 OR P2 POSTS)
FOR CONCRETE SURFACES GREATER THAN 7 INCHES THICK
FOR CONCRETE SURFACES GREATER THAN 12 INCHES IN WIDTH

MOUNTING HARDWARE

- 8 - EACH 5/8" x 5/2" INCH LONG "HILTI KWIK HUS-EZ" SCREW ANCHORS
- 16 - EACH 5/8" INCH FLAT WASHERS
- 8 - EACH 5/8" INCH LOCK WASHERS
- 8 - EACH 5/8" INCH NUTS

INSTALLATION REQUIREMENTS:

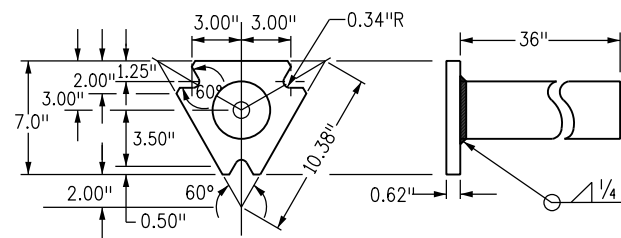
DRILL: (8) - 5/8" INCH HOLES 6 INCH DEEP, CLEAN HOLE PRIOR TO INSTALLING ANCHORS
USE ADDITIONAL WASHERS FOR SHIMMING TO LEVEL BASE PLATE.

ALL HARDWARE WILL BE GALVANIZED OR ZINC PLATED.

SURFACE MOUNT SLIPBASE TUBULAR STEEL SIGN BASE NOTES

1. REFER TO SIGNING PLANS FOR SIGN LOCATIONS AND HEIGHT
2. MINIMUM ALLOWABLE TENSION CAPACITY FOR WEDGE ANCHORS = 3000 LBS.
3. MAXIMUM ALLOWABLE MOMENT FOR SIGN BASE = 5.13 kip-ft.

RETRO-FIT SLIPBASE INSTALLATION



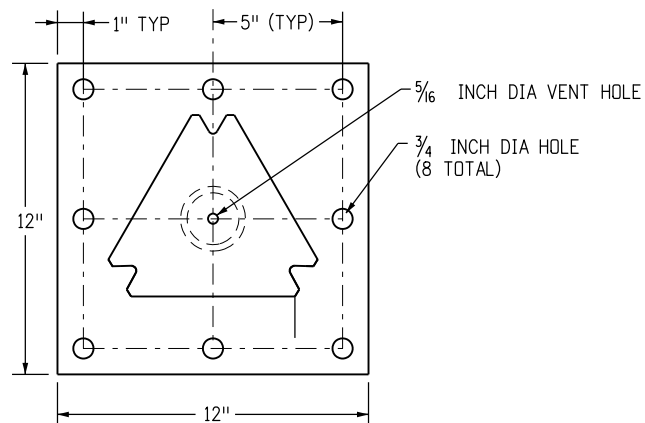
SLIPBASE STUB POST

BASE PLATE FABRICATION REQUIREMENTS:
BASE PLATE: 3/4 INCH ASTM A 36 PLATE STEEL

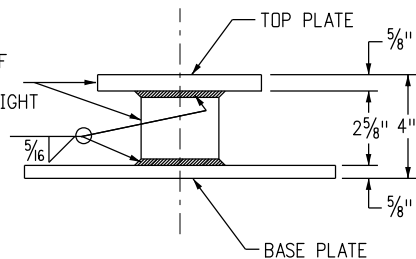
PIPE STUB: 3 INCH NOMINAL SCHEDULE 80, ASTM A 500 GR B

TOP PLATE: MEET REQUIREMENTS OF STD PLAN NO. S-614-8, SHT 2 OF 5

MEET ASTM A 123 GALVANIZING AFTER FABRICATION IS COMPLETED.



SLIPBASE WILL MEET REQUIREMENTS OF STD PLAN NO. S-614-8 SLIPBASE STUB POST DETAIL EXCEPT FOR OVERALL HEIGHT



BASE PLATE DETAIL

Computer File Information

Creation Date: 07/04/12	Initials: KEN
Last Modification Date: 12/01/16	Initials: RPR
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Drawing File Name: S-614-08.dgn	
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English	

Sheet Revisions

Date:	Comments
10/23/14	NEW SHEET. INCLUDES SLIP BASE DETAILS PLUS 4" BASE PLATE DETAIL
04/01/16	UPDATES TO RETRO-FIT HARDWARE
12/01/16	ADDED DETAILS FOR SLIPBASE 2

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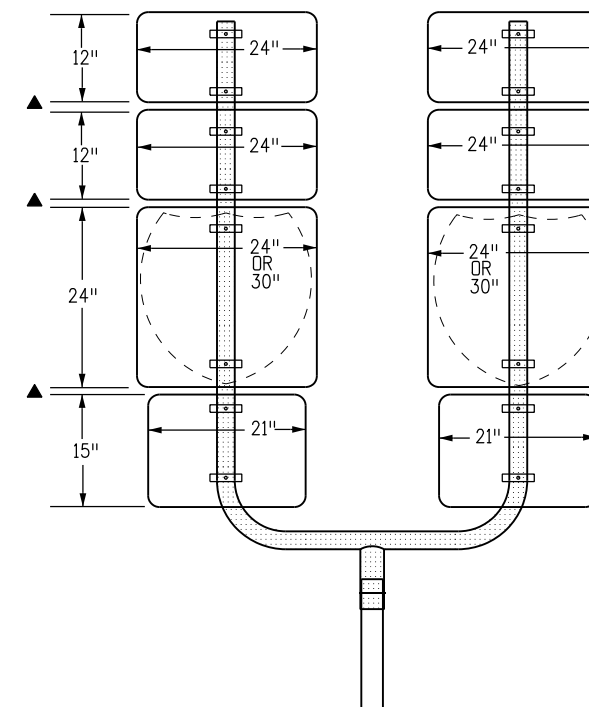
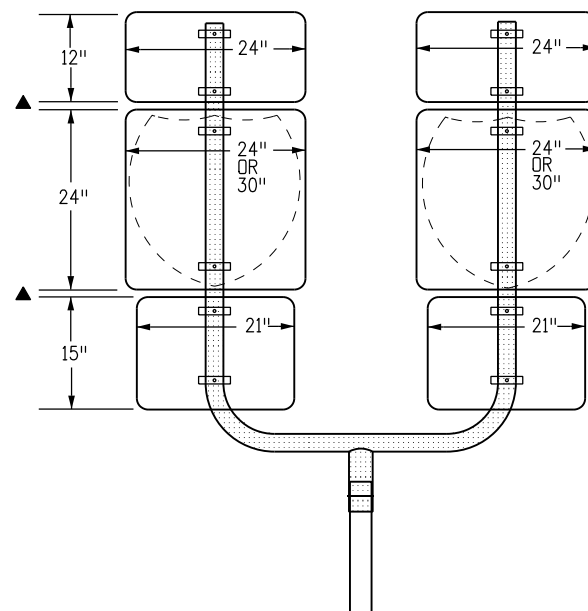
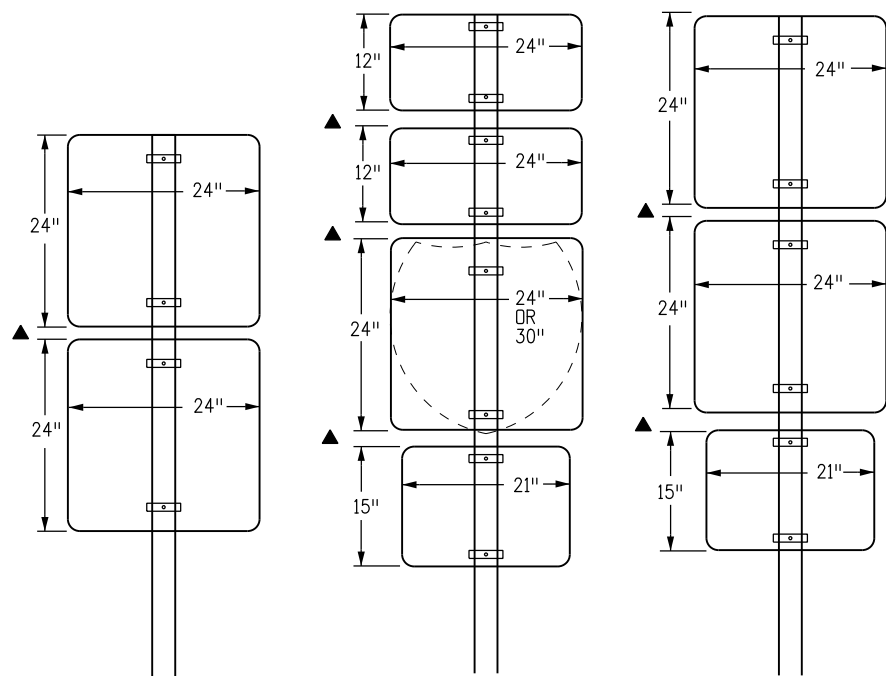
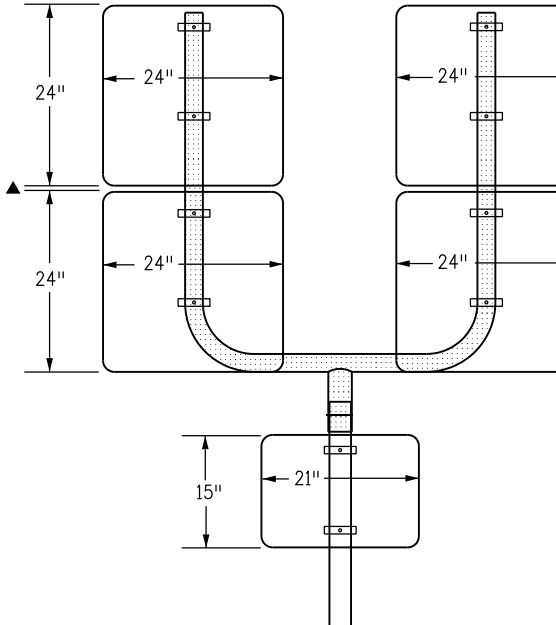
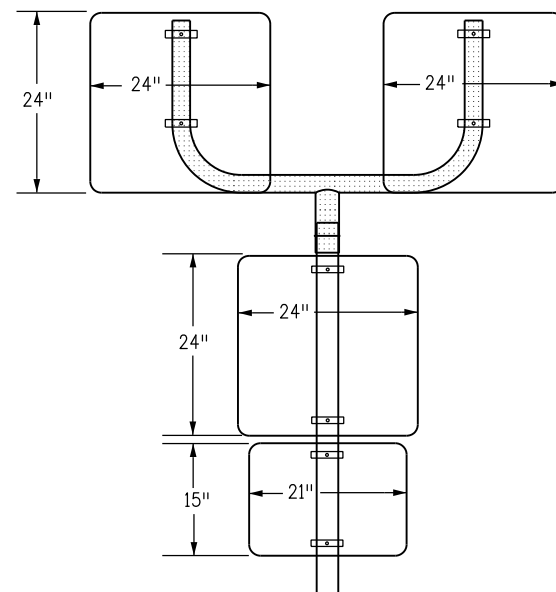
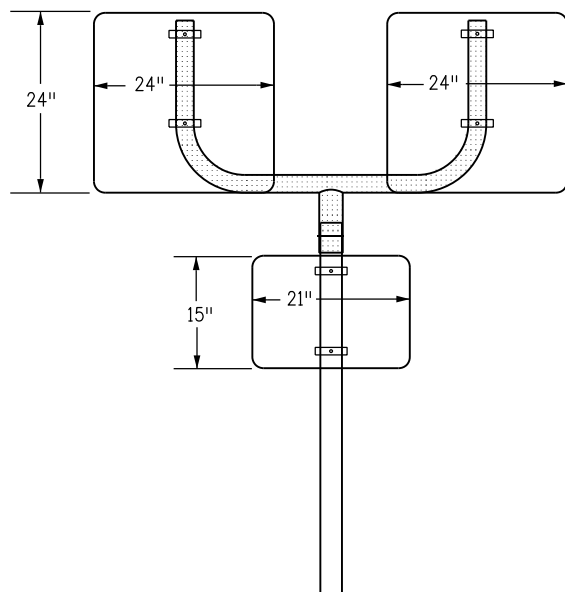
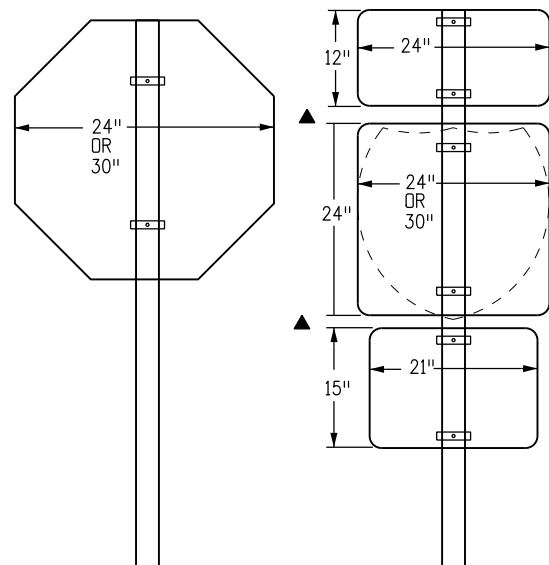
TUBULAR STEEL SIGN SUPPORT DETAILS

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STANDARD PLAN NO.

S-614-8

Sheet No. 3 of 6

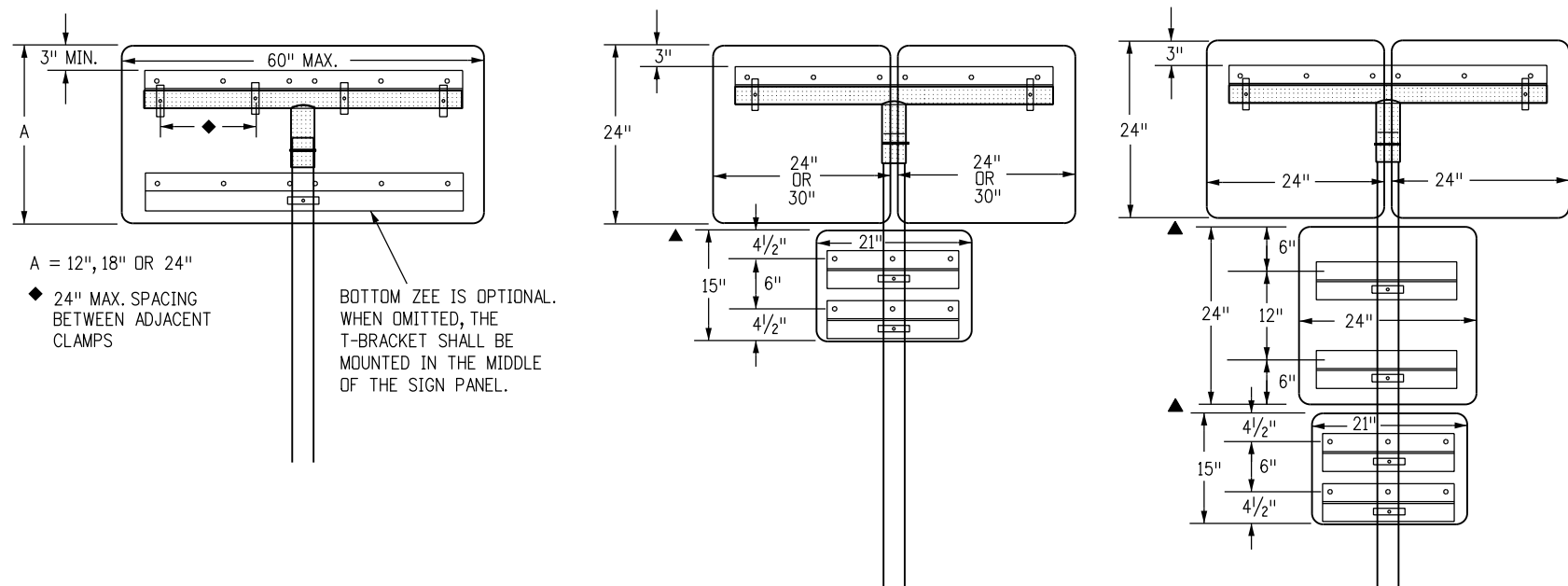


CLASS I SIGN COMBINATIONS (DIRECT ATTACHMENT)

CLASS I SIGN COMBINATIONS USING U-BRACKETS

▲ SEE NOTE 6 ON SHEET 5

Computer File Information		Sheet Revisions		 Colorado Department of Transportation 4201 East Arkansas Avenue Denver, Colorado 80222 Phone: 303-757-9543 FAX: 303-757-9219 Safety & Traffic Engineering KCM	TUBULAR STEEL SIGN SUPPORT DETAILS Issued By: Safety & Traffic Engineering Branch July 4, 2012	STANDARD PLAN NO.	
Creation Date: 07/04/12	Initials: KEN	Date:	Comments:			S-614-8	
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Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans							
Drawing File Name: S-614-08.dgn							
CAD Ver.: MicroStation V8i	Scale: Not to Scale	Units: English					



A = 12", 18" OR 24"

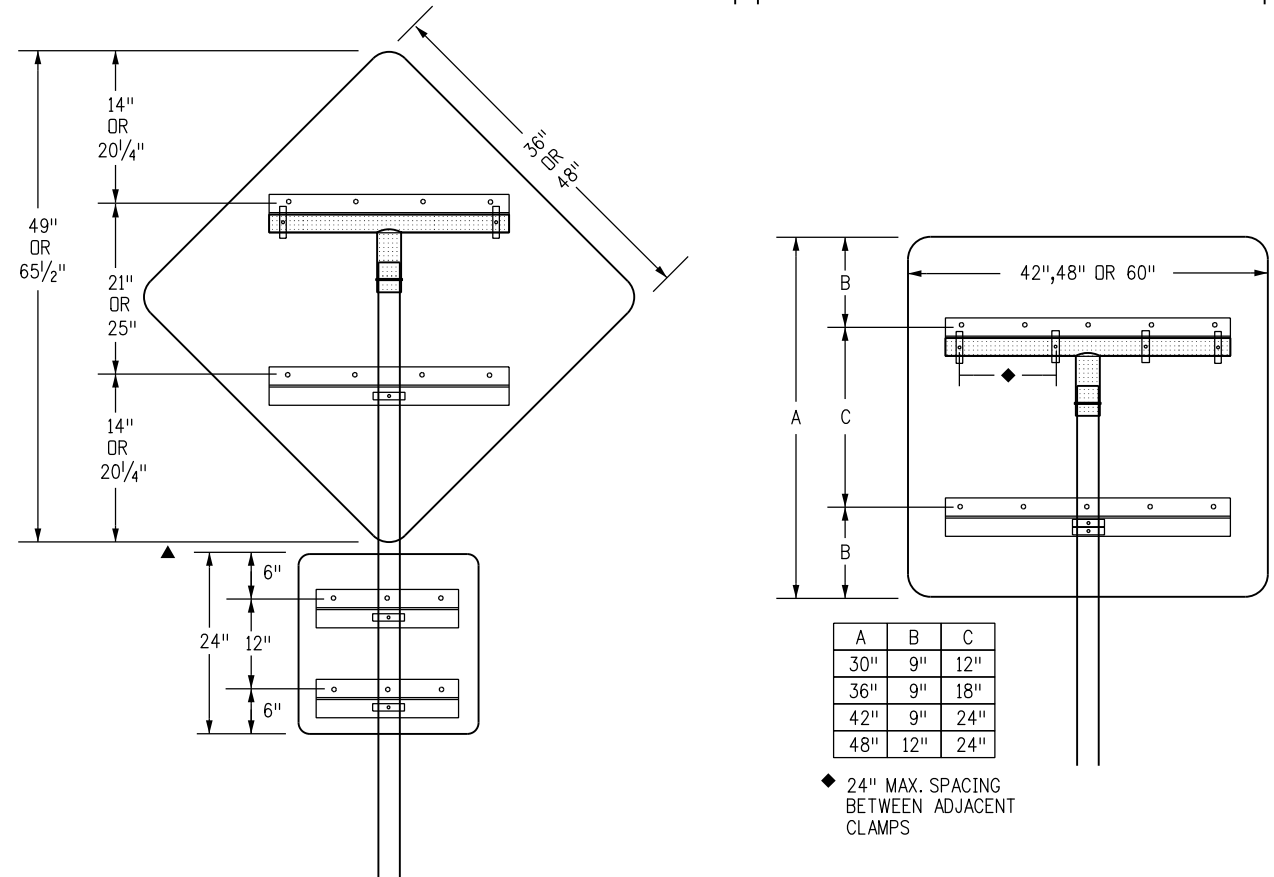
◆ 24" MAX. SPACING BETWEEN ADJACENT CLAMPS

▲ BOTTOM ZEE IS OPTIONAL. WHEN OMITTED, THE T-BRACKET SHALL BE MOUNTED IN THE MIDDLE OF THE SIGN PANEL.

PANEL WIDTHS	ZEE LENGTH
21"	15"
24"	18"
30"	24"
36"	30"
42"	36"
45"	39"
48"	42"
54"	48"
60"	54"
36" DIAMOND	22"
48" DIAMOND	36"
24" & 24"	43"
24" & 30"	49"
30" & 30"	55"
36" & 36"	67"
45" & 36"	76"
24" & 24" & 24"	68"
24" & 24" & 30"	74"
24" & 30" & 24"	74"
30" & 24" & 30"	80"
24" & 30" & 30"	80"
30" & 30" & 30"	86"

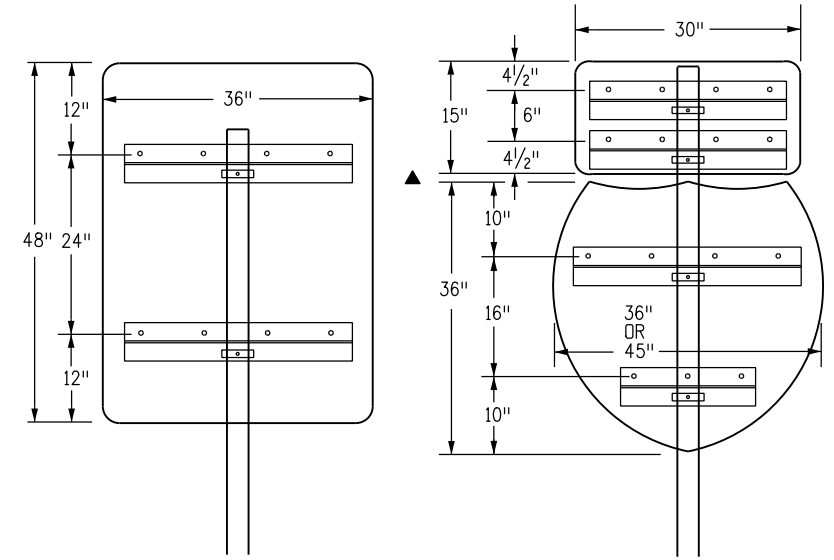
GENERAL NOTES

- Z-BAR LENGTH SHALL BE 3 IN. ($\pm 1/2$ IN.) SHORT OF THE EDGE OF THE SIGN OR ROW OF SIGNS ON BOTH SIDES. THE ACCOMPANYING TABLE GIVES THE Z-BAR LENGTH FOR MOST TYPICAL PANEL COMBINATIONS.
- FIRST AND LAST HOLES SHALL BE 2 IN. FROM EDGE OF Z-BAR. THE HOLES IN BETWEEN SHALL BE 6 IN. TO 8 IN. APART.
- T AND U BRACKETS SHALL TERMINATE 2 IN. TO 3 IN. FROM EDGE OF SIGN PANEL. WHEN A ZEE IS CONNECTED TO A T-BRACKET, THEY SHALL BE THE SAME LENGTH EXCEPT WHEN THE ZEE MUST EXTEND BEYOND THE MAXIMUM LENGTH OF A T-BRACKET.
- TWO MOUNTING CLAMPS ARE REQUIRED ON ZEES WHERE THERE IS ONLY ONE ZEE FOR THE PANEL AND THE ZEE IS ATTACHED TO ONLY ONE POST.
- ZEES SHALL BE ATTACHED TO T-BRACKETS AND U-BRACKETS WITH U-BOLTS OR MOUNTING CLAMPS.
- ▲ VERTICAL SPACING BETWEEN SIGN PANELS SHALL BE 1 IN. TO $1 1/2$ IN. TYPICAL.
- IN SPECIAL CASES U-BRACKETS MAY BE USED TO MOUNT SIGNS THAT FACE DIFFERENT DIRECTIONS. THE ENGINEER SHALL DETERMINE THE ORIENTATION OF THE SIGN PANELS AND VERIFY THAT THE MAXIMUM ALLOWABLE WIND LOADS FOR THE POST ARE NOT EXCEEDED.



A	B	C
30"	9"	12"
36"	9"	18"
42"	9"	24"
48"	12"	24"

◆ 24" MAX. SPACING BETWEEN ADJACENT CLAMPS



CLASS II SIGN COMBINATIONS USING T-BRACKETS WITH Z-BAR

SINGLE POST CLASS II SIGNS USING Z-BAR

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Creation Date: 07/04/12	Initials: KEN
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CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English	

Sheet Revisions	
Date:	Comments

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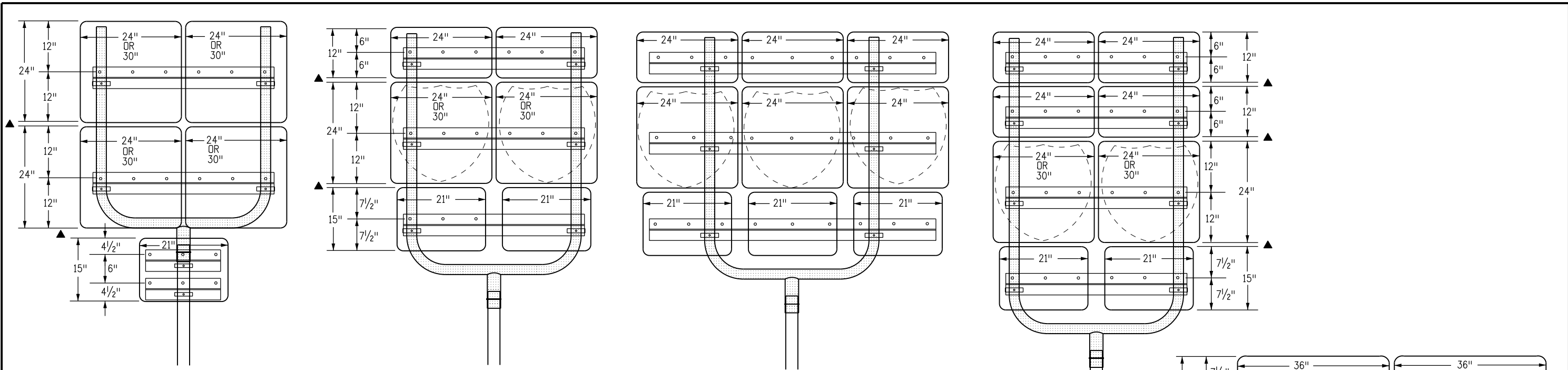
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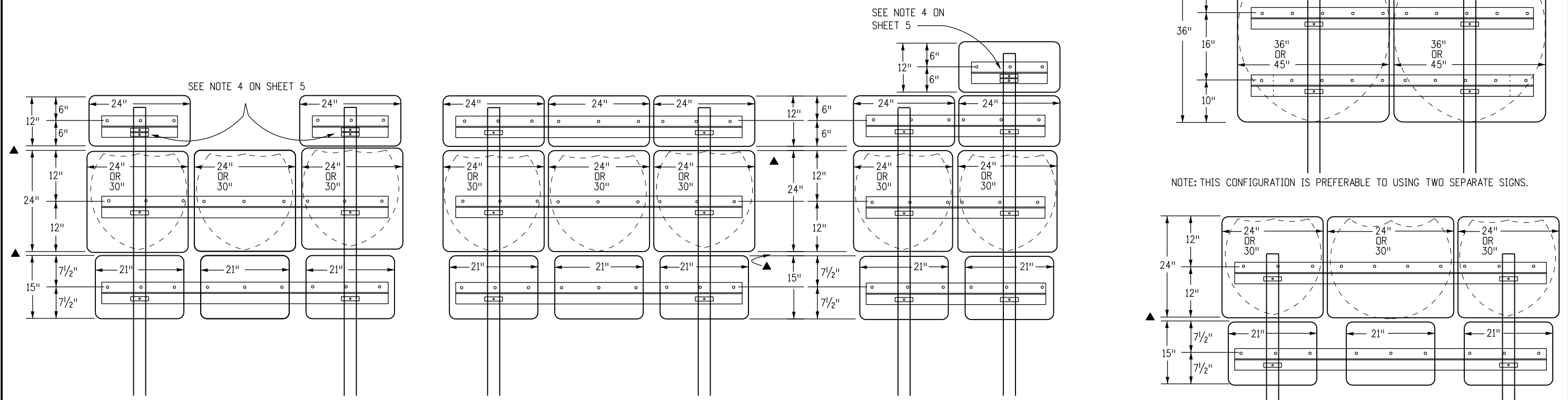
TUBULAR STEEL SIGN SUPPORT DETAILS

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STANDARD PLAN NO.
S-614-8
Sheet No. 5 of 6



CLASS II SIGN COMBINATIONS USING U-BRACKETS



CLASS II SIGN COMBINATIONS USING TWO POSTS

NOTE: THIS CONFIGURATION IS PREFERABLE TO USING TWO SEPARATE SIGNS.

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Drawing File Name: S-614-08.dgn	
CAD Ver.: MicroStation V8i Scale: Not to Scale Units: English	

Sheet Revisions

Date:	Comments:

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STANDARD PLAN NO.

S-614-8
Sheet No. 6 of 6