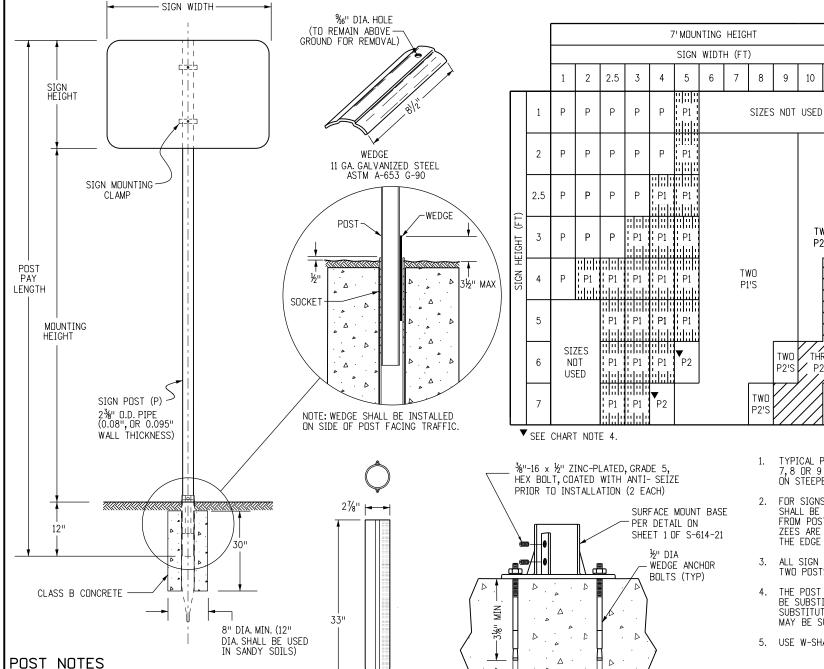
TUBULAR STEEL POSTS (SOCKET SYSTEM) (FOR USE WITH ALL P-POST INSTALLATIONS) (SEE SHEET 2 FOR P1 AND P2 POST INSTALLATIONS)

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



		8' MOUNTING HEIGHT											
			SIGN WIDTH (FT)										
		1	2	2.5	3	4	5	6	7	8	9		
	1	Р	Р	Р	Р	Р	P1	SIZES NOT USED					
	2	Р	Р	Р	Р	 P1	P1 ;	TWO P1'S					
	2.5	Р	Р	Р	: : : P1 :: :: :	P1 ;	P1						
SIGN HEIGHT (FT)	3	Р	Р	P1 :	P1 	: : P1	P1						
SIGN HE	4	Р	P1	P1 ;	P1	: : P1 : :	P1 ;						
	5			P1	 P1 	 P1 	▼ _{P2}						
	6	N	SIZES NOT USED		P1		▼ _{P2}	TWO P2'S			TWO P2'S		
	7			P1	 P1	TWO P1'S	TWO P1'S		TWO P2'S	SIZ NI US	ZES DT ED		

	SIGN WIDTH (FT)											
		1	2	2.5	3	4	5	6	7	8	9	
	1	Р	Р	Р	Р	Р	P1 ;	SIZES NOT USED				
	2	Р	Р	Р	Р	P1	: : P1					
	2.5	Р	Р	Р	: : P1 : :	 P1	: : P1 : :					
SIGN HEIGHT (FT)	3	Р	Р	P1	 P1 	P1	P1					
SIGN HE	4	Р	 P1	P1	P1	P1	P1					
	5			P1	P1	P1	▼ _{P2}				TWO P2'S	
	6	SIZES NOT USED		P1 ;	P1	▼ _{P2}	TWO P1'S	TWO P2'S				
	7			P1	P2	TWO P1'S	TWO P1'S	TWO SI P2'S US		SIZ NI US	ZES DT ED	
GENERAL NOTES												

9' MOUNTING HEIGHT

CHART NOTES

- TYPICAL POST MOUNTING HEIGHTS FROM GROUND TO BOTTOM OF SIGN PANEL ARE 1. 7,8 OR 9 FEET.OTHER HEIGHTS MAY BE REQUIRED WHEN SIGNS ARE MOUNTED ON STEEPER FILL OR CUT SLOPES.
- 2. 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.
- 3. ALL SIGN PANELS GREATER THAN 60 INCHES IN WIDTH MUST BE MOUNTED ON TWO POSTS TO PREVENT TURNING.
- 4. THE POST SIZES SHOWN ARE THE MINIMUM SIZES REQUIRED. TWO P1 POSTS MAY BE SUBSTITUTED WHERE ONE P2 POST IS INDICATED. P2 POSTS MAY SUBSTITUTED FOR P1 POSTS WHEN DIRECTED BY THE ENGINEER. W-SHAPE BEAM MAY BE SUBSTITUTED FOR P2 POSTS WHEN DIRECTED BY THE ENGINEER.
- 5. USE W-SHAPE BEAMS ONLY FOR SIGN POSTS.

EB

12+

P2'S

TĤRÉE

P2'S

- SIGN PANELS LESS THAN 60 INCHES IN WIDTH MAY BE ATTACHED DIRECTLY TO T BRACKETS WITHOUT ZEES AND SIGN PANELS LESS THAN 48 INCHES IN WIDTH MAY BE ATTACHED DIRECTLY TO U BRACKETS WITHOUT ZEES. WIDTH OF A DIAMOND CONFIGURED SIGN PANEL IS MEASURED ACROSS OPPOSITE CORNERS.
- 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.
- THE CONTRACTOR SHALL INSTALL THE POSTS PER THE MANUFACTURER'S RECOMMENDATIONS WITHOUT ADDITIONAL COMPENSATION.

POST SPECIFICATIONS

POST SIZE	OUTSIDE DIAMETER	WALL THICKNESS	MATERIAL	** COATING	MAX ALLOW MOMENT	PAID FOR AS:
Р	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 (2½ INCH ROUND NP-40)
P2	2.875"	.276"	ASTM-500	GC HOT DIPPED PER ASTM-123	5.13 KIP FT	STEEL SIGN SUPPORT (2½ 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	l
Creation Date: 07/04/12		Date:	Comments	l
Created By: KEN	Œ	03/01/24	Update general note 1, updated ASTM reference for galvanized steel, added surface mount detail and updated charts.	l
Last Modification Date: 03/01/24		03/01/24	mount detail and updated charts.	l
Last Modified By: YSaucedo				l
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English				١.

TUBULAR CONCRETE FOOTING 12 GA. GALVANIZED

STEEL ASTM - 787

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

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

DISTANCES FROM THE TOP:

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SIDE VIEW

SURFACE MOUNT DETAIL

(P POST ONLY)

APPROVED BY THE ENGINEER

THE POST MAY BE SURFACE MOUNTED WHEN

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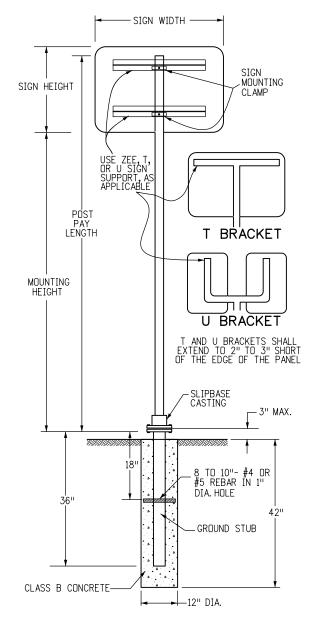
TUBULAR STEEL SIGN SUPPORT DETAILS

STANDARD PLAN NO. S-614-8

Standard Sheet No. 1 of 7

Issued By: Traffic & Safety Engineering Branch July 31, 2019

Project Sheet Number:

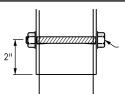


TUBULAR STEEL POST (WITH SLIPBASE) (FOR USE WITH ALL P1 AND P2 POST INSTALLATIONS) (SEE SHEET 1 FOR P-POST INSTALLATIONS)

DIMENSIONS FOR MOUNTING CLAMP (ALL DIMENSION ARE IN INCHES)

STANDARD PIPE SIZE	А	В	С	D	E	F	G	К	L	R ₁	R ₂
2	3¾	23/4	1½	1%	1/2	3/16	1	211/16	13/32	11/4	13/16
2½	41/4	31/4	2	11/4	1/2	1/4	1	33/16	1 ¹⁵ / ₃₂	1½	17/16

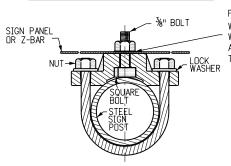
T AND U BRACKET ATTACHMENT



½" x 4½" INCH LONG ZINC-PLATED OR GALVANIZED, GRADE 5 HEX BOLT. 2 FLAT AND 1 LOCK WASHER REQUIRED.

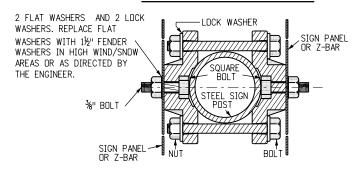
REPLACE FLAT WASHERS WITH 15" FENDER WASHER IN HIGH WIND/SNOW AREAS OR AS DIRECTED BY THE ENGINEER.

TYPICAL SINGLE BRACKET



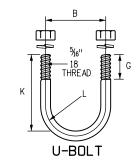
FLAT WASHER. REPLACE FLAT WASHER WITH 1½" FENDER WASHER IN HIGH WIND/SNOW AREAS OR AS DIRECTED BY THE ENGINEER.

TYPICAL BACK TO BACK

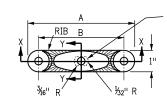


PIPE CLAMP CASTING

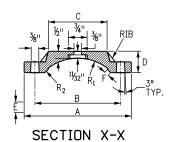
PIPE CLAMP CASTING SHALL BE ASTM B26 OR B108 ALUMINUM ALLOY A444.0-T4 OR 356.0-F. ALL SIGN MOUNTING CLAMP PARTS NOT MADE FROM ALUMINUM SHALL BE GALVANIZED STEEL IN CONFORMANCE WITH ASTM A153 OR STAINLESS STEEL.

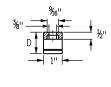


U-BOLT TO BE MADE IN ACCORDANCE WITH STANDARD MANUFACTURING PROCEDURE. 1/4" OR 5/18" DIAMETER STOCK IS PERMISSIBLE. AMERICAN STANDARD REGULAR SEMI-FINISHED HEX NUTS AND SPRING LOCKWASHERS.



SLOT TO HOLD HEAD OF %" HEX HEAD BOLT. THE BOLT SHALL BE 11/4" 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.





SECTION Y-Y

DETAILS FOR SIGN PANEL ATTACHMENT

MOUNTING CLAMP FOR SOCKET OR SLIPBASE

Computer File Information			Sheet Revisions	
Creation Date: 07/04/12		Date:	Comments	
Created By: SCL	Œ-D	12/29/20	BOLT LENGTH IN 'T AND U BRACKET ATTACHMENT' WASHER REQUIREMENTS IN SIGN PANEL ATTACHMENT	
Last Modification Date: 12/29/20	0			
Last Modified By:DiNardo				
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English				

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MKB

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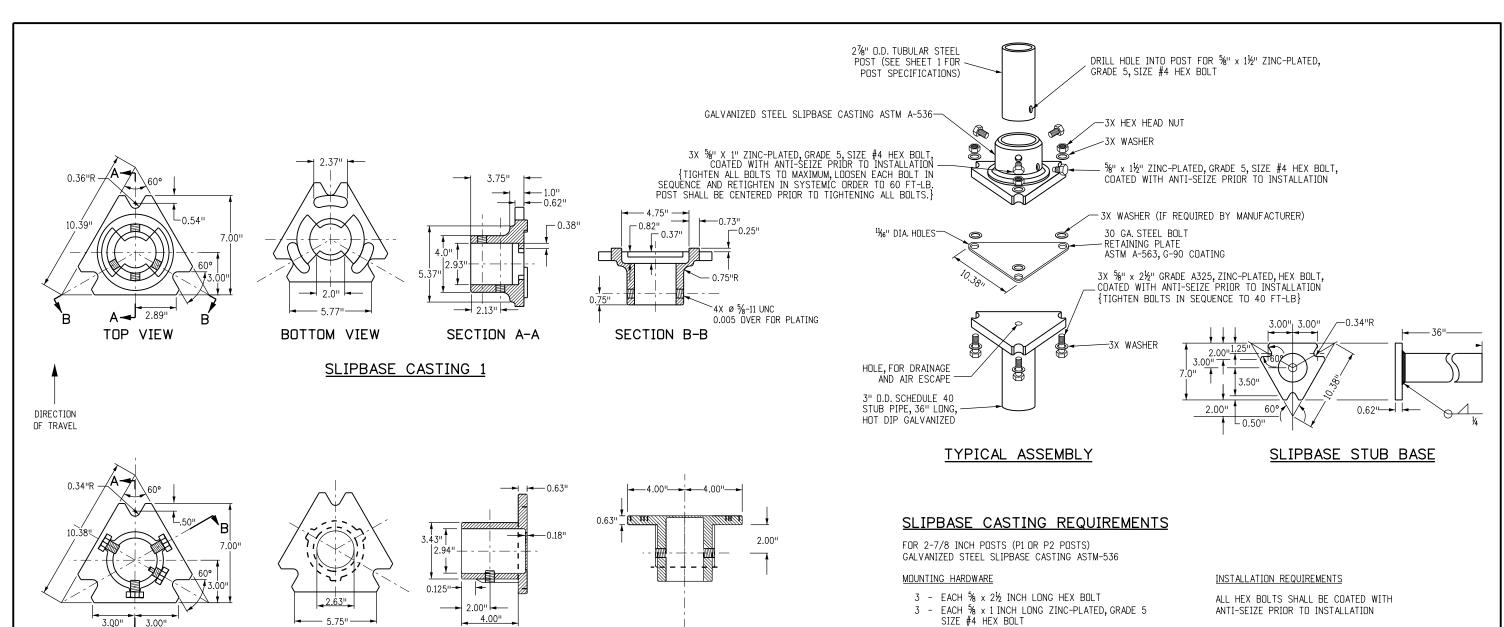
TUBULAR STEEL SIGN SUPPORT DETAILS

STANDARD PLAN NO. S-614-8

Standard Sheet No. 2 of 7

Issued By: Traffic & Safety Engineering Branch July 31, 2019

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- 1 EACH % x 1½ INCH LONG ZINC-PLATED, GRADE 5
- SIZE #4 HEX BOLT
- 1 EACH 30 GAUGE STEEL BOLT RETAINING PLATE ASTM A-563, G-90 COATING

ALL HARDWARE WILL BE GALVANIZED OR ZINC PLATED.

TUBULAR STEEL SIGN SUPPORT SLIPBASE NOTES

- REFER TO SIGNING PLANS FOR SIGN LOCATIONS AND HEIGHT
- 2. MINUMUM ALLOWABLE TENSION CAPACITY FOR WEDGE ANCHORS = 3000 LBS.
- 3. MAXIMUM ALLOWABLE MOMENT FOR SIGN BASE = 5.13 kip-ft.
- PAY ITEM "STEEL SIGN SUPPORT(X-INCH ROUND)(SLIPBASE)" SHALL INCLUDE STUB BASE, CASTING AND NECESSARY HARDWARE (SLIPBASE CASTING MOUNTING HARDWARE AS SHOWN ON THIS SHEET)
- 5. PAY ITEM "STEEL SIGN SUPPORT CASTING" SHALL INCLUDE CASTING AND NECESSARY MOUNTING HARDWARE (SLIPBASE CASTING MOUNTING HARDWARE AS SHOWN ON THIS SHEET)
- 6. PAY ITEM "STEEL SIGN GROUND STUB BASE (36 INCH)" SHALL INCLUDE SLIPBASE STUB BASE

CAST-IN-PLACE SLIPBASE FOR NEW INSTALLATIONS

Computer File Information			Sheet Revisions
Creation Date: 07/04/12		Date:	Comments
Created By: KEN	(R-2)	03/01/24	Updated typical assembly to include a drilled hole into the post for the Hex Bolt and added an optional third washer between retaining plate and slipbase.
Last Modification Date: 03/01/24	6-2		
Last Modified By: YSaucedo	\mathbb{R} -1	12/29/20	%" x 2½" HEX BOLTS FROM GRADE 5, SIZE #4 TO GRADE A325 IN 'TYPICAL ASSEMBLY'
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	0		

BOTTOM VIEW

SLIPBASE CASTING 2

SECTION A-A

TOP VIEW

DIRECTION

OF TRAVEL

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SECTION B-B

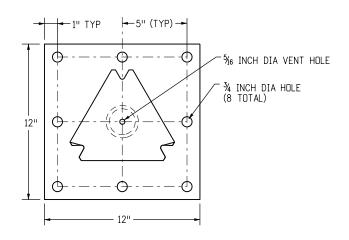
TUBULAR STEEL SIGN SUPPORT DETAILS

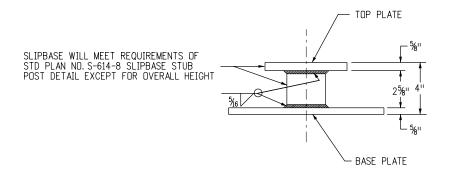
S-614-8 Standard Sheet No. 3 of 7

STANDARD PLAN NO.

Issued By: Traffic & Safety Engineering Branch July 31, 2019

Project Sheet Number:





SURFACE MOUNT SLIPBASE BASE PLATE

SURFACE MOUNT SLIPBASE BASE PLATE FABRICATION REQUIREMENTS

BASE PLATE - 34 INCH ASTM A 36 PLATE STEEL PIPE STUB - 3 INCH NOMINAL SCHEDULE 80, ASTM A-500 GRADE B TOP PLATE - MEET REQUIREMENTS OF SHEET 3

MEET ASTM A-123 GALVANIZING AFTER FABRICATION IS COMPLETE

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 $\frac{5}{8}$ x $\frac{5}{2}$ INCH LONG "HILTI KWIK HUS-EZ SCREW ANCHORS

ALL HARDWARE WILL BE GALVANIZED OR ZINC PLATED.

- 16 EACH 5/8 INCH FLAT WASHERS
 8 EACH 5/8 INCH LOCK WASHERS
 8 EACH 5/8 INCH NUTS

INSTALLATION REQUIREMENTS:

DRILL: (8) - \(\frac{1}{8} \) INCH HOLES 6 INCH DEEP, CLEAN HOLE PRIOR TO INSTALLING ANCHORS

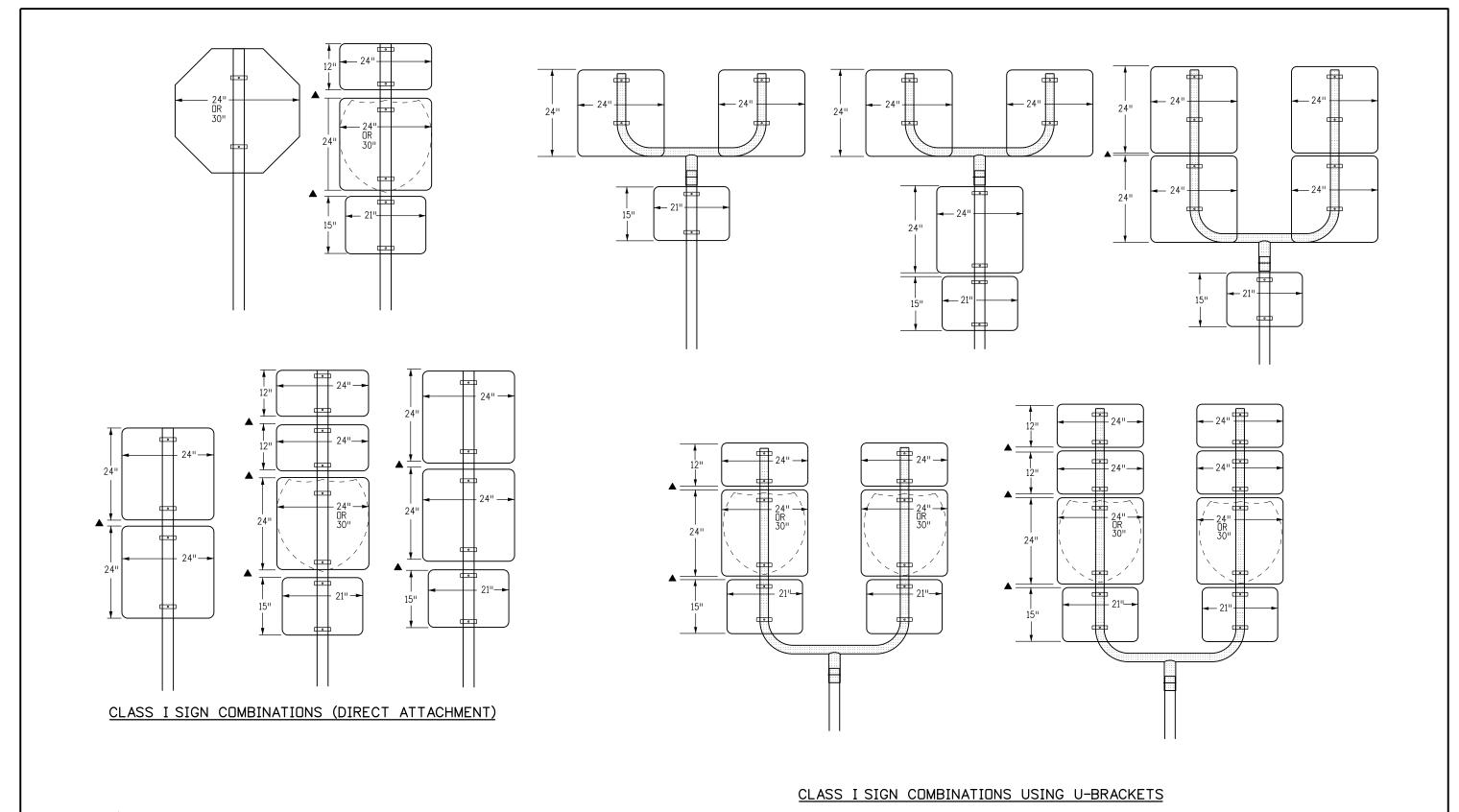
USE ADDITIONAL WASHERS FOR SHIMMING TO LEVEL BASE PLATE.

TUBULAR STEEL SIGN SUPPORT SURFACE MOUNT SLIPBASE NOTES

- REFER TO SIGNING PLANS FOR SIGN LOCATIONS AND HEIGHT
- REFER TO SHEET 3 FOR SLIPBASE CASTING INFORMATION
- MINUMUM ALLOWABLE TENSION CAPACITY FOR WEDGE ANCHORS = 3000 LBS.
- MAXIMUM ALLOWABLE MOMENT FOR SIGN BASE = 5.13 kip-ft.
- PAY ITEM "STEEL SIGN SURFACE MOUNT BASE PLATE (SLIPBASE)" SHALL INCLUDE BASE PLATE. CASTING AND ALL NECESSARY HARDWARE (SLIPBASE CASTING MOUNTING HARDWARE AS SHOWN ON SHEET 3 AND SURFACE MOUNT SLIPBASE MOUNTING HARDWARE AS SHOWN ON THIS SHEET)
- PAY ITEM "STEEL SIGN SURFACE MOUNT BASE PLATE" SHALL INCLUDE BASE PLATE AND NECESSARY HARDWARE (SURFACE MOUNT SLIPBASE MOUNTING HARDWARE AS SHOWN ON THIS SHEET)

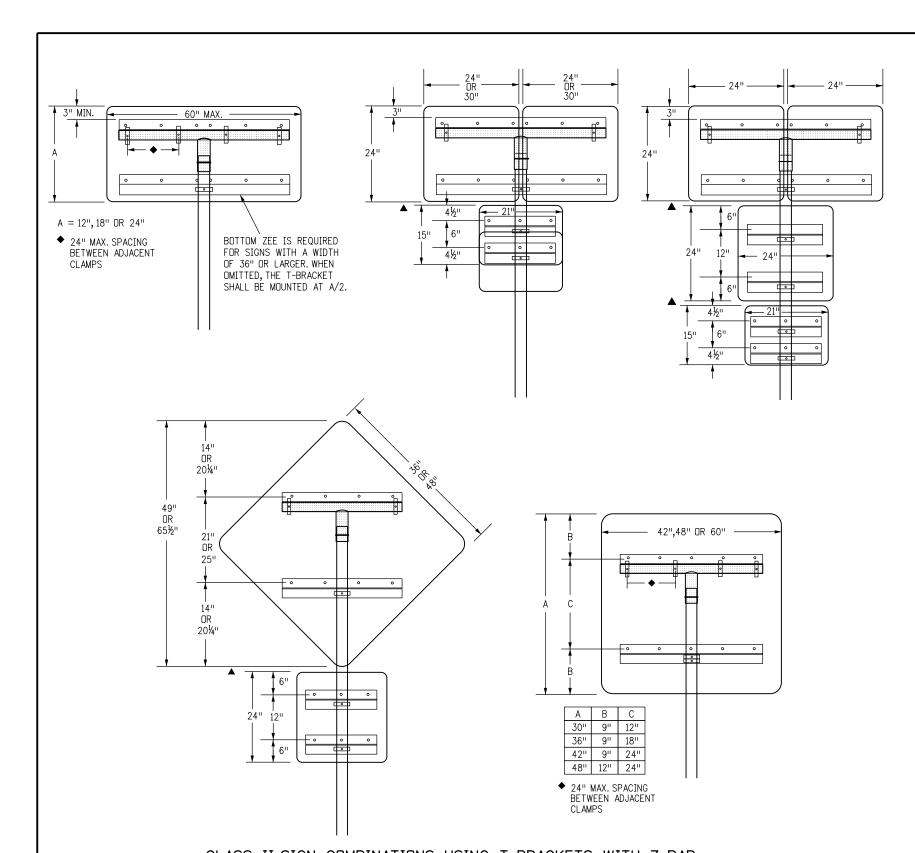
SURFACE MOUNT SLIPBASE FOR RETROFIT INSTALLATIONS

Computer File Information		Sheet Revisions	Colorado Department of Transportation	TUBULAR STEEL SIGN	STANDARD PLAN NO.
Creation Date: 04/12/18 Created By: DiNardo	(R-1)	Date: Comments 03/01/24 Revised note 2,5 and 6.	2829 W. Howard Pl.		S-614-8
Last Modification Date: 03/01/24		0370172+ Revised Note 2, 3 and 0.	Phone: 303-757-9654 FAX: 30.3-757-9219	SUPPORT DETAILS	Standard Sheet No. 4 of 7
Last Modified By: YSaucedo CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	00		Traffic & Safety Engineering EB	Issued By: Traffic & Safety Engineering Branch July 31, 2019	Project Sheet Number:



▲ SEE NOTE 6 ON SHEET 6

Computer File Information Sheet Revisions STANDARD PLAN NO. TUBULAR STEEL SIGN Colorado Department of Transportation Creation Date: 07/04/12 Date: Comments 2829 W. Howard Pl. Denver, CO 80204 Phone: 303-757-9654 FAX: 303-757-9219 S-614-8 \mathbb{R} -D Created By: KEN 03/01/24 Revised reference note for vertical spacing. SUPPORT DETAILS Last Modification Date: 03/01/24 Standard Sheet No. 5 of 7 Last Modified By: YSaucedo EΒ Traffic & Safety Engineering Project Sheet Number: Issued By: Traffic & Safety Engineering Branch July 31, 2019 CAD Ver.; MicroStation V8 Scale: Not to Scale Units: English



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

Computer File Information

CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English

Creation Date: 07/04/12

Last Modified By: YSaucedo

Last Modification Date: 03/01/24

Created By: KEN

Sheet Revisions								

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TUBULAR STEEL SIGN SUPPORT DETAILS

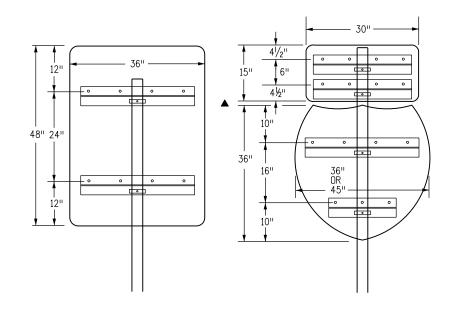
Issued By: Traffic & Safety Engineering Branch July 31, 2019

STANDARD PLAN NO. S-614-8 Standard Sheet No. 6 of 7

Project Sheet Number:

NOTES 1. Z-BAR LENGTH SHALL BE 3 INCH (± ½ INCH) 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. 2. FIRST AND LAST HOLES SHALL BE 2 INCH FROM EDGE OF Z-BAR. THE HOLES IN BETWEEN SHALL BE 6 INCH TO 8 INCH APART. 3. T AND U BRACKETS SHALL TERMINATE 2 INCHES TO 3 INCHES 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.

- 4. 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.
- 5. ZEES SHALL BE ATTACHED TO T-BRACKETS AND U-BRACKETS WITH U-BOLTS OR MOUNTING CLAMPS.
- VERTICAL SPACING BETWEEN SIGN PANELS SHALL BE 1 INCH TO 11/2 INCH
- 7. 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.



PANFI

WIDTHS

21"

24"

30"

36"

42"

45"

48"

54"

60"

36" DIAMOND

48" DIAMOND

24" & 24"

24" & 30"

30" & 30"

36" & 36"

45" & 36"

24" & 24" & 24"

24" & 24" & 30"

24" & 30" & 24"

30" & 24" & 30"

24" & 30" & 30"

30" & 30" & 30"

ZEE

15"

18"

24"

30"

36"

39"

42"

48"

54"

22"

36"

43"

49"

55"

67"

76"

68"

74"

74"

80"

80"

86"

LENGTH

SINGLE POST CLASS II SIGNS USING Z-BAR

