BRASCO INTERNATIONAL, INC.

SUNLINE INSTALLATION GUIDELINES

Thank you for your order. Enclosed with these guidelines are engineering instructions specific to your order. Please review all pages in full before proceeding with your installation.

Storage

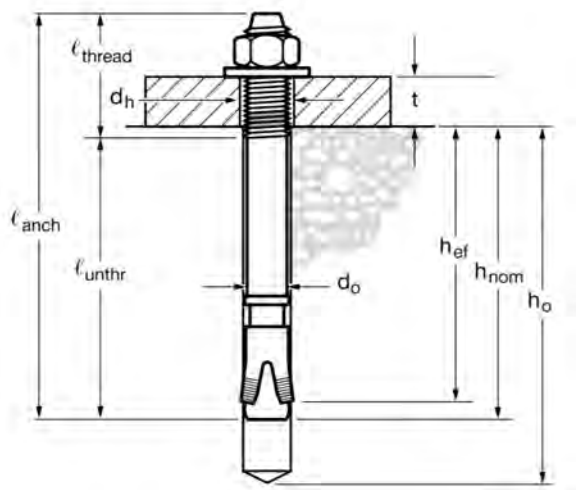
1. Products stored outside must be fully tarped. Wooden crates, cardboard boxes and identifying labels are not weatherproof and will deteriorate in the elements.
2. If your order includes solar lighting, be cautious when handling batteries as they are capable of generating hazardous short-circuit currents. Remove all jewelry (bracelets, metal watches, rings) before attempting to handle or disassemble batteries.
3. Batteries should be stored indoors at a recommended 68 degrees Fahrenheit for max shelf life.
4. Batteries should be installed no later than 3 months from delivery or battery warranties will be void.

TOOLS NEEDED

☐ Drill Motor / Impact Driver	☐ Cordless Drill	☐ Chalk Line
☐ 3/8" Drill Bit (min. 6" lg.)	☐ Air Compressor	☐ Tape Measure
☐ Pry Bar (Leveling)	☐ Steel Hammer	☐ Torque Wrench
☐ 8" Long Masonry Drill Bits	☐ Dead Blow Hammer or Mallet	☐ Hex Key Set
☐ 5/8" and 3/4" Socket and Wrench	☐ Bubble Level, Line / String Level	☐ Generator or Other Power Source
☐ HD Drill Motor or Hammer Drill	☐ Min. 6ft. Step Ladder	☐ Shop Vac or Broom for Clean Up

Installing Expansion Anchors

Expansion Anchor Installed



Setting information	Symbol	Units	Nominal anchor diameter d_o												
			3/8			1/2				5/8				3/4	
Nominal bit diameter	d_{bit}	in.	3/8			1/2				5/8				3/4	
Minimum nominal embedment	h_{nom}	in.	2-5/16			2-3/8		3-5/8		3-9/16		4-7/16		4-5/16	5-9/16
		(mm)	(59)			(60)		(91)		(91)		(113)		(110)	(142)
Effective minimum embedment	h_{ef}	in.	2			2		3-1/4		3-1/8		4		3-3/4	4-3/4
		(mm)	(51)			(51)		(83)		(79)		(102)		(95)	(121)
Min. hole depth	h_o	in.	2-5/8			2-5/8		4		3-3/4		4-3/4		4-5/8	5-3/4
		(mm)	(67)			(67)		(102)		(95)		(121)		(117)	(146)
Min. thickness of fixture[1]	t_{min}	in.	1/8			1/8		n/a		1/8		n/a		1/8	n/a
		(mm)	(3)			(3)				(3)				(3)	
Max. thickness of fixture	t_{max}	in.	2-1/4			4		2-3/4		5-5/8		4-3/4		4-5/8	3-5/8
		(mm)	(57)			(101)		(70)		(143)		(121)		(117)	(92)
Installation torque	T_{inst}	ft-lb	25			40				60				110	
		(Nm)	(34)			(54)				(81)				(149)	
Fixture hole diameter	d_h	in.	7/16			9/16				11/16				13/16	
		(mm)	(11.1)			(14.3)				(17.5)				(20.6)	
Available anchor lengths	ℓ_{anch}	in.	3	3-3/4	5	3-3/4	4-1/2	5-1/2	7	4-3/4	6	8-1/2	10	5-1/2	8	10
		(mm)	(76)	(95)	(127)	(95)	(114)	(140)	(178)	(121)	(152)	(216)	(254)	(140)	(203)	(254)
Threaded length including dog point	ℓ_{thread}	in.	7/8	1-5/8	2-7/8	1-5/8	2-3/8	3-3/8	4-7/8	1-1/2	2-3/4	5-1/4	6-3/4	1-1/2	4	6
		(mm)	(22)	(41)	(73)	(41)	(60)	(86)	(178)	(38)	(70)	(133)	(171)	(38)	(102)	(152)
Unthreaded length	ℓ_{unthr}	in.	2-1/8			2-1/8				3-1/4				4	
		(mm)	(54)			(54)				(83)				(102)	

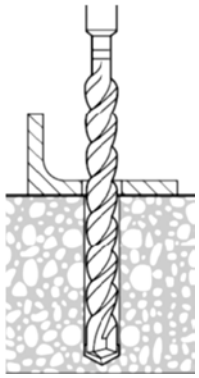
Expansion Anchor Technical Chart

[1] Minimum thickness of fixture is a concern only when the anchor is installed at the minimum nominal embedment. When KWIK Bolt TZ anchors are installed at this embedment, the anchor threading ends near the surface of the concrete. If the fixture is sufficiently thin, it could be possible to run the nut to the bottom of the threading during application of the installation torque. If fixtures are thin, it is recommended that embedment be increased accordingly.

Step 1.

Prepping the Concrete

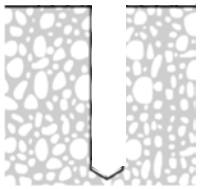
Using anchor boot as a template, mark hole locations and move anchor boot out of the way. Drill a hole the same diameter as the expansion anchor to a minimum depth of ½'' deeper than the anchor will penetrate to allow debris to fall during installation



Step 2.

Prepping the Hole

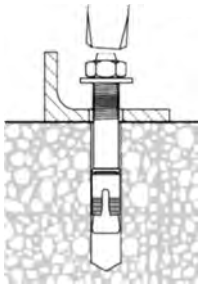
Clean debris from holes using a wire brush, vacuum, or compressed air.



Step 3.

Anchor Installation

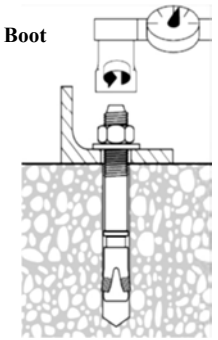
Replace the anchor boot and align with holes in the concrete. Make sure the nut on the expansion anchor is threaded to the top of the threaded rod to prevent damage to the threads. Insert the expansion anchor through the base plate and into the hole in the concrete. Hit the expansion anchor with sharp blows until the washers are snug against the base plates.



Step 4.

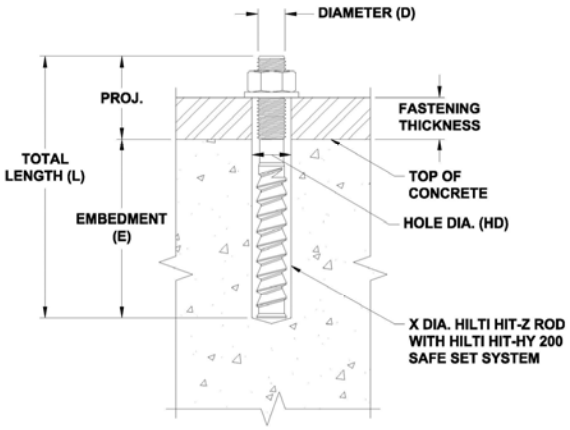
Securing the Anchor Boot

Tighten the nut to the recommended installation torque.



Installing Epoxy Anchors

Epoxy Anchor Installed



Epoxy Anchor Technical Chart

THREADED ROD					
NOMINAL DIAMETER	HILTI HIT-Z HILTI HIT-HY 200				
	HOLE DIAMETER	EMBEDMENT	TOTAL LENGTH	THREAD LENGTH	INSTALLATION TORQUE
D	HD	E	L		
IN	IN	IN	IN	IN	FT-LB (N-M)
3/8	7/16	*	4 3/8	1 13/16	15 (20)
	7/16	*	5 1/8	2 9/16	15 (20)
	7/16	*	6 3/8	3 13/16	15 (20)
1/2	9/16	*	4 1/2	1 11/16	30 (40)
	9/16	*	6 1/2	3 11/16	30 (40)
	9/16	*	7 3/4	4 15/16	30 (40)
5/8	3/4	*	6	1 15/16	60 (80)
	3/4	*	8	3 15/16	60 (80)
	3/4	*	9 1/2	3 15/16	60 (80)
3/4	7/8	*	8 1/2	4	110 (150)
	7/8	*	9 3/4	4	110 (150)

* EMBEDMENT DEPTHS AND MINIMUM HOLE DEPTHS TO BE CALCULATED BY THE ENGINEER OF RECORD BASED ON LOAD REQUIREMENTS

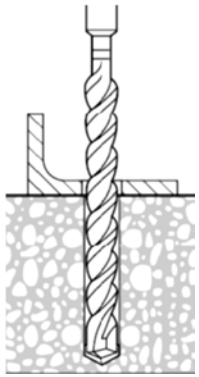
Gel/Full Cure Time

Base Material Temp. (°F)	t_{gel}	t_{cure}
14	90 min	7 hrs
23	90 min	7 hrs
32	50 min	4 hrs
50	15 min	1 hr
68	7 min	30 min
86	4 min	30 min
104	3 min	30 min

Step 1.

Prepping the Concrete

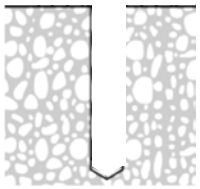
Using an anchor boot as a template, mark hole locations and move anchor boot out of the way. Drill the holes to a minimum depth of a ½'' deeper than the anchor will penetrate. See the chart above to determine the drill size required.



Step 2.

Prepping the Hole

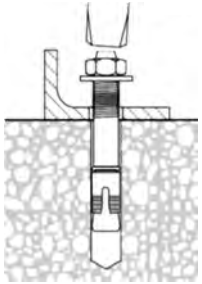
Clean debris from holes using a wire brush, vacuum, or compressed air.



Step 3.

Anchor Installation

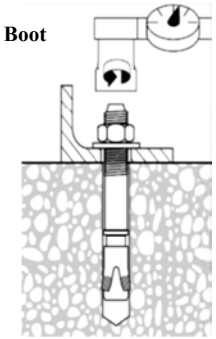
Inject the epoxy into the hole until the hole is approximately 2/3 full. Place the anchor in the hole to the desired depth. Make sure to work the anchor up and down a few times to remove any air bubbles. The epoxy will set-up within a few minutes so be sure to have the anchor's in place before it does. See the chart above for gel and cure times.



Step 4.

Securing the Anchor Boot

Tighten the nut to the recommended installation torque.



Standard Brasco Anchoring Guidelines

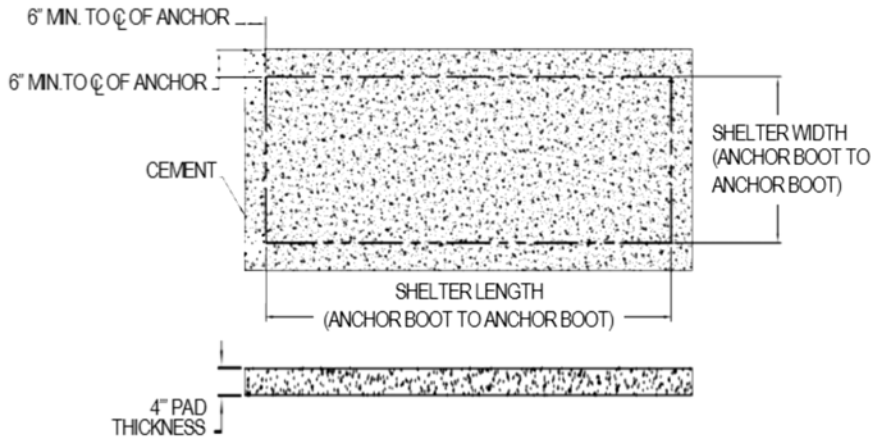
Expansion Anchor Installed

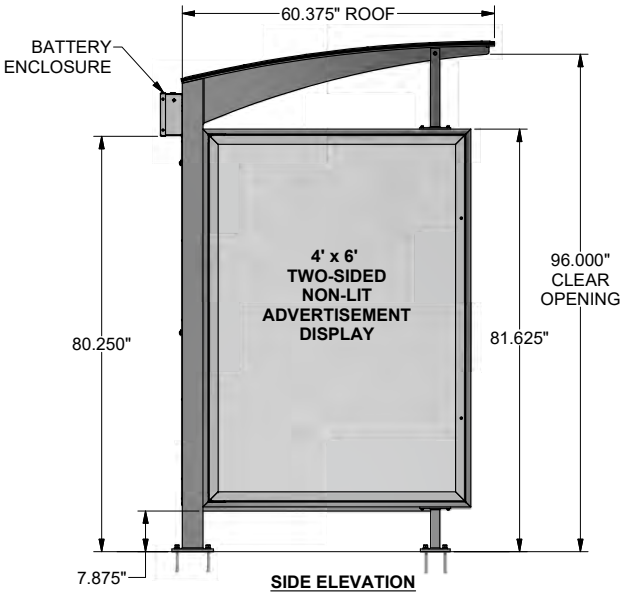
1. Locating proper column locations is critical. Care must be taken to keep columns plumb and walls square to each other.
2. Shelter should be sloped slightly to the rear for proper drainage. Approximately 1/4 inch slope per ft. from front to rear of shelter is recommended. Columns should be shimmed as necessary.
3. Anchors to be installed in conjunction with manufacturers recommendations only. (See Expansion Anchor Technical Chart on previous page.)
4. Anchors need to be installed a minimum of 6 inches from the edge of the concrete pad. See below for reference.

Standard Concrete Pad Overview

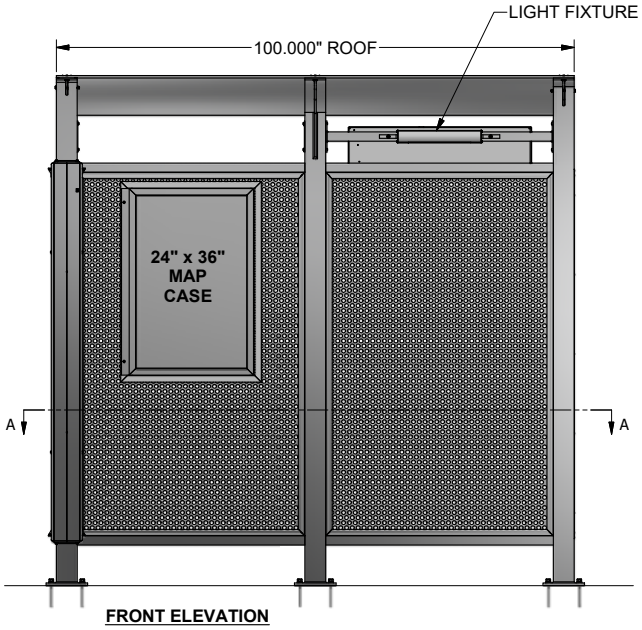
NOTE: This visual is for reference only. Brasco is not liable for concrete installation instructions unless structural concrete calculations are included with an order. Consult your local building codes for specific concrete pad requirements.

RECOMMENDED: Brasco recommends a minimum 4 inch thick, 3000 PSI concrete pad for areas with wind speeds lower than 110 MPH. The concrete pad should allow a minimum of 6 inches around the shelter's perimeter to prevent concrete breakage when anchoring. Concrete may or may not require additional reinforcement.

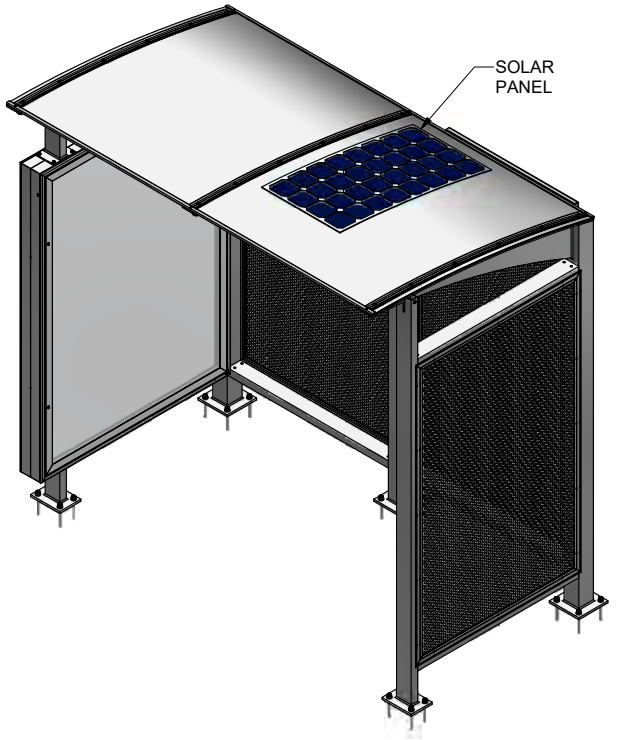


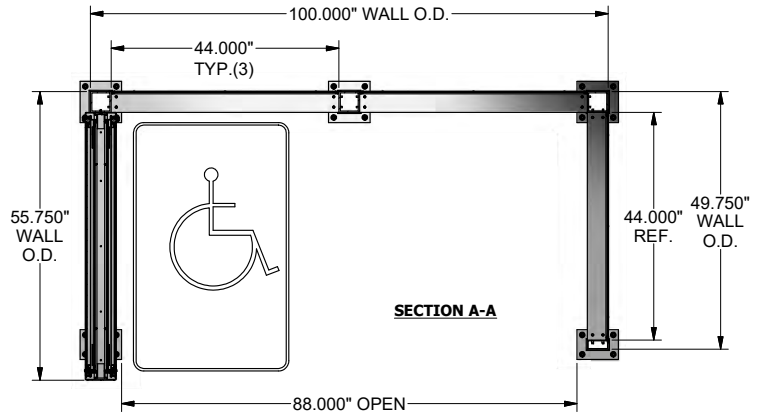


SIDE ELEVATION



FRONT ELEVATION





SECTION A-A

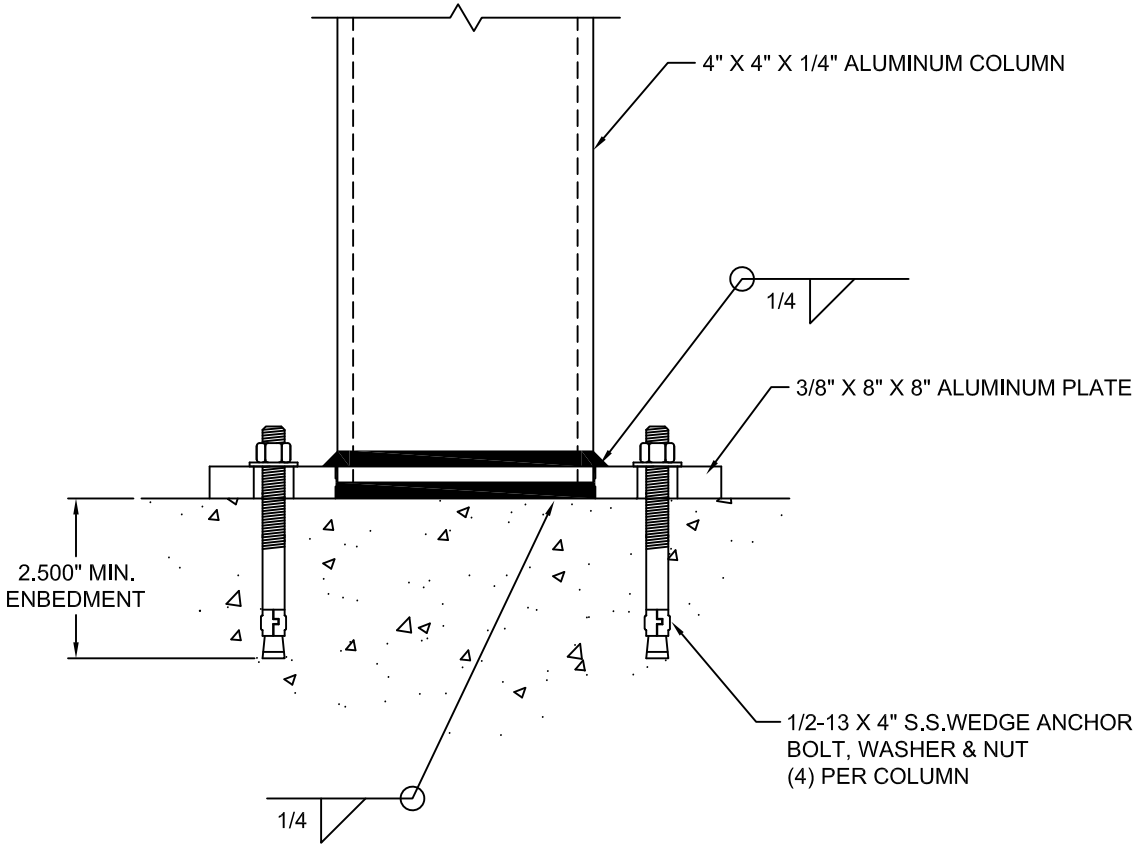
QUANTITY (X) SHELTER THUS

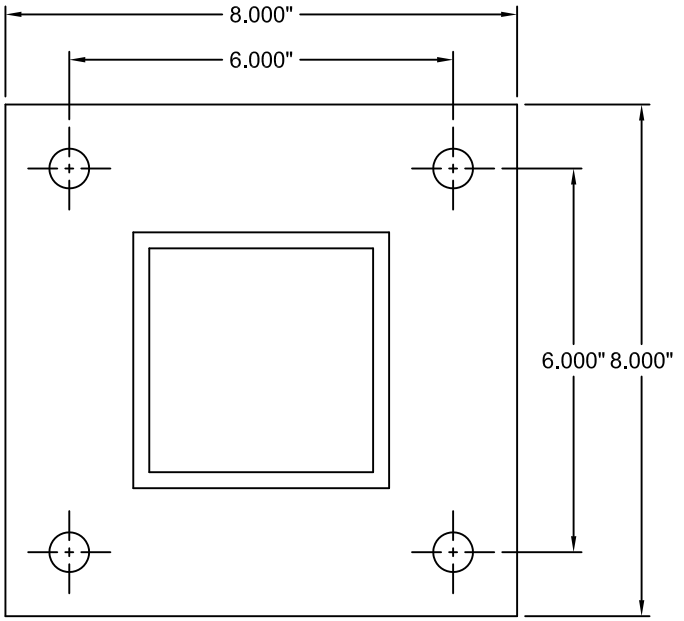
SPECIFICATIONS:

- **POWDER COATED ALUMINUM STRUCTURE - RAL TBD**
- **.090" PERFORATED ALUMINUM WALL GLAZING (Ø1/4" HOLES ON A 3/8" STAGGER)**
- **24" x 36" MAP CASE (REAR WALL - LOCATE AS NEEDED)**
- **4' x 6' TWO SIDED NON-LIT ADVERTISEMENT DISPLAY (LEFT SIDE WALL)**
- **4' ECLIPSE BENCH WITH BLACK HDPE BENCH SLATS AND (1) SEAT DIVIDER**
- **ALUMINUM ARCHED ROOF WITH FLEXIBLE SOLAR PANEL**
- **SOLAR LIGHTING PACKAGE WITH L.E.D. LIGHT FIXTURE AND BATTERY ENCLOSURE**

BRASCO INTERNATIONAL, INC.
32400 INDUSTRIAL DR.
MADISON HEIGHTS, MICHIGAN 48071
1-800-893-3665 WWW.BRASCO.COM

CUSTOMER:		DESIGNER:	CHECKER:
BRASCO INTERNATIONAL		HAUS	BDH
PROJECT:		DATE:	DATE:
SUNLINE STYLE SHELTER		11-6-19	12-30-19
MODEL:	JOB #	SHEET:	REVISION:
SU-0508-F-0-AR-AL-PA-1-1-S		S-001	A



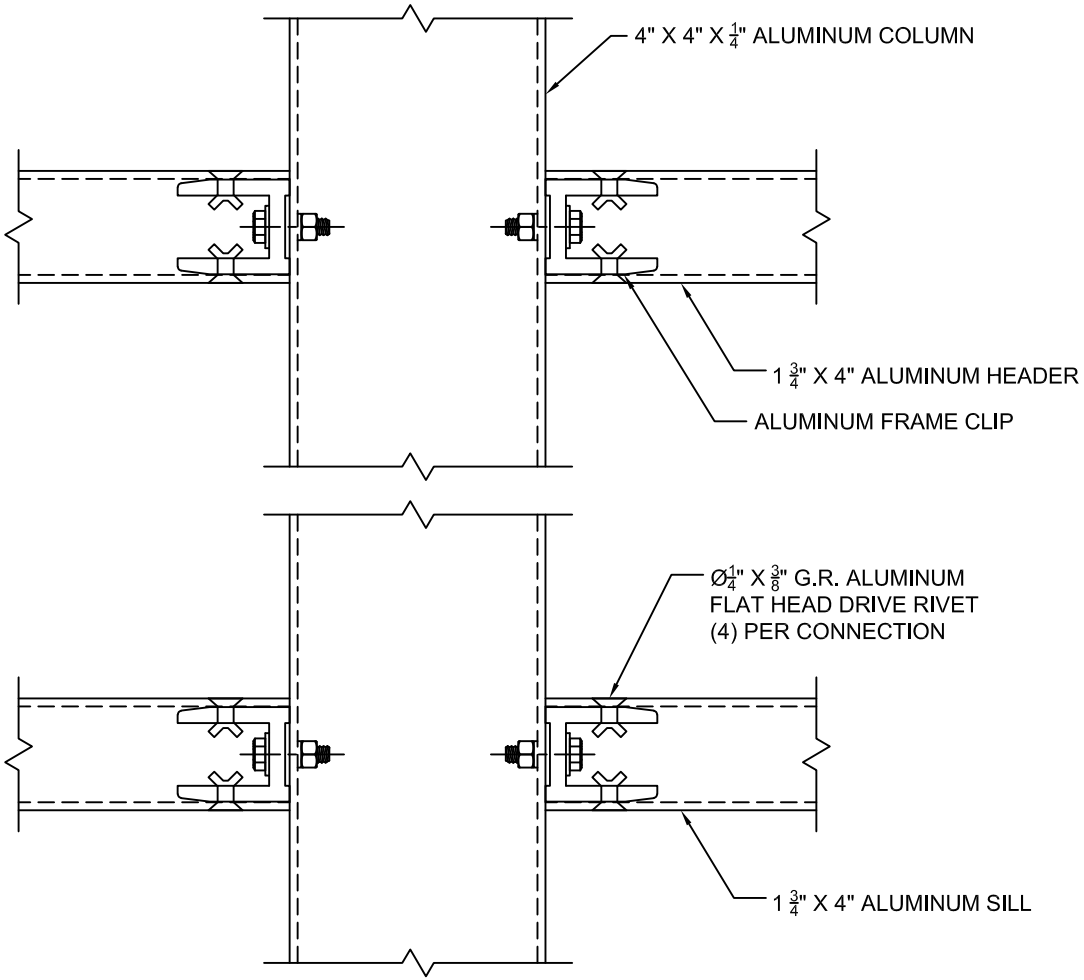


Ⓒ COLUMN ANCHOR CONNECTION
FROM SHT. 1

BRASCO INTERNATIONAL, INC.
32400 INDUSTRIAL DRIVE
MADISON HEIGHTS, MICHIGAN 48071
1-800-893-3665 WWW.BRASCO.COM

SIGNED:_____ DATE:_____

CUSTOMER:	BRASCO INTERNATIONAL			ENGINEER:	SJT
				DATE:	6-14-16
PROJECT:	SUNLINE STYLE TRANSIT SHELTER			CHECKER:	SJT
				DATE:	6-14-16
MODEL:	COLUMN ANCHOR CONNECTION	JOB #	DETAIL	SHEET #:	3

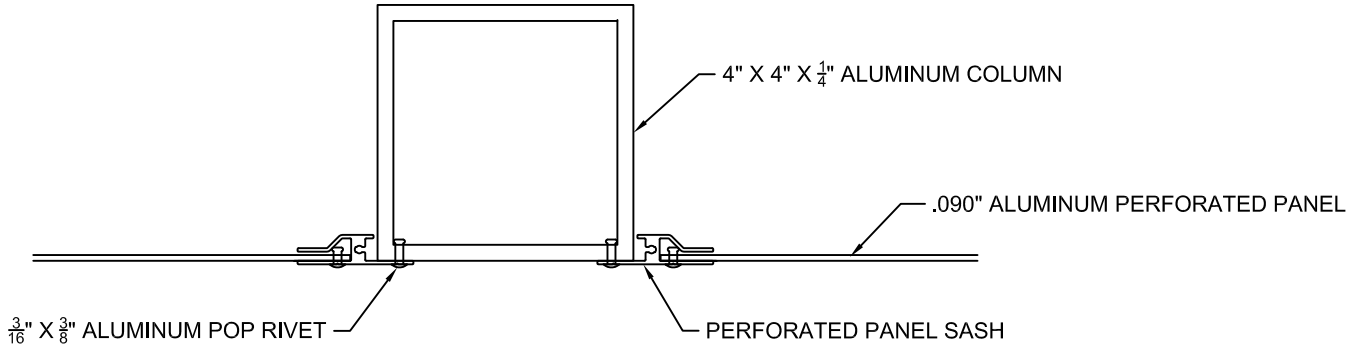


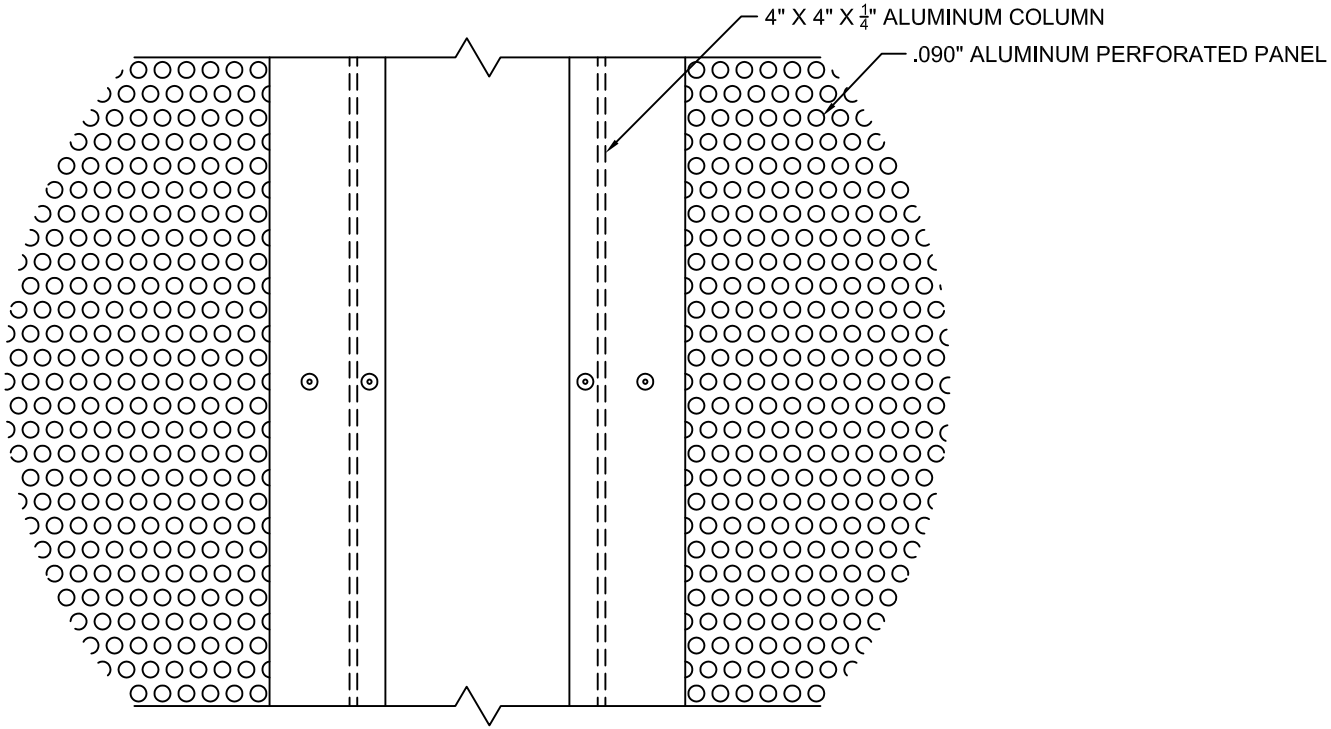
(E) HEADER / SILL TO COLUMN CONNECTION

BRASCO INTERNATIONAL, INC.
32400 INDUSTRIAL DRIVE
MADISON HEIGHTS, MICHIGAN 48071
1-800-893-3665 WWW.BRASCO.COM

SIGNED:_____ DATE:_____

CUSTOMER:	BRASCO INTERNATIONAL			ENGINEER:	SJT
				DATE:	6-14-16
PROJECT:	SUNLINE STYLE TRANSIT SHELTER			CHECKER:	SJT
				DATE:	6-14-16
MODEL:	HEADER / SILL TO COLUMN CONNECTION	JOB #	DETAIL	SHEET #:	5



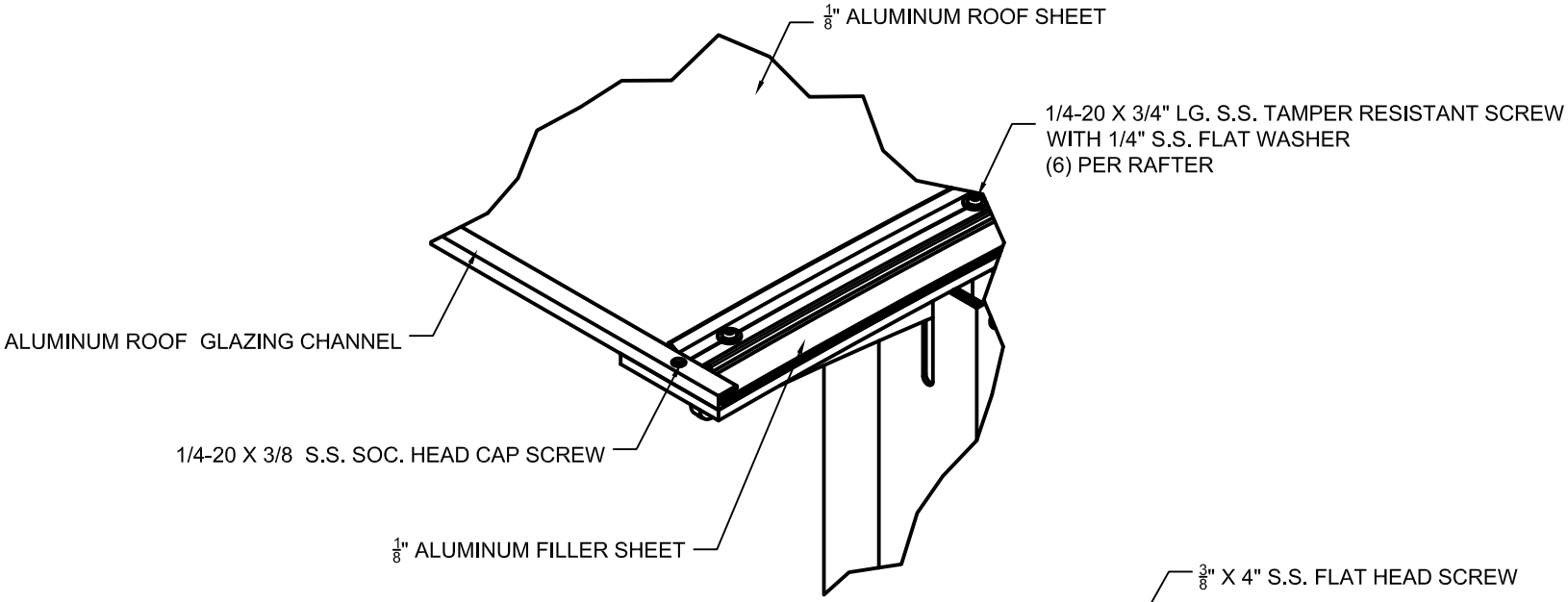


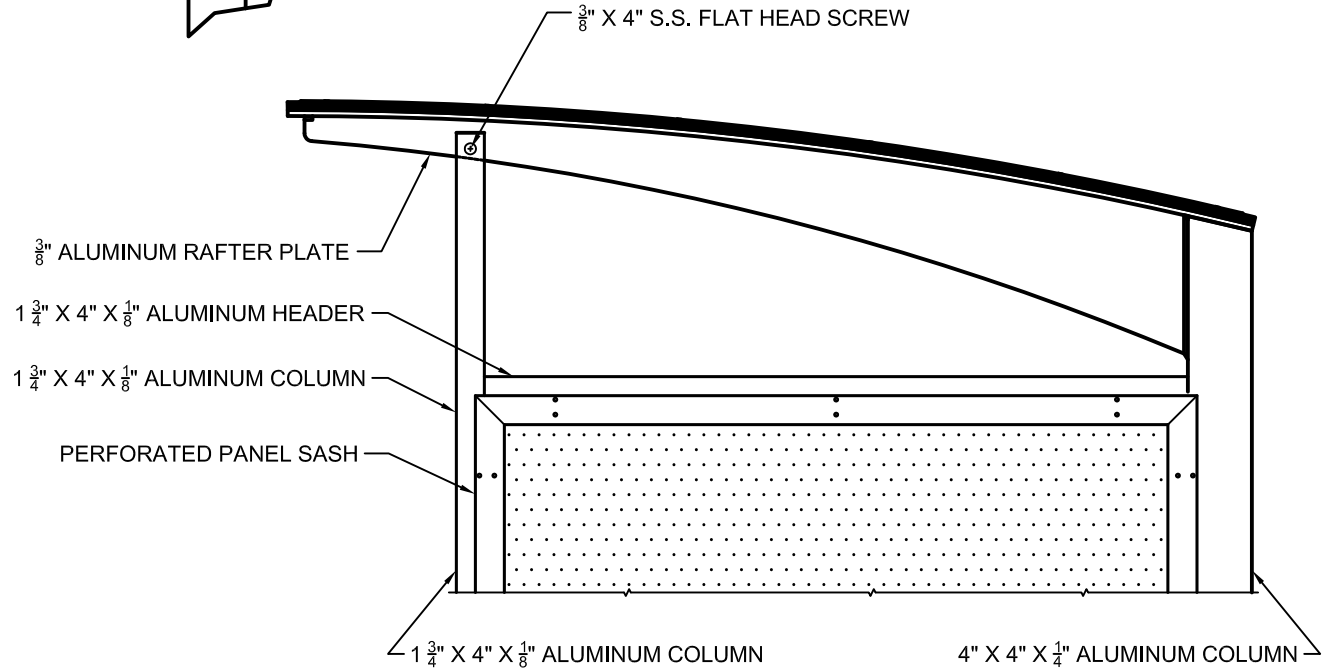
(D) PERFORATED PANEL CONNECTION

BRASCO INTERNATIONAL, INC.
32400 INDUSTRIAL DRIVE
MADISON HEIGHTS, MICHIGAN 48071
1-800-893-3665 WWW.BRASCO.COM

SIGNED:_____ DATE:_____

CUSTOMER:	BRASCO INTERNATIONAL			ENGINEER:	SJT
				DATE:	6-14-16
PROJECT:	SUNLINE STYLE TRANSIT SHELTER			CHECKER:	SJT
				DATE:	6-14-16
MODEL:	PERFORATED PANEL CONNECTION	JOB #	DETAIL	SHEET #:	4





BRASCO INTERNATIONAL, INC.
32400 INDUSTRIAL DRIVE
MADISON HEIGHTS, MICHIGAN 48071
1-800-893-3665 WWW.BRASCO.COM

LEAD TIME BEGINS UPON RECEIPT OF SIGNED APPROVAL.

SIGNED:_____ DATE:_____

CUSTOMER:				ENGINEER:	SJT
				DATE:	6-14-16
PROJECT:				CHECKER:	SJT
				DATE:	6-14-16
MODEL:	SUNLINE STYLE TRANSIT SHELTER SU-0512	JOB #	DETAIL	SHEET #:	2