SECONDARY FRAMING

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General Information

Material

Standard gauges: 12, 14 and 16 gauge. Available in either Red Oxide or Galvanized.

Galvanized members meet ASTM A 653 with minimum yield of 55 ksi, minimum tensile of 70 ksi and G90.

Red Oxide members meet ASTM A 1011 with minimum yield of 55 ksi, minimum tensile of 70 ksi.

Red Oxide finish performance:

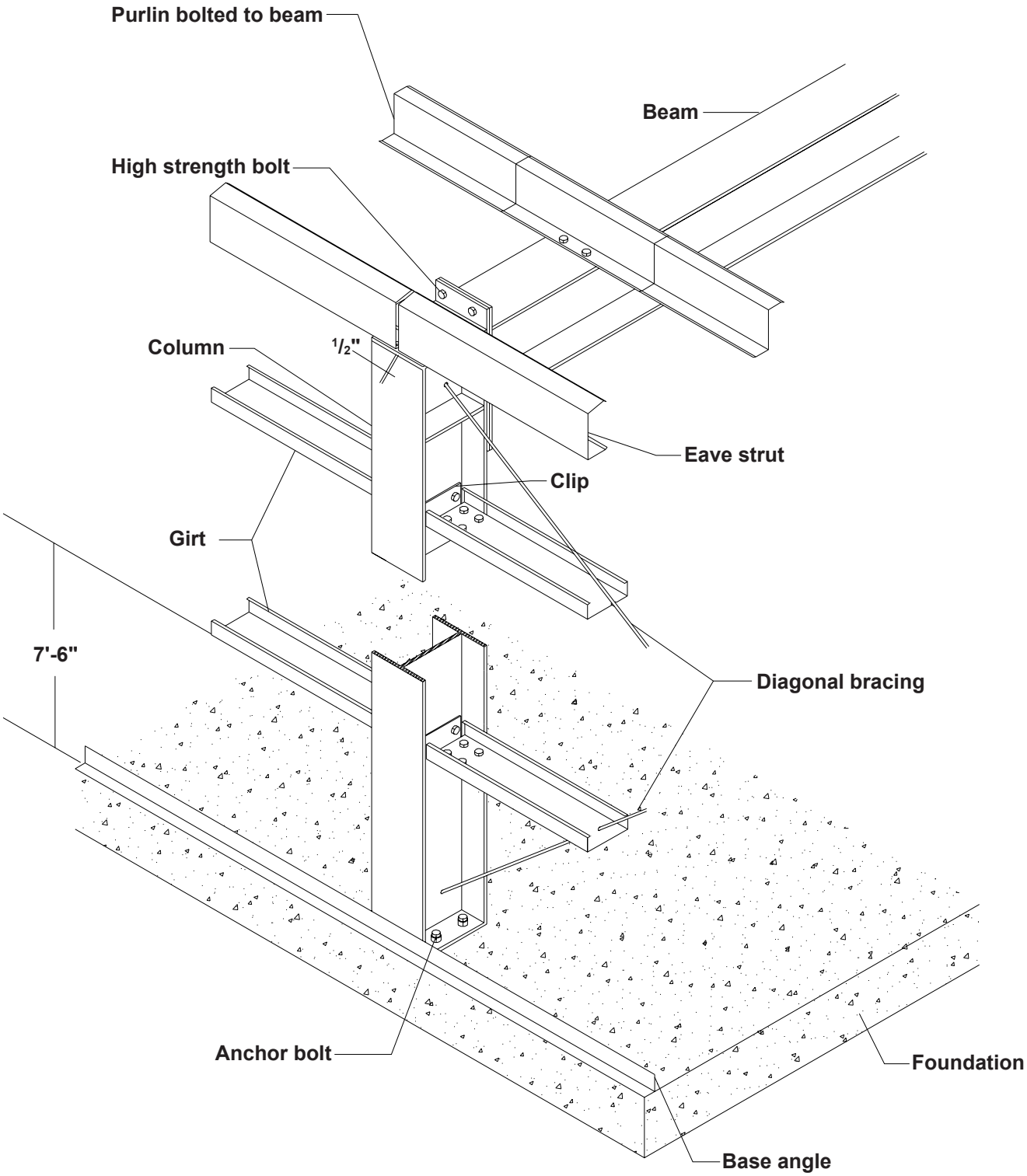
- Pencil Hardness: HB - H
- Impact Resistance: 160 in/lb
- Dry Film Thickness: 0.45 to 0.55 mils
- Lead Content: 0%
- T-Bends: 4T

Length

Cees, Zees, and Eave Struts are ordered cut-to-length. They can be ordered cut to 1/8 inch. For lengths under 7'-0" for Zees and 6'-0" for Cees, members can be press broken at addtional costs (Please consult Metal Sales). Channels, Hip/Valley Plates, Base Angles, and Hat Sections are available in standard 20'-0" lengths.

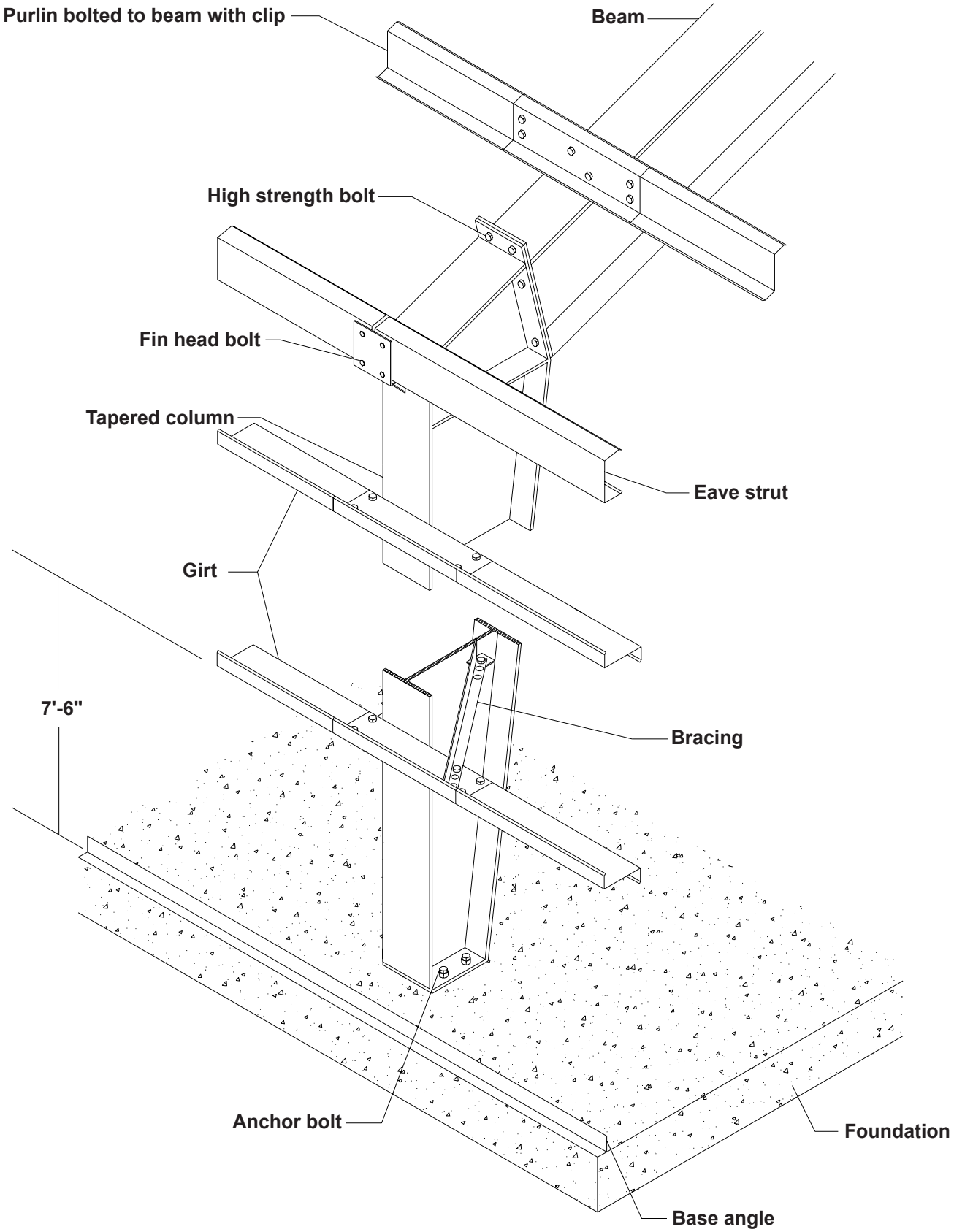
Purlin and Girt Attachment

The drawing below represents girts attached flush with the framing utilizing a clip for attachment to the column. Purlins are shown with typical lap condition directly bolted to the beam.



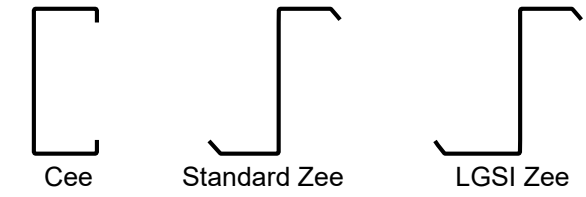
Purlin and Girt Attachment (cont.)

The drawing below represents girts outside the column attached with bolts direct to the column. Purlins are shown with typical lap condition bolted to the beam with a clip.

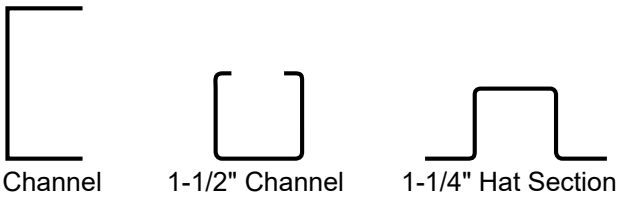


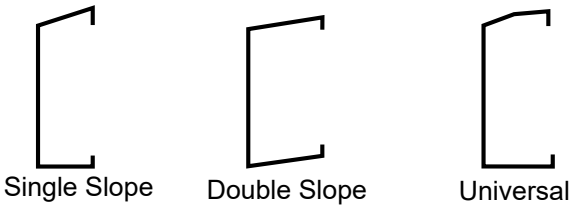
COMPONENTS

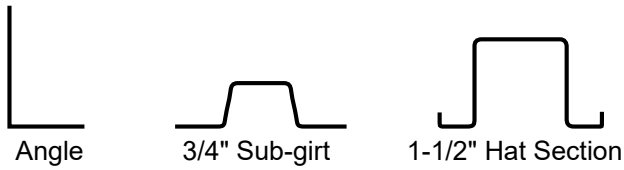
CEES, ZEES AND EAVE STRUTS



CHANNELS, HAT SECTIONS AND ANGLES







Other Components are available. Please inquire.

COMPONENT TECHNICAL

VARIOUS PROFILES

PUNCHING AVAILABLE

GALVANIZED OR RED OXIDE

12, 14 AND 16 GAUGE

CUSTOM LENGTHS

PRODUCT OVERVIEW

- Material:
  - Galvanized per ASTM A 653-11
    - HSLAS, Grade 55, Class 1, G90
    - Minimum Yield is 55 ksi
    - Minimum Tensile is 70 ksi
    - Minimum 2" Elongation is 11% for all gauges
  - Painted per ASTM A 1011-12
    - SS, Grade 55, Red Oxide
    - Minimum Yield is 55 ksi
    - Minimum Tensile is 70 ksi
    - Minimum 2" Elongation is 15% for 12 gauge
      14% for 14 gauge
      9% for 16 gauge

- Thickness:

Gauge	Minimum Coated Thickness	Design Thickness*
16	0.057"	0.058"
14	0.067"	0.069"
12	0.099"	0.103"

* per AISI S100-07, Section A2.4.

- Length Limits:
  Zee: 7'-0" to 45'-0" in 1/8" increments
  Cee: 6'-0" to 45'-0" in 1/8" increments
  Eave Strut: 6'-0" to 39'-0" in 1/8" increments
  Channel, Angle and Hip / Valley Plate: 20'-0" standard

STANDARD SHAPES

Equal Leg Zee:	**Depth** (inches)	**Flange Width(s)** (inches)	**Depth** (inches)	**Flange Width(s)** (inches)
	4	2 1/2, 3 1/2	6	2 1/2
	8	2 1/2, 3 1/2	9	3, 3 1/2
	10	2 1/2, 3, 3 1/2, 4	12	2 1/2, 3, 3 1/2

UnEqual Leg Zee:	**Depth** (inches)	**Flange Width(s)** (inches)	**Depth** (inches)	**Flange Width(s)** (inches)
	4	2 1/8 & 2 3/8	6	2 1/8 & 2 3/8
	8	2 1/8 & 2 3/8, 3 1/8 & 3 3/8	9	2 5/8 & 2 7/8, 3 1/8 & 3 3/8
	10	2 1/8 & 2 3/8, 2 5/8 & 2 7/8, 3 1/8 & 3 3/8, 3 5/8 & 3 7/8		
	12	2 1/8 & 2 3/8, 2 5/8 & 2 7/8, 3 1/8 & 3 3/8		

Cee:	**Depth** (inches)	**Flange Width(s)** (inches)	**Depth** (inches)	**Flange Width(s)** (inches)
	4	2 1/2, 3 1/2	6	2 1/2, 4
	8	2 1/2, 3 1/2 , 4	9	3, 3 1/2
	10	2 1/2, 3, 3 1/2, 4	12	2 1/2, 3, 3 1/2, 4

Channel:	**Depth** (inches)	**Flange Width(s)** (inches)	**Depth** (inches)	**Flange Width(s)** (inches)
	4 1/8	3	6 1/8	3
	8 1/8	2, 3, 4	9 1/8	2 1/2, 3 1/2, 4
	10 1/8	2, 3, 3 1/2, 4	12 1/8	2, 3 1/2, 4

Eave Strut:	**Depth** (inches)	**Flange Width(s)** (inches)	**Depth** (inches)	**Flange Width(s)** (inches)
	6	3 1/2	8	2 1/2, 3 1/2, 5
	9	3 1/2, 4	10	4
	12	3 1/2		

Styles include: Low Eave - Single Slope, Low Eave - Double Slope, High Eave - Single Slope, High Eave - Double Slope and Universal

Angle:	**Leg 1** (inches)	**Leg 2** (inches)	**Leg 1** (inches)	**Leg 2** (inches)
	2	2	3	2, 3
	4	2	6	4

Hip / Valley Plates:	**Leg 1** (inches)	**Leg 2** (inches)	**Leg 1** (inches)	**Leg 2** (inches)
	7	7	9 1/2	9 1/2
	10	10		

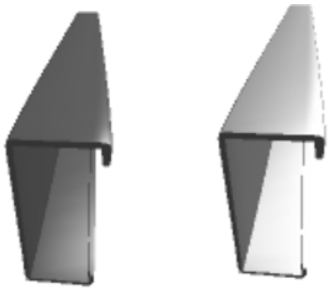
Note: Not all shapes and sizes are available at all branches.

COMPONENT DESCRIPTIONS

Cee Purlin

Multipurpose secondary framing member

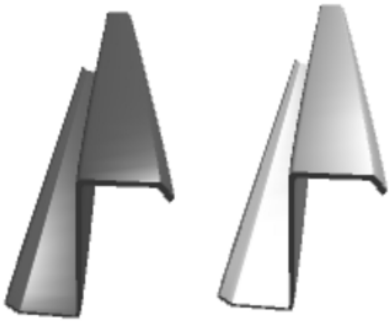
Cee Purlins are secondary steel framing members used for roof and wall support as well as a header, sill, brace, and more. Available in red oxide or galvanized, Cee Purlins are available cut to length.



Zee Purlin - Standard / Equal Leg

Versatile roof and wall support member

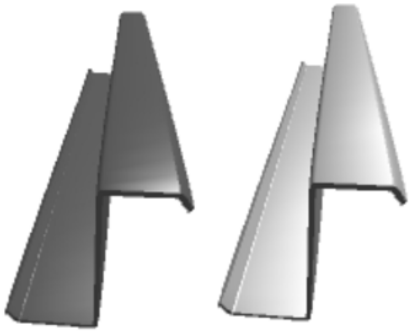
Zee Purlins are secondary steel framing members used for roof and wall. Zee Purlins are commonly chosen for the ability to endlap. Standard zees have symmetrical flanges. Available cut to length.



Zee Purlin - LGSI / Unequal Leg

Versatile LGSI roof and wall support member

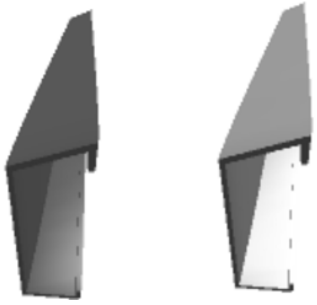
Zee Purlins are secondary steel framing members used for roof and wall. Zee Purlins are commonly chosen for the ability to endlap. LGSI zees have unsymmetrical / unequal flanges. Available cut to length.

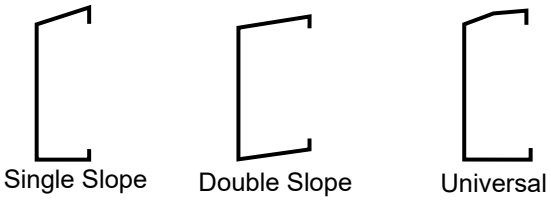


Eave Strut

High/low side secondary framing member

Eave Struts are secondary steel framing members used for support at eaves and high side peak. Single and double slope are available up or down. Available cut to length.



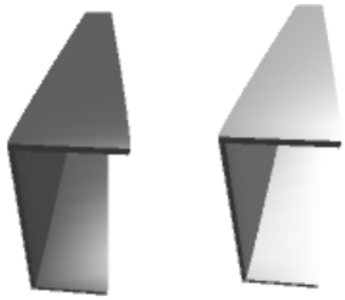


BASE ANGLES

Channel

Secondary framing member to receive Zee Purlins

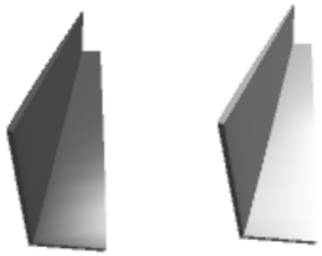
Channels are secondary steel framing members that serve as a receiver channel at the end of Zee Purlin. They can also be used for a number of other applications either alone or welded back-to-back. Standard at 20' long, though some locations can cut to length.



Angle

Rake and low wall secondary framing member

Angles (or Base Angle) are secondary steel framing members used for to fasten panels into at the low end of walls (eave or rake), as wel as the upper end of rake walls. Available in red oxide or galvanized, Angles are standard at 20' long, though some locations can cut to length.



Hat Channel

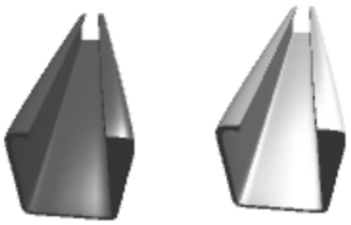
Roof and wall support / Retrofit installation

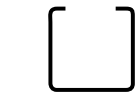
Hat Channel (or Hat Purlin) are light gauge steel framing members used for roof and wall support, as well as retrofit installation over existing metal roofs. Available in galvanized and sometimes red iron, Hat Channel are standard at 20' or 20' 2" long, though some locations can cut to length.

Other Components

Canopy components, hips and valleys, and more

Eave Struts are secondary steel framing members used for support at eaves and high side peak. Single and double slope are available up or down.

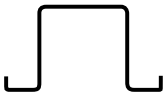




1-1/2" Channel

1-1/4" Hat Section

3/4" Sub-girt



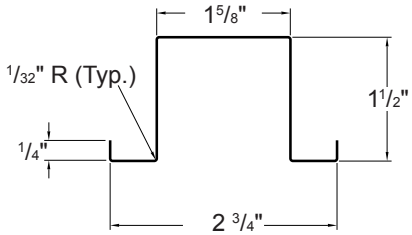
1-1/2" Hat Section

Hip Plate

Valley Plate

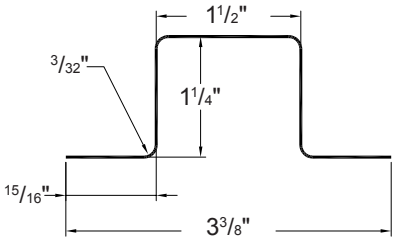
Self Storage Building Accessory Profiles

1 1/2" HAT SECTION



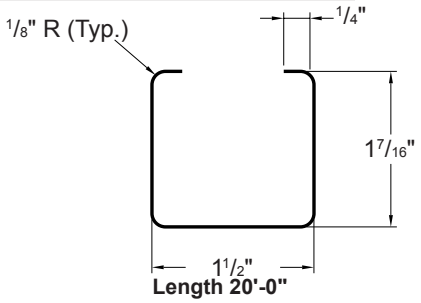
Length 20'-0"
22 Ga., Galvanized

1 1/4" HAT SECTION



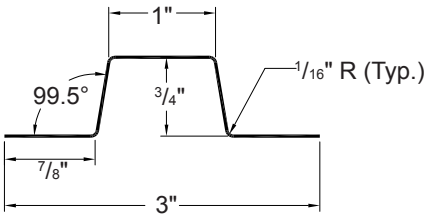
Length 20'-0"
16 Ga., Galvanized

1 1/2" CHANNEL



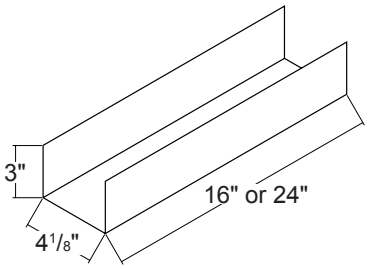
Length 20'-0"
18 Ga., Galvanized

1" SUB-GIRT



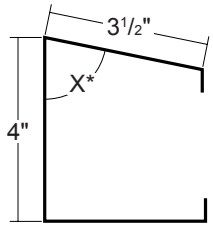
Length 20'-0"
18 Ga., Galvanized or 22Ga., Galvanized

U-CHANNEL



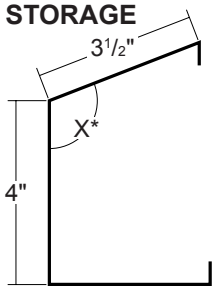
Length 16", 24"

HIGH EAVE STRUT SELF STORAGE



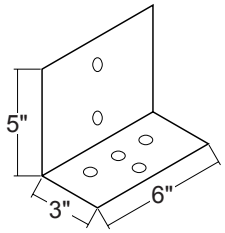
14 Ga., Red Oxide or 16Ga., Red Oxide

LOW EAVE STRUT SELF STORAGE



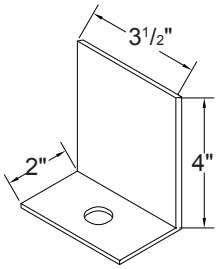
14 Ga., Red Oxide or 16Ga., Red Oxide

BASE CLIP (RETRO-FIT)

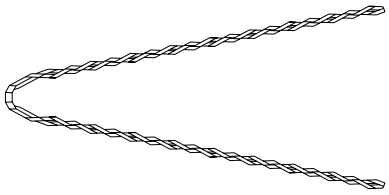


16 Ga., Red Oxide

ANGLE CLIP

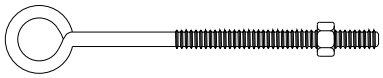


FLO-LOC GRIPS



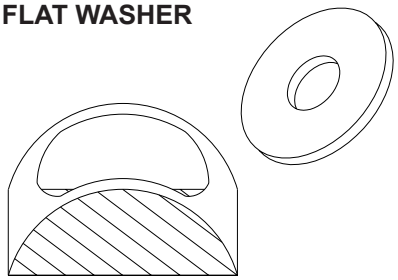
Length 19 1/2", 21", 26"

EYEBOLT WITH NUT



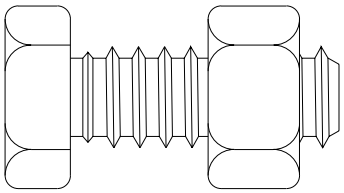
Length 0'-9"

HILLSIDE WASHER & FLAT WASHER



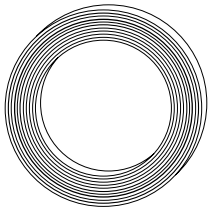
Available in 1/2", 5/8", 3/4" center radius.

BOLT & NUT ASSEMBLY

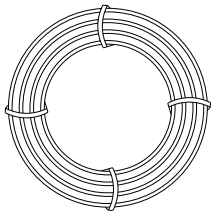


1/2" x 1 1/4" A307 Bolt
1/2" x 1" Fin Head Bolt

BANDING

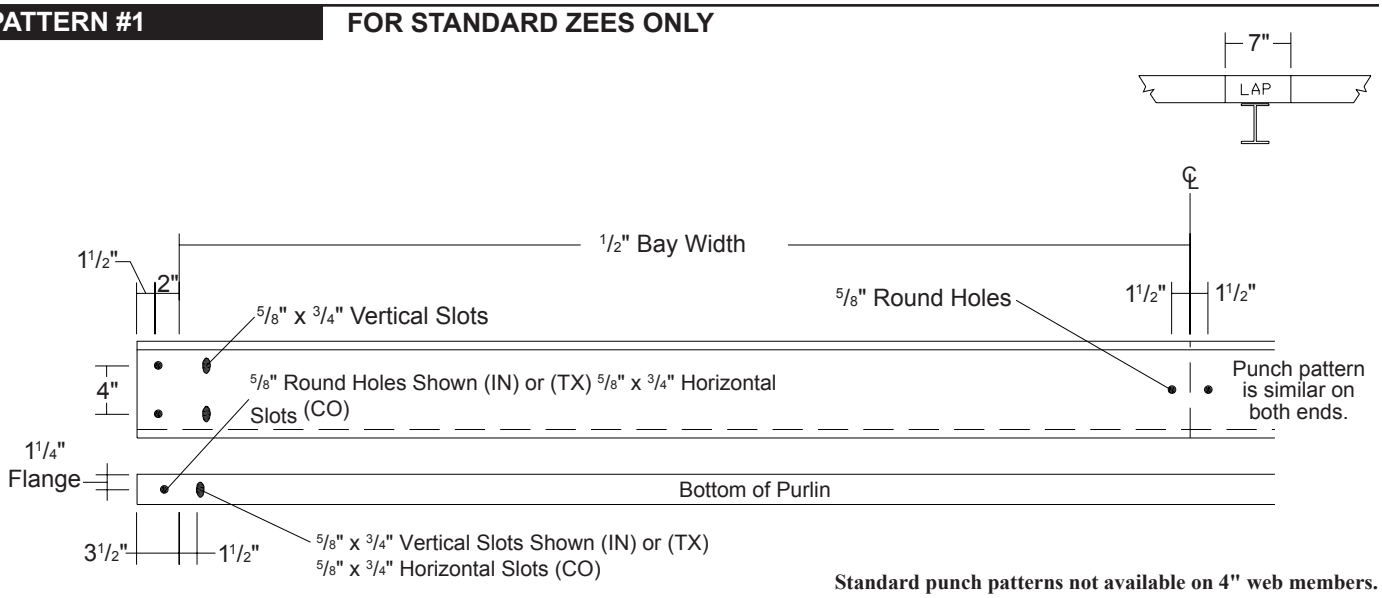


STRAND



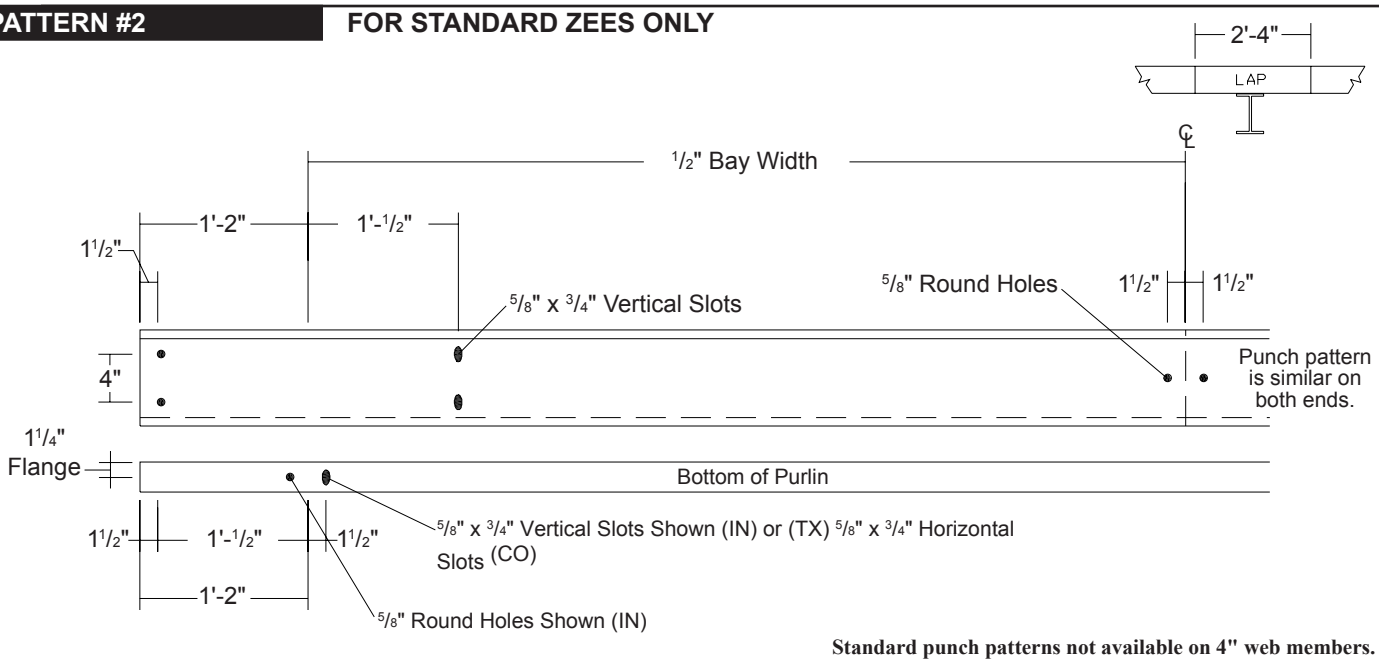
CEE AND ZEE PUNCH PATTERNS

PATTERN #1 — FOR STANDARD ZEES ONLY



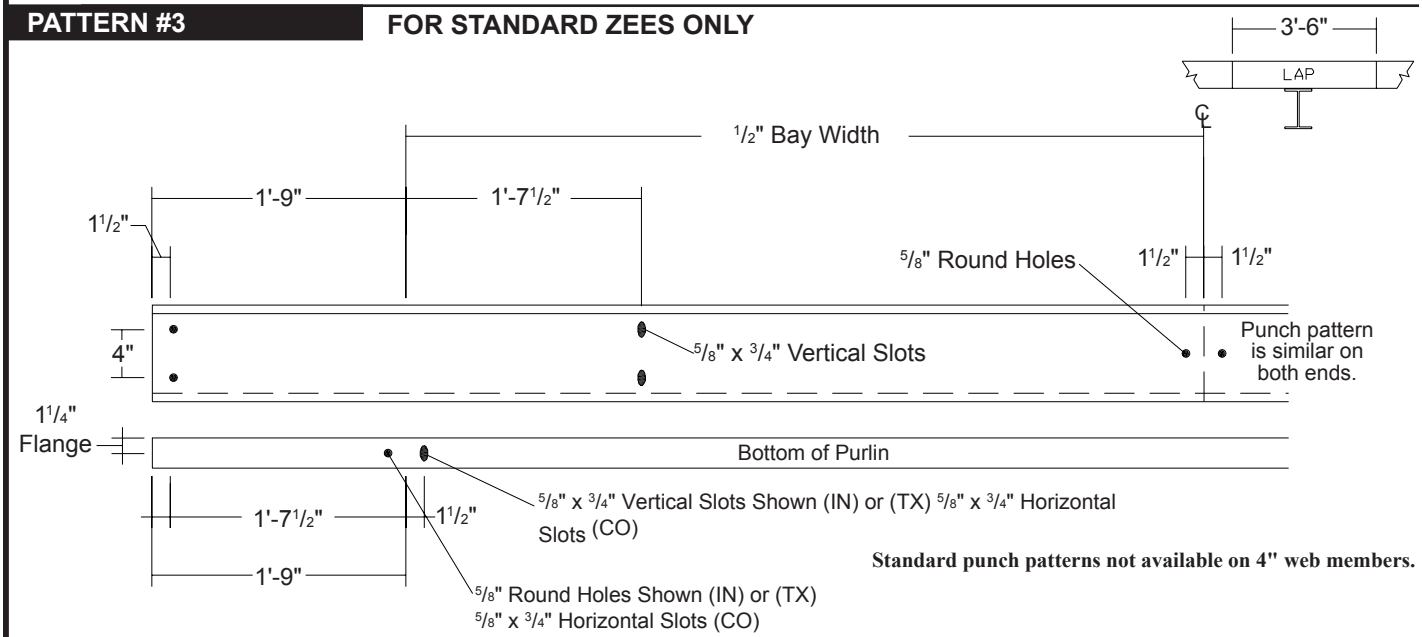
Standard punch patterns not available on 4" web members.

PATTERN #2 — FOR STANDARD ZEES ONLY



Standard punch patterns not available on 4" web members.

PATTERN #3 — FOR STANDARD ZEES ONLY

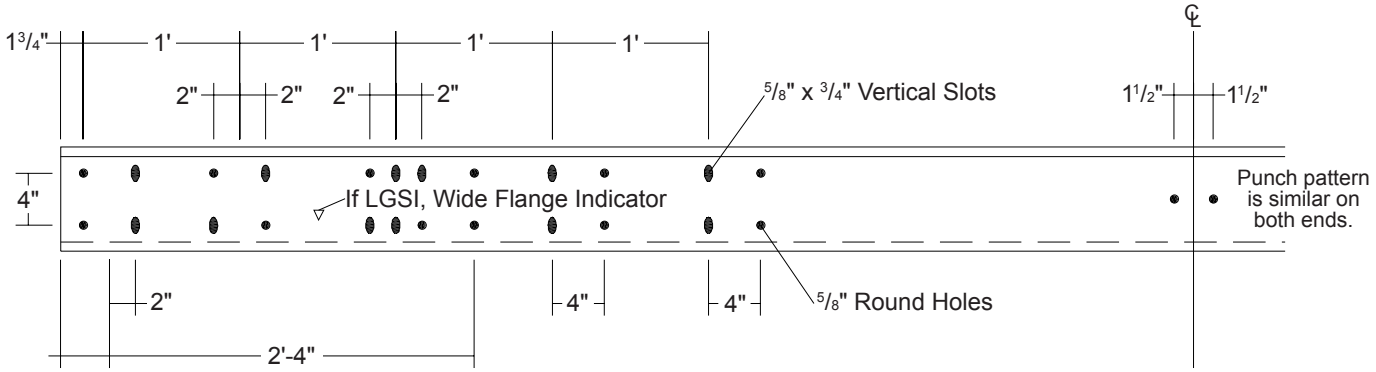


Standard punch patterns not available on 4" web members.

CEE AND ZEE PUNCH PATTERNS

PATTERN #A

For Standard and LGSI Zees — **For 2'-3½" or 4'-3½" Laps**

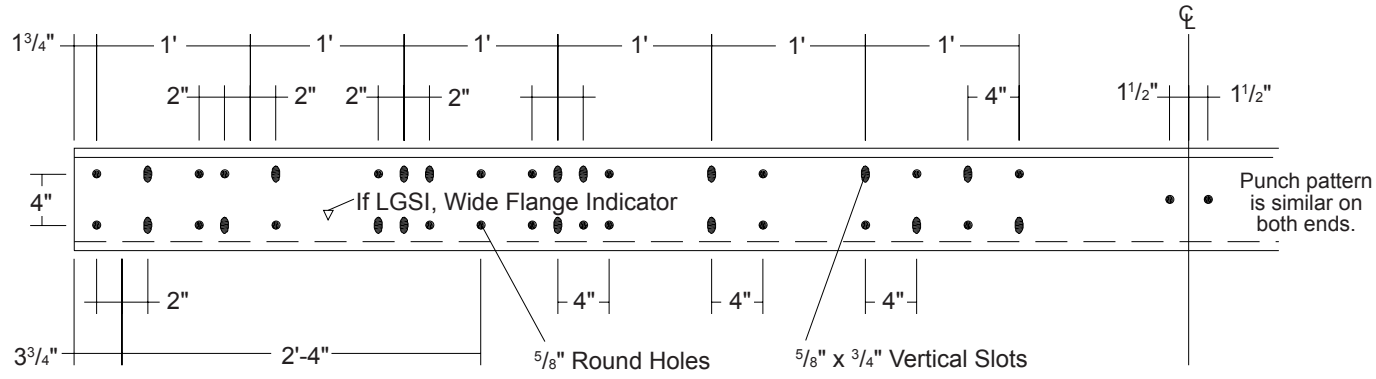


No flange punching for pattern #A.

Standard punch patterns not available on 4" web members.

PATTERN #B

For Standard and LGSI Zees — **For 2'-3½", 4'-3½", or 6'-3½" Laps**

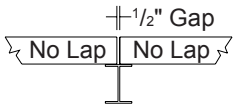


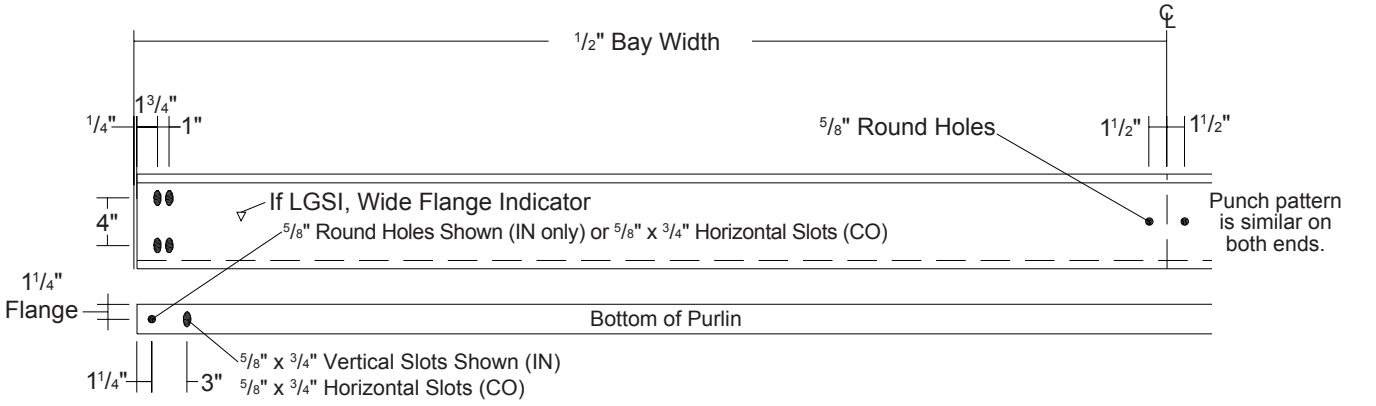
No flange punching for pattern #B.

Standard punch patterns not available on 4" web members.

PATTERN #C

For Standard and LGSI Cees and Zees only



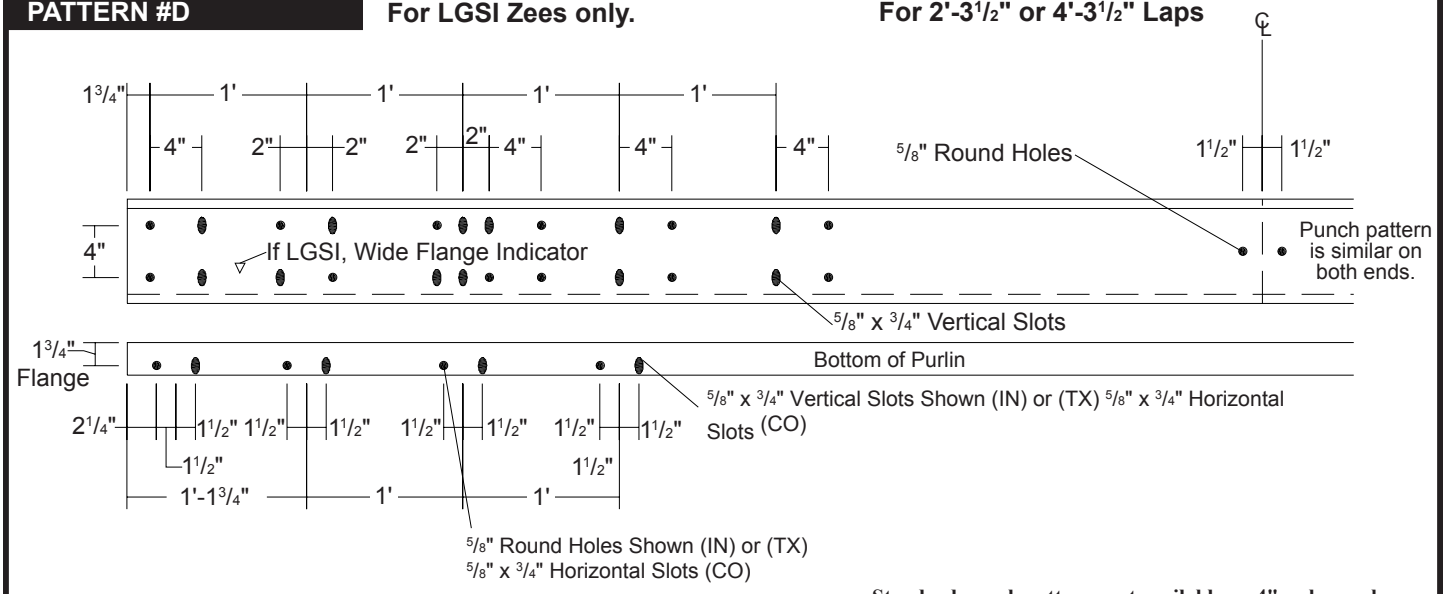


Standard punch patterns not available on 4" web members.

CEE AND ZEE PUNCH PATTERNS

PATTERN #D

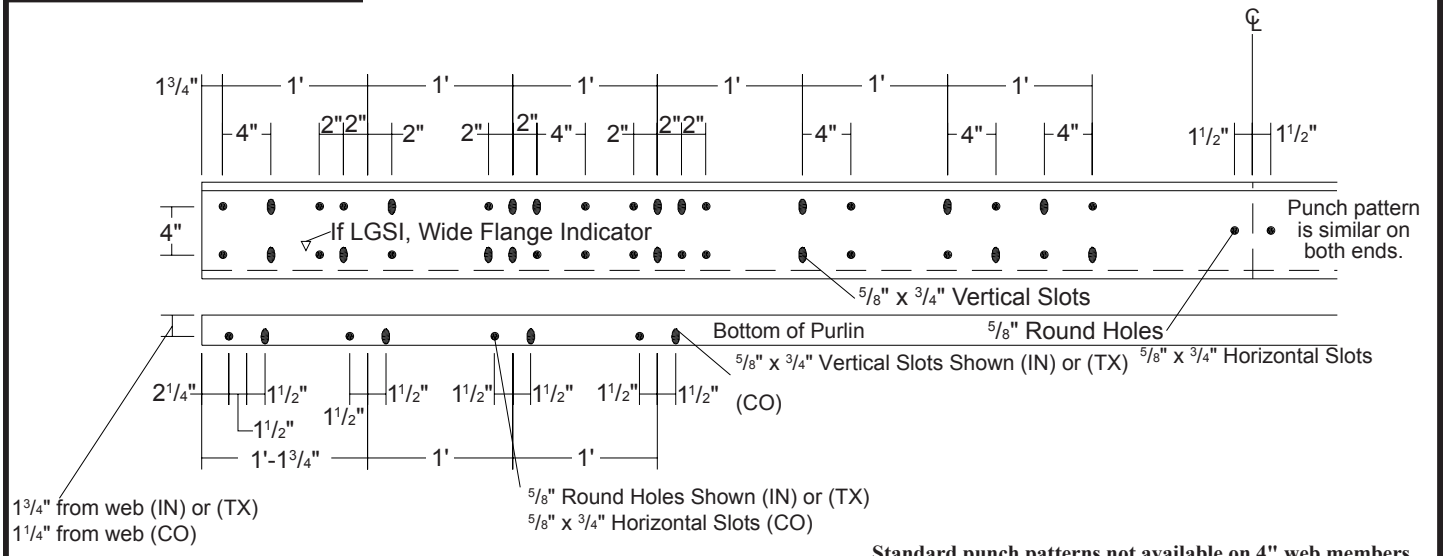
For LGSI Zees only. **For 2'-3½" or 4'-3½" Laps**



Standard punch patterns not available on 4" web members.

PATTERN #E

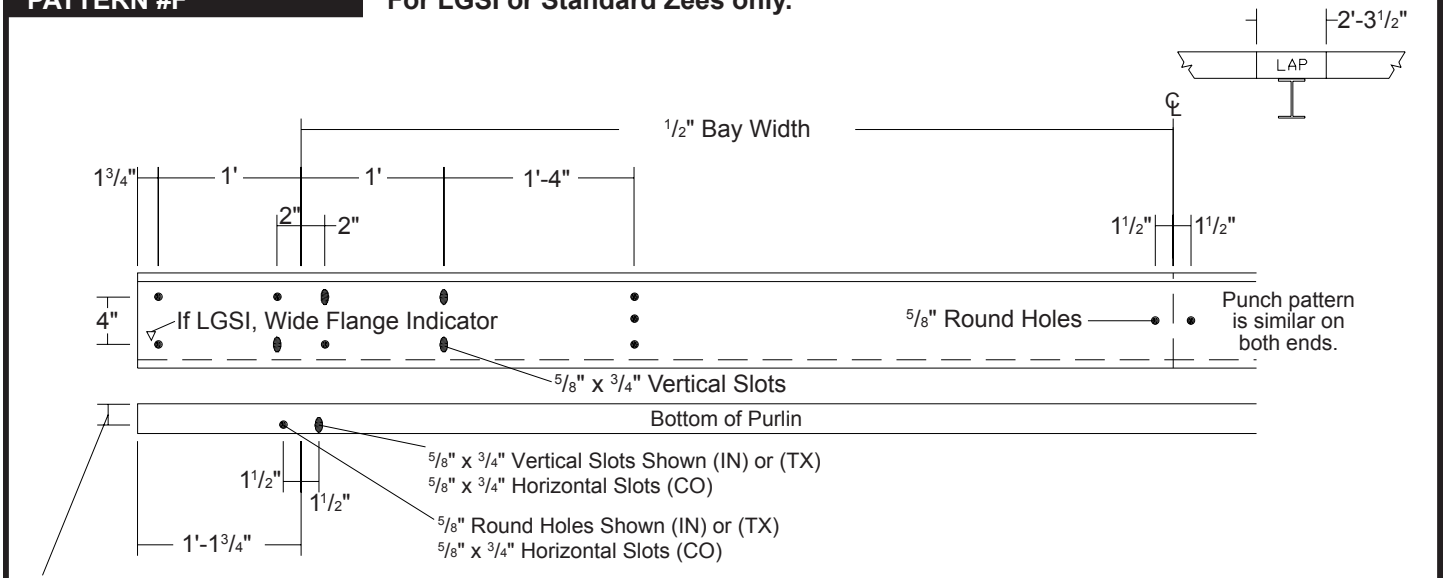
For LGSI Zees only. **For 2'-3½", 4'-3½", or 6'-3½" Laps**



Standard punch patterns not available on 4" web members.

PATTERN #F

For LGSI or Standard Zees only.

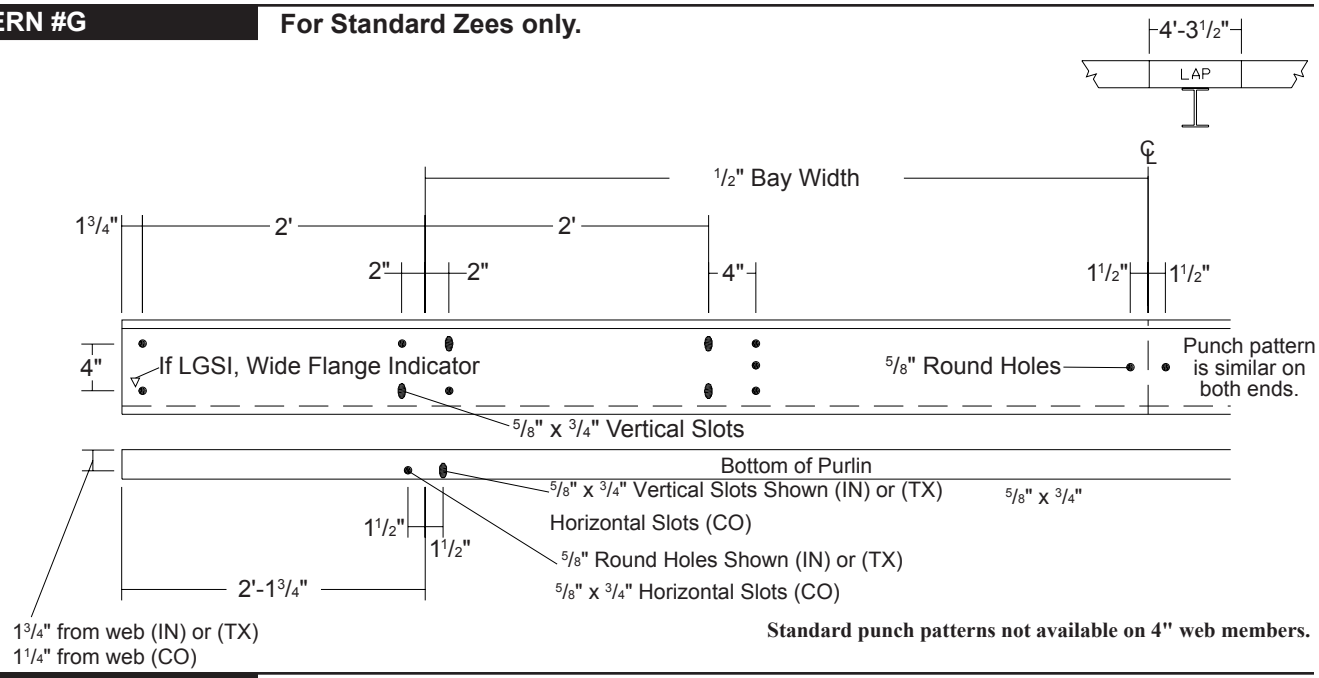


Standard punch patterns not available on 4" web members.

CEE AND ZEE PUNCH PATTERNS

PATTERN #G

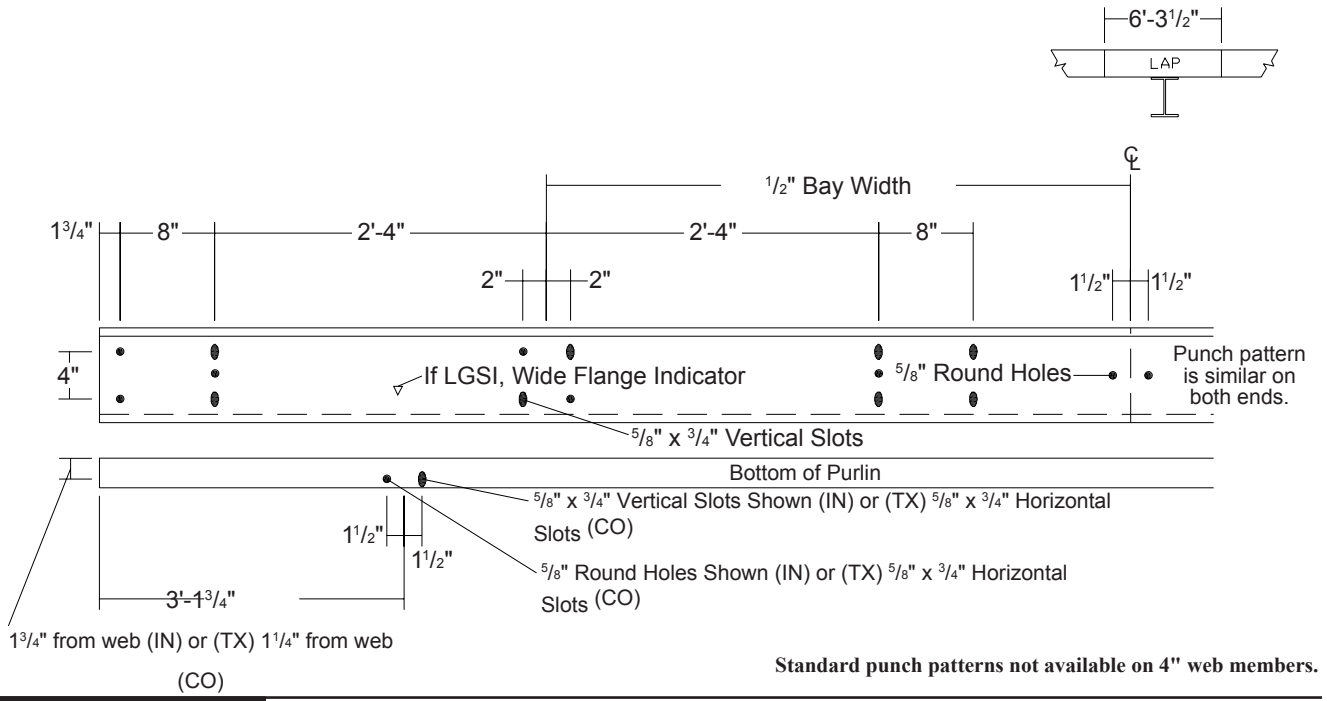
For Standard Zees only.



Standard punch patterns not available on 4" web members.

PATTERN #H

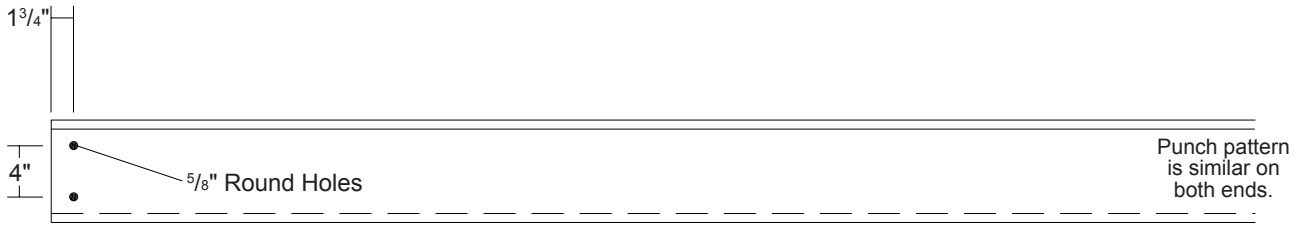
For Standard Zees only.



Standard punch patterns not available on 4" web members.

PATTERN #J

For LGSI or Standard Zees and Cees only.

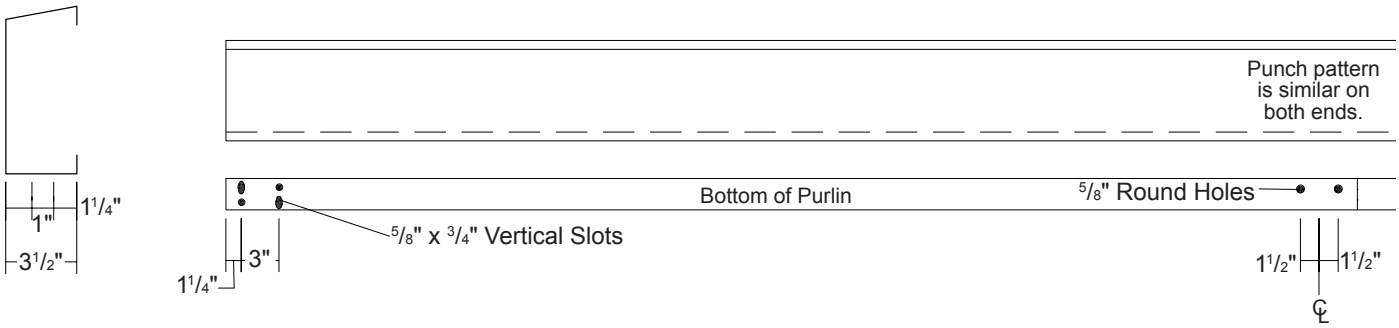


Standard punch patterns not available on 4" web members.

EAVE STRUT PUNCH PATTERNS

PATTERN #S 3 C

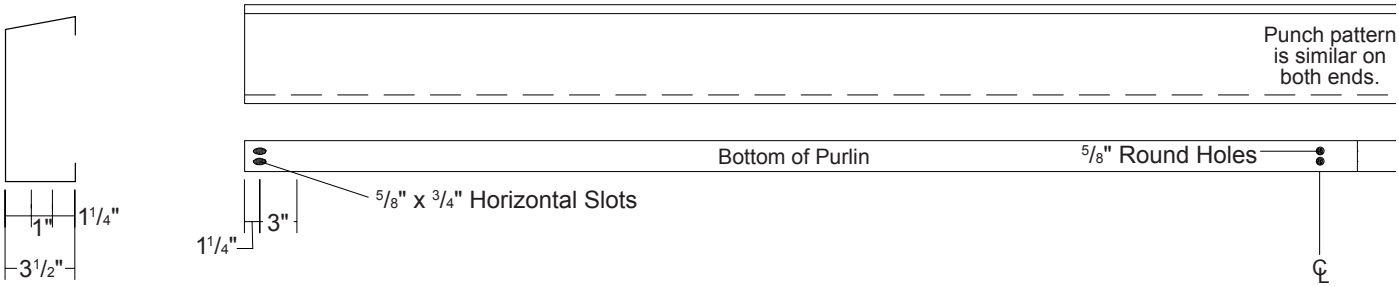
Available at IN, TX and CA



Punch pattern for eave struts with 3.5" flange only.

PATTERN #S 3 D

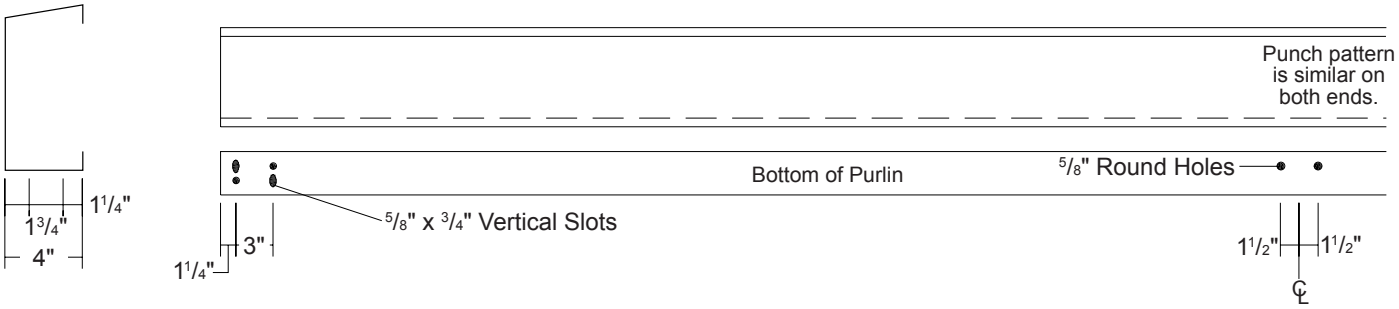
Available at IN, TX and CA



Punch pattern for eave struts with 3.5" flange only.

PATTERN #S 4

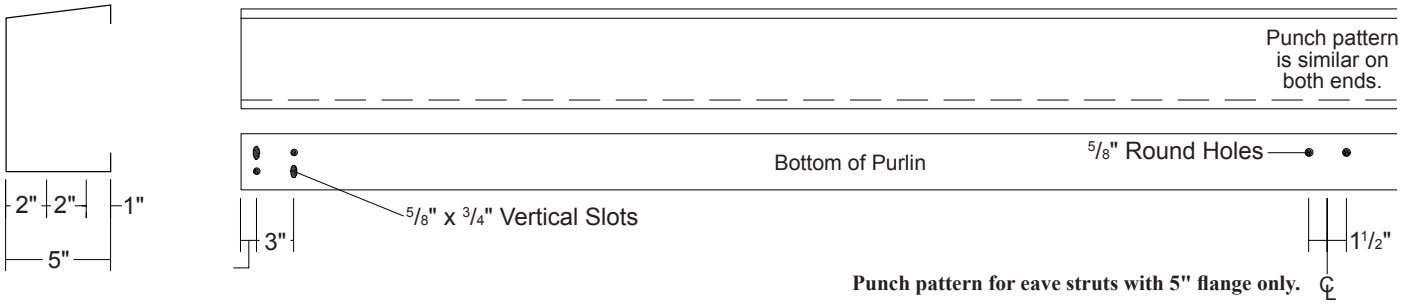
4" flange eave struts available at IN, TX and CA



Punch pattern for eave struts with 4" flange only.

PATTERN #S 5

5" flange eave struts available at IN, TX and CA



Punch pattern for eave struts with 5" flange only.

INDIANA LINE ONLY

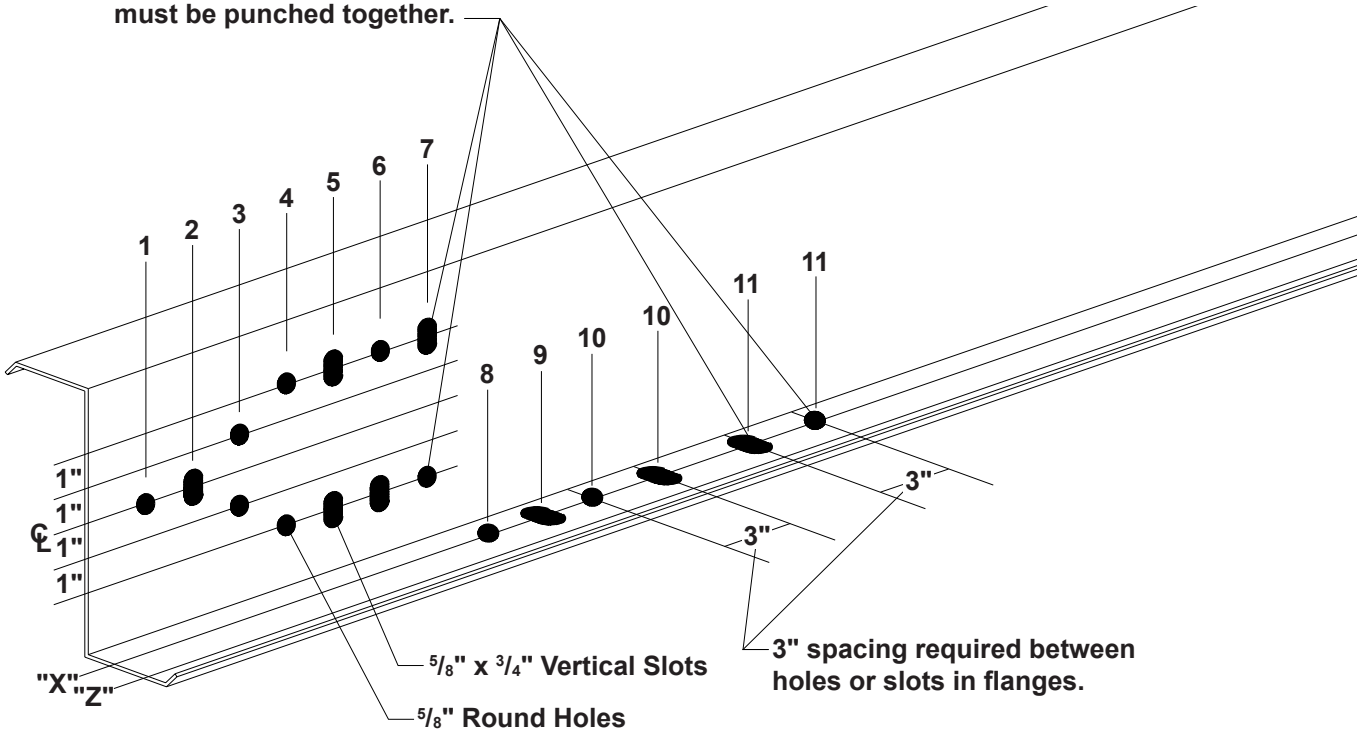
Custom punching can be done for Standard Cees, Zees, LGSI Zees, and Eave Struts.

Web punching is available in 4" to 12" Cees, Zees, and Eave Struts. Punching is available only on center line of web for 4" member.

Flange punching is available in 6" to 12" Cees, Zees, and Eave Struts only.

Any combination of punching (1-11) can be punched together.

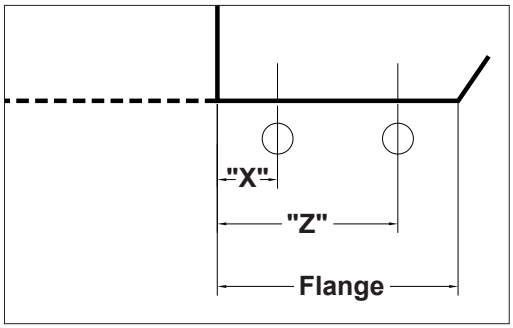
Both holes or slots in 3, 4, 5, 6, 7, 10, and 11 must be punched together.

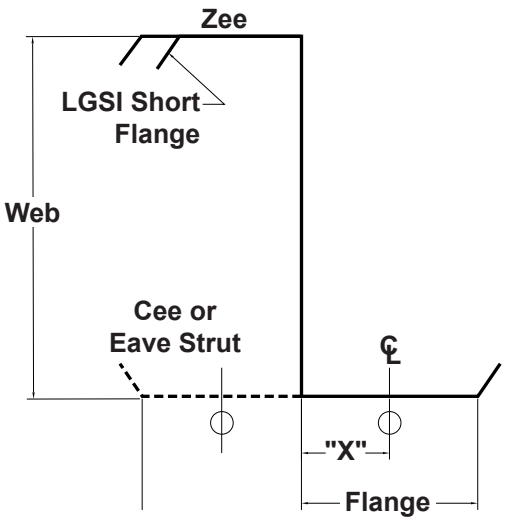


FLANGE PUNCHING

Flange punching can be punched in either "X" or "Z".
"X" must be $1^1/_4$", $1^3/_4$", or 2" from web.
"Z" must be $2^1/_4$", 3", or 4" from web.

Flange width must be $2^7/_8$", 3", $3^3/_8$", $3^1/_2$", $3^7/_8$", 4", or 5" for punching second holes or slots ("Z").





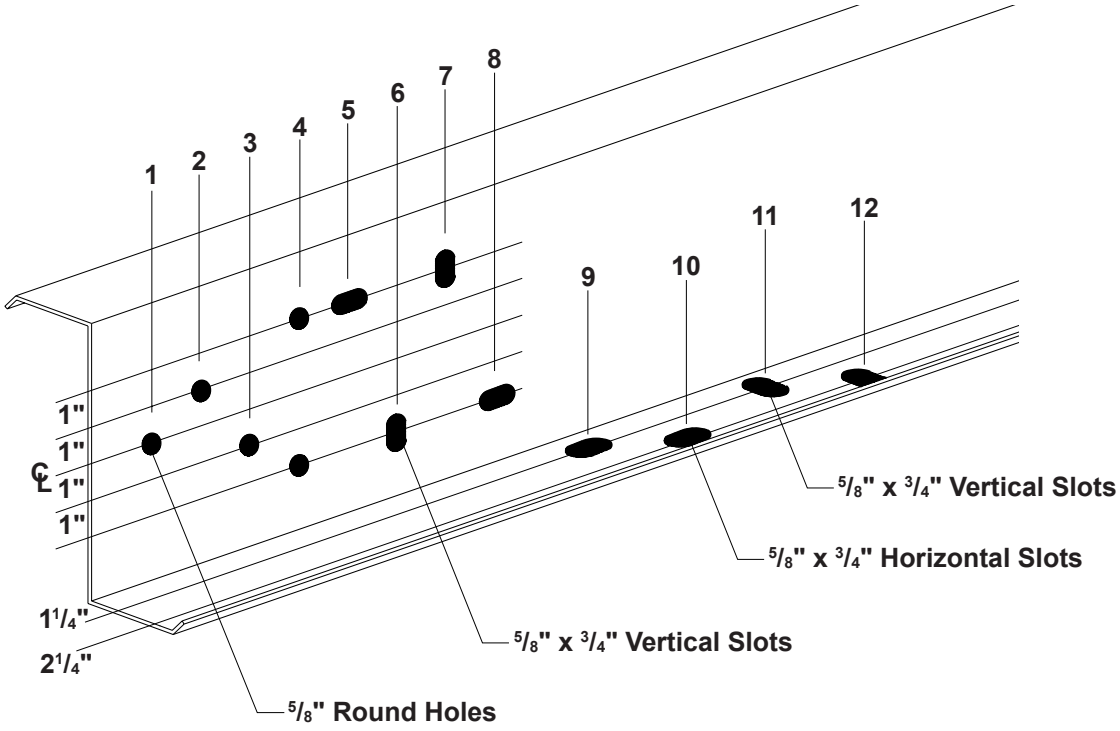
COLORADO LINE ONLY

Custom punching can be done for Standard Cees, Zees, and Eave Struts.

Web punching is available in 4" to 12" Cees, Zees, and Eave Struts.

Flange punching is available in 6" to 12" Cees, Zees, and Eave Struts only.

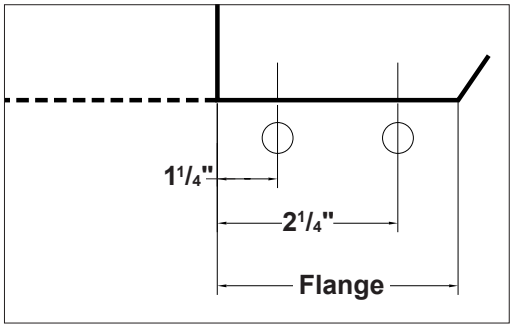
Any combination of punching (1-12) can be punched together.

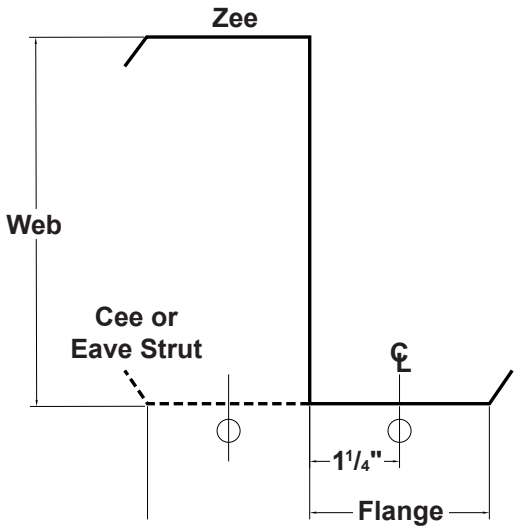


FLANGE PUNCHING

Flange punching can be punched in either "X", "Z", or Both dimensions from web.

Flange width must be 3" or 3½" for punching second slots.





TEXAS LINE ONLY

Custom punching can be done for Standard Cees, Zees, LGSI Zees, and Eave Struts.

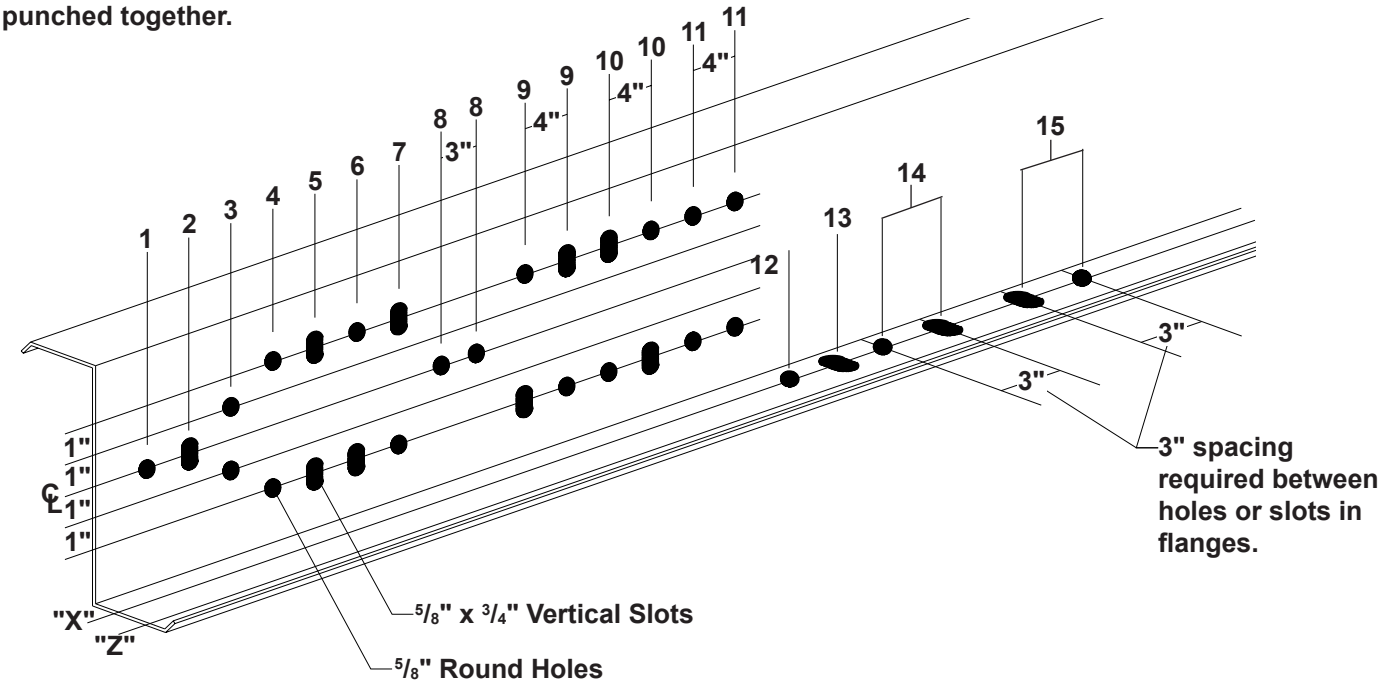
Web punching is available in 4" to 12" Cees, Zees, and Eave Struts. Punching is available only on center line of web for 4" member.

Flange punching is available in 6" to 12" Cees, Zees, and Eave Struts only.

Any combination of punching with the exception of (8) can be punched together.

Both holes or slots in 3, 4, 5, 6, 7, 8, 14, and 15 must be punched together.

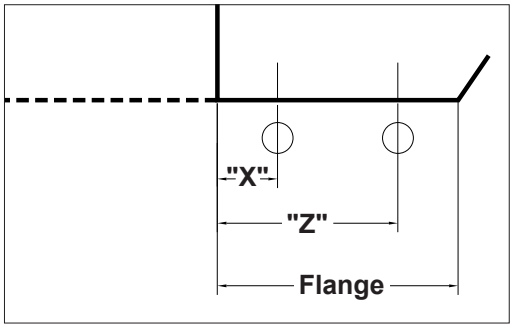
All four holes or slots in 9, 10, and 11 must be punched together.

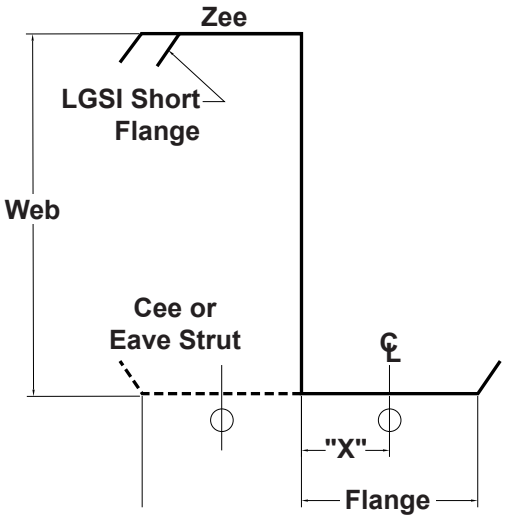


FLANGE PUNCHING

Flange punching can be punched in either "X" or "Z".
"X" must be $1^1/_4$", $1^3/_4$", or 2" from web.
"Z" must be $2^1/_4$", 3", or 4" from web.

Flange width must be $2^7/_8$", 3", $3^3/_8$", $3^1/_2$", $3^7/_8$", 4", or 5" for punching second holes or slots ("Z").





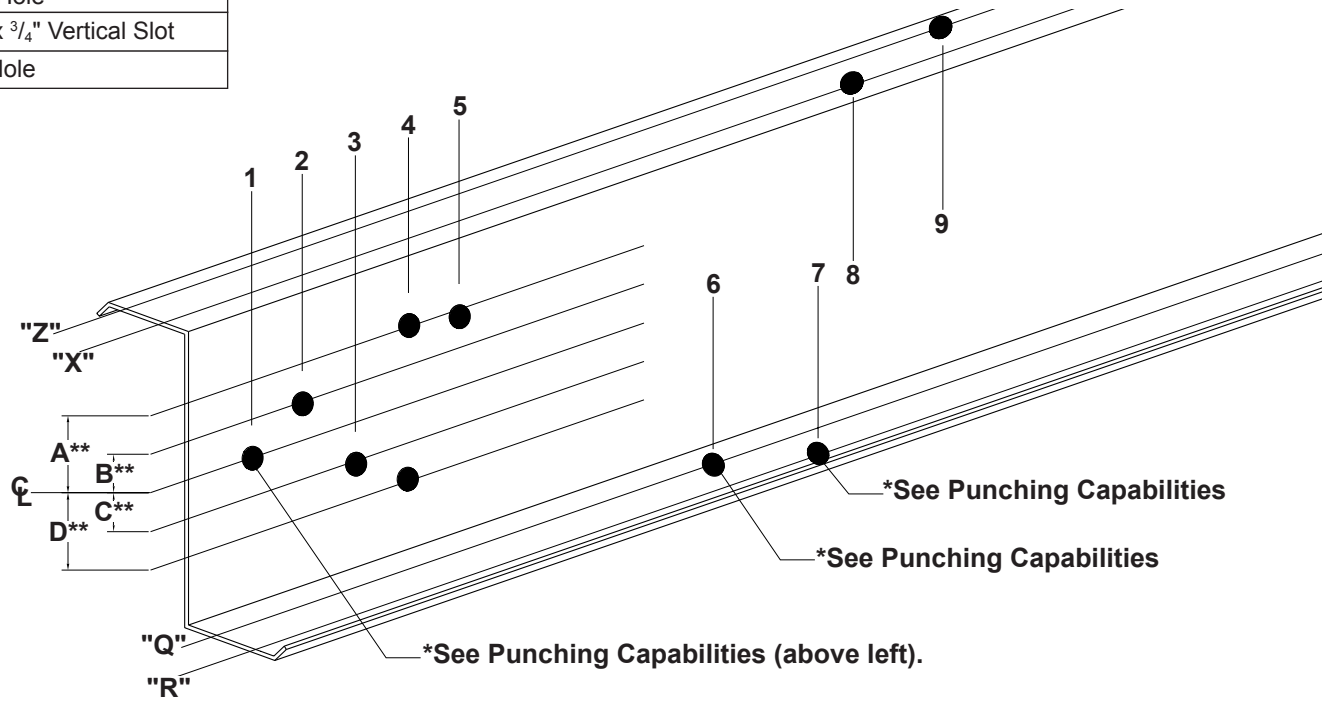
CALIFORNIA LINE ONLY

*Punching Capabilities
Description
5/8" Hole
5/8" x 3/4" Vertical Slot
5/8" x 3/4" Horizontal Slot
13/16" Hole
13/16" x 1 1/4" Vertical Slot
11/16" Hole
1 1/16" Hole
13/16" x 3/4" Vertical Slot
7/16" Hole

Custom punching can be done for Standard Cees, Zees, and LGSI Zees.

Web punching is available in 4" to 14" Cees and Zees.

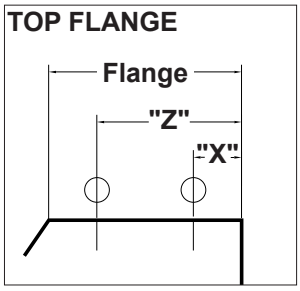
Flange punching is available in 4" to 14" Cees and Zees only.

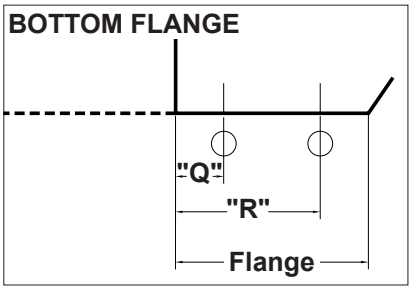


****Dimensions A, B, C, and D must be within web of purlin, please contact rep for more information (see page PGI-2-3).**

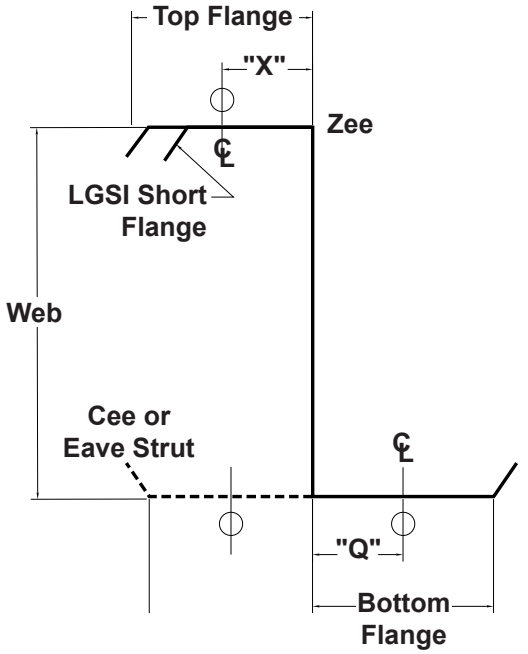
FLANGE PUNCHING

Flange punching can be punched in either "X", "Z", "Q", or "R".
"X" must be 3/4" from web and no more than 3/4" from flange.
"Z" must be 3/4" from web and no more than 3/4" from flange.
"Q" must be 3/4" from web and no more than 3/4" from flange.
"R" must be 3/4" from web and no more than 3/4" from flange.



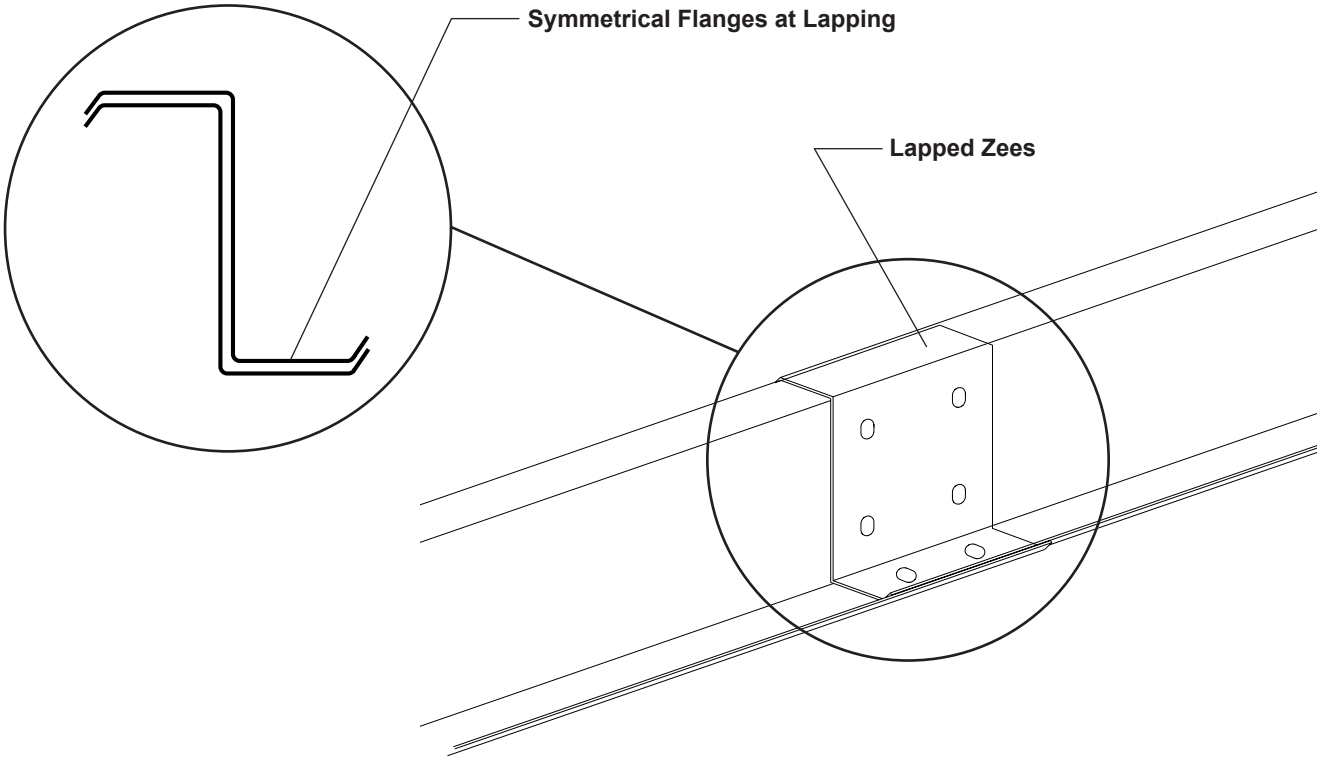


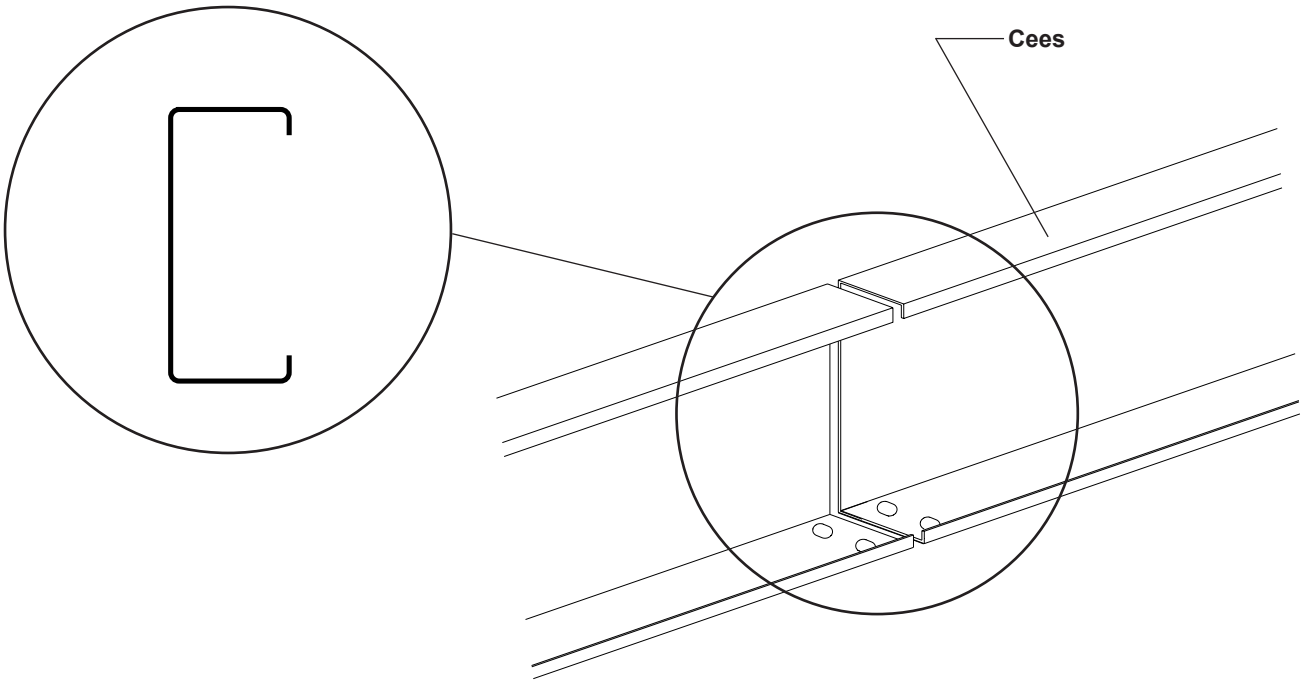
Flange width must be 2 7/8", 3", 3 3/8", 3 1/2", 3 7/8", or 4" for punching second holes or slots ("Z")"Top Flange" or ("R")"Bottom Flange".



GENERAL INFORMATION

Standard Secondary Framing (members with symmetrical flanges) are available in 4", 6", 8", 9", 10", and 12" web sizes and available in 2-1/2", 3", 3-1/2", 4", and 5" flange sizes. Metal Sales offers members in various gauges and finishes. In addition, members can be ordered to your desired length with standard or custom punching. For your specific loading requirements please reference Metal Sales' Technical Reference Product Manual.



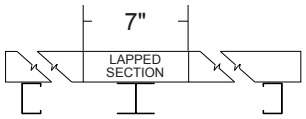


STANDARD ZEE LAP INFORMATION

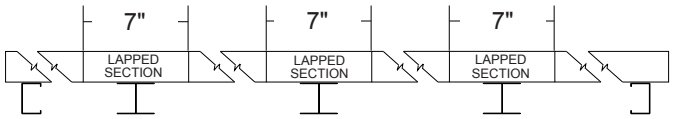
SHORT LAP

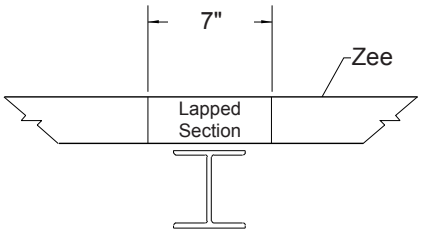
FOR STANDARD ZEES ONLY

TWO SPAN



3 OR MORE SPANS

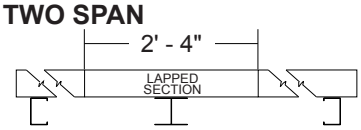




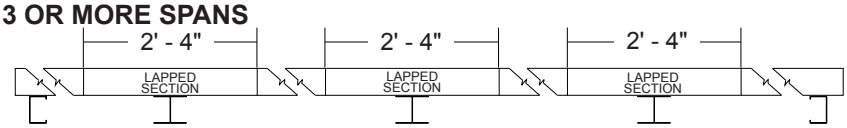
LONG LAP

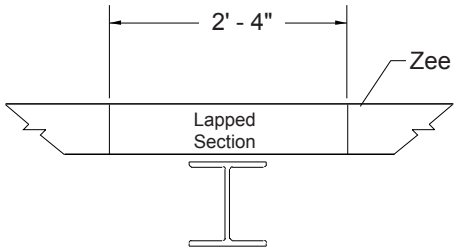
FOR STANDARD ZEES ONLY

TWO SPAN



3 OR MORE SPANS

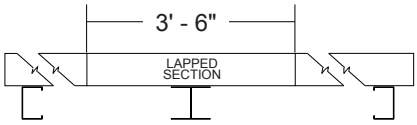




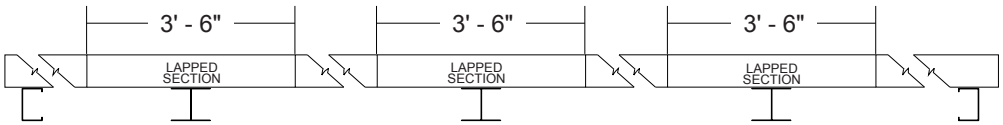
MAX LAP

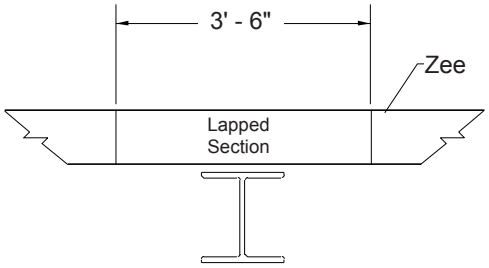
FOR STANDARD ZEES ONLY

TWO SPAN



3 OR MORE SPANS



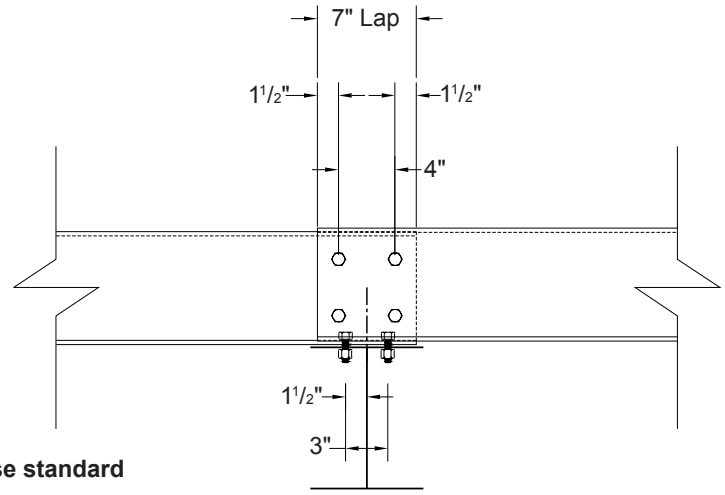


SIMPLE SPAN (NO LAP)

FOR STANDARD ZEES ONLY

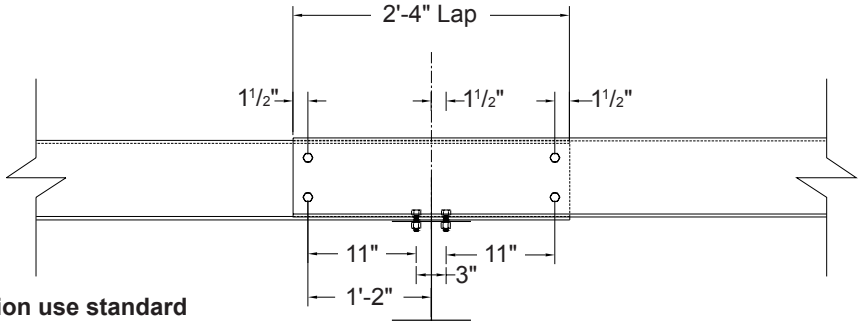
STANDARD ZEE LAP INFORMATION (CONT.)

STANDARD SHORT LAP — FOR STANDARD ZEES ONLY



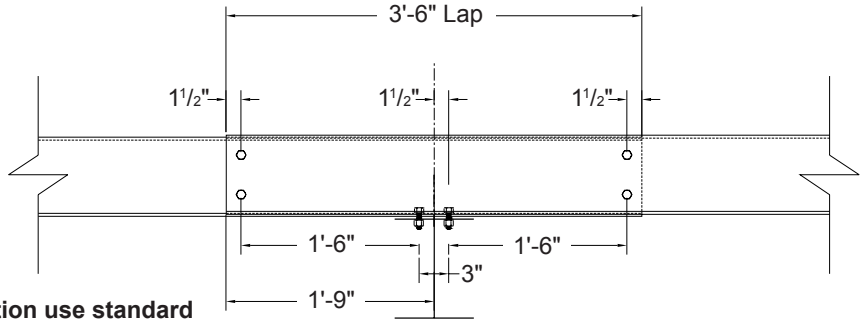
For required lap condition use standard punch pattern #1.

STANDARD LONG LAP — FOR STANDARD ZEES ONLY



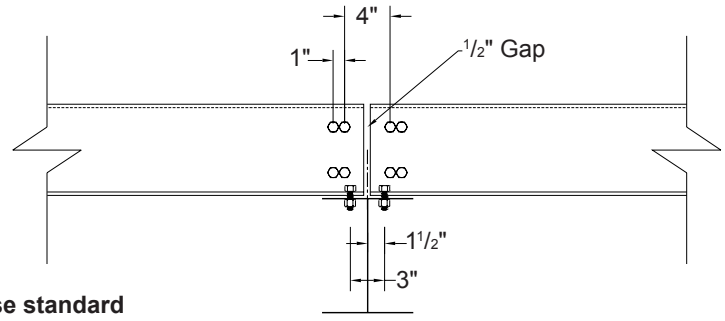
For required lap condition use standard punch pattern #2.

STANDARD MAX LAP — FOR STANDARD ZEES ONLY



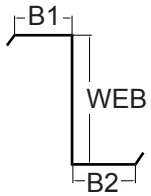
For required lap condition use standard punch pattern #3.

STANDARD (NO LAP) — FOR STANDARD ZEES ONLY



For required lap condition use standard punch pattern #C.

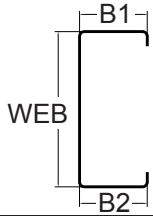
DIMENSIONS AND SECTION PROPERTIES OF STANDARD ZEES



Fy = 55.0 KSI
R = 0.125 In

				Full Section Properties							Effective Section Properties (Fully Braced) X-X Axis				
SIZE Web x Flange	**Thickness GA**	**in**	**Weight plf**	**A In^2**	**Ix-x in^4**	**rx in**	**Iy-y in^4**	**ry in**	**Cw in^6**	**J In^4**	**Ae in^2**	**Ixe in^4**	**Sxe in^3**	**Max K-ft**	**Vay Kips**
4" x 2½"	16	0.057	1.926	0.566	1.552	1.665	1.079	1.380	2.543	0.00061	0.381	1.358	0.621	1.704	3.665
	14	0.070	2.365	0.696	1.891	1.649	1.334	1.385	3.135	0.00114	0.515	1.704	0.793	2.176	5.367
6" x 2½"	16	0.057	2.314	0.680	3.910	2.397	1.079	1.259	6.298	0.00074	0.389	3.452	1.066	2.927	2.865
	14	0.070	2.841	0.836	4.778	2.391	1.334	1.263	7.767	0.00137	0.530	4.327	1.355	3.719	5.331
8" x 2½"	16	0.057	2.701	0.794	7.628	3.099	1.079	1.165	12.000	0.00086	0.393	6.611	1.512	4.150	2.102
	14	0.070	3.317	0.976	9.336	3.094	1.334	1.169	14.806	0.00159	0.538	8.509	2.015	5.529	3.907
	12	0.105	4.976	1.463	13.876	3.079	2.039	1.180	22.500	0.00538	1.055	13.598	3.354	9.204	12.437
8" x 3"	14	0.070	3.555	1.0456	10.437	3.160	2.111	1.420	22.366	0.00170	0.552	9.116	2.106	5.780	3.907
	12	0.105	5.333	1.568	15.513	3.145	3.219	1.433	33.920	0.00576	1.0541	14.430	3.447	9.461	12.437
8" x 3½"	14	0.070	3.793	1.116	11.537	3.216	3.139	1.678	31.893	0.00182	0.556	9.610	2.162	5.933	3.907
	12	0.105	5.690	1.673	17.149	3.201	4.780	1.690	48.284	0.00615	1.022	14.856	3.408	9.354	12.437
9" x 3"	14	0.070	3.793	1.116	13.725	3.508	2.111	1.376	29.162	0.00182	0.554	11.892	2.429	6.665	3.446
	12	0.105	5.690	1.673	20.427	3.494	3.219	1.387	44.244	0.00615	1.062	19.032	4.051	11.118	11.728
9" x 3½"	14	0.070	4.031	1.186	15.121	3.571	3.139	1.627	41.662	0.00194	0.559	12.341	2.431	6.671	3.446
	12	0.105	6.047	1.778	22.504	3.557	4.780	1.640	63.099	0.00654	1.030	19.582	4.012	11.012	11.728
10" x 2½"	14	0.070	3.793	1.116	15.846	3.796	1.334	1.094	24.348	0.00182	0.542	14.104	2.625	7.203	3.083
	12	0.105	5.690	1.673	23.607	3.756	2.039	1.104	37.031	0.00615	1.070	23.139	4.571	12.545	10.483
10" x 3"	14	0.070	4.031	1.186	17.571	3.850	2.111	1.334	36.946	0.00194	0.556	14.860	2.681	7.357	3.038
	12	0.105	6.047	1.778	26.177	3.837	3.220	1.346	56.074	0.00654	1.068	24.431	4.691	12.874	10.483
10" x 3½"															
	12	0.105	6.404	1.883	28.748	3.907	4.781	1.593	80.110	0.00692	1.036	25.123	4.653	12.770	10.483
10" x 4"	14	0.070	4.507	1.326	21.022	3.982	4.455	1.833	72.413	0.00217	0.562	15.884	2.686	7.372	3.083
	12	0.105	6.761	1.988	31.318	3.969	6.775	1.846	109.55	0.00731	1.102	27.143	4.995	13.708	10.483
12" x 2½"															
	12	0.105	6.404	1.883	36.685	4.413	2.039	1.041	55.469	0.00692	1.079	35.980	5.929	16.273	8.646
12" x 3"	14	0.070	4.507	1.326	27.077	4.520	2.111	1.262	55.520	0.00217	0.559	21.909	3.188	8.750	2.546
	12	0.105	6.761	1.988	40.399	4.508	3.220	1.273	84.313	0.00731	1.077	37.833	6.077	16.678	8.646
12" x 3½"															
	12	0.105	7.118	2.093	44.113	4.591	4.781	1.511	120.84	0.00769	1.045	38.860	6.042	16.583	8.646

DIMENSIONS AND SECTION PROPERTIES OF CEES



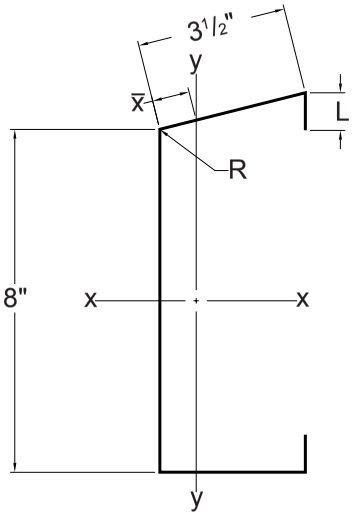
Fy = 55.0 KSI
R = 0.125 In

				Full Section Properties							Effective Section Properties (Fully Braced) X-X Axis				
SIZE Web x Flange	Thickness GA	Thickness in	Weight plf	A In^2	Ix-x in^4	rx in	Iy-y in^4	ry in	Cw in^6	J In^4	Ae in^2	Ixe in^4	Sxe in^3	Max K-ft	Vay Kips
4" x 2½"	16	0.057	1.926	0.566	1.509	1.633	0.515	0.953	2.0581	0.000613	0.4064	1.378	0.647	1.776	3.665
	14	0.070	2.365	0.696	1.835	1.624	0.630	0.352	2.564	0.001136	0.540	1.714	0.815	2.381	5.367
6" x 2½"	16	0.057	2.314	0.680	3.840	2.376	0.595	0.935	4.530	0.000739	0.415	3.521	1.111	3.049	2.865
	14	0.070	2.841	0.836	4.687	2.368	0.729	0.934	5.604	0.001365	0.555	4.378	1.395	3.829	5.331
8" x 2½"	16	0.057	2.701	0.794	7.532	3.079	0.652	0.906	9.328	0.00086	0.418	6.823	1.603	4.400	2.102
	14	0.070	3.317	0.976	9.210	3.072	0.800	0.906	10.270	0.00159	0.562	8.626	2.072	5.686	3.907
	12	0.105	4.9756	1.463	13.649	3.054	1.196	0.904	15.561	0.005378	1.104	13.649	3.412	9.365	12.437
8" x 3"	14	0.070	3.555	1.046	10.311	3.140	1.243	1.090	15.767	0.001708	0.583	9.306	2.186	6.000	3.907
	12	0.105	5.3329	1.569	15.286	3.122	1.863	1.090	23.945	0.005764	1.134	14.895	3.655	10.030	12.437
8" x 3½"	14	0.070	3.793	1.116	11.411	3.198	1.808	1.273	22.735	0.001822	0.594	9.880	2.266	6.219	3.907
	12	0.105	5.6899	1.673	16.922	3.179	2.712	1.273	34.569	0.006150	1.095	15.371	3.616	9.924	12.437
9" x 3"	14	0.070	3.7930	1.116	13.582	3.489	1.289	1.075	20.373	0.00182	0.585	12.256	2.562	7.031	3.446
	12	0.105	5.6896	1.6734	20.168	3.472	1.933	1.075	30.868	0.00615	1.142	19.649	4.288	11.769	11.728
9" x 3½"	14	0.070	4.0310	1.186	14.977	3.554	1.877	1.258	29.375	0.001937	0.596	12.825	2.594	7.119	3.446
	12	0.105	6.0466	1.778	22.245	3.537	2.818	1.259	44.561	0.006536	1.102	20.248	4.246	11.654	11.728
10" x 2½"	14	0.070	3.793	1.116	15.685	3.750	0.853	0.874	16.735	0.001822	0.566	14.436	2.739	7.516	3.083
	12	0.105	5.6896	1.673	23.316	3.733	1.277	0.874	25.256	0.006150	1.118	23.316	4.663	12.798	10.483
10" x 3"	14	0.070	4.031	1.186	17.410	3.832	1.330	1.059	25.701	0.001937	0.587	15.323	2.826	7.757	3.038
	12	0.105	6.0466	1.778	25.887	3.815	1.995	1.059	38.875	0.006536	1.148	25.221	4.958	13.606	10.483
10" x 3½"	12	0.105	6.404	1.883	28.457	3.887	2.912	1.243	56.122	0.00692	1.109	25.958	4.913	13.485	10.483
10" x 4"	14	0.070	4.507	1.326	20.862	3.967	2.692	1.425	51.030	0.00217	0.602	16.586	2.879	7.901	3.083
	12	0.105	6.7606	1.988	31.027	3.950	4.045	1.426	77.322	0.00731	1.161	27.800	5.203	14.280	10.483
12" x 2½"	12	0.105	6.404	1.883	36.331	4.392	1.340	0.843	37.837	0.00692	1.127	36.331	6.055	16.618	8.646
12" x 3"	14	0.070	4.507	1.326	26.881	4.503	1.398	1.027	38.619	0.00217	0.589	22.616	3.358	9.217	2.546
	12	0.105	6.7606	1.988	40.045	4.488	2.099	1.027	58.286	0.00731	1.157	39.025	6.401	17.567	8.646
12" x 3½"	12	0.105	7.118	2.093	43.759	4.572	3.072	1.211	84.177	0.00769	1.118	40.089	6.358	17.441	8.646

SIZE Web x Flange	Thickness GA	Thickness in	Weight plf	Full Section Properties A in^2	Ix-x in^4	rx in	Iy-y in^4	ry in	Cw in^6	J in^4	Effective Section Properties (Fully Braced) X-X Axis Ae in^2	Ixe in^4	Sxe in^3	Vay Kips	Effective Section Properties (Fully Braced) Bottom in compression X-X Axis Ixe in^4	Sxe in^3
6" x 3½"	14	0.070	3.3164	0.975	6.196	2.520	1.627	1.292	11.835	0.001593	0.583	5.218	1.468	5.331	5.323	1.584
8" x 5"																
	12	0.105	6.7600	1.988	22.911	3.395	6.466	1.804	77.903	0.007306	1.161	18.540	3.817	12.488	18.971	4.1434
10" x 4"	14	0.070	4.506	1.325	21.457	4.023	2.672	1.420	49.383	0.002165	0.600	16.907	2.802	3.083	17.031	2.92
	12	0.105	6.7601	1.988	31.929	4.000	4.014	1.421	74.857	0.007307	1.157	28.297	5.028	10.483	28.642	5.312
12" x 3½"	14	0.070	4.744	1.395	29.933	4.632	2.027	1.205	54.344	0.00228	0.597	23.937	3.347	2.546	24.062	3.456
	12	0.105	7.116	2.093	44.607	4.617	3.044	1.206	82.091	0.00769	1.112	40.502	6.171	8.644	40.893	6.4458

ALLOWABLE UNIFORM LIVE LOADS PLF[1.3.6.]

1-Span		Inward (Gravity / Deflection) Load[2.]								Outward Uplift (Stress) Load[3.]							
Size	Ga	14'	16'	18'	20'	22'	24'	26'	28'	14'	16'	18'	20'	22'	24'	26'	28'
6" x 3½"	14	147	126	99	81	67	56	48	41			93	68	51	39	31	25
8" x 5"																	
	12	366	320	259	209	173	145	124	107						145	114	91
10" x 4"	14	129	112	100	90	82	75	69	64								
	12	351	307	273	246	224	192	163	141							159	127
12" x 3½"	14	120	105	93	84	76	70	64	60								
	12	337	295	262	236	214	196	181	168								

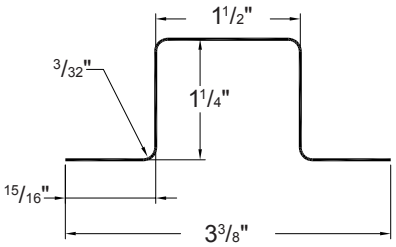


Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
2. Allowable loads have been calculated in accordance with 1996 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
4. Wind loads can be obtained by multiplying tabulated values by 1.33.
5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.
6. Slope 4.763° or 1:12.

SECTION PROPERTIES FOR HAT SECTIONS

Fy = 50 Ksi

1 1/4" Hat Section

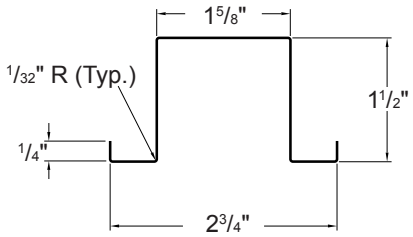


Section Properties									
Size	Thickness GA	Thickness in	Weight plf	Top in Compression			Bottom in Compression		
				Ix-x in⁴	Sx in³	Ma K-In	Ix-x in⁴	Sx in³	Ma K-In
1 1/4" x 3 3/8"	16	0.057	1.106	0.08077	0.12125	3.63	0.07782	0.11976	3.585

Allowable Uniform (Gravity/Deflection) Loads in Pounds Per Linear Foot			
Span in Feet	Single Span	Two Span	Three or More Spans
2	605	598	697
3	269/262	266	310
4	151/110	149	174
5	97/57	96	112
6	67/33	66	77/65
7	49/21	49	57/41

Fy = 50 Ksi

1 1/2" Hat Section



Section Properties									
Size	Thickness GA	Thickness in	Weight plf	Top in Compression			Bottom in Compression		
				Ix-x in⁴	Sx in³	Ma K-In	Ix-x in⁴	Sx in³	Ma K-In
1 1/2" x 2 3/4"	22	0.033	0.665	0.0627	0.08185	2.45	0.06807	0.0935	2.638

Allowable Uniform (Gravity/Deflection) Loads in Pounds Per Linear Foot			
Span in Feet	Single Span	Two Span	Three or More Spans
2	408	440	513
3	182	195	228
4	102/86	110	128
5	65/44	70	82
6	45/25	49	57/52
7	33/16	36	42/33

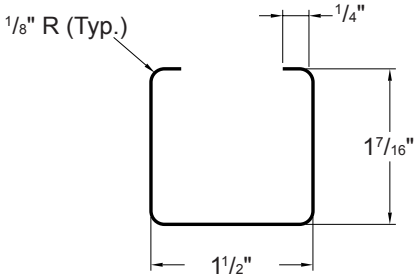
NOTES:

1. Hat Sections are attached adequately to the underlying support members (purlins or joists) so that the panels remain substantial in their original roll formed shape as they are being subjected to load.
2. The allowable spans are calculated for strength only. The Hat Section was not checked to determine if bearing controlled the allowable load.
3. Hat Sections are fully braced as per AISI Cold Formed Steel Design (1996 Edition with supplement 1) Manual requirements.
4. Section properties of the Hat Sections are based on the requirements of the AISI Cold Formed Steel Design (2001 Edition) Manual.
5. Self weight of the Hat Sections has to be deducted from the allowable inward load to arrive at the actual "live load" carrying capacity.
6. Deflection consideration is limited by a maximum deflection ratio of l/180 of span.

SECTION PROPERTIES FOR CHANNELS

Fy = 50 Ksi

1 1/2" Channel



Section Properties									
Size	Thickness GA	Thickness in	Weight plf	Top in Compression Ix-x in⁴	Top in Compression Sx in³	Top in Compression Ma K-In	Bottom in Compression Ix-x in⁴	Bottom in Compression Sx in³	Bottom in Compression Ma K-In
1 1/2" x 1 7/16"	18	0.050	0.762	0.0821	0.1042	3.12	0.0821	0.1042	3.12

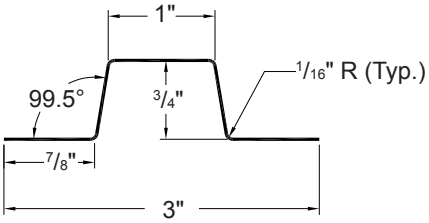
Allowable Uniform Axial Loads in Pounds			
Span in Feet	Ae	Axial Load (lbs)	M (k-ft)
2	0.2241	3.0178	0.260
3	0.2241	1.6500	0.250
4	0.2241	1.0770	0.231
5	0.2241	0.8000	0.204
6	0.2241	0.6470	0.170

1. Channels must be attached adequately to the underlying support members (purlins or joists) so that the panels remain substantial in their original roll formed shape as they are being subjected to load.
2. The allowable axial loads are calculated for strength only. The Channel was not checked to determine if bearing controlled the allowable load.
3. Channels are fully braced as per AISI Cold Formed Steel Design (2001 Edition with supplement 1) Manual requirements.
4. Section properties of the Channels are based on the requirements of the AISI Cold Formed Steel Design (2001 Edition) Manual.
5. Self weight of the Channels has to be deducted from the allowable inward load to arrive at the actual "live load" carrying capacity.

SECTION PROPERTIES FOR SUB-GIRTS

Fy = 50 Ksi

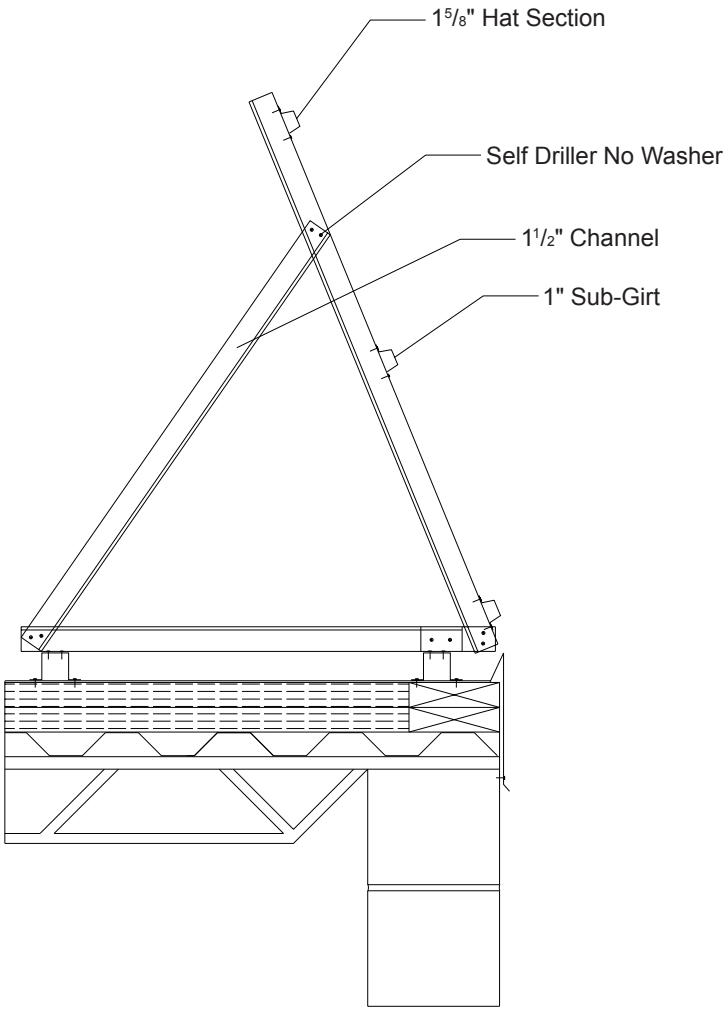
3/4" Sub-Girt



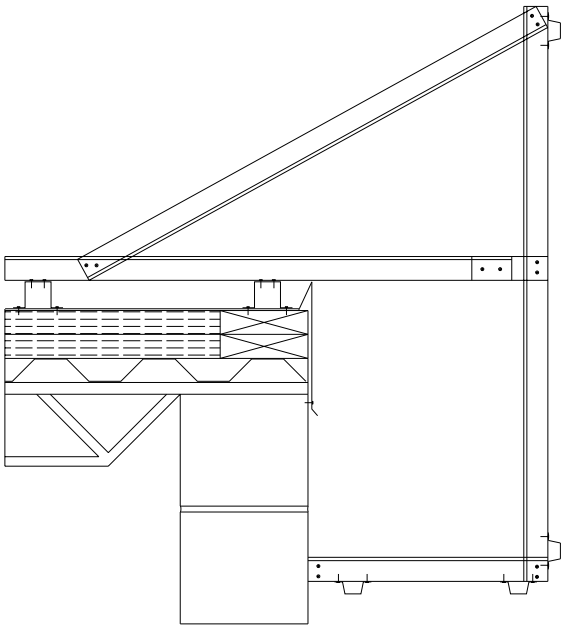
Section Properties									
Size	Thickness GA	Thickness in	Weight plf	Top in Compression Ix-x in⁴	Top in Compression Sx in³	Top in Compression Ma K-In	Bottom in Compression Ix-x in⁴	Bottom in Compression Sx in³	Bottom in Compression Ma K-In
3/4" x 3"	22	0.033	0.454	0.1238	0.0281	0.843	0.0100	0.0264	0.800
3/4" x 3"	18	0.050	0.677	0.0177	0.0402	1.204	0.0168	0.0400	1.185

Allowable Uniform (Gravity/Deflection) Loads in Pounds Per Linear Foot				
Ga	Span in Feet	Single Span	Two Span	Three or More Spans
22	2	140/135	132	154
	3	62/40	59	68
	4	35/17	33	38/33
	5	22/9	21/20	25/17
	6	16/5	15/11	17/10
18	2	201/194	197	230
	3	89/57	88	102
	4	50/24	49	58/48
	5	32/12	32/30	37/25
	6	22/7	22/17	26/14

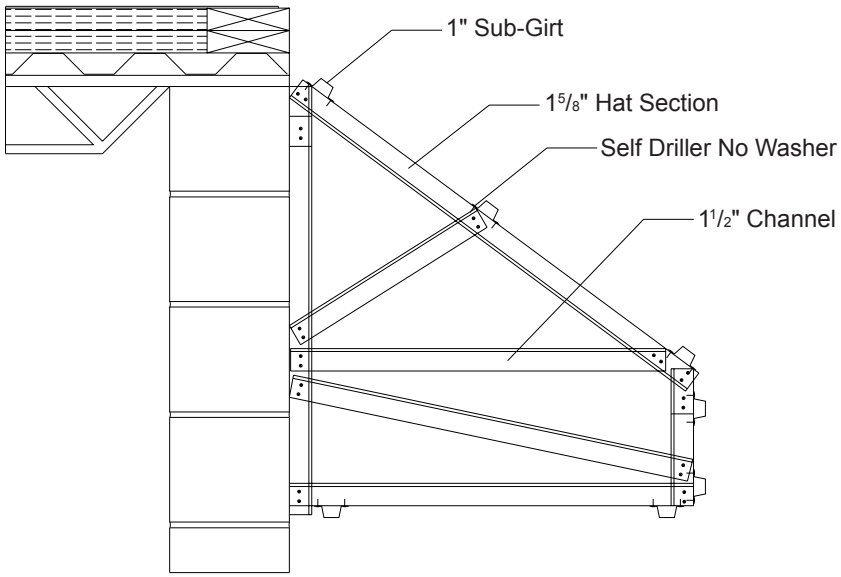
1. Sub-Girts must be attached adequately to the underlying support members (purlins or joists) so that the panels remain substantial in their original roll formed shape as they are being subjected to load.
2. The allowable spans are calculated for strength only. The Sub-Girt was not checked to determine if bearing controlled the allowable load.
3. Sub-Girts are fully braced as per AISI Cold Formed Steel Design (2001 Edition with supplement 1) Manual requirements.
4. Section properties of the 3/4" Sub-Girts are based on the requirements of the AISI Cold Formed Steel Design (2001 Edition) Manual.
5. Self weight of the Sub-Girts has to be deducted from the allowable inward load to arrive at the actual "live load" carrying capacity.
6. Deflection consideration is limited by a maximum deflection ratio of l/180 of span.



Wind/Equipment Screen



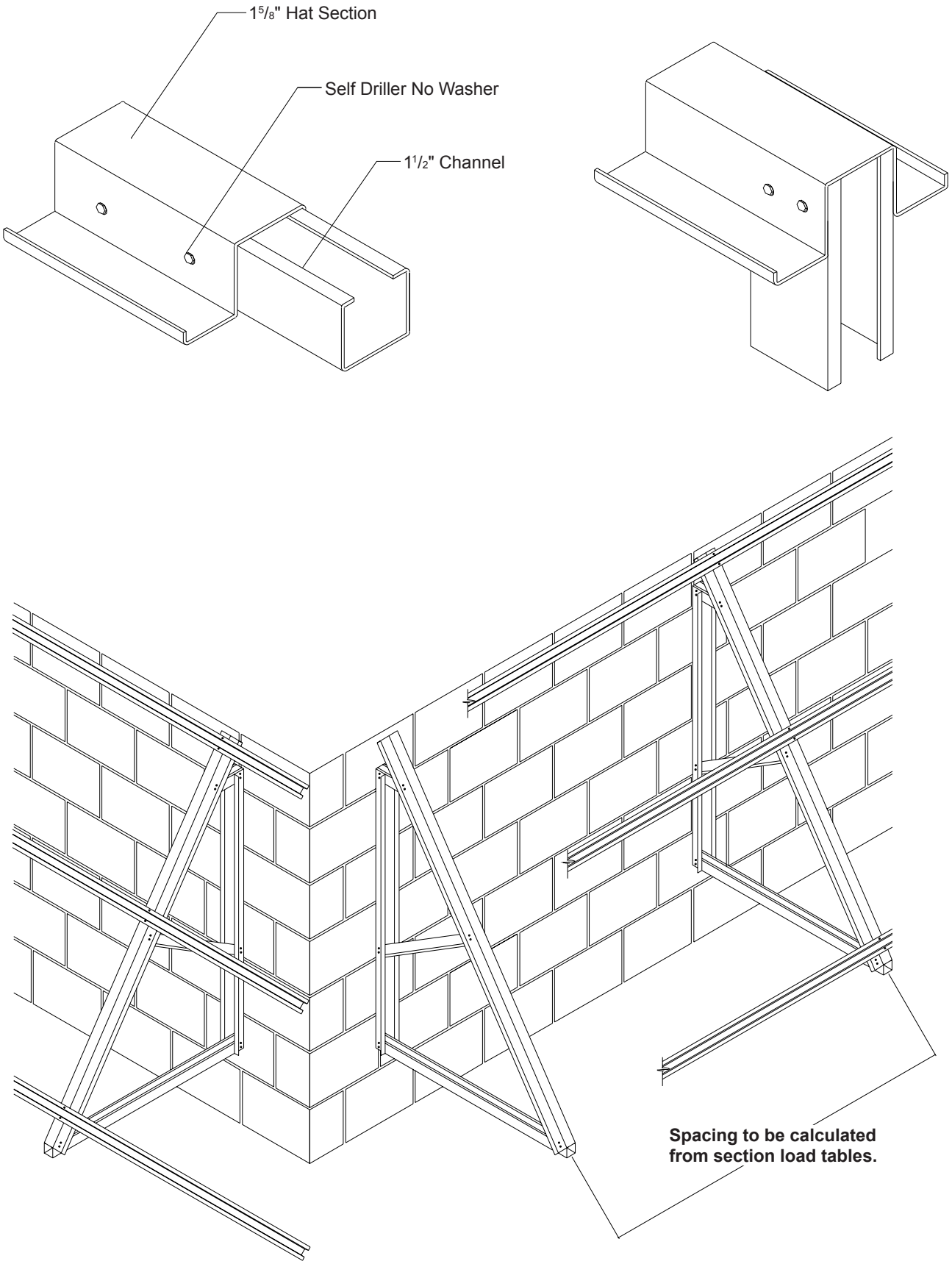
Vertical Mansard



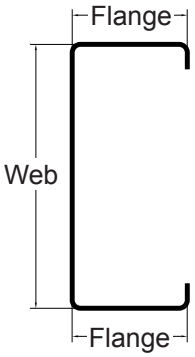
Mansard with Transition

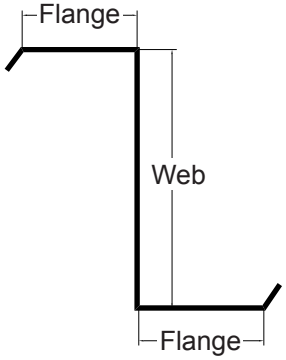
Note: Consult a Professional Engineer for specific design criteria.

Typical Hat and Channel Details



Note: Consult a Professional Engineer for specific design criteria.

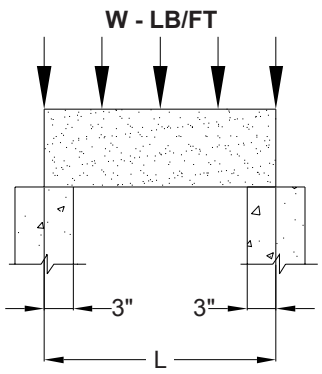




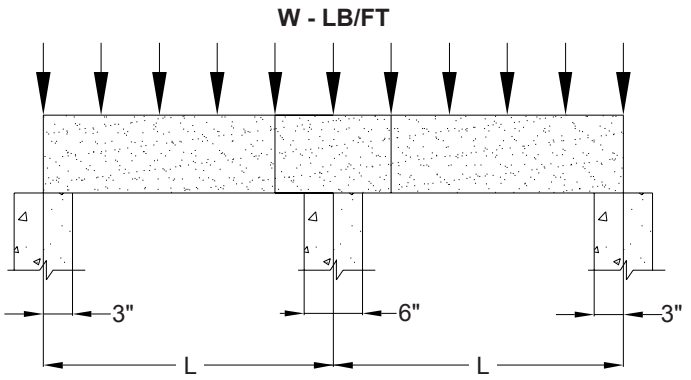
Web of C or Z	Ga.	End Bearing (kips) Length of Bearing					Interior Bearing (kips) Length of Bearing				
		2"	3"	4"	5"	6"	2"	3"	4"	5"	6"
4"	16	0.65	0.735	0.82	0.90	0.99	1.32	1.452	1.615	1.82	2.02
	14	1.09	1.21	1.33	1.45	1.57	2.037	2.21	2.38	2.61	2.87
6"	16	0.6	0.68	0.76	0.84	0.91	1.25	1.37	1.53	1.72	1.92
	14	1.03	1.14	1.25	1.37	1.48	1.95	2.11	2.28	2.50	2.75
8"	16	0.56	0.63	0.70	0.77	0.84	1.18	1.30	1.44	1.63	1.81
	14	0.96	1.07	1.18	1.28	1.89	2.87	2.02	2.18	2.39	2.63
	12	2.56	2.77	2.97	3.18	3.38	4.45	4.71	4.97	5.23	5.49
10"											
	14	0.9	1.0	1.1	1.20	1.30	1.78	1.93	2.08	2.28	2.51
	12	2.46	2.66	2.83	3.05	3.25	4.32	4.57	4.83	5.08	5.33

1. Above values have been calculated in accordance with 2001 AISI Specification, Eq. C3.4-1 (End Reaction) and Eq. C3.4-4 (Interior Reaction).

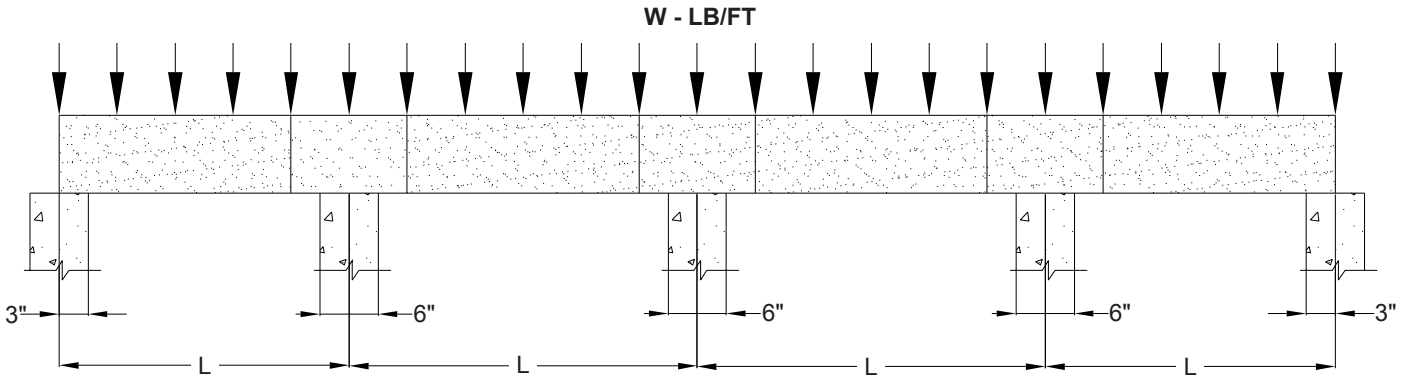
GENERAL NOTES



SIMPLE SPAN



TWO SPAN



THREE OR MORE SPANS

1. Tabulated values are allowable superimposed loads (PLF) on normal 1/2:12 to 4:12 roof pitches. Purlin weights have not been subtracted from them. They meet or exceed L/180 deflection criteria as indicated in the tables.
2. Weight of roofing material and other dead loads must be subtracted from tabulated values of purlins to determine net live load capabilities.
3. Allowable loads have been calculated in accordance with the 2001 edition of AISI Specifications. These values are valid only if the compression flange of the section is adequately supported laterally.
4. Consult with your engineer or architect for design applications such as very low or very high roof pitches (1/4:12, over 4:12), floating SSR, and for uplift (suction) criteria. Sag rods of angle bracing are usually required when members are not laterally supported by sheeting on the compression flange.
5. For continuous girts, wind load values can be obtained by multiplying tabulated values by 1.333.
6. End bearing capacity must be checked using actual load, bearing lengths, and the bearing chart.
7. For full member capacity, 1/2" diameter A-325 bolts are recommended for all lap bolts.
8. Web stiffeners can be provided by welding or bolting a clip plate to the support rafters and connecting the purlins through the web holes to the clip.
9. Tabulated values are based on a 6" bearing at interior supports. Reaction at end supports can be approximated by the following equations:

Simple Span	R = 0.50WL
2 Spans	R = 0.375WL
3 or More Spans	R = 0.40WL

10. Maximum live loads for deflection ratios other than L/180 can be calculated using the values tabulated as follows:
    For L/240: Max. LL (PLF) = (180/240) x (Tabulated Value).
    For L/360: Max. LL (PLF) = (180/360) x (Tabulated Value).

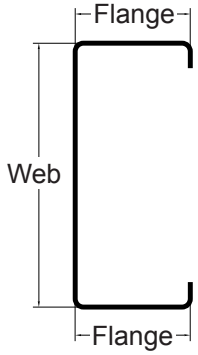
LOAD TABLES FOR STANDARD ZEES AND CEES (Symmetrical Flanges Only)

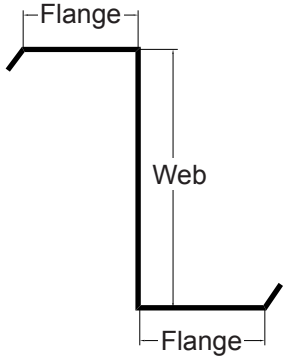
Section	Span in Feet	Simple Span (plf)			
		Stress Controlling		Defl. (L/180) Controlling	
		16 Ga	14 Ga	16 Ga	14 Ga
4" x 2½" Cee or Zee	8	213	272		
	9	168	215		
	10	136	174		149
	11	113	144	102	112
	12	95	121	79	86
	13	81	103	62	68
	14	70	89	50	54
	15	61	77	40	44
	16	53	68	33	36
	17	47	60	28	30
	18	42	54	23	26

Section	Span in Feet	Simple Span (plf)			
		Stress Controlling		Defl. (L/180) Controlling	
		16 Ga	14 Ga	16 Ga	14 Ga
6" x 2½" Cee or Zee	10	234	298		
	11	193	246		
	12	163	207		
	13	139	176		
	14	119	152		
	15	104	132	101	124
	16	91	116	84	102
	17	81	103	70	85
	18	72	92	59	72
	20	59	74	43	52

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
2. Allowable loads have been calculated in accordance with 2001 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
4. Wind loads can be obtained by multiplying tabulated values by 1.33.
5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.

LOAD TABLES FOR STANDARD ZEES AND CEES (Symmetrical Flanges Only)



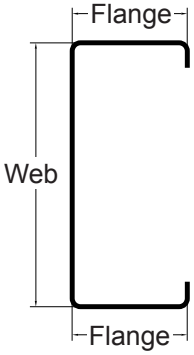


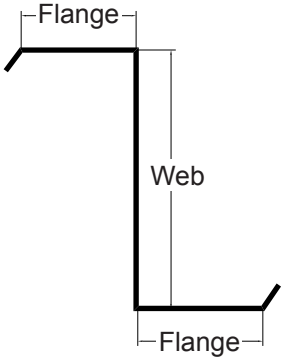
Section	Span in Feet	Simple Span (plf)					
		Stress Controlling			Defl. (L/180) Controlling		
		16 Ga	14 Ga	12 Ga	16 Ga	14 Ga	12 Ga
8" x 2½" Cee or Zee	15	148	197	327			
	16	130	173	288			
	17	115	153	255			247
	18	102	137	227			208
	19	92	123	204		119	177
	20	83	111	184		102	152
	21	75	100	167	72	88	131
	22	69	91	152	63	77	114
	23	63	84	139	55	67	180
	24	58	77	128	48	59	88
	25	53	71	118	43	52	78

Section	Span in Feet	Simple Span (plf)			
		Stress Controlling		Defl. (L/180) Controlling	
		14 Ga	12 Ga	14 Ga	12 Ga
8" x 3" Cee or Zee	15	206	336		
	16	181	296		
	17	160	262		257
	18	143	234	137	217
	19	128	210	116	184
	20	116	189	100	158
	21	105	172	86	136
	22	96	156	75	119
	23	87	143	66	104
	24	80	131	58	91
	25	74	121	51	81

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
2. Allowable loads have been calculated in accordance with 2001 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
4. Wind loads can be obtained by multiplying tabulated values by 1.33.
5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.

LOAD TABLES FOR STANDARD ZEES AND CEES (Symmetrical Flanges Only)





Section	Span in Feet	Simple Span (plf)			
		Stress Controlling		Defl. (L/180) Controlling	
		14 Ga	12 Ga	14 Ga	12 Ga
8" x 3½" Cee or Zee	15	211	333		
	16	185	292		
	17	164	259		
	18	146	231		
	19	131	207		
	20	119	187		
	21	108	170		162
	22	98	155	98	141
	23	90	141	83	123
	24	82	130	73	109
	25	76	120	65	96

Section	Span in Feet	Simple Span (plf)			
		Stress Controlling		Defl. (L/180) Controlling	
		14 Ga	12 Ga	14 Ga	12 Ga
9" x 3" Cee or Zee	14	272	454		
	16	208	347		
	18	165	275		
	20	133	222		
	22	110	184		168
	24	93	154	87	129
	26	79	132	68	102
	28	68	113	55	81
	30	59	99	45	66
	32	52	87	37	55
	34	46	77	31	46

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
2. Allowable loads have been calculated in accordance with 2001 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
4. Wind loads can be obtained by multiplying tabulated values by 1.33.
5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.

LOAD TABLES FOR STANDARD ZEES AND CEES (Symmetrical Flanges Only)

Section	Span in Feet	Simple Span (plf)			
		Stress Controlling		Defl. (L/180) Controlling	
		14 Ga	12 Ga	14 Ga	12 Ga
9" x 3½" Cee or Zee	14	272	449		
	16	208	344		
	18	165	272		
	20	133	220		
	22	101	182		
	24	93	153		143
	26	79	130	75	112
	28	68	112	60	90
	30	59	98	49	73
	32	52	86	40	60
	34	46	76	34	50

Section	Span in Feet	Simple Span (plf)			
		Stress Controlling		Defl. (L/180) Controlling	
		14 Ga	12 Ga	14 Ga	12 Ga
10" x 2½" Cee or Zee	14	294	512		
	16	225	392		
	18	178	310		
	20	144	251		
	22	119	207		194
	24	100	174		150
	26	85	148	79	118
	28	74	128	63	94
	30	64	112	51	77
	32	56	98	42	63
	34	50	87	35	53

Notes:
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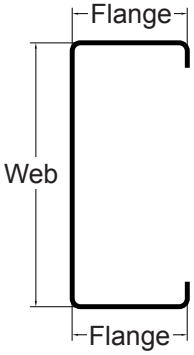
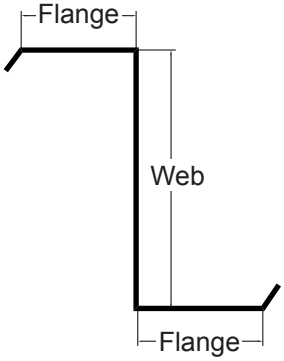
2. Allowable loads have been calculated in accordance with 2001 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
4. Wind loads can be obtained by multiplying tabulated values by 1.33.
5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.

LOAD TABLES FOR STANDARD ZEES AND CEES (Symmetrical Flanges Only)





Section	Span in Feet	Simple Span (plf)			
		Stress Controlling		Defl. (L/180) Controlling	
		14 Ga	12 Ga	14 Ga	12 Ga
10" x 3" Cee or Zee	14	300	525		
	16	230	402		
	18	182	318		
	20	147	257		
	22	122	213		
	24	102	179		166
	26	87	152		130
	28	75	131	70	104
	30	65	114	57	85
	32	57	101	47	70
	34	51	89	39	58

Section	Span in Feet	Simple Span (plf)	
		Stress Controlling	Defl. (L/180) Controlling
		12 Ga	12 Ga
12" x 2½" Cee or Zee	14	664	
	16	509	
	18	402	
	20	325	
	22	269	
	24	226	
	26	193	183
	28	166	146
	30	145	119
	32	127	98
	34	113	82

Notes:
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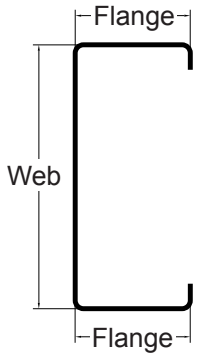
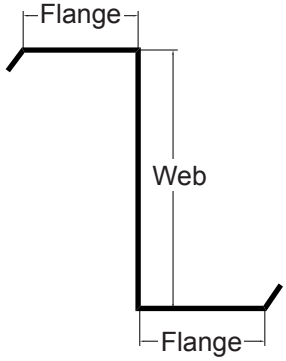
3. Bearing must be checked using actual bearing length and loads.
4. Wind loads can be obtained by multiplying tabulated values by 1.33.
5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.

LOAD TABLES FOR STANDARD ZEES AND CEES (Symmetrical Flanges Only)





Section	Span in Feet	Simple Span (plf)			
		Stress Controlling		Defl. (L/180) Controlling	
		14 Ga	12 Ga	14 Ga	12 Ga
12" x 3" Cee or Zee	14	357	680		
	16	273	521		
	18	216	411		
	20	175	333		
	22	144	275		
	24	121	231		
	26	103	197		
	28	89	170		160
	30	77	148		130
	32	68	130		107
	34	60	115		89

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
2. Allowable loads have been calculated in accordance with 2001 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
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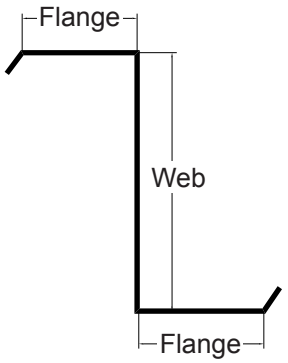
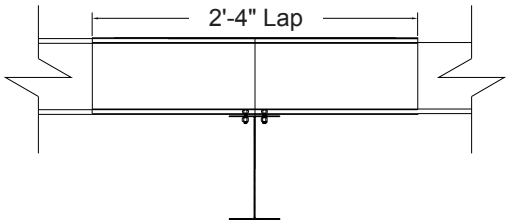
LOAD TABLES FOR STANDARD ZEES (Symmetrical Flanges Only)





Section	Span in Feet	Long Lap - 2 Spans				Long Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		16 Ga	14 Ga	16 Ga	14 Ga	16 Ga	14 Ga	16 Ga	14 Ga
Z- 4" x 2½"	12	139	177			155	198		194
	14	96	122			113	144	99	121
	16	70	90			86	110	66	81
	18	53	68			68	86	46	56

Section	Span in Feet	Long Lap - 2 Spans				Long Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		16 Ga	14 Ga	16 Ga	14 Ga	16 Ga	14 Ga	16 Ga	14 Ga
Z- 6" x 2½"	14	153	202			195	240		
	16	115	149			145	189		
	18	88	114			112	146		142
	20	70	91			89	116	84	102

Section	Span in Feet	Long Lap - 2 Spans						Long Lap - 3 Spans					
		Stress Controlling, plf			Defl. (L/180) Controlling, plf			Stress Controlling, plf			Defl. (L/180) Controlling, plf		
		16 Ga	14 Ga	12 Ga	16 Ga	14 Ga	12 Ga	16 Ga	14 Ga	12 Ga	16 Ga	14 Ga	12 Ga
Z- 8" x 2½"	16	139	205	370				174	261	436			
	18	110	160	286				140	203	360			
	20	90	128	226				115	163	285			
	22	74	105	184				95	134	232			225
	24	63	87	151				80	111	192			170
	25	58	80	139				73	102	175			152
	26	53	74	128				68	94	162		90	135
	28	46	64	109				58	80	123		72	120
	30	40	55	94				50	69	118	48	63	93

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
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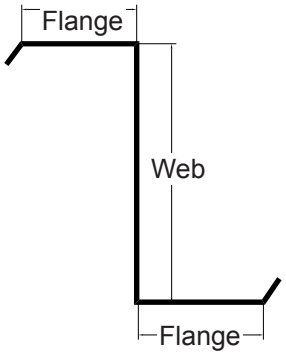
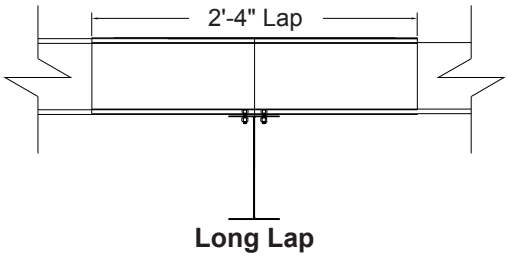
3. Bearing must be checked using actual bearing length and loads.
4. Wind loads can be obtained by multiplying tabulated values by 1.33.
5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.

LOAD TABLES FOR STANDARD ZEES (Symmetrical Flanges Only)





Section	Span in Feet	Long Lap - 2 Spans				Long Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z- 8" x 3"	18	165	292			211	370		
	20	133	231			169	293		
	22	109	188			138	238		
	24	91	155			115	196		193
	25	83	142			106	180		171
	26	77	131			97	165		146
	28	66	111			83	141	81	121
	30	57	96			72	121	66	98

Section	Span in Feet	Long Lap - 2 Spans				Long Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z- 8" x 3½"	18	169	289			215	367		
	20	136	229			173	290		
	22	112	186			142	235		
	24	93	154			118	194		
	25	86	141			108	178		
	26	79	129			100	163		
	28	68	110			85	139		134
	30	58	95			74	120	73	108

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
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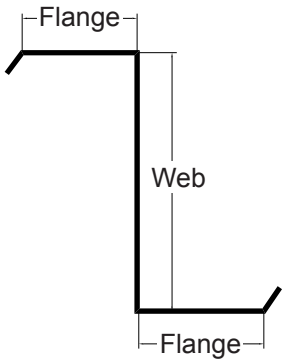
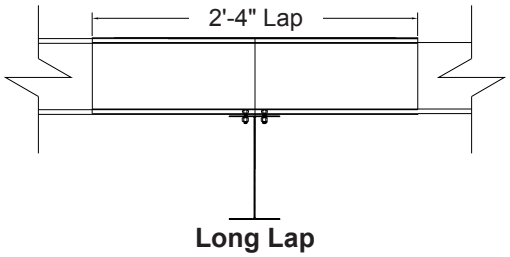
LOAD TABLES FOR STANDARD ZEES (Symmetrical Flanges Only)





Section	Span in Feet	Long Lap - 2 Spans				Long Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z- 9" x 3"	18	179	338			226	429		
	20	146	268			185	341		
	22	120	218			153	277		
	24	101	181			128	229		
	25	93	166			118	210		
	26	86	152			109	193		
	28	74	130			94	164		159
	30	64	112			81	142		129

Section	Span in Feet	Long Lap - 2 Spans				Long Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z- 9" x 3½"	18	179	335			226	425		
	20	146	266			185	337		
	22	120	216			153	274		
	24	101	179			128	227		
	25	93	164			118	208		
	26	86	151			109	191		
	28	74	129			94	163		
	30	64	111			81	140		

Notes:
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2. Allowable loads have been calculated in accordance with 1996 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
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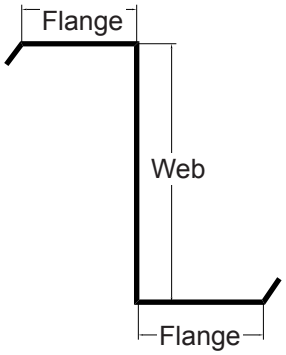
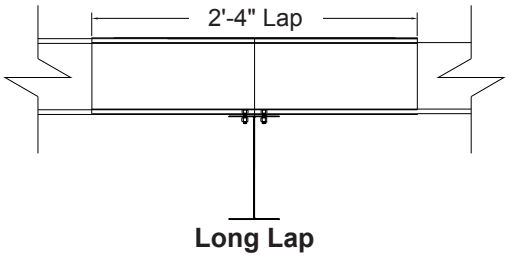
LOAD TABLES FOR STANDARD ZEES (Symmetrical Flanges Only)





Section	Span in Feet	Long Lap - 2 Spans				Long Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z-10" x 2½"	20	149	297			186	377		
	22	124	242			156	307		
	24	105	202			132	255		
	25	97	185			122	234		
	26	90	170			113	215		
	28	78	145			98	184		
	30	68	126			86	159		151
	32	59	110			75	138		123

Section	Span in Feet	Long Lap - 2 Spans				Long Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z-10" x 3"	20	152	300			188	388		
	22	128	245			158	318		
	24	107	207			134	262		
	25	100	190			125	240		
	26	92	175			116	221		
	28	79	149			101	189		
	30	69	129			88	162		
	32	61	113			77	142		136

Notes:
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3. Bearing must be checked using actual bearing length and loads.
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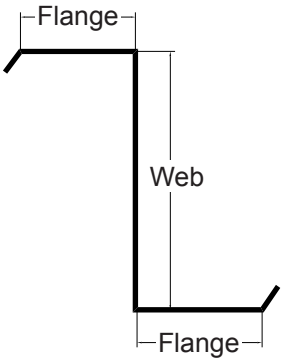
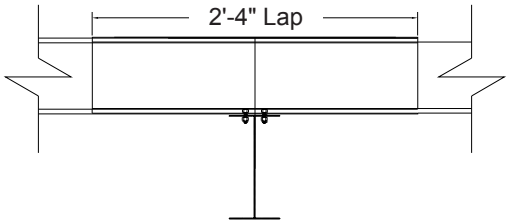
LOAD TABLES FOR STANDARD ZEES (Symmetrical Flanges Only)





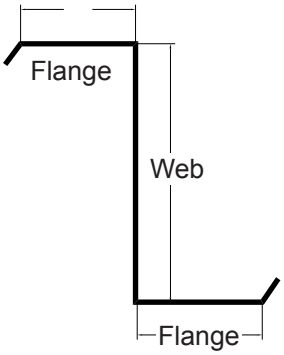
Long Lap

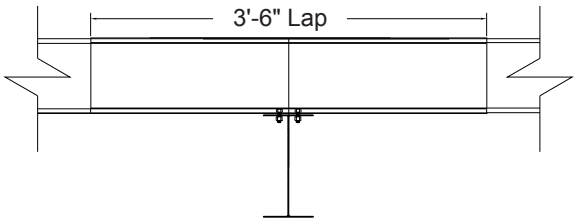
Section	Span in Feet	Long Lap - 2 Spans		Long Lap - 3 Spans	
		Stress Controlling, plf	Defl. (L/180) Controlling, plf	Stress Controlling, plf	Defl. (L/180) Controlling, plf
		12 Ga		12 Ga	
Z- 12" x 2½"	20	358		456	
	22	296		376	
	24	248		315	
	25	229		290	
	26	211		268	
	28	182		230	
	30	158		200	
	32	138		175	

Section	Span in Feet	Long Lap - 2 Spans				Long Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z- 12" x 3"	20	155	365			184	463		
	22	132	302			158	384		
	24	113	254			137	322		
	25	106	234			127	296		
	26	98	216			119	273		
	28	86	186			105	235		
	30	76	161			93	204		
	32	67	141			83	179		

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
2. Allowable loads have been calculated in accordance with 1996 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
4. Wind loads can be obtained by multiplying tabulated values by 1.33.
5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.

LOAD TABLES FOR STANDARD ZEES (Symmetrical Flanges Only)





Max Lap

Section	Span in Feet	Max Lap - 2 Spans				Max Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		16 Ga	14 Ga	16 Ga	14 Ga	16 Ga	14 Ga	16 Ga	14 Ga
Z-4" x 2½"	10	226	288			229	292		
	12	160	204			157	201		198
	14	119	152			115	147	101	124
	16	84	107			87	112	66	82
	18	62	80			69	88	47	57
	20	48	61	47	57	55	71	34	41
	22	38	44	35	41	45	58	25	31

Section	Span in Feet	Max Lap - 2 Spans				Max Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		16 Ga	14 Ga	16 Ga	14 Ga	16 Ga	14 Ga	16 Ga	14 Ga
Z-6" x 2½"	14	185	250			190	250		
	16	135	178			152	193		
	18	103	135			115	150		140
	20	80	104			95	122	85	105
	22	64	83			79	100	63	78
	24	53	68			66	83	48	60
	25	48	62			61	77	43	53

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
2. Allowable loads have been calculated in accordance with 1996 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
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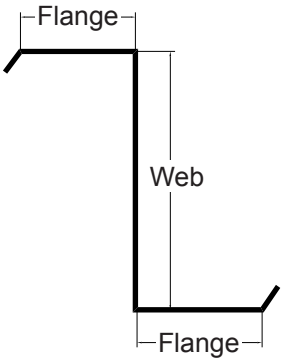
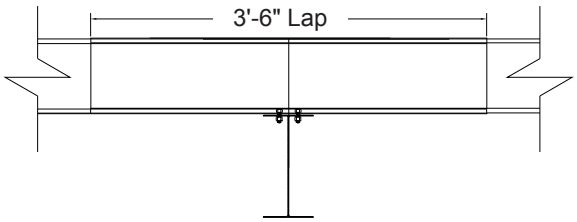
LOAD TABLES FOR STANDARD ZEES (Symmetrical Flanges Only)





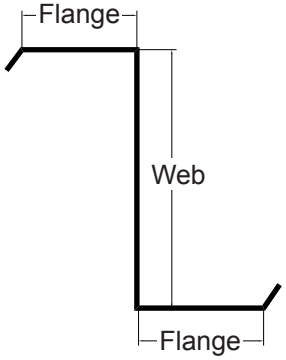
Max Lap

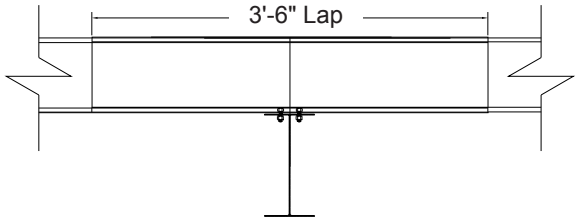
Section	Span in Feet	Max Lap - 2 Spans						Max Lap - 3 Spans					
		Stress Controlling, plf			Defl. (L/180) Controlling, plf			Stress Controlling, plf			Defl. (L/180) Controlling, plf		
		16 Ga	14 Ga	12 Ga	16 Ga	14 Ga	12 Ga	16 Ga	14 Ga	12 Ga	16 Ga	14 Ga	12 Ga
Z- 8" x 2½"	16	156	240	435				205	286	470			
	18	126	183	330				161	225	370			
	20	101	145	250				130	180	301			
	22	83	118	204				106	147	246			226
	24	69	97	166				88	123	208		118	176
	25	63	88	153				81	113	190		103	154
	26	59	81	139				74	103	176		92	137
	28	50	67	118				64	88	151	59	72	110
	30	43	59	102				54	75	128	48	59	89

Section	Span in Feet	Max Lap - 2 Spans				Max Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z- 8" x 3"	18	189	339			234	383		
	20	150	264			188	309		
	22	121	211			155	252		
	24	100	172			128	213		197
	25	92	157			117	196		174
	26	84	144			107	181	103	154
	28	72	121			91	154	82	123
	30	62	104			78	132	67	99

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
2. Allowable loads have been calculated in accordance with 1996 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
4. Wind loads can be obtained by multiplying tabulated values by 1.33.
5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.

LOAD TABLES FOR STANDARD ZEES (Symmetrical Flanges Only)





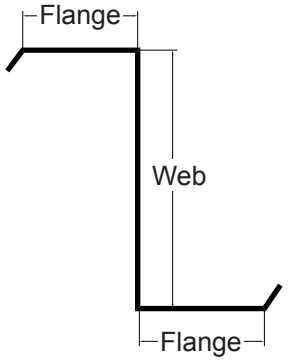
Max Lap

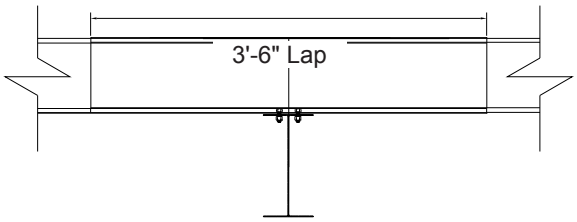
Section	Span in Feet	Max Lap - 2 Spans				Max Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z- 8" x 3½"	16	250	448			300	480		
	18	194	337			240	380		
	20	154	260			193	300		
	22	124	210			158	250		
	24	102	170			130	212		
	25	94	155			120	194		190
	26	86	142			110	180		168
	28	74	120			93	152	90	135
	30	63	102			81	130	73	110

Section	Span in Feet	Max Lap - 2 Spans				Max Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z- 9" x 3"	18	202	391			261	449		
	20	163	305			209	363		
	22	133	245			171	299		
	24	111	201			142	250		
	25	102	183			130	230		229
	26	94	167			119	212		203
	28	80	142			102	180		162
	30	69	122			88	154		131
	32	60	105			77	133	72	108

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
2. Allowable loads have been calculated in accordance with 1996 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
4. Wind loads can be obtained by multiplying tabulated values by 1.33.
5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.

LOAD TABLES FOR STANDARD ZEES (Symmetrical Flanges Only)





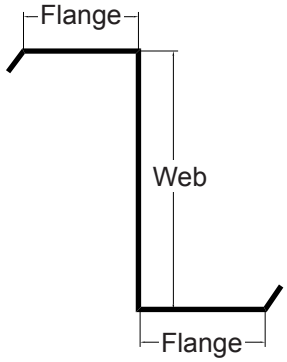
Max Lap

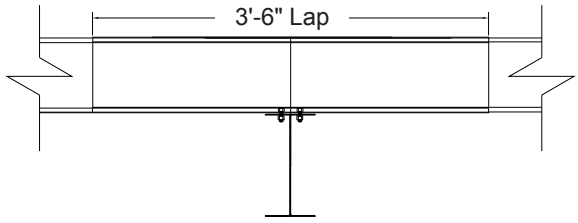
Section	Span in Feet	Max Lap - 2 Spans				Max Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z- 9" x 3½"	18	203	387			261	445		
	20	163	303			209	359		
	22	133	243			171	296		
	24	111	199			142	248		
	25	102	181			130	228		
	26	94	166			120	210		
	28	80	140			102	178		
	30	69	120			88	152		144

Section	Span in Feet	Max Lap - 2 Spans				Max Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z- 10" x 2½"	20	166	336			211	410		
	22	136	271			176	337		
	24	115	223			147	282		
	25	106	204			135	258		
	26	98	187			125	237		235
	28	84	158			107	201		187
	30	73	136			93	172		152
	32	64	118			81	149		124

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
2. Allowable loads have been calculated in accordance with 2001 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
4. Wind loads can be obtained by multiplying tabulated values by 1.33.
5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.

LOAD TABLES FOR STANDARD ZEES (Symmetrical Flanges Only)





Max Lap

Section	Span in Feet	Max Lap - 2 Spans				Max Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z- 10" x 3"	18	205	435			260	520		
	20	168	345			213	420		
	22	140	242			176	350		
	24	117	228			150	290		
	25	106	208			138	265		
	26	100	190			127	245		
	28	86	162			108	205		

Section	Span in Feet	Max Lap - 2 Spans		Max Lap - 3 Spans	
		Stress Controlling, plf	Defl. (L/180) Controlling, plf	Stress Controlling, plf	Defl. (L/180) Controlling, plf
		12 Ga		12 Ga	
Z- 12" x 2½"	20	401		514	
	22	328		419	
	24	273		348	
	25	250		319	
	26	231		293	
	28	197		250	
	30	170		216	
	32	148		188	

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
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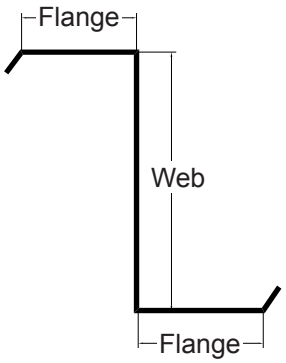
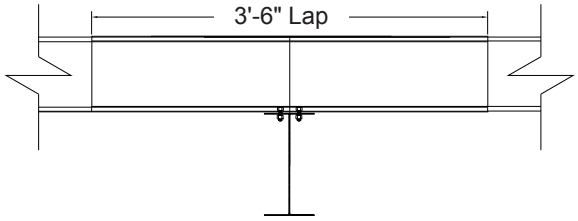
LOAD TABLES FOR STANDARD ZEES (Symmetrical Flanges Only)





Max Lap

Section	Span in Feet	Max Lap - 2 Spans				Max Lap - 3 Spans			
		Stress Controlling, plf		Defl. (L/180) Controlling, plf		Stress Controlling, plf		Defl. (L/180) Controlling, plf	
		14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga	14 Ga	12 Ga
Z-12" x 3"	20	170	410			200	520		
	22	143	335			175	430		
	24	123	280			150	350		
	25	114	255			140	325		
	26	105	235			131	300		
	28	93	202			115	260		
	30	81	194			100	220		

Notes:
1. Tabulated values are allowable superimposed loads. Purlin and all other load weights have not been subtracted from them.
2. Allowable loads have been calculated in accordance with 2001 AISI Specifications.
3. Bearing must be checked using actual bearing length and loads.
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5. Tabulated values are valid only if the compression flange of the section is adequately supported laterally.

The 2001 revision of the AISI specifications made it necessary for manufacturers of light gauge structural sections to make substantial revisions to their design properties, load table, and other published data.

In an effort to answer the requirements mandated by this code revision, several manufacturers formed the Light Gauge Structural Institute in 1989. The Light Gauge Structural Institute is a nonprofit organization comprised of member companies who are in the business of manufacturing light gauge cold-formed sections. This manual is the result of an effort to develop uniform information about light gauge structural sections.

Companies that are members of the Light Gauge Structural Institute conform to a set of bylaws and standards that ensure their compliance with the various policies set forth by the institute including, but not limited to, annual unannounced inspections that allow members to receive certification of compliance.

The AISI code revisions created a need to investigate light gauge structural sections in a manner not previously addressed. As a part of this investigation, sections with unequal flanges were considered; and as a result of considerable design analysis and study, it became obvious that unequal flanges offered considerable advantages, particularly due to the number of applications that were lapped.

Metal Sales also manufactures other light gauge structural sections that are not included in the scope of this manual. Metal Sales will provide information for these shapes unique to their operation. However, a requirement of the Light Gauge Structural Institute is that these shapes be designed in the same manner and using the same criteria applied to the sections in the Light Gauge Structural Steel Framing System Design Handbook.

Section properties, section allowables, load tables and sample calculations are available in the "Light Gauge Structural Steel Framing System Design Handbook". Please refer to the latest edition of this handbook when inquiring about Light Gauge Structural Institute criteria.

Light Gage Structural Steel

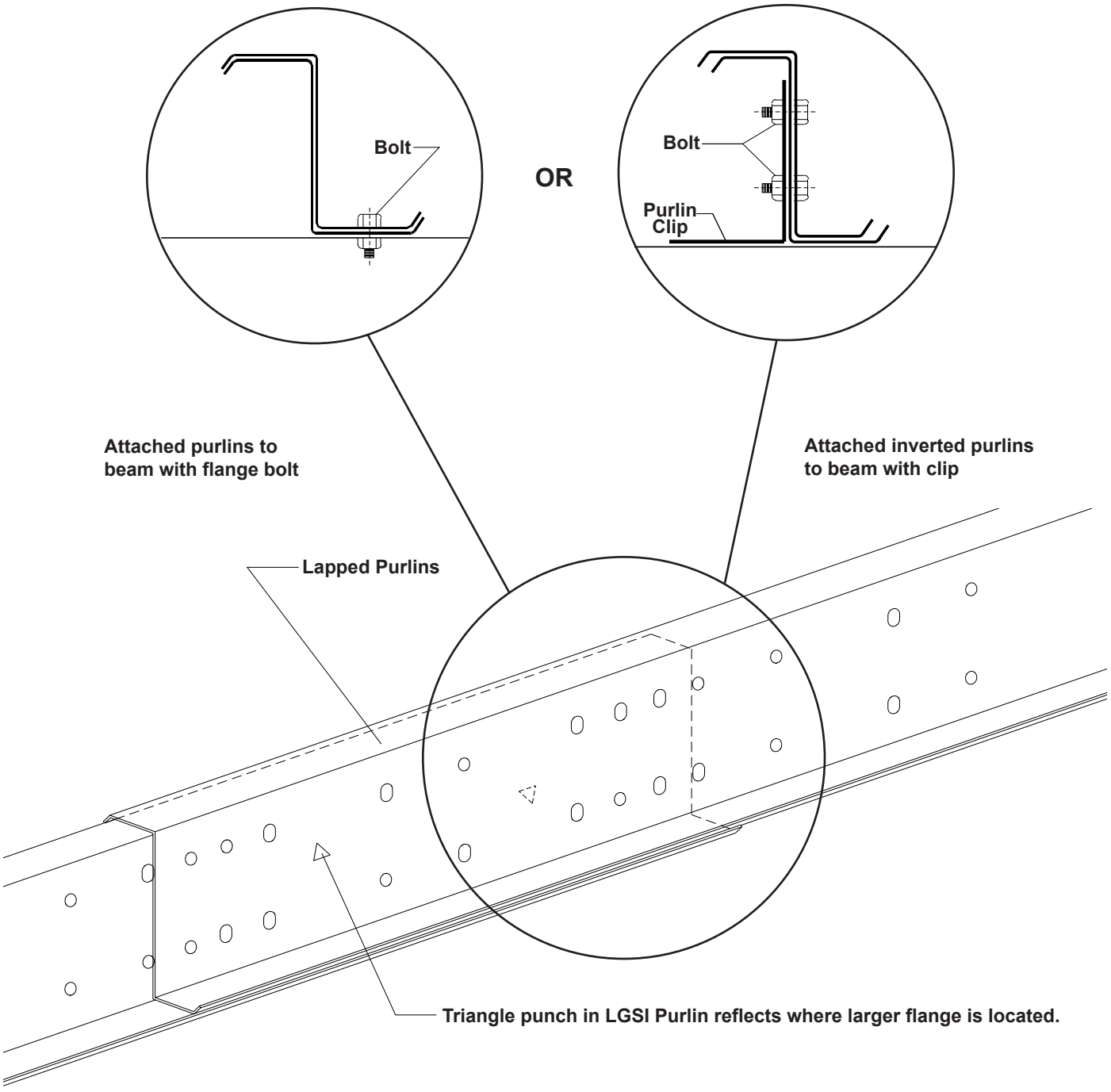
Framing System Design

Handbook

Volume 1

LGSI Zee Information

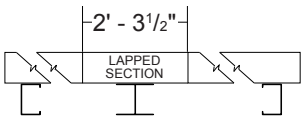
LGSI Secondary Framing (members with unsymmetrical flanges) are available in 4", 6", 8", 9", 10", and 12" web sizes and available in $2^{1}/_{8}$" x $2^{3}/_{8}$", $2^{5}/_{8}$" x $2^{7}/_{8}$", $3^{1}/_{8}$" x $3^{3}/_{8}$", and $3^{5}/_{8}$" x $3^{7}/_{8}$" flange sizes. Metal Sales offers members in various gauges and finishes. In addition, members can be ordered to your desired length with standard or custom punching. For your specific loading requirements please reference Metal Sales' Technical Reference Product Manual.



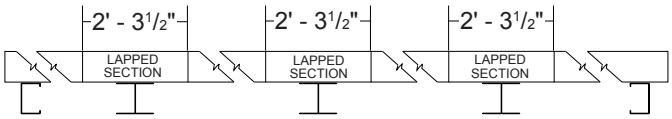
LONG LAP

For Zees Only

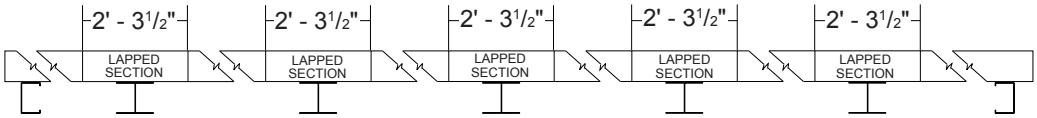
TWO SPAN

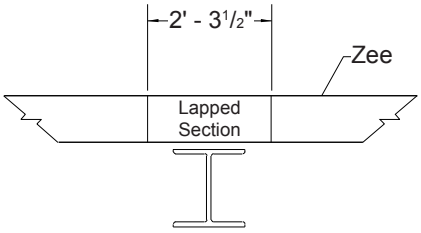


FOUR SPAN



SIX SPAN



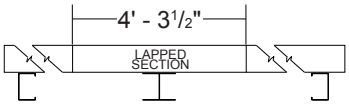


For required lap condition use standard punch pattern #A, #D, or #F.

MAX LAP

For Zees Only

TWO SPAN



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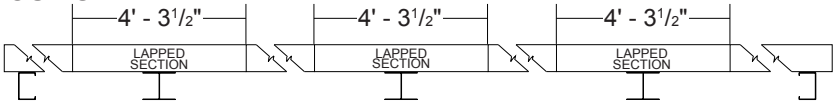
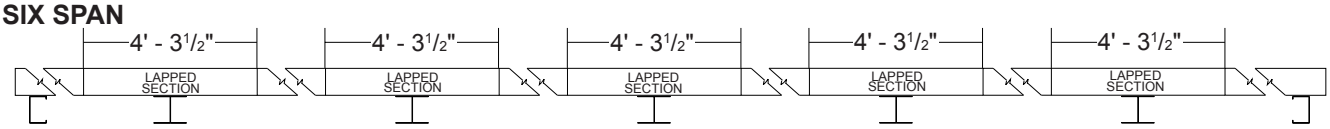
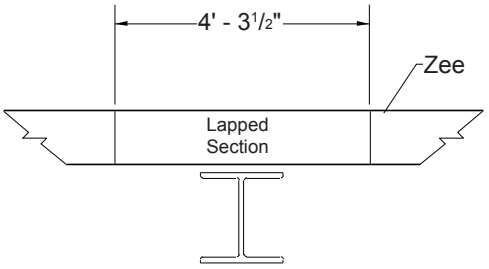


SIX SPAN



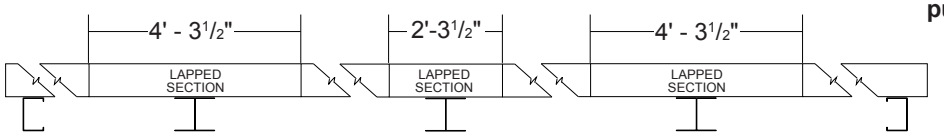


For required lap condition use standard punch pattern #A or #D.

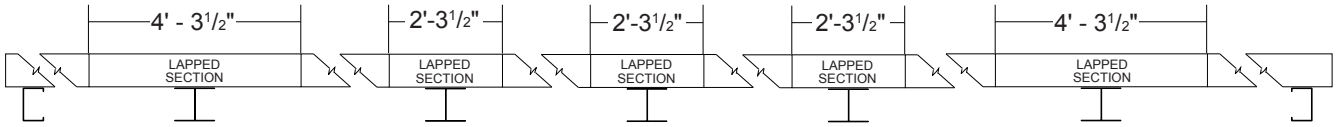
STANDARD LAP

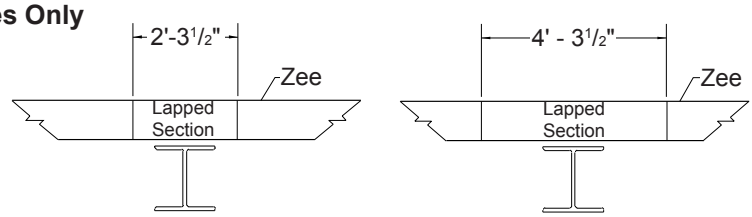
For Zees Only

FOUR SPAN



SIX SPAN

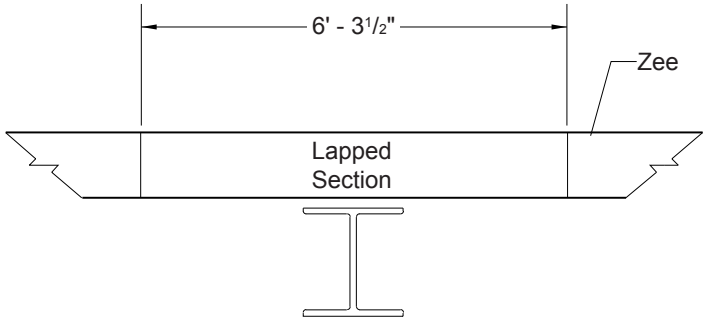




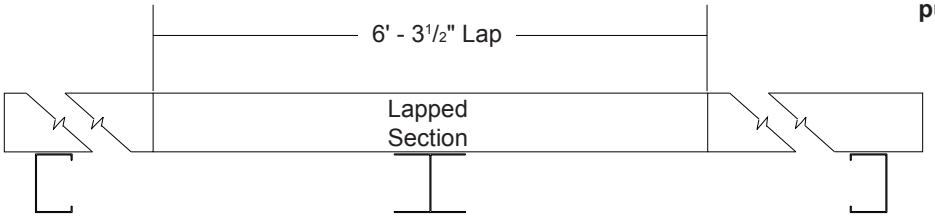
For required lap condition use standard punch pattern #A or #D.

SUPER LAP

For Zees Only



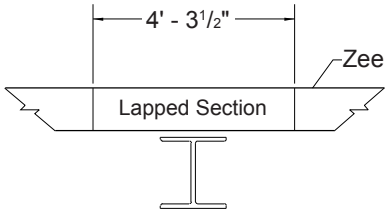
TWO SPAN

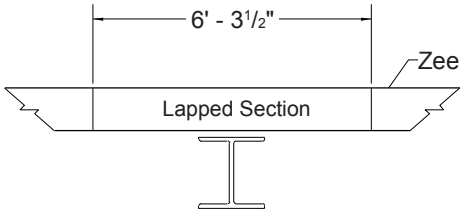


For required lap condition use standard punch pattern #B, #E, or #H.

EXTENDED LAP

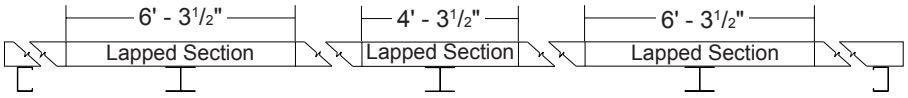
For Zees Only



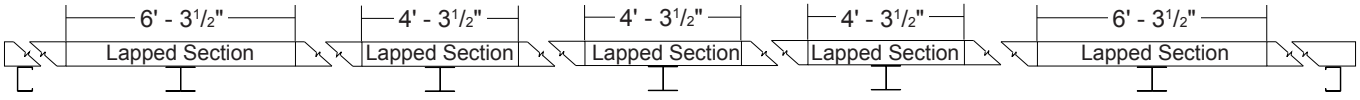


For required lap condition use standard punch pattern #B or #E.

FOUR SPAN

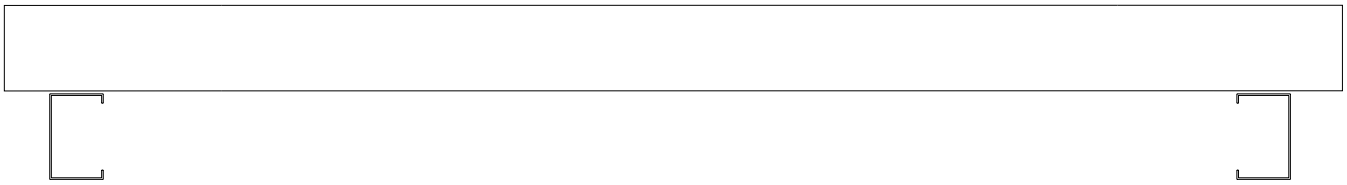


SIX SPAN



SIMPLE SPAN

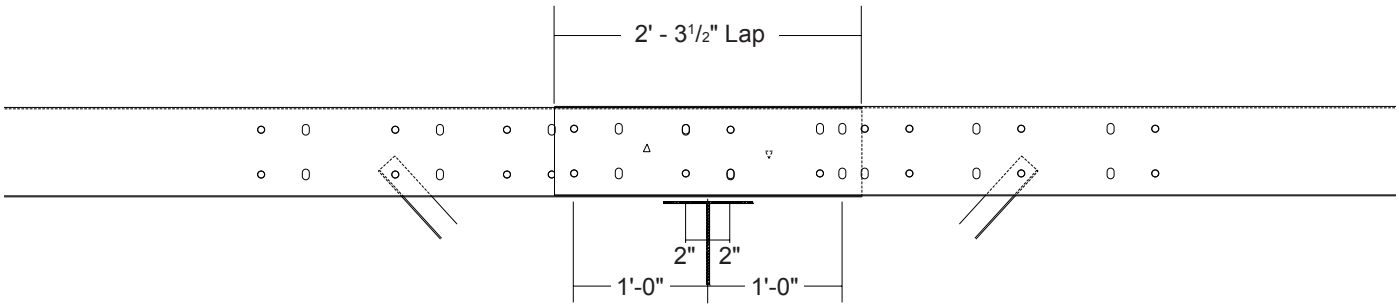
For Zees Only



LGSI Zee Lap Information (cont.)

LGSI LONG LAP

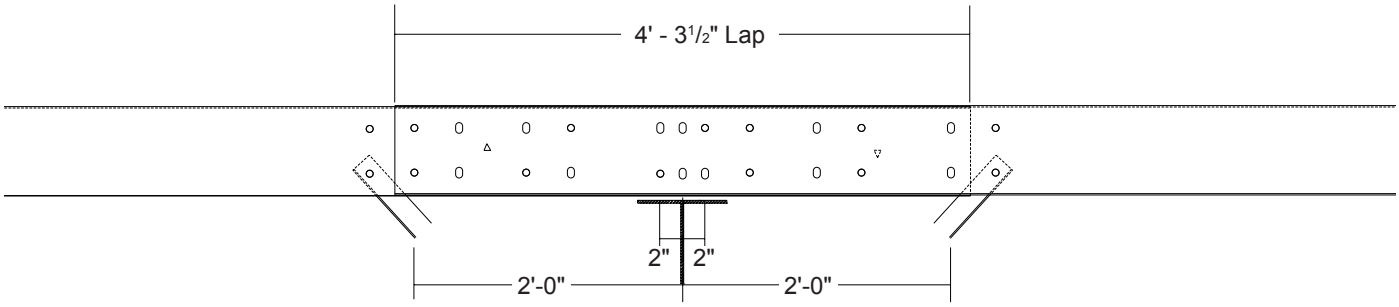
For Zees Only



For required lap condition use standard punch pattern #A, #D, or #F.

LGSI MAX LAP

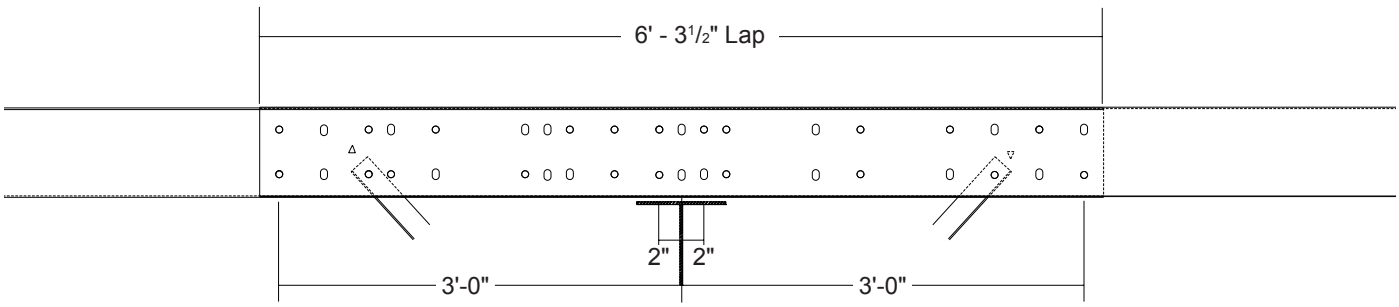
For Zees Only



For required lap condition use standard punch pattern #A, #D, or #G.

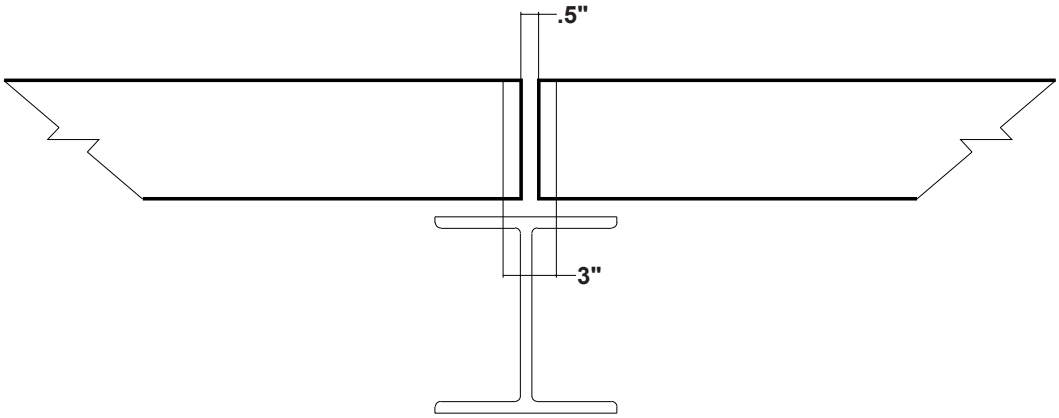
LGSI SUPER LAP

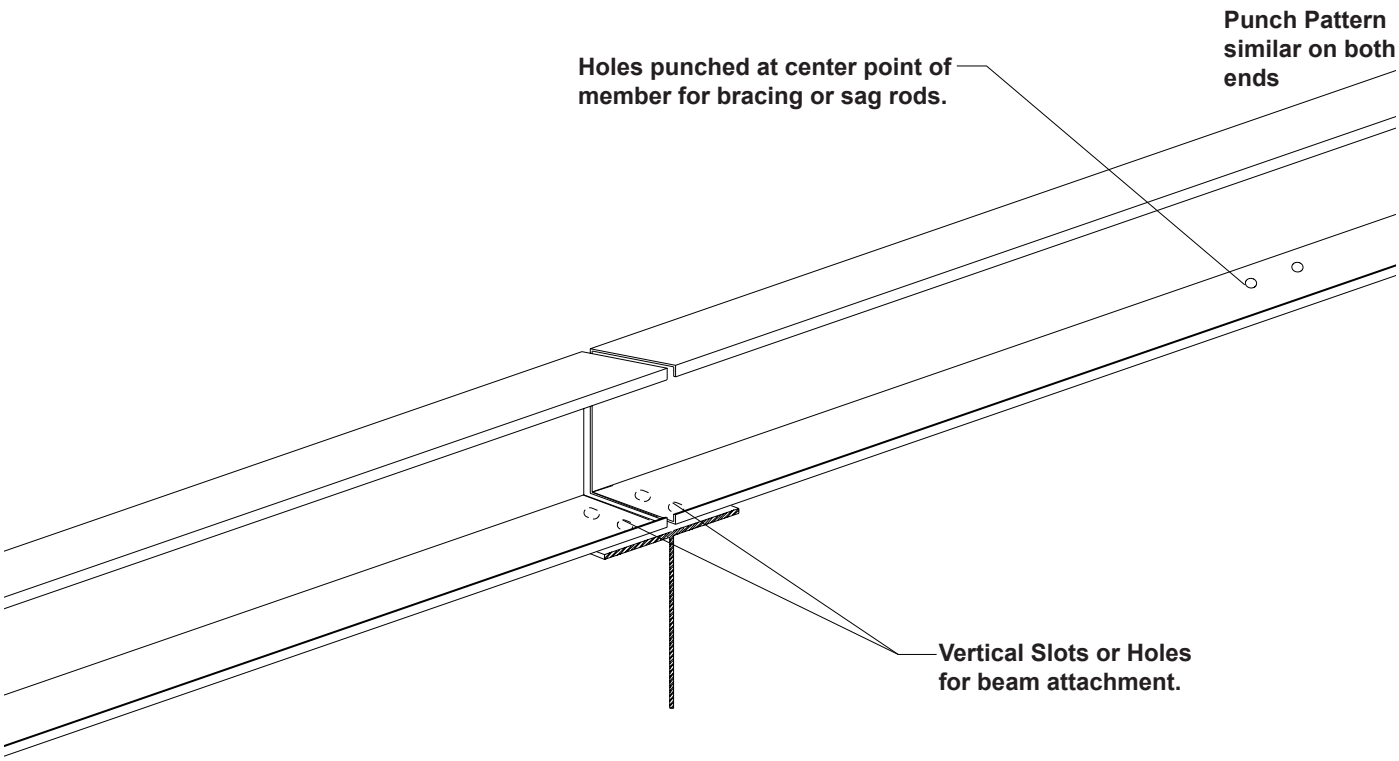
For Zees Only



For required lap condition use standard punch pattern #B, #E, or #H.

Use Eave Strut Punch Patterns:
#S 3 C
#S 3 D
#S 4
#S 5
See Page PSF-13 for information.





EAVE STRUT NOTES

1. Single Slope, Double Slope, or Universal Eave Struts are available, please specify.
2. Before ordering Eave Struts, you must subtract 1/2" from bay width.

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