

STRUCTURAL SECTION PROPERTIES

COLD FORMED PURLINS
AND GRITS

A Global Leader in Steel Building Solutions

Established in 1969 in Brandon, Manitoba, BEHLEN Industries LP has grown to be the largest manufacturer of steel building systems in Canada.

For over 50 years, our success has come from our commitment to quality, innovation and customer service. Our highly trained teams and in-house engineering constantly strives to rise above our customers' expectations.

BEHLEN Industries LP was the first North American steel building manufacturer registered to ISO 9001. In addition, we are certified to CSA standard A660, the Canadian standard for Steel Building Systems, and are a member of the Canadian Institute of Steel Construction as a Steel Fabricator.

The diversity of our product line empowers us to provide a variety of cost-effective building systems to the industrial, institutional, commercial and recreational markets.

BEHLEN Industries LP is committed to the market we serve by providing quality products and services through cost effective building solutions on time and on budget.

DISCLAIMER:

The BEHLEN **Structural Section Properties - Cold Formed Purlins and Girts** guide contains information to assist professional designers, engineers, architects and other interested parties in the use of cold formed C's and Z's properties for uses as girts and purlins.

The material presented including the example calculations are for general information. Effort has been made to ensure the material presented is accurate and factual, and consistent with applicable standards. This guide should not be used without competent professional examination and verification for accuracy, suitability and proper use. Anyone making use of the contents assumes all liability arising from such use. BEHLEN does not assume any responsibility whatsoever for errors or oversights that may result from the use or interpretation of data.

C Section Properties - Metric

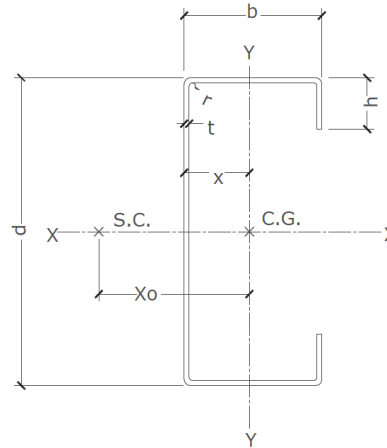
Dimensions

d = section depth
 b = flange width
 h = lip length
 t = steel thickness
 C.G = centre of gravity
 S.C = shear centre
 r = inside bend radius 4.8mm

Section Product Code

4 C 18

depth (in.)/shape/gauge



Properties

I_x eff. = effective moment of inertia about axis X-X at maximum compressive stress = $0.6 F_y$
 S_x eff. = effective elastic section modulus about axis X-X
 r_x = radius of gyration about axis X-X
 I_y = gross moment of inertia about axis Y-Y
 S_y eff. = effective elastic section modulus about axis Y-Y
 r_y = radius of gyration about axis Y-Y
 J = St. Venant torsion constant
 C_w = warping constant
 A_g = gross area of section
 R_o = distance from exterior fiber of web to centre of gravity
 X_o = distance from shear centre to centre gravity

C Section Properties - Metric

Wall Girt Selection Example – Metric

GIVEN

7,300mm single span condition.
 1,600mm girt spacing with two rows of Brace Angles at one third of span to prevent buckling.
 Metal cladding attached to exterior flange at 300mm o/c.
 Cladding considered to prevent distortional buckling and lateral torsional buckling.
 Deflection limit $L/180$.

LOADS

Positive external wind pressure at 0.70 kPa.
 Negative external wind pressure at 0.60 kPa.

CALCULATIONS

Positive $W_f = 1.4 \times 0.70 \text{ kPa} \times 1.6\text{m} = 1.57 \text{ kN/m}$
 Negative $W_f = 1.4 \times 0.60 \text{ kPa} \times 1.6\text{m} = 1.34 \text{ kN/m}$
 $M_f^+ = 1.57 \text{ kN/m} \times (7.3\text{m})^2 / 8 = 10.46 \text{ kN}\cdot\text{m}$
 $M_f^- = 1.34 \text{ kN/m} \times (7.3\text{m})^2 / 8 = 8.93 \text{ kN}\cdot\text{m}$
 $V_f = 1.57 \text{ kN/m} \times 7.3\text{m} / 2 = 5.73 \text{ kN}$
 $I_{\min} \text{ (deflection } < \text{ span } / 180) = \frac{180 \times 5 \times 0.75 \times 1.12 \text{ kN/m} \times (7,300\text{mm})^3}{384 \times 203,000 \text{ MPa}}$
 $I_{\min} = 4.09 \times 10^6 \text{ mm}^4$
 Consult Properties table for sections with $I_{xe} > I_{\min}$.

Section 8C14 $I_{xe} = 4.13 \times 10^6 \text{ mm}^4 > I_{\min} 4.09 \times 10^6 \text{ mm}^4 \therefore \text{ok}$

Fy = steel yield strength = 379Mpa

Vn = factored shear resistance.

Pn(end) = web crippling capacity based on 75mm bearing length

Pn(int) = web crippling capacity based on 75mm bearing length.

Mn = factored moment resistance based on lateral and distortional buckling.

Lu = maximum unbraced length of compression flange beyond which appropriate values in the Table must be reduced for lateral-torsion buckling.

Verify with the selection tables

$M_n^+ = M_n \text{ at } 609.3\text{m Unbraced} > M_f^+$

Section 8C14 $M_n \text{ at } 609.6\text{m} = 11.82 \text{ kN}\cdot\text{m} > M_f^+ 10.46 \text{ kN}\cdot\text{m} \therefore \text{ok}$

$M_n^- = \min. (M_n \text{ flexural-torsional at } 2.4\text{m}, M_n \text{ distortional}) > M_f^-$

Section 8C14 $M_n \text{ at } 2,438\text{mm} = 10.99 \text{ kN}\cdot\text{m} > M_f^- 8.93 \text{ kN}\cdot\text{m} \therefore \text{ok}$

Brace Angle must be connected to the section according to S136-16 standard.

$V_n > V_f$

For girt attached to column with 75mm bearing, use P_n (end).

$P > V$ If not, connection to the support column must be completed by bolting the web to prevent web crippling over the bearing support.

C Section Properties - Metric

"C" Section Properties																			
Section	d (mm)	b (mm)	h (mm)	t (mm)	Area (mm ²)	Mass (kg/m)	Gross						Effective		r-min (mm)	Ro (mm)	Xo (mm)	Cw (mm ²)	J (mm ⁴)
							Ix (mm ⁴)	Sx (mm ³)	rx (mm)	Iy (mm ⁴)	Sy (mm ³)	ry (mm)	Ixe (mm ⁴)	Sxe (mm ³)					
4C18	101.6	63.5	16.8	1.3	321	2.5	557941	10983	41.7	182361	4525	23.8	511715	9483	11.1	72.7	5.76E+08	4.32E+08	179.4
4C16	101.6	63.5	17.4	1.6	390	3.1	672817	13244	41.5	221389	5522	23.8	640933	12156	13.5	72.7	5.78E+08	5.31E+08	322.4
4C14	101.6	63.5	18.3	1.9	478	3.8	816146	16066	41.3	270825	6800	23.8	806651	15701	16.5	72.8	5.81E+08	6.61E+08	593.8
5C18	127.0	50.8	16.8	1.3	321	2.5	798573	12576	49.9	115705	3330	19.0	791632	12381	7.1	66.4	4.17E+08	3.98E+08	179.4
5C16	127.0	50.8	17.4	1.6	390	3.1	964518	15189	49.7	140412	4063	19.0	964518	15189	8.6	66.3	4.19E+08	4.88E+08	322.4
5C14	127.0	50.8	18.3	1.9	478	3.8	1172362	18462	49.5	171667	5002	18.9	1172362	18462	10.5	66.3	4.20E+08	6.03E+08	593.8
5C13	127.0	50.8	19.4	2.4	585	4.6	1419634	22356	49.3	209308	6150	18.9	1419634	22356	12.8	66.2	4.23E+08	7.45E+08	1088.1
6C18	152.4	66.7	19.9	1.3	403	3.2	1487769	19525	60.8	253104	5605	25.1	1395934	17582	15.4	84.2	5.57E+08	1.26E+09	225.5
6C16	152.4	66.7	20.6	1.6	490	3.8	1799142	23611	60.6	307333	6835	25.0	1721319	21905	18.8	84.2	5.59E+08	1.54E+09	405.1
6C14	152.4	66.7	21.5	1.9	601	4.7	2190394	28745	60.4	376077	8409	25.0	2186683	28654	22.9	84.2	5.61E+08	1.90E+09	746.1
6C13	152.4	66.7	22.5	2.4	735	5.8	2657838	34880	60.1	459109	10333	25.0	2657838	34880	28.0	84.1	5.63E+08	2.34E+09	1367.1
8C16	203.2	69.9	20.6	1.6	580	4.6	3624243	35672	79.0	377376	7557	25.5	3312544	30888	23.0	96.9	5.28E+08	3.13E+09	479.5
8C14	203.2	69.9	21.5	1.9	711	5.6	4421646	43520	78.9	462227	9300	25.5	4133663	38999	28.2	96.9	5.30E+08	3.85E+09	883.1
8C13	203.2	69.9	22.5	2.4	870	6.8	5379175	52945	78.6	564947	11433	25.5	5276301	51208	34.5	96.8	5.32E+08	4.74E+09	1618.2
8C12	203.2	69.9	23.5	2.7	1010	7.9	6214059	61162	78.4	655219	13327	25.5	6214059	61162	40.0	96.7	5.34E+08	5.53E+09	2534.3
10C16	254.0	69.9	20.6	1.6	660	5.2	6140859	48353	96.5	403106	7714	24.7	5332425	38177	24.6	109.4	4.80E+08	5.09E+09	545.6
10C14	254.0	69.9	21.5	1.9	809	6.3	7500887	59062	96.3	493975	9495	24.7	7032929	53311	30.1	109.3	4.82E+08	6.25E+09	1004.9
10C13	254.0	69.9	22.5	2.4	990	7.8	9138667	71958	96.1	604098	11674	24.7	8961237	69648	36.9	109.2	4.83E+08	7.68E+09	1841.4
10C12	254.0	69.9	23.5	2.7	1150	9.0	10571001	83236	95.9	700991	13610	24.7	10571001	83236	42.8	109.1	4.85E+08	8.95E+09	2883.8
10C10	254.0	69.9	25.3	3.5	1469	11.5	13399412	105507	95.5	893897	17519	24.7	13399412	105507	54.5	108.9	4.88E+08	1.15E+10	6016.5
118C14	292.1	76.2	21.5	1.9	907	7.1	11004528	75348	110.1	634700	10983	26.5	9711914	61279	38.7	122.9	5.03E+08	1.05E+10	1126.7
118C13	292.1	76.2	22.5	2.4	1110	8.7	13417744	91871	109.9	776755	13506	26.5	12814006	85356	47.4	122.7	5.05E+08	1.28E+10	2064.6
118C12	292.1	76.2	23.1	2.6	1216	9.5	14675826	100485	109.9	855678	14940	26.5	14323298	96560	52.2	122.8	5.08E+08	1.42E+10	2704.4
118C11	292.1	76.2	24.2	3.0	1432	11.2	17212399	117853	109.6	1001971	17557	26.4	17084853	116404	61.1	122.6	5.08E+08	1.67E+10	4435.4
118C10	292.1	76.2	25.3	3.5	1647	12.9	19715471	134991	109.4	1151671	20283	26.4	19715471	134991	70.3	122.4	5.09E+08	1.92E+10	6745.6
12C14	304.8	69.9	21.5	1.9	907	7.1	11624042	76273	113.2	518864	9636	23.9	9994550	58205	31.7	123.0	4.42E+08	9.38E+09	1126.7
12C13	304.8	69.9	22.5	2.4	1110	8.7	14175573	93016	113.0	634796	11848	23.9	13214020	81176	38.7	122.9	4.44E+08	1.15E+10	2064.6
12C12	304.8	69.9	23.5	2.7	1289	10.1	16411388	107686	112.8	736885	13815	23.9	15924348	101014	45.0	122.8	4.45E+08	1.34E+10	3233.4
12C11	304.8	69.9	24.2	3.0	1432	11.2	18189598	119354	112.7	818418	15398	23.9	17832872	114411	49.9	122.7	4.46E+08	1.49E+10	4435.4
12C10	304.8	69.9	25.3	3.5	1647	12.9	20838658	136737	112.5	940333	17786	23.9	20686772	134606	57.4	122.5	4.48E+08	1.72E+10	6745.6
14C13	355.6	88.9	22.5	2.4	1320	10.4	23452259	131902	133.3	1196576	17469	30.1	20514736	105881	73.0	146.5	5.59E+08	2.88E+10	2455.2
14C12	355.6	88.9	23.5	2.7	1533	12.0	27168361	152803	133.1	1390541	20375	30.1	25614870	139304	84.9	146.4	5.60E+08	3.35E+10	3845.1
14C11	355.6	88.9	24.2	3.0	1703	13.4	30127592	169447	133.0	1545805	22716	30.1	29070840	160045	94.3	146.4	5.62E+08	3.73E+10	5274.5
14C10	355.6	88.9	25.3	3.5	1959	15.4	34542512	194277	132.8	1778614	26251	30.1	33786076	187427	108.5	146.2	5.64E+08	4.30E+10	8021.8

Values in table have been calculated to CAN. CSA S136-16 standard for cold formed steel.
 Steel to ASTM A653 Z275 (G90) Zinc Coated Steel. HSLA Grade 55 Yield strength 55ksi (379 Mpa)

C Selection Table - Metric

"C" Selection Table																									
Section	FvN (kN)	FPn (End) (kN)	RPn (Int.) (kN)	Lu (m)	FMn (kNm)	Unbraced Length (mm), FMn (kNm)																			
						609.6	1219.2	1828.8	2438.4	3048	3657.6	4267.2	4876.8	5486.4	6096	6705.6	7315.2	7924.8	8534.4	9144	9753.6	10363	10973	11582	12192
4C18	13.9	3.1	5.1	1.033	2.35	2.34	2.34	2.24	2.00	1.72	1.32	1.00	0.79	0.65	0.55	0.47	0.41	0.36	0.32	0.29	0.27	0.25	0.23	0.21	0.20
4C16	18.5	4.5	7.8	1.042	3.02	3.02	3.02	2.90	2.63	2.21	1.68	1.29	1.03	0.85	0.72	0.63	0.55	0.49	0.44	0.40	0.37	0.34	0.32	0.30	0.28
4C14	22.5	6.7	12.0	1.054	3.90	3.90	3.90	3.73	3.33	2.79	2.19	1.70	1.37	1.15	0.99	0.86	0.76	0.69	0.62	0.57	0.53	0.49	0.46	0.43	0.40
5C18	13.9	3.0	5.1	0.843	3.07	2.80	2.80	2.67	2.08	1.42	1.02	0.77	0.61	0.50	0.42	0.36	0.32	0.28	0.25	0.23	0.21	0.19	0.18	0.17	0.16
5C16	20.6	4.4	7.7	0.848	3.77	3.64	3.64	3.25	2.56	1.79	1.30	0.99	0.80	0.66	0.56	0.49	0.43	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.22
5C14	29.0	6.5	11.8	0.855	4.58	4.58	4.58	3.98	3.20	2.30	1.69	1.31	1.07	0.90	0.77	0.67	0.60	0.54	0.49	0.45	0.42	0.39	0.36	0.34	0.32
5C13	35.3	9.5	18.0	0.864	5.55	5.55	5.55	4.87	4.00	3.00	2.24	1.77	1.45	1.23	1.07	0.95	0.85	0.77	0.70	0.65	0.60	0.56	0.52	0.49	0.47
6C18	12.2	3.0	5.0	1.096	4.36	3.95	3.94	3.94	3.79	3.24	2.52	1.88	1.46	1.18	0.97	0.82	0.71	0.61	0.54	0.48	0.44	0.40	0.36	0.33	0.31
6C16	20.6	4.3	7.6	1.101	5.44	5.16	5.16	5.16	4.87	4.11	3.13	2.35	1.84	1.49	1.24	1.05	0.91	0.80	0.71	0.64	0.58	0.53	0.49	0.45	0.42
6C14	31.0	6.4	11.7	1.108	7.11	6.78	6.78	6.78	6.07	5.10	3.96	3.00	2.37	1.94	1.63	1.39	1.22	1.08	0.96	0.87	0.79	0.73	0.68	0.63	0.59
6C13	43.2	9.4	17.9	1.117	8.66	8.66	8.66	8.36	7.44	6.32	5.04	3.87	3.09	2.55	2.16	1.87	1.65	1.47	1.32	1.21	1.11	1.02	0.95	0.89	0.83
8C16	16.1	5.7	10.3	0.959	10.54	8.87	8.82	8.82	8.37	6.70	4.82	3.59	2.79	2.24	1.85	1.55	1.33	1.16	1.02	0.91	0.82	0.74	0.68	0.62	0.57
8C14	29.8	8.5	15.9	0.963	13.31	11.82	11.82	11.82	10.99	8.53	6.03	4.51	3.53	2.85	2.37	2.01	1.73	1.52	1.34	1.20	1.09	0.99	0.91	0.84	0.78
8C13	54.4	12.5	24.2	0.968	17.48	15.73	15.73	15.73	13.91	10.63	7.58	5.72	4.51	3.67	3.07	2.63	2.28	2.01	1.80	1.62	1.48	1.35	1.25	1.16	1.08
8C12	73.3	16.6	33.0	0.972	20.87	19.34	19.34	19.17	16.20	12.55	9.04	6.87	5.45	4.48	3.77	3.24	2.84	2.52	2.26	2.05	1.88	1.73	1.60	1.49	1.40
10C16	12.7	5.5	10.1	0.945	13.03	11.33	11.16	11.16	11.03	8.87	6.28	4.66	3.61	2.88	2.37	1.98	1.69	1.46	1.28	1.14	1.02	0.92	0.83	0.76	0.70
10C14	23.5	8.2	15.7	0.948	18.19	15.11	15.06	15.06	14.72	11.12	7.81	5.82	4.52	3.64	3.00	2.53	2.17	1.89	1.66	1.48	1.33	1.21	1.10	1.01	0.94
10C13	43.2	12.1	23.9	0.951	23.77	20.20	20.20	20.20	18.53	13.81	9.75	7.31	5.72	4.63	3.84	3.26	2.81	2.47	2.19	1.96	1.78	1.62	1.49	1.38	1.28
10C12	67.8	16.2	32.6	0.955	28.41	25.01	25.01	25.01	21.58	16.26	11.55	8.71	6.85	5.58	4.66	3.98	3.45	3.04	2.72	2.45	2.23	2.04	1.88	1.75	1.63
10C10	119.7	25.7	53.8	0.961	36.01	35.11	35.11	32.94	27.74	21.39	15.44	11.77	9.38	7.72	6.53	5.63	4.94	4.40	3.96	3.60	3.30	3.04	2.82	2.63	2.47
118C14	20.3	8.0	15.5	1.016	20.91	18.08	17.78	17.78	17.78	15.51	11.31	8.39	6.49	5.19	4.26	3.57	3.04	2.63	2.31	2.05	1.83	1.65	1.50	1.37	1.26
118C13	37.3	11.9	23.7	1.019	29.13	24.12	24.01	24.01	24.01	19.65	14.04	10.46	8.13	6.53	5.39	4.54	3.89	3.39	2.99	2.66	2.39	2.17	1.98	1.82	1.69
118C12	48.8	14.1	28.6	1.024	32.95	27.61	27.53	27.53	27.24	21.73	15.61	11.66	9.08	7.32	6.05	5.11	4.40	3.84	3.39	3.03	2.73	2.48	2.27	2.10	1.94
118C11	80.4	19.4	40.2	1.024	39.73	34.84	34.84	34.84	32.34	25.70	18.61	13.97	10.95	8.88	7.39	6.28	5.44	4.77	4.24	3.81	3.45	3.16	2.90	2.69	2.50
118C10	119.7	25.3	53.4	1.028	46.07	42.50	42.50	42.50	37.25	29.85	21.84	16.49	13.00	10.60	8.88	7.59	6.60	5.83	5.21	4.70	4.28	3.93	3.63	3.37	3.14
12C14	19.4	8.0	15.5	0.934	19.86	18.34	18.16	18.16	16.72	12.87	9.35	7.13	5.58	4.47	3.67	3.08	2.63	2.28	2.00	1.78	1.59	1.44	1.31	1.20	1.10
12C13	35.6	11.8	23.7	0.937	27.70	24.58	24.54	24.54	22.05	16.58	12.03	9.00	7.01	5.64	4.66	3.93	3.38	2.95	2.60	2.32	2.09	1.90	1.74	1.60	1.48
12C12	55.9	15.8	32.3	0.939	34.48	30.58	30.58	30.58	26.44	19.98	14.23	10.66	8.34	6.75	5.61	4.76	4.11	3.60	3.20	2.87	2.59	2.37	2.17	2.01	1.87
12C11	76.9	19.3	40.1	0.941	39.05	35.62	35.62	35.62	30.02	22.59	16.02	12.05	9.47	7.69	6.42	5.47	4.74	4.17	3.72	3.35	3.04	2.78	2.56	2.37	2.21
12C10	117.3	25.2	53.3	0.944	45.94	43.46	43.46	41.99	35.18	26.39	18.83	14.25	11.27	9.21	7.73	6.63	5.78	5.11	4.58	4.14	3.78	3.47	3.21	2.99	2.79
14C13	30.3	11.5	23.4	1.159	36.14	31.51	30.46	30.46	30.46	30.46	24.86	18.97	14.65	11.68	9.56	7.99	6.80	5.87	5.13	4.53	4.04	3.64	3.29	3.00	2.76
14C12	47.6	15.4	31.9	1.162	47.54	39.01	38.26	38.26	38.26	36.97	29.77	22.27	17.25	13.80	11.33	9.50	8.11	7.03	6.16	5.47	4.89	4.42	4.02	3.67	3.38
14C11	65.4	18.9	39.7	1.164	54.62	45.41	44.86	44.86	44.86	41.74	33.54	24.99	19.40	15.56	12.81	10.78	9.22	8.01	7.05	6.27	5.63	5.09	4.64	4.26	3.93
14C10	99.7	24.7	52.8	1.167	63.97	55.58	55.27	55.27	55.27	49.26	39.00	29.20	22.75	18.33	15.15	12.80	11.00	9.60	8.48	7.57	6.83	6.20	5.68	5.23	4.84

Notes: 1) One flange loading or reaction
 2) Members being fastened at supports
 3) Web Crippling capacity based on 75mm bearing length
 4) See S136-16 section G5 - Web crippling strength of webs without stiffeners
 Values in table have been calculated to CAN, CSA S136-16 standard for cold formed steel.
 Steel to ASTM A653 Z275 (G90) Zinc Coated Steel, HSLA Grade 55 Yield strength 55ksi (379 Mpa)

C Selection Table - Metric

Section		SPAN (mm)																			
		610	1219	1829	2438	3048	3658	4267	4877	5486	6096	6706	7315	7925	8534	9144	9754	10363	10973	11582	12192
4C18	B	30.50	8.45	3.75	2.11	1.35	0.94	0.69	0.53	0.42	0.34	0.28	0.23	0.20	0.17	0.15	0.13	0.12	0.10	0.09	0.08
	D	213.74	26.72	7.92	3.34	1.71	0.99	0.62	0.42	0.29	0.21	0.16	0.12	0.10	0.08	0.06	0.05	0.04	0.04	0.03	0.03
4C16	B	40.55	10.83	4.81	2.71	1.73	1.20	0.88	0.68	0.53	0.43	0.36	0.30	0.26	0.22	0.19	0.17	0.15	0.13	0.12	0.11
	D	257.75	32.22	9.55	4.03	2.06	1.19	0.75	0.50	0.35	0.26	0.19	0.15	0.12	0.09	0.08	0.06	0.05	0.04	0.04	0.03
4C14	B	49.31	13.98	6.21	3.50	2.24	1.55	1.14	0.87	0.69	0.56	0.46	0.39	0.33	0.29	0.25	0.22	0.19	0.17	0.15	0.14
	D	312.65	39.08	11.58	4.89	2.50	1.45	0.91	0.61	0.43	0.31	0.23	0.18	0.14	0.11	0.09	0.08	0.06	0.05	0.05	0.04
5C18	B	30.50	11.03	4.90	2.76	1.76	1.23	0.90	0.69	0.54	0.44	0.36	0.31	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.11
	D	305.92	38.24	11.33	4.78	2.45	1.42	0.89	0.60	0.42	0.31	0.23	0.18	0.14	0.11	0.09	0.07	0.06	0.05	0.04	0.04
5C16	B	45.08	13.53	6.01	3.38	2.16	1.50	1.10	0.85	0.67	0.54	0.45	0.38	0.32	0.28	0.24	0.21	0.19	0.17	0.15	0.14
	D	369.49	46.19	13.68	5.77	2.96	1.71	1.08	0.72	0.51	0.37	0.28	0.21	0.17	0.13	0.11	0.09	0.08	0.06	0.05	0.05
5C14	B	63.50	16.44	7.31	4.11	2.63	1.83	1.34	1.03	0.81	0.66	0.54	0.46	0.39	0.34	0.29	0.26	0.23	0.20	0.18	0.16
	D	449.11	56.14	16.63	7.02	3.59	2.08	1.31	0.88	0.62	0.45	0.34	0.26	0.20	0.16	0.13	0.11	0.09	0.08	0.07	0.06
5C13	B	77.12	19.91	8.85	4.98	3.19	2.21	1.63	1.24	0.98	0.80	0.66	0.55	0.47	0.41	0.35	0.31	0.28	0.25	0.22	0.20
	D	543.84	67.98	20.14	8.50	4.35	2.52	1.59	1.06	0.75	0.54	0.41	0.31	0.25	0.20	0.16	0.13	0.11	0.09	0.08	0.07
6C18	B	26.62	13.31	6.96	3.91	2.51	1.74	1.28	0.98	0.77	0.63	0.52	0.43	0.37	0.32	0.28	0.24	0.22	0.19	0.17	0.16
	D	569.94	71.24	21.11	8.91	4.56	2.64	1.66	1.11	0.78	0.57	0.43	0.33	0.26	0.21	0.17	0.14	0.12	0.10	0.08	0.07
6C16	B	45.08	19.51	8.67	4.88	3.12	2.17	1.59	1.22	0.96	0.78	0.64	0.54	0.46	0.40	0.35	0.30	0.27	0.24	0.22	0.20
	D	689.22	86.15	25.53	10.77	5.51	3.19	2.01	1.35	0.95	0.69	0.52	0.40	0.31	0.25	0.20	0.17	0.14	0.12	0.10	0.09
6C14	B	67.73	25.52	11.34	6.38	4.08	2.64	1.87	1.59	1.26	1.02	0.84	0.71	0.60	0.52	0.45	0.40	0.35	0.32	0.28	0.26
	D	839.11	104.89	31.08	13.11	6.71	3.88	2.45	1.64	1.15	0.84	0.63	0.49	0.38	0.31	0.25	0.20	0.17	0.14	0.12	0.10
6C13	B	94.49	31.06	13.81	7.77	4.97	3.45	2.54	1.94	1.53	1.24	1.03	0.86	0.74	0.63	0.55	0.49	0.43	0.38	0.34	0.31
	D	1018.18	127.27	37.71	15.91	8.15	4.71	2.97	1.99	1.40	1.02	0.76	0.59	0.46	0.37	0.30	0.25	0.21	0.17	0.15	0.13
8C16	B	35.21	17.61	11.74	8.80	6.05	4.20	3.09	2.36	1.87	1.51	1.25	1.05	0.90	0.77	0.67	0.59	0.52	0.47	0.42	0.38
	D	1388.39	173.55	51.42	21.69	11.11	6.43	4.05	2.71	1.90	1.39	1.04	0.80	0.63	0.51	0.41	0.34	0.28	0.24	0.20	0.17
8C14	B	65.10	32.55	21.23	11.94	7.64	5.31	3.90	2.98	2.36	1.91	1.58	1.33	1.13	0.97	0.85	0.75	0.66	0.59	0.53	0.48
	D	1693.87	211.73	62.74	26.47	13.55	7.84	4.94	3.31	2.32	1.69	1.27	0.98	0.77	0.62	0.50	0.41	0.34	0.29	0.25	0.21
8C13	B	118.92	59.46	27.87	15.68	10.03	6.97	5.12	3.92	3.10	2.51	2.07	1.74	1.48	1.28	1.11	0.98	0.87	0.77	0.69	0.63
	D	2060.68	257.58	76.32	32.20	16.49	9.54	6.01	4.02	2.83	2.06	1.55	1.19	0.94	0.75	0.61	0.50	0.42	0.35	0.30	0.26
8C12	B	160.38	74.90	33.29	18.72	11.98	8.32	6.11	4.68	3.70	3.00	2.48	2.08	1.77	1.53	1.33	1.17	1.04	0.92	0.83	0.75
	D	2380.51	297.56	88.17	37.20	19.04	11.02	6.94	4.65	3.27	2.38	1.79	1.38	1.08	0.87	0.71	0.58	0.48	0.41	0.35	0.30
10C16	B	27.80	13.90	9.27	6.95	5.56	4.63	3.82	2.92	2.31	1.87	1.55	1.30	1.11	0.95	0.83	0.73	0.65	0.58	0.52	0.47
	D	2352.47	294.06	87.13	36.76	18.82	10.89	6.86	4.59	3.23	2.35	1.77	1.36	1.07	0.86	0.70	0.57	0.48	0.40	0.34	0.29
10C14	B	51.35	25.68	17.12	12.84	10.27	7.25	5.33	4.08	3.22	2.61	2.16	1.81	1.55	1.33	1.16	1.02	0.90	0.81	0.72	0.65
	D	2873.48	359.18	106.43	44.90	22.99	13.30	8.38	5.61	3.94	2.87	2.16	1.66	1.31	1.05	0.85	0.70	0.58	0.49	0.42	0.36
10C13	B	94.44	47.22	31.48	21.32	13.65	9.48	6.96	5.33	4.21	3.41	2.82	2.37	2.02	1.74	1.52	1.33	1.18	1.05	0.95	0.85
	D	3500.88	437.61	129.66	54.70	28.01	16.21	10.21	6.84	4.80	3.50	2.63	2.03	1.59	1.28	1.04	0.85	0.71	0.60	0.51	0.44
10C12	B	148.37	74.18	45.30	25.48	16.31	11.33	8.32	6.37	5.03	4.08	3.37	2.83	2.41	2.08	1.81	1.59	1.41	1.26	1.13	1.02
	D	4049.59	506.20	149.98	63.27	32.40	18.75	11.81	7.91	5.55	4.05	3.04	2.34	1.84	1.48	1.20	0.99	0.82	0.69	0.59	0.51
10C10	B	261.86	129.20	57.42	32.30	20.67	14.36	10.59	8.07	6.38	5.17	4.27	3.59	3.06	2.64	2.30	2.02	1.79	1.60	1.43	1.29
	D	5133.11	641.64	190.12	80.20	41.06	23.76	14.97	10.03	7.04	5.13	3.86	2.97	2.34	1.87	1.52	1.25	1.04	0.88	0.75	0.64
118C14	B	44.33	22.17	14.78	11.08	8.87	7.39	6.13	4.69	3.71	3.00	2.48	2.08	1.78	1.53	1.33	1.17	1.04	0.93	0.83	0.75
	D	4215.67	526.96	156.14	65.87	33.73	19.52	12.29	8.23	5.78	4.22	3.17	2.44	1.92	1.54	1.25	1.03	0.86	0.72	0.61	0.53

Continues on next page

B - Strength Loading **D - Deflection Loading**

- Notes: 1) Deflection based on L/180
- 2) Deflection is based on gross moment of inertia and is unconservative when the cross section is not fully active.
- 3) Maximum load based on effective moment of inertia can be obtained by multiply by (I_{xe} / I_x)

C Selection Table - Metric

"C" Selection Table - Maximum Specified Load in Bending, Fully Supported (kN/m) - Continued																					
Section		SPAN (mm)																			
		610	1219	1829	2438	3048	3658	4267	4877	5486	6096	6706	7315	7925	8534	9144	9754	10363	10973	11582	12192
118C13	B	81.49	40.74	27.16	20.37	16.30	11.61	8.53	6.53	5.16	4.18	3.46	2.90	2.47	2.13	1.86	1.63	1.45	1.29	1.16	1.05
	D	5140.13	642.52	190.38	80.31	41.12	23.80	14.99	10.04	7.05	5.14	3.86	2.97	2.34	1.87	1.52	1.25	1.05	0.88	0.75	0.64
118C12	B	106.73	53.37	35.58	26.68	18.92	13.14	9.65	7.39	5.84	4.73	3.91	3.28	2.80	2.41	2.10	1.85	1.64	1.46	1.31	1.18
	D	5622.09	702.76	208.23	87.85	44.98	26.03	16.39	10.98	7.71	5.62	4.22	3.25	2.56	2.05	1.67	1.37	1.14	0.96	0.82	0.70
118C11	B	175.92	87.96	58.64	35.64	22.81	15.84	11.64	8.91	7.04	5.70	4.71	3.96	3.37	2.91	2.53	2.23	1.97	1.76	1.58	1.43
	D	6593.81	824.23	244.22	103.03	52.75	30.53	19.22	12.88	9.05	6.59	4.95	3.82	3.00	2.40	1.95	1.61	1.34	1.13	0.96	0.82
118C10	B	261.86	130.93	73.47	41.33	26.45	18.37	13.49	10.33	8.16	6.61	5.46	4.59	3.91	3.37	2.94	2.58	2.29	2.04	1.83	1.65
	D	7552.70	944.09	279.73	118.01	60.42	34.97	22.02	14.75	10.36	7.55	5.67	4.37	3.44	2.75	2.24	1.84	1.54	1.30	1.10	0.94
12C14	B	42.40	21.20	14.13	10.60	8.48	7.07	5.82	4.45	3.52	2.85	2.36	1.98	1.69	1.45	1.27	1.11	0.99	0.88	0.79	0.71
	D	4452.99	556.62	164.93	69.58	35.62	20.62	12.98	8.70	6.11	4.45	3.35	2.58	2.03	1.62	1.32	1.09	0.91	0.76	0.65	0.56
12C13	B	77.92	38.96	25.97	19.48	15.58	11.04	8.11	6.21	4.91	3.98	3.29	2.76	2.35	2.03	1.77	1.55	1.38	1.23	1.10	0.99
	D	5430.45	678.81	201.13	84.85	43.44	25.14	15.83	10.61	7.45	5.43	4.08	3.14	2.47	1.98	1.61	1.33	1.11	0.93	0.79	0.68
12C12	B	122.36	61.18	40.79	30.59	19.79	13.74	10.10	7.73	6.11	4.95	4.09	3.44	2.93	2.52	2.20	1.93	1.71	1.53	1.37	1.24
	D	6286.95	785.87	232.85	98.23	50.30	29.11	18.33	12.28	8.62	6.29	4.72	3.64	2.86	2.29	1.86	1.53	1.28	1.08	0.92	0.79
12C11	B	168.20	84.10	56.07	35.03	22.42	15.57	11.44	8.76	6.92	5.60	4.63	3.89	3.32	2.86	2.49	2.19	1.94	1.73	1.55	1.40
	D	6968.16	871.02	258.08	108.88	55.75	32.26	20.32	13.61	9.56	6.97	5.24	4.03	3.17	2.54	2.06	1.70	1.42	1.19	1.02	0.87
12C10	B	256.62	128.31	73.26	41.21	26.37	18.31	13.46	10.30	8.14	6.59	5.45	4.58	3.90	3.36	2.93	2.58	2.28	2.03	1.83	1.65
	D	7982.97	997.87	295.67	124.73	63.86	36.96	23.27	15.59	10.95	7.98	6.00	4.62	3.63	2.91	2.37	1.95	1.62	1.37	1.16	1.00
14C13	B	66.33	33.16	22.11	16.58	13.27	11.05	9.48	8.10	6.40	5.19	4.29	3.60	3.07	2.65	2.30	2.03	1.79	1.60	1.44	1.30
	D	8984.20	1123.03	332.75	140.38	71.87	41.59	26.19	17.55	12.32	8.98	6.75	5.20	4.09	3.27	2.66	2.19	1.83	1.54	1.31	1.12
14C12	B	104.11	52.05	34.70	26.03	20.82	17.35	13.93	10.66	8.42	6.82	5.64	4.74	4.04	3.48	3.03	2.67	2.36	2.11	1.89	1.71
	D	10407.78	1300.97	385.47	162.62	83.26	48.18	30.34	20.33	14.28	10.41	7.82	6.02	4.74	3.79	3.08	2.54	2.12	1.78	1.52	1.30
14C11	B	143.07	71.53	47.69	35.77	28.61	21.78	16.00	12.25	9.68	7.84	6.48	5.44	4.64	4.00	3.48	3.06	2.71	2.42	2.17	1.96
	D	11541.42	1442.68	427.46	180.33	92.33	53.43	33.65	22.54	15.83	11.54	8.67	6.68	5.25	4.21	3.42	2.82	2.35	1.98	1.68	1.44
14C10	B	218.17	109.09	72.72	54.54	36.72	25.50	18.74	14.34	11.33	9.18	7.59	6.38	5.43	4.68	4.08	3.59	3.18	2.83	2.54	2.30
	D	13232.71	1654.09	490.10	206.76	105.86	61.26	38.58	25.85	18.15	13.23	9.94	7.66	6.02	4.82	3.92	3.23	2.69	2.27	1.93	1.65

B - Strength Loading D - Deflection Loading

Notes: 1) Deflection based on L/180

- 2) Deflection is based on gross moment of inertia and is unconservative when the cross section is not fully active.
- 3) Maximum load based on effective moment of inertia can be obtained by multiply by (I_{xe} / I_x)

Values in table have been calculated to CAN. CSA S136-16 standard for cold formed steel.
Steel to ASTM A653 Z275 (G90) Zinc Coated Steel. HSLA Grade 55 Yield strength 55ksi (379 Mpa)

C Section Properties - Imperial

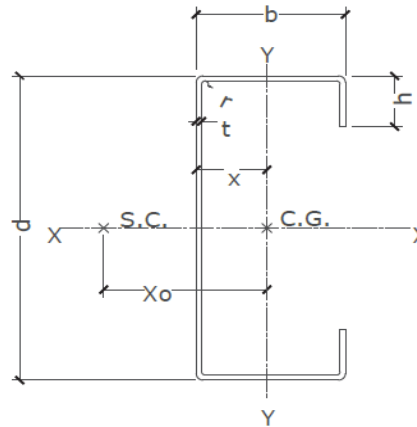
Dimensions

- d = section depth
- b = flange width
- h = lip length
- t = steel thickness
- C.G = centre of gravity
- S.C = shear centre
- r = inside bend radius 0.188"

Section Product Code

4 C 18

depth (in.)/shape/gauge



Properties

- I_x eff. = effective moment of inertia about axis X-X at maximum compressive stress = $0.6 F_y$
- S_x eff. = effective elastic section modulus about axis X-X
- r_x = radius of gyration about axis X-X
- I_y = gross moment of inertia about axis Y-Y
- S_y eff. = effective elastic section modulus about axis Y-Y
- r_y = radius of gyration about axis Y-Y
- J = St. Venant torsion constant
- C_w = warping constant
- Ag = gross area of section
- R_o = distance from exterior fiber of web to centre of gravity
- X_o = distance from shear centre to centre gravity

C Section Properties - Imperial

Wall Girt Selection Example – Imperial

GIVEN

24 ft single span condition.
 5 ft girt spacing with two rows of Brace Angles at one third of span to prevent buckling.
 Metal cladding attached to exterior flange at 12 in. o/c.
 Cladding considered to prevent distortional buckling and lateral torsional buckling.
 Deflection limit $L/180$.

LOADS

Positive external wind pressure at 14.6 psf.
 Negative external wind pressure at 12.5 psf.

CALCULATIONS

Positive $W_f = 1.4 \times 14.6 \text{ psf} \times 5 \text{ ft} = 102 \text{ lb/ft}$.

Negative $W_f = 1.4 \times 12.5 \text{ psf} \times 5 \text{ ft} = 88 \text{ lb/ft}$.

$M_f^+ = 0.102 \text{ kip/ft} \times (24 \text{ ft})^2 / 8 = 7.3 \text{ kip}\cdot\text{ft}$.

$M_f^- = 0.088 \text{ kip/ft} \times (24 \text{ ft})^2 / 8 = 6.3 \text{ kip}\cdot\text{ft}$.

$V_f = 0.102 \text{ kip/ft} \times 24 \text{ ft} / 2 = 1.28 \text{ kip}$.

$$I_{\min} (\text{deflection} < \text{span} / 180) = \frac{180 \times 5 \times 0.75 \times 0.073 \text{ kip/ft} \times (24 \text{ ft})^3 \times 144}{384 \times 29,500 \text{ ksi}}$$

$$I_{\min} = 8.7 \text{ in.}^4$$

Consult Properties table for sections with $I_{xe} > I_{\min}$.

Section 8C14 $I_{xe} = 9.93 \text{ in.}^4 > I_{\min} 8.7 \text{ in.}^4 \therefore \text{ok}$

Fy = steel yield strength = 55 ksi

Vn = factored shear resistance.

Pn(end) = web crippling capacity based on 3 in. bearing length.

Pn(int) = web crippling capacity based on 3 in. bearing length.

Mn = factored moment resistance based on lateral and distortional buckling.

Lu = maximum unbraced length of compression flange beyond which appropriate values in the Table must be reduced for lateral-torsion buckling.

Verify with the selection tables

$M_n^+ = M_n \text{ at } 2 \text{ ft Unbraced} > M_f^+$

Section 8C14 $M_n \text{ at } 2 \text{ ft} = 8.72 \text{ kip}\cdot\text{ft} > 7.3 \text{ kip}\cdot\text{ft} \therefore \text{ok}$

$M_n^- = \min. (M_n \text{ flexural-torsional at } 8 \text{ ft}, M_n \text{ distortional}) > M_f^-$

Section 8C14 $M_n \text{ at } 8 \text{ ft} = 8.10 \text{ kip}\cdot\text{ft} > 6.3 \text{ kip}\cdot\text{ft} \therefore \text{ok}$

Brace Angle must be connected to the section according to S136-16 standard.

$$V_n > V_f$$

For girt attached to column with 3 in. bearing, use P_n (end).

$P > V$ If not, connection to the support column must be completed by bolting the web to prevent web crippling over the bearing support.

C Section Properties - Imperial

"C" Section Properties																			
Section	d (in)	b (in)	h (in)	t (in)	Area (in ²)	Mass (lbs/ft)	Gross						Effective		r-min (in)	Ro (in)	Xo (in ²)	Cw (in ⁴)	J (in ⁴)
							Ix (in ⁴)	Sx (in ³)	rx (in)	Iy (in ⁴)	Sy (in ³)	ry (in)	Ixe (in ⁴)	Sxe (in ³)					
4C18	4	2.500	0.66	0.051	0.50	1.69	1.34	0.67	1.64	0.44	0.28	0.94	1.23	0.58	0.44	2.86	2.15	1.61	4.31E-04
4C16	4	2.500	0.69	0.062	0.60	2.06	1.62	0.81	1.64	0.53	0.34	0.94	1.54	0.74	0.53	2.86	2.15	1.98	7.75E-04
4C14	4	2.500	0.72	0.076	0.74	2.52	1.96	0.98	1.63	0.65	0.41	0.94	1.94	0.96	0.65	2.86	2.16	2.46	1.43E-03
5C18	5	2.000	0.66	0.051	0.50	1.69	1.92	0.77	1.96	0.28	0.20	0.75	1.90	0.76	0.28	2.61	1.55	1.48	4.31E-04
5C16	5	2.000	0.69	0.062	0.60	2.06	2.32	0.93	1.96	0.34	0.25	0.75	2.32	0.93	0.34	2.61	1.56	1.82	7.75E-04
5C14	5	2.000	0.72	0.076	0.74	2.52	2.82	1.13	1.95	0.41	0.31	0.75	2.82	1.13	0.41	2.61	1.57	2.25	1.43E-03
5C13	5	2.000	0.76	0.093	0.91	3.08	3.41	1.36	1.94	0.50	0.38	0.74	3.41	1.36	0.50	2.61	1.57	2.78	2.61E-03
6C18	6	2.625	0.78	0.051	0.62	2.13	3.57	1.19	2.39	0.61	0.34	0.99	3.35	1.07	0.61	3.32	2.08	4.67	5.42E-04
6C16	6	2.625	0.81	0.062	0.76	2.58	4.32	1.44	2.39	0.74	0.42	0.99	4.14	1.34	0.74	3.32	2.08	5.72	9.73E-04
6C14	6	2.625	0.85	0.076	0.93	3.17	5.26	1.75	2.38	0.90	0.51	0.99	5.25	1.75	0.90	3.31	2.09	7.06	1.79E-03
6C13	6	2.625	0.89	0.093	1.14	3.88	6.39	2.13	2.37	1.10	0.63	0.98	6.39	2.13	1.10	3.31	2.10	8.72	3.28E-03
8C16	8	2.750	0.81	0.062	0.90	3.06	8.71	2.18	3.11	0.91	0.46	1.00	7.96	1.88	0.91	3.82	1.97	11.64	1.15E-03
8C14	8	2.750	0.85	0.076	1.10	3.75	10.62	2.66	3.10	1.11	0.57	1.00	9.93	2.38	1.11	3.81	1.97	14.34	2.12E-03
8C13	8	2.750	0.89	0.093	1.35	4.59	12.92	3.23	3.10	1.36	0.70	1.00	12.68	3.12	1.36	3.81	1.98	17.64	3.89E-03
8C12	8	2.750	0.92	0.108	1.57	5.33	14.93	3.73	3.09	1.57	0.81	1.00	14.93	3.73	1.57	3.81	1.99	20.59	6.09E-03
10C16	10	2.750	0.81	0.062	1.02	3.48	14.75	2.95	3.80	0.97	0.47	0.97	12.81	2.33	0.97	4.31	1.79	18.95	1.31E-03
10C14	10	2.750	0.85	0.076	1.25	4.27	18.02	3.60	3.79	1.19	0.58	0.97	16.90	3.25	1.19	4.31	1.79	23.29	2.41E-03
10C13	10	2.750	0.89	0.093	1.53	5.22	21.96	4.39	3.78	1.45	0.71	0.97	21.53	4.25	1.45	4.30	1.80	28.60	4.42E-03
10C12	10	2.750	0.92	0.108	1.78	6.06	25.40	5.08	3.78	1.68	0.83	0.97	25.40	5.08	1.68	4.30	1.81	33.31	6.93E-03
10C10	10	2.750	1.00	0.138	2.28	7.75	32.19	6.44	3.76	2.15	1.07	0.97	32.19	6.44	2.15	4.29	1.82	42.81	1.45E-02
118C14	11.5	3.000	0.85	0.076	1.41	4.78	26.44	4.60	4.34	1.52	0.67	1.04	23.33	3.74	1.52	4.84	1.87	38.97	2.71E-03
118C13	11.5	3.000	0.89	0.093	1.72	5.85	32.24	5.61	4.33	1.87	0.82	1.04	30.79	5.21	1.87	4.83	1.88	47.84	4.96E-03
118C12	11.5	3.000	0.91	0.102	1.88	6.41	35.26	6.13	4.33	2.06	0.91	1.04	34.41	5.89	2.06	4.84	1.89	52.93	6.50E-03
118C11	11.5	3.000	0.95	0.120	2.22	7.55	41.35	7.19	4.32	2.41	1.07	1.04	41.05	7.10	2.41	4.83	1.89	62.02	1.07E-02
118C10	11.5	3.000	1.00	0.138	2.55	8.68	47.37	8.24	4.31	2.77	1.24	1.04	47.37	8.24	2.77	4.82	1.90	71.53	1.62E-02
12C14	12	2.750	0.85	0.076	1.41	4.78	27.93	4.65	4.46	1.25	0.59	0.94	24.01	3.55	1.25	4.84	1.65	34.92	2.71E-03
12C13	12	2.750	0.89	0.093	1.72	5.85	34.06	5.68	4.45	1.53	0.72	0.94	31.75	4.95	1.53	4.84	1.65	42.83	4.96E-03
12C12	12	2.750	0.92	0.108	2.00	6.80	39.43	6.57	4.44	1.77	0.84	0.94	38.26	6.16	1.77	4.83	1.66	49.84	7.77E-03
12C11	12	2.750	0.95	0.120	2.22	7.55	43.70	7.28	4.44	1.97	0.94	0.94	42.84	6.98	1.97	4.83	1.66	55.46	1.07E-02
12C10	12	2.750	1.00	0.138	2.55	8.68	50.07	8.34	4.43	2.26	1.09	0.94	49.70	8.21	2.26	4.82	1.67	63.91	1.62E-02
14C13	14	3.500	0.89	0.093	2.05	6.96	56.34	8.05	5.25	2.87	1.07	1.19	49.29	6.46	2.87	5.77	2.08	107.25	5.90E-03
14C12	14	3.500	0.92	0.108	2.38	8.08	65.27	9.32	5.24	3.34	1.24	1.19	61.54	8.50	3.34	5.76	2.09	124.84	9.24E-03
14C11	14	3.500	0.95	0.120	2.64	8.98	72.38	10.34	5.24	3.71	1.39	1.19	69.84	9.77	3.71	5.76	2.09	138.98	1.27E-02
14C10	14	3.500	1.00	0.138	3.04	10.33	82.99	11.86	5.23	4.27	1.60	1.19	81.17	11.44	4.27	5.76	2.10	160.26	1.93E-02

Values in table have been calculated to CAN. CSA S136-16 standard for cold formed steel.
Steel to ASTM A653 G90 (Z275) Zinc Coated Steel. HSLA Grade 55 Yield strength 55ksi (379 Mpa)

C Selection Table - Imperial

"C" Selection Table																										
Section	FVn (kips)	FPn (End) (kips)	RPn (Int.) (kips)	Lu (ft)	FMn (kip-ft)	Unbraced Length (ft), FMn (kip-ft)																				
						2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	
4C18	3.13	0.70	1.15	3.39	1.74	1.73	1.73	1.65	1.47	1.27	0.97	0.74	0.58	0.48	0.40	0.35	0.30	0.27	0.24	0.22	0.20	0.18	0.17	0.16	0.15	
4C16	4.17	1.02	1.75	3.42	2.23	2.23	2.23	2.14	1.94	1.63	1.24	0.95	0.76	0.63	0.53	0.46	0.41	0.36	0.33	0.30	0.27	0.25	0.24	0.22	0.21	
4C14	5.07	1.50	2.69	3.46	2.87	2.87	2.87	2.75	2.46	2.06	1.61	1.25	1.01	0.85	0.73	0.64	0.56	0.51	0.46	0.42	0.39	0.36	0.34	0.32	0.30	
5C18	3.13	0.68	1.14	2.77	2.27	2.07	2.07	1.97	1.53	1.05	0.75	0.57	0.45	0.37	0.31	0.27	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.12	
5C16	4.63	0.99	1.73	2.78	2.78	2.68	2.68	2.40	1.89	1.32	0.96	0.73	0.59	0.49	0.41	0.36	0.32	0.28	0.26	0.23	0.22	0.20	0.19	0.17	0.16	
5C14	6.53	1.46	2.66	2.81	3.38	3.38	3.38	2.94	2.36	1.70	1.25	0.97	0.79	0.66	0.57	0.50	0.44	0.40	0.36	0.33	0.31	0.29	0.27	0.25	0.24	
5C13	7.93	2.14	4.05	2.84	4.09	4.09	4.09	3.60	2.95	2.21	1.65	1.30	1.07	0.91	0.79	0.70	0.62	0.57	0.52	0.48	0.44	0.41	0.39	0.36	0.34	
6C18	2.74	0.67	1.12	3.59	3.22	2.92	2.91	2.91	2.80	2.39	1.86	1.38	1.08	0.87	0.72	0.61	0.52	0.45	0.40	0.36	0.32	0.29	0.27	0.25	0.23	
6C16	4.63	0.97	1.72	3.61	4.01	3.80	3.80	3.80	3.59	3.03	2.31	1.73	1.36	1.10	0.92	0.78	0.67	0.59	0.53	0.47	0.43	0.39	0.36	0.33	0.31	
6C14	6.96	1.44	2.64	3.64	5.25	5.00	5.00	5.00	4.48	3.76	2.92	2.21	1.75	1.43	1.20	1.03	0.90	0.79	0.71	0.64	0.59	0.54	0.50	0.46	0.43	
6C13	9.71	2.10	4.02	3.67	6.39	6.39	6.39	6.17	5.49	4.66	3.72	2.85	2.28	1.88	1.60	1.38	1.21	1.08	0.98	0.89	0.82	0.75	0.70	0.65	0.61	
8C16	3.62	1.29	2.32	3.15	7.78	6.54	6.50	6.50	6.17	4.94	3.56	2.65	2.06	1.65	1.36	1.15	0.98	0.85	0.75	0.67	0.60	0.55	0.50	0.46	0.42	
8C14	6.69	1.91	3.57	3.16	9.82	8.72	8.72	8.72	8.10	6.29	4.45	3.33	2.60	2.10	1.75	1.48	1.28	1.12	0.99	0.89	0.80	0.73	0.67	0.62	0.58	
8C13	12.22	2.81	5.45	3.17	12.89	11.60	11.60	11.60	10.26	7.84	5.59	4.22	3.32	2.71	2.27	1.94	1.68	1.49	1.33	1.20	1.09	1.00	0.92	0.86	0.80	
8C12	16.48	3.73	7.41	3.19	15.40	14.26	14.26	14.14	11.95	9.26	6.67	5.07	4.02	3.30	2.78	2.39	2.09	1.86	1.67	1.51	1.38	1.27	1.18	1.10	1.03	
10C16	2.86	1.24	2.28	3.10	9.61	8.36	8.23	8.23	8.14	6.54	4.63	3.44	2.66	2.13	1.74	1.46	1.25	1.08	0.95	0.84	0.75	0.68	0.61	0.56	0.52	
10C14	5.28	1.85	3.52	3.11	13.42	11.15	11.11	11.11	10.86	8.20	5.76	4.29	3.34	2.68	2.21	1.86	1.60	1.39	1.23	1.09	0.98	0.89	0.81	0.75	0.69	
10C13	9.71	2.73	5.38	3.12	17.53	14.90	14.90	14.90	13.67	10.18	7.19	5.39	4.22	3.41	2.83	2.40	2.08	1.82	1.61	1.45	1.31	1.20	1.10	1.01	0.94	
10C12	15.25	3.63	7.33	3.13	20.95	18.44	18.44	18.44	15.92	11.99	8.52	6.42	5.05	4.11	3.44	2.93	2.55	2.25	2.00	1.81	1.64	1.50	1.39	1.29	1.20	
10C10	26.91	5.78	12.09	3.15	26.56	25.90	25.90	24.29	20.46	15.78	11.39	8.68	6.92	5.70	4.82	4.16	3.65	3.24	2.92	2.65	2.43	2.24	2.08	1.94	1.82	
118C14	4.56	1.81	3.49	3.33	15.43	13.34	13.11	13.11	13.11	11.44	8.34	6.19	4.79	3.83	3.14	2.63	2.24	1.94	1.70	1.51	1.35	1.22	1.11	1.01	0.93	
118C13	8.38	2.68	5.33	3.34	21.49	17.79	17.71	17.71	17.71	14.49	10.36	7.71	6.00	4.82	3.98	3.35	2.87	2.50	2.20	1.96	1.77	1.60	1.46	1.34	1.24	
118C12	10.97	3.18	6.42	3.36	24.31	20.36	20.31	20.31	20.09	16.03	11.52	8.60	6.70	5.40	4.46	3.77	3.24	2.83	2.50	2.24	2.02	1.83	1.68	1.55	1.43	
118C11	18.08	4.36	9.03	3.36	29.30	25.69	25.69	25.69	23.86	18.96	13.73	10.30	8.08	6.55	5.45	4.63	4.01	3.52	3.13	2.81	2.55	2.33	2.14	1.98	1.84	
118C10	26.91	5.69	12.01	3.37	33.98	31.35	31.35	31.35	27.47	22.02	16.11	12.16	9.59	7.82	6.55	5.60	4.87	4.30	3.84	3.47	3.16	2.90	2.68	2.48	2.32	
12C14	4.36	1.79	3.48	3.06	14.65	13.53	13.39	13.39	12.33	9.49	6.89	5.26	4.12	3.30	2.71	2.27	1.94	1.68	1.48	1.31	1.17	1.06	0.96	0.88	0.81	
12C13	8.01	2.66	5.32	3.07	20.43	18.13	18.10	18.10	16.26	12.23	8.87	6.64	5.17	4.16	3.44	2.90	2.49	2.17	1.92	1.71	1.54	1.40	1.28	1.18	1.09	
12C12	12.58	3.55	7.25	3.08	25.43	22.55	22.55	22.55	19.50	14.74	10.49	7.86	6.15	43.98	4.14	3.51	3.03	2.66	2.36	2.11	1.91	1.75	1.60	1.48	1.38	
12C11	17.29	4.34	9.01	3.09	28.80	26.27	26.27	26.27	22.14	16.66	11.82	8.89	6.98	5.67	4.73	4.03	3.50	3.08	2.74	2.47	2.24	2.05	1.89	1.74	1.63	
12C10	26.38	5.67	11.98	3.10	33.88	32.05	32.05	30.97	25.95	19.46	13.89	10.51	8.31	6.79	5.70	4.89	4.26	3.77	3.38	3.05	2.79	2.56	2.37	2.20	2.06	
14C13	6.82	2.59	5.26	3.80	26.65	23.24	22.47	22.47	22.47	18.34	13.99	10.80	8.62	7.05	5.90	5.02	4.33	3.78	3.34	2.98	2.68	2.43	2.22	2.03	2.03	
14C12	10.70	3.47	47.18	3.81	35.07	28.77	28.22	28.22	28.22	27.27	21.96	16.43	12.72	10.18	8.36	7.01	5.98	5.18	4.55	4.03	3.61	3.26	2.96	2.71	2.50	
14C11	14.70	4.25	8.92	3.82	40.29	33.49	33.08	33.08	33.08	30.79	24.74	18.43	14.31	11.48	9.45	7.95	6.80	5.91	5.20	4.62	4.15	3.76	3.43	3.14	2.90	
14C10	22.42	5.56	11.88	3.83	47.18	41.00	40.76	40.76	40.76	36.33	28.76	21.54	16.78	13.52	11.18	9.44	8.11	7.08	6.25	5.59	5.04	4.58	4.19	3.86	3.57	

Notes: 1) One flange loading or reaction
2) Members being fastened at supports
3) Web Crippling capacity based on 3" bearing length
4) See S136-16 section G5 - Web crippling strength of webs without stiffeners

Values in table have been calculated to CAN. CSA S136-16 standard for cold formed steel.
Steel to ASTM A653 G90 (Z275) Zinc Coated Steel. HSLA Grade 55 Yield strength 55ksi (379 Mpa)

C Selection Table - Imperial

"C" Selection Table - Maximum Specified Load in Bending, Fully Supported (lbs. / ft.) - Continued																					
Section		SPAN (ft)																			
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
118C13	B	5583.6	2791.8	1861.2	1395.9	1116.7	795.8	584.7	447.6	353.7	286.5	236.8	198.9	169.5	146.2	127.3	111.9	99.1	88.4	79.4	71.6
	D	352211.0	44026.4	13044.9	5503.3	2817.7	1630.6	1026.9	687.9	483.1	352.2	264.6	203.8	160.3	128.4	104.4	86.0	71.7	60.4	51.4	44.0
118C12	B	7313.3	3656.7	2437.8	1828.3	1296.3	900.2	661.4	506.4	400.1	324.1	267.8	225.1	191.8	165.3	144.0	126.6	112.1	100.0	89.8	81.0
	D	385235.2	48154.4	14268.0	6019.3	3081.9	1783.5	1123.1	752.4	528.4	385.2	289.4	222.9	175.3	140.4	114.1	94.1	78.4	66.1	56.2	48.2
118C11	B	12054.6	6027.3	4018.2	2441.8	1562.7	1085.2	797.3	610.4	482.3	390.7	322.9	271.3	231.2	199.3	173.6	152.6	135.2	120.6	108.2	97.7
	D	451819.3	56477.4	16734.0	7059.7	3614.6	2091.8	1317.3	882.5	619.8	451.8	339.5	261.5	205.7	164.7	133.9	110.3	92.0	77.5	65.9	56.5
118C10	B	17942.9	8971.4	5034.1	2831.7	1812.3	1258.5	924.6	707.9	559.3	453.1	374.4	314.6	268.1	231.2	201.4	177.0	156.8	139.8	125.5	113.3
	D	517524.0	64690.5	19167.6	8086.3	4140.2	2395.9	1508.8	1010.8	709.9	517.5	388.8	299.5	235.6	188.6	153.3	126.3	105.3	88.7	75.5	64.7
12C14	B	2905.4	1452.7	968.5	726.3	581.1	484.2	398.7	305.2	241.2	195.4	161.4	135.7	115.6	99.7	86.8	76.3	67.6	60.3	54.1	48.8
	D	305126.9	38140.9	11301.0	4767.6	2441.0	1412.6	889.6	596.0	418.6	305.1	229.2	176.6	138.9	111.2	90.4	74.5	62.1	52.3	44.5	38.1
12C13	B	5339.5	2669.7	1779.8	1334.9	1067.9	756.8	556.0	425.7	336.4	272.5	225.2	189.2	161.2	139.0	121.1	106.4	94.3	84.1	75.5	68.1
	D	372103.7	46513.0	13781.6	5814.1	2976.8	1722.7	1084.9	726.8	510.4	372.1	279.6	215.3	169.4	135.6	110.3	90.8	75.7	63.8	54.3	46.5
12C12	B	8384.2	4192.1	2794.7	2096.1	1356.1	941.8	691.9	529.7	418.6	339.0	280.2	235.4	200.6	173.0	150.7	132.4	117.3	104.6	93.9	84.8
	D	430793.0	53849.1	15955.3	6731.1	3446.3	1994.4	1256.0	841.4	590.9	430.8	323.7	249.3	196.1	157.0	127.6	105.2	87.7	73.9	62.8	53.8
12C11	B	11525.2	5762.6	3841.7	2400.0	1536.0	1066.7	783.7	600.0	474.1	384.0	317.4	266.7	227.2	195.9	170.7	150.0	132.9	118.5	106.4	96.0
	D	477470.4	59683.8	17684.1	7460.5	3819.8	2210.5	1392.0	932.6	655.0	477.5	358.7	276.3	217.3	174.0	141.5	116.6	97.2	81.9	69.6	59.7
12C10	B	17584.0	8792.0	5019.8	2823.6	1807.1	1254.9	922.0	705.9	557.8	451.8	373.4	313.7	267.3	230.5	200.8	176.5	156.3	139.4	125.1	112.9
	D	547007.3	68375.9	20259.5	8547.0	4376.1	2532.4	1594.8	1068.4	750.4	547.0	411.0	316.6	249.0	199.3	162.1	133.5	111.3	93.8	79.8	68.4
14C13	B	4544.9	2272.4	1515.0	1136.2	909.0	757.5	649.3	555.3	438.7	355.4	293.7	246.8	210.3	181.3	157.9	138.8	123.0	109.7	98.4	88.8
	D	615613.4	76951.7	22800.5	9619.0	4924.9	2850.1	1794.8	1202.4	844.5	615.6	462.5	356.3	280.2	224.3	182.4	150.3	125.3	105.6	89.8	77.0
14C12	B	7133.7	3566.8	2377.9	1783.4	1426.7	1188.9	954.2	730.5	577.2	467.5	386.4	324.7	276.7	238.5	207.8	182.6	161.8	144.3	129.5	116.9
	D	713159.7	89145.0	26413.3	11143.1	5705.3	3301.7	2079.2	1392.9	978.3	713.2	535.8	412.7	324.6	259.9	211.3	174.1	145.2	122.3	104.0	89.1
14C11	B	9803.1	4901.6	3267.7	2450.8	1960.6	1492.1	1096.2	839.3	663.2	537.2	443.9	373.0	317.8	274.1	238.7	209.8	185.9	165.8	148.8	134.3
	D	790838.5	98854.8	29290.3	12356.9	6326.7	3661.3	2305.7	1544.6	1084.8	790.8	594.2	457.7	360.0	288.2	234.3	193.1	161.0	135.6	115.3	98.9
14C10	B	14949.5	7474.8	4983.2	3737.4	2516.3	1747.4	1283.8	982.9	776.6	629.1	519.9	436.8	372.2	321.0	279.6	245.7	217.7	194.2	174.3	157.3
	D	906728.6	113341.1	33582.5	14167.6	7253.8	4197.8	2643.5	1771.0	1243.8	906.7	681.2	524.7	412.7	330.4	268.7	221.4	184.6	155.5	132.2	113.3

B - Strength Loading D - Deflection Loading

- Notes: 1) Deflection based on L/180
 2) Deflection is based on gross moment of inertia and is unconservative when the cross section is not fully active.
 3) Maximum load based on effective moment of inertia can be obtained by multiply by (I_{xe} / I_x)

Values in table have been calculated to CAN, CSA S136-16 standard for cold formed steel.
 Steel to ASTM A653 Z275 (G90) Zinc Coated Steel, HSLA Grade 55 Yield strength 55ksi (379 Mpa)

Z Section Properties - Metric

Dimensions

d = section depth
 b = flange width
 h = lip length
 t = steel thickness
 C.G = centre of gravity
 S.C = shear centre
 r = inside bend radius = 3.2 mm

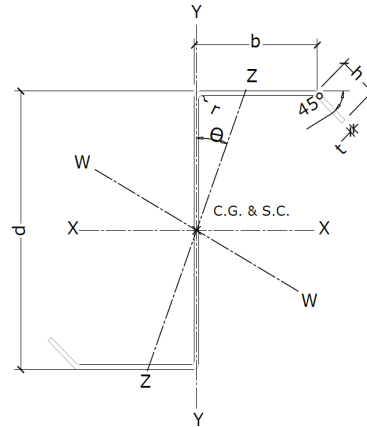
Section Product Codes

4 Z 18

depth (in.)/shape/gauge

8 DZ 18

DZ (Double Z) are two
 same shape Z sections
 nested together



Properties

I_x eff. = effective moment of inertia about axis X-X at maximum
 compressive stress = $0.6 F_y$
 S_x eff. = effective elastic section modulus about axis X-X
 r_x = radius of gyration about axis X-X
 I_y = gross moment of inertia about axis Y-Y
 S_y eff. = effective elastic section modulus about axis Y-Y
 r_y = radius of gyration about axis Y-Y
 $r_{min.}$ = radius of gyration about Z-Z
 J = St. Venant torsion constant
 C_w = warping constant
 A_g = gross area of section
 θ = angle between axis Z-Z and Y-Y

Z Section Properties - Metric

Wall Girt Selection Example – Metric

GIVEN

7,300mm single span condition.
 1,600mm girt spacing with two rows of Brace Angles at one third of span to prevent buckling.
 Metal cladding attached to exterior flange at 300mm o/c.
 Cladding considered to prevent distortional buckling and lateral torsional buckling.
 Deflection limit L/180.

LOADS

Positive external wind pressure at 0.70 kPa.
 Negative external wind pressure at 0.60 kPa.

CALCULATIONS

Positive $W_f = 1.4 \times 0.70 \text{ kPa} \times 1.6\text{m} = 1.57 \text{ kN/m}$

Negative $W_f = 1.4 \times 0.60 \text{ kPa} \times 1.6\text{m} = 1.34 \text{ kN/m}$

$M_f^+ = 1.57 \text{ kN/m} \times (7.3\text{m})^2 / 8 = 10.46 \text{ kN}\cdot\text{m}$.

$M_f^- = 1.34 \text{ kN/m} \times (7.3\text{m})^2 / 8 = 8.93 \text{ kN}\cdot\text{m}$.

$$I_{\min} (\text{deflection} < \text{span} / 180) = \frac{180 \times 5 \times 0.75 \times 1.12 \text{ kN/m} \times (7,300\text{mm})^3}{384 \times 203,000 \text{ MPa}}$$

$$I_{\min} = 3.77 \times 10^6 \text{ mm}^4$$

Consult Properties table for sections with $I_{xe} > I_{\min}$.

Section 8Z14 $I_{xe} = 4.03 \times 10^6 \text{ mm}^4 > I_{\min} 3.77 \times 10^6 \text{ mm}^4 \therefore \text{ok}$

Fy = steel yield strength = 379 Mpa

Vn = factored shear resistance.

Pn(end) = web crippling capacity based on 75mm bearing length.

Pn(int) = web crippling capacity based on 75mm bearing length.

Mn = factored moment resistance based on lateral and distortional buckling.

Lu = maximum unbraced length of compression flange beyond which appropriate values in the Table must be reduced for lateral-torsion buckling.

Verify with the selection tables

$M_n^+ = M_n \text{ fully braced at } 300\text{mm o/c} > M_f^+$

Section 8Z14 $M_n \text{ fully braced} = 12.71 \text{ kN}\cdot\text{m} > M_f^+ 10.46 \text{ kN}\cdot\text{m} \therefore \text{ok}$

$M_n^- = \min. (M_n \text{ flexural-torsional at } 2.4\text{m}, M_n \text{ distortional}) > M_f^-$

Section 8Z14 $M_n \text{ at } 2,438\text{mm} = 10.01 \text{ kN}\cdot\text{m} > M_f^- 8.93 \text{ kN}\cdot\text{m} \therefore \text{ok}$

Brace Angle must be connected to the section according to S136-16 standard.

$$V_n > V_f$$

For girt attached to column with 75mm bearing, use $P_n(\text{end})$.

$P > V$ If not, connection to the support column must be completed by bolting the web to prevent web crippling over the bearing support.

Z Section Properties - Metric

"Z" Section Properties DZ (Double Z) are two same shape Z sections nested together

Section	d (mm)	b (mm)	h (mm)	t (mm)	Radius (mm)	Area (mm ²)	Mass (kg/m)	Gross						Effective		r-min (mm)	Theta (°)	Ro (mm)	Cw (mm ⁴)	J (mm ⁴)
								Ix (mm ⁴)	Sx (mm ³)	rx (mm)	Iy (mm ⁴)	Sy (mm ³)	ry (mm)	Ixe (mm ⁴)	Sxe (mm ³)					
4Z18	101.6	63.5	13.9	1.3	4.8	321	2.5	572445	11269	42.2	370185	5093	34.0	500923	9030	17.4	37.16	54.2	5.48E+08	179.4
4Z16	101.6	63.5	14.4	1.6	4.8	390	3.1	691615	13614	42.1	453052	6217	34.1	625446	11490	17.4	37.39	54.2	6.69E+08	322.4
4Z14	101.6	63.5	15.0	1.9	4.8	478	3.8	841053	16556	41.9	560044	7660	34.2	806161	15358	17.4	37.67	54.1	8.23E+08	593.8
5Z18	127.0	50.8	13.9	1.3	4.8	321	2.5	817389	12872	50.5	211753	3530	25.7	766226	11568	15.7	22.97	56.6	5.54E+08	179.4
5Z16	127.0	50.8	14.4	1.6	4.8	390	3.1	988953	15574	50.4	259447	4311	25.8	963473	14893	15.7	23.12	56.6	6.76E+08	322.4
5Z14	127.0	50.8	15.0	1.9	4.8	478	3.8	1204819	18974	50.2	321170	5316	25.9	1204819	18974	15.8	23.32	56.5	8.34E+08	593.8
5Z13	127.0	50.8	15.7	2.4	4.8	585	4.6	1463170	23042	50.0	397664	6551	26.1	1463170	23042	15.9	23.57	56.4	1.03E+09	1088.1
6Z18	152.4	66.7	17.1	1.3	4.8	403	3.2	1517885	19920	61.4	467492	5985	34.1	1355836	16583	20.3	25.26	70.2	1.73E+09	225.5
6Z16	152.4	66.7	17.5	1.6	4.8	490	3.8	1837941	24120	61.2	571770	7303	34.2	1677805	20764	20.4	25.39	70.1	2.11E+09	405.1
6Z14	152.4	66.7	18.1	1.9	4.8	601	4.7	2241454	29415	61.1	706229	8993	34.3	2147913	27354	20.4	25.57	70.1	2.60E+09	746.1
6Z13	152.4	66.7	18.8	2.4	4.8	735	5.8	2725634	35769	60.9	872125	11065	34.4	2682608	34785	20.5	25.77	70.0	3.20E+09	1367.1
8Z16	203.2	69.9	17.5	1.6	4.8	580	4.6	3677965	36200	79.6	641788	7877	33.3	3178974	28684	21.5	18.32	86.3	4.48E+09	479.5
8Z14	203.2	69.9	18.1	1.9	4.8	711	5.6	4492482	44217	79.5	792535	9700	33.4	4033169	37244	21.5	18.43	86.2	5.52E+09	883.1
8Z13	203.2	69.9	18.8	2.4	4.8	870	6.8	5473441	53872	79.3	978444	11933	33.5	5131684	48511	21.6	18.57	86.1	6.79E+09	1618.2
8Z12	203.2	69.9	19.5	2.7	4.8	1010	7.9	6331681	62320	79.2	1145210	13923	33.7	6092471	58461	21.7	18.69	86.0	7.93E+09	2534.3
8DZ16	203.2	69.9	19.4	2.7	4.8	992	7.8	6217660	61197	79.2	1122836	13657	33.7	5973863	57271	21.7	18.68	86.0	7.77E+09	2396.1
8DZ14	203.2	69.9	20.4	3.3	4.8	1225	9.6	7633919	75137	78.9	1405645	17009	33.9	7565492	73996	21.8	18.88	85.9	9.69E+09	4522.7
8DZ13	203.2	69.9	22.1	4.3	4.8	1590	12.5	9804142	96497	78.5	1860878	22339	34.2	9804142	96497	21.9	19.19	85.6	1.27E+10	9883.9
8DZ12	203.2	69.9	23.6	5.3	4.8	1936	15.2	11818136	116320	78.1	2308576	27507	34.5	11818136	116320	22.1	19.50	85.4	1.57E+10	17844.1
10Z16	254.0	69.9	17.5	1.6	4.8	660	5.2	6209500	48894	97.0	641805	7878	31.2	5104833	35469	21.3	13.51	101.9	7.39E+09	545.6
10Z14	254.0	69.9	18.1	1.9	4.8	809	6.3	7591505	59776	96.9	792565	9700	31.3	6789284	50085	21.4	13.59	101.8	9.10E+09	1004.9
10Z13	254.0	69.9	18.8	2.4	4.8	990	7.8	9259395	72909	96.7	978499	11934	31.4	8707494	66129	21.5	13.69	101.7	1.12E+10	1841.4
10Z12	254.0	69.9	19.5	2.7	4.8	1150	9.0	10721857	84424	96.6	1145298	13925	31.6	10329220	79489	21.5	13.77	101.6	1.31E+10	2883.8
10Z10	254.0	69.9	20.7	3.5	4.8	1469	11.5	13619987	107244	96.3	1486331	17960	31.8	13619987	107244	21.7	13.94	101.4	1.69E+10	6016.4
10DZ16	254.0	69.9	19.1	2.5	4.8	1043	8.2	9747911	76755	96.7	1033846	12595	31.5	9281564	70963	21.5	13.71	101.7	1.18E+10	2154.7
10DZ14	254.0	69.9	20.4	3.3	4.8	1395	10.9	12946861	101944	96.4	1405802	17011	31.8	12825768	100380	21.6	13.90	101.5	1.60E+10	5146.5
10DZ13	254.0	69.9	22.1	4.3	4.8	1810	14.2	16671623	131273	96.0	1861222	22343	32.1	16671623	131273	21.8	14.12	101.2	2.11E+10	11247.2
10DZ12	254.0	69.9	23.6	5.3	4.8	2196	17.2	20063016	157976	95.6	2260893	27095	32.1	20063016	157976	21.8	14.19	100.8	2.54E+10	20238.9

Continues on next page

Values in table have been calculated to CAN.CSA S 136-16 standard for cold formed steel.
Steel to ASTM A653 Z275 (G90) Zinc Coated Steel HSLA Grade 55 Yield strength 55ksi (379 Mpa)

Z Section Properties - Metric

"Z" Section Properties - Continued DZ (Double Z) are two same shape Z sections nested together

Section	d (mm)	b (mm)	h (mm)	t (mm)	Radius (mm)	Area (mm ²)	Mass (kg/m)	Gross						Effective		r-min (mm)	Theta (°)	Ro (mm)	Cw (mm ⁴)	J (mm ⁴)
								Ix (mm ⁴)	Sx (mm ³)	rx (mm)	Iy (mm ⁴)	Sy (mm ³)	ry (mm)	Ixe (mm ⁴)	Sxe (mm ³)					
10DZ10	254.0	69.9	51.9	7.0	4.8	2938	23.1	26478491	208492	94.9	3186057	37441	32.9	26478491	208492	22.3	14.72	100.5	3.54E+10	48130.8
118Z14	292.1	76.2	18.1	1.9	4.8	907	7.1	11109977	76070	110.7	985461	11191	33.0	9357025	57554	22.9	12.35	115.5	1.52E+10	1126.8
118Z13	292.1	76.2	18.8	2.4	4.8	1110	8.7	13558313	92833	110.5	1216029	13764	33.1	12453899	81317	23.0	12.43	115.4	1.87E+10	2064.6
118Z12	292.1	76.2	19.5	2.7	4.8	1289	10.1	15707435	107548	110.4	1422672	16057	33.2	14907228	99003	23.0	12.50	115.3	2.18E+10	3233.4
118Z11	292.1	76.2	20.0	3.0	4.8	1432	11.2	17418878	119267	110.3	1590060	17905	33.3	16754048	112076	23.1	12.56	115.2	2.43E+10	4435.4
118Z10	292.1	76.2	20.7	3.5	4.8	1647	12.9	19973021	136755	110.1	1844673	20701	33.5	19472863	131278	23.2	12.65	115.1	2.81E+10	6745.6
118DZ14	292.1	76.2	20.1	3.1	4.8	1468	11.5	17845530	122188	110.3	1632144	18369	33.3	17192131	115111	23.1	12.57	115.2	2.49E+10	4776.4
118DZ13	292.1	76.2	21.9	4.2	4.8	1981	15.5	23914682	163743	109.9	2249189	25107	33.7	23914682	163743	23.3	12.78	114.9	3.42E+10	11741.1
118DZ12	292.1	76.2	23.4	5.1	4.8	2399	18.8	28787345	197106	109.5	2769494	30712	34.0	28787345	197106	23.4	12.94	114.7	4.18E+10	20843.7
118DZ11	292.1	76.2	24.5	5.8	4.8	2721	21.4	32503765	222552	109.3	3181820	35107	34.2	32503765	222552	23.6	13.07	114.5	4.79E+10	30422.1
118DZ10	292.1	76.2	26.4	6.9	4.8	3246	25.5	38480413	263474	108.9	3874839	42405	34.5	38480413	263474	23.8	13.28	114.2	5.79E+10	51652.4
12Z14	304.8	69.9	18.1	1.9	4.8	907	7.1	11734438	76998	113.7	792596	9700	29.6	9645362	54921	21.0	10.52	117.5	1.37E+10	1.13E+03
12Z13	304.8	69.9	18.8	2.4	4.8	1110	8.7	14322761	93981	113.6	978555	11934	29.7	12718679	76069	21.1	10.59	117.4	1.68E+10	2.06E+03
12Z12	304.8	69.9	19.5	2.7	4.8	1289	10.1	16595485	108894	113.5	1145384	13926	29.8	15436247	95429	21.2	10.65	117.3	1.96E+10	3.23E+03
12Z11	304.8	69.9	20.0	3.0	4.8	1432	11.2	18405862	120773	113.4	1280623	15531	29.9	17535775	110523	21.2	10.70	117.2	2.19E+10	4.44E+03
12Z10	304.8	69.9	20.7	3.5	4.8	1647	12.9	21108454	138507	113.2	1486515	17962	30.0	20956570	136361	21.3	10.78	117.1	2.54E+10	6.75E+03
12DZ14	304.8	69.9	19.9	3.0	4.8	1420	11.1	18255110	119784	113.4	1269244	15397	29.9	17354869	109199	21.2	10.70	117.2	2.17E+10	4.33E+03
12DZ13	304.8	69.9	21.2	3.8	4.8	1790	14.0	22901468	150272	113.1	1625798	19597	30.1	22885458	150045	21.4	10.83	117.0	2.77E+10	8.66E+03
12DZ12	304.8	69.9	23.0	4.9	4.8	2292	18.0	29121246	191084	112.7	2126146	25410	30.5	29121246	191084	21.6	11.00	116.8	3.60E+10	1.82E+04
12DZ11	304.8	69.9	24.3	5.6	4.8	2650	20.8	33509983	219882	112.5	2495860	29649	30.7	33509983	219882	21.7	11.13	116.6	4.21E+10	2.81E+04
12DZ10	304.8	69.9	26.5	7.0	4.8	3294	25.8	41293700	270956	112.0	3187517	37458	31.1	41293700	270956	21.9	11.35	116.2	5.34E+10	5.40E+04
14Z13	355.6	88.9	18.8	2.4	4.8	1320	10.4	23625890	132879	133.8	1799368	17807	36.9	19796512	99860	26.0	11.29	138.8	4.14E+10	2.46E+03
14Z12	355.6	88.9	19.5	2.7	4.8	1533	12.0	27385711	154025	133.7	2103523	20765	37.0	24794250	131886	26.1	11.35	138.7	4.83E+10	3.85E+03
14Z11	355.6	88.9	20.0	3.0	4.8	1703	13.4	30382986	170883	133.6	2349606	23148	37.1	28311301	153100	26.1	11.39	138.6	5.39E+10	5.27E+03
14Z10	355.6	88.9	20.7	3.5	4.8	1959	15.4	34861332	196071	133.4	2723396	26750	37.3	33453566	183704	26.2	11.46	138.5	6.23E+10	8.02E+03
14DZ13	355.6	88.9	21.2	3.8	4.8	2129	16.7	37835155	212796	133.3	2975719	29170	37.4	36424432	200367	26.3	11.51	138.5	6.80E+10	1.03E+04
14DZ12	355.6	88.9	22.9	4.8	4.8	2697	21.2	47678790	268160	133.0	3834923	37345	37.7	47457115	266146	26.4	11.66	138.2	8.72E+10	2.09E+04
14DZ11	355.6	88.9	24.1	5.5	4.8	3094	24.3	54505288	306554	132.7	4453062	43165	37.9	54505288	306554	26.6	11.76	138.0	1.01E+11	3.16E+04
14DZ10	355.6	88.9	26.0	6.7	4.8	3747	29.4	65603525	368974	132.3	5498639	52901	38.3	65603525	368974	26.8	11.93	137.8	1.24E+11	5.62E+04

Values in table have been calculated to CAN.CSA S 136-16 standard for cold formed steel.
Steel to ASTM A653 Z275 (G90). Zinc Coated Steel HSLA Grade 55 Yield strength 55ksi (379 Mpa)

Z Selection Table - Metric

"Z" Selection Table																									
DZ (Double Z) are two same shape Z sections nested together																									
Section	FVn (kN)	FPn (End) (kN)	FPn (Int.) (kN)	Lu (m)	FMn (kNm)	Unbraced Length (mm), FMn (kNm)																			
						609.6	1219.2	1828.8	2438.4	3048	3657.6	4267.2	4876.8	5486.4	6096	6705.6	7315.2	7924.8	8534.4	9144	9753.6	10363	10973	11582	12192
4Z18	13.9	3.5	5.5	1.293	2.24	1.98	1.98	1.98	1.89	1.59	1.25	0.98	0.77	0.63	0.52	0.45	0.39	0.34	0.31	0.27	0.25	0.23	0.21	0.20	0.18
4Z16	18.5	5.0	8.4	1.304	2.85	2.63	2.63	2.63	2.47	2.10	1.63	1.24	0.99	0.81	0.69	0.59	0.52	0.46	0.41	0.37	0.34	0.32	0.29	0.27	0.26
4Z14	22.5	7.4	12.8	1.319	3.81	3.51	3.51	3.51	3.21	2.72	2.12	1.63	1.31	1.09	0.93	0.81	0.71	0.64	0.58	0.53	0.49	0.45	0.42	0.39	0.37
5Z18	13.9	3.4	5.5	1.053	2.87	2.40	2.40	2.40	2.12	1.47	1.04	0.79	0.62	0.50	0.42	0.36	0.31	0.27	0.25	0.22	0.20	0.18	0.17	0.16	0.15
5Z16	20.6	4.9	8.3	1.061	3.70	3.18	3.18	3.18	2.64	1.84	1.32	1.00	0.80	0.65	0.55	0.47	0.42	0.37	0.33	0.30	0.28	0.25	0.24	0.22	0.21
5Z14	29.0	7.2	12.7	1.071	4.71	4.24	4.24	4.11	3.30	2.35	1.70	1.31	1.05	0.88	0.75	0.65	0.57	0.51	0.46	0.42	0.39	0.36	0.34	0.32	0.30
5Z13	35.3	10.5	19.2	1.085	5.72	5.58	5.58	5.04	4.12	3.04	2.24	1.75	1.42	1.20	1.03	0.90	0.80	0.72	0.66	0.61	0.56	0.52	0.49	0.46	0.43
6Z18	12.2	3.3	5.4	1.371	4.12	3.31	3.31	3.31	3.31	3.09	2.51	1.93	1.50	1.20	0.99	0.83	0.71	0.61	0.54	0.48	0.43	0.39	0.35	0.32	0.30
6Z16	20.6	4.8	8.2	1.379	5.15	4.39	4.39	4.39	4.39	4.03	3.22	2.40	1.87	1.51	1.25	1.05	0.91	0.79	0.70	0.63	0.56	0.51	0.47	0.43	0.40
6Z14	31.0	7.1	12.6	1.389	6.79	5.89	5.89	5.89	5.89	5.19	4.06	3.05	2.39	1.94	1.62	1.38	1.19	1.05	0.94	0.84	0.76	0.70	0.64	0.60	0.55
6Z13	43.2	10.3	19.1	1.402	8.63	7.84	7.84	7.84	7.65	6.49	5.15	3.91	3.10	2.54	2.13	1.83	1.60	1.42	1.27	1.15	1.05	0.97	0.90	0.83	0.78
8Z16	16.1	6.3	11.1	1.189	9.79	7.36	7.36	7.36	7.36	6.42	4.92	3.74	2.90	2.31	1.90	1.59	1.36	1.17	1.03	0.91	0.82	0.74	0.67	0.61	0.56
8Z14	29.8	9.4	17.0	1.196	12.71	10.01	10.01	10.01	10.01	8.50	6.30	4.69	3.65	2.93	2.42	2.04	1.75	1.52	1.34	1.19	1.07	0.97	0.89	0.82	0.76
8Z13	54.4	13.8	25.9	1.204	16.56	13.55	13.55	13.55	13.55	11.00	7.91	5.92	4.63	3.75	3.11	2.64	2.28	2.00	1.77	1.59	1.44	1.31	1.20	1.11	1.03
8Z12	73.3	18.2	35.1	1.212	19.95	16.92	16.92	16.92	16.34	13.10	9.41	7.09	5.58	4.54	3.79	3.24	2.81	2.48	2.21	1.99	1.81	1.66	1.53	1.42	1.32
8DZ16	70.6	17.6	33.8	1.211	19.55	16.46	16.46	16.46	15.95	12.83	9.20	6.93	5.45	4.43	3.70	3.15	2.74	2.41	2.15	1.93	1.76	1.61	1.48	1.38	1.28
8DZ14	107.9	26.2	51.9	1.224	25.25	22.42	22.42	22.42	20.46	16.27	11.89	9.04	7.18	5.89	4.97	4.27	3.74	3.32	2.98	2.71	2.48	2.28	2.11	1.97	1.84
8DZ13	145.4	42.4	87.5	1.247	32.93	32.31	32.31	30.92	26.85	21.98	16.65	12.85	10.36	8.63	7.37	6.42	5.68	5.09	4.61	4.22	3.89	3.60	3.36	3.15	2.96
8DZ12	175.3	61.0	129.4	1.270	39.70	39.70	39.70	37.58	33.04	27.74	21.91	17.14	13.99	11.78	10.16	8.93	7.96	7.19	6.55	6.02	5.57	5.18	4.85	4.56	4.30
10Z16	12.7	6.1	10.9	1.159	12.11	9.31	9.31	9.31	9.31	8.62	6.52	4.93	3.80	3.03	2.47	2.07	1.75	1.51	1.32	1.16	1.04	0.93	0.84	0.77	0.70

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- Notes: 1) One flange loading or reaction
- 2) Members being fastened at supports
- 3) Web Crippling capacity (FPn) based on 75mm bearing length
- 4) See S136-16 section G5 - Web crippling strength of webs without stiffeners

Z Selection Table - Metric

"Z" SELECTION TABLE - MAXIMUM SPECIFIED LOAD IN BENDING, FULLY SUPPORTED (kN/m) DZ (Double Z) are two same shape Z sections nested together

		SPAN (mm)																			
Section		610	1219	1829	2438	3048	3658	4267	4877	5486	6096	6706	7315	7925	8534	9144	9754	10363	10973	11582	12192
4Z18	B	30.50	8.04	3.57	2.01	1.29	0.89	0.66	0.50	0.40	0.32	0.27	0.22	0.19	0.16	0.14	0.13	0.11	0.10	0.09	0.08
	D	219.29	27.41	8.12	3.43	1.75	1.02	0.64	0.43	0.30	0.22	0.16	0.13	0.10	0.08	0.06	0.05	0.04	0.04	0.03	0.03
4Z16	B	40.55	10.23	4.55	2.56	1.64	1.14	0.84	0.64	0.51	0.41	0.34	0.28	0.24	0.21	0.18	0.16	0.14	0.13	0.11	0.10
	D	264.95	33.12	9.81	4.14	2.12	1.23	0.77	0.52	0.36	0.26	0.20	0.15	0.12	0.10	0.08	0.06	0.05	0.05	0.04	0.03
4Z14	B	49.31	13.68	6.08	3.42	2.19	1.52	1.12	0.85	0.68	0.55	0.45	0.38	0.32	0.28	0.24	0.21	0.19	0.17	0.15	0.14
	D	2505.04	378.85	11.93	5.03	2.58	1.49	0.94	0.63	0.44	0.32	0.24	0.19	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
5Z18	B	30.50	10.30	4.58	2.58	1.65	1.14	0.84	0.64	0.51	0.41	0.34	0.29	0.24	0.21	0.18	0.16	0.14	0.13	0.11	0.10
	D	313.13	39.14	11.60	4.89	2.51	1.45	0.91	0.61	0.43	0.31	0.24	0.18	0.14	0.11	0.09	0.08	0.06	0.05	0.05	0.04
5Z16	B	45.08	13.26	5.89	3.32	2.12	1.47	1.08	0.83	0.65	0.53	0.44	0.37	0.31	0.27	0.24	0.21	0.18	0.16	0.15	0.13
	D	378.85	47.36	14.03	5.92	3.03	1.75	1.10	0.74	0.52	0.38	0.28	0.22	0.17	0.14	0.11	0.09	0.08	0.06	0.06	0.05
5Z14	B	63.50	16.90	7.51	4.22	2.70	1.88	1.38	1.06	0.83	0.68	0.56	0.47	0.40	0.34	0.30	0.26	0.23	0.21	0.19	0.17
	D	461.55	57.69	17.09	7.21	3.69	2.14	1.35	0.90	0.63	0.46	0.35	0.27	0.21	0.17	0.14	0.11	0.09	0.08	0.07	0.06
5Z13	B	77.12	20.52	9.12	5.13	3.28	2.28	1.68	1.28	1.01	0.82	0.68	0.57	0.49	0.42	0.36	0.32	0.28	0.25	0.23	0.21
	D	560.52	70.06	20.76	8.76	4.48	2.59	1.63	1.09	0.77	0.56	0.42	0.32	0.26	0.20	0.17	0.14	0.11	0.10	0.08	0.07
6Z18	B	26.62	13.31	6.56	3.69	2.36	1.64	1.21	0.92	0.73	0.59	0.49	0.41	0.35	0.30	0.26	0.23	0.20	0.18	0.16	0.15
	D	581.48	72.68	21.54	9.09	4.65	2.69	1.70	1.14	0.80	0.58	0.44	0.34	0.26	0.21	0.17	0.14	0.12	0.10	0.08	0.07
6Z16	B	45.08	18.49	8.22	4.62	2.96	2.05	1.51	1.16	0.91	0.74	0.61	0.51	0.44	0.38	0.33	0.29	0.26	0.23	0.20	0.18
	D	704.09	88.01	26.08	11.00	5.63	3.26	2.05	1.38	0.97	0.70	0.53	0.41	0.32	0.26	0.21	0.17	0.14	0.12	0.10	0.09
6Z14	B	67.73	24.36	10.83	6.09	3.90	2.71	1.99	1.52	1.20	0.97	0.81	0.68	0.58	0.50	0.43	0.38	0.34	0.30	0.27	0.24
	D	858.67	107.33	31.80	13.42	6.87	3.98	2.50	1.68	1.18	0.86	0.65	0.50	0.39	0.31	0.25	0.21	0.17	0.15	0.13	0.11
6Z13	B	94.49	30.98	13.77	7.74	4.96	3.44	2.53	1.94	1.53	1.24	1.02	0.86	0.73	0.63	0.55	0.48	0.43	0.38	0.34	0.31
	D	1044.15	130.52	38.67	16.31	8.35	4.83	3.04	2.04	1.43	1.04	0.78	0.60	0.48	0.38	0.31	0.25	0.21	0.18	0.15	0.13
8Z16	B	35.21	17.61	11.74	8.78	5.62	3.90	2.87	2.20	1.73	1.40	1.16	0.98	0.83	0.72	0.62	0.55	0.49	0.43	0.39	0.35
	D	1408.97	176.12	52.18	22.02	11.27	6.52	4.11	2.75	1.93	1.41	1.06	0.82	0.64	0.51	0.42	0.34	0.29	0.24	0.21	0.18
8Z14	B	65.10	32.55	20.27	11.40	7.30	5.07	3.72	2.85	2.25	1.82	1.51	1.27	1.08	0.93	0.81	0.71	0.63	0.56	0.51	0.46
	D	1721.00	215.13	63.74	26.89	13.77	7.97	5.02	3.36	2.36	1.72	1.29	1.00	0.78	0.63	0.51	0.42	0.35	0.30	0.25	0.22
8Z13	B	118.92	59.40	26.40	14.85	9.50	6.60	4.85	3.71	2.93	2.38	1.96	1.65	1.41	1.21	1.06	0.93	0.82	0.73	0.66	0.59
	D	2096.79	262.10	77.66	32.76	16.77	9.71	6.11	4.10	2.88	2.10	1.58	1.21	0.95	0.76	0.62	0.51	0.43	0.36	0.31	0.26
8Z12	B	160.38	71.59	31.82	17.90	11.45	7.95	5.84	4.47	3.54	2.86	2.37	1.99	1.69	1.46	1.27	1.12	0.99	0.88	0.79	0.72
	D	2425.57	303.20	89.84	37.90	19.40	11.23	7.07	4.74	3.33	2.43	1.82	1.40	1.10	0.88	0.72	0.59	0.49	0.42	0.35	0.30
8DZ16	B	154.50	70.13	31.17	17.53	11.22	7.79	5.72	4.38	3.46	2.81	2.32	1.95	1.66	1.43	1.25	1.10	0.97	0.87	0.78	0.70
	D	2381.89	297.74	88.22	37.22	19.06	11.03	6.94	4.65	3.27	2.38	1.79	1.38	1.08	0.87	0.71	0.58	0.48	0.41	0.35	0.30
8DZ14	B	235.96	90.61	40.27	22.65	14.50	10.07	7.40	5.66	4.47	3.62	3.00	2.52	2.14	1.85	1.61	1.42	1.25	1.12	1.00	0.91
	D	2924.44	365.55	108.31	45.69	23.40	13.54	8.53	5.71	4.01	2.92	2.20	1.69	1.33	1.07	0.87	0.71	0.60	0.50	0.43	0.37
8DZ13	B	318.10	118.17	52.52	29.54	18.91	13.13	9.65	7.39	5.84	4.73	3.91	3.28	2.80	2.41	2.10	1.85	1.64	1.46	1.31	1.18
	D	3755.82	469.48	139.10	58.68	30.05	17.39	10.95	7.34	5.15	3.76	2.82	2.17	1.71	1.37	1.11	0.92	0.76	0.64	0.55	0.47
8DZ12	B	383.40	142.44	63.31	35.61	22.79	15.83	11.63	8.90	7.03	5.70	4.71	3.96	3.37	2.91	2.53	2.23	1.97	1.76	1.58	1.42
	D	4527.35	565.92	167.68	70.74	36.22	20.96	13.20	8.84	6.21	4.53	3.40	2.62	2.06	1.65	1.34	1.11	0.92	0.78	0.66	0.57

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B - Strength Loading D - Deflection Loading (See Notes at end of table)

Z Selection Table - Metric

"Z" SELECTION TABLE - MAXIMUM SPECIFIED LOAD IN BENDING, FULLY SUPPORTED (kN/m) - CONTINUED DZ (Double Z) are two same shape Z sections nested together

		SPAN (mm)																			
Section		610	1219	1829	2438	3048	3658	4267	4877	5486	6096	6706	7315	7925	8534	9144	9754	10363	10973	11582	12192
10Z16	B	27.80	13.90	9.27	6.95	5.56	4.63	3.55	2.71	2.14	1.74	1.44	1.21	1.03	0.89	0.77	0.68	0.60	0.54	0.48	0.43
	D	2378.77	297.35	88.10	37.17	19.03	11.01	6.94	4.65	3.26	2.38	1.79	1.38	1.08	0.87	0.70	0.58	0.48	0.41	0.35	0.30
10Z14	B	51.35	25.68	17.12	12.84	9.81	6.81	5.01	3.83	3.03	2.45	2.03	1.70	1.45	1.25	1.09	0.96	0.85	0.76	0.68	0.61
	D	2908.19	363.52	107.71	45.44	23.27	13.46	8.48	5.68	3.99	2.91	2.18	1.68	1.32	1.06	0.86	0.71	0.59	0.50	0.42	0.36
10Z13	B	94.44	47.22	31.48	20.24	12.96	9.00	6.61	5.06	4.00	3.24	2.68	2.25	1.92	1.65	1.44	1.27	1.12	1.00	0.90	0.81
	D	3547.13	443.39	131.38	55.42	28.38	16.42	10.34	6.93	4.87	3.55	2.67	2.05	1.61	1.29	1.05	0.87	0.72	0.61	0.52	0.44
10Z12	B	148.37	74.18	43.26	24.33	15.57	10.82	7.95	6.08	4.81	3.89	3.22	2.70	2.30	1.99	1.73	1.52	1.35	1.20	1.08	0.97
	D	4107.38	513.42	152.13	64.18	32.86	19.02	11.97	8.02	5.63	4.11	3.09	2.38	1.87	1.50	1.22	1.00	0.84	0.70	0.60	0.51
10Z10	B	261.86	130.93	58.37	32.83	21.01	14.59	10.72	8.21	6.49	5.25	4.34	3.65	3.11	2.68	2.33	2.05	1.82	1.62	1.46	1.31
	D	5217.61	652.20	193.24	81.53	41.74	24.16	15.21	10.19	7.16	5.22	3.92	3.02	2.37	1.90	1.55	1.27	1.06	0.89	0.76	0.65
10DZ16	B	110.62	55.31	36.87	21.72	13.90	9.66	7.09	5.43	4.29	3.48	2.87	2.41	2.06	1.77	1.54	1.36	1.20	1.07	0.96	0.87
	D	3734.28	466.78	138.31	58.35	29.87	17.29	10.89	7.29	5.12	3.73	2.81	2.16	1.70	1.36	1.11	0.91	0.76	0.64	0.54	0.47
10DZ14	B	235.96	117.98	54.63	30.73	19.67	13.66	10.03	7.68	6.07	4.92	4.06	3.41	2.91	2.51	2.19	1.92	1.70	1.52	1.36	1.23
	D	4959.75	619.97	183.69	77.50	39.68	22.96	14.46	9.69	6.80	4.96	3.73	2.87	2.26	1.81	1.47	1.21	1.01	0.85	0.72	0.62
10DZ13	B	397.38	160.75	71.44	40.19	25.72	17.86	13.12	10.05	7.94	6.43	5.31	4.47	3.80	3.28	2.86	2.51	2.22	1.98	1.78	1.61
	D	6386.64	798.33	236.54	99.79	51.09	29.57	18.62	12.47	8.76	6.39	4.80	3.70	2.91	2.33	1.89	1.56	1.30	1.10	0.93	0.80
10DZ12	B	489.74	193.45	85.98	48.36	30.95	21.49	15.79	12.09	9.55	7.74	6.39	5.37	4.58	3.95	3.44	3.02	2.68	2.39	2.14	1.93
	D	7685.84	960.73	284.66	120.09	61.49	35.58	22.41	15.01	10.54	7.69	5.77	4.45	3.50	2.80	2.28	1.88	1.56	1.32	1.12	0.96
10DZ10	B	643.20	255.31	113.47	63.83	40.85	28.37	20.84	15.96	12.61	10.21	8.44	7.09	6.04	5.21	4.54	3.99	3.53	3.15	2.83	2.55
	D	10143.51	1267.94	375.69	158.49	81.15	46.96	29.57	19.81	13.91	10.14	7.62	5.87	4.62	3.70	3.01	2.48	2.06	1.74	1.48	1.27
118Z14	B	44.33	22.17	14.78	11.08	8.87	7.39	5.75	4.40	3.48	2.82	2.33	1.96	1.67	1.44	1.25	1.10	0.98	0.87	0.78	0.70
	D	4256.06	532.01	157.63	66.50	34.05	19.70	12.41	8.31	5.84	4.26	3.20	2.46	1.94	1.55	1.26	1.04	0.87	0.73	0.62	0.53
118Z13	B	81.49	40.74	27.16	20.37	15.93	11.06	8.13	6.22	4.92	3.98	3.29	2.77	2.36	2.03	1.77	1.56	1.38	1.23	1.10	1.00
	D	5193.98	649.25	192.37	81.16	41.55	24.05	15.14	10.14	7.12	5.19	3.90	3.01	2.36	1.89	1.54	1.27	1.06	0.89	0.76	0.65
118Z12	B	127.97	63.98	42.66	30.31	19.40	13.47	9.90	7.58	5.99	4.85	4.01	3.37	2.87	2.47	2.16	1.89	1.68	1.50	1.34	1.21
	D	6017.28	752.16	222.86	94.02	48.14	27.86	17.54	11.75	8.25	6.02	4.52	3.48	2.74	2.19	1.78	1.47	1.22	1.03	0.88	0.75
118Z11	B	175.92	87.96	58.64	34.31	21.96	15.25	11.20	8.58	6.78	5.49	4.54	3.81	3.25	2.80	2.44	2.14	1.90	1.69	1.52	1.37
	D	6672.91	834.11	247.14	104.26	53.38	30.89	19.45	13.03	9.15	6.67	5.01	3.86	3.04	2.43	1.98	1.63	1.36	1.14	0.97	0.83
118Z10	B	261.86	130.93	71.45	40.19	25.72	17.86	13.12	10.05	7.94	6.43	5.31	4.47	3.80	3.28	2.86	2.51	2.22	1.98	1.78	1.61
	D	7651.36	956.42	283.38	119.55	61.21	35.42	22.31	14.94	10.50	7.65	5.75	4.43	3.48	2.79	2.27	1.87	1.56	1.31	1.12	0.96
118DZ14	B	189.56	94.78	62.65	35.24	22.55	15.66	11.51	8.81	6.96	5.64	4.66	3.92	3.34	2.88	2.51	2.20	1.95	1.74	1.56	1.41
	D	6836.35	854.54	253.20	106.82	54.69	31.65	19.93	13.35	9.38	6.84	5.14	3.96	3.11	2.49	2.03	1.67	1.39	1.17	1.00	0.85
118DZ13	B	378.90	189.45	89.12	50.13	32.08	22.28	16.37	12.53	9.90	8.02	6.63	5.57	4.75	4.09	3.56	3.13	2.78	2.48	2.22	2.01
	D	9161.35	1145.17	339.31	143.15	73.29	42.41	26.71	17.89	12.57	9.16	6.88	5.30	4.17	3.34	2.71	2.24	1.86	1.57	1.34	1.15
118DZ12	B	553.60	241.36	107.27	60.34	38.62	26.82	19.70	15.09	11.92	9.65	7.98	6.70	5.71	4.93	4.29	3.77	3.34	2.98	2.67	2.41
	D	11027.99	1378.50	408.44	172.31	88.22	51.06	32.15	21.54	15.13	11.03	8.29	6.38	5.02	4.02	3.27	2.69	2.24	1.89	1.61	1.38
118DZ11	B	624.80	272.52	121.12	68.13	43.60	30.28	22.25	17.03	13.46	10.90	9.01	7.57	6.45	5.56	4.84	4.26	3.77	3.36	3.02	2.73
	D	12451.70	1556.46	461.17	194.56	99.61	57.65	36.30	24.32	17.08	12.45	9.36	7.21	5.67	4.54	3.69	3.04	2.53	2.14	1.82	1.56

Continues on next page

B - Strength Loading D - Deflection Loading (See Notes at end of table)

Z Section Properties - Imperial

Dimensions

d = section depth
 b = flange width
 h = lip length
 t = steel thickness
 C.G = centre of gravity
 S.C = shear centre
 r = inside bend radius 0.188"

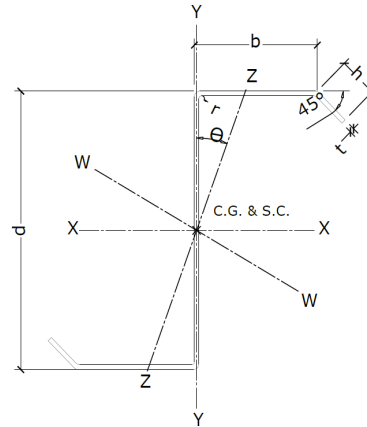
Section Product Codes

4 Z 18

depth (in.)/shape/gauge

8 DZ 18

DZ (Double Z) are two same shape Z sections nested together



Properties

I_x eff. = effective moment of inertia about axis X-X at maximum compressive stress = $0.6 F_y$
 S_x eff. = effective elastic section modulus about axis X-X
 r_x = radius of gyration about axis X-X
 I_y = gross moment of inertia about axis Y-Y
 S_y eff. = effective elastic section modulus about axis Y-Y
 r_y = radius of gyration about axis Y-Y
 $r_{min.}$ = radius of gyration about Z-Z
 J = St. Venant torsion constant
 C_w = warping constant
 A_g = gross area of section
 θ = angle between axis Z-Z and Y-Y

Z Section Properties - Imperial

Wall Girt Selection Example – Imperial

GIVEN

24 ft single span condition.
 5 ft girt spacing with two rows of Brace Angles at one third of span to prevent buckling.
 Metal cladding attached to exterior flange at 12 in. o/c.
 Cladding considered to prevent distortional buckling and lateral torsional buckling.
 Deflection limit $L/180$.

LOADS

Positive external wind pressure at 14.6 psf.
 Negative external wind pressure at 12.5 psf.

CALCULATIONS

Positive $W_f = 1.4 \times 14.6 \text{ psf} \times 5 \text{ ft} = 102 \text{ lb/ft}$.
 Negative $W_f = 1.4 \times 12.5 \text{ psf} \times 5 \text{ ft} = 88 \text{ lb/ft}$.
 $M_f^+ = 0.102 \text{ kip/ft} \times (24 \text{ ft})^2 / 8 = 7.3 \text{ kip}\cdot\text{ft}$.
 $M_f^- = 0.088 \text{ kip/ft} \times (24 \text{ ft})^2 / 8 = 6.3 \text{ kip}\cdot\text{ft}$.
 $V_f = 0.102 \text{ kip/ft} \times 24 \text{ ft} / 2 = 1.28 \text{ kip}$.
 I_{\min} (deflection $<$ span /180) = $\frac{180 \times 5 \times 0.75 \times 0.073 \text{ kip/ft} \times (24 \text{ ft})^3 \times 144}{384 \times 29,500 \text{ ksi}}$
 $I_{\min} = 8.7 \text{ in.}^4$

Consult Properties table for sections with $I_{xe} > I_{\min}$.

Section 8Z14 $I_{xe} = 9.69 \text{ in}^4 > I_{\min} 8.7 \text{ in}^4 \therefore \text{ok}$

Fy = steel yield strength = 55 ksi
Vn = factored shear resistance.
Pn(end) = web crippling capacity based on 3 in. bearing length.
Pn(int) = web crippling capacity based on 3 in. bearing length.
Mn = factored moment resistance based on lateral and distortional buckling.
Lu = maximum unbraced length of compression flange beyond which appropriate values in the Table must be reduced for lateral-torsion buckling.

Verify with the selection tables

$M_n^+ = M_n$ fully braced at 12 in. o/c $> M_f^+$
 Section 8Z14 M_n fully braced = 9.38 kip•ft $> 7.3 \text{ kip}\cdot\text{ft} \therefore \text{ok}$
 $M_n^- = \min. (M_n \text{ flexural-torsional at 8 ft, } M_n \text{ distortional}) > M_f^-$
 Section 8Z14 M_n at 8 ft = 7.38 kip•ft $> 6.3 \text{ kip}\cdot\text{ft} \therefore \text{ok}$

Brace Angle must be connected to the section according to S136-16 standard.

$$V_n > V_f$$

For girt attached to column with 3 in. bearing, use P_n (end).

$P > V$ If not, connection to the support column must be completed by bolting the web to prevent web crippling over the bearing support.

Z Section Properties - Imperial

"Z" Section Properties - Continued DZ (Double Z) are two same shape Z sections nested together

Section	d (in)	b (in)	h (in)	t (in)	Radius (in.)	Area (in)	Mass (lbs/ft)	Gross						Effective		r-min (in)	Theta (°)	Ro (in)	Cw (in ⁴)	J (in ⁴)
								Ix (in ⁴)	Sx (in ³)	rx (in)	Iy (in ⁴)	Sy (in ³)	ry (in)	Ixe (in ⁴)	Sxe (in ³)					
12DZ12	12	2.750	0.91	0.192	0.1875	3.55	12.08	69.96	11.66	4.44	5.11	1.55	1.20	69.96	11.66	0.85	11.00	4.60	134.21	4.36E-02
12DZ11	12	2.750	0.95	0.222	0.1875	4.11	13.97	80.51	13.42	4.43	6.00	1.81	1.21	80.51	13.42	0.85	11.13	4.59	156.86	6.75E-02
12DZ10	12	2.750	1.04	0.276	0.1875	5.11	17.37	99.21	16.53	4.41	7.66	2.29	1.22	99.21	16.53	0.86	11.35	4.57	198.74	1.30E-01
14Z13	14	3.500	0.74	0.093	0.1875	2.05	6.96	56.76	8.11	5.27	4.32	1.09	1.45	47.56	6.09	1.02	11.29	5.46	154.17	5.90E-03
14Z12	14	3.500	0.77	0.108	0.1875	2.38	8.08	65.79	9.40	5.26	5.05	1.27	1.46	59.57	8.05	1.03	11.35	5.46	179.90	9.24E-03
14Z11	14	3.500	0.79	0.120	0.1875	2.64	8.98	73.00	10.43	5.26	5.64	1.41	1.46	68.02	9.34	1.03	11.39	5.46	200.64	1.27E-02
14Z10	14	3.500	0.82	0.138	0.1875	3.04	10.33	83.75	11.96	5.25	6.54	1.63	1.47	80.37	11.21	1.03	11.46	5.45	232.05	1.93E-02
14DZ13	14	3.500	0.84	0.150	0.1875	3.30	11.23	90.90	12.99	5.25	7.15	1.78	1.47	87.51	12.23	1.03	11.51	5.45	253.17	2.48E-02
14DZ12	14	3.500	0.90	0.190	0.1875	4.18	14.22	114.55	16.36	5.23	9.21	2.28	1.48	114.02	16.24	1.04	11.66	5.44	324.66	5.03E-02
14DZ11	14	3.500	0.95	0.218	0.1875	4.80	16.31	130.95	18.71	5.23	10.70	2.63	1.49	130.95	18.71	1.05	11.76	5.43	375.69	7.60E-02
14DZ10	14	3.500	1.02	0.264	0.1875	5.81	19.76	157.61	22.52	5.21	13.21	3.23	1.51	157.61	22.52	1.05	11.93	5.42	461.27	1.35E-01

Values in table have been calculated to CAN.CSA S 136-16 standard for cold formed steel.
 Steel to ASTM A653 G90 (Z275) Zinc Coated Steel HSLA Grade 55 Yield strength 55ksi (379 Mpa)

Z Selection Table - Imperial

"Z" Selection Table <small>DZ (Double Z) are two same shape Z sections nested together</small>																									
Section	FVn (kips)	FPn (End) (kips)	FPn (Int.) (kips)	Lu (ft)	FMn (kip-ft)	Unbraced Length (ft), FMn (kip-ft)																			
						2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
4Z18	3.13	0.78	1.24	4.24	1.65	1.46	1.46	1.46	1.39	1.17	0.92	0.72	0.57	0.46	0.39	0.33	0.29	0.25	0.22	0.20	0.18	0.17	0.16	0.14	0.14
4Z16	4.17	1.13	1.89	4.28	2.10	1.94	1.94	1.94	1.82	1.55	1.20	0.92	0.73	0.60	0.51	0.44	0.38	0.34	0.30	0.28	0.25	0.23	0.22	0.20	0.19
4Z14	5.07	1.65	2.88	4.33	2.81	2.59	2.59	2.59	2.36	2.01	1.56	1.20	0.97	0.80	0.68	0.60	0.53	0.47	0.43	0.39	0.36	0.33	0.31	0.29	0.27
5Z18	3.13	0.76	1.23	3.46	2.12	1.77	1.77	1.77	1.56	1.08	0.77	0.58	0.46	0.37	0.31	0.26	0.23	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11
5Z16	4.63	1.10	1.86	3.48	2.73	2.34	2.34	2.34	1.95	1.36	0.97	0.74	0.59	0.48	0.41	0.35	0.31	0.27	0.24	0.22	0.20	0.19	0.17	0.16	0.15
5Z14	6.53	1.62	2.86	3.51	3.47	3.12	3.12	3.03	2.43	1.73	1.26	0.97	0.78	0.65	0.55	0.48	0.42	0.38	0.34	0.31	0.29	0.27	0.25	0.23	0.22
5Z13	7.93	2.36	4.33	3.56	4.22	4.12	4.12	3.72	3.04	2.24	1.65	1.29	1.05	0.88	0.76	0.67	0.59	0.53	0.49	0.45	0.41	0.38	0.36	0.34	0.32
6Z18	2.74	0.74	1.21	4.50	3.04	2.44	2.44	2.44	2.44	2.28	1.85	1.42	1.10	0.88	0.73	0.61	0.52	0.45	0.40	0.35	0.32	0.29	0.26	0.24	0.22
6Z16	4.63	1.08	1.85	4.52	3.80	3.24	3.24	3.24	3.24	2.97	2.37	1.77	1.38	1.11	0.92	0.78	0.67	0.58	0.52	0.46	0.42	0.38	0.35	0.32	0.30
6Z14	6.96	1.59	2.83	4.56	5.01	4.35	4.35	4.35	4.35	3.83	2.99	2.25	1.77	1.43	1.19	1.02	0.88	0.77	0.69	0.62	0.56	0.52	0.47	0.44	0.41
6Z13	9.71	2.32	4.29	4.60	6.37	5.78	5.78	5.78	5.64	4.79	3.79	2.88	2.28	1.87	1.57	1.35	1.18	1.05	0.94	0.85	0.78	0.71	0.66	0.62	0.58
8Z16	3.62	1.43	2.49	3.90	7.22	5.43	5.43	5.43	5.43	4.74	3.63	2.76	2.14	1.71	1.40	1.17	1.00	0.87	0.76	0.67	0.60	0.54	0.49	0.45	0.41
8Z14	6.69	2.11	3.83	3.92	9.38	7.38	7.38	7.38	7.38	6.27	4.65	3.46	2.69	2.16	1.78	1.50	1.29	1.12	0.99	0.88	0.79	0.72	0.66	0.60	0.56
8Z13	12.22	3.09	5.82	3.95	12.21	10.00	10.00	10.00	10.00	8.11	5.83	4.37	3.42	2.76	2.30	1.95	1.68	1.47	1.31	1.17	1.06	0.97	0.89	0.82	0.76
8Z12	16.48	4.10	7.90	3.98	14.72	12.48	12.48	12.48	12.05	9.66	6.94	5.23	4.11	3.35	2.80	2.39	2.07	1.83	1.63	1.47	1.33	1.22	1.13	1.05	0.98
8DZ16	15.88	3.96	7.60	3.97	14.42	12.14	12.14	12.14	11.76	9.46	6.79	5.11	4.02	3.27	2.73	2.33	2.02	1.78	1.58	1.43	1.30	1.19	1.09	1.01	0.95
8DZ14	24.25	5.88	11.67	4.02	18.63	16.53	16.53	16.53	15.09	12.00	8.77	6.67	5.29	4.35	3.66	3.15	2.76	2.45	2.20	2.00	1.83	1.68	1.56	1.45	1.36
8DZ13	32.70	9.54	19.67	4.09	24.29	23.83	23.83	22.80	19.80	16.21	12.28	9.48	7.64	6.36	5.43	4.73	4.19	3.76	3.40	3.11	2.87	2.66	2.48	2.32	2.18
8DZ12	39.41	13.72	29.10	4.17	29.28	29.28	29.28	27.71	24.37	20.46	16.16	12.64	10.32	8.69	7.50	6.59	5.87	5.30	4.83	4.44	4.11	3.82	3.58	3.36	3.17
10Z16	2.86	1.38	2.46	3.80	8.93	6.87	6.87	6.87	6.87	6.36	4.81	3.63	2.80	2.23	1.83	1.52	1.29	1.12	0.97	0.86	0.76	0.69	0.62	0.57	0.52
10Z14	5.28	2.04	3.78	3.82	12.61	9.40	9.40	9.40	9.40	8.34	6.11	4.53	3.51	2.81	2.30	1.93	1.65	1.43	1.25	1.11	0.99	0.89	0.81	0.74	0.68
10Z13	9.71	3.01	5.75	3.85	16.65	12.82	12.82	12.82	12.82	10.77	7.63	5.68	4.42	3.55	2.93	2.47	2.12	1.85	1.63	1.45	1.31	1.18	1.08	0.99	0.92
10Z12	15.25	4.00	7.81	3.87	20.01	16.09	16.09	16.09	16.09	12.72	9.03	6.76	5.28	4.26	3.54	2.99	2.58	2.26	2.00	1.79	1.62	1.48	1.35	1.25	1.16
10Z10	26.91	6.34	12.83	3.91	27.00	23.21	23.21	23.21	21.31	16.70	12.04	9.09	7.17	5.85	4.90	4.19	3.65	3.22	2.88	2.60	2.37	2.17	2.01	1.86	1.74
10DZ16	11.37	3.32	6.40	3.85	17.86	13.88	13.88	13.88	13.88	11.44	8.09	6.03	4.70	3.78	3.13	2.64	2.27	1.98	1.75	1.56	1.41	1.28	1.17	1.08	1.00
10DZ14	24.25	5.75	11.55	3.90	25.27	21.49	21.49	21.49	20.19	15.76	11.31	8.52	6.71	5.46	4.56	3.89	3.38	2.98	2.66	2.40	2.18	2.00	1.84	1.71	1.59
10DZ13	40.84	9.35	19.50	3.96	33.04	31.36	31.36	30.81	26.48	21.19	15.60	11.90	9.49	7.82	6.61	5.71	5.01	4.46	4.02	3.65	3.35	3.09	2.87	2.68	2.51
10DZ12	50.34	13.48	28.86	3.99	39.77	39.77	39.77	37.23	32.25	26.30	19.86	15.35	12.38	10.32	8.82	7.69	6.81	6.10	5.53	5.06	4.66	4.33	4.03	3.78	3.56
10DZ10	66.11	22.96	51.03	4.15	52.48	52.48	52.48	49.93	44.21	37.62	30.47	24.05	19.74	16.71	14.48	12.77	11.42	10.34	9.45	8.70	8.06	7.52	7.04	6.62	6.25
11BZ14	4.56	2.00	3.74	4.06	14.49	11.06	11.06	11.06	11.06	11.06	8.50	6.52	5.03	4.01	3.28	2.73	2.32	2.00	1.75	1.54	1.37	1.23	1.12	1.02	0.93
11BZ13	8.38	2.95	5.70	4.09	20.47	15.17	15.17	15.17	15.17	14.45	10.95	8.13	6.29	5.03	4.13	3.46	2.95	2.56	2.24	1.99	1.78	1.60	1.46	1.33	1.23
11BZ12	13.15	3.93	7.75	4.11	24.92	19.13	19.13	19.13	19.13	17.31	12.91	9.61	7.46	5.99	4.93	4.15	3.56	3.09	2.72	2.42	2.18	1.97	1.80	1.65	1.53
11BZ11	18.08	4.79	9.60	4.12	28.21	22.51	22.51	22.51	22.51	19.88	14.53	10.84	8.44	6.80	5.62	4.74	4.08	3.56	3.14	2.80	2.53	2.30	2.10	1.93	1.79
11BZ10	26.91	6.24	12.74	4.15	33.05	27.85	27.85	27.85	27.85	23.09	17.05	12.77	9.99	8.09	6.71	5.70	4.92	4.31	3.83	3.43	3.10	2.83	2.60	2.40	2.23

Continues on next page.

- Notes: 1) One flange loading or reaction
- 2) Members being fastened at supports
- 3) Web Crippling capacity (FPn) based on 3" bearing length
- 4) See S136-16 section G5 - Web crippling strength of webs without stiffeners

Z Selection Table - Imperial

"Z" Selection Table - Continued <small>DZ (Double Z) are two same shape Z sections nested together</small>																									
Section	FVn (kips)	FPn (End) (kips)	FPn (Int.) (kips)	Lu (ft)	FMn (kip-ft)	Unbraced Length (ft), FMn (kip-ft)																			
						2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
118DZ14	19.48	5.02	10.10	4.13	28.98	23.37	23.37	23.37	23.37	20.41	14.94	11.15	8.69	7.01	5.79	4.90	4.21	3.68	3.25	2.90	2.62	2.38	2.18	2.01	1.86
118DZ13	38.94	8.82	18.47	4.19	41.22	36.69	36.69	36.69	34.32	28.23	21.22	16.01	12.62	10.28	8.61	7.36	6.40	5.64	5.04	4.55	4.14	3.80	3.51	3.26	3.04
118DZ12	56.90	12.61	27.07	4.24	49.62	48.32	48.32	47.45	41.79	34.87	26.91	20.49	16.30	13.41	11.32	9.76	8.55	7.60	6.84	6.21	5.68	5.24	4.86	4.53	4.25
118DZ11	64.22	15.94	34.78	4.28	56.02	56.02	56.02	53.78	47.62	40.17	31.68	24.30	19.47	16.12	13.69	11.87	10.46	9.34	8.44	7.69	7.07	6.54	6.08	5.69	5.34
118DZ10	75.98	22.12	49.34	4.36	66.32	66.32	66.32	64.05	57.20	49.08	40.01	31.26	25.31	21.16	18.14	15.85	14.07	12.64	11.48	10.52	9.71	9.01	8.42	7.89	7.43
12Z14	4.36	1.98	3.73	3.73	13.82	11.36	11.36	11.36	11.36	9.65	7.33	5.58	4.38	3.49	2.86	2.39	2.03	1.75	1.53	1.35	1.20	1.08	0.98	0.89	0.82
12Z13	8.01	2.93	5.68	3.75	19.15	15.60	15.60	15.60	15.60	13.06	9.46	7.08	5.49	4.39	3.61	3.03	2.59	2.24	1.97	1.75	1.57	1.42	1.29	1.18	1.09
12Z12	12.58	3.90	7.73	3.77	24.02	19.69	19.69	19.69	19.69	15.77	11.25	8.38	6.52	5.24	4.33	3.65	3.13	2.72	2.40	2.14	1.93	1.75	1.60	1.47	1.36
12Z11	17.29	4.77	9.58	3.78	27.82	23.17	23.17	23.17	23.07	17.92	12.68	9.47	7.39	5.96	4.93	4.17	3.59	3.14	2.78	2.48	2.24	2.04	1.87	1.72	1.60
12Z10	26.38	6.21	12.71	3.80	34.33	28.68	28.68	28.68	27.15	20.93	14.90	11.19	8.77	7.11	5.92	5.03	4.35	3.82	3.40	3.05	2.77	2.53	2.32	2.15	2.00
12DZ14	16.86	4.69	9.42	3.78	27.49	22.88	22.88	22.88	22.84	17.76	12.56	9.38	7.32	5.90	4.88	4.13	3.55	3.10	2.74	2.45	2.21	2.01	1.85	1.70	1.58
12DZ13	31.80	7.26	15.04	3.82	37.77	32.51	32.51	32.51	29.61	22.98	16.45	12.39	9.74	7.92	6.62	5.64	4.90	4.31	3.85	3.47	3.15	2.88	2.66	2.47	2.30
12DZ12	52.10	11.53	24.66	3.88	48.10	46.59	46.59	44.74	38.33	30.49	22.32	17.00	13.53	11.13	9.40	8.11	7.11	6.32	5.68	5.16	4.73	4.36	4.04	3.77	3.54
12DZ11	65.53	15.11	32.93	3.92	55.35	55.35	55.35	51.75	44.68	36.15	26.98	20.72	16.63	13.78	11.73	10.18	8.98	8.03	7.25	6.62	6.08	5.63	5.24	4.90	4.61
12DZ10	80.68	22.65	50.70	4.01	68.21	68.21	68.21	64.36	56.33	46.89	36.48	28.42	23.11	19.39	16.67	14.61	13.00	11.71	10.66	9.78	9.04	8.40	7.85	7.37	6.95
14Z13	6.82	2.86	5.62	4.59	25.14	19.15	19.15	19.15	19.15	19.15	18.24	14.07	11.25	8.97	7.32	6.10	5.17	4.45	3.87	3.41	3.03	2.72	2.45	2.23	2.03
14Z12	10.70	3.82	7.65	4.61	33.20	24.32	24.32	24.32	24.32	24.32	21.98	16.91	13.28	10.59	8.66	7.23	6.15	5.30	4.63	4.09	3.64	3.27	2.96	2.70	2.48
14Z11	14.70	4.67	9.49	4.63	38.54	28.75	28.75	28.75	28.75	28.75	24.85	19.31	14.93	11.93	9.77	8.18	6.97	6.03	5.28	4.67	4.17	3.76	3.41	3.11	2.86
14Z10	22.42	6.09	12.61	4.65	46.24	35.85	35.85	35.85	35.85	35.80	29.74	22.57	17.50	14.02	11.53	9.68	8.28	7.18	6.31	5.60	5.02	4.54	4.14	3.79	3.49
14DZ13	28.85	7.13	14.92	4.67	50.44	40.84	40.84	40.84	40.84	39.61	32.95	24.81	19.28	15.48	12.76	10.74	9.20	8.00	7.05	6.27	5.64	5.11	4.66	4.28	3.95
14DZ12	51.02	11.13	23.98	4.72	67.00	58.69	58.69	58.69	58.69	52.27	42.82	32.75	25.62	20.73	17.21	14.61	12.61	11.05	9.81	8.80	7.96	7.26	6.67	6.16	5.73
14DZ11	67.16	14.40	31.55	4.76	77.17	71.96	71.96	71.96	69.21	60.40	50.03	38.76	30.49	24.80	20.71	17.66	15.33	13.50	12.04	10.85	9.86	9.03	8.33	7.72	7.20
14DZ10	91.28	20.59	46.16	4.83	92.88	92.88	92.88	92.18	84.02	74.00	62.39	49.56	39.32	32.27	27.18	23.37	20.45	18.14	16.29	14.76	13.50	12.43	11.52	10.73	10.05

Notes: 1) One flange loading or reaction
 2) Members being fastened at supports
 3) Web Crippling capacity (FPn) based on 3" bearing length
 4) See S136-16 section G5 - Web crippling strength of webs without stiffeners

Z Selection Table - Imperial

"Z" SELECTION TABLE - MAXIMUM SPECIFIED LOAD IN BENDING, FULLY SUPPORTED (lbs. / ft.) <small>DZ (Double Z) are two same shape Z sections nested together</small>																					
		SPAN (ft)																			
Section		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
4Z18	B	2089.9	551.1	244.9	137.8	88.2	61.2	45.0	34.4	27.2	22.0	18.2	15.3	13.0	11.2	9.8	8.6	7.6	6.8	6.1	5.5
	D	15026.5	1878.3	556.5	234.8	120.2	69.6	43.8	29.3	20.6	15.0	11.3	8.7	6.8	5.5	4.5	3.7	3.1	2.6	2.2	1.9
4Z16	B	2778.4	701.2	311.6	175.3	112.2	77.9	57.2	43.8	34.6	28.0	23.2	19.5	16.6	14.3	12.5	11.0	9.7	8.7	7.8	7.0
	D	18154.7	2269.3	672.4	283.7	145.2	84.0	52.9	35.5	24.9	18.2	13.6	10.5	8.3	6.6	5.4	4.4	3.7	3.1	2.6	2.3
4Z14	B	3378.5	937.2	416.5	234.3	149.9	104.1	76.5	58.6	46.3	37.5	31.0	26.0	22.2	19.1	16.7	14.6	13.0	11.6	10.4	9.4
	D	171649.4	25959.7	817.7	345.0	176.6	102.2	64.4	43.1	30.3	22.1	16.6	12.8	10.0	8.0	6.5	5.4	4.5	3.8	3.2	2.8
5Z18	B	2089.9	705.9	313.7	176.5	112.9	78.4	57.6	44.1	34.9	28.2	23.3	19.6	16.7	14.4	12.5	11.0	9.8	8.7	7.8	7.1
	D	21456.2	2682.0	794.7	335.3	171.6	99.3	62.6	41.9	29.4	21.5	16.1	12.4	9.8	7.8	6.4	5.2	4.4	3.7	3.1	2.7
5Z16	B	3088.6	908.8	403.9	227.2	145.4	101.0	74.2	56.8	44.9	36.4	30.0	25.2	21.5	18.5	16.2	14.2	12.6	11.2	10.1	9.1
	D	25959.7	3245.0	961.5	405.6	207.7	120.2	75.7	50.7	35.6	26.0	19.5	15.0	11.8	9.5	7.7	6.3	5.3	4.5	3.8	3.2
5Z14	B	4351.3	1157.8	514.6	289.5	185.3	128.6	94.5	72.4	57.2	46.3	38.3	32.2	27.4	23.6	20.6	18.1	16.0	14.3	12.8	11.6
	D	31626.1	3953.3	1171.3	494.2	253.0	146.4	92.2	61.8	43.4	31.6	23.8	18.3	14.4	11.5	9.4	7.7	6.4	5.4	4.6	4.0
5Z13	B	5284.2	1406.1	624.9	351.5	225.0	156.2	114.8	87.9	69.4	56.2	46.5	39.1	33.3	28.7	25.0	22.0	19.5	17.4	15.6	14.1
	D	38407.7	4801.0	1422.5	600.1	307.3	177.8	112.0	75.0	52.7	38.4	28.9	22.2	17.5	14.0	11.4	9.4	7.8	6.6	5.6	4.8
6Z18	B	1823.8	911.9	449.8	253.0	161.9	112.4	82.6	63.2	50.0	40.5	33.5	28.1	24.0	20.7	18.0	15.8	14.0	12.5	11.2	10.1
	D	39843.9	4980.5	1475.7	622.6	318.8	184.5	116.2	77.8	54.7	39.8	29.9	23.1	18.1	14.5	11.8	9.7	8.1	6.8	5.8	5.0
6Z16	B	3088.6	1267.1	563.1	316.8	202.7	140.8	103.4	79.2	62.6	50.7	41.9	35.2	30.0	25.9	22.5	19.8	17.5	15.6	14.0	12.7
	D	48245.3	6030.7	1786.9	753.8	386.0	223.4	140.7	94.2	66.2	48.2	36.2	27.9	22.0	17.6	14.3	11.8	9.8	8.3	7.0	6.0
6Z14	B	4641.0	1669.2	741.9	417.3	267.1	185.5	136.3	104.3	82.4	66.8	55.2	46.4	39.5	34.1	29.7	26.1	23.1	20.6	18.5	16.7
	D	58837.4	7354.7	2179.2	919.3	470.7	272.4	171.5	114.9	80.7	58.8	44.2	34.0	26.8	21.4	17.4	14.4	12.0	10.1	8.6	7.4
6Z13	B	6474.6	2122.7	943.4	530.7	339.6	235.9	173.3	132.7	104.8	84.9	70.2	59.0	50.2	43.3	37.7	33.2	29.4	26.2	23.5	21.2
	D	71546.9	8943.4	2649.9	1117.9	572.4	331.2	208.6	139.7	98.1	71.5	53.8	41.4	32.6	26.1	21.2	17.5	14.6	12.3	10.4	8.9
8Z16	B	2412.7	1206.3	804.2	601.7	385.1	267.4	196.5	150.4	118.9	96.3	79.6	66.9	57.0	49.1	42.8	37.6	33.3	29.7	26.7	24.1
	D	96545.3	12068.2	3575.8	1508.5	772.4	447.0	281.5	188.6	132.4	96.5	72.5	55.9	43.9	35.2	28.6	23.6	19.7	16.6	14.1	12.1
8Z14	B	4460.5	2230.3	1388.9	781.3	500.0	347.2	255.1	195.3	154.3	125.0	103.3	86.8	74.0	63.8	55.6	48.8	43.3	38.6	34.6	31.3
	D	117926.0	14740.8	4367.6	1842.6	943.4	546.0	343.8	230.3	161.8	117.9	88.6	68.2	53.7	43.0	34.9	28.8	24.0	20.2	17.2	14.7
8Z13	B	8148.9	4070.4	1809.1	1017.6	651.3	452.3	332.3	254.4	201.0	162.8	134.6	113.1	96.3	83.1	72.4	63.6	56.3	50.3	45.1	40.7
	D	143675.9	17959.5	5321.3	2244.9	1149.4	665.2	418.9	280.6	197.1	143.7	107.9	83.1	65.4	52.4	42.6	35.1	29.2	24.6	20.9	18.0
8Z12	B	10989.6	4905.3	2180.1	1226.3	784.9	545.0	400.4	306.6	242.2	196.2	162.2	136.3	116.1	100.1	87.2	76.6	67.9	60.6	54.4	49.1
	D	166204.4	20775.5	6155.7	2596.9	1329.6	769.5	484.6	324.6	228.0	166.2	124.9	96.2	75.7	60.6	49.2	40.6	33.8	28.5	24.2	20.8
8DZ16	B	10586.3	4805.5	2135.8	1201.4	768.9	533.9	392.3	300.3	237.3	192.2	158.9	133.5	113.7	98.1	85.4	75.1	66.5	59.3	53.2	48.1
	D	163211.4	20401.4	6044.9	2550.2	1305.7	755.6	475.8	318.8	223.9	163.2	122.6	94.5	74.3	59.5	48.4	39.8	33.2	28.0	23.8	20.4
8DZ14	B	16168.7	6208.8	2759.5	1552.2	993.4	689.9	506.8	388.1	306.6	248.4	205.2	172.5	147.0	126.7	110.4	97.0	85.9	76.7	68.8	62.1
	D	200387.7	25048.5	7421.8	3131.1	1603.1	927.7	584.2	391.4	274.9	200.4	150.6	116.0	91.2	73.0	59.4	48.9	40.8	34.4	29.2	25.0
8DZ13	B	21796.7	8096.9	3598.6	2024.2	1295.5	899.7	661.0	506.1	399.8	323.9	267.7	224.9	191.6	165.2	143.9	126.5	112.1	100.0	89.7	81.0
	D	257355.2	32169.4	9531.7	4021.2	2058.8	1191.5	750.3	502.6	353.0	257.4	193.4	148.9	117.1	93.8	76.3	62.8	52.4	44.1	37.5	32.2
8DZ12	B	26271.1	9760.2	4337.8	2440.0	1561.6	1084.5	796.7	610.0	482.0	390.4	322.6	271.1	231.0	199.2	173.5	152.5	135.1	120.5	108.1	97.6
	D	310221.8	38777.7	11489.7	4847.2	2481.8	1436.2	904.4	605.9	425.5	310.2	233.1	179.5	141.2	113.1	91.9	75.7	63.1	53.2	45.2	38.8

Continues on next page

B - Strength Loading D - Deflection Loading (See Notes at end of table)



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