RENCANA GORDING

Kontrol Tegangan.

Beban mati (DL Q) baru, Q = 36.62 kg/m' (Pen. atap + INP 18)

Q = 33.52 kg/m' (Pen. atap + C 16)

M o m e n .

1). DL Q	Mxq = 1/8 . Q Cos α . B^2	=	10104.2 kg.cm'	INP 18
	Myq = 1/8 . Q Sin α . B^2	=	5372.5 kg.cm'	
	Mxq = 1/8 . Q Cos α . B^2	=	9248.9 kg.cm'	C 16
	Myq = 1/8 . Q Sin α . B^2	=	4917.7 kg.cm'	
2). LL P	Mxp = 1/4 P Cos α . B	=	11036.8 kg.cm'	
	Myp = 1/4 P Sin α . B	=	5868.4 kg.cm'	
3). LL Wd	Mxwd = 1/8 . Wd . B^2		1996.5 kg.cm'	
	Mywd = 0 Wdy = 0			
4). LL Wp	Mxwp = 1/8 . Wp . B^2	=	-4991.3 kg.cm'	
	Mywp = 0 Wpy = 0			

Pembebanan Tetap,

	INP 18	C 16
Mx maks = Mxq + Mxp =	21141.1 kg.cm'	20285.7 kg.cm'
My maks = Myq + Myp =	11240.9 kg.cm'	10786.1 kg.cm'

Pembebanan Sementara,

	INP 18	C 16
Mx maks = Mxq + Mxp + Mxwd =	23137.6 kg.cm'	22282.2 kg.cm'
My maks = Myq + Myp + Mywd =	11240.9 kg.cm'	10786.1 kg.cm'

Tegangan Yang Terjadi.

Pembebanan Tetap,

$$\sigma = \frac{Mx\ maks}{wx} + \frac{My\ maks}{wy} =$$

INP 18	C 16
699 kg/cm² OK	764.3 kg/cm² OK

Pembebanan Sementara,

$$\sigma = \frac{Mx\ maks}{wx} + \frac{My\ maks}{wy} =$$

INP 18	C 16
711 kg/cm² OK	781.5 kg/cm² OK

Kontrol Lendutan.

$$fx = ¿\ \frac{5}{384}\ \frac{Q\ Cos\ \alpha\ .\ B^4}{E\ Ix} + \frac{1}{48}\ \frac{P\ Cos\ \alpha\ .\ B^3}{E\ Ix} = ¿$$

INP 18	C 16
0.16 cm	0.24 cm

$$fy = ¿\ \frac{5}{384}\ \frac{Q\ Sin\ \alpha\ .\ B^4}{E\ Iy} + \frac{1}{48}\ \frac{P\ Sin\ \alpha\ .\ B^3}{E\ Iy} = ¿$$

INP 18	C 16
1.54 cm	1.40 cm

$$f = ¿\ \sqrt{fx^2 + fy^2} = ¿$$

INP 18	C 16
1.54 cm OK	1.42 cm OK

c5). Variasi Dengan Batang Tarik Gording.

Direncanakan menggunakan 2 (dua) buah batang tarik.

M o m e n .

1). DL Q	Mxq = 1/8 . Q Cos α . B^2	=	90.281 kg.m'	=	9028.1
	Myq = 1/8 . Q Sin α . $(B/3)^2$	=	5.334 kg.m'	=	533.4
2). LL P	Mxp = 1/4 P Cos α . B	=	110.368 kg.m'	=	11036.8
	Myp = 1/4 P Sin α . (B/3)	=	19.561 kg.m'	=	1956.1
3). LL Wd	Mxwd = 1/8 . Wd . B^2	=	19.965 kg.m'	=	1996.5
	Mywd = 0 Wdy = 0				
4). LL Wp	Mxwp = 1/8 . Wp . B^2	=	-49.913 kg.m'	=	-4991.3
	Mywp = 0 Wpy = 0				

BAJA

syarat :

< 1400 kg/cm²

< 1820 kg/cm²

syarat :

< 2.0 cm

kg.cm'
kg.cm'
kg.cm'
kg.cm'
kg.cm'

kg.cm'

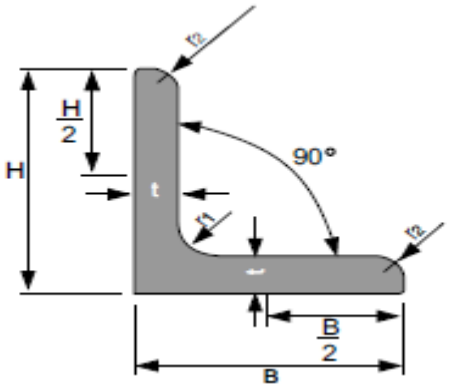
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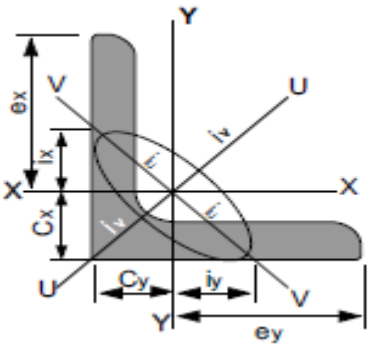
RTIS WIL-I dpk. ITM
nst@hotmail.co.id

PROFIL SIKU SAMA KAKI PRODUKSI PT. GUN

Profil Kanal

Siku tdk s kaki





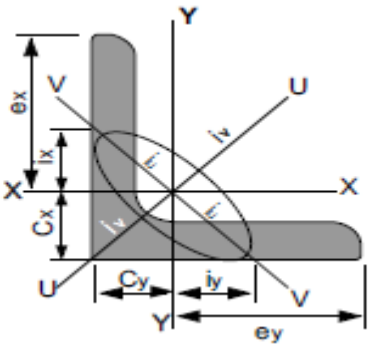
HOT ROLLED

JIS G3192/TIS 1227-194

STANDARD SECTIONAL DIMENSIONS				SECTION AREA	UNIT WEIGHT	INFOR CENTER OF GRAVITY	GEOMETRICAL MOMENT OF INER	
H x B mm x mm	t mm	r_1 mm	r_2 mm	A cm^2	kg/m'	Cx = Cy cm	Ix = Iy cm^4	Max Iu cm^4
25 x 25	3.00	4.00	2.00	1.43	1.12	0.72	0.80	1.26
30 x 30	3.00	4.00	2.00	1.73	1.36	0.84	1.42	2.26
40 x 40	3.00	4.50	2.00	2.34	1.83	1.09	3.53	5.60
40 x 40	4.00	4.50	2.00	2.34	1.83	1.09	3.53	5.60
40 x 40	5.00	4.50	3.00	3.76	2.95	1.17	5.42	8.59
45 x 45	5.00	6.50	3.00	4.30	3.38	1.28	7.91	12.50
45 x 45	4.00	6.50	3.00	3.49	2.74	1.24	6.50	10.30
50 x 50	4.00	6.50	3.00	3.89	3.06	1.37	9.06	14.40
50 x 50	5.00	6.50	3.00	4.80	3.77	1.41	11.10	17.50
50 x 50	6.00	6.50	4.50	5.64	4.43	1.44	12.60	20.00
60 x 60	4.00	6.50	3.00	4.69	3.68	1.61	16.00	25.40
60 x 60	5.00	6.50	3.00	5.80	4.55	1.66	19.60	31.20
60 x 60	6.00	8.00	4.00	6.91	5.40	1.70	22.79	36.16
65 x 65	5.00	8.50	3.00	6.37	5.00	1.77	25.30	40.10
65 x 65	6.00	8.50	4.00	7.53	5.91	1.81	29.40	46.60
65 x 65	8.00	8.50	6.00	9.76	7.66	1.88	36.80	58.30
70 x 70	6.00	8.50	4.00	8.13	6.38	1.93	37.10	58.90
75 x 75	6.00	8.50	4.00	8.73	6.85	2.06	46.10	73.20
75 x 75	9.00	8.50	6.00	12.69	9.96	2.17	64.40	102.00
75 x 75	12.00	8.50	6.00	16.56	13.00	2.29	81.90	129.00
80 x 80	6.00	8.50	4.00	9.23	7.32	2.18	56.40	89.60
90 x 90	6.00	10.00	5.00	10.55	8.28	2.42	80.70	128.00
90 x 90	7.00	10.00	5.00	12.22	9.59	2.46	93.00	148.00
90 x 90	10.00	10.00	7.00	17.00	13.30	2.57	125.00	199.00
90 x 90	13.00	10.00	7.00	21.71	17.00	2.69	156.00	248.00
100 x 100	7.00	10.00	5.00	13.62	10.70	2.71	129.00	205.00
100 x 100	13.00	10.00	7.00	24.31	19.10	2.94	220.00	348.00
100 x 100	10.00	10.00	7.00	19.00	14.90	2.82	175.00	278.00
120 x 120	8.00	12.00	5.00	18.76	14.70	3.24	258.00	410.00
120 x 120	11.00	13.00	6.50	25.37	19.90	3.30	340.00	541.00
120 x 120	12.00	13.00	6.50	27.54	21.60	3.40	367.00	583.00

130 x 130	9.00	12.00	6.00	22.74	17.90	3.53	366.00	583.00
130 x 130	15.00	12.00	8.50	36.75	28.80	3.76	568.00	902.00
130 x 130	12.00	12.00	8.50	29.76	23.40	3.64	467.00	743.00
150 x 150	12.00	14.00	7.00	34.77	27.30	4.14	740.00	1180.00
150 x 150	15.00	14.00	10.00	42.74	33.60	4.24	888.00	1410.00
150 x 150	19.00	14.00	10.00	53.38	41.90	4.40	1090.00	1730.00
175 x 175	12.00	15.00	11.00	40.52	31.80	4.73	1170.00	1860.00
175 x 175	15.00	15.00	11.00	50.21	39.40	4.85	1440.00	2290.00
200 x 200	15.00	17.00	12.00	57.75	45.30	5.46	2180.00	3470.00
200 x 200	20.00	17.00	12.00	76.00	59.70	5.67	2820.00	4490.00
200 x 200	25.00	17.00	12.00	93.75	73.60	5.86	3420.00	5420.00
250 x 250	35.00	24.00	18.00	162.60	128.00	7.45	9110.00	14400.00
250 x 250	25.00	24.00	12.00	119.40	93.70	7.10	6950.00	11000.00

JUNG GARUDA



Mutu baja BJ-37 keatas

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METRIC SIZE

JIS G3192/TIS 1227-194

RMATIVE REFERENCE

TIA	RADIUS OF GYRATION OF AREA			MODULUS OF SECTION
Min Iv cm^4	ix = iy cm	Max iu cm	Min iv cm	Zx = Zy cm^3
0.33	0.75	0.94	0.48	0.45
0.59	0.91	1.14	0.58	0.66
1.46	1.23	1.55	0.79	1.21
1.46	1.23	1.55	0.79	1.21
2.25	1.20	1.51	0.77	1.91
3.29	1.36	1.71	0.87	2.46
2.70	1.36	1.72	0.88	2.00
3.76	1.53	1.92	0.98	2.49
4.58	1.52	1.91	0.98	3.08
5.23	1.50	1.88	0.96	3.55
6.62	1.85	2.33	1.19	3.66
8.09	1.84	2.32	1.18	4.52
9.42	1.82	2.29	1.17	5.28
10.50	1.99	2.51	1.28	5.35
12.20	1.98	2.49	1.27	6.26
15.30	1.94	2.44	1.25	7.96
15.30	2.14	2.69	1.37	7.33
19.00	2.30	2.90	1.48	8.47
26.70	2.25	2.84	1.45	21.10
34.50	2.22	2.79	1.44	15.70
23.20	2.46	3.10	1.58	9.70
33.40	2.77	3.48	1.78	12.30
38.30	2.76	3.48	1.77	14.20
51.70	2.71	3.42	1.74	19.50
65.30	2.68	3.38	1.73	24.80
53.20	3.08	3.88	1.98	17.70
91.10	3.00	3.78	1.94	31.10
72.00	3.04	3.83	1.95	24.40
106.00	3.71	4.67	2.38	29.50
140.00	3.66	4.62	2.35	39.36
151.00	3.65	4.60	2.35	42.68

Classification	Yield N/m Thickne
	16 or under
JIS G3101 SS400	245
JIS G3101 sS540	400
JIS G3101 Ss490	285
JIS G3106 SM400, A,B,C	245
JIS G3106 SM490 A,B,C	325
JIS G3106 SM490 YA,YB	365
JIS G3106 SM520 B,C	365
JIS G3106 SM 570	460

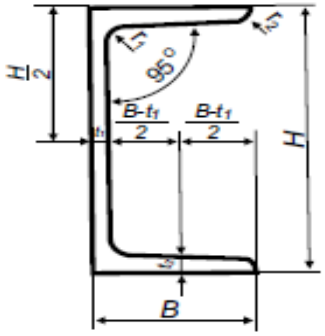
150.00	4.01	5.06	2.57	38.70
234.00	3.93	4.95	2.53	41.60
192.00	3.96	5.00	2.54	49.90
304.00	4.61	5.82	2.96	68.10
365.00	4.56	5.75	2.92	82.60
451.00	4.52	5.69	2.91	103.00
480.00	5.38	6.78	3.44	91.80
589.00	5.35	6.75	3.48	114.00
891.00	6.14	7.75	3.93	150.00
1160.00	6.09	7.68	3.90	197.00
1410.00	6.04	7.61	3.88	242.00
3790.00	7.49	9.42	4.83	519.00
2860.00	7.63	9.62	4.89	388.00

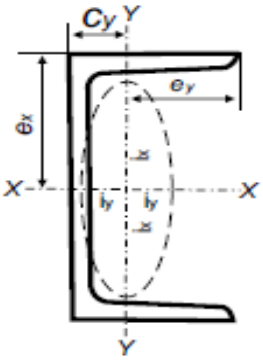
MECHANICAL PROPERTIES				
Point mm^2 ss (mm)	Tensile Strength N/mm^2	Elongation, % min Thickness (mm)		
over 16		5 or under	5 to 16	over 16
235	400-510	21	17	21
390	min. 540	16	13	17
275	490-610	19	15	19
235	400-510	23	18	22
315	490-610	22	17	21
355	490-610	19	15	19
355	520-640	19	15	19
450	570-720	19	19	26

CHEMICAL COMPOSITION
SYMBOL OF GRADE
SS 400, 490 SS 540
SM 400 A
SM 400 B
SM 400 C
SM 490 A
SM 490 B
SM 490 C
SM 490 YA
SM 490 YB
SM 520 B
SM 520 C
SM 570

N				ACCORDING JIS G 3101, G 3106	
CHEMICAL COMPOSITION (%)					
	C	Si	Mn	P	S
	0.3 max		1.60 max	0.050 0.040 max	0.050 0.040 max
50 mm or under in thickness	0.23 max		2.5 x c		
over 50 mm, up to and incl. 200 mm in	0.25 max			0.035	0.035
50 mm or under in thickness	0.20 max	0.35 max	0.60 -1.40	0.035	0.035
over 50 mm, up to and incl. 200 mm in	0.22 max				
100 mm or under in thickness	0.18 max	0.35 max	1.40 max	0.035	0.035
50 mm or under in thickness	0.20 max				
over 50 mm, up to and incl. 200 mm in	0.22 max	0.55 max	1.60 max	0.035	0.035
50 mm or under in thickness	0.18 max	0.55 max			
over 50 mm, up to and incl. 200 mm in	0.20 max		1.60 max	0.035	0.035
100 mm or under in thickness	0.18 max	0.55 max	1.60 max	0.035	0.035
100 mm or under in thickness	0.20 max	0.55 max	1.60 max		
				0.035	0.035
100 mm or under in thickness	0.20 max	0.55 max	1.60 max	0.035	0.035
100 mm or under in thickness	0.18 max	0.55 max	1.60 max	0.035	0.035

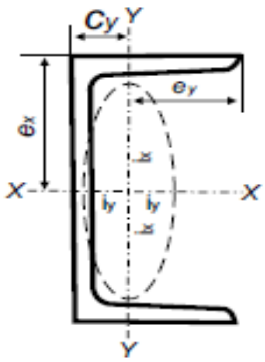
PROFIL KANAL PRODUKSI PT. GU





STANDARD SECTIONAL DIMENSION			SECTIONA AREA	UNIT MASS	CENTER OF GRAVITY	GEOME MOMENT C
H x B mm x mm	t1 mm	t2 mm	A cm^2	w kg/m	Cy cm	Ix cm^4
75 x 40	5	7	8.818	6.92	1.27	75.9
100 x 50	5	7.5	11.92	9.36	1.55	189
125 x 65	6	8	17.11	13.4	1.94	425
150 x 75	6.5	10	23.71	18.6	2.31	864
150 x 75	9	12.5	30.59	24	2.31	1050
180 x 75	7	10.5	27.2	21.4	2.15	1380
200 x 70	7	10	26.92	21.1	1.85	1620
200 x 80	7.5	11	31.33	24.6	2.24	1950
200 x 90	8	13.5	38.65	30.3	2.77	2490
250 x 90	9	13	44.07	34.6	2.43	4180
250 x 90	11	14.5	51.17	40.2	2.39	4690
300 x 90	10	15.5	55.74	43.8	2.33	7400
300 x 90	12	16	61.9	48.6	2.25	7870
380 x 100	10.5	16	69.39	54.5	2.41	14500
380 x 100	13	16.5	78.96	62	2.29	15600
380 x 100	13	20	85.71	67.3	2.5	17600

JNUNG GARUDA



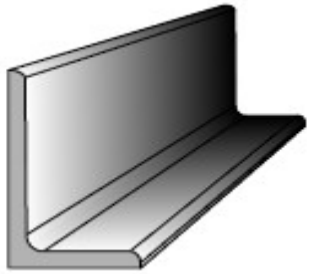
Kembali

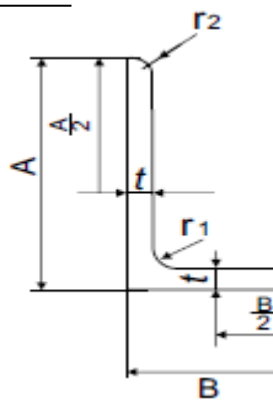
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METRIC SIZE

TRICAL OF INERTIA	RADIUS OF GYRATION		MODULUS OF SECTION		STANDARD SECTIONAL DIMENSIOI		
Iy cm^4	ix cm	iy cm	Zx cm^3	Zy cm^3	H x B mm x mm	t mm	r1 mm
12.4	2.93	1.19	20.2	4.54	95 X 75	9	8.5
26.9	3.98	1.5	37.8	7.82	100 X 75	7	10
65.5	4.99	1.96	68	14.4	100 X 75	10	10
122	6.04	2.27	115	23.6	125 X 75	7	10
147	5.86	2.19	140	28.3	125 X 75	10	10
137	7.13	2.24	150	25.5	125 X 75	13	10
113	7.77	2.04	162	21.8	125 X 90	10	10
177	7.89	2.38	195	30.8	125 X 90	13	10
286	8.03	2.72	249	45.9	150 X 90	9	12
306	9.74	2.64	335	46.5	150 X 90	12	12
342	9.57	2.58	375	51.7	150 X 100	9	12
373	11.5	2.54	494	56	150 X 100	12	12
391	11.3	2.51	525	57.9	150 X 100	15	12
557	14.5	2.83	762	73.3			
584	14.1	2.72	822	75.8			
671	14.3	2.8	924	89.5			

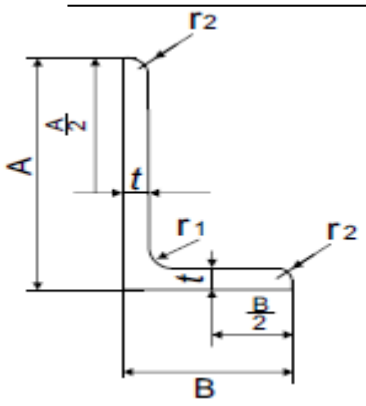
PROFIL SIKU TIDAK SAMA KAKI PRODUKSI PT. GUNUN





NS	SECTION AREA	UNIT WEIGHT	INFORMATIVE REF						
			CENTER OF GRAVITY		GEOMETRICAL MOMENT OF INERTIA				RADI
r2 mm	A cm^2	kg/m	Cx cm	Cy cm	Ix cm^4	Iy cm^4	Max Iu cm^4	Min Iv cm^4	ix cm
6	14.04	11.0	2.75	2.00	109	68.1	143	34.1	2.78
5	11.87	9.3	3.06	1.83	118	56.9	144	30.8	3.15
7	16.50	13.0	3.17	1.94	159	76.1	194	41.3	3.11
5	13.62	10.7	4.10	1.64	219	60.4	243	36.4	4.01
7	19.00	14.9	4.22	1.75	299	80.8	330	49	3.96
7	24.31	19.1	4.35	1.87	376	101	415	61.9	3.93
7	20.50	16.1	3.95	2.22	318	138	380	76.2	3.94
7	26.26	20.6	4.07	2.34	401	173	477	96.3	3.91
6	20.94	16.4	4.95	1.99	485	133	537	80.4	4.81
8.5	27.36	21.5	5.07	2.10	619	167	685	102	4.76
6	21.84	17.1	4.76	2.30	502	181	579	104	4.79
8.5	28.56	22.4	4.88	2.41	642	228	738	132	4.74
8.5	35.25	27.7	5.00	2.53	782	276	897	161	4.71

NG GARUDA



Kembali

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METRIC SIZE

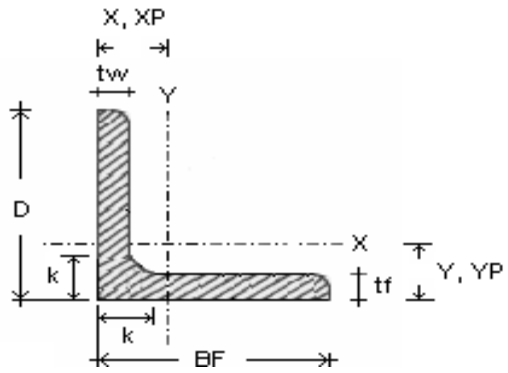
FERENCE

US OF GYRATION OF AREA				MODULUS OF SECTION	
iy cm	Max iu cm	Min iv cm	tan α	Zx cm^3	Zy cm^3
2.2	3.19	1.56	0.676	17.4	12.4
2.19	3.49	1.61	0.548	17.0	10.0
2.15	3.43	1.58	0.543	23.3	13.7
2.11	4.23	1.64	0.362	26.1	10.3
2.06	4.17	1.61	0.357	36.1	14.1
2.04	4.13	1.6	0.352	46.1	17.9
2.59	4.3	1.93	0.505	37.2	20.3
2.57	4.26	1.91	0.501	47.5	25.9
2.52	5.06	1.96	0.361	48.2	19.0
2.47	5	1.93	0.357	62.3	24.3
2.88	5.15	2.18	0.439	49.1	23.5
2.83	5.09	2.15	0.435	63.4	30.1
2.8	5.04	2.14	0.431	78.2	37.0

AISC

AMERICANS INSTITUTE STEEL CONSTRUCTION

Source :
AISC Manual of Steel Construction (1994)



ANGLE

Equal legs and unequ
Propertis for Designin

Metric Units

1 inch = 2.54 cm
1 lb = 4.448222 N
1 ft = 0.3048 m

Converted by : Ir. Thamrin Nasution

Profil Kanal

	Geometric of Section							
	k	Weight w	Area A	Depth D	Width BF	Web and flens thickness tw = tf	Moment of Inertia Ix	Section Modulus Sx
	cm	N/m	cm^2	cm	cm	cm	cm^4	cm^3
L8x8x1 1/8	4.45	830.4	107.74	20.32	20.32	2.86	4079.07	286.77
1	4.13	744.3	96.77	20.32	20.32	2.54	3704.46	258.92
7/8	3.81	656.7	85.16	20.32	20.32	2.22	3313.20	229.42
3/4	3.49	567.7	73.55	20.32	20.32	1.91	2901.13	199.92
5/8	3.18	477.2	62.00	20.32	20.32	1.59	2472.41	168.79
9/16	3.02	432.0	56.00	20.32	20.32	1.43	2251.81	153.06
1/2	2.86	385.3	50.00	20.32	20.32	1.27	2022.88	137.00
L8x6x1	3.81	645.1	83.87	20.32	15.24	2.54	3363.15	247.44
7/8	3.81	570.6	74.19	20.32	15.24	2.22	3009.35	219.59
3/4	3.18	493.3	64.13	20.32	15.24	1.91	2638.91	191.73
5/6	2.86	415.9	53.94	20.32	15.24	1.59	2251.81	161.74
9/16	2.70	375.1	48.77	20.32	15.24	1.43	2052.02	146.66
1/2	2.54	335.7	43.55	20.32	15.24	1.27	1843.91	131.42
7/16	2.38	294.8	38.26	20.32	15.24	1.11	1631.63	115.86
L8x4x1	3.81	545.8	70.97	20.32	10.16	2.54	2896.97	231.06
7/8	3.49	483.1	62.77	20.32	10.16	2.22	2601.45	204.84
3/4	3.18	418.8	54.45	20.32	10.16	1.91	2285.11	178.62
5/8	2.86	353.2	45.87	20.32	10.16	1.59	1952.13	150.92
9/16	2.70	319.6	41.48	20.32	10.16	1.43	1781.47	136.83
1/2	2.54	286.0	37.10	20.32	10.16	1.27	1602.49	122.74
7/16	2.38	251.0	32.65	20.32	10.16	1.11	1419.35	108.15
L7x4x3/4	3.18	382.4	49.61	17.78	10.16	1.91	1573.35	137.98
5/8	2.86	322.5	41.81	17.78	10.16	1.59	1348.59	117.00
1/2	2.54	261.2	33.87	17.78	10.16	1.27	1111.34	95.21
7/16	2.38	229.1	29.81	17.78	10.16	1.11	986.47	84.07
3/8	2.22	198.5	25.68	17.78	10.16	0.95	857.44	72.76
L6x6x1	3.81	545.8	70.97	15.24	15.24	2.54	1477.62	140.44
7/8	3.49	483.1	62.77	15.24	15.24	2.22	1327.78	125.03

3/4	3.18	418.8	54.45	15.24	15.24	1.91	1173.77	109.14
5/8	2.86	353.2	45.87	15.24	15.24	1.59	1007.28	92.75
9/16	2.70	319.6	41.48	15.24	15.24	1.43	919.87	84.23
1/2	2.54	286.0	37.10	15.24	15.24	1.27	828.30	75.54
7/16	2.38	251.0	32.65	15.24	15.24	1.11	736.73	66.86
3/8	2.22	217.4	28.13	15.24	15.24	0.95	641.00	57.85
5/16	2.06	181.0	23.55	15.24	15.24	0.79	541.10	48.67
L6x4x7/8	3.49	397.0	51.48	15.24	10.16	2.22	1152.96	117.17
3/4	3.18	344.4	44.77	15.24	10.16	1.91	1019.77	102.42
5/8	2.86	291.9	37.81	15.24	10.16	1.59	878.25	87.02
9/16	2.70	264.1	34.26	15.24	10.16	1.43	803.33	79.15
1/2	2.54	236.4	30.65	15.24	10.16	1.27	724.24	70.96
7/16	2.38	208.7	26.97	15.24	10.16	1.11	645.16	62.76
3/8	2.22	179.5	23.29	15.24	10.16	0.95	561.91	54.41
5/16	2.06	150.3	19.55	15.24	10.16	0.79	474.50	45.72
L6x3 1/2x1/2	2.54	223.3	29.03	15.24	8.89	1.27	690.94	69.48
3/8	2.22	170.7	22.06	15.24	8.89	0.95	536.94	53.09
5/16	2.06	143.0	18.52	15.24	8.89	0.79	453.69	44.74
L5x5x7/8	3.49	397.0	51.48	12.70	12.70	2.22	740.89	84.72
3/4	3.18	344.4	44.77	12.70	12.70	1.91	653.48	74.23
5/8	2.86	291.9	37.81	12.70	12.70	1.59	566.07	63.25
1/2	2.54	236.4	30.65	12.70	12.70	1.27	470.34	51.78
7/16	2.38	208.7	26.97	12.70	12.70	1.11	416.23	45.72
3/8	2.22	179.5	23.29	12.70	12.70	0.95	363.79	39.66
5/16	2.06	150.3	19.55	12.70	12.70	0.79	308.84	33.43
L5x3 1/2x3/4	3.18	289.0	37.48	12.70	8.89	1.91	578.56	70.14
5/8	2.86	245.2	31.74	12.70	8.89	1.59	499.48	59.81
1/2	2.54	198.5	25.81	12.70	8.89	1.27	415.82	49.00
3/8	2.22	151.8	19.68	12.70	8.89	0.95	323.83	37.53
5/16	2.06	127.0	16.52	12.70	8.89	0.79	274.71	31.79
1/4	1.91	102.2	13.29	12.70	8.89	0.64	224.35	25.73
		0.0	0.00	0.00	0.00	0.00	0.00	0.00
L5x3x1/2	2.54	186.8	24.19	12.70	7.62	1.27	393.34	47.69
7/16	2.38	164.9	21.35	12.70	7.62	1.11	350.88	42.28
3/8	2.22	143.0	18.45	12.70	7.62	0.95	306.76	36.71
5/16	2.06	119.7	15.48	12.70	7.62	0.79	260.56	30.97
1/4	1.91	96.3	12.52	12.70	7.62	0.64	212.69	25.07
L4x4x3/4	2.86	270.0	35.10	10.16	10.16	1.91	319.25	46.05
5/8	2.54	229.1	29.74	10.16	10.16	1.59	277.21	39.33
1/2	2.22	186.8	24.19	10.16	10.16	1.27	231.42	32.28
7/16	2.06	164.9	21.35	10.16	10.16	1.11	206.87	28.68
3/8	1.91	143.0	18.45	10.16	10.16	0.95	181.48	24.91
5/16	1.75	119.7	15.48	10.16	10.16	0.79	154.42	21.14
1/4	1.59	96.3	12.52	10.16	10.16	0.64	126.53	17.21

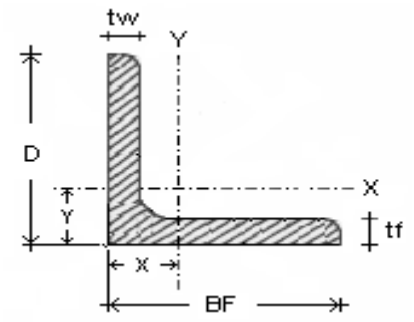
L4x3½x½	2.38	173.7	22.58	10.16	8.89	1.27	221.44	31.79
3/8	2.06	132.8	17.23	10.16	8.89	0.95	173.98	24.42
5/16	1.91	112.4	14.52	10.16	8.89	0.79	148.18	20.65
1/4	1.75	90.5	11.68	10.16	8.89	0.64	121.12	16.88
L4x3x⅝	2.70	198.5	25.68	10.16	7.62	1.59	250.99	37.69
1/2	2.38	162.0	20.97	10.16	7.62	1.27	210.20	30.97
7/16	2.22	143.0	18.52	10.16	7.62	1.11	188.14	27.53
3/8	2.06	124.0	16.00	10.16	7.62	0.95	164.83	23.93
5/16	1.91	105.1	13.48	10.16	7.62	0.79	140.69	20.16
1/4	1.75	84.6	10.90	10.16	7.62	0.64	115.30	16.39
L3½x3½x½	2.22	162.0	20.97	8.89	8.89	1.27	151.51	24.42
7/16	2.06	143.0	18.52	8.89	8.89	1.11	135.69	21.63
3/8	1.91	124.0	16.00	8.89	8.89	0.95	119.46	18.85
5/16	1.75	105.1	13.48	8.89	8.89	0.79	101.98	15.99
1/4	1.59	84.6	10.90	8.89	8.89	0.64	83.66	13.01
L3½x3x½	2.38	148.9	19.35	8.89	7.62	1.27	143.60	23.76
3/8	2.06	115.3	14.84	8.89	7.62	0.95	113.21	18.52
5/16	1.91	96.3	12.45	8.89	7.62	0.79	96.98	15.63
1/4	1.75	78.8	10.06	8.89	7.62	0.64	79.50	12.72
L3½x2½x½	2.38	137.2	17.74	8.89	6.35	1.27	134.86	23.11
3/8	2.06	105.1	13.61	8.89	6.35	0.95	106.56	17.86
1/4	1.75	71.5	9.29	8.89	6.35	0.64	74.92	12.37
L3x3x½	2.06	137.2	17.74	7.62	7.62	1.27	92.40	17.53
7/16	1.91	121.1	15.68	7.62	7.62	1.11	82.83	15.63
3/8	1.75	105.1	13.61	7.62	7.62	0.95	73.26	13.65
5/16	1.59	89.0	11.48	7.62	7.62	0.79	62.85	11.59
1/4	1.43	71.5	9.29	7.62	7.62	0.64	51.61	9.46
3/16	1.27	54.1	7.03	7.62	7.62	0.48	40.04	7.23
L3x2½x½	2.22	124.0	16.13	7.62	6.35	1.27	86.58	17.04
3/8	1.91	96.3	12.39	7.62	6.35	0.95	69.09	13.27
5/16	1.75	81.7	10.45	7.62	6.35	0.79	59.10	11.27
1/4	1.59	65.7	8.45	7.62	6.35	0.64	48.70	9.19
3/16	1.43	49.5	6.43	7.62	6.35	0.48	37.75	7.05
L3x2x½	2.06	112.4	14.52	7.62	5.08	1.27	79.92	16.39
3/8	1.75	86.1	11.16	7.62	5.08	0.95	63.68	12.80
5/16	1.59	73.0	9.42	7.62	5.08	0.79	54.94	10.88
1/4	1.43	59.8	7.68	7.62	5.08	0.64	45.37	8.88

3/16	1.27	44.8	5.82	7.62	5.08	0.48	35.05	6.80
		0.0	0.00	0.00	0.00	0.00	0.00	0.00
L2 1/2x2 1/2x 1/2	2.06	112.4	14.52	6.35	6.35	1.27	51.20	11.86
3/8	1.75	86.1	11.16	6.35	6.35	0.95	40.96	9.28
5/16	1.59	73.0	9.42	6.35	6.35	0.79	35.34	7.90
1/4	1.43	59.8	7.68	6.35	6.35	0.64	29.26	6.46
3/16	1.27	44.8	5.82	6.35	6.35	0.48	22.77	4.97
L2 1/2x2x 3/8	1.75	77.3	10.00	6.35	5.08	0.95	37.96	8.96
5/16	1.59	65.7	8.45	6.35	5.08	0.79	32.80	7.64
1/4	1.43	52.8	6.84	6.35	5.08	0.64	27.22	6.24
3/16	1.27	40.1	5.22	6.35	5.08	0.48	21.19	4.80
		0.0	0.00	0.00	0.00	0.00	0.00	0.00
L2x2x 3/8	1.75	68.6	8.77	5.08	5.08	0.95	19.94	5.75
5/16	1.59	57.2	7.42	5.08	5.08	0.79	17.32	4.92
1/4	1.43	46.6	6.05	5.08	5.08	0.64	14.48	4.05
3/16	1.27	35.6	4.61	5.08	5.08	0.48	11.32	3.11
1/8	1.11	24.1	3.12	5.08	5.08	0.32	7.91	2.15

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Equal legs and unequ
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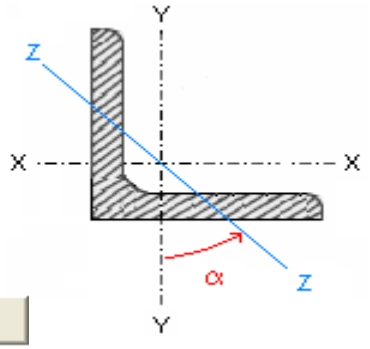
	Geometric of Section							
	k	Weight per ft	Area A	Depth D	Width BF	Web and flens thickness tw = tf	Moment of Inertia Ix	Section Modulus Sx
	in	lb	in^2	in	in	in	in^4	in^3
L8x8x1 1/8	1.7500	56.9	16.7	8	8	1.1250	98.0	17.5
1	1.6250	51.0	15.0	8	8	1.0000	89.0	15.8
7/8	1.5000	45.0	13.2	8	8	0.8750	79.6	14.0
3/4	1.3750	38.9	11.4	8	8	0.7500	69.7	12.2
5/8	1.2500	32.7	9.61	8	8	0.6250	59.4	10.3
9/16	1.1875	29.6	8.68	8	8	0.5625	54.1	9.34
1/2	1.1250	26.4	7.75	8	8	0.5000	48.6	8.36
L8x6x1	1.5000	44.2	13.0	8	6	1.0000	80.8	15.1

7/8	1.5000	39.1	11.5	8	6	0.8750	72.3	13.4
3/4	1.2500	33.8	9.94	8	6	0.7500	63.4	11.7
5/6	1.1250	28.5	8.36	8	6	0.6250	54.1	9.87
9/16	1.0625	25.7	7.56	8	6	0.5625	49.3	8.95
1/2	1.0000	23.0	6.75	8	6	0.5000	44.3	8.02
7/16	0.9375	20.2	5.93	8	6	0.4375	39.2	7.07
L8x4x1	1.5000	37.4	11.0	8	4	1.0000	69.6	14.1
7/8	1.3750	33.1	9.73	8	4	0.8750	62.5	12.5
3/4	1.2500	28.7	8.44	8	4	0.7500	54.9	10.9
5/8	1.1250	24.2	7.11	8	4	0.6250	46.9	9.21
9/16	1.0625	21.9	6.43	8	4	0.5625	42.8	8.35
1/2	1.0000	19.6	5.75	8	4	0.5000	38.5	7.49
7/16	0.9375	17.2	5.06	8	4	0.4375	34.1	6.60
L7x4x$^{3}/_{4}$	1.2500	26.2	7.69	7	4	0.7500	37.8	8.42
5/8	1.1250	22.1	6.48	7	4	0.6250	32.4	7.14
1/2	1.0000	17.9	5.25	7	4	0.5000	26.7	5.81
7/16	0.9375	15.7	4.62	7	4	0.4375	23.7	5.13
3/8	0.8750	13.6	3.98	7	4	0.3750	20.6	4.44
L6x6x1	1.5000	37.4	11.0	6	6	1.0000	35.5	8.57
7/8	1.3750	33.1	9.73	6	6	0.8750	31.9	7.63
3/4	1.2500	28.7	8.44	6	6	0.7500	28.2	6.66
5/8	1.1250	24.2	7.11	6	6	0.6250	24.2	5.66
9/16	1.0625	21.9	6.43	6	6	0.5625	22.1	5.14
1/2	1.0000	19.6	5.75	6	6	0.5000	19.9	4.61
7/16	0.9375	17.2	5.06	6	6	0.4375	17.7	4.08
3/8	0.8750	14.9	4.36	6	6	0.3750	15.4	3.53
5/16	0.8125	12.4	3.65	6	6	0.3125	13.0	2.97
L6x4x$^{7}/_{8}$	1.3750	27.2	7.98	6	4	0.8750	27.7	7.15
3/4	1.2500	23.6	6.94	6	4	0.7500	24.5	6.25
5/8	1.1250	20.0	5.86	6	4	0.6250	21.1	5.31
9/16	1.0625	18.1	5.31	6	4	0.5625	19.3	4.83
1/2	1.0000	16.2	4.75	6	4	0.5000	17.4	4.33
7/16	0.9375	14.3	4.18	6	4	0.4375	15.5	3.83
3/8	0.8750	12.3	3.61	6	4	0.3750	13.5	3.32
5/16	0.8125	10.3	3.03	6	4	0.3125	11.4	2.79
L6x3$^{1}/_{2}$x$^{1}/_{2}$	1.0000	15.3	4.50	6	3 1/2	0.5000	16.6	4.24
3/8	0.8750	11.7	3.42	6	3 1/2	0.3750	12.9	3.24
5/16	0.8125	9.80	2.87	6	3 1/2	0.3125	10.9	2.73
L5x5x7/8	1.3750	27.2	7.98	5	5	0.8750	17.8	5.17
3/4	1.2500	23.6	6.94	5	5	0.7500	15.7	4.53
5/8	1.1250	20.0	5.86	5	5	0.6250	13.6	3.86
1/2	1.0000	16.2	4.75	5	5	0.5000	11.3	3.16
7/16	0.9375	14.3	4.18	5	5	0.4375	10.0	2.79
3/8	0.8750	12.3	3.61	5	5	0.3750	8.74	2.42

5/16	0.8125	10.3	3.03	5	5	0.3125	7.42	2.04
L5x3 1/2 x 3/4	1.2500	19.8	5.81	5	3 1/2	0.7500	13.9	4.28
5/8	1.1250	16.8	4.92	5	3 1/2	0.6250	12.0	3.65
1/2	1.0000	13.6	4.00	5	3 1/2	0.5000	9.99	2.99
3/8	0.8750	10.4	3.05	5	3 1/2	0.3750	7.78	2.29
5/16	0.8125	8.7	2.56	5	3 1/2	0.3125	6.60	1.94
1/4	0.7500	7.0	2.06	5	3 1/2	0.2500	5.39	1.57
L5x3x1/2	1.0000	12.8	3.75	5	3	0.5000	9.45	2.91
7/16	0.9375	11.3	3.31	5	3	0.4375	8.43	2.58
3/8	0.8750	9.8	2.86	5	3	0.3750	7.37	2.24
5/16	0.8125	8.2	2.40	5	3	0.3125	6.26	1.89
1/4	0.7500	6.6	1.94	5	3	0.2500	5.11	1.53
L4x4x3/4	1.1250	18.5	5.44	4	4	0.7500	7.67	2.81
5/8	1.0000	15.7	4.61	4	4	0.6250	6.66	2.40
1/2	0.8750	12.8	3.75	4	4	0.5000	5.56	1.97
7/16	0.8125	11.3	3.31	4	4	0.4375	4.97	1.75
3/8	0.7500	9.8	2.86	4	4	0.3750	4.36	1.52
5/16	0.6875	8.2	2.40	4	4	0.3125	3.71	1.29
1/4	0.6250	6.6	1.94	4	4	0.2500	3.04	1.05
L4x3 1/2 x 1/2	0.9375	11.9	3.50	4	3 1/2	0.5000	5.32	1.94
3/8	0.8125	9.1	2.67	4	3 1/2	0.3750	4.18	1.49
5/16	0.7500	7.7	2.25	4	3 1/2	0.3125	3.56	1.26
1/4	0.6875	6.2	1.81	4	3 1/2	0.2500	2.91	1.03
L4x3x5/8	1.0625	13.6	3.98	4	3	0.6250	6.03	2.30
1/2	0.9375	11.1	3.25	4	3	0.5000	5.05	1.89
7/16	0.8750	9.80	2.87	4	3	0.4375	4.52	1.68
3/8	0.8125	8.50	2.48	4	3	0.3750	3.96	1.46
5/16	0.7500	7.20	2.09	4	3	0.3125	3.38	1.23
1/4	0.6875	5.80	1.69	4	3	0.2500	2.77	1.00
L3 1/2 x 3 1/2 x 1/2	0.8750	11.1	3.25	3 1/2	3 1/2	0.5000	3.64	1.49
7/16	0.8125	9.80	2.87	3 1/2	3 1/2	0.4375	3.26	1.32
3/8	0.7500	8.50	2.48	3 1/2	3 1/2	0.3750	2.87	1.15
5/16	0.6875	7.20	2.09	3 1/2	3 1/2	0.3125	2.45	0.976
1/4	0.6250	5.80	1.69	3 1/2	3 1/2	0.2500	2.01	0.794
L3 1/2 x 3x 1/2	0.9375	10.2	3.00	3 1/2	3	0.5000	3.45	1.45
3/8	0.8125	7.90	2.30	3 1/2	3	0.3750	2.72	1.13
5/16	0.7500	6.60	1.93	3 1/2	3	0.3125	2.33	0.954
1/4	0.6875	5.40	1.56	3 1/2	3	0.2500	1.91	0.776
L3 1/2 x 2 1/2 x 1/2	0.9375	9.40	2.75	3 1/2	2 1/2	0.5000	3.24	1.41
3/8	0.8125	7.20	2.11	3 1/2	2 1/2	0.3750	2.56	1.09

1/4	0.6875	4.90	1.44	3 1/2	2 1/2	0.2500	1.80	0.755
L3x3x1/2	0.8125	9.40	2.75	3	3	0.5000	2.22	1.07
7/16	0.7500	8.30	2.43	3	3	0.4375	1.99	0.954
3/8	0.6875	7.20	2.11	3	3	0.3750	1.76	0.833
5/16	0.6250	6.10	1.78	3	3	0.3125	1.51	0.707
1/4	0.5625	4.90	1.44	3	3	0.2500	1.24	0.577
3/16	0.5000	3.71	1.09	3	3	0.1875	0.962	0.441
L3x2 1/2x1/2	0.8750	8.50	2.50	3	2 1/2	0.5000	2.08	1.04
3/8	0.7500	6.60	1.92	3	2 1/2	0.3750	1.66	0.810
5/16	0.6875	5.60	1.62	3	2 1/2	0.3125	1.42	0.688
1/4	0.6250	4.50	1.31	3	2 1/2	0.2500	1.17	0.561
3/16	0.5625	3.39	0.996	3	2 1/2	0.1875	0.907	0.430
L3x2x1/2	0.8125	7.70	2.25	3	2	0.5000	1.92	1.00
3/8	0.6875	5.90	1.73	3	2	0.3750	1.53	0.781
5/16	0.6250	5.00	1.46	3	2	0.3125	1.32	0.664
1/4	0.5625	4.10	1.19	3	2	0.2500	1.09	0.542
3/16	0.5000	3.07	0.902	3	2	0.1875	0.842	0.415
L2 1/2x2 1/2x1/2	0.8125	7.70	2.25	2 1/2	2 1/2	0.5000	1.23	0.724
3/8	0.6875	5.90	1.73	2 1/2	2 1/2	0.3750	0.984	0.566
5/16	0.6250	5.00	1.46	2 1/2	2 1/2	0.3125	0.849	0.482
1/4	0.5625	4.10	1.19	2 1/2	2 1/2	0.2500	0.703	0.394
3/16	0.5000	3.07	0.902	2 1/2	2 1/2	0.1875	0.547	0.303
L2 1/2x2x3/8	0.6875	5.30	1.55	2 1/2	2	0.3750	0.912	0.547
5/16	0.6250	4.50	1.31	2 1/2	2	0.3125	0.788	0.466
1/4	0.5625	3.62	1.06	2 1/2	2	0.2500	0.654	0.381
3/16	0.5000	2.75	0.809	2 1/2	2	0.1875	0.509	0.293
L2x2x3/8	0.6875	4.70	1.36	2	2	0.3750	0.479	0.351
5/16	0.6250	3.92	1.15	2	2	0.3125	0.416	0.300
1/4	0.5625	3.19	0.938	2	2	0.2500	0.348	0.247
3/16	0.5000	2.44	0.715	2	2	0.1875	0.272	0.190
1/8	0.4375	1.65	0.484	2	2	0.1250	0.190	0.131

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Axis X-X				Axis Y-Y			
Radius of Gyration	Center of Gravity	Plastic Modulus	Plastic neutral axis	Moment of Inertia	Section Modulus	Radius of Gyration	Center of Gravity
Rx	**Y**	**Zx**	**YP**	**Iy**	**Sy**	**Ry**	**X**
cm	cm	cm^3	cm	cm^4	cm^3	cm	cm
6.15	6.12	517.83	2.67	4079.07	286.77	6.15	6.12
6.20	6.02	467.03	2.38	3704.46	258.92	6.20	6.02
6.22	5.92	414.59	2.10	3313.20	229.42	6.22	5.92
6.27	5.79	360.52	1.82	2901.13	199.92	6.27	5.79
6.32	5.66	304.80	1.53	2472.41	168.79	6.32	5.66
6.35	5.61	275.30	1.38	2251.81	153.06	6.35	5.61
6.35	5.56	247.44	1.23	2022.88	137.00	6.35	5.56
6.32	6.73	447.37	3.81	1614.98	146.17	4.39	4.19
6.38	6.63	396.57	3.66	1452.65	130.11	4.42	4.09
6.43	6.50	345.77	3.51	1277.83	113.40	4.47	3.96
6.45	6.40	293.33	3.33	1094.69	96.36	4.50	3.86
6.48	6.35	265.47	3.25	998.96	87.51	4.52	3.81
6.50	6.27	237.61	3.18	903.22	78.49	4.55	3.73
6.53	6.22	209.75	3.10	803.33	69.32	4.57	3.68
6.40	7.75	398.21	6.35	482.83	64.57	2.62	2.67
6.43	7.62	353.96	6.20	437.04	57.52	2.64	2.54
6.48	7.49	309.72	6.05	389.59	50.31	2.67	2.42
6.53	7.39	262.19	5.87	337.15	42.93	2.72	2.30
6.55	7.32	237.61	5.79	309.26	39.00	2.72	2.24
6.58	7.26	213.03	5.72	280.54	35.23	2.74	2.18
6.60	7.19	188.45	5.64	250.57	31.14	2.77	2.12
5.64	6.38	242.53	4.78	376.69	49.65	2.77	2.57
5.69	6.25	206.48	4.60	326.33	42.28	2.79	2.45
5.72	6.15	168.79	4.45	271.80	34.74	2.82	2.33
5.74	6.07	148.96	4.37	242.66	30.81	2.84	2.27
5.77	6.02	128.97	4.29	212.28	26.71	2.87	2.21
4.57	4.72	254.00	2.33	1477.62	140.44	4.57	4.72
4.60	4.62	226.14	2.06	1327.78	125.03	4.60	4.62

4.65	4.52	196.64	1.79	1173.77	109.14	4.65	4.52
4.67	4.39	167.15	1.50	1007.28	92.75	4.67	4.39
4.70	4.34	151.74	1.36	919.87	84.23	4.70	4.34
4.72	4.27	136.18	1.22	828.30	75.54	4.72	4.27
4.75	4.22	120.28	1.07	736.73	66.86	4.75	4.22
4.78	4.17	104.06	0.92	641.00	57.85	4.78	4.17
4.80	4.11	87.67	0.77	541.10	48.67	4.80	4.11
4.72	5.38	208.12	3.66	405.83	55.55	2.82	2.84
4.78	5.28	183.54	3.51	361.29	48.67	2.84	2.74
4.83	5.16	155.84	3.33	313.01	41.62	2.87	2.62
4.83	5.11	141.91	3.25	287.62	37.85	2.90	2.57
4.85	5.05	127.49	3.18	260.98	34.09	2.92	2.51
4.88	4.98	112.74	3.10	233.09	30.32	2.95	2.45
4.90	4.93	97.83	3.02	203.95	26.22	2.97	2.39
4.93	4.88	82.43	2.95	173.98	22.12	2.97	2.33
4.88	5.28	122.90	3.81	176.90	26.06	2.47	2.12
4.93	5.18	94.39	3.66	139.02	20.16	2.51	2.00
4.95	5.11	79.48	3.58	118.63	17.04	2.53	1.94
3.78	3.99	152.89	2.03	740.89	84.72	3.78	3.99
3.84	3.86	133.72	1.76	653.48	74.23	3.84	3.86
3.86	3.76	113.89	1.49	566.07	63.25	3.86	3.76
3.91	3.63	93.08	1.21	470.34	51.78	3.91	3.63
3.94	3.58	82.43	1.06	416.23	45.72	3.94	3.58
3.96	3.53	71.45	0.92	363.79	39.66	3.96	3.53
3.99	3.48	60.30	0.77	308.84	33.43	3.99	3.48
3.94	4.45	125.36	2.87	231.01	36.38	2.48	2.53
3.96	4.32	107.34	2.69	201.04	31.14	2.52	2.42
4.01	4.22	88.16	2.54	168.57	25.56	2.57	2.30
4.06	4.09	67.84	2.38	132.36	19.83	2.59	2.19
4.09	4.04	57.19	2.30	113.21	16.71	2.62	2.13
4.11	3.96	46.38	2.22	92.82	13.60	2.64	2.07
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.04	4.45	84.56	3.18	107.39	18.85	2.11	1.91
4.06	4.39	74.89	3.10	96.57	16.71	2.13	1.85
4.09	4.32	65.06	3.02	84.91	14.55	2.15	1.79
4.09	4.27	55.06	2.95	72.84	12.34	2.17	1.73
4.11	4.22	44.57	2.87	59.94	10.06	2.19	1.67
3.02	3.23	83.08	1.73	319.25	46.05	3.02	3.23
3.05	3.12	70.96	1.46	277.21	39.33	3.05	3.12
3.10	3.00	58.34	1.19	231.42	32.28	3.10	3.00
3.12	2.95	51.78	1.05	206.87	28.68	3.12	2.95
3.12	2.90	44.90	0.91	181.48	24.91	3.12	2.90
3.15	2.84	38.02	0.76	154.42	21.14	3.15	2.84
3.18	2.77	30.81	0.61	126.53	17.21	3.18	2.77

3.12	3.18	57.35	1.27	157.75	24.91	2.64	2.54
3.18	3.07	44.41	1.11	122.79	19.01	2.69	2.43
3.20	3.00	37.53	1.03	106.14	16.29	2.72	2.37
3.23	2.95	30.48	0.95	86.99	13.24	2.72	2.31
3.12	3.48	67.51	2.07	119.46	22.12	2.16	2.21
3.18	3.38	55.88	1.91	100.73	18.35	2.19	2.10
3.18	3.30	49.65	1.83	90.74	16.26	2.21	2.04
3.20	3.25	43.26	1.75	79.92	14.19	2.23	1.99
3.23	3.20	36.54	1.67	68.68	12.03	2.25	1.93
3.25	3.15	29.82	1.59	56.61	9.82	2.28	1.87
2.69	2.69	43.92	1.18	151.51	24.42	2.69	2.69
2.72	2.64	39.00	1.04	135.69	21.63	2.72	2.64
2.72	2.57	34.09	0.90	119.46	18.85	2.72	2.57
2.74	2.51	28.84	0.76	101.98	15.99	2.74	2.51
2.77	2.46	23.43	0.61	83.66	13.01	2.77	2.46
2.72	2.87	43.10	1.27	96.98	18.03	2.24	2.22
2.77	2.74	33.43	1.11	77.00	13.95	2.28	2.11
2.79	2.69	28.35	1.03	65.76	11.83	2.30	2.05
2.82	2.64	23.11	0.95	54.11	9.65	2.32	1.99
2.77	3.05	41.46	1.91	56.61	12.45	1.79	1.79
2.79	2.95	32.28	1.75	45.37	9.70	1.83	1.68
2.84	2.82	22.29	1.59	32.34	6.75	1.87	1.56
2.28	2.37	31.63	1.16	92.40	17.53	2.28	2.37
2.30	2.31	28.19	1.03	82.83	15.63	2.30	2.31
2.32	2.26	24.58	0.89	73.26	13.65	2.32	2.26
2.34	2.20	20.81	0.75	62.85	11.59	2.34	2.20
2.36	2.14	17.04	0.61	51.61	9.46	2.36	2.14
2.39	2.08	13.01	0.46	40.04	7.23	2.39	2.08
2.32	2.54	30.81	1.27	54.11	12.19	1.83	1.91
2.36	2.43	24.09	1.11	43.29	9.52	1.87	1.79
2.38	2.37	20.48	1.03	37.38	8.10	1.89	1.73
2.40	2.31	16.71	0.95	30.93	6.62	1.91	1.68
2.42	2.26	12.80	0.87	24.02	5.08	1.93	1.62
2.35	2.74	29.17	1.91	27.97	7.77	1.39	1.48
2.39	2.64	22.94	1.75	22.60	6.08	1.42	1.37
2.41	2.59	19.50	1.67	19.56	5.19	1.44	1.31
2.43	2.52	15.94	1.59	16.32	4.26	1.46	1.25

2.45	2.46	12.22	1.51	12.78	3.28	1.48	1.19
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.88	2.05	21.47	1.14	51.20	11.86	1.88	2.05
1.91	1.94	16.71	0.88	40.96	9.28	1.91	1.94
1.93	1.88	14.24	0.74	35.34	7.90	1.93	1.88
1.95	1.82	11.65	0.60	29.26	6.46	1.95	1.82
1.98	1.76	8.93	0.46	22.77	4.97	1.98	1.76
1.95	2.11	16.16	1.11	21.39	5.95	1.47	1.48
1.97	2.05	13.81	1.03	18.56	5.08	1.48	1.42
1.99	2.00	11.32	0.95	15.48	4.16	1.50	1.36
2.01	1.94	8.72	0.87	12.11	3.21	1.52	1.31
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.51	1.62	10.37	0.86	19.94	5.75	1.51	1.62
1.53	1.56	8.87	0.73	17.32	4.92	1.53	1.56
1.55	1.50	7.29	0.59	14.48	4.05	1.55	1.50
1.57	1.45	5.62	0.45	11.32	3.11	1.57	1.45
1.59	1.39	3.85	0.31	7.91	2.15	1.59	1.39

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Axis X-X				**Axis Y-Y**			
Radius of Gyration	Center of Gravity	Plastic Modulus	Plastic neutral axis	Moment of Inertia	Section Modulus	Radius of Gyration	Center of Gravity
Rx	**y**	**Zx**	**YP**	**Iy**	**Sy**	**Ry**	**x**
in	in	in^3	in	in^4	in^3	in	in
2.42	2.41	31.6	1.05	98.0	17.5	2.42	2.41
2.44	2.37	28.5	0.938	89.0	15.8	2.44	2.37
2.45	2.33	25.3	0.827	79.6	14.0	2.45	2.33
2.47	2.28	22.0	0.715	69.7	12.2	2.47	2.28
2.49	2.23	18.6	0.601	59.4	10.3	2.49	2.23
2.50	2.21	16.8	0.543	54.1	9.34	2.50	2.21
2.50	2.19	15.1	0.484	48.6	8.36	2.50	2.19
2.49	2.65	27.3	1.50	38.8	8.92	1.73	1.65

2.51	2.61	24.2	1.44	34.9	7.94	1.74	1.61
2.53	2.56	21.1	1.38	30.7	6.92	1.76	1.56
2.54	2.52	17.9	1.31	26.3	5.88	1.77	1.52
2.55	2.50	16.2	1.28	24.0	5.34	1.78	1.50
2.56	2.47	14.5	1.25	21.7	4.79	1.79	1.47
2.57	2.45	12.8	1.22	19.3	4.23	1.80	1.45
2.52	3.05	24.3	2.50	11.6	3.94	1.03	1.05
2.53	3.00	21.6	2.44	10.5	3.51	1.04	0.999
2.55	2.95	18.9	2.38	9.36	3.07	1.05	0.953
2.57	2.91	16.0	2.31	8.10	2.62	1.07	0.905
2.58	2.88	14.5	2.28	7.43	2.38	1.07	0.882
2.59	2.86	13.0	2.25	6.74	2.15	1.08	0.859
2.60	2.83	11.5	2.22	6.02	1.90	1.09	0.835
2.22	2.51	14.8	1.88	9.05	3.03	1.09	1.01
2.24	2.46	12.6	1.81	7.84	2.58	1.10	0.963
2.25	2.42	10.3	1.75	6.53	2.12	1.11	0.917
2.26	2.39	9.09	1.72	5.83	1.88	1.12	0.893
2.27	2.37	7.87	1.69	5.10	1.63	1.13	0.870
1.80	1.86	15.5	0.917	35.5	8.57	1.80	1.86
1.81	1.82	13.8	0.811	31.9	7.63	1.81	1.82
1.83	1.78	12.0	0.703	28.2	6.66	1.83	1.78
1.84	1.73	10.2	0.592	24.2	5.66	1.84	1.73
1.85	1.71	9.26	0.536	22.1	5.14	1.85	1.71
1.86	1.68	8.31	0.479	19.9	4.61	1.86	1.68
1.87	1.66	7.34	0.422	17.7	4.08	1.87	1.66
1.88	1.64	6.35	0.363	15.4	3.53	1.88	1.64
1.89	1.62	5.35	0.304	13.0	2.97	1.89	1.62
1.86	2.12	12.7	1.44	9.75	3.39	1.11	1.12
1.88	2.08	11.2	1.38	8.68	2.97	1.12	1.08
1.90	2.03	9.51	1.31	7.52	2.54	1.13	1.03
1.90	2.01	8.66	1.28	6.91	2.31	1.14	1.01
1.91	1.99	7.78	1.25	6.27	2.08	1.15	0.987
1.92	1.96	6.88	1.22	5.60	1.85	1.16	0.964
1.93	1.94	5.97	1.19	4.90	1.60	1.17	0.941
1.94	1.92	5.03	1.16	4.18	1.35	1.17	0.918
1.92	2.08	7.50	1.50	4.25	1.59	0.972	0.833
1.94	2.04	5.76	1.44	3.34	1.23	0.988	0.787
1.95	2.01	4.85	1.41	2.85	1.04	0.996	0.763
1.49	1.57	9.33	0.798	17.8	5.17	1.49	1.57
1.51	1.52	8.16	0.694	15.7	4.53	1.51	1.52
1.52	1.48	6.95	0.586	13.6	3.86	1.52	1.48
1.54	1.43	5.68	0.475	11.3	3.16	1.54	1.43
1.55	1.41	5.03	0.418	10.0	2.79	1.55	1.41
1.56	1.39	4.36	0.361	8.74	2.42	1.56	1.39

	1.57	1.37	3.68	0.303	7.42	2.04	1.57	1.37
	1.55	1.75	7.65	1.13	5.55	2.22	0.977	0.996
	1.56	1.70	6.55	1.06	4.83	1.90	0.991	0.951
	1.58	1.66	5.38	1.00	4.05	1.56	1.01	0.906
	1.60	1.61	4.14	0.938	3.18	1.21	1.02	0.861
	1.61	1.59	3.49	0.906	2.72	1.02	1.03	0.838
	1.62	1.56	2.83	0.875	2.23	0.830	1.04	0.814
	1.59	1.75	5.16	1.25	2.58	1.15	0.829	0.750
	1.60	1.73	4.57	1.22	2.32	1.02	0.837	0.727
	1.61	1.70	3.97	1.19	2.04	0.888	0.845	0.704
	1.61	1.68	3.36	1.16	1.75	0.753	0.853	0.681
	1.62	1.66	2.72	1.13	1.44	0.614	0.861	0.657
	1.19	1.27	5.07	0.680	7.67	2.81	1.19	1.27
	1.20	1.23	4.33	0.576	6.66	2.40	1.20	1.23
	1.22	1.18	3.56	0.469	5.56	1.97	1.22	1.18
	1.23	1.16	3.16	0.414	4.97	1.75	1.23	1.16
	1.23	1.14	2.74	0.357	4.36	1.52	1.23	1.14
	1.24	1.12	2.32	0.300	3.71	1.29	1.24	1.12
	1.25	1.09	1.88	0.242	3.04	1.05	1.25	1.09
	1.23	1.25	3.50	0.500	3.79	1.52	1.04	1.00
	1.25	1.21	2.71	0.438	2.95	1.16	1.06	0.955
	1.26	1.18	2.29	0.406	2.55	0.994	1.07	0.932
	1.27	1.16	1.86	0.375	2.09	0.808	1.07	0.909
	1.23	1.37	4.12	0.813	2.87	1.35	0.849	0.871
	1.25	1.33	3.41	0.750	2.42	1.12	0.864	0.827
	1.25	1.30	3.03	0.719	2.18	0.992	0.871	0.804
	1.26	1.28	2.64	0.688	1.92	0.866	0.879	0.782
	1.27	1.26	2.23	0.656	1.65	0.734	0.887	0.759
	1.28	1.24	1.82	0.625	1.36	0.599	0.896	0.736
	1.06	1.06	2.68	0.464	3.64	1.49	1.06	1.06
	1.07	1.04	2.38	0.410	3.26	1.32	1.07	1.04
	1.07	1.01	2.08	0.355	2.87	1.15	1.07	1.01
	1.08	0.990	1.76	0.299	2.45	0.976	1.08	0.990
	1.09	0.968	1.43	0.241	2.01	0.794	1.09	0.968
	1.07	1.13	2.63	0.500	2.33	1.10	0.881	0.875
	1.09	1.08	2.04	0.438	1.85	0.851	0.897	0.830
	1.10	1.06	1.73	0.406	1.58	0.722	0.905	0.808
	1.11	1.04	1.41	0.375	1.30	0.589	0.914	0.785
	1.09	1.20	2.53	0.750	1.36	0.760	0.704	0.705
	1.10	1.16	1.97	0.688	1.09	0.592	0.719	0.660

1.12	1.11	1.36	0.625	0.777	0.412	0.735	0.614
0.898	0.932	1.93	0.458	2.22	1.07	0.898	0.932
0.905	0.910	1.72	0.406	1.99	0.954	0.905	0.910
0.913	0.888	1.50	0.352	1.76	0.833	0.913	0.888
0.922	0.865	1.27	0.296	1.51	0.707	0.922	0.865
0.930	0.842	1.04	0.240	1.24	0.577	0.930	0.842
0.939	0.820	0.794	0.182	0.962	0.441	0.939	0.820
0.913	1.000	1.88	0.500	1.30	0.744	0.722	0.750
0.928	0.956	1.47	0.438	1.04	0.581	0.736	0.706
0.937	0.933	1.25	0.406	0.898	0.494	0.744	0.683
0.945	0.911	1.02	0.375	0.743	0.404	0.753	0.661
0.954	0.888	0.781	0.344	0.577	0.310	0.761	0.638
0.924	1.08	1.78	0.750	0.672	0.474	0.546	0.583
0.940	1.04	1.40	0.688	0.543	0.371	0.559	0.539
0.948	1.02	1.19	0.656	0.470	0.317	0.567	0.516
0.957	0.993	0.973	0.625	0.392	0.260	0.574	0.493
0.966	0.970	0.746	0.594	0.307	0.200	0.583	0.470
0.739	0.806	1.31	0.450	1.23	0.724	0.739	0.806
0.753	0.762	1.02	0.347	0.984	0.566	0.753	0.762
0.761	0.740	0.869	0.293	0.849	0.482	0.761	0.740
0.769	0.717	0.711	0.238	0.703	0.394	0.769	0.717
0.778	0.694	0.545	0.180	0.547	0.303	0.778	0.694
0.768	0.831	0.986	0.438	0.514	0.363	0.577	0.581
0.776	0.809	0.843	0.406	0.446	0.310	0.584	0.559
0.784	0.787	0.691	0.375	0.372	0.254	0.592	0.537
0.793	0.764	0.532	0.344	0.291	0.196	0.600	0.514
0.594	0.636	0.633	0.340	0.479	0.351	0.594	0.636
0.601	0.614	0.541	0.288	0.416	0.300	0.601	0.614
0.609	0.592	0.445	0.234	0.348	0.247	0.609	0.592
0.617	0.569	0.343	0.179	0.272	0.190	0.617	0.569
0.626	0.546	0.235	0.121	0.190	0.131	0.626	0.546

AISC

AMERICANS INSTITUTE STEEL CONSTRUCTION

Source :
AISC Manual of Steel Construction (1994)

Converted by : Ir. Tha

Kembali

Axis Z-Z						
Plastic Modulus **Zy**	Plastic neutral axis **XP**	Radius of Gyration **RZ**	Angle to principal axes **z** **Tan α**	C	Area **A**	Depth **d**
cm^3	cm	cm	Unitless		cm^2	cm
517.83	2.67	3.96	1.000	C15x50	94.84	38.10
467.03	2.38	3.96	1.000	x40	76.13	38.10
414.59	2.10	3.99	1.000	x33.9	64.26	38.10
360.52	1.82	4.01	1.000			
304.80	1.53	4.01	1.000	C12x30	56.90	30.48
275.30	1.38	4.04	1.000	x25	47.42	30.48
247.44	1.23	4.04	1.000	x20.7	39.29	30.48
265.47	2.07	3.25	0.543	C10x30	56.90	25.40
235.97	1.82	3.25	0.547	x25	47.42	25.40
204.84	1.58	3.28	0.551	x20	37.94	25.40
172.06	1.33	3.28	0.554	x15.3	28.97	25.40
156.00	1.20	3.30	0.556			
139.45	1.07	3.30	0.558	C9x20	37.94	22.86
122.90	0.94	3.33	0.560	x15	28.45	22.86
				x13.4	25.42	22.86
126.51	1.75	2.15	0.247			
110.94	1.54	2.15	0.253	C8x18.75	35.55	20.32
95.21	1.34	2.16	0.258	x13.75	26.06	20.32
79.64	1.13	2.18	0.262	x11.5	21.81	20.32
71.78	1.02	2.19	0.265			
63.91	0.91	2.20	0.267	C7x12.25	23.23	17.78
56.04	0.80	2.21	0.269	x9.8	18.52	17.78
92.59	1.39	2.18	0.324	C6x13	24.71	15.24
77.67	1.18	2.20	0.329	x10.5	19.94	15.24
62.76	0.95	2.21	0.335	x8.2	15.48	15.24
55.22	0.84	2.22	0.337			
47.52	0.72	2.24	0.340	C5x9	17.03	12.70
				x6.7	12.71	12.70
254.00	2.33	2.97	1.000			
226.14	2.06	2.97	1.000	C4x7.25	13.74	10.16

196.64	1.79	2.97	1.000		x5.4	10.26	10.16
167.15	1.50	3.00	1.000				
151.74	1.36	3.00	1.000		C3x6	11.35	7.62
136.18	1.22	3.00	1.000		x5	9.48	7.62
120.28	1.07	3.02	1.000		x4.1	7.81	7.62
104.06	0.92	3.02	1.000				
87.67	0.77	3.05	1.000		MC18x58	110.32	45.72
					x51.9	98.71	45.72
103.40	1.69	2.18	0.421		x45.8	87.10	45.72
89.64	1.47	2.18	0.428		x42.7	81.29	45.72
75.71	1.24	2.19	0.435				
68.66	1.12	2.20	0.438		MC13x50	94.84	33.02
61.45	1.01	2.21	0.440		x40	76.13	33.02
54.08	0.89	2.22	0.443		x35	66.45	33.02
46.70	0.76	2.23	0.446		x31.8	60.32	33.02
39.33	0.64	2.24	0.448				
					MC12x50	94.84	30.48
47.69	0.95	1.93	0.344		x45	85.16	30.48
36.05	0.72	1.95	0.350		x40	76.13	30.48
30.32	0.61	1.96	0.352		x35	66.45	30.48
					x31	58.84	30.48
152.89	2.03	2.47	1.000				
133.72	1.76	2.48	1.000		MC12x10.6	20.00	30.48
113.89	1.49	2.48	1.000				
93.08	1.21	2.50	1.000		MC10x41.1	78.06	25.40
82.43	1.06	2.50	1.000		x33.6	63.68	25.40
71.45	0.92	2.51	1.000		x28.5	54.00	25.40
60.30	0.77	2.52	1.000				
					MC10x25	47.42	25.40
67.19	1.48	1.90	0.464		x22	41.61	25.40
56.86	1.25	1.91	0.472				
46.38	1.02	1.92	0.479		MC10x8.4	15.87	25.40
35.40	0.77	1.94	0.486				
29.82	0.65	1.95	0.489		MC9x25.4	48.19	22.86
24.09	0.52	1.96	0.492		x23.9	45.29	22.86
0.00	0.00	0.00	0.000				
34.58	0.95	1.65	0.357		MC8x22.8	43.23	20.32
30.48	0.84	1.65	0.361		x21.4	40.52	20.32
26.22	0.73	1.66	0.364				
22.12	0.61	1.67	0.368		MC8x20	37.94	20.32
17.86	0.49	1.68	0.371		x18.7	35.48	20.32
83.08	1.73	1.98	1.000		MC8x8.5	16.13	20.32
70.96	1.46	1.98	1.000				
58.34	1.19	1.99	1.000		MC7x22.7	43.03	17.78
51.78	1.05	1.99	1.000		X19.1	36.19	17.78
44.90	0.91	2.00	1.000				
38.02	0.76	2.01	1.000		MC6x18	34.13	15.24
30.81	0.61	2.02	1.000				

					MC6x16.3	30.90	15.24
44.74	1.11	1.83	0.750		x15.1	28.65	15.24
34.58	0.85	1.85	0.755				
29.17	0.71	1.85	0.757		MC6x12	22.77	15.24
23.60	0.58	1.86	0.759				
40.64	1.26	1.62	0.534				
33.27	1.03	1.62	0.543		**AISC**		
29.33	0.91	1.63	0.547		**AMERICANS**		
25.56	0.79	1.64	0.551		**INSTITUTE**		
21.47	0.66	1.64	0.554		**STEEL**		
17.37	0.54	1.65	0.558		**CONSTRUCTION**		
43.92	1.18	1.73	1.000				
39.00	1.04	1.74	1.000				
34.09	0.90	1.74	1.000		Source :		
28.84	0.76	1.75	1.000		AISC Manual of Steel		
23.43	0.61	1.76	1.000		Construction (1994)		
32.45	1.09	1.58	0.714		C	Area **A**	Depth **d**
25.07	0.83	1.59	0.721				
21.30	0.70	1.59	0.724				
17.21	0.57	1.60	0.727			in^2	in
					C15x50	14.7	15.00
22.94	1.00	1.36	0.486		x40	11.8	15.00
17.53	0.76	1.36	0.496		x33.9	9.96	15.00
12.04	0.52	1.38	0.506				
					C12x30	8.82	12.00
31.63	1.16	1.48	1.000		x25	7.35	12.00
28.19	1.03	1.49	1.000		x20.7	6.09	12.00
24.58	0.89	1.49	1.000				
20.81	0.75	1.50	1.000		C10x30	8.82	10.00
17.04	0.61	1.50	1.000		x25	7.35	10.00
13.01	0.46	1.51	1.000		x20	5.88	10.00
					x15.3	4.49	10.00
22.12	1.06	1.32	0.667		x11.5		
17.21	0.81	1.33	0.676		C9x20	5.88	9.00
14.57	0.69	1.33	0.680		x15	4.41	9.00
11.86	0.56	1.34	0.684			3.94	9.00
9.06	0.42	1.35	0.688				
					C8x18.75	5.51	8.00
14.60	0.95	1.09	0.414		x13.75	4.04	8.00
11.21	0.73	1.09	0.428		x11.50	3.38	8.00
9.46	0.62	1.10	0.435				
7.67	0.50	1.10	0.440		C7x12.25	3.60	7.00

5.85	0.38	1.12	0.446
0.00	0.00	0.00	0.000
21.47	1.14	1.24	1.000
16.71	0.88	1.24	1.000
14.24	0.74	1.24	1.000
11.65	0.60	1.25	1.000
8.93	0.46	1.26	1.000
10.82	0.78	1.07	0.614
9.19	0.67	1.07	0.620
7.49	0.54	1.08	0.626
5.74	0.41	1.08	0.631
0.00	0.00	0.00	0.000
10.37	0.86	0.99	1.000
8.87	0.73	0.99	1.000
7.29	0.59	0.99	1.000
5.62	0.45	1.00	1.000
3.85	0.31	1.01	1.000

x9.8	2.87	7.00
C6x13	3.83	6.00
x10.5	3.09	6.00
x8.2	2.40	6.00
C5x9	2.64	5.00
x6.7	1.97	5.00
C4x7.25	2.13	4.00
x5.4	1.59	4.00
C3x6	1.76	3.00
x5	1.47	3.00
x4.1	1.21	3.00

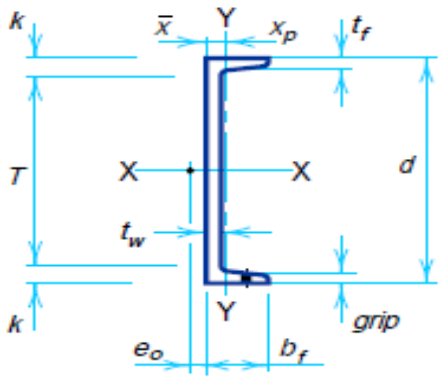
MC18x58	17.1	18.00
x51.9	15.3	18.00
x45.8	13.5	18.00
x42.7	12.6	18.00
MC13x50	14.7	13.00
x40	11.8	13.00
x35	10.3	13.00
x31.8	9.35	13.00
MC12x50	14.7	12.00
x45	13.2	12.00
x40	11.8	12.00
x35	10.3	12.00
x31	9.12	12.00
MC12x10.6	3.10	12.00
MC10x41.1	12.1	10.00
x33.6	9.87	10.00
x28.5	8.37	10.00
MC10x25	7.35	10.00
x22	6.45	10.00
MC10x8.4	2.46	10.00
MC9x25.4	7.47	9.00
x23.9	7.02	9.00
MC8x22.8	6.70	8.00

		A x i s Z -Z	
Plastic Modulus	Plastic neutral axis	Radius of Gyration	Angle to principal axes **z**
Zy	**XP**	**RZ**	**Tan** α
in^3	in	Length	Unitless
31.6	1.05	1.56	1.000
28.5	0.938	1.56	1.000
25.3	0.827	1.57	1.000
22.0	0.715	1.58	1.000
18.6	0.601	1.58	1.000
16.8	0.543	1.59	1.000
15.1	0.484	1.59	1.000
16.2	0.813	1.28	0.543

14.4	0.718	1.28	0.547		x21.4	6.28	8.00
12.5	0.621	1.29	0.551				
10.5	0.522	1.29	0.554		MC8x20	5.88	8.00
9.52	0.472	1.30	0.556		x18.7	5.50	8.00
8.51	0.422	1.30	0.558				
7.50	0.371	1.31	0.560		MC8x8.5	2.50	8.00
7.72	0.688	0.846	0.247		MC7x22.7	6.67	7.00
6.77	0.608	0.848	0.253		X19.1	5.61	7.00
5.81	0.527	0.852	0.258				
4.86	0.444	0.857	0.262		MC6x18	5.29	6.00
4.38	0.402	0.861	0.265				
3.90	0.359	0.865	0.267		MC6x16.3	4.79	6.00
3.42	0.316	0.869	0.269		x15.1	4.44	6.00
5.65	0.549	0.860	0.324		MC6x12	3.53	6.00
4.74	0.463	0.865	0.329				
3.83	0.375	0.872	0.335				
3.37	0.330	0.875	0.337				
2.90	0.285	0.880	0.340				
15.5	0.917	1.17	1.000				
13.8	0.811	1.17	1.000				
12.0	0.703	1.17	1.000				
10.2	0.592	1.18	1.000				
9.26	0.536	1.18	1.000				
8.31	0.479	1.18	1.000				
7.34	0.422	1.19	1.000				
6.35	0.363	1.19	1.000				
5.35	0.304	1.20	1.000				
6.31	0.665	0.857	0.421				
5.47	0.578	0.860	0.428				
4.62	0.488	0.864	0.435				
4.19	0.442	0.866	0.438				
3.75	0.396	0.870	0.440				
3.30	0.349	0.873	0.443				
2.85	0.301	0.877	0.446				
2.40	0.252	0.882	0.448				
2.91	0.375	0.759	0.344				
2.20	0.285	0.767	0.350				
1.85	0.239	0.772	0.352				
9.33	0.798	0.973	1.000				
8.16	0.694	0.975	1.000				
6.95	0.586	0.978	1.000				
5.68	0.475	0.983	1.000				
5.03	0.418	0.986	1.000				
4.36	0.361	0.990	1.000				

3.68	0.303	0.994	1.000	
4.10	0.581	0.748	0.464	
3.47	0.492	0.751	0.472	
2.83	0.400	0.755	0.479	
2.16	0.305	0.762	0.486	
1.82	0.256	0.766	0.489	
1.47	0.206	0.770	0.492	
2.11	0.375	0.648	0.357	
1.86	0.331	0.651	0.361	
1.60	0.286	0.654	0.364	
1.35	0.240	0.658	0.368	
1.09	0.194	0.663	0.371	
5.07	0.680	0.778	1.000	
4.33	0.576	0.779	1.000	
3.56	0.469	0.782	1.000	
3.16	0.414	0.785	1.000	
2.74	0.357	0.788	1.000	
2.32	0.300	0.791	1.000	
1.88	0.242	0.795	1.000	
2.73	0.438	0.722	0.750	
2.11	0.334	0.727	0.755	
1.78	0.281	0.730	0.757	
1.44	0.227	0.734	0.759	
2.48	0.498	0.637	0.534	
2.03	0.406	0.639	0.543	
1.79	0.359	0.641	0.547	
1.56	0.311	0.644	0.551	
1.31	0.261	0.647	0.554	
1.06	0.211	0.651	0.558	
2.68	0.464	0.683	1.000	
2.38	0.410	0.684	1.000	
2.08	0.355	0.687	1.000	
1.76	0.299	0.690	1.000	
1.43	0.241	0.694	1.000	
1.98	0.429	0.621	0.714	
1.53	0.328	0.625	0.721	
1.30	0.276	0.627	0.724	
1.05	0.223	0.631	0.727	
1.40	0.393	0.534	0.486	
1.07	0.301	0.537	0.496	

0.735	0.205	0.544	0.506
1.93	0.458	0.584	1.000
1.72	0.406	0.585	1.000
1.50	0.352	0.587	1.000
1.27	0.296	0.589	1.000
1.04	0.240	0.592	1.000
0.794	0.182	0.596	1.000
1.35	0.417	0.520	0.667
1.05	0.320	0.522	0.676
0.889	0.270	0.525	0.680
0.724	0.219	0.528	0.684
0.553	0.166	0.533	0.688
0.891	0.375	0.428	0.414
0.684	0.289	0.430	0.428
0.577	0.244	0.432	0.435
0.468	0.198	0.435	0.440
0.357	0.150	0.439	0.446
1.31	0.450	0.487	1.000
1.02	0.347	0.487	1.000
0.869	0.293	0.489	1.000
0.711	0.238	0.491	1.000
0.545	0.180	0.495	1.000
0.660	0.309	0.420	0.614
0.561	0.262	0.422	0.620
0.457	0.213	0.424	0.626
0.350	0.162	0.427	0.631
0.633	0.340	0.389	1.000
0.541	0.288	0.390	1.000
0.445	0.234	0.391	1.000
0.343	0.179	0.394	1.000
0.235	0.121	0.398	1.000



CHANNELS
AMERICAN STANDARI
Dimension

Metric Units

1 inch = 2.54 cm

1 lb = 4.448222 N

1 ft = 0.3048 m

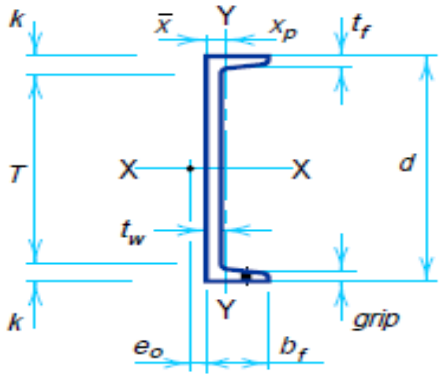
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Geometric of Section										
W E B			FLANGE				DISTANCE		Grip	Max. Flge. Fas-tener
Thickness **tw**		**tw** / **2**	Width **bf**		Thickness **tf**		**T**	**k**		
cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm
1.82	1.75	0.95	9.44	9.53	1.65	1.59	30.80	3.65	1.59	2.54
1.32	1.27	0.64	8.94	8.89	1.65	1.59	30.80	3.65	1.59	2.54
1.02	0.95	0.48	8.64	8.57	1.65	1.59	30.80	3.65	1.59	2.54
1.30	1.27	0.64	8.05	7.94	1.27	1.27	24.77	2.86	1.27	2.22
0.98	0.95	0.48	7.74	7.62	1.27	1.27	24.77	2.86	1.27	2.22
0.72	0.79	0.32	7.47	7.62	1.27	1.27	24.77	2.86	1.27	2.22
1.71	1.75	0.79	7.70	7.62	1.11	1.11	20.32	2.54	1.11	1.91
1.34	1.27	0.64	7.33	7.30	1.11	1.11	20.32	2.54	1.11	1.91
0.96	0.95	0.48	6.96	6.99	1.11	1.11	20.32	2.54	1.11	1.91
0.61	0.64	0.32	6.60	6.67	1.11	1.11	20.32	2.54	1.11	1.91
1.14	1.11	0.64	6.73	6.67	1.05	1.11	18.10	2.38	1.11	1.91
0.72	0.79	0.32	6.31	6.35	1.05	1.11	18.10	2.38	1.11	1.91
0.59	0.64	0.32	6.18	6.03	1.05	1.11	18.10	2.38	1.11	1.91
1.24	1.27	0.64	6.42	6.35	0.99	0.95	15.56	2.38	0.95	1.91
0.77	0.79	0.32	5.95	6.03	0.99	0.95	15.56	2.38	0.95	1.91
0.56	0.64	0.32	5.74	5.72	0.99	0.95	15.56	2.38	0.95	1.91
0.80	0.79	0.48	5.57	5.72	0.93	0.95	13.34	2.22	0.95	1.59
0.53	0.48	0.32	5.31	5.40	0.93	0.95	13.34	2.22	0.95	1.59
1.11	1.11	0.48	5.48	5.40	0.87	0.79	11.11	2.06	0.79	1.59
0.80	0.79	0.48	5.17	5.08	0.87	0.79	11.11	2.06	0.95	1.59
0.51	0.48	0.32	4.88	4.76	0.87	0.79	11.11	2.06	0.79	1.59
0.83	0.79	0.48	4.79	4.76	0.81	0.79	8.89	1.91	0.79	1.59
0.48	0.48	0.32	4.45	4.45	0.81	0.79	8.89	1.91	-	-
0.82	0.79	0.48	4.37	4.45	0.75	0.79	6.67	1.75	0.79	1.59

0.47	0.48	0.16	4.02	4.13	0.75	0.79	6.67	1.75	-	-
0.90	0.95	0.48	4.05	4.13	0.69	0.64	4.13	1.75	-	-
0.66	0.64	0.32	3.80	3.81	0.69	0.64	4.13	1.75	-	-
0.43	0.48	0.16	3.58	3.49	0.69	0.64	4.13	1.75	-	-
1.78	1.75	0.95	10.67	10.80	1.59	1.59	38.74	3.49	1.59	2.54
1.52	1.59	0.79	10.41	10.48	1.59	1.59	38.74	3.49	1.59	2.54
1.27	1.27	0.64	10.16	10.16	1.59	1.59	38.74	3.49	1.59	2.54
1.14	1.11	0.64	10.03	10.16	1.59	1.59	38.74	3.49	1.59	2.54
2.00	0.48	0.95	11.21	11.11	1.55	1.59	26.04	3.49	1.59	2.54
1.42	1.43	0.64	10.63	10.48	1.55	1.59	26.04	3.49	1.43	2.54
1.14	1.11	0.64	10.34	10.48	1.55	1.59	26.04	3.49	1.43	2.54
0.95	0.95	0.48	10.16	10.16	1.55	1.59	26.04	3.49	1.43	2.54
2.12	2.06	1.11	10.50	10.48	1.78	1.75	23.81	3.33	1.75	2.54
1.81	1.75	0.95	10.19	10.16	1.78	1.75	23.81	3.33	1.75	2.54
1.50	1.43	0.79	9.88	10.58	1.78	1.75	23.81	3.33	1.75	2.54
1.19	1.11	0.64	9.57	9.53	1.78	1.75	23.81	3.33	1.75	2.54
0.94	0.95	0.48	9.32	9.21	1.78	1.75	23.81	3.33	1.75	2.54
0.48	0.48	0.32	3.81	3.81	0.78	0.79	26.99	1.75	-	-
2.02	2.06	0.95	10.98	11.11	1.46	1.43	19.05	3.18	1.43	2.22
1.46	1.43	0.79	10.41	10.48	1.46	1.43	19.05	3.18	1.43	2.22
1.08	1.11	0.48	10.03	10.16	1.46	1.43	19.05	3.18	1.43	2.22
0.01	0.95	0.48	8.65	8.57	1.46	1.43	19.05	3.18	1.43	2.22
0.74	0.79	0.32	8.42	8.57	1.46	1.43	19.05	3.18	1.43	2.22
0.43	0.48	0.16	3.81	3.81	0.71	0.64	21.91	1.75	-	-
1.14	1.11	0.64	8.89	8.89	1.40	1.43	16.83	3.02	1.43	2.22
1.02	0.95	0.48	8.76	8.89	1.40	1.43	16.83	3.02	1.43	2.22
1.08	1.11	0.48	8.90	8.89	1.33	1.27	14.29	3.02	1.27	2.22
0.95	0.95	0.48	8.76	8.89	1.33	1.27	14.29	3.02	1.27	2.22
1.02	0.95	0.48	7.68	7.62	1.27	1.27	14.61	2.86	1.27	2.22
0.90	0.95	0.48	7.56	7.62	1.27	1.27	14.61	2.86	1.27	2.22
0.45	0.48	0.16	4.76	4.76	0.79	117241	16.51	1.91	0.79	1.59
1.28	1.27	0.64	9.15	9.21	1.27	1.27	12.07	2.86	1.27	2.22
0.89	0.95	0.48	8.77	8.89	1.27	1.27	12.07	2.86	1.27	2.22
0.96	0.95	0.48	8.90	8.89	1.21	1.27	9.84	2.70	1.27	2.22

0.95	0.95	0.48	7.62	7.62	1.21	1.27	9.84	2.70	1.27	1.91
0.80	0.79	0.48	7.47	7.62	1.21	1.27	9.84	2.70	1.27	1.91
0.79	0.79	0.32	6.34	6.35	0.95	0.95	11.11	0.48	0.95	1.59



CHANNELS
AMERICAN STANDARI
Dimension

US Units

Geometric of Section										
W E B			FLANGE				DISTANCE		Grip	Max. Flge. Fas-tener
Thickness **tw**		**tw** / **2**	Width **bf**		Thickness **tf**		**T**	**k**		
in	in	in	in		in		in	in	in	in
0.716	11/16	3/8	3.716	3 3/4	0.650	5/8	12 1/8	1 7/16	5/8	1
0.520	1/2	1/4	3.520	3 1/2	0.650	5/8	12 1/8	1 7/16	5/8	1
0.400	3/8	3/16	3.400	3 3/8	0.650	5/8	12 1/8	1 7/16	5/8	1
0.510	1/2	1/4	3.170	3 1/8	0.501	1/2	9 3/4	1 1/8	1/2	7/8
0.387	3/8	3/16	3.047	3	0.501	1/2	9 3/4	1 1/8	1/2	7/8
0.282	5/16	1/8	2.942	3	0.501	1/2	9 3/4	1 1/8	1/2	7/8
0.673	11/16	5/16	3.033	3	0.436	7/16	8	1	7/16	3/4
0.526	1/2	1/4	2.886	2 7/8	0.436	7/16	8	1	7/16	3/4
0.379	3/8	3/16	2.739	2 3/4	0.436	7/16	8	1	7/16	3/4
0.240	1/4	1/8	2.600	2 5/8	0.436	7/16	8	1	7/16	3/4
0.448	7/16	1/4	2.648	2 5/8	0.413	7/16	7 1/8	15/16	7/16	3/4
0.285	5/16	1/8	2.485	2 1/2	0.413	7/16	7 1/8	15/16	7/16	3/4
0.233	1/4	1/8	2.433	2 3/8	0.413	7/16	7 1/8	15/16	7/16	3/4
0.487	1/2	1/4	2.527	2 1/2	0.390	3/8	6 1/8	15/16	3/8	3/4
0.303	5/16	1/8	2.343	2 3/8	0.390	3/8	6 1/8	15/16	3/8	3/4
0.220	1/4	1/8	2.260	2 1/4	0.390	3/8	6 1/8	15/16	3/8	3/4
0.314	5/16	3/16	2.194	2 1/4	0.366	3/8	5 1/4	7/8	3/8	5/8

0.210	3/16	1/8	2.090	2 1/8	0.366	3/8	5 1/4	7/8	3/8	5/8
0.437	7/16	3/16	2.157	2 1/8	0.343	5/16	4 3/8	13/16	5/16	5/8
0.314	5/16	3/16	2.034	2	0.343	5/16	4 3/8	13/16	3/8	5/8
0.200	3/16	1/8	1.920	1 7/8	0.343	5/16	4 3/8	13/16	5/16	5/8
0.325	5/16	3/16	1.885	1 7/8	0.320	5/16	3 1/2	3/4	5/16	5/8
0.190	3/16	1/8	1.750	1 3/4	0.320	5/16	3 1/2	3/4	-	-
0.321	5/16	3/16	1.721	1 3/4	0.296	5/16	2 5/8	11/16	5/16	5/8
0.184	3/16	1/16	1.584	1 5/8	0.296	5/16	2 5/8	11/16	-	-
0.356	3/8	3/16	1.596	1 5/8	0.273	1/4	1 5/8	11/16	-	-
0.258	1/4	1/8	1.498	1 1/2	0.273	1/4	1 5/8	11/16	-	-
0.170	3/16	1/16	1.410	1 3/8	0.273	1/4	1 5/8	11/16	-	-

0.700	11/16	3/8	4.200	4 1/4	0.625	5/8	15 1/4	1 3/8	5/8	1
0.600	5/8	5/16	4.100	4 1/8	0.625	5/8	15 1/4	1 3/8	5/8	1
0.500	1/2	1/4	4.000	4	0.625	5/8	15 1/4	1 3/8	5/8	1
0.450	7/16	1/4	3.950	4	0.625	5/8	15 1/4	1 3/8	5/8	1
0.787	3/16	3/8	4.412	4 3/8	0.610	5/8	10 1/4	1 3/8	5/8	1
0.560	9/16	1/4	4.185	4 1/8	0.610	5/8	10 1/4	1 3/8	9/16	1
0.447	7/16	1/4	4.072	4 1/8	0.610	5/8	10 1/4	1 3/8	9/16	1
0.375	3/8	3/16	4.000	4	0.610	5/8	10 1/4	1 3/8	9/16	1
0.835	13/16	7/16	4.135	4 1/8	0.700	11/16	9 3/8	1 5/16	11/16	1
0.712	11/16	3/8	4.012	4	0.700	11/16	9 3/8	1 5/16	11/16	1
0.590	9/16	5/16	3.890	4 1/6	0.700	11/16	9 3/8	1 5/16	11/16	1
0.467	7/16	1/4	3.767	3 3/4	0.700	11/16	9 3/8	1 5/16	11/16	1
0.370	3/8	3/16	3.670	3 5/8	0.700	11/16	9 3/8	1 5/16	11/16	1
0.190	3/16	1/8	1.500	1 1/2	0.309	5/16	10 5/8	11/16	-	-
0.796	13/16	3/8	4.321	4 3/8	0.575	9/16	7 1/2	1 1/4	9/16	7/8
0.575	9/16	5/16	4.100	4 1/8	0.575	9/16	7 1/2	1 1/4	9/16	7/8
0.425	7/16	3/16	3.950	4	0.575	9/16	7 1/2	1 1/4	9/16	7/8
0.0038	3/8	3/16	3.405	3 3/8	0.575	9/16	7 1/2	1 1/4	9/16	7/8
0.290	5/16	1/8	3.315	3 3/8	0.575	9/16	7 1/2	1 1/4	9/16	7/8
0.170	3/16	1/16	1.500	1 1/2	0.280	1/4	8 5/8	11/16	-	-
0.450	7/16	1/4	3.500	3 1/2	0.550	9/16	6 5/8	1 3/16	9/16	7/8
0.400	3/8	3/16	3.450	3 1/2	0.550	9/16	6 5/8	1 3/16	9/16	7/8
0.427	7/16	3/16	3.502	3 1/2	0.525	1/2	5 5/8	1 3/16	1/2	7/8

0.375	3/8	3/16	3.450	3 1/2	0.525	1/2	5 5/8	1 3/16	1/2	7/8
0.400	3/8	3/16	3.025	3	0.500	1/2	5 3/4	1 1/8	1/2	7/8
0.353	3/8	3/16	2.978	3	0.500	1/2	5 3/4	1 1/8	1/2	7/8
0.179	3/16	1/16	1.874	1 7/8	0.311	5/16	6 1/2	3/4	5/16	5/8
0.503	1/2	1/4	3.603	3 5/8	0.500	1/2	4 3/4	1 1/8	1/2	7/8
0.352	3/8	3/16	3.452	3 1/2	0.500	1/2	4 3/4	1 1/8	1/2	7/8
0.379	3/8	3/16	3.504	3 1/2	0.475	1/2	3 7/8	1 1/16	1/2	7/8
0.375	3/8	3/16	3.000	3	0.475	1/2	3 7/8	1 1/16	1/2	3/4
0.316	5/16	3/16	2.941	3	0.475	1/2	3 7/8	1 1/16	1/2	3/4
0.313	5/16	1/8	2.497	2 1/2	0.375	3/8	4 3/8	3/16	3/8	5/8

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				Axis X-X				Axis	
Nominal Wight	C.g. __ X	Shear Center Location eo	PNA Location Xp	Moment of Inertia Ix	Plastic Modulus Zx	Section Modulus Sx	Radius of Gyration Rx	Moment of Inertia Iy	Plastic Modulus Zy
N/m	cm	cm	cm	cm^4	cm^3	cm^3	cm	cm^4	cm^3
729.70	2.03	1.48	1.24	16815.7	1117.6	881.6	13.3	457.9	133.9
583.76	1.97	1.95	0.99	14526.5	937.3	762.0	13.8	384.2	112.6
494.73	2.00	2.28	0.84	13111.3	825.9	688.3	14.3	338.4	102.1
437.82	1.71	1.57	0.93	6742.9	550.6	442.5	10.9	213.9	71.0
364.85	1.71	1.89	0.77	5993.7	478.5	394.9	11.3	186.1	62.9
302.09	1.77	2.21	0.64	5369.4	416.2	352.3	11.7	161.5	57.2
437.82	1.65	0.94	1.12	4287.2	435.9	339.2	8.7	164.0	61.9
364.85	1.57	1.25	0.93	3796.0	376.9	298.2	8.9	139.9	52.3
291.88	1.54	1.62	0.74	3284.1	316.3	258.9	9.3	117.0	44.4
223.29	1.61	2.02	0.57	2805.4	258.9	221.2	9.8	94.9	38.5
291.88	1.48	1.31	0.83	2534.8	275.3	221.2	8.2	100.7	40.5
218.91	1.49	1.73	0.62	2122.8	221.2	185.2	8.6	80.3	33.6
195.56	1.53	1.89	0.55	1993.7	204.8	173.7	8.8	73.3	32.0
273.64	1.44	1.09	0.87	1831.4	226.1	180.3	7.2	82.4	35.6
200.67	1.40	1.53	0.64	1502.6	178.6	148.0	7.6	63.7	28.3
167.83	1.45	1.77	0.53	1356.9	156.5	133.4	7.9	54.9	25.9
178.78	1.33	1.37	0.65	1007.3	137.7	113.6	6.6	48.7	23.4
143.02	1.37	1.64	0.52	886.6	116.7	99.6	6.9	40.3	20.6
189.72	1.31	0.97	0.81	724.2	119.0	95.0	5.4	43.7	22.3
153.24	1.27	1.23	0.65	632.7	100.8	82.9	5.6	36.0	18.8
119.67	1.30	1.52	0.50	545.3	84.1	71.8	5.9	28.8	16.3
131.35	1.21	1.08	0.67	370.4	71.4	58.3	4.6	26.3	15.0
97.78	1.23	1.40	0.55	311.8	57.5	49.2	5.0	19.9	12.5
105.81	1.17	0.98	0.67	191.1	46.0	37.5	3.7	18.0	11.4

78.81	1.16	1.28	0.61	160.2	37.0	31.6	4.0	13.3	9.3
87.56	1.16	0.82	0.74	86.2	28.2	22.6	2.7	12.7	8.9
72.97	1.11	1.00	0.61	77.0	24.6	20.3	2.8	10.3	7.6
59.84	1.11	1.17	0.72	69.1	21.3	18.0	3.0	8.2	6.6
846.45	2.19	1.77	1.20	28137.2	1550.2	1230.7	16.0	740.9	162.9
757.42	2.18	2.02	1.07	26097.7	1417.5	1142.2	16.3	682.6	149.6
668.40	2.20	2.31	0.94	24058.2	1284.7	1053.7	16.7	628.5	138.0
623.16	2.23	2.46	0.88	23059.2	1219.2	1009.4	16.9	599.4	132.7
729.70	2.47	2.07	1.43	13069.7	991.4	793.1	11.7	686.8	165.5
583.76	2.45	2.62	1.14	11363.1	834.1	688.3	12.2	570.2	140.4
510.79	2.49	2.95	1.00	10489.0	757.1	635.8	12.6	512.0	130.3
464.09	2.54	3.15	0.91	9947.9	706.3	603.0	12.9	474.5	124.5
729.70	2.67	1.88	1.55	11196.6	919.3	735.8	10.9	724.2	167.1
656.73	2.64	2.14	1.39	10489.0	847.2	688.3	11.1	657.6	153.2
583.76	2.64	2.42	1.24	9739.8	775.1	639.1	11.3	595.2	140.8
510.79	2.67	2.72	1.08	8990.6	701.4	591.6	11.7	528.6	129.6
452.41	2.74	3.00	1.06	8449.5	644.0	553.9	12.0	470.3	121.9
154.70	0.68	0.72	0.33	2305.9	190.1	151.3	10.7	15.9	10.5
599.81	2.77	2.19	1.53	6576.5	637.5	516.2	9.2	657.6	142.7
490.36	2.74	2.69	1.24	5785.6	547.3	455.6	9.5	549.4	123.1
415.93	2.84	3.07	1.05	5286.1	485.1	414.6	9.9	474.5	111.9
364.85	2.42	2.62	0.92	4578.5	422.8	360.5	9.8	305.9	85.4
321.07	2.51	2.87	1.19	4287.2	386.7	335.9	10.1	270.6	79.6
122.59	0.72	0.84	0.31	1331.9	128.8	104.9	9.2	13.7	9.0
370.69	2.46	2.50	1.04	3662.8	380.2	321.2	8.7	318.4	85.7
348.79	2.49	2.64	0.98	3538.0	363.8	309.7	8.8	300.5	82.8
332.74	2.57	2.64	1.05	2655.6	308.1	262.2	7.8	294.3	80.0
312.31	2.59	2.77	1.14	2564.0	295.0	252.4	8.0	276.4	77.2
291.88	2.13	2.14	0.92	2268.5	265.5	222.9	7.7	186.1	58.5
272.91	2.16	2.26	0.87	2185.2	252.4	214.7	7.8	174.8	56.4
124.05	1.09	1.38	0.39	969.8	113.2	95.5	7.7	26.1	14.5
331.28	2.64	2.57	1.20	1977.1	265.5	222.9	6.8	303.4	79.6
278.74	2.74	2.92	1.44	1798.1	234.3	201.6	7.0	254.3	71.1
262.69	2.84	2.97	1.58	1236.2	188.5	162.4	6.0	246.8	67.8

237.88	2.35	2.36	1.18	1082.2	167.1	142.2	5.9	159.0	52.1
220.37	2.39	2.49	1.36	1040.6	158.8	136.3	6.0	146.1	49.2
175.13	1.79	1.84	0.74	778.4	120.9	102.3	5.8	77.8	29.3

)

				Axis X-X				Axis	
Nominal Wight per ft	C.g. $\bar{X}$	Shear Center Location **eo**	PNA Location **Xp**	Moment of Inertia **Ix**	Plastic Modulus **Zx**	Section Modulus **Sx**	Radius of Gyration **Rx**	Moment of Inertia **Iy**	Plastic Modulus **Zy**
lb	in	in	in	in^4	in^3	in^3	in	in^4	in^3
50	0.798	0.583	0.488	404	68.2	53.8	5.24	11.0	8.17
40	0.777	0.767	0.390	349	57.2	46.5	5.44	9.23	6.87
33.9	0.787	0.896	0.330	315	50.4	42.0	5.62	8.13	6.23
30	0.674	0.618	0.366	162	33.6	27.0	4.29	5.14	4.33
25	0.674	0.746	0.305	144	29.2	24.1	4.43	4.47	3.84
20.7	0.698	0.870	0.252	129	25.4	21.5	4.61	3.88	3.49
30	0.649	0.369	0.439	103	26.6	20.7	3.42	3.94	3.78
25	0.617	0.494	0.366	91.2	23.0	18.2	3.52	3.36	3.19
20	0.606	0.637	0.292	78.9	19.3	15.8	3.66	2.81	2.71
15.3	0.634	0.796	0.223	67.4	15.8	13.5	3.87	2.28	2.35
20	0.583	0.515	0.325	60.9	16.8	13.5	3.22	2.42	2.47
15	0.586	0.682	0.243	51.0	13.5	11.3	3.40	1.93	2.05
13.4	0.601	0.743	0.217	47.9	12.5	10.6	3.48	1.76	1.95
18.75	0.565	0.431	0.343	44.0	13.8	11.0	2.82	1.98	2.17
13.75	0.553	0.604	0.251	36.1	10.9	9.03	2.99	1.53	1.73
11.5	0.571	0.697	0.209	32.6	9.55	8.14	3.11	1.32	1.58
12.25	0.525	0.538	0.255	24.2	8.40	6.93	2.60	1.17	1.43

9.8	0.540	0.647	0.203	21.3	7.12	6.08	2.72	0.968	1.26
13	0.514	0.380	0.317	17.4	7.26	5.80	2.13	1.05	1.36
10.5	0.499	0.486	0.255	15.2	6.15	5.06	2.22	0.866	1.15
8.2	0.511	0.599	0.198	13.1	5.13	4.38	2.34	0.693	0.993
9	0.478	0.427	0.262	8.90	4.36	3.56	1.83	0.632	0.918
6.7	0.484	0.552	0.217	7.49	3.51	3.00	1.95	0.479	0.763
7.25	0.459	0.386	0.264	4.59	2.81	2.29	1.47	0.433	0.697
5.4	0.457	0.502	0.241	3.85	2.26	1.93	1.56	0.319	0.569
6	0.455	0.322	0.291	2.07	1.72	1.38	1.08	0.305	0.544
5	0.438	0.392	0.242	1.85	1.50	1.24	1.12	0.247	0.466
4.1	0.436	0.461	0.284	1.66	1.30	1.10	1.17	0.197	0.401

58	0.862	0.695	0.472	676	94.6	75.1	6.29	17.8	9.94
51.9	0.858	0.797	0.422	627	86.5	69.7	6.41	16.4	9.13
45.8	0.866	0.909	0.372	578	78.4	64.3	6.56	15.1	8.42
42.7	0.877	0.969	0.347	554	74.4	61.6	6.64	14.4	8.10
50	0.974	0.815	0.564	314	60.5	48.4	4.62	16.5	10.1
40	0.963	1.03	0.450	273	50.9	42.0	4.82	13.7	8.57
35	0.980	1.16	0.394	252	46.2	38.8	4.95	12.3	7.95
31.8	1.00	1.24	0.358	239	43.1	36.8	5.06	11.4	7.60
50	1.05	0.741	0.610	269	56.1	44.9	4.28	17.4	10.2
45	1.04	0.844	0.549	252	51.7	42.0	4.36	15.8	9.35
40	1.04	0.952	0.488	234	47.3	39.0	4.46	14.3	8.59
35	1.05	1.07	0.426	216	42.8	36.1	4.59	12.7	7.91
31	1.08	1.18	0.416	203	39.3	33.8	4.71	11.3	7.44
10.6	0.269	0.284	0.129	55.4	11.6	9.23	4.22	0.382	0.639
41.1	1.09	0.864	0.601	158	38.9	31.5	3.61	15.8	8.71
33.6	1.08	1.06	0.490	139	33.4	27.8	3.75	13.2	7.51
28.5	1.12	1.21	0.415	127	29.6	25.3	3.89	11.4	6.83
25	0.953	1.03	0.364	110	25.8	22.0	3.87	7.35	5.21
22	0.990	1.13	0.468	103	23.6	20.5	3.99	6.50	4.86
8.4	0.284	0.332	0.122	32.0	7.86	6.40	3.61	0.328	0.552
25.4	0.970	0.986	0.411	88.0	23.2	19.6	3.43	7.65	5.23
23.9	0.981	1.04	0.386	85.0	22.2	18.9	3.48	7.22	5.05
22.8	1.01	1.04	0.415	63.8	18.8	16.0	3.09	7.07	4.88

21.4	1.02	1.09	0.449	61.6	18.0	15.4	3.13	6.64	4.71
20	0.840	0.843	0.364	54.5	16.2	13.6	3.05	4.47	3.57
18.7	0.849	0.889	0.341	52.5	15.4	13.1	3.09	4.20	3.44
8.5	0.428	0.542	0.155	23.3	6.91	5.83	3.05	0.628	0.882
22.7	1.04	1.01	0.473	47.5	16.2	13.6	2.67	7.29	4.86
19.1	1.08	1.15	0.567	43.2	14.3	12.3	2.77	6.11	4.34
18	1.12	1.17	0.622	29.7	11.5	9.91	2.37	5.93	4.14
16.3	0.927	0.930	0.464	26.0	10.2	8.68	2.33	3.82	3.18
15.1	0.940	0.982	0.537	25.0	9.69	8.32	2.37	3.51	3.00
12	0.704	0.725	0.292	18.7	7.38	6.24	2.30	1.87	1.79

Kembali

Y - Y	
Section Modulus	Radius of Gyration
Sy	**Ry**
cm^3	cm
61.9	2.2
55.2	2.3
51.0	2.3
33.8	1.9
30.8	2.0
28.3	2.0
27.0	1.7
24.3	1.7
21.6	1.8
19.0	1.8
19.2	1.6
16.6	1.7
15.8	1.7
16.6	1.5
14.0	1.6
12.8	1.6
11.5	1.5
10.2	1.5
10.5	1.3
9.2	1.3
8.1	1.4
7.4	1.2
6.2	1.3
5.6	1.1

4.6	1.1
4.4	1.1
3.8	1.0
3.3	1.0
87.2	2.6
83.1	2.6
79.0	2.7
76.9	2.7
78.5	2.7
69.8	2.7
65.4	2.8
62.4	2.8
92.6	2.8
87.3	2.8
81.9	2.8
76.5	2.8
71.9	2.8
5.1	0.9
80.0	2.9
71.8	2.9
65.9	3.0
49.2	2.5
45.9	2.5
4.4	0.9
49.5	2.6
48.0	2.6
46.5	2.6
44.9	2.6
33.6	2.2
32.3	2.2
7.1	1.3
46.7	2.7
42.1	2.6
40.6	2.7

30.2	2.3
28.7	2.3
17.0	1.8

Y - Y	
Section Modulus	Radius of Gyration
Sy	**Ry**
in^3	in
3.78	0.867
3.37	0.886
3.11	0.904
2.06	0.763
1.88	0.780
1.73	0.799
1.65	0.669
1.48	0.676
1.32	0.692
1.16	0.713
1.17	0.642
1.01	0.661
0.962	0.669
1.01	0.599
0.854	0.615
0.781	0.625
0.703	0.571

0.625	0.581
0.642	0.525
0.564	0.529
0.492	0.537
0.450	0.489
0.378	0.493
0.343	0.450
0.283	0.449
0.268	0.416
0.233	0.410
0.202	0.404

5.32	1.02
5.07	1.04
4.82	1.06
4.69	1.07
4.79	1.06
4.26	1.08
3.99	1.10
3.81	1.11
5.65	1.09
5.33	1.09
5.00	1.10
4.67	1.11
4.39	1.12
0.310	0.351
4.88	1.14
4.38	1.16
4.02	1.17
3.00	1.00
2.80	1.00
0.270	0.365
3.02	1.01
2.93	1.01
2.84	1.03

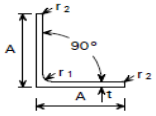
2.74	1.03
2.05	0.872
1.97	0.874
0.434	0.501
2.85	1.05
2.57	1.04
2.48	1.06
1.84	0.892
1.75	0.889
1.04	0.728

BS

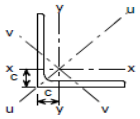
British Standard

BS 5950-1: 2000
BS EN 10056-1: 1999

EQUAL ANGLES



DIMENSIONS AND PROPERTIES



Source :
HANDBOOK OF STRUCTURAL STEELWORK, 3rd Edition
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4 Whitehall Court
London SW1A 2ES
The Steel Construction Institute
Silwood Park
Ascot
SL5 7QN

Section Designation		Mass per	Radius		Area of	Dimen-sion	Second Moment of Area			Radius of Gyration			Elastic Modulus	Torsional Constant	Equivalent Slenderness
Size	Thickness	Metre	Root	Toe	Section		Axis x-x, y-y	Axis u-u	Axis v-v	Axis x-x, y-y	Axis u-u	Axis v-v	Axis x-x, y-y		Coefficient
A x A	t		r_1	r_2		c								J	ϕ_a
mm	mm	kg/m	mm	mm	cm^2	cm	cm^4	cm^4	cm^4	cm	cm	cm	cm^3	cm^4	
200 x 200	24 #	71.1	18.0	9.00	90.6	5.84	3330	5280	1380	6.06	7.64	3.90	235	182	2.50
	20	59.9	18.0	9.00	76.3	5.68	2850	4530	1170	6.11	7.70	3.92	199	107	3.05
	18	54.3	18.0	9.00	69.1	5.60	2600	4150	1050	6.13	7.75	3.90	181	78.9	3.43
	16	48.5	18.0	9.00	61.8	5.52	2340	3720	960	6.16	7.76	3.94	162	56.1	3.85
150 x 150	18 #	40.1	16.0	8.00	51.2	4.38	1060	1680	440	4.55	5.73	2.93	99.8	58.6	2.48
	15	33.8	16.0	8.00	43.0	4.25	898	1430	370	4.57	5.76	2.93	83.5	34.6	3.01
	12	27.3	16.0	8.00	34.8	4.12	737	1170	303	4.60	5.80	2.95	67.7	18.2	3.77
	10	23.0	16.0	8.00	29.3	4.03	624	990	258	4.62	5.82	2.97	56.9	10.80	4.51
120 x 120	15 #	26.6	13.0	6.50	34.0	3.52	448	710	186	3.63	4.57	2.34	52.8	27.0	2.37
	12	21.6	13.0	6.50	27.5	3.40	368	584	152	3.65	4.60	2.35	42.7	14.2	2.99
	10	18.2	13.0	6.50	23.2	3.31	313	497	129	3.67	4.63	2.36	36.0	8.41	3.61
	8 #	14.7	13.0	6.50	18.8	3.24	259	411	107	3.71	4.67	2.38	29.5	4.44	4.56
100 x 100	15 #	21.9	12.0	6.00	28.0	3.02	250	395	105	2.99	3.76	1.94	35.8	22.3	1.92
	12	17.8	12.0	6.00	22.7	2.90	207	328	85.7	3.02	3.80	1.94	29.1	11.8	2.44
	10	15.0	12.0	6.00	19.2	2.82	177	280	73.0	3.04	3.83	1.95	24.6	6.97	2.94
	8	12.2	12.0	6.00	15.5	2.74	145	230	59.9	3.06	3.85	1.96	19.9	3.68	3.70
90 x 90	12 #	15.9	11.0	5.50	20.3	2.66	149	235	62.0	2.71	3.40	1.75	23.5	10.46	2.17
	10	13.4	11.0	5.50	17.1	2.58	127	201	52.6	2.72	3.42	1.75	19.8	6.20	2.64
	8	10.9	11.0	5.50	13.9	2.50	104	166	43.1	2.74	3.45	1.76	16.1	3.28	3.33
	7 #	9.61	11.0	5.50	12.2	2.45	92.6	147	38.3	2.75	3.46	1.77	14.1	2.24	3.80
80 x 80	10 ‡	11.9	10.0	5.00	15.1	2.34	87.5	139	36.4	2.41	3.03	1.55	15.4	5.45	2.33
	8 ‡	9.63	10.0	5.00	12.3	2.26	72.2	115	29.9	2.43	3.06	1.56	12.6	2.88	2.94
75 x 75	8 ‡	8.99	9.00	4.50	11.4	2.14	59.1	93.8	24.5	2.27	2.86	1.46	11.0	2.65	2.76
	6 ‡	6.85	9.00	4.50	8.73	2.05	45.8	72.7	18.9	2.29	2.89	1.47	8.41	1.17	3.70
70 x 70	7 ‡	7.38	9.00	4.50	9.40	1.97	42.3	67.1	17.5	2.12	2.67	1.36	8.41	1.69	2.92
	6 ‡	6.38	9.00	4.50	8.13	1.93	36.9	58.5	15.3	2.13	2.68	1.37	7.27	1.093	3.41
65 x 65	7 ‡	6.83	9.00	4.50	8.73	2.05	33.4	53.0	13.8	1.96	2.47	1.26	7.18	1.58	2.67
60 x 60	8 ‡	7.09	8.00	4.00	9.03	1.77	29.2	46.1	12.2	1.80	2.26	1.16	6.89	2.09	2.14
	6 ‡	5.42	8.00	4.00	6.91	1.69	22.8	36.1	9.44	1.82	2.29	1.17	5.29	0.922	2.90
	5 ‡	4.57	8.00	4.00	5.82	1.64	19.4	30.7	8.03	1.82	2.30	1.17	4.45	0.550	3.48
50 x 50	6 ‡	4.47	7.00	3.50	5.69	1.45	12.8	20.3	5.34	1.50	1.89	0.968	3.61	0.755	2.38
	5 ‡	3.77	7.00	3.50	4.80	1.40	11.0	17.4	4.55	1.51	1.90	0.973	3.05	0.450	2.88
	4 ‡	3.06	7.00	3.50	3.89	1.36	8.97	14.2	3.73	1.52	1.91	0.979	2.46	0.240	3.57
45 x 45	4.5 ‡	3.06	7.00	3.50	3.90	1.25	7.14	11.4	2.94	1.35	1.71	0.870	2.20	0.304	2.84
40 x 40	5 ‡	2.97	6.00	3.00	3.79	1.16	5.43	8.60	2.26	1.20	1.51	0.773	1.91	0.352	2.26
	4 ‡	2.42	6.00	3.00	3.08	1.12	4.47	7.09	1.86	1.21	1.52	0.777	1.55	0.188	2.83
35 x 35	4 ‡	2.09	5.00	2.50	2.67	1.00	2.95	4.68	1.23	1.05	1.32	0.678	1.18	0.158	2.50
30 x 30	4 ‡	1.78	5.00	2.50	2.27	0.878	1.80	2.85	0.754	0.892	1.12	0.577	0.850	0.137	2.07
	3 ‡	1.36	5.00	2.50	1.74	0.835	1.40	2.22	0.585	0.899	1.13	0.581	0.649	0.0613	2.75
25 x 25	4 ‡	1.45	3.50	1.75	1.85	0.762	1.02	1.61	0.430	0.741	0.931	0.482	0.586	0.1070	1.75
	3 ‡	1.12	3.50	1.75	1.42	0.723	0.803	1.27	0.334	0.751	0.945	0.484	0.452	0.0472	2.38
20 x 20	3 ‡	0.882	3.50	1.75	1.12	0.598	0.392	0.618	0.165	0.590	0.742	0.383	0.279	0.0382	1.81

‡ Not available from some leading producers. Check availability.

Check availability.

c is the distance from the back of the leg to the centre of gravity.

FOR EXPLANATION OF TABLES SEE NOTES 2 AND 3