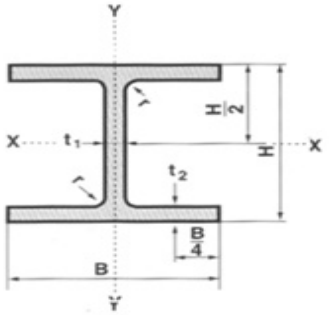
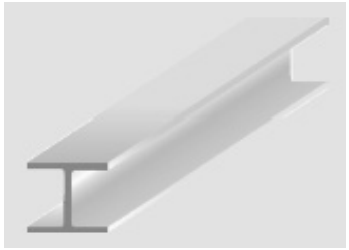
Steel Table

ตารางเหล็ก / เหล็กรูปพรรณ



ตารางที่ ก. 1	Wide Flange Shape	ASTM Standards, ASTM A6 : 1997



Moment of Inertia $I = Ar^2$

Radius of Gyration $r = \sqrt{\frac{I}{A}}$

Modulus of Section $Z = \frac{I}{C}$

A = Sectional Area

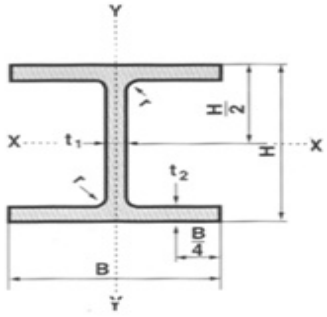
Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H	B	t1	t2	ระยะ r		Ix	Iy	rx	ry	Zx	Zy
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)
900 x 300	286	912	302	18	34	28	364	498,000	15,700	37	6.56	10,900	1,040
	243	900	300	16	28	28	309.8	411,000	12,600	36.4	6.39	9,140	843
	213	890	299	15	23	28	270.9	345,000	10,300	35.7	6.16	7,760	688
800 x 300	241	808	302	16	30	28	307.6	339,000	13,800	33.2	6.7	8,400	915
	210	800	300	14	26	28	267.4	292,000	11,700	33	6.62	7,290	782
	191	792	300	14	22	28	243.4	254,000	9,930	32.3	6.39	6,410	662
700 x 300	215	708	302	15	28	28	273.6	237,000	12,900	29.4	6.86	6,700	853
	185	700	300	13	24	28	235.5	201,000	10,800	29.3	6.78	5,760	722
	166	692	300	13	20	28	211.5	172,000	9,020	28.6	6.53	4,980	602
600 x 300	175	594	302	14	23	28	222.4	137,000	10,600	24.9	6.9	4,620	701
	151	588	300	12	20	28	192.5	118,000	9,020	24.8	6.85	4,020	601
	137	582	300	12	17	28	1,745	103,000	7,670	24.3	6.63	3,530	511
600 x 200	134	612	202	13	23	22	107.7	103,300	3,180	24.6	4.31	3,380	314
	120	606	201	12	20	22	152.5	90,400	2,720	24.3	4.22	2,980	271
	106	600	200	11	17	22	134.4	77,600	2,280	24	4.12	2,590	228
	94.6	596	199	10	15	22	120.5	68,700	1,980	23.9	4.05	2,310	199

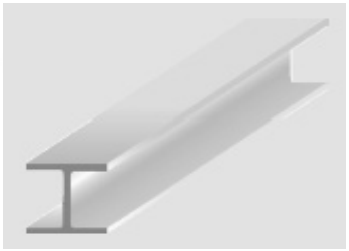
		ตารางที่ ก. 1 (ต่อ)	Wide Flange Shape	ASTM Standards, ASTM A6 : 1997								
Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H	B	t1	t2	ระยะ r		Ix	Iy	rx	ry	Zx	Zy
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)
500 x 300	128	488	300	11	18	26	163.5	71,000	8,110	20.8	7.04	2,190	541
	114	482	300	11	15	26	145.5	60,400	6,760	20.4	6.82	2,500	451
500 x 200	103	506	201	11	19	20	131.3	56,500	2,580	20.7	4.43	2,230	257
	89.6	500	200	10	16	20	114.2	47,800	2,140	20.5	4.33	1,910	214
	79.5	496	199	9	14	20	101.3	41,900	1,840	20.3	4.27	1,690	185
450 x 300	124	440	300	11	18	24	157.4	56.1	8,110	18.9	7.18	2,550	541
	106	434	299	10	15	24	135	46,800	6,690	18.6	7.04	2,160	448
450 x 200	76	450	200	9	14	18	96.76	33,500	1,870	18.6	4.4	1,490	187
	66.2	446	199	8	12	18	84.3	28,700	1,580	18.5	4.33	1,290	159
400 x 400	605	498	432	45	70	22	770.1	298,000	94,400	19.7	11.1	12,000	4,370
	415	458	417	30	50	22	528.6	187,000	60,500	18.8	10.7	8,170	2,900
	283	428	407	20	35	22	360.7	119,000	39,400	18.2	10.4	5,570	1,930
	232	414	405	18	28	22	295.4	92,800	31,000	17.7	10.2	4,480	1,530
	200	406	403	16	24	22	254.9	78,000	26,200	17.5	10.1	3,840	1,300
	197	400	408	21	21	22	250.7	70,900	23,800	16.8	9.75	3,540	1,170
	172	400	400	13	21	22	218.7	66,600	22,400	17.5	10.1	3,330	1,120
	168	394	405	18	18	22	214.4	59,700	20,000	16.7	9.65	3,030	985
	147	394	398	11	18	22	186.8	56,100	18,900	17.3	10.1	2,850	951
	140	388	402	15	15	22	178.5	49,000	16,300	16.6	9.54	2,520	809
400 x 300	107	390	300	10	16	22	136	38,700	7,210	16.9	7.28	1,980	481
	94.3	386	299	9	14	22	120.1	33,700	6,240	16.7	7.21	1,740	418
400 x 200	66	400	200	8	13	16	84.12	23,700	1,740	16.8	4.54	1,190	174
	56.6	396	199	7	11	16	72.16	20,000	1,450	16.7	4.48	1,010	145

		ตารางที่ ก. 1 (ต่อ)		Wide Flange Shape			ASTM Standards, ASTM A6 : 1997					
Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H	B	t1	t2	ระยะ r		Ix	Iy	rx	ry	Zx	Zy
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)
350 x 350	159	356	352	14	22	20	202	47,600	16,000	15.3	8.9	2,670	909
	156	350	357	19	19	20	198.4	42,800	14,400	14.7	8.53	2,450	809
	137	350	350	12	19	20	173.9	40,300	13,600	15.2	8.84	2,300	776
	131	344	354	16	16	20	166.6	35,300	11,800	14.6	8.43	2,050	669
	115	344	348	10	16	20	146	33,300	11,200	15.1	8.78	1,940	646
	106	338	351	13	13	20	135.3	28,200	9,380	14.4	8.33	1,670	534
350 x 250	79.7	340	250	9	14	20	101.5	21,700	3,650	14.6	6	1,280	292
	69.2	336	249	8	12	20	88.15	18,500	3,090	14.5	5.92	1,100	248
350 x 175	49.6	350	175	7	11	14	63.14	13,600	984	14.7	3.95	775	112
	41.4	346	174	6	9	14	52.68	11,100	792	14.5	3.88	641	91
300 x 300	106	304	301	11	17	18	134.8	23,400	7,730	13.2	7.57	1,540	514
	106	300	305	15	15	18	134.8	21,500	7,100	12.6	7.26	1,440	466
	94	300	300	10	15	18	119.8	20,400	6,750	13.1	7.51	1,360	450
	87	298	299	9	14	18	110.8	18,800	6,240	13	7.51	1,270	417
	84.5	294	302	12	12	18	107.7	16,900	5,520	12.5	7.16	1,150	365
300 x 200	65.4	298	201	9	14	18	83.36	13,300	1,900	12.6	4.77	893	189
	56.8	294	200	8	12	18	72.38	11,300	1,600	12.5	4.71	771	160
300 x 150	36.7	300	150	6.5	9	13	46.78	7,120	508	12.4	3.29	481	67.7
	32	298	149	5.5	8	13	40.8	6,320	442	12.4	3.29	424	59.3
250 x 250	82.2	250	255	14	14	16	104.7	11,500	3,880	10.5	6.09	919	304
	72.4	250	250	9	14	16	92.18	10,800	3,650	10.8	6.29	867	292
	66.5	248	249	8	13	16	84.7	9,930	3,350	10.8	6.29	801	269
	64.4	244	252	11	11	16	82.06	8,790	2,940	10.3	5.98	720	233
250 x 175	44.1	244	175	7	11	16	56.24	6,120	984	10.4	4.18	502	113

ตารางที่ ก. 1 (ต่อ)	Wide Flange Shape	ASTM Standards, ASTM A6 : 1997

Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H	B	t1	t2	ระยะ r		Ix	Iy	rx	ry	Zx	Zy
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)
250 x 125	29.6	250	125	6	9	12	37.66	4,050	294	10.4	2.79	324	47
	25.7	248	124	5	8	12	32.68	3,540	255	10.4	2.79	285	41.1
200 x 200	65.7	208	202	10	16	13	83.69	6,530	2,200	8.83	5.13	628	218
	56.2	200	204	12	12	13	71.53	4,980	1,700	8.35	4.88	498	167
	49.9	200	200	8	12	13	63.53	4,720	1,600	8.62	5.02	472	160
200 x 150	30.6	194	150	6	9	13	39.01	2,690	507	8.3	3.61	277	67.6
200 x 100	21.3	200	100	5.5	8	11	27.16	1,840	134	8.24	2.22	184	26.8
	18.2	198	99	4.5	7	11	23.18	1,580	114	8.26	2.21	160	23
175 x 175	40.2	175	175	7.5	11	12	51.21	2,880	984	7.5	4.38	330	112
175 x 125	23.3	169	125	5.5	8	12	29.65	1,530	261	7.18	2.97	181	41.8
175 x 90	18.1	175	90	5	8	9	23.04	1,210	97.5	7.26	2.06	139	21.7
150 x 150	31.5	150	150	7	10	11	40.14	1,640	563	6.39	3.75	219	75.1
150 x 100	21.1	148	100	6	9	11	26.84	1,020	151	6.17	2.37	138	30.1
150 x 75	14	150	75	5	7	8	17.85	666	49.5	6.11	1.66	88.8	13.2
125 x 125	23.8	125	125	6.5	9	10	30.31	847	293	5.29	3.11	136	47
125 x 60	13.2	125	60	6	8	9	16.84	413	29.2	4.95	1.32	66.1	9.73
100 x 100	17.2	100	100	6	8	10	21.9	383	134	4.18	2.47	76.5	26.7
100 x 50	9.3	100	50	5	7	8	11.85	187	14.8	3.98	1.12	37.5	5.91





ตารางที่ ก. 2	H-Sections	(TIS 1227 : 1996 / JIS G3192 : 1990)

(Grade SM400, SM490, SM520, SS400, SS490 or SS540)

Moment of Inertia	I	=	Ar^2
Radius of Gyration	r	=	$\sqrt{\frac{I}{A}}$
Modulus of Section	Z	=	$\frac{I}{C}$
	A	=	Sectional Area

Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H	B	t1	t2	ระยะ r		Ix	Iy	rx	ry	Zx	Zy
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)
100 x 50	9.3	100	50	5	7	8	11.85	187	14.8	3.98	1.12	37.5	5.91
100 x 100	17.2	100	100	6	8	10	21.9	383	134	4.2	2.47	77	27
125 x 60	13.2	125	60	6	8	9	16.84	413	29.2	4.95	1.32	66.1	9.73
125 x 125	23.8	125	125	6.5	9	10	30.31	847	293	5.3	3.11	136	47
150 x 100	21.1	148	100	6	9	11	26.84	1,020	151	6.2	2.37	138	30
150 x 75	14	150	75	5	7	8	17.85	666	49.5	6.11	1.66	88.8	13.2
150 x 150	31.5	150	150	7	10	11	40.14	1,640	563	6.4	3.75	219	75
175 x 90	18.1	175	90	5	8	9	23.04	1210	97.5	7.26	2.06	139	21.7
175 x 175	40.2	175	175	7.5	11	12	51.21	2,880	984	7.5	4.38	330	112
200 x 100	*18.2	198	99	4.5	7	11	23.18	1,580	114	8.3	2.21	160	23
	21.3	200	100	5.5	8	11	27.16	1,840	134	8.2	2.22	184	27
200 x 150	30.6	194	150	6	9	13	39.01	2,690	507	8.3	3.61	277	68
200 x 200	49.9	200	200	8	12	13	63.53	4,720	1,600	8.6	5.02	472	160
	*56.2	200	204	12	12	13	71.53	4,980	1,700	8.4	4.88	498	167
	*65.7	208	202	10	16	13	83.69	6,530	2,200	8.8	5.13	628	218
250 x 125	*25.7	248	124	5	8	12	32.68	3,540	255	10.4	2.79	285	41
	29.6	250	125	6	9	12	37.66	4,050	294	10.4	2.79	324	47

ตารางที่ ก. 2 (ต่อ) H-Sections (TIS 1227 : 1996 / JIS G3192 : 1990)

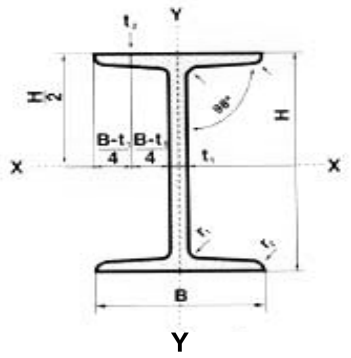
Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H	B	t1	t2	ระยะ r		Ix	Iy	rx	ry	Zx	Zy
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)
250 x 175	44.1	244	175	7	11	16	6.24	6,120	984	10.4	4.18	502	113
250 x 250	*64.4	244	252	11	11	16	82.06	8,790	2,940	10.3	5.98	720	233
	*66.5	248	249	8	13	16	84.07	9,930	3,350	10.8	6.29	801	269
	72.4	250	250	9	14	16	92.18	10,800	3,650	10.8	6.29	867	292
	*82.2	250	255	14	14	16	104.7	11,500	3,880	10.5	6.09	919	304
300 x 150	*32.0	298	149	5.5	8	13	40.8	6,320	442	12.4	3.29	424	59
	36.7	300	150	6.5	9	13	46.78	7,210	508	12.4	3.29	481	68
300 x 200	56.8	294	200	8	12	18	72.38	11,300	1,600	12.5	4.71	771	160
	*65.4	298	201	9	14	18	83.36	13,300	1,900	12.6	4.77	893	189
300 x 300	*84.5	294	302	12	12	18	107.7	16,900	5,520	12.5	7.16	1,150	365
	*87.0	298	299	9	14	18	110.8	18,800	6,240	13	7.51	1,270	417
	94	300	300	10	15	18	119.8	20,400	6,750	13.1	7.51	1,360	450
	*106.0	300	305	15	15	18	134.8	21,500	7,100	12.6	7.26	1,440	466
	*106.0	304	301	11	17	18	134.8	23,400	7,730	13.2	7.57	1,540	514
350 x 175	*41.4	346	174	6	9	14	52.68	11,100	792	14.5	3.88	641	91
	49.6	350	175	7	11	14	53.14	13,600	984	14.7	3.95	775	112
	*57.8	354	176	8	13	14	73.68	16,100	1,180	14.8	4.01	909	134
350 x 250	*69.2	336	249	8	12	20	88.15	18,500	3,090	14.5	5.92	1,100	248
	79.7	340	250	9	14	20	101.5	21,700	3,650	14.6	6	1,280	292
350 x 350	*106.0	338	351	13	20	135.3	28,200	9,380	14.4	8.33	1,670	534	534
	*115.0	344	348	16	20	146	33,300	11,200	15.1	8.78	1,940	464	646
	*131.0	344	354	16	20	166.6	35,300	11,800	14.6	8.43	2,050	669	669
	137	350	350	19	20	173.9	40,300	13,600	15.2	8.84	2,300	776	776
	*156.0	350	357	19	20	198.4	42,800	14,400	14.7	8.53	2,450	809	809

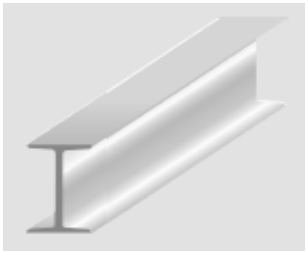
ตารางที่ ก. 2 (ต่อ) H-Sections (TIS 1227 : 1996 / JIS G3192 : 1990)

Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H	B	t1	t2	ระยะ r		Ix	Iy	rx	ry	Zx	Zy
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)
400 x 200	*56.6	396	199	7	11	16	72.16	20,000	1,450	16.7	4.48	1,010	145
	66	400	200	8	13	16	84.12	23,700	1,740	16.8	4.54	1,190	174
	*75.5	404	201	9	15	16	96.16	27,500	2,030	16.9	4.6	1,360	202
400 x 300	*94.3	386	299	9	14	22	120.1	33,700	6,240	16.7	7.21	1,740	418
	107	390	300	10	16	22	136	38,700	7,210	16.9	7.28	1,980	481
400 x 400	*140.0	388	402	15	15	22	178.5	49,000	16,300	16.6	9.54	2,520	809
	*147.0	394	398	11	18	22	186.8	56,100	18,900	17.3	10.1	2,850	951
	*168.0	394	405	18	18	22	214.4	59,700	20,000	16.7	9.65	3,030	985
	172	400	400	13	21	22	218.7	66,600	22,400	17.5	10.1	3,330	1,120
	*197.0	400	408	21	21	22	250.7	70,900	23,800	16.8	9.75	3,540	1,170
	*232.0	414	405	18	28	22	295.4	92,800	31,000	17.7	10.2	4,480	1,530
450 x 200	*66.2	446	199	8	12	18	84.3	28,700	1,580	18.5	4.33	1,290	159
	76	450	200	9	14	18	96.76	33,500	1,870	18.6	4.4	1,490	187
	*88.9	456	201	10	17	18	113.3	40,400	2,310	18.9	4.51	1,770	230
450 x 300	*106.0	434	299	10	15	24	135	46,800	6,690	18.6	7.04	2,160	448
	124	440	300	11	18	24	157.4	56,100	8,110	18.9	7.18	2,550	541
	*145.0	446	302	13	21	24	184.3	66,400	9,660	19	7.24	2,980	639
500 x 200	*79.5	496	199	9	14	20	101.3	41,900	1,840	20.3	4.27	1,690	185
	89.6	500	200	10	16	20	114.2	47,800	2,140	20.5	4.33	1,910	214
	*103.0	506	201	11	19	20	131.3	56,500	2,580	20.7	4.33	2,230	257
500 x 300	*114.0	482	300	11	15	26	145.5	60,400	6,760	20.4	6.82	2,500	451
	128	488	300	11	18	26	163.5	71,000	8,110	20.8	7.04	2,910	541
	*150.0	494	302	13	21	26	191.4	83,800	9,660	20.9	7.1	3,390	640

ตารางที่ ก. 2 (ต่อ) H-Sections (TIS 1227 : 1996 / JIS G3192 : 1990)

Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H	B	t1	t2	ระยะ r		Ix	Iy	rx	ry	Zx	Zy
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)
600 x 200	*94.6	596	199	10	15	22	120.5	68,700	1,980	23.9	4.05	2,310	199
	106	600	200	11	17	22	134.4	77,600	2,280	24	4.12	2,590	228
	*120.0	606	201	12	20	22	152.5	90,400	2,720	24.3	4.22	2,980	271
	*134.0	612	202	13	23	22	170.7	103,000	3,180	24.6	4.31	3,380	314
600 x 300	*137.0	582	300	12	17	28	174.5	103,000	7,670	24.3	6.63	3,530	511
	151	588	300	12	20	28	192.5	118,000	9,020	24.8	6.85	4,020	601
	*175.0	594	302	12	23	28	222.4	137,000	10,600	24.9	6.9	4,620	701
700 x 300	*166.0	692	300	13	20	28	211.5	172,000	9,020	28.6	6.53	4,980	602
	185	700	300	13	24	28	235.5	201,000	10,800	29.3	6.78	5,760	722
800 x 300	*191.0	792	300	14	22	28	243.4	254,000	9,930	32.3	6.39	6,410	662
	210	800	300	14	26	28	267.4	292,000	11,700	33	6.62	7,290	782
900 x 300	243	900	300	16	28	28	309.8	411000	12600	36.4	6.39	9140	843





ตารางที่ ก. 3	I-Sections	(TIS 1227 : 1996 / JIS G3192 : 1990)

(Grade SM400, SM490, SM520, SS400, SS490 or SS540)

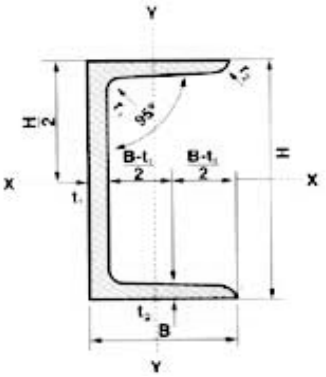
Moment of Inertia $I = Ar^2$

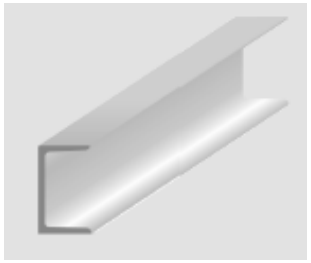
Radius of Gyration $r = \sqrt{\frac{I}{A}}$

Modulus of Section $Z = \frac{I}{C}$

A = Sectional Area

Sectional Dimension					Sectional Area	Weight	Moment of Inertia		Radius of Gyration		Modulus of Section	
H x B	t1	t2	r1	r2			Ix	Iy	rx	ry	Zx	Zy
mm	mm	mm	mm	mm	(cm^2)	kg/m	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)
100 x 75	5	8	7	3.5	16.43	12.9	281	47.3	4.14	1.7	56.2	12.6
125 x 75	5.5	9.5	9	4.5	20.45	16.1	538	57.5	5.13	1.68	86	15.3
150 x 75	5.5	9.5	9	4.5	21.83	17.1	819	57.5	6.12	1.62	109	15.3
150 x 125	8.5	14	13	6.5	46.15	36.2	1760	385	6.18	2.89	235	61.6
180 x 100	6	10	10	5	30.06	23.6	1670	138	7.45	2.14	186	27.5
200 x 100	7	10	10	5	33.06	26	2,170	138	8.11	2.05	217	27.7
200 x 150	9	16	15	7.5	64.16	50.4	4,460	753	8.34	3.43	446	100
250 x 125	7.5	12.5	12	6	48.79	38.3	5,180	337	10.3	2.63	414	53.9
	10	19	21	10.5	70.73	55.5	7,310	538	10.2	2.76	585	86
300 x 150	8	13	12	6	61.58	48.3	9,480	588	12.4	3.09	632	78.4
	10	18.5	19	9.5	83.47	65.5	12,700	886	12.3	3.26	849	118
	11.5	22	23	11.5	97.88	76.8	14,700	1,080	12.2	3.32	978	143
350 x 150	9	15	13	6.5	74.58	58.5	15,200	702	14.3	3.07	870	93.5
	12	24	25	12.5	111.1	87.2	22,400	1,180	14.2	3.26	1,280	158
400 x 150	10	18	17	8.5	91.73	72	24,100	864	16.2	3.07	1,200	115
	12.5	25	27	13.5	122.1	95.8	31,700	1,240	16.1	3.18	1,580	165
450 x 175	11	20	19	9.5	116.8	91.7	39,200	1,510	18.3	3.6	1,740	173
	13	26	27	13.5	146.1	115	48,800	2,020	18.3	3.72	2,170	231
600 x 190	13	25	25	12.5	169.4	133	98,400	2,460	24,10	3.81	3,280	259
	16	35	38	19	224.5	176	130,000	3,540	24.1	3.97	4,330	373



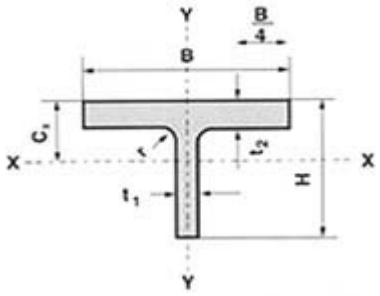


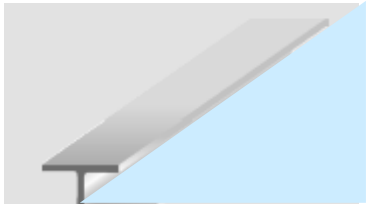
ตารางที่ ก. 4	Channels	(TIS 1227 : 1996 / JIS G3192 : 1990)

(Grade SM400, SM490, SM520, SS400, SS490 or SS540)

Moment of Inertia	I	=	Ar^2
Radius of Gyration	r	=	$\sqrt{\frac{I}{A}}$
Modulus of Section	Z	=	$\frac{I}{C}$
	A	=	Sectional Area

Dimensios (mm)					Sectional Area (cm^2)	Weight (kg/m)	Moment of Inertia (cm^4)		Radius of Gyration (cm)		Modulus of Section (cm^3)	
H x B	t1	t2	r1	r2			Ix	Iy	rx	ry	Zx	Zy
50 x 25	5	6	6	3	4.92	3.86	16.8	2.49	1.85	0.71	6.73	1.48
75 x 40	5	7	8	4	8.818	6.92	75.3	12.2	2.92	1.17	20.1	4.47
100 x 50	5	7.5	8	4	11.92	9.36	188	26	3.97	1.48	37.6	7.52
125 x 65	6	8	8	4	17.11	13.4	424	61.8	4.98	1.9	67.8	13.4
150 x 75	6.5	10	10	5	23.71	18.6	861	117	6.03	2.22	115	22.4
150 x 75	9	12.5	15	7.5	30.59	24	1050	147	5.86	2.19	140	28.3
180 x 75	7	10.5	11	5.5	27.2	21.4	1380	131	7.12	2.19	153	24.3
200 x 80	7.5	11	12	6	31.33	24.6	1,950	168	7.88	2.32	195	29.1
200 x 90	8	13.5	14	7	38.65	30.3	2,490	277	8.02	2.68	249	44.2
250 x 90	9	13	14	7	44.07	34.6	4,180	294	9.74	2.58	334	44.5
	11	14.5	17	8.5	51.17	40.2	4,680	329	9.56	2.54	374	49.9
300 x 90	9	13	14	7	48.57	38.1	6,440	309	11.5	2.52	429	45.7
	10	15.5	19	9.5	55.74	43.8	7,410	360	11.5	2.54	494	54.1
	12	16	19	9.5	61.9	48.6	7,870	379	11.3	2.48	525	56.4
380 x 100	10.5	16	18	9	69.39	54.5	14,500	535	14.5	2.78	763	70.5
	13	20	24	12	85.71	67.3	17,600	655	14.3	2.76	926	87.8





ตารางที่ ก. 5	T-Section (Cut from H-Section)	(TIS 1227 : 1996 / JIS G3192 : 1990)

(Grade SM400, SM490, SM520, SS400, SS490 or SS540)

Moment of Inertia	I	=	Ar^2
Radius of Gyration	r	=	$\sqrt{\frac{I}{A}}$
Modulus of Section	Z	=	$\frac{I}{C}$
	A	=	Sectional Area

Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section		Center of Gravity
		H	B	t1	t2	รัศมี r		Ix	Iy	rx	ry	Zx	Zy	Cx
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)	(cm^3)
50 x 100	8.6	50	100	6	8	10	10.95	16.1	66.9	1.21	2.47	4.03	13.4	1
62.5 x 125	11.9	62.5	125	6.5	9	10	15.16	35	147	1.52	3.11	6.91	23.5	1.19
75 x 100	10.5	74	100	6	9	11	13.42	51.7	75.3	1.96	2.37	8.84	15.1	11.55
75 x 150	15.8	75	150	7	10	11	20.07	66.4	282	1.82	3.75	10.8	37.6	1.37
87.5 x 175	20.1	87.5	175	7.5	11	12	25.61	115	492	2.12	4.38	15.9	56.2	1.55
100 x 100	*9.1	99	99	4.5	7	11	11.59	93.8	56.8	2.84	2.21	12.1	11.5	2.14
	10.7	100	100	5.5	8	11	13.58	114	67	2.9	2.22	4.8	13.4	2.29
100 x 150	15.3	97	150	6	9	13	19.51	125	254	2.53	3.61	15.8	33.8	1.79
100 x 200	24.9	100	200	8	12	13	31.77	184	801	2.41	5.02	22.3	80.1	1.73
	*28.1	100	204	12	12	13	35.77	256	851	2.67	4.88	32.4	83.4	2.09
	*32.8	104	202	10	16	13	41.85	251	1,100.00	2.45	5.13	29.5	109	1.91
125 x 125	*12.8	124	124	5	8	12	16.34	208	127	3.57	2.79	21.3	20.5	2.68
	14.8	125	125	6	9	12	18.83	248	147	3.36	2.79	25.6	23.5	2.78
125 x 175	22.1	122	175	7	11	16	28.12	289	492	3.2	4.18	29.1	56.3	2.27

ตารางที่ ก. 5 (ต่อ) **T-Section (Cut from H-Section)** **(TIS 1227 : 1996 / JIS G3192 : 1990)**

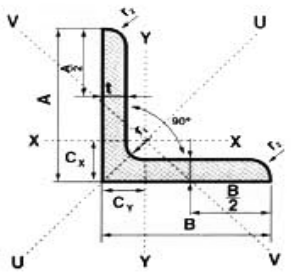
Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section		Center of Gravity
		H	B	t1	t2	ระยะ r		Ix	Iy	rx	ry	Zx	Zy	Cx
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)	(cm^3)
125 x 250	*32.2	122	252	11	11	16	41.03	445	1,470.00	3.29	5.98	45.3	117	2.39
	*33.2	124	249	8	13	16	42.35	364	1,670.00	2.93	6.29	34.9	134	1.98
	36.2	125	250	9	14	16	46.09	412	1,820.00	2.99	6.29	39.5	146	2.08
	*41.1	125	255	14	14	16	52.34	589	1,940.00	3.36	6.09	59.4	152	2.58
150 x 150	*16.0	149	149	5.5	8	13	20.4	393	221	4.39	3.29	33.8	29.7	3.26
	18.4	150	150	6.5	9	13	23.39	464	254	4.45	3.29	40	33.8	3.41
150 x 200	28.4	147	200	8	12	18	36.19	572	802	3.97	4.71	48.2	80.2	2.83
	*32.7	149	201	9	14	18	41.68	662	949	3.99	4.77	55.2	94.9	2.91
150 x 300	*42.3	147	302	12	12	18	53.83	858	2,760.00	3.99	7.16	72.3	183	3.84
	*43.5	149	299	9	14	18	55.4	715	3,120.00	3.59	7.51	57	209	2.36
	47	150	300	10	15	18	59.89	798	3,380.00	3.65	7.51	63.7	225	2.47
	*52.9	150	305	15	15	18	67.39	1,110.00	3,550.00	4.05	7.26	92.5	233	2.03
	*52.9	152	301	11	17	18	67.41	903	3,870.00	3.66	7.57	71.4	257	2.55
175 x 175	*20.7	173	174	6	9	14	26.34	679	396	5.08	3.88	50	45.5	3.71
	24.8	175	175	7	11	14	31.57	815	492	5.08	3.95	59.3	56.2	3.75
175 x 250	*34.6	168	249	8	12	20	44.08	881	1,540.00	4.47	5.92	64	124	3.02
	39.8	170	250	9	14	20	50.76	1,020.00	1,830.00	4.48	6	73.1	146	3.09
175 x 350	*53.1	169	351	13	13	20	67.63	1,420.00	4,690.00	4.59	8.33	104	267	3.21
	*57.3	172	348	10	16	20	73	1,230.00	5,620.00	4.11	8.78	84.7	323	2.67
	*65.4	172	354	16	16	20	83.32	1,800.00	5,920.00	4.65	8.43	131	335	3.4
	68.2	175	350	12	19	20	86.94	1,520.00	6,790.00	4.18	8.84	104	388	2.86
	*77.9	175	357	19	19	20	99.19	2,200.00	7,220.00	4.71	8.53	158	404	3.59
200 x 200	*28.3	198	199	7	11	16	36.08	1,190.00	723	5.76	4.48	76.4	72.7	4.17
	33	200	200	8	13	16	42.06	1,400.00	868	5.76	4.54	88.6	86.8	4.23

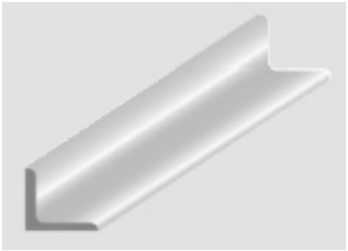
ตารางที่ ก. 5 (ต่อ) **T-Section (Cut from H-Section)** **(TIS 1227 : 1996 / JIS G3192 : 1990)**

Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section		Center of Gravity
		H	B	t1	t2	ระยะ r	Area	Ix	Iy	rx	ry	Zx	Zy	Cx
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)	(cm^3)
200 x 300	*47.1	193	299	9	14	22	60.05	1,530.00	3,120.00	5.04	7.21	95.5	209	3.33
	53.4	195	300	10	16	22	67.98	1,730.00	3,600.00	5.05	7.28	108	240	3.41
200 x 400	*70.0	194	402	15	15	22	89.23	2,480.00	8,130.00	5.27	9.54	158	404	3.7
	*73.3	197	398	11	18	22	93.41	2,050.00	9,460.00	4.68	10.1	123	475	3.01
	*84.1	197	405	18	18	22	107.2	3,050.00	9,980.00	5.34	9.65	193	493	3.89
	85.8	200	400	13	21	22	109.3	2,480.00	11,200.00	4.76	10.1	147	560	3.21
	*98.4	200	408	21	21	22	125.3	3,650.00	11,900.00	5.4	9.75	229	584	4.07
	*116.0	207	405	18	28	22	147.7	3,620.00	15,500.00	4.95	10.2	213	776	3.68
225 x 200	*33.1	223	199	8	12	18	42.15	1,880.00	790	6.67	4.33	109	79.4	5.1
	38	225	200	9	14	18	48.38	2,160.00	936	6.68	4.4	124	93.6	5.15
255 x 300	*53.0	217	299	10	15	24	67.52	2,350.00	3,350.00	5.89	7.04	133	224	4.04
	61.8	220	300	11	18	24	78.69	2,680.00	4,060.00	5.84	7.68	149	270	4.05
250 x 200	*39.7	248	199	9	14	20	50.64	2,840.00	922	7.49	4.27	150	92.6	5.9
	44.8	250	200	10	16	20	57.12	3,210.00	1,070.00	7.5	4.33	169	107	5.96
	*51.5	253	201	11	19	20	65.65	3,670.00	1,290.00	7.48	4.43	190	128	5.95
250 x 300	*57.1	241	300	11	15	26	72.76	3,420.00	3,380.00	6.85	6.82	178	225	4.92
	64.2	244	300	11	18	26	81.76	3.620.0	4,060	6.66	7.07	184	70	4.66
300 x 200	*47.3	298	199	10	15	22	60.23	5,190.00	989	9.29	4.05	236	99.4	7.79
	52.8	300	200	11	17	22	67.21	5,810.00	1,140.00	9.3	4.12	262	114	7.84
	*59.8	303	201	12	20	22	76.24	6,570.00	1,360.00	9.28	4.22	292	135	7.79
	*67.0	306	202	13	23	22	85.33	7,340.00	1,590.00	9.27	4.31	322	157	7.79
300 x 300	*68.5	291	300	12	17	28	87.24	6,360.00	3,830.00	8.54	6.63	280	256	6.39
	75.6	294	300	12	20	28	96.24	6,710.00	4,510.00	8.35	6.85	288	301	6.08
	*87.3	297	302	14	23	28	111.2	7,920.00	5,290.00	8.44	6.9	339	350	6.33

ตารางที่ ก. 5 (ต่อ) **T-Section (Cut from H-Section)** **(TIS 1227 : 1996 / JIS G3192 : 1990)**

Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section		Center of Gravity
		H	B	t1	t2	ระยะ r		Ix	Iy	rx	ry	Zx	Zy	Cx
mm	kg/m	mm	mm	mm	mm	mm	(cm^2)	(cm^4)	(cm^4)	cm	cm	(cm^3)	(cm^3)	(cm^3)
350 x 300	*83.0	346	300	13	20	28	105.7	11,300.00	4,510.00	10.3	6.53	425	301	7.99
	92.4	350	300	13	24	28	117.7	12,000.00	5,410.00	10.1	6.78	438	361	7.55
400 x 300	*95.6	396	300	14	22	28	121.7	17,100	4,960.00	12.1	6.38	593	331	9.66
	105	400	300	14	26	28	133.7	18,800	5,860.00	11.9	6.62	610	391	9.18





ตารางที่ ก. 6	Equal Angle	(TIS 1227 : 1996 / JIS G3192 : 1990)

(Grade SM400, SM490, SM520, SS400, SS490 or SS540)

Moment of Inertia $I = Ar^2$

Radius of Gyration $r = \sqrt{\frac{I}{A}}$

Modulus of Section $Z = \frac{I}{C}$

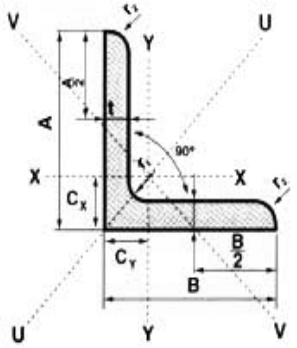
A = Sectional Area

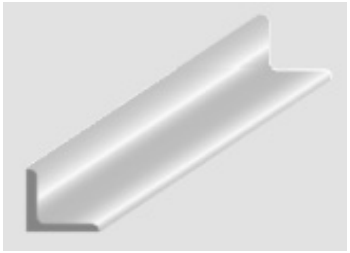
Dimensions (mm)				Sectional Area (cm^2)	Weight (kg/m)	Moment of Inertia (cm^4)				Radius of Gyration (cm)				Modulus of Section (cm^3)		Distance of Center of gravity (cm)	
A x B	t	r1	r2			Ix	Iy	Iu	Iv	rx	ry	ru	rv	Zx	Zy	Cx	Cy
25 x 25	3	4	2	1.427	1.12	0.797	0.797	1.26	0.332	0.747	0.747	0.94	0.433	0.448	0.448	0.719	0.719
	5	3.5	2.4	2.26	1.77	1.2	1.2	1.89	0.52	0.73	0.73	0.91	0.43	0.45	0.45	0.8	0.8
30 x 30	3	4	2	1.727	1.36	1.42	1.42	2.26	0.59	0.908	0.908	1.14	0.585	0.661	0.661	0.844	0.844
	5	5	2.4	2.78	2.18	2.16	2.16	3.41	0.92	0.88	0.88	1.11	0.57	1.04	1.04	0.92	0.92
40 x 40	3	4.5	2	2.336	1.83	3.53	3.53	5.6	1.46	1.23	1.23	1.55	0.79	1.21	1.21	1.09	1.09
	4	6	2.4	3.08	2.42	4.47	4.47	7.09	1.85	1.21	1.21	1.52	0.78	1.55	1.55	1.12	1.12
	5	4.5	3	3.755	2.95	5.42	5.42	8.59	2.25	1.2	1.2	1.51	0.774	1.91	1.91	1.17	1.17
	6	6	2.4	4.48	3.52	6.31	6.31	9.98	2.65	1.19	1.19	149	0.77	2.26	2.26	1.2	1.2
45 x 45	4	6.5	3	3.492	2.74	6.5	6.5	10.3	2.7	1.36	1.36	1.72	0.88	2	2	1.24	1.24
	5	6.5	3	4.302	3.38	7.91	7.91	12.5	3.29	1.36	1.36	1.71	0.874	2.46	2.46	1.28	1.28
50 x 50	3	7	2.4	2.96	1.3	6.86	6.86	10.8	2.88	1.52	1.52	1.91	0.99	1.86	1.86	2.33	1.31
	4	6.5	3	3.892	3.06	9.06	9.06	14.4	3.76	1.53	1.53	1.92	0.983	2.49	2.49	1.37	1.37
	5	6.5	3	4.802	3.77	11.1	11.1	17.5	4.58	1.52	1.52	1.91	0.976	3.08	3.08	1.41	1.41
	6	6.5	4.5	1.5	5.644	4.43	12.6	12.6	20	5.23	1.5	1.88	0.963	3.55	3.55	1.44	1.44
60 x 60	4	6.5	3	4.692	3.68	16	16	25.4	6.62	1.85	1.85	2.33	1.19	3.66	3.66	1.61	1.61
	5	6.5	3	5.802	4.55	19.6	19.6	31.2	8.09	1.84	1.84	2.32	1.18	4.52	4.52	1.66	1.66
65 x 65	5	8.5	3	6.367	5	25.3	25.3	4.1	10.5	1.99	1.99	2.51	1.28	5.35	5.35	1.77	1.77
	6	8.5	4	7.527	5.91	29.4	29.4	46.6	12.2	1.98	1.98	2.49	1.27	6.26	6.26	1.81	1.81
	8	8.5	6	9.761	7.66	36.8	36.8	58.3	15.3	1.94	1.94	2.44	1.25	7.96	7.96	1.88	1.88

ตารางที่ ก.6 (ต่อ) Equal Angle (TIS 1227 : 1996 / JIS G3192 : 1990)

Dimensions (mm)				Sectional Area (cm^2)	Weight (kg/m)	Moment of Inertia (cm^4)				Radius of Gyration (cm)				Modulus of Section (cm^3)		Distance of Center of gravity (cm)	
A x B	t	r1	r2			Ix	Iy	Iu	Iv	rx	ry	ru	rv	Zx	Zy	Cx	Cy
70 x 70	6	8.5	4	8.127	6.38	37.1	37.1	58.9	15.3	2.14	2.14	2.69	1.37	7.33	7.33	1.93	1.93
75 x 75	6	8.5	4	8.727	6.85	46.1	46.1	73.2	19	2.3	2.3	2.9	1.48	8.74	8.74	2.06	2.06
	9	8.5	6	12.69	9.69	64.4	64.4	102	26.7	2.25	2.25	2.84	1.45	12.1	12.1	2.17	2.17
	12	8.5	6	16.56	13	81.9	81.9	129	34.5	2.22	2.22	2.79	1.44	15.7	15.7	2.29	2.29
80 x 80	6	8.5	4	9.327	7.32	56.4	56.4	89.6	23.2	2.46	2.46	3.1	1.58	9.7	9.7	2.18	2.18
90 x 90	6	10	5	10.55	8.28	80.7	80.7	128	33.4	2.77	2.77	3.48	1.78	12.3	12.3	2.42	2.42
	7	10	5	12.22	9.59	93	93	148	38.3	2.76	2.76	3.48	1.77	14.2	14.2	2.46	2.46
	10	10	7	17	13.3	125	125	199	51.7	2.71	2.71	3.42	1.74	19.5	19.5	2.57	2.57
	12	11	4.8	20.3	15.9	148	148	234	61.7	2.7	2.7	3.4	1.75	23.3	23.3	2.66	2.66
	13	10	7	31.71	17	156	156	248	65.3	2.68	2.68	3.38	1.73	24.8	24.8	2.69	2.69
100 x 100	7	10	5	13.62	10.7	129	129	205	53.2	3.03	3.08	3.88	1.98	17.7	17.7	2.71	2.71
	10	10	7	19	14.9	175	175	278	72	3.04	3.04	3.83	1.95	24.4	24.4	2.82	2.82
	12	12	4.8	22.7	17.8	207	207	328	85.7	3.02	3.02	3.8	1.94	29.1	29.1	2.9	2.9
	13	10	7	24.31	19.1	220	220	348	91.1	3	3	3.78	12.94	31.1	31.1	2.94	2.94
120 x 120	8	12	5	18.76	14.7	258	258	410	106	3.71	3.71	4.67	2.38	29.5	29.5	3.24	3.24
130 x 130	9	12	6	22.74	17.9	366	366	583	150	4.01	4.01	5.06	2.57	38.7	38.7	3.53	3.53
	12	12	8.5	29.76	23.4	467	467	743	192	3.96	3.96	5	2.54	49.9	49.9	3.64	3.64
	15	12	8.5	36.75	28.8	568	568	902	234	3.93	3.93	4.95	2.53	61.5	61.5	3.76	3.76
150 x 150	12	14	7	34.77	27.3	740	740	1,180	304	4.61	4.61	5.82	2.96	68.1	68.1	4.14	4.14
	15	14	10	42.74	33.6	888	888	1,410	365	4.56	4.56	5.75	2.92	82.6	82.6	4.24	4.24
	19	14	10	53.38	41.9	1,090	1,090	1,370	451	4.52	4.52	0.69	2.91	103	103	4.4	4.4
175 x 175	12	15	11	40.52	31.8	1,170	1,170	1,860	480	5.38	5.38	6.78	3.44	91.8	91.8	4.73	4.73
	15	15	11	50.21	39.4	1,440	1,440	2,260	589	5.35	5.35	6.75	3.72	114	114	4.85	4.85
200 x 200	15	17	12	57.75	45.3	2,180	2,180	3,470	891	6.14	6.14	7.75	3.92	150	150	5.46	5.46
	20	17	12	76	59.7	2,820	2,820	4,490	1,160	6.09	6.09	7.68	3.9	197	197	5.67	5.67
	25	17	12	93.75	73.6	3,420	3,420	5,420	1,420	60.4	60.4	7.61	3.88	242	242	5.86	5.86
250 x 250	25	24	12	119.4	93.7	6,950	6,950	11,000	2,860	7.63	7.63	9.62	4.9	388	388	7.1	7.1
	35	24	18	162.6	128	9,110	9,110	14,400	3,790	7.49	7.49	9.42	4.83	519	519	7.45	7.45

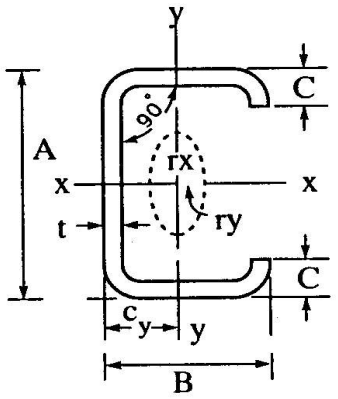
ตารางที่ ก. 7	UnEqual Angle	(TIS 1227 : 1996 / JIS G3192 : 1990)



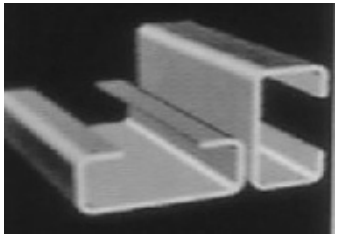


Moment of Inertia	I	=	Ar^2
Radius of Gyration	r	=	$\sqrt{\frac{I}{A}}$
Modulus of Section	Z	=	$\frac{I}{C}$
	A	=	Sectional Area

Dimensions (mm)				Sectional Area (cm^2)	Weight (kg/m)	tan	Moment of Inertia (cm^4)				Radius of Gyration (cm)				Modulus of Section (cm^3)		Distance of Center of gravity (cm)	
A x B	t	r1	r2				Ix	Iy	Iu	Iv	rx	ry	ru	rv	Zx	Zy	Cx	Cy
90 x 75	9	8.5	6	14.04	11	0.676	109	63.1	143	34.1	2.78	2.2	3.19	1.56	17.4	12.4	2.75	2
100 x 75	7	10	5	11.87	9.32	0.548	118	56.9	144	30.8	3.15	2.19	3.49	1.61	17	10	3.06	1.83
100 x 75	10	10	7	16.5	13	0.543	159	76.1	194	41.3	3.11	2.15	3.43	1.58	23.3	13.7	3.17	1.94
125 x 75	7	10	5	13.62	10.7	0.362	219	60.4	243	36.4	4.01	2.11	4.23	1.64	26.1	10.3	4.1	1.64
125 x75	10	10	7	19	14.9	0.357	299	80.8	330	49	3.96	2.06	4.17	1.61	36.1	14.1	4.22	1.75
125 x 75	13	10	7	24.31	19.1	0.352	376	101	415	61.9	3.93	2.04	4.13	1.6	46.1	17.9	4.35	1.87
125 x 90	10	10	7	20.5	16.1	0.505	318	138	380	76.2	3.94	2.59	4.3	1.93	37.2	20.3	3.95	2.22
125 x 90	13	10	7	26.26	20.6	0.501	401	173	477	96.3	3.91	2.57	4.26	1.91	47.5	25.9	4.07	2.34
150 x 90	9	12	6	20.94	16.4	0.361	485	133	537	80.4	4.81	2.52	5.06	1.96	48.2	19	4.95	1.99
150 x 90	12	12	8.5	27.36	21.5	0.357	619	167	685	102	4.76	2.47	5	1.93	62.3	24.3	5.07	2.1
150 x 100	9	12	6	21.84	17.1	0.439	502	181	579	104	4.79	2.88	5.15	2.18	49.1	23.5	4.76	2.3
150 x 100	12	12	8.5	28.56	22.4	0.435	642	223	733	132	4.74	2.83	5.09	2.15	63.4	30.1	4.88	2.41
150 x 100	15	12	8.5	32.25	27.7	0.431	782	276	897	161	4.71	2.8	5.04	2.14	78.2	37	5	2.53



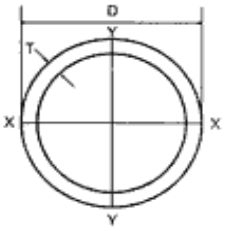
ตารางที่ ก. 8	Light Lip Channel	(TIS 1228 : 2006 / JIS G3192 : 1990)



Moment of Inertia	I	=	Ar^2
Radius of Gyration	r	=	$\sqrt{\frac{I}{A}}$
Modulus of Section	Z	=	$\frac{I}{C}$
	A	=	Sectional Area

Sectional Dimensional (mm)		Sectional Area (cm^2)	Weight (kg/m)	Distance from CG. (cm)		Moment of Inertia (cm^4)		Radius of Gyration (cm)		Modulus of Section (cm^3)		Shear Distance (cm)	
A x B x C	t	A		C x	C y	Ix	Iy	rx	ry	Zx	Zy	Sx	Sy
60 x 30 x 10	2.3	2.872	2.25	0	1.06	15.6	3.32	2.33	1.07	5.2	1.71	2.5	0
75 x 35 x 15	2.3	3.677	2.89	0	1.29	31	6.58	2.91	1.34	8.28	2.98	3.1	0
75 x 45 x 15	2.3	4.137	3.25	0	1.72	37.1	11.8	3	1.69	9.9	4.24	4	0
90 x 48 x 20	3.2	6.367	5	0	1.72	76.9	13.3	3.48	1.69	17.1	6.57	4.1	0
	2.3	4.712	3.7	0	1.73	58.6	14.2	3.53	1.74	13	5.11	4.1	0
100 x 50 x 20	4.5	9.469	7.43	0	1.86	139	30.9	3.82	1.81	27.7	9.82	4.3	0
	4	8.548	6.71	0	1.86	127	28.7	3.85	1.83	25.4	9.13	4.3	0
	3.2	7.007	15.5	0	1.86	107	24.5	3.9	1.87	21.3	7.81	4.4	0
	2.3	5.172	4.06	0	1.86	80.7	19	3.95	1.92	16.1	6.06	4.4	0
120 x 40 x 20	3.2	7.007	5.5	0	1.32	144	15.3	4.53	1.48	24	5.71	3.4	0
120 x 60 x 20	3.2	8.287	6.51	0	2.12	186	40.9	4.74	2.22	31	10.5	4.9	0
120 x 60 x 25	4.5	11.72	9.2	0	2.25	252	58	4.63	2.22	41.9	15.5	5.3	0

						ตารางที่ ก. 8 (ต่อ)		Light Lip Channel		(TIS 1228 : 2006 / JIS G3192 : 1990)			
Sectional Dimensional (mm.)		Sectional Area (cm^2)	Weight (kg/m)	Distance from CG. (cm)		Moment of Inertia (cm^4)		Radius of Gyration (cm)		Modulus of Section (cm^3)		Shear Distance (cm)	
H x A x C	t			C x	C y	Ix	Iy	rx	ry	Zx	Zy	Sx	Sy
125 x 50 x 20	4.5	10.59	8.32	0	1.68	238	33.5	4.74	1.78	33	10	4	0
	4	9.548	7.5	0	1.68	217	33.1	4.77	1.81	34.7	9.38	4	0
	3.2	7.807	6.13	0	1.68	181	26.6	4.82	1.85	29	8.02	4	0
150 x 50 x 20	4.5	11.72	9.2	0	1.54	368	35.7	5.6	1.75	49	10.5	3.7	0
	3.2	8.607	6.76	0	1.54	280	28.3	5.71	1.81	37.4	8.19	3.8	0
150 x 65 x 20	4	11.75	9.22	0	2.11	401	63.7	5.84	2.33	53.5	14.5	5	0
	3.2	9.567	7.51	0	2.11	332	53.8	5.89	2.37	44.3	12.2	5.1	0
150 x 75 x 20	4.5	13.97	11	0	2.5	489	99.2	5.92	2.66	65.2	19.8	6	0
	4	12.55	9.85	0	2.51	445	91	5.95	2.69	59.3	18.2	5.8	0
	3.2	10.21	8.01	0	2.51	366	76.4	5.99	2.74	48.9	15.3	5.1	0
150 x 75 x 25	4.5	14.42	11.3	0	2.65	501	109	5.9	2.75	66.9	22.5	6.3	0
	4	12.95	10.2	0	2.65	455	99.8	5.93	2.78	60.6	20.6	6.3	0
	3.2	10.53	8.27	0	2.66	375	83.6	5.97	2.82	50	17.3	6.4	0
200 x 75 x 20	4.5	16.22	12.7	0	2.19	963	109	7.71	2.6	96.3	20.6	5.3	0
	4	14.55	11.4	0	2.19	871	100	7.74	2.62	87.1	18.9	5.3	0
	3.2	11.81	9.27	0	2.19	716	84.1	7.79	2.67	71.6	15.8	5.4	0
200 x 75 x 25	4.5	16.67	13.1	0	2.32	990	121	7.61	2.69	99	23.3	5.6	0
	4	14.95	11.7	0	2.32	895	110	7.74	2.72	89.5	21.3	5.7	0
	3.2	12.13	9.52	0	2.33	736	92.3	7.7	2.76	73.6	17.8	5.7	0
250 x 75 x 25	4.5	18.92	14.9	0	2.07	1690	129	9.44	2.62	135	23.8	5.1	0

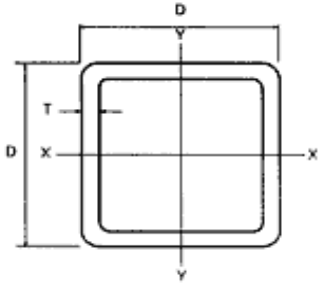


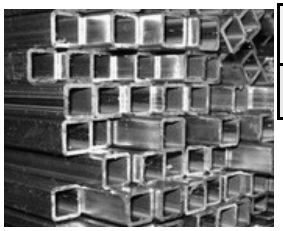
ตารางที่ ก. 9	Carbon Steel Pipe
(TIS 1228 : 2006 / JIS G3192 : 1990)	

Moment of Inertia	I	=	Ar^2
Radius of Gyration	r	=	$\sqrt{\frac{I}{A}}$
Modulus of Section	Z	=	$\frac{I}{C}$
	A	=	Sectional Area

Nominal dimention	Outside Diameter	Thickness	Calculate Weight	Cross Sectional Area	Geometrical Moment of Inertia	Modulus of Section	Radius of Gyration
DN	D	T	W	A	I	Z	r
in (mm)	mm	mm	kg./m	cm^2	cm^4	cm^3	cm
1/2 (15)	21.7	2	0.97	1.24	0.61	0.56	0.7
3/4 (20)	27.2	2	1.24	1.58	1.26	0.93	0.89
		2.3	1.41	1.8	1.41	1.03	0.88
1 (25)	34	2.3	1.8	2.29	2.89	1.7	1.12
1 1/4 (32)	42.7	2.3	2.29	2.92	5.97	2.8	1.43
		2.5	2.48	3.16	6.4	3	1.42
1 1/2 (40)	48.6	2.3	2.63	3.35	8.99	3.7	1.64
		2.5	2.84	3.62	9.65	3.97	1.63
		2.8	3.16	4.03	10.6	4.36	1.62
		3.2	3.58	4.56	11.8	4.86	1.61
2(50)	60.5	2.3	3.3	4.21	17.8	5.9	2.06
		3.2	4.52	5.76	23.7	7.84	2.03
		4	5.57	7.1	28.5	9.41	2
2 1/2 (65)	76.3	2.8	5.08	6.47	43.7	11.5	2.6
		3.2	5.77	7.35	49.2	12.9	2.59
		4	7.13	9.09	59.5	15.6	2.58

				ตารางที่ ก. 9 (ต่อ)		Carbon Steel Pipe	
				(TIS 1228 : 2006 / JIS G3192 : 1990)			
Nominal dimention	Outside Diameter	Thickness	Calculate Weight	Cross Sectional Area	Geometrical Moment of Inertia	Modulus of Section	Radius of Gyration
DN	D	T	W	A	I	Z	r
in (mm)	mm	mm	kg./m	cm^2	cm^4	cm^3	cm
3 (80)	89.1	2.8	5.96	7.59	70.7	15.9	3.05
		3.2	6.78	8.64	79.8	17.9	3.04
3 1/2 (90)	101.6	3.2	7.76	9.89	120	23.6	3.48
		4	9.63	12.26	146	28.8	3.45
4 (100)	114.3	3.2	8.77	11.17	172	30.2	3.93
		3.5	9.58	12.18	187	32.7	3.92
		4.5	12.2	15.52	234	41	3.89
5 (125)	139.8	3.6	12.1	15.4	357	51.1	4.82
		4	13.4	17.07	394	56.3	4.8
		4.5	15	19.13	438	62.7	4.79
		6	19.8	25.22	566	80.2	4.74
6 (150)	165.2	4.5	17.8	22.72	734	88.9	5.68
		5	19.8	25.16	808	97.8	5.67
		6	23.6	30.01	952	115	5.63
		7.1	27.7	35.26	1,100.00	134	5.6
8 (200)	216.3	4.5	23.5	29.94	1,680.00	155	7.49
		5.8	30.1	38.36	2,130.00	197	7.45
		7	36.1	46.03	2,520.00	233	7.4
		8.2	42.1	53.61	2,910.00	269	7.36



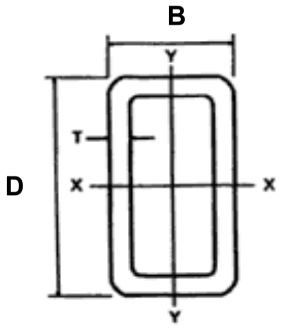


ตารางที่ ก. 10	Square Tube
(TIS 1228 : 2006 / JIS G3192 : 1990)	

Moment of Inertia	I	=	Ar^2
Radius of Gyration	r	=	$\sqrt{\frac{I}{A}}$
Modulus of Section	Z	=	$\frac{I}{C}$
	A	=	Sectional Area

Side Length		Thickness	Calculate Weight	Cross Sectional Area	Geometrical Moment of Inertia	Modulus of Section	Radius of Gyration
D x D		T	W	A	Ix = Iy	Zx = Zy	rx = ry
in	mm	mm	kg./m	cm^2	cm^4	cm^3	cm
1 x 1	25 x 25	2	1.36	1.74	1.48	1.19	0.92
		2.3	1.53	1.97	1.61	1.29	0.9
		2.6	1.65	2.1	1.63	1.31	0.88
		3.2	1.91	2.44	1.75	1.4	0.85
$1\frac{1}{4}$ x $1\frac{1}{4}$	32 x 32	2.3	2.04	2.6	3.71	2.32	1.2
		3.2	2.69	3.42	4.54	2.84	1.15
$1\frac{1}{2}$ x $1\frac{1}{2}$	38 x 38	2.3	2.47	3.15	6.54	3.44	1.44
		3.2	3.29	4.19	8.18	4.3	1.4
2 x 2	50 x 50	1.6	2.38	3.03	11.7	4.68	1.96
		2	2.91	3.7	13.9	5.57	1.94
		2.3	3.34	4.25	15.9	6.34	1.93
		3.2	4.5	5.73	20.4	8.16	1.89
		3.6	4.9	6.24	21.4	8.58	1.85
		4	5.35	6.81	22.9	9.15	1.83
		5	6.39	8.14	25.7	10.3	1.78

				ตารางที่ ก. 10 (ต่อ)		Square Tube	
				(TIS 1228 : 2006 / JIS G3192 : 1990)			
Side Length		Thickness	Calculate Weight	Cross Sectional Area	Moment of Inertia	Modulus of Section	Radius of Gyration
D x D		T	W	A	Ix = Iy	Zx = Zy	rx = ry
in	mm	mm	kg./m	cm^2	cm^4	cm^3	cm
3 x 3	75 x 75	2.3	5.14	6.55	57.1	15.2	2.95
		3.2	7.01	8.93	75.5	20.1	2.91
		4	8.59	10.95	90.2	24.1	2.87
		4.5	9.55	12.17	98.6	26.3	2.85
4 x 4	100 x 100	2.3	6.95	8.85	140	27.9	3.97
		3.2	9.52	12.13	187	37.5	3.93
		4	11.7	14.95	226	45.3	3.89
		4.5	13.1	16.67	249	49.9	3.87
		6	17	21.63	311	62.3	3.79
5 x 5	125 x 125	3.2	12	15.33	376	60.1	4.95
		4.5	16.6	21.17	506	80.9	4.89
		5	18.3	23.36	553	88.4	4.86
		6	21.7	27.63	641	103	4.82
6 x 6	150 x 150	4.5	20.1	25.67	896	120	5.91
		5	22.3	28.36	982	131	5.89
		6	26.4	33.63	1,150.00	153	5.84
		6.3	27.4	34.8	1,174.00	156	5.8



ตารางที่ ก. 11	Rectangular Tube
(TIS 1228 : 2006 / JIS G3192 : 1990)	

Moment of Inertia $I = Ar^2$

Radius of Gyration $r = \sqrt{\frac{I}{A}}$

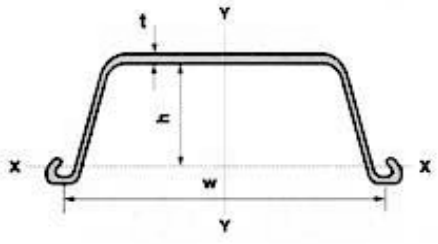
Modulus of Section $Z = \frac{I}{C}$

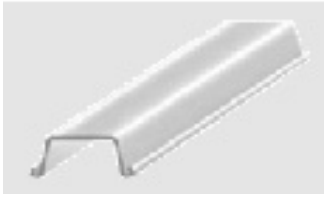
A = Sectional Area

Side Length		Thickness	Calculate Weight	Cross Sectional Area	Moment of Inertia		Modulus of Section		Radius of Gyration	
D x B		T	W	A	Ix	Iy	Zx	Zy	rx	ry
in	mm	mm	kg./m	cm^2	cm^4	cm^4	cm^3	cm^3	cm	cm
2 x 1	50 x 25	2	2.12	2.7	8.17	2.76	3.27	2.2	1.74	1.01
		2.3	2.44	3.1	9.31	3.1	3.72	2.48	1.68	0.96
		3.2	3.24	4.13	11.6	3.8	4.65	3.04	1.68	0.96
		3.6	3.48	4.44	11.7	3.86	4.7	3.09	1.63	0.93
$3 \times 1\frac{1}{4}$	75 x 38	2.3	3.81	4.85	34.6	12	9.23	6.3	2.67	1.57
		3.2	5.15	5.15	45	15.4	12	8.09	2.62	1.53
$3 \times 1\frac{3}{4}$	75 x 45	1.6	2.88	3.67	28.4	12.9	7.56	5.75	2.78	1.88
		2.3	4.06	5.17	38.9	17.6	10.4	7.82	2.74	1.84
		3.2	5.5	7.01	50.8	22.8	13.5	10.1	2.69	1.8
4 x 2	100 x 50	2	4.48	5.7	74.1	25.5	14.8	10.2	3.61	2.11
		2.3	5.14	6.55	84.8	29	17	11.6	3.6	2.1
		3.2	7.01	8.93	112	38	22.5	15.2	3.55	2.06
		3.6	7.72	9.84	121	40.9	24.1	16.3	3.5	2.04
		4	8.59	10.95	142	46.7	28.4	18.7	3.55	2.03
		4.5	9.55	12.17	147	48.9	29.3	19.5	3.47	2

ตารางที่ ก. 11 (ต่อ)	Rectangular Tube
(TIS 1228 : 2006 / JIS G3192 : 1990)	

Side Length		Thickness	Calculate Weight	Cross Sectional Area	Moment of Inertia		Modulus of Section		Radius of Gyration	
D x B		T	W	A	Ix	Iy	Zx	Zy	rx	ry
in	mm	mm	kg./m	cm^2	cm^4	cm^4	cm^3	cm^3	cm	cm
5 x 3	125 x 75	2.3	6.95	8.85	192	87.5	30.6	23.3	4.65	3.14
		3.2	9.52	12.13	257	117	41.1	31.1	4.6	3.1
		4	11.7	14.95	311	141	49.7	37.5	4.56	3.07
		4.5	13.1	16.67	342	155	54.8	41.2	4.53	3.04
		6	17	21.63	428	192	68.5	51.1	4.45	2.98
6 x 2	150 x 50	3.2	9.63	12.13	314.92	55.71	42.61	22.61	5.16	2.17
		4.5	13.5	17.03	423.93	75.75	53.35	29.82	5.05	2.11
		6.3	18.77	22.84	536.98	93.65	72.76	36.87	4.93	2.03
8 x 4	200 x 100	4.5	20.1	25.67	1,330.00	455	133	90.9	7.2	4.21
		6	26.4	33.63	1,700.00	577	170	115	7.12	4.14
		6.3	27.4	34.8	1,739.00	591	174	118	7.06	4.12

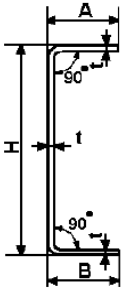


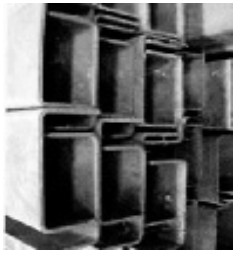


ตารางที่ ก. 12
Sheet Piles
(TIS 1390 : 1996 / JIS A5228 : 1988)
Hot Rolled Steel Sheet Pile
(Grade SY295 or SY390)

Section	Dimensions			Sectional Area	Weight		Moment of Inertia		Section Modulus	
	w	h	t	per pile	per pile	per wall width	per pile	per wall width	per pile	per wall width
	mm	mm	mm	(cm^2)	kg/m	kg/m	(cm^4)	(cm^4/m)	(cm^3)	(cm^3/m)
	in	in	in	in^2	lbs/ft	lbs/ft	in^4	in/ft	in^3	in^3/ft
SP - III	400	125	13	76.42	60	150	2,220.00	16,800	223	1,340.00
	15.7	4.92	0.152	11.85	40.3	30.7	53.3	123	13.6	24.9
SP - IV	400	170	15.5	96.99	76.1	190	4,670.00	38,600	362	2,270.00
	15.7	6.69	0.61	15.03	51.1	38.9	112	283	22.1	42.2

ตารางที่ ก. 13	Light Channels	(TIS 1228 : 2006 / JIS G3192 : 1990)





เหล็กรางพับ (Light Channels) เป็นเหล็กโครงสร้างรูปพรรณขึ้นรูปเย็น

เหมาะสำหรับงานโครงสร้างขนาดเล็ก

Moment of Inertia $I = Ar^2$

Radius of Gyration $r = \sqrt{\frac{I}{A}}$

Modulus of Section $Z = \frac{I}{C}$

A = Sectional Area

Dimensios			Thickn	Sectional	Weight	Distance from CG.		Moment of Inertia		Radius of Gyration		Modulus of Section		Shear Distance	
(mm)			(mm)	Area (cm^2)		(cm)		(cm^4)		(cm)		(cm^3)		(cm)	
H	A	B	t	A	(kg/m)	C x	C y	Ix	Iy	rx	ry	Zx	Zy	Sx	Sy
60	30	30	1.6	1.836	1.44	0	0.82	10.30	1.64	2.37	0.95	3.45	0.75	1.80	0
	30	30	2.3	2.586	2.03	0	0.86	14.20	2.27	2.34	0.94	4.72	1.06	1.80	0
80	40	40	2.3	3.506	2.75	0	1.11	34.90	5.56	3.16	1.26	8.73	1.92	2.40	0
100	40	40	2.3	3.966	3.11	0	0.99	58.90	5.96	3.85	1.23	11.80	1.98	2.20	0
	40	40	3.2	5.423	4.26	0	1.03	78.60	7.99	3.81	1.21	15.70	2.69	2.20	0
	50	50	2.3	4.426	3.47	0	1.36	69.90	11.10	3.97	1.58	14.00	3.04	3.10	0
	50	50	3.2	6.063	4.76	0	1.40	93.60	14.90	3.93	1.57	18.70	4.15	3.10	0
120	40	40	3.2	6.063	4.76	0	0.94	122.00	8.43	4.48	1.18	20.30	2.75	2.10	0
150	50	50	2.3	5.576	4.36	0	1.10	181.00	12.50	5.69	1.50	24.10	3.20	2.60	0
	50	50	3.2	7.663	6.02	0	1.14	244.00	16.90	5.64	1.48	32.50	4.37	2.60	0
	50	50	4.5	10.58	8.31	0	1.20	329.00	22.60	5.58	1.47	43.90	5.99	2.60	0
	75	75	4.0	11.47	9.00	0	2.06	404.00	64.20	5.93	2.36	53.90	11.80	4.60	0
	75	75	4.5	12.83	10.10	0	2.08	448.00	71.40	5.91	2.36	59.80	13.20	4.60	0
	75	75	6.0	16.82	13.20	0	2.15	573.00	91.90	5.84	2.34	76.40	17.20	4.60	0

ตารางที่ ก. 13 (ต่อ) Light Channels (TIS 1228 : 2006 / JIS G3192 : 1990)

Dimensios (mm)			Thickn (mm)	Sectional Area (cm^2)	Weight	Distance from CG. (cm)		Moment of Inertia (cm^4)		Radius of Gyration (cm)		Modulus of Section (cm^3)		Shear Distance (cm)	
H	A	B	t	A	(kg/m)	C x	C y	Ix	Iy	rx	ry	Zx	Zy	Sx	Sy
200	50	50	3.2	9.263	7.27	0	0.97	490	18.2	7.28	1.40	49.00	4.51	2.30	0
	50	50	4.0	11.47	9.00	0	1.00	600	22.2	7.23	1.39	60.00	5.55	2.20	0
	50	50	4.5	12.83	10.10	0	1.03	666	24.6	7.20	1.38	66.60	6.19	2.20	0
	75	75	6.0	19.82	15.60	0	1.87	1130	101.0	7.56	2.25	113.00	17.90	4.10	0
250	50	50	4.0	13.47	10.60	0	0.88	1050	23.3	8.81	1.32	83.70	5.66	2.00	0
	50	50	4.5	15.08	11.80	0	0.91	1160	25.9	8.78	1.31	93.00	6.31	2.00	0
	75	75	6.0	22.82	17.90	0	1.66	1940	107.0	9.23	2.17	155.00	18.40	3.70	0