

HANDBOOK OF STEEL CONSTRUCTION

**FIRST EDITION
SECOND PRINTING DECEMBER 1967**



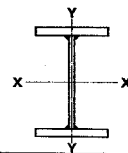
**CANADIAN
INSTITUTE OF STEEL CONSTRUCTION
1815 Yonge Street, Toronto 7, Ontario**

WELDED WIDE FLANGE SHAPES

Standard Web

WWF-S

PROPERTIES



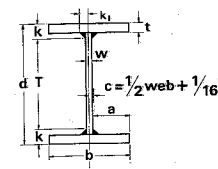
Nominal Size and Weight per Foot	Total Area	Area dw	h/w	d/A _f	Axis X-X				Axis Y-Y		
					I _x	S _x	r _x	Z _x	I _y	S _y	r _y
Lb.	In. ²	In. ²		In. ⁻¹	In. ⁴	In. ³	In.	In. ³	In. ⁴	In. ³	In.
48"											
320	94.03	36.00	60	1.60	38281	1595	20.18	1781	2002	200	4.61
299	88.03	36.00	60	1.78	35037	1460	19.95	1642	1460	162	4.07
279	82.03	36.00	60	2.00	31792	1325	19.69	1502	1026	128	3.54
253	74.41	36.00	61	2.40	27892	1162	19.36	1330	855	107	3.39
236	69.41	36.00	61	2.74	25160	1048	19.04	1213	573	81.9	2.87
213	62.78	36.00	61	3.43	21696	904	18.59	1061	459	65.6	2.70
200	58.78	36.00	61	4.00	19487	812	18.21	967	290	48.3	2.22
186	54.78	36.00	61	4.80	17277	720	17.76	873	168	33.7	1.75
42"											
276	81.09	28.88	57	1.56	25658	1222	17.79	1360	1459	162	4.24
255	75.09	28.88	57	1.75	23196	1105	17.58	1239	1025	128	3.69
229	67.44	28.88	57	2.10	20250	964	17.33	1089	854	107	3.56
212	62.44	28.88	57	2.40	18174	865	17.06	987	573	81.8	3.03
195	57.44	28.88	57	2.80	16097	766	16.74	885	361	60.2	2.51
176	51.78	28.88	58	3.50	13866	660	16.36	773	289	48.2	2.36
156	45.78	28.88	58	4.67	11344	540	15.74	650	123	27.3	1.64
142	41.62	28.88	59	6.22	9663	460	15.24	566	92.3	20.5	1.49
36"											
268	78.76	20.25	59	1.20	19602	1089	15.78	1191	2000	200	5.04
247	72.76	20.25	59	1.33	17816	990	15.65	1088	1458	162	4.48
227	66.76	20.25	59	1.50	16029	890	15.50	984	1024	128	3.92
201	59.04	20.25	60	1.80	13897	772	15.34	856	854	107	3.80
184	54.04	20.25	60	2.06	12387	688	15.14	769	572	81.7	3.25
167	49.04	20.25	60	2.40	10877	604	14.89	682	360	60.1	2.71
147	43.32	20.25	60	3.00	9250	514	14.61	586	288	48.1	2.58
134	39.32	20.25	60	3.60	8025	446	14.29	516	167	33.4	2.06
118	34.60	20.25	61	4.80	6643	369	13.86	435	126	25.1	1.90
33"											
242	71.07	18.56	53	1.22	14714	892	14.39	980	1458	162	4.53
221	65.07	18.56	53	1.37	13225	802	14.26	886	1024	128	3.97
201	59.07	18.56	53	1.57	11736	711	14.10	791	686	98.1	3.41
178	52.35	18.56	54	1.89	10200	618	13.96	689	572	81.7	3.31
161	47.35	18.56	54	2.20	8939	542	13.74	610	360	60.1	2.76
142	41.63	18.56	55	2.75	7589	460	13.50	522	288	48.1	2.63
128	37.63	18.56	55	3.30	6564	398	13.21	458	167	33.4	2.11
121	35.63	18.56	55	3.67	6052	367	13.03	426	122	27.1	1.85
107	31.41	18.56	56	4.89	5024	304	12.65	360	91.6	20.4	1.71

WELDED WIDE FLANGE SHAPES

Standard Web

WWF-S

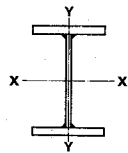
DIMENSIONS



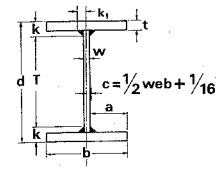
Wt. per Foot	Depth d	Flange		Web Thickness w	Distance						
		Width b	Mean Thickness t		a	T	k	k ₁	c		
Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.		
320	48	20	1.50	1 1/2	.750	3/4	9%	44 1/4	1 1/8	3/4	7/16
299	48	18	1.50	1 1/2	.750	3/4	8%	44 1/4	1 1/8	3/4	7/16
279	48	16	1.50	1 1/2	.750	3/4	7%	44 1/4	1 1/8	3/4	7/16
253	48	16	1.25	1 1/4	.750	3/4	7%	44 1/4	1 1/8	3/4	7/16
236	48	14	1.25	1 1/4	.750	3/4	6%	44 1/4	1 1/8	3/4	7/16
213	48	14	1.00	1	.750	3/4	6%	45 1/4	1 1/8	3/4	7/16
200	48	12	1.00	1	.750	3/4	5%	45 1/4	1 1/8	3/4	7/16
186	48	10	1.00	1	.750	3/4	4%	45 1/4	1 1/8	3/4	7/16
276	42	18	1.50	1 1/2	.687	1 1/16	8%	38 1/4	1 1/8	3/4	7/16
255	42	16	1.50	1 1/2	.687	1 1/16	7%	38 1/4	1 1/8	3/4	7/16
229	42	16	1.25	1 1/4	.687	1 1/16	7%	38 1/4	1 1/8	3/4	7/16
212	42	14	1.25	1 1/4	.687	1 1/16	6%	38 1/4	1 1/8	3/4	7/16
195	42	12	1.25	1 1/4	.687	1 1/16	5%	38 1/4	1 1/8	3/4	7/16
176	42	12	1.00	1	.687	1 1/16	5%	39 1/4	1 1/8	3/4	7/16
156	42	9	1.00	1	.687	1 1/16	4%	39 1/4	1 1/8	3/4	7/16
142	42	9	.750	3/4	.687	1 1/16	4%	39 1/4	1 1/8	3/4	7/16
268	36	20	1.50	1 1/2	.562	5/16	9%	32 1/2	1 1/8	5/8	3/8
247	36	18	1.50	1 1/2	.562	5/16	8%	32 1/2	1 1/8	5/8	3/8
227	36	16	1.50	1 1/2	.562	5/16	7%	32 1/2	1 1/8	5/8	3/8
201	36	16	1.25	1 1/4	.562	5/16	7%	32 1/2	1 1/8	5/8	3/8
184	36	14	1.25	1 1/4	.562	5/16	6%	32 1/2	1 1/8	5/8	3/8
167	36	12	1.25	1 1/4	.562	5/16	5%	32 1/2	1 1/8	5/8	3/8
147	36	12	1.00	1	.562	5/16	5%	33 1/2	1 1/8	5/8	3/8
134	36	10	1.00	1	.562	5/16	4%	33 1/2	1 1/8	5/8	3/8
118	36	10	.750	3/4	.562	5/16	4%	33 1/2	1 1/8	5/8	3/8
242	33	18	1.50	1 1/2	.562	5/16	8%	29 1/2	1 1/8	5/8	3/8
221	33	16	1.50	1 1/2	.562	5/16	7%	29 1/2	1 1/8	5/8	3/8
201	33	14	1.50	1 1/2	.562	5/16	6%	29 1/2	1 1/8	5/8	3/8
178	33	14	1.25	1 1/4	.562	5/16	6%	29 1/2	1 1/8	5/8	3/8
161	33	12	1.25	1 1/4	.562	5/16	5%	29 1/2	1 1/8	5/8	3/8
142	33	12	1.00	1	.562	5/16	5%	30 1/2	1 1/8	5/8	3/8
128	33	10	1.00	1	.562	5/16	4%	30 1/2	1 1/8	5/8	3/8
121	33	9	1.00	1	.562	5/16	4%	30 1/2	1 1/8	5/8	3/8
107	33	9	.750	3/4	.562	5/16	4%	30 1/2	1 1/8	5/8	3/8

WELDED WIDE FLANGE SHAPES
Standard Web
WWF-S

PROPERTIES



Nominal Size and Weight per Foot	Total Area	Area dw	h/w	d/A _f	Axis X-X				Axis Y-Y		
					I _x	S _x	r _x	Z _x	I _y	S _y	r _y
Lb.	In. ²	In. ²		In. ⁻¹	In. ⁴	In. ³	In.	In. ³	In. ⁴	In. ³	In.
30"											
210	61.70	15.00	54	1.25	10611	707	13.11	778	1024	128	4.07
189	55.70	15.00	54	1.43	9392	626	12.99	692	686	98.0	3.51
166	48.95	15.00	55	1.71	8140	543	12.90	600	572	81.7	3.42
149	43.95	15.00	55	2.00	7106	474	12.72	528	360	60.1	2.86
130	38.20	15.00	56	2.50	6000	400	12.53	449	288	48.1	2.75
116	34.20	15.00	56	3.00	5159	344	12.28	391	167	33.4	2.21
109	32.20	15.00	56	3.33	4738	316	12.13	362	122	27.1	1.95
100	29.37	15.00	57	4.00	4199	280	11.96	323	125	25.1	2.07
88	25.75	15.00	58	5.33	3443	230	11.56	270	76.3	16.9	1.72
27"											
173	50.91	11.81	56	1.35	7201	533	11.89	583	854	107	4.09
156	45.91	11.81	56	1.54	6371	472	11.78	519	572	81.7	3.53
139	40.91	11.81	56	1.80	5542	410	11.64	454	360	60.0	2.97
119	35.13	11.81	57	2.25	4658	345	11.51	383	288	48.0	2.86
106	31.13	11.81	57	2.70	3981	295	11.31	331	167	33.4	2.32
99	29.13	11.81	57	3.00	3643	270	11.18	305	122	27.0	2.04
89	26.28	11.81	58	3.60	3209	238	11.05	270	125	25.0	2.18
77	22.64	11.81	59	4.80	2600	193	10.72	222	76.1	16.9	1.83



WELDED WIDE FLANGE SHAPES
Standard Web
WWF-S

DIMENSIONS

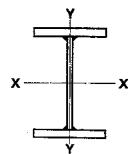
Wt. per Foot	Depth d	Flange		Web Thickness w	Distance						
		Width b	Mean Thickness t		a	T	k	k ₁	c		
Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.		
210	30	16	1.50	1 1/2	.500	1/2	7 3/4	26 3/8	1 13/16	3/16	5/16
189	30	14	1.50	1 1/2	.500	1/2	6 3/4	26 3/8	1 13/16	3/16	5/16
166	30	14	1.25	1 1/4	.500	1/2	6 3/4	26 3/8	1 1/16	3/16	5/16
149	30	12	1.25	1 1/4	.500	1/2	5 3/4	26 3/8	1 1/16	3/16	5/16
130	30	12	1.00	1	.500	1/2	5 3/4	27 3/8	1 5/16	3/16	5/16
116	30	10	1.00	1	.500	1/2	4 3/4	27 3/8	1 5/16	3/16	5/16
109	30	9	1.00	1	.500	1/2	4 3/4	27 3/8	1 5/16	3/16	5/16
100	30	10	.750	3/4	.500	1/2	4 3/4	28	1	1/2	5/16
88	30	9	.625	5/8	.500	1/2	4 3/4	28 1/4	3/8	1/2	5/16
173	27	16	1.25	1 1/4	.437	7/16	7 3/4	23 3/8	1 1/16	3/16	5/16
156	27	14	1.25	1 1/4	.437	7/16	6 3/4	23 3/8	1 1/16	3/16	5/16
139	27	12	1.25	1 1/4	.437	7/16	5 3/4	23 3/8	1 1/16	3/16	5/16
119	27	12	1.00	1	.437	7/16	5 3/4	24 3/8	1 5/16	3/16	5/16
106	27	10	1.00	1	.437	7/16	4 3/4	24 3/8	1 5/16	3/16	5/16
99	27	9	1.00	1	.437	7/16	4 3/4	24 3/8	1 5/16	3/16	5/16
89	27	10	.750	3/4	.437	7/16	4 3/4	25	1	1/2	5/16
77	27	9	.625	5/8	.437	7/16	4 3/4	25 1/4	3/8	1/2	5/16

WELDED WIDE FLANGE SHAPES

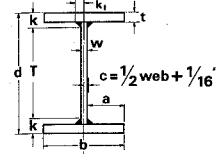
Reduced Web

WWF-R

PROPERTIES



Nominal Size and Weight per Foot	Total Area	Area dw	h/w	d/A _f	Axis X-X				Axis Y-Y		
					I _x	S _x	r _x	Z _x	I _y	S _y	r _y
Lb.	In. ²	In. ²		In. ⁻¹	In. ⁴	In. ³	In.	In. ³	In. ⁴	In. ³	In.
48"											
281	82.70	24.00	90	1.60	36340	1514	20.96		2000	200	4.92
261	76.70	24.00	90	1.78	33095	1379	20.77		1458	162	4.36
240	70.70	24.00	90	2.00	29851	1244	20.55		1024	128	3.81
214	62.95	24.00	91	2.40	25886	1079	20.28		854	107	3.68
197	57.95	24.00	91	2.74	23153	965	19.99		572	81.7	3.14
174	51.20	24.00	92	3.43	19623	818	19.58		458	65.4	2.99
151	44.37	24.00	93	4.57	15978	666	18.98		344	49.1	2.78
130	38.37	24.00	93	6.40	12629	526	18.14		126	25.1	1.81
42"											
242	71.26	18.38	89	1.56	24390	1161	18.50		1458	162	4.52
222	65.26	18.38	89	1.75	21928	1044	18.33		1024	128	3.96
195	57.48	18.38	90	2.10	18933	902	18.15		854	107	3.85
178	52.48	18.38	90	2.40	16857	803	17.92		572	81.7	3.30
155	45.70	18.38	91	3.00	14180	675	17.62		458	65.4	3.16
142	41.70	18.38	91	3.50	12499	595	17.31		288	48.1	2.63
122	35.84	18.38	93	4.67	10131	482	16.81		216	36.0	2.46
107	31.34	18.38	93	6.22	8216	391	16.19		91.4	20.3	1.71
36"											
254	74.63	15.75	75	1.20	19228	1068	16.05		2000	200	5.18
233	68.63	15.75	75	1.33	17441	969	15.94		1458	162	4.61
213	62.63	15.75	75	1.50	15655	870	15.81		1024	128	4.04
186	54.85	15.75	77	1.80	13506	750	15.69		854	107	3.94
169	49.85	15.75	77	2.06	11996	666	15.51		572	81.7	3.39
160	47.07	15.75	78	2.25	11291	627	15.49		683	85.4	3.81
146	43.07	15.75	78	2.57	10066	559	15.29		458	65.4	3.26
133	39.07	15.75	78	3.00	8841	491	15.04		288	48.0	2.72
119	35.07	15.75	78	3.60	7615	423	14.74		167	33.4	2.18
103	30.22	15.75	79	4.80	6194	344	14.32		125	25.1	2.04
33"											
223	65.45	12.38	80	1.22	14293	866	14.78		1458	162	4.72
193	56.63	12.38	81	1.47	12278	744	14.72		1215	135	4.63
176	51.63	12.38	81	1.65	11017	668	14.61		854	107	4.07
159	46.63	12.38	81	1.89	9757	591	14.46		572	81.7	3.50
149	43.82	12.38	83	2.06	9172	556	14.47		683	85.4	3.95
135	39.82	12.38	83	2.36	8148	494	14.30		458	65.4	3.39
122	35.82	12.38	83	2.75	7123	432	14.10		288	48.0	2.84
108	31.82	12.38	83	3.30	6099	370	13.84		167	33.4	2.29
92	26.94	12.38	84	4.40	4908	298	13.50		125	25.0	2.16



WELDED WIDE FLANGE SHAPES

Reduced Web

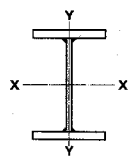
WWF-R

DIMENSIONS

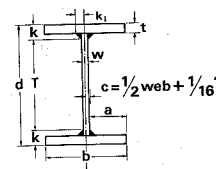
Wt. per Foot	Depth d	Flange		Web		Distance					
		Width b	Mean Thickness t	Thickness w		a	T	k	k ₁	c	
Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	
281	48	20	1.50	1 1/2	.500	1/2	9%	44%	1 13/16	1/16	5/16
261	48	18	1.50	1 1/2	.500	1/2	8%	44%	1 13/16	1/16	5/16
240	48	16	1.50	1 1/2	.500	1/2	7%	44%	1 13/16	1/16	5/16
214	48	16	1.25	1 1/4	.500	1/2	7%	44%	1 1/16	1/16	5/16
197	48	14	1.25	1 1/4	.500	1/2	6%	44%	1 1/16	1/16	5/16
174	48	14	1.00	1	.500	1/2	6%	45%	1 1/16	1/16	5/16
151	48	14	.750	3/4	.500	1/2	6%	46	1	1/2	5/16
130	48	10	.750	3/4	.500	1/2	4%	46	1	1/2	5/16
242	42	18	1.50	1 1/2	.437	7/16	8%	38%	1 13/16	1/16	5/16
222	42	16	1.50	1 1/2	.437	7/16	7%	38%	1 13/16	1/16	5/16
195	42	16	1.25	1 1/4	.437	7/16	7%	38%	1 1/16	1/16	5/16
178	42	14	1.25	1 1/4	.437	7/16	6%	38%	1 1/16	1/16	5/16
155	42	14	1.00	1	.437	7/16	6%	39%	1 1/16	1/16	5/16
142	42	12	1.00	1	.437	7/16	5%	39%	1 1/16	1/16	5/16
122	42	12	.750	3/4	.437	7/16	5%	40	1	1/2	5/16
107	42	9	.750	3/4	.437	7/16	4%	40	1	1/2	5/16
254	36	20	1.50	1 1/2	.437	7/16	9%	32%	1 13/16	1/16	5/16
233	36	18	1.50	1 1/2	.437	7/16	8%	32%	1 13/16	1/16	5/16
213	36	16	1.50	1 1/2	.437	7/16	7%	32%	1 13/16	1/16	5/16
186	36	16	1.25	1 1/4	.437	7/16	7%	32%	1 1/16	1/16	5/16
169	36	14	1.25	1 1/4	.437	7/16	6%	32%	1 1/16	1/16	5/16
160	36	16	1.00	1	.437	7/16	7%	33%	1 1/16	1/16	5/16
146	36	14	1.00	1	.437	7/16	6%	33%	1 1/16	1/16	5/16
133	36	12	1.00	1	.437	7/16	5%	33%	1 1/16	1/16	5/16
119	36	10	1.00	1	.437	7/16	4%	33%	1 1/16	1/16	5/16
103	36	10	.750	3/4	.437	7/16	4%	34	1	1/2	5/16
223	33	18	1.50	1 1/2	.375	3/8	8%	29%	1 13/16	1/2	1/4
193	33	18	1.25	1 1/4	.375	3/8	8%	29%	1 1/16	1/2	1/4
176	33	16	1.25	1 1/4	.375	3/8	7%	29%	1 1/16	1/2	1/4
159	33	14	1.25	1 1/4	.375	3/8	6%	29%	1 1/16	1/2	1/4
149	33	16	1.00	1	.375	3/8	7%	30%	1 1/16	1/2	1/4
135	33	14	1.00	1	.375	3/8	6%	30%	1 1/16	1/2	1/4
122	33	12	1.00	1	.375	3/8	5%	30%	1 1/16	1/2	1/4
108	33	10	1.00	1	.375	3/8	4%	30%	1 1/16	1/2	1/4
92	33	10	.750	3/4	.375	3/8	4%	31	1	1/2	1/4

WELDED WIDE FLANGE SHAPES
Reduced Web
WWF-R

PROPERTIES



Nominal Size and Weight per Foot	Total Area	Area dw	h/w	d/A _f	Axis X-X				Axis Y-Y		
					I _x	S _x	r _x	Z _x	I _y	S _y	r _y
Lb.	In. ²	In. ²		In. ⁻¹	In. ⁴	In. ³	In.	In. ³	In. ⁴	In. ³	In.
30"											
198	58.32	11.25	72	1.25	10406	694	13.36		1024	128	4.19
178	52.32	11.25	72	1.43	9187	612	13.25		686	98.0	3.62
155	45.51	11.25	73	1.71	7923	528	13.19		572	81.7	3.54
132	38.70	11.25	75	2.14	6613	441	13.07		458	65.4	3.44
118	34.70	11.25	75	2.50	5772	385	12.90		288	48.0	2.88
104	30.70	11.25	75	3.00	4930	329	12.67		167	33.4	2.33
98	28.81	11.25	76	3.33	4599	307	12.63		216	36.0	2.74
88	25.81	11.25	76	4.00	3958	264	12.38		125	25.0	2.20
80	23.41	11.25	77	4.80	3465	231	12.17		104	20.9	2.11
27"											
163	47.85	8.44	78	1.35	7048	522	12.14		853	107	4.22
146	42.85	8.44	78	1.54	6218	461	12.05		572	81.7	3.65
136	40.01	8.44	80	1.69	5848	433	12.09		683	85.3	4.13
122	36.01	8.44	80	1.93	5171	383	11.98		457	65.3	3.56
109	32.01	8.44	80	2.25	4495	333	11.85		288	48.0	3.00
89	26.09	8.44	82	3.00	3554	263	11.67		216	36.0	2.88
79	23.09	8.44	82	3.60	3037	225	11.47		125	25.0	2.33
73	21.59	8.44	82	4.00	2778	206	11.34		91.2	20.3	2.06
66	19.42	8.44	82	4.80	2422	179	11.17		76.0	16.9	1.98



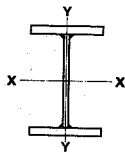
WELDED WIDE FLANGE SHAPES
Reduced Web
WWF-R

DIMENSIONS

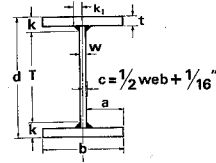
Wt. per Foot	Depth d	Flange		Web Thickness w		Distance					
		Width b	Mean Thickness t			a	T	k	k ₁	c	
Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	
198	30	16	1.50	1½	.375	¾	7%	26%	1½/16	½	¼
178	30	14	1.50	1½	.375	¾	6%	26%	1½/16	½	¼
155	30	14	1.25	1¼	.375	¾	6%	26%	1½/16	½	¼
132	30	14	1.00	1	.375	¾	6%	27%	1½/16	½	¼
118	30	12	1.00	1	.375	¾	5%	27%	1½/16	½	¼
104	30	10	1.00	1	.375	¾	4%	27%	1½/16	½	¼
98	30	12	.750	¾	.375	¾	5%	28	1	7/16	¼
88	30	10	.750	¾	.375	¾	4%	28	1	7/16	¼
80	30	10	.625	¾	.375	¾	4%	28½	¾	7/16	¼
163	27	16	1.25	1¼	.312	5/16	7%	23%	1½/16	½	¼
146	27	14	1.25	1¼	.312	5/16	6%	23%	1½/16	½	¼
136	27	16	1.00	1	.312	5/16	7%	24%	1½/16	½	¼
122	27	14	1.00	1	.312	5/16	6%	24%	1½/16	½	¼
109	27	12	1.00	1	.312	5/16	5%	24%	1½/16	½	¼
89	27	12	.750	¾	.312	5/16	5%	25	1	7/16	¼
79	27	10	.750	¾	.312	5/16	4%	25	1	7/16	¼
73	27	9	.750	¾	.312	5/16	4%	25	1	7/16	¼
66	27	9	.625	¾	.312	5/16	4%	25½	¾	7/16	¼

WELDED WIDE FLANGE SHAPES Thin Web WWF-T

PROPERTIES



Nominal Size and Weight per Foot	Total Area	Area dw	h/w	d/A _f	Axis X-X				Axis Y-Y		
					I _x	S _x	r _x	Z _x	I _y	S _y	r _y
Lb.	In. ²	In. ²		In. ⁻¹	In. ⁴	In. ³	In.	In. ³	In. ⁴	In. ³	In.
48"											
221	65.10	21.00	104	2.13	28128	1172	20.79		1215	135	4.32
204	60.10	21.00	104	2.40	25395	1058	20.56		854	107	3.77
187	55.10	21.00	104	2.74	22663	944	20.28		572	81.7	3.22
164	48.32	21.00	105	3.43	19116	796	19.89		458	65.4	3.08
141	41.47	21.00	106	4.57	15455	644	19.31		343	49.0	2.88
121	35.47	21.00	106	6.40	12106	504	18.47		125	25.1	1.88
42"											
204	60.01	15.75	105	1.87	20688	985	18.57		1215	135	4.50
187	55.01	15.75	105	2.10	18612	886	18.39		854	107	3.94
170	50.01	15.75	105	2.40	16536	787	18.18		572	81.7	3.38
147	43.20	15.75	107	3.00	13847	659	17.90		458	65.4	3.25
133	39.20	15.75	107	3.50	12165	579	17.62		288	48.0	2.71
113	33.31	15.75	108	4.67	9785	466	17.14		216	36.0	2.55
98	28.81	15.75	108	6.22	7870	375	16.53		91.3	20.3	1.78
36"											
179	52.76	13.50	89	1.80	13310	739	15.88		854	107	4.02
162	47.76	13.50	89	2.06	11800	656	15.72		572	81.7	3.46
139	40.95	13.50	91	2.57	9861	548	15.52		458	65.4	3.34
126	36.95	13.50	91	3.00	8636	480	15.29		288	48.0	2.79
112	32.95	13.50	91	3.60	7411	412	15.00		167	33.4	2.25
95	28.06	13.50	92	4.80	5980	332	14.60		125	25.0	2.11
33"											
129	37.88	10.31	99	2.36	7992	484	14.53		457	65.3	3.47
115	33.88	10.31	99	2.75	6968	422	14.34		288	48.0	2.92
102	29.88	10.31	99	3.30	5944	360	14.10		167	33.4	2.36
85	24.97	10.31	101	4.40	4746	288	13.79		125	25.0	2.24
30"											
126	36.95	9.38	90	2.14	6499	433	13.26		457	65.3	3.52
112	32.95	9.38	90	2.50	5657	377	13.10		288	48.0	2.96
98	28.95	9.38	90	3.00	4816	321	12.90		167	33.4	2.40
92	27.03	9.38	91	3.33	4479	299	12.87		216	36.0	2.83
82	24.03	9.38	91	4.00	3837	256	12.64		125	25.0	2.28
73	21.61	9.38	92	4.80	3341	223	12.43		104	20.8	2.20
27"											
90	26.37	6.75	100	2.70	3726	276	11.89		167	33.3	2.51
83	24.50	6.75	102	3.00	3467	257	11.90		216	36.0	2.97
73	21.50	6.75	102	3.60	2950	218	11.71		125	25.0	2.41
68	20.00	6.75	102	4.00	2692	199	11.60		91.2	20.3	2.13
61	17.81	6.75	103	4.80	2333	173	11.44		76.0	16.9	2.07



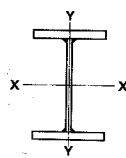
WELDED WIDE FLANGE SHAPES Thin Web WWF-T

DIMENSIONS

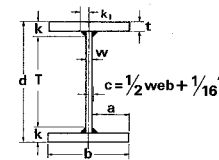
Wt. per Foot	Depth d	Flange		Web		Distance					
		Width b	Mean Thickness t	Thickness w		a	T	k	k ₁	c	
Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	
221	48	18	1.25	1 1/4	.437	7/16	8%	44%	1 1/16	9/16	5/16
204	48	16	1.25	1 1/4	.437	7/16	7%	44%	1 1/16	9/16	5/16
187	48	14	1.25	1 1/4	.437	7/16	6%	44%	1 1/16	9/16	5/16
164	48	14	1.00	1	.437	7/16	6%	45%	1 1/16	9/16	5/16
141	48	14	.750	3/4	.437	7/16	6%	46	1	1/2	5/16
121	48	10	.750	3/4	.437	7/16	4%	46	1	1/2	5/16
204	42	18	1.25	1 1/4	.375	3/8	8%	38%	1 1/16	1/2	1/4
187	42	16	1.25	1 1/4	.375	3/8	7%	38%	1 1/16	1/2	1/4
170	42	14	1.25	1 1/4	.375	3/8	6%	38%	1 1/16	1/2	1/4
147	42	14	1.00	1	.375	3/8	6%	39%	1 1/16	1/2	1/4
133	42	12	1.00	1	.375	3/8	5%	39%	1 1/16	1/2	1/4
113	42	12	.750	3/4	.375	3/8	5%	40	1	7/16	1/4
98	42	9	.750	3/4	.375	3/8	4%	40	1	7/16	1/4
179	36	16	1.25	1 1/4	.375	3/8	7%	32%	1 1/16	1/2	1/4
162	36	14	1.25	1 1/4	.375	3/8	6%	32%	1 1/16	1/2	1/4
139	36	14	1.00	1	.375	3/8	6%	33%	1 1/16	1/2	1/4
126	36	12	1.00	1	.375	3/8	5%	33%	1 1/16	1/2	1/4
112	36	10	1.00	1	.375	3/8	4%	33%	1 1/16	1/2	1/4
95	36	10	.750	3/4	.375	3/8	4%	34	1	7/16	1/4
129	33	14	1.00	1	.312	5/16	6%	30%	1 1/16	1/2	1/4
115	33	12	1.00	1	.312	5/16	5%	30%	1 1/16	1/2	1/4
102	33	10	1.00	1	.312	5/16	4%	30%	1 1/16	1/2	1/4
85	33	10	.750	3/4	.312	5/16	4%	31	1	7/16	1/4
126	30	14	1.00	1	.312	5/16	6%	27%	1 1/16	1/2	1/4
112	30	12	1.00	1	.312	5/16	5%	27%	1 1/16	1/2	1/4
98	30	10	1.00	1	.312	5/16	4%	27%	1 1/16	1/2	1/4
92	30	12	.750	3/4	.312	5/16	5%	28	1	7/16	1/4
82	30	10	.750	3/4	.312	5/16	4%	28	1	7/16	1/4
73	30	10	.625	3/4	.312	5/16	4%	28 1/4	7/8	7/16	1/4
90	27	10	1.00	1	.250	1/4	4%	24 1/2	1 1/4	3/8	3/16
83	27	12	.750	3/4	.250	1/4	5%	25	1	3/8	3/16
73	27	10	.750	3/4	.250	1/4	4%	25	1	3/8	3/16
68	27	9	.750	3/4	.250	1/4	4%	25	1	3/8	3/16
61	27	9	.625	3/4	.250	1/4	4%	25 1/4	7/8	3/8	3/16

WELDED WIDE FLANGE SHAPES
Column Sections
WWF-C

PROPERTIES



Nominal Size and Weight per Foot	Total Area	Area dw	h/w	d/A _f	Axis X-X				Axis Y-Y		
					I _x	S _x	r _x	Z _x	I _y	S _y	r _y
Lb.	In. ²	In. ²		In. ⁻¹	In. ⁴	In. ³	In.	In. ³	In. ⁴	In. ³	In.
20 x 20											
*443	130.28	40.00	8	0.40	8286	829	7.98	990	3344	334	5.07
*417	122.78	30.00	10	0.40	8146	815	8.15	961	3338	334	5.21
*392	115.28	20.00	15	0.40	8005	800	8.33	933	3335	334	5.38
*360	105.78	20.00	16	0.44	7454	745	8.39	861	3001	300	5.33
*327	96.28	20.00	16	0.50	6865	686	8.44	786	2668	267	5.26
314	92.28	15.00	21	0.50	6780	678	8.57	770	2667	267	5.38
297	87.47	15.00	22	0.53	6468	647	8.60	731	2501	250	5.35
281	82.66	15.00	22	0.57	6146	615	8.62	692	2334	233	5.31
265	77.84	15.00	22	0.62	5814	581	8.64	652	2167	217	5.28
248	73.03	15.00	23	0.67	5472	547	8.66	612	2001	200	5.23
232	68.22	15.00	23	0.73	5120	512	8.66	570	1834	183	5.19
224	65.98	12.50	28	0.73	5060	506	8.76	560	1834	183	5.27
208	61.13	12.50	28	0.80	4695	470	8.76	518	1667	167	5.22
191	56.29	12.50	28	0.89	4319	432	8.76	...	1500	150	5.16
175	51.45	12.50	29	1.00	3932	393	8.74	...	1334	133	5.09
158	46.60	12.50	29	1.14	3535	354	8.71	...	1167	117	5.00
142	41.76	12.50	30	1.33	3127	313	8.65	...	1000	100	4.89
18 x 18											
*395	116.28	36.00	7	0.40	5830	648	7.08	784	2439	271	4.58
*373	109.78	27.00	9	0.40	5739	638	7.23	763	2434	270	4.71
*351	103.28	18.00	13	0.40	5647	627	7.39	742	2431	270	4.85
*322	94.78	18.00	14	0.44	5275	586	7.46	685	2188	243	4.80
*293	86.28	18.00	14	0.50	4874	542	7.52	627	1945	216	4.75
281	82.78	13.50	19	0.50	4817	535	7.63	615	1945	216	4.85
267	78.47	13.50	19	0.53	4602	511	7.66	584	1823	203	4.82
252	74.16	13.50	19	0.57	4380	487	7.69	553	1702	189	4.79
237	69.84	13.50	20	0.62	4150	461	7.71	522	1580	176	4.76
223	65.53	13.50	20	0.67	3912	435	7.73	490	1459	162	4.72
208	61.22	13.50	20	0.73	3666	407	7.74	457	1337	149	4.67
201	59.23	11.25	24	0.73	3624	403	7.82	449	1337	148	4.75
187	54.88	11.25	25	0.80	3368	374	7.83	416	1215	135	4.71
172	50.54	11.25	25	0.89	3103	345	7.84	382	1094	122	4.65
165	48.57	9.00	32	0.89	3062	340	7.94	374	1094	122	4.75
150	44.20	9.00	32	1.00	2787	310	7.94	...	972	108	4.69
135	39.82	9.00	33	1.14	2503	278	7.93	...	851	94.5	4.62
120	35.37	9.00	33	1.33	2205	245	7.90	...	729	81.0	4.54
105	31.00	9.00	34	1.60	1903	212	7.84	...	608	67.5	4.43



WELDED WIDE FLANGE SHAPES
Column Sections
WWF-C

DIMENSIONS

Wt. per Foot	Depth d	Flange		Web		Distance					
		Width b	Mean Thickness t	Thickness w		a	T	k	k ₁	c	
Lb.	In.	In.	In.	In.		In.	In.	In.	In.	In.	
443	20	20	2.50	2 1/2	2.00	2	9	14 1/4	2 7/8	1 3/8	1 1/16
417	20	20	2.50	2 1/2	1.50	1 1/2	9 1/4	14 1/4	2 7/8	1 1/8	1 3/16
392	20	20	2.50	2 1/2	1.00	1	9 1/2	14 1/4	2 7/8	7/8	9/16
360	20	20	2.25	2 1/4	1.00	1	9 1/2	14 3/4	2 7/8	7/8	9/16
327	20	20	2.00	2	1.00	1	9 1/2	15 1/4	2 7/8	7/8	9/16
314	20	20	2.00	2	.750	3/4	9 5/8	15 1/4	2 7/8	3/4	7/16
297	20	20	1.88	1 7/8	.750	3/4	9 5/8	15 1/2	2 3/4	3/4	7/16
281	20	20	1.75	1 3/4	.750	3/4	9 5/8	15 3/4	2 3/8	3/4	7/16
265	20	20	1.62	1 5/8	.750	3/4	9 5/8	16	2	3/4	7/16
248	20	20	1.50	1 1/2	.750	3/4	9 5/8	16 1/4	1 7/8	3/4	7/16
232	20	20	1.38	1 1/8	.750	3/4	9 5/8	16 1/2	1 3/4	3/4	7/16
224	20	20	1.38	1 3/8	.625	5/8	9 3/4	16 5/8	1 11/16	5/8	3/8
208	20	20	1.25	1 1/4	.625	5/8	9 3/4	16 3/4	1 7/8	5/8	3/8
191	20	20	1.12	1 1/8	.625	5/8	9 3/4	17 1/8	1 7/8	5/8	3/8
175	20	20	1.00	1	.625	5/8	9 3/4	17 1/2	1 7/8	5/8	3/8
158	20	20	.875	7/8	.625	5/8	9 3/4	17 3/4	1 7/8	5/8	3/8
142	20	20	.750	3/4	.625	5/8	9 3/4	17 3/4	1 7/8	5/8	3/8
395	18	18	2.50	2 1/2	2.00	2	8	12 1/4	2 7/8	1 3/8	1 1/16
373	18	18	2.50	2 1/2	1.50	1 1/2	8 1/4	12 1/4	2 7/8	1 1/8	1 3/16
351	18	18	2.50	2 1/2	1.00	1	8 1/2	12 1/4	2 7/8	7/8	9/16
322	18	18	2.25	2 1/4	1.00	1	8 1/2	12 3/4	2 7/8	7/8	9/16
293	18	18	2.00	2	1.00	1	8 1/2	13 1/4	2 7/8	7/8	9/16
281	18	18	2.00	2	.750	3/4	8 3/4	13 1/4	2 7/8	3/4	7/16
267	18	18	1.88	1 7/8	.750	3/4	8 3/4	13 1/2	2 3/4	3/4	7/16
252	18	18	1.75	1 3/4	.750	3/4	8 3/4	13 3/4	2 3/4	3/4	7/16
237	18	18	1.62	1 5/8	.750	3/4	8 3/4	14	2	3/4	7/16
223	18	18	1.50	1 1/2	.750	3/4	8 3/4	14 1/4	1 7/8	3/4	7/16
208	18	18	1.38	1 1/8	.750	3/4	8 3/4	14 1/2	1 3/4	3/4	7/16
201	18	18	1.38	1 3/8	.625	5/8	8 3/4	14 3/4	1 11/16	5/8	3/8
187	18	18	1.25	1 1/4	.625	5/8	8 3/4	14 3/4	1 7/8	5/8	3/8
172	18	18	1.12	1 1/8	.625	5/8	8 3/4	15 1/8	1 7/8	5/8	3/8
165	18	18	1.12	1 1/8	.500	1/2	8 3/4	15 1/2	1 7/8	9/16	5/16
150	18	18	1.00	1	.500	1/2	8 3/4	15 3/4	1 7/8	9/16	5/16
135	18	18	.875	7/8	.500	1/2	8 3/4	15 3/4	1 3/8	9/16	5/16
120	18	18	.750	3/4	.500	1/2	8 3/4	16	1	1/2	3/16
105	18	18	.625	3/4	.500	1/2	8 3/4	16 1/4	7/8	1/2	5/16

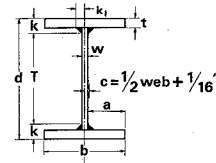
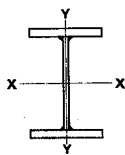
WELDED WIDE FLANGE SHAPES

Column Sections

WWF-C

PROPERTIES

Nominal Size and Weight per Foot	Total Area	Area dw	h/w	d/A _f	Axis X-X				Axis Y-Y		
					I _x	S _x	r _x	Z _x	I _y	S _y	r _y '
Lb.	In. ²	In. ²		In. ⁻¹	In. ⁴	In. ³	In.	In. ³	In. ⁴	In. ³	In.
16 x 16											
*310	91.28	16.00	11	0.40	3806	476	6.46	572	1708	214	4.33
*285	83.78	16.00	12	0.44	3569	446	6.53	530	1537	192	4.28
*259	76.78	16.00	12	0.50	3311	414	6.59	486	1366	171	4.23
249	73.28	12.00	16	0.50	3275	409	6.69	477	1366	171	4.32
236	69.47	12.00	16	0.53	3135	392	6.72	454	1280	160	4.29
223	65.66	12.00	17	0.57	2990	374	6.75	430	1195	149	4.27
210	61.84	12.00	17	0.62	2838	355	6.77	406	1110	139	4.24
197	58.03	12.00	17	0.67	2681	335	6.80	382	1024	128	4.20
184	54.22	12.00	18	0.73	2517	315	6.81	356	939	117	4.16
178	52.48	10.00	21	0.73	2489	311	6.89	350	939	117	4.23
165	48.63	10.00	22	0.80	2318	290	6.90	325	854	107	4.19
152	44.79	10.00	22	0.89	2140	267	6.91	299	768	96.0	4.14
146	43.07	8.00	28	0.89	2112	264	7.00	293	768	96.0	4.22
133	39.20	8.00	28	1.00	1926	241	7.01	266	683	85.4	4.17
120	35.32	8.00	29	1.14	1733	217	7.01	...	598	74.7	4.11
107	31.37	8.00	29	1.33	1530	191	6.98	...	512	64.0	4.04
94	27.50	8.00	30	1.60	1323	165	6.94	...	427	53.4	3.94
14 x 14											
*270	79.28	14.00	9	0.40	2417	345	5.52	424	1144	164	3.80
*247	72.78	14.00	10	0.44	2278	326	5.60	394	1030	147	3.76
*225	66.28	14.00	10	0.50	2125	304	5.66	362	916	131	3.72
217	63.78	10.50	13	0.50	2104	301	5.74	356	915	131	3.79
206	60.47	10.50	14	0.53	2019	288	5.78	339	858	123	3.77
194	57.16	10.50	14	0.57	1930	276	5.81	322	801	114	3.74
183	53.84	10.50	14	0.62	1837	262	5.84	305	744	106	3.72
172	50.53	10.50	15	0.67	1740	248	5.87	287	686	98.1	3.69
161	47.22	10.50	15	0.73	1638	234	5.89	268	629	89.9	3.65
155	45.73	8.75	18	0.73	1620	232	5.95	264	629	89.9	3.71
144	42.38	8.75	18	0.80	1512	216	5.97	245	572	81.7	3.67
133	39.04	8.75	19	0.89	1400	200	5.99	226	515	73.5	3.63
128	37.57	7.00	24	0.89	1383	198	6.07	221	515	73.5	3.70
116	34.20	7.00	24	1.00	1264	181	6.08	201	458	65.4	3.66
105	30.82	7.00	25	1.14	1140	163	6.08	181	400	57.2	3.60
100	29.29	5.25	33	1.14	1121	160	6.19	176	400	57.2	3.70
88	25.81	5.25	33	1.33	988	141	6.19	...	343	49.0	3.65



WELDED WIDE FLANGE SHAPES

Column Sections

WWF-C

DIMENSIONS

Wt. per Foot	Depth d	Flange		Web Thickness w		Distance					
		Width b	Mean Thickness t			a	T	k	k ₁	c	
Lb.	In.	In.	In.			In.	In.	In.	In.	In.	
310	16	16	2.50	2½	1.00	1	7½	10¼	2⅞	⅞	⅞
285	16	16	2.25	2¼	1.00	1	7½	10¼	2⅞	⅞	⅞
259	16	16	2.00	2	1.00	1	7½	11¼	2⅞	⅞	⅞
249	16	16	2.00	2	.750	¾	7⅞	11¼	2⅞	¾	⅞
236	16	16	1.88	1⅞	.750	¾	7⅞	11¼	2¼	¾	⅞
223	16	16	1.75	1¾	.750	¾	7⅞	11¼	2¼	¾	⅞
210	16	16	1.62	1⅝	.750	¾	7⅞	12	2	¾	⅞
197	16	16	1.50	1½	.750	¾	7⅞	12¼	1¾	¾	⅞
184	16	16	1.38	1⅜	.750	¾	7⅞	12½	1¾	¾	⅞
178	16	16	1.38	1⅜	.625	⅝	7¼	12½	1⅞	⅝	⅞
165	16	16	1.25	1¼	.625	⅝	7¼	12⅞	1⅞	⅝	⅞
152	16	16	1.12	1⅜	.625	⅝	7¼	13¼	1⅞	⅝	⅞
146	16	16	1.12	1⅜	.500	½	7¼	13¼	1⅞	⅞	⅞
133	16	16	1.00	1	.500	½	7¼	13¼	1⅞	⅞	⅞
120	16	16	.875	⅞	.500	½	7¼	13⅞	1⅞	⅞	⅞
107	16	16	.750	¾	.500	½	7¼	14	1	½	⅞
94	16	16	.625	⅝	.500	½	7¼	14¼	⅞	½	⅞
270	14	14	2.50	2½	1.00	1	6½	8¼	2⅞	⅞	⅞
247	14	14	2.25	2¼	1.00	1	6½	8¼	2⅞	⅞	⅞
225	14	14	2.00	2	1.00	1	6½	9¼	2⅞	⅞	⅞
217	14	14	2.00	2	.750	¾	6⅞	9¼	2⅞	¾	⅞
206	14	14	1.88	1⅞	.750	¾	6⅞	9¼	2¼	¾	⅞
194	14	14	1.75	1¾	.750	¾	6⅞	9¼	2¼	¾	⅞
183	14	14	1.62	1⅝	.750	¾	6⅞	10	2	¾	⅞
172	14	14	1.50	1½	.750	¾	6⅞	10¼	1⅞	¾	⅞
161	14	14	1.38	1⅜	.750	¾	6⅞	10½	1¾	¾	⅞
155	14	14	1.38	1⅜	.625	⅝	6¼	10½	1⅞	⅝	⅞
144	14	14	1.25	1¼	.625	⅝	6¼	10½	1⅞	⅝	⅞
133	14	14	1.12	1⅜	.625	⅝	6¼	11¼	1⅞	⅝	⅞
128	14	14	1.12	1⅜	.500	½	6¼	11¼	1⅞	⅞	⅞
116	14	14	1.00	1	.500	½	6¼	11¼	1⅞	⅞	⅞
105	14	14	.875	⅞	.500	½	6¼	11¼	1⅞	⅞	⅞
100	14	14	.875	⅞	.375	⅜	6⅞	11⅞	1⅞	½	⅞
88	14	14	.750	¾	.375	⅜	6⅞	12	1	⅞	⅞