

# SPECIFICATIONS FOR STRUCTURAL STEEL SHAPES

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## **ASTM – A36 - Standard Specification for Carbon Structural Steel.**

This specification covers shapes of structural quality for use in riveted, bolted, or welded construction of bridges and buildings, and for general structural purposes.

## **ASTM – A572 - Standard Specification for High-Strength Low-Alloy Structural Steel.**

This specification covers five grades of high-strength low-alloy shapes intended for riveted, bolted, or welded construction of bridges, or for other construction applications.

## **ASTM – A588 - Standard Specification for High-Strength Low-Alloy Structural Steel.**

This specification covers shapes for welded, riveted, or bolted construction but intended primarily for use in welded bridges and buildings where savings in weight or added durability is important. The atmospheric corrosion resistance of this steel in most environments is substantially better than that of carbon steels with or without copper addition.

## **ASTM – A709 - Standard Specification for Carbon and High Strength Low-Alloy Shapes.**

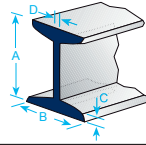
This specification covers shapes, and bars intended for use in bridges. Seven grades are available in four yield strengths.

## **ASTM – A992 - Standard Specification for Steel for Structural Shapes For Use in Building Framing.**

This specification covers rolled shapes for use in building framing or bridges, or for general structural purposes.

## Miscellaneous Beams

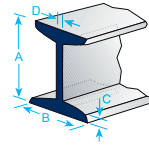
Standard Lengths 20' and 40'



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>M6</b>	4.4	6.00	1.844	0.171	0.114
<b>M8</b>	6.5	8.00	2.281	0.189	0.135
<b>M10</b>	8	9.95	2.690	0.182	0.141
	9	10.00	2.690	0.206	0.157
<b>M12</b>	10	11.97	3.250	0.180	0.149
	10.8	11.97	3.065	0.210	0.160
	11.8	12.00	3.065	0.225	0.177
<b>M12.5</b>	11.6	12.50	3.500	0.211	0.155
	12.4	12.53	3.750	0.228	0.155

## Standard "I" Beams

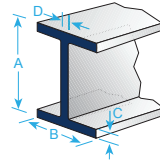
Standard Lengths 20'-60'



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>S3</b>	5.7	3.00	2.330	0.260	0.170
	7.5	3.00	2.509	0.260	0.349
<b>S4</b>	7.7	4.00	2.660	0.293	0.193
	9.5	4.00	2.796	0.293	0.326
<b>S5</b>	10	5.00	3.000	0.326	0.214
	14.75	5.00	3.284	0.326	0.494
<b>S6</b>	12.5	6.00	3.332	0.359	0.232
	17.25	6.00	3.565	0.359	0.465
<b>S7</b>	15.3	7.00	3.662	0.392	0.252
	20	7.00	3.860	0.392	0.450
<b>S8</b>	18.4	8.00	4.001	0.425	0.271
	23	8.00	4.171	0.425	0.441
<b>S10</b>	25.4	10.00	4.661	0.491	0.311
	35	10.00	4.944	0.491	0.594
<b>S12</b>	31.8	12.00	5.000	0.544	0.350
	35	12.00	5.078	0.544	0.428
	40.8	12.00	5.252	0.659	0.462
	50	12.00	5.477	0.659	0.687
<b>S15</b>	42.9	15.00	5.501	0.622	0.411
	50	15.00	5.640	0.622	0.550
<b>S18</b>	54.7	18.00	6.001	0.691	0.461
	70	18.00	6.251	0.691	0.711
<b>S20</b>	66	20.00	6.255	0.795	0.505
	75	20.00	6.385	0.795	0.635
	86	20.30	7.060	0.920	0.660
	96	20.30	7.200	0.920	0.800
<b>S24</b>	80	24.00	7.000	0.870	0.500
	90	24.00	7.125	0.870	0.625
	100	24.00	7.245	0.870	0.745
	106	24.50	7.870	1.090	0.620
	121	24.50	8.050	1.090	0.800

## Wide Flange Beams

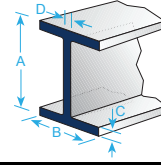
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W4</b>	13	4.16	4.060	0.345	0.280
<b>W5</b>	16	5.01	5.000	0.300	0.240
	19	5.15	5.030	0.430	0.270
<b>W6</b>	8.5	5.83	3.940	0.194	0.170
	9	5.90	3.940	0.215	0.170
	12	6.03	4.000	0.280	0.230
	16	6.28	4.030	0.405	0.260
<b>W6</b>	15	5.99	5.990	0.260	0.230
	20	6.20	6.020	0.365	0.260
	25	6.38	6.080	0.455	0.320
<b>W8</b>	10	7.89	3.940	0.205	0.170
	13	7.99	4.000	0.255	0.230
	15	8.11	4.015	0.315	0.245
<b>W8</b>	18	8.14	5.250	0.330	0.230
	21	8.28	5.270	0.400	0.250
<b>W8</b>	24	7.93	6.490	0.400	0.245
	28	8.06	6.535	0.465	0.285
<b>W8</b>	31	8.00	7.995	0.435	0.285
	35	8.12	8.020	0.495	0.310
	40	8.25	8.070	0.560	0.360
	48	8.50	8.110	0.685	0.400
	58	8.75	8.220	0.810	0.510
	67	9.00	8.280	0.935	0.570
<b>W10</b>	12	9.87	3.960	0.210	0.190
	15	9.99	4.000	0.270	0.230
	17	10.11	4.010	0.330	0.240
	19	10.24	4.020	0.395	0.250

## Wide Flange Beams

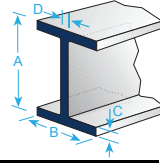
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W10</b>	22	10.17	5.750	0.360	0.240
	26	10.33	5.770	0.440	0.260
	30	10.47	5.810	0.510	0.300
<b>W10</b>	33	9.73	7.960	0.435	0.290
	39	9.92	7.985	0.530	0.315
	45	10.10	8.020	0.620	0.350
<b>W10</b>	49	9.98	10.000	0.560	0.340
	54	10.09	10.030	0.615	0.370
	60	10.22	10.080	0.680	0.420
	68	10.40	10.130	0.770	0.470
	77	10.60	10.190	0.870	0.530
	88	10.84	10.265	0.990	0.605
	100	11.10	10.340	1.120	0.680
	112	11.36	10.415	1.250	0.755
<b>W12</b>	14	11.91	3.970	0.225	0.022
	16	11.99	3.990	0.265	0.220
	19	12.16	4.005	0.350	0.235
	22	12.31	4.030	0.425	0.260
<b>W12</b>	26	12.22	6.490	0.380	0.230
	30	12.34	6.520	0.440	0.260
	35	12.50	6.560	0.520	0.300
<b>W12</b>	40	11.94	8.005	0.515	0.295
	45	12.06	8.045	0.575	0.335
	50	12.19	8.080	0.640	0.370
<b>W12</b>	53	12.06	9.995	0.757	0.345
	58	12.19	10.010	0.640	0.360

## Wide Flange Beams

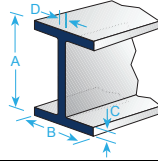
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W12</b>	65	12.12	12.000	0.605	0.390
	72	12.25	12.040	0.670	0.430
	79	12.38	12.080	0.735	0.470
	87	12.53	12.125	0.810	0.515
	96	12.71	12.160	0.900	0.550
	106	12.89	12.220	0.990	0.610
	120	13.12	12.320	1.105	0.710
	136	13.41	12.400	1.250	0.790
	152	13.71	12.480	1.400	0.870
	170	14.03	12.570	1.560	0.960
	190	14.38	12.670	1.735	1.060
	210	14.71	12.790	1.900	1.180
	230	15.05	12.895	2.070	1.285
	252	15.41	13.005	2.250	1.395
	279	15.85	13.140	2.470	1.530
305	16.32	13.235	2.705	1.625	
336	16.82	13.385	2.955	1.775	
<b>W14</b>	22	13.74	5.000	0.335	0.230
	26	13.91	5.025	0.420	0.255
<b>W14</b>	30	13.84	6.730	0.385	0.270
	34	13.98	6.785	0.455	0.285
	38	14.10	6.770	0.515	0.310
<b>W14</b>	43	13.66	7.995	0.530	0.305
	48	13.79	8.030	0.595	0.340
	53	13.92	8.060	0.660	0.370
	61	13.89	9.995	0.645	0.375
	68	14.04	10.035	0.720	0.415
	74	14.17	10.070	0.785	0.450
	82	14.31	10.130	0.855	0.510

## Wide Flange Beams

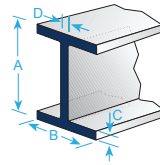
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W14</b>	90	14.02	14.520	0.710	0.440
	99	14.16	14.565	0.780	0.485
	109	14.32	14.605	0.860	0.525
	120	14.48	14.670	0.940	0.590
	132	14.66	14.725	1.030	0.645
<b>W14</b>	145	14.78	15.500	1.090	0.680
	159	14.98	15.565	1.190	0.745
	176	15.22	15.650	1.310	0.830
	193	15.48	15.710	1.440	0.890
	211	15.72	15.800	1.560	0.980
	233	16.04	15.890	1.720	1.070
	257	16.38	15.995	1.890	1.175
	283	16.74	16.110	2.070	1.290
	311	17.12	16.230	2.260	1.410
	342	17.54	16.360	2.470	1.540
	370	17.92	16.475	2.660	1.655
	398	18.29	16.590	2.845	1.770
	426	18.67	16.695	3.035	1.875
	455	19.02	16.835	3.210	2.015
	500	19.60	17.010	3.500	2.190
550	20.24	17.200	3.820	2.380	
605	20.92	17.415	4.160	2.595	
665	21.64	17.650	4.520	2.830	
730	22.42	17.890	4.910	3.070	
<b>W16</b>	26	15.69	5.500	0.345	0.250
	31	15.88	5.525	0.440	0.275
	36	15.86	6.985	0.430	0.295
	40	16.01	6.995	0.505	0.305
	45	16.13	7.035	0.565	0.345
	50	16.26	7.070	0.630	0.380
	57	16.43	7.120	0.715	0.430

## Wide Flange Beams

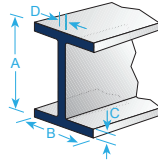
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W16</b>	67	16.33	10.235	0.665	0.395
	77	16.52	10.295	0.760	0.455
	89	16.75	10.365	0.875	0.525
	100	16.97	10.425	0.985	0.585
<b>W18</b>	35	17.70	6.000	0.425	0.300
	40	17.90	6.015	0.525	0.315
	46	18.06	6.060	0.605	0.360
<b>W18</b>	41	17.70	7.450	0.530	0.320
	45	17.86	7.480	0.500	0.340
	50	17.99	7.495	0.570	0.355
	55	18.11	7.530	0.630	0.390
	60	18.24	7.555	0.695	0.415
	65	18.35	7.590	0.750	0.450
	71	18.47	7.635	0.810	0.495
<b>W18</b>	76	18.21	11.035	0.680	0.425
	86	18.39	11.090	0.770	0.480
	97	18.59	11.145	0.870	0.535
	106	18.73	11.200	0.940	0.590
	119	18.97	11.265	1.060	0.655
	130	19.25	11.160	1.200	0.670
	143	19.49	11.220	1.320	0.730
	158	19.72	11.300	1.440	0.810
	175	20.04	11.375	1.590	0.890
	192	20.35	11.455	1.750	0.960
	211	20.67	11.555	1.910	1.060
	234	21.06	11.650	2.110	1.160
	258	21.46	11.770	2.300	1.280
	283	21.85	11.890	2.500	1.400
311	22.32	12.005	2.740	1.520	

## Wide Flange Beams

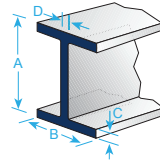
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W21</b>	44	20.66	6.500	0.450	0.350
	50	20.83	6.530	0.535	0.380
	57	21.06	6.555	0.650	0.405
<b>W21</b>	48	20.62	8.140	0.430	0.035
	55	20.80	8.220	0.522	0.375
	62	20.99	8.240	0.615	0.400
	68	21.13	8.270	0.685	0.430
	73	21.24	8.295	0.740	0.455
	83	21.43	8.355	0.835	0.515
	93	21.62	8.420	0.930	0.580
<b>W21</b>	101	21.36	12.290	0.800	0.500
	111	21.51	12.340	0.875	0.550
	122	21.68	12.390	0.960	0.600
	132	21.83	12.440	1.035	0.650
	147	22.06	12.510	1.150	0.720
	166	22.48	12.420	1.360	0.750
	182	22.72	12.500	1.480	0.830
	201	23.03	12.560	1.630	0.910
	223	23.35	12.680	1.790	1.000
	248	23.74	12.775	1.990	1.110
<b>W24</b>	55	23.57	7.005	0.505	0.395
	62	23.74	7.040	0.590	0.430

## Wide Flange Beams

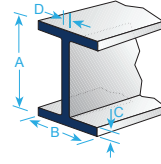
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W24</b>	56	23.48	8.900	0.460	0.355
	61	23.56	8.930	0.500	0.380
	68	23.73	8.965	0.585	0.415
	76	23.92	8.990	0.680	0.440
	84	24.10	9.200	0.770	0.470
	94	24.31	9.065	0.875	0.515
	103	24.53	9.000	0.980	0.550
<b>W24</b>	104	24.06	12.750	0.750	0.500
	117	24.26	12.800	0.850	0.550
	131	24.48	12.855	0.960	0.605
	146	24.74	12.900	1.090	0.650
	162	25.00	12.995	1.220	0.705
	176	25.24	12.890	1.340	0.750
	192	25.47	12.950	1.460	0.810
	207	25.71	13.010	1.570	0.870
	229	26.02	13.110	1.730	0.960
	250	26.34	13.185	1.890	1.040
	279	26.73	13.305	2.090	1.160
	306	27.13	13.405	2.280	1.260
	335	27.52	13.520	2.480	1.380
	370	27.99	13.660	2.720	1.520

## Wide Flange Beams

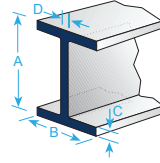
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W27</b>	84	26.71	9.960	0.640	0.460
	94	26.92	9.990	0.745	0.490
	102	27.09	10.015	0.830	0.515
	114	27.29	10.070	0.930	0.570
	129	27.63	10.010	1.100	0.610
<b>W27</b>	146	27.38	13.965	0.975	0.605
	161	27.59	14.020	1.080	0.660
	178	27.81	14.085	1.190	0.725
	194	28.11	14.035	1.340	0.750
	217	28.43	14.115	1.500	0.830
	235	28.66	14.190	1.610	0.910
	258	28.98	14.270	1.770	0.980
	281	29.29	14.350	1.930	1.060
	307	29.61	14.445	2.090	1.160
	336	30.00	14.545	2.280	1.260
368	30.39	14.665	2.480	1.380	
<b>W30</b>	90	29.53	10.400	0.610	0.470
	99	29.65	10.450	0.670	0.520
	108	29.83	10.475	0.760	0.545
	116	30.01	10.495	0.850	0.565
	124	30.17	10.515	0.930	0.585
	132	30.31	10.545	1.000	0.615
	148	30.67	10.480	1.180	0.650

## Wide Flange Beams

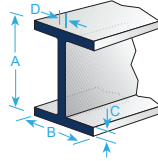
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W30</b>	173	30.44	14.985	1.065	0.655
	191	30.68	15.040	1.185	0.710
	211	30.94	15.105	1.315	0.775
	235	31.30	15.055	1.500	0.830
	261	31.61	15.155	1.650	0.930
	292	32.01	15.255	1.850	1.020
	326	32.40	15.370	2.050	1.140
	357	32.80	15.470	2.240	1.240
	391	33.19	15.590	2.440	1.360
<b>W33</b>	118	32.86	11.480	0.740	0.550
	130	33.09	11.510	0.855	0.580
	141	33.30	11.535	0.960	0.605
	152	33.49	11.565	1.055	0.635
	169	33.82	11.500	1.220	0.670
<b>W33</b>	201	33.68	15.745	1.150	0.715
	221	33.93	15.805	1.275	0.775
	241	34.18	15.860	1.400	0.830
	263	34.53	15.805	1.570	0.870
	291	34.84	15.905	1.730	0.960
	318	35.16	15.985	1.890	1.040
	354	35.55	16.100	2.090	1.160
	387	35.95	16.200	2.280	1.260

## Wide Flange Beams

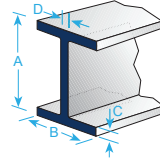
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W36</b>	135	35.55	11.900	0.790	0.600
	150	35.85	11.975	0.940	0.625
	160	36.01	12.000	1.020	0.650
	170	36.17	12.030	1.100	0.680
	182	36.33	12.075	1.180	0.725
	194	36.49	12.115	1.260	0.765
	210	36.69	12.180	1.360	0.830
	232	37.12	12.120	1.570	0.960
	256	37.43	12.215	1.730	0.870
<b>W36</b>	231	36.49	16.470	1.260	0.760
	247	36.67	16.510	1.350	0.800
	262	36.85	16.550	1.440	0.840
	282	37.11	16.595	1.570	0.885
	302	37.33	16.655	1.680	0.945
	330	37.67	16.630	1.850	1.020
	361	37.99	16.730	2.010	1.120
	395	38.41	16.830	2.200	1.220
	441	38.85	16.965	2.440	1.360
	487	39.33	17.086	2.681	1.500
	529	39.80	17.205	2.909	1.610
	652	41.06	17.559	3.539	1.968

## Wide Flange Beams

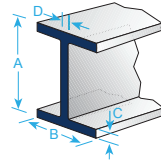
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W40</b>	149	38.20	11.810	0.830	0.630
	167	38.59	11.810	1.025	0.650
	183	38.98	11.810	1.220	0.650
	211	39.37	11.811	1.413	0.752
	235	39.68	11.890	1.575	0.831
	264	40.00	11.929	1.728	0.961
	278	40.16	11.968	1.811	1.024
	294	40.39	12.008	1.929	1.059
	327	40.79	12.126	2.130	1.181
	331	40.79	12.165	2.126	1.220
392	41.57	12.362	2.520	1.417	
<b>W40</b>	199	38.67	15.750	1.065	0.650
	215	38.98	15.750	1.220	0.650
	249	39.38	15.750	1.420	0.750
	277	39.69	15.830	1.575	0.830
	297	39.84	15.825	1.650	0.930
	324	40.16	15.905	1.810	1.000
	362	40.55	16.020	2.010	1.120
	372	40.63	16.060	2.050	1.160
	397	40.95	16.120	2.200	1.220
	431	41.26	16.220	2.363	1.339
	503	42.05	16.417	2.756	1.535
	593	42.99	16.693	3.228	1.791

## Wide Flange Beams

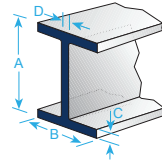
Standard Lengths 20'-70' in 5'0" increments



Section Number	Weight Per/Foot	A	B	C	D
		Depth of Section	Flange Width	Flange Thickness	Web Thickness
	lb.	in.	in.	in.	in.
<b>W44</b>	230	42.91	15.750	1.220	0.710
	262	43.31	15.750	1.420	0.790
	290	43.62	15.830	1.580	0.870
	335	44.02	15.950	1.770	1.020

## Standard "H" Pile Beams

Standard Lengths 20'-70' in 5'0" increments



Section Number	A		B		C		D	
	Weight	Depth of	Flange	Flange	Flange	Web		
	Per/Foot	Section	Width	Thickness	Thickness	Thickness		
	lb.	in.	in.	in.	in.	in.		
<b>HP 8</b>	36	8.02	8.155	0.445	0.445			
	57	10.00	10.225	0.565	0.565			
<b>HP 12</b>	53	11.78	12.045	0.435	0.435			
	63	11.94	12.125	0.515	0.515			
	74	12.13	12.215	0.605	0.605			
	84	12.28	12.295	0.685	0.685			
	89	12.40	12.330	0.720	0.720			
<b>HP 14</b>	73	13.61	14.585	0.505	0.505			
	89	13.83	14.695	0.615	0.615			
	102	14.01	14.785	0.705	0.705			
	117	14.21	14.885	0.805	0.805			
<b>HP 16</b>	88	15.30	15.665	0.540	0.540			
	101	15.50	15.750	0.625	0.625			
	121	15.80	15.875	0.750	0.750			
	141	16.00	16.000	0.875	0.875			
	162	16.30	16.125	1.000	1.000			
	183	16.50	16.250	1.125	1.125			
<b>HP 18</b>	135	17.50	17.750	0.750	0.750			
	157	17.70	17.870	0.870	0.870			
	181	18.00	18.000	1.000	1.000			
	204	18.30	18.125	1.125	1.125			