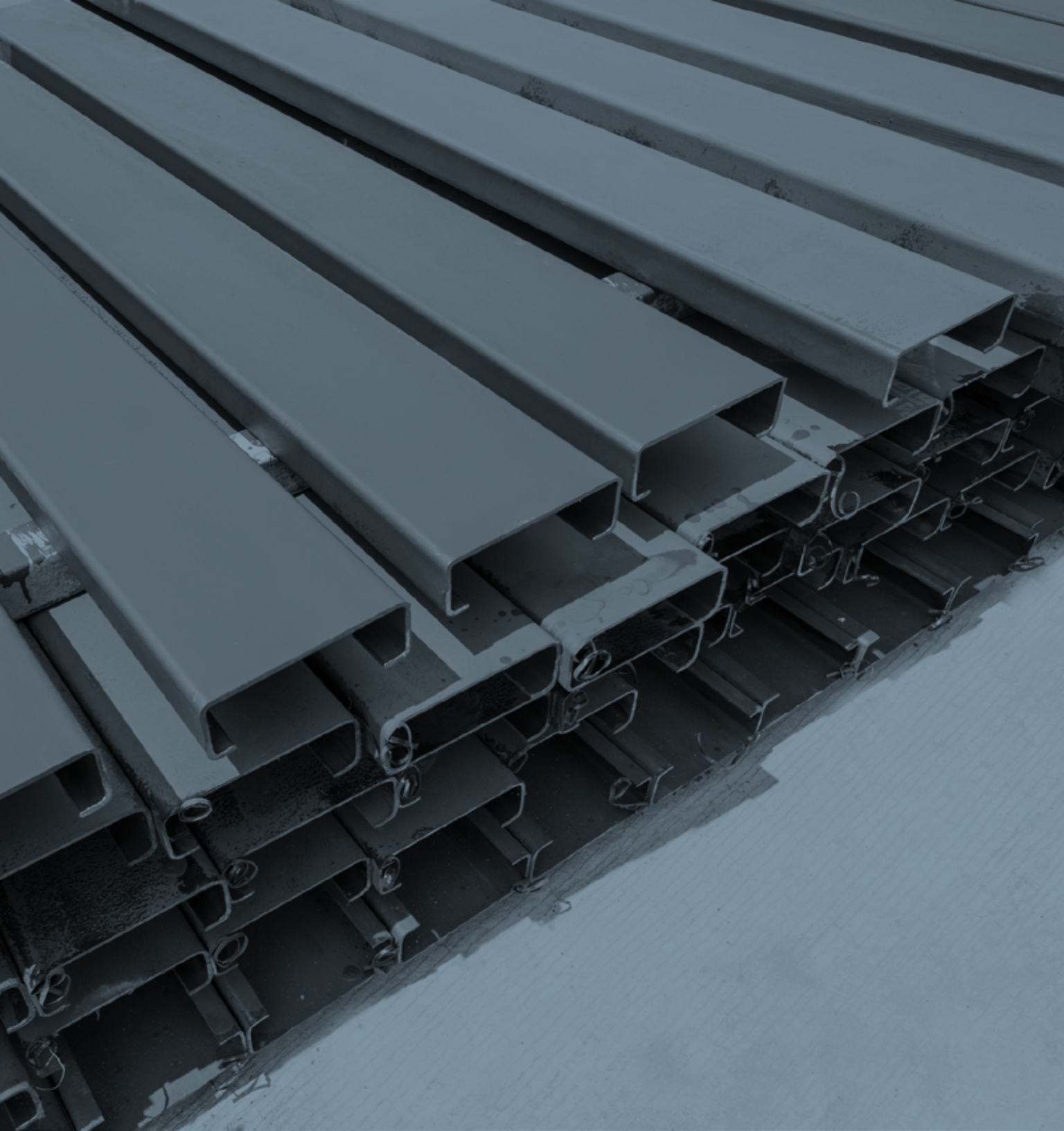




**Carbon Resource Guide**

# **STRUCTURAL SHAPES**

**WEIGHTS & TYPES**



# Structural Shapes

Structural shapes are those whose greatest dimension, not including length, is three inches or greater.

## Applications

ASTM A36 is utilized in riveted, bolted or welded construction in a wide variety of products such as bridges and buildings.

ASTM A572 Grade 50 (high strength, low alloy) structurals are intended for use in riveted or welded fabrication of bridges, buildings and other critical structures where greater strength is required. High strength, low alloy shapes provide excellent strength to weight ratios and in some cases improves resistance to atmospheric corrosion.

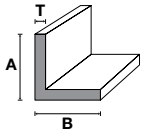
ASTM A992 wide flange beams are dual specification meeting the requirements of ASTM A36 and of ASTM A572 Grade 50.

## Weldability

When any grade of steel is used in welded construction, procedures must be suitable for the steel and the intended service.

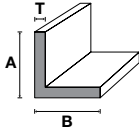
ASTM A36 steel presents no welding problems when using all welding processes. The quality of the welds is generally extremely high for both welds and joints. Welding rod specifications are dependent on welding condition such as the thickness of the sections to be welded, service requirements and design. High strength, low alloy grades such as A572 Grade 50 are weldable with welding techniques suitable for the grade and intended service application.

## Structural Angles



		Size				
A		B		T	Weight Per Foot	Weigth Per 40' Bar
3	x	2	x	3/16	3.073	122.92
				1/4	4.104	164.16
				5/16	5.005	200.20
				3/8	5.906	236.24
				1/2	7.707	308.28
3	x	2 1/2	x	3/16	3.393	135.72
				1/4	4.504	180.16
				5/16	5.605	224.20
				3/8	6.606	264.24
				1/2	8.508	340.32
3	x	3	x	3/16	3.714	148.56
				1/4	4.905	196.20
				5/16	6.106	244.24
				3/8	7.207	288.28
				1/2	9.409	376.36
3 1/2		2 1/2	x	3/16	3.393	135.72
				1/4	4.905	196.20
				5/16	6.106	244.24
				3/8	7.207	288.28
				1/2	9.409	376.36
3 1/2	x	3	x	1/4	5.405	216.20
				5/16	6.606	264.24
				3/8	7.907	316.28
				1/2	10.210	408.40
				3 1/2	x	3 1/2
5/16	7.207	288.28				
3/8	8.805	340.32				
1/2	11.110	444.40				
4	x	3	x			
				5/16	7.207	288.28
				3/8	8.508	340.32

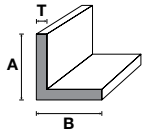
## Structural Angles (Continued)



		Size				
A		B		T	Weight Per Foot	Weighth Per 40' Bar
				1/2	11.110	444.40
				5/8	13.613	544.52
4	x	3 1/2	x	1/4	6.206	248.24
				5/16	7.707	308.28
				3/8	9.109	364.36
				1/2	11.911	476.44
4	x	4	x	1/4	6.606	264.24
				5/16	8.208	328.32
				3/8	9.809	392.36
				1/2	12.812	512.48
				5/8	15.715	628.60
				3/4	18.517	740.68
5	x	3	x	1/4	6.606	264.24
				5/16	8.208	328.32
				3/8	9.809	392.36
				1/2	12.812	512.48
				5/8	15.715	628.60
5	x	3 1/2	x	1/4	7.007	280.28
				5/16	8.708	348.32
				3/8	10.410	416.40
				1/2	13.613	544.52
				5/8	16.816	672.64
				3/4	19.810	792.76
5	x	5	x	5/16	10.310	412.40
				3/8	12.312	492.48
				7/16	14.313	572.52
				1/2	16.215	648.60
				5/8	20.019	800.76
				3/4	23.622	944.88
6	x	3 1/2	x	1/4	7.907	316.28
				5/16	9.809	392.36

Please Note: Most Structural Angles are stocked in 20', 30' and 40' lengths.

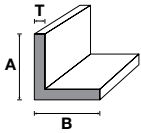
## Structural Angles (Continued)



		Size				
D	W	T	Weight Per Foot	Weight Per 40' Bar		
6	x	3 1/2	x	3/8	11.711	468.44
				1/2	15.314	612.56
				5/8	19.018	760.72
6	x	4	x	5/16	10.310	412.40
				3/8	12.312	492.48
				7/16	14.313	572.52
				1/2	16.215	648.60
				5/8	20.019	800.76
				3/4	23.622	944.88
6	x	6	x	1/4	9.989	399.56
				5/16	12.512	500.48
				3/8	14.914	596.56
				7/16	17.216	688.64
				1/2	19.618	784.72
				5/8	24.223	968.92
				3/4	28.727	1149.08
				1	37.435	1497.40
7	x	4	x	3/8	13.613	544.52
				7/16	15.815	632.60
				1/2	17.917	716.68
				5/8	22.121	884.84
				3/4	26.225	1049.00
8	x	4	x	1/2	19.618	784.72
				3/4	28.727	1149.08
				1	37.435	1497.40
8	x	6	x	1/2	23.022	920.88
				5/8	28.527	1141.08
				3/4	33.832	1353.28
8	x	8	x	1	44.242	1769.68
				1/2	26.425	1057.00
				5/8	32.731	1309.24

Please Note: Most Structural Angles are stocked in 20', 30' and 40' lengths.

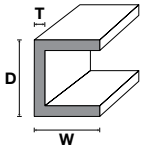
## Structural Angles (Continued)



Size					Weight Per Foot	Weight Per 40' Bar
D	W		T			
			3/4		38.937	1557.48
			1		51.408	2041.92
9	x	4	x	1/2	21.320	852.80
			3/4		31.300	1252.00

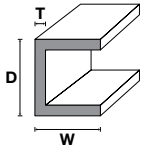
Please Note: Most Structural Angles are stocked in 20', 30', and 40' lengths.

## Structural Channels



Size					Weight Per 40' Bar
D	Lbs./ Foot	W	T		
3	3.5	1.375	.135	140	
	4.1	1.410	.170	164	
	5.0	1.498	.258	200	
4	6.0	1.596	.356	240	
	4.5	1.560	.140	180	
	5.4	1.580	.180	216	
5	6.25	1.647	.247	250	
	7.25	1.720	.320	290	
	6.7	1.750	.190	268	
6	9.0	1.885	.325	360	
	8.2	1.920	.200	328	
	10.5	2.034	.314	420	
7	13.0	2.157	.437	520	
	9.8	2.090	.210	392	
	12.25	2.194	.314	490	
8	14.75	2.299	.419	590	
	11.50	2.260	.220	460	
	13.75	2.343	.303	550	
9	18.75	2.527	.487	750	
	13.4	2.430	.230	536	

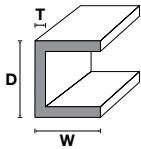
## Structural Channels (Continued)



Size				
D	Lbs./ Foot	W	T	Weight Per 40' Bar
9	15.0	2.485	.285	600
	20.0	2.648	.448	800
10	15.3	2.600	.240	612
	20.0	2.739	.379	800
	25.0	2.886	.526	1000
	30.0	3.033	.673	1200
12	20.7	2.940	.280	828
	25.0	3.047	.387	1000
	30.0	3.107	.510	1200
15	33.9	3.400	.400	1356
	40.0	3.520	.520	1600
	50.0	3.716	.716	2000

Please Note: Most Structural Channels are available in 20', 30', 40', 50' and 60' lengths.

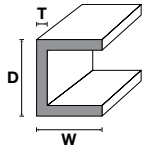
## Misc. Structural Channels



Size				
D	Lbs./ Foot	W	T	Weight Per 40' Bar
3	7.1	1.938	.312	284
4	13.8	2.500	.500	552
6	6.5	1.875	.125	260
	7.0	1.875	.188	280
	12.0	2.500	.313	480
	15.1	2.940	.313	604
	15.3	3.500	.340	612
	16.3	3.000	.375	652
7	18.0	3.500	.375	720
	19.1	3.450	.350	764
	22.7	3.603	.503	908

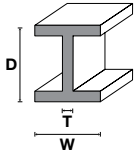


## Misc. Structural Channels (Continued)



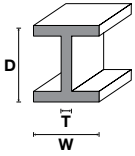
Size				
D	Lbs./ Foot	W	T	Weight Per 40' Bar
8	6.6	1.750	.125	264
	8.5	1.875	.188	340
	18.7	2.978	.353	748
	20.0	3.025	.400	800
	21.4	3.450	.375	856
	22.8	3.500	.425	912
10	6.5	1.125	.150	260
	8.4	1.500	.170	336
	22.0	3.315	.290	880
	25.0	3.405	.380	1000
	28.5	3.950	.425	1140
	33.6	4.100	.575	1244
12	41.1	4.321	.796	1644
	10.6	1.500	.190	424
	31.0	3.670	.370	1240
	35.0	3.767	.467	1400
	40.0	3.890	.590	1600
	45.0	4.012	.712	1800
13	50.0	4.135	.835	2000
	31.8	4.000	.375	1272
	50.0	4.412	.787	2000
18	42.7	3.950	.450	1708
	45.8	4.000	.500	1832
	51.9	4.100	.600	2076
	58.0	4.200	.700	2320

# Wide Flange Beams



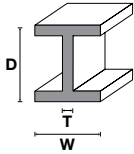
Size						Size					
Lbs/Ft			D	W	T	Lbs/F			D	W	T
4	x	13	4.16	4.060	.280			45	10.10	8.020	.350
5	x	16	5.01	5.000	.240	10	x	49	9.98	10.000	.340
		19	5.15	5.030	.270			54	10.09	10.030	.370
6	x	9	5.90	3.940	.170			60	10.22	10.080	.420
		12	6.03	4.000	.230			68	10.40	10.130	.470
		16	6.28	4.030	.260			77	10.60	10.190	.530
6	x	15	5.99	5.990	.230			88	10.84	10.265	.605
		20	6.20	6.020	.260			100	11.10	10.340	.680
		25	6.38	6.080	.320	10	x	112	11.36	10.415	.755
8	x	10	7.89	3.940	.180	12	x	14	11.91	3.970	.200
		13	7.99	4.000	.240			16	11.99	3.990	.220
		15	8.12	4.015	.250			19	12.16	4.0005	.235
8	x	18	8.14	5.250	.230			22	12.31	4.030	.260
		21	8.28	5.270	.250	12	x	26	12.22	6.490	.230
8	x	24	7.93	6.495	.245			30	12.34	6.520	.260
		28	8.06	6.535	.285			35	12.50	6.560	.300
8	x	31	8.00	7.995	.285	12	x	40	11.94	8.005	.295
		35	8.12	8.020	.310			45	12.06	8.045	.335
		40	8.25	8.070	.360			50	12.19	8.080	.370
		48	8.50	8.110	.400	12	x	53	12.06	9.995	.345
		58	8.75	8.220	.510			58	12.19	10.010	.360
		67	9.00	8.280	.570	12	x	65	12.12	12.000	.390
10	x	12	9.87	3.960	.190			72	12.25	12.040	.430
		15	9.99	4.000	.230			79	12.38	12.080	.470
		17	10.11	4.010	.240			87	12.53	12.125	.515
		19	10.24	4.020	.250			96	12.71	12.160	.550
10	x	22	10.17	5.750	.240			106	12.89	12.220	.610
		26	10.33	5.770	.260			120	13.12	12.320	.710
		30	10.47	5.810	.300			136	13.41	12.400	.790
10	x	33	9.73	7.960	.290			152	13.71	12.480	.870
		39	9.92	7.985	.315			170	14.03	12.570	.960

## Wide Flange Beams (Continued)



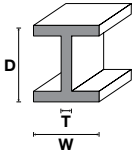
Size					Size						
Lbs/Ft		D	W	T	Lbs/F		D	W	T		
		190	14.38	12.670	1.060			283	16.74	16.110	1.290
		210	14.71	12.790	1.180			311	17.12	16.230	1.410
		230	15.05	12.895	1.285			342	17.54	16.360	1.540
12	x	252	15.41	13.005	1.395			370	17.92	16.475	1.655
		279	15.85	13.140	1.530			398	18.29	16.590	1.770
		305	16.32	13.235	1.625			426	18.67	16.695	1.875
		336	16.82	13.385	1.775			455	19.02	16.835	2.015
14	x	22	13.74	5.000	.230	14	x	500	19.60	17.010	2.190
		26	13.91	5.025	.255			550	20.24	17.200	2.380
14	x	30	13.84	6.730	.270			605	20.92	17.415	2.595
		34	13.98	6.745	.285			665	21.64	17.650	2.830
		38	14.10	6.770	.310			730	22.42	17.890	3.070
14	x	43	13.66	7.995	.305	16	x	26	15.69	5.525	.275
		48	13.79	8.030	.340			31	15.88	5.500	.250
		53	13.92	8.060	.370	16	x	36	15.86	6.985	.295
14	x	61	13.89	9.995	.375			40	16.01	6.995	.305
		68	14.04	10.035	.415			45	16.13	7.035	.345
		74	14.17	10.070	.450			50	16.26	7.070	.380
		82	14.31	10.130	.510			57	16.43	7.120	.430
14	x	90	14.02	14.520	.440	16	x	67	16.35	10.235	.395
		99	14.16	14.565	.485			77	16.52	10.295	.455
		109	14.32	14.605	.525			89	16.75	10.365	.525
		120	14.48	14.670	.590			100	16.97	10.425	.585
		132	14.66	14.725	.645			35	17.70	6.000	.300
14	x	145	14.78	15.500	.680	18	x	40	17.90	6.015	.315
		159	14.98	15.565	.745			46	18.06	6.060	.360
		176	15.22	15.650	.830	18	x	50	17.99	7.495	.355
		193	15.48	15.710	.890			55	18.11	7.530	.390
		211	15.72	15.800	.980			60	18.24	7.555	.415
14	x	233	16.04	15.890	1.070			65	18.35	7.590	.450
		257	16.38	15.995	1.175			71	18.47	7.635	.495

## Wide Flange Beams (Continued)



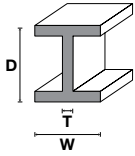
Size						Size				
Lbs/Ft			D	W	T	Lbs/F		D	W	T
18	x	76	18.21	11.035	.425		223	23.35	12.675	1.000
		86	18.39	11.090	.480	21	x	248	23.74	1.100
		97	18.59	11.145	.535			275	24.13	1.220
		106	18.73	11.200	.590			300	24.53	1.320
18	x	119	18.97	11.265	.655			333	25.00	1.460
		130	19.25	11.160	.670			364	25.47	1.590
		143	19.49	11.220	.730			402	26.02	1.730
		185	19.72	11.300	.810	24	x	55	23.57	.395
		175	20.04	11.375	.890			62	23.74	.430
		192	20.35	11.455	.960			68	23.73	.415
		211	20.67	11.555	1.060			76	23.92	.440
		234	21.06	11.650	1.160	24	x	84	24.10	.470
		258	21.46	11.770	1.280			94	24.31	.515
		283	21.85	11.890	1.400			103	24.53	.550
		311	22.32	12.005	1.520	24	x	104	24.06	.500
21	x	44	20.66	6.500	.405			117	24.26	.550
		50	20.83	6.530	.380			131	24.48	.605
		57	21.06	6.555	.350			146	24.74	.650
21	x	62	20.99	8.240	.400			162	25.00	.705
		68	21.13	8.270	.430			176	25.24	.750
		73	21.24	8.295	.455	24	x	192	25.47	.810
		83	21.43	8.355	.515			207	25.71	.870
		93	21.62	8.420	.580			229	26.02	.960
21	x	101	21.36	12.290	.500			250	26.34	1.040
		111	21.51	12.340	.550			279	26.73	1.160
		122	21.68	12.390	.600			306	27.13	1.260
		132	21.85	12.440	.650			335	27.52	1.380
		147	22.06	12.510	.720			370	27.99	1.520
		166	22.48	12.420	.750			408	28.54	1.650
		182	22.72	12.500	.830			450	29.09	1.810
		201	23.03	12.575	.910			492	29.65	1.970

## Wide Flange Beams (Continued)



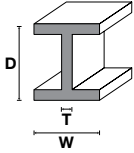
Size						Size																																		
Lbs/Ft			D	W	T	Lbs/Ft			D	W	T																													
27	x	84	26.71	9.960	.460	261	31.61	15.155	.930	94	26.92	9.990	.490																											
		102	27.09	10.015	.515						326	32.40	15.370	1.140																										
		114	27.29	10.070	.570						357	32.80	15.470	1.240																										
		129	27.63	10.010	.610						391	33.19	15.590	1.360																										
		146	27.38	13.965	.605						433	33.66	15.725	1.500																										
		161	27.59	14.020	.660						477	34.21	15.865	1.630																										
		178	27.81	14.085	.725						526	34.76	16.020	1.790																										
		194	28.11	14.035	.750						581	35.39	16.200	1.970																										
		27	x	217	28.43						14.115	.830	33	x	118	32.86	11.480	.550																						
235	28.66			14.190	.910	130	33.09	11.510	.580																															
258	28.96			14.270	.980	33	x	141	33.30	11.535	.605																													
281	29.29			14.350	1.060			152	33.49	11.565	.635																													
307	29.61			14.445	1.160			169	33.82	11.500	.670																													
336	30.00			14.545	1.260			201	33.68	15.745	.715																													
368	30.39			14.665	1.380			221	33.96	15.805	.775																													
407	30.87			14.800	1.520			241	34.18	15.860	.830																													
448	31.42			14.940	1.650	33	x	263	34.53	15.805	.870																													
494	31.97	15.095	1.810	291	34.84			15.905	.960																															
539	32.52	15.260	1.970	318	35.16			15.985	1.040																															
30	x	90	29.53	10.400	.470	354	35.55	16.100	1.160	99	29.65	10.450	.520																											
		108	29.83	10.475	.545						387	35.95	16.200	1.260	108	29.83	10.475	.545																						
		116	30.01	10.495	.565										424	36.34	16.315	1.380	116	30.01	10.495	.565																		
		124	30.17	10.515	.585														468	36.81	16.455	1.520	124	30.17	10.515	.585														
		132	30.31	10.545	.615																		515	37.36	16.590	1.650	132	30.31	10.545	.615										
		148	30.67	10.480	.650																						567	37.91	16.750	1.810	148	30.67	10.480	.650						
		30	x	173	30.44																										14.985	.655	619	38.47	16.910	1.970	191	30.68	15.040	.710
				191	30.68																										15.040	.710						36	x	135
211	30.94			15.105	.755	150	35.85	11.975	.625	211																					30.94	15.105								.755
235	31.30			15.055	.830					160	36.01	12.00	.650	235																	31.30	15.055								.830
170	36.17	12.030	.680																																					

## Wide Flange Beams (Continued)



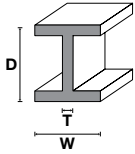
Size					Size				
Lbs/Ft		D	W	T	Lbs/Ft		D	W	T
	182	36.33	12.075	.725		396	41.65	12.380	1.42
	194	36.49	12.115	.765		437	42.13	12.520	1.56
	210	36.69	12.180	.830		475	42.60	12.660	1.69
	232	37.12	12.120	.870	40 x	520	43.15	12.790	1.83
	256	37.43	12.215	.960		561	43.62	12.930	1.97
36 x	230	35.90	16.470	.760		174	38.20	15.750	0.650
	245	36.08	16.510	.800		199	38.67	15.750	0.650
	260	36.26	16.550	.840		215	38.98	15.750	0.650
	280	36.52	16.595	.885		249	39.38	15.750	0.750
	300	36.74	16.655	.945		277	39.69	15.830	0.830
	328	37.09	16.630	1.020		297	39.84	15.825	0.930
	359	37.40	16.730	1.120	40 x	324	40.16	15.905	1.00
	393	37.80	16.830	1.220		362	40.55	16.020	1.12
	439	38.26	16.965	1.360		397	40.95	16.120	1.22
	485	38.74	17.105	1.500		436	41.34	16.24	1.34
	527	39.21	17.220	1.610		480	41.81	16.36	1.46
	588	39.84	17.400	1.790	40 x	531	42.34	16.51	1.61
	650	40.47	17.575	1.970		593	42.99	16.69	1.79
	720	41.19	17.775	2.165		655	43.62	16.87	1.97
	798	41.97	17.990	2.36	40 x	192	38.20	17.71	0.710
	848	42.45	18.130	2.52		221	38.67	17.71	0.710
40 x	149	38.20	11.81	0.630		244	39.06	17.71	0.710
	167	38.59	11.81	0.650		268	39.37	17.75	0.750
	183	38.98	11.81	0.650		298	39.69	17.83	0.830
	211	39.37	11.81	0.750		360	40.00	17.91	0.910
	235	39.69	11.89	0.830	44 x	198	42.91	11.81	0.710
40 x	264	40.00	11.93	0.960		224	43.31	11.81	0.785
	294	40.39	12.025	1.06		248	43.62	11.81	1.025
	327	40.79	12.145	1.18		285	44.02	11.81	1.025
	359	41.18	12.260	1.30					

## Standard (I) Beams



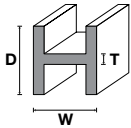
Size				
D	Lbs./Foot	W	T	Weight Per 40' Bar
3	5.70	2.330	.170	228
	7.50	2.509	.349	300
4	7.70	2.660	.190	308
	9.50	2.796	.326	380
5	10.00	3.000	.210	400
	14.75	3.284	.494	590
6	12.50	3.330	.230	500
	17.25	3.565	.465	690
7	15.30	3.660	.250	612
	20.00	3.860	.450	800
8	18.40	4.000	.270	736
	23.00	4.171	.441	920
10	25.40	4.660	.310	1016
	35.00	4.944	.594	1400
12	31.80	5.000	.350	1272
	35.00	5.078	.428	1400
	40.80	5.250	.460	1632
	50.00	5.477	.687	2000
15	42.90	5.500	.410	1716
	50.00	5.640	.550	2000
18	54.70	6.000	.460	2188
	70.00	6.251	.711	2800
20	66.00	6.255	.505	2640
	75.00	6.391	.635	3000
	86.00	7.060	.660	3440
	96.00	7.200	.800	3840
24	80.00	7.000	.500	3200
	90.00	7.125	.625	3600
	100.00	7.245	.745	4000

## Miscellaneous Beams



Size				
D	Lbs./Foot	W	T	Weight Per 40' Bar
4	3.2	2.25	.092	128
4	3.45	2.25	.112	138
4	4.08	2.25	.115	163
5	18.9	5.003	.316	756
6	4.4	1.844	.114	176
8	6.5	2.281	.135	260
10	7.5	2.688	.130	300
10	8.0	2.690	.141	320
10	9.0	2.690	.157	360
12	10.8	3.065	.160	432
12	11.8	3.065	.177	472

## H Pilings



Size				
D	Lbs./Foot	W	T	Weight Per 40' Bar
8	36.0	8.155	.445	1440
10	42.0	10.075	.415	1680
10	57.0	10.225	.565	2280
12	53.0	12.045	.435	2120
12	63.0	12.125	.515	2520
13	60.0	12.900	.460	2400
13	73.0	13.005	.565	2920
14	73.0	14.585	.505	2920
14	89.0	14.695	.615	3560





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