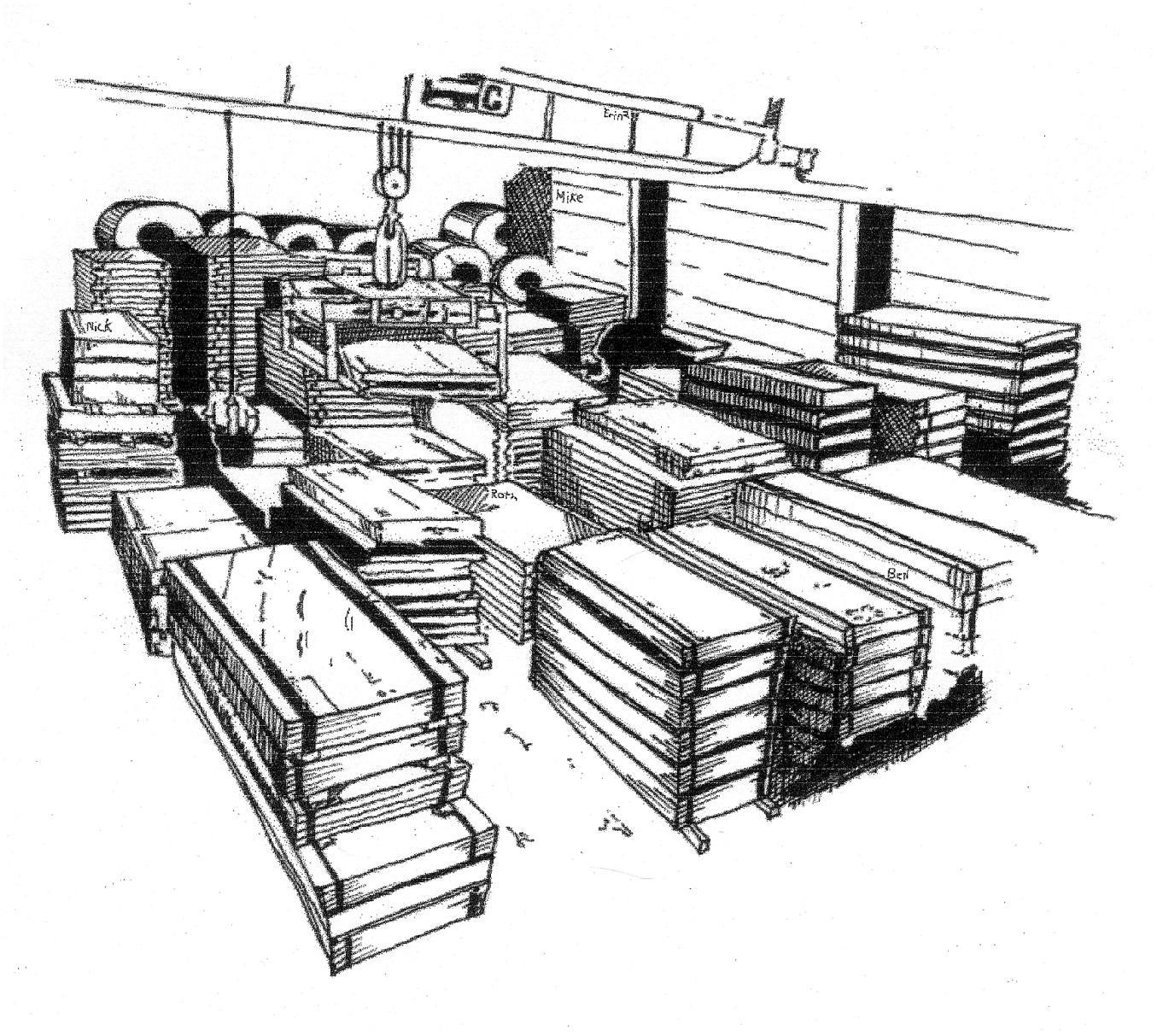


Tensile and Yield Strength Properties

All of the properties of standard steels that we have listed are approximations and for the most part based on physical properties of 1” rounds. Lower range tensile properties are common in larger sections, and higher properties apply to smaller sections. As a result of acceptable variations in analysis, rolling conditions, grain size, methods of treatment, and size of section, there is no guarantee that the properties we have listed will be obtained in all cases.

Only through carefully controlled heat treatment can dependable physical properties be obtained.

Beams

ASTM A-36

I Beams

A				B	C
Size	WT/FT	Length	WT/Length	Web Thick	Flange Width
3”	5.70	20’	114.00	0.170	2.330
4”	7.70	20’	154.00	0.193	2.663
4”	7.70	40’	308.00	0.193	2.663
5”	10.00	20’	200.00	0.214	3.004
5”	10.00	40’	400.00	0.214	3.004
6”	12.50	20’	250.00	0.232	3.332
6”	12.50	40’	500.00	0.232	3.332
7”	15.30	20’	306.00	0.252	3.662
8”	18.40	20’	368.00	0.271	4.001
8”	18.40	40’	736.00	0.271	4.001
10”	25.40	20’	508.00	0.311	4.661
10”	25.40	40’	1016.00	0.311	4.661
12”	31.80	20’	636.00	0.350	5.000
12”	31.80	40’	1272.00	0.350	5.000
15”	42.90	40’	1716.00	0.411	5.501

I Beams – The edges of the flanges of I beams are tapered in for added strength. They are used for structural purposes and also for hoists and cranes.

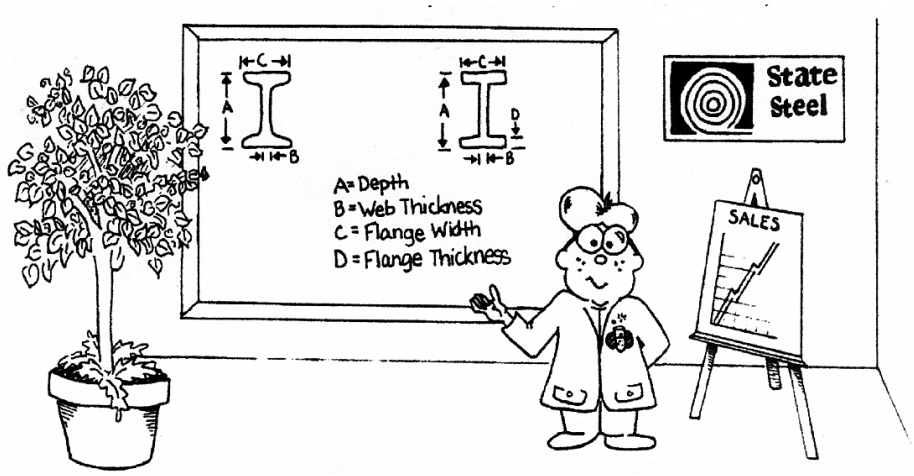
Wide Flange Beams

				A	B	C	D
Size	WT/FT	Length	WT/Length	Depth	Web Thick	Flange Width	Flange Thick
4”	13.00	20’	260.00	4.16	0.280	4.060	0.345
4”	13.00	40’	520.00	4.16	0.280	4.060	0.345
6”	9.00	20’	180.00	5.90	0.170	3.940	0.215
6”	9.00	40’	360.00	5.90	0.170	3.940	0.215
6”	12.00	20’	240.00	6.03	0.230	4.000	0.280
6”	12.00	40’	480.00	6.03	0.230	4.000	0.280
6”	12.00	50’	600.00	6.03	0.230	4.000	0.280
6”	16.00	20’	320.00	6.28	0.260	4.030	0.405
6”	16.00	40’	640.00	6.28	0.260	4.030	0.405
6”	15.00	20’	300.00	5.99	0.230	5.990	0.260
6”	15.00	40’	600.00	5.99	0.230	5.990	0.260
6”	15.00	50’	750.00	5.99	0.230	5.990	0.260
6”	20.00	20’	400.00	6.20	0.260	6.020	0.365
6”	20.00	40’	800.00	6.20	0.260	6.020	0.365

Wide Flange Beams – The web on wide flange beams is longer than the width of the flanges. Wide flange beams are used primarily for structural purposes.

H Beams – H beams are symmetrical beams where the dimensions of the height and width are equal or nearly equal. They are used mainly for structural purposes.

ASTM A-36 – Low carbon, structural quality steel used in bridges, building construction, and general structural applications. Minimum Mechanical Properties:
(Yield 36,000 psi. min.) (Tensile 58,000 - 80,000 psi.)



Rev. 7/03

Beams

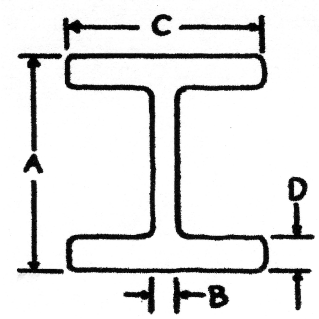
ASTM A-36

Wide Flange Beams

Size	WT/FT	Length	WT/Length	A Depth	B Web Thick	C Flange Width	D Flange Thick
8”	13.00	20’	260.00	7.99	0.230	4.000	0.255
8”	13.00	40’	520.00	7.99	0.230	4.000	0.255
8”	15.00	40’	600.00	8.11	0.245	4.015	0.315
8”	18.00	20’	360.00	8.14	0.230	5.250	0.330
8”	18.00	30’	540.00	8.14	0.230	5.250	0.330
8”	18.00	40’	720.00	8.14	0.230	5.250	0.330
8”	18.00	50’	900.00	8.14	0.230	5.250	0.330
8”	21.00	20’	420.00	8.28	0.250	5.270	0.400
8”	21.00	40’	840.00	8.28	0.250	5.270	0.400
8”	24.00	20’	480.00	7.93	0.245	6.495	0.400
8”	24.00	40’	960.00	7.93	0.245	6.495	0.400
8”	24.00	50’	1200.00	7.93	0.245	6.495	0.400
8”	28.00	20’	560.00	8.06	0.285	6.535	0.465
8”	28.00	30’	840.00	8.06	0.285	6.535	0.465
8”	28.00	40’	1120.00	8.06	0.285	6.535	0.465
8”	31.00	20’	620.00	8.00	0.285	7.995	0.435
8”	31.00	40’4”	1250.33	8.00	0.285	7.995	0.435
8”	31.00	50’	1550.00	8.00	0.285	7.995	0.435
10”	12.00	20’	240.00	9.87	0.190	3.960	0.210
10”	12.00	40’	480.00	9.87	0.190	3.960	0.210
10”	15.00	20’	300.00	9.99	0.230	4.000	0.270
10”	15.00	40’	600.00	9.99	0.230	4.000	0.270
10”	19.00	20’	380.00	10.24	0.250	4.020	0.395
10”	19.00	40’	760.00	10.24	0.250	4.020	0.395

Wide Flange Beams

Size	WT/FT	Length	WT/Length	A Depth	B Web Thick	C Flange Width	D Flange Thick
10”	22.00	20’	440.00	10.17	0.240	5.750	0.360
10”	22.00	30’	660.00	10.17	0.240	5.750	0.360
10”	22.00	40’	880.00	10.17	0.240	5.750	0.360
10”	22.00	50’	1100.00	10.17	0.240	5.750	0.360
10”	54.00	20’	1080.00	10.09	0.370	10.030	0.615
10”	54.00	40’4”	2178.00	10.09	0.370	10.030	0.615
12”	16.00	20’	320.00	11.99	0.220	3.990	0.265
12”	16.00	40’	640.00	11.99	0.220	3.990	0.265
12”	22.00	20’	440.00	12.31	0.260	4.030	0.425
12”	22.00	40’	880.00	12.31	0.260	4.030	0.425
12”	26.00	40’	1040.00	12.22	0.230	6.490	0.380
12”	26.00	50’	1300.00	12.22	0.230	6.490	0.380
12”	30.00	20’	600.00	12.34	0.260	6.520	0.440
12”	30.00	40’	1200.00	12.34	0.260	6.520	0.440
12”	65.00	20’	1300.00	12.12	0.390	12.000	0.605
12”	65.00	40’4”	2621.67	12.12	0.390	12.000	0.605
14”	30.00	40’	1200.00	13.84	0.270	6.730	0.385
14”	30.00	50’	1500.00	13.84	0.270	6.730	0.385
16”	36.00	35’	1260.00	15.86	0.295	6.985	0.430
16”	36.00	50’	1800.00	15.86	0.295	6.985	0.430
18”	40.00	40’	1600.00	17.90	0.315	6.015	0.525



All structural and bar sizes can be galvanized. Please Inquire.

Channel

ASTM A-36

Bar Channel

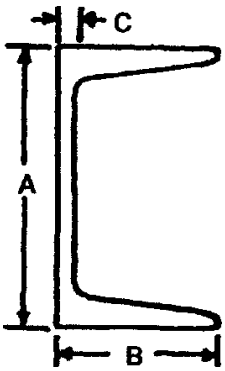
A x B x C Size	Length	WT / FT	WT / Bar
1 x 1/2 x 1/8	20’	0.840	16.80
1 x 1 x 11 ga.	10’	1.280	12.80
1-1/4 x 1/2 x 1/8	20’	1.010	20.20
1-1/2 x 1/2 x 1/8	20’	1.120	22.40
1-1/2 x 9/16 x 3/16	20’	1.440	28.80
1-1/2 x 3/4 x 1/8	20’	1.170	23.40
1-5/8 x 7/8 x 11 ga.	10’	1.200	12.00
2 x 1/2 x 1/8	20’	1.430	28.60
2 x 9/16 x 3/16	20’	1.860	37.20
2 x 1 x 1/8	20’	1.590	31.80
2 x 1 x 3/16	20’	2.320	46.40
2-1/2 x 5/8 x 3/16	20’	2.270	45.40

Formed 1010 Material

Channel

A Size	WT / FT	Length	WT / Bar	B Flange Width	C Web Thick
3“ LC	3.500	20’	70.00	1.350	0.130
3” LC	3.500	40’	140.00	1.350	0.130
3”	4.100	20’	82.00	1.410	0.170
3”	4.100	40’	164.00	1.410	0.170
3”	5.000	20’	100.00	1.498	0.258
3”	6.000	20’	120.00	1.596	0.356
4”	5.400	20’	108.00	1.584	0.184
4”	5.400	40’	216.00	1.584	0.184
4”	7.250	20’	145.00	1.721	0.321
4”	7.250	40’	290.00	1.721	0.321
5”	6.700	20’	134.00	1.750	0.190
5”	6.700	40’	268.00	1.750	0.190
5”	9.000	20’	180.00	1.885	0.325

ASTM- A36 – Low carbon, structural quality steel used in bridges, building construction, and general structural applications. Minimum Mechanical Properties:
Yield – 36,000 psi. min. Tensile – 58,000 - 80,000 psi.



Rev. 7/03

Channel

ASTM A-36

Channel

A Size	WT / FT	Length	WT / Bar	B Flange Width	C Web Thick
6”	8.200	20’	164.00	1.920	0.200
6”	8.200	40’	328.00	1.920	0.200
6”	10.500	20’	210.00	2.034	0.314
6”	10.500	40’	420.00	2.034	0.314
6”	13.000	20’	260.00	2.157	0.437
6”	13.000	40’	520.00	2.157	0.437
7”	9.800	20’	196.00	2.090	0.210
7”	9.800	40’	392.00	2.090	0.210
7”	12.250	20’	245.00	2.194	0.314
7”	14.750	20’	295.00	2.299	0.419
7”	14.750	40’	590.00	2.299	0.419
8”	11.500	20’	230.00	2.260	0.220
8”	11.500	40’	460.00	2.260	0.220
8”	13.750	20’	275.00	2.343	0.303
8”	13.750	40’	550.00	2.343	0.303
8”	18.750	20’	375.00	2.527	0.487
9”	13.400	20’	268.00	2.433	0.233
9”	13.400	40’	536.00	2.433	0.233
10”	15.300	20’	306.00	2.600	0.240
10”	15.300	40’	612.00	2.600	0.240
10”	15.300	50’	765.00	2.600	0.240
10”	20.000	20’	400.00	2.739	0.379
10”	20.000	40’	800.00	2.739	0.379
10”	25.000	20’	500.00	2.886	0.526
10”	25.000	40’	1000.00	2.886	0.526
12”	20.700	20’	414.00	2.942	0.282
12”	20.700	40’	828.00	2.942	0.282
12”	20.700	50’	1035.00	2.942	0.282
12”	30.000	20’	600.00	3.170	0.510
12”	30.000	40’	1200.00	3.170	0.510

Jr. Channel

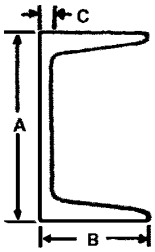
A Size	WT / FT	Length	WT / Bar	B Flange Width	C Web Thick
10”	6.500	20’	130.00	1.127	0.152
10”	6.500	40’	260.00	1.127	0.152
10”	8.400	20’	168.00	1.500	0.170
10”	8.400	40’	336.00	1.500	0.170
12”	10.600	20’	212.00	1.500	0.190
12”	10.600	40’	424.00	1.500	0.190

Galvanized Bar Channel

Size	WT / FT	Length	WT / Bar
1-1/2 x 9/16 x 3/16	1.516	20’	30.32
2 x 1 x 1/8	1.674	20’	33.48
2 x 1 x 3/16	2.442	20’	48.84

Galvanized Channel

A Size	WT / FT	Length	WT / Bar	B Flange Width	C Web Thick
3” 4.1#	4.316	20’	86.32	1.410	0.170
4” 5.4#	5.684	20’	113.68	1.584	0.184
4” 7.25#	7.632	20’	152.64	1.721	0.321
5” 6.7#	7.053	20’	141.06	1.750	0.190
6” 8.2#	8.632	20’	172.64	1.920	0.200



All Structural and bar sizes can be galvanized. Please inquire.

Angles - Bar Size

ASTM A-36

Angles

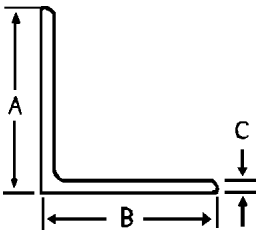
A x B x C

Size	Length	WT / FT	WT / Bar
1/2 x 1/2 x 1/8	20’	0.380	7.60
3/4 x 3/4 x 1/8	20’	0.590	11.80
7/8 x 7/8 x 1/8	20’	0.700	14.00
1 x 1 x 1/8	20’	0.800	16.00
1 x 1 x 1/8	20’6”	0.800	16.40
1 x 1 x 3/16	20’	1.160	23.20
1 x 1 x 1/4	20’	1.490	29.80
1-1/4 x 1-1/4 x 1/8	20’	1.010	20.20
1-1/4 x 1-1/4 x 3/16	20’	1.480	29.60
1-1/4 x 1-1/4 x 1/4	20’	1.920	38.40
1-3/8 x 7/8 x 1/8	20’	0.910	18.20
1-3/8 x 7/8 x 3/16	20’	1.320	26.40
1-1/2 x 1-1/2 x 1/8	20’	1.230	24.60
1-1/2 x 1-1/2 x 3/16	20’	1.800	36.00
1-1/2 x 1-1/2 x 1/4	20’	2.340	46.80
1-3/4 x 1-1/4 x 1/4	20’	2.340	46.80
1-3/4 x 1-3/4 x 1/8	20’	1.440	28.80
1-3/4 x 1-3/4 x 3/16	20’	2.120	42.40
1-3/4 x 1-3/4 x 1/4	20’	2.770	55.40

Angles

A x B x C

Size	Length	WT / FT	WT / Bar
2 x 1-1/4 x 3/16	20’	1.960	39.20
2 x 1-1/4 x 1/4	20’	2.550	51.00
2 x 1-1/2 x 1/8	20’	1.440	28.80
2 x 1-1/2 x 3/16	20’	2.120	42.40
2 x 1-1/2 x 1/4	20’	2.770	55.40
2 x 2 x 1/8	20’	1.650	33.00
2 x 2 x 3/16	20’	2.440	48.80
2 x 2 x 1/4	20’	3.190	63.80
2 x 2 x 1/4	40’	3.190	127.60
2 x 2 x 5/16	20’	3.920	78.40
2 x 2 x 3/8	20’	4.700	94.00
2-1/2 x 1-1/2 x 3/16	20’	2.440	48.80
2-1/2 x 1-1/2 x 1/4	20’	3.190	63.80
2-1/2 x 2 x 3/16	20’	2.750	55.00
2-1/2 x 2 x 1/4	20’	3.620	72.40
2-1/2 x 2 x 3/8	20’	5.300	106.00
2-1/2 x 2-1/2 x 1/8	10’	2.130	21.30
2-1/2 x 2-1/2 x 3/16	20’	3.070	61.40
2-1/2 x 2-1/2 x 1/4	20’	4.100	82.00
2-1/2 x 2-1/2 x 5/16	20’	5.000	100.00
2-1/2 x 2-1/2 x 3/8	20’	5.900	118.00
2-1/2 x 2-1/2 x 1/2	20’	7.700	154.00



Formed 1010 Material

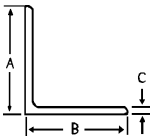
Angles - Structural

ASTM A-36

Angles

A x B x C

Size	Length	WT / FT	WT / Bar
3 x 1-1/2 x 1/8	10’	1.920	19.20
3 x 2 x 1/8	10’	2.130	21.30
3 x 2 x 3/16	20’	3.070	61.40
3 x 2 x 1/4	20’	4.100	82.00
3 x 2 x 5/16	20’	5.000	100.00
3 x 2 x 3/8	20’	5.900	118.00
3 x 2 x 1/2	20’	7.700	154.00
3 x 2-1/2 x 3/16	20’	3.390	67.80
3 x 2-1/2 x 1/4	20’	4.500	90.00
3 x 3 x 1/8	10’	2.550	25.50
3 x 3 x 3/16	20’	3.710	74.20
3 x 3 x 1/4	20’	4.900	98.00
3 x 3 x 1/4	40’	4.900	196.00
3 x 3 x 5/16	20’	6.100	122.00
3 x 3 x 3/8	20’	7.200	144.00
3 x 3 x 1/2	20’	9.400	188.00
3-1/2 x 2-1/2 x 1/4	20’	4.900	98.00
3-1/2 x 3 x 3/8	20’	7.900	158.00
3-1/2 x 3-1/2 x 1/4	20’	5.800	116.00
3-1/2 x 3-1/2 x 5/16	20’	7.200	144.00
3-1/2 x 3-1/2 x 3/8	20’	8.500	170.00
3-1/2 x 3-1/2 x 1/2	20’	11.100	222.00
4 x 2 x 1/8	10’	2.400	24.00
4 x 3 x 1/4	20’	5.800	116.00
4 x 3 x 5/16	20’	7.200	144.00
4 x 3 x 3/8	20’	8.500	170.00
4 x 3 x 3/8	40’	8.500	340.00
4 x 3 x 1/2	20’	11.100	222.00
4 x 3-1/2 x 1/4	20’	6.200	124.00
4 x 3-1/2 x 5/16	20’	7.700	154.00
4 x 3-1/2 x 3/8	20’	9.100	182.00



Formed 1010 Material

Angles

A x B x C

Size	Length	WT / FT	WT / Bar
4 x 4 x 1/4	20’	6.600	132.00
4 x 4 x 1/4	40’	6.600	264.00
4 x 4 x 5/16	20’	8.200	164.00
4 x 4 x 3/8	20’	9.800	196.00
4 x 4 x 3/8	40’	9.800	392.00
4 x 4 x 1/2	20’	12.800	256.00
4 x 4 x 1/2	40’	12.800	512.00
5 x 3 x 1/4	20’	6.600	132.00
5 x 3 x 1/4	40’	6.600	264.00
5 x 3 x 5/16	20’	8.200	164.00
5 x 3 x 3/8	20’	9.800	196.00
5 x 3 x 3/8	40’	9.800	392.00
5 x 3 x 1/2	20’	12.800	256.00
5 x 3-1/2 x 1/4	20’	7.000	140.00
5 x 3-1/2 x 5/16	20’	8.700	174.00
5 x 3-1/2 x 3/8	20’	10.400	208.00
5 x 3-1/2 x 3/8	40’	10.400	416.00
5 x 3-1/2 x 1/2	20’	13.600	272.00
5 x 5 x 5/16	20’	10.300	206.00
5 x 5 x 3/8	20’	12.300	246.00
5 x 5 x 3/8	40’	12.300	492.00
6 x 3-1/2 x 5/16	20’	9.800	196.00
6 x 4 x 5/16	20’	10.300	206.00
6 x 4 x 5/16	40’	10.300	412.00
6 x 4 x 3/8	20’	12.300	246.00
6 x 4 x 3/8	40’	12.300	492.00
6 x 4 x 1/2	20’	16.200	324.00
6 x 6 x 5/16	20’	12.500	250.00
6 x 6 x 3/8	20’	14.900	298.00
6 x 6 x 3/8	40’	14.900	596.00
6 x 6 x 1/2	20’	19.600	392.00
6 x 6 x 1/2	40’	19.600	784.00
8 x 8 x 1/2	20’	26.400	528.00

All structural and bar sizes can be galvanized. Please inquire.

T Iron

ASTM A-36

Size	Length	WT / FT	WT / Bar
1-3/4 x 1-3/4 x 3/16	20’	2.26	45.20
2 x 2 x 1/4	20’	3.62	72.40

Galvanized Angles

ASTM A-36

A x B x C

Size	Length	WT / FT	WT / Bar
1 x 1 x 1/8	20’	0.842	16.84
1 x 1 x 3/16	20’	1.221	24.42
1 x 1 x 1/4	20’	1.568	31.36
1-1/4 x 1-1/4 x 1/8	20’	1.063	21.26
1-1/4 x 1-1/4 x 3/16	20’	1.558	31.16
1-1/4 x 1-1/4 x 1/4	20’	2.021	40.42
1-1/2 x 1-1/2 x 1/8	20’	1.295	25.90
1-1/2 x 1-1/2 x 3/16	20’	1.895	37.90
1-1/2 x 1-1/2 x 1/4	20’	2.463	49.26
2 x 2 x 1/8	20’	1.737	34.74
2 x 2 x 3/16	20’	2.568	51.36
2 x 2 x 1/4	20’	3.358	67.16
2-1/2 x 2-1/2 x 3/16	20’	3.232	64.64
2-1/2 x 2-1/2 x 1/4	20’	4.316	86.32

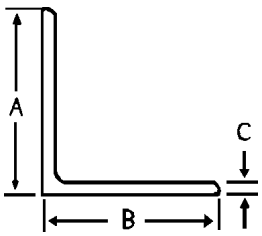
Galvanized Angles

ASTM A-36

A x B x C

Size	Length	WT / FT	WT / Bar
3 x 2 x 3/16	20’	3.232	64.64
3 x 3 x 3/16	20’	3.905	78.10
3 x 3 x 1/4	20’	5.158	103.16
3 x 3 x 3/8	20’	7.579	151.58
3-1/2 x 3-1/2 x 5/16	20’	7.579	151.58
4 x 3 x 1/4	20’	6.105	122.10
4 x 4 x 1/4	20’	6.947	138.94
4 x 4 x 3/8	20’	10.316	206.32
5 x 3 x 1/4	20’	6.947	138.94
6 x 6 x 3/8	20’	15.684	313.68

ASTM A-36 – Low carbon, structural quality steel used in bridges, building construction, and general structural applications. Estimated Minimum Mechanical Properties (EMMP): Yield 36,000 psi. min. – Tensile 58,000-80,000 psi.



Rev. 7/03