

Galvanizing	Hot-Dip Galvanizing	\$1.55
	Epoxy/Epoxy	\$2.77
Painting	Epoxy/Polyurethane	\$2.90
	Inorganic Zinc/Epoxy	\$3.01
	inic Zinc/Epoxy/Polyurethane	\$4.15
	ng/Epoxy/Polyurethane	\$5.25
Metallizing	Metallizing	\$8.25

Initial Cost:		
Coating System	\$/ft²	
Hot-Dip Galvanizing	\$1.76	
Epoxy/Epoxy	\$2.92	
Epoxy/Polyurethane	\$3.35	
Inorganic Zinc/Epoxy	\$3.17	
Inorganic Zinc/Epoxy/Polyurethane (Duplex)	\$4.53	
Galvanizing/Epoxy/Polyurethane (Duplex)	\$5.28	
Metallizing	\$8.37	

https://www.srz.com/featured_stories/hot-dip-galvanized-steel-offers-superior-initial-and-long-term-economic-advantages/

Life Cycle Cost:		
Coating System	\$/ft²	
Hot-Dip Galvanizing	\$4.28	
Galvanizing/Epoxy/Polyurethane (Duplex)	\$22.84	
Inorganic Zinc/Epoxy	\$39.92	
Inorganic Zinc/Epoxy/Polyurethane	\$41.53	
Epoxy/Epoxy	\$51.91	
Epoxy/Polyurethane	\$61.63	
Metallizing	\$62.80	

Initial Cost:		
Coating System	\$/ft²	
Hot-Dip Galvanizing	\$1.76	
Paint (epoxy/polyurethane) 2-coat system	\$2.53	
Paint (IOZ/epoxy/polyurethane) 3-coat system	\$3.76	

https://www.galvanizeit.com/uploads/resources/1443128227_Galvanizing_Costs_Less_Last_Longer_Case_Study.pdf

Life Cycle Cost:		
Coating System	\$/ft²	
Hot-Dip Galvanizing	\$2.33	
Paint (epoxy/polyurethane) 2-coat system	\$23.14	
Paint (IOZ/epoxy/polyurethane) 3-coat system	\$17.29	

	Initial cost	Life-cycle cost
Hot-dip galvanizing	\$0.90/sq ft	\$0.03/sq ft
IOZ/polyurethane paint system	\$1.50/sq ft	\$0.15/sq ft

<https://www.plattinonline.com/articles/galvanizing-the-costs-of-galvanizing-structural-steel/>

Coating System	Initial Cost	
	\$/ft ²	Total
Hot-Dip Galvanizing	\$1.76	\$88,000
Epoxy/Epoxy	\$2.61	\$130,600
Epoxy/Polyurethane	\$2.82	\$141,200
IOZ/Epoxy	\$2.85	\$142,700
IOZ/Epoxy/Polyurethane	\$4.17	\$208,800
Galvanizing/Epoxy/Polyurethane (Duplex)	\$5.22	\$260,750
Zinc Metallizing/Sealer	\$8.13	\$406,450

Notes: 75 Year Project Life • C3 Medium corrosion environment • Typical mix of sizes and shapes (250R/ton • 50,000 ft² project/40 tons • 3% Inflation, 2% Interest

https://www.daamgalvanizing.com/wp-content/uploads/2015/12/Galvanizing_Costs_Less_Last_Longer2015.pdf

Table 2: Life-Cycle Cost

Coating System	\$/ft ²	Life-Cycle Cost	
		Total	AEAC \$/ft ²
Hot-Dip Galvanizing	\$4.17	\$208,500	\$0.11
Galvanizing/Epoxy/Polyurethane (Duplex)	\$22.45	\$1,122,500	\$0.58
IOZ/Epoxy	\$35.91	\$1,795,500	\$0.93
IOZ/Epoxy/Polyurethane	\$38.26	\$1,913,000	\$0.99
Epoxy/Epoxy	\$38.31	\$1,915,500	\$0.99
Epoxy/Polyurethane Epoxy/Epoxy	\$51.90	\$2,595,000	\$1.34
Zinc Metallizing/Sealer	\$60.99	\$3,049,500	\$1.58

Notes: 75 Year Project Life • C3 Medium corrosion environment • Typical mix of sizes and shapes (250R/ton • 50,000 ft² project/40 tons • 3% Inflation, 2% Interest

Coating System	Initial Cost (\$/sq. ft.)	Life-Cycle Cost (\$/sq. ft.)	Average Equivalent Annual Cost (\$/sq. ft.)
Hot-Dip Galvanizing	\$1.76	\$4.17	\$0.11
Epoxy/Epoxy	\$2.61	\$38.31	\$0.99
Epoxy/Polyurethane	\$2.82	\$51.90	\$1.34
IOZ/Epoxy	\$2.85	\$35.91	\$0.93
IOZ/Epoxy/Polyurethane	\$4.17	\$38.26	\$0.99
Galvanizing/Epoxy/Polyurethane (Duplex)	\$5.22	\$22.45	\$0.58
Zinc Metallizing/Sealer	\$8.13	\$60.99	\$1.58

Material	Cost (\$/lb)
Galvanized Structural Steel	\$0.80
Stainless Steel	\$2.02
Aluminum	\$2.79
Titanium	\$4.10

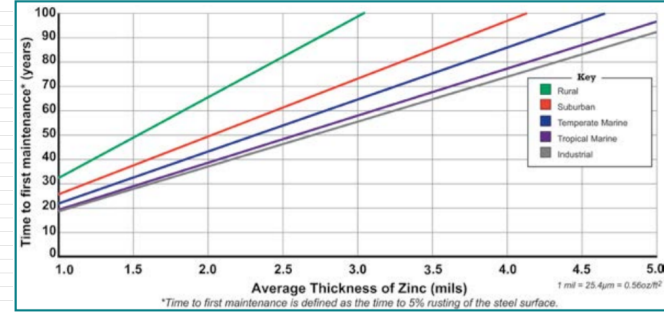
<https://sciencing.com/about-6711987-price-steel-vs-stainless-steel.html#:~:text=Steel%20prices%20change%20daily,&text=Galvanized%20steel%20costs%20a%20few,at%20least%20%24%20per%20pound.>

Galvanized Structural Steel	0.8	\$/pound
Stainless Steel	3	\$/pound

<https://sgmetalminer.com/metal-prices/>

Carbon Steel	0.71	\$/pound
Stainless Steel	2.02	\$/pound
Aluminum	2.79	\$/pound
Titanium	4.1	\$/pound

Figure 1: Time to First Maintenance



Cost Analysis - Four Layer Modules - Steel and Aluminum				Torison of Center Shaft Considerations				Modular Design of Columns - 4 Layers				Modular Design of Columns - 2 Layers				Stress of Plate (Point Load, simply supported at Edges)				
Line Item	Unit Price	Units	Cost	Maximum Wind Speed	2648.15	in ²		Load	27272.23	lb	Load	27272.23	lb	P	87762.29	lb	ab	k1	k2	
Steel	\$1,600.00	gal/ton	\$22.08 tons	Maximum Wind Force	16416.20	lb		Load Per Column	42042.20	lb	Load Per Column	42042.20	lb	I	0.25	in	1.25	0.341	1.26	
Aluminum	\$2,250.00	gal/ton	1583.77 tons					Modulus of Elasticity	29000000	psi	Modulus of Elasticity	29000000	psi	a (radius of plate)	383.858	in	1.5	0.819	1.28	
Labor	\$8.00	per sqft	102868 sqft					Length of Column	576.8616	in	Length of Column	576.8616	in	b (radius of plate)	92.597	in	2	0.892	1.48	
								n (constant)	0.25		n (constant)	0.25		k1	0.724	in	3	0.724	1.88	
								Density of Material	0.284	in ³ /lb	Density of Material	0.284	in ³ /lb	k2	2.17	in	4	0.724	2.91	
								Required Area	6.236	in ² /lb	Required Area	6.236	in ² /lb	E	9000000	psi	5	0.704	2.34	
								Required Area	6.236	in ² /lb	Required Area	6.236	in ² /lb	Stress	304502.822	psi				
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Layers 23 and 24(Starting at top)

Load	409319.26 lbs
Load Per Column	254332.45 lb
Modulus of Elasticity	29000000 psi
Length of Column**	3459.998 ft
n (constant)	0.25
Density of Material	0.284 tpcf
Required Area	26.732 in ²
ReDesign 1 Area	26.790 in ²
ReDesign 2 Area	26.789 in ²
Weight of Columns	35056.67107 lbs

Layers 25 and 26 (Starting at top)

Load	440703.64 lbs
Load Per Column	274423.08 lb
Modulus of Elasticity	29000000 psi
Length of Column**	3748.304 ft
n (constant)	0.25
Density of Material	0.284 tpcf
Required Area	28.381 in ²
ReDesign 1 Area	28.445 in ²
ReDesign 2 Area	28.442 in ²
Weight of Columns	37267.55366 lbs

Layers 27 and 28 (Starting at top)

Load	474942.14 lbs
Load Per Column	296822.63 lb
Modulus of Elasticity	29000000 psi
Length of Column**	4036.6312 ft
n (constant)	0.25
Density of Material	0.284 tpcf
Required Area	30.008 in ²
ReDesign 1 Area	30.068 in ²
ReDesign 2 Area	30.068 in ²
Weight of Columns	39394.99959 lbs

Layers 29 and 30 (Starting at top)

Load	508479.71 lbs
Load Per Column	317698.70 lb
Modulus of Elasticity	29000000 psi
Length of Column**	4324.95 ft
n (constant)	0.25
Density of Material	0.284 tpcf
Required Area	31.099 in ²
ReDesign 1 Area	31.883 in ²
ReDesign 2 Area	31.883 in ²
Weight of Columns	41484.5526 lbs

Layers 31 and 32 (Starting at top)

Load	542398.35 lbs
Load Per Column	339624.61 lb
Modulus of Elasticity	29000000 psi
Length of Column**	4613.2028 ft
n (constant)	0.25
Density of Material	0.284 tpcf
Required Area	33.165 in ²
ReDesign 1 Area	33.232 in ²
ReDesign 2 Area	33.232 in ²
Weight of Columns	43539.4744 lbs

Total Weight of 32 Layers 5,469,937.83 lbs

Type	EDI_Std_Nomenclature	AISC_Manual_Label	W (lb/ft)	Ix (in ⁴)	Zx (in ³)	Sx (in ²)	rx (in)	Iy (in ⁴)	Zy (in ³)	Sy (in ²)	ry (in)	Nominal Size	Weight	Wall Thickness	b/t	h/t	Cross Sectional Area	I	S	r	Z	Torsional Stiffness Constant	Torsional Shear Constant	Surface Area	Cost
				(in ⁴)	(in ³)	(in ²)	(in)	(in ⁴)	(in ³)	(in ²)	(in)	(in x in x in)	(lb/ft)	(in)	-	-	(in ²)	(in ⁴)	(in ³)	(in)	(in ³)	(in ⁴)	(in ³)	(ft ²)	\$/ft
W	W44X335	W44X335	335	31100	1620	1410	17.8	1200	236	150	3.49	32 x 32 x 5/8	259.83	0.625	48.2	48.2	76.4	12300	771	12.7	890	19700	1230	10.34	734.3706
W	W44X290	W44X290	290	27000	1410	1240	17.8	1040	205	132	3.49	32 x 32 x 1/2	210.72	0.5	61	61	61.9	10100	634	12.8	727	15900	991	10.45	595.8804
W	W44X262	W44X262	262	24100	1270	1110	17.7	923	182	117	3.47	32 x 32 x 3/8	159.37	0.375	82.3	82.3	46.8	7750	485	12.9	553	12000	750	10.51	451.0734
W	W44X230	W44X230	230	20800	1100	971	17.5	796	157	101	3.43	30 x 30 x 5/8	242.82	0.625	45	45	71.4	10100	673	11.9	778	16200	1070	9.68	686.4024
W	W40X655	W40X655	655	56500	3080	2590	17.1	2870	542	340	3.86	30 x 30 x 1/2	197.11	0.5	57	57	57.9	8320	555	12	637	13000	869	9.79	557.5002
W	W40X593	W40X593	593	50400	2760	2340	17	2520	481	302	3.8	30 x 30 x 3/8	149.16	0.375	77	77	43.8	6370	424	12.1	485	9870	658	9.84	422.2812
W	W40X503	W40X503	503	41600	2320	1980	16.8	2040	394	249	3.72	28 x 28 x 5/8	225.8	0.625	41.8	41.8	66.4	8140	582	11.1	674	13100	933	9.01	638.406
W	W40X431	W40X431	431	34800	1960	1660	16.6	1690	328	208	3.65	28 x 28 x 1/2	183.5	0.5	53	53	53.9	6730	480	11.2	552	10600	755	9.12	519.12
W	W40X397	W40X397	397	32000	1800	1560	16.6	1540	300	191	3.64	28 x 28 x 3/8	138.95	0.375	71.7	71.7	40.8	5150	368	11.2	421	8010	572	9.17	393.489
W	W40X372	W40X372	372	29600	1680	1460	16.5	1420	277	177	3.6	26 x 26 x 5/8	208.79	0.625	38.6	38.6	61.4	6460	497	10.3	577	10140	801	8.34	590.4378
W	W40X362	W40X362	362	28900	1640	1420	16.5	1380	270	173	3.6	26 x 26 x 1/2	169.89	0.5	49	49	49.9	5350	411	10.4	474	8430	649	8.45	480.7398
W	W40X324	W40X324	324	25600	1460	1280	16.4	1220	239	153	3.58	26 x 26 x 3/8	128.74	0.375	66.3	66.3	37.8	4110	316	10.4	362	6400	492	8.51	364.6968
W	W40X297	W40X297	297	23200	1330	1170	16.3	1090	215	138	3.54	24 x 24 x 5/8	191.78	0.625	35.4	35.4	56.4	5030	419	9.44	487	8180	679	7.68	542.4696
W	W40X277	W40X277	277	21900	1250	1100	16.4	1040	204	132	3.58	24 x 24 x 1/2	156.28	0.5	45	45	45.9	4170	348	9.53	401	6610	551	7.79	442.3596
W	W40X249	W40X249	249	19600	1120	993	16.3	926	182	118	3.55	24 x 24 x 3/8	118.53	0.375	61	61	34.8	3210	268	9.6	307	5020	418	7.84	335.9046
W	W40X215	W40X215	215	16700	964	859	16.2	803	156	101	3.54	22 x 22 x 5/8	174.76	0.625	32.2	32.2	51.4	3820	347	8.62	406	6260	567	7.01	494.4732
W	W40X199	W40X199	199	14900	869	770	16	695	137	88.2	3.45	22 x 22 x 1/2	142.67	0.5	41	41	41.9	3190	290	8.72	335	5070	461	7.12	403.9794
W	W40X392	W40X392	392	29000	1710	1440	16.1	803	212	130	2.64	22 x 22 x 3/8	108.32	0.375	55.7	55.7	31.8	2460	223	8.78	256	3850	350	7.17	307.1124
W	W40X331	W40X331	331	24700	1430	1210	15.9	644	172	106	2.57	20 x 20 x 5/8	157.75	0.625	29	29	46.4	2830	283	7.81	331	4670	465	6.34	446.505
W	W40X327	W40X327	327	24500	1410	1200	16	640	170	105	2.58	20 x 20 x 1/2	129.06	0.5	37	37	37.9	2370	237	7.9	275	3790	379	6.45	365.5992
W	W40X294	W40X294	294	21900	1270	1080	15.9	562	150	93.5	2.55	20 x 20 x 3/8	98.12	0.375	50.3	50.3	28.8	1830	183	7.97	211	2880	288	6.51	278.3484
W	W40X278	W40X278	278	20500	1190	1020	15.8	521	140	87.1	2.52	18 x 18 x 5/8	140.73	0.625	25.8	25.8	41.4	2020	224	6.99	264	3370	373	5.68	398.5086
W	W40X264	W40X264	264	19400	1130	971	15.8	493	132	82.6	2.52	18 x 18 x 1/2	115.45	0.5	33	33	33.9	1700	189	7.08	220	2740	305	5.79	327.219
W	W40X235	W40X235	235	17400	1010	875	15.9	444	118	74.8	2.54	18 x 18 x 3/8	87.91	0.375	45	45	25.8	1320	147	7.15	169	2090	232	5.84	249.5562
W	W40X211	W40X211	211	15500	908	788	15.8	390	105	66.1	2.51	16 x 16 x 5/8	127.37	0.581	24.5	24.5	35	1370	171	6.25	200	2170	276	5.17	360.8334
W	W40X183	W40X183	183	13200	774	675	15.7	331	88.3	58	2.49	16 x 16 x 1/2	103.3	0.465	31.4	31.4	28.2	1130	141	6.31	164	1770	224	5.2	292.956
W	W40X167	W40X167	167	11600	693	600	15.3	283	76	47.9	2.4	16 x 16 x 3/8	78.52	0.349	42.8	42.8	21.5	873	109	6.37	126	1350	171	5.23	223.0764
W	W40X149	W40X149	149	9800	598	513	15	229	62.2	38.8	2.29	16 x 16 x 5/16	65.87	0.291	52	52	18.1	739	92.3	6.39	106	1140	144	4.25	187.4034
W	W36X925	W36X925	925	73000	4130	3390	16.4	4940	862	531	4.26	14 x 14 x 5/8	110.36	0.581	21.1	21.1	30.3	896	128	5.44	151	208	4.5	312.8652	
W	W36X853	W36X853	853	70000	3920	3250	16.7	4600	805	505	4.28	14 x 14 x 1/2	89.68	0.465	27.1	27.1	24.6	743	106	5.49	124	170	4.53	254.5476	
W	W36X802	W36X802	802	64800	3660	3040	16.6	4210	744	468	4.22	14 x 14 x 3/8	68.31	0.349	37.1	37.1	18.7	577	82.5	5.55	95.4	900	130	4.57	194.2842
W	W36X723	W36X723	723	57300	3270	2740	16.4	3700	658	416	4.17	14 x 14 x 5/16	57.36	0.291	45.1	45.1	15.7	490	69.9	5.58	80.5	759	109	4.58	163.4052
W	W36X652	W36X652	652	50600	2910	2460	16.2	3230	581	367	4.1	12 x 12 x 5/8	93.34	0.581	17.7	17.7	25.7	548	91.3	4.62	109	885	151	3.83	264.8688
W	W36X529	W36X529	529	39600	2330	1990	16	2490	454	289	4	12 x 12 x 1/2	76.07	0.465	22.8	22.8	20.9	457	76.2	4.68	89.6	728	123	3.87	216.1674
W	W36X487	W36X487	487	36000	2130	1830	15.8	2250	412	263	3.96	12 x 12 x 3/8	58.1	0.349	31.4	31.4	16	357	59.5	4.73	69.2	56	94.6	3.9	165.492
W	W36X441	W36X441	441	32100	1910	1650	15.7	1990	368	235	3.92	12 x 12 x 5/16	48.86	0.291	38.2	38.2	13.4	304	50.7	4.76	58.6	474	79.7	3.92	139.4352
W	W36X395	W36X395	395	28500	1710	1490	15.7	1750	325	208	3.88	12 x 12 x 1/4	39.43	0.233	48.5	48.5	10.8	248	41.4	4.79	47.6	384	64.5	3.93	112.8426
W	W36X361	W36X361	361	25700	1550	1350	15.6	1570	293	188	3.85	10 x 10 x 5/8	76.33	0.581	14.2	14.2	21	304	60.8	3.8	73.2	498	102	3.17	216.9006
W	W36X330	W36X330	330	23300	1410	1240	15.5	1420	265	171	3.83	10 x 10 x 1/2	62.46	0.465	18.5	18.5	17.2	256	51.2	3.86	60.7	412	102	3.2	177.7872
W	W36X302	W36X302	302	21100	1280	1130	15.4	1300	241	156	3.82	10 x 10 x 3/8	47.9	0.349	25.7	25.7	13.2	202	40.4	3.92	47.2	320	64.8	3.23	136.728
W	W36X282	W36X282	282	19600	1190	1050	15.4	1200	223	144	3.8	10 x 10 x 5/16	40.35	0.291	31.4	31.4	11.1	172	34.5	3.94	40.1	271	54.8	3.25	115.437
W	W36X262	W36X262	262	17900	1100	972	15.3	1090	204	132	3.76	10 x 10 x 1/4	32.63	0.233	39.9	39.9	8.96	141	28.3	3.97	32.7	220	44.4	3.27	93.6666
W	W36X247	W36X247	247	16700	1030	913	15.2	1010	190	123	3.74	10 x 10 x 3/16	24.73	0.174	54.5	54.5	12.6	108	21.6	4	24.8	188	33.6	3.28	71.3886
W	W36X231	W36X231	231	15600	963	854	15.1	940	176	114	3.71	9 x 9 x 1/2	55.66	0.465	16.4	16.4	15.3	182	40.6	3.45	48.4	296	67.4	2.87	158.6112
W	W36X256	W36X256	256	16800	1040	895	14.9	528	137	86.5	2.65	9 x 9 x 3/8	42.79	0.349	22.8	22.8	14.5	145	32.2	3.51	37.8	231	52.1	2.9	122.3178
W	W36X232	W36X232	232	15000	936	809	14.8	468	122	77.2	2.62	9 x 9 x 5/16	36.1	0.291	27.9	27.9	9.92	124	27.6	3.54	32.1	196	44	2.92	103.452
W	W36X210	W36X210	210	13200	833	719	14.6	411	107	67.5	2.58	9 x 9 x 1/4	29.23	0.233	35.6	35.6	8.03	102	22.7	3.56	26.2	159	44	2.92	103.452
W	W36X194	W36X194	194	12100	767	664	14.6	375	97.7	61.9	2.56	9 x 9 x 3/16	22.18	0.174	48.7	48.7	6.06	78.2							

Type	EDI_Std_Nomenclature	AISC_Manual_Label	W (lb/ft)	Ix (in ⁴)	Zx (in ³)	Sx (in ³)	rx (in)	Iy (in ⁴)	Zy (in ³)	Sy (in ³)	ry (in)	Nominal Size (in x in x in)	Weight (lb/ft)	Wall Thickness (in)	b/t	h/t	Cross Sectional Area (in ²)	I (in ⁴)	S (in ³)	r (in)	Z (in ³)	Torsional Stiffness Constant J (in ⁴)	Torsional Shear Constant C (in ³)	Surface Area (ft ² /ft)	Cost \$/ft
W	W30X116	W30X116	116	4930	378	329	12	164	49.2	31.3	2.19	4-1/2 x 4-1/2 x 1/2	25.03	0.465	6.7	6.7	6.95	18	8.02	1.61	10.2	31.3	14.8	1.37	72.2346
W	W30X108	W30X108	108	4470	346	299	11.9	146	43.9	27.9	2.15	4-1/2 x 4-1/2 x 3/8	19.82	0.349	9.9	9.9	5.48	15.3	6.78	1.67	8.36	25.7	11.9	1.4	57.5424
W	W30X99	W30X99	99	3990	312	269	11.7	128	38.6	24.5	2.1	4-1/2 x 4-1/2 x 3/16	16.96	0.291	12.5	12.5	4.68	13.5	5.99	1.7	7.27	22.3	10.2	1.42	49.4772
W	W30X90	W30X90	90	3610	283	245	11.7	115	34.7	22.1	2.09	4-1/2 x 4-1/2 x 1/4	13.91	0.233	16.3	16.3	3.84	11.4	5.08	1.73	6.06	18.5	8.44	1.43	40.8762
W	W27X539	W27X539	539	25600	1890	1570	12.7	2110	437	277	3.65	4-1/2 x 4-1/2 x 3/16	10.7	0.174	22.9	22.9	2.93	9.02	4.01	1.75	4.71	14.4	6.49	1.45	31.824
W	W27X368	W27X368	368	16200	1240	1060	12.2	1310	279	179	3.48	4-1/2 x 4-1/2 x 1/4	7.31	0.116	35.8	35.8	2	6.35	2.82	1.78	3.27	9.92	4.45	1.47	22.2642
W	W27X336	W27X336	336	14600	1130	972	12.1	1180	252	162	3.45	4 x 4 x 1/2	21.63	0.465	5.6	5.6	6.02	11.9	5.95	1.41	7.7	21	11.2	1.2	62.6466
W	W27X307	W27X307	307	13100	1030	887	12	1050	227	146	3.41	4 x 4 x 3/8	17.27	0.349	8.5	8.5	4.78	10.3	5.13	1.46	6.39	17.5	9.14	1.23	50.5514
W	W27X281	W27X281	281	11900	936	814	12	953	206	133	3.39	4 x 4 x 5/16	14.83	0.291	10.7	10.7	4.1	9.14	4.57	1.49	5.59	15.3	7.91	1.25	43.4706
W	W27X258	W27X258	258	10800	852	745	11.9	859	187	120	3.36	4 x 4 x 1/4	12.21	0.233	14.2	14.2	3.37	7.8	3.9	1.52	4.69	12.8	6.56	1.27	36.0822
W	W27X235	W27X235	235	9700	772	677	11.8	769	168	108	3.33	4 x 4 x 3/16	9.42	0.174	20	20	2.58	6.21	3.1	1.55	3.67	9.96	5.07	1.28	28.2144
W	W27X217	W27X217	217	8910	711	627	11.8	704	154	100	3.32	4 x 4 x 1/8	6.46	0.116	31.5	31.5	1.77	4.4	2.2	1.58	2.56	6.91	3.49	1.13	19.8672
W	W27X194	W27X194	194	7860	631	559	11.7	619	136	88.1	3.29	3-1/2 x 3-1/2 x 3/8	14.72	0.349	7	7	4.09	6.48	3.7	1.26	4.69	11.2	6.77	1.07	43.1604
W	W27X178	W27X178	178	7020	570	505	11.6	555	122	78.8	3.25	3-1/2 x 3-1/2 x 5/16	12.7	0.291	9	9	3.52	5.84	3.34	1.29	4.14	9.89	5.9	1.08	37.464
W	W27X161	W27X161	161	6310	515	458	11.5	497	109	70.9	3.23	3-1/2 x 3-1/2 x 1/4	10.51	0.233	12	12	2.91	5.04	2.88	1.32	3.5	8.35	4.92	1.1	31.2882
W	W27X146	W27X146	146	5660	464	414	11.5	443	97.7	63.5	3.2	3-1/2 x 3-1/2 x 3/16	8.15	0.174	17.1	17.1	2.24	4.05	2.31	1.35	2.76	6.56	3.83	1.12	24.633
W	W27X129	W27X129	129	4760	395	345	11.2	384	57.6	36.8	2.21	3-1/2 x 3-1/2 x 1/8	5.61	0.116	27.2	27.2	1.54	2.9	1.66	1.37	1.93	4.58	2.65	1.13	17.4082
W	W27X114	W27X114	114	4080	343	299	11	319	49.3	31.5	2.18	3 x 3 x 3/8	12.17	0.349	5.6	5.6	3.39	3.77	2.51	1.05	3.25	6.64	4.74	0.9	35.9694
W	W27X102	W27X102	102	3620	305	267	11	279	43.4	27.8	2.15	3 x 3 x 5/16	10.58	0.291	7.3	7.3	2.94	3.45	2.3	1.08	2.9	5.94	4.18	0.92	31.4856
W	W27X94	W27X94	94	3270	278	243	10.9	248	38.8	24.8	2.12	3 x 3 x 1/4	8.81	0.233	9.9	9.9	2.44	3.02	2.01	1.11	2.48	5.08	3.52	0.93	26.4942
W	W27X84	W27X84	84	2850	244	213	10.7	216	33.2	21.2	2.07	3 x 3 x 3/16	6.87	0.174	14.2	14.2	1.89	2.46	1.64	1.14	1.97	4.03	2.76	0.95	21.0234
W	W24X370	W24X370	370	13400	1130	957	11.1	1160	287	170	3.27	3 x 3 x 1/8	4.75	0.116	22.9	22.9	1.3	1.78	1.19	1.17	1.4	2.84	1.92	0.97	15.045
W	W24X335	W24X335	335	11900	1020	864	11	1030	238	152	3.23	2-1/2 x 2-1/2 x 5/16	8.45	0.291	5.6	5.6	2.35	1.82	1.45	0.879	1.88	3.2	2.74	0.75	25.479
W	W24X306	W24X306	306	10700	922	789	10.9	919	214	137	3.2	2-1/2 x 2-1/2 x 1/4	7.11	0.233	7.7	7.7	1.97	1.63	1.3	0.908	1.63	2.25	0.77	21.7002	
W	W24X279	W24X279	279	9600	835	718	10.8	823	193	124	3.17	2-1/2 x 2-1/2 x 3/16	5.59	0.174	11.4	11.4	1.54	1.35	1.08	0.937	1.32	2.25	1.86	0.78	17.4138
W	W24X250	W24X250	250	8490	744	644	10.7	724	171	110	3.14	2-1/2 x 2-1/2 x 1/8	3.9	0.116	18.6	18.6	1.07	0.998	0.798	0.965	0.947	1.61	0.8	12.648	
W	W24X229	W24X229	229	7650	675	588	10.7	651	154	98.4	3.11	2-1/4 x 2-1/4 x 1/4	6.26	0.233	6.7	6.7	1.74	1.13	1	0.805	1.28	1.96	1.85	0.68	19.3032
W	W24X207	W24X207	207	6820	606	531	10.6	578	137	88.8	3.08	2-1/4 x 2-1/4 x 3/16	4.96	0.174	9.9	9.9	1.37	0.952	0.847	0.835	1.04	1.6	1.48	0.7	15.6372
W	W24X192	W24X192	192	6260	559	491	10.5	530	126	81.8	3.07	2-1/4 x 2-1/4 x 1/8	3.48	0.116	16.4	16.4	0.96	0.712	0.633	0.863	0.755	1.15	1.05	0.72	11.4636
W	W24X176	W24X176	176	5680	511	450	10.5	479	115	74.3	3.04	2 x 2 x 1/4	5.41	0.233	5.6	5.6	1.51	0.745	0.745	0.703	0.964	1.31	1.41	0.6	16.9062
W	W24X162	W24X162	162	5170	468	414	10.4	443	105	68.4	3.05	2 x 2 x 3/16	4.32	0.174	8.5	8.5	1.19	0.64	0.64	0.732	0.797	1.09	1.14	0.62	13.8324
W	W24X146	W24X146	146	4580	418	371	10.3	391	93.2	60.5	3.01	2 x 2 x 1/8	3.05	0.116	14.2	14.2	0.84	0.486	0.486	0.761	0.584	0.796	0.817	0.63	10.251
W	W24X131	W24X131	131	4020	370	329	10.2	340	81.5	53	2.97	1-3/4 x 1-3/4 x 3/16	3.68	0.174	7.1	7.1	1.02	0.405	0.402	0.63	0.585	0.699	0.844	0.53	12.0276
W	W24X117	W24X117	117	3540	327	291	10.1	297	71.4	46.5	2.94	1-5/8 x 1-5/8 x 3/16	3.36	0.174	6.3	6.3	0.93	0.312	0.384	0.579	0.491	0.544	0.712	0.49	11.1252
W	W24X104	W24X104	104	3100	289	258	10.1	259	62.4	40.7	2.91	1-5/8 x 1-5/8 x 1/8	2.42	0.116	11	11	0.67	0.246	0.302	0.608	0.37	0.41	0.522	0.41	8.4744
W	W24X103	W24X103	103	3000	280	245	10	259	62.4	40.5	2.9	1-1/2 x 1-1/2 x 3/16	3.04	0.174	5.6	5.6	0.84	0.235	0.314	0.528	0.406	0.414	0.592	0.45	10.2228
W	W24X94	W24X94	94	2700	254	222	10	239	37.5	24	1.98	1-1/2 x 1-1/2 x 1/8	2.2	0.116	9.9	9.9	0.61	0.188	0.251	0.556	0.309	0.316	0.438	0.47	7.854
W	W24X84	W24X84	84	2370	224	196	9.79	214	32.6	20.9	1.95	1-1/4 x 1-1/4 x 3/16	2.4	0.174	4.2	4.2	0.67	0.121	0.194	0.425	0.259	0.218	0.383	0.37	8.418
W	W24X76	W24X76	76	2100	200	176	9.69	196	28.6	18.4	1.92	1-1/4 x 1-1/4 x 1/8	1.78	0.116	7.8	7.8	0.49	0.101	0.162	0.454	0.204	0.174	0.292	0.38	6.6696
W	W24X68	W24X68	68	1830	177	154	9.55	170.4	24.5	15.7	1.87														
W	W24X62	W24X62	62	1550	153	131	9.23	145	15.7	9.8	1.38														
W	W24X55	W24X55	55	1350	134	114	9.11	29.1	13.3	8.3	1.34														
W	W21X275	W21X275	275	7690	749	638	9.7	787	191	122	3.1														
W	W21X248	W21X248	248	6830	671	576	9.62	699	170	109	3.08														
W	W21X223	W21X223	223	6080	601	520	9.56	614	150	96.7	3.04														
W	W21X201	W21X201	201	5310	530	461	9.47	542	133	86.1	3.02														
W	W21X182	W21X182	182	4730	476	417	9.4	483	119	77.2	3														
W	W21X166	W21X166	166	4280	432	380	9.36	435	108	70	2.99														
W	W21X147	W21X147	147	3630	373	329	9.17	376	92.6	60.1	2.95														
W	W21X132	W21X132	132	3220	333	295	9.12	333	82.3	53.5	2.93														
W	W21X122	W21X122	122	2960	307	273	9.09	305	75.6	49.2	2.92														
W	W21X111	W21X111	111	2670	279	249	9.05	274	68.2	44.5	2.9														
W	W21X101	W21X101	101	2420	253	2																			

Type	EDI_Std_Nomenclature	AISC_Manual_Label	W (lb/ft)	Ix (in ⁴)	Zx (in ³)	Sx (in ³)	rx (in)	Iy (in ⁴)	Zy (in ³)	Sy (in ³)	ry (in)	Nominal Size (in x in x in)	Weight (lb/ft)	Wall Thickness (in)	b/t	h/t	Cross Sectional Area (in ²)	I (in ⁴)	S (in ³)	r (in)	Z (in)	Torsional Stiffness Constant J (in ⁴)	Torsional Shear Constant C (in ³)	Surface Area (ft ² /ft)	Cost \$/ft
W	W18X71	W18X71	71	1170	146	127	7.5	60.3	24.7	15.8	1.7	2.5	2.5	0.1875	5.59	24	\$347.76	\$14.49							
W	W18X65	W18X65	65	1070	133	117	7.49	54.8	22.5	14.4	1.69	2.5	2.5	0.238	6.83	24	\$1,032.48	\$43.02							
W	W18X60	W18X60	60	984	123	108	7.47	50.1	20.6	13.3	1.68	2.5	2.5	0.25	7.5	24	\$448.08	\$18.67							
W	W18X55	W18X55	55	890	112	98.3	7.41	44.9	18.5	11.9	1.67	3	3	0.083	3.24	24	\$349.92	\$14.58							
W	W18X50	W18X50	50	800	101	88.9	7.38	40.1	16.6	10.7	1.65	3	3	0.012	4.58	24	\$292.08	\$12.17							
W	W18X46	W18X46	46	712	90.7	78.8	7.25	22.5	11.7	7.43	1.29	3	3	0.1875	6.87	24	\$425.76	\$17.74							
W	W18X40	W18X40	40	612	78.4	68.4	7.21	19.1	10	6.35	1.27	3	3	0.25	8.81	24	\$532.80	\$22.20							
W	W18X35	W18X35	35	510	66.5	57.6	7.04	15.3	8.06	5.12	1.22	3	3	0.375	12.17	20	\$675.00	\$33.75							
W	W16X100	W16X100	100	1490	198	175	7.1	186	54.9	35.7	2.51	3.5	3.5	0.12	5.68	20	\$327.00	\$16.35							
W	W16X89	W16X89	89	1300	175	155	7.05	163	48.1	31.4	2.49	3.5	3.5	0.1875	8.15	20	\$418.20	\$20.91							
W	W16X77	W16X77	77	1110	150	134	7	138	41.1	26.9	2.47	3.5	3.5	0.25	10.51	24	\$653.76	\$27.24							
W	W16X67	W16X67	67	954	130	117	6.96	119	35.5	23.2	2.46	3.5	3.5	0.375	14.72	24	\$1,049.04	\$43.71							
W	W16X57	W16X57	57	758	105	92.2	6.72	43.1	18.9	12.1	1.6	4	4	0.083	4.32	24	\$653.04	\$27.21							
W	W16X50	W16X50	50	659	92	81	6.68	37.2	16.3	10.5	1.59	4	4	0.12	6.22	24	\$394.80	\$16.45							
W	W16X45	W16X45	45	586	82.3	72.7	6.65	32.8	14.5	9.34	1.57	4	4	0.1875	9.42	24	\$579.84	\$24.16							
W	W16X40	W16X40	40	518	73	64.7	6.63	28.9	12.7	8.25	1.57	4	4	0.25	12.21	24	\$738.24	\$30.76							
W	W16X36	W16X36	36	448	64	56.5	6.51	24.5	10.8	7	1.52	4	4	0.375	17.27	24	\$1,044.48	\$43.52							
W	W16X31	W16X31	31	375	54	47.2	6.41	12.4	7.03	4.49	1.17	4	4	0.5	21.63	20	\$1,090.00	\$54.50							
W	W16X26	W16X26	26	301	44.2	38.4	6.26	9.59	5.48	3.49	1.12	4.5	4.5	0.1875	10.7	20	\$693.20	\$34.66							
W	W14X873	W14X873	873	18100	2030	1530	8.39	6170	1020	656	4.2	4.5	4.5	0.25	14	20	\$907.20	\$45.36							
W	W14X808	W14X808	808	15900	1830	1390	8.17	5550	930	597	4.83	5	5	0.12	8.16	24	\$1,321.92	\$55.08							
W	W14X730	W14X730	730	14300	1660	1280	8.17	4720	816	527	4.69	5	5	0.1875	11.97	20	\$646.20	\$32.31							
W	W14X665	W14X665	665	12400	1480	1150	7.98	4170	730	472	4.62	5	5	0.25	15.62	20	\$859.00	\$42.95							
W	W14X605	W14X605	605	10800	1320	1040	7.8	3680	652	423	4.55	5	5	0.375	23.12	20	\$1,165.20	\$58.26							
W	W14X550	W14X550	550	9430	1180	931	7.63	3250	583	378	4.49	5	5	0.5	28.43	20	\$1,739.80	\$86.99							
W	W14X500	W14X500	500	8210	1050	838	7.48	2880	522	339	4.43	6	6	0.125	9.85	20	\$638.20	\$31.91							
W	W14X455	W14X455	455	7190	936	756	7.33	2560	468	304	4.38	6	6	0.1875	14.65	20	\$738.20	\$36.91							
W	W14X426	W14X426	426	6600	869	706	7.26	2360	434	283	4.34	6	6	0.25	19.02	24	\$1,167.84	\$48.66							
W	W14X398	W14X398	398	6000	801	656	7.16	2170	402	262	4.31	6	6	0.375	26.48	20	\$1,483.80	\$74.19							
W	W14X370	W14X370	370	5440	736	607	7.07	1990	370	241	4.27	6	6	0.5	35.24	20	\$1,776.00	\$88.80							
W	W14X342	W14X342	342	4900	672	558	6.98	1810	338	221	4.24	7	7	0.25	22.42	20	\$1,372.00	\$68.60							
W	W14X311	W14X311	311	4330	603	506	6.88	1610	304	199	4.2	7	7	0.375	35.58	20	\$1,876.60	\$93.83							
W	W14X283	W14X283	283	3840	542	459	6.79	1440	274	179	4.17	7	7	0.5	42.05	20	\$2,499.40	\$124.97							
W	W14X257	W14X257	257	3400	487	415	6.71	1290	246	161	4.13	8	8	0.1875	19.63	20	\$989.20	\$49.46							
W	W14X233	W14X233	233	3010	436	375	6.63	1150	221	145	4.1	8	8	0.25	26	20	\$1,301.20	\$65.06							
W	W14X211	W14X211	211	2680	390	338	6.55	1030	198	130	4.07	8	8	0.375	37.7	20	\$2,170.80	\$108.54							
W	W14X193	W14X193	193	2400	355	310	6.5	931	180	119	4.05	8	8	0.5	49	20	\$2,637.80	\$131.89							
W	W14X176	W14X176	176	2140	320	281	6.43	838	163	107	4.02	8	8	0.625	59.32	20	\$3,843.80	\$192.19							
W	W14X159	W14X159	159	1900	287	254	6.38	748	146	96.2	4	10	10	0.1875	24.73	20	\$1,468.80	\$73.44							
W	W14X145	W14X145	145	1710	260	232	6.33	677	133	87.3	3.98	10	10	0.25	32.63	20	\$1,938.20	\$96.91							
W	W14X132	W14X132	132	1530	234	209	6.28	548	113	74.5	3.76	10	10	0.375	47.9	20	\$2,845.20	\$142.26							
W	W14X120	W14X120	120	1380	212	190	6.24	495	102	67.5	3.74	10	10	0.5	62.46	20	\$3,710.00	\$185.50							
W	W14X109	W14X109	109	1240	192	173	6.22	447	92.7	61.2	3.73	12	12	0.25	39.45	20	\$1,987.20	\$99.36							
W	W14X99	W14X99	99	1110	173	157	6.17	402	83.6	55.2	3.71	12	12	0.375	58.1	20	\$3,555.60	\$177.78							
W	W14X90	W14X90	90	999	157	143	6.14	362	75.6	49.9	3.7	12	12	0.5	76.07	20	\$4,107.60	\$205.38							
W	W14X82	W14X82	82	881	139	123	6.05	348	70.8	47.8	3.68	12	12	0.625	94.32	20	\$5,148.00	\$257.40							
W	W14X74	W14X74	74	795	126	112	6.04	334	68.4	46.5	3.66	12	12	0.75	112.47	20	\$6,210.00	\$310.50							
W	W14X68	W14X68	68	722	115	103	6.01	321	66.4	45.2	3.64	12	12	0.875	130.62	20	\$7,380.00	\$369.00							
W	W14X61	W14X61	61	640	102	92.1	5.98	307	64.3	43.9	3.62	12	12	1.0	149.77	20	\$8,664.00	\$433.20							
W	W14X53	W14X53	53	541	87.1	77.8	5.89	292	62.8	42.6	3.6	12	12	1.125	169.92	20	\$10,068.00	\$503.40							
W	W14X48	W14X48	48	484	78.4	70.2	5.85	278	61.3	41.3	3.58	12	12	1.25	191.07	20	\$11,580.00	\$579.00							
W	W14X43	W14X43	43	428	69.6	62.6	5.82	264	60.1	40.1	3.56	12	12	1.375	213.22	20	\$13,200.00	\$660.00							
W	W14X38	W14X38	38	385	61.5	54.6	5.87	250	58.9	39.0	3.54	12	12	1.5	236.37	20	\$14,940.00	\$747.00							
W	W14X34	W14X34	34	340	54.6	48.6	5.83	236	57.7	38.1	3.52	12	12	1.625	260.52	20	\$16,800.00	\$840.00							
W	W14X30	W14X30	30	291	47.3	42	5.73	222	56.5	37.2	3.5	12	12	1.75	285.67	20	\$18,780.00	\$939.00							
W	W14X26	W14X26	26	245	40.2	35.3	5.65	208	55.3	36.3	3.48	12	12	1.875	311.82	20	\$20,880.00	\$1044.00							
W	W14X22	W14X22	22	199	33.2	29	5.54	194	54.1	35.3	3.46	12	12	2.0	338.97	20	\$23,100.00	\$1155.00							
W	W12X336	W12X336	336	4060	603	483	6.41	1190	274	177	3.47	12	12	2.125	366.12	20	\$25,440.00	\$1272.00							
W	W12X305	W12X305	305	3550	537	435	6.29	1050	244	159	3.42	12	12	2.25	394.27	20	\$27,960.00	\$1398.00							
W	W12X279	W12X279	279	3110	481	393	6.16	937	220	143	3.38	12	12	2.375	422.42	20	\$30,600.00	\$1530.00							
W	W12X252	W12X252	252	2720	428	353	6.06	828	196	127	3.34	12	12	2.5	450.57	20	\$33,360.00	\$1668.0							

Type	EDI_Std_Nomenclature	AISC_Manual_Label	W (lb/ft)	Ix (in ⁴)	Zx (in ³)	Sx (in ³)	rx (in)	Iy (in ⁴)	Zy (in ³)	Sy (in ³)	ry (in)	Nominal Size (in x in x in)	Weight (lb/ft)	Wall Thickness (in)	b/t	h/t	Cross Sectional Area (in ²)	I (in ⁴)	S (in ³)	r (in)	Z (in ³)	Torsional Stiffness Constant J (in ⁴)	Torsional Shear Constant C (in ³)	Surface Area (ft ² /ft)	Cost \$/ft	
W	W12X40	W12X40	40	307	57	51.5	5.13	44.1	16.8	11	1.94															
W	W12X35	W12X35	35	285	51.2	45.6	5.25	24.5	11.5	7.47	1.54															
W	W12X30	W12X30	30	238	43.1	38.6	5.21	20.3	9.56	6.24	1.52															
W	W12X26	W12X26	26	204	37.2	33.4	5.17	17.3	8.17	5.34	1.51															
W	W12X22	W12X22	22	156	29.3	25.4	4.91	4.66	3.66	2.31	0.848															
W	W12X19	W12X19	19	130	24.7	21.3	4.82	3.76	2.98	1.88	0.822															
W	W12X16	W12X16	16	103	20.1	17.1	4.67	2.82	2.26	1.41	0.773															
W	W12X14	W12X14	14	88.6	17.4	14.9	4.62	2.36	1.9	1.19	0.753															
W	W10X112	W10X112	112	716	147	126	4.66	236	69.2	45.3	2.68															
W	W10X100	W10X100	100	623	130	112	4.6	207	61	40	2.65															
W	W10X88	W10X88	88	534	113	98.5	4.54	179	53.1	34.8	2.63															
W	W10X77	W10X77	77	455	97.6	85.9	4.49	154	45.9	30.1	2.6															
W	W10X68	W10X68	68	394	85.3	75.7	4.44	134	40.1	26.4	2.59															
W	W10X60	W10X60	60	341	74.6	66.7	4.39	116	35	23	2.57															
W	W10X54	W10X54	54	303	66.6	60	4.37	103	31.3	20.6	2.56															
W	W10X49	W10X49	49	272	60.4	54.6	4.35	93.4	28.3	18.7	2.54															
W	W10X45	W10X45	45	248	54.9	49.1	4.32	53.4	20.3	13.3	2.01															
W	W10X39	W10X39	39	209	46.8	42.1	4.27	45	17.2	11.3	1.98															
W	W10X33	W10X33	33	171	38.8	35	4.19	36.6	14	9.2	1.94															
W	W10X30	W10X30	30	170	36.6	32.4	4.38	16.7	8.84	5.75	1.37															
W	W10X26	W10X26	26	144	31.3	27.9	4.35	14.1	7.5	4.89	1.36															
W	W10X22	W10X22	22	118	26	23.2	4.27	11.4	6.1	3.97	1.33															
W	W10X19	W10X19	19	96.3	21.6	18.8	4.14	4.29	3.35	2.14	0.874															
W	W10X17	W10X17	17	81.9	18.7	16.2	4.05	3.56	2.8	1.78	0.845															
W	W10X15	W10X15	15	68.9	16	13.8	3.95	2.89	2.3	1.45	0.81															
W	W10X12	W10X12	12	53.8	12.6	10.9	3.9	2.18	1.74	1.1	0.785															
W	W8X67	W8X67	67	272	70.1	60.4	3.72	88.6	32.7	21.4	2.12															
W	W8X58	W8X58	58	228	59.8	52	3.65	75.1	27.9	16.3	2.1															
W	W8X48	W8X48	48	184	49	43.2	3.61	60.9	22.9	15	2.08															
W	W8X40	W8X40	40	146	39.8	35.5	3.53	49.1	18.5	12.2	2.04															
W	W8X35	W8X35	35	127	34.7	31.2	3.51	42.6	16.1	10.6	2.03															
W	W8X31	W8X31	31	110	30.4	27.5	3.47	37.1	14.1	9.27	2.02															
W	W8X28	W8X28	28	98	27.2	24.3	3.45	21.7	10.1	6.63	1.62															
W	W8X24	W8X24	24	82.7	23.1	20.9	3.42	18.3	8.57	5.63	1.61															
W	W8X21	W8X21	21	75.3	20.4	18.2	3.49	9.77	5.69	3.71	1.26															
W	W8X18	W8X18	18	61.9	17	15.2	3.43	7.97	4.66	3.04	1.23															
W	W8X15	W8X15	15	48	13.6	11.8	3.29	3.41	2.67	1.7	0.876															
W	W8X13	W8X13	13	39.6	11.4	9.91	3.21	2.73	2.15	1.37	0.843															
W	W8X10	W8X10	10	30.8	8.87	7.81	3.22	2.09	1.66	1.06	0.841															
W	W6X25	W6X25	25	53.4	18.9	16.7	2.7	17.1	8.56	5.61	1.52															
W	W6X20	W6X20	20	41.4	14.9	13.4	2.66	13.3	6.72	4.41	1.5															
W	W6X15	W6X15	15	29.1	10.8	9.72	2.56	9.32	4.75	3.11	1.45															
W	W6X16	W6X16	16	32.1	11.7	10.2	2.6	4.43	3.39	2.2	0.967															
W	W6X12	W6X12	12	22.1	8.3	7.31	2.49	2.99	2.32	1.5	0.918															
W	W6X9	W6X9	9	16.4	6.23	5.56	2.47	2.2	1.72	1.11	0.905															
W	W6X8.5	W6X8.5	8.5	14.9	5.73	5.1	2.43	1.99	1.56	1.01	0.89															
W	W5X19	W5X19	19	26.3	11.6	10.2	2.17	9.13	5.53	3.63	1.28															
W	W5X16	W5X16	16	21.4	9.63	8.55	2.13	7.51	4.58	3	1.26															
W	W4X13	W4X13	13	11.3	6.28	5.46	1.72	3.86	2.92	1.9	1															

