

COLUMNS
W shapes

$F_y = 36 \text{ ksi}$
 $F_y = 50 \text{ ksi}$

Allowable axial loads in kips

Designation	W14										
	Wt./ft.	730		665		605		550		500	
		F_y	36	50	36	50	36	50	36	50	36
Effective length in ft. KL with respect to least radius of gyration r_y	0	4644	6450	4234	5880	3845	5340	3499	4860	3175	4410
	11	4315	5887	3928	5356	3562	4855	3237	4411	2933	3995
	12	4277	5819	3892	5293	3529	4797	3206	4357	2905	3945
	13	4237	5749	3855	5228	3494	4736	3175	4301	2875	3893
	14	4196	5677	3817	5161	3459	4674	3142	4243	2845	3840
	15	4153	5602	3777	5092	3422	4609	3108	4183	2813	3784
	16	4110	5525	3737	5020	3384	4543	3073	4121	2781	3727
	17	4065	5446	3695	4946	3345	4474	3037	4057	2748	3668
	18	4019	5365	3652	4870	3306	4404	3000	3992	2714	3608
	19	3971	5282	3608	4793	3265	4331	2962	3925	2678	3546
	20	3923	5196	3563	4713	3223	4257	2923	3856	2642	3482
	22	3823	5018	3469	4547	3136	4103	2842	3713	2568	3350
	24	3718	4832	3372	4374	3045	3942	2758	3564	2490	3211
	26	3609	4638	3270	4193	2951	3774	2670	3407	2409	3066
	28	3496	4436	3164	4004	2853	3598	2579	3244	2324	2915
	30	3378	4225	3055	3807	2751	3415	2484	3074	2236	2758
	32	3256	4006	2941	3603	2645	3225	2386	2897	2145	2594
	34	3130	3779	2823	3391	2535	3028	2284	2714	2051	2423
	36	3000	3543	2702	3170	2422	2822	2179	2522	1954	2246
	38	2865	3298	2576	2941	2305	2609	2070	2324	1853	2061
40	2726	3044	2446	2703	2184	2387	1958	2117	1748	1870	
42	2582	2780	2312	2459	2059	2166	1841	1920	1640	1696	
44	2434	2533	2173	2241	1930	1974	1721	1749	1529	1545	
46	2281	2318	2030	2050	1797	1806	1597	1601	1413	1414	
48	2123	2129	1882	1883	1659	1659	1470	1470	1298	1298	
50	1962	1962	1735	1735	1529	1529	1355	1355	1197	1197	

Properties

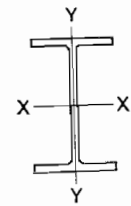
U	2.14	2.14	2.14	2.14	2.16	2.16	2.17	2.17	2.18	2.18
P_{wo} (kips)	3074	4269	2643	3670	2248	3122	1928	2678	1651	2293
P_{wi} (kips/in.)	111	154	102	142	93	130	86	119	79	110
P_{wb} (kips)	63,270	74,560	49,560	58,410	38,210	45,030	29,480	34,740	22,970	27,070
P_{fb} (kips)	5424	7534	4597	6385	3894	5408	3283	4560	2756	3828
L_c (ft.)	18.9	16.0	18.6	15.8	18.4	15.6	18.2	15.4	18.0	15.2
L_u (ft.)	185.2	133.3	171.5	123.5	159.6	114.9	149.3	107.5	140.3	101.0
A (in. ²)	215		196		178		162		147	
I_x (in. ⁴)	14300		12400		10800		9430		8210	
I_y (in. ⁴)	4720		4170		3680		3250		2880	
r_y (in.)	4.69		4.62		4.55		4.49		4.43	
Ratio r_x/r_y	1.74		1.73		1.71		1.70		1.69	
B_x } Bending	0.168		0.170		0.171		0.174		0.175	
B_y } factors	0.408		0.415		0.421		0.429		0.434	
a_x }	2138		1860		1614		1405		1225	
a_y } *	705		623		549		487		430	

* Tabulated values of a_x and a_y must be multiplied by 10^6 .

$F_y = 36 \text{ ksi}$
 $F_y = 50 \text{ ksi}$

COLUMNS
W shapes

Allowable axial loads in kips

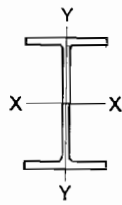


Designation	W14										
	Wt./ft.	455		426		398		370		342	
		F_y	36	50	36	50	36	50	36	50	36
Effective length in ft. KL with respect to least radius of gyration r_y	0	2894	4020	2700	3750	2527	3510	2354	3270	2182	3030
	11	2671	3636	2489	3388	2328	3168	2167	2947	2006	2728
	12	2644	3590	2464	3344	2304	3126	2144	2908	1985	2692
	13	2617	3542	2438	3298	2280	3083	2121	2868	1963	2654
	14	2589	3492	2411	3251	2255	3039	2097	2826	1941	2614
	15	2560	3441	2384	3203	2229	2993	2073	2782	1918	2574
	16	2530	3388	2356	3153	2202	2946	2047	2738	1894	2532
	17	2499	3333	2326	3101	2174	2897	2021	2692	1870	2489
	18	2467	3277	2296	3048	2146	2847	1995	2644	1845	2444
	19	2435	3220	2266	2994	2117	2795	1967	2596	1819	2399
	20	2401	3161	2234	2938	2087	2743	1939	2546	1793	2352
	22	2332	3038	2169	2822	2025	2633	1881	2442	1738	2255
	24	2260	2909	2100	2700	1961	2518	1820	2333	1681	2153
	26	2184	2775	2029	2573	1893	2397	1756	2220	1621	2047
	28	2106	2635	1955	2440	1823	2272	1690	2101	1559	1935
	30	2025	2488	1878	2302	1750	2141	1621	1977	1495	1819
	32	1940	2336	1798	2158	1674	2004	1549	1848	1428	1698
	34	1853	2178	1715	2008	1596	1862	1475	1713	1358	1572
	36	1762	2013	1630	1852	1515	1714	1398	1573	1286	1441
	38	1668	1841	1541	1689	1431	1560	1319	1427	1212	1304
40	1571	1666	1449	1526	1344	1409	1237	1288	1135	1177	
42	1471	1511	1354	1384	1254	1278	1151	1168	1053	1067	
44	1367	1377	1255	1261	1161	1164	1063	1065	972	973	
46	1260	1260	1154	1154	1065	1065	974	974	890	890	
48	1157	1157	1060	1060	978	978	895	895	817	817	
50	1066	1066	977	977	902	902	824	824	753	753	

Properties

U	2.19	2.19	2.20	2.20	2.20	2.20	2.22	2.22	2.23	2.23
P_{wo} (kips)	1405	1952	1245	1729	1115	1549	987	1371	866	1203
P_{wi} (kips/in.)	73	101	68	94	64	89	60	83	55	77
P_{wb} (kips)	17,890	21,080	14,410	16,990	12,130	14,290	9912	11,680	7986	9412
P_{fb} (kips)	2318	3220	2073	2879	1821	2529	1592	2211	1373	1907
L_c (ft.)	17.8	15.1	17.6	15.0	17.5	14.9	17.4	14.8	17.3	14.7
L_u (ft.)	132.3	95.2	125.1	90.1	118.7	85.5	112.9	81.3	107.7	77.5
A (in. ²)	134		125		117		109		101	
I_x (in. ⁴)	7190		6600		6000		5440		4900	
I_y (in. ⁴)	2560		2360		2170		1990		1810	
r_y (in.)	4.38		4.34		4.31		4.27		4.24	
Ratio r_x/r_y	1.67		1.67		1.66		1.66		1.65	
B_x } Bending	0.177		0.177		0.178		0.180		0.181	
B_y } factors	0.441		0.442		0.447		0.452		0.457	
a_x }	1073		982		894		812		733	
a_y } *	383		351		324		296		271	

* Tabulated values of a_x and a_y must be multiplied by 10^6 .



COLUMNS
W shapes

$F_y = 36$ ksi
 $F_y = 50$ ksi

Allowable axial loads in kips

Designation		W14									
Wt./ft.		311		283		257		233		211	
F_y		36	50	36	50	36	50	36	50	36	50
Effective length in ft. KL with respect to least radius of gyration r_y	0	1974	2742	1799	2499	1633	2268	1480	2055	1339	1860
	6	1898	2613	1729	2381	1569	2159	1421	1956	1286	1769
	7	1883	2587	1715	2356	1556	2137	1409	1935	1275	1750
	8	1867	2558	1700	2330	1542	2113	1396	1913	1263	1730
	9	1850	2529	1685	2303	1528	2088	1383	1890	1251	1709
	10	1832	2498	1668	2274	1513	2062	1370	1866	1239	1687
	11	1813	2465	1651	2245	1497	2034	1355	1841	1226	1665
	12	1794	2432	1634	2214	1481	2006	1340	1815	1212	1641
	13	1774	2397	1615	2182	1464	1976	1325	1788	1198	1616
	14	1754	2361	1597	2148	1447	1946	1309	1760	1183	1590
	15	1733	2324	1577	2114	1429	1914	1293	1731	1168	1564
	16	1711	2285	1557	2079	1410	1882	1276	1701	1153	1537
	17	1689	2246	1536	2042	1391	1848	1258	1671	1137	1509
	18	1666	2205	1515	2005	1372	1814	1241	1639	1121	1480
	19	1642	2163	1494	1966	1352	1778	1222	1607	1104	1450
	20	1618	2120	1471	1927	1331	1742	1204	1573	1087	1419
	22	1568	2031	1425	1845	1289	1666	1165	1504	1051	1356
	24	1515	1938	1377	1758	1244	1587	1124	1431	1014	1289
	26	1460	1840	1326	1668	1198	1504	1081	1355	975	1220
	28	1403	1738	1274	1574	1149	1417	1037	1275	934	1147
30	1344	1631	1219	1476	1099	1326	991	1192	892	1071	
32	1283	1520	1162	1373	1047	1232	943	1106	848	991	
34	1219	1404	1104	1266	993	1133	893	1015	803	908	
36	1153	1283	1043	1155	936	1030	842	921	755	822	
38	1084	1158	980	1040	878	926	788	827	707	738	
40	1013	1045	914	939	818	836	733	746	656	666	

Properties

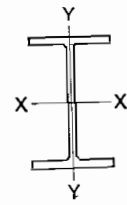
U	2.24	2.24	2.26	2.26	2.27	2.27	2.28	2.28	2.29	2.29
P_{wo} (kips)	746	1035	639	887	542	753	457	635	397	551
P_{wi} (kips/in.)	51	71	46	65	42	59	39	54	35	49
P_{wb} (kips)	6130	7224	4694	5532	3547	4181	2679	3157	2058	2425
P_{fb} (kips)	1149	1596	964	1339	804	1116	666	925	548	761
L_c (ft.)	17.1	14.5	17.0	14.4	16.9	14.3	16.8	14.2	16.7	14.2
L_u (ft.)	98.5	70.9	92.6	66.7	85.7	61.7	78.5	56.5	72.3	52.1
A (in. ²)	91.4	83.3	75.6	68.5	62.0					
I_x (in. ⁴)	4330	3840	3400	3010	2660					
I_y (in. ⁴)	1610	1440	1290	1150	1030					
r_y (in.)	4.20	4.17	4.13	4.10	4.07					
Ratio r_x/r_y	1.64	1.63	1.62	1.61	1.61					
B_x } Bending factors	0.181	0.181	0.182	0.183	0.183					
B_y }	0.459	0.465	0.470	0.472	0.477					
a_x }	645	572	507	449	396					
a_y }	240	216	192	172	153					

* Tabulated values of a_x and a_y must be multiplied by 10^6 .

$F_y = 36$ ksi
 $F_y = 50$ ksi

COLUMNS
W shapes

Allowable axial loads in kips

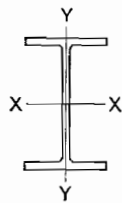


Designation		W14							
Wt./ft.		193		176		159		145	
F_y		36	50	36	50	36	50	36	50
Effective length in ft. KL with respect to least radius of gyration r_y	0	1227	1704	1119	1554	1009	1401	922	1281
	6	1178	1620	1074	1477	968	1331	884	1217
	7	1167	1603	1064	1461	959	1317	877	1203
	8	1157	1584	1054	1444	950	1301	869	1189
	9	1146	1565	1044	1426	941	1285	860	1174
	10	1134	1545	1034	1407	931	1268	851	1159
	11	1122	1524	1022	1388	921	1250	842	1142
	12	1110	1502	1011	1368	911	1232	832	1125
	13	1097	1479	999	1347	900	1213	822	1108
	14	1083	1455	987	1325	889	1193	812	1090
	15	1069	1431	974	1302	877	1173	801	1071
	16	1055	1406	961	1279	865	1152	790	1051
	17	1040	1380	947	1255	853	1130	779	1031
	18	1025	1353	933	1231	840	1107	767	1011
	19	1010	1326	919	1205	827	1085	755	990
	20	994	1298	904	1179	814	1061	743	968
	22	961	1239	874	1125	786	1012	718	923
	24	927	1178	842	1069	758	960	691	875
	26	891	1113	809	1009	727	906	663	825
	28	853	1046	775	947	696	850	634	773
30	814	976	739	882	663	791	604	719	
32	774	902	701	815	629	729	573	662	
34	732	826	662	744	594	665	540	603	
36	688	745	622	670	558	598	507	541	
38	643	669	580	601	520	537	472	486	
40	596	604	537	543	480	484	435	438	

Properties

U	2.29	2.29	2.31	2.31	2.32	2.32	2.34	2.34
P_{wo} (kips)	340	473	299	415	251	349	214	298
P_{wi} (kips/in.)	32	45	30	42	27	37	24	34
P_{wb} (kips)	1542	1817	1250	1474	904	1066	688	810
P_{fb} (kips)	467	648	386	536	319	443	267	371
L_c (ft.)	16.6	14.1	16.5	14.0	16.4	13.9	16.4	13.9
L_u (ft.)	68.1	49.0	62.6	45.0	57.2	41.2	52.6	37.9
A (in. ²)	56.8	51.8	46.7	42.7				
I_x (in. ⁴)	2400	2140	1900	1710				
I_y (in. ⁴)	931	838	748	677				
r_y (in.)	4.05	4.02	4.00	3.98				
Ratio r_x/r_y	1.60	1.60	1.60	1.59				
B_x } Bending factors	0.183	0.184	0.184	0.184				
B_y }	0.477	0.484	0.485	0.489				
a_x }	358	319	283	255				
a_y }	139	125	111	101				

* Tabulated values of a_x and a_y must be multiplied by 10^6 .



COLUMNS
W shapes

$F_y = 36$ ksi
 $F_y = 50$ ksi

Allowable axial loads in kips

Designation	W14										
	Wt./ft.	132		120		109		99		90	
		F_y	36	50	36	50	36	50	36	50	36
Effective length in ft. KL with respect to least radius of gyration r_y	0	838	1164	762	1059	691	960	629	873	572	795
	6	801	1101	729	1002	661	908	600	825	547	751
	7	794	1088	722	990	654	897	595	815	541	742
	8	786	1074	714	977	647	885	589	805	536	732
	9	777	1060	707	963	640	873	582	793	530	722
	10	768	1044	699	949	633	860	575	782	524	711
	11	759	1028	690	935	626	847	568	769	517	700
	12	750	1011	682	919	618	833	561	757	511	689
	13	740	994	673	903	609	818	554	743	504	676
	14	730	976	663	887	601	803	546	730	497	664
	15	719	958	654	870	592	788	538	715	489	651
	16	708	938	644	852	583	772	529	701	482	637
	17	697	919	633	834	574	755	521	685	474	624
	18	686	898	623	815	564	738	512	670	466	609
	19	674	877	612	796	554	721	503	654	458	595
	20	662	856	601	776	544	703	494	637	449	580
	22	637	811	578	735	523	665	475	603	432	548
	24	610	764	554	692	501	626	454	567	413	515
	26	583	714	528	647	478	585	433	529	394	481
	28	554	663	502	599	454	541	411	489	374	444
30	524	608	475	549	429	496	388	448	353	406	
32	493	551	446	497	403	449	365	404	331	366	
34	461	492	416	443	376	399	340	359	308	325	
36	427	439	385	395	348	356	314	320	285	290	
38	392	394	353	355	319	320	287	288	260	261	

Properties

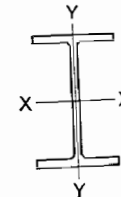
U	2.47	2.47	2.48	2.48	2.49	2.49	2.50	2.28	2.52	2.29
P_{wo} (kips)	196	272	173	240	148	205	125	174	109	151
P_{wi} (kips/in.)	23	32	21	30	19	26	17	24	16	22
P_{wb} (kips)	587	692	449	529	316	373	249	294	186	220
P_{fb} (kips)	239	332	199	276	166	231	137	190	113	158
L_c (ft.)	15.5	13.2	15.5	13.1	15.4	13.1	15.4	13.0	15.3	13.0
L_u (ft.)	47.7	34.4	44.1	31.7	40.6	29.2	37.0	26.7	34.0	24.5
A (in. ²)	38.8	35.3	32.0	32.0	29.1	1110	999			
I_x (in. ⁴)	1530	1380	1240	1110	999					
I_y (in. ⁴)	548	495	447	402	362					
r_y (in.)	3.76	3.74	3.73	3.71	3.70					
Ratio r_x/r_y	1.67	1.67	1.66	1.66	1.66					
B_x } Bending	0.186	0.186	0.185	0.185	0.185					
B_y } factors	0.521	0.523	0.523	0.527	0.531					
a_x }	228.0	204.8	184.5	165.1	148.9					
a_y }	81.7	73.6	66.3	59.7	54.1					

* Tabulated values of a_x and a_y must be multiplied by 10^6 .
† Flange is non-compact; see discussion preceding column load tables.

$F_y = 36$ ksi
 $F_y = 50$ ksi

COLUMNS
W shapes

Allowable axial loads in kips



Designation	W14															
	Wt./ft.	82		74		68		61		53		48		43		
		F_y	36	50	36	50	36	50	36	50	36	50	36	50	36	50
Effective length in ft. KL with respect to least radius of gyration r_y	0	521	723	471	654	432	600	387	537	337	468	305	423	272	377	
	6	482	657	436	595	400	545	358	487	302	408	273	369	244	329	
	7	474	643	429	581	393	533	351	476	295	395	266	356	237	317	
	8	465	627	421	567	385	519	345	464	286	380	258	343	230	305	
	9	456	610	412	552	377	505	338	452	277	364	250	329	223	292	
	10	446	593	403	536	369	491	330	439	268	348	242	313	215	279	
	11	435	575	394	520	360	475	322	425	258	330	233	298	207	264	
	12	425	555	384	502	351	459	314	410	248	312	224	281	199	249	
	14	402	515	363	465	332	425	297	379	226	273	204	245	181	216	
	16	377	471	341	426	311	388	278	346	202	229	182	206	161	181	
	18	351	423	317	383	289	348	258	310	177	184	159	165	140	144	
	20	323	372	292	337	266	305	237	272	149	149	133	133	117	117	
	22	293	318	265	287	241	259	214	230	123	123	110	110	96	96	
	24	261	267	236	241	214	218	190	193	104	104	93	93	81	81	
	26	227	227	206	206	186	186	165	165	88	88	79	79	69	69	
	28	196	196	177	177	160	160	142	142	76	76	68	68	60	60	
	30	171	171	154	154	139	139	124	124	66	66	59	59	52	52	
	31	160	160	145	145	131	131	116	116	62	62	56	56	49	49	
	32	150	150	136	136	123	123	109	109	58	58					
	34	133	133	120	120	109	109	96	96							
36	119	119	107	107	97	97	86	86								
38	106	106	96	96	87	87	77	77								

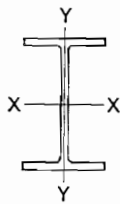
Properties

U	3.69	3.69	3.71	3.71	3.75	3.75	3.77	3.43	4.79	4.35	4.39	4.39	4.44	4.44
P_{wo} (kips)	149	207	127	176	112	156	97	135	96	133	84	117	72	100
P_{wi} (kips/in.)	18	26	16	23	15	21	14	19	13	19	12	17	11	15
P_{wb} (kips)	297	350	204	240	160	188	118	139	113	134	88	104	63	75
P_{fb} (kips)	164	228	139	193	117	162	94	130	98	136	80	111	63	88
L_c (ft.)	10.7	9.1	10.6	9.0	10.6	9.0	10.6	9.0	8.5	7.2	8.5	7.2	8.4	7.2
L_u (ft.)	28.1	20.2	25.9	18.6	23.9	17.2	21.5	15.5	17.7	12.7	16.0	11.5	14.4	10.4
A (in. ²)	24.1	21.8	20.0	17.9	15.6	14.1	12.6							
I_x (in. ⁴)	882	796	723	640	541	485	428							
I_y (in. ⁴)	148	134	121	107	95.7	84	75							
r_y (in.)	2.48	2.48	2.46	2.45	2.44	2.44	2.44							
Ratio r_x/r_y	2.44	2.44	2.44	2.44	2.44	2.44	2.44							
B_x } Bending	0.196	0.195	0.194	0.194	0.194	0.194	0.194							
B_y } factors	0.823	0.820	0.826	0.833	0.833	0.833	0.833							
a_x }	131.4	118.5	107.6	95.4	80.6	71.9	63.6							
a_y }	22.1	20.0	18.0	16.0	14.0	12.0	10.0							

* Tabulated values of a_x and a_y must be multiplied by 10^6 .

† Web may be non-compact for combined axial and bending stress; see AISC Specification Sect. 1.5.1.4.1.

‡ Web exceeds AISC Specification Sect. 1.9. See discussion preceding tables. Note: Heavy line indicates KL/r of 200.



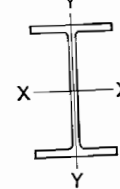
COLUMNS W shapes

$F_y = 36$ ksi
 $F_y = 50$ ksi

Allowable axial loads in kips

Designation	W12										
	336		305		279		252		230		
Wt./ft.	36	50	36	50	36	50	36	50	36	50	
F_y	36	50	36	50	36	50	36	50	36	50	
Effective length in ft. KL with respect to least radius of gyration r_y	0	2134	2964	1935	2688	1769	2457	1601	2223	1462	2031
	6	2031	2788	1840	2526	1681	2306	1519	2085	1387	1903
	7	2009	2751	1820	2491	1662	2274	1502	2055	1371	1876
	8	1986	2711	1799	2454	1642	2240	1484	2023	1355	1847
	9	1962	2669	1777	2415	1622	2204	1465	1990	1337	1816
	10	1937	2625	1753	2375	1600	2166	1445	1955	1319	1784
	11	1911	2579	1729	2332	1578	2126	1425	1919	1300	1750
	12	1884	2531	1704	2288	1554	2085	1403	1881	1280	1715
	13	1856	2482	1678	2242	1530	2042	1381	1842	1259	1678
	14	1827	2430	1651	2194	1505	1998	1358	1801	1238	1641
	15	1797	2377	1623	2145	1479	1952	1334	1759	1216	1601
	16	1766	2322	1594	2094	1452	1905	1309	1715	1193	1561
	17	1733	2265	1565	2041	1425	1856	1284	1670	1169	1519
	18	1701	2206	1534	1987	1396	1805	1258	1623	1145	1476
	19	1667	2146	1503	1931	1367	1753	1231	1575	1120	1431
	20	1632	2084	1471	1873	1337	1699	1203	1526	1095	1386
	22	1560	1955	1404	1753	1275	1588	1146	1423	1041	1290
	24	1484	1819	1333	1627	1209	1470	1085	1314	985	1190
	26	1404	1675	1260	1494	1141	1346	1022	1200	927	1084
	28	1321	1525	1183	1354	1069	1216	956	1079	866	972
30	1235	1366	1102	1206	994	1078	887	952	801	855	
32	1144	1205	1018	1061	916	948	815	837	734	751	
34	1050	1067	930	940	834	839	739	742	664	665	
36	951	952	839	839	749	749	661	661	594	594	
38	854	854	753	753	672	672	594	594	533	533	
40	771	771	679	679	606	606	536	536	481	481	
Properties											
U	2.40	2.40	2.41	2.41	2.42	2.42	2.45	2.45	2.46	2.46	
P_{wo} (kips)	1178	1636	1005	1396	878	1219	738	1024	636	883	
P_{wi} (kips/in.)	64	89	59	81	55	77	50	70	46	64	
P_{wb} (kips)	14,484	17,070	11,110	13,100	9274	10,930	7030	8285	5494	6475	
P_{fb} (kips)	1965	2729	1646	2287	1373	1907	1139	1582	964	1339	
L_c (ft.)	14.1	12.0	14.0	11.9	13.9	11.8	13.7	11.6	13.6	11.5	
L_u (ft.)	107.7	77.5	100.6	72.5	94.5	68.0	87.4	62.9	82.7	59.5	
A (in. ²)	98.8	89.6	81.9	74.1	67.7	61.1	54.9	49.5	44.7	40.5	
I_x (in. ⁴)	4060	3550	3110	2720	2420	2140	1890	1650	1430	1240	
I_y (in. ⁴)	1190	1050	937	828	742	664	589	517	454	398	
r_x (in.)	3.47	3.42	3.38	3.34	3.31	3.28	3.25	3.22	3.19	3.16	
Ratio r_x/r_y	1.85	1.84	1.82	1.81	1.80	1.80	1.79	1.78	1.77	1.76	
B_x } Bending factors	0.205	0.206	0.208	0.210	0.211	0.212	0.212	0.213	0.214	0.215	
B_y }	0.558	0.564	0.573	0.583	0.589	0.594	0.600	0.608	0.614	0.621	
a_x }	605	528	463	405	360	319.5	281.6	245.5	213.4	185.1	
a_y }*	177	156	139	123	111	99.1	87.8	77.2	67.8	59.4	

* Tabulated values of a_x and a_y must be multiplied by 10^6 .



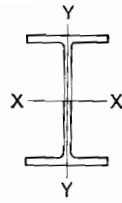
COLUMNS W shapes

$F_y = 36$ ksi
 $F_y = 50$ ksi

Allowable axial loads in kips

Designation	W12												
	210		190		170		152		136		120		
Wt./ft.	36	50	36	50	36	50	36	50	36	50	36	50	
F_y	36	50	36	50	36	50	36	50	36	50	36	50	
Effective length in ft. KL with respect to least radius of gyration r_y	0	1335	1854	1205	1674	1080	1500	966	1341	862	1197	762	1059
	6	1266	1736	1142	1566	1023	1402	914	1253	815	1117	721	987
	7	1251	1711	1129	1543	1011	1381	903	1233	805	1100	712	972
	8	1236	1684	1115	1518	998	1359	891	1213	795	1082	702	956
	9	1219	1655	1100	1492	984	1335	879	1192	784	1062	692	938
	10	1202	1625	1084	1465	970	1310	866	1169	772	1042	682	920
	11	1185	1594	1068	1437	956	1285	853	1146	760	1021	671	901
	12	1166	1562	1051	1407	940	1258	839	1122	747	999	660	881
	13	1147	1528	1034	1376	924	1230	825	1096	734	976	648	860
	14	1127	1493	1016	1344	908	1200	810	1070	721	952	636	839
	15	1107	1457	997	1311	891	1170	794	1042	707	927	624	817
	16	1086	1419	978	1276	873	1139	778	1014	693	901	611	794
	17	1064	1381	958	1241	855	1107	762	985	678	875	597	770
	18	1042	1341	937	1204	837	1074	745	955	662	848	584	746
	19	1019	1300	916	1167	817	1039	728	924	647	819	569	720
	20	995	1257	894	1128	798	1004	710	892	630	790	555	694
	22	946	1169	849	1047	757	931	673	825	597	730	525	640
	24	894	1076	802	962	714	853	633	754	561	666	493	583
	26	840	977	752	872	668	771	592	680	524	598	460	522
	28	783	874	700	776	621	684	549	601	485	527	425	457
30	723	766	645	679	571	597	504	524	444	459	388	398	
32	661	673	588	597	519	525	457	461	402	403	349	350	
34	596	596	529	529	465	465	408	408	357	357	310	310	
36	532	532	472	472	415	415	364	364	319	319	277	277	
38	477	477	423	423	372	372	327	327	286	286	248	248	
40	431	431	382	382	336	336	295	295	258	258	224	224	
Properties													
U	2.47	2.47	2.49	2.49	2.51	2.51	2.53	2.53	2.55	2.55	2.56	2.56	
P_{wo} (kips)	558	774	465	646	389	540	333	462	276	383	232	322	
P_{wi} (kips/in.)	42	59	38	53	35	48	31	44	28	40	26	36	
P_{wb} (kips)	4255	5014	3084	3635	2291	2700	1705	2010	1277	1505	927	1092	
P_{fb} (kips)	812	1128	677	941	548	761	441	613	352	488	275	382	
L_c (ft.)	13.5	11.5	13.4	11.3	13.3	11.3	13.2	11.2	13.1	11.1	13.0	11.0	
L_u (ft.)	75.9	54.6	71.2	51.3	64.3	46.3	58.6	42.2	53.2	38.3	48.2	34.7	
A (in. ²)	61.8	55.8	50.0	44.7	40.5	36.8	33.4	30.1	27.0	24.1	21.3	18.7	
I_x (in. ⁴)	2140	1890	1650	1430	1240	1070	920	790	680	580	490	410	
I_y (in. ⁴)	664	589	517	454	398	345	301	261	224	190	158	130	
r_x (in.)	3.28	3.25	3.22	3.19	3.16	3.13	3.10	3.07	3.04	3.01	2.98	2.95	
Ratio r_x/r_y	1.80	1.79	1.78	1.77	1.76	1.76	1.75	1.75	1.74	1.74	1.73	1.73	
B_x } Bending factors	0.212	0.212	0.213	0.214	0.214	0.214	0.214	0.214	0.214	0.214	0.214	0.214	
B_y }	0.594	0.600	0.608	0.614	0.621	0.627	0.634	0.641	0.648	0.655	0.662	0.669	
a_x }	319.5	281.6	245.5	213.4	185.1	159.7	138.4	120.8	106.1	93.1	81.5	71.1	
a_y }*	99.1	87.8	77.2	67.8	59.4	51.9	45.4	39.8	34.9	30.4	26.2	22.4	

* Tabulated values of a_x and a_y must be multiplied by 10^6 .



COLUMNS
W shapes

$F_y = 36$ ksi
 $F_y = 50$ ksi

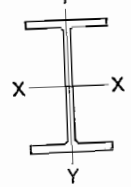
Allowable axial loads in kips

Designation	W12												
	106		96		87		79		72		65		
Wt./ft.	36	50	36	50	36	50	36	50	36	50	36	50†	
F_y	0	674	936	609	846	553	768	501	696	456	633	413	573
Effective length in ft. KL with respect to least radius of gyration r_y	6	637	872	575	788	522	715	473	647	430	589	389	533
	7	629	858	568	775	515	703	467	637	424	579	384	524
	8	620	844	560	762	508	691	460	626	418	569	378	514
	9	611	828	552	748	501	678	453	614	412	558	373	504
	10	602	812	544	733	493	665	446	601	406	547	367	494
	11	593	795	535	718	485	650	439	588	399	535	361	483
	12	583	777	526	701	477	636	431	575	392	522	354	472
	13	572	759	516	685	468	620	423	561	385	509	348	460
	14	561	740	506	667	459	604	415	546	377	496	341	448
	15	550	720	496	649	450	588	407	531	369	482	334	435
	16	539	699	486	630	440	570	398	515	361	468	326	422
	17	527	678	475	611	430	553	389	499	353	453	319	408
	18	514	656	464	591	420	534	379	482	344	438	311	394
	19	502	634	452	570	409	515	370	465	336	422	303	380
	20	489	611	440	549	398	496	360	447	326	406	294	365
	22	462	562	416	505	376	455	339	410	308	372	277	334
	24	433	511	390	458	352	412	317	371	288	336	259	301
	26	404	457	362	408	327	367	294	329	267	297	240	266
	28	372	399	334	356	301	319	270	285	245	258	220	230
	30	340	348	304	310	273	278	245	249	222	225	199	201
	32	305	306	272	273	244	244	219	219	197	197	176	176
34	271	271	242	242	216	216	194	194	175	175	156	156	
36	241	241	215	215	193	193	173	173	156	156	139	139	
38	217	217	193	193	173	173	155	155	140	140	125	125	
40	196	196	175	175	156	156	140	140	126	126	113	113	

Properties

U	2.59	2.59	2.60	2.60	2.62	2.62	2.63	2.63	2.65	2.65	2.66	2.42
P_{wo} (kips)	185	257	161	223	139	193	122	169	106	148	92	128
P_{wi} (kips/in.)	22	31	20	28	19	26	17	24	15	22	14	20
P_{wb} (kips)	588	693	431	508	354	417	269	317	206	243	154	181
P_{fb} (kips)	221	306	182	253	148	205	122	169	101	140	82	114
L_c (ft.)	12.9	10.9	12.8	10.9	12.8	10.9	12.8	10.8	12.7	10.8	12.7	10.7
L_u (ft.)	43.3	31.2	39.9	28.7	36.2	26.0	33.3	24.0	30.5	21.9	27.7	20.0
A (in. ²)	31.2		28.2		25.6		23.2		21.1		19.1	
I_x (in. ⁴)	933		833		740		662		597		533	
I_y (in. ⁴)	301		270		241		216		195		174	
r_x (in.)	3.11		3.09		3.07		3.05		3.04		3.02	
Ratio r_x/r_y	1.76		1.76		1.75		1.75		1.75		1.75	
B_x } Bending factors	0.215		0.215		0.217		0.217		0.217		0.217	
B_y } factors	0.633		0.635		0.645		0.648		0.651		0.656	
a_x }	139.1		124.3		110.4		98.6		88.6		79.3	
a_y }*	45.0		40.1		36.0		32.2		29.1		26.0	

* Tabulated values of a_x and a_y must be multiplied by 10^6 .
† Flange is non-compact; see discussion preceding column load tables.



COLUMNS
W shapes

$F_y = 36$ ksi
 $F_y = 50$ ksi

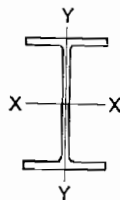
Allowable axial loads in kips

Designation	W12										
	58		53		50		45		40		
Wt./ft.	36	50	36	50	36	50	36	50	36	50†	
F_y	0	367	510	337	468	318	441	285	396	255	354
Effective length in ft. KL with respect to least radius of gyration r_y	6	341	464	312	425	286	386	256	346	229	309
	7	335	454	307	416	279	374	250	335	223	299
	8	329	443	301	406	271	360	243	322	217	288
	9	322	432	295	395	263	346	235	309	210	276
	10	315	420	288	384	254	331	228	296	203	264
	11	308	407	282	372	246	315	220	281	196	251
	12	301	394	275	360	236	298	211	266	188	237
	13	293	380	268	347	226	281	202	250	180	222
	14	285	365	260	333	216	262	193	233	172	207
	15	276	351	252	319	206	243	183	216	163	191
	16	268	335	244	305	195	223	173	197	154	175
	18	249	302	227	274	171	181	152	159	135	141
	20	230	267	209	241	146	146	129	129	114	114
	22	209	229	189	206	121	121	106	106	94	94
	24	187	193	169	173	102	102	89	89	79	79
	26	164	164	147	147	87	87	76	76	67	67
	28	142	142	127	127	75	75	66	66	58	58
	30	123	123	111	111	65	65	57	57	51	51
	32	108	108	97	97	57	57	50	50	45	45
	34	96	96	86	86						
	38	77	77	69	69						
41	66	66	59	59							

Properties

U	3.21	3.21	3.24	2.94	4.10	4.10	4.12	3.75	3.77	3.77
P_{wo} (kips)	89	124	78	108	92	127	75	105	66	92
P_{wi} (kips/in.)	13	18	12	17	13	19	12	17	11	15
P_{wb} (kips)	121	142	106	125	131	155	97	115	66	78
P_{fb} (kips)	92	128	74	103	92	128	74	103	60	83
L_c (ft.)	10.6	9.0	10.6	9.0	8.5	7.2	8.5	7.2	8.4	7.2
L_u (ft.)	24.4	17.5	22.0	15.9	19.6	14.1	17.7	12.8	16.0	11.5
A (in. ²)		17.0		15.6		14.7		13.2		11.8
I_x (in. ⁴)		475		425		394		350		310
I_y (in. ⁴)		107		95.8		56.3		50.0		44.1
r_x (in.)		2.51		2.48		1.96		1.94		1.93
Ratio r_x/r_y		2.10		2.11		2.64		2.65		2.66
B_x } Bending factors		0.218		0.221		0.227		0.227		0.227
B_y } factors		0.794		0.813		1.058		1.065		1.073
a_x }		70.6		63.6		58.8		52.2		46.3
a_y }*		16.0		14.3		8.4		7.4		6.5

* Tabulated values of a_x and a_y must be multiplied by 10^6 .
† Web may be non-compact for combined axial and bending stress; see AISC Specification Sect. 1.5.1.4.1.
Note: Heavy line indicates Kl/r of 200.



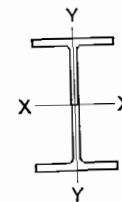
COLUMNS
W shapes

$F_y = 36$ ksi
 $F_y = 50$ ksi

Allowable axial loads in kips

Designation	W10									
	112		100		88		77		68	
	36	50	36	50	36	50	36	50	36	50
Effective length in ft. KL with respect to least radius of gyration r_y	F_y		F_y		F_y		F_y		F_y	
0	711	987	635	882	559	777	488	678	432	600
6	663	906	592	808	521	712	454	620	402	548
7	653	888	583	792	513	697	447	607	395	537
8	642	869	573	775	504	682	439	593	388	525
9	631	848	562	756	495	665	431	579	381	512
10	619	827	551	737	485	648	422	564	373	498
11	606	805	540	717	475	630	413	548	365	484
12	593	782	528	696	464	611	404	531	357	469
13	579	757	516	674	453	591	394	513	348	454
14	565	732	503	651	442	571	384	495	339	437
15	550	706	489	627	430	550	373	476	330	421
16	535	679	476	602	417	528	362	457	320	403
17	519	651	461	577	405	505	351	437	310	385
18	503	622	446	550	392	481	339	416	299	366
19	486	591	431	523	378	457	327	394	289	347
20	469	560	416	494	364	432	315	371	278	327
22	433	495	383	435	335	379	289	324	255	285
24	395	425	348	372	304	323	261	275	230	242
26	355	362	312	317	271	275	232	234	204	206
28	313	313	273	273	237	237	202	202	177	177
30	272	272	238	238	206	206	176	176	155	155
32	239	239	209	209	181	181	155	155	136	136
34	212	212	185	185	161	161	137	137	120	120
36	189	189	165	165	143	143	122	122	107	107
38	170	170	148	148	129	129	110	110	96	96
40	153	153	134	134	116	116	99	99	87	87
Properties										
U	2.45	2.45	2.46	2.46	2.49	2.49	2.51	2.51	2.52	2.52
P_{wo} (kips)	255	354	214	298	177	246	143	199	116	162
P_{wi} (kips/in.)	27	38	24	34	22	30	19	27	17	24
P_{wb} (kips)	1388	1636	1014	1196	714	842	480	566	335	395
P_{fb} (kips)	352	488	282	392	221	306	170	237	133	185
L_c (ft.)	11.0	9.3	10.9	9.3	10.8	9.2	10.8	9.1	10.7	9.1
L_u (ft.)	53.2	38.3	48.2	34.7	43.3	31.2	38.6	27.8	34.8	25.1
A (in. ²)	32.9		29.4		25.9		22.6		20.0	
I_x (in. ⁴)	716		623		534		455		394	
I_y (in. ⁴)	236		207		179		154		134	
r_y (in.)	2.68		2.65		2.63		2.60		2.59	
Ratio r_x/r_y	1.74		1.74		1.73		1.73		1.71	
B_x } Bending	0.261	0.263	0.263	0.263	0.263	0.263	0.263	0.264	0.264	0.264
B_y } factors	0.726	0.735	0.744	0.744	0.751	0.751	0.751	0.758	0.758	0.758
a_x }	106.5	92.7	79.5	79.5	67.9	67.9	58.7	58.7	58.7	58.7
a_y } *	35.2	30.8	26.7	26.7	22.8	22.8	20.0	20.0	20.0	20.0

* Tabulated values of a_x and a_y must be multiplied by 10^6 .



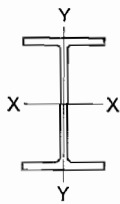
COLUMNS
W shapes

$F_y = 36$ ksi
 $F_y = 50$ ksi

Allowable axial loads in kips

Designation	W10											
	60		54		49		45		39		33	
	36	50	36	50	36	50	36	50	36	50	36	50
Effective length in ft. KL with respect to least radius of gyration r_y	F_y											
0	380	528	341	474	311	432	287	399	248	345	210	291
6	353	482	317	433	289	394	260	351	224	303	189	255
7	348	472	312	423	284	385	253	340	218	293	184	246
8	341	461	306	414	279	376	247	328	213	283	179	237
9	335	450	300	403	273	367	240	316	206	272	173	228
10	328	437	294	392	268	357	232	303	200	260	167	217
11	321	425	288	381	262	346	224	289	193	248	161	207
12	313	412	281	369	256	335	216	274	186	235	155	196
13	306	398	274	356	249	324	208	259	178	221	149	184
14	297	383	267	343	242	312	199	243	170	207	142	171
15	289	368	259	330	235	299	190	227	162	193	135	159
16	280	353	251	316	228	286	180	209	154	177	127	145
17	271	337	243	301	221	273	170	191	145	161	120	131
18	262	320	235	286	213	259	160	172	136	144	112	117
19	253	303	226	271	205	245	149	154	126	130	103	105
20	243	285	217	255	197	230	138	139	116	117	95	95
22	222	248	199	221	180	198	115	115	97	97	78	78
24	201	209	179	186	161	167	97	97	81	81	66	66
26	177	178	158	159	142	143	82	82	69	69	56	56
28	154	154	137	137	123	123	71	71	60	60	48	48
30	134	134	119	119	107	107	62	62	52	52	42	42
32	118	118	105	105	94	94	54	54	46	46	37	37
33	111	111	99	99	88	88	51	51	43	43		
34	104	104	93	93	83	83						
36	93	93	83	83	74	74						
Properties												
U	2.55	2.55	2.56	2.56	2.57	2.57	3.25	3.25	3.28	3.28	3.35	3.35
P_{wo} (kips)	99	138	83	116	73	101	79	109	64	89	55	77
P_{wi} (kips/in.)	15	21	13	19	12	17	13	18	11	16	10	15
P_{wb} (kips)	239	282	163	193	127	149	138	163	101	119	79	93
P_{fb} (kips)	104	145	85	118	71	98	86	120	63	88	43	59
L_c (ft.)	10.6	9.0	10.6	9.0	10.6	9.0	8.5	7.2	8.4	7.2	8.4	7.1
L_u (ft.)	31.1	22.4	28.2	20.3	26.0	18.7	22.8	16.4	19.8	14.2	16.5	11.9
A (in. ²)	17.6		15.8		14.4		13.3		11.5		9.71	
I_x (in. ⁴)	341		303		272		248		209		170	
I_y (in. ⁴)	116		103		93.4		83.4		68.4		58.4	
r_y (in.)	2.57		2.56		2.54		2.51		2.48		2.46	
Ratio r_x/r_y	1.71		1.71		1.71		1.71		1.71		1.71	
B_x } Bending	0.264	0.263	0.263	0.263	0.264	0.264	0.264	0.264	0.271	0.273	0.277	0.277
B_y } factors	0.765	0.767	0.770	0.770	0.770	0.770	0.770	0.770	0.770	0.770	0.770	0.770
a_x }	50.5	45.0	40.6	40.6	37.2	37.2	37.2	37.2	31.2	31.2	25.4	25.4
a_y } *	17.3	15.4	13.8	13.8	13.8	13.8	8.0	8.0	6.7	6.7	5.4	5.4

* Tabulated values of a_x and a_y must be multiplied by 10^6 .
Note: Heavy line indicates Kl/r of 200.



COLUMNS
W shapes

$F_y = 36$ ksi
 $F_y = 50$ ksi

Allowable axial loads in kips

Designation	W8												
	67		58		48		40		35		31		
Wt./ft.	36	50	36	50	36	50	36	50	36	50	36	50	
Effective length in ft. KL with respect to least radius of gyration r_y	0	426	591	369	513	305	423	253	351	222	309	197	274
	6	387	525	336	455	276	375	229	310	201	272	178	241
	7	379	510	328	442	270	363	223	300	197	264	174	236
	8	370	494	320	428	263	352	218	290	191	255	170	226
	9	360	477	312	413	256	339	212	279	186	246	165	217
	10	350	459	303	397	249	326	205	268	180	236	160	208
	11	339	440	293	380	241	312	199	256	174	225	154	199
	12	328	420	283	363	233	297	192	244	168	214	149	189
	13	316	399	273	344	224	282	184	231	162	202	143	179
	14	304	378	263	325	215	266	177	217	155	190	137	168
	15	292	355	251	305	206	249	169	203	148	177	131	156
	16	279	331	240	284	196	232	160	188	141	164	124	145
	17	265	307	228	263	186	214	152	172	133	150	117	132
	18	251	281	216	240	176	195	143	156	125	136	110	119
	19	236	254	203	217	165	175	134	140	117	122	103	107
	20	221	230	190	196	154	158	124	126	109	110	95	97
	22	190	190	162	162	131	131	104	104	91	91	80	80
	24	159	159	136	136	110	110	88	88	76	76	67	67
	26	136	136	116	116	94	94	75	75	65	65	57	57
	28	117	117	100	100	81	81	64	64	56	56	49	49
	30	102	102	87	87	70	70	56	56	49	49	43	43
	32	90	90	76	76	62	62	49	49	43	43	38	38
	33	84	84	72	72	58	58	46	46	40	40	35	35
	34	79	79	68	68	55	55	44	44				
	35	75	75	64	64								

Properties

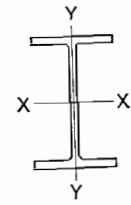
U	2.48	2.48	2.50	2.50	2.54	2.54	2.56	2.56	2.59	2.59	2.61	2.61
P_{wo} (kips)	147	205	120	167	86	119	69	96	56	78	48	67
P_{wi} (kips/in.)	21	29	18	26	14	20	13	18	11	16	10	14
P_{wb} (kips)	744	877	533	628	257	303	187	221	120	141	93	110
P_{fb} (kips)	197	273	148	205	106	147	71	98	55	77	43	59
L_c (ft.)	8.7	7.4	8.7	7.4	8.6	7.3	8.5	7.2	8.5	7.2	8.4	7.2
L_u (ft.)	39.9	28.7	35.3	25.4	30.3	21.8	25.3	18.2	22.6	16.3	20.1	14.5
A (in. ²)	19.7		17.1		14.1		11.7		10.3		9.13	
I_x (in. ⁴)	272		228		184		146		127		110	
I_y (in. ⁴)	88.6		75.1		60.9		49.1		42.6		37.1	
r_y (in.)	2.12		2.10		2.08		2.04		2.03		2.02	
Ratio r_x/r_y	1.75		1.74		1.74		1.73		1.73		1.72	
B_x } Bending	0.326		0.329		0.326		0.330		0.330		0.332	
B_y } factors	0.921		0.934		0.940		0.959		0.972		0.985	
a_x }	40.6		33.9		27.4		21.7		18.9		16.4	
a_y }*	13.2		11.2		9.1		7.3		6.3		5.6	

* Tabulated values of a_x and a_y must be multiplied by 10^6 .

Note: Heavy line indicates Kl/r of 200.

$F_y = 36$ ksi
 $F_y = 50$ ksi

COLUMNS
W shapes



Allowable axial loads in kips

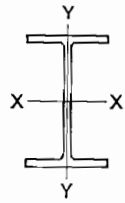
Designation	W8				W6						
	28		24		25		20		15		
Wt./ft.	36	50	36	50	36	50	36	50	36†	50†	
Effective length in ft. KL with respect to least radius of gyration r_y	0	178	248	153	212	159	220	127	176	96	133
	6	155	208	133	178	136	182	109	145	81	108
	7	150	198	129	170	131	173	105	137	78	102
	8	144	188	124	161	126	163	100	129	75	96
	9	138	178	118	152	120	152	95	121	71	89
	10	132	166	113	142	114	141	90	112	67	82
	11	125	154	107	132	107	129	85	102	62	74
	12	118	142	101	121	100	117	79	92	58	66
	13	111	128	95	109	93	103	73	81	53	57
	14	103	114	88	97	85	90	67	70	48	49
	15	95	100	81	85	77	78	60	61	43	43
	16	87	88	74	74	69	69	54	54	38	38
	17	78	78	66	66	61	61	47	47	33	33
	18	69	69	59	59	54	54	42	42	30	30
	19	62	62	53	53	49	49	38	38	27	27
	20	56	56	48	48	44	44	34	34	24	24
	22	46	46	39	39	36	36	28	28	20	20
	24	39	39	33	33	31	31	24	24	17	17
	25	36	36	30	30	28	28	22	22		
	26	33	33	28	28						
	27	31	31								

Properties

U	3.23	3.23	3.27	3.27	2.38	2.07	2.43	1.86	1.93	1.45
P_{wo} (kips)	48	67	39	54	47	65	35	49	26	36
P_{wi} (kips/in.)	10	14	9	12	12	16	9	13	8	12
P_{wb} (kips)	93	110	59	70	170	200	91	107	63	74
P_{fb} (kips)	49	68	36	50	47	65	30	42	15	21
L_c (ft.)	6.9	5.9	6.9	5.8	6.4	5.4	6.4	5.4	6.3	5.4
L_u (ft.)	17.5	12.6	15.2	10.9	20.0	14.4	16.4	11.8	12.0	8.7
A (in. ²)	8.25		7.08		7.34		5.87		4.43	
I_x (in. ⁴)	98.0		82.8		53.4		41.4		29.1	
I_y (in. ⁴)	21.7		18.3		17.1		13.3		9.32	
r_y (in.)	1.62		1.61		1.52		1.50		1.45	
Ratio r_x/r_y	2.13		2.12		1.78		1.77		1.77	
B_x } Bending	0.340		0.339		0.440		0.438		0.456	
B_y } factors	1.244		1.258		1.308		1.331		1.424	
a_x }	14.63		12.34		7.97		6.19		4.33	
a_y }*	3.23		2.73		2.53		1.97		1.39	

* Tabulated values of a_x and a_y must be multiplied by 10^6 .

† Flange is non-compact; see discussion preceding column load tables.
Note: Heavy line indicates Kl/r of 200.



COLUMNS
W shapes

$F_y = 36$ ksi
 $F_y = 50$ ksi

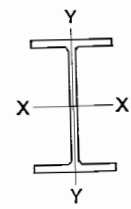
Allowable axial loads in kips

Designation	W6						W5				W4		
	16		12		9		19		16		13		
	36	50	36	50	36	50	36	50	36	50	36	50	
Effective length in ft. <i>KL</i> with respect to least radius of gyration r_y	0	102	142	77	107	58	80	120	166	101	140	83	115
	2	96	132	72	98	54	74	115	158	97	133	78	107
	3	92	124	68	92	51	69	111	152	94	128	75	101
	4	87	116	64	85	48	64	107	145	91	122	71	94
	5	82	106	60	77	45	58	103	138	87	116	67	87
	6	76	95	55	69	41	51	99	129	83	109	62	79
	7	69	83	50	59	37	44	93	120	79	101	57	70
	8	62	70	44	48	33	36	88	111	74	93	52	60
	9	54	57	38	38	28	28	82	100	69	84	46	49
	10	46	46	31	31	23	23	76	89	64	75	39	40
	11	38	38	26	26	19	19	70	77	58	64	33	33
	12	32	32	22	22	16	16	63	65	52	54	28	28
	13	27	27	18	18	13	13	55	56	46	46	24	24
	14	23	23	16	16	12	12	48	48	40	40	20	20
	15	20	20	14	14	10	10	42	42	35	35	18	18
	16	18	18					37	37	31	31	16	16
	17							33	33	27	27		
	18							29	29	24	24		
	19							26	26	22	22		
	20							24	24	20	20		
	21							21	21	18	18		

Properties

<i>U</i>	3.35	2.55	2.89	2.05	2.26	1.63	2.25	2.01	2.17	1.85	2.30	1.98
P_{wo} (kips)	35	49	26	36	17	24	39	55	32	45	35	48
P_{wi} (kips/in.)	9	13	8	12	6	9	10	14	9	12	10	14
P_{wb} (kips)	91	107	63	74	25	30	138	163	97	115	196	231
P_{fb} (kips)	37	51	18	25	10	14	42	58	29	41	27	37
L_c (ft.)	4.3	3.6	4.2	3.6	4.2	3.5	5.3	4.5	5.3	4.5	4.3	3.6
L_u (ft.)	12.0	8.7	8.6	6.2	6.7	4.8	19.5	14.0	16.7	12.0	15.6	11.2
A (in. ²)	4.74	3.55		2.68			5.54		4.68			3.83
I_x (in. ⁴)	32.1	22.1		16.4			26.2		21.3			11.3
I_y (in. ⁴)	4.43	2.99		2.20			9.13		7.51			3.86
r_y (in.)	0.966	0.918		0.905			1.28		1.27			1.00
Ratio r_x/r_y	2.69	2.71		2.73			1.70		1.68			1.72
B_x } Bending	0.465	0.486		0.482			0.543		0.550			0.701
B_y } factors	2.155	2.367		2.414			1.526		1.560			2.016
a_x }	4.77	3.28		2.44			3.89		3.16			1.69
a_y }*	0.66	0.45		0.33			1.35		1.12			0.57

* Tabulated values of a_x and a_y must be multiplied by 10⁶.
Note: Heavy line indicates Kl/r of 200.



COLUMNS
M shapes

$F_y = 36$ ksi
 $F_y = 50$ ksi

Allowable axial loads in kips

Designation	M6		M5		M4		
	20		18.9		13		
	36	50	36	50	36	50	
Effective length in ft. <i>KL</i> with respect to least radius of gyration r_y	0	127	177	120	167	82	114
	2	122	168	114	157	77	105
	3	119	163	111	151	74	99
	4	116	157	106	143	70	92
	5	112	150	102	135	65	84
	6	107	142	96	126	60	75
	7	103	134	91	116	54	65
	8	98	125	85	105	48	54
	9	92	115	78	93	42	43
	10	87	105	71	81	35	35
	11	81	94	64	67	29	29
	12	74	83	56	57	24	24
	13	68	71	48	48	21	21
	14	61	61	42	42	18	18
	15	53	53	36	36	15	15
	16	47	47	32	32		
	17	41	41	28	28		
	18	37	37	25	25		
	19	33	33	23	23		
	20	30	30				
	21	27	27				
	22	25	25				
	23	23	23				

Properties

<i>U</i>	2.53	2.12	2.45	1.78	2.45	2.35
P_{wo} (kips)	39	55	50	69	37	52
P_{wi} (kips/in.)	9	13	11	16	9	13
P_{wb} (kips)	90	107	239	281	170	200
P_{fb} (kips)	32	45	39	54	31	43
L_c (ft.)	6.3	5.3	5.3	4.5	4.2	3.5
L_u (ft.)	17.4	12.5	19.3	13.9	16.9	12.2
A (in. ²)		5.89		5.55		3.81
I_x (in. ⁴)		39.0		24.1		10.5
I_y (in. ⁴)		11.6		7.86		3.36
r_y (in.)		1.40		1.19		0.939
Ratio r_x/r_y		1.84		1.75		1.77
B_x } Bending		0.453		0.576		0.727
B_y } factors		1.510		1.768		2.228
a_x }		5.80		3.58		1.56
a_y }*		1.72		1.17		0.50

* Tabulated values of a_x and a_y must be multiplied by 10⁶.
Note: Heavy line indicates Kl/r of 200.