Column Base Plate Design Table

SURENDRA J. CHHABRA

The column base plate design procedure given in AISC ASD Ninth Edition manual[1] differs considerably from the Eighth Edition manual.[2] Additionally, the procedure contained in the first printing of the Ninth Edition manual has been refined in the later printings of the manual to incorporate improvements proposed by Thornton.[3,4] These changes result in lighter base plates under certain conditions of loading and base plate geometry. The purpose of this paper is to provide a design table that includes AISC Ninth as well as Eighth Edition base plates, and to compare the two designs.

The basis for the design method contained in the AISC manual has been discussed in detail by others,[3,4,5] and will not be repeated here.

The table is generated for plate F_y of 36 ksi and concrete f_c' of 4.0 ksi. The concrete Bearing Area Factor in the table refers to the quantity $\sqrt{A_2/A_1}$ in the AISC manual. Three values of this quantity are considered: 1.0, 1.5, and 2.0. The corresponding concrete allowable bearing stress (F_p) is also given.

The table values are:

- base plate width B parallel to column flange,
- base plate width N parallel to column web,
- base plate thickness t_8 in accordance with AISC Eighth Edition manual, and
- base plate thickness t_9 in accordance with AISC Ninth Edition manual (latest printing).

Where plate thickness t_8 differs from t_9, the table values are highlighted. Base plate widths B and N remain unchanged from Eighth to Ninth Editions of the manual. These widths are rounded to whole inches in the table. A minimum plate thickness of 1 in. has been used, as it is customary in industrial buildings due to heavier loads. Likewise a thickness increment of ¼-in. is used. In the interest of space, only the W14 sections are included in the table.

A study of this table shows that the AISC Ninth Edition method always produces the same or lighter base plate compared to the AISC Eighth Edition manual. It is also apparent that lighter columns are more likely to produce savings in base plate thickness than the heavier columns. Similarly, savings are more likely at higher allowable concrete bearing stress F_p than at lower F_p.

For a given column, the savings in base plate thickness is more pronounced in the lower load range. In this load range the design is controlled by the bending stress of the plate inside the column footprint (Column $b_f \times d$). The plate stress inside the foot-print is evaluated using either the Murray Stockwell equivalent static load method[3,5] or Thornton's yield line method[3,4] in the Ninth Edition manual. The Eighth Edition manual uses elastic analysis to calculate the same stress. The new methods used in the Ninth Edition manual account for the savings in plate thickness. The table shows that this saving can be quite significant in a number of cases. At higher loads, however, the base plate has to extend outside the column footprint to satisfy the concrete bearing stress limit. As a result plate cantilevers outside the column footprint (cantilever dimensions m and n in the AISC manual) control design, and therefore, the Ninth Edition manual leads to the same design as the Eighth Edition manual.

REFERENCES

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3. Thornton, W. A., "Design of Base Plates for Wide Flange Columns—A Concatenation of Methods," *Engineering Journal,* Vol. 27, Fourth Quarter, 1990, 173–174
4. Thornton, W. A., "Design of Small Base Plates for Wide Flange Columns" *Engineering Journal,* Vol. 27, Third Quarter, 1990, 108–110.
5. Murray, T. M., "Design of Lightly Loaded Column Base Plates," *Engineering Journal,* Vol. 20, Fourth Quarter, 1983, 143–152.

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Column Base Plate Design Table

f_c' = 4.0 ksi

For plates thicker than 8 in., F_y of 32 ksi is used

Plate F_y= 36 ksi

Column Load (kips)	Bearing Area Factor (Allowable Bearing Stress)											
	1.0 (F_p = 1400 psi)				1.5 (F_p = 2100 psi)				2.0 (F_p = 2800 psi)			
	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.
W14×730												
6450	65	71	10¾	10¾	53	59	10	10	45	52	9¼	9¼
6000	63	69	10¼	10¼	51	57	9½	9½	43	50	8½	8½
5500	60	66	9¾	9¾	48	55	8¾	8¾	41	48	7½	7½
5000	57	63	9	9	46	52	8¼	8¼	39	46	7	7
4500	54	60	8	8	43	50	7	7	37	44	6½	6½
4250	52	59	7½	7½	42	49	6¾	6¾	36	43	6	6
4000	51	57	7¼	7¼	41	47	6½	6½	35	41	6	6
3750	49	55	7	7	39	46	6	6	34	40	5½	5 ½
3500	47	54	6½	6½	38	44	5¾	5¾	33	39	5¼	5¼
3250	45	52	6¼	6¼	36	43	5¼	5¼	31	38	4¾	4¾
3000	43	50	5¾	5¾	35	41	5	5	30	36	4 ½	4½
2750	41	48	5½	5½	33	40	4½	4½	29	35	4¼	4¼
2500	39	46	5	5	32	38	4¼	4¼	27	34	3 ½	3½
2250	37	44	4½	4½	30	36	4	4	26	32	3 ¼	3¼
2000	35	41	4¼	4¼	28	35	3½	3½	24	30	3¼	3
1750	33	39	3¾	3¾	26	33	3	3	22	29	3¼	3
1500	30	36	3¼	3¼	24	30	3	2½	20	27	3¼	3
1250	27	34	2½	2½	22	28	2¾	2½	20	25	3¼	2¾
1000	24	30	2½	2	20	26	2¾	2½	20	24	3	2½
750	20	27	2½	2	20	24	2½	2¼	20	24	2½	2
W14×665												
5880	62	68	10	10	50	56	9¼	9¼	43	49	8¾	8¾
5500	60	66	9¾	9¾	49	54	9	9	41	48	8¼	8¼
5000	57	63	9	9	46	52	8¼	8¼	39	46	7¼	7¼
4500	54	60	8	8	43	50	7¼	7¼	38	43	6¾	6¾
4250	53	58	7¾	7¾	43	48	7	7	37	42	6 ½	6½
4000	51	57	7¼	7¼	41	47	6½	6½	35	41	6	6
3750	49	55	7	7	39	46	6¼	6¼	34	40	5¾	5¾
3500	48	53	6¾	6¾	38	44	6	6	33	39	5¼	5¼
3250	45	52	6¼	6¼	36	43	5½	5½	32	37	5	5
3000	43	50	6	6	35	41	5¼	5¼	30	36	4½	4½
2750	41	48	5½	5½	33	40	4¾	4¾	29	35	4¼	4¼
2500	39	46	5¼	5¼	32	38	4½	4½	28	33	4	4
2250	38	43	4¾	4¾	30	36	4	4	26	32	3 ½	3½
2000	35	41	4¼	4¼	29	34	3¾	3¾	24	30	3¼	2¾
1750	33	39	3¾	3¾	27	32	3¼	3¼	23	28	3¼	2¾
1500	30	36	3¼	3¼	24	30	3	2½	20	27	3¼	2¾
1250	28	33	2¾	2¾	22	28	2¾	2½	20	25	3¼	2¾
1000	24	30	2½	2	20	25	2¾	2½	20	24	3	2½
750	20	27	2½	2	20	24	2½	2¼	20	24	2½	2
W14×605												
5340	59	65	9½	9½	48	53	8¾	8¾	41	47	7¾	7¾
5000	57	63	9	9	46	52	8¼	8¼	40	45	7¼	7¼
4500	54	60	8	8	44	49	7¼	7¼	38	43	6¾	6¾
4250	53	58	7¾	7¾	43	48	7	7	37	42	6 ½	6½
4000	51	57	7½	7½	41	47	6¾	6¾	35	41	6	6
3750	49	55	7	7	40	45	6½	6½	34	40	5¾	5¾
3500	48	53	6¾	6¾	38	44	6	6	33	38	5 ½	5½
3250	46	51	6½	6½	37	42	5¾	5¾	32	37	5	5
3000	44	49	6	6	35	41	5¼	5¼	30	36	4 ½	4½
2750	42	47	5¾	5¾	34	39	5	5	29	34	4 ¼	4¼

Note: Shaded values indicate that Ninth Edition design differs from Eighth Edition.

Column Base Plate Design Table (cont.)											f_c' = 4.0 ksi	
For plates thicker than 8 in., F_y of 32 ksi is used											Plate F_y= 36 ksi	
Column Load (kips)	Bearing Area Factor (Allowable Bearing Stress)											
	1.0 (F_p = 1400 psi)				1.5 (F_p = 2100 psi)				2.0 (F_p = 2800 psi)			
	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.
2500	40	45	5 1/4	5 1/4	32	38	4 1/2	4 1/2	28	33	4	4
2250	38	43	4 3/4	4 3/4	30	36	4	4	26	31	3 1/2	3 1/2
2000	35	41	4 1/4	4 1/4	29	34	3 3/4	3 3/4	24	30	3 1/4	3
1750	33	38	4	4	27	32	3 1/4	3 1/4	23	28	3 1/4	2 3/4
1500	30	36	3 1/4	3 1/4	24	30	3	2 1/2	21	26	3 1/4	2 3/4
1250	28	33	2 3/4	2 3/4	22	28	2 3/4	2 1/2	19	24	3 1/4	2 3/4
1000	24	30	2 1/2	2	20	25	2 3/4	2 1/4	19	23	3	2 1/2
750	21	26	2 1/2	2	19	23	2 3/4	2 1/4	19	23	2 3/4	2
W14X550												
4860	56	62	9	9	46	51	8 1/4	8 1/4	40	44	7 1/2	7 1/2
4500	55	59	8 3/4	8 3/4	44	49	7 1/2	7 1/2	38	43	6 3/4	6 3/4
4250	53	58	7 3/4	7 3/4	43	48	7	7	37	42	6 1/2	6 1/2
4000	52	56	7 1/2	7 1/2	42	46	7	7	35	41	6 1/4	6 1/4
3750	49	55	7 1/4	7 1/4	40	45	6 1/2	6 1/2	35	39	6	6
3500	48	53	6 3/4	6 3/4	38	44	6	6	33	38	5 1/2	5 1/2
3250	46	51	6 1/2	6 1/2	37	42	5 3/4	5 3/4	32	37	5 1/4	5 1/4
3000	44	49	6	6	35	41	5 1/4	5 1/4	30	36	4 3/4	4 3/4
2750	42	47	5 3/4	5 3/4	34	39	5	5	29	34	4 1/4	4 1/4
2500	40	45	5 1/4	5 1/4	33	37	4 3/4	4 3/4	28	33	4	4
2250	38	43	4 3/4	4 3/4	30	36	4 1/4	4 1/4	26	31	3 1/2	3 1/2
2000	35	41	4 1/2	4 1/2	29	34	3 3/4	3 3/4	24	30	3 1/4	3
1750	33	38	4	4	27	32	3 1/4	3 1/4	23	28	3 1/4	2 3/4
1500	30	36	3 1/2	3 1/2	24	30	3	2 3/4	21	26	3 1/4	2 3/4
1250	28	33	3	3	23	27	2 3/4	2 1/4	19	24	3 1/4	2 3/4
1000	24	30	2 1/2	2 1/4	20	25	2 3/4	2 1/4	19	22	3	2 1/2
750	21	26	2 1/2	2	19	22	2 3/4	2 1/4	19	22	2 3/4	2 1/4
500	19	22	2 1/4	1 3/4	19	22	2 1/4	1 3/4	19	22	2 1/4	1 1/2
W14X500												
4410	54	59	8	8	44	48	7 1/2	7 1/2	38	42	7	7
4250	53	58	7 3/4	7 3/4	43	48	7 1/4	7 1/4	37	42	6 1/2	6 1/2
4000	52	56	7 1/2	7 1/2	42	46	7	7	36	40	6 1/4	6 1/4
3750	50	54	7 1/4	7 1/4	40	45	6 1/2	6 1/2	35	39	6	6
3500	48	53	6 3/4	6 3/4	39	43	6 1/4	6 1/4	33	38	5 1/2	5 1/2
3250	46	51	6 1/2	6 1/2	37	42	5 3/4	5 3/4	32	37	5 1/4	5 1/4
3000	44	49	6	6	36	40	5 1/2	5 1/2	31	35	5	5
2750	42	47	5 3/4	5 3/4	34	39	5	5	29	34	4 1/2	4 1/2
2500	40	45	5 1/4	5 1/4	33	37	4 3/4	4 3/4	28	32	4 1/4	4 1/4
2250	38	43	5	5	31	35	4 1/4	4 1/4	26	31	3 1/2	3 1/2
2000	36	40	4 1/2	4 1/2	29	33	3 3/4	3 3/4	25	29	3 1/4	3 1/4
1750	33	38	4	4	27	31	3 1/4	3 1/4	23	28	3 1/4	2 3/4
1500	31	35	3 1/2	3 1/2	25	29	3	2 3/4	21	26	3 1/4	2 3/4
1250	28	32	3	3	23	27	2 3/4	2 1/4	19	24	3 1/4	2 3/4
1000	25	29	2 1/2	2 1/4	20	24	3	2 1/4	19	22	3	2 1/2
750	21	26	2 1/2	2	19	22	2 3/4	2 1/4	19	22	2 3/4	2 1/4
500	19	22	2 1/4	1 3/4	19	22	2 1/4	1 3/4	19	22	2 1/4	1 1/4
W14X455												
4020	52	56	7 3/4	7 3/4	42	46	7	7	36	40	6 1/2	6 1/2
4000	52	56	7 3/4	7 3/4	42	46	7	7	36	40	6 1/2	6 1/2
3750	50	54	7 1/4	7 1/4	40	45	6 1/2	6 1/2	35	39	6	6
3500	49	52	7	7	39	43	6 1/4	6 1/4	33	38	5 3/4	5 3/4
3250	46	51	6 1/2	6 1/2	37	42	6	6	33	36	5 1/2	5 1/2
3000	44	49	6 1/4	6 1/4	36	40	5 1/2	5 1/2	31	35	5	5

Note: Shaded values indicate that Ninth Edition design differs from Eighth Edition.

Column Base Plate Design Table (cont.)

f_c' = 4.0 ksi

For plates thicker than 8 in., F_y of 32 ksi is used

Plate F_y= 36 ksi

Column Load (kips)	Bearing Area Factor (Allowable Bearing Stress)											
	1.0 (F_p = 1400 psi)				1.5 (F_p = 2100 psi)				2.0 (F_p = 2800 psi)			
	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.
2750	42	47	5¾	5¾	34	39	5¼	5¼	29	34	4½	4½
2500	40	45	5½	5½	33	37	4¾	4¾	28	32	4¼	4¼
2250	39	42	5	5	31	35	4¼	4¼	26	31	3¾	3¾
2000	36	40	4½	4½	29	33	3¾	3¾	25	29	3¼	3¼
1750	33	38	4	4	27	31	3½	3½	24	27	3¼	3
1500	31	35	3½	3½	25	29	3	3	21	26	3¼	2½
1250	28	32	3	3	23	27	2¾	2½	19	24	3¼	2½
1000	25	29	2½	2½	20	24	3	2¼	19	21	3¼	2½
750	21	26	2½	1¾	19	21	2¾	2¼	19	21	2¾	2¼
500	19	21	2¼	1¾	19	21	2¼	1¾	19	21	2¼	1½
W14×426												
3750	50	54	7¼	7¼	40	45	6¾	6¾	35	39	6	6
3500	49	52	7	7	39	43	6¼	6¼	33	38	5¾	5¾
3250	47	50	6¾	6¾	37	42	6	6	33	36	5½	5½
3000	44	49	6¼	6¼	36	40	5½	5½	31	35	5	5
2750	42	47	6	6	35	38	5¼	5¼	29	34	4¾	4¾
2500	40	45	5½	5½	33	37	4¾	4¾	28	32	4¼	4¼
2250	39	42	5¼	5¼	31	35	4¼	4¼	26	31	3¾	3¾
2000	36	40	4½	4½	29	33	4	4	25	29	3¼	3¼
1750	33	38	4	4	27	31	3½	3½	24	27	3¼	3
1500	31	35	3½	3½	25	29	3	3	22	25	3¼	2½
1250	28	32	3	3	23	27	2¾	2½	20	23	3¼	2½
1000	25	29	2½	2½	20	24	3	2¼	19	21	3¼	2½
750	22	25	2¼	1¾	19	21	2¾	2¼	19	21	2¾	2¼
500	19	21	2¼	1¾	19	21	2¼	1¾	19	21	2¼	1½
375	19	21	2	1½	19	21	2	1¼	19	21	2	1
W14×398												
3510	49	52	7	7	39	43	6¼	6¼	33	38	6	6
3500	49	52	7	7	39	43	6¼	6¼	34	37	6	6
3250	47	50	6¾	6¾	38	41	6	6	33	36	5½	5½
3000	45	48	6¼	6¼	36	40	5½	5½	31	35	5	5
2750	43	46	6	6	35	38	5¼	5¼	30	33	4¾	4¾
2500	41	44	5½	5½	33	37	4¾	4¾	28	32	4¼	4¼
2250	39	42	5¼	5¼	31	35	4½	4½	27	30	4	4
2000	36	40	4½	4½	29	33	4	4	25	29	3¼	3¼
1750	34	37	4¼	4¼	27	31	3½	3½	24	27	3¼	3
1500	31	35	3½	3½	25	29	3	3	22	25	3¼	2½
1250	28	32	3	3	23	27	2¾	2½	20	23	3¼	2½
1000	25	29	2½	2½	20	24	3	2¼	19	21	3¼	2½
750	22	25	2¼	1¾	19	21	2¾	2	19	20	2¾	2¼
500	19	21	2¼	1¾	19	20	2¼	1¾	19	20	2¼	1½
375	19	20	2	1½	19	20	2	1¼	19	20	2	1
W14×370												
3270	47	50	6¾	6¾	38	41	6	6	33	36	5½	5½
3250	47	50	6¾	6¾	38	41	6	6	33	36	5½	5½
3000	45	48	6½	6½	36	40	5¾	5¾	31	35	5	5
2750	43	46	6	6	35	38	5¼	5¼	30	33	4¾	4¾
2500	41	44	5½	5½	34	36	5	5	28	32	4¼	4¼
2250	39	42	5¼	5¼	31	35	4½	4½	27	30	4	4
2000	36	40	4¾	4¾	29	33	4	4	25	29	3½	3½
1750	34	37	4¼	4¼	27	31	3½	3½	24	27	3¼	3
1500	31	35	3¾	3¾	25	29	3	3	22	25	3¼	2½

Note: Shaded values indicate that Ninth Edition design differs from Eighth Edition.

Column Base Plate Design Table (cont.)

f_c' = 4.0 ksi

For plates thicker than 8 in., F_y of 32 ksi is used

Plate F_y = 36 ksi

Column Load (kips)	Bearing Area Factor (Allowable Bearing Stress)											
	1.0 (F_p = 1400 psi)				1.5 (F_p = 2100 psi)				2.0 (F_p = 2800 psi)			
	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.
1250	28	32	3	3	23	26	3	2 1/2	20	23	3 1/4	2 1/2
1000	25	29	2 1/2	2 1/2	20	24	3	2 1/4	18	21	3 1/4	2 1/2
750	22	25	2 1/4	1 3/4	18	21	2 3/4	2 1/4	18	20	3	2 1/4
500	18	21	2 1/4	1 3/4	18	20	2 1/2	1 3/4	18	20	2 1/2	1 1/2
375	18	20	2	1 1/2	18	20	2	1 1/4	18	20	2	1
W14×342												
3030	46	48	6 1/2	6 1/2	37	40	5 3/4	5 3/4	31	35	5 1/4	5 1/4
3000	45	48	6 1/2	6 1/2	36	40	5 3/4	5 3/4	31	35	5 1/4	5 1/4
2750	43	46	6	6	35	38	5 1/2	5 1/2	30	33	4 3/4	4 3/4
2500	41	44	5 1/2	5 1/2	34	36	5	5	28	32	4 1/2	4 1/2
2250	39	42	5 1/4	5 1/4	31	35	4 1/2	4 1/2	27	30	4	4
2000	36	40	4 3/4	4 3/4	29	33	4	4	25	29	3 1/2	3 1/2
1750	34	37	4 1/4	4 1/4	27	31	3 1/2	3 1/2	24	27	3 1/4	3
1500	31	35	3 3/4	3 3/4	25	29	3	3	22	25	3 1/4	2 1/2
1250	28	32	3 1/4	3 1/4	23	26	3	2 1/2	20	23	3 1/4	2 1/2
1000	25	29	2 1/2	2 1/2	20	24	3	2 1/4	18	21	3 1/4	2 1/2
750	22	25	2 1/4	1 3/4	18	21	2 3/4	2	18	20	3	2 1/4
500	18	21	2 1/4	1 3/4	18	20	2 1/2	1 3/4	18	20	2 1/2	1 1/2
375	18	20	2	1 1/2	18	20	2	1 1/4	18	20	2	1
W14×311												
2742	43	46	6	6	35	38	5 1/2	5 1/2	30	33	4 3/4	4 3/4
2500	41	44	5 1/2	5 1/2	34	36	5 1/4	5 1/4	28	32	4 1/2	4 1/2
2250	39	42	5 1/4	5 1/4	32	34	4 3/4	4 3/4	27	30	4	4
2000	37	39	4 3/4	4 3/4	29	33	4 1/4	4 1/4	26	28	3 3/4	3 3/4
1750	34	37	4 1/4	4 1/4	27	31	3 3/4	3 3/4	24	27	3 1/4	3 1/4
1500	32	34	3 3/4	3 3/4	26	28	3 1/4	3 1/4	22	25	3 1/4	2 1/2
1250	28	32	3 1/4	3 1/4	23	26	3	2 1/2	20	23	3 1/4	2 1/2
1000	26	28	2 3/4	2 3/4	20	24	3	2 1/4	18	21	3 1/4	2 1/2
750	22	25	2 1/4	2	18	21	2 3/4	2	18	19	3	2 1/4
500	18	21	2 1/4	1 3/4	18	19	2 1/2	1 3/4	18	19	2 1/2	1 1/2
375	18	19	2 1/4	1 1/2	18	19	2 1/4	1 1/4	18	19	2 1/4	1 1/4
W14×283												
2499	41	44	5 3/4	5 3/4	34	36	5 1/4	5 1/4	29	31	4 1/2	4 1/2
2250	39	42	5 1/4	5 1/4	32	34	4 3/4	4 3/4	27	30	4	4
2000	37	39	4 3/4	4 3/4	30	32	4 1/4	4 1/4	26	28	3 3/4	3 3/4
1750	34	37	4 1/4	4 1/4	28	30	3 3/4	3 3/4	24	27	3 1/4	3 1/4
1500	32	34	3 3/4	3 3/4	26	28	3 1/4	3 1/4	22	25	3 1/4	2 3/4
1250	29	31	3 1/4	3 1/4	23	26	3	2 1/2	20	23	3 1/4	2 1/2
1000	26	28	2 3/4	2 3/4	21	23	3	2	18	20	3 1/4	2 1/2
750	22	25	2 1/4	2	18	20	3	2	18	19	3	2 1/4
500	18	20	2 1/2	1 3/4	18	19	2 1/2	1 3/4	18	19	2 1/2	1 1/2
375	18	19	2 1/4	1 1/2	18	19	2 1/4	1 1/4	18	19	2 1/4	1 1/4
250	18	19	1 3/4	1	18	19	1 3/4	1	18	19	1 3/4	1
W14×257												
2268	39	42	5 1/4	5 1/4	32	34	4 3/4	4 3/4	27	30	4 1/4	4 1/4
2250	40	41	5 1/2	5 1/2	32	34	4 3/4	4 3/4	27	30	4 1/4	4 1/4
2000	37	39	4 3/4	4 3/4	30	32	4 1/4	4 1/4	26	28	3 3/4	3 3/4
1750	34	37	4 1/4	4 1/4	28	30	3 3/4	3 3/4	25	26	3 1/2	3 1/2
1500	32	34	4	4	26	28	3 1/4	3 1/4	22	25	3 1/4	2 3/4
1250	29	31	3 1/4	3 1/4	23	26	3	2 3/4	20	23	3 1/4	2 1/4
1000	26	28	2 3/4	2 3/4	21	23	3	2	18	20	3 1/4	2 1/4
750	22	25	2 1/4	2	18	20	3	2	18	18	3	2 1/4

Note: Shaded values indicate that Ninth Edition design differs from Eighth Edition.

Column Base Plate Design Table (cont.)

f_c' = 4.0 ksi

For plates thicker than 8 in., F_y of 32 ksi is used

Plate F_y= 36 ksi

Column Load (kips)	Bearing Area Factor (Allowable Bearing Stress)											
	1.0 (F_p = 1400 psi)				1.5 (F_p = 2100 psi)				2.0 (F_p = 2800 psi)			
	B, in.	*N*, in.	t_8, in.	t_9, in.	*B*, in.	*N*, in.	t_8, in.	t_9, in.	*B*, in.	*N*, in.	t_8, in.	t_9, in.
500	18	20	2½	1¾	18	18	2½	1¾	18	18	2½	1½
375	18	18	2¼	1½	18	18	2¼	1½	18	18	2¼	1¼
250	18	18	1¾	1¼	18	18	1¾	1	18	18	1¾	1
W14×233												
2055	37	40	5	5	30	33	4½	4½	27	28	4	4
2000	37	39	5	5	30	32	4¼	4¼	26	28	3¾	3¾
1750	34	37	4½	4½	28	30	3¾	3¾	25	26	3½	3½
1500	32	34	4	4	26	28	3¼	3¼	23	24	3¼	3
1250	29	31	3¼	3¼	23	26	3	2¾	21	22	3¼	2½
1000	26	28	2¾	2¾	21	23	3	2	18	20	3¼	2¼
750	23	24	2¼	2	18	20	3	2	18	18	3	2¼
500	18	20	2½	1¾	18	18	2½	1¾	18	18	2½	1½
375	18	18	2¼	1½	18	18	2¼	1½	18	18	2¼	1¼
250	18	18	1¾	1¼	18	18	1¾	1	18	18	1¾	1
W14×211												
1860	35	38	4¾	4¾	29	31	4	4	25	27	3½	3½
1750	34	37	4½	4½	28	30	3¾	3¾	25	26	3½	3½
1500	32	34	4	4	26	28	3¼	3¼	23	24	3¼	3
1250	29	31	3¼	3¼	23	26	3	2¾	21	22	3¼	2½
1000	26	28	2¾	2¾	21	23	3	2¼	18	20	3¼	2¼
750	23	24	2¼	2¼	18	20	3	2	18	18	3	2
500	18	20	2½	1¾	18	18	2½	1¾	18	18	2½	1½
375	18	18	2¼	1½	18	18	2¼	1½	18	18	2¼	1¼
250	18	18	1¾	1¼	18	18	1¾	1	18	18	1¾	1
200	18	18	1¾	1	18	18	1¾	1	18	18	1¾	1
W14×193												
1704	34	36	4¼	4¼	28	30	3¾	3¾	24	26	3¼	3¼
1500	32	34	4	4	26	28	3¼	3¼	23	24	3¼	3
1250	29	31	3¼	3¼	24	25	3	3	21	22	3¼	2½
1000	26	28	2¾	2¾	21	23	3	2¼	18	20	3¼	2¼
750	23	24	2¼	2¼	18	20	3	2	18	17	3¼	2¼
500	18	20	2½	1¾	18	17	2½	1¾	18	17	2½	1¾
375	18	17	2¼	1½	18	17	2¼	1½	18	17	2¼	1¼
250	18	17	1¾	1¼	18	17	1¾	1	18	17	1¾	1
200	18	17	1¾	1	18	17	1¾	1	18	17	1¾	1
W14×176												
1554	33	34	4¼	4¼	27	28	3½	3½	23	25	3¼	3
1500	32	34	4	4	26	28	3¼	3¼	23	24	3¼	3
1250	29	31	3½	3½	24	25	3	3	21	22	3¼	2½
1000	26	28	2¾	2¾	21	23	3	2¼	18	20	3¼	2¼
750	23	24	2¼	2¼	18	20	3	2	18	17	3¼	2¼
500	18	20	2½	1¾	18	17	2½	1¾	18	17	2½	1¾
375	18	17	2¼	1½	18	17	2¼	1½	18	17	2¼	1¼
250	18	17	1¾	1¼	18	17	1¾	1	18	17	1¾	1
200	18	17	1¾	1	18	17	1¾	1	18	17	1¾	1

Note: Shaded values indicate that Ninth Edition design differs from Eighth Edition.

Column Base Plate Design Table (cont.)

f_c' = 4.0 ksi

For plates thicker than 8 in., F_y of 32 ksi is used

Plate F_y= 36 ksi

Column Load (kips)	Bearing Area Factor (Allowable Bearing Stress)											
	1.0 (F_p = 1400 psi)				1.5 (F_p = 2100 psi)				2.0 (F_p = 2800 psi)			
	B, in.	*N*, in.	t_8, in.	t_9, in.	*B*, in.	*N*, in.	t_8, in.	t_9, in.	*B*, in.	*N*, in.	t_8, in.	t_9, in.
W14×159												
1401	31	33	3¾	3¾	25	27	3¼	3¼	22	23	3¼	2¾
1250	29	31	3½	3½	24	25	3	3	21	22	3¼	2½
1000	26	28	2¾	2¾	21	23	3	2¼	18	20	3¼	2¼
750	23	24	2¼	2¼	18	20	3	2	18	17	3¼	2
500	18	20	2½	1½	18	17	2½	1¾	18	17	2½	1¾
375	18	17	2¼	1½	18	17	2¼	1½	18	17	2¼	1¼
250	18	17	1¾	1¼	18	17	1¾	1	18	17	1¾	1
200	18	17	1¾	1	18	17	1¾	1	18	17	1¾	1
150	18	17	1½	1	18	17	1½	1	18	17	1½	1
W14×145												
1281	30	31	3½	3½	24	26	3	3	21	22	3¼	2½
1250	29	31	3½	3½	24	25	3	3	21	22	3¼	2½
1000	26	28	2¾	2¾	21	23	3	2¼	18	20	3¼	2¼
750	23	24	2¼	2¼	18	20	3	2	17	17	3¼	2¼
500	18	20	2½	1½	17	17	2¾	1¾	17	17	2¾	1¾
375	17	17	2¼	1½	17	17	2¼	1½	17	17	2¼	1¼
250	17	17	2	1¼	17	17	2	1	17	17	2	1
200	17	17	1¾	1	17	17	1¾	1	17	17	1¾	1
150	17	17	1½	1	17	17	1½	1	17	17	1½	1
W14×132												
1164	28	30	3¼	3¼	23	25	2¾	2¾	20	21	3¼	2½
1000	26	28	3	3	21	23	2¾	2¼	18	20	3¼	2¼
750	23	24	2¼	2¼	18	20	2¾	2	17	17	3¼	2
500	18	20	2¼	1½	17	17	2½	1¾	17	17	2½	1¾
375	17	17	2¼	1½	17	17	2¼	1½	17	17	2¼	1¼
250	17	17	1¾	1¼	17	17	1¾	1	17	17	1¾	1
200	17	17	1¾	1	17	17	1¾	1	17	17	1¾	1
150	17	17	1½	1	17	17	1½	1	17	17	1½	1
125	17	17	1¼	1	17	17	1¼	1	17	17	1¼	1
W14×120												
1059	27	29	3	3	22	23	2¾	2½	19	20	3¼	2¼
1000	26	28	3	3	21	23	2¾	2¼	18	20	3¼	2¼
750	23	24	2¼	2¼	18	20	2¾	2	17	17	3¼	2
500	18	20	2¼	1½	17	16	2¾	1¾	17	16	2¾	1¾
375	17	17	2¼	1½	17	16	2¼	1½	17	16	2¼	1¼
250	17	16	2	1¼	17	16	2	1	17	16	2	1
200	17	16	1¾	1	17	16	1¾	1	17	16	1¾	1
150	17	16	1½	1	17	16	1½	1	17	16	1½	1
125	17	16	1½	1	17	16	1½	1	17	16	1½	1
W14×109												
960	26	27	3	3	21	22	2¾	2¼	18	20	3¼	2
750	23	24	2¼	2¼	18	20	2¾	1¾	17	17	3¼	2
500	18	20	2¼	1½	17	16	2¾	1¾	17	16	2¾	1¾
375	17	17	2¼	1½	17	16	2¼	1½	17	16	2¼	1¼
250	17	16	2	1¼	17	16	2	1	17	16	2	1
200	17	16	1¾	1	17	16	1¾	1	17	16	1¾	1
150	17	16	1½	1	17	16	1½	1	17	16	1½	1
125	17	16	1½	1	17	16	1½	1	17	16	1½	1
100	17	16	1¼	1	17	16	1¼	1	17	16	1¼	1

Note: Shaded values indicate that Ninth Edition design differs from Eighth Edition.

Column Base Plate Design Table (cont.)

f_c' = 4.0 ksi

For plates thicker than 8 in., F_y of 32 ksi is used

Plate F_y= 36 ksi

Column Load (kips)	Bearing Area Factor (Allowable Bearing Stress)											
	1.0 (F_p = 1400 psi)				1.5 (F_p = 2100 psi)				2.0 (F_p = 2800 psi)			
	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.
W14×99												
873	24	26	2½	2½	20	21	2¾	2¼	17	19	3¼	2
750	23	24	2¼	2¼	18	20	2¾	1¾	17	17	3¼	2
500	18	20	2¼	1½	17	16	2¾	1¾	17	16	2¾	1¾
375	17	17	2¼	1½	17	16	2¼	1½	17	16	2¼	1¼
250	17	16	2	1¼	17	16	2	1	17	16	2	1
200	17	16	1¾	1	17	16	1¾	1	17	16	1¾	1
150	17	16	1½	1	17	16	1½	1	17	16	1½	1
125	17	16	1½	1	17	16	1½	1	17	16	1½	1
100	17	16	1¼	1	17	16	1¼	1	17	16	1¼	1
W14×90												
795	23	25	2½	2½	19	20	2¾	2	17	18	3¼	2
750	23	24	2¼	2¼	18	20	2¾	1¾	17	17	3¼	2
500	18	20	2¼	1½	17	16	2¾	1¾	17	16	2¾	1¾
375	17	17	2¼	1½	17	16	2¼	1½	17	16	2¼	1¼
250	17	16	2	1¼	17	16	2	1	17	16	2	1
200	17	16	1¾	1	17	16	1¾	1	17	16	1¾	1
150	17	16	1½	1	17	16	1½	1	17	16	1½	1
125	17	16	1½	1	17	16	1½	1	17	16	1½	1
100	17	16	1¼	1	17	16	1¼	1	17	16	1¼	1
W14×82												
723	20	26	2½	2½	16	22	2¼	2¼	14	19	2½	1¾
500	17	22	1¾	1¾	14	18	2¼	1½	12	16	2½	1¾
375	15	19	1¾	1½	12	16	2¼	1½	12	16	2¼	1½
250	12	16	1¾	1¼	12	16	1¾	1¼	12	16	1¾	1
200	12	16	1¾	1¼	12	16	1¾	1	12	16	1¾	1
150	12	16	1½	1	12	16	1½	1	12	16	1½	1
125	12	16	1¼	1	12	16	1¼	1	12	16	1¼	1
100	12	16	1¼	1	12	16	1¼	1	12	16	1¼	1
75	12	16	1	1	12	16	1	1	12	16	1	1
W14×74												
654	20	24	2½	2½	15	21	2¼	2	13	18	2½	1¾
500	17	22	1¾	1¾	14	18	2¼	1½	12	16	2½	1¾
375	15	19	1¾	1½	12	16	2¼	1½	12	16	2¼	1½
250	12	16	1¾	1¼	12	16	1¾	1¼	12	16	1¾	1
200	12	16	1¾	1¼	12	16	1¾	1	12	16	1¾	1
150	12	16	1½	1	12	16	1½	1	12	16	1½	1
125	12	16	1¼	1	12	16	1¼	1	12	16	1¼	1
100	12	16	1¼	1	12	16	1¼	1	12	16	1¼	1
75	12	16	1	1	12	16	1	1	12	16	1	1
W14×68												
600	18	24	2¼	2¼	15	20	2¼	1¾	12	18	2½	1¾
500	17	22	1¾	1¾	14	18	2¼	1½	12	16	2½	1¾
375	15	19	1¾	1½	12	16	2¼	1½	12	16	2¼	1½
250	12	16	1¾	1¼	12	16	1¾	1¼	12	16	1¾	1
200	12	16	1¾	1¼	12	16	1¾	1	12	16	1¾	1
150	12	16	1½	1	12	16	1½	1	12	16	1½	1
125	12	16	1¼	1	12	16	1¼	1	12	16	1¼	1
100	12	16	1¼	1	12	16	1¼	1	12	16	1¼	1
75	12	16	1	1	12	16	1	1	12	16	1	1

Note: Shaded values indicate that Ninth Edition design differs from Eighth Edition.

Column Base Plate Design Table (cont.)

$f_c' = 4.0$ ksi

For plates thicker than 8 in., F_y of 32 ksi is used

Plate $F_y = 36$ ksi

Column Load (kips)	Bearing Area Factor (Allowable Bearing Stress)											
	1.0 (F_p = 1400 psi)				1.5 (F_p = 2100 psi)				2.0 (F_p = 2800 psi)			
	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.	B, in.	N, in.	t_8, in.	t_9, in.
W14×61												
537	18	22	2	2	14	19	2 1/4	1 1/2	12	17	2 1/2	1 3/4
500	17	22	1 3/4	1 3/4	14	18	2 1/4	1 1/2	12	16	2 1/2	1 3/4
375	15	19	1 3/4	1 1/2	12	16	2 1/4	1 1/2	12	16	2 1/4	1 1/2
250	12	16	1 3/4	1 1/4	12	16	1 3/4	1 1/4	12	16	1 3/4	1
200	12	16	1 3/4	1 1/4	12	16	1 3/4	1	12	16	1 3/4	1
150	12	16	1 1/2	1	12	16	1 1/2	1	12	16	1 1/2	1
125	12	16	1 1/4	1	12	16	1 1/4	1	12	16	1 1/4	1
100	12	16	1 1/4	1	12	16	1 1/4	1	12	16	1 1/4	1
75	12	16	1	1	12	16	1	1	12	16	1	1
W14×53												
468	16	22	2	2	12	19	2	1 1/2	10	17	2 1/4	1 1/2
375	14	20	1 1/2	1 1/2	11	17	1 3/4	1 1/4	10	16	2	1 1/2
250	11	17	1 1/2	1 1/4	10	16	1 3/4	1 1/4	10	16	1 3/4	1
200	10	16	1 1/2	1	10	16	1 1/2	1	10	16	1 1/2	1
150	10	16	1 1/4	1	10	16	1 1/4	1	10	16	1 1/4	1
125	10	16	1 1/4	1	10	16	1 1/4	1	10	16	1 1/4	1
100	10	16	1	1	10	16	1	1	10	16	1	1
75	10	16	1	1	10	16	1	1	10	16	1	1
W14×48												
423	15	21	1 3/4	1 3/4	12	18	1 3/4	1 1/2	10	16	2	1 1/2
375	14	20	1 1/2	1 1/2	11	17	1 3/4	1 1/4	10	16	2	1 1/2
250	11	17	1 1/2	1 1/4	10	16	1 3/4	1 1/4	10	16	1 3/4	1
200	10	16	1 1/2	1	10	16	1 1/2	1	10	16	1 1/2	1
150	10	16	1 1/4	1	10	16	1 1/4	1	10	16	1 1/4	1
125	10	16	1 1/4	1	10	16	1 1/4	1	10	16	1 1/4	1
100	10	16	1	1	10	16	1	1	10	16	1	1
75	10	16	1	1	10	16	1	1	10	16	1	1
W14×43												
378	14	20	1 1/2	1 1/2	11	17	1 3/4	1 1/4	10	16	2	1 1/2
375	14	20	1 1/2	1 1/2	11	17	1 3/4	1 1/4	10	16	2	1 1/2
250	11	17	1 1/2	1 1/4	10	16	1 3/4	1 1/4	10	16	1 3/4	1
200	10	16	1 1/2	1	10	16	1 1/2	1	10	16	1 1/2	1
150	10	16	1 1/4	1	10	16	1 1/4	1	10	16	1 1/4	1
125	10	16	1 1/4	1	10	16	1 1/4	1	10	16	1 1/4	1
100	10	16	1	1	10	16	1	1	10	16	1	1
75	10	16	1	1	10	16	1	1	10	16	1	1
W14×38												
336	12	20	1 1/2	1 1/2	10	17	1 1/2	1 1/4	9	16	1 3/4	1 1/4
250	10	18	1 1/4	1	9	16	1 1/2	1 1/4	9	16	1 1/2	1
200	9	17	1 1/4	1	9	16	1 1/4	1	9	16	1 1/4	1
150	9	16	1 1/4	1	9	16	1 1/4	1	9	16	1 1/4	1
125	9	16	1	1	9	16	1	1	9	16	1	1
100	9	16	1	1	9	16	1	1	9	16	1	1
75	9	16	1	1	9	16	1	1	9	16	1	1
W14×34												
300	12	19	1 1/2	1 1/2	9	17	1 1/2	1 1/4	9	16	1 3/4	1 1/4
250	10	18	1 1/4	1	9	16	1 1/2	1 1/4	9	16	1 1/2	1
200	9	17	1 1/4	1	9	16	1 1/4	1	9	16	1 1/4	1
150	9	16	1 1/4	1	9	16	1 1/4	1	9	16	1 1/4	1
125	9	16	1	1	9	16	1	1	9	16	1	1
100	9	16	1	1	9	16	1	1	9	16	1	1

Note: Shaded values indicate that Ninth Edition design differs from Eighth Edition.