

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM									
Desig.	W/D	Metric Desig.	M/D	Hp/A	1-Hour	1-1/2 Hour	2-Hour	3-Hour	4-Hour
W44 x 335	2.52	W1120 x 498	148.7	53.2	1/2	3/8	3/8	1/2	11/16
290	2.2	432	129.8	60.9	5/16	3/8	3/8	9/16	3/4
262	2	390	118.0	67.0	5/16	3/8	3/8	9/16	13/16
230	1.77	342	104.4	75.7	5/16	3/8	3/8	5/8	7/8
W40 x 593	4.56	W1000 x 883	269.0	29.4	5/16	3/8	3/8	3/8	7/16
503	3.93	748	231.9	34.1	5/16	3/8	3/8	3/8	1/2
431	3.42	641	201.8	39.2	5/16	3/8	3/8	3/8	9/16
397	3.15	591	185.9	42.5	5/16	3/8	3/8	7/16	9/16
392	3.38	583	199.4	39.6	5/16	3/8	3/8	3/8	9/16
372	2.98	554	175.8	45.0	5/16	3/8	3/8	7/16	5/8
362	2.9	539	171.1	46.2	5/16	3/8	3/8	7/16	5/8
331	2.9	493	171.1	46.2	5/16	3/8	3/8	7/16	5/8
327	2.89	487	170.5	46.4	5/16	3/8	3/8	7/16	5/8
324	2.61	482	154.0	51.3	5/16	3/8	3/8	1/2	11/16
297	2.41	442	142.2	55.6	5/16	3/8	3/8	1/2	11/16
278	2.48	414	146.3	54.0	5/16	3/8	3/8	1/2	11/16
277	2.25	412	132.8	59.5	5/16	3/8	3/8	1/2	3/4
264	2.36	393	139.2	56.8	5/16	3/8	3/8	1/2	11/16
249	2.02	371	119.2	66.3	5/16	3/8	3/8	9/16	13/16
235	2.1	350	123.9	63.8	5/16	3/8	3/8	9/16	13/16
215	1.76	321	103.8	76.1	5/16	3/8	3/8	5/8	7/8
211	1.9	314	112.1	70.5	5/16	3/8	3/8	5/8	13/16
199	1.64	296	96.8	81.7	5/16	3/8	3/8	11/16	15/16
183	1.66	272	97.9	80.7	5/16	3/8	3/8	5/8	15/16
167	1.53	249	90.3	87.6	5/16	3/8	3/8	11/16	1
149	1.37	222	80.8	97.8	5/16	3/8	3/8	3/4	1-1/16
W36 x 798	6.09	W920 x 1188	359.3	22.0	5/16	3/8	3/8	3/8	3/8
650	5.08	967	299.7	26.4	5/16	3/8	3/8	3/8	3/8
527	4.22	784	249.0	31.7	5/16	3/8	3/8	3/8	7/16
439	3.57	653	210.6	37.5	5/16	3/8	3/8	3/8	1/2
393	3.25	585	191.8	41.2	5/16	3/8	3/8	3/8	9/16
359	2.97	534	175.2	45.1	5/16	3/8	3/8	7/16	5/8
328	2.73	488	161.1	49.1	5/16	3/8	3/8	7/16	5/8
300	2.5	446	147.5	53.6	5/16	3/8	3/8	1/2	11/16
280	2.35	417	138.7	57.0	5/16	3/8	3/8	1/2	11/16
260	2.18	387	128.6	61.5	5/16	3/8	3/8	9/16	3/4
256	2.37	381	139.8	56.5	5/16	3/8	3/8	1/2	11/16
245	2.08	365	122.7	64.4	5/16	3/8	3/8	9/16	13/16
232	2.15	345	126.9	62.3	5/16	3/8	3/8	9/16	3/4
230	1.95	342	115.1	68.7	5/16	3/8	3/8	9/16	13/16

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM									
Desig.	W/D	Metric Desig.	M/D	Hp/A	1-Hour	1-1/2 Hour	2-Hour	3-Hour	4-Hour
W36 x 210	1.96	W920 x 313	115.6	68.4	5/16	3/8	3/8	9/16	13/16
194	1.81	289	106.8	74.0	5/16	3/8	3/8	5/8	7/8
182	1.72	271	101.5	77.9	5/16	3/8	3/8	5/8	7/8
170	1.6	253	94.4	83.7	5/16	3/8	3/8	11/16	15/16
160	1.51	238	89.1	88.7	5/16	3/8	3/8	11/16	1
150	1.43	223	84.4	93.7	5/16	3/8	3/8	3/4	1
135	1.29	201	76.1	103.9	5/16	3/8	3/8	3/4	1-1/8
W33 x 387	3.31	W840 x 576	195.3	40.5	5/16	3/8	3/8	3/8	9/16
354	3.05	527	180.0	43.9	5/16	3/8	3/8	7/16	9/16
318	2.77	473	163.4	48.4	5/16	3/8	3/8	7/16	5/8
291	2.55	433	150.5	52.5	5/16	3/8	3/8	1/2	11/16
263	2.33	392	137.5	57.5	5/16	3/8	3/8	1/2	3/4
241	2.13	359	125.7	62.9	5/16	3/8	3/8	9/16	3/4
221	1.97	329	116.2	68.0	5/16	3/8	3/8	9/16	13/16
201	1.79	299	105.6	74.9	5/16	3/8	3/8	5/8	7/8
169	1.7	251	100.3	78.8	5/16	3/8	3/8	5/8	15/16
152	1.53	226	90.3	87.6	5/16	3/8	3/8	11/16	1
141	1.43	210	84.4	93.7	5/16	3/8	3/8	3/4	1
130	1.32	193	77.9	101.5	5/16	3/8	3/8	3/4	1-1/16
118	1.21	176	71.4	110.7	5/16	3/8	7/16	13/16	1-1/8
W30 x 391	3.59	W760 x 582	211.8	37.3	5/16	3/8	3/8	3/8	1/2
357	3.31	531	195.3	40.5	5/16	3/8	3/8	3/8	9/16
326	3.05	484	180.0	43.9	5/16	3/8	3/8	7/16	9/16
292	2.73	434	161.1	49.1	5/16	3/8	3/8	7/16	5/8
261	2.46	389	145.1	54.5	5/16	3/8	3/8	1/2	11/16
235	2.24	350	132.2	59.8	5/16	3/8	3/8	1/2	3/4
211	2.01	314	118.6	66.7	5/16	3/8	3/8	9/16	13/16
191	1.85	284	109.2	72.4	5/16	3/8	3/8	5/8	7/8
173	1.66	257	97.9	80.7	5/16	3/8	3/8	5/8	15/16
148	1.64	220	96.8	81.7	5/16	3/8	3/8	11/16	15/16
132	1.47	196	86.7	91.1	5/16	3/8	3/8	11/16	1
124	1.39	185	82.0	96.4	5/16	3/8	3/8	3/4	1-1/16
116	1.3	173	76.7	103.1	5/16	3/8	3/8	3/4	1-1/8
108	1.21	161	71.4	110.7	5/16	3/8	7/16	13/16	1-1/8
99	1.12	147	66.1	119.6	5/16	3/8	7/16	7/8	1-3/16
90	1.02	134	60.2	131.4	3/8	3/8	7/16	7/8	1-5/16
W27 x 539	5.08	W690 x 802	299.7	26.4	5/16	3/8	3/8	3/8	3/8
368	3.64	548	214.8	36.8	5/16	3/8	3/8	3/8	1/2

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM									
Desig.	W/D	Metric Desig.	M/D	Hp/A	1-Hour	1-1/2 Hour	2-Hour	3-Hour	4-Hour
W27 x 336	3.36	W690 x 500	198.2	39.9	5/16	3/8	3/8	3/8	9/16
307	3.11	457	183.5	43.1	5/16	3/8	3/8	7/16	9/16
281	2.86	418	168.7	46.8	5/16	3/8	3/8	7/16	5/8
258	2.64	384	155.8	50.8	5/16	3/8	3/8	7/16	11/16
235	2.43	350	143.4	55.1	5/16	3/8	3/8	1/2	11/16
217	2.26	323	133.3	59.3	5/16	3/8	3/8	1/2	3/4
194	2.03	289	119.8	66.0	5/16	3/8	3/8	9/16	13/16
178	1.87	265	110.3	71.6	5/16	3/8	3/8	5/8	7/8
161	1.7	240	100.3	78.8	5/16	3/8	3/8	5/8	15/16
146	1.55	217	91.5	86.4	5/16	3/8	3/8	11/16	1
129	1.56	192	92.0	85.9	5/16	3/8	3/8	11/16	1
114	1.39	170	82.0	96.4	5/16	3/8	3/8	3/4	1-1/16
102	1.24	152	73.2	108.1	5/16	3/8	7/16	13/16	1-1/8
94	1.15	140	67.9	116.5	5/16	3/8	7/16	13/16	1-3/16
84	1.03	125	60.8	130.1	3/8	3/8	7/16	7/8	1-1/4
W24 x 370	3.98	W610 x 551	234.8	33.7	5/16	3/8	3/8	3/8	1/2
335	3.66	498	215.9	36.6	5/16	3/8	3/8	3/8	1/2
306	3.37	455	198.8	39.8	5/16	3/8	3/8	3/8	9/16
279	3.11	415	183.5	43.1	5/16	3/8	3/8	7/16	9/16
250	2.81	372	165.8	47.7	5/16	3/8	3/8	7/16	5/8
229	2.6	341	153.4	51.5	5/16	3/8	3/8	1/2	11/16
207	2.36	307	139.2	56.8	5/16	3/8	3/8	1/2	11/16
192	2.2	285	129.8	60.9	5/16	3/8	3/8	9/16	3/4
176	2.03	262	119.8	66.0	5/16	3/8	3/8	9/16	13/16
162	1.88	241	110.9	71.3	5/16	3/8	3/8	5/8	7/8
146	1.7	217	100.3	78.8	5/16	3/8	3/8	5/8	15/16
131	1.54	195	90.9	87.0	5/16	3/8	3/8	11/16	1
117	1.38	174	81.4	97.1	5/16	3/8	3/8	3/4	1-1/16
104	1.24	155	73.2	108.1	5/16	3/8	7/16	13/16	1-1/8
103	1.4	153	82.6	95.7	5/16	3/8	3/8	3/4	1-1/16
94	1.28	140	75.5	104.7	5/16	3/8	3/8	3/4	1-1/8
84	1.15	125	67.9	116.5	5/16	3/8	7/16	13/16	1-3/16
76	1.05	113	62.0	127.6	3/8	3/8	7/16	7/8	1-1/4
68	0.94	101	55.5	142.5	3/8	3/8	1/2	15/16	1-3/8
62	0.93	92	54.9	144.1	3/8	3/8	1/2	15/16	1-3/8
55	0.82	82	48.4	163.4	3/8	3/8	1/2	1	1-7/16
W21 x 201	2.5	W530 x 300	147.5	53.6	5/16	3/8	3/8	1/2	11/16
182	2.28	272	134.5	58.8	5/16	3/8	3/8	1/2	3/4

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCE® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM									
Desig.	W/D	Metric Desig.	M/D	Hp/A	1-Hour	1-1/2 Hour	2-Hour	3-Hour	4-Hour
W21 x 166	2.09	W530 x 248	123.3	64.1	5/16	3/8	3/8	9/16	13/16
147	1.87	219	110.3	71.6	5/16	3/8	3/8	5/8	7/8
132	1.68	196	99.1	79.8	5/16	3/8	3/8	5/8	15/16
122	1.57	182	92.6	85.3	5/16	3/8	3/8	11/16	15/16
111	1.43	165	84.4	93.7	5/16	3/8	3/8	3/4	1
101	1.3	150	76.7	103.1	5/16	3/8	3/8	3/4	1-1/8
93	1.4	138	82.6	95.7	5/16	3/8	3/8	3/4	1-1/16
83	1.26	123	74.3	106.3	5/16	3/8	7/16	13/16	1-1/8
73	1.11	109	65.5	120.7	5/16	3/8	7/16	7/8	1-3/16
68	1.04	101	61.4	128.8	3/8	3/8	7/16	7/8	1-1/4
62	0.95	92	56.1	141.0	3/8	3/8	1/2	15/16	1-5/16
57	0.95	85	56.1	141.0	3/8	3/8	1/2	15/16	1-5/16
55	0.85	82	50.2	157.6	3/8	3/8	1/2	1	1-7/16
50	0.83	74	49.0	161.4	3/8	3/8	1/2	1	1-7/16
48	0.75	72	44.3	178.6	7/16	7/16	9/16	1-1/16	1-9/16
44	0.74	66	43.7	181.1	7/16	7/16	9/16	1-1/16	1-9/16
W18 x 175	2.46	W460 x 260	145.1	54.5	5/16	3/8	3/8	1/2	11/16
158	2.24	235	132.2	59.8	5/16	3/8	3/8	1/2	3/4
143	2.05	213	121.0	65.4	5/16	3/8	3/8	9/16	13/16
130	1.88	193	110.9	71.3	5/16	3/8	3/8	5/8	7/8
119	1.72	177	101.5	77.9	5/16	3/8	3/8	5/8	7/8
106	1.55	158	91.5	86.4	5/16	3/8	3/8	11/16	1
97	1.42	144	83.8	94.4	5/16	3/8	3/8	3/4	1-1/16
86	1.27	128	74.9	105.5	5/16	3/8	7/16	13/16	1-1/8
76	1.13	113	66.7	118.6	5/16	3/8	7/16	7/8	1-3/16
71	1.22	106	72.0	109.8	5/16	3/8	7/16	13/16	1-1/8
65	1.13	97	66.7	118.6	5/16	3/8	7/16	7/8	1-3/16
60	1.04	89	61.4	128.8	3/8	3/8	7/16	7/8	1-1/4
55	0.96	82	56.6	139.6	3/8	3/8	1/2	15/16	1-5/16
50	0.88	74	51.9	152.3	3/8	3/8	1/2	1	1-3/8
46	0.87	68	51.3	154.0	3/8	3/8	1/2	1	1-7/16
40	0.76	60	44.8	176.3	7/16	7/16	9/16	1-1/16	1-1/2
35	0.67	52	39.5	200.0	7/16	7/16	9/16	1-1/8	1-5/8
W16 x 100	1.59	W410 x 149	93.8	84.3	5/16	3/8	3/8	11/16	15/16
89	1.43	132	84.4	93.7	5/16	3/8	3/8	3/4	1
77	1.25	114	73.8	107.2	5/16	3/8	7/16	13/16	1-1/8
67	1.09	100	64.3	122.9	3/8	3/8	7/16	7/8	1-1/4
57	1.09	85	64.3	122.9	3/8	3/8	7/16	7/8	1-1/4
50	0.96	74	56.6	139.6	3/8	3/8	1/2	15/16	1-5/16
45	0.87	67	51.3	154.0	3/8	3/8	1/2	1	1-7/16

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM Desig.	W/D	Metric Desig.	M/D	Hp/A	1-Hour	1-1/2 Hour	2-Hour	3-Hour	4-Hour
W16 x 40	0.78	W410 x 60	46.0	171.8	7/16	7/16	9/16	1-1/16	1-1/2
36	0.7	53	41.3	191.4	7/16	7/16	9/16	1-1/8	1-9/16
31	0.66	46	38.9	203.0	7/16	7/16	9/16	1-1/8	1-5/8
26	0.55	39	32.5	243.6	1/2	1/2	5/8	1-1/4	1-13/16
W14 x 808	8.75	W360 x 1202	516.3	15.3	5/16	3/8	3/8	3/8	3/8
730	8.08	1086	476.7	16.6	5/16	3/8	3/8	3/8	3/8
665	7.49	990	441.9	17.9	5/16	3/8	3/8	3/8	3/8
605	6.96	900	410.6	19.3	5/16	3/8	3/8	3/8	3/8
550	6.43	818	379.4	20.8	5/16	3/8	3/8	3/8	3/8
500	5.95	744	351.1	22.5	5/16	3/8	3/8	3/8	3/8
455	5.53	677	326.3	24.2	5/16	3/8	3/8	3/8	3/8
426	5.21	634	307.4	25.7	5/16	3/8	3/8	3/8	3/8
398	4.93	592	290.9	27.2	5/16	3/8	3/8	3/8	3/8
370	4.63	551	273.2	28.9	5/16	3/8	3/8	3/8	7/16
342	4.32	509	254.9	31.0	5/16	3/8	3/8	3/8	7/16
311	3.98	463	234.8	33.7	5/16	3/8	3/8	3/8	1/2
283	3.66	421	215.9	36.6	5/16	3/8	3/8	3/8	1/2
257	3.36	382	198.2	39.9	5/16	3/8	3/8	3/8	9/16
233	3.08	347	181.7	43.5	5/16	3/8	3/8	7/16	9/16
211	2.81	314	165.8	47.7	5/16	3/8	3/8	7/16	5/8
193	2.6	287	153.4	51.5	5/16	3/8	3/8	1/2	11/16
176	2.38	262	140.4	56.3	5/16	3/8	3/8	1/2	11/16
159	2.16	237	127.4	62.0	5/16	3/8	3/8	9/16	3/4
145	1.99	216	117.4	67.3	5/16	3/8	3/8	9/16	13/16
132	1.89	196	111.5	70.9	5/16	3/8	3/8	5/8	7/8
120	1.71	179	100.9	78.4	5/16	3/8	3/8	5/8	15/16
109	1.57	162	92.6	85.3	5/16	3/8	3/8	11/16	15/16
99	1.43	147	84.4	93.7	5/16	3/8	3/8	3/4	1
90	1.31	134	77.3	102.3	5/16	3/8	3/8	3/4	1-1/16
82	1.45	122	85.6	92.4	5/16	3/8	3/8	3/4	1
74	1.32	110	77.9	101.5	5/16	3/8	3/8	3/4	1-1/16
68	1.22	101	72.0	109.8	5/16	3/8	7/16	13/16	1-1/8
61	1.1	91	64.9	121.8	5/16	3/8	7/16	7/8	1-1/4
53	1.06	79	62.5	126.4	3/8	3/8	7/16	7/8	1-1/4
48	0.97	72	57.2	138.1	3/8	3/8	1/2	15/16	1-5/16
43	0.87	64	51.3	154.0	3/8	3/8	1/2	1	1-7/16
38	0.8	57	47.2	167.5	7/16	7/16	9/16	1-1/16	1-1/2
34	0.72	51	42.5	186.1	7/16	7/16	9/16	1-1/8	1-9/16
30	0.64	45	37.8	209.3	7/16	7/16	5/8	1-3/16	1-11/16
26	0.62	39	36.6	216.1	7/16	7/16	5/8	1-3/16	1-11/16
22	0.53	33	31.3	252.8	1/2	1/2	5/8	1-1/4	1-13/16

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM									
Desig.	W/D	Metric Desig.	M/D	Hp/A	1-Hour	1-1/2 Hour	2-Hour	3-Hour	4-Hour
W12 x 336	4.85	W310 x 500	286.2	27.6	5/16	3/8	3/8	3/8	3/8
305	4.49	454	264.9	29.8	5/16	3/8	3/8	3/8	7/16
279	4.19	415	247.2	32.0	5/16	3/8	3/8	3/8	7/16
252	3.84	375	226.6	34.9	5/16	3/8	3/8	3/8	1/2
230	3.55	342	209.5	37.7	5/16	3/8	3/8	3/8	1/2
210	3.27	313	192.9	41.0	5/16	3/8	3/8	3/8	9/16
190	3	283	177.0	44.7	5/16	3/8	3/8	7/16	5/8
170	2.72	253	160.5	49.3	5/16	3/8	3/8	7/16	5/8
152	2.45	225	144.6	54.7	5/16	3/8	3/8	1/2	11/16
136	2.23	202	131.6	60.1	5/16	3/8	3/8	1/2	3/4
120	1.99	179	117.4	67.3	5/16	3/8	3/8	9/16	13/16
106	1.77	158	104.4	75.7	5/16	3/8	3/8	5/8	7/8
96	1.61	143	95.0	83.2	5/16	3/8	3/8	11/16	15/16
87	1.47	129	86.7	91.1	5/16	3/8	3/8	11/16	1
79	1.34	117	79.1	100.0	5/16	3/8	3/8	3/4	1-1/16
72	1.23	107	72.6	108.9	5/16	3/8	7/16	13/16	1-1/8
65	1.11	97	65.5	120.7	5/16	3/8	7/16	7/8	1-3/16
58	1.1	86	64.9	121.8	5/16	3/8	7/16	7/8	1-1/4
53	1.02	79	60.2	131.4	3/8	3/8	7/16	7/8	1-5/16
50	1.06	74	62.5	126.4	3/8	3/8	7/16	7/8	1-1/4
45	0.97	67	57.2	138.1	3/8	3/8	1/2	15/16	1-5/16
40	0.86	60	50.7	155.8	3/8	3/8	1/2	1	1-7/16
35	0.81	52	47.8	165.4	3/8	3/8	1/2	1	1-7/16
30	0.69	45	40.7	194.2	7/16	7/16	9/16	1-1/8	1-5/8
26	0.61	39	36.0	219.6	7/16	7/16	5/8	1-3/16	1-11/16
22	0.62	33	36.6	216.1	7/16	7/16	5/8	1-3/16	1-11/16
19	0.54	28	31.9	248.1	1/2	1/2	5/8	1-1/4	1-13/16
16	0.45	24	26.6	297.7	9/16	9/16	11/16	1-3/8	1-15/16
14	0.4	21	23.6	335.0	9/16	9/16	3/4	1-7/16	2-1/16
W10 x 112	2.17	W250 x 167	128.0	61.7	5/16	3/8	3/8	9/16	3/4
100	1.97	149	116.2	68.0	5/16	3/8	3/8	9/16	13/16
88	1.74	131	102.7	77.0	5/16	3/8	3/8	5/8	7/8
77	1.54	115	90.9	87.0	5/16	3/8	3/8	11/16	1
68	1.38	101	81.4	97.1	5/16	3/8	3/8	3/4	1-1/16
60	1.22	89	72.0	109.8	5/16	3/8	7/16	13/16	1-1/8
54	1.11	80	65.5	120.7	5/16	3/8	7/16	7/8	1-3/16
49	1.01	73	59.6	132.7	3/8	3/8	1/2	15/16	1-5/16
45	1.06	67	62.5	126.4	3/8	3/8	7/16	7/8	1-1/4
39	0.92	58	54.3	145.6	3/8	3/8	1/2	15/16	1-3/8
33	0.78	49	46.0	171.8	7/16	7/16	9/16	1-1/16	1-1/2
30	0.8	45	47.2	167.5	7/16	7/16	9/16	1-1/16	1-1/2

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM									
Desig.	W/D	Metric Desig.	M/D	Hp/A	1-Hour	1-1/2 Hour	2-Hour	3-Hour	4-Hour
W10 x 26	0.7	W10 x 39	41.3	191.4	7/16	7/16	9/16	1-1/8	1-9/16
22	0.6	33	35.4	223.3	1/2	1/2	5/8	1-3/16	1-3/4
19	0.6	28	35.4	223.3	1/2	1/2	5/8	1-3/16	1-3/4
17	0.54	25	31.9	248.1	1/2	1/2	5/8	1-1/4	1-13/16
15	0.48	22	28.3	279.1	1/2	1/2	11/16	1-5/16	1-15/16
12	0.39	18	23.0	343.5	9/16	9/16	3/4	1-7/16	2-1/16
W8 x 67	1.65	W200 x 100	97.4	81.2	5/16	3/8	3/8	11/16	15/16
58	1.44	86	85.0	93.0	5/16	3/8	3/8	3/4	1
48	1.21	71	71.4	110.7	5/16	3/8	7/16	13/16	1-1/8
40	1.03	59	60.8	130.1	3/8	3/8	7/16	7/8	1-1/4
35	0.9	52	53.1	148.9	3/8	3/8	1/2	1	1-3/8
31	0.8	46	47.2	167.5	7/16	7/16	9/16	1-1/16	1-1/2
28	0.81	42	47.8	165.4	3/8	3/8	1/2	1	1-7/16
24	0.7	36	41.3	191.4	7/16	7/16	9/16	1-1/8	1-9/16
21	0.67	31	39.5	200.0	7/16	7/16	9/16	1-1/8	1-5/8
18	0.58	27	34.2	231.0	1/2	1/2	5/8	1-1/4	1-3/4
15	0.55	22	32.5	243.6	1/2	1/2	5/8	1-1/4	1-13/16
13	0.48	19	28.3	279.1	1/2	1/2	11/16	1-5/16	1-15/16
10	0.37	15	21.8	362.1	9/16	9/16	3/4	1-1/2	2-1/8
W6 x 25	0.83	W150 x 37	49.0	161.4	3/8	3/8	1/2	1	1-7/16
20	0.67	30	39.5	200.0	7/16	7/16	9/16	1-1/8	1-5/8
16	0.68	24	40.1	197.0	7/16	7/16	9/16	1-1/8	1-5/8
15	0.52	22	30.7	257.7	1/2	1/2	11/16	1-5/16	1-13/16
12	0.52	18	30.7	257.7	1/2	1/2	11/16	1-5/16	1-13/16
9	0.39	14	23.0	343.5	9/16	9/16	3/4	1-7/16	2-1/16
8.5	0.37	13	21.8	362.1	9/16	9/16	3/4	1-1/2	2-1/8
W5 x 19	0.77	W130 x 28	45.4	174.0	7/16	7/16	9/16	1-1/16	1-1/2
16	0.66	24	38.9	203.0	7/16	7/16	9/16	1-1/8	1-5/8
W4 x 13	0.67	W100 x 19	39.5	200.0	7/16	7/16	9/16	1-1/8	1-5/8

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM Desig.	W/D	Metric Desig.	M/D	Hp/A	2-1/2 Hour	3-1/2 Hour
W44 x 335	2.52	W1120 x 498	148.7	53.2	7/16	5/8
290	2.2	432	129.8	60.9	1/2	11/16
262	2	390	118.0	67.0	1/2	11/16
230	1.77	342	104.4	75.7	9/16	3/4
W40 x 593	4.56	W1000 x 883	269.0	29.4	3/8	3/8
503	3.93	748	231.9	34.1	3/8	7/16
431	3.42	641	201.8	39.2	3/8	1/2
397	3.15	591	185.9	42.5	3/8	1/2
392	3.38	583	199.4	39.6	3/8	1/2
372	2.98	554	175.8	45.0	3/8	1/2
362	2.9	539	171.1	46.2	3/8	9/16
331	2.9	493	171.1	46.2	3/8	9/16
327	2.89	487	170.5	46.4	3/8	9/16
324	2.61	482	154.0	51.3	7/16	9/16
297	2.41	442	142.2	55.6	7/16	5/8
278	2.48	414	146.3	54.0	7/16	5/8
277	2.25	412	132.8	59.5	7/16	5/8
264	2.36	393	139.2	56.8	7/16	5/8
249	2.02	371	119.2	66.3	1/2	11/16
235	2.1	350	123.9	63.8	1/2	11/16
215	1.76	321	103.8	76.1	9/16	3/4
211	1.9	314	112.1	70.5	1/2	3/4
199	1.64	296	96.8	81.7	9/16	13/16
183	1.66	272	97.9	80.7	9/16	13/16
167	1.53	249	90.3	87.6	5/8	7/8
149	1.37	222	80.8	97.8	11/16	15/16
W36 x 798	6.09	W920 x 1188	359.3	22.0	3/8	3/8
650	5.08	967	299.7	26.4	3/8	3/8
527	4.22	784	249.0	31.7	3/8	3/8
439	3.57	653	210.6	37.5	3/8	7/16
393	3.25	585	191.8	41.2	3/8	1/2
359	2.97	534	175.2	45.1	3/8	1/2
328	2.73	488	161.1	49.1	3/8	9/16
300	2.5	446	147.5	53.6	7/16	5/8
280	2.35	417	138.7	57.0	7/16	5/8
260	2.18	387	128.6	61.5	1/2	11/16
256	2.37	381	139.8	56.5	7/16	5/8
245	2.08	365	122.7	64.4	1/2	11/16
232	2.15	345	126.9	62.3	1/2	11/16
230	1.95	342	115.1	68.7	1/2	3/4

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM Desig.	W/D	Metric Desig.	M/D	Hp/A	2-1/2 Hour	3-1/2 Hour
W36 x 210	1.96	W920 x 313	115.6	68.4	1/2	3/4
194	1.81	289	106.8	74.0	9/16	3/4
182	1.72	271	101.5	77.9	9/16	13/16
170	1.6	253	94.4	83.7	9/16	13/16
160	1.51	238	89.1	88.7	5/8	7/8
150	1.43	223	84.4	93.7	5/8	7/8
135	1.29	201	76.1	103.9	11/16	15/16
W33 x 387	3.31	W840 x 576	195.3	40.5	3/8	1/2
354	3.05	527	180.0	43.9	3/8	1/2
318	2.77	473	163.4	48.4	3/8	9/16
291	2.55	433	150.5	52.5	7/16	9/16
263	2.33	392	137.5	57.5	7/16	5/8
241	2.13	359	125.7	62.9	1/2	11/16
221	1.97	329	116.2	68.0	1/2	11/16
201	1.79	299	105.6	74.9	9/16	3/4
169	1.7	251	100.3	78.8	9/16	13/16
152	1.53	226	90.3	87.6	5/8	7/8
141	1.43	210	84.4	93.7	5/8	7/8
130	1.32	193	77.9	101.5	11/16	15/16
118	1.21	176	71.4	110.7	11/16	1
W30 x 391	3.59	W760 x 582	211.8	37.3	3/8	7/16
357	3.31	531	195.3	40.5	3/8	1/2
326	3.05	484	180.0	43.9	3/8	1/2
292	2.73	434	161.1	49.1	3/8	9/16
261	2.46	389	145.1	54.5	7/16	5/8
235	2.24	350	132.2	59.8	7/16	5/8
211	2.01	314	118.6	66.7	1/2	11/16
191	1.85	284	109.2	72.4	9/16	3/4
173	1.66	257	97.9	80.7	9/16	13/16
148	1.64	220	96.8	81.7	9/16	13/16
132	1.47	196	86.7	91.1	5/8	7/8
124	1.39	185	82.0	96.4	5/8	15/16
116	1.3	173	76.7	103.1	11/16	15/16
108	1.21	161	71.4	110.7	11/16	1
99	1.12	147	66.1	119.6	3/4	1-1/16
90	1.02	134	60.2	131.4	13/16	1-1/8
W27 x 539	5.08	W690 x 802	299.7	26.4	3/8	3/8
368	3.64	548	214.8	36.8	3/8	7/16

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM						
Desig.	W/D	Metric Desig.	M/D	Hp/A	2-1/2 Hour	3-1/2 Hour
W27 x 336	3.36	W690 x 500	198.2	39.9	3/8	1/2
307	3.11	457	183.5	43.1	3/8	1/2
281	2.86	418	168.7	46.8	3/8	9/16
258	2.64	384	155.8	50.8	7/16	9/16
235	2.43	350	143.4	55.1	7/16	5/8
217	2.26	323	133.3	59.3	7/16	5/8
194	2.03	289	119.8	66.0	1/2	11/16
178	1.87	265	110.3	71.6	1/2	3/4
161	1.7	240	100.3	78.8	9/16	13/16
146	1.55	217	91.5	86.4	5/8	7/8
129	1.56	192	92.0	85.9	5/8	7/8
114	1.39	170	82.0	96.4	5/8	15/16
102	1.24	152	73.2	108.1	11/16	1
94	1.15	140	67.9	116.5	3/4	1-1/16
84	1.03	125	60.8	130.1	13/16	1-1/8
W24 x 370	3.98	W610 x 551	234.8	33.7	3/8	7/16
335	3.66	498	215.9	36.6	3/8	7/16
306	3.37	455	198.8	39.8	3/8	1/2
279	3.11	415	183.5	43.1	3/8	1/2
250	2.81	372	165.8	47.7	3/8	9/16
229	2.6	341	153.4	51.5	7/16	9/16
207	2.36	307	139.2	56.8	7/16	5/8
192	2.2	285	129.8	60.9	1/2	11/16
176	2.03	262	119.8	66.0	1/2	11/16
162	1.88	241	110.9	71.3	1/2	3/4
146	1.7	217	100.3	78.8	9/16	13/16
131	1.54	195	90.9	87.0	5/8	7/8
117	1.38	174	81.4	97.1	5/8	15/16
104	1.24	155	73.2	108.1	11/16	1
103	1.4	153	82.6	95.7	5/8	15/16
94	1.28	140	75.5	104.7	11/16	15/16
84	1.15	125	67.9	116.5	3/4	1-1/16
76	1.05	113	62.0	127.6	3/4	1-1/8
68	0.94	101	55.5	142.5	13/16	1-3/16
62	0.93	92	54.9	144.1	13/16	1-3/16
55	0.82	82	48.4	163.4	7/8	1-1/4
W21 x 201	2.5	W530 x 300	147.5	53.6	7/16	5/8
182	2.28	272	134.5	58.8	7/16	5/8

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM Desig.	W/D	Metric Desig.	M/D	Hp/A	2-1/2 Hour	3-1/2 Hour
W21 x 166	2.09	W530 x 248	123.3	64.1	1/2	11/16
147	1.87	219	110.3	71.6	1/2	3/4
132	1.68	196	99.1	79.8	9/16	13/16
122	1.57	182	92.6	85.3	5/8	13/16
111	1.43	165	84.4	93.7	5/8	7/8
101	1.3	150	76.7	103.1	11/16	15/16
93	1.4	138	82.6	95.7	5/8	15/16
83	1.26	123	74.3	106.3	11/16	1
73	1.11	109	65.5	120.7	3/4	1-1/16
68	1.04	101	61.4	128.8	13/16	1-1/8
62	0.95	92	56.1	141.0	13/16	1-3/16
57	0.95	85	56.1	141.0	13/16	1-3/16
55	0.85	82	50.2	157.6	7/8	1-1/4
50	0.83	74	49.0	161.4	7/8	1-1/4
48	0.75	72	44.3	178.6	15/16	1-5/16
44	0.74	66	43.7	181.1	15/16	1-3/8
W18 x 175	2.46	W460 x 260	145.1	54.5	7/16	5/8
158	2.24	235	132.2	59.8	7/16	5/8
143	2.05	213	121.0	65.4	1/2	11/16
130	1.88	193	110.9	71.3	1/2	3/4
119	1.72	177	101.5	77.9	9/16	13/16
106	1.55	158	91.5	86.4	5/8	7/8
97	1.42	144	83.8	94.4	5/8	7/8
86	1.27	128	74.9	105.5	11/16	1
76	1.13	113	66.7	118.6	3/4	1-1/16
71	1.22	106	72.0	109.8	11/16	1
65	1.13	97	66.7	118.6	3/4	1-1/16
60	1.04	89	61.4	128.8	13/16	1-1/8
55	0.96	82	56.6	139.6	13/16	1-3/16
50	0.88	74	51.9	152.3	7/8	1-1/4
46	0.87	68	51.3	154.0	7/8	1-1/4
40	0.76	60	44.8	176.3	15/16	1-5/16
35	0.67	52	39.5	200.0	1	1-7/16
W16 x 100	1.59	W410 x 149	93.8	84.3	5/8	13/16
89	1.43	132	84.4	93.7	5/8	7/8
77	1.25	114	73.8	107.2	11/16	1
67	1.09	100	64.3	122.9	3/4	1-1/16
57	1.09	85	64.3	122.9	3/4	1-1/16
50	0.96	74	56.6	139.6	13/16	1-3/16
45	0.87	67	51.3	154.0	7/8	1-1/4

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM Desig.	W/D	Metric Desig.	M/D	Hp/A	2-1/2 Hour	3-1/2 Hour
W16 x 40	0.78	W410 x 60	46.0	171.8	15/16	1-5/16
36	0.7	53	41.3	191.4	1	1-3/8
31	0.66	46	38.9	203.0	1	1-7/16
26	0.55	39	32.5	243.6	1-1/8	1-9/16
W14 x 808	8.75	W360 x 1202	516.3	15.3	3/8	3/8
730	8.08	1086	476.7	16.6	3/8	3/8
665	7.49	990	441.9	17.9	3/8	3/8
605	6.96	900	410.6	19.3	3/8	3/8
550	6.43	818	379.4	20.8	3/8	3/8
500	5.95	744	351.1	22.5	3/8	3/8
455	5.53	677	326.3	24.2	3/8	3/8
426	5.21	634	307.4	25.7	3/8	3/8
398	4.93	592	290.9	27.2	3/8	3/8
370	4.63	551	273.2	28.9	3/8	3/8
342	4.32	509	254.9	31.0	3/8	3/8
311	3.98	463	234.8	33.7	3/8	7/16
283	3.66	421	215.9	36.6	3/8	7/16
257	3.36	382	198.2	39.9	3/8	1/2
233	3.08	347	181.7	43.5	3/8	1/2
211	2.81	314	165.8	47.7	3/8	9/16
193	2.6	287	153.4	51.5	7/16	9/16
176	2.38	262	140.4	56.3	7/16	5/8
159	2.16	237	127.4	62.0	1/2	11/16
145	1.99	216	117.4	67.3	1/2	11/16
132	1.89	196	111.5	70.9	1/2	3/4
120	1.71	179	100.9	78.4	9/16	13/16
109	1.57	162	92.6	85.3	5/8	13/16
99	1.43	147	84.4	93.7	5/8	7/8
90	1.31	134	77.3	102.3	11/16	15/16
82	1.45	122	85.6	92.4	5/8	7/8
74	1.32	110	77.9	101.5	11/16	15/16
68	1.22	101	72.0	109.8	11/16	1
61	1.1	91	64.9	121.8	3/4	1-1/16
53	1.06	79	62.5	126.4	3/4	1-1/16
48	0.97	72	57.2	138.1	13/16	1-1/8
43	0.87	64	51.3	154.0	7/8	1-1/4
38	0.8	57	47.2	167.5	15/16	1-5/16
34	0.72	51	42.5	186.1	15/16	1-3/8
30	0.64	45	37.8	209.3	1	1-7/16
26	0.62	39	36.6	216.1	1-1/16	1-1/2
22	0.53	33	31.3	252.8	1-1/8	1-9/16

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM						
Desig.	W/D	Metric Desig.	M/D	Hp/A	2-1/2 Hour	3-1/2 Hour
W12 x 336	4.85	W310 x 500	286.2	27.6	3/8	3/8
305	4.49	454	264.9	29.8	3/8	3/8
279	4.19	415	247.2	32.0	3/8	3/8
252	3.84	375	226.6	34.9	3/8	7/16
230	3.55	342	209.5	37.7	3/8	7/16
210	3.27	313	192.9	41.0	3/8	1/2
190	3	283	177.0	44.7	3/8	1/2
170	2.72	253	160.5	49.3	3/8	9/16
152	2.45	225	144.6	54.7	7/16	5/8
136	2.23	202	131.6	60.1	7/16	5/8
120	1.99	179	117.4	67.3	1/2	11/16
106	1.77	158	104.4	75.7	9/16	3/4
96	1.61	143	95.0	83.2	9/16	13/16
87	1.47	129	86.7	91.1	5/8	7/8
79	1.34	117	79.1	100.0	11/16	15/16
72	1.23	107	72.6	108.9	11/16	1
65	1.11	97	65.5	120.7	3/4	1-1/16
58	1.1	86	64.9	121.8	3/4	1-1/16
53	1.02	79	60.2	131.4	13/16	1-1/8
50	1.06	74	62.5	126.4	3/4	1-1/16
45	0.97	67	57.2	138.1	13/16	1-1/8
40	0.86	60	50.7	155.8	7/8	1-1/4
35	0.81	52	47.8	165.4	7/8	1-1/4
30	0.69	45	40.7	194.2	1	1-3/8
26	0.61	39	36.0	219.6	1-1/16	1-1/2
22	0.62	33	36.6	216.1	1-1/16	1-1/2
19	0.54	28	31.9	248.1	1-1/8	1-9/16
16	0.45	24	26.6	297.7	1-3/16	1-11/16
14	0.4	21	23.6	335.0	1-1/4	1-13/16
W10 x 112	2.17	W250 x 167	128.0	61.7	1/2	11/16
100	1.97	149	116.2	68.0	1/2	11/16
88	1.74	131	102.7	77.0	9/16	13/16
77	1.54	115	90.9	87.0	5/8	7/8
68	1.38	101	81.4	97.1	5/8	15/16
60	1.22	89	72.0	109.8	11/16	1
54	1.11	80	65.5	120.7	3/4	1-1/16
49	1.01	73	59.6	132.7	13/16	1-1/8
45	1.06	67	62.5	126.4	3/4	1-1/16
39	0.92	58	54.3	145.6	13/16	1-3/16
33	0.78	49	46.0	171.8	15/16	1-5/16
30	0.8	45	47.2	167.5	15/16	1-5/16

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.

N823

Restrained Beam

Cellular or Corrugated Deck

Normal Weight Concrete

CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM						
Desig.	W/D	Metric Desig.	M/D	Hp/A	2-1/2 Hour	3-1/2 Hour
W10 x 26	0.7	W10 x 39	41.3	191.4	1	1-3/8
22	0.6	33	35.4	223.3	1-1/16	1-1/2
19	0.6	28	35.4	223.3	1-1/16	1-1/2
17	0.54	25	31.9	248.1	1-1/8	1-9/16
15	0.48	22	28.3	279.1	1-3/16	1-11/16
12	0.39	18	23.0	343.5	1-1/4	1-13/16
W8 x 67	1.65	W200 x 100	97.4	81.2	9/16	13/16
58	1.44	86	85.0	93.0	5/8	7/8
48	1.21	71	71.4	110.7	11/16	1
40	1.03	59	60.8	130.1	13/16	1-1/8
35	0.9	52	53.1	148.9	7/8	1-3/16
31	0.8	46	47.2	167.5	15/16	1-5/16
28	0.81	42	47.8	165.4	7/8	1-1/4
24	0.7	36	41.3	191.4	1	1-3/8
21	0.67	31	39.5	200.0	1	1-7/16
18	0.58	27	34.2	231.0	1-1/16	1-1/2
15	0.55	22	32.5	243.6	1-1/8	1-9/16
13	0.48	19	28.3	279.1	1-3/16	1-11/16
10	0.37	15	21.8	362.1	1-5/16	1-7/8
W6 x 25	0.83	W150 x 37	49.0	161.4	7/8	1-1/4
20	0.67	30	39.5	200.0	1	1-7/16
16	0.68	24	40.1	197.0	1	1-7/16
15	0.52	22	30.7	257.7	1-1/8	1-5/8
12	0.52	18	30.7	257.7	1-1/8	1-5/8
9	0.39	14	23.0	343.5	1-1/4	1-13/16
8.5	0.37	13	21.8	362.1	1-5/16	1-7/8
W5 x 19	0.77	W130 x 28	45.4	174.0	15/16	1-5/16
16	0.66	24	38.9	203.0	1	1-7/16
W4 x 13	0.67	W100 x 19	39.5	200.0	1	1-7/16

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to Design N815.