

SECTION III—FLOOR/CEILING ASSEMBLIES

FIGURE 3.1—FLOOR/CEILING ASSEMBLIES—REINFORCED CONCRETE

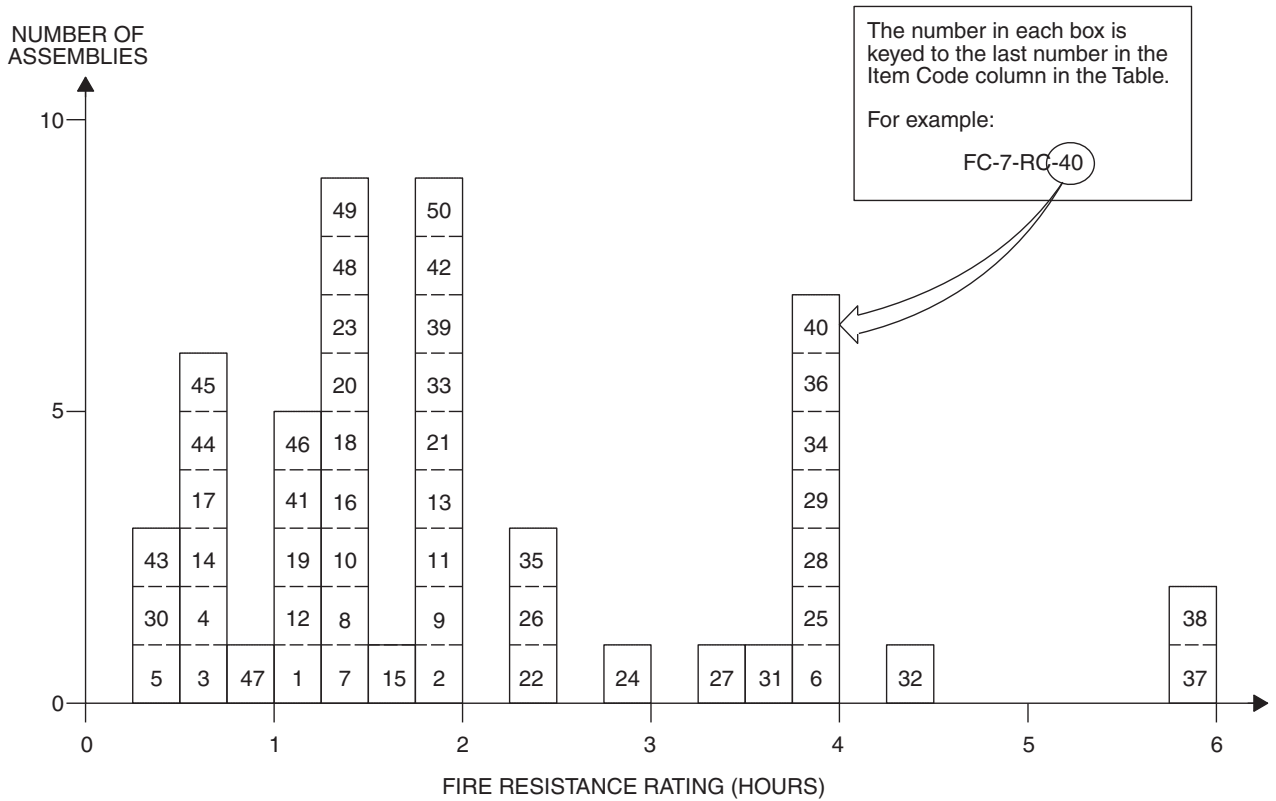


TABLE 3.1—FLOOR/CEILING ASSEMBLIES—REINFORCED CONCRETE

ITEM CODE	ASSEMBLY THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-3-RC-1	3 ³ / ₄ "	3 ³ / ₄ " thick floor; 3 ¹ / ₄ " (5475 psi) concrete deck; 1/2" plaster under deck; 3/8" main reinforcement bars at 5 ¹ / ₂ " pitch with 7/8" concrete cover; 3/8" main reinforcement bars at 4 ¹ / ₂ " pitch perpendicular with 1/2" concrete cover; 13'1" span restrained.	195 psf	24 min.			7	1, 2	1/3
F/C-3-RC-2	3 ¹ / ₄ "	3 ¹ / ₄ " deep (3540 psi) concrete deck; 3/8" main reinforcement bars at 5 ¹ / ₂ " pitch with 7/8" cover; 3/8" main reinforcement bars at 4 ¹ / ₂ " pitch perpendicular with 1/2" cover; 13'1" span restrained.	195 psf	2 hrs.			7	1, 3, 4	2
F/C-3-RC-3	3 ¹ / ₄ "	3 ¹ / ₄ " deep (4175 psi) concrete deck; 3/8" main reinforcement bars at 5 ¹ / ₂ " pitch with 7/8" cover; 3/8" main reinforcement bars at 4 ¹ / ₂ " pitch perpendicular with 1/2" cover; 13'1" span restrained.	195 psf	31 min.			7	1, 5	1/2

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TABLE 3.1—FLOOR/CEILING ASSEMBLIES—REINFORCED CONCRETE—continued

ITEM CODE	ASSEMBLY THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-3-RC-4	3 1/4"	3 1/4" deep (4355 psi) concrete deck; 3/8" main reinforcement bars at 5 1/2" pitch with 7/8" cover; 3/8" main reinforcement bars at 4 1/2" pitch perpendicular with 1/2" cover; 13'1" span restrained.	195 psf	41 min.			7	1, 5, 6	1/2
F/C-3-RC-5	3 1/4"	3 1/4" thick (3800 psi) concrete deck; 3/8" main reinforcement bars at 5 1/2" pitch with 7/8" cover; 3/8" main reinforcement bars at 4 1/2" pitch perpendicular with 1/2" cover; 13'1" span restrained.	195 psf	1 hr. 5 min.			7	1, 5	1
F/C-4-RC-6	4 1/4"	4 1/4" thick; 3 1/4" (4000 psi) concrete deck; 1" sprayed asbestos lower surface; 3/8" main reinforcement bars at 5 7/8" pitch with 7/8" concrete cover; 3/8" main reinforcement bars at 4 1/2" pitch perpendicular with 1/2" concrete cover; 13'1" span restrained.	195 psf	4 hrs.			7	1, 7	4
F/C-4-RC-7	4"	4" (5025 psi) concrete deck; 1/4" reinforcement bars at 7 1/2" pitch with 3/4" cover; 3/8" main reinforcement bars at 3 3/4" pitch perpendicular with 1/2" cover; 13'1" span restrained.	140 psf	1 hr. 16 min.			7	1, 2	1 1/4
F/C-4-RC-8	4"	4" thick (4905 psi) deck; 1/4" reinforcement bars at 7 1/2" pitch with 7/8" cover; 3/8" main reinforcement bars at 3 3/4" pitch perpendicular with 1/2" cover; 13'1" span restrained.	100 psf	1 hr. 23 min.			7	1, 2	1 1/3
F/C-4-RC-9	4"	4" deep (4370 psi); 1/4" reinforcement bars at 6" pitch with 3/4" cover; 1/4" main reinforcement bars at 4" pitch perpendicular with 1/2" cover; 13'1" span restrained.	150 psf	2 hrs.			7	1, 3	2
F/C-4-RC-10	4"	4" thick (5140 psi) deck; 1/4" reinforcement bars at 7 1/2" pitch with 7/8" cover; 3/8" main reinforcement bars at 3 3/4" pitch perpendicular with 1/2" cover; 13'1" span restrained.	140 psf	1 hr. 16 min.			7	1, 5	1 1/4
F/C-4-RC-11	4"	4" thick (4000 psi) concrete deck; 3" x 1 1/2" x 4 lbs. R.S.J.; 2' 6" C.R.S.; flush with top surface; 4" x 6" x 13 SWG mesh reinforcement 1" from bottom of slab; 6'6" span restrained.	150 psf	2 hrs.			7	1, 3	2
F/C-4-RC-12	4"	4" deep (2380 psi) concrete deck; 3" x 1 1/2" x 4 lbs. R.S.J.; 2' 6" C.R.S.; flush with top surface; 4" x 6" x 13 SWG mesh reinforcement 1" from bottom surface; 6'6" span restrained.	150 psf	1 hr. 3 min.			7	1, 2	1

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TABLE 3.1—FLOOR/CEILING ASSEMBLIES—REINFORCED CONCRETE—continued

ITEM CODE	ASSEMBLY THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-4-RC-13	4 1/2"	4 1/2" thick (5200 psi) deck; 1/4" reinforcement bars at 7 1/4" pitch with 7/8" cover; 3/8" main reinforcement bars at 3 3/4" pitch perpendicular with 1/2" cover; 13' 1" span restrained.	140 psf	2 hrs.			7	1, 3	2
F/C-4-RC-14	4 1/2"	4 1/2" deep (2525 psi) concrete deck; 1/4" reinforcement bars at 7 1/2" pitch with 7/8" cover; 3/8" main reinforcement bars at 3 3/8" pitch perpendicular with 1/2" cover; 13' 1" span restrained.	150 psf	42 min.			7	1, 5	2/3
F/C-4-RC-15	4 1/2"	4 1/2" deep (4830 psi) concrete deck; 1 1/2" x No. 15 gauge wire mesh; 3/8" reinforcement bars at 15" pitch with 1" cover; 1/2" main reinforcement bars at 6" pitch perpendicular with 1/2" cover; 12' span simply supported.	75 psf	1 hr. 32 min.			7	1, 8	1 1/2
F/C-4-RC-16	4 1/2"	4 1/2" deep (4595 psi) concrete deck; 1/4" reinforcement bars at 7 1/2" pitch with 7/8" cover; 3/8" main reinforcement bars at 3 1/2" pitch perpendicular with 1/2" cover; 12' span simply supported.	75 psf	1 hr. 20 min.			7	1, 8	1 1/3
F/C-4-RC-17	4 1/2"	4 1/2" deep (3625 psi) concrete deck; 1/4" reinforcement bars at 7 1/2" pitch with 7/8" cover; 3/8" main reinforcement bars at 3 1/2" pitch perpendicular with 1/2" cover; 12' span simply supported.	75 psf	35 min.			7	1, 8	1/2
F/C-4-RC-18	4 1/2"	4 1/2" deep (4410 psi) concrete deck; 1/4" reinforcement bars at 7 1/2" pitch with 7/8" cover; 3/8" main reinforcement bars at 3 1/2" pitch perpendicular with 1/2" cover; 12' span simply supported.	85 psf	1 hr. 27 min.			7	1, 8	1 1/3
F/C-4-RC-19	4 1/2"	4 1/2" deep (4850 psi) deck; 3/8" reinforcement bars at 15" pitch with 1" cover; 1/2" main reinforcement bars at 6" pitch perpendicular with 1/2" cover; 12' span simply supported.	75 psf	2 hrs. 15 min.			7	1, 9	1 1/4
F/C-4-RC-20	4 1/2"	4 1/2" deep (3610 psi) deck; 1/4" reinforcement bars at 7 1/2" pitch with 7/8" cover; 3/8" main reinforcement bars at 3 1/2" pitch perpendicular with 1/2" cover; 12' span simply supported.	75 psf	1 hr. 22 min.			7	1, 8	1 1/3
F/C-5-RC-21	5"	5" deep; 4 1/2" (5830 psi) concrete deck; 1/2" plaster finish bottom of slab; 1/4" reinforcement bars at 7 1/2" pitch with 7/8" cover; 3/8" main reinforcement bars at 3 1/2" pitch perpendicular with 1/2" cover; 12' span simply supported.	69 psf	2 hrs.			7	1, 3	2

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TABLE 3.1—FLOOR/CEILING ASSEMBLIES—REINFORCED CONCRETE—continued

ITEM CODE	ASSEMBLY THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-5-RC-22	5"	4½" (5290 psi) concrete deck; ½" plaster finish bottom of slab; ¼" reinforcement bars at 7½" pitch with ⅞" cover; ⅜" main reinforcement bars at 3½" pitch perpendicular with ½" cover; 12' span simply supported.	No load	2 hrs. 28 min.			7	1, 10, 11	2¼
F/C-5-RC-23	5"	5" (3020 psi) concrete deck; 3" × 1½" × 4 lbs. R.S.J.; 2' C.R.S. with 1" cover on bottom and top flanges; 8' span restrained.	172 psf	1 hr. 24 min.			7	1, 2, 12	1½
F/C-5-RC-24	5½"	5" (5180 psi) concrete deck; ½" retarded plaster underneath slab; ¼" reinforcement bars at 7½" pitch with 1⅜" cover; ⅜" main reinforcement bars at 3½" pitch perpendicular with 1" cover; 12' span simply supported.	60 psf	2 hrs. 48 min.			7	1, 10	2¾
F/C-6-RC-25	6"	6" deep (4800 psi) concrete deck; ¼" reinforcement bars at 7½" pitch with ⅞" cover; ⅜" main reinforcement bars at 3½" pitch perpendicular with ⅞" cover; 13'1" span restrained.	195 psf	4 hrs.			7	1, 7	4
F/C-6-RC-26	6"	6" (4650 psi) concrete deck; ¼" reinforcement bars at 7½" pitch with ⅞" cover; ⅜" main reinforcement bars at 3½" pitch perpendicular with ½" cover; 13'1" span restrained.	195 psf	2 hrs. 23 min.			7	1, 2	2¼
F/C-6-RC-27	6"	6" deep (6050 psi) concrete deck; ¼" reinforcement bars at 7½" pitch ⅞" cover; ⅜" reinforcement bars at 3½" pitch perpendicular with ½" cover; 13'1" span restrained.	195 psf	3 hrs. 30 min.			7	1, 10	3½
F/C-6-RC-28	6"	6" deep (5180 psi) concrete deck; ¼" reinforcement bars at 8" pitch ¾" cover; ¼" reinforcement bars at 5½" pitch perpendicular with ½" cover; 13'1" span restrained.	150 psf	4 hrs.			7	1, 7	4
F/C-6-RC-29	6"	6" thick (4180 psi) concrete deck; 4" × 3" × 10 lbs. R.S.J.; 2'6" C.R.S. with 1" cover on both top and bottom flanges; 13'1" span restrained.	160 psf	3 hrs. 48 min.			7	1, 10	3¾
F/C-6-RC-30	6"	6" thick (3720 psi) concrete deck; 4" × 3" × 10 lbs. R.S.J.; 2'6" C.R.S. with 1" cover on both top and bottom flanges; 12' span simply supported.	115 psf	29 min.			7	1, 5, 13	¼
F/C-6-RC-31	6"	6" deep (3450 psi) concrete deck; 4" × 1¾" × 5 lbs. R.S.J.; 2'6" C.R.S. with 1" cover on both top and bottom flanges; 12' span simply supported.	25 psf	3 hrs. 35 min.			7	1, 2	3½

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TABLE 3.1—FLOOR/CEILING ASSEMBLIES—REINFORCED CONCRETE—continued

ITEM CODE	ASSEMBLY THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-6-RC-32	6"	6" deep (4460 psi) concrete deck; 4" × 1 ³ / ₄ " × 5 lbs. R.S.J.; 2' C.R.S.; with 1" cover on both top and bottom flanges; 12' span simply supported.	60 psf	4 hrs. 30 min.			7	1, 10	4 ¹ / ₂
F/C-6-RC-33	6"	6" deep (4360 psi) concrete deck; 4" × 1 ³ / ₄ " × 5 lbs. R.S.J.; 2' C.R.S.; with 1" cover on both top and bottom flanges; 13'1" span restrained.	60 psf	2 hrs.			7	1, 3	2
F/C-6-RC-34	6 ¹ / ₄ "	6 ¹ / ₄ " thick; 4 ³ / ₄ " (5120 psi) concrete core; 1" T&G board flooring; 1/2" plaster undercoat; 4" × 3" × 10 lbs. R.S.J.; 3' C.R.S. flush with top surface concrete; 12' span simply supported; 2" × 1'3" clinker concrete insert.	100 psf	4 hrs.			7	1, 7	4
F/C-6-RC-35	6 ¹ / ₄ "	4 ³ / ₄ " (3600 psi) concrete core; 1" T&G board flooring; 1/2" plaster undercoat; 4" × 3" × 10 lbs. R.S.J.; 3' C.R.S.; flush with top surface concrete; 12' span simply supported; 2" × 1'3" clinker concrete insert.	100 psf	2 hrs. 30 min.			7	1, 5	2 ¹ / ₂
F/C-6-RC-36	6 ¹ / ₄ "	4 ³ / ₄ " (2800 psi) concrete core; 1" T&G board flooring; 1/2" plaster undercoat; 4" × 3" × 10 lbs. R.S.J.; 3' C.R.S.; flush with top surface concrete; 12" span simply supported; 2" × 1'3" clinker concrete insert.	80 psf	4 hrs.			7	1, 7	4
F/C-7-RC-37	7"	(3640 psi) concrete deck; 1/4" reinforcement bars at 6" pitch with 1 ¹ / ₂ " cover; 1/4" reinforcement bars at 5" pitch perpendicular with 1 ¹ / ₂ " cover; 13'1" span restrained.	169 psf	6 hrs.			7	1, 14	6
F/C-7-RC-38	7"	(4060 psi) concrete deck; 4" × 3" × 10 lbs. R.S.J.; 2'6" C.R.S. with 1 ¹ / ₂ " cover on both top and bottom flanges; 4" × 6" × 13 SWG mesh reinforcement 1 ¹ / ₂ " from bottom of slab; 13'1" span restrained.	175 psf	6 hrs.			7	1, 14	6
F/C-7-RC-39	7 ¹ / ₄ "	5 ³ / ₄ " (4010 psi) concrete core; 1" T&G board flooring; 1/2" plaster undercoat; 4" × 3" × 10 lbs. R.S.J.; 2'6" C.R.S.; 1" down from top surface of concrete; 12' simply supported span; 2" × 1'3" clinker concrete insert.	95 psf	2 hrs.			7	1, 3	2
F/C-7-RC-40	7 ¹ / ₄ "	5 ³ / ₄ " (3220 psi) concrete core; 1" T&G flooring; 1/2" plaster undercoat; 4" × 3" × 10 lbs. R.S.J.; 2'6" C.R.S.; 1" down from top surface of concrete; 12' simply supported span; 2" × 1'3" clinker concrete insert.	95 psf	4 hrs.			7	1, 7	4

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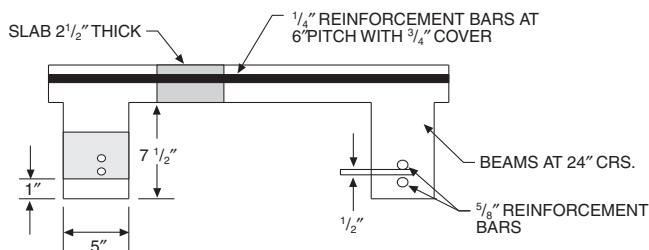
TABLE 3.1—FLOOR/CEILING ASSEMBLIES—REINFORCED CONCRETE—continued

ITEM CODE	ASSEMBLY THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-7-RC-41	10" (2 1/4" Slab)	Ribbed floor, see Note 15 for details; slab 2 1/2" deep (3020 psi); 1/4" reinforcement bars at 6" pitch with 3/4" cover; beams 7 1/2" deep x 5" wide; 24" C.R.S.; 5/8" reinforcement bars two rows 1/2" vertically apart with 1" cover; 13'1" span restricted.	195 psf	1 hr. 4 min.			7	1, 2, 15	1
F/C-5-RC-42	5 1/2"	Composite ribbed concrete slab assembly; see Note 17 for details.	See Note 16	2 hrs.			43	16, 17	2
F/C-3-RC-43	3"	2500 psi concrete; 5/8" cover; fully restrained at test.	See Note 16	30 min.			43	16	1/2
F/C-3-RC-44	3"	2000 psi concrete; 5/8" cover; free or partial restraint at test.	See Note 16	45 min.			43	16	3/4
F/C-4-RC-45	4"	2500 psi concrete; 5/8" cover; fully restrained at test.	See Note 16	40 min.			43	16	2/3
F/C-4-RC-46	4"	2000 psi concrete; 3/4" cover; free or partial restraint at test.	See Note 16	1 hr. 15 min.			43	16	1 1/4
F/C-5-RC-47	5"	2500 psi concrete; 3/4" cover; fully restrained at test.	See Note 16	1 hr.			43	16	1
F/C-5-RC-48	5"	2000 psi concrete; 3/4" cover; free or partial restraint at test.	See Note 16	1 hr. 30 min.			43	16	1 1/2
F/C-6-RC-49	6"	2500 psi concrete; 1" cover; fully restrained at test.	See Note 16	1 hr. 30 min.			43	16	1 1/2
F/C-6-RC-50	6"	2000 psi concrete; 1" cover; free or partial restraint at test.	See Note 16	2 hrs.			43	16	2

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound per square inch = 0.00689 MPa, 1 pound per square foot = 47.9 N/m².

Notes:

1. British test.
2. Failure mode - local back face temperature rise.
3. Tested for Grade "C" (2 hour) fire resistance.
4. Collapse imminent following hose stream.
5. Failure mode - flame thru.
6. Void formed with explosive force and report.
7. Achieved Grade "B" (4 hour) fire resistance (British).
8. Failure mode - collapse.
9. Test was run to 2 hours, but specimen was partially supported by the furnace at 1 1/4 hours.
10. Failure mode - average back face temperature.
11. Recommended endurance for nonload bearing performance only.
12. Floor maintained load bearing ability to 2 hours at which point test was terminated.
13. Test was run to 3 hours at which time failure mode 2 (above) was reached in spite of crack formation at 29 minutes.
14. Tested for Grade "A" (6 hour) fire resistance.
- 15.



16. Load unspecified.

17. Total assembly thickness 5 1/2 inches. Three-inch thick blocks of molded excelsior bonded with portland cement used as inserts with 2 1/2-inch cover (concrete) above blocks and 3/4-inch gypsum plaster below. Nine-inch wide ribs containing reinforcing steel of unspecified size interrupted 20-inch wide segments of slab composite (i.e., plaster, excelsior blocks, concrete cover).

FIGURE 3.2—FLOOR/CEILING ASSEMBLIES—STEEL STRUCTURAL ELEMENTS

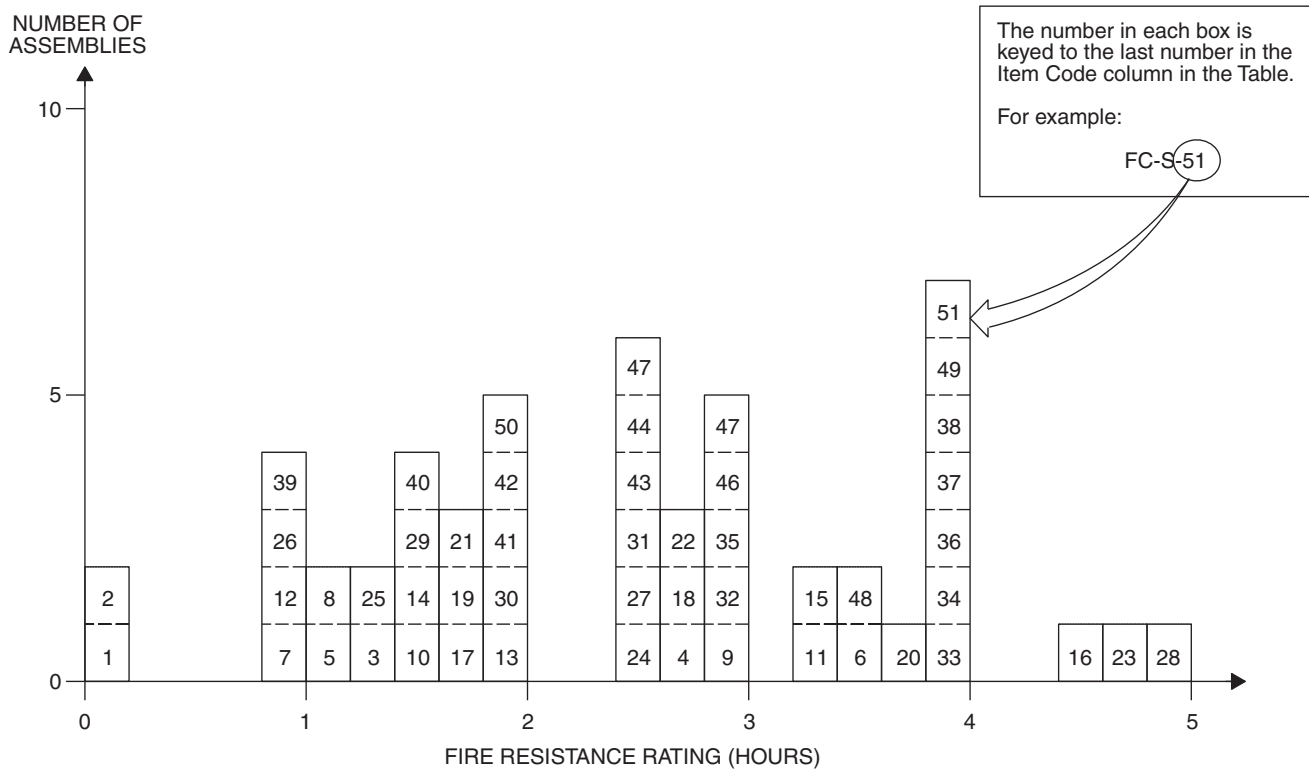


TABLE 3.2—FLOOR/CEILING ASSEMBLIES—STEEL STRUCTURAL ELEMENTS

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-S-1	0"	- 10' × 13'6"; S.J. 103 - 24" o.c.; Deck: 2" concrete; Membrane: none.	145 psf	7 min.			3	1, 2, 3, 8	0
F/C-S-2	0"	- 10' × 13'6"; S.J. 103 - 24" o.c.; Deck: 2" concrete; Membrane: none	145 psf	7 min.			3	1, 2, 3, 8	0
F/C-S-3	1/2"	- 10' × 13'6"; S.J. 103 - 24" o.c.; Deck: 2" concrete 1:2:4; Membrane: furring 12" o.c.; Clips A, B, G; No extra reinforcement; 1/2" plaster - 1.5:2.5.	145 psf	1 hr. 15 min.			3	2, 3, 8	1 1/4
F/C-S-4	1/2"	- 10' × 13'6"; S.J. 103 - 24" o.c.; Deck: 2" concrete 1:2:4; Membrane: furring 16" o.c.; Clips D, E, F, G; Diagonal wire reinforcement; 1/2" plaster - 1.5:2.5.	145 psf	2 hrs. 46 min.			3	3, 8	2 3/4
F/C-S-5	1/2"	- 10' × 13'6"; S.J. 103 - 24" o.c.; Deck: 2" concrete 1:2:4; Membrane: furring 16" o.c.; Clips A, B, G; No extra reinforcement; 1/2" plaster - 1.5:2.5.	145 psf	1 hr. 4 min.			3	2, 3, 8	1

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TABLE 3.2—FLOOR/CEILING ASSEMBLIES—STEEL STRUCTURAL ELEMENTS—continued

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-S-6	1/2"	10' × 13'6"; S.J. 103 - 24" o.c.; Deck: 2" concrete 1:2:4; Membrane: furring 16" o.c.; Clips D, E, F, G; Hexagonal mesh reinforcement; 1/2" plaster.	145 psf	3 hrs. 28 min.			3	2, 3, 8	2 1/3
F/C-S-7	1/2"	10' × 13'6"; S.J. 103 - 24" o.c.; Deck: 4 lbs. rib lath; 6" × 6" - 10 × 10 ga. reinforcement; 2" deck gravel concrete; Membrane: furring 16" o.c.; Clips C, E; Reinforcement: none; 1/2" plaster - 1.5:2.5 mill mix.	N/A	55 min.			3	5, 8	3/4
F/C-S-8	1/2"	Spec. 9' × 4'4"; S.J. 103 bar joists - 18" o.c.; Deck: 4 lbs. rib lath base; 6" × 6" - 10 × 10 ga. reinforcement; 2" deck 1:2:4 gravel concrete; Membrane: furring, 3/4" C.R.S., 16" o.c.; Clips C, E; Reinforcement: none; 1/2" plaster - 1.5:2.5 mill mix.	300 psf	1 hr. 10 min.			3	2, 3, 8	1
F/C-S-9	5/8"	10' × 13'6"; S.J. 103 - 24" o.c.; Deck: 2" concrete 1:2:4; Membrane: furring 12" o.c.; Clips A, B, G; Extra "A" clips reinforcement; 5/8" plaster - 1.5:2; 1.5:3.	145 psf	3 hrs.			3	6, 8	3
F/C-S-10	5/8"	18' × 13'6"; Joists, S.J. 103 - 24" o.c.; Deck: 4 lbs. rib lath; 6" × 6" - 10 × 10 ga. reinforcement; 2" deck 1:2:3.5 gravel concrete; Membrane: furring, spacing 16" o.c.; Clips C, E; Reinforcement: none; 5/8" plaster - 1.5:2.5 mill mix.	145 psf	1 hr. 25 min.			3	2, 3, 8	1 1/3
F/C-S-11	5/8"	10' × 13'6"; S.J. 103 - 24" o.c.; Deck: 2" concrete 1:2:4; Membrane: furring 12" o.c.; Clips D, E, F, G; Diagonal wire reinforcement; 5/8" plaster - 1.5:2; 0.5:3.	145 psf	3 hrs. 15 min.			3	2, 4, 8	3 1/4
F/C-S-12	5/8"	10' × 13'6"; Joists, S.J. 103 - 24" o.c.; Deck: 3.4 lbs. rib lath; 6" × 6" - 10 × 10 ga. reinforcement; 2" deck 1:2:4 gravel concrete; Membrane: furring 16" o.c.; Clips D, E, F, G; Reinforcement: none; 5/8" plaster - 1.5:2.5.	145 psf	1 hr.			3	7, 8	1
F/C-S-13	3/4"	Spec. 9' × 4'4"; S.J. 103 - 18" o.c.; Deck: 4 lbs. rib lath; 6" × 6" - 10 × 10 ga. reinforcement; 2" deck 1:2:4 gravel concrete; Membrane: furring, 3/4" C.R.S., 16" o.c.; Clips C, E; Reinforcement: none; 3/4" plaster - 1.5:2.5 mill mix.	300 psf	1 hr. 56 min.			3	3, 8	1 3/4

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TABLE 3.2—FLOOR/CEILING ASSEMBLIES—STEEL STRUCTURAL ELEMENTS—continued

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-S-14	7/8"	Floor finish: 1" concrete; plate cont. weld; 4" - 7.7 lbs. "I" beams; Ceiling: 1/4" rods 12" o.c.; 7/8" gypsum sand plaster.	105 psf	1 hr. 35 min.			6	2, 4, 9, 10	1 1/2
F/C-S-15	1"	Floor finish: 1 1/2" L.W. concrete; 1/2" limestone cement; plate cont. weld; 5" - 10 lbs. "I" beams; Ceiling: 1/4" rods 12" o.c. tack welded to beams metal lath; 1" P. C. plaster.	165 psf	3 hrs. 20 min.			6	4, 9, 11	3 1/3
F/C-S-16	1"	10' x 13'6"; S.J. 103 - 24" o.c.; Deck: 2" concrete 1:2:4; Membrane: furring 12" o.c.; Clips D, E, F, G; Hexagonal mesh reinforcement; 1" thick plaster - 1.5:2; 1.5:3.	145 psf	4 hrs. 26 min.			3	2, 4, 8	4 1/3
F/C-S-17	1"	10' x 13'6"; Joists - S.J. 103 - 24" o.c.; Deck: 3.4 lbs. rib lath; 6" x 6" - 10 x 10 ga. reinforcement; 2" deck 1:2:4 gravel concrete; Membrane: furring 16" o.c.; Clips D, E, F, G; 1" plaster.	145 psf	1 hr. 42 min.			3	2, 4, 8	1 2/3
F/C-S-18	1 1/8"	10' x 13'6"; S. J. 103 - 24" o.c.; Deck: 2" concrete 1:2:4; Membrane: furring 12" o.c.; Clips C, E, F, G; Diagonal wire reinforcement; 1 1/8" plaster.	145 psf	2 hrs. 44 min.			3	2, 4, 8	2 2/3
F/C-S-19	1 1/8"	10' x 13'6"; Joists - S.J. 103 - 24" o.c.; Deck: 1 1/2" gypsum concrete over; 1/2" gypsum board; Membrane: furring 12" o.c.; Clips D, E, F, G; 1 1/8" plaster - 1.5:2; 1.5:3.	145 psf	1 hr. 40 min.			3	2, 3, 8	1 2/3
F/C-S-20	1 1/8"	2 1/2" cinder concrete; 1/2" topping; plate 6" welds 12" o.c.; 5" - 18.9 lbs. "H" center; 5" - 10 lbs. "I" ends; 1" channels 18" o.c.; 1 1/8" gypsum sand plaster.	150 psf	3 hrs. 43 min.			6	2, 4, 9, 11	3 2/3
F/C-S-21	1 1/4"	10' x 13'6"; Joists - S.J. 103 - 24" o.c.; Deck: 1 1/2" gypsum concrete over; 1/2" gypsum board base; Membrane: furring 12" o.c.; Clips D, E, F, G; 1 1/4" plaster - 1.5:2; 1.5:3.	145 psf	1 hr. 48 min.			3	2, 3, 8	1 2/3
F/C-S-22	1 1/4"	Floor finish: 1 1/2" limestone concrete; 1/2" sand cement topping; plate to beams 3 1/2"; 12" o.c. welded; 5" - 10 lbs. "I" beams; 1" channels 18" o.c.; 1 1/4" wood fiber gypsum sand plaster on metal lath.	292 psf	2 hrs. 45 min.			6	2, 4, 9, 10	2 3/4
F/C-S-23	1 1/2"	2 1/2" L.W. (gas exp.) concrete; Deck: 1/2" topping; plate 6 1/4" welds 12" o.c.; Beams: 5" - 18.9 lbs. "H" center; 5" - 10 lbs. "I" ends; Membrane: 1" channels 18" o.c.; 1 1/2" gypsum sand plaster.	150 psf	4 hrs. 42 min.			6	2, 4, 9	4 2/3

(Continued)

TABLE 3.2—FLOOR/CEILING ASSEMBLIES—STEEL STRUCTURAL ELEMENTS—continued

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-S-24	1 1/2"	Floor finish: 1 1/2" limestone concrete; 1/2" cement topping; plate 3 1/2" - 12" o.c. welded; 5" - 10 lbs. "I" beams; Ceiling: 1" channels 18" o.c.; 1 1/2" gypsum plaster.	292 psf	2 hrs. 34 min.			6	2, 4, 9, 10	2 1/2
F/C-S-25	1 1/2"	Floor finish: 1 1/2" gravel concrete on exp. metal; plate cont. weld; 4" - 7.7 lbs. "I" beams; Ceiling: 1/4" rods 12" o.c. welded to beams; 1 1/2" fiber gypsum sand plaster.	70 psf	1 hr. 24 min.			6	2, 4, 9, 10	1 1/3
F/C-S-26	2 1/2"	Floor finish: bare plate; 6 1/4" welding - 12" o.c.; 5" - 18.9 lbs. "H" girders (inner); 5" - 10 lbs "I" girders (two outer); 1" channels 18" o.c.; 2" reinforced gypsum tile; 1/2" gypsum sand plaster.	122 psf	1 hr.			6	7, 9, 11	1
F/C-S-27	2 1/2"	Floor finish: 2" gravel concrete; plate to beams 3 1/2" - 12" o.c. welded; 4" - 7.7 lbs. "I" beams; 2" gypsum ceiling tiles; 1/2" 1:3 gypsum sand plaster.	105 psf	2 hrs. 31 min.			6	2, 4, 9, 10	2 1/2
F/C-S-28	2 1/2"	Floor finish: 1 1/2" gravel concrete; 1/2" gypsum asphalt; plate continuous weld; 4" - 7.7 lbs. "I" beams; 12" - 31.8 lbs. "I" beams - girder at 5' from one end; 1" channels 18" o.c.; 2" reinforcement gypsum tile; 1/2" 1:3 gypsum sand plaster.	200 psf	4 hrs. 55 min.			6	2, 4, 9, 11	4 2/3
F/C-S-29	3/4"	Floor: 2" reinforced concrete or 2" precast reinforced gypsum tile; Ceiling: 3/4" portland cement-sand plaster 1:2 for scratch coat and 1:3 for brown coat with 15 lbs. hydrated lime and 3 lbs. of short asbestos fiber bag per cement or 3/4" sanded gypsum plaster 1:2 for scratch coat and 1:3 for brown coat.	See Note 12	1 hr. 30 min.			1	12, 13, 14	1 1/2
F/C-S-30	3/4"	Floor: 2 1/4" reinforced concrete or 2" reinforced gypsum tile; the latter with 1/4" mortar finish; Ceiling: 3/4" sanded gypsum plaster; 1:2 for scratch coat and 1:3 for brown coat.	See Note 12	2 hrs.			1	12, 13, 14	2
F/C-S-31	3/4"	Floor: 2 1/2" reinforced concrete or 2" reinforced gypsum tile; the latter with 1/4" mortar finish; Ceiling: 1" neat gypsum plaster or 3/4" gypsum-vermiculite plaster, ratio of gypsum to fine vermiculite 2:1 to 3:1.	See Note 12	2 hrs. 30 min.			1	12, 13, 14	2 1/2

(Continued)

TABLE 3.2—FLOOR/CEILING ASSEMBLIES—STEEL STRUCTURAL ELEMENTS—continued

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-S-32	3/4"	Floor: 2 1/2" reinforced concrete or 2" reinforced gypsum tile; the latter with 1/2" mortar finish; Ceiling: 1" neat gypsum plaster or 3/4" gypsum-vermiculite plaster, ratio of gypsum to fine vermiculite 2:1 to 3:1.	See Note 12	3 hrs.		1		12, 13, 14	3
F/C-S-33	1"	Floor: 2 1/2" reinforced concrete or 2" reinforced gypsum slabs; the latter with 1/2" mortar finish; Ceiling: 1" gypsum-vermiculite plaster applied on metal lath and ratio 2:1 to 3:1 gypsum to vermiculite by weight.	See Note 12	4 hrs.		1		12, 13, 14	4
F/C-S-34	2 1/2"	Floor: 2" reinforced concrete or 2" precast reinforced portland cement concrete or gypsum slabs; precast slabs to be finished with 1/4" mortar top coat; Ceiling: 2" precast reinforced gypsum tile, anchored into beams with metal ties or clips and covered with 1/2" 1:3 sanded gypsum plaster.	See Note 12	4 hrs.		1		12, 13, 14	4
F/C-S-35	1"	Floor: 1:3:6 portland cement, sand and gravel concrete applied directly to the top of steel units and 1 1/2" thick at top of cells, plus 1/2" 1:2 1/2" cement-sand finish, total thickness at top of cells, 2"; Ceiling: 1" neat gypsum plaster, back of lath 2" or more from underside of cellular steel.	See Note 15	3 hrs.		1		15, 16, 17, 18	3
F/C-S-36	1"	Floor: same as F/C-S-35; Ceiling: 1" gypsum-vermiculite plaster (ratio of gypsum to vermiculite 2:1 to 3:1), the back of lath 2" or more from under-side of cellular steel.	See Note 15	4 hrs.		1		15, 16, 17, 18	4
F/C-S-37	1"	Floor: same as F/C-S-35; Ceiling: 1" neat gypsum plaster; back of lath 9" or more from underside of cellular steel.	See Note 15	4 hrs.		1		15, 16, 17, 18	4
F/C-S-38	1"	Floor: same as F/C-S-35; Ceiling: 1" gypsum-vermiculite plaster (ratio of gypsum to vermiculite 2:1 to 3:1), the back of lath being 9" or more from underside of cellular steel.	See Note 15	5 hrs.		1		15, 16, 17, 18	5
F/C-S-39	3/4"	Floor: asbestos paper 14 lbs./100 ft. ² cemented to steel deck with waterproof linoleum cement, wood screeds and 7/8" wood floor; Ceiling: 3/4" sanded gypsum plaster 1:2 for scratch coat and 1:3 for brown coat.	See Note 19	1 hr.		1		19, 20, 21, 22	1

(Continued)

TABLE 3.2—FLOOR/CEILING ASSEMBLIES—STEEL STRUCTURAL ELEMENTS—continued

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-S-40	3/4"	Floor: 1 1/2", 1:2:4 portland cement concrete; Ceiling: 3/4" sanded gypsum plaster 1:2 for scratch coat and 1:3 for brown coat.	See Note 19	1 hr. 30 min.		1		19, 20, 21, 22	1 1/2
F/C-S-41	3/4"	Floor: 2", 1:2:4 portland cement concrete; Ceiling: 3/4" sanded gypsum plaster, 1:2 for scratch coat and 1:3 for brown coat.	See Note 19	2 hrs.		1		19, 20, 21, 22	2
F/C-S-42	1"	Floor: 2", 1:2:4 portland cement concrete; Ceiling: 1" portland cement-sand plaster with 10 lbs. of hydrated lime for @ bag of cement 1:2 for scratch coat and 1:2 1/2" for brown coat.	See Note 19	2 hrs.		1		19, 20, 21, 22	2
F/C-S-43	1 1/2"	Floor: 2", 1:2:4 portland cement concrete; Ceiling: 1 1/2", 1:2 sanded gypsum plaster on ribbed metal lath.	See Note 19	2 hrs. 30 min.		1		19, 20, 21, 22	2 1/2
F/C-S-44	1 1/8"	Floor: 2", 1:2:4 portland cement concrete; Ceiling: 1 1/8", 1:1 sanded gypsum plaster.	See Note 19	2 hrs. 30 min.		1		19, 20, 21, 22	2 1/2
F/C-S-45	1"	Floor: 2 1/2", 1:2:4 portland cement concrete; Ceiling: 1", 1:2 sanded gypsum plaster.	See Note 19	2 hrs. 30 min.		1		19, 20, 21, 22	2 1/2
F/C-S-46	3/4"	Floor: 2 1/2", 1:2:4 portland cement concrete; Ceiling: 1" neat gypsum plaster or 3/4" gypsum-vermiculite plaster, ratio of gypsum to vermiculite 2:1 to 3:1.	See Note 19	3 hrs.		1		19, 20, 21, 22	3
F/C-S-47	1 1/8"	Floor: 2 1/2", 1:2:4 portland cement, sand and cinder concrete plus 1/2", 1:2 1/2" cement-sand finish; total thickness 3"; Ceiling: 1 1/8", 1:1 sanded gypsum plaster.	See Note 19	3 hrs.		1		19, 20, 21, 22	3
F/C-S-48	1 1/8"	Floor: 2 1/2", gas expanded portland cement-sand concrete plus 1/2", 1:2.5 cement-sand finish; total thickness 3"; Ceiling: 1 1/8", 1:1 sanded gypsum plaster.	See Note 19	3 hrs. 30 min.		1		19, 20, 21, 22	3 1/2
F/C-S-49	1"	Floor: 2 1/2", 1:2:4 portland cement concrete; Ceiling: 1" gypsum-vermiculite plaster; ratio of gypsum to vermiculite 2:1 to 3:1.	See Note 19	4 hrs.		1		19, 20, 21, 22	4
F/C-S-50	2 1/2"	Floor: 2", 1:2:4 portland cement concrete; Ceiling: 2" interlocking gypsum tile supported on upper face of lower flanges of beams, 1/2" 1:3 sanded gypsum plaster.	See Note 19	2 hrs.		1		19, 20, 21, 22	2

(Continued)

TABLE 3.2—FLOOR/CEILING ASSEMBLIES—STEEL STRUCTURAL ELEMENTS—continued

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-S-51	2 1/2"	Floor: 2", 1:2:4 portland cement concrete; Ceiling: 2" precast metal reinforced gypsum tile, 1/2" 1:3 sanded gypsum plaster (tile clipped to channels which are clipped to lower flanges of beams).	See Note 19	4 hrs.		1		19, 20, 21, 22	4

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound per square inch = 0.00689 MPa, 1 pound per square foot = 47.9 N/m².

Notes:

1. No protective membrane over structural steel.
2. Performance time indicates first endpoint reached only several tests were continued to points where other failures occurred.
3. Load failure.
4. Thermal failure.
5. This is an estimated time to load bearing failure. The same joist and deck specimen was used for a later test with different membrane protection.
6. Test stopped at 3 hours to reuse specimen; no endpoint reached.
7. Test stopped at 1 hour to reuse specimen; no endpoint reached.
8. All plaster used = gypsum.
9. Specimen size - 18 feet by 13 1/2 inches. Floor deck - base material - 1/4-inch by 18-foot steel plate welded to "I" beams.
10. "I" beams - 24 inches o.c.
11. "I" beams - 48 inches o.c.
12. Apply to open web joists, pressed steel joists or rolled steel beams, which are not stressed beyond 18,000 lbs./in.² in flexure for open-web pressed or light rolled joists, and 20,000 lbs./in.² for American standard or heavier rolled beams.
13. Ratio of weight of portland cement to fine and coarse aggregates combined for floor slabs shall not be less than 1:6 1/2.
14. Plaster for ceiling shall be applied on metal lath which shall be tied to supports to give the equivalent of single No. 18 gage steel wires 5 inches o.c.
15. Load: maximum fiber stress in steel not to exceed 16,000 psi.
16. Prefabricated units 2 feet wide with length equal to the span, composed of two pieces of No. 18 gage formed steel welded together to give four longitudinal cells.
17. Depth not less than 3 inches and distance between cells no less than 2 inches.
18. Ceiling: metal lath tied to furring channels secured to runner channels hung from cellular steel.
19. Load: rolled steel supporting beams and steel plate base shall not be stressed beyond 20,000 psi in flexure.
Formed steel (with wide upper flange) construction shall not be stressed beyond 16,000 psi.
20. Some type of expanded metal or woven wire shall be embedded to prevent cracking in concrete flooring.
21. Ceiling plaster shall be metal lath wired to rods or channels which are clipped or welded to steel construction. Lath shall be no smaller than 18 gage steel wire and not more than 7 inches o.c.
22. The securing rods or channels shall be at least as effective as single 3/16-inch rods with 1-inch of their length bent over the lower flanges of beams with the rods or channels tied to this clip with 14 gage iron wire.

FIGURE 3.3—FLOOR/CEILING ASSEMBLIES—WOOD JOIST

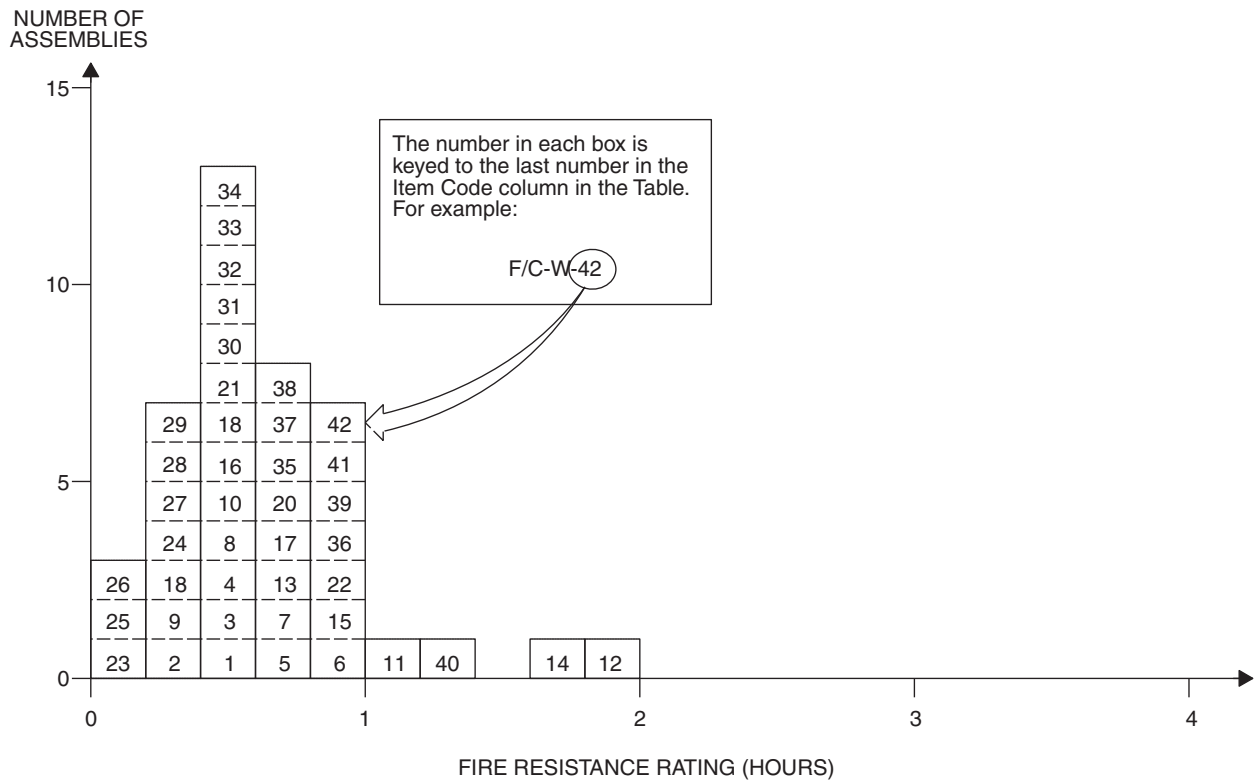


TABLE 3.3—FLOOR/CEILING ASSEMBLIES—WOOD JOIST

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-W-1	3/8"	12' clear span - 2" x 9" wood joists; 18" o.c.; Deck: 1" T&G; Filler: 3" of ashes on 1/2" boards nailed to joist sides 2" from bottom; 2" air space; Membrane: 3/8" gypsum board.	60 psf	36 min.			7	1, 2	1/2
F/C-W-2	1/2"	12' clear span - 2" x 7" joists; 15" o.c.; Deck: 1" nominal lumber; Membrane: 1/2" fiber board.	60 psf	22 min.			7	1, 2, 3	1/4
F/C-W-3	1/2"	12' clear span - 2" x 7" wood joists; 16" o.c.; 2" x 1 1/2" bridging at center; Deck: 1" T&G; Membrane: 1/2" fiber board; 2 coats "distemper" paint.	30 psf	28 min.			7	1, 3, 15	1/3
F/C-W-4	3/16"	12' clear span - 2" x 7" wood joists; 16" o.c.; 2" x 1 1/2" bridging at center span; Deck: 1" nominal lumber; Membrane: 1/2" fiber board under 3/16" gypsum plaster.	30 psf	32 min.			7	1, 2	1/2
F/C-W-5	5/8"	As per previous F/C-W-4 except membrane is 5/8" lime plaster.	70 psf	48 min.			7	1, 2	3/4
F/C-W-6	5/8"	As per previous F/C-W-5 except membrane is 3/8" gypsum plaster on 22 gage 3/8" metal lath.	70 psf	49 min.			7	1, 2	3/4

(Continued)

TABLE 3.3—FLOOR/CEILING ASSEMBLIES—WOOD JOIST—continued

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-W-7	1/2"	As per previous F/C-W-6 except membrane is 1/2" fiber board under 1/2" gypsum plaster.	60 psf	43 min.			7	1, 2, 3	2/3
F/C-W-8	1/2"	As per previous F/C-W-7 except membrane is 1/2" gypsum board.	60 psf	33 min.			7	1, 2, 3	1/2
F/C-W-9	9/16"	12' clear span - 2" x 7" wood joists; 15" o.c.; 2" x 1 1/2" bridging at center; Deck: 1" nominal lumber; Membrane: 3/8" gypsum board; 3/16" gypsum plaster.	60 psf	24 min.			7	1, 2, 3	1/3
F/C-W-10	5/8"	As per F/C-W-9 except membrane is 5/8" gypsum plaster on wood lath.	60 psf	27 min.			7	1, 2, 3	1/3
F/C-W-11	7/8"	12' clear span - 2" x 9" wood joists; 15" o.c.; 2" x 1 1/2" bridging at center span; Deck: 1" T&G; Membrane: original ceiling joists have 3/8" plaster on wood lath; 4" metal hangers attached below joists creating 15" chases filled with mineral wool and closed with 7/8" plaster (gypsum) on 3/8" S.W.M. metal lath to form new ceiling surface.	75 psf	1 hr. 10 min.			7	1, 2	1
F/C-W-12	7/8"	12' clear span - 2" x 9" wood joists; 15" o.c.; 2" x 1 1/2" bridging at center; Deck: 1" T&G; Membrane: 3" mineral wood below joists; 3" hangers to channel below joists; 7/8" gypsum plaster on metal lath attached to channels.	75 psf	2 hrs.			7	1, 4	2
F/C-W-13	7/8"	12' clear span - 2" x 9" wood joists; 16" o.c.; 2" x 1 1/2" bridging at center span; Deck: 1" T&G on 1" bottoms on 3/4" glass wool strips on 3/4" gypsum board nailed to joists; Membrane: 3/4" glass wool strips on joists; 3/8" perforated gypsum lath; 1/2" gypsum plaster.	60 psf	41 min.			7	1, 3	2/3
F/C-W-14	7/8"	12' clear span - 2" x 9" wood joists; 15" o.c.; Deck: 1" T&G; Membrane: 3" foam concrete in cavity on 1/2" boards nailed to joists; wood lath nailed to 1" x 1 1/4" straps 14 o.c. across joists; 7/8" gypsum plaster.	60 psf	1 hr. 40 min.			7	1, 5	1 2/3
F/C-W-15	7/8"	12' clear span - 2" x 9" wood joists; 18" o.c.; Deck: 1" T&G; Membrane: 2" foam concrete on 1/2" boards nailed to joist sides 2" from joist bottom; 2" air space; 1" x 1 1/4" wood straps 14" o.c. across joists; 7/8" lime plaster on wood lath.	60 psf	53 min.			7	1, 2	3/4

(Continued)

TABLE 3.3—FLOOR/CEILING ASSEMBLIES—WOOD JOIST—continued

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-W-16	7/8"	12' clear span - 2" × 9" wood joists; Deck: 1" T&G; Membrane: 3" ashes on 1/2" boards nailed to joist sides 2" from joist bottom; 2" air space; 1" × 1 1/4" wood straps 14" o.c.; 7/8" gypsum plaster on wood lath.	60 psf	28 min.			7	1, 2	1/3
F/C-W-17	7/8"	As per previous F/C-W-16 but with lime plaster mix.	60 psf	41 min.			7	1, 2	2/3
F/C-W-18	7/8"	12' clear span - 2" × 9" wood joists; 18" o.c.; 2" × 1 1/2" bridging at center; Deck: 1" T&G; Membrane: 7/8" gypsum plaster on wood lath.	60 psf	36 min.			7	1, 2	1/2
F/C-W-19	7/8"	As per previous F/C-W-18 except with lime plaster membrane and deck is 1" nominal boards (plain edge).	60 psf	19 min.			7	1, 2	1/4
F/C-W-20	7/8"	As per F/C-W-19, except deck is 1" T&G boards.	60 psf	43 min.			7	1, 2	2/3
F/C-W-21	1"	12' clear span - 2" × 9" wood joists; 16" o.c.; 2" × 1 1/2" bridging at center; Deck: 1" T&G; Membrane: 3/8" gypsum base board; 5/8" gypsum plaster.	70 psf	29 min.			7	1, 2	1/3
F/C-W-22	1 1/8"	12' clear span - 2" × 9" wood joists; 16" o.c.; 2" × 2" wood bridging at center; Deck: 1" T&G; Membrane: hangers, channel with 3/8" gypsum baseboard affixed under 3/4" gypsum plaster.	60 psf	1 hr.			7	1, 2, 3	1
F/C-W-23	3/8"	Deck: 1" nominal lumber; Joists: 2" × 7"; 15" o.c.; Membrane: 3/8" plasterboard with plaster skim coat.	60 psf	11 1/2 min.			12	2, 6	1/6
F/C-W-24	1/2"	Deck: 1" T&G lumber; Joists: 2" × 9"; 16" o.c.; Membrane: 1/2" plasterboard.	60 psf	18 min.			12	2, 7	1/4
F/C-W-25	1/2"	Deck: 1" T&G lumber; Joists: 2" × 7"; 16" o.c.; Membrane: 1/2" fiber insulation board.	30 psf	8 min.			12	2, 8	2/15
F/C-W-26	1/2"	Deck: 1" nominal lumber; Joists: 2" × 7"; 15" o.c.; Membrane: 1/2" fiber insulation board.	60 psf	8 min.			12	2, 9	2/15
F/C-W-27	5/8"	Deck: 1" nominal lumber; Joists: 2" × 7"; 15" o.c.; Membrane: 5/8" gypsum plaster on wood lath.	60 psf	17 min.			12	2, 10	1/4
F/C-W-28	5/8"	Deck: 1" T&G lumber; Joists: 2" × 9"; 16" o.c.; Membrane: 1/2" fiber insulation board; 1/2" plaster.	60 psf	20 min.			12	2, 11	1/3
F/C-W-29	No Membrane	Exposed wood joists.	See Note 13	15 min.		1		1, 12, 13, 14	1/4

(Continued)

TABLE 3.3—FLOOR/CEILING ASSEMBLIES—WOOD JOIST—continued

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-W-30	3/8"	Gypsum wallboard: 3/8" or 1/2" with 1 1/2" No. 15 gage nails with 3/16" heads spaced 6" centers with asbestos paper applied with paperhangers' paste and finished with casein paint.	See Note 13	25 min.		1		1, 12, 13, 14	1/2
F/C-W-31	1/2"	Gypsum wallboard: 1/2" with 1 3/4" No. 12 gage nails with 1/2" heads, 6" o.c., and finished with casein paint.	See Note 13	25 min.		1		1, 12, 13, 14	1/2
F/C-W-32	1/2"	Gypsum wallboard: 1/2" with 1 1/2" No. 12 gage nails with 1/2" heads, 18" o.c., with asbestos paper applied with paperhangers' paste and secured with 1 1/2" No. 15 gage nails with 3/16" heads and finished with casein paint; combined nail spacing 6" o.c.	See Note 13	30 min.		1		1, 12, 13, 14	1/2
F/C-W-33	3/8"	Gypsum wallboard: two layers 3/8" secured with 1 1/2" No. 15 gage nails with 3/8" heads, 6" o.c.	See Note 13	30 min.		1		1, 12, 13, 14	1/2
F/C-W-34	1/2"	Perforated gypsum lath: 3/8", plastered with 1 1/8" No. 13 gage nails with 5/16" heads, 4" o.c.; 1/2" sanded gypsum plaster.	See Note 13	30 min.		1		1, 12, 13, 14	1/2
F/C-W-35	1/2"	Same as F/C-W-34, except with 1 1/8" No. 13 gage nails with 3/8" heads, 4" o.c.	See Note 13	45 min.		1		1, 12, 13, 14	3/4
F/C-W-36	1/2"	Perforated gypsum lath: 3/8", nailed with 1 1/8" No. 13 gage nails with 3/8" heads, 4" o.c.; joints covered with 3" strips of metal lath with 1 3/4" No. 12 nails with 1/2" heads, 5" o.c.; 1/2" sanded gypsum plaster.	See Note 13	1 hr.		1		1, 12, 13, 14	1
F/C-W-37	1/2"	Gypsum lath: 3/8" and lower layer of 3/8" perforated gypsum lath nailed with 1 3/4" No. 13 nails with 5/16" heads, 4" o.c.; 1/2" sanded gypsum plaster or 1/2" portland cement plaster.	See Note 13	45 min.		1		1, 12, 13, 14	3/4
F/C-W-38	3/4"	Metal lath: nailed with 1 1/4" No. 11 nails with 3/8" heads or 6d common driven 1" and bent over, 6" o.c.; 3/4" sanded gypsum plaster.	See Note 13	45 min.		1		1, 12, 13, 14	3/4
F/C-W-39	3/4"	Same as F/C-W-38, except nailed with 1 1/2" No. 11 barbed roof nails with 7/16" heads, 6" o.c.	See Note 13	1 hr.		1		1, 12, 13, 14	1

(Continued)

TABLE 3.3—FLOOR/CEILING ASSEMBLIES—WOOD JOIST—continued

ITEM CODE	MEMBRANE THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-W-40	3/4"	Same as F/C-W-38, except with lath nailed to joists with additional supports for lath 27" o.c.; attached to alternate joists and consisting of two nails driven 1 1/4", 2" above bottom on opposite sides of the joists, one loop of No. 18 wire slipped over each nail; the ends twisted together below lath.	See Note 13	1 hr. 15 min.		1		1, 12, 13, 14	1 1/4
F/C-W-41	3/4"	Metal lath: nailed with 1 1/2" No. 11 barbed roof nails with 7/16" heads, 6 o.c., with 3/4" portland cement plaster for scratch coat and 1:3 for brown coat, 3 lbs. of asbestos fiber and 15 lbs. of hydrated lime/94 lbs. bag of cement.	See Note 13	1 hr.		1		1, 12, 13, 14	1
F/C-W-42	3/4"	Metal lath: nailed with 8d, No. 11 1/2 gage barbed box nails, 2 1/2" driven, 1 1/4" on slant and bent over, 6" o.c.; 3/4" sanded gypsum plaster, 1:2 for scratch coat and 1:3 for below coat.	See Note 13	1 hr.		1		1, 12, 13, 14	1

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound per square inch = 0.00689 MPa, 1 pound per square foot = 47.9 N/m².

Notes:

1. Thickness indicates thickness of first membrane protection on ceiling surface.
2. Failure mode - flame thru.
3. Failure mode - collapse.
4. No endpoint reached at termination of test.
5. Failure imminent - test terminated.
6. Joist failure - 11.5 minutes; flame thru - 13 minutes; collapse - 24 minutes.
7. Joist failure - 17 minutes; flame thru - 18 minutes; collapse - 33 minutes.
8. Joist failure - 18 minutes; flame thru - 8 minutes; collapse - 30 minutes.
9. Joist failure - 12 minutes; flame thru - 8 minutes; collapse - 22 minutes.
10. Joist failure - 11 minutes; flame thru - 17 minutes; collapse - 27 minutes.
11. Joist failure - 17 minutes; flame thru - 20 minutes; collapse - 43 minutes.
12. Joists: 2-inch by 10-inch southern pine or Douglas fir; No. 1 common or better. Subfloor: 3/4-inch wood sheathing diaphragm of asbestos paper, and finish of tongue-and-groove wood flooring.
13. Loadings: not more than 1,000 psi maximum fiber stress in joists.
14. Perforations in gypsum lath are to be not less than 3/4-inch diameter with one perforation for not more than 16/in.² diameter.
15. "Distemper" is a British term for a water-based paint such as white wash or calcimine.

FIGURE 3.4—FLOOR/CEILING ASSEMBLIES—HOLLOW CLAY TILE WITH REINFORCED CONCRETE

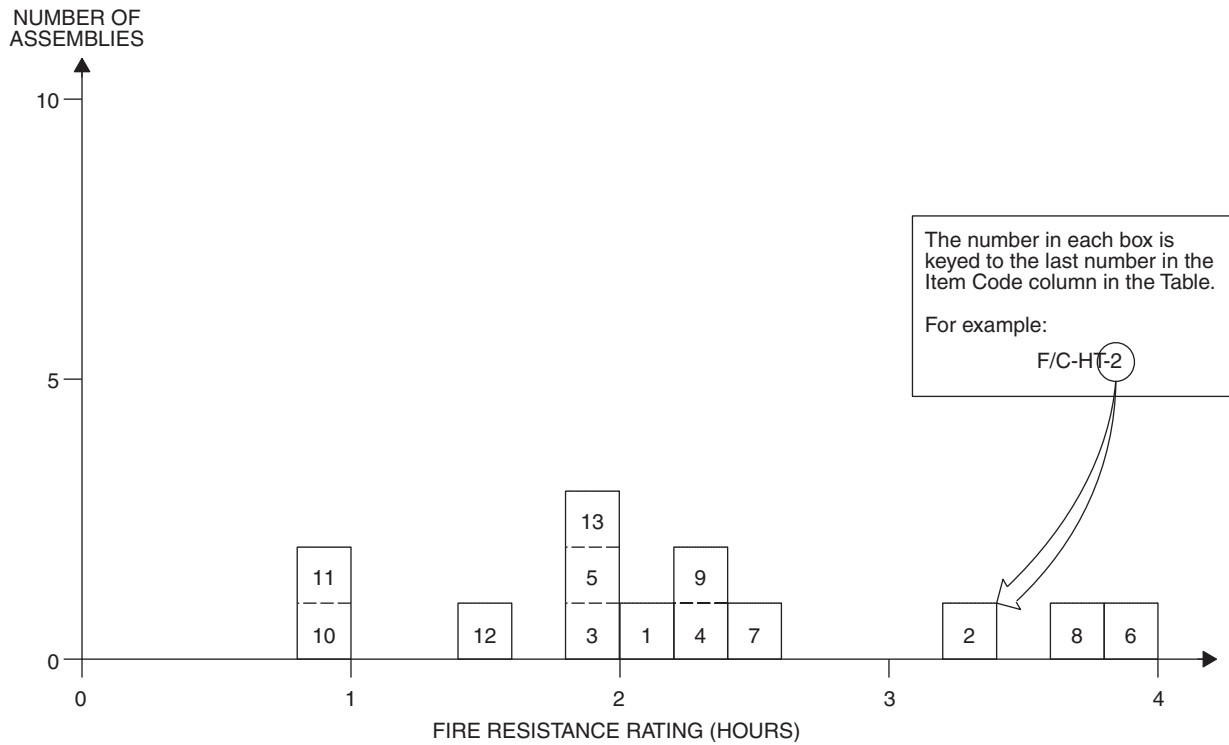


TABLE 3.4—FLOOR/CEILING ASSEMBLIES—HOLLOW CLAY TILE WITH REINFORCED CONCRETE

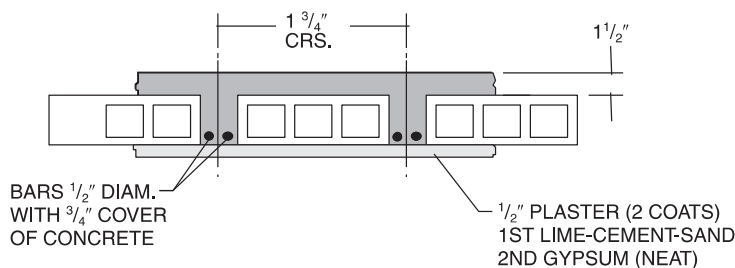
ITEM CODE	ASSEMBLY THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-HT-1	6"	Cover: 1½" concrete (6080 psi); three cell hollow clay tiles, 12" × 12" × 4"; ¾" concrete between tiles including two ½" rebars with ¾" concrete cover; ½" plaster cover, lower.	75 psf	2 hrs. 7 min.			7	1, 2, 3	2
F/C-HT-2	6"	Cover: 1½" concrete (5840 psi); three cell hollow clay tiles, 12" × 12" × 4"; ¾" concrete between tiles including two ½" rebars each with ½" concrete cover and ⅝" filler tiles between hollow tiles; ½" plaster cover, lower.	61 psf	3 hrs. 23 min.			7	3, 4, 6	3⅓
F/C-HT-3	6"	Cover: 1½" concrete (6280 psi); three cell hollow clay tiles, 12" × 12" × 4"; ¾" concrete between tiles including two ½" rebars with ½" cover; ½" plaster cover, lower.	122 psf	2 hrs.			7	1, 3, 5, 8	2
F/C-HT-4	6"	Cover: 1½" concrete (6280 psi); three cell hollow clay tiles, 12" × 12" × 4"; ¾" concrete between tiles including two ½" rebars with ¾" cover; ½" plaster cover, lower.	115 psf	2 hrs. 23 min.			7	1, 3, 7	2⅓

(Continued)

TABLE 3.4—FLOOR/CEILING ASSEMBLIES—HOLLOW CLAY TILE WITH REINFORCED CONCRETE—continued

ITEM CODE	ASSEMBLY THICKNESS	CONSTRUCTION DETAILS	PERFORMANCE		REFERENCE NUMBER			NOTES	REC. HOURS
			LOAD	TIME	PRE-BMS-92	BMS-92	POST-BMS-92		
F/C-HT-5	6"	Cover: 1 1/2" concrete (6470 psi); three cell hollow clay tiles, 12" x 12" x 4"; 3 1/4" concrete between tiles including two 1/2" rebars with 1/2" cover; 1/2" plaster cover, lower.	122 psf	2 hrs.			7	1, 3, 5, 8	2
F/C-HT-6	8"	Floor cover: 1 1/2" gravel cement (4300 psi); three cell, 12" x 12" x 6"; 3 1/2" space between tiles including two 1/2" rebars with 1" cover from concrete bottom; 1/2" plaster cover, lower.	165 psf	4 hrs.			7	1, 3, 9, 10	4
F/C-HT-7	9" (nom.)	Deck: 7/8" T&G on 2" x 1 1/2" bottoms (18" o.c.) 1 1/2" concrete cover (4600 psi); three cell hollow clay tiles, 12" x 12" x 4"; 3" concrete between tiles including one 3/4" rebar 3/4" from tile bottom; 3/4" plaster cover.	95 psf	2 hrs. 26 min.			7	4, 11, 12, 13	2 1/3
F/C-HT-8	9" (nom.)	Deck: 7/8" T&G on 2" x 1 1/2" bottoms (18" o.c.) 1 1/2" concrete cover (3850 psi); three cell hollow clay tiles, 12" x 12" x 4"; 3" concrete between tiles including one 3/4" rebar 3/4" from tile bottoms; 1/2" plaster cover.	95 psf	3 hrs. 28 min.			7	4, 11, 12, 13	
F/C-HT-9	9" (nom.)	Deck: 7/8" T&G on 2" x 1 1/2" bottoms (18" o.c.) 1 1/2" concrete cover (4200 psi); three cell hollow clay tiles, 12" x 12" x 4"; 3" concrete between tiles including one 3/4" rebar 3/4" from tile bottoms; 1/2" plaster cover.	95 psf	2 hrs. 14 min.			7	3, 5, 8, 11	
F/C-HT-10	5 1/2"	Fire clay tile (4" thick); 1 1/2" concrete cover; for general details, see Note 15.	See Note 14	1 hr.			43	15	1
F/C-HT-11	8"	Fire clay tile (6" thick); 2" cover.	See Note 14	1 hr.			43	15	1
F/C-HT-12	5 1/2"	Fire clay tile (4" thick); 1 1/2" cover; 5/8" gypsum plaster, lower.	See Note 14	1 hr. 30 min.			43	15	1 1/2
F/C-HT-13	8"	Fire clay tile (6" thick); 2" cover; 5/8" gypsum plaster, lower.	See Note 14	2 hrs.			43	15	1 1/2

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound per square inch = 0.00689MPa, 1 pound per square foot = 47.9 N/m².

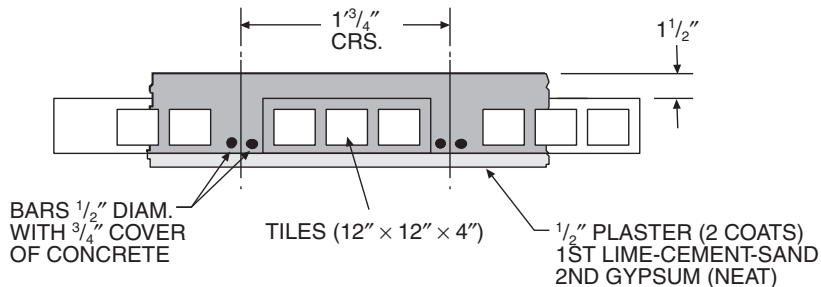


Notes:

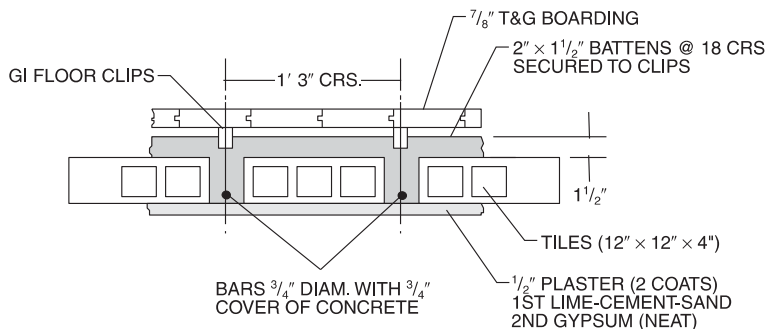
1. A generalized cross section of this floor type follows:
2. Failure mode - structural.
3. Plaster: base coat - lime-cement-sand; top coat - gypsum (neat).

TABLE 3.4—FLOOR/CEILING ASSEMBLIES—HOLLOW CLAY TILE WITH REINFORCED CONCRETE—continued

- 4. Failure mode - collapse.
- 5. Test stopped before any endpoints were reached.
- 6. A generalized cross section of this floor type follows:



- 7. Failure mode - thermal - back face temperature rise.
- 8. Passed hose stream test.
- 9. Failed hose stream test.



- 8. Passed hose stream test.
- 9. Failed hose stream test.
- 10. Test stopped at 4 hours before any endpoints were reached.
- 11. A generalized cross section of this floor type follows:
- 12. Plaster: base coat - retarded hemihydrate gypsum-sand; second coat - neat gypsum.
- 13. Concrete in Item 7 is P.C. based but with crushed brick aggregates while in Item 8 river sand and river gravels are used with the P.C.
- 14. Load - unspecified.
- 15. The 12-inch by 12-inch fire-clay tiles were laid end to end in rows spaced 2 1/2 inches or 4 inches apart. The reinforcing steel was placed between these rows and the concrete cast around them and over the tile to form the structural floor.