2010 Edition of ASCE 7

Minimum Design Loads for Buildings and Other Structures

Errata No.2

Effective: March 31, 2013

This document contains errata to ASCE 7-10 and is periodically updated and posted on the SEI website at www.asce.org/sei/errata.

THIS TYPE AND SIZE FONT INDICATES DIRECTIVE TEXT THAT IS NOT PART OF THE STANDARD. CHANGES TO THE STANDARD ARE INDICATED USING STRIKE-OUT AND UNDERLINE TEXT.

Chapter 4

REVISE TABLE 4-1 AS FOLLOWS:

Occupancy or Use	Uniform psf (kN/m2)	Conc. lb (kN)
Screen enclosure support frame	5 (0.24) nonreducible and based on the tributary area of the roof supported by the frame members	200 (0.89)

4.7.2 Reduction in Uniform Live Loads.

…

~~**EXCEPTION:** For structural members in one- and two-family dwellings supporting more than one floor load, the following floor live load reduction shall be permitted as an alternative to Eq. 4.7-1:~~

~~$L = 0.7 \times (L_{o1} + L_{o2} + \ldots)$~~

~~L_{o1}, L_{o2}, … are the unreduced floor live loads applicable to each of multiple supported story levels regardless of tributary area. The reduced floor live load effect, L, shall not be less than that produced by the effect of the largest unreduced floor live load on a given story level acting alone.~~

Chapter 7

7.4.2 Cold Roof Slope Factor, Cs.

Cold roofs are those with a $C_t > 1.0$ as determined from Table 7-3. For cold roofs with $C_t = 1.1$ and an unobstructed slippery surface that will allow snow to slide off the eaves, the roof slope factor C_s shall be determined using the dashed line in Fig. 7-2b. For all other cold roofs with $C_t = 1.1$, the solid line in Fig. 7-2b shall be used to determine the roof slope factor C_s. For cold roofs with $C_t = 1.2$ or larger and an unobstructed slippery surface that will allow snow to slide off the eaves, the roof slope factor C_s shall be determined using the dashed line on Fig. 7-2c. For all other cold roofs with $C_t = 1.2$ or larger, the solid line in Fig. 7-2c shall be used to determine the roof slope factor C_s.

REVISE FIGURE 7-5 TO CHANGE "W < 20 FT" TO "W ≤ 20 FT" AND "Θ ≤ 2.38°" TO "Θ < 2.38°"

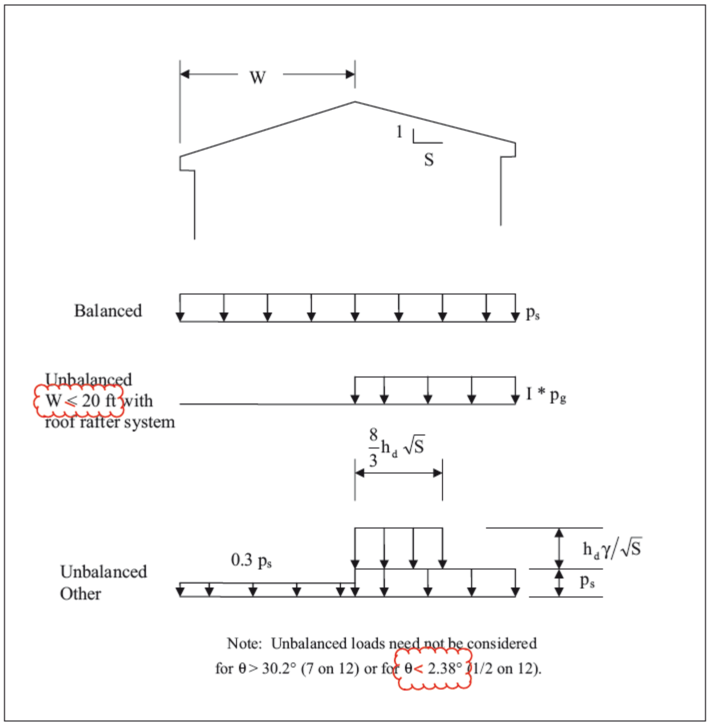
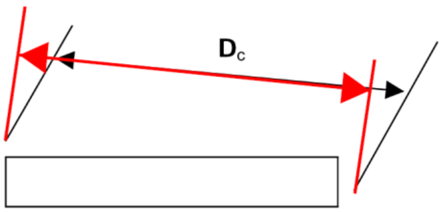


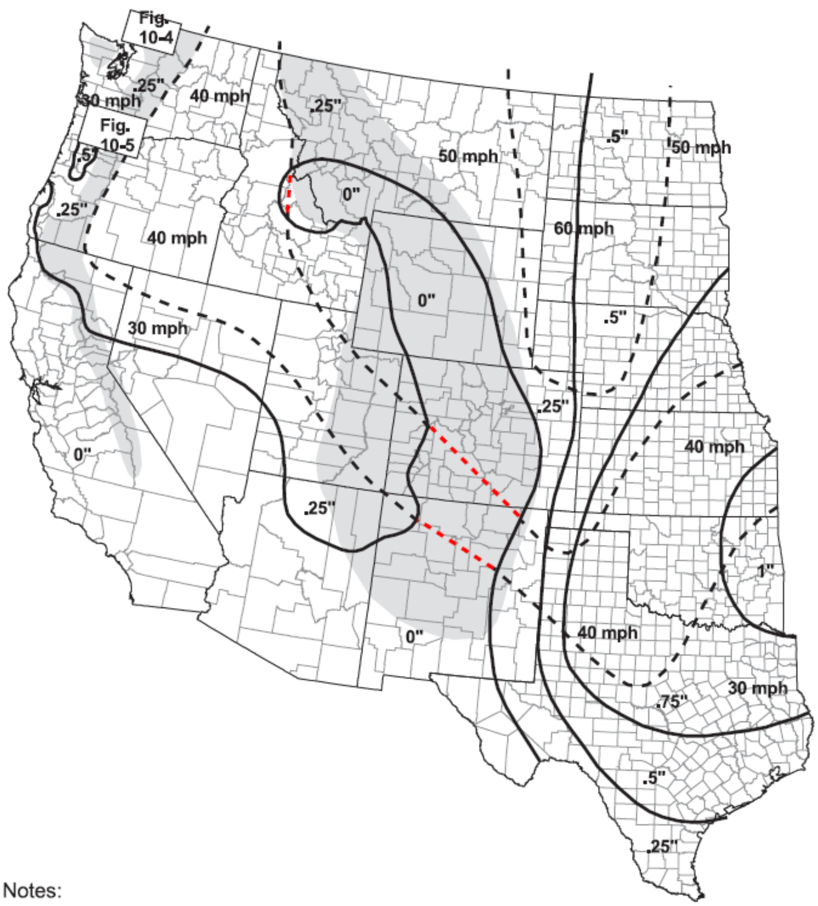
FIGURE 7-5 Balanced and Unbalanced Snow Loads for Hip and Gable Roofs.

Chapter 10

REVISE FIGURE 10-1 RECTANGULAR SHAPE TO SHOW DIMENSION LINE PERPENDICULAR TO THE EXTENSION LINES.



REVISE FIGURE 10-2 TO CONNECT GUST SPEED CONTOURS IDAHO, COLORADO AND NEW MEXICO AS SHOWN IN RED BELOW.



Notes:

Chapter 12

REVISE THE REFERENCE TO ACI 318 UNDER THE EXCEPTION IN SECTION 12.12.5 TO READ:

EXCEPTION: Reinforced concrete frame members not designed as part of the seismic force–resisting system shall comply with Section ~~21.11~~ 21.13 of ACI 318.

REVISE TABLE 12.6-1 TO DELETE THE "TYPE 5B" ENTRY UNDER THE STRUCTURAL CHARACTERISTICS COLUMN. SECTION 12.3.3.1 PROHIBITS VERTICAL IRREGULARITY TYPE 5B IN STRUCTURES ASSIGNED TO SDC D OR HIGHER.

REVISE SECTION 12.14.3.1.2 EXCEPTION CONDITION 1 AS FOLLOWS:

1. In Eqs. 12.14-3, 12.14-4, 12.14-7, and 12.14-8 where SDS is equal to or less than 0.125.

Chapter 15

15.4.4 Fundamental Period.

…

$$\require{cancel}\cancel{T = 2\pi\sqrt{\frac{\sum_{i=1}^{n} f_i \delta_i^2}{g\sum_{i=1}^{n} f_i \delta_i}}}$$

$$T = 2\pi\sqrt{\frac{\sum_{i=1}^{n} w_i \delta_i^2}{g\sum_{i=1}^{n} f_i \delta_i}} \quad (15.4\text{-}6)$$

Chapter 16

16.1.4 Response Parameters.

REVISE PARAGRAPH 2 AS FOLLOWS:

For each ground motion i, where i is the designation assigned to each ground motion, the maximum value of the base shear, V_i, member forces, Q_{Ei}, and story drifts, Δ_i at each story, scaled as indicated in the preceding text ~~and story drifts, Δ_i, at each story as defined in Section 12.8.6~~ shall be determined. Where the maximum scaled base shear predicted by the analysis, V_i, is less than 85 percent of the value of V determined using the minimum value of C_s set forth in Eq. 12.8-5 or when located where S_1 is equal to or greater than 0.6g, the minimum value of C_s set forth in Eq. 12.8-6, the scaled member forces,

Q_{Ei}, shall be additionally multiplied by $0.85\frac{V}{V_i}$ where V is

the minimum base shear that has been determined using the minimum value of C_s set forth in Eq. 12.8-5, or when located where S_1 is equal to or greater than 0.6g, the minimum value of C_s set forth in Eq. 12.8-6.

REMAINDER OF THE SECTION IS UNCHANGED.

Chapter 22

REPLACE FIGURES 22-7 TO 22-9 WITH NEW MCE_G PGA MAPS THAT REVISE, FROM 60% g TO 50% g, SHADED AREAS OF DETERMINISTIC LOWER LIMIT PEAK GROUND ACCELERATIONS FOR THE CONTERMINOUS UNITED STATES, ALASKA, AND HAWAII. MAPS ARE APPENDED TO THE END OF THIS ERRATUM.

Chapter 23

ADD EDITION DATETO AWWA D100 TO AVOID CONFUSION. COPYRIGHT IS 2006, EDITION IS 2005.

AWWA D100-05
Sections 15.4.1, 15.7.7.1, 15.7.9.4, 15.7.10.6
Welded Steel Tanks for Water Storage, 2006

Chapter 26

FIGURES 26.5-1A, FIGURE 26.5B, FIGURE 26.5-1C

Notes:
1. Values are ~~nominal~~ design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.

EQUATION 26.11-1 IN THE DENOMINATOR CHANGE “22.800” TO “22,800”.

Chapter 27

Table 27.2-1 Steps to Determine MWFRS Wind Loads for Enclosed, Partially Enclosed, and Open Buildings of All Heights
Step 1: Determine risk category of building or other structure, see Table ~~1.4-1~~ 1.5-1.

Table 27.5-1 Steps to Determine MWFRS Wind Loads Enclosed Simple Diaphragm Buildings (*h* ≤ 160 ft. (48.8 m))

Step 1: Determine risk category of building or other structure, see Table 1.5-1
Step 2: Determine the basic wind speed, *V*, for applicable risk category, see Figure 26.5-1A, B or C
Step 3: Determine wind load parameters:

- ~~Wind directionality factor, Kd, see Section 26.6 and Table 26.6-1~~
- Exposure category B, C or D, see Section 26.7
- Topographic factor, Kzt, see Section 26.8 and Figure 26.8-1
- Enclosure classification, see Section 26.10

Table 27.6-2 MWFRS- Part 2: Wind Loads – Roof Exposure C

FOR V = 160–200 MPH, ALL HEIGHTS, REPLACE MULIPLE VALUES FOR 160 MPH, ZONE 2, LOAD CASE 1.

Table 27.6-2
MWFRS- Part 2: Wind Loads - Roof
Exposure C

MWFRS – Roof
V = 160–200 mph
h = 50–80 ft.

V (MPH)			160					180					200				
		Load			Zone					Zone					Zone		
h (ft)	Roof Slope	Case	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Flat < 2:12 (9.46 deg)	1	NA	NA	-71.3	-63.6	-52.1	NA	NA	-90.2	-80.5	-66.0	NA	NA	-111.4	-99.3	-81.5
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-70.0	-47.6	-71.3	-63.6	-52.1	-88.5	-60.2	-90.2	-80.5	-66.0	-109.3	-74.3	-111.4	-99.3	-81.5
		2	10.1	-14.2	0.0	0.0	0.0	12.8	-18.0	0.0	0.0	0.0	15.8	-22.2	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-57.5	-46.4	-71.3	-63.6	-52.1	-72.8	-58.7	-90.2	-80.5	-66.0	-89.9	-72.5	-111.4	-99.3	-81.5
		2	19.9	-20.4	0.0	0.0	0.0	25.2	-25.8	0.0	0.0	0.0	31.1	-31.8	0.0	0.0	0.0
80	5:12 (22.6 deg)	1	-46.1	-46.4	-71.3	-63.6	-52.1	-58.4	-58.7	-90.2	-80.5	-66.0	-72.1	-72.5	-111.4	-99.3	-81.5
		2	26.5	-22.2	0.0	0.0	0.0	33.5	-28.1	0.0	0.0	0.0	41.4	-34.7	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-37.1	-46.4	-71.3	-63.6	-52.1	-46.9	-58.7	-90.2	-80.5	-66.0	-57.9	-72.5	-111.4	-99.3	-81.5
		2	29.3	-22.2	0.0	0.0	0.0	37.0	-28.1	0.0	0.0	0.0	45.7	-34.7	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-21.5	-46.4	-71.3	-63.6	-52.1	-27.2	-58.7	-90.2	-80.5	-66.0	-33.5	-72.5	-111.4	-99.3	-81.5
		2	35.0	-22.2	0.0	0.0	0.0	44.3	-28.1	0.0	0.0	0.0	54.7	-34.7	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-12.1	-46.4	-71.3	-63.6	-52.1	-15.3	-58.7	-90.2	-80.5	-66.0	-18.9	-72.5	-111.4	-99.3	-81.5
		2	35.0	-22.2	0.0	0.0	0.0	44.3	-28.1	0.0	0.0	0.0	54.7	-34.7	0.0	0.0	0.0
	Flat < 2:12 (9.46 deg)	1	NA	NA	-69.3	-61.8	-50.7	NA	NA	-87.7	-78.2	-64.2	NA	NA	-108.3	-96.6	-79.2
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-68.0	-46.2	-69.3	-61.8	-50.7	-86.1	-58.5	-87.7	-78.2	-64.2	-106.3	-72.2	-108.3	-96.6	-79.2
		2	9.8	-13.8	0.0	0.0	0.0	12.4	-17.5	0.0	0.0	0.0	15.3	-21.6	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-55.9	-45.1	-69.3	-61.8	-50.7	-70.8	-57.1	-87.7	-78.2	-64.2	-87.4	-70.5	-108.3	-96.6	-79.2
		2	19.4	-19.8	0.0	0.0	0.0	24.5	-25.1	0.0	0.0	0.0	30.2	-31.0	0.0	0.0	0.0
70	5:12 (22.6 deg)	1	-44.9	-45.1	-69.3	-61.8	-50.7	-56.8	-57.1	-87.7	-78.2	-64.2	-70.1	-70.5	-108.3	-96.6	-79.2
		2	25.8	-21.6	0.0	0.0	0.0	32.6	-27.3	0.0	0.0	0.0	40.3	-33.7	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-36.0	-45.1	-69.3	-61.8	-50.7	-45.6	-57.1	-87.7	-78.2	-64.2	-56.3	-70.5	-108.3	-96.6	-79.2
		2	28.4	-21.6	0.0	0.0	0.0	36.0	-27.3	0.0	0.0	0.0	44.5	-33.7	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-20.9	-45.1	-69.3	-61.8	-50.7	-26.4	-57.1	-87.7	-78.2	-64.2	-32.6	-70.5	-108.3	-96.6	-79.2
		2	34.0	-21.6	0.0	0.0	0.0	43.0	-27.3	0.0	0.0	0.0	53.1	-33.7	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-11.8	-45.1	-69.3	-61.8	-50.7	-14.9	-57.1	-87.7	-78.2	-64.2	-18.4	-70.5	-108.3	-96.6	-79.2
		2	34.0	-21.6	0.0	0.0	0.0	43.0	-27.3	0.0	0.0	0.0	53.1	-33.7	0.0	0.0	0.0
	Flat < 2:12 (9.46 deg)	1	NA	NA	-67.1	-59.8	-49.1	NA	NA	-84.9	-75.7	-62.1	NA	NA	-104.9	-93.5	-76.7
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-65.8	-44.8	-67.1	-59.8	-49.1	-83.3	-56.7	-84.9	-75.7	-62.1	-102.9	-69.9	-104.9	-93.5	-76.7
		2	9.5	-13.4	0.0	0.0	0.0	12.0	-16.9	0.0	0.0	0.0	14.8	-20.9	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-54.1	-43.7	-67.1	-59.8	-49.1	-68.5	-55.3	-84.9	-75.7	-62.1	-84.6	-68.3	-104.9	-93.5	-76.7
		2	18.7	-19.2	0.0	0.0	0.0	23.7	-24.3	0.0	0.0	0.0	29.3	-30.0	0.0	0.0	0.0
60	5:12 (22.6 deg)	1	-43.4	-43.7	-67.1	-59.8	-49.1	-55.0	-55.3	-84.9	-75.7	-62.1	-67.9	-68.3	-104.9	-93.5	-76.7
		2	24.9	-20.9	0.0	0.0	0.0	31.6	-26.4	0.0	0.0	0.0	39.0	-32.6	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-34.9	-43.7	-67.1	-59.8	-49.1	-44.2	-55.3	-84.9	-75.7	-62.1	-54.5	-68.3	-104.9	-93.5	-76.7
		2	27.5	-20.9	0.0	0.0	0.0	34.9	-26.4	0.0	0.0	0.0	43.0	-32.6	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-20.2	-43.7	-67.1	-59.8	-49.1	-25.6	-55.3	-84.9	-75.7	-62.1	-31.6	-68.3	-104.9	-93.5	-76.7
		2	32.9	-20.9	0.0	0.0	0.0	41.7	-26.4	0.0	0.0	0.0	51.4	-32.6	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-11.4	-43.7	-67.1	-59.8	-49.1	-14.4	-55.3	-84.9	-75.7	-62.1	-17.8	-68.3	-104.9	-93.5	-76.7
		2	32.9	-20.9	0.0	0.0	0.0	41.7	-26.4	0.0	0.0	0.0	51.4	-32.6	0.0	0.0	0.0
	Flat < 2:12 (9.46 deg)	1	NA	NA	-64.6	-57.6	-47.2	NA	NA	-81.7	-72.9	-59.8	NA	NA	-100.9	-90.0	-73.8
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-63.4	-43.1	-64.6	-57.6	-47.2	-80.2	-54.5	-81.7	-72.9	-59.8	-99.0	-67.3	-100.9	-90.0	-73.8
		2	9.1	-12.9	0.0	0.0	0.0	11.6	-16.3	0.0	0.0	0.0	14.3	-20.1	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-52.1	-42.0	-64.6	-57.6	-47.2	-65.9	-53.2	-81.7	-72.9	-59.8	-81.4	-65.7	-100.9	-90.0	-73.8
		2	18.0	-18.5	0.0	0.0	0.0	22.8	-23.4	0.0	0.0	0.0	28.2	-28.8	0.0	0.0	0.0
50	5:12 (22.6 deg)	1	-41.8	-42.0	-64.6	-57.6	-47.2	-52.9	-53.2	-81.7	-72.9	-59.8	-65.3	-65.7	-100.9	-90.0	-73.8
		2	24.0	-20.1	0.0	0.0	0.0	30.4	-25.4	0.0	0.0	0.0	37.5	-31.4	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-33.6	-42.0	-64.6	-57.6	-47.2	-42.5	-53.2	-81.7	-72.9	-59.8	-52.5	-65.7	-100.9	-90.0	-73.8
		2	26.5	-20.1	0.0	0.0	0.0	33.5	-25.4	0.0	0.0	0.0	41.4	-31.4	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-19.4	-42.0	-64.6	-57.6	-47.2	-24.6	-53.2	-81.7	-72.9	-59.8	-30.4	-65.7	-100.9	-90.0	-73.8
		2	31.7	-20.1	0.0	0.0	0.0	40.1	-25.4	0.0	0.0	0.0	49.5	-31.4	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-11.0	-42.0	-64.6	-57.6	-47.2	-13.9	-53.2	-81.7	-72.9	-59.8	-17.1	-65.7	-100.9	-90.0	-73.8
		2	31.7	-20.1	0.0	0.0	0.0	40.1	-25.4	0.0	0.0	0.0	49.5	-31.4	0.0	0.0	0.0

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Table 27.6-2
MWFRS- Part 2: Wind Loads - Roof
Exposure C

MWFRS – Roof
V = 160–200 mph
h = 90–120 ft.

	V (MPH)		160					180					200				
		Load			Zone					Zone					Zone		
h (ft)	Roof Slope	Case	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
120	Flat < 2:12 (9.46 deg)	1	NA	NA	-77.7	-69.2	-56.8	NA	NA	-98.3	-87.6	-71.9	NA	NA	-121.3	-108.2	-88.7
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-76.2	-51.8	-77.7	-69.2	-56.8	-96.4	-65.6	-98.3	-87.6	-71.9	-119.0	-80.9	-121.3	-108.2	-88.7
		2	11.0	-15.5	0.0	0.0	0.0	13.9	-19.6	0.0	0.0	0.0	17.2	-24.2	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-62.6	-50.5	-77.7	-69.2	-56.8	-79.3	-64.0	-98.3	-87.6	-71.9	-97.9	-79.0	-121.3	-108.2	-88.7
		2	21.7	-22.2	0.0	0.0	0.0	27.4	-28.1	0.0	0.0	0.0	33.9	-34.7	0.0	0.0	0.0
	5:12 (22.6 deg)	1	-50.3	-50.5	-77.7	-69.2	-56.8	-63.6	-64.0	-98.3	-87.6	-71.9	-78.5	-79.0	-121.3	-108.2	-88.7
		2	28.9	-24.2	0.0	0.0	0.0	36.5	-30.6	0.0	0.0	0.0	45.1	-37.8	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-40.4	-50.5	-77.7	-69.2	-56.8	-51.1	-64.0	-98.3	-87.6	-71.9	-63.1	-79.0	-121.3	-108.2	-88.7
		2	31.9	-24.2	0.0	0.0	0.0	40.3	-30.6	0.0	0.0	0.0	49.8	-37.8	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-23.4	-50.5	-77.7	-69.2	-56.8	-29.6	-64.0	-98.3	-87.6	-71.9	-36.5	-79.0	-121.3	-108.2	-88.7
		2	38.1	-24.2	0.0	0.0	0.0	48.2	-30.6	0.0	0.0	0.0	59.5	-37.8	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-13.2	-50.5	-77.7	-69.2	-56.8	-16.7	-64.0	-98.3	-87.6	-71.9	-20.6	-79.0	-121.3	-108.2	-88.7
		2	38.1	-24.2	0.0	0.0	0.0	48.2	-30.6	0.0	0.0	0.0	59.5	-37.8	0.0	0.0	0.0
110	Flat < 2:12 (9.46 deg)	1	NA	NA	-76.2	-68.0	-55.7	NA	NA	-96.5	-86.0	-70.6	NA	NA	-119.1	-106.2	-87.1
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-74.8	-50.9	-76.2	-68.0	-55.7	-94.7	-64.4	-96.5	-86.0	-70.6	-116.9	-79.5	-119.1	-106.2	-87.1
		2	10.8	-15.2	0.0	0.0	0.0	13.7	-19.2	0.0	0.0	0.0	16.9	-23.7	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-61.5	-49.6	-76.2	-68.0	-55.7	-77.8	-62.8	-96.5	-86.0	-70.6	-96.1	-77.6	-119.1	-106.2	-87.1
		2	21.3	-21.8	0.0	0.0	0.0	26.9	-27.6	0.0	0.0	0.0	33.3	-34.1	0.0	0.0	0.0
	5:12 (22.6 deg)	1	-49.3	-49.6	-76.2	-68.0	-55.7	-62.5	-62.8	-96.5	-86.0	-70.6	-77.1	-77.6	-119.1	-106.2	-87.1
		2	28.3	-23.7	0.0	0.0	0.0	35.9	-30.0	0.0	0.0	0.0	44.3	-37.1	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-39.6	-49.6	-76.2	-68.0	-55.7	-50.2	-62.8	-96.5	-86.0	-70.6	-61.9	-77.6	-119.1	-106.2	-87.1
		2	31.3	-23.7	0.0	0.0	0.0	39.6	-30.0	0.0	0.0	0.0	48.9	-37.1	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-22.9	-49.6	-76.2	-68.0	-55.7	-29.0	-62.8	-96.5	-86.0	-70.6	-35.9	-77.6	-119.1	-106.2	-87.1
		2	37.4	-23.7	0.0	0.0	0.0	47.3	-30.0	0.0	0.0	0.0	58.4	-37.1	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-12.9	-49.6	-76.2	-68.0	-55.7	-16.4	-62.8	-96.5	-86.0	-70.6	-20.2	-77.6	-119.1	-106.2	-87.1
		2	37.4	-23.7	0.0	0.0	0.0	47.3	-30.0	0.0	0.0	0.0	58.4	-37.1	0.0	0.0	0.0
100	Flat < 2:12 (9.46 deg)	1	NA	NA	-74.7	-66.6	-54.6	NA	NA	-94.6	-84.3	-69.2	NA	NA	-116.8	-104.1	-85.4
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-73.3	-49.9	-74.7	-66.6	-54.6	-92.8	-63.1	-94.6	-84.3	-69.2	-114.6	-77.9	-116.8	-104.1	-85.4
		2	10.6	-14.9	0.0	0.0	0.0	13.4	-18.8	0.0	0.0	0.0	16.5	-23.2	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-60.3	-48.6	-74.7	-66.6	-54.6	-76.3	-61.6	-94.6	-84.3	-69.2	-94.2	-76.0	-116.8	-104.1	-85.4
		2	20.9	-21.4	0.0	0.0	0.0	26.4	-27.0	0.0	0.0	0.0	32.6	-33.4	0.0	0.0	0.0
	5:12 (22.6 deg)	1	-48.4	-48.6	-74.7	-66.6	-54.6	-61.2	-61.6	-94.6	-84.3	-69.2	-75.6	-76.0	-116.8	-104.1	-85.4
		2	27.8	-23.3	0.0	0.0	0.0	35.2	-29.4	0.0	0.0	0.0	43.4	-36.4	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-38.8	-48.6	-74.7	-66.6	-54.6	-49.2	-61.6	-94.6	-84.3	-69.2	-60.7	-76.0	-116.8	-104.1	-85.4
		2	30.7	-23.3	0.0	0.0	0.0	38.8	-29.4	0.0	0.0	0.0	47.9	-36.4	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-22.5	-48.6	-74.7	-66.6	-54.6	-28.5	-61.6	-94.6	-84.3	-69.2	-35.1	-76.0	-116.8	-104.1	-85.4
		2	36.7	-23.3	0.0	0.0	0.0	46.4	-29.4	0.0	0.0	0.0	57.3	-36.4	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-12.7	-48.6	-74.7	-66.6	-54.6	-16.1	-61.6	-94.6	-84.3	-69.2	-19.8	-76.0	-116.8	-104.1	-85.4
		2	36.7	-23.3	0.0	0.0	0.0	46.4	-29.4	0.0	0.0	0.0	57.3	-36.4	0.0	0.0	0.0
90	Flat < 2:12 (9.46 deg)	1	NA	NA	-73.1	-65.2	-53.4	NA	NA	-92.5	-82.5	-67.6	NA	NA	-114.2	-101.8	-83.5
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-71.7	-48.8	-73.1	-65.2	-53.4	-90.8	-61.7	-92.5	-82.5	-67.6	-112.1	-76.2	-114.2	-101.8	-83.5
		2	10.3	-14.5	0.0	0.0	0.0	13.1	-18.4	0.0	0.0	0.0	16.2	-22.7	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-59.0	-47.6	-73.1	-65.2	-53.4	-74.6	-60.2	-92.5	-82.5	-67.6	-92.1	-74.3	-114.2	-101.8	-83.5
		2	20.4	-20.9	0.0	0.0	0.0	25.8	-26.4	0.0	0.0	0.0	31.9	-32.6	0.0	0.0	0.0
	5:12 (22.6 deg)	1	-47.3	-47.6	-73.1	-65.2	-53.4	-59.9	-60.2	-92.5	-82.5	-67.6	-73.9	-74.3	-114.2	-101.8	-83.5
		2	27.2	-22.8	0.0	0.0	0.0	34.4	-28.8	0.0	0.0	0.0	42.5	-35.6	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-38.0	-47.6	-73.1	-65.2	-53.4	-48.1	-60.2	-92.5	-82.5	-67.6	-59.4	-74.3	-114.2	-101.8	-83.5
		2	30.0	-22.8	0.0	0.0	0.0	38.0	-28.8	0.0	0.0	0.0	46.9	-35.6	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-22.0	-47.6	-73.1	-65.2	-53.4	-27.8	-60.2	-92.5	-82.5	-67.6	-34.4	-74.3	-114.2	-101.8	-83.5
		2	35.9	-22.8	0.0	0.0	0.0	45.4	-28.8	0.0	0.0	0.0	56.0	-35.6	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-12.4	-47.6	-73.1	-65.2	-53.4	-15.7	-60.2	-92.5	-82.5	-67.6	-19.4	-74.3	-114.2	-101.8	-83.5
		2	35.9	-22.8	0.0	0.0	0.0	45.4	-28.8	0.0	0.0	0.0	56.0	-35.6	0.0	0.0	0.0

Table 27.6-2
MWFRS – Part 2: Wind Loads – Roof
Exposure C

MWFRS – Roof
V = 160–200 mph
h = 130–160 ft.

	V (MPH)		160					180					200				
		Load			Zone					Zone					Zone		
h (ft)	Roof Slope	Case	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
160	Flat < 2:12 (9.46 deg)	1	NA	NA	-82.5	-73.6	-60.3	NA	NA	-104.4	-93.1	-76.3	NA	NA	-128.9	-114.9	-94.3
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-80.9	-55.0	-82.5	-73.6	-60.3	-102.5	-69.6	-104.4	-93.1	-76.3	-126.5	-86.0	-128.9	-114.9	-94.3
		2	11.7	-16.4	0.0	0.0	0.0	14.8	-20.8	0.0	0.0	0.0	18.2	-25.7	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-66.5	-53.7	-82.5	-73.6	-60.3	-84.2	-68.0	-104.4	-93.1	-76.3	-104.0	-83.9	-128.9	-114.9	-94.3
		2	23.0	-23.6	0.0	0.0	0.0	29.2	-29.8	0.0	0.0	0.0	36.0	-36.8	0.0	0.0	0.0
	5:12 (22.6 deg)	1	-53.4	-53.7	-82.5	-73.6	-60.3	-67.6	-68.0	-104.4	-93.1	-76.3	-83.4	-83.9	-128.9	-114.9	-94.3
		2	30.7	-25.7	0.0	0.0	0.0	38.8	-32.5	0.0	0.0	0.0	47.9	-40.1	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-42.9	-53.7	-82.5	-73.6	-60.3	-54.3	-68.0	-104.4	-93.1	-76.3	-67.0	-83.9	-128.9	-114.9	-94.3
		2	33.9	-25.7	0.0	0.0	0.0	42.9	-32.5	0.0	0.0	0.0	52.9	-40.1	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-24.8	-53.7	-82.5	-73.6	-60.3	-31.4	-68.0	-104.4	-93.1	-76.3	-38.8	-83.9	-128.9	-114.9	-94.3
		2	40.5	-25.7	0.0	0.0	0.0	51.2	-32.5	0.0	0.0	0.0	63.2	-40.1	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-14.0	-53.7	-82.5	-73.6	-60.3	-17.7	-68.0	-104.4	-93.1	-76.3	-21.9	-83.9	-128.9	-114.9	-94.3
		2	40.5	-25.7	0.0	0.0	0.0	51.2	-32.5	0.0	0.0	0.0	63.2	-40.1	0.0	0.0	0.0
150	Flat < 2:12 (9.46 deg)	1	NA	NA	-81.4	-72.6	-59.5	NA	NA	-103.0	-91.8	-75.3	NA	NA	-127.2	-113.4	-93.0
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-79.9	-54.3	-81.4	-72.6	-59.5	-101.1	-68.7	-103.0	-91.8	-75.3	-124.8	-84.8	-127.2	-113.4	-93.0
		2	11.5	-16.2	0.0	0.0	0.0	14.6	-20.5	0.0	0.0	0.0	18.0	-25.3	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-65.7	-53.0	-81.4	-72.6	-59.5	-83.1	-67.1	-103.0	-91.8	-75.3	-102.6	-82.8	-127.2	-113.4	-93.0
		2	22.7	-23.3	0.0	0.0	0.0	28.8	-29.4	0.0	0.0	0.0	35.5	-36.4	0.0	0.0	0.0
	5:12 (22.6 deg)	1	-52.7	-53.0	-81.4	-72.6	-59.5	-66.7	-67.1	-103.0	-91.8	-75.3	-82.3	-82.8	-127.2	-113.4	-93.0
		2	30.3	-25.3	0.0	0.0	0.0	38.3	-32.1	0.0	0.0	0.0	47.3	-39.6	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-42.3	-53.0	-81.4	-72.6	-59.5	-53.5	-67.1	-103.0	-91.8	-75.3	-66.1	-82.8	-127.2	-113.4	-93.0
		2	33.4	-25.3	0.0	0.0	0.0	42.3	-32.1	0.0	0.0	0.0	52.2	-39.6	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-24.5	-53.0	-81.4	-72.6	-59.5	-31.0	-67.1	-103.0	-91.8	-75.3	-38.3	-82.8	-127.2	-113.4	-93.0
		2	39.9	-25.3	0.0	0.0	0.0	50.5	-32.1	0.0	0.0	0.0	62.4	-39.6	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-13.8	-53.0	-81.4	-72.6	-59.5	-17.5	-67.1	-103.0	-91.8	-75.3	-21.6	-82.8	-127.2	-113.4	-93.0
		2	39.9	-25.3	0.0	0.0	0.0	50.5	-32.1	0.0	0.0	0.0	62.4	-39.6	0.0	0.0	0.0
140	Flat < 2:12 (9.46 deg)	1	NA	NA	-80.2	-71.5	-58.6	NA	NA	-101.5	-90.5	-74.2	NA	NA	-125.3	-111.7	-91.6
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-78.7	-53.5	-80.2	-71.5	-58.6	-99.6	-67.7	-101.5	-90.5	-74.2	-123.0	-83.6	-125.3	-111.7	-91.6
		2	11.4	-16.0	0.0	0.0	0.0	14.4	-20.2	0.0	0.0	0.0	17.7	-24.9	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-64.7	-52.2	-80.2	-71.5	-58.6	-81.9	-66.1	-101.5	-90.5	-74.2	-101.1	-81.6	-125.3	-111.7	-91.6
		2	22.4	-22.9	0.0	0.0	0.0	28.4	-29.0	0.0	0.0	0.0	35.0	-35.8	0.0	0.0	0.0
	5:12 (22.6 deg)	1	-51.9	-52.2	-80.2	-71.5	-58.6	-65.7	-66.1	-101.5	-90.5	-74.2	-81.1	-81.6	-125.3	-111.7	-91.6
		2	29.8	-25.0	0.0	0.0	0.0	37.7	-31.6	0.0	0.0	0.0	46.6	-39.0	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-41.7	-52.2	-80.2	-71.5	-58.6	-52.8	-66.1	-101.5	-90.5	-74.2	-65.2	-81.6	-125.3	-111.7	-91.6
		2	32.9	-25.0	0.0	0.0	0.0	41.7	-31.6	0.0	0.0	0.0	51.4	-39.0	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-24.1	-52.2	-80.2	-71.5	-58.6	-30.6	-66.1	-101.5	-90.5	-74.2	-37.7	-81.6	-125.3	-111.7	-91.6
		2	39.4	-25.0	0.0	0.0	0.0	49.8	-31.6	0.0	0.0	0.0	61.5	-39.0	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-13.6	-52.2	-80.2	-71.5	-58.6	-17.2	-66.1	-101.5	-90.5	-74.2	-21.3	-81.6	-125.3	-111.7	-91.6
		2	39.4	-25.0	0.0	0.0	0.0	49.8	-31.6	0.0	0.0	0.0	61.5	-39.0	0.0	0.0	0.0
130	Flat < 2:12 (9.46 deg)	1	NA	NA	-79.0	-70.4	-57.7	NA	NA	-100.0	-89.1	-73.1	NA	NA	-123.4	-110.0	-90.2
		2	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0
	3:12 (14.0 deg)	1	-77.5	-52.7	-79.0	-70.4	-57.7	-98.1	-66.7	-100.0	-89.1	-73.1	-121.1	-82.3	-123.4	-110.0	-90.2
		2	11.2	-15.7	0.0	0.0	0.0	14.1	-19.9	0.0	0.0	0.0	17.5	-24.6	0.0	0.0	0.0
	4:12 (18.4 deg)	1	-63.7	-51.4	-79.0	-70.4	-57.7	-80.6	-65.1	-100.0	-89.1	-73.1	-99.5	-80.3	-123.4	-110.0	-90.2
		2	22.1	-22.6	0.0	0.0	0.0	27.9	-28.6	0.0	0.0	0.0	34.5	-35.3	0.0	0.0	0.0
	5:12 (22.6 deg)	1	-51.1	-51.4	-79.0	-70.4	-57.7	-64.7	-65.1	-100.0	-89.1	-73.1	-79.9	-80.3	-123.4	-110.0	-90.2
		2	29.4	-24.6	0.0	0.0	0.0	37.2	-31.1	0.0	0.0	0.0	45.9	-38.4	0.0	0.0	0.0
	6:12 (26.6 deg)	1	-41.1	-51.4	-79.0	-70.4	-57.7	-52.0	-65.1	-100.0	-89.1	-73.1	-64.1	-80.3	-123.4	-110.0	-90.2
		2	32.4	-24.6	0.0	0.0	0.0	41.0	-31.1	0.0	0.0	0.0	50.6	-38.4	0.0	0.0	0.0
	9:12 (36.9 deg)	1	-23.8	-51.4	-79.0	-70.4	-57.7	-30.1	-65.1	-100.0	-89.1	-73.1	-37.1	-80.3	-123.4	-110.0	-90.2
		2	38.7	-24.6	0.0	0.0	0.0	49.0	-31.1	0.0	0.0	0.0	60.5	-38.4	0.0	0.0	0.0
	12:12 (45.0 deg)	1	-13.4	-51.4	-79.0	-70.4	-57.7	-17.0	-65.1	-100.0	-89.1	-73.1	-21.0	-80.3	-123.4	-110.0	-90.2
		2	38.7	-24.6	0.0	0.0	0.0	49.0	-31.1	0.0	0.0	0.0	60.5	-38.4	0.0	0.0	0.0

Chapter 28

28.4.3 Roof Overhangs.

The positive external pressure on the bottom surface of windward roof overhangs shall be determined using GC_p = 0.7 in combination with the top surface pressures determined using Fig. 28.4-1.

Fig 28.4-1

Notes:

8. For Load Case A, the roof pressure the roof pressure coefficient (GC_{pf}), when negative in Zone 2 and 2E, shall be applied in Zone 2/2E for a distance from the edge of roof equal to 0.5 times the horizontal dimension of the building ~~parallel to the direction of the MWFRS being designed~~ measured perpendicular to the ridge line or 2.5 times the eave height at the windward wall, whichever is less; the remainder of Zone 2/2E extending to the ridge line shall use the pressure coefficient (GC_{pf}) for Zone 3/3E.

Fig 28.6-1

Notes:

10. For Load Case A, the roof pressure the roof pressure coefficient (GC_{pf}), when negative in Zone 2 and 2E, shall be applied in Zone 2/2E for a distance from the edge of roof equal to 0.5 times the horizontal dimension of the building measured perpendicular to the ridge line or 2.5 times the eave height at the windward wall, whichever is less; the remainder of Zone 2/2E extending to the ridge line shall use the pressure coefficient (GC_{pf}) for Zone 3/3E.

Chapter 29

IN THE FIRST SENTENCE OF SECTION 29.5 CHANGE “h>60°” TO “h>60’”.

COMMENTARY

Chapter C1

C1.3.1 Strength and Stiffness.

FIRST PARAGRAPH

Chapter ~~6~~30 of this standard specifies wind loads that must be considered in the design of cladding. Chapter 13 of this standard specifies earthquake loads and deformations that must be considered in the design of nonstructural components and systems designated in that chapter.

Chapter C2

C2.3.2 Load Combinations Including Flood Load.

DELETE THE 8TH PARAGRAPH

~~The fluid load is included in the load combinations where its effects are additive to the other loads (load combinations 1 through 5). Where F acts as a resistance to uplift forces, it should be included with dead load D. The mass of the fluid is included in the inertial effect due to E (see 15.4.3) and the base shear calculations for tanks (15.7). To make it clear that the fluid weight in a tank can be used to resist uplift, F was added to load combination 7 where it will be treated as dead load only when F counteracts E. Note that the fluid mass effects on stabilization depend on the degree to which the tank is filled. F is not included in combination 6 because the wind load can be present, whether the tank is full or empty, so the governing load case in combination 6 is when F is zero.~~

C2.3.4 Load Combinations Including Atmospheric Ice Loads.

Load combinations ~~1 and 2~~ (2), (4), and (6) in Section~~s~~ 2.3.4 and load combinations (2), (3) and (7) in Section 2.4.3 include the simultaneous effects of snow loads as defined in Chapter 7 and Atmospheric Ice Loads as defined in Chapter 10.

Chapter C7

C7.2 GROUND SNOW LOADS, p_g

AT THE END OF THE 4TH TO LAST PARAGRAPH CHANGE:

For example, a ground snow load based on a 3.3% annual probability of being exceeded (30-yr mean recurrence interval) should be multiplied by 1.18 to generate a value of p_g for use in Eq. ~~7-1~~7.3-1.

C7.7 DRIFTS ON LOWER ROOFS (AERODYNAMIC SHADE)

REVISE END OF 4TH TO LAST PARAGRAPH AND INSERT NEW PARAGRAPH BELOW.

The drift load provisions cover most, but not all, situations. Finney (1939) and O'Rourke (1989) document a larger drift than would have been expected based on the length of the upper roof. The larger drift was caused when snow on a somewhat lower roof, upwind of the upper roof, formed a drift between those two roofs allowing snow from the upwind lower roof to be carried up onto the upper roof then into the drift on its downwind side. It was suggested that the sum of the lengths of both roofs could be used to calculate the size of the leeward drift. ~~The issue of potential reduction in leeward drift size at a roof step due to a parapet wall is discussed in O'Rourke (2007).~~

Generally, the addition of a parapet wall on a high roof cannot be relied upon to substantially reduce the leeward snow drift loading on an adjacent or adjoining lower roof. This is particularly true for the case of a single parapet wall of typical height located at the roof step. Also, the addition of a parapet wall at a roof step would increase the space available for windward drift formation on the lower roof. The issue of potential reduction in leeward drift size at a roof step due to a parapet wall is discussed in more detail in O'Rourke (2007).

C7.8 ROOF PROJECTIONS AND PARAPETS

NEW PARAGRAPH AT THE END OF THE SECTION.

Refer to Section C7.7 for more description of the effects that a parapet wall at a high roof can have on the snow drift loading at an adjacent or adjoining lower roof.

C7.13 OTHER ROOFS AND SITES

Example 2

CHANGE "I" TO "I_s" IN 2 LOCATIONS. CHANGE THE "Tangent of the vertical angle from eaves to crown" FROM "= 5/40" TO "= 15/40"

…

Flat-Roof Snow Load:

$p_f = 0.7C_eC_tI_sp_g$

where

p_g = 25 lb/ft^2 (1.20 kN/m^2) (from Fig. 7-1)
C_e = 0.9 (from Table 7-2 for Terrain Category B and a fully exposed roof)
C_t = 1.0 (from Table 7-3)
I_s = 1.1 (from Table 1.5-2)

Thus:
p_f = (0.7)(0.9)(1.0)(1.1)(25) = 17 lb/ft^2
In SI: p_f = (0.7)(0.9)(1.0)(1.1)(1.19) = 0.83 kN/m^2
Tangent of vertical angle from eaves to crown = 15/40 = 0.375
Angle = 21°.
Because the vertical angle exceeds 10°, the minimum roof snow load, p_m, does not apply. See Section 7.3.4.

Example 3

CHANGE "I" TO "I_s" IN 4 LOCATIONS.

…

High Roof:

$p_f = 0.7C_eC_tI_sp_g$

where

p_g = 40 lb/ft^2 (1.92 kN/m^2) (given)
C_e = 0.9 (from Table 7-2)
C_t = 1.0 (from Table 7-3)
I_s = 1.1 (from Table 1.5-2)
…

Low Roof:

$p_f = 0.7C_eC_tI_sp_g$

where

p_g = 40 lb/ft^2 (1.92 kN/m^2) (given)
C_e = 1.0 (from Table 7-2) partially exposed due to presence of high roof
C_t = 1.0 (from Table 7-3)
I_s = 0.8 (from Table 1.5-2)

Figure 22-7 Maximum Considered Earthquake Geometric Mean (MCE_G) PGA, %g, Site Class B for the Conterminous United States.

Figure 22-7 (*continued*) Maximum Considered Earthquake Geometric Mean (MCE_G) PGA, %g, Site Class B for the Conterminous United States.

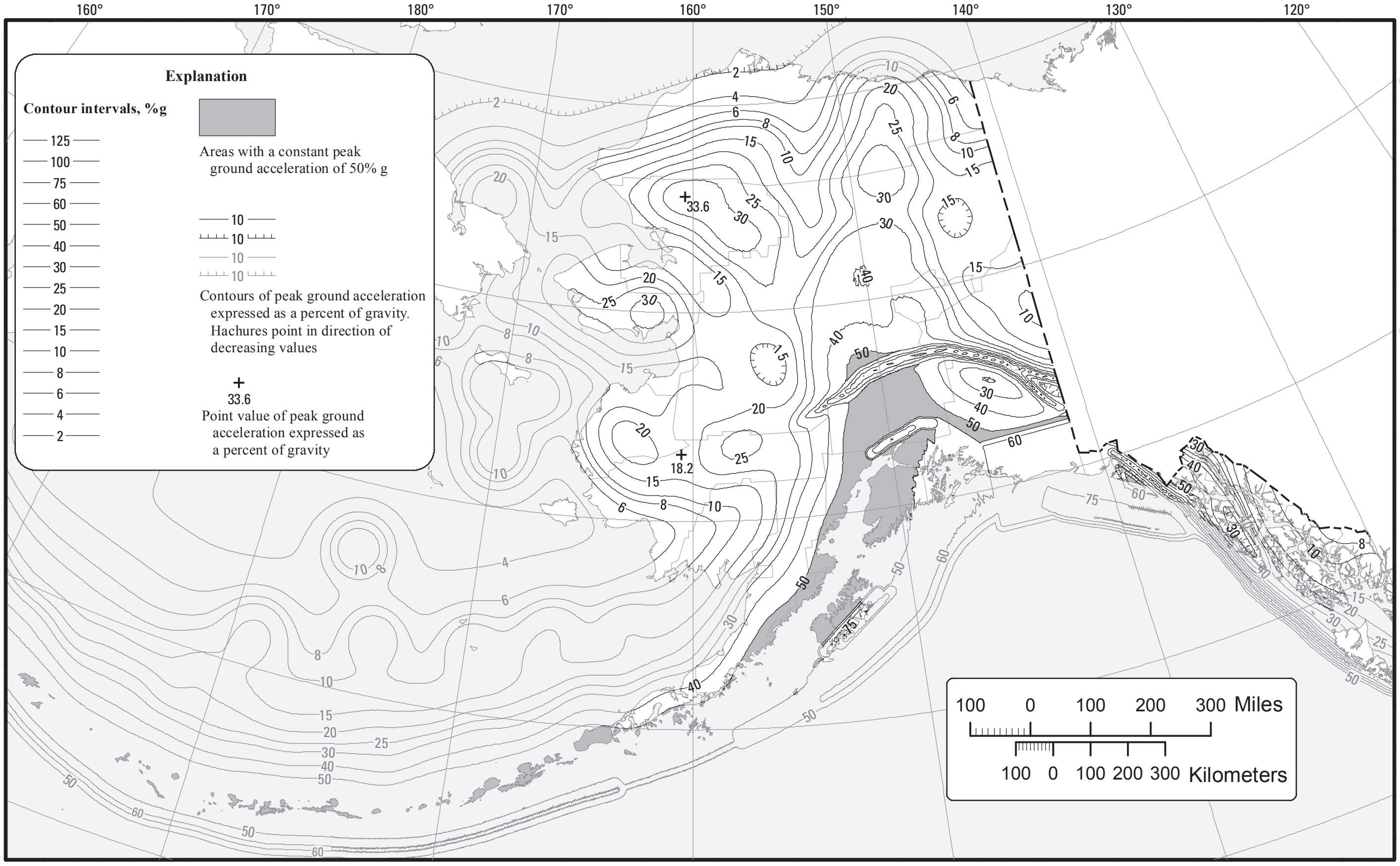


Figure 22-8 Maximum Considered Earthquake Geometric Mean (MCE_G) PGA, %g, Site Class B for Alaska.

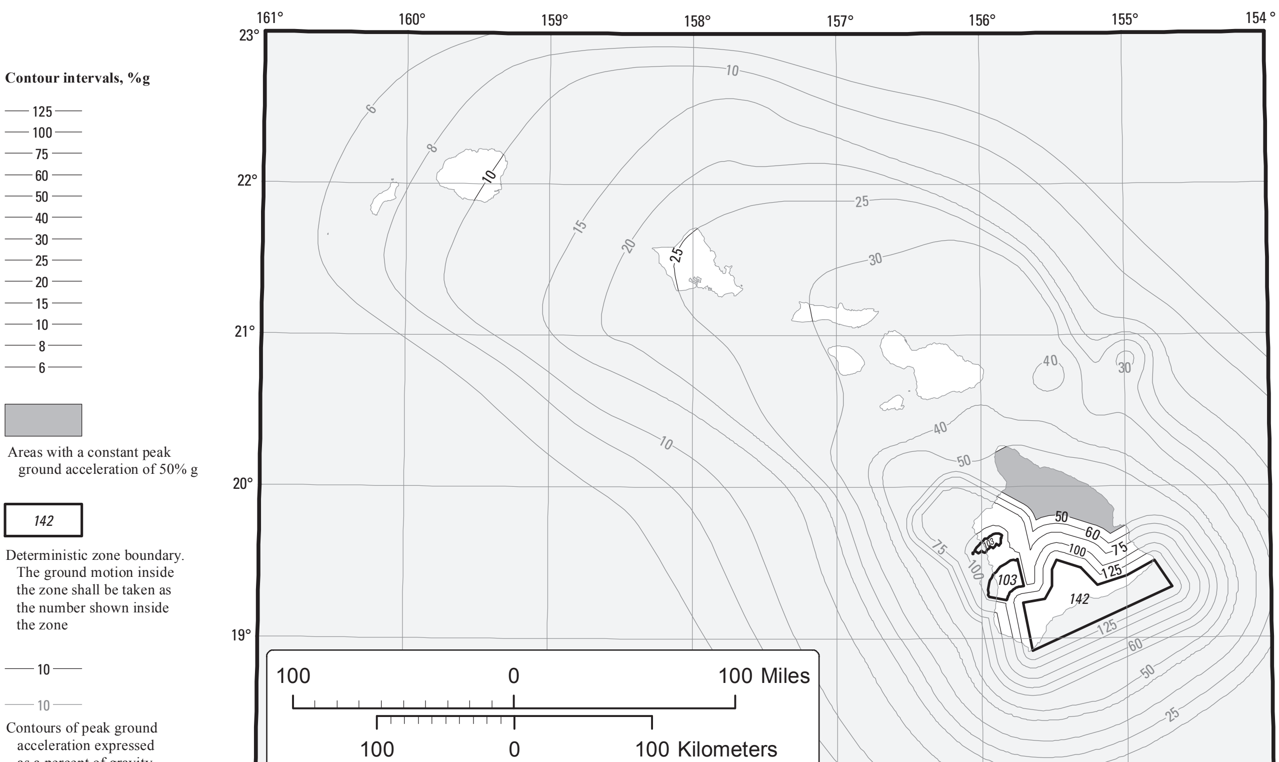


Figure 22-9 Maximum Considered Earthquake Geometric Mean (MCE_G) PGA, %g, Site Class B for Hawaii.

2010 Edition of ASCE 7
Minimum Design Loads for Buildings and Other Structures

Errata

This document, containing the errata to ASCE 7-10, is periodically updated and posted on the SEI website at www.SEInstitute.org The errata are organized by date in descending order (most recent to furthest past) hence regular users of this document need only review the errata posted since their previous use. This document will be regularly updated as errata are identified.

Errata posting: January 11, 2011

Errata Posted on January 11, 2011

CONTENTS

Revise page xlii:

CHAPTER 1:

Revise the titles of Sections 1.2 and 1.1.2 (1.2.2) and a definition as follows:

1.2 DEFINITIONS AND ~~NOTATIONS~~ SYMBOLS

RISK CATEGORY: A categorization of buildings and other structures for determination of flood, ~~wind,~~ snow, ice, and earthquake loads based on the risk associated with unacceptable performance. See Table 1.5-1.

1.2.2 ~~1.1.2~~ Symbols ~~and Notations~~

N Lateral ~~N~~notional load used to evaluate conformance with minimum structural integrity criteria

Revise Section 1.3.1 as follows:

1.3.1 Strength and stiffness. Buildings and other structures, and all parts thereof, shall be designed and constructed with adequate strength and stiffness to provide structural stability, protect nonstructural components and systems ~~from unacceptable damage~~, and meet the serviceability requirements of Section 1.3.2.

Revise cross references in Section 1.4 as follows:

1.4 GENERAL STRUCTURAL INTEGRITY All structures shall be provided with a continuous load path in accordance with the requirements of Section 1.4.2~~1~~ and shall have a complete lateral force-resisting system with adequate strength to resist the forces indicated in Section 1.4.3~~2~~. All members of the structural system shall be connected to their supporting members in accordance with Section 1.4.4~~3~~. Structural walls shall be anchored to diaphragms and supports in accordance with Section 1.4.5~~4~~. The effects on the structure and its components due to the forces stipulated in this section shall be taken as the notional load, *N*, and combined with the effects of other loads in accordance with the load combinations of Section 2.3 or

2.4. Where material resistance is dependent on load duration, notional loads are permitted to be taken as having a duration of 10 minutes. Structures designed in conformance with the requirements of this Standard for Seismic Design Categories B, C, D, E, or F shall be deemed to comply with the requirements of Sections ~~1.4.1,~~ 1.4.2, 1.4.3, 1.4.4 and 1.4.5.

Revise Section 1.4.1 as follows:

1.4.1 Load Combinations for Integrity Loads. The notional loads, N, specified in Sections 1.4.2 through 1.4.5 shall be combined with other ~~dead and live~~ loads in accordance with Section 1.4.1.1 for strength design and 1.4.1.2 for allowable stress design.

Revise equation A of Section 1.4.1.2 by including a plus sign:

A. $D + 0.7N$

Revise the third item for Risk Category III in Table 1.5-1 as shown below – Note the addition of the reference to Footnote "a" at the end of the item:

Buildings and other structures not included in Risk Category IV (including, but not limited to, facilities that manufacture, process, handle, store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, hazardous waste, or explosives) containing toxic or explosive substances where ~~their~~ the quantity of the material exceeds a threshold quantity established by the authority having jurisdiction and is sufficient to pose a threat to the public if released. [a]

Revise the third item for Risk Category IV in Table 1.5-1 as shown below:

Buildings and other structures (including, but not limited to, facilities that manufacture, process, handle, store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, or hazardous waste) containing sufficient quantities of highly toxic substances where the quantity of the material exceeds a threshold quantity established by the authority having jurisdiction ~~to be dangerous to the public if released~~ and is sufficient to pose a threat to the public if released. [a]

Revise footnote "a" of Table 1.5-1 as follows:

[a] Buildings and other structures containing toxic, highly toxic, or explosive substances shall be eligible for classification to a lower Risk Category if it can be demonstrated to the satisfaction of the authority having jurisdiction by a hazard assessment as described in ~~Section 1.5.2~~ Section 1.5.3 that a release of the substances is commensurate with the risk associated with that Risk Category.

CHAPTER 2:

Revise Footnote 1 of Chapter 2 (bottom of page 7 and 8) as follows:

[1] The same *E* from Section ~~1.4 and~~ 12.4 is used for both Sections 2.3.2 and 2.4.1. Refer to the Chapter 11 Commentary for the Seismic Provisions.

CHAPTER 3:

Revise the designations of the footnotes to Table 3.2-1 as follows ("c" to "b" : "d" to "c" and "b" to "d"):

[a] Design lateral soil loads are given for moist conditions for the specified soils at their optimum densities. Actual field conditions shall govern. Submerged or saturated soil pressures shall include the weight of the buoyant soil plus the hydrostatic loads.

~~c~~ [b] For relatively rigid walls, as when braced by floors, the design lateral soil load shall be increased for sand and gravel type soils to 60 psf (9.43 kN/m^2) per foot (meter) of depth. Basement walls extending not more than 8 ft (2.44 m) below grade and supporting light floor systems are not considered as being relatively rigid walls.

~~d~~ c For relatively rigid walls, as when braced by floors, the design lateral load shall be increased for silt and clay type soils to 100 psf (15.71 kN/m^2) per foot (meter) of depth. Basement walls extending not more than 8 ft (2.44 m) below grade and supporting light floor systems are not considered as being relatively rigid walls.

~~b~~ d Unsuitable as backfill material.

CHAPTER 4:

Revise Section 4.3.1 as follows:

4.3.1 Required Live Loads: The live loads used in the design of buildings and other structures shall be the maximum loads expected by the intended use or occupancy, but shall in no case be less than the minimum uniformly distributed unit loads required by Table 4-1~~, including any permissible reduction~~.

Revise the title of Section 4.5 as follows:

4.5 LOADS ON HANDRAIL, GUARDRAIL, GRAB BAR AND VEHICLE BARRIER SYSTEMS, AND FIXED LADDERS

Revise the first paragraph of Section 4.5.1 as follows:

All handrail and guardrail systems shall be designed to resist a single concentrated load of 200 lb (0.89 kN) applied in any direction at any point on the handrail or top rail ~~and to transfer this load through the supports to the structure~~ to produce the maximum load effect on the element being considered and to transfer this load through the supports to the structure.

Revise the first sentence of the third paragraph of Section 4.5.1 as follows:

Intermediate rails (all those except the handrail or top rail), and panel fillers shall be designed to withstand a horizontally applied normal load of 50 lb (0.22 kN) on an area not to exceed 12 in. by 12 in. (305 mm by 305 mm) including openings and space between rails and located so as to produce the maximum load effects.

Revise Section 4.5.3 as follows:

4.5.3 Loads on Vehicle Barrier Systems: Vehicle barrier systems for passenger vehicles shall be designed to resist a single load of 6,000 lb (26.70 kN) applied horizontally in any direction to the barrier system, and shall have anchorages or attachments capable of transferring this load to the structure. For design of the system, the load shall be assumed to act at heights between 1 ft 6 in. (460 mm) and 2 ft 3 in. (686 mm) above the floor or ramp surface, located ~~selected~~ to produce the maximum load effects. The load shall be applied on an area not to exceed 12 in. by 12 in. (305 mm by 305 mm) ~~and located so as to produce the maximum load effects~~. This load is not required to act concurrently with any handrail or guardrail system loadings specified in Section 4.5.1. Vehicle barrier systems in garages accommodating trucks and buses shall be designed in accordance with *AASHTO LRFD Bridge Design Specifi cations*.

Revise Table 4-1 as follows (entire revised table included as separate file):

a. "Assembly areas." Delete "and theaters" from the title and add a sixth item: "Other assembly areas" – "100 (4.79)[a] "
b. "Balconies and decks." Change from "occupancy" to "area" in the second column so that it reads: "1.5 times the live load for the area served,"
c. "Corridors, Other floors." Relocate "same as occupancy served except as indicated" from the first column to the second column.
d. "Helipad." Change from "Nonreducible" to "nonreducible".
e. "Roofs, Roofs used for assembly purposes." Change from "assembly purposes" to "other occupancies" so that it reads: "Roofs used for other occupancies".
f. "Roofs, Roofs used for other occupancies." Change from "occupancies" to "special purposes" so that it reads: "Roofs used for other special purposes" .
g. "Roofs, Awnings and canopies, Fabric construction supported by a skeleton structure." At the third column, delete "300 (1.33) applied to skeleton structure" so that there is nothing specified.
h. "Roofs, Awnings and canopies, Screen enclosure support frame." At the second column, change from "applied to the roof frame members only, not the screen" to "based on the tributary area of the roof supported by the frame" so that it reads: "5 (0.24) nonreducible and based on the tributary area of the roof supported by the frame".
i. "Roofs, Awnings and canopies, Screen enclosure support frame." At the third column, delete "applied to supporting roof frame members only" so that it reads: "200 (0.89)".
j. Footnote (c). Change from "per" to "in accordance with" and add "therein" after "allowance" so that it reads: "…trucks and buses shall be in accordance with AASHTO…dynamic load allowance therein are not required…".
k. Footnote (f). Change from "shall not be concurrent" to "are not required to act concurrently".
l. Footnote (g). Change from "need not be assumed" to "is not required" and add "of" after "area" so that it reads: "…over an area of 4.5 in. by 4.5 in…"
m. Footnote (m). At the beginning of the second sentence, change from "At the trusses," to "For attics constructed of trusses," .
n. Footnote (n). Change from Section 4.8.1 to 4.8.2.
o. Footnote (o). Change from "occupancies" to "special purposes" so that it reads: "Roofs used for other special purposes shall…".

CHAPTER 7:

Revise equation embedded in Section 7.6.1 as shown below (h_d is removed from under the radical sign):

… and horizontal extent from the ridge ~~$8\sqrt{Sh_d}/3$~~ $\frac{8}{3}h_d\sqrt{S}$ where h_d is the …

CHAPTER 11:

Revise the symbol in Section 11.3 as follows:

Cs = seismic response coefficient determined in Section 12.8.1.1 or ~~and~~ 19.3.1 (dimensionless)

Revise the heading of Section 11.4.6 as follows:

11.4.6 Risk-Targeted Maximum Considered Earthquake (MCER) Response Spectrum.

Revise Section 11.5.1 as follows (I sub C should be I sub e):

11.5.1 Importance Factor. An importance factor, ~~I_C~~ I_e , shall be assigned to each structure in accordance with Table 1.5-2.

Revise the definition for PGA in Section 11.8.3 following Equation 11.8-1 as follows:

PGA = Mapped MCE_G peak ground acceleration shown in Figs. ~~22-6 through 22-10~~ 22-7 through 22-11.

CHAPTER 12:

Revise line A15 of Table 12.2-1 as follows:

15.	Light-frame (wood) walls sheathed with wood structural panels rated for shear resistance ~~or steel sheets~~	~~14.1 and~~ 14.5	6½	3	4	NL	NL	65	65	65

Revise line D3 of Table 12.2-1 as follows (add reference to Note m in description of system):

3.	Special reinforced concrete shear walls [l, m]	14.2	7	2 ½	5 ½	NL	NL	NL	NL	NL

Revise line E2 of Table 12.2-1 as follows (add reference to Note m in description of system):

2.	Special reinforced concrete shear walls [l, m]	14.2	6 ½	2 ½	5	NL	NL	160	100	100

Revise the description of variables following Equation 12.10-1 as follows:

F_{px} = the diaphragm design force at Level x

Revise line A16 of Table 12.14-1 as follows:

16.	Light-frame (cold-formed steel) wall systems using fl at strap bracing	14.1 ~~and 14.5~~	4	P	P	P

Revise line B22 of Table 12.14-1 as follows:

22.	Light-frame (wood) walls sheathed with wood structural panels rated for shear resistance ~~or steel sheets~~	14.5	7	P	P	P

Revise Section ***12.4.2.3 Seismic Load Combinations***, to agree with sections 2.3.2 and 2.4.1, as follows:

Basic Combinations for Strength Design (see Sections 2.3.2 and 2.2 for notation).

5. $(1.2 + 0.2S_{DS})D + \rho Q_E + L + 0.2S$

7 ~~6~~. $(0.9 - 0.2S_{DS})D + \rho Q_E$ ~~$+1.6H$~~

NOTES:

1. (no change)
2. ~~The load factor on H shall be set equal to zero in combination 7 if the structural action due to H counteracts that due to E.~~ Where fluid loads F are present, they shall be included with the same load factor as dead load D in combinations 1 through 5 and 7. Where load H are present, they shall be included as follows:
   a. where the effect of H adds to the primary variable load effect, include H with a load factor of 1.6;
   b. where the effect of H resists the primary variable load effect, include H with a load factor of 0.9 where the load is permanent or a load factor of 0 for all other conditions.

Basic Combinations for Allowable Stress Design (see Sections 2.4.1 and 2.2 for notation).

5. $(1.0 + 0.14S_{DS})D$ + ~~H + F +~~ $0.7\ \rho Q_E$

6b ~~6~~. $(1.0 + 0.105_{DS})D$ + ~~H + F +~~ $0.525\ \rho Q_E + 0.75L + 0.75$~~($L_r$ or~~ S ~~or R)~~

8. $(0.6 – 0.14\ S_{DS})D + 0.7\rho Q_E$ ~~$+H$~~

NOTES:

Where fluid loads F are present, they shall be included in combinations 1 through 6 and 8 with the same factor as that used for dead load D.

Where load H is present, it shall be included as follows:

1. where the effect of H adds to the primary variable load effect, include H with a load factor of 1.0;
2. where the effect of H resists the primary variable load effect, include H with a load factor of 0.6 where the load is permanent or a load factor of 0 for all other conditions.

Revise Section ***12.4.3.2 Load Combinations with Overstrength Factor***, to agree with Sections 2.3.2 and 2.4.1, as follows:

Basic Combinations for Strength Design (see Sections 2.3.2 and 2.2 for notation).

5. $(1.2 + 0.2S_{DS})D + \Omega_o Q_E + L + 0.2S$

7 ~~6~~. $(0.9 – 0.2S_{DS})D + \Omega_o Q_E$ ~~$+1.6H$~~

NOTES:

1. (no change)
2. ~~The load factor on H shall be set equal to zero in combination 7 if the structural action due to H counteracts that due to E.~~ Where fluid loads F are present, they shall be included with the same load factor as dead load D in combinations 1 through 5 and 7. Where load H are present, they shall be included as follows:
   a. where the effect of H adds to the primary variable load effect, include H with a load factor of 1.6;
   b. where the effect of H resists the primary variable load effect, include H with a load factor of 0.9 where the load is permanent or a load factor of 0 for all other conditions.

   Where lateral earth pressure provides resistance to structural actions from other forces, it shall not be included in H but shall be included in the design resistance.

Basic Combinations for Allowable Stress Design with Overstrength Factor (see Sections 2.4.1 and 2.2 for notation).

5. $(1.0 + 0.14S_{DS})D$ + ~~H + F +~~ $0.7\Omega_o Q_E$

6b ~~6~~. $(1.0 + 0.105_{DS})D$ + ~~H + F +~~ $0.525\ \rho Q_E + 0.75L + 0.75$~~($L_r$ or~~ S ~~or R)~~

8. $(0.6 – 0.14S_{DS})D + 0.7\Omega_o\ Q_E$ ~~$+H$~~

NOTES:

Where fluid loads F are present, they shall be included in combinations 1 through 6 and 8 with the same factor as that used for dead load D.

Where load H is present, it shall be included as follows:

1. where the effect of H adds to the primary variable load effect, include H with a load factor of 1.0;
2. where the effect of H resists the primary variable load effect, include H with a load factor of 0.6 where the load is permanent or a load factor of 0 for all other conditions.

Revise Section ***12.14.3.1Seismic Load Effect***, to agree with Sections 2.3.2 and 2.4.1, as follows:

Basic Combinations for Strength Design (see Sections 2.3.2 and 2.2 for notation).

5. $(1.2 + 0.2S_{DS})D + Q_E + L + 0.2S$

7. $(0.9 – 0.2S_{DS})D + Q_E$ ~~$+1.6H$~~

NOTES:

1. (no change)

2. ~~The load factor on H shall be set equal to zero in combination 7 if the structural action due to H counteracts that due to E.~~ Where fluid loads F are present, they shall be included with the same load factor as dead load D in combinations 1 through 5 and 7. Where load H are present, they shall be included as follows:
   a. where the effect of H adds to the primary variable load effect, include H with a load factor of 1.6;
   b. where the effect of H resists the primary variable load effect, include H with a load factor of 0.9 where the load is permanent or a load factor of 0 for all other conditions.

   Where lateral earth pressure provides resistance to structural actions from other forces, it shall not be included in H but shall be included in the design resistance.

Basic Combinations for Allowable Stress Design (see Sections 2.4.1 and 2.2 for notation).

5. $(1.0 + 0.14S_{DS})D +$ ~~H + F +~~ $0.7\ Q_E$

6b ~~6~~. $(1.0 + 0.105_{DS})D +$ ~~H + F +~~ $0.525Q_E + 0.75L + 0.75S$ ~~(L_r or S or R)~~

8. $(0.6 – 0.14\ S_{DS})D + 0.7Q_E$ ~~$+H$~~

NOTES:

Where fluid loads F are present, they shall be included in combinations 1 through 6 and 8 with the same factor as that used for dead load D.

Where load H is present, it shall be included as follows:

1. where the effect of H adds to the primary variable load effect, include H with a load factor of 1.0;
2. where the effect of H resists the primary variable load effect, include H with a load factor of 0.6 where the load is permanent or a load factor of 0 for all other conditions.

Revise Section ***12.14.3.2 Seismic Load Effect Including a 2.5 Overstrength Factor***, to agree with Sections 2.3.2 and 2.4.1, as follows:

Basic Combinations for Strength Design (see Sections 2.3.2 and 2.2 for notation).

5. $(1.2 + 0.2S_{DS})D + 2.5Q_E + L + 0.2S$

7. $(0.9 – 0.2S_{DS})D + 2.5Q_E$ ~~$+1.6H$~~

NOTES:

1. (no change)
2. ~~The load factor on H shall be set equal to zero in combination 7 if the structural action due to H counteracts that due to E.~~ Where fluid loads F are present, they shall be included with the same load factor as dead load D in combinations 1 through 5 and 7. Where load H are present, they shall be included as follows:
   a. where the effect of H adds to the primary variable load effect, include H with a load factor of 1.6;
   b. where the effect of H resists the primary variable load effect, include H with a load factor of 0.9 where the load is permanent or a load factor of 0 for all other conditions.

   Where lateral earth pressure provides resistance to structural actions from other forces, it shall not be included in H but shall be included in the design resistance.

Basic Combinations for Allowable Stress Design with Overstrength Factor (see Sections 2.4.1 and 2.2 for notation).

5. $(1.0 + 0.14S_{DS})D +$ ~~H + F +~~ $1.75Q_E$

6b ~~6~~. $(1.0 + 0.105_{DS})D +$ ~~H + F +~~ $1.313Q_E + 0.75L + 0.75S$ ~~(L_r or S or R)~~

8. $(0.6 – 0.14S_{DS})D + 1.75Q_E$ ~~$+H$~~

NOTES:

Where fluid loads F are present, they shall be included in combinations 1 through 6 and 8 with the same factor as that used for dead load D.

Where load H is present, it shall be included as follows:

1. where the effect of H adds to the primary variable load effect, include H with a load factor of 1.0;

2. where the effect of *H* resists the primary variable load effect, include *H* with a load factor of 0.6 where the load is permanent or a load factor of 0 for all other conditions.

CHAPTER 13:

Revise the 4th sentence of the 2nd paragraph of Section 13.4 as follows:

The component forces shall be those determined in Section 13.3.1. ~~, except that modifications to *Fp* and *Rp* due to anchorage conditions need not be considered.~~

Revise the header of the third column of Table 13.5-1 to remove the superscript "b":

TABLE 13.5-1 COEFFICIENTS FOR ARCHITECTURAL COMPONENTS

Architectural Component	a_p[a]	R_p~~[b]~~

Revise the first paragraph of Section 13.4.2.2 as follows:

13.4.2.2 Anchors in Masonry: Anchors in masonry shall be designed in accordance with TMS 402/ACI ~~503~~530/ASCE 5. Anchors shall be designed to be governed by the tensile or shear strength of a ductile steel element.

EXCEPTION: Anchors shall be permitted to be designed so that the support ~~attachment~~ that the anchor is connecting to the structure undergoes ductile yielding at a load level corresponding to anchor forces not greater than their design strength, or the minimum design strength of the anchors shall be at least 2.5 times the factored forces transmitted by the component.

Revise the format of the Exception in Section 13.4.5 as follows:

13.4.5 Power Actuated Fasteners: Power actuated fasteners in concrete or steel shall not be used for sustained tension loads or for brace applications in Seismic Design Categories D, E, or F unless approved for seismic loading. Power actuated fasteners in masonry are not permitted unless approved for seismic loading.

EXCEPTIONS:
1. Power actuated fasteners in concrete used for support of acoustical tile or lay-in panel suspended ceiling applications and distributed systems where the service load on any individual fastener does not exceed 90 lb (400 N).
2. Power actuated fasteners in steel where the service load on any individual fastener does not exceed 250 lb (1,112 N).

Revise the title "EXCEPTION" in Section 13.5.9.1 to "EXCEPTIONS"

CHAPTER 14:

Revise Section 14.1.3.2 as follows:

> ***14.1.3.2 Seismic Requirements for Cold-Formed Steel Structures:*** Where a response modification coefficient, *R*, in accordance with Table 12.2-1 is used for the design of cold-formed steel structures, the structures shall be designed and detailed in accordance with the requirements of AISI S100, ASCE 8, and, for cold-formed steel-special bolted moment frames, AISI S110 as modified in Section 14.1.3.3.

Revise the Exception in Section 14.1.7 as follows:

> **EXCEPTION:** Connection tensile capacity need not exceed the strength required to resist seismic load effects including overstrength factor of ~~Section 12.4.3.2 or Section 12.14.2.2.2~~ Section 12.4.3 or 12.14.3.2. Connections need not be provided where the foundation or supported structure does not rely on the tensile capacity of the piles for stability under the design seismic forces.

Revise Section 14.4.5.6 as follows:

> ***14.4.5.6 Shear Keys:*** Add the following new Section 3.3.6.6 to TMS 402/ACI 530/ASCE 5:
>
> > ***3.3.6.~~11~~6 Shear Keys.*** *The surface of concrete upon which a special reinforced masonry… (remainder of section is unchanged)*

CHAPTER 15:

Revise the formatting of Item 2 of Section 15.4.1 as follows:

2. For nonbuilding systems that have an *R* value provided in Table 15.4-2, the minimum specified value in Eq. 12.8-5 shall be replaced by

   $C_S = 0.044 S_{DS} I_e$ (15.4-1)

   The value of *Cs* shall not be taken as less than 0.03.

   And for nonbuilding structures located where $S_1 \geq 0.6g$, the minimum specified value in Eq. 12.8-6 shall be replaced by

   $C_S = 0.8 S_1 / (R/I_e)$ (15.4-2)

The sentence containing Equation 15.4-4 – the first word, "and", should be capitalized as follows:

> And ~~and~~ for nonbuilding structures located where $S1 \geq 0.6g$, the minimum specified value in Eq. 12.8-6 shall be replaced by
>
> $Cs = 0.5S1/(R/I_e)$ (15.4-4)

In the listing of terms for Equation 15.7-3, the metric units should be added as follows:

> *D* = tank diameter in feet (m)
> *Ws* = total weight of tank shell in pounds (N)

In Table 15.4-2, first column, last line in table should be changed from "standards that are similar to buildings" to "standards that are not similar to buildings".

Modify the heading of Table 15.4-2 as follows (pages 142 and 143):

TABLE 15.4-2 SEISMIC COEFFICIENTS FOR NONBUILDING STRUCTURES NOT SIMILAR TO BUILDINGS

Nonbuilding Structure Type	Detailing Requirements[c]	R	Ω_0	C_d	Structural System And Structural Height, h_n, Limits (ft.)[a,d]				
					A & B	C	D	E	F

Modify entry in Table 15.4-2 as follows:

All steel and reinforced concrete distributed mass cantilever structures not otherwise covered herein including stacks, chimneys, silos, and skirt-supported vertical vessels. ~~and single pedestal or skirt supported~~	15.6.2								
Single pedestal or skirt supported									
Welded steel	15.7.10	2	2[b]	2	NL	NL	NL	NL	NL
Welded steel with special detailing[e]	15.7.10 & 15.7.10.5 a and b.	3	2[b]	2	NL	NL	NL	NL	NL
Prestressed or reinforced concrete	15.7.10	2	2[b]	2	NL	NL	NL	NL	NL
Prestressed or reinforced concrete with special detailing	15.7.10 and 14.2.3.6 ~~and ACI 318 Chapter 21, Sections 21.2 and 21.7~~	3	2[b]	2	NL	NL	NL	NL	NL

Revise paragraph breaks of Section 15.6.1 as follows:

15.6.1 Earth-Retaining Structures: This section applies to all earth-retaining structures assigned to Seismic Design Category D, E, or F. The lateral earth pressures due to earthquake ground motions shall be determined in accordance with Section 11.8.3. *[remove break]* The risk category shall be determined by the proximity of the earth-retaining structure to other buildings and structures. If failure of the earth-retaining structure would affect the adjacent building or structure, the risk category shall not be less than that of the adjacent building or structure. *[add break]*

Earth-retaining walls are permitted to be designed for seismic loads as either yielding or nonyielding walls. Cantilevered reinforced concrete or masonry retaining walls shall be assumed to be yielding walls and shall be designed as simple flexural wall elements.

Revise reference in second paragraph of Section 15.6.5 as follows:

… determined by the risk assessment required by Section ~~1.5.2~~ 1.5.3 or by the authority having jurisdiction that the site may be… *(remainder of section unchanged)*

Section 15.7.6.1 - Clarify the portions of the text that are the "Notes" and that which is the "Exception" in Section 15.7.6.1 as shown below. There is no change to the text itself – boxes and shading added for clarity.

For $T_i > T_L$

$$S_{ai} = \frac{S_{D1}T_L}{T_i^2} \qquad (15.7\text{-}9)$$

NOTES:

a. Where a reference document is used in which the spectral acceleration for the tank shell, and the impulsive component of the liquid is independent of T_i, then $S_{ai} = S_{DS}$.
b. Eq. 15.7-8 and Eq. 15.7-9 shall not be less than the minimum values required in Section 15.4.1 Item 2 multiplied by $\frac{R}{I}$.
c. For tanks in Risk Category IV, the value of the importance factor, I, used for freeboard determination only shall be taken as 1.0.
d. For tanks in Risk Categories I, II, and III, the value of T_L used for freeboard determination are permitted to be set equal to 4 s. The value of the importance factor, I, used for freeboard determination for tanks in Risk Categories I, II, and III shall be the value determined from Table 11.5-1.
e. Impulsive and convective seismic forces for tanks are permitted to be combined using the square root of the sum of the squares (SRSS) method in lieu of the direct sum method shown in Section 15.7.6 and its related subsections.

S_{ac} = the spectral acceleration of the sloshing liquid (convective component) based on the sloshing period T_c and 0.5 percent damping

For $T_c \le T_L$:

$$S_{ac} = \frac{1.5S_{D1}}{T_c} \le 1.5S_{DS} \qquad (15.7\text{-}10)$$

For $T_c > T_L$:

$$S_{ac} = \frac{1.5S_{D1}T_L}{T_c^2} \qquad (15.7\text{-}11)$$

EXCEPTION: For $T_c > 4$ s, S_{ac} is permitted be determined by a site-specific study using one or more of the following methods: (i) the procedures found in Chapter 21, provided such procedures, which rely on ground-motion attenuation equations for computing response spectra, cover the natural period band containing T_c, (ii) ground-motion simulation methods employing seismological models of fault rupture and wave propagation, and (iii) analysis of representative strong-motion accelerogram data with reliable long-period content extending to periods greater than T_c. Site-specific values of S_{ac} shall be based on one standard deviation determinations. However, in no case shall the value of S_{ac} be taken as less than the value determined in accordance with Eq. 15.7-11 using 50% of the mapped value of *TL* from Chapter 22.

The 80 percent limit on S_a required by Sections 21.3 and 21.4 shall not apply to the determination of site-specific values of S_{ac}, which satisfy the requirements of this exception. In determining the value of S_{ac}, the value of *TL* shall not be less than 4 s.

Where

$$T_c = 2\pi\sqrt{\frac{D}{3.68g\tanh\left(\frac{3.68H}{D}\right)}} \qquad (15.7\text{-}12)$$

and where

D = the tank diameter in ft (m),
H = liquid height in ft (m),
g = acceleration due to gravity in consistent units
W_i = impulsive weight (impulsive component of liquid, roof and equipment, shell, bottom, and internal elements)
W_c = the portion of the liquid weight sloshing

15.7.6.1.1 Distribution of Hydrodynamic and Inertia Forces Unless otherwise required by the appropriate reference document listed in Chapter 23, the method given in ACI 350.3 is permitted to be used to determine the vertical and horizontal distribution of the hydrodynamic and inertia forces on the walls of circular and rectangular tanks.

CHAPTER 17:

Revise item 3 of Section 17.4.1 as follows:

a. The structure above the isolation interface is less than or equal to four stories or 65 ft (19.8 m) in structural height, h_n ~~measured from the base as defined in Section 11.2~~.

Revise the second paragraph of 17.5.4.2 as follows:

The R_I factor shall be based on the type of seismic force-resisting system used for the structure above the isolation system and shall be three-eighths of the value of R given in Table 12.2-1, Table 15.4-1 or Table 15.4-2, as appropriate, with a maximum value not greater than 2.0 and a minimum value of 1.0.

Revise the title of Section 17.5.4.3 by italicizing the symbol V_S to match outline level formatting.

17.5.4.3 Limits on ~~V_S~~ V_S

Clarify what text is part of the Exceptions in 17.6.4.2 (the sentence beginning "The design…" and ending "… Section 17.5.4.3." is not part of the Exception). There is no change to the text itself.

…. from the dynamic analysis reduced by a factor of *RI* as determined in accordance with Section 17.5.4.2. The design lateral shear force on the structure above the isolation system, if regular in configuration, shall not be taken as less than 80 percent of *Vs*, or less than the limits specified by Section 17.5.4.3.

EXCEPTION: The lateral shear force on the structure above the isolation system, if regular in configuration, is permitted to be taken as less than 80 percent, but shall not be less than 60 percent of *Vs*, where the response-history procedure is used for analysis of the seismically isolated structure.

The design lateral shear force on the structure above the isolation system, if irregular in configuration, shall not be taken as less than *Vs* or less than the limits specified by Section 17.5.4.3.

EXCEPTION: The design lateral shear force on the structure above the isolation system, if irregular in configuration, is permitted to be taken as less than 100 percent, but shall not be less than 80 percent of *Vs*, where the response-history procedure is used for analysis of the seismically isolated structure.

17.6.4.3 Scaling of Results…

Revise notations following Eq. 17.5-9 as follows:

Where

F_x = portion of V_s that is assigned to Level x
V_s = total lateral seismic design force or shear on elements above the isolation system as prescribed by Eq. 17.5-8
w_x = portion of W that is located at or assigned to Level ~~x~~ <u>i , n, or x, respectively</u>
h_x = height above the base of Level ~~x~~ <u>i , n, or x, respectively</u>

CHAPTER 18:

Revise Section 18.1.3 as follows:

~~h_r = height of the structure above the base to the roof level, Section 18.5.2.3~~

Revise Eq. 18.5-3 as follows *(the subscript in the denominator is "n" not "r")*:

$$\phi_{i1} = h_i / h_{\not{r}\,\underline{n}} \qquad (18.5\text{-}3)$$

No change to equation 18.5-4

where:

h_i = the height ~~of the structure~~ above the base to Level i
$h_{\not{r}\,\underline{n}}$ = the <u>structural</u> height ~~of the structure above the base to the roof level~~ <u>as defined in Section 11.2</u>
w_i = the portion of the total effective seismic weight, W, located at or assigned to Level i

CHAPTER 19:

Clarify the end of the Exception in Section 19.2.1.2 as follows *(the sentence starting with "The value…" is not part of the Exception)*:

….value of r shall be determined by linear interpolation.

EXCEPTION: For structures supported on point-bearing piles and in all other cases where the foundation soil consists of a soft stratum of reasonably uniform properties underlain by a much stiffer, rock-like deposit with an abrupt increase in stiffness, the factor β_o in Eq. 19.2-9 shall be replaced by β_0' if $\frac{4D_s}{v_s\tilde{T}} < 1$ where D_s is the total depth of the stratum. β_0' shall be determined as follows:

$$\beta_o' = \left(\frac{4D_s}{v_s\tilde{T}}\right)^2 \beta_o \qquad (19.2\text{-}12)$$

The value of $\tilde{\beta}$ computed from Eq. 19.2-9, both with or without the adjustment represented by Eq. 19.2-12, shall in no case be taken as less than $\tilde{\beta}$ = 0.05 or greater than $\tilde{\beta}$ = 0.20.

CHAPTER 21:

Revise Section 21.2.1.1 as follows:

21.2.1.1 Method 1. At each spectral response period for which the acceleration is computed, ordinates of the probabilistic ground-motion response spectrum shall be determined as the product of the risk coefficient, C_R, and the spectral response acceleration from a 5 percent damped acceleration response spectrum having a 2 percent probability of exceedance within a 50-yr. period. The value of the risk coefficient, C_R, shall be determined using values of C_{RS} and C_{R1} from Figs. 22-17 and 22-18 ~~22-3 and 22-4~~, respectively. At spectral response periods less than or equal to 0.2 second, C_R shall be taken as equal to C_{RS}. At spectral response periods greater than or equal to 1.0 second, C_R shall be taken as equal to C_{R1}. At response spectral periods greater than 0.2 second and less than 1.0 second, C_R shall be based on linear interpolation of C_{RS} and C_{R1}.

CHAPTER 22:

Revise first paragraph as follows:

Contained in this chapter are Figs. 22-1 through 22-6, which provide the risk-targeted ~~adjusted~~ maximum considered earthquake (MCE_R) ground motion parameters S_S and S_1; Figs. 22-17 and 22-18, which provide the risk coefficients C_{RS} and C_{R1}; and Figs. 22-12 through 22-15, which provide the long-period transition periods T_L for use in applying the seismic provisions of this standard. S_S is the risk- targeted ~~adjusted~~ MCE_R, 5 percent damped, spectral response acceleration parameter at short periods as defined in Section 11.4.1. S_1 is the risk-targeted ~~mapped~~ MCE_R ground motion, 5 percent damped, spectral response acceleration parameter at a period of 1 s as defined in Section 11.4.1. C_{RS} is the mapped risk coefficient at short periods used in Section 21.2.1.1. C_{R1} is the mapped risk coefficient at a period of 1 s used in Section 21.2.1.1. T_L is the mapped long-period transition period used in Section 11.4.5.

Revise the titles of the following figures as shown below:

Figure 22-1 S_S Risk-~~Adjusted~~ Targeted Maximum Considered Earthquake (MCE_R) Ground Motion for the Conterminous United States of 0.2 s Spectral Response Acceleration (5% of Critical Damping), Site Class B.

Figure 22-2 S_1 Risk-~~Adjusted~~ Targeted Maximum Considered Earthquake (MCE_R) Ground Motion for the Conterminous United States of 1 s Spectral Response Acceleration (5% of Critical Damping), Site Class B

Figure 22-3 S_S Risk-~~Adjusted~~ Targeted Maximum Considered Earthquake (MCE_R) Ground Motion for Alaska of 0.2 s Spectral Response Acceleration (5% of Critical Damping), Site Class B

Figure 22-4 S_1 Risk-~~Adjusted~~ Targeted Maximum Considered Earthquake (MCE_R) Ground Motion for Alaska of 1.0s Spectral Response Acceleration (5% of Critical Damping), Site Class B

Figure 22-5 S_S and S_1 Risk-~~Adjusted~~ Targeted Maximum Considered Earthquake (MCE_R) Ground Motion for Hawaii of 0.2 and 1.0 s Spectral Response Acceleration (5% of Critical Damping), Site Class B

Figure 22-6 S_S and S_1 Risk-~~Adjusted~~ Targeted Maximum Considered Earthquake (MCE_R) Ground Motion for Puerto Rico and the United States Virgin Islands of 0.2 and 1.0 s Spectral Response Acceleration (5% of Critical Damping), Site Class B

Figure 22-14 Mapped Long-Period Transition Period, TL (s), for ~~the~~ Hawaii.

Figure 22-16 Mapped Long-Period Transition Period, *TL* (s), for ~~Puerto~~ Guam and American Samoa.

CHAPTER 26:

Revise text in first box in Figure 26.1-1 as follows:

Chapter 26- General Requirements: ~~Use~~ Used to determine….

Revise the title and first sentence of Section 26.3 as follows:

26.3 SYMBOLS ~~AND NOTATION~~: The following symbols ~~and notation~~ apply only to the provisions of Chapters 26 through 31:

Revise the titles of the basic wind speed maps as follows:

Figure 26.5-1A Basic Wind Speeds for ~~Occupancy~~ Risk Category II Buildings and Other Structures.

Figure 26.5-1B Basic Wind Speeds for ~~Occupancy~~ Risk Category III and IV Buildings and Other Structures.

Figure 26.5-1C Basic Wind Speeds for ~~Occupancy~~ Risk Category I Buildings and Other Structures.

Revise the first paragraph of Section 26.8.1 as follows:

26.8.1 Wind Speed-Up over Hills, Ridges, and Escarpments: Wind speed-up effects at isolated hills, ridges, and escarpments constituting abrupt changes in the general topography, located in any exposure category, shall be included in the ~~design~~ determination of the wind loads when buildings….

Revise the last paragraph of Section 26.8.2 as follows:

If site conditions and locations of buildings and other structures do not meet all the conditions specified in Section 26.8.1 then K_{zt} = 1.0.

Revise the first sentence of Section 26.9.2 as follows:

26.9.2 Frequency Determination. To determine whether a building or other structure is rigid or flexible as defined…

Revise the last paragraph in Section 26.10.3.1 as follows (add the word "other" in three places):

For Risk Category II buildings and other structures and Risk Category III buildings and other structures, except health care facilities, the wind-borne debris region shall be based on Fig. 26.5-1A. For Risk Category III health care facilities and Risk Category IV buildings and other structures, the wind-borne debris region shall be based on Fig. 26.5-1B. Risk Categories shall be determined in accordance with Section 1.5.

Revise the first sentence of the last paragraph of Section 26.10.3.2 as follows:

> Glazing and impact-protective systems in buildings and other structures classified as Risk Category IV in accordance with Section 1.5 shall…..

CHAPTER 27:

Relocate Section 27.4.7 to become Section 27.1.5 so that the requirements of the section are applicable to wind loads calculated using either Part I or Part II of Chapter 27:

> **27.1.5** ~~27.4.7~~ **Minimum Design Wind Loads.** The wind load to be used in the design of the MWFRS for an enclosed or partially enclosed building shall not be less than 16 lb/ft2 (0.77 kN/m2) multiplied by the wall area of the building and 8 lb/ft^2 (0.38 kN/m2) multiplied by the roof area of the building projected onto a vertical plane normal to the assumed wind direction. Wall and roof loads shall be applied simultaneously. The design wind force for open buildings shall be not less than 16 lb/ft^2 (0.77 kN/m2) multiplied by the area *Af*.

CHAPTER 29:

Revise Table 29.1-1 as follows:

Step 4: Determine velocity pressure exposure coefficient, K_z or K_h, see Table ~~29.2-1~~ 29.3-1

Step 6: Determine force coefficient, C_f.

- Solid freestanding signs or solid freestanding walls, Fig. 29.4-1
- Chimneys, tanks, rooftop equipment Fig. 29.5-1
- Open signs, lattice frameworks Fig. 29.5-2
- Trussed towers Fig. ~~29.4-3~~ 29.5-3

Step 7: Calculate wind force, F:

- Eq. 29.4-1 for signs and walls
- Eq. ~~29-6-1 and Eq. 29.6-2~~ 29.5-2 and 29.5-3 for rooftop structures and equipment
- Eq. 29.5-1 for other structures

Appendix 11B:

Revise reference to “Table 1-1” in the first paragraph of Section **11B.5 CHANGE OF USE**, to read “Table 1.5-1”

COMMENTARY

CHAPTER C1:

Revise the header of Table C1.3.1a to read "Risk Category" instead of "Occupancy Category".

Basis	**~~Occupancy~~ Risk Category**			
	I	**II**	**III**	**IV**

CHAPTER C3:

Replace Tables C3-1 and C3-2 with the reformatted tables (attached as separate file) that clearly distinguish between the customary and SI values. Previously the table was shown as one large table with no clear break between customary units and SI units. Table header was only labeled with customary units. The table has now been broken into two tables. Note that none of the values in either table were changed.

CHAPTER C4:

Revise the heading in the right hand column of the table contained in Figure C4-1 to read "Figure C4-1"

Revise the reference to Section 1.4.5 in the first paragraph of **C1.4 GENERAL STRUCTURAL INTEGRITY** to read "Section 1.4.":

> For such structures, additional precautions can and should be taken in the design of structures to limit the effects of local collapse and to prevent or minimize progressive collapse in accordance with the procedures of Section 2.5, as charged by Section 1.4.~~5.~~

CHAPTER C5:

Revise two references to Table 1-1 in Section **C5.4.5 Impact Loads** to read "Table 1.5-1"

Page 419, first paragraph.

Page421, **Coefficients *CI*, *CO*, *CD*, and *CB*.**, second paragraph

CHAPTER C7:

Revise Table C7-1 to place city location names under the correct state heading. Unaffected states omitted for brevity. Note that none of the values are affected.

Location	*Ground Snow Load (lb/ft²)*		
	Years of record	*Maximum observed*	*2% Annual probability*[a]
MASSACHUSETTS			
Boston	39	25	34
Nantucket	16	14	24

Worcester	33	29	44
~~Columbus~~	~~40~~	~~11~~	~~11~~
~~Dayton~~	~~40~~	~~18~~	~~11~~
~~Mansfield~~	~~30~~	~~31~~	~~17~~
~~Toledo Express~~	~~36~~	~~10~~	~~10~~
~~Youngstown~~	~~40~~	~~14~~	~~10~~
OHIO			
Akron-Canton	40	16	14
Cleveland	40	27	19
Columbus	40	11	11
Dayton	40	18	11
Mansfield	30	31	17
Toledo Express	36	10	10
Youngstown	40	14	10
~~Austin~~	~~39~~	~~2~~	~~2~~
~~Dallas~~	~~23~~	~~3~~	~~3~~
~~El Paso~~	~~38~~	~~8~~	~~8~~
~~Fort Worth~~	~~39~~	~~5~~	~~4~~
~~Lubbock~~	~~40~~	~~9~~	~~11~~
~~Midland~~	~~38~~	~~4~~	~~4~~
~~San Angelo~~	~~40~~	~~3~~	~~3~~
~~San Antonio~~	~~40~~	~~9~~	~~4~~
~~Waco~~	~~40~~	~~3~~	~~2~~
~~Wichita Falls~~	~~40~~	~~4~~	~~5~~
TEXAS			
Abilene	40	6	6
Amarillo	39	15	10
Austin	39	2	2
Dallas	23	3	3
El Paso	38	8	8
Fort Worth	39	5	4
Lubbock	40	9	11
Midland	38	4	4
San Angelo	40	3	3
San Antonio	40	9	4
Waco	40	3	2
Wichita Falls	40	4	5

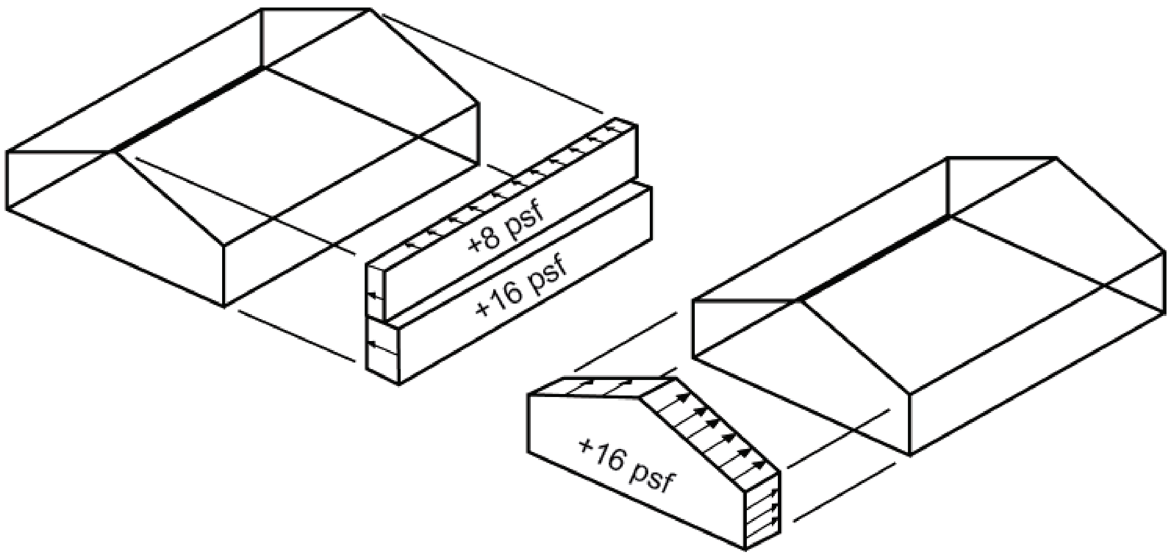
CHAPTER C26:

Revise right-hand column labeled "ASCE 7-10 Section" of Table C26.1-1 as follows:

~~29.7~~ 29.6 Parapets
~~30.10~~ 30.9 Parapets
~~30.10.1 General Design Procedure~~
~~29.6~~ 29.5.1 Rooftop Structures and Equipment for Buildings with h ≤ 60 ft (18.3 m)

CHAPTER C27:

Revise Figure C27.4-1 as shown below:



CHAPTER C29:

Revise the title of Section C29.6 section as follows:

~~C29.6~~ C29.5.1 ROOFTOP STRUCTURES AND EQUIPMENT FOR BUILDINGS WITH *h* ≤ 60 ft

Revise section C29.6 first paragraph as follows:

Because of the small size of the structures in comparison to the building, it is expected that the wind force will be higher than predicted by ~~Eq. 29.6-1~~Eq. 29.5-2 due to higher correlation of pressures across the structure surface, higher turbulence on the building roof, and accelerated wind speed on the roof.

Revise section C29.6 last paragraph as follows:

In both cases the research also showed high uplifts on the top of rooftop. Hence uplift load should also be considered by the designer and is addressed in Section ~~29.6~~29.5.1.

2010 Edition of ASCE 7
Minimum Design Loads for Buildings and Other Structures

Errata for Grammatical Clarifications

This document, containing the errata to ASCE 7-10, is periodically updated and posted on the SEI website at www.SEInstitute.org The errata are organized by date in descending order (most recent to furthest past) hence regular users of this document need only review the errata posted since their previous use. This document will be regularly updated as errata are identified.

Errata posting: January 11, 2011

Errata Posted on January 11, 2011

ACKNOWLEDGEMENTS:

Therese P. McAllister, Ph.D, P.E., M.ASCE

Subcommittee on Dead and Live Loads

Change: Adam W. Dayhoff, A.M.ASCE to Robert J. Dayhoff, M.ASCE

Add: Philip R. Brazil, S.E., M.ASCE

CHAPTER 1:

Revise the last sentence of Section 1.3.1.3.4 to read as follows, remainder of section is unchanged:

> Upon satisfactory completion, the peer reviewers ~~review~~ shall submit a letter to the authority having jurisdiction indicating the scope of their review and their findings.

Revise the last sentence of Section 1.4.2 as follows:

> Any smaller portion of the structure shall be tied to the remainder of the structure with elements having the strength to resist a force of not less than 5% of the portion's weight.

CHAPTER 2:

Revise the second paragraph following the exceptions in Sections 2.3.2 and 2.4.1 as follows – make the word "load" plural:

> Where loads H are present, they shall be included as follows:

Revise Section 2.3.6 as follows:

2.3.6 Load Combinations for Nonspecified Loads: Where approved by the Authority Having Jurisdiction, the Registered ~~Responsible~~ Design Professional is permitted to … (remainder of section is unchanged)

Revise Section 2.5.2.2 as follows:

2.5.2.2 Residual Capacity: For checking the residual load-carrying capacity of a structure or structural element following the occurrence of a damaging event, selected load-bearing elements identified by the Registered ~~Responsible~~ Design Professional shall be… (remainder of section is unchanged)

CHAPTER 4:

Revise the definition of Screen Enclosure in Section 4.1 as shown below – make the word "enclose" plural:

SCREEN ENCLOSURE: A building or part thereof, in whole or in part self-supporting, and having walls and a roof of insect or sun screening using fiberglass, aluminum, plastic or similar lightweight netting material, which encloses an occupancy or use such as outdoor swimming pools, patios or decks, and horticultural and agricultural production facilities.

Revise the last sentence of the second paragraph of Section 4.5.4 as follows – make "ship" plural:

Where rails of fixed ladders extend above a floor or platform at the top of the ladder, each side rail extension shall be designed to resist a single concentrated live load of 100 lb (0.445 kN) in any direction at any height up to the top of the side rail extension. Ships ladders with treads instead of rungs shall have minimum design loads as stairs, defined in Table 4-1.

Revise Section 4.9.2 as follows:

4.9.2 Maximum Wheel Load: The maximum wheel loads shall be the wheel loads produced by the weight of the bridge, as applicable, plus the sum of the rated capacity and the weight of the trolley with the trolley positioned on its runway at the location where the resulting load effect is maximized ~~maximum~~.

Remove extraneous text in AASHTO reference in Section 4.10 as follows:

AASHTO
American Association of State Highway and Transportation Officials, 444 North Capitol Street, NW, Suite 249, Washington, DC 20001

~~Sections 4.4.3, Table 4-1~~

AASHTO LRFD Bridge Design Specifications, 4th edition, 2007, with 2008 Interim Revisions
Sections 4.5.3, Table 4-1

CHAPTER 12:

Revise the third sentence of Section 12.2.1 as follows – make "system" plural:

The structural systems used shall be in accordance with… (remainder of section unchanged)

CHAPTER 13:

Revise Item 3b in Section 13.6.8.3 as follows:

> b. For Seismic Design Categories D, E, or F and ~~values of~~ I_p ~~are~~ is greater than 1.0, the nominal pipe size shall be 1 in. (25 mm) or less.

CHAPTER 14:

Revise Section 14.2.2.3 as follows:

> ***14.2.2.3 Scope:*** Modify Section 21.1.1.3 to read as follows:
>
> > **21.1.1.3** All members shall satisfy requirements of Chapters 1 to 19 and 22. Structures assigned to SDC B, C, D, E, or F also shall satisfy 21.1.1.4 through 21.1.1.8, as applicable*, except as modified by the requirements of Chapters 14 and 15 of ASCE 7-10 ~~this standard~~*.

Revise Section 14.2.2.6 as follows:

> ***14.2.2.6 Special Precast Structural Walls:*** Modify Section 21.10.2 to read as follows:
>
> > ***21.10.2*** Special structural walls constructed using precast concrete shall satisfy all requirements of *Section 21.9* in addition *to Section 21.4 as modified by Section 14.2.2 of ASCE 7-10*.

CHAPTER 15:

Section 15.7.6.1 – remove the words "of this standard" from the end of items b and c.

CHAPTER 23:

Revise references as follows:

ACI 307
Sections 15.4.1 and 15.6.2
Code Requirements for Reinforced Concrete Chimneys and Commentary, 2008

ACI 318
Sections 13.4.2.1, 13.4.4, 13.5.7.2, 14.2.1 14.2.2, 14.2.2.1, 14.2.2.2, 14.2.2.3, 14.2.2.4, 14.2.2.5, 14.2.2.6, 14.2.2.7, 14.2.2.8, 14.2.2.9, 14.2.3, 14.2.3.1.1, 14.2.3.2.1, 14.2.3.2.2, 14.2.3.2.3, 14.2.3.2.5, 14.2.3.2.6, 14.3.1, 14.4.6.2.2, 14.4.7.2. ~~14.4.6.2.2, 14.4.7.2,~~ 14.4.4.2.2, 14.4.5.2, 15.4.9.1, 15.6.2, 15.7.5, 15.7.11.7

ACI 355.2
Section ~~13.4.2~~ 13.4.2.3, 13.6.5.5, 15.4.9.3.

ACI 530
Sections 13.4.2.2, 14.4.1, 14.4.2, ~~14.4.4,~~ 14.4.5, 14.4.5.1, ~~14.4.5.2,~~ 14.4.6, 14.4.6.1, 14.4.6.2.2, 14.4.7, 14.4.7.1, 14.4.7.2, 14.4.7.3, 14.4.7.4, 14.4.7.5, 14.4.7.6, ~~14.4.7.7, 14.4.7.8,~~ 14.4.8, 14.4.8.1, 15.4.9.2

AF&PA NDS
Sections 12.4.3.3, ~~12.14.2.2.2.3~~, 14.5.1

AF&PA SDPWS
Sections ~~12.14.6.2~~ 12.14.7.2, 14.5.1~~, 14.5.3, 14.5.3.1~~

ANSI/AISC 360
Sections 14.1.1, 14.1.2.1, 14.1.2.2.1, 14.3.1, 14.3.2, ~~11A.1.3.6.2~~

ANSI/AISC 341
Sections 14.1.1, ~~14.1.2, 14.1.3~~ 14.1.2.2.1, 14.1.2.2.2, 14.1.7, 14.3.1, 14.3.3, 11A.1.3.6, 11A.2.4

ANSI/AISI S100
Sections 14.1.1, 14.1.3.1, 14.1.3.2, 14.1.3.3.2, 14.1.3.3.3, 14.1.3.3.4, 14.1.4, 14.1.4.1, 14.1.5

ANSI/AISI S110
Sections 14.1.1, ~~14.1.4~~, 14.1.3, 14.1.3.2, 14.1.3.3, 14.1.3.3.1, 14.1.3.3.2, 14.1.3.3.3, 14.1.3.3.4, 14.1.3.3.5; Table 12.2-1

ANSI/AISI S230 w/S2-08
Sections 14.1.1, ~~14.1.4.2~~ 14.1.4.3

ANSI/AISI S213 w/S1-09
Sections 12.14.7.2, 14.1.1, ~~14.1.2, 14.1.3~~ 14.1.4.2

ASCE 5
Sections 13.4.2.2, 14.4.1, 14.4.2, ~~14.4.4,~~ 14.4.5, 14.4.5.1, ~~14.4.5.2,~~ 14.4.6, 14.4.6.1, 14.4.6.2.2, 14.4.7, 14.4.7.1, 14.4.7.2, 14.4.7.3, 14.4.7.4, 14.4.7.5, 14.4.7.6, ~~14.4.7.7, 14.4.7.8,~~ 14.4.8, 14.4.8.1, 15.4.9.2

ASCE 8
Sections 14.1.1, ~~14.1.4, 14.1.4.2, 14.1.6~~ 14.1.3.1, 14.1.3.2, 14.1.5

ASCE 19
Sections 14.1.1, ~~14.1.7,~~ 14.1.6

ASME A17.1
ASME A17.1 Safety Code for Elevators and Escalator, ~~2004~~ 2007

ASME B31 (consists of the following listed standards)
Sections 13.6.5.1, 13.6.8.1, ~~13.6.8.4~~

~~**ASTM A 421/A421 M**~~
~~Section 14.2.2.4~~
~~*Standard Specification for Uncoated Stress-Relieved Steel Wire for Prestressed Concrete, 2002*~~

~~**ASTM A 435**~~
~~Section 11A.2.5~~
~~*Specification for Straight Beam Ultrasound Examination of Steel Plates*, 2001~~

~~**ASTM A 615/A615M**~~
~~Section 14.2.2.4~~
~~*Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement*, 2004b~~

ASTM A 108
Section 11.3
Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished, 2007

ASTM A 307
Section 11.3
Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength, 2007b

ASTM A 500
Section 14.1.3.3.4
Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes, 2009

ASTM A 653
Section 14.1.3.3.3
Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process, 2009

ASTM A 706/A706M
Sections ~~14.2.2.4, 14.4.9~~ 14.4.4.2.2, 14.4.5.2

~~**ASTM A 722 /A722M**~~
~~Section 14.2.2.4~~
~~*Standard Specification for Uncoated High-Strength Steel Bars for Prestressing Concrete*, 2003~~

~~**ASTM A 898/A898M**~~
~~Section 11A.2.5~~
~~*Specification for Straight Beam Ultrasound Examination for Rolled Steel Shapes*, 2001~~

ASTM C 635
Sections, 13.5.6.2.1, 13.5.6.2.2

ASTM C 636
Sections, 13.5.6.2.1, 13.5.6.2.2

ASTM E 580
Sections 13.5.6.2.1, 13.5.6.2.2
Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions, 2009a

AWWA D100
Sections 15.4.1, 15.7.7.1, 15.7.9.4, 15.7.10.6, ~~15.7.10.6.2~~
Welded Steel Tanks for Water Storage, ~~2005~~ 2006

AWWA D110
Section 15.7.7.3
Wire- and Strand-Wound Circular Prestressed Concrete Water Tanks, ~~1995~~2004

~~**CISCA**~~
~~**Ceilings and Interior Systems Construction Association**~~
~~**1500 Lincoln Highway**~~
~~**Suite 202**~~
~~**St. Charles, Illinois 60174**~~

~~*CISCA-04 for Seismic Zones 0-2~~

Section 13.5.6.2.1
Recommendations for Direct-Hung Acoustical Tile and Lay-In Panel Ceilings, Seismic Zones 0-2, 2004

*CISCA-04 for Seismic Zones 3-4
Section 13.5.6.2.2
Recommendations for Direct-Hung Acoustical Tile and Lay-In Panel Ceilings, Seismic Zones 3-4, 2004

NFPA 13
Sections 13.4.6, 13.6.5.1, 13.6.8, 13.6.8.2, 13.6.8.4.

NFPA 59A
Section 15.4.8
Production, Storage, and Handling of Liquefied Natural Gas (LNG), 2005 2006

TMS 402
Sections 13.4.2.2, 14.4.1, 14.4.2, 14.4.4, 14.4.5, 14.4.5.1, 14.4.5.2, 14.4.6, 14.4.6.1, 14.4.6.2.2, 14.4.7, 14.4.7.1, 14.4.7.2, 14.4.7.3, 14.4.7.4, 14.4.7.5, 14.4.7.6, 14.4.7.7, 14.4.7.8, 14.4.8, 14.4.8.1, 15.4.9.2

COMMENTARY

CHAPTER C7:

Revise Figures C7-2 and C7-3 captions as follows:

FIGURE C7-2 Leeward Snow Drift on Adjacent Roof, Seperation Separation *S* < 20 Ft.

FIGURE C7-3 Windward Snow Drift on Adjacent Roof, Seperation Separation *S* < 20 Ft.

CHAPTER C28:

Revise reference for Figures C28.4-1from “(After Ellingwood, 1982)” to “(After Davenport, A. G., Surry, D., and Stathopoulos, T. 1978)”.

2010 Edition of ASCE 7
Minimum Design Loads for Buildings and Other Structures

Errata

TABLE 4-1 Minimum Uniformly Distributed Live Loads, L_o, and Minimum Concentrated Live Loads

Occupancy or Use	*Uniform psf (kN/m²)*	*Conc. lb (kN)*
Apartments (see Residential)		
Access floor systems		
Office use	50 (2.4)	2,000 (8.9)
Computer use	100 (4.79)	2,000 (8.9)
Armories and drill rooms	150 (7.18)[a]	
Assembly areas ~~and theaters~~		
Fixed seats (fastened to floor)	60 (2.87)[a]	
Lobbies	100 (4.79)[a]	
Movable seats	100 (4.79)[a]	
Platforms (assembly)	100 (4.79)[a]	
Stage floors	150 (7.18)[a]	
Assembly areas (other)	100 (4.79)[a]	
Balconies and decks	1.5 times the live load for the ~~occupancy~~ area served. Not required to exceed 100 psf (4.79 kN/m²)	
Catwalks for maintenance access	40 (1.92)	300 (1.33)
Corridors		
First floor	100 (4.79)	
Other floors~~, same as occupancy served except as indicated~~	Same as occupancy served except as indicated	
Dining rooms and restaurants	100 (4.79)[a]	
Dwellings (see Residential)		
Elevator machine room grating (on area of 2 in. by 2 in. (50 mm by 50 mm))		300 (1.33)
Finish light floor plate construction (on area of 1 in. by 1 in. (25 mm by 25 mm))		200 (0.89)
Fire escapes	100 (4.79)	
On single-family dwellings only	40 (1.92)	
Fixed ladders	See Section 4.5	
Garages (passenger vehicles only)	40 (1.92)[a,b,c]	
Trucks and buses	[c]	
Handrails, guardrails, and grab bars	See Section 4.5	
Helipads	60 (2.87)[d,e] nonreducible	[e,f,g]
Hospitals		
Operating rooms, laboratories	60 (2.87)	1,000 (4.45)
Patient rooms	40 (1.92)	1,000 (4.45)
Corridors above first floor	80 (3.83)	1,000 (4.45)
Hotels (see Residential)		
Libraries		
Reading rooms	60 (2.87)	1,000 (4.45)
Stack rooms	150 (7.18)[a,h]	1,000 (4.45)
Corridors above first floor	80 (3.83)	1,000 (4.45)

TABLE 4-1 *(Continued)*

Occupancy or Use	*Uniform psf (kN/m^2)*	*Conc. lb (kN)*
Manufacturing		
Light	125 (6.00)[a]	2,000 (8.90)
Heavy	250 (11.97)[a]	3,000 (13.40)
Office buildings		
File and computer rooms shall be designed for heavier loads based on anticipated occupancy		
Lobbies and first-floor corridors	100 (4.79)	2,000 (8.90)
Offices	50 (2.40)	2,000 (8.90)
Corridors above first floor	80 (3.83)	2,000 (8.90)
Penal institutions		
Cell blocks	40 (1.92)	
Corridors	100 (4.79)	
Recreational uses		
Bowling alleys, poolrooms, and similar uses	75 (3.59)[a]	
Dance halls and ballrooms	100 (4.79)[a]	
Gymnasiums	100 (4.79)[a]	
Reviewing stands, grandstands, and bleachers	100 (4.79)[a,k]	
Stadiums and arenas with fixed seats (fastened to the floor)	60 (2.87)[a,k]	
Residential		
One- and two-family dwellings		
Uninhabitable attics without storage	10 (0.48)[l]	
Uninhabitable attics with storage	20 (0.96)[m]	
Habitable attics and sleeping areas	30 (1.44)	
All other areas except stairs	40 (1.92)	
All other residential occupancies		
Private rooms and corridors serving them	40 (1.92)	
Public rooms[a] and corridors serving them	100 (4.79)	
Roofs		
Ordinary flat, pitched, and curved roofs	20 (0.96)[n]	
Roofs used for roof gardens	100 (4.79)	
Roofs used for ~~assembly purposes~~<u>other occupacies</u>	Same as occupancy served	
Roofs used for other ~~occupancies~~ special purposes	[o]	[o]
Awnings and canopies		
Fabric construction supported by a skeleton structure	5 (0.24) nonreducible	~~300 (1.33) applied to skeleton structure~~
Screen enclosure support frame	5 (0.24) nonreducible and <u>based on the tributary area of the roof supported by the frame</u>~~applied to the roof frame members only, not the screen~~	200 (0.89) ~~applied to supporting roof frame members only~~
All other construction	20 (0.96)	
Primary roof members, exposed to a work floor		
Single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs over manufacturing, storage warehouses, and repair garages		2,000 (8.9)
All other primary roof members		300 (1.33)
All roof surfaces subject to maintenance workers		300 (1.33)

TABLE 4-1 *(Continued)*

Occupancy or Use	*Uniform psf (kN/m^2)*	*Conc. lb (kN)*
Schools		
Classrooms	40 (1.92)	1,000 (4.45)
Corridors above first floor	80 (3.83)	1,000 (4.45)
First-floor corridors	100 (4.79)	1,000 (4.45)
Scuttles, skylight ribs, and accessible ceilings		200 (0.89)
Sidewalks, vehicular driveways, and yards subject to trucking	250 (11.97)[a,p]	8,000 (35.60)[q]
Stairs and exit ways	100 (4.79)	300[r]
One- and two-family dwellings only	40 (1.92)	300[r]
Storage areas above ceilings	20 (0.96)	
Storage warehouses (shall be designed for heavier loads if required for anticipated storage)		
Light	125 (6.00)[a]	
Heavy	250 (11.97)[a]	
Stores		
Retail		
First floor	100 (4.79)	1,000 (4.45)
Upper floors	75 (3.59)	1,000 (4.45)
Wholesale, all floors	125 (6.00)[a]	1,000 (4.45)
Vehicle barriers	See Section 4.5	
Walkways and elevated platforms (other than exit ways)	60 (2.87)	
Yards and terraces, pedestrian	100 (4.79)[a]	

[a]Live load reduction for this use is not permitted by Section 4.8 unless specific exceptions apply.

[b]Floors in garages or portions of a building used for the storage of motor vehicles shall be designed for the uniformly distributed live loads of Table 4-1 or the following concentrated load: (1) for garages restricted to passenger vehicles accommodating not more than nine passengers, 3,000 lb (13.35 kN) acting on an area of 4.5 in. by 4.5 in. (114 mm by 114 mm); and (2) for mechanical parking structures without slab or deck that are used for storing passenger vehicles only, 2,250 lb (10 kN) per wheel.

[c]Design for trucks and buses shall be ~~per~~ in accordance with AASHTO LRFD Bridge Design Specifications; however, provisions for fatigue and dynamic load allowancetherein are not required to be applied.

[d]Uniform load shall be 40 psf (1.92 kN/m^2) where the design basis helicopter has a maximum take-off weight of 3,000 lbs (13.35 kN) or less. This load shall not be reduced.

[e]Labeling of helicopter capacity shall be as required by the authority having jurisdiction.

[f]Two single concentrated loads, 8 ft (2.44 m) apart shall be applied on the landing area (representing the helicopter's two main landing gear, whether skid type or wheeled type), each having a magnitude of 0.75 times the maximum take-off weight of the helicopter and located to produce the maximum load effect on the structural elements under consideration. The concentrated loads shall be applied over an area of 8 in. by 8 in. (200 mm by 200 mm) and are not required to act concurrently ~~shall not be concurrent~~ with other uniform or concentrated live loads.

[g]A single concentrated load of 3,000 lbs (13.35 kN) shall be applied over an area of 4.5 in. by 4.5 in. (114 mm by 114 mm), located so as to produce the maximum load effects on the structural elements under consideration. The concentrated load ~~need not be assumed~~is not required to act concurrently with other uniform or concentrated live loads.

[h]The loading applies to stack room floors that support nonmobile, double-faced library book stacks subject to the following limitations: (1) The nominal book stack unit height shall not exceed 90 in. (2,290 mm); (2) the nominal shelf depth shall not exceed 12 in. (305 mm) for each face; and (3) parallel rows of double-faced book stacks shall be separated by aisles not less than 36 in. (914 mm) wide.

[i]Piled snow from snow removal operations (e.g., piled using a truck with an attached plow) shall be based on a density of 40 pcf (6.27 kN/m^3) and planned maximum depths subject to the approval of the authority having jurisdiction.

[j]As required by railroad company.

TABLE 4-1 *(Continued)*

[k]In addition to the vertical live loads, the design shall include horizontal swaying forces applied to each row of the seats as follows: 24 lb per linear ft of seat applied in a direction parallel to each row of seats and 10 lb per linear ft of seat applied in a direction perpendicular to each row of seats. The parallel and perpendicular horizontal swaying forces need not be applied simultaneously.
[l]Uninhabitable attic areas without storage are those where the maximum clear height between the joist and rafter is less than 42 in. (1,067 mm), or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 in. (1,067 mm) in height by 24 in. (610 mm) in width, or greater, within the plane of the trusses. This live load need not be assumed to act concurrently with any other live load requirement.
[m]Uninhabitable attic areas with storage are those where the maximum clear height between the joist and rafter is 42 in. (1,067 mm) or greater, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 in. (1,067 mm) in height by 24 in. (610 mm) in width, or greater, within the plane of the trusses. For attics constructed of trussesAt the trusses, the live load need only be applied to those portions of the bottom chords where both of the following conditions are met:

i. The attic area is accessible from an opening not less than 20 in. (508 mm) in width by 30 in. (762 mm) in length that is located where the clear height in the attic is a minimum of 30 in. (762 mm); and

ii. The slope of the truss bottom chord is no greater than 2 units vertical to 12 units horizontal (9.5% slope).

The remaining portions of the bottom chords shall be designed for a uniformly distributed concurrent live load of not less than 10 lb/ft^2 (0.48 kN/m^2).
[n]Where uniform roof live loads are reduced to less than 20 lb/ft^2 (0.96 kN/m^2) in accordance with Section 4.8.1 2 and are applied to the design of structural members arranged so as to create continuity, the reduced roof live load shall be applied to adjacent spans or to alternate spans, whichever produces the greatest unfavorable load effect.
[o]Roofs used for other special purposes shall be designed for appropriate loads as approved by the authority having jurisdiction.
[p]Other uniform loads in accordance with an approved method, which contains provisions for truck loadings, shall also be considered where appropriate.
[q]The concentrated wheel load shall be applied on an area of 4.5 in. by 4.5 in. (114 mm by 114 mm).
[r]Minimum concentrated load on stair treads (on area of 2 in. by 2 in. [50 mm by 50 mm]) is to be applied nonconcurrent with the uniform load.

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Minimum Design Loads for Buildings and Other Structures

Errata

Table C3-1 Minimum Design Dead Loads[a]

Component	Load (psf)
CEILINGS	
Acoustical fiber board	1
Gypsum board (per 1/8-in. thickness)	0.55
Mechanical duct allowance	4
Plaster on tile or concrete	5
Plaster on wood lath	8
Suspended steel channel system	2
Suspended metal lath and cement plaster	15
Suspended metal lath and gypsum plaster	10
Wood furring suspension system	2.5
COVERINGS, ROOF, AND WALL	
Asbestos-cement shingles	4
Asphalt shingles	2
Cement tile	16
Clay tile (for mortar add 10 psf)	
Book tile, 2-in.	12
Book tile, 3-in.	20
Ludowici	10
Roman	12
Spanish	19
Composition:	
Three-ply ready roofing	1
Four-ply felt and gravel	5.5
Five-ply felt and gravel	6
Copper or tin	1
Corrugated asbestos-cement roofing	4
Deck, metal, 20 gage	2.5
Deck, metal, 18 gage	3
Decking, 2-in. wood (Douglas fir)	5
Decking, 3-in. wood (Douglas fir)	8
Fiberboard, 1/2-in.	0.75
Gypsum sheathing, 1/2-in.	2
Insulation, roof boards (per inch thickness)	
Cellular glass	0.7
Fibrous glass	1.1
Fiberboard	1.5
Perlite	0.8
Polystyrene foam	0.2
Urethane foam with skin	0.5
Plywood (per 1/8-in. thickness)	0.4
Rigid insulation, 1/2-in.	0.75
Skylight, metal frame, 3/8-in. wire glass	8
Slate, 3/16-in.	7
Slate, 1/4-in.	10

Table C3-1 *(Continued)*

Component				Load (psf)
Waterproofing membranes:				
Bituminous, gravel-covered				5.5
Bituminous, smooth surface				1.5
Liquid applied				1
Single-ply, sheet				0.7
Wood sheathing (per inch thickness)				3
Wood shingles				3
FLOOR FILL				
Cinder concrete, per inch				9
Lightweight concrete, per inch				8
Sand, per inch				8
Stone concrete, per inch				12
FLOORS AND FLOOR FINISHES				
Asphalt block (2-in.), 1/2-in. mortar				30
Cement finish (1-in.) on stone–concrete fill				32
Ceramic or quarry tile (3/4-in.) on 1/2-in. mortar bed				16
Ceramic or quarry tile (3/4-in.) on 1-in. mortar bed				23
Concrete fill finish (per inch thickness)				12
Hardwood flooring, 7/7-in.				4
Linoleum or asphalt tile, 1/4-in.				1
Marble and mortar on stone–concrete fill				33
Slate (per mm thickness)				15
Solid flat tile on 1-in. mortar base				23
Subflooring, 3/4-in.				3
Terrazzo (1-1/2-in.) directly on slab				19
Terrazzo (1-in.) on stone–concrete fill				32
Terrazzo (1-in.), 2-in. stone concrete				32
Wood block (3-in.) on mastic, no fill				10
Wood block (3-in.) on 1/2-in. mortar base				16
FLOORS, WOOD-JOIST (NO PLASTER)				
DOUBLE WOOD FLOOR				
Joint sizes (in.)	12-in. spacing (1b/ft^2)	16-in. spacing (1b/ft^2)	24-in. spacing (1b/ft^2)	
2 × 6	6	5	5	
2 × 8	6	6	5	
2 × 10	7	6	6	
2 × 12	8	7	6	
FRAME PARTITIONS				
Movable steel partitions				4
Wood or steel studs, 1/2-in. gypsum board each side				8
Wood studs, 2 × 4, unplastered				4
Wood studs, 2 × 4, plastered one side				12
Wood studs, 2 × 4, plastered two sides				20
FRAME WALLS				
Exterior stud walls:				
2 × 4 @ 16-in., 5/8-in. gypsum, insulated, 3/8-in. siding				11
2 × 6 @ 16-in., 5/8-in. gypsum, insulated, 3/8-in. siding				12
Exterior stud walls with brick veneer				48
Windows, glass, frame, and sash				8
Clay brick wythes:				

Table C3-1 *(Continued)*

Component						Load (psf)
4 in.						39
8 in.						79
12 in.						115
16 in.						155
Hollow concrete masonry unit wythes:						
Wythe thickness (in inches)		4	6	8	10	12
Density of unit (105 pcf)						
No grout		22	24	31	37	43
48 in. o.c.			29	38	47	55
40 in. o.c.	grout		30	40	49	57
32 in. o.c.	spacing		32	42	52	61
24 in. o.c.			34	46	57	67
16 in. o.c.			40	53	66	79
Full grout			55	75	95	115
Density of unit (125 pcf)						
No grout		26	28	36	44	50
48 in. o.c.			33	44	54	62
40 in. o.c.	grout		34	45	56	65
32 in. o.c.	spacing		36	47	58	68
24 in. o.c.			39	51	63	75
16 in. o.c.			44	59	73	87
Full grout			59	81	102	123
Density of unit (135 pcf)						
No grout		29	30	39	47	54
48 in. o.c.			36	47	57	66
40 in. o.c.	grout		37	48	59	69
32 in. o.c.	spacing		38	50	62	72
24 in. o.c.			41	54	67	78
16 in. o.c.			46	61	76	90
Full grout			62	83	105	127
Solid concrete masonry unit wythes (incl. concrete brick):						
Wythe thickness (in mm)		4	6	8	10	12
Density of unit (105 pcf)		32	51	69	87	105
Density of unit (125 pcf)		38	60	81	102	124
Density of unit (135 pcf)		41	64	87	110	133

Table C3-1 Minimum Design Dead Loads[a] (SI Units)

Component	Load (kN/m2)
CEILINGS	
Acoustical fiber board	0.05
Gypsum board (per mm thickness)	0.008
Mechanical duct allowance	0.19
Plaster on tile or concrete	0.24
Plaster on wood lath	0.38
Suspended steel channel system	0.10
Suspended metal lath and cement plaster	0.72
Suspended metal lath and gypsum plaster	0.48
Wood furring suspension system	0.12
COVERINGS, ROOF, AND WALL	
Asbestos-cement shingles	0.19
Asphalt shingles	0.10
Cement tile	0.77
Clay tile (for mortar add 0.48 kN/m^2)	
Book tile, 51 mm	0.57
Book tile, 76 mm	0.96
Ludowici	0.48
Roman	0.57
Spanish	0.91
Composition:	
Three-ply ready roofing	0.05
Four-ply felt and gravel	0.26
Five-ply felt and gravel	0.29
Copper or tin	0.05
Corrugated asbestos-cement roofing	0.19
Deck, metal, 20 gage	0.12
Deck, metal, 18 gage	0.14
Decking, 51-mm wood (Douglas fir)	0.24
Decking, 76-mm wood (Douglas fir)	0.38
Fiberboard, 13 mm	0.04
Gypsum sheathing, 13 mm	0.10
Insulation, roof boards (per mm thickness)	
Cellular glass	0.0013
Fibrous glass	0.0021
Fiberboard	0.0028
Perlite	0.0015
Polystyrene foam	0.0004
Urethane foam with skin	0.0009
Plywood (per mm thickness)	0.006
Rigid insulation, 13 mm	0.04
Skylight, metal frame, 10-mm wire glass	0.38
Slate, 5 mm	0.34
Slate, 6 mm	0.48
Waterproofing membranes:	
Bituminous, gravel-covered	0.26
Bituminous, smooth surface	0.07
Liquid applied	0.05
Single-ply, sheet	0.03

Table C3-1(SI Units) *(Continued)*

Component				Load (kN/m2)
Wood sheathing (per mm thickness)				
Plywood				0.0057
Oriented strand board				0.0062
Wood shingles				0.14
FLOOR FILL				
Cinder concrete, per mm				0.017
Lightweight concrete, per mm				0.015
Sand, per mm				0.015
Stone concrete, per mm				0.023
FLOORS AND FLOOR FINISHES				
Asphalt block (51 mm), 13-mm mortar				1.44
Cement finish (25 mm) on stone–concrete fill				1.53
Ceramic or quarry tile (19 mm) on 13-mm mortar bed				0.77
Ceramic or quarry tile (19 mm) on 25-mm mortar bed				1.10
Concrete fill finish (per mm thickness)				0.023
Hardwood flooring, 22 mm				0.19
Linoleum or asphalt tile, 6 mm				0.05
Marble and mortar on stone–concrete fill				1.58
Slate (per mm thickness)				0.028
Solid flat tile on 25-mm mortar base				1.10
Subflooring, 19 mm				0.14
Terrazzo (38 mm) directly on slab				0.91
Terrazzo (25 mm) on stone–concrete fill				1.53
Terrazzo (25 mm), 51-mm stone concrete				1.53
Wood block (76 mm) on mastic, no fill				0.48
Wood block (76 mm) on 13-mm mortar base				0.77
FLOORS, WOOD-JOIST (NO PLASTER)				
DOUBLE WOOD FLOOR				
Joist sizes (mm):	305-mm spacing (kN/m^2)	406-mm spacing (kN/m^2)	610-mm spacing (kN/m^2)	
51 × 152	0.29	0.24	0.24	
51 × 203	0.29	0.29	0.24	
51 × 254	0.34	0.29	0.29	
51 × 305	0.38	0.34	0.29	
FRAME PARTITIONS				
Movable steel partitions				0.19
Wood or steel studs, 13-mm gypsum board each side				0.38
Wood studs, 51 × 102, unplastered				0.19
Wood studs, 51 × 102, plastered one side				0.57
Wood studs, 51 × 102, plastered two sides				0.96
FRAME WALLS				
Exterior stud walls:				
51 mm × 102 mm @ 406 mm, 16-mm gypsum, insulated, 10-mm siding				0.53
51 mm × 152 mm @ 406 mm, 16-mm gypsum, insulated, 10-mm siding				0.57
Exterior stud walls with brick veneer				2.30
Windows, glass, frame, and sash				0.38

Table C3-1(SI Units) *(Continued)*

Component						Load (kN/m2)
Clay brick wythes:						
102 mm						1.87
203 mm						3.78
305 mm						5.51
406 mm						7.42
Hollow concrete masonry unit wythes:						
Wythe thickness (in mm)		102	152	203	254	305
Density of unit (16.49 kN/m^3)						
No grout		1.05	1.29	1.68	2.01	2.35
1,219 mm			1.48	1.92	2.35	2.78
1,016 mm	grout		1.58	2.06	2.54	3.02
813 mm	spacing		1.63	2.15	2.68	3.16
610 mm			1.77	2.35	2.92	3.45
406 mm			2.01	2.68	3.35	4.02
Full grout			2.73	3.69	4.69	5.70
Density of unit (19.64 kN/m^3)						
No grout		1.25	1.34	1.72	2.11	2.39
1,219 mm			1.58	2.11	2.59	2.97
1,016 mm	grout		1.63	2.15	2.68	3.11
813 mm	spacing		1.72	2.25	2.78	3.26
610 mm			1.87	2.44	3.02	3.59
406 mm			2.11	2.78	3.50	4.17
Full grout			2.82	3.88	4.88	5.89
Density of unit (21.21 kN/m^3)						
No grout		1.39	1.68	2.15	2.59	3.02
1,219 mm			1.58	2.39	2.92	3.45
1,016 mm	grout		1.72	2.54	3.11	3.69
813 mm	spacing		1.82	2.63	3.26	3.83
610 mm			1.96	2.82	3.50	4.12
406 mm			2.25	3.16	3.93	4.69
Full grout			3.06	4.17	5.27	6.37
Solid concrete masonry unit						
Wythe thickness (in mm)		102	152	203	254	305
Density of unit (16.49 kN/m^3)		1.53	2.35	3.21	4.02	4.88
Density of unit (19.64 kN/m^3)		1.82	2.82	3.78	4.79	5.79
Density of unit (21.21 kN/m^3)		1.96	3.02	4.12	5.17	6.27

[a]Weights of masonry include mortar but not plaster. For plaster, add 0.24 kN/m^2 for each face plastered. Values given represent averages. In some cases there is a considerable range of weight for the same construction.

Errata

Table C3-2 Minimum Densities For Design Loads From Materials

Material	Density (lb/ft^3)	Density (kN/m^3)
Aluminum	170	27.0
Bituminous products		
Asphaltum	81	12.7
Graphite	135	21.2
Paraffin	56	8.8
Petroleum, crude	55	8.6
Petroleum, refined	50	7.9
Petroleum, benzine	46	7.2
Petroleum, gasoline	42	6.6
Pitch	69	10.8
Tar	75	11.8
Brass	526	82.6
Bronze	552	86.7
Cast-stone masonry (cement, stone, sand)	144	22.6
Cement, portland, loose	90	14.1
Ceramic tile	150	23.6
Charcoal	12	1.9
Cinder fill	57	9.0
Cinders, dry, in bulk	45	7.1
Coal		
Anthracite, piled	52	8.2
Bituminous, piled	47	7.4
Lignite, piled	47	7.4
Peat, dry, piled	23	3.6
Concrete, plain		
Cinder	108	17.0
Expanded-slag aggregate	100	15.7
Haydite (burned-clay aggregate)	90	14.1
Slag	132	20.7
Stone (including gravel)	144	22.6
Vermiculite and perlite aggregate, nonload-bearing	25–50	3.9-7.9
Other light aggregate, load-bearing	70–105	11.0-16.5
Concrete, reinforced		
Cinder	111	17.4
Slag	138	21.7
Stone (including gravel)	150	23.6
Copper	556	87.3
Cork, compressed	14	2.2

Table C3-2 *(Continued)*

Material	Density (lb/ft^3)	Density (kN/m^3)
Earth (not submerged)		
Clay, dry	63	9.9
Clay, damp	110	17.3
Clay and gravel, dry	100	15.7
Silt, moist, loose	78	12.3
Silt, moist, packed	96	15.1
Silt, flowing	108	17.0
Sand and gravel, dry, loose	100	15.7
Sand and gravel, dry, packed	110	17.3
Sand and gravel, wet	120	18.9
Earth (submerged)		
Clay	80	12.6
Soil	70	11.0
River mud	90	14.1
Sand or gravel	60	9.4
Sand or gravel and clay	65	10.2
Glass	160	25.1
Gravel, dry	104	16.3
Gypsum, loose	70	11.0
Gypsum, wallboard	50	7.9
Ice	57	9.0
Iron		
Cast	450	70.7
Wrought	480	75.4
Lead	710	111.5
Lime		
Hydrated, loose	32	5.0
Hydrated, compacted	45	7.1
Masonry, ashlar stone		
Granite	165	25.9
Limestone, crystalline	165	25.9
Limestone, oolitic	135	21.2
Marble	173	27.2
Sandstone	144	22.6
Masonry, brick		
Hard (low absorption)	130	20.4
Medium (medium absorption)	115	18.1
Soft (high absorption)	100	15.7
Masonry, concrete[a]		
Lightweight units	105	16.5
Medium weight units	125	19.6
Normal weight units	135	21.2
Masonry grout	140	22.0
Masonry, rubble stone		
Granite	153	24.0
Limestone, crystalline	147	23.1
Limestone, oolitic	138	21.7
Marble	156	24.5
Sandstone	137	21.5
Mortar, cement or lime	130	20.4
Particleboard	45	7.1
Plywood	36	5.7

Table C3-2 *(Continued)*

Material	Density (lb/ft^3)	Density (kN/m^3)
Riprap (not submerged)		
Limestone	83	13.0
Sandstone	90	14.1
Sand		
Clean and dry	90	14.1
River, dry	106	16.7
Slag		
Bank	70	11.0
Bank screenings	108	17.0
Machine	96	15.1
Sand	52	8.2
Slate	172	27.0
Steel, cold-drawn	492	77.3
Stone, quarried, piled		
Basalt, granite, gneiss	96	15.1
Limestone, marble, quartz	95	14.9
Sandstone	82	12.9
Shale	92	14.5
Greenstone, hornblende	107	16.8
Terra cotta, architectural		
Voids filled	120	18.9
Voids unfilled	72	11.3
Tin	459	72.1
Water		
Fresh	62	9.7
Sea	64	10.1
Wood, seasoned		
Ash, commercial white	41	6.4
Cypress, southern	34	5.3
Fir, Douglas, coast region	34	5.3
Hem fir	28	4.4
Oak, commercial reds and whites	47	7.4
Pine, southern yellow	37	5.8
Redwood	28	4.4
Spruce, red, white, and Sitka	29	4.5
Western hemlock	32	5.0
Zinc, rolled sheet	449	70.5