Table 3.1.2

OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES

Category	Occupancy	Nature of Occupancy
I	Temporary	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: • Agricultural facilities • Certain temporary facilities • Minor storage facilities
IIA	Low	Buildings and other structures except those listed in Occupancy Categories I. IIB. III and IV
IIB	Medium	Buildings and other structures which needs additional seismic safety requirements. including but not limited to: • Number of story above 8. • An occupant load from 151to 5000 except those listed in Category III. • Any building defined by the authority for additional seismic safety requirements.
III	High	Buildings and other structures, the failure of which could pose a substantial risk to human life, including but not limited to: • Covered structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures with elementary school, secondary school or day care facilities with an occupant load greater than 250. • Buildings and other structures with an occupant load greater than 500 for colleges or adult education facilities. • Healthcare facilities with an occupant load of 50 or more resident patients, but not having surgery or emergency treatment facilities. • Jails and detention facilities. • Any other occupancy with an occupant load greater than 5,000. • Power-generating stations, water treatment for potable water, waste water treatment facilities and other public utility facilities not included in Occupancy Category IV. • Buildings and other structures not included in Occupancy Category IV containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released.
IV	Essential	Buildings and other structures designated as essential facilities, including but not limited to: • Hospitals and other health care facilities having surgery or emergency treatment facilities. • Fire, rescue and police stations and emergency vehicle garages. • Designated earthquake, hurricane or other emergency shelters. • Designated emergency preparedness, communication, and operation centers and other facilities required for emergency response. • Power generating stations and other public utility facilities required as emergency backup facilities for Occupancy Category IV structures. • Structures containing highly toxic materials. • Aviation control towers, air traffic control centers and emergency aircraft hangars. • Buildings and other structures having critical national defense functions. • Water treatment facilities required to maintain water pressure for the suppression.

TABLE 3.2.2

MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L0, AND MINIMUM CONCENTRATED LIVE LOAD

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs)
1. Apartments (see residential)	—	—
2. Access floor systems		
Office use	50	2,000
Computer use	100	2,000
3. Armories and drill rooms	150	—
4. Assembly areas and theaters		
Fixed seats (fastened to floor)	60	
Follow spot, projections and control rooms	50	
Lobbies	100	—
Movable seats	100	
Stages and platforms	125	
5. Balconies	100	
On one- and two-family residences only, and not exceeding 100 sft	60	—
6. Bowling alleys	75	—
7. Catwalks	40	300
8. Dance halls and ballrooms	100	—
9. Decks	Same as occupancy served[g]	—
10. Dining rooms and restaurants	100	—
11. Dwellings (see residential)	—	—
12. Cornices	60	—
13. Corridors, except as otherwise indicated	100	—
14. Elevator machine room grating (on area of 4 in^2)	—	300
15. Finish light floor plate construction (on area of 1 in^2)	—	200
16. Fire escapes	100	
On single-family dwellings only	40	—
17. Garages (passenger vehicles only)	40	Note[a]
Trucks and buses	See Section 3.2.3.4	
18. Grandstands (see stadium and arena bleachers)	—	—
19. Gymnasiums, main floors and balconies	100	—
20. Handrails, guards and grab bars	See Section 3.2.3.5.1	
21. Hospitals		
Corridors above first floor	80	1,000
Operating rooms, laboratories	60	1,000
Patient rooms	40	1,000
22. Hotels (see residential)	—	—
23. Libraries		
Corridors above first floor	80	1,000
Reading rooms	60	1,000
Stack rooms	150[b]	1,000
24. Manufacturing		
Heavy	250	3,000
Light	125	2,000
25. Marquees	75	—
26. Office buildings		
Corridors above first floor	80	2,000
File and computer rooms shall be designed for heavier loads based on anticipated occupancy	—	—
Lobbies and first-floor corridors	100	2,000
Offices	50	2,000
27. Penal institutions		
Cell blocks	40	—
Corridors	100	

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs)
28. Residential		
One- and two-family dwellings		
Uninhabitable attics without storage[h]	10	
Uninhabitable attics with limited storage[h,i,j]	20	
Habitable attics and sleeping areas	30	
All other areas except balconies and decks	40	—
Hotels and multiple-family dwellings		
Private rooms and corridors serving them	40	
Public rooms and corridors serving them	100	
29. Reviewing stands, grandstands and bleachers	Note [c]	
30. Roofs		
All roof surfaces subject to maintenance workers		300
Awnings and canopies		
Fabric construction supported by a light weight rigid skeleton structure	5 Non-reducible	
All other construction	20	
Ordinary flat, pitched, and curved roofs	20	
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, Warehouse, and repair garages		2,000
All other occupancies		300
Roofs used for other special purposes	Note [k]	Note [k]
Roofs used for promenade purposes	60	
Roofs used for roof gardens or assembly purposes	100	
31. Schools		
Classrooms	40	1,000
Corridors above first floor	80	1,000
First-floor corridors	100	1,000
32. Scuttles, skylight ribs and accessible ceilings	—	200
33. Sidewalks, vehicular driveways and yards, subject to trucking	250[d]	8,000[e]
34. Skating rinks	100	—
35. Stadiums and arenas		
Bleachers	100[c]	
Fixed seats (fastened to floor)	60[c]	—
36. Stairs and exits		Note [f]
One- and two-family dwellings	40	
All other	100	
37. Storage warehouses (shall be designed for heavier loads if required for anticipated storage)		
Heavy	250	
Light	125	
38. Stores		
Retail		
First floor	100	1,000
Upper floors	75	1,000
Wholesale, all floors	125	1,000
39. Vehicle barriers	See Section 3.2.3.5.3	
40. Walkways and elevated platforms (other than exit ways)	60	—
41. Yards and terraces, pedestrians	100	—

TABLE 3.4.2 SITE CLASS DEFINITIONS

SITE CLASS	SOIL PROFILE NAME	AVERAGE PROPERTIES IN TOP 100 FEET, SEE SECTION 3.4.1.3.4.2		
		Soil shear wave velocity $\bar{v}_s$, (fps)	Standard penetration resistance $\bar{N}$	Soil undrained shear strength, $\bar{s}_u$, (psf)
A	Hard Rock	$\bar{v}_s$> 5,000	N/A	N/A
B	Rock	2,500 <$\bar{v}_s$≤ 5,000	N/A	N/A
C	Very dense soil and soft rock	1,200 <$\bar{v}_s$≤ 2,500	$\bar{N}$> 50	$\bar{s}_u$≥ 2,000
D	Stiff soil profile	600 ≤ $\bar{v}_s$≤ 1,200	15 ≤ $\bar{N}$ ≤ 50	1,000 ≤ $\bar{s}_u$≤ 2,000
E	Soft soil profile	$\bar{v}_s$< 600	$\bar{N}$< 15	$\bar{s}_u$< 1,000
E		Any profile with more than 10 feet of soil having the following characteristics: • Plasticity index *PI* > 20, • Moisture content *w* ≥ 40%, and • Undrained shear strength $\bar{s}_u$< 500 psf		
F		Any profile containing soils having one or more of the following characteristics: • Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. • Peats and/or highly organic clays (*H* > 10 feet of peat and/or highly organic clay where *H* = thickness of soil) • Very high plasticity clays (*H* > 25 feet with plasticity index *PI* > 75). • Very thick soft/medium stiff clays (*H* > 120 feet)		
For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2, 1 pound per square foot = 0.0479 kPa. N/A = Not applicable.				

Table 3.4.7 SEISMIC DESIGN CATEGORY BASED ON SHORT PERIOD AND 1-SECOND PERIOD RESPONSE ACCELERATION PARAMETER

S_{DS}	S_{D1}	Level of Seismicity	I	IIA	IIB	III	IV
<0.167g	<0.067g	Very Low	A	A	A	A	B
0.167 to 0.33g	0.067 to 0.133g	Low	A	A	B	B	C
0.33 to 0.5g	0.133 to 0.2g	Moderate	A	B	B	C	D
0.5 to 0.9g	0.2 to 0.8g	High	C	C	D	D	E
>0.9g	>0.8g	Very High	C	D	D	E	E
S_1≥0.75g		Severe	E	E	E	E	F

TABLE 3.4.9 HORIZONTAL STRUCTURAL IRREGULARITIES

Item	Type	Description	SDC					Issue	Reference
			B	C	D	E	F		
H1a	Torsional Irregularity	The maximum storey drift, computed including accidental torsion, at one end of the structure transverse to an axis is more than 1.2 times the average of the storey drifts at the two ends of the structure. Torsional irregularity requirements in the reference sections apply only to structures in which the diaphragms are rigid or semi-rigid.			√	√	√	Force Increase	3.4.3.3.4
					√	√	√	Analysis Limit	3.4.6, Table 3.4.12
			√	√	√	√	√	3D Model	3.4.7.3, ASCE7-05 16.2.2
				√	√	√	√	Torsion Limit	3.4.8.4.3
				√	√	√	√	Drift Limit	3.4.12.1
H1b	Extreme Torsional Irregularity	The maximum storey drift, computed including accidental torsion, at one end of the structure transverse to an axis is more than 1.4 times the average of the storey drifts at the two ends of the structure. Extreme torsional irregularity requirements in the reference sections apply only to structures in which the diaphragms are rigid or semi-rigid.				X	X	Not Permit	3.4.3.3.1
					√			Force Increase	3.4.3.3.4
					√			Analysis Limit	3.4.6, Table 3.4.12
			√	√	√			3D Model	3.4.7.3, ASCE7-05 16.2.2
				√	√			Torsion Limit	3.4.8.4.3
				√	√			Drift Limit	3.4.12.1
H2	Reentrant Corner	Both plan projections of the structure beyond a reentrant corner are greater than 15% of the plan dimension of the structure in the given direction.			√	√	√	Force Increase	3.4.3.3.4
					√	√	√	Drift Limit	3.4.12.1
H3	Diaphragm Discontinuity	There are diaphragms with abrupt discontinuities or variations in stiffness, including those having cutout or open areas greater than 50% of the gross enclosed diaphragm area, or changes in effective diaphragm stiffness of more than 50% from one storey to the next.			√	√	√	Force Increase	3.4.3.3.4
					√	√	√	Drift Limit	3.4.12.1
H4	Out-of-Plane Offsets	There are discontinuities in a lateral force-resistance path, such as out-of-plane offsets of the vertical elements.	√	√	√	√	√	Discontinuity	3.4.3.3.3
					√	√	√	Force Increase	3.4.3.3.4
					√	√	√	Analysis Limit	3.4.6, Table 3.4.12
			√	√	√	√	√	3D Model	3.4.7.3, ASCE7-05 16.2.2
H5	Nonparallel System	The vertical lateral force-resisting elements are not parallel to or symmetric about the major orthogonal axes of the seismic force–resisting system.		√	√	√	√	Directional	3.4.5.3
					√	√	√	Analysis Limit	3.4.6, Table 3.4.12
			√	√	√	√	√	3D Model	3.4.7.3, ASCE7-05 16.2.2

√ = Need to be checked.
X = Not allowed.

TABLE 3.4.10 VERTICAL STRUCTURAL IRREGULARITIES

Item	Type	Description	SDC					Issue	Reference
			B	C	D	E	F		
V1a	Soft Story (Stiffness)	A storey in which the lateral stiffness is less than 70% of that in the storey above or less than 80% of the average stiffness of the three storeys above.			√	√	√	Analysis Limit	3.4.6, Table 3.4.12
V1b	Extreme Soft Story (Stiffness)	A storey in which the lateral stiffness is less than 60% of that in the storey above or less than 70% of the average stiffness of the three storeys above.				√	√	Discontinuity	3.4.3.3.3
					√	√	√	Analysis Limit	3.4.6, Table 3.4.12
V2	Weight Irregularity	The effective mass of any storey is more than 150% of the effective mass of an adjacent storey. A roof that is lighter than the floor below need not be considered.			√	√	√	Analysis Limit	3.4.6, Table 3.4.12
V3	Vertical Geometry	The horizontal dimension of the seismic force–resisting system in any storey is more than 130% of that in an adjacent storey.			√	√	√	Analysis Limit	3.4.6, Table 3.4.12
V4	In-plane Discontinuity	An in-plane offset of the lateral force-resisting elements is greater than the length of those elements or there exists a reduction in stiffness of the resisting element in the storey below.	√	√	√	√	√	Discontinuity	3.4.3.3.3
						√	√	Force Increase	3.4.3.3.4
					√	√	√	Analysis Limit	3.4.6, Table 3.4.12
V5a	Weak Story (Strength)	The storey lateral strength is less than 80% of that in the storey above. The storey lateral strength is the total lateral strength of all seismic-resisting elements sharing the storey shear for the direction under consideration.				√	√	Not Permit	3.4.3.3.1
					√	√	√	Analysis Limit	3.4.6, Table 3.4.12
V5b	Extreme Weak Story (Strength)	The storey lateral strength is less than 65% of that in the storey above. The storey strength is the total strength of all seismic-resisting elements sharing the storey shear for the direction under consideration.			X	X	X	Not Permit	3.4.3.3.1
			√	√				Height Limit	3.4.3.3.2
					√	√	√	Analysis Limit	3.4.6, Table 3.4.12

√ = Need to be checked.
X = Not allowed.

TABLE 3.4.12 PERMITTED ANALYTICAL PROCEDURES

Seismic Design Category	Structural Characteristics	Equivalent Lateral Force Analysis (Sec. 3.4.2.6)	Modal Response Spectrum Analysis (Sec. 3.4.9)	Response History Procedures (Chap.16 ASCE 7-05)
B, C	Occupancy Category I or IIA or IIB Buildings	P	P	P
	Other Occupancy Category I or IIA or IIB buildings	P	P	P
	All other structures	P	P	P
D, E, F	Occupancy Category I or IIA or IIB buildings	P	P	P
	Other Occupancy Category I or IIA or IIB buildings	P	P	P
	Regular structures with T < 3.5Ts and all structures of light frame construction	P	P	P
	Irregular structures with T < 3.5Ts and having only horizontal irregularities Type H2, H3, H4, or H5 of Table 3.4.9 or vertical irregularities type V4, V5a, or V5b of Table 3.4.10	P	P	P
	All other structures	NP	P	P

NOTE: P: Permitted; NP: Not Permitted.