ORTHOGONAL. To be in two horizontal directions, at 90 degrees (1.57 rad) to each other.

SEISMIC DESIGN CATEGORY. A classification assigned to a structure based on its occupancy category and the severity of the design earthquake ground motion at the site.

SEISMIC-FORCE-RESISTING SYSTEM. That part of the structural system that has been considered in the design to provide the required resistance to the prescribed seismic forces.

SITE CLASS. A classification assigned to a site based on the types of soils present and their engineering properties as defined in Section 1613.5.2.

SITE COEFFICIENTS. The values of F_a and F_v indicated in Tables 1613.5.3(1) and 1613.5.3(2), respectively.

1613.3 Existing buildings. Additions, alterations, modification, or change of occupancy of existing buildings shall be in accordance with Sections 3403.2.3 and 3406.4.

1613.4 Special inspections. Where required by Section 1705.3, the statement of special inspections shall include the special inspections required by Section 1705.3.1.

1613.5 Seismic ground motion values. Seismic ground motion values shall be determined in accordance with this section.

1613.5.1 Mapped acceleration parameters. The parameters S_s and S_1 shall be determined from the 0.2 and 1-second spectral response accelerations shown on Figures 1613.5(1) through 1613.5(14). Where S_1 is less than or equal to 0.04 and S_s is less than or equal to 0.15, the structure is permitted to be assigned to Seismic Design Category A.

Exception: [OSHPD 2] Seismic design category shall be per exception to Section 1613.5.6.

1613.5.2 Site class definitions. Based on the site soil properties, the site shall be classified as either Site Class A, B, C, D, E or F in accordance with Table 1613.5.2. When the soil properties are not known in sufficient detail to determine the site class, Site Class D shall be used unless the building official or geotechnical data determines that Site Class E or F soil is likely to be present at the site.

1613.5.3 Site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters. The maximum considered earthquake spectral response acceleration for short periods, S_{MS}, and at 1-second period, S_{M1}, adjusted for site class effects shall be determined by Equations 16-37 and 16-38, respectively:

$$S_{MS} = F_a S_s \qquad \textbf{(Equation 16-37)}$$

$$S_{M1} = F_v S_1 \qquad \textbf{(Equation 16-38)}$$

where:

F_a = Site coefficient defined in Table 1613.5.3(1).

F_v = Site coefficient defined in Table 1613.5.3(2).

S_S = The mapped spectral accelerations for short periods as determined in Section 1613.5.1.

TABLE 1613.5.2
SITE CLASS DEFINITIONS

SITE CLASS	SOIL PROFILE NAME	AVERAGE PROPERTIES IN TOP 100 feet, SEE SECTION 1613.5.5		
		Soil shear wave velocity, $\bar{v}_s$, (ft/s)	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	$2{,}500 < \bar{v}_s \le 5{,}000$	N/A	N/A
C	Very dense soil and soft rock	$1{,}200 < \bar{v}_s \le 2{,}500$	$\bar{N} > 50$	$\bar{s}_u \ge 2{,}000$
D	Stiff soil profile	$600 \le \bar{v}_s \le 1{,}200$	$15 \le \bar{N} \le 50$	$1{,}000 \le \bar{s}_u \le 2{,}000$
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: 1. Plasticity index $PI > 20$, 2. Moisture content $w \ge 40\%$, and 3. Undrained shear strength $\bar{s}_u < 500$ psf		
F	—	Any profile containing soils having one or more of the following characteristics: 1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. 2. Peats and/or highly organic clays (H > 10 feet of peat and/or highly organic clay where H = thickness of soil) 3. Very high plasticity clays ($H > 25$ feet with plasticity index $PI > 75$) 4. Very thick soft/medium stiff clays ($H > 120$ feet)		