[0101] Codes

2025-02-23 | 02:21AM

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0101-[1] Project Summary

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0101-[2] Overview and Codes

This report **describes** the structural design of a solar canopy *covering* a residential patio located in the City of Larkspur, California. It includes the design of a concrete slab and *stem* wall, steel tube frame, and clip attachments of solar panels to the frame.

wt■ = ■■■■■■

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Building Codes and Jurisdiction

- City of Larkspur, California
- 2019 California Building Code [CBC]
- 2019 California Residential Code [CRC]

**Table 01: Loading [from file: d01-loadsins01cbc2019A_stds.csv]

Category	Standard	Year
Loading	ASCE-7	2016
Concrete	ACI-318	2014
Wood-National Design Specifications	AWC-NDS	2018
Wood-Special Design Provisions for Wind and Seismic	AWC-SDPWS	2015
Wood Frame Construction Manual	AWC-WFCM	2018

Design loads for the project are from the California Building and Residential Codes and are summarized in the following tables.

[from file: d01-loadsins01load_types01.csv]

Sym	Load Effect	Notes
D	Dead load	See IBC 1606 and Chapter 3 of this publication

E	Combined effect of horizontal and vertical earthquake-induced forces as defined in ASCE/SEI 12.4.2	See IBC 1613, ASCE/SEI 12.4.2 and Chapter 6 of this publication
Em	Maximum seismic load effect of horizontal and vertical forces as set forth in ASCE/SEI 12.4.3	See IBC 1613, ASCE/SEI 12.4.3 and Chapter 6 of this publication
H	Load due to lateral earth pressures, ground water pressure or pressure of bulk materials	See IBC 1610 for soil lateral loads
L	Live load, except roof live load, including any permitted live load reduction	See IBC 1607 and Chapter 3 of this publication
Li	Roof live load including any permitted live load reduction	See IBC 1607 and Chapter 3 of this publication
R	Rain load	See IBC 1611 and Chapter 3 of this publication
W	Load due to wind pressure	See IBC 1609 and Chapter 5 of this publication

**Table 02: Load Combinations [from file: d01-loadsins01asce7_load_comb.csv]

CBC 2019 reference	Equation
Equation 16-1	1.4(D +F)
Equation 16-2	1.2(D + F) + l.6(L + H) + 0.5(L or S or R)
Equation 16-3	1.2(D + F) + l.6(Lr or S or R) + l.6H + (f1L or 0.5W)
Equation 16-4	1.2(D + F) + 1.0W + f1L +1.6H + 0.5(Lr or S or R)
Equation 16-5	1.2(D + F) + 1.0E + f1L + l.6H + f2S
Equation 16-6	0.9D+ l.0W+ l.6H
Equation 16-7	0.9(D + F) + 1.0E+ l.6H

0101-[3] Gravity Loads and Seismic Mass

First floor dimensions Eq-01

variable	value	[value]	description
area1	10700.00 sf	994.06 SM	roof area
area2	100000.00 sf	9290.30 SM	floor area
area3	25.00 sf	2.32 SM	floor area
ht1	9.00 ft	2.74 m	wall height
len1	110.00 ft	33.53 m	interior wall length
len2	155.00 ft	47.24 m	exterior wall length
udl1	12.20 psf	584.14 Pa	description

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[from file: valsv01test1.csv]

variable	value	[value]	description
floordl1	50.00 psf	2394.01 Pa	interior wall length
floordl2	10.00 psf	478.80 Pa	exterior wall length

Equation for floor area Eq-02 .. raw:: math

wt■ = area■·floordl■

wt2	floordl1	area2
5000.00 kips	50.00 psf	100000.00 sf
22241108.00 N	2394.01 Pa	9290.30 SM

Equation for wall area Eq-03 .. raw:: math

wt■ = area■·floordl■·0.1

wt3	area3	floordl2
25.0 lbs	25.00 sf	10.00 psf
111.2 N	2.32 SM	478.80 Pa

Exterior wall - total area load Eq-04 [from file: valsv01test2.csv]

variable	value	[value]	description
len1	410.00 ft	124.97 m	interior wall length
len2	455.00 ft	138.68 m	exterior wall length