

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** =====

Category	Standard	Year
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		Loading

===== [table read from file: c:\gitrivt-solar-canopy-structural-calculations\d01-loadsins01cbc2019A_stds.csv]

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

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

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****Table 02: Load Combinations** =====

CBC 2019 reference Equation

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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variable	value	[value]	description
floodl1	50.00 psf	2394.01 Pa	interior wall length
floodl2	10.00 psf	478.80 Pa	exterior wall length

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

$$wt_{\blacksquare} = area_{\blacksquare} \cdot floodl_{\blacksquare}$$

wt2	area2	floodl1
5000.00 kips	100000.00 sf	50.00 psf

22241108.00 N	9290.30 SM	2394.01 Pa
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Equation for wall area Eq-03 .. raw:: math

$$wt = area \cdot floordl \cdot 0.1$$

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