Overview SECTION [0101] - 1

This report describes the structural design residential solar canopy in the City of Larkspur, California. It includes the design of a concrete slab, stem wall, steel tube frame, and attachments of solar panels to the frame.
The report is divided into the following three divisions:

- 01 Loads: gravity, wind and seismic
- 02 Frame: steel tubes, connections and clips
- 03 Foundation: slab and stem wall

Client:
Date:
Location:

Solar Canopy Location and Applicable Codes SECTION [0101] - 2

The project is located in Larkspur, California.

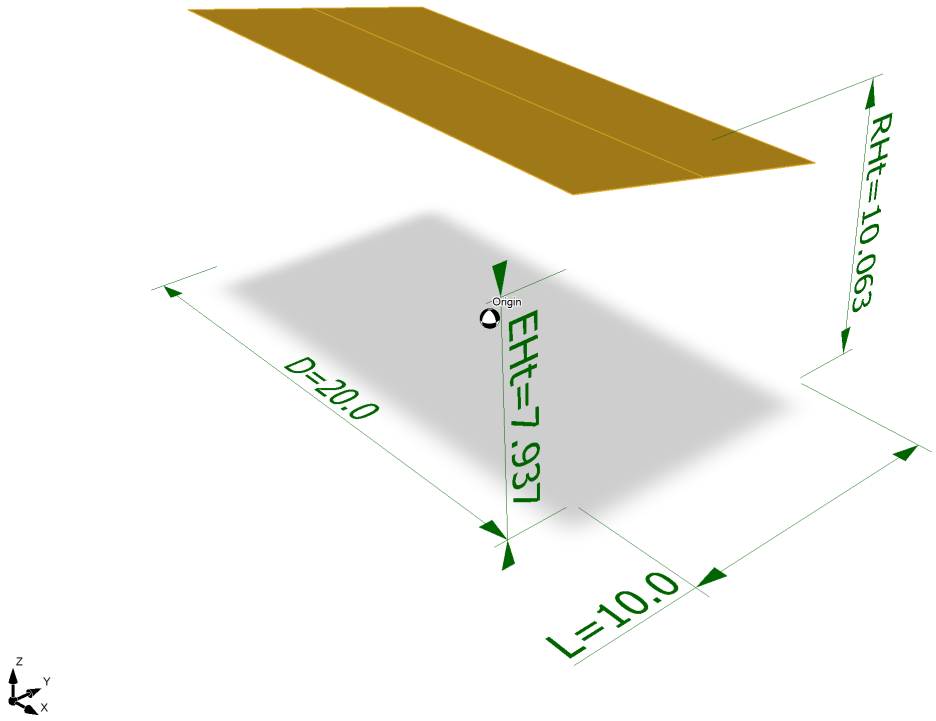

Figure 1 Wind load 1 F01 - 02

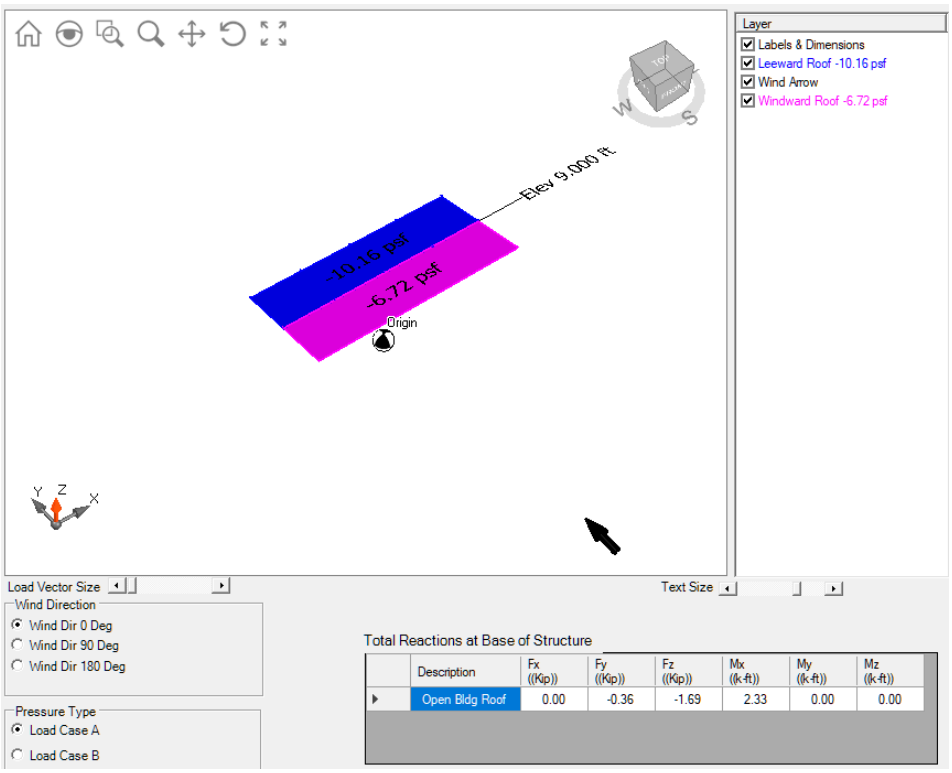

Figure 2 Wind load 2 F02 - 02

The permit approval is under the jurisdiction of the City of Larkspur, California which adopted the 2019 California Building Code [CBC] and the 2019 California Residential Code [CRC] as the basis for permiting construction work. The canopy is designed compliant with the requirements of the CBC.

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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

Basic loads and load combinations are derived from the California Building and Residential Codes.

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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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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
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

Gravity Loads and Seismic Mass **SECTION [0101] - 3**

Some filler text

Table 01 Roof unit dead loads T01 - 03

system-message

ERROR/3 in c:\git\solar_canopy\rivtManual\solar-canopy-2023\resource\rv00-temp\r0101.rst, line 177

Malformed table. Column span incomplete in table line 8.

```
==========  =======  =========  ================================
variable      value    [value]  description
==========  =======  =========  ================================
ld1         2.0 psf   0.10 KPa  Urethane foam (4 inch thick)
ld2         1.0 psf   0.05 KPa  Three-ply roofing
ld3         5.0 psf   0.24 KPa  Doug Fir decking 2-in.
ld4         1.0 psf   0.05 KPa  Doug Fir beams 4x12 at 12 ft o.c.
------       ------     ------  ------
roofdl1     9.0 psf   0.43 KPa  Total roof unit load
==========  =======  =========  ================================
```

backrefs:

Table 02 Floor unit dead loads T02 - 03

system-message

ERROR/3 in c:\git\solar_canopy\rivtManual\solar-canopy-2023\resource\rv00-temp\r0101.rst, line 192

Malformed table. Column span incomplete in table line 8.

```
==========  ========  =========  ==========================
variable       value    [value]  description
==========  ========  =========  ==========================
ld1          3.0 psf   0.14 KPa  3/4 in. hardwood flooring
ld2          2.0 psf   0.10 KPa  1/2 in. plywood subfloor
ld3          4.0 psf   0.19 KPa  2x10 joists at 16 in. o.c.
ld4          1.5 psf   0.07 KPa  fixtures
------        ------     ------  ------
floordl1    10.5 psf   0.50 KPa  Total floor unit load
==========  ========  =========  ==========================
```

backrefs:

Table 03 Interior wall unit dead loads T03 - 03

system-message

ERROR/3 in c:\git\solar_canopy\rivtManual\solar-canopy-2023\resource\rv00-temp\r0101.rst, line 206

Malformed table. Column span incomplete in table line 7.

variable	value	[value]	description
ld1	5.5 psf	0.26 KPa	5/8" sheet rock (2)
ld2	2 psf	0.10 KPa	2x4 studs at 16" o.c.
ld3	1.5 psf	0.07 KPa	fixtures
intwalldl1	9 psf	0.43 KPa	Total interior wall unit load

backrefs:

Table 04 Exterior wall unit dead loads T04 - 03

system-message

ERROR/3 in c:\git\solar_canopy\rivtManual\solar-canopy-2023\resource\rv00-temp\r0101.rst, line 221

Malformed table. Column span incomplete in table line 8.

variable	value	[value]	description
ld1	2.0 psf	0.10 KPa	1/2 in plywood sheathing
ld2	2.0 psf	0.10 KPa	2x4 studs at 16 in o.c.
ld3	3.0 psf	0.14 KPa	5/8 in sheet rock
ld4	1.5 psf	0.07 KPa	fixtures
extwalldl1	8.5 psf	0.41 KPa	Total exterior wall unit load

backrefs:

Table 05 Areas T05 - 03

Eq. 1 Roof weight E01 - 03

Eq. 1 rfwt1 = arearf1 * roofdl1 E01 - 03

Material Densities and Seismic Models **SECTION [0101] - 4**

Because the T&G roof is relatively more flexible, the effective floor load for seismic models is calculated as the sum of the floor and all of the partition weight.

Eq. 6 Effective model floor load E06 - 04

Eq. 6 eflrdl1 = (flrwt1 + partwt1)/(areaflr1) E06 - 04

Eq. 7 Effective model floor density E07 - 04

Eq. 7 eflrdens1 = eflrdl1/(0.5*IN) E07 - 04

Eq. 8 Effective model roof density E08 - 04

Eq. 8 erfdens1 = roofdl1/(1.5*IN) E08 - 04

Eq. 9 Effective model wall density E09 - 04

Eq. 9 ewalldens1 = extwalldl1/(0.5*IN) E09 - 04

Table 07 Model loads T07 - 04