20-141477 REV 01 RS

Structural Calculations
for
224 SE 136th Ave
Portland, Oregon 97233
August 25, 2022

DESIGN CODE

2021 Oregon Residential Specialty Code

DESIGN LOADS

Gravity Loads	Material Wt lbs (Dead)
	25 psf (Live - Snow)
Seismic, S_{DS}	0.724 g
Wind, Exposure "B"	98 mph

CONTENTS

EXPIRES: 6/30/2024

SCOPE OF WORK

The attached calculations pertain to the lateral analysis of the gable end roof at the above address. This scope of work does not include any analysis of any other portions of structure to remain.

Seismic Design Force

Risk Category II

$$F_p = \frac{0.4 a_p S_{DS} W_p}{(R_p/I_p)} (1+2z/h)$$ (ASCE 7-16 EQ. 13.3-1)

a_p	3		(ASCE 7-16 Table 13.5/6-1)
S_{DS}	0.724	g	(Applied Technology Council Report)
W_p	10	psf	
R_p	2.5		(ASCE 7-16 Table 13.5/6-1)
I_p	1		(ASCE 7-16 § 13.1.3)
z	11	ft	(ASCE 7-16 § 13.3.1.1)
h	11	ft	(ASCE 7-16 § 13.3.1.1)

F_p =	8.7	psf			
$F_{p\,Max.}$ =	11.6		=	$1.6 S_{DS} I_p W_p$	(ASCE 7-16 EQ. 13.3-2)
$F_{p\,Min.}$ =	2.2		=	$0.3 S_{DS} I_p W_p$	(ASCE 7-16 EQ. 13.3-3)

	F_p =	8.7	psf	
(ASD)	**F_p =**	**6.1**	**psf**	(ASCE 7-16 § 2.4.5)

Wind Design Force (C&C Part 2: Low-Rise Buildings (Simplified))

$$p_{net} = \lambda K_{zt} p_{net30}$$ (ASCE 7-16 EQ. 30.4-1)

λ	0.82	(ASCE 7-16 Fig. 30.4-1)
K_{zt}	0.70	(ASCE 7-16 § 26.8.2)
p_{net30}	18.0	(ASCE 7-16 Fig. 30.4-1)

	p_{net} =	10.3	psf	
(ASD)	**p_{net} =**	**6.2**	**psf**	(ASCE 7-16 § 2.4.1)

Per ASCE 7-16 §28.5.4 Use Minimums Below

p_s (wall) = 16.0 psf

(ASD) **p_s (wall) = 9.6 psf** (ASCE 7-16 § 2.4.1)

The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

Search Information

Address: 224 SE 136th Ave, Portland, OR, USA

Coordinates: 45.5208079, -122.5232154

Elevation: 301 ft

Timestamp: 2022-08-24T22:39:32.456Z

Hazard Type: Seismic

Reference Document: ASCE7-16

Risk Category: II

Site Class: D-default

Basic Parameters

Name	Value	Description
S_S	0.904	MCE_R ground motion (period=0.2s)
S_1	0.381	MCE_R ground motion (period=1.0s)
S_{MS}	1.085	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	0.724	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

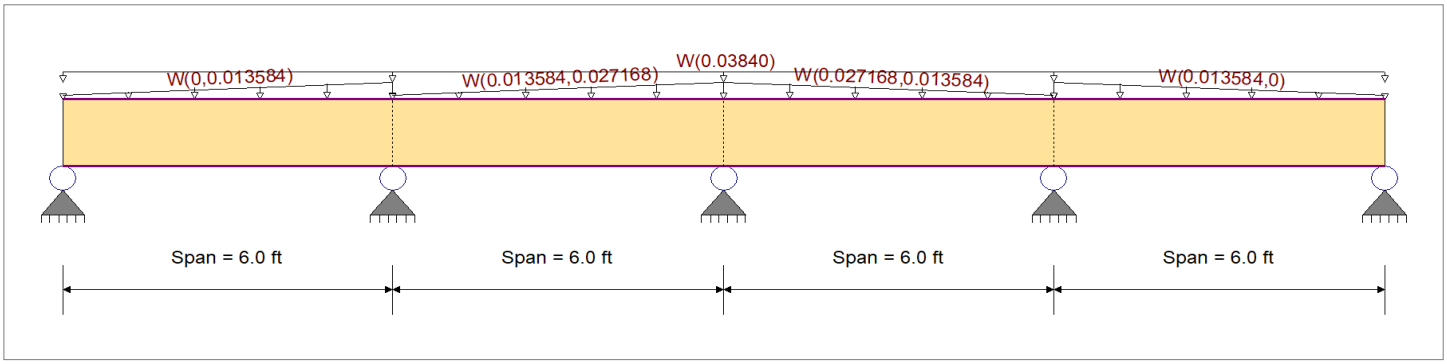
Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.879	Coefficient of risk (0.2s)
CR_1	0.865	Coefficient of risk (1.0s)
PGA	0.41	MCE_G peak ground acceleration

DESCRIPTION: Wind Reactions

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2018



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : W = 0.00960 ksf, Tributary Width = 4.0 ft
Load for Span Number 1
Varying Uniform Load : W= 0.0->0.00480 ksf, Extent = 0.0 -->> 6.0 ft, Trib Width = 2.830 ft

Load for Span Number 2
Varying Uniform Load : W= 0.00480->0.00960 ksf, Extent = 0.0 -->> 6.0 ft, Trib Width = 2.830 ft

Load for Span Number 3
Varying Uniform Load : W= 0.00960->0.00480 ksf, Extent = 0.0 -->> 6.0 ft, Trib Width = 2.830 ft

Load for Span Number 4
Varying Uniform Load : W= 0.00480->0.0 ksf, Extent = 0.0 -->> 6.0 ft, Trib Width = 2.830 ft

Wood Beam

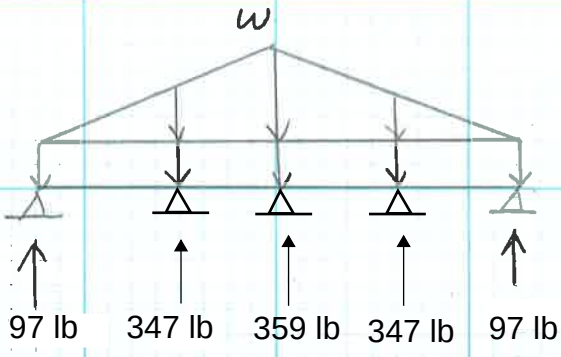
DESCRIPTION: Wind Reactions

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4	Support 5
Overall MAXimum	0.097	0.347	0.359	0.347	0.097
Overall MINimum	0.097	0.347	0.359	0.347	0.097
+0.60W	0.058	0.208	0.216	0.208	0.058
+0.450W	0.044	0.156	0.162	0.156	0.044
W Only	0.097	0.347	0.359	0.347	0.097

WIND LOAD



400 lbs (ASD) MAX CAPACITY FOR GABLE END BRACE

359 lb MAX w/ 3 KICKER BRACES

→ USE 3 GABLE END BRACES

HAYDEN ENGINEERS
STRUCTURAL | CIVIL
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224 SE 136th AVE

BY SS DATE 8/25/2022
REV ____ DATE ____
JOB NO 22254
SHEET ____ OF ____