

## Wind Loads

### ASCE 7-10 Velocity Pressure

$$qz_{10} = 0.00256 V^2 K_z K_{zt} K_d$$

where:

$qz_{10}$  = ASCE 7-10 velocity pressure evaluated at mean roof height (psf)

$K_z$  = velocity pressure exposure coefficient

$K_{zt}$  = topographic factor

$K_d$  = wind directionality factor

$V$  = basic wind speed (mph) from ASCE 7-10 maps referred to as ultimate wind speed maps in 2012 IBC.

Assuming all correction factors  $K=1$  for exposure C and a mean roof height that will be < 30ft and head on wind:

$qz_{10}=28.224$  (psf). This would be assuming a worst case scenario for the greenhouse.

ASCE 7-10 data is provided by the [American Wood Council](#)

# Velocity Pressure using tables

## CHAPTER 27 WIND LOADS ON BUILDINGS—MWFRS (DIRECTIONAL PROCEDURE)

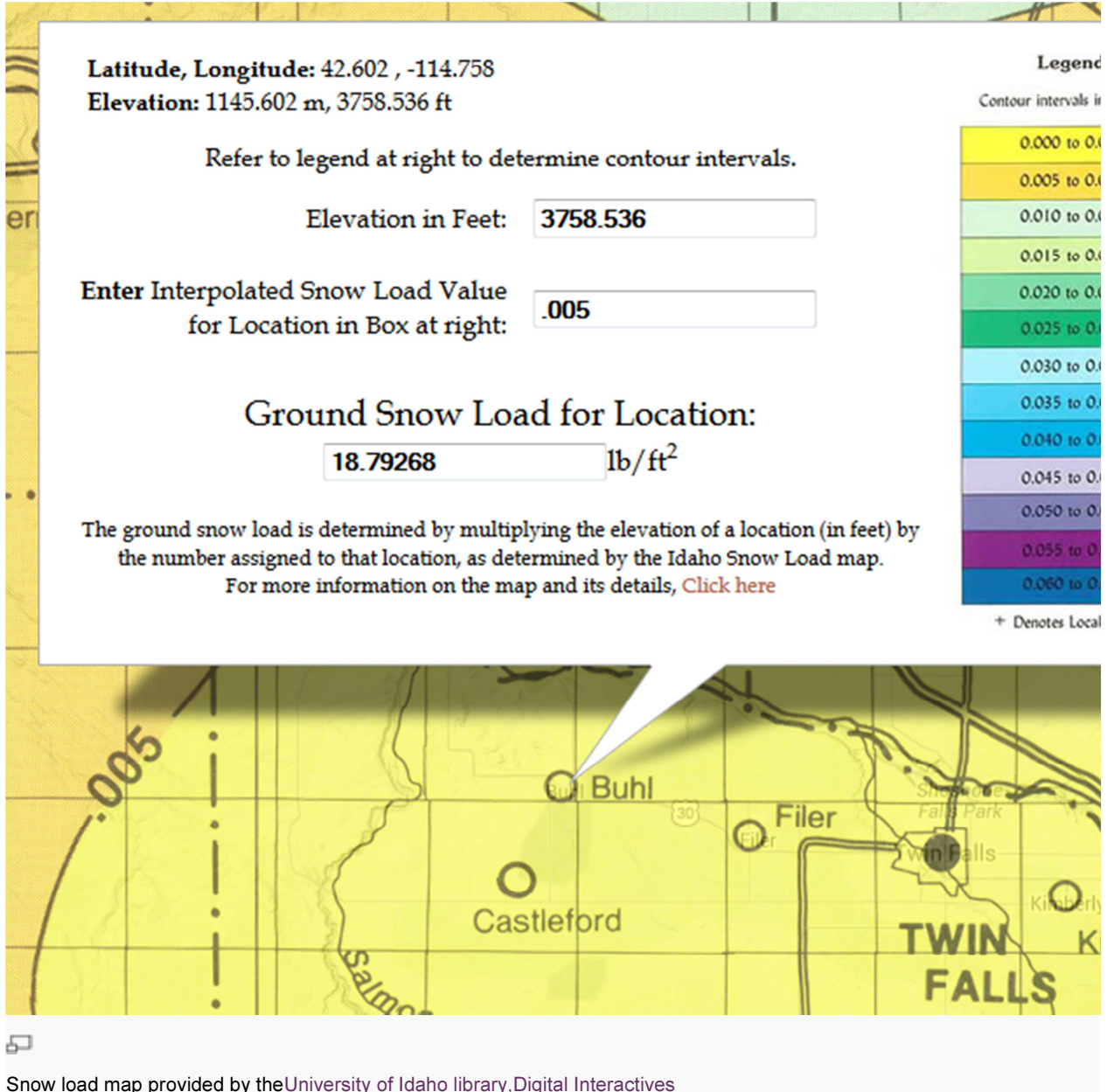
Table 27.6-1  
MWFRS – Part 2: Wind Loads – Walls  
Exposure C

V (mph)	110		115		120		130		140		160		180		200								
	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1							
160	49.2	46.7	43.7	54.5	53.8	60.0	59.3	53.3	72.2	71.1	64.1	85.8	84.3	76.1	117.4	115.0	103.9	151.8	137.2	200.2	195.0	176.2	
150	36.1	35.7	30.0	40.0	39.5	44.1	43.5	36.6	53.0	52.2	44.0	62.9	61.9	52.3	86.2	84.4	71.5	114.1	111.4	94.3	146.9	143.1	121.1
140	48.0	47.5	42.6	53.0	52.4	58.4	57.7	51.9	70.1	69.2	62.3	83.3	82.0	74.0	113.8	111.7	101.0	150.6	147.3	133.3	193.8	189.0	171.0
130	35.5	35.2	29.6	39.3	38.8	43.3	42.8	36.1	52.0	51.3	43.3	61.7	60.7	51.4	84.3	82.8	70.2	111.5	109.1	92.7	143.5	140.0	118.9
120	46.6	46.2	41.4	51.5	51.0	56.7	56.1	50.4	68.1	67.2	60.6	80.7	79.6	71.8	110.2	108.3	98.0	145.6	142.6	129.2	187.2	182.9	165.7
110	34.9	34.6	29.1	38.6	38.2	42.4	42.0	35.5	50.9	50.3	42.6	60.4	59.5	50.6	82.4	81.0	69.9	108.9	106.7	90.9	140.0	136.8	116.6
100	45.3	45.0	40.2	50.0	49.6	55.0	54.5	48.9	65.9	65.2	58.7	78.1	77.1	69.6	106.4	104.7	94.8	140.4	137.7	124.9	180.4	176.5	160.1
90	34.3	34.0	28.7	37.8	37.5	41.6	41.2	34.9	49.9	49.3	41.9	59.1	58.3	48.6	80.5	79.2	67.6	106.2	104.1	89.1	136.4	133.4	114.2
80	43.9	43.6	39.0	48.5	48.1	53.3	52.8	47.4	63.8	63.1	56.8	75.4	74.6	67.3	102.6	101.1	91.5	135.1	132.7	120.5	173.3	169.8	154.3
70	33.6	33.4	28.2	37.1	36.8	40.7	40.4	34.3	48.8	48.3	41.1	57.7	57.1	48.7	78.5	77.3	66.2	103.3	101.5	87.1	132.6	129.9	111.6
60	42.5	42.3	37.7	46.9	46.6	51.5	51.1	45.8	61.5	61.0	54.8	72.7	72.0	64.8	98.6	97.3	86.1	129.6	127.6	115.8	166.0	163.0	148.2
50	32.9	32.8	27.7	36.3	36.1	39.9	39.6	33.6	47.7	47.3	40.3	56.3	55.8	47.6	76.4	75.4	64.7	100.4	98.8	85.1	128.6	126.3	108.9
40	41.1	40.9	36.4	45.2	45.0	49.6	49.3	44.1	59.2	58.8	52.7	69.8	69.3	62.3	94.5	93.5	84.5	123.9	122.2	111.0	158.5	155.9	141.9
30	32.3	32.1	27.2	35.5	35.4	39.0	38.8	33.0	46.5	46.2	39.4	54.9	54.4	46.6	74.2	73.4	63.2	97.4	96.0	82.9	124.5	122.5	106.1
20	39.6	39.4	35.0	43.5	43.3	47.7	47.5	42.3	56.8	56.5	50.6	68.9	68.5	59.7	90.3	89.4	80.8	118.1	116.7	105.9	150.6	148.5	135.2
15	31.6	31.5	26.6	34.7	34.6	38.1	37.9	32.3	45.4	45.1	38.5	53.4	53.1	45.5	72.1	71.4	61.6	94.2	93.2	80.7	120.3	118.6	103.0
10	38.0	37.9	33.5	41.8	41.6	45.8	45.6	40.5	54.4	54.2	48.3	63.9	63.6	56.9	85.9	85.3	76.8	112.0	111.0	100.5	142.6	140.9	128.1
5	30.9	30.8	26.1	33.9	33.8	37.2	37.1	31.5	44.2	44.0	37.6	52.0	51.7	44.3	69.8	69.3	59.8	91.0	90.2	78.3	118.8	114.5	99.8
0	30.2	30.1	25.5	33.1	33.1	36.3	36.2	30.8	43.0	42.9	36.6	50.5	50.3	43.1	67.5	67.2	58.0	87.8	87.1	75.7	111.3	110.3	96.3
0	34.6	34.6	30.3	38.0	38.0	41.6	41.5	36.5	49.2	49.1	43.4	57.6	57.4	50.9	76.8	76.5	68.3	99.4	98.8	88.9	125.6	124.7	112.8
0	29.4	29.4	24.9	32.3	32.2	35.3	35.2	30.0	41.8	41.7	35.6	48.9	48.8	41.9	65.2	65.0	56.1	84.4	83.9	73.0	106.7	105.9	92.7
0	32.8	32.8	28.6	36.0	35.9	39.3	39.2	34.3	46.4	46.3	40.7	54.2	54.1	47.7	72.0	71.8	63.7	92.7	92.4	82.5	116.7	116.1	104.4
0	28.7	28.6	24.3	31.4	31.4	34.3	34.3	29.2	40.5	40.5	34.6	47.4	47.3	40.5	62.9	62.7	54.2	81.0	80.7	70.2	101.9	101.4	88.8
0	30.8	30.8	26.7	33.7	33.7	36.8	36.8	32.0	43.4	43.4	37.8	50.6	50.5	44.2	66.9	66.8	58.8	85.8	85.6	75.8	107.4	107.1	95.5
0	27.8	27.8	23.6	30.5	30.5	33.3	33.2	28.3	39.2	39.2	33.5	45.7	45.7	39.2	60.4	60.3	52.1	77.5	77.3	67.2	97.1	96.8	84.6
0	28.5	28.5	24.6	31.2	31.2	34.1	34.1	29.5	40.1	40.1	34.8	46.7	46.6	40.5	61.4	61.4	53.6	78.4	78.3	68.8	97.8	97.6	86.1
0	26.9	26.9	22.9	29.4	29.4	32.1	32.1	27.4	37.8	37.8	32.4	44.0	43.9	37.7	57.9	57.8	49.9	73.9	73.8	64.0	92.1	91.9	80.2
0	26.2	26.2	22.6	28.6	28.6	31.2	31.2	26.9	36.7	36.7	31.7	42.6	42.6	36.9	55.9	55.9	48.2	71.1	71.1	61.9	88.2	88.2	77.0
0	25.8	25.8	22.2	28.3	28.3	30.8	30.8	26.5	36.2	36.2	31.2	42.1	42.1	36.3	55.2	55.1	47.7	70.1	70.1	60.9	87.1	87.0	75.8
0	25.2	25.2	21.8	27.6	27.6	30.0	30.0	26.0	35.3	35.3	30.6	41.0	41.0	35.5	53.7	53.7	46.6	68.1	68.1	59.3	84.4	84.4	73.6
0	25.2	25.2	21.8	27.6	27.6	30.0	30.0	26.0	35.3	35.3	30.6	41.0	41.0	35.5	53.7	53.7	46.6	68.1	68.1	59.3	84.4	84.4	73.6

Wind loads for exposure C (open terrain) provided by Purdue University and the ASCE 7-10 handbook. This table is wind velocity for ASCE7-10 against the mean roof height, as well as the ratio between the base and length (L/B)

Using the ASCE 7-10 Table 27.6-1 for exposure C and assuming the maximum height of around 20ft, the wind pressure is read to be between 23-27 (psf). This value will be slightly higher than expected values as the table ends at 110 (mph) instead of the wind velocity provided by the Applied Technology Council of 105 (mph).

## Snow Loads



Using the interactive snow load map provided by the University of Idaho, the worst case snow load can be assumed to be about 20 (psf).