Snow Load Report

1. Roof and Building Data

Ground Snow Load (Pg):	120.0 psf	Exposure:	Partially Exposed
Roof Pitch:	6.75 /12	Thermal Factor (C_t):	1.10
Risk Category:	II	Roof Surface:	Metal
Eave-to-Ridge (W):	9 ft.	Roof System:	Attic Truss
Attic Width (A):	12 ft.	Spacing:	16 in. o/c
Terrain Category:	B	Overhang:	12 in.

2. Design Loads

Top Chord Dead Load:	7	psf
Bottom Chord Dead Load:	10	psf
Ceiling Dead Load:	5	psf
Floor Dead Load:	10	psf
Floor Live Load:	40	psf

SF (Slope Factor) = 1/Cosine(Φ) = 1.15 (Dead loads specified on a projected horizontal basis take into account the effect of the pitch via a slope factor.)

Adj. TCDL (TCDL x SF):   8.0 psf

3. Design Assumptions

Code Standard:	ASCE 7-10
Number of Plies:	1 PLY
Bottom Chord Pitch:	0 /12

4. Snow Load Calculations

Calculate flat roof snow load p_f using the following equation:

$$p_f = 0.7 C_e C_t I_s p_g$$

where:

p_f = Flat Roof Snow Load in psf
C_e = 1.00 = Exposure Factor, as determined by ASCE 7-10 Table 7-2 (Terrain Cat. B, Exp. Partially Exposed)
C_t = 1.10 = Thermal Factor, as determined by ASCE 7-10 Table 7-3
I_s = 1.00 = Importance Factor, as determined by ASCE 7-10 Table 1.5-2 (Risk Cat. II)
p_g = 120.0 psf = Ground Snow Load in psf

$$p_f = 0.7 C_e C_t I_s p_g = 0.7(1.00)(1.10)(1.00)(120.0) = 92.4 \text{ psf}$$

Subject	Customer	Location	Job No.
Snow Loads	Charles Alex Lanis	725 W 5th St, Silcerton, CO 81433	2024A565

Engr.			Rev.
Engr. Name	**STRUCTURAL ENGINEERING INC.**	This report may not be copied, reproduced or distributed without the written consent of Engineering Company Inc.	-

Date			Page
7/29/2024	Street Address City, ST 99999 ph. (800) 000-0000 www.website.com	Copyright © 2024	1

A minimum roof snow load, p_m shall apply to monoslope, hip and gable roofs with slopes less than 15 degrees using the following equations:

Where p_g is 20 psf or less: $p_m=I_sp_g$
Where p_g exceeds 20 psf: $p_m=I_s(20)$

Roof slope is greater than 15 degrees, the minimum roof snow load, p_m, does not apply.

For locations where p_g is 20 psf or less, but not zero, all roofs with slopes (in degrees) less than W/50 with W in feet shall included a 5 psf rain-on-snow surcharge load. This additional load applies only to the sloped roof (balanced) load case and need not be used in combination with drift, sliding, unbalanced, minimum, or partial loads.

Roof slope in degrees (29.36°) is greater than W/50 = 0.2, the 5.0 psf rain-on-snow surcharge load does not apply.

Calculate sloped roof snow load p_s using the following equation:

$p_s = C_sp_f$

where:

p_s = Sloped Roof Snow Load in psf
$C_s = 1-[(29.36-10)/60] = 0.68$ = Roof Slope Factor, as determined by ASCE 7-10 Sec. 7.4.1-7.4.4 and Figure 7-2
p_f = Flat Roof Snow Load in psf

Roof surface (Metal) is considered a "slippery" roof. For a $C_t = 1.10$ the roof slope factor C_s is given by the dashed line of ASCE 7-10 Figure 7-2b.

$p_s = C_sp_f = (0.68)(92.4) = 62.6$ psf

Calculate unbalanced snow load for hip and gable roofs as shown in ASCE 7-10 Figure 7-5.
Unbalanced snow loads are required for roof pitches between 1/2 on 12 to 7 on 12.
Using the following equations:

$\gamma = 0.13p_g + 14$ (snow density)
$h_d = .43\sqrt[3]{l_u}\sqrt[4]{p_g+10}-1.5$ (drift height) [if l_u < 20 ft., use l_u = 20 ft.]
$l_d = \frac{8}{3}h_d\sqrt{S}$ (width of drift surcharge)
$p_d = h_d\gamma/\sqrt{S}$ (drift surcharge snow load)

where:

γ = Snow density in pcf, not to exceed 30 pcf.
h_d = Drift height in feet, as determined by eqn. or ASCE 7-10 Fig. 7-9.
l_u = W = Ridge to eave distance in feet, windward side of roof.
S = 12/Roof Pitch
l_d = Width of drift surcharge in feet.
p_d = Drift Surcharge Snow Load in psf

FIGURE 7-5 Balanced and Unbalanced Snow Loads for Hip and Gable Roofs.

$p_{windward} = 0.3p_s = (0.3)(62.6) = 18.8$ psf
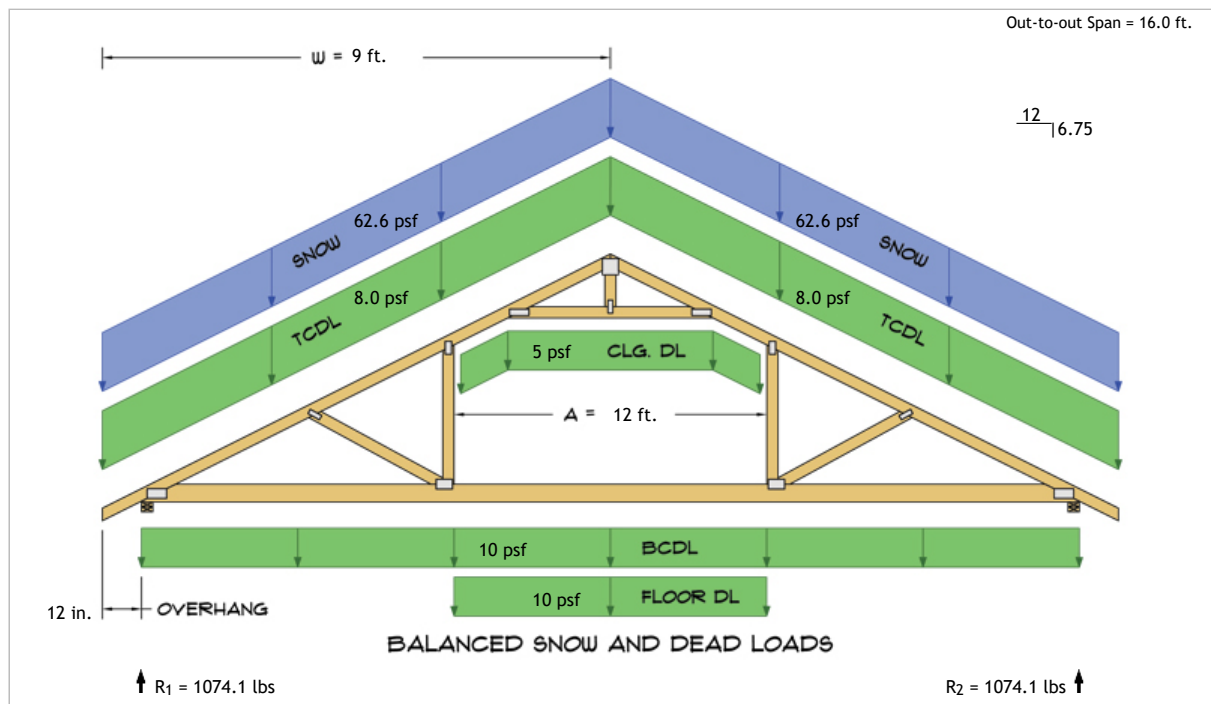
$p_{leeward} = p_s = 62.6$ psf

$\gamma = 0.13(120.0) + 14 = 29.60$ pcf

$h_d = .43\sqrt[3]{20}\sqrt[4]{120.0 + 10} - 1.5 = 2.44$ ft. [$l_u = 20$ ft.]

$l_d = \dfrac{8}{3} \times 2.44 \times \sqrt{12/6.75} = 8.68$ ft.

$p_d = \dfrac{2.44 \times 29.60}{\sqrt{12/6.75}} = 54.2$ psf

On warm roofs apply a distributed $2p_f$ snow load on all overhanging portions as per ASCE 7-10 section 7.4.5. No other loads except dead loads shall be present on the roof when this uniformly distributed load is applied.

$2p_f = (2)(92.4) = 184.8$ psf

BALANCED SNOW AND DEAD LOADS

$R_1 = 1074.1$ lbs $R_2 = 1074.1$ lbs

$R_1 = D + S = 323.0$ lbs $+ 751.0$ lbs
$R_2 = D + S = 323.0$ lbs $+ 751.0$ lbs

Subject	Customer	Location	Job No.
Snow Loads	Charles Alex Lanis	725 W 5th St, Silcerton, CO 81433	2024A565

Engr.			Rev.
Engr. Name	STRUCTURAL ENGINEERING INC.		-
Date	Street Address City, ST 99999		Page
7/29/2024	ph. (800) 000-0000 www.website.com		3

This report may not be copied, reproduced or distributed without the written consent of Engineering Company Inc.

Copyright © 2024

FLOOR AND DEAD LOADS

- w = 9 ft.
- 12 | 6.75
- 8.0 psf TCDL
- 8.0 psf TCDL
- 5 psf CLG. DL
- A = 12 ft.
- 40 psf FLOOR LL
- 10 psf BCDL
- 10 psf FLOOR DL
- 12 in. OVERHANG
- R₁ = 643.0 lbs
- R₂ = 643.0 lbs

$R_1 = D + L = 323.0 \text{ lbs} + 320.0 \text{ lbs}$
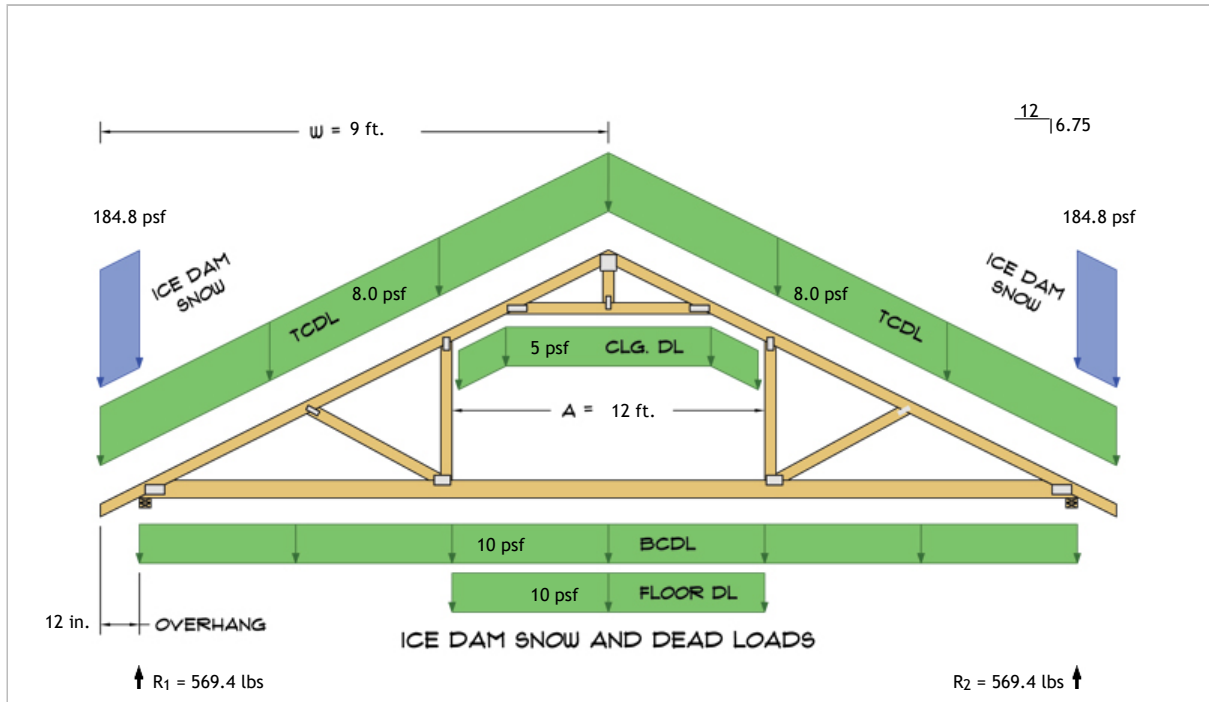$R_2 = D + L = 323.0 \text{ lbs} + 320.0 \text{ lbs}$

BALANCED SNOW, FLOOR AND DEAD LOADS

- w = 9 ft.
- 12 | 6.75
- 46.9 psf SNOW
- 46.9 psf SNOW
- 8.0 psf TCDL
- 8.0 psf TCDL
- 5 psf CLG. DL
- A = 12 ft.
- 30.0 psf FLOOR LL
- 10 psf BCDL
- 10 psf FLOOR DL
- 12 in. OVERHANG
- R₁ = 1126.3 lbs
- R₂ = 1126.3 lbs
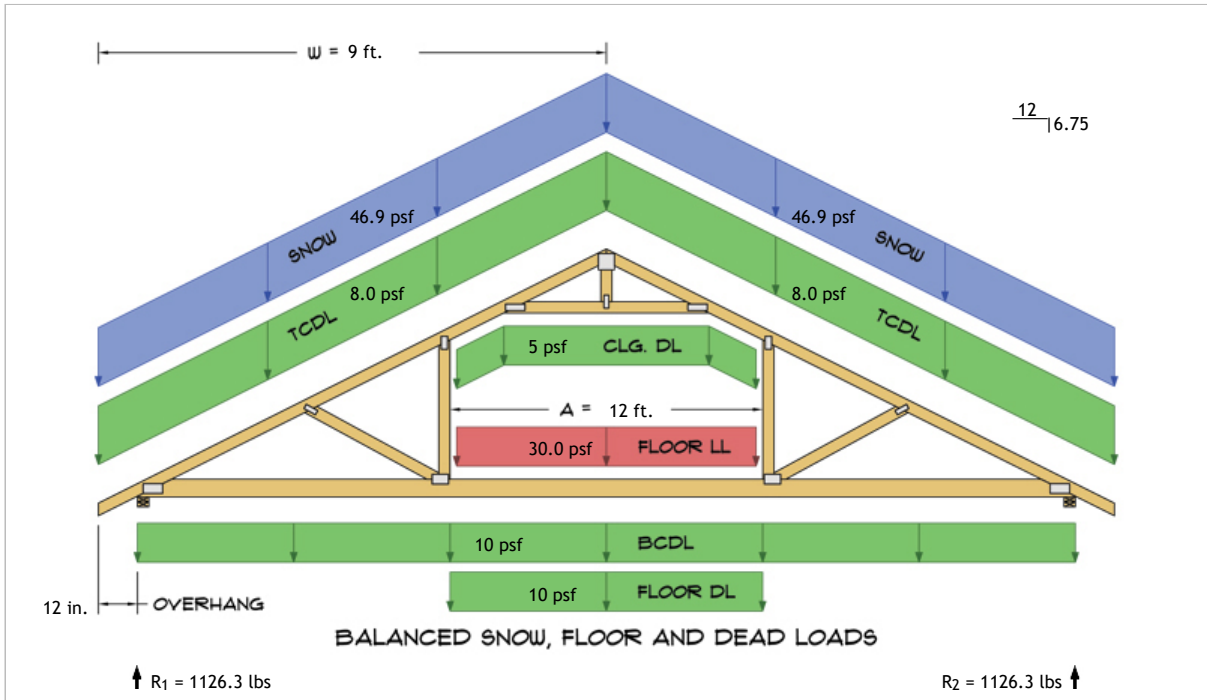
$R_1 = D + 0.75L + 0.75S = 323.0 \text{ lbs} + 240.0 \text{ lbs} + 563.3 \text{ lbs}$
$R_2 = D + 0.75L + 0.75S = 323.0 \text{ lbs} + 240.0 \text{ lbs} + 563.3 \text{ lbs}$

Subject	Customer	Location		Job No.
Snow Loads	Charles Alex Lanis	725 W 5th St, Silcerton, CO 81433		2024A565

Engr.				Rev.
Engr. Name	**STRUCTURAL ENGINEERING INC.**	STRUCTURAL ENGINEERS COMPANY LOGO	This report may not be copied, reproduced or distributed without the written consent of Engineering Company Inc.	-
Date	Street Address City, ST 99999			**Page**
7/29/2024	ph. (800) 000-0000 www.website.com		Copyright © 2024	4

UNBALANCED SNOW AND DEAD LOADS

- 8.68 ft.
- w = 9 ft.
- 54.2 psf DRIFT SURCHARGE
- $\frac{12}{}$ 6.75
- 18.8 psf SNOW WINDWARD
- 62.6 psf SNOW LEEWARD
- 8.0 psf TCDL
- 8.0 psf TCDL
- 5 psf CLG. DL
- A = 12 ft.
- 10 psf BCDL
- 10 psf FLOOR DL
- 12 in. OVERHANG
- R_1 = 806.8 lbs
- R_2 = 1442.8 lbs

$R_1 = D + S = 323.0 \text{ lbs} + 483.8 \text{ lbs}$
$R_2 = D + S = 323.0 \text{ lbs} + 1119.8 \text{ lbs}$

ICE DAM SNOW AND DEAD LOADS

- w = 9 ft.
- $\frac{12}{}$ 6.75
- 184.8 psf ICE DAM SNOW
- 184.8 psf ICE DAM SNOW
- 8.0 psf TCDL
- 8.0 psf TCDL
- 5 psf CLG. DL
- A = 12 ft.
- 10 psf BCDL
- 10 psf FLOOR DL
- 12 in. OVERHANG
- R_1 = 569.4 lbs
- R_2 = 569.4 lbs

$R_1 = D + S = 323.0 \text{ lbs} + 246.4 \text{ lbs}$
$R_2 = D + S = 323.0 \text{ lbs} + 246.4 \text{ lbs}$

*Disclaimer: The calculations produced herein are for initial design and estimating purposes only. The calculations and drawings presented do not constitute a fully engineered design. All of the load cases required to fully design an actual structure are not provided by this calculator. For the design of an actual structure, a registered and licensed professional should be consulted as per IRC 2012 Sec. R802.10.2 and designed according to the minimum requirements of ASCE 7-10. The snow load calculations provided by this online tool are for educational and illustrative purposes only. Medeek Design assumes no liability or loss for any designs presented and does not guarantee fitness for use.

Subject	Customer	Location		Job No.
Snow Loads	Charles Alex Lanis	725 W 5th St, Silcerton, CO 81433		2024A565

Engr. Engr. Name

STRUCTURAL ENGINEERING INC.
Street Address City, ST 99999
ph. (800) 000-0000   www.website.com

STRUCTURAL ENGINEERS
COMPANY LOGO

This report may not be copied, reproduced or distributed without the written consent of Engineering Company Inc.

Copyright © 2024

Rev. -

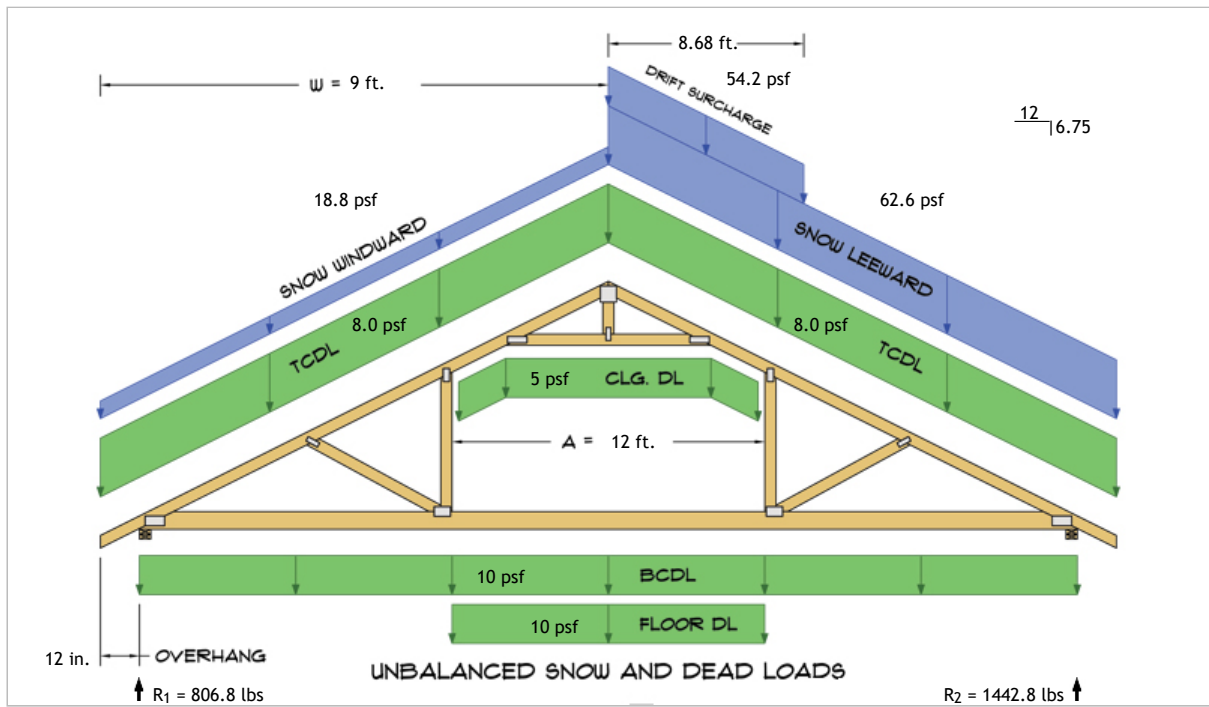Date 7/29/2024