TSE Engineers
136 S. State Street
Shelley, Idaho 83274
208-357-2420

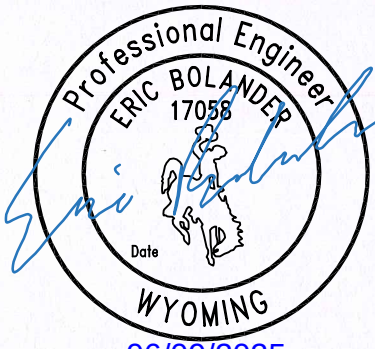
JOB TITLE	Wooden Spur Renovation		
	368 Wppdem Spur Dr. Alpine Wy.		
JOB NO.	225112	SHEET NO.	
CALCULATED BY	EVB	DATE	6/4/25
CHECKED BY		DATE	

STRUCTURAL CALCULATIONS

FOR

Wooden Spur Renovation

368 Wppdem Spur Dr. Alpine Wy.



06/09/2025

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JOB TITLE Wooden Spur Renovation
368 Wppdem Spur Dr. Alpine Wy.
JOB NO. 225112 SHEET NO. 1 of 39
CALCULATED BY EVB DATE 6/4/25
CHECKED BY DATE

CODE SUMMARY

Code: International Building Code 2021

Live Loads:

Roof	0 to 200 sf:	20 psf
	200 to 600 sf:	24 - 0.02Area, but not less than 12 psf
	over 600 sf:	12 psf

Typical Floor	40 psf
Partitions	N/A
All other residential areas except bal	40 psf
Habitable attics & sleeping areas	30 psf
Attics without storage	10 psf
Decks (1.5 times live load)	60 psf

Dead Loads:

Floor	10.0 psf
Roof	15.0 psf

Roof Snow Loads:

Design Uniform Roof Snow load		=	100.0 psf
Flat Roof Snow Load	Pf	=	98.0 psf
Balanced Snow Load	Ps	=	98.0 psf
Ground Snow Load	Pg	=	140.0 psf
Importance Factor	I	=	1.00
Snow Exposure Factor	Ce	=	1.00
Thermal Factor	Ct	=	1.00
Sloped-roof Factor	Cs	=	1.00
Drift Surcharge load	Pd	=	
Width of Snow Drift	w	=	

Earthquake Design Data:

Risk Category		=	II
Importance Factor	I	=	1.00
Mapped spectral response accelerat	Ss	=	110.90
	S1	=	34.10
Site Class		=	code default
Spectral Response Coef.	Sds	=	0.887
	Sd1	=	0.445
Seismic Design Category		=	D
Basic Structural System		=	Bearing Wall Systems
Seismic Resisting System		=	Light frame (wood) walls with structural wood shear panels
Seismic Response Coef.	Cs	=	0.136
Response Modification Factor	R	=	6.5
Analysis Procedure		=	Equivalent Lateral-Force Analysis

Rain Design Data:

Rain intensity	*i* =	7.23 in/hr
Rain Load	R =	24.4 psf

Wind Design Data:

Ultimate Design Wind Speed	120 mph
Nominal Design Wind Speed	92.95 mph
Risk Category	II
Mean Roof Ht (h)	17.0 ft
Exposure Category	C
Enclosure Classif.	Enclosed Building
Internal pressure Coef.	+/-0.18
Directionality (Kd)	0.85

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JOB NO. 225112 SHEET NO. 2 of 39
CALCULATED BY EVB DATE 6/4/25
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Component and Cladding Nominal Wind Pressures

Roof	Surface Pressure (psf)							
Area	2 sf	10 sf	20 sf	50 sf	75 sf	100 sf	200 sf	250 sf
Negative Zone 1 & 2e	-29.1	-29.1	-29.1	-17.7	-12.7	-10.0	-10.0	-10.0
Negative Zone 2n, 2r &3e	-42.4	-42.4	-36.7	-29.1	-25.7	-23.3	-17.6	-15.8
Negative Zone 3r	-50.5	-50.5	-43.2	-33.7	-29.4	-26.4	-26.4	-26.4
Positive All Zones	11.7	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Overhang Zone 1 & 2e	-33.4	-33.4	-33.4	-25.8	-22.4	-20.0	-20.0	-20.0
Overhang Zone 2n & 2r	-46.7	-46.7	-42.4	-36.7	-34.2	-32.4	-28.1	-26.7
Overhang Zone 3e	-54.7	-54.7	-47.3	-37.4	-33.0	-29.9	-22.4	-20.0
Overhang Zone 3r	-62.7	-62.7	-53.1	-40.3	-34.7	-30.7	-30.7	-30.7

Overhang soffit pressure equals adj wall pressure (which includes internal pressure of 2.4 psf)

Parapet		Solid Parapet Pressure (psf)					
	Area	10 sf	20 sf	50 sf	100 sf	250 sf	500 sf
CASE A:	Zone 2e :	0.0	0.0	0.0	0.0	0.0	0.0
	Zone 2n, 2r & 3e :	0.0	0.0	0.0	0.0	0.0	0.0
	Zone 3r :	0.0	0.0	0.0	0.0	0.0	0.0
CASE B :	Interior zone :	0.0	0.0	0.0	0.0	0.0	0.0
	Corner zone :	0.0	0.0	0.0	0.0	0.0	0.0

Wall	Surface Pressure (psf)			
Area	10 sf	100 sf	200 sf	500 sf
Negative Zone 4	-15.6	-13.5	-12.9	-12.0
Negative Zone 5	-19.2	-15.0	-13.7	-12.0
Positive Zone 4 & 5	14.4	12.3	11.7	10.8

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JOB TITLE Wooden Spur Renovation
368 Wppdem Spur Dr. Alpine Wy.
JOB NO. 225112 SHEET NO. 3 of 39
CALCULATED BY EVB DATE 6/4/25
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Code Search

Code: International Building Code 2021

Occupancy:

Occupancy Group = R Residential

Risk Category & Importance Factors:

Risk Category =	II	
Wind factor =	1.00	use 0.60 NOTE: Output will be nominal wind pressures
Snow factor =	1.00	
Seismic factor =	1.00	

Type of Construction:

Fire Rating:

Roof =	0.0 hr
Floor =	0.0 hr

Building Geometry:

Roof angle (θ)	2.00 / 12	9.5 deg
Building length	26.0 ft	
Least width	38.0 ft	
Mean Roof Ht (h)	17.0 ft	
Parapet ht above grd	0.0 ft	
Minimum parapet ht	0.0 ft	

Live Loads:

Roof
0 to 200 sf: 20 psf
200 to 600 sf: 24 - 0.02Area, but not less than 12 psf
over 600 sf: 12 psf

Floor:

Typical Floor	40 psf
Partitions	N/A
All other residential areas except balc	40 psf
Habitable attics & sleeping areas	30 psf
Attics without storage	10 psf
Decks (1.5 times live load)	60 psf

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JOB TITLE Wooden Spur Renovation
368 Wppdem Spur Dr. Alpine Wy.
JOB NO. 225112 SHEET NO. 4 of 39
CALCULATED BY EVB DATE 6/4/25
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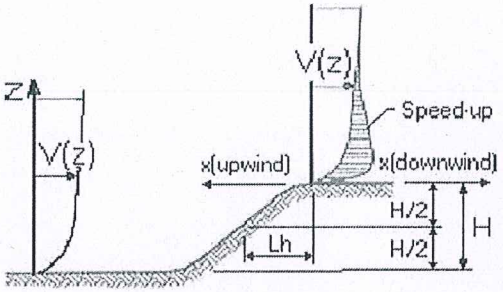
Wind Loads : ASCE 7- 16

Ultimate Wind Speed	120 mph
Nominal Wind Speed	93 mph
Risk Category	II
Exposure Category	C
Enclosure Classif.	Enclosed Building
Internal pressure	+/-0.18
Directionality (Kd)	0.85
Kh case 1	0.872
Kh case 2	0.872
Type of roof	Gable

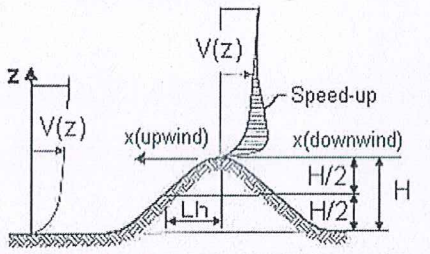
Topographic Factor (Kzt)

Topography		Flat
Hill Height	(H)	80.0 ft
Half Hill Length (Lh)		100.0 ft
Actual H/Lh	=	0.80
Use H/Lh	=	0.50
Modified Lh	=	160.0 ft
From top of crest: x =		50.0 ft
Bldg up/down wind?		downwind

H/Lh= 0.50 K_1 = 0.000
x/Lh = 0.31 K_2 = 0.792
z/Lh = 0.11 K_3 = 1.000
At Mean Roof Ht:
Kzt = $(1+K_1K_2K_3)^2$ = 1.00



ESCARPMENT



2D RIDGE or 3D AXISYMMETRICAL HILL

Gust Effect Factor

h = 17.0 ft
B = 38.0 ft
/z (0.6h) = 15.0 ft

Flexible structure if natural frequency < 1 Hz (T > 1 second).
If building h/B>4 then may be flexible and should be investigated.
h/B = 0.45 Rigid structure (low rise bldg)

G = 0.85 Using rigid structure formula

Rigid Structure

$\bar{e}$ =	0.20
ℓ =	500 ft
z_{min} =	15 ft
c =	0.20
g_Q, g_v =	3.4
L_z =	427.1 ft
Q =	0.92
I_z =	0.23
G =	**0.88** use G = 0.85

Flexible or Dynamically Sensitive Structure

Natural Frequency (η_1) =	0.0 Hz				
Damping ratio (β) =	0				
/b =	0.65				
/α =	0.15				
Vz =	101.3				
N_1 =	0.00				
R_n =	0.000				
R_h =	28.282	η =	0.000	h =	17.0 ft
R_B =	28.282	η =	0.000		
R_L =	28.282	η =	0.000		
g_R =	0.000				
R =	0.000				
Gf =	0.000				

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Enclosure Classification

Test for Enclosed Building: Ao < 0.01Ag or 4 sf, whichever is smaller

Test for Open Building: All walls are at least 80% open.
Ao ≥ 0.8Ag

Test for Partially Enclosed Building: Predominately open on one side only

	Input			Test	
Ao	180.0	sf	Ao ≥ 1.1Aoi	NO	
Ag	286.0	sf	Ao > 4' or 0.01Ag	YES	
Aoi	308.0	sf	Aoi / Agi ≤ 0.20	NO	Building is NOT Partially Enclosed
Agi	858.0	sf			

Conditions to qualify as Partially Enclosed Building. Must satisfy all of the following:
Ao ≥ 1.1Aoi
Ao > smaller of 4' or 0.01 Ag
Aoi / Agi ≤ 0.20
Where:
Ao = the total area of openings in a wall that receives positive external pressure.
Ag = the gross area of that wall in which Ao is identified.
Aoi = the sum of the areas of openings in the building envelope (walls and roof) not including Ao.
Agi = the sum of the gross surface areas of the building envelope (walls and roof) not including Ag.

Test for Partially Open Building: A building that does not qualify as open, enclosed or partially enclosed. (This type building will have same wind pressures as an enclosed building.

Reduction Factor for large volume partially enclosed buildings (Ri) :

If the partially enclosed building contains a single room that is unpartitioned , the internal pressure coefficient may be multiplied by the reduction factor Ri.

Total area of all wall & roof openings (Aog): 0 sf
Unpartitioned internal volume (Vi) : 0 cf
Ri = 1.00

Ground Elevation Factor (Ke)

Grd level above sea level = 5664.0 ft Ke = 0.8146
Constant = 0.00256 Adj Constant = 0.00209

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Wind Loads - MWFRS h≤60' (Low-rise Buildings) except for open buildings

Kz = Kh (case 1) = 0.87
Base pressure (qh) = **13.3 psf**
GCpi = +/-0.18

Edge Strip (a) = 3.0 ft
End Zone (2a) = 6.0 ft
Zone 2 length = 13.0 ft

Wind Pressure Coefficients

	CASE A				CASE B		
		θ = 9.5 deg					
Surface	GCpf	w/-GCpi	w/+GCpi		GCpf	w/-GCpi	w/+GCpi
1	0.44	0.62	0.26		-0.45	-0.27	-0.63
2	-0.69	-0.51	-0.87		-0.69	-0.51	-0.87
3	-0.40	-0.22	-0.58		-0.37	-0.19	-0.55
4	-0.33	-0.15	-0.51		-0.45	-0.27	-0.63
5					0.40	0.58	0.22
6					-0.29	-0.11	-0.47
1E	0.67	0.85	0.49		-0.48	-0.30	-0.66
2E	-1.07	-0.89	-1.25		-1.07	-0.89	-1.25
3E	-0.58	-0.40	-0.76		-0.53	-0.35	-0.71
4E	-0.49	-0.31	-0.67		-0.48	-0.30	-0.66
5E					0.61	0.79	0.43
6E					-0.43	-0.25	-0.61

Nominal Wind Surface Pressures (psf)

1		8.3	3.5		-3.6	-8.4
2		-6.8	-11.6		-6.8	-11.6
3		-3.0	-7.8		-2.5	-7.3
4		-2.0	-6.8		-3.6	-8.4
5					7.7	2.9
6					-1.5	-6.3
1E		11.3	6.5		-4.0	-8.8
2E		-11.9	-16.7		-11.9	-16.7
3E		-5.3	-10.1		-4.7	-9.5
4E		-4.2	-9.0		-4.0	-8.8
5E					10.5	5.7
6E					-3.3	-8.1

Parapet

Windward parapet = 0.0 psf (GCpn = +1.5)
Leeward parapet = 0.0 psf (GCpn = -1.0)

Windward roof overhangs = 9.3 psf (upward) add to windward roof pressure

Horizontal MWFRS Simple Diaphragm Pressures (psf)

Transverse direction (normal to L)

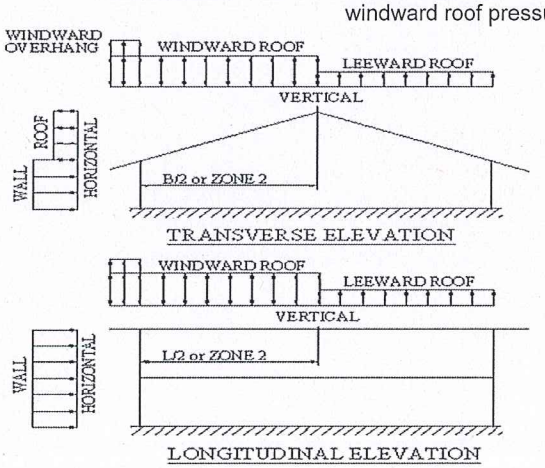
Interior Zone: Wall 10.3 psf
Roof -3.8 psf **
End Zone: Wall 15.5 psf
Roof -6.6 psf **

Longitudinal direction (parallel to L)

Interior Zone: Wall 9.2 psf
End Zone: Wall 13.9 psf

** NOTE: Total horiz force shall not be less than that determined by neglecting roof forces (except for MWFRS moment frames).

The code requires the MWFRS be designed for a min ultimate force of 16 psf multiplied by the wall area plus an 8 psf force applied to the vertical projection of the roof.



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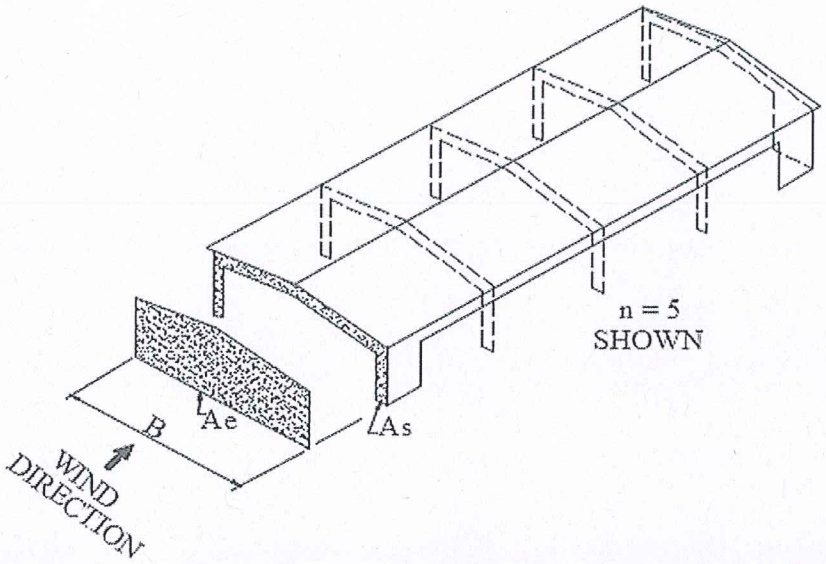
Wind Loads - h≤60' Longitudinal Direction MWFRS On Open or Partially Enclosed Buildings with Transverse Frames and Pitched Roofs

Base pressure (qh) = **13.3 psf** **ASCE 7-16 procedure**
GCpi = +/-0.18 Enclosed bldg, procdure doesn't apply
Roof Angle (θ) = 9.5 deg



B=	38.0 ft
# of frames (n) =	5
Solid are of end wall including fascia (As) =	1,500.0 sf
Roof ridge height =	20.2 ft
Roof eave height =	17.0 ft
Total end wall area if soild (Ae) =	706.2 sf

Longidinal Directional Force (F) = pAe
p= qh [(GCpf)windward -(GCpf)leeward] K_B K_S

Solidarity ratio (Φ) =	2.124
n =	5
KB =	1.42
KS =	5.597
Zones 5 & 6 area =	653 sf
5E & 6E area =	53 sf
(GCpf) windward - (GCpf) leeward] =	0.716
p =	76.0 psf

Total force to be resisted by MWFRS (F) = **53.7 kips** applied at the centroid of the end wall area Ae

Note: The longidudinal force acts in combination with roof loads calculated elsewhere for an open or partially enclosed building.

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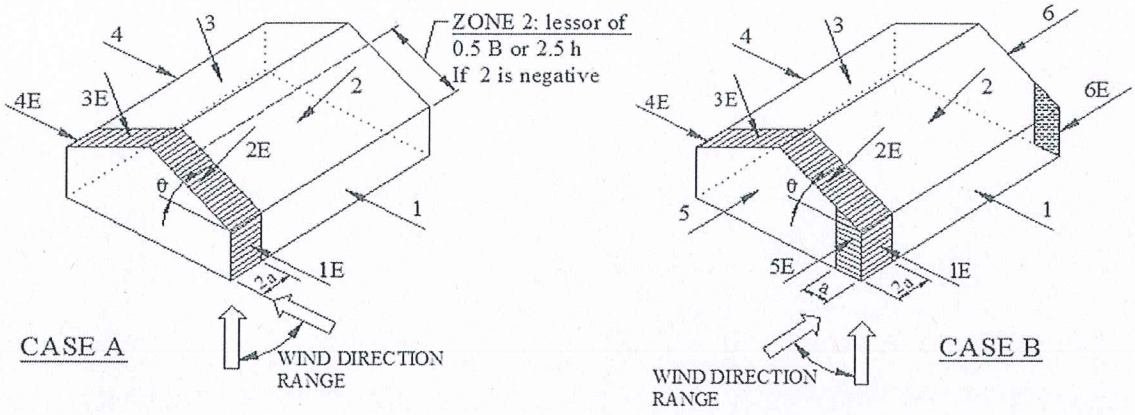
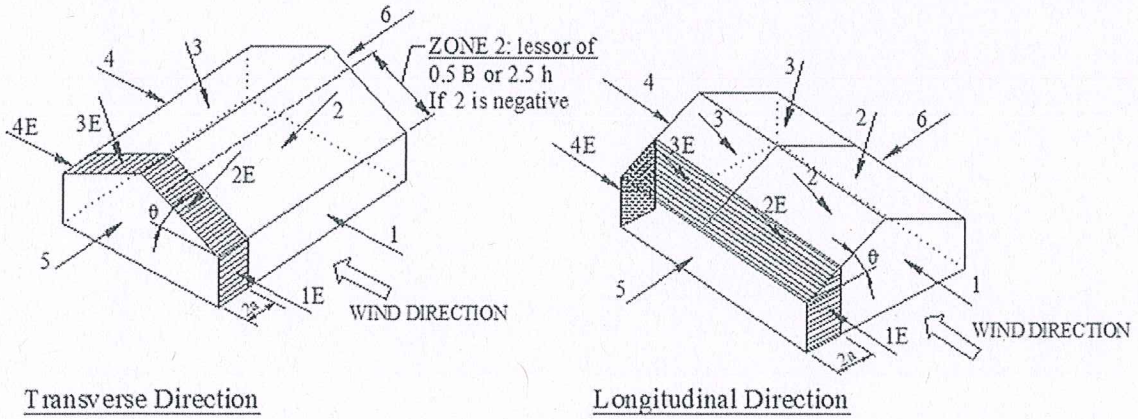


NOTE: Torsional loads are 25% of zones 1 - 6. See code for loading diagram.
Exception: One story buildings h<30' and 1 to 2 storybuildings framed with light-frame construction or with flexible diaphragms need not be designed for the torsional load case.

ASCE 7-98 & ASCE 7-10 (& later) - MWFRS wind pressure zones



NOTE: Torsional loads are 25% of zones 1 - 4. See code for loading diagram.
Exception: One story buildings h<30' and 1 to 2 storybuildings framed with light-frame construction or with flexible diaphragms need not be designed for the torsional load case.

ASCE 7-02 and ASCE 7-05 - MWFRS wind pressure zones

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Nominal Wind Pressures

Wind Loads - Components & Cladding : h ≤ 60'

Kh (case 2) =	0.87	h =	17.0 ft
Base pressure (qh) =	**13.3 psf**	a =	3.0 ft
Minimum parapet ht =	0.0 ft	GCpi =	+/-0.18
Roof Angle (θ) =	9.5 deg	qi = qh =	13.3 psf
Type of roof =	Gable		

Roof

	Surface Pressure (psf)								User input	
Area	2 sf	10 sf	20 sf	50 sf	75 sf	100 sf	200 sf	250 sf	25 sf	50 sf
Negative Zone 1 & 2e	-29.1	-29.1	-29.1	-17.7	-12.7	-10.0	-10.0	-10.0	-26.3	-17.7
Negative Zone 2n, 2r &3e	-42.4	-42.4	-36.7	-29.1	-25.7	-23.3	-17.6	-15.8	-34.8	-29.1
Negative Zone 3r	-50.5	-50.5	-43.2	-33.7	-29.4	-26.4	-26.4	-26.4	-40.9	-33.7
Positive All Zones	11.7	10	10	10	10.0	10.0	10.0	10.0	10.0	10.0
Overhang Zone 1 & 2e	-33.4	-33.4	-33.4	-25.8	-22.4	-20.0	-20.0	-20.0	-31.5	-25.8
Overhang Zone 2n & 2r	-46.7	-46.7	-42.4	-36.7	-34.2	-32.4	-28.1	-26.7	-41.0	-36.7
Overhang Zone 3e	-54.7	-54.7	-47.3	-37.4	-33.0	-29.9	-22.4	-20.0	-44.8	-37.4
Overhang Zone 3r	-62.7	-62.7	-53.1	-40.3	-34.7	-30.7	-30.7	-30.7	-50.0	-40.3

Overhang pressures in the table above assume an internal pressure coefficient (Gcpi) of 0.0
Overhang soffit pressure equals adj wall pressure (which includes internal pressure of 2.4 psf)

Parapet

qp = 0.0 psf

		Surface Pressure (psf)						User input
Solid Parapet Pressure		10 sf	20 sf	50 sf	100 sf	250 sf	500 sf	50 sf
CASE A:	Zone 2e :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zone 2n, 2r & 3e :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zone 3r :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CASE B :	Interior zone :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Corner zone :	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Walls

	GCp +/- GCpi				Surface Pressure at h				User input	
Area	10 sf	100 sf	200 sf	500 sf	10 sf	100 sf	200 sf	500 sf	21 sf	50 sf
Negative Zone 4	-1.17	-1.01	-0.96	-0.90	-15.6	-13.5	-12.9	-12.0	-14.9	-14.1
Negative Zone 5	-1.44	-1.12	-1.03	-0.90	-19.2	-15.0	-13.7	-12.0	-17.8	-16.3
Positive Zone 4 & 5	1.08	0.92	0.87	0.81	14.4	12.3	11.7	10.8	13.7	12.9

Note: GCp reduced by 10% due to roof angle <= 10 deg.

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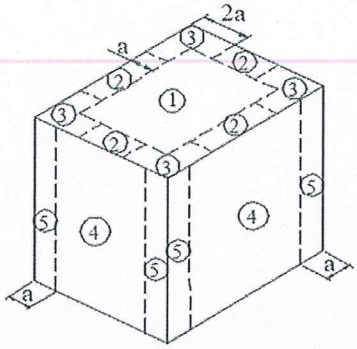
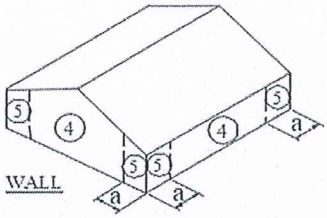
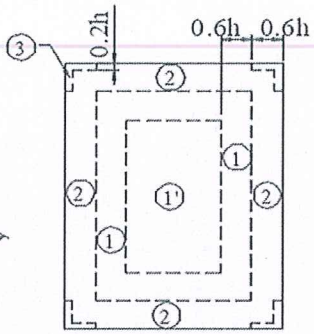
Location of C&C Wind Pressure Zones - ASCE 7-16



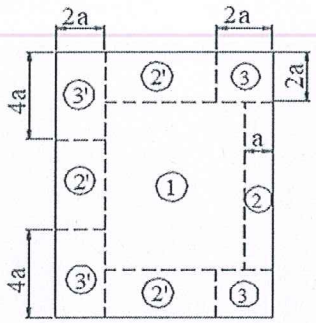
Roofs w/ $\theta \leq 10°$
and all walls
h > 60'



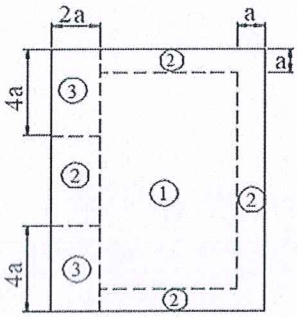
Walls h ≤ 60'
& alt design h<90'



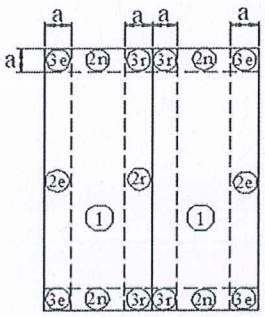
Gable, Sawtooth and
Multispan Gable $\theta \leq 7$ degrees &
Monoslope ≤ 3 degrees
h ≤ 60' & alt design h<90'



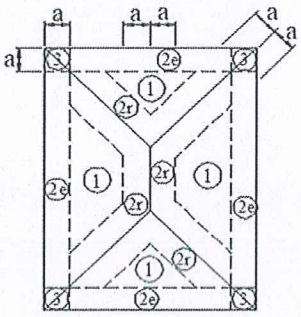
Monoslope roofs
$3° < \theta \leq 10°$
h ≤ 60' & alt design h<90'



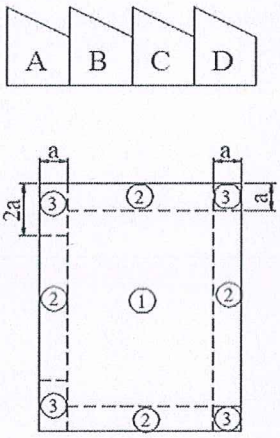
Monoslope roofs
$10° < \theta \leq 30°$
h ≤ 60' & alt design h<90'



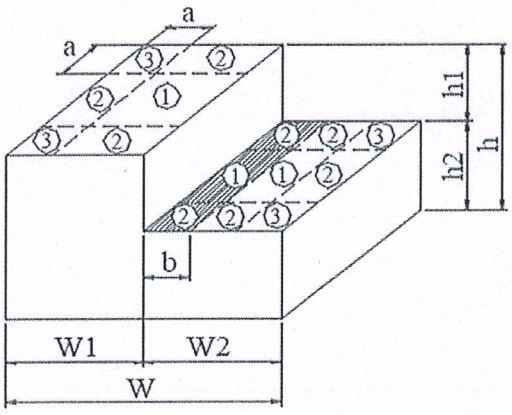
Multispan Gable &
Gable $7° < \theta \leq 45°$

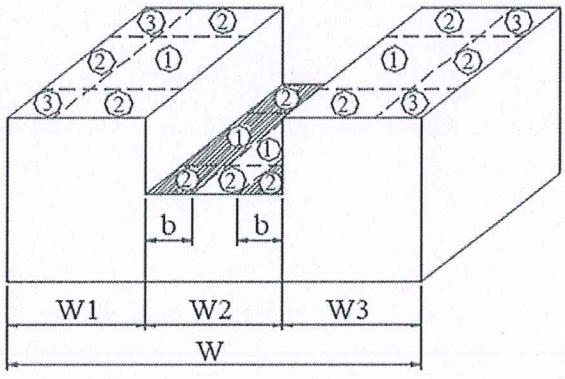


Hip $7° < \theta \leq 27°$



Sawtooth $10° < \theta \leq 45°$
h ≤ 60' & alt design h<90'





Stepped roofs $\theta \leq 3°$
h ≤ 60' & alt design h<90'

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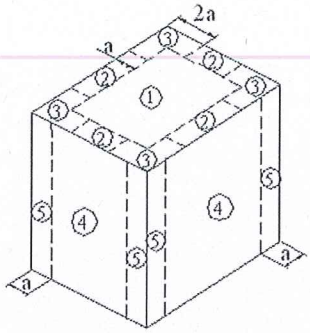
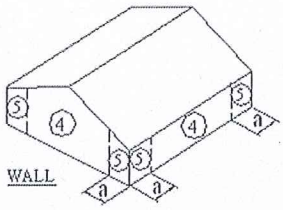
DATE	

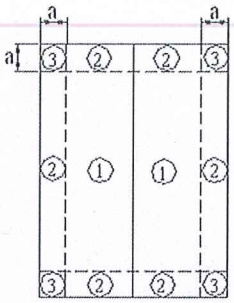
Location of C&C Wind Pressure Zones - ASCE 7-10 & earlier



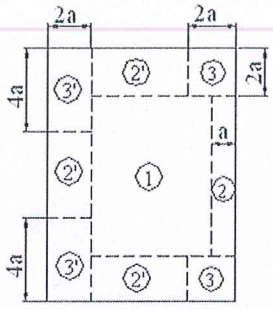
Roofs w/ $\theta \leq 10°$
and all walls
h > 60'



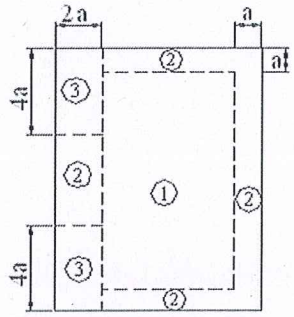
Walls h ≤ 60'
& alt design h<90'



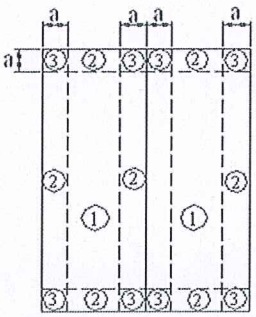
Gable, Sawtooth and
Multispan Gable $\theta \leq 7$ degrees &
Monoslope ≤ 3 degrees
h ≤ 60' & alt design h<90'



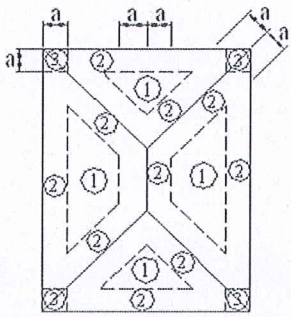
Monoslope roofs
$3° < \theta \leq 10°$
h ≤ 60' & alt design h<90'



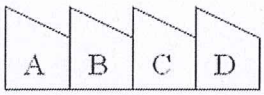
Monoslope roofs
$10° < \theta \leq 30°$
h ≤ 60' & alt design h<90'

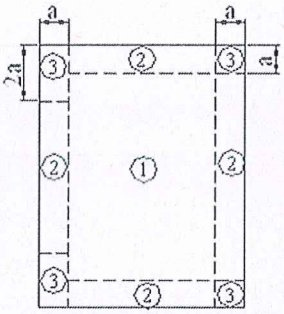


Multispan Gable &
Gable $7° < \theta \leq 45°$

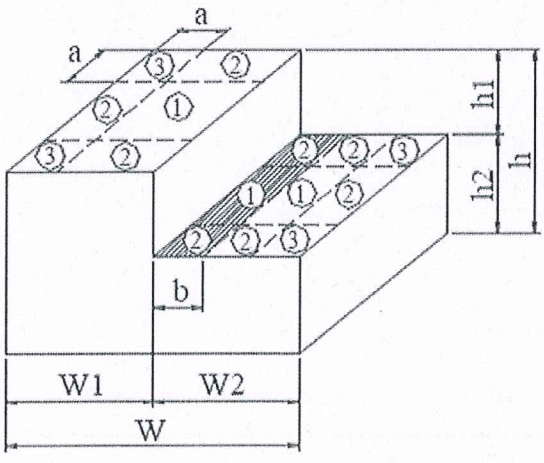


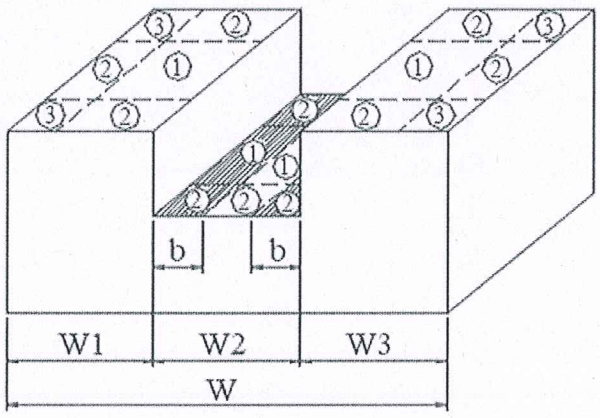
Hip $7° < \theta \leq 27°$





Sawtooth $10° < \theta \leq 45°$
h ≤ 60' & alt design h<90'





Stepped roofs $\theta \leq 3°$
h ≤ 60' & alt design h<90'

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Snow Loads : ASCE 7- 16

Nominal Snow Forces

Roof slope	=	9.5 deg
Horiz. eave to ridge dist (W)	=	19.0 ft
Roof length parallel to ridge (L)	=	26.0 ft

Type of Roof			Hip and gable w/ trussed systems
Ground Snow Load	Pg	=	140.0 psf
Risk Category		=	II
Importance Factor	I	=	1.0
Thermal Factor	Ct	=	1.00
Exposure Factor	Ce	=	1.0
Pf = 0.7*Ce*Ct*I*Pg		=	98.0 psf
Unobstructed Slippery Surface			no
Sloped-roof Factor	Cs	=	1.00
Balanced Snow Load		=	**98.0 psf**

Near ground level surface balanced snow load = **140.0 psf**

Rain on Snow Surcharge Angle			0.38 deg
Code Maximum Rain Surcharge			5.0 psf
Rain on Snow Surcharge		=	0.0 psf
Ps plus rain surcharge		=	98.0 psf
Minimum Snow Load	Pm	=	20.0 psf
Uniform Roof Design Snow Load		=	**98.0 psf** use 100.0

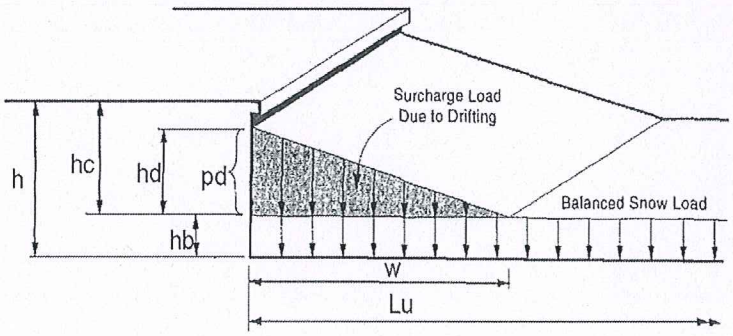
NOTE: Alternate spans of continuous beams shall be loaded with half the design roof snow load so as to produce the greatest possible effect - see code for loading diagrams and exceptions for gable roofs..

Unbalanced Snow Loads - for Hip & Gable roofs only

Required if slope is between 7 on 12 =	30.26 deg	
and 2.38 deg =	2.38 deg	**Unbalanced snow loads must be applied**
Windward snow load =	29.4 psf	= 0.3Ps
Leeward snow load from ridge to 16.88' =	129.7 psf	= hdγ / √S + Ps
Leeward snow load from 16.88' to the eave =	98.0 psf	= Ps

Windward Snow Drifts 1 - Against walls, parapets, etc

Up or downwind fetch	lu	=	40.0 ft
Projection height	h	=	6.0 ft
Projection width/length	lp	=	18.0 ft
Snow density	g	=	30.0 pcf
Balanced snow height	hb	=	3.27 ft
	hd	=	2.73 ft
	hc	=	2.73 ft
hc/hb >0.2 = 0.8	**Therefore, design for drift**		
Drift height (hc)		=	2.73 ft
Drift width	w	=	10.95 ft
Surcharge load:	pd = γ*hd	=	**82.0 psf**
Balanced Snow load:		=	98.0 psf
			180.0 psf



Note: If bottom of projection is at least 2 feet above hb then snow drift is not required.

Windward Snow Drifts 2 - Against walls, parapets, etc

Up or downwind fetch	lu	=	12.0 ft
Projection height	h	=	6.0 ft
Projection width/length	lp	=	18.0 ft
Snow density	g	=	30.0 pcf
Balanced snow height	hb	=	3.27 ft
	hd	=	1.94 ft
	hc	=	2.73 ft
hc/hb >0.2 = 0.8	**Therefore, design for drift**		
Drift height (hd)		=	1.94 ft
Drift width	w	=	7.75 ft
Surcharge load:	pd = γ*hd	=	**58.2 psf**
Balanced Snow load:		=	98.0 psf
			156.2 psf

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Seismic Loads: IBC 2021 Strength Level Forces

Risk Category : II
Importance Factor (Ie) : 1.00
Site Class : D - code default

Ss (0.2 sec) = 110.90 %g
S1 (1.0 sec) = 34.10 %g
A site specific ground motion analysis is required for seismically isolated structures or with damping systems, see ASCE7 11.4.8

Fa =	1.200	Sms =	1.331	S_{DS} =	0.887	Design Category =	D
Fv =	1.959	Sm1 =	0.668	S_{D1} =	0.445	Design Category =	D

Seismic Design Category = **D**
Redundancy Coefficient ρ = 1.30
Number of Stories: 1
Structure Type: All other building systems
Horizontal Struct Irregularities: No plan Irregularity
Vertical Structural Irregularities: No vertical Irregularity

Flexible Diaphragms: Yes
Building System: **Bearing Wall Systems**
Seismic resisting system: **Light frame (wood) walls with structural wood shear panels**
System Structural Height Limit: **65 ft**
Actual Structural Height (hn) = 17.0 ft
See ASCE7 Section 12.2.5 for exceptions and other system limitations

DESIGN COEFFICIENTS AND FACTORS

Response Modification Coefficient (R) = 6.5
Over-Strength Factor (Ωo) = 2.5
Deflection Amplification Factor (Cd) = 4
S_{DS} = 0.887
S_{D1} = 0.445

Seismic Load Effect (E) = Eh +/-Ev = ρ Q_E +/- 0.2S_{DS} D = 1.3Qe +/ 0.177D Q_E = horizontal seismic force
Special Seismic Load Effect (Em) = Emh +/- Ev = Ωo Q_E +/- 0.2S_{DS} D = 2.5Qe +/ 0.177D D = dead load

PERMITTED ANALYTICAL PROCEDURES

Simplified Analysis - Use Equivalent Lateral Force Analysis

Equivalent Lateral-Force Analysis - Permitted
Building period coef. (C_T) = 0.020 Cu = 1.40
Approx fundamental period (Ta) = $C_T h_n^{x}$ = 0.167 sec x= 0.75 Tmax = CuTa = 0.234 sec
User calculated fundamental period = 0.500 s T = 0.234 sec
Long Period Transition Period (TL) = ASCE7 map = 8 sec

Seismic response coef. (Cs) = Sdsl/R = 0.136 ASCE7 11.4.8 exception 2 equations used
but not less than Cs = 0.044Sdsl = 0.039
USE Cs = 0.136
Design Base Shear V = 0.136W

Model & Seismic Response Analysis - Permitted (see code for procedure)

ALLOWABLE STORY DRIFT

Structure Type: All other structures
Allowable story drift Δa = 0.020hsx where hsx is the story height below level x

Total Stories =	1	Floor Dead Load =	40.0 psf	Roof Dead Load =	20.0 psf
Building length L =	26.0 ft	Floor LL to include =	0.0 psf	Roof Snow Load =	20.0 psf
Building width W =	38.0 ft	Floor Equip wt =	0.0 kips	Roof Equip wt =	0.0 kips
hn =	17.0 ft	Partition weight =	10.0 psf	Parapet weight =	0.0 psf
k =	1.000	Ext Wall Weight =	0.0 psf	Parapet height =	0.0 ft
V =	0.136W				

Bottom Floor is a slab on grade

Diaphragm shall be designed for level force Fx, but not less than Fpx = (Σ Fi / Σ wi) wpx, but :
Fpx min = $0.2S_{DS}$ Ie wpx = 0.177 wpx
Fpx max = $0.4S_{DS}$ Ie wpx = 0.355 wpx

Seismic Forces Normal to Building Length

V = 5.4k

Level (x)	EL above Seismic Base hx (ft)	Level Weight Wx (kips)	$Wx\ hx^k$ (ft-kips)	Cvx = $\frac{Wx\ hx^k}{\Sigma\ Wi\ hi^k}$	Base Shear Distribution Fx=CvxV	Σ Fx (k)	Story M	Diaphragm Force Fpx Σ Wi (k)	Fpx	Design Fpx
Roof	15.00	40	593	1.000	5.39	5.4	0	40	5.4	7.0
1	2.00	0	0	0.000	0.00	0.0	0	0	0.0	0.0
Base		40		1.000		5.4	81			

81 = Base M

Seismic Forces Parallel to Building Length

V = 5.4k

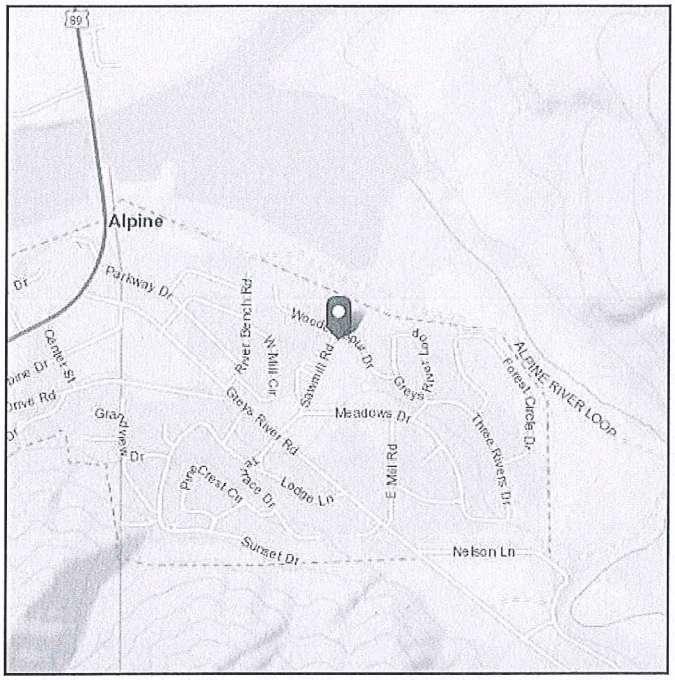
Level (x)	hx (ft)	Wx (kips)	$Wx\ hx^k$	Cvx =	Base Shear Distribution Fx=CvxV	Σ Fx (k)	Story M	Diaphragm Force Fpx Σ Wi (k)	Fpx	Design Fpx
Roof	15.00	40	593	1.000	5.39	5.4	0	40	5.4	7.0
1	2.00	0	0	0.000	0.00	0.0	0	0	0.0	0.0
Base	0.00	40		1.000		5.4	81			

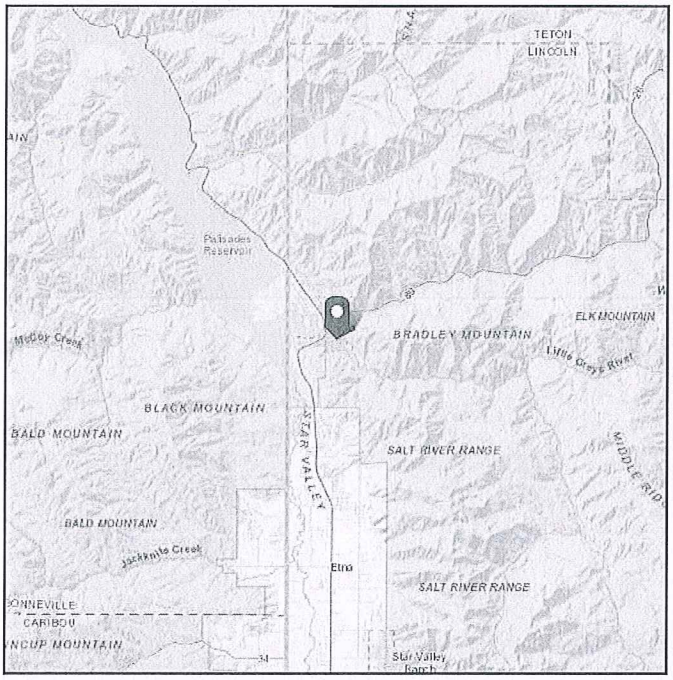
81 = Base M

ASCE Hazards Report

Address:
368 Wooden Spur Dr
Alpine, Wyoming
83128

Standard:	ASCE/SEI 7-16	**Latitude:**	43.16238
Risk Category:	II	**Longitude:**	-111.008836
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	5666.142041756172 ft (NAVD 88)





ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	1.109	S_{D1} :	N/A
S_1 :	0.341	T_L :	6
F_a :	1.2	PGA :	0.477
F_v :	N/A	PGA_M :	0.572
S_{MS} :	1.331	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	0.888	C_v :	1.322

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Wed Jun 04 2025

Date Source: USGS Seismic Design Maps

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Roof Design Loads

Items	Description	Multiple	psf (max)	psf (min)
Roofing	Asphalt Shingles w/roll roofing		3.0	2.0
Decking	5/8" plywood/OSB		2.2	1.8
Framing	Wood Trusses @ 24"		3.0	2.5
Insulation	R-40 Fiberglass insul.	x 1.4	1.8	1.7
Ceiling	5/8" gypsum		2.8	2.5
			0.0	0.0
			0.0	0.0
			0.0	0.0
		Actual Dead Load	○ 12.8	○ 10.5
		Use this DL instead	◉ 15.0	◉ 9.0
		Live Load	20.0	0.0
		Snow Load	100.0	0.0
		Ultimate Wind (zone 2 - 100sf)	16.0	-38.9
ASD Loading		D + S	115.0	-
		D + 0.75(0.6*W + S)	97.2	-
		0.6*D + 0.6*W	-	-17.9
LRFD Loading		1.2D + 1.6 S + 0.5W	186.0	-
		1.2D + 1.0W + 0.5S	84.0	-
		0.9D + 1.0W	-	-30.8

Roof Live Load Reduction Roof angle 2.00 / 12 9.5 deg

0 to 200 sf: 20.0 psf
200 to 600 sf: 24 - 0.02Area, but not less than 12 psf
over 600 sf: 12.0 psf

	300 sf	18.0 psf
	400 sf	16.0 psf
	500 sf	14.0 psf
User Input:	450 sf	15.0 psf

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JOB TITLE Wooden Spur Renovation
368 Wppdem Spur Dr. Alpine Wy.
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Floor Design Loads

Items	Description	Multiple	psf (max)	psf (min)
Flooring	Carpet & pad		1.0	1.0
	None		0.0	0.0
Decking	3/4" plywood/OSB		2.7	2.3
Framing	TJI @ 24"	x 1.4	2.8	1.4
	None		0.0	0.0
Ceiling	5/8" gypsum		2.8	2.5
	None		0.0	0.0
	None		0.0	0.0
	None		0.0	0.0
		Actual Dead Load	○ 9.3	◉ 7.2
		Use this DL instead	◉ 10.0	○ 8.0
		Partitions	15.0	0.0
		Live Load	40.0	0.0
		Total Live Load	55.0	0.0
		Total Load	65.0	7.2

FLOOR LIVE LOAD REDUCTION (not including partitions)

NOTE: Not allowed for assembly occupancy or LL>100psf or passenger car garages, except may reduce members supporting 2 or more floors & non-assembly 20%.

$L=Lo(0.25+15/\sqrt{K_{LL}A_T})$

Unreduced design live load: Lo = 40 psf

Floor member & 1 floor cols K_{LL} = 2
Tributary Area A_T = 300 sf
Reduced live load: L = 34.5 psf

Columns (2 or more floors) K_{LL} = 4
Tributary Area A_T = 500 sf
Reduced live load: L = 23.4 psf

IBC alternate procedure
Smallest of:
R= .08%(SF - 150)
R= 23.1(1+D/L) = 28.9%
R= 40% member supports 1 floor
R= 60% member supports ≥2 floors
R = 12.0%
Reduced live load: L = 35.2 psf

R = 28.0%
Reduced live load: L = 28.8 psf

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Wood Header Design Or Wood Beam (Not Laterally Supported)
NDS 2018

Mark: HDR1

Span(ft)=	18
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	1.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	16	240	1600	1840
floor				0	0	0
wall				0	0	0
misc.				0	0	0
Total				240.0	1600.0	1840

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	roof				0	0

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	2160	2160
	RLL=	14400	14400
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	16560	16560
	Max Shear=	16.6	k

DIM TIMBER LVL GLB

Wood Species=	Douglas Fir #2	Douglas Fir #1	LVL	24F-V4
Option 1	No Single Ply	4x None	No Single Ply	3.125 x None
Option 2	No Double Ply	6x None	No Double Ply	5.125x22.5
Option 3	No Triple Ply	8x None	No Triple Ply	6.75x19.5
Option 4	No Four Ply	10x None	(4) 1.75x18	8.75x18
Option 5	-	12x None	-	10.75x16.5
Option 6	-	14x None	-	-
Option 7	-	16x18	-	-

Moment

	Center	Point Load 1	Point Load 2
RDL=	9720	0	0
RLL=	64800	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	74520	0	0
Max M=	74.5		k-ft

Mark: HDR2

Span(ft)=	3
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	1.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	4	60	400	460
floor				0	0	0
wall				0	0	0
misc.				0	0	0
Total				65.2	434.8	500

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	roof				0	0

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	98	98
	RLL=	652	652
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	750	750
	Max Shear=	0.8	k

DIM TIMBER LVL GLB

Wood Species=	Douglas Fir #2	Douglas Fir #1	LVL	24F-V4
Option 1	(1) 2x6	4x4	(1) 1.75x5.5	3.125x9
Option 2	(2) 2x4	6x6	(2) 1.75x5.5	5.125x6
Option 3	(3) 2x4	8x8	(3) 1.75x5.5	6.75x9
Option 4	(4) 2x4	10x10	(4) 1.75x5.5	8.75x9
Option 5	-	12x12	-	10.75x12
Option 6	-	14x14	-	-
Option 7	-	16x16	-	-

Moment

	Center	Point Load 1	Point Load 2
RDL=	73	0	0
RLL=	489	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	563	0	0
Max M=	0.6		k-ft

TSE Engineers
136 S State Street
Shelley, ID 83274
208-357-2420

JOB TITLE	Wooden Spur Renovation		
368 Wooden Spur Dr. Alpine, Wyoming			
JOB NO.	225112	SHEET NO.	20 of 39
CALCULATED BY	EVB	DATE	6/4/2025
CHECKED BY	0	DATE	

Wood Header Design Or Wood Beam (Not Laterally Supported)
NDS 2018

Mark: HDR3

Span(ft)=	8
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	1.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	14	210	1400	1610
floor				0	0	0
wall				0	0	0
misc.				0	0	0
Total				210.0	1400.0	1610

Load Factors Applied

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	DL	LL
Point Load 1	roof				0	0
Point Load 2	roof				0	0

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	840	840
	RLL=	5600	5600
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	6440	6440
	Max Shear=	6.4	k

DIM **TIMBER** **LVL** **GLB**

Wood Species=	Douglas Fir #2	Douglas Fir #1	LVL	24F-V4
Option 1	No Single Ply	4x None	No Single Ply	3.125x12
Option 2	No Double Ply	6x12	(2) 1.75x11.875	5.125x9
Option 3	No Triple Ply	8x12	(3) 1.75x9.5	6.75x9
Option 4	No Four Ply	10x10	(4) 1.75x9.5	8.75x9
Option 5	-	12x12	-	10.75x12
Option 6	-	14x14	-	-
Option 7	-	16x16	-	-

Moment

	Center	Point Load 1	Point Load 2
RDL=	1680	0	0
RLL=	11200	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	12880	0	0
	Max M=	12.9	k-ft

Mark: HDR4

Span(ft)=	3
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	1.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	14	210	1400	1610
floor				0	0	0
wall				0	0	0
misc.				0	0	0
Total				210.0	1400.0	1610

Load Factors Applied

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	DL	LL
Point Load 1	roof				0	0
Point Load 2	roof				0	0

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	315	315
	RLL=	2100	2100
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	2415	2415
	Max Shear=	2.4	k

DIM **TIMBER** **LVL** **GLB**

Wood Species=	Douglas Fir #2	Douglas Fir #1	LVL	24F-V4
Option 1	No Single Ply	4x8	(1) 1.75x9.5	3.125x9
Option 2	(2) 2x8	6x6	(2) 1.75x5.5	5.125x6
Option 3	(3) 2x6	8x8	(3) 1.75x5.5	6.75x9
Option 4	(4) 2x6	10x10	(4) 1.75x5.5	8.75x9
Option 5	-	12x12	-	10.75x12
Option 6	-	14x14	-	-
Option 7	-	16x16	-	-

Moment

	Center	Point Load 1	Point Load 2
RDL=	236	0	0
RLL=	1575	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	1811	0	0
	Max M=	1.8	k-ft

TSE Engineers
136 S State Street
Shelley, ID 83274
208-357-2420

JOB TITLE	Wooden Spur Renovation		
368 Wooden Spur Dr. Alpine, Wyoming			
JOB NO.	225112	SHEET NO.	21 of 39
CALCULATED BY	EVB	DATE	6/4/2025
CHECKED BY	0	DATE	

Wood Header Design Or Wood Beam (Not Laterally Supported)
NDS 2018

Mark: HDR5

Span(ft)=	4
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	1.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	4	60	400	460
floor				0	0	0
wall				0	0	0
misc.				0	0	0
Total				65.2	434.8	500

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	roof				0	0

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	130	130
	RLL=	870	870
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	1000	1000
	Max Shear=	1.0	k

DIM **TIMBER** **LVL** **GLB**

Wood Species=	Douglas Fir #2	Douglas Fir #1	LVL	24F-V4
Option 1	(1) 2x8	4x4	(1) 1.75x5.5	3.125x9
Option 2	(2) 2x6	6x6	(2) 1.75x5.5	5.125x6
Option 3	(3) 2x4	8x8	(3) 1.75x5.5	6.75x9
Option 4	(4) 2x4	10x10	(4) 1.75x5.5	8.75x9
Option 5	-	12x12	-	10.75x12
Option 6	-	14x14	-	-
Option 7	-	16x16	-	-

Moment

	Center	Point Load 1	Point Load 2
RDL=	130	0	0
RLL=	870	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	1000	0	0
	Max M=	1.0	k-ft

Mark: HDR6

Span(ft)=	3
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	1.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	4	60	400	460
floor				0	0	0
wall				0	0	0
misc.				0	0	0
Total				65.2	434.8	500

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	roof				0	0

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	98	98
	RLL=	652	652
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	750	750
	Max Shear=	0.8	k

DIM **TIMBER** **LVL** **GLB**

Wood Species=	Douglas Fir #2	Douglas Fir #1	LVL	24F-V4
Option 1	(1) 2x6	4x4	(1) 1.75x5.5	3.125x9
Option 2	(2) 2x4	6x6	(2) 1.75x5.5	5.125x6
Option 3	(3) 2x4	8x8	(3) 1.75x5.5	6.75x9
Option 4	(4) 2x4	10x10	(4) 1.75x5.5	8.75x9
Option 5	-	12x12	-	10.75x12
Option 6	-	14x14	-	-
Option 7	-	16x16	-	-

Moment

	Center	Point Load 1	Point Load 2
RDL=	73	0	0
RLL=	489	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	563	0	0
	Max M=	0.6	k-ft

TSE Engineers
136 S State Street
Shelley, ID 83274
208-357-2420

JOB TITLE	Wooden Spur Renovation		
368 Wooden Spur Dr. Alpine, Wyoming			
JOB NO.	225112	SHEET NO.	22 of 39
CALCULATED BY	EVB	DATE	6/4/2025
CHECKED BY	0	DATE	

Wood Header Design Or Wood Beam (Not Laterally Supported)
NDS 2018

Mark: HDR7

Span(ft)=	3
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors	
Dead	1.00
Floor Live	1.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	7	105	700	805
floor				0	0	0
wall				0	0	0
misc.				0	0	0
Total				105.0	700.0	805

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	roof				0	0

DIM **TIMBER** **LVL** **GLB**

Wood Species=	Douglas Fir #2	Douglas Fir #1	LVL	24F-V4
Option 1	(1) 2x8	4x4	(1) 1.75x5.5	3.125x9
Option 2	(2) 2x6	6x6	(2) 1.75x5.5	5.125x6
Option 3	(3) 2x4	8x8	(3) 1.75x5.5	6.75x9
Option 4	(4) 2x4	10x10	(4) 1.75x5.5	8.75x9
Option 5	-	12x12	-	10.75x12
Option 6	-	14x14	-	-
Option 7	-	16x16	-	-

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	158	158
	RLL=	1050	1050
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	1208	1208
	Max Shear=	1.2	k

Moment

	Center	Point Load 1	Point Load 2
RDL=	118	0	0
RLL=	788	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	906	0	0
Max M=	0.9	k-ft	

Mark: HDR8

Span(ft)=	3
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors	
Dead	1.00
Floor Live	1.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	9	135	900	1035
floor				0	0	0
wall				0	0	0
misc.				0	0	0
Total				135.0	900.0	1035

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	roof				0	0

DIM **TIMBER** **LVL** **GLB**

Wood Species=	Douglas Fir #2	Douglas Fir #1	LVL	24F-V4
Option 1	(1) 2x10	4x6	(1) 1.75x5.5	3.125x9
Option 2	(2) 2x6	6x6	(2) 1.75x5.5	5.125x6
Option 3	(3) 2x6	8x8	(3) 1.75x5.5	6.75x9
Option 4	(4) 2x4	10x10	(4) 1.75x5.5	8.75x9
Option 5	-	12x12	-	10.75x12
Option 6	-	14x14	-	-
Option 7	-	16x16	-	-

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	203	203
	RLL=	1350	1350
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	1553	1553
	Max Shear=	1.6	k

Moment

	Center	Point Load 1	Point Load 2
RDL=	152	0	0
RLL=	1013	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	1164	0	0
Max M=	1.2	k-ft	

TSE Engineers
136 S State Street
Shelley, ID 83274
208-716-2426

JOB TITLE	Wooden Spur Renovation		
368 Wooden Spur Dr. Alpine, Wyoming			
JOB NO.	225112	SHEET NO.	23 of 39
CALCULATED BY	EVB	DATE	6/4/2025
CHECKED BY		DATE	

Wood Beam Design (Lateral Supported Fully)
NDS 2018

Mark: BM1

Span(ft)=	12
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	1.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	8.5	127.5	850	977.5
floor				0	0	0
wall				0	0	0
misc.				0	0	0
Total				127.5	850	977.5

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	floor				0	0

	DIM	TIMBER	LVL	GLB
Wood Species=	Douglas Fir #2	Douglas Fir #2	LVL	24F-V4
Option 1	No Single Ply	4x None	(1) 1.75x18	3.125x13.5
Option 2	No Double Ply	6x None	(2) 1.75x14	5.125x12
Option 3	No Triple Ply	8x16	(3) 1.75x11.875	6.75x10.5
Option 4	No Four Ply	10x14	(4) 1.75x11.875	8.75x10.5
Option 5	-	12x14	-	10.75x12
Option 6	-	14x14	-	-
Option 7	-	16x16	-	-

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	765	765
	RLL=	5100	5100
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	5865	5865
	Max Shear=	5.9	k

Moment

	Center	Point Load	Point Load 2
RDL=	2295	0	0
RLL=	15300	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	17595	0	0
Max M=	17.6	k-ft	

Mark: BM 2

Span(ft)=	12
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	1.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	5.75	86.25	575	661.25
floor				0	0	0
wall				0	0	0
misc.				0	0	0
Total				86.25	575	661.25

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	floor				0	0

	DIM	TIMBER	LVL	GLB
Wood Species=	Douglas Fir #2	Douglas Fir #2	LVL	24F-V4
Option 1	No Single Ply	4x None	(1) 1.75x14	3.125x12
Option 2	No Double Ply	6x16	(2) 1.75x11.875	5.125x10.5
Option 3	No Triple Ply	8x14	(3) 1.75x9.5	6.75x9
Option 4	No Four Ply	10x12	(4) 1.75x9.5	8.75x9
Option 5	-	12x12	-	10.75x12
Option 6	-	14x14	-	-
Option 7	-	16x16	-	-

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	518	518
	RLL=	3450	3450
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	3968	3968
	Max Shear=	4.0	k

Moment

	Center	Point Load	Point Load 2
RDL=	1553	0	0
RLL=	10350	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	11903	0	0
Max M=	11.9	k-ft	

TSE Engineers
136 S State Street
Shelley, ID 83274
208-357-2420

JOB TITLE	Wooden Spur Renovation		
368 Wooden Spur Dr. Alpine, Wyoming			
JOB NO.	225112	SHEET NO.	24 of 39
CALCULATED BY	EVB	DATE	6/4/2025
CHECKED BY	0	DATE	

Wood Joist/Rafters (simple span)
NDS 2018

Mark: RFT1

Span(ft)=	8.5
Spacing (in)=	16
LL Deflection<L/	360
Total Deflection<L/	240
C_D=	1
C_r=	1.15

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	1.33	20.0	133.3	153.3
floor			1.33	0.0	0.0	0.0
misc.			1.33	0.0	0.0	0.0
			Total	20.0	133.3	153.3

Reactions	Left (lbs)	Right (lbs)	Moment	
RDL=	85	85	RDL=	181
RLL=	567	567	RLL=	1204
RTL=	652	652	MTL=	1385
Max Shear (k)=	0.7		Max M (k-ft)=	1.4

	DIM	TJI	BCI
Wood Species=	Douglas Fir #1	-	-
Single Ply	(1) 2x8	9 1/2" 110	9 1/2" 5000
Double Ply	(2) 2x6	9 1/2" 210	9 1/2" 6000
4x	4x6	9 1/2" 230	9 1/2" 6500
6x	6x6	11 7/8" 360	11 7/8" 60
8x	8x8	11 7/8" 560	11 7/8" 90
10x	10x10		
12x	12x12		
14x	14x14		
16x	16x16		

Mark: RFT 2

Span(ft)=	10
Spacing (in)=	16
LL Deflection<L/	360
Total Deflection<L/	240
C_D=	1
C_r=	1.15

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	1.33	20.0	133.3	153.3
floor			1.33	0.0	0.0	0.0
misc.		60	1.33	0.0	80.0	80.0
			Total	20.0	213.3	233.3

Reactions	Left (lbs)	Right (lbs)	Moment	
RDL=	100	100	RDL=	250
RLL=	1067	1067	RLL=	2667
RTL=	1167	1167	MTL=	2917
Max Shear (k)=	1.2		Max M (k-ft)=	2.9

	DIM	TJI	BCI
Wood Species=	Douglas Fir #1	-	-
Single Ply	(1) 2x12	11 7/8" 110	11 7/8" 5000
Double Ply	(2) 2x8	9 1/2" 210	9 1/2" 6000
4x	4x8	9 1/2" 230	9 1/2" 6500
6x	6x8	11 7/8" 360	11 7/8" 60
8x	8x8	11 7/8" 560	11 7/8" 90
10x	10x10		
12x	12x12		
14x	14x14		
16x	16x16		

Mark: FLR 1

Span(ft)=	10
Spacing (in)=	16
LL Deflection<L/	480
Total Deflection<L/	240
C_D=	1
C_r=	1.15

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof			1.33	0.0	0.0	0.0
floor	10	40	1.33	13.3	53.3	66.7
misc.			1.33	0.0	0.0	0.0
			Total	13.3	53.3	66.7

Reactions	Left (lbs)	Right (lbs)	Moment	
RDL=	67	67	RDL=	167
RLL=	267	267	RLL=	667
RTL=	333	333	MTL=	833
Max Shear (k)=	0.3		Max M (k-ft)=	0.8

	DIM	TJI	BCI
Wood Species=	Douglas Fir #2	-	-
Single Ply	(1) 2x8	9 1/2" 110	9 1/2" 5000
Double Ply	(2) 2x6	9 1/2" 210	9 1/2" 6000
4x	4x6	9 1/2" 230	9 1/2" 6500
6x	6x6	11 7/8" 360	11 7/8" 60
8x	8x8	11 7/8" 560	11 7/8" 90
10x	10x10		
12x	12x12		
14x	14x14		
16x	16x16		

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JOB TITLE	Wooden Spur Renovation		
368 Wooden Spur Dr. Alpine, Wyoming			
JOB NO.	225112	SHEET NO.	25 of 39
CALCULATED BY	EVB	DATE	6/4/2025
CHECKED BY		DATE	

Wood Beam Design (Lateral Supported Fully)
NDS 2018

Mark: BM21

Span(ft)=	18
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	0.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	7	105	700	805
floor	10	40	5	50	0	50
wall				0	0	0
misc.		60	5	0	300	300
Total				155	1000	1155

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	floor				0	0

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	1395	1395
	RLL=	9000	9000
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	10395	10395
	Max Shear=	10.4	k

	DIM	TIMBER	LVL	GLB
Wood Species=	Douglas Fir #2	Douglas Fir #2	LVL	24F-V4
Option 1	No Single Ply	4x None	No Single Ply	3.125 x None
Option 2	No Double Ply	6x None	No Double Ply	5.125x18
Option 3	No Triple Ply	8x None	(3) 1.75x18	6.75x16.5
Option 4	No Four Ply	10x None	(4) 1.75x16	8.75x15
Option 5	-	12x None	-	10.75x13.5
Option 6	-	14x18	-	-
Option 7	-	16x18	-	-

Moment

	Center	Point Load	Point Load 2
RDL=	6278	0	0
RLL=	40500	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	46778	0	0
Max M=	46.8	k-ft	

Mark: BM 21

Span(ft)=	18
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	0.75
Roof Live/Snow	0.75
Misc.	0.75

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	7	105	525	630
floor	10	40	5	50	150	200
wall				0	0	0
misc.		60	5	0	225	225
Total				155	900	1055

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	floor				0	0

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	1395	1395
	RLL=	8100	8100
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	9495	9495
	Max Shear=	9.5	k

	DIM	TIMBER	LVL	GLB
Wood Species=	Douglas Fir #2	Douglas Fir #2	LVL	24F-V4
Option 1	No Single Ply	4x None	No Single Ply	3.125x21
Option 2	No Double Ply	6x None	No Double Ply	5.125x18
Option 3	No Triple Ply	8x None	(3) 1.75x18	6.75x16.5
Option 4	No Four Ply	10x None	(4) 1.75x16	8.75x15
Option 5	-	12x None	-	10.75x13.5
Option 6	-	14x18	-	-
Option 7	-	16x18	-	-

Moment

	Center	Point Load	Point Load 2
RDL=	6278	0	0
RLL=	36450	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	42728	0	0
Max M=	42.7	k-ft	

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JOB TITLE	Wooden Spur Renovation		
368 Wooden Spur Dr. Alpine, Wyoming			
JOB NO.	225112	SHEET NO.	26 of 39
CALCULATED BY	EVB	DATE	6/4/2025
CHECKED BY		DATE	

Wood Beam Design (Lateral Supported Fully)
NDS 2018

Mark: BM22

Span(ft)=	10
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	0.00
Roof Live/Snow	1.00
Misc.	1.00

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	4	60	400	460
floor	10	40	1	10	0	10
wall				0	0	0
misc.		60	4	0	240	240
Total				70	640	710

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	floor				0	0

	DIM	TIMBER	LVL	GLB
Wood Species=	Douglas Fir #2	Douglas Fir #2	LVL	24F-V4
Option 1	No Single Ply	4x None	(1) 1.75x11.875	3.125x10.5
Option 2	No Double Ply	6x14	(2) 1.75x9.5	5.125x9
Option 3	No Triple Ply	8x12	(3) 1.75x9.5	6.75x9
Option 4	(4) 2x12	10x10	(4) 1.75x9.5	8.75x9
Option 5	-	12x12	-	10.75x12
Option 6	-	14x14	-	-
Option 7	-	16x16	-	-

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	350	350
	RLL=	3200	3200
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	3550	3550
	Max Shear=	3.6	k

Moment

	Center	Point Load	Point Load 2
RDL=	875	0	0
RLL=	8000	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	8875	0	0
Max M=	8.9	k-ft	

Mark: BM 22

Span(ft)=	10
LL Deflection<L/	360
Total Deflection<L/	240
CD=	1

Load Factors

Dead	1.00
Floor Live	0.75
Roof Live/Snow	0.75
Misc.	0.75

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	4	60	300	360
floor	10	40	1	10	30	40
wall				0	0	0
misc.		60	4	0	180	180
Total				70	510	580

	Load	DL(lbs)	LL(lbs)	x(ft)(left)	Load Factors Applied DL	LL
Point Load 1	roof				0	0
Point Load 2	floor				0	0

	DIM	TIMBER	LVL	GLB
Wood Species=	Douglas Fir #2	Douglas Fir #2	LVL	24F-V4
Option 1	No Single Ply	4x None	(1) 1.75x11.875	3.125x10.5
Option 2	No Double Ply	6x12	(2) 1.75x9.5	5.125x9
Option 3	No Triple Ply	8x10	(3) 1.75x9.5	6.75x9
Option 4	(4) 2x12	10x10	(4) 1.75x7.25	8.75x9
Option 5	-	12x12	-	10.75x12
Option 6	-	14x14	-	-
Option 7	-	16x16	-	-

Reactions

		Left (lbs)	Right (lbs)
Uniform	RDL=	350	350
	RLL=	2550	2550
Point Loads	P1DL=	0	0
	P1LL=	0	0
	P2DL=	0	0
	P2LL=	0	0
	RTL=	2900	2900
	Max Shear=	2.9	k

Moment

	Center	Point Load	Point Load 2
RDL=	875	0	0
RLL=	6375	0	0
P1DL=	0	0	0
P1LL=	0	0	0
P2DL=	0	0	0
P2LL=	0	0	0
MTL=	7250	0	0
Max M=	7.3	k-ft	

SL = 100 DL = 15

Prifty / sliding = 100psf

Rafters

Le 5' cant $w = (100+100+15)(16/12) = 287$ $M = 3.6$ $V = 1.4$

$w = (100+100+15)(1) =$ $M =$ $V =$

1 3/4 x 7 1/4 LVL	7.11	4.8	110	$\Delta = 0.19"$	$\frac{L}{323}$	OK

1 3/4 x 7 1/4 LVL @ 16" O.C.

max span

L = ? $w = (100+1000+15)(16/12) = 287$

$V_A = 4800$

$M_A = 7110$

$\Delta = L/360$

$V = 4800 = \frac{(287)(L)}{2}$ $L = 33'$

$M = 7110 = \frac{287(L)^2}{8}$ $L = 14'$

$\Delta = \frac{L(12)}{360} = \frac{5(287/12)((L)(12))^4}{384(1100000)(110)}$ $L = 10'$ max span = 10'-0"

1 3/4 x 7 1/4 LVL @ 16" O.C.

(99) Beam

L = 6' $w = (100+100+15)(8/12+5) = 1935$

$M = 8.7$ $V = 5.8$

5 1/8 x 9	13.8	8.1	310	$\Delta = 0.10"$	$\frac{L}{712}$

5 1/8 x 9 GLB

(100) Floor Beam

L = 5'-0" Cant

W = (60+10)(14/12) = 500

M = 6.3 V = 2.5

5 1/8 x 10 1/2	18.8	9.5	490	Δ = 0.0001

5 1/8 x 10 1/2" GLB

(101) Beam

L = 14' W = ?

(2) 1 3/4 x 7 1/4 LVL I = 170

VA = 7230 $7230 = \frac{w(14)}{2} = 1032$

MA = 10700 $10700 = \frac{w(14)^2}{8} = 436$

Δ = 0.25"

$0.25 = \frac{5w((14)(12))^4}{384(1900000)(170)} = 7.785(12) = 93$ plf

(3) 1 3/4 x 9 1/2" LVL I = 380

VA = 9480 φV = 1354

MA = 17700 w = 722

Δ = 0.25" w = 208

Use (3) 1 3/4 x 9 1/2" LVL

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JOB TITLE	Wooden Spur Renovation		
368 Wooden Spur Dr. Alpine, Wyoming			
JOB NO.	225112	SHEET NO.	29 of 39
CALCULATED BY	EVB	DATE	6/4/2025
CHECKED BY	0	DATE	

Wood Joist/Rafters (simple span)
NDS 2018

Mark: FLR 2

Span(ft)=	14
Spacing (in)=	12
LL Deflection<L/	360
Total Deflection<L/	240

C_D= 1
C_r= 1.15

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	10	60	1.00	10.0	60.0	70.0
floor			1.00	0.0	0.0	0.0
misc.			1.00	0.0	0.0	0.0
Total				10.0	60.0	70.0

Reactions	Left (lbs)	Right (lbs)	Moment	
RDL=	70	70	RDL=	245
RLL=	420	420	RLL=	1470
RTL=	490	490	MTL=	1715
Max Shear (k)=	0.5		Max M (k-ft)=	1.7

	DIM	TJI	BCI
Wood Species=	Douglas Fir S.S.	-	-
Single Ply	(1) 2x10	9 1/2" 110	9 1/2" 5000
Double Ply	(2) 2x8	9 1/2" 210	9 1/2" 6000
4x	4x8	9 1/2" 230	9 1/2" 6500
6x	6x6	11 7/8" 360	11 7/8" 60
8x	8x8	11 7/8" 560	11 7/8" 90
10x	10x10		
12x	12x12		
14x	14x14		
16x	16x16		

Mark:

Span(ft)=	
Spacing (in)=	16
LL Deflection<L/	360
Total Deflection<L/	240

C_D= 1
C_r= 1.15

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof	15	100	1.33	20.0	133.3	153.3
floor			1.33	0.0	0.0	0.0
misc.		60	1.33	0.0	80.0	80.0
Total				20.0	213.3	233.3

Reactions	Left (lbs)	Right (lbs)	Moment	
RDL=	0	0	RDL=	0
RLL=	0	0	RLL=	0
RTL=	0	0	MTL=	0
Max Shear (k)=	0.0		Max M (k-ft)=	0.0

	DIM	TJI	BCI
Wood Species=	Douglas Fir #1	-	-
Single Ply	(1) 2x4	9 1/2" 110	9 1/2" 5000
Double Ply	(2) 2x4	9 1/2" 210	9 1/2" 6000
4x	4x4	9 1/2" 230	9 1/2" 6500
6x	6x6	11 7/8" 360	11 7/8" 60
8x	8x8	11 7/8" 560	11 7/8" 90
10x	10x10		
12x	12x12		
14x	14x14		
16x	16x16		

Mark:

Span(ft)=	
Spacing (in)=	16
LL Deflection<L/	480
Total Deflection<L/	240

C_D= 1
C_r= 1.15

Loading

	DL (psf)	LL(psf)	trib (ft)	DLw(plf)	LLw(plf)	TLw(plf)
roof			1.33	0.0	0.0	0.0
floor	10	40	1.33	13.3	53.3	66.7
misc.			1.33	0.0	0.0	0.0
Total				13.3	53.3	66.7

Reactions	Left (lbs)	Right (lbs)	Moment	
RDL=	0	0	RDL=	0
RLL=	0	0	RLL=	0
RTL=	0	0	MTL=	0
Max Shear (k)=	0.0		Max M (k-ft)=	0.0

	DIM	TJI	BCI
Wood Species=	Douglas Fir #2	-	-
Single Ply	(1) 2x4	9 1/2" 110	9 1/2" 5000
Double Ply	(2) 2x4	9 1/2" 210	9 1/2" 6000
4x	4x4	9 1/2" 230	9 1/2" 6500
6x	6x6	11 7/8" 360	11 7/8" 60
8x	8x8	11 7/8" 560	11 7/8" 90
10x	10x10		
12x	12x12		
14x	14x14		
16x	16x16		

$q_A = 1500$

Footings Exterior

$W = 1610$ Try 10x24

$P = 5.9\ k$

$$q = \frac{1610(1)}{(24/12)(1)} + \frac{5900}{(24/12)(6)} = 1296 < 1500 \quad \underline{ok}$$

$A_s = 0.0018(10)(24) = 0.43\ in^2$

(3) #4 = 0.6 in²

∴ 10x24 w/ (3) #4 Layers.

$W = 1840$

$P = 16.6$ Try 10x20

$$q = \frac{1840(1)}{(24/12)(1)} + \frac{16{,}600}{(24/12)(6)} = 2300 > 1500 \text{ Fails USC}$$

Spot Footings for Point Load

$$q = \frac{1840(1)}{(20/12)(1)} = 1104 < 1500 \quad \underline{\underline{ok}}$$

$A_s = 0.0018(10)(20) = 0.36\ in^2$

(3) #4 = 0.6 in²

∴ 10 x 20 w/ (3) #4 Layers

Spot Footings $q_A = 1500$

Size	PA
2'-0"	6.0
2'-6"	9.4
3'-0"	13.5
3'-6"	18.4
4'-0"	24.0

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Date JUN 04 2025

Project Wooden Spar Renovation

Project # 225112

Title Lateral Loads

By EVB Ck'd

Code IBC 2021 Jurisdiction City of Alpine Wy.

Sheet 31 of 39

Seismic RISK II I = 1.0 S_S = 110.9 S_1 = 34.1 SC = D

S_{DS} = 0.887 S_{D1} = 0.445 SDC = D R = 6.5 C_S = 0.136

V = 0.136 W (ultimate)

Garage $W = (29)(29)(15) + (29)(29)(100)(0.2) = 29435$

$V = 0.136(29435)/1.4/2 = 1.4$

Covered Patio $W = (15)(29)(15) + (15)(29)(100)(0.2) = 15225$

$V = 0.136(15225)/1.4 = 1.5/2 = 0.8$

Sun Room $W = (21)(12)(15) + (21)(12)(100)(0.2) = 8820$

$V = 0.136(8820)/1.4/2 = 0.4$

Existy House

$W = (40)(30)(15) + (40)(30)(100)(0.2) = 42000$

$V = 0.136(42000)/1.4/2 = 2.0$

Existy Garage

$W = (30)(22)(20) + (30)(22)(100)(0.2) = 26400$

$V = 0.136(26400)/1.4/2 = 1.3$

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Date JUN 04 2025

Project Wooden Spur Renovation

Project # 225112

Title Lateral Loads

By EvB Ck'd

Code IBC 2021 Jurisdiction City of Alpine Wy.

Sheet 32 of 39

Wind 115 mph Exp=C RC=II z_g = 6'

P_W = 15.5 ; 10.3 P_{G_1} = 13.9 ; 9.2 P_L = -6.6 ; -3.8

(W1) $V = (13.9(6) + 10(^{26}/_{z} - 6))(^{11}/_{z} + 2 + ^{5.5}/_{z}) = 1.6$

(W2) $V = (15.5(6) + 10.3(^{26}/_{z} - 6))(^{11}/_{z} + 2) + 10(^{26}/_{z})(5.5) = 2.0$

(W3) $V = (15.5(6) + 10.3(^{26}/_{z} - 6))(^{11}/_{z} + 4) + 10(^{26}/_{z})(5.5) = 2.3$

(W4) $V = (10)(2)(15) = 0.3$

(W5) $V = (15.5(6) + 10.3(^{18}/_{z} - 6))(^{8}/_{z}) + 10(^{18}/_{z})(2) = 0.7$

(W6) $V = (13.9(6) + 10.3(^{10}/_{z} - 6))(^{8}/_{z} + ^{3}/_{z}) = 0.4$

(W7) $V = (15.5(6) + 10.3(^{40}/_{z} - 6))(^{8}/_{z}) + 10(^{40}/_{z})(8.5) = 2.6$

(W8) $V = (15.5(6) + 10.3(^{22}/_{z} - 6))(^{9}/_{z} + 3) + 10(^{22}/_{z})(8.5) = 2.0$

(W9) $V = (13.9(6) + 10.3(^{30}/_{z} - 6))(^{10}/_{z} + 3 + ^{8.5}/_{z}) = 2.2$

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JOB TITLE	Wooden Spur Renovation		
368 Wooden Spur Dr. Alpine, Wyoming			
JOB NO.	225112	SHEET NO.	33 of 39
CALCULATED BY	EVB	DATE	6/4/2025
CHECKED BY	0	DATE	

Wood Shear Walls w/ Wood Studs (Top Story)
NDS 2021 (ASD Loading)
Total Length of walls (ft) = 8.00

Shear Line:	SW1
Sesimic Load (lb):	1400
S_{DS}	0.887
Wind Load (lb):	1600
Roof DL (psf)	15
Floor DL (psf)	10
Wall Self (psf)	8

		Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7
	length (ft)	4	4					
	height (ft)	11	11					
	roof trib. (ft)	16	16					
	floor trib. (ft)	0	0					
	Distance from HD to end of wall (in)	3	3					
	Aspect Ratio:	2.75	2.75					
	Aspect Ratio Factor (WSP):	0.91	0.91					
Seismic	shear flow (plf)	175.0	175.0					
	F (lbs)	700	700					
	Seismic Factor	0.73	0.73					
	Adjusted Shear Flow (plf)	240.63	240.63					
	MOT (ft-lb)	7700	7700					
	DL Factor A=	1.12	1.12					
	A x wDL (plf)	369	369					
	End Post Compression (lb)	2175	2175					
	DL Factor B=	0.48	0.48					
	B x wDL (plf)	156	156					
	End Post Uplift for HDs (lb)	1035	1035					
Wind	shear flow (plf)	200	200					
	F (lb)	800	800					
	MOT (ft-lb)	8800	8800					
	wDL (plf)	328	328					
	End Post Compression (lb)	3003	3003					
	DL Factor	0.6	0.6					
	wDL (plf)	196.8	197					
	End Post Uplift for HDs (lb)	2121	2121					
	Max Compression	3003	3003					
	Max Uplift	2121	2121					
	Max Shear Flow	241	241					
	Max Shear Floow Due to Wind or Seismic (W/S)	S	S					
	Sheathing Nails	7/16 w/ 8d @ 4" O.C.	7/16 w/ 8d @ 4" O.C.					
	# of Layers	1	1					
	Shear Flow Allowabel (plf)	317	317					
	Check	Adequate	Adequate					
	Sheathing Staples	7/16 w/ 1 1/2" 16 ga. @ 3" O.C.	7/16 w/ 1 1/2" 16 ga. @ 3" O.C.					
	Shar Flow Allowable (plf)	310	310					
	Check	Adequate	Adequate					
	Recommended Holdown @ Foundation 8" wall	HDU2	HDU2					
	Strap Style (Midwall)	LSTHD8	LSTHD8					
	Strap Style (End Wall)	LSTHD8	LSTHD8					
	Recommended Holdown @ Wood Wall	MSTC40	MSTC40					
	Strap Nailing Req'd	(32) 16d	(32) 16d					
	# OF Minimum End Post	2	2					

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JOB TITLE	Wooden Spur Renovation		
368 Wooden Spur Dr. Alpine, Wyoming			
JOB NO.	225112	**SHEET NO.**	34 of 39
CALCULATED BY	EVB	**DATE**	6/4/2025
CHECKED BY	0	**DATE**	

Wood Shear Walls w/ Wood Studs (Top Story)
NDS 2021 (ASD Loading)
Total Length of walls (ft) = 9.00

Shear Line:	SW2
Sesimic Load (lb):	2900
S_{DS}	0.887
Wind Load (lb):	1900
Roof DL (psf)	15
Floor DL (psf)	10
Wall Self (psf)	8

	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7
length (ft)	9						
height (ft)	11						
roof trib. (ft)	13						
floor trib. (ft)	0						
Distance from HD to end of wall (in)	3						
Aspect Ratio:	1.22						
Seismic							
shear flow (plf)	322.2						
F (lbs)	2900						
Seismic Factor	1.00						
Adjusted Shear Flow (plf)	322.22						
MOT (ft-lb)	31900						
DL Factor A=	1.12						
A x wDL (plf)	318						
End Post Compression (lb)	3984						
DL Factor B=	0.48						
B x wDL (plf)	135						
End Post Uplift for HDs (lb)	1875						
Wind							
shear flow (plf)	211						
F (lb)	1900						
MOT (ft-lb)	20900						
wDL (plf)	283						
End Post Compression (lb)	3662						
DL Factor	0.6						
wDL (plf)	169.8						
End Post Uplift for HDs (lb)	1695						
Max Compression	3984						
Max Uplift	1875						
Max Shear Flow	322						
Max Shear Floow Due to Wind or Seismic (W/S)	S						
Sheathing Nails	7/16 w/ 8d @ 3" O.C.						
# of Layers	1						
Shear Flow Allowabel (plf)	450						
Check	Adequate						
Sheathing Staples	7/16 w/ 1 1/2" 16 ga.@ 2" O.C.						
Shar Flow Allowable (plf)	395						
Check	Adequate						
Recommended Holdown @ Foundation 8" wall	HDU2						
Strap Style (Midwall)	LSTHD8						
Strap Style (End Wall)	LSTHD8						
Recommended Holdown @ Wood Wall	MSTA49						
Strap Nailing Req'd	(26) 10d						
# OF Minimum End Post	2						

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JOB TITLE	Wooden Spur Renovation		
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CALCULATED BY	EVB	**DATE**	6/4/2025
CHECKED BY	0	**DATE**	

Wood Shear Walls w/ Wood Studs (Top Story)
NDS 2021 (ASD Loading)
Total Length of walls (ft) = 20.00

Shear Line:	SW3
Sesimic Load (lb):	2200
S_{DS}	0.887
Wind Load (lb):	2000
Roof DL (psf)	15
Floor DL (psf)	10
Wall Self (psf)	8

	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7
length (ft)	20						
height (ft)	11						
roof trib. (ft)	4						
floor trib. (ft)	0						
Distance from HD to end of wall (in)	3						
Aspect Ratio:	0.55						
Seismic shear flow (plf)	110.0						
F (lbs)	2200						
Seismic Factor	1.00						
Adjusted Shear Flow (plf)	110.00						
MOT (ft-lb)	24200						
DL Factor A=	1.12						
A x wDL (plf)	166						
End Post Compression (lb)	2522						
DL Factor B=	0.48						
B x wDL (plf)	70						
End Post Uplift for HDs (lb)	143						
Wind shear flow (plf)	100						
F (lb)	2000						
MOT (ft-lb)	22000						
wDL (plf)	148						
End Post Compression (lb)	2594						
DL Factor	0.6						
wDL (plf)	88.8						
End Post Uplift for HDs (lb)	240						
Max Compression	2594						
Max Uplift	240						
Max Shear Flow	110						
Max Shear Floow Due to Wind or Seismic (W/S)	S						
Sheathing Nails	7/16 w/ 8d @ 6" o.c.						
# of Layers	1						
Shear Flow Allowabel (plf)	240						
Check	Adequate						
Sheathing Staples	7/16 w/ 1 1/2" 16 ga. @ 6" o.c.						
Shar Flow Allowable (plf)	155						
Check	Adequate						
Recommended Holdown @ Foundation 8" wall	not reqd.						
Strap Style (Midwall)	not reqd.						
Strap Style (End Wall)	not reqd.						
Recommended Holdown @ Wood Wall	not reqd.						
Strap Nailing Req'd	not reqd.						
# OF Minimum End Post	not reqd						

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JOB TITLE	Wooden Spur Renovation		
368 Wooden Spur Dr. Alpine, Wyoming			
JOB NO.	225112	SHEET NO.	36 of 39
CALCULATED BY	EVB	DATE	6/4/2025
CHECKED BY	0	DATE	

Wood Shear Walls w/ Wood Studs (Top Story)
NDS 2021 (ASD Loading)
Total Length of walls (ft) = 15.00

Shear Line:	SW4
Sesimic Load (lb):	2200
S_{os}	0.887
Wind Load (lb):	2000
Roof DL (psf)	15
Floor DL (psf)	10
Wall Self (psf)	8

		Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7
	length (ft)	9	6					
	height (ft)	11	11					
	roof trib. (ft)	4	4					
	floor trib. (ft)	0	0					
	Distance from HD to end of wall (in)	3	3					
	Aspect Ratio:	1.22	1.83					
Seismic	shear flow (plf)	146.7	146.7					
	F (lbs)	1320	880					
	Seismic Factor	1.00	1.00					
	Adjusted Shear Flow (plf)	146.67	146.67					
	MOT (ft-lb)	14520	9680					
	DL Factor A=	1.12	1.12					
	A x wDL (plf)	166	166					
	End Post Compression (lb)	1910	1678					
	DL Factor B=	0.48	0.48					
	B x wDL (plf)	70	70					
	End Post Uplift for HDs (lb)	812	918					
Wind	shear flow (plf)	133	133					
	F (lb)	1200	800					
	MOT (ft-lb)	13200	8800					
	wDL (plf)	148	148					
	End Post Compression (lb)	2175	1974					
	DL Factor	0.6	0.6					
	wDL (plf)	88.8	89					
	End Post Uplift for HDs (lb)	1153	1334					
	Max Compression	2175	1974					
	Max Uplift	1153	1334					
	Max Shear Flow	147	147					
	Max Shear Floow Due to Wind or Seismic (W/S)	S	S					
	Sheathing Nails	7/16 w/ 8d @ 6" O.C.	7/16 w/ 8d @ 6" O.C.					
	# of Layers	1	1					
	Shear Flow Allowabel (plf)	240	240					
	Check	Adequate	Adequate					
	Sheathing Staples	7/16 w/ 1 1/2" 16 ga. @ 6" O.C.	7/16 w/ 1 1/2" 16 ga. @ 6" O.C.					
	Shar Flow Allowable (plf)	155	155					
	Check	Adequate	Adequate					
	Recommended Holdown @ Foundation 8" wall	HDU2	HDU2					
	Strap Style (Midwall)	LSTHD8	LSTHD8					
	Strap Style (End Wall)	LSTHD8	LSTHD8					
	Recommended Holdown @ Wood Wall	MSTC28	MSTC28					
	Strap Nailing Req'd	(16) 16d	(16) 16d					
	# OF Minimum End Post	2	2					

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JOB TITLE	Wooden Spur Renovation		
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JOB NO.	225112	**SHEET NO.**	37 of 39
CALCULATED BY	EVB	**DATE**	6/4/2025
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Wood Shear Walls w/ Wood Studs (Top Story)
NDS 2021 (ASD Loading)
Total Length of walls (ft) = 5.00

Shear Line:	SW5
Sesimic Load (lb):	400
S_{DS}	0.887
Wind Load (lb):	400
Roof DL (psf)	15
Floor DL (psf)	10
Wall Self (psf)	8

		Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7
	length (ft)	2.5	2.5					
	height (ft)	7	7					
	roof trib. (ft)	7	7					
	floor trib. (ft)	0	0					
	Distance from HD to end of wall (in)	3	3					
	Aspect Ratio:	2.80	2.80					
	Aspect Ratio Factor (WSP):	0.90	0.90					
Seismic	shear flow (plf)	80.0	80.0					
	F (lbs)	200	200					
	Seismic Factor	0.71	0.71					
	Adjusted Shear Flow (plf)	112.00	112.00					
	MOT (ft-lb)	1400	1400					
	DL Factor A=	1.12	1.12					
	A x wDL (plf)	181	181					
	End Post Compression (lb)	662	662					
	DL Factor B=	0.48	0.48					
	B x wDL (plf)	77	77					
	End Post Uplift for HDs (lb)	296	296					
Wind	shear flow (plf)	80	80					
	F (lb)	200	200					
	MOT (ft-lb)	1400	1400					
	wDL (plf)	161	161					
	End Post Compression (lb)	823	823					
	DL Factor	0.6	0.6					
	wDL (plf)	96.6	97					
	End Post Uplift for HDs (lb)	579	579					
	Max Compression	823	823					
	Max Uplift	579	579					
	Max Shear Flow	112	112					
	Max Shear Floow Due to Wind or Seismic (W/S)	S	S					
	Sheathing Nails	7/16 w/ 8d @ 6" O.C.	7/16 w/ 8d @ 6" O.C.					
	# of Layers	1	1					
	Shear Flow Allowabel (plf)	216	216					
	Check	Adequate	Adequate					
	Sheathing Staples	7/16 w/ 1 1/2" 16 ga. @ 6" O.C.	7/16 w/ 1 1/2" 16 ga. @ 6" O.C.					
	Shar Flow Allowable (plf)	155	155					
	Check	Adequate	Adequate					
	Recommended Holdown @ Foundation 8" wall	not reqd.	not reqd.					
	Strap Style (Midwall)	not reqd.	not reqd.					
	Strap Style (End Wall)	not reqd.	not reqd.					
	Recommended Holdown @ Wood Wall	not reqd.	not reqd.					
	Strap Nailing Req'd	not reqd.	not reqd.					
	# OF Minimum End Post	not reqd	not reqd					

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JOB TITLE	Wooden Spur Renovation		
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JOB NO.	225112	SHEET NO.	38 of 39
CALCULATED BY	EVB	DATE	6/4/2025
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Wood Shear Walls w/ Wood Studs (Top Story)
NDS 2021 (ASD Loading)
Total Length of walls (ft) = 8.00

Shear Line:	SW6
Sesimic Load (lb):	1300
S_{DS}	0.887
Wind Load (lb):	2000
Roof DL (psf)	15
Floor DL (psf)	10
Wall Self (psf)	8

	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7
length (ft)	8						
height (ft)	9						
roof trib. (ft)	4						
floor trib. (ft)	1						
Distance from HD to end of wall (in)	3						
Aspect Ratio:	1.13						

Seismic	shear flow (plf)	162.5
	F (lbs)	1300
	Seismic Factor	1.00
	Adjusted Shear Flow (plf)	162.50
	MOT (ft-lb)	11700
	DL Factor A=	1.12
	A x wDL (plf)	160
	End Post Compression (lb)	1695
	DL Factor B=	0.48
	B x wDL (plf)	68
	End Post Uplift for HDs (lb)	753

Wind	shear flow (plf)	250
	F (lb)	2000
	MOT (ft-lb)	18000
	wDL (plf)	142
	End Post Compression (lb)	2891
	DL Factor	0.6
	wDL (plf)	85.2
	End Post Uplift for HDs (lb)	2059
	Max Compression	2891
	Max Uplift	2059
	Max Shear Flow	250
	Max Shear Floow Due to Wind or Seismic (W/S)	W
	Sheathing Nails	7/16 w/ 8d @ 6" O.C.
	# of Layers	1
	Shear Flow Allowabel (plf)	335
	Check	Adequate
	Sheathing Staples	7/16 w/ 1 1/2" 16 ga. @ 4" O.C.
	Shar Flow Allowable (plf)	322
	Check	Adequate
	Recommended Holdown @ Foundation 8" wall	HDU2
	Strap Style (Midwall)	LSTHD8
	Strap Style (End Wall)	LSTHD8
	Recommended Holdown @ Wood Wall	MSTC40
	Strap Nailing Req'd	(32) 16d
	# OF Minimum End Post	2

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JOB TITLE	Wooden Spur Renovation		
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JOB NO.	225112	**SHEET NO.**	39 of 39
CALCULATED BY	EVB	**DATE**	6/4/2025
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Wood Shear Walls w/ Wood Studs (Top Story)
NDS 2021 (ASD Loading)
Total Length of walls (ft) = 16.50

Shear Line:	SW7
Sesimic Load (lb):	3300
S_{DS}	0.887
Wind Load (lb):	4600
Roof DL (psf)	15
Floor DL (psf)	10
Wall Self (psf)	8

	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7
length (ft)	8	8.5					
height (ft)	8	8					
roof trib. (ft)	4	4					
floor trib. (ft)	2	2					
Distance from HD to end of wall (in)	3	3					
Aspect Ratio:	1.00	0.94					
Seismic shear flow (plf)	200.0	200.0					
F (lbs)	1600	1700					
Seismic Factor	1.00	1.00					
Adjusted Shear Flow (plf)	200.00	200.00					
MOT (ft-lb)	12800	13600					
DL Factor A=	1.12	1.12					
A x wDL (plf)	162	162					
End Post Compression (lb)	1804	1842					
DL Factor B=	0.48	0.48					
B x wDL (plf)	69	69					
End Post Uplift for HDs (lb)	846	829					
Wind shear flow (plf)	279	279					
F (lb)	2230	2370					
MOT (ft-lb)	17842	18958					
wDL (plf)	144	144					
End Post Compression (lb)	2878	2910					
DL Factor	0.6	0.6					
wDL (plf)	86.4	86					
End Post Uplift for HDs (lb)	2033	2002					
Max Compression	2878	2910					
Max Uplift	2033	2002					
Max Shear Flow	279	279					
Max Shear Floow Due to Wind or Seismic (W/S)	W	W					
Sheathing Nails	7/16 w/ 8d @ 6" O.C.	7/16 w/ 8d @ 6" O.C.					
# of Layers	1	1					
Shear Flow Allowabel (plf)	335	335					
Check	Adequate	Adequate					
Sheathing Staples	7/16 w/ 1 1/2" 16 ga. @ 4" O.C.	7/16 w/ 1 1/2" 16 ga. @ 4" O.C.					
Shar Flow Allowable (plf)	322	322					
Check	Adequate	Adequate					
Recommended Holdown @ Foundation 8" wall	HDU2	HDU2					
Strap Style (Midwall)	LSTHD8	LSTHD8					
Strap Style (End Wall)	LSTHD8	LSTHD8					
Recommended Holdown @ Wood Wall	MSTC40	MSTA49					
Strap Nailing Req'd	(32) 16d	(26) 10d					
# OF Minimum End Post	2	2					