STRUCTURAL ENGINEERING CALCULATIONS

FOR

A NEW CLUBHOUSE FOR
EVREN APARTMENTS
AT
TUDOR AND DOUGLAS
LEE'S SUMMIT, MO

PREPARED BY

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FOR

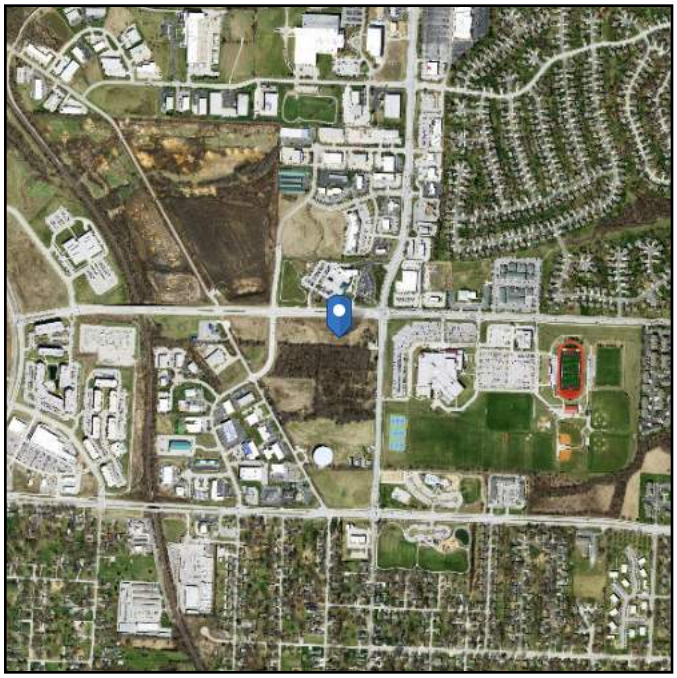
MITSCH DESIGN
200 SOUTH RANGELINE ROAD
SUITE 226
CARMEL, IN 46032
(317) 573-2222

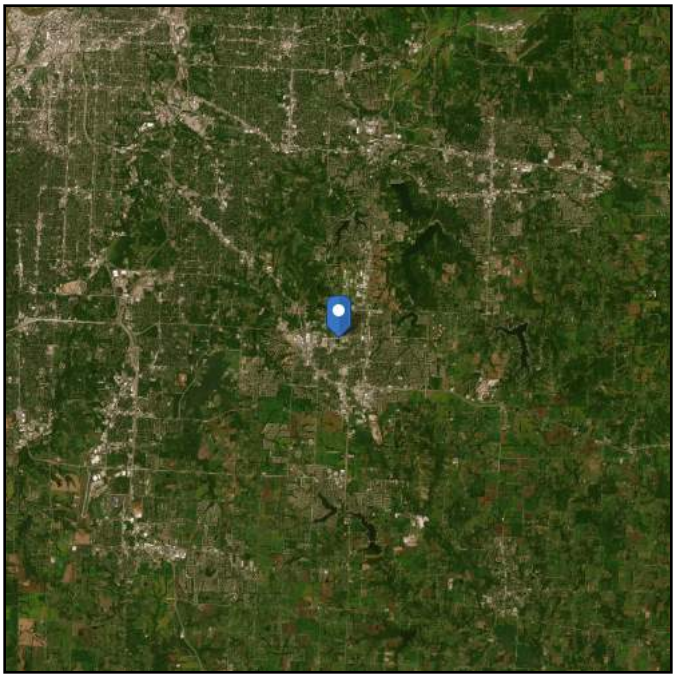
May 31, 2024

ASCE Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	38.929931
Risk Category:	II	**Longitude:**	-94.381096
Soil Class:	C - Very Dense Soil and Soft Rock	**Elevation:**	1036.7056910518777 ft (NAVD 88)





Wind

Results:

Wind Speed	109 Vmph
10-year MRI	76 Vmph
25-year MRI	83 Vmph
50-year MRI	88 Vmph
100-year MRI	94 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Fri May 31 2024

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

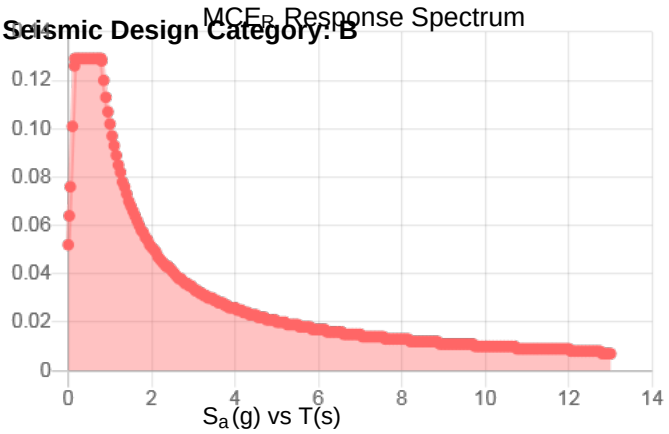
Seismic

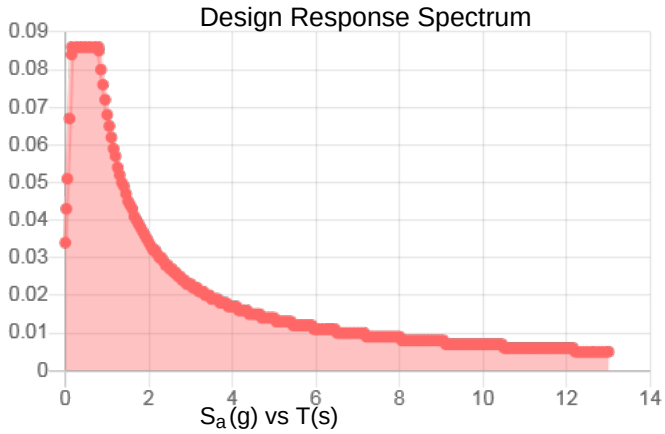
Site Soil Class: C - Very Dense Soil and Soft Rock

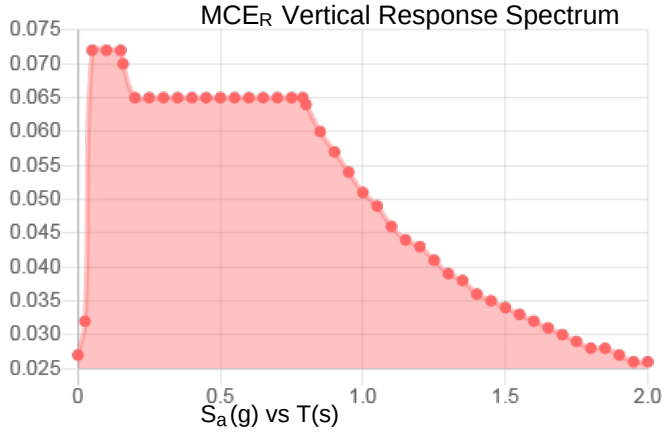
Results:

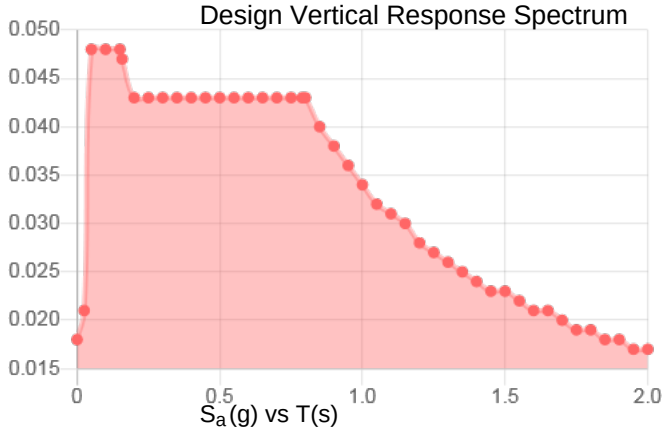
S_S :	0.099	S_{D1} :	0.068
S_1 :	0.068	T_L :	12
F_a :	1.3	PGA :	0.047
F_v :	1.5	PGA_M :	0.061
S_{MS} :	0.129	F_{PGA} :	1.3
S_{M1} :	0.102	I_e :	1
S_{DS} :	0.086	C_v :	0.7

Seismic Design Category: B









Data Accessed: **Fri May 31 2024**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	5 F
Gust Speed	40 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Fri May 31 2024

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Snow

Results:

Ground Snow Load, p_g:	20 lb/ft^2
Mapped Elevation:	1036.7 ft
Data Source:	ASCE/SEI 7-16, Table 7.2-8
Date Accessed:	Fri May 31 2024

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

Snow load values are mapped to a 0.5 mile resolution. This resolution can create a mismatch between the mapped elevation and the site-specific elevation in topographically complex areas. Engineers should consult the local authority having jurisdiction in locations where the reported ‘elevation’ and ‘mapped elevation’ differ significantly from each other.

Rain

Results:

15-minute Precipitation Intensity: 7.49 in./h

60-minute Precipitation Intensity: 3.52 in./h

Data Source: NOAA National Weather Service, Precipitation Frequency Data Server, Atlas 14 (https://www.nws.noaa.gov/oh/hdsc/)

Date Accessed: Fri May 31 2024

Flood

Results:

Flood Zone Categorization: X (unshaded)

Base Flood Elevation:

Data Source:	FEMA National Flood Hazard Layer - Effective Flood Hazard Layer for US, where modernized (https://msc.fema.gov/portal/search)
Date Accessed:	Fri May 31 2024
FIRM Panel:	If available, download FIRM panel here
Insurance Study Note:	Download FEMA Flood Insurance Study for this area here

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General Data

h_z =	21.00 ft	Eave Height
h_{avg} =	24.00 ft	Avg Roof Height
L =	130.0 ft	Dim Parallel to Wind
B =	80.0 ft	Dim Normal to Wind
Roof Type:	Gable	
Slope, θ =	45. deg	

Step 1 - Risk Category **(Section 1.5)**

Category =	II	(Table 1.5-1)

Step 2 - Basic Wind Speed **(Section 26.5.1)**

V =	109 mph	(Figure 26.5-1a-c)

Step 3 - Wind Load Parameters **(Section 26)**

K_d =	0.85	Wind Directionality Factor	(Table 26.6-1)
Exposure:	C	Exposure Category	(Section 26.7)
K_{zt} =	1.00	Topographic Factor	(Section 26.8.2)
G =	0.85	Gust Effect Factor	(Section 26.9)
Classification:	Enclosed	Enclosure Classifcation	(Section 26.10)
(GC_{pi}) =	+/- .18	Internal Pressure Coefficient	(Table 26.11-1)

Step 4 - Velocity Pressure Exposure Coefficient **(Section 27.3-1)**

α =	9.5	(3 sec gust speed power law exponent)	(Table 26.9-1)
z_g =	900	(Nominal height of atmospheric bounday layer)	(Table 26.9-1)
K_h =	0.94	Velocity Pressure Coefficient at Average Roof Height	(Table 27.3-1)

Step 5 - Velocity Pressure **(Section 27.3-2)**

q_h =	24.23	Velocity Pressure at Average Roof Height	(EQ 27.3-1)

Step 6 - External Pressure Coefficient **(Figure 30.4-1 thru 30.4-7)**

Span, l =	20	Span Length of Component
TW =	1.33	Tributary Width of Component
EWA =	27	Effective Wind Area
a =	8	

	Zone	[-] GC_p	[+] GC_p
Roof	1	-0.92	0.86
	2	-1.16	0.86
	3	-1.16	0.86
Wall	4	-1.03	0.99
	5	-1.27	0.99

Step 7 - Wind Pressure **(Equation 30.4-1)**

	Zone	$[-]GC_p$ - $[+]GC_{pi}$	$[+]GC_p$ - $[-]GC_{pi}$	p (psf)	0.6p (psf)
Roof	1	-26.57	25.23	26.57	15.94
	2	-32.50	25.23	32.50	19.50
	3	-32.50	25.23	32.50	19.50
Wall	4	-29.43	28.38	29.43	17.66
	5	-35.11	28.38	35.11	21.07

Tudor & Douglas - Lee's Summit Clubhouse
Stud Wall Design

Bob D. Campbell & Co.
5/31/2024

Level Loadings

Type	DL	LL	TL
Balcony (Private)	55 psf	60 psf	115 psf
Balcony (Public)	55 psf	100 psf	155 psf
Floor (Private)	28 psf	40 psf	68 psf
Floor (Public)	28 psf	100 psf	128 psf
Roof (Flat)	25 psf	20 psf	45 psf
Roof (Sloped)	25 psf	20 psf	45 psf
Storage	35 psf	125 psf	160 psf

Notes:

Wood Properties

Grade	Fb	Fc
Stud	700	850
No. 2	900	1350
No. 1	1000	1500
Sel. Struct.	1500	1700

Wind Pressure

Exterior	25 psf
Interior	5 psf
Special	-

Built-up Col Design (L=12', Lu=60")		P allow
(4) 2x4 @ 16"oc	5 psf	3656 plf
(4.5) 2x4 @ 16"oc	5 psf	4165 plf
(5) 2x4 @ 16"oc	5 psf	4673 plf
(5.5) 2x4 @ 16"oc	5 psf	5187 plf
(6) 2x4 @ 16"oc	5 psf	5700 plf

Exterior

REVIEWED	Roof Bearing - 2x6						Wood Stud Properties									
Level	**DL**	**LL**	**TL**	**TW**	**Adt'l Ld**	**TL**	**Number**	**Size**	**Spacing**	**Grade**	**Lu (in.)**	**Height**	**Wall Condition**	**Lateral Force**	**P allow.**	**Unity**
Roof (Flat)	25 psf	20 psf	45 psf	24.0 ft	50 plf	1130 plf	1.0	2x6	16.0 in.	No. 2	12 in.	10 ft	Exterior	35 plf	3199 plf	35%

Interior

REVIEWED	Roof Bearing - 2x4						Wood Stud Properties									
Level	**DL**	**LL**	**TL**	**TW**	**Adt'l Ld**	**TL**	**Number**	**Size**	**Spacing**	**Grade**	**Lu (in.)**	**Height**	**Wall Condition**	**Lateral Force**	**P allow.**	**Unity**
Roof (Flat)	25 psf	20 psf	45 psf	34.0 ft	50 plf	1580 plf	1.5	2x4	16.0 in.	No. 2	12 in.	10 ft	Interior	8 plf	1808 plf	87%

REVIEWED	Roof Bearing - 2x6						Wood Stud Properties									
Level	**DL**	**LL**	**TL**	**TW**	**Adt'l Ld**	**TL**	**Number**	**Size**	**Spacing**	**Grade**	**Lu (in.)**	**Height**	**Wall Condition**	**Lateral Force**	**P allow.**	**Unity**
Roof (Flat)	25 psf	20 psf	45 psf	34.0 ft	50 plf	1580 plf	1.0	2x6	16.0 in.	No. 2	12 in.	10 ft	Interior	8 plf	4370 plf	36%

2-2x10 Wall Studs at Great Room

Compression-Bending Member Analysis

Project:

CAB **Date: 31-May-24**

Units: inches, pounds

General Member Specifications

Member Type	Visually Graded		
Nominal Size	2 x 10		
Species	Douglas Fir-Larch		
Grade	No. 2		
Grade -- For C_F	Select, No.1, No.2 or No.3		
Custom Breadth		b =	
Depth		d =	
Number Studs		N =	2
Load Duration?	Ten Years (Live)		
Operating Temperature	T < 100 F		
Cross Section Shape			Rectangle
Wet Service?			No
Incising?			No
Flat Use?			No
Repetitive Member?			No
Truss Chord?			No

Member Characteristics

Axial Compression Load	P =	7,866 lb
Applied Bending Moment	M =	20,000 in-lb
Maximum Shear Force	V =	333 lb
ı Unbraced Length (1-1 axis - weak):	l_1 =	12.0 in.
Unbraced Length (2-2 axis - strong):	l_2 =	240.0 in.
End Conditions: for 1-1 axis:		pinned-pinned
for 2-2 axis:		pinned-pinned
Bending Unbraced Length:	l_u =	12.0 in.
Bending Supports:	Simple span - Uniformly distributed load	

Cross-Section Properties

Breadth	b =	3.00 in.
Depth	d =	9.25 in.
Area	A =	27.75 in.
Section Modulus	S =	42.8 in^3
Orientation		Strong Axis Bending
Size Classification		Dimension Lumber

Computed Data

Bending Effective Length:	l_e =	24.7 in.
Bending Slenderness Ratio:	R_B =	5.04
Effective Length Factors:	K_{e1} =	1.00
	K_{e2} =	1.00
Slenderness Ratios:	l_{e1}/d_1 =	4.0
	l_{e2}/d_2 =	25.9
max slenderness ratio:	l_e/d =	25.9
Applied Compressive Stress:	f_c =	283 psi
Applied Bending Stress:	f_b =	467 psi
Applied Shear Stress:	f_v =	18 psi
Plate Bearing	$f_{c\ Perp.}$ =	283 psi
Bearing Area Factor	Cb =	1.13

Compresive Capacity:	$P_{allowable}$ =	37,116 lb
Compression Unity Check:	f_c / F_c' =	0.463
Bending Capacity:	$M_{allowable}$ =	42,275 in-lb
Bending Unity Check:	f_b / F_b' =	0.473
Shear Capacity:	$V_{allowable}$ =	3,330 lb
Shear Unity Check:	f_v / F_v' =	0.100
Plate Bearing Check	f_c / F_c' =	0.446

Tabulated Design Values

Flexural Strength	F_b =	900 psi	
Compressive Strength	F_c =	1,350 psi	
Shear Strength	F_v =	180 psi	
Modulus of Elasticity	E =	1.60E+06 psi	
Compression Perp, to Grain	$F_{c\ Perp.}$ =	565	565 AT Southern Pin
Adjustment Factors on F_c			625 AT Douglas Fir S
Load Duration Factor	C_D =	1.00	
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Size Factor	C_F =	1.00	<-- Use 1 instead of -->
Incising Factor	C_i =	1.00	
Adjustment Factors on F_b			
Load Duration Factor	C_D =	1.00	
Size Factor	C_F =	1.10	<-- Use 1 instead of -->
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Flat Use Factor	C_{fu} =	1.00	<-- not implemented
Incising Factor	C_i =	1.00	
Repetitive Member Factor	C_r =	1.00	
Form Factor	C_f =	1.00	
Adjustments for Shear			
Load Duration Factor	C_D =	1.00	
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Incising Factor	C_i =	1.00	
Shear Stress Factor	C_H =	1.00	<-- not implemented
Adjustment Factors on E			
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Incising Factor	C_i =	1.00	

Member Strength		Weak Axis	Strong Axis
Adjusted Shear Strength	F_v' =	180 psi	
Adjusted Compressive Strength	F_c^* =	1,350 psi	
Adjusted MOE	E' =	1.60E+06 psi	
	K_{cE} =	.30	
Euler Stress	F_{cE} =	30,000 psi	713 psi
Column Stress Ratio	F_{cE} / F_c^* =	22.222	0.528
Built Up Column Factor	Kf =	1.0	1.0
Stress-strain Curve Factor	c =	0.80	0.80
Column Stability Factor	C_P =	0.991	0.453
Allowable Compressive Stress	F_c' =	1,338 psi	612 psi
Adjusted Bending Strength	F_b^* =	990 psi	990 psi
Lateral Buckling Coefficient	K_{bE} =	0.438	0.438
Lateral Buckling Stress	F_{bE} =	27,583 psi	27,583 psi
Bending Stress Ratio	F_{bE} / F_b^* =	27.862	27.862
Beam Stability Factor	C_L =	0.998	0.998
Allowable Bending Stress	F_b' =	988 psi	988 psi

Interaction:		
Strong Axis Euler Stress	F_{cE1} =	713 psi
Moment Magnifier	B =	1.660
Eq. (3.9-3)	I =	1.000
Member Status		OK

5-2x10 Jamb at Great Room Door

Compression-Bending Member Analysis

Project:

CAB **Date: 31-May-24**

Units: inches, pounds

General Member Specifications

Member Type	Visually Graded	
Nominal Size	2 x 10	
Species	Douglas Fir-Larch	
Grade	No. 2	
Grade -- For C_F	Select, No.1, No.2 or No.3	
Custom Breadth	b =	
Depth	d =	
Number Studs	N =	5
Load Duration?	Ten Years (Live)	
Operating Temperature	T < 100 F	
Cross Section Shape	Rectangle	
Wet Service?	No	
Incising?	No	
Flat Use?	No	
Repetitive Member?	No	
Truss Chord?	No	

Member Characteristics

Axial Compression Load	P =	2,543 lb
Applied Bending Moment	M =	100,050 in-lb
Maximum Shear Force	V =	1,668 lb
ı Unbraced Length (1-1 axis - weak):	l_1 =	12.0 in.
Unbraced Length (2-2 axis - strong):	l_2 =	240.0 in.
End Conditions: for 1-1 axis:	pinned-pinned	
for 2-2 axis:	pinned-pinned	
Bending Unbraced Length:	l_u =	12.0 in.
Bending Supports:	Simple span - Uniformly distributed load	

Cross-Section Properties

Breadth	b =	7.50 in.
Depth	d =	9.25 in.
Area	A =	69.38 in.
Section Modulus	S =	107.0 in^3
Orientation		Strong Axis Bending
Size Classification		Dimension Lumber

Computed Data

Bending Effective Length:	l_e =	24.7 in.
Bending Slenderness Ratio:	R_B =	2.02
Effective Length Factors:	K_{e1} =	1.00
	K_{e2} =	1.00
Slenderness Ratios:	l_{e1}/d_1 =	1.6
	l_{e2}/d_2 =	25.9
max slenderness ratio:	l_e/d =	25.9
Applied Compressive Stress:	f_c =	37 psi
Applied Bending Stress:	f_b =	935 psi
Applied Shear Stress:	f_v =	36 psi
Plate Bearing	$f_{c\ Perp.}$ =	37 psi
Bearing Area Factor	Cb =	1.05

Compresive Capacity:	$P_{allowable}$ =	93,521 lb
Compression Unity Check:	f_c / F_c' =	0.060
Bending Capacity:	$M_{allowable}$ =	105,853 in-lb
Bending Unity Check:	f_b / F_b' =	0.945
Shear Capacity:	$V_{allowable}$ =	8,325 lb
Shear Unity Check:	f_v / F_v' =	0.200
Plate Bearing Check	f_c / F_c' =	0.062

Tabulated Design Values

Flexural Strength	F_b =	900 psi	
Compressive Strength	F_c =	1,350 psi	
Shear Strength	F_v =	180 psi	
Modulus of Elasticity	E =	1.60E+06 psi	
Compression Perp, to Grain	$F_{c\ Perp.}$ =	565	565 AT Southern Pin
Adjustment Factors on F_c			625 AT Douglas Fir S
Load Duration Factor	C_D =	1.00	
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Size Factor	C_F =	1.00	<-- Use 1 instead of -->
Incising Factor	C_i =	1.00	
Adjustment Factors on F_b			
Load Duration Factor	C_D =	1.00	
Size Factor	C_F =	1.10	<-- Use 1 instead of -->
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Flat Use Factor	C_{fu} =	1.00	<-- not implemented
Incising Factor	C_i =	1.00	
Repetitive Member Factor	C_r =	1.00	
Form Factor	C_f =	1.00	
Adjustments for Shear			
Load Duration Factor	C_D =	1.00	
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Incising Factor	C_i =	1.00	
Shear Stress Factor	C_H =	1.00	<-- not implemented
Adjustment Factors on E			
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Incising Factor	C_i =	1.00	

Member Strength		Weak Axis	Strong Axis
Adjusted Shear Strength	F_v' =	180 psi	
Adjusted Compressive Strength	F_c^* =	1,350 psi	
Adjusted MOE	E' =	1.60E+06 psi	
	K_{cE} =	.30	
Euler Stress	F_{cE} =	187,500 psi	713 psi
Column Stress Ratio	F_{cE} / F_c^*=	138.889	0.528
Built Up Column Factor	Kf =	1.0	1.0
Stress-strain Curve Factor	c =	0.80	0.80
Column Stability Factor	C_P =	0.999	0.453
Allowable Compressive Stress	F_c'=	1,348 psi	612 psi
Adjusted Bending Strength	F_b^* =	990 psi	990 psi
Lateral Buckling Coefficient	K_{bE} =	0.438	0.438
Lateral Buckling Stress	F_{bE} =	172,396 psi	172,396 psi
Bending Stress Ratio	F_{bE} / F_b^*=	174.137	174.137
Beam Stability Factor	C_L =	1.000	1.000
Allowable Bending Stress	F_b'=	990 psi	990 psi

Interaction:		
Strong Axis Euler Stress	F_{cE1} =	713 psi
Moment Magnifier	B =	1.054
Eq. (3.9-3)	I =	1.000
Member Status		NG

20ft Interior 2x6

Compression-Bending Member Analysis

Project:

CAB ***Date: 31-May-24***

Units: inches, pounds

General Member Specifications

Member Type	Visually Graded	
Nominal Size	2 x 6	
Species	Douglas Fir-Larch	
Grade	No. 2	
Grade -- For C_F	Select, No.1, No.2 or No.3	
Custom Breadth	b =	
Depth	d =	
Number Studs	N =	2
Load Duration?	Ten Years (Live)	
Operating Temperature	T < 100 F	
Cross Section Shape	Rectangle	
Wet Service?	No	
Incising?	No	
Flat Use?	No	
Repetitive Member?	No	
Truss Chord?	No	

Member Characteristics

Axial Compression Load	P =	1,718 lb
Applied Bending Moment	M =	4,000 in-lb
Maximum Shear Force	V =	67 lb
ı Unbraced Length (1-1 axis - weak):	l_1 =	12.0 in.
Unbraced Length (2-2 axis - strong):	l_2 =	240.0 in.
End Conditions: for 1-1 axis:	pinned-pinned	
for 2-2 axis:	pinned-pinned	
Bending Unbraced Length:	l_u =	12.0 in.
Bending Supports:	Simple span - Uniformly distributed load	

Cross-Section Properties

Breadth	b =	2.25 in.
Depth	d =	5.50 in.
Area	A =	12.38 in.
Section Modulus	S =	11.3 in^3
Orientation		Strong Axis Bending
Size Classification		Dimension Lumber

Computed Data

Bending Effective Length:	l_e =	24.7 in.
Bending Slenderness Ratio:	R_B =	5.18
Effective Length Factors:	K_{e1} =	1.00
	K_{e2} =	1.00
Slenderness Ratios:	l_{e1}/d_1 =	5.3
	l_{e2}/d_2 =	43.6
max slenderness ratio:	l_e/d =	43.6
Applied Compressive Stress:	f_c =	139 psi
Applied Bending Stress:	f_b =	353 psi
Applied Shear Stress:	f_v =	8 psi
Plate Bearing	$f_{c\ Perp.}$ =	139 psi
Bearing Area Factor	Cb =	1.17

Compresive Capacity:	$P_{allowable}$ =	18,036 lb
Compression Unity Check:	f_c / F_c' =	0.572
Bending Capacity:	$M_{allowable}$ =	13,241 in-lb
Bending Unity Check:	f_b / F_b' =	0.302
Shear Capacity:	$V_{allowable}$ =	1,485 lb
Shear Unity Check:	f_v / F_v' =	0.045
Plate Bearing Check	f_c / F_c' =	0.211

Tabulated Design Values

Flexural Strength	F_b =	900 psi	
Compressive Strength	F_c =	1,350 psi	
Shear Strength	F_v =	180 psi	
Modulus of Elasticity	E =	1.60E+06 psi	
Compression Perp, to Grain	$F_{c\ Perp.}$ =	565	565 AT Southern Pin
Adjustment Factors on F_c			625 AT Douglas Fir S
Load Duration Factor	C_D =	1.00	
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Size Factor	C_F =	1.10	<-- Use 1 instead of -->
Incising Factor	C_i =	1.00	
Adjustment Factors on F_b			
Load Duration Factor	C_D =	1.00	
Size Factor	C_F =	1.30	<-- Use 1 instead of -->
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Flat Use Factor	C_{fu} =	1.00	<-- not implemented
Incising Factor	C_i =	1.00	
Repetitive Member Factor	C_r =	1.00	
Form Factor	C_f =	1.00	
Adjustments for Shear			
Load Duration Factor	C_D =	1.00	
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Incising Factor	C_i =	1.00	
Shear Stress Factor	C_H =	1.00	<-- not implemented
Adjustment Factors on E			
Wet Service Factor	C_M =	1.00	
Temperature Factor	C_t =	1.00	<-- not implemented
Incising Factor	C_i =	1.00	

Member Strength		**Weak Axis**	**Strong Axis**
Adjusted Shear Strength	F_v' =	180 psi	
Adjusted Compressive Strength	F_c^* =	1,485 psi	
Adjusted MOE	E' =	1.60E+06 psi	
	K_{cE} =	.30	
Euler Stress	F_{cE} =	16,875 psi	252 psi
Column Stress Ratio	F_{cE} / F_c^* =	11.364	0.170
Built Up Column Factor	Kf =	1.0	1.0
Stress-strain Curve Factor	c =	0.80	0.80
Column Stability Factor	C_P =	0.981	0.163
Allowable Compressive Stress	F_c' =	1,457 psi	243 psi
Adjusted Bending Strength	F_b^* =	1,170 psi	1,170 psi
Lateral Buckling Coefficient	K_{bE} =	0.438	0.438
Lateral Buckling Stress	F_{bE} =	26,094 psi	26,094 psi
Bending Stress Ratio	F_{bE} / F_b^* =	22.303	22.303
Beam Stability Factor	C_L =	0.998	0.998
Allowable Bending Stress	F_b' =	1,167 psi	1,167 psi

Interaction:		
Strong Axis Euler Stress	F_{cE1} =	252 psi
Moment Magnifier	B =	2.226
Eq. (3.9-3)	I =	1.000
Member Status		OK

Evren Clubhouse
Header and Jamb Design

Bob D. Campbell & Co.
5/31/2024

Level Loadings

Type	DL	LL	TL
Balcony (Private)	15 psf	60 psf	75 psf
Balcony (Public)	15 psf	100 psf	115 psf
Floor (Private)	28 psf	40 psf	68 psf
Floor (Public)	28 psf	100 psf	128 psf
Roof (Flat)	25 psf	20 psf	45 psf
Roof (Sloped)	25 psf	20 psf	45 psf
Roof (MECH)	25 psf	45 psf	70 psf
Storage	35 psf	125 psf	160 psf

Header Grade	Fb
Stud	700
No. 2	900
No. 1	1000
LVL	2600
PSL	2900

Jamb Grade	Fc
Stud	850
No. 2	1350
No. 1	1500
Sel. Struct.	1700

TL Deflection Criteria L/ 360

Interior WL 5 psf
Exterior WL 20 psf

Notes:
-Refer to ' Wood Header and Jamb Design Key' for member locations
- *Refer to Forte Calculations for beam/header design on where specified

Note: Jack Studs assumed to be braced at 24"oc (weak axis) and L = Stud Height - 1 ft

Exterior

REVIEWED **9.5' - Game Room South Window**

							Header								Jamb Size						Jack						King					
Level	DL	LL	TL	TW	Adt'l Ld	Truss Spcg	Length	WTTL	Type	Size	Grade	Lu	WAllow	Unity	WTTL	Grade	Jamb Size	Int or Ext	WL	Stud Spcg	HT	Pactual	BRG W Req'd	Jack	Pallow	Unity	HT	Pactual	Lu	King	Pallow	Unity
Roof (Sloped)	25 psf	20 psf	45 psf	17.5 ft	50 plf	2.0 ft	10 ft	838 plf	3 LVL	11.25	No. 2	Span	1753 plf	0.48	884 plf	No. 2	2x6	Exterior	80 plf	16 in. oc	9 ft	4419 lb	1.35	2	11602 lb	0.38	10 ft	589 lb	60 in.	2	7260 lb	0.08

REVIEWED **10' - Kitchen & Fitness Room South Window**

							Header								Jamb Size						Jack						King					
Level	DL	LL	TL	TW	Adt'l Ld	Truss Spcg	Length	WTTL	Type	Size	Grade	Lu	WAllow	Unity	WTTL	Grade	Jamb Size	Int or Ext	WL	Stud Spcg	HT	Pactual	BRG W Req'd	Jack	Pallow	Unity	HT	Pactual	Lu	King	Pallow	Unity
Roof (Sloped)	25 psf	20 psf	45 psf	22.0 ft	50 plf	2.0 ft	10 ft	1040 plf	3 LVL	11.25	No. 2	Span	1753 plf	0.59	1098 plf	No. 2	2x6	Exterior	80 plf	16 in. oc	9 ft	0 lb	1.67	0	0 lb	NA	10 ft	6223 lb	60 in.	2	7260 lb	0.86

REVIEWED **12' - Lease Lounge South Window**

							Header								Jamb Size						Jack						King					
Level	DL	LL	TL	TW	Adt'l Ld	Truss Spcg	Length	WTTL	Type	Size	Grade	Lu	WAllow	Unity	WTTL	Grade	Jamb Size	Int or Ext	WL	Stud Spcg	HT	Pactual	BRG W Req'd	Jack	Pallow	Unity	HT	Pactual	Lu	King	Pallow	Unity
Roof (Sloped)	25 psf	20 psf	45 psf	5.0 ft	50 plf	2.0 ft	12 ft	275 plf	(3) 2x	2 x 12	No. 2	Span	392 plf	0.70	286 plf	No. 2	2x6	Exterior	80 plf	16 in. oc	9 ft	0 lb	0.53	0	0 lb	NA	10 ft	1908 lb	60 in.	2	7260 lb	0.26

Jamb per Separate Spread Sheet Calc - 2 Jack 4 King

REVIEWED **10' - Well Beats Room South Window**

							Header								Jamb Size						Jack						King					
Level	DL	LL	TL	TW	Adt'l Ld	Truss Spcg	Length	WTTL	Type	Size	Grade	Lu	WAllow	Unity	WTTL	Grade	Jamb Size	Int or Ext	WL	Stud Spcg	HT	Pactual	BRG W Req'd	Jack	Pallow	Unity	HT	Pactual	Lu	King	Pallow	Unity
Roof (Sloped)	25 psf	20 psf	45 psf	5.0 ft	50 plf	2.0 ft	10 ft	275 plf	(3) 2x	2 x 10	No. 2	Span	421 plf	0.65	288 plf	No. 2	2x6	Exterior	80 plf	16 in. oc	9 ft	0 lb	0.44	0	0 lb	NA	10 ft	1633 lb	60 in.	2	7260 lb	0.22

REVIEWED **6' - Pool Storage West Door**

							Header								Jamb Size						Jack						King					
Level	DL	LL	TL	TW	Adt'l Ld	Truss Spcg	Length	WTTL	Type	Size	Grade	Lu	WAllow	Unity	WTTL	Grade	Jamb Size	Int or Ext	WL	Stud Spcg	HT	Pactual	BRG W Req'd	Jack	Pallow	Unity	HT	Pactual	Lu	King	Pallow	Unity
Roof (Sloped)	25 psf	20 psf	45 psf	13.0 ft	50 plf	2.0 ft	6 ft	635 plf	(3) 2x	2 x 8	No. 2	Span	786 plf	0.81	688 plf	No. 2	2x6	Exterior	70 plf	16 in. oc	9 ft	2065 lb	0.61	1	5623 lb	0.37	10 ft	459 lb	60 in.	1	757 lb	0.61

REVIEWED **11'-6 -Theater N. Window**

							Header								Jamb Size						Jack						King					
Level	DL	LL	TL	TW	Adt'l Ld	Truss Spcg	Length	WTTL	Type	Size	Grade	Lu	WAllow	Unity	WTTL	Grade	Jamb Size	Int or Ext	WL	Stud Spcg	HT	Pactual	BRG W Req'd	Jack	Pallow	Unity	HT	Pactual	Lu	King	Pallow	Unity
Roof (Sloped)	25 psf	20 psf	45 psf	19.0 ft	50 plf	2.0 ft	12 ft	905 plf	3 LVL	11.25	No. 2	Span	1015 plf	0.89	948 plf	No. 2	2x6	Exterior	80 plf	16 in. oc	9 ft	5687 lb	1.75	2	11602 lb	0.49	10 ft	632 lb	60 in.	2	7260 lb	0.09

REVIEWED **3'-0" Office N. Window**

							Header								Jamb Size						Jack						King					
Level	DL	LL	TL	TW	Adt'l Ld	Truss Spcg	Length	WTTL	Type	Size	Grade	Lu	WAllow	Unity	WTTL	Grade	Jamb Size	Int or Ext	WL	Stud Spcg	HT	Pactual	BRG W Req'd	Jack	Pallow	Unity	HT	Pactual	Lu	King	Pallow	Unity
Roof (Sloped)	25 psf	20 psf	45 psf	19.0 ft	50 plf	2.0 ft	3 ft	1190 plf	(3) 2x	2 x 8	No. 2	Span	2610 plf	0.46	1234 plf	No. 2	2x6	Exterior	40 plf	16 in. oc	9 ft	1851 lb	0.57	1	5623 lb	0.33	10 ft	823 lb	60 in.	1	1567 lb	0.53

Interior

REVIEWED **3'-0" Storage MECH Closet 127**

							Header								Jamb Size						Jack						King					
Level	DL	LL	TL	TW	Adt'l Ld	Truss Spcg	Length	WTTL	Type	Size	Grade	Lu	WAllow	Unity	WTTL	Grade	Jamb Size	Int or Ext	WL	Stud Spcg	HT	Pactual	BRG W Req'd	Jack	Pallow	Unity	HT	Pactual	Lu	King	Pallow	Unity
Roof (Sloped)	25 psf	20 psf	45 psf	34.0 ft	50 plf	2.0 ft	3 ft	2090 plf	(3) 2x	2 x 8	No. 2	Span	2610 plf	0.80	2168 plf	No. 2	2x6	Interior	10 plf	16 in. oc	9 ft	3253 lb	1.01	1	5623 lb	0.58	10 ft	1446 lb	60 in.	1	2208 lb	0.65

REVIEWED **3'-0" Storage Package 136**

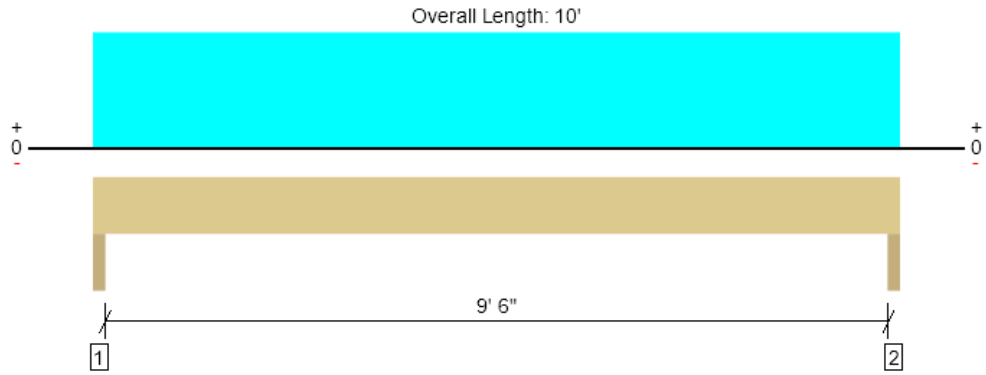
							Header								Jamb Size						Jack						King					
Level	DL	LL	TL	TW	Adt'l Ld	Truss Spcg	Length	WTTL	Type	Size	Grade	Lu	WAllow	Unity	WTTL	Grade	Jamb Size	Int or Ext	WL	Stud Spcg	HT	Pactual	BRG W Req'd	Jack	Pallow	Unity	HT	Pactual	Lu	King	Pallow	Unity
Roof (Sloped)	25 psf	20 psf	45 psf	21.0 ft	50 plf	2.0 ft	3 ft	1310 plf	(2) 2x	2 x 8	No. 2	Span	1740 plf	0.75	1358 plf	No. 2	2x4	Interior	10 plf	16 in. oc	9 ft	2038 lb	0.99	1	2438 lb	0.84	10 ft	906 lb	60 in.	2	3041 lb	0.30

REVIEWED **17'-0" Lease Lounge**

							Header								Jamb Size						Jack						King					
Level	DL	LL	TL	TW	Adt'l Ld	Truss Spcg	Length	WTTL	Type	Size	Grade	Lu	WAllow	Unity	WTTL	Grade	Jamb Size	Int or Ext	WL	Stud Spcg	HT	Pactual	BRG W Req'd	Jack	Pallow	Unity	HT	Pactual	Lu	King	Pallow	Unity
Roof (Sloped)	25 psf	20 psf	45 psf	12.0 ft	50 plf	2.0 ft	17 ft	622 plf	3 LVL	14	No. 2	Span	688 plf	0.90	639 plf	No. 2	2x6	Interior	50 plf	16 in. oc	9 ft	0 lb	1.70	0	0 lb	NA	10 ft	5858 lb	60 in.	3	15904 lb	0.37

Level			
Member Name	Results (Max UTIL %)	Current Solution	Comments
Game Room-S Window	Passed (62% ΔT)	3 piece(s) 1 3/4" x 11 1/4" 2.0E Microllam® LVL	
Kitchen S Window	Passed (88% ΔT)	3 piece(s) 1 3/4" x 11 1/4" 2.0E Microllam® LVL	
Lease Lounge S. Window	Passed (29% M)	4 piece(s) 2 x 12 DF No.2	
Well Beats S. Window	Passed (51% M)	3 piece(s) 2 x 10 DF No.2	
Theater N. Window	Passed (98% ΔT)	3 piece(s) 1 3/4" x 11 1/4" 2.0E Microllam® LVL	
Low Entry Roof Canopy	Passed (82% M)	4 piece(s) 2 x 10 DF No.2	
Low Entry Roof Canopy ST FASIA	Passed (66% ΔT)	3 piece(s) 2 x 10 DF No.2	
Low Entry Roof Canopy Side ST FASIA	Passed (50% M)	3 piece(s) 2 x 10 DF No.2	
Lease Lounge - E/W Upset BM	Passed (52% ΔT)	3 piece(s) 1 3/4" x 14" 2.0E Microllam® LVL	

Level, Game Room-S Window
3 piece(s) 1 3/4" x 11 1/4" 2.0E Microllam® LVL



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4024 @ 1 1/2"	11419 (3.00")	Passed (35%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3068 @ 1' 2 1/4"	12905	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	9562 @ 5'	27837	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.082 @ 5'	0.195	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.150 @ 5'	0.244	Passed (L/780)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10'
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/600) and TL (L/480).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Trimmer - SPF	3.00"	3.00"	1.50"	1836	2188	2188	4024	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	1836	2188	2188	4024	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' o/c	
Bottom Edge (Lu)	10' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10'	N/A	17.2	--	--	
1 - Uniform (PSF)	0 to 10'	17' 6"	20.0	25.0	25.0	Default Load

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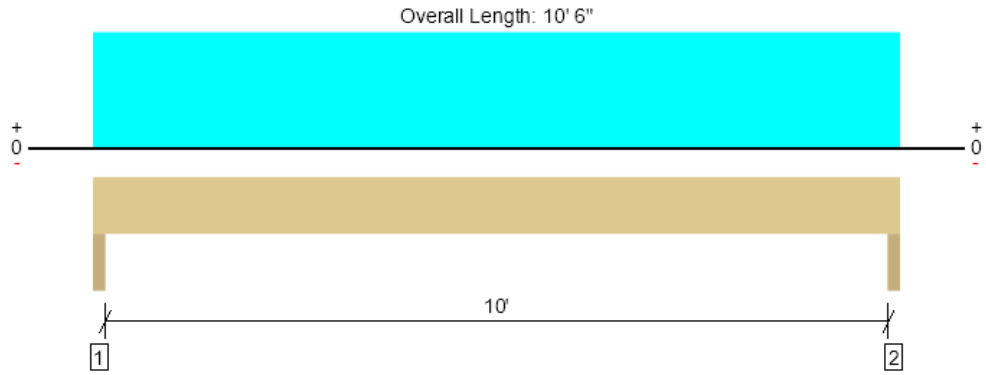
The product application, input design loads, dimensions and support information have been provided by Bob D Campbell

ForteWEB Software Operator	Job Notes
Chris Beverlin Bob D Campbell & Co (816) 531-4144 cbeverlin@bdc-engrs.com	

Weyerhaeuser

Level, Kitchen S Window
3 piece(s) 1 3/4" x 11 1/4" 2.0E Microllam® LVL



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5288 @ 1 1/2"	11419 (3.00")	Passed (46%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4092 @ 1' 2 1/4"	12905	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	13228 @ 5' 3"	27837	Passed (48%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.124 @ 5' 3"	0.205	Passed (L/994)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.227 @ 5' 3"	0.256	Passed (L/543)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10' 6"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/600) and TL (L/480).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Trimmer - SPF	3.00"	3.00"	1.50"	2400	2888	2888	5288	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	2400	2888	2888	5288	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 6" o/c	
Bottom Edge (Lu)	10' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 6"	N/A	17.2	--	--	
1 - Uniform (PSF)	0 to 10' 6"	22'	20.0	25.0	25.0	Default Load

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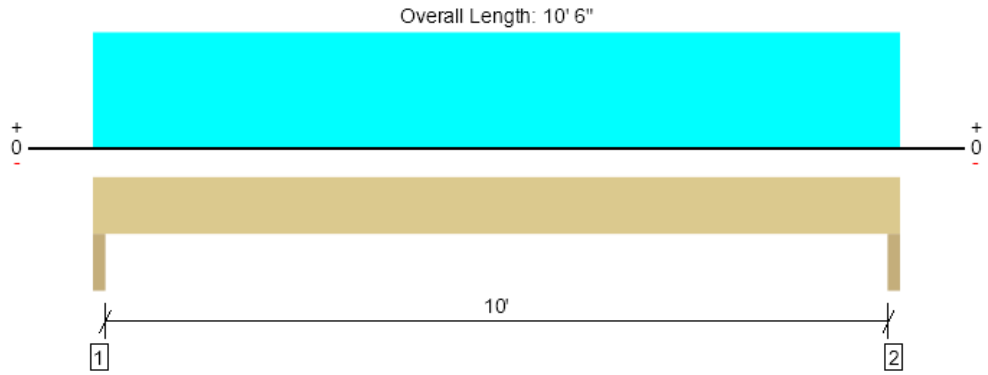
The product application, input design loads, dimensions and support information have been provided by Bob D Campbell

ForteWEB Software Operator	Job Notes
Chris Beverlin Bob D Campbell & Co (816) 531-4144 cbeverlin@bdc-engrs.com	

Weyerhaeuser

Level, Lease Lounge S. Window
4 piece(s) 2 x 12 DF No.2



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1271 @ 1 1/2"	11250 (3.00")	Passed (11%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	984 @ 1' 2 1/4"	9315	Passed (11%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3179 @ 5' 3"	10916	Passed (29%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.027 @ 5' 3"	0.205	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.053 @ 5' 3"	0.256	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10' 6"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/600) and TL (L/480).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Trimmer - SPF	3.00"	3.00"	1.50"	615	656	656	1271	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	615	656	656	1271	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 6" o/c	
Bottom Edge (Lu)	10' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 6"	N/A	17.1	--	--	
1 - Uniform (PSF)	0 to 10' 6"	5'	20.0	25.0	25.0	Default Load

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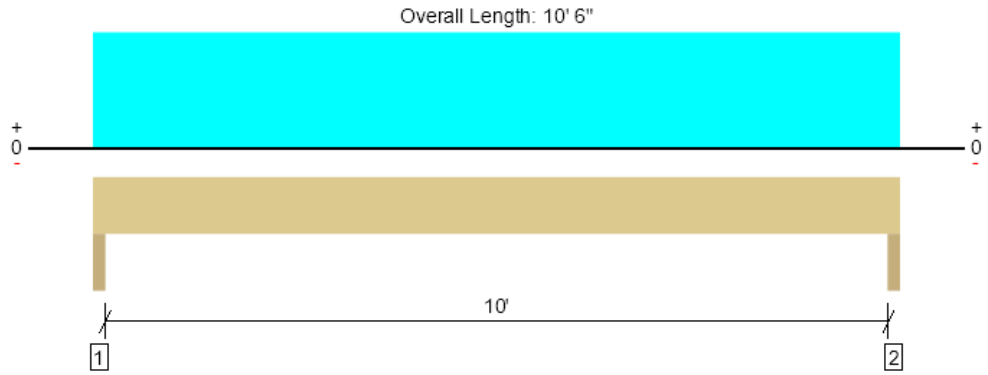
The product application, input design loads, dimensions and support information have been provided by Bob D Campbell

Level, Well Beats S. Window
3 piece(s) 2 x 10 DF No.2



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1237 @ 1 1/2"	8438 (3.00")	Passed (15%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	996 @ 1' 1/4"	5744	Passed (17%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3093 @ 5' 3"	6088	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.065 @ 5' 3"	0.205	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.123 @ 5' 3"	0.256	Passed (L/998)	--	1.0 D + 1.0 S (All Spans)

Member Length : 10' 6"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/600) and TL (L/480).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Trimmer - SPF	3.00"	3.00"	1.50"	580	656	656	1237	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	580	656	656	1237	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	10' 6" o/c	
Bottom Edge (Lu)	10' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 10' 6"	N/A	10.6	--	--	
1 - Uniform (PSF)	0 to 10' 6"	5'	20.0	25.0	25.0	Default Load

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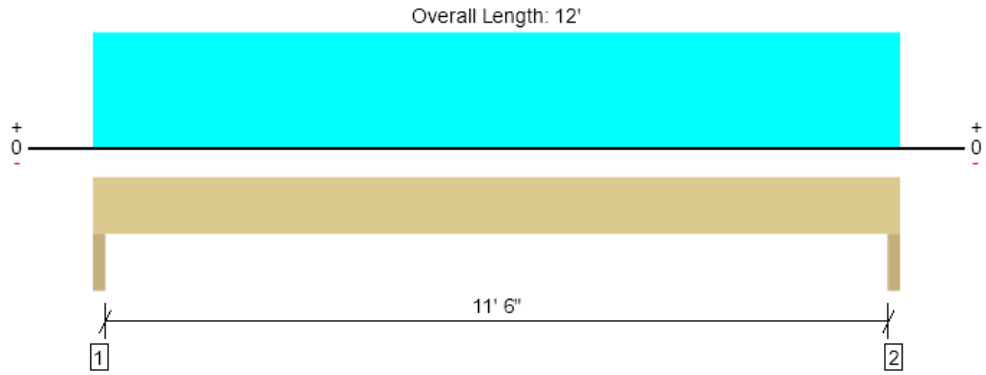
The product application, input design loads, dimensions and support information have been provided by Bob D Campbell

Level, Theater N. Window
3 piece(s) 1 3/4" x 11 1/4" 2.0E Microllam® LVL



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5233 @ 1 1/2"	11419 (3.00")	Passed (46%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4198 @ 1' 2 1/4"	12905	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	15053 @ 6'	27837	Passed (54%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.180 @ 6'	0.235	Passed (L/785)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.330 @ 6'	0.336	Passed (L/428)	--	1.0 D + 1.0 S (All Spans)

Member Length : 12'
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/600) and TL (L/420).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Trimmer - SPF	3.00"	3.00"	1.50"	2383	2850	2850	5233	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	2383	2850	2850	5233	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' o/c	
Bottom Edge (Lu)	12' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 12'	N/A	17.2	--	--	
1 - Uniform (PSF)	0 to 12'	19'	20.0	25.0	25.0	Default Load

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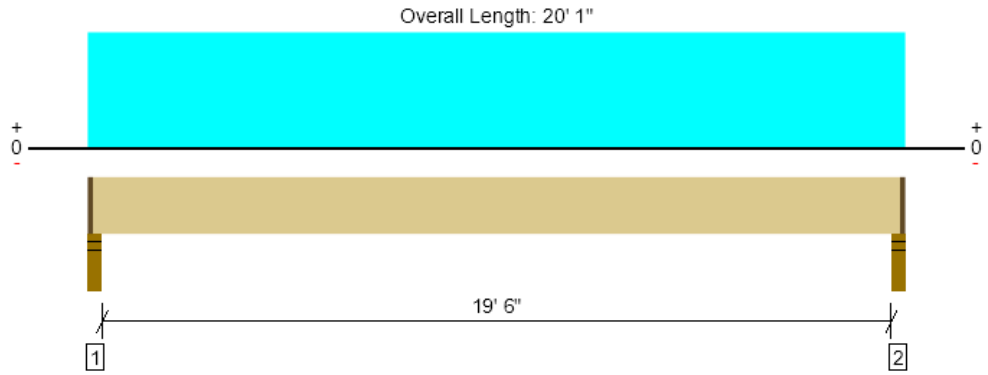
The product application, input design loads, dimensions and support information have been provided by Bob D Campbell

ForteWEB Software Operator	Job Notes
Chris Beverlin Bob D Campbell & Co (816) 531-4144 cbeverlin@bdc-engrs.com	

Level, Low Entry Roof Canopy
4 piece(s) 2 x 10 DF No.2



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1481 @ 2"	5738 (2.25")	Passed (26%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	1338 @ 1' 3/4"	8325	Passed (16%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	7268 @ 10' 1/2"	8824	Passed (82%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.406 @ 10' 1/2"	0.494	Passed (L/584)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.806 @ 10' 1/2"	0.988	Passed (L/294)	--	1.0 D + 1.0 Lr (All Spans)

Member Length : 19' 10 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Factored	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	742	753	1495	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.50"	742	753	1495	1 1/4" Rim Board

• Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	15' 4" o/c	
Bottom Edge (Lu)	19' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	1 1/4" to 19' 11 3/4"	N/A	14.1	--	
1 - Uniform (PSF)	0 to 20' 1" (Front)	3'	20.0	25.0	Default Load

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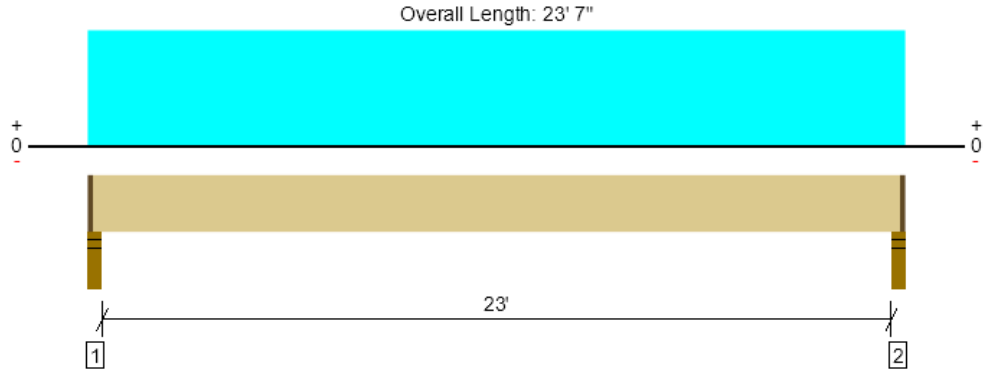
Level, Low Entry Roof Canopy ST FASIA
3 piece(s) 2 x 10 DF No.2



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	649 @ 2"	4303 (2.25")	Passed (15%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	596 @ 1' 3/4"	6244	Passed (10%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	3753 @ 11' 9 1/2"	6618	Passed (57%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.346 @ 11' 9 1/2"	0.581	Passed (L/806)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.769 @ 11' 9 1/2"	1.163	Passed (L/363)	--	1.0 D + 1.0 Lr (All Spans)

Member Length : 23' 4 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Factored	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	359	295	654	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.50"	359	295	654	1 1/4" Rim Board

• Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	21' 4" o/c	
Bottom Edge (Lu)	23' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	1 1/4" to 23' 5 3/4"	N/A	10.6	--	
1 - Uniform (PSF)	0 to 23' 7" (Front)	1'	20.0	25.0	Default Load

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The product application, input design loads, dimensions and support information have been provided by Bob D Campbell

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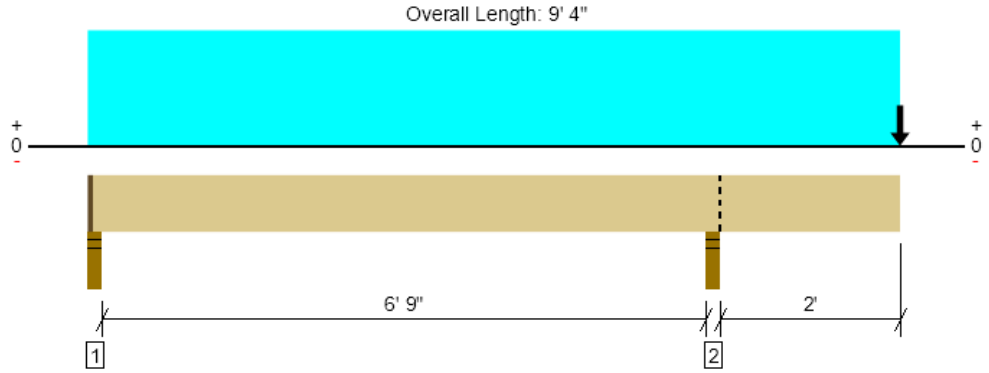
Weyerhaeuser

Level, Low Entry Roof Canopy Side ST FASIA
3 piece(s) 2 x 10 DF No.2



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2284 @ 7' 2 1/4"	6694 (3.50")	Passed (34%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	1563 @ 8' 1 1/4"	6244	Passed (25%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	-3336 @ 7' 2 1/4"	6618	Passed (50%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.038 @ 9' 4"	0.200	Passed (2L/999+)	--	1.0 D + 1.0 Lr (Alt Spans)
Total Load Defl. (in)	0.075 @ 9' 4"	0.215	Passed (2L/690)	--	1.0 D + 1.0 Lr (Alt Spans)

Member Length : 9' 2 3/4"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (0.2") and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -317 lbs uplift at support located at 2". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Factored	
1 - Stud wall - SPF	3.50"	2.25"	1.50"	-126	-191	-317	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	3.50"	1.50"	1152	1133	2284	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 3" o/c	
Bottom Edge (Lu)	9' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (1.25)	Comments
0 - Self Weight (PLF)	1 1/4" to 9' 4"	N/A	10.6	--	
1 - Uniform (PSF)	0 to 9' 4" (Front)	1'	20.0	25.0	Default Load
2 - Point (lb)	9' 4" (Front)	N/A	742	753	Linked from: Low Entry Roof Canopy, Support 1

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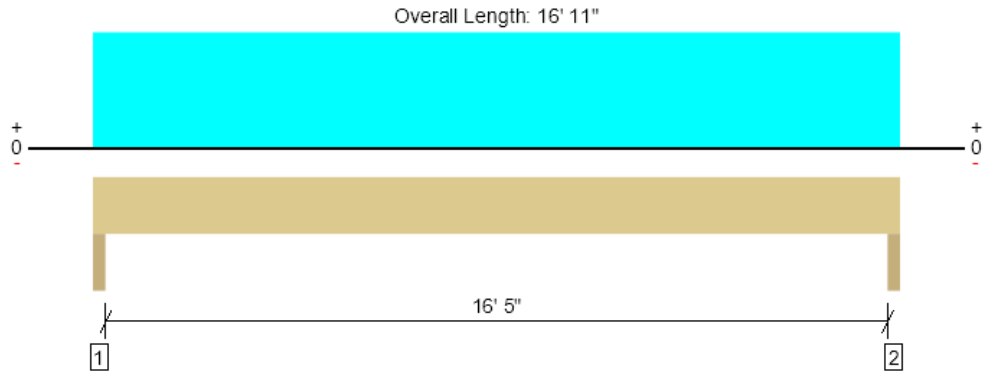
Weyerhaeuser

Level, Lease Lounge - E/W Upset BM

3 piece(s) 1 3/4" x 14" 2.0E Microllam® LVL



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4749 @ 1 1/2"	11419 (3.00")	Passed (42%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3953 @ 1' 5"	16060	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	19494 @ 8' 5 1/2"	41846	Passed (47%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.233 @ 8' 5 1/2"	0.556	Passed (L/857)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.437 @ 8' 5 1/2"	0.833	Passed (L/458)	--	1.0 D + 1.0 S (All Spans)

Member Length : 16' 11"
System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Trimmer - SPF	3.00"	3.00"	1.50"	2211	2538	2538	4749	None
2 - Trimmer - SPF	3.00"	3.00"	1.50"	2211	2538	2538	4749	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	16' 11" o/c	
Bottom Edge (Lu)	16' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 16' 11"	N/A	21.5	--	--	
1 - Uniform (PSF)	0 to 16' 11"	12'	20.0	25.0	25.0	Default Load

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