TYLin | Silman Structural Solutions

GOGA Stinson Beach

Structural Calculation Package

September 5, 2025

PREPARED FOR:
Golden Gate National Recreation Area

Stinson Beach

PREPARED BY:
Silman
707 Wilshire Blvd, Suite 4900
Los Angeles, CA 90017

Silman Project # W3947

SEISMIC BASIS OF DESIGN

Design Parameters

Soil Site Class	D
Short Period Mapped Spectral Accel. *(USGS)*	S_s = 2.341 g
One Second Period Mapped Spectral Accel. *(USGS)*	S_1 = 0.979 g
Short Period Design Spectral Acceleration	S_{DS} = 1.56 g
One Second Period Design Spectral Acceleration	S_{D1} = 1.11g
Seismic Design Category (ASCE 7-16, §11.6)	E
Seismic Importance Factor (ASCE 7-16, Table 1.5-2)	I_e = 1.0
Response Modification Coeff. (ASCE 7-16, Table 12.2-1)	R = 6.5
Overstrength Factor (ASCE 7-16, Table 12.2-1)	Ω_O = 2.5
Deflection Amplification Factor (ASCE 7-16, Table 12.2-1)	C_d = 4

Geometry

Levels	*Story Height*	*Cumulative Height*	*Mass*
Penthouse/Observation Canopy	9	29.5	10 kip
3rd Floor/Observation Deck	9.5	20.5	15 kip
2nd Floor/Low Roof	11	11	50.4
Grade	0	0	*
Total			*75. kip*

LFRS Basis of Design

Penthouse

The percentage of mass of the Penthouse/Observation Canopy is 10/75.4 = 13.3% of the total structural mass. This qualifies for analysis as a nonstructural component per ASCE 7-16 Chp. 13. Will be treated as an additional seismic mass on the 3rd floor observation deck.

Building

The main building is predominantly single story with a small two-story portion. The LFRS will be plywood shearwalls for the structure.

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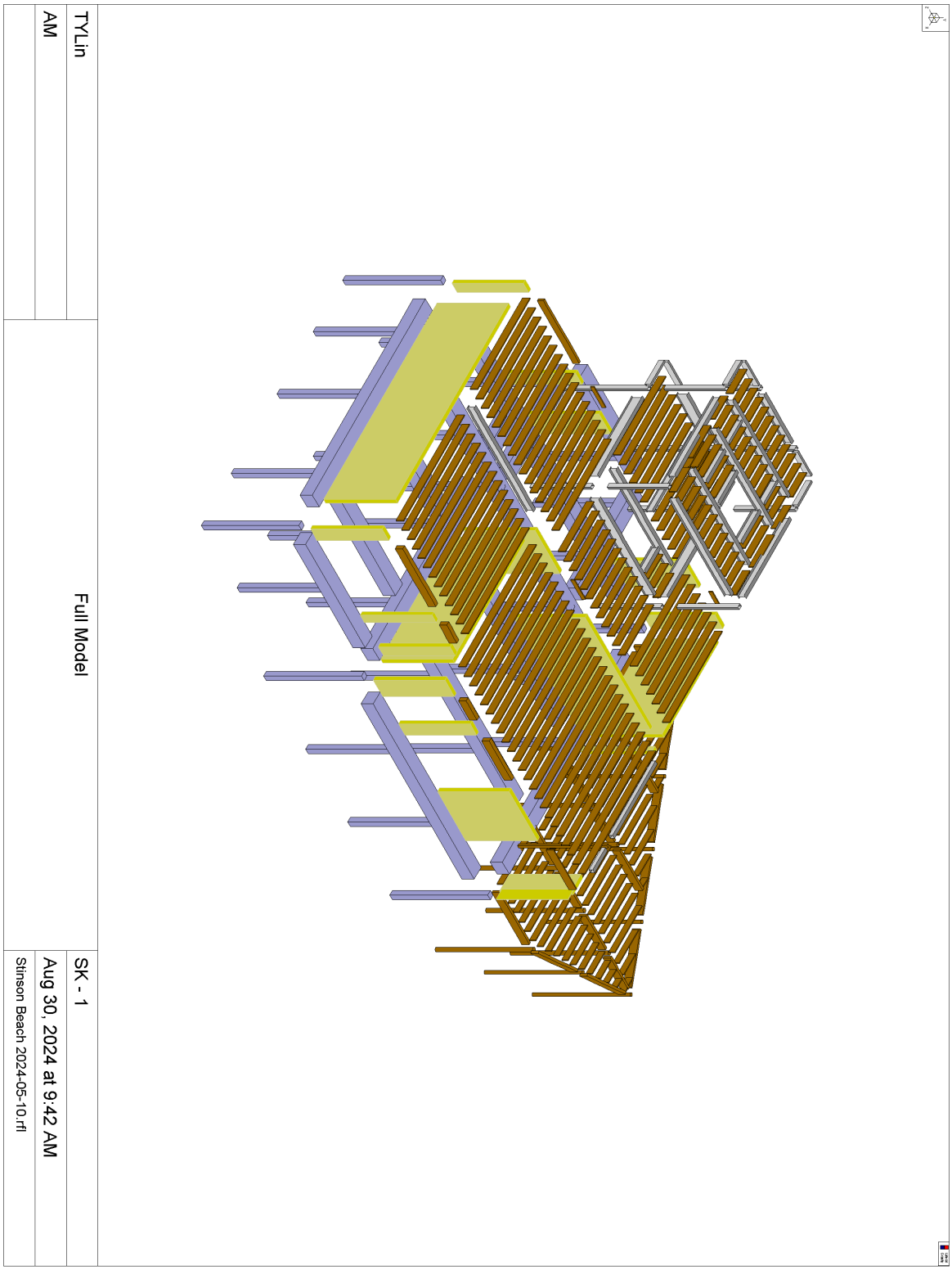

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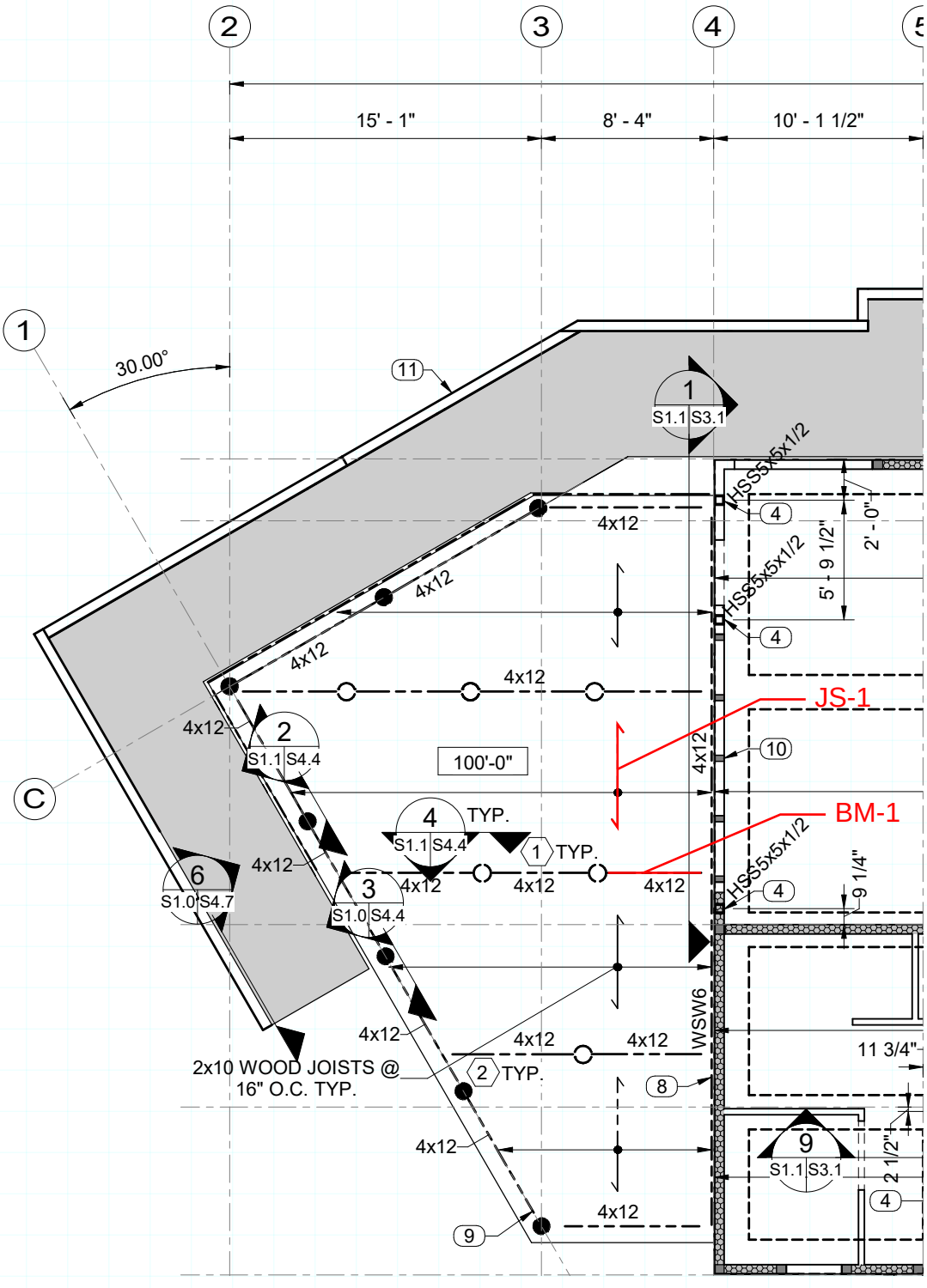

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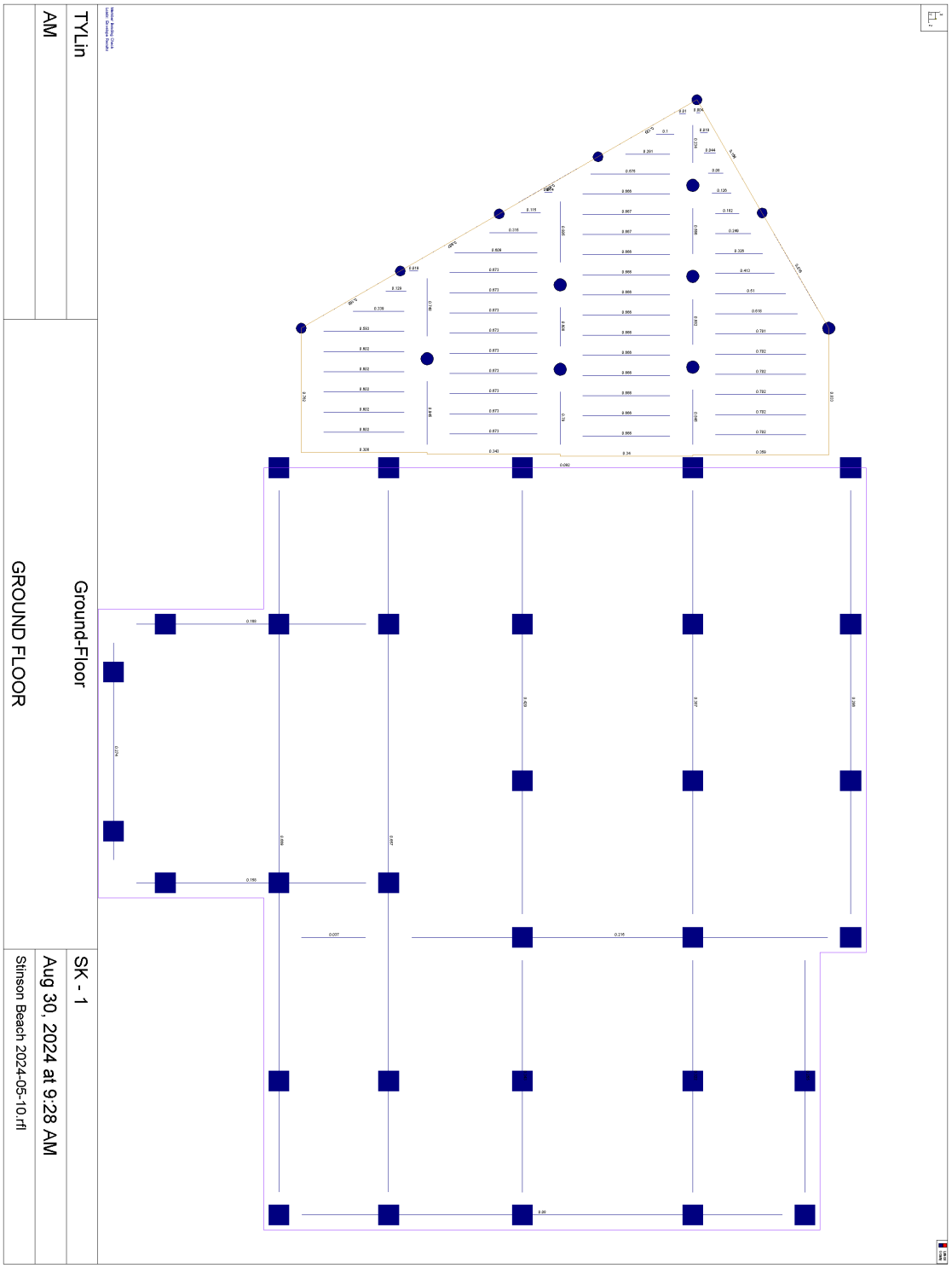

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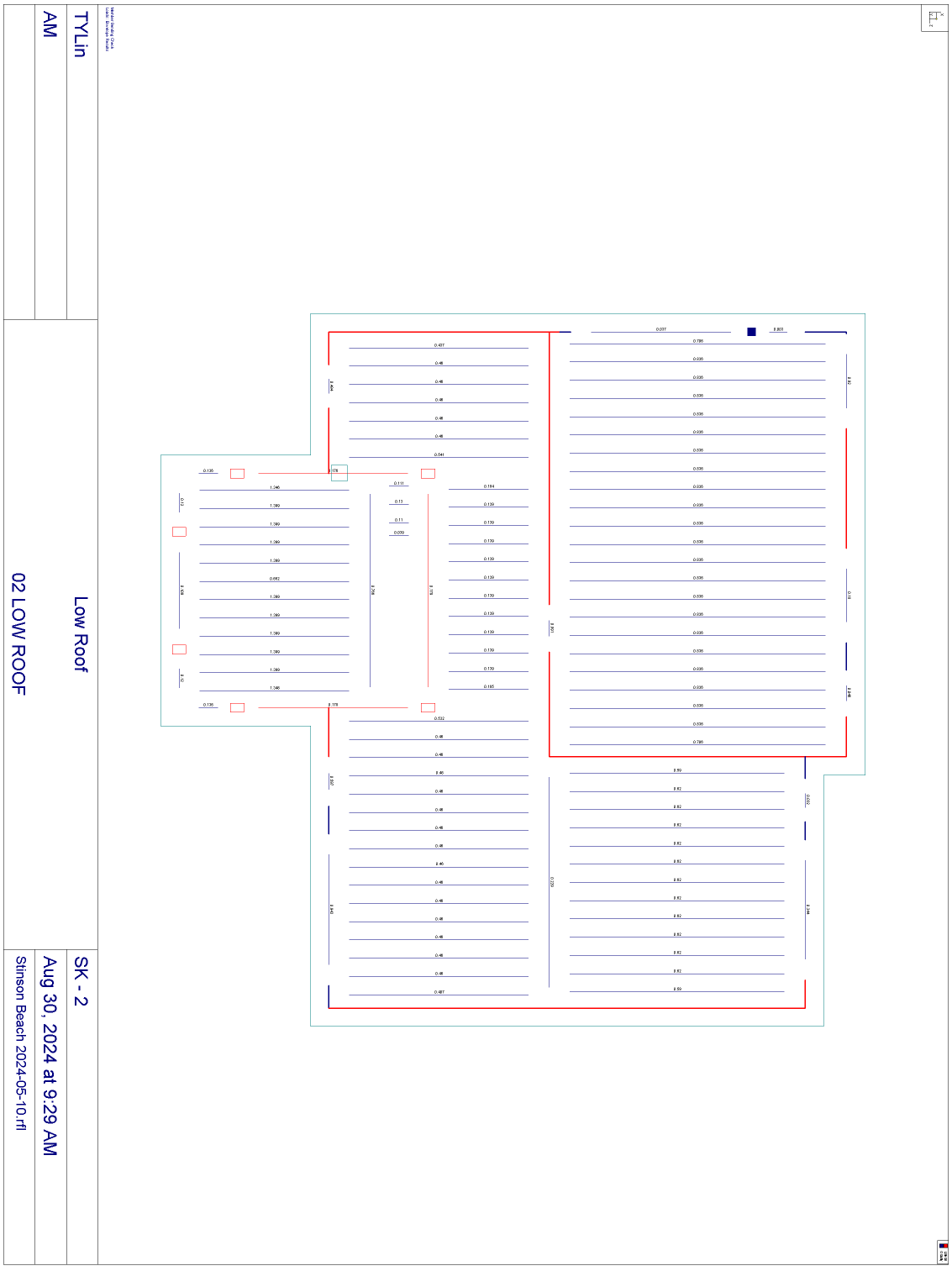

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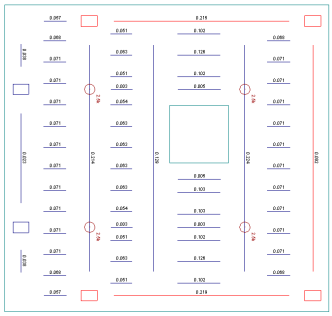
03 THIRD FLOOR

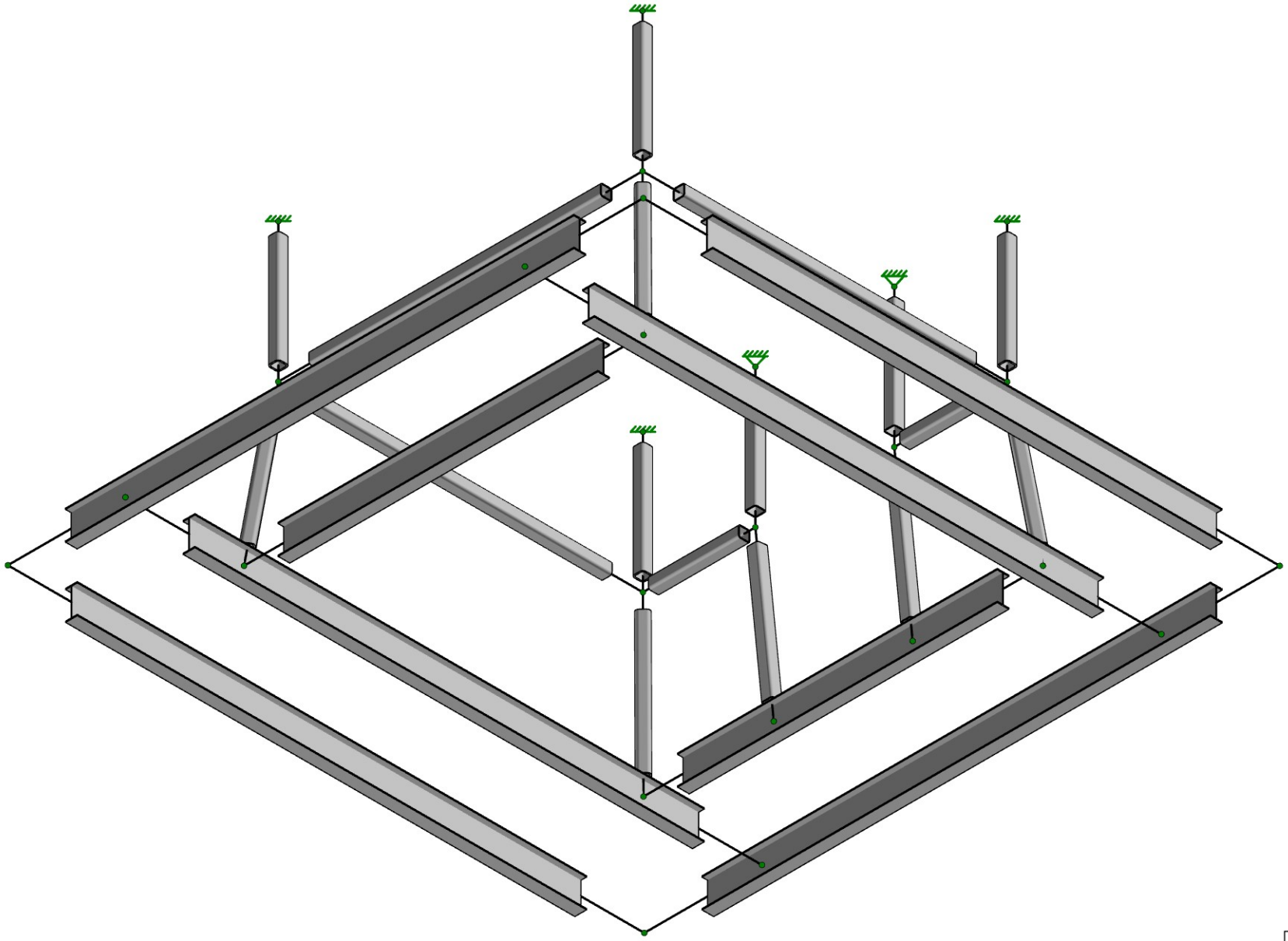
3rd Floor

SK - 3

Aug 30, 2024 at 9:34 AM

Stinson Beach 2024-05-10.rfl

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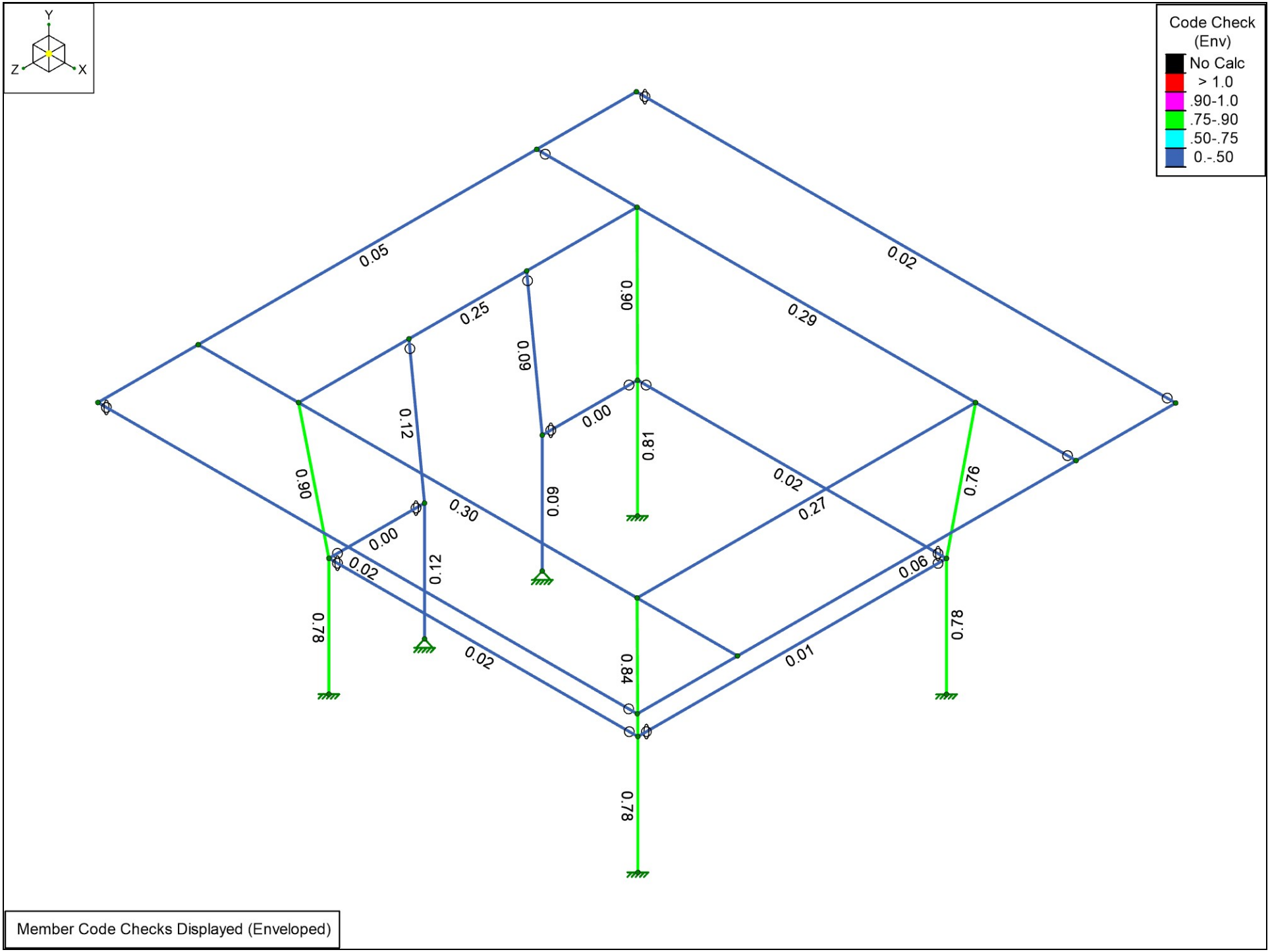
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Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.07.08 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

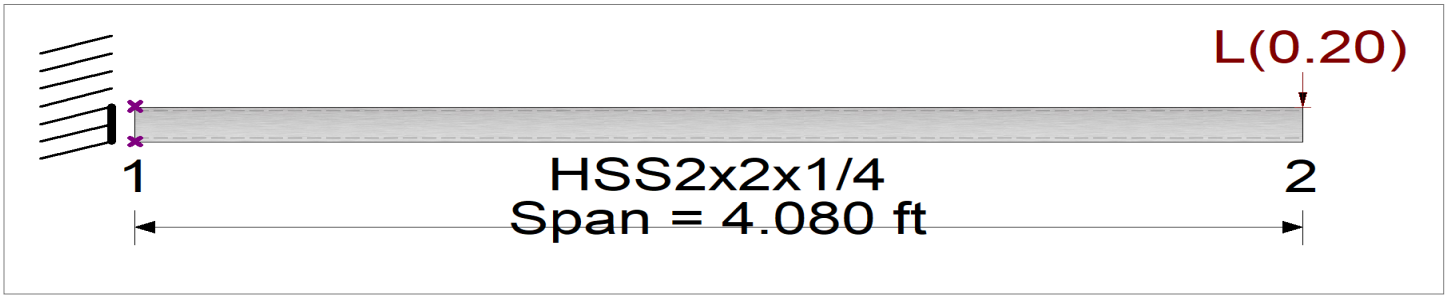
DESCRIPTION: Rectangular Guardrail at Observation Deck

CODE REFERENCES

Calculations per AISC 360-16, IBC 2021, ASCE 7-16
Load Combination Set : ASCE 7-22 / IBC 2024 (L<=100psf)

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Completely Unbraced	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

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

Beam self weight NOT internally calculated and added
Load(s) for Span Number 1
Point Load : L = 0.20 k @ 4.080 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.339 : 1	Maximum Shear Stress Ratio =	0.018 : 1
Section used for this span	HSS2x2x1/4	Section used for this span	HSS2x2x1/4
Ma : Applied	0.816 k-ft	Va : Applied	0.20 k
Mn / Omega : Allowable	2.405 k-ft	Vn/Omega : Allowable	10.891 k
Load Combination	L Only	Load Combination	L Only
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.360 in	Ratio =	272	>=180	Span: 1 : L Only
Max Upward Total Deflection	0 in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
Dsgn. L = 4.08 ft	1		0.000				4.02	2.41	1.00	1.00	-0.00	18.19 10.89
L Only												
Dsgn. L = 4.08 ft	1	0.339	0.018		-0.82	0.82	4.02	2.41	1.00	1.00	0.20	18.19 10.89
+0.750L												
Dsgn. L = 4.08 ft	1	0.254	0.014		-0.61	0.61	4.02	2.41	1.00	1.00	0.15	18.19 10.89

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
L Only	1	0.3604	4.080		0.0000	0.000

Vertical Reactions

Support notation : Far left is #: Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.200	
Max Upward from Load Combinations	0.150	
Max Upward from Load Cases	0.200	
L Only	0.200	
+0.750L	0.150	

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.07.08 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: Angle Guardrail at Observation Deck

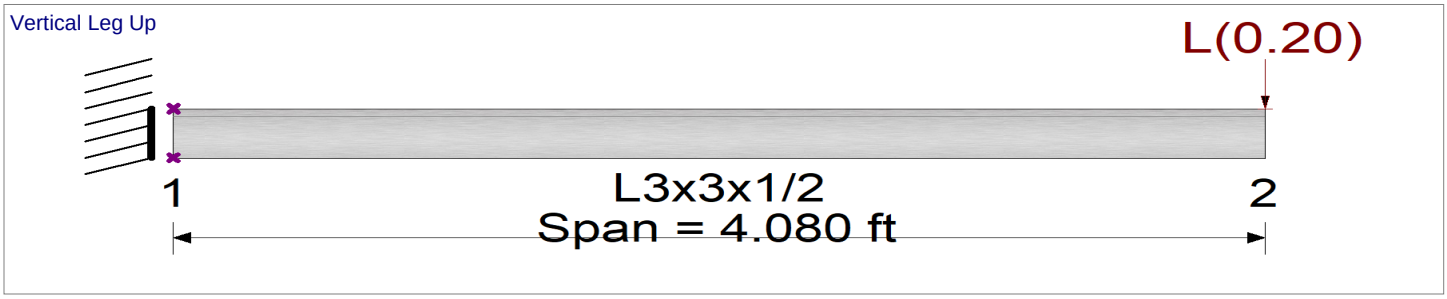
CODE REFERENCES

Calculations per AISC 360-16, IBC 2021, ASCE 7-16
Load Combination Set : ASCE 7-22 / IBC 2024 (L<=100psf)

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	36.0 ksi
Beam Bracing :	Completely Unbraced	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		

Vertical Leg Up



Applied Loads

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

Beam self weight NOT internally calculated and added
Load(s) for Span Number 1
Point Load : L = 0.20 k @ 4.080 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.357 : 1	Maximum Shear Stress Ratio =	0.010 : 1
Section used for this span	L3x3x1/2	Section used for this span	L3x3x1/2
Ma : Applied	0.816 k-ft	Va : Applied	0.20 k
Mn / Omega : Allowable	2.285 k-ft	Vn/Omega : Allowable	19.401 k
Load Combination	L Only	Load Combination	L Only
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.122 in	Ratio =	800	>=180	Span: 1 : L Only
Max Upward Total Deflection	0 in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
Dsgn. L = 4.08 ft	1		0.000				3.82	2.29	1.00	1.00	-0.00	32.40 19.40
L Only												
Dsgn. L = 4.08 ft	1	0.357	0.010		-0.82	0.82	3.82	2.29	1.00	1.00	0.20	32.40 19.40
+0.750L												
Dsgn. L = 4.08 ft	1	0.268	0.008		-0.61	0.61	3.82	2.29	1.00	1.00	0.15	32.40 19.40

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
L Only	1	0.1224	4.080		0.0000	0.000

Vertical Reactions

Support notation : Far left is #: Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.200	
Max Upward from Load Combinations	0.150	
Max Upward from Load Cases	0.200	
L Only	0.200	
+0.750L	0.150	

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Concrete Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.23.04.05 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

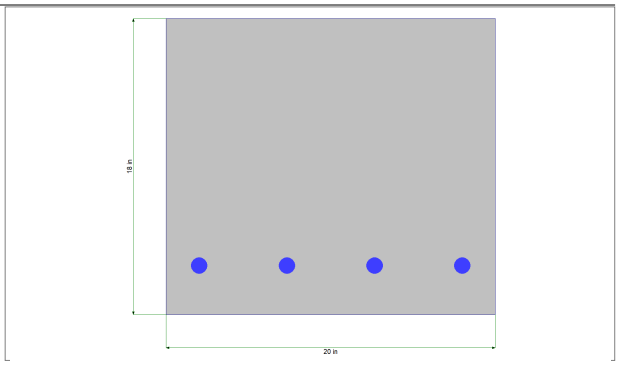
DESCRIPTION: GRADE BEAM

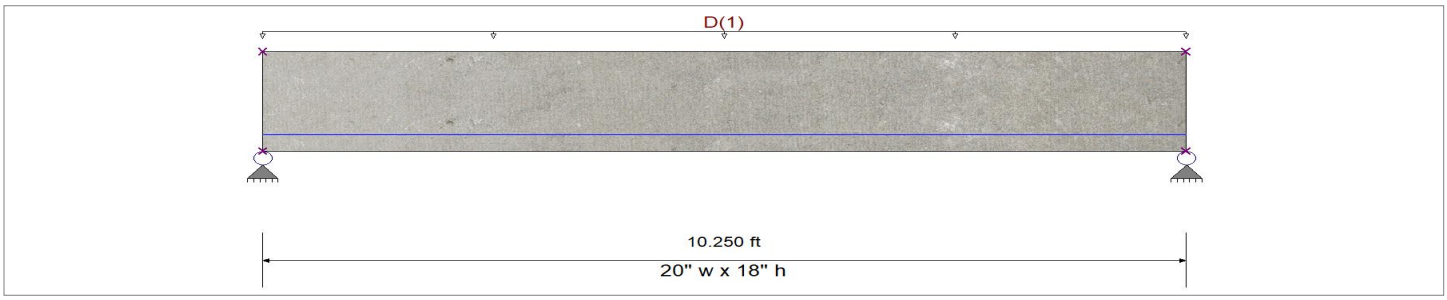
CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

General Information

f'c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
fr = f'c$^{1/2}$ * 7.50	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups		40.0 ksi
fy - Main Rebar	=	60.0 ksi	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #		3
			Number of Resisting Legs Per Stirrup	=	2





Cross Section & Reinforcing Details

Rectangular Section, Width = 20.0 in, Height = 18.0 in
Span #1 Reinforcing....
4-#8 at 3.0 in from Bottom, from 0.0 to 10.250 ft in this span

Beam self weight calculated and added to loads
Load for Span Number 1
Uniform Load : D = 1.0 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	**0.134** : 1	
Section used for this span	**Typical Section**	
Mu : Applied	25.051	k-ft
Mn * Phi : Allowable	186.868	k-ft
Location of maximum on span	5.134	ft
Span # where maximum occurs	Span # 1	

Maximum Deflection

Max Downward Transient Deflection	0.000 in	Ratio =	0	<360.0	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	
Max Downward Total Deflection	0.011 in	Ratio =	11033	>=180.0	Span: 1 : D Only
Max Upward Total Deflection	0.000 in	Ratio =	0	<180.0	Span: 1 : D Only

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	6.983	6.983
Max Upward from Load Combinations	4.190	4.190
Max Upward from Load Cases	6.983	6.983
D Only	6.983	6.983
+0.60D	4.190	4.190

Shear Stirrup Requirements

Entire Beam Span Length : Vu < Phi*Vc / 2, Req'd Vs = Not Reqd per 9.6.3.1, Stirrups are not required.

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Concrete Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.23.04.05 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

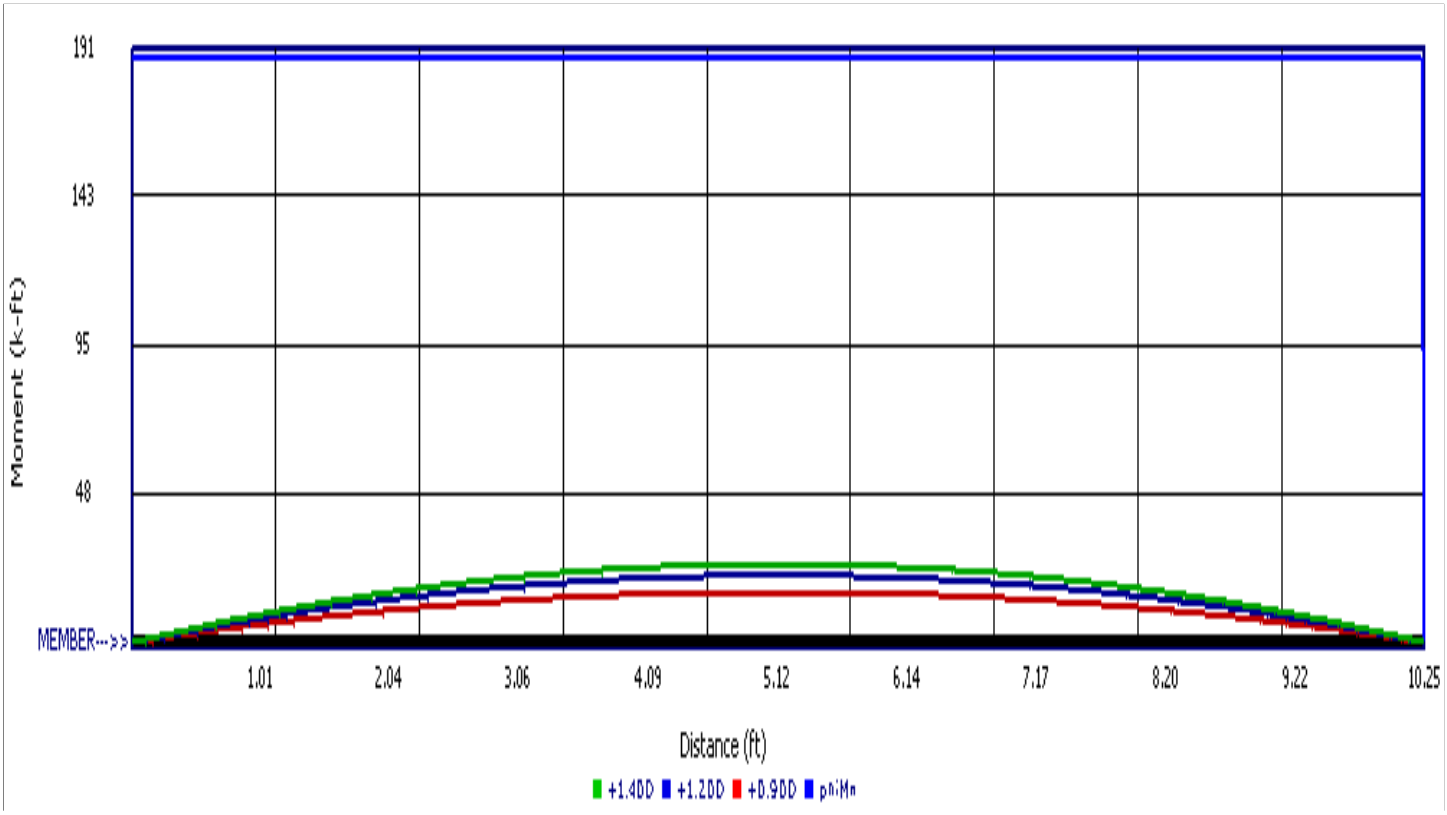
DESCRIPTION: GRADE BEAM

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl (in)	Location in Span (ft	Load Combination	Max. "+" Defl (in)	Location in Span (ft
D Only	1	0.0111	5.125		0.0000	0.000

Maximum Deflections for Load Combinations

Load Combination	Span	Max. Downward Defl	Location in Span	Max. Upward Defl	Location in Span
D Only	1	0.0111	5.125	0.0000	0.000
+0.60D	1	0.0067	5.125	0.0000	0.000



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Suite 4900
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Concrete Beam

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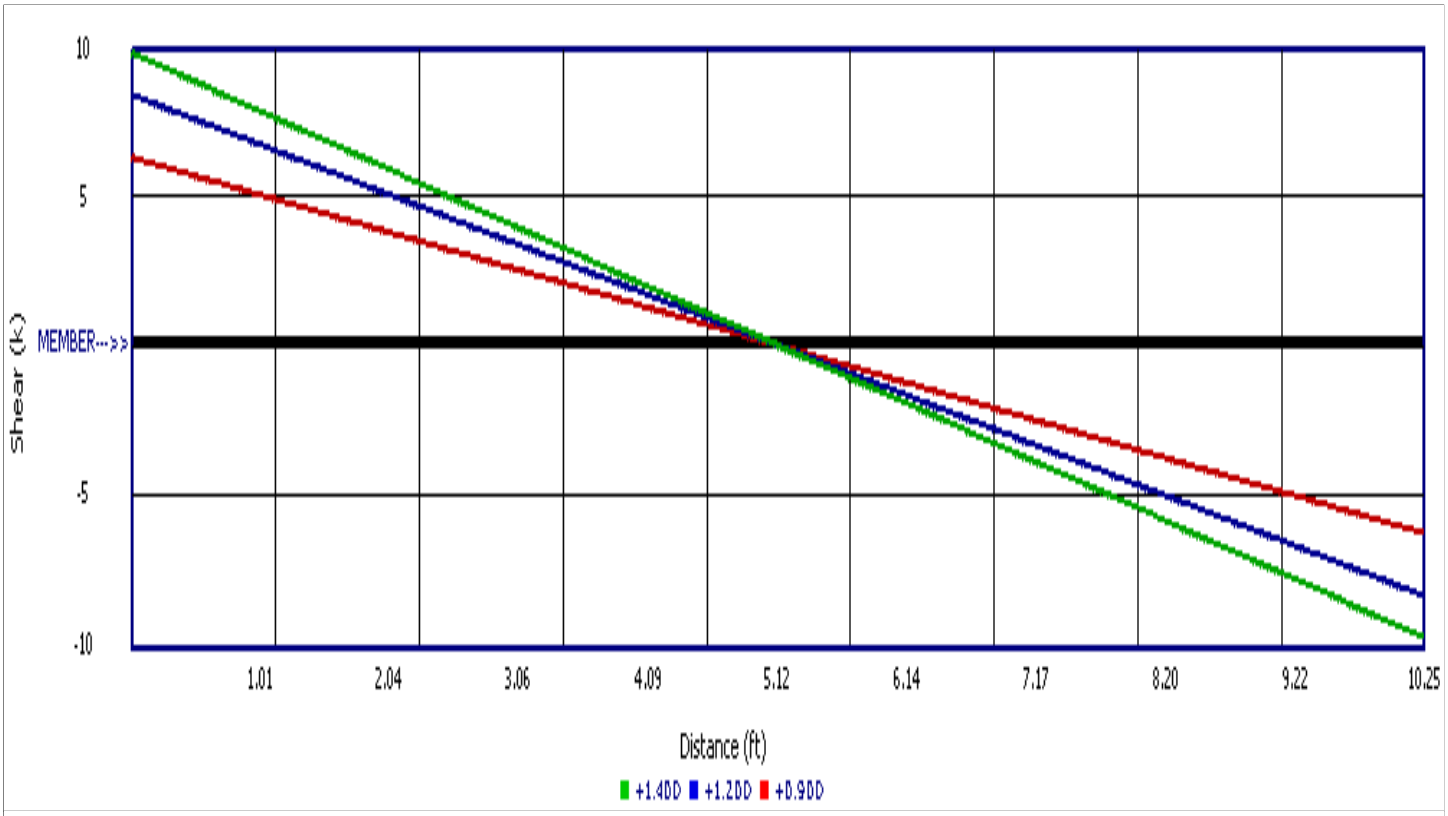
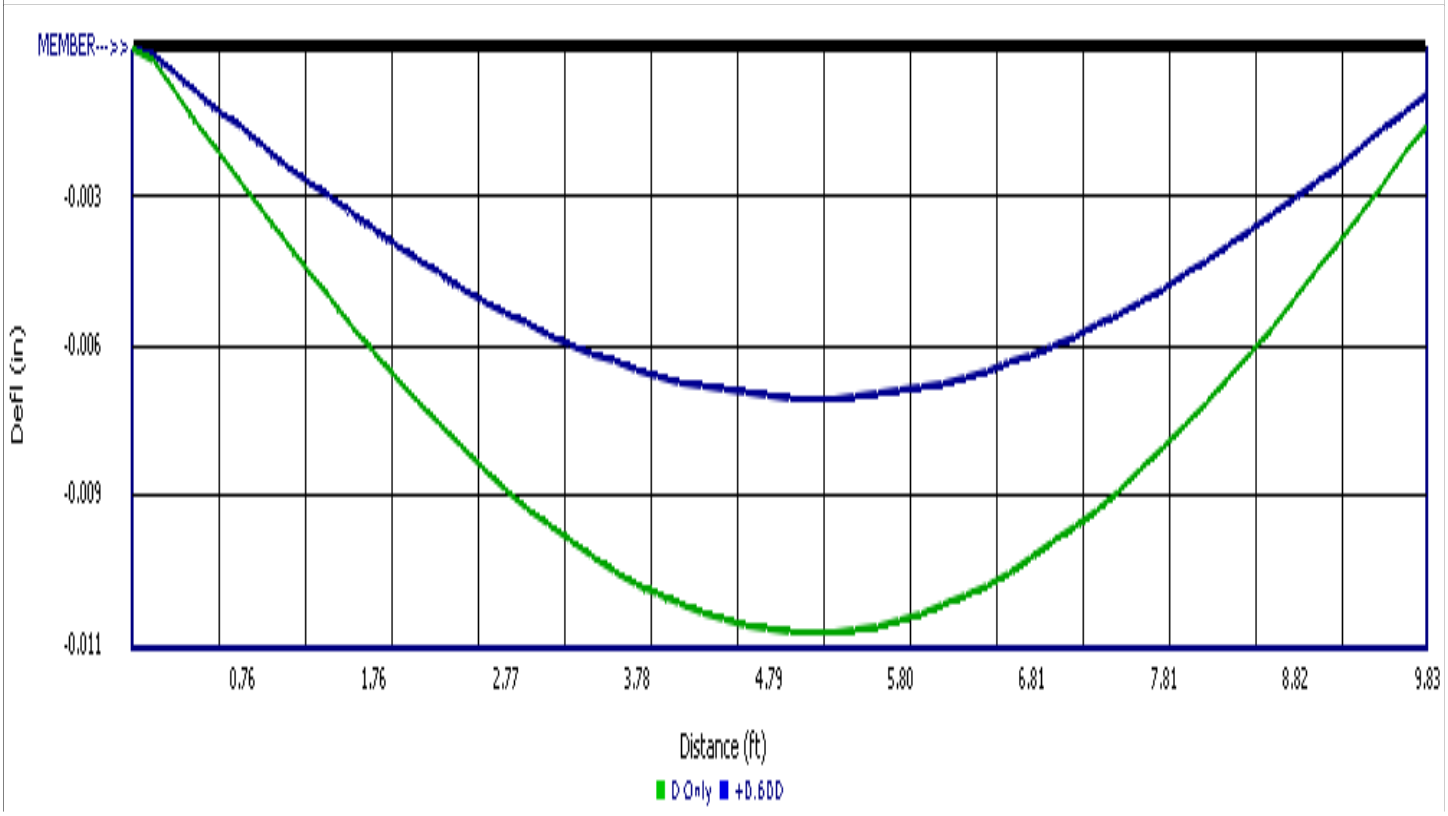
DESCRIPTION: GRADE BEAM





Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: STINSON.ec6

DESCRIPTION: Cantilevered Column

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design		
End Fixities	Top Free, Bottom Fixed		
Overall Column Height	10 ft		
(Used for non-slender calculations)			
Wood Species	Douglas Fir-Larch		
Wood Grade	No.1		
Fb +	1200 psi	Fv	170 psi
Fb -	1200 psi	Ft	825 psi
Fc - Prll	1000 psi	Density	31.21 pcf
Fc - Perp	625 psi		

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1600	1600	1600 ksi
Minimum	580	580	

Wood Section Name	**10x10**		
Wood Grading/Manuf.	Southern Pine		
Wood Member Type	Sawn		
Exact Width	**9.50** in	Allow Stress Modification Factors	
Exact Depth	**9.50** in	Cf or Cv for Bending	1.0
Area	90.250 in^2	Cf or Cv for Compressio	1.0
Ix	678.76 in^4	Cf or Cv for Tension	1.0
Iy	678.76 in^4	Cm : Wet Use Factor	0.85
Incising Factors :		Ct : Temperature Fact	1.0
for Bending	0.80	Cfu : Flat Use Factor	1.0
for Elastic Modulus	0.95	Kf : Built-up columns	1.0 *NDS 15.3.2*
		Use Cr : Repetitive ?	No

Brace condition for deflection (buckling) along columns :
X-X (width) axis : Unbraced Length for buckling ABOUT Y-Y Axis = 10 ft, k
Y-Y (depth) axis : Unbraced Length for buckling ABOUT X-X Axis = 10 ft, k

Applied Loads

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

Column self weight included : 195.604 lbs * Dead Load Factor
BENDING LOADS . . .
Wind: Lat. Point Load at 10.0 ft creating Mx-x, W = 2.50 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9679 : 1**

Load Combination	+D+0.60W
Governing NDS Forumla	Comp + Mxx, NDS Eq. 3.9-3
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	0.1956 k
Applied Mx	-15.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	580.98 psi

PASS Maximum Shear Stress Ratio = **0.1146 : 1**

Load Combination	+D+0.60W
Location of max.above base	9.933 ft
Applied Design Shear	24.931 psi
Allowable Shear	217.60 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.0 k	Bottom along Y-Y	2.50 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 1.389 in at 10.0 ft above base
for load combination : W Only

Along X-X 0.0 in at 0.0 ft above base
for load combination : n/a

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.670	0.004495	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.60W	1.600	0.454	0.9679	PASS	0.0 ft	0.1146	PASS	9.933 ft
+D+0.450W	1.600	0.454	0.7259	PASS	0.0 ft	0.08593	PASS	9.933 ft
+0.60D+0.60W	1.600	0.454	0.9667	PASS	0.0 ft	0.1146	PASS	9.933 ft
+0.60D	1.600	0.454	0.002238	PASS	0.0 ft	0.0	PASS	10.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction k @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments k-ft @ Base	@ Top	Mx - End Moments @ Base	@ Top
D Only					0.196				
+D+0.60W			1.500		0.196			15.000	

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: STINSON.ec6

DESCRIPTION: Cantilevered Column

Maximum Reactions

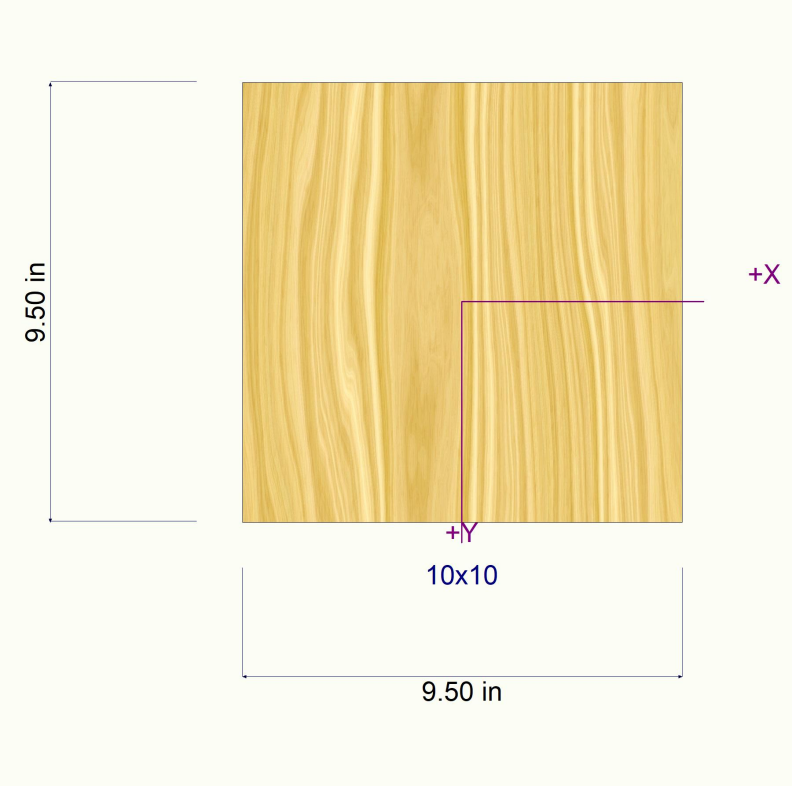
Note: Only non-zero reactions are listed.

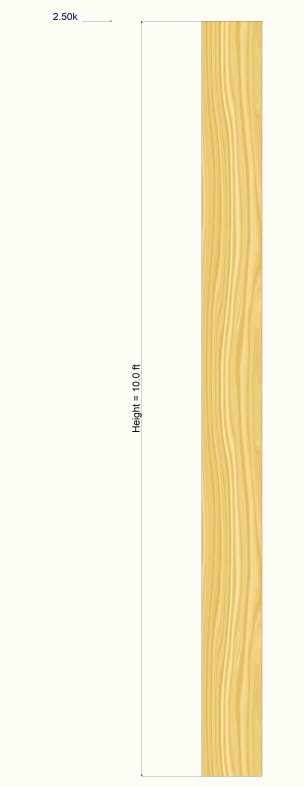
Load Combination	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments @ Base	@ Top	k-ft	Mx - End Moments @ Base	@ Top
+D+0.450W				1.125		0.196				11.250	
+0.60D+0.60W				1.500		0.117				15.000	
+0.60D						0.117					
W Only				2.500						25.000	

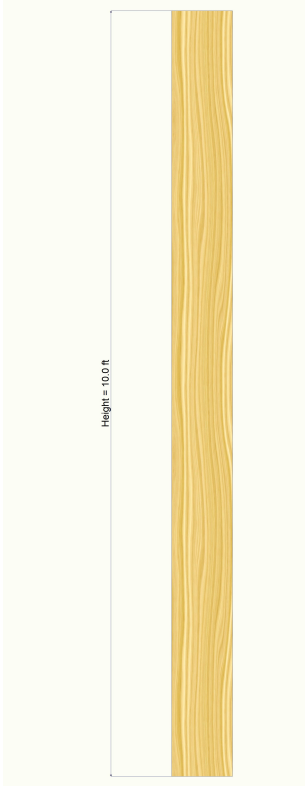
Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.60W	0.0000 in	0.000ft	0.833 in	10.000 ft
+D+0.450W	0.0000 in	0.000ft	0.625 in	10.000 ft
+0.60D+0.60W	0.0000 in	0.000ft	0.833 in	10.000 ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000ft	1.375 in	9.933 ft

Sketches







Silman (a TY Lin Company)
707 Wilshire Boulevard
Suite 4900
Los Angeles, CA 90017

Steel Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.23.04.05 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

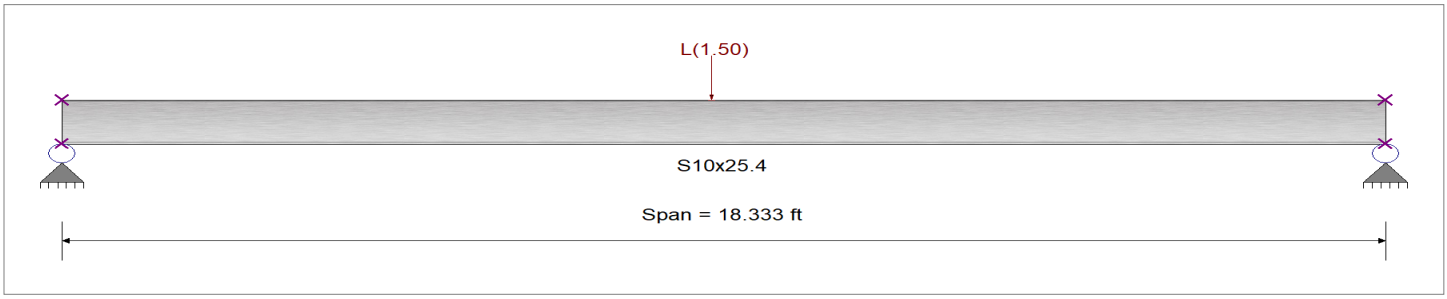
DESCRIPTION: Trolley Hoist Beam

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	36.0 ksi
Beam Bracing :	Completely Unbraced	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

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

Beam self weight calculated and added to loading
Load(s) for Span Number 1
Point Load : L = 1.50 k @ 9.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.223 : 1	Maximum Shear Stress Ratio =	0.022 : 1
Section used for this span	S10x25.4	Section used for this span	S10x25.4
Ma : Applied	7.933 k-ft	Va : Applied	0.9965 k
Mn / Omega : Allowable	35.631 k-ft	Vn/Omega : Allowable	44.784 k
Load Combination	+D+L	Load Combination	+D+L
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.094 in	Ratio =	2,349	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 1 : L Only
Max Downward Total Deflection	0.112 in	Ratio =	1967	>=180	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0	<180	

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.1118	9.167		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.996	0.969
Max Upward from Load Combinations	0.996	0.969
Max Upward from Load Cases	0.764	0.736
D Only	0.233	0.233
+D+L	0.996	0.969
+D+0.750L	0.806	0.785
+0.60D	0.140	0.140
L Only	0.764	0.736

Silman (a TY Lin Company)
707 Wilshire Boulevard
Suite 4900
Los Angeles, CA 90017

Steel Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.23.04.05 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: Trolley Hoist Beam

Steel Section Properties : S10x25.4

Depth	=	10.000 in	I xx	=	123.00 in^4	J	=	0.603 in^4
Web Thick	=	0.311 in	S xx		24.60 in^3	Cw	=	152.00 in^6
Flange Width	=	4.660 in	R xx	=	4.070 in			
Flange Thick	=	0.491 in	Zx	=	28.300 in^3			
Area	=	7.450 in^2	I yy	=	6.730 in^4			
Weight	=	25.400 plf	S yy	=	2.890 in^3	Wno	=	11.100 in^2
Kdesign	=	1.130 in	R yy	=	0.950 in	Sw	=	6.340 in^4
K1	=	0.000 in	Zy	=	4.990 in^3	Qf	=	5.080 in^3
rts	=	1.140 in				Qw	=	14.000 in^3
Ycg	=	5.000 in						

Silman (a TY Lin Company)
707 Wilshire Boulevard
Suite 4900
Los Angeles, CA 90017

Pole Footing Embedded in Soil

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.23.04.05 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

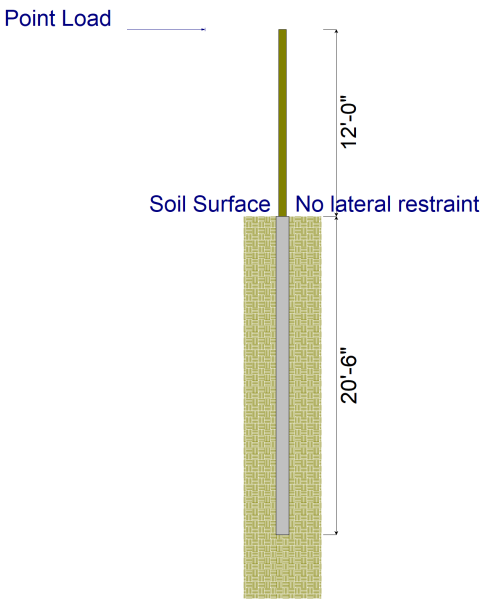
DESCRIPTION: Pole Footing for Sail

Code References

Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Pole Footing Shape	Circular
Pole Footing Diameter	10.0 in
Calculate Min. Depth for Allowable Pressures	
No Lateral Restraint at Ground Surface	
Allow Passive	150.0 pcf
Max Passive	1,500.0 psf



Controlling Values

Governing Load Combination	+D+0.750L+0.450W
Lateral Load	4.50 k
Moment	54.0 k-ft
NO Ground Surface Restraint	
Pressures at 1/3 Depth	
Actual	**1,018.01** psf
Allowable	**1,018.96** psf
Minimum Required Depth	**20.50 ft**
Footing Base Area	0.5454 ft^2
Maximum Soil Pressure	27.502 ksf

Applied Loads

Lateral Concentrated Load (k)		Lateral Distributed Loads (kl		Vertical Load (k)	
D : Dead Load	k		k/ft	15.0	k
Lr : Roof Live	0.0 k		k/ft		k
L : Live	3.0 k		k/ft		k
S : Snow	k		k/ft		k
W : Wind	5.0 k		k/ft		k
E : Earthquake	k		k/ft		k
H : Lateral Earth	k		k/ft		k
Load distance above ground surface	12.0 ft	TOP of Load above ground surface	ft		
		BOTTOM of Load above ground surface	ft		

Load Combination Results

	Forces @ Ground Surface		Required	Pressure at 1/3 Depth		Soil Increase
Load Combination	Loads - (k)	Moments - (ft-k)	Depth - (ft)	Actual - (psf)	Allow - (psf)	Factor
D Only	0.000	0.000	0.13	0.0	0.0	1.000
+D+L	3.000	36.000	17.25	860.4	861.3	1.000
+D+0.750L	2.250	27.000	15.38	764.7	765.9	1.000
+D+0.60W	3.000	36.000	17.25	860.4	861.3	1.000
+D+0.750L+0.450W	4.500	54.000	20.50	1,018.0	1,019.0	1.000
+0.60D+0.60W	3.000	36.000	17.25	860.4	861.3	1.000
+0.60D	0.000	0.000	0.13	0.0	0.0	1.000

Silman (a TY Lin Company)
707 Wilshire Boulevard
Suite 4900
Los Angeles, CA 90017

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.23.04.05 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: 2nd Floor Spiral Staircase Support Beam

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

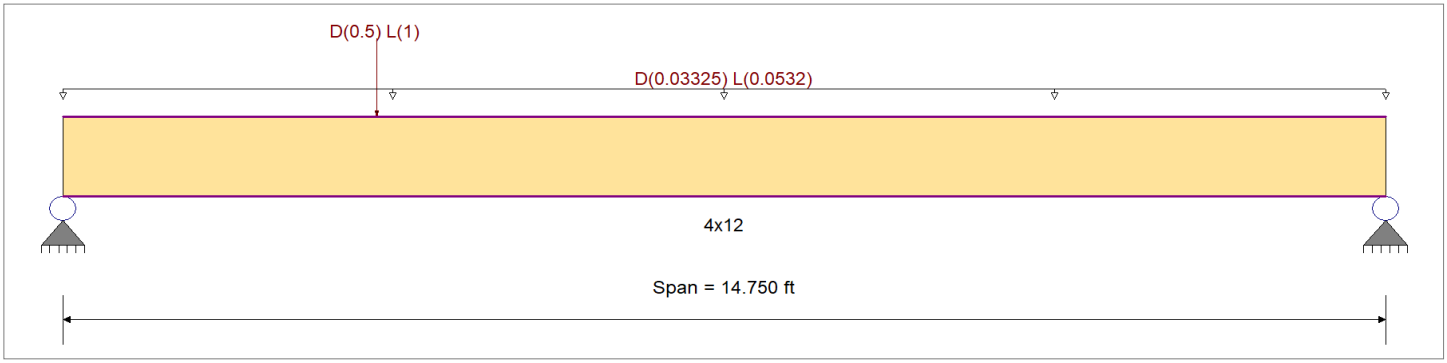
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	1000 psi
Fb -	1000 psi
Fc - Prll	1500 psi
Fc - Perp	625 psi
Fv	180 psi
Ft	675 psi

E : Modulus of Elasticity

Ebend- xx	1700 ksi
Eminbend - xx	620 ksi
Density	31.21 pcf



Applied Loads

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

Beam self weight calculated and added to loading
Point Load : D = 0.50, L = 1.0 k @ 3.50 ft, (Spiral Staircase)
Uniform Load : D = 0.0250, L = 0.040 ksf, Tributary Width = 1.330 ft, (Gravity Framing)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.868 : 1	Maximum Shear Stress Ratio	=	0.372 : 1
Section used for this span		4x12	Section used for this span		4x12
fb: Actual	=	954.92 psi	fv: Actual	=	66.96 psi
F'b	=	1,100.00 psi	F'v	=	180.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	3.607 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.190 in	Ratio =	930 >=360	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.308 in	Ratio =	574 >=180	Span: 1 : +D+L
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 14.750 ft	1	0.358	0.153	0.90	1.00	1.00	1.00	1.100	1.00	1.00	1.00	2.18	354.3	990.0	0.65	24.8	162.0
+D+L					1.00	1.00	1.00	1.100	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 14.750 ft	1	0.868	0.372	1.00	1.00	1.00	1.00	1.100	1.00	1.00	1.00	5.87	954.9	1,100.0	1.76	67.0	180.0
+D+0.750L					1.00	1.00	1.00	1.100	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 14.750 ft	1	0.585	0.251	1.25	1.00	1.00	1.00	1.100	1.00	1.00	1.00	4.95	804.2	1,375.0	1.48	56.4	225.0
+0.60D					1.00	1.00	1.00	1.100	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 14.750 ft	1	0.121	0.052	1.60	1.00	1.00	1.00	1.100	1.00	1.00	1.00	1.31	212.6	1,760.0	0.39	14.9	288.0

Silman (a TY Lin Company)
707 Wilshire Boulevard
Suite 4900
Los Angeles, CA 90017

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.23.04.05 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: 2nd Floor Spiral Staircase Support Beam

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.3083	6.944		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.845	1.056
Max Upward from Load Combinations	1.845	1.056
Max Upward from Load Cases	1.155	0.630
D Only	0.690	0.427
+D+L	1.845	1.056
+D+0.750L	1.556	0.899
+0.60D	0.414	0.256
L Only	1.155	0.630

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.04.09 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: JOIST OVER KITCHEN WITH UNIT

CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : Douglas Fir-Larch
Wood Grade : No.1

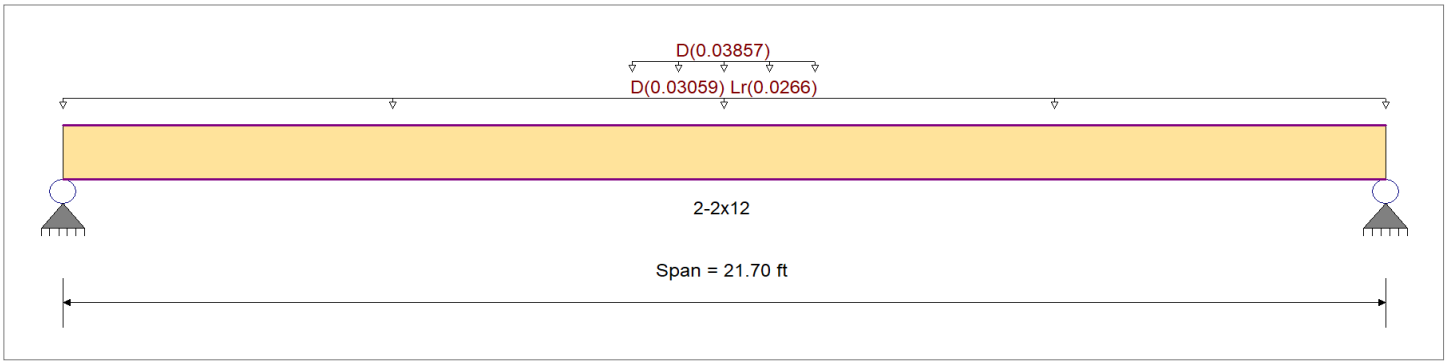
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	1350 psi
Fb -	1350 psi
Fc - Prll	925 psi
Fc - Perp	625 psi
Fv	170 psi
Ft	675 psi

E : Modulus of Elasticity

Ebend- xx	1600 ksi
Eminbend - xx	580 ksi
Density	31.21 pcf

Repetitive Member Stress Increase



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.0230, Lr = 0.020 ksf, Tributary Width = 1.330 ft
Uniform Load : D = 0.0290 ksf, Extent = 9.350 -->> 12.350 ft, Tributary Width = 1.330 ft, (MEP)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.428 : 1	Maximum Shear Stress Ratio	=	0.147 : 1
Section used for this span		2-2x12	Section used for this span		2-2x12
fb: Actual	=	830.80 psi	fv: Actual	=	31.18 psi
F'b	=	1,940.63 psi	F'v	=	212.50 psi
Load Combination		+D+Lr	Load Combination		+D+Lr
Location of maximum on span	=	10.850 ft	Location of maximum on span	=	20.829 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.234 in	Ratio =	0 >=360	Span: 1 : Lr Only
Max Upward Transient Deflection	0 in	Ratio =	1111 <360	n/a
Max Downward Total Deflection	0.643 in	Ratio =	405 >=240	Span: 1 : +D+Lr
Max Upward Total Deflection	0 in	Ratio =	0 <240	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 21.70 ft	1	0.382	0.127	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.15	2.82	533.9	1,397.3	0.44	19.4	153.0
+D+Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.15			0.0	0.00	0.0	0.0
Length = 21.70 ft	1	0.428	0.147	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.15	4.38	830.8	1,940.6	0.70	31.2	212.5
+D+0.750Lr					1.00	1.00	1.00	1.000	1.00	1.00	1.15			0.0	0.00	0.0	0.0
Length = 21.70 ft	1	0.390	0.133	1.25	1.00	1.00	1.00	1.000	1.00	1.00	1.15	3.99	756.6	1,940.6	0.64	28.2	212.5
+0.60D					1.00	1.00	1.00	1.000	1.00	1.00	1.15			0.0	0.00	0.0	0.0
Length = 21.70 ft	1	0.129	0.043	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.15	1.69	320.3	2,484.0	0.26	11.6	272.0

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.04.09 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: JOIST OVER KITCHEN WITH UNIT

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr	1	0.6428	10.929		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.758	0.758
Max Upward from Load Combinations	0.758	0.758
Max Upward from Load Cases	0.469	0.469
D Only	0.469	0.469
+D+Lr	0.758	0.758
+D+0.750Lr	0.686	0.686
+0.60D	0.281	0.281
Lr Only	0.289	0.289

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.07.08 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: Observation Deck Joists AT CANTILEVER TUBE

CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16
Load Combination Set : ASCE 7-22 / IBC 2024 (L<=100psf)

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-22 / IBC 2024 (L<=100psf)

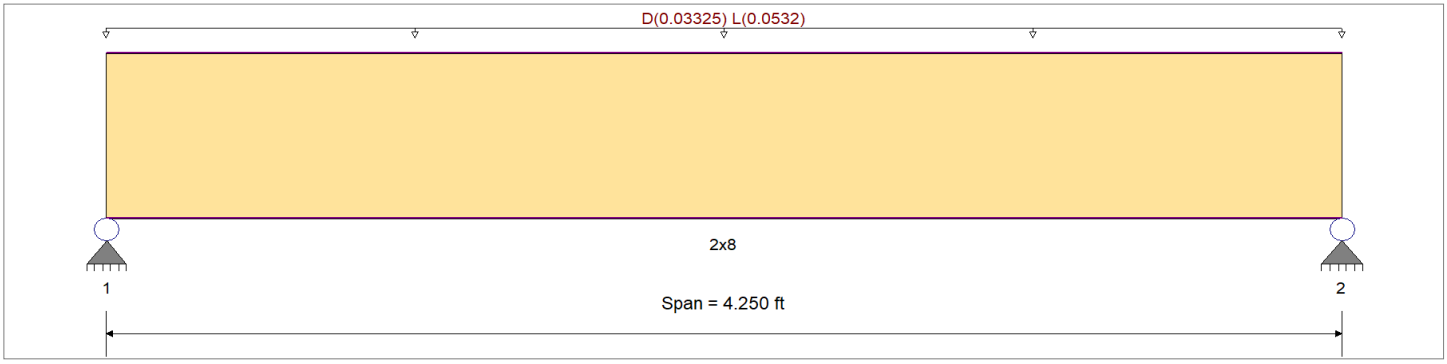
Wood Species : Douglas Fir-Larch
Wood Grade : No.2

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	750 psi
Fb -	750 psi
Fc - Prll	700 psi
Fc - Perp	625 psi
Fv	170 psi
Ft	475 psi

E : Modulus of Elasticity

Ebend- xx	1300 ksi
Eminbend - xx	470 ksi
Density	31.21 pcf



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.0250, L = 0.040 ksf, Tributary Width = 1.330 ft, (Gravity)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.203 : 1	Maximum Shear Stress Ratio	=	0.111 : 1
Section used for this span		2x8	Section used for this span		2x8
fb: Actual	=	183.11 psi	fv: Actual	=	18.81 psi
F'b	=	900.00 psi	F'v	=	170.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	2.125 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.006 in	Ratio =	8040 >=360	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.011 in	Ratio =	4816 >=180	Span: 1 : +D+L
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 4.250 ft	1	0.091	0.049	0.90	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.08	73.4	810.0	0.05	7.5	153.0
+D+L					1.00	1.00	1.00	1.200	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 4.250 ft	1	0.203	0.111	1.00	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.20	183.1	900.0	0.14	18.8	170.0
+D+0.750L					1.00	1.00	1.00	1.200	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 4.250 ft	1	0.138	0.075	1.25	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.17	155.7	1,125.0	0.12	16.0	212.5
+0.60D					1.00	1.00	1.00	1.200	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 4.250 ft	1	0.031	0.017	1.60	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.05	44.0	1,440.0	0.03	4.5	272.0

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.07.08 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: Observation Deck Joists AT CANTILEVER TUBE

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.0106	2.141		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.189	0.189
Max Upward from Load Combinations	0.189	0.189
Max Upward from Load Cases	0.113	0.113
D Only	0.076	0.076
+D+L	0.189	0.189
+D+0.750L	0.160	0.160
+0.60D	0.045	0.045
L Only	0.113	0.113

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.04.09 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

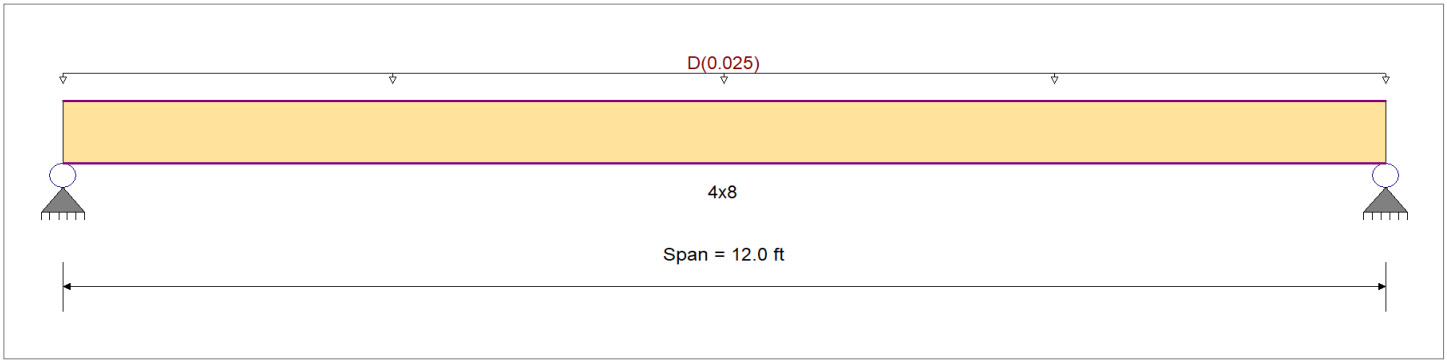
DESCRIPTION: Serving Window Header

CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Stress Design	Fb +	1350 psi	*E : Modulus of Elasticity*	
Load Combination :	IBC 2021	Fb -	1350 psi	Ebend- xx	1600 ksi
		Fc - Prll	925 psi	Eminbend - xx	580 ksi
Wood Species :	Douglas Fir-Larch	Fc - Perp	625 psi		
Wood Grade :	No.1	Fv	170 psi		
		Ft	675 psi	Density	31.21 pcf
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling				



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.020 ksf, Tributary Width = 1.250 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.136 : 1	Maximum Shear Stress Ratio	=	0.064 : 1
Section used for this span		4x8	Section used for this span		4x8
fb: Actual	=	214.86 psi	fv: Actual	=	9.79 psi
F'b	=	1,579.50 psi	F'v	=	153.00 psi
Load Combination		D Only	Load Combination		D Only
Location of maximum on span	=	6.000 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.080 in	Ratio =	1789 >=240	Span: 1 : D Only
Max Upward Total Deflection	0 in	Ratio =	0 <240	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 12.0 ft	1	0.136	0.064	0.90	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.55	214.9	1,579.5	0.17	9.8	153.0
+0.60D					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 12.0 ft	1	0.046	0.022	1.60	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.33	128.9	2,808.0	0.10	5.9	272.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
D Only	1	0.0805	6.044		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

 (c) ENERCALC INC 1983-2023

DESCRIPTION: Serving Window Header

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.183	0.183
Max Upward from Load Combinations	0.110	0.110
Max Upward from Load Cases	0.183	0.183
D Only	0.183	0.183
+0.60D	0.110	0.110

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.04.09 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: EXTERIOR CANOPY FASCIA

CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

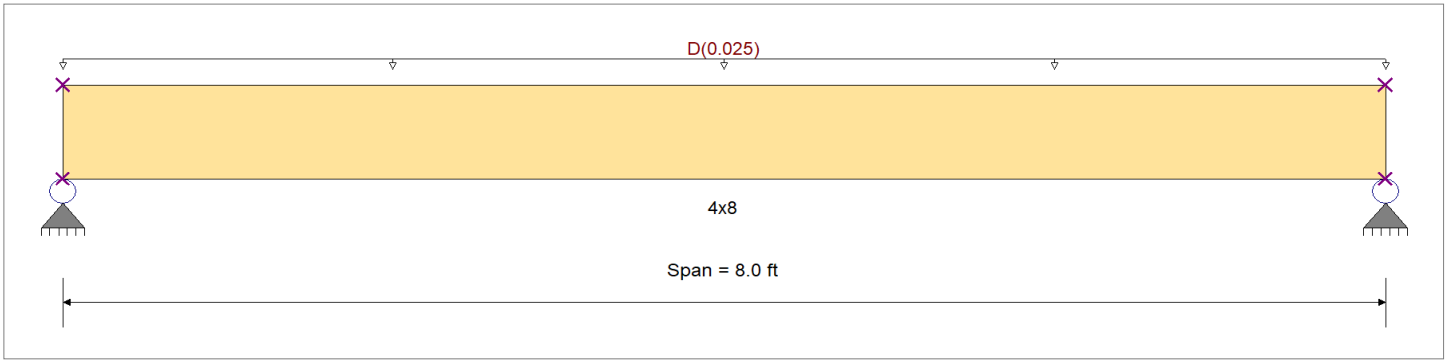
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

Beam Bracing : Completely Unbraced

Fb +	1,350.0 psi
Fb -	1,350.0 psi
Fc - Prll	925.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	675.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.020 ksf, Tributary Width = 1.250 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.090 : 1	Maximum Shear Stress Ratio	=	0.052 : 1
Section used for this span		4x8	Section used for this span		4x8
fb: Actual	=	95.49 psi	fv: Actual	=	6.16 psi
F'b	=	1,058.87 psi	F'v	=	118.73 psi
Load Combination		D Only	Load Combination		D Only
Location of maximum on span	=	4.000 ft	Location of maximum on span	=	7.416 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.019 in	Ratio =	5162 >=240	Span: 1 : D Only
Max Upward Total Deflection	0 in	Ratio =	0 <240	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 8.0 ft	1	0.090	0.052	0.90	0.85	1.00	0.99	1.300	1.00	0.80	1.00	0.24	95.5	1,058.9	0.10	6.2	118.7
+0.60D					0.85	1.00	0.99	1.300	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 8.0 ft	1	0.031	0.018	1.60	0.85	1.00	0.97	1.300	1.00	0.80	1.00	0.15	57.3	1,850.4	0.06	3.7	211.1

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
D Only	1	0.0186	4.029		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.04.09 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: EXTERIOR CANOPY FASCIA

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.122	0.122
Max Upward from Load Combinations	0.073	0.073
Max Upward from Load Cases	0.122	0.122
D Only	0.122	0.122
+0.60D	0.073	0.073

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.04.09 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: DECK BEAM

CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

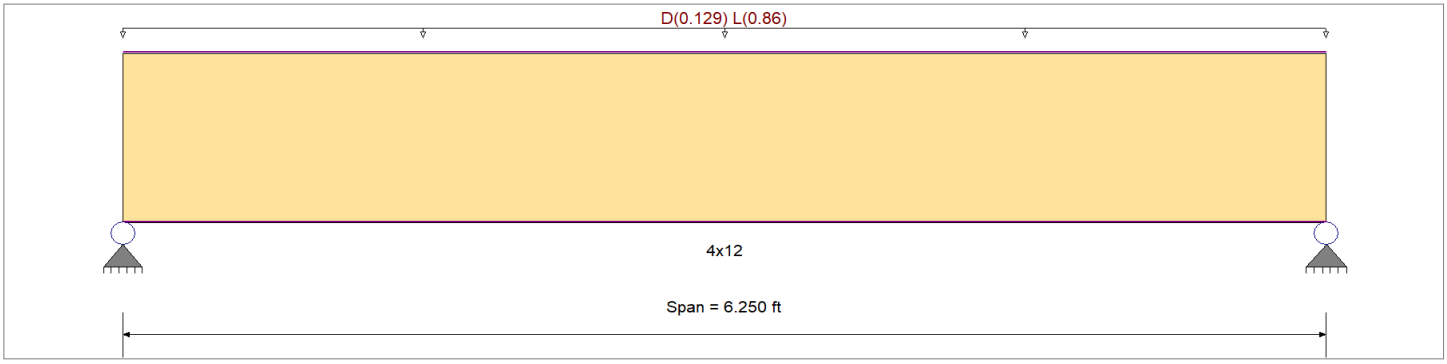
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	1,350.0 psi
Fb -	1,350.0 psi
Fc - Prll	925.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	675.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.0150, L = 0.10 ksf, Tributary Width = 8.60 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.784 : 1	Maximum Shear Stress Ratio	=	0.631 : 1
Section used for this span		4x12	Section used for this span		4x12
fb: Actual	=	791.69 psi	fv: Actual	=	83.21 psi
F'b	=	1,009.80 psi	F'v	=	131.92 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	3.125 ft	Location of maximum on span	=	5.315 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.052 in	Ratio =	0 >=360	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	1434 <360	n/a
Max Downward Total Deflection	0.061 in	Ratio =	1236 >=240	Span: 1 : +D+L
Max Upward Total Deflection	0 in	Ratio =	0 <240	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 6.250 ft	1	0.120	0.097	0.90	0.85	1.00	1.00	1.100	1.00	0.80	1.00	0.67	109.2	908.8	0.30	11.5	118.7
+D+L					0.85	1.00	1.00	1.100	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 6.250 ft	1	0.784	0.631	1.00	0.85	1.00	1.00	1.100	1.00	0.80	1.00	4.87	791.7	1,009.8	2.18	83.2	131.9
+D+0.750L					0.85	1.00	1.00	1.100	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 6.250 ft	1	0.492	0.396	1.25	0.85	1.00	1.00	1.100	1.00	0.80	1.00	3.82	621.1	1,262.3	1.71	65.3	164.9
+0.60D					0.85	1.00	1.00	1.100	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 6.250 ft	1	0.041	0.033	1.60	0.85	1.00	1.00	1.100	1.00	0.80	1.00	0.40	65.5	1,615.7	0.18	6.9	211.1

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.04.09 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: DECK BEAM

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.0606	3.148		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	3.117	3.117
Max Upward from Load Combinations	3.117	3.117
Max Upward from Load Cases	2.688	2.688
D Only	0.430	0.430
+D+L	3.117	3.117
+D+0.750L	2.445	2.445
+0.60D	0.258	0.258
L Only	2.688	2.688

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.05.02 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: 4 ft wall 8x8 Post

CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

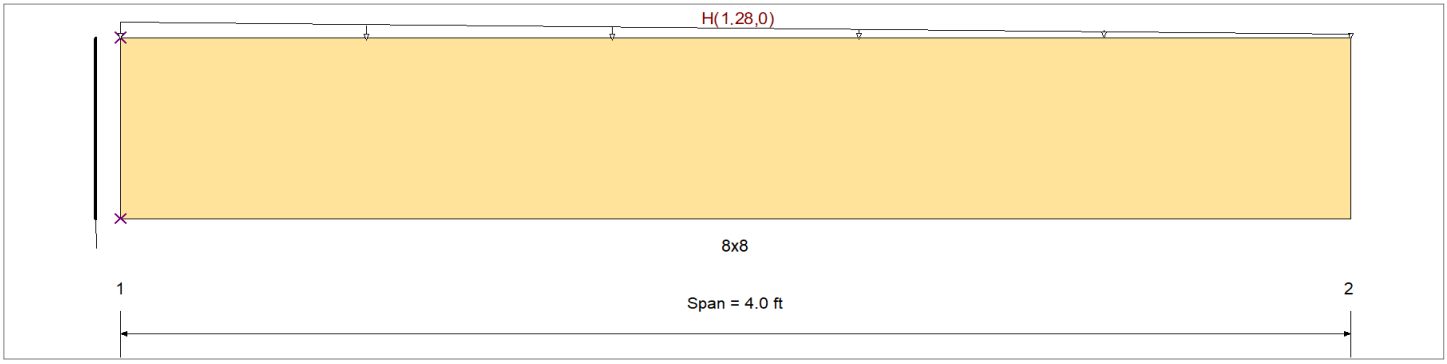
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

Beam Bracing : Completely Unbraced

Fb +	1,200.0 psi
Fb -	1,200.0 psi
Fc - Prll	1,000.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	825.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight NOT internally calculated and added
Load for Span Number 1
Varying Uniform Load : H= 1.280->0.0 k/ft, Extent = 0.0 -->> 4.0 ft, Trib Width = 1.0 ft, (Earth)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.793 : 1	Maximum Shear Stress Ratio	=	0.412 : 1
Section used for this span		8x8	Section used for this span		8x8
fb: Actual	=	582.54 psi	fv: Actual	=	48.94 psi
F'b	=	734.40 psi	F'v	=	118.73 psi
Load Combination		H Only	Load Combination		H Only
Location of maximum on span	=	0.000 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.059 in	Ratio =	1634 >=180	Span: 1 : H Only
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
H Only														0.0	0.00	0.0	0.0
Length = 4.0 ft	1	0.793	0.412	0.90	0.85	1.00	1.00	1.000	1.00	0.80	1.00	3.41	582.5	734.4	1.84	48.9	118.7
+0.60H					0.85	1.00	1.00	1.000	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 4.0 ft	1	0.268	0.139	1.60	0.85	1.00	1.00	1.000	1.00	0.80	1.00	2.05	349.5	1,305.6	1.10	29.4	211.1

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
H Only	1	0.0587	4.000		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.05.02 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: 4 ft wall 8x8 Post

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	2.560	
Max Upward from Load Combinations	1.536	
Max Upward from Load Cases	2.560	
H Only	2.560	
+0.60H	1.536	

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.05.02 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: 8 ft board at bottom (4x12)

CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

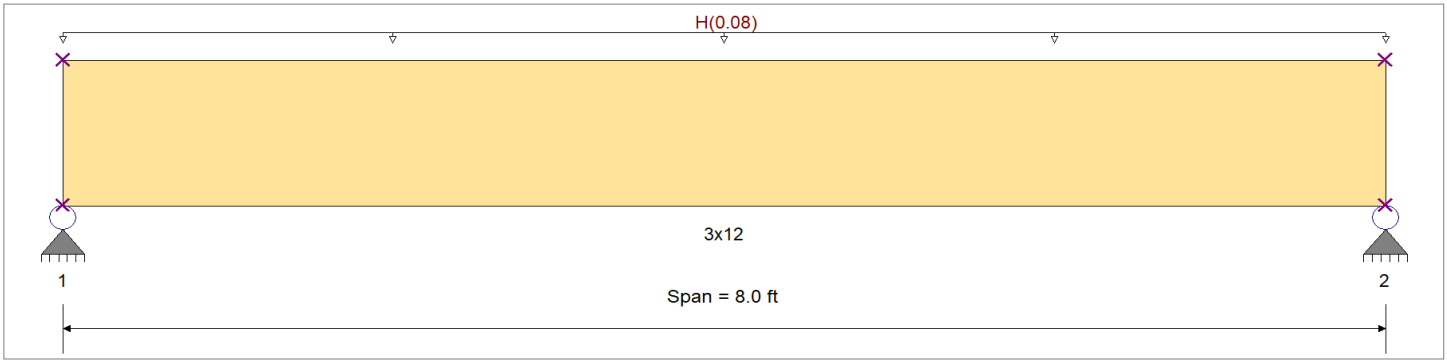
Wood Species : Douglas Fir-Larch
Wood Grade : No.1

Beam Bracing : Completely Unbraced

Fb +	1,200.0 psi
Fb -	1,200.0 psi
Fc - Prll	1,000.0 psi
Fc - Perp	625.0 psi
Fv	170.0 psi
Ft	825.0 psi

E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	31.210 pcf



Applied Loads

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

Beam self weight NOT internally calculated and added
Uniform Load : H = 0.080 , Tributary Width = 1.0 ft, (Earth)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.892 : 1	Maximum Shear Stress Ratio	=	0.110 : 1
Section used for this span		3x12 (weak orientation)	Section used for this span		3x12 (weak orientation)
fb: Actual	=	655.36 psi	fv: Actual	=	13.08 psi
F'b	=	734.40 psi	F'v	=	118.73 psi
Load Combination		H Only	Load Combination		H Only
Location of maximum on span	=	4.000 ft	Location of maximum on span	=	7.066 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.416 in	Ratio =	230 >=180	Span: 1 : H Only
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
H Only														0.0	0.00	0.0	0.0
Length = 8.0 ft	1	0.892	0.110	0.90	0.85	1.00	1.00	1.000	1.00	0.80	1.00	0.64	655.4	734.4	0.25	13.1	118.7
+0.60H					0.85	1.00	1.00	1.000	1.00	0.80	1.00			0.0	0.00	0.0	0.0
Length = 8.0 ft	1	0.301	0.037	1.60	0.85	1.00	1.00	1.000	1.00	0.80	1.00	0.38	393.2	1,305.6	0.15	7.8	211.1

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
H Only	1	0.4163	4.029		0.0000	0.000

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: STINSON.ec6

LIC# : KW-06017627, Build:20.24.05.02 T.Y. LIN INTERNATIONAL (c) ENERCALC INC 1983-2023

DESCRIPTION: 8 ft board at bottom (4x12)

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.320	0.320
Max Upward from Load Combinations	0.192	0.192
Max Upward from Load Cases	0.320	0.320
H Only	0.320	0.320
+0.60H	0.192	0.192

Project Title:
Engineer:
Project ID:
Project Descr:

Pole Footing Embedded in Soil

Project File: STINSON.ec6

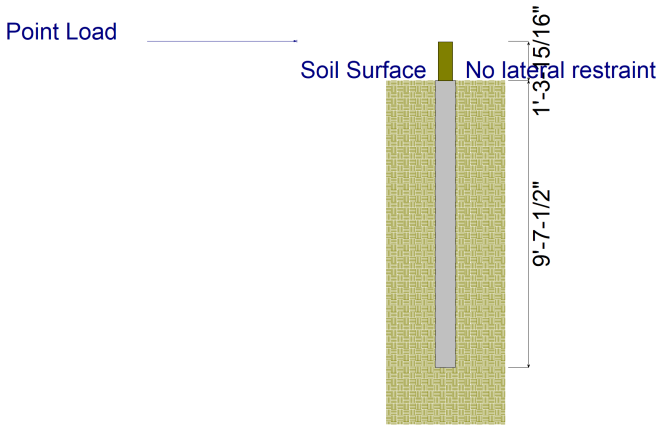
DESCRIPTION: Pile Embedment

Code References

Calculations per IBC 2021 1807.3, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Pole Footing Shape	Rectangular
Pole Footing Width	8.0 in
Calculate Min. Depth for Allowable Pressures	
No Lateral Restraint at Ground Surface	
Allow Passive	240.0 pcf
Max Passive	2,000.0 psf



Controlling Values

Governing Load Combination	H Only
Lateral Load	2.560 k
Moment	3.405 k-ft
NO Ground Surface Restraint	
Pressures at 1/3 Depth	
Actual	**765.28** psf
Allowable	**766.93** psf
Minimum Required Depth	**9.625 ft**
Footing Base Area	0.4444 ft^2
Maximum Soil Pressure	0.0 ksf

Applied Loads

Lateral Concentrated Load (k)		Lateral Distributed Loads (kl		Vertical Load (k)	
D : Dead Load	k		k/ft		k
Lr : Roof Live	k		k/ft		k
L : Live	k		k/ft		k
S : Snow	k		k/ft		k
W : Wind	k		k/ft		k
E : Earthquake	k		k/ft		k
H : Lateral Earth	2.560 k		k/ft		k
Load distance above ground surface	1.330 ft	TOP of Load above ground surface	ft		
		BOTTOM of Load above ground surface	ft		

Load Combination Results

	Forces @ Ground Surface		Required	Pressure at 1/3 Depth		Soil Increase
Load Combination	Loads - (k)	Moments - (ft-k)	Depth - (ft)	Actual - (psf)	Allow - (psf)	Factor
H Only	2.560	3.405	9.63	765.3	766.9	1.000
+0.60H	1.536	2.043	7.63	603.8	603.9	1.000