ARW ENGINEERS
structural consultants

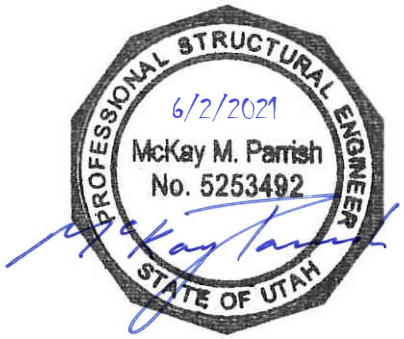
Structural Calculations

For

Hillcrest Elementary Kitchen Remodel

Project Number: 21908

June 2, 2021



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STRUCTURAL CALCULATIONS

FOR

Project Name

Client: KNIT Designing Community

Project Number: 21908

DESIGN CRITERIA

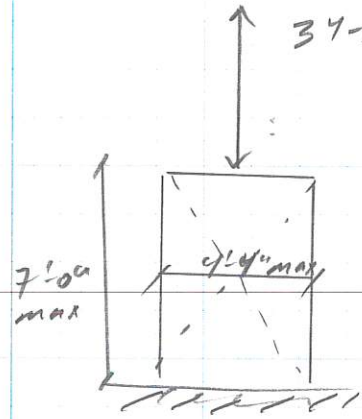
GOVERNING CODE: IBC 2018

GENERAL: Risk Category = III

SEISMIC: Seismic Design Category = D
I_E = 1.25
S_{DS} = 0.1.116
S_{D1} = 0.614

WIND: Basic Wind Speed = 109 mph
Exposure Classification = C

SOILS: Site Class: D
Design Allowable Soil Pressure = 1500 psf



Wt of wall = 150 psf (12")

Wt above wall = 150(27') = 4050 plf

Floor load = $\frac{50'}{2}$(100psf + 20psf + 60) =

= 4500 plf

(2) L 8x4x7/16 members ok ✓

Encrete shows 1/2 load on single member.

Title Block Line 1
You can change this area
using the "Settings" menu item
and then using the "Printing &
Title Block" selection.
Title Block Line 6

Project Title:
Engineer:
Project ID:
Project Descr:

Printed: 28 MAY 2021, 5:47PM

Steel Beam

File: 21908 - Hillcrest.ec6

Lic. # : KW-06002489

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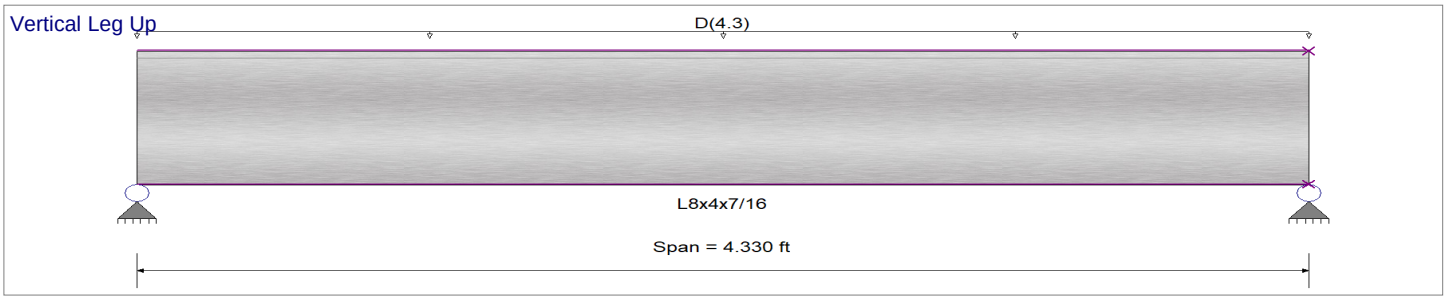
DESCRIPTION: Header beam

CODE REFERENCES

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	36.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	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
Uniform Load : D = 4.30 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.643 : 1	Maximum Shear Stress Ratio =	0.205 : 1
Section used for this span	L8x4x7/16	Section used for this span	L8x4x7/16
Ma : Applied	10.078 k-ft	Va : Applied	9.310 k
Mn / Omega : Allowable	15.663 k-ft	Vn/Omega : Allowable	45.321 k
Load Combination	D Only	Load Combination	D Only
Location of maximum on span	2.165 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	0.000 in	Ratio =	0 <360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.034 in	Ratio =	1508 >=180
Max Upward Total Deflection	0.000 in	Ratio =	0 <180

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios		Summary of Moment Values							Summary of Shear Values		
Segment Length	Span #	M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
D Only													
Dsgn. L = 4.33 ft	1	0.643	0.205	10.08		10.08	26.16	15.66	1.00	1.00	9.31	75.69	45.32
+0.60D													
Dsgn. L = 4.33 ft	1	0.386	0.123	6.05		6.05	26.16	15.66	1.00	1.00	5.59	75.69	45.32

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
D Only	1	0.0344	2.177		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	9.310	9.310
Overall MINimum	5.586	5.586
D Only	9.310	9.310
+0.60D	5.586	5.586