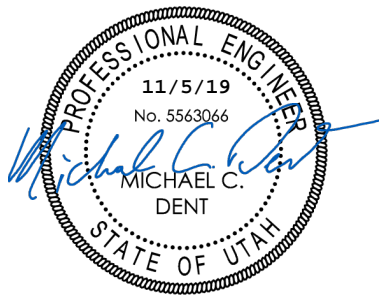




Structural Design  
(801) 876-3501



Structural Calculations

R1889

R1889 - 1088 Maple Drive, Huntsville, UT, USA

Prepared For:



Habitations Home Plans  
1523 East Skyline Drive, Suite B  
Ogden, UT 84405

11/5/2019

11/5/2019

## STRUCTURAL CALCULATIONS

For: Habitations Home Plans  
Plan #: R1889  
Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

From: York Engineering Inc.  
4883 Old Highway Rd. Suite A  
Morgan, Utah 84050  
(801) 876-3501

Design Criteria: 2015 IRC

Roof Loads:

Roof Snow Load (psf): 55  
Roof Dead Load (psf): 15

Floor Loads:

Floor Live Load (psf): 40  
Floor Dead Load (psf): 30

Seismic Design Category: D

Wind Speed: 115 mph for Exposure C

Material Properties:

Concrete ( $f_c'$ ): 3000 psi (foundation) to 4000 psi (suspended slab)

Concrete Reinforcement: ASTM A615 Grade 60

Site Conditions: Dry & stable granular based, 1500 psf bearing capacity, granular based

Backfill: KH = 35 pcf, slope not to exceed 20%, setback from slopes is min. 25'

Dimensional Lumber: Doug Fir #2 or better

Posts and Timbers: Doug Fir #1 or better

Steel: ASTM Grade 50

Use straps and tie downs, and meet nailing, reinforcement and other structural requirements as noted on the drawing and within the pages of this document. These structural calculations are based on conditions and assumptions listed above. If the conditions listed herein are not met or are different, contractor shall notify York Engineering prior to construction. Prefab trusses to be engineered by the supplier. This engineering assumes that the building site is dry and stable, a high water table or adverse soils such as plastic clays, fills etc. could cause future flooding, settlement, site instability, or other adverse conditions. Verification of and liability for the soil bearing pressure, site stability, and all other site conditions, including site engineering as required, is the responsibility of others. This engineering assumes that the site is stable having no global stability concerns or hazards. If this is not true, contact soils engineer and provide soils/slope stability report to York Engineering for review and further design. These calculations and engineering are for the new building structure only and do not provide any engineering analysis of or liability/warranty for the non-structural portions of the building, or the site itself. York Engineering Inc. does not assume the role of "Registered Design Professional in Responsible Charge" on this project. The purpose of these calculations and engineering is to help reduce structural damage and loss of life due to seismic activity and/or high wind conditions. York Engineering liability is limited to five times the fee collected for services. The contractor(s) must read, understand, and accept all York Engineering documents applicable to this design prior to utilizing the design. By using the design, the owner/contractor accepts the design, assumed loads, and limits on liability stated. If any discrepancies occur between the structural and other project documents, notify York Engineering of the discrepancy prior to construction.

**The following general requirements shall be followed during construction:**

1. Attach (2) ply headers together with (3) 16d at 12" O.C. [(2) 16d OK for 2x6 headers], use (3) 16d at 12" O.C. each side of (3) ply headers [use (4) 16d when header height is greater than 11"]. Attach (4) ply headers together with (2) 1/2" through bolts at 16" O.C. or (2) SDS 1/4" x 6" screws at 16" O.C. each side of header U.N.O., see plan.
2. Contractor shall assure that all materials are used per manufactures recommendations.
3. Site engineering and liability shall be provided by the owner/builder as required.
4. Contractor shall assure that footings are properly drained, soil is dry, footings rest on undisturbed native soil, building horizontal clearance from footings to adjacent slopes is per IRC Section R403.1.7.2. If setback requirements of R403.1.7.2 cannot be met then contact engineer for further design requirements.
5. The contractor shall conform to all building codes and practices as per the current IRC
6. Provide solid blocking through structure down to footing for all load paths
7. Builder shall follow all recommendations found in all applicable geotechnical reports.
8. Stacking of two sill plates is permitted with 5/8" J-Bolts through both plates. Stacking more than two plates is not permitted without special engineering.
9. All footings, foundations, and interior slabs shall be normal wt. concrete with a compressive strength of 2,500 PSI min. U.N.O. to meet strength requirements (see calcs., no special inspections required U.N.O., see plan) however, per IRC 402.2 use 3000 PSI concrete for durability purposes.



## **Table of Contents**

Snow Calculation	5
Footings	6
Seismic	7
Shear	8
FTW	9
FTW (2)	10
FTW (3)	11
FTW (4)	12
Wind (Left & Right Loading)	13
Wind (Front & Back Loading)	14
Joists	15
Beam Schedule	16
Beams	17
Beams (2)	18
Beams (3)	19
Beams (4)	20
Studs	21
Studs (2)	22
Spot Footings	23

SNOW CALCULATION:	
Elevation:	5624
Utah Snow Load	<a href="#">Utah Snow Loads</a>
Idaho Snow Load	<a href="#">Idaho Snow Loads</a>
$P_g$ (psf)	78
$C_e$	1
$C_t$	1
$I$	1
$C_s$	1
<b><math>P_f</math> (psf)</b>	<b>55</b>

Plan: R1889  
 Date: 7/15/2019  
 Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>
<b>LOCATION</b>	<b>Back</b>	<b>Front</b>	<b>Left</b>	<b>Right</b>	<b>Interior</b>
	FS: 1.22	FS: 1.24	FS: 1.34	FS: 1.34	FS: 2.63
	DL+0.75LL+0.75S	DL+0.75LL+0.75S	DL+S	DL+S	DL+LL
<b>SOIL SPECS</b>					
Density (pcf)	125	125	125	125	125
Soil Pressure (psf)	1500	1500	1500	1500	1500
Weight (k/ft)	0.04	0.04	0.04	0.04	0.03
<b>BUILDING LOADS</b>					
Roof Span (ft)	32	24	30.5	30.5	0
Floor Span (ft)	20	20	4	4	4
Wall Height (ft)	14	23	23	23	23
Suspended Slab Span (ft)	0	0	0	0	0
Total Load (k/ft)	1.78	1.74	1.59	1.59	0.60
<b>FOOTING SPECS</b>					
Footing Width (in)	20	20	20	20	18
Footing Height (in)	10	10	10	10	10
<b>FOUNDATION</b>					
Height Above Grade (ft)	0.67	0.67	0.67	0.67	0.67
Wall Thickness (ft)	0.67	0.67	0.67	0.67	0.67
Weight (k/ft)	0.07	0.07	0.07	0.07	0.07
<b>CONCRETE SPECS</b>					
Density (pcf)	150	150	150	150	150
Strength (psi)	2500	2500	2500	2500	2500
Clear Cover Thickness (in)	3	3	3	3	3
<b>CALCULATIONS</b>					
Total Weight on Soil (k/ft)	2.06	2.01	1.86	1.86	0.85
Soil Load (ksf)	1.23	1.21	1.12	1.12	0.57
<b>FOOTING SELECTION</b>	<b>F-20</b>	<b>F-20</b>	<b>F-20</b>	<b>F-20</b>	<b>F-18</b>

Plan: R1889  
 Date: 7/15/2019  
 Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

LOADING SUMMARY	
Roof Live Load (psf):	55
Roof Dead Load (psf):	15
Floor Live Load (psf):	40
Floor Dead Load (psf):	30
Exterior Wall Dead Load (psf):	20
Interior Wall Dead Load (psf):	10
Suspended Slab Dead Load (psf):	75
Suspended Slab Live Load (psf):	60
SNOW LOAD PARAMETERS	
Roof Slope (x/12):	2
Roof Pitch (θ):	9.46
Total Roof Load (psf):	70.00
SEISMIC LOAD PARAMETERS	
Site Class:	D
F <sub>a</sub> :	1.19
R:	6.5
S <sub>s</sub> :	0.777
S <sub>MUS</sub> :	0.924
S <sub>DS</sub> :	0.615
C <sub>s</sub> :	0.095
Redundancy Factor, ρ :	1.30
ASD Load Combination Factor:	0.70
Factored C <sub>s</sub> :	0.086
SHEAR DISTRIBUTION	
Base Shear Force lb:	17,367
Floor 1 Lateral Force lb:	7,407
Floor 2 Lateral Force lb:	0
Roof Lateral Force lb:	9,960
Diaphragm Loading (plf):	88
<b>Diaphragm FS</b>	<b>2.44</b>

DIAPHRAGM LOADING									
	Avg. Length (ft)	Avg. Width (ft)	Wall Height (ft)	Dead Wgt. (psf)	Snow Wgt. (psf)	Diaphragm Weight (lb)	Wall Weight (lb)	Total Weight (lb)	Shear (lb)
<b>Roof</b>	56.446	60.788	---	15	12	92,156	23,447	115,603	9,960
<b>Floor 2</b>	56.446	61	0	30		0	23,447	0	0
<b>Floor 1</b>	56.446	61	10	30		56,670	29,309	85,979	7,407

SEISMIC FORCE DISTRIBUTION							
	H <sub>x</sub> (ft)	W <sub>x</sub> (kip)	H <sub>x</sub> x W <sub>x</sub>	% Force	Total Shear (kip)	F <sub>x</sub>	V <sub>x</sub>
<b>Roof</b>	14.08	115.60	1,628	88%	15.34	15.34	15.34
<b>Floor 2</b>	0.00	0.00	0	0%	15.34	0.00	15.34
<b>Floor 1</b>	2.50	85.98	215	12%	17.37	2.03	17.37
<b>TOTALS</b>	0.01	201.58	1,843	17.367	---	---	17.37

Plan: R1889  
 Date: 7/15/2019  
 Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

	Seismic (kips)		Wind (kips)		Shear Wall Allowable Loads (plf)		
	total		left/right	front/back	seismic	wind	
2nd Floor	0.0 kips		0.0	0.0	SW-1	350	490
1st Floor	15.3 kips		6.2	6.3	SW-2	450	630
Basement	2.0 kips		7.6	7.7	SW-3	585	819

Location	Master		Boat/RV		Kitchen		Entry		Bath 2		Mstr Bath		Master		Dining/Living		Bed 2		Boat/RV		Garage/Mud		Stairs/Bed	
	Front side	Front side	Front side	Front side	Front side	Front side	Back side	Back side	Back side	Back side	Back side	Back side	Back side	Back side	Back side	Back side	Back side	Back side	Back side	Front/Back	mi./left	Right	Mid	
Floor	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lines up w/	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
Width	27.5	38	8	17	13.5	10	17.5	36	14	12.5	24.5	15												
Depth	19	17.5	25.5	27.5	19.5	12.5	19	27.5	19.5	17.5	38.5	79.5												
Area (sqft)	318.25	589.75	102	340	141.375	127.5	166.25	775.75	136.5	109.375	672.0925	552												
Force (lb)	1423	2637	456	1520	632	570	743	3469	610	489	3008	2468												
Adj. Force	1403	2600	450	1499	623	562	733	3420	602	482	2966	2577												
% of floor	9%	17%	3%	10%	4%	4%	5%	22%	4%	3%	19%	17%												
Fr. Diaphragm	0	0	0	0	0	0	0	0	0	0	0	0												
Transferred Source	none	none	none	none	none	none	none	none	none	none	none	none												
Transferred Forces	0	0	0	0	0	0	0	0	0	0	0	0												
Forces from Upper	0	0	0	0	0	0	0	0	0	0	0	0												
Total Seismic	1403	2600	450	1499	623	562	733	3420	602	482	2966	2577												
Wind (lb)	582	1079	187	622	259	233	304	1419	250	200	1231	999												
Adj. Force	574	1064	184	614	255	230	300	1400	246	197	1214	1044												
% of total	9%	17%	3%	10%	4%	4%	5%	22%	4%	3%	19%	17%												
Total Wind	574	1064	184	614	255	230	300	1400	246	197	1214	1044												
Shear Wall	21.38	38	4	Portal	11.38	3.5	FTW	8	FTW	9.5	18	15.5												
Aspect Ratio	1	1	0.94	Frame	1	1	(1)	1	(2)	1	1	1												
PSW Adj. C <sub>o</sub>	0.99	1	1		0.99	1	(1)	1	(2)	1	1	1												
Seis Load (plf)	66	68	112		55	161		428		51	165	166												
Wind Load (plf)	27	28	46		22	66		175		21	67	67												
Shear Wall	SW-1	SW-1	SW-1		SW-1	SW-1	SW-1	SW-2	SW-1	SW-1	SW-1	SW-1												

Uplift												
% Force on pier	100%	100%	100%	100%	100%	100%	100%	50%	100%	42%	31%	100%
Wall Length (ft)	25	38	4	Portal	13.5	3.5	FTW	4	FTW	4	5.5	15.5
Wall Height (ft)	9	10	11	11	8.5	10	10.5	13	10	12	9	10
Floor Span (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Roof Span (ft)	16	4	15	11	19	18.5	24	41	22	4	4	4
Wall Load (plf)	180	200	220	220	170	200	210	260	200	240	180	200
Total DL (plf)	180	138	199.5	181.5	187.5	203.25	234	340.5	219	162	126	138
Seis Uplift (lbs)	0	0	838	-	0	1251	664	4877	0	285	1137	593
Wind Uplift (lbs)	0	0	107	-	0	302	64	1594	0	0	260	0
			LSTHD8RJ	STHD14RJ		CS16X42"	CS16X32"	MST60		N/A	LSTHD8RJ	N/A

Location	Dining		Master		Mstr Bath		Pantry/Mud		Garage		Living		Fire		Bed 2		Bath 2		Pantry/Mud		Garage		Boat/RV	
	Left side	Left side	Left side	Left side	Left side	Left side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	
Floor	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lines up w/	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none
Width	5	6.5	12.5	18.5	38.5	5	7	13	6.5	17	21	17.5												
Depth	36.5	64.5	66	10	24.5	36.5	56	16.5	14	10	24.5	38												
Area (sqft)	191.25	242.125	112.5	92.5	581	191.25	196	107.25	45.5	65	257.25	332.5												
Force (lb)	855	1063	1844	414	2598	855	876	480	203	380	1150	1487												
Adj. Force	893	1130	1926	432	2712	893	915	501	212	397	1201	1552												
% of floor	6%	7%	13%	3%	18%	6%	6%	3%	1%	3%	8%	10%												
Fr. Diaphragm	0	0	0	0	0	0	0	0	0	0	0	0												
Transferred Source	none	1-Left-Dining	1-Left-Master	none	none	none	1-right-Living	none	none	none	none	none												
Transferred Forces	0	893	2023	0	0	0	893	0	0	0	0	0												
Forces from Upper	0	0	0	0	0	0	0	0	0	0	0	0												
Total Seismic	893	2023	3949	432	2712	893	1808	501	212	397	1201	1552												
Wind (lb)	346	438	747	167	1052	346	355	194	82	154	466	602												
Adj. Force	362	458	780	175	1098	362	371	203	86	161	486	629												
% of total	6%	7%	13%	3%	18%	6%	6%	3%	1%	3%	8%	10%												
Total Wind	362	819	1599	175	1098	362	732	203	86	161	486	629												
Shear Wall	Transferred	Transferred	9.7	4.67	30.34	Transferred	7	7.67	FTW	5.67	5	5.34												
Aspect Ratio	Master	Mstr Bath	1	1	1	Fire	1	1	(3)	1	1	1												
PSW Adj. C <sub>o</sub>			0.99	1	0.99	1	1	1	(3)	1	1	1												
Seis Load (plf)			407	92	89		258	65	70	240	291													
Wind Load (plf)			165	37	36		105	26	28	97	118													
Shear Wall			SW-2	SW-1	SW-1		SW-1	SW-1	SW-1	SW-1	SW-1	SW-1												

Uplift												
% Force on pier	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	50%
Wall Length (ft)	Transferred	Transferred	12.5	4.67	38.5	Transferred	7	7.67	FTW	5.67	2.5	2.67
Wall Height (ft)	13	10	9	8	9	13	10	9	9	8	10.5	13
Floor Span (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Roof Span (ft)	4	4	4.5	14.5	30.5	4	4	4	4	14.5	30.5	43
Wall Load (plf)	260	200	180	160	180	260	200	180	180	160	210	260
Total DL (plf)	174	138	128.25	161.25	245.25	174	138	126	126	161.25	263.25	349.5
Seis Uplift (lbs)	-	-	2062	363	0	-	2100	104	0	103	2193	3312
Wind Uplift (lbs)	-	-	353	0	0	-	563	0	0	0	692	1064
			MST37	N/A			MST37	N/A		N/A	LSTHD8	LSTHD8

Location	Bath		Steam		Hot Tub		Media/Rec		Bed 3		Media		Hot Tub		Steam		Rec		Bed 3	
	Front side	Back side	Back side	Back side	Back side	Left side	Left side	Left side	Left side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	Right side	
Floor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lines up w/	1-front-Master	1-front-Bath	2-back-Mastack	Dining/L1	1-back-Bed	2:1-Left-Dining	1-Left-Master	Left-Mstr	Left-Mstr	1-right-Living	1-right-Bed	2								
Width	13.67	9.33																		



Master First Floor Back Side

**LOAD PARAMETERS**

Seismic Load (lb):	733
Wind Load (lb):	300

**SHEAR WALL SELECTION**

Shear Wall Callout:	SW-1
---------------------	------

Seismic Strength (lb/ft):	350
Edge Nailing (in o.c.):	4
Field Nailing (in o.c.):	12
<b>Seismic FS</b>	<b>2.15</b>
<b>Wind FS</b>	<b>7.35</b>

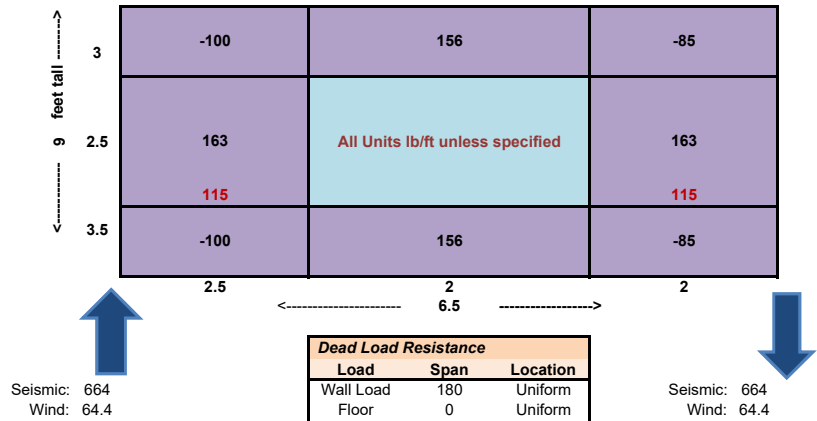
**ASPECT RATIO**

Left Aspect Ratio:	100%
Right Aspect Ratio:	100%

**CONNECTORS**

Force-Transfer Wall Location:	Interfloor
Tie-Down:	CS16X32
<b>Tie-Down Seismic FS</b>	<b>1.17</b>
<b>Tie-Down Wind FS</b>	<b>12.04</b>
Window Strap:	CS16
Window Strap Connector:	Nails
<b>Strap FS</b>	<b>14.78</b>
Bolt Diameter (in):	1/2
Bolt Spacing (in o.c.):	32
Bolt Capacity (plf):	390
<b>Bolt FS</b>	<b>3.46</b>
Stud Size:	2x4
Tension (lb):	710
Stress (psi):	146
F <sub>T</sub> (psi):	920
<b>Stud FS:</b>	<b>6.31</b>

**FORCE TRANSFER WALL**



<b>FORCE TRANSFER WALL DESIGN</b>	
Shear Wall:	SW-1 --- 4" Edge Nailing and 12" Field Nailing
Tie-Down:	CS16X32
Straps:	CS16 --- Nails to Connect
Bolts:	1/2" Bolts @ 32" O.C.
Studs:	2x4 Studs

**Bed 2 First Floor Back Side**

**LOAD PARAMETERS**

Seismic Load (lb):	602
Wind Load (lb):	246

**SHEAR WALL SELECTION**

Shear Wall Callout:	SW-1
---------------------	------

Seismic Strength (lb/ft):	350
Edge Nailing (in o.c.):	4
Field Nailing (in o.c.):	12
<b>Seismic FS</b>	<b>2.04</b>
<b>Wind FS</b>	<b>6.96</b>

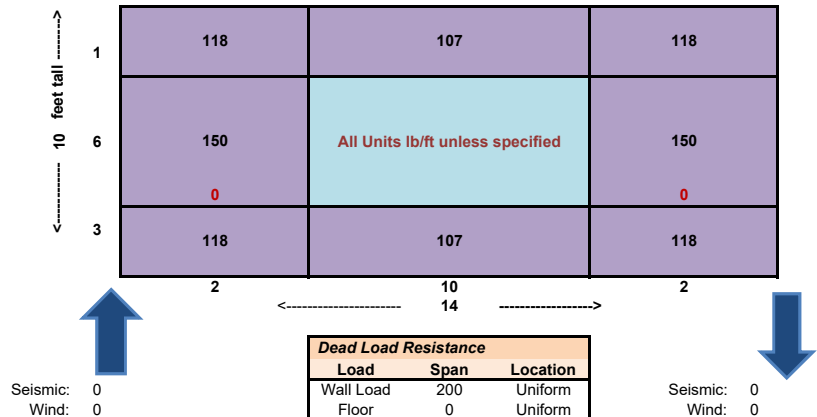
**ASPECT RATIO**

Left Aspect Ratio:	88%
Right Aspect Ratio:	88%

**CONNECTORS**

Force-Transfer Wall Location:	Interfloor
Tie-Down:	CS16X32
<b>Tie-Down Seismic FS</b>	<b>Not Needed</b>
<b>Tie-Down Wind FS</b>	<b>Not Needed</b>
Window Strap:	CS16
Window Strap Connector:	Nails
<b>Strap FS</b>	<b>1.50</b>
Bolt Diameter (in):	1/2
Bolt Spacing (in o.c.):	32
Bolt Capacity (plf):	390
<b>Bolt FS</b>	<b>9.07</b>
Stud Size:	2x4
Tension (lb):	301
Stress (psi):	62
F <sub>T</sub> (psi):	920
<b>Stud FS:</b>	<b>14.90</b>

**FORCE TRANSFER WALL**



Dead Load Resistance		
Load	Span	Location
Wall Load	200	Uniform
Floor	0	Uniform
Roof	0	Uniform
Point Load	0	0

FORCE TRANSFER WALL DESIGN	
Shear Wall:	SW-1 --- 4" Edge Nailing and 12" Field Nailing
Tie-Down:	CS16X32
Straps:	CS16 --- Nails to Connect
Bolts:	1/2" Bolts @ 32" O.C.
Studs:	2x4 Studs

**Bath 2 First Floor Right Side**

**LOAD PARAMETERS**

Seismic Load (lb):	212
Wind Load (lb):	86

**SHEAR WALL SELECTION**

Shear Wall Callout:	SW-1
Seismic Strength (lb/ft):	350
Edge Nailing (in o.c.):	4
Field Nailing (in o.c.):	12
<b>Seismic FS</b>	<b>4.12</b>
<b>Wind FS</b>	<b>14.24</b>

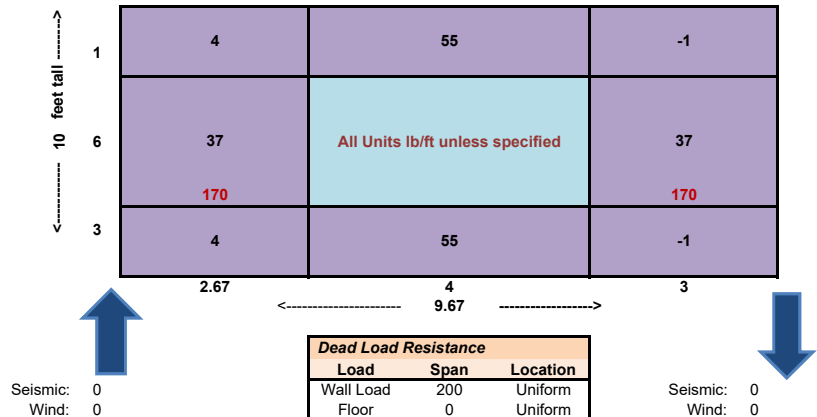
**ASPECT RATIO**

Left Aspect Ratio:	97%
Right Aspect Ratio:	100%

**CONNECTORS**

Force-Transfer Wall Location:	Interfloor
Tie-Down:	CS16X32
<b>Tie-Down Seismic FS</b>	<b>Not Needed</b>
<b>Tie-Down Wind FS</b>	<b>Not Needed</b>
Window Strap:	CS16
Window Strap Connector:	Nails
<b>Strap FS</b>	<b>10.03</b>
Bolt Diameter (in):	1/2
Bolt Spacing (in o.c.):	32
Bolt Capacity (plf):	390
<b>Bolt FS</b>	<b>17.75</b>
Stud Size:	2x4
Tension (lb):	154
Stress (psi):	32
F <sub>T</sub> (psi)	920
<b>Stud FS:</b>	<b>29.17</b>

**FORCE TRANSFER WALL**



Dead Load Resistance		
Load	Span	Location
Wall Load	200	Uniform
Floor	0	Uniform
Roof	0	Uniform
Point Load	0	0

FORCE TRANSFER WALL DESIGN	
Shear Wall:	SW-1 --- 4" Edge Nailing and 12" Field Nailing
Tie-Down:	CS16X32
Straps:	CS16 --- Nails to Connect
Bolts:	1/2" Bolts @ 32" O.C.
Studs:	2x4 Studs

**Bed 3 Basement Floor Back Side**

**LOAD PARAMETERS**

Seismic Load (lb):	696
Wind Load (lb):	462

**SHEAR WALL SELECTION**

Shear Wall Callout:	SW-1
---------------------	------

Seismic Strength (lb/ft):	350
Edge Nailing (in o.c.):	4
Field Nailing (in o.c.):	12
<b>Seismic FS</b>	<b>1.76</b>
<b>Wind FS</b>	<b>3.71</b>

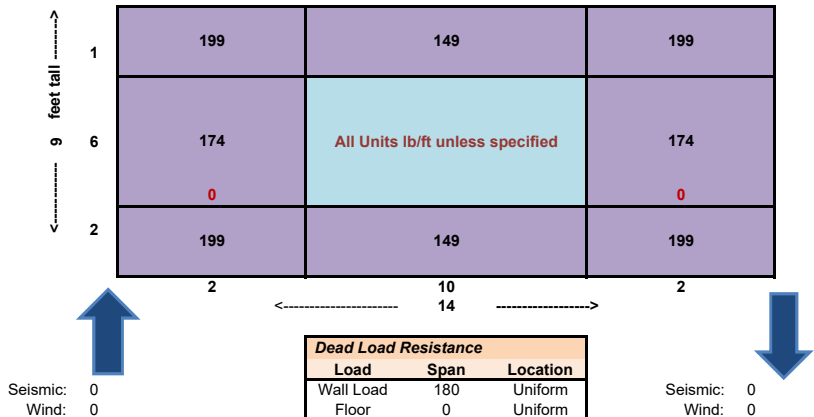
**ASPECT RATIO**

Left Aspect Ratio:	88%
Right Aspect Ratio:	88%

**CONNECTORS**

Force-Transfer Wall Location:	Interfloor
Tie-Down:	CS16X32
<b>Tie-Down Seismic FS</b>	<b>Not Needed</b>
<b>Tie-Down Wind FS</b>	<b>Not Needed</b>
Window Strap:	CS16
Window Strap Connector:	Nails
<b>Strap FS</b>	<b>1.50</b>
Bolt Diameter (in):	1/2
Bolt Spacing (in o.c.):	32
Bolt Capacity (plf):	390
<b>Bolt FS</b>	<b>7.84</b>
Stud Size:	2x4
Tension (lb):	313
Stress (psi):	64
F <sub>T</sub> (psi)	920
<b>Stud FS:</b>	<b>14.31</b>

**FORCE TRANSFER WALL**



Dead Load Resistance		
Load	Span	Location
Wall Load	180	Uniform
Floor	0	Uniform
Roof	0	Uniform
Point Load	0	0

FORCE TRANSFER WALL DESIGN	
Shear Wall:	SW-1 --- 4" Edge Nailing and 12" Field Nailing
Tie-Down:	CS16X32
Straps:	CS16 --- Nails to Connect
Bolts:	1/2" Bolts @ 32" O.C.
Studs:	2x4 Studs

Plan: R1889  
Date: 7/15/2019

Location: R1889 - 1088 Maple Drive, Huntsville, U **LEFT AND RIGHT LOADING**

**Wind Loading Calculations using Main Windforce-Resisting System (MWFRS)**

**Longitudinal Direction**

**Table 27.5-1 Steps to Determine MWFRS Loads Enclosed Simple Diaphragm Buildings**

Risk Category	<b>II</b>	Table 1.5-1	
Wind speed	<b>115</b>	Figure 26.5-1 A-B or C	
Exposure Category	<b>C</b>	Section 26.7	
L/B upper floor	1.08		
L/B main floor	1.08		
Roof Height	3.17		
Mean roof Height	14.1		
<b>Truss Span</b>	<b>38</b>		
Roof Slope	2 /12		
Roof Angle (deg)	9.46	Sine = 0.1644	
<b>Lower Truss Span</b>	<b>38</b>		
Lower roof Slope	2 /12		
Lower roof Angle (deg)	9.46	Sine = 0.1644	
Load combination factor	0.6	(ASCE 7-10 2.4.1)	
Upper floor, p <sub>n</sub>	22.3	Table 27.6-1	
Upper floor, p <sub>o</sub>	22.3	Table 27.6-1	
Main floor, p <sub>n</sub>	22.3		
Main floor, p <sub>o</sub>	22.3		
Basement floor, p <sub>n</sub>	22.3		
Basement floor, p <sub>o</sub>	22.3		
<b>Upper Floor (psf)</b>			
Net Pressure	13.4	Windward	8.4
		Leeward	5.0
		Left	7.1
		Right	7.1
<b>Main Floor (psf)</b>			
Net Pressure	13.4	Windward	8.4
		Leeward	5.0
		Left	7.1
		Right	7.1
<b>Basement Floor (psf)</b>			
Net Pressure	13.4	Windward	8.4
		Leeward	5.0
		Left	7.1
		Right	7.1
<b>Roof (psf)</b>			
Load Case 1	Zone 1	Zone 2	Exposure Adj. Factor 1.000
Load Case 2	0.0	0.0	Elevation Adj. Factor 0.816
<b>Lower Roof (psf)</b>			
Load Case 1	0.0	0.0	
Load Case 2	0.0	0.0	
<b>Roof Load</b>			
Roof Height	Length	Area (ft <sup>2</sup> )	Horizontal Force (lbs)
3.17	84.50	267.6	0
<b>Lower Roof Load</b>			
Low Roof Height	Upper Length	Lower length	Low Roof Length(ft)
0.0	85	84.5	0
		Area (ft <sup>2</sup> )	Horizontal Force (lbs)
		0.0	0.0
<b>Wall Load</b>			
	<b>Basement</b>	(height) 2.5	<b>1st floor</b> (height) 11
		force (lbs)	<b>2nd floor</b> (height) 0
Windward	211	1774.6	929.5
Leeward	211	1049.1	929.5
		force (lbs)	7808.1
		ft <sup>2</sup>	0
		force (lbs)	0.0
<b>2nd Floor Diaphragm Shear</b>			
Total Shear (lbs)	0		
<b>1st Floor Diaphragm Shear</b>			
Total Shear (lbs)	6212		
<b>Basement Diaphragm Shear</b>			
Total Shear (lbs)	13836		
<b>Base Wind Shear</b>	15248		
<b>Hurricane Ties</b>			
	<b>Uplift</b>	(lbs)	<b>Factors of Safety</b>
Roof (per truss)	-342.0		H1 H2.5
Low roof (per truss)	-		-1.71 -1.75
	<b>Lateral</b>	(lbs)	H1 H2.5
Roof (per truss)	0.0		#DIV/0! #DIV/0!
Low roof (per truss)	0.0		- -

**Wind Loading Calculations using Main Windforce-Resisting System (MWFRS)**

**Longitudinal Direction**  
**Table 27.5-1 Steps to Determine MWFRS Loads Enclosed Simple Diaphragm Buildings**

Risk Category	<b>II</b>	Table 1.5-1	
Wind speed	<b>115</b>	Figure 26.5-1 A-B or C	
Exposure Category	<b>C</b>	Section 26.7	
L/B upper floor	0.93		
L/B main floor	0.93		
Roof Height	3.17		
Mean roof Height	14.1		
<b>Truss Span</b>	<b>38</b>		
Roof Slope	2 /12		
Roof Angle (deg)	9.46	Sine = 0.1644	
<b>Lower Truss Span</b>	<b>38</b>		
Lower roof Slope	2 /12		
Lower roof Angle (deg)	9.46	Sine = 0.1644	
Load combination factor	0.6	(ASCE 7-10 2.4.1)	
Upper floor, p <sub>n</sub>	22.5	Table 27.6-1	
Upper floor, p <sub>o</sub>	22.5	Table 27.6-1	
Main floor, p <sub>n</sub>	22.5		
Main floor, p <sub>o</sub>	22.5		
Basement floor, p <sub>n</sub>	22.5		
Basement floor, p <sub>o</sub>	22.5		
<b>Upper Floor (psf)</b>			
Net Pressure	13.5	Windward	8.4
		Leeward	5.1
		Left	7.3
		Right	7.3
<b>Main Floor (psf)</b>			
Net Pressure	13.5	Windward	8.4
		Leeward	5.1
		Left	7.3
		Right	7.3
<b>Basement Floor (psf)</b>			
Net Pressure	13.5	Windward	8.4
		Leeward	5.1
		Left	7.3
		Right	7.3
<b>Roof (psf)</b>			
Load Case 1	Zone 1	Zone 2	Exposure Adj. Factor 1.000
Load Case 2	0.0	0.0	Elevation Adj. Factor 0.816
<b>Lower Roof (psf)</b>			
Load Case 1	0.0	0.0	
Load Case 2	0.0	0.0	
<b>Roof Load</b>			
Roof Height	Length	Area (ft <sup>2</sup> )	Horizontal Force (lbs)
3.17	91.00	288.2	0
<b>Lower Roof Load</b>			
Low Roof Height	Upper Length	Lower length	Low Roof Length(ft)
0.0	91	91	0
		Area (ft <sup>2</sup> )	Horizontal Force (lbs)
		0.0	0.0
<b>Wall Load</b>			
	<b>Basement</b>	(height)	<b>1st floor</b>
		2.5	(height)
		11	<b>2nd floor</b>
		0	(height)
		ft <sup>2</sup>	force (lbs)
Windward	211	1769.4	929.5
Leeward	211	1084.5	929.5
		ft <sup>2</sup>	force (lbs)
		7785.5	0
		0	0.0
		0	0.0
<b>2nd Floor Diaphragm Shear</b>			
Total Shear (lbs)	0		
<b>1st Floor Diaphragm Shear</b>			
Total Shear (lbs)	6279		
<b>Basement Diaphragm Shear</b>			
Total Shear (lbs)	13984		
<b>Base Wind Shear</b>			
	15411		
<b>Hurricane Ties</b>			
<b>Uplift</b>		<b>Factors of Safety</b>	
Roof (per truss)	(lbs)	H1	H2.5
Low roof (per truss)	-342.0	-1.71	-1.75
	-	-	-
<b>Lateral</b>		H1	H2.5
Roof (per truss)	(lbs)	#DIV/0!	#DIV/0!
Low roof (per truss)	0.0	-	-

Plan: R1889  
Date: 7/15/2019  
Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	
	Moment: 2.76	TL Deflection: 1.47	Moment: 1.55 Roof	Moment: 1.3	
<b>JOIST SPECIFICATION</b>		Truss Joists	Truss Joists		Truss Joists
Joist Type:	SAWN	TJI	TJI	SAWN	TJI
Joist Series:	DF #2	360	360	DF #2	210
Joist Depth (ft):	11.25	11.88	14	11.25	11.88
Joist Span (ft):	8	18	18	12	2
Joist Spacing (in):	16	16	16	16	16
<b>LOAD PARAMETERS</b>					
Floor Dead Load	30	30	30	30	30
Floor Live Load	60	40	55	55	40
Total Floor Load	90	70	85	85	70
Pressure Treated (Sawn Only)	No	No	No	No	No
<b>SIMPLE SPAN JOIST</b>					
Duration Increase	1	1	1	1	1
Joist Weight (plf)	3.375	3	3.3	3.375	2.8
Joist Loading (plf)	123	96	117	117	96
Max Reaction (lb)	494	867	1050	700	96
Max Moment (ft-lb)	987	3902	4724	2101	48
<b>JOIST DETERMINATION</b>					
F'b (psi)	1035	6180	7335	1035	3795
Max Bending Stress (Sawn Only) (psi)	374.3	1326.9	1156.8	796.7	16.3
<b>Moment FS</b>	<b>2.76</b>	<b>1.58</b>	<b>1.55</b>	<b>1.30</b>	<b>78.95</b>
Max Shear Capacity (lb)	2025	1705	1955	2025	1655
<b>Shear FS</b>	<b>4.10</b>	<b>1.97</b>	<b>1.86</b>	<b>2.89</b>	<b>17.22</b>
Bearing Required (in)	2.00	2.00	2.00	2.00	2.00
Live Load Deflection Limit	360	360	360	360	360
Live Load Deflection (in)	0.03	0.34	0.33	0.12	0.00
Allowable Live Load Deflection (in)	0.27	0.60	0.60	0.40	0.07
<b>LL Deflection FS</b>	<b>10.30</b>	<b>1.77</b>	<b>1.83</b>	<b>3.33</b>	<b>123.36</b>
Total Load Deflection Limit	240	240	240	240	240
Total Load Deflection (in)	0.04	0.61	0.52	0.19	0.00
Allowable Total Load Deflection (in)	0.40	0.90	0.90	0.60	0.10
<b>TL Deflection FS</b>	<b>10.02</b>	<b>1.47</b>	<b>1.72</b>	<b>3.14</b>	<b>102.66</b>
<b>SELECTION</b>	2x12 DF #2 @ 16" O.C.	11 7/8" TJI 360 @ 16" O.C.	14" TJI 360 @ 16" O.C.	2x12 DF #2 @ 16" O.C.	11 7/8" TJI 210 @ 16" O.C.

Plan: R1889  
 Date: 7/15/2019  
 Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

**Beam Page 1**

RB-1	(2) 11 7/8" LVL	2.0E 2600 Fb
RB-2	(3) 18" LVL	2.0E 2600 Fb
RB-3	(2) 2X6's DF #2	
RB-4	(3) 16" LVL	2.0E 2600 Fb
RB-5	(2) 2X6's DF #2	
RB-6	(2) 2X8's DF #2	
RB-7	(2) 11 7/8" LVL	2.0E 2600 Fb
RB-8	(2) 2X10's DF #2	
RB-9	(2) 9 1/2" LVL	2.0E 2600 Fb
RB-10	(2) 2X8's DF #2	

**Beam Page 2**

RB-11	(2) 2X10's DF #2	
RB-12	(2) 11 7/8" LVL	2.0E 2600 Fb
RB-13	(2) 11 7/8" LVL	2.0E 2600 Fb
RB-14	5 1/8" x 27" GLB	24F-V4
RB-14 (OPT)	W10x88 Steel	Gr 50
RB-14 (OPT)	W14x53 Steel	Gr 50
RB-15	5 1/8" x 24" GLB	24F-V4
RB-16	(2) 2X10's DF #2	
RB-17	(2) 11 7/8" LVL	2.0E 2600 Fb
RB-18	(2) 2X10's DF #2	

**Beam Page 3**

RB-19	(2) 11 7/8" LVL	2.0E 2600 Fb
MFB-1	(2) 11 7/8" LVL	2.0E 2600 Fb
MFB-2	(2) 2X12's DF #2	
MFB-3	(2) 2X6's DF #2	
MFB-4	(2) 11 7/8" LVL	2.0E 2600 Fb
MFB-5	(2) 2X8's DF #2	

**Beam Page 4**

MFB-6	W12x19 Steel	Gr 50
MFB-7	(2) 11 7/8" LVL	2.0E 2600 Fb
MFB-8	(2) 11 7/8" LVL	2.0E 2600 Fb
MFB-9	W10x30 Steel	Gr 50
MFB-10	W10x30 Steel	Gr 50
MFB-11	W10x33 Steel	Gr 50
MFB-12	10 3/4" x 12" GLB	24F-V4
MFB-13	(2) 9 1/2" LVL	2.0E 2600 Fb



Plan: R1889  
 Date: 07/15/2019  
 Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	(2) 11 7/8" LVL	(3) 18" LVL	(2) 2X6's DF #2	(3) 16" LVL	(2) 2X6's DF #2	(2) 2X8's DF #2	(2) 11 7/8" LVL	(2) 2X10's DF #2	(2) 9 1/2" LVL	(2) 2X8's DF #2
	Moment: 1.42	Moment: 1.25	Moment: 4.02	Moment: 1.27	Moment: 1.18	Moment: 1.37	Moment: 1.07	Moment: 1.63	Moment: 2.09	Moment: 1.1
	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S
Controlling Load Case	RB-1	RB-2	RB-3	RB-4	RB-5	RB-6	RB-7	RB-8	RB-9	RB-10
Name	LVL	LVL	DF #2	LVL	DF #2	DF #2	LVL	DF #2	LVL	DF #2
Grade										
<b>LOADING PARAMETERS</b>										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	70	70	70	70	70	70	70	70	70	70
Roof Live Load (psf)	55	55	55	55	55	55	55	55	55	55
Roof Total Load (psf)	70	70	70	70	70	70	70	70	70	70
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
<b>BEAM SPECIFICATIONS</b>										
Beam Span (ft)	12	16.67	4	16	4	4	12	5	9.67	4
Beam Weight (plf)	12.06	27.41	3.30	24.36	3.30	4.35	12.06	5.55	9.64	4.35
<b>BEAM SIZING</b>										
Beam Depth (in)	11.88	18	5.5	16	5.5	7.25	11.88	9.25	9.5	7.25
Beam Width/Weight	3.5	5.25	3	5.25	3	3	3.5	3	3.5	3
<b>UNIFORM LOADING</b>										
Floor Span (ft)	0	0	0	0	0	0	0	0	0	0
Roof Span (ft)	18.5	37.5	4	31	16	24	25	18.5	13.5	29
Wall Height (ft)	2	0	2	2	3	1	2	2	0	3
Total Uniform Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Live Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Uniform Roof Load (plf)	647.5	1312.5	140	1085	560	840	875	647.5	472.5	1015
Total Live Roof Load (plf)	508.75	1031.25	110	852.5	440	660	687.5	508.75	371.25	797.5
Total Uniform Wall Load (plf)	40	0	40	40	60	20	40	40	0	60
<b>PARTIALLY UNIFORM LOADING</b>										
Partially Uniform Load 1										
1 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
1 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
1 End Point (ft)	0	0	0	0	0	0	0	0	0	0
1 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
Partially Uniform Load 2										
2 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
2 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
2 End Point (ft)	0	0	0	0	0	0	0	0	0	0
2 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
Partially Uniform Load 3										
3 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
3 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
3 End Point (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
<b>POINT LOADS</b>										
Point Load 1										
1 Location (ft)	0	0	0	0	0	0	0	0	0	0
1 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
Point Load 2										
2 Location (ft)	0	0	0	0	0	0	0	0	0	0
2 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
Point Load 3										
3 Location (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
<b>TAPERED LOADS</b>										
Tapered Load Starting Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load Ending Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load at Start (plf)	0	0	0	0	0	0	0	0	0	0
Tapered Load at End (plf)	0	0	0	0	0	0	0	0	0	0
<b>REACTIONS &amp; MOMENT</b>										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	4197	11168	367	9195	1247	1729	5562	1733	2331	2159
Right Reaction (lb)	4197	11168	367	9195	1247	1729	5562	1733	2331	2159
Max Moment (lb-ft)	12592	46542	367	36780	1247	1729	16687	2166	5635	2159
Max Shear (lb)	4197	11168	367	9195	1247	1729	5562	1733	2331	2159
C <sub>v</sub>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C <sub>t</sub>	1.00	1.00	1.30	1.00	1.30	1.20	1.10	1.10	1.00	1.20
Area (in <sup>2</sup> )	41.58	94.50	16.50	84.00	16.50	21.75	41.58	27.75	33.25	21.75
Moment of Inertia I (in <sup>4</sup> )	489	2552	42	1792	42	95	489	198	250	95
Maximum Bending Stress (psi)	1835	1970	291	1970	989	789	2432	607	1284	986
Allowable Bending Stress (psi)	2604	2461	1170	2500	1170	1080	2604	990	2684	1080
Allowable Moment (lb-ft)	17862	58130	1475	46671	1475	2365	17862	3529	11775	2365
<b>MOMENT FS</b>	1.42	1.25	4.02	1.27	1.18	1.37	1.07	1.63	2.09	1.10
Allowable Shear Stress (psi)	285	285	180	285	180	180	285	180	285	180
Maximum Shear Capacity (lb)	7900	17955	1980	15960	1980	2610	7900	3330	6318	2610
<b>SHEAR FS</b>	1.88	1.81	5.40	1.74	1.69	1.51	1.42	1.82	2.71	1.21
Bearing Required	1.60	2.84	0.20	2.34	0.66	0.92	2.12	0.92	0.89	1.15
Elastic Modulus (psi)	2,000,000	2,000,000	1,600,000	2,000,000	1,600,000	1,600,000	2,000,000	1,600,000	2,000,000	1,600,000
Live Load Deflection (in)	0.25	0.35	0.01	0.35	0.04	0.03	0.33	0.02	0.15	0.03
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.40	0.56	0.13	0.53	0.13	0.13	0.40	0.17	0.32	0.13
<b>LIVE LOAD DEFLECTION FS</b>	1.63	1.57	13.87	1.51	3.47	5.29	1.21	7.30	2.19	4.38
Total Load Deflection (in)	0.34	0.46	0.02	0.48	0.05	0.03	0.45	0.03	0.19	0.04
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.60	0.83	0.20	0.80	0.20	0.20	0.60	0.25	0.48	0.20
<b>TOTAL LOAD DEFLECTION FS</b>	1.78	1.81	12.48	1.68	3.67	6.06	1.34	8.04	2.52	4.86
<b>SELECTION</b>	LVL	LVL	DF #2	LVL	DF #2	DF #2	LVL	DF #2	LVL	DF #2
	(2) 11 7/8"	(3) 18"	(2) 2X6's	(3) 16"	(2) 2X6's	(2) 2X8's	(2) 11 7/8"	(2) 2X10's	(2) 9 1/2"	(2) 2X8's

Plan: R1889  
 Date: 07/15/2019  
 Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	(2) 2X10's DF #2	(2) 11 7/8" LVL	(2) 11 7/8" LVL	5 1/8" x 27" GLB	W10x8 Steel	W14x53 Steel	5 1/8" x 24" GLB	(2) 2X10's DF #2	(2) 11 7/8" LVL	(2) 2X10's DF #2
	Moment: 1.23	Moment: 1.41	Shear: 2.06	Moment: 1.6	LL Deflection: L/665	LL Deflection: L/673	Moment: 1.81	Shear: 1.34	Moment: 1.23	Shear: 1.32
	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S	DL+S
Controlling Load Case	RB-11	RB-12	RB-13	RB-14	RB-14 (OPT)	RB-14 (OPT)	RB-15	RB-16	RB-17	RB-18
Name	DF #2	LVL	LVL	GLB	Steel	Steel	GLB	DF #2	LVL	DF #2
Grade										
<b>LOADING PARAMETERS</b>										
Floor Live Load (psf)	40	40	40	40	40	40	40	40	40	40
Floor Total Load (psf)	70	70	70	70	70	70	70	70	70	70
Roof Live Load (psf)	55	55	55	55	55	55	55	55	55	55
Roof Total Load (psf)	70	70	70	70	70	70	70	70	70	70
Wall Load (psf)	20	20	20	20	20	20	20	20	20	20
<b>BEAM SPECIFICATIONS</b>										
Beam Span (ft)	5.5	12.5	8	26	9'3" max unbraced	6'9" max unbraced	26	18.5	4	11
Beam Weight (plf)	5.55	12.06	12.06	33.60	88.00	53.00	29.86	5.55	12.06	5.55
<b>BEAM SIZING</b>										
Beam Depth (in)	9.25	11.88	11.88	27	10	14	24	9.25	11.88	9.25
Beam Width/Weight	3	3.5	3.5	5.125	88	53	5.125	3	3.5	3
<b>UNIFORM LOADING</b>										
Floor Span (ft)	0	0	0	0	0	0	0	0	0	0
Roof Span (ft)	21.5	13.33	27	25	25	25	32	32	18.5	16
Wall Height (ft)	0	2	0	0	0	0	6	6	3	3
Total Uniform Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Live Floor Load (plf)	0	0	0	0	0	0	0	0	0	0
Total Uniform Roof Load (plf)	752.5	466.55	945	875	875	875	1120	1120	647.5	560
Total Live Roof Load (plf)	591.25	366.575	742.5	687.5	687.5	687.5	880	880	508.75	440
Total Uniform Wall Load (plf)	0	40	0	0	0	0	120	120	60	60
<b>PARTIALLY UNIFORM LOADING</b>										
Partially Uniform Load 1										
1 Span/Height (ft)	0	0	0	Roof	Roof	Roof	----	----	Roof	----
1 Start Point (ft)	0	0	0	17.67	17.67	17.67	0	0	0	0
1 End Point (ft)	0	0	0	26	26	26	0	0	9.67	0
1 Total Partially Uniform Load (plf)	0	0	0	70	70	70	0	0	245	0
Partially Uniform Load 2										
2 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
2 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
2 End Point (ft)	0	0	0	0	0	0	0	0	0	0
2 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
Partially Uniform Load 3										
3 Span/Height (ft)	0	0	0	0	0	0	0	0	0	0
3 Start Point (ft)	0	0	0	0	0	0	0	0	0	0
3 End Point (ft)	0	0	0	0	0	0	0	0	0	0
3 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0	0	0
<b>POINT LOADS</b>										
Point Load 1										
1 Location (ft)	---	RB-21 #1	RB-21 #2	RB-21 #2	RB-21 #2	RB-21 #2	---	---	---	RB-21 #1
1 Total Load (lb)	0	9.67	3	4.33	4.33	4.33	0	0	0	3
1 Total Load (lb)	0	1702	0	0	0	0	0	0	0	1702
Point Load 2										
2 Location (ft)	---	---	---	---	---	---	---	---	---	---
2 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
Point Load 3										
3 Location (ft)	---	---	---	---	---	---	---	---	---	---
3 Total Load (lb)	0	0	0	0	0	0	0	0	0	0
<b>TAPERED LOADS</b>										
Tapered Load Starting Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load Ending Point (ft)	0	0	0	0	0	0	0	0	0	0
Tapered Load at Start (plf)	0	0	0	0	0	0	0	0	0	0
Tapered Load at End (plf)	0	0	0	0	0	0	0	0	0	0
<b>REACTIONS &amp; MOMENT</b>										
Duration Increase	1	1	1	1	1	1	1	1	1	1
Left Reaction (lb)	2085	3627	3828	11905	12612	12157	11746	2491	5285	1677
Right Reaction (lb)	2085	4558	3828	12301	13009	12554	11746	2491	4999	2528
Max Moment (lb-ft)	2865	12681	7656	77996	82592	79635	54325	2491	14481	2247
Max Shear (lb)	2085	4558	3828	12301	13009	12554	11746	2491	5285	2528
C <sub>v</sub>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C <sub>t</sub>	1.10	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.00	1.10
Area (in <sup>2</sup> )	27.75	41.58	41.58	138.38	---	---	123.00	27.75	41.58	27.75
Moment of Inertia I (in <sup>4</sup> )	198	489	489	8406	534	541	5904	198	489	198
Maximum Bending Stress (psi)	804	1848	1116	1503	9280	12365	1325	699	2111	630
Allowable Bending Stress (psi)	990	2604	2604	2400	470833	362917	2400	990	2604	990
Allowable Moment (lb-ft)	3529	17862	17862	124538	281936	217315	98400	3529	17862	3529
<b>MOMENT FS</b>	1.23	1.41	2.33	1.60	3.41	2.73	1.81	1.42	1.23	1.57
Allowable Shear Stress (psi)	180	285	285	285	---	---	285	180	285	180
Maximum Shear Capacity (lb)	3330	7900	7900	24446	93750	157500	21730	3330	7900	3330
<b>SHEAR FS</b>	1.60	1.73	2.06	1.99	7.21	12.55	1.85	1.34	1.49	1.32
Bearing Required	1.11	1.74	1.46	3.69	---	---	3.53	1.33	2.01	1.35
Elastic Modulus (psi)	1,600,000	2,000,000	2,000,000	1,800,000	29,000,000	29,000,000	1,800,000	1,600,000	2,000,000	1,600,000
Live Load Deflection (in)	0.04	0.27	0.07	0.48	0.47	0.46	0.22	0.02	0.24	0.01
Live Load Deflection Limit	360	360	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.18	0.42	0.27	0.87	0.87	0.87	0.62	0.13	0.37	0.13
<b>LIVE LOAD DEFLECTION FS</b>	4.72	1.55	3.77	1.80	1.85	1.87	2.80	8.25	1.55	8.95
Total Load Deflection (in)	0.05	0.37	0.09	0.63	0.66	0.62	0.32	0.02	0.33	0.02
Total Load Deflection Limit	240	240	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.28	0.63	0.40	1.30	1.30	1.30	0.93	0.20	0.55	0.20
<b>TOTAL LOAD DEFLECTION FS</b>	5.53	1.68	4.39	2.05	1.98	2.91	8.74	1.69	1.69	9.92
<b>SELECTION</b>										
DF #2	(2) 2X10's	(2) 11 7/8"	(2) 11 7/8"	5 1/8" x 27"	W10x88	W14x53	5 1/8" x 24"	(2) 2X10's	(2) 11 7/8"	(2) 2X10's

Plan: R1889  
 Date: 07/15/2019  
 Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

	PASS (2) 11 7/8" LVL Moment: 1.97 DL+0.75LL+0.75S	PASS (2) 11 7/8" LVL Moment: 1.1 DL+0.75LL+0.75S	PASS (2) 2X12's DF #2 Moment: 1.51 DL+LL	PASS (2) 2X6's DF #2 Moment: 2.6 DL+LL	PASS (2) 11 7/8" LVL Moment: 1.36 DL+LL	PASS (2) 2X8's DF #2 Moment: 1.19 DL+LL
	RB-19 LVL	MFB-1 LVL	MFB-2 DF #2	MFB-3 DF #2	MFB-4 LVL	MFB-5 DF #2
<b>LOADING PARAMETERS</b>						
Floor Live Load (psf)	40	40	40	40	40	40
Floor Total Load (psf)	70	70	70	70	70	70
Roof Live Load (psf)	55	55	55	55	55	55
Roof Total Load (psf)	70	70	70	70	70	70
Wall Load (psf)	20	20	20	20	20	20
<b>BEAM SPECIFICATIONS</b>						
Beam Span (ft)	11.5	9	10	4	12	5
Beam Weight (plf)	12.06	12.06	6.75	3.30	12.06	4.35
<b>BEAM SIZING</b>						
Beam Depth (in)	11.88	11.88	11.25	5.5	11.88	7.25
Beam Width/Weight	3.5	3.5	3	3	3.5	3
<b>UNIFORM LOADING</b>						
Floor Span (ft)	0	26	7	6	18.5	16
Roof Span (ft)	0	13	0	0	0	0
Wall Height (ft)	0	0	0	3.5	3.5	3.5
Total Uniform Floor Load (plf)	0	780	245	210	647.5	560
Total Live Floor Load (plf)	0	390	140	120	370	320
Total Uniform Roof Load (plf)	0	365.625	0	0	0	0
Total Live Roof Load (plf)	0	268.125	0	0	0	0
Total Uniform Wall Load (plf)	0	0	0	70	70	70
<b>PARTIALLY UNIFORM LOADING</b>						
Partially Uniform Load 1						
1 Span/Height (ft)	0	Roof -13	0	0	0	0
1 Start Point (ft)	0	2.67	0	0	0	0
1 End Point (ft)	0	5.67	0	0	0	0
1 Total Partially Uniform Load (plf)	0	-365.625	0	0	0	0
Partially Uniform Load 2						
2 Span/Height (ft)	0	0	0	0	0	0
2 Start Point (ft)	0	0	0	0	0	0
2 End Point (ft)	0	0	0	0	0	0
2 Total Partially Uniform Load (plf)	0	0	0	0	0	0
Partially Uniform Load 3						
3 Span/Height (ft)	0	0	0	0	0	0
3 Start Point (ft)	0	0	0	0	0	0
3 End Point (ft)	0	0	0	0	0	0
3 Total Partially Uniform Load (plf)	0	0	0	0	0	0
<b>POINT LOADS</b>						
Point Load 1						
1 Location (ft)	0	RB-18 Left 2.67	0	0	0	0
1 Total Load (lb)	0	1677	0	0	0	0
Point Load 2						
2 Location (ft)	0	RB-18 Right 5.67	0	0	0	0
2 Total Load (lb)	0	2528	0	0	0	0
Point Load 3						
3 Location (ft)	0	0	0	0	0	0
3 Total Load (lb)	0	0	0	0	0	0
<b>TAPERED LOADS</b>						
Tapered Load Starting Point (ft)	0	0	0	0	0	0
Tapered Load Ending Point (ft)	11.5	0	0	0	0	0
Tapered Load at Start (plf)	0	0	0	0	0	0
Tapered Load at End (plf)	560	0	0	0	0	0
<b>REACTIONS &amp; MOMENT</b>						
Duration Increase	1	1	1	1	1	1
Left Reaction (lb)	1143	6735	1259	567	4377	1586
Right Reaction (lb)	2216	6791	1259	567	4377	1586
Max Moment (lb-ft)	9079	16267	3147	567	13132	1982
Max Shear (lb)	2216	6791	1259	567	4377	1586
C <sub>v</sub>	1.00	1.00	1.00	1.00	1.00	1.00
C <sub>t</sub>	1.00	1.00	1.00	1.30	1.00	1.20
Area (in <sup>2</sup> )	41.58	41.58	33.75	16.50	41.58	21.75
Moment of Inertia I (in <sup>4</sup> )	489	489	356	42	489	95
Maximum Bending Stress (psi)	1323	2371	597	450	1914	905
Allowable Bending Stress (psi)	2604	2604	900	1170	2604	1080
Allowable Moment (lb-ft)	17862	17862	4746	1475	17862	2365
<b>MOMENT FS</b>						
Allowable Shear Stress (psi)	285	285	180	180	285	180
Maximum Shear Capacity (lb)	7900	7900	4050	1980	7900	2610
<b>BEARING FS</b>						
Bearing Required	0.84	2.59	0.67	0.30	1.67	0.85
Elastic Modulus (psi)	2,000,000	2,000,000	1,600,000	1,600,000	2,000,000	1,600,000
Live Load Deflection (in)	0.18	0.15	0.06	0.01	0.18	0.03
Live Load Deflection Limit	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.38	0.30	0.33	0.13	0.40	0.17
<b>LIVE LOAD DEFLECTION FS</b>						
Total Load Deflection (in)	2.14	2.01	5.97	12.71	2.24	5.59
Total Load Deflection Limit	0.23	0.24	0.10	0.02	0.35	0.06
Allowable Total Load Deflection (in)	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.58	0.45	0.50	0.20	0.60	0.25
<b>TOTAL LOAD DEFLECTION FS</b>						
SELECTION	LVL (2) 11 7/8"	LVL (2) 11 7/8"	DF #2 (2) 2X12's	DF #2 (2) 2X6's	LVL (2) 11 7/8"	DF #2 (2) 2X8's

Plan: R1889  
 Date: 07/15/2019  
 Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

	PASS W12x19 Steel TL Deflection: L/309	PASS (2) 11 7/8" LVL Moment: 1.57	PASS (2) 11 7/8" LVL Moment: 8.81	PASS W10x30 Steel Moment: 4.54	PASS W10x30 Steel Moment: 12.95	PASS W10x33 Steel LL Deflection: L/396	PASS 10 3/4" x 12" GLB TL Deflection: L/300	PASS (2) 9 1/2" LVL Moment: 1.19
	DL+LL	DL+LL	DL+LL	DL+LL	DL+LL	DL+LL	DL+LL	DL+LL
Name	MFB-6	MFB-7	MFB-8	MFB-9	MFB-10	MFB-11	MFB-12	MFB-13
Grade	Steel	LVL	LVL	Steel	Steel	Steel	GLB	LVL
<b>LOADING PARAMETERS</b>								
Floor Live Load (psf)	40	40	40	40	40	40	60	40
Floor Total Load (psf)	70	70	70	70	70	70	90	70
Roof Live Load (psf)	55	55	55	55	55	55	55	55
Roof Total Load (psf)	70	70	70	70	70	70	70	70
Wall Load (psf)	20	20	20	20	20	20	20	20
<b>BEAM SPECIFICATIONS</b>	2'10" max unbraced			4'10" max unbraced	4'10" max unbraced	6'10" max unbraced		
Beam Span (ft)	18	11.33	10.33	11.33	8	15.5	19.5	10
Beam Weight (plf)	19.00	12.06	12.06	30.00	30.00	33.00	31.32	9.64
<b>BEAM SIZING</b>								
Beam Depth (in)	12	11.88	11.88	10	10	10	12	9.5
Beam Width/Weight	19	3.5	3.5	30	30	33	10.75	3.5
<b>UNIFORM LOADING</b>								
Floor Span (ft)	16	18.33	4	24.33	24.33	16	14	19
Roof Span (ft)	0	0	0	0	0	0	0	0
Wall Height (ft)	3.5	3.5	0	0	0	0	0	6
Total Uniform Floor Load (plf)	560	641.55	140	851.55	851.55	560	630	665
Total Live Floor Load (plf)	320	366.6	80	486.6	486.6	320	420	380
Total Uniform Roof Load (plf)	0	0	0	0	0	0	0	0
Total Live Roof Load (plf)	0	0	0	0	0	0	0	0
Total Uniform Wall Load (plf)	70	70	0	0	0	0	0	120
<b>PARTIALLY UNIFORM LOADING</b>								
Partially Uniform Load 1	Floor	Floor	----	----	----	Floor	----	----
1 Span/Height (ft)	13.005	-5.5	0	0	0	10.33	0	0
1 Start Point (ft)	0	9	0	0	0	0	0	0
1 End Point (ft)	18	11.33	0	0	0	7	0	0
1 Total Partially Uniform Load (plf)	455.175	-192.5	0	0	0	361.55	0	0
Partially Uniform Load 2	----	----	----	----	----	----	----	----
2 Span/Height (ft)	0	0	0	0	0	0	0	0
2 Start Point (ft)	0	0	0	0	0	0	0	0
2 End Point (ft)	0	0	0	0	0	0	0	0
2 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0
Partially Uniform Load 3	----	----	----	----	----	----	----	----
3 Span/Height (ft)	0	0	0	0	0	0	0	0
3 Start Point (ft)	0	0	0	0	0	0	0	0
3 End Point (ft)	0	0	0	0	0	0	0	0
3 Total Partially Uniform Load (plf)	0	0	0	0	0	0	0	0
<b>POINT LOADS</b>								
Point Load 1	---	---	---	RB-14 Left	---	MFB-8 Right	---	---
1 Location (ft)	0	0	0	1	0	7.5	0	0
1 Total Load (lb)	0	0	0	11905	0	785	0	0
Point Load 2	---	---	---	---	---	RB-13/RB-14	---	---
2 Location (ft)	0	0	0	0	0	7.5	0	0
2 Total Load (lb)	0	0	0	0	0	16130	0	0
Point Load 3	---	---	---	---	---	---	---	---
3 Location (ft)	0	0	0	0	0	0	0	0
3 Total Load (lb)	0	0	0	0	0	0	0	0
<b>TAPERED LOADS</b>								
Tapered Load Starting Point (ft)	0	0	0	0	0	0	0	0
Tapered Load Ending Point (ft)	0	0	0	0	0	0	0	0
Tapered Load at Start (plf)	0	0	0	0	0	0	0	0
Tapered Load at End (plf)	0	0	0	0	0	0	0	0
<b>REACTIONS &amp; MOMENT</b>								
Duration Increase	1	1	1	1	1	1	1	1
Left Reaction (lb)	9938	4053	785	15848	3526	15285	6448	3973
Right Reaction (lb)	9938	3697	785	6045	3526	13352	6448	3973
Max Moment (lb-ft)	44719	11351	2028	20129	7052	87840	31433	9933
Max Shear (lb)	9938	4053	785	15848	3526	15285	6448	3973
C <sub>v</sub>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C <sub>t</sub>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Area (in <sup>2</sup> )	---	41.58	41.58	---	---	---	129.00	33.25
Moment of Inertia I (in <sup>4</sup> )	130	489	489	170	170	171	1548	250
Maximum Bending Stress (psi)	24767	1655	296	7104	2489	30821	1462	2264
Allowable Bending Stress (psi)	102917	2604	2604	152500	152500	161667	2400	2684
Allowable Moment (lb-ft)	61627	17862	17862	91317	91317	96806	51600	11775
<b>MOMENT FS</b>	1.38	1.57	8.81	4.54	12.95	1.10	1.64	1.19
Allowable Shear Stress (psi)	---	285	285	---	---	---	265	285
Maximum Shear Capacity (lb)	90000	7900	7900	93750	93750	93750	22790	6318
<b> SHEAR FS</b>	9.06	1.95	10.06	5.92	26.59	6.13	3.53	1.59
Bearing Required	---	1.54	0.30	---	---	---	0.92	1.51
Elastic Modulus (psi)	29,000,000	2,000,000	2,000,000	29,000,000	29,000,000	29,000,000	1,800,000	2,000,000
Live Load Deflection (in)	0.37	0.14	0.02	0.06	0.01	0.47	0.50	0.17
Live Load Deflection Limit	360	360	360	360	360	360	360	360
Allowable Live Load Deflection (in)	0.60	0.38	0.34	0.38	0.27	0.52	0.65	0.33
<b>LIVE LOAD DEFLECTION FS</b>	1.63	2.77	16.27	5.95	29.03	1.10	1.31	1.93
Total Load Deflection (in)	0.70	0.27	0.04	0.10	0.02	0.66	0.78	0.36
Total Load Deflection Limit	240	240	240	240	240	240	240	240
Allowable Total Load Deflection (in)	0.90	0.57	0.52	0.57	0.40	0.78	0.98	0.50
<b>TOTAL LOAD DEFLECTION FS</b>	1.29	2.10	12.84	5.63	24.03	1.18	1.25	1.38
<b>SELECTION</b>	Steel	LVL	LVL	Steel	Steel	Steel	GLB	LVL
	W12x19	(2) 11 7/8"	(2) 11 7/8"	W10x30	W10x30	W10x33	10 3/4" x 12"	(2) 9 1/2"

Plan: R1889  
Date: 7/15/2019  
Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>
	<b>8x8 POST</b>	<b>4x6 POST</b>	<b>3 1/2" x 5 1/4" Parallam</b>	<b>8x8 POST</b>	<b>8x8 POST</b>
Controlling Factor	FS:2.2 Axial Compression	FS:1.3 Axial Compression	FS:1.5 Axial Compression	FS:3.8 Axial Compression	FS:1.9 Axial Compression
Location:	<b>RB-13/RB-14</b>	<b>RB-14</b>	<b>MFB-9</b>	<b>MFB-9/MFB-10</b>	<b>MFB-10/MFB-11</b>
	---	Left	Left	---	---
<b>COLUMN DIMENSIONS:</b>					
Total Column Length (ft):	10	10	10	10	10
X-Unbraced Length (ft):	10	10	10	10	10
Y-Unbraced Length (ft):	0	0	0	0	0
<b>MATERIAL SPECS:</b>					
Material:	Doug Fir #2	Doug Fir #2	Parallam	Doug Fir #2	Doug Fir #2
Depth-x (in):	7.5	5.5	5.25	7.5	7.5
Width-y (in):	7.5	3.5	3.5	7.5	7.5
# Members	1	1	1	1	1
<b>Choose Post or Stud spacing</b>					
Post, Axial Load (lbs)	16130	11905	15848	9571	18812
Post, Lateral Loading (plf)	0	0	0	0	0
<b>Loading for Stud Design</b>					
Lateral Loading (psf)	0	0	0	0	0
Roof Span (ft)	0	0	0	0	0
Floor Span (ft)	0	0	0	0	0
Additional Wall Height (ft)	0	0	0	0	0
Allowable Bending Stress (psi)	1,728	2,153	4,416	1,728	1,728
F <sub>bE</sub>	423,000	155,018	256,166	423,000	423,000
Moment of Inertia (in <sup>4</sup> )	264	49	42	264	264
<b>D+ (0.6W)</b>					
Bending Stress (f <sub>b</sub> )	0	0	0	0	0
f <sub>c</sub> (psi)	287	618	862	170	334
Bending and Axial (3.9-3)	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>D + 0.75L + 0.75S + 0.75(0.6W)</b>					
Bending Stress (f <sub>b</sub> )	0	0	0	0	0
f <sub>c</sub> (psi)	287	618	862	170	334
Bending and Axial (3.9-3)	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>MATERIAL PROPERTIES:</b>					
Area (in <sup>2</sup> )	56.25	19.25	18.38	56.25	56.25
F <sub>c</sub>	700	1,350	2,500	700	700
E	1,300,000	1,600,000	1,800,000	1,300,000	1,300,000
E <sub>min</sub>	470,000	580,000	914,880	470,000	470,000
Lex/dx	16.00	21.82	22.86	16.00	16.00
Ley/dy	0.00	0.00	0.00	0.00	0.00
<b>FACTORS:</b>					
C <sub>d</sub> (axial loads)	1	1	1	1	1
C <sub>d</sub> (lateral loads)	1.6	1.6	1.6	1.6	1.6
C <sub>L</sub>	1.000	0.999	0.999	1.000	1.000
C <sub>f</sub> (compression)	1.05	1.1	1	1.05	1.05
C <sub>f</sub> (bending)	1.2	1.3	1	1.2	1.2
C <sub>r</sub> (bending only)	1	1.15	1.15	1	1
Ke	1	1	1	1	1
F <sub>c</sub> *	735	1,485	2,500	735	735
F <sub>ce</sub>	1,509	1,002	1,439	1,509	1,509
C <sub>p</sub>	0.87	0.54	0.52	0.87	0.87
F' <sub>c</sub>	641	808	1,299	641	641
Allowable Load (lbs)	<b>36,030</b>	<b>15,561</b>	<b>23,868</b>	<b>36,030</b>	<b>36,030</b>
Wind Deflection (in)	0.00	0.00	0.00	0.00	0.00
Wind Load Deflection Limit	120	120	120	120	120
Allowable Deflection (in)	1.0	1.0	1.0	1.0	1.0

Plan: R1889  
 Date: 7/15/2019  
 Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

OK (0% Over stress)



	PASS (4) 2x6	PASS (2) 2x6	FAIL 4x6 POST	PASS (2) 2x4	PASS 4x4 POST
Controlling Factor	FS:1.2 Axial Compression	FS:1.3 Axial Compression	FS:1 Axial Compression	FS:1.9 Axial Compression	FS:1.9 Axial Compression
Location:	MFB-6/RB-15	MFB-4/RB-7	MFB-12	RB-11	MFB-2
COLUMN DIMENSIONS:	---	---	---	---	---
Total Column Length (ft):	10	10	10	10	10
X-Unbraced Length (ft):	10	10	10	10	10
Y-Unbraced Length (ft):	0	0	0	0	0
MATERIAL SPECS:					
Material:	Doug Fir #2	Doug Fir #2	Doug Fir #2	Doug Fir #2	Doug Fir #2
Depth-x (in):	5.5	5.5	5.5	3.5	3.5
Width-y (in):	1.5	1.5	3.5	1.5	3.5
# Members	4	2	1	2	1
Choose Post or Stud spacing	Post	Post	Post	Post	Post
Post, Axial Load (lbs)	21684	9940	15285	2085	2518
Post, Lateral Loading (plf)	0	0	0	0	0
Loading for Stud Design					
Lateral Loading (psf)	0	0	0	0	0
Roof Span (ft)	0	0	0	0	0
Floor Span (ft)	0	0	0	0	0
Additional Wall Height (ft)	0	0	0	0	0
Allowable Bending Stress (psi)	2,153	2,153	2,153	2,484	2,484
F <sub>bE</sub>	455,564	113,891	155,018	178,971	243,600
Moment of Inertia (in <sup>4</sup> )	83	42	49	11	13
D+ (0.6W)					
Bending Stress (f <sub>b</sub> )	0	0	0	0	0
f <sub>c</sub> (psi)	657	602	794	199	206
Bending and Axial (3.9-3)	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
D + 0.75L + 0.75S + 0.75(0.6W)					
Bending Stress (f <sub>b</sub> )	0	0	0	0	0
f <sub>c</sub> (psi)	657	602	794	199	206
Bending and Axial (3.9-3)	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
MATERIAL PROPERTIES:					
Area (in <sup>2</sup> )	33.00	16.50	19.25	10.50	12.25
F <sub>c</sub>	1,350	1,350	1,350	1,350	1,350
E	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000
E <sub>min</sub>	580,000	580,000	580,000	580,000	580,000
Lex/dx	21.82	21.82	21.82	34.29	34.29
Ley/dy	0.00	0.00	0.00	0.00	0.00
FACTORS:					
C <sub>d</sub> (axial loads)	1	1	1	1	1
C <sub>d</sub> (lateral loads)	1.6	1.6	1.6	1.6	1.6
C <sub>L</sub>	1.000	0.999	0.999	0.999	0.999
C <sub>f</sub> (compression)	1.1	1.1	1.1	1.15	1.15
C <sub>f</sub> (bending)	1.3	1.3	1.3	1.5	1.5
C <sub>r</sub> (bending only)	1.15	1.15	1.15	1.15	1.15
Ke	1	1	1	1	1
F <sub>c</sub> *	1,485	1,485	1,485	1,553	1,553
F <sub>ce</sub>	1,002	1,002	1,002	406	406
C <sub>p</sub>	0.54	0.54	0.54	0.25	0.25
F' <sub>c</sub>	808	808	808	381	381
Allowable Load (lbs)	<b>26,676</b>	<b>13,338</b>	<b>15,561</b>	<b>3,999</b>	<b>4,665</b>
Wind Deflection (in)	0.00	0.00	0.00	0.00	0.00
Wind Load Deflection Limit	120	120	120	120	120
Allowable Deflection (in)	1.0	1.0	1.0	1.0	1.0

OK (2% Over stress)

Plan: R1889  
 Date: 7/15/2019  
 Location: R1889 - 1088 Maple Drive, Huntsville, UT, USA

	PASS	FAIL	PASS	PASS	PASS
	FS: 1.16	FS: 0.98	FS: 1.11	FS: 1.2	FS: 1.92
<b>INPUT</b>					
Location:	MFB-9	MFB-10/MFB-11	MFB-6/RB-15	MFB-12	MFB-9/MFB-10
Callout	S-42	S-42	S-48	S-42	S-42
Column Width (in)	3.5	3.5	3.5	3.5	3.5
Load (lb)	15,848	18,812	21,684	15,285	9,571
<b>SPECS</b>		BEARING FAILURE			
Soil Bearing Pressure (psf)	1500	1500	1500	1500	1500
Footing Width/Diameter (in)	42	42	48	42	42
Footing Length/Diameter (in)	42	42	48	42	42
Footing Depth (in)	10	10	12	10	10
<b>CALCULATIONS</b>					
Area Required (ft <sup>2</sup> )	10.57	12.54	14.46	10.19	6.38
Area Provided (ft <sup>2</sup> )	12.25	12.25	16.00	12.25	12.25
<b>FLEXURE</b>					
M <sub>u</sub> (lb-ft/ft)	2520.73	2992.05	3527.70	2431.19	1522.28
ΦMn (lb-ft/ft)	6396.31	6396.31	8950.37	6396.31	6396.31
<b>ONE WAY SHEAR</b>					
V <sub>u</sub> (kip)	2.12	2.52	2.39	2.05	1.28
ΦV <sub>c</sub> (kip)	6.16	6.16	8.13	6.16	6.16
<b>PUNCHING SHEAR</b>					
V <sub>u</sub> (kip)	22.7	27.0	30.9	21.9	13.7
ΦV <sub>c</sub> (kip)	40.1	40.1	63.7	40.1	40.1
<b>SELECTION</b>	S-42 42" Square by 10" Deep Concrete Footing with (5) #4 Bars Each Way	S-42 42" Square by 10" Deep Concrete Footing with (5) #4 Bars Each Way	S-48 48" Square by 12" Deep Concrete Footing with (6) #4 Bars Each Way	S-42 42" Square by 10" Deep Concrete Footing with (5) #4 Bars Each Way	S-42 42" Square by 10" Deep Concrete Footing with (5) #4 Bars Each Way

	PASS	PASS			
	FS: 1.38	FS: 3.72			
<b>INPUT</b>					
Location:	MFB-11	MFB-2	---	---	---
Callout	S-42	S-30	S-24	S-24	S-24
Column Width (in)	3.5	3.5	3.5	3.5	3.5
Load (lb)	13,352	2,518	10	10	10
<b>SPECS</b>					
Soil Bearing Pressure (psf)	1500	1500	1500	1500	1500
Footing Width/Diameter (in)	42	30	24	24	24
Footing Length/Diameter (in)	42	30	24	24	24
Footing Depth (in)	10	10	10	10	10
<b>CALCULATIONS</b>					
Area Required (ft <sup>2</sup> )	8.90	1.68	0.01	0.01	0.01
Area Provided (ft <sup>2</sup> )	12.25	6.25	4.00	4.00	4.00
<b>FLEXURE</b>					
M <sub>u</sub> (lb-ft/ft)	2123.66	371.82	1.38	1.38	1.38
ΦMn (lb-ft/ft)	6396.31	5413.24	6700.37	6700.37	6700.37
<b>ONE WAY SHEAR</b>					
V <sub>u</sub> (kip)	1.79	0.36	0.00	0.00	0.00
ΦV <sub>c</sub> (kip)	6.16	6.16	6.16	6.16	6.16
<b>PUNCHING SHEAR</b>					
V <sub>u</sub> (kip)	19.1	3.4	0.0	0.0	0.0
ΦV <sub>c</sub> (kip)	40.1	40.1	40.1	40.1	40.1
<b>SELECTION</b>	S-42 42" Square by 10" Deep Concrete Footing with (5) #4 Bars Each Way	S-30 30" Square by 10" Deep Concrete Footing with (3) #4 Bars Each Way	S-24 24" Square by 10" Deep Concrete Footing with (3) #4 Bars Each Way	S-24 24" Square by 10" Deep Concrete Footing with (3) #4 Bars Each Way	S-24 24" Square by 10" Deep Concrete Footing with (3) #4 Bars Each Way

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: 15 AUG 2019, 8:26AM

## Wood Beam

File = \\MORGAN-SHARE\Awork\DESIGN-1\HABITA-1\Rambler\2019\1889--1\Beams.ec6 .  
 Software copyright ENERCALC, INC. 1983-2019, Build:10.19.1.30 .

Lic. # : KW-06012024

York Engineering

DESCRIPTION: RB-21

### CODE REFERENCES

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

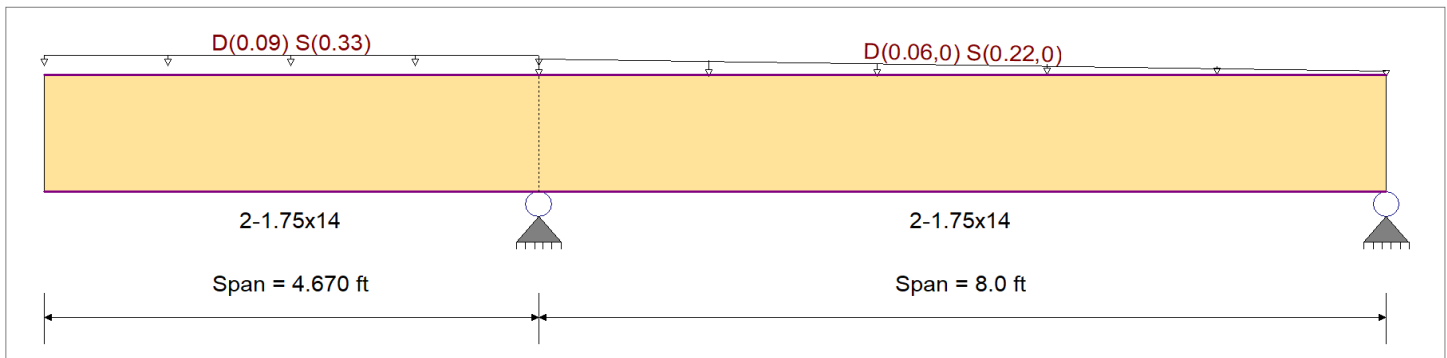
### Material Properties

Analysis Method : Allowable Stress Design  
 Load Combination : ASCE 7-16

Wood Species : iLevel Truss Joist  
 Wood Grade : MicroLam LVL 1.9 E

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

Fb + 2600 psi E : Modulus of Elasticity  
 Fb - 2600 psi Ebend- xx 1900ksi  
 Fc - Prll 2510 psi Eminbend - xx 965.71 ksi  
 Fc - Perp 750 psi  
 Fv 285 psi  
 Ft 1555 psi Density 42.01 pcf



### Applied Loads

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

Load for Span Number 1

Uniform Load : D = 0.0150, S = 0.0550 ksf, Tributary Width = 6.0 ft, (Roof)

Load for Span Number 2

Varying Uniform Load : D= 0.0150->0.0150, S= 0.0550->0.0550 ksf, Extent = 0.0 -->> 8.0 ft, Trib Width = 4.0->0.0 ft, (Roof)

### DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.164	1	Maximum Shear Stress Ratio	=	0.138	: 1
Section used for this span		2-1.75x14		Section used for this span		2-1.75x14	
fb : Actual	=	480.69	psi	fv : Actual	=	45.28	psi
FB : Allowable	=	2,927.97	psi	Fv : Allowable	=	327.75	psi
Load Combination		+D+S+H		Load Combination		+D+S+H	
Location of maximum on span	=	4.670	ft	Location of maximum on span	=	3.522	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
<b>Maximum Deflection</b>							
Max Downward Transient Deflection		0.060	in	Ratio =		1866	>=360
Max Upward Transient Deflection		-0.010	in	Ratio =		9159	>=360
Max Downward Total Deflection		0.076	in	Ratio =		1466	>=180
Max Upward Total Deflection		-0.013	in	Ratio =		7196	>=180

### Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values						
			M	V	C <sub>d</sub>	C <sub>FV</sub>	C <sub>i</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	C <sub>L</sub>	M	fb	F'b	V	fv	F'v			
+D+H	Length = 4.670 ft	1	0.045	0.038	0.90	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	2291.45	0.00	0.00	0.00	0.00	9.70	256.50
	Length = 8.0 ft	2	0.045	0.038	0.90	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	2291.45	0.22	9.70	256.50			
+D+L+H	Length = 4.670 ft	1	0.040	0.034	1.00	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	2546.06	0.00	0.00	0.00	0.00	9.70	285.00
	Length = 8.0 ft	2	0.040	0.034	1.00	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	2546.06	0.22	9.70	285.00			
+D+Lr+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00			



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: 15 AUG 2019, 8:26AM

**Wood Beam**

File = \\MORGAN-SHARE\Awork\DESIGN-1\HABITA-1\Rambler\2019\1889--1\Beams.ec6 .  
 Software copyright ENERCALC, INC. 1983-2019, Build:10.19.1.30 .

Lic. #: KW-06012024

York Engineering

DESCRIPTION: RB-21

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values		
			M	V	C <sub>d</sub>	C <sub>FV</sub>	C <sub>i</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	C <sub>L</sub>	M	fb	F'b	V	fv
Length = 4.670 ft	1	0.032	0.027	1.25	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	3182.57	0.32	9.70	356.25
Length = 8.0 ft	2	0.032	0.027	1.25	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	3182.57	0.22	9.70	356.25
+D+S+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.670 ft	1	0.164	0.138	1.15	0.979	1.00	1.00	1.00	1.00	1.00	4.58	480.69	2927.97	1.48	45.28	327.75
Length = 8.0 ft	2	0.164	0.138	1.15	0.979	1.00	1.00	1.00	1.00	1.00	4.58	480.69	2927.97	1.02	45.28	327.75
+D+0.750Lr+0.750L+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.670 ft	1	0.032	0.027	1.25	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	3182.57	0.32	9.70	356.25
Length = 8.0 ft	2	0.032	0.027	1.25	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	3182.57	0.22	9.70	356.25
+D+0.750L+0.750S+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.670 ft	1	0.132	0.111	1.15	0.979	1.00	1.00	1.00	1.00	1.00	3.68	386.27	2927.97	1.19	36.39	327.75
Length = 8.0 ft	2	0.132	0.111	1.15	0.979	1.00	1.00	1.00	1.00	1.00	3.68	386.27	2927.97	0.82	36.39	327.75
+D+0.60W+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.670 ft	1	0.025	0.021	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	4073.70	0.32	9.70	456.00
Length = 8.0 ft	2	0.025	0.021	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	4073.70	0.22	9.70	456.00
+D+0.750Lr+0.450W+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.670 ft	1	0.025	0.021	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	4073.70	0.32	9.70	456.00
Length = 8.0 ft	2	0.025	0.021	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	4073.70	0.22	9.70	456.00
+D+0.750S+0.450W+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.670 ft	1	0.095	0.080	1.60	0.979	1.00	1.00	1.00	1.00	1.00	3.68	386.27	4073.70	1.19	36.39	456.00
Length = 8.0 ft	2	0.095	0.080	1.60	0.979	1.00	1.00	1.00	1.00	1.00	3.68	386.27	4073.70	0.82	36.39	456.00
+0.60D+0.60W+0.60H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.670 ft	1	0.015	0.013	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.59	61.80	4073.70	0.19	5.82	456.00
Length = 8.0 ft	2	0.015	0.013	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.59	61.80	4073.70	0.13	5.82	456.00
+D+0.70E+0.60H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.670 ft	1	0.025	0.021	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	4073.70	0.32	9.70	456.00
Length = 8.0 ft	2	0.025	0.021	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.98	103.00	4073.70	0.22	9.70	456.00
+D+0.750L+0.750S+0.5250E+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.670 ft	1	0.095	0.080	1.60	0.979	1.00	1.00	1.00	1.00	1.00	3.68	386.27	4073.70	1.19	36.39	456.00
Length = 8.0 ft	2	0.095	0.080	1.60	0.979	1.00	1.00	1.00	1.00	1.00	3.68	386.27	4073.70	0.82	36.39	456.00
+0.60D+0.70E+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.670 ft	1	0.015	0.013	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.59	61.80	4073.70	0.19	5.82	456.00
Length = 8.0 ft	2	0.015	0.013	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.59	61.80	4073.70	0.13	5.82	456.00

**Overall Maximum Deflections**

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S+H	1	0.0764	0.000		0.0000	0.000
	2	0.0000	0.000	+D+S+H	-0.0133	3.084

**Vertical Reactions**

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum		3.281	-0.199
Overall MINimum		2.578	-0.043
+D+H		0.703	-0.043
+D+L+H		0.703	-0.043
+D+Lr+H		0.703	-0.043
+D+S+H		3.281	-0.199
+D+0.750Lr+0.750L+H		0.703	-0.043
+D+0.750L+0.750S+H		2.636	-0.160
+D+0.60W+H		0.703	-0.043
+D+0.750Lr+0.450W+H		0.703	-0.043
+D+0.750S+0.450W+H		2.636	-0.160
+0.60D+0.60W+0.60H		0.422	-0.026
+D+0.70E+0.60H		0.703	-0.043
+D+0.750L+0.750S+0.5250E+H		2.636	-0.160
+0.60D+0.70E+H		0.422	-0.026
D Only		0.703	-0.043
Lr Only			
L Only			
S Only		2.578	-0.156
W Only			

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: 15 AUG 2019, 8:26AM

## Wood Beam

File = \\MORGAN-SHARE\Awork\DESIGN-1\HABITA-1\Rambler\2019\1889--1\Beams.ec6 .  
Software copyright ENERCALC, INC. 1983-2019, Build:10.19.1.30 .

Lic. # : KW-06012024

York Engineering

DESCRIPTION: RB-21

### Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination

Support 1    Support 2    Support 3

E Only  
H Only

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: 15 AUG 2019, 8:27AM

## Wood Beam

File = \\MORGAN-SHARE\Awork\DESIGN-1\HABITA-1\Rambler\2019\1889--1\Beams.ec6 .  
 Software copyright ENERCALC, INC. 1983-2019, Build:10.19.1.30 .

Lic. # : KW-06012024

York Engineering

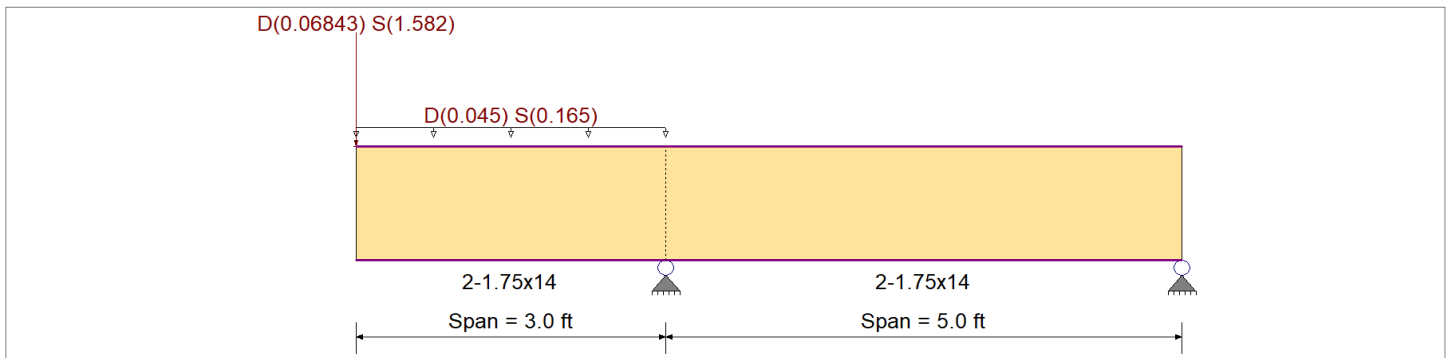
DESCRIPTION: RB-22

### CODE REFERENCES

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

### Material Properties

Analysis Method : Allowable Stress Design	Fb +	2600 psi	E : Modulus of Elasticity
Load Combination : ASCE 7-16	Fb -	2600 psi	Ebend- xx
	Fc - Prll	2510 psi	Eminbend - xx
Wood Species : iLevel Truss Joist	Fc - Perp	750 psi	
Wood Grade : MicroLam LVL 1.9 E	Fv	285 psi	Density
	Ft	1555 psi	42.01 pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			



### Applied Loads

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

Load for Span Number 1

Uniform Load : D = 0.0150, S = 0.0550 ksf, Tributary Width = 3.0 ft, (Roof)  
 Point Load : D = 0.06843, S = 1.582 k @ 0.0 ft, (RB-21)

### DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.211 : 1	Maximum Shear Stress Ratio	=	0.190 : 1
Section used for this span	=	2-1.75x14	Section used for this span	=	2-1.75x14
fb : Actual	=	618.85 psi	fv : Actual	=	62.37 psi
FB : Allowable	=	2,927.97 psi	Fv : Allowable	=	327.75 psi
Load Combination	=	+D+S+H	Load Combination	=	+D+S+H
Location of maximum on span	=	3.000ft	Location of maximum on span	=	1.844 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
<b>Maximum Deflection</b>					
Max Downward Transient Deflection		0.049 in	Ratio =		1458 >=360
Max Upward Transient Deflection		-0.010 in	Ratio =		5912 >=360
Max Downward Total Deflection		0.053 in	Ratio =		1360 >=180
Max Upward Total Deflection		-0.011 in	Ratio =		5503 >=180

### Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values			
			M	V	C <sub>d</sub>	C <sub>F/V</sub>	C <sub>i</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	C <sub>L</sub>	M	fb	F'b	V	fv	F'v
+D+H	Length = 3.0 ft	1	0.019	0.018	0.90	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	2291.45	0.00	0.00	0.00
	Length = 5.0 ft	2	0.019	0.018	0.90	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	2291.45	0.08	4.63	256.50
+D+L+H	Length = 3.0 ft	1	0.017	0.016	1.00	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	2546.06	0.00	0.00	0.00
	Length = 5.0 ft	2	0.017	0.016	1.00	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	2546.06	0.08	4.63	285.00
+D+Lr+H	Length = 3.0 ft	1	0.013	0.013	1.25	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	3182.57	0.00	0.00	0.00
	Length = 5.0 ft	2	0.013	0.013	1.25	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	3182.57	0.08	4.63	356.25

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: 15 AUG 2019, 8:27AM

**Wood Beam**

File = \\MORGAN-SHARE\Awork\DESIGN-1\HABITA-1\Rambler\2019\1889--1\Beams.ec6 .  
 Software copyright ENERCALC, INC. 1983-2019, Build:10.19.1.30 .

Lic. #: KW-06012024

York Engineering

DESCRIPTION: RB-22

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values		
		M	V	C <sub>d</sub>	C <sub>FV</sub>	C <sub>i</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	C <sub>L</sub>	M	fb	F'b	V	fv	F'v
+D+S+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.211	0.190	1.15	0.979	1.00	1.00	1.00	1.00	1.00	5.90	618.85	2927.97	2.04	62.37	327.75
Length = 5.0 ft	2	0.211	0.190	1.15	0.979	1.00	1.00	1.00	1.00	1.00	5.90	618.85	2927.97	1.18	62.37	327.75
+D+0.750Lr+0.750L+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.013	0.013	1.25	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	3182.57	0.15	4.63	356.25
Length = 5.0 ft	2	0.013	0.013	1.25	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	3182.57	0.08	4.63	356.25
+D+0.750L+0.750S+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.162	0.146	1.15	0.979	1.00	1.00	1.00	1.00	1.00	4.52	474.84	2927.97	1.57	47.94	327.75
Length = 5.0 ft	2	0.162	0.146	1.15	0.979	1.00	1.00	1.00	1.00	1.00	4.52	474.84	2927.97	0.90	47.94	327.75
+D+0.60W+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.011	0.010	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	4073.70	0.15	4.63	456.00
Length = 5.0 ft	2	0.011	0.010	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	4073.70	0.08	4.63	456.00
+D+0.750Lr+0.450W+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.011	0.010	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	4073.70	0.15	4.63	456.00
Length = 5.0 ft	2	0.011	0.010	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	4073.70	0.08	4.63	456.00
+D+0.750S+0.450W+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.117	0.105	1.60	0.979	1.00	1.00	1.00	1.00	1.00	4.52	474.84	4073.70	1.57	47.94	456.00
Length = 5.0 ft	2	0.117	0.105	1.60	0.979	1.00	1.00	1.00	1.00	1.00	4.52	474.84	4073.70	0.90	47.94	456.00
+0.60D+0.60W+0.60H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.006	0.006	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.24	25.68	4073.70	0.09	2.78	456.00
Length = 5.0 ft	2	0.006	0.006	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.24	25.68	4073.70	0.05	2.78	456.00
+D+0.70E+0.60H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.011	0.010	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	4073.70	0.15	4.63	456.00
Length = 5.0 ft	2	0.011	0.010	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.41	42.80	4073.70	0.08	4.63	456.00
+D+0.750L+0.750S+0.5250E+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.117	0.105	1.60	0.979	1.00	1.00	1.00	1.00	1.00	4.52	474.84	4073.70	1.57	47.94	456.00
Length = 5.0 ft	2	0.117	0.105	1.60	0.979	1.00	1.00	1.00	1.00	1.00	4.52	474.84	4073.70	0.90	47.94	456.00
+0.60D+0.70E+H					0.979	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.006	0.006	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.24	25.68	4073.70	0.09	2.78	456.00
Length = 5.0 ft	2	0.006	0.006	1.60	0.979	1.00	1.00	1.00	1.00	1.00	0.24	25.68	4073.70	0.05	2.78	456.00

**Overall Maximum Deflections**

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S+H	1	0.0529	0.000		0.0000	0.000
	2	0.0000	0.000	+D+S+H	-0.0109	2.123

**Vertical Reactions**

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum		3.460	-1.179
Overall MINimum		3.175	-0.082
+D+H		0.285	-0.082
+D+L+H		0.285	-0.082
+D+Lr+H		0.285	-0.082
+D+S+H		3.460	-1.179
+D+0.750Lr+0.750L+H		0.285	-0.082
+D+0.750L+0.750S+H		2.666	-0.905
+D+0.60W+H		0.285	-0.082
+D+0.750Lr+0.450W+H		0.285	-0.082
+D+0.750S+0.450W+H		2.666	-0.905
+0.60D+0.60W+0.60H		0.171	-0.049
+D+0.70E+0.60H		0.285	-0.082
+D+0.750L+0.750S+0.5250E+H		2.666	-0.905
+0.60D+0.70E+H		0.171	-0.049
D Only		0.285	-0.082
Lr Only			
L Only			
S Only		3.175	-1.098
W Only			
E Only			
H Only			

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: 20 JUL 2019, 3:12PM

## Wood Beam

File = \\MORGAN-SHARE\Awork\DESIGN-1\HABITA-1\Rambler\2019\1889--1\Beams.ec6 .  
 Software copyright ENERCALC, INC. 1983-2019, Build:10.19.1.30 .

Lic. # : KW-06012024

York Engineering

DESCRIPTION: RB-24

### CODE REFERENCES

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

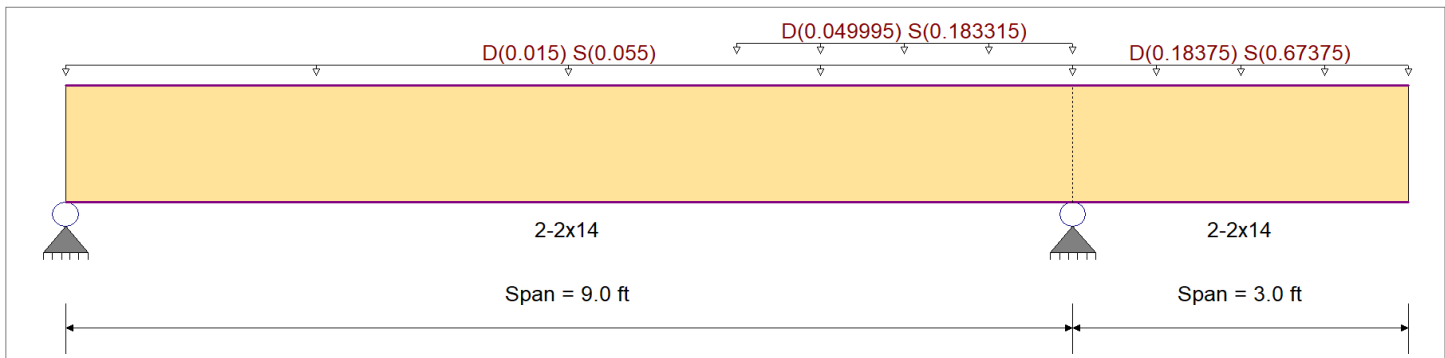
### Material Properties

Analysis Method : Allowable Stress Design  
 Load Combination : ASCE 7-16

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

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

Fb + 900 psi E : Modulus of Elasticity  
 Fb - 900 psi Ebend- xx 1600ksi  
 Fc - Prll 1350 psi Eminbend - xx 580ksi  
 Fc - Perp 625 psi  
 Fv 180 psi  
 Ft 575 psi Density 31.21pcf



### Applied Loads

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

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load : D = 0.0150, S = 0.0550 ksf, Tributary Width = 1.0 ft, (Roof)

Uniform Load : D = 0.0150, S = 0.0550 ksf, Extent = 6.0 ---> 9.0 ft, Tributary Width = 3.333 ft, (Roof)

Load for Span Number 2

Uniform Load : D = 0.0150, S = 0.0550 ksf, Tributary Width = 12.250 ft, (Roof)

### DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.572	1	Maximum Shear Stress Ratio	=	0.302	: 1
Section used for this span		2-2x14		Section used for this span		2-2x14	
fb : Actual	=	532.80	psi	fv : Actual	=	62.45	psi
FB : Allowable	=	931.50	psi	Fv : Allowable	=	207.00	psi
Load Combination		+D+S+H		Load Combination		+D+S+H	
Location of maximum on span	=	9.000	ft	Location of maximum on span	=	9.000	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
<b>Maximum Deflection</b>							
Max Downward Transient Deflection		0.044	in	Ratio =		1620	>=360
Max Upward Transient Deflection		-0.014	in	Ratio =		7822	>=360
Max Downward Total Deflection		0.056	in	Ratio =		1288	>=180
Max Upward Total Deflection		-0.017	in	Ratio =		6468	>=180

### Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values				
			M	V	C <sub>d</sub>	C <sub>F/V</sub>	C <sub>i</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	C <sub>L</sub>	M	fb	F'b	V	fv	F'v	
+D+H																		
Length = 9.0 ft	1		0.162	0.086	0.90	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	729.00	0.37	13.87	162.00	
Length = 3.0 ft	2		0.162	0.086	0.90	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	729.00	0.37	13.87	162.00	
+D+L+H																		
Length = 9.0 ft	1		0.146	0.077	1.00	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	810.00	0.37	13.87	180.00	
Length = 3.0 ft	2		0.146	0.077	1.00	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	810.00	0.37	13.87	180.00	

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: 20 JUL 2019, 3:12PM

**Wood Beam**

File = \\MORGAN-SHARE\Awork\DESIGN-1\HABITA-1\Rambler\2019\1889--1\Beams.ec6 .  
 Software copyright ENERCALC, INC. 1983-2019, Build:10.19.1.30 .

Lic. #: KW-06012024

York Engineering

DESCRIPTION: RB-24

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values			
			M	V	C <sub>d</sub>	C <sub>FV</sub>	C <sub>i</sub>	C <sub>r</sub>	C <sub>m</sub>	C <sub>t</sub>	C <sub>L</sub>	M	fb	F'b	V	fv	F'v
+D+Lr+H					0.900	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00
Length = 9.0 ft	1	0.117	0.062	1.25	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	1012.50	0.37	13.87	225.00	
Length = 3.0 ft	2	0.117	0.062	1.25	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	1012.50	0.37	13.87	225.00	
+D+S+H					0.900	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 9.0 ft	1	0.572	0.302	1.15	0.900	1.00	1.00	1.00	1.00	1.00	3.90	532.80	931.50	1.65	62.45	207.00	
Length = 3.0 ft	2	0.572	0.302	1.15	0.900	1.00	1.00	1.00	1.00	1.00	3.90	532.80	931.50	1.65	62.45	207.00	
+D+0.750Lr+0.750L+H					0.900	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 9.0 ft	1	0.117	0.062	1.25	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	1012.50	0.37	13.87	225.00	
Length = 3.0 ft	2	0.117	0.062	1.25	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	1012.50	0.37	13.87	225.00	
+D+0.750L+0.750S+H					0.900	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 9.0 ft	1	0.461	0.243	1.15	0.900	1.00	1.00	1.00	1.00	1.00	3.14	429.19	931.50	1.33	50.30	207.00	
Length = 3.0 ft	2	0.461	0.243	1.15	0.900	1.00	1.00	1.00	1.00	1.00	3.14	429.19	931.50	1.33	50.30	207.00	
+D+0.60W+H					0.900	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 9.0 ft	1	0.091	0.048	1.60	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	1296.00	0.37	13.87	288.00	
Length = 3.0 ft	2	0.091	0.048	1.60	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	1296.00	0.37	13.87	288.00	
+D+0.750Lr+0.450W+H					0.900	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 9.0 ft	1	0.091	0.048	1.60	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	1296.00	0.37	13.87	288.00	
Length = 3.0 ft	2	0.091	0.048	1.60	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	1296.00	0.37	13.87	288.00	
+D+0.750S+0.450W+H					0.900	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 9.0 ft	1	0.331	0.175	1.60	0.900	1.00	1.00	1.00	1.00	1.00	3.14	429.19	1296.00	1.33	50.30	288.00	
Length = 3.0 ft	2	0.331	0.175	1.60	0.900	1.00	1.00	1.00	1.00	1.00	3.14	429.19	1296.00	1.33	50.30	288.00	
+0.60D+0.60W+0.60H					0.900	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 9.0 ft	1	0.055	0.029	1.60	0.900	1.00	1.00	1.00	1.00	1.00	0.52	71.00	1296.00	0.22	8.32	288.00	
Length = 3.0 ft	2	0.055	0.029	1.60	0.900	1.00	1.00	1.00	1.00	1.00	0.52	71.00	1296.00	0.22	8.32	288.00	
+D+0.70E+0.60H					0.900	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 9.0 ft	1	0.091	0.048	1.60	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	1296.00	0.37	13.87	288.00	
Length = 3.0 ft	2	0.091	0.048	1.60	0.900	1.00	1.00	1.00	1.00	1.00	0.87	118.34	1296.00	0.37	13.87	288.00	
+D+0.750L+0.750S+0.5250E+H					0.900	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 9.0 ft	1	0.331	0.175	1.60	0.900	1.00	1.00	1.00	1.00	1.00	3.14	429.19	1296.00	1.33	50.30	288.00	
Length = 3.0 ft	2	0.331	0.175	1.60	0.900	1.00	1.00	1.00	1.00	1.00	3.14	429.19	1296.00	1.33	50.30	288.00	
+0.60D+0.70E+H					0.900	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 9.0 ft	1	0.055	0.029	1.60	0.900	1.00	1.00	1.00	1.00	1.00	0.52	71.00	1296.00	0.22	8.32	288.00	
Length = 3.0 ft	2	0.055	0.029	1.60	0.900	1.00	1.00	1.00	1.00	1.00	0.52	71.00	1296.00	0.22	8.32	288.00	

**Overall Maximum Deflections**

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S+H	1	0.0000	0.000	+D+S+H	-0.0167	5.883
	2	0.0559	3.000		0.0000	5.883

**Vertical Reactions**

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	0.037	3.968	
Overall MINimum	0.002	3.064	
+D+H	0.035	0.905	
+D+L+H	0.035	0.905	
+D+Lr+H	0.035	0.905	
+D+S+H	0.037	3.968	
+D+0.750Lr+0.750L+H	0.035	0.905	
+D+0.750L+0.750S+H	0.037	3.202	
+D+0.60W+H	0.035	0.905	
+D+0.750Lr+0.450W+H	0.035	0.905	
+D+0.750S+0.450W+H	0.037	3.202	
+0.60D+0.60W+0.60H	0.021	0.543	
+D+0.70E+0.60H	0.035	0.905	
+D+0.750L+0.750S+0.5250E+H	0.037	3.202	
+0.60D+0.70E+H	0.021	0.543	
D Only	0.035	0.905	
Lr Only			
L Only			
S Only	0.002	3.064	

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: 20 JUL 2019, 3:12PM

## Wood Beam

File = \\MORGAN-SHARE\Awork\DESIGN-1\HABITA-1\Rambler\2019\1889--1\Beams.ec6 .  
Software copyright ENERCALC, INC. 1983-2019, Build:10.19.1.30 .

Lic. # : KW-06012024

York Engineering

DESCRIPTION: RB-24

### Vertical Reactions

Support notation : Far left is #1

Values in KIPS

---

Load Combination	Support 1	Support 2	Support 3
W Only			
E Only			
H Only			

---