Dwight Mason Structural Design, Inc.
P.O. Box 683 Beavercreek, Oregon 97004 (503) 632-8863

April 15, 2013

Vatik Dulo
North Side Construction, LLC
915 3rd Ave.
Oregon City, OR 97045

Re: Beam Design- 2931 Orchard Hill Place, Lake Oswego, OR 97035
Job # 13-017

Dear Mr. Dulo:

Please find the attached calculations 1-3 which verify the structural design of the replacement beam design shown on attached details S1-S2. The design is based on the 2010 Oregon Structural Specialty Code. If you have any questions or would like further clarification, please feel free to contact us.

Cordially,
Dwight Mason Structural Design, Inc., by

Dwight Mason, P.E., S.E.
President

STRUCTURAL REGISTERED PROFESSIONAL ENGINEER 72308PE OREGON NOV 12, 2002 DWIGHT MASON
EXPIRES: 12-31-2014

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Dwight Mason Structural Design, Inc
PO Box 683
Beavercreek, OR 97004

Title :
Engineer:
Project Desc.:

Job # 2/3

Printed: 15 APR 2013, 2:08PM

Wood Beam

ENERCALC, INC. 1983-2011, Build:6.12.5.30, Ver:6.11.12.31

Lic. # : KW-06009044 **Licensee : Dwight Mason Structural Design, Inc.**

Description : Bearing Wall Beam Replacement

Material Properties

Calculations per NDS 2005, IBC 2006, CBC 2007, ASCE 7-05

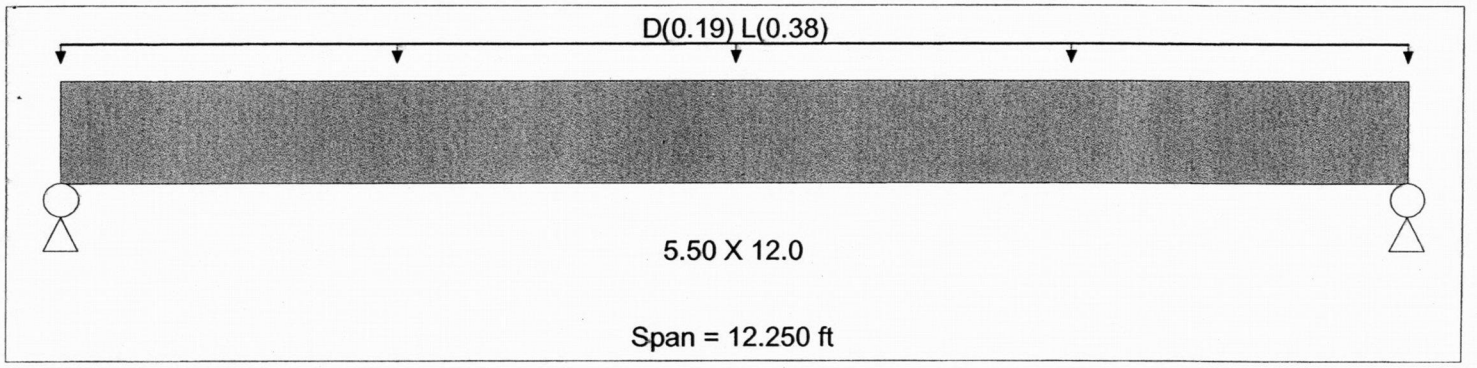
Analysis Method : Allowable Stress Design
Load Combination 2006 IBC & ASCE 7-05

Wood Species : DF/DF
Wood Grade : 24F - V4

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

Fb - Tension	2400 psi
Fb - Compr	1850 psi
Fc - Prll	1650 psi
Fc - Perp	650 psi
Fv	265 psi
Ft	1100 psi

E : Modulus of Elasticity	
Ebend- xx	1800 ksi
Eminbend - xx	930 ksi
Ebend- yy	1600 ksi
Eminbend - yy	830 ksi
Density	32.21 pcf



Applied Loads

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

Uniform Load : D = 0.020, L = 0.040 ksf, Tributary Width = 9.50 ft, (Upper Floor Load

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	**0.405 : 1**	Maximum Shear Stress Ratio	=	**0.252 : 1**
Section used for this span		**5.50 X 12.0**	Section used for this span		**5.50 X 12.0**
fb : Actual	=	972.00 psi	fv : Actual	=	66.65 psi
FB : Allowable	=	2,400.00 psi	Fv : Allowable	=	265.00 psi
Load Combination		+D+L+H	Load Combination		+D+L+H
Location of maximum on span	=	6.125 ft	Location of maximum on span	=	11.270 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward L+Lr+S Deflection	0.136 in	Ratio =	1079
Max Upward L+Lr+S Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.204 in	Ratio =	719
Max Upward Total Deflection	0.000 in	Ratio =	0 <180

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Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values Fb	Shear Values V	Shear Values fv	Shear Values Fv
+D												0.00	0.00	0.00	0.00
Length = 12.250 ft	1	0.150	0.093	0.900	1.000	1.000	1.000	1.000	1.000	3.56	324.00	2160.00	0.98	22.22	238.50
+D+L+H					1.000	1.000	1.000	1.000	1.000			0.00	0.00	0.00	0.00
Length = 12.250 ft	1	0.405	0.252	1.000	1.000	1.000	1.000	1.000	1.000	10.69	972.00	2400.00	2.93	66.65	265.00
+D+0.750Lr+0.750L+H					1.000	1.000	1.000	1.000	1.000			0.00	0.00	0.00	0.00
Length = 12.250 ft	1	0.270	0.168	1.250	1.000	1.000	1.000	1.000	1.000	8.91	810.00	3000.00	2.44	55.54	331.25
+D+0.750L+0.750S+H					1.000	1.000	1.000	1.000	1.000			0.00	0.00	0.00	0.00
Length = 12.250 ft	1	0.293	0.182	1.150	1.000	1.000	1.000	1.000	1.000	8.91	810.00	2760.00	2.44	55.54	304.75
+D+0.750Lr+0.750L+0.750W+H					1.000	1.000	1.000	1.000	1.000			0.00	0.00	0.00	0.00
Length = 12.250 ft	1	0.211	0.131	1.600	1.000	1.000	1.000	1.000	1.000	8.91	810.00	3840.00	2.44	55.54	424.00
+D+0.750L+0.750S+0.750W+H					1.000	1.000	1.000	1.000	1.000			0.00	0.00	0.00	0.00
Length = 12.250 ft	1	0.211	0.131	1.600	1.000	1.000	1.000	1.000	1.000	8.91	810.00	3840.00	2.44	55.54	424.00
+D+0.750Lr+0.750L+0.5250E+H					1.000	1.000	1.000	1.000	1.000			0.00	0.00	0.00	0.00
Length = 12.250 ft	1	0.211	0.131	1.600	1.000	1.000	1.000	1.000	1.000	8.91	810.00	3840.00	2.44	55.54	424.00
+D+0.750L+0.750S+0.5250E+H					1.000	1.000	1.000	1.000	1.000			0.00	0.00	0.00	0.00
Length = 12.250 ft	1	0.211	0.131	1.600	1.000	1.000	1.000	1.000	1.000	8.91	810.00	3840.00	2.44	55.54	424.00

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Overall Maximum Deflections - Unfactored Loads

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
D+L	1	0.2042	6.186		0.0000	0.000

Vertical Reactions - Unfactored

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	3.491	3.491
D Only	1.164	1.164
L Only	2.328	2.328
D+L	3.491	3.491

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PROJECT: HOME REMODEL BM	LOCATION: LAKE OSWEGO		JOB # 13-017
CLIENT: NORTH SIDE CONST.	DATE: 4/15/13	BY: DM	SHEET# 1 / 3

BEAM REPLACEMENT

BEAM LENGTH - 12'-3"

LOADING

$TW_{FLOOR} = 19'-6''/2$
$= 9.75'$

ROOF - NO LOAD - ROOF CONFIGURATION BEARS ON EXTERIOR OF ORIGINAL PATIO BASED ON ORIGINAL DRAWING REVIEW - HIP ~~NO UPPER GABLE WALL~~ ROOF.

SEE ENERCALC OUTPUT
GL 5 1/2 x 12" 24F-V4

REACTION = 3500# MAX
* OK FOR STD. CONT. WALL FOOTING.

LATERAL -

WALLS REMOVED DO NOT APPEAR TO BE PART OF THE LATERAL FORCE SYSTEM

- LESS THAN 3'-0" IN WIDTH
- NO LFRS DESIGNATED ON ORIGINAL DRAWINGS
- WALL LENGTH ARE BEING REPLACED AT REAR WALL
- REAR WALL CONSISTS OF LONGER PIERS THAT WOULD RESIST MAJORITY OF LATERAL SHEAR.

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