

Design Intelligence, LLC

Engineering Calculations Summary

Date: June 1, 2017

Subject: Sudbury Residence, Summit County, Utah

Abstract

This analysis uses the Design Criteria required by the local jurisdiction and the IBC 2015 as the basis for the calculations.

Materials:

Dimensional Lumber – NDS 2005 design values

Concrete: 2500 psi @ 28 days

Reinforcing Steel - #4 and smaller Grade 40, #5 and larger Grade 60

Assumptions:

IBC 2015 – Foundations designed for Max Brg Pressure of 1500 psf

Design Loads:

Roof Live Load (min) – 20 psf during construction

Ground Snow load – 225 psf

Roof Snow load – 158 psf

Snow Load Importance Factor – 1.0

Snow Exposure Factor – 1.0

Wind – 115 mph

Wind Importance Factor – 1.0

Wind Exposure – B

Seismic Design Category – D

References:

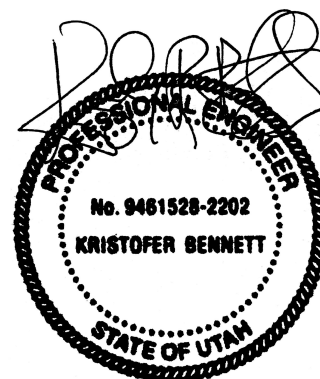
IBC 2015

Customer Drawings

TrusJoist MacMillian Design Guides

Summary:

All beam sizes and footing sizes are noted on the drawings.



06/01/17

These calculations and included details are for this location and customer only and not to be reused in any manner without the written consent of Design Intelligence.

<i>Designed By:</i>	<i>Kris Bennett, P.E.</i>
<i>Date:</i>	<i>06/01/17</i>

Design Parameters					ASCE 7			
					Occupancy Category II			
Snow								
Snow Loads per ASCE 7								
		Fully	Partial	Sheltered				
Ce = Exposure Factor		0.9	1	1.2	=	1		
			Above					
		Freezing	Freezing	Heated				
Ct = Thermal Factor		1.2	1.1	1	=	1		
I = Importance Factor		(Non-Essential)			=	1		
pg = Ground Snow Load (20 psf min)					=	225	psf	
pf = Flat Roof Snow Load (slope less than 1/12)					=	157.5	psf	
Roof Pitch		(units Vertical per 12 units Horizontal)			=	8		
Slippery					Non-Slippery			
Pitch	Warm	Curved	Barrel		Pitch	Warm	Curved	Barrel
3/12	0.87	0.87	1		3/12	1	1	1
4/12	0.81	0.81	1		4/12	1	1	1
5/12	0.73	0.73	1		5/12	1	1	1
6/12	0.68	0.68	1		6/12	1	1	1
7/12	0.63	0.63	1		7/12	1	1	1
8/12	0.58	0.58	1		8/12	0.95	0.95	1
9/12	0.52	0.52	1		9/12	0.85	0.85	1
10/12	0.49	0.49	1		10/12	0.78	0.78	1
11/12	0.42	0.42	1		11/12	0.71	0.71	1
12/12	0.39	0.39	1		12/12	0.63	0.63	1
Cs = Roof Slope Factor					=	0.78		
ps = Sloped Roof Snow Load					=	122.85	psf	
W = Distance from Ridge to Eave					=	15	ft	
lu = Length of Roof upwind of the Drift					=	15	ft	
hd = Height of the Drift					=	2.65	ft	
Gamma = Density of Snow					=	30	pcf	
Drift Surcharge Load					=	64.96	psf	
Length of Surcharge					=	8.66	ft	
Unbalanced Uniform Snow Load - Windward Side					=	0.00	psf	
Unbalanced Uniform Snow Load - Leeward Side					=	225.00	psf	

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Seismic						
Reference Code - IBC 2015		Values for Ss, S1, Fa and Fv are taken from Code Control CD using Zip Code				
1615.1.2.(1)	Fa					
1615.1.2(2)	Fv					
1615.1	Ss	0.570	g			
1615.1	S1	0.186	g			
				Fa	Fv	
Site Class A - Hard Rock				0.8	0.8	
Site Class B - Dense Soil or Soft Rock				1	1	
Site Class C - Stiff Soil				1.2	1.7	
Site Class D - Soft Soil				1.17	1.53	
Site Class		A	B	C	D	
1615.1.2	SMS = FaSs	0.456	0.57	0.684	0.766	
1615.1.2	SM1 = FvS1	0.1488	0.186	0.3162	0.383	
Design Spectral Resp Accel						
1615.1.3	SDS = 2/3*SMS	0.30552	0.3819	0.45828	0.51322	
	SDI = 2/3*SMI	0.099696	0.12462	0.211854	0.25661	
Seismic Use Group		Seismic Design Category				
Group I - Non-Essential		Table 1616.3(1)		D		
		Table 1616.3(2)		D		
Seismic Response Coefficient						
Response Modification Factor R =				2	(Use 2.0 for Log Structures)	
Occupancy Importance Factor I =				1		
Basic Fundamental Period						
		Ct				
Steel Moment Resisting Frame		0.035				
Reinforced Concrete Moment Resisting Frame		0.03				
All Other Building Systems		0.02				
Building Height	27 ft	Table 1617.4.2 Cu =		1.2		
Approximate Fundamental Period						
Ta = Ct*hn^3/4 =		0.28	sec	Rigid Bldg		
Site Class		A	B	C	D	
Cs = SDS/(R/I) =		0.1528	0.1910	0.2291	0.2566	
Max Cs = SDI/(R/I)T =		0.1754	0.2192	0.3726	0.4513	
Min Cs = 0.044SDS*I =		0.0134	0.0168	0.0202	0.0226	

Design Seismic Response Coefficient								
Site Class			A	B	C	D		
Cs =			0.1528	0.1910	0.2291	0.2566		
Equiv Lateral Force Method			V = CsW =		0.2566	W		
Simplified Approach			V = 1.2*(SDS/R)*W =		0.30793	W		
Determine Method of Seismic Analysis								
Light Framing Construction Criteria								
Building stories			2	stories		YES		
Bearing wall floor to floor height			9	ft		YES		
Average DL			15	psf		YES		
Floor Live Loads			40	psf		YES		
Ground Snow Load			225.00	psf		NO		
Wind speed			90	mph		YES		
Truss Span			0	ft		YES		
Simplified Analysis Requirements								
1. Does Building meet light frame construction criteria ?							NO	
2. Is building of any other construction with flexible diaphragms at every level?							YES	

Material	Fb psi	Fv psi	E psi						
DOUG FIR #2	1400	160	1600000						
DOUG FIR SELECT	1300	165	1600000						
LODGE POLE SELECT	975	125	1100000						
LODGE POLE WL30	475	125	900000						
WEST WOOD PREMUM	950	125	1000000						
B1	Ridge Beam								
Material	Fb psi	Fv psi	E psi			WB1			
DOUG FIR SELECT	1300	165	1600000			Load 1	Load 2	Load 3	Load 4
					Pt. Load	9688			
Span =	18.5	ft.			Distance	2.25			
Tributary Width =	9	ft.			Left Reaction			Right Reaction	
					8509.73	lbs		1178.27	lbs
Loads									
Snow	158	psf			Uniform Load =		1422	lbs/ft	
Live Load =	0	psf					0	lbs/ft	
Dead Load =	15	psf					135	lbs/ft	
Moment									
Live Load Moment =			60834.9	lb-ft	=	730019.3	lb-in		
Dead Load Moment =			5775.5	lb-ft	=	69305.63	lb-in		
Point Load Moment =			19146.9	lb-ft	=	229762.7	lb-in		
Section Modulus Required =			791.6	in3					
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	22	in.	OK	1045.4	in3	11499.0	in4	887.3	in3
Stacked	0	in.	OK	1045.4		11499.0	in4		
I1	11499	A1	380		Y1	0	in		
I2	0	A2	0		Y2	11	in		
Centroid	11.000		CTop	11.000		C	11		
Deflection									
Live Load =		0.25	in.		L/360 =		0.62	in.	OK
Dead Load =		0.02	in						
Total =		0.27	in.		L/240 =		0.93	in.	OK
Horizontal Shear									
fv Left =	80.4	psi	OK		fv Right =	54.6	psi		OK
FV =	165	psi	Allowable			P44		WALL	
						Reaction Left		Reaction Right	
Use	22"R DOUG FIR SELECT					22911.98	lbs	15580.52	lbs

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B2	Dormer Ridge Beam								
Material	Fb psi	Fv psi	E psi						
WEST WOOD SELECT	850	115	1100000			Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =	8 ft.				Distance				
Tributary Width =	4 ft.				Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	158 psf				Uniform Load =		632 lbs/ft		
Live Load =	0 psf						0 lbs/ft		
Dead Load =	15 psf						60 lbs/ft		
Moment									
Live Load Moment =			5056.0 lb-ft	=	60672 lb-in				
Dead Load Moment =			480.0 lb-ft	=	5760 lb-in				
Point Load Moment =			0.0 lb-ft	=	0 lb-in				
Section Modulus Required =			78.2 in3						
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	12 in.	OK	169.6 in3		1017.9 in4		144.0 in3		
Stacked	0 in.	OK	169.6 in3		1017.9 in4				
I1	1018	A1	113		Y1	0 in			
I2	0	A2	0		Y2	6 in			
Centroid	6.000		CTop	6.000		C	6		
Deflection									
Live Load =		0.05 in.		L/360 =		0.27 in.		OK	
Dead Load =		0.00 in							
Total =		0.06 in.		L/240 =		0.40 in.		OK	
Horizontal Shear									
fv Left =	32.6 psi	OK		fv Right =	32.6 psi			OK	
FV =	115 psi	Allowable			WB2		WALL		
					Reaction Left		Reaction Right		
Use	12"R WEST WOOD SELECT					2768 lbs		2768 lbs	

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B3	Ridge Beam								
Material	Fb psi	Fv psi	E psi			WB4	WB4		
DOUG FIR SELECT	1300	165	1500000			Load 1	Load 2	Load 3	Load 4
					Pt. Load	4548.813	4548.81		
Span =	17	ft.			Distance	5.67	12.5		
Tributary Width =	12	ft.			Left Reaction			Right Reaction	
					4235.747	lbs		4861.878	lbs
Loads									
Snow	158	psf			Uniform Load =		1896	lbs/ft	
Live Load =	0	psf					0	lbs/ft	
Dead Load =	15	psf					180	lbs/ft	
Moment									
Live Load Moment =			68493.0	lb-ft	=	821916	lb-in		
Dead Load Moment =			6502.5	lb-ft	=	78030	lb-in		
Point Load Moment =			24016.7	lb-ft	=	288200.2	lb-in		
Section Modulus Required =			914.0	in3					
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	22	in.	OK	1045.4	in3	11499.0	in4	887.3	in3
Stacked	0	in.	OK	1045.4		11499.0	in4		
I1	11499	A1	380		Y1	0	in		
I2	0	A2	0		Y2	11	in		
Centroid	11.000		CTop	11.000		C	11		
Deflection									
Live Load =		0.26	in.		L/360 =		0.57	in.	OK
Dead Load =		0.02	in						
Total =		0.28	in.		L/240 =		0.85	in.	OK
Horizontal Shear									
fv Left =	76.8	psi	OK		fv Right =	78.9	psi		OK
FV =	165	psi	Allowable			P45,P43		WALL	
						Reaction Left		Reaction Right	
Use	22"R DOUG FIR SELECT					21881.75	lbs	22507.88	lbs

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B4	Ridge Beam								
Material	Fb psi	Fv psi	E psi						
DOUG FIR WL30	425	115	800000			Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =	10	ft.			Distance				
Tributary Width =	10	ft.			Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	158	psf			Uniform Load =		1580	lbs/ft	
Live Load =	0	psf					0	lbs/ft	
Dead Load =	15	psf					150	lbs/ft	
Moment									
Live Load Moment =			19750.0	lb-ft	=	237000	lb-in		
Dead Load Moment =			1875.0	lb-ft	=	22500	lb-in		
Point Load Moment =			0.0	lb-ft	=	0	lb-in		
Section Modulus Required =			610.6	in3					
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	22	in.	OK	1045.4	in3	11499.0	in4	887.3	in3
Stacked	0	in.	OK	1045.4		11499.0	in4		
I1	11499	A1	380		Y1	0	in		
I2	0	A2	0		Y2	11	in		
Centroid	11.000		CTop	11.000		C	11		
Deflection									
Live Load =		0.04	in.		L/360 =		0.33	in.	OK
Dead Load =		0.00	in						
Total =		0.04	in.		L/240 =		0.50	in.	OK
Horizontal Shear									
fv Left =	30.3	psi	OK		fv Right =	30.3	psi		OK
FV =	115	psi	Allowable			P45,P44		P44,P43	
						Reaction Left		Reaction Right	
Use	22"R DOUG FIR WL30					8650	lbs	8650	lbs

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B5	Porch Carrier								
Material	Fb psi	Fv psi	E psi						
LODGE POLE SELECT	975	125	1100000			Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =	12	ft.			Distance				
Tributary Width =	7	ft.			Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	158	psf			Uniform Load =		1106	lbs/ft	
Live Load =	0	psf					0	lbs/ft	
Dead Load =	15	psf					105	lbs/ft	
Moment									
Live Load Moment =			19908.0	lb-ft	=	238896	lb-in		
Dead Load Moment =			1890.0	lb-ft	=	22680	lb-in		
Point Load Moment =			0.0	lb-ft	=	0	lb-in		
Section Modulus Required =			268.3	in3					
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	14	in.	OK	269.4	in3	1885.7	in4	228.7	in3
Stacked	0	in.	OK	269.4		1885.7	in4		
I1	1886	A1	154		Y1	0	in		
I2	0	A2	0		Y2	7	in		
Centroid	7.000		CTop	7.000		C	7		
Deflection									
Live Load =		0.25	in.		L/360 =		0.40	in.	OK
Dead Load =		0.02	in						
Total =		0.27	in.		L/240 =		0.60	in.	OK
Horizontal Shear									
fv Left =	62.9	psi	OK		fv Right =	62.9	psi		OK
FV =	125	psi	Allowable			P1.,P2.		P2.	
						Reaction Left		Reaction Right	
Use	14"R LODGE POLE SELECT					7266	lbs	7266	lbs

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B6	Porch Carrier								
Material	Fb psi	Fv psi	E psi						
WEST WOOD SELECT	850	115	1100000			Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =	8 ft.				Distance				
Tributary Width =	5 ft.				Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	158 psf				Uniform Load =		790 lbs/ft		
Live Load =	0 psf						0 lbs/ft		
Dead Load =	15 psf						75 lbs/ft		
Moment									
Live Load Moment =			6320.0 lb-ft	=		75840 lb-in			
Dead Load Moment =			600.0 lb-ft	=		7200 lb-in			
Point Load Moment =			0.0 lb-ft	=		0 lb-in			
Section Modulus Required =			97.7 in3						
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	14 in.	OK	269.4 in3		1885.7 in4		228.7 in3		
Stacked	0 in.	OK	269.4		1885.7				
I1	1886	A1	154		Y1	0 in			
I2	0	A2	0		Y2	7 in			
Centroid	7.000		CTop	7.000		C	7		
Deflection									
Live Load =		0.04 in.		L/360 =		0.27 in.		OK	
Dead Load =		0.00 in							
Total =		0.04 in.		L/240 =		0.40 in.		OK	
Horizontal Shear									
fv Left =	30.0 psi	OK		fv Right =	30.0 psi			OK	
FV =	115 psi	Allowable				P40,P39,P30,P27,P2	P39,P30,P26,P32		
						Reaction Left	Reaction Right		
Use	14"R WEST WOOD SELECT					3460 lbs	3460	lbs	

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B7	Porch Carrier								
Material	Fb psi	Fv psi	E psi						
WEST WOOD SELECT	850	115	1100000			Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =	10 ft.				Distance				
Tributary Width =	5 ft.				Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	158 psf				Uniform Load =		790 lbs/ft		
Live Load =	0 psf						0 lbs/ft		
Dead Load =	15 psf						75 lbs/ft		
Moment									
Live Load Moment =			9875.0 lb-ft	=	118500 lb-in				
Dead Load Moment =			937.5 lb-ft	=	11250 lb-in				
Point Load Moment =			0.0 lb-ft	=	0 lb-in				
Section Modulus Required =			152.6 in3						
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	14 in.	OK	269.4 in3		1885.7 in4		228.7 in3		
Stacked	0 in.	OK	269.4		1885.7 in4				
I1	1886	A1	154		Y1	0 in			
I2	0	A2	0		Y2	7 in			
Centroid	7.000		CTop	7.000		C	7		
Deflection									
Live Load =		0.09 in.		L/360 =		0.33 in.	OK		
Dead Load =		0.01 in							
Total =		0.09 in.		L/240 =		0.50 in.	OK		
Horizontal Shear									
fv Left =	37.5 psi	OK		fv Right =	37.5 psi		OK		
FV =	115 psi	Allowable			P1.,P40		P40		
					Reaction Left		Reaction Right		
Use	14"R WEST WOOD SELECT				4325 lbs		4325 lbs		

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B8	Second Floor Joist								
Material	Fb psi	Fv psi	E psi						
WEST WOOD SELECT	850	115	1100000			Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =	12	ft.			Distance				
Tributary Width =	3	ft.			Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	0	psf			Uniform Load =		0 lbs/ft		
Live Load =	40	psf					120 lbs/ft		
Dead Load =	15	psf					45 lbs/ft		
Moment									
Live Load Moment =			2160.0	lb-ft	=	25920	lb-in		
Dead Load Moment =			810.0	lb-ft	=	9720	lb-in		
Point Load Moment =			0.0	lb-ft	=	0	lb-in		
Section Modulus Required =			41.9	in3					
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	10	in.	OK	98.2	in3	490.9	in4	83.3	in3
Stacked	0	in.	OK	98.2		490.9	in4		
I1	491	A1	79		Y1	0	in		
I2	0	A2	0		Y2	5	in		
Centroid	5.000		CTop	5.000		C	5		
Deflection									
Live Load =		0.10	in.		L/360 =		0.40	in.	OK
Dead Load =		0.04	in						
Total =		0.14	in.		L/240 =		0.60	in.	OK
Horizontal Shear									
fv Left =	16.8	psi	OK		fv Right =	16.8	psi		OK
FV =	115	psi	Allowable			WALL		B	
						Reaction Left		Reaction Right	
Use	10"R WEST WOOD SELECT					990	lbs	990	lbs

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B9	Second Floor Joist Carrier								
Material	Fb psi	Fv psi	E psi			B8	B8	B8	
WEST WOOD SELECT	850	115	1100000			Load 1	Load 2	Load 3	Load 4
					Pt. Load	1485	1485	1485	
Span =	14 ft.				Distance	4	8	11.5	
Tributary Width =	0 ft.				Left Reaction			Right Reaction	
					1962.321 lbs			2492.679 lbs	
Loads									
Snow	0 psf				Uniform Load =		0 lbs/ft		
Live Load =	40 psf						0 lbs/ft		
Dead Load =	15 psf						0 lbs/ft		
Moment									
Live Load Moment =			0.0	lb-ft	=	0	lb-in		
Dead Load Moment =			0.0	lb-ft	=	0	lb-in		
Point Load Moment =			9758.6	lb-ft	=	117102.9	lb-in		
Section Modulus Required =			137.8	in3					
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	12 in.		OK	169.6	in3	1017.9	in4	144.0	in3
Stacked	0 in.		OK	169.6		1017.9	in4		
I1	1018	A1	113		Y1	0 in			
I2	0	A2	0		Y2	6 in			
Centroid	6.000		CTop	6.000		C	6		
Deflection									
Live Load =		0.25 in.		L/360 =		0.47 in.		OK	
Dead Load =		0.00 in							
Total =		0.25 in.		L/240 =		0.70 in.		OK	
Horizontal Shear									
fv Left =	23.1 psi	OK		fv Right =	29.4 psi			OK	
FV =	115 psi	Allowable			WALL		P42		
					Reaction Left		Reaction Right		
Use	12"R WEST WOOD SELECT				1962.321 lbs		2492.679 lbs		

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B10	Second Floor Joist Carrier								
Material	Fb psi	Fv psi	E psi						
LODGE POLE SELECT	975	125	1100000			Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =	16	ft.			Distance				
Tributary Width =	12	ft.			Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	0	psf			Uniform Load =		0	lbs/ft	
Live Load =	40	psf					480	lbs/ft	
Dead Load =	15	psf					180	lbs/ft	
Moment									
Live Load Moment =			15360.0	lb-ft	=	184320	lb-in		
Dead Load Moment =			5760.0	lb-ft	=	69120	lb-in		
Point Load Moment =			0.0	lb-ft	=	0	lb-in		
Section Modulus Required =			259.9	in3					
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	14	in.	OK	269.4	in3	1885.7	in4	228.7	in3
Stacked	0	in.	OK	269.4		1885.7	in4		
I1	1886	A1	154		Y1	0	in		
I2	0	A2	0		Y2	7	in		
Centroid	7.000		CTop	7.000		C	7		
Deflection									
Live Load =		0.34	in.		L/360 =		0.53	in.	OK
Dead Load =		0.13	in						
Total =		0.47	in.		L/240 =		0.80	in.	OK
Horizontal Shear									
fv Left =	45.7	psi	OK		fv Right =	45.7	psi		OK
FV =	125	psi	Allowable			WALL		P45	
						Reaction Left		Reaction Right	
Use	14"R LODGE POLE SELECT					5280	lbs	5280	lbs

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B11	Second Floor Joist Carrier								
Material	Fb psi	Fv psi	E psi			B8	B8		
WEST WOOD SELECT	850	115	1100000			Load 1	Load 2	Load 3	Load 4
					Pt. Load	990	990		
Span =	10 ft.				Distance	4	8		
Tributary Width =	0 ft.				Left Reaction			Right Reaction	
					792 lbs			1188 lbs	
Loads									
Snow	0 psf				Uniform Load =		0 lbs/ft		
Live Load =	40 psf						0 lbs/ft		
Dead Load =	15 psf						0 lbs/ft		
Moment									
Live Load Moment =			0.0	lb-ft	=	0	lb-in		
Dead Load Moment =			0.0	lb-ft	=	0	lb-in		
Point Load Moment =			3168.0	lb-ft	=	38016	lb-in		
Section Modulus Required =			44.7	in3					
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	14 in.		OK	269.4	in3	1885.7	in4	228.7	in3
Stacked	0 in.		OK	269.4		1885.7	in4		
I1	1886	A1	154		Y1	0 in			
I2	0	A2	0		Y2	7 in			
Centroid	7.000		CTop	7.000		C	7		
Deflection									
Live Load =		0.02 in.			L/360 =		0.33 in.	OK	
Dead Load =		0.00 in							
Total =		0.02 in.			L/240 =		0.50 in.	OK	
Horizontal Shear									
fv Left =	6.9 psi	OK			fv Right =	10.3 psi		OK	
FV =	115 psi	Allowable				P45,P44		P44,P43	
						Reaction Left		Reaction Right	
Use	14"R WEST WOOD SELECT					792 lbs		1188 lbs	

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B12	Second Floor Joist Carrier								
Material	Fb psi	Fv psi	E psi						
DOUG FIR SELECT	1300	165	1600000			Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =	18	ft.			Distance				
Tributary Width =	12	ft.			Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	0	psf			Uniform Load =		0	lbs/ft	
Live Load =	40	psf					480	lbs/ft	
Dead Load =	15	psf					180	lbs/ft	
Moment									
Live Load Moment =			19440.0	lb-ft	=	233280	lb-in		
Dead Load Moment =			7290.0	lb-ft	=	87480	lb-in		
Point Load Moment =			0.0	lb-ft	=	0	lb-in		
Section Modulus Required =			246.7	in3					
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	14	in.	OK	269.4	in3	1885.7	in4	228.7	in3
Stacked	0	in.	OK	269.4		1885.7	in4		
I1	1886	A1	154		Y1	0	in		
I2	0	A2	0		Y2	7	in		
Centroid	7.000		CTop	7.000		C	7		
Deflection									
Live Load =		0.38	in.		L/360 =		0.60	in.	OK
Dead Load =		0.14	in						
Total =		0.52	in.		L/240 =		0.90	in.	OK
Horizontal Shear									
fv Left =	51.4	psi	OK		fv Right =	51.4	psi		OK
FV =	165	psi	Allowable			P43		WALL	
						Reaction Left		Reaction Right	
Use	14"R DOUG FIR SELECT					5940	lbs	5940	lbs

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B13	Roof Ridge								
Material	Fb psi	Fv psi	E psi						
WEST WOOD SELECT	850	115	1100000			Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =	6 ft.				Distance				
Tributary Width =	5 ft.				Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	0 psf				Uniform Load =		0 lbs/ft		
Live Load =	40 psf						200 lbs/ft		
Dead Load =	15 psf						75 lbs/ft		
Moment									
Live Load Moment =			900.0 lb-ft	=	10800 lb-in				
Dead Load Moment =			337.5 lb-ft	=	4050 lb-in				
Point Load Moment =			0.0 lb-ft	=	0 lb-in				
Section Modulus Required =			17.5 in3						
				<u>S</u>		<u>I</u>		<u>Q</u>	
Log Dia.	10 in.	OK	98.2 in3		490.9 in4		83.3 in3		
Stacked	0 in.	OK	98.2		490.9				
I1	491	A1	79		Y1	0 in			
I2	0	A2	0		Y2	5 in			
Centroid	5.000		CTop	5.000		C	5		
Deflection									
Live Load =		0.01 in.		L/360 =		0.20 in.	OK		
Dead Load =		0.00 in							
Total =		0.01 in.		L/240 =		0.30 in.	OK		
Horizontal Shear									
fv Left =	14.0 psi	OK		fv Right =	14.0 psi		OK		
FV =	115 psi	Allowable			WALL		B14		
					Reaction Left		Reaction Right		
Use	10"R WEST WOOD SELECT					825 lbs	825 lbs		

Material	Fb psi	Fv psi	E psi						
DOUG FIR PREMIUM	1500	165	1500000						
DOUG FIR SELECT	1300	165	1500000						
LODGE POLE SELECT	975	125	1100000						
WEST WOOD SELECT	850	115	1100000						
WEST WOOD WL30	425	115	800000						
B14	Ridge Carrier								
Material	Fb psi	Fv psi	E psi			B13			
WEST WOOD SELECT	850	115	1100000			Load 1	Load 2	Load 3	Load 4
					Pt. Load	825			
Span =	10 ft.				Distance	5			
Tributary Width =	0 ft.				Left Reaction			Right Reaction	
					412.5 lbs			412.5 lbs	
Loads									
Snow	0 psf				Uniform Load =		0 lbs/ft		
Live Load =	40 psf						0 lbs/ft		
Dead Load =	15 psf						0 lbs/ft		
Moment									
Live Load Moment =			0.0 lb-ft	=		0 lb-in			
Dead Load Moment =			0.0 lb-ft	=		0 lb-in			
Point Load Moment =			2062.5 lb-ft	=		24750 lb-in			
Section Modulus Required =			29.1 in ³						
				S		I		Q	
Log Dia.	10 in.	OK	98.2 in ³		490.9 in ⁴		83.3 in ³		
Stacked	0 in.	OK	98.2		490.9 in ⁴				
I1	491	A1	79		Y1	0 in			
I2	0	A2	0		Y2	5 in			
Centroid	5.000		CTop	5.000		C	5		
Deflection									
Live Load =		0.06 in.		L/360 =		0.33 in.		OK	
Dead Load =		0.00 in							
Total =		0.06 in.		L/240 =		0.50 in.		OK	
Horizontal Shear									
fv Left =	7.0 psi	OK		fv Right =	7.0 psi			OK	
FV =	115 psi	Allowable			P10		P15		
					Reaction Left		Reaction Right		
Use	10"R WEST WOOD SELECT					412.5 lbs		412.5 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB1	Valley								
Type	Fb psi	Fv psi	E psi	Ply Width					
LVL	2600	285	1900000	1.75		Load 1	Load 2	Load 3	Load 4
Span =		14	ft		Pt. Load				
Tributary Width =		3	ft		Distance				
					Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	158	psf		Uniform Load =	474	lbs/ft			
Live Load	0	psf			0	lbs/ft			
Dead Load	15	psf			45	lbs/ft			
Moment									
Live Load Moment =		11613	lb-ft	=	139356	lb-in			
Dead Load Moment =		1103	lb-ft	=	13230	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	58.69	in3				
Section Width =		5.25	in.						
Section Depth =		14	in.						
Section Modulus Provided =			171.5	in3			OK		
Moment of Inertia Provided =			1200.5	in4					
Deflection									
Live Load =		0.18	in.	L/360	0.47	in.	OK		
Dead Load =		0.02	in.						
Total =		0.20	in.	L/240	0.7	in.	OK		
Horizontal Shear									
fv Left =	74	psi	OK	fv Right =	74	psi	OK		
FV =	285	psi	Allowable			B1		WALL	
						Reaction Left		Reaction Right	
Use	(3) 1.75X14 LVL					4844	lbs	2422	lbs

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB2	Valley								
Type	Fb psi	Fv psi	E psi	Ply Width					
LVL	2600	285	1900000	1.75		Load 1	Load 2	Load 3	Load 4
Span =		3	ft		Pt. Load				
Tributary Width =		2	ft		Distance				
					Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	237	psf			Uniform Load =	474	lbs/ft		
Live Load	0	psf				0	lbs/ft		
Dead Load	15	psf				30	lbs/ft		
Moment									
Live Load Moment =		533	lb-ft	=	6399	lb-in			
Dead Load Moment =		34	lb-ft	=	405	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	2.62	in ³				
Section Width =		1.75	in.						
Section Depth =		11.875	in.						
Section Modulus Provided =			41.1	in ³			OK		
Moment of Inertia Provided =			244.2	in ⁴					
Deflection									
Live Load =		0.00	in.	L/360	0.10	in.	OK		
Dead Load =		0.00	in.						
Total =		0.00	in.	L/240	0.15	in.	OK		
Horizontal Shear									
fv Left =	55	psi	OK	fv Right =	55	psi	OK		
FV =	285	psi	Allowable			WB3		WB4	
						Reaction Left		Reaction Right	
Use	(1) 1.75X11.875 LVL					756	lbs	756	lbs

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB3	Dormer Header								
Type	Fb psi	Fv psi	E psi	Ply Width		B2,WB2			
LVL	2600	285	1900000	1.75		Load 1	Load 2	Load 3	Load 4
					Pt. Load	4280			
Span =		7	ft		Distance	3.5			
Tributary Width =		3	ft		Left Reaction			Right Reaction	
					2140 lbs			2140 lbs	
Loads									
Snow	158	psf		Uniform Load =		474	lbs/ft		
Live Load	0	psf				0	lbs/ft		
Dead Load	15	psf				45	lbs/ft		
Moment									
Live Load Moment =		2903	lb-ft	=	34839	lb-in			
Dead Load Moment =		276	lb-ft	=	3308	lb-in			
Point Load Moment =		7490	lb-ft	=	89880	lb-in			
Section Modulus Required			=	49.24	in3				
Section Width =		3.5	in.						
Section Depth =		11.875	in.						
Section Modulus Provided =			82.3	in3		OK			
Moment of Inertia Provided =			488.4	in4					
Deflection									
Live Load =		0.08	in.	L/360	0.23	in.	OK		
Dead Load =		0.00	in.						
Total =		0.09	in.	L/240	0.35	in.	OK		
Horizontal Shear									
fv Left =	143	psi	OK	fv Right =	143	psi	OK		
FV =	285	psi	Allowable			WB4		WB4	
						Reaction Left		Reaction Right	
Use	(2) 1.75X11.875 LVL					3956.5 lbs		3956.5 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB4	Dormer Wall Carrier								
Type	Fb psi	Fv psi	E psi	Ply Width		WB3			
LVL	2600	285	1900000	1.75		Load 1	Load 2	Load 3	Load 4
					Pt. Load	3956.5			
Span =		12	ft		Distance	7.5			
Tributary Width =		2	ft		Left Reaction			Right Reaction	
					1483.688 lbs			2472.813 lbs	
Loads									
Snow	158	psf		Uniform Load =		316	lbs/ft		
Live Load	0	psf				0	lbs/ft		
Dead Load	15	psf				30	lbs/ft		
Moment									
Live Load Moment =		5688	lb-ft	=	68256	lb-in			
Dead Load Moment =		540	lb-ft	=	6480	lb-in			
Point Load Moment =		11127.66	lb-ft	=	133532	lb-in			
Section Modulus Required			=	80.10	in3				
Section Width =		3.5	in.						
Section Depth =		11.875	in.						
Section Modulus Provided =			82.3	in3			OK		
Moment of Inertia Provided =			488.4	in4					
Deflection									
Live Load =		0.41	in.	L/360	0.40	in.	OK		
Dead Load =		0.02	in.						
Total =		0.42	in.	L/240	0.6	in.	OK		
Horizontal Shear									
fv Left =	128	psi	OK	fv Right =	164	psi	OK		
FV =	285	psi	Allowable			WALL		B3	
						Reaction Left		Reaction Right	
Use	(2) 1.75X11.875 LVL					3559.688	lbs	4548.813	lbs

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB5	Porch Rafter								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =		10	ft		Distance				
Tributary Width =		1.33	ft		Left Reaction		Right Reaction		
					0 lbs			0 lbs	
Loads									
Snow	158	psf		Uniform Load =	210.14	lbs/ft			
Live Load	0	psf			0	lbs/ft			
Dead Load	15	psf			19.95	lbs/ft			
Moment									
Live Load Moment =		2627	lb-ft	=	31521	lb-in			
Dead Load Moment =		249	lb-ft	=	2993	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	25.57	in3				
Section Width =		1.5	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			31.6	in3		OK			
Moment of Inertia Provided =			178.0	in4					
Deflection									
Live Load =		0.17	in.	L/360	0.33	in.	OK		
Dead Load =		0.02	in.						
Total =		0.18	in.	L/240	0.5	in.	OK		
Horizontal Shear									
fv Left =	102	psi	OK	fv Right =	102	psi	OK		
FV =	180	psi	Allowable			B	WALL		
						Reaction Left		Reaction Right	
Use	DF 2X12 @ 16 IN. O.C.					1150.45 lbs		1150.45 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB6	Porch Rafter								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =		7	ft		Distance				
Tributary Width =		2	ft		Left Reaction		Right Reaction		
					0 lbs			0 lbs	
Loads									
Snow	158	psf		Uniform Load =	316	lbs/ft			
Live Load	0	psf			0	lbs/ft			
Dead Load	15	psf			30	lbs/ft			
Moment									
Live Load Moment =		1936	lb-ft	=	23226	lb-in			
Dead Load Moment =		184	lb-ft	=	2205	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	18.84	in3				
Section Width =		1.5	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			31.6	in3		OK			
Moment of Inertia Provided =			178.0	in4					
Deflection									
Live Load =		0.06	in.	L/360	0.23	in.	OK		
Dead Load =		0.01	in.						
Total =		0.07	in.	L/240	0.35	in.	OK		
Horizontal Shear									
fv Left =	108	psi	OK	fv Right =	108	psi	OK		
FV =	180	psi	Allowable			B		WALL	
						Reaction Left		Reaction Right	
Use	DF 2X12 @ 24 IN. O.C.					1211 lbs		1211 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB7	Porch Hip Rafter								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =		12	ft		Distance				
Tributary Width =		3	ft		Left Reaction		Right Reaction		
					0 lbs		0 lbs		
Loads									
Snow	158	psf		Uniform Load =		474	lbs/ft		
Live Load	0	psf				0	lbs/ft		
Dead Load	15	psf				45	lbs/ft		
Moment									
Live Load Moment =		8532	lb-ft	=	102384	lb-in			
Dead Load Moment =		810	lb-ft	=	9720	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	83.04	in3				
Section Width =		4.5	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			94.9	in3		OK			
Moment of Inertia Provided =			533.9	in4					
Deflection									
Live Load =		0.26	in.	L/360	0.40	in.	OK		
Dead Load =		0.02	in.						
Total =		0.28	in.	L/240	0.6	in.	OK		
Horizontal Shear									
fv Left =	92	psi	OK	fv Right =	92	psi	OK		
FV =	180	psi	Allowable			P1.		WALL	
						Reaction Left		Reaction Right	
Use	(3) DF 2X12					3114 lbs		3114 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB8	Porch Hip Rafter								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =		9	ft		Distance				
Tributary Width =		4	ft		Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	158	psf		Uniform Load =	632	lbs/ft			
Live Load	0	psf			0	lbs/ft			
Dead Load	15	psf			60	lbs/ft			
Moment									
Live Load Moment =		6399	lb-ft	=	76788	lb-in			
Dead Load Moment =		608	lb-ft	=	7290	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	62.28	in3				
Section Width =		3	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			63.3	in3		OK			
Moment of Inertia Provided =			356.0	in4					
Deflection									
Live Load =		0.16	in.	L/360	0.30	in.	OK		
Dead Load =		0.02	in.						
Total =		0.18	in.	L/240	0.45	in.	OK		
Horizontal Shear									
fv Left =	138	psi	OK	fv Right =	138	psi	OK		
FV =	180	psi	Allowable			P30,P27		WALL	
						Reaction Left		Reaction Right	
Use	(2) DF 2X12					3114 lbs		3114 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB9	Main Floor Carrier								
Type	Fb psi	Fv psi	E psi	Ply Width					
LVL	2600	285	1900000	1.75		Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =		14	ft		Distance				
Tributary Width =		9	ft		Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	0	psf		Uniform Load =		0	lbs/ft		
Live Load	40	psf				360	lbs/ft		
Dead Load	15	psf				135	lbs/ft		
Moment									
Live Load Moment =		8820	lb-ft	=	105840	lb-in			
Dead Load Moment =		3308	lb-ft	=	39690	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	55.97	in3				
Section Width =		3.5	in.						
Section Depth =		11.875	in.						
Section Modulus Provided =			82.3	in3			OK		
Moment of Inertia Provided =			488.4	in4					
Deflection									
Live Load =		0.34	in.	L/360	0.47	in.	OK		
Dead Load =		0.13	in.						
Total =		0.46	in.	L/240	0.7	in.	OK		
Horizontal Shear									
fv Left =	125	psi	OK	fv Right =	125	psi	OK		
FV =	285	psi	Allowable			P41		P42	
						Reaction Left		Reaction Right	
Use	(2) 1.75X11.875 LVL					3465	lbs	3465	lbs

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB10	Main Floor Carrier								
Type	Fb psi	Fv psi	E psi	Ply Width					
LVL	2600	285	1900000	1.75		Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =		10	ft		Distance				
Tributary Width =		12	ft		Left Reaction			Right Reaction	
					0 lbs			0 lbs	
Loads									
Snow	0	psf		Uniform Load =		0	lbs/ft		
Live Load	40	psf				480	lbs/ft		
Dead Load	15	psf				180	lbs/ft		
Moment									
Live Load Moment =		6000	lb-ft	=	72000	lb-in			
Dead Load Moment =		2250	lb-ft	=	27000	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	38.08	in3				
Section Width =		1.75	in.						
Section Depth =		11.875	in.						
Section Modulus Provided =			41.1	in3		OK			
Moment of Inertia Provided =			244.2	in4					
Deflection									
Live Load =		0.23	in.	L/360	0.33	in.	OK		
Dead Load =		0.09	in.						
Total =		0.32	in.	L/240	0.5	in.	OK		
Horizontal Shear									
fv Left =	238	psi	OK	fv Right =	238	psi	OK		
FV =	285	psi	Allowable			P45,P44		P44,P43	
						Reaction Left		Reaction Right	
Use	(1) 1.75X11.875 LVL					3300 lbs		3300 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB11	Main Floor Carrier								
Type	Fb psi	Fv psi	E psi	Ply Width					
LVL	2600	285	1900000	1.75		Load 1	Load 2	Load 3	Load 4
					Pt. Load Distance				
Span =		19	ft						
Tributary Width =		10	ft	Left Reaction				Right Reaction	
					0 lbs				0 lbs
Loads									
Snow	0 psf				Uniform Load =		0 lbs/ft		
Live Load	40 psf						400 lbs/ft		
Dead Load	15 psf						150 lbs/ft		
Moment									
Live Load Moment =		18050	lb-ft	=	216600	lb-in			
Dead Load Moment =		6769	lb-ft	=	81225	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	114.55	in3				
Section Width =		7 in.							
Section Depth =		11.875 in.							
Section Modulus Provided =			164.5	in3			OK		
Moment of Inertia Provided =			976.8	in4					
Deflection									
Live Load =		0.63	in.	L/360	0.63	in.	OK		
Dead Load =		0.24	in.						
Total =		0.87	in.	L/240	0.95	in.	OK		
Horizontal Shear									
fv Left =	94	psi	OK	fv Right =	94	psi	OK		
FV =	285	psi	Allowable			P46	P47		
						Reaction Left		Reaction Right	
Use	(4) 1.75X11.875 LVL					5225 lbs		5225 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB12	Main Floor Deck Joist								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load Distance				
Span =		11	ft						
Tributary Width =		1.33	ft		Left Reaction		Right Reaction		
					0 lbs		0 lbs		
Loads									
Snow	80	psf		Uniform Load =		106.4	lbs/ft		
Live Load	0	psf				0	lbs/ft		
Dead Load	15	psf				19.95	lbs/ft		
Moment									
Live Load Moment =		1609	lb-ft	=	19311.6	lb-in			
Dead Load Moment =		302	lb-ft	=	3621	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	16.99	in3				
Section Width =		1.5	in.						
Section Depth =		9.25	in.						
Section Modulus Provided =			21.4	in3		OK			
Moment of Inertia Provided =			98.9	in4					
Deflection									
Live Load =		0.22	in.	L/360	0.37	in.	OK		
Dead Load =		0.04	in.						
Total =		0.26	in.	L/240	0.55	in.	OK		
Horizontal Shear									
fv Left =	75	psi	OK	fv Right =	75	psi	OK		
FV =	180	psi	Allowable			WB	WALL		
						Reaction Left		Reaction Right	
Use	DF 2X10 @ 16 IN. O.C.					694.925 lbs		694.925 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB13	Main Floor Deck Joist								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =		7	ft		Distance				
Tributary Width =		2	ft		Left Reaction		Right Reaction		
					0 lbs		0 lbs		
Loads									
Snow	80	psf		Uniform Load =	160	lbs/ft			
Live Load	0	psf			0	lbs/ft			
Dead Load	15	psf			30	lbs/ft			
Moment									
Live Load Moment =		980	lb-ft	=	11760	lb-in			
Dead Load Moment =		184	lb-ft	=	2205	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	10.34	in3				
Section Width =		1.5	in.						
Section Depth =		7.25	in.						
Section Modulus Provided =			13.1	in3		OK			
Moment of Inertia Provided =			47.6	in4					
Deflection									
Live Load =		0.11	in.	L/360	0.23	in.	OK		
Dead Load =		0.02	in.						
Total =		0.13	in.	L/240	0.35	in.	OK		
Horizontal Shear									
fv Left =	92	psi	OK	fv Right =	92	psi	OK		
FV =	180	psi	Allowable			WB	WALL		
						Reaction Left		Reaction Right	
Use	DF 2X8 @ 24 IN. O.C.					665 lbs		665 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB14	Main Floor Deck Joist								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load Distance				
Span =		6	ft						
Tributary Width =		1.33	ft		Left Reaction		Right Reaction		
					0 lbs		0 lbs		
Loads									
Snow	158	psf		Uniform Load =	210.14	lbs/ft			
Live Load	0	psf			0	lbs/ft			
Dead Load	15	psf			19.95	lbs/ft			
Moment									
Live Load Moment =		946	lb-ft	=	11347.56	lb-in			
Dead Load Moment =		90	lb-ft	=	1077	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	9.20	in3				
Section Width =		1.5	in.						
Section Depth =		7.25	in.						
Section Modulus Provided =			13.1	in3		OK			
Moment of Inertia Provided =			47.6	in4					
Deflection									
Live Load =		0.08	in.	L/360	0.20	in.	OK		
Dead Load =		0.01	in.						
Total =		0.09	in.	L/240	0.3	in.	OK		
Horizontal Shear									
fv Left =	95	psi	OK	fv Right =	95	psi	OK		
FV =	180	psi	Allowable			WB	WB		
						Reaction Left		Reaction Right	
Use	DF 2X8 @ 16 IN. O.C.					690.27 lbs		690.27 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB15	Main Floor Deck Joist Carrer								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =		11	ft		Distance				
Tributary Width =		3	ft		Left Reaction		Right Reaction		
					0 lbs		0 lbs		
Loads									
Snow	158	psf		Uniform Load =		474	lbs/ft		
Live Load	0	psf				0	lbs/ft		
Dead Load	15	psf				45	lbs/ft		
Moment									
Live Load Moment =		7169	lb-ft	=	86031	lb-in			
Dead Load Moment =		681	lb-ft	=	8168	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	69.78	in3				
Section Width =		4.5	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			94.9	in3		OK			
Moment of Ineritia Provided =			533.9	in4					
Deflection									
Live Load =		0.18	in.	L/360	0.37	in.	OK		
Dead Load =		0.02	in.						
Total =		0.20	in.	L/240	0.55	in.	OK		
Horizontal Shear									
fv Left =	85	psi	OK	fv Right =	85	psi	OK		
FV =	180	psi	Allowable			P11,P12		P14,P13	
						Reaction Left		Reaction Right	
Use	(3) DF 2X12					2854.5 lbs		2854.5 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB16	Main Floor Deck Joist Carrer								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =		9	ft		Distance				
Tributary Width =		3	ft		Left Reaction		Right Reaction		
					0 lbs			0 lbs	
Loads									
Snow	158	psf		Uniform Load =		474	lbs/ft		
Live Load	0	psf				0	lbs/ft		
Dead Load	15	psf				45	lbs/ft		
Moment									
Live Load Moment =		4799	lb-ft	=	57591	lb-in			
Dead Load Moment =		456	lb-ft	=	5468	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	46.71	in3				
Section Width =		3	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			63.3	in3		OK			
Moment of Inertia Provided =			356.0	in4					
Deflection									
Live Load =		0.12	in.	L/360	0.30	in.	OK		
Dead Load =		0.01	in.						
Total =		0.13	in.	L/240	0.45	in.	OK		
Horizontal Shear									
fv Left =	104	psi	OK	fv Right =	104	psi	OK		
FV =	180	psi	Allowable			P37,P38		P36,P35	
						Reaction Left		Reaction Right	
Use	(2) DF 2X12					2335.5 lbs		2335.5 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB17	Main Floor Deck Joist Carrer								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =		9	ft		Distance				
Tributary Width =		6	ft		Left Reaction		Right Reaction		
					0 lbs		0 lbs		
Loads									
Snow	80	psf		Uniform Load =	480	lbs/ft			
Live Load	0	psf			0	lbs/ft			
Dead Load	15	psf			90	lbs/ft			
Moment									
Live Load Moment =		4860	lb-ft	=	58320	lb-in			
Dead Load Moment =		911	lb-ft	=	10935	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	51.30	in3				
Section Width =		3	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			63.3	in3		OK			
Moment of Ineritia Provided =			356.0	in4					
Deflection									
Live Load =		0.12	in.	L/360	0.30	in.	OK		
Dead Load =		0.02	in.						
Total =		0.15	in.	L/240	0.45	in.	OK		
Horizontal Shear									
fv Left =	114	psi	OK	fv Right =	114	psi	OK		
FV =	180	psi	Allowable			P37,P38		P36,P35	
						Reaction Left		Reaction Right	
Use	(2) DF 2X12					2565 lbs		2565 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB18	Main Floor Deck Joist Carrer								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load Distance				
Span =		10	ft						
Tributary Width =		3.5	ft		Left Reaction		Right Reaction		
					0 lbs		0 lbs		
Loads									
Snow	80	psf		Uniform Load =		280	lbs/ft		
Live Load	0	psf				0	lbs/ft		
Dead Load	15	psf				52.5	lbs/ft		
Moment									
Live Load Moment =		3500	lb-ft	=	42000	lb-in			
Dead Load Moment =		656	lb-ft	=	7875	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	36.94	in3				
Section Width =		3	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			63.3	in3		OK			
Moment of Inertia Provided =			356.0	in4					
Deflection									
Live Load =		0.11	in.	L/360	0.33	in.	OK		
Dead Load =		0.02	in.						
Total =		0.13	in.	L/240	0.5	in.	OK		
Horizontal Shear									
fv Left =	74	psi	OK	fv Right =	74	psi	OK		
FV =	180	psi	Allowable			P40		P39	
						Reaction Left	Reaction Right		
Use	(2) DF 2X12					1662.5	lbs	1662.5	lbs

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB19	Main Floor Deck Joist Carrer								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load				
Span =		8	ft		Distance				
Tributary Width =		7	ft		Left Reaction		Right Reaction		
					0 lbs		0 lbs		
Loads									
Snow	80	psf		Uniform Load =	560	lbs/ft			
Live Load	0	psf			0	lbs/ft			
Dead Load	15	psf			105	lbs/ft			
Moment									
Live Load Moment =		4480	lb-ft	=	53760	lb-in			
Dead Load Moment =		840	lb-ft	=	10080	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	47.29	in3				
Section Width =		3	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			63.3	in3		OK			
Moment of Ineritia Provided =			356.0	in4					
Deflection									
Live Load =		0.09	in.	L/360	0.27	in.	OK		
Dead Load =		0.02	in.						
Total =		0.11	in.	L/240	0.4	in.	OK		
Horizontal Shear									
fv Left =	118	psi	OK	fv Right =	118	psi	OK		
FV =	180	psi	Allowable			P30,P31	P31		
						Reaction Left	Reaction Right		
Use	(2) DF 2X12					2660 lbs		2660 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB20	Main Floor Deck Joist Carrer								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load Distance				
Span =		8	ft						
Tributary Width =		3.5	ft		Left Reaction		Right Reaction		
					0 lbs		0 lbs		
Loads									
Snow	80	psf		Uniform Load =	280	lbs/ft			
Live Load	0	psf			0	lbs/ft			
Dead Load	15	psf			52.5	lbs/ft			
Moment									
Live Load Moment =		2240	lb-ft	=	26880	lb-in			
Dead Load Moment =		420	lb-ft	=	5040	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	23.64	in3				
Section Width =		1.5	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			31.6	in3		OK			
Moment of Ineritia Provided =			178.0	in4					
Deflection									
Live Load =		0.09	in.	L/360	0.27	in.	OK		
Dead Load =		0.02	in.						
Total =		0.11	in.	L/240	0.4	in.	OK		
Horizontal Shear									
fv Left =	118	psi	OK	fv Right =	118	psi	OK		
FV =	180	psi	Allowable			P27,P26		P26	
						Reaction Left		Reaction Right	
Use	(1) DF 2X12					1330 lbs		1330 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB21	Main Floor Deck Joist Carrer								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load Distance				
Span =		8	ft						
Tributary Width =		3.5	ft		Left Reaction		Right Reaction		
					0 lbs		0 lbs		
Loads									
Snow	158	psf		Uniform Load =		553	lbs/ft		
Live Load	0	psf				0	lbs/ft		
Dead Load	15	psf				52.5	lbs/ft		
Moment									
Live Load Moment =		4424	lb-ft	=	53088	lb-in			
Dead Load Moment =		420	lb-ft	=	5040	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	43.06	in3				
Section Width =		3	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			63.3	in3		OK			
Moment of Ineritia Provided =			356.0	in4					
Deflection									
Live Load =		0.09	in.	L/360	0.27	in.	OK		
Dead Load =		0.01	in.						
Total =		0.10	in.	L/240	0.4	in.	OK		
Horizontal Shear									
fv Left =	108	psi	OK	fv Right =	108	psi	OK		
FV =	180	psi	Allowable			P29,P28		P28,P27	
						Reaction Left		Reaction Right	
Use	(2) DF 2X12					2422 lbs		2422 lbs	

Type	Fb psi	Fv psi	E psi	Ply Width					
STEEL	24000	14400	29000000						
LVL	2600	285	1900000	1.75					
LSL	1700	400	1300000	1.75					
PARALAM	2900	290	2000000	1.75					
GLB	2400	190	1800000						
DF	1350	180	1600000	1.5					
WB22	Main Floor Deck Joist Carrer								
Type	Fb psi	Fv psi	E psi	Ply Width					
DF	1350	180	1600000	1.5		Load 1	Load 2	Load 3	Load 4
					Pt. Load Distance				
Span =		8	ft						
Tributary Width =		7	ft		Left Reaction		Right Reaction		
					0 lbs		0 lbs		
Loads									
Snow	120	psf		Uniform Load =	840	lbs/ft			
Live Load	0	psf			0	lbs/ft			
Dead Load	15	psf			105	lbs/ft			
Moment									
Live Load Moment =		6720	lb-ft	=	80640	lb-in			
Dead Load Moment =		840	lb-ft	=	10080	lb-in			
Point Load Moment =		0	lb-ft	=	0	lb-in			
Section Modulus Required			=	67.20	in3				
Section Width =		4.5	in.						
Section Depth =		11.25	in.						
Section Modulus Provided =			94.9	in3		OK			
Moment of Ineritia Provided =			533.9	in4					
Deflection									
Live Load =		0.09	in.	L/360	0.27	in.	OK		
Dead Load =		0.01	in.						
Total =		0.10	in.	L/240	0.4	in.	OK		
Horizontal Shear									
fv Left =	112	psi	OK	fv Right =	112	psi	OK		
FV =	180	psi	Allowable		P30,P31		P31		
					Reaction Left		Reaction Right		
Use	(3) DF 2X12					3780	lbs	3780	lbs

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F4	Exterior Bearing Walls							
Allowable Bearing Capacity		1500	psf	Max Roof Span =		4	ft	
				Max Floor Span =		17	ft	
Snow Load		158	psf	Wall Height =		18	ft	
Floor Live Load		40	psf	Stem Wall Height =		4	ft	
Wall Dead Load		30	psf	Stem Wall Width =		8	in.	
Roof Dead Load		15	psf					
Brick Dead Load		0	psf					
Floor Dead Load		15	psf					
B1		779.026	lbs/ft	Proposed Footing				
Roof Loads		346	lbs/ft		Width		24	in
Floor Loads		467.5	lbs/ft		Depth		10	in
Wall Load		540	lbs/ft					
Stem Wall Load		400	lbs/ft					
Footing Load		250	lbs/ft					
Total		2783	lbs/ft	Bearing Pressure =		1391	psf	OK
Reinforcing Requirements								
Min Reinforcing Factors								
Footing		0.002						
Stem Wall								
	Vertical	0.0012						
	Horizontal	0.002		Reinforcing Bar	#4	0.2	in*in	
Footing								
Continuous Reinforcing Count				3 bars				
Stem Wall								
Continuous Reinforcing Count				4 bars				
Vertical - Reinforcing Spacing				18 in.				
Use	24X10 CONT. FTG WITH (3) #4 CONT.							

F17	Interior Bearing Walls						
Allowable Bearing Capacity		1500	psf	Max Roof Span =		0	ft
				Max Floor Span =		23	ft
Snow Load		158	psf	Wall Height =		18	ft
Floor Live Load		40	psf	Stem Wall Height =		2	ft
Wall Dead Load		15	psf	Stem Wall Width =		8	in.
Roof Dead Load		15	psf				
Brick Dead Load		0	psf				
Floor Dead Load		15	psf				
				Proposed Footing			
Roof Loads		0	lbs/ft		Width	12	in
Floor Loads		632.5	lbs/ft		Depth	8	in
Wall Load		270	lbs/ft				
Stem Wall Load		200	lbs/ft				
Footing Load		100	lbs/ft				
Total		1203	lbs/ft	Bearing Pressure =		1203	psf
							OK
Reinforcing Requirements							
Min Reinforcing Factors							
Footing		0.002					
Stem Wall							
	Vertical	0.0012					
	Horizontal	0.002		Reinforcing Bar	#4	0.2	in*in
Footing							
Continuous Reinforcing Count				2 bars			
Stem Wall							
Continuous Reinforcing Count				2 bars			
Vertical - Reinforcing Spacing				18 in.			
Use	12X8 CONT. FTG WITH (2) #4 CONT.						

F5	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	14705		Part 3 Loads	0	
	Part 2 Loads	0		Part 4 Loads	0	
P1.	Total Loads	14705	lbs	0	ft-lbs	
	L = Length	3.75	ft	Soil Wt	110	pcf
	B = Width	3.75	ft			
	Thickness	1	ft			
	Soil Depth	2	ft	Weight	5203.125	lbs
	V =	19908.13	lbs	e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1416	psf	OK	
	Qmin = V/BL(1-6e/L) =		1416	psf	OK	
Reinforcing for Long Direction						
	Use	3.75	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.08	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	6	#4	7.80	in O.C.	
Reinforcing for Short Direction						
	Use	3.75	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.08	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	6	#4	7.80	in. O.C.	
USE	45X45X12 FTG WITH (6) #4 EACH WAY					
Post Specification			(Based on 10' unbraced Length)			
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	7	15120	lbs	
Use >>>	DF #1 2x6	7470	2	14940	lbs	OK
	DF #1 6x6	21000	1	21000	lbs	
	DF #1 6X8	28600	1	28600	lbs	
	DF #1 8X8	48200	1	48200	lbs	
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	1	33000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
	(2) DF #1 2x6					

F6	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	14532		Part 3 Loads	0	
	Part 2 Loads	0		Part 4 Loads	0	
P2.	Total Loads	14532	lbs	0	ft-lbs	
	L = Length	3.75	ft	Soil Wt	110	pcf
	B = Width	3.75	ft			
	Thickness	1	ft			
	Soil Depth	2	ft	Weight	5203.125	lbs
	V =	19735.13	lbs	e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1403	psf	OK	
	Qmin = V/BL(1-6e/L) =		1403	psf	OK	
Reinforcing for Long Direction						
	Use	3.75	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.08	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	6	#4	7.80	in O.C.	
Reinforcing for Short Direction						
	Use	3.75	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.08	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	6	#4	7.80	in. O.C.	
USE	45X45X12 FTG WITH (6) #4 EACH WAY					
Post Specification (Based on 10' unbraced Length)						
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	7	15120	lbs	
Use >>>	DF #1 2x6	7470	2	14940	lbs	OK
	DF #1 6x6	21000	1	21000	lbs	
	DF #1 6X8	28600	1	28600	lbs	
	DF #1 8X8	48200	1	48200	lbs	
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	1	33000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
	(2) DF #1 2x6					

F7	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	0		Part 3 Loads	9447.5	
	Part 2 Loads	0		Part 4 Loads	0	
P40	Total Loads	9447.5	lbs	0	ft-lbs	
	L = Length	3	ft	Soil Wt	110	pcf
	B = Width	3	ft			
	Thickness	1	ft			
	Soil Depth	2	ft	Weight	3330	lbs
	V =	12777.5	lbs	e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1420	psf	OK	
	Qmin = V/BL(1-6e/L) =		1420	psf	OK	
Reinforcing for Long Direction						
	Use	3	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			0.864	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	5	#4	7.50	in O.C.	
Reinforcing for Short Direction						
	Use	3	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			0.864	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	5	#4	7.50	in. O.C.	
USE	36X36X12 FTG WITH (5) #4 EACH WAY					
Post Specification (Based on 10' unbraced Length)						
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	5	10800	lbs	
Use >>>	DF #1 2x6	7470	2	14940	lbs	OK
	DF #1 6x6	21000	1	21000	lbs	
	DF #1 6X8	28600	1	28600	lbs	
	DF #1 8X8	48200	1	48200	lbs	
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	1	33000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
	(2) DF #1 2x6					

F8	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	0		Part 3 Loads	0	
	Part 2 Loads	16474		Part 4 Loads	0	
P30	Total Loads	16474	lbs	0	ft-lbs	
	L = Length	4	ft	Soil Wt	110	pcf
	B = Width	4	ft			
	Thickness	1	ft			
	Soil Depth	2	ft	Weight	5920	lbs
	V =	22394	lbs	e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1400	psf	OK	
	Qmin = V/BL(1-6e/L) =		1400	psf	OK	
Reinforcing for Long Direction						
	Use	4	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.152	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	6	#4	8.40	in O.C.	
Reinforcing for Short Direction						
	Use	4	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.152	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	6	#4	8.40	in. O.C.	
USE	48X48X12 FTG WITH (6) #4 EACH WAY					
Post Specification (Based on 10' unbraced Length)						
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	8	17280	lbs	
Use >>>	DF #1 2x6	7470	3	22410	lbs	OK
	DF #1 6x6	21000	1	21000	lbs	
	DF #1 6X8	28600	1	28600	lbs	
	DF #1 8X8	48200	1	48200	lbs	
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	1	33000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
	(3) DF #1 2x6					

F9	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	0		Part 3 Loads	12880	
	Part 2 Loads	0		Part 4 Loads	0	
P31	Total Loads	12880	lbs	0	ft-lbs	
	L = Length	3.5	ft	Soil Wt	110	pcf
	B = Width	3.5	ft			
	Thickness	1	ft			
	Soil Depth	2	ft	Weight	4532.5	lbs
	V =	17412.5	lbs	e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1421	psf	OK	
	Qmin = V/BL(1-6e/L) =		1421	psf	OK	
Reinforcing for Long Direction						
	Use	3.5	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.008	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	6	#4	7.20	in O.C.	
Reinforcing for Short Direction						
	Use	3.5	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.008	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	6	#4	7.20	in. O.C.	
USE	42X42X12 FTG WITH (6) #4 EACH WAY					
Post Specification			(Based on 10' unbraced Length)			
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	6	12960	lbs	
Use >>>	DF #1 2x6	7470	2	14940	lbs	OK
	DF #1 6x6	21000	1	21000	lbs	
	DF #1 6X8	28600	1	28600	lbs	
	DF #1 8X8	48200	1	48200	lbs	
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	1	33000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
	(2) DF #1 2x6					

F10	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	0		Part 3 Loads	0	
	Part 2 Loads	10326		Part 4 Loads	0	
P27	Total Loads	10326	lbs	0	ft-lbs	
	L = Length	3.25	ft	Soil Wt	110	pcf
	B = Width	3.25	ft			
	Thickness	1	ft			
	Soil Depth	2	ft	Weight	3908.125	lbs
	V =	14234.13	lbs	e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1348	psf	OK	
	Qmin = V/BL(1-6e/L) =		1348	psf	OK	
Reinforcing for Long Direction						
	Use	3.25	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			0.936	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	5	#4	8.25	in O.C.	
Reinforcing for Short Direction						
	Use	3.25	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			0.936	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	5	#4	8.25	in. O.C.	
USE	39X39X12 FTG WITH (5) #4 EACH WAY					
Post Specification			(Based on 10' unbraced Length)			
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	5	10800	lbs	
Use >>>	DF #1 2x6	7470	2	14940	lbs	OK
	DF #1 6x6	21000	1	21000	lbs	
	DF #1 6X8	28600	1	28600	lbs	
	DF #1 8X8	48200	1	48200	lbs	
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	1	33000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
	(2) DF #1 2x6					

F11	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	2854.5		Part 3 Loads	0	
	Part 2 Loads	0		Part 4 Loads	0	
P14	Total Loads	2854.5	lbs	0	ft-lbs	
	L = Length	2	ft	Soil Wt	110	pcf
	B = Width	2	ft			
	Thickness	1	ft			
	Soil Depth	2	ft	Weight	1480	lbs
	V =	4334.5	lbs	e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1084	psf	OK	
	Qmin = V/BL(1-6e/L) =		1084	psf	OK	
Reinforcing for Long Direction						
	Use	2	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			0.576	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	3	#4	9.00	in O.C.	
Reinforcing for Short Direction						
	Use	2	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			0.576	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	3	#4	9.00	in. O.C.	
USE	24X24X12 FTG WITH (3) #4 EACH WAY					
Post Specification			(Based on 10' unbraced Length)			
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	2	4320	lbs	
Use >>>	DF #1 2x6	7470	1	7470	lbs	OK
	DF #1 6x6	21000	1	21000	lbs	
	DF #1 6X8	28600	1	28600	lbs	
	DF #1 8X8	48200	1	48200	lbs	
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	1	33000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
	(1) DF #1 2x6					

F12	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	0		Part 3 Loads	3465	
	Part 2 Loads	0		Part 4 Loads	0	
P41	Total Loads	3465 lbs		0	ft-lbs	
	L = Length	2 ft		Soil Wt	110	pcf
	B = Width	2 ft				
	Thickness	1 ft				
	Soil Depth	2 ft		Weight	1480	lbs
	V =	4945 lbs		e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1236	psf	OK	
	Qmin = V/BL(1-6e/L) =		1236	psf	OK	
Reinforcing for Long Direction						
	Use	2	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			0.576	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	3	#4	9.00	in O.C.	
Reinforcing for Short Direction						
	Use	2	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			0.576	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	3	#4	9.00	in. O.C.	
USE	24X24X12 FTG WITH (3) #4 EACH WAY					
Post Specification			(Based on 10' unbraced Length)			
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	2	4320	lbs	
	DF #1 2x6	7470	1	7470	lbs	
Use >>>	DF #1 6x6	21000	1	21000	lbs	OK
	DF #1 6X8	28600	1	28600	lbs	
	DF #1 8X8	48200	1	48200	lbs	
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	1	33000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
	(1) DF #1 6x6					

F13	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	0		Part 3 Loads	5957.678571	
	Part 2 Loads	0		Part 4 Loads	0	
P42	Total Loads	5957.679	lbs	0	ft-lbs	
	L = Length	2.5	ft	Soil Wt	110	pcf
	B = Width	2.5	ft			
	Thickness	1	ft			
	Soil Depth	2	ft	Weight	2312.5	lbs
	V =	8270.179	lbs	e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1323	psf	OK	
	Qmin = V/BL(1-6e/L) =		1323	psf	OK	
Reinforcing for Long Direction						
	Use	2.5	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			0.72	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	4	#4	8.00	in O.C.	
Reinforcing for Short Direction						
	Use	2.5	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			0.72	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	4	#4	8.00	in. O.C.	
USE	30X30X12 FTG WITH (4) #4 EACH WAY					
Post Specification			(Based on 10' unbraced Length)			
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	3	6480	lbs	
	DF #1 2x6	7470	1	7470	lbs	
Use >>>	DF #1 6x6	21000	1	21000	lbs	OK
	DF #1 6X8	28600	1	28600	lbs	
	DF #1 8X8	48200	1	48200	lbs	
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	1	33000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
	(1) DF #1 6x6					

F14	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	0		Part 3 Loads	40959.74717	
	Part 2 Loads	0		Part 4 Loads	0	
P43	Total Loads	40959.75	lbs	0	ft-lbs	
	L = Length	6.25	ft	Soil Wt	110	pcf
	B = Width	6.25	ft			
	Thickness	1	ft			
	Soil Depth	2	ft	Weight	14453.125	lbs
	V =	55412.87	lbs	e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1419	psf	OK	
	Qmin = V/BL(1-6e/L) =		1419	psf	OK	
Reinforcing for Long Direction						
	Use	6.25	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.8	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	10	#4	7.67	in O.C.	
Reinforcing for Short Direction						
	Use	6.25	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.8	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	10	#4	7.67	in. O.C.	
USE	75X75X12 FTG WITH (10) #4 EACH WAY					
Post Specification			(Based on 10' unbraced Length)			
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	19	41040	lbs	
	DF #1 2x6	7470	6	44820	lbs	
	DF #1 6x6	21000	2	42000	lbs	
	DF #1 6X8	28600	2	57200	lbs	
Use >>>	DF #1 8X8	48200	1	48200	lbs	OK
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	2	66000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
	(1) DF #1 8X8					

F15	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	0		Part 3 Loads	48791.97973	
	Part 2 Loads	0		Part 4 Loads	0	
P44	Total Loads	48791.98	lbs	0	ft-lbs	
	L = Length	7.25	ft	Soil Wt	110	pcf
	B = Width	7.25	ft			
	Thickness	1.25	ft			
	Soil Depth	2	ft	Weight	21419.21875	lbs
	V =	70211.2	lbs	e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1336	psf	OK	
	Qmin = V/BL(1-6e/L) =		1336	psf	OK	
Reinforcing for Long Direction						
	Use	7.25	ft. Wide X	15	in. Deep Footing	
	Calculated Minimum Reinforcing =			2.61	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	14	#4	6.23	in O.C.	
Reinforcing for Short Direction						
	Use	7.25	ft. Wide X	15	in. Deep Footing	
	Calculated Minimum Reinforcing =			2.61	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	14	#4	6.23	in. O.C.	
USE	87X87X15 FTG WITH (14) #4 EACH WAY					
Post Specification			(Based on 10' unbraced Length)			
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	23	49680	lbs	
	DF #1 2x6	7470	7	52290	lbs	
	DF #1 6x6	21000	3	63000	lbs	
	DF #1 6X8	28600	2	57200	lbs	
	DF #1 8X8	48200	2	96400	lbs	
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	2	66000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
16" R LOG POST						

F16	Spread Footing					
	Allowable Soil Bearing Pressure =				1500	psf
	Min Reinforcing Factor =				0.002	
	Concrete Strength @ 28 days				2500	psi
	Steel Reinforcing (fy) =				60000	psi
Post	Description	Vertical		Moment		
	Part 1 Loads	0		Part 3 Loads	39903.74717	
	Part 2 Loads	0		Part 4 Loads	0	
P45	Total Loads	39903.75	lbs	0	ft-lbs	
	L = Length	6	ft	Soil Wt	110	pcf
	B = Width	6	ft			
	Thickness	1	ft			
	Soil Depth	2	ft	Weight	13320	lbs
	V =	53223.75	lbs	e = M/V	0.0000	
	Qmax = V/BL(1+6e/L) =		1478	psf	OK	
	Qmin = V/BL(1-6e/L) =		1478	psf	OK	
Reinforcing for Long Direction						
	Use	6	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.728	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	9	#4	8.25	in O.C.	
Reinforcing for Short Direction						
	Use	6	ft. Wide X	12	in. Deep Footing	
	Calculated Minimum Reinforcing =			1.728	in*in	
	Rebar Size =	#4	Area =	0.2	in*in	
	Use	9	#4	8.25	in. O.C.	
USE	72X72X12 FTG WITH (9) #4 EACH WAY					
Post Specification (Based on 10' unbraced Length)						
	Description	Capacity	Quantity	Total Capacity		
	DF #1 2x4	2160	19	41040	lbs	
	DF #1 2x6	7470	6	44820	lbs	
	DF #1 6x6	21000	2	42000	lbs	
	DF #1 6X8	28600	2	57200	lbs	
Use >>>	DF #1 8X8	48200	1	48200	lbs	OK
	DF #1 10X10	83000	1	83000	lbs	
	HSS 3x3x1/4	33000	2	66000	lbs	
	HSS 4x4x1/4	65000	1	65000	lbs	
	(1) DF #1 8X8					

Basement Wall Design					
Assumptions: Wall is pinned at the top and the bottom					
Thickness =	8	in.			
Equivalent Fluid Pressure =	35	pcf			
Design Moment					
Wall Height =	9	ft	Pt. Load	1264.375	lbs/ft
Soil Height =	8.5	ft	Distance	2.833333	ft
Tributary Width =	1	ft	Bottom Reaction	Top Reaction	
			866.331	lbs	398.044
Design Moment =	2454.605		lb-ft	=	29455
		lb-in			
Allowable Stresses					
Concrete	2500	psi @ 28 days			
Reinforcing Steel	60000	psi			
Calculate Reinforcing Steel for Wall					
Vertical Steel					
Ult Lateral Load Factor	1.7				
Flexure Reduction Factor	0.9				
d	4	in			
Mu - Req'd	50074	lb-in			
	As - in sq	a - in.	Steel Ratio	Mu cap	
	0.31	0.73	0.003	60855	OK
Longitudinal Steel	Minimum Steel Ratio = 0.002				
	As Req'd	0.192			
Use #5 @ 12" o.c. vertical centered in the wall					
Use #4 @ 12" o.c. horizontal centered in the wall					

Shear Wall Analysis - Perforated Wall Method											Revised 11/21/07	
Wind Load =			17.8	psf								
		Horizontal	Vertical									
Basement		0	0									
Main		54	37									
Second		54	37									
Third		0	0									
Opening Adjustment Factor - Co												
					OH/WH							
OL/WL	0.3333	0.4000	0.5000	0.6000	0.6667	0.7000	0.8000	0.8333	0.9000	1.0000		
0.10	1.00	0.876	0.69	0.594	0.53	0.51	0.45	0.43	0.402	0.36		
0.20	1.00	0.884	0.71	0.62	0.56	0.538	0.472	0.45	0.422	0.38		
0.30	1.00	0.896	0.74	0.65	0.59	0.57	0.51	0.49	0.462	0.42		
0.40	1.00	0.908	0.77	0.686	0.63	0.61	0.55	0.53	0.498	0.45		
0.50	1.00	0.92	0.8	0.722	0.67	0.65	0.59	0.57	0.542	0.5		
0.60	1.00	0.932	0.83	0.758	0.71	0.694	0.646	0.63	0.602	0.56		
0.70	1.00	0.948	0.87	0.81	0.77	0.754	0.706	0.69	0.666	0.63		
0.80	1.00	0.964	0.91	0.862	0.83	0.818	0.782	0.77	0.746	0.71		
0.90	1.00	0.98	0.95	0.926	0.91	0.902	0.878	0.87	0.854	0.83		
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Wall No.	Tributary Width	Area	Wind Force	WL	WH	OL	OH	OL/WL	OH/WH	Co	Req'd Wall Capacity	Distr. Factor
				Roof Height =		12 ft						
H1-2	5.481481	109.62963	1951.407	16	8	0	0	1.0	0.0	1	122	0.15
		Seismic	2802.181	Required Hold Down Capacity at ends of the wall =						976 lbs		
H1-1	5.481481	49.333333	2829.541	16	9	0	0	1.0	0.0	1	177	0.15
		Seismic	4063.163	Required Hold Down Capacity at ends of the wall =						1592 lbs		
				Roof Height =		12 ft						
H2-2	6.851852	137.037037	2439.259	20	8	0	0	1.0	0.0	1	122	0.19
		Seismic	3502.727	Required Hold Down Capacity at ends of the wall =						976 lbs		
H2-1	6.851852	61.666667	3536.926	20	9	0	0	1.0	0.0	1	177	0.19
		Seismic	5078.953	Required Hold Down Capacity at ends of the wall =						1592 lbs		
				Roof Height =		12 ft						
H3-2	6.166667	123.333333	2195.333	18	8	0	0	1.0	0.0	1	122	0.17
		Seismic	3152.454	Required Hold Down Capacity at ends of the wall =						976 lbs		
H3-1	6.166667	55.5	3183.233	18	9	0	0	1.0	0.0	1	177	0.17
		Seismic	4571.058	Required Hold Down Capacity at ends of the wall =						1592 lbs		
				Roof Height =		12 ft						
H4-2	6.166667	123.333333	2195.333	18	8	0	0	1.0	0.0	1	122	0.17
		Seismic	3152.454	Required Hold Down Capacity at ends of the wall =						976 lbs		
H4-1	6.166667	55.5	3183.233	18	9	3	6.67	0.8	0.7	0.818	259	0.17
		Seismic	4571.058	Required Hold Down Capacity at ends of the wall =						2335 lbs		
				Roof Height =		12 ft						
H5-2	6.851852	137.037037	2439.259	20	8	0	0	1.0	0.0	1	122	0.19
		Seismic	3502.727	Required Hold Down Capacity at ends of the wall =						976 lbs		
H5-1	6.851852	61.666667	3536.926	20	9	12	5.56	0.4	0.6	0.686	644	0.19
		Seismic	5078.953	Required Hold Down Capacity at ends of the wall =						5800 lbs		
				Roof Height =		12 ft						
H6-2	5.481481	109.62963	1951.407	16	8	0	0	1.0	0.0	1	122	0.15
		Seismic	2802.181	Required Hold Down Capacity at ends of the wall =						976 lbs		
H6-1	5.481481	49.333333	2829.541	16	9	3	6.67	0.8	0.7	0.818	266	0.15
		Seismic	4063.163	Required Hold Down Capacity at ends of the wall =						2395 lbs		
				Roof Height =		12 ft						
V1-2	17.51351	350.27027	6234.811	24	8	0	0	1.0	0.0	1	260	0.32
		Seismic	8953.061	Required Hold Down Capacity at ends of the wall =						2078 lbs		
V1-1	17.51351	157.621622	9040.476	24	9	0	0	1.0	0.0	1	377	0.32

		Seismic	12981.94		Required Hold Down Capacity at ends of the wall =				3390	lbs	
				Roof Height =	12 ft						
V2-2	4.378378	87.5675676	1558.703	6	8	0	0	1.0	0.0	1	260 0.08
		Seismic	2238.265	Required Hold Down Capacity at ends of the wall =				2078	lbs		
V2-1	4.378378	39.4054054	2260.119	6	9	0	0	1.0	0.0	1	377 0.08
		Seismic	3245.485	Required Hold Down Capacity at ends of the wall =				3390	lbs		
				Roof Height =	12 ft						
V3-2	4.378378	87.5675676	1558.703	6	8	0	0	1.0	0.0	1	260 0.08
		Seismic	2238.265	Required Hold Down Capacity at ends of the wall =				2078	lbs		
V3-1	4.378378	39.4054054	2260.119	6	9	0	0	1.0	0.0	1	377 0.08
		Seismic	3245.485	Required Hold Down Capacity at ends of the wall =				3390	lbs		
				Roof Height =	12 ft						
V4-2	17.51351	350.27027	6234.811	24	8	0	0	1.0	0.0	1	260 0.32
		Seismic	8953.061	Required Hold Down Capacity at ends of the wall =				2078	lbs		
V4-1	17.51351	157.621622	9040.476	24	9	0	0	1.0	0.0	1	377 0.32
		Seismic	12981.94	Required Hold Down Capacity at ends of the wall =				3390	lbs		
				Roof Height =	12 ft						
V5-2	5.108108	102.162162	1818.486	7	8	0	0	1.0	0.0	1	260 0.09
		Seismic	2611.309	Required Hold Down Capacity at ends of the wall =				2078	lbs		
V5-1	5.108108	45.972973	2636.805	7	9	0	0	1.0	0.0	1	377 0.09
		Seismic	3786.399	Required Hold Down Capacity at ends of the wall =				3390	lbs		
				Roof Height =	12 ft						
V6-2	5.108108	102.162162	1818.486	7	8	0	0	1.0	0.0	1	260 0.09
		Seismic	2611.309	Required Hold Down Capacity at ends of the wall =				2078	lbs		
V6-1	5.108108	45.972973	2636.805	7	9	0	0	1.0	0.0	1	377 0.09
		Seismic	3786.399	Required Hold Down Capacity at ends of the wall =				3390	lbs		
Seismic Analysis				Seismic Multiplier =		0.307932					
Roof & Snow Load				Area		Snow Load		Weight			
				109.6296 ft^2		71.25 psf		7811.111 lbs			
Trib. Wall Length		5.48148148 ft		Height	Length	Dead Load		Weight			
Shear Wall Length		16 ft		8	21.48148	15		1288.889 lbs			
Seismic Force @ Mid Height of Wall				2802 lbs		Wind		1951.407 lbs. Seismic Governs			

Wood Connections									
Bolt Diameter (D) =		0.625	in.						
Bolt Yield (Fyb) =		45000	psi	(A307 Bolt)					
Fes Steel = 1.5Fu =		87000	psi	A36 Steel					
Middle Member									
Specific Gravity =		0.35							
FePerpendicular =		1684	psi						
FeParallel =		3920	psi						
Dowel Brg Length (lm) =			1.5	in.					
Bearing Angle Main Member (Phi(m))=			0	degrees					
Bearing Stress in Main Member (Fem) =			3920	psi					
Side Member									
Specific Gravity =		0.35		(7.77 for Steel)					
FePerpendicular =		1684	psi						
FeParallel =		3920	psi						
Dowel Brg Length (ls) =			3	in.					
Bearing Angle Side Member (Phi(s))=			0	degrees					
Bearing Stress in Main Member (Fes) =			3920	psi					
Coefficients for Yield Limit Equations									
Re = Fem/Fes =		1		Rt = lm/ls =		0.5			
1+ Re =		2		1+Rt =		1.5			
1+2Re =		3		1+Rt+Rt^2 =		1.75			
2+ Re =		3							
Phi (larger of Phi(m) and Phi(s) =		0		Kphi = 1+ Phi/360 =				1	
k1 = (sqrt[(Re+2Re^2(1+Rt+Rt^2)+Rt^2Re^3) - Re(1+Rt)]/(1+Re) =						0.339725			
k2 = -1+sqrt[(2*(1+Re)+(2Fyb(1+2Re)D)/3*Femlm^2) =						1.825946			
k3 = -1 + sqrt[(2(1+Re))/Re+(2Fyb(2+Re)D^2)/3*Femls^2] =						1.235284			
Single Shear									
Mode Im	Z = DlmFem/4Kphi =			918.75	lbs		(crushing in main member)		
Mode Is	Z = DlsFes/4Kphi =			1837.5	lbs		(crushing in side member)		
Mode II	Z = k1DlsFes/3.6Kphi =			694	lbs		(rotation of fastener)		
Mode IIIIm	Z = k2DlmFem/3.2(1+2Re)Kphi =			699	lbs		(plastic hinge & crushing - main)		
Mode IIIIs	Z = k3DlsFem/3.2(1+2Re)Kphi =			946	lbs		(plastic hinge & crushing - side)		
Mode IV	Z = D^2/3.2Kphi(sqrt(2FemFyb/3(1+Re))) =			936	lbs		(2 plastic hinges per plane)		
Allowable Bolt Design Value =						694	lbs		
Double Shear									
Mode Im	Z = DlmFem/4Kphi =			918.75			(crushing in main member)		
Mode Is	Z = 2DlsFes/4Kphi =			3675			(crushing in side member)		
Mode IIIIs	Z = 2k3DlsFem/3.2(2+2Re)Kphi =			1892			(plastic hinge & crushing - side)		
Mode IV	Z = 2D^2/3.2Kphi(sqrt(2FemFyb/3(1+Re))) =			1872.099			(2 plastic hinges per plane)		
Allowable Bolt Design Value =						919	lbs		

Wood Connections									
Bolt Diameter (D) =		0.23	in.						
Bolt Yield (Fyb) =		189000	psi	OLY LOG HOG					
Fes Steel = 1.5Fu =		87000	psi	A36 Steel					
Middle Member									
Specific Gravity =		0.35							
FePerpendicular =		2776	psi						
FeParallel =		3920	psi						
Dowel Brg Length (lm) =			9	in.					
Bearing Angle Main Member (Phi(m))=			0	degrees					
Bearing Stress in Main Member (Fem) =			3920	psi					
Side Member									
Specific Gravity =		0.35		(7.77 for Steel)					
FePerpendicular =		2776	psi						
FeParallel =		3920	psi						
Dowel Brg Length (ls) =			3	in.					
Bearing Angle Side Member (Phi(s))=			0	degrees					
Bearing Stress in Main Member (Fes) =			3920	psi					
Coefficients for Yield Limit Equations									
Re = Fem/Fes =		1		Rt = lm/ls =		3			
1+ Re =		2		1+Rt =		4			
1+2Re =		3		1+Rt+Rt^2 =		13			
2+ Re =		3							
Phi (larger of Phi(m) and Phi(s) =		0		Kphi = 1+ Phi/360 =		1			
k1 = (sqrt[(Re+2Re^2(1+Rt+Rt^2)+Rt^2Re^3] - Re(1+Rt))/(1+Re) =						1			
k2 = -1+sqrt[(2*(1+Re)+(2Fyb(1+2Re)D)/3*Femlm^2] =						1.015683			
k3 = -1 + sqrt[(2(1+Re))/Re+(2Fyb(2+Re)D^2)/3*Femls^2] =						1.137004			
Single Shear									
Mode Im	Z = DlmFem/4Kphi =			2028.6	lbs		(crushing in main member)		
Mode Is	Z = DlsFes/4Kphi =			676.2	lbs		(crushing in side member)		
Mode II	Z = k1DlsFes/3.6Kphi =			751	lbs		(rotation of fastener)		
Mode IIIIm	Z = k2DlmFem/3.2(1+2Re)Kphi =			859	lbs		(plastic hinge & crushing - main)		
Mode IIIIs	Z = k3DlsFem/3.2(1+2Re)Kphi =			320	lbs		(plastic hinge & crushing - side)		
Mode IV	Z = D^2/3.2Kphi(sqrt(2FemFyb/3(1+Re))) =			260	lbs		(2 plastic hinges per plane)		
Allowable Bolt Design Value =						260	lbs		
Double Shear									
Mode Im	Z = DlmFem/4Kphi =			2028.6			(crushing in main member)		
Mode Is	Z = 2DlsFes/4Kphi =			1352.4			(crushing in side member)		
Mode IIIIs	Z = 2k3DlsFem/3.2(2+2Re)Kphi =			641			(plastic hinge & crushing - side)		
Mode IV	Z = 2D^2/3.2Kphi(sqrt(2FemFyb/3(1+Re))) =			519.5759			(2 plastic hinges per plane)		
Allowable Bolt Design Value =						520	lbs		