

Structural Calculations for:

Holtan Residence

Project Address:
4626 89th Ave SE
Mercer Island, WA 98040

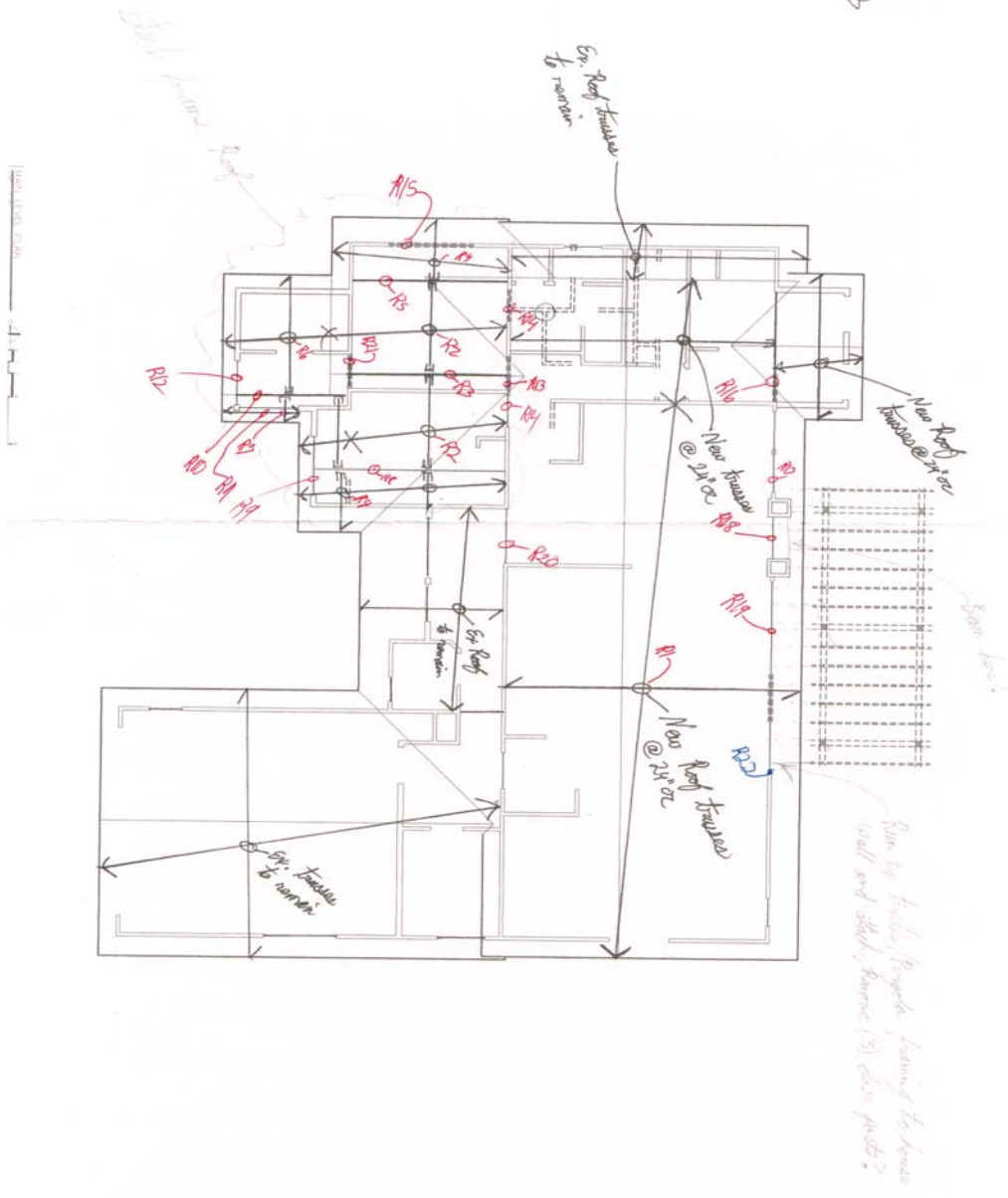
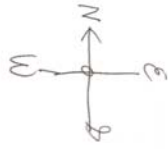


Structural Engineering by:

Nickerson Engineering

2221 Everett Ave, #202
Everett, WA 98201

Design per:
2018 International Building Code



SCALE BAR

Run by bolts through framing to house wall and stud, remove (5) also posts?

E2, Roof Trusses to remove

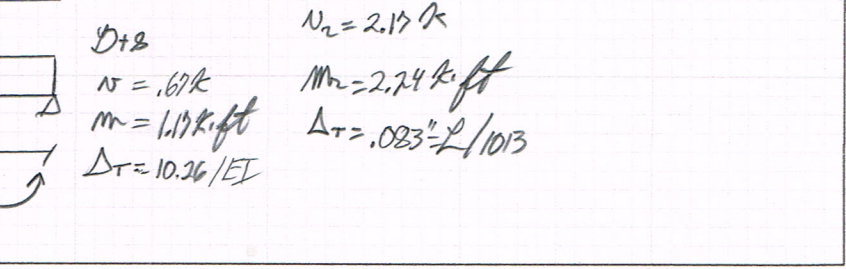
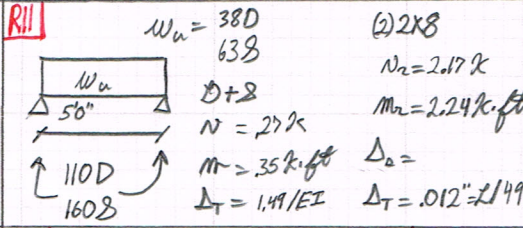
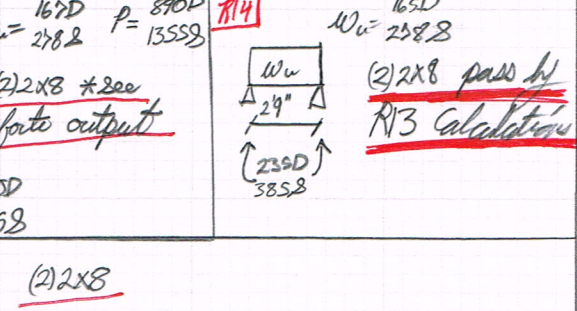
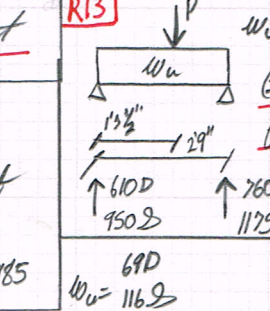
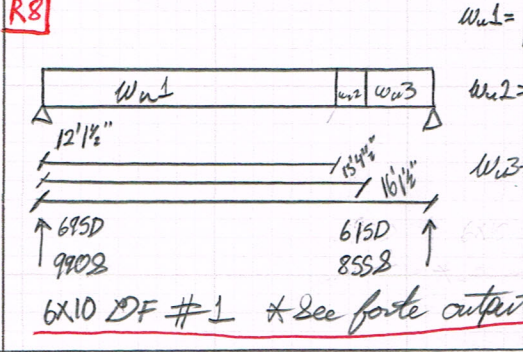
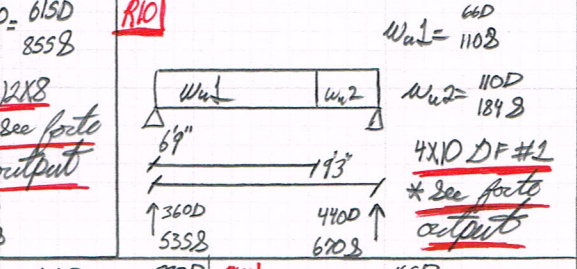
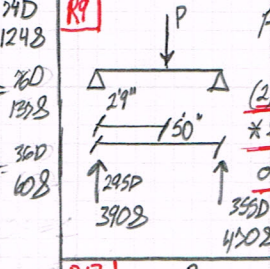
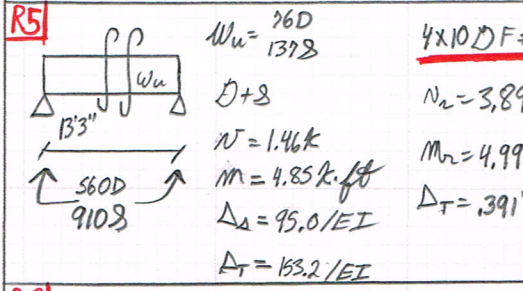
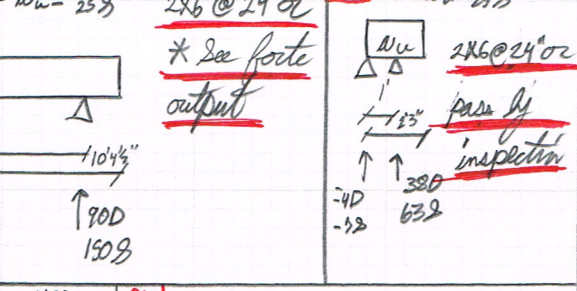
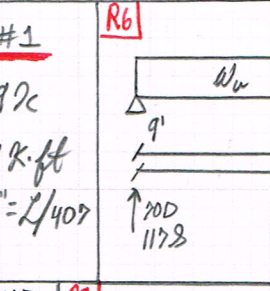
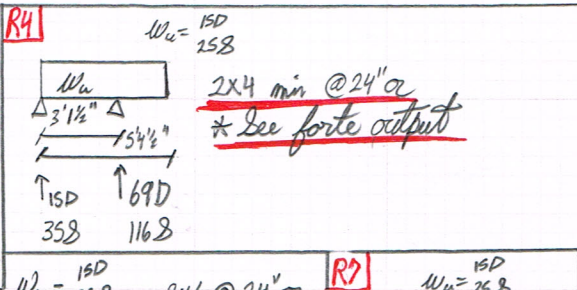
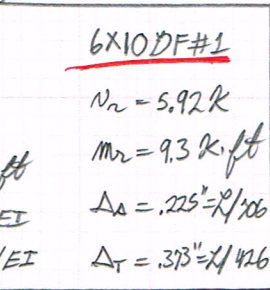
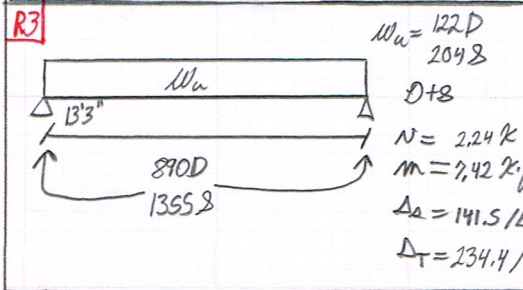
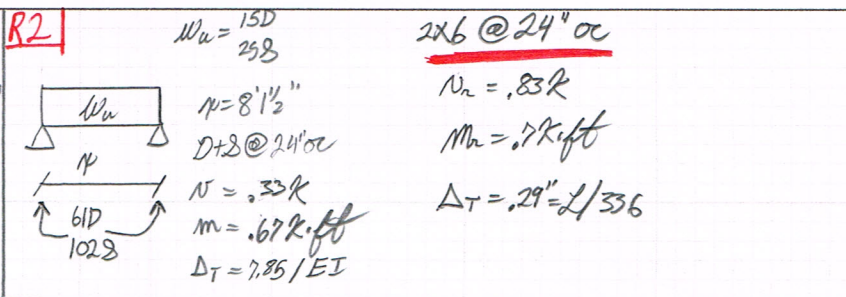
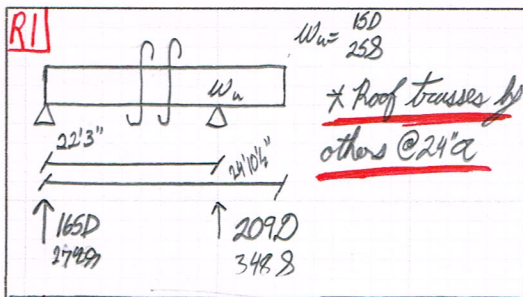
New Roof Trusses @ 24" o.c.

New Roof Trusses @ 24" o.c.

E1, Trusses to remove

E3, Trusses to remove

Span beam?



DATE 4th - Mar - 2021

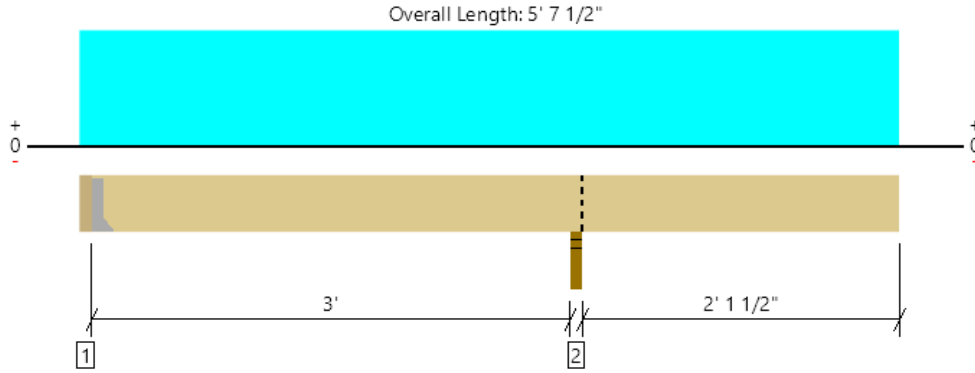
PROJ. NO. 20-097

DESIGN JC

SHEET _____

Level, R4

1 piece(s) 2 x 4 Hem-Fir No. 2 @ 24" OC



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	370 @ 3' 4 1/2"	1823 (3.00")	Passed (20%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	156 @ 2' 11 1/2"	604	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-203 @ 3' 4 1/2"	430	Passed (47%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.096 @ 5' 7 1/2"	0.200	Passed (2L/566)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.142 @ 5' 7 1/2"	0.225	Passed (2L/380)	--	1.0 D + 1.0 S (Alt Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/240).
- Right cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on 3 1/2" SPF beam	3.00"	Hanger ¹	1.50"	30	70	100	See note ¹
2 - Stud wall - SPF	3.00"	3.00"	1.50"	139	231	370	Blocking

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 5" o/c	
Bottom Edge (Lu)	5' 5" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 5' 7 1/2"	24"	15.0	25.0	

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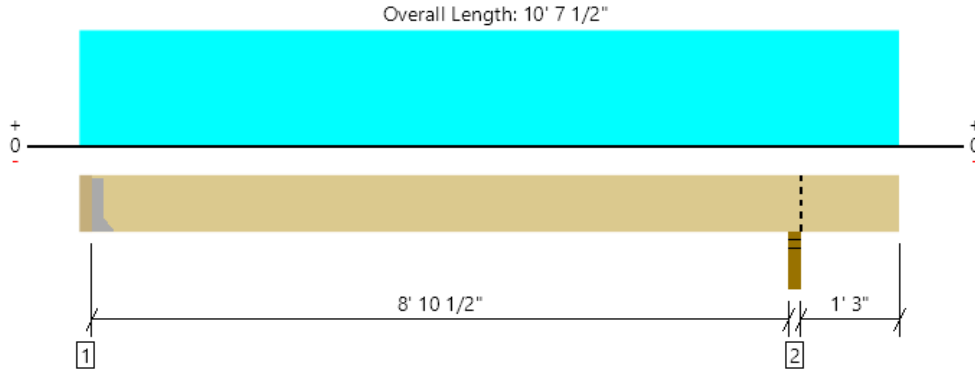
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jonathan Nickerson Engineering (425) 610-4425 carlson@nickersonengineering.com	



Level, R6

1 piece(s) 2 x 6 Hem-Fir No. 2 @ 24" OC



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	354 @ 3"	911 (1.50")	Passed (39%)	--	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	322 @ 8' 8"	949	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	784 @ 4' 8 1/8"	921	Passed (85%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.265 @ 4' 8 3/4"	0.300	Passed (L/407)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.420 @ 4' 8 11/16"	0.450	Passed (L/257)	--	1.0 D + 1.0 S (Alt Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on 5 1/2" SPF beam	3.00"	Hanger ¹	1.50"	139	235	374	See note ¹
2 - Stud wall - SPF	3.00"	3.00"	1.50"	179	299	478	Blocking

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 6" o/c	
Bottom Edge (Lu)	10' 5" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
1 - Face Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 10' 7 1/2"	24"	15.0	25.0	

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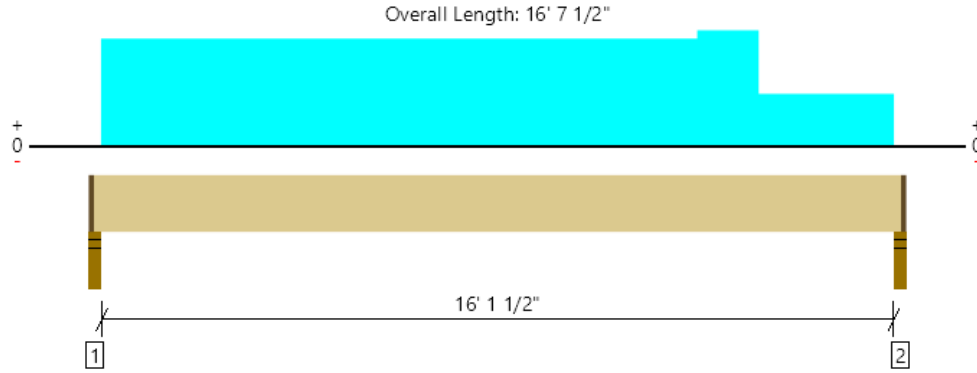
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jonathan Nickerson Engineering (425) 610-4425 carlson@nickersonengineering.com	



Level, R8

1 piece(s) 6 x 10 Douglas Fir-Larch No. 1



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1683 @ 1' 1/2"	4091 (1.75")	Passed (41%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1514 @ 1' 1/2"	6810	Passed (22%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	6902 @ 8' 2 1/2"	10703	Passed (64%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.344 @ 8' 3 5/16"	0.409	Passed (L/571)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.586 @ 8' 3 5/16"	0.819	Passed (L/335)	--	1.0 D + 1.0 S (All Spans)

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2015
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.00"	1.75"	1.50"	696	987	1683	1 1/4" Rim Board
2 - Stud wall - SPF	3.00"	1.75"	1.50"	612	853	1465	1 1/4" Rim Board

• Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	16' 5" o/c	
Bottom Edge (Lu)	16' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1' 1/4" to 16' 6 1/4"	N/A	13.2	--	
1 - Uniform (PLF)	3" to 12' 4 1/2" (Top)	N/A	74.0	124.0	
2 - Uniform (PLF)	12' 4 1/2" to 13' 7 1/2" (Top)	N/A	76.0	137.0	
3 - Uniform (PLF)	13' 7 1/2" to 16' 4 1/2" (Top)	N/A	36.0	60.0	

Weyerhaeuser Notes

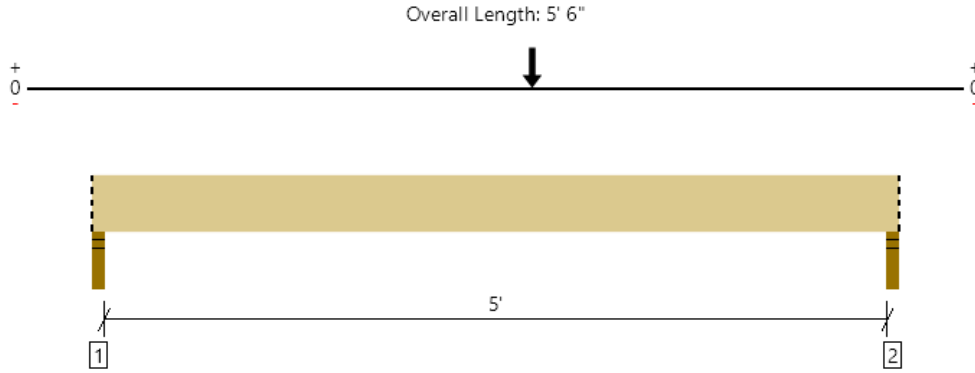
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ForteWEB Software Operator	Job Notes
Jonathan Nickerson Engineering (425) 610-4425 carlson@nickersonengineering.com	



Level, R9
2 piece(s) 2 x 8 Hem-Fir No. 2



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	820 @ 5' 4 1/2"	3645 (3.00")	Passed (23%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	815 @ 4' 7 3/4"	2501	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1931 @ 3'	2569	Passed (75%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.036 @ 2' 9 5/16"	0.131	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.062 @ 2' 9 5/16"	0.262	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.00"	3.00"	1.50"	293	387	680	Blocking
2 - Stud wall - SPF	3.00"	3.00"	1.50"	352	468	820	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 6" o/c	
Bottom Edge (Lu)	5' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 6"	N/A	5.5	--	
1 - Point (lb)	3' (Top)	N/A	615	855	

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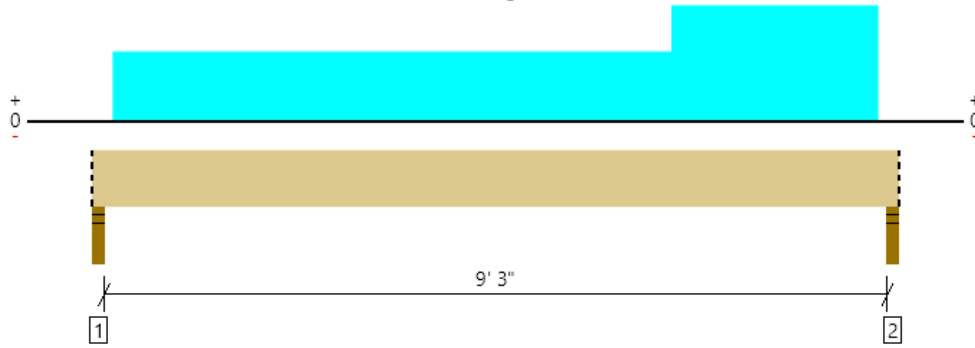
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ForteWEB Software Operator	Job Notes
Jonathan Nickerson Engineering (425) 610-4425 carlson@nickersonengineering.com	



Level, R10
1 piece(s) 4 x 10 Douglas Fir-Larch No. 1

Overall Length: 9' 9"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	1106 @ 9' 7 1/2"	4463 (3.00")	Passed (25%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	871 @ 8' 8 3/4"	4468	Passed (20%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2284 @ 5' 1 5/16"	5740	Passed (40%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.057 @ 4' 11 1/8"	0.237	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.096 @ 4' 11 1/8"	0.475	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.00"	3.00"	1.50"	361	536	897	Blocking
2 - Stud wall - SPF	3.00"	3.00"	1.50"	439	667	1106	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 9" o/c	
Bottom Edge (Lu)	9' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 9"	N/A	8.2	--	
1 - Uniform (PLF)	3" to 7' (Top)	N/A	66.0	110.0	
2 - Uniform (PLF)	7' to 9' 6" (Top)	N/A	110.0	184.0	

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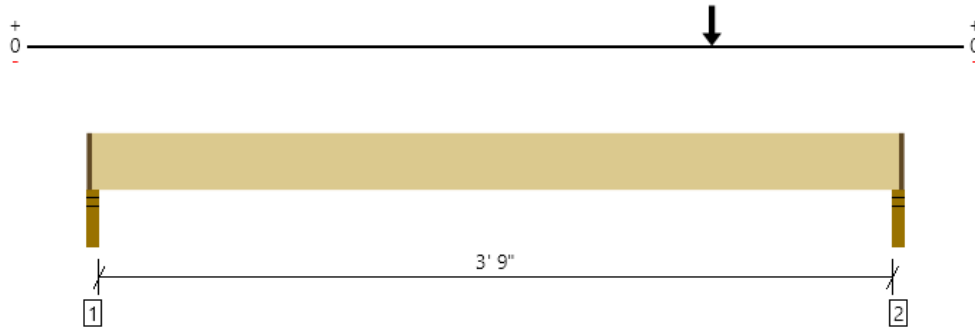
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ForteWEB Software Operator	Job Notes
Jonathan Nickerson Engineering (425) 610-4425 carlson@nickersonengineering.com	



Level, R12
2 piece(s) 2 x 8 Hem-Fir No. 2

Overall Length: 4' 3"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	710 @ 4' 1 1/2"	2126 (1.75")	Passed (33%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	706 @ 3' 4 3/4"	2501	Passed (28%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	619 @ 3' 3"	2569	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.006 @ 2' 4 3/16"	0.100	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.011 @ 2' 4 1/8"	0.200	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.00"	1.75"	1.50"	90	117	207	1 1/4" Rim Board
2 - Stud wall - SPF	3.00"	1.75"	1.50"	292	418	710	1 1/4" Rim Board

• Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 1" o/c	
Bottom Edge (Lu)	4' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 4' 1 3/4"	N/A	5.5	--	
1 - Point (lb)	3' 3" (Top)	N/A	360	535	

Weyerhaeuser Notes

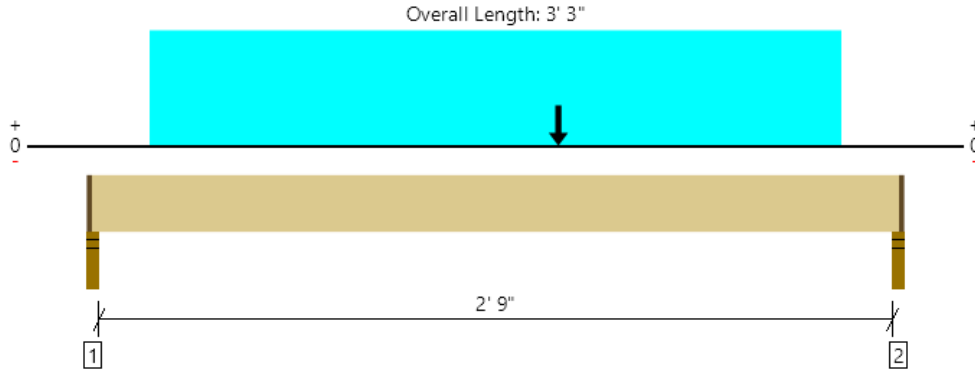
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jonathan Nickerson Engineering (425) 610-4425 carlson@nickersonengineering.com	



Level, R13
2 piece(s) 2 x 8 Hem-Fir No. 2



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1930 @ 3' 1 1/2"	2126 (1.75")	Passed (91%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1657 @ 2' 4 3/4"	2501	Passed (66%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	2126 @ 1' 10 1/2"	2569	Passed (83%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.014 @ 1' 7 3/4"	0.075	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.024 @ 1' 7 3/4"	0.150	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.00"	1.75"	1.50"	609	947	1556	1 1/4" Rim Board
2 - Stud wall - SPF	3.00"	1.75"	1.59"	757	1173	1930	1 1/4" Rim Board

• Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 1" o/c	
Bottom Edge (Lu)	3' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 3' 1 3/4"	N/A	5.5	--	
1 - Uniform (PLF)	3" to 3' (Top)	N/A	167.0	278.0	
2 - Point (lb)	1' 10 1/2" (Top)	N/A	890	1355	

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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jonathan Nickerson Engineering (425) 610-4425 carlson@nickersonengineering.com	



R16 $W_u = 167D$
 $278B$
 $4 \times 10 \text{ DF \#1}$
 $\bullet C_d = 1.15$
 W_u
 $9'6"$
 $835D$
 $1320B$
 $D+2$
 $N = 2.17K$
 $M = 5.11K \cdot \text{ft}$
 $\Delta_T = 83.0/EI$
 $N_2 = 4.47K$
 $M_2 = 5.73K \cdot \text{ft}$
 $\Delta_T = .212" = L/538$

R17 $W_u = 209D$
 $348B$
 $4 \times 8 \text{ DF \#1}$
 $\bullet C_d = 1.15$
 W_u
 $7'0"$
 $755D$
 $1220B$
 $D+2$
 $N = 1.97K$
 $M = 3.45K \cdot \text{ft}$
 $\Delta_T = 30.4/EI$
 $N_2 = 3.5K$
 $M_2 = 3.82K \cdot \text{ft}$
 $\Delta_T = .161" = L/521$

R18 $W_u = 209D$
 $348B$
 $(2) 2 \times 8$
 W_u
 $3'7\frac{1}{2}"$
 $380D$
 $630B$
 $D+2$
 $N = 1.02K$
 $M = .93K \cdot \text{ft}$
 $\Delta_T = 2.18/EI$
 $N_2 = 2.17K$
 $M_2 = 2.24K \cdot \text{ft}$
 $\Delta_T = .018" = L/246$

R19 $W_u = 209D$
 $348B$
 $3\frac{1}{2} \times 16 \text{ LxL}$
 W_u
 $16'2"$
 $1820D$
 $2815B$
 $D+2$
 $N = 4.63K$
 $M = 18.72K \cdot \text{ft}$
 $\Delta_2 = 534.8/EI$
 $\Delta_T = 880.6/EI$
 $N_2 = 11.57K$
 $M_2 = 28.18K \cdot \text{ft}$
 $\Delta_2 = .288" = L/671$
 $\Delta_T = .477" = L/406$

R20 $W_u = 174D$
 $321B$
 $(2) 2 \times 8$
 W_u
 $4'9"$
 $425D$
 $765B$
 $D+2$
 $N = 1.19K$
 $M = 1.41K \cdot \text{ft}$
 $\Delta_T = 5.73/EI$
 $N_2 = 2.17K$
 $M_2 = 2.24K \cdot \text{ft}$
 $\Delta_T = .046" = L/132$

R22
 $P = 1820D$
 $285B$
 $\pm 233E$
 $\pm 1786W$
 $M_{max} \downarrow = 5.14K$
 $(1.5)(1.5)(N) = 514$
 $N = 2.78$
 $14" \text{ deep } \checkmark$

R21 $P = 890D$
 $1355B$
 $(2) 2 \times 8 \text{ NDR}$
 $* \text{ See forte output}$
 W_u
 $14'3"$
 $385D$
 $525D$
 $575B$
 $785B$

New floor framing
 $W_u = 15D$
 $40K$
 $D+L @ 16" \text{ or } (N=9'0")$
 $2 \times 8 @ 16" \text{ or}$
 $N_2 = 1.08K$
 $M_2 = 1.12K \cdot \text{ft}$
 $\Delta_T = .174" = L/617$
 $N = 5'6"$
 $N = 9'0"$
 $N = .33K$
 $M = .743K \cdot \text{ft}$
 $\Delta_T = 10.83/EI$

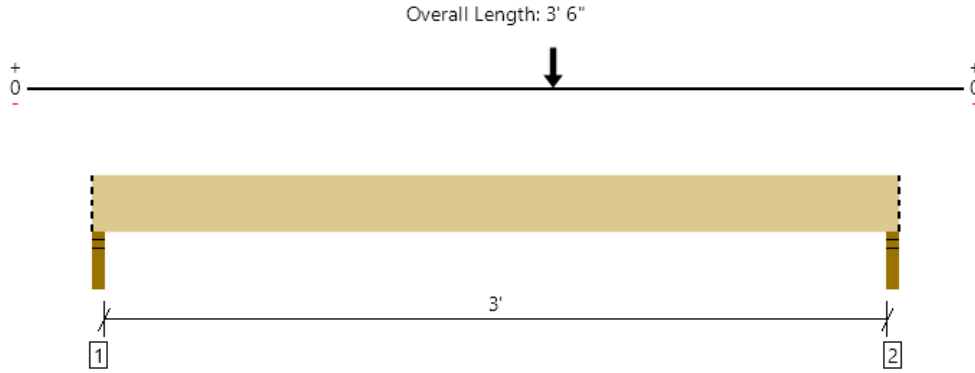
M1 $W_{u1} = 434D$
 $274B$
 $478K$
 $W_{u2} = 174D$
 $478K$
 $P_0 = 560D$
 $910B$
 $P_1 = 235D$
 $385B$
 $4 \times 6 - \text{ex pass}$
 $* \text{ See forte output}$
 $18" \phi \text{ pad good for}$
 $\pi \cdot .75^2 (1.5) = 2.65K$
 W_{u1}
 $30'$
 $1'6"$
 $7'53"$
 $505D$
 $2040D$
 $75D$
 $325B$
 $1740B$
 $5B$
 $565K$
 $1665K$
 $450K$
 $M_{max} \downarrow = 4.74K$
F2.0

M2 $W_{u1} = 174D$
 $478K$
 $W_{u2} = 434D$
 $274B$
 $478K$
 $P_0 = 235D$
 $385B$
 $P_1 = 610D$
 $908B$
 $1/2" \times 3'7\frac{1}{2}"$
 $1'5\frac{1}{2}"$
 $2'3\frac{1}{2}"$
 $2'6"$
 $465D$
 $1840D$
 $310D$
 $345B$
 $1605B$
 $205B$
 $516K$
 $1605K$
 $496K$
 $N_{verify} \text{ or provide } 4 \times 6$
 $* \text{ See forte output}$
 $M_{max} \downarrow = 4.25K$
F2.0

M3 $W_{u1} = 174D$
 $478K$
 $W_{u2} = 434D$
 $274B$
 $478K$
 $P_0 = 995D$
 $1560B$
 $P_1 = 235D$
 $385B$
 $1'6"$
 $4'11\frac{1}{2}"$
 $7'11\frac{1}{2}"$
 $2'3\frac{1}{2}"$
 $2'6"$
 $570D$
 $1485D$
 $355D$
 $165B$
 $1330B$
 $305B$
 $516K$
 $1605K$
 $495K$
 $F2.0$
 $4 \times 6 * \text{ See forte output}$

M4 $W_u = 434D$
 $274B$
 $478K$
 $P = 675D$
 $990B$
 W_u
 $2'6"$
 $1'53"$
 $360D$
 $2205D$
 $435D$
 $355B$
 $1730B$
 $290B$
 $495K$
 $1645K$
 $540K$
 $M_{max} \downarrow = 4.89K$
F2.0
 $4 \times 6 * \text{ See forte output}$

Level, R21
2 piece(s) 2 x 8 Hem-Fir No. 2



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1305 @ 3' 4 1/2"	3645 (3.00")	Passed (36%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1300 @ 2' 7 3/4"	2501	Passed (52%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1788 @ 2'	2569	Passed (70%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.013 @ 1' 9 5/16"	0.081	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.022 @ 1' 9 5/16"	0.162	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - SPF	3.00"	3.00"	1.50"	386	573	959	Blocking
2 - Stud wall - SPF	3.00"	3.00"	1.50"	523	782	1305	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 6" o/c	
Bottom Edge (Lu)	3' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 6"	N/A	5.5	--	
1 - Point (lb)	2' (Top)	N/A	890	1355	

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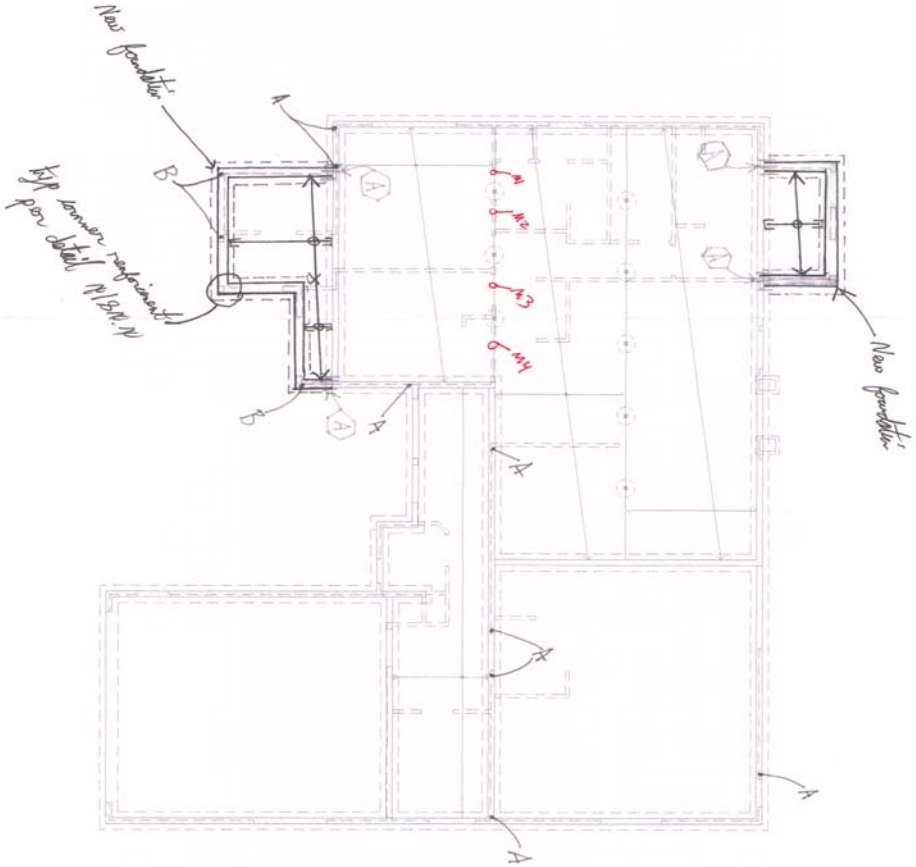
ForteWEB Software Operator	Job Notes
Jonathan Nickerson Engineering (425) 610-4425 carlson@nickersonengineering.com	



New floor framing
2x8 @ 16" oc
typ

A = 1465 per detail 11.2.2.1.2
B = 1465 per detail 11.2.2.1.2

1" = 4'-0" (1:12)



R16 $W_u = 167D$
 $278B$
 $4 \times 10 \text{ DF \#1}$
 $\bullet Cd = 1.15$
 W_u
 $9'6"$
 $835D$
 $1320B$
 $D+2$
 $N = 2.17K$
 $M = 5.11K \cdot \text{ft}$
 $\Delta_T = 83.0/EI$
 $N_2 = 4.47K$
 $M_2 = 5.73K \cdot \text{ft}$
 $\Delta_T = .212" = L/538$

R17 $W_u = 209D$
 $348B$
 $4 \times 8 \text{ DF \#1}$
 $\bullet Cd = 1.15$
 W_u
 $7'0"$
 $755D$
 $1220B$
 $D+2$
 $N = 1.97K$
 $M = 3.45K \cdot \text{ft}$
 $\Delta_T = 30.4/EI$
 $N_2 = 3.5K$
 $M_2 = 3.82K \cdot \text{ft}$
 $\Delta_T = .161" = L/521$

R18 $W_u = 209D$
 $348B$
 $(2) 2 \times 8$
 W_u
 $3'7\frac{1}{2}"$
 $380D$
 $630B$
 $D+2$
 $N = 1.02K$
 $M = .93K \cdot \text{ft}$
 $\Delta_T = 2.18/EI$
 $N_2 = 2.17K$
 $M_2 = 2.24K \cdot \text{ft}$
 $\Delta_T = .018" = L/246$

R19 $W_u = 209D$
 $348B$
 $3\frac{1}{2} \times 16 \text{ LxL}$
 W_u
 $16'2"$
 $1820D$
 $2815B$
 $D+2$
 $N = 4.63K$
 $M = 18.72K \cdot \text{ft}$
 $\Delta_2 = 534.8/EI$
 $\Delta_T = 880.6/EI$
 $N_2 = 11.57K$
 $M_2 = 28.18K \cdot \text{ft}$
 $\Delta_2 = .288" = L/671$
 $\Delta_T = .477" = L/406$

R20 $W_u = 174D$
 $321B$
 $(2) 2 \times 8$
 W_u
 $4'9"$
 $425D$
 $765B$
 $D+2$
 $N = 1.19K$
 $M = 1.41K \cdot \text{ft}$
 $\Delta_T = 5.73/EI$
 $N_2 = 2.17K$
 $M_2 = 2.24K \cdot \text{ft}$
 $\Delta_T = .046" = L/132$

R22
 $P = 1820D$
 $285B$
 $\pm 233E$
 $\pm 1786W$
 $M_{max} \downarrow = 5.14K$
 $(1.5)(1.5)(N) = 514$
 $N = 2.78$
 $14" \text{ deep } \checkmark$

R21 $P = 890D$
 $1355B$
 $(2) 2 \times 8 \text{ NDR}$
 $* \text{ See forte output}$
 W_u
 $14'3"$
 $385D$
 $525D$
 $575B$
 $785B$

New floor framing
 $W_u = 15D$
 $40K$
 $D+L @ 16" \text{ or } (N=9'0")$
 W_u
 $N = 5'6"$
 $N = 9'0"$
 $N = 3.3K$
 $M = .743K \cdot \text{ft}$
 $\Delta_T = 10.83/EI$
 $2 \times 8 @ 16" \text{ or}$
 $N_2 = 1.08K$
 $M_2 = 1.12K \cdot \text{ft}$
 $\Delta_T = .174" = L/617$

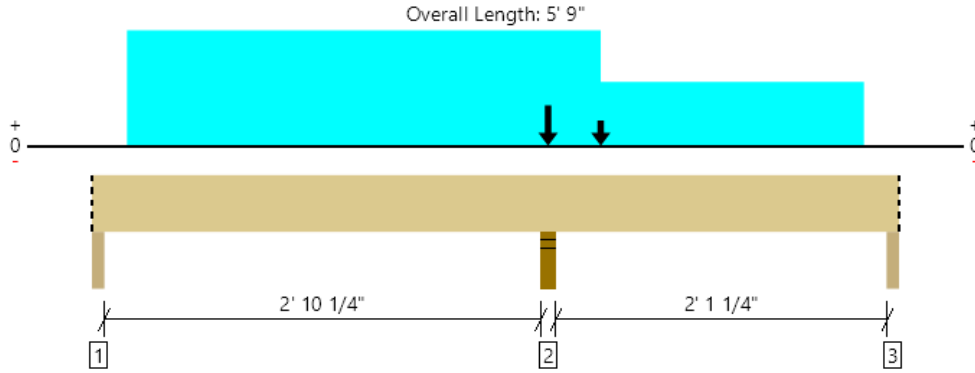
M1 $W_{u1} = 434D$
 $274B$
 $478K$
 $W_{u2} = 174D$
 $478K$
 $P_0 = 560D$
 $910B$
 $P_1 = 235D$
 $385B$
 $4 \times 6 - \text{ex pass}$
 $* \text{ See forte output}$
 $18" \phi \text{ pad good for}$
 $\pi \cdot .75^2 (1.5) = 2.65K$
 W_{u1}
 $30'$
 $1'6"$
 $7'53"$
 $505D$
 $2040D$
 $75D$
 $325B$
 $1740B$
 $5B$
 $565K$
 $1665K$
 $450K$
 $M_{max} \downarrow = 4.74K$
F2.0

M2 $W_{u1} = 174D$
 $478K$
 $W_{u2} = 434D$
 $274B$
 $478K$
 $P_0 = 235D$
 $385B$
 $P_1 = 610D$
 $908B$
 $1/2" \times 3'7\frac{1}{2}"$
 $1'5\frac{1}{2}"$
 $2'3\frac{1}{2}"$
 $2'6"$
 $465D$
 $1840D$
 $310D$
 $345B$
 $1605B$
 $205B$
 $516K$
 $1605K$
 $495K$
 $N_{verify} \text{ or provide } 4 \times 6$
 $* \text{ See forte output}$
 $M_{max} \downarrow = 4.25K$
F2.0

M3 $W_{u1} = 174D$
 $478K$
 $W_{u2} = 434D$
 $274B$
 $478K$
 $P_0 = 995D$
 $1560B$
 $P_1 = 235D$
 $385B$
 $1'6"$
 $4'11"$
 $7'11"$
 $2'3\frac{1}{2}"$
 $2'6"$
 $570D$
 $1485D$
 $355D$
 $165B$
 $1330B$
 $305B$
 $516K$
 $1605K$
 $495K$
 $F2.0$
 $4 \times 6 * \text{ See forte output}$

M4 $W_u = 434D$
 $274B$
 $478K$
 $P = 675D$
 $990B$
 W_u
 $2'6"$
 $1'53"$
 $360D$
 $2205D$
 $435D$
 $355B$
 $1730B$
 $290B$
 $495K$
 $1645K$
 $540K$
 $M_{max} \downarrow = 4.89K$
F2.0
 $4 \times 6 * \text{ See forte output}$

Main Floor Framing, M1
1 piece(s) 4 x 6 Douglas Fir-Larch No. 1



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4742 @ 3' 3"	5206 (3.50")	Passed (91%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1155 @ 2' 7 3/4"	2310	Passed (50%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-870 @ 3' 3"	1912	Passed (46%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.009 @ 1' 6 7/16"	0.078	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.016 @ 1' 6 3/16"	0.156	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Beam - SPF	3.00"	3.00"	1.50"	507	583/-46	325	1415/-46	Blocking
2 - Stud wall - SPF	3.50"	3.50"	3.19"	2041	1664	1938	5643	None
3 - Beam - SPF	3.00"	3.00"	1.50"	75	449/-139	6/-57	530/-196	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 9" o/c	
Bottom Edge (Lu)	5' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 9"	N/A	4.9	--	--	
1 - Uniform (PLF)	3" to 3' 7 1/2" (Top)	N/A	434.0	478.0	274.0	
2 - Uniform (PLF)	3' 7 1/2" to 5' 6" (Top)	N/A	179.0	478.0	-	
3 - Point (lb)	3' 3" (Top)	N/A	560	-	910	
4 - Point (lb)	3' 7 1/2" (Top)	N/A	235	-	385	

Weyerhaeuser Notes

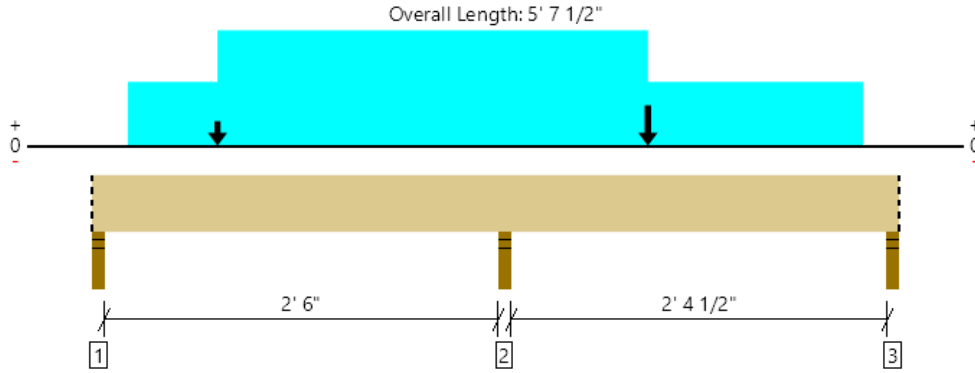
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jonathan Nickerson Engineering (425) 610-4425 carlson@nickersonengineering.com	



Main Floor Framing, M2 (New Post)
1 piece(s) 4 x 6 Douglas Fir-Larch No. 1



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4246 @ 2' 10 1/2"	4463 (3.00")	Passed (95%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1762 @ 3' 5 1/2"	2657	Passed (66%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	-1170 @ 2' 10 1/2"	2198	Passed (53%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.007 @ 4' 2 11/16"	0.066	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.010 @ 4' 2 7/8"	0.131	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.00"	3.00"	1.50"	405	515/-73	363	1283/-73	Blocking
2 - Stud wall - SPF	3.00"	3.00"	2.85"	1840	1602	1605	5047	None
3 - Stud wall - SPF	3.00"	3.00"	1.50"	309	493/-88	274	1076/-88	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 8" o/c	
Bottom Edge (Lu)	5' 8" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 7 1/2"	N/A	4.9	--	--	
1 - Uniform (PLF)	3" to 10 1/2" (Top)	N/A	179.0	478.0	-	
2 - Uniform (PLF)	10 1/2" to 3' 10 1/2" (Top)	N/A	434.0	478.0	274.0	
3 - Uniform (PLF)	3' 10 1/2" to 5' 4 1/2" (Top)	N/A	179.0	478.0	-	
4 - Point (lb)	10 1/2" (Top)	N/A	235	-	385	
5 - Point (lb)	3' 10 1/2" (Top)	N/A	610	-	950	

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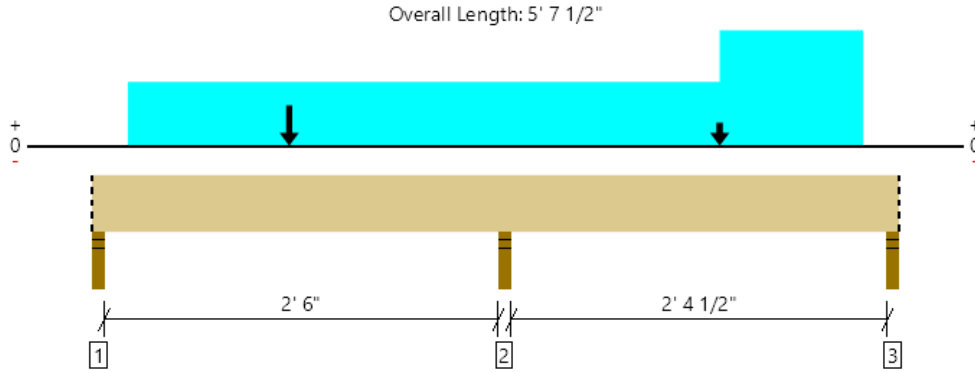
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jonathan Nickerson Engineering (425) 610-4425 carlson@nickersonengineering.com	



Main Floor Framing, M3
1 piece(s) 4 x 6 Douglas Fir-Larch No. 1



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3680 @ 2' 10 1/2"	4463 (3.00")	Passed (82%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1855 @ 2' 3 1/2"	2657	Passed (70%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	1518 @ 1' 4 1/2"	2198	Passed (69%)	1.15	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Live Load Defl. (in)	0.011 @ 1' 4 7/8"	0.069	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)
Total Load Defl. (in)	0.018 @ 1' 4 5/8"	0.138	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (Alt Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.00"	3.00"	1.50"	590	515/-73	684	1789/-73	Blocking
2 - Stud wall - SPF	3.00"	3.00"	2.47"	1484	1602	1327	4413	None
3 - Stud wall - SPF	3.00"	3.00"	1.50"	356	493/-88	306	1155/-88	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 8" o/c	
Bottom Edge (Lu)	5' 8" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 7 1/2"	N/A	4.9	--	--	
1 - Uniform (PLF)	3" to 4' 4 1/2" (Top)	N/A	179.0	478.0	-	
2 - Uniform (PLF)	4' 4 1/2" to 5' 4 1/2" (Top)	N/A	434.0	478.0	274.0	
3 - Point (lb)	1' 4 1/2" (Top)	N/A	995	-	1560	
4 - Point (lb)	4' 4 1/2" (Top)	N/A	235	-	385	

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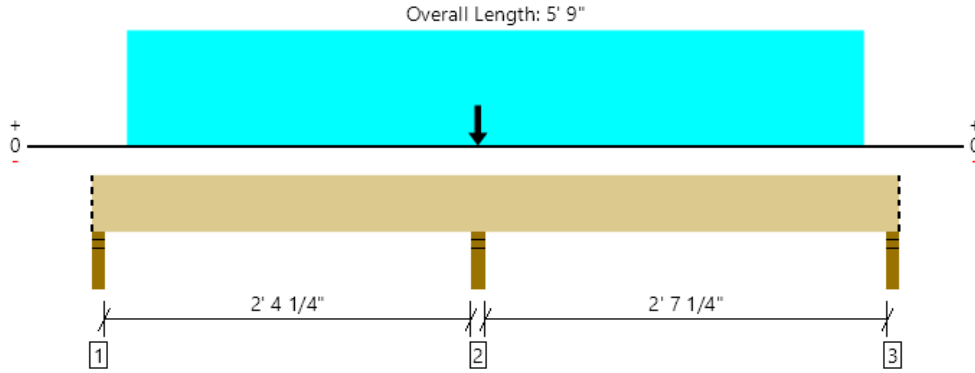
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jonathan Nickerson Engineering (425) 610-4425 carlson@nickersonengineering.com	



Main Floor Framing, M4
1 piece(s) 4 x 6 Douglas Fir-Larch No. 1



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4882 @ 2' 9"	5206 (3.50")	Passed (94%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1064 @ 3' 4 1/4"	2310	Passed (46%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-869 @ 2' 9"	1912	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.007 @ 4' 3 15/16"	0.072	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.010 @ 4' 4 3/8"	0.144	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Total	
1 - Stud wall - SPF	3.00"	3.00"	1.50"	365	495/-98	255	1115/-98	Blocking
2 - Stud wall - SPF	3.50"	3.50"	3.28"	2202	1642	1931	5775	None
3 - Stud wall - SPF	3.00"	3.00"	1.50"	434	539/-68	290	1263/-68	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 9" o/c	
Bottom Edge (Lu)	5' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 9"	N/A	4.9	--	--	
1 - Uniform (PLF)	3" to 5' 6" (Top)	N/A	434.0	478.0	274.0	
2 - Point (lb)	2' 9" (Top)	N/A	695	-	990	

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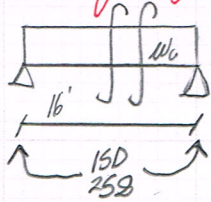
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Trellis framing

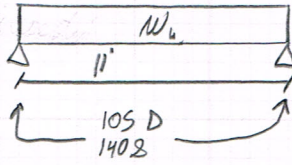
$W_u = 2D$
 $3B$



2x8 pass by inspection

Trellis Beams

$W_u = 15D$
 $25B$



D+8

$N = .24K$

$M = .666 K\text{-ft}$

$\Delta_T = 14.5/EI$

PT 4x6 HF#2-C'

$N_u = 1.54K$

$M_u = 1.29 K\text{-ft}$

$\Delta_T = .242' = X/545$



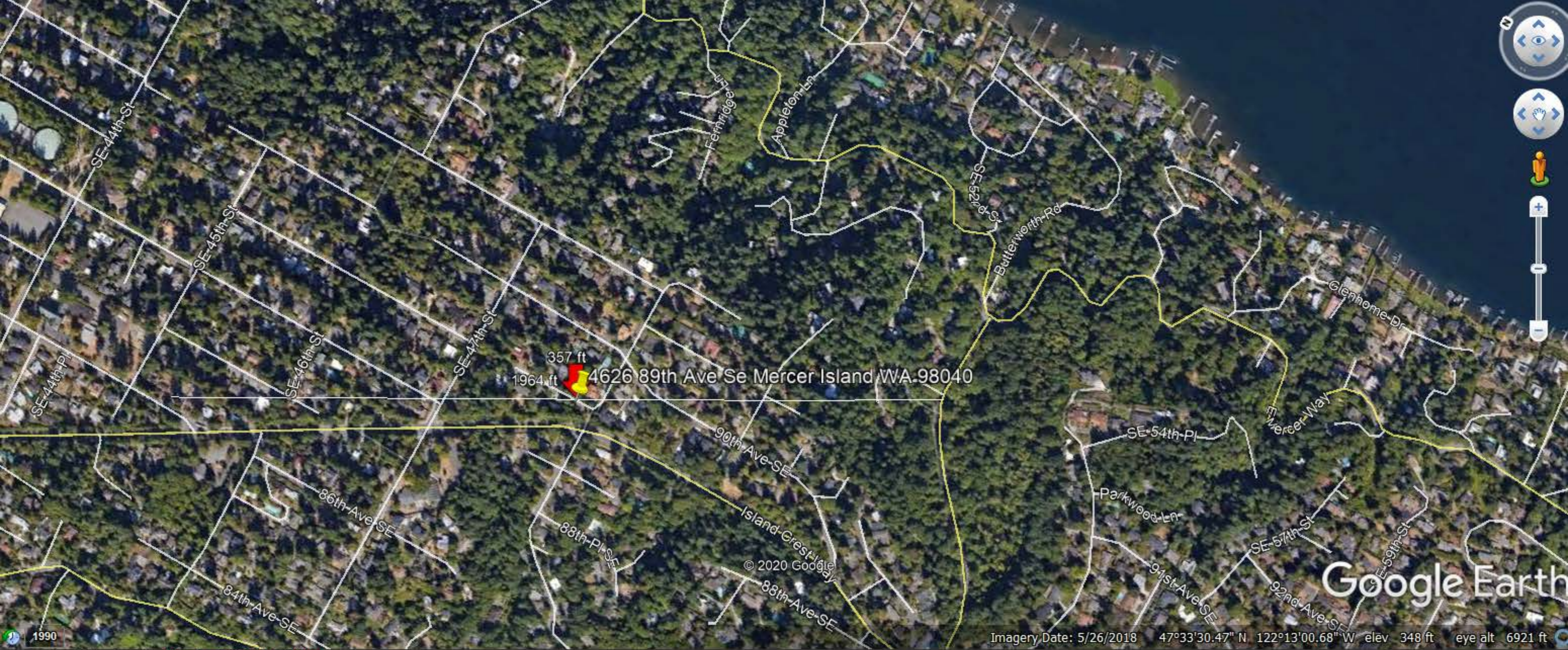
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_____ DATE _____

_____ PROJ. NO. _____

_____ DESIGN _____

_____ SHEET _____



357 ft
1964 ft
4626 89th Ave Se Mercer Island WA 98040

Graph: Min, Avg, Max Elevation: 183, 340, 365 ft
Range Totals: Distance: 0.71 mi Elev Gain/Loss: 77.8 ft, -250 ft Max Slope: 46.1%, -65.4% Avg Slope: 4.4%, -10.4%



Winds - Directional procedure

Exposure B

$K_{zt} = 1.23$

Base wind speed = 97 mph

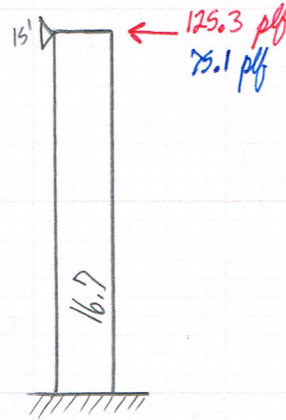
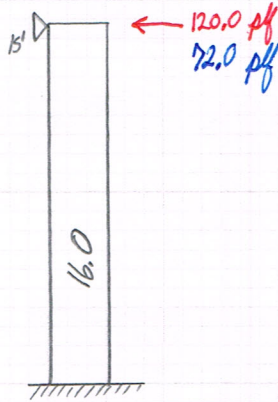
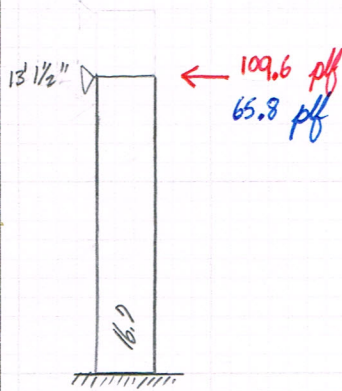
Red = 1.0 W
Blue = .6 W

Winds N/B

$L = 10'6"$ $B = 45'4\frac{1}{2}"$

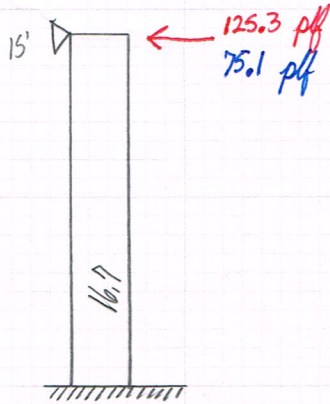
$L = 59'10\frac{1}{2}"$ $B = 45'4\frac{1}{2}"$

$L = 10'6"$ $B = 45'4\frac{1}{2}"$



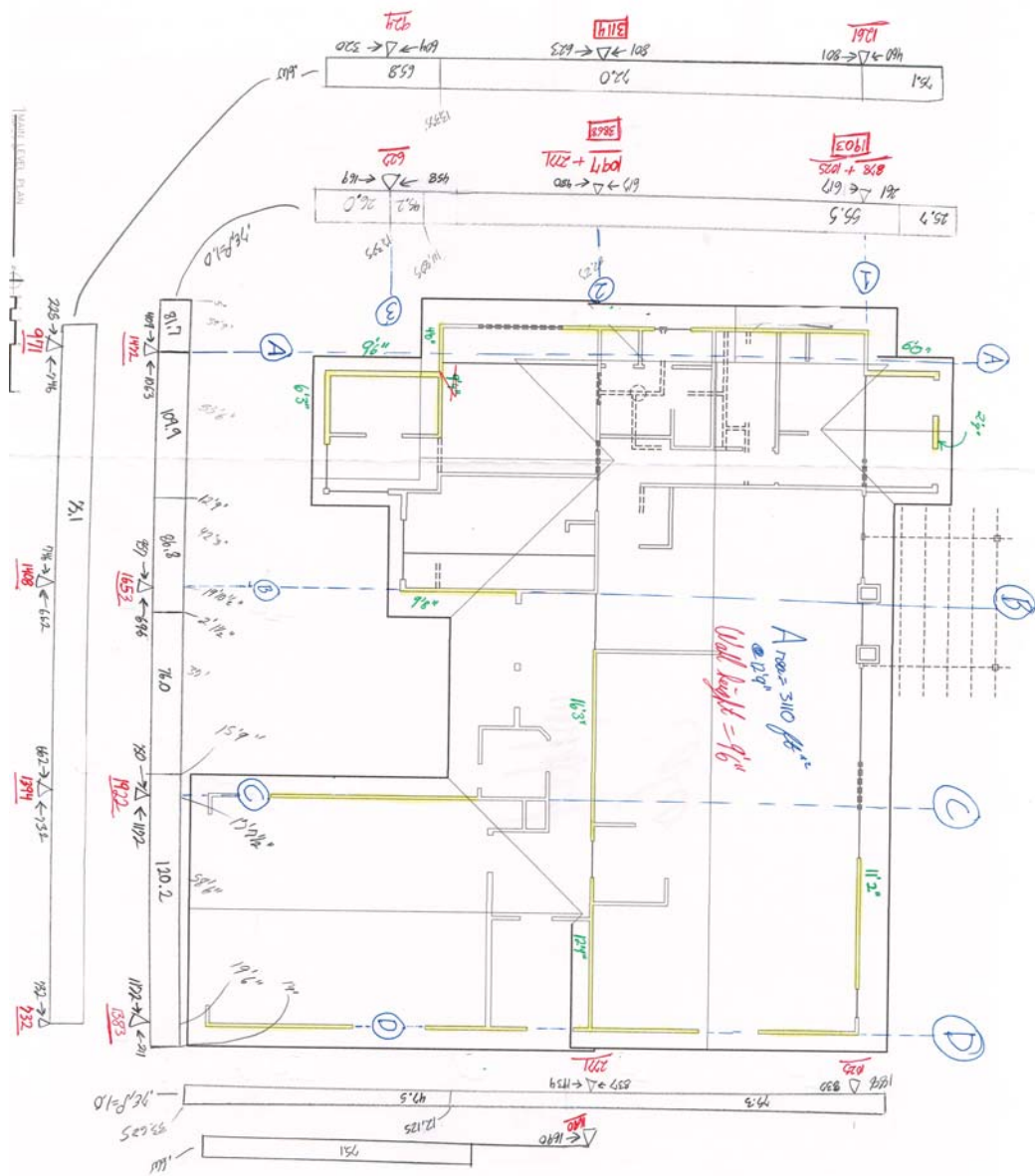
Winds E/W

$L = 38'10\frac{1}{2}"$ $B = 59'10\frac{1}{2}"$



NICKERSON
ENGINEERING

DATE _____
PROJ. NO. _____
DESIGN _____
SHEET _____



Seismic Design Loads (ASCE 7-16)

for a Wood Framed Structure

OCCUPANCY CAT. II Table 1.5-1
 IMP. FACTOR 1 Table 1.5-2
 SITE CLASS D Table 20.3-1
 R = 6.5 Table 12.2-1
 h = 34.5 ft

$S_s = 1.431$ <https://www.seismicmaps.org/>
 $S_1 = 0.44$ 2016 ASCE 7 Standard (<http://hazards.atcouncil.org>)
 $F_a = 1$ Table 11.4-1
 $F_v = 1.86$ Table 11.4-2
 $S_{DS} = 0.954$ Eqn. 11.4-3
 $S_{D1} = 0.5456$ Eqn. 11.4-4

Period, T = 0.28470449 Eqn. 12.8-7
 $T_s = 0.571907757$ Sec. 11.4.6
 $C_s = 0.146769231$ Eqn. 12.8-2
 $C_{smax} = 0.294826616$ Eqn. 12.8-3
 $C_{smin} = 0.01$ Eqn. 12.8-5

Base Shear, V = 6390 lbs (ASD)

Shearwalls	DL (psf)	A (sq.ft.)	W (#'s)	h_x (ft)	$W \cdot h_x$	C_{vx}	Lat. Load (lbs)
Roof (Main Floor Walls)	20	3110	62200	29	1803800	1	6390
			0		0	0	0
			0		0	0	0
		Sum=	62200	Sum=	1803800		

Diaphragm Forces (per ASCE 7-16 12.10.1.1)

level	lower limit	upper limit	sum F	sum W	calc'd force	Diaphragm Load (lbs)
Roof	8307.432	16614.86	6390	62200	6390.3	8307
3rd	0	0	6390	62200	0.0	0
2nd	0	0	6390	62200	0.0	0



Project:
 4626 89th Ave SE
 Mercer Island WA 98040

Date: 3/18/2021
 Project #: 20-077
 Design: JCC

Sheet: L1

**Shear Wall Lengths
Roof (Main Floor Walls)**

4626 89th Ave SE

	h_{max}	Lmin (Ft-In)	wall 1	wall 2	wall 3	wall 4	wall 5	wall 6	wall 7	wall 8	wall 9	L Total (Ft)
grid 1	9.5	2		11.16667								11.16666667
aspect ratio reduc		9		11.16667								11.16666667
grid 2	9.5	2	16.25									16.25
aspect ratio reduc		9	16.25									16.25
grid 3	9.5	2	6.25	4								10.25
aspect ratio reduc		9	6.25	3.368421								9.618421053
grid 4												0
aspect ratio reduc												0
grid 5												0
aspect ratio reduc												0
grid 6												0
aspect ratio reduc												0
grid A	9.5	2	9.5	6								15.5
aspect ratio reduc		9	9.5	6								15.5
grid B	9.5	2	9.666667									9.66666667
aspect ratio reduc		9	9.666667									9.66666667
grid C												0
aspect ratio reduc												0
grid D												0
aspect ratio reduc												0
grid E												0
aspect ratio reduc												0
grid F												0
aspect ratio reduc												0

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**4626 89th Ave SE
Mercer Island WA 98040**

Roof (Main Floor Walls)		story shears: Vs = 6390									
	grid	V _{seismic} (lbs)	V _{wind} (lbs)	∑ l _{wall} (ft)	v _{u,s} (plf)	v _{u,w} (plf)	SW	h (ft)	DL(lbs)	uplift (lbs)	holdown
E to W	1	1903	1261	11.16667	170	113	SW1	9.5	1018	601	NONE
	2	3868	3114	16.25	238	192	SW1	9.5	1268	994	HTT5
	3	627	924	9.618421	65	96	SW1	9.5	114	742	HTT5
	4										
	5										
	6										
N to S	A	1472	971	15.5	95	63	SW1	9.5	340	562	NONE
	B	1653	1408	9.666667	171	146	SW1	9.5	345	1280	HTT5
	C										
	D										
	E										
	F										